#### MECHANICAL ABBREVIATIONS

|   | MICAL ABBREVIATIO  |
|---|--|
| AFF<br>AC<br>AHU<br>AS<br>A.T.C.          | ABOVE FINISH FLOOR AIR COMPRESSOR AIR HANDLING UNIT AIR SEPARATOR ARCHITECTURAL TRADES CONTRACTOR  |
| B<br>B.A.S.                               | BOILER<br>BUILDING AUTOMATION SYSTEM   |
| CAF CC CFM CHLR CHP CONV CT CU CUH CV CWP | COMBUSTION AIR FAN COOLING COIL CUBIC FEET PER MINUTE CHILLER CONSOLE HEAT PUMP CONVECTOR COOLING TOWER CONDENSING UNIT CABINET UNIT HEATER CONTROL VALVE CHILLED WATER PUMP |
| DB<br>DFU<br>DIA<br>DN<br>DPR<br>DS       | DRY BULB DUCT FURNACE DIAMETER DOWN DAMPER DUCT SILENCER   |
| EAT EF EG E.T.C. EVR EWT EXH EXIST        | ENTERING AIR TEMPERATURE EXHAUST FAN EXHAUST GRILLE ELECTRICAL TRADES CONTRACTOR EVAPORATOR ENTERING WATER TEMPERATURE EXHAUST EXISTING                                      |

- FINISH FLOOR FPM FEET PER MINUTE FEET FINNED TUBE RADIATION **FURNACE** GALLON GFRH GAS FIRED RADIANT HEATER GR GRILLE
- HUMIDIFIER **HEATING COIL** HEAD (FT) HORSE POWER HORIZONTAL HEAT PUMP HTG HEATING HVAC HEATING, VENTILATION, & AIR CONDITIONING

HEATING WATER PUMP

HEAT EXCHANGER

HWP

HX

INSIDE DIAMETER INVERT ELEVATION INTAKE HOOD

MBH

NTS

SQ. FT.

STR

TCL

T&P

VRH

**FPVAV** 

V.F.D

- LEAVING AIR TEMPERATURE LATENT HEAT (MBH) LEAVING WATER TEMPERATURE MAXIMUM
- BTU PER HOUR (THOUSAND) MECHANICAL TRADES CONTRACTOR
- NFPA NATIONAL FIRE PROTECTION ASSOCIATION NOT TO SCALE
- PCR PUMPED CONDENSATE RETURN PRESSURE DROP RADIANT CEILING PANEL REQ'D REQUIRED

SUPPLY DIFFUSER

SENSIBLE HEAT (MBH)

TOTAL COOLING (MBH)

TEMPERATURE CONTROL

VARIABLE AIR VOLUME BOX

VARIABLE FREQUENCY DRIVE

VARIABLE AIR VOLUME REHEAT BOX

FAN POWERED VARIABLE AIR VOLUME BOX

EXISTING ITEM (EXISTING SUPPLY AIR DUCT)

SATURATED SUCTION TEMPERATURE

TEMPERATURE & PRESSURE RELIEF VALVE

SUPPLY FAN

SUPPLY GRILLE

SHEET METAL

SQUARE FEET

STRAINER

TYPICAL

UNIT HEATER

ZONE DAMPER

─ ITEM

EXISTING

- RETURN GRILLE RELATIVE HUMIDITY RELIEF HOOD **ROOF TOP UNIT**
- CONTRACTORS AND SUBCONTRACTORS AS REQUIRED BY LAW. 10. IF THERE IS CONFLICTING INFORMATION IN THE PLANS OR
- SPECIFICATIONS THE MORE STRINGENT AND GREATER COST ITEM SHALL BE USED.
- 11. DRAWINGS INDICATE REQUIRED SIZES AND POINTS OF TERMINATION OF PIPES AND SUGGESTED ROUTES. IT IS NOT INTENTION OF DRAWINGS TO INDICATE ALL NECESSARY OFFSETS. INSTALL WORK IN MANNER TO CONFORM TO STRUCTURE, AVOID OBSTRUCTIONS, PRESERVE HEADROOM AND KEEP OPENINGS AND PASSAGEWAYS CLEAR. DO NOT SCALE FROM DRAWINGS.
- 12. ANY INFORMATION FOUND ON THE DRAWINGS AND NOT IN THE SPECIFICATIONS, OR FOUND IN SPECIFICATIONS AND NOT IN THE DRAWINGS, SHALL BE CONSTRUED AS TO BE INCLUDED IN BOTH THE SPECIFICATIONS AND THE DRAWINGS. ANY CONFLICT BETWEEN THE PLANS AND THE SPECIFICATIONS WILL BE INTERPRETED BY THE ARCHITECT. IN THE EVENT OF CONFLICT, FOR THE PURPOSE OF BIDDING, THE CONTRACTOR SHALL PRESUME THE MOST EXPENSIVE COMBINATION OF QUALITY AND QUANTITY OF WORK SHALL PREVAIL.

#### **GENERAL HVAC NOTES**

- 1. ALL WORK SHALL CONFORM TO MICHIGAN MECHANICAL CODE, LATEST APPLICABLE EDITION.
- 2. INSTALL ALL EQUIPMENT, MATERIALS, AND ACCESSORIES PER MANUFACTURERS WRITTEN INSTRUCTIONS.
- 3. FIELD VERIFY LOCATIONS OF EXISTING PIPING THAT MAY CONFLICT WITH NEW CONSTRUCTION AND RELOCATE AS
- 4. CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER DISCIPLINES PRIOR TO CONSTRUCTION TO AVOID CONFLICTS.
- 5. PROVIDE MANUAL AIR VENTS WITH 3/4" HOSE CONNECTION AT ALL HIGH POINTS.
- 6. OFFSET PIPING TO ACCOMMODATE LARGE DUCTWORK.
- 7. THE CONTRACTOR SHALL FIELD VERIFY THE SIZES, LOCATION, ELEVATIONS, AND DETAILS OF ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK.
- 8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE INTEGRITY OF ALL EQUIPMENT AND MATERIALS IN A "NEW" CONDITION DURING CONSTRUCTION.
- 9. ALL WORK SHALL BE PERFORMED BY LICENSED

- 13. PERFORM WORK IN ACCORDANCE WITH THE LATEST EDITIONS. REVISIONS, AMENDMENTS, OR SUPPLEMENTS OF APPLICABLE STATUTES, ORDINANCES, CODES OR REGULATIONS OF FEDERAL, STATE, AND LOCAL AUTHORITIES HAVING JURISDICTION IN EFFECT ON THE DATE BIDS ARE RECEIVED.
- 14. WHERE APPROVED STANDARDS HAVE BEEN ESTABLISHED BY OSHA, UNDERWRITERS, LABORATORIES, AMERICAN CODES, ASA, ASHRAE, ARI, NEC, STATE FIRE INSURANCE REGULATION BODY, NFPA OR OTHERS, THESE STANDARDS SHALL BE FOLLOWED WHETHER OR NOT INDICATED ON THE DRAWING AND SPECIFICATIONS.
- PIPING LAYOUT IS SCHEMATIC. EXACT LOCATION OF PIPING AND EQUIPMENT SHALL BE COORDINATED WITH BUILDING STRUCTURE, EQUIPMENT FURNISHED, ARCHITECTURAL DRAWINGS, AND ALL OTHER TRADES PRIOR TO INSTALLATION. ANY CONTRACTOR INSTALLING WORK WITHOUT PRIOR COORDINATION SHALL RELOCATE HIS WORK AT HIS EXPENSE TO ALLOW PROPER INSTALLATION OF ANY AND ALL TRADES WORK.
- UNLESS OTHERWISE NOTED, ALL PIPING SHALL BE CONCEALED WHEREVER POSSIBLE. PROVIDE CHROME ESCUTCHEON OR ALUMINUM DUCT COLLAR AT EACH PENETRATION OF A FINISHED SURFACE.
- 17. DUCT/PIPING SHALL NOT BE RUN ABOVE ELECTRICAL GEAR IN THE SERVICE SPACE REQUIRED BY THE NATIONAL ELECTRICAL CODE.
- 18. ANY ADDITIONAL LOW VOLTAGE CONTROL WIRING THAT IS REQUIRED SHALL BE PROVIDED BY THE HVAC CONTRACTOR. CONTROL WIRING SHALL BE RUN IN CONDUIT IF REQUIRED BY LOCAL CODES OR THE SPECIFICATIONS. POWER SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
- PROVIDE VIBRATION ISOLATION AT EACH CONNECTION TO A MOTORIZED PIECE OF EQUIPMENT BY THE HVAC CONTRACTOR.

#### MECHANICAL SYMBOLS LEGEND

## **HVAC DUCTWORK SYMBOLS** SUPPLY AIR DUCT RISER RETURN AIR DUCT RISER OUTSIDE AIR DUCT RISER (AS NOTED) EXHAUST AIR DUCT INSULATED DUCTWORK (AS NOTED) SUPPLY AIR DIFFUSER (SQUARE) SUPPLY AIR DIFFUSER (INLINE) TURNING VANES SURFACE MTD. GRILLE SUPPLY AIR DIFFUSER (ROUND) 90° TEE W/45° APPROACH CONICAL TAKE-OFF CONICAL TAKE-OFF W/ DAMPER BALANCE DAMPER

RETURN AIR DUCT BOOT

ECCENTRIC REDUCER

CONCENTRIC REDUCER VERTICAL FIRE DAMPER

EXISTING VERTICAL FIRE DAMPER

EXISTING HORIZONTAL FIRE DAMPER

HORIZONTAL FIRE / SMOKE DAMPER

DUCT SMOKE DETECTOR, INSTALLED BY M.T.C.,

HORIZONTAL FIRE DAMPER

VERTICAL SMOKE DAMPER

HORIZONTAL SMOKE DAMPER VERTICAL FIRE / SMOKE DAMPER

PROVIDED & WIRED BY E.T.C.

