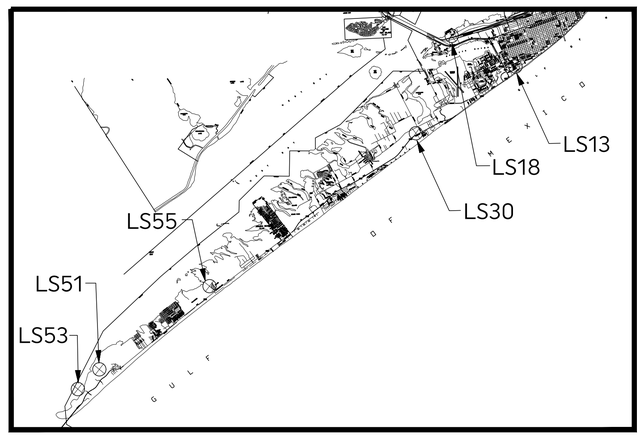
# CONSTRUCTION PLANS FOR

# LIFT STATION 13, ~~18~~, ~~30~~, 51, ~~53~~, & ~~55~~ IMPROVEMENTS

## TO SERVE

# CITY OF GALVESTON

# GALVESTON COUNTY, TX




JOB NO: COG-210 **VICINITY MAP** N.T.S. DATE: APRIL 2021


Engineering F-16194 | Surveying 10194049

ARCENEAUX WILSON & COLE
engineering | surveying | planning

2901 Turtle Creek Drive, Suite 320
Port Arthur, TX 77642

409 724 7888
awceng.com


STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/06/2021

RECEIVED BY:

CITY ENGINEER - CITY OF GALVESTON

BY: _____ DATE: _____

DANIEL CHRISTODOSS, PhD, P.E.


LAST PRINTED: Thursday, March 25, 2021 3:36:46 PM FROM: O:\1-ENGINEERING\1-PROJECTS\COG-210\4-DRAFTING\2-SHEETS\TITLE SHEET.dwg


CITY OF GALVESTON

MAYOR

Craig Brown

COUNCIL MEMBERS

ER Johnson

William Schuster

David Collins

Bill Quiroga

John Paul Listowski

Marie Robb

CITY MANAGER

Brian Maxwell

INDEX OF DRAWINGS


| SHEET | DESCRIPTION |
|---|---|
| 1 | TITLE SHEET |
| 2 | LEGEND AND CONSTRUCTION NOTES |
| 3 | LIFT STATION CONSTRUCTION NOTES |
| 4 | GENERAL SPECIFICATIONS |
| 5 | LIFT STATION 13 - EXISTING SITE PLAN |
| 6 | LIFT STATION 13 - PROPOSED SITE PLAN |
| 7 | LIFT STATION 13 - EXISTING PIPING PLAN AND SECTIONS |
| 8 | LIFT STATION 13 - PROPOSED PIPING PLAN AND SECTIONS |
| ~~9~~ | ~~LIFT STATION 18 - EXISTING SITE PLAN~~ |
| ~~10~~ | ~~LIFT STATION 18 - PROPOSED SITE PLAN~~ |
| ~~11~~ | ~~LIFT STATION 18 - EXISTING PIPING PLAN AND SECTIONS~~ |
| ~~12~~ | ~~LIFT STATION 18 - PROPOSED PIPING PLAN AND SECTIONS~~ |
| ~~13~~ | ~~LIFT STA~~ NOT IN THIS CONTRACT |
| ~~14~~ | ~~LIFT STATION 30 - EXISTING SITE PLAN~~ |
| ~~15~~ | ~~LIFT STATION 30 - PROPOSED SITE PLAN~~ |
| ~~16~~ | ~~LIFT STATION 30 - EXISTING PIPING PLAN AND SECTIONS~~ |
| ~~17~~ | ~~LIFT STATION 30 - PROPOSED PIPING PLAN AND SECTIONS~~ |
| ~~18~~ | ~~LIFT STATION 30 - PAVING PLAN~~ |
| 19 | LIFT STATION 51 - EXISTING SITE PLAN |
| 20 | LIFT STATION 51 - PROPOSED SITE PLAN |
| 21 | LIFT STATION 51 - EXISTING PIPING PLAN AND SECTIONS |
| 22 | LIFT STATION 51 - PROPOSED PIPING PLAN AND SECTIONS |
| 23 | LIFT STATION 51 - PAVING PLAN |
| ~~24~~ | ~~LIFT STATION 53 - EXISTING SITE PLAN~~ |
| ~~25~~ | ~~LIFT STATION 53 - PROPOSED SITE PLAN~~ |
| ~~26~~ | ~~LIFT STATION 53 - EXISTING PIPING PLAN AND SECTIONS~~ |
| ~~27~~ | ~~LIFT STATION 53 - PROPOSED PIPING PLAN AND SECTIONS~~ |
| ~~28~~ | ~~LIFT ST~~ NOT IN THIS CONTRACT |
| ~~29~~ | ~~LIFT STATION 55 - PROPOSED SITE PLAN~~ |
| ~~30~~ | ~~LIFT STATION 55 - EXISTING PIPING PLAN AND SECTIONS~~ |
| ~~31~~ | ~~LIFT STATION 55 - PROPOSED PIPING PLAN AND SECTIONS~~ |
| ~~32~~ | ~~LIFT STATION 55 - PAVING PLAN~~ |
| 33-34 | MISCELLANEOUS DETAILS |
| ~~35~~ | ~~LIFT STATION 18 PLATFORM DETAILS~~ |
| 36 | FENCING DETAILS |
| 37-42 | CITY OF GALVESTON DETAILS |
| 43-44 | TRAFFIC CONTROL PLANS |
| 45-80 | ELECTRICAL DRAWINGS |
| 1-10 | ELECTRICAL REFERENCE DRAWINGS |

# PLAN AND PROFILE LEGEND

## PLAN

### EXISTING

BACK OF CURB, INLET AND DIRECTION OF FLOW

WATERLINE, VALVE, FLUSHING VALVE, REDUCER, RELIEF VALVE AND PLUG

STORM SEWER, MANHOLE AND PLUG (SMALLER THAN 30")

STORM SEWER, MANHOLE AND PLUG (30" AND LARGER)

SANITARY SEWER, PLUG, MANHOLE, STACK AND CLEAN-OUT

DITCH AND DIRECTION OF FLOW

### PROPOSED

BACK OF CURB, INLET AND DIRECTION OF FLOW

(SIZE)

WATERLINE, VALVE, FLUSHING VALVE, REDUCER, RELIEF VALVE AND PLUG

(SIZE)

STORM SEWER, MANHOLE AND PLUG (SMALLER THAN 30")

(SIZE)

STORM SEWER, MANHOLE AND PLUG (30" AND LARGER)

(SIZE)

SANITARY SEWER, PLUG, WYE, MANHOLE, STACK AND CLEAN-OUT

DITCH AND DIRECTION OF FLOW

## MISCELLANEOUS PLAN

LOT LINE, STREET RIGHT OF WAY LINE

PROPERTY BOUNDARY LINE

EASEMENT LINE

1+00 2+00 3+00

CENTERLINE AND STATION MARKERS

1+00 2+00 3+00

BASELINE AND STATION MARKERS

X BARBED WIRE X
CLF CHAIN LINK CLF
IRON ROD
WOOD

EXISTING FENCES

EXISTING RAILROAD

GAS GAS GAS

GAS LINE

PL PL PL PL

PIPE LINE

T T T T

TELEPHONE LINE

18.0

CONTOUR LINE AND ELEVATION

DRAINAGE AREA BOUNDARY

1.8 / 2.5 ACRES C.F.S.

ACCUMULATED DRAINAGE AREA

1.8 / 2.5 ACRES C.F.S.

INLET DRAINAGE AREA

GUY ANCHOR UP

UTILITY POLE W/ GUY WIRE

UP

UTILITY POLE W/STREET LIGHT

BENCHMARK

BOUNDARY MARKER

SOIL BORE

EDGE OF ASPHALT PAVING

IP IP IP

INLET PROTECTION

SCF SCF SCF

SEDIMENT CONTROL FENCE

## PROFILE

### EXISTING

NATURAL GROUND

% GRADE TOP OF CURB

WATERLINE AND PLUG

SIZE AND % GRADE

STORM SEWER, MANHOLE AND PLUG

SIZE, TYPE AND % GRADE

SANITARY SEWER, PLUG MANHOLE, DROP CONN., STACK AND CLEAN-OUT

END VIEW OF ALL LINES

### PROPOSED

% GRADE TOP OF CURB

WATERLINE AND PLUG

SIZE, TYPE AND % GRADE

STORM SEWER, MANHOLE AND PLUG

SIZE, TYPE AND % GRADE

SANITARY SEWER, PLUG, MANHOLE, DROP CONN., STACK AND CLEAN-OUT

END VIEW OF ALL LINES

## LIST OF ABBREVIATIONS

| | |
|---|---|
| AC | ACRE |
| B/B | BACK TO BACK |
| ℄ | BASE LINE |
| BM | BENCH MARK |
| B.L. | BUILDING LINE |
| B.V. | BUTTERFLY VALVE |
| C.I. | CAST IRON |
| C/C | CENTER TO CENTER |
| ℄ | CENTERLINE |
| CONC | CONCRETE |
| CONC MON | CONCRETE MONUMENT |
| C.J. | CONCRETE JOINT |
| C.P.P. | CORRUGATED PLASTIC PIPE |
| X-SECT | CROSS-SECTION |
| C.Y. | CUBIC YARD |
| DIA | DIAMETER |
| DR. | DRIVE |
| D.I.P. | DUCTILE IRON PIPE |
| ESMT | EASEMENT |
| EB | ELECTRICAL BOX |
| EL ELEV | ELEVATION |
| ER | END RETURN |
| EQ SPA, ES | EQUALLY SPACED |
| EXIST | EXISTING |
| F.B. | FIELDBOOK |
| F.G. | FINISHED GRADE |
| F.H. | FIRE HYDRANT |
| F.S. | FIRE SPRINKLER |
| FL, ℄ | FLOW LINE (INVERT) |
| FT | FOOT, FEET |
| FND | FOUND |
| GALV | GALVANIZED |
| HWY | HIGHWAY |
| I.P., I.R. | IRON PIPE, IRON ROD |
| LT | LEFT (X-SECTION NOTES) |
| MH | MANHOLE |
| MAX | MAXIMUM |
| M.S.L | MEAN SEA LEVEL |
| MIN | MINIMUM |
| MON. | MONUMENT |
| NTS | NOT TO SCALE |
| NO. | NUMBER |
| O.C.E.W. | ON CENTER EACH WAY |
| PVMT | PAVEMENT |
| P.V.C. | POLYVINYL CHLORIDE |
| PROP | PROPOSED |
| RCB | REINFORCED CONCRETE BOX |
| RCP | REINFORCED CONCRETE PIPE |
| REQ'D | REQUIRED |
| RT | RIGHT (X-SECTION NOTES) |
| R.O.W. | RIGHT-OF-WAY |
| SPEC'D | SPECIFIED |
| SF | SQUARE FEET, FOOT |
| SS | STAINLESS STEEL |
| STA | STATION |
| STL | STEEL |
| ST. | STREET |
| TBM | TEMPORARY BENCH MARK |
| TC | TOP OF CURB |
| TP | TOP OF PAVEMENT |
| TYP | TYPICAL |
| UP | UTILITY POLE |
| VPI | VERTICAL POINT OF INFLECTION |
| WM | WATER METER |

## PROJECT DESCRIPTION

REHABILITATE LS#13, LS#18, LS#30, LS#51, LS#53, AND LS#55 INCLUDING INSTALLATION OF NEW PUMPS AND CONSTRUCTION OF NEW HEADER PIPING AT EACH EXISTING LIFT STATION.

## GENERAL CONSTRUCTION NOTES

1. ALL ROAD WIDTHS, CURB RADII, AND CURB ALIGNMENT SHOWN INDICATE BACK OF CURB.
2. ALL EXISTING UTILITIES ARE SHOWN AT APPROXIMATE DEPTHS. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY DEPTHS PRIOR TO CONSTRUCTION OF PROPOSED UTILITIES.
3. ALL DRIVEWAYS, SIDEWALKS, & HANDICAP ACCESSIBLE RAMPS NECESSARY TO BE REMOVED FOR UTILITY CONSTRUCTION SHALL BE REPLACED TO EQUAL OR BETTER THAN PRE-EXISTING CONDITIONS . ALL SIDEWALKS & HANDICAP ACCESSIBLE RAMPS SHALL BE CONSTRUCTED TO CURRENT ADA STANDARDS.
4. SPOIL FROM CONSTRUCTION SHALL BE DISPOSED OFFSITE PER SPECIFICATION 01564 WASTE MATERIAL DISPOSAL BY CONTRACTOR AT NO ADDITIONAL PAY.
5. LIFT STATION SITES ARE WITHIN FLOOD ZONE AE AND HAVE BASE FLOOD ELEVATIONS OF 10', 11', AND 12'.
6. PROFILE LINES SHOWN INDICATED EXISTING NATURAL GROUND PRIOR TO CLEARING AND GRUBBING.
7. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF ALL EXISTING FACILITIES INCLUDING FACILITIES WHICH MAY NOT BE SHOWN IN PLANS AT NO EXTRA COST.
8. CONTRACTOR WILL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION IN AREA OF POSSIBLE UNDERGROUND UTILITIES WHICH MAY NOT BE SHOWN ON DRAWING.
9. UNLESS OTHERWISE PROVIDED, THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR SUCH TESTS, INSPECTIONS AND APPROVALS WITH AN INDEPENDENT TESTING LABORATORY OR ENTITY ACCEPTABLE TO THE OWNER AND CONTRACTOR SHALL BEAR ALL RELATED COSTS OF TESTS, INSPECTIONS AND APPROVALS. THE CONTRACTOR SHALL GIVE THE ENGINEER TIMELY NOTICE OF WHEN AND WHERE TESTS AND INSPECTIONS ARE TO BE MADE SO THAT THE ENGINEER MAY BE PRESENT FOR SUCH PROCEDURES.
10. CONTRACTOR SHALL NOTIFY CITY OF GALVESTON BY EMAIL TO PUBLICWORKS@GALVESTONTX.GOV AND CALL TO 409-797-3630 48 HOURS IN ADVANCE OF SHUTTING DOWN ANY ROADS OR ALLEYS. THE STANDARD FORM FOR REPORTING ROAD CLOSURES SHALL BE OBTAINED FROM PUBLIC WORKS AT THE PRE-CONSTRUCTION MEETING PRIOR TO ANY ROAD CLOSURES .
11. THE FOLLOWING IS A LIST OF CONTACTS:

| | |
|---|---|
| TEXAS GAS SERVICE | 1-800-700-2443 |
| CENTER POINT ENERGY | CURTIS NEWBERRY<br>409-765-4022 |
| SOUTHWESTERN BELL (GALVESTON) | 800-235-9800 |
| AT&T | 1-800-246-8464 |
| COMCAST CABLE | 713-335-3273 |
| CITY OF GALVESTON WATER AND SEWER | MR. ROBERT DIAZ<br>409-797-3963 |
| CITY OF GALVESTON PUBLIC WORKS | 409-797-3630 |
| GALVESTON FIRE DEPARTMENT #1 GFD #1 FIRE CHIEF | MR. CHARLIE OLSEN<br>409-797-3850 |
| GALVESTON ISD WATER AND SEWER MAINTENANCE | MR. PAUL BYERS<br>409-692-394 |
| TEXAS ONE CALL SYSTEM | 1-800-245-4545 |
| DIG-TESS | 1-800-344-8377 |
| TEXAS DEPARTMENT OF TRANSPORTATION | JOEL H. CLARKE, PE<br>409-978-2502 |

12. DEPICTED QUANTITIES ARE APPROXIMATE ONLY. BIDDING CONTRACTORS SHALL PERFORM THEIR OWN TAKE-OFF/ESTIMATE FOR BIDDING PURPOSES. CITY OF GALVESTON SHALL ONLY PAY FOR APPROVED WORK.

## TRAFFIC CONTROL PLAN GENERAL NOTES

1. TRANSITION BETWEEN PAVEMENT ELEVATIONS THROUGH CONSTRUCTION AREAS TO ACCESS DRIVEWAYS OR INTERSECTIONS SHALL BE THE CONTRACTOR'S RESPONSIBILITY. AFTER EACH WORK DAY THE CONTRACTOR SHALL BACKFILL TRENCH TO MATCH EXIST. ROAD GRADE OR AS DIRECTED BY THE ENGINEER/INSPECTOR.
2. THE CONTRACTOR SHALL PROVIDE ACCESS TO INTERSECTING STREETS AND TO PROPERTIES AND BUSINESSES ADJACENT TO THE RIGHT OF WAY AND MAINTAIN AT ALL TIMES UNLESS OTHERWISE DIRECTED AND APPROVED BY THE ENGINEER/INSPECTOR. THE CONTRACTOR WILL CONTACT THE BUSINESS OR PROPERTY OWNER AT LEAST FIVE (5) DAYS IN ADVANCE OF THE DRIVEWAY CLOSURE. IF THE PROPERTY HAS MORE THAN ONE DRIVEWAY, ONLY ONE ACCESS SHALL BE CLOSED AT A TIME. IF CLOSURE OF A SINGLE ACCESS TO ANY BUSINESS IS REQUIRED, THIS ACTIVITY SHALL BE PERFORMED DURING AN OFF-PEAK HOURS OR AS DIRECTED AND APPROVED BY THE ENGINEER/INSPECTOR.
3. THE CONTRACTOR MAY CLOSE A MAXIMUM OF ONE (1) INTERSECTION AT A TIME.
4. CONTRACTOR MAY CLOSE NO MORE THAN THREE (3) RESIDENTIAL DRIVEWAYS AT ANY TIME.
5. THE CONTRACTOR WILL BE RESTRICTED TO THE FOLLOWING TIME SCHEDULE:
   MONDAY TO FRIDAY: 8:30 AM TO 4:30 PM
   SATURDAY: 8:00 AM TO 6:00 PM
   SUNDAY 10:00 AM TO 6:00 PM
6. THE CONTRACTOR MAY, WITH THE APPROVAL OF AND AS DIRECTED BY THE ENGINEER, BE REQUIRED TO VARY THE NUMBER AND LOCATION OF SIGNS AND BARRICADES FROM THAT INDICATED ON THE PLANS.
7. THE CONTRACTOR SHALL NOT HAVE EXCLUSIVE USE OF THE RIGHT OF WAY, BUT SHALL COOPERATE IN THE USE OF THE RIGHT OF WAY WITH THE CITY OF GALVESTON IN THE EVENT OF UNFORESEEN UTILITY ADJUSTMENTS. THE CONTRACTOR SHALL PROSECUTE WORK IN SUCH A MANNER AND SEQUENCE AS TO ALLOW THE ADJUSTMENT TO BE MADE.
8. ALL CONSTRUCTION TRAFFIC SHALL BE REGULATED SO AS TO CAUSE A MINIMUM INCONVENIENCE TO THE TRAVELING PUBLIC AT ALL TIMES. AT TIMES WHEN IT IS NECESSARY FOR TRUCKS TO STOP, UNLOAD OR CROSS ROADWAY UNDER TRAFFIC, WARNING SIGNS AND CERTIFIED FLAGGERS SHALL BE PROVIDED AS NECESSARY TO ADEQUATELY PROTECT PUBLIC TRAVEL.
9. SIGNS, BARRICADES, ETC., LISTED HEREON ARE CONSIDERED TO BE THE MINIMUM REQUIRED FOR TRAFFIC HANDLING IN THIS PROJECT.
10. ALL TRAFFIC CONTROL WORK AND DEVICES SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (T.M.U.T.C.D.)
11. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR THE WORK REQUIRED BY THESE PROVISIONS. SUCH WORK SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS ITEMS FOR WHICH BIDS ARE REQUIRED AND ITS COST INCLUDED IN THE UNIT PRICE BID, EXCEPT AS OTHERWISE SHOWN IN THE PLANS.
12. THE STAGES HAVE BEEN DEVELOPED TO ACCOMMODATE THE NEW STORM SEWER SYSTEM CONSTRUCTION AND PROVIDE FOR EXISTING DRAINAGE TO FUNCTION DURING CONSTRUCTION. THE CONTRACTOR SHALL INSURE CONTINUED DRAINAGE THROUGHOUT CONSTRUCTION.
13. CHANNELIZING DEVICES SHALL USE MAXIMUM SPACING AS SHOWN BY TxDOT BARRICADE AND CONSTRUCTION PLANS AS SHOWN IN TECHNICAL SPECIFICATIONS.
14. CONTRACTOR SHALL NOTIFY CITY OF GALVESTON AT LEAST 24 HOURS BEFORE INITIAL TRAFFIC CONTROL OR BEFORE RELOCATING TRAFFIC CONTROL.

## SEPARATION DISTANCES

(30TAC-CHAPTER 217.53, SUBSECTION (d), PRINTED 12/4/15)

THE FOLLOWING RULES APPLY TO SEPARATION DISTANCE BETWEEN POTABLE WATER AND WASTEWATER TREATMENT PLANTS, AND WATERLINES AND SANITARY SEWERS.

(A) WATER LINE/NEW SEWER LINE SEPARATION. WHEN NEW SANITARY SEWERS ARE INSTALLED, THEY SHALL BE INSTALLED NO CLOSER TO WATER LINES THAN NINE FEET IN ALL DIRECTIONS. SEWERS THAT PARALLEL WATERLINES MUST BE INSTALLED IN SEPARATE TRENCHES. WHERE THE NINE FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE FOLLOWING GUIDELINES WILL APPLY:

(1) WHERE A SANITARY SEWER PARALLELS A WATERLINE, THE SEWER SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC MEETING ASTM SPECIFICATIONS WITH A PRESSURE RATING FOR BOTH THE PIPE AND JOINTS OF 150 PSI. THE VERTICAL SEPARATION SHALL BE A MINIMUM OF TWO FEET BETWEEN OUTSIDE DIAMETERS AND THE HORIZONTAL SEPARATION SHALL BE A MINIMUM OF FOUR FEET BETWEEN OUTSIDE DIAMETERS. THE SEWER SHALL BE LOCATED BELOW THE WATERLINE.

(2) WHERE A SANITARY SEWER CROSSES A WATERLINE AND THE SEWER IS CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC WITH A MINIMUM PRESSURE RATING OF 150 PSI, AN ABSOLUTE MINIMUM DISTANCE OF 6 INCHES BETWEEN OUTSIDE DIAMETERS SHALL BE MAINTAINED. IN ADDITION THE SEWER SHALL BE LOCATED BELOW THE WATERLINE WHERE POSSIBLE AND ONE LENGTH OF THE SEWER PIPE MUST BE CENTERED ON THE WATERLINE.

(3) WHERE A SEWER CROSSES UNDER A WATERLINE AND THE SEWER IS CONSTRUCTED OF ABS TRUSS PIPE, SIMILAR SEMI-RIGID PLASTIC COMPOSITE PIPE, CLAY PIPE OR CONCRETE PIPE WITH GASKET JOINTS, A MINIMUM TWO FOOT SEPARATION DISTANCE SHALL BE MAINTAINED. THE INITIAL BACKFILL SHALL BE CEMENT STABILIZED SAND (TWO OR MORE BAGS OF CEMENT PER CUBIC YARD OF SAND) FOR ALL SECTIONS OF SEWER WITHIN NINE FEET OF THE WATERLINE. THIS INITIAL BACKFILL SHALL BE FROM ONE QUARTER DIAMETER BELOW THE CENTERLINE OF THE PIPE TO ONE PIPE DIAMETER (BUT NOT LESS THAN 12 INCHES) ABOVE THE TOP OF THE PIPE.

(4) WHERE A SEWER CROSSES OVER A WATERLINE ALL PORTION OF THE SEWER WITHIN NINE FEET OF THE WATERLINE SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC PIPE WITH A PRESSURE RATING OF AT LEAST 150 PSI USING APPROPRIATE ADAPTERS. IN LIEU OF THIS PROCEDURE THE NEW CONVEYANCE MAY BE ENCASED IN A JOINT OF 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THAN THE NEW CONVEYANCE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT 5 FEET INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. THE ENCASEMENT PIPE SHOULD BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR MANUFACTURED SEAL.

(B) WATER LINE/MANHOLE SEPARATION. UNLESS SANITARY SEWER MANHOLE THE CONNECTING SEWER CAN BE MADE WATERTIGHT AND TESTED FOR NO LEAKAGE, THEY MUST BE INSTALLED SO AS TO PROVIDE A MINIMUM OF NINE FEET OF HORIZONTAL CLEARANCE FROM AN EXISTING OR PROPOSED WATERLINE. WHERE THE NINE FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, A CARRIER PIPE AS DESCRIBED IN SUBSECTION (A) (4) OF THIS SECTION MAY BE USED WHERE APPROPRIATE.

## UTILITY NOTES (CITY OF GALVESTON)

1. THE ACCURATE LOCATION OF ALL UTILITIES, STRUCTURES, LANDSCAPING, IRRIGATION, ETC., AS SHOWN IS APPROXIMATE AND ALL MAY NOT BE SHOWN ON THE PLANS, QUANTIFIED ON THE BID FORMS, OR DETAILED IN THE SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THE MATERIAL, SIZE, LOCATION, QUANTITY, AND OTHER DETAILS OF ALL OBJECTS INCLUDING PIPELINES, STRUCTURES, CONDUITS, CABLES, SURFACE, SUBSURFACE AND ENVIRONMENTAL CONDITIONS (EX: WATER DEPTH, ABANDONED DUCT BANKS, RAIL, CONCRETE BLOCKS), ETC.
2. THE OF GALVESTON REQUIRES THE CONTRACTOR TO PRE-LOCATE, PRE-VERIFY AND PRE-INVESTIGATE ALL UTILITIES, OBSTRUCTIONS AND SURFACE AND SUBSURFACE ENVIRONMENTAL CONDITIONS (SHOWN OR NOT SHOWN) BEFORE CONSTRUCTION OF THIS PROJECT, BY WHATEVER METHOD, SUBJECT TO APPROVAL BY THE OWNER WHICH INCLUDES BUT NOT LIMITED TO THE FOLLOWING:
   (A) UTILIZATION OF METER DETECTION EQUIPMENT AND PROBES.
   (B) EXCAVATION, EX: HYDROVAC POT HOLING
   (C) OPENING MANHOLES TO DETERMINE FLOW LINES OF STORM PIPES AND SANITARY SEWER
   (D) MEASURING THE DEPTH TO VALVE NUT AND ADDING 18" TO DETERMINE THE DEPTH TO WATERLINES.
   (E) PROBING TO IDENTIFY SPRINKLERS, STORM SYSTEMS, WATER/SANITARY SERVICES, ETC.
   (F) SUBSURFACE UTILITY INVESTIGATION (SUE) LEVEL A THROUGH D SURVEY WHICH INCLUDES I THRU V.
3. ALL INVESTIGATIVE WORK DONE AND ALL REPAIRS REQUIRED AFTER INVESTIGATION SHALL BE ACCOMPLISHED BY THE CONTRACTOR (NO SEPARATE PAY).
4. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR INCREASE IN COST, DELAYS IN SCHEDULE, IMPACT TO THE PUBLIC, CHANGES IN THEIR CONSTRUCTION SCOPE, INCLUDING ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UTILITIES, STRUCTURES AND OTHER OBSTRUCTIONS
5. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES THROUGH AND '811 CALL BEFORE YOU DIG AT LEAST 14 CALENDAR DAYS PRIOR TO CONSTRUCTION IN AREA OF KNOWN AND UNKNOWN UTILITIES WHICH MAY OR MAY NOT BE SHOWN ON THE PLANS.
6. IF THE CONTRACTOR REQUESTS THE CITY STAFF TO ASSIST WITH LOCATING UTILITIES, STRUCTURES OR OTHER SURFACE AND BELOW GROUND FEATURES, THE CITY WILL INVOICE THE CONTRACTOR FULLY FOR SUCH SERVICES, AND COST WILL BE DEDUCTED FROM THE CONTRACTOR'S PAY ESTIMATES.

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com


STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/06/2021

# CITY OF GALVESTON

GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS

LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LEGEND AND CONSTRUCTION NOTES

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/CDP | 2 |


LAST PRINTED: Thursday, March 25, 2021 1:36:56 PM FROM: O:\-ENGINEERING\1-PROJECTS\COG-21\04-DRAFTING\2-SHEETS\LEGEND AND CONSTRUCTION NOTES.dwg

## LIFT STATION CONSTRUCTION NOTES

1. THE LOCATION OF ALL UTILITIES (WATER, TELEPHONE, ELECTRICAL, GAS, ETC.) IS THE RESPONSIBILITY OF THE CONTRACTOR. THE UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY AND ARE NOT INTENDED TO SHOW THE EXACT LOCATION OF THE UTILITIES. THE CONTRACTOR SHALL GIVE EACH UTILITY OWNER THE REQUIRED NOTICE PRIOR TO BEGINNING CONSTRUCTION NEAR EACH UTILITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESOLVING ANY DISPUTES WITH THE UTILITY OWNERS REGARDING DAMAGE TO THE UTILITIES. THE OWNER SHALL NOT BE RESPONSIBLE FOR DAMAGE TO EXISTING UTILITIES.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS OF THE JOB SITE. ANY VARIATION FROM DIMENSIONS OR DETAILS AS SHOWN ON THE DRAWINGS SHALL BE REPORTED TO THE ENGINEER.
3. THE CONTRACTOR SHALL KEEP ALL WORK SITES IN A NEAT, ORDERLY AND SAFE MANNER DURING THE CONSTRUCTION. ALL EXCESS SOILS AND MATERIALS SHALL BE DISPOSED OF ON A REGULAR BASIS OR WHENEVER, IN THE OPINION OF THE OWNER/ENGINEER, THEY CONSTITUTE A HAZARD OR NUISANCE. DISPOSAL OF EXCESS SOILS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE PROJECT SITE AT AN OFFSITE DISPOSAL AREA IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL LAWS. ON SITE BURNING WILL NOT BE ALLOWED. ALL WORK AREAS AND SURFACES DISTURBED BY THE CONTRACTOR SHALL BE CLEANED AND RESTORED TO THEIR ORIGINAL CONDITION OR BETTER PRIOR TO THE CONTRACT BEING CONSIDERED COMPLETE. ALL MATERIALS DESIGNATED TO BE SALVAGED TO THE OWNER SHALL BE DEPOSITED IN AN OWNER APPROVED SITE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING GENERAL SAFETY AT AND ADJACENT TO THE PROJECT AREA, INCLUDING THE PERSONAL SAFETY OF THE CONSTRUCTION CREW AND GENERAL PUBLIC AND THE SAFETY OF PUBLIC AND PRIVATE PROPERTY.
5. TRENCH PROTECTION IN ACCORDANCE WITH THE SPECIFICATIONS SHALL BE USED WHERE EXCAVATIONS ARE DEEPER THAN FIVE (5) FEET DEEP OR IF THE TRENCH IS LESS THAN (5) FEET DEEP AND IN A DANGEROUS CONDITION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SHORING OF OPEN PITS AS REQUIRED BY OSHA AND THE SPECIFICATIONS.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF GROUND WATER IN TRENCHES AND PITS. PAYMENT FOR GROUND WATER CONTROL SHALL BE INCIDENTAL TO THE APPROPRIATE BID ITEMS UNLESS OTHERWISE PROVIDED FOR IN THE CONTRACT DOCUMENTS.
7. IF UNSTABLE OR WET SOIL CONDITIONS ARE ENCOUNTERED IN THE TRENCH BOTTOM, THE CONTRACTOR SHALL CEASE WORK AND STABILIZE THE UNSTABLE AREA ACCORDING TO THE METHOD CALLED FOR IN THE SPECIFICATIONS AT NO ADDITIONAL COST TO THE OWNER UNLESS A PAY ITEM IS PROVIDED IN THE CONTRACT. THE CONTRACTOR MUST OBTAIN THE APPROVAL OF THE ENGINEER PRIOR TO PLACEMENT OF SUCH MATERIAL.
8. THE CONTRACTOR SHALL MAINTAIN ADEQUATE DRAINAGE THROUGHOUT THE LIMITS OF THE PROJECT DURING ALL CONSTRUCTION PHASES.
9. IF AN OPEN PIT IS TO BE LEFT UNBACKFILLED OVERNIGHT, ALL OPEN PIPES IN THE PIT SHALL BE PLUGGED. OPEN PITS SHALL BE BARRICADED AND ROPED OFF AND WARNING SIGNS SHALL BE PLACED DIRECTING PEDESTRIAN TRAFFIC AROUND THE PIT. IF AN OPEN PIT IS LEFT OVERNIGHT IN THE ROADWAY, LIGHTED SIGNS SHALL BE USED IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AS ADOPTED BY TXDOT. NO DRIVEWAY OR INTERSECTION SHALL BE LEFT BLOCKED OVERNIGHT BY THE CONTRACTOR'S OPERATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MAINTENANCE OF THE TRAVEL WAY AND APPURTENANCES WITHIN THE BARRICADES FOR THE DURATION OF THE PROJECT.
10. THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT SOIL, ROCK, AND OTHER EXCAVATION MATERIAL FROM BEING WASHED INTO THE DITCHES AND DRAINAGE WAYS. ALL DRAINAGE STRUCTURES SHALL BE CLEANED AND OUTFALL CHANNELS UNOBSTRUCTED AT THE TIME OF ACCEPTANCE BY THE OWNER. THE ENGINEER AND OWNER SHALL HAVE THE RIGHT TO REQUIRE THAT THE CONTRACTOR REMEDY ANY SITUATION CONSIDERED DETRIMENTAL TO PUBLIC HEALTH, SAFETY, THE ENVIRONMENT AND WHICH IS CAUSED BY THE CONTRACTOR'S WORK.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION OF ALL PROPERTY MARKERS DISTURBED DURING CONSTRUCTION.
12. THE CONTRACTOR SHALL NOTIFY THE LOCAL TXDOT OFFICE AT LEAST 48 HOURS PRIOR TO BEGINNING WORK IN THE TXDOT RIGHT OF WAY.
13. TRAFFIC CONTROL PLAN. THE CONTRACTOR SHALL MAINTAIN AT LEAST ONE LINE OF TRAFFIC OPEN AT ALL TIMES WHEN WORKING WITHIN OR CROSSING A PUBLIC ROAD RIGHT-OF-WAY, UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL PREPARE AND FURNISH A TRAFFIC CONTROL PLAN, FOR ALL WORK AREAS, TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION ACTIVITIES. ALL WORK SHALL BE LIMITED TO CITY RIGHT-OF-WAY AND CITY EASEMENTS. THE CONTRACTOR SHALL NOTIFY THE CITY OF ALL STREET OR LANE CLOSURES AND CONSTRUCTION SCHEDULES.
14. THE CONTRACTOR SHALL CONFINE HIS OPERATIONS TO THE INDICATED EASEMENTS AND RIGHTS OF WAYS.
15. ALL DISTURBED AREAS OF THE PROJECT SITE AND CITY/COUNTY/TXDOT RIGHT-OF-WAY SHALL BE BROADCAST SEEDED IN ACCORDANCE WITH THE SPECIFICATIONS. ANY DAMAGE TO EXISTING FACILITIES OR GROUND SURFACES BY THE CONTRACTOR WILL BE REPLACED TO ITS ORIGINAL CONDITION BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
16. ANY ASPHALT OR CONCRETE DRIVEWAY OR ROAD DISTURBED AS A RESULT OF THE WORK SHALL BE RESTORED TO THEIR ORIGINAL CONDITION OR BETTER AT NO ADDITIONAL COST TO THE OWNER. IF NECESSARY, THE CONTRACTOR SHALL TEMPORARILY USE FLEXIBLE BASE LIMESTONE IN PLACE OF THE ASPHALT OR CONCRETE PAVEMENT IN ORDER TO MAINTAIN SAFE TRAFFIC FLOW. THE ASPHALT OR CONCRETE PAVEMENT SHALL BE REPLACED AS SOON AS POSSIBLE.
17. THE CONTRACTOR SHALL SAW CUT EXISTING CURB AND GUTTER, PAVEMENT, DRIVEWAYS, AND SIDEWALKS AT AREAS WHERE PAVEMENT OR CONCRETE IS TO BE REMOVED. PAVEMENT REPLACEMENT WILL BE CONSIDERED SUBSIDIARY TO THE PRICE BID FOR LINEAR FEET OF SEWER REHABILITATION WORK OR NEW CONSTRUCTION.
18. ANY SIGNS OR POSTS DAMAGED BY THE CONTRACTOR SHALL BE REPLACED AT HIS ENTIRE EXPENSE. THERE WILL BE NO DIRECT PAYMENT FOR THIS WORK, BUT IT SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS OF THE CONTRACT.
19. THE REMOVAL OF OCCASIONAL TREES AND BRUSH WITHIN THE LIMITS OF THE PROJECT SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS UNLESS SPECIFICALLY INDICATED IN THE BID ITEMS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATION OF EXISTING LANDSCAPING SURFACES AND FOLIAGE. THE CONTRACTOR SHALL ATTEMPT TO SAVE ALL TREES. TREES REQUIRING TRIMMING SHALL BE TRIMMED WITH A TREE SAW ONLY BY LICENSED TREE TRIMMING COMPANY EMPLOYING A CERTIFIED ABORIST.
20. UPON COMPLETION OF CONSTRUCTION, FINISHED GRADES WILL BE BROUGHT BACK TO PRE-CONSTRUCTION CONDITIONS UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER OR NOTED ON THE PLANS.
21. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR NECESSARY WHEN ENCOUNTERING PUBLIC OR PRIVATE ROAD REMOVAL AND REPLACEMENT, CULVERT REMOVAL AND REPLACEMENT, AND REMOVAL AND REPLACEMENT OF UTILITIES ON PRIVATE PROPERTY FOR THIS PROJECT. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO THE INSTALLATION OF THE IMPROVEMENTS AND NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE.
22. ALL CONCRETE SHALL BE 4000 PSI CONCRETE UNLESS INDICATED OTHERWISE.
23. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE OWNERS SPECIFICATIONS FOR WATER AND SANITARY SEWER, EXCEPT WHERE MODIFIED IN THESE PLANS OR IN THE SPECIFICATIONS OF THE CONTRACT DOCUMENTS.
24. ALL MANHOLE TOPS SHALL BE FLUSH WITH THE PAVEMENT. THE INVERT OF EACH MANHOLE SHALL BE RESHAPED WITH NON-SHRINK GROUT AS NECESSARY TO PROVIDE A SMOOTH TRANSITION TO THE EFFLUENT SEWER LINE.
25. IN ALL CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL FITTINGS AND APPURTENANCES NECESSARY FOR A COMPLETE INSTALLATION EVEN IF NOT SPECIFICALLY MENTIONED.
26. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE SEWER SYSTEM IN SERVICE AT ALL TIMES. THE CONTRACTOR SHALL PROVIDE FOR ANY TEMPORARY PUMPING NECESSARY TO PREVENT DISRUPTION OF SEWER SERVICE. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR COORDINATING WITH ALL PRIVATE PROPERTY OWNERS REGARDING ANY DISRUPTION OF SEWER SERVICE. SEE ALSO BY-PASS PUMPING.

## LIFT STATION CONSTRUCTION NOTES

GENERAL SCOPE

LIFT STATION IS TO BE REHABILITATED IN-PLACE INCLUDING THE FOLLOWING CONSTRUCTION AND IMPROVEMENTS:

1. REMOVE/REPLACE THE EXISTING PUMPS WITH NEW PUMPS INCLUDING NEW PUMPS; BASE ELLS; PUMP RAILS; STAINLESS STEEL PUMP RAILS, STAINLESS STEEL CHAINS; PUMP CHORDS; ETC.
   a. ALL PROPOSED PUMPS SHALL BE MODY, FLYGT, OR ENGINEER PRIOR APPROVED EQUIVALENT.
      -Mody Pumps-IPS Pump Services (Bobby Dillard 832-867-9266)
      -Flygt Pumps-Hahn Equipment (Eric Prescott 713-868-3255)
2. THE EXISTING LIFT STATION PUMPS ARE TO BE REPLACED WITH NEW PUMPS AS SPECIFIED INCLUDING NEW GUIDE RAILS.
3. PROVIDE BY-PASS PUMPING REQUIRED DURING LIFT STATION REHABILITION.
4. LIFT STATION WET WELL REHABILITATION TO INCLUDE BUT NOT BE LIMITED TO:
   a. CLEANING;
   b. EXISTING GROUT REMOVED/REPLACED;
   c. ALL STRUCTURAL REPAIRS MADE TO THE STRUCTURE;
   d. THE EXISTING LINING REMOVED AND REPLACED WITH NEW SPECTRASHIELD LINING;
   e. REPLACE/INSTALL NEW FALL PROTECTION IN ALL WET WELLS.
5. PIPING REPLACEMENT TO INCLUDE:
   a. REMOVAL AND REPLACEMENT OF ALL EXISTING PIPING WITHIN THE WET WELL. NEW PIPING TO BE INSTALLED AS SHOWN ON THE PLANS.
   b. ABANDONMENT OF VALVE VAULT. REMOVAL AND REPLACEMENT OF ALL EXISTING PIPING THE VALVE VAULT AS SHOWN ON THE PLANS. WHERE SHOWN, NEW DISCHARGE PIPING IS TO BE EXTENDED THROUGH THE WET WELL TOP. DISCHARGE MANIFOLD PIPING IS TO BE INSTALLED ON TOP OF VALVE VAULT, AND THE VALVE VAULT IS TO BE ABANDONED IN PLACE.

      TO ABANDON THE VALVE VAULT, THE WALL PENETRATIONS ARE TO BE SEALED; THE HATCH(ES) REMOVED; THE VALVE VAULT IS TO BE FILLED WITH FLOWABLE FILL; AND THE OPEN CONCRETE TOP CLOSED AS SHOWN.

   c. REUSE OF VALVE VAULT. REMOVE/REPLACE ALL EXISTING PIPING WITHIN THE VALVE VAULT AS SHOWN ON THE PLANS.
   d. ALL NEW DISCHARGE PIPING TO INCLUDE A BYPASS PUMP CONNECTION AS SHOWN. THE BYPASS PUMP CONNECTION WILL INCLUDE A 6-INCH QUICK-CONNECT HOSE CONNECTION WITH CAP AND 6-INCH PLUG VALVE.
   e. A NEW BYPASS PUMP SUCTION PIPE IS TO BE INSTALLED IN THE WET WELL AS SHOWN. THE UPPER END OF THE SUCTION PIPE IS TO INCLUDE A 6-INCH QUICK-CONNECT HOSE CONNECTION WITH CAP AS SHOW.
   f. ALL SUBSURFACE PIPING LOCATED IN THE WET WELL SHALL BE REMOVED/REPLACED WITH 316L STAINLESS STEEL PIPING.
6. WHERE INDICATED ON THE SITE PLAN, THE ENTIRE LIFT STATION SITE WITHIN THE FENCED AREA IS TO BE GRADED AND CONCRETE PAVED.
7. WHERE INDICATED ON THE SITE PLAN, INSTALL A NEW OR REMOVE/REPLACE THE EXISTING ELECTRICAL SUPPORT STRUCTURE.
8. ELECTRICAL IMPROVEMENTS INCLUDE:
   a. REMOVE/REPLACE THE EXISTING ELECTRICAL AND CONTROLS ON THE EXISTING OR NEW ELECTRICAL SUPPORT STRUCTURE, AS INDICATED. ALL LIFT STATIONS WILL BE MADE SCADA READY AS PART OF THE ELECTRICAL IMPROVEMENTS.

BYPASS PUMPING

4. CONTRACTOR TO PROVIDE AUTOMATIC BYPASS PUMPING THROUGHOUT THE ENTIRE TIME A LIFT STATION IS OUT OF SERVICE FOR UPGRADES.
5. CONTRACTOR MAY UTILIZE THE EXISTING PUMPS IN TEMPORARY SERVICE PROVIDED ADEQUATE ROOM IS AVAILABLE OR PROVIDE AUTOMATIC PORTABLE PUMPS TO PROVIDE BYPASS PUMPING. IF EXISTING PUMPS ARE USED, TEMPORARY POWER AND CONTROL IS THE RESPONSIBILITY OF THE CONTRACTOR. NEW PUMPS CANNOT BE USED FOR BYPASS PUMPING.
6. **CONTRACTOR IS RESPONSIBLE FOR ALL PIPING, VALVES, OPERATION, ETC. REQUIRED FOR BYPASS PUMPING.**
7. **CONTRACTOR IS RESPONSIBLE FOR 24 HOUR 7 DAYS A WEEK OPERATION OF BYPASS PUMPING OPERATION, ETC. AS REQUIRED TO ASSURE BYPASS PUMPING IS RELIABLE WITHOUT FAILURE.**
8. **CONTRACTOR SHALL PROVDE EITHER AUTOMATIC ALARM AUTO DIALER ON CONTROL SYSTEM FOR BYPASS PUMP SYSTEM SETUP TO CALL CONTRACTTOR 24HRS 7 DAYS A WEEK OR MAN BYPASS PUMP SYSTEM 24 HOURS 7 DAYS A WEEK.**

## LIFT STATION CONSTRUCTION NOTES

UTILITY LOCATIONS CONSTRUCTION NOTES

1. THE ACCURATE LOCATION OF ALL UTILITIES, STRUCTURES, LANDSCAPING, IRRIGATION, ETC., AS SHOWN IS APPROXIMATE AND ALL MAY NOT BE SHOWN ON THE PLANS, QUANTIFIED ON THE BID FORMS, OR DETAILED IN THE SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THE MATERIAL, SIZE, LOCATION, QUANTITY, AND OTHER DETAILS OF ALL OBJECTS INCLUDING PIPELINES, STRUCTURES, CONDUITS, CABLES, SURFACE, SUBSURFACE AND ENVIRONMENTAL CONDITIONS (EX: WATER DEPTH, ABANDONED DUCT BANKS, RAILS, CONCRETE BLOCKS,), ETC.
2. THE CITY OF GALVESTION REQUIRES THE CONTRACTOR TO PRE-LOCATE, PRE-VERIFY AND PRE-INVESTIGATE ALL UTILITIES, OBSTRUCTIONS AND SURFACE AND SUBSURFACE ENVIRONMENTAL CONDITIONS (SHOWN OR NOT SHOWN) BEFORE CONSTRUCTION OF THIS PROJECT, BY WHATEVER METHOD, SUBJECT TO APPROVAL BY THE OWNER WHICH INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:
   1. UTILIZATION OF METAL DETECTION EQUIPMENT AND PROBES
   2. EXCAVATION, EX: HYDROVAC POT HOLING
   3. OPENING MANHOLES TO DETERMINE THE FLOW LINE OF STORM PIPES AND SANITARY SEWER
   4. MEASURING THE DEPTH TO VALVE NUT AND ADDING 18" TO DETERMINE THE DEPTH TO WATERLINES
   5. PROBING TO IDENTIFY SPRINKLERS, STORM SYSTEM, WATER/SANITARY SERVICES, ETC.
   6. SUBSURFACE UTILITY INVESTIGATION (SUE) LEVEL A THROUGH D SURVEY WHICH INCLUDES I THRU' V.
3. ALL INVESTIGATIVE WORK DONE AND ALL REPAIRS REQUIRED AFTER INVESTIGATION SHALL BE ACCOMPLISHED BY THE CONTRACTOR (NO SEPARATE PAY)
4. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR INCREASE IN COST, DELAYS IN SCHEDULE, IMPACT TO THE PUBLIC, CHANGES IN THEIR CONSTRUCTION SCOPE, INCLUDING ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UTILITIES, STRUCTURES AND OTHER OBSTRUCTIONS.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES THROUGH AN "811 CALL BEFORE YOU DIG" AT LEAST 14 CALENDAR DAYS PRIOR TO CONSTRUCTION IN AREA OF KNOWN AND UNKNOWN UTILITIES WHICH MAY OR MAY NOT BE SHOWN ON THE PLANS.
6. IF THE CONTRACTOR REQUESTS THE CITY STAFF TO ASSIST WITH LOCATING UTILITIES, STRUCTURES OR OTHER SURFACE AND BELOW GROUND FEATURES, THE CITY WILL INVOICE THE CONTRACTOR FULLY FOR SUCH SERVICES, AND THIS COST WILL BE DEDUCTED FROM THE CONTRACTOR'S PAY ESTIMATES.

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE

2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888

TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com

STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/06/2021


# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION CONSTRUCTION NOTES

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CDP/BKZ | 3 |


LAST PRINTED: Thursday, March 25, 2021 3:37:54 PM FROM: O:\1-ENGINEERING\1-PROJECTS\COG-2104-DRAFTING\2-SHEETS\3 LIFT STATION CONSTRUCTION NOTES.dwg

## 1.0 GENERAL

1. UNLESS OTHERWISE NOTED ON THE DRAWINGS, ALL DESIGN, MATERIALS, FABRICATION, TESTING, AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FOLLOWING NOTES, REFERENCED CODES, SPECIFICATIONS, AND STANDARDS. SHOULD THESE NOTES, CODES, SPECIFICATIONS OR STANDARDS DISAGREE, THE MORE STRINGENT REQUIREMENT AS DETERMINED BY THE OWNER'S REPRESENTATIVE SHALL GOVERN.
2. THE LATEST EDITION OF THE REFERENCED CODES, SPECIFICATIONS, OR STANDARDS ARE APPLICABLE.
3. COPIED OF ALL CODES, SPECIFICATIONS AND STANDARDS REFERENCED IN THESE NOTES ARE AVAILABLE FROM THE FOLLOWING ORGANIZATIONS:

   AMERICAN CONCRETE INSTITUTE (ACI)

   AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

   AMERICAN IRON AND STEEL INSTITUTE (AISI)

   AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

   AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

   AMERICAN WELDING SOCIETY (AWS)

   CITY OF GALVESTON

   INTERNATIONAL CODE COUNCIL (ICC)

   OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA)

   STEEL JOIST INSTITUTE (SJI)

   STEEL STRUCTURES PAINTING COUNCIL (SSPC)

   TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS (TXDOT)
4. ALL DESIGNED, FABRICATION, TESTING AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FOLLOWING CODES AND STANDARDS. THESE NOTES ARE NOT APPLICABLE TO PRE-ENGINEER METAL BUILDING SYSTEMS.

   ACI 301, "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"

   ACI 304, "RECOMMENDED PRACTICE FOR MEASURING, MIXING TRANSPORTING AND PLACING CONCRETE"

   ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCING CONCRETE"

   ACI 350 CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES.

   AISC, "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS"

   AISC, "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"

   ASTM, STANDARDS FOR THE MATERIALS SPECIFIED.

   AISI, STANDARDS FOR THE MATERIAL SPECIFIED.

   OSHA STANDARDS

   STRUCTURAL WELDING CODE- STEEL, AWS D1.1.

## 2.0 EARTHWORK

1. ALL AREAS TO BE CUT, FILLED OR IMPROVED SHALL BE STRIPPED TO REMOVE ORGANIC MATTER, ROOTS, DEBRIS AND OTHER MATERIALS. DISPOSAL OF ALL DEBRIS FROM DEMOLITION AND STRIPPING OPERATIONS SHALL BE AS SPECIFIED BY THE PROJECT SPECIFICATIONS.
2. THE DEPTH OF STRIPPING SHALL BE 6" UNLESS OTHERWISE BY THE GEOTECHNICAL REPORT THE COSTS OF EXCESSIVE STRIPPING AND RESULTING COMPACTED FILL REPLACEMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. PROOF ROLLING: AFTER STRIPPING, THE EXPOSED SOILS IN SHALLOW CUT AREAS TO BE IMPROVED OR FILLED SHALL BE PROOF ROLLED WITH EARTH MOVING EQUIPMENT ACCORDING TO THE SOIL REPORT. THE EXPOSED SOIL SUBGRADE SHOULD THE BE PROOF-ROLLED WITH AT LEAST A 15-TON PNEUMATIC ROLLER, LOADED DUMP TRUCK OR EQUIVALENT TO DETECT WEAK AREAS.
4. WEAK AREAS SHOULD BE REMOVED AND REPLACED WITH SOILS EXHIBITING SIMILAR CLASSIFICATION, MOISTURE CONTENT AND DENSITY AS THE ADJACENT IN-PLACE SOILS. SUBSEQUENT TO PROOF-ROLLING, AND JUST PRIOR TO PLACEMENT OF SELECT FILL, THE EXPOSED SUBGRADE IN FOUNDATION AREAS SHOULD BE COMPACTED TO AT 95% OF THE MAXIMUM DRY DENSITY NEAR OPTIMUM (TO+3%) IN ACCORDANCE WITH STANDARD PROCTOR COMPACTION EFFORTS (ASTM D 698) PROCEDURES. THESE SUBGRADE PREPARATION RECOMMENDATIONS ARE NOT APPLICABLE TO AREAS WHERE STRUCTURES WILL BE SUPPORTED ENTIRELY ON DEEP FOUNDATIONS.
5. THE EXTENT OF OVER EXCAVATION, STABILIZATION OR OTHER METHODS OR IMPROVEMENT SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER. NO UNSTABLE AREA IMPROVEMENT SHALL BE CONDUCTED WITHOUT THE APPROVAL OF THE ENGINEER.
6. UNLESS SPECIFIED BY THE GEOTECHNICAL REPORT, FILL AND BACKFILL SHALL BE STRUCTURAL FILL MATERIALS OR EXCAVATED, UNCONTAMINATED, ON-SITE SOIL, FREE OF SUCH MATERIALS AS STONES LARGER THAN 3", DEBRIS, VEGETATION, ORGANICS AND FOREIGN MATERIALS. THIS MATERIAL IS ACCEPTABLE IF IT MEETS NOTE 12.
7. IN UNPAVED AREAS, GENERAL FILL SHOULD BE COMPACTED TO AT LEAST 85% OF STANDARD PROCTOR DRY DENSITY (ASTM D 698) AT MOISTURE CONTENTS WITHIN (±) 3% OF OPTIMUM MOISTURE CONTENT.
8. IN PAVED OR AREAS TO RECEIVE SLAB OR FOUNDATIONS, SUBGRADE SHALL BE COMPACTED TO AT LEAST 95% OF MODIFIED PROCTOR DRY DENSITY. MOISTURE CONTENTS SHALL BE WITHIN (±) 3% OF OPTIMUM MOISTURE CONTENT.
9. POTENTIALLY EXPANSIVE SOILS (HIGH PLASTICITY CLAYS) AT SUBGRADE ELEVATION SHALL BE LIME STABILIZED AS SHOWN ON THE DRAWINGS. LIME STABILIZATION SHALL CONSIST OF AT LEAST 7% LIME BY DRY WEIGHT OF SOIL TO A DEPTH OF 8". PROCEDURES FOR LIME STABILIZATION, MIXING, MOISTURE, CONDITIONING, CURING AND COMPACTING SHALL CONFORM TO THE TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) STANDARD SPECIFICATIONS, ITEM 262.
10. FILL OR BACKFILL AROUND FOUNDATIONS, SEWERS, CULVERTS, MANHOLES, PIPING AND CONDUIT SHALL BE CAREFULLY PLACED AND COMPACTED AS SPECIFIED FOR STRUCTURAL FILL. FILL PLACEMENT AND COMPACTION SHALL BE PERFORMED WITH THE PROPER EQUIPMENT AND METHODS TO AVOID DAMAGE TO THE ABOVE ITEMS.
11. WHERE SHOWN ON THE DRAWINGS, BACKFILL FOR UNDERGROUND PIPING SHALL INCLUDE CEMENT STABILIZED SAND.
12. STRUCTURAL FILL FOR THE VARIOUS PROJECT AREAS SHOULD CONSIST OF A CLEAN, LOW-PLASTICITY SANDY CLAY MATERIAL WITH A LIQUID LIMIT OF LESS THAN 40 AND A PLASTICITY INDEX BETWEEN 10 AND 20. SELECT FILL SHOULD BE PLACED IN THIN LIFTS, NOT EXCEEDING 8-IN. LOOSE MEASURE, MOISTURE CONDITIONED BETWEEN -2% AND +3% OF OPTIMUM MOISTURE CONTENT AND COMPACTED TO A MINIMUM 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698 (STANDARD PROCTOR COMPACTION EFFORT).
13. PROPER SITE DRAINAGE SHOULD BE MAINTAINED DURING CONSTRUCTION, SO THAT PONDING OF SURFACE RUNOFF DOES NOT OCCUR AND CAUSE CONSTRUCTION DELAYS OR INHIBITS SITE ACCESS. DUE TO THE NATURE OF THE SUBGRADE, THE NATURAL COHESIVE SOILS CAN BECOME WET AND SOFT. IF THIS SUBGRADE BECOMES WET AND SOFT, CONSIDERATION CAN BE GIVEN TO EITHER REMOVAL OR REPLACEMENT OF THE WET MATERIAL WITH STRUCTURAL FILL MATERIAL.

## 3.0 EXCAVATION & DEMOLITION

1. ALL EXCAVATIONS SHALL COMPLY WITH OSHA STANDARDS. PROBING PRIOR TO EXCAVATION IS REQUIRED FOR VERIFICATION OF THE LOCATION AND CLEARANCES OF UNDERGROUND PIPING AND ELECTRICAL CONDUITS.
2. HAND EXCAVATION IS REQUIRED AROUND ALL UNDERGROUND PIPING AND ELECTRICAL CONDUITS ENCOUNTERED AT NO ADDITIONAL COST TO THE CITY.
3. EXCAVATION IN EXISTING PAVED AREAS SHALL INCLUDE SAW CUTTING AND REMOVING EXISTING CONCRETE. THE EXISTING REINFORCING SHALL BE MAINTAINED TO ALLOW THE NEW CONCRETE TO TIE TO THE EXISTING CONCRETE. AT THE CONTRACTOR'S OPTION, THE PAVEMENT CAN BE SAW CUT FULL DEPTH AND NEW DOWELS BETWEEN THE EXISTING AND NEW CONCRETE CAN BE SET USING THE HILTI ADHESIVE ANCHORING SYSTEM OR APPROVED EQUAL. EXISTING JOINT SYSTEM SHALL BE MAINTAINED.
4. PRIOR TO EXCAVATION, CONTRACTOR SHALL CONTACT TEXAS ONE CALL AT 1-800-245-4545.
5. THE SOILS EXPOSED IN EXCAVATIONS FOR SHALLOW FOUNDATIONS SHOULD BE PROTECTED FROM DISTURBANCE PRIOR TO AND DURING FOUNDATION CONSTRUCTION (2-IN. THICK SEAL SLAB OF LEAN CONCRETE COULD BE PLACED OVER THE EXPOSED SOILS.) THE NEED FOR PROTECTION WILL BE MOST CRITICAL FOR LARGE FOUNDATION EXCAVATIONS WHICH ARE EXPECTED TO REMAIN OPEN FOR MORE THAN ONE (1) WORKING DAY. IF ANY OF THE FOUNDATIONS ARE FORMED, ANY VOIDS BETWEEN THE FOOTING AND THE EXCAVATION WALLS SHOULD BE BACKFILLED WITH CEMENT-STABILZIED SAND [ONE (1) SACK OF CEMENT PER CUBIC YARD OF SAND] OR FLOWABLE FILL.

## 4.0 FOUNDATIONS

1. CARE SHALL BE TAKEN NOT TO OVER EXCAVATE FOR FOUNDATIONS. ANY OVER EXCAVATION BELOW THE BOTTOM OF FOUNDATION ELEVATION SHALL BE BACKFILLED WITH LEAN CONCRETE, CEMENT STABILIZED SAND OR SELECT FILL AT THE CONTRACTOR'S EXPENSE. WHERE THE SOIL CONDITIONS ARE APPROPRIATE AND AS ALLOWED BY OSHA STANDARDS, FOUNDATIONS BELOW GRADE MAY BE EARTH FORMED UNLESS OTHERWISE NOTED. EXPOSED SURFACES OF FOUNDATIONS SHALL BE FORMED USING CLEAN FORM WORK.
2. THE SOILS EXPOSED IN FOUNDATION EXCAVATIONS SHALL BE OBSERVED BY THE GEOTECHNICAL AGENCY FOR CONFORMANCE WITH ANTICIPATED BEARING STRATA. THE SOILS EXPOSED SHALL BE PROBED, SAMPLED AND TESTED.
3. THE CONTRACTOR SHALL REMOVE LOOSE, SOFT, OTHERWISE UNDESIRABLE SOILS FROM THE FOUNDATION BEARING AREA. IF REMOVAL OF UNSATISFACTORY MATERIALS IS REQUIRED, THE MATERIALS SHALL BE REPLACED WITH LEAN CONCRETE, CEMENT STABILIZED SAND OR SELECT FILL.
4. NO GEOTECHNICAL REPORT WAS PREPARED FOR THIS PROJECT.
5. FOUNDATION EXCAVATIONS SHALL BE KEPT DRY PRIOR TO CONCRETE PLACEMENT. A CONCRETE SEAL SLAB SHALL BE USED TO MAINTAIN INTEGRITY OF SUBGRADE IF A DRY EXCAVATION CANNOT BE MAINTAINED.

## 5.0 CONCRETE

5.1 MATERIALS AND CONCRETE STRENGTH

1. ALL CONCRETE SHALL BE READY-MIXED CONFORMING TO ACI 304. CONCRETE SHALL BE TESTED ACCORDING TO THE REQUIREMENTS OF ASTM.
2. CONCRETE SHALL HAVE STONE AGGREGATE (1 1/2" MAXIMUM) AND SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS. CONCRETE FOR PAVEMENT SHALL DEVELOP A MINIMUM FLEXURAL STRENGTH OF 650 PSI AT 28 DAYS.
3. CONCRETE SLUMP RANGE SHALL BE MAINTAINED AT NO LESS THAN 2" MINIMUM OR MORE THAN 5" MAXIMUM BY THE USE OF WATER REDUCING AGENTS (SUPER PLASTICIZERS).
4. CONCRETE DESIGNS FOR EXTERIOR INSTALLATIONS SHALL HAVE AN AIR CONTENT OF 5% (+) 1% (-) 0%.
5. CONCRETE STRENGTH SHALL BE TYPE 1 AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI IN 28 DAYS UNLESS NOTED OTHERWISE.
6. CMU UNITS SHALL HAVE f'm = 1,500 PSI ULTIMATE COMPRESSIVE STRENGTH.

5.2 CONSTRUCTION

1. ALL EXPOSED EDGES OF CONCRETE ABOVE GRADE SHALL HAVE A 3/4" 45° CHAMFER.
2. CONCRETE SHALL BE CONSOLIDATED WITH MECHANICAL VIBRATOR.
3. CONTRACTOR SHALL REFER TO ARCHITECTURAL, ELECTRICAL, PIPING, MECHANICAL, AND VENDOR DRAWINGS FOR EMBEDDED ITEMS, SLEEVES, ANCHORS, VENT OPENINGS, ETC., NOT SHOWN ON STRUCTURAL PLANS THAT MIGHT BE REQUIRED.
4. WHERE THE BONDING OF NEW CONCRETE TO EXISTING CONCRETE IS REQUIRED, USE "MASTEREMACO ADH 326" AS MANUFACTURED BY MASTER BUILDERS INC., CLEVELAND, OH, OR APPROVED EQUAL. FOLLOW MANUFACTURER'S RECOMMENDATIONS.
5. FOR CONSTRUCTION JOINTS, WHEN NO KEY WAY HAS BEEN PROVIDED, THE SURFACE OF THE CONSTRUCTION JOINTS SHALL BE ROUGHENED TO AN AMPLITUDE OF 1/4". THE SURFACES OF JOINTS SHALL BE CLEANED AND LAITANCE REMOVED. IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, ALL CONSTRUCTION JOINTS SHALL BE WETTED.
6. CONCRETE SHALL BE MAINTAINED ABOVE 50° F AND MOIST CURED FOR AT LEAST 7 DAYS. CURING COMPOUNDS MEETING ASTM C 309 IS AN ACCEPTABLE SUBSTITUTION FOR WET CURING.
7. UNLESS OTHERWISE SPECIFIED, CONCRETE MUST REACH THE FOLLOWING PERCENTAGES OF IT'S 28 DAY COMPRESSIVE STRENGTH (f'c) BEFORE FORMS MAY BE REMOVED.
   A. WALLS, COLUMNS & BEAMS SIDES 40%
   B. JOIST PANS & BEAM BOTTOMS (IF SHORED) 70%
   C. SHORING FOR FLOOR SYSTEMS 85%

## 5.3 JOINTS AND JOINT SEALERS

1. EXPANSION JOINT MATERIAL SHALL BE PREFORMED, NON-EXTRUDING RESILIENT FILLER, BITUMINOUS TYPE, PER ASTM D 1751.
2. WHEN REQUIRED JOINT SEALER SHALL BE EITHER HOT POURED ELASTIC TYPE AS PER ASTM D 1190 OR COLD APPLIED ELASTIC TYPE AS PER ASTM D 1850.
3. ISOLATION JOINTS OF 1/2" EXPANSION JOINT MATERIAL SHALL BE PROVIDED AT ALL FOUNDATIONS, COLUMNS AND WALLS TO PROVIDE A SEPARATION AT THE PAVING (UNLESS SHOWN OTHERWISE).
4. MAXIMUM JOINT SPACING IN SLABS AND PAVEMENT SHALL BE AS FOLLOWS (UNLESS NOTED OTHERWISE):
1. EXPANSION JOINTS 80'
2. CONSTRUCTION JOINTS 60'
3. CONTROL JOINTS 20' OR +/- 400 SQUARE FEET GRIDS.

## 5.4 CONCRETE COVER

1. PROVIDE THE FOLLOWING CONCRETE PROTECTIVE COVERINGS FOR REINFORCEMENT:
   A. 3" FOR ALL CONCRETE DEPOSITED DIRECTLY AGAINST THE GROUND OR CONCRETE DIRT FORMED.
   B. 2" FOR ALL FORMED CONCRETE EXPOSED TO WEATHER OR IN CONTACT WITH THE GROUND.
   C. 3/4" FOR CONCRETE SLABS AND WALLS, AND 1 1/2" FOR BEAMS, GIRDERS, COLUMNS OR FORMED CONCRETE NOT EXPOSED TO WEATHER OR IN DIRECT CONTACT WITH THE GROUND.

## 5.5 CONCRETE TESTING

1. THE OWNER SHALL SELECT AND PAY FOR A QUALIFIED TESTING AGENCY FOR PURPOSE OF SAMPLING AND TESTING OF THE CONCRETE. THE TESTING AGENCY SHALL BE RESPONSIBLE FOR THE SAMPLING AND TESTING OF MATERIALS, THE MAKING, CURING AND TESTING OF CONCRETE TEST CYLINDERS, THE DETERMINATION OF SLUMP, TEMPERATURE OF THE CONCRETE AND REVIEW OF THE CONCRETE MIXES.
2. THE CONTRACTOR SHALL CONTACT AND SCHEDULE THE TESTS TO BE PERFORMED BY THE TESTING AGENCY IN A TIMELY MANNER.
3. CONCRETE SHALL COMPLY WITH THE COMPRESSIVE STRENGTH REQUIREMENTS AS SPECIFIED. PROVIDE THREE TEST CYLINDERS PER ASTM C-31 FOR EACH DAY'S PLACING AND FOR EACH 100 CUBIC YARDS OR FRACTION THERE OF FOR EACH CLASS OF CONCRETE. DATE THE CYLINDERS, NUMBER AND NOTE INDICATING THE POINT FROM WHICH THE SAMPLE WAS TAKEN AND THE SLUMP TEST RESULTS OF THE SAMPLE. DO NOT TAKE MORE THAN THREE CYLINDERS FROM ANY ONE POINT OR BATCH OF CONCRETE.
4. AT THE END OF 24 HOURS AFTER MAKING, STORE THE CYLINDERS UNDER MOIST CURING CONDITIONS AT APPROXIMATELY 70 DEGREES UNTIL TESTED. TEST CYLINDERS IN ACCORDANCE WITH ASTM C-39 AT THE AGE OF 7 AND 28 DAYS.

## 5.6 CONCRETE FINISHING

1. CONCRETE TO BE USED AS A WALKING OR DRIVING SURFACE SHALL RECEIVE A LIGHT BROOM FINISH. THE BROOM FINISH SHALL BE APPLIED AFTER THE LAST STEEL TROWEL FINISH AND THE FINAL SET.
2. ALL FORMED SURFACES SHALL RECEIVE AN AS-CAST PLYWOOD FINISH. SURFACE FINS SHALL BE REMOVED, TIE HOLES SHALL BE FILLED SOLID WITH PATCHING MORTAR. ALL HONEYCOMBED AND OTHER DEFECTIVE CONCRETE SHALL BE REMOVED DOWN TO SOUND CONCRETE AND REPAIRED TO AN APPROVED CONDITION USING A BONDING GROUT AND SAND-CEMENT PATCHING MORTAR OF THE SAME MATERIAL AND APPROXIMATELY THE SAME PROPERTIES AS USED FOR THE CONCRETE, EXCEPT THAT THE COURSE AGGREGATE SHALL BE OMITTED.
3. BUILDING SLABS SHALL HAVE A TROWEL FINISH AS DEFINED BY ACI 301.
4. ALL OTHER SURFACES SHALL HAVE A "FLOAT FINISH" AS DEFINED BY ACI 301.

## 6.0 REINFORCING STEEL

1. DETAILING, FABRICATION AND PLACING OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH THE ACI 315, LATEST REVISION. THE FABRICATOR SHALL SUBMIT BAR BENDING SCHEDULES AND PLACEMENT DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.
2. APPROVAL OF BAR BENDING SCHEDULES AND PLACEMENT DRAWINGS DOES NOT RELIEVE THE FABRICATOR OF RESPONSIBILITY FOR DIMENSIONS, QUANTITIES, OR FOR COMPLIANCE WITH THE DESIGN DRAWINGS AND SPECIFICATIONS LISTED HEREIN.
3. WHERE LAP LENGTHS ARE NOT SHOWN ON THE DESIGN DRAWINGS, THEY SHALL CONFORM TO THE "REINFORCEMENT LAP LENGTH" TABLE SHOWN ON THIS DRAWING.
4. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60.
5. WELDED WIRE FABRIC SHALL MEET ASTM A 185 SPECIFICATIONS. ROLL TYPE FABRIC SHALL NOT BE USED.

## 7.0 GROUTING

1. GROUT SHALL BE MASTERFLOW 928 BY MASTER BUILDERS, FIVE STAR, CORMIX SUPREME OR APPROVED EQUAL. GROUT SHALL MEET MOST CURRENT VERSION OF ASTM C 1107 AT FLOWABLE, PLASTIC AND STIFF CONSISTENCY. GROUT SHALL NOT BE TYPE A GROUT (GAS GENERATED EXPANSION). SURFACE PREPARATION, MIXING, PLACING AND CURING SHALL CONFORM TO THE MANUFACTURER'S RECOMMENDATIONS. THE GROUT SHALL HAVE MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI AT 7 DAYS WHEN TESTED IN ACCORDANCE WITH ASTM C 109.
2. WHERE EPOXY GROUT IS SPECIFIED, IT SHALL BE CEILCOTE 648 CP PLUS BY MASTER BUILDERS, FIVE STAR EPOXY GROUT OR APPROVED EQUAL. COEFFICIENT OF THERMAL EXPANSION AT 73-210°F PER ASTM C 531 SHALL NOT EXCEED 23 x 10 (-6) IN/IN. SHRINKAGE, UNRESTRAINED - LINEAR (ASTM C 531-85) SHALL NOT EXCEED 0.00065 IN/IN. CREEP (ASTM C 1181-91 400 PSI 140°F) SHALL NOT EXCEED 4.5 x 10 (-3) IN/IN. EPOXY GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 14,000 PSI AT 7 DAYS WHEN TESTED IN ACCORDANCE WITH ASTM C 579. SURFACE PREPARATION, MIXING, PLACEMENT, AND CURING SHALL CONFORM TO THE MANUFACTURER'S RECOMMENDATIONS. OWNER'S REPRESENTATIVE SHALL BE PRESENT PRIOR TO AND DURING THE FIRST DAY OF GROUTING AND SHALL INSPECT AND APPROVE GROUTING PROCEDURE.
3. LEVELING SCREWS SHALL BE REMOVED AFTER GROUT HAS SET RESULTING VOIDS SHALL BE FILLED WITH GROUT. LEVELING SHIMS AND WEDGES SHOULD BE LEFT IN PLACE AFTER GROUTING.
4. REBAR, DOWELS OR THREADED RODS THAT ARE ANCHORED INTO EXISTING CONCRETE SHALL BE ANCHORED WITH HILTI HY-150 OR EPCON PREPARATION OF THE HOLE, INSTALLATION OF THE EPOXY AND CURING SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. THE RESIN AND STATIC MIXER ELEMENTS CONTAINED IN THE SYSTEM NOZZLE.
5. CMU UNITS SHALL REQUIRED MORTAR TYPE "S" AND A GROUT EQUAL TO 2,000 PSI UNLESS NOTED OTHERWISE.

## 8.0 EMBEDDED ITEMS

1. ALL STEEL EMBEDDED ITEMS SHALL BE ASTM A36 HOT DIPPED GALVANIZED PER ASTM A123. WELDING SHALL BE IN ACCORDANCE WITH AWS D 1.1.
2. ANCHOR BOLTS SHALL MEET ASTM A36 OR A307 SPECIFICATIONS (UNLESS NOTED) WITH ASTM A563 (GRADE B) HEAVY HEX NUTS AND WASHERS. (ASTM B18.2.2).
3. ALL ANCHOR BOLTS SHALL BE HOT DIPPED GALVANIZED ACCORDING TO ASTM A 153 UNLESS NOTED OTHERWISE. THREADS SHALL BE TAPPED OR CHASED AFTER GALVANIZING.
4. ALL ANCHOR BOLT SLEEVES SHALL BE "SINCO/WILSON ANCHOR BOLT SLEEVES" AS MANUFACTURED BY SINCO PRODUCTS, INC. OR EQUAL. TOPS OF SLEEVES SHALL BE CUT OUT PRIOR TO PLACING GROUT FOR THE EQUIPMENT OR STRUCTURE.
5. CONCRETE ADHESIVE ANCHORS SHALL BE HILTI ADHESIVE ANCHORS HIT-150 AS MANUFACTURED BY HILTI INC., TULSA, OK., OR AN APPROVED EQUAL.

## STRUCTURAL STEEL

1. SEE NOTES ON PRIMARY CODES AND SPECIFICATIONS
2. MATERIALS:

| | |
|---|---|
| W-SHAPES & WT-SHAPES | ASTM A992 |
| S-SHAPES, M-SHAPES, HP-SHAPES | ASTM A36 |
| ST-SHAPES & MT-SHAPES | ASTM A36 |
| C-SHAPES & MC-SHAPES | ASTM A36 |
| ANGLES & PLATES | ASTM A36 |
| HSS SHAPES | ASTM A500, GRADE B |
| STEEL PIPE | ASTM A53 (TYPE E OR S_, GRADE B |
| HIGH STRENGTH BOLTS | ASTM A325 |
| MACHINE BOLTS | ASTM A307 |
| ANCHOR RODS | ASTM F1557, GRADE 55 TYPE S1 (UNO) |
| WELDED HEADED STUDS | ASTM A108 |
| DEFORMED BAR ANCHORS | ASTM A496 |
| WELDING ELECTRODES | AWS D1.1, E70 SERIES |

3. NON-SHRINK, NON-METALLIC GROUT WITH A 28-DAY STRENGTH OF 500-PSI SHALL BE USED UNDER BASE PLATES AND SHALL CONFORM TO CORPS OF ENGINEER CRD-C621, FACTORY PREMIX GROUT. SEE SPECIFICATION FOR TESTING REQUIREMENTS.
4. ENGINEER SHALL BE CONTACTED FOR APPROVAL OF ANY FIELD MODIFICATION OF ANCHOR BOLTS OR RODS AND COLUMN BASE PLATES (PER OSHA).
5. TEMPORARY BRACING OF STRUCTURAL STEEL ELEMENTS IS THE RESPONSIBILITY OF THE CONTRACTOR. STRUCTURAL STABILITY SHALL BE MAINTAINED AT ALL TIMES DURING THE ERECTION PROCESS.

   CONTRACTOR MUST PROVIDE NOTIFICATION TO THE ERECTOR THAT, BY TESTING, THE FOUNDATION AND SUPPORTING WALLS HAVE ATTAINED SUFFICIENT STRENGTH TO SUPPORT THE STEEL TO BE ERECTED BEFORE ERECTING STRUCTURAL STEEL.
6. PROVIDE ONE SHOP COAT OF PRIMER (TT-P-636) ON ALL STEEL EXCEPT FOR ITEMS TO BE HOT DIPPED GALVANIZED OR SPRAY FIREPROOFED. DO NOT PAINT PORTIONS EMBEDDED IN CONCRETE.
7. FRAMING CONNECTIONS NOT DETAILED, OR CONNECTIONS THAT ARE MODIFIED FROM THOSE DETAILED, SHALL BE DESIGNED BY SUPPLIER FOR THE END REACTION SHOWN ON THE PLAN. IF NO REACTION IS PROVIDED, DESIGN FOR ½ THE BEAM MAXIMUM UNIFORM LOAD PER AISC MANUAL FOR STEEL CONSTRUCTION. SUBMIT SIGNED AND SEALED CALCULATIONS.
8. ALL WELD OPERATORS SHALL BE CURRENTLY AWS QUALIFIED.
9. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED. USE 3/16" FILLET WELD MINIMUM.
10. FIELD CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED AS DETAILED. NO FIELD WELDING OF HOT DIPPED GALVANIZED MEMBERS WILL BE ALLOWED. USE 3/16" FILLET WELD MINIMUM.
11. DURING THE ERECTION OF STEEL BEAMS AND DIAGONAL BRACING, ALL BOLTING AND FIELD WELDING SHALL BE COMPLETE BEFORE RELEASING HOISTING CABLES.
12. SUBMIT FOR REVIEW SHOP DRAWING OF STEEL DETAILS PRIOR TO FABRICATING STRUCTURAL STEEL.
13. ALL EXTERIOR ELEMENTS AND THOSE ELEMENTS NOTED TO BE GALVANIZED SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER SANDBLAST CLEANING PER SSPC-SP10. USE ASTM A325 BOLTS HOT DIPPED GALVANIZED WITH GALVANIZED HARDENED WASHERS AND GALVANIZED HEAVY HEX NUTS FOR BOLTING OF GALVANIZED ITEMS.
14. STEEL COLUMNS, BASE PLATES AND ALL STEEL BELOW GRADE SHALL HAVE A MINIMUM 3" CONCRETE COVER PROTECTION.
15. MEMBERS NOTED AS "CONTINUOUS" SHALL BE FULLY WELDED AT ALL BUTT SPLICES OR CONNECTIONS SHALL BE DETAILED TO PROVIDE CONTINUITY.

## STEEL JOISTS - NOT USED

1. SEE NOTES ON PRIMARY CODES AND SPECIFICATIONS.
2. THE MANUFACTURER OF THE JOISTS SHALL BE A MEMBER OF THE STEEL JOIST INSTITUTE.
3. PROVIDE ONE SHOP COAT OF PRIMER (TT-P-636) EXCEPT ITEMS TO RECEIVE SPRAY FIREPROOFING.
4. SEE GENERAL NOTES FOR SPRINKLER PIPE SUPPORT.
5. REFER TO DETAILS FOR SPECIAL TREATMENT OF:

   SUPPORTED CONCENTRATED LOADS
6. JOISTS SHALL BE DESIGNED TO RESIST A NET UPLIFT AS SHOWN ON LOADING DIAGRAMS.
7. CONNECT JOIST BEARING PLATES TO JOIST TOP CHORD FOR 4K.
8. SUBMIT FOR REVIEW SHOP DRAWINGS OF JOIST DETAILS FOR FABRICATION AND ERECTION PRIOR TO FABRICATING JOISTS.
9. PROVIDE HORIZONTAL OR DIAGONAL TYPE BRIDGING FOR ALL JOISTS AS REQUIRED BY SJI SPECIFICATION AND AS INDICATRED ON HE DRAWINGS. THE ENDS OF ALL BRIDGING LINES TERMINATING AT BEAMS SHALL BE ANCHORED THERETO AT TOP AND BOTTOM CHORDS. PROVIDE ALL REQUIRED BRIDGING ANCHORS.
10. ALL JOISTS SHALL BE DESIGNED FOR A SINGLE CONCENTRATED TRAVELING PROVISIONAL LOAD OF 300 POUNDS ALONG THE TOP CHORD AND 100 POUNDS ALONG THE BOTTOM CHORD APPLIED BETWEEN PANEL POINTS.
11. JOIST DIAGONAL MEMBERS LOCATED IN THEMIDDLE QUARTER OF THE SPAN SHALL BE DESIGNED FOR A MINIMUM SHEAR, IN COMPRESSION, OF 15 PERCENT OF THE END REACTION. THIS MINIMUM DESIGN LOAD SHALL BE TO ACCOUNT FOR THE POSSIBLITY OF SHEAR REVERSAL DUE TO UNBALANCED LOADING.
12. JOIST SEATS SHALL HAVE THE CAPACITY TO RESIST A LATERAL LOAD APPLIED TO THE TOP CHORD, PERPENDICULAR TO THE SPAN (ROLLOVER). PROVIDE A MINUMUM ROLLOVER FORCE OF 2,000 POUNDS FOR SEATS UP TO 3-1/2 INCHES DEEP AND 1,200 POUNS FOR SEATS OVER 3-1/2 INCHES DEEP.

## STEEL ROOF DECK - NOT USED

1. ROOF DECK SHALL BE 1-1/2" DEEP (UNO). SEE ROOF PLAN FOR GAGE AND PROFILE DESIGNATION.
2. ROOF DECK SHALL BE PLACED SO AS TO COVER AT LEAST TWO SPANS. NO SINGLE SPAN CONDITION SHALL BE USED.
3. DECK SHALL BE FABRICATED SO THAT DECK RUNS CONTINUOUSLY OVER OPENINGS. THE OPENINGS IN THE DECK SHALL NOT BE CUT UNTIL THE OPENING IS NEEDED (PER OSHA).
4. STEEL DECK SHALL CONFORM TO ASTM A653 SQ GRADE 33 (Fy = 33,000 PSI).
5. STEEL DECK SHALL BE GALVANIZED WITH A PROTECTIVE ZINC COATING CONFORMING TO ASTM A924, WITH A COATING DESIGNATION G90.
6. SEE ROOF PLAN AND DETAILS FOR ROOF DECK ATTACHMENT AND FORCES IMPOSED DUE TO UPLIFT AND DIAPHRAGM SHEAR UNDER WIND LOADING. SEE SPECIFICATIONS FOR INSPECTION AND REPORTING REQUIRED ON ROOF DECK ATTACHMENT.
7. PROVIDE A MINIMUM END BEARING OF 2" OVER SUPPORTS. END LAPS OF SHEETS SHALL BE A MINIMUM OF TWO INCHES AND SHALL OCCUR OVER SUPPORTS.
8. THE CONTRACTOR SHALL COORDINATE ALL TRADE REQUIREMENTS AND CONFIRM THE SIZE AND LOCATION OF ALL OPENING. OPENINGS LARGER THAN 12", AND AS DETAILED, SHALL HAVE STEEL FRAMING SUPPORTING ALL EDGES. SEE TYPICAL ANGLE FRAMING DETAILS.
9. STEEL MEMBERS SUPPORTING STEEL DECK AT THE PERIMETER OF THE BUILDING SHALL BE CONTINUOUS, BUTT WELD PIECES WHERE SPLICES OCCUR.

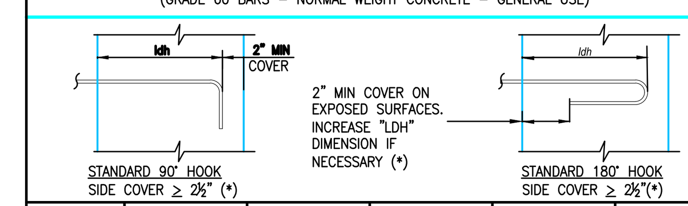
## COLD FORMED METAL FRAMING - NOT USED

1. SEE NOTES ON PRIMARY CODES AND SPECIFICATIONS.
2. ALL EXTERIOR WALLS, LINTELS, BEAMS, TRUSSES, ETC. AS WELL AS INTERIOR BEARING WALLS, LINTELS, BEAMS, ETC. SHALL BE DESIGNED, SIGNED AND SEALED BY THE SUPPLIER'S ENGINEER REGISTERED IN THE STATE OF TEXAS.
3. ALL MEMBERS SHALL BE FORMED FROM HOT DIPPED GALVANIZED STEEL, CORRESPONDING TO THE REQUIREMENTS OF ASTM A653 SQ GRADE 33 (Fy = 33,000 PSI). GALVANIZED COATING SHALL CONFORM TO ASTM A924 WITH THE COATING DESIGNATION G60.
4. EXTERIOR METAL WALL STUDS:
   A. THE COLD FORMED METAL STUD FRAMING CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF EXTERIOR METAL STUDS. SHOP DRAWINGS SHOWING PLANS, ELEVATIONS, AND SECTIONS SHALL BE SUBMITTED WITH CALCULATIONS SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEERING IN THE STATE OF TEXAS.
   B. THE MINUMUM SIZE AND SPACING SHALL BE AS DESCRIBED IN THE CONSTRUCTION DOCUMENTS.
   C. DO NOT CUT OR OTHERWISE DAMAGE LOAD BEARING STUDS DURING INSTALLATION OF WORK BY OTHER TRADES.

