

CONSTRUCTION PLANS FOR
LAKE O' THE PINES
RAW WATER INTAKE STRUCTURE & PUMP STATION
ELECTRICAL IMPROVEMENTS
CITY OF LONGVIEW, TEXAS

REVIEWED AND FILED BY:



PUBLIC WORKS
 ENGINEERING DEPARTMENT

SUBMITTED BY:



ELECTRICAL EXPERTISE INC.
 TEXAS REGISTERED ENGINEERING FIRM F-2490
 ST 87 LAKE CHEROKEE TEL.: (903) 297-7811
 HENDERSON, TEXAS 75652

APPROVED BY:

[Signature]
 ROLIN C. McPHEE, P.E.
 DIRECTOR OF PUBLIC WORKS

8/15/16
 DATE

CITY COUNCIL

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 KRISTEN ISHIHARA
 DAVID WRIGHT
 STEVE PIRTLE

CITY MANAGER

DAVID WILLARD

ASSISTANT CITY MANAGER

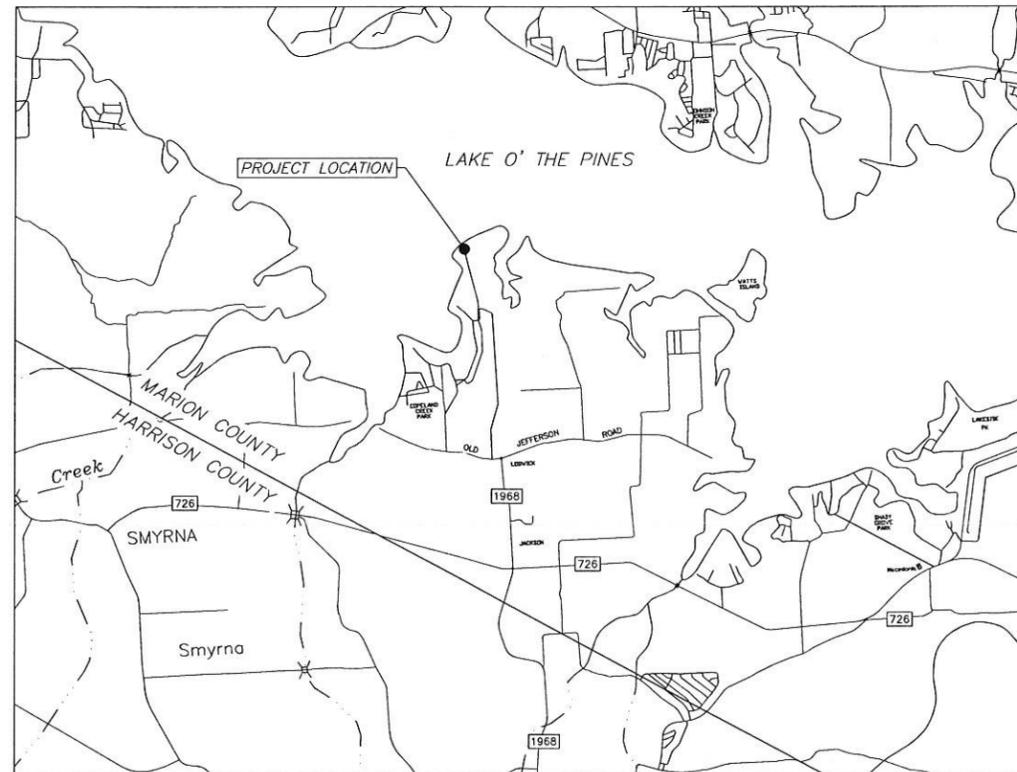
KEITH BONDS, P.E.

DIRECTOR OF PUBLIC WORKS

ROLIN C. McPHEE, P.E.

CITY ENGINEER

ALTON BRADLEY, P.E.



VICINITY MAP

[Signature]
 WILLARD W. JORDAN, P.E.
 STATE OF TEXAS
 WILLARD W. JORDAN
 37135
 REGISTERED
 PROFESSIONAL ENGINEER
 8/15/16

BID ITEM NOTES

REFER TO THE BID SCHEDULE IN THE CONTRACT SPECIFICATIONS FOR DESCRIPTION OF BID ITEMS.

BID ITEM #1:

THE WORK IN BID ITEM #1 SHALL INCLUDE ELECTRICAL CONSTRUCTION NOTES 1 THRU 4, 17, & 24 THRU 27.

BID ITEM #2:

THE WORK IN BID ITEM #2 SHALL INCLUDE ELECTRICAL CONSTRUCTION NOTES 1 THRU 27.