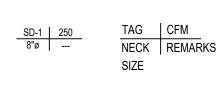
ROOF MOUNTED EXHAUST FAN

CEILING EXHAUST FAN

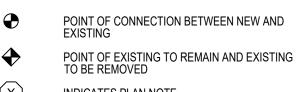
UNIT HEATER

\_ \_ \_ \_ DEMOLITION

# **HVAC DUCTWORK & DIFFUSER TAGS**



### MISCELLANEOUS NOTES



INDICATES PLAN NOTE

INDICATES DEMOLITION NOTE

DETAIL BUBBLE XX DETAIL NUMBER XXXX PAGE LOCATION INDICATES DIRECTION OF DETAIL SECTION

#### **HVAC PIPING**

| —— CWS —— | CHILLED WATER SUPPLY               | $-\!\!-\!$ | GATE V          |
|-----------|------------------------------------|--|-----------------|
| —— CWR —— | CHILLED WATER RETURN               | <b>──</b> Þ  | GAS CO          |
| —— CD ——  | CONDENSATE DRAIN                   | <b>──</b> ₹  | CHECK           |
| ——cs——    | CONDENSER WATER SUPPLY             |  | BALANG          |
| —— CR ——  | CONDENSER WATER RETURN             |  | CIRCUI          |
| —— CTS —— | COOLING TOWER WATER SUPPLY         | ——————————————————————————————————————                                     | TWO-W           |
| —— CTR —— | COOLING TOWER WATER RETURN         | —— <b>⋛</b> ——   | THREE           |
| ——DX ——   | DIRECT EXPANSION                   | ——¤——  | GLOBE           |
| —— HPS —— | HEAT PUMP WATER SUPPLY             |  | BALL V          |
| —— HPR —— | HEAT PUMP WATER RETURN             |  | SOLEN           |
| ——HS——    | HEATING WATER SUPPLY               | —————————————————————————————————————                                      | EXPAN:<br>THERM |
| ——HR ——   | HEATING WATER RETURN               | ——√—   | PLUG V          |
| ——s—      | SUCTION (REFRIGERANT)              | ——ф——  | BUTTER          |
| ——L——     | LIQUID (REFRIGERANT)               | — <u>\$</u>  | RELIEF          |
| —— DXS —— | SUCTION (DIRECT EXPANSION)         | —— <del>———————————————————————————————————</del>                          | HOSE 8          |
| —— DXL —— | LIQUID (DIRECT EXPANSION)          | <u>₽</u>   | PRESS           |
| —— LPS —— | LOW PRESSURE STEAM (0-20 LBS.)     | <b>&amp;</b>   | PRESS           |
| —— MPS —— | MEDIUM PRESSURE STEAM (21-75 LBS.) | M  | TDIDI E         |

## **HVAC DUCTWORK**

SC — STEAM CONDENSATE (GRAVITY)

− − SCP − − PUMPED STEAM CONDENSATE

- SC (BF) - STEAM CONDENSATE BOILER FEED

| TIVAG BOOT WORK  |                        |  |  |  |  |  |  |
|------------------|------------------------|--|--|--|--|--|--|
| —— SA —— S       | SUPPLY AIR DUCT        |  |  |  |  |  |  |
| —— X-SA ——     E | EXIST SUPPLY AIR DUCT  |  |  |  |  |  |  |
| —— RA —— F       | RETURN AIR DUCT        |  |  |  |  |  |  |
| —— X-RA ——       | EXIST RETURN AIR DUCT  |  |  |  |  |  |  |
| —— OA ——         | OUTSIDE AIR DUCT       |  |  |  |  |  |  |
| —— X-OA ——       | EXIST OUTSIDE AIR DUCT |  |  |  |  |  |  |
| ——EA —— E        | EXHAUST AIR DUCT       |  |  |  |  |  |  |
| —— X-EA ——       | EXIST EXHAUST AIR DUCT |  |  |  |  |  |  |

#### HVAC PIPING VALVES

| <b>——⋈—</b>                            | GAS COCK                               |
|--|--|
| <b>₹</b>                               | CHECK VALVE                            |
|  | BALANCE COCK                           |
|  | CIRCUIT SETTER                         |
| —————————————————————————————————————— | TWO-WAY CONTROL VALVE                  |
| —————————————————————————————————————— | THREE-WAY CONTROL VALVE                |
|  | GLOBE VALVE                            |
|  | BALL VALVE                             |
| <b>\bar{b}</b>                         | SOLENOID VALVE                         |
| ——√⊗i——                                | EXPANSION VALVE WITH THERMOSTATIC BULB |
| ——I∱——                                 | PLUG VALVE                             |
| —нфі——                                 | BUTTERFLY VALVE                        |
| <del></del> \$                         | RELIEF VALVE                           |
| — <u>\</u>                             | HOSE & DRAIN END VALVE                 |
| <b>\$</b>                              | PRESSURE RELIEF VALVE                  |
| ——₩——                                  | PRESSURE REDUCING VALVE                |
| <b>──</b>                              | TRIPLE DUTY VALVE                      |
| <u> </u>                               | GAS PRESSURE REGULATOR                 |
| <del></del>                            | STRAINER (BLOW-OFF)                    |

#### TEMPERATURE CONTROL SYMBOLS

| $\bigcirc$   | THERMOSTAT                    |
|--------------|-------------------------------|
| $\bigcirc$ P | PROGRAMMABLE THERMOSTAT       |
| $\bigcirc$ N | THERMOSTAT (W/ NIGHT SETBACK) |
| S            | ROOM SENSOR                   |
| $\bigoplus$  | HUMIDISTAT                    |
| P            | PRESSURE GAUGE                |
| <u>M</u> -   | DAMPER (ELECTRIC OPERATION)   |
| M-           | DAMPER (PNEUMATIC OPERATION)  |

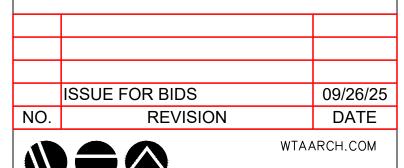
DAMPER BLADES

#### **HVAC PIPING SYMBOLS**

FLOW DIRECTION

| <del></del> -                         | PIPING DROP                     |
|---------------------------------------|---------------------------------|
| <del>+</del> 0                        | PIPING RISE                     |
| <del></del>                           | INLINE PIPING DROP              |
| <del></del>                           | INLINE PIPING RISE              |
| , <del>t</del> ,                      | PIPING TEE                      |
| t,                                    | PIPING ELBOW                    |
| Q                                     | THERMOMETER                     |
| $-\!\!-\!\!\!\!-\!\!\!\!-\!\!\!\!\!-$ | PUMP                            |
| ı ı                                   | UNION                           |
| <del></del>                           | PIPE ANCHOR                     |
| _=_                                   | PIPE GUIDE                      |
|                                       | BACK FLOW PREVENTER             |
| <del></del>                           | PIPE CAP                        |
| ——≀                                   | PIPE BREAK                      |
| т                                     | THERMOMETER WELL                |
|                                       | EXPANSION LOOP                  |
|                                       | EXPANSION COMPENSATOR           |
| —_FT—                                 | FLOAT & THERMOSTATIC STEAM TRAP |

BT INVERTED BUCKET STEAM TRAP



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PROJECT TITLE EXTERIOR ENTRANCE REPLACEMENT FOR: JEROME T. HART STATE OFFICE BUILDING

SAGINAW, MI 48607

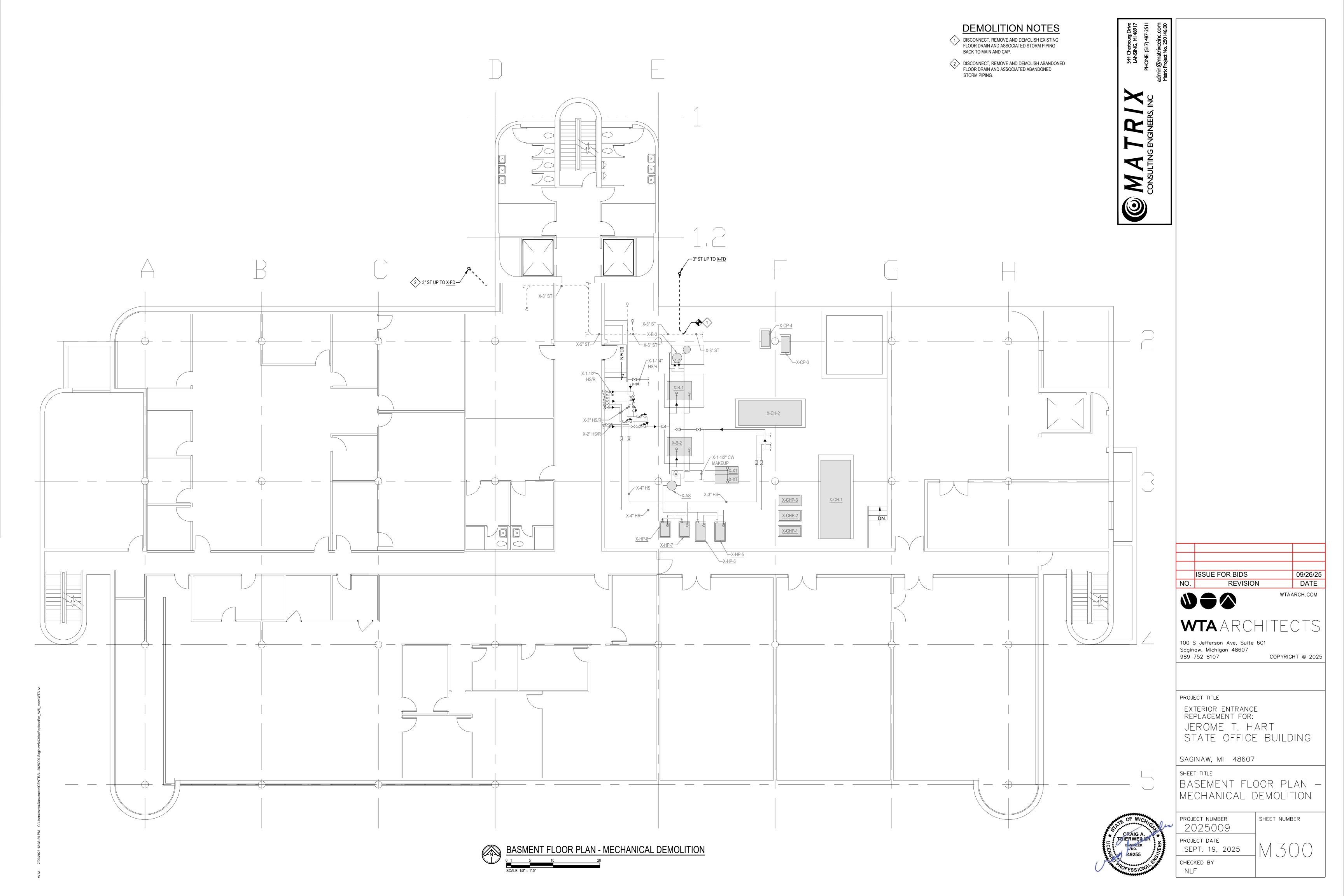
MECHANICAL SYMBOLS, ABBREVITATIONS, & NOTES



