

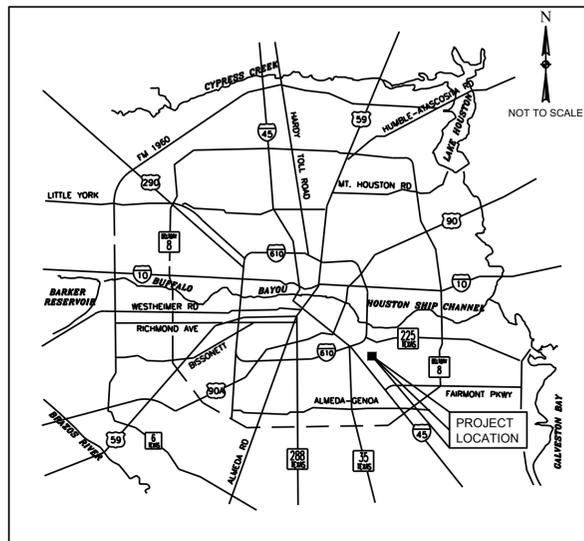
CITY OF HOUSTON HOUSTON PUBLIC WORKS CAPITAL PROJECTS

SIMS SOUTH WASTEWATER TREATMENT PLANT

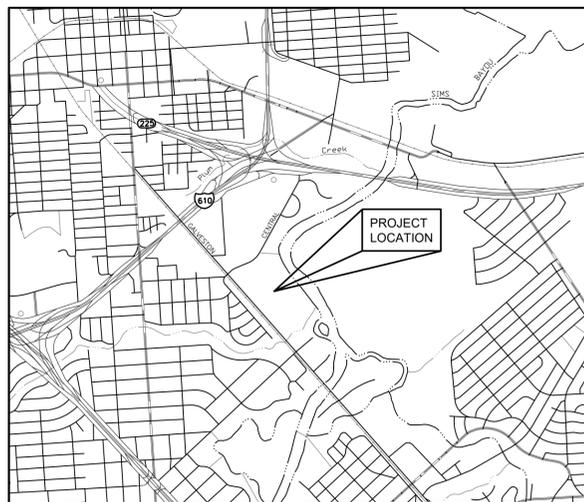
ELECTRICAL IMPROVEMENTS

60% SUBMITTAL

WBS NO. R-000265-0146-3



LOCATION MAP



VICINITY MAP
KEY MAP NO 535L



MAYOR
JOHN WHITMIRE

CONTROLLER
CHRIS HOLLINS

DISTRICT
COUNCIL MEMBERS

- | | | | |
|--------------------------------|---------------------------------|-----------------------------------|-------------------------------------|
| AMY PECK DISTRICT A | TARSHA JACKSON DISTRICT B | ABBIE KAMIN DISTRICT C | CAROLYN EVANS-SHABAZZ DISTRICT D |
| FRED FLICKINGER DISTRICT E | TIFFANY D. THOMAS DISTRICT F | MARY NAN HUFFMAN DISTRICT G | MARIO CASTILLO DISTRICT H |
| JOAQUIN MARTINEZ DISTRICT I | EDWARD POLLARD DISTRICT J | MARTHA CASTEX-TATUM DISTRICT K | |

COUNCIL MEMBERS
AT-LARGE

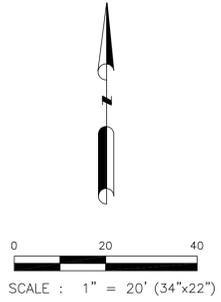
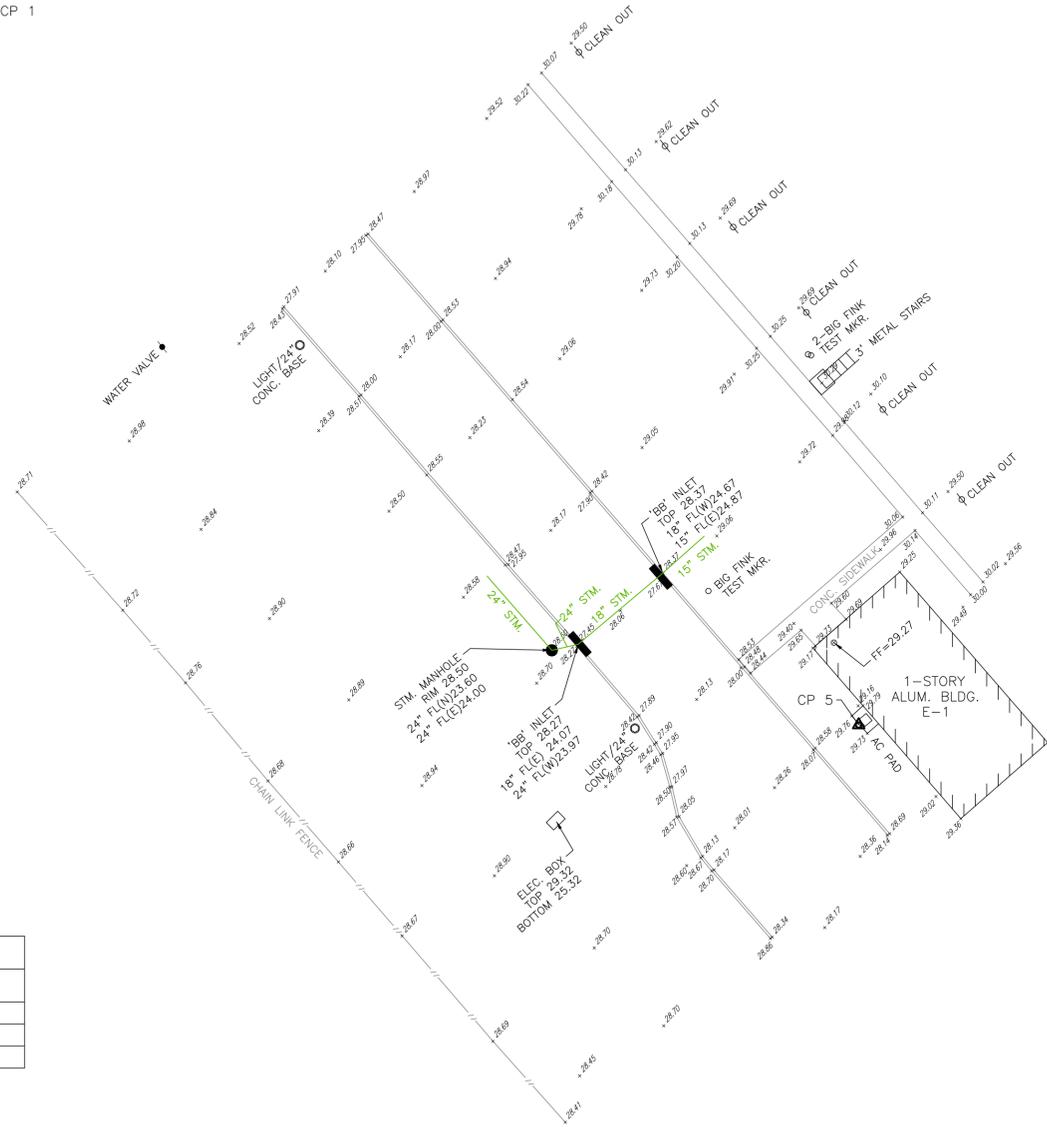
- | | |
|------------------------------|-------------------------------|
| JULIAN RAMIREZ POSITION 1 | WILLIE DAVIS POSITION 2 |
| TWILA CARTER POSITION 3 | LETITIA PLUMMER POSITION 4 |
| SALLIE ALCORN POSITION 5 | |

TDLR EABPR N/A

| NO. | DATE | REVISION | APP. |
|---|------|--|------|
| | | | |
| | | | |
| | | | |
| 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com | | NOT FOR CONSTRUCTION <small>THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF: SHELDON M. BUCK P. E. TEXAS NO. 93693 ON DATE: 10/27/2025 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES.</small> | |
| SURVEYED BY: LANDTECH, INC. FB NO. P- | | | |
| <hr/> PARKS-FORESTRY DEPT. | | | |
| <hr/> METRO | | | |
| <hr/> HOUSTON WATER | | | |
| <hr/> TRANSPORTATION & DRAINAGE OPERATIONS | | | |
| <hr/> CAPITAL PROJECTS | | <hr/> SURVEY | |
| <hr/> CITY ENGINEER | | <hr/> DATE | |
| <hr/> DIRECTOR OF HOUSTON PUBLIC WORKS | | <hr/> DATE | |
| SHEET NO 1 | | OF 111 SHEETS | |
| FOR CITY OF HOUSTON USE ONLY | | | |

FILE PATH: C:\Users\08764\DC\ACCDocs\Freese And Nichols\Sim South WWTP Improvements\Project Files\03_Design Files\WW\GENERAL SHEETS\0146-3\0146-3.dwg
 PLOTTED: 10/30/2025 11:25 AM

CP 1



BENCHMARK:
 HCFC RM 030190 - BRASS DISK IS LOCATED ON THE EAST SIDEWALK OF THE BRIDGE FROM THE INTERSECTION OF PARK PLACE BOULEVARD AND GALVESTON ROAD, TRAVEL NORTHWEST 0.1 MILE ON GALVESTON ROAD TO BRIDGE
 ELEVATION = 23.22' (NAVD 88, 2001 ADJ.)

| CONTROL POINT TABLE | | | | |
|---------------------|---------------|--------------|-------|---------------------------|
| POINT | GRID NORTHING | GRID EASTING | ELEV. | DESCRIPTION |
| 1 | 13,820,883.59 | 3,152,923.36 | 28.59 | SET 3/8" IRw LANDTECH CAP |
| 5 | 13820,732.83 | 3,153,116.99 | 29.75 | TBM CUT SQUARE IN CONC |
| 30190 | 13,819,539.55 | 3,153,950.78 | 23.22 | HCFC RM 030190 - FND |

LANDTECH

1315 W Sam Houston Parkway N, Suite 100
 Houston, Texas 77043
 T: 713-861-7068 F: 713-861-4131
 TBPELS Registration No. 10019100

FREESE NICHOLS
 10497 Town and Country Way, Suite 500
 Houston, Texas 77024
 Phone - (713) 600-6800
 Web - www.freese.com

NOT FOR CONSTRUCTION
 THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF: PAUL KWAN, RPLS TEXAS NO: 4313 ON DATE: 10/27/2025 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES.

SURVEYED BY: LANDTECH
 FB NO. P-

CITY OF HOUSTON

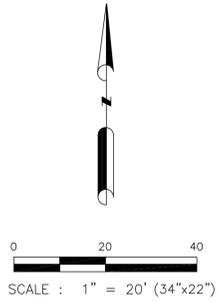
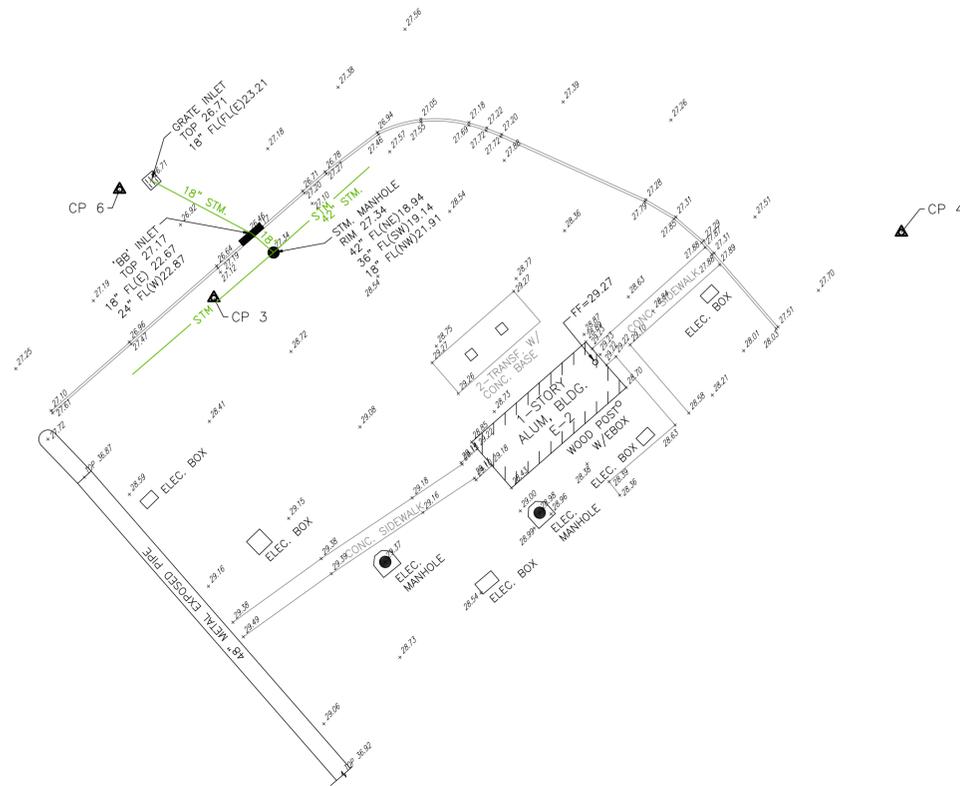
HOUSTON PUBLIC WORKS

SIMS SOUTH WASTEWATER TREATMENT PLAN

NEW E1 BUILDING

TOPOGRAPHIC SURVEY

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| AS SHOWN | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| C-2 | SHEET NO. 6 OF 111 |



BENCHMARK:
 HCFCO RM 030190 - BRASS DISK IS LOCATED ON THE
 EAST SIDEWALK OF THE BRIDGE
 FROM THE INTERSECTION OF PARK PLACE BOULEVARD
 AND GALVESTON ROAD, TRAVEL NORTHWEST 0.1 MILE ON
 GALVESTON TOAD TO BRIDGE
 ELEVATION = 23.22' (NAVD 88, 2001 ADJ.)

| CONTROL POINT TABLE | | | | |
|---------------------|---------------|--------------|-------|-------------------------|
| POINT | GRID NORTHING | GRID EASTING | ELEV. | DESCRIPTION |
| 3 | 13,821,375.55 | 3,152,903.79 | 27.32 | SET 3/8"IRwLANDTECH CAP |
| 4 | 13,821,389.85 | 3,153,054.21 | 27.88 | SET 3/8"IRwLANDTECH CAP |
| 6 | 13,821,399.21 | 3,152,883.16 | 27.79 | TBM CUT SQUARE IN CONC |
| 30190 | 13,819,539.55 | 3,153,950.78 | 23.22 | HCFCO RM 030190 - FND |

LANDTECH

1315 W Sam Houston Parkway N, Suite 100
 Houston, Texas 77043
 T: 713-861-7068 F: 713-861-4131
 TBPELS Registration No. 10019100

FREESE NICHOLS
 10497 Town and Country Way, Suite 500
 Houston, Texas 77024
 Phone - (713) 600-6800
 Web - www.freese.com

NOT FOR CONSTRUCTION
 THIS DOCUMENT IS RELEASED FOR THE
 PURPOSE OF INTERIM REVIEW UNDER THE
 AUTHORITY OF: PAUL KWAN, RPLS
 TEXAS NO: 4513 - ON DATE: 10/27/2025
 IT IS NOT TO BE USED FOR CONSTRUCTION,
 BIDDING OR PERMIT PURPOSES.

SURVEYED BY: LANDTECH
 FB NO. P-

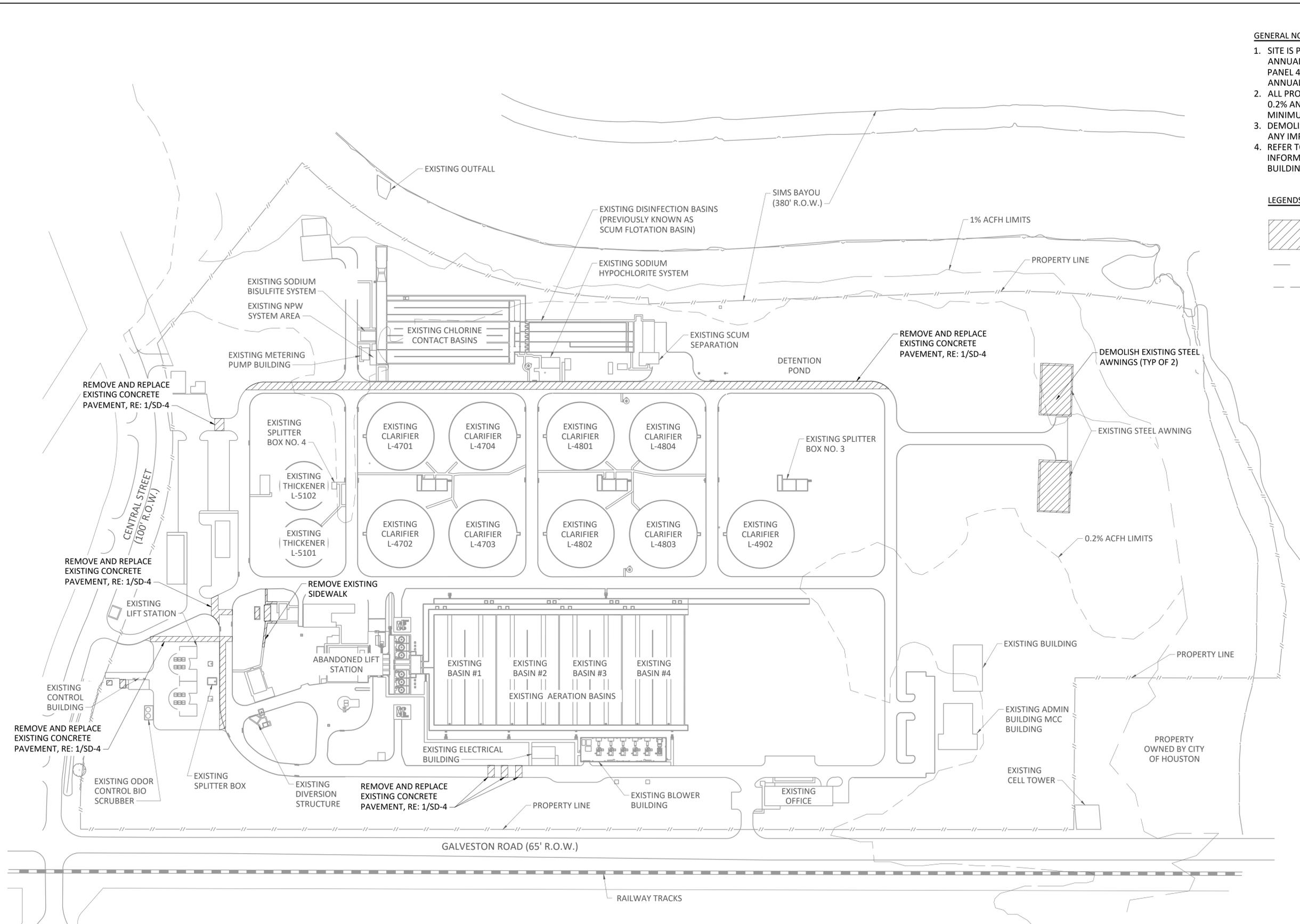
CITY OF HOUSTON

HOUSTON PUBLIC WORKS

SIMS SOUTH WASTEWATER TREATMENT PLAN

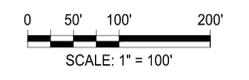
NEW E2 BUILDING TOPOGRAPHIC SURVEY

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| AS SHOWN | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |



- GENERAL NOTES:**
1. SITE IS PARTIALLY LOCATED IN ZONE AE AND THE 0.2% ANNUAL CHANCE FLOOD HAZARD AREA PER FIRM MAP PANEL 4802960885M, DATED MAY 2, 2029, WITH A 0.2% ANNUAL CHANCE FLOOD HAZARD ELEVATION OF 25.9'.
 2. ALL PROPOSED IMPROVEMENTS ARE LOCATED OUTSIDE 0.2% ANNUAL CHANCE FLOOD HAZARD AREAS WITH A MINIMUM SLAB ELEVATION ABOVE 28.9'.
 3. DEMOLISH EXISTING STEEL AWNINGS PRIOR TO ADDING ANY IMPERVIOUS COVER.
 4. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION ABOUT DEMOLITION OF ELECTRICAL BUILDINGS AND TRANSFORMERS.

- LEGENDS:**
- TO BE DEMOLISHED
 - 1% ANNUAL CHANCE FLOOD HAZARD LIMITS
 - 0.2% ANNUAL CHANCE FLOOD HAZARD LIMITS



| | |
|---|--|
| <p>10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>NOT FOR CONSTRUCTION</p> <p>THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF: SHELDON M. BUCK P.E. TEXAS NO: 93693 ON DATE: 10/27/2025. IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES.</p> |
| | <p>SURVEYED BY: FB NO. P-</p> |

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 CIVIL
 DEMOLITION SITE PLAN

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| 1" = 100' | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 8 OF 111 | |

DEMOLITION SITE PLAN
 SCALE: 1" = 100'



1 NORTHERN STEEL AWNING, WEST SIDE
VD-01 NOT TO SCALE



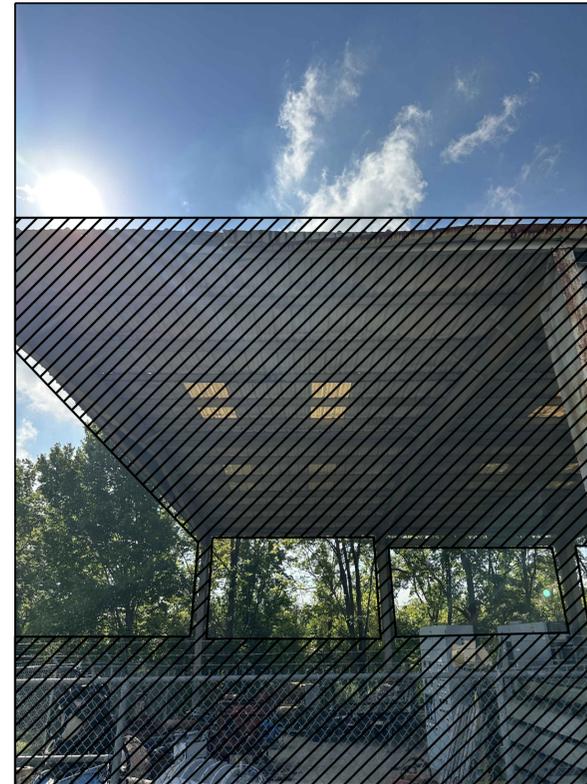
2 NORTHERN STEEL AWNING, NORTH SIDE
VD-01 NOT TO SCALE



3 NORTHERN STEEL AWNING, EAST SIDE
VD-01 NOT TO SCALE



4 NORTHERN STEEL AWNING, NORTH SIDE
VD-01 NOT TO SCALE



5 NORTHERN STEEL AWNING, WEST SIDE
VD-01 NOT TO SCALE



6 NORTHERN STEEL AWNING, NORTHEAST SIDE
VD-01 NOT TO SCALE

GENERAL NOTES:

- PHOTOS PROVIDED FOR GENERAL VISUAL REPRESENTATION OF PROCESSES AND EQUIPMENT. CONTRACTOR SHALL FIELD VERIFY SITE CONDITIONS.
- REFER TO SECTION 02221 REMOVING EXISTING PAVEMENTS, STRUCTURES, WOOD AND DEMOLITION DEBRIS FOR REQUIREMENTS FOR WASTE MATERIAL DISPOSAL.
- NOTIFY THE CITY 48 HOURS PRIOR TO DEMOLITION IN ORDER TO COORDINATE THE REMOVAL OF ANY ITEMS THE CITY WISHES TO CLAIM AS SALVAGE.
- CITY TO HAVE THE RIGHT OF FIRST REFUSAL. DELIVER SALVAGE ITEMS TO CITY FACILITY WITHIN CITY LIMITS. OTHER ITEMS TO BE DISPOSED OF BY THE CONTRACTOR AT THE EXPENSE OF THE CONTRACTOR.
- CONTRACTOR SHALL SECURE PERMIT AND NOTIFY THE TEXAS DEPARTMENT OF HEALTH IN ACCORDANCE WITH TEXAS ADMINISTRATIVE CODE TITLE 25, CHAPTER 295 NO LESS THAN 10 WORKING DAYS PRIOR TO THE DEMOLITION OF ANY FACILITY.

| NO. | DATE | REVISION | APP. |
|-----|------|----------|------|
| | | | |

| | | |
|---|-------------------------------------|--|
| <p>10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | | <p>NOT FOR CONSTRUCTION</p> <p>THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF: SHELDON M. BUCK P.E. TEXAS NO: 93693 ON DATE: 10/27/2025. IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES.</p> |
| <p>SURVEYED BY: FB NO. P-</p> | | <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS CIVIL STEEL AWNING DEMOLITION DETAILS I</p> |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> | |
| <p>DRAWING SCALE</p> | | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | | |
| <p>SHEET NO. 10 OF 111</p> | | |

| SYMBOLS | DESCRIPTION |
|---------|--|
| | MEDIUM VOLTAGE DRAWOUT TYPE POWER CIRCUIT BREAKER CS-CONTROL SWITCH |
| | LOW VOLTAGE CIRCUIT BREAKER, 3 POLE UNLESS OTHERWISE NOTED. LSIG IF NOTED MCP IF NOTED ERMS IF NOTED |
| | COMBINATION MOTOR CIRCUIT PROTECTOR AND MAGNETIC MOTOR STARTER, FULL VOLTAGE NON-REVERSING UNLESS OTHERWISE NOTED: * FVR-FULL VOLTAGE REVERSING RVNR-REDUCED VOLTAGE NON-REVERSING 2S1W-TWO SPEED, ONE WINDING 2S2W-TWO SPEED, TWO WINDING |
| | NON-FUSIBLE DISCONNECT SWITCH, 600 VOLT, 3 POLE * AMPERE RATING NOTED IF OTHER THAN 30A |
| | FUSIBLE DISCONNECT SWITCH, 600 VOLT, 3 POLE, AMPERE RATING AND FUSE SIZE AS NOTED: * AMPERE RATING NOTED IF OTHER THAN 30A * FUSE RATING |
| | MOTOR ISOLATION SWITCH, HORSEPOWER RATED |
| | DRAWOUT TYPE EQUIPMENT OR DEVICE |
| | MEDIUM VOLTAGE CABLE TERMINATION |
| | MEDIUM VOLTAGE AIR INTERRUPTER SWITCH |
| | MEDIUM VOLTAGE FUSED AIR INTERRUPTER SWITCH |
| | MEDIUM VOLTAGE FUSED MOTOR CONTROLLER |
| | TRANSFORMER, RATINGS AND CONNECTIONS AS NOTED. UNLESS OTHERWISE NOTED ON THE SINGLE LINE DIAGRAMS ALL DRY TYPE TRANSFORMERS SERVICING ADMINISTRATIVE AND LABORATORY SPACES SHALL HAVE A K FACTOR OF 13. ALL OTHER DRY TYPE TRANSFORMERS SHALL HAVE A K-4 RATING. ISOLATION TRANSFORMERS SHALL HAVE A K-20 RATING |
| | CURRENT TRANSFORMER: * QUANTITY A= PRIMARY AMPERES |
| | POTENTIAL TRANSFORMER: * QUANTITY PV= PRIMARY VOLTAGE SV= SECONDARY VOLTAGE |
| | GENERATOR, RATINGS AND CONNECTIONS AS NOTED |
| | TRANSFER SWITCH AUTOMATIC TRANSFER SWITCH (EG ATS-1) MANUAL TRANSFER SWITCH (EG MTS-1) "N" INDICATES NORMAL SOURCE "S" INDICATES STANDBY SOURCE 100A INDICATES CONTINUOUS CURRENT RATING |
| | VARIABLE SPEED DRIVE CONTROLLER * D.C.= D.C. DRIVE CONTROLLER SCR= SILICON CONTROLLED RECTIFIER VFD= VARIABLE FREQUENCY DRIVE AFD= ADJUSTABLE FREQUENCY DRIVE |
| | VACUUM CONTACTOR |
| | UNIT HEATER - ELECTRIC HEATING COIL AND FAN |
| | UNIT HEATER - STEAM OR WATER HEATING COIL AND FAN |
| | MOTOR, NUMERAL INDICATES HORSEPOWER |
| | SURGE PROTECTION DEVICE |
| | VARIABLE FREQUENCY DRIVE |

| SYMBOLS | DESCRIPTION | | | | | | | | | | | | | | | | |
|----------|---|----------------|----------------|----------------|----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| | VOLTMETER (WITH SWITCH IF 3-PHASE) | | | | | | | | | | | | | | | | |
| | AMMETER (WITH SWITCH IF 3-PHASE) | | | | | | | | | | | | | | | | |
| | METER * WM- WATTMETER WHM- WATTHOUR METER WHDM- WATTHOUR DEMAND METER WHDR- WATTHOUR DEMAND RECORDER PF- POWER FACTOR METER RT- RUNNING TIME METER TRANSDUCER AX- CURRENT TRANSDUCER WX- WATT TRANSDUCER | | | | | | | | | | | | | | | | |
| | RELAY, NO. AS INDICATED 25- SYNCHRONISM CHECK RELAY 27- UNDER VOLTAGE RELAY 38- BEARING PROTECTIVE DEVICE 40- LOSS OF EXCITATION RELAY 42- RUNNING CONTACTOR/PILOT RELAY 46- REVERSE PHASE/PHASE BALANCE/CURRENT RELAY 47- PHASE SEQUENCE VOLTAGE RELAY 49- MACHINE OR TRANSFORMER THERMAL RELAY 50- INSTANTANEOUS OVERCURRENT RELAY 50G- INSTANTANEOUS GROUND 51- TIME OVER CURRENT RELAY 51G- TIME OVERCURRENT RELAY, GROUNDING RESISTOR TYPE 51N- TIME OVERCURRENT RELAY, RESIDUAL TYPE 51V- TIME OVERCURRENT RELAY WITH VOLTAGE RESTRAINT 60- NEGATIVE SEQUENCE VOLTAGE RELAY 62- TIME DELAY RELAY 63- OVER PRESSURE RELAY 67- AC DIRECTIONAL OVERCURRENT RELAY 83- AUTOMATIC SELECTIVE CONTROL OR TRANSFER RELAY 86- LOCKING-OUT RELAY 87- DIFFERENTIAL PROTECTIVE RELAY B- SUFFIX INDICATES "BUS" G- SUFFIX INDICATES "GENERATOR" GF- GROUND FAULT ST- SHUNT TRIP T- SUFFIX INDICATES "TRANSFORMER" X- SUFFIX INDICATES "AUXILIARY" | | | | | | | | | | | | | | | | |
| | SPECIAL CAPACITOR * SC- SURGE CAPACITOR PF- POWER FACTOR CORRECTION CAPACITOR INCLUDING INDUCTIVE LINK AS NEEDED | | | | | | | | | | | | | | | | |
| | PUSH BUTTON, MOMENTARY CONTACT, SPRING RETURN, NORMALLY CLOSED | | | | | | | | | | | | | | | | |
| | PUSH BUTTON, MOMENTARY CONTACT, SPRING RETURN, NORMALLY OPEN | | | | | | | | | | | | | | | | |
| | EMERGENCY STOP PUSH BUTTON WITH RED MUSHROOM HEAD OPERATOR (MAINTAINED CONTACT) | | | | | | | | | | | | | | | | |
| | STOP PUSH BUTTON WITH RED HEAD OPERATOR (MAINTAINED CONTACT) WITH LOCKABLE OPTION * : E-STOP * : STOP | | | | | | | | | | | | | | | | |
| | START-STOP PUSH BUTTON CONTROL STATION (MOMENTARY CONTACT) "L" DENOTES LOCKOUT TYPE | | | | | | | | | | | | | | | | |
| | START-STOP PUSH BUTTON CONTROL STATION, MAINTAINED CONTACT WITH LOCKOUT DEVICE ON STOP | | | | | | | | | | | | | | | | |
| | OFF/ON SELECTOR SWITCH | | | | | | | | | | | | | | | | |
| | 3 POSITION SELECTOR SWITCH, MAINTAINED CONTACT O-OPEN X-CLOSED <table border="1"> <thead> <tr> <th>POSITION</th> <th>TOP CONTACT</th> <th>MIDDLE CONTACT</th> <th>BOTTOM CONTACT</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>X</td> <td>O</td> <td>O</td> </tr> <tr> <td>B</td> <td>O</td> <td>O</td> <td>O</td> </tr> <tr> <td>C</td> <td>O</td> <td>O</td> <td>X</td> </tr> </tbody> </table> * NAMEPLATE (A/B/C) HOA- HAND/OFF/AUTO HOR- HAND/OFF/REMOTE LOR- LOCAL/OFF/REMOTE RSL- RAISE/STOP/LOWER TOA- TEST/OFF/AUTO NOTE: 2 POSITION MULTI-CONTACT SWITCH FOLLOWS SAME CONVENTION | POSITION | TOP CONTACT | MIDDLE CONTACT | BOTTOM CONTACT | A | X | O | O | B | O | O | O | C | O | O | X |
| POSITION | TOP CONTACT | MIDDLE CONTACT | BOTTOM CONTACT | | | | | | | | | | | | | | |
| A | X | O | O | | | | | | | | | | | | | | |
| B | O | O | O | | | | | | | | | | | | | | |
| C | O | O | X | | | | | | | | | | | | | | |
| | MOTOR STARTER COIL, NUMBER AS INDICATED | | | | | | | | | | | | | | | | |
| | CONTROL RELAY COIL, NUMBER AS INDICATED | | | | | | | | | | | | | | | | |
| | RVSS: REDUCED VOLTAGE STATIC SOLID SOFT STARTER | | | | | | | | | | | | | | | | |

| SYMBOLS | DESCRIPTION |
|---------|--|
| | PILOT LIGHT, COLOR AS NOTED * R- RED G- GREEN B- BLUE W- WHITE A- AMBER |
| | PILOT LIGHT, PUSH-TO-TEST TYPE, COLOR AS NOTED ABOVE. |
| | TIME DELAY RELAY RANGE AS NOTED SET POINT AS NOTED |
| | TDD-TIME DELAY AFTER DE-ENERGIZATION-OFF DELAY TDE-TIME DELAY AFTER ENERGIZATION-ON DELAY |
| | NOTC-NORMALLY OPEN, TIMED CLOSING WHEN ENERGIZED NCTO-NORMALLY CLOSED, TIMED OPENING WHEN ENERGIZED NOTO-NORMALLY OPEN, TIMED OPENING WHEN DE-ENERGIZED NCTC-NORMALLY CLOSED, TIMED CLOSING WHEN DE-ENERGIZED |
| | FIELD INSTRUMENT, TAG NO. OR LOOP # AS INDICATED *INDICATES INSTRUMENT TYPE DEFINED ON LOOP SHEETS ##- INDICATES LOOP NO. |
| | LIQUID LEVEL (FLOAT) SWITCH NORMALLY OPEN, CLOSING ON RISING LEVEL NORMALLY CLOSED, OPENS ON RISING LEVEL NORMALLY OPEN, CLOSING ON DROPPING LEVEL NORMALLY CLOSED, OPENS ON DROPPING LEVEL |
| | PRESSURE OR VACUUM SWITCH NORMALLY OPEN, CLOSING ON RISING PRESSURE NORMALLY CLOSED, OPENS ON RISING PRESSURE NORMALLY OPEN, CLOSING ON DROPPING PRESSURE NORMALLY CLOSED, OPENS ON DROPPING PRESSURE |
| | TEMPERATURE SWITCH OR THERMOSTAT NORMALLY OPEN, CLOSING ON RISING TEMPERATURE NORMALLY CLOSED, OPENS ON RISING TEMPERATURE NORMALLY OPEN, CLOSING ON DROPPING TEMPERATURE NORMALLY CLOSED, OPENS ON DROPPING TEMPERATURE |
| | FLOW SWITCH (AIR, WATER, ETC.) NORMALLY OPEN, CLOSING ON INCREASED FLOW NORMALLY OPEN, CLOSING ON DROPPING FLOW NORMALLY CLOSED, OPENS ON INCREASED FLOW NORMALLY CLOSED, OPENS ON DROPPING FLOW |
| | POSITION (LIMIT) SWITCH NORMALLY OPEN NORMALLY OPEN - HELD CLOSED NORMALLY CLOSED NORMALLY CLOSED - HELD OPEN |
| | TORQUE SWITCH NORMALLY CLOSED, OPENS ON HIGH TORQUE |
| | CONDUCTORS OR CONDUITS CROSSING PATHS BUT NOT CONNECTED |
| | CONDUCTORS ELECTRICALLY CONNECTED |
| | SUPPLY/EXHAUST FAN |

| SYMBOLS | DESCRIPTION |
|---------|---|
| | LIGHTNING ARRESTER/SURGE CAPACITOR |
| | GROUND ROD |
| | GROUND ROD WELL |
| | FUSE, AMPERE RATING AS NOTED |
| | HEATER |
| | INDUCTOR |
| | TACHOMETER GENERATOR |
| | CONTACT, NORMALLY OPEN (NO) |
| | CONTACT, NORMALLY CLOSED (NC) |
| | OVERLOAD RELAY HEATER |
| | KEY INTERLOCK |
| | TERMINAL OR TEST BLOCK |
| | RESISTANCE TEMPERATURE DETECTOR |
| | VIBRATION DETECTOR |
| | DAMPER MOTOR |
| | ELAPSED TIME METER |
| | MOTOR OPERATED VALVE |
| | PUSH BUTTON STATION, REFER TO ELECTRICAL SCHEMATIC FOR NUMBER OF DEVICES. |
| | JUNCTION BOX |
| | POWER JUNCTION BOX |
| | 4-20mA SIGNAL JUNCTION BOX |
| | CONTROL JUNCTION BOX |
| | PULL BOX |
| | TERMINATION CABINET |
| | REMOTE DEVICES |
| | MOV WITHOUT INTEGRATED DISCONNECT |
| | MOV WITH INTEGRATED DISCONNECT |
| | INDICATES LIMITS OF EQUIPMENT OR WIRING ENCLOSURE |
| | (MPR) MOTOR PROTECTION RELAY |

GENERAL NOTE
THIS IS A STANDARD LEGEND. SOME SYMBOLS MAY NOT APPEAR ON THE DRAWINGS.

GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
Tel: 713-636-2936
CONSULTING ENGINEERING Houston, Texas 77024
Fax: 713-636-2987
Registration No. F-2593 email: hforouzan@gaiconsulting.com

FREESE NICHOLS
10497 Town and Country Way, Suite 500 Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748
OCTOBER 2025 DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
LEGENDS AND SYMBOLS - 1

| | |
|----------------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 12 OF 111 | |

| SYMBOLS | DESCRIPTION |
|---------|---|
| | REFER TO LIGHT FIXTURE SCHEDULE FOR TYPE FIXTURE: *A*- FIXTURE TYPE *b*- CONTROLLED BY SWITCH "b" *LA-3*- CIRCUIT 3 FROM PANEL LA |
| | REFER TO LIGHT FIXTURE SCHEDULE FOR TYPE FIXTURE, NOTATIONS SAME AS ABOVE |
| | INDICATES LIGHT FIXTURES WHICH ARE NONSWITCHED, NOTATIONS SAME AS ABOVE *NS* - NONSWITCHED |
| | WALL MOUNTED LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE |
| | POLE MOUNTED LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE |
| | EMERGENCY LIGHTING BATTERY UNIT WITH TWO LAMP HEADS, NOTATIONS SAME AS ABOVE |
| | REMOTE EMERGENCY ADJUSTABLE WALL LIGHTING FIXTURE WITH TWO LAMP HEADS, NOTATIONS SAME AS ABOVE |
| | CEILING MOUNTED EXIT SIGN, NOTATIONS SAME AS ABOVE |
| | WALL OUTLET EXIT SIGN. ARROW INDICATES DIRECTION OF EGRESS, NOTATIONS SAME AS ABOVE |
| | CONDUIT, EXPOSED/SURFACE MOUNTED |
| | CONDUIT OR DUCTBANK, CONCEALED |
| | CONDUIT, EXPOSED/SURFACE MOUNTED, TURNING UP |
| | CONDUIT, EXPOSED/SURFACE MOUNTED, TURNING DOWN |
| | CONDUIT STUBBED OUT AND CAPPED |
| | DENOTES A QUANTITY OF 2 SETS OF THREE (3) NO.3/0 AWG CONDUCTORS AND 1 NO. AWG GROUND CONDUCTOR EACH INSTALLED IN 3" CONDUIT. |
| | DENOTES A QUANTITY OF TWO INSTRUMENT CABLES. EACH CONSISTS OF TWO NO. 16 AWG CONDUCTORS TWISTED TOGETHER AND COVERED WITH A METALLIC SHIELD AND AN OVERALL PROTECTIVE JACKET. REFER TO THE SPECIFICATIONS FOR THE EXACT CABLE TO BE PROVIDED. |
| | DENOTES A QUANTITY OF THREE 4-INCH CONDUITS. |
| | FLEXIBLE METAL CONDUIT "WHIP" (#12, #12G, 3/4"C UNLESS OTHERWISE NOTED) FOR RECESSED LIGHTING FIXTURES AND LIQUID TIGHT MOTOR CONNECTIONS |
| | HOMERUN, CIRCUITS 1 AND 3 RUN TO PANEL LP-1 |
| | SINGLE POLE SWITCH *b*- INDICATES SWITCH LEG SHALL CONTROL LIGHT FIXTURES WITH "b" DESIGNATION |
| | MULTI POLE SWITCH *x*- INDICATES NUMBER OF POLE *b*- NOTATIONS SAME AS ABOVE |
| | SINGLE POLE SWITCH AND PILOT LIGHT, *b*- NOTATIONS SAME AS ABOVE |
| | DIMMER LIGHTING CONTROL SWITCH, *b*- NOTATIONS SAME AS ABOVE |
| | TIME SWITCH, *b*-NOTATIONS SAME AS ABOVE |
| | MANUAL MOTOR STARTER /DISCONNECT |
| | SINGLE POLE SWITCH WITH OCCUPANCY SENSOR |
| | SINGLE POLE DIMMER SWITCH |
| | SWITCH ENCLOSURE *x*- NOTATIONS SAME AS ABOVE *b*- NOTATIONS SAME AS ABOVE *xx*- INDICATES ENCLOSURE TYPE |
| | LIGHTING CONTACTOR WITH NUMBER OF POLES AS INDICATED |

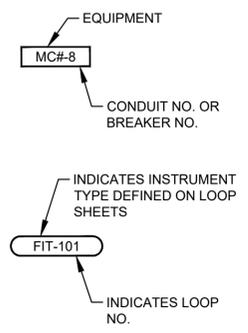
| SYMBOLS | DESCRIPTION |
|---------|---|
| | LIGHTING PANELBOARD (TYPICAL 120V/240V OR 120V/208V) |
| | DISTRIBUTION PANELBOARD (TYPICAL 277V/480V) |
| | DUPLEX RECEPTACLE, 20A, 120V, 2P, 3W * GFI- GROUND FAULT INTERRUPTER TYPE * WP- WEATHERPROOF *LA-3*- CIRCUIT 3 FROM PANEL LA |
| | WELDING RECEPTACLE |
| | 20A, 240V, 2P, 3W, RECEPTACLE |
| | CLASS 1, DIVISION 1, RATED TWIST LOCK RECEPTACLE, VOLTAGE AND AMPERAGE RATING AS NOTED |
| | SINGLE FACE, SINGLE GANG PEDESTAL WITH 20A, 120V, 2P, 3W DUPLEX RECEPTACLE, FURNISHED AND INSTALLED UNDER DIVISION 16 UNLESS OTHERWISE NOTED. * DENOTES FURNISHED UNDER OTHER DIVISIONS OF THE SPECIFICATIONS BUT INSTALLED UNDER DIVISION 16 |
| | DOUBLE DUPLEX RECEPTACLE AND 20A, 240V, 2P, 3W SINGLE RECEPTACLE, FURNISHED AND INSTALLED UNDER DIVISION 16 UNLESS OTHERWISE NOTED. * DENOTES FURNISHED UNDER OTHER DIVISIONS OF THE SPECIFICATIONS BUT INSTALLED UNDER DIVISION 16 |
| | DOUBLE RECEPTACLE, 20A, 120V, 2P, 3W MOUNTED IN BOX CURB FURNISHED UNDER OTHER DIVISIONS OF THE SPECIFICATIONS BUT INSTALLED UNDER DIVISION 16 |
| | SINGLE GANG 20A, 120V, 3P, 3W RECEPTACLE |
| | QUAD RECEPTACLE |
| | OCCUPANCY SENSOR CAPABLE OF VACANCY |
| | PHOTOCELL |
| | QUICK CONNECT TERMINALS |

| TAGGING | | |
|----------------------------|----------------|------------------|
| EQUIPMENT | EQUIPMENT TAG | CONDUIT TAG |
| MOTOR CONTROL CENTER | MCC-1 | MC1-XX |
| SWITCHBOARD | SWBD-1 | SB1-XX |
| SWITCHGEAR | SWGR-1 | SG1-XX |
| PROGRAMMABLE LOGIC CABINET | PLC-1 | PL1-XX |
| VARIABLE FREQUENCY DRIVE | VFD-1 | VF1-P |
| LOW VOLTAGE TRANSFORMER | TX-LX OR TX-HX | TXLX-P OR TXHX-P |
| SERVICE TRANSFORMER | TX-1 | TX1-P |
| GENERATOR | GEN-1 | GN1-X |
| LIGHTING/POWER PANELBOARD | LP/PP-XX | XX-XX |
| AUTOMATIC TRANSFER SWITCH | ATS-1 | AT1-XX |

TYPICAL TAG FOR CONDUIT FROM THIS EQUIPMENT TO DOWN STREAM LOAD FOR EXAMPLE.

| SYMBOLS | DESCRIPTION |
|------------------------|---|
| COMMUNICATIONS SYSTEMS | |
| | TELEPHONE OUTLET |
| | DATA OUTLET |
| | DATA INPUT/OUTPUT CABLE OUTLET. "P" DENOTES PROCESS COMPUTER SYSTEM |
| | VOICE/DATA OUTLET |
| | PAGING SPEAKER HORN |
| | PAGING SPEAKER BI-DIRECTIONAL |
| | PAGING SPEAKER, CEILING MOUNTED TYPE |
| | PAGING SPEAKER, WALL MOUNTED TYPE |
| SECURITY SYSTEMS | |
| | SECURITY ALARM PANEL |
| | SECURITY ALARM DOOR SWITCH |
| | SECURITY ALARM KEY PAD |
| | SECURITY SYSTEM CARD ACCESS READER |
| | SECURITY ALARM WINDOW SWITCH |
| | SECURITY ALARM MOTION DETECTOR |
| | SECURITY CAMERA * CCTV- CLOSED CIRCUIT TV CAMERA * PTZ- PAN, TILT, ZOOM CAMERA LENS CONTROLS |
| | GLASS BREAK DETECTOR |
| | ACCESS CONTROL PANEL |
| FIRE ALARM SYSTEMS | |
| | FIRE ALARM CONTROL PANEL |
| | SMOKE DETECTOR * D- DENOTES DUCT SMOKE DETECTOR * R- DENOTES FIXED TEMPERATURE RATE-OF-RISE TYPE. |
| | FIRE ALARM MANUAL PULL STATION, MOUNT AT 4'-0" |
| | ALARM HORN, MOUNT AT 7'-6" * F- DENOTES FIRE ALARM |
| | ALARM STROBE, MOUNT AT 6'-8" * F- DENOTES FIRE ALARM |
| | ALARM HORN AND STROBE LIGHT COMBINATION, MOUNT AT 6'-8" * F- DENOTES FIRE ALARM |

EXAMPLE LEGEND:



| ABBREVIATIONS | |
|---------------|----------------------------------|
| AC | ALTERNATING CURRENT |
| AFD | ADJUSTABLE FREQUENCY DRIVE |
| AFF | ABOVE FINISHED FLOOR |
| AG | ABOVE GRADE |
| ALUM | ALUMINUM |
| AMP/A | AMPERE |
| ATS | AUTOMATIC TRANSFER SWITCH |
| AUTO | AUTOMATIC |
| AUX | AUXILIARY |
| AWG | AMERICAN WIRE GAUGE |
| C | CONDUIT |
| CB | CIRCUIT BREAKER |
| CKT | CIRCUIT |
| CLF | CURRENT LIMITING FUSE |
| CP | CONTROL PANEL |
| CPT | CONTROL POWER TRANSFORMER |
| CR | CONTROL RELAY |
| CS | CONTROL SWITCH |
| CT | CURRENT TRANSFORMER |
| CU | COPPER |
| DC | DIRECT CURRENT |
| DI | DOOR INTERLOCK |
| DN | DOWN |
| DWG | DRAWING |
| EHH | ELECTRICAL HANDHOLE |
| EC | EMPTY CONDUIT |
| ELEC | ELECTRICAL |
| ELEV | ELEVATION |
| EM | EMERGENCY |
| EMH | ELECTRICAL MANHOLE |
| EO | ELECTRICALLY OPERATED |
| ERMS | ENERGY-REDUCING |
| FBO | FURNISHED BY OTHERS |
| FO | FIBER OPTIC |
| FRP | FIBERGLASS REINFORCED POLYESTER |
| FU | FUSE |
| GCP | GENERATOR CONTROL PANEL |
| GEN | GENERATOR |
| G, GRD | GROUND |
| GFI | GROUND FAULT INTERRUPTER |
| GFCI | GROUND FAULT CIRCUIT INTERRUPTER |
| GO | GATE OPERATOR |
| GRS | GALVANIZED RIGID STEEL |
| HH | HANDHOLE |
| HT | HEIGHT |
| HTP | HEAT TRACE PANEL |
| HZ | HERTZ |
| IMH | INSTRUMENT MAN HOLE |
| INST | INSTRUMENT |
| LA | LIGHTNING ARRESTER |
| LC | LIGHTNING CONTACTOR |
| LCP | LOCAL CONTROL PANEL |
| LGTS | LIGHTS |
| LP | LIGHTING PANEL |
| | CONTINUED ABOVE RIGHT |

| | |
|-------|---|
| LSIG | LONG TIME/SHORT TIME/ INSTANTANEOUS/GROUND FAULT FEATURE INCLUDED |
| MCC | MOTOR CONTROL CENTER |
| MCP | MOTOR CIRCUIT PROTECTOR |
| MFR | MANUFACTURER |
| MH | MANHOLE |
| MLO | MAIN LUGS ONLY |
| MTG | MOUNTING |
| MTD | MOUNTED |
| MTS | MANUAL TRANSFER SWITCH |
| NC | NORMALLY CLOSED |
| NEC | NATIONAL ELECTRICAL CODE |
| NO | NORMALLY OPEN OR NUMBER |
| NTS | NOT TO SCALE |
| OL | OVERLOAD |
| OLX | OVERLOAD CONTROL RELAY |
| PB | PUSH BUTTON OR PULL BOX |
| PCC | PUMP CONTROL CONSOLE |
| PPR | PHASE PROTECTIVE RELAY |
| PPU | PERPETUAL POWER UNIT |
| PFR | PHASE FAILURE RELAY |
| PH | PHASE |
| PNLBD | PANELBOARD |
| PR | PAIR |
| PT | POTENTIAL TRANSFORMER |
| PTT | PUSH TO TEST TYPE |
| PVC | POLYVINYL CHLORIDE |
| QTY | QUANTITY |
| RCP | RELAY CONTROL PANEL |
| RECP | RECEPTACLES |
| RVSS | REDUCED VOLTAGE SOFT STARTER |
| SC | SURGE CAPACITOR |
| SCH | SCHEMATIC |
| SCCR | SHORT CIRCUIT CURRENT RATING |
| SEC | SECONDS OR SECONDARY |
| SH | SHIELDED OR SHEET |
| SHT | SHEET |
| SM | MOTOR RATED SWITCH |
| SN | SOLID NEUTRAL |
| SS | STAINLESS STEEL |
| ST | STARTER |
| SV | SOLENOID VALVE |
| SW | SWITCH |
| SWBD | SWITCHBOARD |
| SWGR | SWITCHGEAR |
| TC | TERMINATION CABINET |
| TEL | TELEPHONE |
| TO | TIME DELAY ON OPENING |
| TS | TEMPERATURE SWITCH |
| TVSS | TRANSIENT VOLTAGE SURGE SUPPRESSOR |
| TSW | TWISTED SHIELDED WIRE |
| TYP | TYPICAL |
| UG | UNDERGROUND |
| V | VOLTS |
| VFD | VARIABLE FREQUENCY DRIVE |
| VO | VALVE OPERATOR |
| W | WIRE |
| WP | WEATHERPROOF |
| XP | EXPLOSION PROOF |
| XFMR | TRANSFORMER |

GENERAL NOTE
THIS IS A STANDARD LEGEND. SOME SYMBOLS MAY NOT APPEAR ON THE DRAWINGS.

GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
LEGENDS AND SYMBOLS - II

| | |
|----------------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 13 OF 111 | |

ELECTRICAL GENERAL NOTES

- THE NOTES CONTAINED ON THIS SHEET ARE PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR WHEN WORKING IN THE FIELD, AND CONTAIN EXCERPTS FROM THE SPECIFICATION SECTIONS. HOWEVER THE CONTRACTOR IS HEREBY ADVISED THAT THE CONTRACT DOCUMENTS CONSIST OF BOTH THE DRAWINGS AND THE SPECIFICATIONS, AND THAT THE CONTRACTOR MUST COMPLY FULLY WITH BOTH THE BOUND DRAWINGS AND THE BOUND SPECIFICATIONS.
- ALL EQUIPMENT WIRING, RACEWAYS, ETC. SHALL BE INSTALLED AND GROUNDED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, LOCAL CODES, AND INDUSTRY STANDARDS (IE. UL, NEMA, IEEE, ANSI, ETC.) THE DRAWING NOTES AND DETAILS SHALL BE COMPLIED WITH IN ADDITION TO THE REQUIREMENTS IN THE SPECIFICATIONS. REFER TO EACH SPECIFICATION SECTION FOR SPECIFIC REQUIREMENTS.
- ALL RACEWAY INSTALLATIONS SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND STRUCTURAL CONDITIONS. ALL EXPOSED RACEWAY SHALL BE INSTALLED PARALLEL TO BEAMS, CEILINGS, FLOORS AND WALLS. SEE SPECIFICATION ON RACEWAYS FOR ADDITIONAL REQUIREMENTS.
- CONDUITS SHALL BE TERMINATED IN A NEAT MANNER AND STRICTLY IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWING DETAILS.
- CONDUITS TERMINATED INTO ENCLOSURES SHALL BE PERPENDICULAR TO THE WALLS OF THE ENCLOSURE. THE USE OF SHORT SEALTIGHT ELBOW FITTINGS FOR SUCH TERMINATIONS IS NOT PERMITTED.
- ALL RACEWAY INSTALLATIONS, CROSSING EXPANSION JOINTS OR TRANSITIONS FROM BELOW GRADE TO EXPOSED ABOVE GRADE, SHALL HAVE EXPANSION OR EXPANSION/DEFLECTION TYPE FITTINGS AS SPECIFIED FOR THE APPLICATION. SEE THE DRAWINGS AND THE SPECIFICATION ON RACEWAYS FOR THE EXACT TYPE OF FITTING TO BE USED.
- NO CONDUIT SMALLER THAN 3/4", NOR WIRE SMALLER THAN NO. 12 AWG, SHALL BE USED UNLESS SPECIFICALLY NOTED.
- ALL UNDERGROUND SINGLE CONDUITS AND DUCTBANKS OF MULTIPLE CONDUITS SHALL BE RIGID PVC CONDUIT ENCASED IN REINFORCED RED CONCRETE. CONCRETE DYED RED BEFORE PLACEMENT. MINIMUM SIZE CONDUIT IN THE GROUND IS 2 INCH. FIELD VERIFY THE ROUTING OF ALL EXISTING UNDERGROUND CONDUIT AND DUCTBANKS. COORDINATE ROUTING OF NEW CONDUIT AND DUCTBANKS TO AVOID INTERFERENCE WITH EXISTING CONDUIT, DUCTBANKS, AND OTHER UNDERGROUND UTILITIES.
- ALL CHANGES OF DIRECTION GREATER THAN 20 DEGREES IN UNDERGROUND SINGLE, OR DUCTBANKS OF MULTIPLE CONDUITS, SHALL BE ACCOMPLISHED USING PVC COATED RIGID ALUMINUM LONG RADIUS BENDS. BENDS OF PVC CONDUIT GREATER THAN 20 DEGREES, OR THE USE OF FLEXIBLE CONDUIT OF ANY TYPE, WILL NOT BE PERMITTED. SEE THE SPECIFICATIONS FOR MORE REQUIREMENTS.
- LIQUID TIGHT FLEXIBLE ALUMINUM CONDUIT SHALL BE USED FOR THE PRIMARY AND SECONDARY OF TRANSFORMERS. GENERATOR TERMINATIONS AND OTHER EQUIPMENT WHERE VIBRATION IS PRESENT. USE IN OTHER LOCATIONS IS NOT PERMITTED, EXCEPT FOR CONNECTIONS TO INSTRUMENTATION TRANSMITTERS. WHERE MULTIPLE PENETRATIONS ARE REQUIRED, LIQUID TIGHT FLEXIBLE ALUMINUM CONDUIT SHALL HAVE A MAXIMUM LENGTH NOT GREATER THAN THAT OF A FACTORY MANUFACTURED LONG RADIUS ELBOW OF THE CONDUIT SIZE BEING USED. THE MAXIMUM BENDING RADIUS SHALL NOT BE LESS THAN THAT SHOWN IN THE NEC CHAPTER 9, TABLE 2, "OTHER BENDS". BX OR AC TYPE PREFABRICATED CABLES WILL NOT BE PERMITTED.
- THE WIRING DIAGRAMS, BLOCK DIAGRAMS, QUANTITY/SIZES OF WIRES/CONDUITS REPRESENT A SUGGESTED ARRANGEMENT BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS ACCEPTABLE TO THE ENGINEER MAY BE MADE BY THE CONTRACTOR TO ACCOMMODATE EQUIPMENT ACTUALLY APPROVED. ALL MODIFICATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND/OR SPECIFIED.
- ALL JUNCTION BOXES, PULL BOXES AND TERMINATION BOXES IN NEMA 12 AREAS SHALL BE ALUMINUM. FOR NEMA 4X AREAS SEE SPECIFICATIONS FOR BOX DETAILS AND SPECIFICATIONS.
- SEAL ALL RACEWAYS ENTERING JUNCTION BOXES OR CONTROL PANELS CONTAINING ELECTRICAL OR INSTRUMENTATION EQUIPMENT WITH WATERTIGHT SEALANT. REFER TO THE SPECIFICATIONS FOR DETAILS.
- ALL EQUIPMENT AND ELECTRICAL EQUIPMENT ENCLOSURE LOCATIONS, OR TERMINAL BOX LOCATIONS, ARE APPROXIMATE. THE EXACT LOCATIONS SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER/ENGINEER, DURING CONSTRUCTION, AT NO ADDITIONAL COST TO THE OWNER.
- ALL EQUIPMENT AND ELECTRICAL EQUIPMENT ENCLOSURES DIMENSIONS ARE APPROXIMATE. ALL EQUIPMENT AND ELECTRICAL EQUIPMENT ENCLOSURES OR TERMINAL BOX DIMENSIONS SHALL BE VERIFIED WITH THE EQUIPMENT SUPPLIER. ALLOW FOR LOCATION CHANGES AND INCLUDE IN THE CONTRACT PRICE. THE EXACT LOCATIONS OF ALL ELECTRICAL EQUIPMENT AND ROUTING OF ALL CABLES AND CONDUITS SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER/ENGINEER DURING CONSTRUCTION.
- CORING OF AN EXISTING STRUCTURE SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER/ENGINEER. CORING THROUGH STRUCTURAL BEAMS IS STRICTLY PROHIBITED WITHOUT PRIOR WRITTEN APPROVAL FROM THE OWNER/ENGINEER.
- THE LOCATION OF ALL ELECTRICAL EQUIPMENT AND ROUTING OF CABLES AND CONDUITS SHALL BE COORDINATED AND APPROVED BY THE OWNER.
- THE DUCTBANK ROUTING AS SHOWN ON THE DRAWING IS APPROXIMATE. FIELD VERIFY THE EXACT DUCTBANK ROUTING, CABLE LENGTH AND CONDUIT LENGTH.
- PROVIDE CONDUIT SEALS FOR CONDUIT PENETRATIONS AS PER NEC AND NFPA820.

- COORDINATE ALL WORK WITH THE OWNER.
- LOCATE ALL UNDERGROUND UTILITIES BEFORE DIGGING. COORDINATE THE EFFORT WITH THE OWNER.
- ALL SLOTTED CHANNEL, SLOTTED CHANNEL SUPPORT MATERIAL, WASHERS, SCREWS, NUTS, CONDUIT CLAMPS, ALL THREAD SPRING NUTS AND MISC. MOUNTING HARDWARE SHALL BE 316 STAINLESS STEEL.
- LIGHTING FIXTURES SHALL BE MOUNTED ACCORDING TO THE MOUNTING HEIGHT GIVEN ON THE DRAWINGS. THE MOUNTING HEIGHT SHALL BE MEASURED FROM THE BOTTOM OF THE LIGHTING FIXTURE TO THE FINISHED FLOOR.
- CONDUIT AND WIRE FOR THE HVAC EQUIPMENT AND MISCELLANEOUS DEVICES SHALL BE:
 - 3/4" (MIN) RIGID ALUMINUM.
 - NO.14 XHHW TINNED COPPER CU. (MIN.).
 - IN ACCORDANCE WITH ALL ELECTRICAL AND HVAC SPECIFICATIONS REQUIREMENTS.
- CONDUITS AND WIRES SHOWN ON THE INTERFACE DIAGRAM SHALL BE INSTALLED BY THE CONTRACTOR. GROUPING OF CONDUIT AND WIRE MAY BE CHANGED, IF APPROVED BY THE ENGINEER AND OWNER.
- ALL CONDULETS SHALL BE FORM 7 AND SHALL HAVE 316 SS CLAMP COVERS WITH 316 SS CLAMPS AND SCREWS. SCREW DOWN COVERS ARE UNACCEPTABLE. REFER TO THE SPECIFICATIONS FOR MORE INFORMATION.
- ALL UNDERGROUND GROUNDING CONDUCTORS SHALL BE BARE TIN-PLATED COPPER, ALL GROUND RODS SHALL BE 3/4" BY 10' LONG. ALL EXPOSED COPPER GROUND CABLES SHALL BE GREEN INSULATED CONDUCTORS. PROVIDE XHHW INSULATION.
- WHERE NOTES ON THE DRAWING INDICATE THAT THE CONTRACTOR SHALL FIELD-VERIFY, THE INTENT IS FOR THE CONTRACTOR TO INVESTIGATE TO THE EXTENT NECESSARY TO PROVIDE THE WORK AND MATERIALS PRIOR TO BIDDING AND INCLUDE ALL COSTS IN THE BID PRICE. THE CONTRACT PRICE SHALL NOT BE INCREASED WHEN THE CONTRACTOR HAS NOT INVESTIGATED PER THE NOTES DIRECTING THAT BE DONE.
- REFER TO SPECIFICATION SECTION 16110 RACEWAYS BOXES ENCLOSURES AND FITTINGS FOR INSTALLATION REQUIREMENTS.

TYPICAL ENCLOSURE TYPES BY AREA

| NON-HAZARDOUS AREAS | BOXES & ENCLOSURES | | | | |
|---|--|----|----|-----|----|
| | 1 | 3R | 4X | 4X* | 12 |
| OUTDOOR; GENERAL AREAS | | X | X | | |
| OUTDOOR; CHEMICAL AREAS | | | | X | |
| INDOOR; CHEMICAL ROOM | | | | X | |
| INDOOR; CONDITIONED SPACE | | | | | X |
| INDOOR; NON-CONDITIONED SHOP SPACE | | | | | X |
| INDOOR; NON-CONDITIONED PROCESS AREA | | | X | | |
| INDOOR, ADMIN BUILDING | X | | | | |
| CLASS I, DIVISION 1 | REFER TO NEC, NFPA-820, AND CONTRACT CONSTRUCTION SPECIFICATIONS | | | | |
| CLASS I, DIVISION 2 | REFER TO NEC, NFPA-820, AND CONTRACT CONSTRUCTION SPECIFICATIONS | | | | |
| GENERAL NOTES: | | | | | |
| <ul style="list-style-type: none"> EQUIPMENT SUCH AS MOTOR CONTROL CENTER, SWITCHGEAR, VFDS, AND OTHER STAND-ALONE MOTOR STARTERS ARE TO BE SPECIFIED UNIQUELY. NEMA 1 ENCLOSURES ARE TO BE NEMA 1 GASKETED. NEMA 4X* ENCLOSURES ARE TO BE NON-METALLIC (ie PVC) NEMA 4X OUTDOOR GENERAL AREAS COULD BE 3R OR 4X DEPENDING ON OWNER PREFERENCE AND WHETHER WTP OR WWTP - REFER TO DRAWINGS. | | | | | |

| CONDUIT TYPE | LOCATION |
|---|--|
| RIGID GALVANIZED CONDUIT | NOT ACCEPTABLE FOR USE ON THIS PROJECT EXCEPT FOR THE UTILITY COMPANY'S CONDUCTORS. ALL UTILITY COMPANY'S DUCTS SHALL BE AS SPECIFIED BY UTILITY COMPANY. |
| PVC COATED ALUMINUM CONDUIT | ALL EMBEDDED CONDUIT BENDS, UNDERGROUND DUCTBANK OF MORE THAN 20 DEGREES, AND ALL CONDUIT STUB-UPS TO A MINIMUM OF 6" ABOVE FINISHED FLOOR OR GRADE AND IN CHLORINE AND CAUSTIC ROOMS. |
| LIQUID TIGHT FLEXIBLE ALUMINUM CONDUIT | RACEWAY CONNECTION TO VIBRATING EQUIPMENT ONLY, IN ALL AREAS. |
| RIGID NON-METALLIC, SCHEDULE 40 PVC CONDUIT | UNDERGROUND ENCASED IN RED DYE REINFORCED CONCRETE. (AS WHERE SPECIFIED) |
| RIGID NON-METALLIC, SCHEDULE 80 PVC CONDUIT | FOR USE IN CHLORINE AND CAUSTIC ROOMS, AND UNDERGROUND. ENCASED IN RED DYED REINFORCED CONCRETE. (AS WHERE SPECIFIED) |
| FLEXIBLE ALUMINUM CONDUIT | FIXTURE WHIP CONNECTION TO LIGHTING FIXTURES IN NEMA 12 AREAS (MAXIMUM 3-FT). BX OR AC TYPE PREFABRICATED CABLES ARE NOT PERMITTED. |
| ALUMINUM RIGID METAL CONDUIT | ALL ABOVE GRADE AREAS, EXCEPT FOR CONCRETE EMBEDDED AND THOSE AREAS ALREADY DESCRIBED IN THIS TABLE |
| ELECTRIC METALLIC TUBING (EMT) CONDUIT | FOR USE ONLY ON CONCEALED, ABOVE GROUND, INTERIOR ELECTRICAL WIRING IN AIR-CONDITIONED BUILDINGS. |

*REFER TO DESIGN GUIDE LINE SPECIFICATIONS.

DEMOLITION NOTES

- COORDINATE THE DEMOLITION OF ELECTRICAL CONDUIT, WIRE, EQUIPMENT AND DEVICES WITH THE GENERAL DEMOLITION AND SCHEDULE. THE DRAWINGS ARE INTENDED TO CONVEY THE GENERAL NATURE AND SCOPE OF THE DEMOLITION WORK. EVERY ITEM TO BE DEMOLISHED MAY NOT BE SHOWN. FIELD VERIFY, AND INCLUDE ALL DEMOLITION WORK IN THE CONTRACT PRICE.
- PROVIDE TEMPORARY WIRE AND CONDUIT FOR THE EQUIPMENT WHICH MAY BE AFFECTED BY THE DEMOLITION BUT TO REMAIN IN SERVICE.
- RELOCATE AND RECONNECT POWER AND CONTROL RACEWAYS AND CONDUCTORS TO EQUIPMENT AFFECTED BY DEMOLITION WORK.
- ALL CONDUCTORS BEING DEMOLISHED SHALL BE DISCONNECTED AND REMOVED FROM THE LOAD TO THE SOURCE. SURFACE MOUNTED CONDUITS AND MOUNTING HARDWARE SHALL BE REMOVED. UNDERGROUND CONDUITS WHICH ARE NOT BEING REMOVED OR OTHERWISE NOT BEING MADE UNUSABLE SHALL BE CAPPED AND TAGGED AS SPARE, WITH INFORMATION CLEARLY INDICATING THE LOCATION OF THE OTHER END.
- ALL SURFACES WHERE DEMOLISHED EQUIPMENT OR CONDUIT IS REMOVED SHALL BE CLEANED, PATCHED AND PAINTED TO MATCH THE SURROUNDING SURFACE.
- CHECK THE FUNCTION OF EACH CONDUCTOR BEFORE REMOVING OR DISCONNECTING.
- IF A CONDUCTOR WHICH HAS TO STAY IN SERVICE (NOT BEING DEMOLISHED) IS INSTALLED IN A COMMON CONDUIT WITH CONDUCTORS WHICH ARE BEING DEMOLISHED, THE CONTRACTOR SHALL REMOVE ALL CONDUCTORS FROM THE CONDUIT, PROVIDE NEW CONDUCTORS WHICH ARE REPLACEMENTS FOR THE CONDUCTORS THAT ARE TO REMAIN IN SERVICE AND RE-INSTALL THE NEW CONDUCTORS. AFTER THE CONDUCTORS ARE PULLED, MEGGER OR VFL TEST EACH CONDUCTOR. CONNECT BOTH ENDS OF THE NEW CONDUCTORS AND TEST THE SYSTEM FOR PROPER FUNCTION. DO NOT RE-PULL USED CONDUCTORS UNLESS SPECIFIED.
- WHERE EQUIPMENT IS BEING RE-FED FROM A NEW SOURCE, EXISTING CONDUIT MAY BE REUSED ONLY IF THE CONDUIT AND FITTINGS ARE OF THE TYPE SPECIFIED FOR NEW WORK ON THIS CONTRACT. IF NOT, THE CONDUIT AND CONDUCTORS SHALL BE REPLACED WITH NEW MATERIAL MEETING THE SPECIFICATIONS, AT NO ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR SHALL COORDINATE WITH THE OWNER/ENGINEER TO FLAG EXISTING UNDERGROUND CONDUITS BEFORE DIGGING.
- THE OWNER HAS THE RIGHT OF FIRST REFUSAL TO THE EQUIPMENT BEING REMOVED. THE CONTRACTOR SHALL DELIVER THE EQUIPMENT WHICH THE OWNER WISHES TO KEEP AT A LOCATION DESIGNATED BY THE OWNER. SEE SPECIFICATIONS.
- DO NOT MAKE ANY MODIFICATIONS TO THE EXISTING ELECTRICAL EQUIPMENT UNTIL THE FOLLOWING HAS BEEN DONE:
 - THE OWNER/CONTRACTOR SHALL WITNESS AND RECORD THE CONDITION OF THE EXISTING EQUIPMENT, THE CONTRACTOR SHALL NOTE DOWN ANY DEFECTS OR DEFICIENCIES.
 - THE OWNER SHALL OPERATE THE EQUIPMENT TO DEMONSTRATE THE CURRENT CONDITIONS. THE CONTRACTOR SHALL NOTE DOWN ANY DEFECTS OR DEFICIENCIES.
 - A WRITTEN AND PHOTOGRAPHIC RECORD OF THE OPERATION AND EXISTING CONDITION SHALL BE KEPT IN A THREE RING BINDER AT THE OWNER/CONTRACTOR TRAILER, IN FORM OF PICTURES AND INFORMATION.
 - A FORM SHALL BE GENERATED BY THE CONTRACTOR TO RECORD THE OBSERVATIONS. BOTH PARTIES SHALL SIGN ON THE FORM.
 - REPLACE ALL MATERIAL OR EQUIPMENT DAMAGED DURING THE COURSE OF WORK.
 - AFTER THE CHANGES ARE MADE, THE EQUIPMENT SHALL BE INSPECTED AND RE-TESTED TO DEMONSTRATE THAT IT FUNCTIONS CORRECTLY.
 - NO PORTION OF EXISTING CONDUCTORS SHALL BE SPLICED TO NEW CONDUCTORS FOR RE-USE WITHOUT SPECIFIC APPROVAL FROM THE OWNER/ENGINEER ON A CASE-BY-CASE BASIS.

MCC, CONTROL PANELS, PANELBOARDS

THESE NOTES APPLY TO CONTROL PANELS, MCC ETC WHICH HAS TO BE REFURBISHED, MODIFIED, DISCONNECTED & RECONNECTED OR REWORKED. SEE SPECIFICATION SECTION 16060 ELECTRICAL DEMOLITION:

THE CONTRACTOR SHALL NOT MAKE ANY MODIFICATION UNTIL THE FOLLOWING HAS BEEN DONE:

- THE OWNER/CONTRACTOR SHALL WITNESS THE CONDITION OF THE EXISTING EQUIPMENT, THE CONTRACTOR SHALL NOTE DOWN ANY DEFECTS OR DEFICIENCY.
- THE OWNER SHALL OPERATE THE EQUIPMENT TO DEMONSTRATE THE CURRENT CONDITIONS. THE CONTRACTOR SHALL NOTE DOWN ANY DEFECTS OR DEFICIENCIES.
- A RECORD OF THE OPERATION AND EXISTING CONDITION SHALL BE KEPT IN A THREE RING BINDER AT THE OWNER/CONTRACTOR TRAILER, IN FORM OF PICTURES AND INFORMATION.
- A FORM SHALL BE GENERATED BY THE CONTRACTOR TO RECORD THE OBSERVATIONS. BOTH PARTIES SHALL SIGN ON THE FORM.
- REPLACE ALL MATERIAL OR EQUIPMENT DAMAGED DURING THE COURSE OF WORK.
- AFTER THE CHANGES ARE MADE, THE EQUIPMENT SHALL BE INSPECTED AND RE-TESTED TO DEMONSTRATE THAT IT FUNCTIONS CORRECTLY.

GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
Tel: 713-636-2936
CONSULTING ENGINEERING Fax: 713-636-2987
Registration No. F-2593 email: hforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500 Houston, Texas 77024
Phone - (713) 600-6800 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748

SURVEYED BY: FB NO. P- DATE

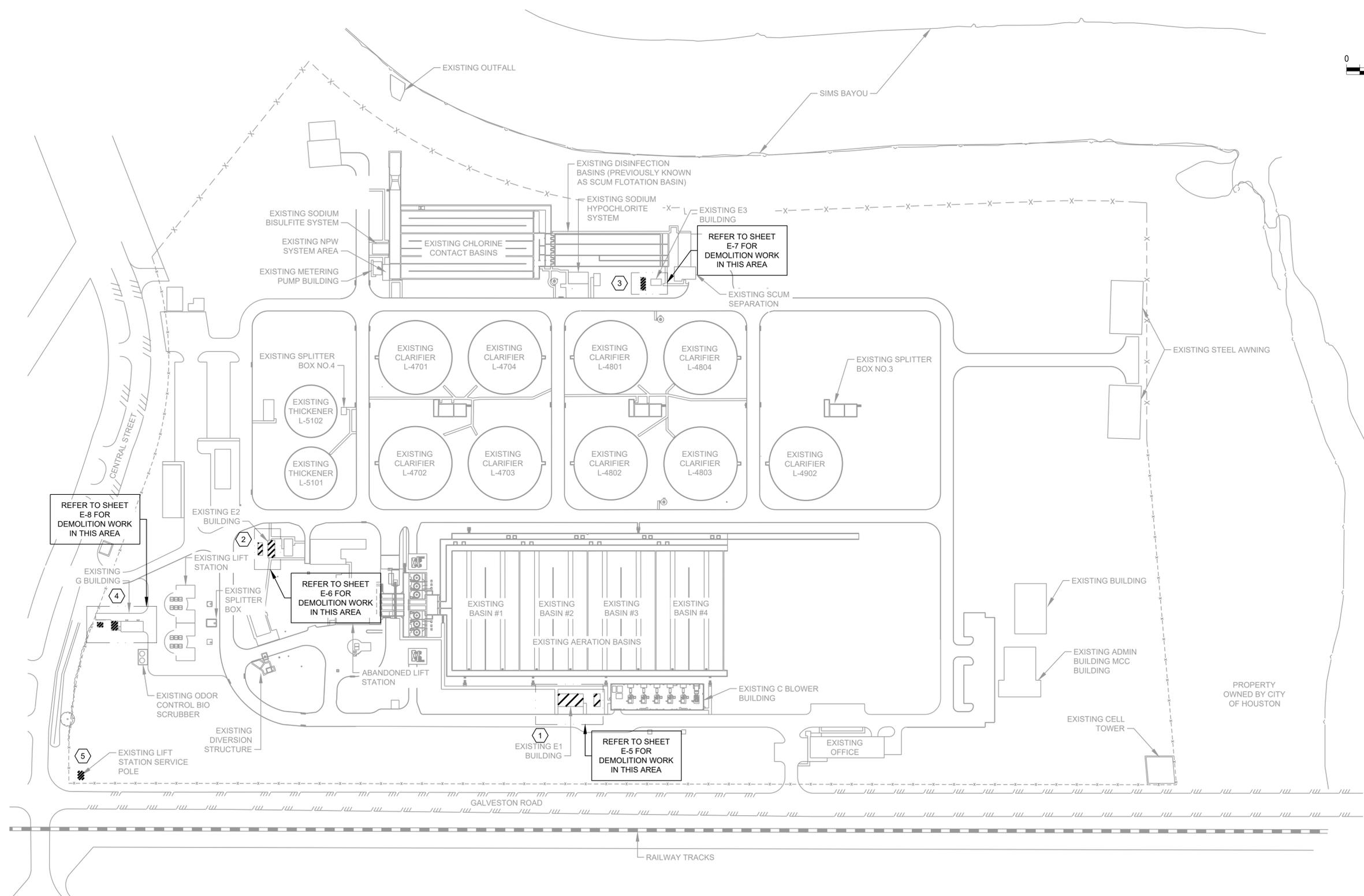
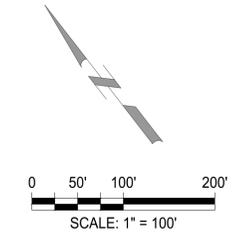
CITY OF HOUSTON

HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL GENERAL NOTES

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 14 OF 111 | |

FILE PATH: C:\HB78_Sim South WWTP Improvement\5 Drawings\Electrical\Working\HB78_E-04.dwg
 PLOT STYLE: FN-MONO-HB78.CTB
 PLOTTED: 10/29/2025 4:51 PM



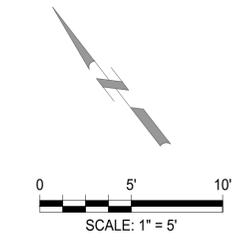
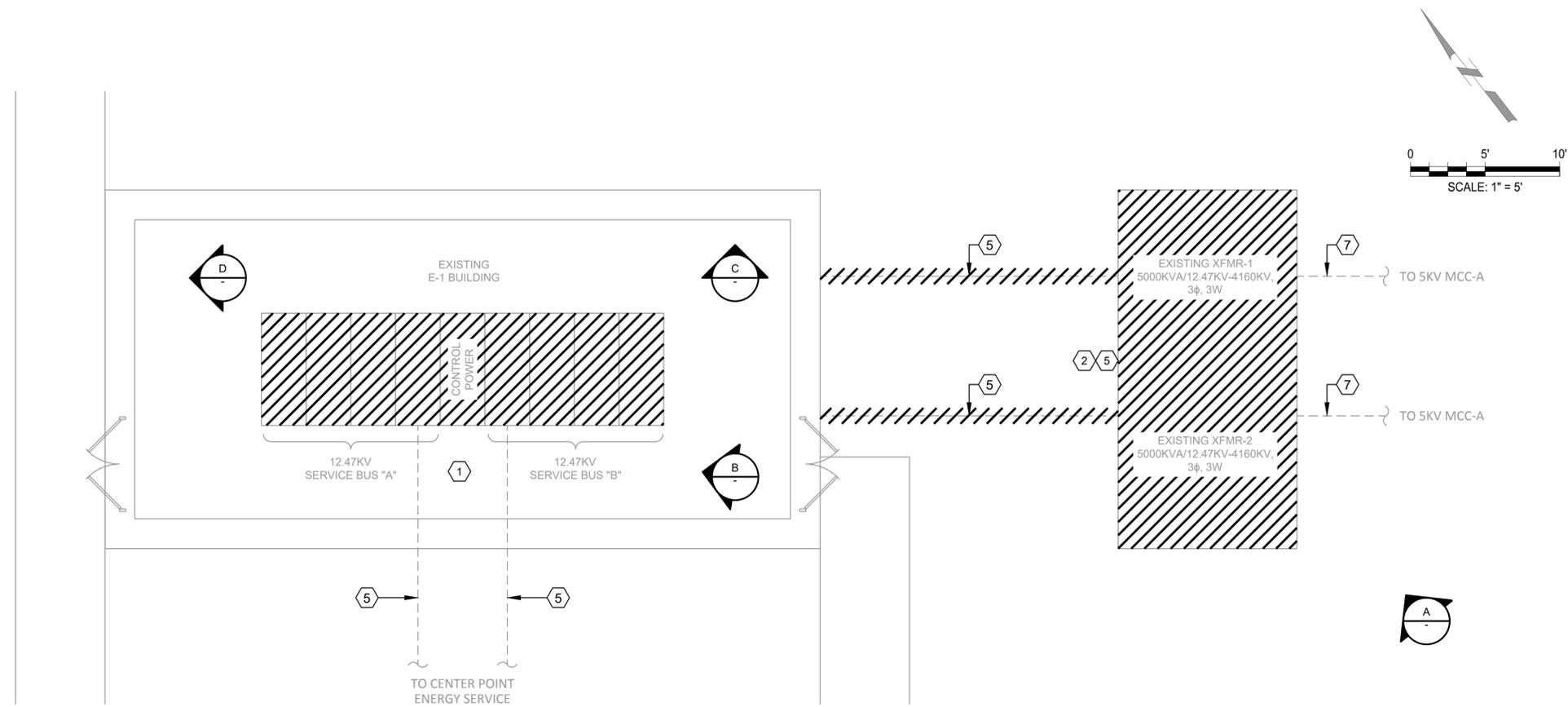
- NOTES BY SYMBOL (#):
- 1 EXISTING MV SWITCHGEAR AND ASSOCIATED WIRES AND CONDUITS TO BE DEMOLISHED AND REMOVED. TRANSFORMERS OUTSIDE BUILDING "E1" TO BE DEMOLISHED AND REMOVED.
 - 2 ALL EXISTING ELECTRICAL EQUIPMENT, DEVICES AND COMPONENTS IN THE BUILDING TO BE DEMOLISHED AND REMOVED. TRANSFORMERS OUTSIDE BUILDING "E2" TO BE DEMOLISHED AND REMOVED.
 - 3 EXISTING TRANSFORMER OUTSIDE BUILDING "E3" TO BE DEMOLISHED AND REMOVED.
 - 4 EXISTING SWITCHBOARD AND TRANSFORMERS OUTSIDE BUILDING "G" TO BE DEMOLISHED AND REMOVED.
 - 5 DEMOLISH AND REMOVE THE LIFT STATION SERVICE POLE, RISER AND ASSOCIATED WIRES.