BID ITEM #3:

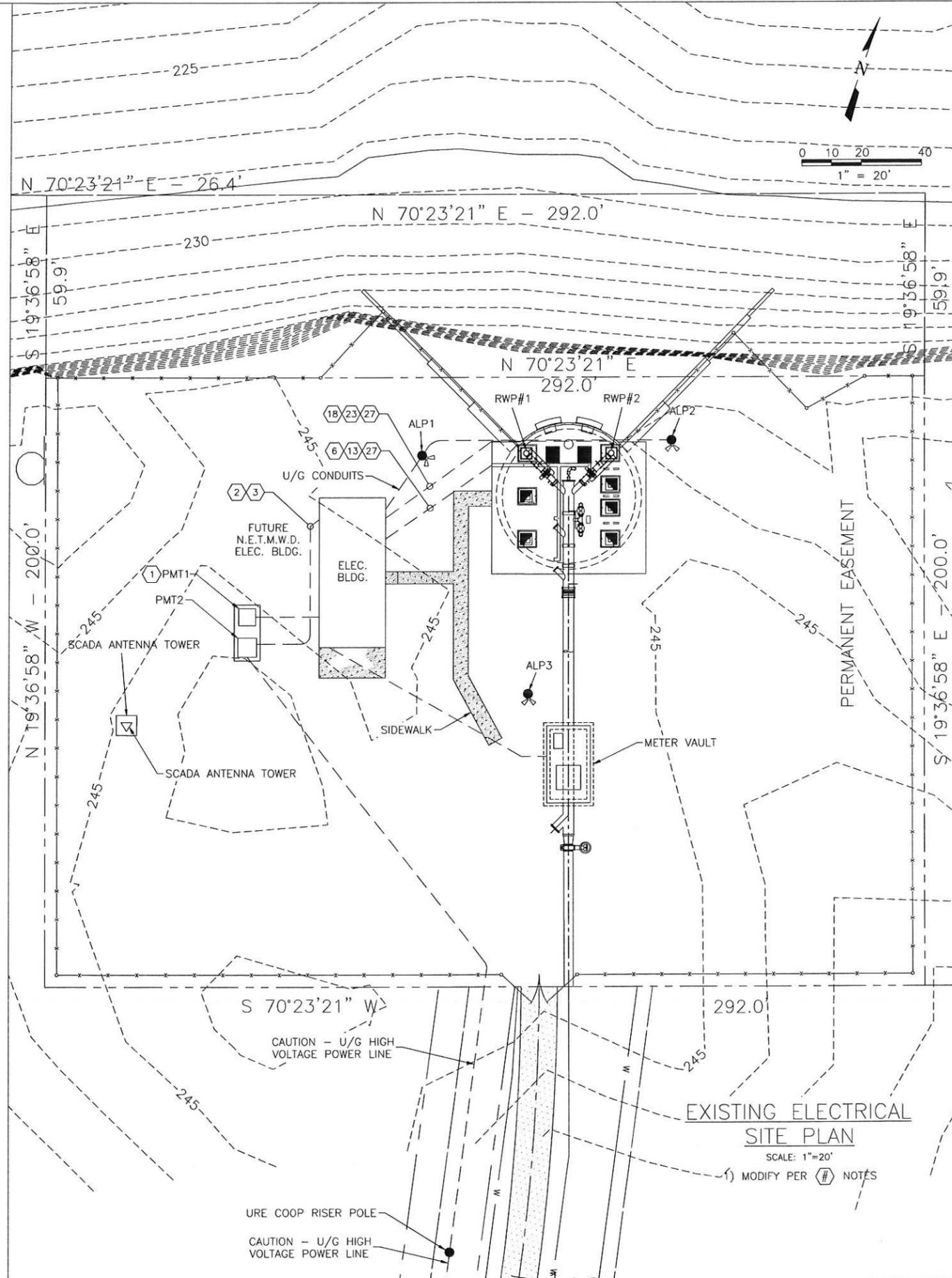
THE WORK IN BID ITEM #3 SHALL INCLUDE ELECTRICAL CONSTRUCTION NOTES 1 THRU 4, 17 THRU 20, & 24 THRU 30.

BID ITEM #4:

THE WORK IN BID ITEM #4 SHALL INCLUDE ELECTRICAL CONSTRUCTION NOTES 1 THRU 20, 24, 24, 25, 25, 26, 26, & 27 THRU 30.

