

LAKE HAVASU CITY, ARIZONA

PUBLIC WORKS DEPARTMENT

PARK AVENUE LIFT STATION RENOVATION

PROJECT NO. 107019
 CONSTRUCTION DRAWINGS
 AUGUST 2023



| NO. | REVISIONS / SUBMISSIONS | DATE |
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LAKE HAVASU CITY
PUBLIC WORKS DEPARTMENT
PARK AVENUE LIFT STATION
RENOVATION

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| Designed by: HN | Drawn by: HN | Checked by: RN | Date: 08-01-2023 | Dwg scale: N/A |
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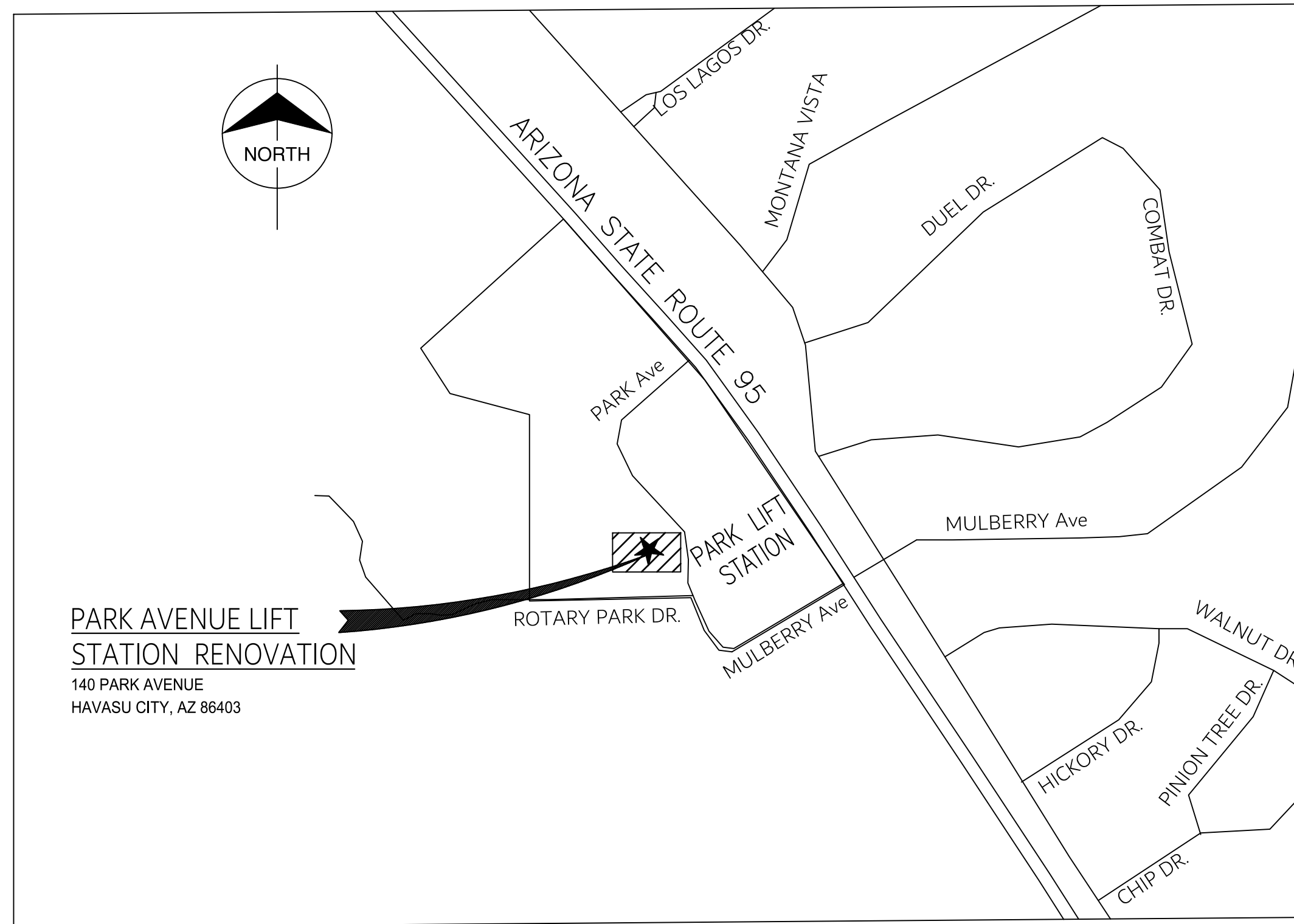
COVER SHEET



Sheet Number:

G-01
 Sheet 1 of 19

CONSTRUCTION DRAWINGS



LOCATION MAP
 SCALE: NTS

TEMPORARY BENCH MARK
 DISCHARGE MANHOLE RIM
 EL = 482.78. SEE SHEET C-02

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CITY COUNCIL

| | |
|----------------|----------------|
| CAL SHEEHY | MAYOR |
| JIM DOLAN | VICE MAYOR |
| DAVID LANE | COUNCIL MEMBER |
| JENI COKE | COUNCIL MEMBER |
| NANCY CAMPBELL | COUNCIL MEMBER |
| MICHELE LIN | COUNCIL MEMBER |
| CAMERON MOSES | COUNCIL MEMBER |

CITY MANAGER

JESS KNUDSON

CITY ENGINEER

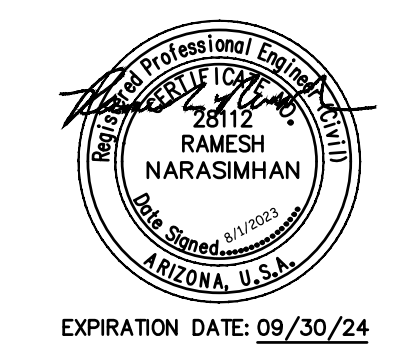
GREG FROSLIE, P.E.

PROJECT MANAGER

PHILIP PORTER

UTILITY CONTACTS

| | |
|--------------------------------------|----------------|
| LAKE HAVASU CITY (WASTEWATER) | (928) 855-3999 |
| LAKE HAVASU CITY (WATER) | (928) 855-2618 |
| SUDDEN LINK | (928) 855-9855 |
| FRONTIER COMMUNICATION | (928) 453-0541 |
| UNISOURCE ENERGY SERVICES (GAS) | (877) 837-4968 |
| UNISOURCE ENERGY SERVICES (ELECTRIC) | (928) 505-7016 |



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GENERAL NOTES

GENERAL

1. THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT ALL IMPROVEMENTS ARE BUILT, CONSTRUCTED, AND/OR INSTALLED IN ACCORDANCE WITH THESE PROJECT PLANS AND THE TECHNICAL SPECIFICATIONS FOR THE WORK.
2. THE CONTRACTOR IS RESPONSIBLE FOR THE SURVEY, LAYOUT, AND STAKING OF THE PROPOSED IMPROVEMENTS FOR CONSTRUCTION PURPOSES.
3. IF THERE ARE ANY QUESTIONS REGARDING THE PLANS OR THE INTENT OF THE DESIGN, THE CONTRACTOR SHALL CONTACT THE ENGINEER AND DISCUSS THE ISSUE SO THAT IT IS CLARIFIED OR RESOLVED PRIOR TO THE START OF CONSTRUCTION.
4. THE CONTRACTOR SHALL TAKE THE NECESSARY STEPS AND PRECAUTIONS TO PROTECT AND SAFEGUARD ADJACENT IMPROVEMENTS AND PROPERTY FROM DAMAGE DUE TO CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS PROJECT.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING AND OBTAINING ANY PERMITS NEEDED TO COMPLETE THE PROJECT, POTENTIALLY INCLUDING AN AGENCY BUSINESS LICENSE, RIGHT OF WAY WORK PERMIT, WATER USAGE AGREEMENT, ETC., AND INCLUDE THE COSTS FOR THE SAME, IF ANY, IN THE PROJECT BID PRICES.
6. ALL PROJECT IMPROVEMENTS INCLUDING BUT NOT LIMITED TO MANHOLE FRAMES, VALVE BOXES, VAULTS, HANDHOLES, FIRE HYDRANTS, ETC., SHALL BE SET OR RESET TO FINISHED GRADE OF THE SURROUNDING GROUND OR PAVEMENT SURFACE WHETHER OR NOT SPECIFICALLY CALLED OUT ON THE PLANS OR IN THE SPECIFICATIONS.

UTILITIES

1. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES OR UTILITY STRUCTURES SHOWN ON THESE PLANS SHOULD BE VERIFIED BASED ON AN AZ 811 UTILITY MAPPING REQUEST.
2. THE LOCATION OF THE UTILITIES MAY OR MAY NOT BE ACCURATELY SHOWN ON THE UTILITY MAPPING PROVIDED AND ON THE PROJECT PLANS.
3. THERE MAY BE OTHER UTILITY LINES AND FACILITIES PRESENT THAT ARE IN SERVICE OR HAVE BEEN ABANDONED WITHIN THE PROJECT CORRIDOR OR AREA THAT ARE NOT SHOWN ON THE MAPPING AND ON THE PLANS.
4. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING AZ811 (BLUE STAKE) PRIOR TO COMMENCING ANY DIGGING ACTIVITIES TO HAVE THE LOCATIONS OF THE UTILITIES MARKED IN THE FIELD AT THE PROJECT SITE. EXISTING PIPING, ELECTRICAL, AND UTILITIES ARE BASED ON EXISTING RECORDS. CONTRACTOR IS RESPONSIBLE FOR VERIFYING LOCATIONS OF ALL EXISTING PIPING, ELECTRICAL, AND UTILITIES AND AVOIDING DAMAGE TO THE SAME.
5. THE CONTRACTOR IS ALSO RESPONSIBLE FOR VISUALLY INSPECTING THE MARKED UTILITIES AT THE PROJECT SITE TO ASCERTAIN IF ANY POTENTIAL CONFLICTS EXIST BETWEEN THE PROPOSED IMPROVEMENTS UNDER THIS PROJECT AND THE EXISTING UTILITY FACILITIES.
6. THE CONTRACTOR SHALL "POTHOLE" TO DETERMINE THE EXACT LOCATION AND DEPTH OF EXISTING UTILITY FACILITIES TO IDENTIFY ANY POTENTIAL CONFLICTS BETWEEN UTILITY FACILITIES AND THE PROPOSED IMPROVEMENTS AND, IF NEEDED, REVIEW THE INFORMATION WITH THE OWNER AND THE ENGINEER TO RESOLVE ANY POTENTIAL CONFLICT PRIOR TO CONSTRUCTION.
7. THE CONTRACTOR SHALL OBSERVE ALL POSSIBLE PRECAUTIONS WHEN WORKING IN CLOSE PROXIMITY TO EXISTING UTILITY LINES AND/OR STRUCTURES TO PROTECT THE SAME AND AVOID ANY DAMAGE TO THE UTILITY FACILITIES.
8. SHOULD ANY UTILITY FACILITY BE DAMAGED BY THE CONTRACTOR'S ACTIVITIES, THE CONTRACTOR SHALL CONTACT AND COORDINATE WITH THE UTILITY OWNER FOR THE REPAIR OF THE FACILITY AT NO ADDITIONAL COST TO THE PROJECT.
9. WHEN GRAVITY SEWER SYSTEM CONTAIN PRESSURE COMPONENTS, THE MINIMUM SEPARATION BETWEEN FORCE MAINS OR PRESSURE SEWERS AND WATER MAINS SHALL BE 2 FEET VERTICALLY AND 6 FEET HORIZONTALLY UNDER ALL CONDITIONS. WHERE A SEWER FORCE MAIN CROSSES ABOVE OR LESS THAN 6 FEET BELOW A WATER LINE, THE SEWER MAIN SHALL BE ENCASED IN AT LEAST 6 INCHES OF CONCRETE FOR 10 FEET ON EITHER SIDE OF THE WATER MAIN.

CONSTRUCTION JOBSITE SAFETY

1. THE CONTRACTOR ASSUMES SOLE AND COMPLETE RESPONSIBILITY FOR JOBSITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY.
2. THIS SAFETY REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
3. NEITHER THE OWNER NOR THE ENGINEER WILL ENFORCE SAFETY MEASURES OR REGULATIONS.
4. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN, CONSTRUCTION, AND MAINTENANCE OF ALL SAFETY DEVICES INCLUDING SHORING.
5. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE, AND FEDERAL SAFETY AND HEALTH STANDARDS, LAWS, AND REGULATIONS.
6. THE CONTRACTOR SHALL FOLLOW THE GUIDELINES AND REGULATIONS AS SET FORTH BY OSHA CONCERNING THE PROJECT WORK AND JOBSITE ACTIVITIES.
7. CONTRACTOR IS RESPONSIBLE FOR REVIEWING ALL PLANS FOR DEMOLITION ITEMS.
8. PROVIDE TEMPORARY THRUST RESTRAINT FOR EXISTING PIPING WHENEVER THE WORK REQUIRES. CONTRACTOR SHALL REPLACE OR RESTORE THE EXISTING RESTRAINT SYSTEM TO LIKE-NEW CONDITION.
9. DIMENSIONS AND ELEVATIONS FOR EQUIPMENT INSTALLATION TO BE DETERMINED BASED UPON EQUIPMENT MANUFACTURER SELECTED.
10. WHERE INDICATED, DIMENSIONS AND ELEVATIONS SHALL BE FIELD VERIFIED.
11. EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED SHALL BE MARKED BY ENGINEER OR OWNER PRIOR TO WORK, UNLESS OTHERWISE NOTED ON THE CONTRACT DOCUMENTS.
12. ALTHOUGH SUCH WORK MAY NOT BE SPECIFICALLY INDICATED, FURNISH AND INSTALL SUPPLEMENTARY OR MISCELLANEOUS ITEMS, APPURTENANCES AND DEVICES INCIDENTAL TO, OR NECESSARY FOR A SOUND, SECURE AND COMPLETE INSTALLATION.
13. CONTRACTOR TO MAINTAIN ACCESS FOR EMERGENCY RESPONSE VEHICLES DURING CONSTRUCTION.
14. CONTRACTOR SHALL PROVIDE TEMPORARY SAFETY AND SECURITY FENCING AND SITE IMPROVEMENTS AS NEEDED AT NO EXTRA COST.
15. CONSTRUCTION DEBRIS SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF AT LEAST WEEKLY BY THE CONTRACTOR. KEEP SITE AREA CLEAN.
16. EXCAVATED SOIL IS TO BE USED TO FILL IN LOW SPOTS PRIOR TO BEING HAULED OFF SITE. CONTRACTOR SHALL ESTABLISH A SUITABLE STAGING AREA FOR STORAGE OF EXCAVATED SOIL.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY AT THE SITE WHILE CONSTRUCTION IS IN PROGRESS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE PUBLIC FROM ANY HAZARDS ARISING FROM

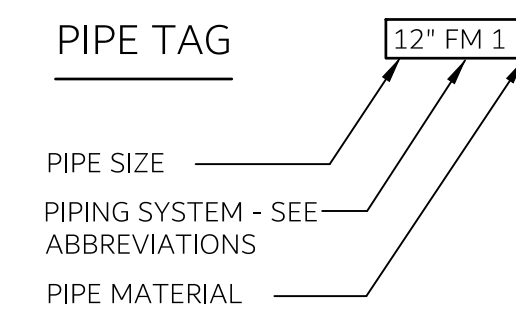
CONSTRUCTION OPERATIONS AND PROTECTING EXISTING AND NEW IMPROVEMENTS FROM DAMAGE DUE TO ACCIDENT OR VANDALISM.

18. ALL MATERIALS WHICH MAY COME IN CONTACT WITH DRINKING WATER SHALL CONFORM TO NSF INTERNATIONAL STANDARD 60 AND 61.
19. REFER TO PROJECT SPECIFICATION FOR ANY SUPPLEMENT DETAILS REFERRED TO IN THE DRAWINGS.
20. MAINTAIN, RELOCATE, OR REPLACE EXISTING SURVEY MONUMENTS, CONTROL POINTS, AND STAKES WHICH ARE DISTURBED OR DESTROYED, PERFORM THE WORK TO PRODUCE THE SAME LEVEL OF ACCURACY AS THE ORIGINAL MONUMENT(S) IN A TIMELY MANNER, AND AT THE CONTRACTOR'S EXPENSE.
21. COORDINATES AND DIMENSIONS SHOWN FOR ROADWAY IMPROVEMENTS ARE TO FACE OF CURB OR EDGE OF PAVEMENT.
22. ELEVATIONS GIVEN ARE TO FINISH GRADE UNLESS OTHERWISE SHOWN. SLOPE UNIFORMLY BETWEEN CONTOURS AND SPOT ELEVATIONS SHOWN.
23. UNLESS SHOWN ON THE DRAWINGS, ALL DISTURBED AREAS NOT RECEIVING A HARD SURFACE OR GRAVEL SURFACE SHALL BE GRADED SMOOTH AND COMPACTED AS SPECIFIED.
24. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION CONTROL DEVICES DURING CONSTRUCTION. EROSION CONTROL DEVICES, SILT FENCING, RUNOFF CONTAINMENT BERMS, AND STRAW BALES ARE THE MINIMUM REQUIRED.
25. CONTRACTOR SHALL TAKE ALL OTHER MEASURES TO POSITIVELY PRECLUDE EROSION MATERIALS FROM LEAVING THE SITE.
26. WHERE ALUMINUM IS TO BE EMBEDDED IN CONCRETE, THE ALUMINUM SHALL FIRST BE COATED WITH COAL TAR EPOXY.
27. BACKFILLING OF PIPING AND STRUCTURES SHALL NOT BE STARTED UNTIL INSTALLATION IS APPROVED BY THE OWNER.
28. UNLESS OTHERWISE NOTED, ALL PVC INSTALLED ABOVE GROUND SHALL BE PAINTED PER SPECIFICATION SECTION 09900.
29. THE CONTRACTOR SHALL ADJUST ALL EXISTING MANHOLES, VALVE BOXES, CLEANOUTS, BLIND FLANGED PIPING, AND FIRE HYDRANTS WITHIN WORK LIMITS REQUIRED TO MATCH PROPOSED FINAL GRADE.
30. GOVERNING BUILDING CODES:
2018 INTERNATIONAL BUILDING CODE
2017 NATIONAL ELECTRICAL CODE
2018 INTERNATIONAL PLUMBING CODE
2018 INTERNATIONAL FIRE CODE
31. ALL BURIED DIP & PVC PIPING SHALL BE MECHANICALLY RESTRAINED USING MEGALUG TYPE JOINTS.