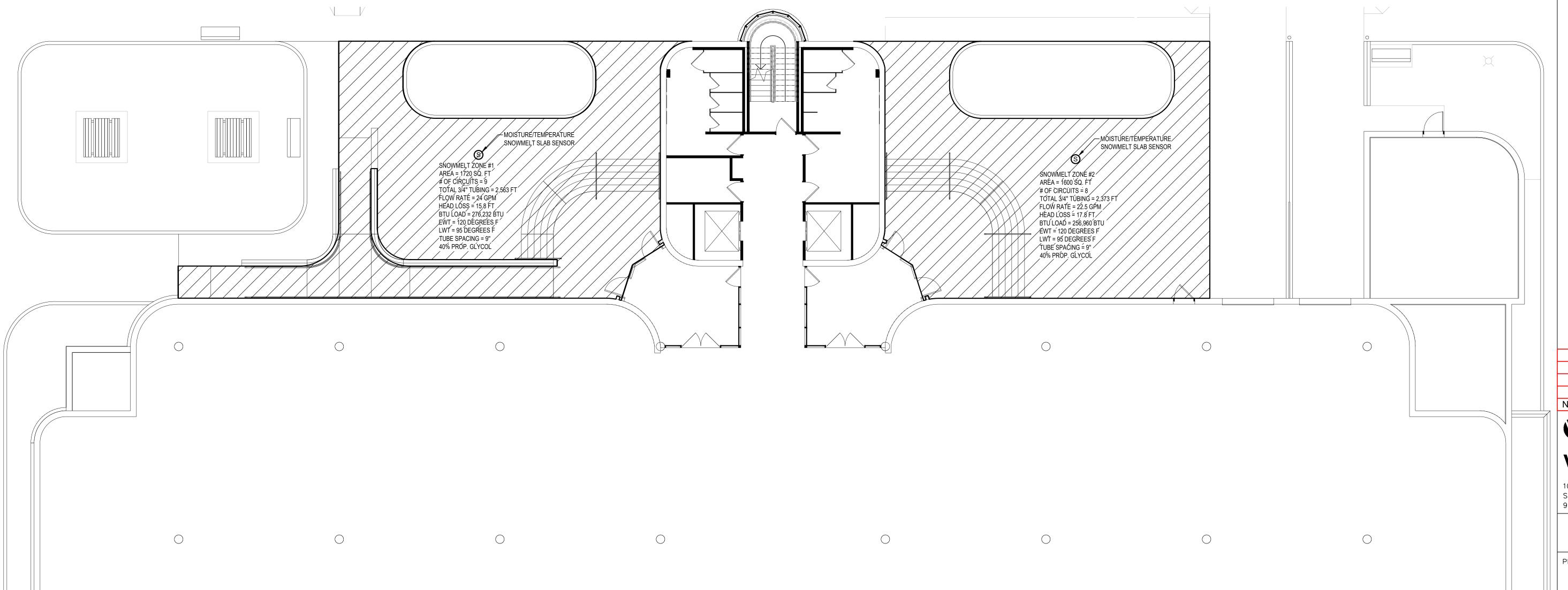
PROJECT NUMBER 2025009 PROJECT DATE SEPT. 19, 2025

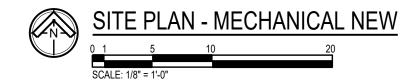
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|             | ISSUE FOR BIDS |  | 09/26/25 |  |
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STATE OFFICE BUILDING

SAGINAW, MI 48607

SHEET TITLE

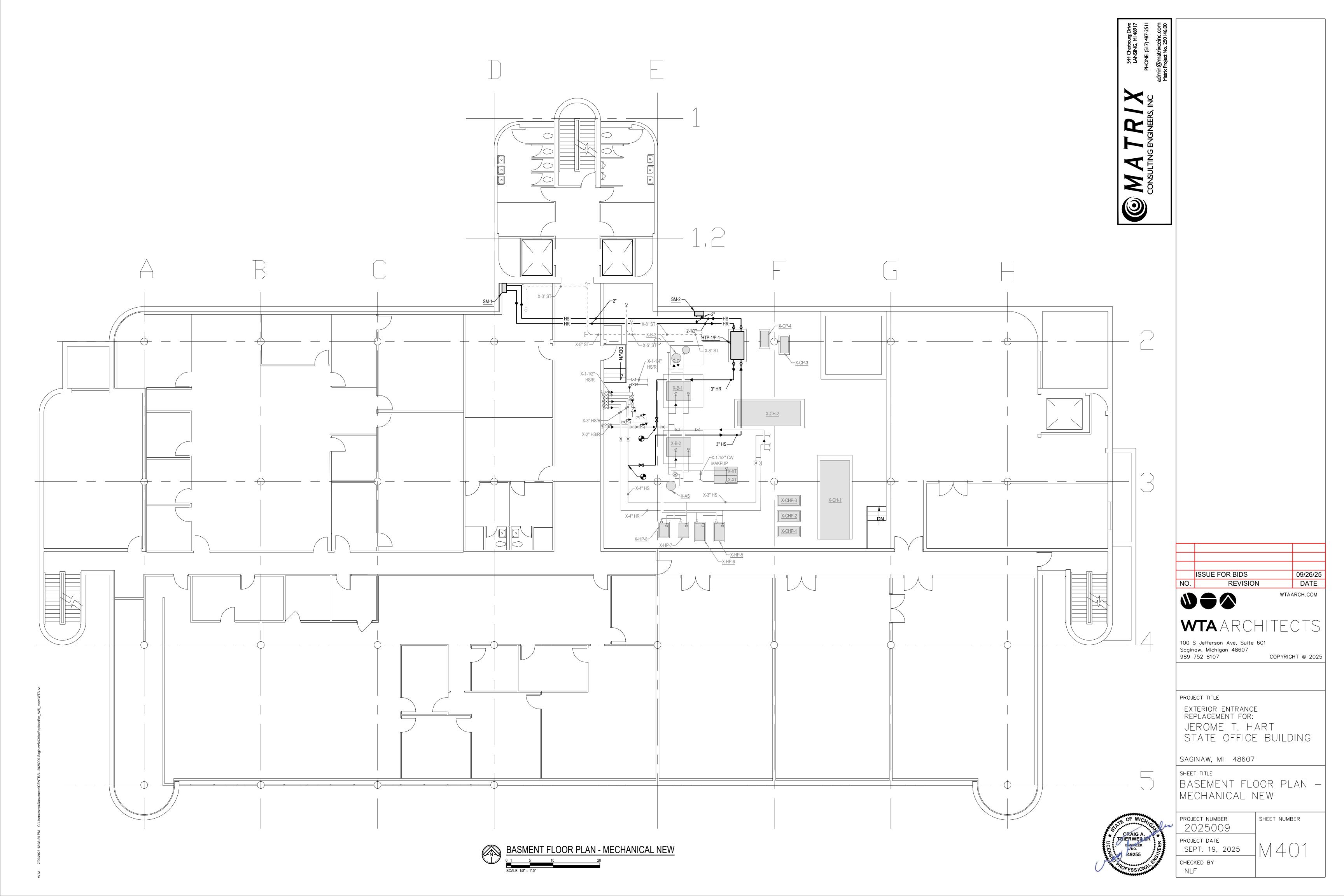
SITE PLAN — MECHANICAL

NEW

PROJECT NUMBER SHEET NUMBER 2025009

PROJECT DATE
SEPT. 19, 2025

CHECKED BY
NLF



|       | HEAT TRANSFER PACKAGE SCHEDULE |                       |             |          |          |            |             |            |     |                     |    |            |        |      |         |       |            |            |    |             |                  |      |                        |                |            |                 |  |
|-------|--------------------------------|-----------------------|-------------|----------|----------|------------|-------------|------------|-----|---------------------|----|------------|--------|------|---------|-------|------------|------------|----|-------------|------------------|------|------------------------|----------------|------------|-----------------|--|
| TAG   | MBH                            | SERVES                | HX<br>MODEL | EWT (°F) | LWT (°F) | BOILER SIE | WPD (FT-HD) | FLUID      | EWT | 1903 80 20 20 20 20 |    | WPD (FT-   | FLUID  | MARK | MODEL   | COUNT | PUI<br>GPM | HEAD       | НР | HEADER SIZE | AIR<br>SEPARATOR |      | ANSION TANK ACCEPTANCE |                | ECTRICAL   |                 | COMMENTS                               |
| HTP-1 | 540                            | SNOWMELT ZONE #1 & #2 | AP07-19     | 180      | 160      | 55.5       | 15          | 100% WATER | 95  | 120                 | 47 | <b>HD)</b> | 40% PG | P-1  | 1.25AAB | 1     | 47         | (FT)<br>65 | 3  | 2-1/2"      | 551009A          | B130 | VOLUME (GAL)           | VOLTAGE<br>208 | PHASE<br>1 | <b>FLA</b> 18.7 | 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16 |

NOTES:

PACKAGE BASED ON ProPak SOLUTIONS HEAT TRANSFER PACKAGE

2. COMPONENTS BASED ON BELL & GOSSETT

TIE INTO BAS
 SYSTEM HEAD PROVIDED IS HEAD OUTSIDE OF PACKAGED SYSTEM. PUMP SELECTION MUST ACCOUNT FOR ON-PACKAGE LOSSES.