ELECTRICAL CONSTRUCTION NOTES

- ① COORDINATE WITH UPSHUR RURAL ELECTRIC COOP AND THE CITY TO ARRANGE FOR AN ELECTRICAL OUTAGE AT EXISTING PAD MOUNTED TRANSFORMER #1 (PMT1).
- ② DISCONNECT AND REMOVE THE EXISTING MEDIUM VOLTAGE SERVICE WIRING BETWEEN PMT1 AND THE THREE 5 KV MAIN FUSED SWITCHES AND DELIVER TO OWNER.
- ③ FURNISH AND INSTALL (F&I) THREE 1/C, #4/0 AWG STRANDED COPPER, 5 KV, MV-115, SHIELDED POWER CABLES AND ONE 1/C, #4/0 AWG STRANDED COPPER, 600V, NEUTRAL IN EXISTING 3" DUCT BETWEEN PMT1 AND THE THREE MAIN FUSED SWITCHES.
- ④ F&I STRESS RELIEF TERMINATION KIT ON EACH MEDIUM VOLTAGE CABLE AT EACH END, 3M COLD SHRINK QT-III TERMINATION KIT, OR EQUIVALENT.
- ⑤ ARRANGE ELECTRICAL CLEARANCE WITH CITY AND DISCONNECT AND REMOVE THE EXISTING MEDIUM VOLTAGE FEEDER WIRING BETWEEN THE LOAD SIDE OF THE 5 KV MAIN FUSED SWITCH #1 AND THE RAW WATER PUMP #1 VARIABLE FREQUENCY DRIVE (VFD-5001) AND DELIVER TO OWNER.
- ⑥ DISCONNECT AND REMOVE THE EXISTING MEDIUM VOLTAGE MOTOR FEEDER WIRING BETWEEN THE LOAD SIDE OF THE VFD-5001 AND RAW WATER PUMP #1 MOTOR AND DELIVER TO OWNER.
- ⑦ DISCONNECT THE EXISTING LIGHTNING ARRESTER ENCLOSURE (LAC1) AND ALL ASSOCIATED 2" LIQUID-TIGHT TAP CONDUIT & WIRING TO THE MOTOR POWER JUNCTION BOX AND DELIVER TO OWNER.
- ⑧ F&I 2" PLUG AND CAP HOLE IN MOTOR POWER JUNCTION BOX.
- ⑨ DISCONNECT AND REMOVE THE EXISTING SHEET METAL HVAC DUCT WORK ABOVE THE TWO VFD'S AND DELIVER TO OWNER.
- ⑩ DISCONNECT EXISTING VFD-5001 AND ALL ASSOCIATED CONTROL POWER, RTD CONTROL, AND SCADA SYSTEM CONDUIT & WIRING AND DELIVER TO OWNER. ARRANGE FOR LOADING, TRANSPORTING TO LONGVIEW, TX, AND UN-LOADING THE EXISTING EQUIPMENT AT A SITE AS DETERMINED BY THE CITY.
- ⑪ F&I PROPOSED VFD-5001, AS SPECIFIED. POSITION THE PROPOSED VFD ENCLOSURE OVER THE EXISTING IN AND OUT CONDUIT STUB-UPS.
- ⑫ F&I THREE 1/C, #3/0 AWG STRANDED COPPER, 5 KV, MV-115, SHIELDED POWER CABLES AND ONE 1/C, #1/0 AWG STRANDED COPPER, 600V, EQUIPMENT GROUNDING CONDUCTOR IN EXISTING 3" CONDUIT BETWEEN THE LOAD SIDE OF MAIN FUSED SWITCH #1 AND THE PROPOSED VARIABLE FREQUENCY DRIVE.
- ⑬ F&I THREE 1/C, #1/0 AWG STRANDED COPPER, 5 KV, MV-115, SHIELDED POWER CABLES AND ONE 1/C, #1/0 AWG STRANDED COPPER, 600V, EQUIPMENT GROUNDING CONDUCTOR IN EXISTING 3" CONDUIT BETWEEN THE LOAD SIDE OF PROPOSED VFD-5001 AND EXISTING RAW WATER PUMP #1 MOTOR.
- ⑭ F&I CONDUIT, FITTINGS, & WIRING AS REQUIRED AND EXTEND AND RECONNECT THE EXISTING 1" CONDUIT WITH (4)-#8 FOR 480V, 3-PHASE CONTROL POWER FROM PANEL "P1" FOR THE PROPOSED VFD.
- ⑮ F&I CONDUIT, FITTINGS, & WIRING AS REQUIRED AND EXTEND AND RECONNECT THE EXISTING 3/4" CONDUIT WITH (11)-#14 FOR SCADA SYSTEM DISCRETE INPUT/OUTPUT WIRING FOR THE PROPOSED VFD.
- ⑯ F&I CONDUIT, FITTINGS, & WIRING AS REQUIRED AND EXTEND AND RECONNECT THE EXISTING 3/4" CONDUIT WITH (2)-# TPS FOR SCADA SYSTEM ANALOG INPUT/OUTPUT WIRING FOR THE PROPOSED VFD.