ABBREVIATIONS & SYMBOLS

| | |
|--------|-------------------------|
| Ø | DIAMETER |
| * | FIELD VERIFY |
| ** | VERIFY WITH VENDOR |
| ARV | AIR RELEASE VALVE |
| COMBO | COMBINATION |
| CVM | CHECK VALVE MANHOLE |
| DIP | DUCTILE IRON PIPE |
| EL | ELEVATION |
| FL | FLANGE |
| GPM | GALLONS PER MINUTE |
| HORIZ | HORIZONTAL |
| IE | INVERT ELEVATION |
| LS | LIFT STATION |
| MAX | MAXIMUM |
| MIN | MINIMUM |
| MJ | MECHANICAL JOINT |
| MH | MANHOLE |
| PE | PLAIN END |
| PI | PRESSURE INDICATOR |
| PSH | PRESSURE SWITCH HIGH |
| PT | PRESSURE TRANSMITTER |
| PUE | PUBLIC UTILITY EASEMENT |
| PVC | POLYVINYL CHLORIDE |
| ROW | RIGHT OF WAY |
| SCH | SCHEDULE |
| SFM/FM | FORCEMAIN |
| SLS | SANITARY LIFT STATION |
| TOC | TOP OF CONCRETE |
| TYP | TYPICAL |
| UGE | UNDERGROUND ELECTRIC |
| VAC | VACUUM |

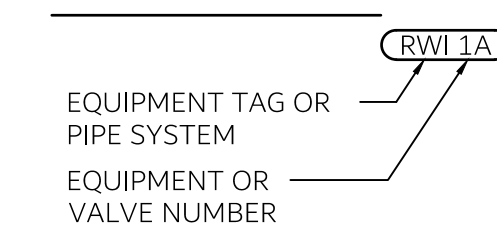
PIPE TAG



PIPE MATERIAL

- 1 - DUCTILE IRON - EPOXY COATED PROTECTO 401
- 2 - C-900 PVC
- 3 - COPPER
- 4 - SDR 35 PVC
- 5 - GALVANIZED IRON PIPE
- 6 - FIBER REINFORCED PLASTIC
- 7 - HDPE

EQUIPMENT TAG



LEGEND

| | |
|--|-------------------------------------|
| | BALL VALVE |
| | BALL VALVE |
| | BALL VALVE (SHOWN IN OPEN POSITION) |
| | AGGREGATE BASE |
| | CENTERLINE |
| | CHECK VALVE |
| | CONCRETE IN SECTION |
| | CONSTRUCTION KEYNOTE |
| | EARTH IN SECTION |
| | FLANGED 90° BEND (SHOWN AS FLANGED) |
| | FLANGED REDUCER |
| | FLANGED TEE |
| | ULTRASONIC FLOW METER |
| | MECHANICAL JOINT FITTING |
| | PIPE CONTINUATION-DOUBLE PIPE |
| | PIPE CONTINUATION-SINGLE PIPE |
| | BREAKLINE |
| | PIPE SUPPORT |
| | PIPE SUPPORT (FLANGE) |
| | PLUG VALVE |
| | REMOVALS |
| | REMOVALS KEYNOTE |
| | PAVEMENT |
| | SURVEY BENCHMARK |



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| | | | | | | | | | REVISIONS / SUBMISSIONS |
| | | | | | | | | | NO. |

LAKE HAVASU CITY
PUBLIC WORKS DEPARTMENT
PARK AVENUE LIFT STATION
RENOVATION

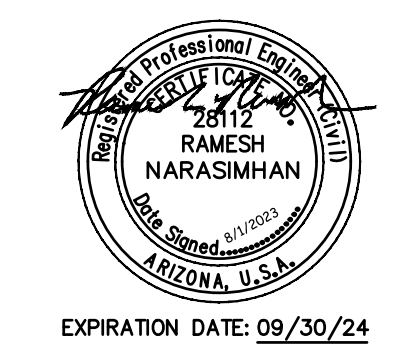
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GENERAL NOTES,
LEGENDS AND
ABBREVIATIONS



Sheet Number:

G-02
Sheet 2 of 19

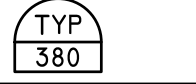


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CONSTRUCTION DRAWINGS

REMOVAL AND RECONSTRUCTION NOTES

| DESCRIPTION | |
|-------------|--|
| 1 | ABANDON EXISTING FM IN PLACE AND PLUG OPEN END WITH SINGLE SACK SLURRY |
| 2 | SAWCUT, REMOVE & REPLACE CONCRETE/PAVEMENT |
| 3 | CUT AND DISCONNECT THE EXISTING FORCE MAIN AND CONNECT NEW FORCE MAIN |

| CONSTRUCTION NOTES | |
|--------------------|---|
| DESCRIPTION | |
| 1 | 45° DIP MJ ELBOW |
| 2 | ENCASE EXISTING WATERLINE PER GENERAL UTILITIES NOTE 9, SHEET G-02 |
| 3 | FIELD VERIFY EXISTING INVERT ELEVATION AS NEED TO MATCH |
| 4 | THRUST BLOCK PER MAG DETAIL  |

| GENERAL NOTES | |
|---------------|--|
| 1 | TRENCH FORCE MAIN PER DETAIL 1, SEE SHEET C-03 |

| HORIZONTAL CONTROL POINTS | | |
|---------------------------|----------|----------|
| | NORTHING | EASTING |
| 1 | 45156.47 | 44712.62 |
| 2 | 45152.03 | 44757.05 |
| 3 | 45078.89 | 44844.27 |
| 4 | 45151.36 | 44796.15 |
| 5 | 45088.12 | 45032.77 |
| 6 | 45077.80 | 45034.74 |



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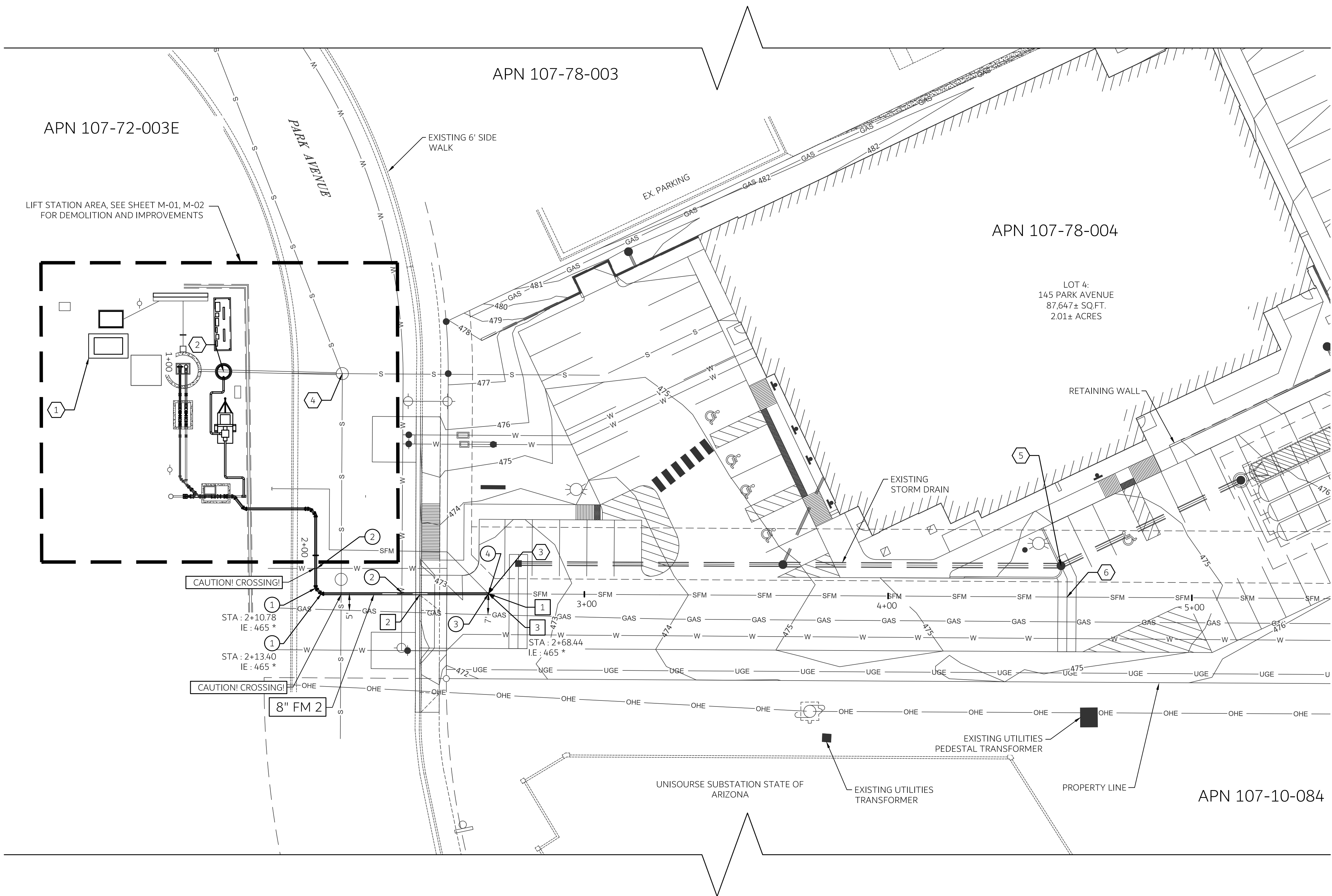
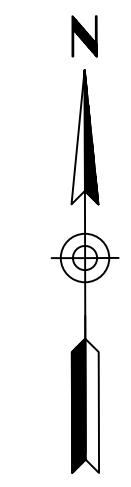
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PARK AVENUE LIFT STATION
RENOVATION

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 Drawn by: HN
 Checked by: RN
 Date: 08-01-2023
 Dwg scale: 1"=30'

SITE PLAN & FORCEMAIN ALIGNMENT 1

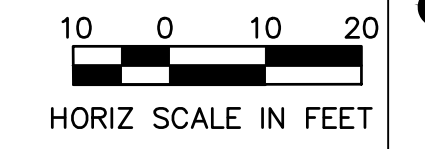


Sheet Number:
 C-01
 Sheet 3 of 19



STA : 5+45.60 SEE SHEET C-02 FOR CONTINUATION

SITE PLAN & FORCEMAIN ALIGNMENT STA: 1+00 TO STA: 5+45.60
 SCALE: 1"=20'-0"



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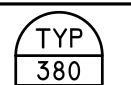
CONSTRUCTION DRAWINGS



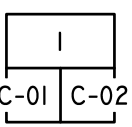
REMOVAL AND RECONSTRUCTION NOTES

| DESCRIPTION | |
|-------------|--|
| 1 | ABANDON EXISTING FM IN PLACE AND PLUG OPEN END WITH SINGLE SACK SLURRY |
| 2 | SAWCUT, REMOVE & REPLACE CONCRETE/PAVEMENT |
| 3 | CUT AND DISCONNECT THE EXISTING FORCE MAIN AND CONNECT NEW FORCE MAIN |
| 4 | RECONSTRUCT RECEIVING MANHOLE (DW-1112) PER DETAIL 3 SHEET C-03 |

CONSTRUCTION NOTES

| DESCRIPTION | |
|-------------|---|
| 3 | FIELD VERIFY EXISTING INVERT ELEVATION AS NEED TO MATCH |
| 4 | THRUST BLOCK PER MAG DETAIL  |
| 5 | 11.25° DIP MJ ELBOW |

GENERAL NOTES

| | |
|---|--|
| 1 | TRENCH FORCE MAIN PER DETAIL 1  |
|---|--|

HORIZONTAL CONTROL POINTS

| | NORTHING | EASTING |
|---|----------|----------|
| 7 | 45077.45 | 45154.41 |
| 8 | 45077.12 | 45294.80 |

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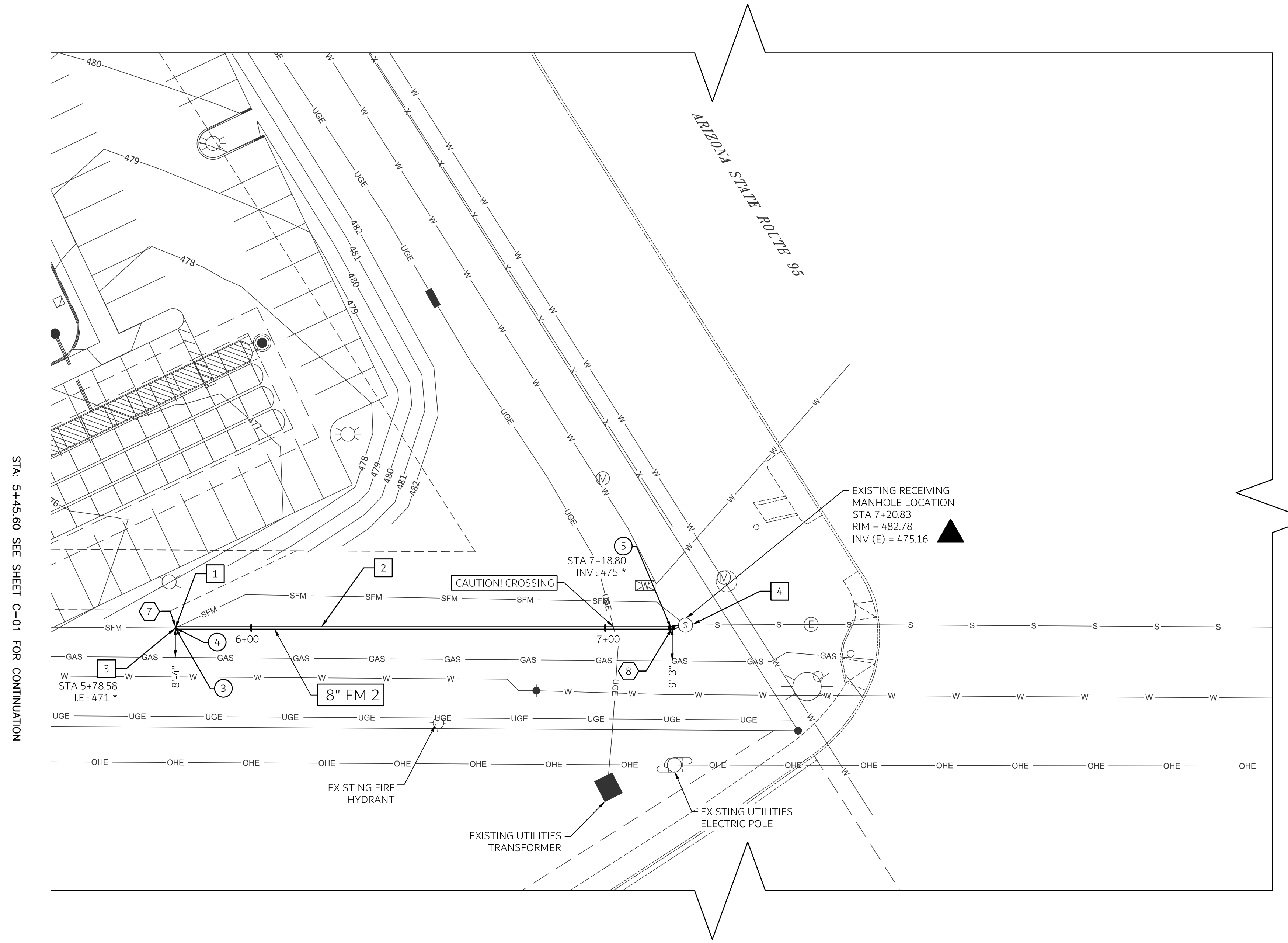
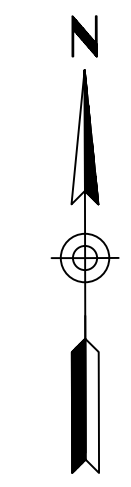
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SITE PLAN & FORCEMAIN ALIGNMENT 2

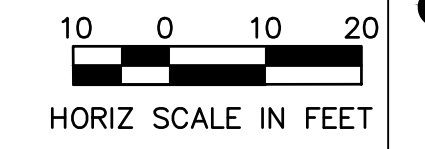
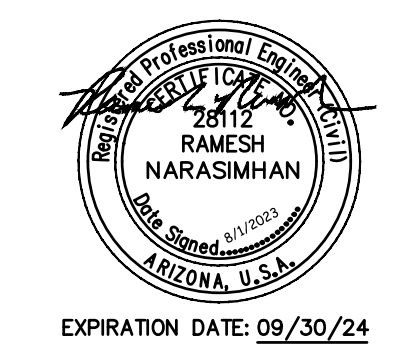


Sheet Number:
 C-02
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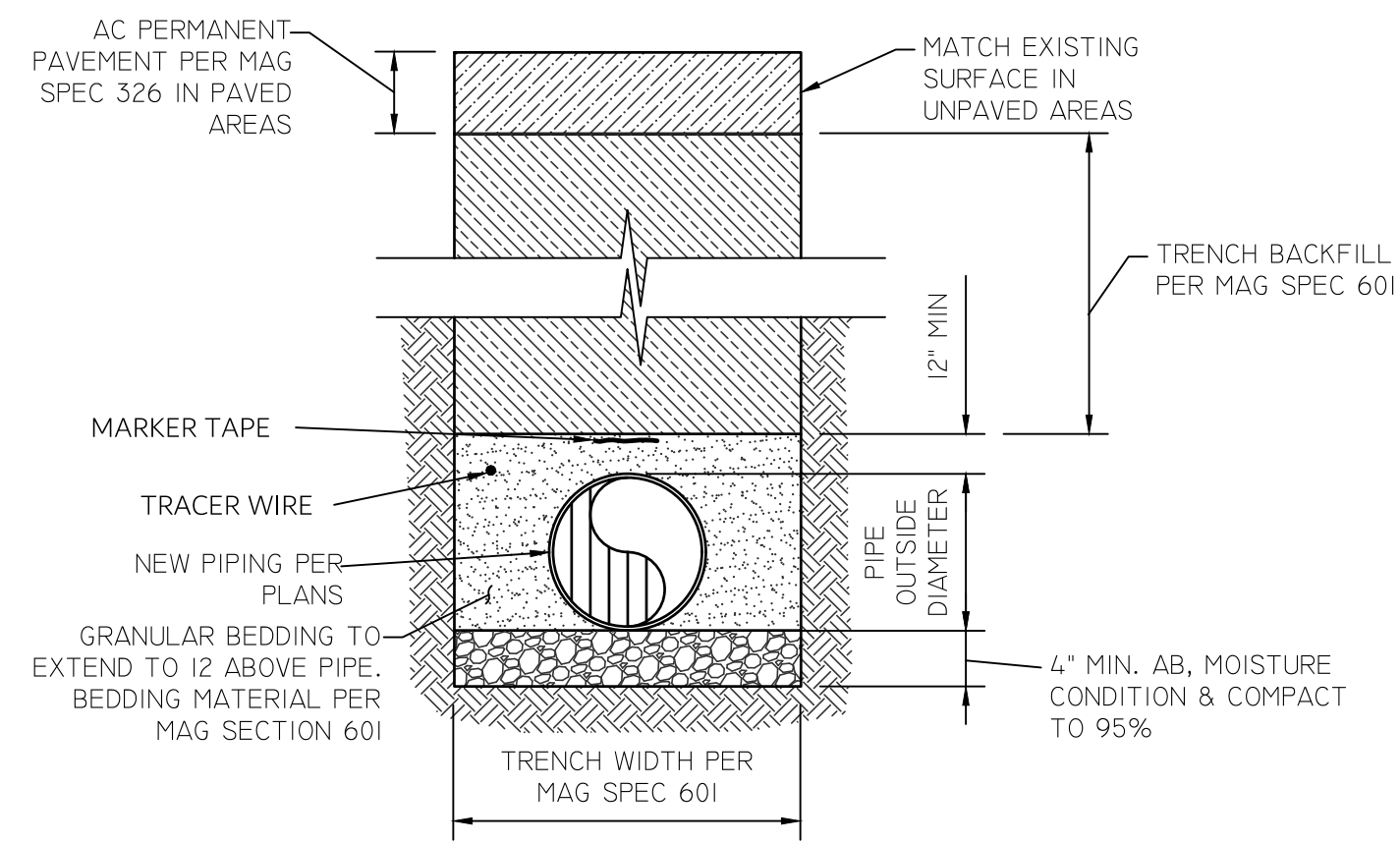
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SITE PLAN & FORCEMAIN ALIGNMENT STA: 5+45.60 TO STA: 7+24.00
 SCALE: 1"=20'-0"



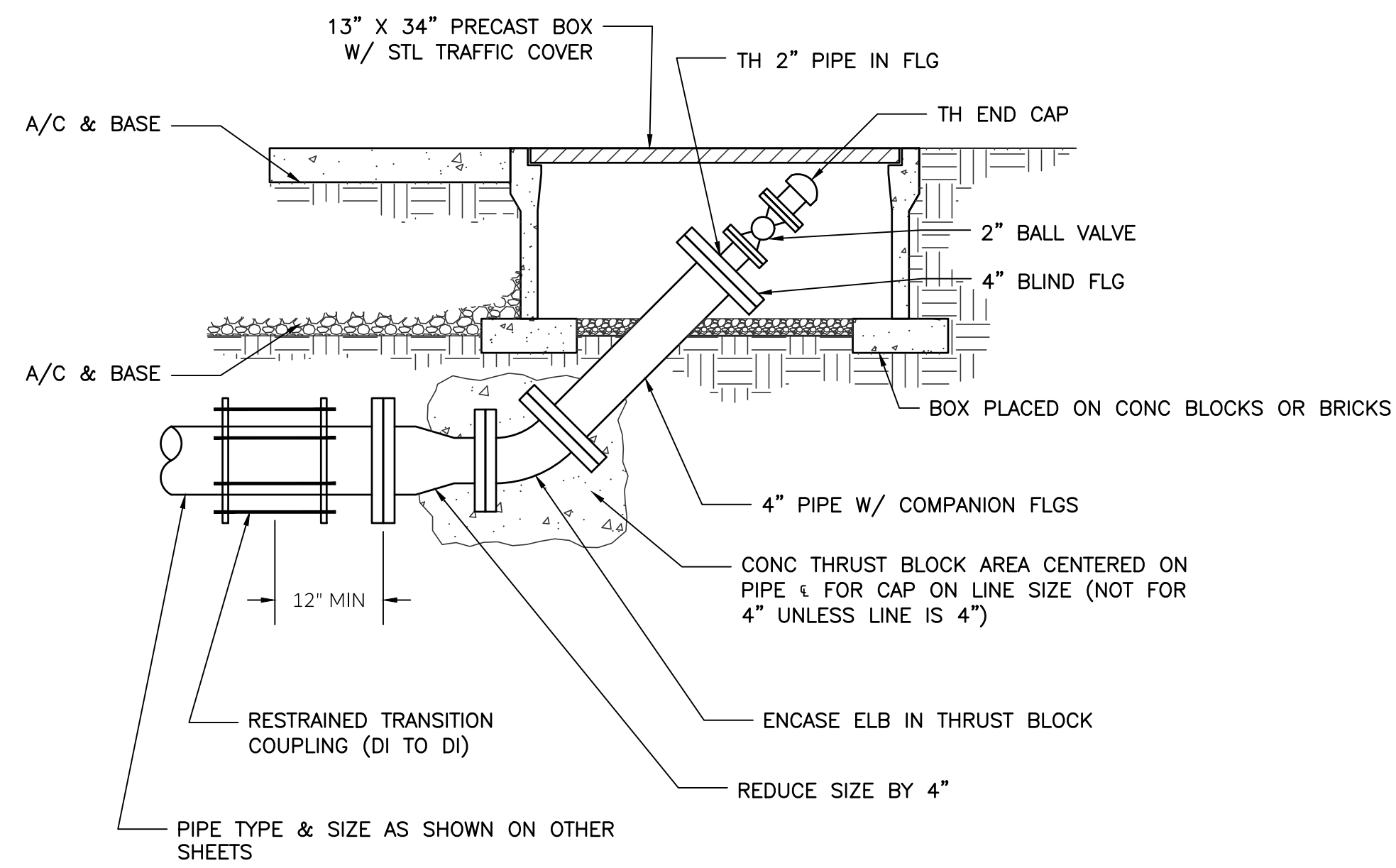
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CONSTRUCTION DRAWINGS