LEGEND:
 ITEMS TO BE DEMOLISHED.

| | |
|---|--|
| GAI Gupta & Associates, Inc. 302 Dennis St. Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: hforsuzan@gaiconsulting.com | |
| Freese & Nichols 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com | This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE |
| SURVEYED BY: FB NO. P- | |

| | |
|--|------------------------------|
| CITY OF HOUSTON HOUSTON PUBLIC WORKS | |
| SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL OVERALL SITE DEMOLITION PLANS | |
| WBS NUMBER R-000265-0146-3 | FOR CITY OF HOUSTON USE ONLY |
| DRAWING SCALE 1" = 100' | |
| CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE | |
| SHEET NO. 15 OF 111 | |

1
EXISTING SITE PLAN DEMOLITION
 SCALE: 1" = 100'



GENERAL NOTES:

1. CUT AND GROUT ALL IN SLAB CONDUITS FLUSH WITH GRADE.
2. SEAL ALL PENETRATIONS CREATED AS A RESULT OF DEMOLITION WORK.
3. REMOVE ALL EXCESS SPOILS OFF SIDE.

NOTES BY SYMBOL (#):

- 1 ONLY EXISTING MV SWITCHGEAR A & B AND ASSOCIATED WIRES AND CONDUITS TO BE DEMOLISHED AND REMOVED.
- 2 EXISTING TRANSFORMERS OUTSIDE BUILDING "E1" AND ASSOCIATED WIRES AND CONDUITS TO BE DEMOLISHED AND REMOVED.
- 3 EXISTING LIGHTING PANEL AND ASSOCIATED CONDUITS AND WIRES TO REMAIN IN PLACE. BUILDING E-1 WILL STILL BE IN USE BY THE CITY OF HOUSTON.
- 4 EXISTING HVAC SYSTEM ASSOCIATED WITH BUILDING E-1 SHALL REMAIN IN PLACE. BUILDING E-1 WILL STILL BE IN USE BY THE CITY OF HOUSTON.
- 5 DEMOLISH DUCTBANK AND ASSOCIATED CABLES.
- 6 EXISTING TRANSFORMER PAD TO REMOVE.
- 7 DEMOLISH WIRES INSIDE DUCTBANK - CLEAN AND PREPARE CONDUITS FOR RE-USE.

EXISTING DEMO ENLARGED SITE PLAN BUILDING E-1
SCALE: 1" = 5'

LEGEND:

ITEMS TO BE DEMOLISHED.

| | |
|---|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St. Houston, Texas 77006 Tel: 713-636-2936 Fax: 713-636-2987 email: mforouzan@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL ENLARGED SITE DEMOLITION PLAN ELECTRICAL BUILDING 1</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE 1" = 5'</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 16 OF 111</p> | |



EXISTING 5000KVA XFMR - 1 & 2 PHOTO
SCALE: NTS



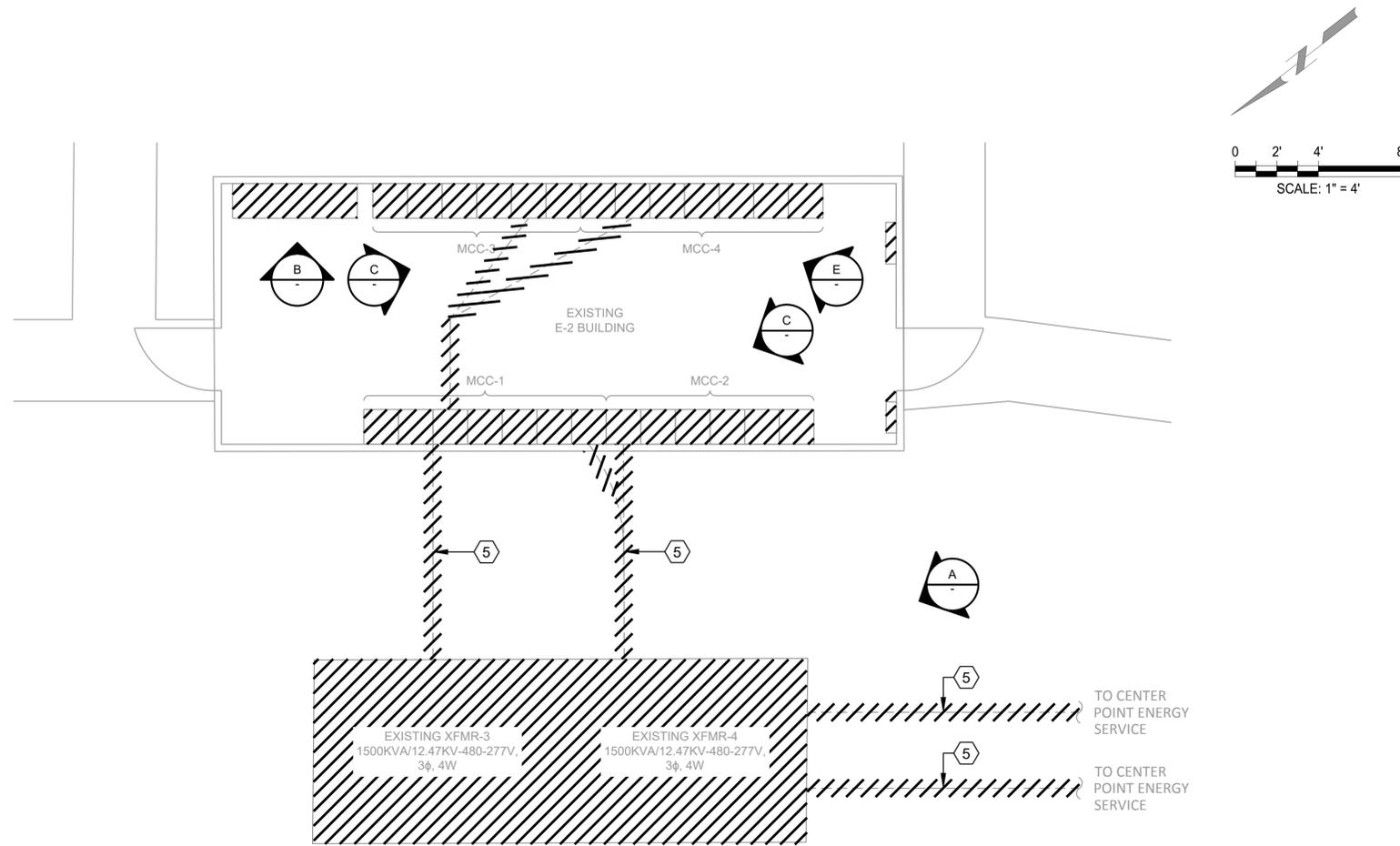
EXISTING SWITCHGEAR BUS A & B PHOTO
SCALE: NTS



EXISTING LIGHTIGN PANEL PHOTO
SCALE: NTS



EXISTING WALL MOUNT A/C PHOTO
SCALE: NTS



EXISTING DEMO ENLARGED SITE PLAN BUILDING E-2
SCALE: 1" = 4'

GENERAL NOTES:

- CUT AND GROUT ALL IN SLAB CONDUITS FLUSH WITH GRADE.
- SEAL ALL PENETRATIONS CREATED AS A RESULT OF DEMOLITION WORK.
- REMOVE ALL EXCESS SPOILS OFF SIDE.

NOTES BY SYMBOL (#):

- ALL EXISTING ELECTRICAL EQUIPMENT, DEVICES, AND COMPONENTS IN THE BUILDING TO DEMOLISHED AND REMOVED.
- EXISTING TRANSFORMERS 3 & 4 OUTSIDE BUILDING "E2" AND ASSOCIATED WIRES AND CONDUITS TO BE DEMOLISHED AND REMOVED.
- EXISTING CONTROL PANEL AND ASSOCIATED WIRES AND CONDUITS TO BE DEMOLISHED AND REMOVED.
- EXISTING MCC-1, 2, 3 & 4 AND ASSOCIATED WIRES AND CONDUITS TO BE DEMOLISHED AND REMOVED.
- DEMOLISHED DUCTBANK AND ALL ASSOCIATED WIRES.

LEGEND:

ITEMS TO BE DEMOLISHED.

GAI

Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
Tel: 713-636-2936
CONSULTING ENGINEERING Fax: 713-636-2987
Registration No. F-2593 email: hbosouran@gaiconsulting.com

FREESE & NICHOLS

10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by

HOSS FOROUZAN
TEXAS P.E. No. 77748

OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

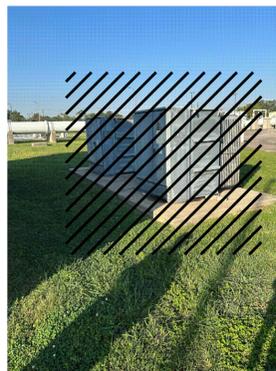
CITY OF HOUSTON

HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL

EXISTIG DEMO ENLARGED
SITE PLAN BUILDING E-2

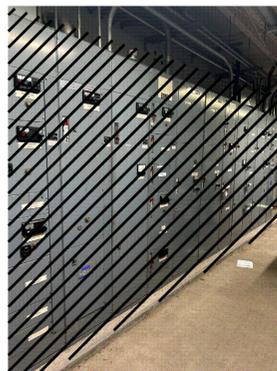
| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 17 OF 111 | |



EXISTING 1500KVA XFMR - 3 & 4 PHOTO
SCALE: NTS



EXISTING CONTROL PANEL PHOTO
SCALE: NTS



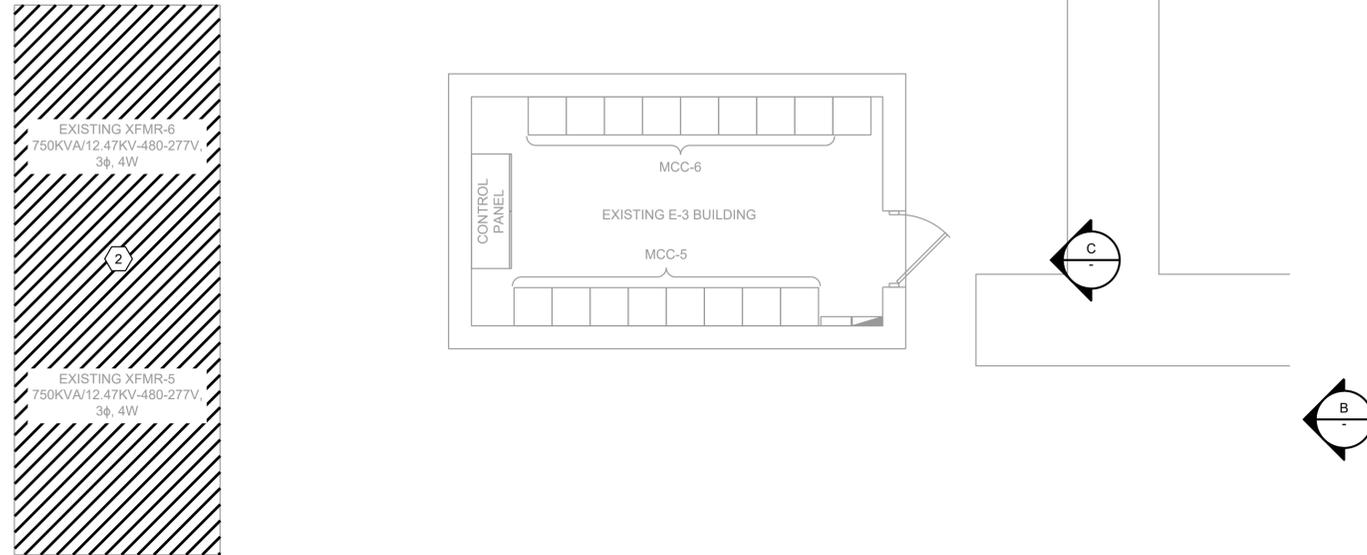
EXISTING MCC-1 & 2 PHOTO
SCALE: NTS



EXISTING MCC-3 PHOTO
SCALE: NTS



EXISTING MCC-4 PHOTO
SCALE: NTS



GENERAL NOTES:

- CUT AND GROUT ALL IN SLAB CONDUITS FLUSH WITH GRADE.
- SEAL ALL PENETRATIONS CREATED AS A RESULT OF DEMOLITION WORK.
- REMOVE ALL EXCESS SPOILS OFF SIDE.

NOTES BY SYMBOL (#):

- 1 EXISTING ELECTRICAL BUILDING E-3 TO BE DONE BY OTHERS.
- 2 EXISTING TRANSFORMERS 5 & 6 OUTSIDE BUILDING "E3" AND ASSOCIATED WIRES AND CONDUITS TO BE DEMOLISHED AND REMOVED.



EXISTING DEMO ENLARGED SITE PLAN BUILDING E-3

SCALE: 1" = 5'

LEGEND:

ITEMS TO BE DEMOLISHED.

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St.
Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hsroozani@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by

HOSS FOROUZAN
TEXAS P.E. No. 77748

SURVEYED BY:
FB NO. P-

OCTOBER 2025
DATE

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
EXISTIG DEMO ENLARGED
SITE PLAN BUILDING E-3

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 18 OF 111 | |



A
-
EXISTING 750KVA
XFMR - 5 & 6 PHOTO
SCALE: NTS



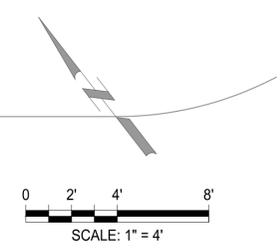
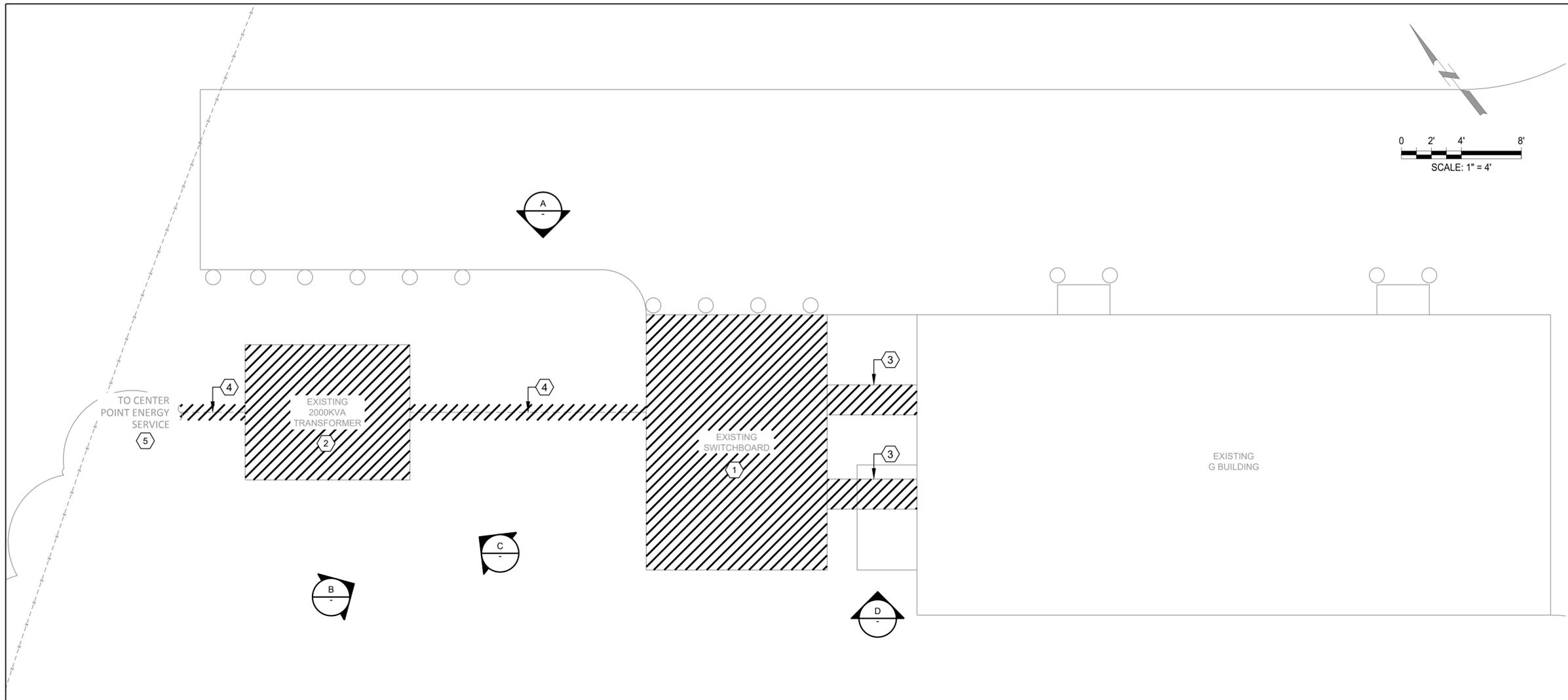
B
-
EXISTING BUILDING E-3
PHOTO
SCALE: NTS



C
-
EXISTING BUILDING E-3
PHOTO
SCALE: NTS

PLOT STYLE: FN-MONO-HB78.CTB PLOTTED: 10/29/2025 4:52 PM

FILE PATH: C:\HB78_Sim South WWTP Improvement\5 Drawings\Electrical\Working\HB78_E-08.dwg



- GENERAL NOTES:**
1. CUT AND GROUT ALL IN SLAB CONDUITS FLUSH WITH GRADE.
 2. SEAL ALL PENETRATIONS CREATED AS A RESULT OF DEMOLITION WORK.
 3. REMOVE ALL EXCESS SPOILS OFF SIDE.

- NOTES BY SYMBOL (#):**
1. EXISTING SWITCHBOARD OUTSIDE BUILDING "G" AND ASSOCIATED WIRES AND CONDUITS TO BE DEMOLISHED AND REMOVED.
 2. EXISTING 2000KVA TRANSFORMER OUTSIDE BUILDING "G" ASSOCIATED WIRES AND CONDUITS TO BE DEMOLISHED AND REMOVED.
 3. DEMOLISH BUS DUCT FROM THE EXISTING SWITCHBOARD TO THE LAST BUS DUCT COUPLING INSIDE THE BUILDING. BUS DUCT FROM EXISTING MCC'S TO WEST WALL TO REMAIN AND BE RECONNECTED.
 4. DEMOLISH DUCTBANK AND ASSOCIATED WIRES.
 5. DEMOLISH AND REMOVE THE LIFT STATION SERVICE POLE, RISER AND ASSOCIATED WIRES.

LEGEND:
 ITEMS TO BE DEMOLISHED.

1
 -
EXISTING DEMO ENLARGED SITE PLAN LIFT STATION
 SCALE: 1" = 5'

GAI
 Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
 CONSULTING ENGINEERING Tel: 713-636-2936
 Registration No. F-2593 Fax: 713-636-2987
 email: mforouzan@gaiconsulting.com

FREESE & NICHOLS
 10497 Town and Country Way, Suite 500 Houston, Texas 77024
 Phone - (713) 600-6800 Web - www.freese.com

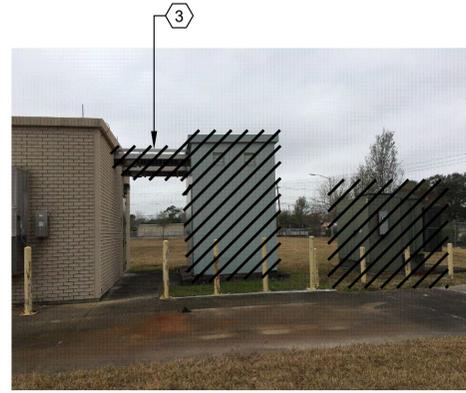
This document is released for interim review & not intended for construction, bidding or permit purposes by
 HOSS FOROUZAN TEXAS P.E. No. 77748
 OCTOBER 2025 DATE

SURVEYED BY:
 FB NO. P--

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 ELECTRICAL
 EXISTIG DEMO ENLARGED
 SITE PLAN LIFT STATION

| | |
|----------------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 19 OF 111 | |



EXISTING 2000KVA XFMR PHOTO
 SCALE: NTS



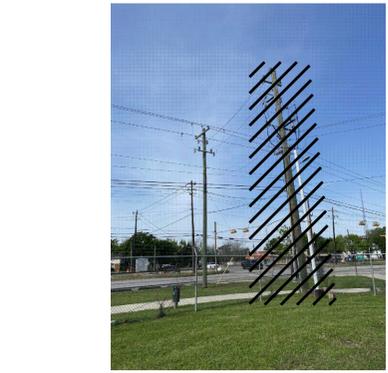
EXISTING SWITCHGEAR PHOTO
 SCALE: NTS



EXISTING 2000KVA XFMR PHOTO
 SCALE: NTS



EXISTING BUSS DUCT PHOTO
 SCALE: NTS



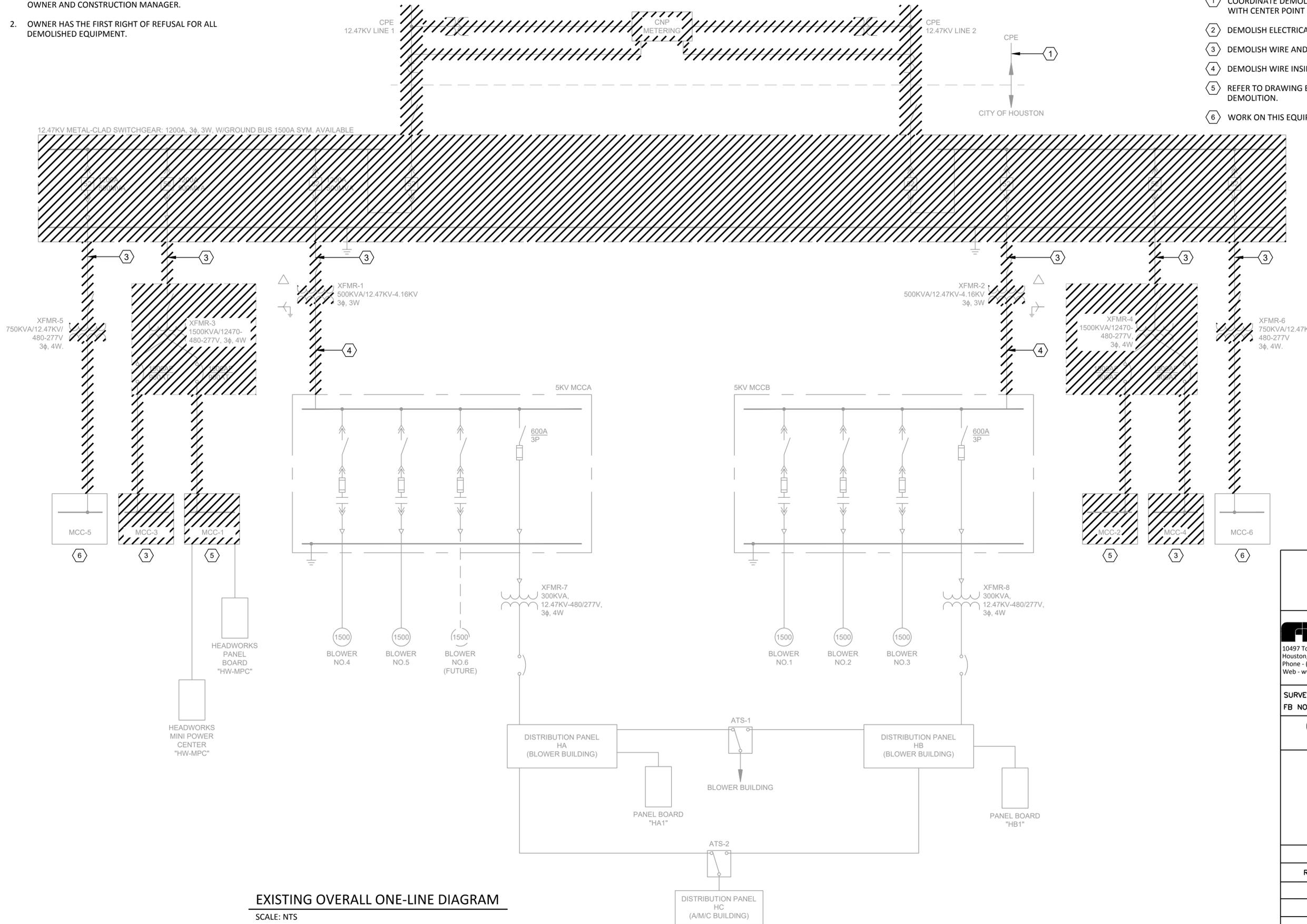
EXISTING LIFT STATION SERVICE POLE PHOTO
 SCALE: NTS

GENERAL NOTES:

- COORDINATE ALL DEMOLITION WORK WITH THE OWNER AND CONSTRUCTION MANAGER.
- OWNER HAS THE FIRST RIGHT OF REFUSAL FOR ALL DEMOLISHED EQUIPMENT.

NOTES BY SYMBOL (#):

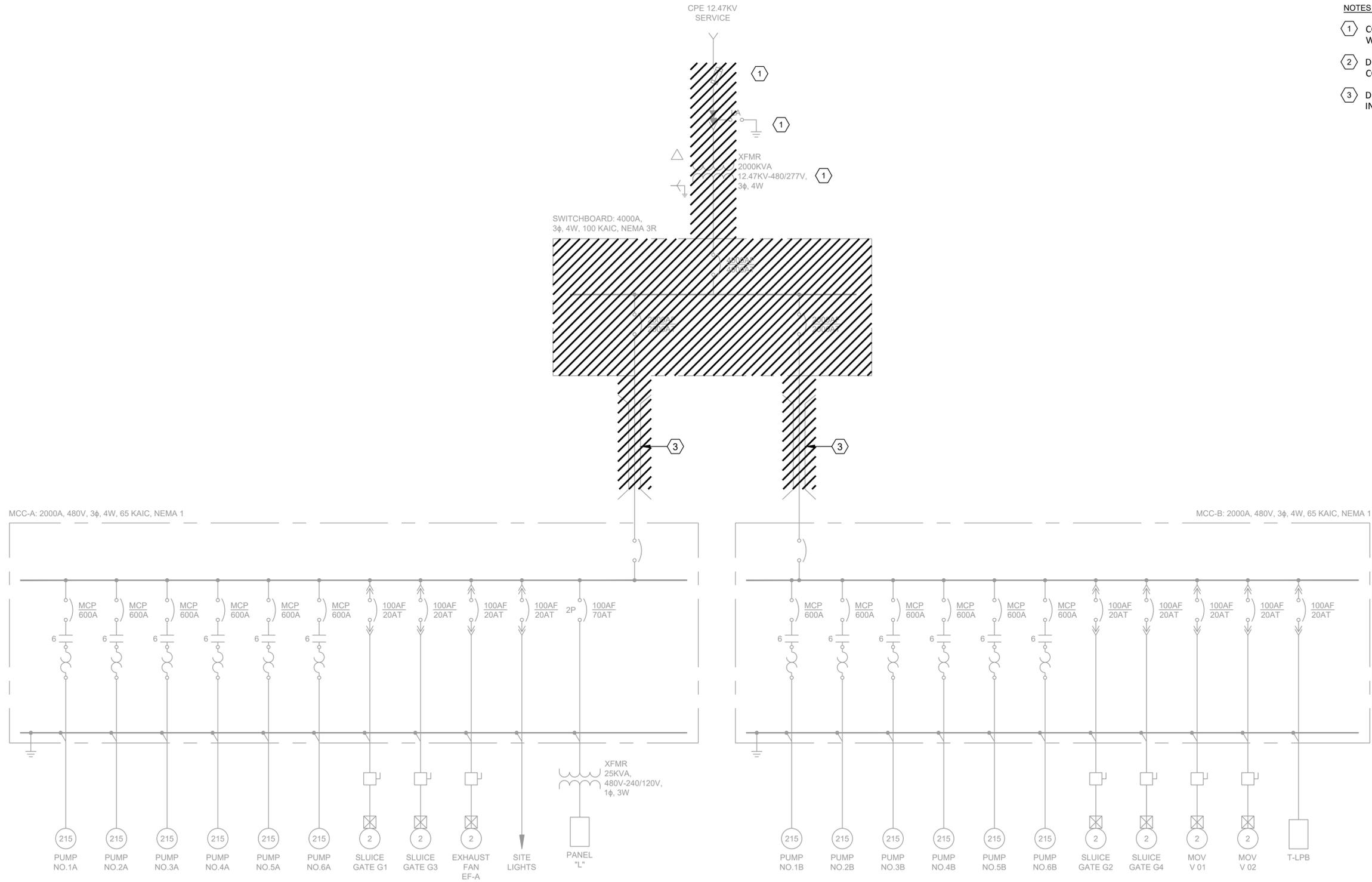
- COORDINATE DEMOLITION OF UTILITY INFRASTRUCTURE WITH CENTER POINT ENERGY.
- DEMOLISH ELECTRICAL EQUIPMENT.
- DEMOLISH WIRE AND CONDUIT. DEMOLISH DUCTBANK.
- DEMOLISH WIRE INSIDE DUCTBANK.
- REFER TO DRAWING E-11 THROUGH E-14 FOR ONE-LINE DEMOLITION.
- WORK ON THIS EQUIPMENT REFERRED BY OTHERS.



LEGEND:
 ITEMS TO BE DEMOLISHED.

| | |
|---|-------------------------------------|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: mforouzan@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | |
| <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748</p> | |
| <p>SURVEYED BY: FB NO. P- DATE: OCTOBER 2025</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL EXISTIG OVERALL ONE-LINE DIAGRAM</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 20 OF 111</p> | |
| <p>E-9</p> | |

EXISTING OVERALL ONE-LINE DIAGRAM
 SCALE: NTS



EXISTING OVERALL LIFT STATION ONE-LINE DIAGRAM

SCALE: NTS

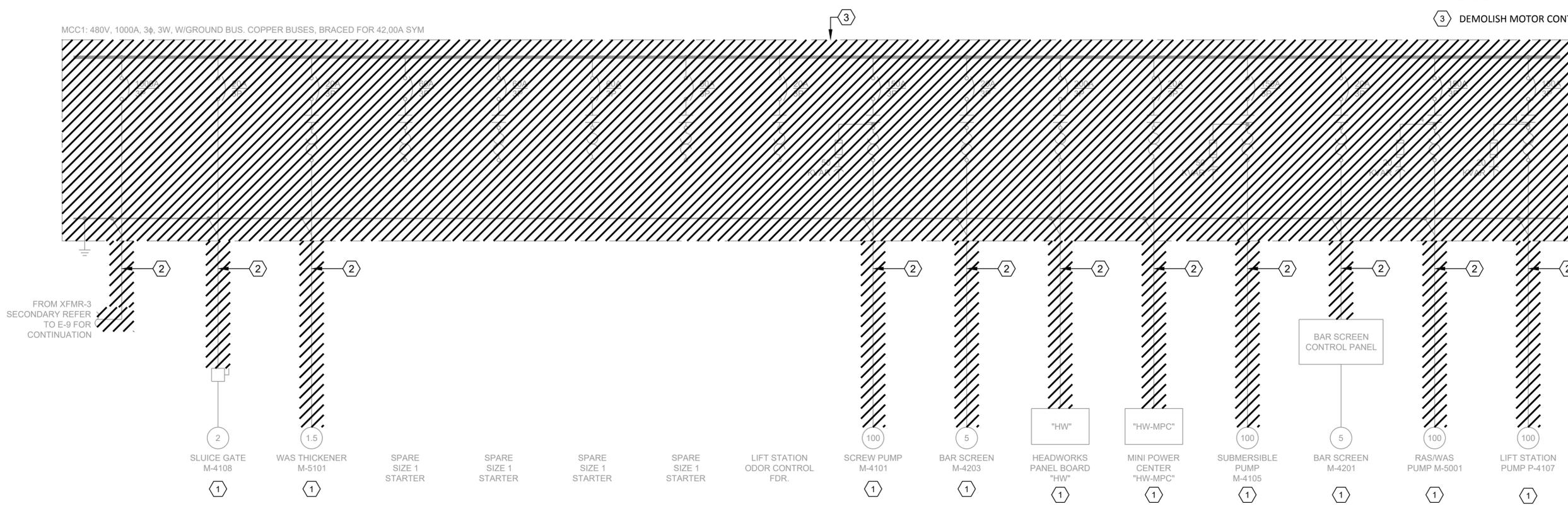
NOTES BY SYMBOL (#):

- 1 COORDINATE DEMOLITION OF UTILITY INFRASTRUCTURE WITH CENTER POINT ENERGY.
- 2 DEMOLISH SWITCHBOARD AND ALL ASSOCIATED WIRES AND CONDUITS.
- 3 DEMOLISH BUS DUCT UP TO THE LAST BUS DUCT COUPLING INSIDE THE BUILDING.

LEGEND:

ITEMS TO BE DEMOLISHED.

| | |
|--|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: hbosozani@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL EXISTIG DEMO OVERALL LIFT STATION ONE-LINE DIAGRAM</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 21 OF 111</p> | |

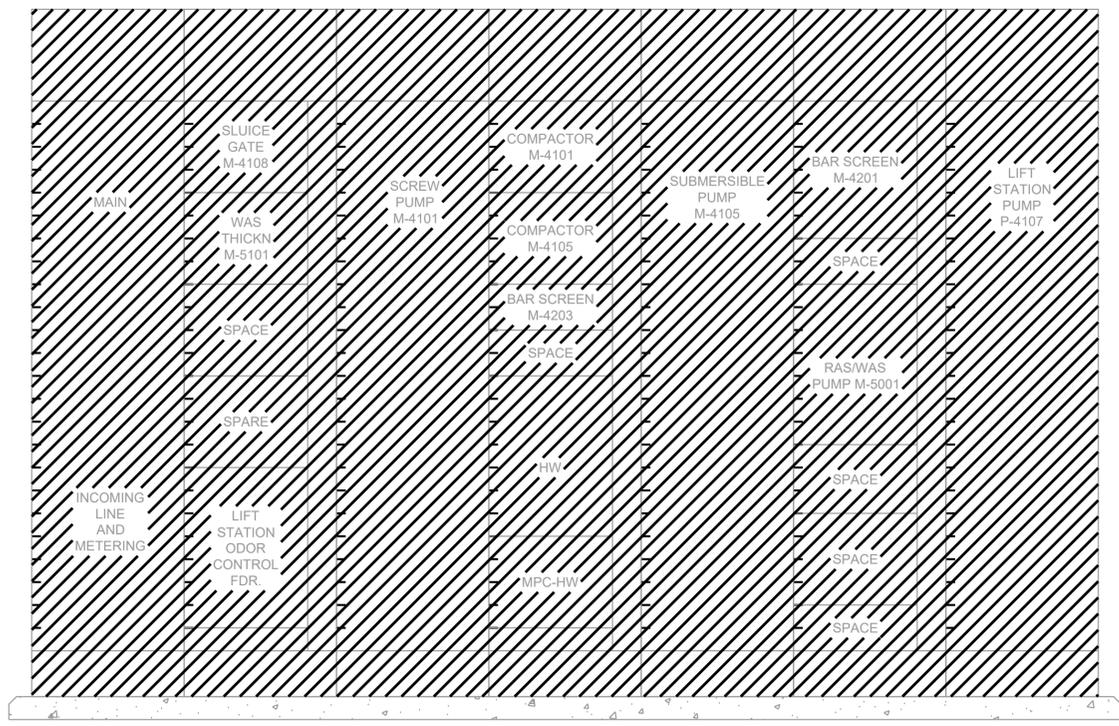


GENERAL NOTES:
 1. OWNER HAS THE FIRST RIGHT OF REFUSAL FOR ALL DEMOLISHED EQUIPMENT.

NOTES BY SYMBOL (#):
 1 EXISTING EQUIPMENT TO REMAIN AND BE RECONNECTED.
 2 DEMOLISH ALL WIRERS AND CONDUITS. DEMOLISH DUCTBANK.
 3 DEMOLISH MOTOR CONTROL CENTER.

EXISTING MCC-1 ONE-LINE DIAGRAM
 SCALE: NTS

LEGEND:
 ITEMS TO BE DEMOLISHED.



EXISTING MCC-1 ELEVATION DETAIL
 SCALE: NTS

| | |
|---|--|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: hforouzan@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL EXISTING DEMO MCC-1 ONE-LINE DIAGRAM</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 22 OF 111</p> | |

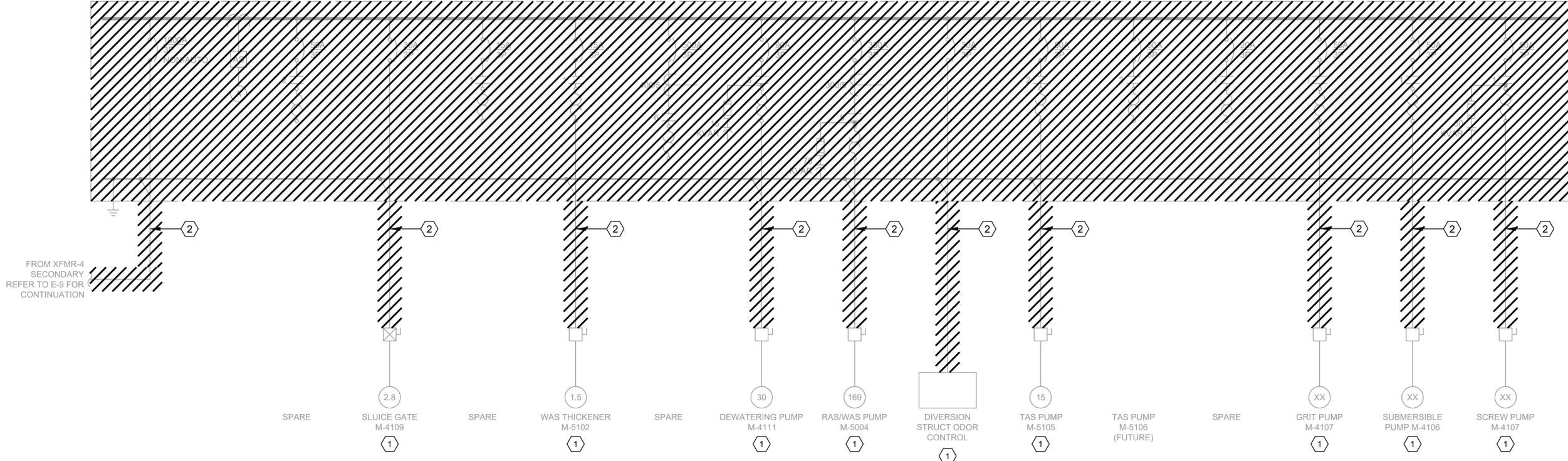
GENERAL NOTES:

- OWNER HAS THE FIRST RIGHT OF REFUSAL FOR ALL DEMOLISHED EQUIPMENT.

NOTES BY SYMBOL (#):

- 1 EXISTING EQUIPMENT TO REMAIN AND BE RECONNECTED.
- 2 DEMOLISH ALL WIRERS AND CONDUITS. DEMOLISH DUCTBANK.
- 3 DEMOLISH MOTOR CONTROL CENTER.

MCC2: 480V, 1000A, 3φ, 3W, W/GROUND WIRE, BRACE FOR 42,00A SYM

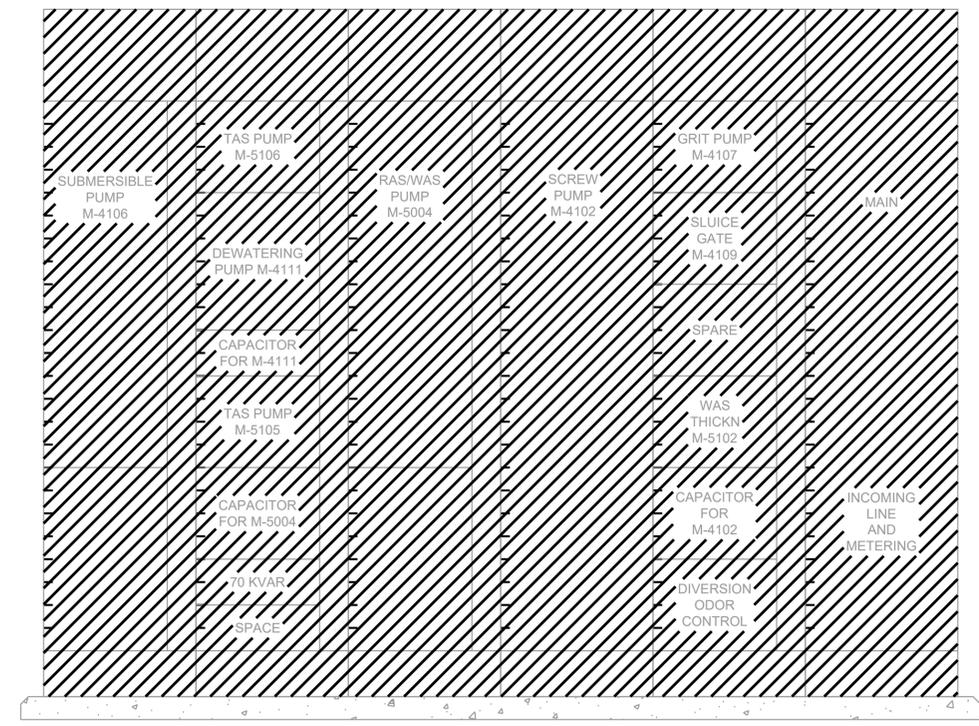


EXISTING MCC-2 ONE-LINE DIAGRAM

SCALE: NTS

LEGEND:

ITEMS TO BE DEMOLISHED.



EXISTING MCC-2 ELEVATION DETAIL

SCALE: NTS

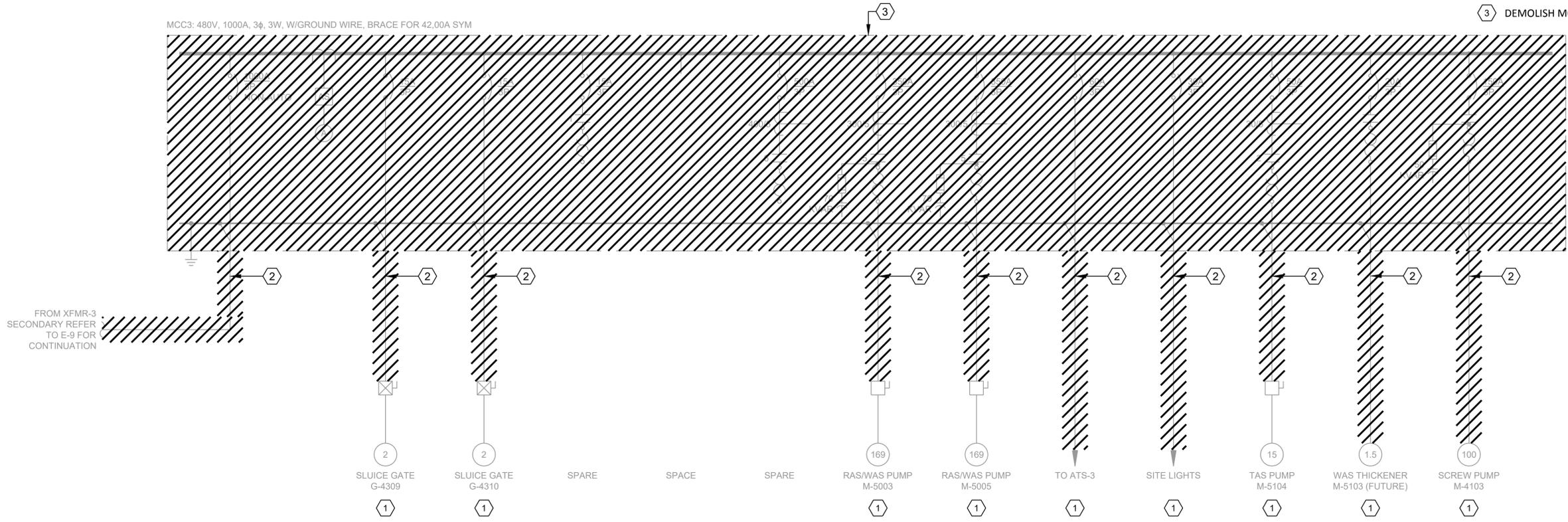
| | |
|---|-------------------------------------|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: hforouzan@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | |
| <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748</p> | |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>OCTOBER 2025 DATE</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL EXISTING DEMO MCC-2 ONE-LINE DIAGRAM</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 23 OF 111</p> | |

GENERAL NOTES:

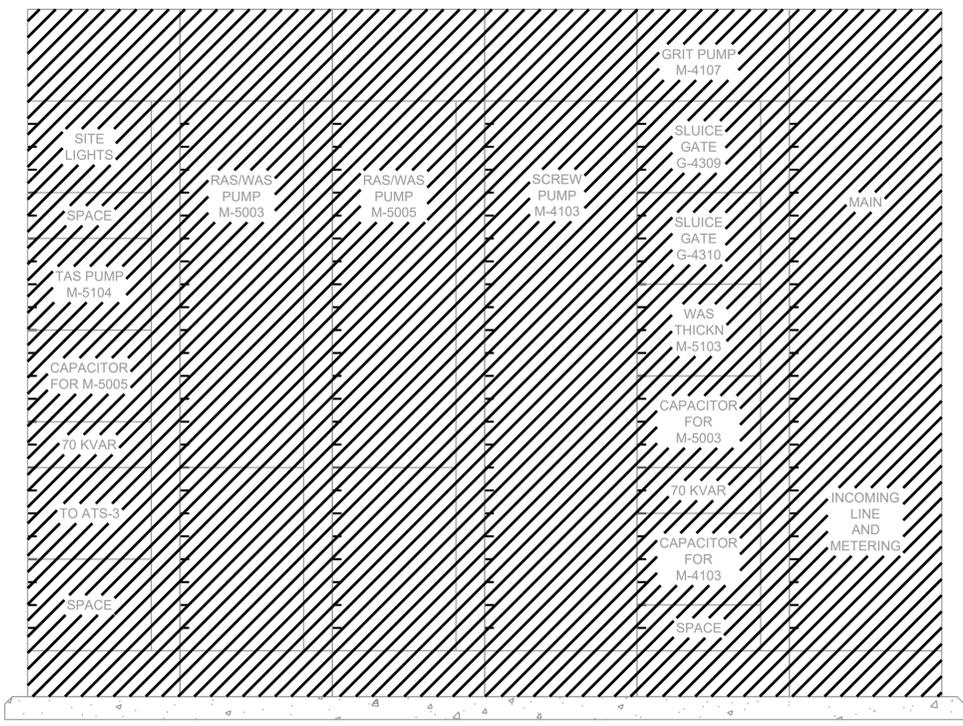
- OWNER HAS THE FIRST RIGHT OF REFUSAL FOR ALL DEMOLISHED EQUIPMENT.

NOTES BY SYMBOL (#):

- 1 EXISTING EQUIPMENT TO REMAIN AND BE RECONNECTED.
- 2 DEMOLISH ALL WIRERS AND CONDUITS. DEMOLISH DUCTBANK.
- 3 DEMOLISH MOTOR CONTROL CENTER.



EXISTING MCC-3 ONE-LINE DIAGRAM
SCALE: NTS



EXISTING MCC-3 ELEVATION DETAIL
SCALE: NTS

LEGEND:

ITEMS TO BE DEMOLISHED.

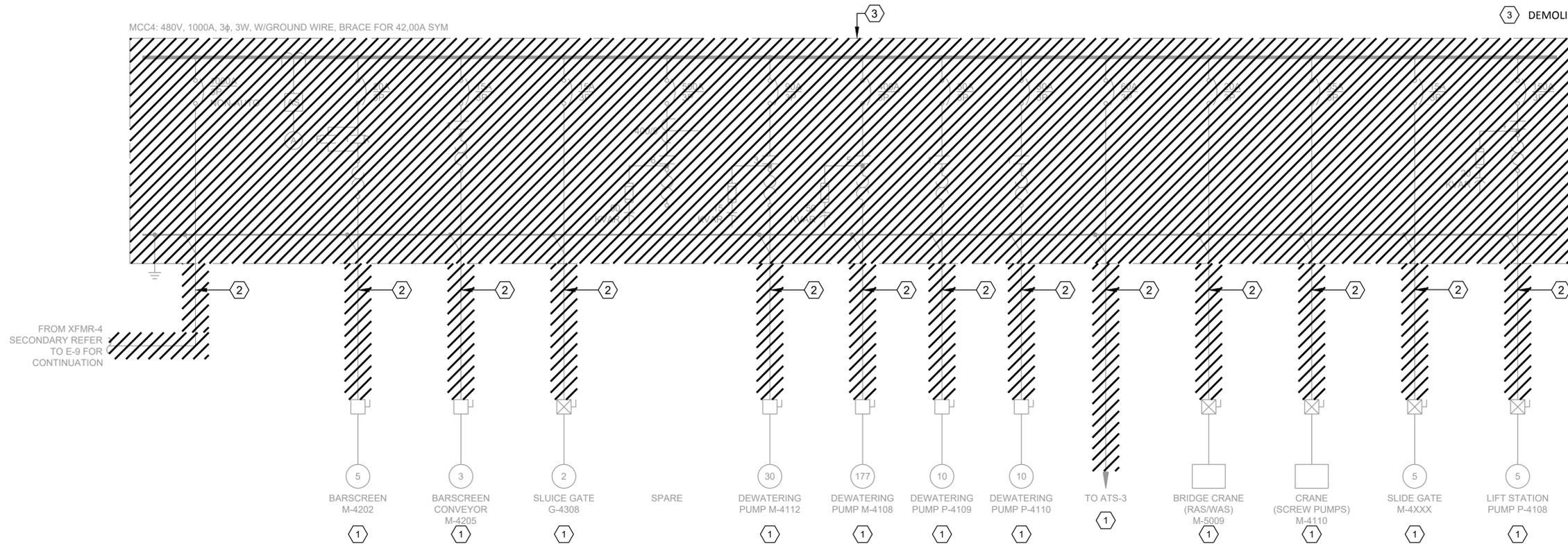
| | |
|---|-------------------------------------|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: hforouzan@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | |
| <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> | |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL EXISTING DEMO MCC-3 ONE-LINE DIAGRAM</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 24 OF 111</p> | |
| <p>E-13</p> | |

GENERAL NOTES:

- OWNER HAS THE FIRST RIGHT OF REFUSAL FOR ALL DEMOLISHED EQUIPMENT.

NOTES BY SYMBOL (#):

- 1 EXISTING EQUIPMENT TO REMAIN AND BE RECONNECTED.
- 2 DEMOLISH ALL WIRERS AND CONDUITS. DEMOLISH DUCTBANK.
- 3 DEMOLISH MOTOR CONTROL CENTER.

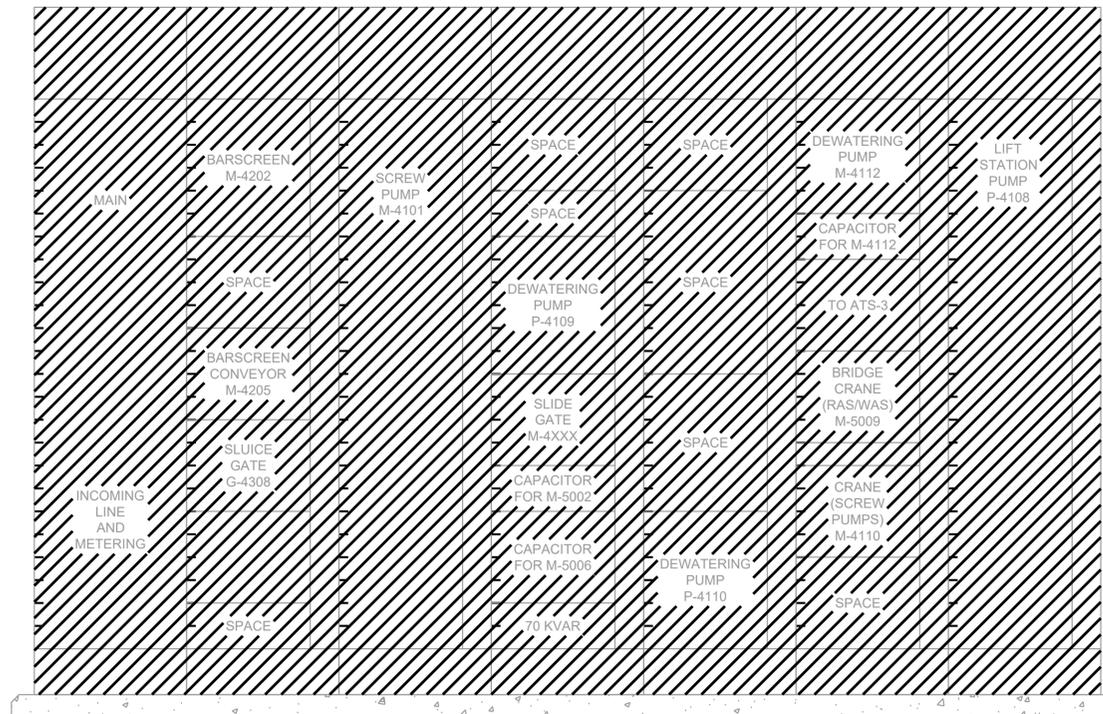


EXISTING MCC-4 ONE-LINE DIAGRAM

SCALE: NTS

LEGEND:

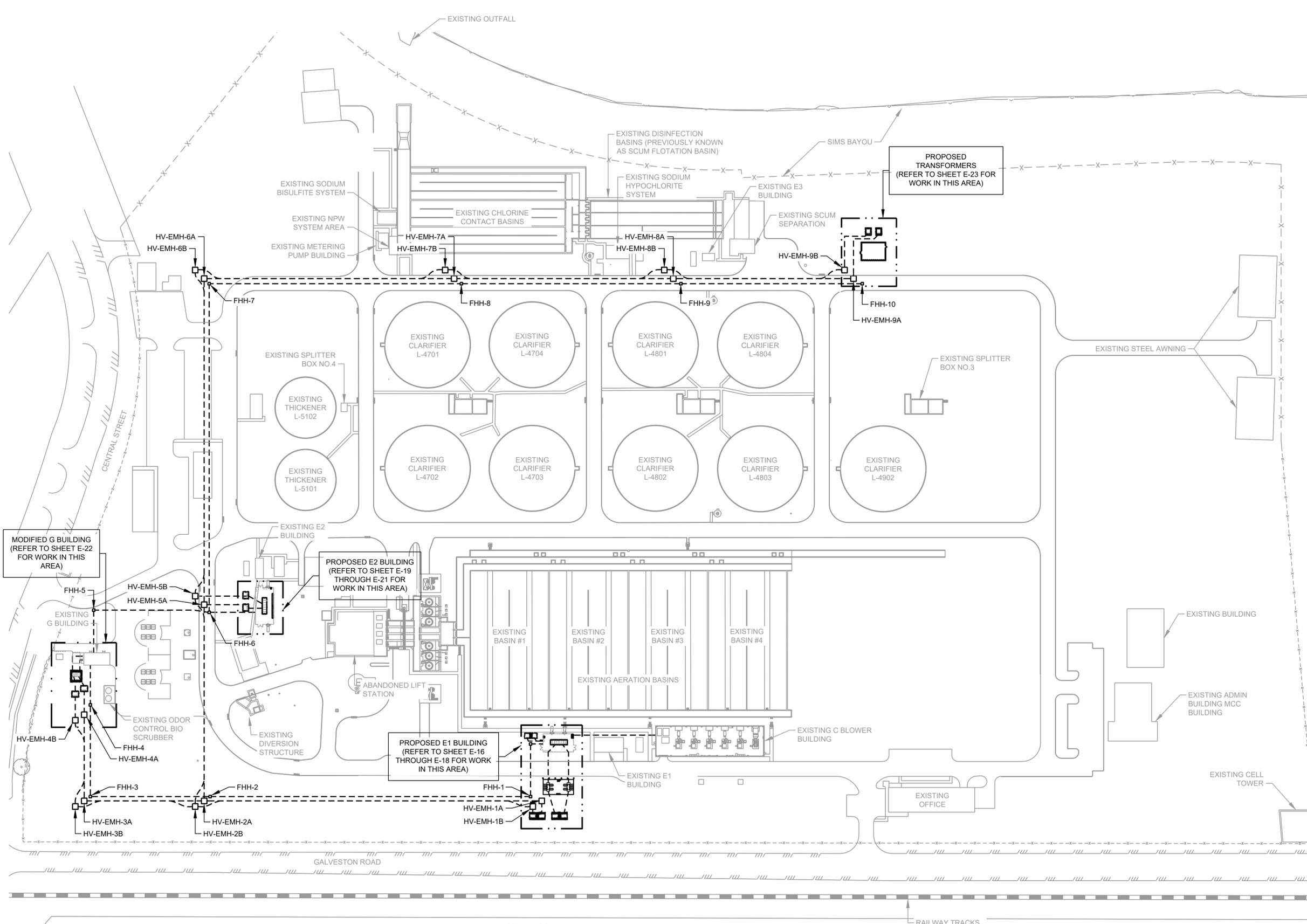
ITEMS TO BE DEMOLISHED.



EXISTING MCC-4 ELEVATION DETAIL

SCALE: NTS

| | |
|--|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: mhossain@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL EXISTING DEMO MCC-4 ONE-LINE DIAGRAM</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 25 OF 111</p> | |



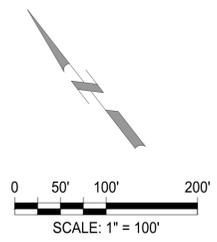
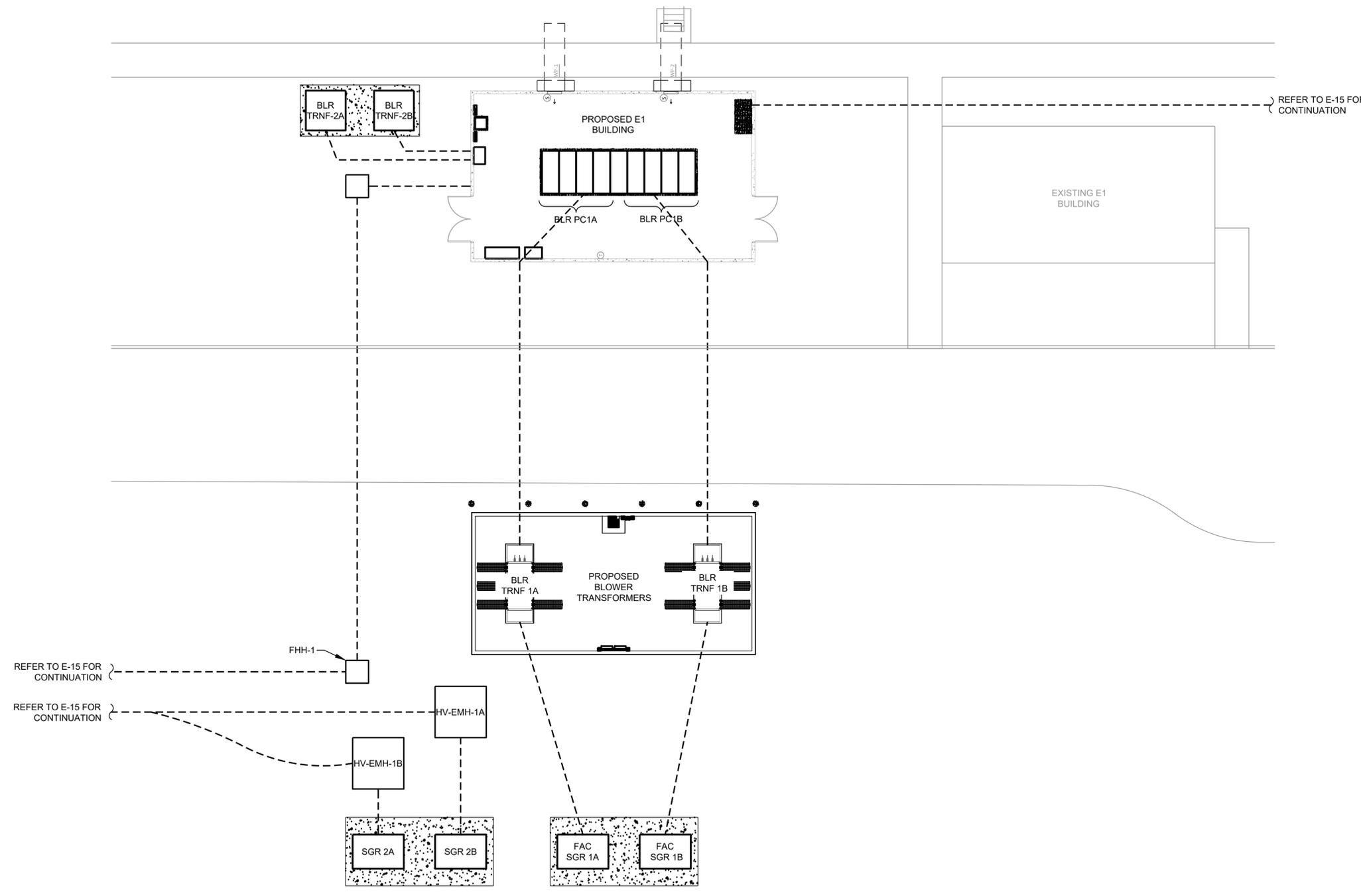
GENERAL NOTES:

1. NOT ALL UNDERGROUND UTILITIES ARE SHOWN ON THE PLANS.
2. THE EXACT LOCATION AND ELEVATIONS OF PROPOSED DUCTBANKS SHALL BE FIELD COORDINATED WITH ALL UNDERGROUND UTILITIES.
3. CONTRACTOR SHALL PERFORM SUE PRIOR TO INSTALLATION TO NEW DUCTBANK.

| | |
|---|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St. Houston, Texas 77006 Tel: 713-636-2936 Fax: 713-636-2987 email: mforouzan@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |

| | |
|--|-------------------------------------|
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL PROPOSED OVERALL SITE PLAN</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE 1" = 100'</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 26 OF 111</p> | |

1
PROPOSED OVERALL SITE PLAN
 SCALE: 1" = 80'



GENERAL NOTES:

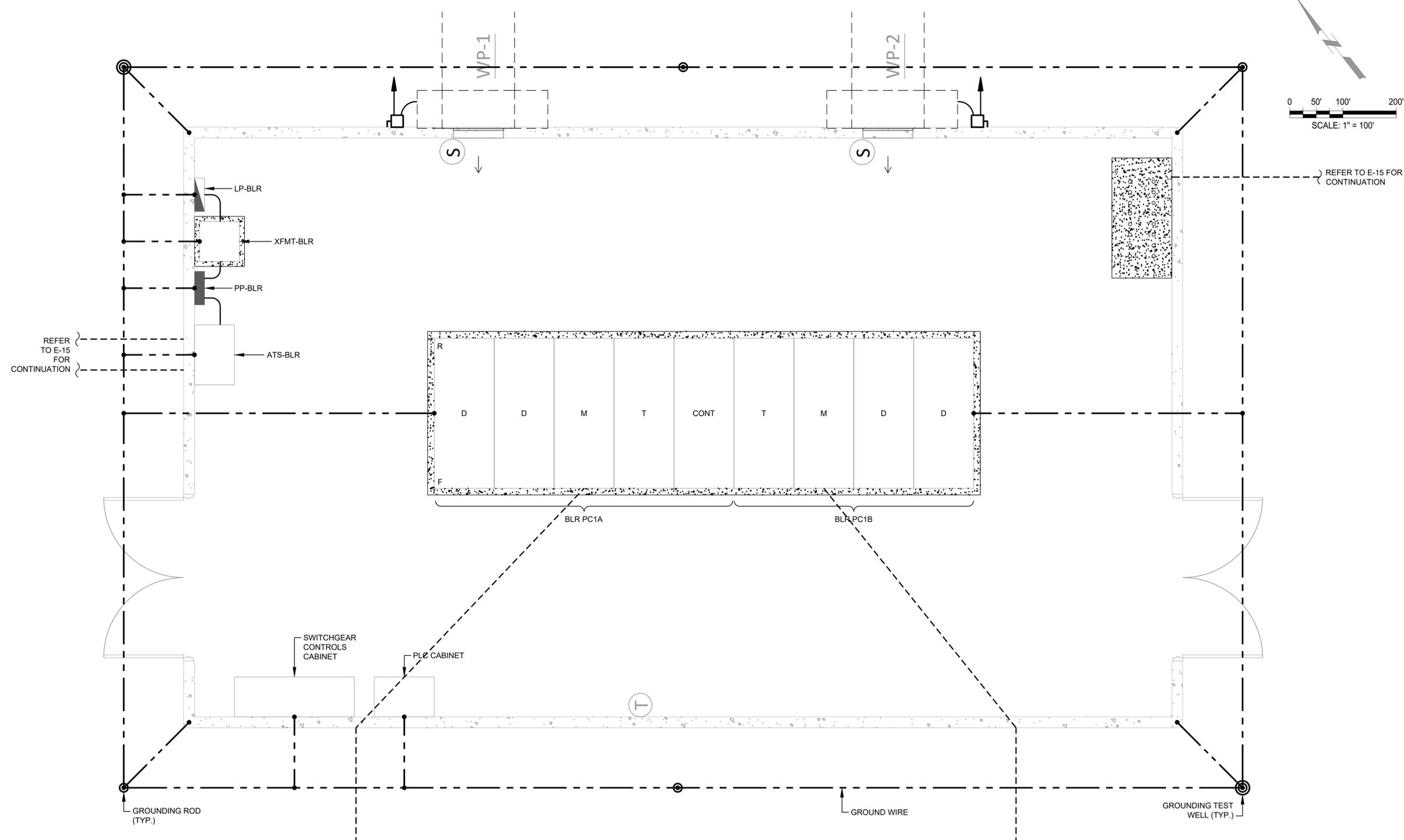
1. NOT ALL UNDERGROUND UTILITIES ARE SHOWN ON THE PLANS.
2. THE EXACT LOCATION AND ELEVATIONS OF PROPOSED DUCTBANKS SHALL BE FIELD COORDINATED WITH ALL UNDERGROUND UTILITIES.
3. CONTRACTOR SHALL PERFORM SUE PRIOR TO INSTALLATION TO NEW DUCTBANK.

1
PROPOSED ELECTRICAL POWER PLAN BUILDING E-1
 SCALE: 3/32" = 1'-0"

| | |
|---|---|
| <p>GAI Gupta & Associates, Inc. CONSULTING ENGINEERING Registration No. F-2593</p> | <p>302 Dennis St. Houston, Texas 77006 Tel: 713-636-2936 Fax: 713-636-2987 email: Msourani@gaiconsulting.com</p> |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by</p> <p style="text-align: center;">HOSS FOROUZAN TEXAS P.E. No. 77748</p> <p style="text-align: center;">OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |

| | | | | | | | | | | | | | | | |
|---|------------------------------|------------------------------|-----------------|--|---------------|--|---------------|--|--------------------|--|---------------------|--|---------------------|--|--|
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | | | | | | | | | | | | | | | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL PROPOSED ELECTRICAL POWER PLAN BLDG. E-1</p> | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 8pt;">WBS NUMBER</td> <td style="font-size: 8pt;">FOR CITY OF HOUSTON USE ONLY</td> </tr> <tr> <td style="font-size: 8pt;">R-000265-0146-3</td> <td></td> </tr> <tr> <td style="font-size: 8pt;">DRAWING SCALE</td> <td></td> </tr> <tr> <td style="font-size: 8pt;">3/32" = 1'-0"</td> <td></td> </tr> <tr> <td style="font-size: 8pt;">CITY OF HOUSTON PM</td> <td></td> </tr> <tr> <td style="font-size: 8pt;">SHAHIDUR RAHMAN, PE</td> <td></td> </tr> <tr> <td style="font-size: 8pt;">SHEET NO. 27 OF 111</td> <td></td> </tr> </table> | WBS NUMBER | FOR CITY OF HOUSTON USE ONLY | R-000265-0146-3 | | DRAWING SCALE | | 3/32" = 1'-0" | | CITY OF HOUSTON PM | | SHAHIDUR RAHMAN, PE | | SHEET NO. 27 OF 111 | | |
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY | | | | | | | | | | | | | | |
| R-000265-0146-3 | | | | | | | | | | | | | | | |
| DRAWING SCALE | | | | | | | | | | | | | | | |
| 3/32" = 1'-0" | | | | | | | | | | | | | | | |
| CITY OF HOUSTON PM | | | | | | | | | | | | | | | |
| SHAHIDUR RAHMAN, PE | | | | | | | | | | | | | | | |
| SHEET NO. 27 OF 111 | | | | | | | | | | | | | | | |

FILE PATH: O:\HB78_Sim South WWTP Improvement\5 Drawings\Electrical\Working\HB78_E-17.dwg PLOT STYLE: FN-MONO-HB78.CTB PLOTTED: 10/29/2025 4:52 PM



PROPOSED ELECTRICAL
GROUNDING PLAN BUILDING E-1
SCALE: 3/8" = 1'-0"

GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
CONSULTING ENGINEERING Tel: 713-636-2936
Registration No. F-2593 Fax: 713-636-2987
email: shouran@gaiconsulting.com

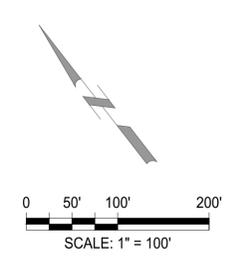
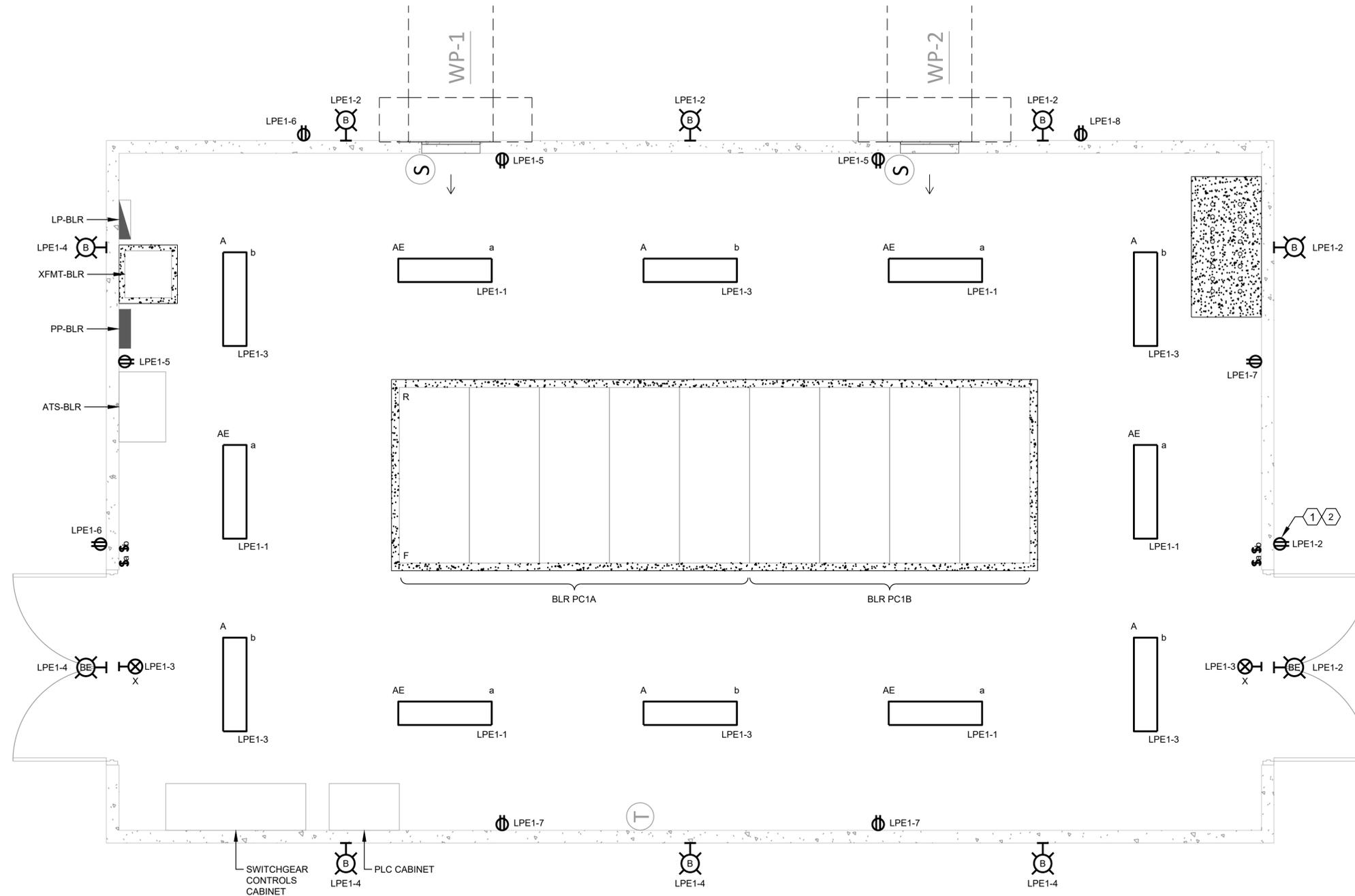
FREESE NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
PROPOSED ELECTRICAL
GROUNDING PLAN BLDG. E-1

| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
|---------------------|------------------------------|
| R-000265-0146-3 | |
| DRAWING SCALE | |
| 3/8" = 1'-0" | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 28 OF 111 | |



- NOTES BY SYMBOL:
- ① INSTALL WP/GFI RECEPTACLE WITH WEATHER PROOF HOUSE COVER.
 - ② INSTALL 4'-0" ABOVE FINISHED FLOOR..

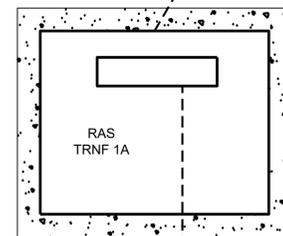
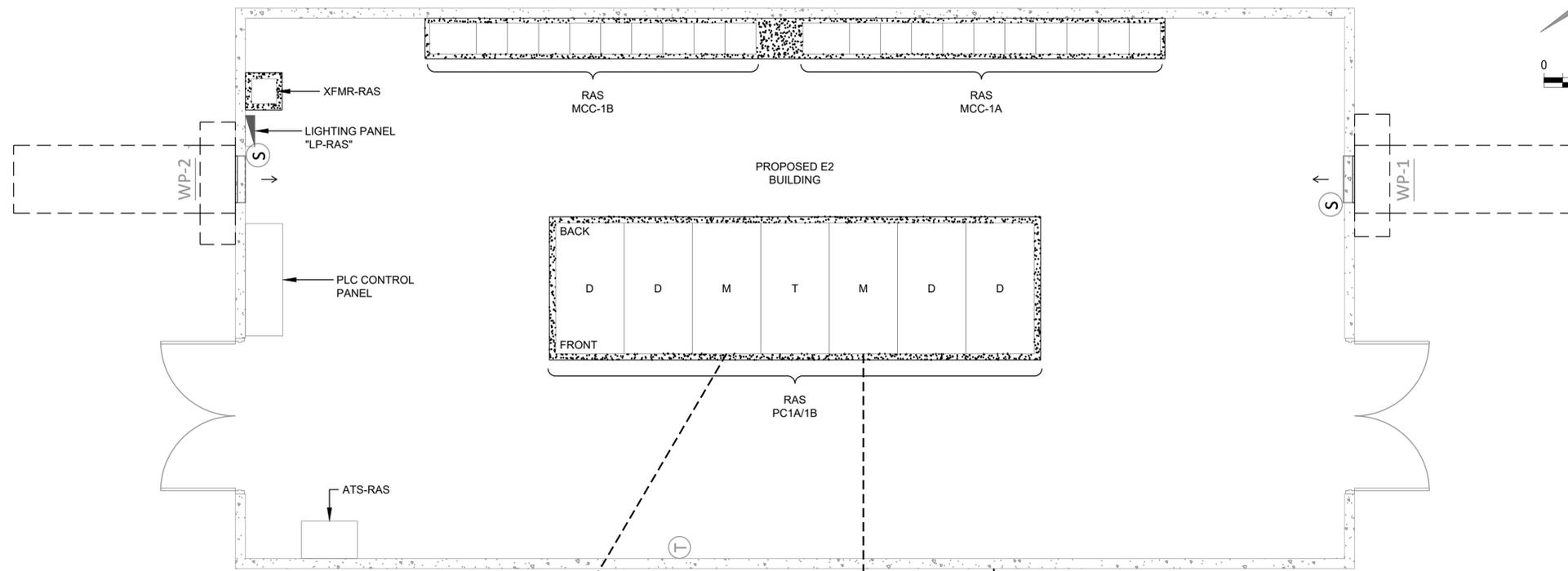
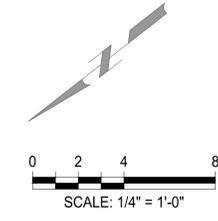
PROPOSED ELECTRICAL LIGHTING PLAN BUILDING E-1

SCALE: 3/8" = 1'-0"

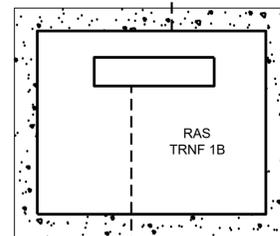
| | |
|--|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: Msouzan@gaiconsulting.com</p> | |
| <p>FREESE NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by</p> <p>HOSS FOROUZAN TEXAS P.E. No. 77748</p> <p>OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL PROPOSED ELECTRICAL LIGHTING PLAN BLDG. E-1</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE 3/8" = 1'-0"</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 29 OF 111</p> | |
| <p>E-18</p> | |

NOTES BY SYMBOL:

1 REFER TO SHEET E-15 FOR LOCATION OF NEW BUILDING AND SWITCHGEAR.



PROPOSED TRANSFORMER



TO MANHOLE EMH-XX

TO MANHOLE EMH-XX

TO MANHOLE EMH-XX



PROPOSED ELECTRICAL POWER PLAN BUILDING E-2

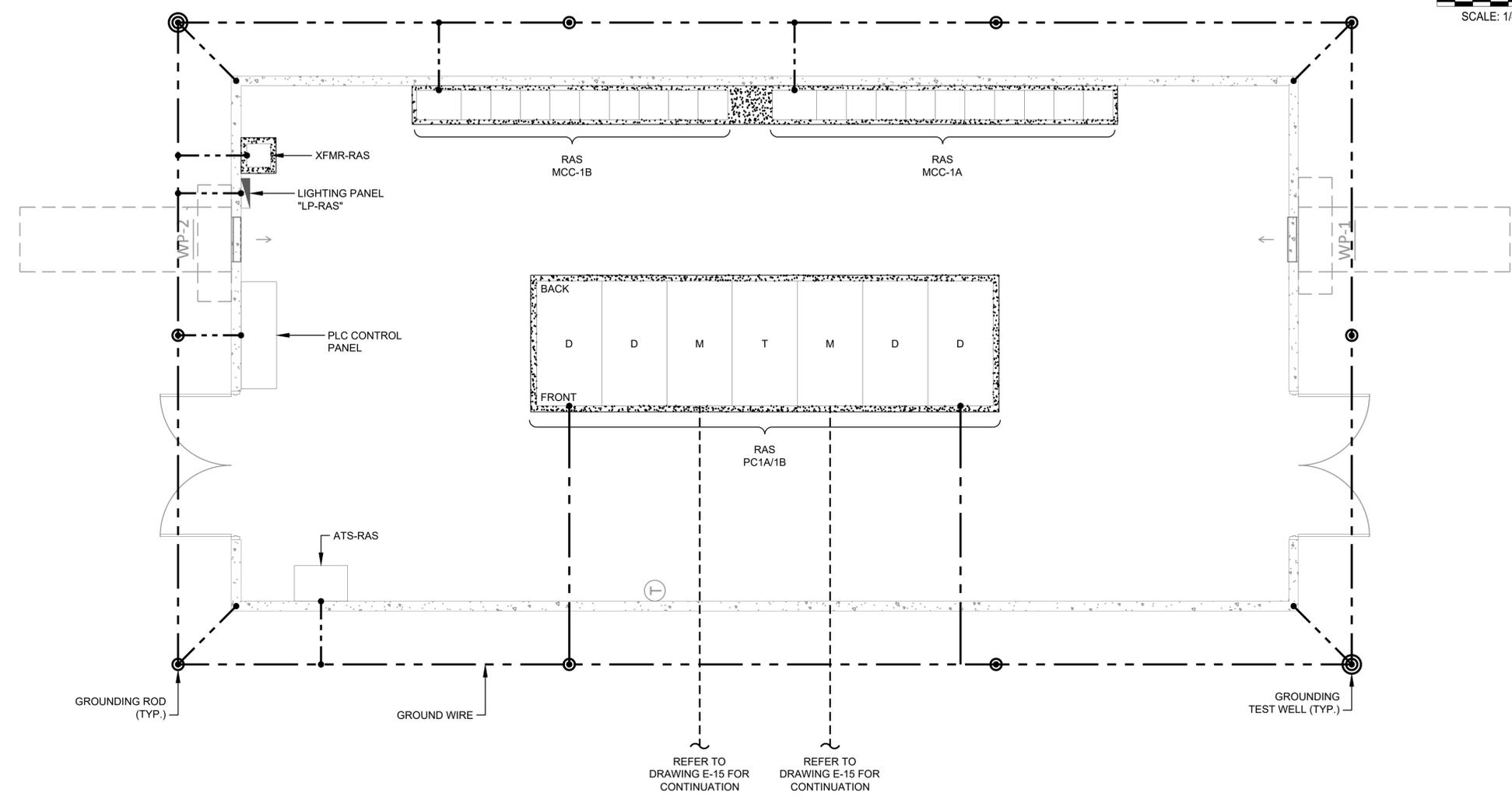
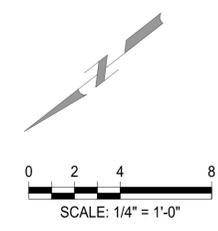
SCALE: 1/4" = 1'-0"



| | |
|---|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: mforouzan@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL PROPOSED ELECTRICAL POWER PLAN BLDG. E-2</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE 1/4" = 1'-0"</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 30 OF 111</p> | |

FILE PATH: C:\HB78_Sim South WWTP Improvement\5 Drawings\Electrical\Working\HB78_E-20.dwg PLOT STYLE: FN-MONO-HB78.CTB PLOTTED: 10/29/2025 4:53 PM

NOTES BY SYMBOL:
 1 REFER TO SHEET E-15 FOR LOCATION OF NEW BUILDING AND SWITCHGEAR.