TRIPLE DUTY VALVE
 2-1/2" CIRCUIT SETTER

9. 2-1/2" Y-STRAINER, METRAFLEX LPD0250

7. 2-1/2" CIRCUIT SETTER8. GRISWOLD UR2E5FB CONTROL VALVE WITH, MEP-4001 ACTUATOR

11. WESSELS MODEL G-6 GLYCOL/WATER MAKEUP PACKAGE12. ASME RELIEF VENT, B&G 790-3013. HOFFMAN MODEL 79 WATER VENT

15. AIR SEPARATOR IS BASED ON CALEFFI

14. 3/4" TANK PURGE VALVE

16. CONSTANT SPEED PUMP

ABBREVIATIONS

EC = ELECTRICAL CONTRACTOR

MC = MECHANCIAL CONTRACTOR

MFR = MANUFACTURER

|       | NR = NOT REC | QUIRED |                    |                    |         |
|-------|--------------|--------|--------------------|--------------------|---------|
|       |              |        |                    |                    |         |
| SN    | IOWMELT MA   | NIFOLD | SCHED              | ULE                |         |
| MODEL | LOCATION     | TYPE   | MANIFOLD<br>LENGTH | GPM PER<br>CIRCUIT | COMMENT |

24.8"

22.8"

4. BALANCING FLOW METERS WITH

2.79

9 CIRCUIT

8 CIRCUIT

NOTES:
1. 1 1/2" STAINLESS STEEL MANIFOLD.

328 SERIES

328 SERIES

TAG

SM-2

2. FULLY ASSEMBLED WITH FLOW METERS. A READABLE RANGE OF 0 TO 8 GPM.
3. MOUNT MANIFOLD ON WALL.

JANITORS OFFICE

MECHANICAL ROOM

OMMENTS

1,2,3,4

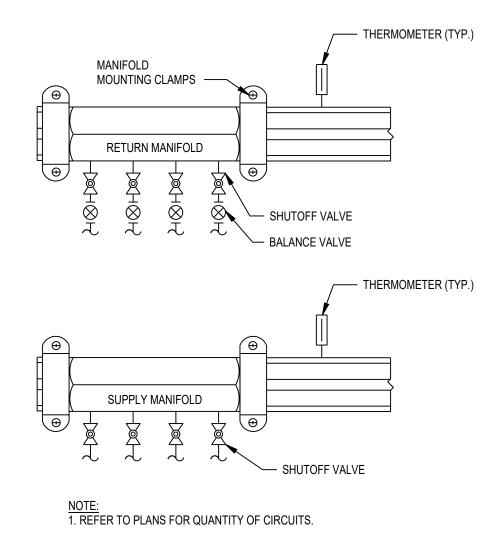
1,2,3,4

1,2,3,4

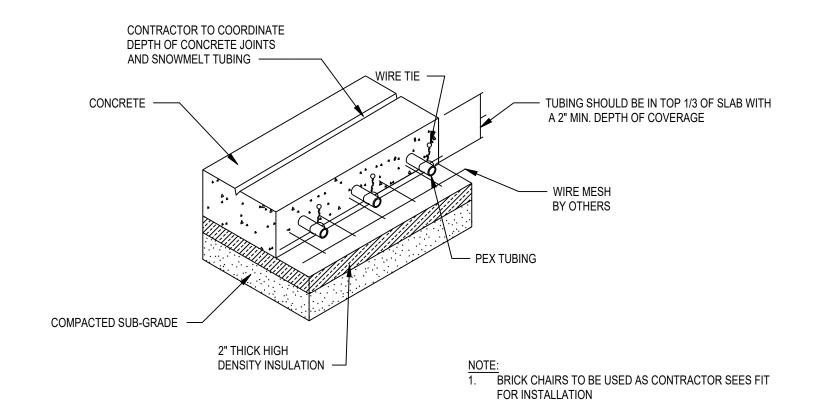
AUTOMATIC AIR VENT (TYP.) PRESSURE RELIEF VALVE — HEATING HOT WATER -TRIPLE DUTY VALVE SUPPLY (INLET) \_\_ 2-1/2" HS — 2-1/2" HS THERMOMETER (TYP.) — √\_1/2" HS √\_3/4" HS PRESSURE GAGE (TYP.) — SNOWMELT WATER ►EXPANSION TANK 2-WAY MODULATING — BALANCE VALVE— GLYCOL MAKEUP RETURN (INLET) CONTROL VALVE PACKAGE **EXCHANGER** HEATING HOT WATER RETURN (OUTLET) STRAINER \_ \_ \_ \_ \_ \_ CONTROL VALVE SYSTEM RETURN **BOILER RETURN** SYSTEM SUPPLY SNOWMELT CONTROLLER OUTDOOR SENSOR BY OTHERS IN FIELD NOTE: ALL EQUIPMENT SHOWN TO PUMP ENABLE SNOW/ICE SENSOR PUMP BE INCLUDED IN SKID PACKAGE. STARTER

5. SNOWMELT CONTROL TEKMAR 680 PANEL BY MANUFACTURER SET FOR HYDRONC HEAT EXCHANGER. PROVIDE WITH ONE 070 OUTDOOR AIR SENSOR AND THREE 082 UNIVERSAL SENSORS. 10. 2" B&G TRIPLE DUTY VALVE 3DV-2RFF

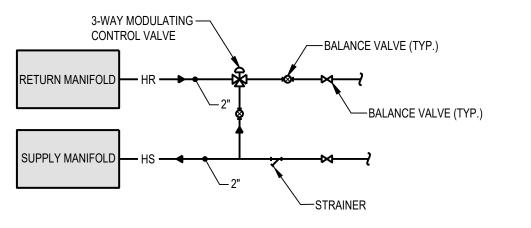








3 SNOWMELT CONCRETE DETAIL
SCALE: NTS







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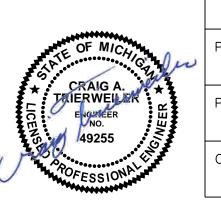
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STATE OFFICE BUILDING

SAGINAW, MI 48607

SHEET TITLE

MECHANICAL SCHEDULES

& DETAILS



| PROJECT NUMBER<br>2025009      | SHEET NUMBER |
|--------------------------------|--------------|
| PROJECT DATE<br>SEPT. 19, 2025 | M900         |
| CHECKED BY                     |              |

DIGITAL EQUIPMENT METER, AS REQUIRED

DUAL TECHNOLOGY SENSOR - 360° - 1000 SQ FT

DUAL TECHNOLOGY SENSOR - 360° - 500 SQ FT

WALL MOUNT DUAL TECHNOLOGY SENSOR

□ HORN

□ SPEAKER

□ HORN & LIGHT

☐
○ SPEAKER & LIGHT

ANNUNCIATOR PANEL - EOL- END OF LINE DEVICE

∇ VISUAL ONLY UNIT

FACP FIRE ALARM CONTROL PANEL

MAGNETIC DOOR HOLDER

+= TAMPER SWITCH (furnished by FP/C)

CARBON MONOXIDE DETECTOR

FCPS FIRE CONTROL POWER SUPPLY

MONITOR MODULE

CONTROL MODULE

▶ REMOTE INDICATING LIGHT, WALL MTD. REMOTE INDICATING LIGHT, CLG. MTD.