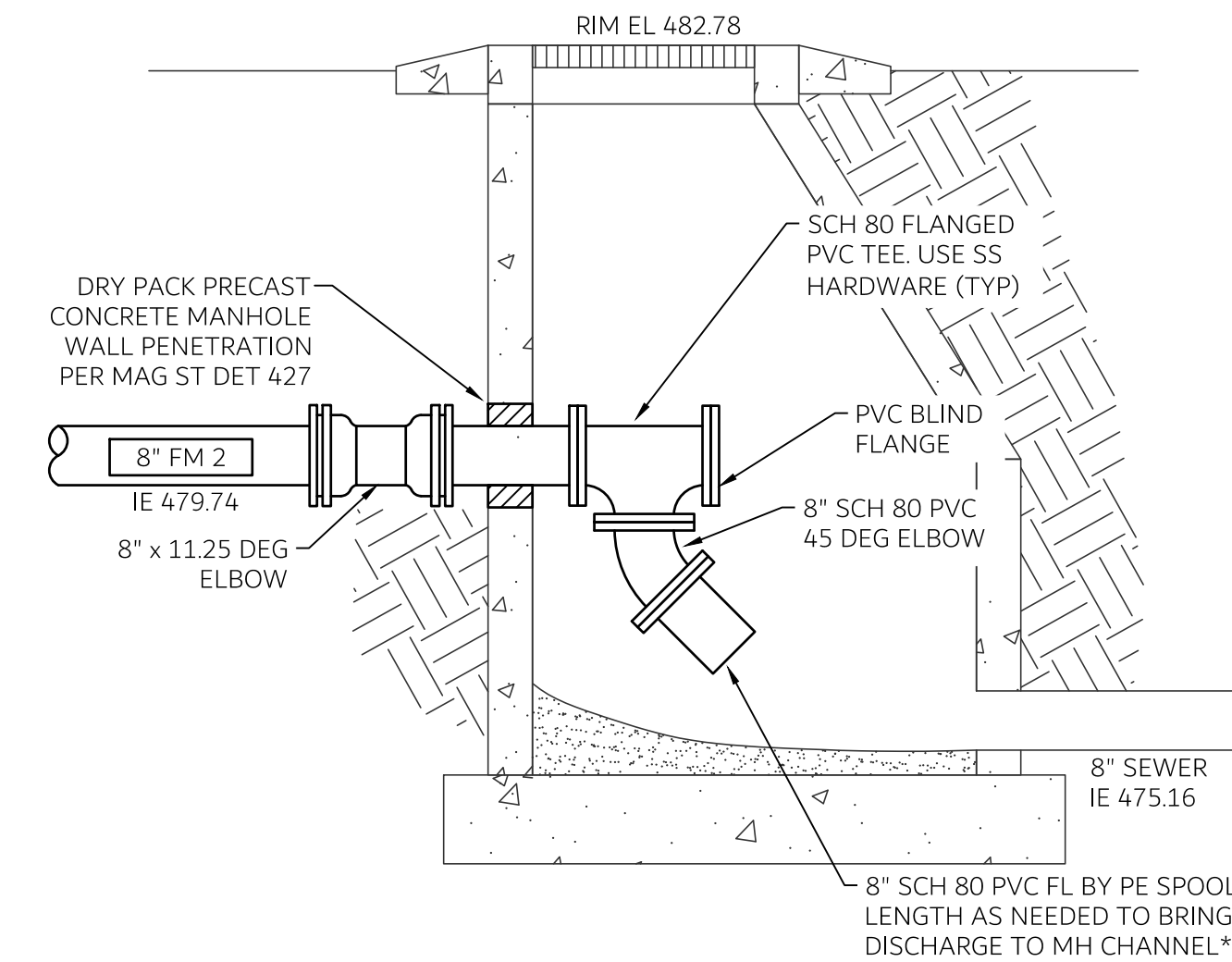
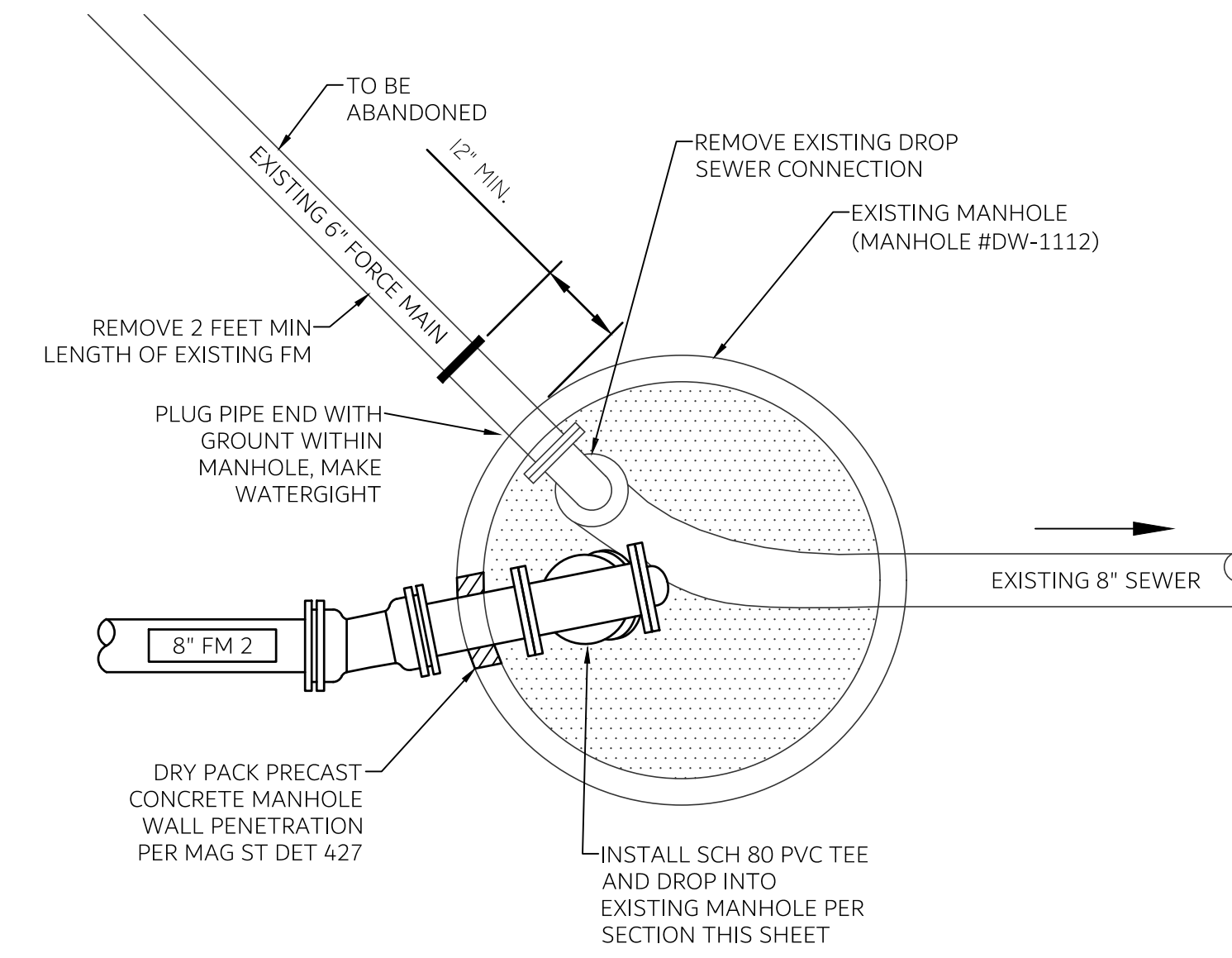
TYPICAL TRENCH
SCALE: NTS

1
C-01 | C-02



PRESSURE CLEANOUT
SCALE: NTS

2
C-01 | C-03



MANHOLE DW-112 RECONSTRUCTION DETAIL
SCALE: NTS

3
C-01 | C-01



| NO. | REVISIONS / SUBMISSIONS | DATE |
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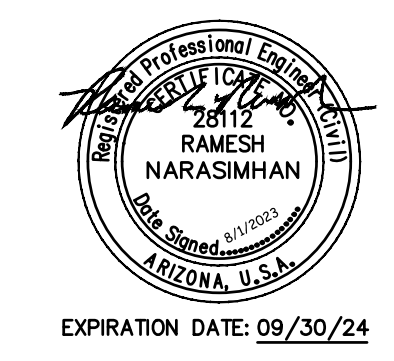
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CIVIL DETAILS



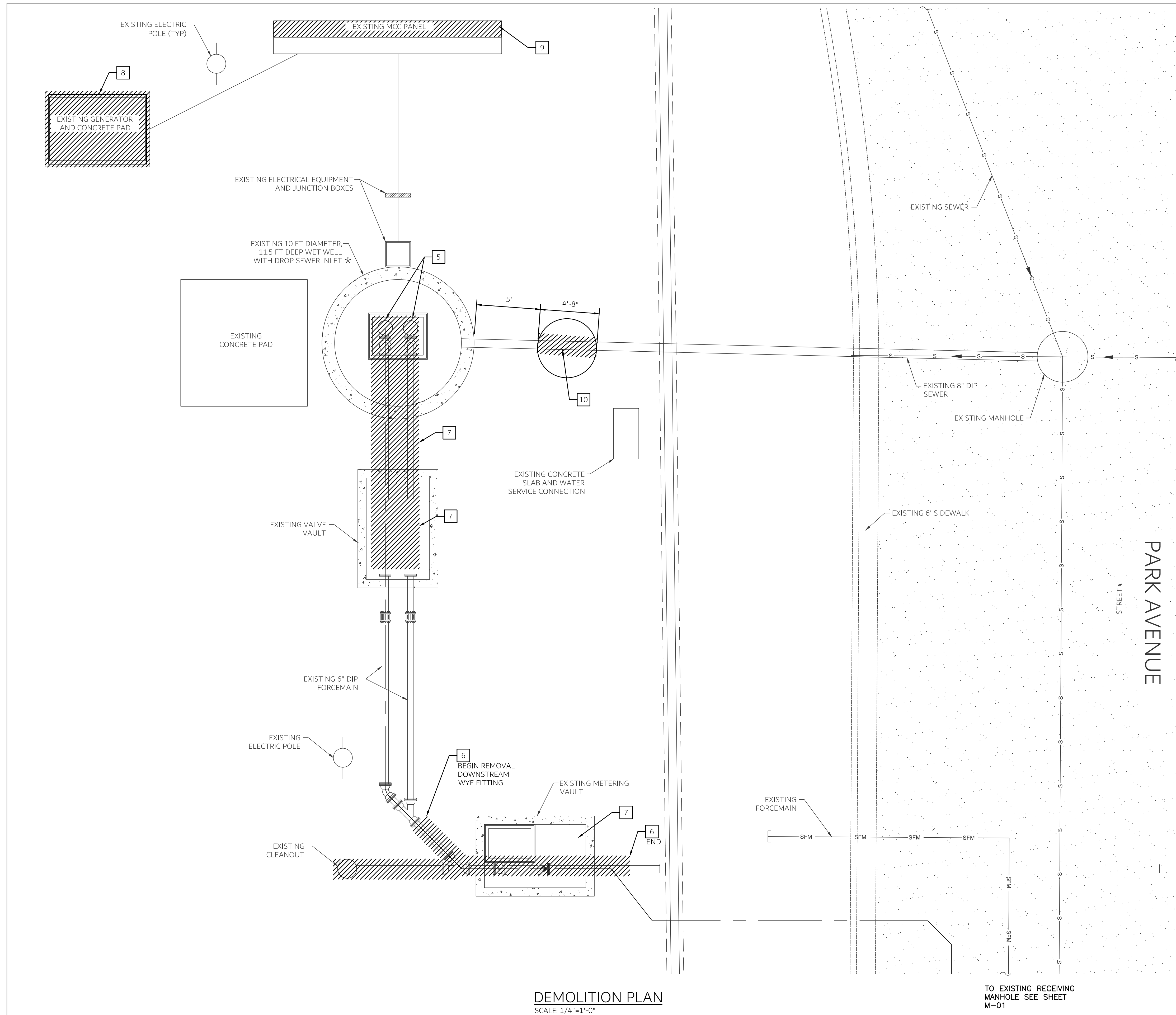
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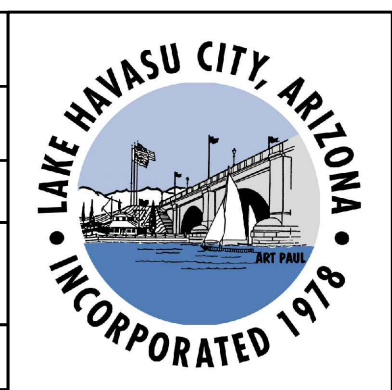
CONSTRUCTION DRAWINGS



REMOVAL AND RECONSTRUCTION NOTES

| Description |
|---|
| 5 REMOVE EXISTING PUMPS PIPING AND VALVES |
| 6 DEMOLISH THE EXISTING FM AFTER THE NEW FM IS INSTALLED AND CONNECTION TO EXISTING FM IS ESTABLISHED. ABANDON REMAINING EXISTING FORCEMAIN |
| 7 REMOVE EXISTING PIPING, VALVES AND EQUIPMENT |
| 8 REMOVE EXISTING GENERATOR |
| 9 REMOVE MCC PANEL |
| 10 CUT AND REMOVE EXISTING FORCE MAIN AFTER CONSTRUCTION OF MANHOLE, SEE SHEET M-02 |

GENERAL NOTES:
 1. ALL FREE STANDING ENCLOSURES SHALL SIT ON A 4" HOUSEKEEPING PAD, SEE SHEET M-04 DETAIL



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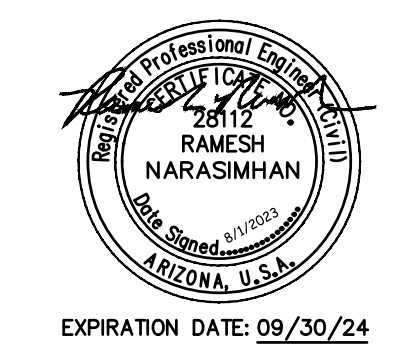
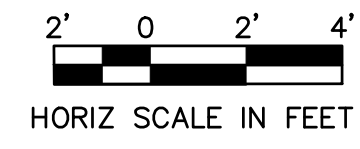
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PARK AVENUE LIFT STATION
RENOVATION

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LIFT STATION
DEMOLITION PLAN



Sheet Number:
 M-01
 Sheet 6 of 19

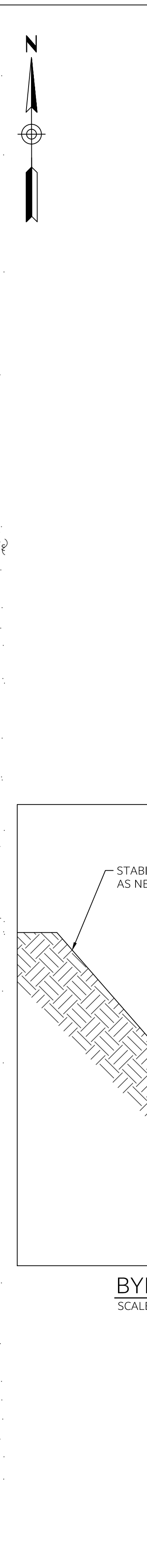
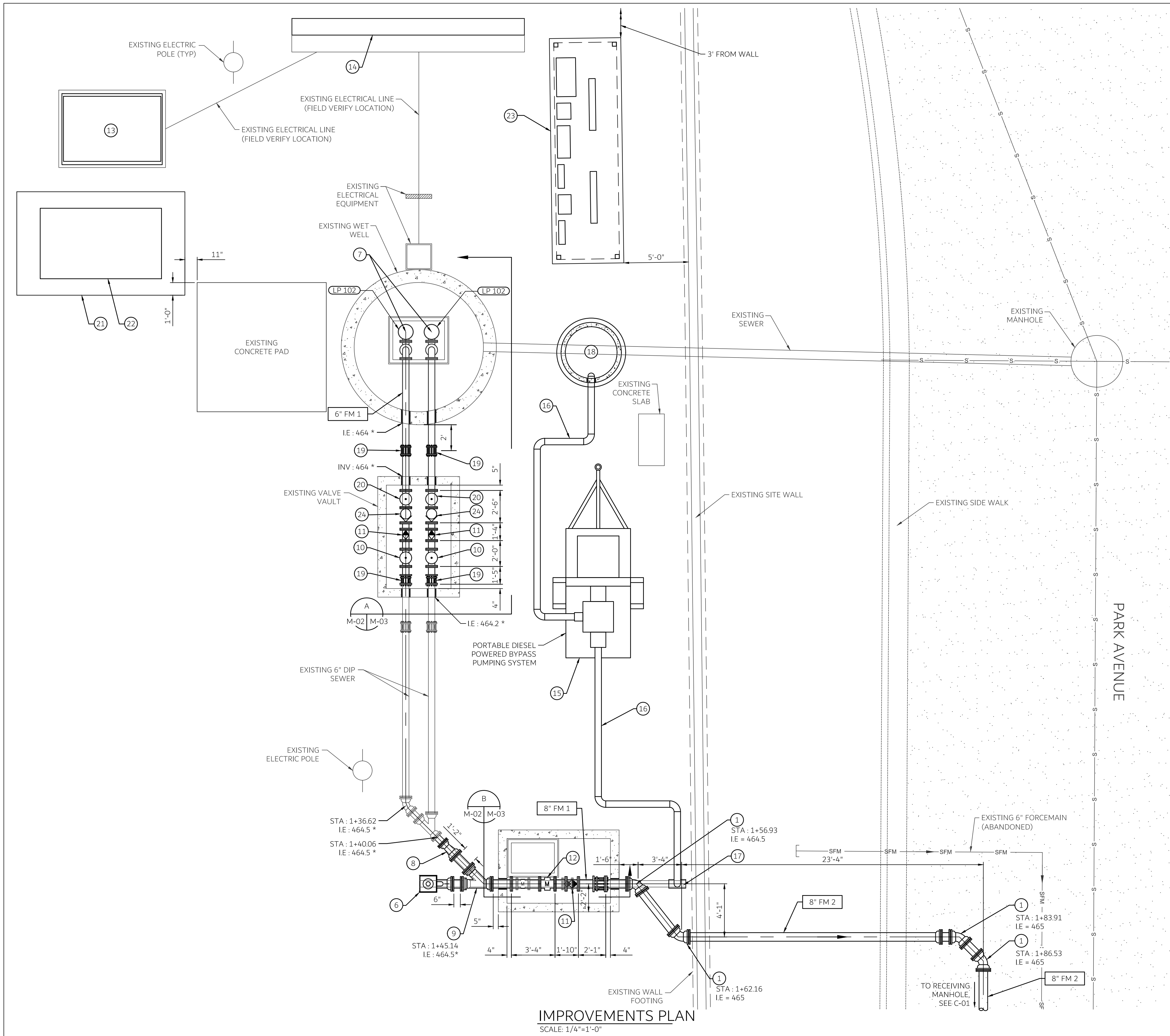