- ⑰ ARRANGE ELECTRICAL CLEARANCE WITH CITY AND DISCONNECT AND REMOVE THE EXISTING MEDIUM VOLTAGE FEEDER WIRING BETWEEN THE LOAD SIDE OF THE 5 KV MAIN FUSED SWITCH #2 AND THE RAW WATER PUMP #2 VARIABLE FREQUENCY DRIVE (VFD-5002) AND DELIVER TO OWNER.
- ⑱ DISCONNECT AND REMOVE THE EXISTING MEDIUM VOLTAGE MOTOR FEEDER WIRING BETWEEN THE LOAD SIDE OF THE VFD-5002 AND RAW WATER PUMP #2 MOTOR AND DELIVER TO OWNER.
- ⑲ DISCONNECT THE EXISTING LIGHTNING ARRESTER ENCLOSURE (LAC2) AND ALL ASSOCIATED 2" LIQUID-TIGHT TAP CONDUIT & WIRING TO THE MOTOR POWER JUNCTION BOX AND DELIVER TO OWNER.
- ⑳ DISCONNECT EXISTING VFD-5002 AND ALL ASSOCIATED CONTROL POWER, RTD CONTROL, AND SCADA SYSTEM CONDUIT & WIRING AND DELIVER TO OWNER. ARRANGE FOR LOADING, TRANSPORTING TO LONGVIEW, TX, AND UN-LOADING THE EXISTING EQUIPMENT AT A SITE AS DETERMINED BY THE CITY.
- ㉑ F&I PROPOSED VFD-5002, AS SPECIFIED. POSITION THE PROPOSED VFD ENCLOSURE OVER THE EXISTING IN AND OUT CONDUIT STUB-UPS.
- ㉒ F&I THREE 1/C, #3/0 AWG STRANDED COPPER, 5 KV, MV-115, SHIELDED POWER CABLES AND ONE 1/C, #1/0 AWG STRANDED COPPER, 600V, EQUIPMENT GROUNDING CONDUCTOR IN EXISTING 3" CONDUIT BETWEEN THE LOAD SIDE OF MAIN FUSED SWITCH #2 AND THE PROPOSED VARIABLE FREQUENCY DRIVE (VFD-5002).
- ㉓ F&I THREE 1/C, #1/0 AWG STRANDED COPPER, 5 KV, MV-115, SHIELDED POWER CABLES AND ONE 1/C, #1/0 AWG STRANDED COPPER, 600V, EQUIPMENT GROUNDING CONDUCTOR IN EXISTING 3" CONDUIT BETWEEN THE LOAD SIDE OF PROPOSED VFD-5002 AND EXISTING RAW WATER PUMP #2 MOTOR.
- ㉔ REMOVE EXISTING RTD MONITOR AND F&I PROPOSED 18" X 18" X 8" NEMA-12 ENCLOSURE WITH BACK PANEL AND 24 POINT TERMINAL BLOCKS.
- ㉕ F&I CONDUIT, FITTINGS, AS REQUIRED AND RECONNECT THE EXISTING 2" CONDUIT WITH (8) - 3/C, #16 SHIELDED RTD CABLES AND LAND ON THE TERMINAL BLOCKS IN THE PROPOSED ENCLOSURE.
- ㉖ F&I 2" CONDUIT WITH (8) - 3/C, #16 SHIELDED RTD CABLES BETWEEN THE RTD ENCLOSURE AND THE RTD MONITOR IN THE VFD.
- ㉗ HIGH POTENTIAL TEST ALL MEDIUM VOLTAGE CABLES WITH STRESS RELIEF TERMINATORS IN PLACE BEFORE ENERGIZING.
- ㉘ F&I PROPOSED MV REDUCED VOLTAGE SOLID STATE STARTER (RVSS), AS SPECIFIED FROM RWP#2. POSITION THE PROPOSED RVSS ENCLOSURE OVER THE EXISTING IN AND OUT CONDUIT STUB-UPS.
- ㉙ F&I THREE 1/C, #3/0 AWG STRANDED COPPER, 5 KV, MV-115, SHIELDED POWER CABLES AND ONE 1/C, #1/0 AWG STRANDED COPPER, 600V, EQUIPMENT GROUNDING CONDUCTOR IN EXISTING 3" CONDUIT BETWEEN THE LOAD SIDE OF MAIN FUSED SWITCH #2 AND THE PROPOSED RVSS.
- ㉚ F&I THREE 1/C, #1/0 AWG STRANDED COPPER, 5 KV, MV-115, SHIELDED POWER CABLES AND ONE 1/C, #1/0 AWG STRANDED COPPER, 600V, EQUIPMENT GROUNDING CONDUCTOR IN EXISTING 3" CONDUIT BETWEEN THE LOAD SIDE OF PROPOSED RVSS AND EXISTING RAW WATER PUMP #2 MOTOR.