FIREFIGHTER COMMUNICATION JACK FLOW SWITCH (furnished by FP/C)

F PULL STATION

TRANSIENT VOLTAGE SURGE SUPPRESSION

SRS STAFF REGISTER STATION STAFF STATION DS DUTY STATION **DESIGNATIONS** ⟨x⟩ DEMOLITION NOTE PLAN NOTE

ADDENDUM NOTE

DOME LIGHT

|                     | <u>FIXTURES</u>  |                 | SERVICE and EQUIPMENT                            |
|---------------------|--|-----------------|--|
| 0                   | LIGHT FIXTURE  | TVSS            | TRANSIENT VOLTAGE SURGE SUPPRES                  |
| <u> </u>            | STRIP FIXTURE  | VFD             | VARIABLE FREQUENCY DRIVE                         |
|                     | EMERGENCY LIGHT FIXTURE  | T               | TRANSFORMER                                      |
| •                   | IN-GRADE LIGHT FIXTURE   |                 | FUSED DISCONNECT SWITCH                          |
| Ø.                  | SPOTLIGHT (number of heads shown)                              | $\boxtimes$     | MAGNETIC STARTER                                 |
| <b>⊗</b> •          | EXIT SIGN (face & direction as shown) WALL MOUNT LIGHT FIXTURE | $oxide{oxtime}$ | COMB. STARTER                                    |
| <del>ф</del>        | CEILING LIGHT FIXTURE  | _               | PANELBOARD, SURFACE MOUNTED                      |
| <del>•</del>        | TRACK & FIXTURE  | _               | PANELBOARD, FLUSH MOUNTED                        |
| $\overline{\Delta}$ | STREET TYPE POLE FIXTURE                                       |                 | WEATHERHEAD                                      |
| <b>⊶</b> □          | POLE MOUNTED LIGHT FIXTURE                                     | (þ              | UTILITY METER, AS REQUIRED                       |
| +□                  | EXTERIOR WALL MOUNT LIGHT FIXTURE                              | <b>@</b>        | DIGITAL EQUIPMENT METER, AS REQUI                |
| _                   | WALLPACK LIGHT FIXTURE   | CT              | CURRENT TRANSFORMERS                             |
|                     | SPECIAL PURPOSE LIGHT FIXTURE                                  | /G/             | GENERATOR, KW SHOWN                              |
|                     | HIGH BAY LIGHT FIXTURE   | <u></u>         | TELEPHONE TERMINAL BOARD                         |
| _                   | EMERGENCY EGRESS LIGHT FIXTURE                                 | Ī.              | GROUND CONNECTION PER N.E.C.                     |
|                     | (number of heads shown)  | WW              | WIREWAY  |
| $\wedge$            | DOCK LIGHT FIXTURE   | TSh             | TRANSFER SWITCH                                  |
| -                   | CIRCUITRY and RACEWAYS   | $\Box$          | ENCLOSED CIRCUIT BREAKER                         |
|                     |  | <del>IC</del>   | CAPACITOR  |
|                     | CONDUIT INSTALLED (by E.C.)                                    |                 | CONTROL  |
|                     | CONDUIT INSTALLED (by others)                                  |                 |  |
| <del></del>         | CONDUIT STUB DOMAN   | ①               | THERMOSTAT                                       |
|                     | CONDUIT STUB DOWN  | $\Theta$        | HUMIDISTAT                                       |
| 1,3                 | HOME RUN (with circuit numbers)                                | ⊖ PC            | PHOTOCELL (voltage as required)                  |
|                     | END OF CONDUIT RUN   | TC              | TIME CLOCK (24 hour U.O.N.)                      |
| <del></del> ]       | END OF CONDUIT RUN, CAP AND STAKE                              | <b>₿</b> 3      | PUSHBUTTON STATION (number of buttons indicated) |
| <i>─</i>            | "CONDUIT RUN CONTINUES" INDICATION                             | 310             | CONTROL TRANSFORMER                              |
| ····oR              | FLEXIBLE PIGTAILS/CONNECTIONS                                  | <br><b>⊠</b>    | LIGHTING CONTACTOR                               |
|                     | WIREMOLD AS SPECIFIED  | IC              | IRRIGATION CONTROLLER (120 volt                  |
|                     | PLUGMOLD AS SPECIFIED  | _               | xxVA connection by x/C)                          |
|                     | BUS DUCT   | $\triangle$     |  |
| —UFD—               | UNDERFLOOR DUCT  | OS1)            | WALL MOUNT DUAL TECHNOLOGY SEN                   |
|                     | SOUND and SIGNAL   | $\triangle$     |  |
| S                   | SPEAKER  | (OS2)           | OCCUPANCY SENSOR / PHOTOCELL                     |
| (S)H                | WALL MOUNTED SPEAKER   | <b>1</b>        |  |
| $\bowtie$           | WALL MOUNTED SPEAKER / CLOCK COMB                              | O (083)         | ULTRASONIC SENSOR - 360° - 2 CIRCUI              |
| Ф                   | SINGLE FACE CLOCK  | $\Psi$          |  |
| <del>Ф</del> Ф      | DUAL FACE CLOCK  | (OS4)           | DUAL TECHNOLOGY SENSOR - 360° - 10               |
| VI                  | VIDEO INPUT  | $\checkmark$    |  |
| AV                  | AUDIO / VIDEO INPUT  | $\triangle$     |  |
| BO                  | BELL   | (OS5)           | DUAL TECHNOLOGY SENSOR - 360° - 50               |
| $\bigcirc$          | VOLUME CONTROL   |                 |  |
| B                   | BUZZER   | oc              | SWITCH STYLE OCCUPANCY SENSOR                    |
| ٥                   | CHIME  |                 |  |
| $\Phi$              | TELEVISION OUTLET  | PP              | POWER PACK                                       |
| M                   | MICROPHONE OUTLET  |                 |  |
| $\bigcirc$          | INTERCOM OUTLET  | \$т             | DIGITAL TIME SWITCH                              |
| CX                  | CAMERA   | , .             |  |
| DC                  | DOOR CONTACT   |                 | FIRE ALARM                                       |
|                     | MOTION DETECTOR  | (2)             | SMOKE DETECTOR                                   |
| B                   | BEAM DETECTOR  | $\oplus$        | HEAT DETECTOR                                    |
| KP                  | KEY PAD  |                 | DUCT SMOKE DETECTOR                              |
| SSCP                | SECURITY SYSTEM CONTROL PANEL                                  | F/S             | DUCT SMOKE DETECTOR                              |
| CCTV                |  | Πи              | HODN   |

CCTV CONTROL PANEL

ADMINISTRATION STATION

CARD READER

G GLASS BREAK

TS

STUDENT STATION

TEACHER STATION

## GENERAL ELECTRICAL NOTES

- 1. ALL WALL AND FLOOR PENETRATIONS ARE TO BE SEALED TO MAINTAIN ORIGINAL
- 2. ALL CONDUITS TO BE FIELD ROUTED ALONG EXISTING PIPING AND STRUCTURAL
- 3. THE DIVISION 26 CONTRACTORS SHALL VISIT THE PROJECT AND DETERMINE THE EXACT EXTENT OF THE DEMOLITION WORK REQUIRED BEFORE BIDDING THE PROJECT.
- 4. REMOVE ALL EXISTING OBSOLETE EXPOSED CONDUIT, WIRE AND UNUSED EQUIPMENT WHERE WORK IS BEING DONE EXCEPT ITEMS NOTED OTHERWISE.
- 5. WHERE BUILDING SURFACES ARE DAMAGED BY THE REMOVAL OF OLD WORK, SURFACES SHALL BE PATCHED TO MATCH ADJACENT.
- 6. EXISTING WORK WHICH IS PRESENTLY CONCEALED AND WHICH WILL REMAIN CONCEALED AND DOES NOT INTERFERE WITH ANY NEW WORK OF ANY TRADE NEED NOT BE REMOVED. HOWEVER, ALL CONDUIT SHALL BE CAPPED BELOW FINISH

SURFACE AND THEN PATCHED TO MATCH, OR AS NOTED.

- 7. EXISTING OPENINGS, WHICH ARE TO BE REUSED, SHALL BE MODIFIED OR ENLARGED TO SUIT THE NEW SYSTEMS AS REQUIRED. PROVIDE ALL REQUIRED CUTTING AND PATCHING.
- 8. IF ASBESTOS IS PRESENT, IT WILL BE REMOVED OR RENDERED HARMLESS UNDER SEPARATE CONTRACT BY THE OWNER.
- 9. THE DIVISION 26 CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING THE EXISTING WALLS TO MATCH THE ADJACENT SURFACES BEHIND ALL SURFACE MOUNTED
- 10. CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT VOLTAGES AND LOADS PRIOR TO INSTALLING SERVICE TO EQUIPMENT.
- 11. DRAWINGS ARE BASED ON EXISTING RECORD DOCUMENT AND CASUAL FIELD OBSERVATION. REPORT ANY DISCREPANCIES TO ENGINEER FOR CLARIFICATION.
- 12. OBSERVATION. REPORT ANY DISCREPANCIES TO ENGINEER FOR CLARIFICATION. CONTRACTOR SHALL PROVIDE COMMISSIONING OF ELECTRICAL SYSTEMS BY INDEPENDENT THIRD PARTY AGENCY OR INDEPENDENT COMMISSIONING AGENT AS REQUIRED BY THE 2021 MICHIGAN COMMERCIAL ENERGY CODE SECTION 408.2.4 AND 408.3. TEST, CERTIFY, AND PROVIDE DOCUMENTATION OF LIGHTING CONTROL DEVICES AND CONTROL SYSTEMS TO ENSURE THAT CONTROL HARDWARE AND SOFTWARE ARE CALIBRATED, ADJUSTED, PROGRAMMED AND IN PROPER WORKING CONDITION IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS. THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, AND ENERGY CONTROL DESIGN GUIDE LINES.