REFER TO DRAWING E-15 FOR CONTINUATION REFER TO DRAWING E-15 FOR CONTINUATION

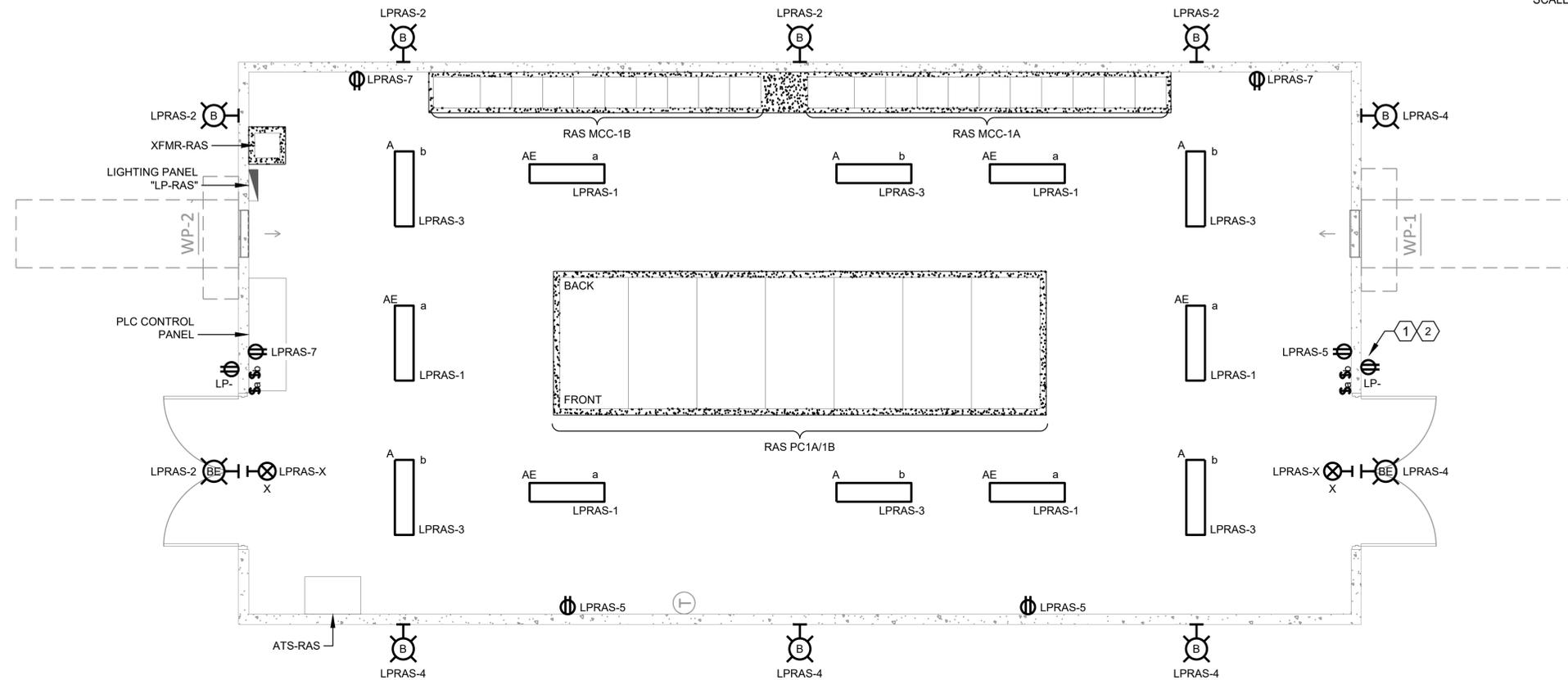
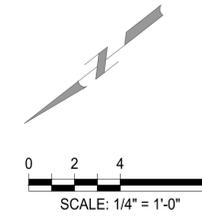
**PROPOSED ELECTRICAL
 GROUNDING PLAN BUILDING E-2**

SCALE: 1/4" = 1'-0"

| | |
|--|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: Msorouzan@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by</p> <p>HOSS FOROUZAN TEXAS P.E. No. 77748</p> <p>OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL PROPOSED ELECTRICAL GROUNDING PLAN BLDG. E-2</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE 1/4" = 1'-0"</p> | |
| <p>CITY OF HOUSTON PM</p> | |
| <p>SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 31 OF 111</p> | |

NOTES BY SYMBOL:

- ① INSTALL WP/GFI RECEPTACLE WITH WEATHER PROOF HOUSE COVER.
- ② INSTALL 4'-0" ABOVE FINISHED FLOOR..



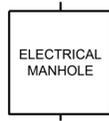
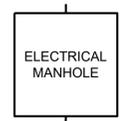
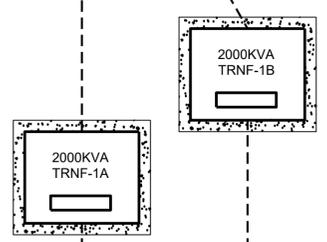
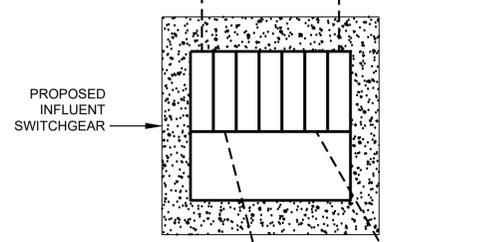
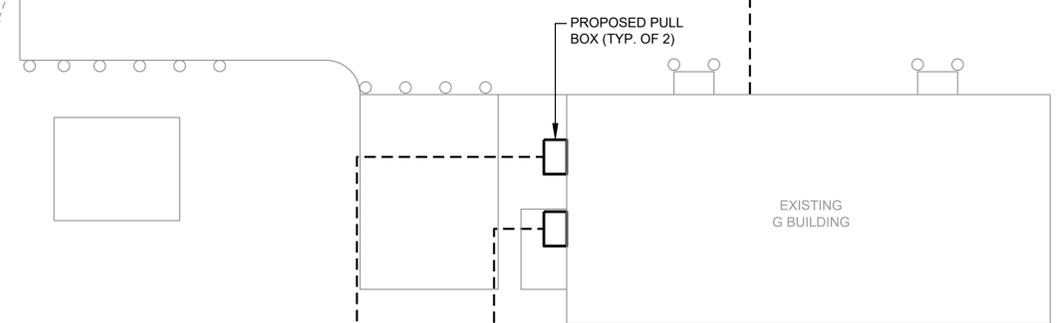
1
PROPOSED ELECTRICAL LIGHTING PLAN BUILDING E-2
1

SCALE: 1/4" = 1'-0"

| | |
|---|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: hforouzan@gaiconsulting.com</p> | |
| <p>FREESE NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL PROPOSED ELECTRICAL LIGHTING PLAN BLDG. E-2</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE 1/4" = 1'-0"</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 32 OF 111</p> | |
| <p>E-21</p> | |

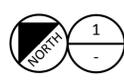
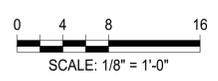
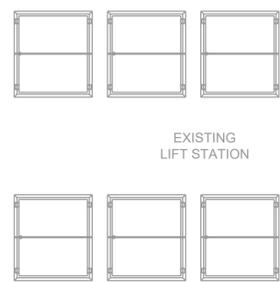
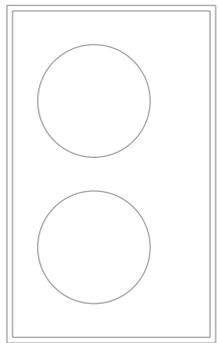
PLOT STYLE: FN-MONO-HB78.CTB PLOTTED: 10/29/2025 4:53 PM

FILE PATH: O:\HB78_Sim South WWTP Improvement\5 Drawings\Electrical\Working\HB78_E-22.dwg



REFER TO SHEET E-15 FOR CONTINUATION

REFER TO SHEET E-15 FOR CONTINUATION



PROPOSED ENLARGED SITE PLAN LIFT STATION

SCALE: 1/8" = 1'-0"

GAI
 Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
 CONSULTING ENGINEERING Tel: 713-636-2936
 Registration No. F-2593 Fax: 713-636-2987
 email: Msourani@gaiconsulting.com

FREESE & NICHOLS
 10497 Town and Country Way, Suite 500 Houston, Texas 77024
 Phone - (713) 600-6800 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
 HOSS FOROUZAN
 TEXAS P.E. No. 77748

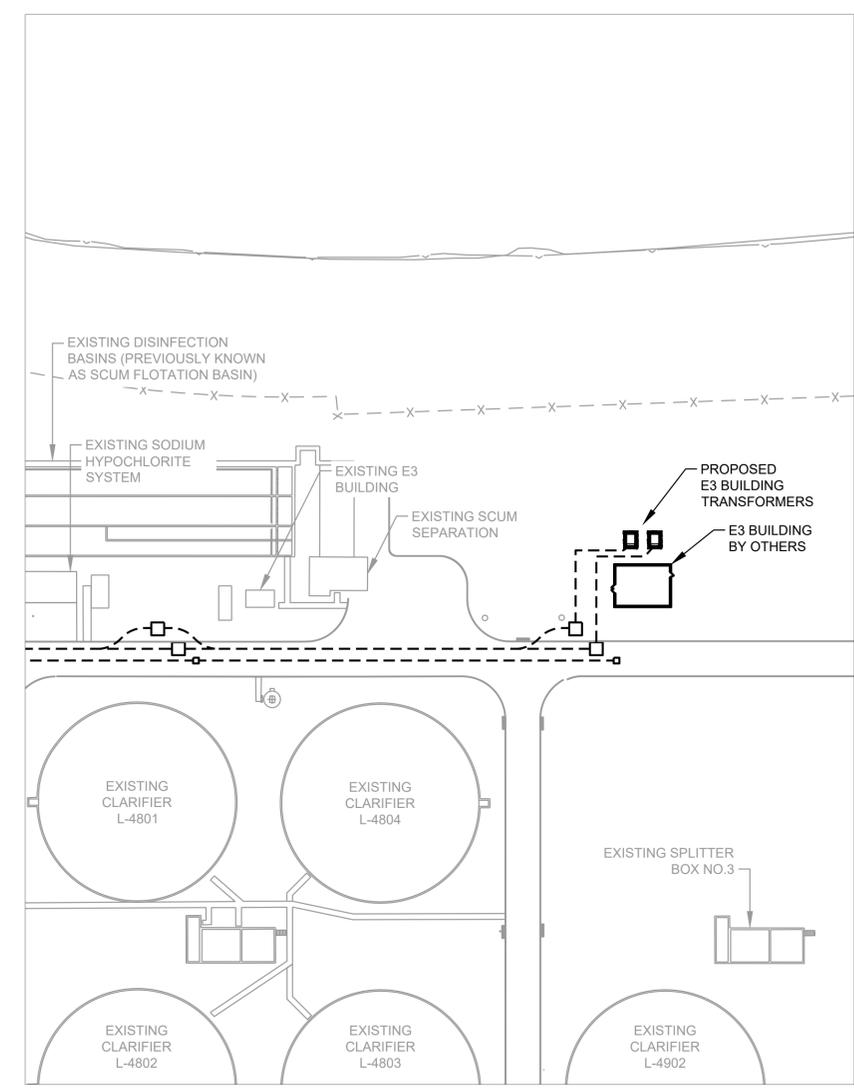
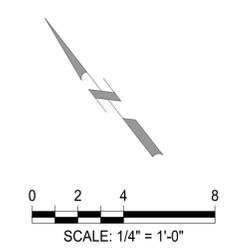
SURVEYED BY: _____
 FB NO. P- _____
 DATE: OCTOBER 2025

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

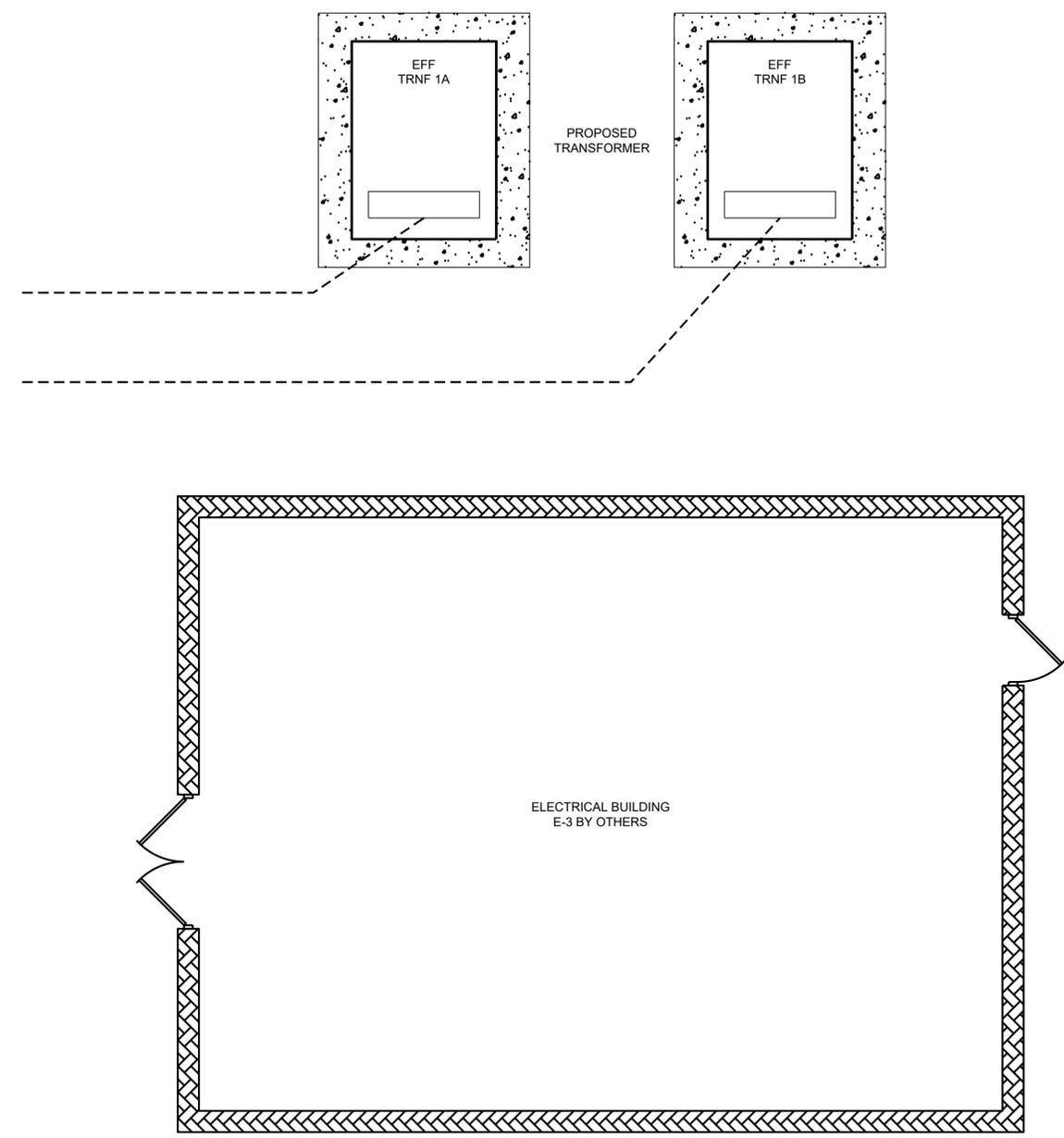
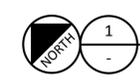
SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 ELECTRICAL
 PROPOSED ENLARGED
 SITE PLAN LIFT STATION

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| 1/8" = 1'-0" | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 33 OF 111 | |

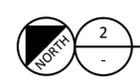
FILE PATH: O:\HB78_Sim South WWTP Improvement\5 Drawings\Electrical\HB78_E-23.dwg PLOT STYLE: FN-MONO-HB78.CTB PLOTTED: 10/29/2025 4:53 PM



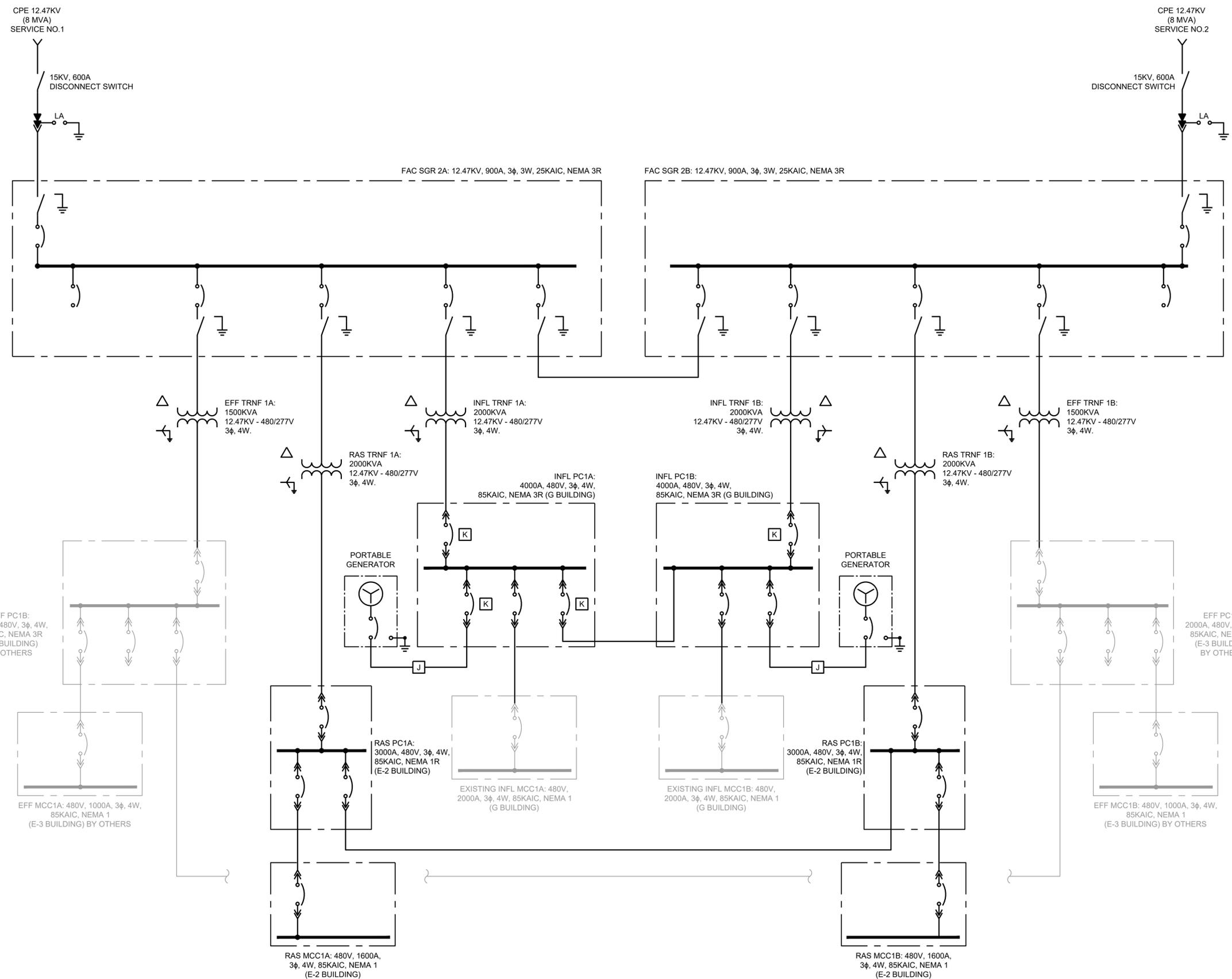
PROPOSED ELECTRICAL ENLARGED SITE PLAN BUILDING E-3
SCALE: NTS



ELECTRICAL ENLARGED SITE PLAN BUILDING E-3
SCALE: 1/4" = 1'-0"



| | |
|---|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: mforouzan@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL PROPOSED ENLARGED SITE PLAN BLDG. E-3</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE 1/4" = 1'-0"</p> | |
| <p>CITY OF HOUSTON PM</p> | |
| <p>SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 34 OF 111</p> | |



PROPOSED OVERALL ONE-LINE DIAGRAM - I
SCALE: NTS

| SGR-2A LOAD CALCULATION | | | | |
|---------------------------|------------------|-----|-------|------|
| ITEM | DESCRIPTION | HP | FLA* | KVA |
| 1 | INFL (2.20) PC1A | --- | 62 A | 1349 |
| 2 | RAS (5.25) PC1A | --- | 31 A | 675 |
| 3 | EFF (8.00) PC1A | --- | 21 A | 443 |
| SUBTOTAL | | | 114 A | 2467 |
| 25% OF LARGEST MOTOR LOAD | | | 70 A | --- |
| MINIMUM AMPACITY @480V/3φ | | | 184 A | --- |

* BASED ON SELECTED PUMP MFG DATA

| SGR-2B LOAD CALCULATION | | | | |
|---------------------------|------------------|-----|-------|------|
| ITEM | DESCRIPTION | HP | FLA* | KVA |
| 1 | INFL (2.20) PC1B | --- | 62 A | 1338 |
| 2 | RAS (5.25) PC1B | --- | 31 A | 910 |
| 3 | EFF (8.00) PC1B | --- | 21 A | 213 |
| SUBTOTAL | | | 114 A | 2460 |
| 25% OF LARGEST MOTOR LOAD | | | 70 A | --- |
| MINIMUM AMPACITY @480V/3φ | | | 184 A | --- |

* BASED ON SELECTED PUMP MFG DATA

GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
CONSULTING ENGINEERING Tel: 713-636-2936
Registration No. F-2593 Fax: 713-636-2987
email: mforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500 Houston, Texas 77024
Phone - (713) 600-6800 Web - www.freese.com

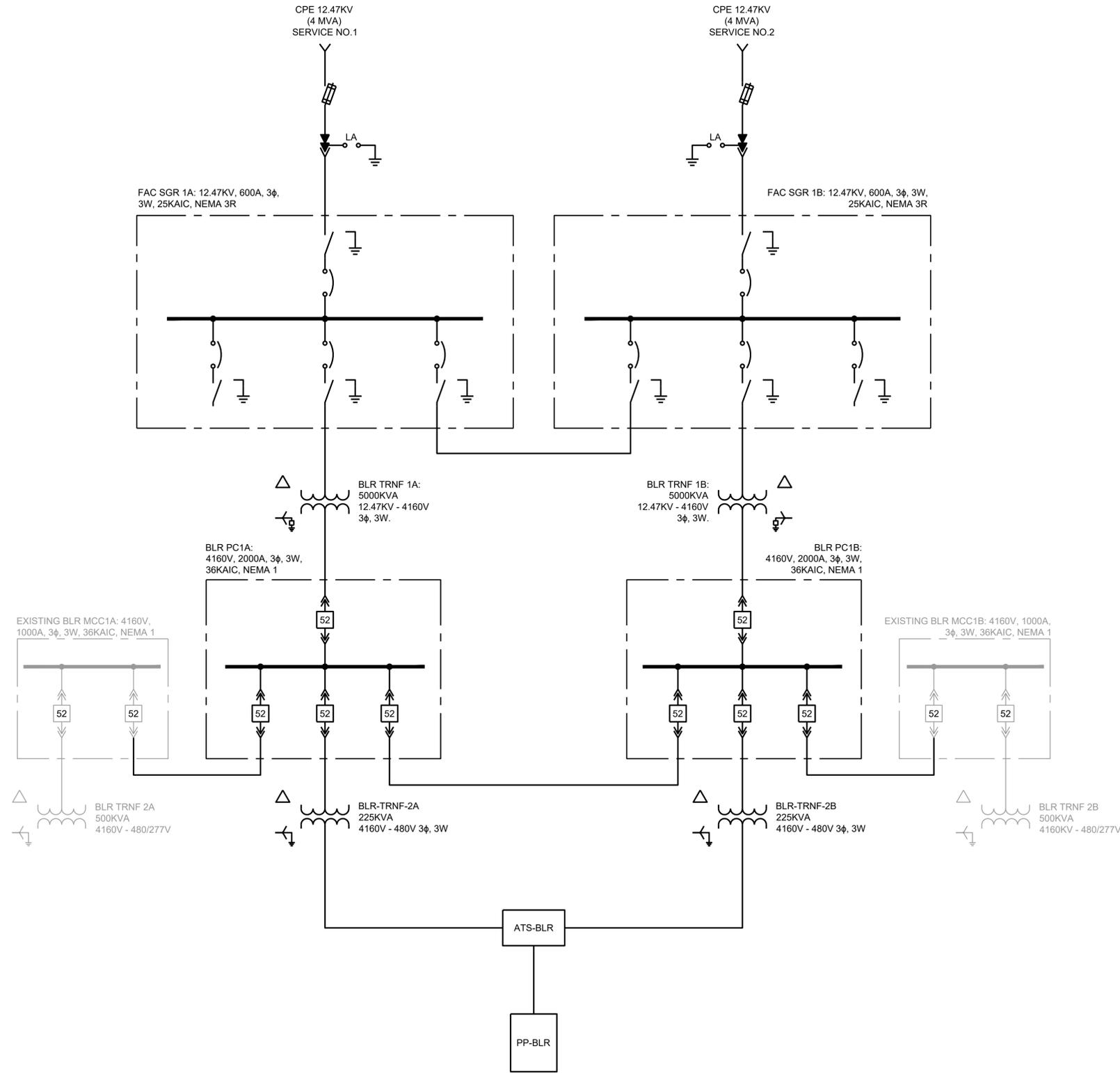
This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN TEXAS P.E. No. 77748
OCTOBER 2025 DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
PROPOSED OVERALL
ONE-LINE DIAGRAM - I

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 35 OF 111 | |



PROPOSED OVERALL ONE-LINE DIAGRAM - II

SCALE: NTS

| SGR-2A LOAD CALCULATION | | | | |
|---------------------------|-----------------|-----|-------|------|
| ITEM | DESCRIPTION | HP | FLA* | KVA |
| 1 | BLR (5.05) PC1A | --- | 162 A | 3492 |
| SUBTOTAL | | | 162 A | 3492 |
| 25% OF LARGEST MOTOR LOAD | | | 46 A | --- |
| MINIMUM AMPACITY @480V/3φ | | | 208 A | --- |

* BASED ON SELECTED PUMP MFG DATA

| SGR-2B LOAD CALCULATION | | | | |
|---------------------------|-----------------|-----|-------|------|
| ITEM | DESCRIPTION | HP | FLA* | KVA |
| 1 | BLR (5.05) PC1B | --- | 162 A | 3492 |
| SUBTOTAL | | | 162 A | 2460 |
| 25% OF LARGEST MOTOR LOAD | | | 46 A | --- |
| MINIMUM AMPACITY @480V/3φ | | | 208 A | --- |

* BASED ON SELECTED PUMP MFG DATA

GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
CONSULTING ENGINEERING Tel: 713-636-2936
Registration No. F-2593 Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

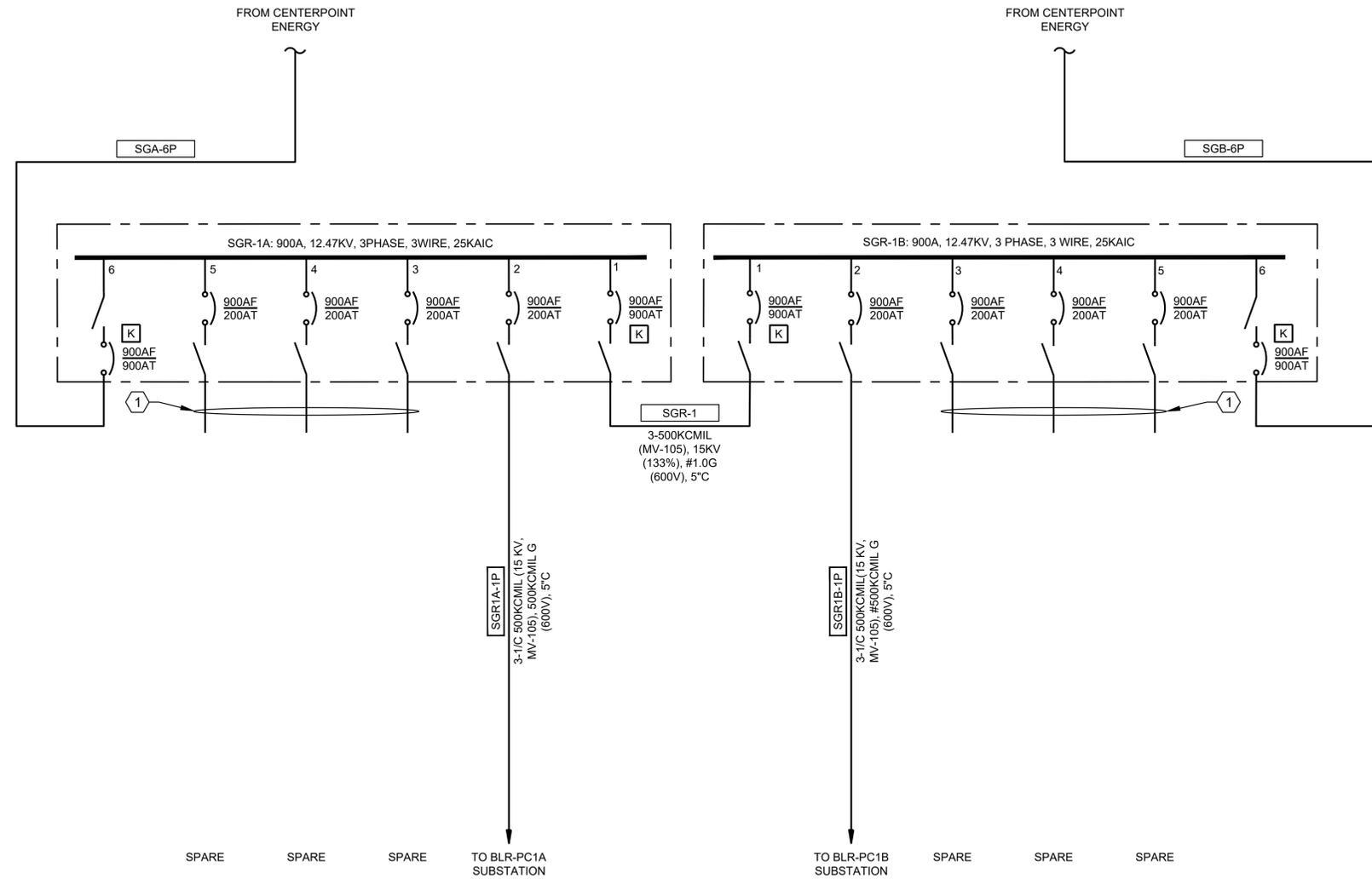
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
PROPOSED OVERALL
ONE-LINE DIAGRAM - II

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 36 | OF 111 |

NOTES BY SYMBOL (#):

1 INSTALL 4" SPARE CONDUIT FOR FUTURE USE. STUB OUR 12" FROM GRADE AND CAP FOR FUTURE USE.



SWITCHGEAR SGR-1A & SGR-1B ONE-LINE DIAGRAM

SCALE: NTS

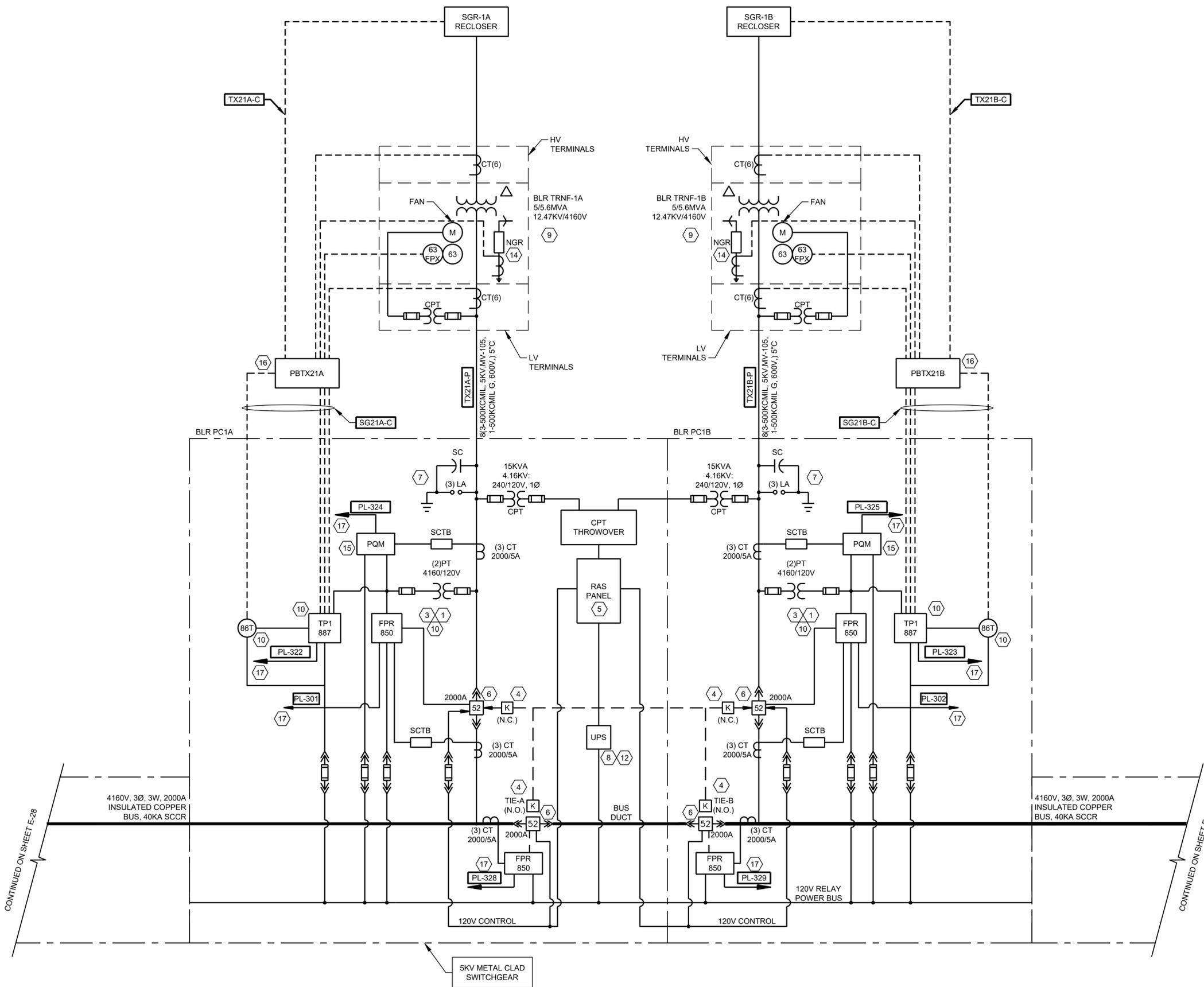
| SGR-2A LOAD CALCULATION | | | | |
|---------------------------|-----------------|-----|-------|------|
| ITEM | DESCRIPTION | HP | FLA* | KVA |
| 1 | BLR (5.05) PC1A | --- | 162 A | 3492 |
| SUBTOTAL | | | 162 A | 3492 |
| 25% OF LARGEST MOTOR LOAD | | | 46 A | --- |
| MINIMUM AMPACITY @480V/3φ | | | 208 A | --- |

* BASED ON SELECTED PUMP MFG DATA

| SGR-2B LOAD CALCULATION | | | | |
|---------------------------|-----------------|-----|-------|------|
| ITEM | DESCRIPTION | HP | FLA* | KVA |
| 1 | BLR (5.05) PC1B | --- | 162 A | 3492 |
| SUBTOTAL | | | 162 A | 2460 |
| 25% OF LARGEST MOTOR LOAD | | | 46 A | --- |
| MINIMUM AMPACITY @480V/3φ | | | 208 A | --- |

* BASED ON SELECTED PUMP MFG DATA

| | |
|---|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St. Houston, Texas 77006 Tel: 713-636-2936 CONSULTING ENGINEERING Fax: 713-636-2987 Registration No. F-2593 email: Morozan@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL SWITCH SGR-1A & SGR-1B ONE-LINE DIAGRAM</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 37 OF 111</p> | |
| <p>E-26</p> | |



**4160 MEDIUM VOLTAGE SWITCHGEAR
BLR PC1A & PC1B ONE-LINE DIAGRAM**
SCALE: NTS

- NOTES BY SYMBOL (#):
1. FEEDR MANGEMENT RELAY TYPE FPR PER SPECIFICATIONS. CONNECT TO PLC VIA ETHERNET PORT. INCLUDE LOCKOUT FUNCTION 86.
 2. SHORTING TYPE TERMINAL BLOCK AND FLEXITEST SWITCH (SCTB).
 3. ALL TRIP SETTINGS SHALL BE SET BY CONTRACTOR PER POWER COORDINATION STUDY.
 4. PROVIDE KIRK KEY SYSTEM SO ONLY THREE OF THE FOUR BREAKERS MAY BE CLOSED AT ANY ONE TIME.
 5. SWITCHGEAR MANUFACTURER SHALL PROVIDE 120V PANEL OF ADEQUATE SIZE AND BRACING.
 6. PROVIDE REMOTE RACKING DEVICE FOR ALL CIRCUIT BREAKERS.
 7. FURNISH STATION CLASS ARRESTOR RATED 6KV.
 8. UPS TO BE SIZED BY SWITCHGEAR MANUFACTURER, BACKUP TIME TO BE 30 MINUTES MINIMUM.
 9. TRANSFORMER TO BE PROVIDED WITH 2-SETS OF MULTI-RATIO CTS ON EACH PRIMARY AND SECONDARY BUSHING.
 10. REFER TO SHEET E-30 FOR RELAY ANSI DEVICE PROTECTION CODES.
 11. REFER TO SHEET E-XX.
 12. PROVIDE 10W BATTERY AND UPS FAIL CONTACT.
 13. TRANSFORMER MANUFACTURER SHALL SUPPLY CPT CONNECTED TO TRANSFER SECONDARY FOR FANS.
 14. TRANSFORMER MANUFACTURER SHALL SUPPLY A 200A, 10SEC SS, NEMA GROUNDS RESISTOR, (NGR), COVER MOUNTED ON TOP OF TRANSFORMER. PROVIDE 200/5 CT.
 15. GE MULTILIN PQM-II.
 16. REFER TO SHEET E-30 FOR DETAILS.
 17. ROUTE WIRE AND CONDUIT TO NETWORK ENCLOSURE.

GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

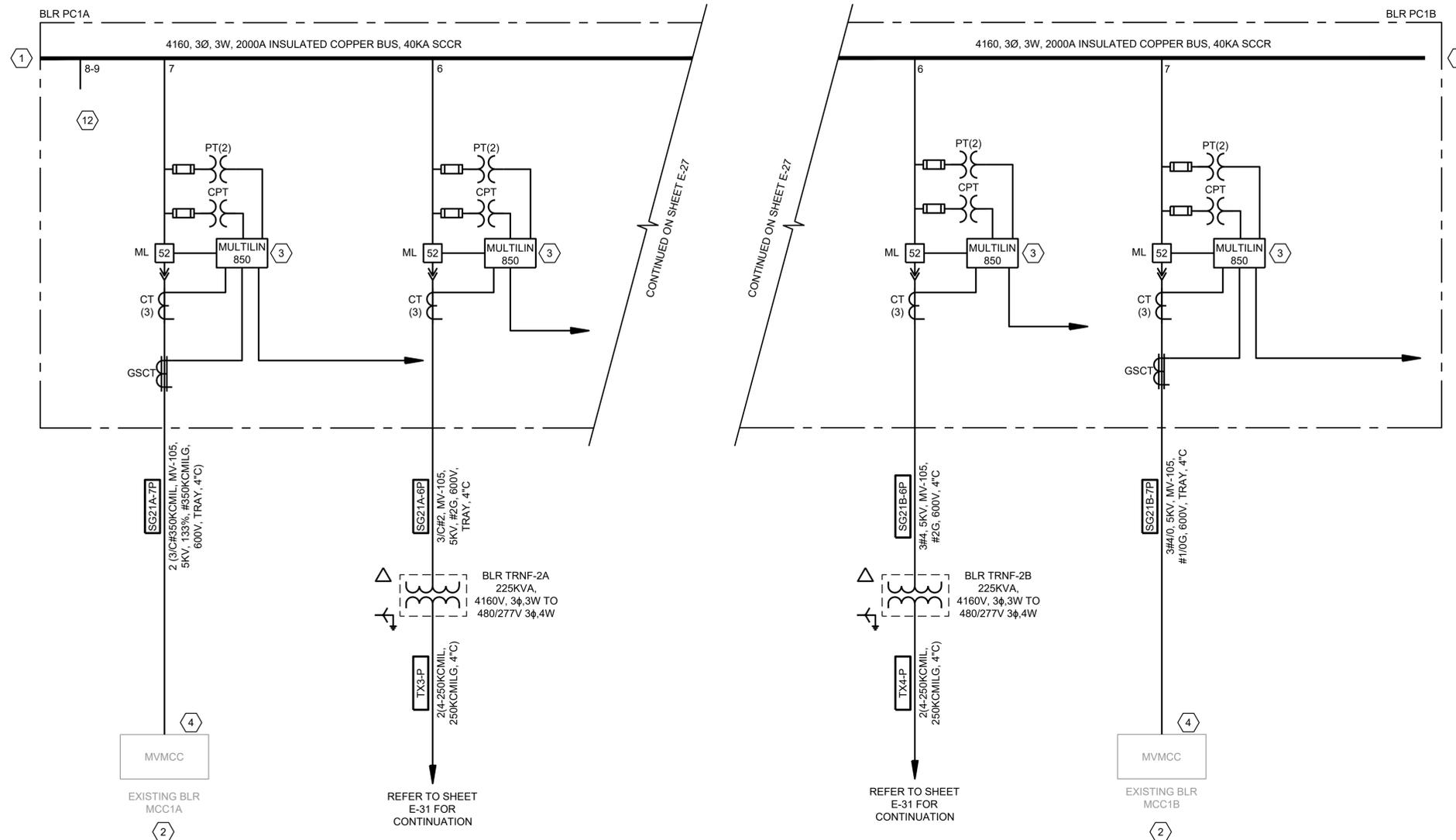
This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
4160 MED. VOLT. SWG BLR
PC1A & PC1B ONE-LINE DIA.

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 38 OF 111 | |



4160 MEDIUM VOLTAGE SWITCHGEAR
BLR PC1A & PC1B ONE-LINE DIAGRAM-II

SCALE: NTS

GENERAL NOTES:

1. THE CONTRACTOR SHALL OBTAIN THE EXISTING NAME PLATE DATA AND COORDINATE THE FUSE SIZE WITH THE NAME PLATE.
2. THE CONTRACTOR SHALL COORDINATE INSTALLATION OF THE POWER CABLES WITH THE OWNERS INSPECTION GROUP.
3. THE CONTRACTOR SHALL MAINTAIN THE BEND RADIUS OF THE 5KV CABLE AS PER MANUFACTURER REQUIREMENTS.
4. PROVIDE REMOTE RACKING DEVICE FOR ALL CIRCUITS BREAKERS.

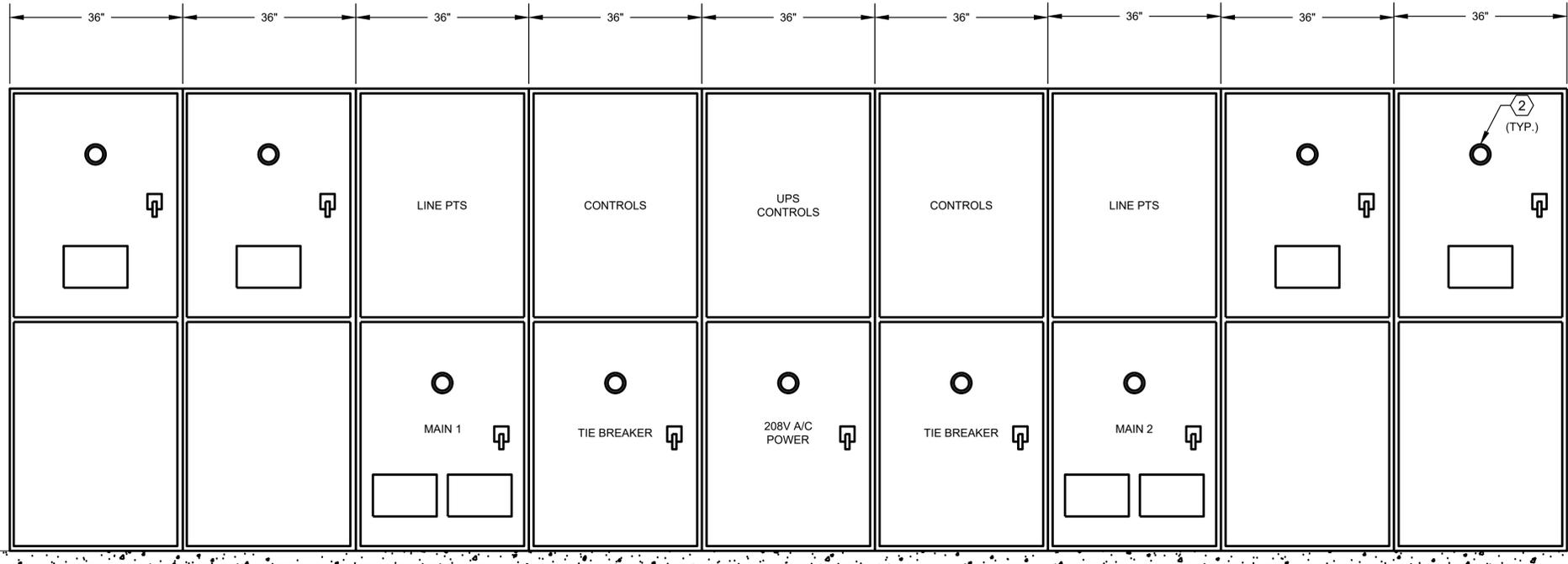
NOTES BY SYMBOL (#):

1. PROVIDE REMOVABLE PLATE TO EXTEND BUS IN FUTURE.
2. LOCATED IN NEW EXISTING BLOWER BUILDING.
3. REFER TO SHEET E-30 FOR RELAY ANSI DEVICE CODES.
4. TOP FED EQUIPMENT.

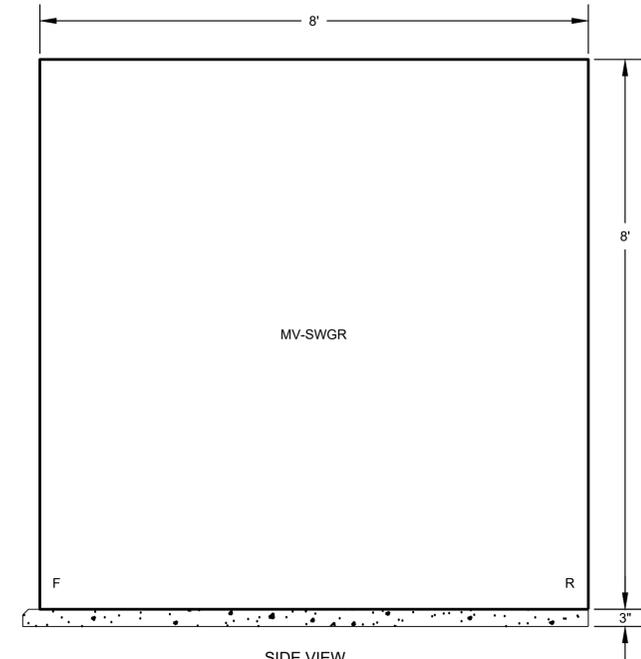
| | |
|--|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: Info@gaiconsulting.com</p> | |
| <p>FREES & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL SWITCHGEAR BLR PC1A & PC1B ONE-LINE DIAGRAM II</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 39 OF 111</p> | |

NOTES BY SYMBOL #:

1. REFER TO DETAILS A AND B FOR ADDITIONAL DETAILS.
2. FURNISH INFRARED WINDOWS FOR EACH CUBICLE.



FRONT VIEW

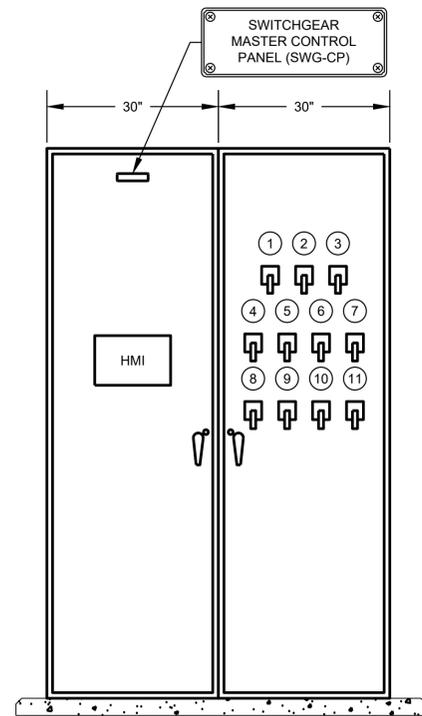


SIDE VIEW

SWITCHGEAR BLR PC1A/PC1B ELEVATION

SCALE: NTS

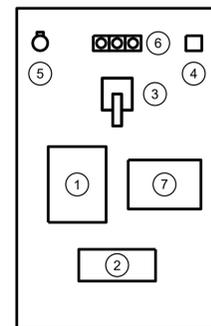
1



SWITCHGEAR CONTROL PANEL

SCALE: NTS

| NO. | EQUIPMENT |
|-----|----------------------------------|
| 1 | UTILITY MAIN 1 OPEN/CLOSE SWITCH |
| 2 | UTILITY MAIN 2 OPEN/CLOSE SWITCH |
| 3 | TIE BREAKER 1 OPEN/CLOSE SWITCH |
| 4 | TIE BREAKER 2 OPEN/CLOSE SWITCH |
| 5 | FEEDER 1A OPEN/CLOSE SWITCH |
| 6 | FEEDER 2A OPEN/CLOSE SWITCH |
| 7 | FEEDER 1B OPEN/CLOSE SWITCH |
| 8 | FEEDER 2B OPEN/CLOSE SWITCH |
| 9 | |
| 10 | |
| 11 | |

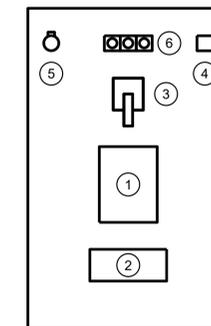


UTILITY MAIN1, UTILITY MAIN 2, AND TIE BREAKER CUBICLE DETAIL

SCALE: NTS

A

| NO. | EQUIPMENT |
|-----|-------------------------|
| 1 | PROTECTION RELAY |
| 2 | TEST SWITCH |
| 3 | 86 LOCKOUT RELAY |
| 4 | INTEGRAL REMOTE RACKING |
| 5 | OPEN/CLOSE PENDANT |
| 6 | INDICATOR LIGHTS |
| 7 | POWER METER |



FEEDER BREAKER CUBICLE DETAIL

SCALE: NTS

B

| NO. | EQUIPMENT |
|-----|-------------------------|
| 1 | PROTECTION RELAY |
| 2 | TEST SWITCH |
| 3 | 86 LOCKOUT RELAY |
| 4 | INTEGRAL REMOTE RACKING |
| 5 | OPEN/CLOSE PENDANT |
| 6 | INDICATOR LIGHTS |

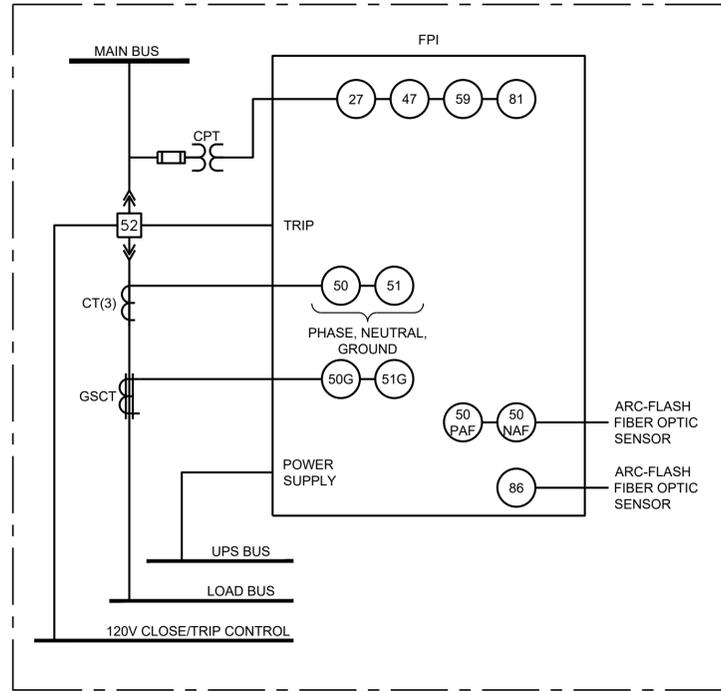
GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
CONSULTING ENGINEERING Tel: 713-636-2936
Registration No. F-2593 Fax: 713-636-2987
email: mforouzan@gaiconsulting.com

FREESE NICHOLS
10497 Town and Country Way, Suite 500 Houston, Texas 77024
Phone - (713) 600-6800 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN TEXAS P.E. No. 77748
OCTOBER 2025 DATE

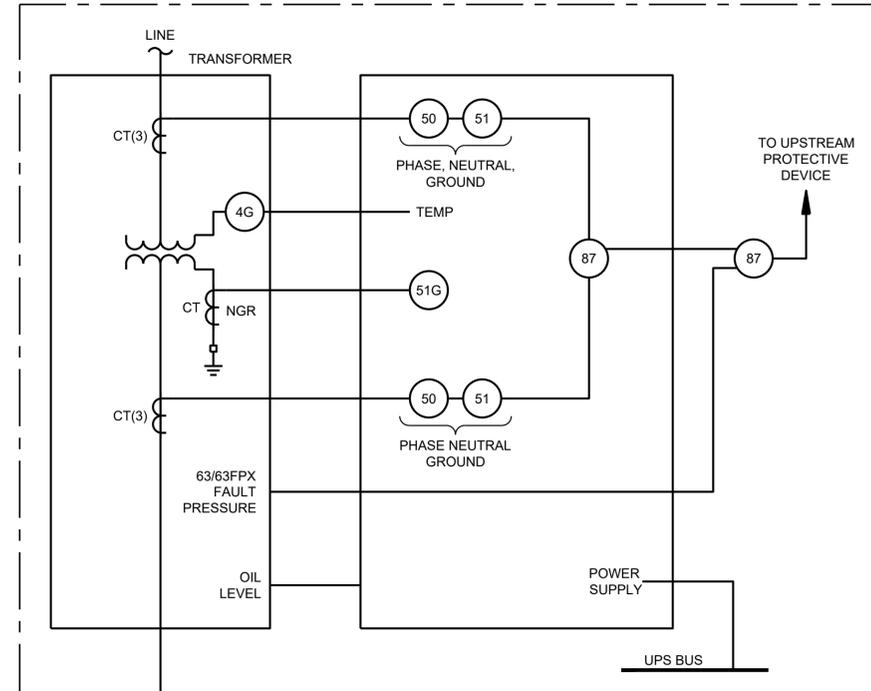
CITY OF HOUSTON
HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS
ELECTRICAL
MEDIUM VOLTAGE SWITCHGEAR
BLR PC1A/PC1B ELEVATION

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 40 OF 111 | |



1 FEEDER PROTECTION RELAY MULTILIN 850 SCHEMATIC
SCALE: NTS

| ANSI DEVICE NO. | FUNCTION |
|-----------------|-----------------------------------|
| 27 | BUS/LINE UNDERVOLTAGE |
| 50N | NEUTRAL INSTANTANEOUS OVERCURRENT |
| 50P | PHASE INSTANTANEOUS OVERCURRENT |
| 50G | GROUND INSTANTANEOUS OVERCURRENT |
| 51N | NEUTRAL TIME OVERCURRENT |
| 51P | PHASE TIME OVERCURRENT |
| 51G | GROUND TIME OVERCURRENT |
| 59 | OVERVOLTAGE |
| 81U/O | UNDER/OVER FREQUENCY |
| 50PAF | ARC-FLASH DETECTION |
| 50NAF | ARC-FLASH OVERCURRENT |



2 TRANSFORMER PROTECTION RELAY MULTILIN 887 SCHEMATIC
SCALE: NTS

| ANSI DEVICE NO. | FUNCTION |
|-----------------|---------------------------------------|
| 50G | GROUND TOC |
| 50N | NEUTRAL TOC |
| 50P | PHASE TOC |
| 51G | GROUND TOC |
| 51N | NEUTRAL TOC |
| 51P | PHASE TOC |
| 87 | DIFFERENTIAL |
| 63 | FAULT PRESSURE RELAY |
| 63FPX | FAULT PRESSURE AUXILIARY |
| 86T | TRANSFORMER LOCK OUT RELAY HAND RESET |

* HAND RESET LOCKOUT RELAY LOCATED IN SWITCHGEAR

NOTES BY SYMBOL (#):

- HAND RESET LOCKOUT RELAY LOCATED IN SWITCHGEAR.
- NEMA GROUND RESISTOR.

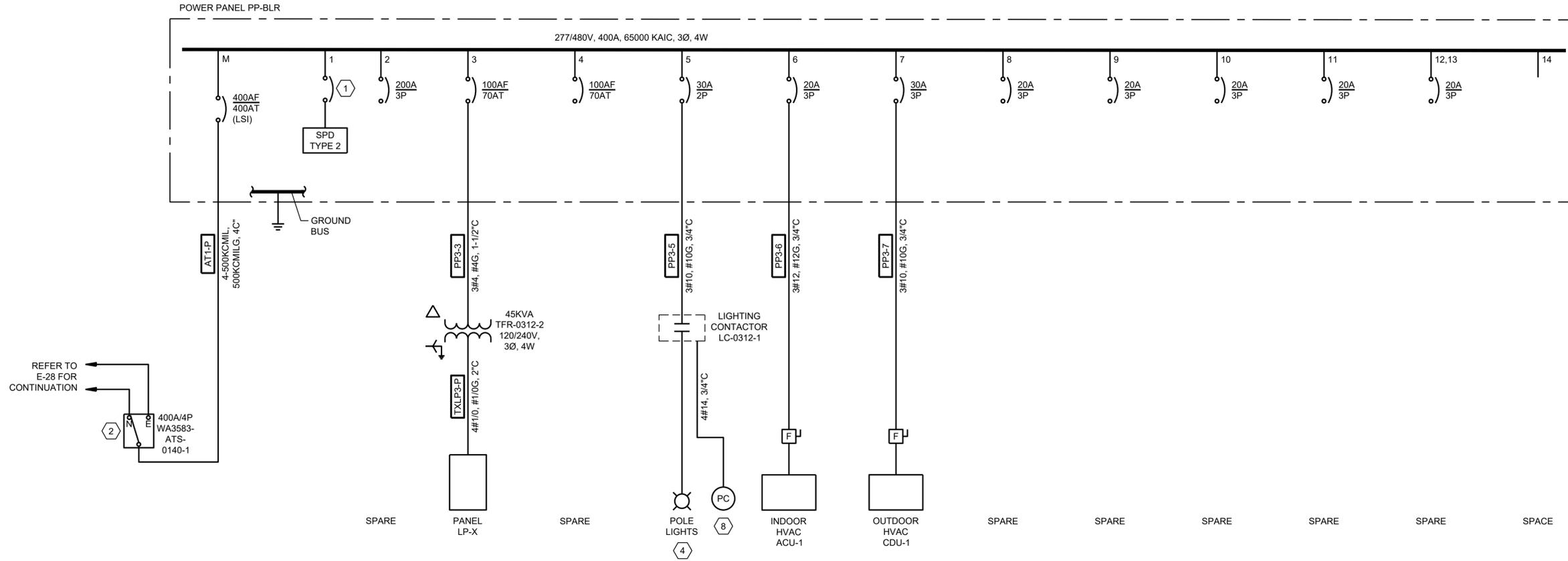
GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
CONSULTING ENGINEERING Tel: 713-636-2936
Registration No. F-2593 Fax: 713-636-2987
email: Msouran@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500 Houston, Texas 77024
Phone - (713) 600-6800 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN TEXAS P.E. No. 77748
OCTOBER 2025
DATE

CITY OF HOUSTON
HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS
ELECTRICAL RELAY DEVICE DIAGRAM

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 41 OF 111 | |



- NOTES BY SYMBOL (#):
1. MANUFACTURER SHALL SIZE THE BREAKER FOR THE SPD.
 2. ATS SHALL BE 4-POLE AND SWITCH NEUTRAL.
 3. REFER TO DRAWING E-28 FOR CONTINUATION.

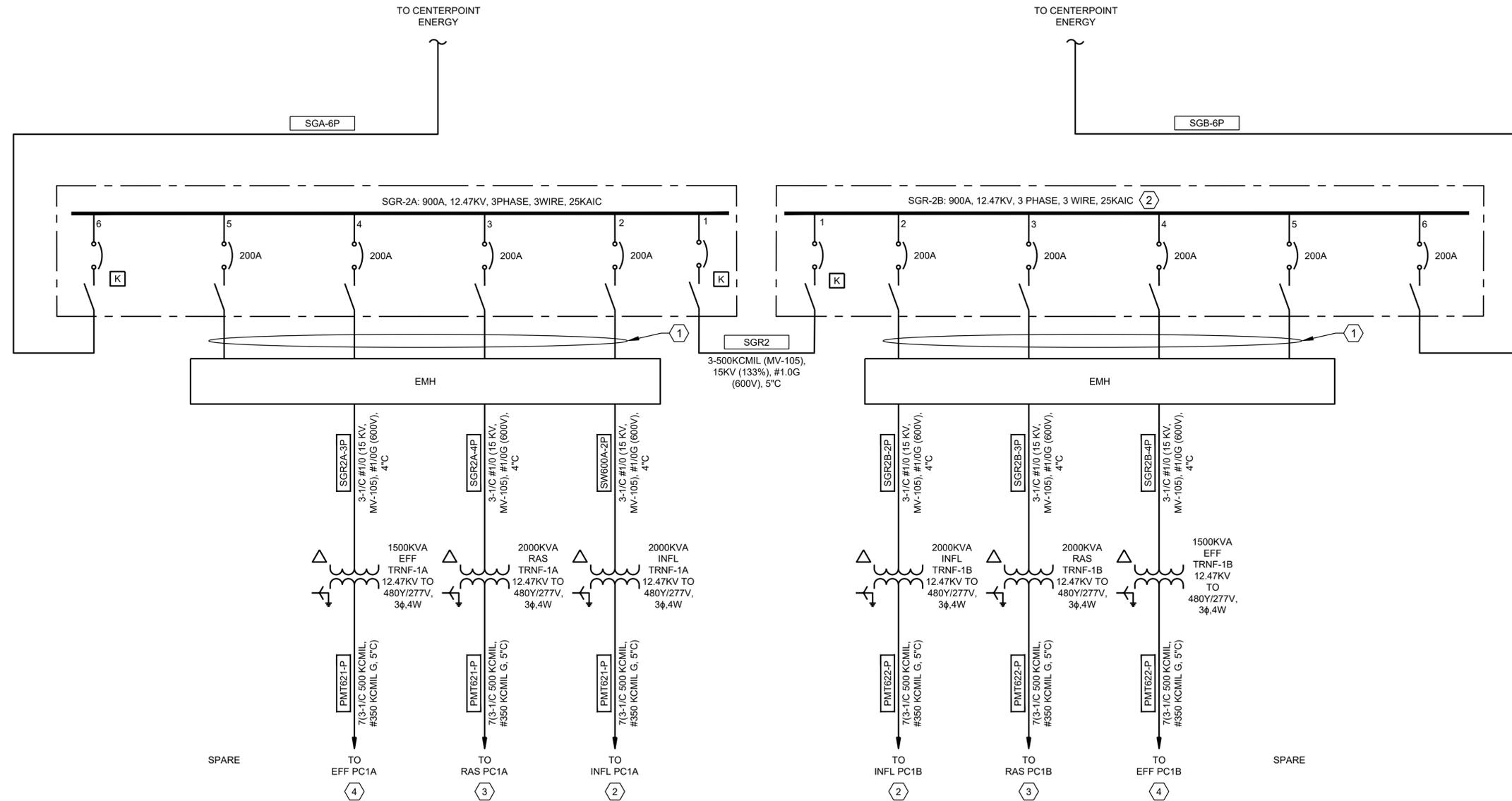
POWER PANEL PP-BLR ONE-LINE DIAGRAM

SCALE: NTS

| | |
|--|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: Msouran@gaiconsulting.com</p> | |
| <p>FREESSE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL POWER PANEL PP-BLR ONE-LINE DIAGRAM</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM</p> | |
| <p>SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 42 OF 111</p> | |

NOTES BY SYMBOL (#):

1. INSTALL 4" SPARE CONDUIT FOR FUTURE USE.
2. REFER TO DRAWING E-33.
3. REFER TO DRAWING E-34.
4. CONNECT TO EQUIPMENT THAT IS INSTALLED BY OTHERS.



SWITCHGEAR SGR-2A & SGR-2B ONE-LINE DIAGRAM

SCALE: NTS

GAI
 Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
 CONSULTING ENGINEERING Tel: 713-636-2936
 Registration No. F-2593 Fax: 713-636-2987
 email: hbosozan@gaiconsulting.com

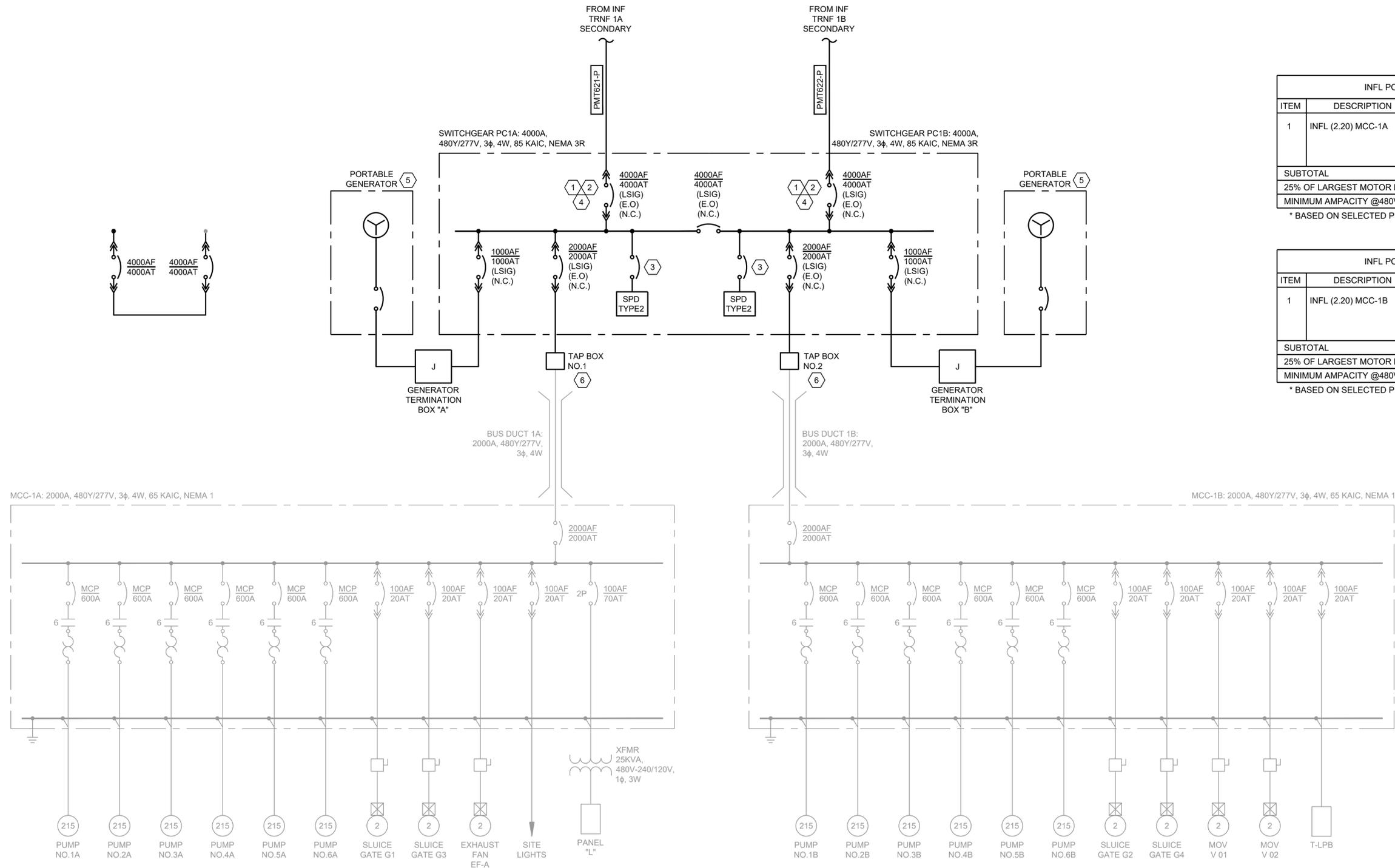
FREESE & NICHOLS
 10497 Town and Country Way, Suite 500 Houston, Texas 77024
 Phone - (713) 600-6800 Web - www.freese.com

SURVEYED BY: _____
 FB NO. P- _____
 This document is released for interim review & not intended for construction, bidding or permit purposes by _____
 HOSS FOROUZAN TEXAS P.E. No. 77748
 OCTOBER 2025 DATE

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 ELECTRICAL
 SWITCH SGR-2A & SGR-2B
 ONE-LINE DIAGRAM

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 43 OF 111 | |



PROPOSED OVERALL LIFT STATION ONE-LINE DIAGRAM
SCALE: NTS

| INFL PC1A LOAD CALCULATION | | | | |
|----------------------------|--------------------|-----|--------|------|
| ITEM | DESCRIPTION | HP | FLA* | KVA |
| 1 | INFL (2.20) MCC-1A | --- | 1622 A | 1349 |
| SUBTOTAL | | | 1622 A | 3492 |
| 25% OF LARGEST MOTOR LOAD | | | 70 A | --- |
| MINIMUM AMPACITY @480V/3φ | | | 1692 A | --- |

* BASED ON SELECTED PUMP MFG DATA

| INFL PC1B LOAD CALCULATION | | | | |
|----------------------------|--------------------|-----|--------|------|
| ITEM | DESCRIPTION | HP | FLA* | KVA |
| 1 | INFL (2.20) MCC-1B | --- | 1609 A | 1338 |
| SUBTOTAL | | | 1609 A | 2460 |
| 25% OF LARGEST MOTOR LOAD | | | 70 A | --- |
| MINIMUM AMPACITY @480V/3φ | | | 1679 A | --- |

* BASED ON SELECTED PUMP MFG DATA

NOTES BY SYMBOL (#):

- SERVICE ENTRANCE RATED.
- BREAKER RATED FOR 100% OPERATION.
- MANUFACTURER SHALL SIZE THE BREAKER FOR THE SPD.
- PROVIDE ENERGY - REDUCING MAINTENANCE SWITCH TO MITIGATE THE ARC FLASH.
- BY OTHERS.
- CONNECT EXISTING BUS DUCT TO NEW CABLES IN THE TAP BOX.