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 HENDERSON, TEXAS 75625



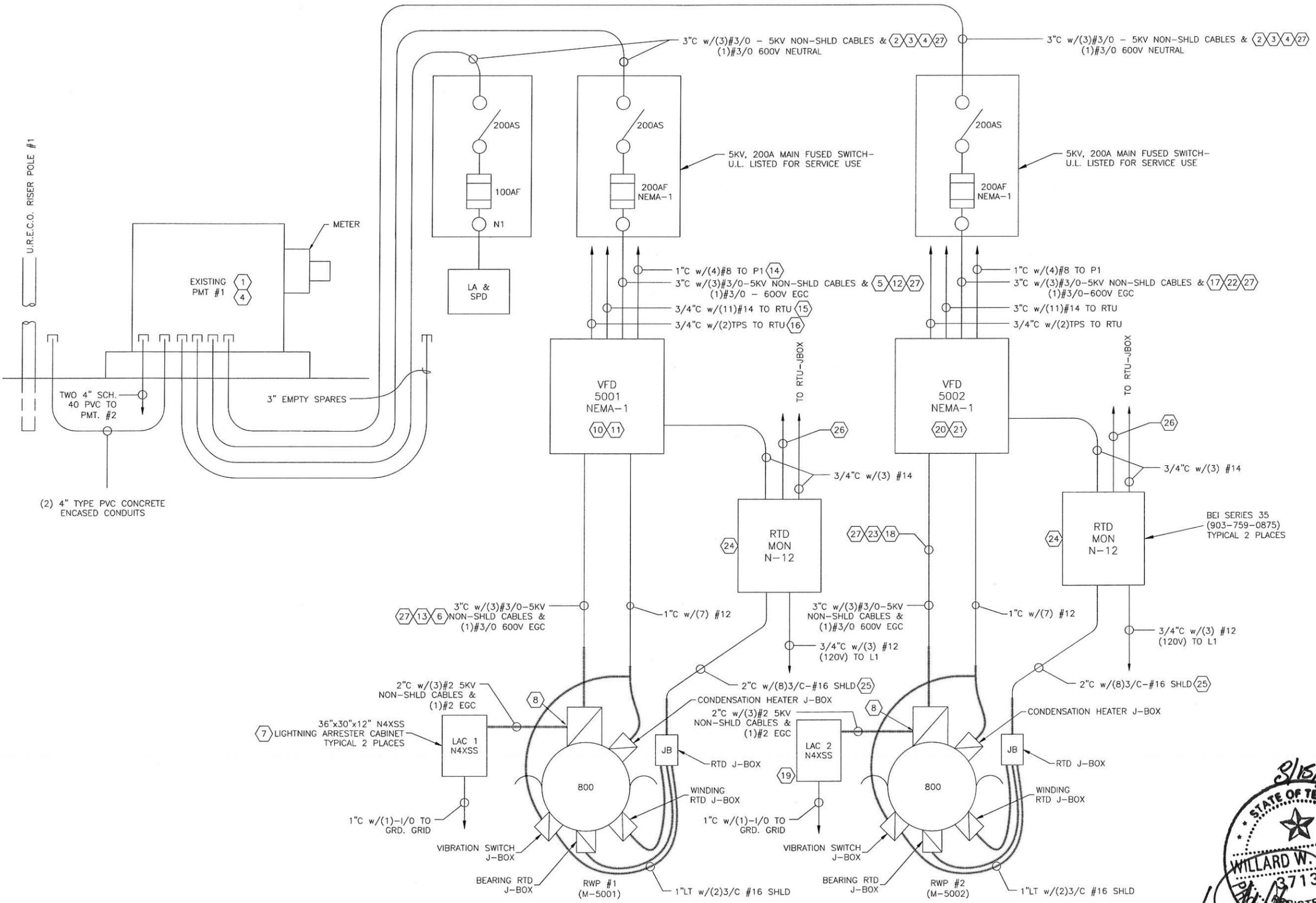
CITY OF LONGVIEW, TEXAS
LAKE O' THE PINES
 RAW WATER INTAKE AND PUMP STATION
 ELECTRICAL SITE PLAN AND LEGEND

| NO. | REVISION | DATE | BY | F&I JOB NO. | FILE | DATE | DESIGNED | DRAWN | REVIEWED | CHECKED |
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| | | | | LONG7275D | ELECSITE.DWG | SEPT 2000 | WJW | WJW | | WJW |

VERIFY SCALE: Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET **E-1**

SEQ. **1 OF 5**



EXISTING MEDIUM VOLTAGE ONELINE DIAGRAM

1) MODIFY PER (#) NOTES



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 TEXAS REGISTERED ENGINEERING FIRM E-6490
 8117 LAKE CHEROKEE TEL: (903) 397-7411
 HENDERSON, TEXAS 75828