## POST INSTALLED ANCHORS

1. POST INSTALLED ANCHORS SHALL ONLY BE USED WHERE SPECIFIED ON THE DRAWINGS. CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO USING POST INSTALLED ANCHORS FOR MISSING, MISPLACED, OR DAMAGED ANCHORS.
2. CARE SHALL BE GIVEN TO AVOID CONFLICTS WITH EXISTING REINFORCING WHEN DRILLING HOLES. HOLES SHALL BE DRILLED AND CLEANED PER THE MANUFACTURER'S INSTRUCTIONS. ANCHORS SHALL BE INSTALLED PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AT NOT LESS THAN MINIMUM EDGE DISTANCES AND/OR SPACINGS INDICATED IN THE MANUFACTURER'S LITERATURE.
3. SPECIAL INSPECTION SHALL BE PROVIDED FOR ALL ADHESIVE AND MECHANICAL ANCHOR INSTALLATIONS AS REQUIRED BY THE ENGINEER. INDEPENDENT ON-SITE PROOF LOAD TESTING SHALL BE PERFORMED AS REQUIRED BY THE ENGINEER.
4. UNLESS NOTED OTHERWISE ON THE DOCUMENTS, ACCEPTABLE PRODUCTS SHALL BE AS LISTED BELOW:
   A. MECHANICAL ANCHORS INTO CONCRETE:
      i. HILTI KWIK BILT TZ CARBON AND STAINLESS-STEEL ANCHORS (ICC-ES ESR1917)
      ii. RED HEAD THRUBOLT + WEDGE ANCHORS (ICC-ES ESR2427)
      iii. SIMPSON STRONG-TIE (STB) (ICC-ES ESR1771)
   B. MECHANICAL ANCHORS INTO MASONRY LINTELS OR GROUT FILLED CELLS:
      i. HILTI KWIK BILT 3 MASONRY ANCHORS (ICC-ES ESR1385)
      ii. SIMPSON STRONG-TIE WEDGE-ALL ANCHOR (WA) (ICBO-ES ER-3631)
   C. ADHESIVE ANCHORS INTO CONCRETE:
      i. HILTI HIT-RE 500-SD ADHESIVE (ICC-ES ESR2322)
      ii. RED HEAD EPCON G5 ADHESIVE (ICC-ES ESR1137)
      iii. SIMPSON STRONG-TIE SET-XP EPOXY-TIE ADHESIVE (SETXP) (ICC-ES ESR2508)
   D. ADHESIVE ANCHORS INTO MASONRY LINTELS OR GROUT FILLED CELLS:
      i. HILTI HIT HY-150 MAX ADHESIVE (ICC-ES ESR1967)
      ii. SIMPSON STRONG-TIE SET EPOXY-TIE ADHESIVE (SET) (ICE-ES ESR1772)

"ldh" TENSION DEVELOPMENT (EMBEDMENT) LENGTH FOR STANDARD END HOOKS (GRADE 60 BARS – NORMAL WEIGHT CONCRETE – GENERAL USE)




| BAR SIZE | f'c=3000 PSI | f'c=4000 | f'c=5000 | f'c=6000 | f'c=8000 PSI |
|---|---|---|---|---|---|
| | ldh | ldh | ldh | ldh | ldh |
| # 3 | 6" | 6" | 6" | 6" | 6" |
| # 4 | 8" | 7" | 6" | 6" | 6" |
| # 5 | 10" | 9" | 8" | 7" | 6" |
| # 6 | 1'–0" | 10" | 9" | 9" | 7" |
| # 7 | 1'–2" | 1'–0" | 11" | 10" | 9" |
| # 8 | 1'–4" | 1'–2" | 1'–0" | 11" | 10" |
| # 9 | 1'–6" | 1'–3" | 1'–2" | 1'–1" | 11" |
| # 10 | 1'–8" | 1'–5" | 1'–4" | 1'–2" | 1'–0" |
| # 11 | 1'–10" | 1'–7" | 1'–5" | 1'–4" | 1'–1" |

NOTES:
1. "*" WHEN EITHER SIDE OR END COVER IS SMALLER THAN THESE NUMBERS MULTIPLY "ldh" BY 1.4.

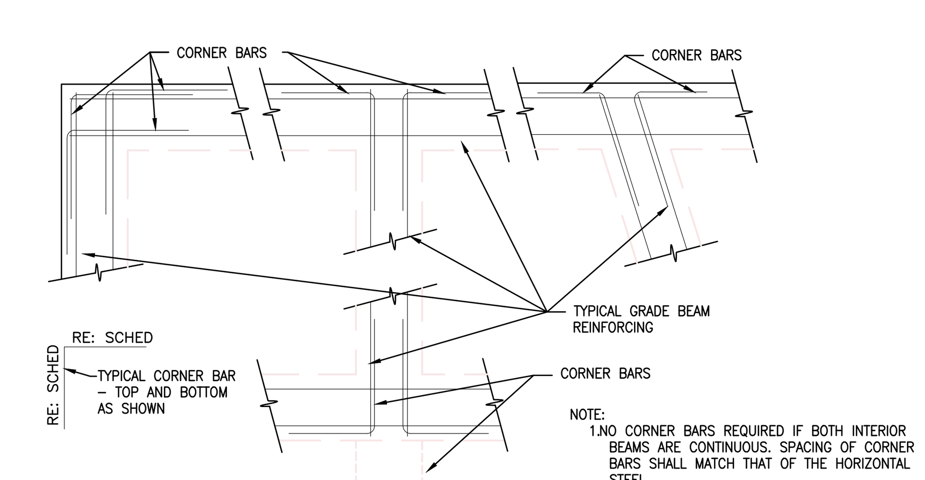
TENSION LAP SPLICES CLASS B FOR TOP & BOTTOM BARS (GRADE 60 UNCOATED BARS – NORMAL WEIGHT CONCRETE)

| BAR SIZE | f'c=3000 PSI | | f'c=4000 PSI | | f'c=5000 PSI | | f'c=6000 PSI | | f'c=8000 PSI | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ld TOP | ld BOT | ld TOP | ld BOT | ld TOP | ld BOT | ld TOP | ld BOT | ld TOP | ld BOT |
| # 3 | 2'–4" | 1'–9" | 2'–0" | 1'–6" | 1'–10" | 1'–5" | 1'–8" | 1'–4" | 1'–5" | 1'–4" |
| # 4 | 3–1" | 2'–4" | 2'–8" | 2'–1" | 2'–5" | 1'–10" | 2'–2" | 1'–8" | 1'–11" | 1'–5" |
| # 5 | 3'–10" | 3'–0" | 3'–4" | 2'–7" | 3'–0" | 2'–4" | 2'–9" | 2'–1" | 2'–4" | 1'–10" |
| # 6 | 4'–8" | 3'–7" | 4'–0" | 3'–1" | 3'–7" | 2'–9" | 3'–3" | 2'–6" | 2'–10" | 2'–2" |
| # 7 | 6'–9" | 5'–2" | 5'–10" | 4'–6" | 5'–3" | 4'–0" | 4'–9" | 3'–8" | 4'–2" | 3'–2" |
| # 8 | 7'–9" | 5'–11" | 6'–8" | 5'–2" | 6'–0" | 4'–7" | 5'–5" | 4'–2" | 4'–9" | 3'–8" |
| # 9 | 8'–8" | 6'–8" | 7'–6" | 5'–9" | 6'–9" | 5'–2" | 6'–2" | 4'–9" | 5'–4" | 4'–1" |
| # 10 | 9'–10" | 7'–6" | 8'–6" | 6'–6" | 7'–7" | 5'–10" | 6'–11" | 5'–4" | 6'–0" | 4'–7" |
| # 11 | 10'–11" | 8'–4" | 9'–5" | 7'–3" | 8'–5" | 6'–6" | 7'–8" | 5'–11" | 6'–8" | 5'–1" |

NOTES:
1. FOR CLASS "A" SPLICE (PERMITTED ONLY WHEN NOT MORE THAN HALF THE THE BARS SPLICED & SPLICES STAGGERED BY THE DISTANCE OF THE SPLICE LENGTH), USE THE SAME AS d" = TENSION DEVELOPEMENT LENGTH TABLE.

"ld " TENSION DEVELOPMENT LENGTH FOR BEAMS, SLAB & WALL REINFORCING (GRADE 60 UNCOATED BARS – NORMAL WEIGHT CONCRETE)

| BAR SIZE | f'c=3000 | | f'c=4000 | | f'c=5000 | | f'c=6000 | | f'c=8000 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TOP | BOT | TOP | BOT | TOP | BOT | TOP | BOT | TOP | BOT |
| # 3 | 1'–9" | 1'–4" | 1'–6" | 1'–2" | 1'–5" | 1'–0" | 1'–3" | 1'–0" | 1'–1" | 1'-0" |
| # 4 | 2'–4" | 1'–10" | 2'–1" | 1'–7" | 1'–10" | 1'–5" | 1'–8" | 1'–3" | 1'–5" | 1'-1" |
| # 5 | 3'–0" | 2'–3" | 2'–7" | 2'–0" | 2'–4" | 1'–9" | 2'–1" | 1'–7" | 1'–10" | 1'–5" |
| # 6 | 3'–7" | 2'–9" | 3'–1" | 2'–4" | 2'–9" | 2'–1" | 2'–6" | 1–'11" | 2'–2" | 1'–8" |
| # 7 | 5'–2" | 4'–0" | 4'–6" | 3'–6" | 4'–0" | 3'–1" | 3'–8" | 2'–10" | 3'–2" | 2'–5" |
| # 8 | 5'–11" | 4'–7" | 5'–2" | 3'–11" | 4'–7" | 3'–6" | 4'–2" | 3'–3" | 3'–8" | 2'–10" |
| # 9 | 6'–8" | 5'–2" | 5'–9" | 4'–5" | 5'–2" | 4'–0" | 4'–9" | 3'–8" | 4'–1" | 3'–2" |
| # 10 | 7'–6" | 5'–10" | 6'–6" | 5'–0" | 5'–10" | 4'–6" | 5'–4" | 4'–1" | 4'–7" | 3'–7" |
| # 11 | 8'–4" | 6'–5" | 7'–3" | 5'–7" | 6'–6" | 5'–0" | 5'–11" | 4'–7" | 5'–1" | 3'–11" |




TYPICAL CORNER REINFORCING BAR DETAILS (PLAN)

NOTES:
1. 'TOP' BARS ARE HORIZONTAL REBARS WITH MORE THAN 12 INCHES OF FRESH CONCRETE CAST BELOW THE BARS AT THE DEVELOPMENT LENGTH.
2. 'ld' FOR #3 AND #4 BARS IN SLAB OR WALL ARE CONSERVATIVE MAY BE REDUCED TO 0.75 TIMES (FOR #3 BARS) AND 0.94 TIMES (FOR #4 BARS) THE TABULATED VALUES.
3. FOR LIGHT-WEIGHT CONCRETE MULTIPLY VALUES BY 1.3.

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888

TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com

STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED
PROFESSIONAL ENGINEER
04/05/2021

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

# LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## GENERAL SPECIFICATIONS
CONSTRUCTION & MATERIAL SPECIFICATIONS

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CDP/BKZ | 4 |

LAST PRINTED: Thursday, March 25, 2021 3:37:16 PM FROM: Q:\1-ENGINEERING\1-PROJECTS\COG-210\4-DRAFTING\7-SHEETS\4 GENERAL SPECIFICATIONS.dwg

EXISTING PLAN VIEW
SCALE: 1" = 5'

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE

2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888

TEXAS REGISTERED
ENGINEERING FIRM
F-16194
TEXAS REGISTERED
SURVEYING FIRM
10194049

www.awceng.com


STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED
PROFESSIONAL ENGINEER
04/06/2021

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 13
EXISTING SITE PLAN

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CDP/BKZ | 5 |


LAST PRINTED Tuesday, June 20, 2006 1:14:21 PM FROM: O:\1-engineering\1-projects\COG-21\04-DRAFTING\2-SHEETS\TITLE.DWG[TITLE.dwg]

0 5 10

NOTES:

LIFT STATION #13, 53RD/ STREET, IS TO BE REHABILITATED WITH NEW PUMPS AND PIPING.

1. WET WELL IS TO BE REHABILITATED PER THE GENERAL CONSTRUCTION NOTES.
2. THE DISCHARGE PIPING MANIFOLD WILL BE REPLACED AS SHOWN WITHIN THE EXISTING VALVE VAULT.
3. BYPASS PUMPING
   a. USE MANHOLE (1) TO THE SOUTH OF THE LIFT STATION LOCATED IN THE WEST BOUND LANE OF AVENUE U FOR BYPASS PUMPING.
   b. CONTRACTOR TO SET UP TRAFFIC CONTROL AS REQUIRED AROUND BYPASS PUMPING OPERATION TO KEEP TWO-WAY TRAFFIC ALONG AVENUE U AND 53RD/ STREET.
   c. BYPASS DISCHARGE TO BE TIED TO EXISTING FORCE MAIN AT POINT (2) . CONNECTION AT POINT (2) CAN BE MADE INSIDE VALVE VAULT OR TO THE EXISTING FORCE MAIN CAN BE EXPOSED IN GRASSED AREA OUTSIDE VALVE VAULT AND TAPPED FOR TEMPORARY CONNECTION. IF A TAP IS MADE FOR THE TEMPORARY CONNECTION, TAP TO BE MADE USING A FORD STYLE FTSS FLANGED TAPPING SLEEVE (OR APPROVED EQUIVALENT). TAPPING SLEEVE SHALL BE SIZED TO MATCH BYPASS PUMP DISCHARGE PIPING. UPON COMPLETION OF BYPASS PUMPING, A BLIND FLANGE IS TO BE INSTALLED ON THE TAPPING SADDLE FLANGE. NOTE THAT A TEMPORARY BLIND FLANGE WILL HAVE TO BE INSTALLED ON THE PIPING INSIDE THE VALVE VAULT WHILE BYPASS PUMPING IS OCCURING.
4. ZONE X PER FIRM 4854690024E EFF. DATE 12/6/2002 0.2% ANNUAL CHANCE FLOOD HAZARD.
5. ALL EXISTING VALVES & VENTS TO BE REPLACED BY CONTRACTOR.
6. ALL EXISTING CONTROL PANELS, ELECTRICAL EQUIPMENT, AND ASSOCIATED APPURTENANCES TO BE RELOCATED AND REPLACED BY THE CONTRACTOR AS DETAILED ON SHEETS 45–80.

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com

STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/05/2021

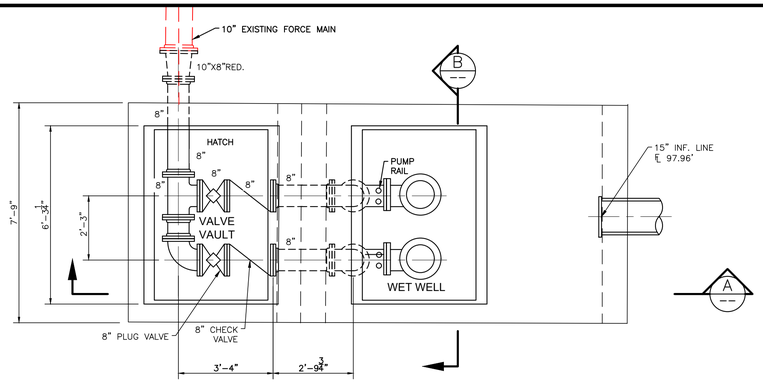
# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

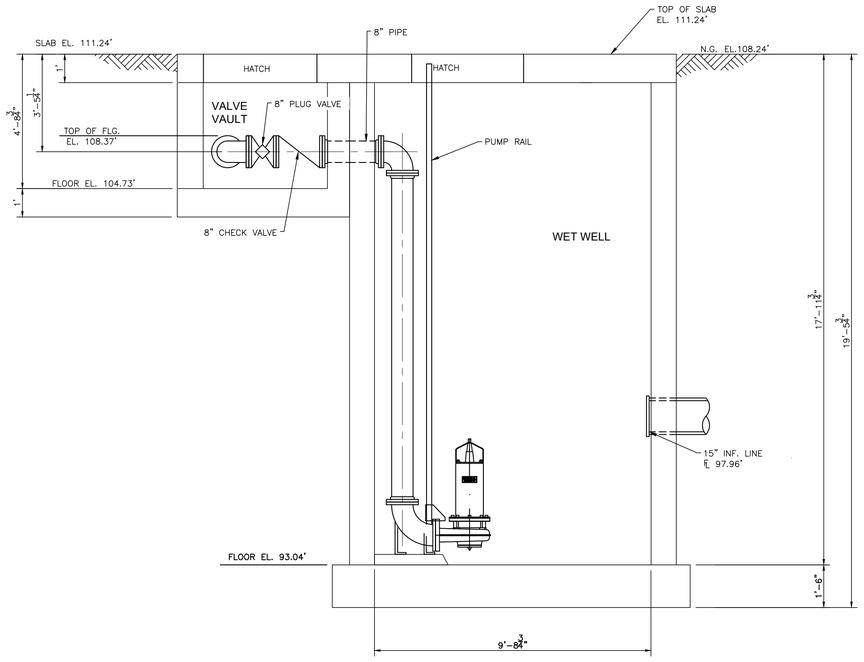
## LIFT STATION NO. 13
PROPOSED SITE PLAN

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CDP/BKZ | 6 |

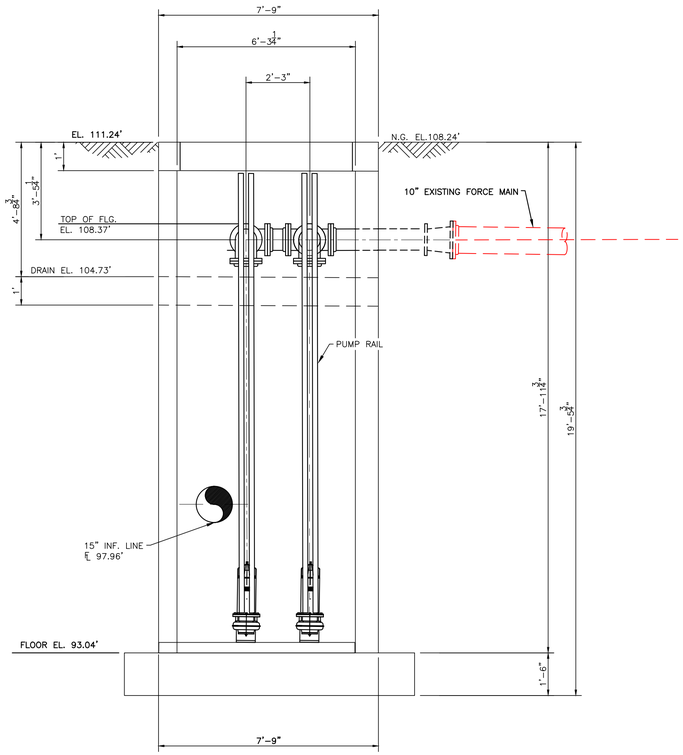
LAST PRINTED Tuesday, June 29, 2006 3:14:21 PM FROM: G:\1-ENGINEERING\1-PROJECTS\COG\-210\A-DRAFTING\5-SHEETS\N LIFT STATION NO. 13.dwg




EXISTING PLAN VIEW
SCALE: 3/8" = 1'0"




EXISTING SECTION A
SCALE: 3/8" = 1'0"




EXISTING SECTION B
SCALE: 3/8" = 1'0"

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2. | | |
| 1. | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com

STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/05/2021

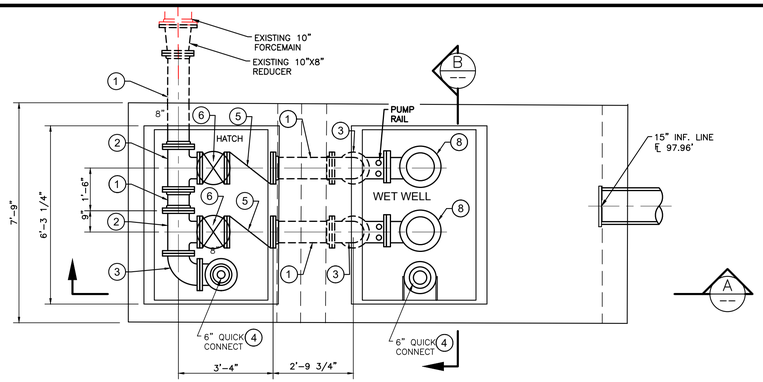
# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

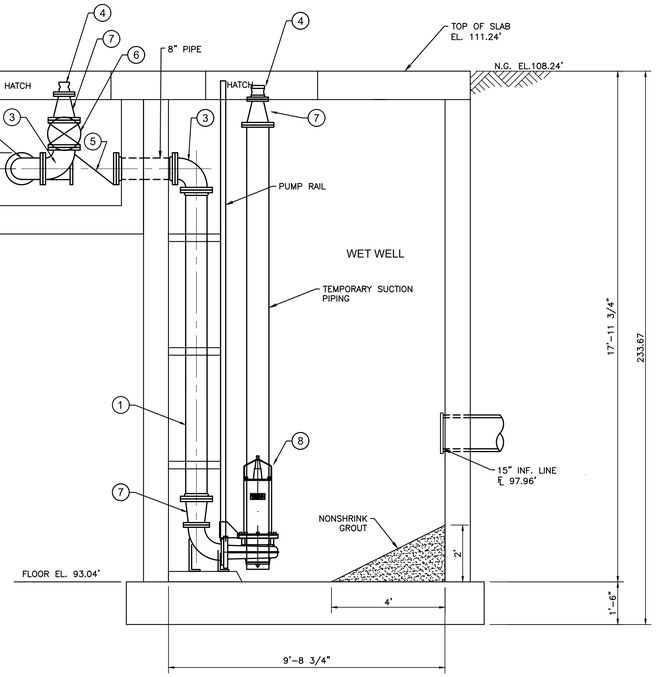
## LIFT STATION NO. 13
EXISTING PIPING PLAN AND SECTIONS

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CDP/BKZ | 7 |

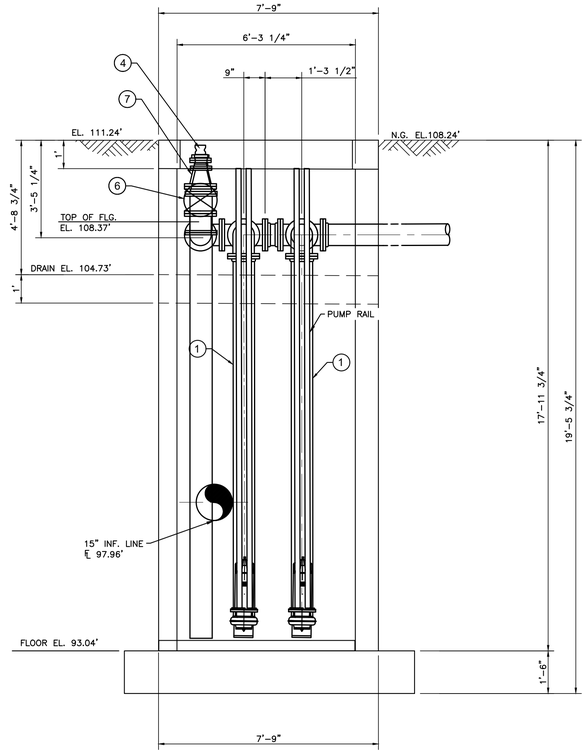
LAST PRINTED: Tuesday, June 29, 2021 3:14:21 PM FROM: Q:\1-engineering\1-projects\COG-210\04-DRAFTING\01-SHEETS\TITLE SHEET.dwg




PROPOSED PLAN VIEW
SCALE: 3/8" = 1'0"




PROPOSED SECTION A
SCALE: 3/8" = 1'0"




PROPOSED SECTION B
SCALE: 3/8" = 1'0"

| BILL OF MATERIAL | | |
|---|---|---|
| NO. | DESCRIPTION | QTY. |
| 1. | 8" DIA. FLG. SPOOL PIECE (LENGTH AS REQUIRED) | (LENGTH AS REQUIRED) |
| 2. | 8" TEE SIDE | 2 |
| 3. | 8" DIA. FLG. 90° ELBOW | 4 |
| 4. | 6" DIA. SS FLG. MALE QUICK CONNECT W/ CAP | 2 |
| 5. | 8" DIA. FLG. CHECK VALVE | 2 |
| 6. | 8" DIA. FLG. GATE VALVE | 3 |
| 7. | 8"X6" DIA. FLG. REDUCER | 4 |
| 8. | MODY MSP2-150.0-4 CHANNEL 2 15 HP SUBMERSIBLE PUMP | 2 |

LIFT STATION NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING THE ENTIRE LIFT STATION SITE OF ALL TREES, ROOTS, STUMPS, AND UNDERBRUSH. ALL ORGANIC MATERIAL SHALL BE REMOVED FROM THE SOIL. THE SOIL SHALL BE COMPACTED TO THE SATISFACTION OF THE ENGINEER PRIOR TO PLACEMENT OF THE PAVEMENT MATERIALS. ANY BRUSH REMOVED SHALL BE DISPOSED OF OFFSITE BY THE CONTRACTOR AT HIS OWN EXPENSE.
2. THE LIFT STATION WET WELL MAY BE CONSTRUCTED WITH PRECAST WET WELL SECTIONS OR CAST IN PLACE CONCRETE. BACKFILL AROUND THE WET WELL STRUCTURE SHALL BE 1 ½ SACK PER TON CEMENT STABILIZED SAND COMPACTED IN 12" LIFTS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF GROUND WATER AT THE LIFT STATION SITE. THE CONTRACTOR SHALL SUBMIT HIS PLAN FOR PUMPING THE GROUND WATER DOWN TO AN ACCEPTABLE LEVEL TO THE OWNER/ENGINEER. AT NO TIME SHALL GROUND WATER BE ALLOWED IN THE EXCAVATION WHILE PLACING THE LIFT STATION FOUNDATION OR CONSTRUCTING THE LIFT STATION WALLS. FOR ALL BELOW GRADE STRUCTURES, A 2" CONCRETE SEAL SLAB SHALL BE POURED PRIOR TO CONSTRUCTION OF THE FOUNDATION TO CONTROL INSITU SOIL CONDITIONS, UNLESS APPROVED OTHERWISE BY THE ENGINEER/OWNER.
4. LIFT STATION SITE SHALL BE GRADED TO PROVIDE FOR DRAINAGE AS INDICATED ON THE PLANS. SURFACE DRAINAGE SHALL BE CONTROLLED DURING CONSTRUCTION TO PREVENT RUNOFF FROM ENTERING EXCAVATIONS THROUGH THE USE OF TEMPORARY BERMS, SWELLS, ETC. AS REQUIRED.
5. ALL FINISHED SLAB SURFACES SHALL BE SLOPED AWAY FROM OPENINGS.
6. ALL PIPE PENETRATIONS INTO THE WET WELL OR VALVE VAULT SHALL HAVE WATER STOP INSTALLED IN ANNULAR SPACES BETWEEN THE PIPE AND WALL AND SEALED WITH NON-SHRINK GROUT.
7. EACH PROPOSED HATCH SHALL BE MANUFACTURED FROM ALUMINUM DIAMOND PLATE AND STAINLESS-STEEL HINGES WITH HEAVY DUTY HASPS AND HARDWARE. THE HATCH SHALL BE DESIGNED FOR A LIVE LOAD OF 300 PSF. THE HATCH OVER THE PUMPS SHALL BE CENTERED ON THE PUMP(S). THE SIZE AND PLACEMENT SHALL BE AS PER THE PUMP MANUFACTURER'S RECOMMENDATIONS FOR EASE OF REMOVAL. ALL HATCHES SHALL SIT FLUSH ON THE CONCRETE. LIFT STATION HATCH OPENINGS ARE TO BE FITTED WITH NEW FALL PROTECTION APPARATUS. FALL PROTECTION SAFETY NET RETROFIT SHALL BE AS MANUFACTURER BY U.S.F. FABRICATION, HIALEA, FLORIDA, OR APPROVED EQUIVALENT.
8. ALL NUTS AND BOLTS INSTALLED UNDERGROUND OR IN THE WET WELL SHALL BE STAINLESS STEEL. NO CORRODIBLE MATERIALS WILL BE ALLOWED IN THE WET WELL. ALL PIECES OF THE CAM AND GROVE FITTINGS SHALL BE STAINLESS STEEL.
9. THE INTERIOR WALLS OF THE WET WELL SHALL BE COATED WITH SPECTRASHIELD PROTECTIVE LINING OR ENGINEER PRIOR APPROVED EQUIVALENT.
10. ALL DUCTILE IRON PIPING SHALL BE PAINTED IN ACCORDANCE WITH THE SPECIFICATIONS.
11. THE LOCATION OF THE ELECTRICAL SERVICE RACK AND ALL OTHER ELECTRICAL INSTALLATIONS SHALL BE AS PER THE NATIONAL ELECTRIC CODE (LATEST EDITION). THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADEQUATELY SIZED CONDUIT, CONDUCTORS, BREAKERS, AND THE GROUNDING SYSTEM.
12. ALL WET WELL FLOAT LEVELS SHALL BE COORDINATED BETWEEN THE CITY & CONTRACTOR.

    THE CABLE SHALL BE 3/8" STAINLESS STEEL CABLE. THE FLOATS SHALL BE SECURED TO THE CABLE WITH PLASTIC TIE WRAPS. THE HEIGHTS OF THE FLOATS SHALL BE SUCH THAT WHEN THE WATER LEVEL CAUSES THE FLOATS TO RISE TO THE HORIZONTAL POSITION AND ACTIVATES THE SWITCHES, THE FLOATS WILL BE AT THE SPECIFIED HEIGHTS. THE WEIGHT FOR THE FLOAT APPARATUS SHALL BE TOTALLY ENCAPSULATED IN RUBBER OR SHALL BE OF PRIOR APPROVED NON-CORROSIVE MATERIAL AND SHALL WEIGH BETWEEN 7 LBS. AND 10 LBS. ALL MATERIALS SHALL BE NON-CORROSIVE.
13. AUTO DIALER ALARMS FOR PUMP FAILURE, ELECTRICAL FAILURE, & HIGH WET WELL LEVELS TO BE COORDINATED BETWEEN THE CITY & CONTRACTOR.

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2. | | |
| 1. | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com

STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED
PROFESSIONAL ENGINEER
04/06/2021

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 13
PROPOSED PIPING PLAN AND SECTIONS

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/CDP | 8 |

LAST PRINTED Tuesday, June 29, 2021 1:14:21 PM FROM: O:\-ENGINEERING\-PROJECTS\COG-210\4-DRAFTING\X-SHEETS\8 LIFT STATION NO. 13.dwg

NOT IN THIS CONTRACT

EXISTING PLAN VIEW
SCALE: 1" = 5'

0 10 20

**BENCHMARK POINT INFORMATION**

| BM# | NORTHING | EASTING | DESCRIPTION | ELEVATION |
|---|---|---|---|---|
| 1 | 13676841.23 | 3257243.44 | RR SPK | 6.86' |

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awcenc.com
STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/06/2020

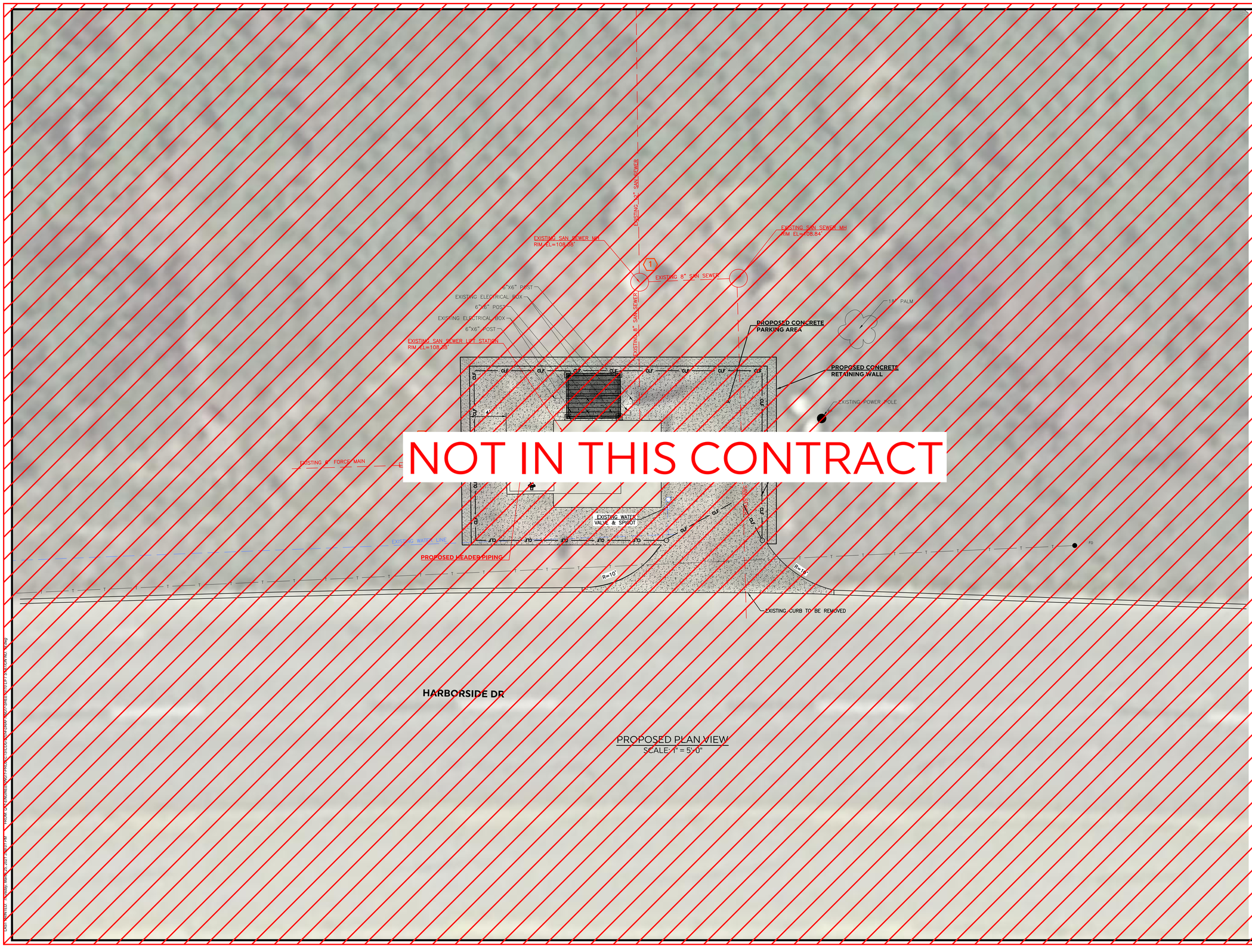

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 18
EXISTING SITE PLAN

| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CDP/BKZ | 9 |


Jan 06,2021 - Monday, 4:28:21 PM - C:\Users\bkzotzky\Arceneaux Wilson & Cole\Arceneaux Wilson & Cole - Documents\Projects\COG-210 Lift Station Improvements\Drawings\Lift Station 18\Lift Station 18 Existing Site Plan.dwg




PROPOSED PLAN VIEW
SCALE: 1" = 5'-0"

0 5 10

NOTES:

LIFT STATION # 18, HARBORSIDE, IS TO BE REHABILITATED WITH NEW PUMPS AND PIPING. THE DISCHARGE PIPING WILL BE BROUGHT ABOVE GROUND OUTSIDE THE VALVE VAULT TO ALLOW EASE OF MAINTENANCE AND TO PREVENT THE VAULT FROM FLOODING. ADDITIONALLY, A NEW ELECTRICAL SUPPORT PLATFORM IS TO BE INSTALLED TO ALLOW THE ELECTRICAL TO BE INSTALLED ABOVE THE BASE FLOOD ELEVATION (BFE) AND, THE SITE WILL BE CONCRETE PAVED TO ALLOW BETTER MAINTENANCE AND ACCESS AROUND THE SITE.

1. CONSTRUCT A RETAINING WALL TO THE NORTH EXTENDING TO THE WEST AND EAST AS SHOWN. THE ENTIRE SITE WILL BE CONCRETE PAVED AND FENCED AS SHOWN. A CONCRETE ACCESS DRIVE WILL BE CONSTRUCTED ON THE EAST SIDE TO ALLOW FOR ACCESS TO THE SITE AND WET WELL FOR REMOVAL OF THE PUMPS.
2. WET WELL IS TO BE REHABILITATED PER THE GENERAL CONSTRUCTION NOTES.
3. THE DISCHARGE PIPING MANIFOLD WILL BE REPLACED AND MOVED TO ABOVE GROUND ON TOP OF THE EXISTING VALVE VAULT AS SHOWN. THE EXISTING VALVE VAULT IS TO BE ABANDONED IN PLACE AS INDICATED IN THE GENERAL CONSTRUCTION NOTES.
4. BYPASS PUMPING
   a. USE MANHOLE (1) LOCATED TO THE WEST OF THE LIFT STATION LOCATED FOR BYPASS PUMPING.
   b. BYPASS DISCHARGE TO BE TIED TO EXISTING FORCE MAIN AT POINT (2). CONNECTION AT POINT (2) CAN BE MADE INSIDE VALVE VAULT OR IF THE EXISTING FORCE MAIN CAN BE EXPOSED IN GRASSED AREA OUTSIDE VALVE VAULT AND TAPPED FOR TEMPORARY CONNECTION. IF A TAP IS MADE FOR THE TEMPORARY CONNECTION, TAP TO BE MADE USING A FORD STYLE FTSS FLANGED TAPPING SLEEVE (OR APPROVED EQUIVALENT). TAPPING SCEEVE SHALL BE SIZED TO MATCH BYPASS PUMP DISCHARGE PIPING. UPON COMPLETION OF BYPASS PUMPING, A BLIND FLANGE IS TO BE INSTALLED ON THE TAPPING SADDLE FLANGE. NOTE THAT A TEMPORARY BLIND FLANGE WILL HAVE TO BE INSTALLED ON THE PIPING INSIDE THE VALVE VAULT WHILE BYPASS PUMPING IS OCCURRING.
5. AN ELEVATED PLATFORM WILL BE ADDED FOR INSTALLATION OF THE ELECTRICAL EQUIPMENT. THE ELEVATED PLATFORM WILL BE INSTALLED ABOVE THE FLOOD ELEVATION.
6. TRAFFIC CONTROL FOR CONSTRUCTION
   a. A TRAFFIC CONTROL PLAN SHALL BE SUBMITTED FOR APPROVAL BEFORE WORK CAN BEGIN ON SITE.
   b. CONTRACTOR SHALL SET UP TRAFFIC CONTROL AROUND SITE TO MAINTAIN SAFE TRAVEL IN THE SOUTH BOUND LANE. ONLY ONE LANE OF TRAFFIC CAN BE REMOVED FROM SERVICE. THE LEFT TURN LANE CAN BE USED FOR DIVERTING TRAFFIC. PROVIDED ACCESS TO ADJACENT BUSINESS IS NOT BLOCKED.
   c. WARNING SIGNALS SHALL BE PROVIDED NORTH AND SOUTH OF THE WORK ZONE. SIGNALS SHALL MEET ALL CITY AND TXDOT REQUIREMENTS.
   d. TRAFFIC CONTROL SHALL BE IN PLACE AT ALL TIMES WORK IS IN PROGRESS ON SITE.
7. ZONE AE PER FIRM 4854680021E EFF. DATE 12/6/2002. ELEV. 12 FEET.
8. CONTRACTOR SHALL ADJUST EXISTING WATER VALVE AND SPIGOT ELEVATION AS NECESSARY.
9. ALL EXISTING VALVES & VENTS TO BE REPLACED BY CONTRACTOR.
10. ALL EXISTING CONTROL PANELS, ELECTRICAL EQUIPMENT, AND ASSOCIATED APPURTENANCES TO BE RELOCATED AND REPLACED BY THE CONTRACTOR AS DETAILED ON SHEETS 45-50.

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED
ENGINEERING FIRM
F-16194
TEXAS REGISTERED
SURVEYING FIRM
10194049
www.awcenc.com

STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED
PROFESSIONAL
ENGINEER
04/06/2021

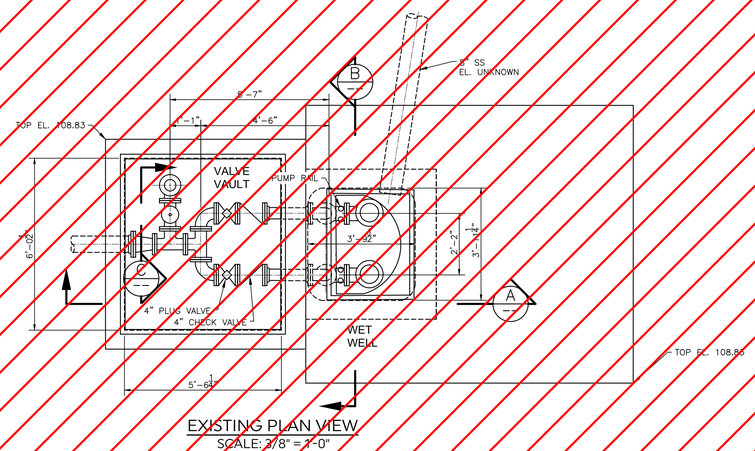
# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 18
PROPOSED SITE PLAN

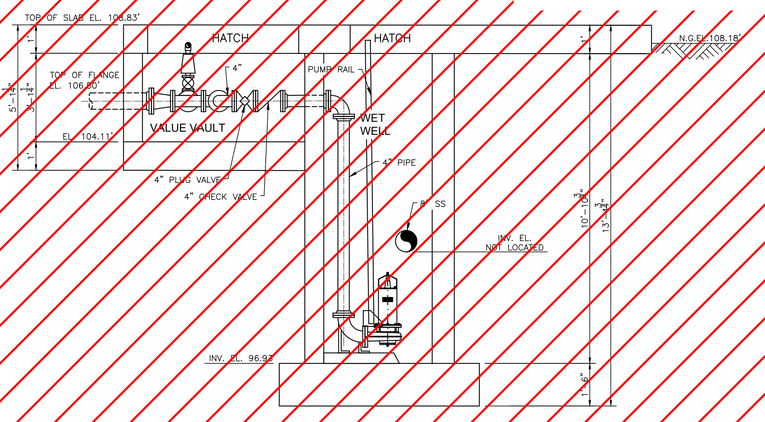
| AWC NO. | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/CSP | 10 |

JAN 06, 2021 - 11:49:17 AM
H:\PROJECTS\COG-210 LIFT STATIONS\CONSTRUCTION\LIFT STATION 18\LS18 SITE PLAN.dwg

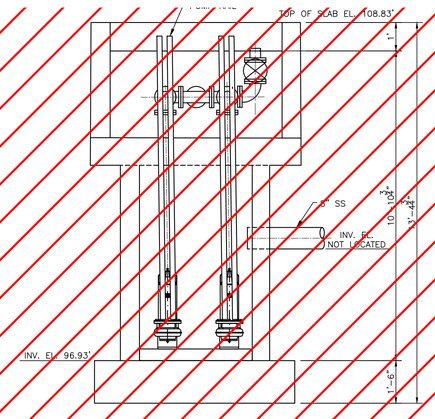



EXISTING PLAN VIEW
SCALE: 3/8" = 1'-0"

# NOT IN THIS CONTRACT




EXISTING SECTION A
SCALE: 3/8" = 1'-0"




EXISTING SECTION B
SCALE: 3/8" = 1'-0"

CROSS-SECTION C
SCALE: 3/8" = 1'-0"

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com
STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/06/2021

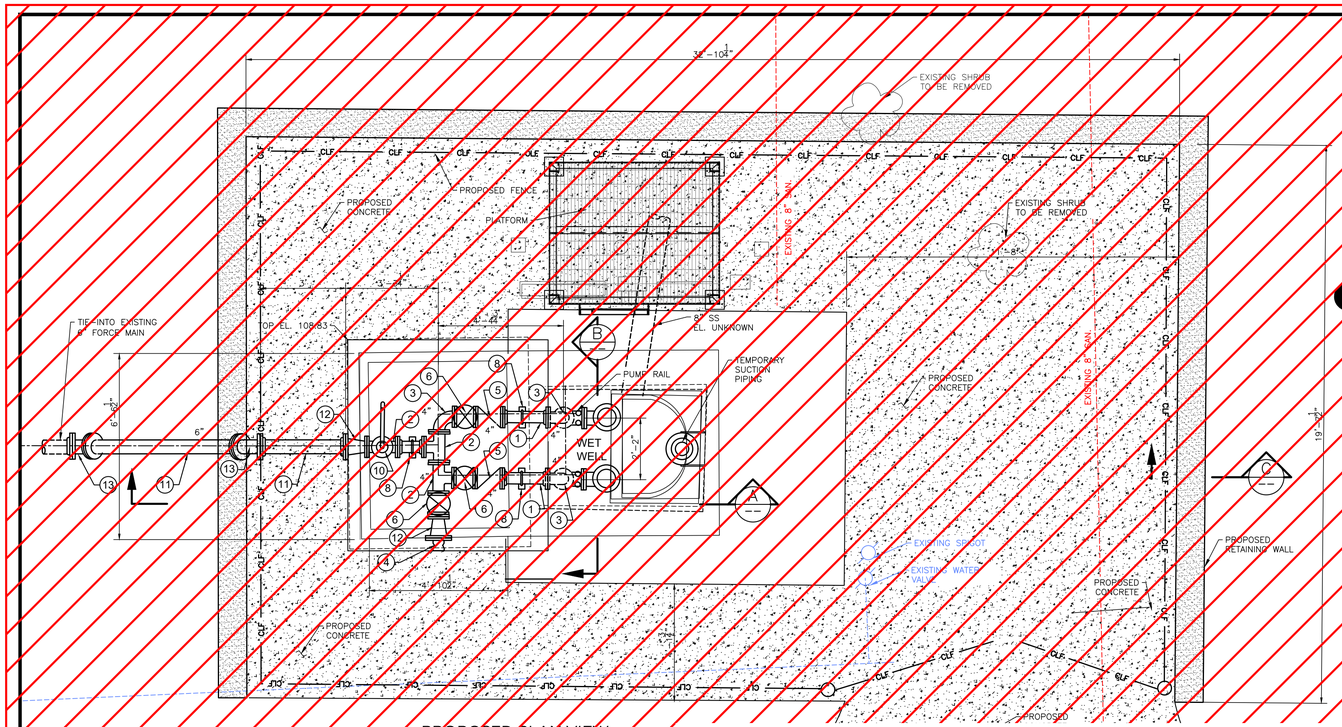
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

LIFT STATION NO. 18
EXISTING PIPING PLAN AND SECTIONS

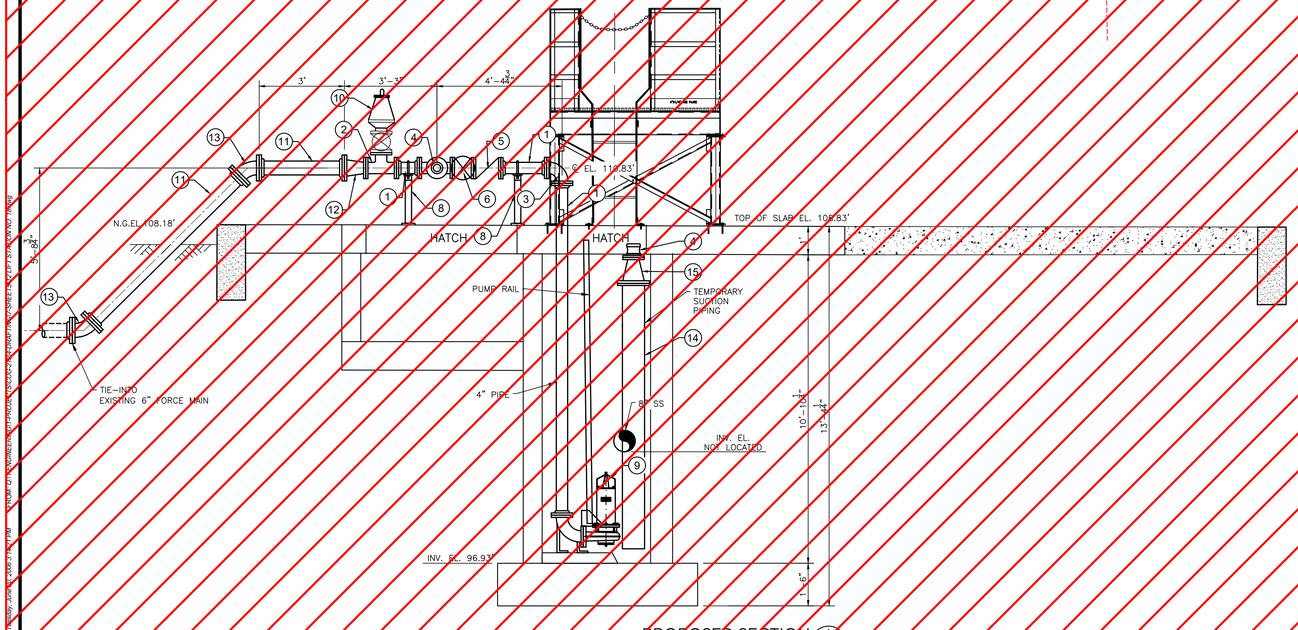
| AWC NO. | DRAWN BY: MAK | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/GMP | 11 |

LAST PLOTTED: Tuesday, April 06, 2021 at 1:42 PM
C:\Users\mkuhl\Desktop\Galveston\Lift Station Improvements\Lift Station No. 18\Lift Station No. 18 - Piping Plan and Sections.dwg

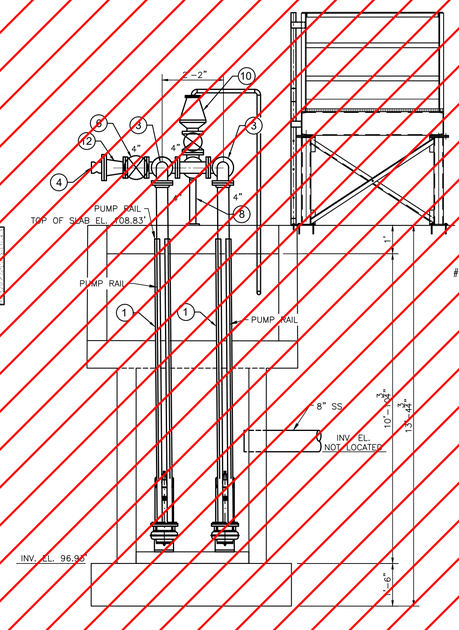



PROPOSED PLAN VIEW
SCALE: 3/8" = 1'-0"

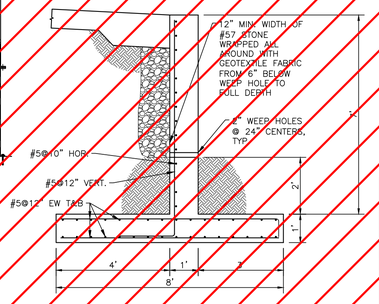
NOT IN THIS CONTRACT




PROPOSED SECTION A
SCALE: 3/8" = 1'-0"




PROPOSED SECTION B
SCALE: 3/8" = 1'-0"




PROPOSED SECTION C
SCALE: 3/8" = 1'-0"

BILL OF MATERIAL

| NO. | DESCRIPTION | QTY. |
|---|---|---|
| 1. | 4" DIA. FLG. SPOOL PIECE (LENGTH AS REQUIRED) | (LENGTH AS REQUIRED) |
| 2. | 4"X4"X4" TEE SIDE | 3 |
| 3. | 4" DIA. FLG. 90° ELBOW | 5 |
| 4. | 6" DIA. SS FLG. MALE QUICK CONNECT W/ CAP | 2 |
| 5. | 4" DIA. FLG. CHECK VALVE | 2 |
| 6. | 4" DIA. FLG. GATE VALVE | 3 |
| 7. | 4" DIA. FLG. 45° ELBOW | 2 |
| 8. | PIPE SUPPORT | 3 |
| 9. | MODY MSP3-100.0-6 CHANNEL 1 1/2 HP SUBMERSIBLE PUMP | 2 |
| 10. | 4" FLG X.R.I. COMBINATION AIR VALVE WITH 4" FLG GATE VALVE (PIPE DISCHARGE TO WETWELL CASING 3" SCH. 10 SS PIPE | 1 |
| 11. | 6" DIA. FLG. SPOOL PIECE (LENGTH AS REQUIRED) | (LENGTH AS REQUIRED) |
| 12. | 4"X6" REDUCER | |
| 13. | 6" DIA. FLG. 90° ELBOW | 2 |
| 14. | 8" DIA. FLG. SPOOL PIECE (LENGTH AS REQUIRED) | (LENGTH AS REQUIRED) |
| 15. | 6"X8" REDUCER | 1 |

LIFT STATION NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING THE ENTIRE LIFT STATION SITE OF ALL TREES, ROOTS, STUMPS, AND UNDERBRUSH. ALL ORGANIC MATERIAL SHALL BE REMOVED FROM THE SOIL. THE SOIL SHALL BE COMPACTED TO THE SATISFACTION OF THE ENGINEER PRIOR TO PLACEMENT OF THE PAVEMENT MATERIALS. ANY BRUSH REMOVED SHALL BE DISPOSED OF OFFSITE BY THE CONTRACTOR AT HIS OWN EXPENSE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF GROUND WATER AT THE LIFT STATION SITE. THE CONTRACTOR SHALL SUBMIT HIS PLAN FOR DEWATERING THE GROUND WATER DOWN TO AN ACCEPTABLE LEVEL TO THE OWNER/ENGINEER. AT NO TIME SHALL GROUND WATER BE ALLOWED IN THE EXCAVATION WHILE PLACING THE LIFT STATION FOUNDATION OR CONSTRUCTING THE LIFT STATION WALLS. FOR ALL BELOW GRADE STRUCTURES, A 2" CONCRETE SEAL SLAB SHALL BE POURED PRIOR TO CONSTRUCTION OF THE FOUNDATION TO CONTROL IN-SITU SOIL CONDITIONS UNLESS APPROVED OTHERWISE BY THE ENGINEER/OWNER.
3. LIFT STATION SITE SHALL BE GRADED TO PROVIDE FOR DRAINAGE AS INDICATED ON THE PLANS. SURFACE DRAINAGE SHALL BE CONTROLLED DURING CONSTRUCTION TO PREVENT RUNOFF FROM ENTERING EXCAVATIONS THROUGH THE USE OF TEMPORARY BERMS, SWELLS ETC. AS REQUIRED.
4. ALL FINISHED SLAB SURFACES SHALL BE SLOPED AWAY FROM OPENINGS.
5. ALL PIPE PENETRATIONS INTO THE WET WELL OR VALVE VAULT SHALL HAVE WATER STOP INSTALLED IN ANNULAR SPACES BETWEEN THE PIPE AND WALL AND SEALED WITH NON-SHRINK GROUT.
6. EACH PROPOSED HATCH SHALL BE MANUFACTURED FROM ALUMINUM DIAMOND PLATE AND STAINLESS-STEEL HINGES WITH HEAVY DUTY HASPS AND HARDWARE. THE HATCH SHALL BE DESIGNED FOR A LIVE LOAD OF 300 PSF. THE HATCH OVER THE PUMPS SHALL BE CENTERED ON THE PUMP(S). THE SIZE AND PLACEMENT SHALL BE AS PER THE PUMP MANUFACTURER'S RECOMMENDATIONS FOR EASE OF REMOVAL. ALL HATCHES SHALL SIT FLUSH ON THE CONCRETE. LIFT STATION HATCH OPENINGS ARE TO BE FITTED WITH NEW FALL PROTECTION APPARATUS. FALL PROTECTION SAFETY NET RETROFIT SHALL BE AS MANUFACTURER BY U.S.F. FABRICATION, HIALEA, FLORIDA OR APPROVED EQUIVALENT.
7. ALL NUTS AND BOLTS INSTALLED UNDERGROUND OR IN THE WET WELL SHALL BE STAINLESS STEEL. NO CORRODIBLE MATERIALS WILL BE ALLOWED IN THE WET WELL. ALL PIECES OF THE CAM AND GROVE FITTINGS SHALL BE STAINLESS STEEL.
8. THE INTERIOR WALLS OF THE WET WELL BE SHALL BE COATED WITH SPECTRASHIELD PROTECTIVE LINING OR ENGINEER PRIOR APPROVED EQUIVALENT.
9. ALL DUCTILE IRON PIPING SHALL BE PAINTED IN ACCORDANCE WITH THE SPECIFICATIONS.
10. THE LOCATION OF THE ELECTRICAL SERVICE RACK AND ALL OTHER ELECTRICAL INSTALLATIONS SHALL BE AS PER THE NATIONAL ELECTRIC CODE (LATEST EDITION). THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADEQUATELY SIZED CONDUIT, CONDUCTORS, BREAKERS AND THE GROUNDING SYSTEM.
11. ALL WET WELL FLOAT LEVELS SHALL BE COORDINATED BETWEEN THE CITY & CONTRACTOR.

    THE CABLE SHALL BE 3/8" STAINLESS STEEL CABLE. THE FLOATS SHALL BE SECURED TO THE CABLE WITH PLASTIC TIE WRAPS. THE HEIGHTS OF THE FLOATS SHALL BE SUCH THAT WHEN THE WATER LEVEL CAUSES THE FLOATS TO RISE TO THE HORIZONTAL POSITION AND ACTIVATES THE SWITCHES, THE FLOATS WILL BE AT THE SPECIFIED HEIGHTS. THE WEIGHT FOR THE FLOAT APPARATUS SHALL BE TOTALLY ENCAPSULATED IN RUBBER OR SHALL BE OF PRIOR APPROVED NON-CORROSIVE MATERIAL AND SHALL WEIGH BETWEEN 7 LBS. AND 10 LBS. ALL MATERIALS SHALL BE NON-CORROSIVE.
12. AUTO DIALER ALARMS FOR PUMP FAILURE, ELECTRICAL FAILURE & HIGH WET WELL LEVELS TO BE COORDINATED BETWEEN THE CITY & CONTRACTOR.
13. SITE GATES SHALL OPEN INWARD TO L.S. SITE.

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com
STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
01/06/2021

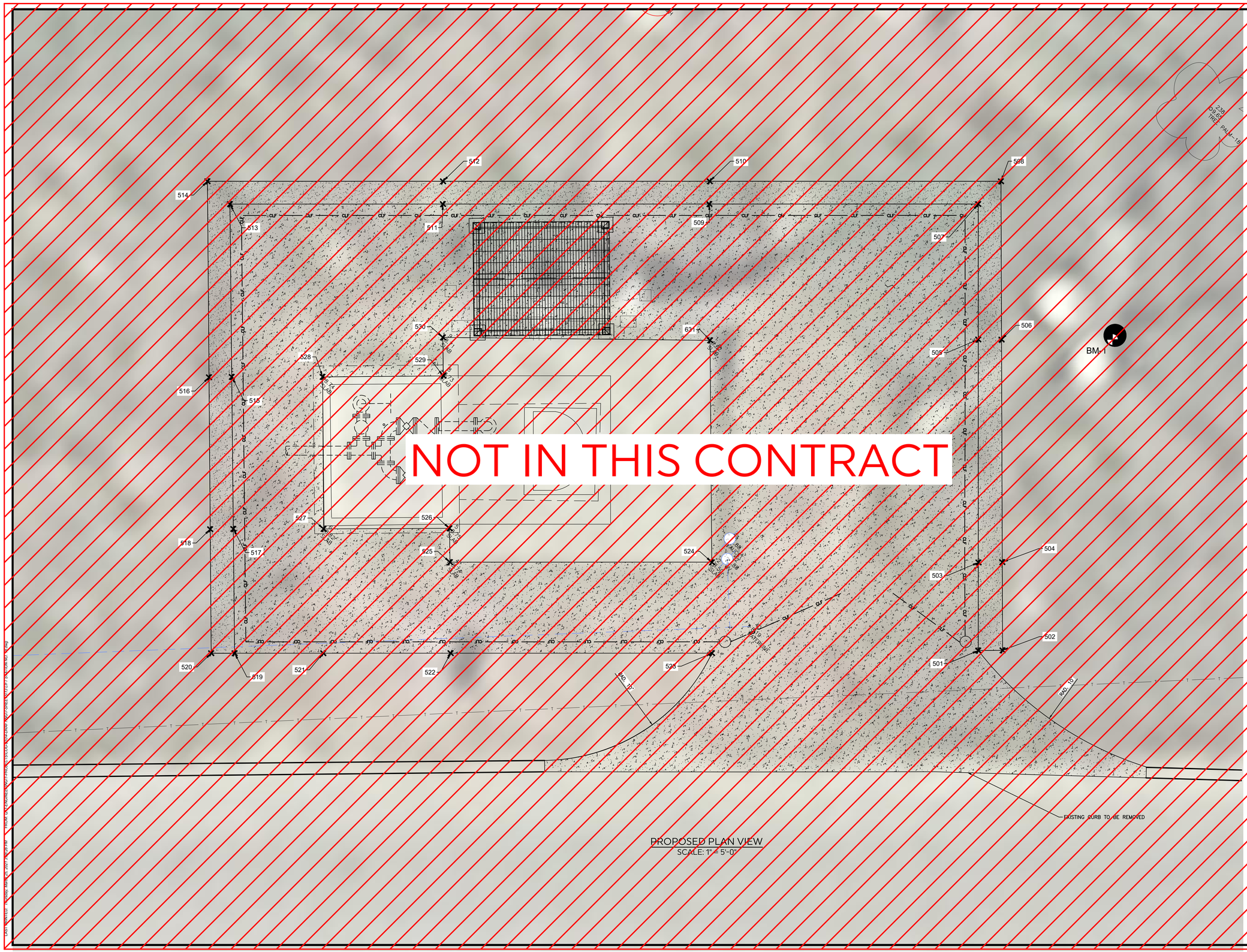
# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 18
PROPOSED PIPING PLAN AND SECTIONS

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/JDP | 12 |

LAST SAVED: Thursday, January 07, 2021 11:47 AM
FILE: G:\Projects\COG\COG-210 Lift Station Improvements\CAD\Sheets\LS 18 PLAN & SECTIONS.dwg




PROPOSED PLAN VIEW
SCALE: 1" = 5'-0"

NOTE:

1. CONTRACTOR TO MATCH EXISTING ROAD ELEVATIONS AT DRIVE TIE-IN LOCATIONS.

**BENCHMARK POINT INFORMATION**

| BM# | NORTHING | EASTING | DESCRIPTION | ELEVATION |
|---|---|---|---|---|
| 1 | 13676884.23 | 3287243.44 | RR SPK | 6.86' |

**BUILDING POINT INFORMATION**

| POINT # | NORTHING | EASTING | DESCRIPTION | ELEVATION |
|---|---|---|---|---|
| 501 | 13676827.15 | 3287248.31 | TP | 8.32' |
| 502 | 13676827.88 | 3287249.09 | TP | 8.32' |
| 503 | 13676830.93 | 3287245.70 | TP | 8.31' |
| 504 | 13676830.74 | 3287246.47 | TP | 8.33' |
| 505 | 13676837.29 | 3287239.10 | TP | 8.40' |
| 506 | 13676837.97 | 3287239.86 | TP | 8.40' |
| 507 | 13676841.70 | 3287235.09 | TP | 8.45' |
| 508 | 13676843.12 | 3287235.15 | TP | 8.45' |
| 509 | 13676833.74 | 3287226.32 | TP | 8.49' |
| 510 | 13676834.49 | 3287225.65 | TP | 8.49' |
| 511 | 13676825.89 | 3287217.64 | TP | 8.58' |
| 512 | 13676826.60 | 3287216.92 | TP | 8.58' |
| 513 | 13676819.55 | 3287210.70 | TP | 8.47' |
| 514 | 13676819.62 | 3287209.20 | TP | 8.47' |
| 515 | 13676813.97 | 3287215.87 | TP | 8.65' |
| 516 | 13676813.28 | 3287215.14 | TP | 8.65' |
| 517 | 13676809.06 | 3287220.42 | TP | 8.73' |
| 518 | 13676808.37 | 3287219.68 | TP | 8.73' |
| 519 | 13676805.05 | 3287224.15 | TP | 8.67' |
| 520 | 13676804.35 | 3287223.38 | TP | 8.67' |
| 521 | 13676807.67 | 3287227.04 | TP | 8.70' |
| 522 | 13676811.44 | 3287231.19 | TP | 8.65' |
| 523 | 13676819.18 | 3287239.71 | TP | 8.41' |
| 524 | 13676822.14 | 3287237.01 | TP | 8.56' |
| 525 | 13676814.39 | 3287228.47 | TP | 8.74' |
| 526 | 13676815.48 | 3287227.45 | TP | 8.75' |
| 527 | 13676811.73 | 3287223.67 | TP | 8.82' |
| 528 | 13676816.66 | 3287218.83 | TP | 8.74' |
| 529 | 13676820.27 | 3287222.74 | TP | 8.74' |
| 530 | 13676821.51 | 3287221.59 | TP | 8.71' |
| 531 | 13676829.32 | 3287230.38 | TP | 8.62' |

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awcengr.com


STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
01/05/2021

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 18
PAVING PLAN

| AWC NO. | DRAWN BY: MAK | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/CMP | 13 |

STEWART RD

EXISTING SAN SEWER MH
RIM EL. 103.78'

EXISTING 24" SAN SEWER

EXISTING 30" SAN SEWER

POWER POLE
W/TRANS.

EXISTING POWER POLE
MBRRSPK

BM#1

EXISTING POWER POLE

EXISTING VALVE VAULT

18" PALM TREE
(TO REMAIN)

EXISTING WET WELL

EXISTING FENCE

EXISTING ELECT. PLATFORM

NOT IN THIS CONTRACT

EXISTING PLAN VIEW
SCALE: 1" = 5'-0"

0 5 10

**BENCHMARK POINT INFORMATION**

| BM# | NORTHING | EASTING | DESCRIPTION | ELEVATION |
|---|---|---|---|---|
| 1 | 13676841.23 | 3287343.44 | MBRRSPK | 6.85 |

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7868
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awcenc.com


STATE OF TEXAS
BRIAN K. ZOTZKY
24808
LICENSED PROFESSIONAL ENGINEER
04/08/2020

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 30
EXISTING SITE PLAN

| AWC NO: | DRAWN BY: MAX | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/JDP | 14 |


Jan 08,2020 - Thursday - 2:01:56 PM - C:\Users\jdp\Documents\Projects\COG-210 LIFT STATIONS\LS30\LS30 - Plan.dwg

STEWART RD

EXISTING SAN SEWER MH
RIM ELEV=10.78

EXISTING 8" SAN SEWER

EXISTING SAN SEWER

POWER POLE W/ TRANS.

PROPOSED 12' WIDE CONCRETE DRIVEWAY

EXISTING POWER POLE

BM-1

EXISTING POWER POLE

NOT IN THIS CONTRACT

PROPOSED CONCRETE PAVING

18" PALM TREE (TO REMAIN)

5'X5'(±) VOID TO ACCOMMODATE TREE FILL W/RUBBER MULCH WEED MAT BY CONSERV-A-STORE OR EQUAL.

PROPOSED CHAINLINK FENCING LOCATED 6" FROM EDGE OF PAVING

PROPOSED CONCRETE PAVING

EXISTING ELECT. PLATFORM

CLF

PROPOSED PLAN VIEW
SCALE: 1" = 5'-0"

0 5 10

NOTES:

LIFT STATION #30, 8 MILE ROAD, IS TO BE REHABILITATED WITH NEW PUMPS AND PIPING. THE WET WELL IS TO BE RAISED. THE DISCHARGE PIPING WILL BE BROUGHT ABOVE GROUND OUTSIDE THE VALVE VAULT TO ALLOW EASE OF MAINTENANCE AND TO PREVENT THE VAULT FROM FLOODING. AND THE SITE IS TO BE CONCRETE PAVED WITHIN THE FENCED AREA TO ALLOW BETTER MAINTENANCE AND ACCESS AROUND THE SITE.

1. WET WELL IS TO BE REHABILITATED PER THE GENERAL CONSTRUCTION NOTES. ADDITIONALLY THE WET WELL TOP WILL BE RAISED 15-INCHES TO PREVENT FLOODING FROM TIDAL INFLUENCES.
2. THE DISCHARGE PIPING MANIFOLD WILL BE REPLACED AND MOVED TO ABOVE GROUND ON TOP OF THE EXISTING VALVE VAULT AS SHOWN. THE EXISTING VALVE VAULT IS TO BE ABANDONED IN PLACE AS INDICATED IN THE GENERAL CONSTRUCTION NOTES.
3. THE ENTIRE SITE WITHIN THE FENCED AREA WILL BE CONCRETE PAVED TO WITHIN 6-INCHES OF THE EXISTING FENCE. THE ACCESS ROAD WILL BE REPLACED WITH CONCRETE PAVING TO STEWART ROAD.
4. BYPASS PUMPING
   a. USE MANHOLE (1) TO THE WEST OF THE LIFT STATION LOCATED FOR BYPASS PUMPING.
   b. BYPASS DISCHARGE TO BE TIED TO EXISTING FORCE MAIN AT POINT (X). CONNECTION AT POINT (2) CAN BE MADE INSIDE VALVE VAULT OR TO THE EXISTING FORCE MAIN CAN BE EXPOSED IN GRASSED AREA OUTSIDE VALVE VAULT AND TAPPED FOR TEMPORARY CONNECTION. IF A TAP IS MADE FOR THE TEMPORARY CONNECTION, TAP TO BE MADE USING A FORD STYLE FTSS FLANGED TAPPING SLEEVE OR APPROVED EQUIVALENT. TAPPING SLEEVE SHALL BE SIZED TO MATCH BYPASS PUMP DISCHARGE PIPING. UPON COMPLETION OF BYPASS PUMPING, A BLIND FLANGE IS TO BE INSTALLED ON THE TAPPING SADDLE FLANGE. NOTE THAT A TEMPORARY BLIND FLANGE WILL HAVE TO BE INSTALLED ON THE PIPING INSIDE THE VALVE VAULT WHILE BYPASS PUMPING IS OCCURRING.
5. NOTE THE OVERHEAD ELECTRICAL ROUTED ACROSS THE NORTH SIDE OF THE LIFT STATION SITE.
6. ZONE VE PER FIRM 48541900466 EFF. DATE 12/6/2002 ELEVATION 17 FEET.
7. ALL EXISTING VALVES & VENTS TO BE REPLACED BY CONTRACTOR.
8. ALL EXISTING CONTROL PANELS ELECTRICAL EQUIPMENT, AND ASSOCIATED APPURTENANCES TO BE RELOCATED & REPLACED BY CONTRACTOR AS DETAILED ON SHEETS 45-60.
9. ALL INFLUENT GATE STRUCTURES TO BE REPLACED BY CONTRACTOR.

**BENCHMARK POINT INFORMATION**

| BM# | NORTHING | EASTING | DESCRIPTION | ELEVATION |
|---|---|---|---|---|
| 1 | 13676841.33 | 3287243.44 | MBRRSPK | 6.86' |

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awcenc.com


STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/08/2020

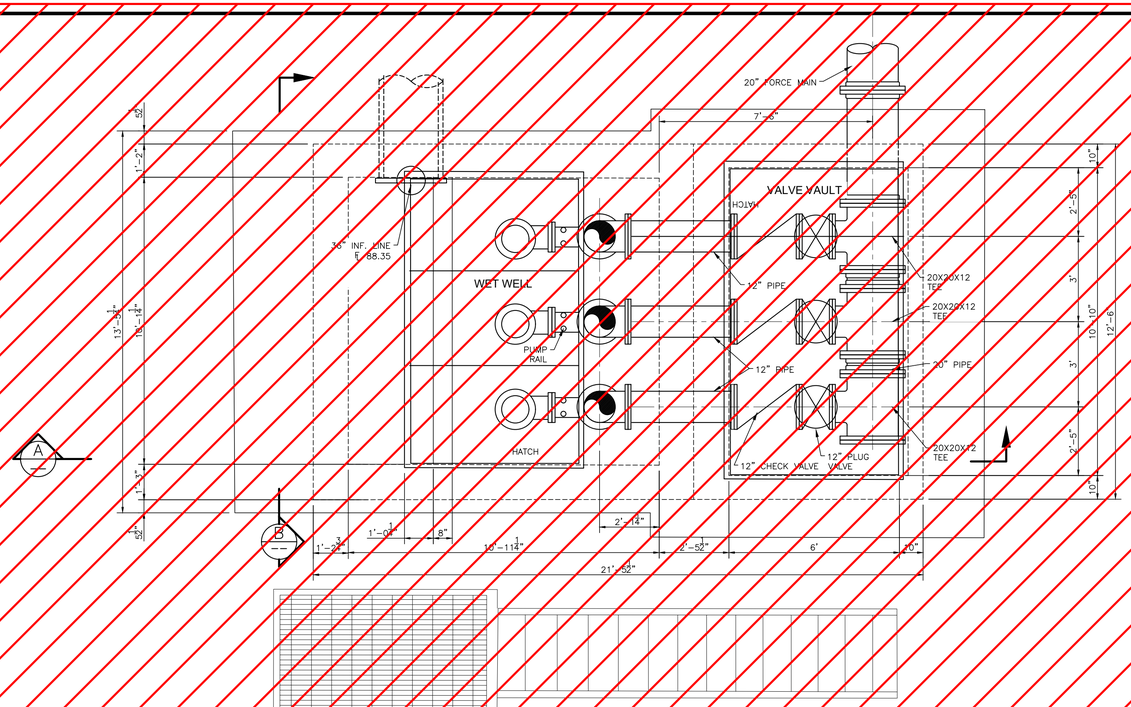
# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

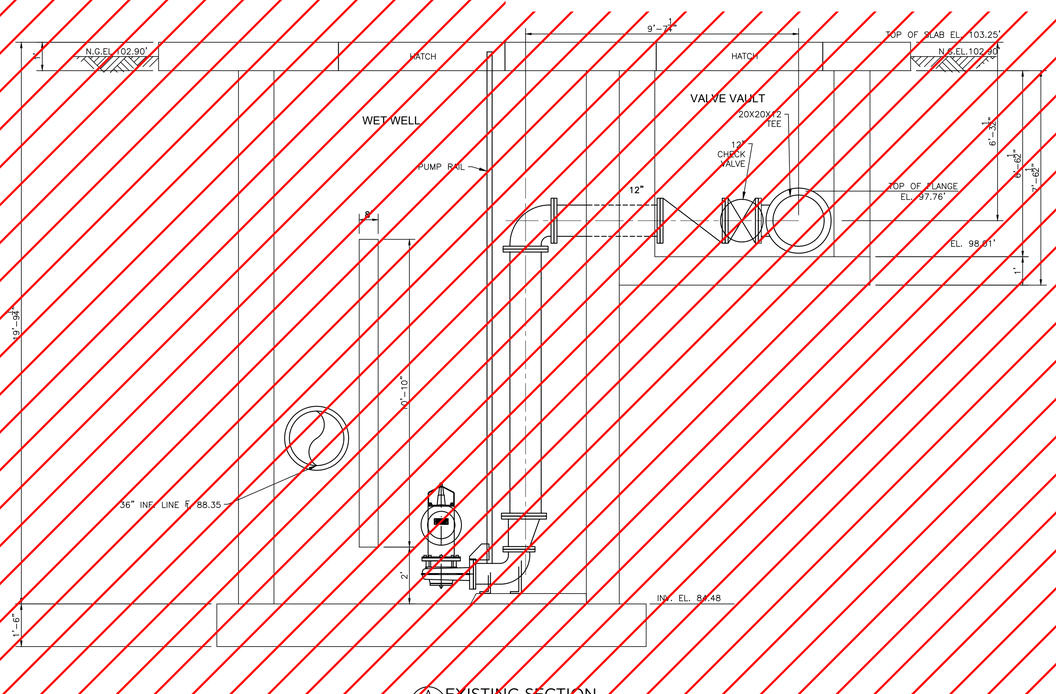
## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

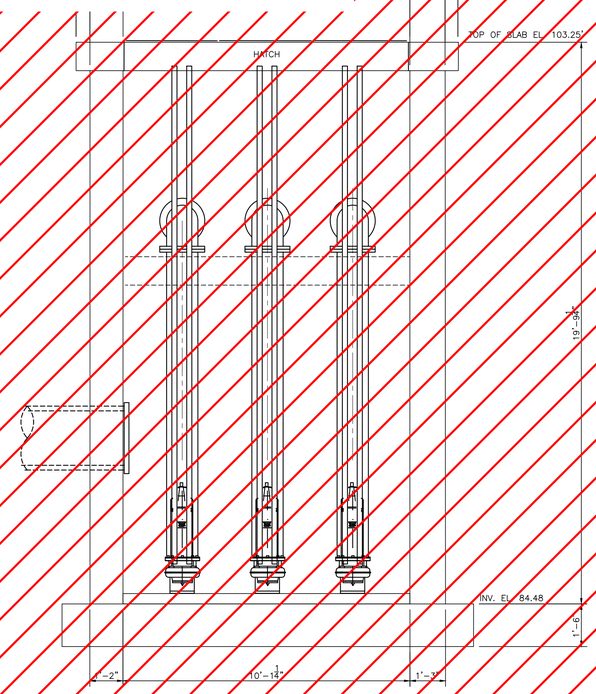
## LIFT STATION NO. 30
PROPOSED SITE PLAN

| AWC NO: | DRAWN BY: MAT | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/JDP | 15 |


ANY REPRODUCTION, REUSE, OR DISTRIBUTION OF THIS PLAN WITHOUT THE EXPRESSED WRITTEN CONSENT OF ARCENEAUX WILSON & COLE IS PROHIBITED. © 2020 AWC, INC.




# NOT IN THIS CONTRACT

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


AWC
ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com
STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/05/2021

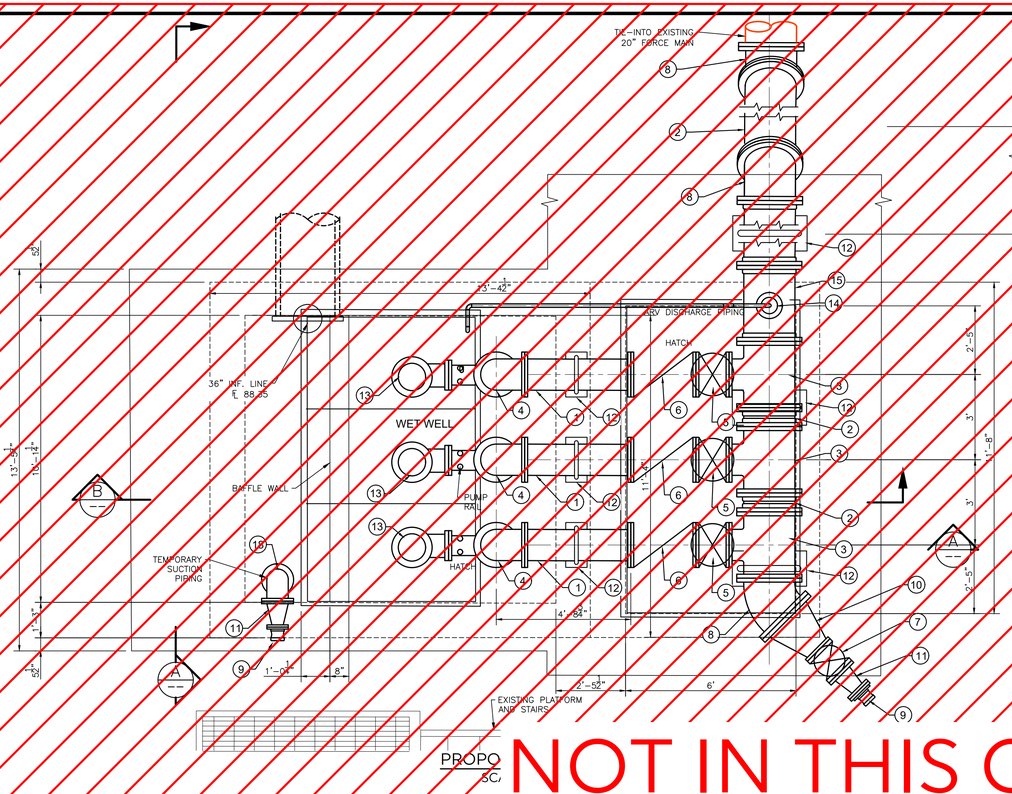

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

**LIFT STATION IMPROVEMENTS**
LIFT STATIONS 13, 18, 30, 51, 53, & 55

**LIFT STATION NO. 30**
EXISTING PIPING PLAN AND SECTIONS

| AWC NO. | DRAWN BY: MAK | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/JDP | 16 |

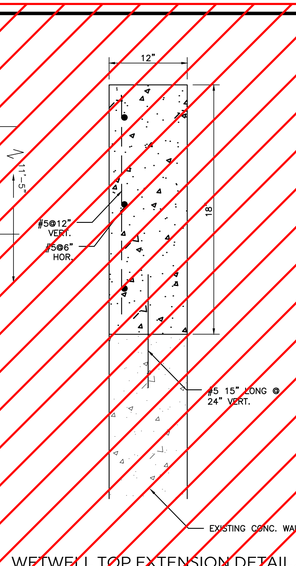

Last Modified: Thursday, April 01, 2021 1:42:17 PM
C:\Users\mkuhl\Arceneaux Wilson & Colvin\Arceneaux Wilson & Colvin - Documents\Projects\COG-210\Drawings\Lift Station 30\LS30 Piping Plan and Sections.dwg




PROPO

SC

NOT IN THIS CONTRACT




WETWELL TOP EXTENSION DETAIL

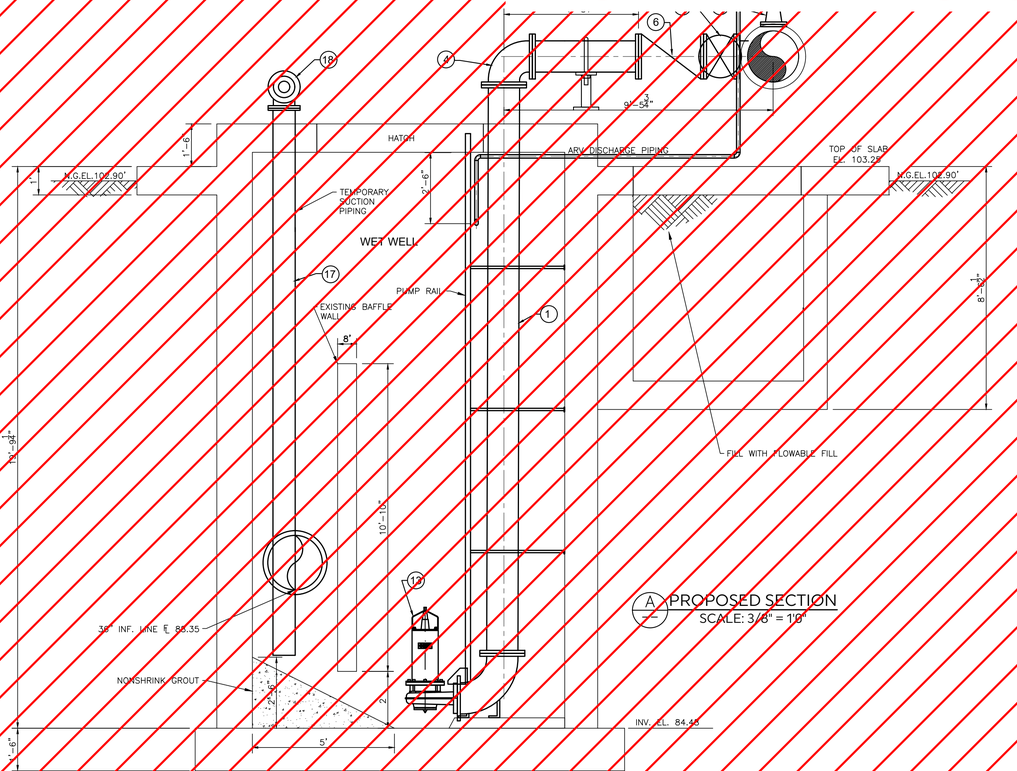
BILL OF MATERIAL

| NO. | DESCRIPTION | QTY. |
|---|---|---|
| 1. | 12" DIA. FLG. SPOOL PIECE (LENGTH AS REQUIRED) | (LENGTH AS REQUIRED) |
| 2. | 20" DIA. FLG. SPOOL PIECE (LENGTH AS REQUIRED) | (LENGTH AS REQUIRED) |
| 3. | 20"X20"X12" FLG. TEE SIDE | 3 |
| 4. | 12" DIA. FLG. 90° ELBOW | 3 |
| 5. | 12" DIA. FLG. GATE VALVE | 3 |
| 6. | 12" DIA. FLG. CHECK VALVE | 3 |
| 7. | 8" DIA. FLG. GATE VALVE | 1 |
| 8. | 20" DIA FLG. 45° ELBOW | 3 |
| 9. | 6" DIA. SS FLG. MALE QUICK CONNECT W/ CAP | 2 |
| 10. | 20"X8" DIA. FLG. REDUCER | 1 |
| 11. | 8"X6" DIA FLG. REDUCER | 3 |
| 12. | PIPE SUPPORT | 6 |
| 13. | MODY MSP4-300.9-6 CHANNEL 1-40 HP SUBMERSIBLE PUMP | 3 |
| 14. | 4" ARV | 1 |
| 15. | 20"X20"X6" FLG. TEE SIDE | 1 |
| 16. | 4" DIA. FLG. GATE VALVE | 1 |
| 17. | 8" DIA. FLG. SPOOL PIECE (LENGTH AS REQUIRED) | (LENGTH AS REQUIRED) |
| 18. | 8" DIA. FLG. 90° ELBOW | 1 |
| 19. | 6"x4" FLG. REDUCER | 1 |

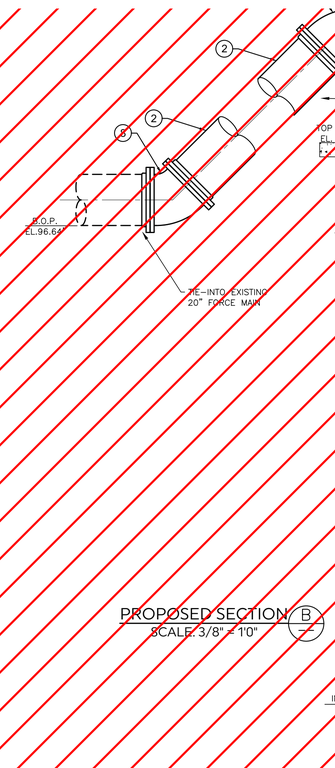
LIFT STATION NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING THE ENTIRE LIFT STATION SITE OF ALL TREES, ROOTS, STUMPS, AND UNDERBRUSH. ALL ORGANIC MATERIAL SHALL BE REMOVED FROM THE SOIL. THE SOIL SHALL BE COMPACTED TO THE SATISFACTION OF THE ENGINEER PRIOR TO PLACEMENT OF THE PAVEMENT MATERIALS. ANY BRUSH REMOVED SHALL BE DISPOSED OF OFFSITE BY THE CONTRACTOR AT HIS OWN EXPENSE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF GROUND WATER AT THE LIFT STATION SITE. THE CONTRACTOR SHALL SUBMIT HIS PLAN FOR PUMPING THE GROUND WATER DOWN TO AN ACCEPTABLE LEVEL TO THE OWNER/ENGINEER. AT NO TIME SHALL GROUND WATER BE ALLOWED IN THE EXCAVATION WHILE PLACING THE LIFT STATION FOUNDATION OR CONSTRUCTING THE LIFT STATION WALLS. FOR ALL BELOW GRADE STRUCTURES, A 2" CONCRETE SEAL SLAB SHALL BE POURED, PRIOR TO CONSTRUCTION OF THE FOUNDATION TO CONTROL INSITU SOIL CONDITIONS, UNLESS APPROVED OTHERWISE BY THE ENGINEER/OWNER.
3. LIFT STATION SITE SHALL BE GRADED TO PROVIDE FOR DRAINAGE AS INDICATED ON THE PLANS. SURFACE DRAINAGE SHALL BE CONTROLLED DURING CONSTRUCTION TO PREVENT RUNOFF FROM ENTERING EXCAVATIONS THROUGH THE USE OF TEMPORARY BERMS, SWELES, ETC. AS REQUIRED.
4. ALL FINISHED SLAB SURFACES SHALL BE SLOPED AWAY FROM OPENINGS.
5. ALL PIPE PENETRATIONS INTO THE WET WELL OR VALVE VAULT SHALL HAVE WATERSTOP INSTALLED IN ANNULAR SPACES BETWEEN THE PIPE AND WALL AND SEALED WITH NON-SHRINK GROUT.
6. EACH PROPOSED HATCH SHALL BE MANUFACTURED FROM ALUMINUM DIAMOND PLATE AND STAINLESS-STEEL HINGES WITH HEAVY DUTY HASPS AND HARDWARE. THE HATCH SHALL BE DESIGNED FOR A LIVE LOAD OF 300 PSF. THE HATCH OVER THE PUMPS SHALL BE CENTERED ON THE PUMP(S). THE SIZE AND PLACEMENT SHALL BE AS PER THE PUMP MANUFACTURER'S RECOMENDATIONS FOR EASE OF REMOVAL. ALL HATCHES SHALL SIT FLUSH ON THE CONCRETE. LIFT STATION HATCH OPENINGS ARE TO BE FITTED WITH NEW FALL PROTECTION APPARATUS. FALL PROTECTION SAFETY NET RETROFIT SHALL BE AS MANUFACTURER BY U.S.F. FABRICATION, HIALEA, FLORIDA, OR APPROVED EQUIVALENT.
7. ALL NUTS AND BOLTS INSTALLED UNDERGROUND OR IN THE WET WELL SHALL BE STAINLESS STEEL. NO CORRODIBLE MATERIALS WILL BE ALLOWED IN THE WET WELL. ALL PIECES OF THE CAM AND GROVE FITTINGS SHALL BE STAINLESS STEEL.
8. THE INTERIOR WALLS OF THE WET WELL SHALL BE COATED WITH SPECTRASHIELD PROTECTIVE LINING OR ENGINEER PRIOR APPROVED EQUIVALENT.
9. THE LOCATION OF THE ELECTRICAL SERVICE RACK AND ALL OTHER ELECTRICAL INSTALLATIONS SHALL BE AS PER THE NATIONAL ELECTRIC CODE (LATEST EDITION). THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADEQUATELY SIZED CONDUIT, CONDUCTORS, BREAKERS, AND THE GROUNDING SYSTEM.
10. ALL WET WELL FLOAT LEVELS SHALL BE COORDINATED BETWEEN THE CITY & CONTRACTOR.