#### ABBREVIATIONS LEGEND

| A AMPS GC GENERAL CONTRACTOR P POLE  |             |
|--|-------------|
| AC ABOVE COUNTER GFI GROUND FAULT INTERRUPTER P- PUMP  |             |
| ACU- AIR CONDITIONING UNIT GND GROUND PB PULL BOX  |             |
| AFF ABOVE FINISHED FLOOR PNL PANEL   |             |
| AHJ AUTHORITY HAVING JURISDICTION H- HUMIDIFIER PRV- POWER ROOF VENTILATOR   | ,<br>L      |
| AHU- AIR HANDLING UNIT HID HIGH INTENSITY DISCHARGE PVC POLY VINYL CLORIDE   |             |
| AIC AMPS INTERRUPTING CAPACITY HOA HAND-OFF-ALITO SELECTOR SWITCH PWR POWER  |             |
| AS ABOVE SHELF HP HORSEPOWER   |             |
| ATS AUTOMATIC TRANSFER SWITCH LID LIQUID RECEPT RECEPTACLE   | OONDUIT     |
| HVAC: HEATING/VENTILATING/AIR CONDITIONING RGC RIGID GALVANIZED STEEL  | CONDUIT     |
| B- BOILER RTU- ROOF TOP UNIT   |             |
| BC BELOW COUNTER IG ISOLATED GROUND  |             |
| BLDG BUILDING INC INTERMEDIATE METAL CONDUIT SE- SUPPLY FAN  |             |
| INC INTERMEDIATE METAL CONDUIT SPEC SPECIFICATIONS   |             |
| CHLR- CHILLER JB JUNCTION BOX SWBD SWITCH CND (C) CONDUIT SWBD SWITCHBOARD   |             |
| OND (O) CONDON   |             |
| CKT CIRCUIT LC LIGHT CONTROL TCC TEMPERATURE CONTROL   | CONTRACTOR  |
| ON DIN ONOON DILANEN IT IIGHT  |             |
| OI- COOLING TOWER I IGH I ING  | <b>/</b> LL |
| THE EXTENSIVE ONLY   |             |
| OST ONDINE FORTINE NEW   |             |
| DELL DUCT FURNACE MAX MAXIMUM UF UNDER FLOOR   |             |
| MC MECHANICAL CONTRACTOR UH. LINIT HEATER  |             |
| MCC MOTOR CONTROL CENTER UI LINDERWRITERS' LABORAT   | ORIES INC   |
| MIN MINIMUM UNO LINESS NOTED OTHERWIS  |             |
| MLO MAIN LUG ONLY  | _           |
| MT MOUNT V VOLTS   |             |
| EBB- ELECTRIC BASEBUARD MTD MOUNTED VI VERIEY LOCATION WITH O  | VNER        |
| EE EVILATIOT FAN   |             |
| EF- EXHAUST FAN MUAU- MAKE-UP AIR UNIT W WATTS  EM EMERGENCY   |             |
| EMEROCINO I W/ WITH  |             |
| ENGLISHED STORES OF THE STORES |             |
| NIC NOT IN CONTRACT WP WEATHER PROOF   |             |
| EXISTIVE NL NIGHT LIGHT  |             |
|  |             |
| FLA FULL LOAD AMPS NTS NOT TO SCALE XFMR TRANSFORMER   |             |

|      |                                | LIGH                             | TING FIXTURE SCHEDULE                    |              |                               |                                  |
|------|--------------------------------|----------------------------------|--|--------------|-------------------------------|----------------------------------|
| TYPE | MANUFACTURER                   | CATALOG NO.                      | DESCRIPTION AND COMMENTS                 | DIMMING INFO | FIXTURE<br>MOUNTING<br>HEIGHT | DRIVER                           |
| LP   | U.S. ARCHITECTURAL<br>LIGHTING | RSB18-PLED-III-M-20LED-350mA-40K | ALUMINUM HOUSED LED LIGHT WITH 1040 POLE | -            | POLE MOUNTED                  | 3000 LUMENS<br>28W, 4000K<br>LED |

| PANEL "EM-LP"  VOLTS: 208 / 120 PHASE: 3 WIRE: 4 AMPS: 225 MAIN: MCB |   |                           |   |       |   |      |      |       |       |                             |        |     |  |
|--|---|---------------------------|---|-------|---|------|------|-------|-------|-----------------------------|--------|-----|--|
|  |   |                           |   |       |   |      |      |       |       |                             |        |     |  |
| Α  | P | DESCRIPTION               | VA                                      | NO    | A | В    | С    | NO VA |       |                             |        | P   |  |
| 20   | 1 | EX BASEMENT EM LTS        |   | 1     | 0 |      |      | 2     |       | EX 1ST FL EM NL EAST        | 20     | 1   |  |
| 20   | 1 | EX BASEMENT EM LTS        |   | 3     |   | 0    |      | 4     |       | EX 1ST FL EM NL LOBBY       | 20     | 1   |  |
| 20   | 1 | EX BASEMENT TELE RECEPT   |   | 5     |   |      | 0    | 6     |       | EX 1ST FL PLUG MOLD         | 20     | 1   |  |
| 20   | 1 | EX PHONE PLUG MOLD        |   | 7     | 0 |      |      | 8     |       | EX 1ST FL DOOR LOCKS        | 20     | 1   |  |
| 20   | 1 | EX BASMENT HALL EM LTS    |   | 9     |   | 0    |      | 10    |       | EX 4TH FL EM NL             | 20     | 1   |  |
| 20   | 1 | EX GEN BLOCK HEATER       |   | 11    |   |      | 0    | 12    |       | EX 4TH FL EM NL             | 20     | 1   |  |
| 20   | 1 | EX COMPR. AIR DRYER       |   | 13    | 0 |      |      | 14    |       | EX SPARE                    | 60     | 3   |  |
| 20   | 1 | EX BASEMENT EM LTS EAST   |   | 15    |   | 0    |      | 16    |       | -                           | -      | -   |  |
| 20   | 1 | EX BASEMENT EM LTS EAST   | 110000110000000000000000000000000000000 | 17    |   |      | 0    | 18    |       | -                           | -      | -   |  |
| 20   | 1 | EX BASEMENT EM LTS EAST   |   | 19    | 0 |      |      | 20    |       | EX 2ND FL PLUG MOLD         | 20     | 1   |  |
| 20   | 1 | EX 2ND EM LTS EAST        |   | 21    |   | 0    |      | 22    |       | EX TRIDINM PNL 1 EAST       | 20     | 1   |  |
| 20   | 1 | EX 2ND EM LTS EAST        |   | 23    |   |      | 0    | 24    |       | EX BASEMENT PN RM RECEPT    | 20     | 1   |  |
| 20   | 1 | EX 2ND EM LTS EAST        |   | 25    | 0 |      |      | 26    |       | EX SPARE                    | 20     | 1   |  |
| 20   | 1 | EX EXIT LTS BASEMENT      |   | 27    |   | 0    |      | 28    |       | EX BUBBLER ICE              | 20     | 1   |  |
| 20   | 1 | EX EXIT LTS BASEMENT      |   | 29    |   |      | 0    | 30    |       | EX DDC BASEMENT             | 20     | 1   |  |
| 20   | 1 | EX PHONE PLUG MOLD 2ND    |   | 31    | 0 |      |      | 32    |       | EX 4TH TELE RECEPT/SPARE    | 20/20  | 1   |  |
| 25   | 2 | NEW HTP-1                 | 1944                                    | 33    |   | 1944 |      | 34    |       | EX EM RECEPT E MECH RM      | 20     | 1   |  |
| -  |   | -                         | 1944                                    | 35    |   |      | 1944 | 36    |       | EX DDC EASR SIDE            | 20     | 1   |  |
| 100  | 3 | EX EM PHONE RM PANEL AHUI |   | 37    | 0 |      |      | 38    |       | EX LERBERT 1ST WEST MECH RM | 100    | 3   |  |
| •  |   |                           |   | 39    |   | 0    |      | 40    |       | •                           | -      |     |  |
|  |   |                           |   | 41    |   |      | 0    | 42    |       |                             | -      |     |  |
|  |   | •                         | CONNI                                   | ECTED | 0 | 1944 | 1944 | TOTAL | CONNE | CTED LOAD 3888              | VOLT-A | MP: |  |
| TOTAL CONNECTED  |   |                           |   | 3888  |   |      |      | 10.79 | -     |                             |        |     |  |

FLR

FLUOR

FSES

F/S FU-

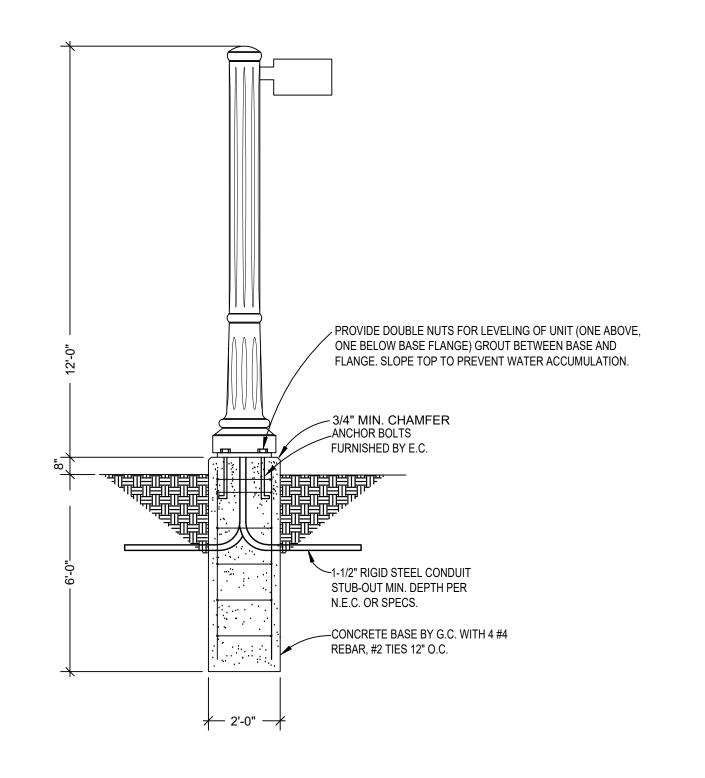
FLOOR

FLUORESCENT

FIRE/SMOKE

**FURNACE** 

FOOD SERVICE EQUIP. SUPPLIER



POLE BASE DETAIL - FIXTURE TYPE "LP" SCALE: N.T.S.