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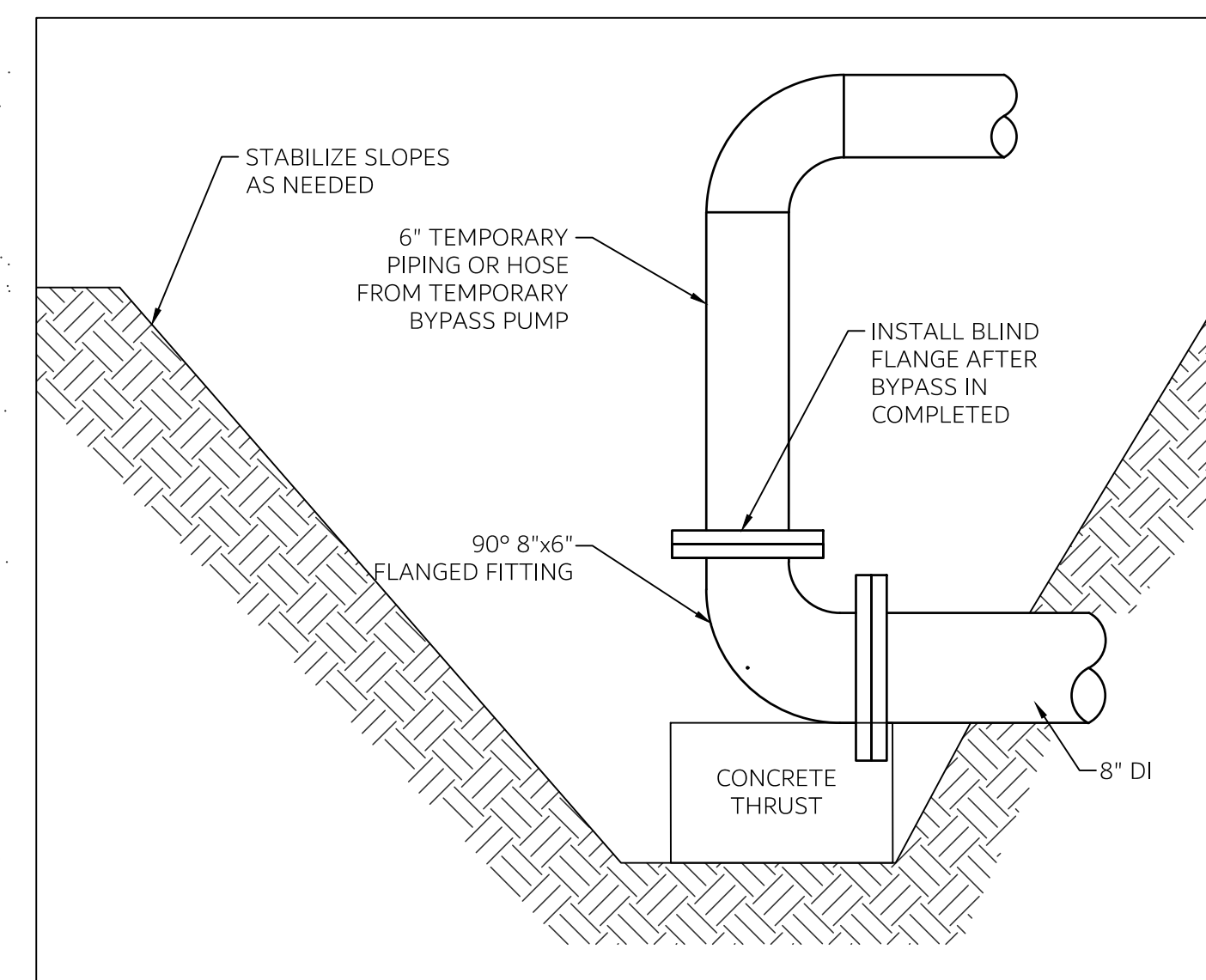
DEMOLITION PLAN
 SCALE: 1/4"=1'-0"

TO EXISTING RECEIVING
 MANHOLE SEE SHEET
 M-01

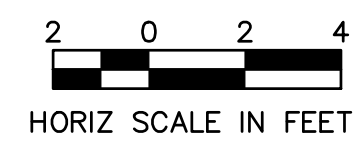
CONSTRUCTION DRAWINGS




| CONSTRUCTION NOTES | |
|--------------------|--|
| Description | |
| 1 | 45° DIP MJ ELBOW |
| 6 | PRESSURE CLEANOUT PER DETAIL 1 SHEET C-03 |
| 7 | 10 HP, 400 GPM SUBMERSIBLE PUMP, SEE SPECIFICATIONS |
| 8 | 8"x6" DIP MJ REDUCER |
| 9 | DIP MJ WYE |
| 10 | PRESSURE INDICATOR WITH BALL VALVE, THREADED CONNECTION INTO BLIND FLANGE |
| 11 | 6" FLANGED PLUG VALVE |
| 12 | ROSEMOUNT FLOW METER |
| 13 | GENERATOR ON EXISTING GENERATOR PAD, SEE ELECTRICAL DRAWINGS |
| 14 | MCC PANEL IMPROVEMENTS, SEE ELECTRICAL DRAWINGS |
| 15 | BY-PASS PUMP SYSTEM: PROVIDE MOBILE PUMP WITH HOSE AND CONNECTION NECESSARY TO PERFORM CONTINUED PUMPING AS REQUIRED TO CONSTRUCT ALL PIPING AND VALVING MODIFICATIONS. THE PUMP SHALL BE A MINIMUM OF 500 GPM AT 100 FEET OF HEAD AND CAPABLE OF HANDLING RAW SEWAGE. |
| 16 | TEMPORARY 6" HDPE PUMP AROUND DURING DEMO AND NEW CONSTRUCTION. PLUG EXISTING CONNECTION TO WET WELL DURING USE OF BY-PASS PUMP SYSTEM |
| 17 | BYPASS CONNECTION LOCATION, SEE DETAIL THIS SHEET |
| 18 | 4'-0" DIAMETER MANHOLE PER MAG STANDARD DETAIL 420-1. MATCH MANHOLE BASE TO EXISTING INVERT ELEVATION OF FORCE MAIN. CORE DRILL MANHOLE FOR TEMPORARY BY-PASS PIPING |
| 19 | DISMANTLING JOINT |
| 20 | AIR RELEASE THREAD CONNECTION INTO BLIND FLANGE |
| 21 | 13'-0" x 8'-0" CONCRETE PAD FOR NEW GENERATOR. SEE DETAIL |
| 22 | GENERATOR. SEE ELECTRICAL DRAWINGS |
| 23 | 17'-6" x 5'-6" CONCRETE PAD FOR ELECTRICAL CONTROL PANELS PER DETAIL 2 SHEET M-04 |
| 24 | CHECK VALVE |



BYPASS PUMP CONNECTION DETAIL
SCALE: NTS



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IMPROVEMENTS PLAN



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SHEET NUMBER:

M-02
Sheet 7 of 19

CONSTRUCTION DRAWINGS

CONSTRUCTION NOTES

| Description | |
|-------------|---|
| 7 | 10 HP, 400 GMP SUBMERSIBLE PUMP, SEE SPECIFICATIONS |
| 12 | ROSEMOUNT FLOW METER |
| 19 | DISMANTLING JOINT |
| 25 | PIPE SUPPORT DETAIL 1, SEE SHEET M-04 |
| 26 | AIR RELEASE VALVE |
| 27 | PRESSURE GAUGE |
| 28 | TEE |
| 29 | 6"x4" DUCTILE IRON REDUCER (VERIFY WITH PUMP MFR) |
| 30 | LINK SEAL PER DETAIL 2, SEE SHEET M-02 |
| 31 | 90° ELBOW |
| 32 | FULL PORT SOLIDS HANDLING BALL CHECK |
| 33 | RESTRAINED FLANGE ADAPTER |
| 34 | PIPE SUPPORT BRACKET BY MFR |
| 35 | PLUG VALVE |

- GENERAL NOTES:
- ALL LIST STATION PIPING AND FITTINGS SHALL BE DIP WITH PROTECTO 401 COATING.
 - RECOAT ENTIRE MANHOLE WETWELL INCLUDING ALL SITES, FLOOR AND ROOF AS FOLLOWS:
 - SURFACE PREPARATION OF 5,000 PSI POWER WASH.
 - ABRASIVE LAST SURFACE TO MEET ICRI CSP 3-5 REQUIREMENTS.
 - RE-SURFACE WITH TNEC CERAMICO AS NEEDED.
 - SPRAY APPL 125 MILS OF EPOXYTEC CPP SPRAYLINER.
 - HIGH VOLTAGE SPARK TEST FOR QUALITY CONTROL OF COATING APPLICATION.
 - CONDUIT REMOVE AND RE-INSTALL EXISTING SS BRACKETS INSIDE WET WELL.
 - FACTORY ACCEPTANCE TEST OF NEW SOLIDS HANDLING SEWAGE PUMPS AND CONTRACTS:
 - PUMPS SHALL BE TESTED AT THE MANUFACTURER'S FACILITY PRIOR TO SHIPPING AND INSTALLATION ON SITE
 - PUMPS SHALL BE CERTIFIED BY ENGINEER PRIOR TO SHIPPING



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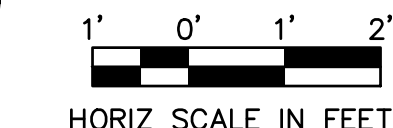
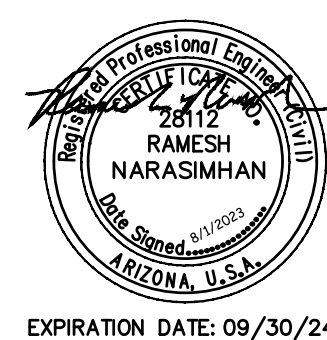
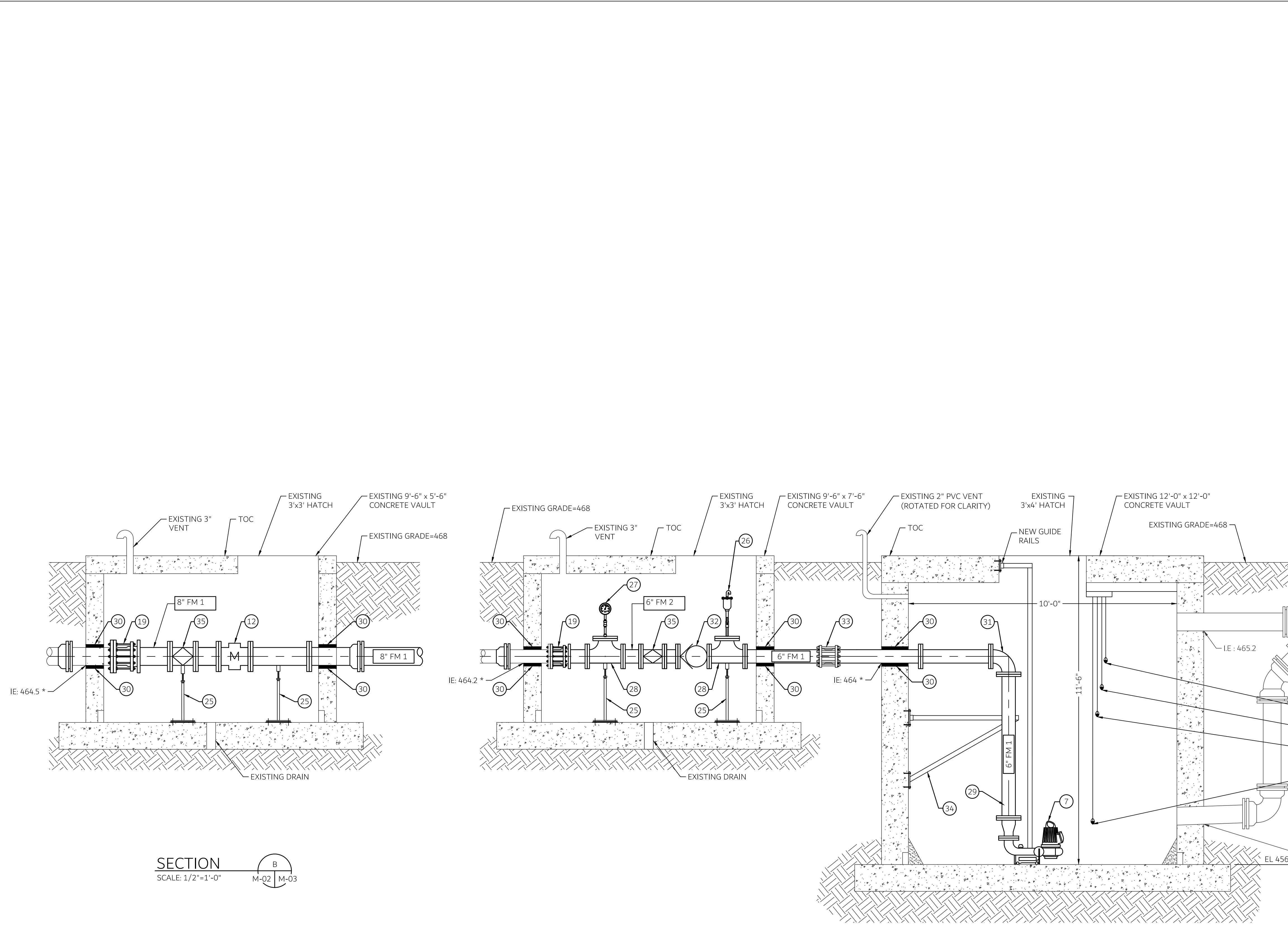
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MECHANICAL SECTIONS



Sheet Number:
 M-03
 Sheet 8 of 19



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CONSTRUCTION DRAWINGS



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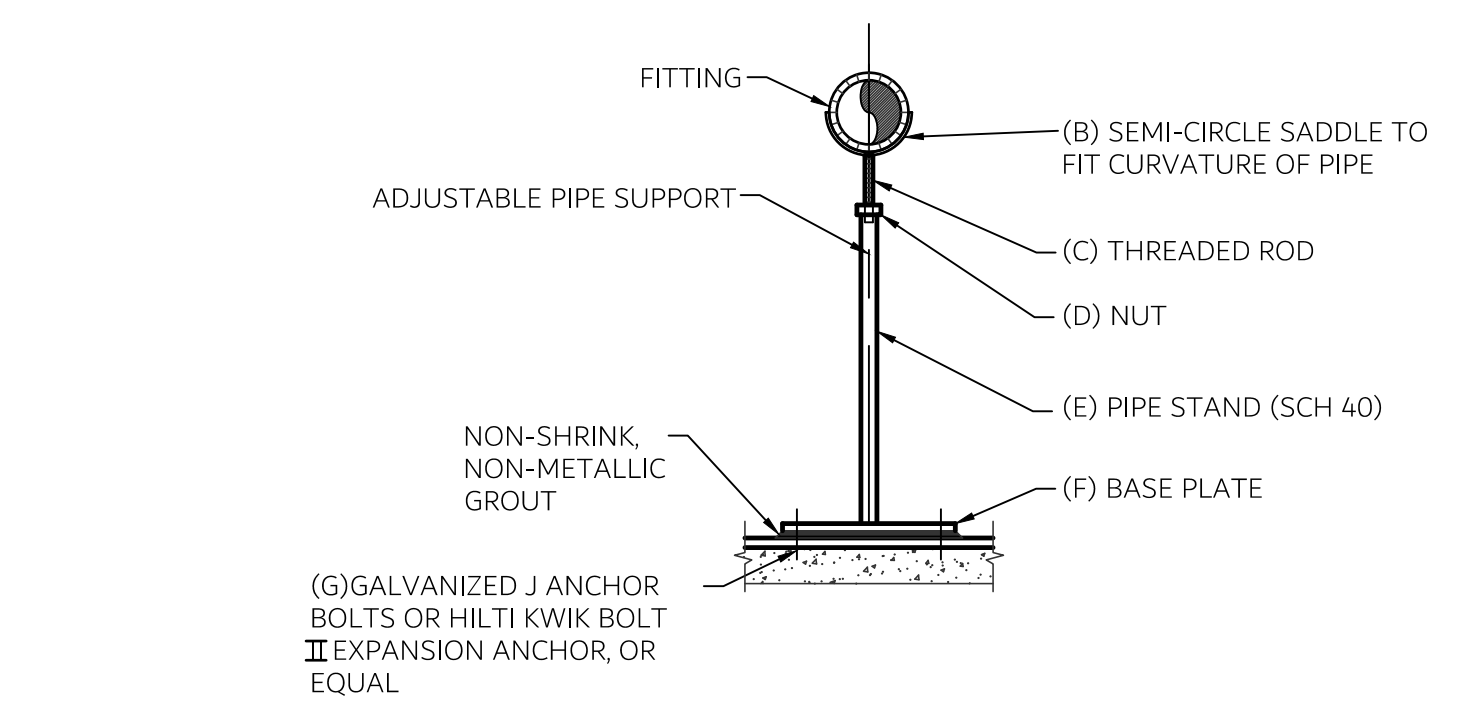
MECHANICAL DETAILS



Sheet Number:
 M-04
 Sheet 9 of 19

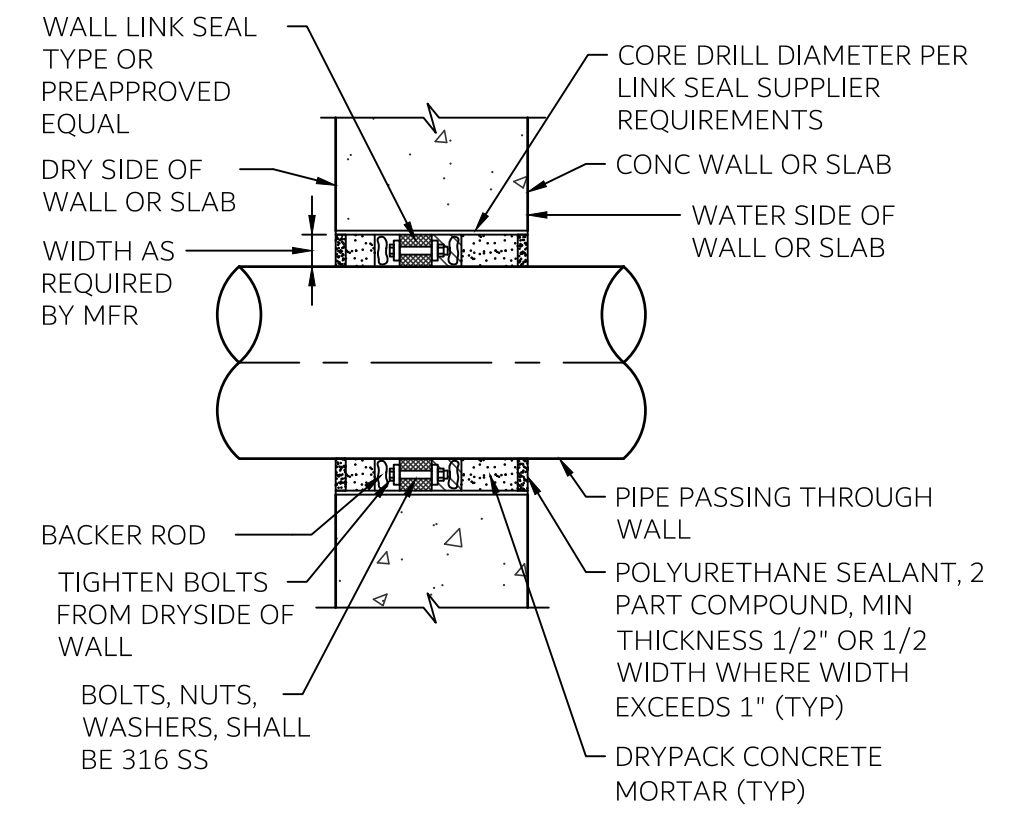
CONSTRUCTION DRAWINGS

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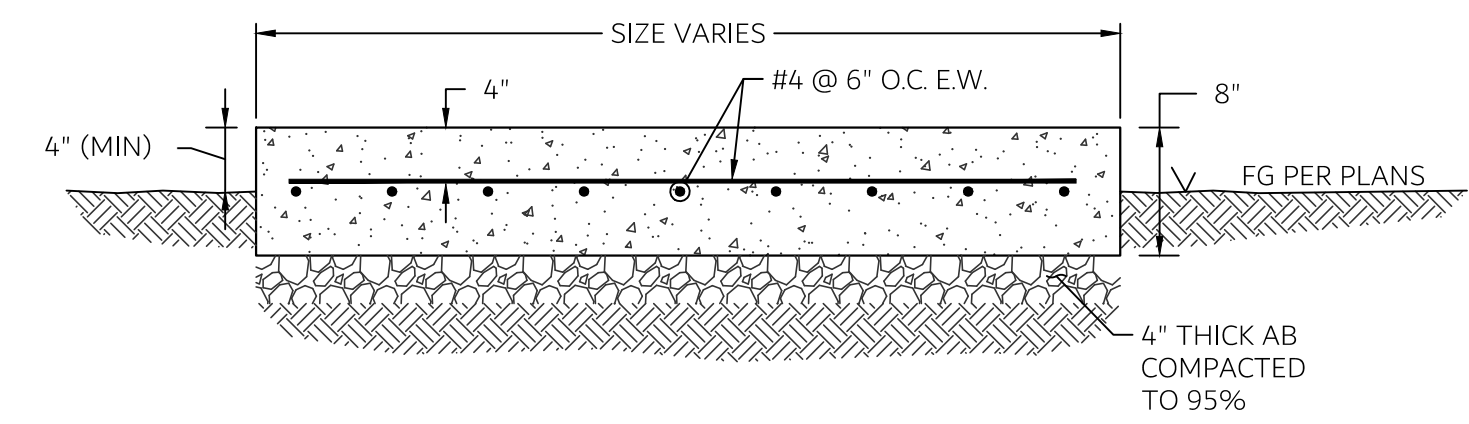


| PIPE SIZE | A | B | C, D | E | F | G |
|-----------|------|---------|--------|----------|--------------|------------|
| 2"-4" | 1/2" | 2"x1/4" | 1" | 1 1/2" Ø | 6"x6"x3/8" | 4-1/2" DIA |
| 6"-10" | 5/8" | 2"x1/4" | 1 1/2" | 2" Ø | 6"x6"x3/4" | 4-1/2" DIA |
| 12"-18" | 3/4" | 3"x3/8" | 2" | 3" Ø | 10"x10"x3/8" | 4-5/8" DIA |