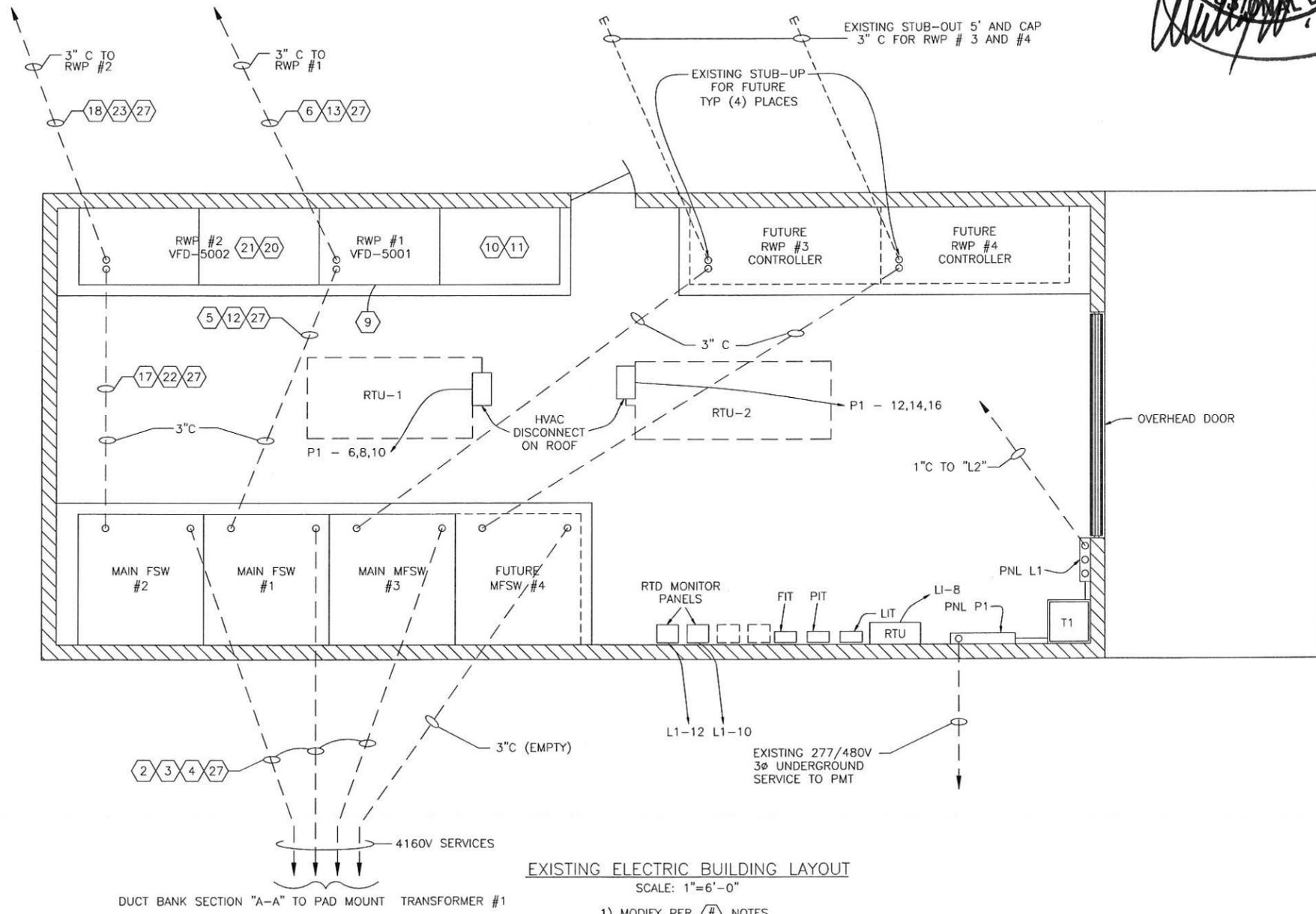


CITY OF LONGVIEW, TEXAS
LAKE O' THE PINES
 RAW WATER INTAKE AND PUMP STATION
 MEDIUM VOLTAGE ONELINE DIAGRAM

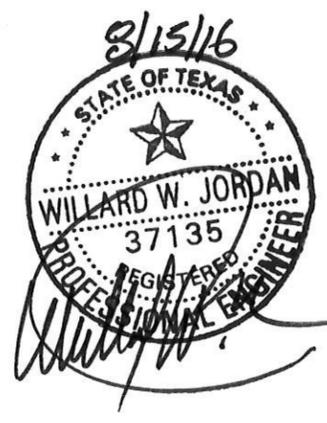
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| | | | LANG97275D | SEPT 2000 | WMJ | WMJ | WMJ | WMJ |
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| SHEET E-2 | | | | | | | | |
| SEQ. 2 OF 5 | | | | | | | | |

LEGEND

- S — SWITCH, 120/277V, 20A, SINGLE POLE SINGLE THROW
- S3 — SWITCH, 120/277V, 20A, THREE-WAY
- ☒ — MANUAL MOTOR STARTER
- ⊕ — DUPLEX RECEPTACLE, 125V, 20A, NEMA - 5-20R
- HOME RUN FROM DEVICE TO PANEL 3/4" C MIN - NO MORE THAN 3 CONDUCTORS PER CONDUIT W/O DERATING 20A CIRCUIT - #12 THWN COPPER, 30A CIRCUIT - #10 THWN COPPER
- JB — JUNCTION BOX OR PULL BOX - SIZE AS NOTED OR PER NEC IF NOT NOTED
- ⊕ — MOTOR WITH INTEGRAL J-BOX AND FLEXIBLE CONDUIT - 3/4 HP INDICATED
- 600 AS — DISCONNECT SWITCH - SIZE AND TYPE AS NOTED 600 AMP DENOTED
- 600 AF — FUSE - 600 AMP DENOTED
- CPT — CONTROL POWER TRANSFORMER - SIZE AS NECESSARY FOR LOAD
- MCH — MOTOR CONDENSATION HEATER
- LA — LIGHTNING ARRESTOR EQUAL TO COOPER POWER SYSTEMS "STORM TRAPPER" OR AS NOTED (903-759-0875)
- PVR — PHASE FAILURE RELAY WITH HIGH VOLTAGE, LOW VOLTAGE, PHASE LOSS & PHASE REVERSAL PROTECTION SSAC, INC MODEL WVM (315-638-1300)
- OL — MOTOR OVERLOAD RELAY
- MCP — MOTOR CIRCUIT PROTECTOR CIRCUIT BREAKER
- YN — MOTOR STARTER CONTACTOR - SIZE AS INDICATED
- YN — MOTOR STARTER COIL - VOLTAGE AS INDICATED
- YNX — MOTOR STARTER AUXILIARY CONTACT (NC)
- CONCEALED OR UNDERGROUND CONDUIT
- EXPOSED CONDUIT
- SPD — SURGE PROTECTIVE DEVICE
- C.T. — CURRENT TRANSFORMER
- DRY TYPE TRANSFORMER - SIZE AND TYPE AS NOTED
- LT — LIQUID TIGHT FLEXIBLE CONDUIT
- ⊕ — GROUND
- ⊕ — GROUND ROD, COPPER WELD, SIZE AND LENGTH AS NOTED
- TDR — TIME DELAY RELAY
- OTS — OVER-TEMPERATURE SWITCH OR OVER-TORQUE SWITCH
- CH — CONDENSATION HEATER
- T — THERMOSTAT, TYPE AS NOTED
- TPS — TWISTED PAIR SHIELDED - INSTRUMENTATION HOOK-UP WIRE - SEE SPECS.
- WP — WEATHER PROOF
- HDG — HOT DIPPED GALVANIZED
- GEC — GROUNDING ELECTRODE CONDUCTOR
- EGC — EQUIPMENT GROUNDING CONDUCTOR
- FSW — H.D. FUSED SWITCH
- N1 — NEMA - 1
- N3R — NEMA - 3R
- FWE — FURNISHED WITH EQUIPMENT
- TRIAD — TWISTED 3/C SHIELDED
- CP — CONTROL PANEL
- NC — NORMALLY CLOSED
- NO — NORMALLY OPEN
- PMT — PAD MOUNTED TRANSFORMER
- OEP — OVERHEAD ELECTRIC POWER