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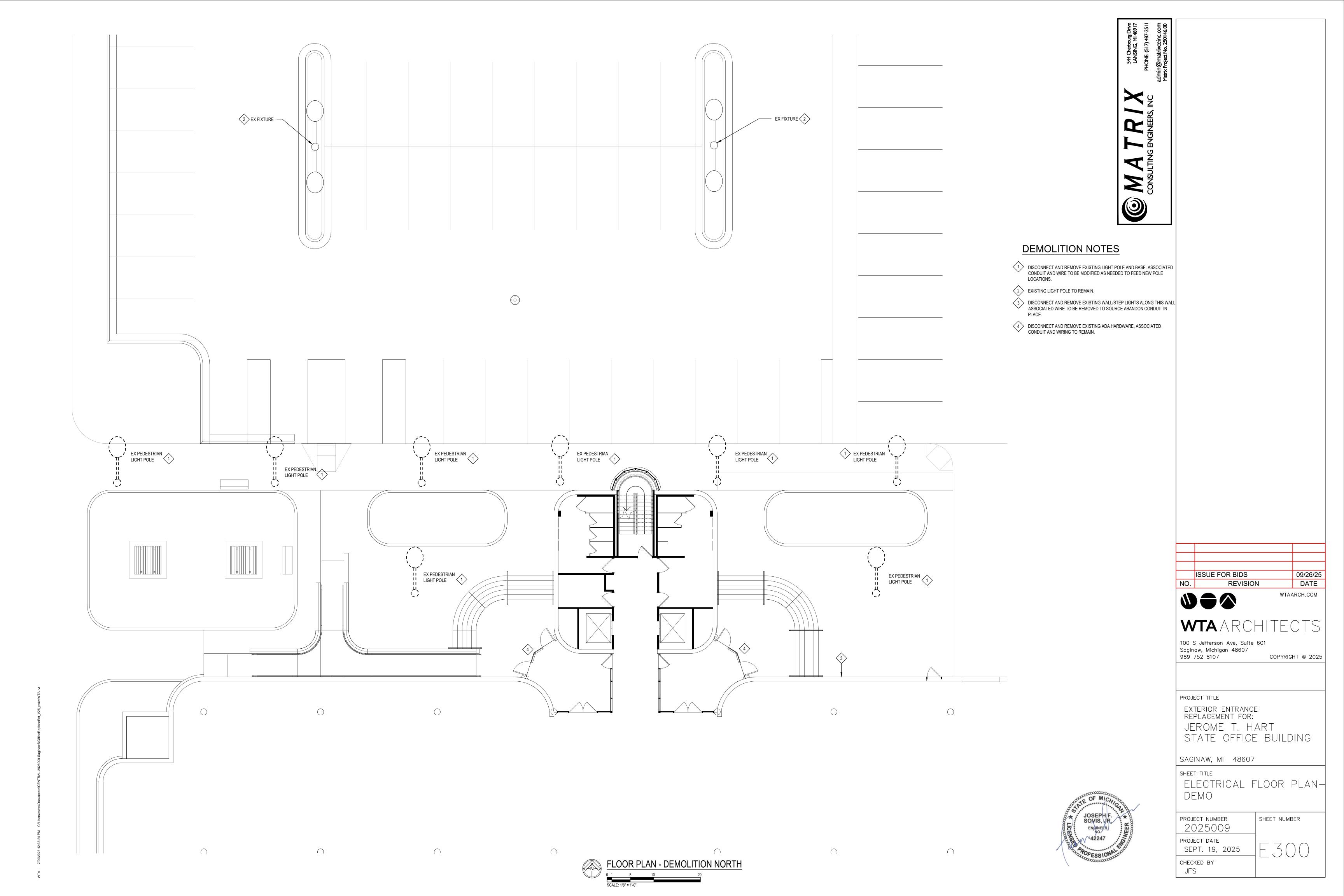
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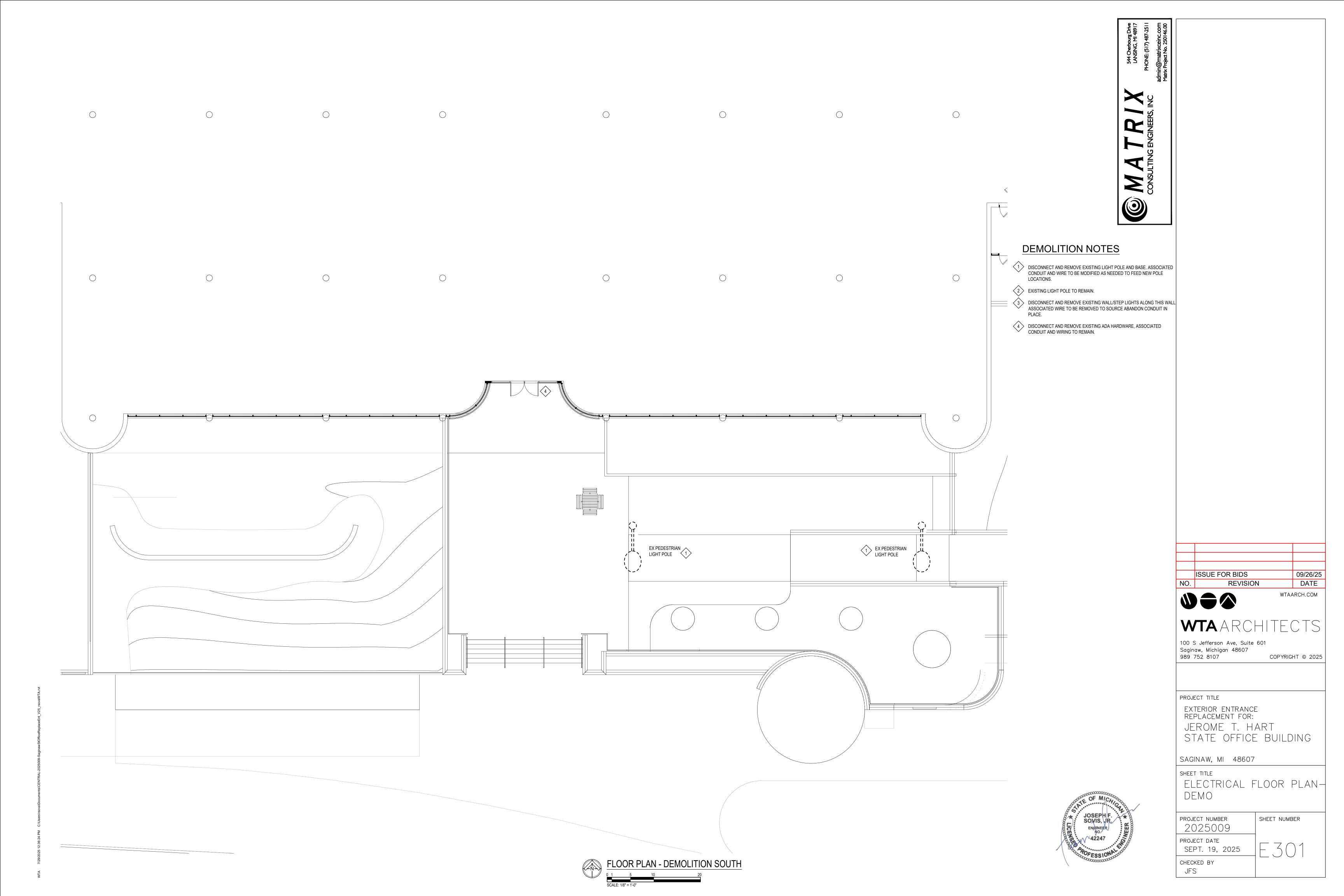
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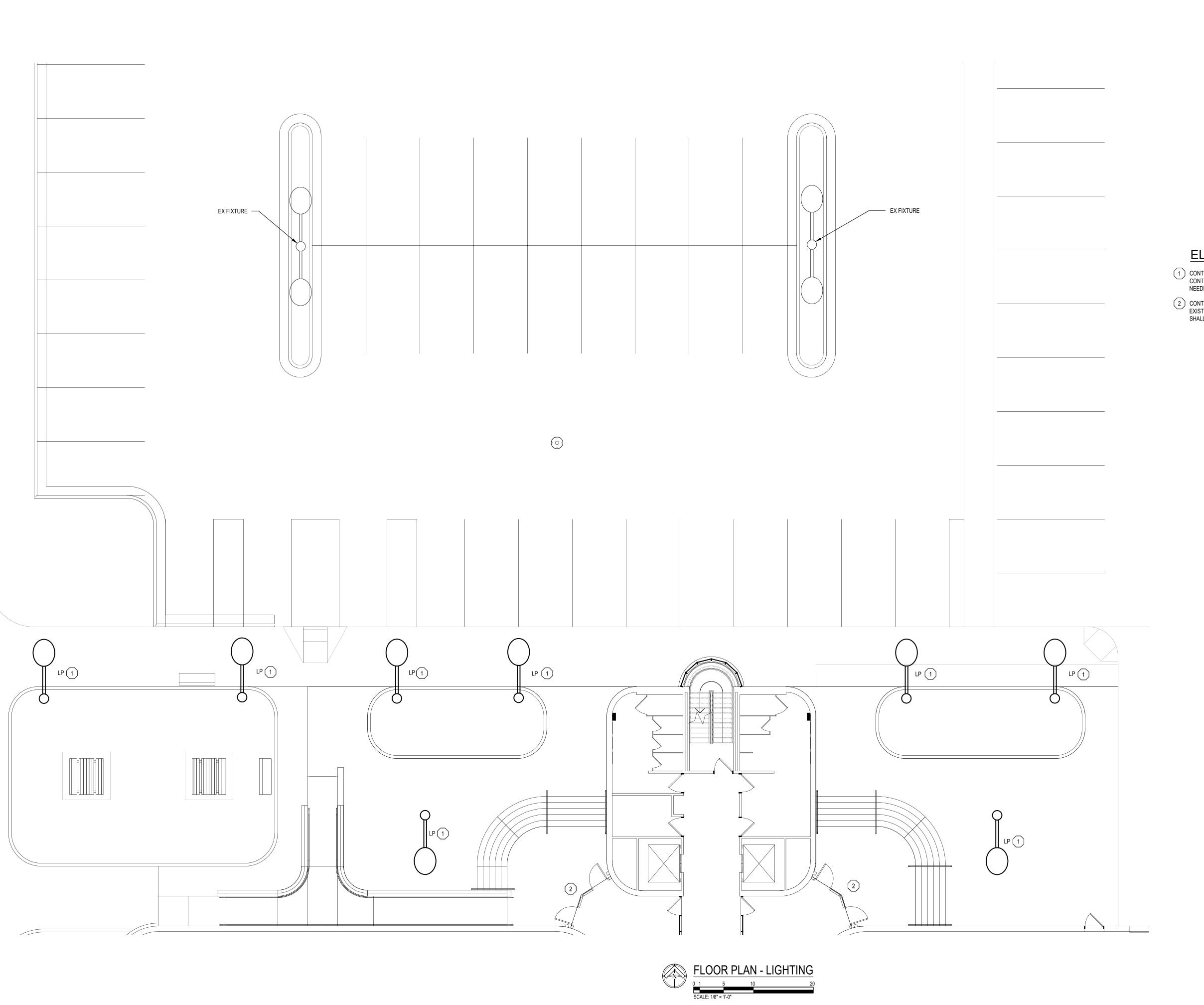
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## **ELECTRICAL KEY NOTES**