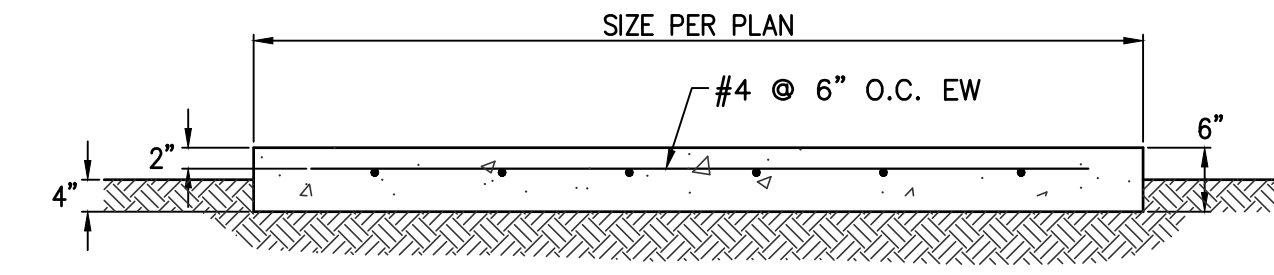
① PIPE SUPPORT DETAIL
 NOT TO SCALE



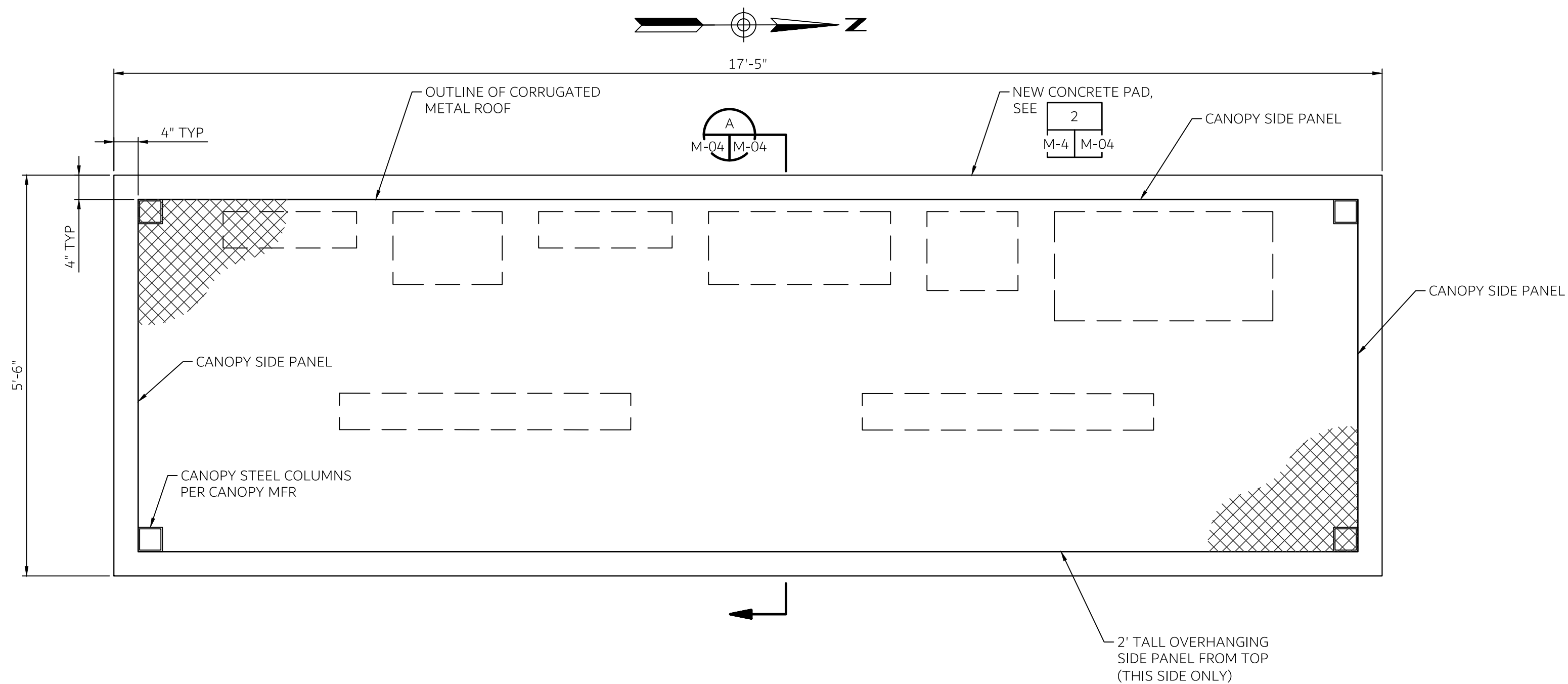
② LINK SEAL
 NOT TO SCALE



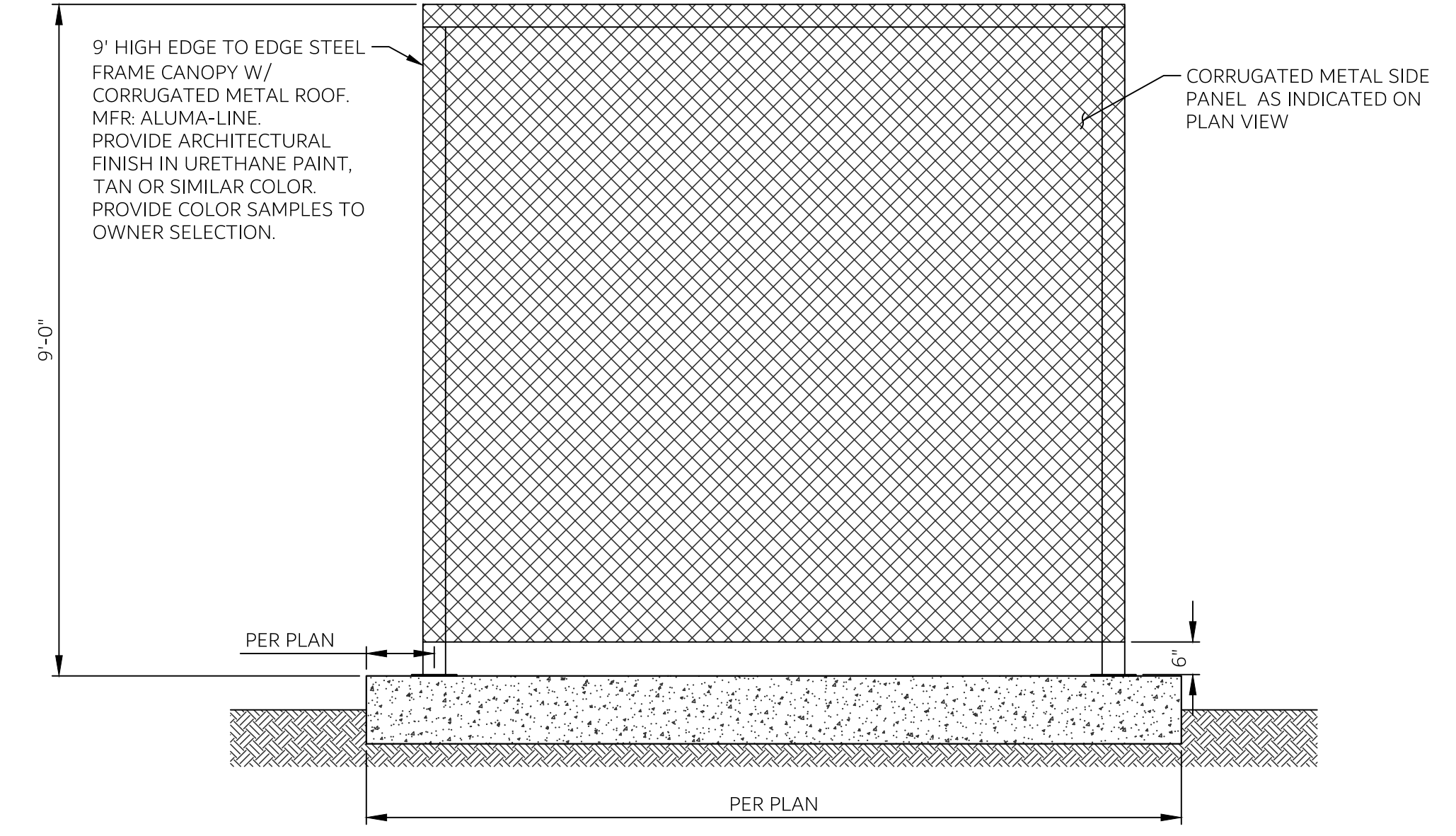
DETAIL 1
 SCALE: 1/2"=1'-0" M-04 M-04



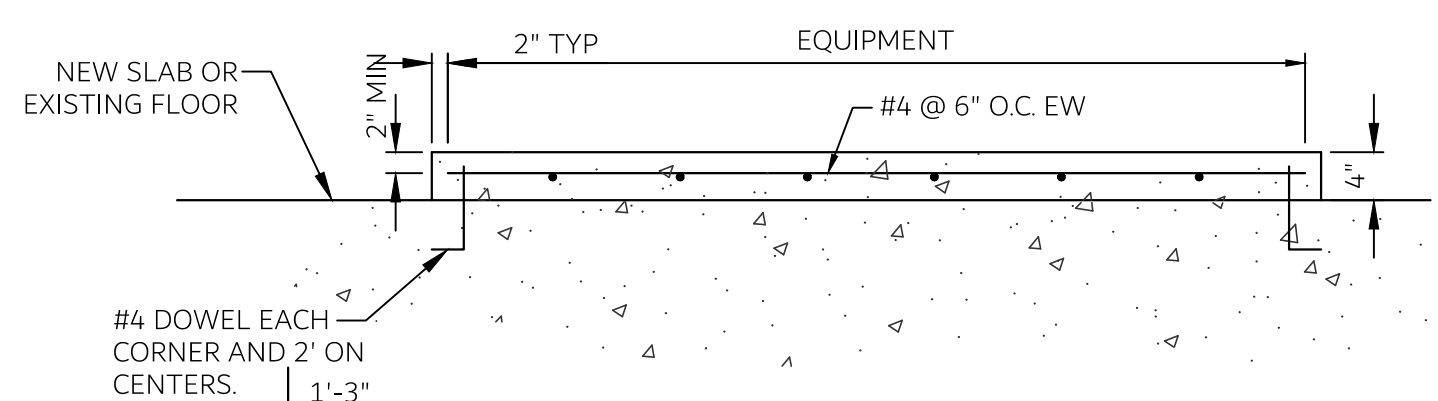
DETAIL 2
 SCALE: 1/2"=1'-0" M-04 M-04



SHADE CANOPY AND CONCRETE PAD PLAN
 SCALE: 3/4"=1'-0"

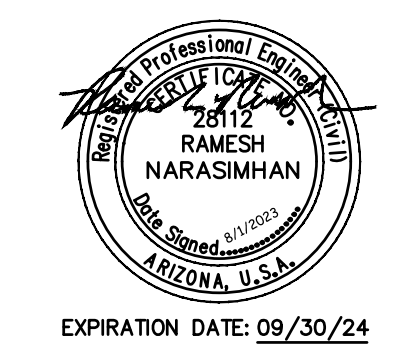


SECTION
 SCALE: 1/2"=1'-0" M-04 M-04



HOUSEKEEPING PAD
 SCALE: NTS

FOR NEW SLAB.
 FOR EXISTING FLOOR, EPOXY #4 REBAR 6" INTO EXISTING FLOOR AT EACH CORNER AND 2 FT ON CENTERS.



Contact Arizona 811 at least two full working days before you begin excavation



SCHEMATIC DIAGRAM SYMBOLS

| | | | |
|--|--|--|---|
| | CONTROL RELAY | | 2 POSITION SELECTOR SWITCH POSITION LEGEND: X=CLOSED O=OPEN |
| | TIME DELAY RELAY | | 3 POSITION SELECTOR SWITCH HAND - OFF - AUTO POSITION LEGEND: X=CLOSED O=OPEN |
| | ALARM RELAY | | NORMALLY CLOSED PUSH BUTTON |
| | ELAPSED TIME METER | | LOCKOUT STOP PUSH BUTTON |
| | MOTOR STARTER OR CONTACTOR COIL | | NORMALLY OPEN PUSH BUTTON |
| | PHOTO CELL | | EMERGENCY STOP PUSH BUTTON (MAINTAINED) |
| | BEACON ALARM LIGHT LETTER INDICATES COLOR R=RED, A=AMBER, B=BLUE, G=GREEN | | DISCONNECT SWITCH SHOWN WITH RATING AND NUMBER OF POLES |
| | PILOT LIGHT LETTER INDICATES COLOR R=RED, A=AMBER, B=BLUE, G=GREEN | | LIMIT OR POSITION SWITCH |
| | OUTPUT DV/DT FILTER | | PRESSURE SWITCH HIGH |
| | HEATING ELEMENT | | PRESSURE SWITCH LOW |

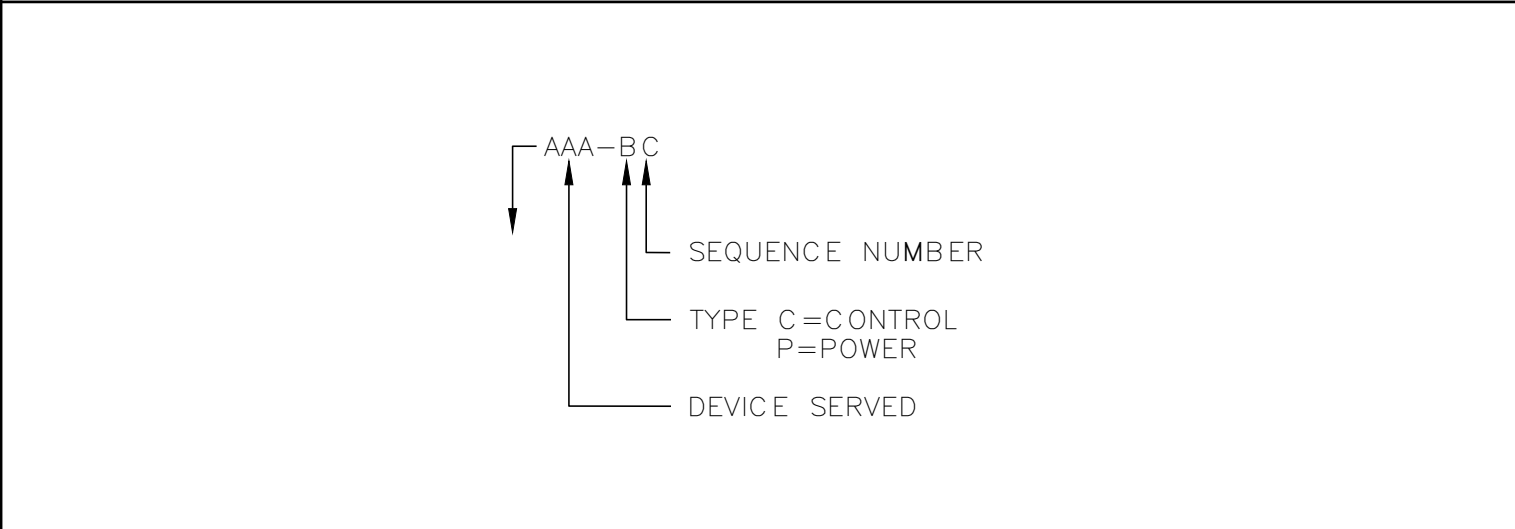
POWER SINGLE LINE DIAGRAM SYMBOLS

| | | | |
|--|--|--|--|
| | JUNCTION BOX WITH POWER DISTRIBUTION BLOCK OR LUGS | | CIRCUIT BREAKER, SHOWN WITH TRIP RATING AND NUMBER OF POLES |
| | CONDUIT SEALOFF | | MOTOR CIRCUIT PROTECTOR WITH TRIP RATING AND NUMBER OF POLES |
| | LTC CONNECTION | | DISCONNECT SWITCH SHOWN WITH RATING AND NUMBER OF POLES |
| | MC CONNECTION | | MOTOR MANAGEMENT RELAY |
| | BOND TO METALLIC WATER PIPE | | SURGE PROTECTIVE DEVICE |
| | UTILITY METER | | SOLID STATE STARTER |
| | MOTOR, NUMBER DESIGNATES NEMA HORSEPOWER SIZE | | VARIABLE FREQUENCY DRIVE |
| | FUSE | | HARMONIC FILTER |
| | FUSEHOLDER OR FUSEBLOCK | | ELECTRONIC OVERLOAD RELAY |
| | GENERATOR | | GROUND CONNECTION |
| | | | TRANSFORMER |
| | | | CONTACTOR |

SITE PLAN SYMBOLS

| | | | |
|--|--------------------------------------|--|----------------------|
| | TELEPHONE OUTLET | | FIELD DEVICE |
| | SINGLE POLE SWITCH | | GROUND ROD |
| | 3 WAY SWITCH | | DUPLEX RECEPTACLE |
| | 4-WAY SWITCH | | ANTENNA MAST |
| | MANUAL MOTOR STARTER | | CONDUIT SEALOFF |
| | SPECIAL PURPOSE OR WELDING OUTLET | | DISCONNECT SWITCH |
| | SMOKE DETECTOR | | MOTOR |
| | THERMOSTAT | | CONDUIT TURN UP |
| | | | CONDUIT TURN DOWN |