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St.
Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

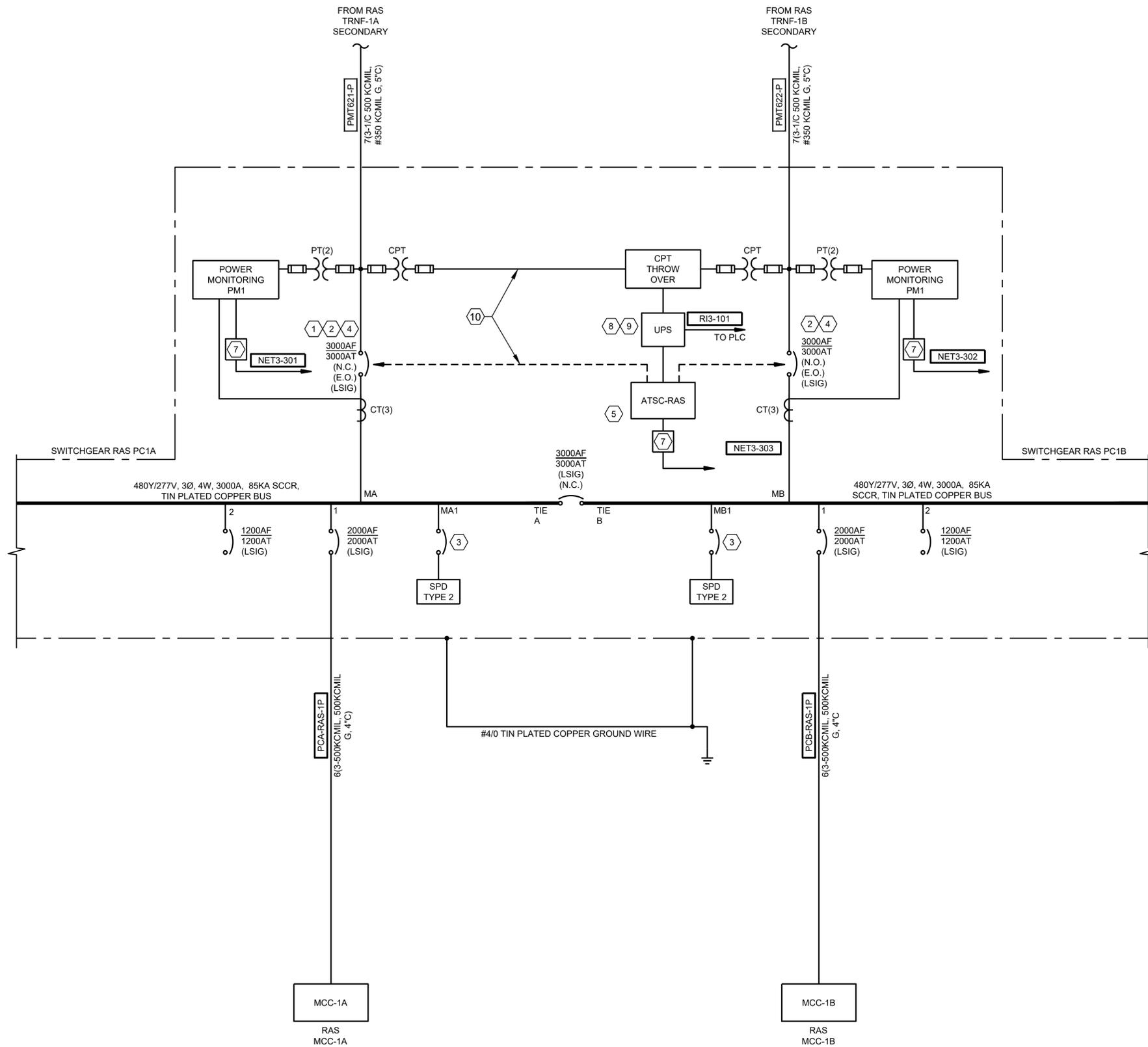
This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
PROPOSED OVERALL LIFT
STATION ONE-LINE DIAGRAM

| | |
|---------------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | NTS |
| CITY OF HOUSTON PM | SHAHIDUR RAHMAN, PE |
| SHEET NO. | 44 OF 111 |



SWITCHGEAR RAS PC1A & PC1B ONE-LINE DIAGRAM

SCALE: NTS

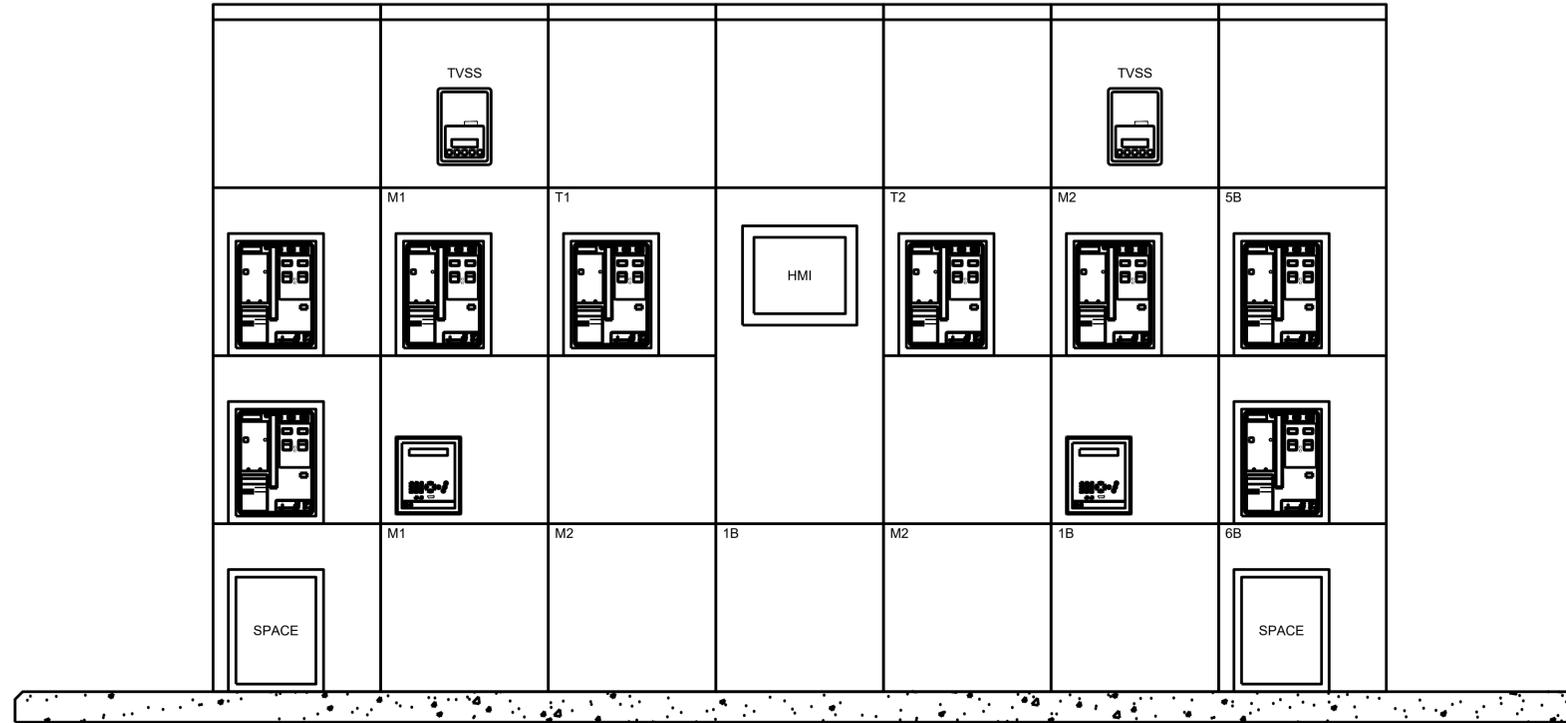
GENERAL NOTES:

1. ALL WIRES INSTALLED IN CABLE TRAY SHALL BE TRAY RATED.

NOTES BY SYMBOL (#):

1. SERVICE ENTRANCE RATED.
2. BREAKER RATED FOR 100% OPERATION.
3. MANUFACTURER SHALL SIZE THE BREAKER FOR THE SPD.
4. PROVIDE ENERGY - REDUCING MAINTENANCE SWITCH TO MITIGATE THE ARC FLASH.
5. ATSC SHALL BE WITH TOUCH SCREEN INSIDE SWITCHBOARD ENCLOSURE DESIGNED TO AUTOMATICALLY OPERATE THE BREAKERS. MANUFACTURER SHALL ALSO PROVIDE LIGHTS, SWITCHES AND PUSHBUTTONS TO OPERATE AND MONITOR THE SWITCHBOARD.
6. PRIMARY CONDUCTORS PROVIDED BY UTILITY.
7. PROVIDE ETHERNET CONVERTER IF REQUIRED.
8. UPS SIZED TO PROVIDE MINIMUM 30 MINUTES OF RUN TIME.
9. PROVIDE LOW BATTERY & UPS FAIL CONTACT.
10. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER TO DETERMINE NUMBER OF WIRES REQUIRED. INSTALL IN 2" MINIMUM.

| | |
|--|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: Info@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL PROPOSED RAS POWER CENTER RAS PC1A/1B ONE-LINE DIA.</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 45 OF 111</p> | |
| <p>E-34</p> | |

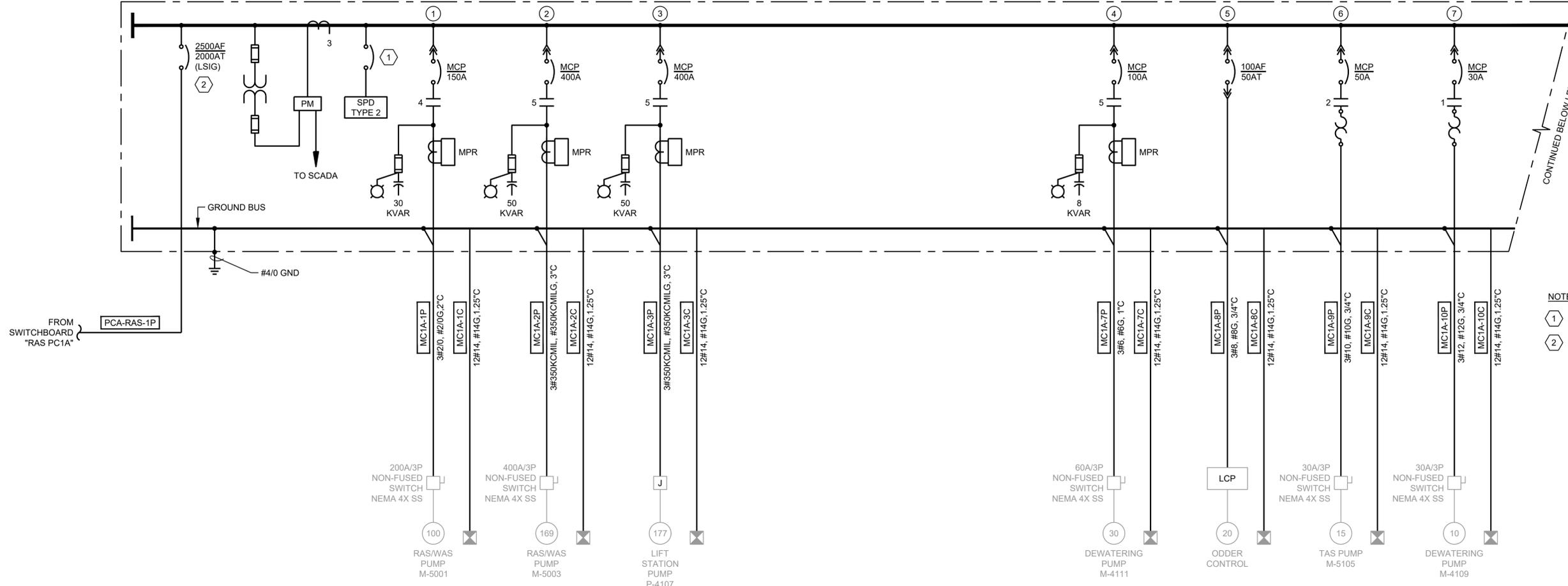


PROPOSED RAS POWER CENTER PC1A/1B ELEVATION

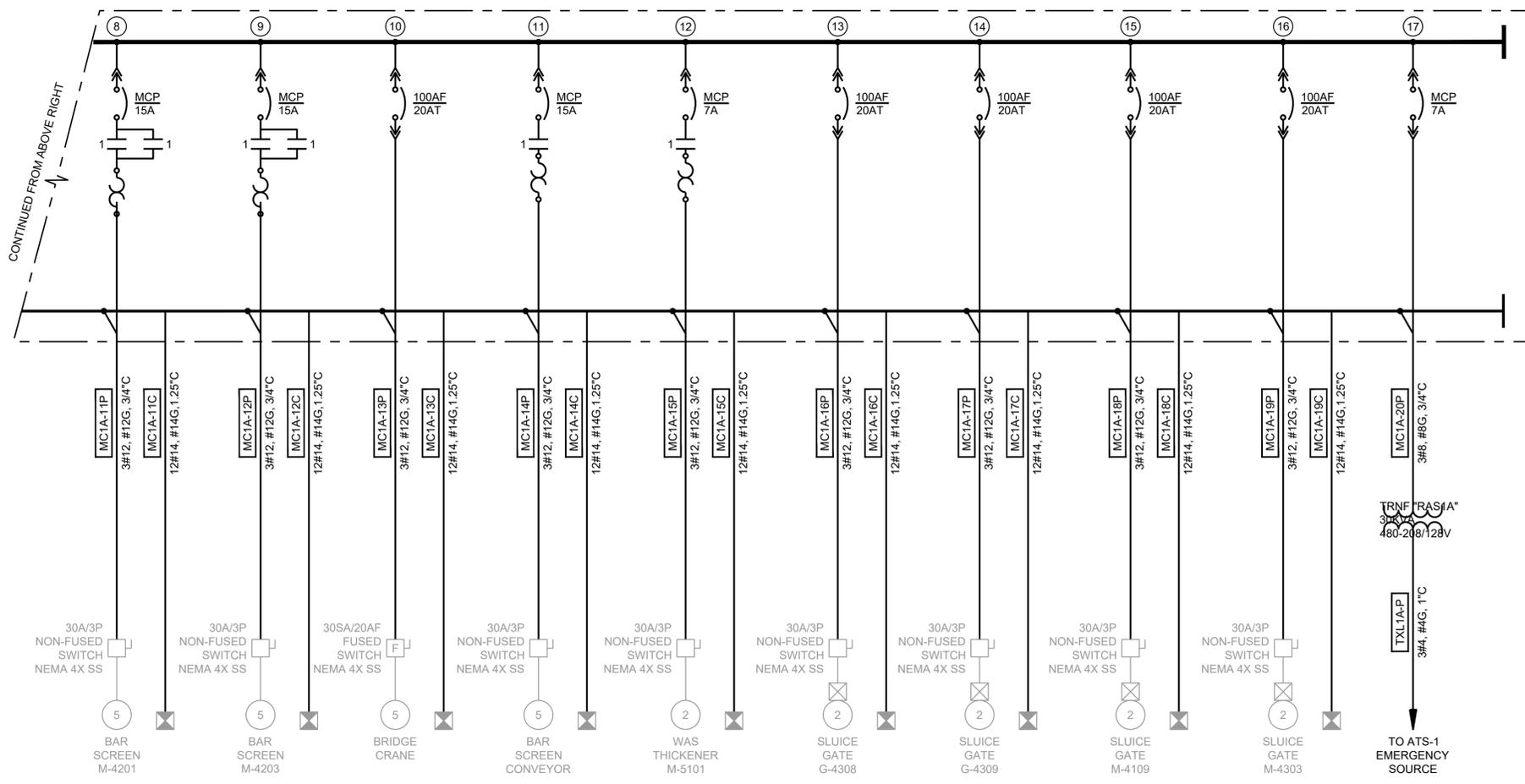
SCALE: NTS

| | |
|--|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: hbosouran@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL PROPOSED RAS POWER CENTER RAS PC1A/1B ELEVATION</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 46 OF 111</p> | |
| <p>E-35</p> | |

PROPOSED RAS MCC-1A: 2000A, 480/277V, 3 ϕ , 4W, 85KAIC NEMA 1 ENCLOSURE

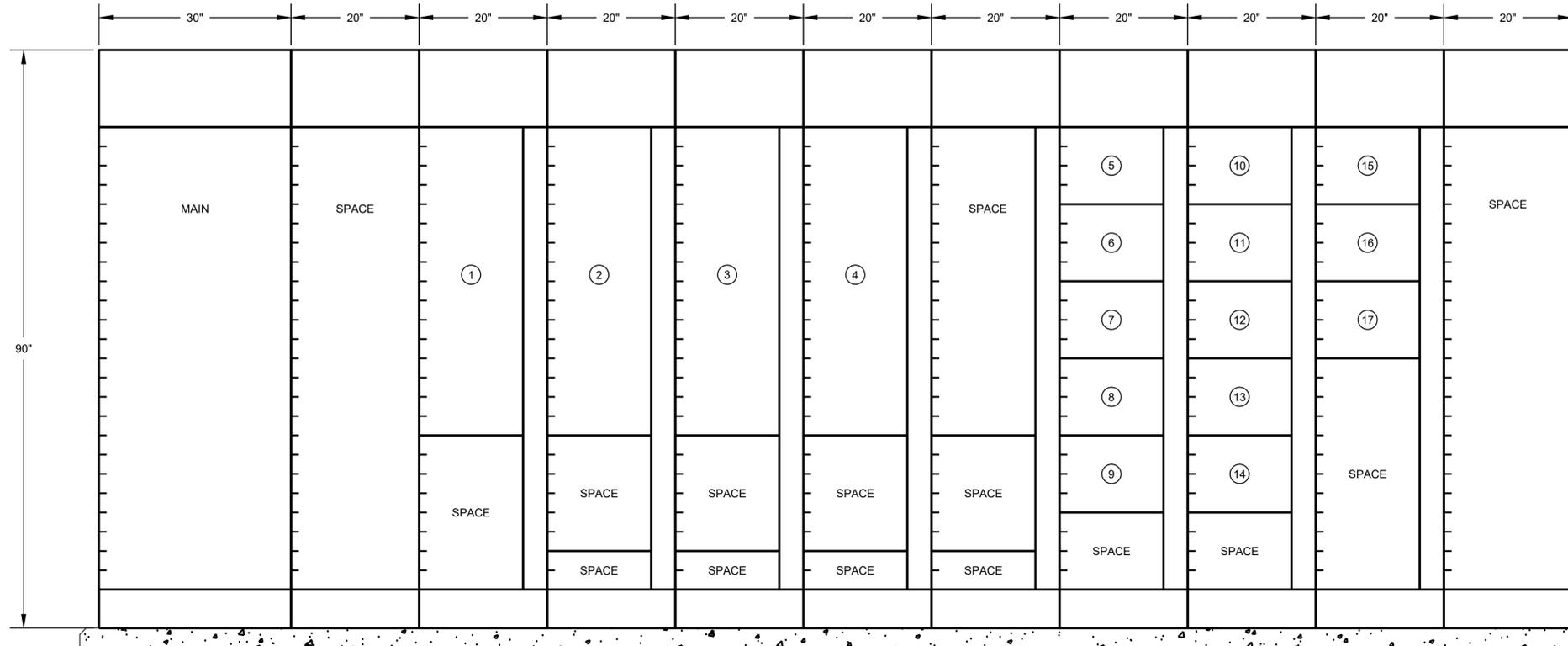


- NOTES BY SYMBOL (#):
- 1 MANUFACTURER SHALL SIZE THE BREAKER FOR SPD.
 - 2 PROVIDE ENERGY REDUCING MAIN BREAKER SWITCH TO MITIGATE THE ARC FLASH.



PROPOSED RAS MCC-1A ONE-LINE DIAGRAM
SCALE: NTS

| | |
|--|-------------------------------------|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: info@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | |
| <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> | |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL PROPOSED RAS MCC-1A ONE-LINE DIAGRAM</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 47 OF 111</p> | |



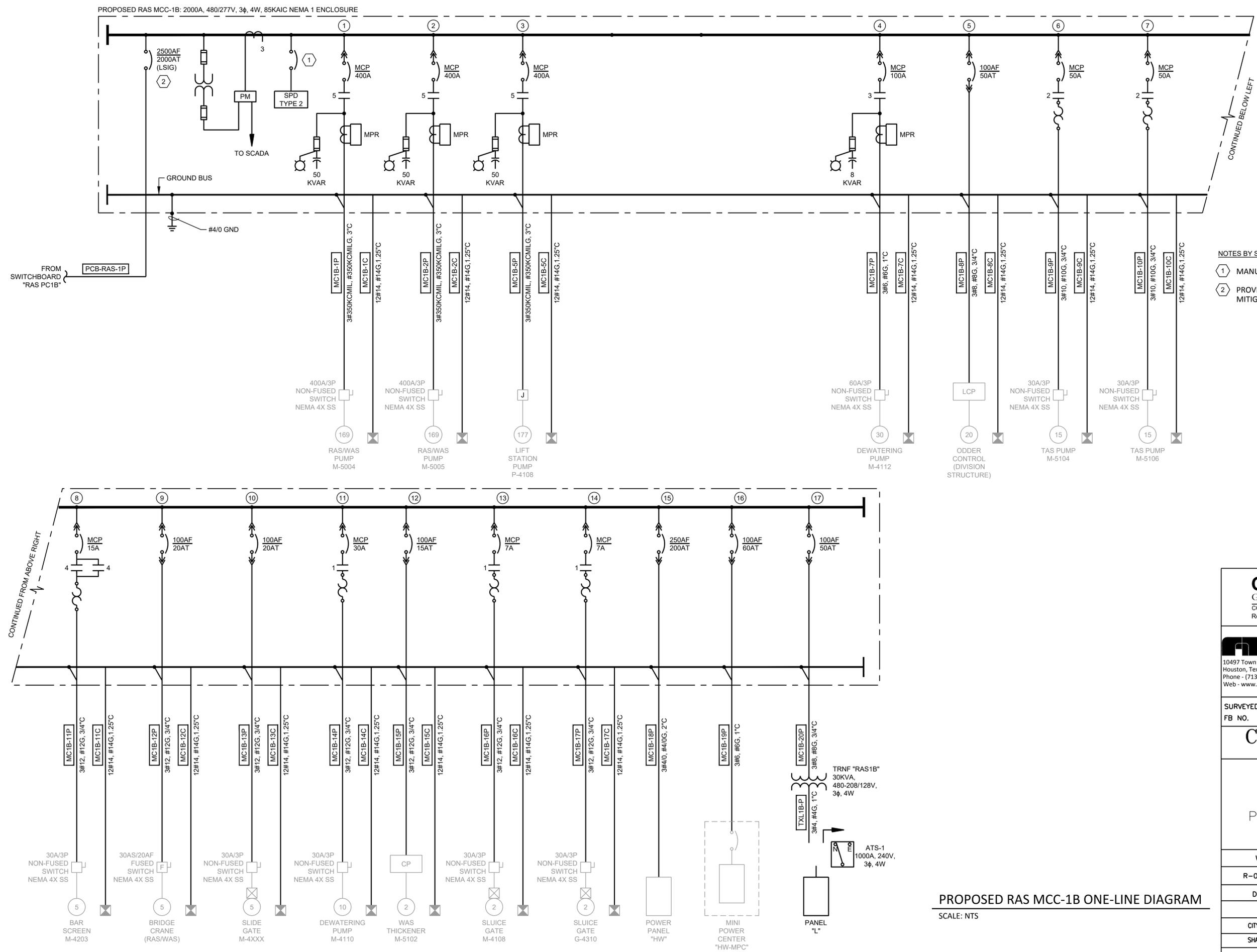
PROPOSED RAS MCC-1A ELEVATION

SCALE: NTS

| PROPOSED RAS MCC-1A LOAD CALCULATION | | | | |
|--------------------------------------|--------------------------|--------|-------|-----|
| ITEM | DESCRIPTION | HP | FLA* | KVA |
| 1 | RAS/WAS PUMP M-5001 | 100 HP | 130 A | 108 |
| 2 | RAS/WAS PUMP M-5003 | 169 HP | 220 A | 183 |
| 3 | LIFT STATION PUMP P-4107 | 177 HP | 231 A | 192 |
| 4 | DEWATERING PUMP M-4111 | 30 HP | 39 A | 33 |
| 5 | ODOR CONTROL | 20 HP | 26 A | 22 |
| 6 | TAS PUMP M-5105 | 15 HP | 20 A | 16 |
| 7 | DEWATERING PUMP M-4109 | 10 HP | 13 A | 11 |
| 8 | BAR SCREEN M-4201 | 5 HP | 7 A | 5 |
| 9 | BAR SCREEN M-4203 | 5 HP | 7 A | 5 |
| 10 | BRIDGE CRANE | 5 HP | 7 A | 5 |
| 11 | BAR SCREEN CONVEYOR | 5 HP | 7 A | 5 |
| 12 | WAS THICKENER M-5101 | 2 HP | 3 A | 2 |
| 13 | SLUICE GATE G-4308 | 2 HP | 3 A | 2 |
| 14 | SLUICE GATE G-4309 | 2 HP | 3 A | 2 |
| 15 | SLUICE GATE M-4109 | 2 HP | 3 A | 2 |
| 16 | SLUICE GATE M-4303 | 2 HP | 3 A | 2 |
| 17 | TRNF-RAS1A 30KVA | --- | 36 A | 30 |
| SUBTOTAL | | | 758 A | 625 |
| 25% OF LARGEST MOTOR LOAD | | | 58 A | --- |
| MINIMUM AMPACITY @480V/3φ | | | 816 A | --- |

* BASED ON SELECTED PUMP MFG DATA

| | |
|---|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: hforouzan@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL PROPOSED RAS MCC-1A ELEVATION</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 48 OF 111</p> | |
| <p>E-37</p> | |



- NOTES BY SYMBOL (#):
- 1 MANUFACTURER SHALL SIZE THE BREAKER FOR SPD.
 - 2 PROVIDE ENERGY REDUCING MAIN BREAKER SWITCH TO MITIGATE THE ARC FLASH.

GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: info@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

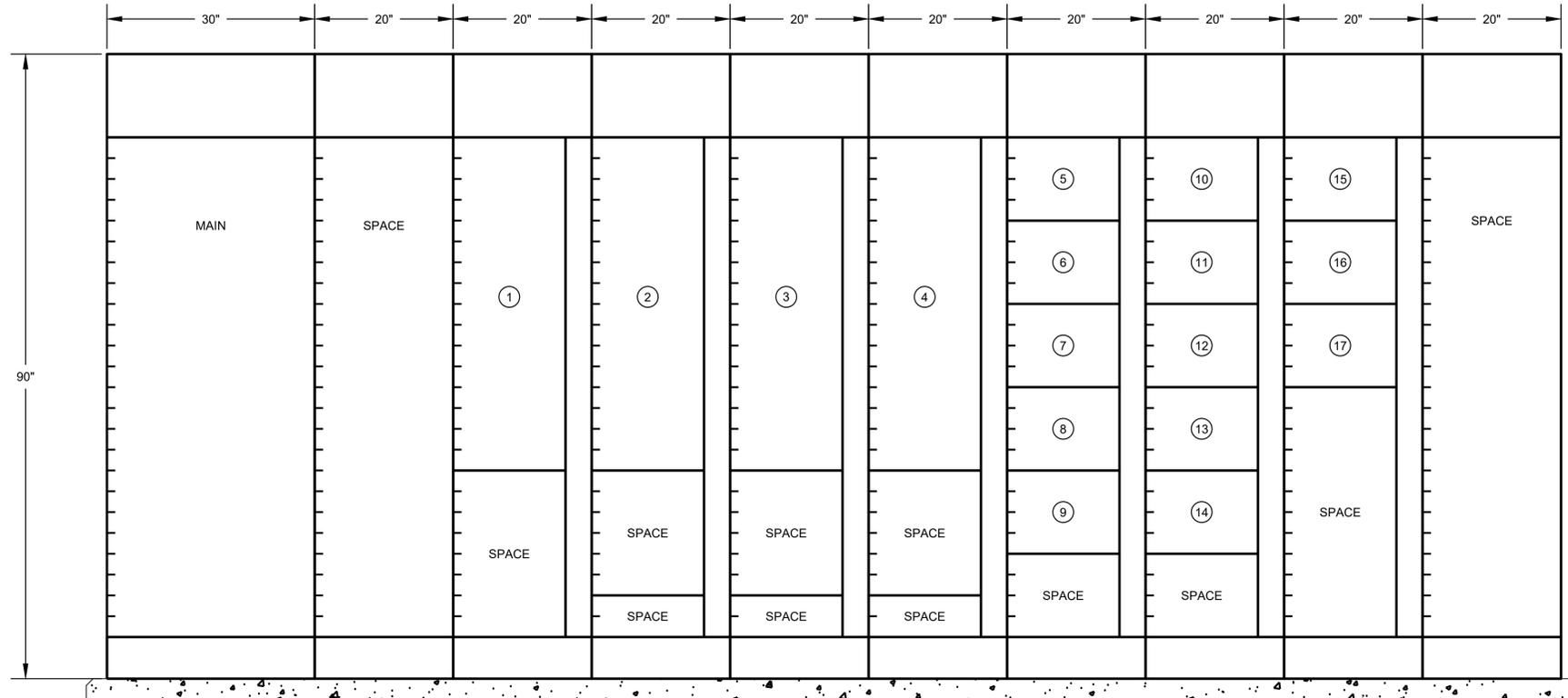
SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
PROPOSED RAS MCC-1B
ONE-LINE DIAGRAM

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 49 OF 111 | |

PROPOSED RAS MCC-1B ONE-LINE DIAGRAM
SCALE: NTS



PROPOSED RAS MCC-1B ELEVATION

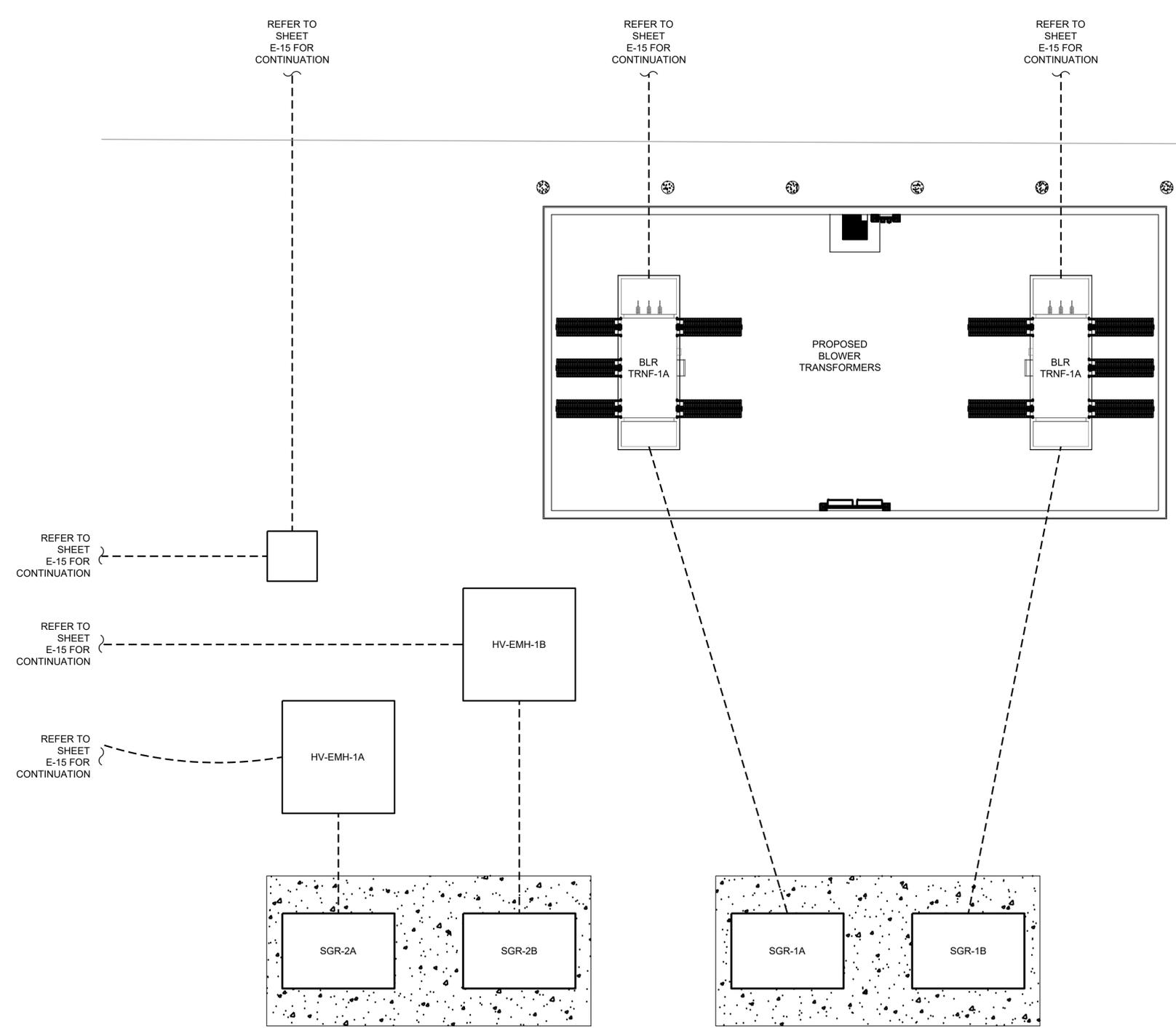
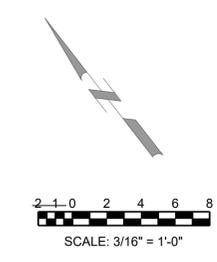
SCALE: NTS

| PROPOSED RAS MCC-1A LOAD CALCULATION | | | | |
|--------------------------------------|----------------------------|--------|--------|-----|
| ITEM | DESCRIPTION | HP | FLA* | KVA |
| 1 | RAS/WAS PUMP M-5004 | 169 HP | 220 A | 183 |
| 2 | RAS/WAS PUMP M-5005 | 169 HP | 220 A | 183 |
| 3 | LIFT STATION PUMP P-4108 | 177 HP | 231 A | 192 |
| 4 | DEWATERING PUMP M-4112 | 30 HP | 39 A | 33 |
| 5 | ODOR CONTROL | 20 HP | 26 A | 22 |
| 6 | TAS PUMP M-5104 | 15 HP | 20 A | 16 |
| 7 | TAS PUMP M-5106 | 15 HP | 20 A | 11 |
| 8 | BAR SCREEN M-4203 | 5 HP | 7 A | 5 |
| 9 | BRIDGE CRANE | 5 HP | 7 A | 5 |
| 10 | SLIDE GATE M-4XXX | 5 HP | 7 A | 5 |
| 11 | DEWATERING PUMP M-4110 | 10 HP | 13 A | 11 |
| 12 | WAS THICKENER M-5102 | 2 HP | 3 A | 2 |
| 13 | SLUICE GATE M-4108 | 2 HP | 3 A | 2 |
| 14 | SLUICE GATE G-4310 | 2 HP | 3 A | 2 |
| 15 | POWER PANEL "HW" | --- | 168 A | 140 |
| 16 | MINI POWER CENTER "HW-MPC" | --- | 17 A | 14 |
| 17 | TRNF-RAS1A 30KVA | --- | 36 A | 30 |
| SUBTOTAL | | | 1040 A | 856 |
| 25% OF LARGEST MOTOR LOAD | | | 58 A | --- |
| MINIMUM AMPACITY @480V/3φ | | | 1098 A | --- |

* BASED ON SELECTED PUMP MFG DATA

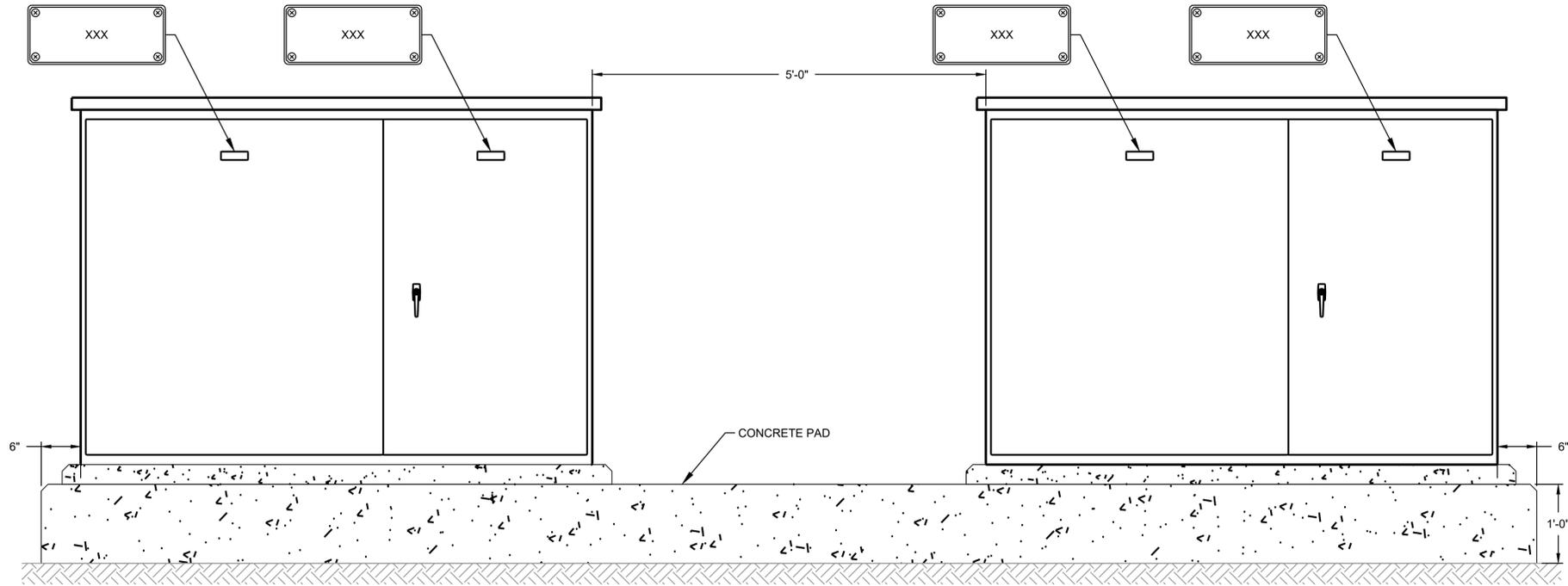
| | |
|---|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 Tel: 713-636-2936 CONSULTING ENGINEERING Fax: 713-636-2987 Registration No. F-2593 email: hforouzan@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL PROPOSED RAS MCC-1B ELEVATION</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 50 OF 111</p> | |
| <p>E-39</p> | |

FILE PATH: C:\HB78_Sim South WWTP Improvement\5 Drawings\Electrical\Working\HB78_E-40.dwg PLOT STYLE: FN-MONO-HB78.CTB PLOTTED: 10/29/2025 4:54 PM



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

| | |
|---|--|
| GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: Morozani@gaiconsulting.com | |
|  10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com | This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE |
| SURVEYED BY: FB NO. P- | |
| CITY OF HOUSTON HOUSTON PUBLIC WORKS | |
| SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL TRANSFORMERS ENLARGED PLAN | |
| WBS NUMBER R-000265-0146-3 | FOR CITY OF HOUSTON USE ONLY |
| DRAWING SCALE 3/16" = 1'-0" | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 51 OF 111 | |



A TRANSFORMERS DETAIL
SCALE: NTS

GAI
Gupta & Associates, Inc. 302 Dennis St. Houston, Texas 77006
CONSULTING ENGINEERING Tel: 713-636-2936
Registration No. F-2593 Fax: 713-636-2987
email: hforsuzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748

SURVEYED BY:
FB NO. P-

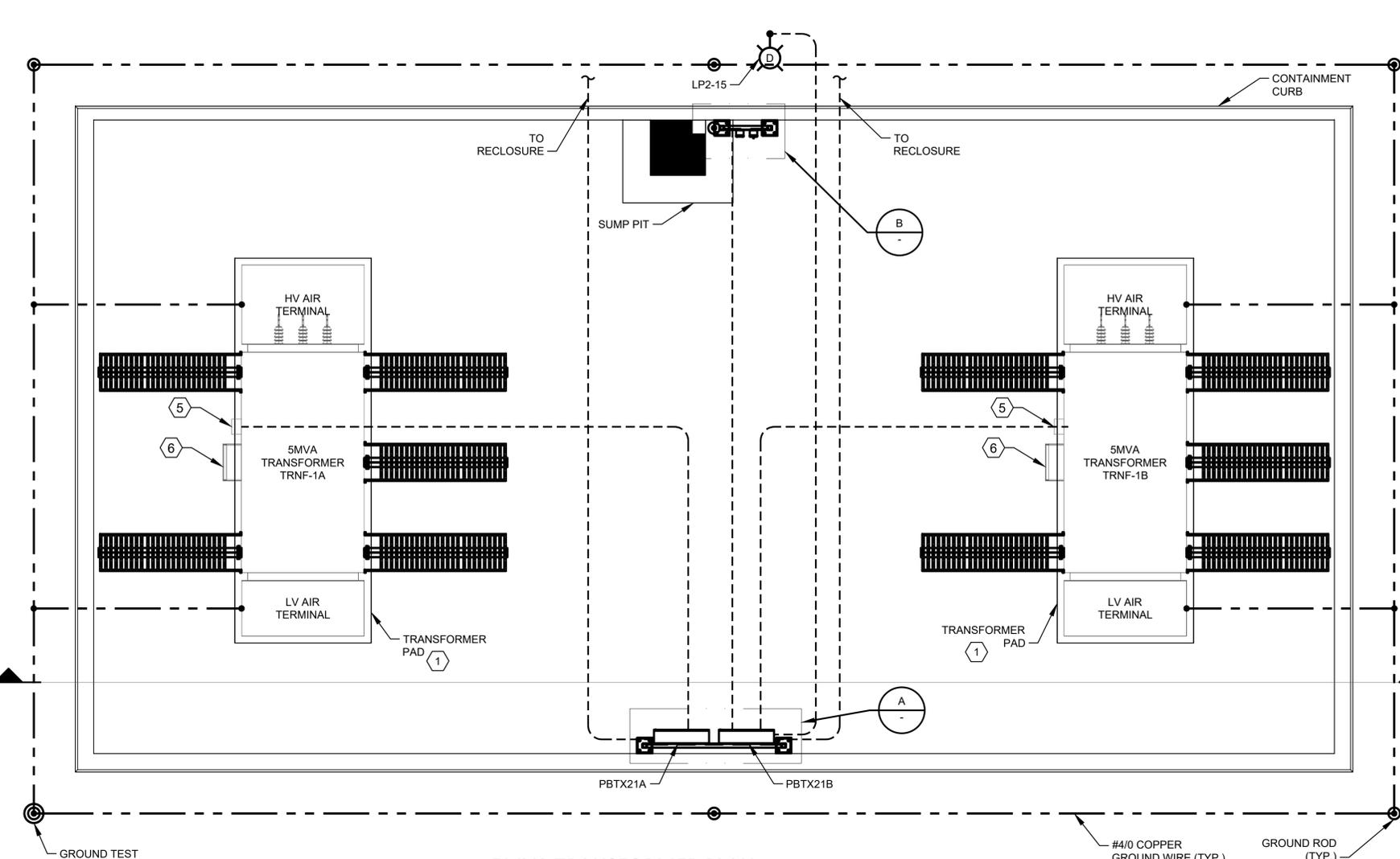
OCTOBER 2025
DATE

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

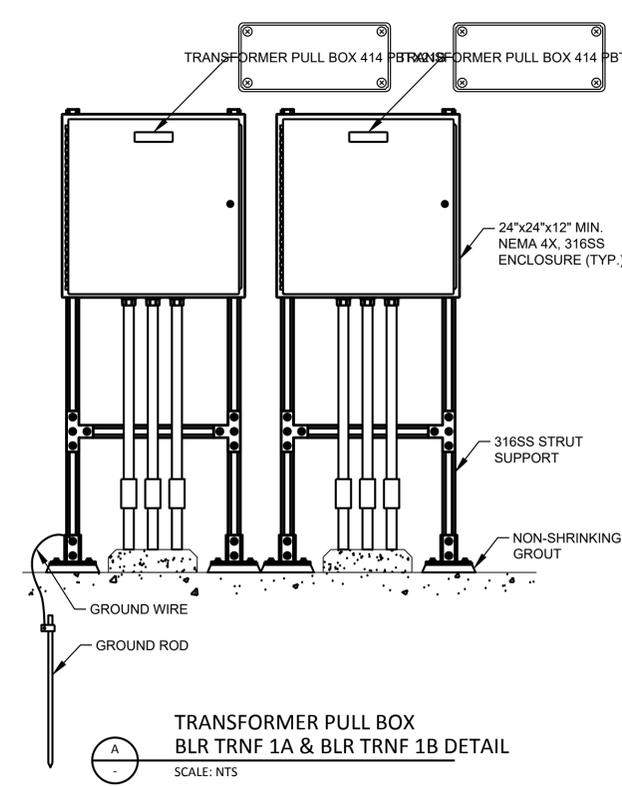
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
TRANSFORMER
TYPICAL DETAILS

| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
|---------------------|------------------------------|
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 52 OF 111 | |

FILE PATH: C:\HB78_Sim South WWTP Improvement\5 Drawings\Electrical\Working\HB78_E-42.dwg
 PLOT STYLE: FN-MONO-HB78.CTB
 PLOTTED: 10/29/2025 4:54 PM

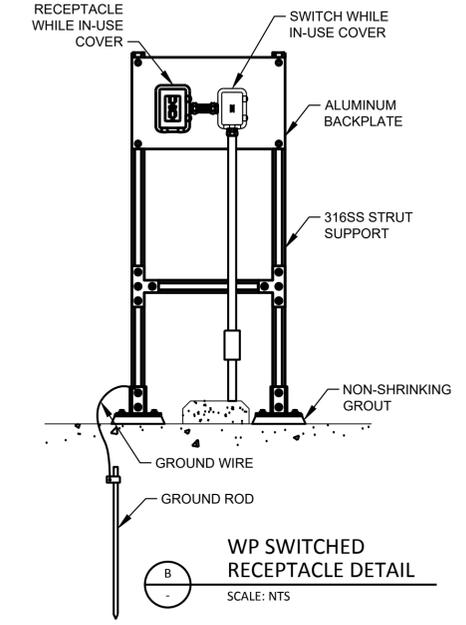


5MVA TRANSFORMER PLAN
SCALE: 3/8" = 1'-0"

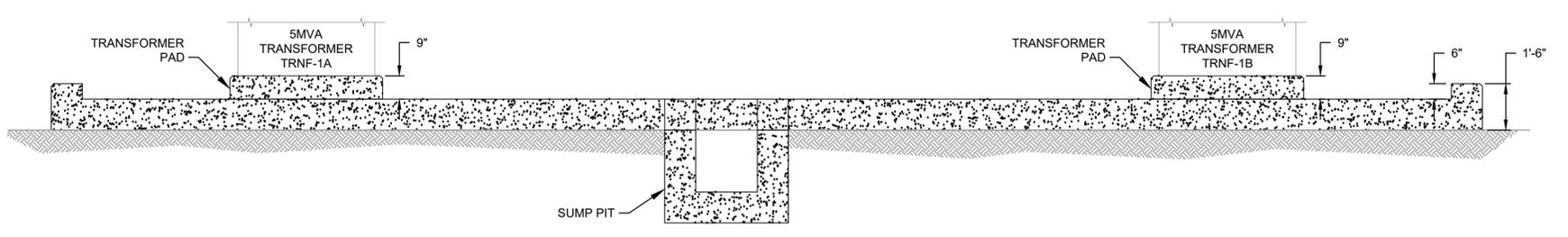


**TRANSFORMER PULL BOX
BLR TRNF 1A & BLR TRNF 1B DETAIL**
SCALE: NTS

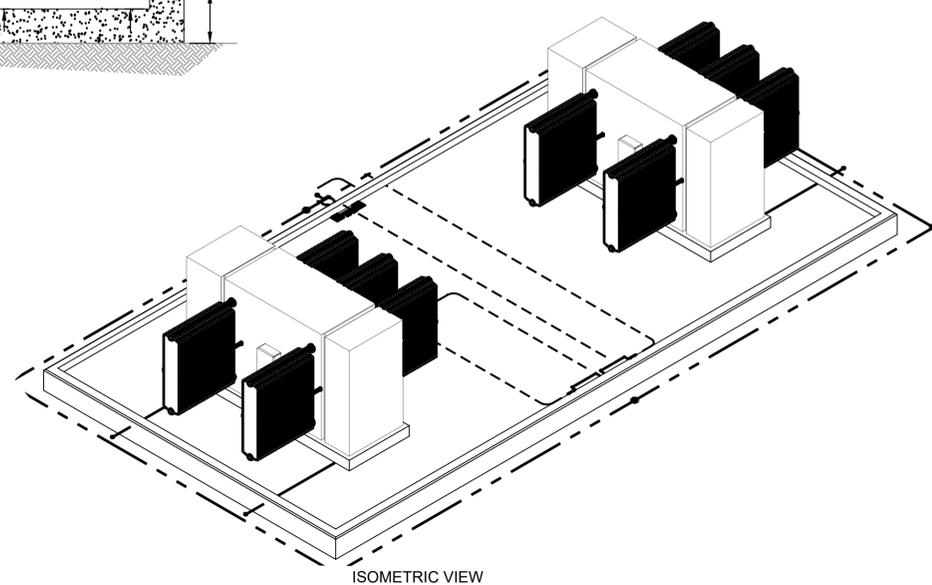
- NOTES BY SYMBOL (#):
1. TRANSFORMER PAD SHALL BE 3" HIGHER THAN CONTAINMENT CURB.
 2. ALL EQUIPMENT TAGS ON THIS SHEET ARE PRECEDED BY "XXXX".
 3. RECEPTACLE FOR SUMP PUMP. WP/GFI WITH IN-USE COVER.
 4. CONTRACTOR SHALL PROVIDE A GRATED PLATFORM. REFER TO STRUCTURAL DRAWINGS FOR DETAILS.
 5. TERMINATION BOX FOR TRANSFORMERS BY MANUFACTURER. REFER TO SHEET E-XX FOR RISER DIAGRAM
 6. RIGID TRANSFORMER AND CONTROL BOX.
 7. THE PAD DIMENSION SHALL BE ADJUSTED BASED ON THE TRANSFORMER FOR SUPPLIED.
 8. REFER TO STRUCTURAL DRAWINGS FOR PAD DETAILS.



**WP SWITCHED
RECEPTACLE DETAIL**
SCALE: NTS

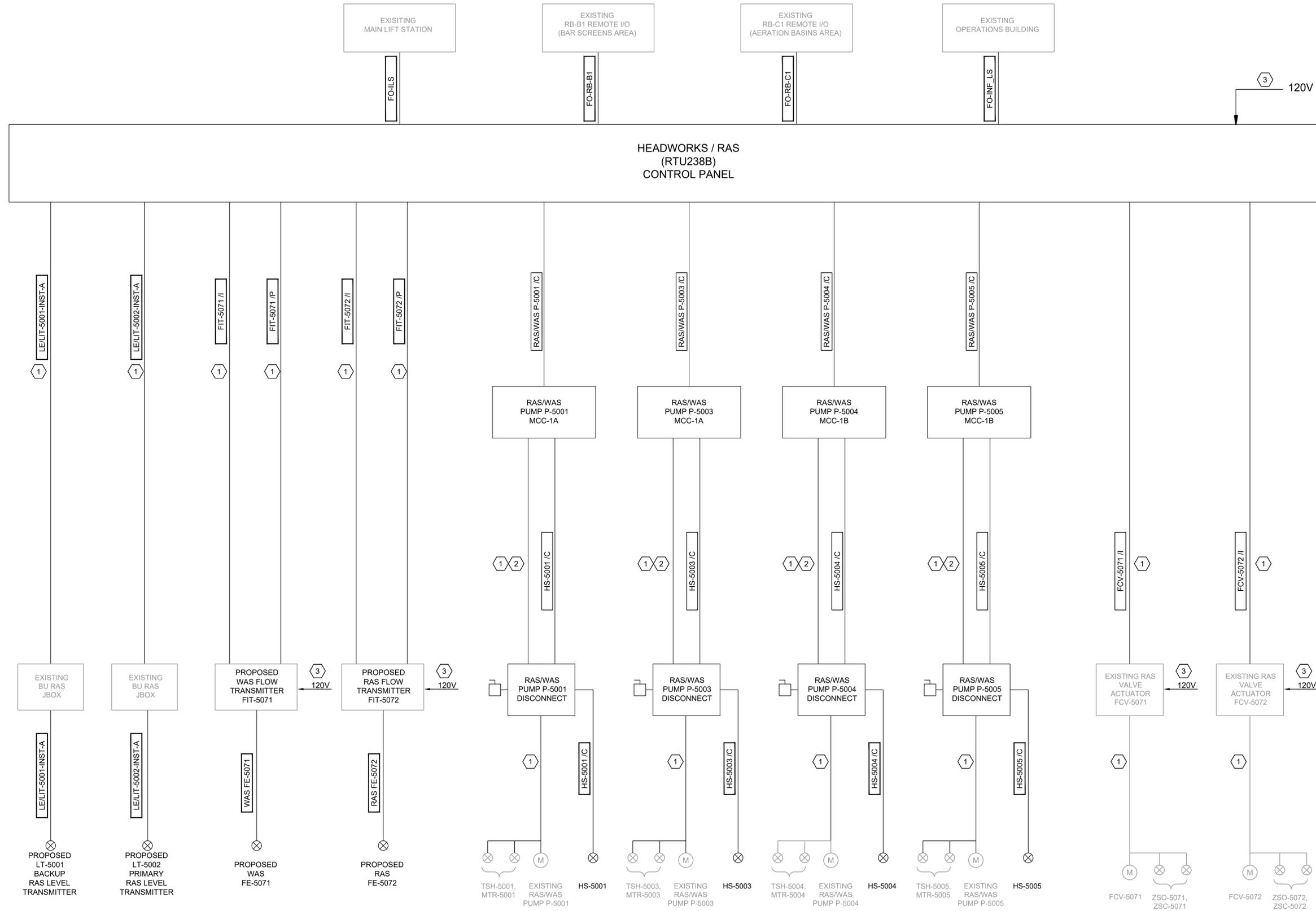


5MVA TRANSFORMER SECTION
SCALE: 3/8" = 1'-0"



ISOMETRIC VIEW

| | |
|--|-------------------------------------|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: info@gaiconsulting.com</p> | |
| <p>FREESE NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | |
| <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL 5MVA TRANSFORMER DETAILS</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 53 OF 111</p> | |



TO SHEET E-44

- NOTES BY SYMBOL (#):**
- 1 PRIOR TO DEMOLISHED EXISTING PLC RTU283B CONTROL PANEL, CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING POWER AND CONTROL WIRES, CONDUITS, J-BOXES, EQUIPMENT AND ALL FIELD DEVICES. THE CONTRACTOR SHALL REPLACE ALL EXISTING CONTROLS AND SIGNAL WIRES, INCLUDING PROVIDES NEW AND EXTEND EXISTING CONDUITS TO NEW RTU283B CONTROL PANEL LOCATED IN PROPOSED E2 ELECTRICAL BUILDING AS REQUIRED.
 - 2 REFER TO ONE-LINE DIAGRAM AND SCHEDULE FOR CONDUIT AND WIRE SIZES.
 - 3 SEE ELECTRICAL LIGHTING PANEL "LP-1".

GAI
 Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
 CONSULTING ENGINEERING Tel: 713-636-2936
 Registration No. F-2593 Fax: 713-636-2987
 email: mforouzan@gaiconsulting.com

FREESE & NICHOLS
 10497 Town and Country Way, Suite 500 Houston, Texas 77024
 Phone - (713) 600-6800 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748
 OCTOBER 2025 DATE

SURVEYED BY: FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 ELECTRICAL
 PROPOSED RAS
 INTERFACE DIAGRAM

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 54 OF 111 | |

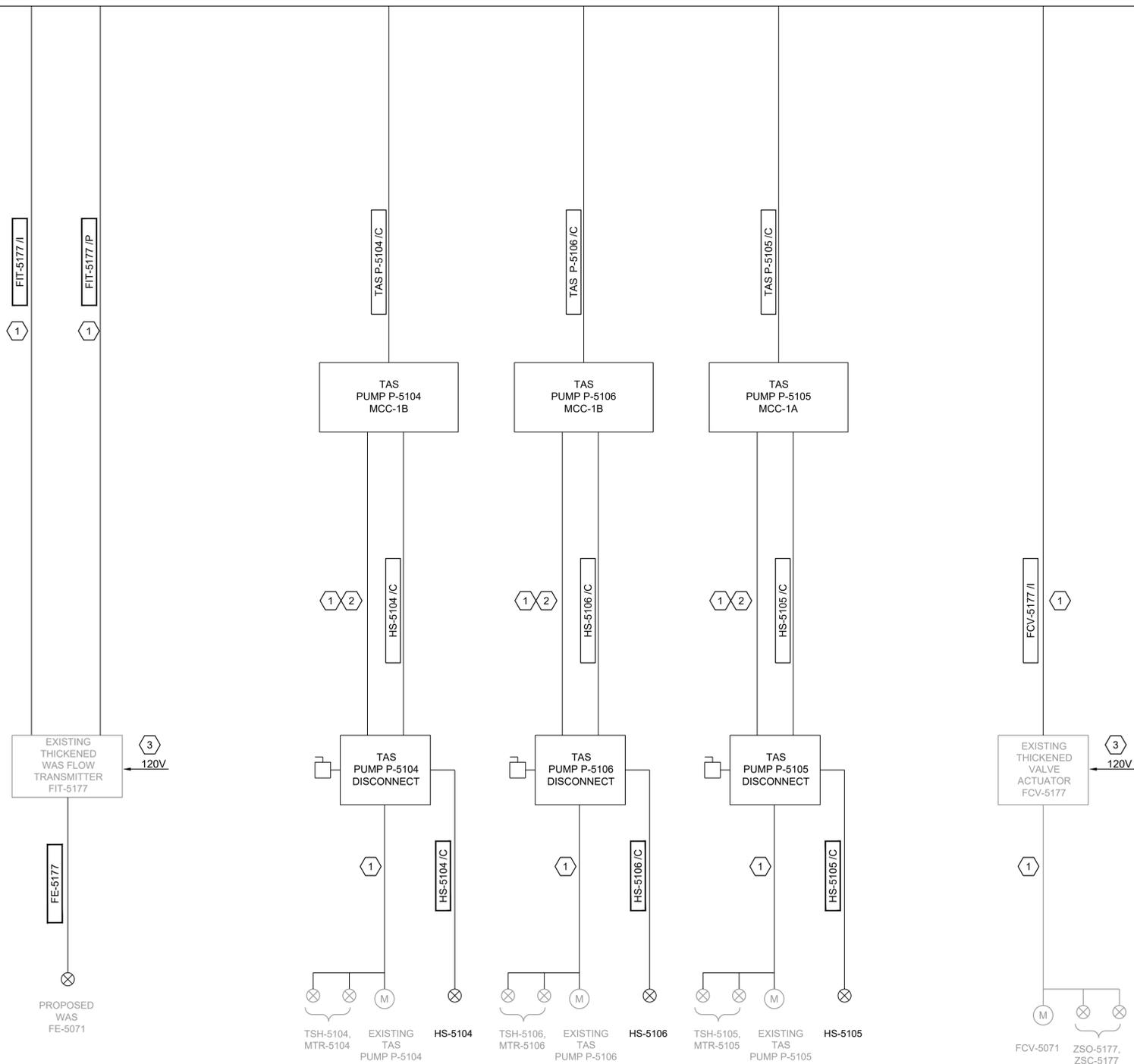
RAS/WAS PUMPS INTERFACE DIAGRAM
 SCALE: NTS

FILE PATH: O:\HB78_Sim South WWP Improvement\5 Drawings\Electrical\Working\HB78_E-44.dwg PLOT STYLE: FN-MONO-HB78.CTB PLOTTED: 10/29/2025 4:55 PM

FROM SHEET E-43

HEADWORKS / RAS (RTU238B) CONTROL PANEL

TO SHEET E-45



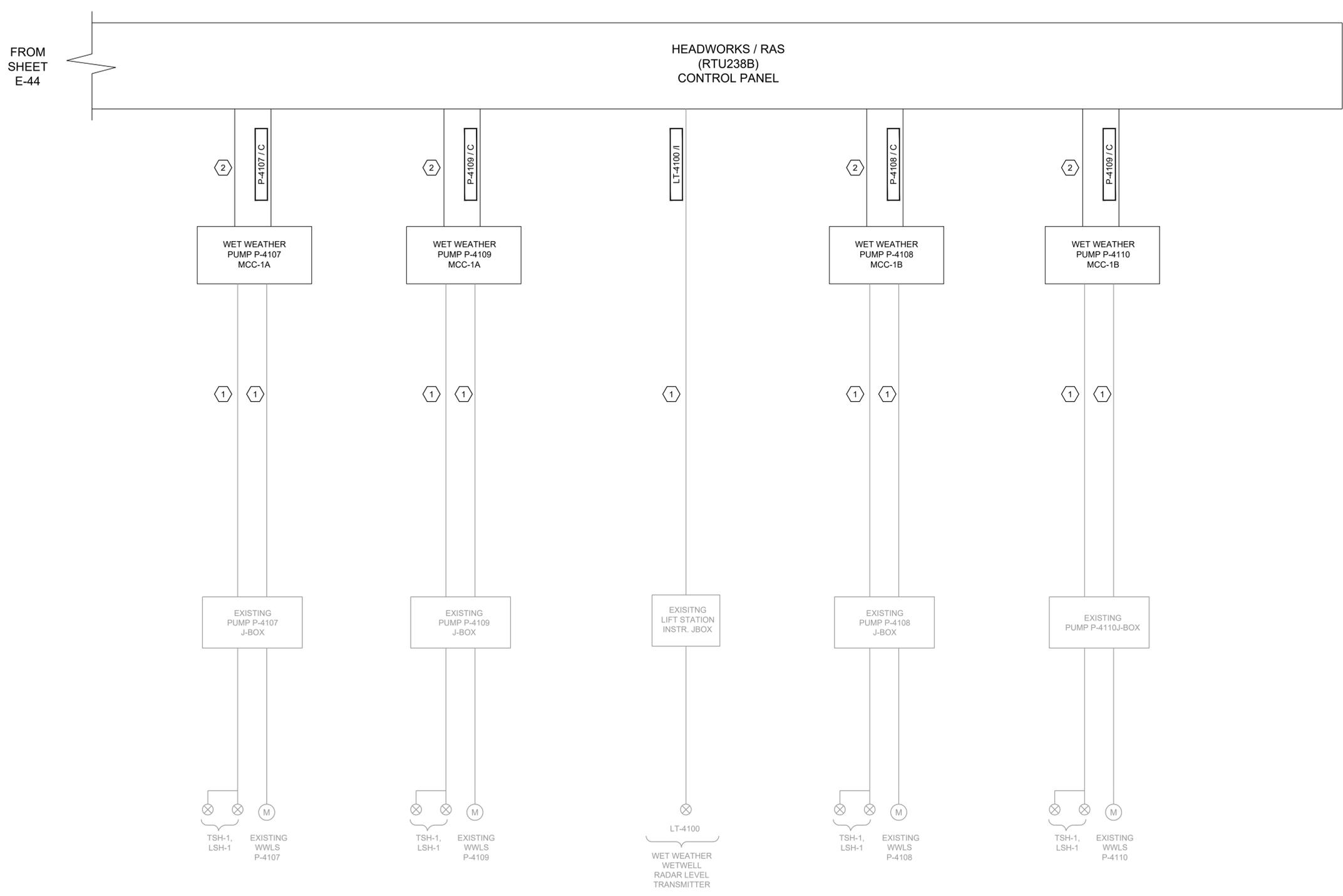
RAS/WAS PUMPS INTERFACE DIAGRAM

SCALE: NTS

NOTES BY SYMBOL (#):

- 1 PRIOR TO DEMOLISHED EXISTING PLC RTU283B CONTROL PANEL, CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING POWER AND CONTROL WIRES, CONDUITS, J-BOXES, EQUIPMENT AND ALL FIELD DEVICES. THE CONTRACTOR SHALL REPLACE ALL EXISTING CONTROLS AND SIGNAL WIRES, INCLUDING PROVIDES NEW AND EXTEND EXISTING CONDUITS TO NEW RTU283B CONTROL PANEL LOCATED IN PROPOSED E2 ELECTRICAL BUILDING AS REQUIRED.
- 2 REFER TO ONE-LINE DIAGRAM AND SCHEDULE FOR CONDUIT AND WIRE SIZES.
- 3 SEE ELECTRICAL LIGHTING PANEL "LP-1".

| | |
|--|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: hbouazani@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL PROPOSED TAS INTERFACE DIAGRAM</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 55 OF 111</p> | |
| <p>E-44</p> | |



- NOTES BY SYMBOL (#):**
- 1 PRIOR TO DEMOLISHED EXISTING PLC RTU283B CONTROL PANEL, CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING POWER AND CONTROL WIRES, CONDUITS, J-BOXES, EQUIPMENT AND ALL FIELD DEVICES. THE CONTRACTOR SHALL REPLACE ALL EXISTING CONTROLS AND SIGNAL WIRES, INCLUDING PROVIDES NEW AND EXTEND EXISTING CONDUITS TO NEW RTU283B CONTROL PANEL LOCATED IN PROPOSED E2 ELECTRICAL BUILDING AS REQUIRED.
 - 2 REFER TO ONE-LINE DIAGRAM AND SCHEDULE FOR CONDUIT AND WIRE SIZES.
 - 3 SEE ELECTRICAL LIGHTING PANEL "LP-1".

GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
CONSULTING ENGINEERING Tel: 713-636-2936
Registration No. F-2593 Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500 Houston, Texas 77024
Phone - (713) 600-6800 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN TEXAS P.E. No. 77748
OCTOBER 2025 DATE

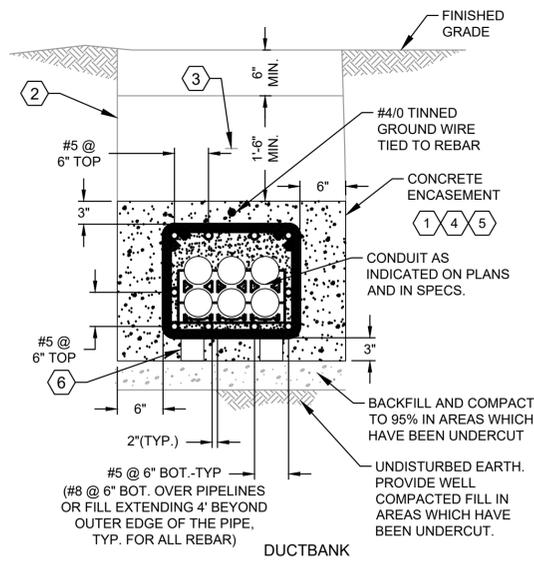
SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
PROPOSED WET WEATHER
LIFT PUMPS INTERFACE DIAGRAM

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 56 OF 111 | |

WET WEATHER LIFT PUMPS INTERFACE DIAGRAM
SCALE: NTS



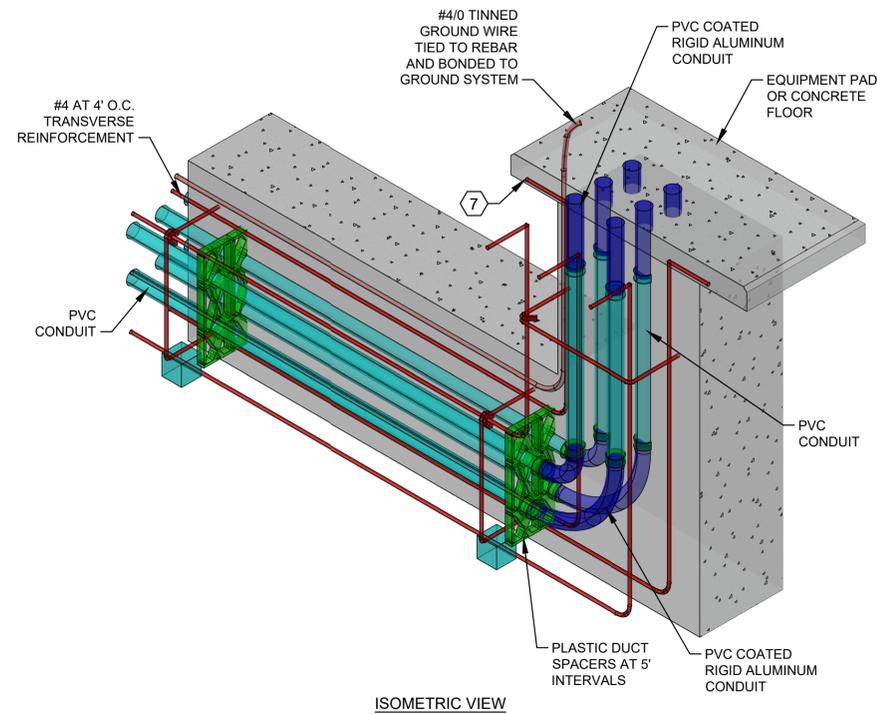
SECTION 1
NOT TO SCALE

NOTES BY SYMBOL (#):

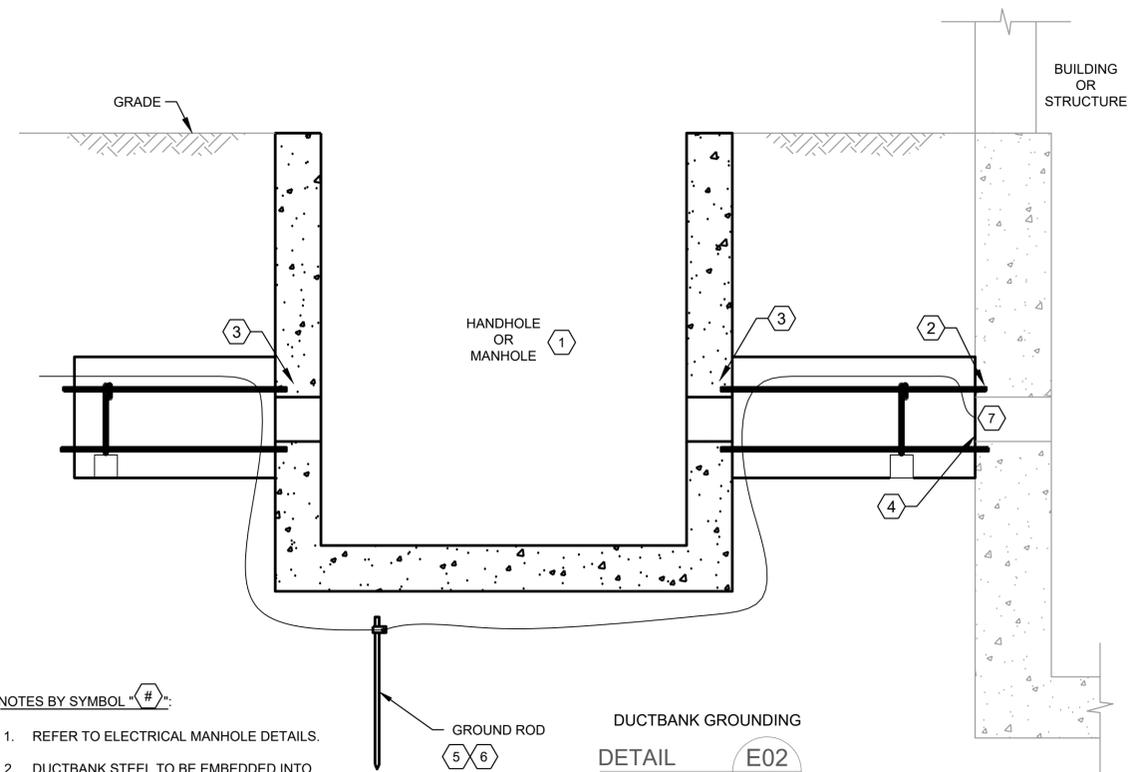
1. PROVIDE MIN. 3 INCHES CONCRETE COVER OVER AND UNDER REINFORCEMENT CAGE AND 6 INCHES ON EACH SIDE.
2. NATIVE FILL TO A MINIMUM OF 18" ABOVE DUCTBANK TOP 6" TO BE TOPSOIL. NATIVE FILL SHALL BE CLEARED OF ALL DEBRIS AND ROCKS LARGER THAN 2". COMPACT ALL BACKFILL IN 8 IN. LIFTS TO 90 PERCENT OF STANDARD PROCTOR (ASTM D 698) DENSITY, UNLESS UNDER EXISTING OR PROPOSED PAVEMENT, OTHER UNDERGROUND UTILITIES, OR STRUCTURES. IF DUCT BANK IS UNDER EXISTING OR PROPOSED PAVEMENT, OTHER UNDERGROUND UTILITIES, OR STRUCTURES, COMPACT ALL BACKFILL IN 8 IN. LIFTS TO 95 PERCENT OF STANDARD PROCTOR DENSITY.
3. PLACE RED WARNING TAPE ABOVE DUCTBANK HALF-WAY BETWEEN CONCRETE AND GRADE LEVEL. REFER TO SPEC SECTION 16600 [26 05 43] FOR ADDITIONAL REQUIREMENTS.
4. REFER TO CONCRETE SPECIFICATIONS FOR MIX DESIGN.
5. RED DYE TO BE MIXED IN CONCRETE BEFORE PLACEMENT.
6. 3"X3"X3" CONCRETE BLOCK TWO ON EACH SIDE MINIMUM TO SUPPORT REBAR CASE PLACED 5'-0" ON CENTER.
7. REBAR EMBEDDED IN EQUIPMENT PAD OR CONCRETE FLOOR MINIMUM OF 6".

REINFORCED CONCRETE ENCASED CONDUIT DUCTBANK

DETAIL E01
NOT TO SCALE



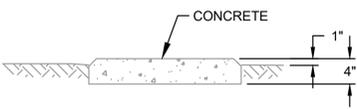
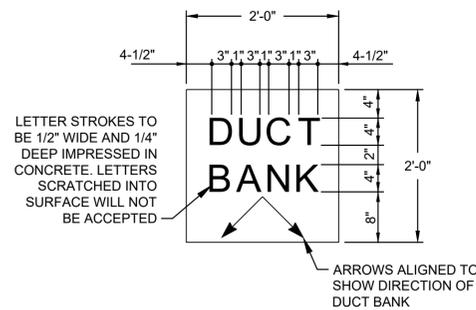
ISOMETRIC VIEW



NOTES BY SYMBOL (#):

1. REFER TO ELECTRICAL MANHOLE DETAILS.
2. DUCTBANK STEEL TO BE EMBEDDED INTO STRUCTURES AND MANHOLES.
3. SEE DETAIL FOR WATERTIGHT DUCT PENETRATIONS BELOW GROUND FOR MANHOLES OR HANDHOLES.
4. SEE DETAIL FOR WATERTIGHT DUCT PENETRATIONS BELOW GRADE FOR STRUCTURES OTHER MANHOLES OR HANDHOLES.
5. BOND TO MANHOLE/HANDHOLE COVER RING GROUND WIRE IF PRESENT.
6. TIE TO GROUND RING WHERE AVAILABLE.
7. TIE TO SWITCHGEAR, MCC, PANELBOARD, ETC. GROUNDING

DUCTBANK GROUNDING
DETAIL E02
NOT TO SCALE



DUCTBANK MARKER DETAIL LOW VOLTAGE CONDUCTORS

DETAIL E05
NOT TO SCALE

NOTES BY SYMBOL (#):

1. INSTALL AT 90° INTERVALS MAXIMUM OR ONE MARKER BETWEEN EACH MANHOLE OR HAND HOLE.

GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
CONSULTING ENGINEERING Tel: 713-636-2936
Registration No. F-2593 Fax: 713-636-2987
email: Microsuran@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500 Houston, Texas 77024
Phone - (713) 600-6800 Web - www.freese.com

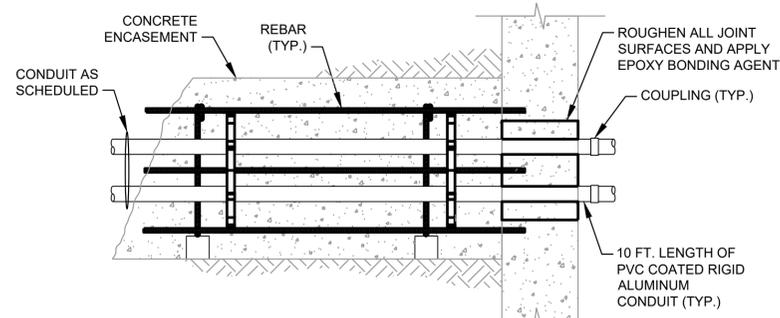
This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN TEXAS P.E. No. 77748

SURVEYED BY: FB NO. P- DATE: OCTOBER 2025

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

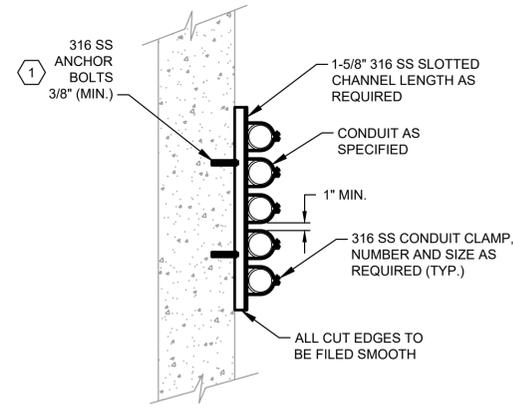
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
STANDARD DETAILS - I

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 57 OF 111 | |



WATERTIGHT DUCT PENETRATION BELOW GRADE STRUCTURES

DETAIL E06
NOT TO SCALE

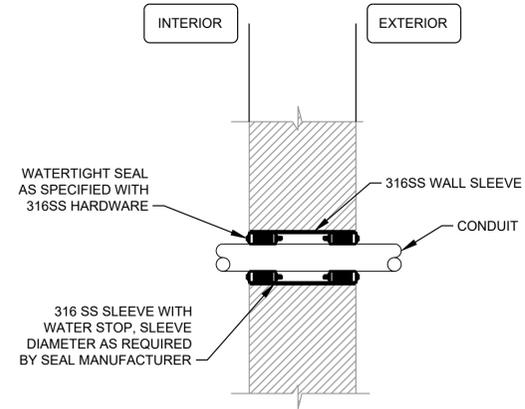


WALL - EXPOSED CONDUIT INSTALLATION

DETAIL E07
NOT TO SCALE

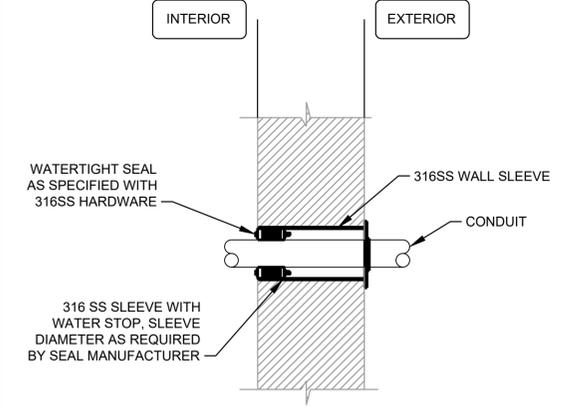
NOTES BY SYMBOL (#):

1. PROVIDE THE CORRECT SIZE ANCHOR BOLTS BASED ON LOAD.



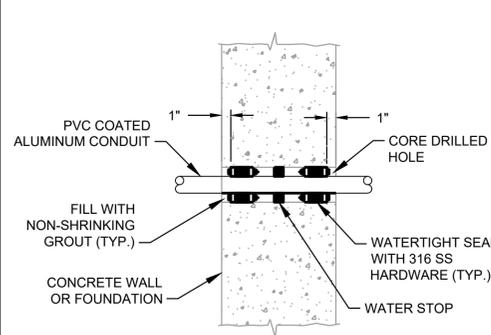
NEW CONSTRUCTION MASONRY, CMU, OR CONCRETE BELOW GRADE - WATERTIGHT CONDUIT PENETRATION

DETAIL E08
NOT TO SCALE



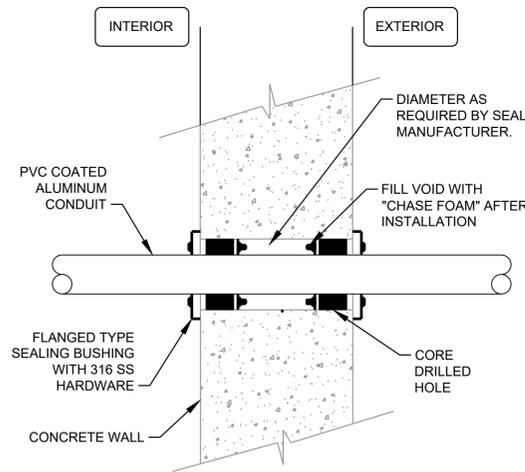
NEW CONSTRUCTION MASONRY, CMU, OR CONCRETE ABOVE GRADE - WATERTIGHT CONDUIT PENETRATION

DETAIL E09
NOT TO SCALE



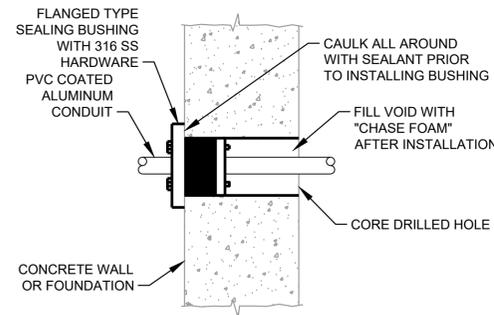
EXISTING CONCRETE STRUCTURE BELOW GRADE WATERTIGHT SINGLE CONDUIT PENETRATION

DETAIL E10
NOT TO SCALE



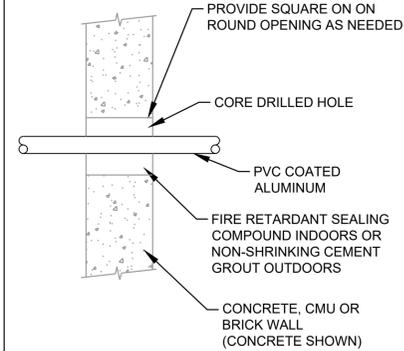
EXISTING MASONRY WALL BELOW GRADE - SINGLE CONDUIT PENETRATION

DETAIL E11
NOT TO SCALE



EXISTING MASONRY WALL ABOVE GRADE - WATERTIGHT SINGLE CONDUIT PENETRATION

DETAIL E12
NOT TO SCALE

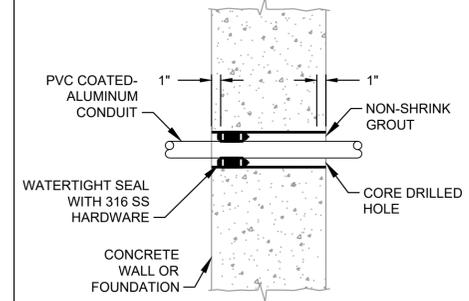


EXISTING BLOCK OR CONCRETE WALL - INTERIOR CONDUIT PENETRATION

DETAIL E13
NOT TO SCALE

NOTES BY SYMBOL (#):

1. LEAVE REBAR INTACT WHEN BREAKING OUT EXISTING WALLS.



EXISTING CONCRETE STRUCTURE ABOVE GRADE - WATERTIGHT SINGLE CONDUIT PENETRATION

DETAIL E14
NOT TO SCALE

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

SURVEYED BY:
FB NO. P-

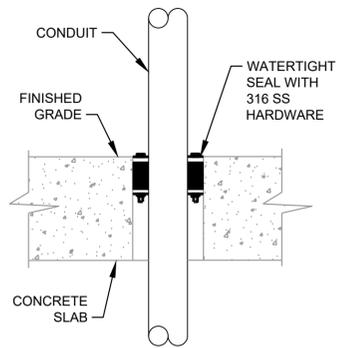
This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748

OCTOBER 2025
DATE

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

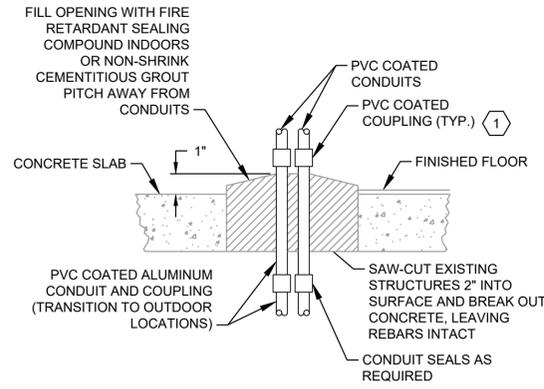
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
STANDARD DETAILS - II

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 58 OF 111 | |



EXISTING CONCRETE SLAB -
WATERTIGHT SINGLE CONDUIT PENETRATION

DETAIL **E15**
NOT TO SCALE

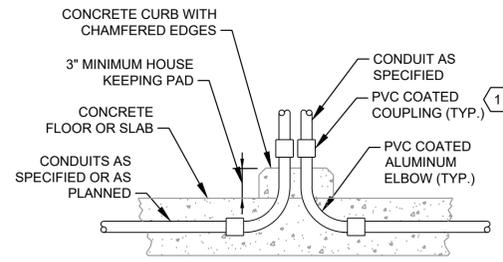


EXISTING CONCRETE SLAB-WET LOCATIONS -
WATERTIGHT MULTIPLE CONDUIT PENETRATION

DETAIL **E16**
NOT TO SCALE

NOTES BY SYMBOL "#":

1. THE FIRST FITTING PAST ANY FINISH SURFACE SHALL BE A MIN. OF 3" ABOVE THAT FINISH SURFACE.

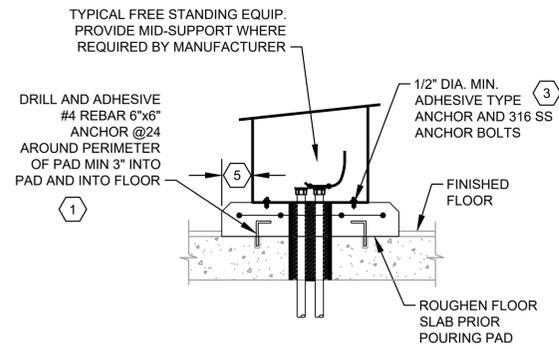


INTERIOR OR EXTERIOR -
CONCEALED CONDUIT INSTALLATION CONCRETE SLAB

DETAIL **E17**
NOT TO SCALE

NOTES BY SYMBOL "#":

1. THE FIRST FITTING PAST ANY FINISH SURFACE SHALL BE A MIN. OF 3" ABOVE THAT FINISH SURFACE.

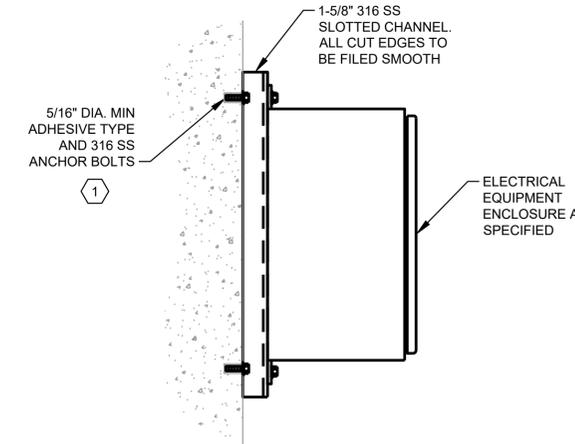


ELECTRICAL EQUIPMENT
FLOOR MOUNTING

DETAIL **E18**
NOT TO SCALE

NOTES BY SYMBOL "#":

1. ALSO SEE STRUCTURAL DETAILS FOR FURTHER INFORMATION.
2. PROVIDE FINAL INSTALLATION LEVEL.
3. PROVIDE THE CORRECT SIZE ANCHOR BASED ON LOAD.
4. COORDINATE CONDUIT PENETRATION THROUGH FLOOR AND EQUIPMENT PAD WITH STRUCTURAL DESIGN.
5. EQUIPMENT PAD SHALL BE 3" MORE IN LENGTH AND WIDTH THAN THE EQUIPMENT TO BE PLACED. IF EQUIPMENT IS PLACED UP AGAINST THE WALL, THERE SHALL NOT BE A 3" GAP BETWEEN THE EQUIPMENT AND WALL. REFER TO PLAN VIEWS FOR ADDITIONAL INFORMATION.