- 1 CONTRACTOR SHALL CONNECT NEW LIGHT POLE TO EXISTING CIRCUIT.
  CONTRACTOR SHALL MODIFY AND EXTEND EXISTING CONDUIT AND WIRE AS NEEDED.
- 2 CONTRACTOR SHALL PROVIDE AND INSTALL NEW ADA HARDWARE. EXTEND EXISTING CONDUIT AND WIRE AS NEED FOR NEW LOCATION. CONTRACTOR SHALL VERIFY WITH OWNER AND ARCHITECT FOR FINAL LOCATION.

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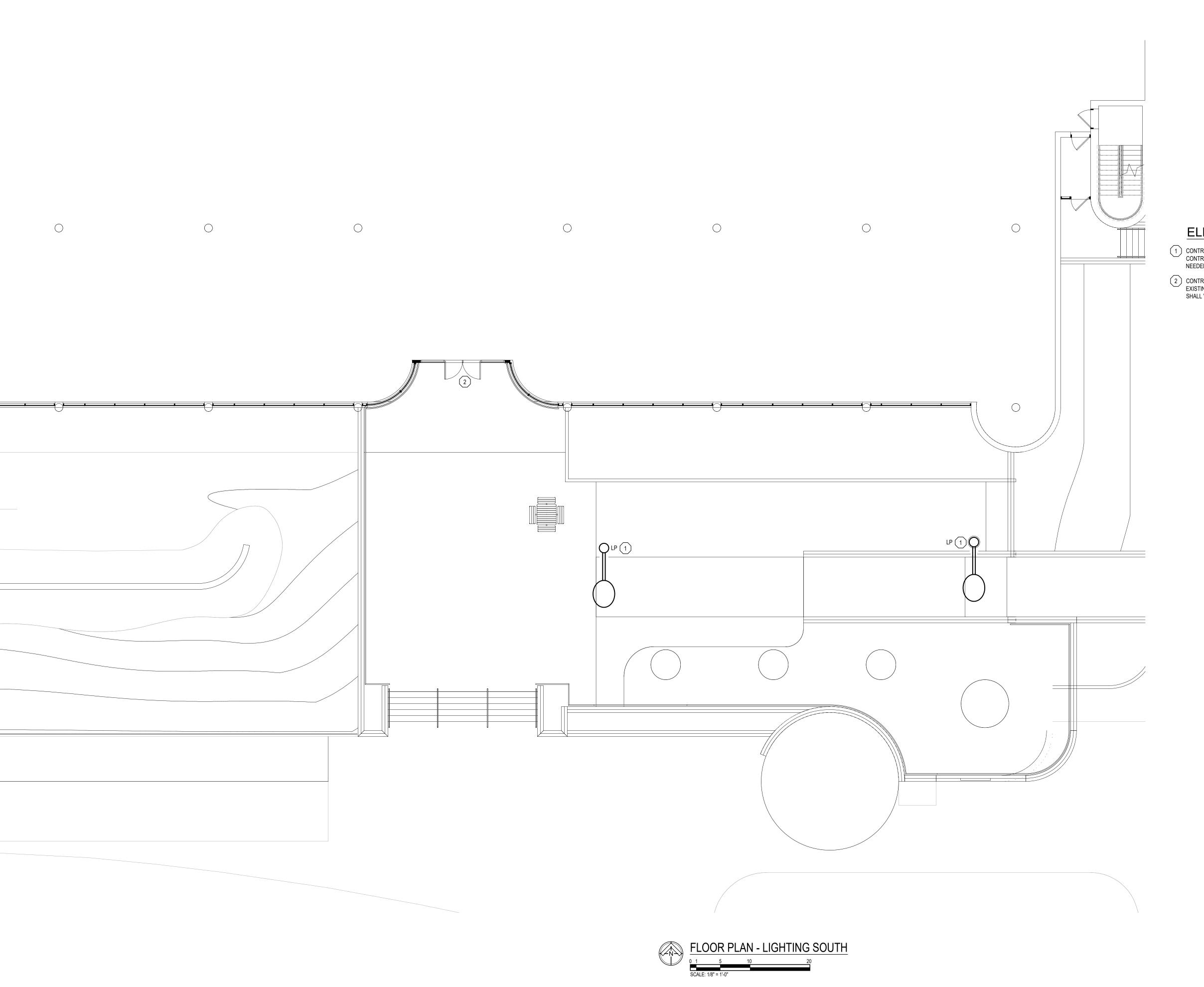
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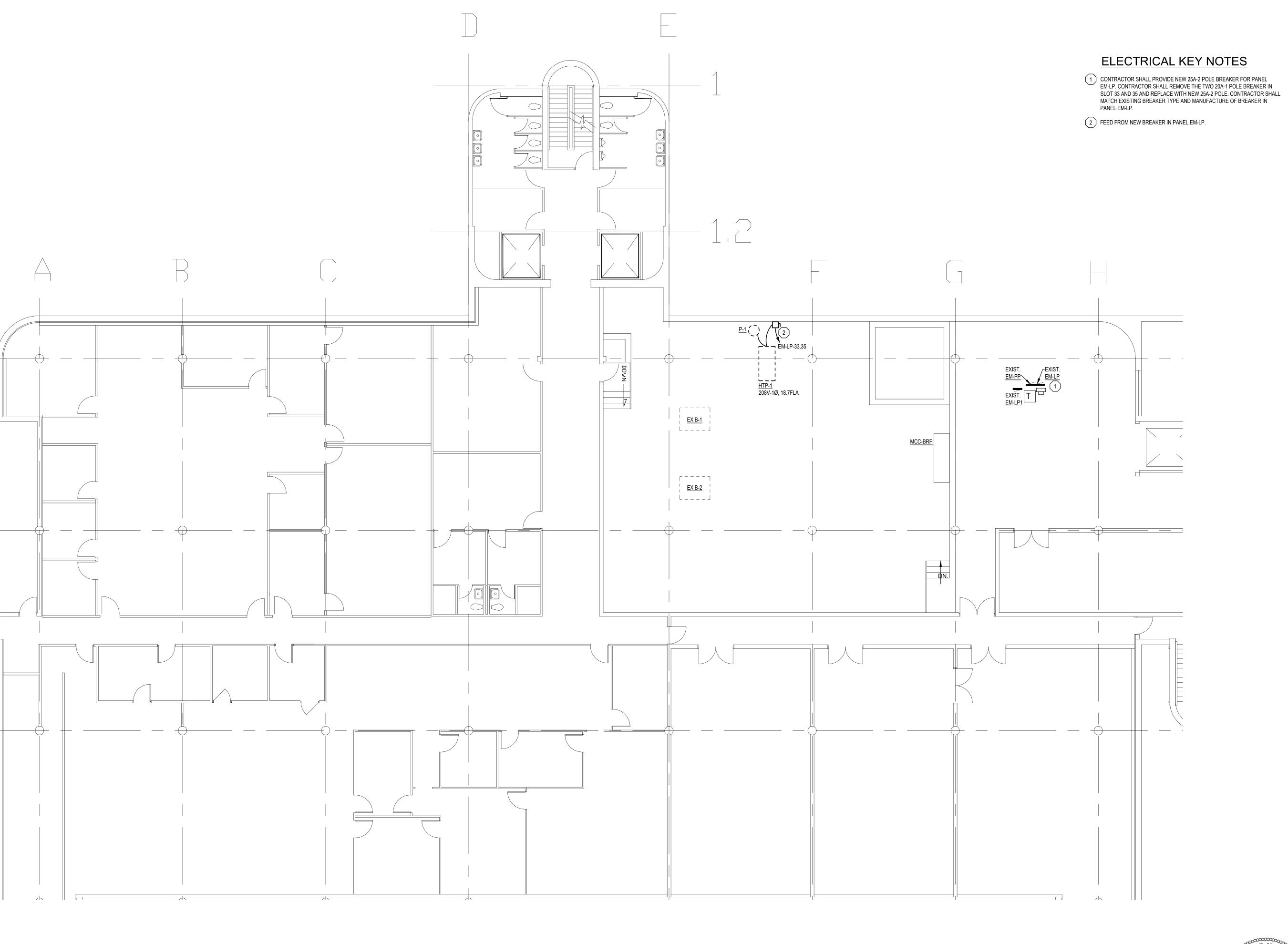
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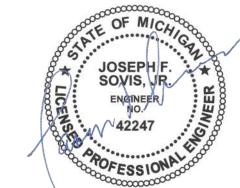
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