EXISTING ELECTRIC BUILDING LAYOUT
SCALE: 1"=6'-0"
1) MODIFY PER (#) NOTES



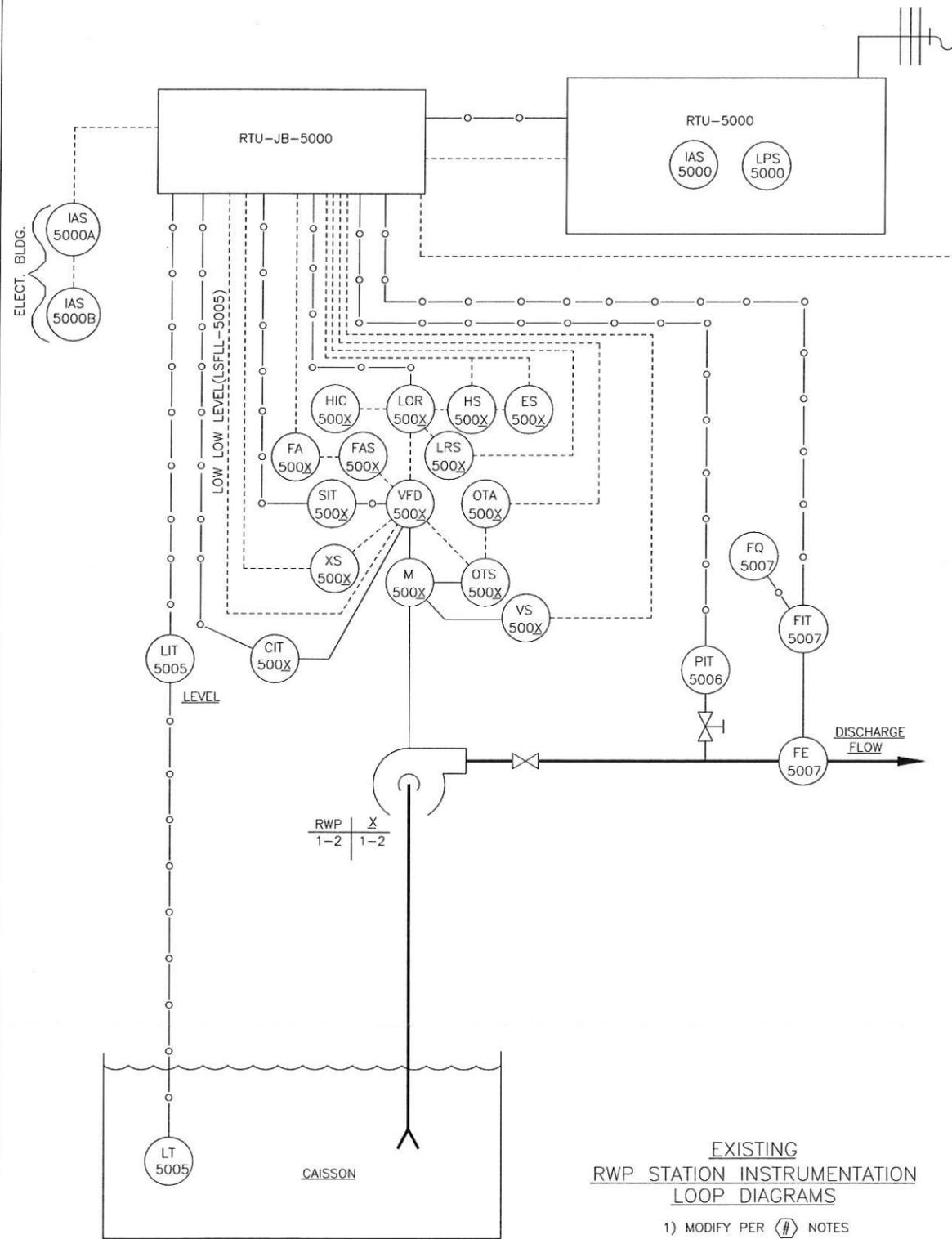
ELECTRICAL EXPERTISE INC.
TEXAS REGISTERED ENGINEERING FIRM E-24890
8707 LAKE CHEROKEE TEL: (800) 297-7911
HENDERSON, TEXAS 75852