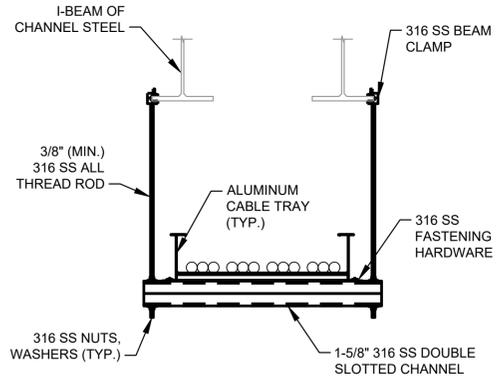


ELECTRICAL EQUIPMENT
WALL MOUNTING

DETAIL **E19**
NOT TO SCALE

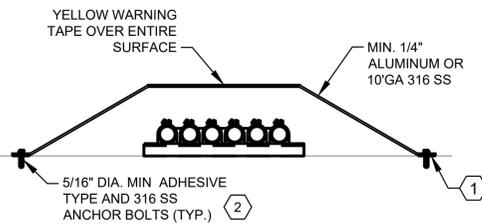
NOTES BY SYMBOL "#":

1. PROVIDE THE CORRECT SIZE ANCHOR BOLTS BASED ON LOAD



TRAPEZE TRAY SUPPORT

DETAIL **E21**
NOT TO SCALE

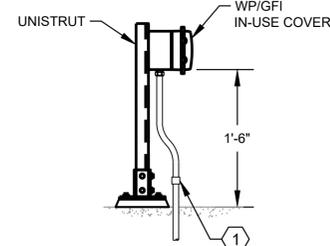


CONDUIT COVER

DETAIL **E22**
NOT TO SCALE

NOTES BY SYMBOL "#":

1. PROVIDE 1/8" NEOPRENE GASKET WHERE ALUMINUM IS SELECTED. DO NOT ALLOW ALUMINUM TO COME INTO DIRECT CONTACT WITH CONCRETE.
2. PROVIDE THE CORRECT SIZE ANCHOR BOLTS BASED ON LOAD.



120V RECEPTACLE

DETAIL **E24**
NOT TO SCALE

NOTES BY SYMBOL "#":

1. THE FIRST FITTING PAST ANY FINISH SURFACE SHALL BE A MIN. OF 3" ABOVE THAT FINISH SURFACE.

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St.
Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

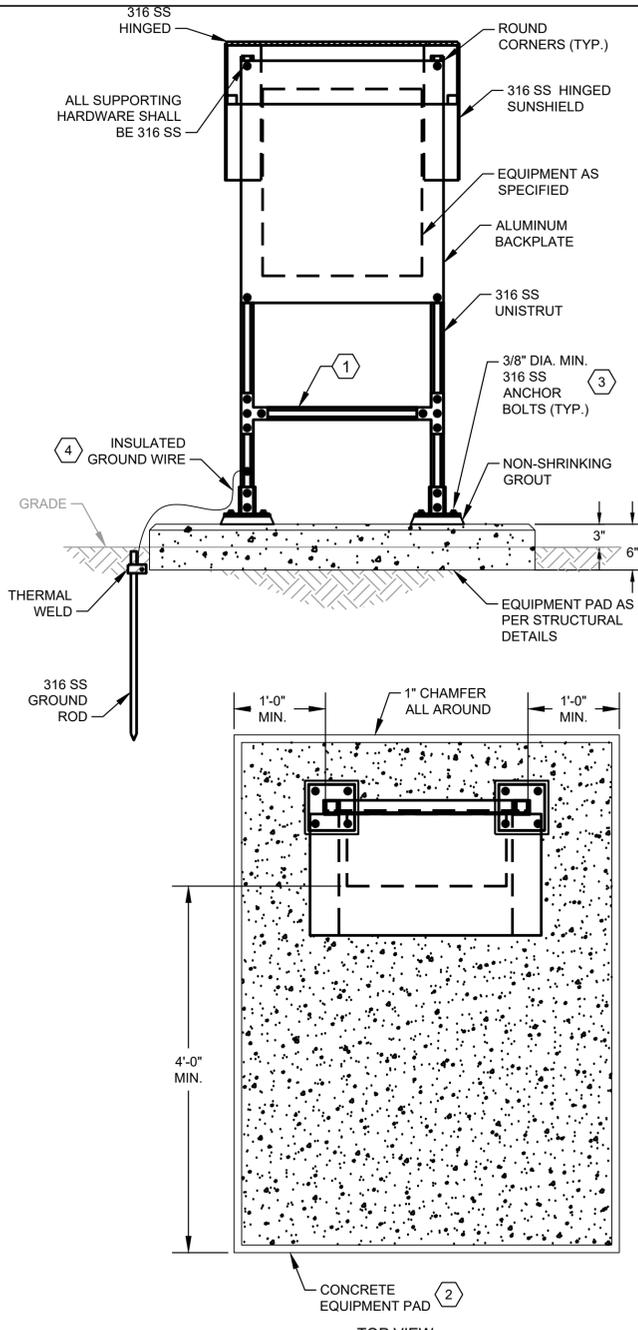
SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
STANDARD DETAILS - III

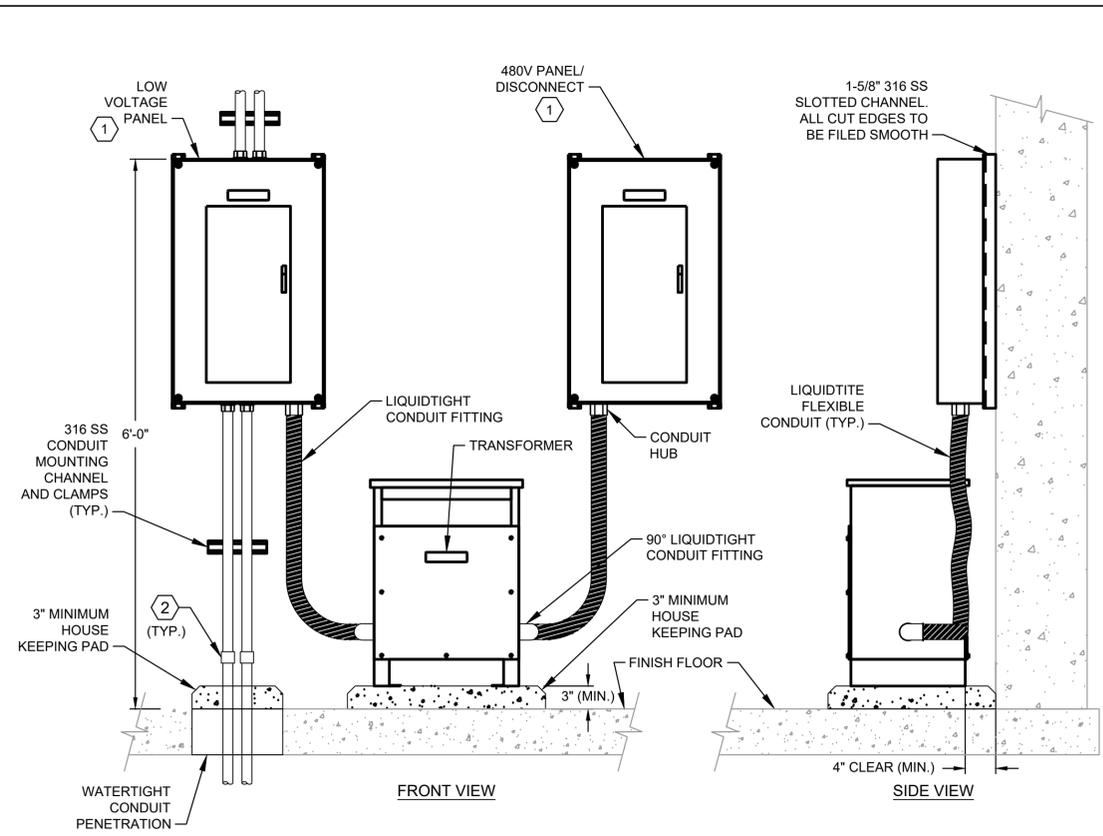
| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 59 OF 111 | |

FILE PATH: O:\HB78_Sim South WWTP Improvement\5 Drawings\Electrical\Working\HB78_E-50.dwg
 PLOT STYLE: FN-MONO-HB78.CTB
 PLOTTED: 10/29/2025 4:56 PM



- NOTES BY SYMBOL (#):
1. INSTALL STRUT CHANNEL AS REQUIRED TO PROVIDE FOR RIGIDITY.
 2. PROVIDE CONCRETE PAD IN UNPAVED AREAS. SEE STRUCTURAL PLANS FOR DETAILS.
 3. PROVIDE THE CORRECT SIZE ANCHOR BOLTS ON LOAD, (TYPICAL)
 4. SECURE GROUND WIRE TO EQUIPMENT RACK LEG. BOLT GROUND WIRE TO BACKPLATE WITH APPROVED GROUND LUGS.

OUTDOOR MOUNTED EQUIPMENT
(UNPAVED AREA)
DETAIL E31
NOT TO SCALE



LIGHTING PANEL AND
TRANSFORMER INSTALLATION
DETAIL E32
NOT TO SCALE

- NOTES BY SYMBOL (#):
1. LOCATION OF THE TWO PANELS MAY BE INTERCHANGED AS INDICATED ON THE DRAWING PLANS.
 2. THE FIRST FITTING PAST ANY FINISH SURFACE SHALL BE A MIN. OF 3\"/>

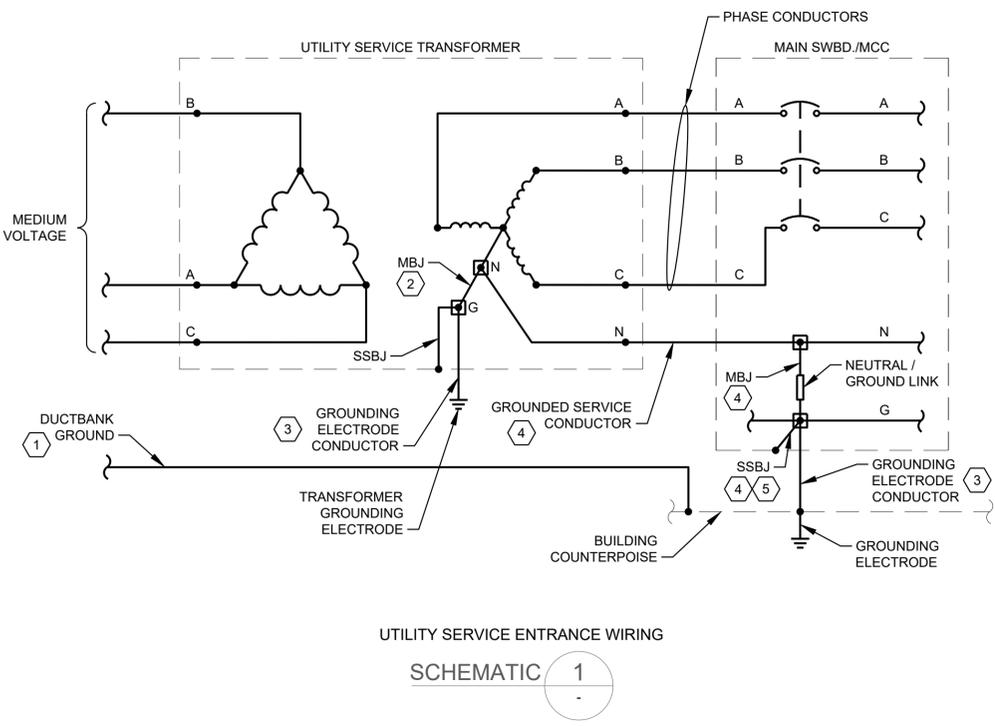
GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
CONSULTING ENGINEERING Tel: 713-636-2936
Registration No. F-2593 Fax: 713-636-2987
email: hb78@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

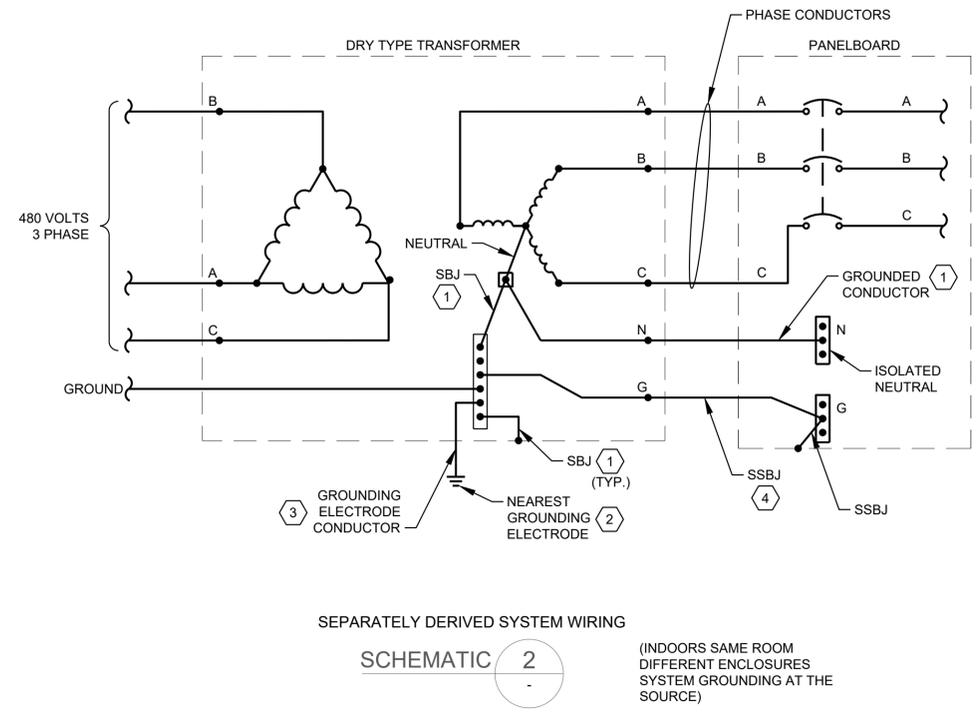
SURVEYED BY:
FB NO. P-

| | |
|--|------------------------------|
| CITY OF HOUSTON HOUSTON PUBLIC WORKS | |
| SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL STANDARD DETAILS - V | |
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 61 OF 111 | |



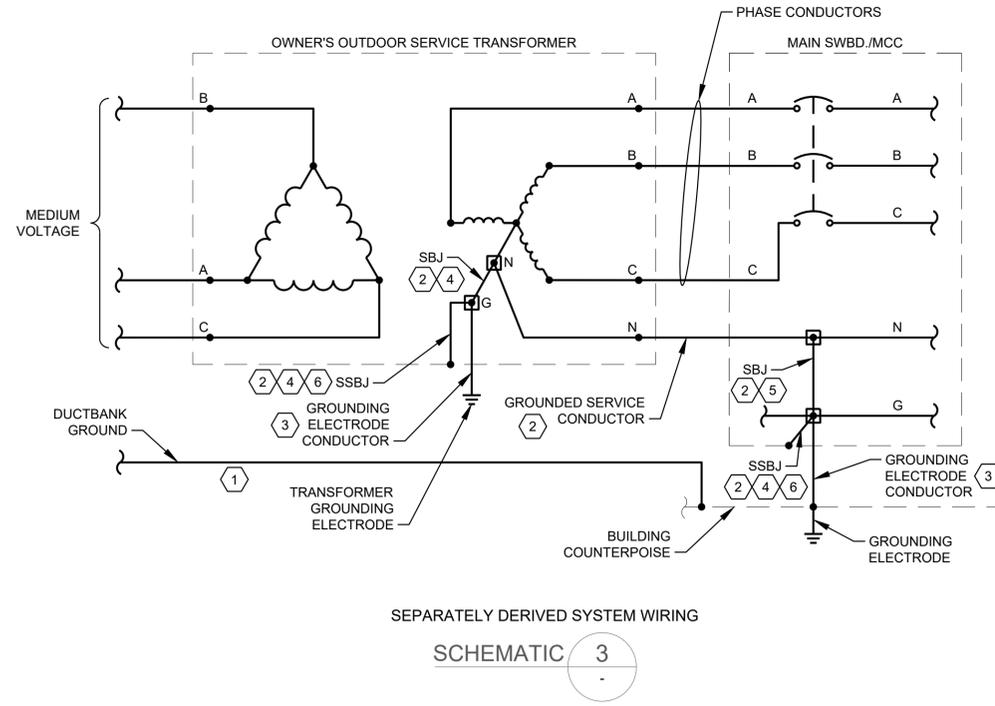
UTILITY SERVICE ENTRANCE WIRING
 SCHEMATIC 1

- LEGEND:**
 MBJ: MAIN BONDING JUMPER.
 SBJ: SYSTEM BONDING JUMPER.
 SSBJ: SUPPLY SIDE BONDING JUMPER.
- NOTES BY SYMBOL (#):**
- DO NOT CONNECT DUCTBANK GROUND TO TRANSFORMER ENCLOSURE, TRANSFORMER GROUNDING ELECTRODE OR TRANSFORMER NEUTRAL.
 - NEC ART. 250.24(A)(2)
 - NEC ART. 250.66
 - NEC TABLE 250.102(C)(1)
 - NEC ART. 250.30(A)(2)



SEPARATELY DERIVED SYSTEM WIRING
 SCHEMATIC 2
 (INDOORS SAME ROOM DIFFERENT ENCLOSURES SYSTEM GROUNDING AT THE SOURCE)

- LEGEND:**
 MBJ: MAIN BONDING JUMPER.
 SBJ: SYSTEM BONDING JUMPER.
 SSBJ: SUPPLY SIDE BONDING JUMPER.
- NOTES BY SYMBOL (#):**
- NEC TABLE 250.102(C)(1)
 - NEC ART. 250.30(A)(4)
 - NEC ART. 250.66
 - NEC ART. 250.30(A)(2)



SEPARATELY DERIVED SYSTEM WIRING
 SCHEMATIC 3

- LEGEND:**
 MBJ: MAIN BONDING JUMPER.
 SBJ: SYSTEM BONDING JUMPER.
 SSBJ: SUPPLY SIDE BONDING JUMPER.
- NOTES BY SYMBOL (#):**
- DO NOT CONNECT DUCTBANK GROUND TO TRANSFORMER ENCLOSURE, TRANSFORMER GROUNDING ELECTRODE OR TRANSFORMER NEUTRAL.
 - NEC TABLE 250.102(C)(1)
 - NEC ART. 250.66
 - NEC ART. 250.30(C)
 - NEC ART. 250.30(A)(1)
 - NEC ART. 250.30(A)(2)

GAI
 Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
 CONSULTING ENGINEERING Tel: 713-636-2936
 Registration No. F-2593 Fax: 713-636-2987
 email: hforouzan@gaiconsulting.com

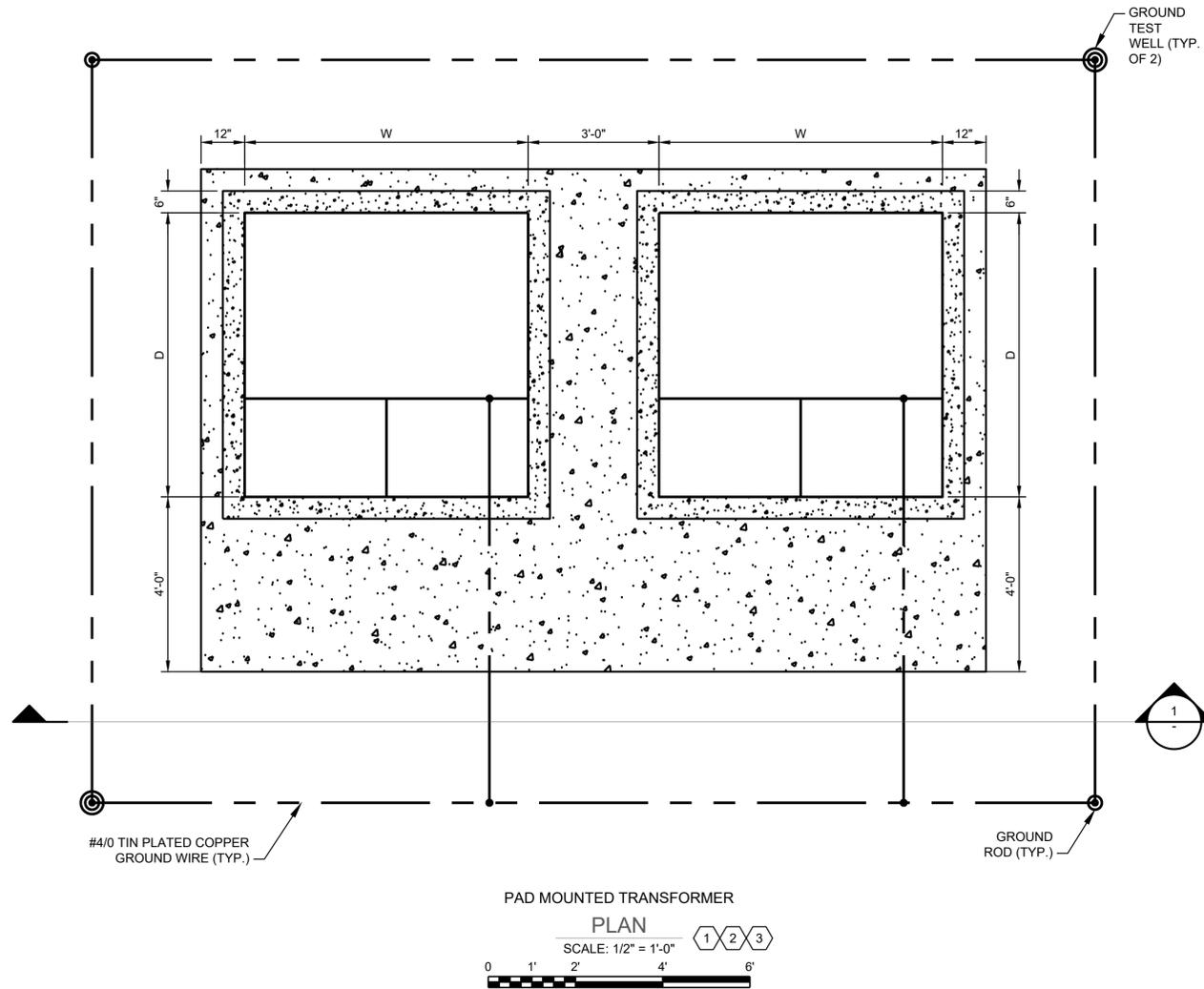
FREESE NICHOLS
 10497 Town and Country Way, Suite 500 Houston, Texas 77024
 Phone - (713) 600-6800 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
 HOSS FOROUZAN TEXAS P.E. No. 77748
 OCTOBER 2025 DATE

SURVEYED BY:
 FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
 SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 ELECTRICAL
 STANDARD DETAILS - VI

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 62 OF 111 | |



NOTES BY SYMBOL (#):

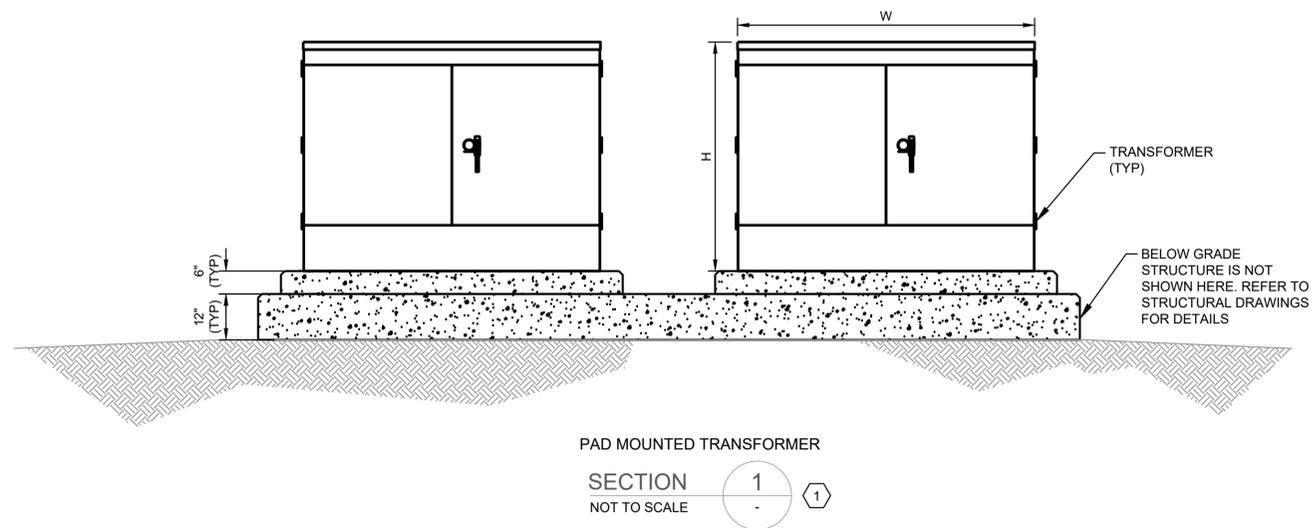
1. REFER TO STRUCTURAL DRAWINGS FOR PAD DETAILS.
2. GROUND ALL EQUIPMENT PER NEC ARTICLE 250.
3. DIMENSIONS SHALL BE ADJUSTED FOR THE EQUIPMENT PROVIDED.
4. ALL TRANSFORMERS SHALL BE DEAD FRONT.

TRANSFORMER PAD DIMENSIONS

| NO. | 300KVA | 500KVA | 750KVA | 1000KVA | 1500KVA | 2000KVA | 2500KVA | 3000KVA |
|-----|--------|--------|--------|---------|---------|---------|---------|---------|
| W | 62" | 66" | 81" | 84" | 86" | 92" | 98" | 102" |
| D | 58" | 62" | 64" | 66" | 72" | 80" | 82" | 83" |
| H | 58" | 60" | 68" | 68" | 68" | 72" | 72" | 77" |

TRANSFER SIZE

| NO. | 300KVA | 500KVA | 750KVA | 1000KVA | 1500KVA | 2000KVA | 2500KVA | 3000KVA |
|---------------|--------|--------|--------|---------|---------|---------|---------|---------|
| W | 62" | 66" | 81" | 84" | 86" | 92" | 98" | 102" |
| D | 60" | 64" | 66" | 68" | 74" | 88" | 90" | 91" |
| H | 58" | 60" | 68" | 68" | 68" | 72" | 72" | 77" |
| WEIGHT (LBS.) | 3700 | 5400 | 7200 | 9000 | 10250 | 13400 | 15000 | 16500 |



GAI
Gupta & Associates, Inc. 302 Dennis St.
Houston, Texas 77006
CONSULTING ENGINEERING Tel: 713-636-2936
Registration No. F-2593 Fax: 713-636-2987
email: mforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748

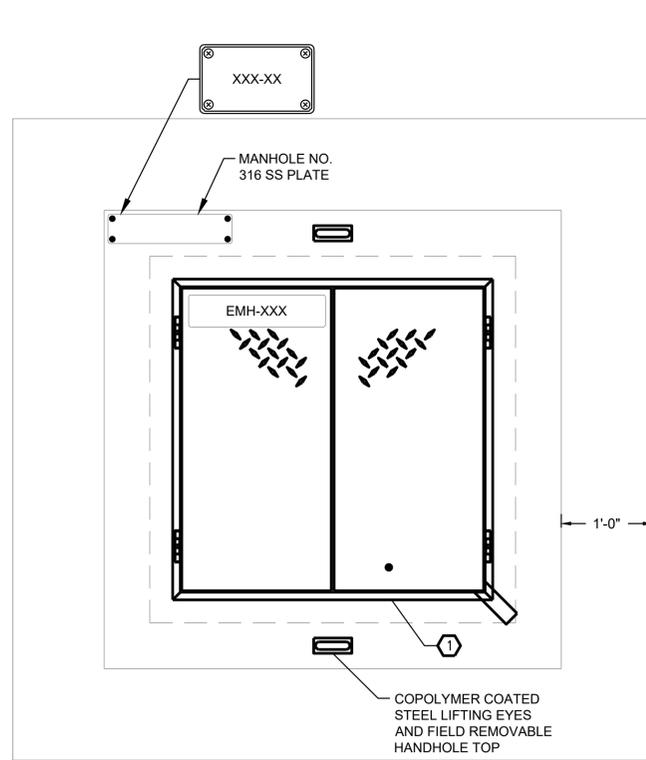
SURVEYED BY:
FB NO. P-

OCTOBER 2025
DATE

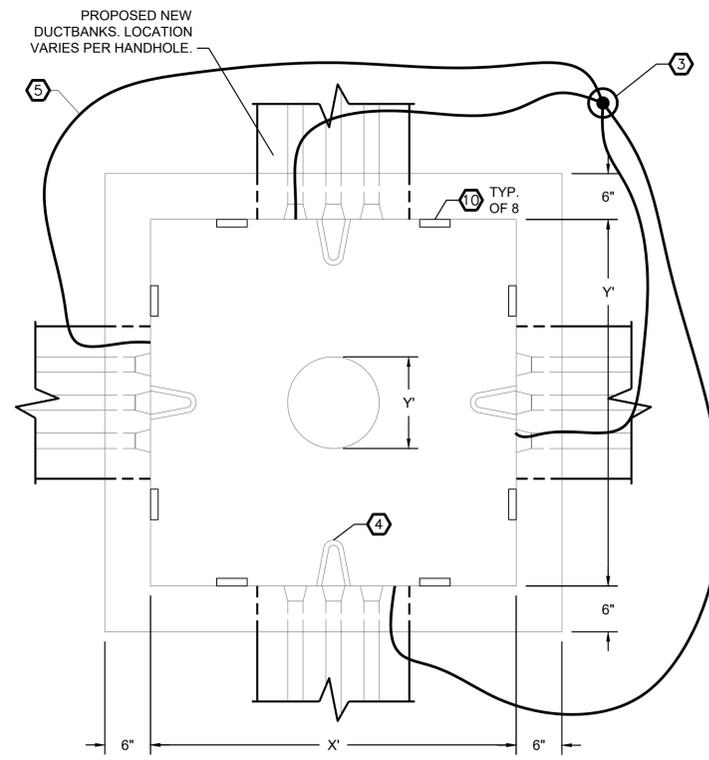
CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
STANDARD DETAILS - VII

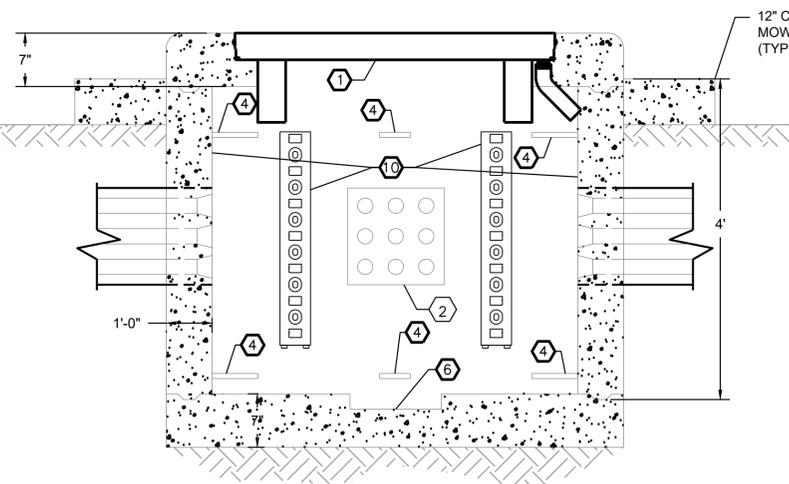
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
|---------------------|------------------------------|
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 63 OF 111 | |



PLAN



2 SECTION
SCALE: NTS



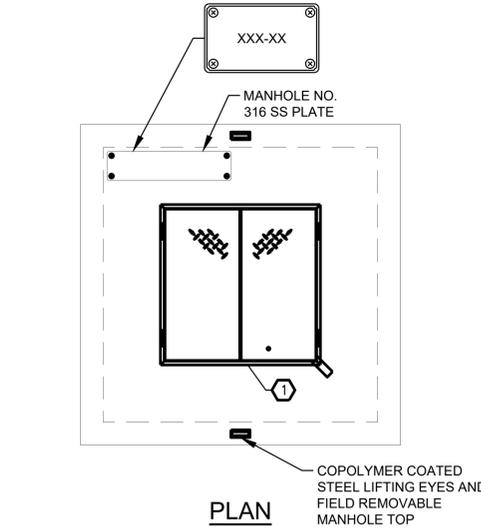
1 SECTION
SCALE: NTS

(NON-ROAD WAY) HANDHOLE (EHH)
INSTALLATION DETAIL

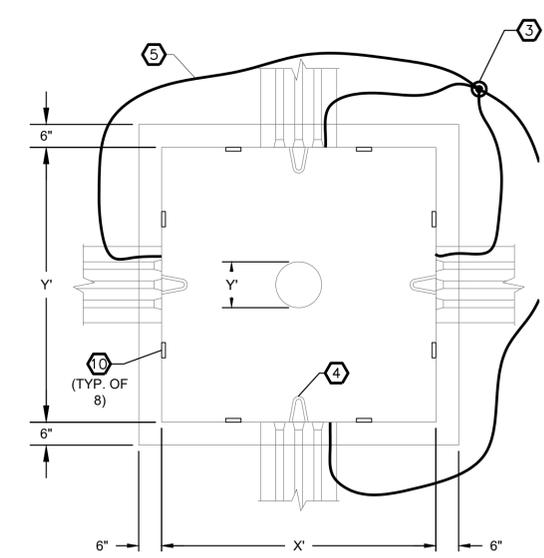
1 SECTION
SCALE: NTS
7 8 9 11

NOTES BY SYMBOL (#):

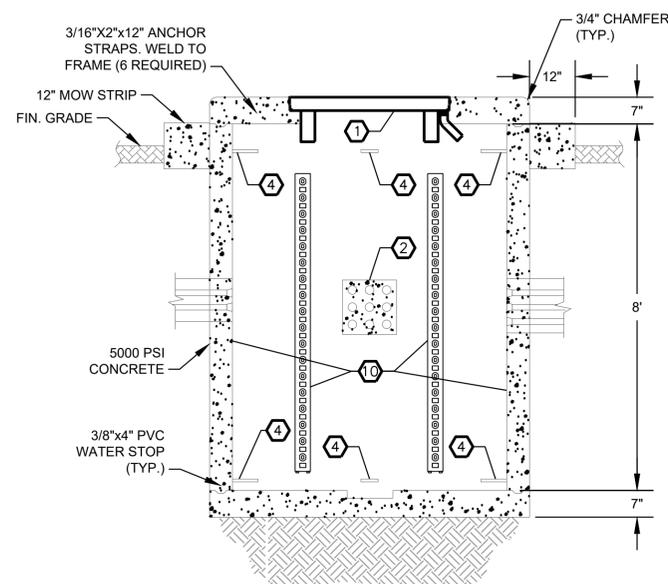
1. HANDHOLE COVER SHALL BE AS SPECIFIED, AND SHALL BE STAMPED ELECTRICAL OR COMMUNICATION AS REQUIRED BY CONTRACTOR.
2. ALL CONDUITS SHALL BE TERMINATED IN HANDHOLE WITH BELL ENDS AND CENTER ON THE ENTERING WALL.
3. 3/4"Ø X 10'-0" GROUND ROD.
4. PROVIDE PULLING IRONS AS SPECIFIED.
5. #4/0 BARE STRANDED COPPER CONDUCTOR TO MAIN GROUND GRID.
6. HANDHOLES SHALL BE EQUIPPED WITH 12" DEPRESSION.
7. HANDHOLE EXTENSIONS SHALL BE USED WHENEVER BOX IS BELOW EXISTING GRADE.
8. ANCHORS SHALL BE 316 SS OR FIBERGLASS AS SPECIFIED.
9. HANDHOLE SHALL BE 12" ABOVE GRADE WHEN LOCATED IN GRASSY AREAS, CONTRACTOR SHALL PROVIDE A 12" MOW STRIP 6" TALL AROUND HANDHOLE.
10. MOUNTING RACKS SHALL BE AS SPECIFIED.
11. REFER TO SPECIFICATION 260543 "UNDERGROUND SYSTEM" FOR ADDITIONAL INFORMATION.



PLAN



2 SECTION
SCALE: NTS



1 SECTION
SCALE: NTS

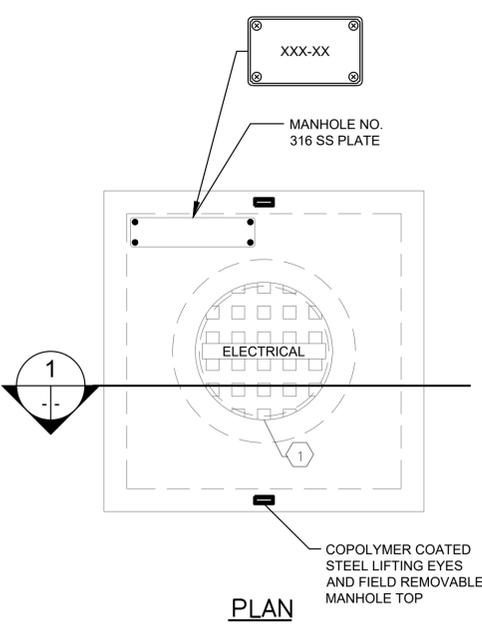
(NON-ROAD WAY) MANHOLE (EMH)
INSTALLATION DETAIL

2 SECTION
SCALE: NTS
3 5 7 8

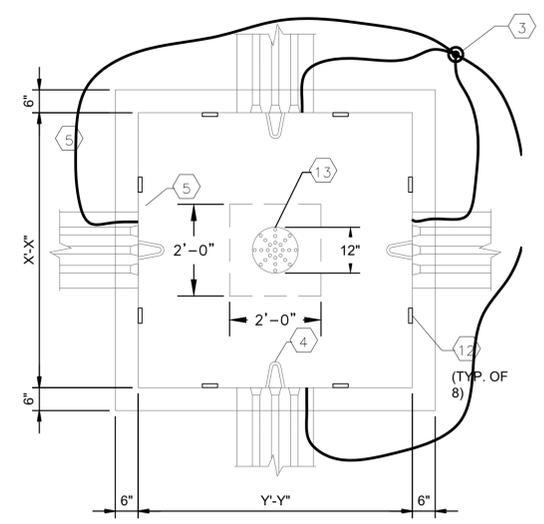
NOTES BY SYMBOL (#):

1. MANHOLE COVER SHALL BE AS SPECIFIED, AND SHALL BE STAMPED ELECTRICAL OR COMMUNICATION AS REQUIRED BY CONTRACTOR.
2. ALL CONDUITS SHALL BE TERMINATED IN MANHOLE WITH BELL ENDS AND CENTER ON THE ENTERING WALL.
3. 3/4"Ø X 10'-0" GROUND ROD.
4. PROVIDE PULLING IRONS AS SPECIFIED. BOND TO SYSTEM GROUND.
5. #4/0 BARE STRANDED COPPER CONDUCTOR BOND TO SYSTEM TO GROUND.
6. MANHOLES SHALL BE EQUIPPED WITH 12" DEPRESSION.
7. MANHOLE EXTENSIONS SHALL BE USED WHENEVER BOX IS BELOW EXISTING GRADE.
8. ANCHORS SHALL BE 316 SS OR FIBERGLASS AS SPECIFIED.
9. MANHOLE SHALL BE 12" ABOVE GRADE WHEN LOCATED IN GRASSY AREAS, CONTRACTOR SHALL PROVIDE A 12" MOW STRIP 6" TALL AROUND MANHOLE.
10. MOUNTING RACKS SHALL BE AS SPECIFIED. BOND TO SYSTEM GROUND.
11. REFER TO SPECIFICATION 260543 "UNDERGROUND SYSTEM" FOR ADDITIONAL INFORMATION.
12. ALL MANHOLES CARRYING MEDIUM VOLTAGE CABLES SHALL BE 8' X 8'. ALL MANHOLES CARRYING CABLES 1000V AND BELOW SHALL BE 6' X 6'.

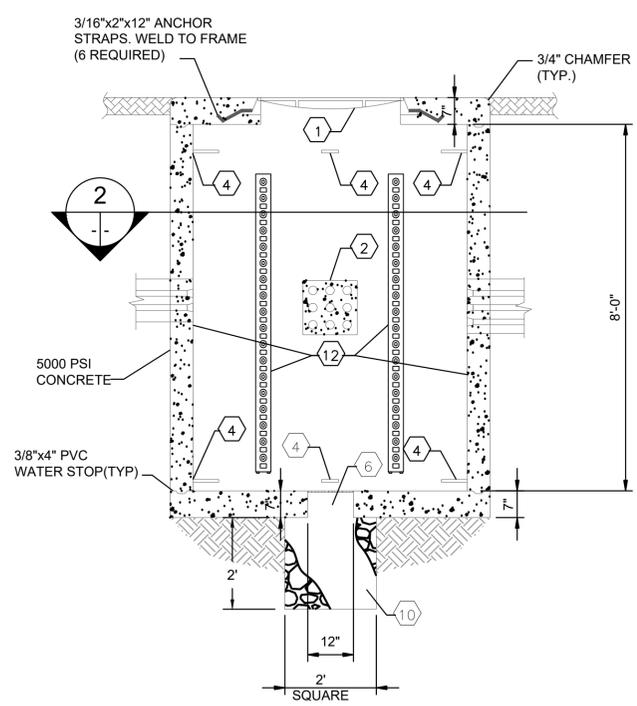
| | |
|--|-------------------------------------|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St. Houston, Texas 77006 Tel: 713-636-2936 Fax: 713-636-2987 email: info@gaiconsulting.com</p> | |
| <p>FREESE NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | |
| <p>This document is released for interim review & not intended for construction, bidding or permit purposes by</p> <p>HOSS FOROUZAN TEXAS P.E. No. 77748</p> <p>OCTOBER 2025 DATE</p> | |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ELECTRICAL STANDARD DETAILS - VIII</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 64 OF 111</p> | |



PLAN



SECTION
SCALE: NTS

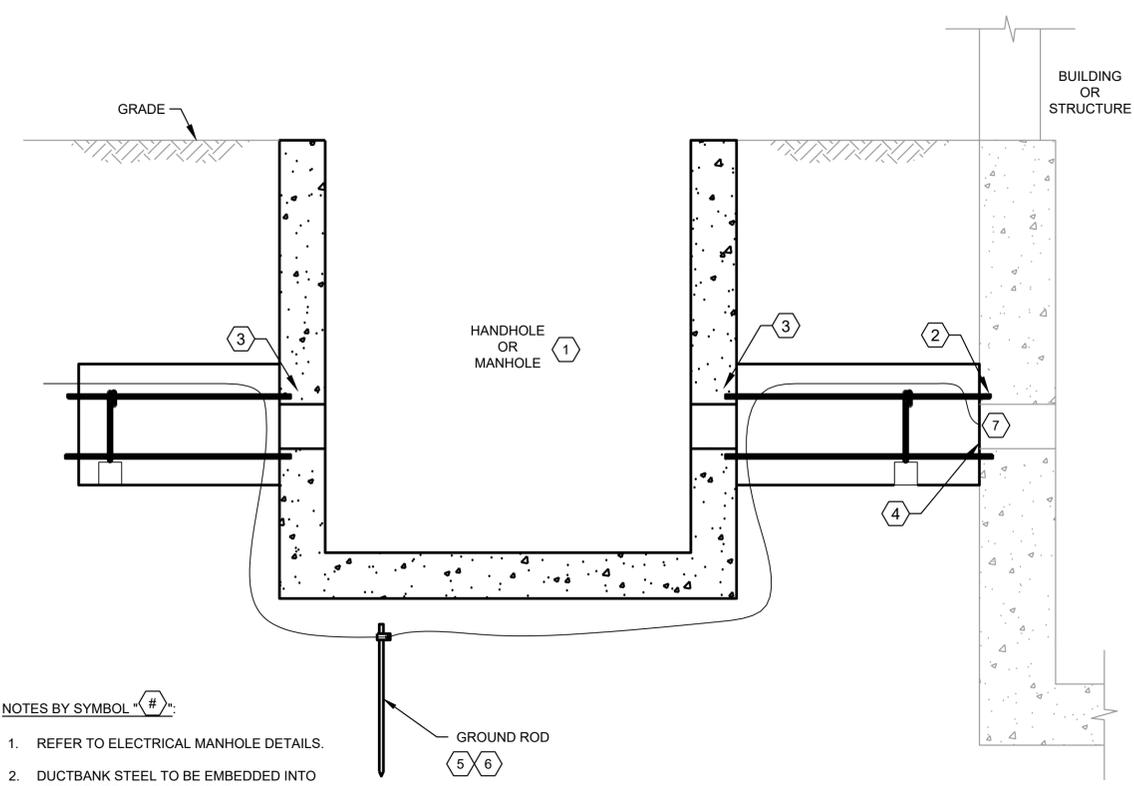


SECTION
SCALE: NTS

1 (ROADWAY) ELECTRICAL MANHOLE (EMH)
SCALE: NTS

NOTES BY SYMBOL (#):

1. MANHOLE COVER SHALL BE AS SPECIFIED, AND SHALL BE STAMPED ELECTRICAL OR COMMUNICATION AS REQUIRED BY CONTRACTOR.
2. ALL CONDUITS SHALL BE TERMINATED IN MANHOLE WITH BELL ENDS AND CENTER ON THE ENTERING WALL.
3. 3/4"Ø X 10'-0" STAINLESS STEEL GROUND ROD.
4. PROVIDE PULLING IRONS AS SPECIFIED.
5. #4/0 BARE STRANDED COPPER CONDUCTOR TO MAIN GROUND GRID.
6. MANHOLES SHALL BE EQUIPPED WITH 12" SUMP OPENING.
7. MANHOLE EXTENSIONS SHALL BE USED WHENEVER BOX IS BELOW EXISTING GRADE.
8. ANCHORS SHALL BE 316 SS OR FIBERGLASS AS SPECIFIED.
9. MANHOLES SHALL BE FLUSH WITH THE PAVEMENT WHEN INSTALLED IN ROADWAYS.
10. TO BE FILLED WITH PEA GRAVEL.
11. REFER TO SPECIFICATION 260543 "UNDERGROUND SYSTEM" FOR ADDITIONAL INFORMATION.
12. MOUNTING RACKS SHALL BE AS SPECIFIED.
13. SHALL BE PLASTIC GRATE.
14. MANHOLE SHALL BE 12" ABOVE GRADE WHEN LOCATED IN GRASSY AREAS. CONTRACTOR SHALL PROVIDE A 12" MOW STRIP 6" TALL AROUND, MANHOLE.



NOTES BY SYMBOL (#):

1. REFER TO ELECTRICAL MANHOLE DETAILS.
2. DUCTBANK STEEL TO BE EMBEDDED INTO STRUCTURES AND MANHOLES.
3. SEE DETAIL FOR WATERTIGHT DUCT.

2 DUCTBANK GROUNDING DETAIL
SCALE: NTS

NOTES BY SYMBOL (#):

1. REFER TO ELECTRICAL MANHOLE DETAILS.
2. DUCTBANK STEEL TO BE EMBEDDED INTO STRUCTURES AND MANHOLES.
3. SEE DETAIL FOR WATERTIGHT DUCT PENETRATIONS BELOW GROUND FOR MANHOLES OR HANDHOLES.
4. SEE DETAIL FOR WATERTIGHT DUCT PENETRATIONS BELOW GRADE FOR STRUCTURES OTHER MANHOLES OR HANDHOLES.

| | |
|---|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St. Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: hb78@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |

CITY OF HOUSTON
HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ELECTRICAL
STANDARD DETAILS - IX

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 65 OF 111 | |

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: COH.ctb

FILE PATH: C:\H878_Sim South WTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_I-01.dwg

| PRIMARY FLOW ELEMENTS | |
|------------------------|---|
| | MAGNETIC FLOW METER |
| | ULTRASONIC DOPPLER FLOW METER |
| | ULTRASONIC TIME TRANSIT FLOW METER |
| | VORTEX FLOW METER |
| | VENTURI TUBE |
| | TURBINE OR PROPELLER TYPE METER |
| | ROTAMETER |
| | PITOT TUBE |
| | WEIR FLOW METER |
| | PARSHALL FLUME OR TRAPEZOIDAL FLUME |
| | ORIFICE PLATE |
| | THERMAL MASS FLOWMETER |
| PRIMARY LEVEL ELEMENTS | |
| | ULTRASONIC LEVEL TRANSDUCER |
| | RADAR LEVEL TRANSDUCER |
| | PRIMARY ELEMENT PRESSURE PROBE LEVEL TRANSMITTER |
| | BUBBLER LEVEL TUBE ELEMENT |
| | CONDUCTIVE LEVEL PROBE |
| | FLOAT SWITCH |
| VALVES | |
| | VALVE - OTHER IN-LINE TYPE NOT OTHERWISE IDENTIFIED |
| | THREE-WAY VALVE |
| | BALL VALVE |
| | GLOBE VALVE |
| | PINCH VALVE |
| | GATE VALVE |
| | NEEDLE VALVE |
| | DIAPHRAGM VALVE |
| | BUTTERFLY VALVE |
| | CHECK VALVE WITH FLOW DIRECTION |
| | PLUG VALVE |
| | PRESSURE-REDUCING REGULATOR INTERNAL PRESSURE TAP |
| | BACK PRESSURE REGULATOR INTERNAL PRESSURE TAP |
| | PRESSURE-REDUCING REGULATOR EXTERNAL PRESSURE TAP |
| | BACK PRESSURE REGULATOR EXTERNAL PRESSURE TAP |

| VALVES | | | | | | | | | | | | | |
|-----------------------------------|---|-----|--|---|--------------|---|--------------|---|--------------------|---|----------------|---|----------------|
| | SOLENOID ACTUATED VALVE | | | | | | | | | | | | |
| | <table border="1"> <tr><td>"X"</td><td></td></tr> <tr><td>P</td><td>AIR CYLINDER</td></tr> <tr><td>O</td><td>OIL CYLINDER</td></tr> <tr><td>H</td><td>HYDRAULIC CYLINDER</td></tr> <tr><td>E</td><td>ELECTRIC MOTOR</td></tr> <tr><td>S</td><td>SOLENOID VALVE</td></tr> </table> | "X" | | P | AIR CYLINDER | O | OIL CYLINDER | H | HYDRAULIC CYLINDER | E | ELECTRIC MOTOR | S | SOLENOID VALVE |
| "X" | | | | | | | | | | | | | |
| P | AIR CYLINDER | | | | | | | | | | | | |
| O | OIL CYLINDER | | | | | | | | | | | | |
| H | HYDRAULIC CYLINDER | | | | | | | | | | | | |
| E | ELECTRIC MOTOR | | | | | | | | | | | | |
| S | SOLENOID VALVE | | | | | | | | | | | | |
| | MANUAL VALVE | | | | | | | | | | | | |
| MISC PROCESS SYMBOLS | | | | | | | | | | | | | |
| | ANNULAR TYPE SEAL | | | | | | | | | | | | |
| | CHEMICAL INJECTION POINT | | | | | | | | | | | | |
| | STRAINER | | | | | | | | | | | | |
| | DRAIN | | | | | | | | | | | | |
| | NORMAL OPERATING LEVEL | | | | | | | | | | | | |
| | UV CHAMBER | | | | | | | | | | | | |
| | FLOW STRAIGHTENER | | | | | | | | | | | | |
| | LOAD CELL | | | | | | | | | | | | |
| | SPRAY NOZZLE | | | | | | | | | | | | |
| | BLIND FLANGE | | | | | | | | | | | | |
| | FLANGE | | | | | | | | | | | | |
| | DIAPHRAGM SEAL | | | | | | | | | | | | |
| | PRESSURE RELIEF (OUT) | | | | | | | | | | | | |
| | VACUUM RELIEF (IN) | | | | | | | | | | | | |
| GATES | | | | | | | | | | | | | |
| | SLUICE/SLIDE GATE | | | | | | | | | | | | |
| | FLOW CONTROL GATE | | | | | | | | | | | | |
| MOTORS | | | | | | | | | | | | | |
| | VARIABLE SPEED MOTOR | | | | | | | | | | | | |
| | CONSTANT SPEED MOTOR | | | | | | | | | | | | |
| PUMPS, BLOWERS AND MISC EQUIPMENT | | | | | | | | | | | | | |
| | CENTRIFUGAL BLOWER | | | | | | | | | | | | |
| | CENTRIFUGAL PUMP | | | | | | | | | | | | |
| | DIAPHRAGM PUMP AND MOTOR | | | | | | | | | | | | |
| | PROGRESSIVE CAVITY PUMP | | | | | | | | | | | | |
| | SUBMERSIBLE PUMP | | | | | | | | | | | | |
| | POSITIVE DISPLACEMENT BLOWER | | | | | | | | | | | | |

| PUMPS, BLOWERS AND MISC EQUIPMENT | |
|-----------------------------------|--|
| | MIXER/FLOCCULATOR/AERATOR |
| | VERTICAL PUMP-1 USED WHEN DISCHARGE LINE IS IN WETWELL |
| | VERTICAL PUMP-2 USED WHEN DISCHARGE LINE IS EXPOSED. |
| | VERTICAL PUMP SHAFT USED WHEN INTAKE OF PUMP IS ENCASED. |
| | SUBMERSIBLE MIXER |
| | COMPRESSOR |
| | HEAT EXCHANGER |
| | FEED PUMP |
| | GRINDER/MACERATOR |
| | METERING PUMP |
| | PLUNGER PUMP |
| | PERISTALTIC METERING PUMP |
| | CENTRIFUGE |
| | PULSATION DAMPENER |
| | TURBO BLOWER |

| PUMPS, BLOWERS AND MISC EQUIPMENT | | | | | | | | | | | | | | | | | | | | | |
|--|--|---------------------------------|--|-----|--------------------------|-----|---------------------|-----|-----------------|-----|-----------------|---|-------------------|-----|---|----|-------------|-----|--------------------------|---|-------------------------|
| | ROTARY SCREEN | | | | | | | | | | | | | | | | | | | | |
| CONTROL ENCLOSURE, INSTRUMENTS AND SCADA | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <tr><th colspan="2">DIGITAL/ANALOG INSTRUMENT</th></tr> <tr><td>AAA</td><td>ISA TAG (REFER TO TABLE)</td></tr> <tr><td>BBB</td><td>LOOP NUMBER</td></tr> <tr><td>CCC</td><td>LOOP NUMBER SUB</td></tr> <tr><td>D</td><td>DIVISION NUMBER</td></tr> <tr><td>P</td><td>POWER REQUIREMENT</td></tr> <tr><td>XXX</td><td>DESCRIPTION (USED ON PANEL INSTRUMENTS)</td></tr> <tr><td>YY</td><td>CHEMICAL</td></tr> <tr><td>ZZZ</td><td>LOCATION</td></tr> </table> | DIGITAL/ANALOG INSTRUMENT | | AAA | ISA TAG (REFER TO TABLE) | BBB | LOOP NUMBER | CCC | LOOP NUMBER SUB | D | DIVISION NUMBER | P | POWER REQUIREMENT | XXX | DESCRIPTION (USED ON PANEL INSTRUMENTS) | YY | CHEMICAL | ZZZ | LOCATION | | |
| DIGITAL/ANALOG INSTRUMENT | | | | | | | | | | | | | | | | | | | | | |
| AAA | ISA TAG (REFER TO TABLE) | | | | | | | | | | | | | | | | | | | | |
| BBB | LOOP NUMBER | | | | | | | | | | | | | | | | | | | | |
| CCC | LOOP NUMBER SUB | | | | | | | | | | | | | | | | | | | | |
| D | DIVISION NUMBER | | | | | | | | | | | | | | | | | | | | |
| P | POWER REQUIREMENT | | | | | | | | | | | | | | | | | | | | |
| XXX | DESCRIPTION (USED ON PANEL INSTRUMENTS) | | | | | | | | | | | | | | | | | | | | |
| YY | CHEMICAL | | | | | | | | | | | | | | | | | | | | |
| ZZZ | LOCATION | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <tr><th colspan="2">DIGITAL/ANALOG INSTRUMENT</th></tr> <tr><td>AAA</td><td>ISA TAG (REFER TO TABLE)</td></tr> <tr><td>BBB</td><td>LOOP NUMBER</td></tr> <tr><td>CCC</td><td>LOOP NUMBER SUB</td></tr> <tr><td>XXX</td><td>DESCRIPTION</td></tr> </table> | DIGITAL/ANALOG INSTRUMENT | | AAA | ISA TAG (REFER TO TABLE) | BBB | LOOP NUMBER | CCC | LOOP NUMBER SUB | XXX | DESCRIPTION | | | | | | | | | | |
| DIGITAL/ANALOG INSTRUMENT | | | | | | | | | | | | | | | | | | | | | |
| AAA | ISA TAG (REFER TO TABLE) | | | | | | | | | | | | | | | | | | | | |
| BBB | LOOP NUMBER | | | | | | | | | | | | | | | | | | | | |
| CCC | LOOP NUMBER SUB | | | | | | | | | | | | | | | | | | | | |
| XXX | DESCRIPTION | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <tr><th colspan="2">DISPLAY (INDICATION/CONTROLLER)</th></tr> <tr><td>AAA</td><td>ISA TAG (REFER TO TABLE)</td></tr> <tr><td>BBB</td><td>LOOP NUMBER</td></tr> <tr><td>CCC</td><td>LOOP NUMBER SUB</td></tr> <tr><td>XXX</td><td>DESCRIPTION</td></tr> </table> | DISPLAY (INDICATION/CONTROLLER) | | AAA | ISA TAG (REFER TO TABLE) | BBB | LOOP NUMBER | CCC | LOOP NUMBER SUB | XXX | DESCRIPTION | | | | | | | | | | |
| DISPLAY (INDICATION/CONTROLLER) | | | | | | | | | | | | | | | | | | | | | |
| AAA | ISA TAG (REFER TO TABLE) | | | | | | | | | | | | | | | | | | | | |
| BBB | LOOP NUMBER | | | | | | | | | | | | | | | | | | | | |
| CCC | LOOP NUMBER SUB | | | | | | | | | | | | | | | | | | | | |
| XXX | DESCRIPTION | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <tr><th colspan="2">DISPLAY (INDICATION/CONTROLLER)</th></tr> <tr><td>AAA</td><td>ISA TAG (REFER TO TABLE)</td></tr> <tr><td>BBB</td><td>LOOP NUMBER</td></tr> <tr><td>CCC</td><td>LOOP NUMBER SUB</td></tr> <tr><td>XXX</td><td>DESCRIPTION</td></tr> </table> | DISPLAY (INDICATION/CONTROLLER) | | AAA | ISA TAG (REFER TO TABLE) | BBB | LOOP NUMBER | CCC | LOOP NUMBER SUB | XXX | DESCRIPTION | | | | | | | | | | |
| DISPLAY (INDICATION/CONTROLLER) | | | | | | | | | | | | | | | | | | | | | |
| AAA | ISA TAG (REFER TO TABLE) | | | | | | | | | | | | | | | | | | | | |
| BBB | LOOP NUMBER | | | | | | | | | | | | | | | | | | | | |
| CCC | LOOP NUMBER SUB | | | | | | | | | | | | | | | | | | | | |
| XXX | DESCRIPTION | | | | | | | | | | | | | | | | | | | | |
| | INTERLOCKING RELAY | | | | | | | | | | | | | | | | | | | | |
| CONTROL ENCLOSURE AND SCADA | | | | | | | | | | | | | | | | | | | | | |
| | DIGITAL INPUT | | | | | | | | | | | | | | | | | | | | |
| | DIGITAL OUTPUT | | | | | | | | | | | | | | | | | | | | |
| | ANALOG INPUT | | | | | | | | | | | | | | | | | | | | |
| | ANALOG OUTPUT | | | | | | | | | | | | | | | | | | | | |
| | SURGE SUPPRESSOR | | | | | | | | | | | | | | | | | | | | |
| | OPTO ISOLATOR | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <tr><th colspan="2">SIGNAL CONVERTER/ ISOLATOR</th></tr> <tr><td>*.*</td><td>(INPUT/OUTPUT)</td></tr> <tr><td>*</td><td>DEFINED AS FOLLOWS:</td></tr> <tr><td>E</td><td>- VOLTAGE</td></tr> <tr><td>I</td><td>- CURRENT</td></tr> <tr><td>P</td><td>- PNEUMATIC</td></tr> <tr><td>PD</td><td>- PULSE DURATION</td></tr> <tr><td>H</td><td>- HYDRAULIC</td></tr> <tr><td>O</td><td>- ELECTROMAGNETIC, SONIC</td></tr> <tr><td>R</td><td>- RESISTANCE (ELECTRIC)</td></tr> </table> | SIGNAL CONVERTER/ ISOLATOR | | *.* | (INPUT/OUTPUT) | * | DEFINED AS FOLLOWS: | E | - VOLTAGE | I | - CURRENT | P | - PNEUMATIC | PD | - PULSE DURATION | H | - HYDRAULIC | O | - ELECTROMAGNETIC, SONIC | R | - RESISTANCE (ELECTRIC) |
| SIGNAL CONVERTER/ ISOLATOR | | | | | | | | | | | | | | | | | | | | | |
| *.* | (INPUT/OUTPUT) | | | | | | | | | | | | | | | | | | | | |
| * | DEFINED AS FOLLOWS: | | | | | | | | | | | | | | | | | | | | |
| E | - VOLTAGE | | | | | | | | | | | | | | | | | | | | |
| I | - CURRENT | | | | | | | | | | | | | | | | | | | | |
| P | - PNEUMATIC | | | | | | | | | | | | | | | | | | | | |
| PD | - PULSE DURATION | | | | | | | | | | | | | | | | | | | | |
| H | - HYDRAULIC | | | | | | | | | | | | | | | | | | | | |
| O | - ELECTROMAGNETIC, SONIC | | | | | | | | | | | | | | | | | | | | |
| R | - RESISTANCE (ELECTRIC) | | | | | | | | | | | | | | | | | | | | |

| CONTROL ENCLOSURE, INSTRUMENTS AND SCADA | | |
|--|--------------------------------|---|
| PLC/RTU LOGIC | | |
| FUNCTION SYMBOLS AND ABBREVIATIONS | | |
| | K | PROPORTIONAL GAIN OR ATTENUATE (INPUT:OUTPUT) |
| | -K | REVERSE PROPORTIONAL GAIN OR ATTENUATE (INPUT:OUTPUT) |
| | Σ | SUMMING |
| | Σ/n | AVERAGING |
| | Δ | SUBTRACTING |
| | √ | EXTRACT SQUARE ROOT |
| | ÷ | DIVIDE |
| | X | MULTIPLY |
| | S | INTEGRATE |
| | + | BIAS POSITIVE |
| | - | BIAS NEGATIVE |
| | F(x) | NONLINEAR OR UNSPECIFIED FUNCTION |
| > symbol"/> | > | HIGH SELECT |
| < symbol"/> | < | LOW SELECT |
| symbol"/> | | HIGH LIMIT |
| symbol"/> | | LOW LIMIT |
| INSTRUMENT (COMMON HOUSING) | INSTRUMENT (SEPERATOR HOUSING) | INSTRUMENT (PART OF MAJOR EQUIPMENT) |
| | | |

- GENERAL NOTES:**
- THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT APPLY TO THIS SPECIFIC PROJECT.
 - THIS LEGEND APPLIES TO INSTRUMENTATION DIAGRAMS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.
 - IN GENERAL THIS LEGEND SHEET AND THE INSTRUMENTATION DIAGRAMS ARE BASED ON INTERNATIONAL SOCIETY OF AUTOMATION, STANDARDS FOR PRACTICES FOR INSTRUMENTATION, STANDARD S5.1 SOME MODIFICATIONS, ADDITIONS AND ALTERATIONS HAVE BEEN MADE AS REQUIRED TO ACCOMMODATE THE PROJECT REQUIREMENTS.
 - SOME PROCESS ITEMS, SUCH AS EQUIPMENT ISOLATION VALVES, BYPASS LINES, ETC., WHICH ARE NOT CRITICAL FOR AN UNDERSTANDING OF THE INSTRUMENTATION AND CONTROL FUNCTIONS ARE NOT SHOWN ON THE INSTRUMENTATION SHEETS.
 - SEE ELECTRICAL SHEETS AND SPECIFICATIONS FOR ADDITIONAL CONTROL AND INTERLOCK REQUIREMENTS FOR EQUIPMENT NOT SHOWN OR NOT PROVIDED BY THE INSTRUMENTATION SUPPLIER.
 - IN THE EVENT OF DISCREPANCY BETWEEN THE PROCESS & INSTRUMENTATION DIAGRAMS AND THE LOOP DIAGRAMS, THE INFORMATION FROM THE LOOP DIAGRAMS SHALL BE USED.

- HAND SWITCH ABBREVIATIONS:**
- HOA HAND/OFF/AUTO
 - HOR HAND/OFF/REMOTE
 - LOC LOCAL/OFF/COMPUTER
 - LOR LOCAL/OFF/REMOTE
 - LOS LOCKOUT STOP
 - OSC OPEN/STOP/CLOSE
 - RSL RAISE/STOP/LOWER
 - L/C LOCAL/COMPUTER
 - L/R LOCAL/REMOTE
 - O/C OPEN/CLOSE
 - S/S START/STOP
 - A/M AUTO/MANUAL
 - H/C HAND/COMPUTER
 - PB PUSHBUTTON

GENERAL NOTE

THIS IS A STANDARD LEGEND. SOME SYMBOLS MAY NOT APPEAR ON THE DRAWINGS.

GAI
Gupta & Associates, Inc. Houston, Texas 77006
CONSULTING ENGINEERING
Registration No. F-2593

FREESE NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

CITY OF HOUSTON
HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
LEGENDS & SYMBOLS-I

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 66 | OF 111 |

FILE PATH: C:\H878_Sim South WTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_I-02.dwg

PLOT STYLE: GAI.ctb

PLOTTED: 10/29/2025 4:40 PM

| LINE SYMBOLS | |
|--------------|---|
| | MAJOR PROCESS LINE |
| | MINOR PROCESS LINE |
| | FUTURE PROCESS LINE |
| | EXISTING PROCESS LINE |
| | HARDWIRED SIGNAL |
| | SOFT LINK |
| | HYDRAULIC LINK |
| | PNEUMATIC LINK |
| | CAPILLARY TUBE OR FILLED SYSTEM SIGNAL |
| | ELECTROMAGNET OR SONIC SIGNAL (GUIDED) |
| | (USED WHEN REFERRING TO A SHEET IN THE DESIGN SET) DESCRIPTION - WHERE FLOW IS GOING SHEET# - WHAT SHEET PROCESS CONTINUES ON X - USED WHEN TWO OR MORE ARROWS ARE REFERRING TO THE SAME SHEET. Y - USED WHEN TWO OR MORE ARROWS ARE REFERRING TO THE SAME SHEET. |
| | (USED WHEN REFERRING TO A SHEET NOT IN THE DESIGN SET) DESCRIPTION - WHERE FLOW IS GOING |
| | CAT-5e ETHERNET CABLE |
| | CAT-6 ETHERNET CABLE |
| | MODBUS PLUS CABLE |
| | RS-485 CABLE |
| | RS-232 CABLE |
| | POWER OVER ETHERNET CABLE |
| | T1 FIBER CONNECTION |
| | NON-SPECIFIC FIBER OPTIC CABLE |
| | FIBER 100BASE-FX |
| | FIBER 1000BASE-FX |
| | SIGNAL CROSSING |
| | PROCESS LINE CROSSING |
| | PROCESS LINE/ HARDWIRE SIGNAL CROSSING |

| EQUIPMENT/LOOP TAGGING | |
|---------------------------------|--|
| | EQUIPMENT TAG USED TO IDENTIFY NON-INSTRUMENT EQUIPMENT |
| | LOOP TAG USED TO TIE THE PROCESS FLOW DIAGRAM TO A LOOP DIAGRAM |
| STANDARD VALVE AND PIPING USAGE | |
| | BLOCK/BLEED VALVE ARRANGEMENT |
| | INSTRUMENTS WITH VALVE ONLY |
| | INSTRUMENTS WITH DIAPHRAGM SEAL |
| | INSTRUMENTS WITH ANNULAR SEAL |
| PANEL DETAIL SYMBOLS | |
| | INDICATING LIGHT -R RED (ACTIVE EQUIPMENT) -G GREEN (EQUIPMENT OFF) -W WHITE (POWER) -B BLUE (CONDITION IE BACKWASH IN PROGRESS) -A AMBER (ALARM CONDITION) |
| | SWITCH -L/R (LOCAL - REMOTE) -L/O/A (LOCAL - OFF - AUTO) -L/O/R (LOCAL - OFF - REMOTE) -H/O/A (HAND - OFF - AUTO) -H/O/R (HAND - OFF - REMOTE) |
| | PUSHBUTTON |
| | PUSHBUTTON |
| | HORN |
| | BEACON |
| | OPERATOR INTERFACE TERMINAL |
| SECURITY SYSTEM SYMBOLS | |
| | CLOSED CIRCUIT TELEVISION CAMERA |
| | PAN, TILT, ZOOM CAMERA |

| GENERAL ABBREVIATIONS | |
|-----------------------|---|
| AI | ANALOG INPUT |
| AL | ALARM PILOT LIGHT |
| AO | ANALOG OUTPUT |
| AS | AIR SUPPLY |
| ASP | APPLICATION SERVICE PROVIDER |
| BFV | BUTTERFLY VALVE |
| CCTV | CLOSED CIRCUIT TELEVISION |
| CH4 | METHANE |
| CL2 | CHLORINE |
| COND | CONDUCTIVITY |
| COMP | COMPUTER |
| CP | CONTROL PANEL |
| CPU | CENTRAL PROCESSING UNIT |
| CRC | CONTROL ROOM CONSOLE |
| CTU | CENTRAL TELEMTRY UNIT |
| DCU | DISTRIBUTED CONTROL UNIT |
| DI | DIGITAL OR DISCRETE INPUT |
| DO | DISSOLVED OXYGEN OR DIGITAL OUTPUT |
| DPU | DISTRIBUTED PROCESSING UNIT |
| EPP | ETHERNET PATCH PANEL |
| ES | EMERGENCY STOP |
| ESW | ETHERNET SWITCH |
| ETM | ELAPSED TIME METER |
| FC | FAIL CLOSED |
| FCP | FIELD CONTROL PANEL |
| FCS | FILTER CONTROL STATION |
| FCV | FLOW CONTROL VALVE |
| FLP | FAIL LAST POSITION |
| FO | FAIL OPEN |
| FOPP | FIBER OPTIC PATCH PANEL |
| FPR | FEEDER PROTECTION RELAY |
| H2S | HYDROGEN SULFIDE |
| HMI | HUMAN MACHINE INTERFACE |
| JB | JUNCTION BOX |
| IO | INPUT/OUTPUT |
| IR | INFARED |
| LAS | LIQUID AMMONIA SULFATE |
| LCP | LOCAL CONTROL PANEL |
| LCS | LOCAL CONTROL STATION |
| LPU | LOCAL PROCESSING UNIT |
| LTS | LOCAL TERMINAL SYSTEM |
| MC | MOTOR CONTROLLER |
| NAOCL | SODIUM HYPOCHLORIDE |
| NC | NORMALLY CLOSED |
| NH3 | AMMONIA |
| NIM | NETWORK INTERFACE MODULE |
| NO | NORMALLY OPEN |
| MCC | MOTOR CONTROL CENTER |
| MM | MULTI MODE FIBER OPTIC CABLE |
| MPR | MOTOR PROTECTION RELAY |
| OIT | OPERATIONS INTERFACE TERMINAL |
| OL | OVERLOAD |
| OWS | OPERATOR WORKSTATION |
| PB | PUSH BUTTON |
| PCSI | PROCESS CONTROL SYSTEM INTEGRATOR |
| pH | HYDROGEN ION |
| PLC | PROGRAMMABLE LOGIC CONTROLLER |
| PMCS | PROCESS MONITORING CONTROL SYSTEM |
| POLY | POLYMER |
| PQM | POWER QUALITY METER |
| PS | POWER SUPPLY |
| PSU | POWER SUPPLY UNIT |
| PV | PINCH VALVE |
| RBC | REMOTE BASE CONTROLLER |
| RIO | REMOTE INPUT OUTPUT |
| RTU | REMOTE TERMINAL UNIT |
| SCADA | SUPERVISORY CONTROL AND DATA AQUISITION |
| SM | SINGLE MODE FIBER OPTIC CABLE |
| SO2 | SULFUR DIOXIDE |
| SOL | SOLENOID |
| SPD | SURGE PROTECTION DEVICE |
| UPS | UNINTERRUPTIBLE POWER SUPPLY |
| TC | TERMINATION CABINET |
| TURB | TURBIDITY |
| VIB | VIBRATION |
| VFD | VARIABLE FREQUENCY DRIVE |
| VLV | VALVE |

| MEANINGS OF IDENTIFICATION LETTERS | | | | | |
|--|------------------------------------|-----------------------|-----------------------------|--|------------------------|
| THIS TABLE APPLIES ONLY TO THE FUNCTIONAL IDENTIFICATION OF INSTRUMENTS. | | | | | |
| | FIRST LETTER | | SUCCEEDING LETTERS | | |
| | MEASURED OR INITIATING VARIABLE | MODIFIER | READOUT OR PASSIVE FUNCTION | OUTPUT FUNCTION | MODIFIER |
| A | ANALYSIS/ANALYTICAL | | ALARM | | |
| B | BURNER, COMBUSTION | | | | |
| C | CONDUCTIVITY | | | CONTROL | |
| D | DENSITY (MASS) OR SPECIFIC GRAVITY | DIFFERENTIAL | | | |
| E | VOLTAGE (EMF) | | PRIMARY ELEMENT | | |
| F | FLOW RATE | RATIO (FRACTION) | | | |
| G | GAUGING (DIMENSIONAL) | | GLASS VIEWING DEVICE | | |
| H | HAND | | | | HIGH OR OPEN |
| I | CURRENT (ELECTRICAL) | | INDICATE | | |
| J | POWER | SCAN | | | |
| K | TIME OR TIME SCHEDULE | | | CONTROL STATION | |
| L | LEVEL | | LIGHT (PILOT) | | LOW OR CLOSED |
| M | MOISTURE OR HUMIDITY | | | | MIDDLE OR INTERMEDIATE |
| N | USERS CHOICE | | USER'S CHOICE | | USER'S CHOICE |
| O | USER'S CHOICE | | ORIFICE (RESTRICTION) | | |
| P | PRESSURE OR VACUUM | | POINT (TEST CONNECTION) | | |
| Q | QUANTITY | INTEGRATE OR TOTALIZE | | | |
| R | RADIATION | | RECORD | | |
| S | SPEED OR FREQUENCY | SAFETY | | SWITCH | |
| T | TEMPERATURE | | | TRANSMIT | |
| U | MULTIVARIABLE | | MULTIFUNCTION | MULTIFUNCTION | MULTIFUNCTION |
| V | VIBRATION | | | VALVE, DAMPER OR LOUVER | |
| W | WEIGHT OR FORCE | | WELL | | UNCLASSIFIED |
| X | UNCLASSIFIED | X AXIS | UNCLASSIFIED | UNCLASSIFIED | UNCLASSIFIED |
| Y | EVENT, STATE | Y AXIS | | RELAY, COMPUTE, CONVERT | |
| Z | POSITION, DIMENSION | Z AXIS | | DRIVE, ACTUATE OR UNCLASSIFIED CONTROL ELEMENT | |

| COMMON HMI/INSTRUMENT ISA TAGGING | |
|-----------------------------------|-----------------------------------|
| ABBREVIATION | MEANING |
| AIT | ANALYTICAL INDICATING TRANSMITTER |
| AE | ANALYTICAL ELEMENT |
| AI | CHEMICAL RESIDUAL/INDICATION |
| FIT | FLOW INDICATING TRANSMITTER |
| FE | FLOW ELEMENT |
| FI | FLOW INDICATION |
| HS | HAND SWITCH |
| JAL | POWER ALARM LOW |
| II | CURRENT INDICATION |
| LIT | LEVEL INDICATING TRANSMITTER |
| LE | LEVEL ELEMENT |
| LI | LEVEL INDICATION |
| LSH | LEVEL SWITCH HIGH |
| LSL | LEVEL SWITCH LOW |
| LAL | LEVEL ALARM LOW |
| LAH | LEVEL ALARM HIGH |
| PIT | PRESSURE INDICATING TRANSMITTER |
| PE | PRESSURE ELEMENT |
| PI | PRESSURE INDICATION |
| PSH | PRESSURE SWITCH HIGH |
| PSL | PRESSURE SWITCH HIGH |

| COMMON HMI/INSTRUMENT ISA TAGGING | |
|-----------------------------------|------------------------------------|
| ABBREVIATION | MEANING |
| SI | SPEED INDICATION |
| SIC | SPEED INDICATING CONTROLLER |
| TIT | TEMPERATURE INDICATING TRANSMITTER |
| TE | TEMPERATURE ELEMENT |
| TI | TEMPERATURE INDICATION |
| TSH | TEMPERATURE SWITCH HIGH |
| WIT | WEIGHT INDICATING TRANSMITTER |
| WE | WEIGHT ELEMENT |
| WI | WEIGHT INDICATION |
| YL | MISC. EVENT LIGHT (IN REMOTE) |
| ZCH | OPEN GATE/VALVE |
| ZCL | CLOSE GATE/VALVE |
| ZSH | POSITION SWITCH HIGH |
| ZSL | POSITION SWITCH LOW |
| ZLH | VALVE/GATE OPEN |
| ZLL | VALVE/GATE CLOSED |
| ZIT | POSITION INDICATING TRANSMITTER |

GENERAL NOTE
THIS IS A STANDARD LEGEND. SOME SYMBOLS MAY NOT APPEAR ON THE DRAWINGS.