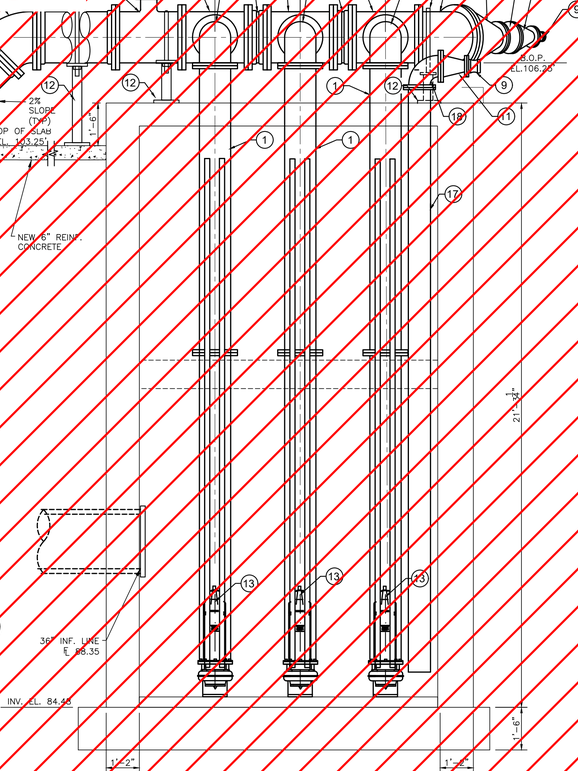
    THE CABLE SHALL BE 3/8" STAINLESS STEEL CABLE. THE FLOATS SHALL BE SECURED TO THE CABLE WITH PLASTIC TIE WRAPS. THE HEIGHTS OF THE FLOATS SHALL BE SUCH THAT WHEN THE WATER LEVEL CAUSES THE FLOATS TO RISE TO THE HORIZONTAL POSITION AND ACTIVATES THE SWITCHES, THE FLOATS WILL BE AT THE SPECIFIED HEIGHTS. THE WEIGHT FOR THE FLOAT APPARATUS SHALL BE TOTALLY ENCAPSULATED IN RUBBER OR SHALL BE OF PRIOR APPROVED NON-CORROSIVE MATERIAL AND SHALL WEIGH BETWEEN 7 LBS. AND 10 LBS. ALL MATERIALS SHALL BE NON-CORROSIVE.
11. AUTO DIALER ALARMS FOR PUMP FAILURE, ELECTRICAL FAILURE, & HIGH WET WELL LEVELS TO BE COORDINATED BETWEEN THE CITY & CONTRACTOR.




A PROPOSED SECTION
SCALE: 3/8" = 1'0"




PROPOSED SECTION B
SCALE: 3/8" = 1'0"




| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awcenc.com
STATE OF TEXAS
BRIAN K. ZOTZKY
124809
LICENSED PROFESSIONAL ENGINEER
04/06/2021

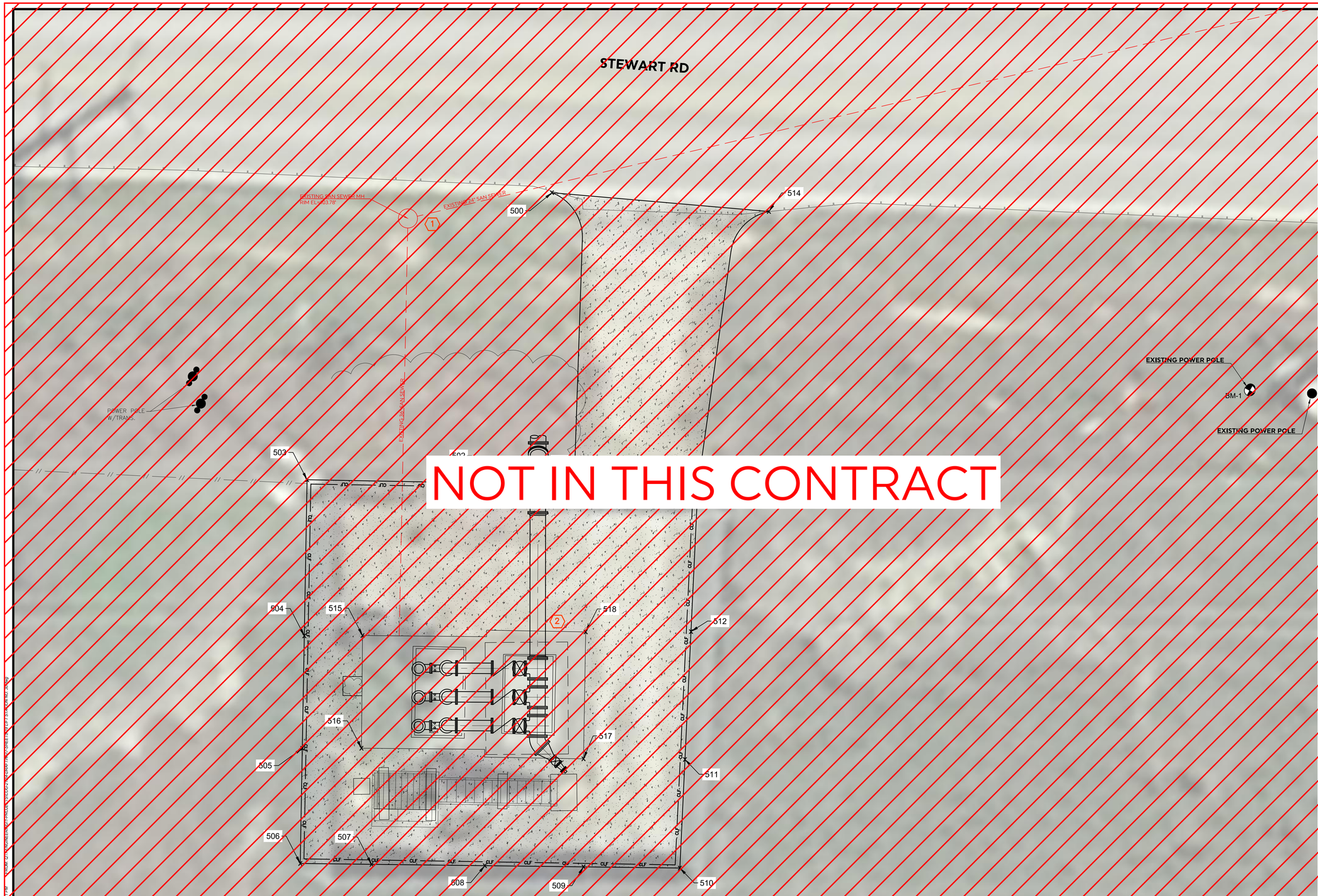

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

LIFT STATION NO. 30
PROPOSED PIPING PLAN AND SECTIONS

| AWC NO. | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/JDP | 17 |


DATA PROVIDED HEREIN IS FOR INFORMATIONAL PURPOSES ONLY. NEITHER AWC NOR ANY OF ITS SUBCONSULTANTS MAKE ANY WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY OF THE DATA PROVIDED HEREIN BY OTHERS. DO NOT SCALE PLANS.




PROPOSED PLAN VIEW
SCALE: 1" = 5'-0"

0 5 10

NOTE

1. CONTRACTOR TO MATCH EXISTING ROAD ELEVATIONS AT DRIVE TIE IN LOCATIONS.

**BENCHMARK POINT INFORMATION**

| BM# | NORTHING | EASTING | DESCRIPTION | ELEVATION |
|---|---|---|---|---|
| 1 | 13678841.23 | 3287243.44 | MBRRSRK | 6.86' |

PAVING POINT INFORMATION

| PM# | NORTHING | EASTING | DESCRIPTION | ELEVATION |
|---|---|---|---|---|
| 500 | 13658151.13' | 3279970.10' | TP | 3.39' |
| 501 | 13658125.36 | 3279986.68 | TP | 2.57' |
| 501 | 13658119.05 | 3279974.85 | TP | 2.98' |
| 503 | 13658112.45 | 3279961.88 | TP | 2.72' |
| 504 | 13658087.97 | 3279969.42 | TP | 3.21' |
| 505 | 13658087.52 | 3279974.84 | TP | 3.24' |
| 506 | 13658076.81 | 3279980.40 | TP | 3.08' |
| 507 | 13658080.29 | 3279967.01 | TP | 3.11' |
| 508 | 13658085.82 | 3279997.51 | TP | 3.01' |
| 509 | 13658090.64 | 3280006.66 | TP | 2.99' |
| 510 | 13658096.34 | 3280015.59 | TP | 2.91' |
| 511 | 13658105.59 | 3280010.64 | TP | 3.00' |
| 512 | 13658117.67 | 3280004.83 | TP | 2.97' |
| 513 | 13658131.33 | 3279998.22 | TP | 2.81' |
| 514 | 13658160.23' | 3279991.02' | TP | 2.19' |
| 515 | 13658100.91 | 3279974.76 | TP | 3.34' |
| 516 | 13658090.48 | 3279980.29 | TP | 3.37' |
| 517 | 13658100.58 | 3280001.26 | TP | 3.23' |
| 518 | 13658112.58 | 3279995.13 | TP | 3.20' |

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awcenc.com

STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/08/2020

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

**LIFT STATION IMPROVEMENTS**
LIFT STATIONS 13, 18, 30, 51, 53, & 55

**LIFT STATION NO. 30**
PAVING PLAN

| AWC NO: | DRAWN BY: MAX | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/JDP | 18 |

ALL RIGHTS RESERVED. THESE PLANS, IDEAS, DESIGNS, AND CONCEPTS ARE THE PROPERTY OF ARCENEAUX WILSON & COLE AND SHALL NOT BE USED IN WHOLE OR IN PART FOR ANY PROJECT WITHOUT THE WRITTEN PERMISSION OF ARCENEAUX WILSON & COLE.

| BENCHMARK POINT INFORMATION | | | | |
|---|---|---|---|---|
| BM# | NORTHING | EASTING | DESCRIPTION | ELEVATION |
| 1 | 13608948.91 | 3216520.03 | 60D NAIL | 5.92 |
| 2 | 13608958.68 | 3216530.43 | 60D NAIL | 5.84 |
| 3 | 13608937.54 | 6216527.13 | 60D NAIL | 6.01 |

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE

2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888

TEXAS REGISTERED
ENGINEERING FIRM
F-16194
TEXAS REGISTERED
SURVEYING FIRM
10194049
www.awceng.com

STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED
PROFESSIONAL ENGINEER
04/06/2021


# CITY OF GALVESTON

GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS

LIFT STATIONS 13, 18, 30, 51, & 55

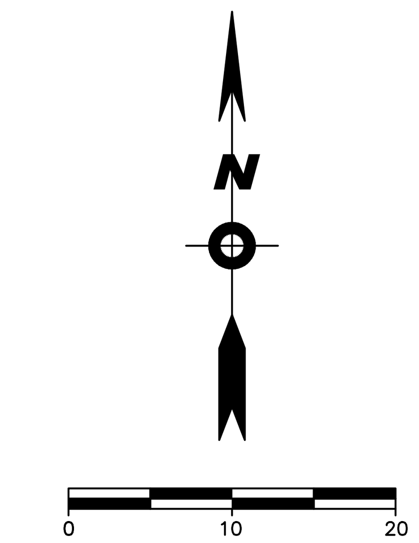
## LIFT STATION NO. 51

EXISTING SITE PLAN

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/CDP | 19 |

LAST PRINTED Thursday, March 25, 2021 3:39:39 PM FROM: Q:\1-ENGINEERING\1-PROJECTS\COG-21\04-DRAFTING\7-SHEETS\19 LIFT STATION NO. 51.dwg

LAST PRINTED: Thursday, March 25, 2021 3:39:38 PM FROM: Q:\1-ENGINEERING\1-PROJECTS\COG-210\4-DRAFTING\7-SHEETS\20 LIFT STATION NO. 51.dwg




NOTES:

LIFT STATION #51, SAN LUIS PASS, IS TO BE REHABILITATED WITH NEW PUMPS AND PIPING; THE DISCHARGE PIPING WILL BE BROUGHT ABOVE GROUND OUTSIDE THE VALVE VAULT TO ALLOW EASE OF MAINTENANCE AND TO PREVENT THE VAULT FROM FLOODING; THE SITE INSIDE THE FENCE WILL BE CONCRETE PAVED TO ALLOW BETTER MAINTENANCE AND ACCESS AROUND THE SITE.

1. WET WELL IS TO BE REHABILITATED PER THE GENERAL CONSTRUCTION NOTES.
2. THE DISCHARGE PIPING MANIFOLD WILL BE REPLACED AND MOVED TO ABOVE GROUND ON TOP OF THE EXISTING VALVE VAULT AS SHOWN. THE EXISTING VALVE VAULT IS TO BE ABANDONED IN PLACE AS INDICATED IN THE GENERAL CONSTRUCTION NOTES.
3. THE ENTIRE SITE WITHIN THE FENCED AREA WILL BE CONCRETE PAVED TO WITHIN 6-INCHES OF THE EXISTING FENCE.
4. BYPASS PUMPING
   a. USE MANHOLE (1) TO THE WEST OF THE LIFT STATION LOCATED FOR BYPASS PUMPING.
   b. BYPASS DISCHARGE TO BE TIED TO EXISTING FORCE MAIN AT POINT (2). CONNECTION AT POINT (2) CAN BE MADE INSIDE VALVE VAULT OR TO THE EXISTING FORCE MAIN CAN BE EXPOSED IN GRASSED AREA OUTSIDE VALVE VAULT AND TAPPED FOR TEMPORARY CONNECTION. IF A TAP IS MADE FOR THE TEMPORARY CONNECTION, TAP TO BE MADE USING A FORD STYLE FTSS FLANGED TAPPING SLEEVE (OR APPROVED EQUIVALENT). TAPPING SLEEVE SHALL BE SIZED TO MATCH BYPASS PUMP DISCHARGE PIPING. UPON COMPLETION OF BYPASS PUMPING, A BLIND FLANGE IS TO BE INSTALLED ON THE TAPPING SADDLE FLANGE. NOTE THAT A TEMPORARY BLIND FLANGE WILL HAVE TO BE INSTALLED ON THE PIPING INSIDE THE VALVE VAULT WHILE BYPASS PUMPING IS OCCURRING.
5. NOTE THE OVERHEAD ELECTRICAL ROUTED ACROSS THE NORTH SIDE OF THE LIFT STATION SITE.
6. ALL EXISTING VALVES & VENTS TO BE REPLACED BY CONTRACTOR.
7. ALL EXISTING CONTROL PANELS ELECTRICAL EQUIPMENT, AND ASSOCIATED APPURTENANCES TO BE RELOCATED & REPLACED BY CONTRACTOR AS DETAILED ON SHEETS 45-80.
8. CONTRACTOR SHALL REMOVE EXISTING GOOSE NECKS ON EXISTING VENT PIPING & REPLACE WITH NEW STAINLESS TEE FITTINGS IN LIKE SIZE & WELDED WIRE MESH.

**BENCHMARK POINT INFORMATION**

| BM# | NORTHING | EASTING | DESCRIPTION | ELEVATION |
|---|---|---|---|---|
| 1 | 13608948.91 | 3216520.03 | 60D NAIL | 5.92 |
| 2 | 13608958.68 | 3216530.43 | 60D NAIL | 5.84 |
| 3 | 13608937.54 | 6216527.13 | 60D NAIL | 6.01 |

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com

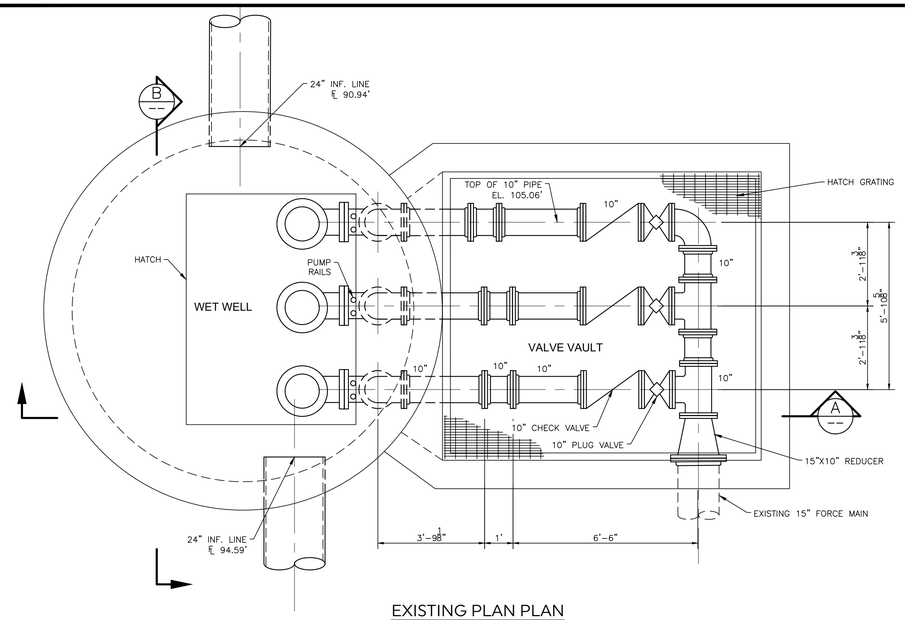
STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/05/2021

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

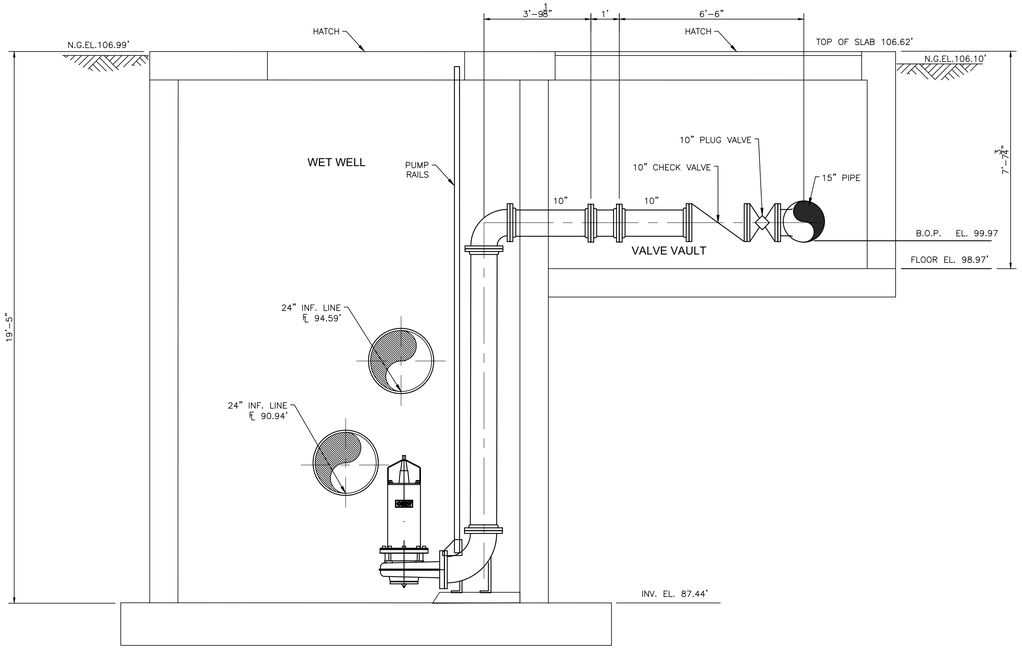
## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 51
PROPOSED SITE PLAN

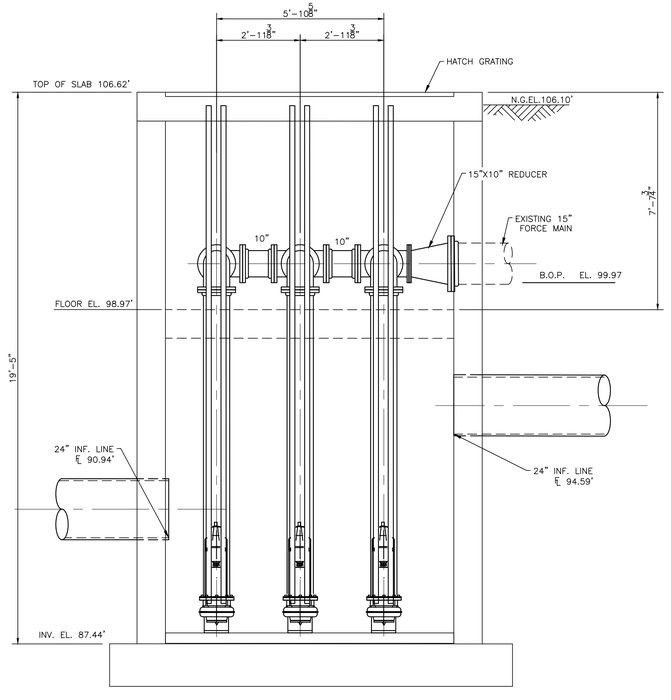
| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/CDP | 20 |




EXISTING PLAN PLAN
SCALE: 3/8" = 1'0"




EXISTING SECTION A
SCALE: 3/8" = 1'0"




EXISTING SECTION B
SCALE: 3/8" = 1'0"

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com


STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/06/2021

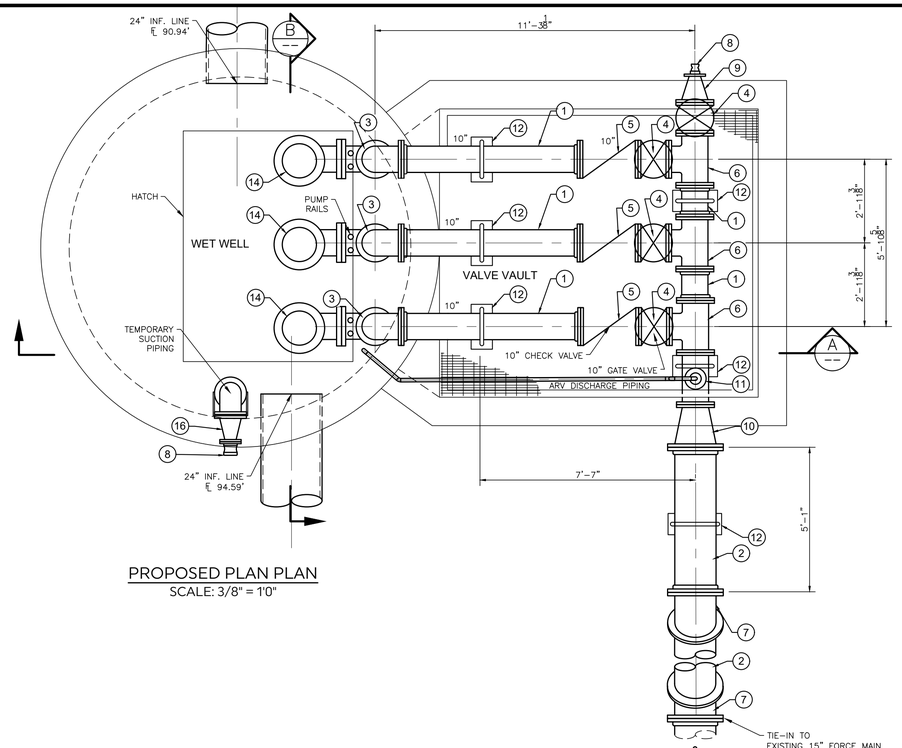
# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

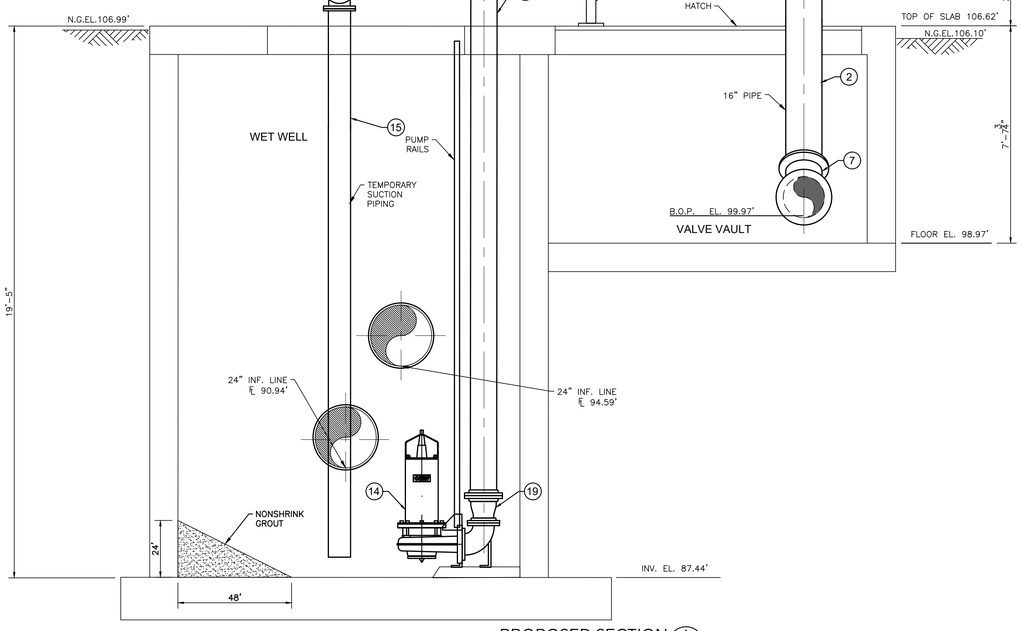
## LIFT STATION NO. 51
EXISTING PIPING PLAN AND SECTIONS

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/CDP | 21 |

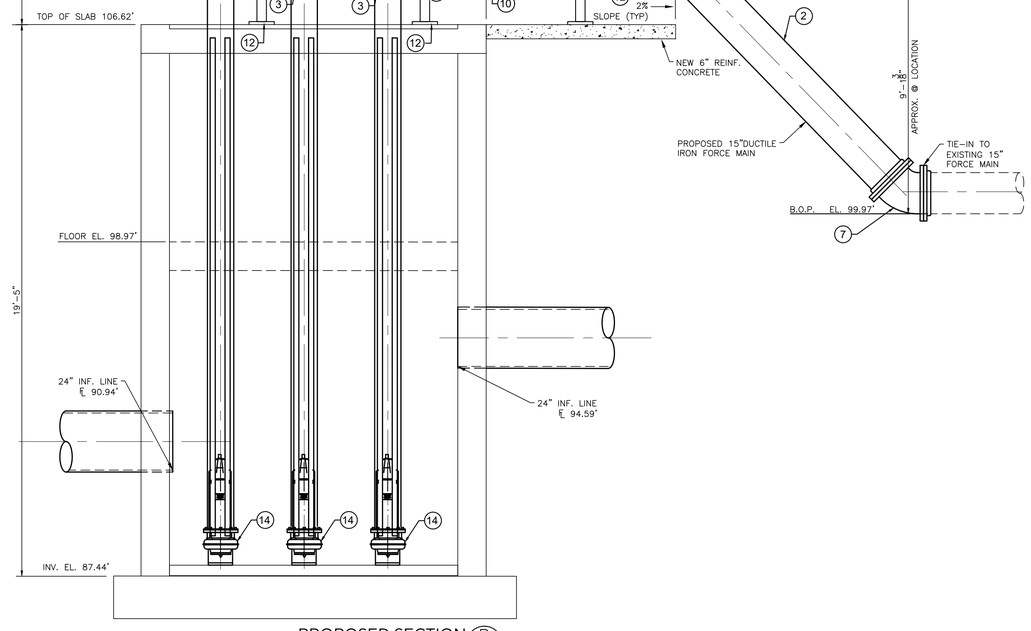

LAST PRINTED: Tuesday, June 29, 2021 3:14:21 PM FROM: Q:\1-engineering\1-projects\COG-210\04-DRAFTING\01-SHEETS\TITLE SHEET.dwg




PROPOSED PLAN PLAN
SCALE: 3/8" = 1'0"




PROPOSED SECTION A
SCALE: 3/8" = 1'0"




PROPOSED SECTION B
SCALE: 3/8" = 1'0"

## BILL OF MATERIAL

| NO. | DESCRIPTION | QTY. |
|---|---|---|
| 1. | 10" DIA. FLG. SPOOL PIECE (LENGTH AS REQUIRED) | (LENGTH AS REQUIRED) |
| 2. | 15" DIA. FLG. SPOOL PIECE (LENGTH AS REQUIRED) | (LENGTH AS REQUIRED) |
| 3. | 10" DIA. FLG. 90° ELBOW | 3 |
| 4. | 10" DIA. FLG. GATE VALVE | 4 |
| 5. | 10" DIA. FLG. CHECK VALVE | 3 |
| 6. | 10"X10"X10" FLG. TEE SIDE | 3 |
| 7. | 15" DIA FLG. 45° ELBOW | 2 |
| 8. | 6" DIA. SS FLG. MALE QUICK CONNECT W/ CAP | 2 |
| 9. | 10"X6" DIA. FLG. REDUCER | 1 |
| 10. | 10"X15" DIA. FLG. REDUCER | 4 |
| 11. | 4" AIR RELEASE VALVE | 1 |
| 12. | PIPE SUPPORT | 6 |
| 13. | 4" DIA. FLG. GATE VALVE | 1 |
| 14. | MODY MSP4-150.0-4 CHANNEL 1 75HP SUBMERSIBLE PUMP | 3 |
| 15. | 8" DIA. FLG. SPOOL PIECE (LENGTH AS REQUIRED) | (LENGTH AS REQUIRED) |
| 16. | 8"X6" DIA. FLG. ECC. REDUCER | 1 |
| 17. | 8" DIA FLG. 45° ELBOW | 1 |
| 18. | 10"x10"x4" FLG. REDUCING TEE | 1 |
| 19. | 10"X8" DIA. REDUCER | 3 |

LIFT STATION NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING THE ENTIRE LIFT STATION SITE OF ALL TREES, ROOTS, STUMPS, AND UNDERBRUSH. ALL ORGANIC MATERIAL SHALL BE REMOVED FROM THE SOIL. THE SOIL SHALL BE COMPACTED TO THE SATISFACTION OF THE ENGINEER PRIOR TO PLACEMENT OF THE PAVEMENT MATERIALS. ANY BRUSH REMOVED SHALL BE DISPOSED OF OFFSITE BY THE CONTRACTOR AT HIS OWN EXPENSE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF GROUND WATER AT THE LIFT STATION SITE. THE CONTRACTOR SHALL SUBMIT HIS PLAN FOR PUMPING THE GROUND WATER DOWN TO AN ACCEPTABLE LEVEL TO THE OWNER/ENGINEER. AT NO TIME SHALL GROUND WATER BE ALLOWED IN THE EXCAVATION WHILE PLACING THE LIFT STATION FOUNDATION OR CONSTRUCTING THE LIFT STATION WALLS. FOR ALL BELOW GRADE STRUCTURES, A 2" CONCRETE SEAL SLAB SHALL BE POURED PRIOR TO CONSTRUCTION OF THE FOUNDATION TO CONTROL INSITU SOIL CONDITIONS, UNLESS APPROVED OTHERWISE BY THE ENGINEER/OWNER.
3. LIFT STATION SITE SHALL BE GRADED TO PROVIDE FOR DRAINAGE AS INDICATED ON THE PLANS. SURFACE DRAINAGE SHALL BE CONTROLLED DURING CONSTRUCTION TO PREVENT RUNOFF FROM ENTERING EXCAVATIONS THROUGH THE USE OF TEMPORARY BERMS, SWELLS, ETC. AS REQUIRED.
4. ALL FINISHED SLAB SURFACES SHALL BE SLOPED AWAY FROM OPENINGS.
5. ALL PIPE PENETRATIONS INTO THE WET WELL OR VALVE VAULT SHALL HAVE WATER STOP INSTALLED IN ANNULAR SPACES BETWEEN THE PIPE AND WALL AND SEALED WITH NON-SHRINK GROUT.
6. EACH PROPOSED HATCH SHALL BE MANUFACTURED FROM ALUMINUM DIAMOND PLATE AND STAINLESS-STEEL HINGES WITH HEAVY DUTY HASPS AND HARDWARE. THE HATCH SHALL BE DESIGNED FOR A LIVE LOAD OF 300 PSF. THE HATCH OVER THE PUMPS SHALL BE CENTERED ON THE PUMP(S). THE SIZE AND PLACEMENT SHALL BE AS PER THE PUMP MANUFACTURER'S RECOMMENDATIONS FOR EASE OF REMOVAL. ALL HATCHES SHALL SIT FLUSH ON THE CONCRETE. LIFT STATION HATCH OPENINGS ARE TO BE FITTED WITH NEW FALL PROTECTION APPARATUS. FALL PROTECTION SAFETY NET RETROFIT SHALL BE AS MANUFACTURER BY U.S.F. FABRICATION, HIALEA, FLORIDA, OR APPROVED EQUIVALENT.
7. ALL NUTS AND BOLTS INSTALLED UNDERGROUND OR IN THE WET WELL SHALL BE STAINLESS STEEL. NO CORRODIBLE MATERIALS WILL BE ALLOWED IN THE WET WELL. ALL PIECES OF THE CAM AND GROVE FITTINGS SHALL BE STAINLESS STEEL.
8. THE INTERIOR WALLS OF THE WET WELL SHALL BE COATED WITH SPECTRASHIELD PROTECTIVE LINING OR ENGINEER PRIOR APPROVED EQUIVALENT.
9. ALL DUCTILE IRON PIPING SHALL BE PAINTED IN ACCORDANCE WITH THE SPECIFICATIONS.
10. THE LOCATION OF THE ELECTRICAL SERVICE RACK AND ALL OTHER ELECTRICAL INSTALLATIONS SHALL BE AS PER THE NATIONAL ELECTRIC CODE (LATEST EDITION). THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADEQUATELY SIZED CONDUIT, CONDUCTORS, BREAKERS, AND THE GROUNDING SYSTEM.
11. ALL WET WELL FLOAT LEVELS SHALL BE COORDINATED BETWEEN THE CITY & CONTRACTOR.

    THE CABLE SHALL BE 3/8" STAINLESS STEEL CABLE. THE FLOATS SHALL BE SECURED TO THE CABLE WITH PLASTIC TIE WRAPS. THE HEIGHTS OF THE FLOATS SHALL BE SUCH THAT WHEN THE WATER LEVEL CAUSES THE FLOATS TO RISE TO THE HORIZONTAL POSITION AND ACTIVATES THE SWITCHES, THE FLOATS WILL BE AT THE SPECIFIED HEIGHTS. THE WEIGHT FOR THE FLOAT APPARATUS SHALL BE TOTALLY ENCAPSULATED IN RUBBER OR SHALL BE OF PRIOR APPROVED NON-CORROSIVE MATERIAL AND SHALL WEIGH BETWEEN 7 LBS. AND 10 LBS. ALL MATERIALS SHALL BE NON-CORROSIVE.
12. AUTO DIALER ALARMS FOR PUMP FAILURE, ELECTRICAL FAILURE, & HIGH WET WELL LEVELS TO COORDINATED BETWEEN THE CITY & CONTRACTOR.

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2. | | |
| 1. | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com

STATE OF TEXAS
BRIAN K. ZOTZKY
NO. 124808
LICENSED PROFESSIONAL ENGINEER
04/06/2021

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 51
PROPOSED PIPING PLAN AND SECTIONS

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/CDP | 22 |

LAST PRINTED: Tuesday, June 29, 2006 3:14:21 PM FROM: Q:\1-ENGINEERING\1-PROJECTS\COG-21044-DRAFTING\7-SHEETS\22-LIFT STATION NO. 51.dwg

NOTE:

1. CONTRACTOR TO MATCH EXISTING DRIVE ELEVATIONS AT DRIVE TIE IN LOCATIONS.

**BENCHMARK POINT INFORMATION**

| BM# | NORTHING | EASTING | DESCRIPTION | ELEVATION |
|---|---|---|---|---|
| 1 | 13608948.91 | 3216520.03 | 60D NAIL | 5.92 |
| 2 | 13608958.68 | 3216530.43 | 60D NAIL | 5.84 |
| 3 | 13608937.54 | 6216527.13 | 60D NAIL | 6.01 |

PAVING POINT INFORMATION

| BM# | NORTHING | EASTING | DESCRIPTION | ELEVATION |
|---|---|---|---|---|
| 600 | 13608972.44 | 3216517.99 | TP | 6.12' |
| 601 | 13608970.06 | 3216516.23 | TP | 5.93' |
| 602 | 13608966.80 | 3213513.83 | TP | 5.85' |
| 603 | 13608960.24 | 3216509.00 | TP | 5.98' |
| 604 | 13608948.65 | 3216500.45 | TP | 5.95' |
| 605 | 13608945.60 | 3216504.60 | TP | 6.00' |
| 606 | 13608940.90 | 3216511.00 | TP | 5.82' |
| 507 | 13608933.01 | 3216521.73 | TP | 6.61' |
| 608 | 13608924.59 | 3216533.18 | TP | 6.71' |
| 609 | 13608945.48 | 3216548.69 | TP | 5.64' |
| 610 | 13608959.84 | 3216559.28 | TP | 5.21' |
| 611 | 13608964.63 | 3216562.92 | TP | 5.13' |
| 612 | 13608976.77 | 3216546.48 | TP | 5.23' |
| 613 | 13608988.87 | 3216530.09 | TP | 5.74 |
| 614 | 13608984.41 | 3216526.81 | TP | 5.86' |
| 615 | 13608969.22 | 3216522.39 | TP | 6.00' |
| 616 | 13608966.83 | 3216520.72 | TP | 6.05' |
| 617 | 13608947.12 | 3216546.47 | TP | 5.70' |
| 618 | 13608961.44 | 3216557.11 | TP | 5.27' |

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com

STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/05/2021

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 51
PAVING PLAN

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/CDP | 23 |

LAST PRINTED: Thursday, March 25, 2021 3:40:08 PM FROM: G:\ENGINEERING\ARCH\PROJECTS\COG\2104-LIFTSTATIONS\DRAWINGS\SHEETS\23 LIFT STATION NO. 51.dwg

NOT IN THIS CONTRACT

CONCRETE DRIVE

CONCRETE DRIVE

CONCRETE DRIVE

EXISTING 8" SAN SEWER

EXISTING SAN SEWER MH
RIM=109.18

EXISTING 8" SAN SEWER

EXISTING SAN SEWER MH
RIM=108.37

CONCRETE SLAB

EXISTING SAN SEWER

EXISTING VALVE VAULT

UTILITY PP
W/ GUY WIRE

EXISTING CHAIN LINK FENCE
(TO REMAIN)

CONCRETE SLAB

BAYWATER DRIVE

EXISTING WET WELL

EXISTING 12" FORCE MAIN

EXISTING TELEPHONE COMPANY BUILDING

TELE. POLE

CONCRETE SLAB

CONCRETE SLAB

MP

WATER METER

N

0 5 10

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE

2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888

TEXAS REGISTERED
ENGINEERING FIRM
F-16194
TEXAS REGISTERED
SURVEYING FIRM
10194049
www.awceng.com

STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED
PROFESSIONAL ENGINEER

04/06/2021


# CITY OF GALVESTON

GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS

LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 53

EXISTING SITE PLAN

| AWC NO. | DRAWN BY: MAK | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/JDP | 24 |

NOT IN THIS CONTRACT

0 5 10

NOTES:

LIFT STATION #53, MANGROVE, IS TO BE REHABILITATED WITH NEW PUMPS AND PIPING, AND THE DISCHARGE PIPING WILL BE BROUGHT ABOVE GROUND OUTSIDE THE VALVE VAULT TO ALLOW EASE OF MAINTENANCE AND TO PREVENT THE VAULT FROM FLOODING.

1. WET WELL IS TO BE REHABILITATED PER THE GENERAL CONSTRUCTION NOTES.
2. THE DISCHARGE PIPING MANIFOLD WILL BE REPLACED AND MOVED TO ABOVE GROUND ON TOP OF THE EXISTING VALVE VAULT AS SHOWN. THE EXISTING VALVE VAULT IS TO BE ABANDONED IN PLACE AS INDICATED IN THE GENERAL CONSTRUCTION NOTES.
3. BYPASS PUMPING
   a. USE MANHOLE (1) TO THE WEST OF THE LIFT STATION LOCATED FOR BYPASS PUMPING.
   b. BYPASS DISCHARGE TO BE TIED TO EXISTING FORCE MAIN AT POINT (2). CONNECTION AT POINT (2) CAN BE MADE INSIDE VALVE VAULT OR TO THE EXISTING FORCE MAIN CAN BE EXPOSED IN GRASSED AREA OUTSIDE VALVE VAULT AND TAPPED FOR TEMPORARY CONNECTION. IF A TAP IS MADE FOR THE TEMPORARY CONNECTION, TAP TO BE MADE USING A FORD STYLE FTSS FLANGED TAPPING SLEEVE (OR APPROVED EQUIVALENT). TAPPING SLEEVE SHALL BE SIZED TO MATCH BYPASS PUMP DISCHARGE PIPING. UPON COMPLETION OF BYPASS PUMPING, A BLIND FLANGE IS TO BE INSTALLED ON THE TAPPING SADDLE FLANGE. NOTE THAT A TEMPORARY BLIND FLANGE WILL HAVE TO BE INSTALLED ON THE PIPING INSIDE THE VALVE VAULT WHILE BYPASS PUMPING IS OCCURRING.
4. NOTE THE OVERHEAD ELECTRICAL ROUTED ACROSS THE NORTH SIDE OF THE LIFT STATION SITE.
5. CONTRACTOR TO PROTECT ALL LANDSCAPING IN AND AROUND LIFT STATION SITE.
6. EXISTING TELEPHONE COMPANY BUILDING TO BE PROTECTED FROM DAMAGE. TELEPHONE COMPANY SHALL BE CONTACTED BEFORE WORK IS TO BEGIN ON THIS SITE.
7. ZONE VE PER FIRM 48167C0031E EFF. DATE 6/6/2002. ELEVATION 17 FEET.
8. ALL EXISTING VALVES & VENTS TO BE REPLACED BY CONTRACTOR.
9. ALL EXISTING CONTROL PANELS, ELECTRICAL EQUIPMENT AND ASSOCIATED APPURTENANCES TO BE RELOCATED & REPLACED BY CONTRACTOR AS DETAILED ON SHEETS 45-80.
10. CONTRACTOR SHALL REMOVE EXISTING GOOSE NECKS ON EXISTING VENT PIPING & REPLACE WITH NEW STAINLESS TEE FITTINGS IN LIKE SIZE & WELDED WIRE MESH.

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awcenc.com

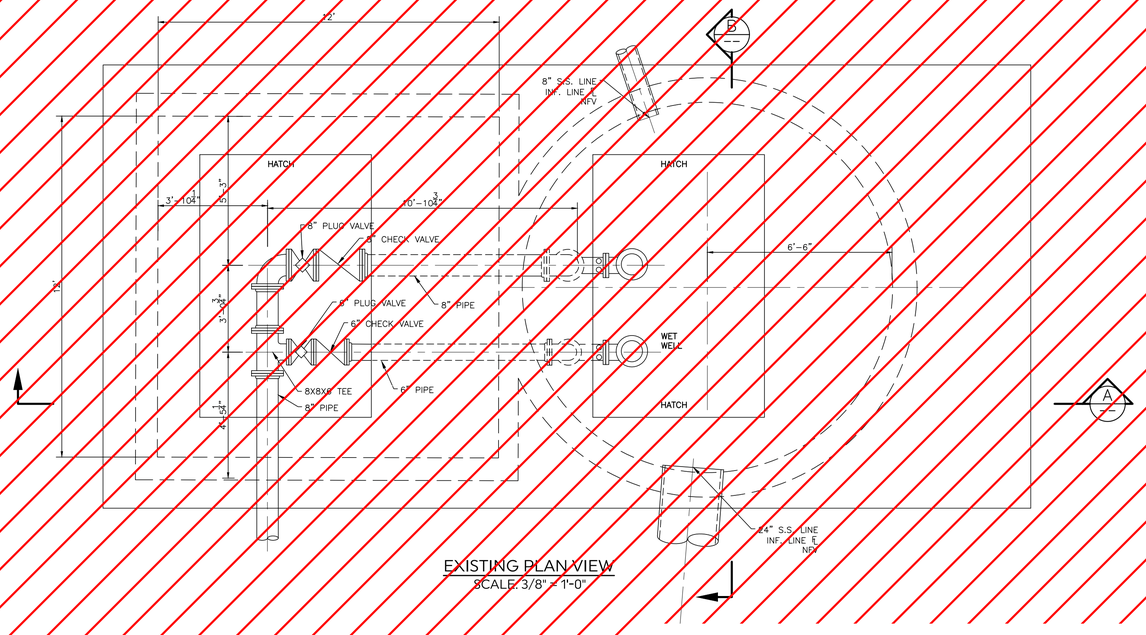
STATE OF TEXAS
BRIAN K. ZOTZKY
24809
LICENSED PROFESSIONAL ENGINEER
01/08/2021

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

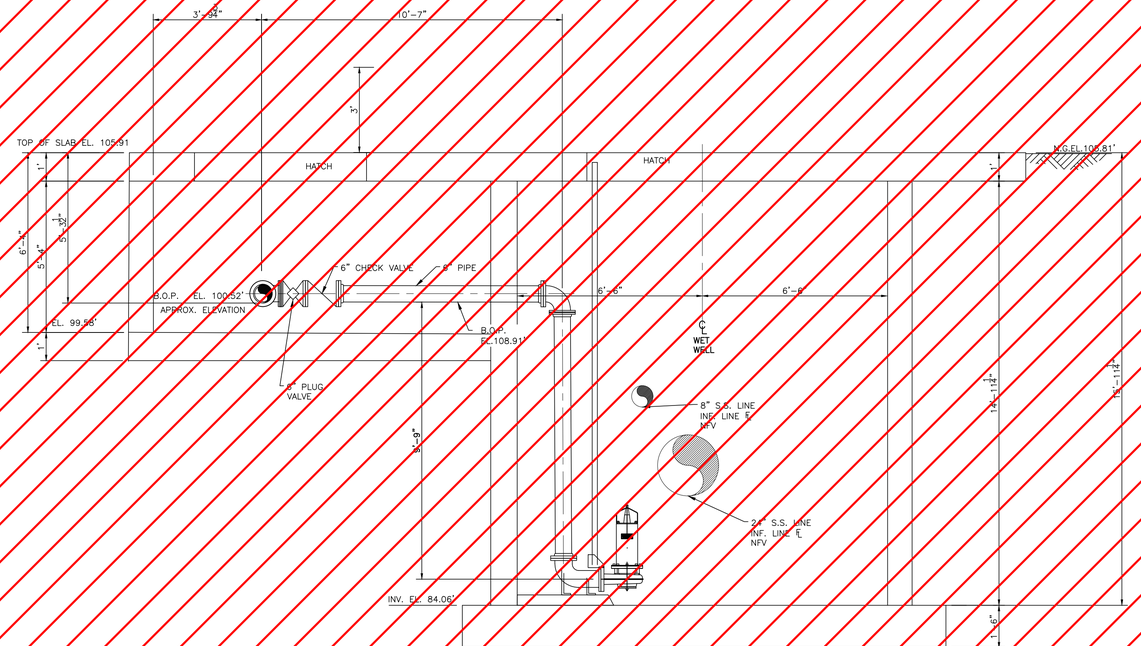
## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 53
PROPOSED SITE PLAN

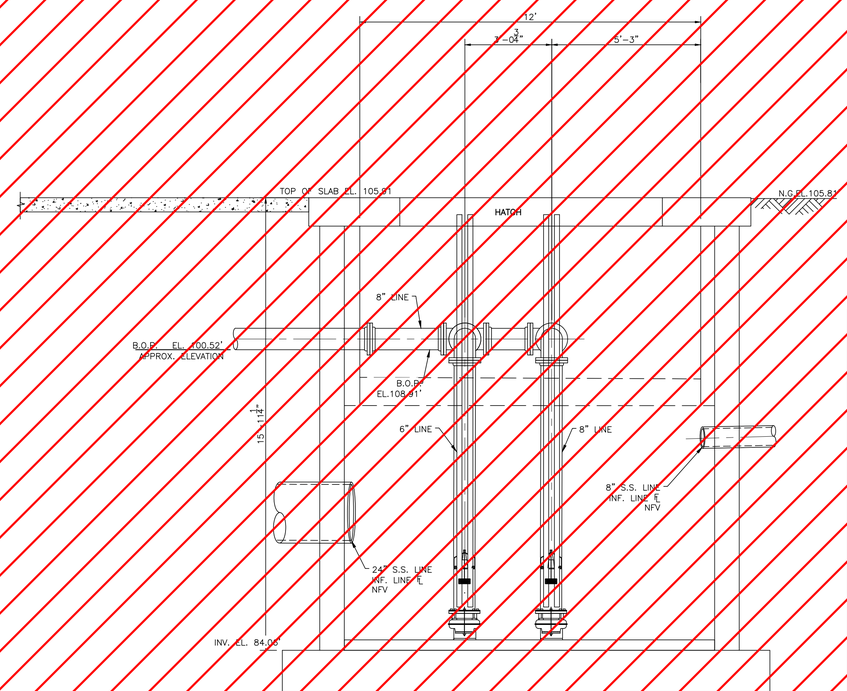
| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/GDP | 25 |




EXISTING PLAN VIEW
SCALE: 3/8" = 1'-0"




EXISTING SECTION A
SCALE: 3/8" = 1'-0"




EXISTING SECTION B
SCALE: 3/8" = 1'-0"

NOT IN THIS CONTRACT

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

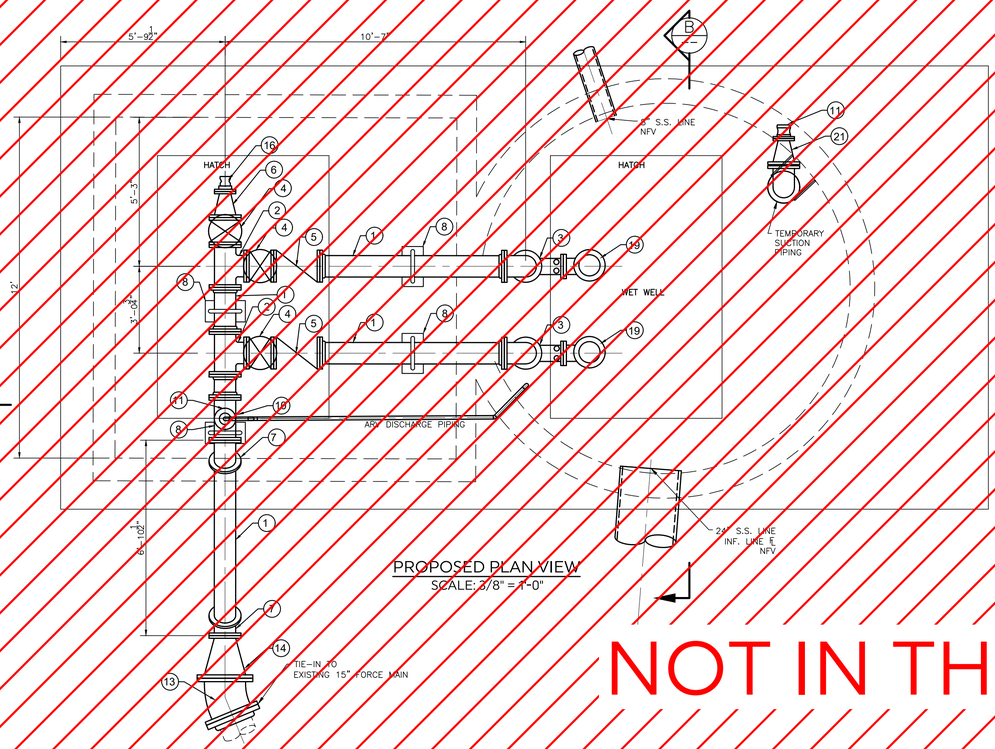

AWC
ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awcenc.com
STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
07/09/2021


CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

LIFT STATION NO. 53
EXISTING PIPING PLAN AND SECTIONS

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/GDP | 26 |




PROPOSED PLAN VIEW
SCALE: 3/8" = 1'-0"

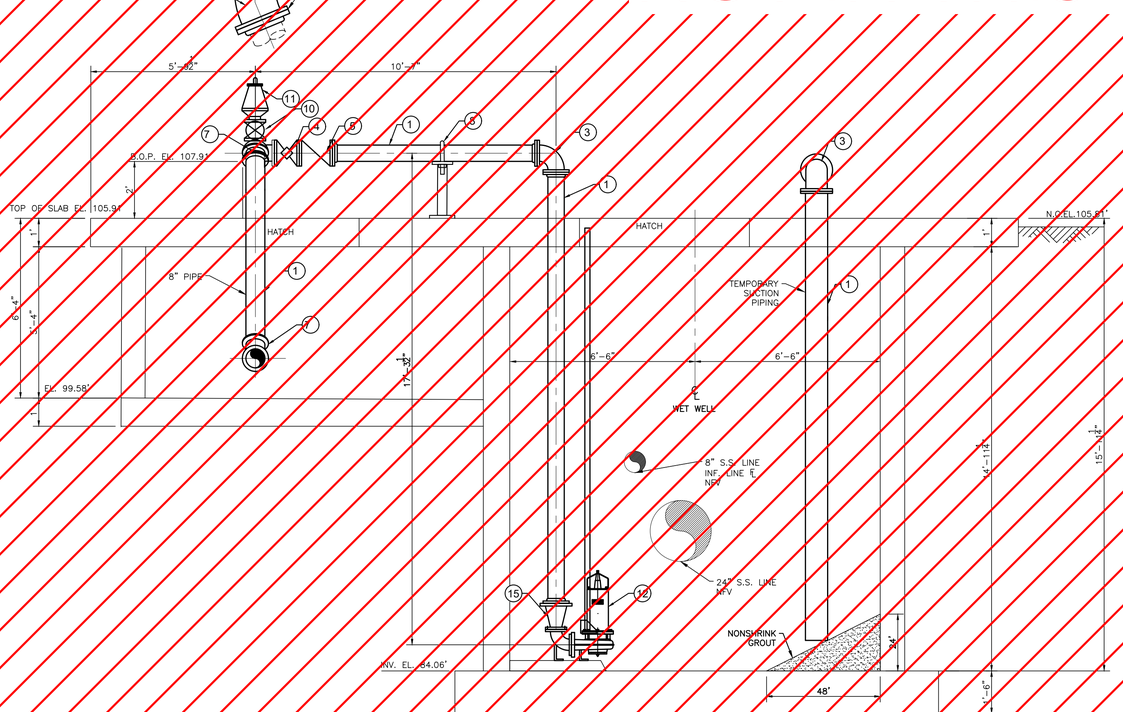
| BILL OF MATERIAL | | |
|---|---|---|
| NO. | DESCRIPTION | QTY. |
| 1. | 8" DIA. FLG. SPOOL PIECE (LENGTH AS REQUIRED) | (LENGTH AS REQUIRED) |
| 2. | 8"X8"X8" FLG. TEE SIDE | 2 |
| 3. | 8" DIA. FLG. 90° ELBOW | 4 |
| 4. | 8" DIA. FLG. GATE VALVE | 3 |
| 5. | 8" DIA. FLG. CHECK VALVE | 2 |
| 6. | 8"X6" DIA. FLG. REDUCER | 2 |
| 7. | 8" DIA. FLG. 45° ELBOW | 2 |
| 8. | PIPE SUPPORT | 4 |
| 9. | 8"x8"x4" DIA. FLG. REDUCING TEE | 1 |
| 10. | 4" DIA. FLG. GATE VALVE | 1 |
| 11. | 4" AIR RELEASE VALVE | 1 |
| 12. | MODY MSP3-100.0-6 CHANNEL 70 HP SUBMERSIBLE PUMP | 2 |
| 13. | 15" DIA. FLG. 22.5° ELBOW | 1 |
| 14. | 8"X15" ECC. REDUCER | 1 |
| 15. | 8"x4" REDUCER | 2 |
| 16 | 6" DIA. SS FLG. MALE QUICK CONNECT W/ CAP | 2 |

LIFT STATION NOTES:

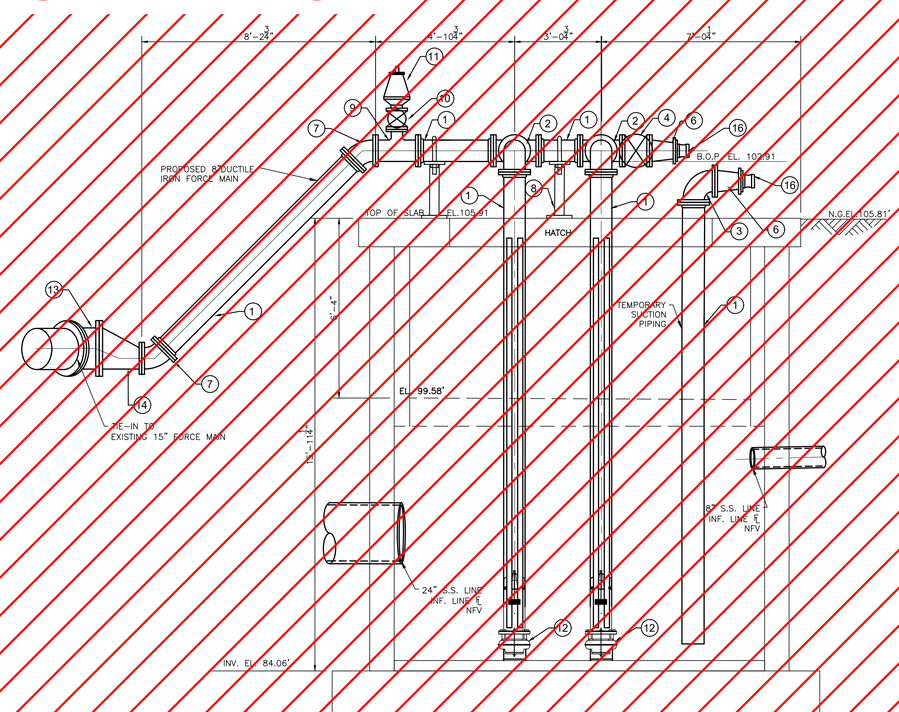
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING THE ENTIRE LIFT STATION SITE OF ALL TREES, ROOTS, STUMPS, AND UNDERBRUSH. ALL ORGANIC MATERIAL SHALL BE REMOVED FROM THE SOIL. THE SOIL SHALL BE COMPACTED TO THE SATISFACTION OF THE ENGINEER PRIOR TO PLACEMENT OF THE PAVEMENT MATERIALS. ANY BRUSH REMOVED SHALL BE DISPOSED OF OFFSITE BY THE CONTRACTOR AT HIS OWN EXPENSE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF GROUND WATER AT THE LIFT STATION SITE. THE CONTRACTOR SHALL SUBMIT HIS PLAN FOR PUMPING THE GROUND WATER DOWN TO AN ACCEPTABLE LEVEL TO THE OWNER/ENGINEER. AT NO TIME SHALL GROUND WATER BE ALLOWED IN THE EXCAVATION WHILE PLACING THE LIFT STATION FOUNDATION OR CONSTRUCTING THE LIFT STATION WALLS. FOR ALL BELOW GRADE STRUCTURES, A 2" CONCRETE SEAL SLAB SHALL BE POURED PRIOR TO CONSTRUCTION OF THE FOUNDATION TO CONTROL IN-SITU SOIL CONDITIONS, UNLESS APPROVED OTHERWISE BY THE ENGINEER/OWNER.
3. LIFT STATION SITE SHALL BE GRADED TO PROVIDE FOR DRAINAGE AS INDICATED ON THE PLANS. SURFACE DRAINAGE SHALL BE CONTROLLED DURING CONSTRUCTION TO PREVENT RUNOFF FROM ENTERING EXCAVATIONS THROUGH THE USE OF TEMPORARY BERMS, SWELLS ETC. AS REQUIRED.
4. ALL FINISHED SLAB SURFACES SHALL BE SLOPED AWAY FROM OPENINGS.
5. ALL PIPE PENETRATIONS INTO THE WET WELL OR VALVE VAULT SHALL HAVE WATER STOP INSTALLED IN ANNULAR SPACES BETWEEN THE PIPE AND WALL AND SEALED WITH NON-SHRINK GROUT.
6. EACH PROPOSED HATCH SHALL BE MANUFACTURED FROM ALUMINUM DIAMOND PLATE AND STAINLESS-STEEL HINGES WITH HEAVY DUTY HASPS AND HARDWARE. THE HATCH SHALL BE DESIGNED FOR A LIVE LOAD OF 300 PSF. THE HATCH OVER THE PUMPS SHALL BE CENTERED ON THE PUMP(S). THE SIZE AND PLACEMENT SHALL BE AS PER THE PUMP MANUFACTURER'S RECOMMENDATIONS FOR EASE OF REMOVAL. ALL HATCHES SHALL SIT FLUSH ON THE CONCRETE. LIFT STATION HATCH OPENINGS ARE TO BE FITTED WITH A FALL PROTECTION APPARATUS. FALL PROTECTION SAFETY NET RETROFIT SHALL BE AS MANUFACTURER BY U.S.F. FABRICATION, HIALEA, FLORIDA, OR APPROVED EQUIVALENT.
7. ALL NUTS AND BOLTS INSTALLED UNDERGROUND OR IN THE WET WELL SHALL BE STAINLESS STEEL. NO CORRODIBLE MATERIALS WILL BE ALLOWED IN THE WET WELL. ALL PIECES OF THE CAM AND GROVE FITTINGS SHALL BE STAINLESS STEEL.
8. THE INTERIOR WALLS OF THE WET WELL SHALL BE COATED WITH SPECTRASHIELD PROTECTIVE LINING OR ENGINEER PRIOR APPROVED EQUIVALENT.
9. ALL DUCTILE IRON PIPING SHALL BE PAINTED IN ACCORDANCE WITH THE SPECIFICATIONS.
10. THE LOCATION OF THE ELECTRICAL SERVICE RACK AND ALL OTHER ELECTRICAL INSTALLATIONS SHALL BE AS PER THE NATIONAL ELECTRIC CODE (LATEST EDITION). THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADEQUATELY SIZED CONDUIT, CONDUCTORS, BREAKERS AND THE GROUNDING SYSTEM.
11. ALL WET WELL FLOAT LEVELS SHALL BE COORDINATED BETWEEN THE CITY & CONTRACTOR.

   THE CABLE SHALL BE 3/8" STAINLESS STEEL CABLE. THE FLOATS SHALL BE SECURED TO THE CABLE WITH PLASTIC TIE WRAPS. THE HEIGHTS OF THE FLOATS SHALL BE SUCH THAT WHEN THE WATER LEVEL CAUSES THE FLOATS TO RISE TO THE HORIZONTAL POSITION AND ACTIVATES THE SWITCHES, THE FLOATS WILL BE AT THE SPECIFIED HEIGHTS. THE WEIGHT FOR THE FLOAT APPARATUS SHALL BE TOTALLY ENCAPSULATED IN RUBBER OR SHALL BE OF PRIOR APPROVED NON-CORROSIVE MATERIAL AND SHALL WEIGH BETWEEN 7 LBS. AND 10 LBS. ALL MATERIALS SHALL BE NON-CORROSIVE.
12. AUTO DIALER ALARMS FOR PUMP FAILURE, ELECTRICAL FAILURE & HIGH WET WELL LEVELS TO BE COORDINATED BETWEEN THE CITY & CONTRACTOR.

NOT IN THIS CONTRACT




PROPOSED SECTION A
SCALE: 3/8" = 1'-0"




PROPOSED SECTION B
SCALE: 3/8" = 1'-0"

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awcenc.com

STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
07/09/2021

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 53
PROPOSED PIPING PLAN AND SECTIONS

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/GDR | 27 |

N
0
10
20
BENCHMARK POINT INFORMATION
BM# | NORTHING | EASTING | DESCRIPTION | ELEVATION
1 | 13626008.34 | 3239678.09 | RRSPKBMPP | 7.88
2 | 13625987.62 | 3239670.91 | MISCX | 3.78
3 | 13625980.56 | 3239695.22 | MISCX2 | 7.71
EXISTING 8" FORCE MAIN
PP
BM-1
OHE
CLF
BM-2
EXISTING VALVE VAULT
NOT IN THIS CONTRACT
EXISTING SAN SEWER MH
RIM EL=107.84'
MH
BM-3
SHORES DR
EXISTING 10" SAN SEWER
EXISTING 8" SAN SEWER
EXISTING SAN SEWER MH
RIM EL=109.72'
MH
NO
DESCRIPTION
DATE
ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com
STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
08/08/2025
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55
LIFT STATION NO. 55
EXISTING SITE PLAN
AWC NO: COG-210
DRAWN BY: MAA
DESIGNED BY: BKZ/GDP
SHEET 28

0 5 10

NOTES:

LIFT STATION #53, SHORELINE, IS TO BE REHABILITATED WITH NEW PUMPS AND PIPING; AND, THE DISCHARGE PIPING WILL BE BROUGHT ABOVE GROUND OUTSIDE THE VALVE VAULT TO ALLOW EASE OF MAINTENANCE AND TO PREVENT THE VAULT FROM FLOODING.

1. WET WELL IS TO BE REHABILITATED PER THE GENERAL CONSTRUCTION NOTES.
2. THE DISCHARGE PIPING MANIFOLD WILL BE REPLACED AND MOVED TO ABOVE GROUND ON TOP OF THE EXISTING VALVE VAULT AS SHOWN. THE EXISTING VALVE VAULT IS TO BE ABANDONED IN PLACE AS INDICATED IN THE GENERAL CONSTRUCTION NOTES.
3. THE EXISTING FENCE IS TO BE REMOVED AND REPLACED.
4. THE ENTIRE SITE IS TO BE CONCRETE PAVED TO SIX INCHES OUTSIDE THE EXISTING FENCE LINE. THE FENCE WILL BE INSTALLED ON THE NEW CONCRETE PAVING AS SHOWN.
5. BYPASS PUMPING
   a. USE MANHOLE 1 TO THE WEST OF THE LIFT STATION, LOCATED FOR BYPASS PUMPING.
   b. BYPASS DISCHARGE TO BE TIED TO EXISTING FORCE MAIN AT POINT 2. CONNECTION AT POINT 2 CAN BE MADE INSIDE VALVE VAULT OR TO THE EXISTING FORCE MAIN CAN BE EXPOSED IN GRASSED AREA OUTSIDE VALVE VAULT AND TAPPED FOR TEMPORARY CONNECTION. IF A TAP IS MADE FOR THE TEMPORARY CONNECTION, TAP TO BE MADE USING A FORD STYLE FTSS FLANGED TAPPING SLEEVE (OR APPROVED EQUIVALENT). TAPPING SLEEVE SHALL BE SIZED TO MATCH BYPASS PUMP DISCHARGE PIPING. UPON COMPLETION OF BYPASS PUMPING, A BLIND FLANGE IS TO BE INSTALLED ON THE TAPPING SADDLE FLANGE. NOTE THAT A TEMPORARY BLIND FLANGE WILL HAVE TO BE INSTALLED ON THE PIPING INSIDE THE VALVE VAULT WHILE BYPASS PUMPING IS OCCURRING.
6. NOTE THE OVERHEAD ELECTRICAL ROUTED ACROSS THE NORTH SIDE OF THE LIFT STATION SITE.
7. ZONE VE PER FIRM 4890067E EFF. DATE 12/6/2002. ELEV. 17 FEET.
8. ALL EXISTING CONTROL PANELS, ELECTRICAL EQUIPMENT, AND ASSOCIATED APPURTENANCES TO BE RELOCATED AND REPLACED BY THE CONTRACTOR AS DETAILED ON SHEETS 45-80.

**BENCHMARK POINT INFORMATION**

| BM# | NORTHING | EASTING | DESCRIPTION | ELEVATION |
|---|---|---|---|---|
| 1 | 13626808.34 | 3239676.09 | RRSPKBMPP | 7.88 |
| 2 | 13625987.02 | 3239670.91 | MISCX | 7.18 |
| 3 | 13625580.56 | 3239695.12 | MISCX2 | 7.71 |

| NO | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com

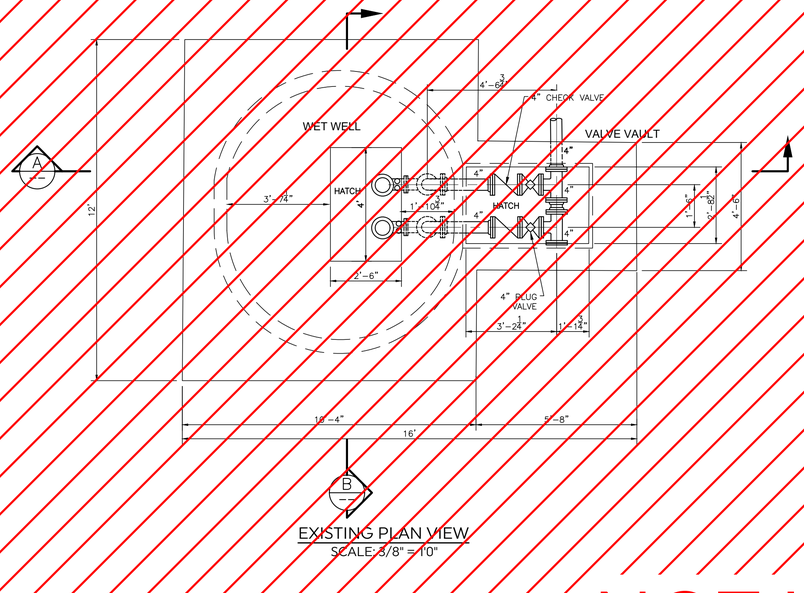
STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
07/09/2021

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

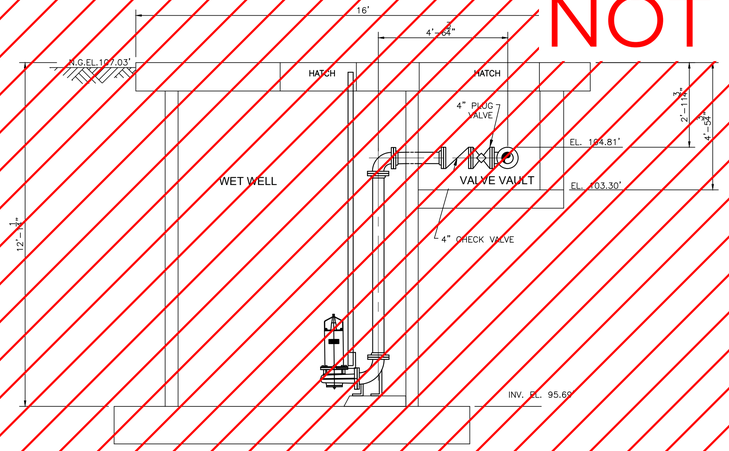
## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 55
PROPOSED SITE PLAN

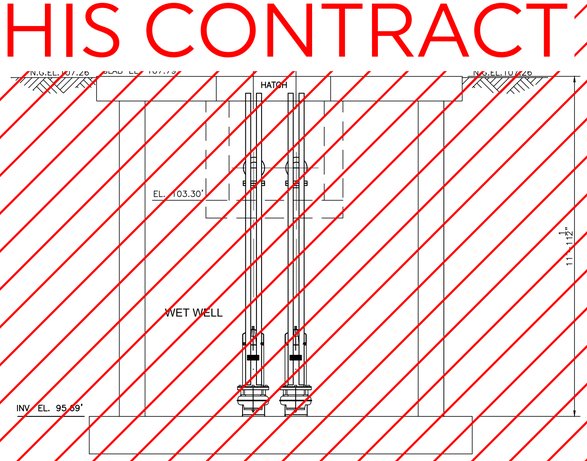
| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/GDR | 29 |




EXISTING PLAN VIEW
SCALE: 3/8" = 1'0"




EXISTING SECTION A
SCALE: 3/8" = 1'0"




EXISTING SECTION B
SCALE: 3/8" = 1'0"

# NOT IN THIS CONTRACT

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awcenc.com

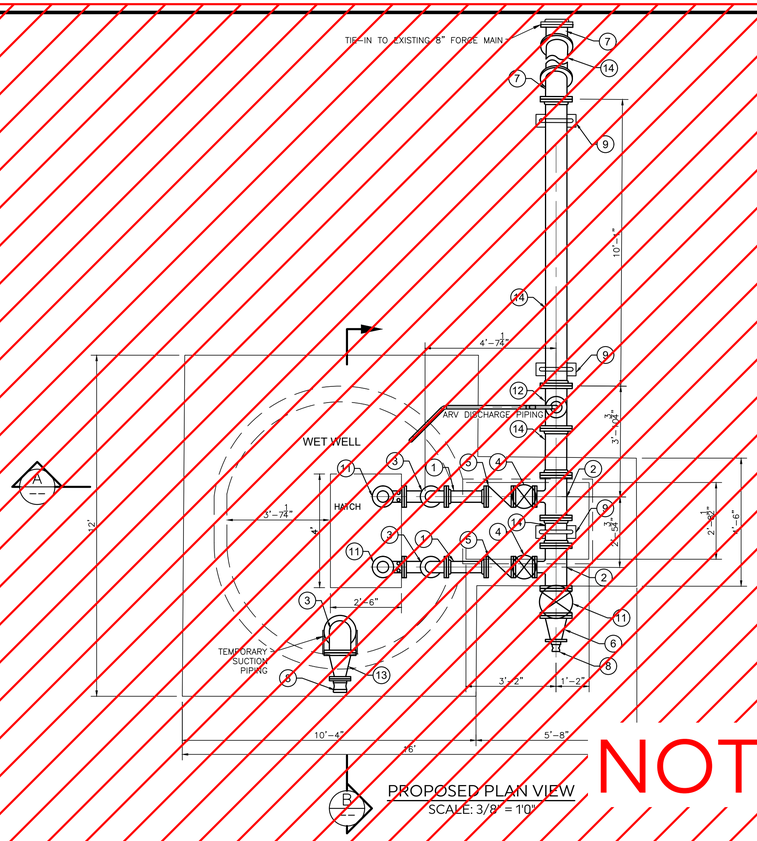
STATE OF TEXAS
BRIAN K. ZOTZKY
124809
LICENSED PROFESSIONAL ENGINEER
01/08/2021

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

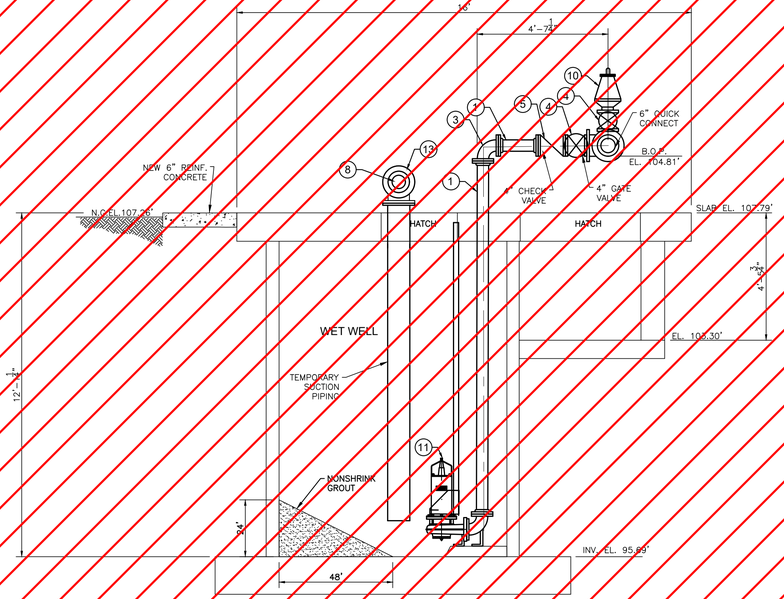
LIFT STATION NO. 55
EXISTING PIPING PLAN AND SECTIONS

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/GDP | 30 |

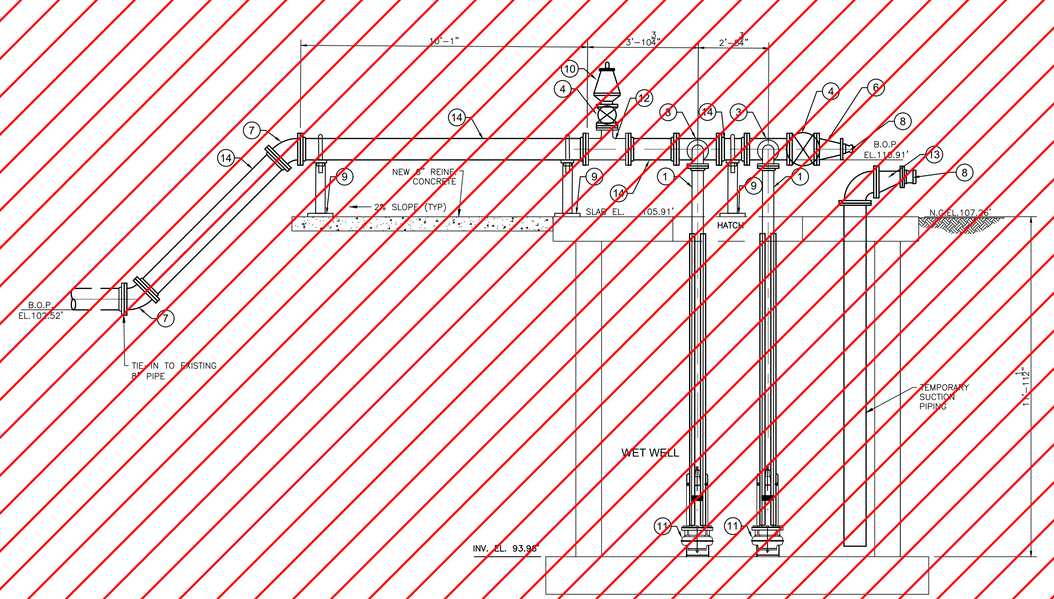



PROPOSED PLAN VIEW
SCALE: 3/8" = 1'0"

# NOT IN THIS CONTRACT




PROPOSED SECTION A
SCALE: 3/8" = 1'0"




PROPOSED SECTION B
SCALE: 3/8" = 1'0"

## BILL OF MATERIAL

| NO. | DESCRIPTION | QTY. |
|---|---|---|
| 1. | 4" DIA. FLG. SPOOL PIECE (LENGTH AS REQUIRED) | (LENGTH AS REQUIRED) |
| 2. | 8"X8"X4" FLG. TEE SIDE | 2 |
| 3. | 4" DIA. FLG. 90° ELBOW | 3 |
| 4. | 4" DIA. FLG. GATE VALVE | 3 |
| 5. | 4" DIA. FLG. CHECK VALVE | 3 |
| 6. | 8"X6" DIA. FLG. REDUCER | 1 |
| 7. | 8" DIA FLG. 45° ELBOW | 2 |
| 8. | 6" DIA. SS FLG. MALE QUICK CONNECT W/ CAP | 2 |
| 9. | PIPE SUPPORT | 3 |
| 10. | 4" DIA. FLG. AIR RELEASE VALVE | 1 |
| 11. | MODEL MSP1-30.0-4 CHANNEL 1 6 HP SUBMERSIBLE PUMP | 2 |
| 12. | 8"X8"X6" DIA. FLG. REDUCING TEE | 2 |
| 13. | 6"X8" ECC. REDUCER | 1 |
| 14. | 8" DIA. FLG. SPOOL PIECE (LENGTH AS REQUIRED) | (LENGTH AS REQUIRED) |

LIFT STATION NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING THE ENTIRE LIFT STATION SITE OF ALL TREES, ROOTS, STUMPS, AND UNDERBRUSH. ALL ORGANIC MATERIAL SHALL BE REMOVED FROM THE SOIL. THE SOIL SHALL BE COMPACTED TO THE SATISFACTION OF THE ENGINEER PRIOR TO PLACEMENT OF THE PAVEMENT MATERIALS. ANY BRUSH REMOVED SHALL BE DISPOSED OF OFFSITE BY THE CONTRACTOR AT HIS OWN EXPENSE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF GROUND WATER AT THE LIFT STATION SITE. THE CONTRACTOR SHALL SUBMIT A PLAN FOR PUMPING THE GROUND WATER DOWN TO AN ACCEPTABLE LEVEL TO THE OWNER/ENGINEER. AT NO TIME SHALL GROUND WATER BE ALLOWED IN THE EXCAVATION WHILE PLACING THE LIFT STATION FOUNDATION OR CONSTRUCTING THE LIFT STATION WALLS. FOR ALL BELOW GRADE STRUCTURES, A 2" CONCRETE SEAL SLAB SHALL BE POURED PRIOR TO CONSTRUCTION OF THE FOUNDATION TO CONTROL INSITU SOIL CONDITIONS, UNLESS APPROVED OTHERWISE BY THE ENGINEER/OWNER.
3. LIFT STATION SITE SHALL BE GRADED TO PROVIDE FOR DRAINAGE AS INDICATED ON THE PLANS. SURFACE DRAINAGE SHALL BE CONTROLLED DURING CONSTRUCTION TO PREVENT RUNOFF FROM ENTERING EXCAVATIONS THROUGH THE USE OF TEMPORARY BERMS, SWELLS, ETC. AS REQUIRED.
4. ALL FINISHED SLAB SURFACES SHALL BE SLOPED AWAY FROM OPENINGS.
5. ALL PIPE PENETRATIONS INTO THE WET WELL OR VALVE VAULT SHALL HAVE WATER STOP INSTALLED IN ANNULAR SPACES BETWEEN THE PIPE AND WALL AND SEALED WITH NON-SHRINK GROUT.
6. EACH PROPOSED HATCH SHALL BE MANUFACTURED FROM ALUMINUM DIAMOND PLATE AND STAINLESS-STEEL HINGES WITH HEAVY DUTY CAMS AND HARDWARE. THE HATCH SHALL BE DESIGNED FOR A LIVE LOAD OF 300 PSF. THE HATCH OVER THE PUMPS SHALL BE CENTERED ON THE PUMP(S). THE SIZE AND PLACEMENT SHALL BE AS PER THE PUMP MANUFACTURER'S RECOMMENDATIONS FOR EASE OF REMOVAL. ALL HATCHES SHALL SIT FLUSH ON THE CONCRETE. LIFT STATION HATCH OPENINGS ARE TO BE FITTED WITH NEW FALL PROTECTION APPARATUS. FALL PROTECTION SAFETY NET RETROFIT SHALL BE AS MANUFACTURER BY U.S.E. FABRICATION, HIALEA, FLORIDA OR APPROVED EQUIVALENT.
7. ALL NUTS AND BOLTS INSTALLED UNDERGROUND OR IN THE WET WELL SHALL BE STAINLESS STEEL. NO CORRODIBLE MATERIALS WILL BE ALLOWED IN THE WET WELL. ALL PIECES OF THE CAM AND GROVE FITTINGS SHALL BE STAINLESS STEEL.
8. THE INTERIOR WALLS OF THE WET WELL SHALL BE COATED WITH SPECTRASHIELD PROTECTIVE LINING OR ENGINEER PRIOR APPROVED EQUIVALENT.
9. ALL DUCTILE IRON PIPING SHALL BE PAINTED IN ACCORDANCE WITH THE SPECIFICATIONS.
10. THE LOCATION OF THE ELECTRICAL SERVICE RACK AND ALL OTHER ELECTRICAL INSTALLATIONS SHALL BE AS PER THE NATIONAL ELECTRIC CODE (LATEST EDITION). THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADEQUATELY SIZED CONDUIT, CONDUCTORS, BREAKERS, AND THE GROUNDING SYSTEM.
11. ALL WET WELL FLAT LEVELS SHALL BE COORDINATED BETWEEN THE CITY & CONTRACTOR.