CITY OF LONGVIEW, TEXAS
LAKE O' THE PINES
RAW WATER INTAKE AND PUMP STATION
ELECTRIC & ACCUMULATOR BLDG. LAYOUT

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SHEET F-3
SEQ. 3 OF 5

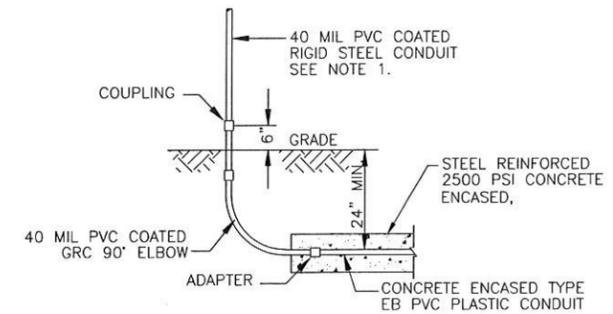


EXISTING SCADA SYSTEM SCHEMATIC

- LPA-5000 LOSS OF POWER ALARM
- IA-5000 RTU INTRUSION ALARM
- IA-5000A ELECTRICAL BUILDING INTRUSION ALARM
- LRI-500x RWP VFD LOR SWITCH POSITION STATUS (x=1-2)
- HOA-500x RWP HAND-OFF-AUTO SELECTOR SWITCH FUNCTION (x=1-2)
- HS-500xA RWP STOP/START HAND SWITCH FUNCTION (x=1-2)
- HC-500x RWP HAND CONTROLLER FUNCTION (x=1-2)
- FA-500xA RWP VFD FAIL ALARM (x=1-2)
- XL-500X RWP VFD RUN STATUS (x=1-2)
- KIRQ-500x RWP PUMP RUN TIME (x=1-2)
- OTA-500xA RWP MOTOR OVER-TEMPERATURE ALARM (x=1-2)
- VA-500xA RWP MOTOR VIBRATION ALARM (x=1-2)
- SI-500x RWP SPEED INDICATION (x=1-2)
- SSFL-500x SPEED SWITCH FUNCTION LOW (x=1-2)
- SAL-500x SPEED ALARM LOW (x=1-2)
- SSFH-500x SPEED SWITCH FUNCTION HIGH (x=1-2)
- SAH-500x SPEED ALARM HIGH (x=1-2)
- CI-500x RWP LOAD CURRENT INDICATION (x=1-2)
- CSFL-500x CURRENT SWITCH FUNCTION LOW (x=1-2)
- CAL-500x CURRENT ALARM LOW (x=1-2)
- CSFH-500x CURRENT SWITCH FUNCTION HIGH (x=1-2)
- CAH-500x CURRENT ALARM HIGH (x=1-2)
- LIR-5005 LAKE LEVEL INDICATING RECORDER
- LSFL-5005 LEVEL SWITCH FUNCTION LOW
- LAL-5005 LEVEL ALARM LOW
- LSFH-5005 LEVEL SWITCH FUNCTION HIGH
- LAH-5005 LEVEL ALARM HIGH
- PIR-5006 DISCHARGE PRESSURE INDICATING RECORDER
- PSFL-5006 PRESSURE SWITCH FUNCTION LOW
- PAL-5006 PRESSURE ALARM LOW
- PSFH-5006 PRESSURE SWITCH FUNCTION HIGH
- PAH-5006 PRESSURE ALARM HIGH
- FIRQ-5007 DISCHARGE FLOW INDICATING RECORDING TOTALIZER
- FSFL-5007 FLOW ALARM SWITCH FUNCTION LOW
- FAL-5007 FLOW ALARM LOW
- FSFH-5007 FLOW ALARM SWITCH FUNCTION HIGH
- FAH-5007 FLOW ALARM HIGH
- XA-500X SURGE VALVE ALARM (X=8,9)

EXISTING RWP STATION INSTRUMENTATION LOOP DIAGRAMS

- 1) MODIFY PER (#) NOTES
- BISTABLE SIGNAL
- o---o---o ANALOG SIGNAL



NOTE 1:
RIGID GALVANIZED STEEL CONDUIT AND FITTINGS MAY BE USED FOR ABOVE GRADE IN ELECTRIC BUILDINGS.

TYPICAL CONDUIT DETAIL
NOT TO SCALE



CITY OF LONGVIEW, TEXAS
LAKE O' THE PINES
RAW WATER INTAKE AND PUMP STATION
MISCELLANEOUS ELECTRICAL DETAILS

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| | | | | MISCELEC2.DWG | SEPT 2000 | WNU | WNU | WNU | WNU |

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SHEET E-5
SEQ. 5 OF 5