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St.
Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

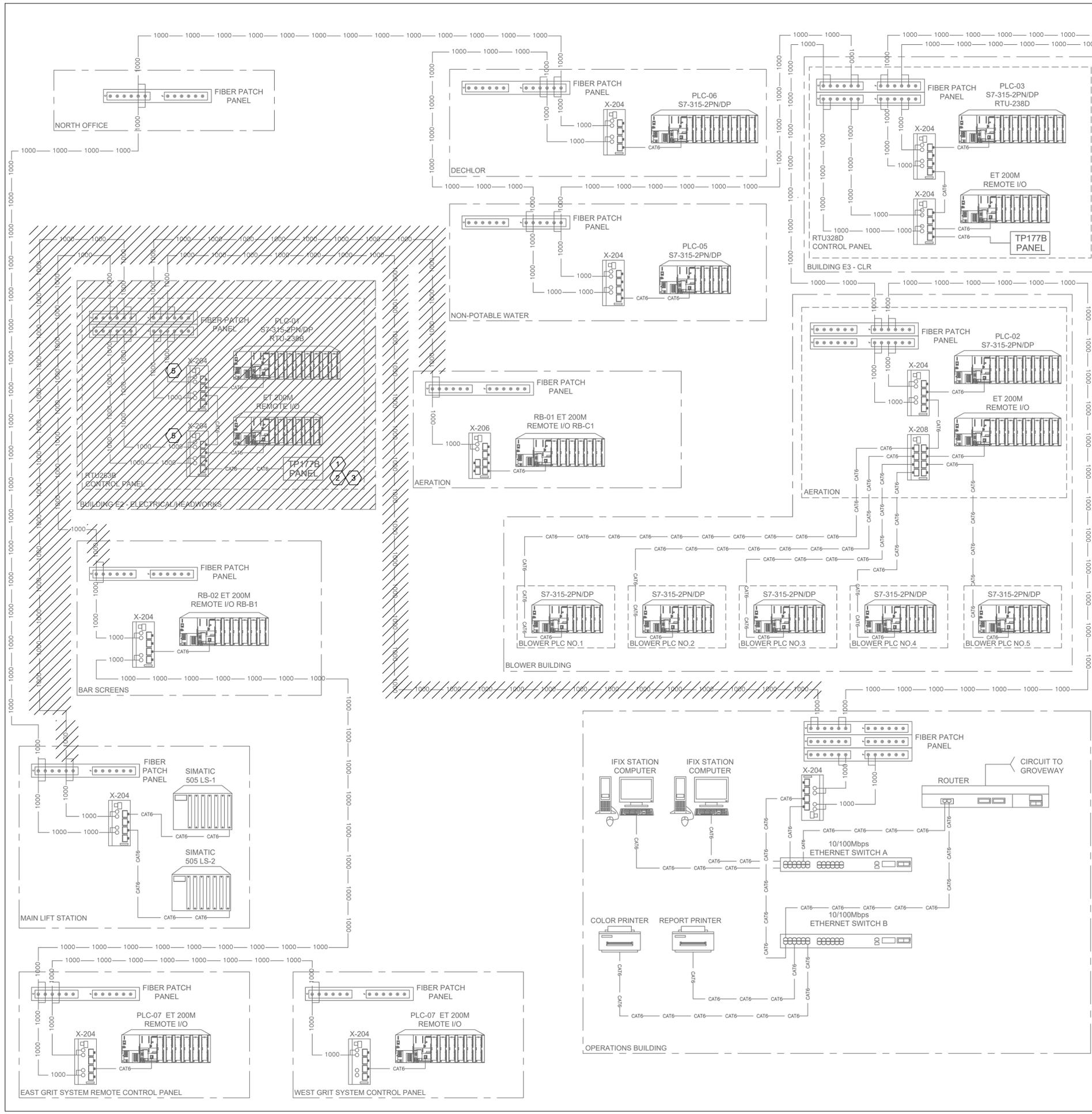
This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

**SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
LEGENDS & SYMBOLS-II**

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 67 OF 111 | |



RTU283B
CONTROL PANEL DEMOLITION
PHOTOGRAPH 1

- NOTES BY SYMBOL (#):
- CONTRACTOR SHALL DEMOLISHED EXISTING CONTROL PANEL, INCLUDING ASSOCIATED FIBER OPTIC CABLES AND REPLACED IT WITH NEW WITH SIEMENS S7-1500 PLC CONTROL PANEL AND 24 STRANDS FIBER OPTIC CABLES.
 - PRIOR TO DEMOLISHED EXISTING PLC CONTROL PANEL, CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING WIRES, CONDUITS, J-BOXES, FIELD DEVICES AND EQUIPMENT. CONTRACTOR SHALL REPLACE ALL EXISTING CONTROLS AND SIGNAL WIRES, INCLUDING PROVIDES NEW AND EXTEND EXISTING CONDUITS TO NEW RTU283B CONTROL PANEL LOCATED IN PROPOSED E2 ELECTRICAL BUILDING AS REQUIRED.
 - CONTRACTOR TO COORDINATE WITH SOFTWARE ENGINEER (SE) TO REVIEW EXISTING I/O DATABASE AND PROVIDE NEW SIGNALS AS REQUIRED.
 - CONTRACTOR SHALL COORDINATE WITH THE OWNER FOR DISCARD OR SALVAGE THESE EQUIPMENT.
 - CONTRACTOR SHALL PROVIDE TEMPORARY FIBER OPTIC ETHERNET SWITCHES FOR COMMUNICATION WITH THE EXISTING PLANT NETWORK, WHILE EQUIPMENT BEING DEMOLISHED.

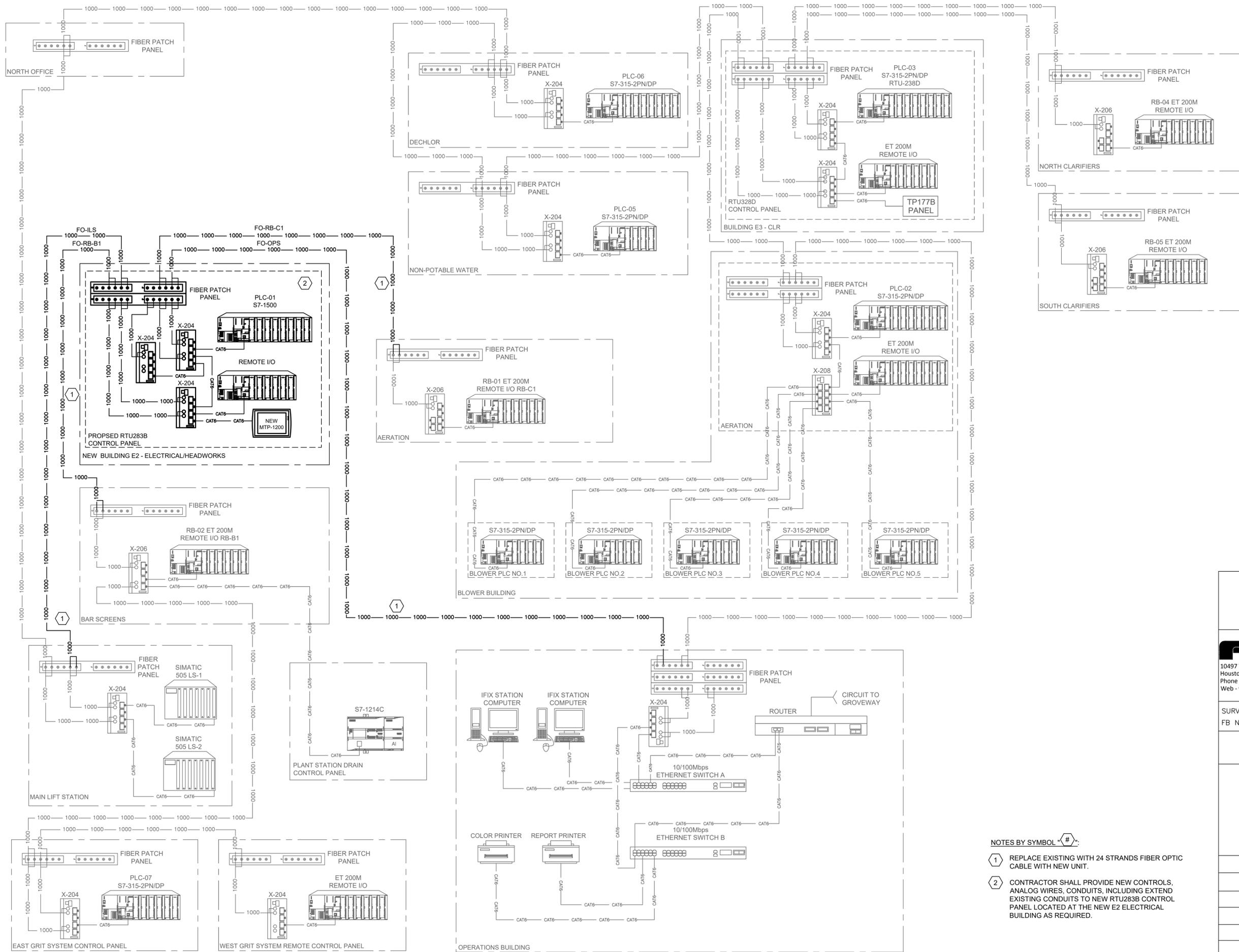
GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
Tel: 713-636-2936
CONSULTING ENGINEERING Fax: 713-636-2987
Registration No. F-2593 email: hforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500 Houston, Texas 77024
Phone - (713) 600-6800 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

| | |
|---|------------------------------|
| CITY OF HOUSTON HOUSTON PUBLIC WORKS | |
| SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS INSTRUMENTATION EXISTING PLANT NETWORK DIAGRAM | |
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 68 | OF 111 |



- NOTES BY SYMBOL *#:**
- ① REPLACE EXISTING WITH 24 STRANDS FIBER OPTIC CABLE WITH NEW UNIT.
 - ② CONTRACTOR SHALL PROVIDE NEW CONTROLS, ANALOG WIRES, CONDUITS, INCLUDING EXTEND EXISTING CONDUITS TO NEW RTU283B CONTROL PANEL LOCATED AT THE NEW E2 ELECTRICAL BUILDING AS REQUIRED.

GAI
 Gupta & Associates, Inc.
 CONSULTING ENGINEERING
 Registration No. F-2593

302 Dennis St.
 Houston, Texas 77006
 Tel: 713-636-2936
 Fax: 713-636-2987
 email: hforouzan@gaiconsulting.com

This document is released for interim review & not intended for construction, bidding or permit purposes by

HOSS FOROUZAN
 TEXAS P.E. No. 77748

OCTOBER 2025
 DATE

SURVEYED BY:
 FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

**SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 INSTRUMENTATION
 PROPOSED PLANT
 NETWORK DIAGRAM**

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 69 OF 111 | |

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: GAI.ctb

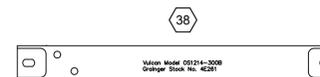
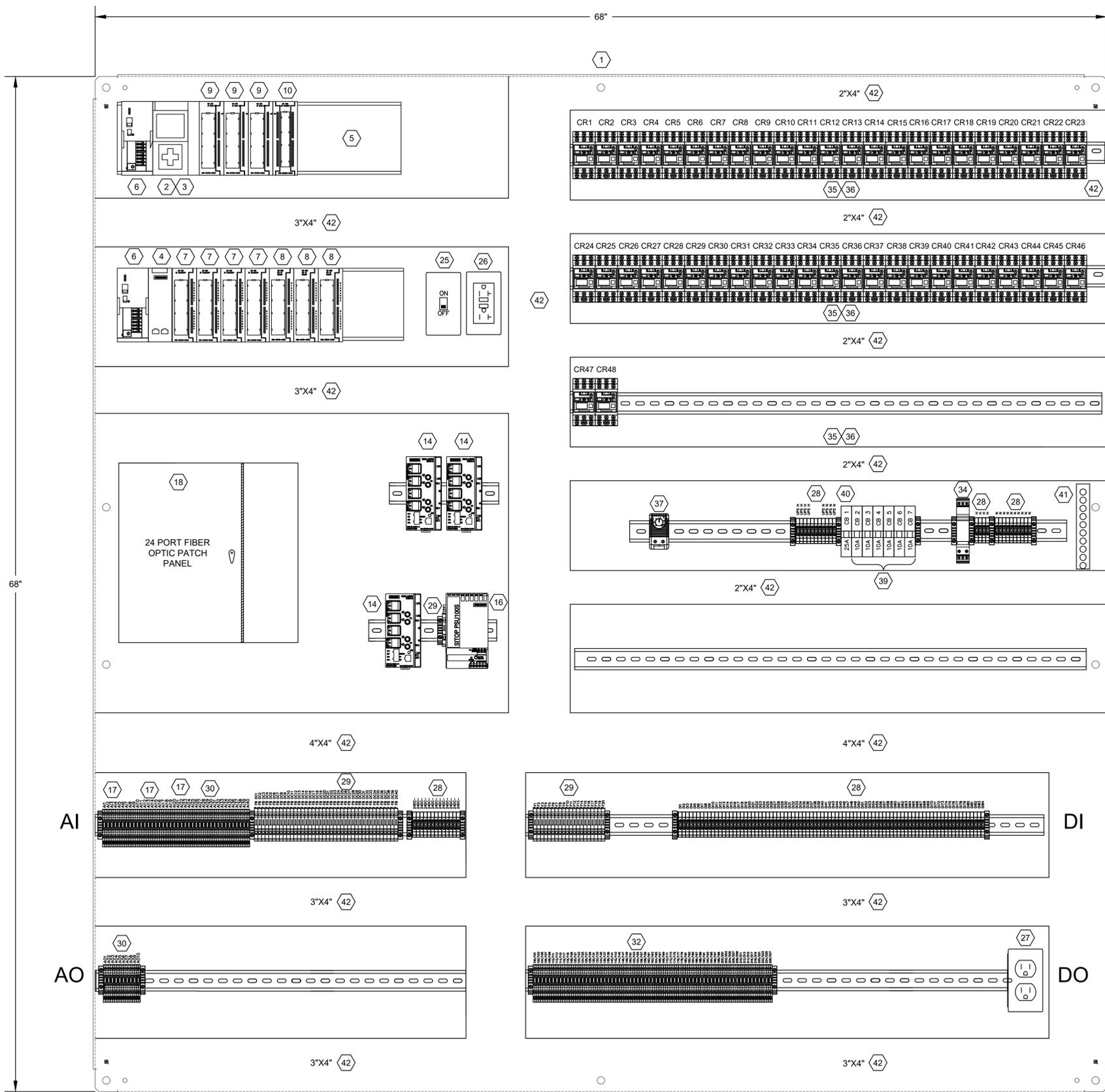
FILE PATH: C:\H878_Sim South WWTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-05.dwg

| HEADWORKS (RTU-283B) EQUIPMENT & DEVICE SCHEDULE | | | | |
|--|----------|---|-----------------|---------------------|
| ITEM | QUANTITY | DESCRIPTION | MFG. | MODEL NO. |
| 1 | 1 | STEEL BACK PANEL FOR FREE STANDING ENCLOSURE | HOFFMAN | A72P72F1 |
| 2 | 1 | SIMATIC S7-1500, CPU 1516-3 PN/DP, 1MB PROG., 5 MB DATA | SIEMENS | 6ES7516-3AN02-0AB0 |
| 3 | 1 | MICRO MEMORY CARD 12 MB | SIEMENS | 6ES7 954-8LE03-0AA0 |
| 4 | 1 | ET 200MP, IM155-5 PROFINET INTERFACE MODULE | SIEMENS | 6ES7 155-5AA01-0AB0 |
| 5 | 2 | 19" PLC RAIL RACK | SIEMENS | 6ES7 390-1AE80-0AA0 |
| 6 | 2 | 24 VDC, 115/230V 8A POWER SUPPLY | SIEMENS | 6ES7 1333-4BA00 |
| 7 | 4 | 16-PT 24VDC DISCRETE INPUT MODULE | SIEMENS | 6ES7 521-1BH00-0AB0 |
| 8 | 3 | 16-PT 24VDC OUTPUT MODULE | SIEMENS | 6ES7 522-1BH01-0AB0 |
| 9 | 3 | 8-CHANNEL ANALOG INPUT MODULE | SIEMENS | 6ES7 531-7KF00-0AB0 |
| 10 | 1 | 8-CHANNEL ANALOG OUTPUT MODULE | SIEMENS | 6ES7532-5HF00-0AB0 |
| 11 | 7 | FRONT CONNECTOR, 16-PIN FOR DISCRETE I/O MODULES | SIEMENS | 6ES7 592-1AM00-0XB0 |
| 12 | 4 | FRONT CONNECTOR, 16-PIN AI & AO MOD | SIEMENS | 6ES7 921-5KA20-0AA0 |
| 13 | 1 | 12" COLOR TOUCH PANEL COMFORT KP-1200 | SIEMENS | 6AV2124-1MC01-0AX0 |
| 14 | 3 | IND MGD ETHERNET SWITCH, 4RJ, 2FOST | SIEMENS | 6GK5 204-2BB10-2AA3 |
| 15 | - | NOT USED. | - | - |
| 16 | 1 | SMART 24VDC POWER SUPPLY, 10A | SIEMENS | 6EP1 331-2AA01 |
| 17 | 18 | ANALOG SURGE PROTECTOR FOR FIELD DEVICES | PHOENIX CONTACT | - |
| 18 | 1 | 24-PORT FIBER OPTIC PATCH PANEL, ST | AWC AUTOMATION | PB-24ST-WM |
| 19 | 5 | DUPLEX FO JUMPER CABLE, ST 3-FT. | AWC AUTOMATION | CBL-2STST-3 |
| 20 | 5 | CAT6 CABLE, RJ45, 3-FT. | L CON | TRD695SCR-3 |
| 21 | 1 | UPS TOWER POWER SUPPLY | POWERWARE | PW9130-1000T |
| 22 | 1 | EXTENDED BATTERY MODULE | POWERWARE | PW9130-1000T-EBM |
| 23 | 1 | RELAY CARD FOR PW9130 | POWERWARE | PW1014018-RELAY |
| 24 | * | NOT USED. | - | - |
| 25 | 1 | SINGLE POLE SWITCH 20A, 120/277VAC | PASS & SEYMOUR | CS20AC1-1 |
| 26 | 1 | GFCI DUPLEX RECEPTACLE TRIP INDICATOR LIGHT 20A, 125VAC, 60Hz | PASS & SEYMOUR | 2095-1 |
| 27 | 1 | DUPLEX RECEPTACLE TRIP INDICATOR LIGHT 20A, 125VAC, 60Hz | PASS & SEYMOUR | PT53621 |

* - AS SCHEDULED

| BLOWER BUILDING (RTU-283B) EQUIPMENT & DEVICE SCHEDULE | | | | |
|--|----------|---|-----------------|---------------------------|
| ITEM | QUANTITY | DESCRIPTION | MFG. | MODEL NO. |
| 28 | 1 | STEEL BACK PANEL FOR FREE STANDING ENCLOSURE | PHOENIX CONTACT | 3001035 |
| 29 | 60 | FUSED TERMINAL UT 4-HESI | PHOENIX CONTACT | 3046032 |
| 30 | 50 | DUAL TERMINAL BLOCK W/GROUND | PHOENIX CONTACT | 2717139 |
| 31 | 2 | DUAL TERMINAL BLOCK W/GROUND END | PHOENIX CONTACT | 1413272 |
| 32 | 70 | DUAL TERMINAL BLOCK | PHOENIX CONTACT | 3044636 |
| 33 | 1 | DUAL TERMINAL BLOCK END PLATE | PHOENIX CONTACT | - |
| 34 | 1 | 120VAC SURGE PROTECTOR W/DRY RELAY CONTACT & BASE PT2-PE/S120VAC-ST | PHOENIX CONTACT | 2839334 W/BASE 2839282 |
| 35 | 48 | 24VDC 3 POLE CONTROL RELAYS SPDT | TURCK | C3-A30X/24VDC |
| 36 | 48 | 3 POLE RELAY BASE | TURCK | S3-S |
| 37 | 1 | DIN RAIL THERMOSTAT | INGRAM | (1) HTS |
| 38 | 1 | STRIP HEATER | VULCAN | OS1214-300B |
| 39 | 6 | 1 POLE 10 AMP CIRCUIT BREAKER 240VAC MAX | CHINT | NB1-B10-1P |
| 40 | 1 | 1 POLE 25 AMP CIRCUIT BREAKER 240VAC MAX | CHINT | NB1-B25-1P |
| 41 | 1 | GROUND BAR | SQUARE D | PK9GTA |
| 42 | LOT | TYPE F NARROW SLOT WIRING DUCT | PANDUIT | F2X4WH6, F3X4WH6, F4X4WH6 |

| | |
|--|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: forouzan@gaiconsulting.com</p> | |
| <p>FREESE & NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS INSTRUMENTATION HEADWORKS/RAS (RTU283B) EQUIPMENT LAYOUT & SCHEDULE</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 70 OF 111</p> | |
| <p>I-05</p> | |

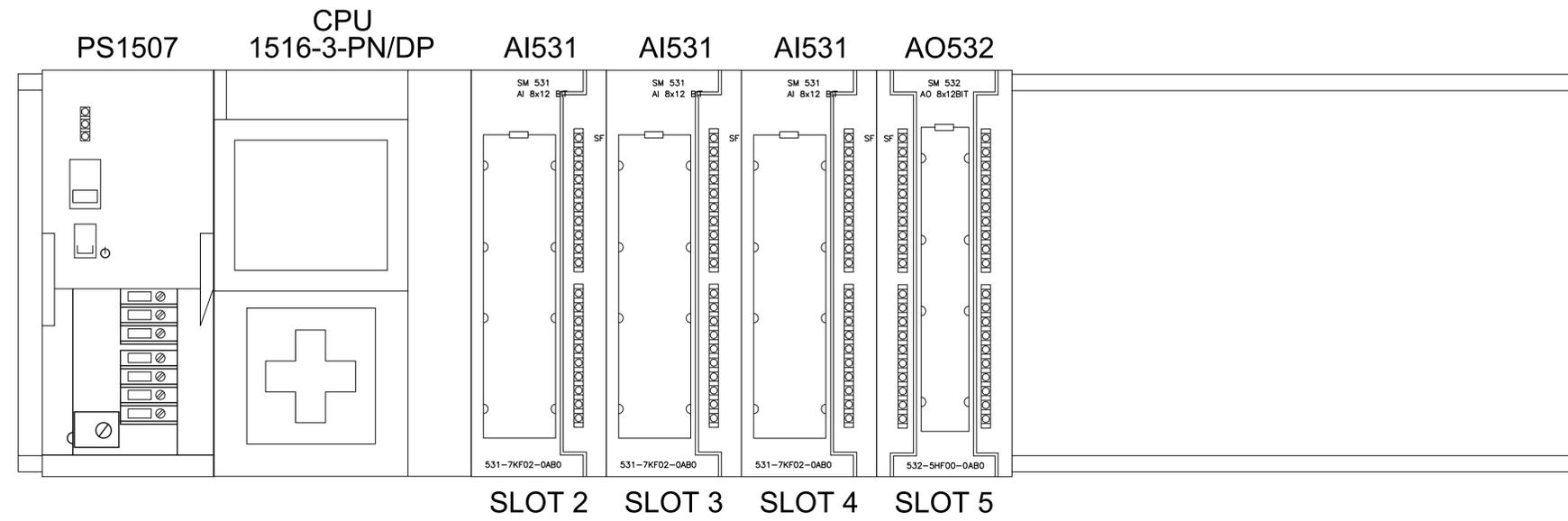


GENERAL NOTES:

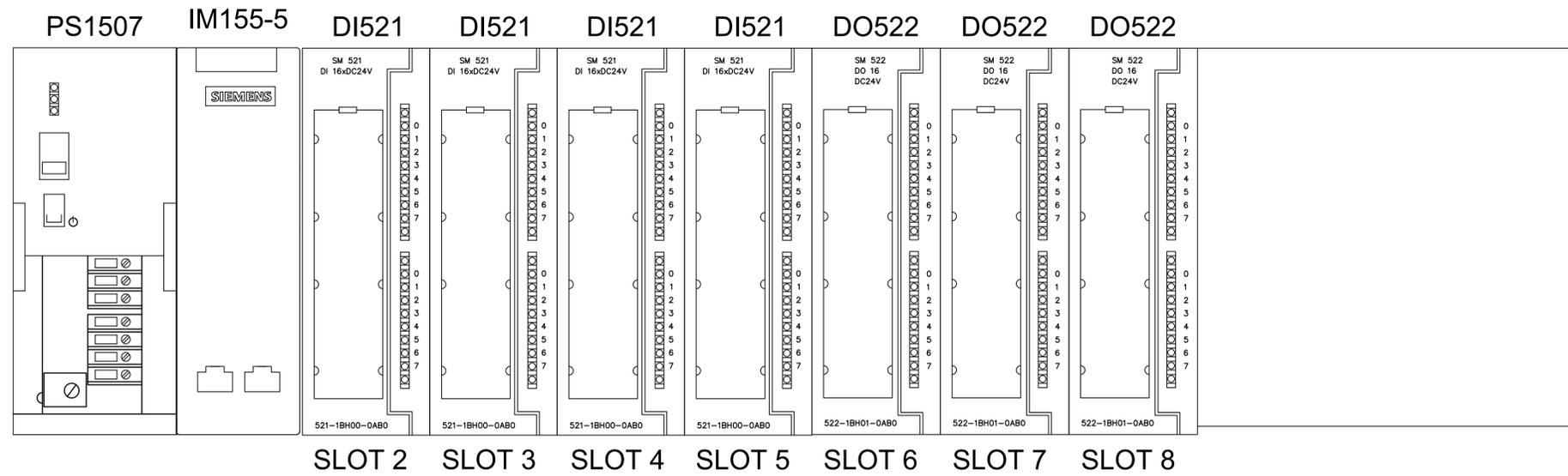
- 1. REFER TO SHEET I-29 FOR EQUIPMENT SCHEDULE

| | |
|--|------------------------------|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: Info@gaiconsulting.com</p> | |
| <p>FREESE NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | |
| <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748 OCTOBER 2025 DATE</p> | |
| <p>SURVEYED BY: FB NO. P-</p> | |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS INSTRUMENTATION HEADWORKS/RAS (RTU283B) EQUIPMENT LAYOUT-I</p> | |
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 71 | OF 111 |

RACK NO.1



RACK NO.2



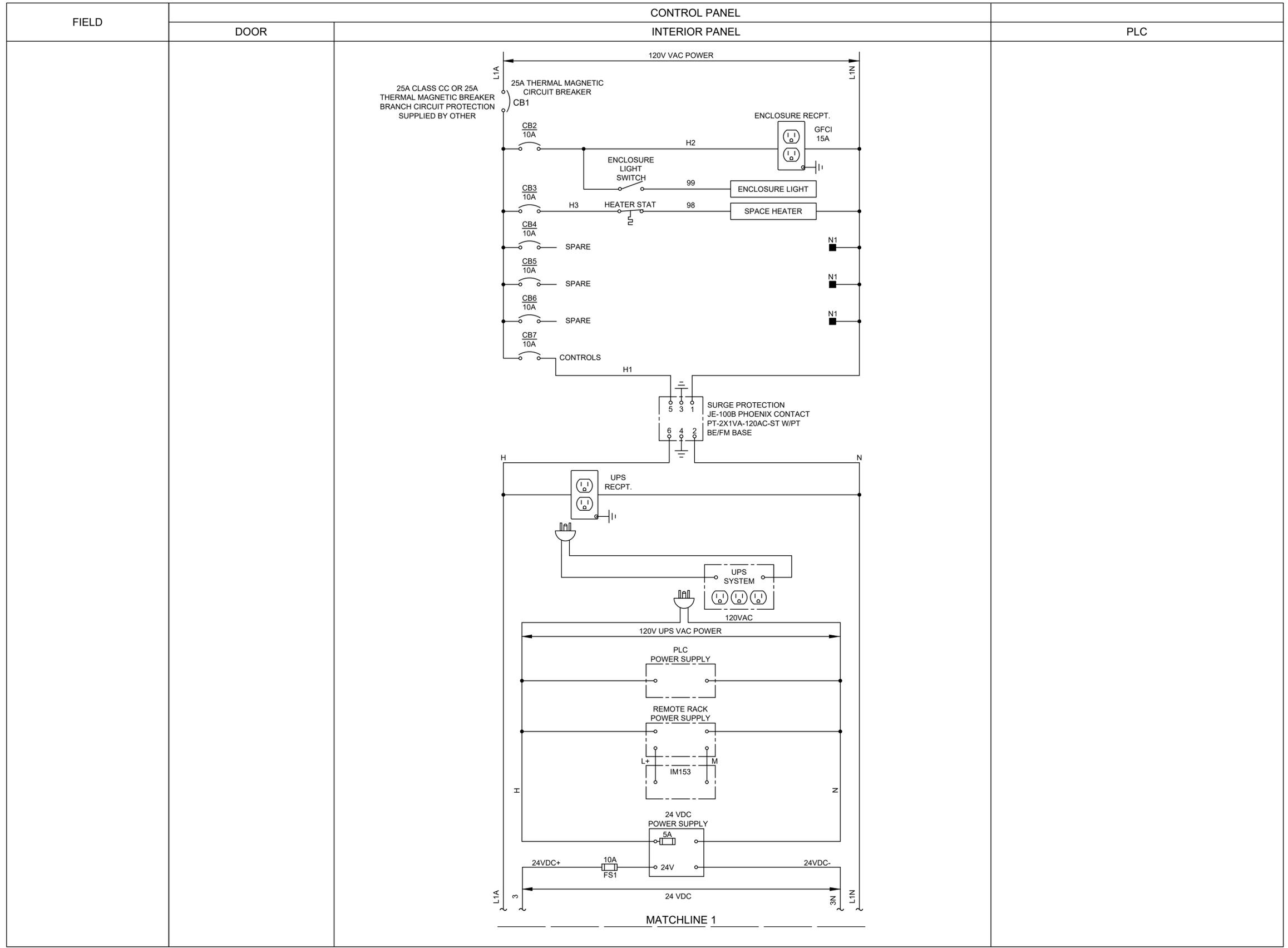
| | |
|---|---|
| <p>GAI Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006 CONSULTING ENGINEERING Tel: 713-636-2936 Registration No. F-2593 Fax: 713-636-2987 email: hforouzan@gaiconsulting.com</p> | |
| <p>FREESE NICHOLS 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com</p> | <p>This document is released for interim review & not intended for construction, bidding or permit purposes by HOSS FOROUZAN TEXAS P.E. No. 77748</p> |
| <p>SURVEYED BY: FB NO. P-</p> | <p>OCTOBER 2025 DATE</p> |
| <p>CITY OF HOUSTON HOUSTON PUBLIC WORKS</p> | |
| <p>SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS INSTRUMENTATION HEADWORKS/RAS (RTU283B) EQUIPMENT LAYOUT-II</p> | |
| <p>WBS NUMBER R-000265-0146-3</p> | <p>FOR CITY OF HOUSTON USE ONLY</p> |
| <p>DRAWING SCALE NTS</p> | |
| <p>CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE</p> | |
| <p>SHEET NO. 72 OF 111</p> | |

FILE PATH: C:\H878_Sim South WWTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_I-07.dwg
 PLOT STYLE: GAI.ctb
 PLOTTED: 10/29/2025 4:40 PM

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WWTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-08.dwg



- LEGEND**
- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

GAI
 Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
 CONSULTING ENGINEERING Tel: 713-636-2936
 Registration No. F-2593 Fax: 713-636-2987
 email: hforouzan@gaiconsulting.com

FREESE NICHOLS
 10497 Town and Country Way, Suite 500 Houston, Texas 77024
 Phone - (713) 600-6800 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
 HOSS FOROUZAN TEXAS P.E. No. 77748
 OCTOBER 2025 DATE

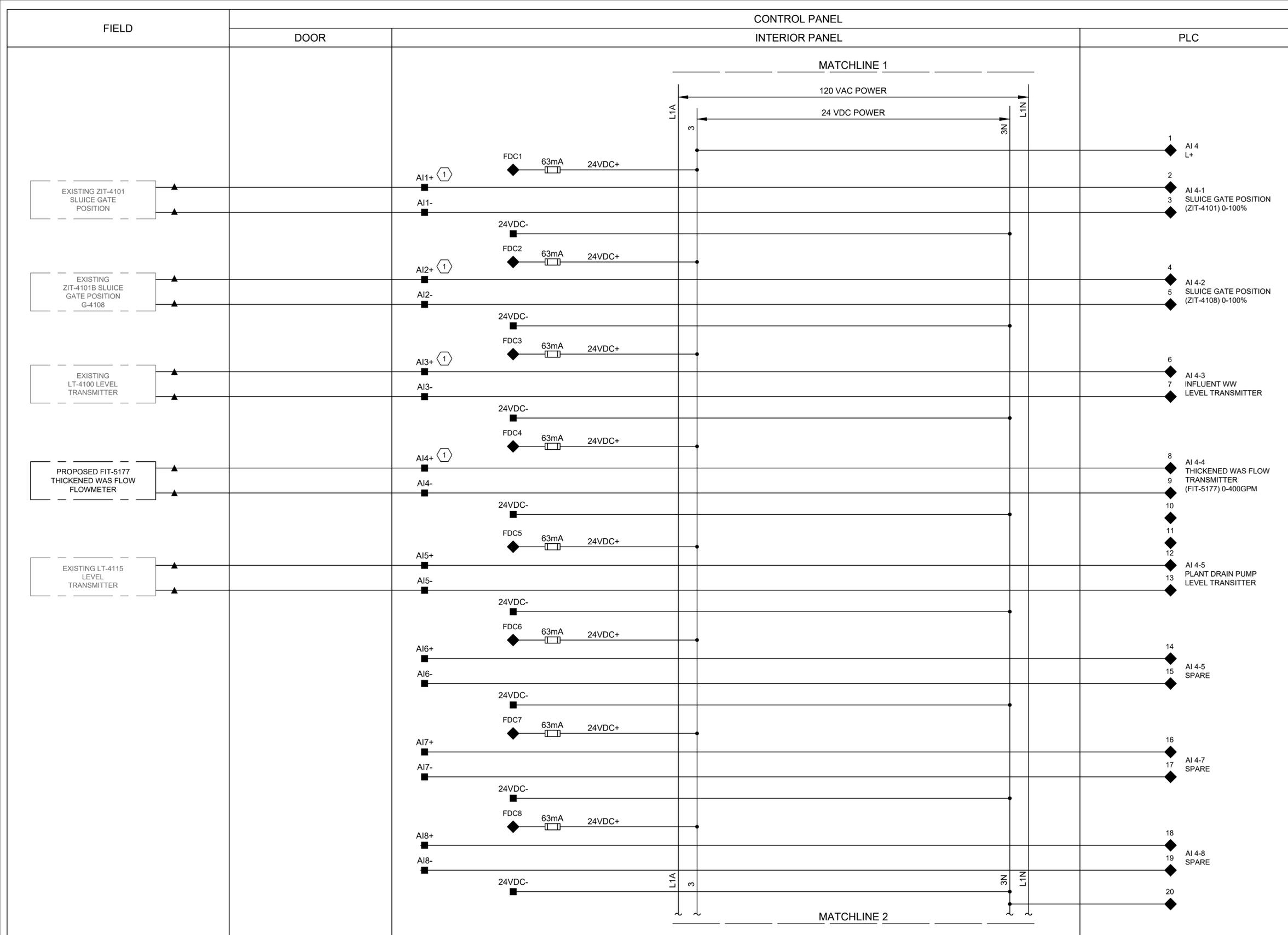
SURVEYED BY:
 FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 INSTRUMENTATION
 HEADWORKS/RAS (RTU283B)
 CONTROL WIRING DIAGRAM-I

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 73 OF 111 | |

FILE PATH: C:\H878_Sim South WTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-09.dwg
 PLOT STYLE: GAI.ctb
 PLOTTED: 10/29/2025 4:40 PM



- LEGEND**
- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

NOTES:

- ① ANALOG SURGE PROTECTOR.

GAI
 Gupta & Associates, Inc.
 CONSULTING ENGINEERING
 Registration No. F-2593

302 Dennis St.
 Houston, Texas 77006
 Tel: 713-636-2936
 Fax: 713-636-2987
 email: mforouzan@gaiconsulting.com

FREESE & NICHOLS
 10497 Town and Country Way, Suite 500
 Houston, Texas 77024
 Phone - (713) 600-6800
 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
 HOSS FOROUZAN
 TEXAS P.E. No. 77748
 OCTOBER 2025
 DATE

SURVEYED BY:
 FB NO. P-

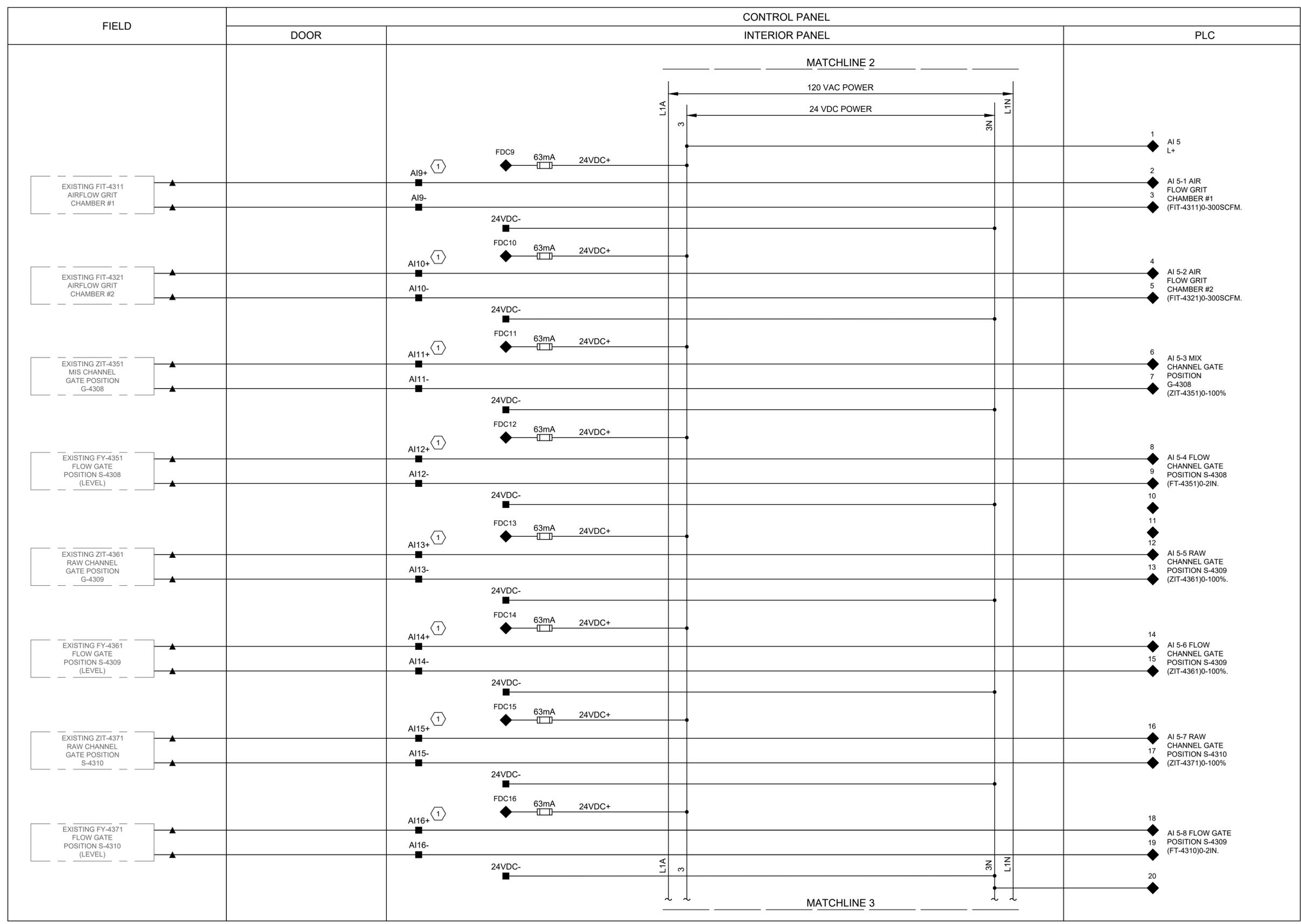
CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 INSTRUMENTATION
 HEADWORKS/RAS (RTU283B)
 CONTROL WIRING DIAGRAM-II

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 74 OF 111 | |

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WWTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-10.dwg



- LEGEND**
- ▲ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

NOTES:

- ① ANALOG SURGE PROTECTOR.

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St., Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: mforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

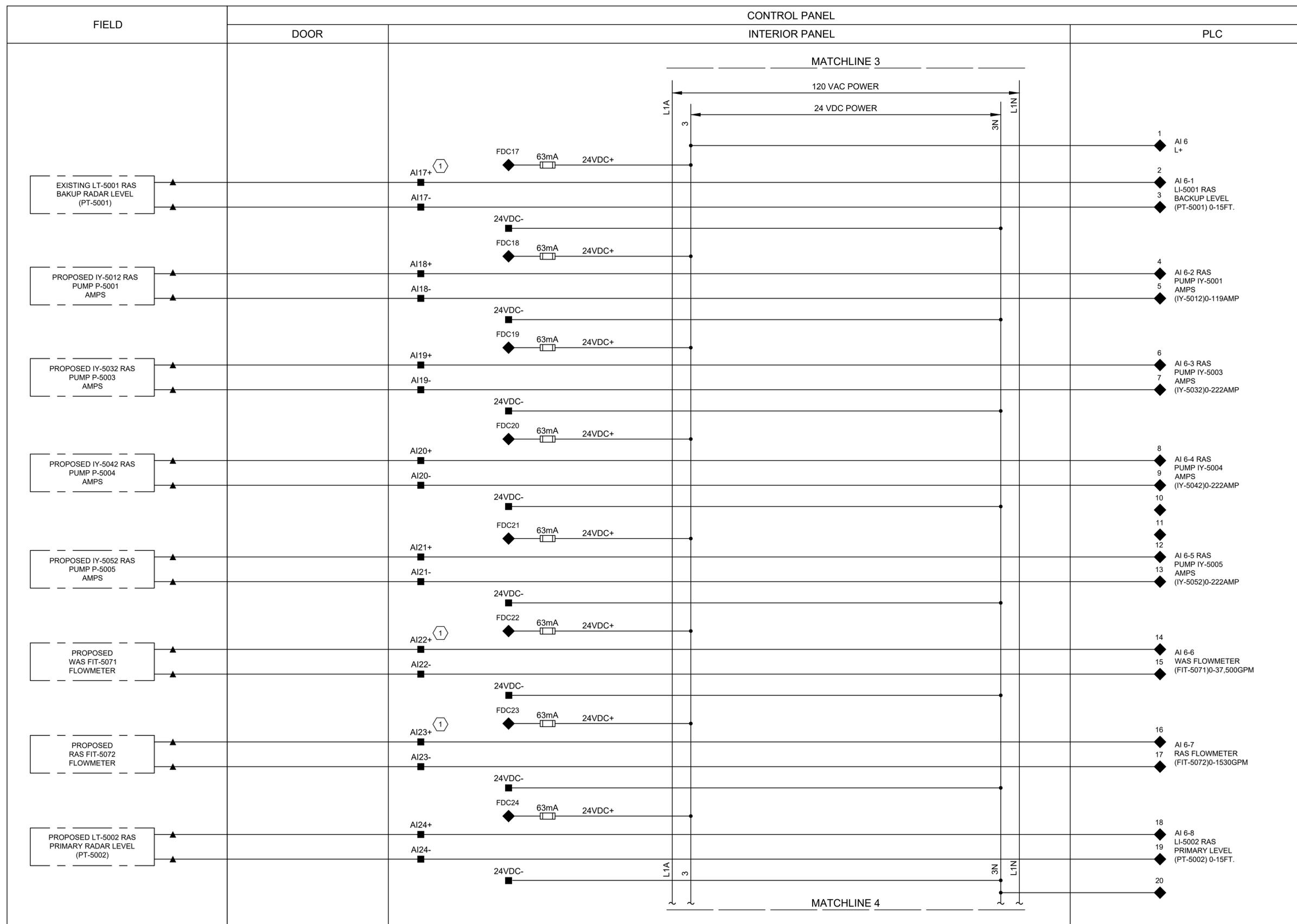
CITY OF HOUSTON
HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
HEADWORKS/RAS (RTU283B)
CONTROL WIRING DIAGRAM-III

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 75 OF 111 | |

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WWTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-11.dwg



MATCHLINE 3

MATCHLINE 4

- LEGEND**
- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

NOTES:

① ANALOG SURGE PROTECTOR.

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St.
Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

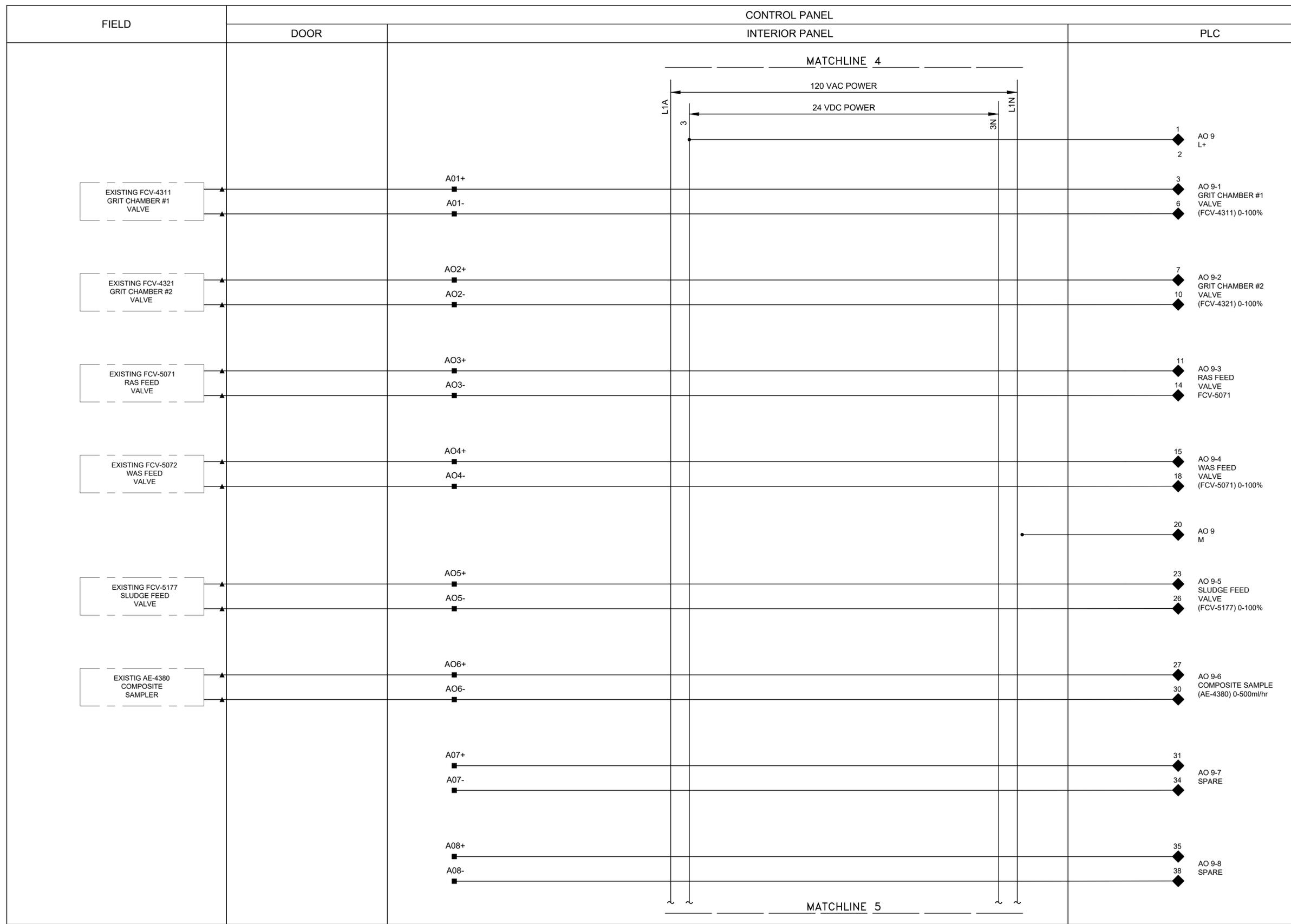
**SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
HEADWORKS/RAS (RTU283B)
CONTROL WIRING DIAGRAM-IV**

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 76 OF 111 | |

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WWTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_I-12.dwg



- LEGEND**
- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

NOTES:

1 ANALOG SURGE PROTECTOR.

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St.
Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: mforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748

OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

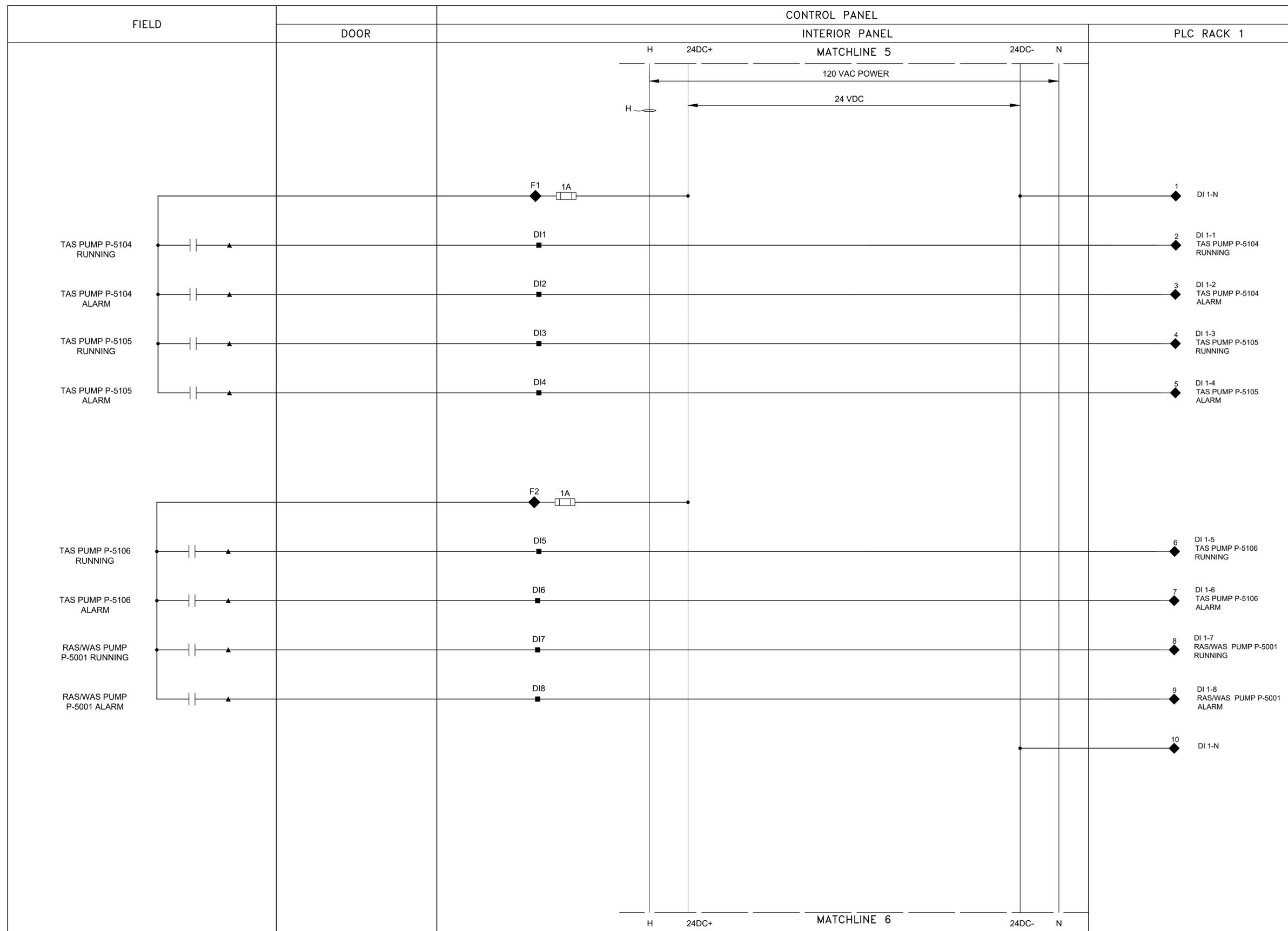
**SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
HEADWORKS/RAS (RTU283B)
CONTROL WIRING DIAGRAM-V**

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 77 OF 111 | |

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WWTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_I-13.dwg



- LEGEND**
- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St.
Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

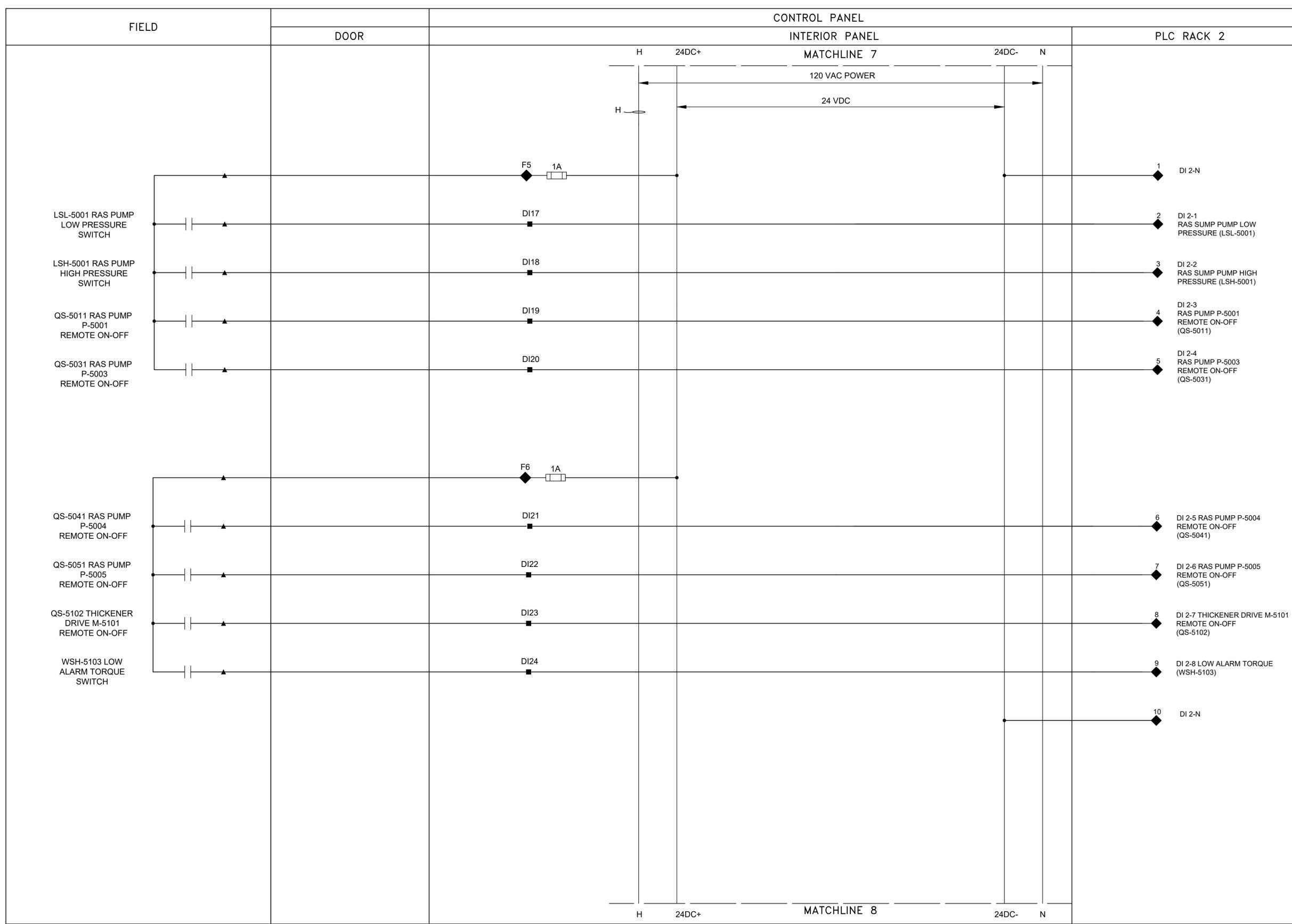
**SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
HEADWORKS/RAS (RTU283B)
CONTROL WIRING DIAGRAM-VI**

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 78 OF 111 | |

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WWTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-15.dwg



- LEGEND**
- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St.
Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748

OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

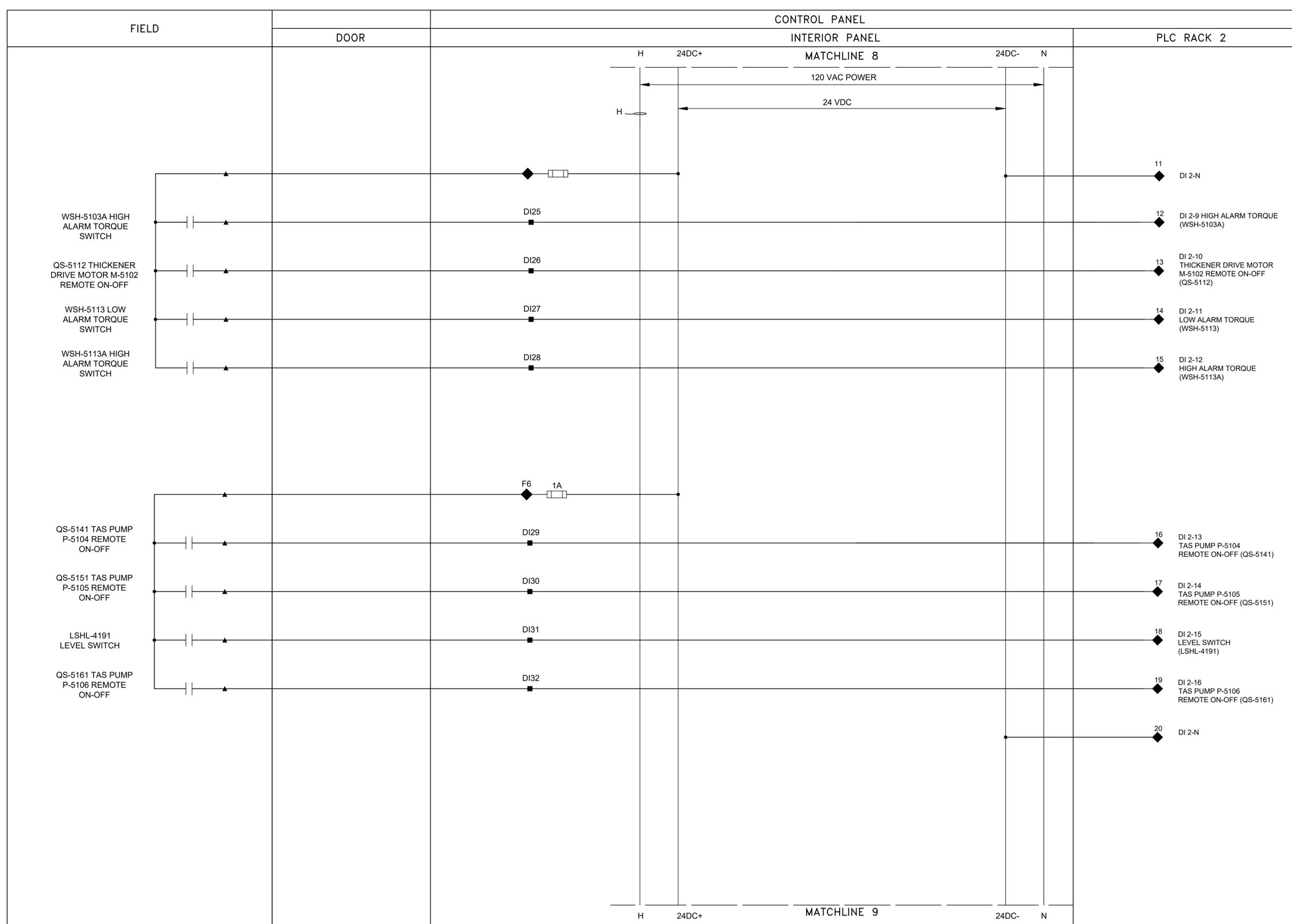
**SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
HEADWORKS/RAS (RTU283B)
CONTROL WIRING DIAGRAM—VIII**

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 80 OF 111 | |

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WWTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-16.dwg



- LEGEND**
- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St.
Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748

OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

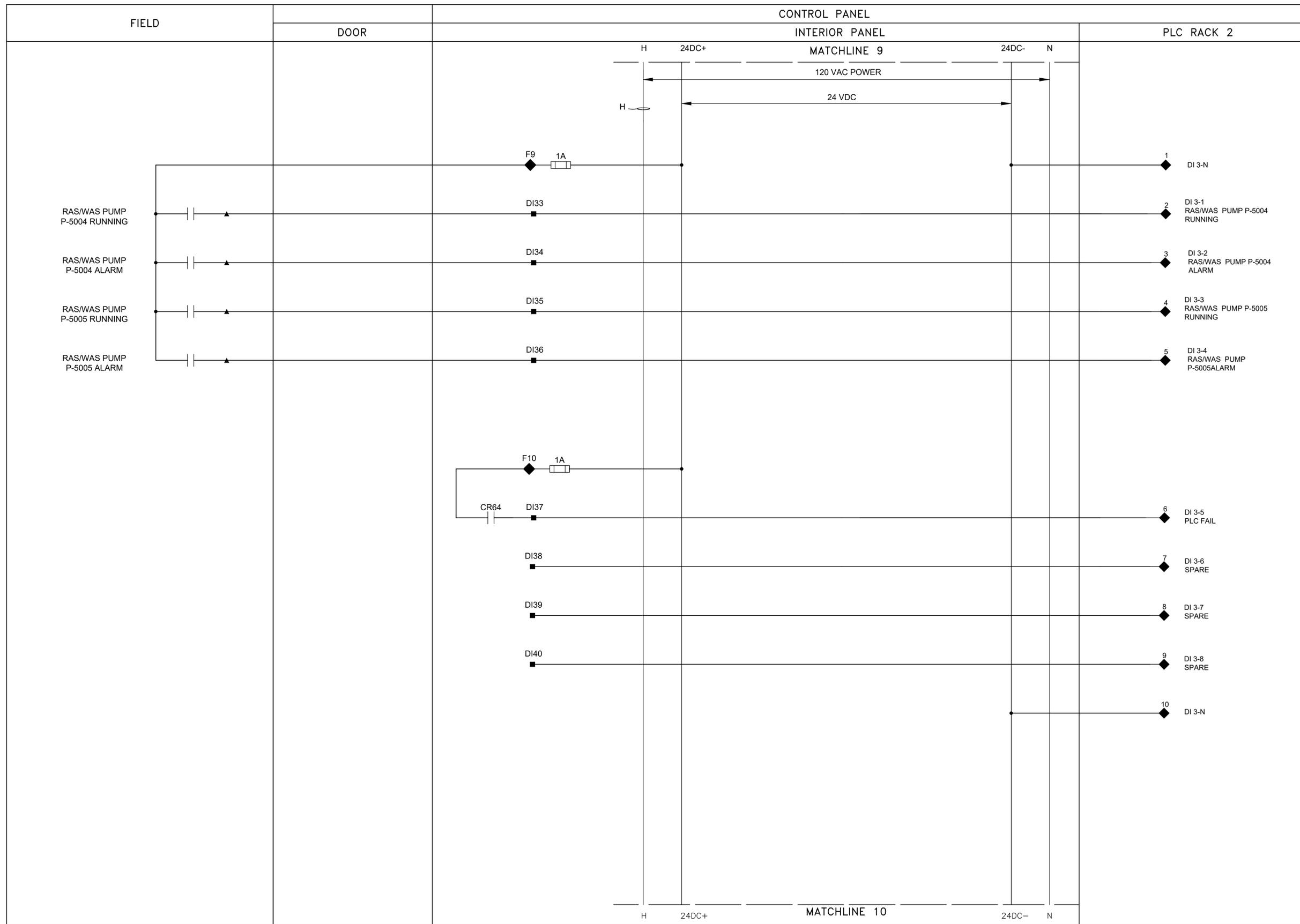
**SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
HEADWORKS/RAS (RTU283B)
CONTROL WIRING DIAGRAM-IX**

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 81 OF 111 | |

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WWTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-17.dwg



- LEGEND**
- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St.
Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

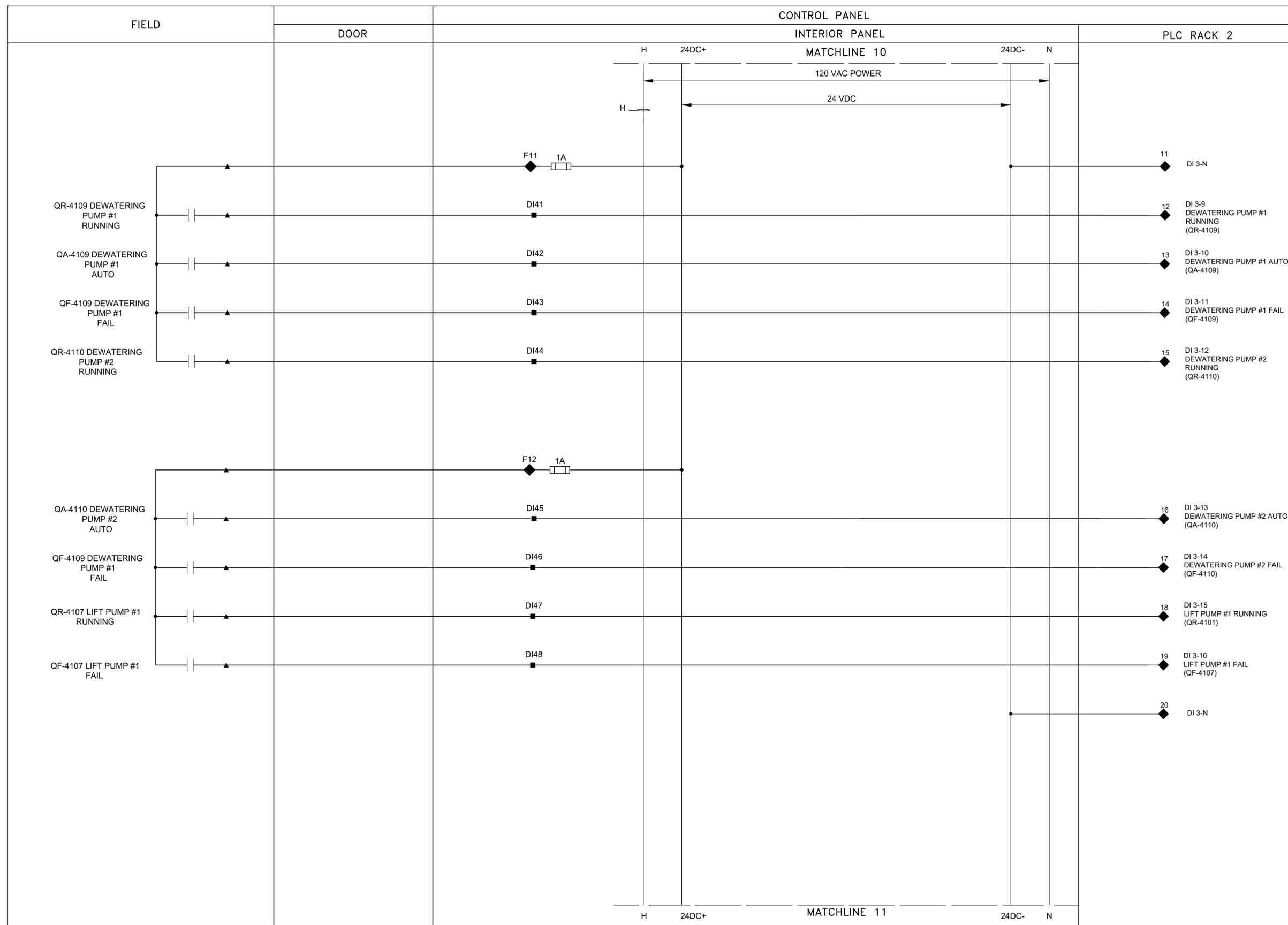
**SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
HEADWORKS/RAS (RTU283B)
CONTROL WIRING DIAGRAM-X**

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 82 OF 111 | |

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-18.dwg



- LEGEND**
- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

GAI
 Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
 CONSULTING ENGINEERING Tel: 713-636-2936
 Registration No. F-2593 Fax: 713-636-2987
 email: hforouzan@gaiconsulting.com

Freese & Nichols
 10497 Town and Country Way, Suite 500 Houston, Texas 77024
 Phone - (713) 600-6800 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
 HOSS FOROUZAN TEXAS P.E. No. 77748
 OCTOBER 2025 DATE

SURVEYED BY: _____
 FB NO. P-

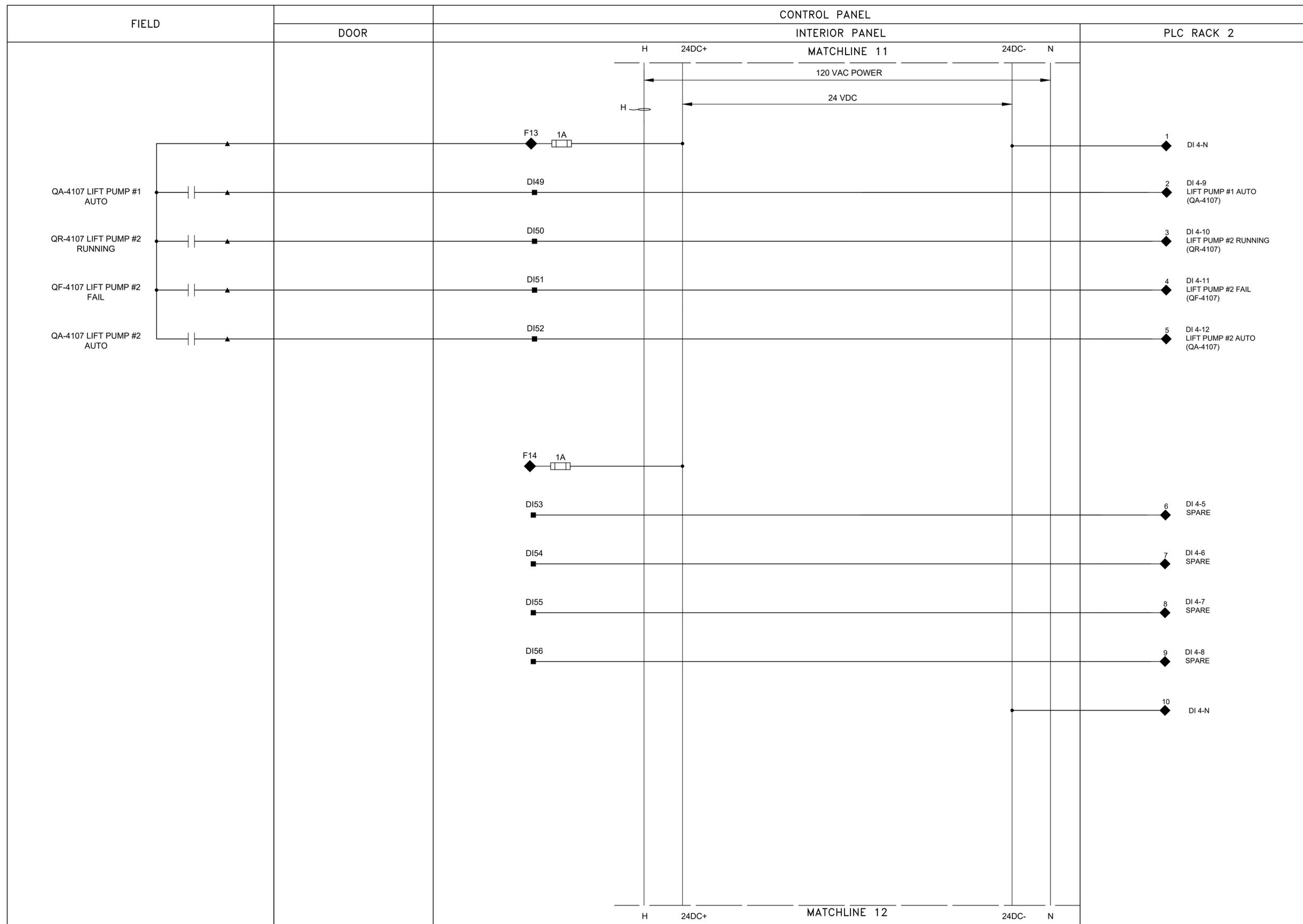
CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 INSTRUMENTATION
 HEADWORKS/RAS (RTU283B)
 CONTROL WIRING DIAGRAM-XI

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 83 OF 111 | |

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WWTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-19.dwg



- LEGEND**
- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

GAI
 Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
 CONSULTING ENGINEERING Tel: 713-636-2936
 Registration No. F-2593 Fax: 713-636-2987
 email: hforouzan@gaiconsulting.com

FREESE & NICHOLS
 10497 Town and Country Way, Suite 500
 Houston, Texas 77024
 Phone - (713) 600-6800
 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
 HOSS FOROUZAN
 TEXAS P.E. No. 77748
 OCTOBER 2025
 DATE

SURVEYED BY:
 FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

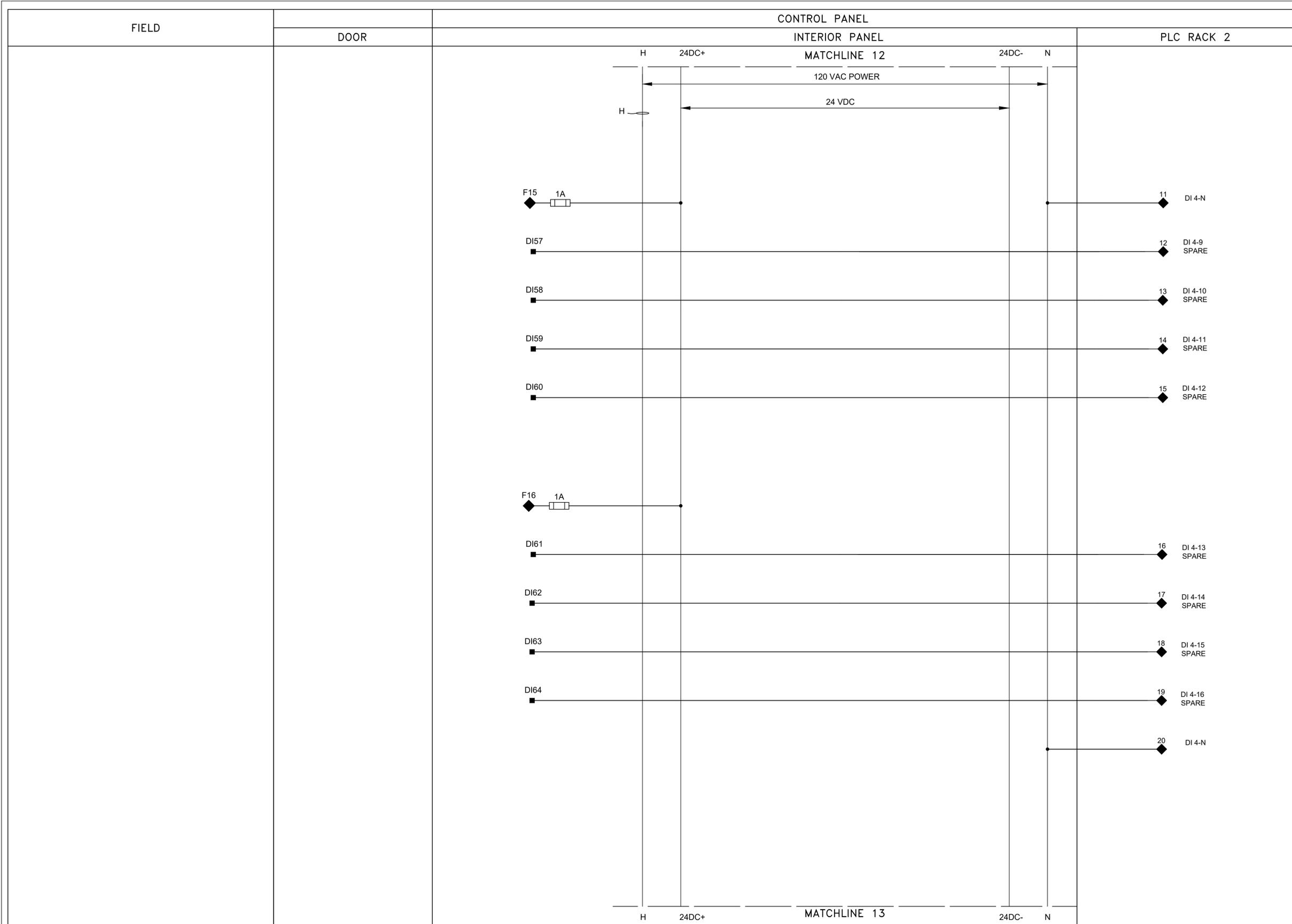
SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 INSTRUMENTATION
 HEADWORKS/RAS (RTU283B)
 CONTROL WIRING DIAGRAM—XII

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 84 OF 111 | |

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_I-20.dwg



- LEGEND**
- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

GAI
 Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
 CONSULTING ENGINEERING Tel: 713-636-2936
 Registration No. F-2593 Fax: 713-636-2987
 email: hforouzan@gaiconsulting.com

FREESE NICHOLS
 10497 Town and Country Way, Suite 500
 Houston, Texas 77024
 Phone - (713) 600-6800
 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
 HOSS FOROUZAN
 TEXAS P.E. No. 77748
 OCTOBER 2025
 DATE

SURVEYED BY:
 FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

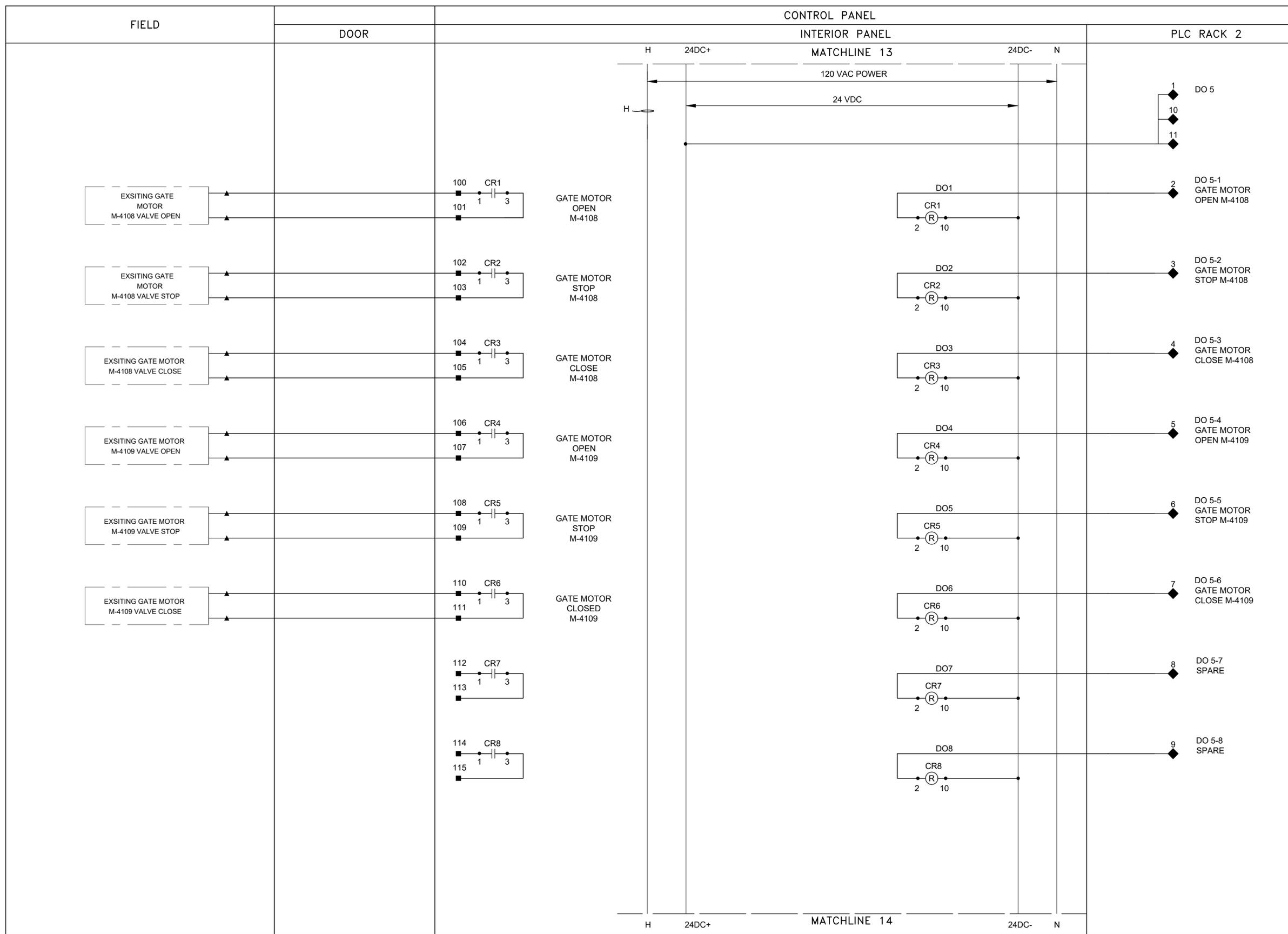
**SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 INSTRUMENTATION
 HEADWORKS/RAS (RTU283B)
 CONTROL WIRING DIAGRAM—XIII**