    THE CABLE SHALL BE 3/8" STAINLESS STEEL CABLE. THE FLOATS SHALL BE SECURED TO THE CABLE WITH PLASTIC TIE WRAPS. THE HEIGHTS OF THE FLOATS SHALL BE SUCH THAT WHEN THE WATER LEVEL CAUSES THE FLOATS TO RISE TO THE HORIZONTAL POSITION AND ACTIVATES THE SWITCHES, THE FLOATS WILL BE AT THE SPECIFIED HEIGHTS. THE WEIGHT FOR THE FLOAT APPARATUS SHALL BE TOTALLY ENCAPSULATED IN RUBBER OR SHALL BE OF PRIOR APPROVED NON-CORROSIVE MATERIAL AND SHALL WEIGH BETWEEN 7 LBS. AND 10 LBS. ALL MATERIALS SHALL BE NON-CORROSIVE.
12. AUTO DIALER ALARMS FOR PUMP FAILURE, ELECTRICAL FAILURE & HIGH WET WELL LEVELS TO BE COORDINATED BETWEEN THE CITY & CONTRACTOR.

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awcenc.com

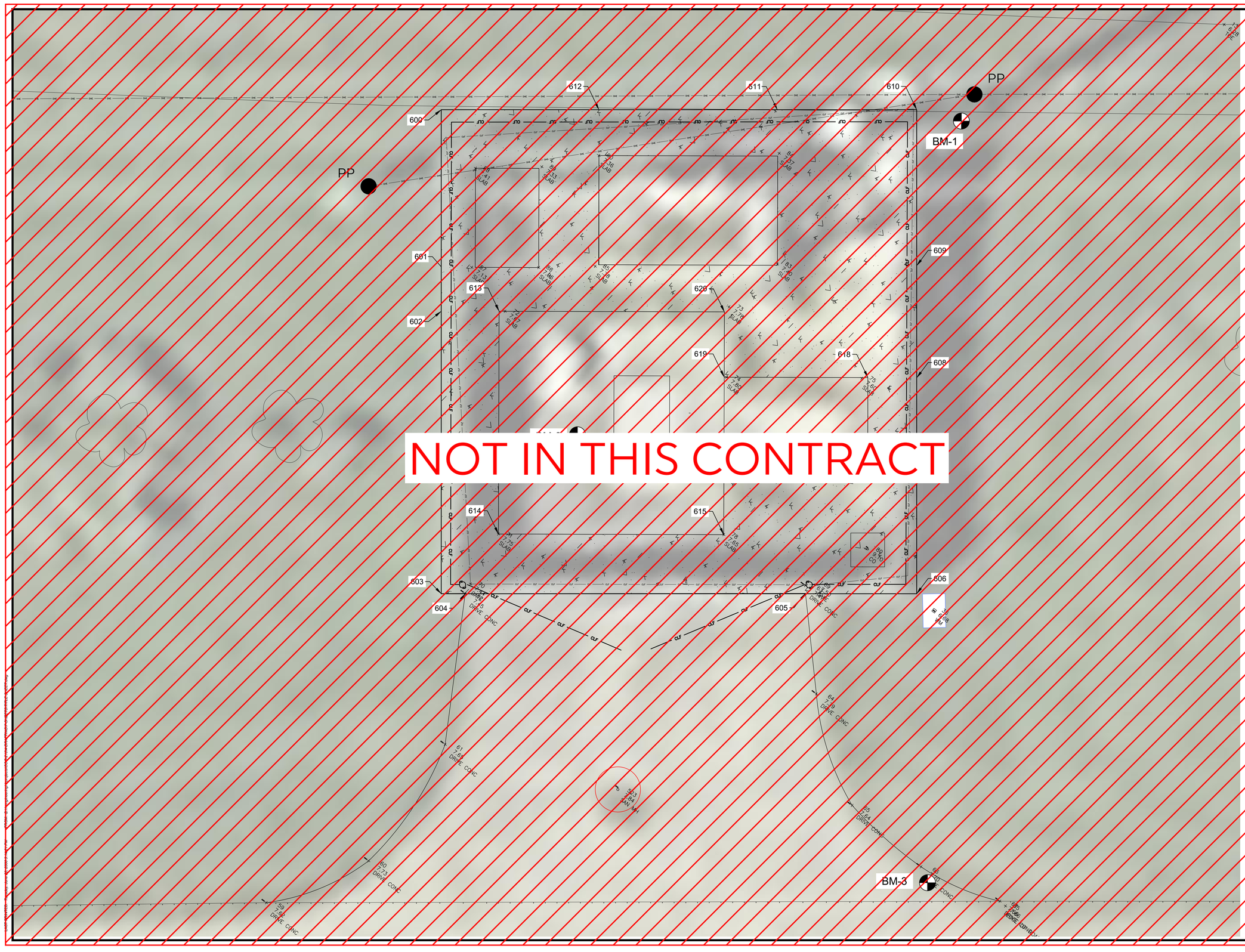

STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
08/08/2021

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

LIFT STATION NO. 55
PROPOSED PIPING PLAN AND SECTIONS

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/GDR | 31 |




NOT IN THIS CONTRACT

NOTE

1. CONTRACTOR TO MATCH EXISTING DRIVE ELEVATIONS AT DRIVE TIE IN LOCATIONS.

**BENCHMARK POINT INFORMATION**

| BM# | NORTHING | EASTING | DESCRIPTION | ELEVATION |
|---|---|---|---|---|
| 1 | 13626008.34 | 3239678.09 | RRSPKBMPP | 7.88 |
| 2 | 13625987.62 | 3239670.91 | MISCX | 7.78 |
| 3 | 13625980.56 | 3239695.22 | MISCX2 | 7.71 |

PAVING POINT INFORMATION

| BM# | NORTHING | EASTING | DESCRIPTION | ELEVATION |
|---|---|---|---|---|
| 600 | 13625994.86 | 3239687.43 | TP | 7.34' |
| 601 | 13625988.31 | 3239661.62 | TP | 7.09' |
| 602 | 13625987.75 | 3239662.81 | TP | 7.61' |
| 603 | 13625977.77 | 3239670.35 | TP | 7.45' |
| 604 | 13625978.42 | 3239671.19 | TP | 7.45' |
| 605 | 13625987.51 | 3239683.20 | TP | 7.47' |
| 606 | 13625990.46 | 3239683.13 | TP | 7.32' |
| 607 | 13625994.92 | 3239683.77 | TP | 7.64' |
| 608 | 13625998.09 | 3239681.37 | TP | 7.55' |
| 609 | 13626002.64 | 3239678.38 | TP | 7.27' |
| 610 | 13626007.55 | 3239674.22 | TP | 7.23' |
| 611 | 13626003.83 | 3239669.30 | TP | 7.52' |
| 612 | 13625999.07 | 3239663.00 | TP | 7.31' |
| 613 | 13625989.29 | 3239664.85 | TP | 7.57' |
| 614 | 13625981.41 | 3239670.77 | TP | 7.75' |
| 615 | 13625987.40 | 3239678.74 | TP | 7.76' |
| 616 | 13625989.80 | 3239676.85 | TP | 7.74' |
| 617 | 13625993.64 | 3239682.03 | TP | 7.69' |
| 618 | 13625996.79 | 3239679.64 | TP | 7.60' |
| 619 | 13625992.97 | 3239674.56 | TP | 7.80' |
| 620 | 13625995.28 | 3239672.82 | TP | 7.78' |

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awcenc.com

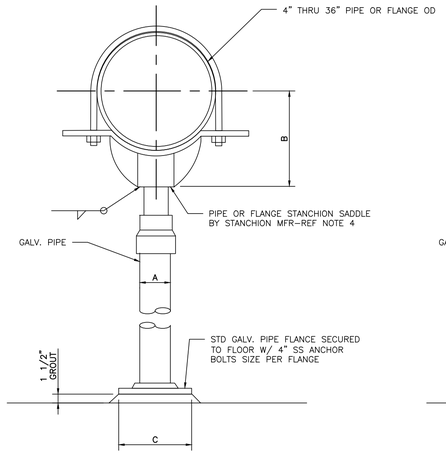
STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
01/06/2021

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

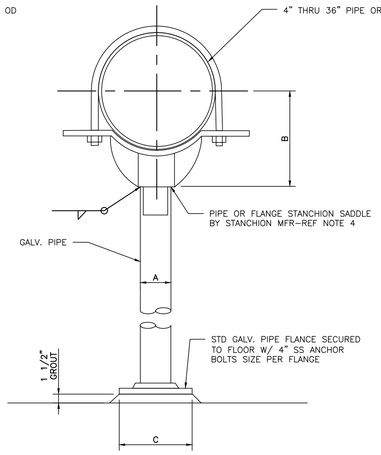
## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## LIFT STATION NO. 55
PAVING PLAN

| AWC NO. | DRAWN BY: MAK | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/JDP | 32 |




ADJUSTABLE STANCHION

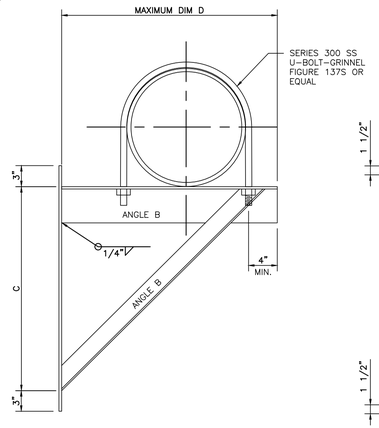



FIXED STANCHION

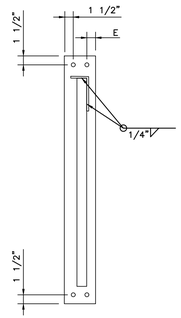
| PIPE SIZE | DIMENSIONS (IN.) | | |
|---|---|---|---|
| | A | B | C |
| 4" | 3" | 4 3/16" | 7 1/2" |
| 5" | 3" | 4 3/16" | 7 1/2" |
| 6" | 3" | 5 7/16" | 7 1/2" |
| 8" | 3" | 6 15/16" | 7 1/2" |
| 10" | 3" | 8 7/16" | 7 1/2" |
| 12" | 4" | 9 15/16" | 7 1/2" |
| 14" | 4" | 10 15/16" | 9" |
| 16" | 4" | 12 3/8" | 9" |
| 18" | 4" | 13 7/8" | 9" |

1 DETAIL
N.T.S.

1. PROVIDE NEOPRENE WAFFLE ISOLATION PAD SIMILAR TO MASON TYPE "W" OR KORFUND, KORPAD 40 UNDER SUPPORT FOT WHEN PIPING IS ISOLATED OR SUPPORT IS ADJACENT TO MECHANICAL EQUIPMENT.
2. FOR BASE HEIGHT AND FLANGE DIMENSIONS SEE TABLE.
3. ANVIL FIGURE 265 OR EQUAL ADJUSTABLE PIPE SADDLE. USE OPEN, FULL CIRCLE, AND FLAT.



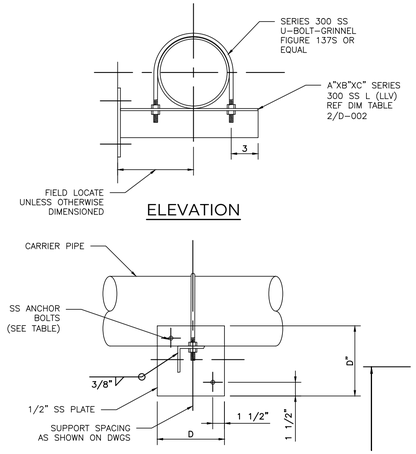

ELEVATION




ELEVATION

| PIPE SIZE | ANGLE A | ANGLE B | C | D | EXPANSION BOLTS | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | DIA. | EMBED. | E | MAX LOAD |
| 12" | 3 1/2"x3 1/2"x1/4" | 3"x3"x1/4" | 24" | 36" | 1/2" | 4" | 6" | 1,532 |
| 16" | 4"x4"x1/4" | 3"x3"x1/4" | 24" | 36" | 1/2" | 4" | 6" | 1,392 |
| 18" | 4"x4"x3/8" | 3 1/2"x3 1/2"x1/4" | 36" | 48" | 5/8" | 4 1/2" | 7 1/7" | 3,026 |

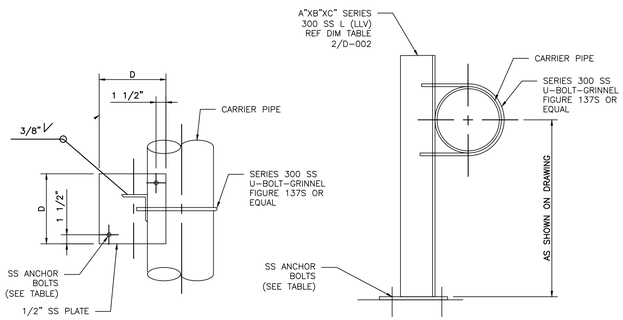
2 PIPE SUPPORT DETAIL
N.T.S.




ELEVATION

| PIPE SIZE | A | B | C | D | QTYxØ AB |
|---|---|---|---|---|---|
| 4" TO 8" | 5/8" | 3" | 4" | 8" | 4x1/2" Ø |
| >4" | 3/8" | 2" | 3" | 6" | 2x1/2" Ø |

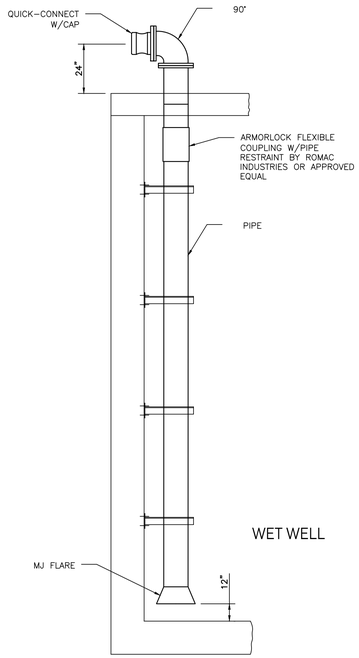
3 PIPE SUPPOPT DETAIL
N.T.S.



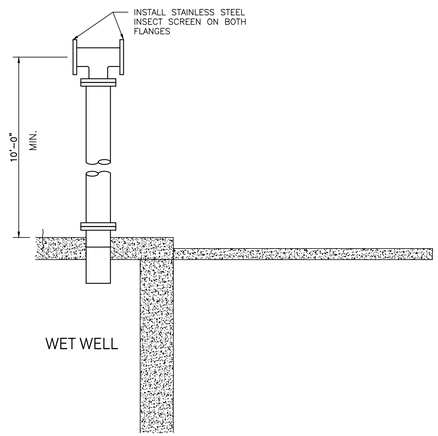

PLAN ELEVATION

| PIPE SIZE | A | B | C | D | QTYxØ AB |
|---|---|---|---|---|---|
| 4" TO 8" | 5/8" | 3" | 4" | 8" | 4x1/2" Ø |
| >4" | 3/8" | 2" | 3" | 6" | 2x1/2" Ø |

4 PIPE SUPPOPT DETAIL
N.T.S.




5 TEMPORARY SUCTION PIPING
N.T.S.




6 VENT LINE DETAILS
N.T.S.

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com
STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/05/2021

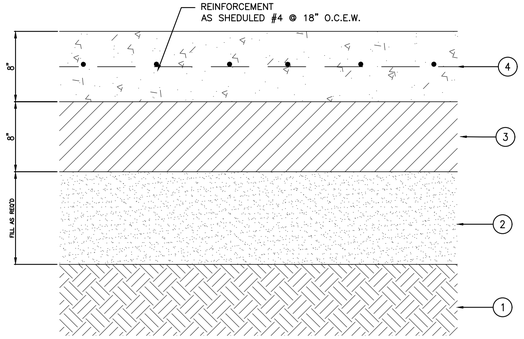

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## MISCELLANEOUS DETAILS
SHEET 1 OF 1

| AWC NO: | DRAWN BY: JDLLG | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/CDP | 33 |

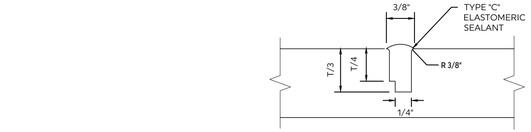

LAST PRINTED: Thursday, April 1, 2021 8:39:09 AM
FROM: O:\1-ENGINEERING\1-PROJECTS\COG-21\14-DRAFTING\2-SHEETS\33 MISCELLANEOUS DETAILS.dwg



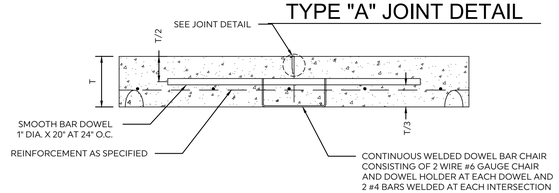

SUBGRADE PREPARATION NOTES

1. THE TOP 6 INCHES OF SOIL, VEGETATION, AND ROOTS IN THE PROPOSED PAVEMENT AREAS SHALL BE STRIPPED FROM THE SITE AND EITHER WASTED OR STOCKPILED FOR LATER USE. AFTER STRIPPING AND EXCAVATING TO THE DESIRED SUBGRADE ELEVATION, THE EXPOSED SUBGRADE SOILS SHALL BE PROOF ROLLED WITH AT LEAST A 15 TON PNEUMATIC ROLLER TO DETECT WEAK AREAS. SUCH AREAS SHALL BE REMOVED AND REPLACED WITH SOILS EXHIBITING SIMILAR CLASSIFICATION, MOISTURE CONTENT, AND DENSITY AS THE ADJACENT IN SITU SOILS.
2. ANY FILL REQUIRED FOR GRADING PURPOSES SHALL BE PLACED IN MAXIMUM LOOSE LIFTS OF 8 INCHES. IF WATER MUST BE ADDED, IT SHALL BE UNIFORMLY APPLIED AND THOROUGHLY MIXED INTO THE SOIL BY DISKING OR SCARIFYING. COMPACTED FILL SHALL EXTEND A MINIMUM OF 2 FEET BEYOND THE EDGES OF THE PAVEMENT PRIOR TO SLOPING. SELECT FILL SHALL BE FREE OF ORGANIC OR OTHER DELETERIOUS MATERIALS, HAVE A MAXIMUM PARTICLE SIZE OF LESS THAN 3 INCHES, HAVE A LIQUID LIMIT LESS THAN 35 AND A PLASTICITY INDEX BETWEEN 8 AND 18. SELECT FILL SHALL BE COMPACTED TO AT LEAST 95% OF STANDARD PROCTOR (ASTM D 698 MAXIMUM DRY DENSITY), AT -2% TO +3% OF OPTIMUM MOISTURE CONTENT.
3. STABILIZE AND COMPAT THE UPPER 8 INCHES OF FILL WITH LIME.(CONTRACTOR SHALL ASSUME 6% LIME FOR BIDDING PURPOSES)
4. 8" REINFORCED CONCRETE SHALL HAVE MINIMUM FLEXURAL STRENGTH OF 450 PSI @ 7 DAYS, HAVE MINIMUM COMPRESSION STRENGTH SHALL BE 2000 PSI @ 7 DAYS AND 3000 @ 28 DAYS. THE RATIO FOR LBS OF WATER TO LB OF CEMENT SHALL BE 0.66 OR 7.5 GALLONS OF WATER PER BAG OF CEMENT. THE MINIMUM CEMENT PER CUBIC YARD SHALL BE 470 LBS OR 5 BAGS. THE SLUMP SHALL RANGE FROM 3 TO 5 IN AND THE TOTAL AIR CONTENT SHOULD RANGE FROM 2.5% TO 4.5%.

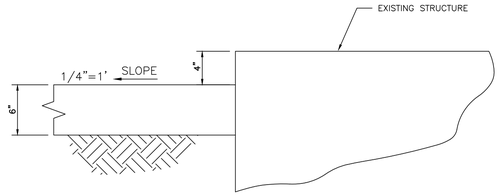
## CONCRETE PAVING SECTION



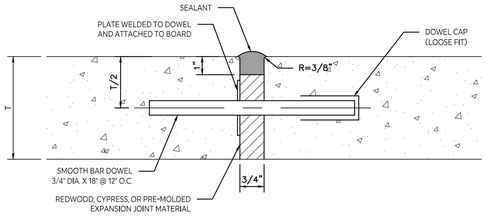

## TYPE "A" JOINT DETAIL



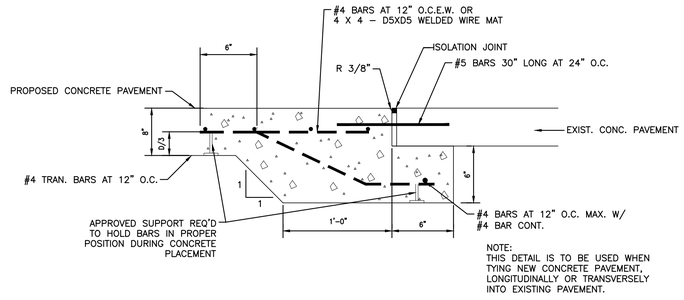

## TYPE "A" JOINT
(FOR PAVING CONSTRUCTION)




## PROPOSED SLAB AND SLOPE
N.T.S.




## TYPE "A" EXPANSION JOINT




## PAVEMENT TRANSITION
( NEW CONC. TO EXIST. CONC.)

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awceng.com

STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED PROFESSIONAL ENGINEER
04/06/2021

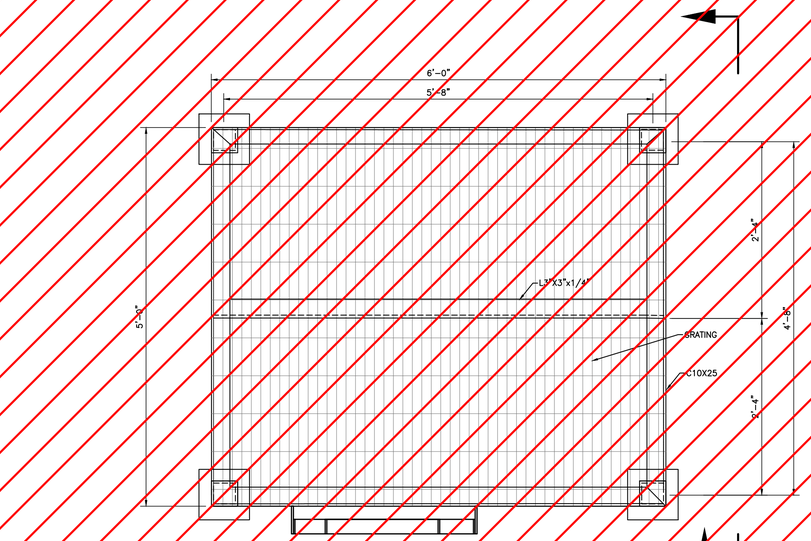
# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

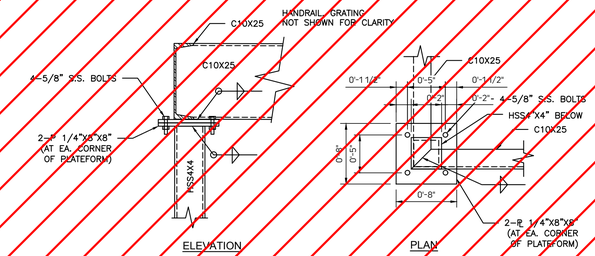
## MISCELLANEOUS DETAILS
SHEET 1 OF 1

| AWC NO: | DRAWN BY: JDLLG | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: BKZ/CDP | 34 |

LAST PRINTED: Thursday, March 25, 2021 3:41:43 PM FROM: O:\1-ENGINEERING\1-PROJECTS\COG-21\04-DRAFTING\2-SHEETS\34 MISCELLANEOUS DETAILS.dwg




PLATFORM PLANVIEW
SCALE: 1"=1'-0"




FRAMING CONNECTIONS
SCALE: 1"=1'-0"

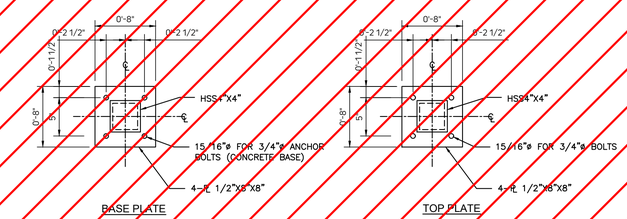
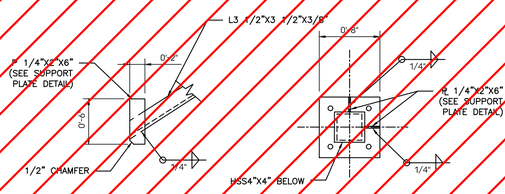
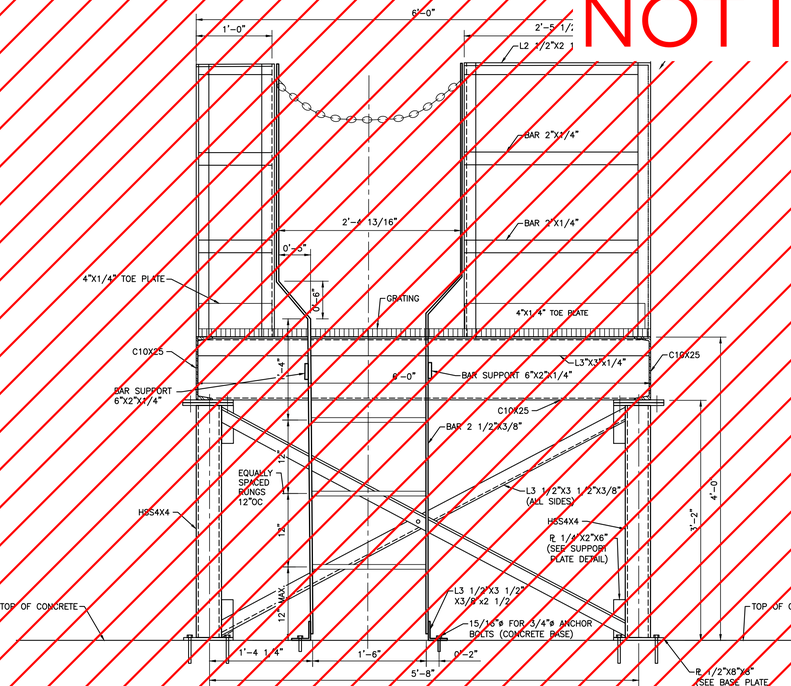



PLATE DETAIL
SCALE: 1"=1'-0"

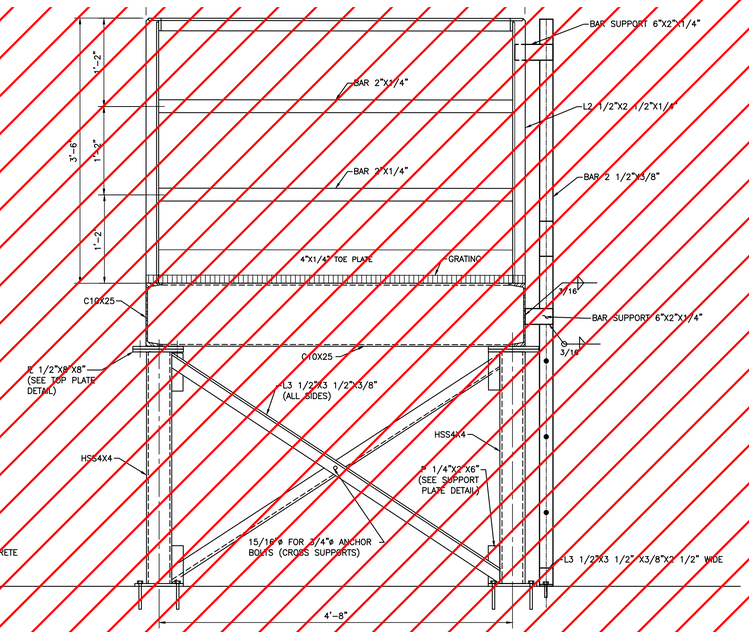



SUPPORT PLATE DETAIL
SCALE: 1"=1'-0"

# NOT IN THIS CONTRACT




A SECTION
SCALE: 1"=1'-0"




B SECTION
SCALE: 1"=1'-0"

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

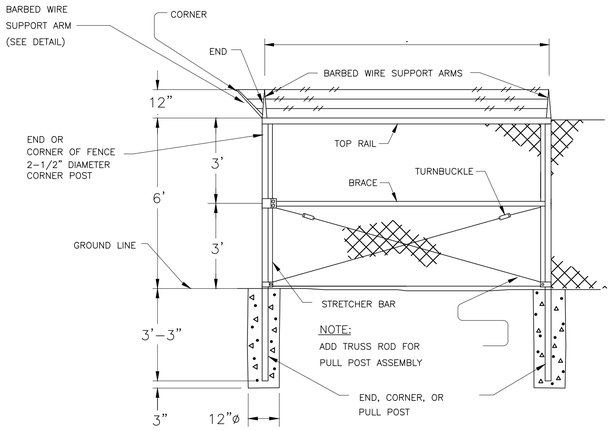

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED ENGINEERING FIRM F-16194
TEXAS REGISTERED SURVEYING FIRM 10194049
www.awcenc.com
STATE OF TEXAS
BRIAN K. ZOTZKI
124808
LICENSED PROFESSIONAL ENGINEER
07/08/2021


CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

LIFT STATION IMPROVEMENTS
LIFT STATIONS 13, 18, 30, 51, 53, & 55

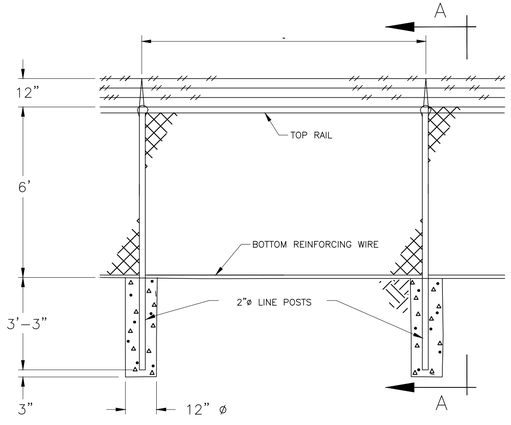
LIFT STATION 18 PLATFROM DETAILS
SHEET 1 OF 1

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: MAA/BKZ | 35 |



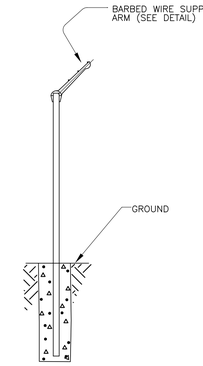

## CORNER OR END PANEL ASS'Y PULL POST ASS'Y SIMILAR (EXCEPT AS INDICATED)

NTS

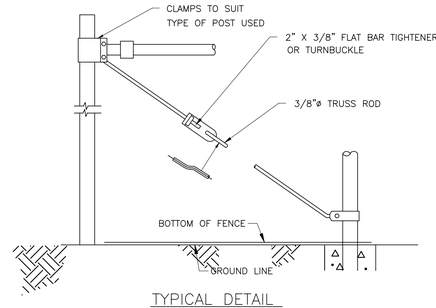



## TYPICAL LINE FENCE DETAIL

NTS

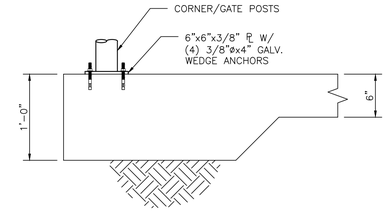



## VIEW A-A



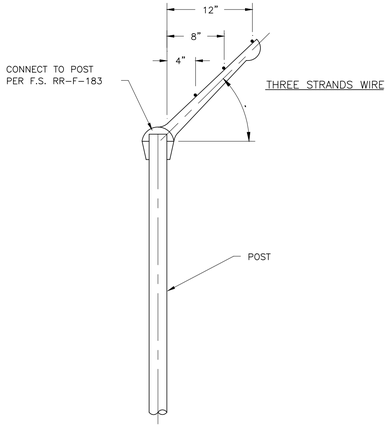

## TYPICAL DETAIL TRUSS ROD TIES

NTS



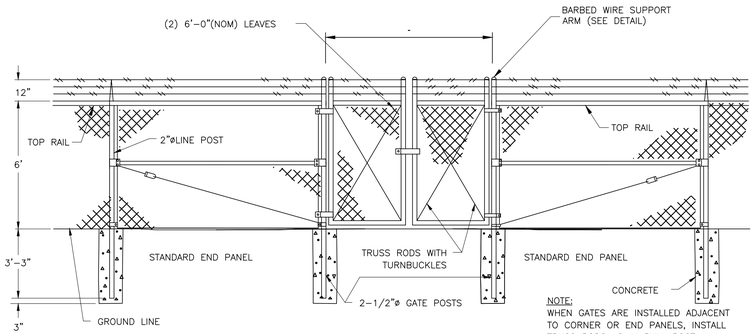

## PROPOSED FENCE POST FASTENED TO CONCRETE

NTS



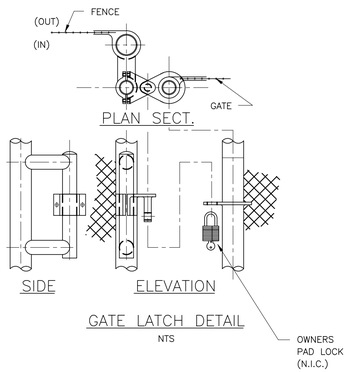

## DETAIL BARBED WIRE SUPPORT ARM AND POST CAP

NTS




## DOUBLE PANEL GATE DETAIL

NTS




## GATE LATCH DETAIL

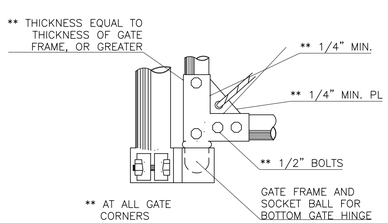
NTS



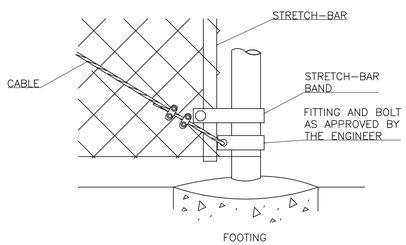

## PROPOSED FENCE POST SET IN CONCRETE

NTS

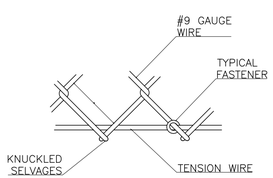
NOTE:
PROPOSED FENCING SHALL HAVE A MINIMUM 6" INSET FROM OUTSIDE EDGE OF CONCRETE PAVING.



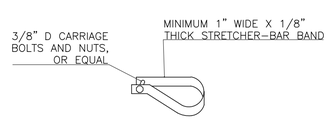

## TYPICAL BOTTOM GATE HINGE




## TERMINAL POST DETAIL




## FABRIC & TENSION WIRE DETAIL BOTTOM




## TYPICAL STRETCHER-BAR BAND

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE
2901 Turtle Creek Dr, Suite 320
Port Arthur, TX 77642
409.724.7888
TEXAS REGISTERED
ENGINEERING FIRM
F-16194
TEXAS REGISTERED
SURVEYING FIRM
10194049
www.awceng.com
STATE OF TEXAS
BRIAN K. ZOTZKY
124808
LICENSED
PROFESSIONAL ENGINEER
04/05/2021

# CITY OF GALVESTON

GALVESTON COUNTY, TEXAS

## LIFT STATION IMPROVEMENTS

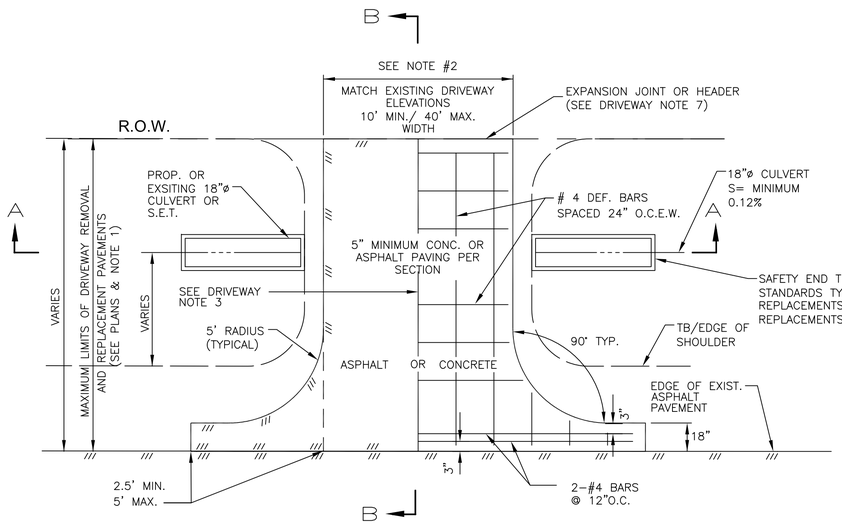
LIFT STATIONS 13, 18, 30, 51, 53, & 55

## FENCING DETAILS

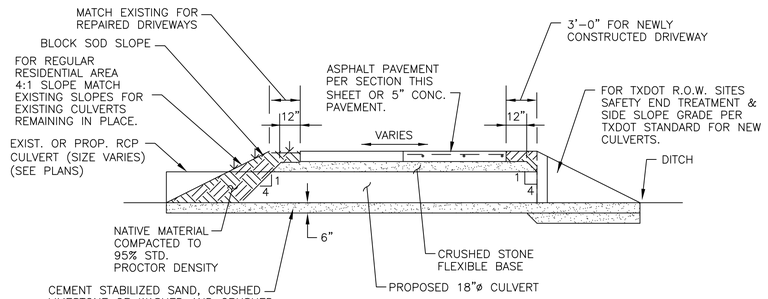
SHEET 1 OF 1

| AWC NO: | DRAWN BY: MAA | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CDP | 36 |

LAST PRINTED: Thursday, March 25, 2021 1:42:03 PM FROM: O:\-ENGINEERING\1-PROJECTS\COG-21\04-DRAFTING\1-SHEETS\36 FENCING DETAILS.dwg

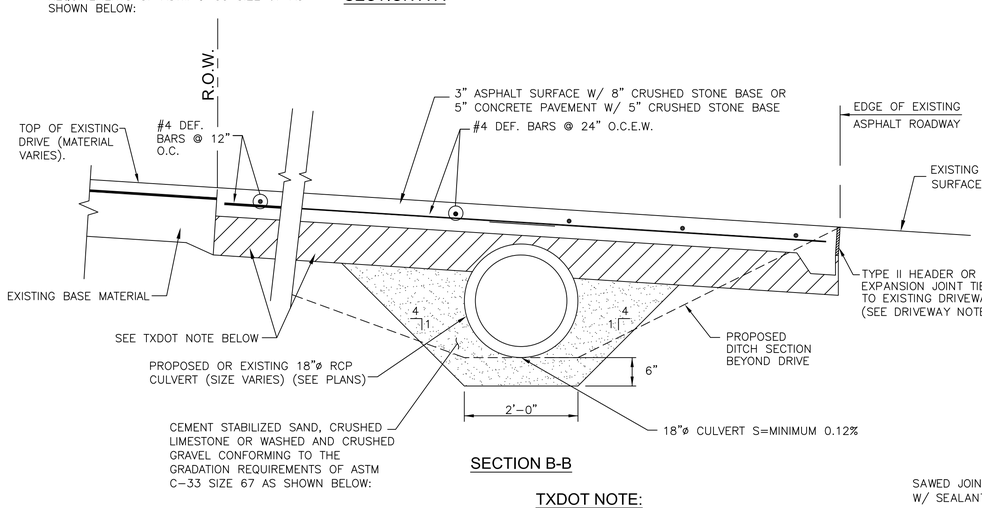



PLAN




SECTION A-A

| | | |
|---|---|---|
| PASSING | 1 INCH SIEVE | 100% |
| PASSING | ¾ INCH SIEVE | 90 – 100% |
| PASSING | ⅜ INCH SIEVE | 20 – 55% |
| PASSING | NO. 4 SIEVE | 0 – 10% |
| PASSING | NO. 8 SIEVE | 0 – 5% |

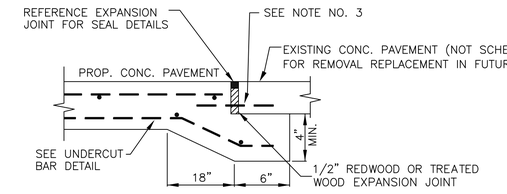



SECTION B-B

TXDOT NOTE:
6" MINIMUM CONRETE AND
ANY ASPHALT DRIVEWAYS TO BE REPAIRED/REPLACED IN TXDOT RIGHT-OF-WAY SHALL MATCH EXISTING TXDOT PAVEMENT SECTION. BASE MATERIAL FOR ASPHALT DRIVEWAYS SHALL BE CRUSHED LIMESTONE. CRUSHED RECYCLED CONCRETE IS NOT ACCEPTABLE TO TXDOT.

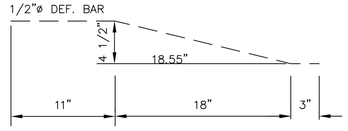
## CONCRETE OR ASPHALT DRIVEWAY DETAIL

SCALE: NTS

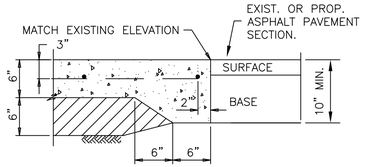



## TYPE I PAVING HEADER DETAIL

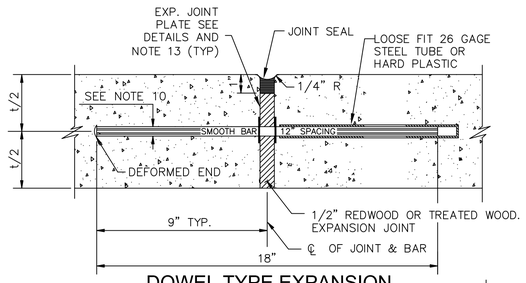
SCALE: NTS




## UNDERCUT BAR DETAIL

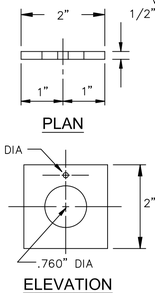



## CONCRETE TO ASPHALT TYPE II PAVING HEADER




## DOWEL TYPE EXPANSION JOINT DETAIL

SCALE: 3"=1'-0"

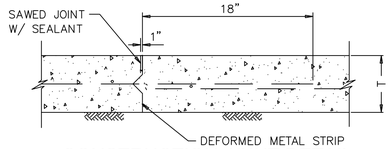



PLAN

ELEVATION

## PRE-MFG. JOINT PLATE DETAIL

SCALE= NTS

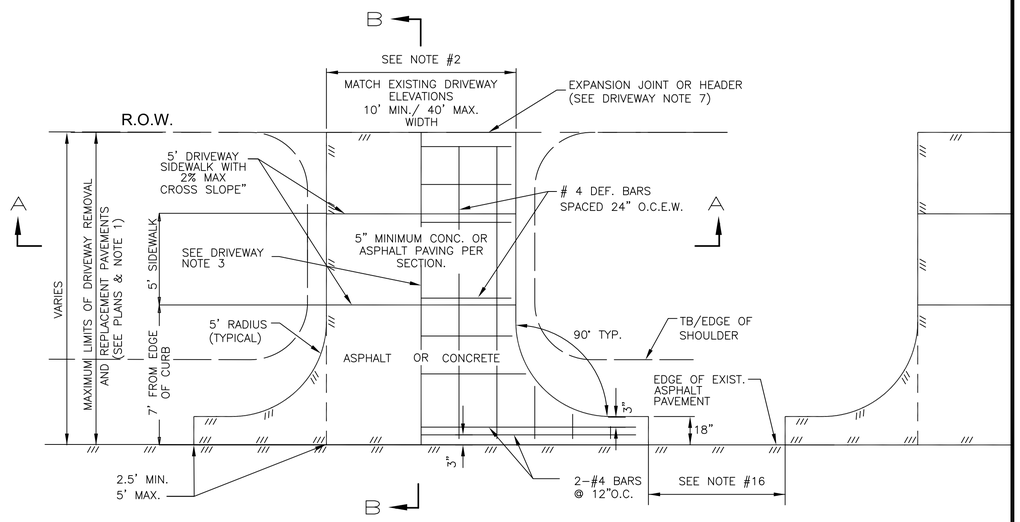



## CONSTRUCTION JOINT DETAIL

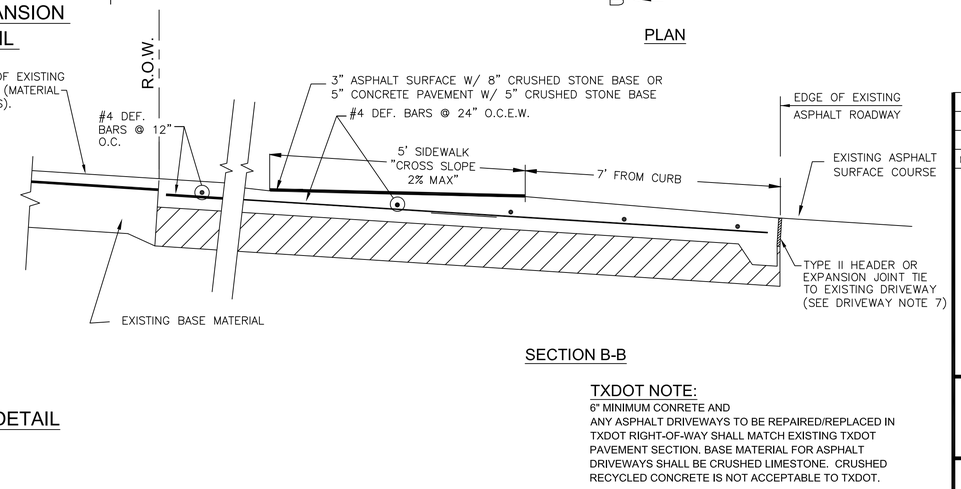
SCALE: 1 1/2"=1'-0"

## DRIVEWAY NOTES:

1. IN THE EVENT TOTAL DRIVEWAY AND/OR CULVERT REMOVAL & REPLACEMENT IS REQUIRED, IT SHALL BE DONE PER DETAILS ON THIS SHEET. ASPHALT DRIVEWAYS IN TXDOT R.O.W. SHALL MATCH TXDOT PAVEMENT SECTION.
2. THE MAXIMUM LIMIT OF DRIVEWAY REMOVAL AND REPLACEMENT SHALL BE LOCATED AT THE RIGHT-OF-WAY UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER (SEE NOTE 7).
3. DRIVEWAYS SHALL BE CONSTRUCTED TO MATCH EXISTING DRIVEWAY WIDTH MEASURED AT THE RIGHT-OF-WAY TO A MAXIMUM WIDTH OF 40'-0". WHEN DRIVEWAY EXCEEDS 20'-0" IN WIDTH, A 3/4" REDWOOD BOARD EXPANSION JOINT W/ STEEL RUNNING THROUGH IT, OR APPROVED EQUAL, SHALL BE INSTALLED THE FULL LENGTH OF THE DRIVEWAY. EXCEPTIONS WILL BE MADE ON A CASE BY CASE BASIS BY CITY ENGINEER'S OFFICE.
4. PROPOSED DRIVEWAY FINISH SURFACE MATERIAL SHALL MATCH EXISTING MATERIALS SUCH AS PEA GRAVEL, INLAID BRICK, STAMPED OR COLORED CONCRETE. EXISTING ASPHALT, SHELL, SHELLCRETE, DIRT, GRAVEL OR GRASS DRIVEWAYS SHALL BE REPAIRED IN KIND AS REQUIRED UNLESS OTHERWISE SHOWN ON PLANS. ASPHALT DRIVEWAYS SHALL BE REPAIRED PER PROPOSED PAVEMENT REPLACEMENT SECTION.
5. DRIVEWAYS SHALL BE MATCHED TO STREET PAVEMENT ELEVATIONS.
6. NATIVE MATERIALS SHALL BE USED AS A BASE LEVELER AND /OR AS BACKFILL REQUIRED WHEN OVER EXCAVATION OCCURS DUE TO POOR SOILS OR ANY OTHER CONDITION RESULTING IN OVER EXCAVATION OF DRIVEWAYS. NATIVE MATERIALS SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.
7. WHERE TYING INTO EXISTING CONCRETE DRIVEWAY AND CONDITION OF EXISTING DRIVEWAY ALLOWS, PROVIDE 1x4" REDWOOD BOARD W/24" LONG #4 DEFORMED BARS @ 12" O.C.E.W. THROUGH IT DRILLED INTO EXISTING DRIVEWAY. WHERE EXISTING CONCRETE IS IN POOR CONDITION PROVIDE TYPE II PAVING HEADER (DRIVEWAYS ONLY).
8. FILL AT CULVERTS SHALL BE CONTROLLED BY 4H:1V SL OPE RATHER THAN DRIVEWAY SHOULDER WIDTH TO MINIMIZE AMOUNT OF CULVERT PIPE EXPOSED. FOR DRIVEWAYS IN FM3005 R.O.W., SLOPES SHALL CONFORM TO TXDOT STANDARDS. (SEE NOTE 9)
9. IN THE EVENT TOTAL CULVERT REMOVAL IS REQUIRED, SAFETY END TREATMENTS SHALL BE REPLACED OR ADDED PER TXDOT STANDARDS IF NONE EXISTED AT NO SEPARATE PAY. (APPLICABLE TO DRIVEWAYS IN TXDOT R.O.W. ONLY)
10. DOWELS FOR PAVEMENT EXPANSION JOINTS SHALL BE 1" DIA. FOR 6" PAVEMENT THICKNESS.
11. ALL JOINT SEAL MATERIAL SHALL BE HOT POURED ASPHALT RUBBER OR AS APPROVED IN ACCORDANCE W/ ASTM DESIGNATION D3405.
12. DEFORMED METAL STRIPS SHALL BE STAKED IN PLACE W/ #3 BARS.
13. PRE-MANUFACTURED JOINT PLATE, TWO PER LOAD TRANSFER DEVICE, LOOSE FIT ON EXPANSION END AND TACK WELD TO FIXED END.
14. PROVIDE 3/4" (5" THICK PAVEMENT) DIAMETER SMOOTH STEEL BAR, 20" LONG ON 12" CENTERS. END DIAMETER SMOOTH STEEL BAR, 20" LONG ON 12" CENTERS. END TREATMENT SHALL MATCH EXPANSION JOINT ADJACENT TO HEADER. WHERE THE ADJACENT EXPANSION JOINT HAS A SLIP SLEEVE ADJACENT TO HEADER, DRILL HOLE AND DRIVE DOWEL INTO EXISTING PAVEMENT. WHERE ADJACENT EXPANSION JOINT HAS A SLIP SLEEVE OPPOSITE TO THE HEADER, DRILL AND EPOXY DOWEL INTO EXISTING PAVEMENT W/"PRO-ROC" OR EQUAL, AND PROVIDE SLIP SLEEVE ON EXPOSED END. WHEN TYPE II PAVING HEADER IS ADJACENT TO PROPOSED ASPHALT PAVEMENT, PLACEMENT OF EXPANSION JOINT AND SMOOTH BAR IS NOT APPLICABLE.
15. ALL PROPOSED SUBGRADE SHALL BE PROOF ROLLED. IF SOFTSPOTS OR WET SUBGRADE IS ENCOUNTERED TREAT IT WITH FLYASH TO ESTABLISH FIRM SUBGRADE.
16. PROPERTIES WIITH TWO DRIVEWAYS SHALL MAINTAIN A 20' MIN. DISTANCE BETWEEN FLARES AT STREET.




PLAN




SECTION B-B

TXDOT NOTE:
6" MINIMUM CONRETE AND
ANY ASPHALT DRIVEWAYS TO BE REPAIRED/REPLACED IN TXDOT RIGHT-OF-WAY SHALL MATCH EXISTING TXDOT PAVEMENT SECTION. BASE MATERIAL FOR ASPHALT DRIVEWAYS SHALL BE CRUSHED LIMESTONE. CRUSHED RECYCLED CONCRETE IS NOT ACCEPTABLE TO TXDOT.

## CONCRETE OR ASPHALT DRIVEWAY DETAIL

SCALE: NTS

| MK. | DESCRIPTION | DATE | DWN. | CHK. |
|---|---|---|---|---|
| | | | | |

CITY OF GALVESTON 1839

City Engineer

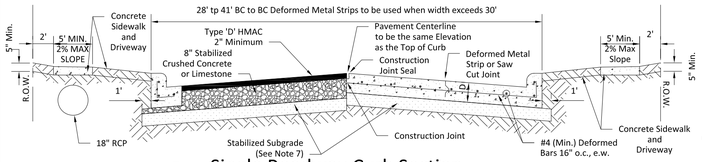
City of Galveston, Texas

Engineering Section

Driveway Construction Details

| | | | |
|---|---|---|---|
| SHEET NO.: | | SCALE: HORZ : VERT : | SHEET 37 OF |
| DATE: | FEBRUARY, 2018 | ONE INCH | |
| DWN BY: | JR | IF ABOVE MARK DOES NOT MEASURE ONE INCH, THEN THIS DWG. NOT TO SCALE | |
| CHKD BY: | DRF | | |

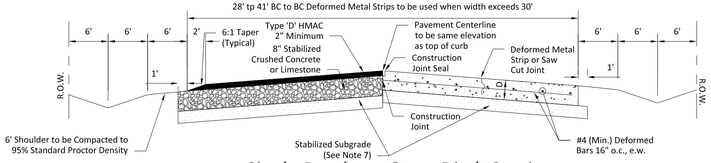
Typical H.M.A.C. Paving Section  Typical Concrete Paving Section




## 1 Single Roadway Curb Section

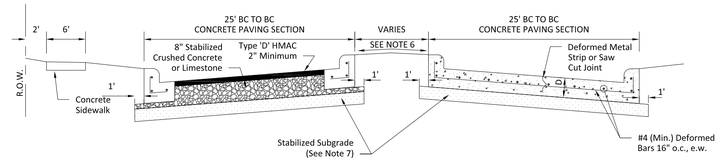
Scale: NTS

TYPICAL H.M.A.C. PAVING SECTION  TYPICAL CONCRETE PAVING SECTION



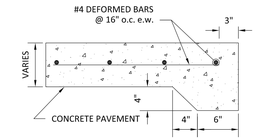

## 2 Single Roadway Open Ditch Section

Scale: NTS




## 3 Double Roadway Section

Scale: NTS



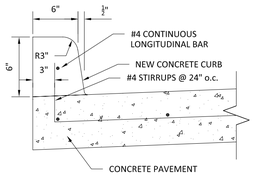

## CONCRETE PAVING HEADER

NOTES:

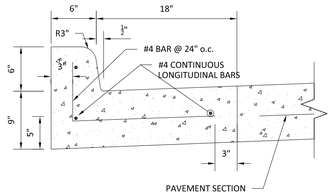
1. FOR ALL SIX (6) AND SEVEN (7) INCH PAVING USE #4 REBAR ON SIXTEEN (16) INCH CENTERS EACH WAY.
2. ALL REINFORCING BAR SHALL CONFORM TO ASTM A15-54T AND A305-53T.
3. THE LOCATION OF CONSTRUCTION JOINTS, CONTROL JOINTS AND DEFORMED STRIPS MAY BE VARIED, WITH THE APPROVAL OF THE CITY OF GALVESTON, TO SUIT THE PROPOSED CONSTRUCTION METHODS OF THE CONTRACTOR. THE MAXIMUM LENGTH BETWEEN LONGITUDINAL JOINTS SHALL NOT EXCEED 15'-0".
4. ALL PAVEMENT CROSS SECTION SHALL EITHER BE HYPERBOLIC OR TANGENT CROWN. MINIMUM SLOPE SHALL BE ONE-QUARTER (¼) INCH PER FOOT.
5. D = SIX (6) INCH OR LOCAL ONLY. ALL OTHERS TO BE BASED ON GEOTECHINAL RECOMENDATIONS.
6. MINIMUM SLOPE FOR MEDIAN SHALL BE ONE-HALF (½) INCH PER FOOT.
7. STABILIZATION REQUIREMENTS TO BE SPECIFIED PER PROJECT SPECIFIC GEOTECHNICAL REPORT.

## 4 Concrete Curb

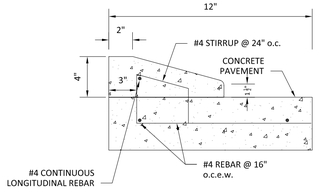
Scale: NTS



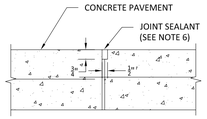

TYPE I - 6" CONCRETE CURB



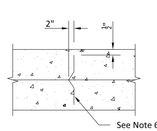

TYPE II - MONOLITHIC CONCRETE CURB AND GUTTER



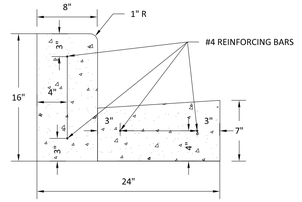

TYPE III - 4" X 12" CONCRETE CURB




CONSTRUCTION JOINT



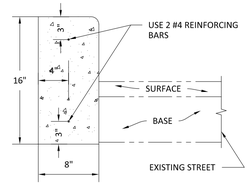

DEFORMED METAL STRIP




NOTES:
INSTALL 1/2" PREMOULDED EXPANSION JOINTS ON 40' SPACING, AT CURB INLETS, DRIVEWAYS, AND END OF CORNER RADIUS CURBS.

REINFORCING STEEL TO BE CUT OFF 2" CLEAR OF EXPANSION JOINTS AND ALL FORMS.

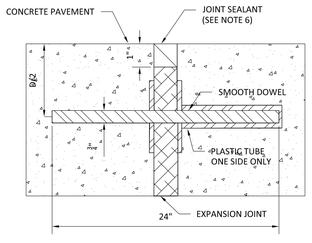
## STANDARD CURB AND GUTTERPAN TYPE "A"




NOTES:
INSTALL 1/2" PREMOULDED EXPANSION JOINTS ON 40' SPACING, AT CURB INLETS, DRIVEWAYS, AND END OF CORNER RADIUS CURBS.

REINFORCING STEEL TO BE CUT OFF 2" CLEAR OF EXPANSION JOINTS AND ALL FORMS.

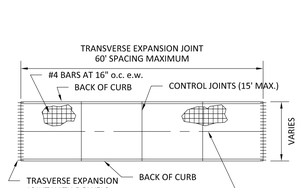
## STANDARD CURB TYPE "A"



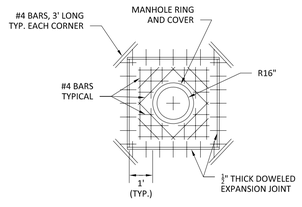

## DOWEL EXPANSION JOINT

NOTES:

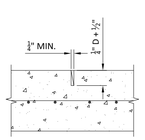
1. CANTILEVER TYPE, CAST MALLEABLE IRON LOAD TRANSMISSION UNIT-STARLUG MODEL D-27 OR EQUAL ON 22" o.c. ARE ACCEPTABLE ALTERNATIVES.
2. EXPANSION JOINT TO BE PLACED AT THE END OF EACH CURB RADIUS AND SPACED A MINIMUM OF 40'-0" APART. MATCH TO EXPANSION JOINTS IN PAVING PANELS.
3. STAKES FOR TRANSVERSE JOINTS SHALL NOT BE PLACED CLOSER THAN 6" TO A LONGITUDINAL JOINT. THE TOP OF STAKE SHALL NOT BE LESS THAN 1 ½" BELOW THE FINISH SURFACE.
4. LOCATION OF CONSTRUCTION JOINTS AND DEFORMED STRIPS MAY BE VARIED WITH THE APPROVAL OF THE CITY, TO SUIT PROPOSED CONSTRUCTION OF THE CONTRACTOR.
5. CONTROL JOINTS SHALL BE SPACED AT A MAXIMUM OF 15'-0".
6. JOINTS AND SEALANTS SHALL ADHERE TO CITY OF GALVESTON TECHNICAL SPECIFICATION 02840 - CONCRETE PAVEMENT JOINTS.




## PAVING DETAIL



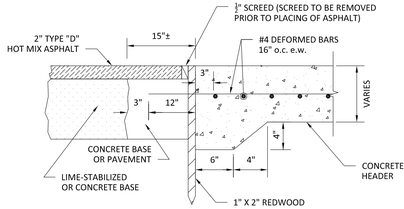

## MANHOLE BLOCKOUT




## CONTRACTION JOINT

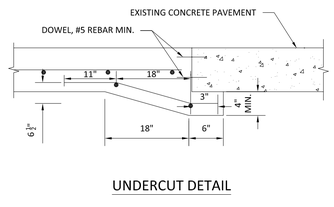
NOTES:

1. D = DEPTH OF CONCRETE.
2. SAW-CUT CONTRACTION JOINT TO DIMENSIONS SHOWN.

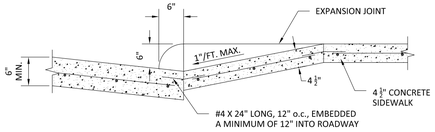



## ASPHALT PAVING HEADER

## PAVING HEADER

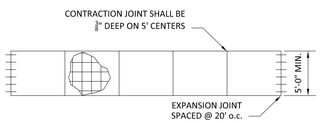



## UNDERCUT DETAIL

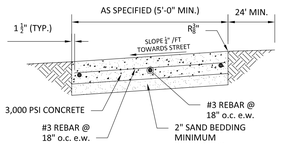



## 5 Pavement Joints

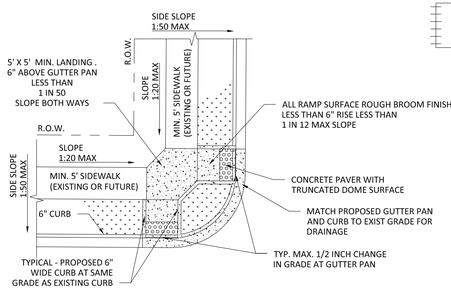
Scale: NTS




## SIDEWALK PLAN VIEW




## SIDEWALK SECTION



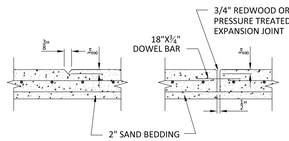

## ACCESSIBLE CURB RAMP

NOTES:

1. CURB RAMPS AND WALKWAYS SHALL COMPLY WITH CURRENT TEXAS ACCESSIBILITY STANDARDS (TAS) AND THE ADA ACCESSIBILITY GUIDELINES (ADAAG)
2. WALKWAY AND RAMP SURFACE SHALL BE STABLE AND FIRM WITH A SLIP RESISTANT MEDIUM BROOM FINISH PERPENDICULAR TO THE DIRECTION OF TRAVEL. COMPLY WITH TAS 302.
3. ALL CUTOUTS MUST HAVE BARRICADES INSTALLED UNTIL WHEELCHAIR RAMPS ARE COMPLETED.
4. THE MINIMUM WIDTH OF THE RAMP SHALL BE 36" BUT MAY BE NOTED GREATER THAN 36".
5. CHANGES IN LEVEL UP TO 1/4 IN (6 MM) MAY BE VERTICAL AND WITHOUT EDGE TREATMENT
6. CHANGES IN LEVEL BETWEEN 1/4 IN AND 1/2 IN (6 MM AND 13 MM) SHALL BE BEVELED WITH A SLOPE NO GREATER THAN 1:2
7. CHANGES IN LEVEL GREATER THAN 1/2 IN (13 MM) SHALL BE FLUSH AND FREE OF ABRUPT CHANGES
8. ALL CUT OUTS MUST HAVE BARRICADES INSTALLED UNTIL ACCESSIBLE RAMP IS COMPLETED.

## 6 ACCESSIBLE CURB RAMP

Scale: NTS




## SIDEWALK JOINTS

NOTES:

1. ALL EDGES SHALL BE ROUNDED WITH ¾" RADIUS.
2. CONTRACTION JOINTS SHALL BE PLACED AT 4'-0" INTERVALS.
3. CONTRACTION JOINTS SHALL BE ¾" DEEP AND HAVE TROWEL EDGE.
4. ½" EXPANSION JOINT MATERIAL REQUIRED WHERE SIDEWALKS ABUT BUILDINGS, CURBS, DRIVEWAYS, OR EXISTING SIDEWALKS.
5. EXPANSION JOINTS SHALL BE PLACED AT 20'-0" INTERVALS.
6. WHERE NEW SIDEWALK IS PLACED AGAINST EXISTING SIDEWALK, SAW CUT EXISTING SIDEWALK TO AN EVEN STRAIGHT LINE PRIOR TO INSTALLATION OF THE NEW SIDEWALK INSTALL #4 REBAR DOWEL INTO EXISTING SIDEWALK.

## SIDEWALK & WHEEL CHAIR RAMP SECTION

## PAVING CONSTRUCTION NOTES:

1. PAVEMENT AND SUBGRADE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF GALVESTON STANDARD DETAILS AND TECHNICAL SPECIFICATIONS, LATEST REVISION.
2. CONTRACTOR SHALL NOTIFY THE CITY OF GALVESTON OWNER'S REPRESENTATIVE A MINIMUM OF TWENTY-FOUR (24) HOURS PRIOR TO ALL LIMING AND PAVING OPERATIONS.
3. ALL TURN-OUTS SHALL HAVE A TWENTY-FIVE (25) FOOT RADIUS AT BACK OF CURB UNLESS OTHERWISE NOTED.
4. GUIDELINES SET FORTH IN THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (TMUTCD), LATEST EDITION, SHALL BE OBSERVED.
5. ALL FILL IN EXISTING RIGHT-OF-WAY, INCLUDING BACKDRESSING BEHIND THE CURB, SHALL BE PLACED IN MAXIMUM LOOSE LIFTS TO TWELVE (12) INCHES OR LESS AND COMPACTED TO A NINETY-FIVE (95) PERCENT STANDARD PROCTOR DENSITY WITH A MOISTURE CONTENT OF PLUS (+) OR MINUS (-) THREE PERCENT (3%) OF OPTIMUM MOISTURE.
6. MINIMUM PAVEMENT REINFORCEMENT REQUIREMENT SHALL BE GRADE 60, NO. 4 REBAR, SPACED AT SIXTEEN (16) INCHES ON CENTER, EACH WAY. FOR 6" PAVEMENT ONLY. ALL OTHERS TO BE PROJECT SPECIFIC.
7. ALL RESIDENTIAL OR COLLECTION PAVEMENT TO BE A MINIMUM OF SIX (6) INCHES THICK REINFORCED CONCRETE, UNLESS OTHERWISE NOTED. **FOR THIS PROJECT PAVEMENT.**
8. FOR PAVEMENT WIDTHS LESS THAN OR EQUAL TO TWENTY-EIGHT (28) FEET BACK OF CURB TO BACK OF CURB:

8.1. MINIMUM CONCRETE SLAB THICKNESS SHALL BE SIX (6) INCHES, UNLESS OTHERWISE NOTED.

8.2. MINIMUM STABILIZED SUBGRADE THICKNESS SHALL BE SIX (6) INCHES.

9. FOR PAVEMENT WIDTHS GREATER THAN TWENTY-EIGHT (28) FEET FROM BACK OF CURB TO BACK OF CURB AND MAJOR ARTERIAL THOROUGHFARES:

9.1. MINIMUM CONCRETE SLAB THICKNESS SHALL BE SEVEN (7) INCHES.

9.2. MINIMUM STABILIZED SUBGRADE THICKNESS SHALL BE EIGHT (8) INCHES.

10. PAVING EXPANSION JOINTS SHALL BE PLACED AT A MINIMUM SIXTY (60) FEET INTERVALS.
11. ALL CONCRETE USED FOR PAVEMENT SHALL BE "CLASS A" CONCRETE, MINIMUM OF 5.0 SACKS OF CEMENT PER CUBIC YARD OF CONCRETE, 3500 PSI COMPRESSIVE STRENGTH AT TWENTY-EIGHT (28) DAYS.
12. CONTRACTOR SHALL INSTALL STREET SIGNS AND STOP SIGNS PER CITY OF GALVESTON STANDARD DETAILS AND TECHNICAL SPECIFICATIONS, LATEST EDITION.
13. ALIGNMENTS, CENTERLINE CURVE DATA, AND STATIONING FOR ALL CONSTRUCTION SHALL BE DETERMINED FROM SUBDIVISION PLAT.
14. FOR ALL CONCRETE TO BE REMOVED, A MINIMUM TWO (2) INCH DEEP SAW CUT SHALL BE PROVIDED PRIOR TO REMOVAL.
15. REPRESENTATIVES FROM THE CITY OF GALVESTON, THE OWNER, AND THE TESTING LABORATORY SHALL BE PRESENT FOR ALL GRADATIONS, DENSITY TESTING, LIME OPERATIONS, AND PLACEMENT OF CONCRETE OR ASPHALT PAVING.
16. UNDER NO CIRCUMSTANCES SHALL WATER BE ADDED TO A CONCRETE LOAD AFTER SLUMP TEST HAVE BEEN TAKEN.
17. BLUE REFLECTORIZED RAISED PAVEMENT MARKERS SHALL BE PLACED ADJACENT TO FIRE HYDRANT LOCATIONS AT A POINT OFFSET SIX (6) INCHES FROM THE CENTERLINE OF THE ROADWAY (REFLECTORS SHALL FACE TRAFFIC FLOW).
18. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION. DURING THE COURSE OF ANY AND ALL CLEARING, GRUBBING, FILL, GRADING, EXCAVATION, OR OTHER CONSTRUCTION. CONTRACTOR SHALL ENSURE THAT STORM DRAINAGE PATHWAYS ARE MAINTAINED AND REMAIN OPEN TO ENSURE POSITIVE DRAINAGE AND THAT SUCH CONVEYANCES ARE NOT IMPEDED OR BLOCKED IN ANY WAY. STORM SEWER INLETS SHALL BE PROTECTED FROM ENTRY OF SILT, TRASH, DEBRIS, AND ANY OTHER SUBSTANCES DELETERIOUS TO THE STORM SEWER SYSTEM AND/OR WATERWAYS RECEIVING STORM WATER RUNOFF. CONTRACTOR SHALL, AT COMPLETION OF WORK, FILL LOW SPOTS AND GRADE ALL RIGHT-OF-WAY AND UTILITY EASEMENTS AND REGRADE/RESTORE DITCHES AS NECESSARY TO MAINTAIN AND/OR ESTABLISH POSITIVE DRAINAGE.

| MK. | DESCRIPTION | DATE | DWN. | CHK. |
|---|---|---|---|---|
| | | | | |

CITY OF GALVESTON 1839

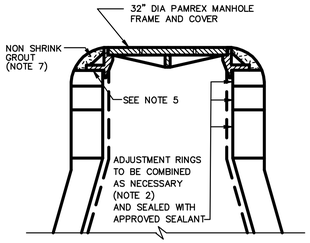
City Engineer

City of Galveston, Texas

Engineering Section

**Paving Construction Details**

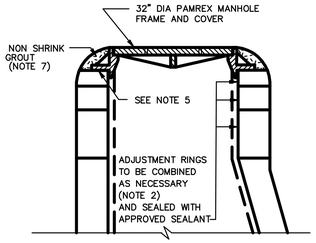
| | | |
|---|---|---|
| SHEET NO.: | SCALE: HORZ : VERT : (ONE INCH) | SHEET 38 |
| DATE: MARCH, 2018 | IF ABOVE MARK DOES NOT MEASURE ONE INCH, THEN THIS DWG. NOT TO SCALE | OF |
| DWN BY: JR | | |
| CHKD BY: DRF | | |



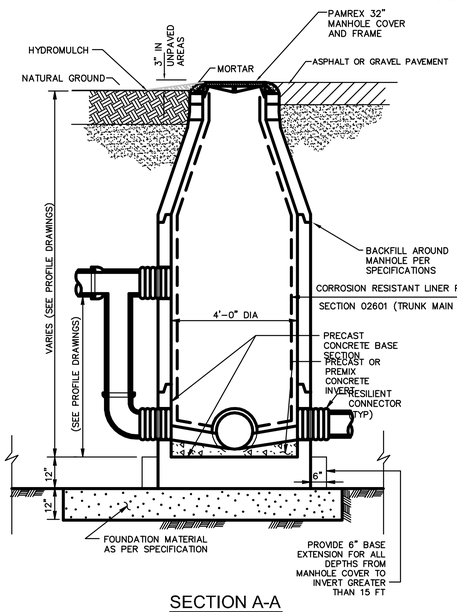

TOP DETAIL

NOTES:

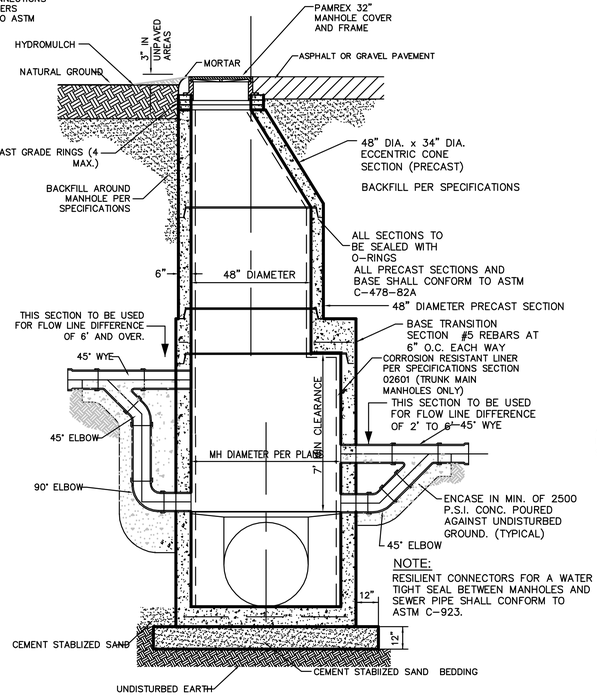
1. DEPTH OF MANHOLE DETERMINES SECTIONS REQUIRED.
2. PRECAST CONCRETE RINGS SHALL BE PROVIDED FOR A COMBINED ADJUSTMENT HEIGHT OF AT LEAST 12". THE TOTAL HEIGHT OF THE ADJUSTMENT RINGS SHALL NOT EXCEED 1'-6".
3. MANHOLE WALL THICKNESS FOR DEPTH EXCEEDING 12'-0" SHALL BE DETERMINED TO MEET LOADING CONDITIONS. MIN THICKNESS 5".
4. MANHOLE DROP AND INTERSECTING PIPES SHALL BE INSTALLED ONLY WHEN CALLED FOR IN PLAN AND PROFILE DRAWING.
5. SEAT MANHOLE FRAME PER MANUFACTURER.
6. ECCENTRIC PRECAST CONCRETE MANHOLE MAY BE USED.
7. OMIT NON SHRINK GROUT WHEN MANHOLE IS LOCATED IN PAVED AREAS.
8. MIN REINFORCING IN THE PRECAST CONCRETE BASE SHALL BE # 5 @ 8 EW.
9. PROVIDE BACKFILL TO MATCH ADJACENT PIPE TRENCH BACKFILL PER SPECIFICATION.
10. CENTRIFUGALLY CAST FIBERGLASS PIPE CONNECTIONS TO MANHOLE SHALL BE PER MANUFACTURERS RECOMMENDATION AND SHALL CONFORM TO ASTM C-923.




TOP DETAIL

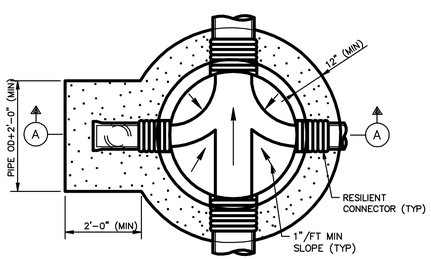



SECTION A-A




NOTE:
RESILIENT CONNECTORS FOR A WATER TIGHT SEAL BETWEEN MANHOLES AND SEWER PIPE SHALL CONFORM TO ASTM C-923.

SECTION A-A



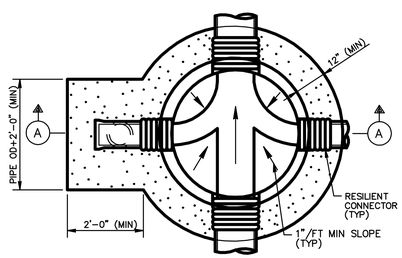

FOUNDATION PLAN

## SANITARY SEWER 4'-0" DIAMETER PRECAST CONCRETE CORROSION RESISTANT MANHOLE

SCALE: N.T.S.

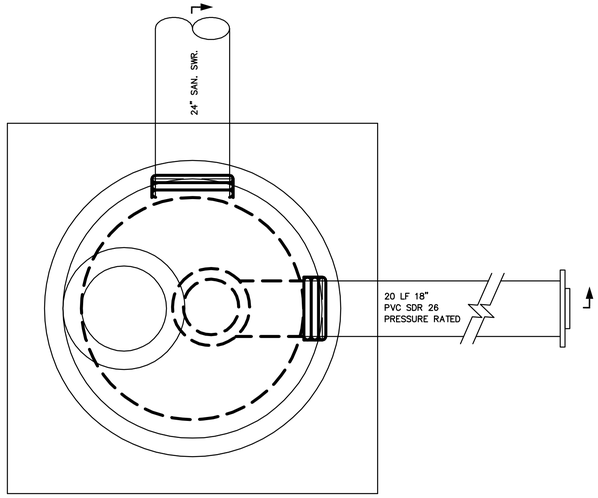
GENERAL NOTES:

1. STANDARD PAY DEPTH FOR ALL MANHOLES IS 8'-0". MANHOLE DEPTH BEYOND 8' IS TO BE PAID PER THE UNIT PRICE BID FOR EXTRA DEPTH FOR THE SIZE MANHOLE STATED.
2. ALL MANHOLES SHALL BE INSTALLED WITH EXTERNAL JOINT WRAPS(PER MANUFACTURERS RECOMMENDATIONS) TO SEAL AGAINST GROUND WATER INFILTRATION ("RISER WRAP" PER PIPELINE SEAL AND INSULATOR, INC. OR APPROVED EQUAL). NO SEPARATE PAY




FOUNDATION PLAN

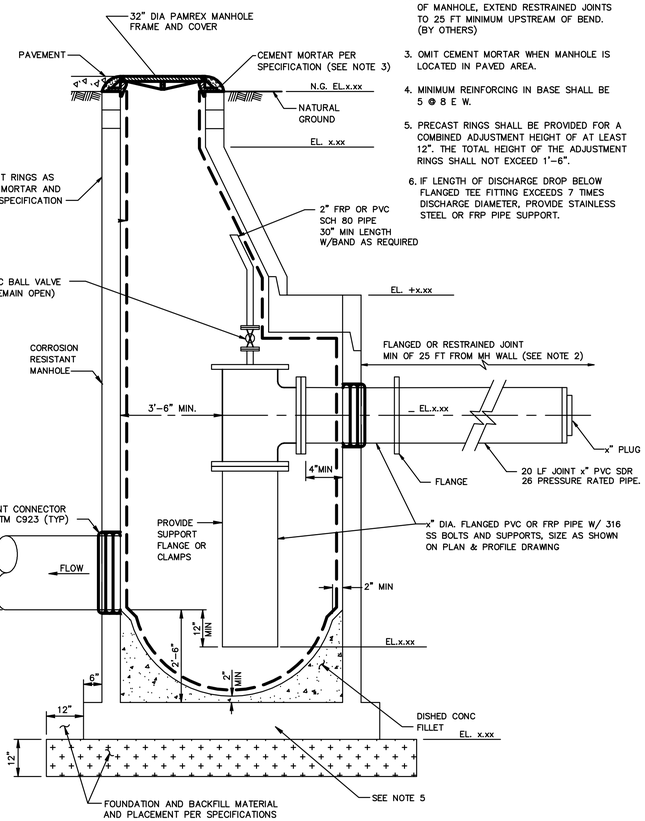
## 5' DIAMETER & GREATER PRECAST SANITARY SEWER MANHOLE DETAIL




PLAN VIEW

NOTES:

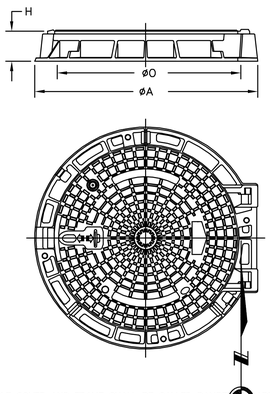
1. SEAT MANHOLE FRAME IN PER MANUFACTURER.
2. IF FORCE MAIN HAS BENDS WITHIN 25 FT OF MANHOLE, EXTEND RESTRAINED JOINTS TO 25 FT MINIMUM UPSTREAM OF BEND. (BY OTHERS)
3. OMIT CEMENT MORTAR WHEN MANHOLE IS LOCATED IN PAVED AREA.
4. MINIMUM REINFORCING IN BASE SHALL BE 5 @ 8 E W.
5. PRECAST RINGS SHALL BE PROVIDED FOR A COMBINED ADJUSTMENT HEIGHT OF AT LEAST 12". THE TOTAL HEIGHT OF THE ADJUSTMENT RINGS SHALL NOT EXCEED 1'-6".
6. IF LENGTH OF DISCHARGE DROP BELOW FLANGED TEE FITTING EXCEEDS 7 TIMES DISCHARGE DIAMETER, PROVIDE STAINLESS STEEL OR FRP PIPE SUPPORT.