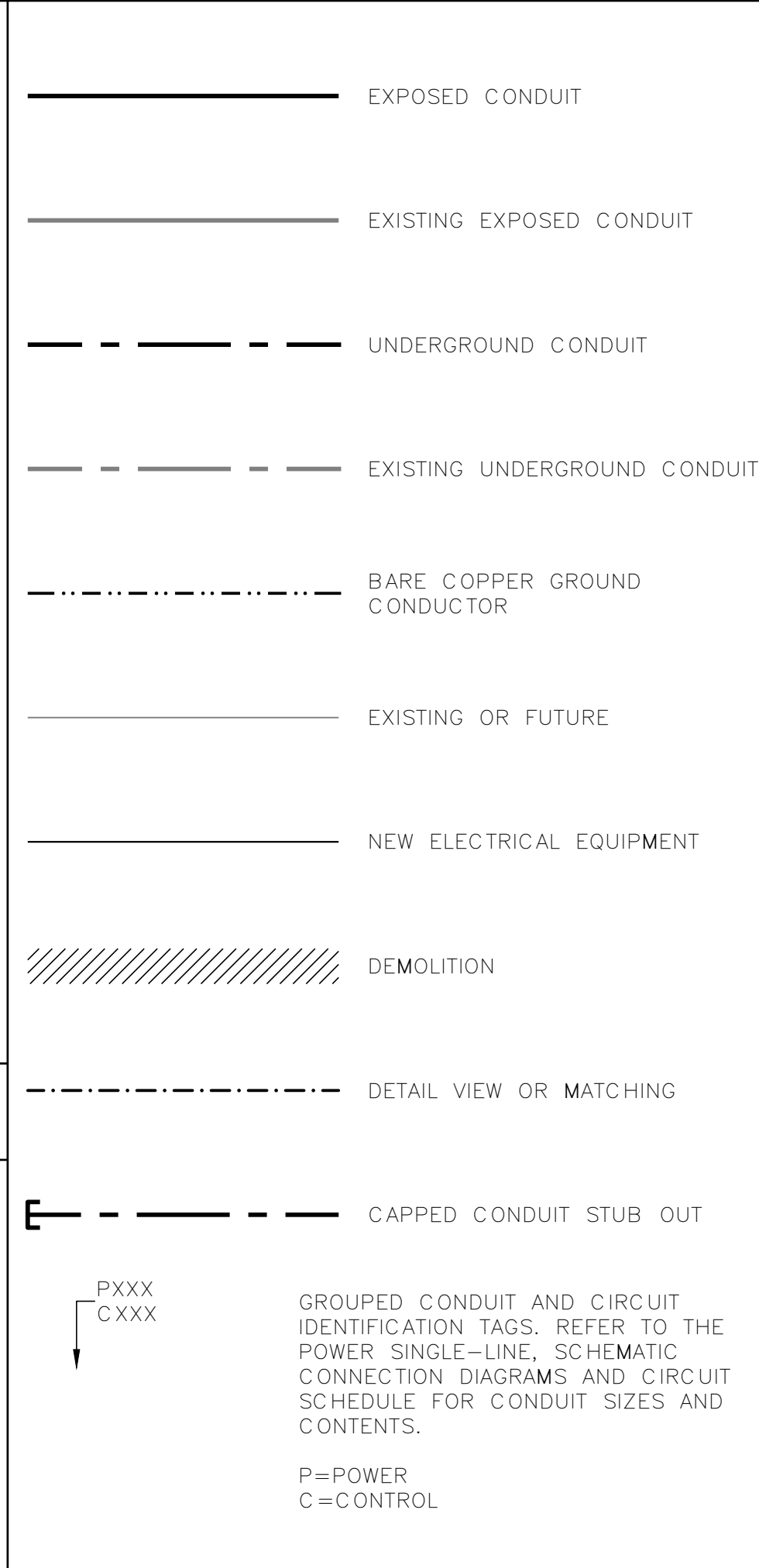
CIRCUIT SCHEDULE LEGEND



ELECTRICAL ABBREVIATIONS

| | | | | | |
|-------|----------------------------------|-------------|-----------------------------------|------|------------------------------------|
| A | AMPERE | L, LO | LOW | PO | PULSE OUTPUT |
| AFD | ADJUSTABLE FREQUENCY DRIVE | LAN | LOCAL AREA NETWORK | PPB | POWER PULLBOX |
| AFG | ABOVE FINISHED FLOOR | LC | LOOP CONTROLLER | PPG | POUNDS PER GALLON |
| AI | ANALOG INPUT | LCL | LEVEL CONTROL LOW | PPH | POUNDS PER HOUR |
| AIC | AMPS INTERRUPTING CAPACITY | LCP | LOCAL CONTROL PANEL | PPM | PARTS PER MILLION |
| AO | ANALOG OUTPUT | LOS | LOCK-OUT-STOP | PR | PAIR |
| AS | AIR SUPPLY | LOR | LOCAL/OFF/REMOTE | PRES | PRESSURE |
| ATS | AUTOMATIC TRANSFER SWITCH | LS | LEVEL (i.e., FLOAT) SWITCH | PS | PRESSURE SWITCH |
| B | BYPASS CONTACTOR | LTC | LIQUDTIGHT FLEXIBLE METAL CONDUIT | PSH | PRESSURE SWITCH, HIGH |
| CB | CIRCUIT BREAKER | M | MOTOR | PSI | POUNDS PER SQUARE INCH |
| CCW | COUNTER CLOCKWISE | MA | MANUAL/AUTO | PV | PROCESS VARIABLE |
| CL2 | CHLORINE | MA | MILLIAMPERE | RAS | RETURN ACTIVATED SLUDGE |
| CON | CONTACTOR | MAX | MAXIMUM | RW | RAW WATER |
| CPB | CONTROL PULLBOX | MC | MANUFACTURER'S CABLE | RF | RADIO FREQUENCY |
| CU | COPPER, BARE | MCB | MAIN CIRCUIT BREAKER | RIO | REMOTE INPUT OUTPUT |
| CW | CLOCKWISE | MCC | MOTOR CONTROL CENTER | RS | RAW SEWAGE |
| DCS | DISTRIBUTED CONTROL SYSTEM | MCP | MOTOR CIRCUIT PROTECTOR | RSP | RAW SEWAGE PUMP |
| DI | DISCRETE INPUT | MFR(S) | MANUFACTURER(S) | RST | RESET |
| DO | DISCRETE OUTPUT | MGD | MILLION GALLONS PER DAY | RTD | RESISTANCE TEMPERATURE DETECTOR |
| DP | DISTRIBUTION PANEL | MGL | MILLIGRAMS PER LITER | RTU | REMOTE TELEMETRY UNIT |
| DV/DT | DIFFERENTIAL VOLTAGE/TIME | MH | MANHOLE | RWT | REFLECTED WAVE TRAP |
| ETM | ELAPSED TIME METER | MIN | MINIMUM | SCA | SHORT CIRCUIT AMPS |
| EOL | ELECTRONIC OVERLOAD | MOV | MOTOR OPERATED VALVE | SCCR | SHORT CIRCUIT CURRENT RATING |
| EXIST | EXISTING | MMR | MOTOR MANAGEMENT RELAY | SEQ | SERVICE ENTRANCE EQUIPMENT |
| FA | FOUL AIR | MTU | MASTER TELEMETRY UNIT | SFI | SERVICE ENTRANCE SECTION |
| FC | FAIL CLOSED | NEC | NATIONAL ELECTRICAL CODE | SLC | SINGLE LOOP CONTROLLER |
| FE | FLOW ELEMENT | NECA | NATIONAL ELECTRICAL CONTRACTOR | SLOS | START-LOCK-OUT-STOP |
| FLA | FULL LOAD AMPS | ASSOCIATION | | SMC | SUBMERSIBLE MANUFACTURER CABLE |
| FS | FLOW SWITCH | N.C. | NORMALLY CLOSED | SMF | SINGLE MODE FIBER |
| FVNR | FULL VOLTAGE NON-REVERSING | N.O. | NORMALLY OPEN | SO2 | SULFUR DIOXIDE |
| FW | FINISHED WATER | NIC | NOT IN CONTRACT | SP | SET POINT |
| GFCI | GROUND FAULT CIRCUIT INTERRUPTER | NOTC | NORMALLY OPEN TIMED CLOSED | SPC | SPARE CONDUIT |
| GFP | GROUND FAULT PROTECTION | NPW | NON-POTABLE WATER | SPR | SPARE |
| GND | GROUND | NS | NITROGEN SUPPLY | SS | START/STOP |
| GPD | GALLONS PER DAY | NTS | NOT TO SCALE | SSS | SOLID STATE STARTER (SOFT START) |
| GPH | GALLONS PER HOUR | NTU | TURBIDITY | ST | SHUNT TRIP |
| GPM | GALLONS PER MINUTE | OF | OVERFLOW | TC | TELEPHONE CABLE |
| GRS | GALVANIZED RIGID STEEL | OIT | OPERATOR INTERFACE TERMINAL | TVSS | TRANSIENT VOLTAGE SURGE SUPPRESSOR |
| H, HI | HIGH | OLR | OVERLOAD RELAY | TYP | TYPICAL |
| H2S | HYDROGEN SULFIDE | OO | ON/OFF (MAINTAINED) | UG | UNDERGROUND |
| HMI | HUMAN MACHINE INTERFACE | OR | OFF-REMOTE | UL | UNDERWRITERS LABORATORIES |
| HQA | HAND-OFF-AUTO | OSC | OPEN/STOP/CLOSE | UM | UTILITY METER |
| HOR | HAND-OFF-REMOTE | P | PHASE | UNO | UNLESS NOTED OTHERWISE |
| I | INSTRUMENTATION CABLE | PB | PULL BOX | V | VOLT |
| ICR | INTERMITTENT CYCLE REACTOR | PCP | PROCESS CONTROL PANEL | VFD | VARIABLE FREQUENCY DRIVE |
| IO | INPUT/OUTPUT | PCV | PRESSURE CONTROL VALVE | W | WATT, WIRE |
| ISC | SHORT CIRCUIT CURRENT | PFR | PHASE/POWER FAILURE RELAY | WAS | WASTE ACTIVATED SLUDGE |
| JB | JUNCTION BOX | PI | PULSE INPUT | WP | WEATHERPROOF |
| | | PLC | PROGRAMMABLE LOGIC CONTROLLER | XFMR | TRANSFORMER |
| | | PLI | PLANT INFLUENT | XMR | TRANSFORMER |
| | | PMP | PUMP | XMTR | TRANSMITTER |
| | | PNL | PANEL | ZS | POSITION (i.e., LIMIT) SWITCH |

ELECTRICAL LINETYPES



GENERAL NOTES

1. THE COMPLETED INSTALLATION SHALL COMPLY WITH LATEST REVISION OF APPLICABLE FEDERAL, STATE, AND LOCAL CODES, ORDINANCES, AND REGULATIONS. THE CONTRACTOR SHALL OBTAIN NECESSARY PERMITS AND INSPECTIONS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION. ALL WORK SHALL BE COMPLETED IN A NEAT, WORKMANLIKE MANNER IN ACCORDANCE WITH THE LATEST NECA STANDARDS OF INSTALLATION UNDER COMPETENT SUPERVISION. INSTALL GROUNDING PER NEC.
2. VISIT THE SITE PRIOR TO BIDDING TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND OTHER FACTORS, WHICH MAY AFFECT THE EXECUTION OF THE WORK. INCLUDE ALL RELATED COSTS IN THE INITIAL BID PROPOSAL.
3. THE CONTRACTOR SHALL COORDINATE WORK WITH THE UTILITIES PROVIDING SERVICES ON THIS PROJECT, AND SHALL COMPLY WITH ALL THEIR INSTALLATION REQUIREMENTS.
4. ALL MATERIALS SHALL BE NEW AND OF THE BEST QUALITY, MANUFACTURED IN ACCORDANCE WITH THE LATEST REVISION OF NEMA, ANSI, UL, OR OTHER APPLICABLE STANDARDS. THE USE OF MANUFACTURERS' NAMES, MODELS, AND NUMBERS IS INTENDED TO ESTABLISH STYLE, QUALITY, APPEARANCE, USEFULNESS, AND BID PRICE.
5. PROTECT ALL ELECTRICAL MATERIAL AND EQUIPMENT INSTALLED AGAINST DAMAGE BY OTHER TRADES, WEATHER CONDITIONS, OR ANY OTHER PREVENTABLE CAUSES. EQUIPMENT DAMAGED DURING SHIPPING OR CONSTRUCTION, PRIOR TO ACCEPTANCE BY THE ENGINEER OR THE OWNER, WILL BE REJECTED AS DEFECTIVE.
6. LEAVE THE SITE CLEAN. REMOVE ALL DEBRIS, EMPTY CARTONS, TOOLS, CONDUIT, WIRE SCRAPS AND ALL MISCELLANEOUS SPARE EQUIPMENT AND MATERIALS USED IN THE WORK DURING CONSTRUCTION. ALL COMPONENTS SHALL BE FREE OF DUST, GRIT AND FOREIGN MATERIALS, LEFT AS NEW BEFORE FINAL ACCEPTANCE OF WORK. DAMAGED PAINT AND FINISHES SHALL BE TOUCHED UP OR REPAINTED WITH MATCHING COLOR PAINT AND FINISH.
7. CIRCUIT CONDUCTORS #6 AWG OR SMALLER SHALL BE THWN STRANDED COPPER. #4 AWG THROUGH #2 AWG SHALL BE XHHW STRANDED COPPER. #1 AWG OR LARGER SHALL BE XHHW-2 STRANDED COPPER. MINIMUM POWER CONDUCTOR SIZE SHALL BE #12 AWG WITH #12 AWG GROUND.
8. UNDERGROUND CONDUITS SHALL BE SCHEDULE 40 PVC. MINIMUM CONDUIT DEPTH SHALL BE 24 INCHES. MINIMUM UNDERGROUND CONDUIT SIZE SHALL BE 1 INCH.
9. CONDUITS SHALL BE MARKED AT EACH END WITH MATCHING NUMBERED BRASS TAGS. SPARE CONDUITS SHALL HAVE A PULL STRING INSTALLED, SECURED, AND CAPPED.
10. EXPOSED CONDUITS SHALL BE GALVANIZED RIGID STEEL (GRS). MINIMUM SIZE 3/4 INCH, UNLESS OTHERWISE NOTED ON THE PLANS.
11. SAFETY SWITCHES, ELECTRICAL DISTRIBUTION EQUIPMENT, CONTROL PANELS, AND OTHER ELECTRICAL DEVICES SHALL BE UL LISTED, AND RATED FOR HEAVY DUTY SERVICE.
12. WIRING DEVICES SHALL BE SPECIFICATION GRADE.
13. THE CONTRACTOR IS RESPONSIBLE FOR MANAGING, SCHEDULING, DOCUMENTING, AND PERFORMING THE WORK SO THAT A COMPLETE ELECTRICAL, INSTRUMENTATION AND CONTROL SYSTEM FOR THE FACILITY IS PROVIDED. ACCURATE SHOP AND RECORD DRAWINGS, AND O&M MANUALS SHALL BE SUBMITTED PRIOR TO FINAL ACCEPTANCE OF THE WORK.
14. TYPICAL DETAILS SHALL APPLY IN ALL CASES, WHETHER SPECIFICALLY REFERRED TO OR NOT.

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Dwg scale: AS NOTED

ELECTRICAL NOTES, SYMBOLS, AND LEGEND

CELEBRATING 25 YEARS

Sheet Number: **E-01**
Sheet 1 of 19

EXPIRATION DATE: 12/31/24



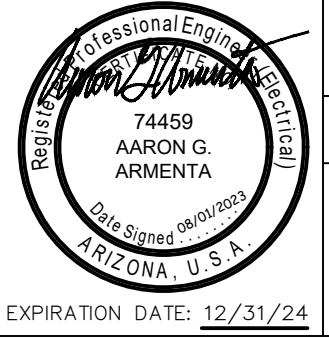
LAKE HAVASU CITY
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SINGLE LINE
DIAGRAM



Sheet Number:
E-02
 Sheet 1 of 19



EXPIRATION DATE: 12/31/24

NOTES:

- ALL SHORT CIRCUIT INTERRUPTING AND PROTECTING DEVICES SHALL HAVE A SHORT CIRCUIT INTERRUPTING RATING EQUAL TO OR GREATER THAN THE AVAILABLE SHORT CIRCUIT ON THE BUS.
- UNSIZE OVERCURRENT PROTECTIVE DEVICES SHALL BE SIZED PER ASSOCIATED EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
- ALL OVERCURRENT PROTECTIVE DEVICES SHALL BE PROPERLY COORDINATED AS REQUIRED BY NEC AND SO AS TO ENSURE LOCALIZATION OF OVERCURRENT CONDITIONS TO THE CIRCUIT OR EQUIPMENT AFFECTED.
- BYPASS AND EOL ARE NOT REQUIRED IF SOLID STATE STARTER PROVIDES INTEGRAL BYPASS CONTACTOR AND EOL. EOL MUST PROTECT MOTOR IN BYPASS AND NON-BYPASS MODES OF OPERATION.
- PROVIDE CIRCUIT INSTALLATION PER UNISOURCE STANDARDS.

| CIRCUIT/DESCRIPTION | KVA | HP | FLA |
|-----------------------------|------|------|-------|
| MOTOR LOADS | | | |
| LIFT PUMP NO. 1 (LP-101) | | 10.0 | 14.0 |
| LIFT PUMP NO. 2 (LP-102) | | 10.0 | 14.0 |
| NON-MOTOR LOADS | | | |
| MINI POWER CENTER (MPC-100) | 10.0 | | 20.8 |
| SUBTOTAL | | | 48.8 |
| + 25% OF LARGEST MOTOR | | | 3.5 |
| TOTAL AMPS @ 480V/3PHASE | | | 52.3 |
| SERVICE SIZE (AMPS) | | | 100.0 |

B LOAD CALCULATIONS

NOTE 5

| CALLOUT NO. | NO. SETS | CONDUIT SIZE | CIRCUIT CONDUCTORS | CIRCUIT NO.'s |
|-------------|----------|--------------|-------------------------|---------------|
| U100 | 1 | 1 1/2" | 3 - #2, #2 NEUT, #8 GND | SES100-P1 |
| P100 | 1 | 1 1/2" | 3 - #2, #2 NEUT, #8 GND | ATS100-P1 |
| P101 | 1 | 1" | 3 - #4, #10 GND | GEN100-P1 |
| P102 | 1 | 1 1/2" | 3 - #2, #8 GND | DP100-P1 |
| P103 | 1 | 1" | 3 - #8, #10 GND | PC101-P1 |
| P103A | 1 | 1" | 3 - #12, #12 GND | LP101-P1 |
| P103B | 1 | 1" | 3 - #12, #12 GND | LP102-P1 |
| P103C | 1 | 1" | MANUF. PROVIDED | LP102-P2 |
| P103D | 1 | 1" | MANUF. PROVIDED | LP102-P2 |

C CALLOUT SCHEDULE

| DEFINITIONS | | FORMULAS |
|--------------------|------------------------------|--|
| ISC = | SHORT CIRCUIT CURRENT (AMPS) | 3 PH: $f = \frac{1.732 \times L \times I_{sc}}{N \times C \times V_{L-L}}$ |
| N = | NUMBER OF CONDUCTORS/PHASE | |
| L = | LENGTH OF CONDUCTOR (FEET) | |
| C = | CONSTANT FROM TABLE OF "C" | 1 PH: $f = \frac{2 \times L \times I_{sc}}{N \times C \times V_{L-L}}$ |
| I _{sc} = | AVAILABLE SHORT-CIRCUIT AMPS | |
| V _{L-L} = | LINE TO LINE VOLTAGE (VOLTS) | |
| V _P = | PRIMARY VOLTAGE | 1 PH XFMR: $f = \frac{I_{sc} \times V_P \times \% Z}{100,000 \times KVA}$ |
| V _S = | SECONDARY VOLTAGE | |
| % Z = | TRANSFORMER % IMPEDANCE | |

ISC(1)

$$f1 = \frac{1.732 \times 5 \times 8,578}{1 \times 6044 \times 480} = 0.0256$$

$$M = \frac{1}{1 + 0.0256} = 0.975$$

ISC(1) = 8,578 x 0.975 = 8,364 A

ISC(2)

$$f2 = \frac{1.732 \times 5 \times 8,364}{1 \times 6044 \times 480} = 0.025$$

$$M = \frac{1}{1 + 0.025} = 0.9756$$

ISC(2) = 8,364 x 0.9756 = 8,160 A

ISC(3)

$$f3 = \frac{1.732 \times 5 \times 8,160}{1 \times 1558 \times 480} = 0.0945$$

$$M = \frac{1}{1 + 0.0945} = 0.9137$$

ISC(3) = 8,160 x 0.9137 = 7,456 A

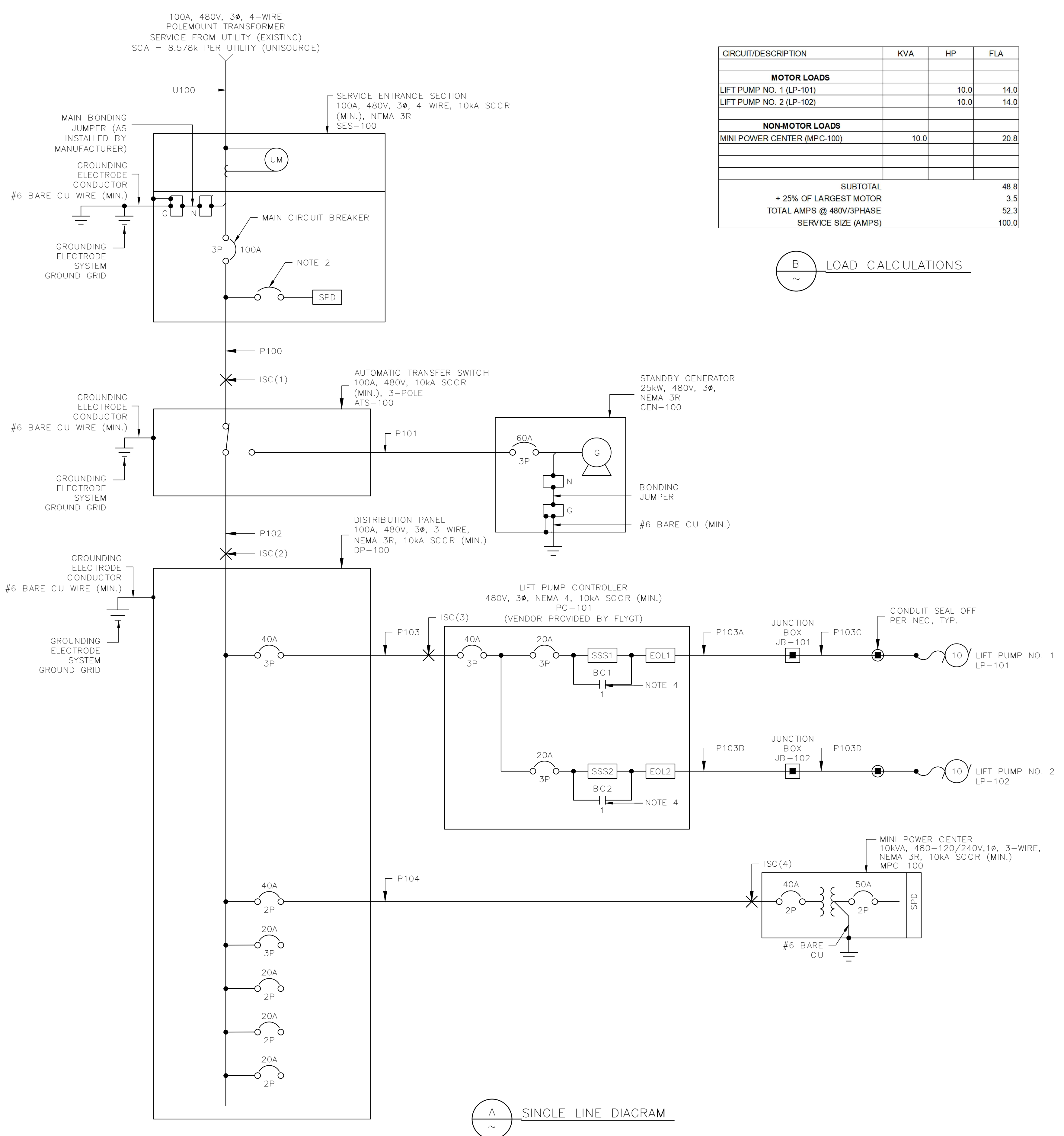
ISC(4)