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 85 OF 111 | |

PLOTTED: 10/29/2025 4:40 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_I-21.dwg



LEGEND

| | | | |
|---|---|---|------------------------|
| △ | DEVICE OR FIELD TERMINAL LOCATED AT MOTOR | ▲ | REMOTE TERMINAL |
| * | DEVICE OR FIELD TERMINAL LOCATED REMOTE | ● | DEVICE TERMINAL NO. |
| □ | DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL | ◆ | PLC INTERFACE TERMINAL |
| ■ | FIELD TERMINAL LOCATED AT CONTROL PANEL | | |

GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
CONSULTING ENGINEERING Tel: 713-636-2936
Registration No. F-2593 Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500 Houston, Texas 77024
Phone - (713) 600-6800 Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN TEXAS P.E. No. 77748
OCTOBER 2025 DATE

SURVEYED BY:
FB NO. P-

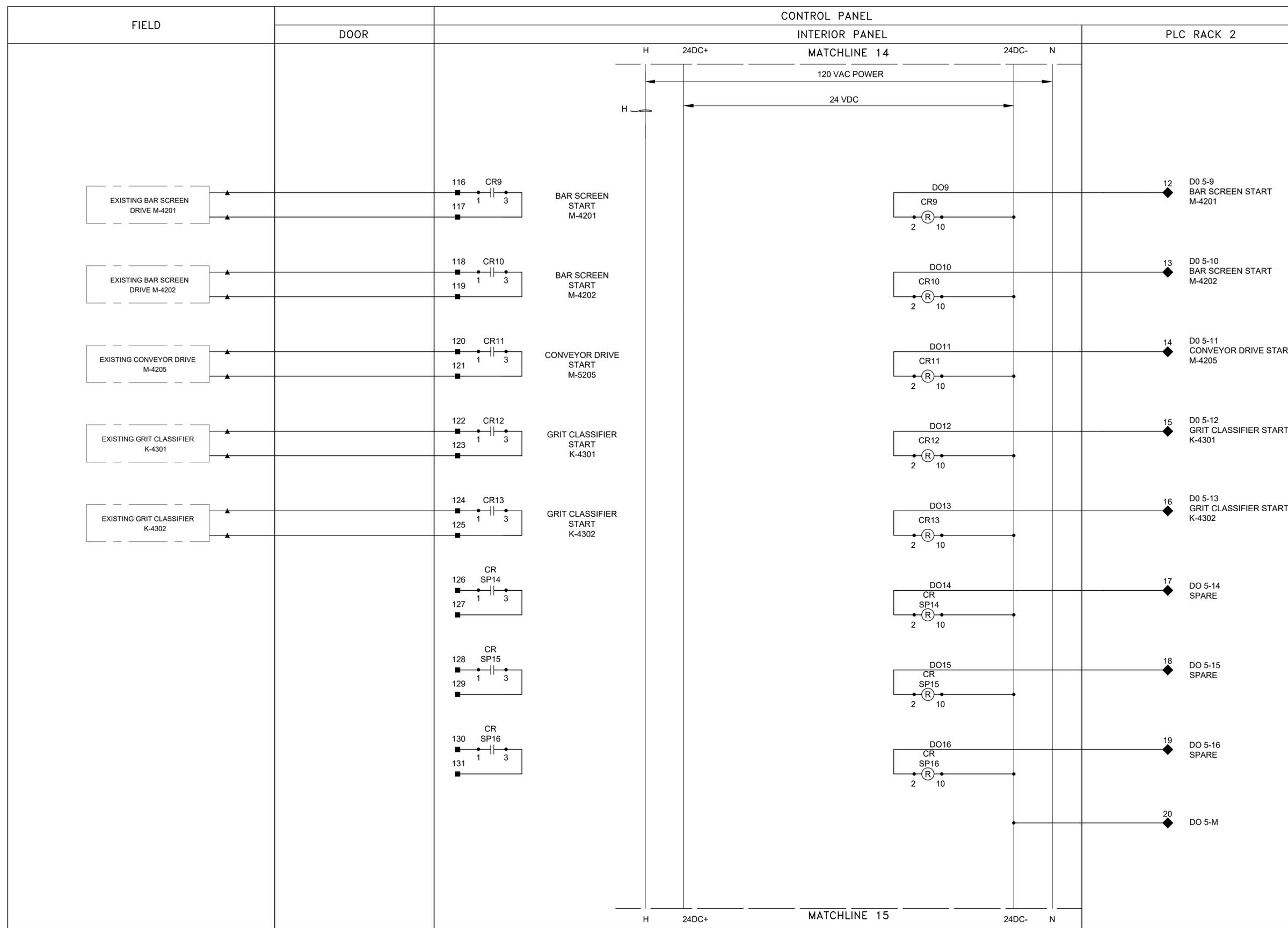
CITY OF HOUSTON
HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
HEADWORKS/RAS (RTU283B)
CONTROL WIRING DIAGRAM-XIV

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 86 OF 111 | |

PLOTTED: 10/29/2025 4:41 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-22.dwg



LEGEND

- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
- * DEVICE OR FIELD TERMINAL LOCATED REMOTE
- DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
- FIELD TERMINAL LOCATED AT CONTROL PANEL
- ▲ REMOTE TERMINAL
- DEVICE TERMINAL NO.
- ◆ PLC INTERFACE TERMINAL

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St., Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

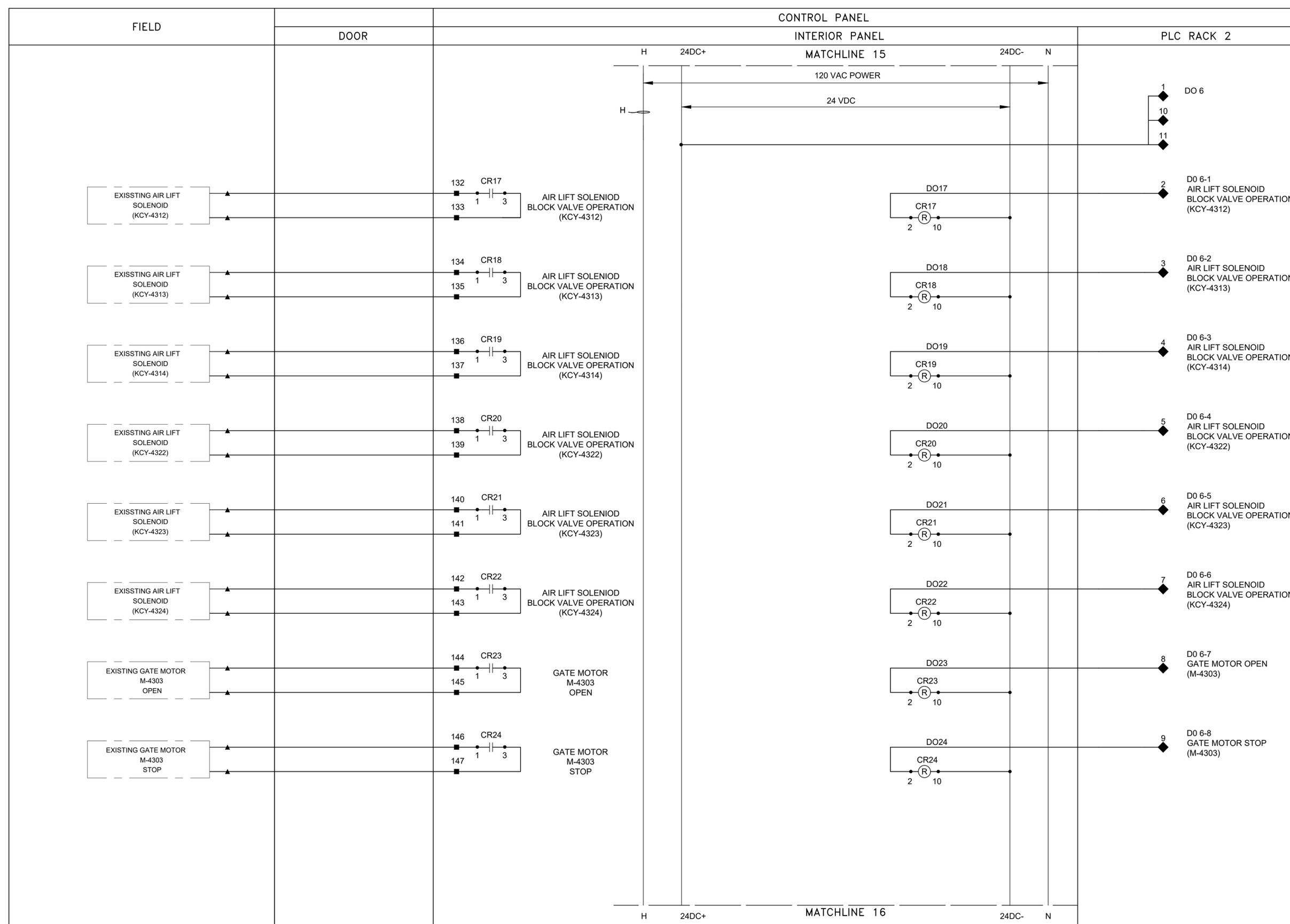
**SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
HEADWORKS/RAS (RTU283B)
CONTROL WIRING DIAGRAM-XV**

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 87 OF 111 | |

PLOTTED: 10/29/2025 4:41 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WWTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-23.dwg



LEGEND

- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
- * DEVICE OR FIELD TERMINAL LOCATED REMOTE
- DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
- FIELD TERMINAL LOCATED AT CONTROL PANEL
- ▲ REMOTE TERMINAL
- DEVICE TERMINAL NO.
- ◆ PLC INTERFACE TERMINAL

GAI
Gupta & Associates, Inc. 302 Dennis St., Houston, Texas 77006
CONSULTING ENGINEERING Tel: 713-636-2936
Registration No. F-2593 Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

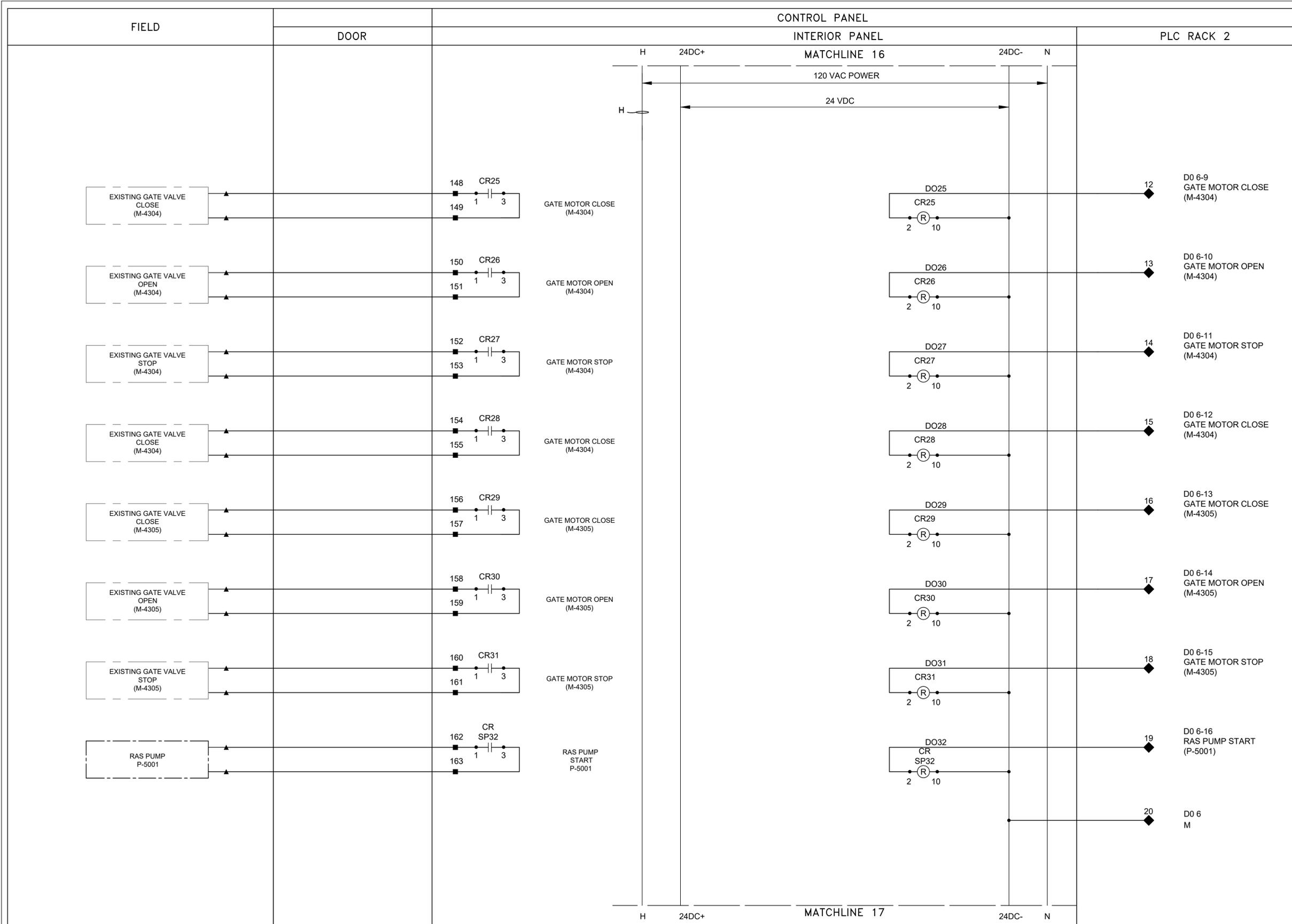
CITY OF HOUSTON
HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
HEADWORKS/RAS (RTU283B)
CONTROL WIRING DIAGRAM-XVI

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 88 OF 111 | |

PLOTTED: 10/29/2025 4:41 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WWTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_I-24.dwg



- LEGEND**
- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St.
Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

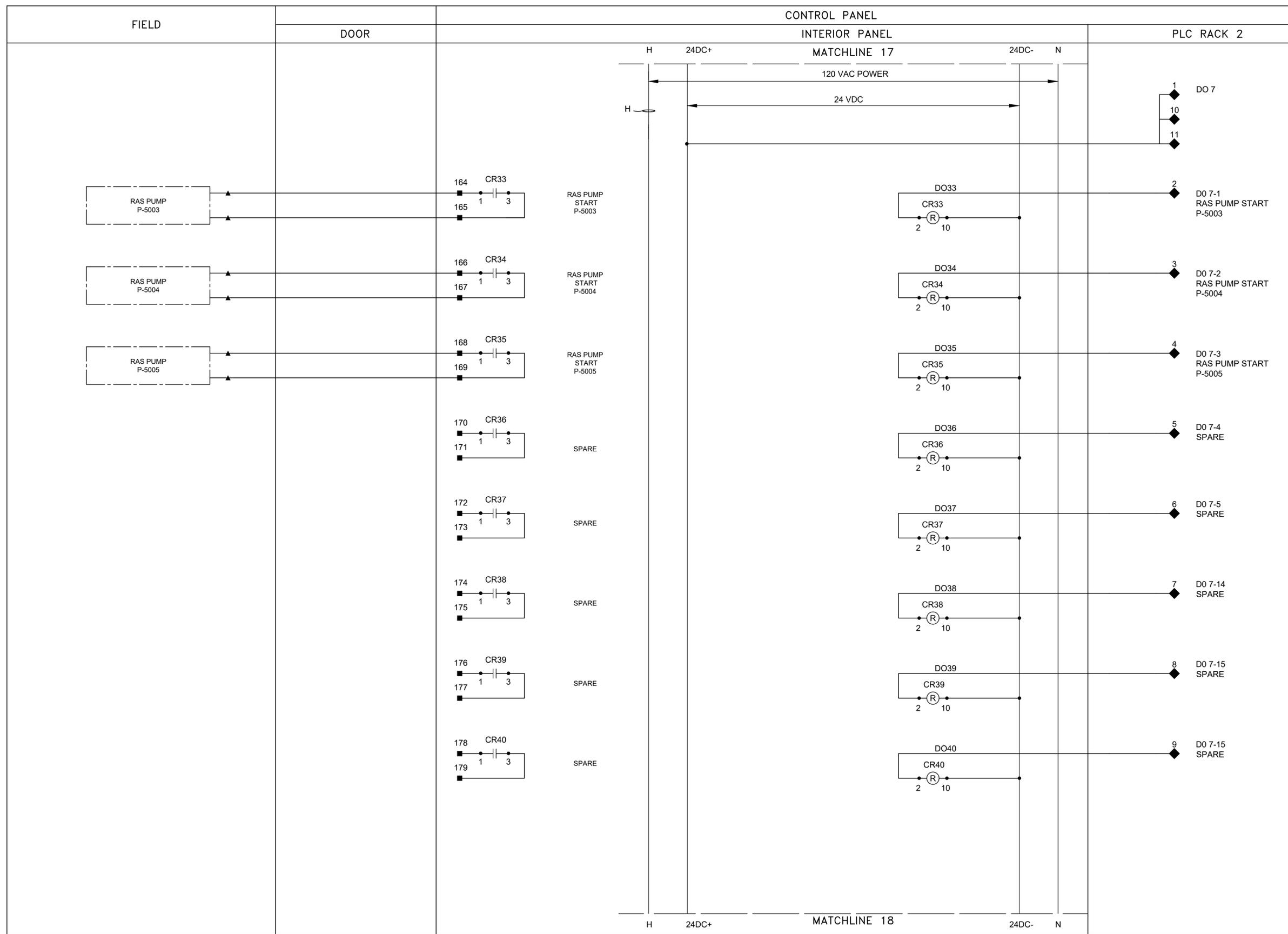
CITY OF HOUSTON
HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
HEADWORKS/RAS (RTU283B)
CONTROL WIRING DIAGRAM—XVII

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 89 OF 111 | |

PLOTTED: 10/29/2025 4:41 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-25.dwg



- LEGEND**
- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
 - * DEVICE OR FIELD TERMINAL LOCATED REMOTE
 - DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
 - FIELD TERMINAL LOCATED AT CONTROL PANEL
 - ▲ REMOTE TERMINAL
 - DEVICE TERMINAL NO.
 - ◆ PLC INTERFACE TERMINAL

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St.
Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748

OCTOBER 2025
DATE

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

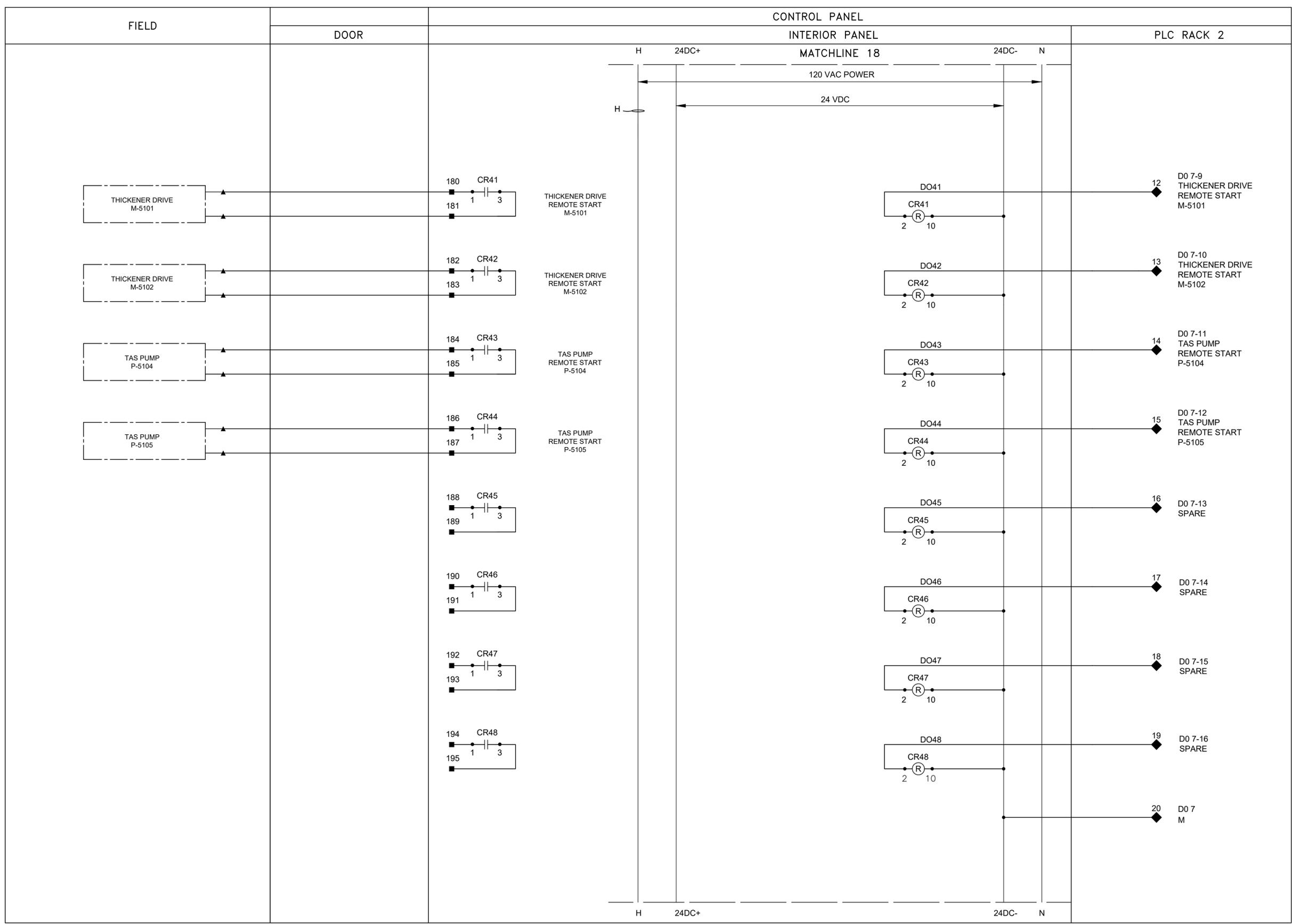
**SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
HEADWORKS/RAS (RTU283B)
CONTROL WIRING DIAGRAM—XVIII**

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 90 OF 111 | |

PLOTTED: 10/29/2025 4:41 PM

PLOT STYLE: GAI.ctb

FILE PATH: C:\H878_Sim South WTP Improvement\5 Drawings\Instrumentation And Control\Working\H878_L-26.dwg



LEGEND

- △ DEVICE OR FIELD TERMINAL LOCATED AT MOTOR
- * DEVICE OR FIELD TERMINAL LOCATED REMOTE
- DEVICE OR FIELD TERMINAL LOCATED AT MCC/POWER PANEL
- FIELD TERMINAL LOCATED AT CONTROL PANEL
- ▲ REMOTE TERMINAL
- DEVICE TERMINAL NO.
- ◆ PLC INTERFACE TERMINAL

GAI
Gupta & Associates, Inc.
CONSULTING ENGINEERING
Registration No. F-2593

302 Dennis St.
Houston, Texas 77006
Tel: 713-636-2936
Fax: 713-636-2987
email: hforouzan@gaiconsulting.com

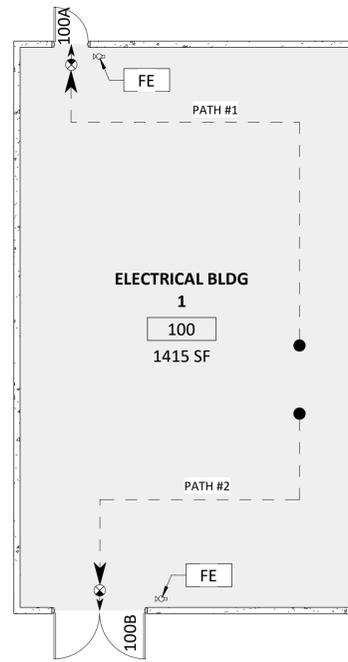
FREESE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

This document is released for interim review & not intended for construction, bidding or permit purposes by
HOSS FOROUZAN
TEXAS P.E. No. 77748
OCTOBER 2025
DATE

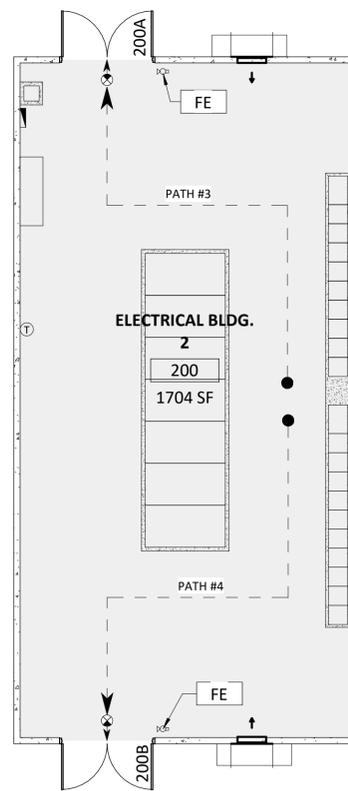
SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
INSTRUMENTATION
HEADWORKS/RAS (RTU283B)
CONTROL WIRING DIAGRAM-XIX

| | |
|---------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| NTS | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 91 OF 111 | |



1 ELECTRICAL BLDG. 1 LIFE SAFETY PLAN
1/8" = 1'-0"

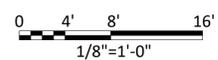


2 ELECTRICAL BLDG. 2 LIFE SAFETY PLAN
1/8" = 1'-0"

LEGEND

- Factory
- FE FIRE EXTINGUISHER & BRACKET
- EXIT SIGN
- EGRESS PATHWAY

| TRAVEL DISTANCES | |
|------------------|-----------------|
| Travel Path | Travel Distance |
| PATH #1 | 44' - 0" |
| PATH #2 | 32' - 5" |
| PATH #3 | 41' - 7" |
| PATH #4 | 41' - 7" |



CODE REVIEW - IBC - 2021

PROJECT: SIMS SOUTH WWTP IMPROVEMENTS
LOCATION: HOUSTON, TEXAS
CODES: 2021 INTERNATIONAL BUILDING CODE AS AMENDED
 2021 INTERNATIONAL FIRE CODE AS AMENDED
 2021 INTERNATIONAL PLUMBING CODE AS AMENDED
 2021 INTERNATIONAL MECHANICAL CODE AS AMENDED
 2021 INTERNATIONAL ENERGY CONSERVATION CODE AS AMENDED
 2023 NATIONAL ELECTRICAL CODE AS AMENDED

PRIMARY OCCUPANCY: F-1. MODERATE HAZARD FACTORY INDUSTRIAL (SEC. 306)

AUTOMATIC FIRE SUPPRESSION: NO

BUILDING SIZE:
 ELECTRICAL BLDG. 1 1,415 SF
 ELECTRICAL BLDG. 2 1,704 SF

TYPE OF CONSTRUCTION: II-B

BUILDING AREA LIMITATION: 15,500 SF (TABLE 506.2)

HEIGHT LIMITATION: 55 FT, 2 STORIES (TABLE 504.3, 504.4.)

FIRE RESISTIVE REQUIREMENTS (HR) (TABLE 601 & 602)
 STRUCTURAL FRAME = 0
 BEARING WALL - INT/EXT = 0
 NON BEARING WALLS AND PARTITIONS - EXTERIOR
 < 5' = 2
 ≥ 5' < 10' = 1
 ≥ 10' < 30' = 0
 > 30' = 0

EGRESS (TABLE 1004.1.2)
 SF/ OCC.
 ELECTRICAL BLDG. 1 1,415 SF / 300 GROSS 5 OCCUPANTS
 ELECTRICAL BLDG. 2 1,705 SF / 300 GROSS 6 OCCUPANTS

NUMBER OF EXITS REQUIRED = 2 (TABLE 1006.3.1)

EXIT ACCESS TRAVEL DISTANCE= 200' (TABLE 1017.2)

EGRESS WIDTH (TABLE 1005.3.1 & 1005.3.2)
 EXITS = .2" / OCCUPANT
 ELECTRICAL BLDG. 1 .2" *5 = 1.0" REQUIRED = 192" PROVIDED
 ELECTRICAL BLDG. 2 .2" *6 = 1.2" REQUIRED = 192" PROVIDED

MINIMUM DOOR CLEAR WIDTH (SEC 1010.1.1)
 =32" CLEAR

ENERGY CODE COMPLIANCE: 2021

CLIMATE ZONE: 2A

PRESCRIPTIVE REQUIREMENTS:

ROOF INSULATION ENTIRELY ABOVE DECK R-25ci
 MASS WALLS R-13ci
 SWINGING DOORS

ROOF SOLAR REFLECTANCE AND THERMAL EMITTANCE REQUIREMENTS EXEMPTION: STEEP ROOF PITCH > 2:12

PANIC AND FIRE EXIT HARDWARE FOR ELECTRICAL ROOMS (SEC 1010.1.10)
 =ELECTRICAL ROOMS WITH EQUIPMENT RATED 1,200 AMPERES OR MORE AND OVER 6' WIDE, AND THAT CONTAIN OVERCURRENT DEVICES, SWITCHING DEVICES OR CONTROL DEVICES WITH EXIT OR EXIT ACCESS DOORS SHALL BE EQUIPPED WITH PANIC HARDWARE OR FIRE EXIT HARDWARE. THE DOORS SHALL SWING IN THE DIRECTION OF EGRESS TRAVEL.

| NO. | DESCRIPTION | DATE | DWN. | CHK. |
|---|-------------|------|------|------|
|  10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144 | | | | |

NOT FOR CONSTRUCTION
 THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF GREG GASKIE
 TEXAS NO. 32250 ON DATE: 10/29/2025
 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES

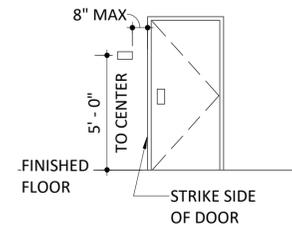
SURVEYED BY:
 FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

**SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 ARCHITECTURE
 ELECTRICAL BUILDING
 LIFE SAFETY AND CODE REVIEW**

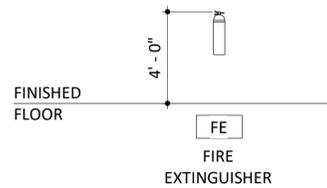
| | |
|----------------------------|--|
| WBS NUMBER | |
| R-000265-0146-4 | |
| DRAWING SCALE | |
| As indicated | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 92 OF 111 | |

FIXTURE ACCESSORIES AND MOUNTING HEIGHTS



TYP SIGNAGE MOUNTING LOCATION

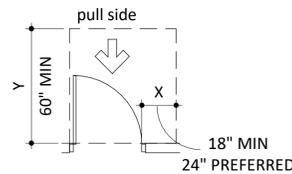
1/4"=1'-0"



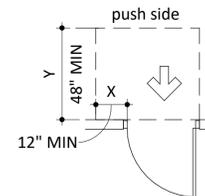
SPECIALTY MOUNTING HEIGHTS

1/4"=1'-0"

DOOR CLEARANCES



NOTE:
'X'=12" IF DOOR HAS BOTH
A LATCH AND CLOSER



NOTE:
'X'=0" IF DOOR NOT HAVE
BOTH LATCH AND CLOSER

FRONT APPROACH - SWINGING DOORS

PLAN GRAPHICS

REFERENCE



LINEWORK



SYMBOLS

- ACCESSORY KEY: ABC
- DOOR DESIGNATION: 127
- ELEVATION REFERENCE: A4.1
- FIRE EXTINGUISHER: FE
- NORTH ARROW: NORTH
- NOTE BY SYMBOL: 1
- PARTITION TYPE MARK: A1
- REVISION NUMBER: 1
- SIGNAGE: 101A, E.3
- WINDOW TYPE MARK: A

GENERAL NOTES

A. GENERAL NOTES:

- THE CONTRACTOR SHALL PROVIDE COMPLETE PROJECT SYSTEMS AND COMPONENTS AND COMPLY WITH ALL REQUIREMENTS INDICATED ON THE PROJECT DOCUMENTS.
- WORK WITHIN THE AREA BOUNDARIES INDICATED IN THE PROJECT DOCUMENTS AND COMPLY WITH ALL APPLICABLE BUILDING CODE, REGULATION AND ORDINANCE REQUIREMENTS. OCCUPANTS ADJACENT TO THE PROJECT AREA BOUNDARIES SHALL CONTINUE UNINTERRUPTED OCCUPANCY DURING CONSTRUCTION OF THE PROJECT.
- VERIFY FIELD CONDITIONS AND COORDINATION WITH THE PROJECT DOCUMENTS PRIOR TO PROCEEDING WITH THE WORK.
- COORDINATE THE WORK WITH ALL REQUIREMENTS INDICATED IN THE PROJECT DOCUMENTS.
- PERFORM THE WORK AT THE PROJECT SITE DURING NORMAL BUSINESS HOURS, UNLESS OTHERWISE NOTED.
- COORDINATE THE WORK WITH EQUIPMENT, FURNISHINGS, AND SYSTEMS PROVIDED BY THE OWNER.

B. DEFINITIONS:

- "TYPICAL" OR "TYP." INDICATES IDENTICAL COMPLETE SYSTEM SHALL BE PROVIDED FOR EACH OCCURRENCE OF THE CONDITION NOTED.
- "SIMILAR" OR "SIM." INDICATES COMPONENTS SHALL BE PROVIDED COMPARABLE TO THE CHARACTERISTICS FOR THE CONDITION NOTED.
- "AS REQUIRED" INDICATES COMPONENTS REQUIRED TO COMPLETE THE NOTED SYSTEM AS INDICATED IN THE PROJECT DOCUMENTS SHALL BE PROVIDED.
- "ALIGN" INDICATES ACCURATELY PROVIDE FINISH FACES OF MATERIALS IN STRAIGHT, TRUE AND PLUMB RELATION TO ADJACENT MATERIALS.

C. DIMENSIONS:

- DIMENSIONS ARE INDICATED TO THE CENTERLINE OF THE STRUCTURAL GRID, FACE OF CONCRETE WALL, NOMINAL FACE OF CMU WALL, FINISH FACE OF PARTITION TYPE AS SCHEDULED, UNLESS OTHERWISE NOTED.
- ALIGNMENT OF PARTITIONS AND FINISHES AS SCHEDULED SHALL BE STRAIGHT, TRUE AND PLUMB. THE PRIORITY FOR THE PROJECT DIMENSIONS SHALL BE IN THE FOLLOWING ORDER:
 - MIN. DIMENSIONS FOR THE ACCESSIBILITY CLEARANCE AND BUILDING CODE REQUIREMENTS.
 - LARGE SCALE DETAILS
 - SMALL SCALE DETAILS
 - ENLARGED VIEWS
 - FLOOR PLANS AND ELEVATIONS
- FLOOR ELEVATIONS ARE INDICATED TO THE FACE OF THE STRUCTURAL SLAB, UNLESS OTHERWISE NOTED.
- VERTICAL DIMENSIONS ARE INDICATED FROM THE FLOOR ELEVATION TO FACE OF FINISHED MATERIAL AT THE DIMENSION POINT, UNLESS NOTED ABOVE FINISH FLOOR - "AFF".
- DIMENSIONS SHOWN ON THE DRAWINGS SHALL INDICATE THE REQUIRED SIZE, CLEARANCE AND DIMENSIONAL RELATIONSHIP BETWEEN PROJECT SYSTEMS AND COMPONENTS. DIMENSIONS SHALL NOT BE DETERMINED BY SCALING THE DRAWINGS.

D. DOOR & FIXTURES:

- ALL FIXTURE HEIGHTS AND MOUNTING DIMENSIONS SHALL COMPLY WITH REQUIREMENTS OF TAS (ADA). CONTRACTOR MUST VERIFY EACH SUCH DIMENSION.
- ALL DOOR DIMENSIONS ARE CLEAR, FROM EDGE OF DOOR STOP TO EDGE OF DOOR IN 90° OPEN POSITION.

SCHEDULE OF TYPICAL ARCHITECTURAL ABBREVIATIONS

(NOT ALL ABBREVIATIONS MAY BE USED)

| | | | | | | | | | | |
|----------|----------|---------------------------------|----------|----------|--------------------------------------|----------|----------|--------------------------|----------|--------------------------------|
| A | ACOUST | ACOUSTICAL | E | EA | EACH | M | MAINT | MAINTENANCE | SIM | SIMILAR |
| | ADA | AMERICANS WITH DISABILITIES ACT | | EJ | EXPANSION JOINT | | MAX | MAXIMUM | SPEC | SPECIFICATIONS |
| | ACT | ACOUSTICAL CEILING TILE | | EL | ELEVATION | | MECH | MECHANICAL | SS | STAINLESS STEEL |
| | ADJ | ADJACENT OR ADJUSTABLE | | ELEC | ELECTRIC(AL) | | MFR | MANUFACTURER | SSM | SOLID SURFACE MATERIAL |
| | AFF | ABOVE FINISH FLOOR | | ELEV | ELEVATOR/ELEVATION | | MH | MANHOLE | STD | STANDARD |
| | ALUM | ALUMINUM | | EMERG | EMERGENCY | | MIN | MINIMUM | STL | STEEL |
| | ALT | ALTERNATE | | EQ | EQUIPMENT | | MO | MASONRY OPENING | STOR | STORAGE |
| | APPROX | APPROXIMATELY | | EWC | ELECTRIC WATER COOLER | | MTL | METAL | STRUCT | STRUCTURAL |
| | ARCH | ARCHITECT(URAL) | | EXIST | EXISTING | | N | NUMBER | SYM | SYMMETRICAL |
| | B | | | EXT | EXTERIOR | | NO | NOT IN CONTRACT | I | TAS |
| | BLDG | BUILDING | | F | | | NTS | NOT TO SCALE | TEMP | TEMPERATURE |
| | BLKG | BLOCKING | | FDC | FIRE DEPT. CONNECTION | | O | | TLT | TOILET |
| | BIT | BITUMEN | | FD | FLOOR DRAIN | | OC | ON CENTER | TS | TUBE STEEL |
| | BLK | BLOCK | | FF | FINISH FLOOR | | OD | OUTSIDE DIAMETER | T-STAT | THERMOSTAT |
| | BTWN | BETWEEN | | FL/FLR | FLOOR | | OFD | OVERFLOW DRAIN | TYP | TYPICAL |
| | C | | | FT | FEET OR FOOT | | OPNG | OPENING | U | |
| | CG | CORNER GUARD | | G | | | OPP | OPPOSITE | UL | UNDERWRITERS LABORATORIES INC. |
| | CIP | CAST IN PLACE | | GALV | GALVANIZED | | OSB | ORIENTED STRAND BOARD | UNO | UNLESS NOTED OTHERWISE |
| | CJ | CONTROL JOINT | | GWB | GYPSPUM WALLBOARD | | P | PART | V | VCT |
| | CL | CENTERLINE | | GYP | GYPSPUM | | PART | PARTITION | W | VINYL COMPOSITION TILE |
| | CLG | CEILING | | H | | | PLAM | PLASTIC LAMINATE | VERT | VERTICAL |
| | CLR | CLEAR | | HDWR | HOSE BIBB | | PR | PAIR | W | WITH |
| | CMU | CONCRETE MASONRY UNIT | | HM | HARDWARE | | PSI | POUNDS PER SQUARE INCH | WC | WATER CLOSET |
| | CO | CLEANOUT | | HR | HOLLOW METAL | | PVC | POLYVINYL CHLORIDE | WD | WOOD |
| | COL | COLUMN | | HORIZ | HORIZONTAL | | PVMT | PAVEMENT | WDW | WINDOW |
| | COMP | COMPOSITION | | HR | HOUR | | R | | W/O | WITHOUT |
| | CONC | CONCRETE | | HVAC | HEATING/VENTILATION/AIR CONDITIONING | | RD | ROOF DRAIN | | |
| | CONST | CONSTRUCTION | | I | | | RE | REFER TO | | |
| | CONT | CONTINUOUS | | IN | INCH | | REF | REFERENCE | | |
| | CTR | CENTER | | INS | INSULATION | | REINF | REINFORCING (REINFORCED) | | |
| | D | | | INSUL | INSULATION | | REQ'D | REQUIRED | | |
| | DBL | DOUBLE | | INT | INTERIOR | | RM | ROOM | | |
| | DIA | DIAMETER | | J | | | RO | ROUGH OPENING | | |
| | DIAG | DIAGONAL | | JAN | JANITOR | | | | | |
| | DN | DOWN | | L | | | S | SCHED | | SCHEDULE, SCHEDULED |
| | DR | DOOR | | LAM | LAMINATE | | SECT | SECTION | | |
| | DS | DOWNSPOUT | | LAV | LAVATORY | | SF | SQUARE FEET | | |
| | DWG | DRAWING | | LBS. | POUNDS | | SHT | SHEET | | |
| | DTL | DETAIL | | LTG | LIGHTING | | | | | |
| | | | | LVL | LEVEL | | | | | |

| | | | | |
|--|-------------|------|------|------|
| NO. | DESCRIPTION | DATE | DWN. | CHK. |
| | | | | |
| 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com Freese and Nichols, Inc. Texas Registered Engineering Firm F- 2144 | | | | |
| NOT FOR CONSTRUCTION THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF: GREG GASKIE TEXAS NO. 32250 ON DATE: 10/29/2025 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES | | | | |
| SURVEYED BY: | | | | |
| FB NO. P- | | | | |
| CITY OF HOUSTON HOUSTON PUBLIC WORKS | | | | |
| SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ARCHITECTURE ELECTRICAL BUILDING GENERAL NOTES & SYMBOLS | | | | |
| WBS NUMBER | | | | |
| R-000265-0146-4 | | | | |
| DRAWING SCALE | | | | |
| 1/4" = 1'-0" | | | | |
| CITY OF HOUSTON PM | | | | |
| SHAHIDUR RAHMAN, PE | | | | |
| SHEET NO. 93 OF 111 | | | | |

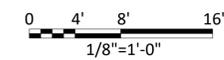
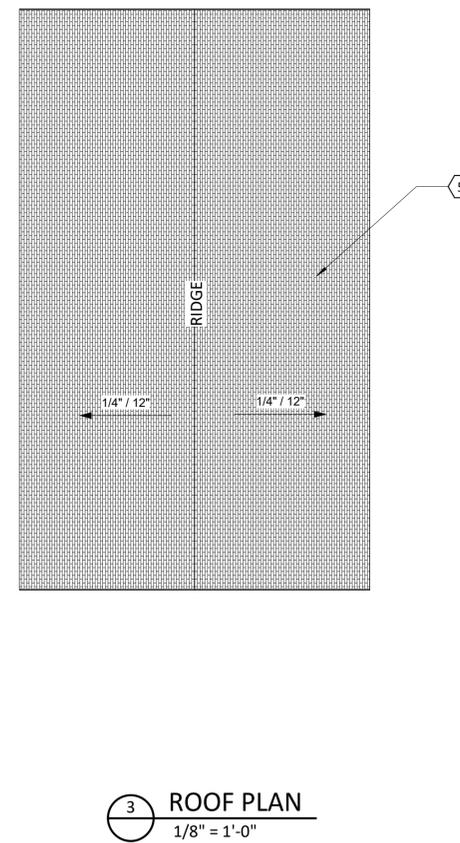
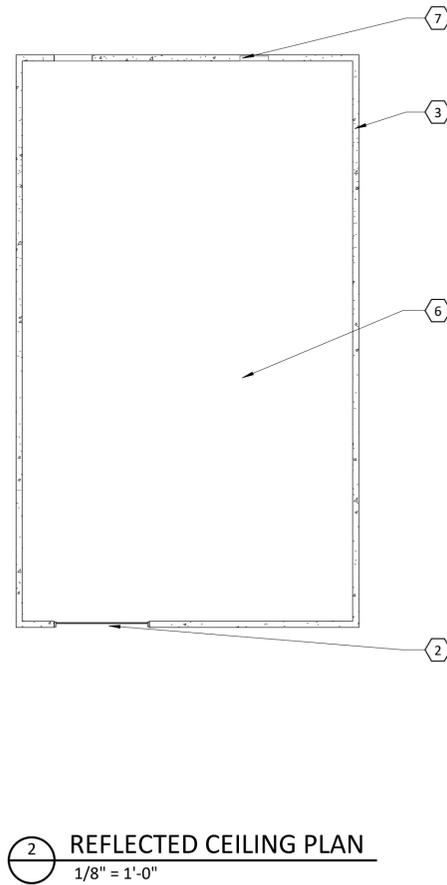
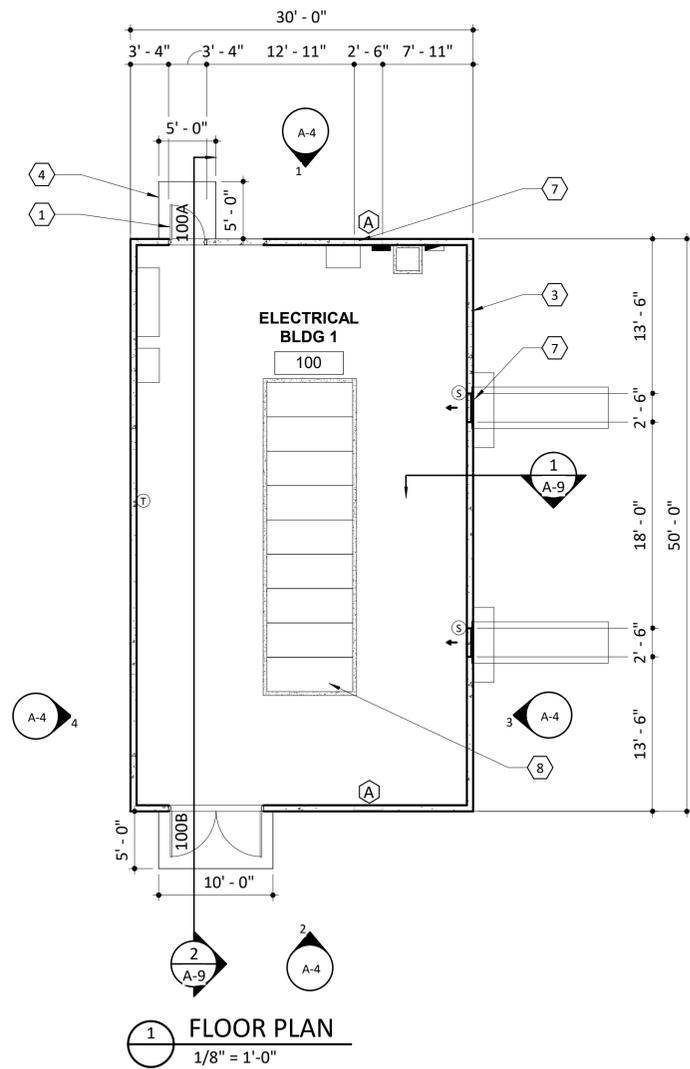
AR-R025516-ELB-R25.RVT

GENERAL NOTES

1. ALL DIMENSIONS ARE GIVEN TO:
 - A. FACE OF CONCRETE
 - B. CENTER LINE OF COLUMNS WHERE INDICATED.
 - C. FACE OF FINISH.
 - D. CONCRETE FLOOR LINE.
2. REFER TO LIFE SAFETY PLAN FOR LOCATION OF FIRE EXTINGUISHER (FE).
3. REFER TO WALL SECTIONS (A-7) AND STRUCTURAL FRAMING PLANS (S2 SHEETS) FOR EXPOSED STRUCTURE AND DECK HEIGHTS ABOVE FINISH FLOOR (NO CEILINGS).
4. NOT ALL LIGHTING FIXTURES AND DEVICES ARE SHOWN ON THIS PLAN. REFER TO LIGHTING AND MECHANICAL SHEETS.

NOTES BY SYMBOL "X"

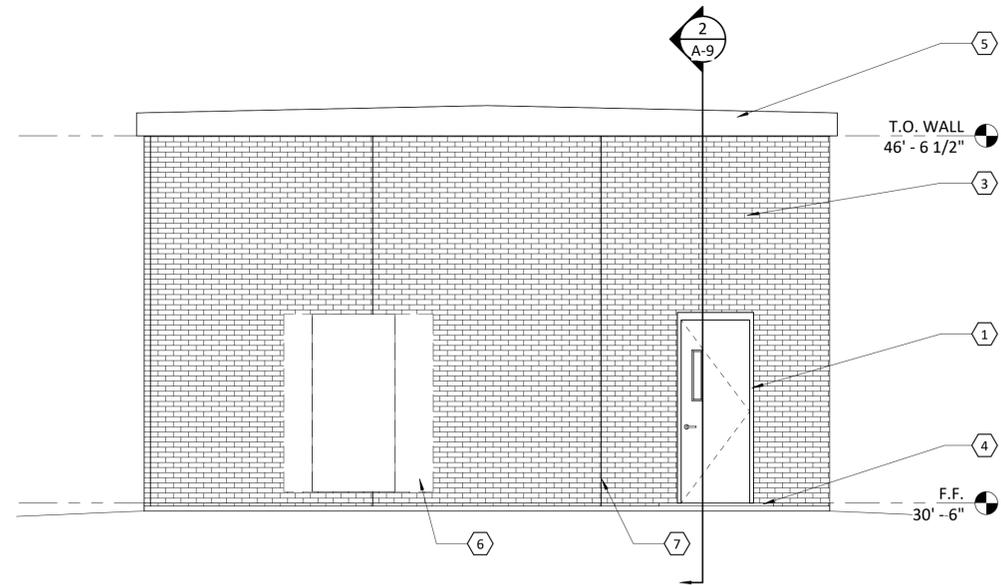
- 1 DOOR AS SCHEDULED
- 2 INSULATED REMOVABLE TRANSOM PANEL
- 3 PRECAST CONCRETE WALL PANEL
- 4 CONCRETE SLAB, REFER STRUCTURAL
- 5 PRECAST INSULATED CONCRETE ROOF PANEL
- 6 EXPOSED STRUCTURE ABOVE
- 7 HVAC EQUIPMENT, REFER MECHANICAL
- 8 ELECTRICAL EQUIPMENT, REFER ELECTRICAL



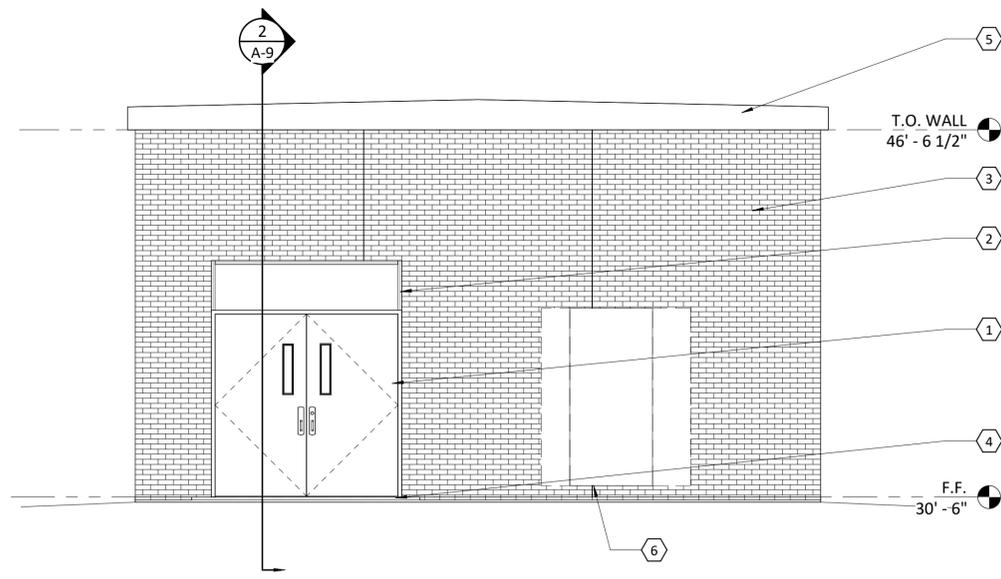
A-3

| NO. | DESCRIPTION | DATE | DWN. | CHK. |
|---|-------------|------|------|------|
| | | | | |
| 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144 | | | | |
| NOT FOR CONSTRUCTION THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF: GREG GASKIE TEXAS NO. 32250 ON DATE: 10/29/2025 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES | | | | |
| SURVEYED BY: FB NO. P- | | | | |
| CITY OF HOUSTON HOUSTON PUBLIC WORKS | | | | |
| SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ARCHITECTURE ELECTRICAL BUILDING 1 PLANS | | | | |
| WBS NUMBER R-000265-0146-4 | | | | |
| DRAWING SCALE As indicated | | | | |
| CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE | | | | |
| SHEET NO. 94 OF 111 | | | | |

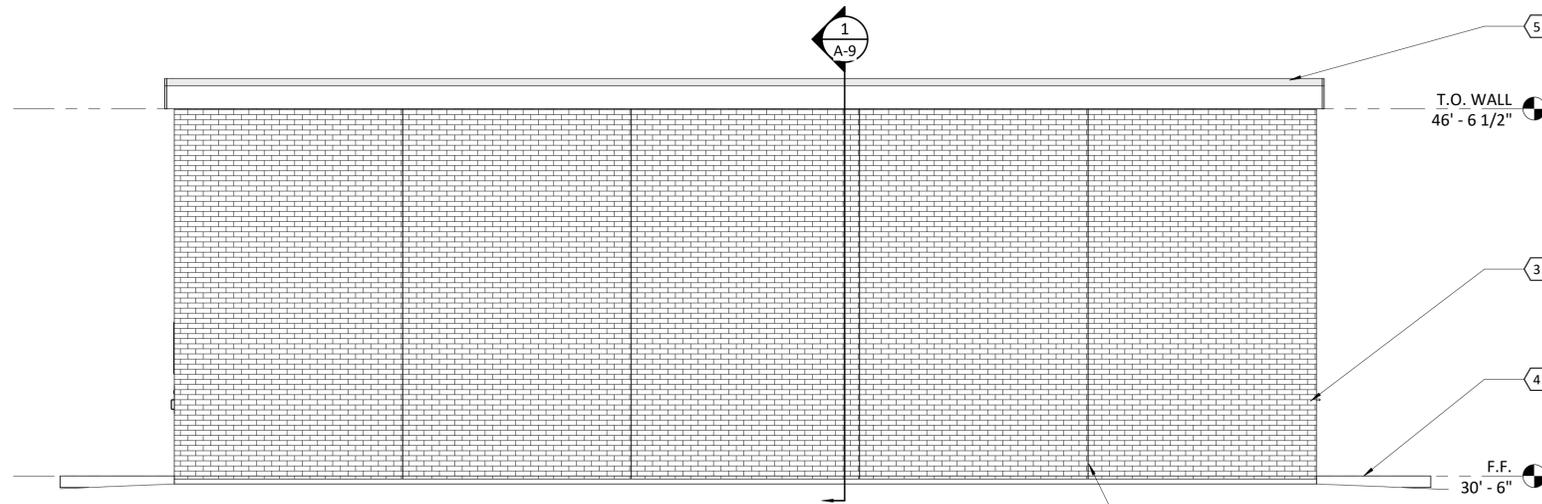
AR-R02516-EL-BLDG25.RVT



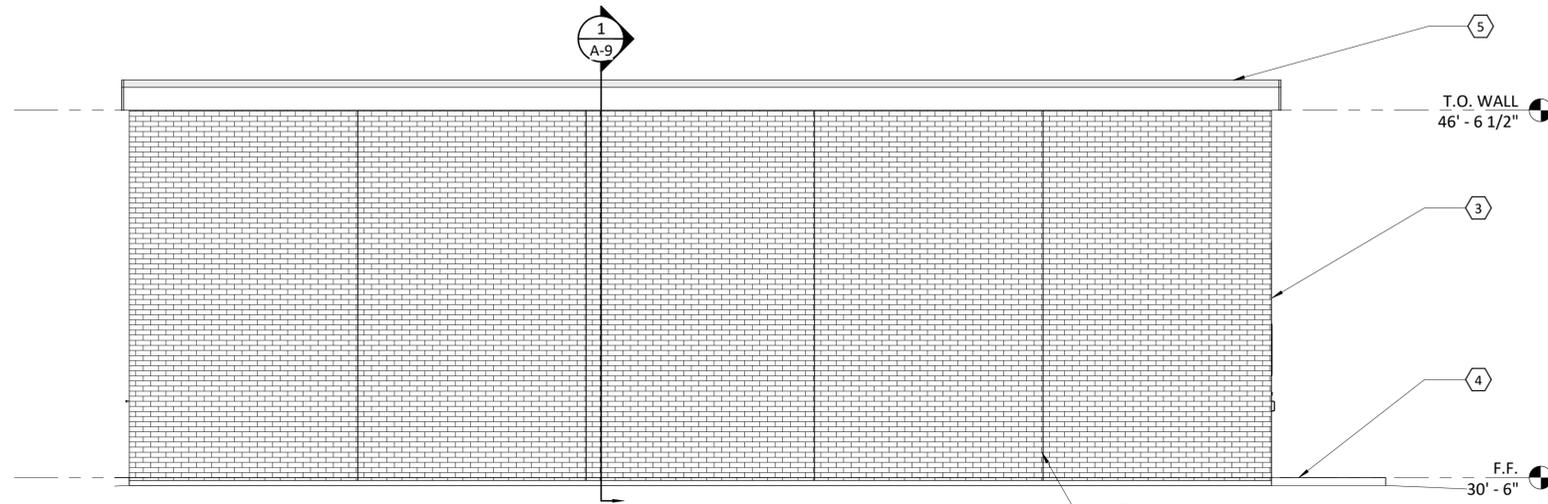
1 NORTH ELEVATION
1/4" = 1'-0"



2 SOUTH ELEVATION
1/4" = 1'-0"



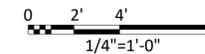
3 EAST ELEVATION
1/4" = 1'-0"



4 WEST ELEVATION
1/4" = 1'-0"

NOTES BY SYMBOL "X"

- 1 INSULATED HOLLOW STAINLESS STEEL DOOR AS SCHEDULED
- 2 INSULATED REMOVABLE TRANSOM PANEL
- 3 PRECAST CONCRETE WALL PANEL
- 4 CONCRETE SLAB, REFER STRUCTURAL
- 5 PRECAST INSULATED CONCRETE ROOF PANEL
- 6 HVAC EQUIPMENT, REFER MECHANICAL
- 7 CONCRETE PANEL JOINTS, REFER STRUCTURAL



| NO. | DESCRIPTION | DATE | DWN. | CHK. |
|-----|-------------|------|------|------|
| | | | | |

FREESE & NICHOLS
 10497 Town and Country Way,
 Suite 500
 Houston, Texas 77024
 Phone - (713) 600-6800
 Web - www.freese.com
 Freese and Nichols, Inc.
 Texas Registered Engineering Firm F-2144

NOT FOR CONSTRUCTION
 THIS DOCUMENT IS RELEASED FOR THE
 PURPOSE OF INTERIM REVIEW UNDER THE
 AUTHORITY OF: GREG GASKIE
 TEXAS NO. 32250 ON DATE: 10/29/2025
 IT IS NOT TO BE USED FOR CONSTRUCTION,
 BIDDING OR PERMIT PURPOSES

SURVEYED BY:
 FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 ARCHITECTURE
 ELECTRICAL BUILDING 1
 EXTERIOR ELEVATIONS

| | |
|--------------------|---------------------|
| WBS NUMBER | R-000265-0146-4 |
| DRAWING SCALE | 1/4" = 1'-0" |
| CITY OF HOUSTON PM | SHAHIDUR RAHMAN, PE |
| SHEET NO. 95 | OF 111 |

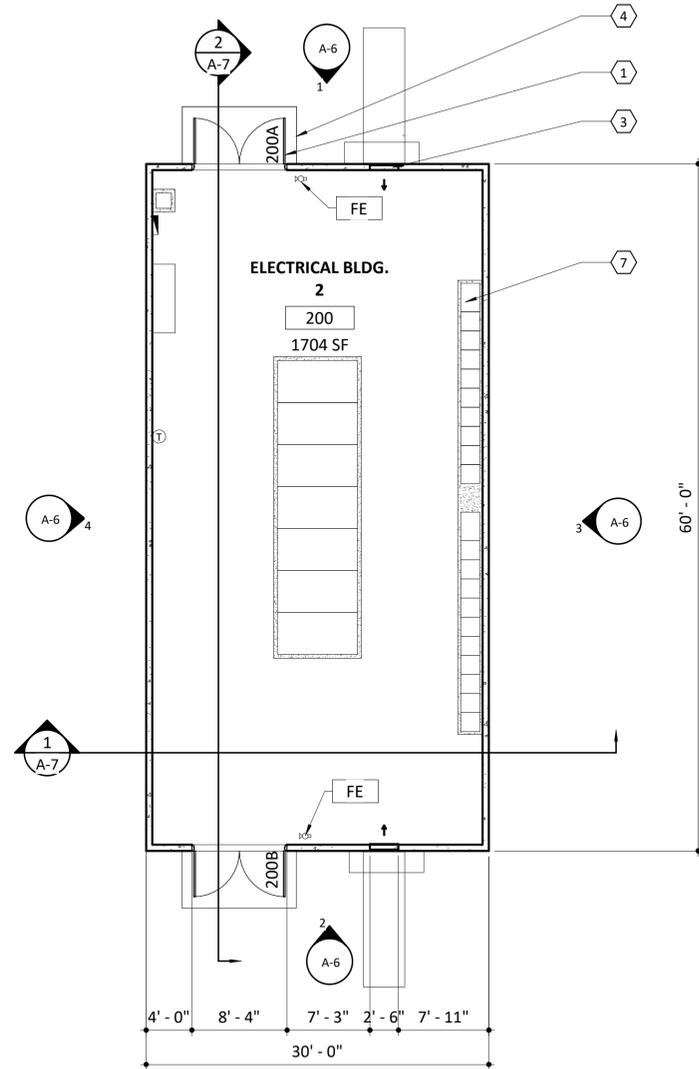
AR-R025516-ELR-25.RVT

GENERAL NOTES

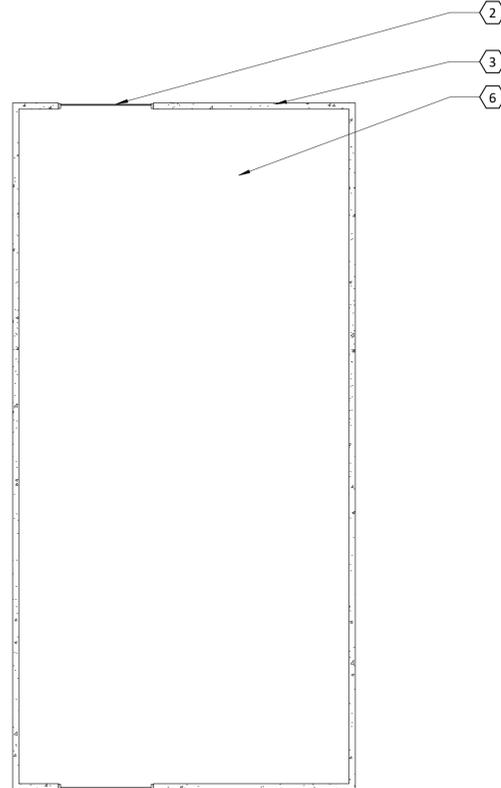
1. ALL DIMENSIONS ARE GIVEN TO:
 - A. FACE OF CONCRETE OR MASONRY.
 - B. CENTER LINE OF COLUMNS WHERE INDICATED.
 - C. FACE OF FINISH.
 - D. CONCRETE FLOOR LINE.
2. REFER TO LIFE SAFETY PLAN FOR LOCATION OF FIRE EXTINGUISHER (FE).
3. REFER TO SHEET A-1 FOR GENERAL NOTES, ABBREVIATIONS AND WALL TYPES.

NOTES BY SYMBOL "X"

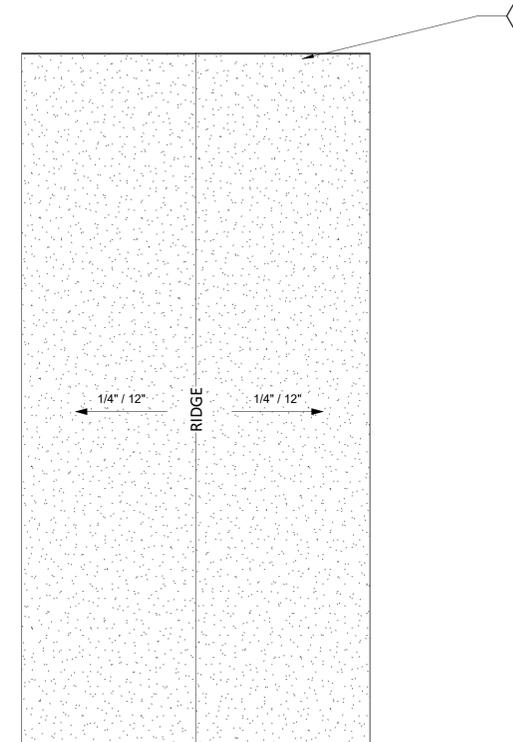
- 1 DOOR AS SCHEDULED
- 2 INSULATED REMOVABLE TRANSOM PANEL
- 3 PRECAST CONCRETE WALL PANEL
- 4 CONCRETE SLAB, REFER STRUCTURAL
- 5 PRECAST INSULATED CONCRETE ROOF PANEL
- 6 EXPOSED STRUCTURE ABOVE
- 7 ELECTRICAL EQUIPMENT, REFER ELECTRICAL



1 FLOOR PLAN
 1/8" = 1'-0"



2 REFLECTED CEILING PLAN
 1/8" = 1'-0"



3 ROOF PLAN
 1/8" = 1'-0"

| NO. | DESCRIPTION | DATE | DWN. | CHK. |
|-----|-------------|------|------|------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

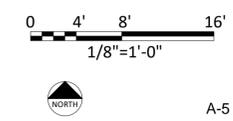
FRESE & NICHOLS
 10497 Town and Country Way,
 Suite 500
 Houston, Texas 77024
 Phone - (713) 600-6800
 Web - www.freese.com
 Freese and Nichols, Inc.
 Texas Registered Engineering Firm F-2144

NOT FOR CONSTRUCTION
 THIS DOCUMENT IS RELEASED FOR THE
 PURPOSE OF INTERIM REVIEW UNDER THE
 AUTHORITY OF: GREG GASKIE
 TEXAS NO. 32250 ON DATE: 10/29/2025
 IT IS NOT TO BE USED FOR CONSTRUCTION,
 BIDDING OR PERMIT PURPOSES

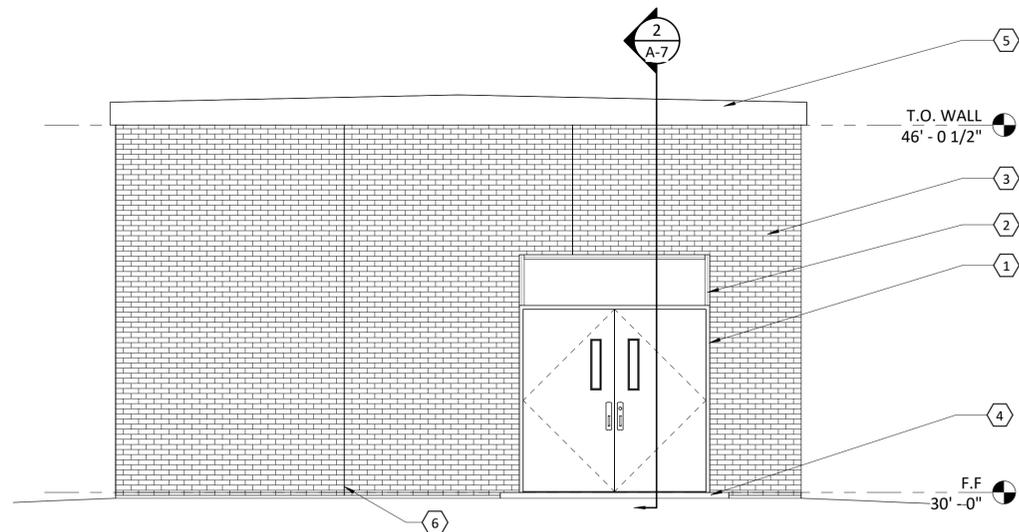
SURVEYED BY:
 FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
ARCHITECTURE
ELECTRICAL BUILDING 2
PLANS

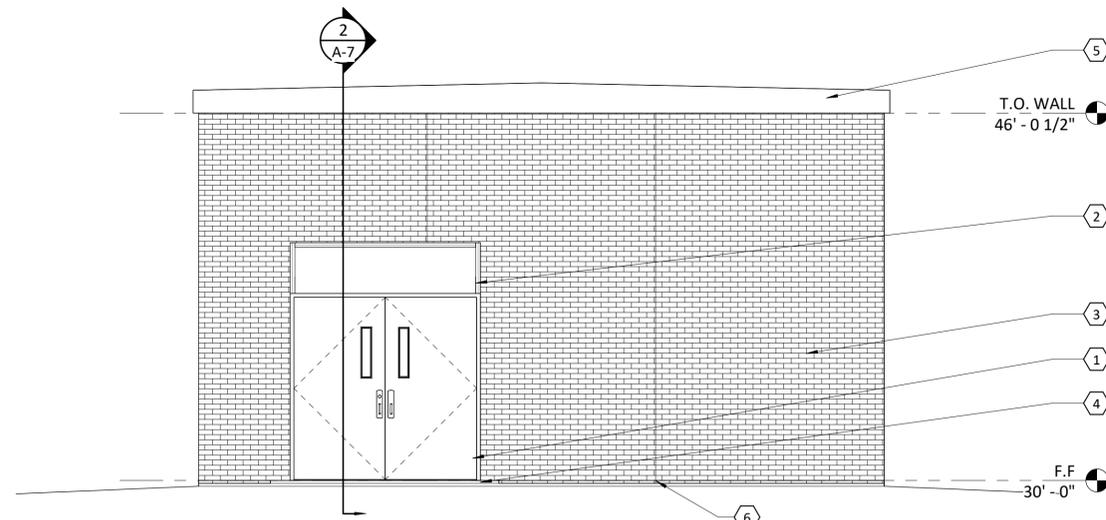
| | |
|--------------------|---------------------|
| WBS NUMBER | R-000265-0146-4 |
| DRAWING SCALE | As indicated |
| CITY OF HOUSTON PM | SHAHIDUR RAHMAN, PE |
| SHEET NO. 96 | OF 111 |



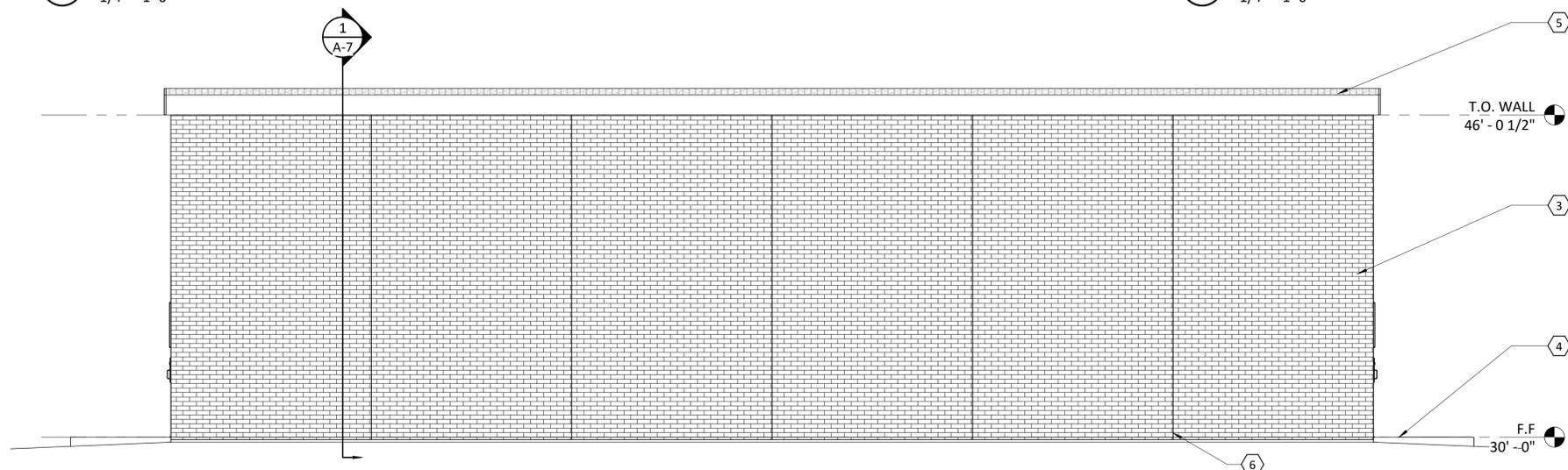
AE-R002516-ELB-025.RVT



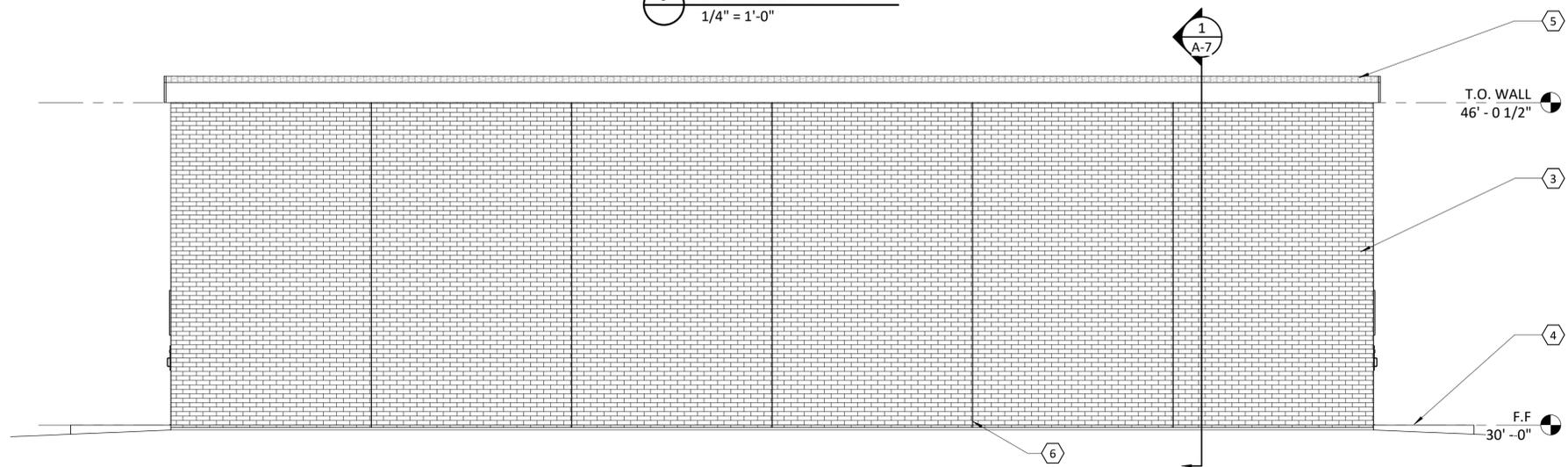
1 NORTH ELEVATION
1/4" = 1'-0"



2 SOUTH ELEVATION
1/4" = 1'-0"



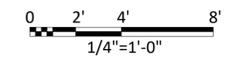
3 EAST ELEVATION
1/4" = 1'-0"



4 WEST ELEVATION
1/4" = 1'-0"

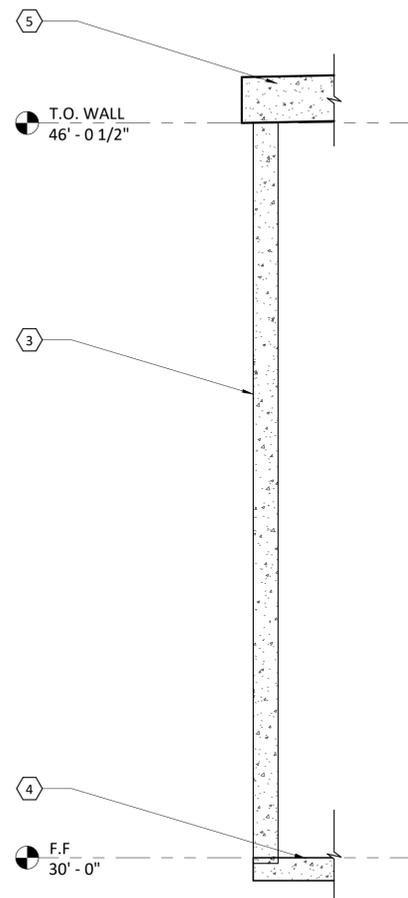
NOTES BY SYMBOL "X"

- 1 INSULATED STAINLESS STEEL DOOR AS SCHEDULED
- 2 INSULATED REMOVABLE TRANSOM PANEL
- 3 PRECAST INSULATED CONCRETE WALL PANEL
- 4 CONCRETE SLAB, REFER STRUCTURAL
- 5 PRECAST INSULATED CONCRETE ROOF PANEL
- 6 CONCRETE PANEL JOINTS, REFER STRUCTURAL

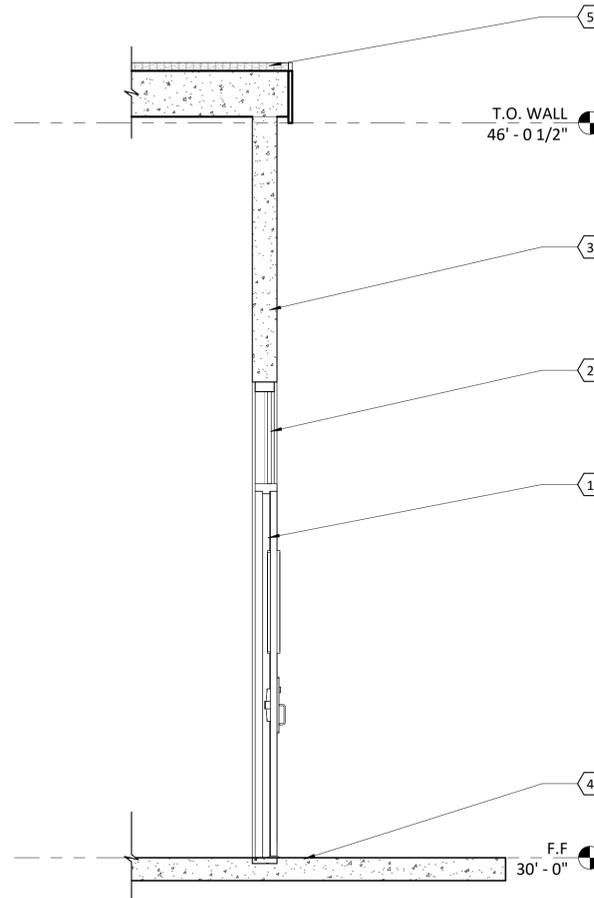


| NO. | DESCRIPTION | DATE | DWN. | CHK. |
|--|-------------|------|------|---|
| | | | | |
| 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144 | | | | NOT FOR CONSTRUCTION <small>THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF: GREG GASKIE TEXAS NO: 32250 ON DATE: 10/29/2025 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES</small> |
| SURVEYED BY: FB NO. P- | | | | |
| CITY OF HOUSTON HOUSTON PUBLIC WORKS | | | | |
| SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ARCHITECTURE ELECTRICAL BUILDING 2 EXTERIOR ELEVATIONS | | | | |
| WBS NUMBER R-000265-0146-4 | | | | |
| DRAWING SCALE 1/4" = 1'-0" | | | | |
| CITY OF HOUSTON PM SHAHIDUR RAHMAN, PE | | | | |
| SHEET NO. 97 OF 111 | | | | |

AR-R025516-ELB-R25.RVT



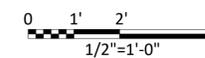
1 SECTION 1
A-5 1/2" = 1'-0"



2 SECTION 2
A-5 1/2" = 1'-0"

NOTES BY SYMBOL "X"

- 1 INSULATED STAINLESS STEEL DOOR AS SCHEDULED
- 2 INSULATED REMOVABLE TRANSOM PANEL
- 3 PRECAST INSULATED CONCRETE WALL PANEL
- 4 CONCRETE SLAB, REFER STRUCTURAL
- 5 PRECAST INSULATED CONCRETE ROOF PANEL

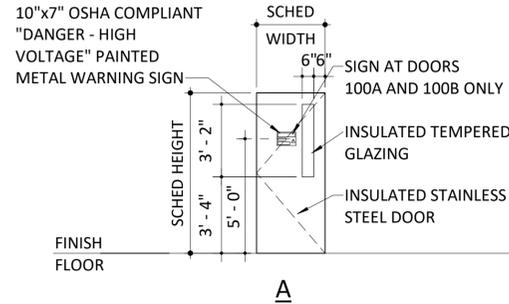


| NO. | DESCRIPTION | DATE | DWN. | CHK. |
|--|-------------|------|------|---|
|  10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com <small>Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144</small> | | | | |
| SURVEYED BY: FB NO. P- | | | | NOT FOR CONSTRUCTION <small>THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF: GREG GASKIE TEXAS NO: 32250 ON DATE: 10/29/2025 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES</small> |
| CITY OF HOUSTON HOUSTON PUBLIC WORKS | | | | |
| SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ARCHITECTURE ELECTRICAL BUILDING 2 WALL SECTIONS | | | | |
| WBS NUMBER | | | | |
| R-000265-0146-4 | | | | |
| DRAWING SCALE | | | | |
| 1/2" = 1'-0" | | | | |
| CITY OF HOUSTON PM | | | | |
| SHAHIDUR RAHMAN, PE | | | | |
| SHEET NO. 98 OF 111 | | | | |

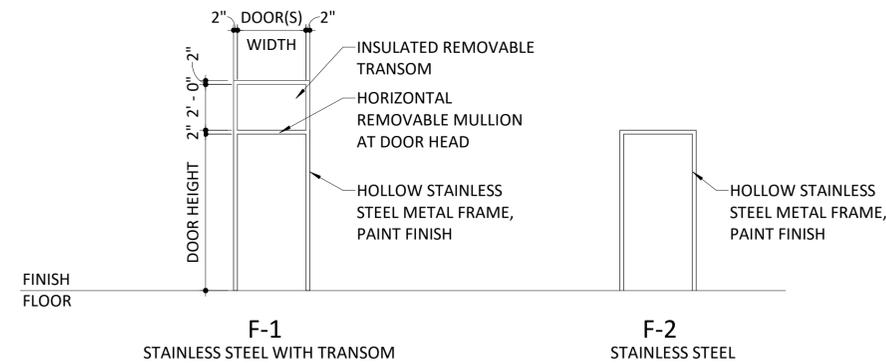
| DOOR & FRAME SCHEDULE | | | | | | | | | | | | | |
|-----------------------|------------------|---------|-----------|-----------|-------------------|-----------|--------------|-------|-------|-------|-------|---------|----------|
| DOOR NO. | DOOR DESCRIPTION | | | | FRAME DESCRIPTION | | | | | | | | COMMENTS |
| | SIZE | | | | DOOR MAT | DOOR TYPE | DOOR DETAILS | | | | | | |
| | WIDTH | HEIGHT | THICKNESS | FRAME MAT | | | FRAME TYPE | HEAD | JAMB | JAMB | SILL | | |
| 100A | 3' - 0" | 8' - 0" | 1 3/4" | STL | A | STL | F-2 | 8/A-9 | 6/A-9 | 6/A-9 | 7/A-9 | 1, 2, 3 | |
| 100B | 8' - 0" | 8' - 0" | 1 3/4" | STL | A | STL | F-1 | 4/A-9 | 6/A-9 | 6/A-9 | 7/A-9 | 1, 2, 3 | |
| 200A | 8' - 0" | 8' - 0" | 1 3/4" | STL | A | STL | F-1 | 4/A-9 | 6/A-9 | 6/A-9 | 7/A-9 | 1, 2, 3 | |
| 200B | 8' - 0" | 8' - 0" | 1 3/4" | STL | A | STL | F-1 | 4/A-9 | 6/A-9 | 6/A-9 | 7/A-9 | 1, 2, 3 | |

NOTES

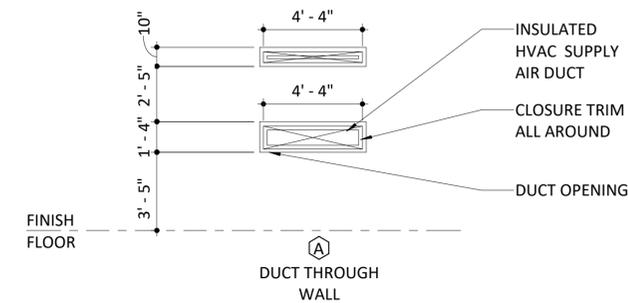
- INSULATED DOOR.
- DOOR TO BE REPAINTED PER FINISH SCHEDULE.
- VISION PANEL TO BE FIRE RATED PER IBC 2015 TABLE 716.5, FIRE-RATED GLAZING MARKING DOOR VISION PANEL, D-H-45.