SECTION

## 6' DIAMETER SANITARY SEWER CORROSION RESISTANT MANHOLE FOR FORCE MAIN DISCHARGE

SCALE: N.T.S.




MANHOLE COVER AND FRAME SHALL BE CALLED PAMREX OR APPROVED EQUAL. COVER AND FRAME SHALL BE MANUFACTURED FROM DUCTILE IRON.
COVERS SHALL BE DUALLY HINGED AND INCORPORATE A 90 DEGREE BLOCKING SYSTEM TO PREVENT ACCIDENTAL CLOSURE. COVERS SHALL BE ONE MAN OPERABLE USING STANDARD TOOLS AND SHALL BE CAPABLE OF WITHSTANDING A TEST LOAD OF 80,000 LBS.
FRAMES SHALL BE CIRCULAR, INCORPORATE A SEATING RING AND A FITTED PLUG IN EACH HINGE HOUSING, AND BE AVAILABLE IN A 32 INCH CLEAR OPENING. THE FRAME DEPTH SHALL NOT EXCEED 5 INCHES, AND THE FLANGE SHALL INCORPORATE BEDDING SLOTS, BOLT HOLES, AND LIFTING EYES.
ALL COMPONENTS SHALL BE BLACK COATED.
FRAME WEIGHT: 107 LBS. COVER WEIGHT: 162 LBS.
TOTAL WEIGHT: 269 LBS.
PAMREX IS AVAILABLE FROM JIM COX SALES, INC. (800) 838-7377.

| DIMENSIONS (INCHES) | | | WEIGHT (lbs) | | REFERENCE |
|---|---|---|---|---|---|
| A | O | H | COVER AND FRAME | COVER ONLY | |
| 39 4/10 | 32 | 5 | 269 | 162 | RE 32 R8 FD |

NOTE:
PAMREX MANHOLE COVERS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS. CONTRACTOR SHALL ENSURE THAT BEDDING MORTAR IS NOT IN CONTACT WITH EITHER HINGE HOUSING OR CUSHIONING INSERT. CONTRACTOR SHALL ENSURE THAT ELASTOMER PLUGS, HINGE, LOCKING DEVICES, GASKETS AND ANTI-THEFT DEVICES ARE ALL CLEAN AND FULLY OPERATIONAL.

## PAMREX 32 INCH MANHOLE COVER AND FRAME (SEE SPECIFICATION SECTION FOR INSTALLATION INSTRUCTIONS)

| MK. | DESCRIPTION | DATE | DWN. | CHK. |
|---|---|---|---|---|
| | | | | |

CITY OF GALVESTON *1839*

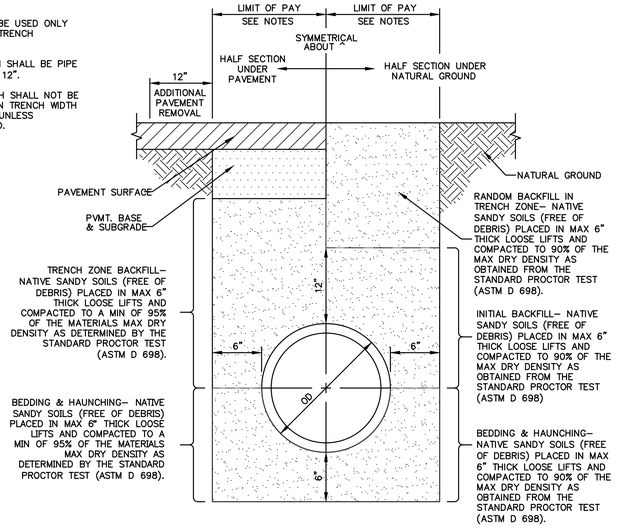
City of Galveston, Texas

Department of Public Works

Sanitary Sewer Manhole Construction Details

SHEET NO.:
DATE: MAY, 2012
DWN BY:
CHKD BY:
SCALE: HORZ : N.T.S. VERT : N.T.S.
SHEET 39

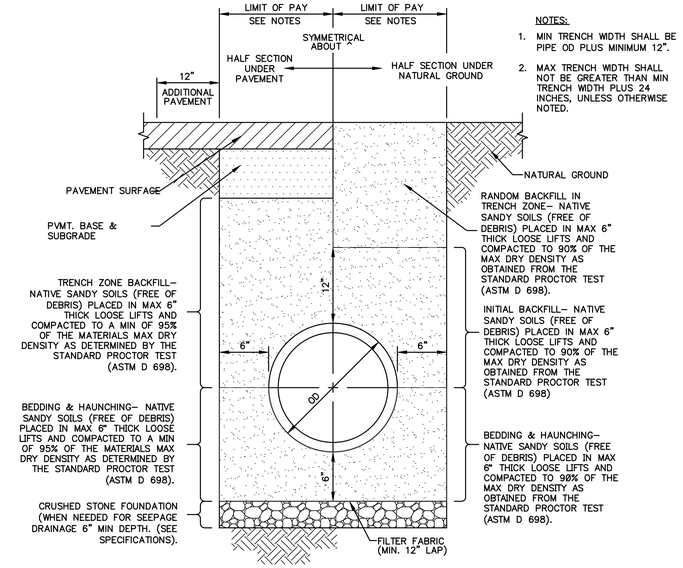
NOTES:
1. THIS DETAIL MAY BE USED ONLY FOR DRY STABLE TRENCH CONDITIONS.
2. MIN TRENCH WIDTH SHALL BE PIPE OD PLUS MINIMUM 12".
3. MAX TRENCH WIDTH SHALL NOT BE GREATER THAN MIN TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.




## TYPICAL WATER LINE & SANITARY SEWER FORCE MAIN BEDDING & BACKFILL FOR DRY STABLE TRENCH

SCALE: N.T.S.

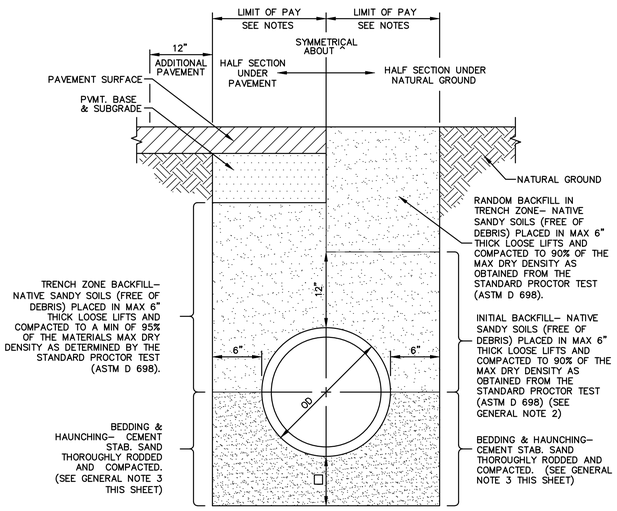
NOTES:
1. MIN TRENCH WIDTH SHALL BE PIPE OD PLUS MINIMUM 12".
2. MAX TRENCH WIDTH SHALL NOT BE GREATER THAN MIN TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.




## TYPICAL WATER LINE & SANITARY SEWER FORCE MAIN CRUSHED STONE FOUNDATION FOR WET STABLE TRENCH

SCALE: N.T.S.

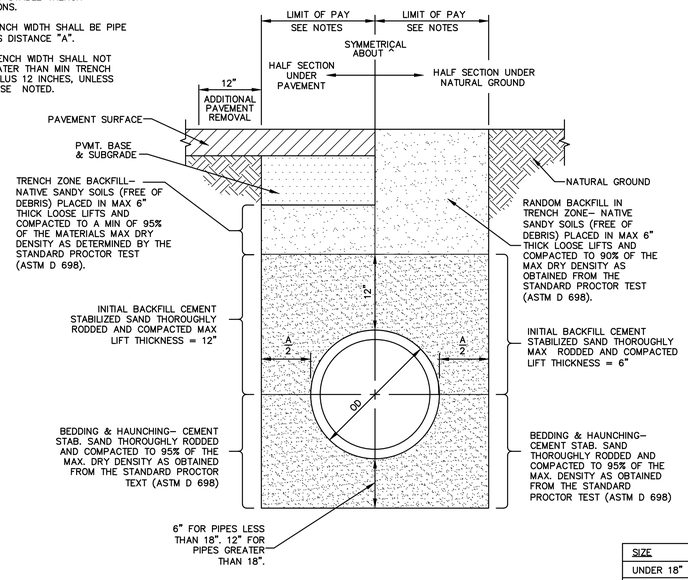
NOTES:
1. THIS DETAIL MAY BE USED ONLY FOR DRY STABLE TRENCH CONDITIONS.
2. MIN TRENCH WIDTH SHALL BE PIPE OD PLUS MINIMUM 12".
3. MAX TRENCH WIDTH SHALL NOT BE GREATER THAN MIN TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.




## TYPICAL SANITARY SEWER (6"-15") GRAVITY LINE BEDDING & BACKFILL FOR DRY STABLE TRENCH

SCALE: N.T.S.

NOTES:
1. THIS DETAIL MAY BE USED ONLY FOR DRY STABLE TRENCH CONDITIONS.
2. MIN TRENCH WIDTH SHALL BE PIPE OD PLUS DISTANCE "A".
3. MAX TRENCH WIDTH SHALL NOT BE GREATER THAN MIN TRENCH WIDTH PLUS 12 INCHES, UNLESS OTHERWISE NOTED.

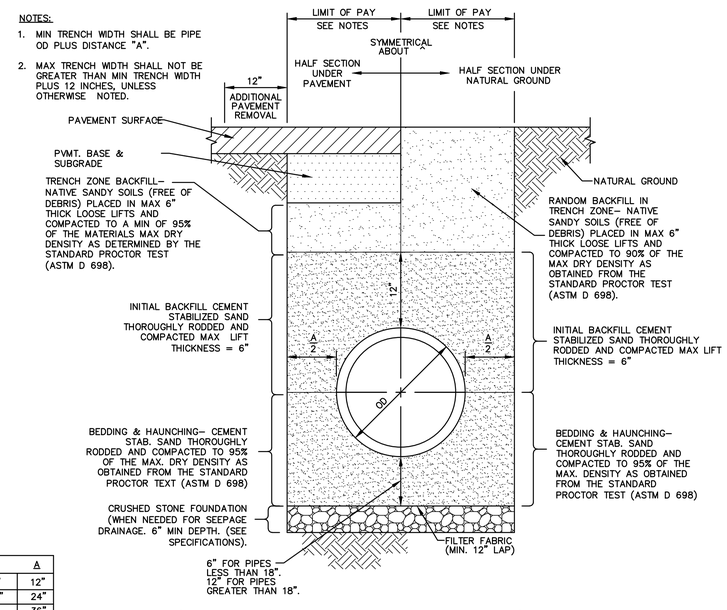



| SIZE | A |
|---|---|
| UNDER 18" | 12" |
| 18" TO 30" | 24" |
| OVER 30" | 36" |

## SANITARY SEWER TRUNK MAIN (24"-30") GRAVITY LINE BEDDING & BACKFILL FOR DRY STABLE TRENCH

SCALE: N.T.S.

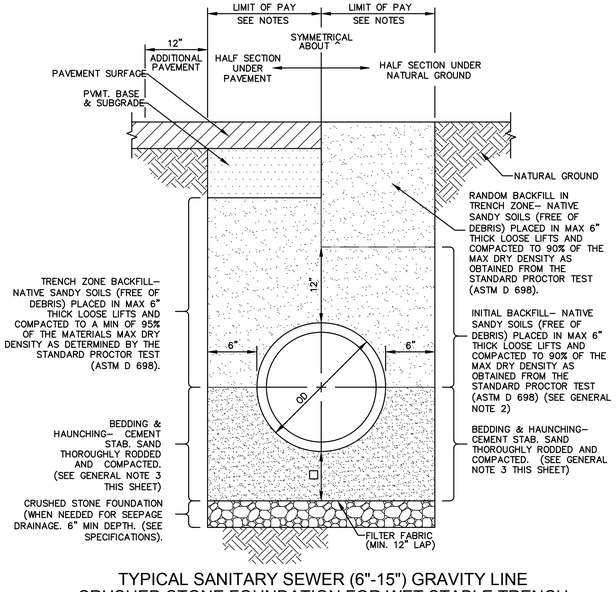
NOTES:
1. MIN TRENCH WIDTH SHALL BE PIPE OD PLUS DISTANCE "A".
2. MAX TRENCH WIDTH SHALL NOT BE GREATER THAN MIN TRENCH WIDTH PLUS 12 INCHES, UNLESS OTHERWISE NOTED.




## SANITARY SEWER TRUNK MAIN (24"-30") GRAVITY LINE CRUSHED STONE FOUNDATION FOR WET STABLE TRENCH

SCALE: N.T.S.

NOTES:
1. MIN TRENCH WIDTH SHALL BE PIPE OD PLUS MINIMUM 12".
2. MAX TRENCH WIDTH SHALL NOT BE GREATER THAN MIN TRENCH WIDTH PLUS 24 INCHES, UNLESS OTHERWISE NOTED.




## TYPICAL SANITARY SEWER (6"-15") GRAVITY LINE CRUSHED STONE FOUNDATION FOR WET STABLE TRENCH

SCALE: N.T.S.

## GENERAL NOTES:

1. TRENCH EXCAVATION, BEDDING & BACKFILL COSTS ARE INCIDENTAL TO PIPE INSTALLATION AND ARE BASED ON THE LIMITS SHOWN IN THESE DETAILS. ANY COSTS INCURRED FOR AREAS EXCAVATED AND OR REQUIRING BACKFILL BEYOND THESE LIMITS RESULTING FROM CONTRACTORS FAILURE TO CONTROL THESE LIMITS SHALL BE BORNE BY THE CONTRACTOR.
2. WHERE PROPOSED SANITARY SEWERS CROSS PROPOSED OR EXISTING WATER LINES, INITIAL BACKFILL FOR 10' EACH SIDE OF CROSSING SHALL BE CEMENT STABILIZED SAND (UNDER NATURAL GROUND OR UNDER PAVEMENT).
3. IN THE EVENT THE CONTRACTOR CAN DEMONSTRATE THE ABILITY TO OBTAIN SPECIFIED COMPACTION DENSITIES W/ THE USE OF NATIVE MATERIALS, CONTRACTOR MAY OMIT CEMENT STABILIZED SAND FOR BEDDING AND HAUNCHING OF TRENCH FOR 6"–15" PIPE SIZES ONLY. OWNERS REPRESENTATIVE SHALL MAKE FINAL DECISION FOR APPROVING THIS OMITTANCE.

| MK. | DESCRIPTION | DATE | DWN. | CHK. |
|---|---|---|---|---|
| | | | | |

CITY OF GALVESTON 1839

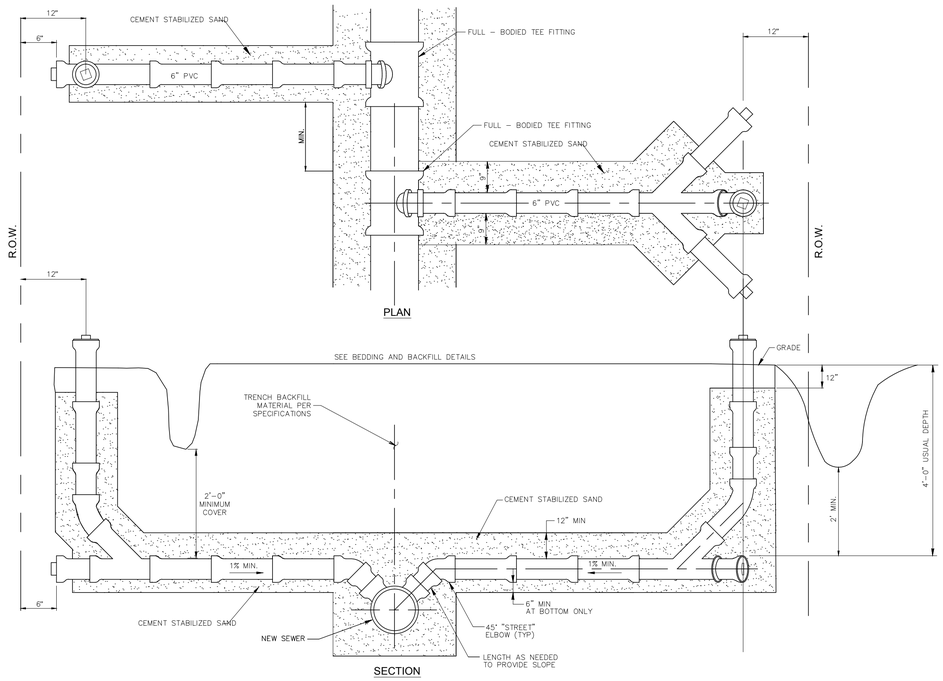
City of Galveston, Texas

Department of Public Works

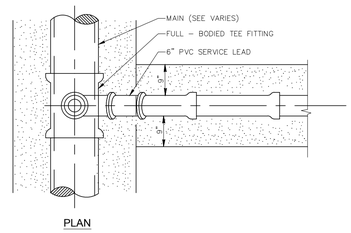
Water Line and Sanitary Sewer Line Construction Details

SHEET NO.:
DATE: JULY, 2011
DWN BY:
CHKD BY:
SCALE: HORZ : NTS VERT : NTS (ONE INCH) IF ABOVE MARK DOES NOT MEASURE ONE INCH, THEN THIS DWG. NOT TO SCALE

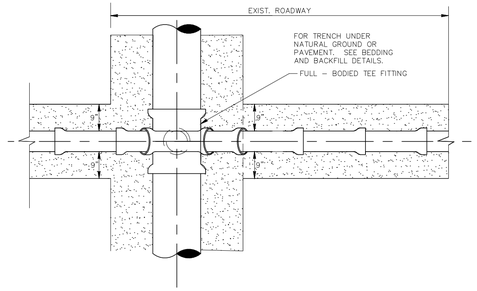
SHEET 40 OF

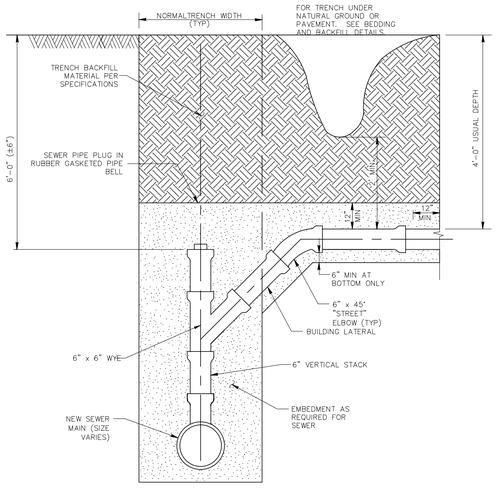



## STANDARD CONNECTION SINGLE OR DOUBLE SERVICE

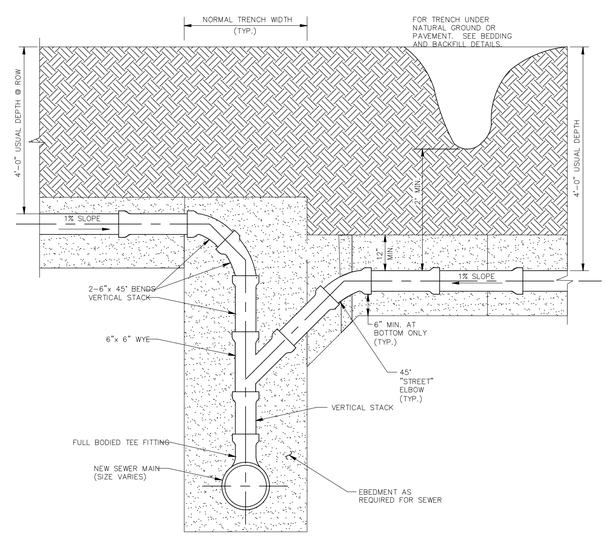



## SINGLE BEDDING AND BACKFILL DETAILS

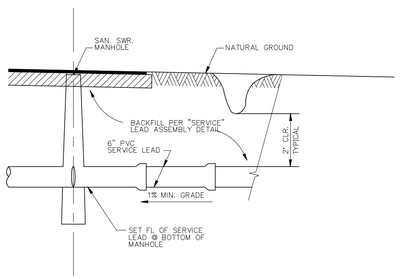


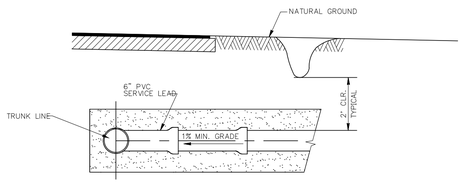

## SINGLE SIDE STACK W/SINGLE OR DOUBLE SERVICE CONNECTION




## DUAL SIDE STACK W/ SINGLE OR DOUBLE SERVICE CONNECTIONS




AT CONNECTION TO MANHOLE




AT CONNECTION TO PIPE

## SHALLOW SEWER SERVICE CONNECTION

| MK. | DESCRIPTION | DATE | DWN. | CHK. |
|---|---|---|---|---|
| | | | | |

CITY OF GALVESTON 1839

City of Galveston, Texas

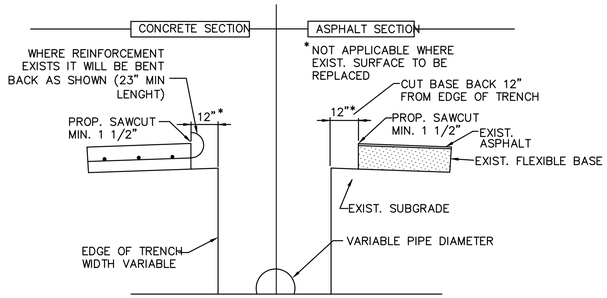
Department of Public Works

Sanitary Sewer Service Construction Details

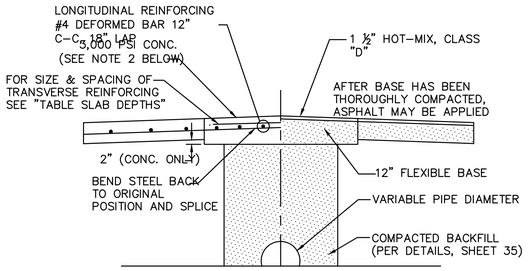
SHEET No.:
DATE: JULY, 2011
DWN BY:
CHKD BY:

SCALE:
HORZ :
VERT :
ONE INCH
IF ABOVE MARK DOES NOT MEASURE ONE INCH, THEN THIS DWG. NOT TO SCALE

SHEET 41 OF




SECTION SHOWING METHOD OF CUTTING




SECTION SHOWING METHOD OF REPAIR

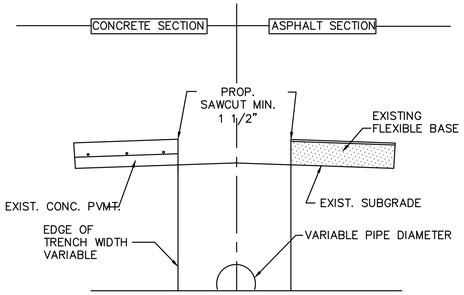
NOTE:

1. THIS DETAIL SHALL ONLY BE USED IN THE PROJECT WHERE THE EXISTING STREET PAVEMENT IS NOT TO BE TOTALLY REPLACED INCLUDING DRIVEWAYS (ONLY REPAIRED DUE TO UTILITY OR STORM SEWER CONSTRUCTION.) TYPICAL FOR ALL PROPOSED UTILITY CONSTRUCTION. (NO SEPARATE PAY)

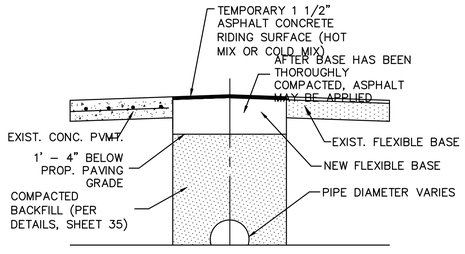
## CUTTING AND REPAIRING CONCRETE AND ASPHALT PAVEMENT DETAIL

TABLE OF SLAB DEPTHS & REINFORCEMENT

| Min. Depth of Slab | Width of Trench | Size of Bar | Spacing | Length of Bar |
|---|---|---|---|---|
| 8" | 18" | 4 | 9" | 40" |
| 8" | 24" | 4 | 8" | 46" |
| 8" | 30" | 4 | 7" | 52" |
| 8" | 36" | 4 | 6" | 58" |
| 10" | 42" | 4 | 7 ½" | 64" |
| 10" | 48" | 4 | 8 ½" | 70" |
| 10" | 54" | 4 | 7" | 76" |
| 10" | 60" | 4 | 6 ½" | 82" |
| 10" | 66" | 5 | 9" | 88" |
| 10" | 72" | 6 | 8 ½" | 94" |
| 10" | 78" | 6 | 8" | 100" |
| 10" | 84" | 6 | 7 ½" | 106" |




SECTION SHOWING METHOD OF CUTTING

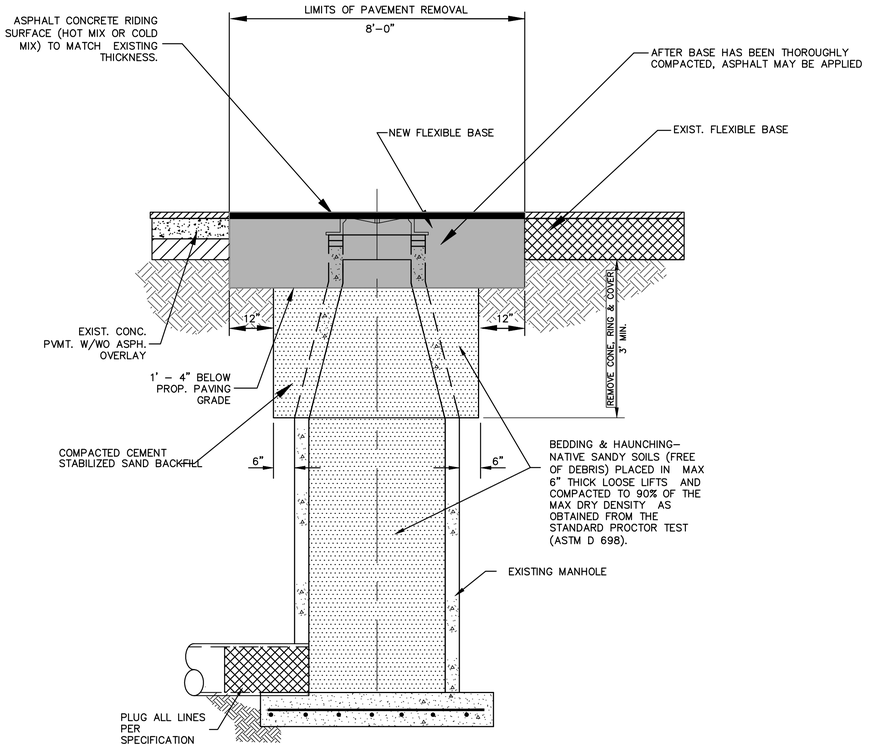



SECTION SHOWING METHOD OF REPAIR

NOTE:

THIS DETAIL SHALL ONLY BE USED IN THE PROJECT WHERE THE EXISTING STREET PAVEMENT IS TO BE TOTALLY REPLACED, SCHEDULING OF REPLACEMENT IS NOT TIMELY AS DETERMINED BY THE CITY. TYPICAL FOR ALL PROPOSED UTILITY CONSTRUCTION. (NO SEPARATE PAY)

## TEMPORARY CUTTING AND REPAIRING CONCRETE AND ASPHALT PAVEMENT DETAIL

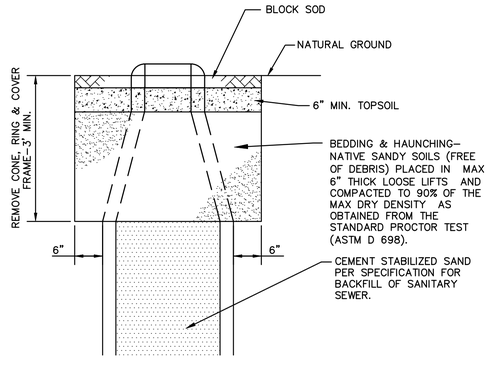



## DEMOLITION/ABANDONMENT OF MANHOLE OR LIFT STATION IN PAVED AREA

NOT TO SCALE

NOTE:

LIFT STATION ABANDONMENT TO INCLUDE REMOVAL OF ELECTRICAL COMPONENTS AND PLATFORM




## DEMOLITION/ABANDONMENT OF MANHOLE OR LIFT STATION IN UNPAVED AREA

NOT TO SCALE

| MK. | DESCRIPTION | DATE | DWN. | CHK. |
|---|---|---|---|---|
| | | | | |

CITY OF GALVESTON 1839

City of Galveston, Texas

Department of Public Works

Miscellaneous Details

SHEET No.:

DATE: JULY, 2011

DWN BY:

CHKD BY:

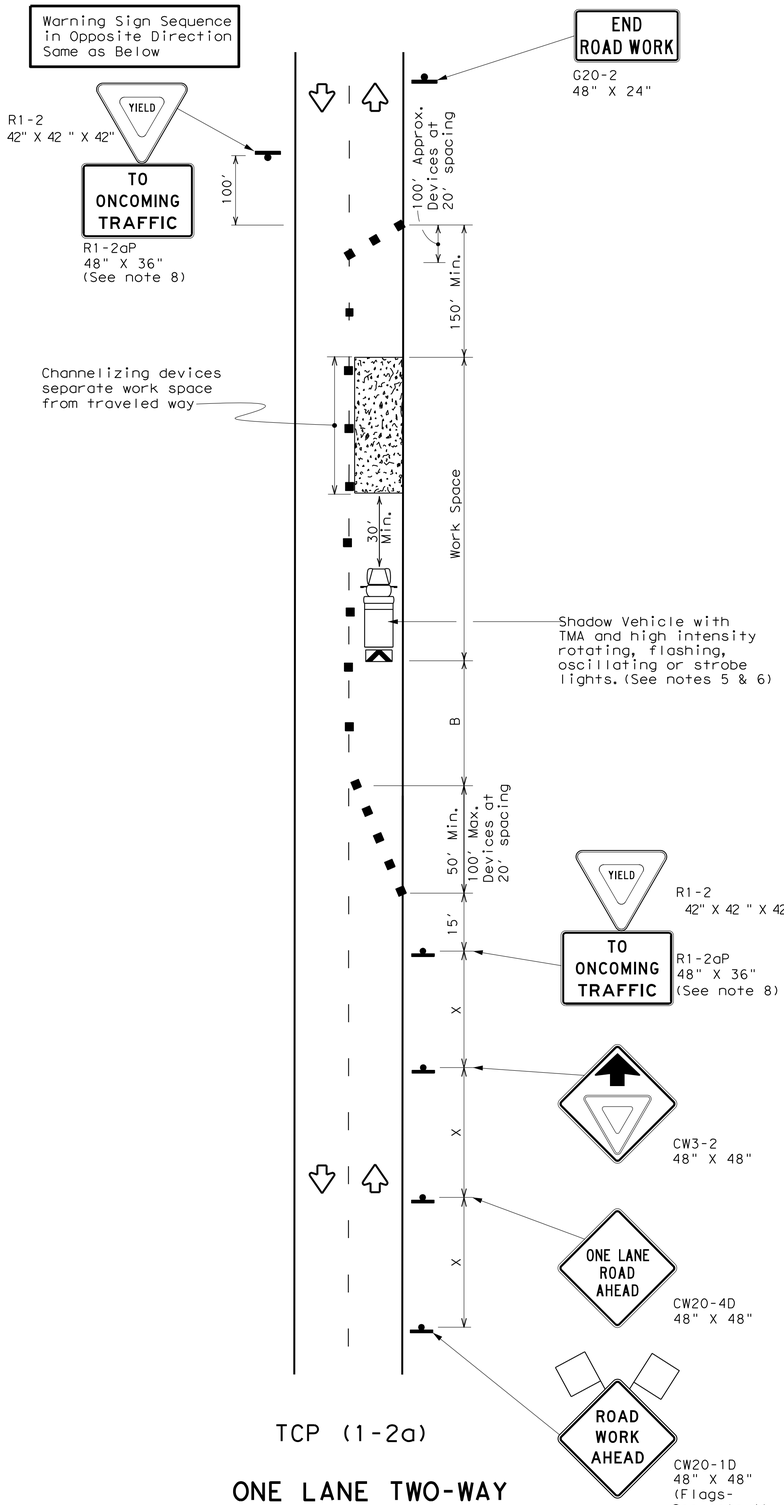
SCALE: HORZ : VERT : ONE INCH

IF ABOVE MARK DOES NOT MEASURE ONE INCH, THEN THIS DWG. NOT TO SCALE

SHEET 42 OF

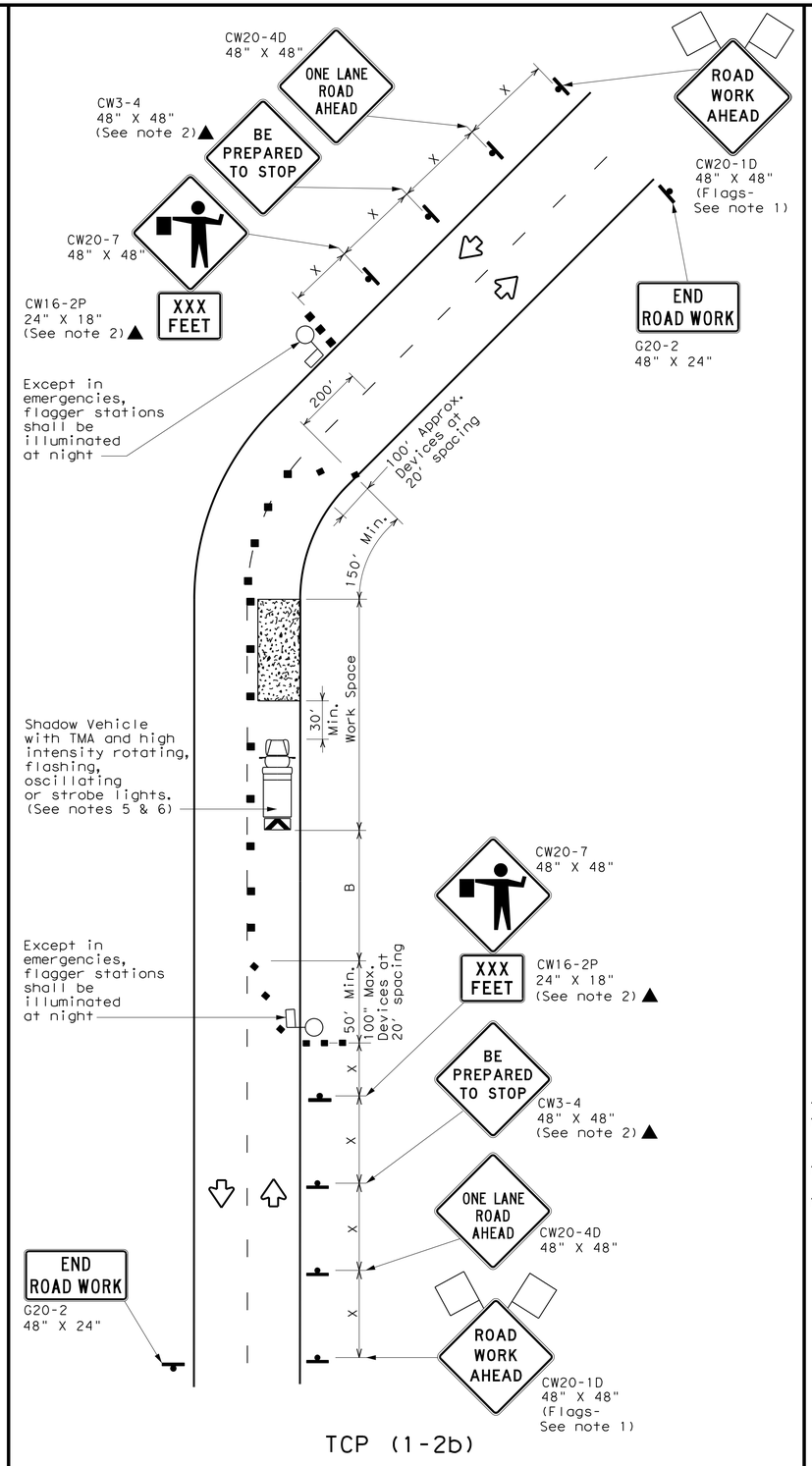
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:




TCP (1-2a)

## ONE LANE TWO-WAY
## CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See note 7)




TCP (1-2b)

## ONE LANE TWO-WAY
## CONTROL WITH FLAGGERS

| LEGEND | | | |
|---|---|---|---|
| | Type 3 Barricade | | Channelizing Devices |
| | Heavy Work Vehicle | | Truck Mounted Attenuator (TMA) |
| | Trailer Mounted Flashing Arrow Board | M | Portable Changeable Message Sign (PCMS) |
| | Sign | | Traffic Flow |
| | Flag | | Flagger |

| Posted Speed * | Formula | Minimum Desirable Taper Lengths ** 10' Offset | 11' Offset | 12' Offset | Suggested Maximum Spacing of Channelizing Devices: On a Taper | On a Tangent | Minimum Sign Spacing "X" Distance | Suggested Longitudinal Buffer Space "B" | Stopping Sight Distance |
|---|---|---|---|---|---|---|---|---|---|
| 30 | $L = \frac{WS^2}{60}$ | 150' | 165' | 180' | 30' | 60' | 120' | 90' | 200' |
| 35 | | 205' | 225' | 245' | 35' | 70' | 160' | 120' | 250' |
| 40 | | 265' | 295' | 320' | 40' | 80' | 240' | 155' | 305' |
| 45 | L = WS | 450' | 495' | 540' | 45' | 90' | 320' | 195' | 360' |
| 50 | | 500' | 550' | 600' | 50' | 100' | 400' | 240' | 425' |
| 55 | | 550' | 605' | 660' | 55' | 110' | 500' | 295' | 495' |
| 60 | | 600' | 660' | 720' | 60' | 120' | 600' | 350' | 570' |
| 65 | | 650' | 715' | 780' | 65' | 130' | 700' | 410' | 645' |
| 70 | | 700' | 770' | 840' | 70' | 140' | 800' | 475' | 730' |
| 75 | | 750' | 825' | 900' | 75' | 150' | 900' | 540' | 820' |

* Conventional Roads Only
** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

| TYPICAL USAGE | | | | |
|---|---|---|---|---|
| MOBILE | SHORT DURATION | SHORT TERM STATIONARY | INTERMEDIATE TERM STATIONARY | LONG TERM STATIONARY |
| | ✓ | ✓ | | |

## GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

### TCP (1-2a)

7. R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work spaces should be no longer than one half city block. In rural areas on roadways with less than 2000 ADT, work spaces should be no longer than 400 feet.
8. R1-2 "YIELD" sign with R1-2aP "TO ONCOMING TRAFFIC" plaque shall be placed on a support at a 7 foot minimum mounting height.

### TCP (1-2b)

9. Flaggers should use two-way radios or other methods of communication to control traffic.
10. Length of work space should be based on the ability of flaggers to communicate.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
12. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
13. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation

Traffic Operations Division Standard

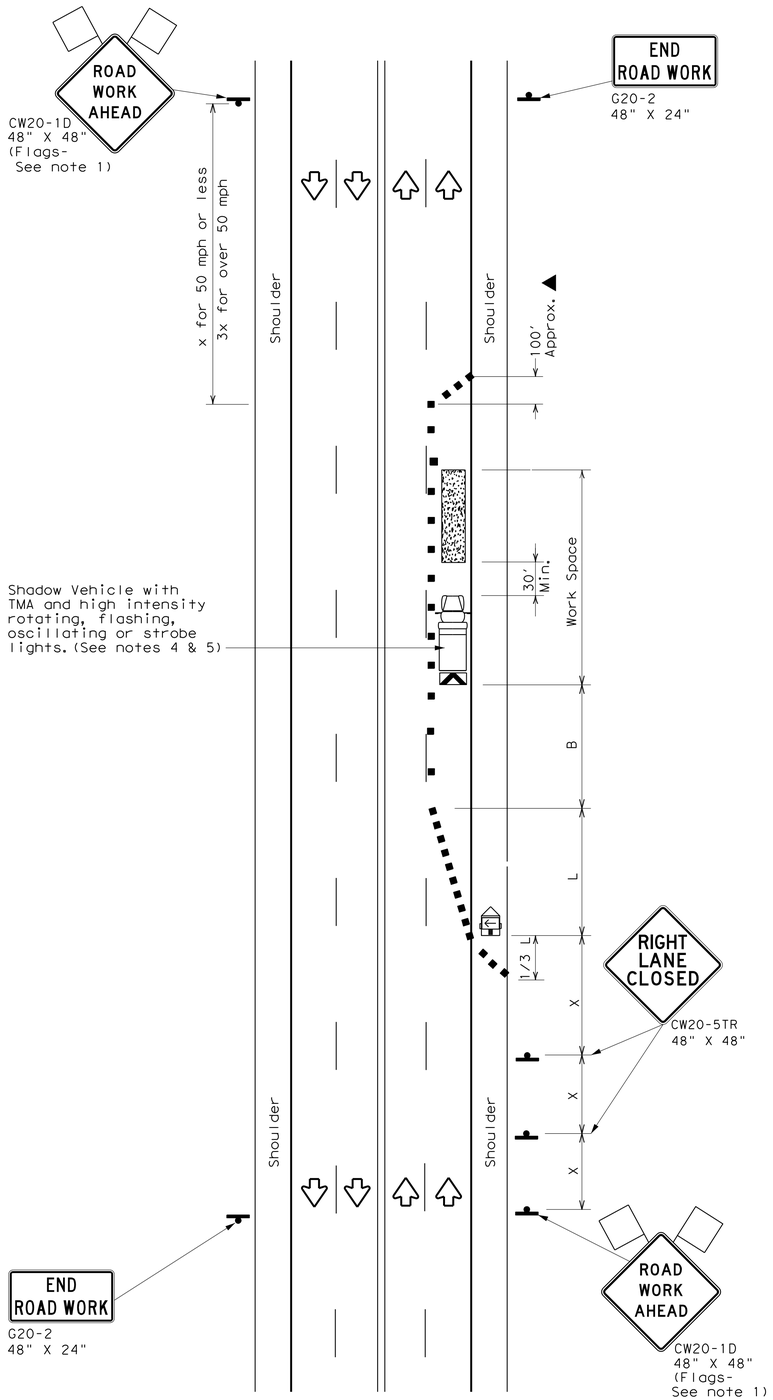
# TRAFFIC CONTROL PLAN
# ONE-LANE TWO-WAY
# TRAFFIC CONTROL

# TCP(1-2)-18

| FILE: tcp1-2-18.dgn | DN: | CK: | DW: | CK: |
|---|---|---|---|---|
| ©TxDOT December 1985 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS 4-90 4-98 2-94 2-12 1-97 2-18 | DIST | COUNTY | | 43 |

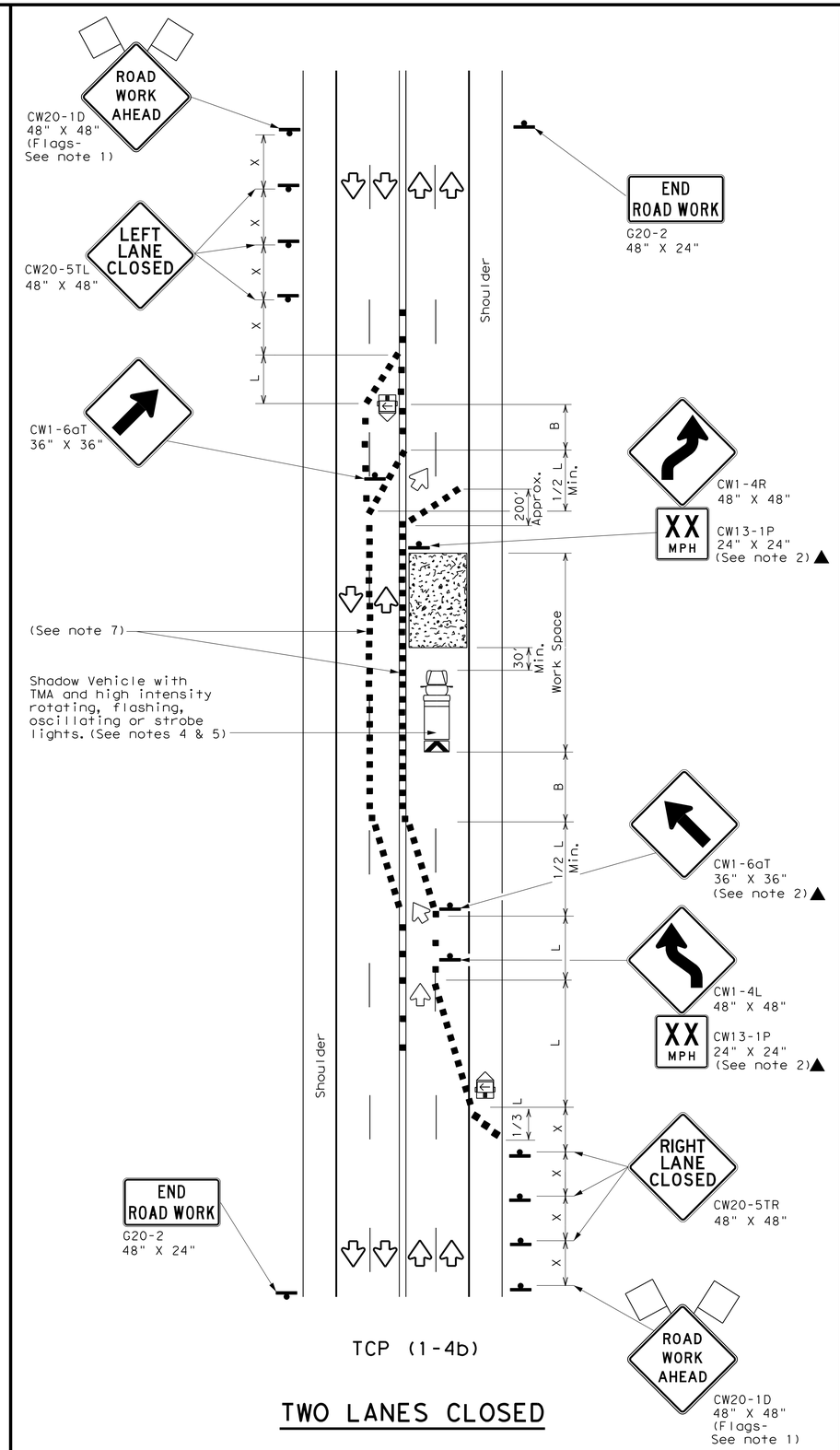
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:




TCP (1-4a)

## ONE LANE CLOSED




TCP (1-4b)

## TWO LANES CLOSED

| LEGEND | | | |
|---|---|---|---|
| | Type 3 Barricade | | Channelizing Devices |
| | Heavy Work Vehicle | | Truck Mounted Attenuator (TMA) |
| | Trailer Mounted Flashing Arrow Board | M | Portable Changeable Message Sign (PCMS) |
| | Sign | | Traffic Flow |
| | Flag | | Flagger |

| Posted Speed * | Formula | Minimum Desirable Taper Lengths ** 10' Offset | 11' Offset | 12' Offset | Suggested Maximum Spacing of Channelizing Devices On a Taper | On a Tangent | Minimum Sign Spacing "X" Distance | Suggested Longitudinal Buffer Space "B" |
|---|---|---|---|---|---|---|---|---|
| 30 | $L = \frac{WS^2}{60}$ | 150' | 165' | 180' | 30' | 60' | 120' | 90' |
| 35 | | 205' | 225' | 245' | 35' | 70' | 160' | 120' |
| 40 | | 265' | 295' | 320' | 40' | 80' | 240' | 155' |
| 45 | L = WS | 450' | 495' | 540' | 45' | 90' | 320' | 195' |
| 50 | | 500' | 550' | 600' | 50' | 100' | 400' | 240' |
| 55 | | 550' | 605' | 660' | 55' | 110' | 500' | 295' |
| 60 | | 600' | 660' | 720' | 60' | 120' | 600' | 350' |
| 65 | | 650' | 715' | 780' | 65' | 130' | 700' | 410' |
| 70 | | 700' | 770' | 840' | 70' | 140' | 800' | 475' |
| 75 | | 750' | 825' | 900' | 75' | 150' | 900' | 540' |

* Conventional Roads Only
** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

| TYPICAL USAGE | | | | |
|---|---|---|---|---|
| MOBILE | SHORT DURATION | SHORT TERM STATIONARY | INTERMEDIATE TERM STATIONARY | LONG TERM STATIONARY |
| | ✓ | ✓ | | |

## GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

### TCP (1-4a)

6. If this TCP is used for a left lane closure , CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

### TCP (1-4b)

7. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

# TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

## TCP(1-4)-18

| FILE: tcp1-4-18.dgn | DN: | CK: | DW: | CK: |
|---|---|---|---|---|
| © TxDOT December 1985 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | | | | |
| 2-94 4-98 | DIST | COUNTY | | 44 |
| 8-95 2-12 | | | | |
| 1-97 2-18 | | | | |

# CITY OF GALVESTON

## 2019 LIFT STATION IMPROVEMENTS

## LIFTSTATIONS 13, ~~18~~,~~30~~,51,~~53~~, & ~~55~~

| DWG # | TITLE | REV. | DATE |
|---|---|---|---|
| | | | |
| 45 | DRAWING INDEX | IFB | 3/31/2021 |
| 46 | SYMBOLS AND LEGEND | IFB | 3/31/2021 |
| | **LIFT STATION 13** | | |
| 47 | ONE-LINE DIAGRAM | IFB | 3/31/2021 |
| 48 | LS-13 EXISTING SITE PLAN | IFB | 3/31/2021 |
| 49 | LS-13 PROPOSED SITE PLAN | IFB | 3/31/2021 |
| 50 | LS-13 PANEL MOUNTING DETAILS | IFB | 3/31/2021 |
| | | | |
| | | | |
| | | | |
| | | | |
| | **LIFT STATION 18** | | |
| 51 | ONE-LINE DIAGRAM | IFB | 3/31/2021 |
| 52 | LS-18 EXISTING SITE PLAN | IFB | 3/31/2021 |
| 53 | LS-18 PROPOSED SITE PLAN | IFB | 3/31/2021 |
| 54 | LS-18 EQUIPMENT PLATFORM ELEVATION | IFB | 3/31/2021 |
| | | | |
| | NOT IN THIS CONTRACT | | |
| | | | |
| | **LIFT STATION 30** | | |
| 55 | ONE-LINE DIAGRAM | IFB | 3/31/2021 |
| 56 | LS-30 EXISTING SITE PLAN | IFB | 3/31/2021 |
| 57 | LS-30 PROPOSED SITE PLAN | IFB | 3/31/2021 |
| 58 | LS-30 EQUIPMENT PLATFORM ELEVATION | IFB | 3/31/2021 |
| | | | |
| | **LIFT STATION 51** | | |
| 59 | ONE-LINE DIAGRAM | IFB | 3/31/2021 |
| 60 | LS-51 EXISTING SITE PLAN | IFB | 3/31/2021 |
| 61 | LS-51 PROPOSED SITE PLAN | IFB | 3/31/2021 |
| 62 | LS-51 EQUIPMENT PLATFORM ELEVATION | IFB | 3/31/2021 |
| | | | |
| | | | |
| | | | |
| | | | |
| | **LIFT STATION 53** | | |
| 63 | ONE-LINE DIAGRAM | IFB | 3/31/2021 |
| 64 | LS-53 EXISTIN NOT IN THIS CONTRACT | IFB | 3/31/2021 |
| 65 | LS-53 PROPO | IFB | 3/31/2021 |
| 66 | LS-53 EQUIPMENT PLATFORM ELEVATION | IFB | 3/31/2021 |

| DWG # | TITLE | REV. | DATE |
|---|---|---|---|
| | **LIFT STATION 55** | | |
| 67 | ONE-LINE DIAGRAM | IFB | 3/31/2021 |
| 68 | LS-55 EXISTING SITE PLAN | IFB | 3/31/2021 |
| 69 | LS-55 PROPOSE NOT IN THIS CONTRACT | IFB | 3/31/2021 |
| 70 | LS-55 EQUIPMEN | IFB | 3/31/2021 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| | | | |
|---|---|---|---|
| | **LIFT STATION CONTROLS - TYPICAL** | | |
| 71 | CONTROL DESCRIPTION | IFB | 3/31/2021 |
| 72 | CONTROL DIAGRAM SHEET 1 | IFB | 3/31/2021 |
| 73 | CONTROL DIAGRAM SHEET 2 | IFB | 3/31/2021 |
| 74 | CONTROL DIAGRAM SHEET 3 | IFB | 3/31/2021 |
| 75 | CONTROL DIAGRAM SHEET 4 | IFB | 3/31/2021 |
| 76 | MISC DETAILS SHEET 1 | IFB | 3/31/2021 |
| 77 | MISC DETAILS SHEET 2 | IFB | 3/31/2021 |
| 78 | JUNCTION BOX DETAILS SHEET 1 | IFB | 3/31/2021 |
| 79 | JUNCTION BOX DETAILS SHEET 2 | IFB | 3/31/2021 |
| 80 | JUNCTION BOX DETAILS SHEET 3 | IFB | 3/31/2021 |

| | | | |
|---|---|---|---|
| | **FIVE STAR REFERENCE DRAWINGS** | | |
| | DX50463FV-COG-LS-S1 | | |
| | DX50463FV-COG-LS-S2 | | |
| | DX50463FV-COG-LS-S3 | | |
| | DX50463FV-COG-LS-S4 | | |
| | DX50463FV-COG-LS-S5 | | |
| | TPX25463FV-COG-LS-S1 | | |
| | TPX25463FV-COG-LS-S2 | | |
| | TPX25463FV-COG-LS-S3 | | |
| | TPX25463FV-COG-LS-S4 | | |
| | TPX25463FV-COG-LS-S5 | | |
| | | | |
| | | | |

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

Lon A. Hubbard
3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53 & 55

DRAWING INDEX

AWC NO: COG-210 | DRAWN BY: JEB | DESIGNED BY: CH | SHEET 45

LAST PRINTED: Wednesday, March 31, 2021 3:57:16 PM FROM: C:\Users\Epic-Drafting 1\Dropbox (EPIC Engineering)\Project Drawings\19-1099 AWC - City of Galveston LS\1-Final Release Work\fb dwg\18-CoG AWC Drawing Index-MDW-2.dwg

# ELECTRICAL SYSTEM SYMBOLS

| SYMBOLS | DESCRIPTIONS |
|---|---|
| | HIGH VOLTAGE LOAD BREAK SWITCH |
| | HIGH VOLTAGE CIRCUIT BREAKER FIXED TYPE |
| | HIGH VOLTAGE CIRCUIT BREAKER DRAWN OUT TYPE |
| | EARTHING SWITCH |
| | HIGH VOLTAGE FUSE |
| TRx | DISTRIBUTION TRANSFORMER NO. x |
| G | GENERATOR SET |
| | LIGHTNING ARRESTER OR SURGE ARRESTER |
| PT | POTENTIAL TRANSFORMER |
| CT | CURRENT TRANSFORMER |
| | LOW VOLTAGE CIRCUIT BREAKER FIXED TYPE |
| | LOW VOLTAGE CIRCUIT BREAKER DRAWN OUT TYPE |
| Ⓜ | MOTOR OPERATION (FOR SWITCHGEAR) |
| Ⓚ | KEY INTERLOCK |
| A | AMMETER |
| V | VOLT–METER |
| F | FREQUENCY METER |
| PF | POWER FACTOR METER |
| kW | KILOWATT–METER |
| kVAR | KILOVAR–METER |
| kWh | KILOWATTHOUR METER |
| kVAR CON | KILOVAR CONTROLLER FOR POWER FACTOR IMPROVEMENT |
| V–TR | VOLTAGE TRANSDUCER |
| A–TR | AMPERE TRANSDUCER |
| W–TR | WATT TRANSDUCER |
| kWh | KILOWATTHOUR WITH PULSE INITIATOR |
| PF–TR | POWER FACTOR TRANSDUCER |
| 25A | AUTOMATIC SYNCHRONIZING RELAY |
| 25M | MANUAL SYNCHRONIZING RELAY |
| 27 | UNDERVOLTAGE RELAY |
| 32 | DIRECTIONAL POWER RELAY |
| 37 | UNDERCURRENT OR UNDERPOWER RELAY |
| 47 | PHASE SEQUENCE VOLTAGE RELAY |
| 49 | THERMAL RELAY |
| 49A | TRANSFORMER TEMPERATURE RELAY, ALARM CONDITION |
| 49T | TRANSFORMER TEMPERATURE RELAY, TRIPPING CONDITION |
| 50/51 | OVERCURRENT AND INSTANTANEOUS TRIP RELAY |
| 50/51G | OVERCURRENT GROUND FAULT RELAY |
| 59 | OVERVOLTAGE RELAY |
| 64 | GROUND PROTECTION RELAY |
| 68 | BLOCKING RELAY |
| 71A | GAS OR BUCHHOLZ RELAY, ALARM CONDITION. |

| SYMBOLS | DESCRIPTIONS |
|---|---|
| 71T | GAS OR BUCHHOLZ RELAY, TRIPPING CONDITION. |
| 81 | OVER/UNDER FREQUENCY RELAY |
| 86 | LOCKING–OUT RELAY |
| 90L | ISOCHRONOUS LOAD SHARING DEVICE |
| 90V | VOLTAGE REGULATOR |
| | SELECTOR SWITCH |
| NV | NO VOLTAGE RELEASE TRIP COIL |
| UV | UNDERVOLTAGE RELEASE TRIP COIL |
| ST | SHUNT TRIP COIL |
| CC | CLOSING COIL |
| HP | THREE PHASE MOTOR |
| HP | SINGLE PHASE MOTOR |
| | CAPACITOR BANK |
| OR | NORMALLY OPENED CONTACT |
| OR | NORMALLY CLOSED CONTACT |
| | OPERATING COIL FOR RELAY OR CONTACTOR |
| OR | OVERLOAD RELAY |
| | HIGH TENSION TERMINATOR |
| | ENCASED CONCRETE SLEEVE ACROSS THE ROAD |
| MDBx OR EMDBx | MAIN DISTRIBUTION BOARD FOR NORMAL LOAD OR ESSENTIAL LOAD NUMBER x |
| xDBy OR xEDBy | DISTRIBUTION BOARD FOR NORMAL LOAD OR ESSENTIAL LOAD LOCATED AT x FLOOR, NUMBER y |
| xPy OR xEPy | PANELBOARD, FOR NORMAL LOAD OR ESSENTIAL LOAD LOCATED AT x FLOOR, NUMBER y |
| OR | FUSED DISCONECTING SWITCH FOR NORMAL LOAD OR ESSENTIAL |
| OR | NON FUSED DISCONNECTING SWITCH FOR NORMAL LOAD OR ESSENTIAL |
| CB | CIRCUIT BREAKER BOX RATING AS SPECIFIED |
| J OR P | JUNCTION BOX OR PULL BOX |
| JC | JUNCTION BOX MOUNTED ABOVE CEILING LEVEL |
| | WIRING WITH 2 CONDUCTORS OR 2 CONDUCTORS AND GROUNDING CONDUCTOR IN 15 mm. DIAMETER CONDUIT |
| x | WIRING WITH 'x' CONDUCTORS OR 'x' CONDUCTORS AND GROUNDING CONDUCTOR IN CONDUIT |
| g–xyz | HOME RUN TO CIRCUIT NUMBER 'x', 'y' AND 'z' IN PANEL 'a' |
| a–x/yRSz | HOME RUN TO CIRCUIT NUMBER 'x' PANEL 'a' AND REMOTE SWITCH NUMBER yRSz |
| Sx | WIRING TO SWITCH 'x' |
| | SINGLE CONVENIENT OUTLET 15 A., 250 V. W/GROUND EXCEPT OTHERWISE INDICATED |
| | DUPLEX CONVENIENT OUTLET 15 A., 250 V. W/GROUND EXCEPT OTHERWISE INDICATED |
| | SINGLE FLOOR OUTLET 15 A. 250 V. W/GROUND |
| OF | OUTLET FOR EXHAUST FAN |
| OC | OUTLET, MOUNTED ABOVE CEILING LEVEL |
| OB | OUTLET FOR SELF CONTAINED BATTERY EMERGENCY LIGHT |
| | POWER OUTLET WITH GROUND RATED AS INDICATED |
| xRSy | ON–OFF PUSH BUTTON FOR TWO WIRE REMOTE SWITCH SYSTEM LOCATED AT x FLOOR, NUMBER y |
| SPx | SWITCH PANEL OR CONTROL SWITCH PANEL |
| D | DIMMER SWITCH |

| SYMBOLS | DESCRIPTIONS |
|---|---|
| S | SINGLE POLE SWITCH 10 A., 250 V. |
| S2 | THREE WAY SWITCH 10 A., 250 V. |
| SF | FAN SWITCH WITH INDICATING LAMP 10 A., 250 V. |
| MH | MANHOLE |
| H | HANDHOLE |
| X – X | CONDUIT/CABLE CALLOUT |
| | MOTOR CIRCUIT PROTECTOR |
| | PHOTOCELL |
| | TRANSFER SWITCH |
| T S W | –– |
| SIZE 1 | STARTER WITH NEMA SIZE |
| HOA | HAND–OFF–AUTOMATIC SWITCH |
| ETM | ELAPSED TIME METER |
| IND | INDICATION LIGHT |
| OT | OVER TEMPERATURE SWITCH |
| 20A/1P | CIRCUIT BREAKER, 20A, SINGLE POLE |
| KWH | UTILITY METER, KILOWATT/HOUR |
| KW PST | INSTRUMENT, FLOAT SWITCH |
| M S | MOISTURE DETECTION SWITCH |
| M W T | MOTOR WINDING TEMPERATURE SWTICH |
| S L | MOISTURE DETECTION RELAY (SEAL LEAK) |
| OT | MOTOR WINDING OVER TEMPERATURE |

# LUMINAIRE SYMBOLS & ABBREVIATION

| SYMBOLS | DESCRIPTIONS |
|---|---|
| | LUMINAIRE WITH 1 x 36 W. FLUORESCENT LAMP |
| | LUMINAIRE WITH 2 x 36 W. FLUORESCENT LAMPS |
| | LUMINAIRE WITH 3 x 36 W. OR 4 x 36 W. FLUORESCENT LAMPS |
| | LUMINAIRE WITH 1 x 18 W. FLUORESCENT LAMP |
| | LUMINAIRE WITH 2 x 18 W. FLUORESCENT LAMPS |
| | LUMINAIRE WITH 3 x 18 W. OR 4 x 18 W. FLUORESCENT LAMPS |
| | DOWNLIGHT LUMINAIRE OR HIGH BAY LUMINAIRE |
| | FLOOD OR SPOT LIGHTING LUMINAIRE |
| OR | STREET OR AREA LIGHTING LUMINAIRE MOUNTED ON POLE OR WALL |
| | SELF–CONTAINED SEALED LEAD BATTERY EMERGENCY LIGHT |
| | SELF–CONTAINED SEALED LEAD BATTERY EMERGENCY LIGHT WITH REMOTE LAMP |
| | OBSTRUCTION LIGHT |
| | WALL MOUNTED LUMINAIRE |
| | DIRECTIONAL LIGHT OR WALL WASHER LIGHT |
| | EXIT OR FIRE EXIT SIGN LUMINAIRE |
| | REMOTE LAMP FOR BATTERY EMERGENCY LIGHT DECORATIVE TYPE |

# LIGHTNING PROTECTION AND GROUNDING SYSTEM

| SYMBOLS | DESCRIPTIONS |
|---|---|
| | AIR TERMINAL ø 19 mm. x 600 mm. LONG. |
| | EXOTHERMIC CONNECTION |
| | CONDUCTOR RUN FROM ONE LEVEL TO OTHER LEVEL |
| | COPPER CLAD STEEL GROUND ROD ø 16 mm. x 3000 mm. LONG |
| | GROUNDING CONDUCTOR RUN TO GROUNDING SYSTEM |
| T | TEST BOX |
| | GROUND BAR |
| | CONDUCTOR UP FEED |
| | CONDUCTOR DOWN FEED |

# GENERAL ABBREVIATION

| CODE | DESCRIPTIONS |
|---|---|
| AFF | ABOVE FINISHED FLOOR |
| CO | CONDUIT ONLY (EMPTY CONDUIT) |
| EMT | ELECTRICAL METALLIC TUBING |
| IMC | INTERMEDIATE METAL CONDUIT |
| RSC | RIGID STEEL CONDUIT |
| EXP | EXPLOSION PROOF |
| G | GROUND |
| NIC | NOT IN CONTRACT |
| WP | WEATHERPROOF |
| AMCC | AIR–CONDITIONING MOTOR CONTROL CENTER BOARD |
| xAPy | AIR–CONDITIONING PANELBOARD LOCATED AT x FLOOR, NUMBER y |
| xSPy | SANITARY PANELBOARD LOCATED AT x FLOOR, NUMBER y |
| xFPy | FIRE PROTECTION PANELBOARD LOCATED AT x FLOOR, NUMBER y |

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

Lon A. Hubbard
3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

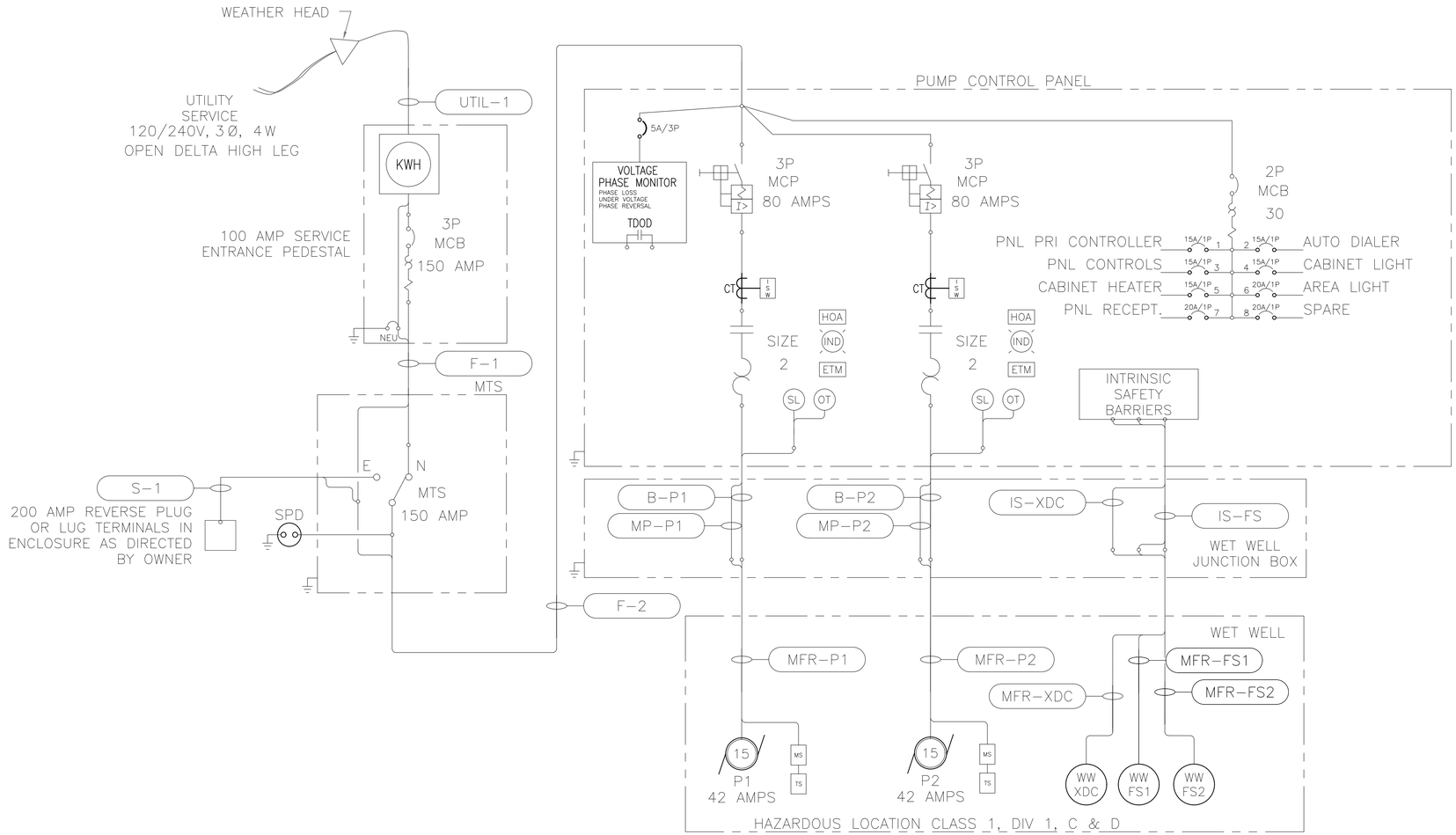
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

SYMBOLS AND LEGEND

| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG–210 | JEB | 46 |
| | DESIGNED BY: CH | |

LAST PRINTED: Wednesday, March 31, 2021 1:57:19 PM FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Project Drawings\19-1008 AWC - City of Galveston LS\11-Final Release Work\dh-dwg\SHEDs\COG AWC symbols and legend.dwg




## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. ELECTRICAL CONTRACTOR SHALL INSTALL PUMP CONTROL PANEL SUPPLIED BY PUMP MANUFACTURER.
3. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL AUTODIALER AND WIRE TO PUMP CONTROL PANEL.
4. ELECTRICAL CONTRACTOR SHALL GROUND FRAME OF GENERATOR IN ACCORDANCE WITH N.E.C. AND MANUFACTURER INSTRUCTIONS.
5. BREAKER SIZES SHOWN ARE PROPOSED AND ACTUAL SIZES DETERMINED BY PUMP CONTROL PANEL MANUFACTURER AND VERIFIED BY INSTALLING ELECTRICIAN.
6. PUMP CONTROL PANEL LABELING SHALL COMPLY WITH NEC ARTICLE 409.
7. VERIFY PUMP CABLE SIZE WITH PUMP MANUFACTURER AND ADJUST CONDUIT & CSBE SIZE AS REQUIRED.
8. HAZARDOUS LOCATION SEALING AND INTRINSIC SAFETY EXPLOSION PROOF AND EXPLOSION PREVENTION METHODS ARE TO COMPLY WITH TCEQ CHAPTER 217, NEC ARTICLE 500, NFPA 820 REGULATIONS AND STANDARDS. DEVIATIONS FROM DESIGN SHALL BE APPROVED BY OWNER.
9. SEE FIVE STAR ELECTRICAL REFERENCE DRAWINGS AND SPECIFICATION 15443.

**ELECTRICAL LOAD ANALYSIS LS 13**

| LOAD | STARTER SIZE | VOLTS | AMPS A | AMPS B (HIGH-LEG) | AMPS C | kVA |
|---|---|---|---|---|---|---|
| LIFT STATION PUMP #1 (15 HP) | 2 | 230 | 42 | 42 | 42 | 16.7 |
| LIFT STATION PUMP #2 (15 HP) | 2 | 230 | 42 | 42 | 42 | 16.7 |
| PANEL PRIMARY CONTROLLER | N/A | 120 | 5 | | | 0.6 |
| PANEL CONTROLS | N/A | 120 | | | 5 | 0.6 |
| CABINET LIGHT | N/A | 120 | 5 | | | 0.6 |
| CABINET HEATER | N/A | 120 | | | 5 | 0.6 |
| AREA LIGHT | N/A | 120 | 5 | | | 0.6 |
| PANEL RECEPTACEL | N/A | 120 | | | 5 | 0.6 |
| 25% OF LARGEST MOTOR | N/A | 230 | 10.5 | 10.5 | 10.5 | 4.2 |
| TOTAL LOAD | | | 109.5 | 94.5 | 109.5 | 41.2 |
| SERVICE RATING @ 120/240, 3PH, 4W | | | 150 | 150 | 150 | 62.4 |
| SPARE CAPACITY | | | 40.5 | 55.5 | 40.5 | 21.1 |

Notes: SERVICE CONDUCTOR 4 - 1C 1/0
MAXIMUM AVAILABLE FAULT CURRENT CALCULATED BASED ON FIELD SURVEY. OPEN-DELTA 25 kVA POTS. 43 KVA WITH 1.7 %Z USED 10% TOLERANCE. MAX FAULT CURRENT WITHOUT SERVICE CONDUCTOR 6810 AMPS. 14 KAIC RATED DEVICES AND BRACING. VERIFY IN FIELD WITH POWER COMPANY.

**CABLE AND CONDUIT SCHEDULE LS 13**

| TAG | CONDUIT SIZE | CONDUCTOR CONFIGURATION | LENGTH | TO | FROM | DESCRIPTION |
|---|---|---|---|---|---|---|
| MFR-P1 | 2" | MANUFACTURER | | P1 | WW JBX | PUMP MANUFACTURER CABLE |
| MFR-P2 | 2" | MANUFACTURER | | P2 | WW JBX | PUMP MANUFACTURER CABLE |
| MFR-XDC | 2" | MANUFACTURER | | WW | WW JBX | TRANSDUCER MANUFACTURER CABLE |
| MFR-FS1 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| MFR-FS2 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| B-P1 | 1" | 3-1C #12 With G | | WW JBX | PCP | WET WELL JUNCTION BOX BRANCH CIRCUIT |
| MP-P1 | 1" | 6-1C #6 | | WW JBX | PCP | WET WELL JUNCTION BOX MOTOR PROTECTION |
| B-P2 | 1" | 3-1C #12 With G | | WW JBX | PCP | WET WELL JUNCTION BOX BRANCH CIRCUIT |
| MP-P2 | 1" | 6-1C #6 | | WW JBX | PCP | WET WELL JUNCTION BOX MOTOR PROTECTION |
| IS-XDC | 1" | 1-1PR #18 SHLD | | WW JBX | PCP | INTRINSICALLY SAFE ANALOG CIRCUIT |
| IS-FS | 1" | 4-1C #12 | | WW JBX | PCP | INTRINSICALLY SAFE FLOAT CIRCUITS |
| TELE-1 | 1" | 1-2PR #22 TW, SHLD | | TELEPHONE | PCP | AUTO-DAILER PHONE LINE |
| F-1 | 2" | 4-1C #1/0 With G | | MTS | UTIL DISC | MANUAL TRANSFER SWITCH UTILITY FEEDER |
| F-2 | 2" | 4-1C #1/0 With G | | PCP | MTS | PUMP CONTROL PANEL FEEDER |
| S-1 | 2" | 4-1C #1/0 With G | | MTS | GEN CON | GENERATOR SERIVE CONNECTION |
| UTIL-1 | 2" | 4-1C #1/0 | | UTIL MTR | UTIL | UTILITY SERVICE DROP |

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER
Lon A. Hubbard
3/31/2021

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53 & 55

LS-13 ONE-LINE DIAGRAM

AWC NO: COG-210
DRAWN BY: JEB
DESIGNED BY: CH
SHEET 47

LAST PRINTED: Wednesday, March 31, 2021 3:57:23 PM FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Projects\Drawings\18-1999 AWC - City of Galveston LS\1-Final Release Wet\lift-stations\ls-44-45-52-56-60_CoG AWC ONE LINES.dwg

EXISTING VALVE VAULT

EXISTING WET WELL

ABANDONED WET WELL

EXISTING CONTROL PANEL
ON LIGHT POLE

EXISTING UG ELEC
TO LIFT STATION

53RD ST

AVENUE U

CONC. SLAB

CONC. WALK

HANDICAP RAMP

G HEADWALL

18" SAN SEWER

EXISTING STM INLET
RIM EL=111.02'

EXISTING 12" SAN SEWER

EXISTING SAN SEWER MH
RIM EL=111.04'

EXISTING 15" SAN SEWER

EXISTING SAN SEWER MH
RIM EL=111.34'

EXISTING STM INLET
RIM EL=111.10'

EXISTING SAN SEWER MH
RIM EL=111.04'

EXISTING 10" SAN SEWER

EXISTING ELECTRIC METER

WOOD FENCE

OHE

PP

EM

MP

SCALE: 1"=5'-0"

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

Lon A. Hubbard

3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2. | | |
| 1. | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

LS-13 EXISTING SITE PLAN

| AWC NO: | DRAWN BY: JEB | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CH | 48 |

LAST PRINTED: Thursday, May 13, 2021 8:24:35 PM FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Project Drawings\18-1008 AWC - City of Galveston LS 11-Final Release Wrestfit.dwg=41-42,S-13 SITE FOR COG.dwg

SCALE: 1"=5'-0"

## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH CITY POWER DEPARTMENT TO INSTALL NEW UTILITY POLE IF REQUIRED.
3. SEE DETAIL 1 ON DRAWING FOR ELECTRICAL PLATFORM ELEVATION

## REFERENCE DRAWINGS

EX.....ONE LINE DIAGRAM
EX.....ELECTRICAL DETAILS

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

Lon A. Hubbard
3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

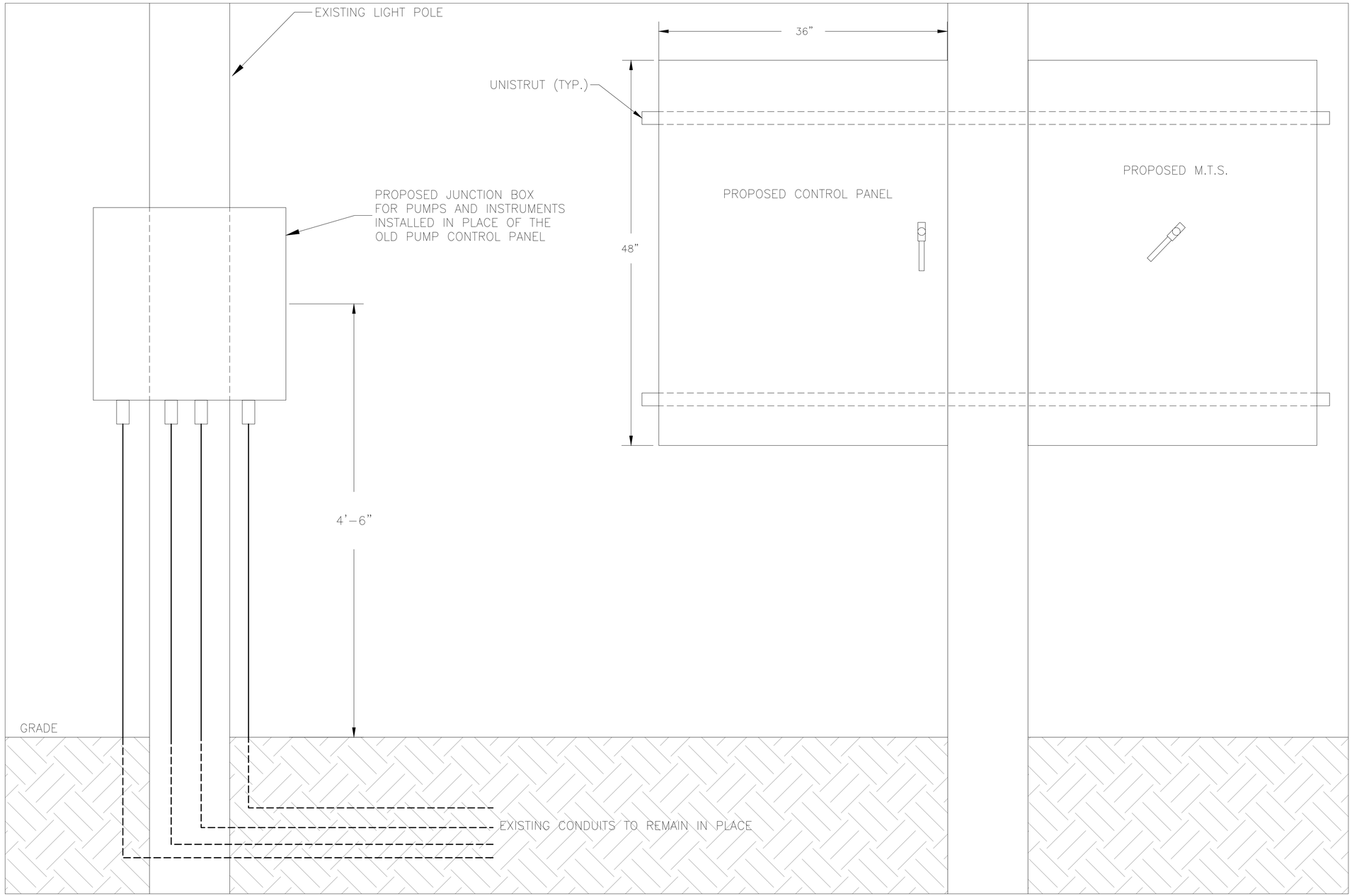
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

LS-13 PROPOSED SITE PLAN

| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG-210 | JEB | 49 |
| | DESIGNED BY: CH | |

LAST PRINTED: Thursday, May 10, 2018 3:46:36 PM FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Project Drawings\18-1008 AWC - City of Galveston LS\11-Final Release Workfile.dwg\sf 1-42-LS-13 SITE FOR COG.dwg




FRONT ELEVATION

REAR ELEVATION

## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH CITY POWER DEPARTMENT TO INSTALL NEW UTILITY POLE IF REQUIRED.
3. SEE ELECTRICAL DETAILS, FOR PLAN VIEW OF POLE MOUNTING.

## REFERENCE DRAWINGS

40.....ONE LINE DIAGRAM
64.....ELECTRICAL DETAILS SHEET 2
71.....JUNCTION BOX DETAILS

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

Lon A. Hubbard
3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

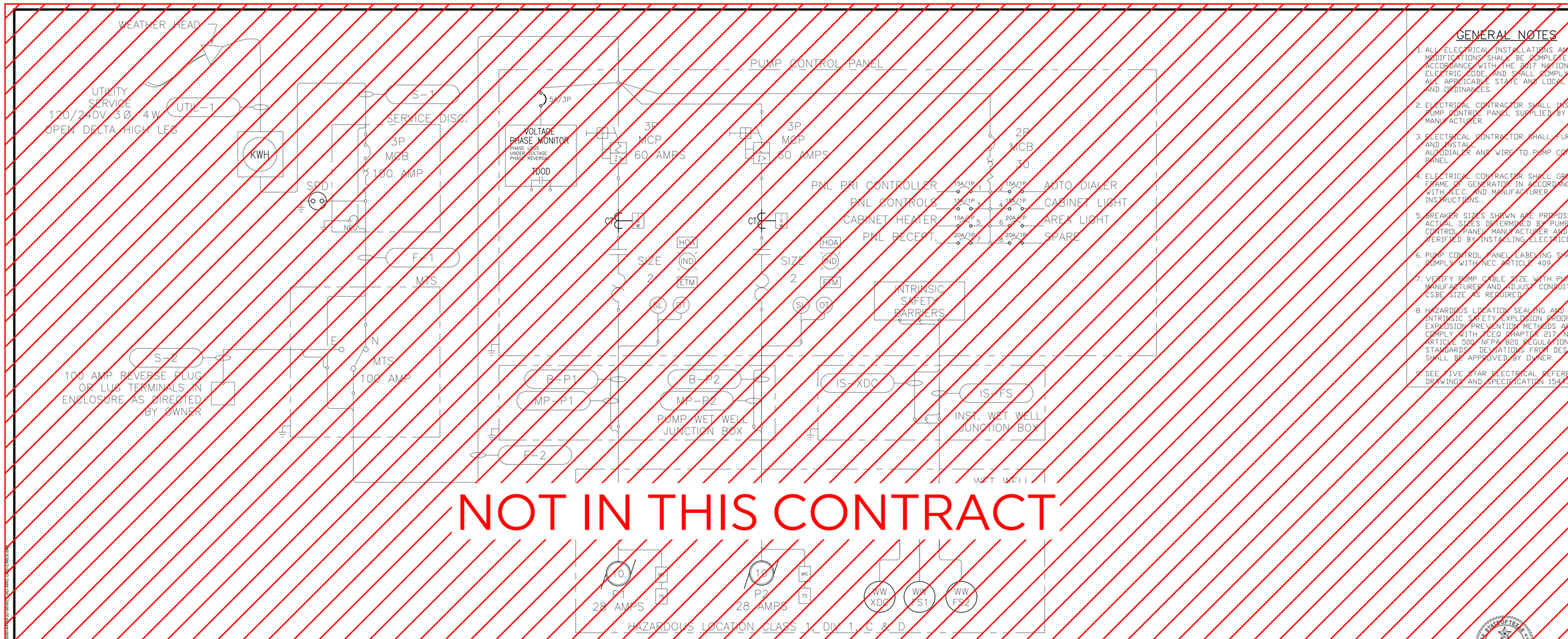
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53 & 55

LS-13 PANEL MOUNTING DETAILS

| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG-210 | JEB | 50 |
| | DESIGNED BY: CH | |

LAST PRINTED: Wednesday, March 31, 2021 3:57:11 PM FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Project Drawings\13-1009 AWC - City of Galveston LS\11-Final Release Work\dwg\64-LOG AND LIFT STATION 13 ELEC MOUNTING DETAILS_2.dwg




# NOT IN THIS CONTRACT

## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. ELECTRICAL CONTRACTOR SHALL INSTALL PUMP CONTROL PANEL SUPPLIED BY PUMP MANUFACTURER.
3. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL AUTODIALER AND WIRE TO PUMP CONTROL PANEL.
4. ELECTRICAL CONTRACTOR SHALL GROUND FRAME OF GENERATOR IN ACCORDANCE WITH N.E.C. AND MANUFACTURER INSTRUCTIONS.
5. BREAKER SIZES SHOWN ARE PROPOSED AND ACTUAL SIZES DETERMINED BY PUMP CONTROL PANEL MANUFACTURER AND VERIFIED BY INSTALLING ELECTRICIAN.
6. PUMP CONTROL PANEL LABELING SHALL COMPLY WITH NEC ARTICLE 409.
7. VERIFY PUMP CABLE SIZE WITH PUMP MANUFACTURER AND ADJUST CONDUIT & CSBE SIZE AS REQUIRED.
8. HAZARDOUS LOCATION SEALING AND INTRINSIC SAFETY, EXPLOSION PROOF AND EXPLOSION PREVENTION METHODS ARE TO COMPLY WITH TCEQ CHAPTER 217, NEC ARTICLE 500, NFPA 820 REGULATIONS AND STANDARDS. DEVIATIONS FROM DESIGN SHALL BE APPROVED BY OWNER.
9. SEE TIVE STAR ELECTRICAL REFERENCE DRAWINGS AND SPECIFICATION 15443.