$$f4 = \frac{2 \times 8 \times 8,160}{1 \times 1558 \times 480} = 0.1746$$

$$M = \frac{1}{1 + 0.1746} = 0.8514$$

ISC(4) = 8,160 x 0.8514 = 6,947 A

D SHORT CIRCUIT CALCULATIONS



A SINGLE LINE DIAGRAM



| | |
|--|--------------------------------------|
| PANEL TAG No. MPC-100 | NEMA TYPE/MOUNTING 3R/SURFACE |
| LOCATION ELECTRICAL PAD | MAIN DEVICE 50A MCB |
| BUS AMPACITY 100 | AIC RATING 10kA |
| VOLTS, PHASE, WIRE 240 V/1-PHASE/3-WIRE | FED FROM DP-100 |
| REMARKS | ACCESSORIES TVSS |

| LOAD VA | | LOAD DESCRIPTION | WIRE SIZE | DEMAND | BKR | BKR. NO. | | | DEMAND | WIRE SIZE | LOAD DESCRIPTION | LOAD VA | |
|---------|---------|--------------------------|-----------|--------|------|----------|----|------|--------|-----------|---------------------------|---------|---------|
| PHASE A | PHASE B | | | | | 1 | 2 | 3 | | | | PHASE A | PHASE B |
| 150 | | RTU-100 | #12 | 1.25 | 20/1 | 1 | 2 | 20/1 | 1.25 | #12 | RTU-100 AC UNIT | 1500 | |
| | 200 | SHADE STRUCTURE LIGHTING | #12 | 1.25 | 20/1 | 3 | 4 | 20/1 | 1.25 | #12 | GENERATOR BATTERY CHARGER | | 250 |
| 180 | | CONVENIENCE RECEPTACLE | #12 | 1.00 | 20/1 | 5 | 6 | 20/1 | 1.25 | #12 | GENERATOR BLOCK HEATER | 1000 | |
| 0 | 0 | SPARE | | | 20/1 | 7 | 8 | 20/1 | 1.25 | #12 | GENERATOR BLOCK HEATER | | 1000 |
| 0 | 0 | SPARE | | | 20/1 | 9 | 10 | 20/1 | | | SPARE | 0 | |
| 0 | 0 | SPARE | | | 20/1 | 11 | 12 | 20/1 | | | SPARE | 0 | |
| 0 | 0 | SPARE | | | 20/1 | 13 | 14 | 20/1 | | | SPARE | 0 | |
| 0 | 0 | SPACE | | | 20/1 | 15 | 16 | | | | SPACE | 0 | |
| 0 | 0 | SPACE | | | | 17 | 18 | | | | SPACE | 0 | |
| 0 | 0 | SPACE | | | | 19 | 20 | | | | SPACE | 0 | |
| 330 | 200 | CONNECTED VA | | | | | | | | | CONNECTED VA | 2500 | 1250 |
| 368 | 250 | DEMAND VA | | | | | | | | | DEMAND VA | 3125 | 1563 |

| | | | | | | |
|--|----------------------------|------|-------|--------------------------------|------|------|
| * - Each branch circuit shall have an equipment grounding conductor sized per N.E.C. Article 250 | TOTAL PANEL CONNECTED LOAD | VA | AMPS | TOTAL CONNECTED VA - PER PHASE | 2830 | 1450 |
| | TOTAL PANEL DEMAND LOAD | 4280 | 17.83 | TOTAL DEMAND VA - PER PHASE | 3493 | 1813 |
| | PANEL DEMAND FACTOR | 5305 | 22.10 | TOTAL DEMAND PHASE AMPS | 29.1 | 15.1 |
| | | 124% | | | | |

A MPC-100 PANEL SCHEDULE

| LIGHTING FIXTURE SCHEDULE | | | | | |
|---------------------------|--|----------------------|--|-------------------------------|---------------------------------|
| SYMBOL | DESCRIPTION | MOUNTING | MANUFACTURER | LAMPS | REMARKS |
| | 120V, 4', ENCLOSED AND GASKETED LED FIXTURE. | SURFACE OR SUSPENDED | COLUMBIA LIGHTING LXEM SERIES OR EQUAL | 4K LUMEN OUTPUT (MIN.), 3500K | 50° C RATED, DARK SKY COMPLIANT |

C FIXTURE SCHEDULE

| SHEET NO. | CIRCUIT | CONDUCTORS |
|-----------|------------|-------------------|
| E-05 | LP101-C1 | 2 - #14, #14 GND |
| E-05 | LP102-C1 | 2 - #14, #14 GND |
| E-05 | PC101-C1 | 12 - #14, #14 GND |
| E-05 | PC101-C2 | 14 - #14, #14 GND |
| E-05 | GEN100-C1 | 4 - #14, #14 GND |
| E-05 | GEN100-C2 | 8 - #14, #14 GND |
| E-05 | GEN100-C3 | 1 - IC, #14 GND |
| E-05 | ATS100-C1 | 2 - #14, #14 GND |
| E-05 | ATS100-C2 | 12 - #14, #14 GND |
| E-05 | LT101-C1 | 1 - IC, #14 GND |
| E-05 | LSHH101-C1 | 2 - #14, #14 GND |
| E-05 | LSHH101-C2 | 1 MANUF. CABLE |
| E-05 | LSH101-C1 | 2 - #14, #14 GND |
| E-05 | LSH101-C2 | 1 MANUF. CABLE |
| E-05 | LSL101-C1 | 2 - #14, #14 GND |
| E-05 | LSL101-C2 | 1 MANUF. CABLE |
| E-05 | LSLL101-C1 | 2 - #14, #14 GND |
| E-05 | LSLL101-C2 | 1 MANUF. CABLE |
| E-05 | FIT104-C1 | 1 - IC, #14 GND |
| E-05 | FE104-C1 | 1 - IC, #14 GND |
| E-05 | RTU100-C1 | 6 PAIR - SMF |
| E-05 | RTU100-C2 | 6 PAIR - SMF |

B MASTER CIRCUIT SCHEDULE

| NO. | REVISIONS / SUBMISSIONS | DATE |
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PARK AVENUE LIFT STATION
RENOVATION

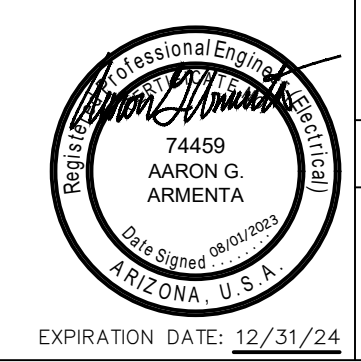
CONSTRUCTION DRAWINGS

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| Drawn by: CFL |
| Checked by: AGA |
| Date: 08/01/23 |
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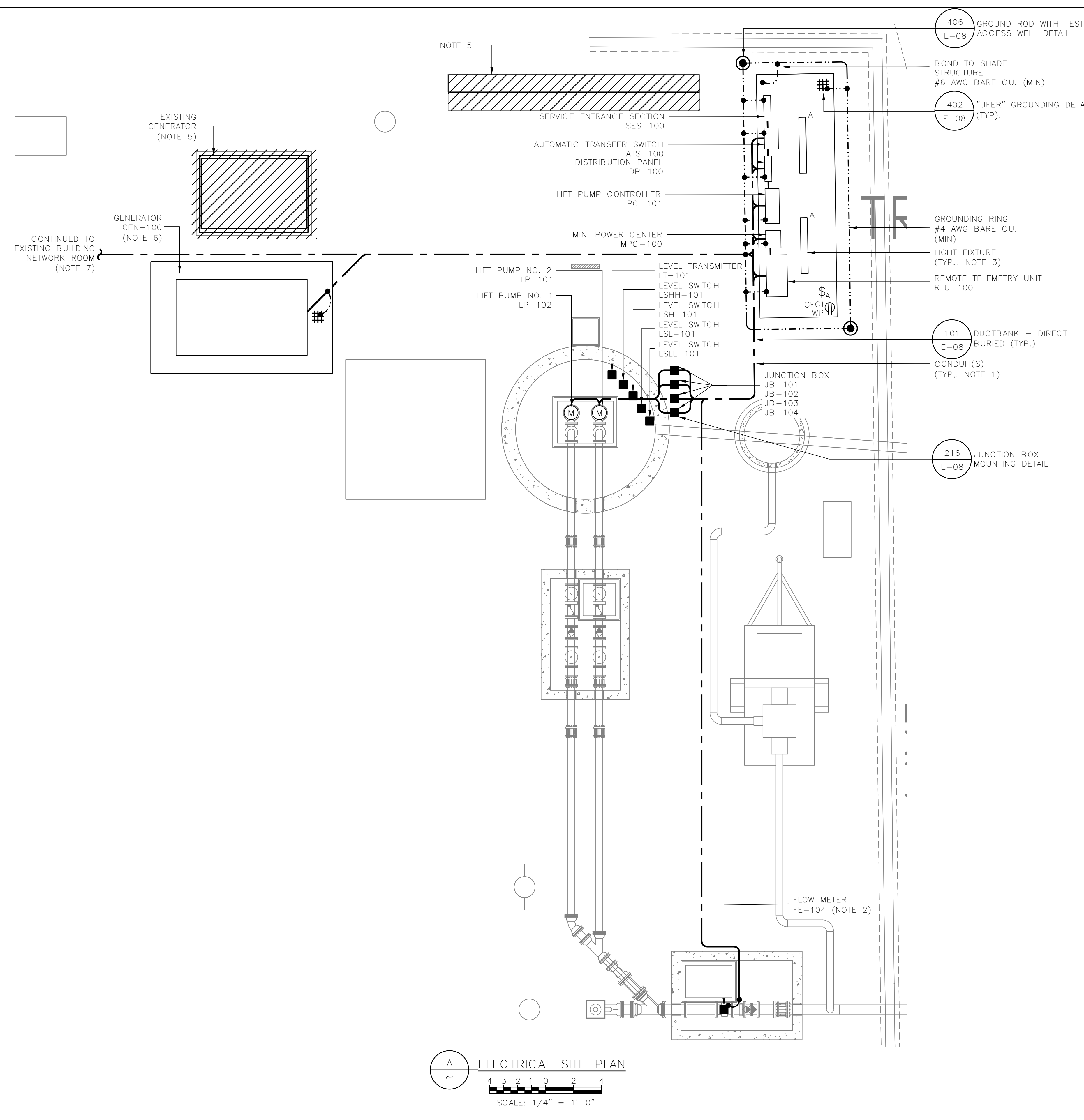
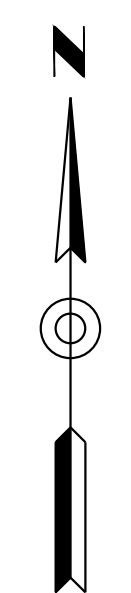
ELECTRICAL SCHEDULES

CELEBRATING 25 YEARS

Sheet Number:



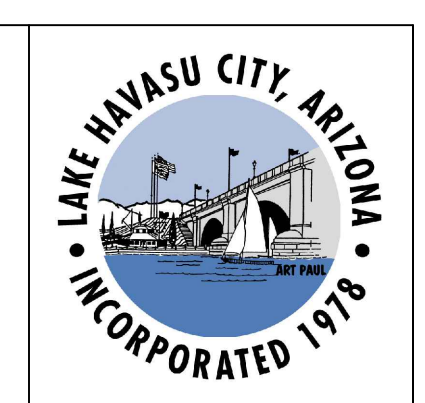
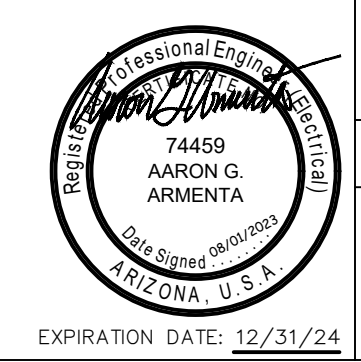
E-03
 Sheet 12 of 19



NOTES:

1. CONDUIT ROUTING SHALL BE FIELD DETERMINED. REFER TO CONDUIT BLOCK DIAGRAM ON E-07 FOR CONDUIT REQUIREMENTS INCLUDING TO/FROM, CONTENTS, ETC.
2. GROUND/BOND FLOW METER PER MANUFACTURER'S RECOMMENDATIONS.
3. REF. E-03 FOR LIGHTING FIXTURE SCHEDULE.
4. CONTRACTOR SHALL ENSURE THAT CONDUITS ENTERING SEWAGE LIFT STATION WET WELL ARE ISOLATED FROM THE REST OF THE ELECTRICAL SYSTEM.
5. EXISTING ELECTRICAL EQUIPMENT TO BE DEMOLISHED. CONTRACTOR SHALL COORDINATE WITH OWNER FOR DISPOSAL OF EQUIPMENT.
6. PROVIDE NEW CONCRETE PAD FOR GENERATOR. SEE CIVIL SHEETS FOR DIMENSIONS AND DETAILS.
7. CONTRACTOR SHALL ROUTE NEW CONDUIT TO EXISTING BUILDING NETWORK ROOM. PENETRATE EXTERIOR WALL OF EXISTING BUILDING.
8. ALL FREE STANDING ENCLOSURES SHALL SIT ON A 4" HOUSEKEEPING PAD.
9. RTU ENCLOSURE SHALL HAVE A RUBBER BARRIER BETWEEN THE CONCRETE AND THE BOTTOM OF THE ENCLOSURE.

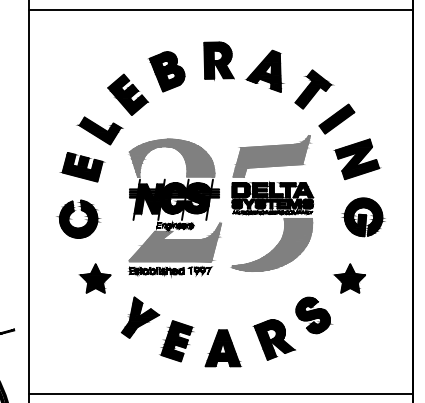
A ELECTRICAL SITE PLAN
 SCALE: 1/4" = 1'-0"



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ELECTRICAL SITE
 PLAN



Sheet Number:

E-04
 Sheet 13 of 19

| NO. | REVISIONS / SUBMISSIONS | DATE |
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CONSTRUCTION DRAWINGS



| NO. | REVISIONS / SUBMISSIONS | DATE |
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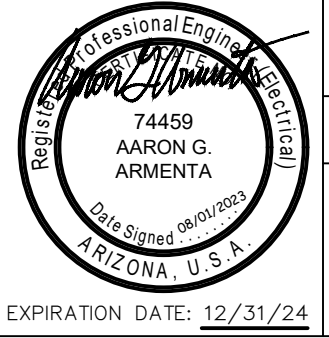
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CONNECTION DIAGRAM

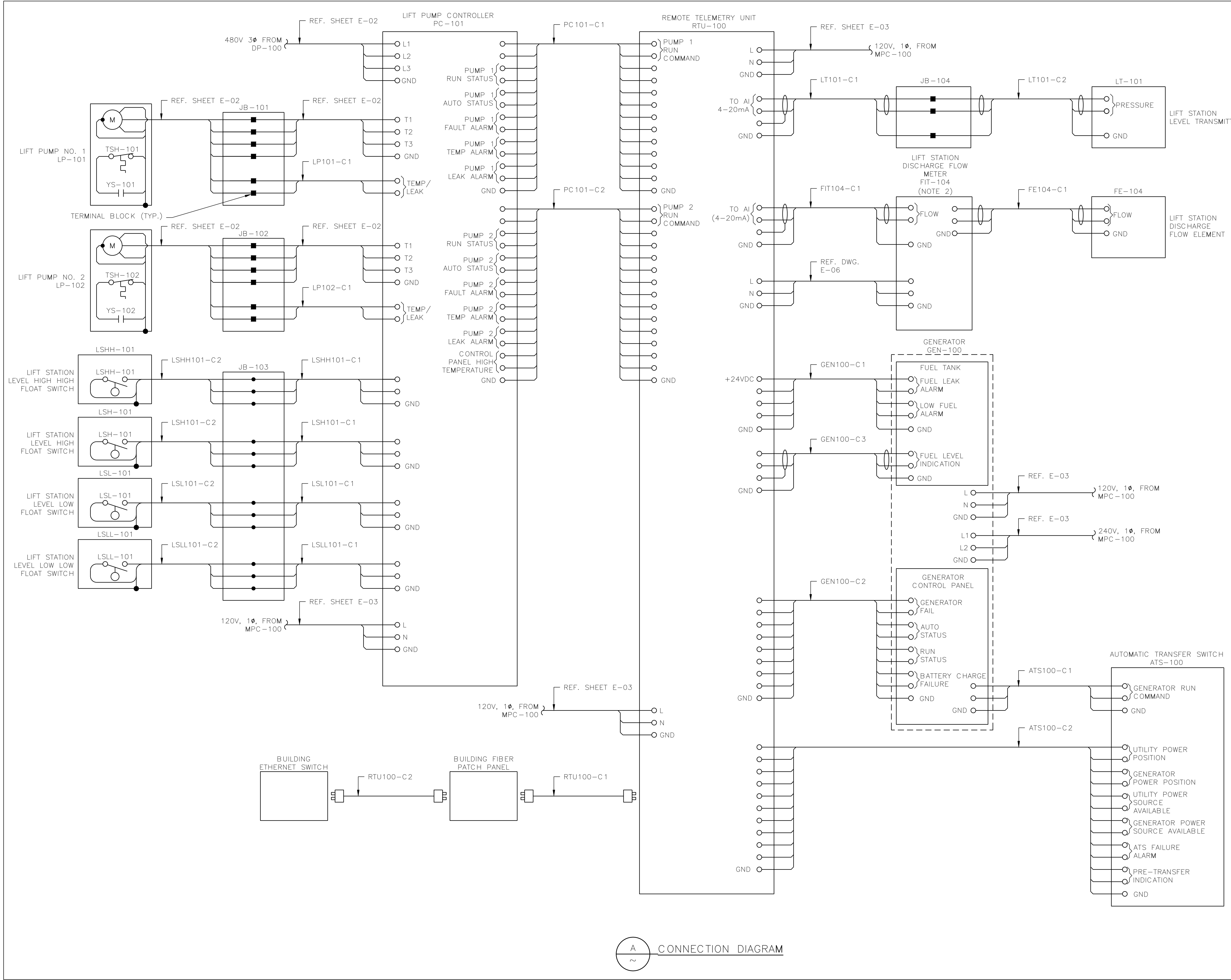


Sheet Number:
E-05
 Sheet 14 of 19



NOTES:

1. REFERENCE E-03 FOR MASTER CIRCUIT SCHEDULE.
2. FIT-104 SHALL BE LOCATED WITHIN RTU-100. CONNECTION DIAGRAM IS SCHEMATIC IN NATURE AND DOES NOT REPRESENT PHYSICAL LOCATION OF EQUIPMENT. SEE DRAWING E-06 FOR RTU POWER DISTRIBUTION SCHEMATIC.
3. ALL CONTROL PANEL LIGHTS AND SELECTOR SWITCHES SHALL BE 30MM. ELAPSED TIME METERS SHALL BE MOUNTED BETWEEN 5'-0" AND 6'-0" ABOVE FINISHED GRADE. ALL SCREENS, LIGHTS, CONTROLS AND INSTRUMENTS FOR THE CONTROL PANEL SHALL BE MOUNTED ON AN INTERIOR SWING OUT DOOR.