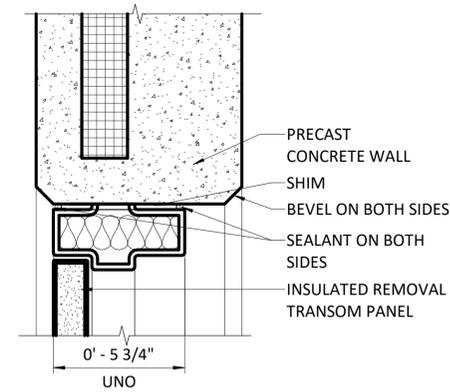
1 DOOR TYPES
1/4" = 1'-0"



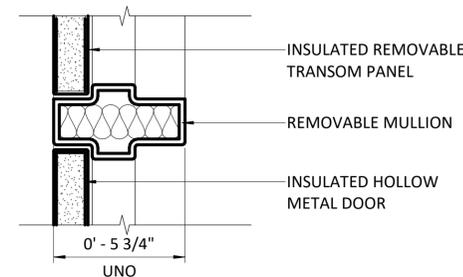
2 FRAME TYPES
1/4" = 1'-0"



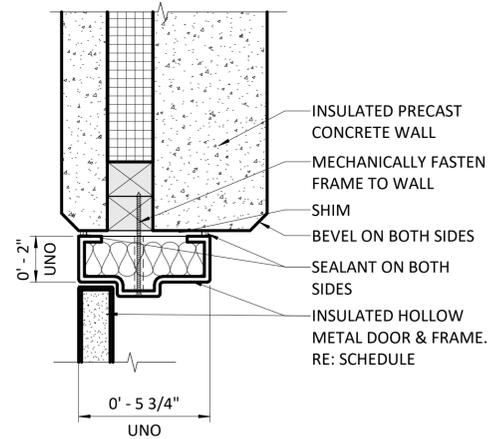
3 OPENING TYPES
NTS



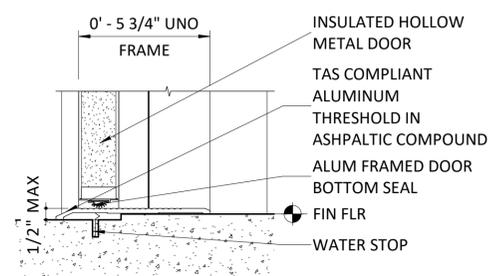
4 DOOR HEAD DETAIL
3" = 1'-0"



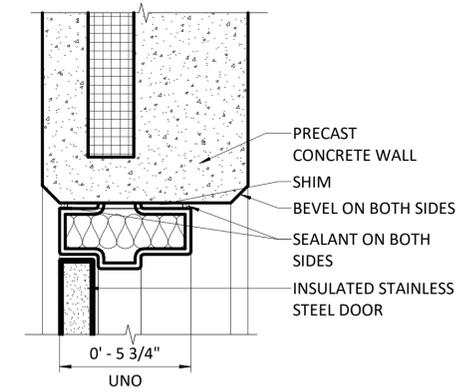
5 TRANSOM DOOR HEAD
3" = 1'-0"



6 DOOR JAMB DETAIL
3" = 1'-0"



7 DOOR SILL DETAIL
3" = 1'-0"

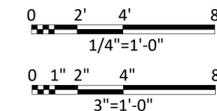


8 SINGLE DOOR HEAD DETAIL
3" = 1'-0"

GENERAL NOTES

- PANIC HARDWARE TO MATCH DOOR FRAME.
- ALL FRAMES TO BE HOLLOW METAL U.N.O.
- ALL DOOR DIMENSIONS ARE CLEAR, FROM EDGE OF DOOR STOP TO EDGE OF DOOR IN 90° OPEN POSITION.

| | | | | | | | | | | |
|--|--|--|--|-------------|--|--|--|------|------|------|
| NO. | | | | DESCRIPTION | | | | DATE | DWN. | CHK. |
| | | | | | | | | | | |
| 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144 | | | | | | | | | | |
| NOT FOR CONSTRUCTION THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF: GREG GASKIE TEXAS NO: 32250 ON DATE: 10/29/2025 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES | | | | | | | | | | |
| SURVEYED BY: | | | | | | | | | | |
| FB NO. P- | | | | | | | | | | |
| CITY OF HOUSTON HOUSTON PUBLIC WORKS SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS ARCHITECTURE ELECTRICAL BUILDING DOOR AND FRAME LEGEND | | | | | | | | | | |
| WBS NUMBER | | | | | | | | | | |
| R-000265-0146-4 | | | | | | | | | | |
| DRAWING SCALE | | | | | | | | | | |
| As indicated | | | | | | | | | | |
| CITY OF HOUSTON PM | | | | | | | | | | |
| SHAHIDUR RAHMAN, PE | | | | | | | | | | |
| SHEET NO. 100 OF 111 | | | | | | | | | | |



AR-R0026510-ELB-025.RVT

GENERAL NOTES

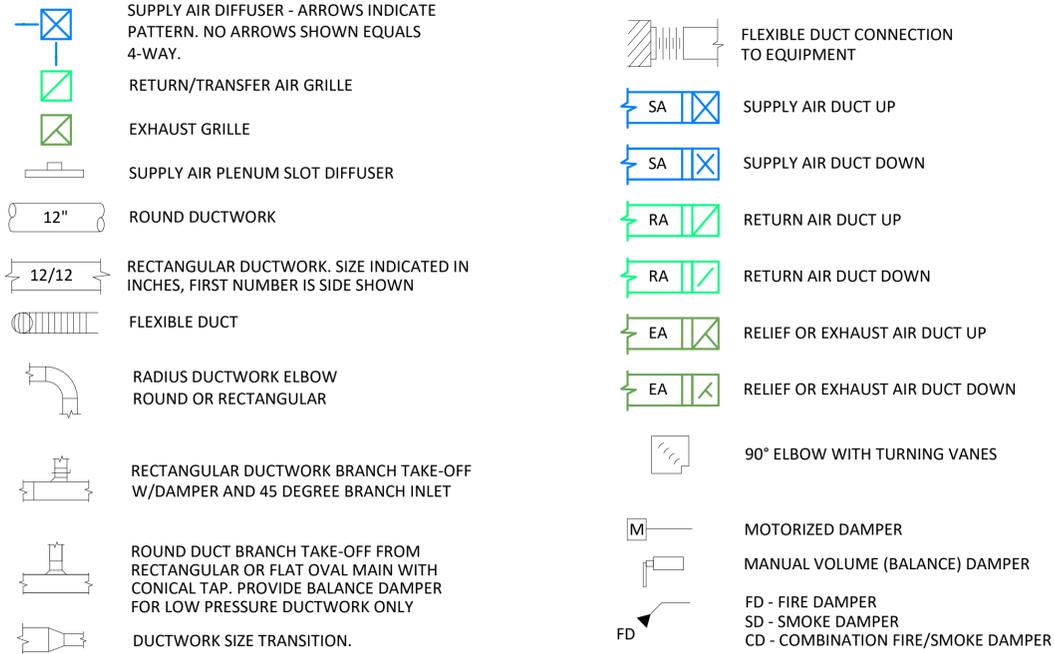
- THIS PROJECT IS DESIGNED BASED ON THE FOLLOWING CODES: UNIFORM MECHANICAL CODE 2021, INTERNATIONAL ENERGY CONSERVATION CODE 2021, ASHRAE 62.1.
- ALL INFORMATION REQUIRED FOR DESIGN MAY NOT BE COVERED IN THE DRAWINGS. REFER TO DIVISION 23 TECHNICAL SPECIFICATIONS AND OTHER RELATED SECTIONS FOR ADDITIONAL INFORMATION.
- ALL DUCT SIZES SHOWN ON THE DRAWINGS ARE NET INSIDE CLEAR DIMENSIONS.
- UTILIZE LONG RADIUS ELBOWS WHERE SPACE PERMITS UNLESS OTHERWISE NOTED. ALL RECTANGULAR ELBOWS SHALL CONTAIN TURNING VANES.
- COORDINATE WITH OTHER UTILITIES TO AVOID INTERFERENCES WHEN INSTALLING DUCTWORK, PIPING AND EQUIPMENT.
- FURNISH AND INSTALL ALL EQUIPMENT AS PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS. PROVIDE MODIFICATIONS AND ACCESSORIES AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER TO ASSURE PROPER OPERATION OF THE EQUIPMENT.
- VERIFY DIMENSIONS, LOCATIONS, ELEVATIONS AND CONFIGURATION OF ALL ITEMS ASSOCIATED WITH THE INSTALLATION OF DUCTWORK AND EQUIPMENT.
- EQUIPMENT, DUCTWORK AND PIPING SHALL NOT BE SUPPORTED OR SECURED TO OTHER EQUIPMENT, DUCTWORK, PIPING OR OTHER UTILITIES.
- PAINT ALL EQUIPMENT VISIBLE THROUGH AIR DEVICES MATTE BLACK.
- PROVIDE MANUAL VOLUME DAMPERS IN ALL DUCTWORK AT ALL DUCT SPLITS, BRANCH RUNOUTS AND DUCT COLLARS FOR REGISTERS. ALL MANUAL DAMPERS MAY NOT BE SHOWN ON DRAWINGS.
- ALL DUCTWORK SHALL BE CONSTRUCTED, SEALED AND INSTALLED IN CONFORMANCE TO SMACNA DUCT CONSTRUCTION STANDARDS.
- TO RESOLVE FIELD PROBLEMS IN ROUTING DUCTWORK THE CONTRACTOR SHALL USE THE SAME CIRCULAR EQUIVALENT DIAMETER TO TRANSFORM DUCT SIZE FROM THAT SPECIFIED ON THE DRAWINGS.

$$DE = \frac{1.30 (AB)^{0.625}}{(A+B)^{0.250}}$$

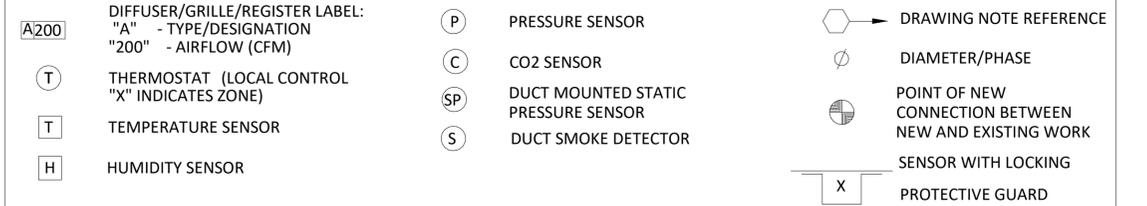
DE = CIRCULAR EQUIVALENT OF RECTANGULAR DUCT IN INCHES
 A = LENGTH OF ONE SIDE OF DUCT IN INCHES
 B = LENGTH OF OTHER SIDE OF DUCT IN INCHES

- PROVIDE FIRE DAMPERS IN DUCTWORK AT ALL FIRE BARRIER PENETRATIONS. PROVIDE ACCESS DOORS IN DUCTWORK TO VIEW AND SERVICE FIRE DAMPERS PER SMACNA AND APPLICABLE LOCAL CODES.
- PROVIDE FIRE RESISTANT FLEXIBLE CONNECTION WHENEVER DUCTWORK IS CONNECTED TO MOTORIZED EQUIPMENT.
- DUCT MATERIAL SHALL BE ZINC-COATED STEEL WITH METAL AND GALVANIZING THICKNESS AS PER SMACNA CONSTRUCTION STANDARDS.
- PROVIDE OSHA-REQUIRED CLEARANCES AROUND ALL HVAC EQUIPMENT AND COMPONENTS FOR PERSONNEL ACCESS AND MAINTENANCE.
- ALL PIPE HANGERS AND SUPPORTS SHALL COMPLY WITH MANUFACTURER'S STANDARDIZATION SOCIETY (MSS) STANDARDS. VERTICAL PIPES MUST BE SUPPORTED AT EACH FLOOR WITH PIPE CLAMPS.
- INSULATE BACKS AND PLENUMS OF SUPPLY AIR DEVICES WITH MINIMUM 1" MINERAL FIBER.
- ALL AIR MOVING EQUIPMENT CONTAINING PARTICULATE FILTERS SHALL NOT BE OPERATED WITHOUT PARTICULATE FILTERS IN PLACE.
- ADD DIELECTRIC CONNECTIONS BETWEEN PIPES OF DIFFERENT METALS.
- MAINTAIN A VERTICAL SLOPE OF 1/8" PER FOOT IN THE DIRECTION OF FLOW FOR ALL HORIZONTAL CONDENSATE PIPING. ROUTE CONDENSATE DRAIN ALONG WALL TO TERMINATE OPEN-SITE AT MOP SINK.
- INSTALL ALL PIPING PARALLEL TO BUILDING LINES UNLESS STATED OTHERWISE IN DRAWINGS.

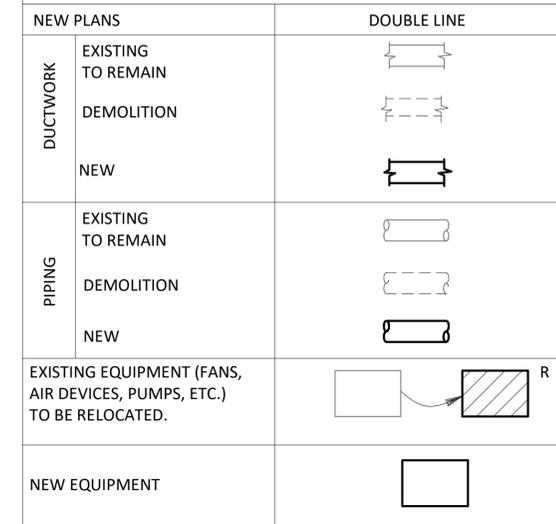
DUCTWORK SYMBOLS



MISCELLANEOUS



PLAN SYMBOLOGY



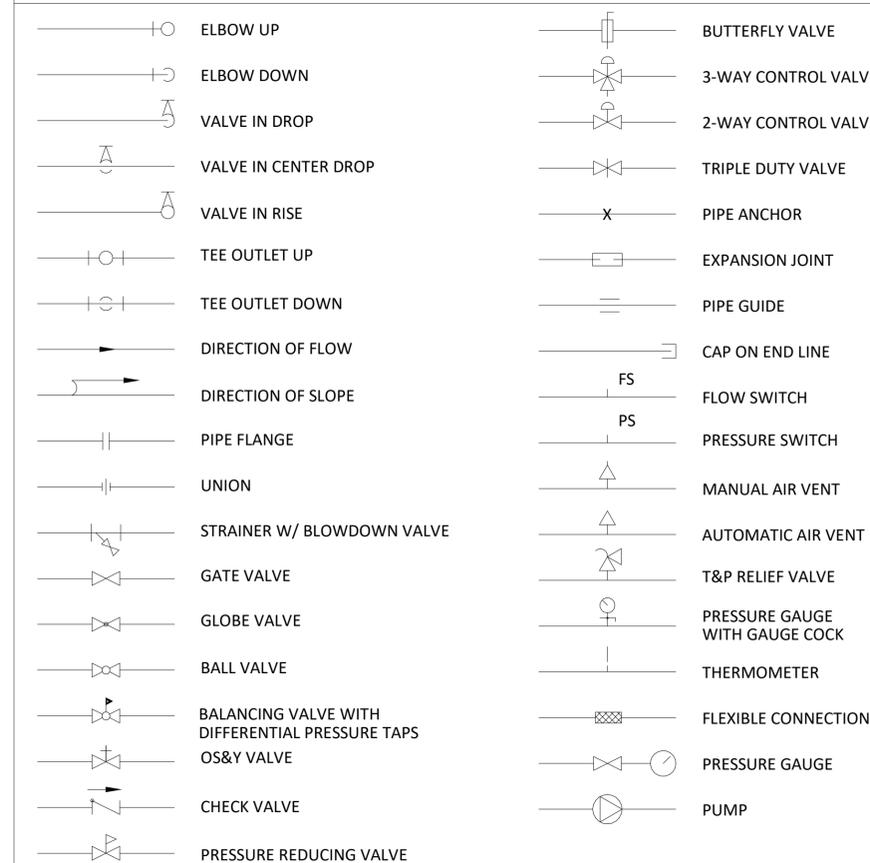
EQUIPMENT DESIGNATIONS



HVAC SYMBOLS (ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED ON THE DRAWINGS)

| ABBREVIATIONS | | | |
|---------------|---|--------|--|
| A/C | AIR CONDITIONING | HP | HORSEPOWER |
| AFF | ABOVE FINISHED FLOOR | HTG | HEATING |
| AI | ANALOG INPUT | IN | INCHES |
| AO | ANALOG OUTPUT | KW | KILOWATT |
| APPROX | APPROXIMATELY | LAT | LEAVING AIR TEMPERATURE |
| ARCH | ARCHITECTURE/ARCHITECTURAL | LWT | LEAVING WATER TEMPERATURE |
| AV | ANALOG VALUE | MAX | MAXIMUM |
| BI | BINARY INPUT | MECH | MECHANICAL |
| BHP | BRAKE HORSEPOWER | MCA | MINIMUM CIRCUIT AMPACITY |
| BO | BINARY OUTPUT | MBH | THOUSANDS BTU's PER HOUR |
| BOD | BOTTOM OF DUCT | MIN | MINIMUM |
| BTUH | BRITISH THERMAL UNIT PER HOUR | MOC | MAXIMUM OVERCURRENT PROTECTION |
| BV | BINARY VALUE | NFPA | NATIONAL FIRE PROTECTION ASSOC. |
| C | CELSIUS | NC | NOISE CRITERIA |
| CC | COOLING COIL | NOM | NOMINAL |
| CFM | CUBIC FEET PER MINUTE | NTS | NOT TO SCALE |
| CD | CONDENSATE DRAIN | NO | NUMBER |
| CONN | CONNECTION | N.C. | NORMALLY CLOSED |
| dB | DECIBELS | N.O. | NORMALLY OPEN |
| DI | DIGITAL INPUT | OA | OUTSIDE AIR |
| DIA | DIAMETER | P/PH | PHASE |
| DB | DRY BULB | PLBG | PLUMBING |
| DDC | DIRECT DIGITAL CONTROL | PSI | POUNDS PER SQUARE INCH |
| DEG | DEGREE | RE | REFER/REFERENCE |
| DO | DIGITAL OUTPUT | RA | RETURN AIR |
| DX | DIRECT EXPANSION | RPM | REVOLUTIONS PER MINUTE |
| DWGS | DRAWINGS | SMACNA | SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOC. |
| ELEC | ELECTRIC/ELECTRICAL | SQ FT | SQUARE FEET |
| EAT | ENTERING AIR TEMPERATURE | SP | STATIC PRESSURE |
| EWT | ENTERING WATER TEMPERATURE | SA | SUPPLY AIR |
| EFF | EFFICIENCY | TEMP | TEMPERATURE |
| EL | ELEVATION | T-STAT | THERMOSTAT |
| EMCS | ENERGY MONITORING AND CONTROL SYSTEM | TYP | TYPICAL |
| EXH | EXHAUST | VAV | VARIABLE AIR VOLUME |
| F | FAHRENHEIT | VFD | VARIABLE FREQUENCY DRIVE |
| FLEX | FLEXIBLE | VD | VOLUME DAMPER |
| FPM | FEET PER MINUTE | WT | WATTS |
| FT | FEET, FOOT | WTR | WATER |
| GPM | GALLONS PER MINUTE | WC | WATER COLUMN |
| HC | HEATING COIL | WG | WATER GAUGE |
| HVAC | HEATING, VENTILATION AND AIR CONDITIONING | WB | WET BULB |
| HZ | HERTZ | | |

PIPING SYMBOLS



FREES & NICHOLS
 10497 Town and Country Way, Suite 500
 Houston, Texas 77024
 Phone - (713) 600-6800
 Web - www.freese.com
 Freese and Nichols, Inc.
 Texas Registered Engineering Firm F-2144

NOT FOR CONSTRUCTION
 THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF TEXAS TEXAS NO: 149359 ON DATE: 10/29/2025 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES

SURVEYED BY:
 FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 MECHANICAL
 ELECTRICAL BUILDING 1
 NOTES, SYMBOLS & ABB.

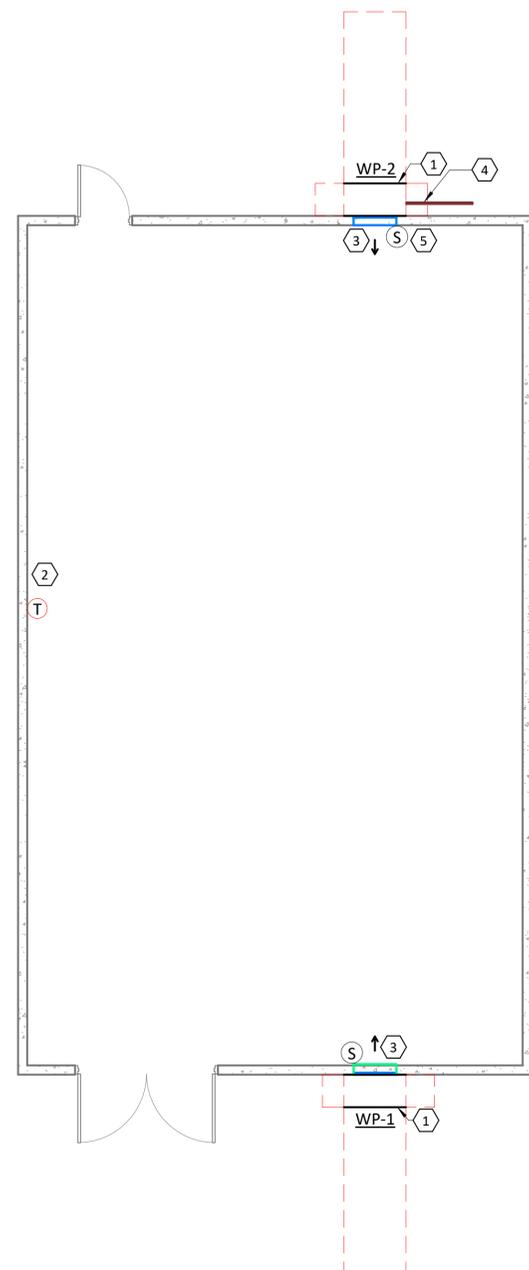
WBS NUMBER
 R-000265-0150-4

DRAWING SCALE
 NOT TO SCALE

CITY OF HOUSTON PM
 SHAHIDUR RAHMAN, PE

SHEET NO. 101 OF 111

HV-000265-0150-4-01-01-01



1 HVAC FLOOR PLAN
3/16" = 1'-0"

GENERAL NOTES

1. REFER TO M-0 FOR LEGEND, GENERAL NOTES AND ABBREVIATIONS.
2. REFER TO DIVISION 16 FOR TECHNICAL SPECIFICATIONS.
3. REFER TO ELECTRICAL DRAWINGS FOR POWER ROUTING/CONNECTION TO MECHANICAL EQUIPMENT.
4. DUCT SIZE FOR BRANCHED DUCTWORK SHALL MATCH WITH NECK SIZE OF DIFFUSERS.
5. INSTALL THERMOSTATS AT 48" AFF.
6. MAINTAIN 1/8" VERTICAL DROP PER HORIZONTAL FOOT MINIMUM FOR CONDENSATE DRAIN PIPING.

NOTES BY SYMBOL "○"

- 1 PROVIDE NEW WALL MOUNTED UNIT AS SCHEDULED. REFER TO DETAIL 1/M-2 FOR MORE DETAILS.
- 2 PROVIDE NEW LEAD-LAG CONTROLLER FOR BOTH WALL MOUNTED UNITS. ELECTRICAL CONTRACTOR TO PROVIDE NEW CONDUIT TO RESPECTIVE UNITS.
- 3 PROVIDE FACTORY FURNISHED SUPPLY AND RETURN GRILLES.
- 4 PROVIDE 1" DIAMETER COPPER CONDENSATE DRAIN AND P-TRAP, ROUTE AND TERMINATE PIPING IN DRY WELL AS SHOWN ON PLANS. PLACE FRY WELL X' FROM BUILDING. REFER TO DETAIL 2/M-2 FOR MORE DETAILS.
- 5 SMOKE DETECTORS TO BE MOUNTED INSIDE RETURN AIR DUCT.

WALL PACK CONTROL SEQUENCES

UNITS SHALL BE CONTROLLED BY A FACTORY-PROVIDED STAND ALONE PLC BASED ON THE SEQUENCES BELOW:

- A. EACH PACKAGED DX WALL MOUNTED UNIT WILL CONSIST OF A DIRECT EXPANSION (DX) COOLING COIL, A VARIABLE SPEED SUPPLY AIR FAN, SUPPLY AIR DAMPER, AND OUTSIDE AIR DAMPER. THE UNITS WILL BE RESPONSIBLE FOR SERVING A SINGLE ZONE.
- B. ENABLE/DISABLE CONTROL: THE WALL PACK'S SHALL BE ENABLED TO RUN 24/7.
- C. WHEN THE WALL PACK IS OFF, ALL DAMPERS SHALL BE FULLY CLOSED.
- D. SPACE TEMPERATURE CONTROL: WHEN THERE IS A CALL FOR COOLING FROM THE SPACE AIR TEMPERATURE THERMOSTAT, THE PRIMARY WALL PACK SUPPLY AIR FAN SHALL RUN. THE SPACE AIR TEMPERATURE SETPOINT SHALL BE DETERMINED BY THE OWNER, BUT WILL BE INITIALLY SET TO 80°F IN COOLING AND 45°F IN HEATING. THE UNIT SHALL MODULATE THE SUPPLY AIR FAN(S) AND COMPRESSOR(S) (PER THE MANUFACTURER'S PREFERRED SEQUENCE) TO MAINTAIN THE SPACE AIR TEMPERATURE SETPOINT.
- E. RUN SCHEDULE: ONE UNIT WILL ACT AS THE PRIMARY UNIT, AND THE OTHER AS BACKUP. EACH UNIT SHALL SWITCH FROM PRIMARY TO BACKUP STATUS ON A WEEKLY BASIS. BACKUP UNIT SHALL BECOME PRIMARY UNIT IN THE EVENT OF PRIMARY UNIT FAILURE OR IF IT IS UNABLE TO MEET COOLING DEMANDS.
- F. ALARMS:
 - a. SMOKE ALARM: SMOKE DETECTOR LOCATED IN THE RETURN AIR DUCTWORK SHALL BE HARD WIRED INTO THE MOTOR CONTROL CIRCUIT TO SHUT DOWN THE FAN UPON SENSING SMOKE

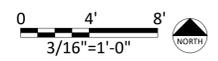
FRESE & NICHOLS
10497 Town and Country Way,
Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com
Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

NOT FOR CONSTRUCTION
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF TEXAS
TEXAS NO: 149359 ON DATE: 10/29/2025
IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
MECHANICAL
ELECTRICAL BUILDING 1
FLOOR PLAN

| | |
|--------------------|---------------------|
| WBS NUMBER | R-000265-0150-4 |
| DRAWING SCALE | As indicated |
| CITY OF HOUSTON PM | SHAHIDUR RAHMAN, PE |
| SHEET NO. M-1 | OF XXX |

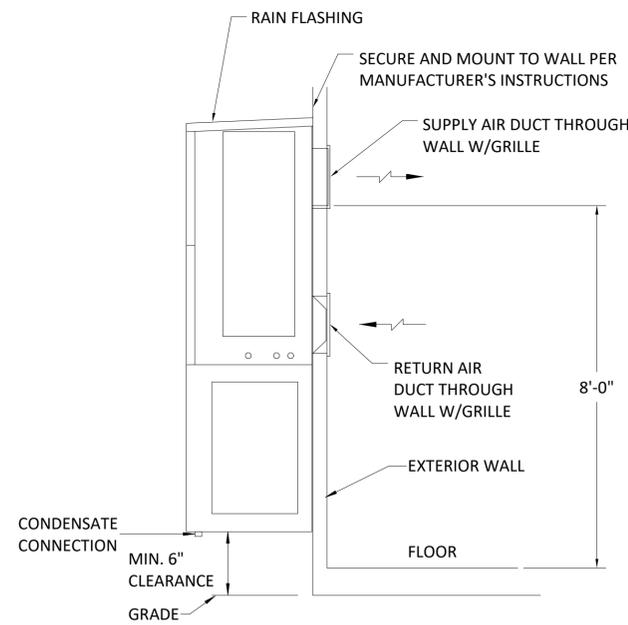


M-2

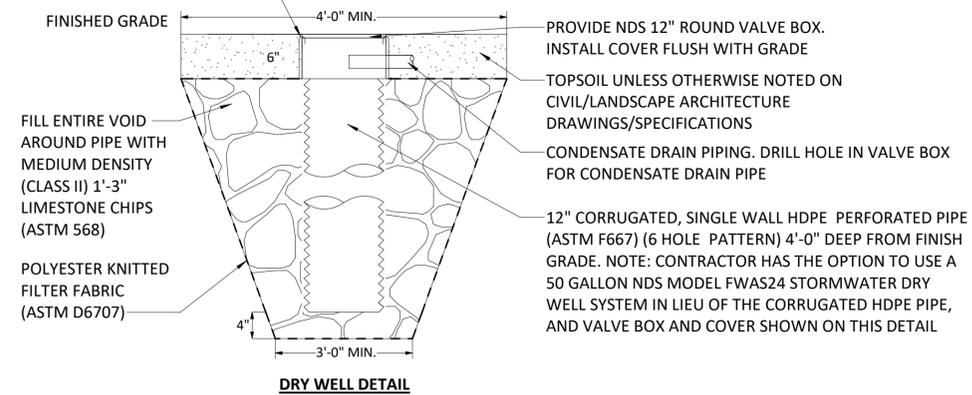
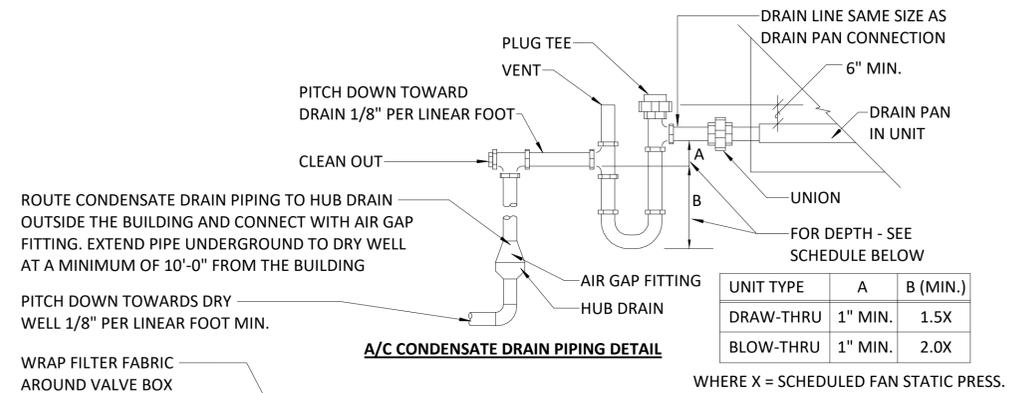
| WALL PACK UNIT SCHEDULE | | | | | | | | | | | | | | | | |
|-------------------------|-----------------------|-----------------|--------------|---------------|------------------|---------------|-----------------|-----------------|----------------|------------------|--------------|-----------------|-------|-----|------|--------------------|
| MARK | SERVES | NOM SIZE (TONS) | AIR FLOW | | EXT S.P. (IN WG) | SUPPLY FAN HP | COOLING | | | | COND. FAN HP | UNIT ELECTRICAL | | | | MANUFACTURER/MODEL |
| | | | SUPPLY (CFM) | OUTSIDE (CFM) | | | TOTAL CAP (MBH) | SENS CAP. (MBH) | EAT DB/WB (°F) | AMBIENT AIR (°F) | | VOLTAGE | PHASE | MCA | MOCP | |
| WP-1 | ELECTRICAL BUILDING 2 | 3 | 0 | | 0.15 | | 34,400.0 | 26,200.0 | 80/67 | 97 | | 460 | 3 | 11 | 15 | BARD / |
| WP-2 | ELECTRICAL BUILDING 2 | 3 | | | 0.15 | | 34,400.0 | 26,200.0 | 80/67 | 97 | | 460 | 3 | 11 | 15 | BARD / |

REMARKS:

1. PROVIDE WITH RETURN AIR SMOKE DETECTOR, TO TURN OFF UNIT WHEN SMOKE IS DETECTED.
2. PROVIDE WITH FACTORY WALL MOUNTING ACCESSORIES.
3. PROVIDE WITH MERV 8" REPLACEABLE FILTER.
4. PROVIDE WITH FACTORY FURNISHED SUPPLY AND RETURN GRILLES.
5. PROVIDE WITH CONDENSATE DRAIN AND DRY WELL.
6. PROVIDE POWDER COATING ON COIL AND CABINET TO PROTECT AGAINST CORROSION
7. PROVIDE DISCONNECTS



1 PACKAGED WALL-MOUNTED UNIT DETAIL
 NOT TO SCALE



2 TYPICAL A/C CONDENSATE DRAINAGE PIPING DETAIL
 NOT TO SCALE

FREESSE & NICHOLS
 10497 Town and Country Way,
 Suite 500
 Houston, Texas 77024
 Phone - (713) 600-6800
 Web - www.freese.com
 Freese and Nichols, Inc.
 Texas Registered Engineering Firm F-2144

NOT FOR CONSTRUCTION
 THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF TEXAS TEXAS NO: 149359 ON DATE: 10/29/2025 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES

SURVEYED BY:
 FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 MECHANICAL
 ELECTRICAL BUILDING 1
 SCHEDULES AND DETAILS

| | |
|----------------------|--|
| WBS NUMBER | |
| R-000265-0150-4 | |
| DRAWING SCALE | |
| NOT TO SCALE | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. M-2 OF XXX | |

HV-H0025510-EL-ER-25.RVT

GENERAL NOTES

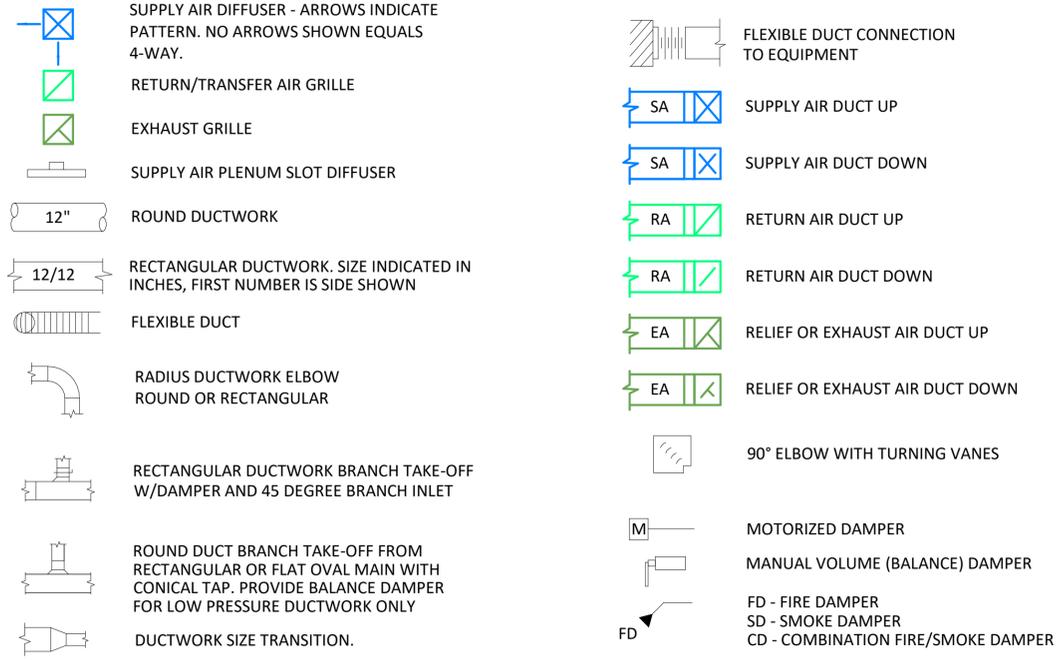
- THIS PROJECT IS DESIGNED BASED ON THE FOLLOWING CODES: UNIFORM MECHANICAL CODE 2021, INTERNATIONAL ENERGY CONSERVATION CODE 2021, ASHRAE 62.1.
- ALL INFORMATION REQUIRED FOR DESIGN MAY NOT BE COVERED IN THE DRAWINGS. REFER TO DIVISION 23 TECHNICAL SPECIFICATIONS AND OTHER RELATED SECTIONS FOR ADDITIONAL INFORMATION.
- ALL DUCT SIZES SHOWN ON THE DRAWINGS ARE NET INSIDE CLEAR DIMENSIONS.
- UTILIZE LONG RADIUS ELBOWS WHERE SPACE PERMITS UNLESS OTHERWISE NOTED. ALL RECTANGULAR ELBOWS SHALL CONTAIN TURNING VANES.
- COORDINATE WITH OTHER UTILITIES TO AVOID INTERFERENCES WHEN INSTALLING DUCTWORK, PIPING AND EQUIPMENT.
- FURNISH AND INSTALL ALL EQUIPMENT AS PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS. PROVIDE MODIFICATIONS AND ACCESSORIES AS REQUIRED AND RECOMMENDED BY THE MANUFACTURER TO ASSURE PROPER OPERATION OF THE EQUIPMENT.
- VERIFY DIMENSIONS, LOCATIONS, ELEVATIONS AND CONFIGURATION OF ALL ITEMS ASSOCIATED WITH THE INSTALLATION OF DUCTWORK AND EQUIPMENT.
- EQUIPMENT, DUCTWORK AND PIPING SHALL NOT BE SUPPORTED OR SECURED TO OTHER EQUIPMENT, DUCTWORK, PIPING OR OTHER UTILITIES.
- PAINT ALL EQUIPMENT VISIBLE THROUGH AIR DEVICES MATTE BLACK.
- PROVIDE MANUAL VOLUME DAMPERS IN ALL DUCTWORK AT ALL DUCT SPLITS, BRANCH RUNOUTS AND DUCT COLLARS FOR REGISTERS. ALL MANUAL DAMPERS MAY NOT BE SHOWN ON DRAWINGS.
- ALL DUCTWORK SHALL BE CONSTRUCTED, SEALED AND INSTALLED IN CONFORMANCE TO SMACNA DUCT CONSTRUCTION STANDARDS.
- TO RESOLVE FIELD PROBLEMS IN ROUTING DUCTWORK THE CONTRACTOR SHALL USE THE SAME CIRCULAR EQUIVALENT DIAMETER TO TRANSFORM DUCT SIZE FROM THAT SPECIFIED ON THE DRAWINGS.

$$DE = \frac{1.30 (AB)^{0.625}}{(A + B)^{0.250}}$$

DE = CIRCULAR EQUIVALENT OF RECTANGULAR DUCT IN INCHES
 A = LENGTH OF ONE SIDE OF DUCT IN INCHES
 B = LENGTH OF OTHER SIDE OF DUCT IN INCHES

- PROVIDE FIRE DAMPERS IN DUCTWORK AT ALL FIRE BARRIER PENETRATIONS. PROVIDE ACCESS DOORS IN DUCTWORK TO VIEW AND SERVICE FIRE DAMPERS PER SMACNA AND APPLICABLE LOCAL CODES.
- PROVIDE FIRE RESISTANT FLEXIBLE CONNECTION WHENEVER DUCTWORK IS CONNECTED TO MOTORIZED EQUIPMENT.
- DUCT MATERIAL SHALL BE ZINC-COATED STEEL WITH METAL AND GALVANIZING THICKNESS AS PER SMACNA CONSTRUCTION STANDARDS.
- PROVIDE OSHA-REQUIRED CLEARANCES AROUND ALL HVAC EQUIPMENT AND COMPONENTS FOR PERSONNEL ACCESS AND MAINTENANCE.
- ALL PIPE HANGERS AND SUPPORTS SHALL COMPLY WITH MANUFACTURER'S STANDARDIZATION SOCIETY (MSS) STANDARDS. VERTICAL PIPES MUST BE SUPPORTED AT EACH FLOOR WITH PIPE CLAMPS.
- INSULATE BACKS AND PLENUMS OF SUPPLY AIR DEVICES WITH MINIMUM 1" MINERAL FIBER.
- ALL AIR MOVING EQUIPMENT CONTAINING PARTICULATE FILTERS SHALL NOT BE OPERATED WITHOUT PARTICULATE FILTERS IN PLACE.
- ADD DIELECTRIC CONNECTIONS BETWEEN PIPES OF DIFFERENT METALS.
- MAINTAIN A VERTICAL SLOPE OF 1/8" PER FOOT IN THE DIRECTION OF FLOW FOR ALL HORIZONTAL CONDENSATE PIPING. ROUTE CONDENSATE DRAIN ALONG WALL TO TERMINATE OPEN-SITE AT MOP SINK.
- INSTALL ALL PIPING PARALLEL TO BUILDING LINES UNLESS STATED OTHERWISE IN DRAWINGS.

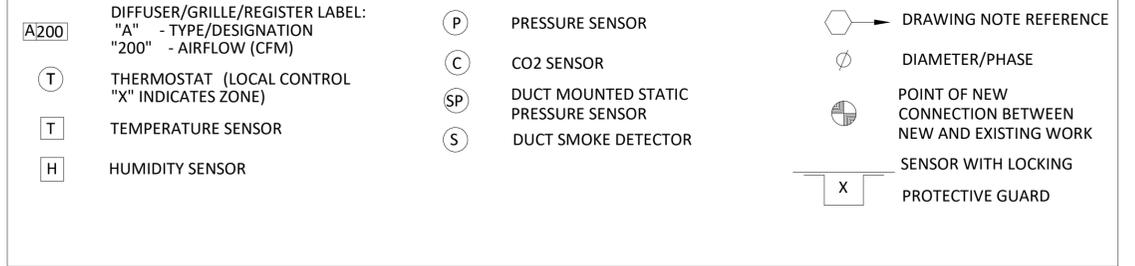
DUCTWORK SYMBOLS



HVAC SYMBOLS (ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED ON THE DRAWINGS)

| ABBREVIATIONS | | | |
|---------------|---|--------|--|
| A/C | AIR CONDITIONING | HP | HORSEPOWER |
| AFF | ABOVE FINISHED FLOOR | HTG | HEATING |
| AI | ANALOG INPUT | IN | INCHES |
| AO | ANALOG OUTPUT | KW | KILOWATT |
| APPROX | APPROXIMATELY | LAT | LEAVING AIR TEMPERATURE |
| ARCH | ARCHITECTURE/ARCHITECTURAL | LWT | LEAVING WATER TEMPERATURE |
| AV | ANALOG VALUE | MAX | MAXIMUM |
| BI | BINARY INPUT | MECH | MECHANICAL |
| BHP | BRAKE HORSEPOWER | MCA | MINIMUM CIRCUIT AMPACITY |
| BO | BINARY OUTPUT | MBH | THOUSANDS BTU's PER HOUR |
| BOD | BOTTOM OF DUCT | MIN | MINIMUM |
| BTUH | BRITISH THERMAL UNIT PER HOUR | MOC | MAXIMUM OVERCURRENT PROTECTION |
| BV | BINARY VALUE | NFPA | NATIONAL FIRE PROTECTION ASSOC. |
| C | CELSIUS | NC | NOISE CRITERIA |
| CC | COOLING COIL | NOM | NOMINAL |
| CFM | CUBIC FEET PER MINUTE | NTS | NOT TO SCALE |
| CD | CONDENSATE DRAIN | NO | NUMBER |
| CONN | CONNECTION | N.C. | NORMALLY CLOSED |
| dB | DECIBELS | N.O. | NORMALLY OPEN |
| DI | DIGITAL INPUT | OA | OUTSIDE AIR |
| DIA | DIAMETER | P/PH | PHASE |
| DB | DRY BULB | PLBG | PLUMBING |
| DDC | DIRECT DIGITAL CONTROL | PSI | POUNDS PER SQUARE INCH |
| DEG | DEGREE | RE | REFER/REFERENCE |
| DO | DIGITAL OUTPUT | RA | RETURN AIR |
| DX | DIRECT EXPANSION | RPM | REVOLUTIONS PER MINUTE |
| DWGS | DRAWINGS | SMACNA | SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOC. |
| ELEC | ELECTRIC/ELECTRICAL | SQ FT | SQUARE FEET |
| EAT | ENTERING AIR TEMPERATURE | SP | STATIC PRESSURE |
| EWT | ENTERING WATER TEMPERATURE | SA | SUPPLY AIR |
| EFF | EFFICIENCY | TEMP | TEMPERATURE |
| EL | ELEVATION | T-STAT | THERMOSTAT |
| EMCS | ENERGY MONITORING AND CONTROL SYSTEM | TYP | TYPICAL |
| EXH | EXHAUST | VAV | VARIABLE AIR VOLUME |
| F | FAHRENHEIT | VFD | VARIABLE FREQUENCY DRIVE |
| FLEX | FLEXIBLE | VD | VOLUME DAMPER |
| FPM | FEET PER MINUTE | WT | WATTS |
| FT | FEET, FOOT | WTR | WATER |
| GPM | GALLONS PER MINUTE | WC | WATER COLUMN |
| HC | HEATING COIL | WG | WATER GAUGE |
| HVAC | HEATING, VENTILATION AND AIR CONDITIONING | WB | WET BULB |
| HZ | HERTZ | | |

MISCELLANEOUS



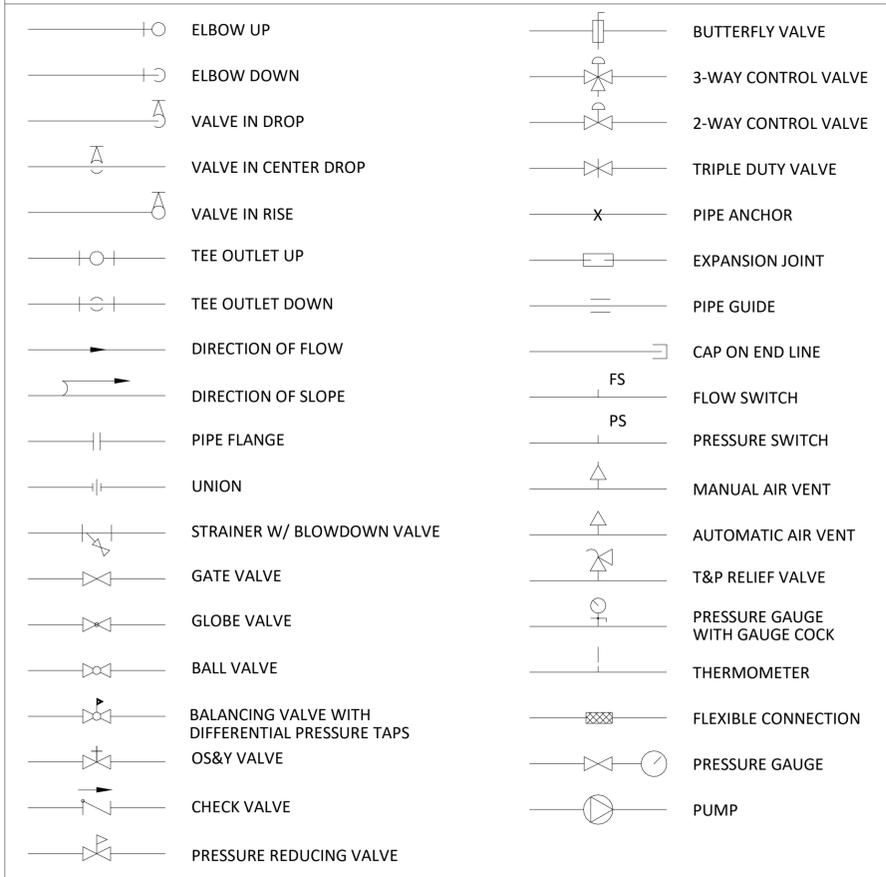
PLAN SYMBOLOGY

| NEW PLANS | | DOUBLE LINE |
|--|--------------------|-------------|
| DUCTWORK | EXISTING TO REMAIN | |
| | DEMOLITION | |
| | NEW | |
| PIPING | EXISTING TO REMAIN | |
| | DEMOLITION | |
| | NEW | |
| EXISTING EQUIPMENT (FANS, AIR DEVICES, PUMPS, ETC.) TO BE RELOCATED. | | |
| NEW EQUIPMENT | | |

EQUIPMENT DESIGNATIONS

| | |
|----|-----------|
| WP | WALL PACK |
|----|-----------|

PIPING SYMBOLS



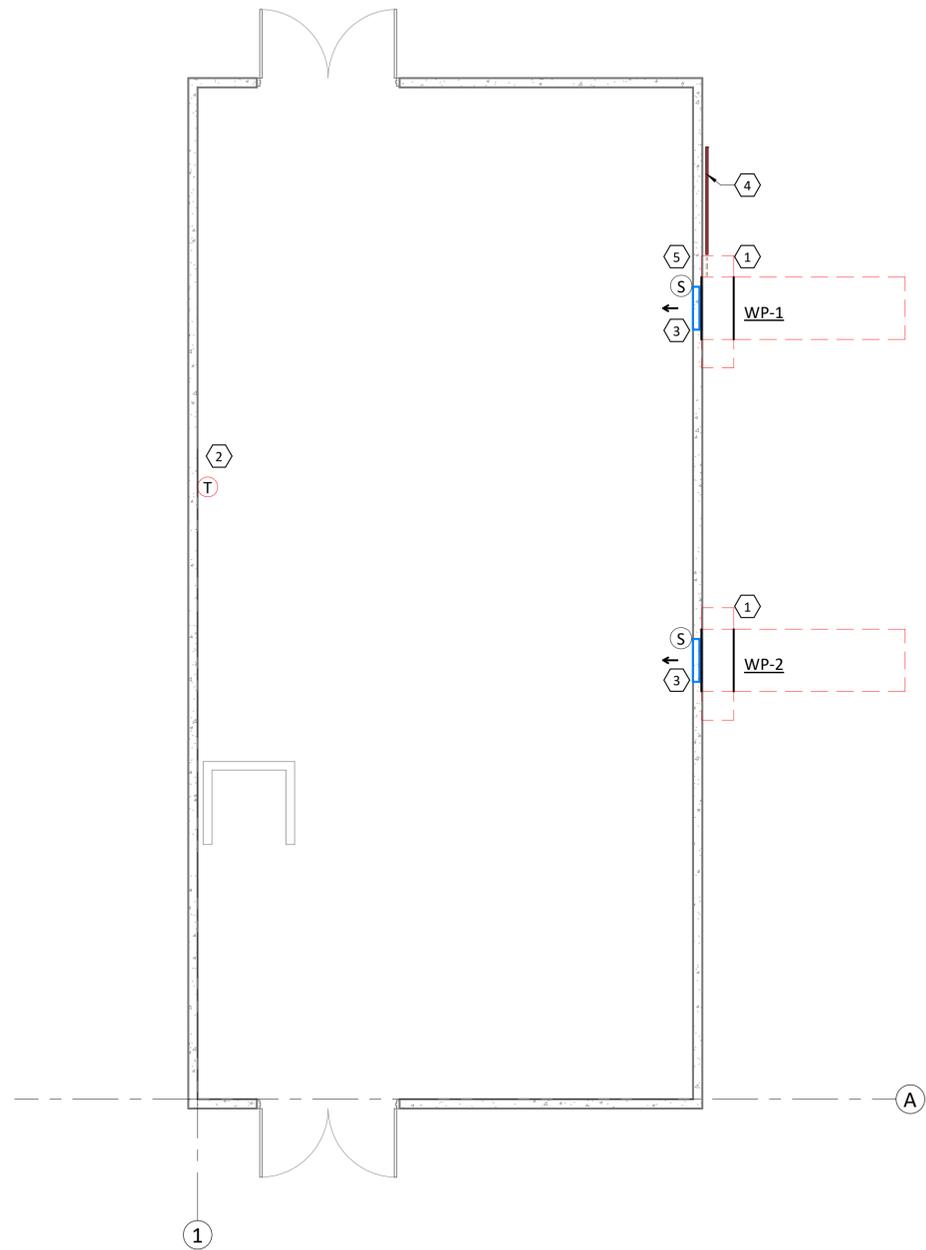
FREES & NICHOLS
 10497 Town and Country Way,
 Suite 500
 Houston, Texas 77024
 Phone - (713) 600-6800
 Web - www.freese.com
 Freese and Nichols, Inc.
 Texas Registered Engineering Firm F-2144

NOT FOR CONSTRUCTION
 THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF TEXAS. TEXAS NO: 149359 ON DATE: 10/29/2025. IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES.

SURVEYED BY:
 FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
MECHANICAL
ELECTRICAL BUILDING 2
NOTES, SYMBOLS & ABB.

| | |
|--------------------|---------------------|
| WBS NUMBER | R-000265-0150-4 |
| DRAWING SCALE | NOT TO SCALE |
| CITY OF HOUSTON PM | SHAHIDUR RAHMAN, PE |
| SHEET NO. 104 | OF 111 |



1 HVAC FLOOR PLAN
3/16" = 1'-0"

GENERAL NOTES

1. REFER TO M-0 FOR LEGEND, GENERAL NOTES AND ABBREVIATIONS.
2. REFER TO DIVISION 16 FOR TECHNICAL SPECIFICATIONS.
3. REFER TO ELECTRICAL DRAWINGS FOR POWER ROUTING/CONNECTION TO MECHANICAL EQUIPMENT.
4. DUCT SIZE FOR BRANCHED DUCTWORK SHALL MATCH WITH NECK SIZE OF DIFFUSERS.
5. INSTALL THERMOSTATS AT 48" AFF.
6. MAINTAIN 1/8" VERTICAL DROP PER HORIZONTAL FOOT MINIMUM FOR CONDENSATE DRAIN PIPING.

NOTES BY SYMBOL "1"

1. PROVIDE NEW WALL MOUNTED UNIT AS SCHEDULED. REFER TO DETAIL 1/M-2 FOR MORE DETAILS.
2. PROVIDE NEW LEAD-LAG CONTROLLER FOR BOTH WALL MOUNTED UNITS. ELECTRICAL CONTRACTOR TO PROVIDE NEW CONDUIT TO RESPECTIVE UNITS.
3. PROVIDE FACTORY FURNISHED SUPPLY AND RETURN GRILLES.
4. PROVIDE 1" DIAMETER COPPER CONDENSATE DRAIN AND P-TRAP, ROUTE AND TERMINATE PIPING IN DRY WELL AS SHOWN ON PLANS. PLACE FRY WELL 'X' FROM BUILDING. REFER TO DETAIL 2/M-2 FOR MORE DETAILS.
5. SMOKE DETECTORS TO BE MOUNTED INSIDE RETURN AIR DUCT.

WALL PACK CONTROL SEQUENCES

UNITS SHALL BE CONTROLLED BY A FACTORY-PROVIDED STAND ALONE PLC BASED ON THE SEQUENCES BELOW:

- A. EACH PACKAGED DX WALL MOUNTED UNIT WILL CONSIST OF A DIRECT EXPANSION (DX) COOLING COIL, A VARIABLE SPEED SUPPLY AIR FAN, SUPPLY AIR DAMPER, AND OUTSIDE AIR DAMPER. THE UNITS WILL BE RESPONSIBLE FOR SERVING A SINGLE ZONE.
- B. ENABLE/DISABLE CONTROL: THE WALL PACK'S SHALL BE ENABLED TO RUN 24/7.
- C. WHEN THE WALL PACK IS OFF, ALL DAMPERS SHALL BE FULLY CLOSED.
- D. SPACE TEMPERATURE CONTROL: WHEN THERE IS A CALL FOR COOLING FROM THE SPACE AIR TEMPERATURE THERMOSTAT, THE PRIMARY WALL PACK SUPPLY AIR FAN SHALL RUN. THE SPACE AIR TEMPERATURE SETPOINT SHALL BE DETERMINED BY THE OWNER, BUT WILL BE INITIALLY SET TO 80°F IN COOLING AND 45°F IN HEATING. THE UNIT SHALL MODULATE THE SUPPLY AIR FAN(S) AND COMPRESSOR(S) (PER THE MANUFACTURER'S PREFERRED SEQUENCE) TO MAINTAIN THE SPACE AIR TEMPERATURE SETPOINT.
- E. RUN SCHEDULE: ONE UNIT WILL ACT AS THE PRIMARY UNIT, AND THE OTHER AS BACKUP. EACH UNIT SHALL SWITCH FROM PRIMARY TO BACKUP STATUS ON A WEEKLY BASIS. BACKUP UNIT SHALL BECOME PRIMARY UNIT IN THE EVENT OF PRIMARY UNIT FAILURE OR IF IT IS UNABLE TO MEET COOLING DEMANDS.
- F. ALARMS:
 - a. SMOKE ALARM: SMOKE DETECTOR LOCATED IN THE RETURN AIR DUCTWORK SHALL BE HARD WIRED INTO THE MOTOR CONTROL CIRCUIT TO SHUT DOWN THE FAN UPON SENSING SMOKE

FREESSE & NICHOLS
 10497 Town and Country Way,
 Suite 500
 Houston, Texas 77024
 Phone - (713) 600-6800
 Web - www.freese.com
 Freese and Nichols, Inc.
 Texas Registered Engineering Firm F-2144

NOT FOR CONSTRUCTION
 THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF TEXAS TEXAS NO: 149359 ON DATE: 10/29/2025 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES

SURVEYED BY:
 FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 MECHANICAL
 ELECTRICAL BUILDING 2
 FLOOR PLAN

| | |
|----------------------|--|
| WBS NUMBER | |
| R-000265-0150-4 | |
| DRAWING SCALE | |
| As indicated | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. M-1 OF XXX | |



M-5

HV-H0025510-ELB-R25-RVT

| WALL PACK UNIT SCHEDULE | | | | | | | | | | | | | | | | |
|-------------------------|-----------------------|-----------------|--------------|---------------|------------------|---------------|-----------------|-----------------|----------------|------------------|--------------|-----------------|-------|-----|------|---------------------|
| MARK | SERVES | NOM SIZE (TONS) | AIR FLOW | | EXT S.P. (IN WG) | SUPPLY FAN HP | COOLING | | | | COND. FAN HP | UNIT ELECTRICAL | | | | MANUFACTURER/ MODEL |
| | | | SUPPLY (CFM) | OUTSIDE (CFM) | | | TOTAL CAP (MBH) | SENS CAP. (MBH) | EAT DB/WB (°F) | AMBIENT AIR (°F) | | VOLTAGE | PHASE | MCA | MOCF | |
| WP-1 | ELECTRICAL BUILDING 2 | 3 | | | 0.15 | | 34,400.0 | 26,200.0 | 80/67 | 97 | | 460 | 3 | 11 | 15 | BARD / |
| WP-2 | ELECTRICAL BUILDING 2 | 3 | | | 0.15 | | 34,400.0 | 26,200.0 | 80/67 | 97 | | 460 | 3 | 11 | 15 | BARD / |

REMARKS:

1. PROVIDE WITH RETURN AIR SMOKE DETECTOR, TO TURN OFF UNIT WHEN SMOKE IS DETECTED.
2. PROVIDE WITH FACTORY WALL MOUNTING ACCESSORIES.
3. PROVIDE WITH MERV 8" REPLACEABLE FILTER.
4. PROVIDE WITH FACTORY FURNISHED SUPPLY AND RETURN GRILLES.
5. PROVIDE WITH CONDENSATE DRAIN AND DRY WELL.
6. PROVIDE POWDER COATING ON COIL AND CABINET TO PROTECT AGAINST CORROSION
7. PROVIDE DISCONNECTS

HV-H002510-ELB-R25-RVT

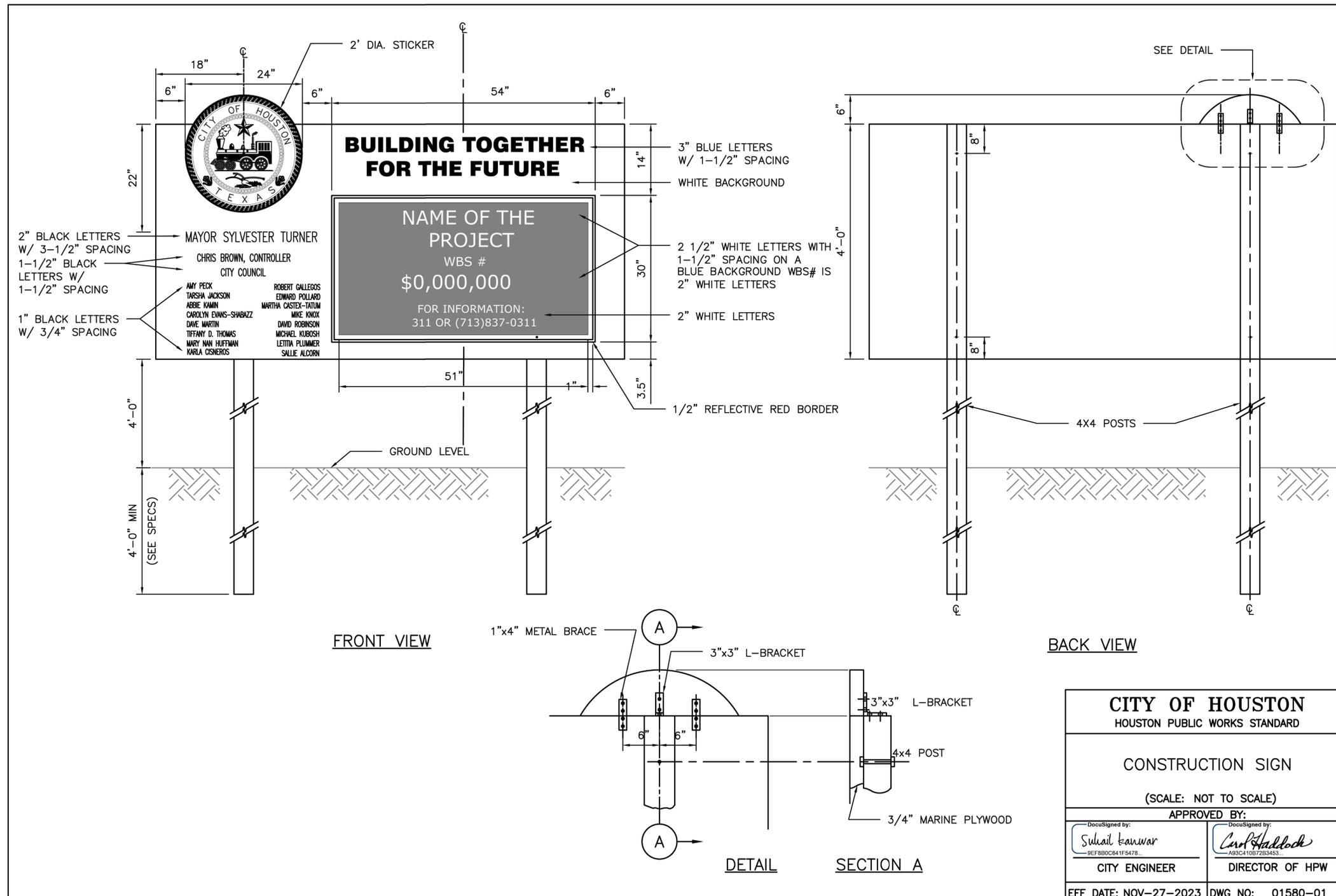
| | |
|---|---|
|  <p>10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144</p> | <p>NOT FOR CONSTRUCTION</p> <p>THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF TEXAS TEXAS NO: 149359 ON DATE: 10/29/2025 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES</p> |
| | <p>SURVEYED BY: FB NO. P-</p> |

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS
SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
MECHANICAL
ELECTRICAL BUILDING 2
SCHEDULE

| | |
|----------------------|--|
| WBS NUMBER | |
| R-000265-0150-4 | |
| DRAWING SCALE | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. M-2 OF XXX | |

M-6

| | | | |
|-----|------|----------|------|
| NO. | DATE | REVISION | APP. |
| | | | |



FREESSE & NICHOLS
 10497 Town and Country Way, Suite 500
 Houston, Texas 77024
 Phone - (713) 600-6800
 Web - www.freese.com

NOT FOR CONSTRUCTION
 THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF: SHELDON M. BLICK P.E. TEXAS NO: 93693 ON DATE: 10/27/2025. IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES.

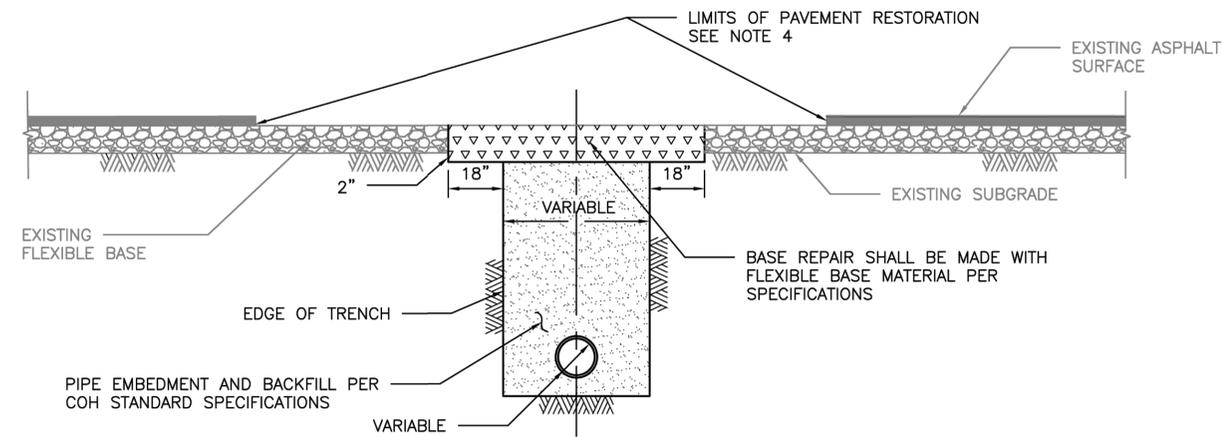
SURVEYED BY:
 FB NO. P-

CITY OF HOUSTON
 HOUSTON PUBLIC WORKS

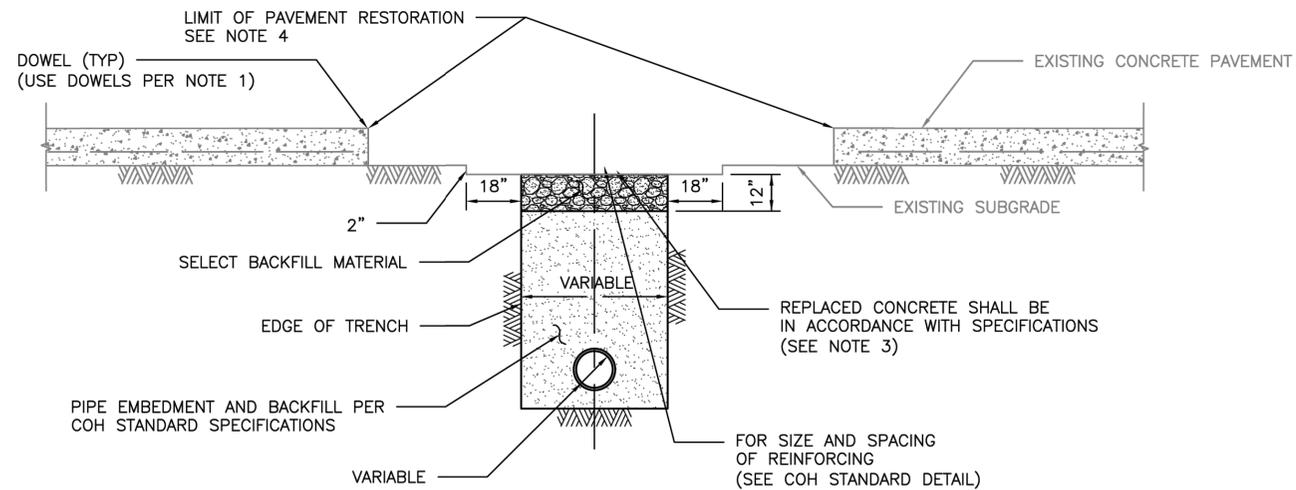
SIMS SOUTH WWTP
 ELECTRICAL IMPROVEMENTS
 STANDARD DETAILS
 CONSTRUCTION SIGN

| | |
|----------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 107 OF 111 | |

| | | | |
|-----|------|----------|------|
| NO. | DATE | REVISION | APP. |
| | | | |



ELEVATION A
REPAIR OF FLEXIBLE BASE PAVEMENT



ELEVATION B
REPAIR OF REINFORCED CONCRETE PAVEMENT

NOTES:

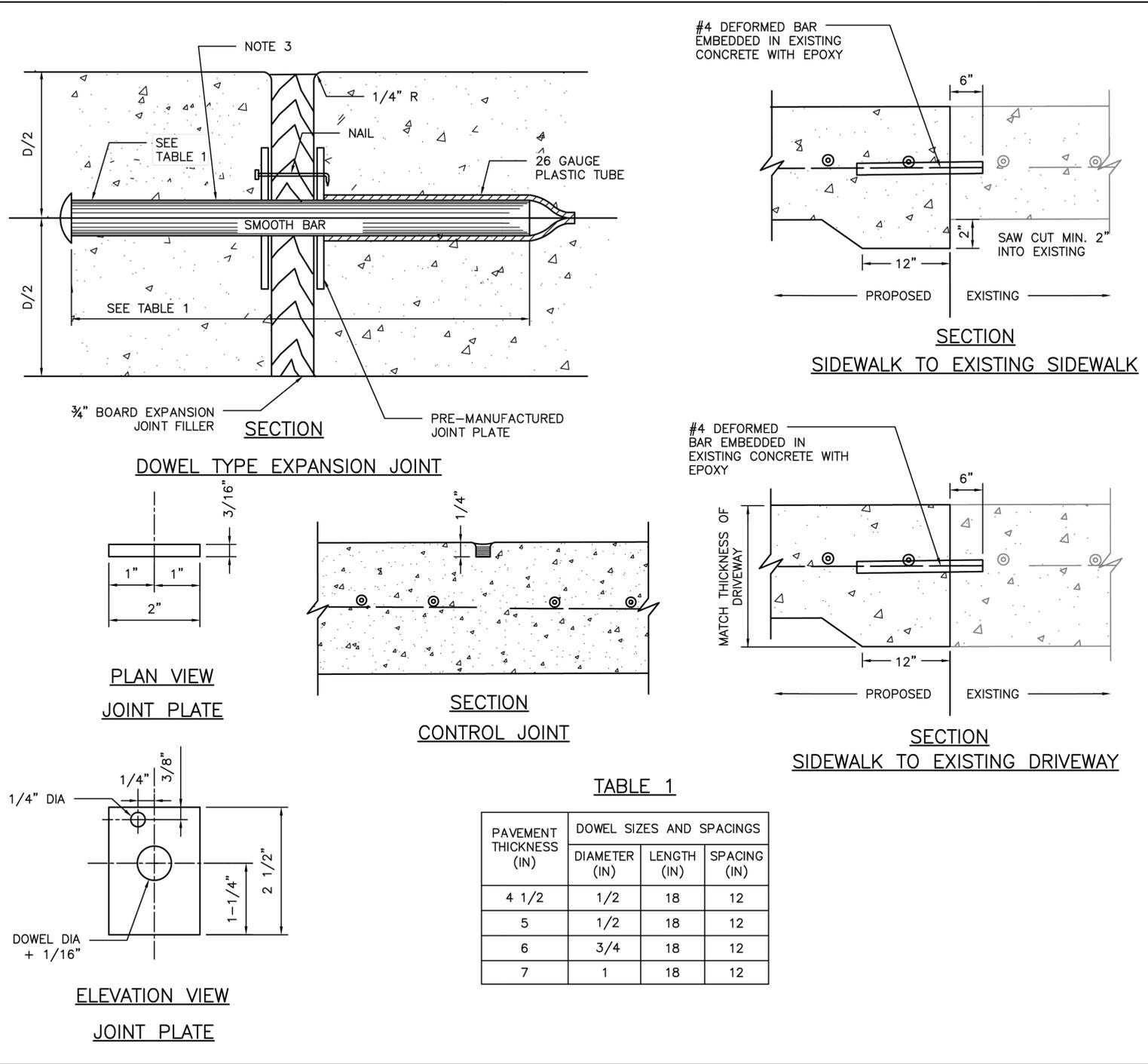
1. EXPOSE 15" OF REINFORCING STEEL AT PROPOSED SAWED JOINT. IF NO REINFORCING STEEL EXISTS, USE HORIZONTAL DOWELS. HORIZONTAL DOWELS SHALL BE #6 BAR, 24" LONG, 24" C-C, DRILLED AND EMBEDDED 8" INTO THE CENTER OF THE EXISTING SLAB. WITH "PO ROC" OR EQUAL.
2. IF REINFORCED CONCRETE IS OVERLAYED WITH ASPHALT, REPLACE WITH 2" MIN HMAC SURFACING.
3. REFER TO STANDARD DETAIL 02751-01 FOR REINFORCING STEEL REQUIREMENTS.
4. REFER TO STANDARD DETAIL 02951-01 THROUGH 03 FOR PAVEMENT RESTORATION LIMITS.

| | |
|--|---|
| CITY OF HOUSTON HOUSTON PUBLIC WORKS STANDARD | |
| PAVEMENT REPAIR DETAIL FOR STREET CUTS (FLEX-BASE PAVEMENT & CONCRETE PAVEMENT) (SCALE: NOT TO SCALE) | |
| APPROVED BY: | |
| DocuSigned by: <i>Suhail Kanwar</i> REF880C841F5478 CITY ENGINEER | DocuSigned by: <i>Carol Haddock</i> A93C410872B3453... DIRECTOR OF HPW |
| DocuSigned by: <i>ERIKING NGUYEN</i> 95A29EFD7A75B4CD CITY TRAFFIC ENGINEER | |
| EFF DATE: NOV-27-2023 | DWG NO: 02951-04 |

| | |
|---|---|
| 10497 Town and Country Way, Suite 500 Houston, Texas 77024 Phone - (713) 600-6800 Web - www.freese.com | NOT FOR CONSTRUCTION THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF: SHELDON M. BUCK P.E. TEXAS NO: 33693 ON DATE: 10/27/2025. IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES. |
| | SURVEYED BY: FB NO. P- |

| | |
|---|------------------------------|
| CITY OF HOUSTON HOUSTON PUBLIC WORKS | |
| SIMS SOUTH WWTP ELECTRICAL IMPROVEMENTS STANDARD DETAILS PAVEMENT REPAIR DETAIL FOR STREET CUTS | |
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 108 OF 111 | |

| NO. | DATE | REVISION | APP. |
|-----|------|----------|------|
| | | | |



NOTES:

1. STEEL TO MEET ASTM STANDARD SPECIFICATIONS FOR CONCRETE REINFORCING BARS.
2. EXPANSION JOINT TO BE PLACED AT THE END OF EACH CURB RADIUS AND SPACED AT A MAXIMUM DISTANCE OF 3 FEET MAXIMUM SPACING FOR CONTROL JOINTS SHALL BE 5 FEET.
3. CENTER DOWEL HORIZONTALLY ON JOINT.
4. CENTER DOWEL VERTICALLY IN CONCRETE AS NEEDED TO MAINTAIN A 2 INCH MINIMUM COVER.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS STANDARD

SIDEWALK EXPANSION AND CONSTRUCTION JOINT DETAILS

(SCALE: NOT TO SCALE)

APPROVED BY:

| | |
|---|--|
| <p>DocuSigned by: <i>Sulail Kanwar</i> 9EF8B0C641F5478 CITY ENGINEER</p> | <p>DocuSigned by: <i>Carl Haddock</i> A93C410B72B3483 DIRECTOR OF HPW</p> |
| <p>DocuSigned by: <i>Khang Nguyen</i> 95A29EFD75B4CD CITY TRAFFIC ENGINEER</p> | |

EFF DATE: NOV-27-2023 DWG NO: 02752-02

FREESSE & NICHOLS
10497 Town and Country Way, Suite 500
Houston, Texas 77024
Phone - (713) 600-6800
Web - www.freese.com

NOT FOR CONSTRUCTION
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF: SHELDON M. BLICK P.E. TEXAS NO: 93693 ON DATE: 10/27/2025 IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES.

SURVEYED BY:
FB NO. P-

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

SIMS SOUTH WWTP
ELECTRICAL IMPROVEMENTS
STANDARD DETAILS
SIDEWALK EXPANSION AND
CONSTRUCTION JOINT DETAILS

| | |
|----------------------|------------------------------|
| WBS NUMBER | FOR CITY OF HOUSTON USE ONLY |
| R-000265-0146-3 | |
| DRAWING SCALE | |
| CITY OF HOUSTON PM | |
| SHAHIDUR RAHMAN, PE | |
| SHEET NO. 109 OF 111 | |