**ELECTRICAL LOAD ANALYSIS LS 18**

| LOAD | STARTER SIZE | VOLTS | AMPS A | AMPS B (HIGH-LEG) | AMPS C | kVA |
|---|---|---|---|---|---|---|
| LIFT STATION PUMP #1 (3 HP) | 2 | 230 | 28 | 28 | 28 | 11.2 |
| LIFT STATION PUMP #2 (3 HP) | 2 | 230 | 28 | 28 | 28 | 11.2 |
| PANEL PRIMARY CONTROLLER | N/A | 120 | 5 | | | 0.6 |
| PANEL CONTROLS | N/A | 120 | | | 5 | 0.6 |
| CABINET LIGHT | N/A | 120 | 5 | | | 0.6 |
| CABINET HEATER | N/A | 120 | | | 5 | 0.6 |
| AREA LIGHT | N/A | 120 | 5 | | | 0.6 |
| PANEL RECEPTACEL | N/A | 120 | | | 5 | 0.6 |
| 25% OF LARGEST MOTOR | N/A | 230 | 7.0 | 7.0 | 7.0 | 2.8 |
| TOTAL LOAD | | | 78.0 | 63.0 | 78.0 | 28.7 |
| SERVICE RATING @ 120/240, 3PH, 4W | | | 100 | 100 | 100 | 41.6 |
| SPARE CAPACITY | | | 22.0 | 37.0 | 22.0 | 12.9 |

Notes: SERVICE CONDUCTOR 4 - 1C #2
MAXIMUM AVAILABLE FAULT CURRENT CALCULATED BASED ON FIELD SURVEY. OPEN-DELTA 25 kVA POTS. 43 KVA WITH 1.7 %Z USED 10% TOLERANCE. MAX FAULT CURRENT WITHOUT SERVICE CONDUCTOR 6810 AMPS. 14 KAIC RATED DEVICES AND BRACING. VERIFY IN FIELD WITH POWER COMPANY.

**CABLE AND CONDUIT SCHEDULE LS 18**

| TAG | CONDUIT SIZE | CONDUCTOR CONFIGURATION | LENGTH | TO | FROM | DESCRIPTION |
|---|---|---|---|---|---|---|
| MFR-P1 | 2" | MANUFACTURER | | P1 | WW JBX | PUMP MANUFACTURER CABLE |
| MFR-P2 | 2" | MANUFACTURER | | P2 | WW JBX | PUMP MANUFACTURER CABLE |
| MFR-XDC | 2" | MANUFACTURER | | WW | WW JBX | TRANSDUCER MANUFACTURER CABLE |
| MFR-FS1 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| MFR-FS2 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTUBER CABLE |
| B-P1 | 1" | 3-1C #10 With G | | WW JBX | PCP | PUMP 1 JUNCTION BOX BRANCH CIRCUIT |
| MP-P1 | 1" | 6-1C #12 | | WW JBX | PCP | PUMP 1 JUNCTION BOX MOTOR PROTECTION |
| B-P2 | 1" | 3-1C #10 With G | | WW JBX | PCP | PUMP 2 JUNCTION BOX BRANCH CIRCUIT |
| MP-P2 | 1" | 6-1C #12 | | WW JBX | PCP | PUMP 1 JUNCTION BOX MOTOR PROTECTION |
| IS-XDC | 1" | 1-1PR #18 SHLD | | WW JBX | PCP | INTRINSICALLY SAFE ANALOG CIRCUIT |
| IS-FS | 1" | 4-1C #12 | | WW JBX | PCP | INTRINSICALLY SAFE FLOAT CIRCUITS |
| TELE-1 | 1" | 1-2PR #22 TW, SHLD | | TELEPHONE | PCP | AUTO-DAILER PHONE LINE |
| LGT-1 | 1" | 2-1C #12 With G | | AREA LIGHT | PCP | AREA LIGHTING BRANCH CIRCUIT |
| F-1 | 2" | 4-1C #2 With G | | MTS | UTIL DISC | MANUAL TRANSFER SWITCH UTILITY FEEDER |
| F-2 | 2" | 4-1C #2 With G | | PCP | MTS | PUMP CONTROL PANEL FEEDER |
| S-1 | 2" | 4-1C #2 With G | | UTIL DISC | UTIL MTR | UTILITY SERVICE |
| S-2 | 2" | 4-1C #2 With G | | MTS | GEN CON | GENERATOR SERIVE CONNECTION |
| UTIL-1 | 2" | 4-1C #2 | | UTIL MTR | UTIL | UTILITY SERVICE DROP |

LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS
3/31/2021

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53 & 55
LS-18 ONE-LINE DIAGRAM

AWC NO: COG-210
DRAWN BY: JEB
DESIGNED BY: CH
SHEET 51

UNAUTHORIZED REPRODUCTION OR DISTRIBUTION OF THIS DRAWING, IN WHOLE OR IN PART, BY ANY MEANS, IS PROHIBITED WITHOUT THE WRITTEN PERMISSION OF ARCENEAUX WILSON & COLE, INC.

EXISTING SAN SEWER MH
RIM EL=108.38

RIM EL=108.84

1

EXISTING 8" SAN SEWER

EXISTING 8" SAN SEWER

6"X6" POST

EXISTING ELECTRICAL BOX

6"X6" POST

EXISTING ELECTRICAL BOX

6"X6" POST

CLF

4'

PP

EXISTING WATER LINE

R=12'

R=12'

# NOT IN THIS CONTRACT

N

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

STATE OF TEXAS
LON HUBBARD
84383
LICENSED
PROFESSIONAL ENGINEER

3/31/2021

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

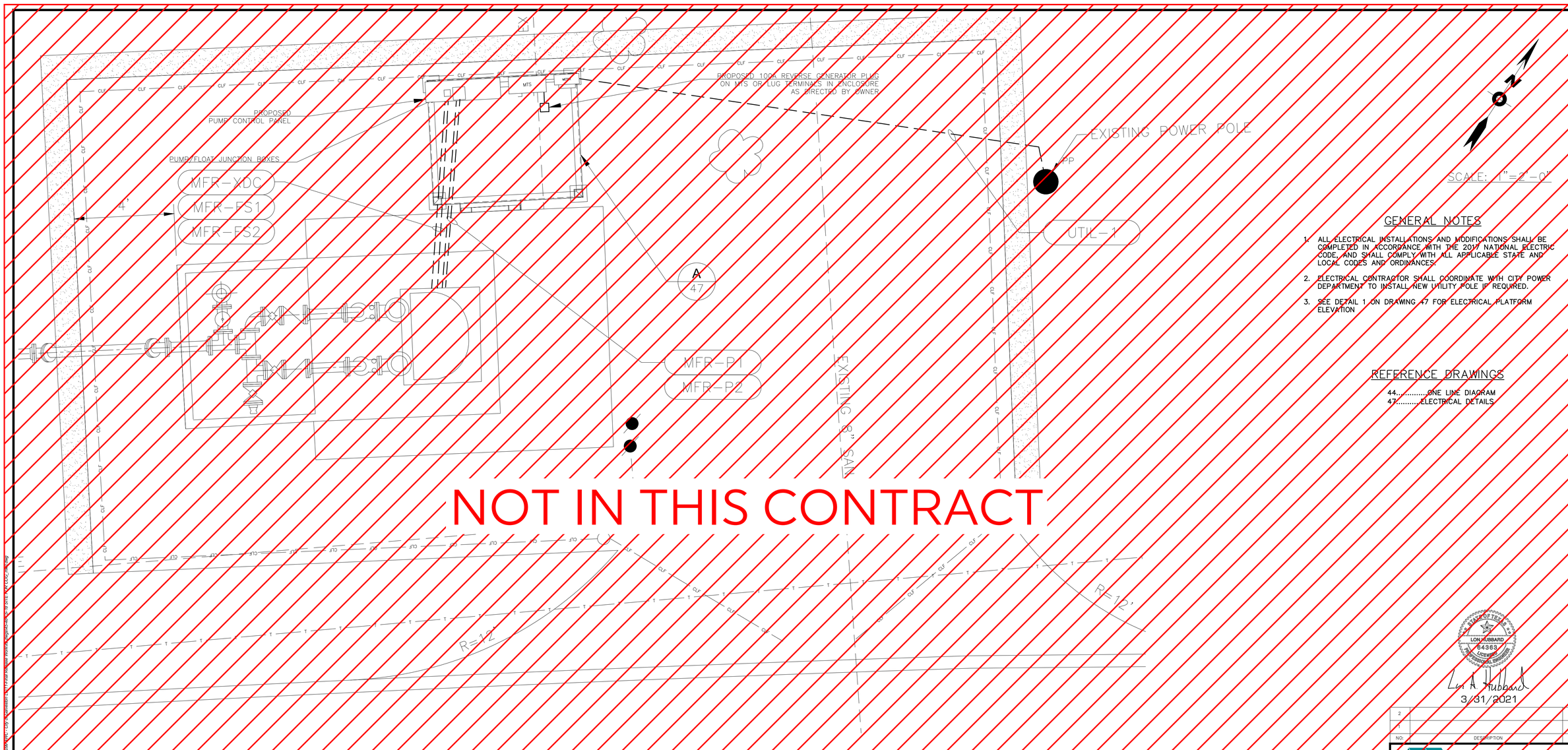
ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55
LS-18 EXISTING SITE PLAN

AWC NO: COG-210
DRAWN BY: JEP
DESIGNED BY: CH
SHEET 52

DO NOT PLOT - Drawings, Models, and Data on this Medium are Property of the Engineer. Any Reuse without Written Verification or Adaptation by the Engineer for Any Other Project is Prohibited and Any Such Reuse or Adaptation by Others Will be at User's Sole Risk and Without Liability to the Engineer.




# NOT IN THIS CONTRACT

**CABLE AND CONDUIT SCHEDULE LS 18**

| TAG | CONDUIT SIZE | CONDUCTOR CONFIGURATION | LENGTH | TO | FROM | DESCRIPTION |
|---|---|---|---|---|---|---|
| MFR-P1 | 2" | MANUFACTURER | | P1 | WW JBX | PUMP MANUFACTURER CABLE |
| MFR-P2 | 2" | MANUFACTURER | | P2 | WW JBX | PUMP MANUFACTURER CABLE |
| MFR-XDC | 2" | MANUFACTURER | | WW | WW JBX | TRANSDUCER MANUFACTURER CABLE |
| MFR-FS1 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| MFR-FS2 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| B-P1 | 1" | 3-1C #12 With G | | WW JBX | PCP | PUMP 1 JUNCTION BOX BRANCH CIRCUIT |
| MP-P1 | 1" | 6-1C #12 | | WW JBX | PCP | PUMP 1 JUNCTION BOX MOTOR PROTECTION |
| B-P2 | 1" | 3-1C #12 With G | | WW JBX | PCP | PUMP 2 JUNCTION BOX BRANCH CIRCUIT |
| MP-P2 | 1" | 6-1C #12 | | WW JBX | PCP | PUMP 1 JUNCTION BOX MOTOR PROTECTION |
| IS-XDC | 1" | 1-1PR #18 SHLD | | WW JBX | PCP | INTRINSICALLY SAFE ANALOG CIRCUIT |
| IS-FS | 1" | 4-1C #12 | | WW JBX | PCP | INTRINSICALLY SAFE FLOAT CIRCUITS |
| TELE-1 | 1" | 1-2PR #22 TW, SHLD | | TELEPHONE | PCP | AUTO-DAILER PHONE LINE |
| LGT-1 | 1" | 2-1C #12 With G | | AREA LIGHT | PCP | AREA LIGHTING BRANCH CIRCUIT |
| F-1 | 2" | 4-1C #2 With G | | MTS | UTIL DISC | MANUAL TRANSFER SWITCH UTILITY FEEDER |
| F-2 | 2" | 4-1C #2 With G | | PCP | MTS | PUMP CONTROL PANEL FEEDER |
| S-1 | 2" | 4-1C #2 With G | | UTIL DISC | UTIL MTR | UTILITY SERVICE |
| S-2 | 2" | 4-1C #2 With G | | MTS | GEN CON | GENERATOR SERIVE CONNECTION |
| UTIL-1 | 2" | 4-1C #2 | | UTIL MTR | UTIL | UTILITY SERVICE DROP |

SCALE: 1"=2'-0"

## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH CITY POWER DEPARTMENT TO INSTALL NEW UTILITY POLE IF REQUIRED.
3. SEE DETAIL 1 ON DRAWING 47 FOR ELECTRICAL PLATFORM ELEVATION

## REFERENCE DRAWINGS

44.....ONE LINE DIAGRAM
47.....ELECTRICAL DETAILS

STATE OF TEXAS
LON HUBBARD
84363
LICENSED
PROFESSIONAL ENGINEER

L. A. Hubbard
3/31/2021

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

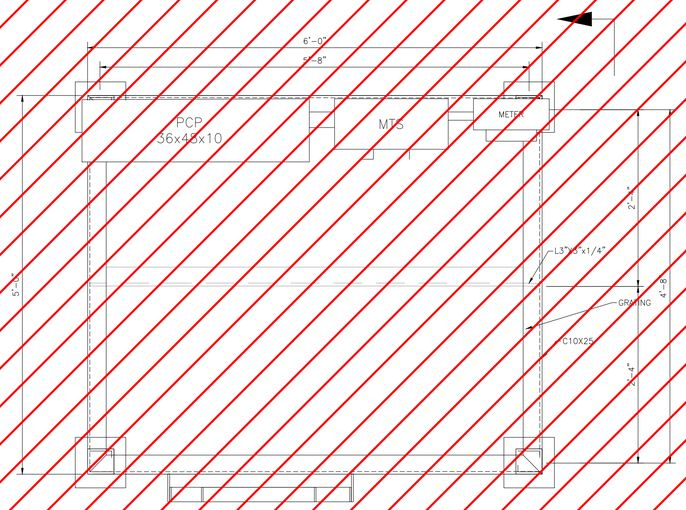
ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

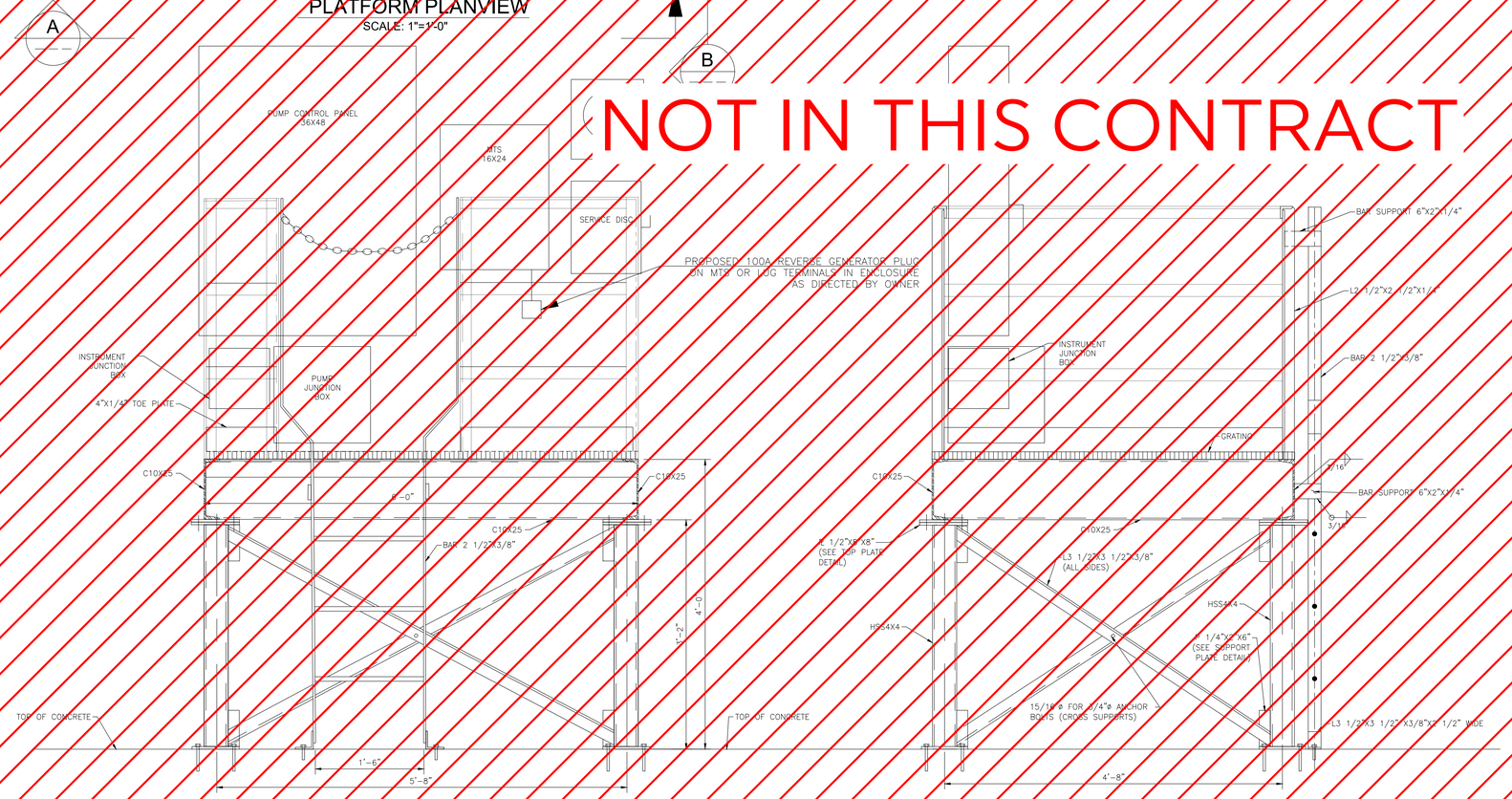
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55
LS-18 PROPOSED SITE PLAN

AWC NO: C03-210
DRAWN BY: JER
DESIGNED BY: CH
SHEET 53

DAN NORTON - Wednesday, March 31, 2021 10:47:47 AM - J:\PROJECTS\C03-210 - 2019 Lift Station Improvements\Engineering\Drawings\Civil\LS-18 PROPOSED SITE PLAN.dwg




PLATFORM PLANVIEW
SCALE: 1"=1'-0"




A SECTION
SCALE: 1"=1'-0"

B SECTION
SCALE: 1"=1'-0"

# NOT IN THIS CONTRACT

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER
3/31/2021

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

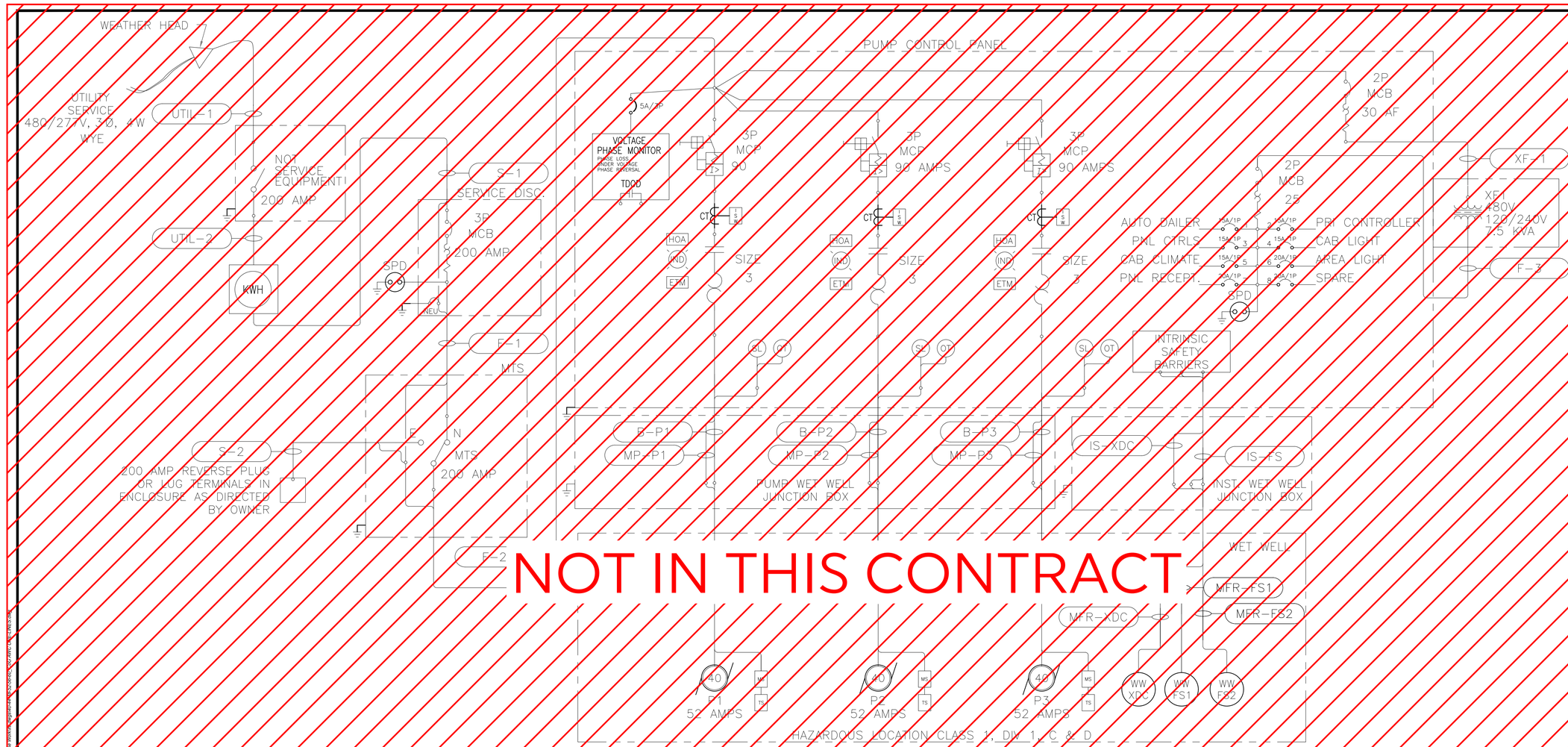
ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55
LS-18 ELECTRICAL PLATFORM ELEVATIONS

| AWC NO. | DRAWN BY: JER | SHEET |
|---|---|---|
| COG-210 | DESIGNED CH | 54 |

DO NOT COPY - Property of AWC, Inc. - Galveston\Drawings\Sheets\LS-18 Electrical Platform Elevations.dwg, Oct 31, 2020 - 10:47am, jrobertson, 1:1




# NOT IN THIS CONTRACT

## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. ELECTRICAL CONTRACTOR SHALL INSTALL PUMP CONTROL PANEL SUPPLIED BY PUMP MANUFACTURER.
3. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL AUTODIALER AND WIRE TO PUMP CONTROL PANEL.
4. ELECTRICAL CONTRACTOR SHALL GROUND FRAME OF GENERATOR IN ACCORDANCE WITH N.E.C. AND MANUFACTURER INSTRUCTIONS.
5. BREAKER SIZES SHOWN ARE PROPOSED AND ACTUAL SIZES DETERMINED BY PUMP CONTROL PANEL MANUFACTURER AND VERIFIED BY INSTALLING ELECTRICIAN.
6. PUMP CONTROL PANEL LABELING SHALL COMPLY WITH NEC ARTICLE 409.
7. VERIFY PUMP CABLE SIZE WITH PUMP MANUFACTURER AND ADJUST CONDUIT & CSBE SIZE AS REQUIRED.
8. HAZARDOUS LOCATION SEALING AND INTRINSIC SAFETY, EXPLOSION PROOF AND EXPLOSION PREVENTION METHODS ARE TO COMPLY WITH TCEQ CHAPTER 217, NEC ARTICLE 500, NFPA 820 REGULATIONS AND STANDARDS. DEVIATIONS FROM DESIGN SHALL BE APPROVED BY OWNER.
9. SEE TIVE STAR ELECTRICAL REFERENCE DRAWINGS AND SPECIFICATION 15443.

**ELECTRICAL LOAD ANALYSIS LS 30**

| LOAD | STARTER SIZE | VOLTS | AMPS A | AMPS B | AMPS C | kVA |
|---|---|---|---|---|---|---|
| LIFT STATION PUMP #1 (20 HP) | 3 | 460 | 52 | 52 | 52 | 41.4 |
| LIFT STATION PUMP #2 (20 HP) | 3 | 460 | 52 | 52 | 52 | 41.4 |
| LIFT STATION PUMP #3 (20 HP) | 3 | 460 | 52 | 52 | 52 | 41.4 |
| TRANSFORMER XF1 | N/A | 480 | 9 | 9 | 9 | 7.5 |
| 25% OF LARGEST MOTOR | N/A | 460 | 13.0 | 13.0 | 13.0 | 10.4 |
| TOTAL LOAD | | | 178.0 | 178.0 | 178.0 | 142.1 |
| SERVICE RATING @ 277/480, 3PH, 4W | | | 200 | 200 | 200 | 166.3 |
| SPARE CAPACITY | | | 22.0 | 22.0 | 22.0 | 24.1 |

Notes: SERVICE CONDUCTOR 4 - 1C 3/0
MAXIMUM AVAILABLE FAULT CURRENT CALCULATED BASED ON FIELD SURVEY. WYE 3 50 kVA POTS. 150 KVA WITH 1.7 %Z USED 10% TOLERANCE. MAX FAULT CURRENT WITHOUT SERVICE CONDUCTOR 11,791 AMPS. 22 KAIC RATED DEVICES AND BRACING. VERIFY IN FIELD WITH POWER COMPANY.

**CABLE AND CONDUIT SCHEDULE LS 30**

| TAG | CONDUIT SIZE | CONDUCTOR CONFIGURATION | LENGTH | TO | FROM | DESCRIPTION |
|---|---|---|---|---|---|---|
| MFR-P1 | 2" | MANUFACTURER | | P1 | PWW JBX | PUMP MANUFACTURER CABLE |
| MFR-P2 | 2" | MANUFACTURER | | P2 | PWW JBX | PUMP MANUFACTURER CABLE |
| MFR-P3 | 2" | MANUFACTURER | | P3 | PWW JBX | PUMP MANUFACTURER CABLE |
| MFR-XDC | 2" | MANUFACTURER | | WW | IWW JBX | TRANSDUCER MANUFACTURER CABLE |
| MFR-FS1 | 2" | MANUFACTURER | | WW | IWW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| MFR-FS2 | 2" | MANUFACTURER | | WW | IWW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| B-P1 | 1" | 3-1C #6 With G | | PWW JBX | PCP | WET WELL JUNCTION BOX P1 BRANCH CIRCUIT |
| MP-P1 | 1" | 6-1C #12 | | PWW JBX | PCP | WET WELL JUNCTION BOX P1 MOTOR PROTECTION |
| B-P2 | 1" | 3-1C #6 With G | | PWW JBX | PCP | WET WELL JUNCTION BOX P2 BRANCH CIRCUIT |
| MP-P2 | 1" | 6-1C #12 | | PWW JBX | PCP | WET WELL JUNCTION BOX P2 MOTOR PROTECTION |
| B-P3 | 1" | 3-1C #10 With G | | PWW JBX | PCP | WET WELL JUNCTION BOX P3 BRANCH CIRCUIT |
| MP-P3 | 1" | 6-1C #12 | | PWW JBX | PCP | WET WELL JUNCTION BOX P3 MOTOR PROTECTION |
| IS-XDC | 1" | 1-1PR #18 SHLD | | IWW JBX | PCP | INTRINSICALLY SAFE ANALOG CIRCUIT |
| IS-FS | 1" | 4-1C #12 | | IWW JBX | PCP | INTRINSICALLY SAFE FLOAT CIRCUITS |
| TELE-1 | 1" | 1-2PR #22 TW, SHLD | | TELEPHONE | PCP | AUTO-DAILER PHONE LINE |
| XF-1 | 3/4" | 2-1C #10 With G | | XF1 | PCP | STATION TRANSFORMER PRIMARY FEEDER |
| LGT-1 | 1" | 2-1C #12 With G | | AREA LIGHT | PCP | AREA LIGHTING BRANCH CIRCUIT |
| F-1 | 2" | 4-1C 3/0 With G | | MTS | UTIL DISC | MANUAL TRANSFER SWITCH UTILITY FEEDER |
| F-2 | 2" | 4-1C 3/0 With G | | PCP | MTS | PUMP CONTROL PANEL FEEDER |
| F-3 | 3/4" | 2-1C #8 With G | | PCP | XF1 | STATION TRANSFORMER SECONDARY FEEDER |
| S-1 | 2" | 4-1C 3/0 With G | | UTIL DISC | UTIL MTR | UTILITY SERVICE |
| S-2 | 2" | 4-1C 3/0 With G | | MTS | GEN CON | GENERATOR SERIVE CONNECTION |
| UTIL-1 | 2" | 4-1C 3/0 With G | | UTIL MTR | UTIL | UTILITY SERVICE DROP |
| UTIL-2 | 2" | 4-1C 3/0 | | UTIL MTR | UTIL | UTILITY SERVICE DROP |

LON HUBBARD 64363 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

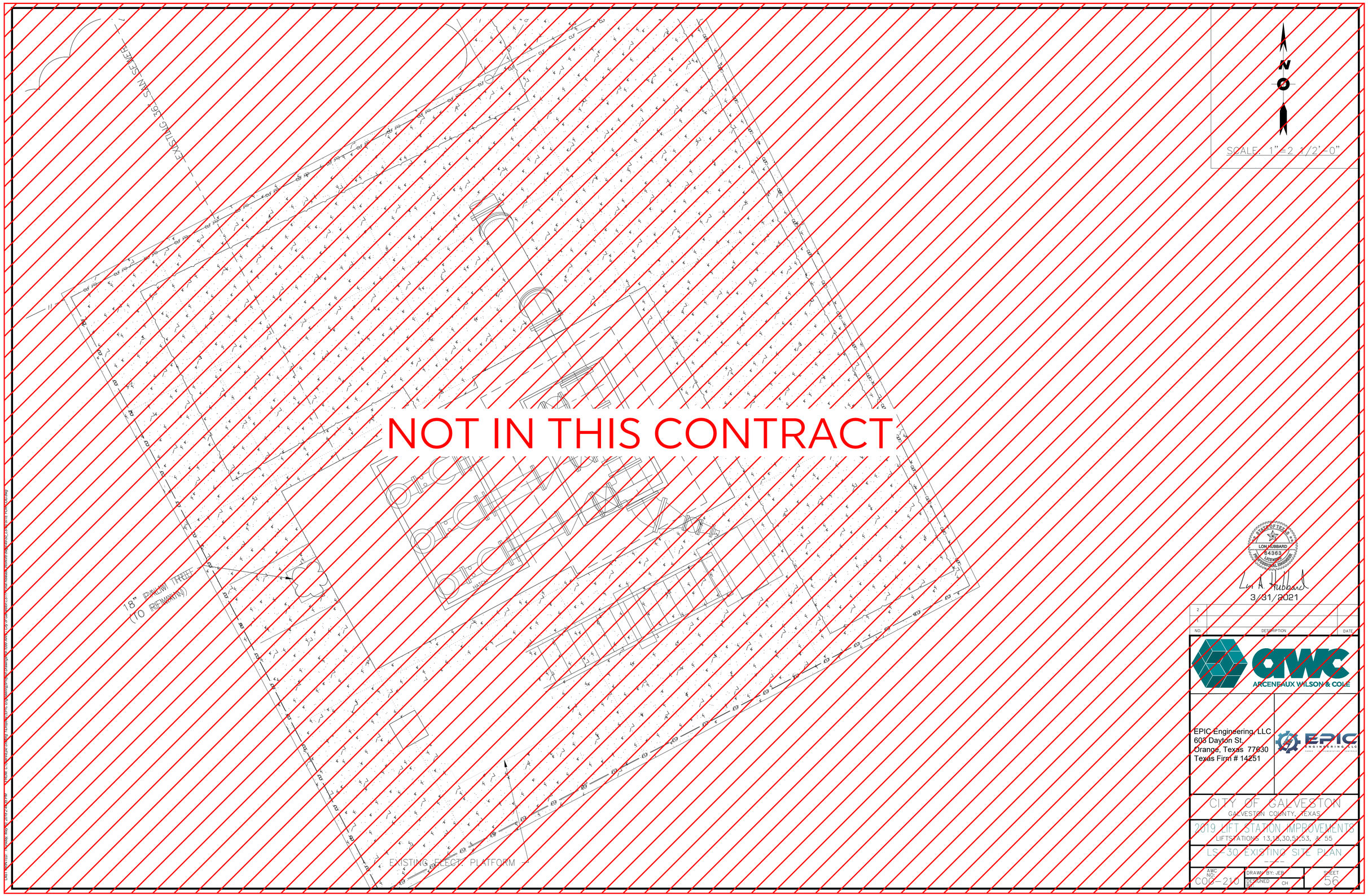
3/31/2021

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,15,30,51,53 & 55
LS-30 ONE-LINE DIAGRAM

A/C NO: COG-210
DRAWN BY: JEB
DESIGNED BY: CH
SHEET 55




NOT IN THIS CONTRACT

STATE OF TEXAS
LON HUBBARD
84363
LICENSED
PROFESSIONAL ENGINEER
3/31/2021

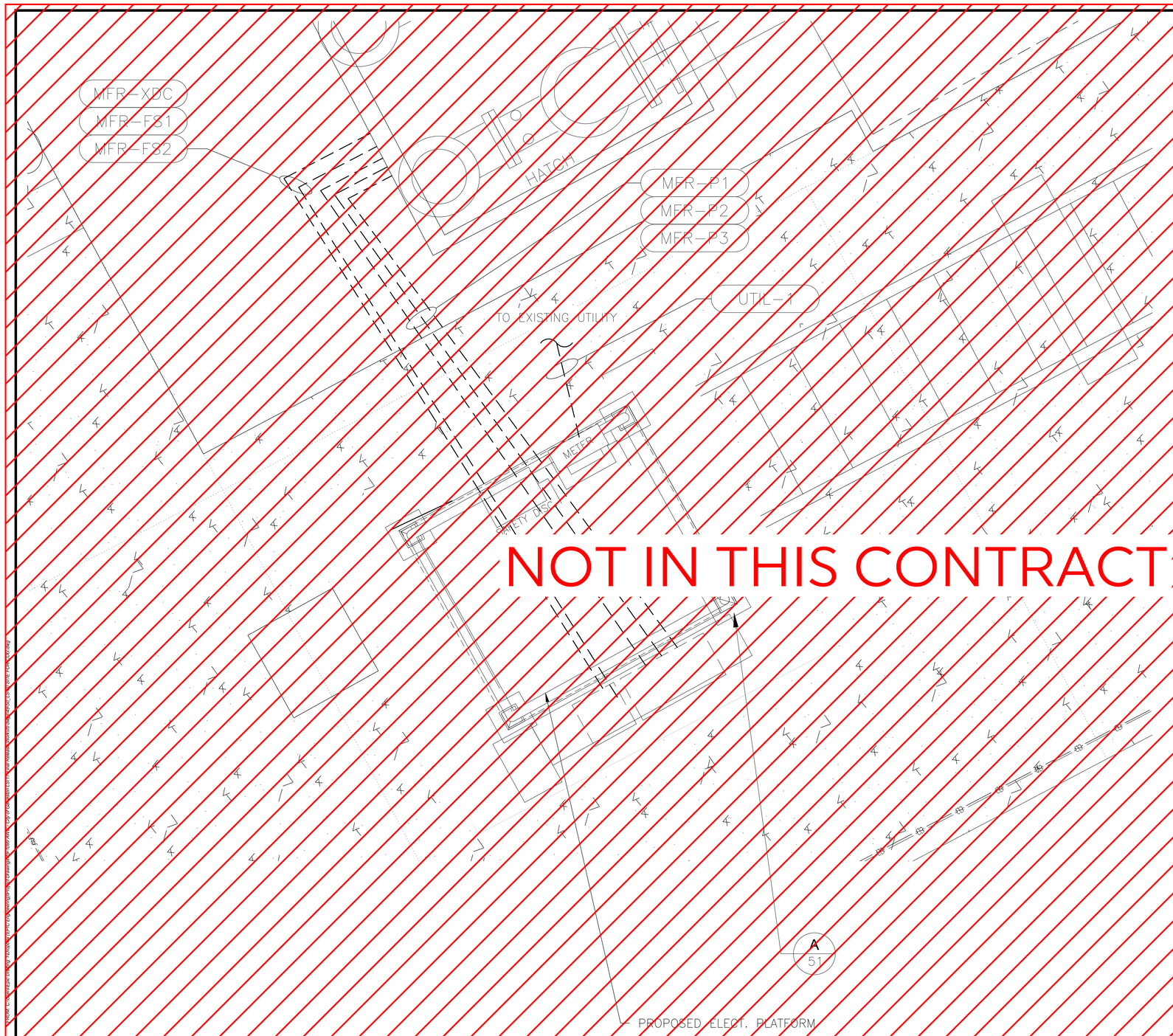
| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

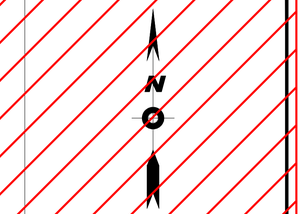
EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55
LS-30 EXISTING SITE PLAN

AWC NO.: COG-210
DRAWN BY: JEB
DESIGNED BY: CH
SHEET 56




NOT IN THIS CONTRACT




## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH CITY POWER DEPARTMENT TO INSTALL NEW UTILITY POLE IF REQUIRED.
3. SEE DETAIL 1 ON DRAWING FOR ELECTRICAL PLATFORM ELEVATION

## REFERENCE DRAWINGS

48.....ONE LINE DIAGRAM
51.....ELECTRICAL RACK DETAILS

Lon A. Hubbard
3/31/2021

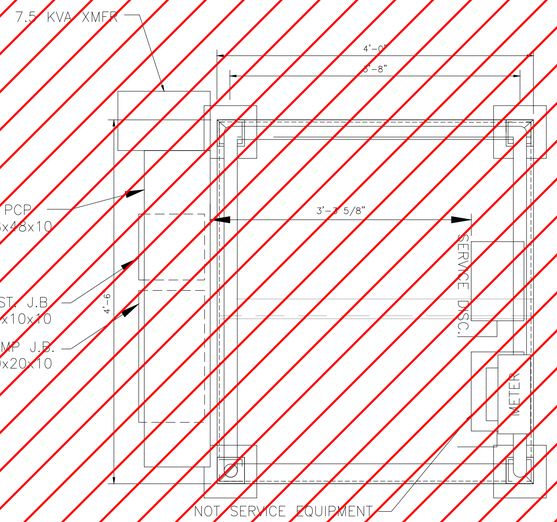
| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

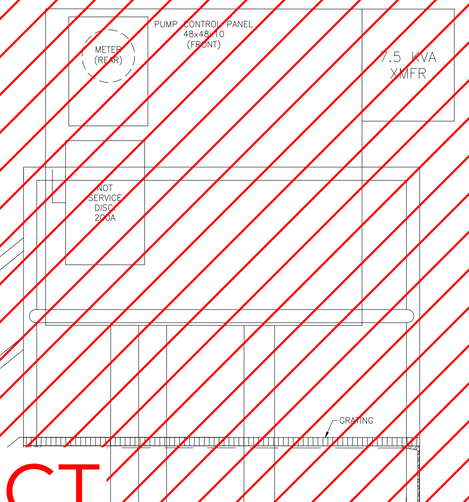
EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

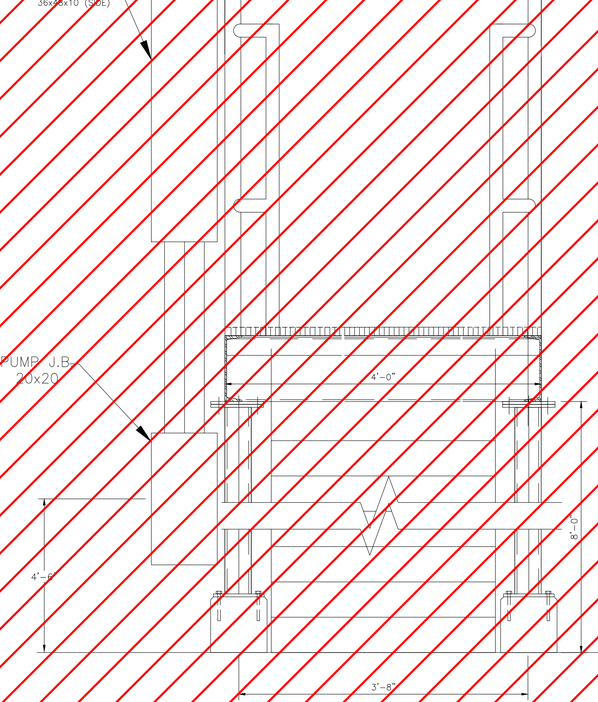
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55
LS-30 PROPOSED SITE PLAN

| AWC NO: | DRAWN BY: JEB | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CH | 57 |




PLATFORM PLANVIEW
SCALE: 1"=1'-0"




A SECTION
SCALE: 1"=1'-0"

B SECTION
SCALE: 1"=1'-0"

NOT IN THIS CONTRACT

STATE OF TEXAS
LON HUBBARD
84363
LICENSED
PROFESSIONAL ENGINEER
3/31/2021

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

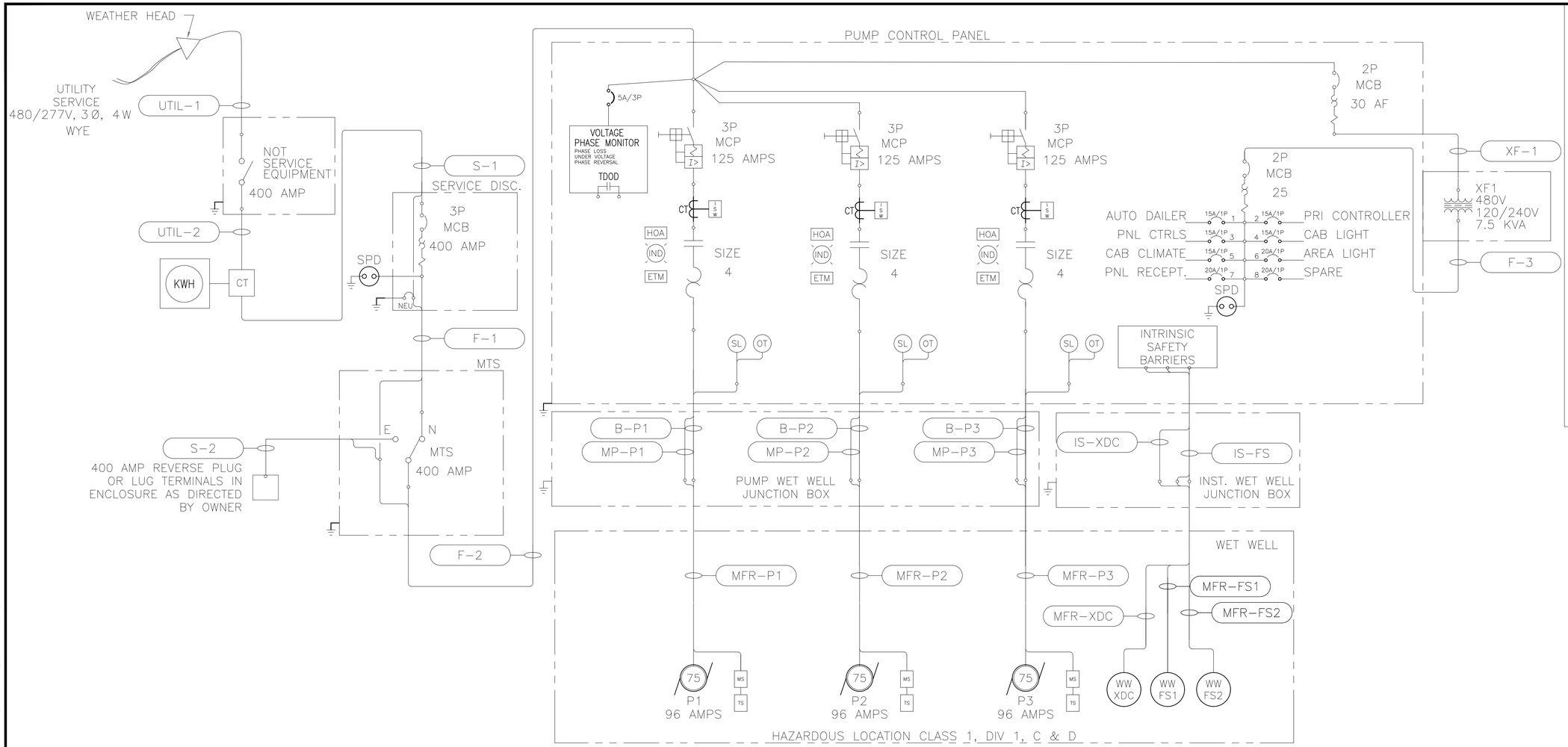
ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFTSTATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53 &55
LS-30 ELECTRICAL PLATFORM ELEVATIONS

AWC NO: COG-210
DRAWN BY: JER
DESIGNED BY: CH
SHEET 58

USER:Jennifer Rowell J:\AWC\COG\210 - 2019 Liftstation Improvements\Drawings\Electrical\LS-30 Electrical Platform Elevations.dwg




## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. ELECTRICAL CONTRACTOR SHALL INSTALL PUMP CONTROL PANEL SUPPLIED BY PUMP MANUFACTURER.
3. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL AUTODIALER AND WIRE TO PUMP CONTROL PANEL.
4. ELECTRICAL CONTRACTOR SHALL GROUND FRAME OF GENERATOR IN ACCORDANCE WITH N.E.C. AND MANUFACTURER INSTRUCTIONS.
5. BREAKER SIZES SHOWN ARE PROPOSED AND ACTUAL SIZES DETERMINED BY PUMP CONTROL PANEL MANUFACTURER AND VERIFIED BY INSTALLING ELECTRICIAN.
6. PUMP CONTROL PANEL LABELING SHALL COMPLY WITH NEC ARTICLE 409.
7. VERIFY PUMP CABLE SIZE WITH PUMP MANUFACTURER AND ADJUST CONDUIT & CSBE SIZE AS REQUIRED.
8. HAZARDOUS LOCATION SEALING AND INTRINSIC SAFETY EXPLOSION PROOF AND EXPLOSION PREVENTION METHODS ARE TO COMPLY WITH TCEQ CHAPTER 217, NEC ARTICLE 500, NFPA 820 REGULATIONS AND STANDARDS. DEVIATIONS FROM DESIGN SHALL BE APPROVED BY OWNER.
9. SEE FIVE STAR ELECTRICAL REFERENCE DRAWINGS AND SPECIFICATION 15443.

**ELECTRICAL LOAD ANALYSIS LS 51**

| LOAD | STARTER SIZE | VOLTS | AMPS A | AMPS B | AMPS C | kVA |
|---|---|---|---|---|---|---|
| LIFT STATION PUMP #1 (35 HP) | 4 | 460 | 96 | 96 | 96 | 76.5 |
| LIFT STATION PUMP #2 (35 HP) | 4 | 460 | 96 | 96 | 96 | 76.5 |
| LIFT STATION PUMP #3 (35 HP) | 4 | 460 | 96 | 96 | 96 | 76.5 |
| TRANSFORMER XF1 | N/A | 480 | 9 | 9 | 9 | 7.5 |
| 25% OF LARGEST MOTOR | N/A | 460 | 24.0 | 24.0 | 24.0 | 19.1 |
| TOTAL LOAD | | | 321.0 | 321.0 | 321.0 | 256.1 |
| SERVICE RATING @ 277/480, 3PH, 4W | | | 400 | 400 | 400 | 332.6 |
| SPARE CAPACITY | | | 79.0 | 79.0 | 79.0 | 76.5 |

Notes: SERVICE CONDUCTOR 4 - 1C 600mcm.
MAXIMUM AVAILABLE FAULT CURRENT CALCULATED BASED ON FIELD SURVEY. WYE 2 75 + 1 50 kVA POTS. 200 KVA WITH 1.7 %Z USED 10% TOLERANCE. MAX FAULT CURRENT WITHOUT SERVICE CONDUCTOR 15,725 AMPS. 22 KAIC RATED DEVICES AND BRACING. VERIFY IN FIELD WITH POWER COMPANY.

**CABLE AND CONDUIT SCHEDULE LS 51**

| TAG | CONDUIT SIZE | CONDUCTOR CONFIGURATION | LENGTH | TO | FROM | DESCRIPTION |
|---|---|---|---|---|---|---|
| MFR-P1 | 2" | MANUFACTURER | | P1 | PWW JBX | PUMP MANUFACTURER CABLE |
| MFR-P2 | 2" | MANUFACTURER | | P2 | PWW JBX | PUMP MANUFACTURER CABLE |
| MFR-P3 | 2" | MANUFACTURER | | P3 | PWW JBX | PUMP MANUFACTURER CABLE |
| MFR-XDC | 2" | MANUFACTURER | | WW | IWW JBX | TRANSDUCER MANUFACTURER CABLE |
| MFR-FS1 | 2" | MANUFACTURER | | WW | IWW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| MFR-FS2 | 2" | MANUFACTURER | | WW | IWW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| B-P1 | 1 1/2" | 3-1C #1 With G | | PWW JBX | PCP | WET WELL JUNCTION BOX P1 BRANCH CIRCUIT |
| MP-P1 | 1" | 6-1C #12 | | PWW JBX | PCP | WET WELL JUNCTION BOX P1 MOTOR PROTECTION |
| B-P2 | 1 1/2" | 3-1C #1 With G | | PWW JBX | PCP | WET WELL JUNCTION BOX P2 BRANCH CIRCUIT |
| MP-P2 | 1" | 6-1C #12 | | PWW JBX | PCP | WET WELL JUNCTION BOX P2 MOTOR PROTECTION |
| B-P3 | 1 1/2" | 3-1C #1 With G | | PWW JBX | PCP | WET WELL JUNCTION BOX P3 BRANCH CIRCUIT |
| MP-P3 | 1" | 6-1C #12 | | PWW JBX | PCP | WET WELL JUNCTION BOX P3 MOTOR PROTECTION |
| IS-XDC | 1" | 1-1PR #18 SHLD | | IWW JBX | PCP | INTRINSICALLY SAFE ANALOG CIRCUIT |
| IS-FS | 1" | 4-1C #12 | | IWW JBX | PCP | INTRINSICALLY SAFE FLOAT CIRCUITS |
| TELE-1 | 1" | 1-2PR #22 TW, SHLD | | TELEPHONE | PCP | AUTO-DAILER PHONE LINE |
| XF-1 | 3/4" | 2-1C #10 With G | | XF1 | PCP | STATION TRANSFORMER PRIMARY FEEDER |
| LGT-1 | 1" | 2-1C #12 With G | | AREA LIGHT | PCP | AREA LIGHTING BRANCH CIRCUIT |
| F-1 | 3 1/2" | 4-1C 600MCM With G | | MTS | UTIL DISC | MANUAL TRANSFER SWITCH UTILITY FEEDER |
| F-2 | 3 1/2" | 4-1C 600MCM With G | | PCP | MTS | PUMP CONTROL PANEL FEEDER |
| F-3 | 3/4" | 2-1C #8 With G | | PCP | XF1 | STATION TRANSFORMER SECONDARY FEEDER |
| S-1 | 3 1/2" | 4-1C 600 MCM With G | | UTIL DISC | UTIL MTR | UTILITY SERVICE |
| S-2 | 3 1/2" | 4-1C 600 MCM With G | | MTS | GEN CON | GENERATOR SERIVE CONNECTION |
| UTIL-1 | 3 1/2" | 4-1C 600 MCM With G | | UTIL MTR | UTIL | UTILITY SERVICE DROP |
| UTIL-2 | 3 1/2" | 4-1C 600 MCM | | UTIL MTR | UTIL | UTILITY SERVICE DROP |

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

Lon A. Hubbard
3/31/2021

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

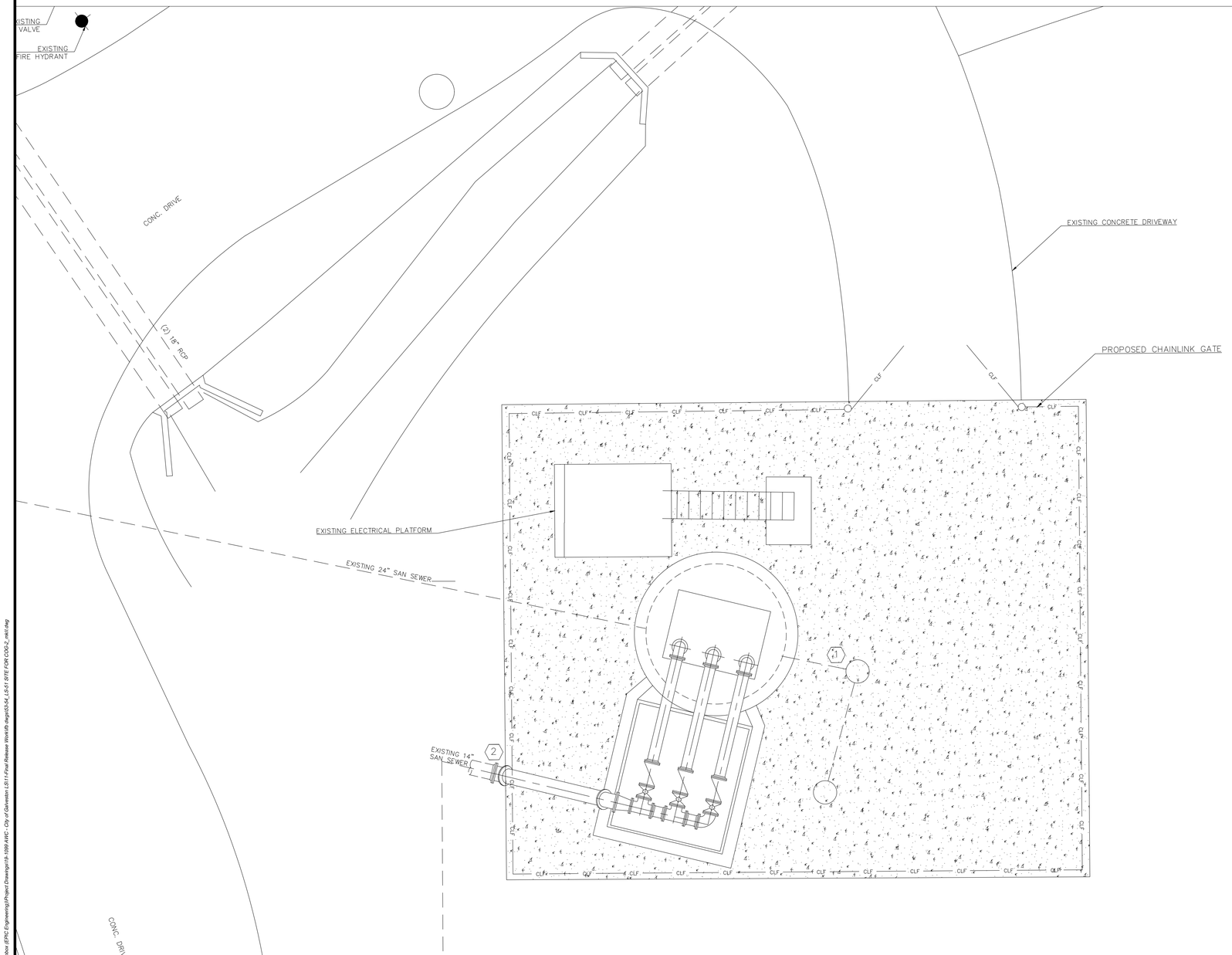
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

LS-51 ONE-LINE DIAGRAM

AWC NO: COG-210 | DRAWN BY: JEB | DESIGNED BY: CH | SHEET 59

LAST PRINTED: Wednesday, March 31, 2021 3:57:59 PM FROM: C:\Users\jbc\Dropbox (EPIC Engineering)\Project Drawings\18-1006 AWC - City of Galveston LS11-Final Release Work\18-drwg\4544-44A-S-SK-60_CoG AWC ONE-LINES.dwg




N

SCALE: 1"=5'-0"

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

Lon A. Hubbard

3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2. | | |
| 1. | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

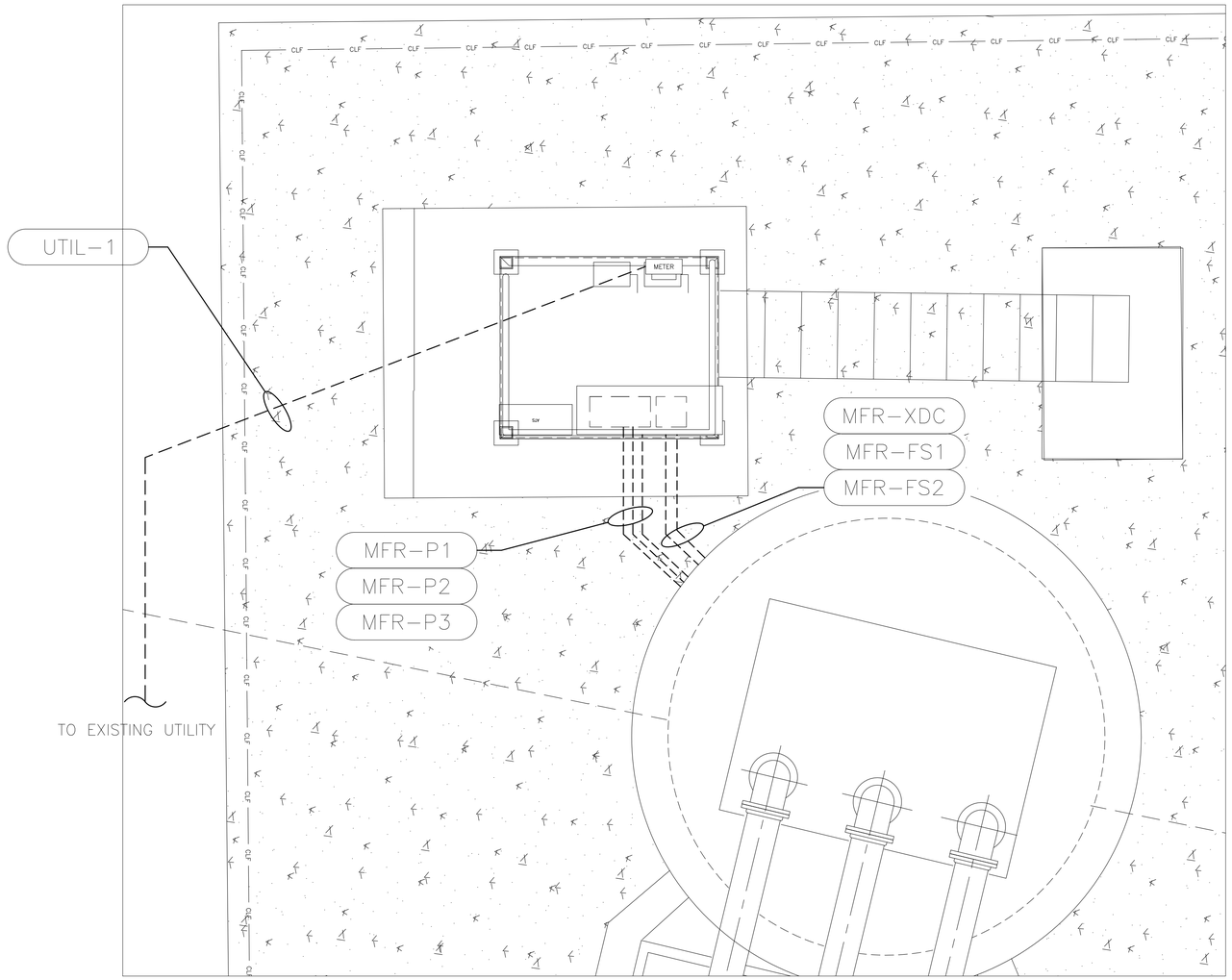
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

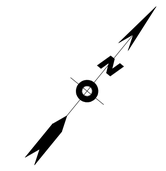
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

LS-51 EXISTING SITE PLAN

| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG-210 | JEB | 60 |
| | DESIGNED BY: CH | |

LAST PRINTED: Wednesday, March 31, 2021 3:58:03 PM FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Project Drawings\19-1069-AWC - City of Galveston LS\1-Final Release Wrkdfls dwgs\SS-54_LS-51 SITE FOR COG-2_awk1.dwg




SCALE: 1"=2'-0"

## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH CITY POWER DEPARTMENT TO INSTALL NEW UTILITY POLE IF REQUIRED.
3. SEE DETAIL 1 ON DRAWING FOR ELECTRICAL PLATFORM ELEVATION

**CABLE AND CONDUIT SCHEDULE LS 51**

| TAG | CONDUIT SIZE | CONDUCTOR CONFIGURATION | LENGTH | TO | FROM | DESCRIPTION |
|---|---|---|---|---|---|---|
| MFR-P1 | 2" | MANUFACTURER | | P1 | PWW JBX | PUMP MANUFACTURER CABLE |
| MFR-P2 | 2" | MANUFACTURER | | P2 | PWW JBX | PUMP MANUFACTURER CABLE |
| MFR-P3 | 2" | MANUFACTURER | | P3 | PWW JBX | PUMP MANUFACTURER CABLE |
| MFR-XDC | 2" | MANUFACTURER | | WW | IWW JBX | TRANSDUCER MANUFACTURER CABLE |
| MFR-FS1 | 2" | MANUFACTURER | | WW | IWW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| MFR-FS2 | 2" | MANUFACTURER | | WW | IWW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| B-P1 | 1" | 3-1C #6 With G | | PWW JBX | PCP | WET WELL JUNCTION BOX P1 BRANCH CIRCUIT |
| MP-P1 | 1" | 6-1C #12 | | PWW JBX | PCP | WET WELL JUNCTION BOX P1 MOTOR PROTECTION |
| B-P2 | 1" | 3-1C #6 With G | | PWW JBX | PCP | WET WELL JUNCTION BOX P2 BRANCH CIRCUIT |
| MP-P2 | 1" | 6-1C #12 | | PWW JBX | PCP | WET WELL JUNCTION BOX P2 MOTOR PROTECTION |
| B-P3 | 1" | 3-1C #6 With G | | PWW JBX | PCP | WET WELL JUNCTION BOX P3 BRANCH CIRCUIT |
| MP-P3 | 1" | 6-1C #12 | | PWW JBX | PCP | WET WELL JUNCTION BOX P3 MOTOR PROTECTION |
| IS-XDC | 1" | 1-1PR #18 SHLD | | IWW JBX | PCP | INTRINSICALLY SAFE ANALOG CIRCUIT |
| IS-FS | 1" | 4-1C #12 | | IWW JBX | PCP | INTRINSICALLY SAFE FLOAT CIRCUITS |
| TELE-1 | 1" | 1-2PR #22 TW, SHLD | | TELEPHONE | PCP | AUTO-DAILER PHONE LINE |
| XF-1 | 3/4" | 2-1C #10 With G | | XF1 | PCP | STATION TRANSFORMER PRIMARY FEEDER |
| LGT-1 | 1" | 2-1C #12 With G | | AREA LIGHT | PCP | AREA LIGHTING BRANCH CIRCUIT |
| F-1 | 2" | 4-1C 3/0 With G | | MTS | UTIL DISC | MANUAL TRANSFER SWITCH UTILITY FEEDER |
| F-2 | 2" | 4-1C 3/0 With G | | PCP | MTS | PUMP CONTROL PANEL FEEDER |
| F-3 | 3/4" | 2-1C #8 With G | | PCP | XF1 | STATION TRANSFORMER SECONDARY FEEDER |
| S-1 | 2" | 4-1C 3/0 With G | | UTIL DISC | UTIL MTR | UTILITY SERVICE |
| S-2 | 2" | 4-1C 3/0 With G | | MTS | GEN CON | GENERATOR SERIVE CONNECTION |
| UTIL-1 | 2" | 4-1C 3/0 With G | | UTIL MTR | UTIL | UTILITY SERVICE DROP |
| UTIL-2 | 2" | 4-1C 3/0 | | UTIL MTR | UTIL | UTILITY SERVICE DROP |

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

Lon A. Hubbard
3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2. | | |
| 1. | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

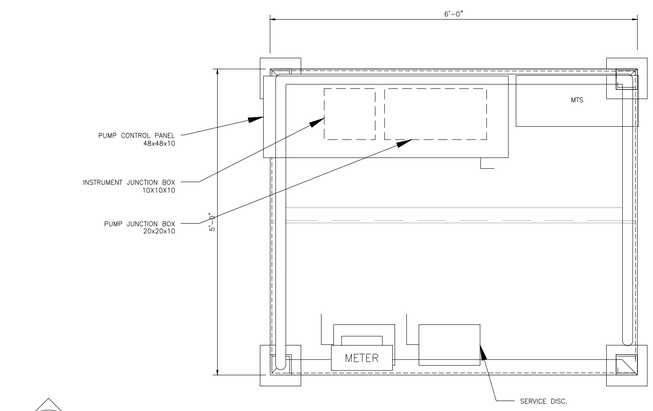
LS-51 PROPOSED SITE PLAN

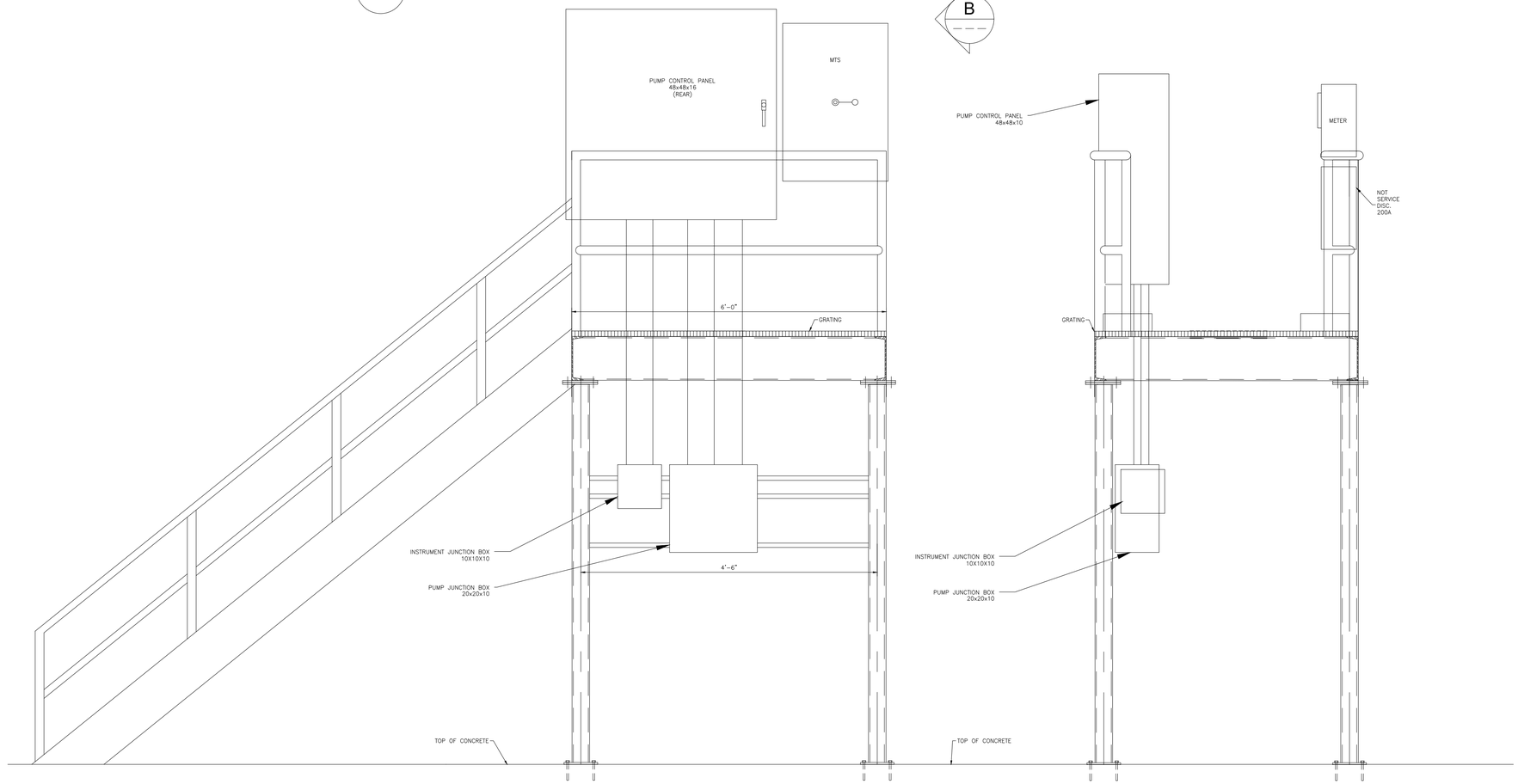
| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG-210 | JEB | 61 |
| | DESIGNED BY: CH | |

LAST PRINTED: Wednesday, March 31, 2021 3:58:03 PM
FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Project Drawings\19-1009 AWC - City of Galveston LS\11-Final Release Work\lift station\LS-51 SITE FOR COG-2_mM.dwg

# PLATFORM PLAN VIEW

SCALE: 1"=1'-0"




A SECTION

SCALE: 1"=1'-0"




B SECTION

SCALE: 1"=1'-0"

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

Lon A. Hubbard

3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2. | | |
| 1. | | |


ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251


CITY OF GALVESTON

GALVESTON COUNTY, TEXAS

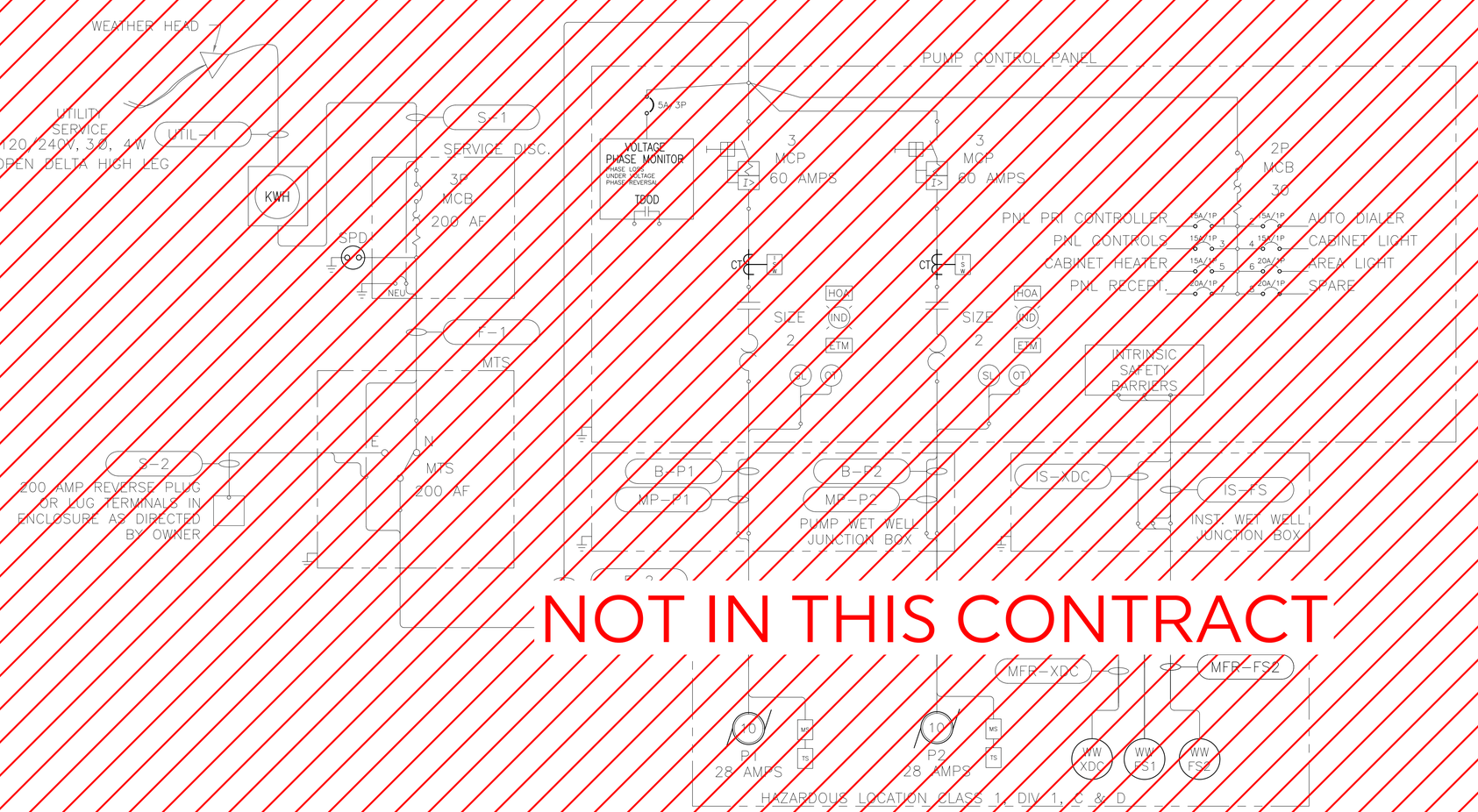
2019 LIFT STATIONS IMPROVEMENTS

LIFTSTATIONS 13,18,30,51,53, & 55

LS-51 ELECTRICAL PLATFORM ELEVATIONS

| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG-210 | JEB | 62 |
| | DESIGNED BY: CH | |


LAST PRINTED: Wednesday, March 31, 2021 5:58:07 PM FROM: C:\Users\Epic Dunlap \Dropbox (EPIC Engineering)\Project Drawings\14-1099 AWC - City of Galveston LS11-Final Release Work\Drawings\LS_CoG AWC LIFT STATION 51-PLATFORM DETAILS.dwg




# NOT IN THIS CONTRACT

## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. ELECTRICAL CONTRACTOR SHALL INSTALL PUMP CONTROL PANEL SUPPLIED BY PUMP MANUFACTURER.
3. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL AUTODIALER AND WIRE TO PUMP CONTROL PANEL.
4. ELECTRICAL CONTRACTOR SHALL GROUND FRAME OF GENERATOR IN ACCORDANCE WITH N.E.C. AND MANUFACTURER INSTRUCTIONS.
5. BREAKER SIZES SHOWN ARE PROPOSED AND ACTUAL SIZES DETERMINED BY PUMP CONTROL PANEL MANUFACTURER AND VERIFIED BY INSTALLING ELECTRICIAN.
6. PUMP CONTROL PANEL LABELING SHALL COMPLY WITH NEC ARTICLE 409.
7. VERIFY PUMP CABLE SIZE WITH PUMP MANUFACTURER AND ADJUST CONDUIT & CSBE SIZE AS REQUIRED.
8. HAZARDOUS LOCATION SEALING AND INTRINSIC SAFETY, EXPLOSION PROOF AND EXPLOSION PREVENTION METHODS ARE TO COMPLY WITH TCEQ CHAPTER 217, NEC ARTICLE 500, NFPA 820 REGULATIONS AND STANDARDS. DEVIATIONS FROM DESIGN SHALL BE APPROVED BY OWNER.
9. SEE TIVE STAR ELECTRICAL REFERENCE DRAWINGS AND SPECIFICATION 15443.

**ELECTRICAL LOAD ANALYSIS LS 53**

| LOAD | STARTER SIZE | VOLTS | AMPS A | AMPS B (HIGH-LEG) | AMPS C | kVA |
|---|---|---|---|---|---|---|
| LIFT STATION PUMP #1 (15 HP) | 1 | 230 | 28 | 28 | 28 | 11.2 |
| LIFT STATION PUMP #2 (15 HP) | 1 | 230 | 28 | 28 | 28 | 11.2 |
| PANEL PRIMARY CONTROLLER | N/A | 120 | 5 | | | 0.6 |
| PANEL CONTROLS | N/A | 120 | | | 5 | 0.6 |
| CABINET LIGHT | N/A | 120 | 5 | | | 0.6 |
| CABINET HEATER | N/A | 120 | | | 5 | 0.6 |
| AREA LIGHT | N/A | 120 | 5 | | | 0.6 |
| PANEL RECEPTACEL | N/A | 120 | | | 5 | 0.6 |
| 25% OF LARGEST MOTOR | N/A | 230 | 7.0 | 7.0 | 7.0 | 2.8 |
| TOTAL LOAD | | | 81.2 | 63.0 | 81.2 | 28.7 |
| SERVICE RATING @ 120/240, 3PH, 4W | | | 200.0 | 200.0 | 200.0 | 83.1 |
| SPARE CAPACITY | | | 118.8 | 137.0 | 118.8 | 54.4 |

Notes: SERVICE CONDUCTOR 4 - 1C 3/0.
MAXIMUM AVAILABLE FAULT CURRENT CALCULATED BASED ON FIELD SURVEY. CLOSED DELTA 2 25 + 1 50 KVA POTS, 100 KVA WITH 1.7 %Z USED 10% TOLERANCE. MAX FAULT CURRENT WITHOUT SERVICE CONDUCTOR 15,725 AMPS. 22 KAIC RATED DEVICES AND BRACING. VERIFY IN FIELD WITH POWER COMPANY.

**CABLE AND CONDUIT SCHEDULE LS 53**

| TAG | CONDUIT SIZE | CONDUCTOR CONFIGURATION | LENGTH | TO | FROM | DESCRIPTION |
|---|---|---|---|---|---|---|
| MFR-P1 | 2" | MANUFACTURER | | P1 | WW JBX | PUMP MANUFACTURER CABLE |
| MFR-P2 | 2" | MANUFACTURER | | P2 | WW JBX | PUMP MANUFACTURER CABLE |
| MFR-XDC | 2" | MANUFACTURER | | WW | WW JBX | TRANSDUCER MANUFACTURER CABLE |
| MFR-FS1 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| MFR-FS2 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| B-P1 | 1" | 3-1C #10 With G | | WW JBX | PCP | PUMP 1 JUNCTION BOX BRANCH CIRCUIT |
| MP-P1 | 1" | 6-1C #12 | | WW JBX | PCP | PUMP 1 JUNCTION BOX MOTOR PROTECTION |
| B-P2 | 1" | 3-1C #10 With G | | WW JBX | PCP | PUMP 2 JUNCTION BOX BRANCH CIRCUIT |
| MP-P2 | 1" | 6-1C #12 | | WW JBX | PCP | PUMP 1 JUNCTION BOX MOTOR PROTECTION |
| IS-XDC | 1" | 1-1PR #18 SHLD | | WW JBX | PCP | INTRINSICALLY SAFE ANALOG CIRCUIT |
| IS-FS | 1" | 4-1C #12 | | WW JBX | PCP | INTRINSICALLY SAFE FLOAT CIRCUITS |
| TELE-1 | 1" | 1-2PR #22 TW, SHLD | | TELEPHONE | PCP | AUTO-DAILER PHONE LINE |
| LGT-1 | 1" | 2-1C #12 With G | | AREA LIGHT | PCP | AREA LIGHTING BRANCH CIRCUIT |
| F-1 | 2" | 4-1C 3/0 With G | | MTS | UTIL DISC | MANUAL TRANSFER SWITCH UTILITY FEEDER |
| F-2 | 2" | 4-1C 3/0 With G | | PCP | MTS | PUMP CONTROL PANEL FEEDER |
| S-1 | 2" | 4-1C 3/0 With G | | UTIL DISC | UTIL MTR | UTILITY SERVICE |
| S-2 | 2" | 4-1C 3/0 With G | | MTS | GEN CON | GENERATOR SERIVE CONNECTION |
| UTIL-1 | 2" | 4-1C 3/0 | | UTIL MTR | UTIL | UTILITY SERVICE DROP |

STATE OF TEXAS LON HUBBARD 84363 LICENSED PROFESSIONAL ENGINEER
3/31/2021

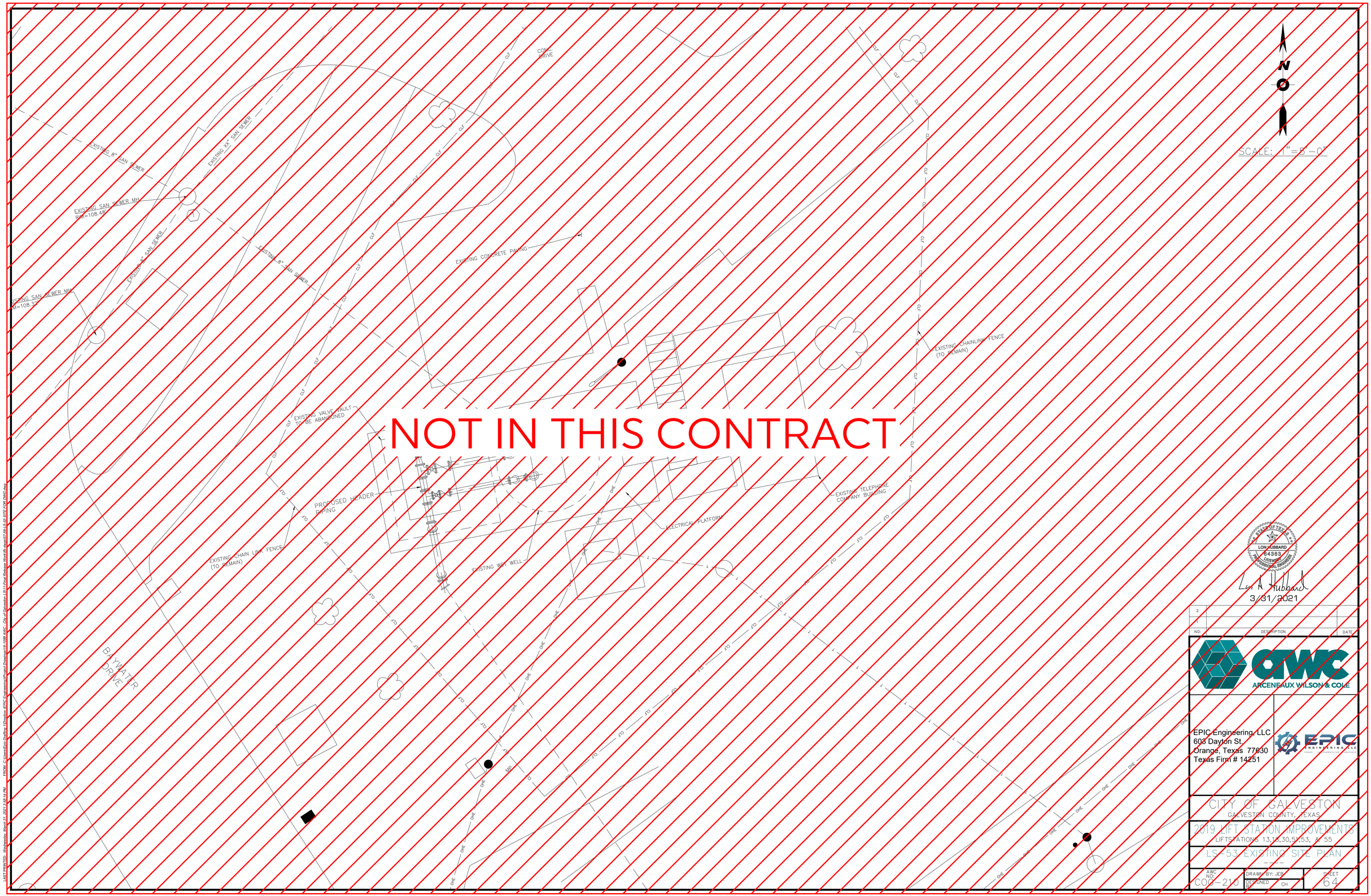
ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55
LS-53 ONE-LINE DIAGRAM

AWC NO: COG-210 | DRAWN BY: JER | DESIGNED CH | SHEET 63

LAST REVISED: Wednesday, March 31, 2021 3:40:11 PM
EBOW: C:\Users\Erin Chaffins\Dropbox (EPIC Engineering)\Project Drawings\19-1009 AWC - City of Galveston LS 51-53\Final Release 3\Print\Lift Station 53 ONE-LINE.dwg




# NOT IN THIS CONTRACT

LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

3/31/2021

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

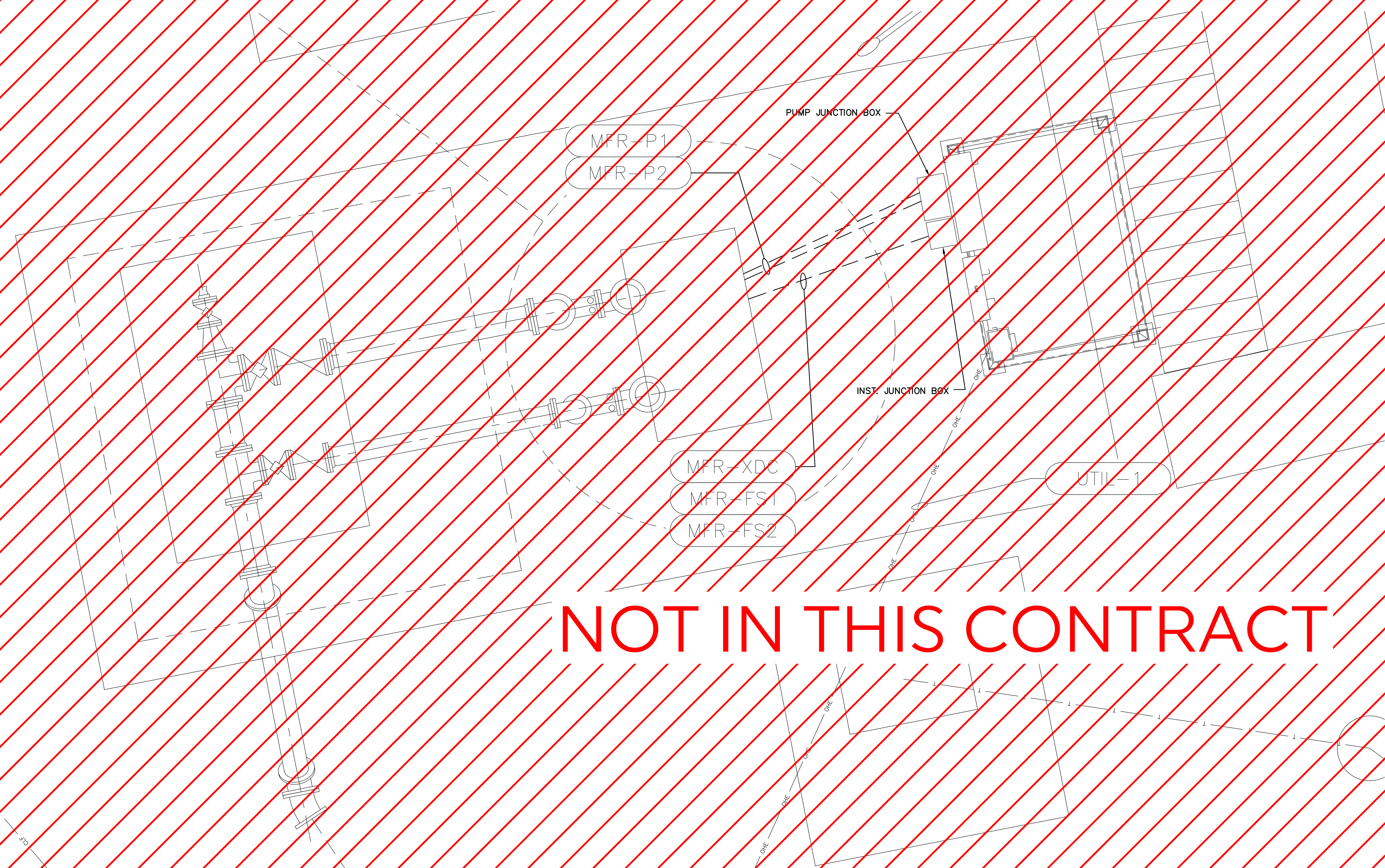
ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,19,30,51,53, & 55
LS-53 EXISTING SITE PLAN

| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG-210 | JEB | 64 |
| | DESIGNED CH | |

LAST PRINTED: Wednesday, March 31, 2021 2:58:54 PM
FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Epic Drawings\19-1009 AWC - City of Galveston LS Lift Pump Rehab Retrofit\dwg\01-04-LS-53 SITE FOR DWG.dwg




NOT IN THIS CONTRACT

## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH CITY POWER DEPARTMENT TO INSTALL NEW UTILITY POLE IF REQUIRED.
3. SEE DETAIL 1 ON DRAWING 59 FOR ELECTRICAL PLATFORM ELEVATION

## REFERENCE DRAWINGS

56..............ONE LINE DIAGRAM
59..........ELECTRICAL RACK ELEVATIONS

**CABLE AND CONDUIT SCHEDULE LS 53**

| TAG | CONDUIT SIZE | CONDUCTOR CONFIGURATION | LENGTH | TO | FROM | DESCRIPTION |
|---|---|---|---|---|---|---|
| MFR-P1 | 2" | MANUFACTURER | | P1 | WW JBX | PUMP MANUFACTURER CABLE |
| MFR-P2 | 2" | MANUFACTURER | | P2 | WW JBX | PUMP MANUFACTURER CABLE |
| MFR-XDC | 2" | MANUFACTURER | | WW | WW JBX | TRANSDUCER MANUFACTURER CABLE |
| MFR-FS1 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| MFR-FS2 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| B-P1 | 1" | 3-1C #6 With G | | WW JBX | PCP | PUMP 1 JUNCTION BOX BRANCH CIRCUIT |
| MP-P1 | 1" | 6-1C #12 | | WW JBX | PCP | PUMP 1 JUNCTION BOX MOTOR PROTECTION |
| B-P2 | 1" | 3-1C #6 With G | | WW JBX | PCP | PUMP 2 JUNCTION BOX BRANCH CIRCUIT |
| MP-P2 | 1" | 6-1C #12 | | WW JBX | PCP | PUMP 1 JUNCTION BOX MOTOR PROTECTION |
| IS-XDC | 1" | 1-1PR #18 SHLD | | WW JBX | PCP | INTRINSICALLY SAFE ANALOG CIRCUIT |
| IS-FS | 1" | 4-1C #12 | | WW JBX | PCP | INTRINSICALLY SAFE FLOAT CIRCUITS |
| TELE-1 | 1" | 1-2PR #22 TW, SHLD | | TELEPHONE | PCP | AUTO-DAILER PHONE LINE |
| LGT-1 | 1" | 2-1C #12 With G | | AREA LIGHT | PCP | AREA LIGHTING BRANCH CIRCUIT |
| F-1 | 2" | 4-1C 3/0 With G | | MTS | UTIL DISC | MANUAL TRANSFER SWITCH UTILITY FEEDER |
| F-2 | 2" | 4-1C 3/0 With G | | PCP | MTS | PUMP CONTROL PANEL FEEDER |
| S-1 | 2" | 4-1C 3/0 With G | | UTIL DISC | UTIL MTR | UTILITY SERVICE |
| S-2 | 2" | 4-1C 3/0 With G | | MTS | GEN CON | GENERATOR SERIVE CONNECTION |
| UTIL-1 | 2" | 4-1C 3/0 | | UTIL MTR | UTIL | UTILITY SERVICE DROP |

LAST PRINTED: Wednesday, March 31, 2021 3:58:15 PM FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Project Drawings\19-1099 AWC - City of Galveston LS\11-Final Release Work\fb dwgs\57-58-LS-53 SITE FOR DWG.dwg

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

Lon A. Hubbard
3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC
POWER · INSTRUMENTATION · CONTROLS

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

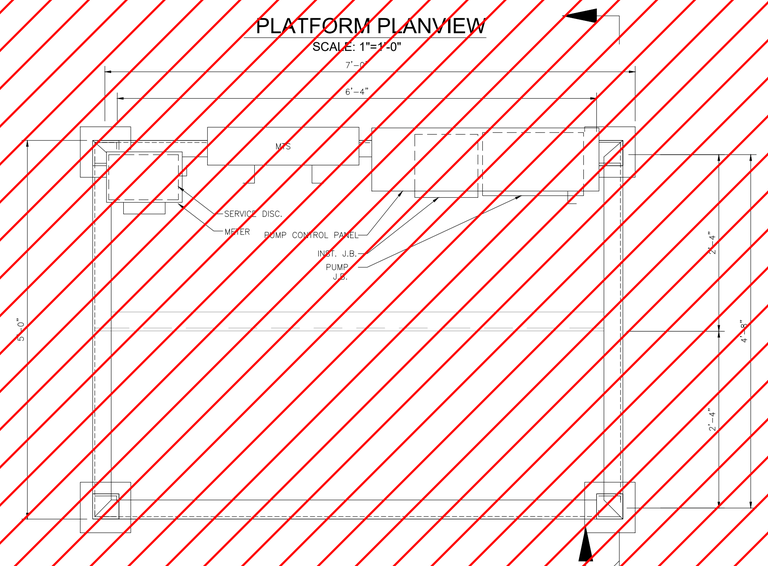
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

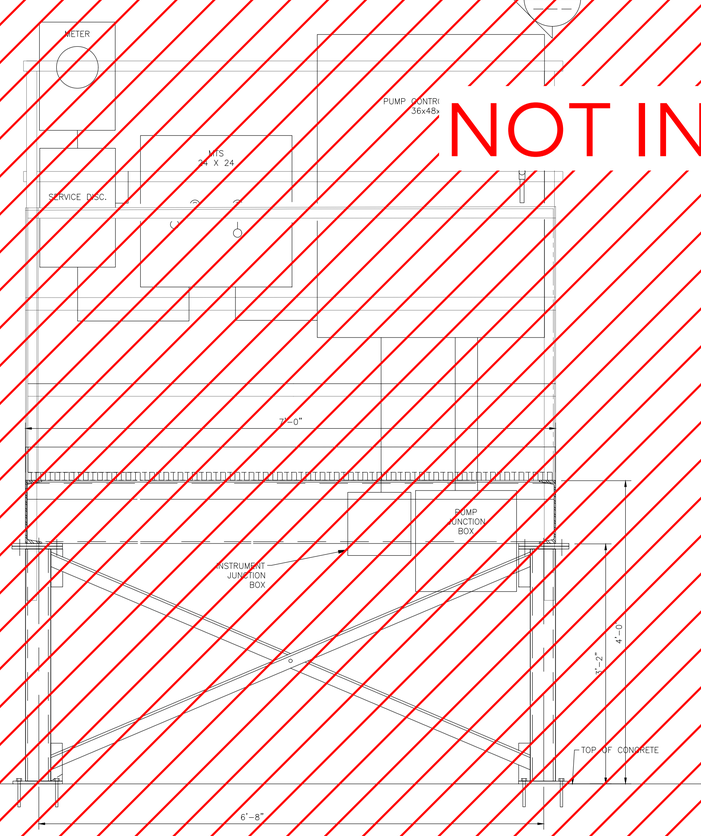
LS-53 PROPOSED SITE PLAN

AWC NO: C06-210
DRAWN BY: JEB
DESIGNED BY: CH
SHEET 65

# PLATFORM PLANVIEW

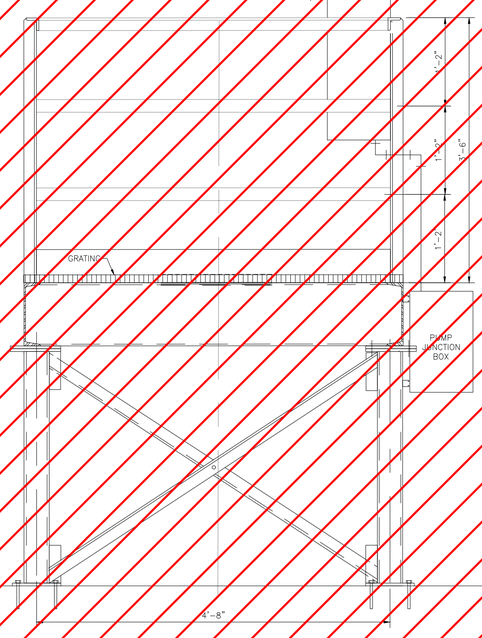
SCALE: 1"=1'-0"




A SECTION

SCALE: 1"=1'-0"




B SECTION

SCALE: 1"=1'-0"

NOT IN THIS CONTRACT

LAST REVISED: Wednesday, March 31, 2021 8:56:18 PM

ERROR: C:\Users\Erica Chaffins 1\Dropbox (EPIC Engineering)\Project Drawings\19-1008 (AWC - City of Galveston LS)\Lift Stations\53 Platform\[COG LIMIT LIFT STATION 53 PLATFORM DETAILS.dwg

LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

L. A. Hubbard

3/31/2021

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE


EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251


CITY OF GALVESTON

GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS

LIFTSTATIONS 13,16,30,51,53 & 55

LS-53 ELECTRICAL PLATFORM ELEVATIONS

| AWC NO. | DRAWN BY: JER | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CH | 66 |

# NOT IN THIS CONTRACT

## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. ELECTRICAL CONTRACTOR SHALL INSTALL PUMP CONTROL PANEL SUPPLIED BY PUMP MANUFACTURER.
3. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL AUTODIALER AND WIRE TO PUMP CONTROL PANEL.
4. ELECTRICAL CONTRACTOR SHALL GROUND FRAME OF GENERATOR IN ACCORDANCE WITH N.E.C. AND MANUFACTURER INSTRUCTIONS.
5. BREAKER SIZES SHOWN ARE PROPOSED AND ACTUAL SIZES DETERMINED BY PUMP CONTROL PANEL MANUFACTURER AND VERIFIED BY INSTALLING ELECTRICIAN.
6. PUMP CONTROL PANEL LABELING SHALL COMPLY WITH NEC ARTICLE 409.
7. VERIFY PUMP CABLE SIZE WITH PUMP MANUFACTURER AND ADJUST CONDUIT & CSBE SIZE AS REQUIRED.
8. HAZARDOUS LOCATION SEALING AND INTRINSIC SAFETY, EXPLOSION PROOF AND EXPLOSION PREVENTION METHODS ARE TO COMPLY WITH TCEQ CHAPTER 217, NEC ARTICLE 500, NFPA 820 REGULATIONS AND STANDARDS. DEVIATIONS FROM DESIGN SHALL BE APPROVED BY OWNER.
9. SEE TIVE STAR ELECTRICAL REFERENCE DRAWINGS AND SPECIFICATION 15443.

**ELECTRICAL LOAD ANALYSIS LS 55**

| LOAD | STARTER SIZE | VOLTS | AMPS A | AMPS B (HIGH-LEG) | AMPS C | KVA |
|---|---|---|---|---|---|---|
| LIFT STATION PUMP #1 (5 HP) | 2 | 230 | 22 | 22 | 22 | 8.8 |
| LIFT STATION PUMP #2 (5 HP) | 2 | 230 | 22 | 22 | 22 | 8.8 |
| PANEL PRIMARY CONTROLLER | N/A | 120 | 5 | | | 0.6 |
| PANEL CONTROLS | N/A | 120 | | | 5 | 0.6 |
| CABINET LIGHT | N/A | 120 | 5 | | | 0.6 |
| CABINET HEATER | N/A | 120 | | | 5 | 0.6 |
| AREA LIGHT | N/A | 120 | 5 | | | 0.6 |
| PANEL RECEPTACEL | N/A | 120 | | | 5 | 0.6 |
| 25% OF LARGEST MOTOR | N/A | 230 | 5.5 | 5.5 | 5.5 | 2.2 |
| TOTAL LOAD | | | 64.5 | 49.5 | 64.5 | 23.3 |
| SERVICE RATING @ 120/240, 3PH, 4W | | | 100 | 100 | 100 | 41.6 |
| SPARE CAPACITY | | | 35.5 | 50.5 | 35.5 | 18.2 |

Notes: SERVICE CONDUCTOR 4 - 1/C #3.
MAXIMUM AVAILABLE FAULT CURRENT CALCULATED BASED ON FIELD SURVEY. OPEN-DELTA 25 kVA POTS. 43 kVA WITH 1.7 %Z USED 10% TOLERANCE. MAX FAULT CURRENT WITHOUT SERVICE CONDUCTOR 6810 AMPS. 14 KAIC RATED DEVICES AND BRACING. VERIFY IN FIELD WITH POWER COMPANY.

**CABLE AND CONDUIT SCHEDULE LS 55**

| TAG | CONDUIT SIZE | CONDUCTOR CONFIGURATION | LENGTH | TO | FROM | DESCRIPTION |
|---|---|---|---|---|---|---|
| MFR-P1 | 2" | MANUFACTURER | | P1 | P1 JBX | PUMP MANUFACTURER CABLE |
| MFR-P2 | 2" | MANUFACTURER | | P2 | P2 JBX | PUMP MANUFACTURER CABLE |
| MFR-XDC | 2" | MANUFACTURER | | WW | WW JBX | TRANSDUCER MANUFACTURER CABLE |
| MFR-FS1 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| MFR-FS2 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| B-P1 | 1" | 3-1C #10 With G | | P1 JBX | PCP | PUMP 1 JUNCTION BOX BRANCH CIRCUIT |
| MP-P1 | 1" | 6-1C #12 | | P1 JBX | PCP | PUMP 1 JUNCTION BOX MOTOR PROTECTION |
| B-P2 | 1" | 3-1C #10 With G | | P2 JBX | PCP | PUMP 2 JUNCTION BOX BRANCH CIRCUIT |
| MP-P2 | 1" | 6-1C #12 | | P2 JBX | PCP | PUMP 1 JUNCTION BOX MOTOR PROTECTION |
| IS-XDC | 1" | 1-1PR #18 SHLD | | INSTR JBX | PCP | INTRINSICALLY SAFE ANALOG CIRCUIT |
| IS-FS | 1" | 4-1C #12 | | INSTR JBX | PCP | INTRINSICALLY SAFE FLOAT CIRCUITS |
| TELE-1 | 1" | 1-2PR #22 TW, SHLD | | TELEPHONE | PCP | AUTO-DAILER PHONE LINE |
| LGT-1 | 1" | 2-1C #12 With G | | AREA LIGHT | PCP | AREA LIGHTING BRANCH CIRCUIT |
| F-1 | 2" | 4-1C #3 With G | | MTS | UTIL DISC | MANUAL TRANSFER SWITCH UTILITY FEEDER |
| F-2 | 2" | 4-1C #3 With G | | PCP | MTS | PUMP CONTROL PANEL FEEDER |
| S-1 | 2" | 4-1C #3 With G | | UTIL DISC | UTIL MTR | UTILITY SERVICE |
| S-2 | 2" | 4-1C #3 With G | | MTS | GEN CON | GENERATOR SERIVE CONNECTION |
| UTIL-1 | 2" | 4-1C #3 | | UTIL MTR | UTIL | UTILITY SERVICE DROP |

LON HUBBARD 64363 LICENSED PROFESSIONAL ENGINEER
3/31/2021

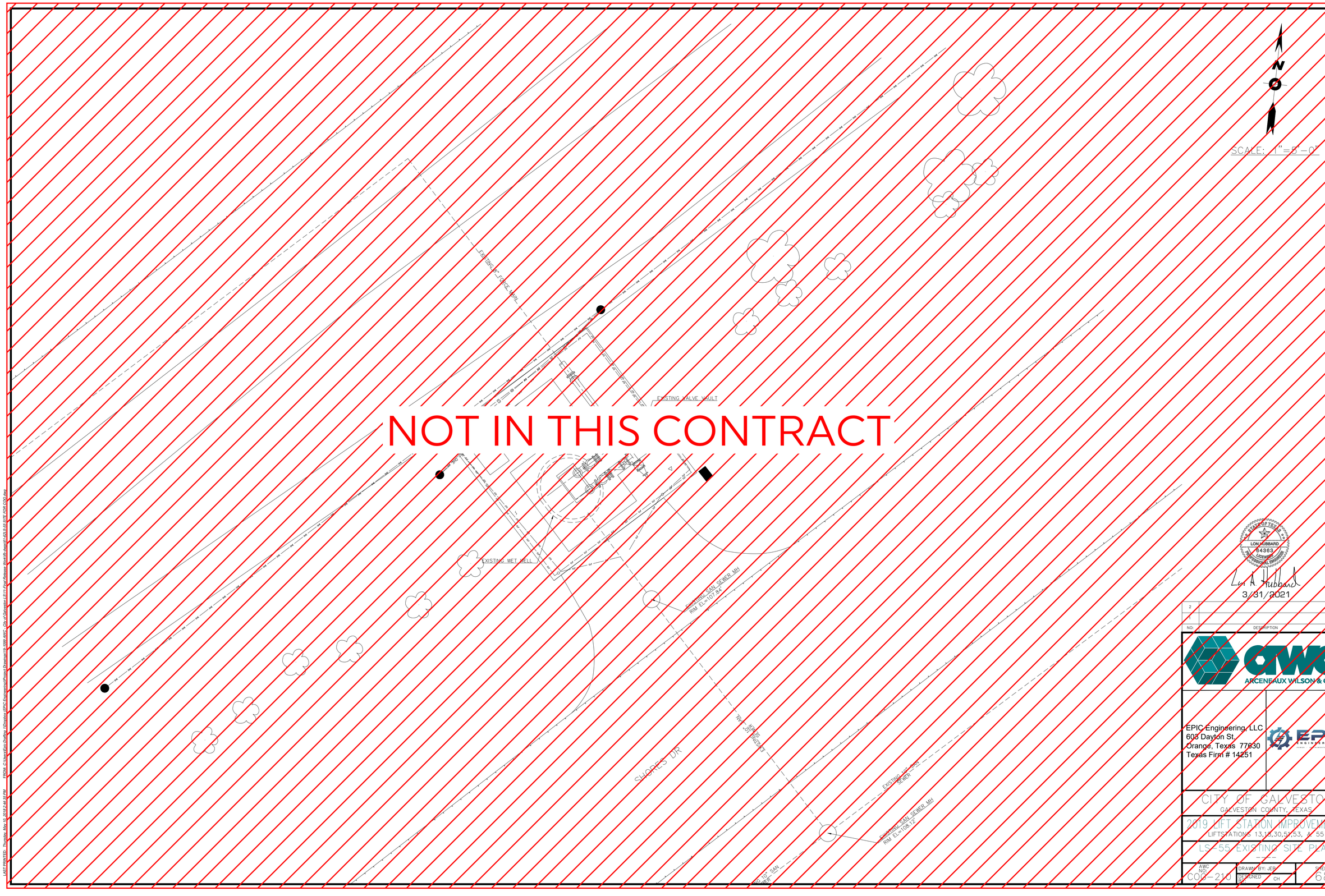
ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55
LS-55 ONE-LINE DIAGRAM

AWC NO: COG-210 | DRAWN BY: JER | DESIGNED CH | SHEET 67

LAST REVISED: Wednesday, March 31, 2021 3:49:23 PM
FROM: C:\Users\Erin Chaffins\Dropbox (EPIC Engineering)\Project Drawings\19-1009 AWC - City of Galveston LS 51 Force Release Work\Drawings\LS-55-ELEC-OneLINE.dwg




NOT IN THIS CONTRACT

LAST PRINTED: Thursday, May 10, 2018 2:44:35 PM
FROM: C:\Users\Erin Dudley\ED\Dudley (EDC Consession)\Shores Drive\ls-55_1999 AWC - City of Galveston LS 51's\Final Release_Wrestle_new\ls55_EXISTING SITE PLAN_COG.dwg

STATE OF TEXAS
LON HUBBARD
84383
LICENSED
PROFESSIONAL ENGINEER
3/31/2021

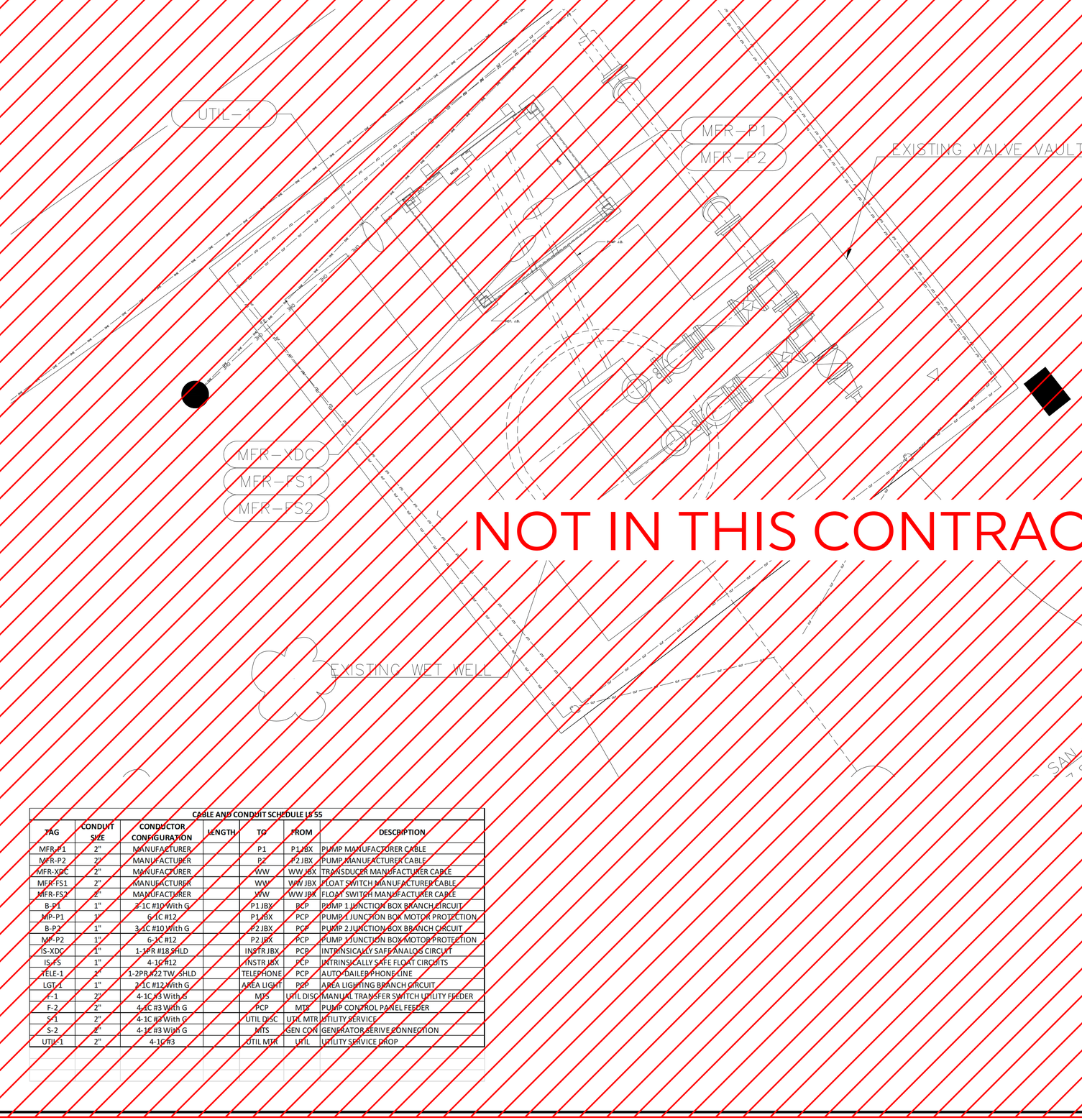
| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55
LS-55 EXISTING SITE PLAN

| AWC NO. | DRAWN BY: JER | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CH | 68 |




# NOT IN THIS CONTRACT

SCALE: 1"=8'-0"

## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH CITY POWER DEPARTMENT TO INSTALL NEW UTILITY POLE IF REQUIRED.
3. SEE DETAIL 1 ON DRAWING FOR ELECTRICAL PLATFORM ELEVATION

**CABLE AND CONDUIT SCHEDULE LS 55**

| TAG | CONDUIT SIZE | CONDUCTOR CONFIGURATION | LENGTH | TO | FROM | DESCRIPTION |
|---|---|---|---|---|---|---|
| MFR-P1 | 2" | MANUFACTURER | | P1 | P1 JBX | PUMP MANUFACTURER CABLE |
| MFR-P2 | 2" | MANUFACTURER | | P2 | P2 JBX | PUMP MANUFACTURER CABLE |
| MFR-XDC | 2" | MANUFACTURER | | WW | WW JBX | TRANSDUCER MANUFACTURER CABLE |
| MFR-FS1 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| MFR-FS2 | 2" | MANUFACTURER | | WW | WW JBX | FLOAT SWITCH MANUFACTURER CABLE |
| B-P1 | 1" | 3-1C #10 With G | | P1 JBX | PCP | PUMP 1 JUNCTION BOX BRANCH CIRCUIT |
| MP-P1 | 1" | 6-1C #12 | | P1 JBX | PCP | PUMP 1 JUNCTION BOX MOTOR PROTECTION |
| B-P2 | 1" | 3-1C #10 With G | | P2 JBX | PCP | PUMP 2 JUNCTION BOX BRANCH CIRCUIT |
| MP-P2 | 1" | 6-1C #12 | | P2 JBX | PCP | PUMP 1 JUNCTION BOX MOTOR PROTECTION |
| IS-XDC | 1" | 1-1PR #18 SHLD | | INSTR JBX | PCP | INTRINSICALLY SAFE ANALOG CIRCUIT |
| IS-FS | 1" | 4-1C #12 | | INSTR JBX | PCP | INTRINSICALLY SAFE FLOAT CIRCUITS |
| TELE-1 | 1" | 1-2PR #22 TW, SHLD | | TELEPHONE | PCP | AUTO-DAILER PHONE LINE |
| LGT-1 | 1" | 2-1C #12 With G | | AREA LIGHT | PCP | AREA LIGHTING BRANCH CIRCUIT |
| F-1 | 2" | 4-1C #3 With G | | MTS | UTIL DISC | MANUAL TRANSFER SWITCH UTILITY FEEDER |
| F-2 | 2" | 4-1C #3 With G | | PCP | MTS | PUMP CONTROL PANEL FEEDER |
| S-1 | 2" | 4-1C #3 With G | | UTIL DISC | UTIL MTR | UTILITY SERVICE |
| S-2 | 2" | 4-1C #3 With G | | MTS | GEN CON | GENERATOR SERIVE CONNECTION |
| UTIL-1 | 2" | 4-1C #3 | | UTIL MTR | UTIL | UTILITY SERVICE DROP |

LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

3/31/2021

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

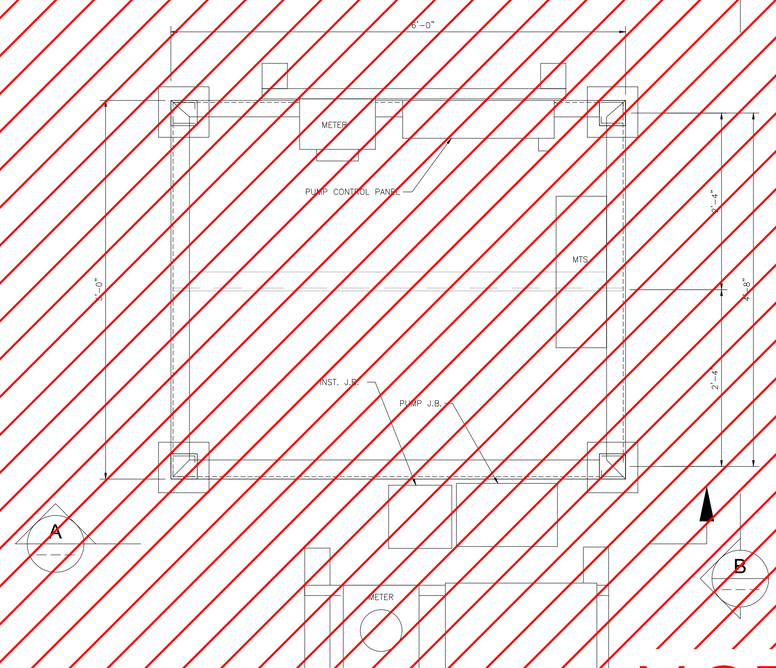
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,19,30,51,53, & 55
LS-55 PROPOSED SITE PLAN

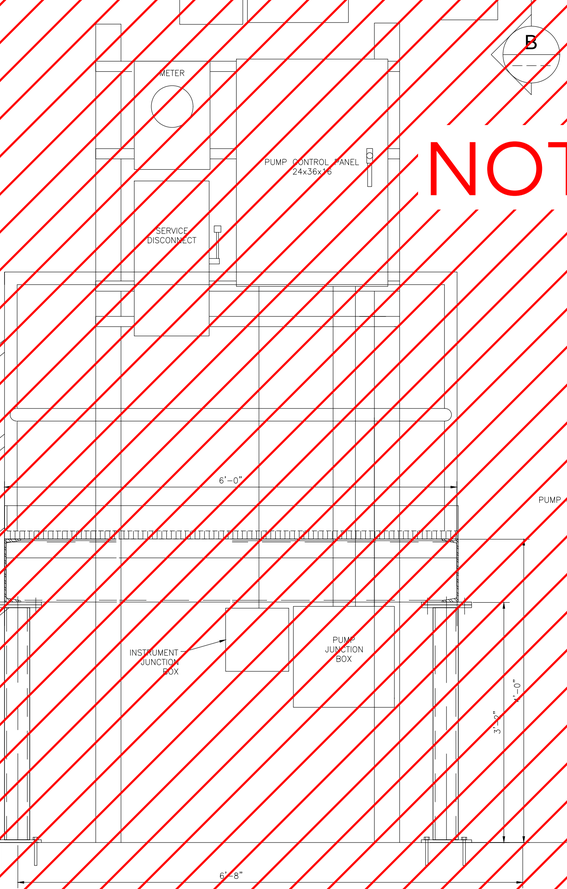
AWC NO: COG-210 | DRAWN BY: JEB | DESIGNED CH | SHEET 69

LAST PRINTED: Thursday, May 13, 2021 7:46:16 AM
FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Shared Drawings\18_009 AWC - City of Galveston LS 51-Final Release Month\Arcen51-55-55_SITE_FOR_COG.dwg

# PLATFORM PLAN VIEW

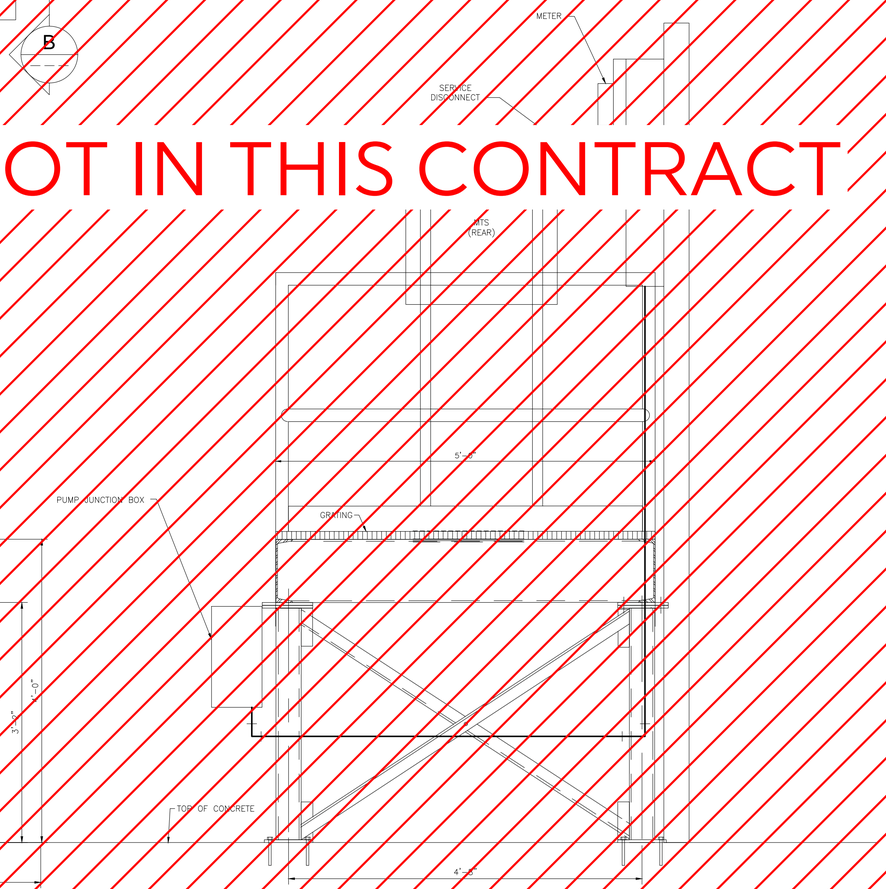
SCALE: 1"=1'-0"




A SECTION

SCALE: 1"=1'-0"




B SECTION

SCALE: 1"=1'-0"

NOT IN THIS CONTRACT

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

3/31/2021

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE


EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251


CITY OF GALVESTON

GALVESTON COUNTY, TEXAS

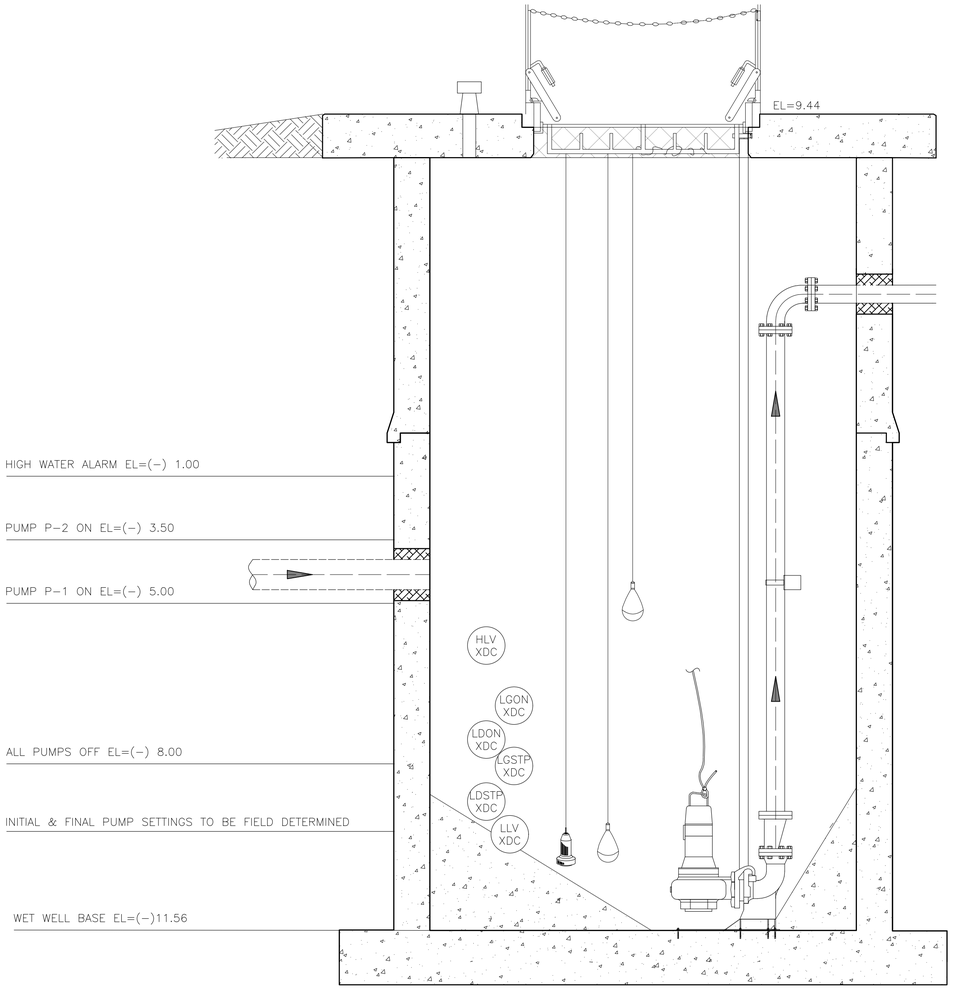
2019 LIFT STATION IMPROVEMENTS

LIFTSTATIONS 13,16,30,51,53 & 55

LS-55 ELECTRICAL PLATFORM ELEVATIONS

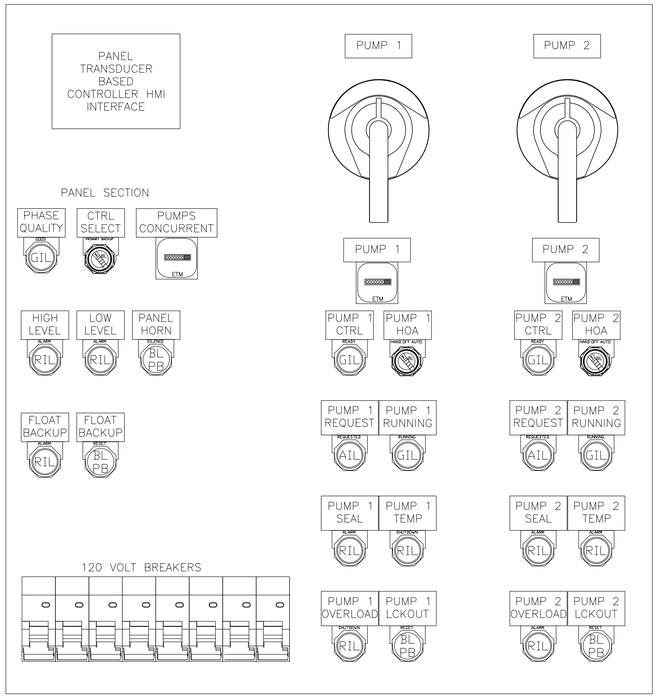
| AWC NO. | DRAWN BY: JER | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CH | 70 |


LAST REPLOTTED: Wednesday, March 31, 2021 8:56:30 PM
FROM: C:\Users\Erin Chaffins 1\Dropbox (EPIC Engineering)\Project Drawings\19-1999 AWC - City of Galveston LS\1-Lift Station Package Work\Lift Stations\COG LIMIT LIFT STATION 55 PLATFORM DETAILS.dwg




## PCP HINGED INNER DOOR INDICATION AND CONTROLS

DIAGRAM PURPOSES ONLY REFER TO SUPPLIED SHOP DRAWING SUPPLIED WITH PANEL FOR ACTUAL



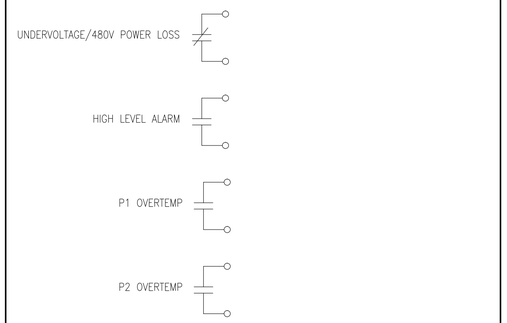

## GENERAL NOTES

1. ALL ELECTRICAL INSTALLATIONS AND MODIFICATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRIC CODE, AND SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
2. CONTRACTOR SHALL FURNISH AND INSTALL NEW PUMP CONTROL PANEL IN ACCORDANCE WITH THE SPECIFICATIONS.
3. ALL ELECTRICAL ENCLOSURES SHALL BE 316 S.S. NEMA 4X.
4. ALL ELECTRICAL EQUIPMENT SHALL BE CORROSION RESISTANT.

| STATION CAUSE AND EFFECT | | | | |
|---|---|---|---|---|
| TAG | NAME | LONG DESCRIPTION | EFFECT | RESET |
| PF-OFF | PHASE FAULT DROP OUT | PHASE LOSS, UNDERVOLTAGE, PHASE IMBALANCE (VOLTAGE ONLY) | INHIBIT PUMP RUN, AUTO DIALER, PANEL LIGHT | AUTO |
| FS2-ON | HIGH HIGH LEVEL FLOAT | WET WELL HIGH HIGH LEVEL BACKUP FLOAT IS ON | AUTO DIALER, PANEL LIGHT, PRIMARY CONTROLLER LOCKOUT, START PUMP DOWN, BEACON\HORN | PANEL PUSH BUTTON |
| HLV-XDC | HIGH WET WELL LEVEL | WET WELL HIGH LEVEL ALARM TRANSDUCER | AUTO DIALER, PANEL LIGHT, BEACON\HORN | AUTO |
| LGON-XDC | WET WELL LAG LEVEL | WET WELL CALL LAG PUMP LEVEL | CALL LAG PUMP, PUMP X REQUESTED PANEL LIGHT | N/A |
| LDON-XDC | WET WELL LEAD LEVEL | WET WELL CALL LEAD PUMP LEVEL | CALL LEAD PUMP, PUMP X REQUESTED PANEL LIGHT | N/A |
| LGSTP-XDC | WET WELL LAG STOP | WET WELL STOP LAG PUMP LEVEL | STOP LAG PUMP | N/A |
| LDSTP-XDC | WET WELL LEAD STOP | WET WELL STOP LEAD PUMP LEVEL | STOP LEAD PUMP, RE-ASSIGN LEAD PUMP | N/A |
| LLV-XDC | WET WELL LOW LEVEL | WET WELL LOW LEVEL ALARM TRANSDUCER | PANEL LIGHT | AUTO |
| FS1-OFF | LOW LOW LEVEL FLOAT | WET WELL LOW LEVEL BACKUP FLOAT IS OFF | AUTO DIALER, PANEL LIGHT, PRIMARY CONTROLLER LOCKOUT, STOP PUMP DOWN, RE-ASSIGN LEAD PUMP, BEACON\HORN | PANEL PUSH BUTTON |
| P1-RQI | PUMP 1 REQUESTED | PUMP 1 REQUESTED TIME DELAY BEFORE START | PANEL LIGHT, START P1 AFTER DELAY | N/A |
| P2-RQI | PUMP 2 REQUESTED | PUMP 2 REQUESTED TIME DELAY BEFORE START | PANEL LIGHT, START P2 AFTER DELAY | N/A |
| P1-RI | PUMP 1 RUNNING | PUMP 1 IS RUNNING | PANEL LIGHT | N/A |
| P2-RI | PUMP 2 RUNNING | PUMP 2 IS RUNNING | PANEL LIGHT | N/A |
| P1-OLRS | PUMP 1 OVERLOAD TRIP | PUMP 1 TRIPPED ON OVERLOAD | PUMP 1 SHUTDOWN, PANEL LIGHT, PUMP 1 LOCKOUT | PUMP 1 PUSH BUTTON |
| P2-OLRS | PUMP 2 OVERLOAD TRIP | PUMP 2 TRIPPED ON OVERLOAD | PUMP 2 SHUTDOWN, PANEL LIGHT, PUMP 2 LOCKOUT | PUMP 2 PUSH BUTTON |
| P1-OTS | PUMP 1 OVERTEMP TRIP | PUMP 1 TRIPPED ON OVER TEMPERATURE | PUMP 1 SHUTDOWN, PANEL LIGHT, PUMP 1 LOCKOUT | PUMP 1 PUSH BUTTON |
| P2-OTS | PUMP 2 OVERTEMP TRIP | PUMP 2 TRIPPED ON OVER TEMPERATURE | PUMP 2 SHUTDOWN, PANEL LIGHT, PUMP 2 LOCKOUT | PUMP 2 PUSH BUTTON |
| P1-SFR | PUMP 1 SEAL FAIL ALARM | PUMP 1 ALARMED ON SEAL FAIL | PANEL LIGHT | AUTO |
| P2-SFR | PUMP 2 SEAL FAIL ALARM | PUMP 2 ALARMED ON SEAL FAIL | PANEL LIGHT | AUTO |
| P1-FR | PUMP 1 FAILED TO RUN | PUMP 1 FAILED TO RUN WHEN REQUESTED | AUTO DIALER, BEACON\HORN | AUTO |
| P2-FR | PUMP 2 FAILED TO RUN | PUMP 2 FAILED TO RUN WHEN REQUESTED | AUTO DIALER, BEACON\HORN | AUTO |

## PCP STATION ALARM DRY CONTACTS FOR EXTERNAL MONITOR

DIAGRAM PURPOSES ONLY REFER TO SUPPLIED SHOP DRAWING SUPPLIED WITH PANEL FOR ACTUAL




PUMP X FAILED TO RUN ALARM PX–FR

PUMP X SEAL FAIL ALARM PX–SFR

PUMP X OVERTEMP SHUTDOWN PX–OTS

PUMP X OVERLOAD SHUTDOWN PX–OLRS

PUMP X RUNNING INDICATION PX–RI

PUMP X REQUESTED INDICATION PX–RQI

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

Lon A. Hubbard

3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

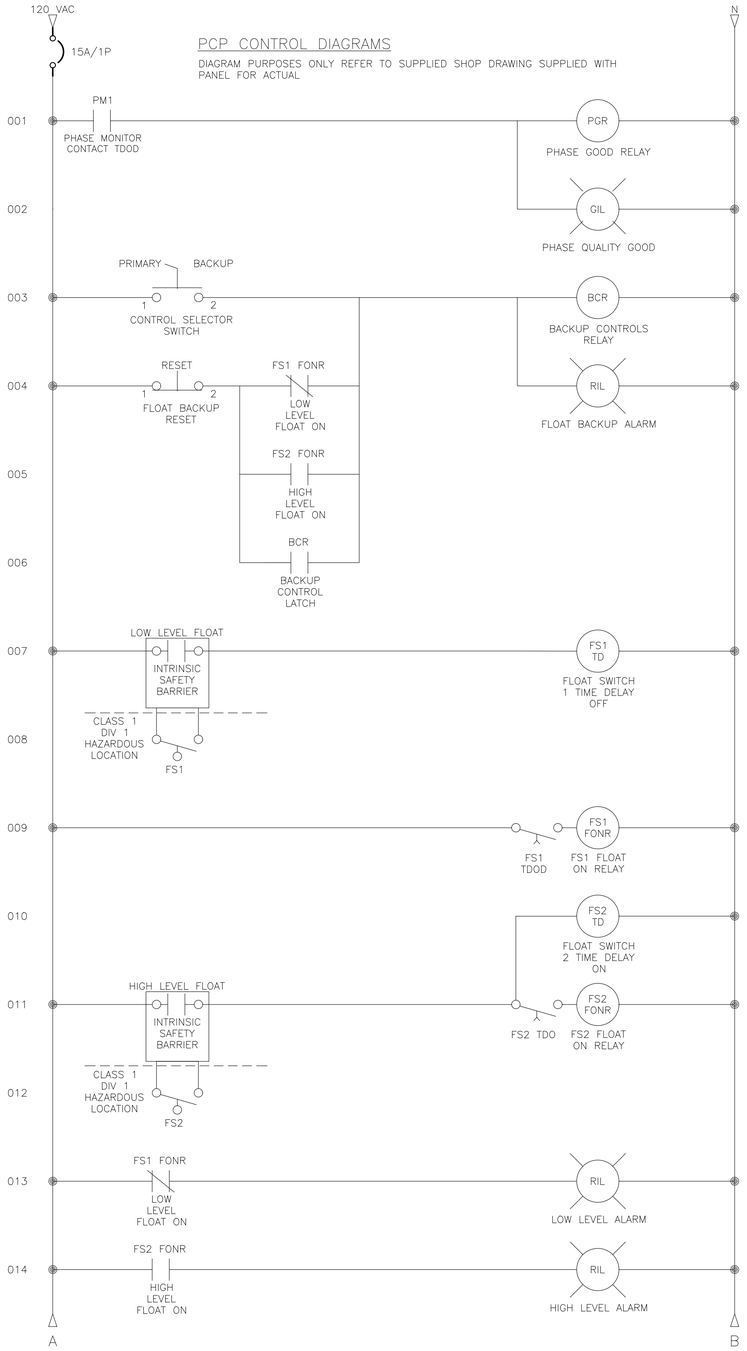
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

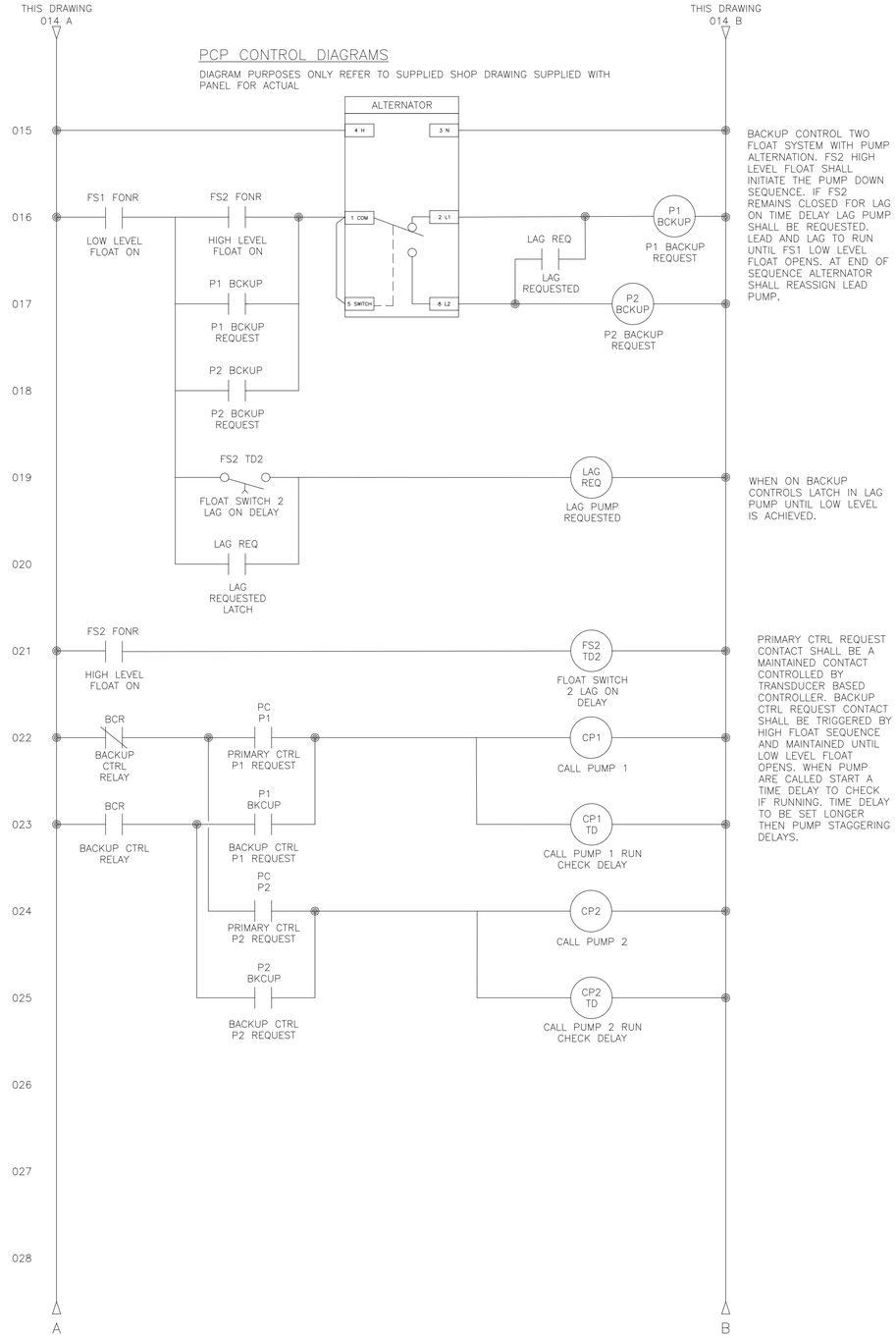
2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

CONTROLS DESCRIPTION

AWC NO: COG–210 | DRAWN BY: JEB | DESIGNED BY: CH | SHEET 71

LAST PRINTED: Wednesday, March 31, 2021 1:58:54 PM FROM: C:\Users\Epic Dwtfpc 1\Dropbox (EPIC Engineering)\Project Drawings\1b-1088 AWC - City of Galveston LS\11-Final Release Work\fb.dwg\64-COG AWC CONTROL DESC_2.dwg




LAST PRINTED: Wednesday, March 31, 2021 1:58:37 PM FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Project Drawings\14-1099 AWC - City of Galveston ( 5411-Final Release Work\Lift stns\COG AWC CTRL Diagrams dwt 1.dwg

LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

Lon A. Hubbard
3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

CONTROLS DESCRIPTION
---

| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CH | 72 |

DRAWING XXX SHT 1
028 A

# PCP CONTROL DIAGRAMS

DIAGRAM PURPOSES ONLY REFER TO SUPPLIED SHOP DRAWING SUPPLIED WITH PANEL FOR ACTUAL

029
030
031
032
033
034
035
036
037
038
039
040
041
042

PUMP 1 HOA
PGR — PHASE QUALITY GOOD
FS1 FONR — FS1 FLOAT ON RELAY
P1 OTS — P1 OVER TEMP SHUTDOWN
P1 LKOUT — P1 LOCKOUT
H O A XOO
OOX
CP1 — CALL PUMP 1 AUTO
P1 TD — P1 START DELAY
P1 TDO
P1 — P1 RUN COIL
OLs — P1 OVERLOADS
AIL — PUMP 1 REQUESTED
GIL — PUMP 1 READY

PUMP 2 HOA
P2 OTS — P2 OVER TEMP SHUTDOWN
P2 LKOUT — P2 LOCKOUT
H O A XOO
OOX
CP2 — CALL PUMP 2 AUTO
P2 TD — P2 START DELAY
P2 TDO
P2 — P2 RUN COIL
OLs — P2 OVERLOADS
AIL — PUMP 2 REQUESTED
GIL — PUMP 2 READY

P1 ISW — P1 RUN SWITCH VIA CT
GIL — PUMP 1 RUNNING
P1 ARR — PUMP 1 AUX RUN RELAY
ETM — PUMP 1 ELAPSE TIME

P2 ISW — P2 RUN SWITCH VIA CT
GIL — PUMP 2 RUNNING
P2 ARR — PUMP 2 AUX RUN RELAY
ETM — PUMP 2 ELAPSE TIME

PUMP RUN LOGIC. PUMP RUN PERMISSIVE LOGIC IS TO INCLUDE LOW LEVEL FLOAT ON, NOT PUMP OVER-TEMP ALARM, AND PHASE QUALITY MUST BE GOOD. WHEN IN AUTO THE PUMP IS EITHER CALLED BY TRANSDUCER BASED PUMP CONTROLLER OR BACKUP FLOAT SYSTEM. TYPICAL OVERLOAD PROTECTION REQUIRED. TIME DELAYED START REQUIRED TO STAGGER P1 & P2 IN ORDER TO PREVENT STARTING AT SAME TIME.

DRAWING XXX SHT 1
028 B

A
B

THIS DRAWING
042 A

# PCP CONTROL DIAGRAMS (CONT.)

DIAGRAM PURPOSES ONLY REFER TO SUPPLIED SHOP DRAWING SUPPLIED WITH PANEL FOR ACTUAL

043
044
045
046
047
048
049
050
051
052
053
054
055
056

P1 ARR — P1 RUNNING
P2 ARR — P2 RUNNING
ETM — CONCURRENT ELAPSE TIME

PUMP 1 OVER TEMP
COM — NC — HOLD CLOSED, OPEN ON FAULT
PROBE
PROBE
P1 OTS — PUMP 1 OVER TEMP SHUTDOWN RELAY
CLASS 1 DIV 1 HAZARDOUS LOCATION EXPLOSION PROOF PUMP HOUSING
P1 OVRT — OVER TEMP DETECTION SUPPLIED BY PUMP MANUFACTURER

OLs
P1 OVERLOADS
P1 OLRS — PUMP 1 OVERLOAD SHUTDOWN RELAY

P1 RESET
PUMP 1 RESET
P1 OTS — P1 OVER TEMP SHUTDOWN
P1 OTLCK — P1 OVER TEMP LOCKOUT
P1 OLRS — P1 OVERLOAD SHUTDOWN
P1 OLLCK — P1 OVERLOAD LOCKOUT

P1 OTLCK — PUMP 1 OVER TEMP LOCKOUT
RIL — PUMP 1 OVER TEMP SHUTDOWN
P1 OLLCK — PUMP 1 OVERLOAD LOCKOUT
RIL — PUMP 1 OVERLOAD SHUTDOWN

P1 OLLCK — P1 OVER TEMP LOCKOUT
P1 OLLCK — P1 OVERLOAD LOCKOUT
P1 LKOUT — PUMP 1 LOCKOUT

PUMP 1 SEAL FAIL
COM — NC — CLOSE ON FAULT
PROBE
PROBE
P1 SFR — PUMP 1 SEAL FAIL RELAY
CLASS 1 DIV 1 HAZARDOUS LOCATION EXPLOSION PROOF PUMP HOUSING
P1 SFR — SEAL FAIL DETECTION SUPPLIED BY PUMP MANUFACTURER
RIL — PUMP 1 SEAL FAIL ALARM

CP1 — PUMP 1 CALLED
P1 ARR — PUMP 1 AUX RUN RELAY
CP1 TD — CALL PUMP 1 RUN CHECK DELAY
P1 FR — PUMP 1 FAULT RELAY

PUMP SHUTDOWN AND RESET LOGIC. PUMPS ARE REQUIRED TO SHUTDOWN AND BE LOCKED OUT ON OVER TEMP AND OVERLOAD. RESET BUTTON ASSOCIATED WITH PUMP WILL RESET THE SHUTDOWN LOCKOUT. INDICATION LIGHTS ON INNER DOOR FOR EACH SHUTDOWN CONDITION. LOGIC REDUCTION BASED ON PROTECTION DEVICE CAPABILITIES ACCEPTABLE. SEAL FAILURE SHALL ILLUMINATE PANEL LIGHT BUT SHALL NOT SHUTDOWN PUMP. PUMP OVERALL FAULT SHALL BE DETECTED BY PUMP FAILED TO RUN LOGIC. PUMP FAILURE SHALL SOUND HORN, ILLUMINATE PANEL BEACON, AND CALL OUT ON AUTO DIALER PER TCEQ REQUIREMENT.

THIS DRAWING
042 B

A
B

LAST PRINTED: Wednesday, March 31, 2021 3:58:40 PM
FROM: C:\Users\Epic Dunlop 1\Dropbox (EPIC Engineering)\Project Drawings\19-1006 AWC - City of Galveston LS\11-Final Release Work\Bryan\CoG AWC CTRL Diagrams Sht 2.dwg

LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

Lon A. Hubbard
3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2. | | |
| 1. | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC
POWER · INSTRUMENTATION · CONTROLS

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

CONTROLS DESCRIPTION

| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG-210 | JEB | 73 |
| | DESIGNED BY: CH | |

DRAWING XXX SHT 2
056 A

DRAWING XXX SHT 2
056 B

# PCP CONTROL DIAGRAMS

DIAGRAM PURPOSES ONLY REFER TO SUPPLIED SHOP DRAWING SUPPLIED WITH PANEL FOR ACTUAL

057 — PUMP 2 OVER TEMP (COM, NC, HOLD CLOSED OPEN ON FAULT, PROBE, PROBE) — P2 OTS — PUMP 2 OVER TEMP SHUTDOWN RELAY

058 — CLASS 1 DIV 1 HAZARDOUS LOCATION EXPLOSION PROOF PUMP HOUSING — P2 OVRT — OVER TEMP DETECTION SUPPLIED BY PUMP MANUFACTURER

OLs

059 — P2 OVERLOADS — P2 OLRS — PUMP 2 OVERLOAD SHUTDOWN RELAY

060 — P2 RESET (1, 2) PUMP 2 RESET — P2 OTS P2 OVER TEMP SHUTDOWN — P2 OTLCK PUMP 2 OVER TEMP LOCKOUT

061 — P2 OTLCK P2 OVER TEMP LOCKOUT — RIL PUMP 2 OVER TEMP SHUTDOWN

062 — P2 OLRS P2 OVERLOAD SHUTDOWN — P2 OLLCK PUMP 2 OVERLOAD LOCKOUT

063 — P2 OLLCK P2 OVERLOAD LOCKOUT — RIL PUMP 2 OVERLOAD SHUTDOWN

064 — P2 OLLCK P2 OVER TEMP LOCKOUT — P2 LKOUT PUMP 2 LOCKOUT

065 — P2 OLLCK P2 OVERLOAD LOCKOUT

066 — PUMP 2 SEAL FAIL (COM, NC, CLOSE ON FAULT, PROBE, PROBE) — P2 SFR PUMP 2 SEAL FAIL RELAY

067 — CLASS 1 DIV 1 HAZARDOUS LOCATION EXPLOSION PROOF PUMP HOUSING — P2 SFR SEAL FAIL DETECTION SUPPLIED BY PUMP MANUFACTURER — RIL PUMP 2 SEAL FAIL ALARM

068 — CP2 PUMP 2 CALLED — P2 ARR PUMP 2 AUX RUN RELAY — CP2 TD CALL PUMP 2 RUN CHECK DELAY — P2 FR PUMP 2 FAULT RELAY

069

070

A — B

P2 OVERLOAD SHUTDOWN AND RESET LOGIC. PUMPS ARE REQUIRED TO SHUTDOWN AND BE LOCKED OUT ON OVER TEMP AND OVERLOAD. RESET BUTTON ASSOCIATED WITH PUMP WILL RESET THE SHUTDOWN LOCKOUT. INDICATION LIGHTS ON INNER DOOR FOR EACH SHUTDOWN CONDITION. LOGIC REDUCTION BASED ON PROTECTION DEVICE CAPABILITIES ACCEPTABLE. SEAL FAILURE SHALL ILLUMINATE PANEL LIGHT BUT SHALL NOT SHUTDOWN PUMP. PUMP OVERALL FAULT SHALL BE DETECTED BY PUMP FAILED TO RUN LOGIC. PUMP FAILURE SHALL SOUND HORN, ILLUMINATE PANEL BEACON, AND CALL OUT ON AUTO DIALER PER TCEQ REQUIREMENT.

THIS DRAWING
070 A

THIS DRAWING
070 B

# PCP CONTROL DIAGRAMS (CONT.)

DIAGRAM PURPOSES ONLY REFER TO SUPPLIED SHOP DRAWING SUPPLIED WITH PANEL FOR, ACTUAL

071 — ALARM TEST (1, 2) PUSH TO TEST ALARM — HRNR HORN RELAY — PANEL HORN

072 — PC HRN PRIMARY CONTROLLER HORN — SILENCE (1, 2) PUSH TO SILENCE HORN — HRN QUIET HORN SILENCE RELAY

073 — P1 FR PUMP 1 FAULT RELAY — HRN QUIET HORN SILENCE RELAY

074 — P2 FR PUMP 2 FAULT RELAY — RRB PANEL RED ROTATING BEACON

075 — FS2 FONR HIGH LEVEL FLOAT ON RELAY

076

A — B

IF MONITORED SCADA SYSTEM IS NOT PRESENT, TCEQ REQUIRES HORN AND BEACON ALERTS FOR PUMP FAILURES AND WELL HIGH LEVEL. POWER FAILURE ALERTS WILL BE PERFORMED BY AUTO DIALER. PANEL SILENCE WILL SILENCE HORN. ALARM CONDITIONS MAY STILL BE PRESENT AND INDICATED BY PANEL LIGHTS.

077

120_VAC — N

078 — 20A/1P DS1 DOOR SWITCH CLOSE ON OPEN DOOR — DOR DOOR OPEN RELAY

079 — LED PANEL CONVENIENCE LIGHT

080

C — D

081

082

083

084

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

Lon A. Hubbard
3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

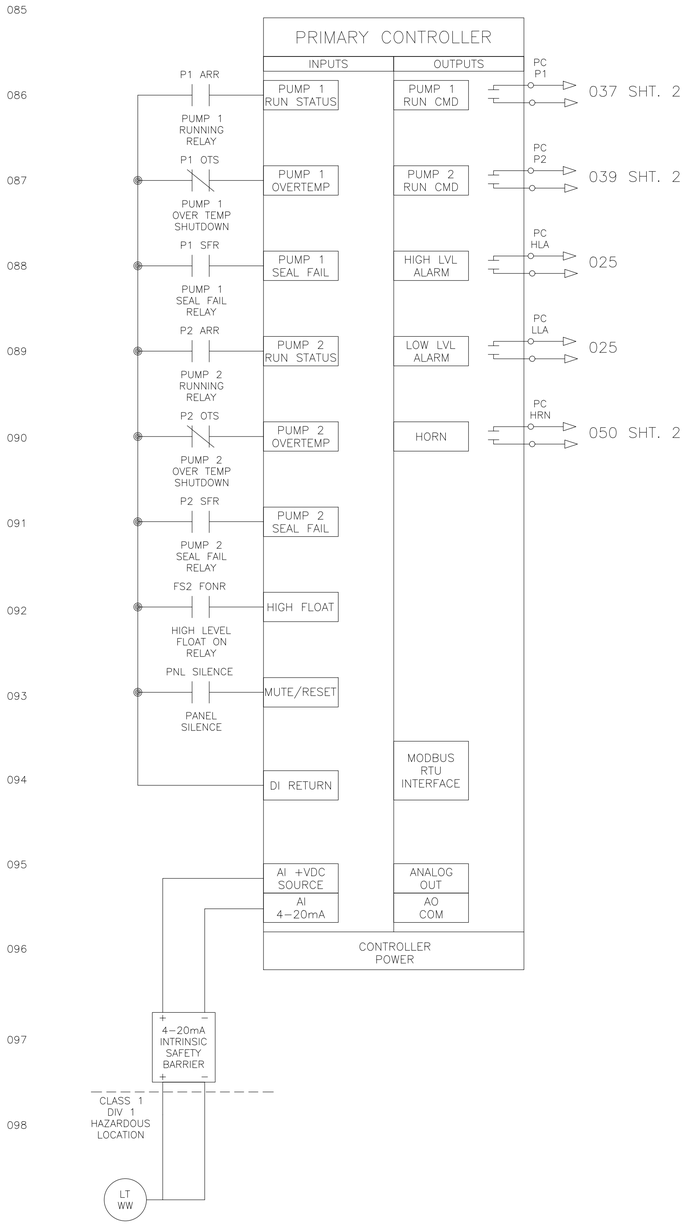
CONTROLS DESCRIPTION

| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG-210 | JEB | 74 |
| | DESIGNED BY: CH | |

LAST PRINTED: Wednesday, March 31, 2021 8:58:44 AM FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Project Drawings\19-1008 AWC - City of Galveston LS\11-Final Release Work\Rs-dwg\P7-Co3 AWC CTRL Diagrams Sht 3.dwg

## PCP CONTROL DIAGRAMS

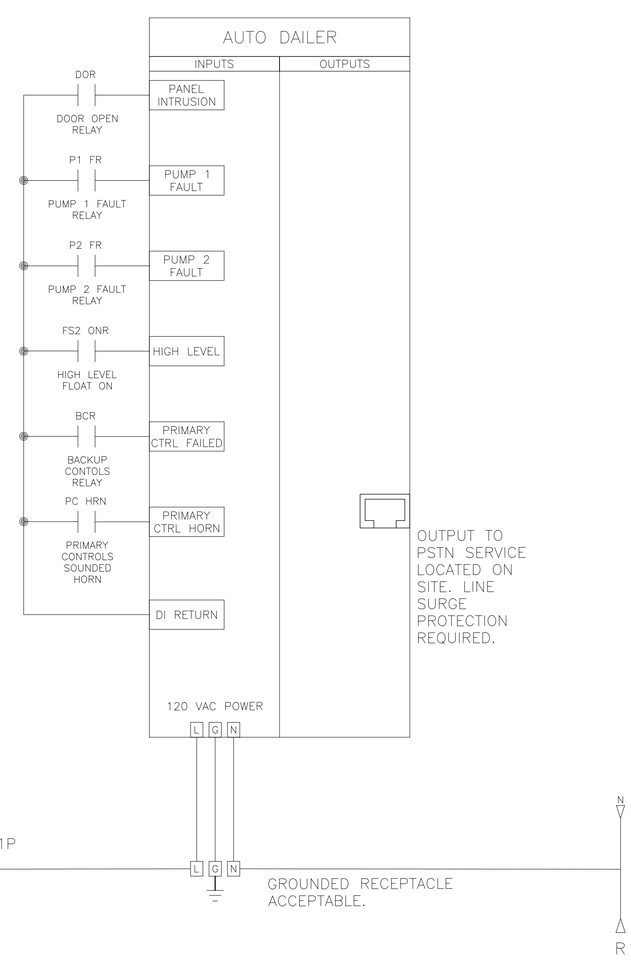
DIAGRAM PURPOSES ONLY REFER TO SUPPLIED SHOP DRAWING SUPPLIED WITH PANEL FOR ACTUAL




PRIMARY CONTROLLER SHALL BE A LEVEL TRANSDUCER BASE CONTROLLER 4–20mA INPUT. TRANSDUCER SHALL BE WIRED USING INTRINSIC SAFETY WIRING METHODS. PANEL MANUFACTURE TO DETERMINE AND PROVIDE CONTROLLER POWER REQUIREMENTS. PRIMARY CONTROLLER POWER SOURCE TO BE DERIVED FROM 120VAC BREAKER DEDICATED TO THE CONTROLLER. THE CONTROLLER SHALL BE AN OFF THE SHELF MICROPROCESSOR BASED CONTROLLER DESIGNED FOR PUMP DOWN PURPOSES. PROGRAMMABLE LOGIC CONTROLLERS WITH CUSTOM SOFTWARE ARE UNACCEPTABLE.

## PCP CONTROL DIAGRAMS (CONT.)

DIAGRAM PURPOSES ONLY REFER TO SUPPLIED SHOP DRAWING SUPPLIED WITH PANEL FOR ACTUAL




IF MONITORED SCADA SYSTEM IS NOT PRESENT, TCEQ REQUIRES THE USE OF AN AUTO DIALER THE DIALS OUT FOR POWER OUTAGES, PUMP FAILURES, AND HIGH WATER LEVELS.

STATE OF TEXAS
LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER

Lon A. Hubbard
3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |


ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

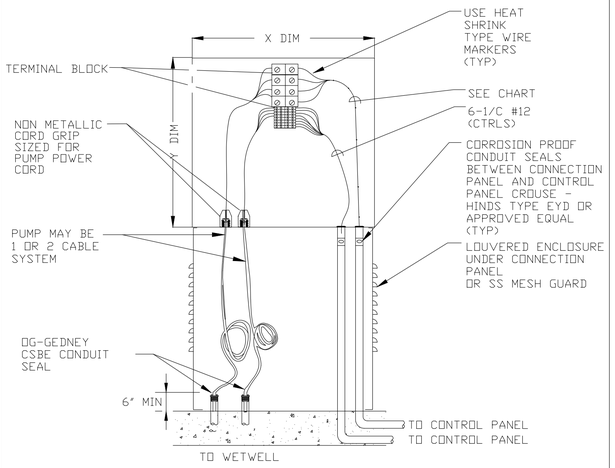

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

CONTROLS DESCRIPTION
---

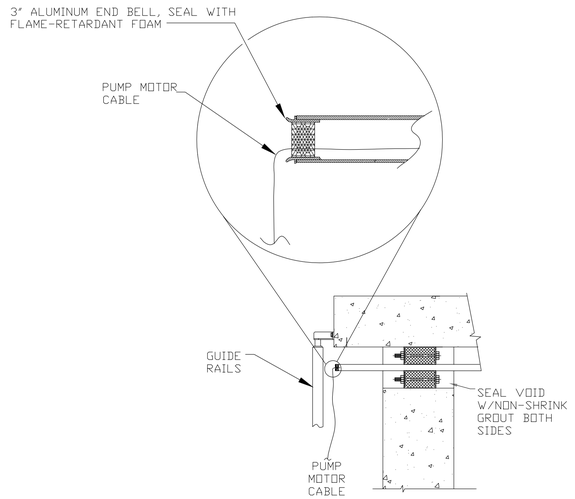
| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG–210 | JEB | 75 |
| | DESIGNED BY: CH | |


LAST PRINTED: Wednesday, March 31, 2021 3:58:47 PM FROM: C:\Users\Epic Dwtfpy 1\Dropbox (EPIC Engineering)\Project Drawings\19-1008 AWC - City of Galveston LS\11-Final Release Work\Br.dwg\BrDwCv2 AWC CTRL Diagrams SH 4.dwt dwg




PUMP CONNECTION PANEL DETAIL

RESERVED
FOR
STARTER SIZE TABLE

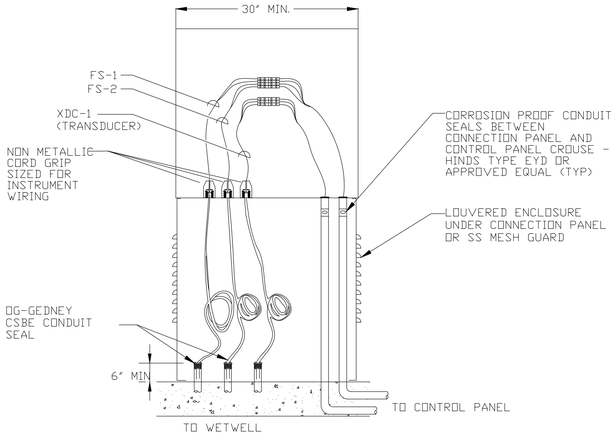



NTS

GUIDE RAIL AND PUMP CONDUIT

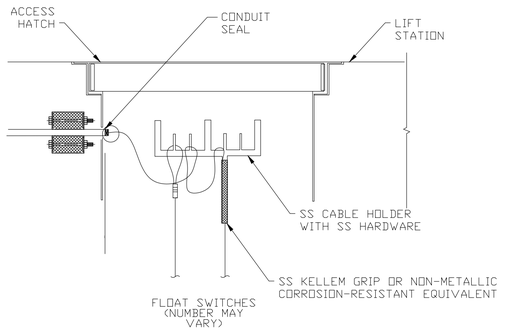
NTS

XXXXXXXXXXXXXXXXXXXXXX



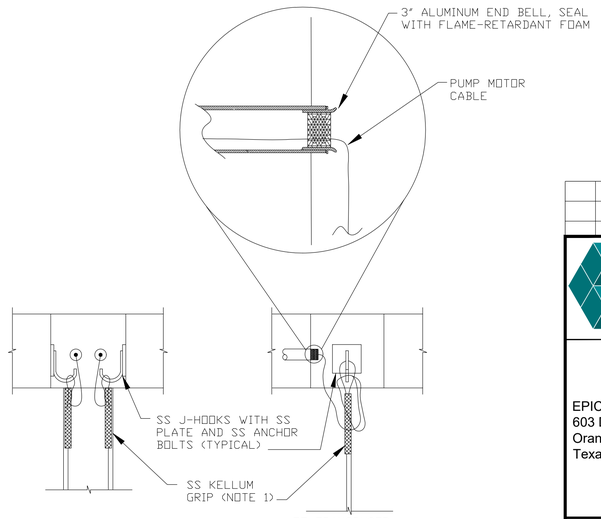

NTS

FLOAT SWITCHES AND TRANSDUCER CONNECTION PANEL DETAIL




NTS

PUMP CABLE INSTALLATION DETAIL




TRANSDUCER AND FLOATS J-HOOK

PUMP CABLE INSTALLATION DETAIL -2

Lon A. Hubbard
3/31/2021

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

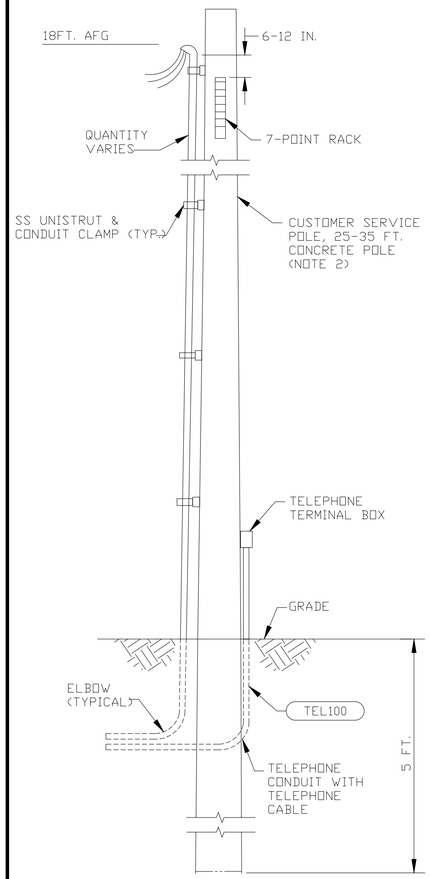
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

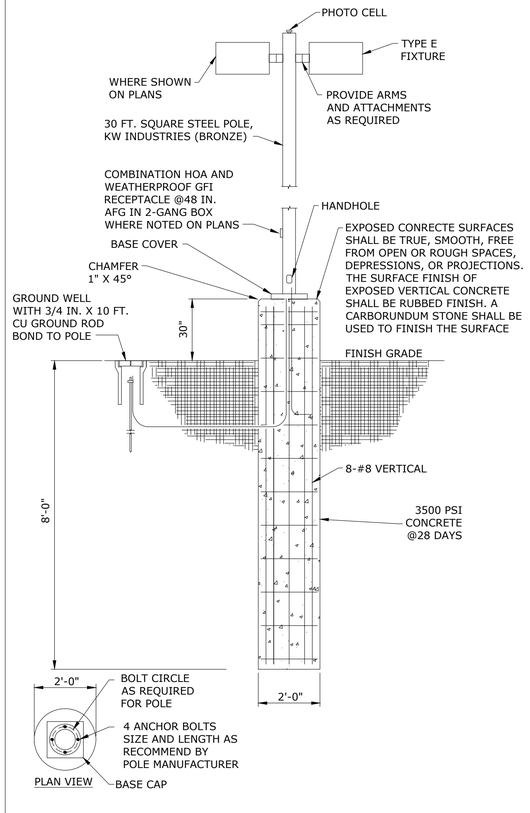
ELECTRICAL DETAILS SHT 1

| AWC NO: | DRAWN BY: JEB | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CH | 76 |

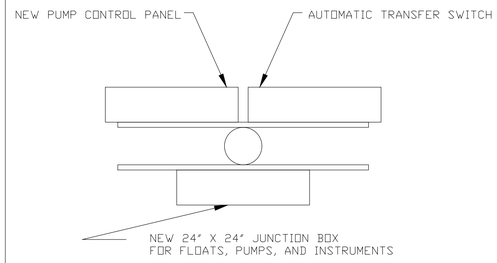
LAST PRINTED: Wednesday, March 31, 2021 1:58:50 PM FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Project Drawings\19-1008 AWC - City of Galveston LS\11-Final Release Work\fls-dwg\05-Civil\ AWC ELEC DETAILS SHT 1.vdx dwg



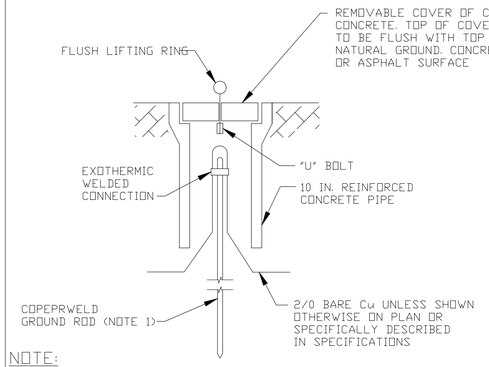

## SERVICE POLE DETAIL




## LIGHT POLE AND FOUNDATION DETAIL



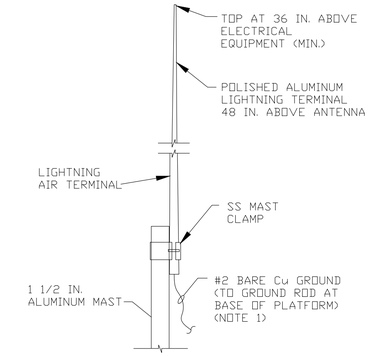

## LS-13 POLE MOUNTING DETAIL




NOTE:

1. GROUND ROD SHALL BE IN 3/4 IN. X 20 FT. FOR SURGE PROTECTION GROUND AND LIGHTNING PROTECTION SYSTEMS. ALL OTHER APPLICATIONS SHALL BE 3/4 IN. X 10 FT.

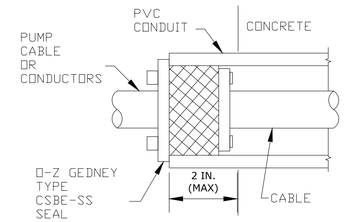
## GROUND WELL DETAIL



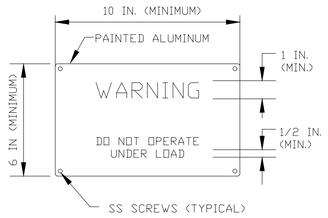

NOTE:

1. GROUND TERMINAL BY EXOTHERMIC CONNECTION TO STEEL RAIL.

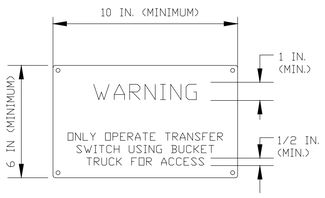
## LIGHTNING TERMINAL DETAIL



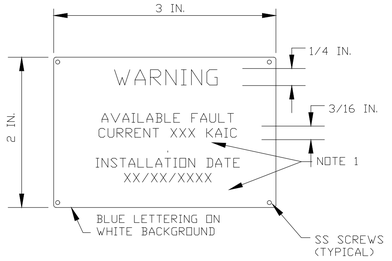

## CONDUIT SEAL DETAIL




## DO NOT OPERATE WARNING SIGN DETAIL




## DO NOT OPERATE WARNING SIGN DETAIL




NOTE:

1. CONTRACTOR TO FILL AVAILABLE FAULT CURRENT KAIC BASED ON DATA OUTLET STATEMENT FROM ELECTRICAL PROVIDER.

## FAULT CURRENT WARNING SIGN DETAIL

LAST PRINTED: Wednesday, March 31, 2021 1:58:54 PM FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Project Drawings\19-1089 AWC - City of Galveston LS 11-Five\Release Wealth Depot\DrCoG AWC ELEC DETAILS SHT 2.dwfmp

LON HUBBARD 64363 LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

Lon A. Hubbard
3/31/2021

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

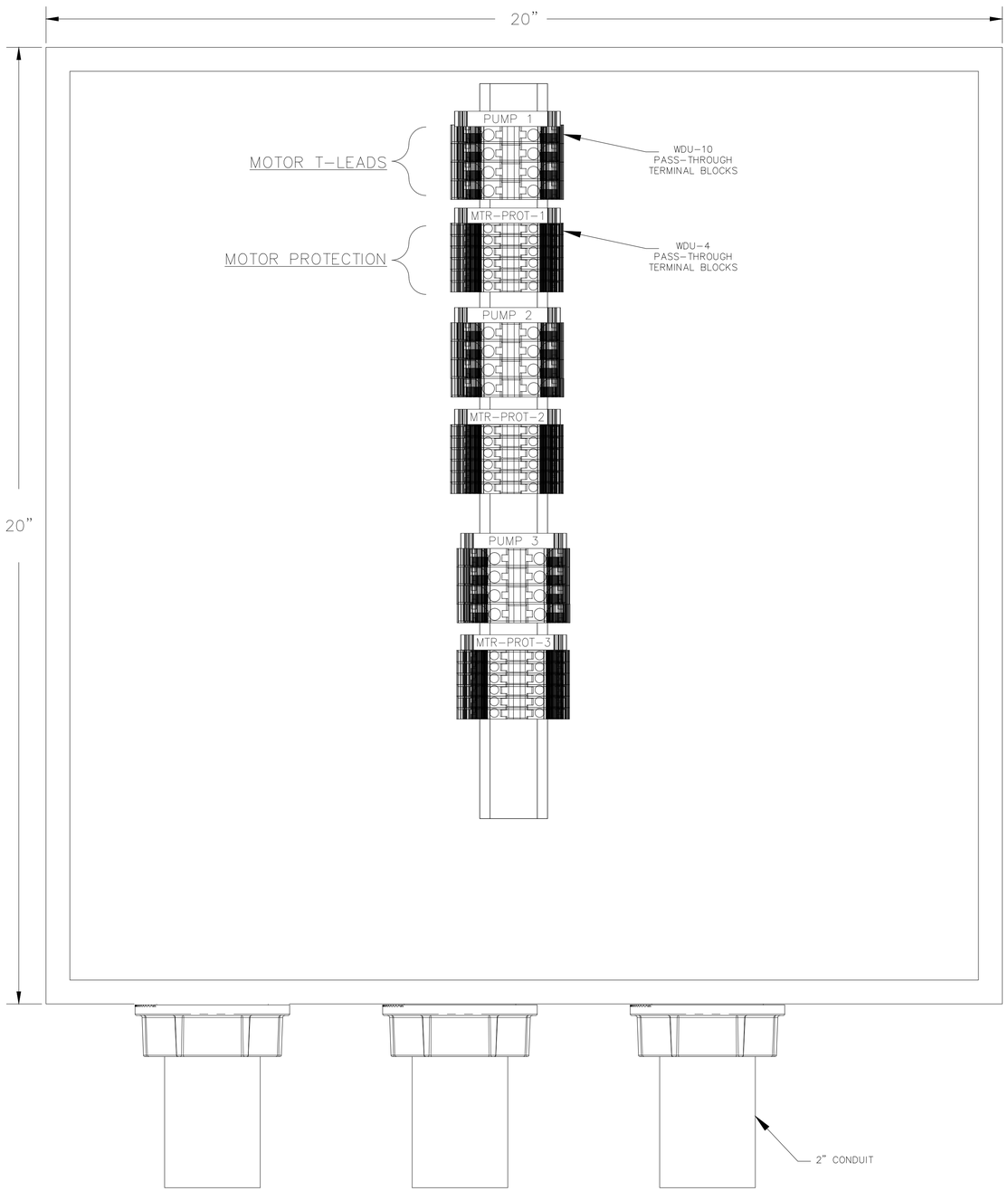
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53, & 55

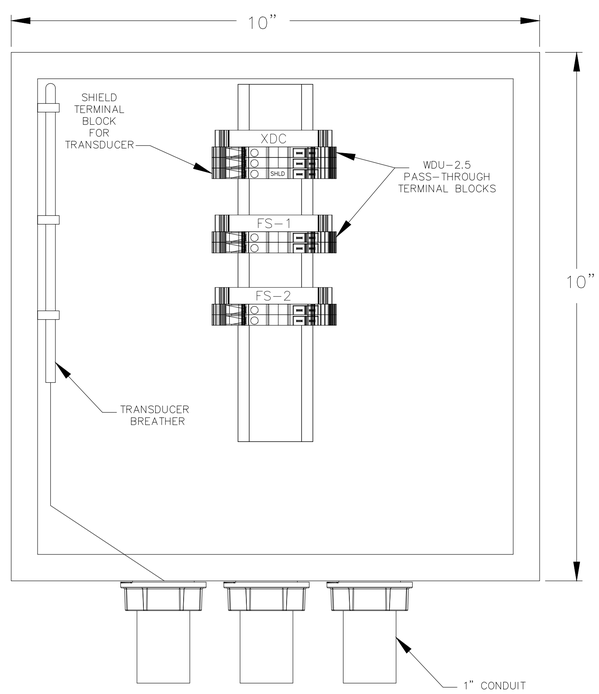
ELECTRICAL DETAILS SHT 2

| AWC NO: | DRAWN BY: JEB | SHEET |
|---|---|---|
| COG-210 | DESIGNED BY: CH | 77 |

# PUMP JUNCTION BOX




# INSTRUMENT JUNCTION BOX




LAST PRINTED: Wednesday, March 31, 2021 1:58:58 PM FROM: C:\Users\Epic Drafting 1\Dropbox (EPIC Engineering)\Project Drawings\19.1089 AWC - City of Galveston LS 51-1-Final Release Wrkstn.dwg\21-12\COG AWC_RAMP_INST._BOX DETAILS.dwg

LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

Lon A. Hubbard
3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2. | | |
| 1. | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

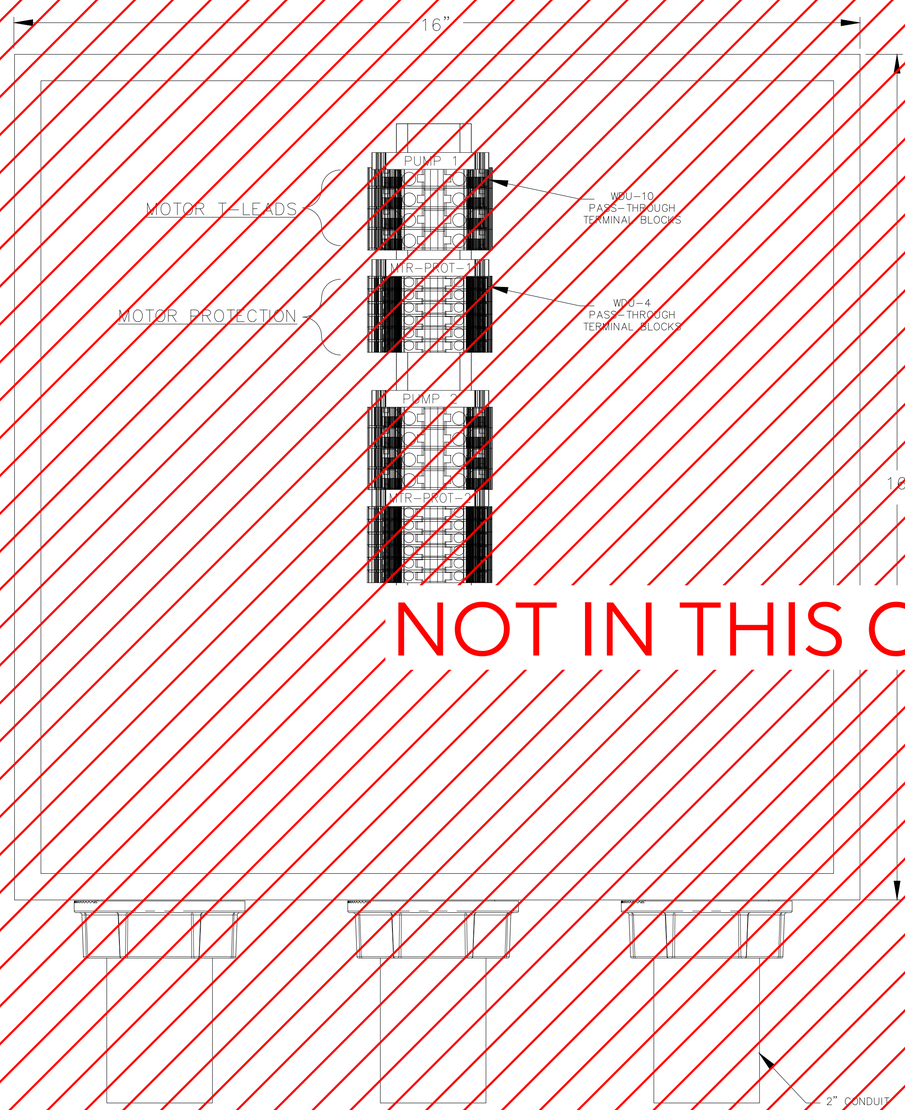
CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53 & 55

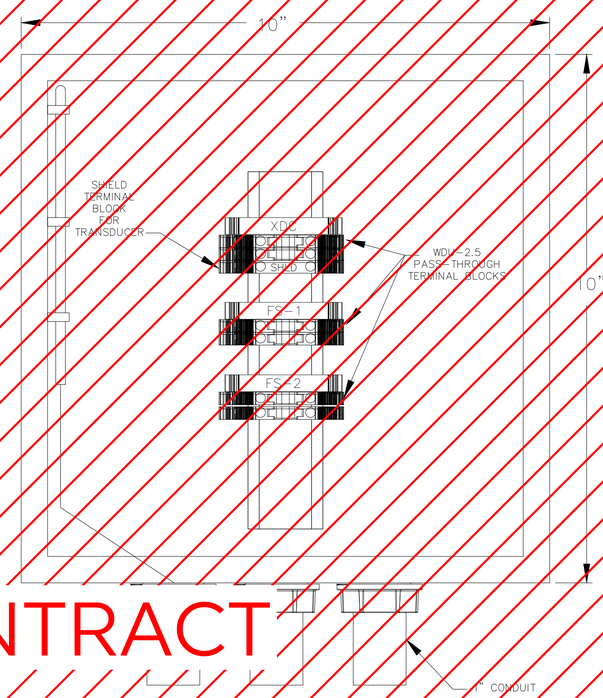
LS-30 & 51 JUNCTION BOX DETAILS

| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG-210 | JEB | 78 |
| | DESIGNED BY: CH | |

## PUMP JUNCTION BOX




## INSTRUMENT JUNCTION BOX




# NOT IN THIS CONTRACT

STATE OF TEXAS
LON HUBBARD
84363
LICENSED
PROFESSIONAL ENGINEER

L. A. Hubbard
3/31/2021

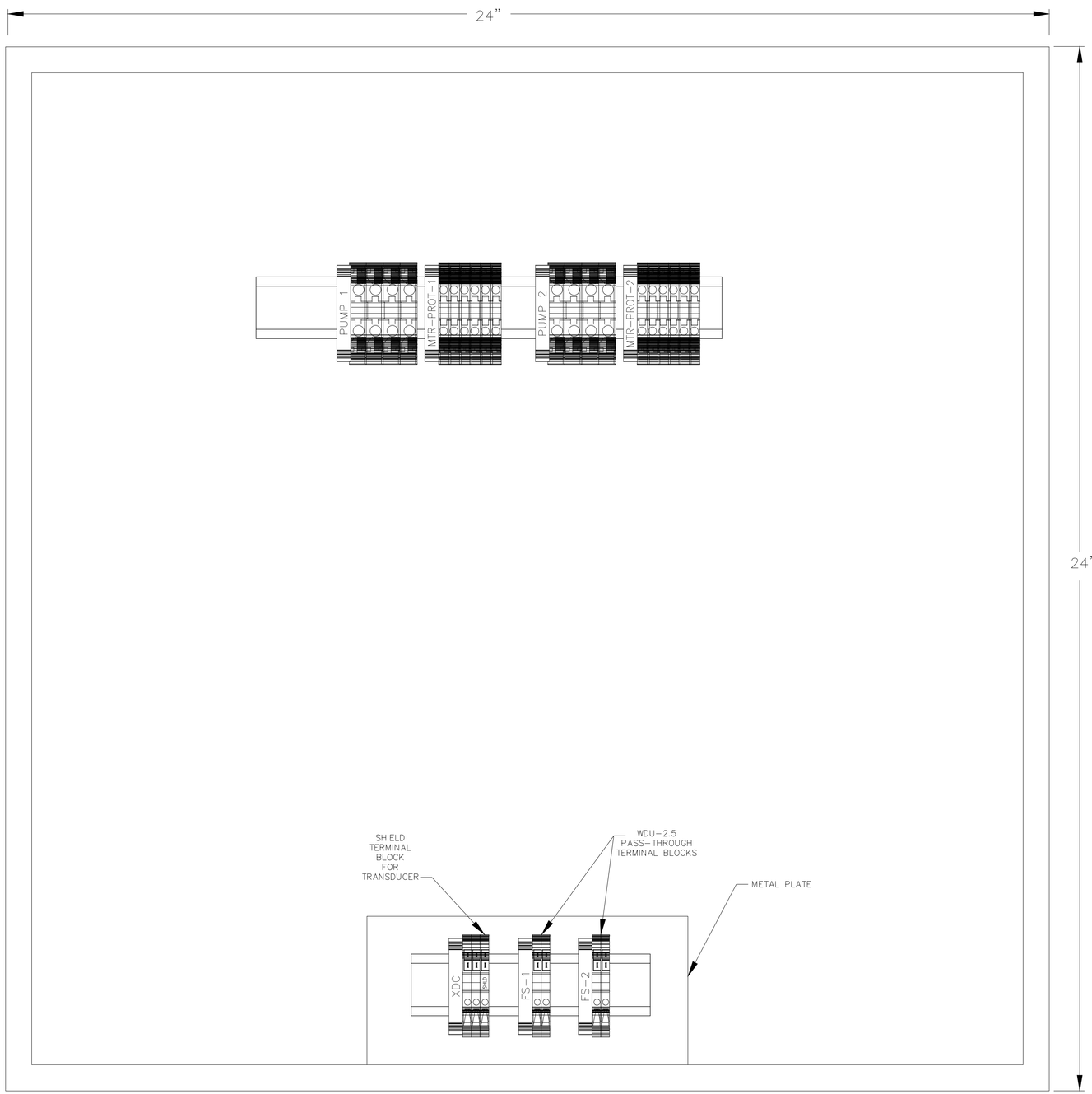
| NO. | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

CITY OF GALVESTON
GALVESTON COUNTY, TEXAS
2019 LIFTSTATION IMPROVEMENTS
LIFTSTATIONS 13,15,30,51,53 & 55
LS-18, 53, 55 JUNCTION BOX DETAILS

AWC NO: COG-210
DRAWN BY: JEB
DESIGNED BY: CH
SHEET 79




LAST PRINTED Wednesday, March 31, 2021 3:49:03 PM FROM: C:\Users\Epic-Dan\Epic Dropbox\Epic Engineering\Project Drawings\cl-19-1099 AWC - City of Galveston LS\11-Final Release Work\dn-dwg\01_CoG AWC_ PUMP_INST_dt\01 DETAILS_LS-13.dwg

LON HUBBARD
64363
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

Lon A. Hubbard
3/31/2021

| NO: | DESCRIPTION | DATE |
|---|---|---|
| 2 | | |
| 1 | | |

ARCENEAUX WILSON & COLE

EPIC Engineering, LLC
603 Dayton St.
Orange, Texas 77630
Texas Firm # 14251

EPIC ENGINEERING, LLC

# CITY OF GALVESTON
GALVESTON COUNTY, TEXAS

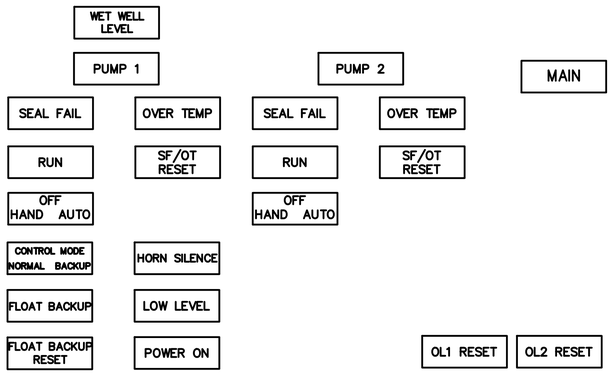
## 2019 LIFT STATION IMPROVEMENTS
LIFTSTATIONS 13,18,30,51,53 & 55

## LS-13 JUNCTION BOX DETAILS

| AWC NO: | DRAWN BY: | SHEET |
|---|---|---|
| COG-210 | JEB | 80 |
| | DESIGNED BY: CH | |

NAMEPLATES: WHITE TEXT/BLACK BACKGROUND

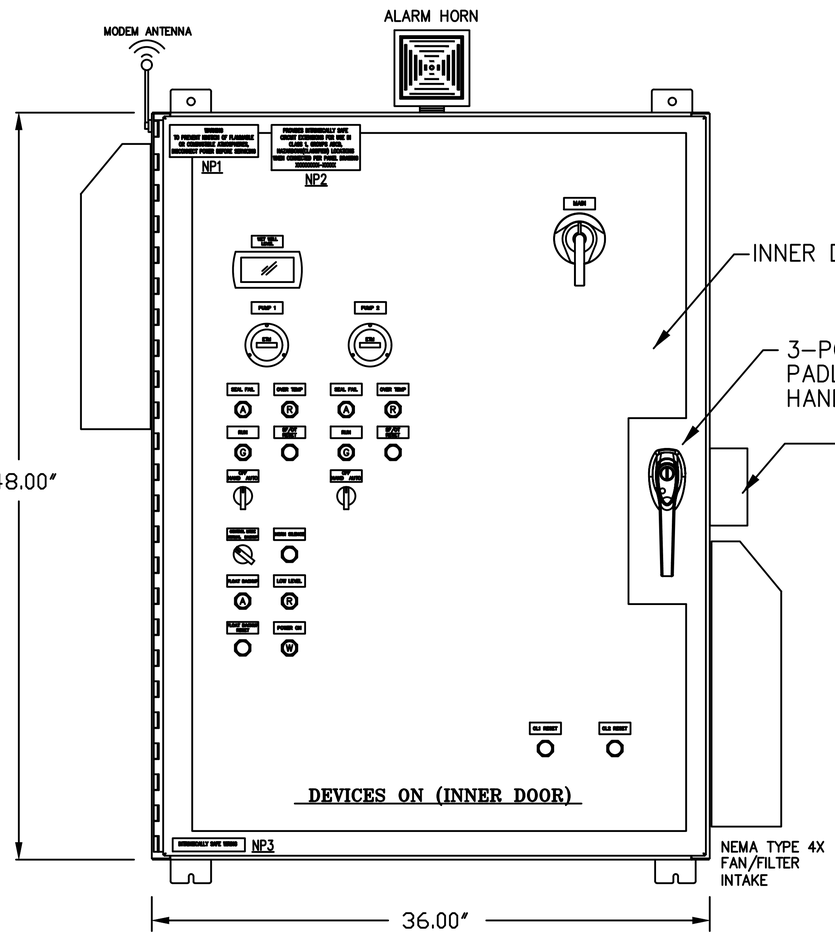
| | |
|---|---|
| WARNING<br>TO PREVENT IGNITION OF FLAMMABLE OR COMBUSTIBLE ATMOSPHERES, DISCONNECT POWER BEFORE SERVICING | NP1<br>2"x5" |
| PROVIDES INTRINSICALLY SAFE CIRCUIT EXTENSIONS FOR USE IN CLASS 1, GROUPS ABCD, HAZARDOUS(CLASSIFIED) LOCATIONS WHEN CONNECTED PER PANEL DRAWING XXXXXXXXX-XXXXX | NP2<br>3"x5" |
| INTRINSICALLY SAFE WIRING CIRCUITS | NP3<br>1"x5" |
| WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY | NP4<br>1"x4" |
| INTRINSICALLY SAFE FIELD WIRING TERMINALS | NP5<br>1"x4" |




INNER DOOR NAMEPLATE DETAIL

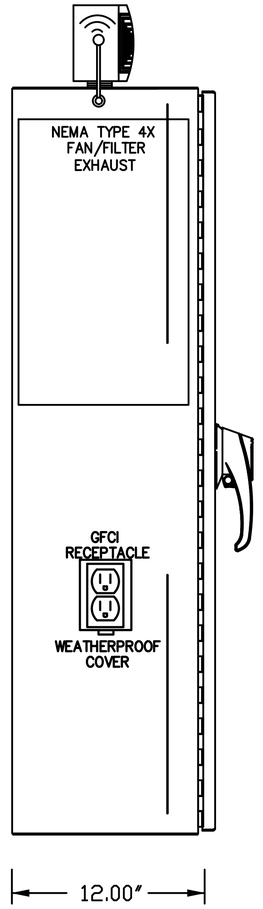
ALARM LIGHT

NOTE: HIGH LEVEL ALARM BEACON MOUNTS ON RACK. (SHIPS LOOSE) (POSITION AT HEIGHT VISIBLE FROM STREET)




DEVICES ON (INNER DOOR)

FRONT ELEVATION (INNER DOOR SHOWN)




LEFT SIDE VIEW

ENCLOSURE NOTES:

STYLE: WALL/RACK MOUNT WITH INNER DOOR & 3-POINT LATCH.
RATING: NEMA TYPE 4X 316 STAINLESS STEEL
FINISH: WHITE POWDER COAT.
DIMENSIONS: 48.00" X 36.00" X 12.00" (FANS ADD 10.00" TO TOTAL WIDTH)

120VAC UPS

(SET ON BOTTOM – BACKUP POWER FOR PAC & MODEM)

* = CUSTOMER SUPPLIED REMOTE DEVICE

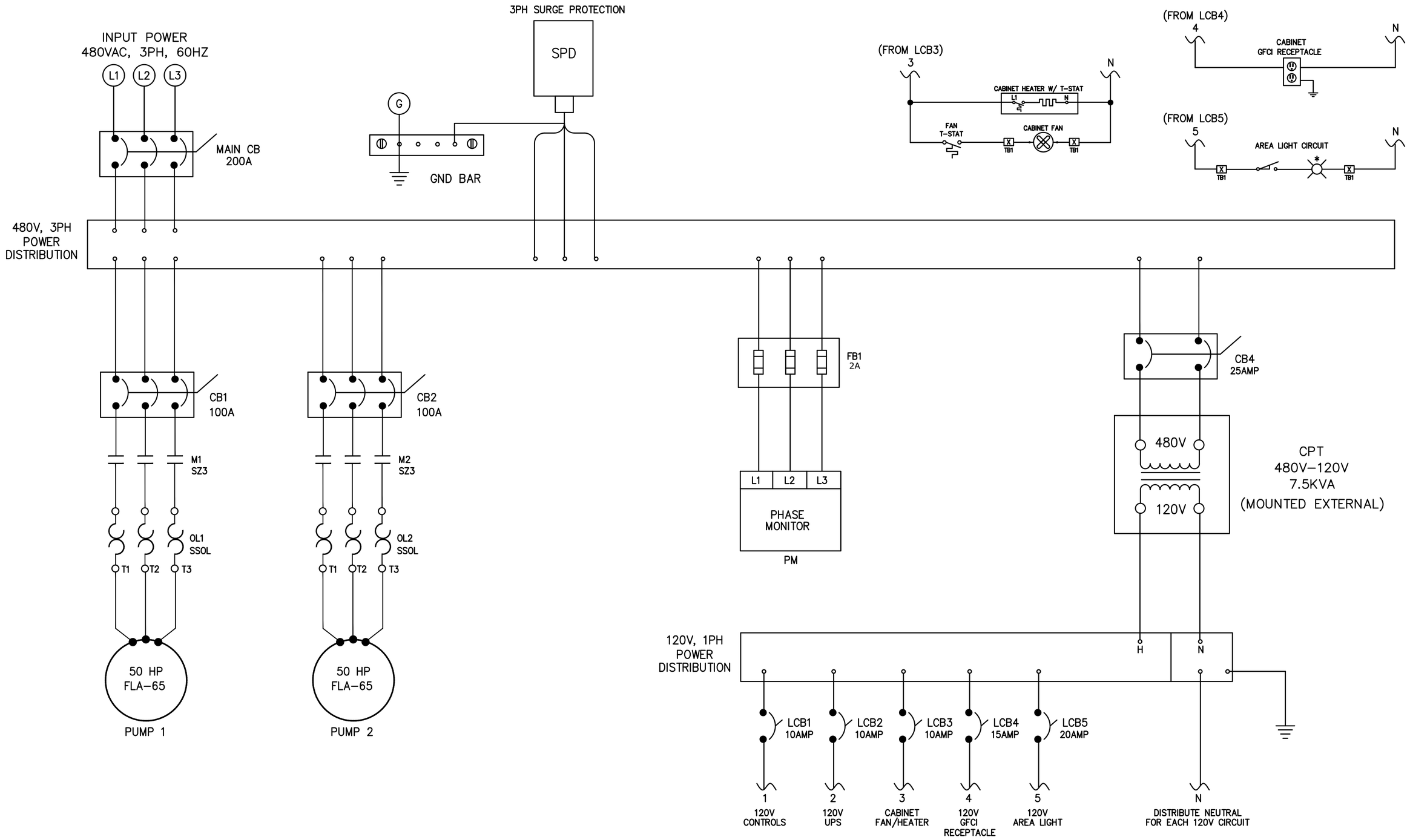
| NO. | REVISIONS | DRW | APR | DATE |
|---|---|---|---|---|
| 1 | FOR APPROVAL | AMS | AMS | 8/15/20 |
| 2 | ADDED UPS FOR PAC & MODEM | AMS | AMS | 9/2/20 |
| | | | | |

| NO. | REVISIONS | DRW | APR | DATE |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

FIVE STAR ELECTRIC
POWERED BY INNOVATION

FIVE STAR ELECTRIC
11135 IOTA DRIVE
SAN ANTONIO, TX
78217
1-800-229-8965
PHONE: 210-492-4200
FAX: 210-492-4280
WWW.VFD.COM

| | |
|---|---|
| SITE: VARIOUS | TITLE: 50HP, SZ3, 480V, 3PH NEMA TYPE 4X DUPLEX LIFT STATION PUMP CONTROL PANEL |
| CUSTOMER: CITY OF GALVESTON | DRAWING NUMBER: DX50463FV-COG-LS-S1 |
| JOB NO. XXXXX | SCALE: NTS |
| | PAGE NO. 1 OF 5 |



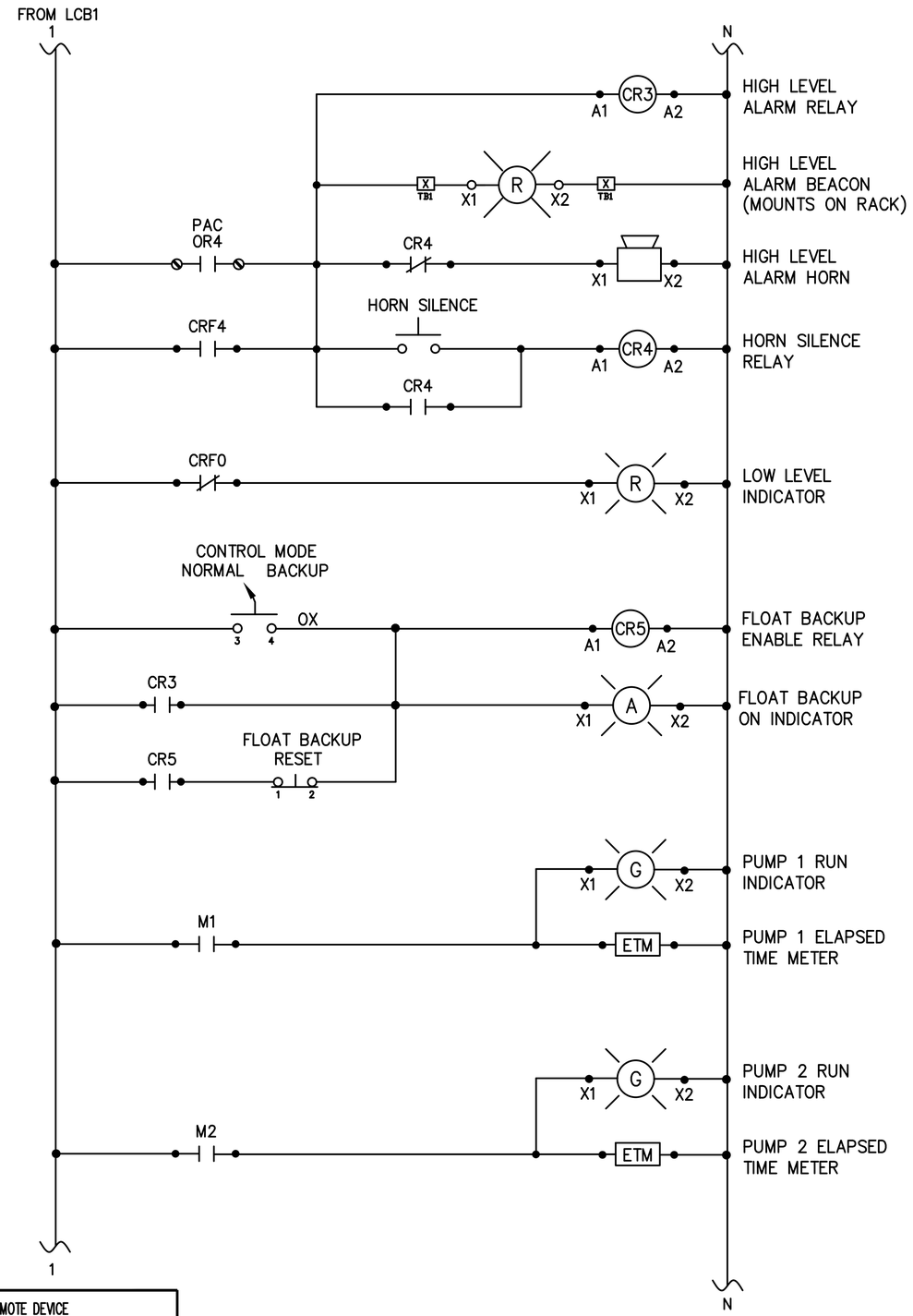

* = CUSTOMER SUPPLIED REMOTE DEVICE

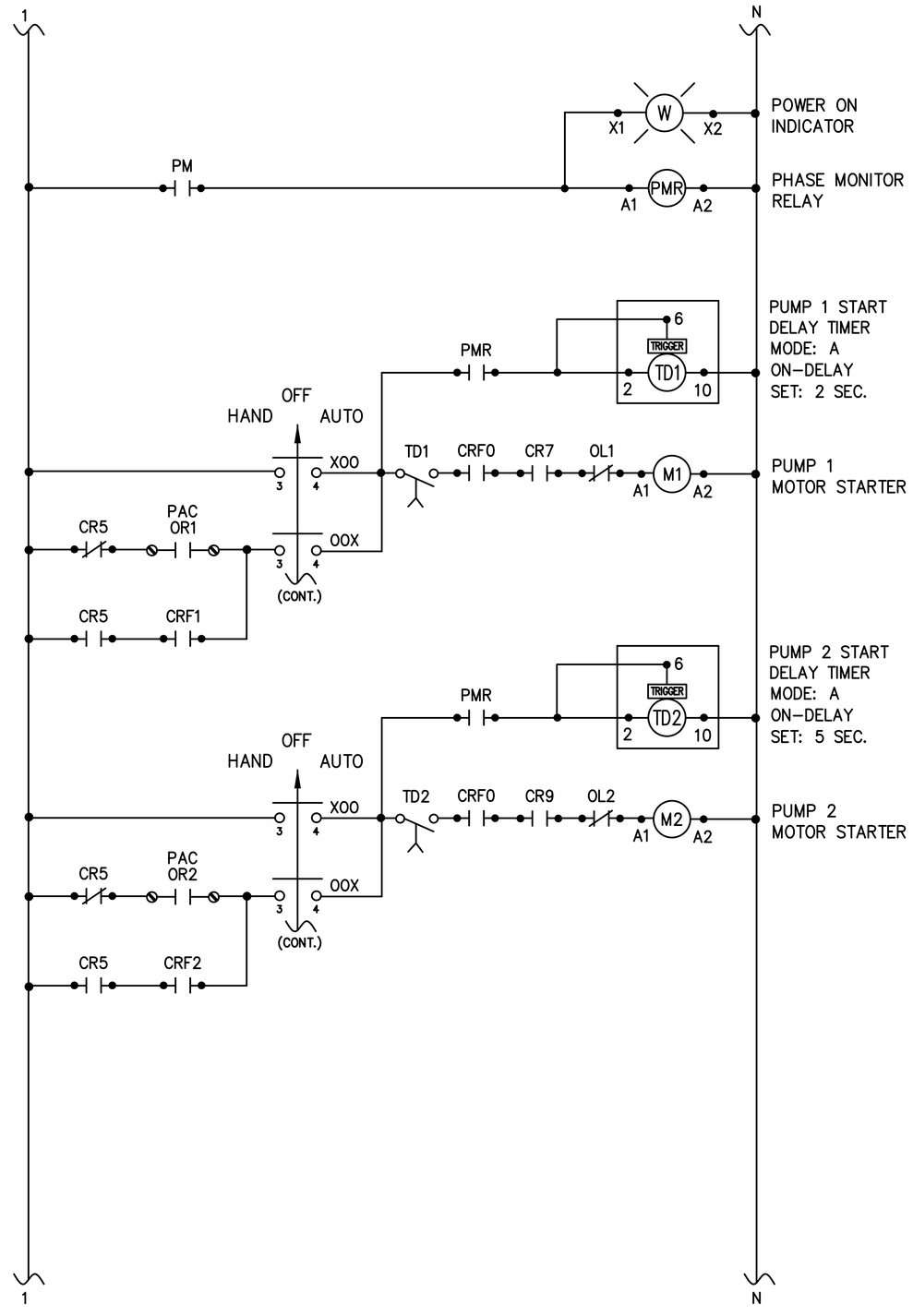
| NO. | REVISIONS | DRW | APR | DATE | NO. | REVISIONS | DRW | APR | DATE |
|---|---|---|---|---|---|---|---|---|---|
| 1 | FOR APPROVAL | AMS | AMS | 8/15/20 | | | | | |
| 2 | ADDED UPS FOR PAC & MODEM | AMS | AMS | 9/2/20 | | | | | |
| | | | | | | | | | |

FIVE STAR ELECTRIC
POWERED BY INNOVATION

FIVE STAR ELECTRIC
11135 IOTA DRIVE
SAN ANTONIO, TX
78217
1-800-229-8965
PHONE: 210-492-4200
FAX: 210-492-4280
WWW.VFD.COM

| | |
|---|---|
| SITE: VARIOUS | TITLE: 50HP, SZ3, 480V, 3PH NEMA TYPE 4X DUPLEX LIFT STATION PUMP CONTROL PANEL |
| CUSTOMER: CITY OF GALVESTON | DRAWING NUMBER: DX50463FV-COC-LS-S2 |
| JOB NO. XXXXX | SCALE: NTS |
| | PAGE NO. 2 OF 5 |




* = CUSTOMER SUPPLIED REMOTE DEVICE

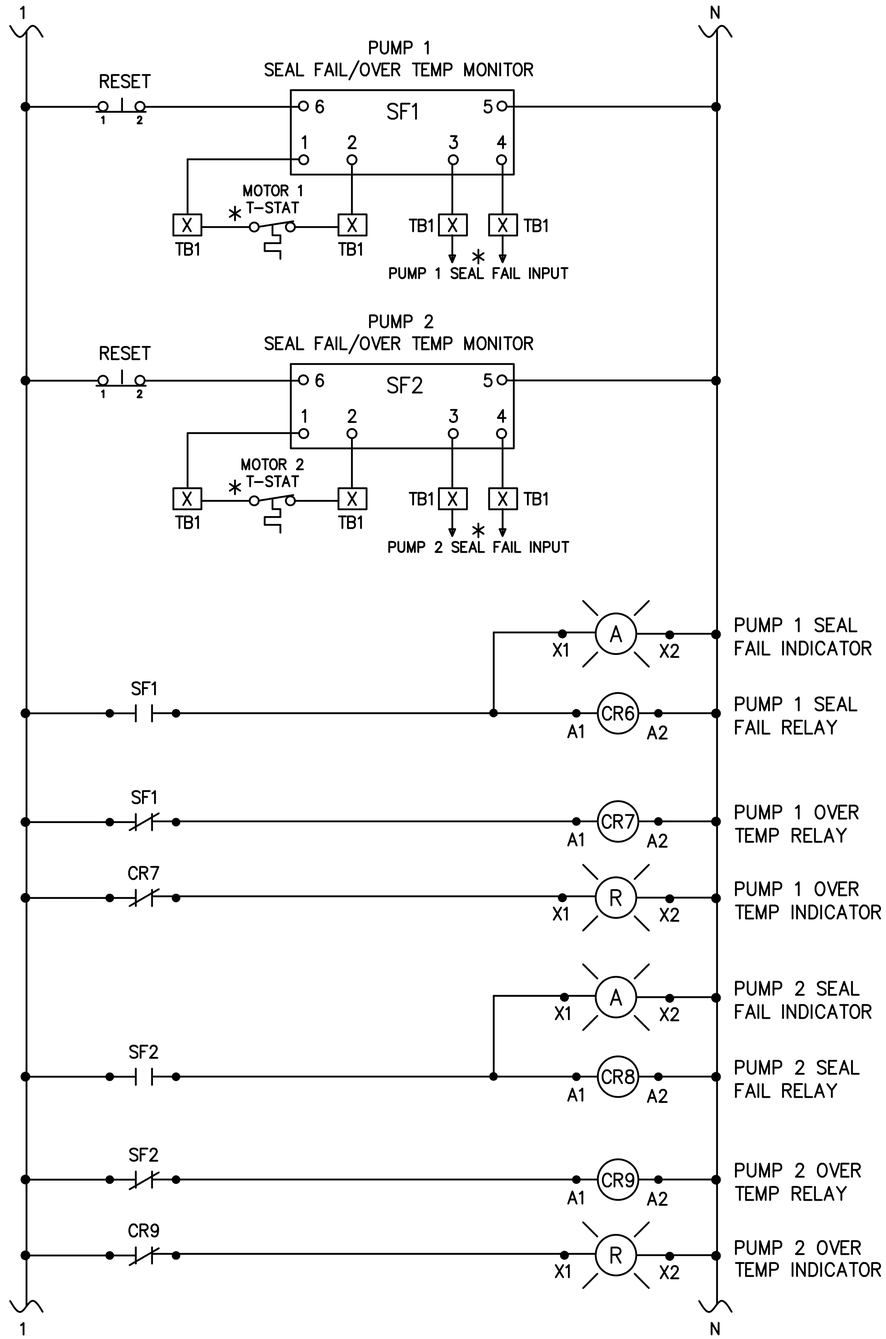
| NO. | REVISIONS | DRW | APR | DATE |
|---|---|---|---|---|
| 1 | FOR APPROVAL | AMS | AMS | 8/15/20 |
| 2 | ADDED UPS FOR PAC & MODEM | AMS | AMS | 9/2/20 |
| | | | | |

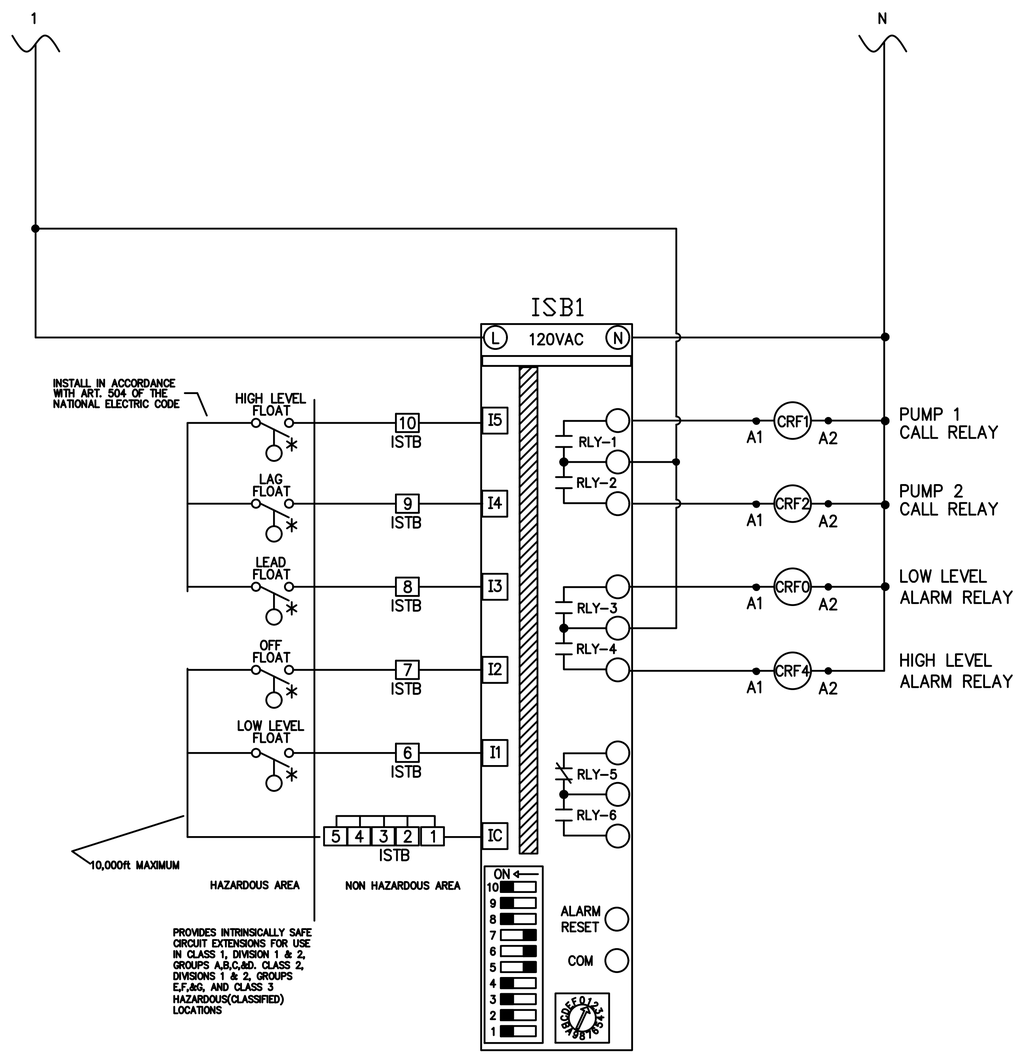
| NO. | REVISIONS | DRW | APR | DATE |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

FIVE STAR ELECTRIC
POWERED BY INNOVATION

FIVE STAR ELECTRIC
11135 IOTA DRIVE
SAN ANTONIO, TX
78217
1-800-229-8965
PHONE: 210-492-4200
FAX: 210-492-4280
WWW.VFD.COM

| | |
|---|---|
| SITE: VARIOUS | TITLE: 50HP, SZ3, 480V, 3PH NEMA TYPE 4X DUPLEX LIFT STATION PUMP CONTROL PANEL |
| CUSTOMER: CITY OF GALVESTON | DRAWING NUMBER: DX50463FV-COG-LS-S3 |
| JOB NO. XXXXX | SCALE: NTS |
| | PAGE NO. 3 OF 5 |



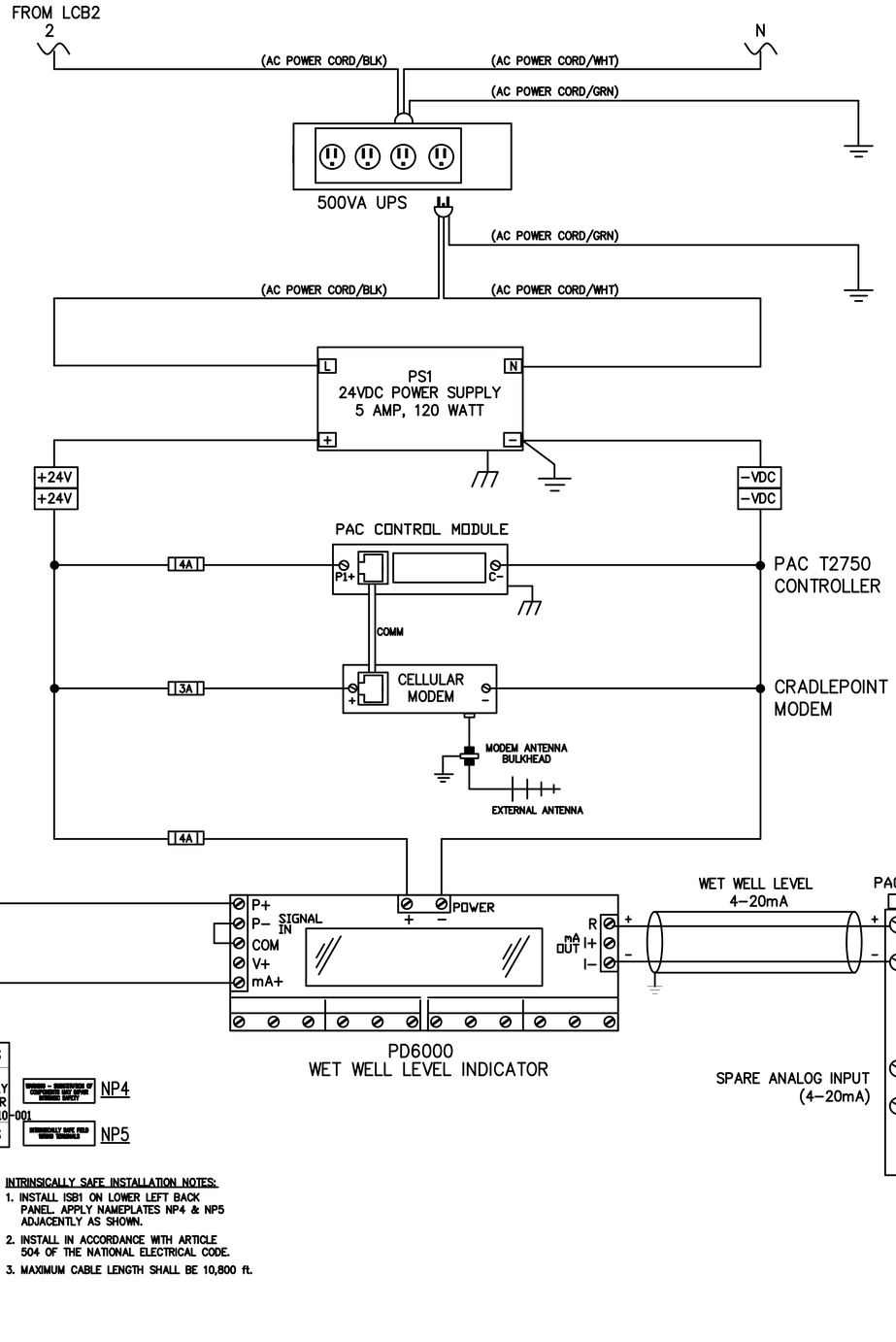

(INTRINSICALLY SAFE FLOAT CONTROLLER)
(BACKUP CONTROL MODE)

* = CUSTOMER SUPPLIED REMOTE DEVICE

| NO. | REVISIONS | DRW | APR | DATE | NO. | REVISIONS | DRW | APR | DATE |
|---|---|---|---|---|---|---|---|---|---|
| 1 | FOR APPROVAL | AMS | AMS | 8/15/20 | | | | | |
| 2 | ADDED UPS FOR PAC & MODEM | AMS | AMS | 9/2/20 | | | | | |
| | | | | | | | | | |

FIVE STAR ELECTRIC
POWERED BY INNOVATION
FIVE STAR ELECTRIC
11135 IDTA DRIVE
SAN ANTONIO, TX
78217
1-800-229-8965
PHONE: 210-492-4200
FAX: 210-492-4280
WWW.VFD.COM

| | |
|---|---|
| SITE: VARIOUS | TITLE: 50HP, SZ3, 480V, 3PH NEMA TYPE 4X DUPLEX LIFT STATION PUMP CONTROL PANEL |
| CUSTOMER: CITY OF GALVESTON | DRAWING NUMBER: DX50463FV-COG-LS-S4 |
| JOB NO. XXXXX | SCALE: NTS |
| | PAGE NO. 4 OF 5 |




* = CUSTOMER SUPPLIED REMOTE DEVICE

| NO. | REVISIONS | DRW | APR | DATE | NO. | REVISIONS | DRW | APR | DATE |
|---|---|---|---|---|---|---|---|---|---|
| 1 | FOR APPROVAL | AMS | AMS | 8/15/20 | | | | | |
| 2 | ADDED UPS FOR PAC & MODEM | AMS | AMS | 9/2/20 | | | | | |
| | | | | | | | | | |

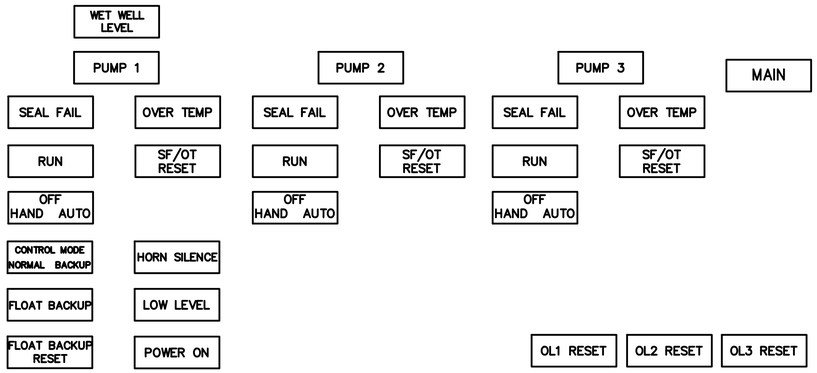
FIVE STAR ELECTRIC
POWERED BY INNOVATION

FIVE STAR ELECTRIC
11135 IDTA DRIVE
SAN ANTONIO, TX
78217
1-800-229-8965
PHONE: 210-492-4200
FAX: 210-492-4280
WWW.VFD.COM

| | |
|---|---|
| SITE: VARIOUS | TITLE: 50HP, SZ3, 480V, 3PH NEMA TYPE 4X DUPLEX LIFT STATION PUMP CONTROL PANEL |
| CUSTOMER: CITY OF GALVESTON | DRAWING NUMBER: DX50463FV-COG-LS-S5 |
| JOB NO. XXXXX | SCALE: NTS |
| | PAGE NO. 5 OF 5 |

NAMEPLATES: WHITE TEXT/BLACK BACKGROUND

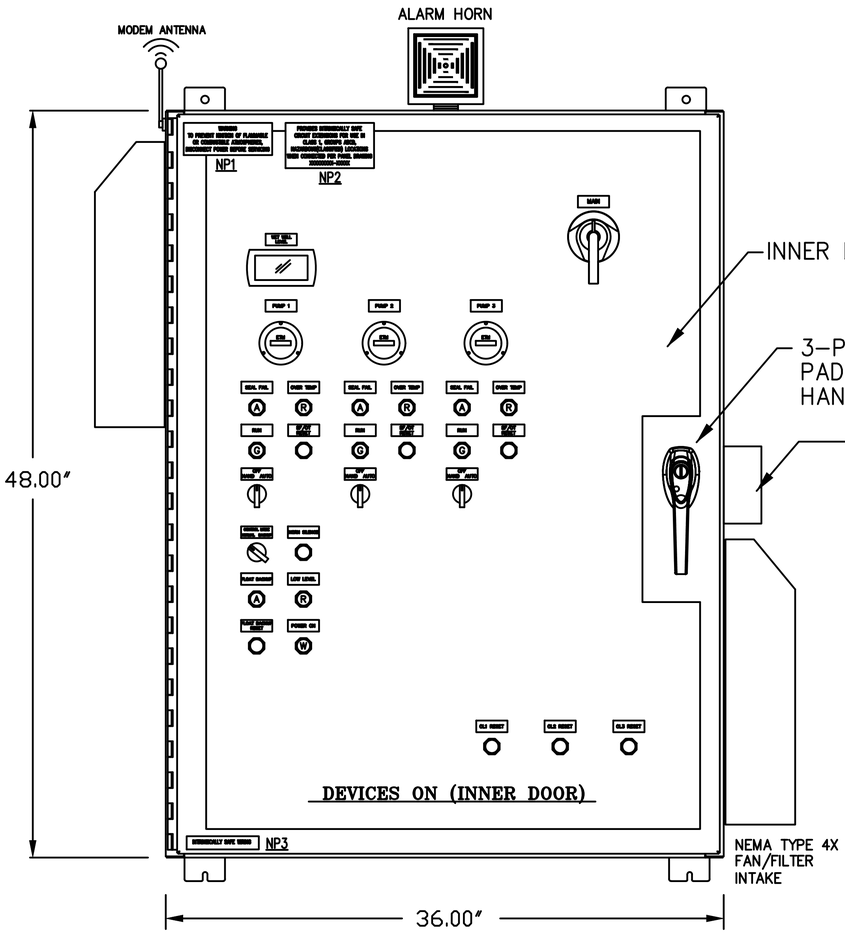
| | |
|---|---|
| WARNING<br>TO PREVENT IGNITION OF FLAMMABLE OR COMBUSTIBLE ATMOSPHERES, DISCONNECT POWER BEFORE SERVICING | NP1<br>2"x5" |
| PROVIDES INTRINSICALLY SAFE CIRCUIT EXTENSIONS FOR USE IN CLASS 1, GROUPS ABCD, HAZARDOUS(CLASSIFIED) LOCATIONS WHEN CONNECTED PER PANEL DRAWING XXXXXXXXX-XXXXX | NP2<br>3"x5" |
| INTRINSICALLY SAFE WIRING CIRCUITS | NP3<br>1"x5" |
| WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY | NP4<br>1"x4" |
| INTRINSICALLY SAFE FIELD WIRING TERMINALS | NP5<br>1"x4" |




INNER DOOR NAMEPLATE DETAIL

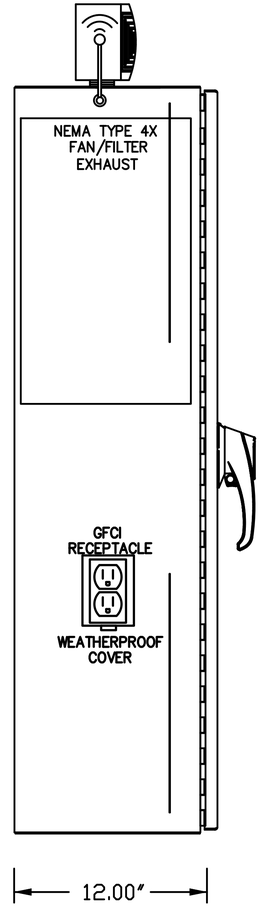
ALARM LIGHT

NOTE: HIGH LEVEL ALARM BEACON MOUNTS ON RACK. (SHIPS LOOSE)
(POSITION AT HEIGHT VISIBLE FROM STREET)




DEVICES ON (INNER DOOR)

FRONT ELEVATION (INNER DOOR SHOWN)




LEFT SIDE VIEW

ENCLOSURE NOTES:

STYLE: WALL/RACK MOUNT WITH INNER DOOR & 3-POINT LATCH.
RATING: NEMA TYPE 4X 316 STAINLESS STEEL
FINISH: WHITE POWDER COAT.
DIMENSIONS: 48.00" X 36.00" X 12.00" (FANS ADD 10.00" TO TOTAL WIDTH)

120VAC UPS

(SET ON BOTTOM – BACKUP POWER FOR PAC & MODEM)

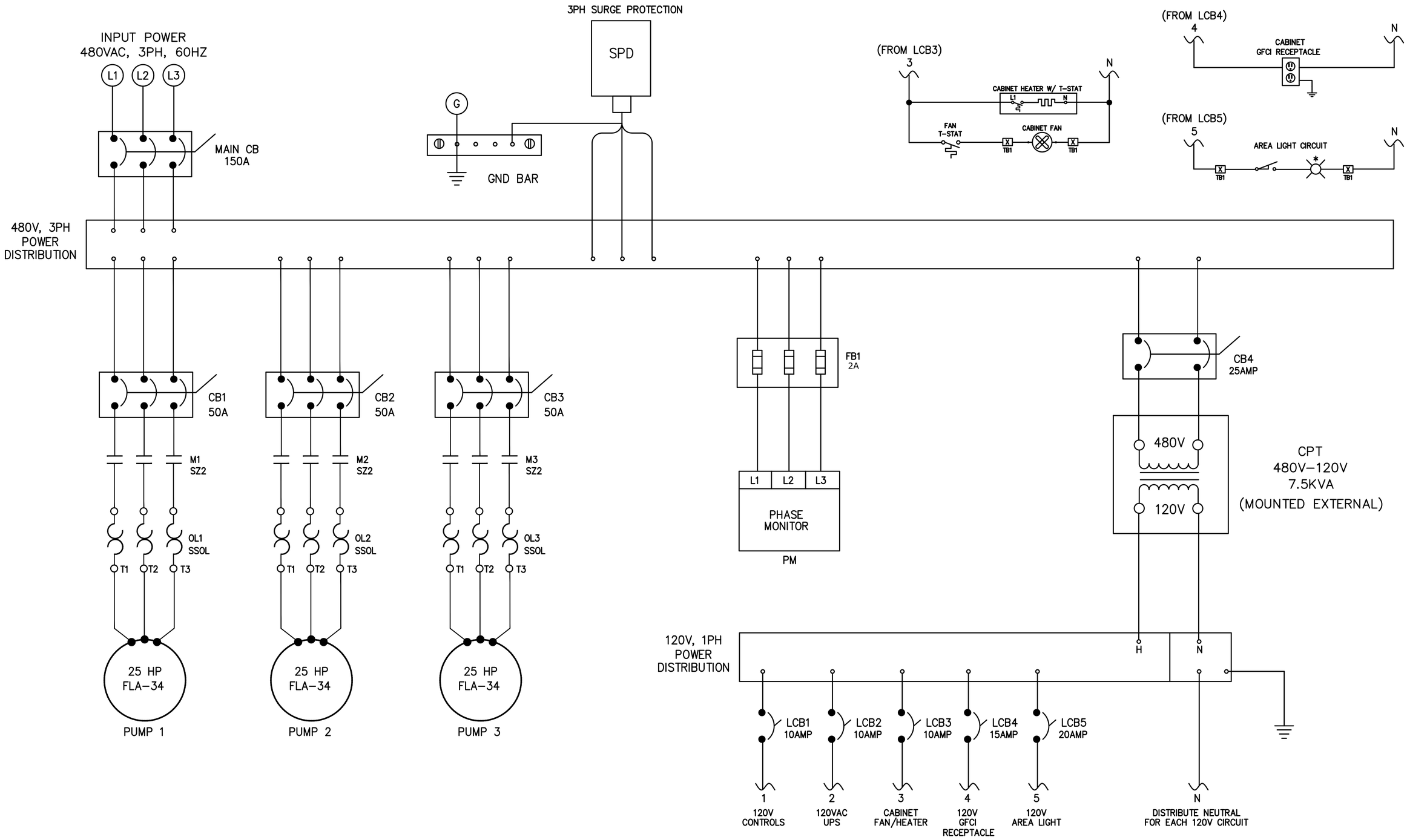
* = CUSTOMER SUPPLIED REMOTE DEVICE

| NO. | REVISIONS | DRW | APR | DATE | NO. | REVISIONS | DRW | APR | DATE |
|---|---|---|---|---|---|---|---|---|---|
| 1 | FOR APPROVAL | AMS | AMS | 8/15/20 | | | | | |
| 2 | ADDED UPS FOR PAC & MODEM | AMS | AMS | 9/2/20 | | | | | |
| | | | | | | | | | |

FIVE STAR ELECTRIC
POWERED BY INNOVATION

FIVE STAR ELECTRIC
11135 IOTA DRIVE
SAN ANTONIO, TX
78217
1-800-229-8965
PHONE: 210-492-4200
FAX: 210-492-4280
WWW.VFD.COM

| | |
|---|---|
| SITE: VARIOUS | TITLE: 25HP, SZ2, 480V, 3PH NEMA TYPE 4X TRIPLEX LIFT STATION PUMP CONTROL PANEL |
| CUSTOMER: CITY OF GALVESTON | DRAWING NUMBER: TPX25463FV-COG-LS-S1 |
| JOB NO. XXXXX | SCALE: NTS |
| | PAGE NO. 1 OF 5 |




* = CUSTOMER SUPPLIED REMOTE DEVICE

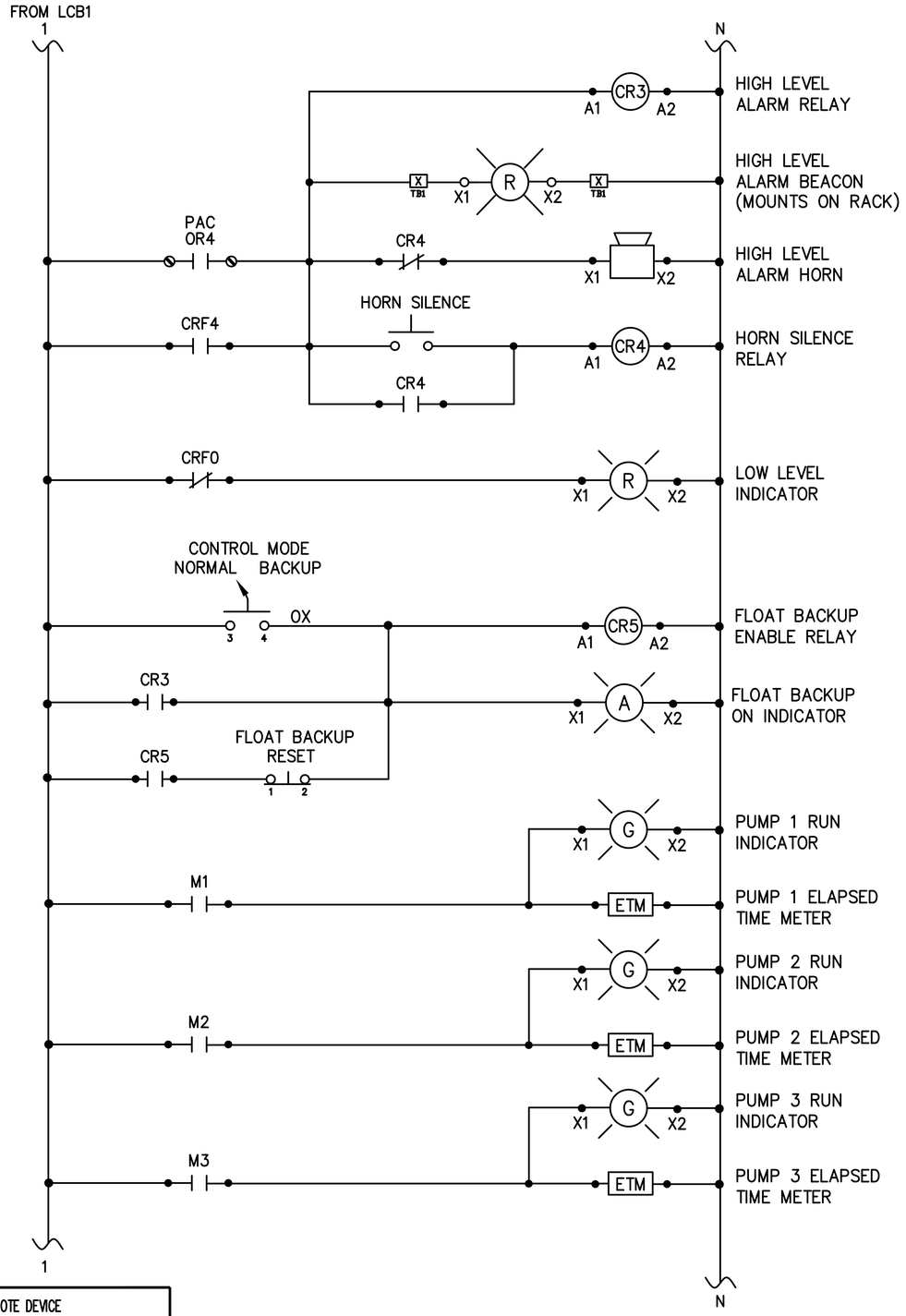
| NO. | REVISIONS | DRW | APR | DATE |
|---|---|---|---|---|
| 1 | FOR APPROVAL | AMS | AMS | 8/15/20 |
| 2 | ADDED UPS FOR PAC & MODEM | AMS | AMS | 9/2/20 |
| | | | | |

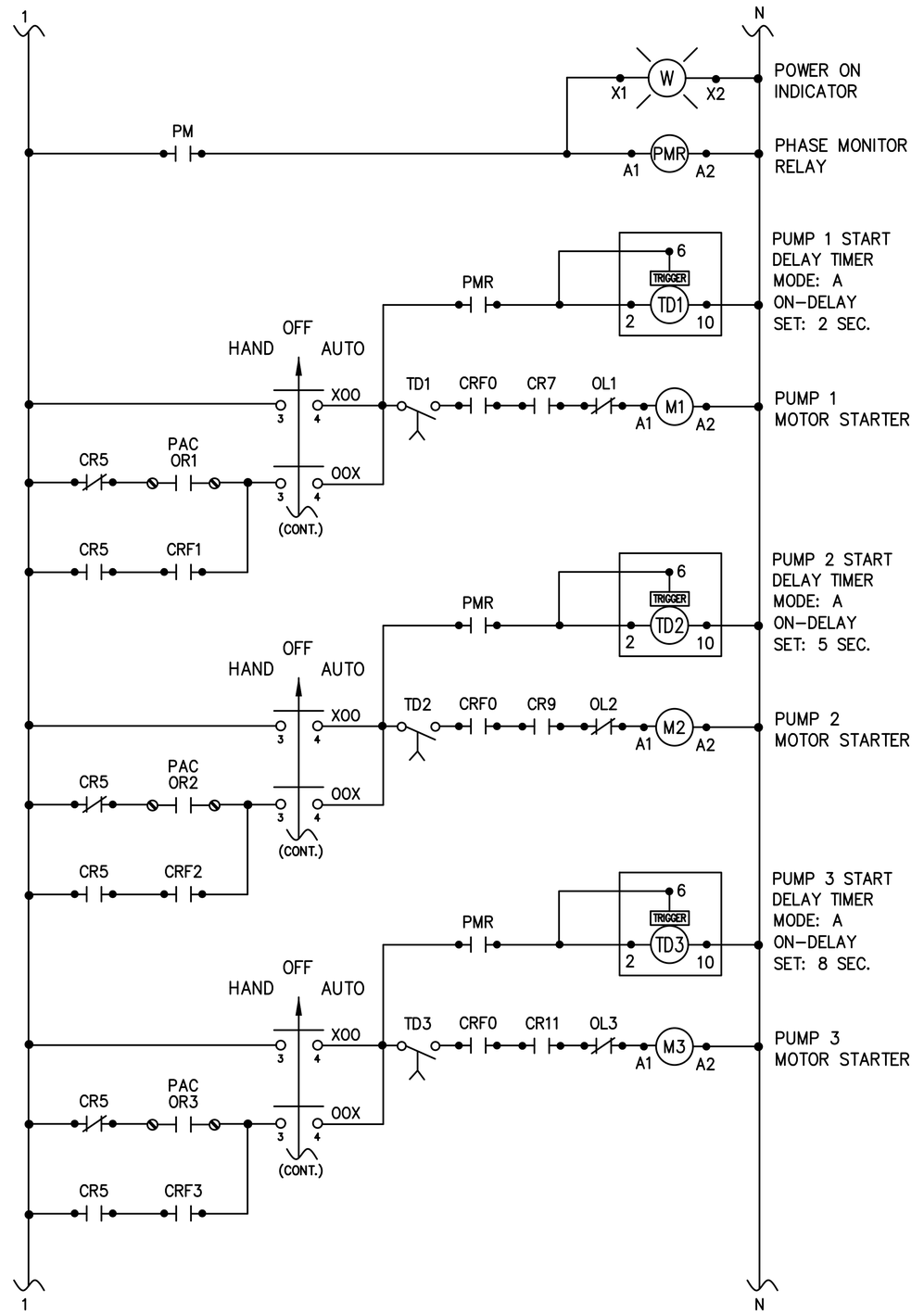
| NO. | REVISIONS | DRW | APR | DATE |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

FIVE STAR ELECTRIC
POWERED BY INNOVATION

FIVE STAR ELECTRIC
11135 IOTA DRIVE
SAN ANTONIO, TX
78217
1-800-229-8965
PHONE: 210-492-4200
FAX: 210-492-4280
WWW.VFD.COM

| | |
|---|---|
| SITE: VARIOUS | TITLE: 25HP, SZ2, 480V, 3PH NEMA TYPE 4X TRIPLEX LIFT STATION PUMP CONTROL PANEL |
| CUSTOMER: CITY OF GALVESTON | DRAWING NUMBER: TPX25463FV-COG-LS-S2 |
| JOB NO. XXXXX | SCALE: NTS |
| | PAGE NO. 2 OF 5 |



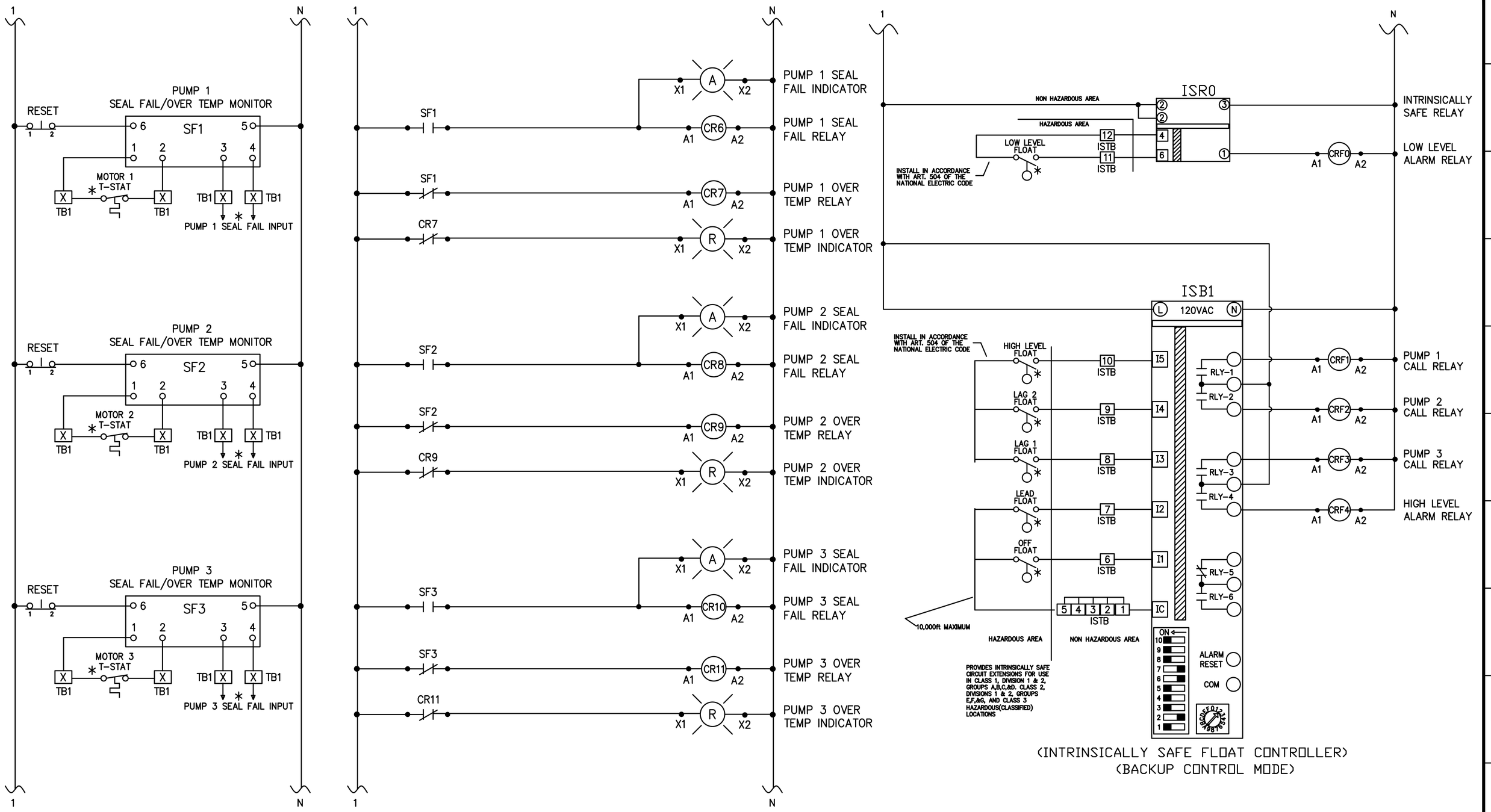

* = CUSTOMER SUPPLIED REMOTE DEVICE

| NO. | REVISIONS | DRW | APR | DATE | NO. | REVISIONS | DRW | APR | DATE |
|---|---|---|---|---|---|---|---|---|---|
| 1 | FOR APPROVAL | AMS | AMS | 8/15/20 | | | | | |
| 2 | ADDED UPS FOR PAC & MODEM | AMS | AMS | 9/2/20 | | | | | |
| | | | | | | | | | |

FIVE STAR ELECTRIC
POWERED BY INNOVATION

FIVE STAR ELECTRIC
11135 IDTA DRIVE
SAN ANTONIO, TX
78217
1-800-229-8965
PHONE: 210-492-4200
FAX: 210-492-4280
WWW.VFD.COM

| | |
|---|---|
| SITE: VARIOUS | TITLE: 25HP, SZ2, 480V, 3PH NEMA TYPE 4X TRIPLEX LIFT STATION PUMP CONTROL PANEL |
| CUSTOMER: CITY OF GALVESTON | DRAWING NUMBER: TPX25463FV-COG-LS-S3 |
| JOB NO. XXXXX | SCALE: NTS |
| | PAGE NO. 3 OF 5 |




(INTRINSICALLY SAFE FLOAT CONTROLLER)
(BACKUP CONTROL MODE)

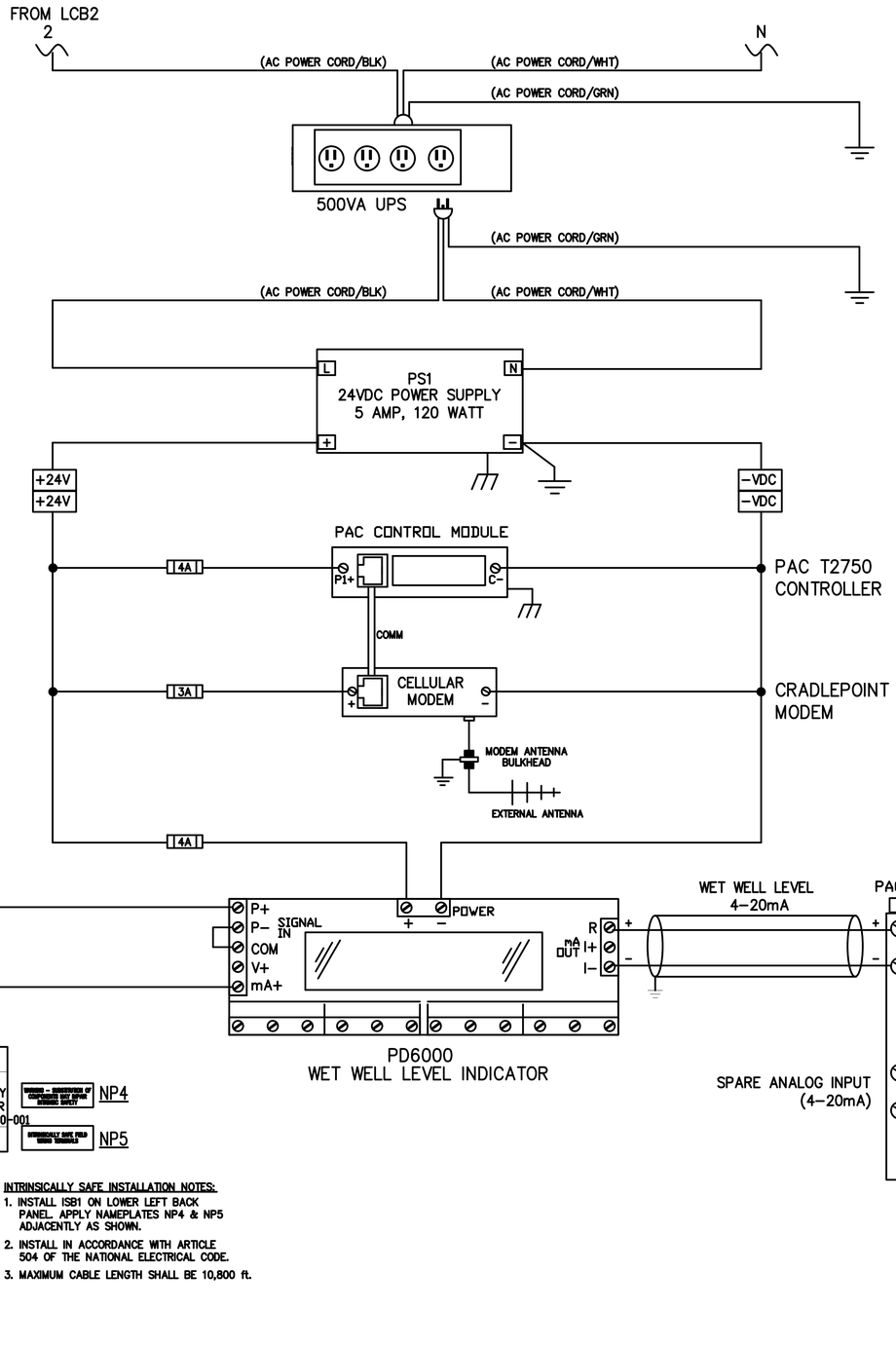
* = CUSTOMER SUPPLIED REMOTE DEVICE

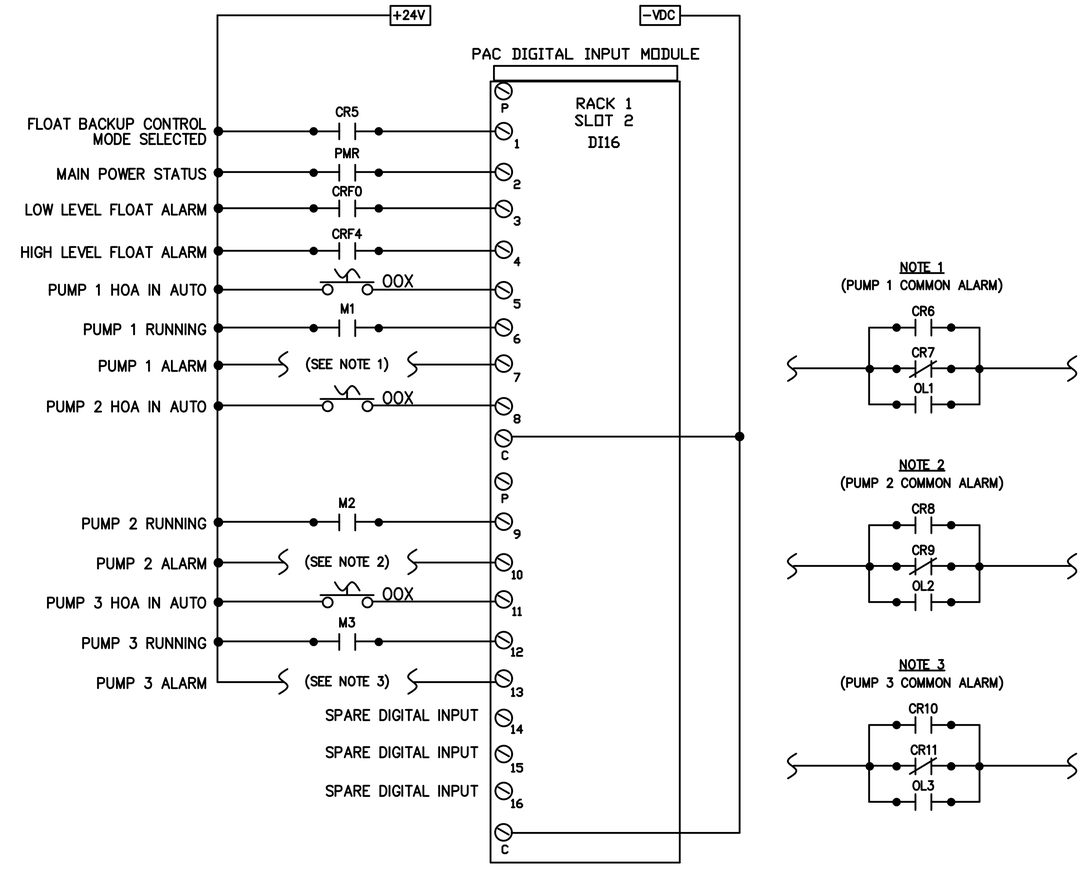
| NO. | REVISIONS | DRW | APR | DATE |
|---|---|---|---|---|
| 1 | FOR APPROVAL | AMS | AMS | 8/15/20 |
| 2 | ADDED UPS FOR PAC & MODEM | AMS | AMS | 9/2/20 |

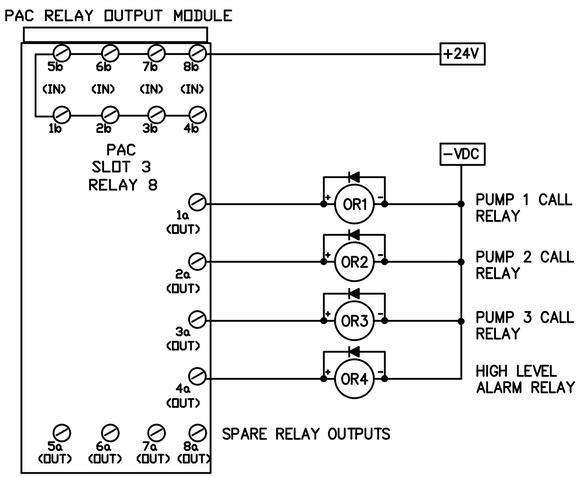

FIVE STAR ELECTRIC
POWERED BY INNOVATION

FIVE STAR ELECTRIC
11135 IDTA DRIVE
SAN ANTONIO, TX
78217
1-800-229-8965
PHONE: 210-492-4200
FAX: 210-492-4280
WWW.VFD.COM


| | |
|---|---|
| SITE: VARIOUS | TITLE: 25HP, SZ2, 480V, 3PH NEMA TYPE 4X TRIPLEX LIFT STATION PUMP CONTROL PANEL |
| CUSTOMER: CITY OF GALVESTON | DRAWING NUMBER: TPX25463FV-COG-LS-S4 |
| JOB NO. XXXXX | SCALE: NTS |
| | PAGE NO. 4 OF 5 |




* = CUSTOMER SUPPLIED REMOTE DEVICE

| NO. | REVISIONS | DRW | APR | DATE | NO. | REVISIONS | DRW | APR | DATE |
|---|---|---|---|---|---|---|---|---|---|
| 1 | FOR APPROVAL | AMS | AMS | 8/15/20 | | | | | |
| 2 | ADDED UPS FOR PAC & MODEM | AMS | AMS | 9/2/20 | | | | | |
| | | | | | | | | | |

FIVE STAR ELECTRIC
POWERED BY INNOVATION

FIVE STAR ELECTRIC
11135 IDTA DRIVE
SAN ANTONIO, TX
78217
1-800-229-8965
PHONE: 210-492-4200
FAX: 210-492-4280
WWW.VFD.COM

| | |
|---|---|
| SITE: VARIOUS | TITLE: 25HP, SZ2, 480V, 3PH NEMA TYPE 4X TRIPLEX LIFT STATION PUMP CONTROL PANEL |
| CUSTOMER: CITY OF GALVESTON | DRAWING NUMBER: TPX25463FV-COG-LS-S5 |
| JOB NO. XXXXX | SCALE: NTS |
| | PAGE NO. 5 OF 5 |