A CONNECTION DIAGRAM



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RTU POWER DISTRIBUTION SCHEMATIC



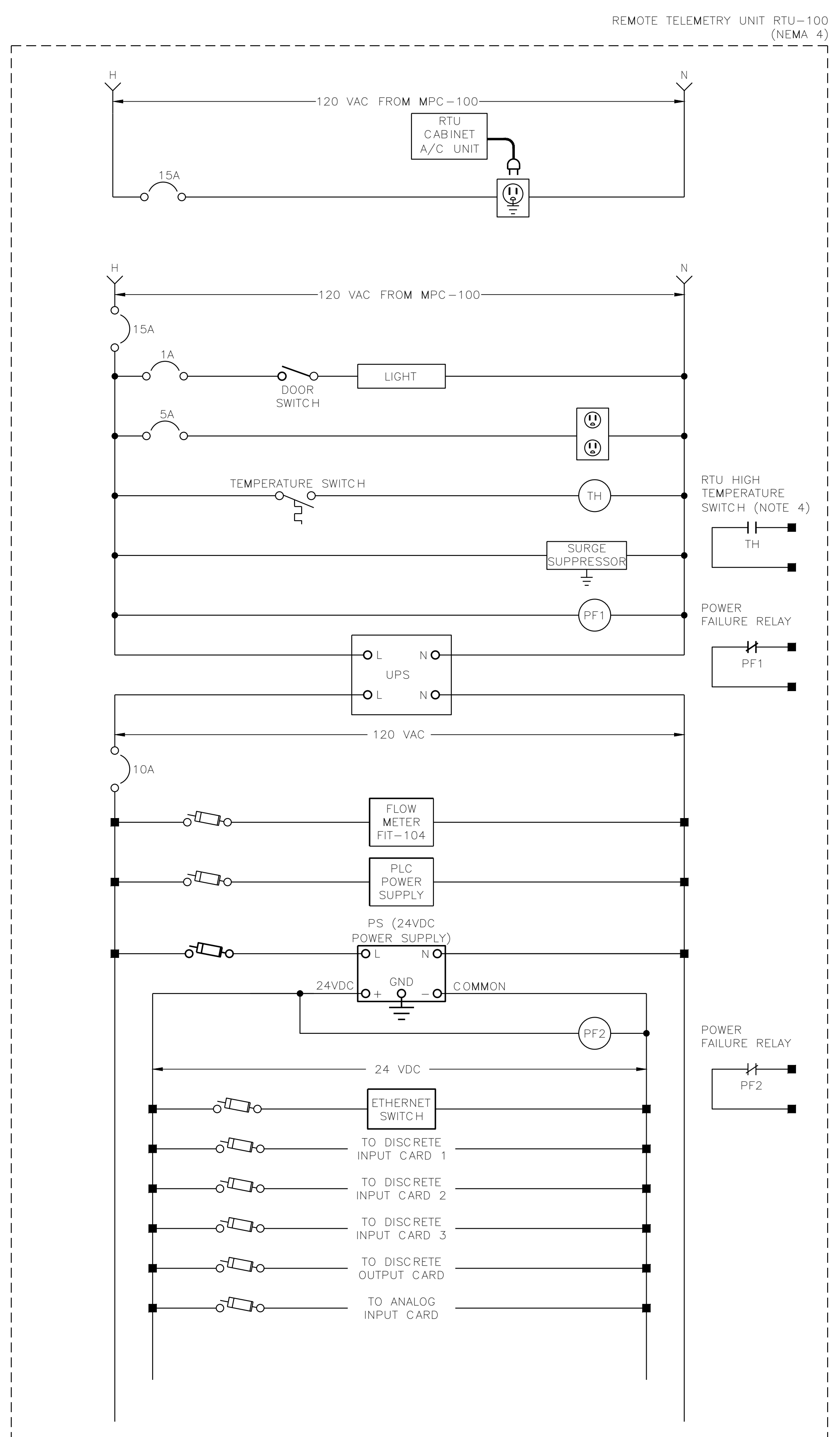
Sheet Number:
E-06
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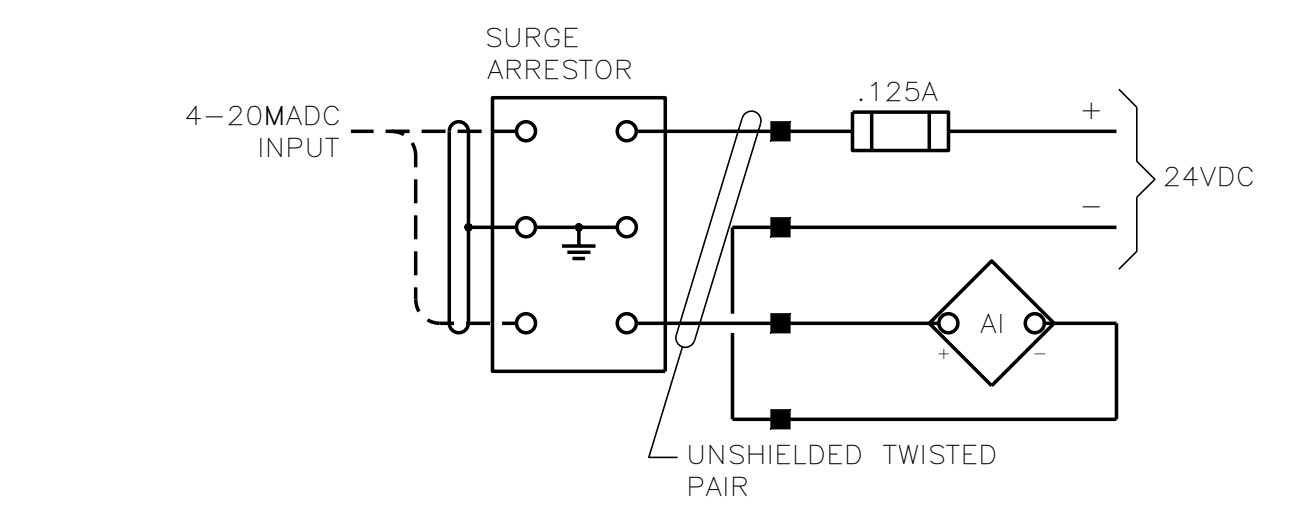
CONSTRUCTION DRAWINGS

NOTES:

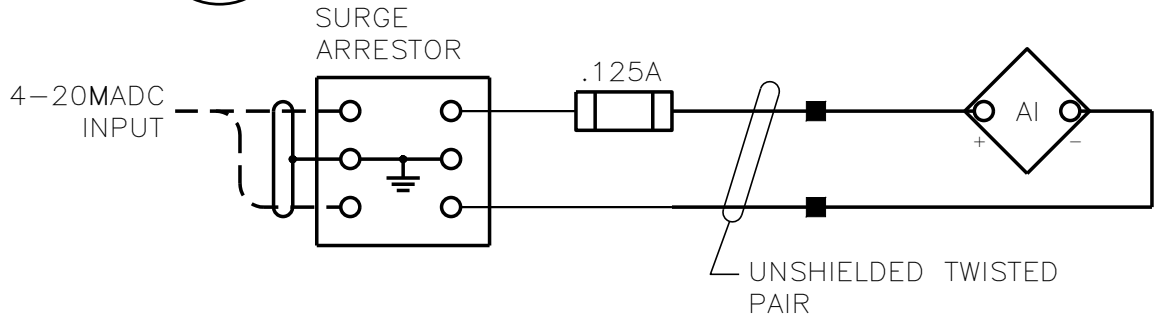
1. TYPICAL SCHEMATIC DIAGRAMS ARE INTENDED TO REFLECT THE GENERAL CONTROL STRATEGY. ACTUAL CIRCUITRY MAY VARY FOR SPECIFIC EQUIPMENT SUPPLIED. THE NUMBER AND TYPE OF DEVICES SHALL BE FURNISHED AS REQUIRED FOR PROPER OPERATION OF THE EQUIPMENT.
2. CONTROL FUSES AND CIRCUIT BREAKERS SHALL BE SIZED PER ASSOCIATED EQUIPMENT MANUFACTURERS' RECOMMENDATIONS.
3. PROVIDE ETHERNET SWITCH BY MOXA, MODEL EDS-510E-3GTXSFP. PROVIDE ETHERNET TRANSCEIVER MODULE BY MOXA, MODEL SFP-1GSXLC.
4. CONTRACTOR SHALL PROVIDE ADJUSTABLE HIGH TEMPERATURE SWITCH WITHIN RTU CABINET.
5. PLC SHALL HAVE SCREW TERMINALS.



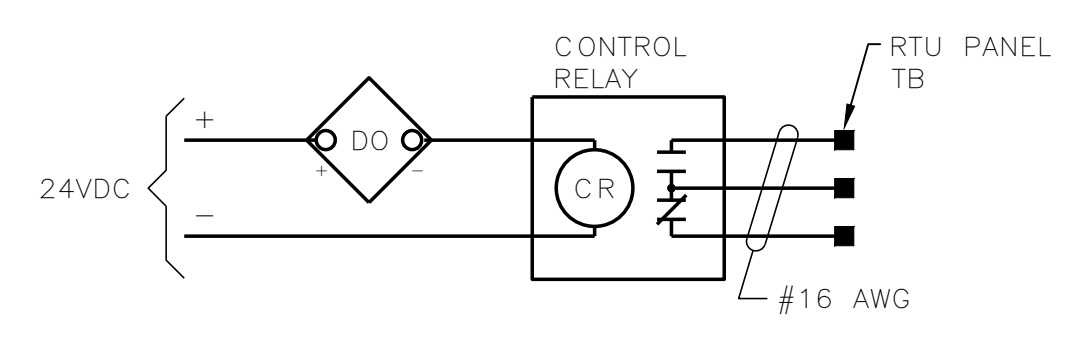
A RTU POWER DISTRIBUTION SCHEMATIC (RTU-100)
 SCHEMATIC



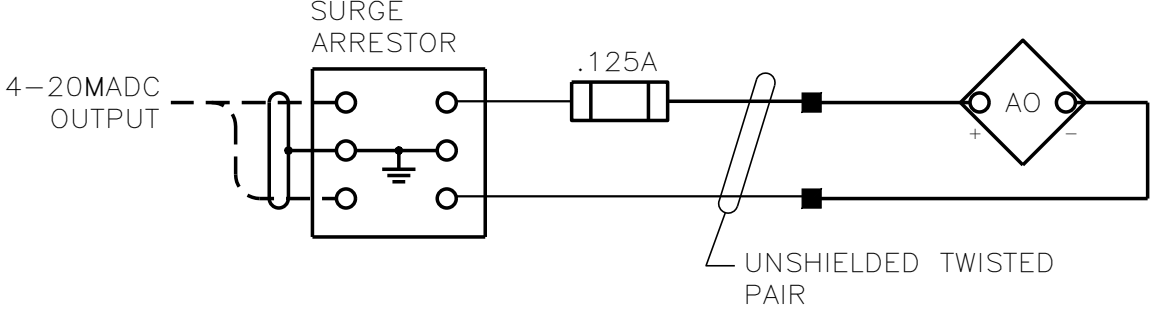
B TYPICAL ANALOG INPUT CONNECTION DIAGRAM (LOOP POWERED)
 SCHEMATIC



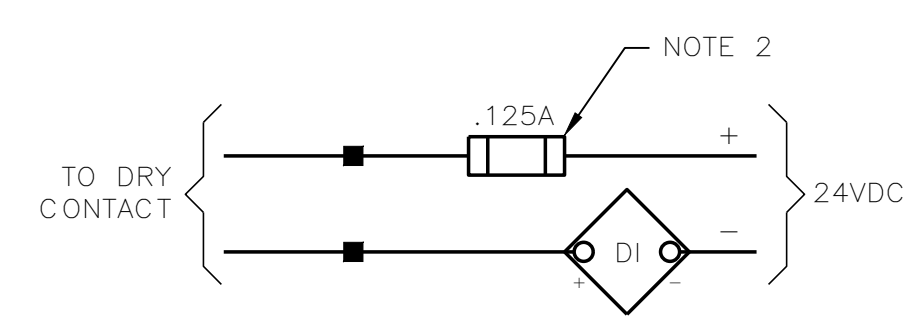
C TYPICAL ANALOG INPUT CONNECTION DIAGRAM (ISOLATED)
 SCHEMATIC



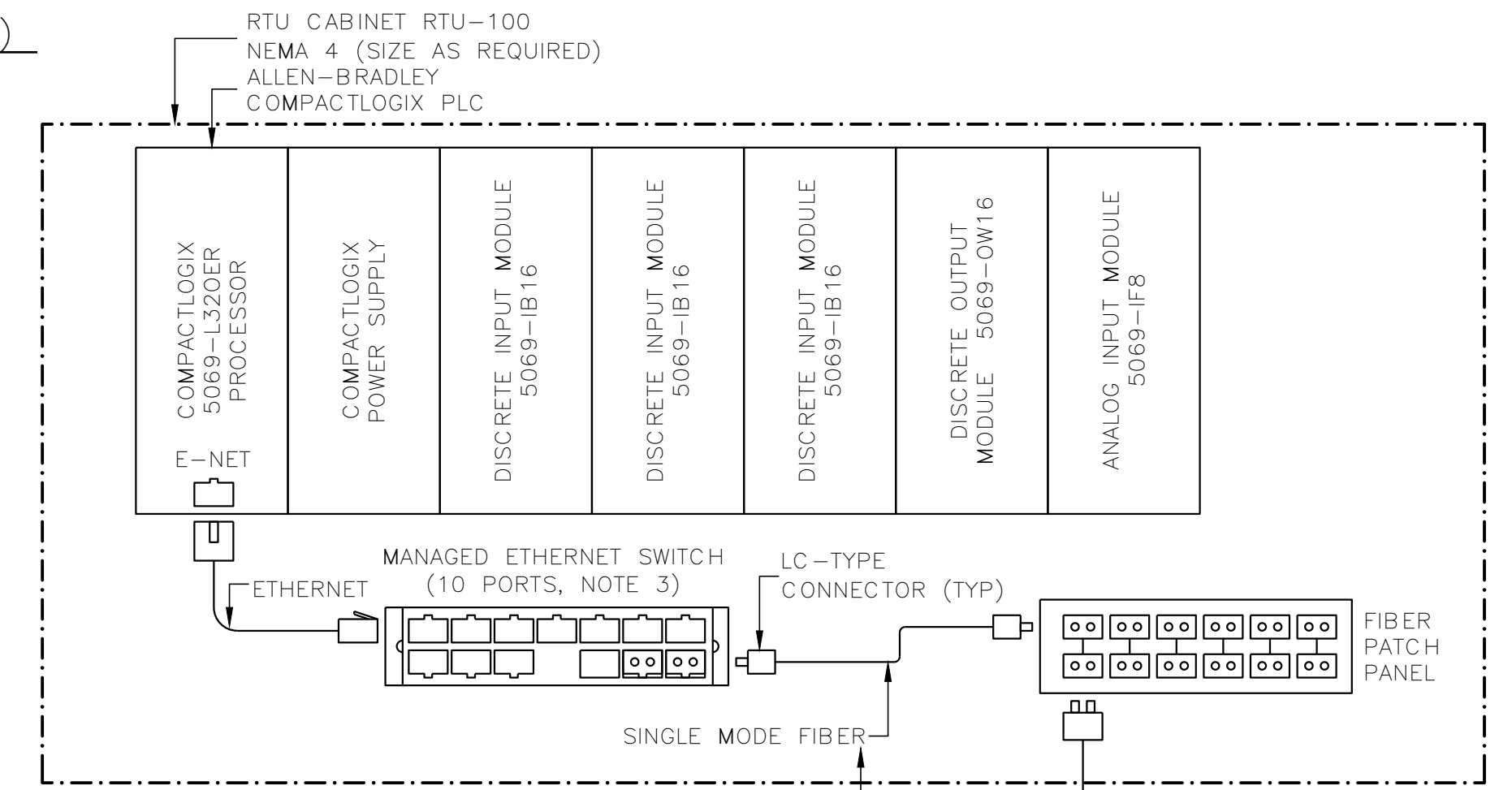
D TYPICAL DIGITAL OUTPUT CONNECTION DIAGRAM
 SCHEMATIC



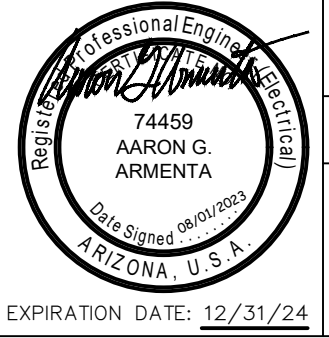
E TYPICAL ANALOG OUTPUT CONNECTION DIAGRAM
 SCHEMATIC



F TYPICAL DIGITAL INPUT CONNECTION DIAGRAM
 SCHEMATIC



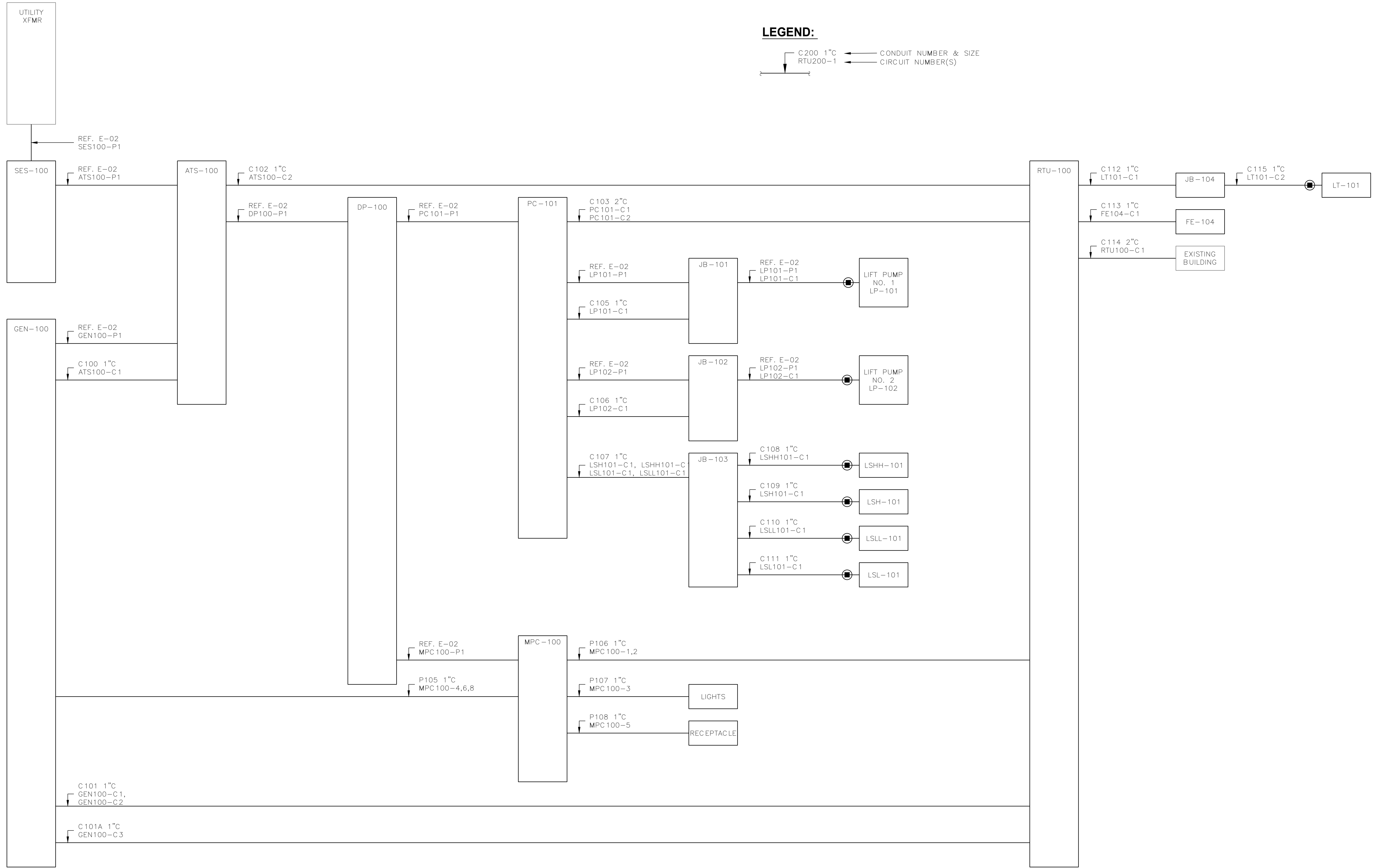
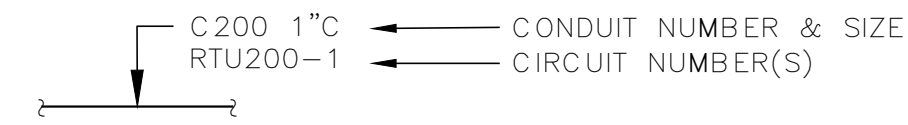
G COMMUNICATION DIAGRAM
 SCHEMATIC



EXPIRATION DATE: 12/31/24



LEGEND:



| NO. | REVISIONS / SUBMISSIONS | DATE |
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RENOVATION
 CONSTRUCTION DRAWINGS

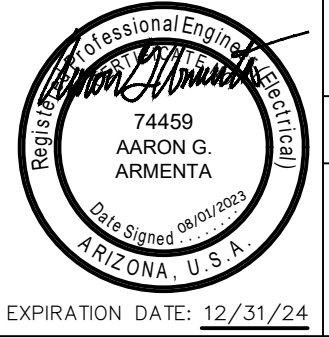
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CONDUIT BLOCK DIAGRAM

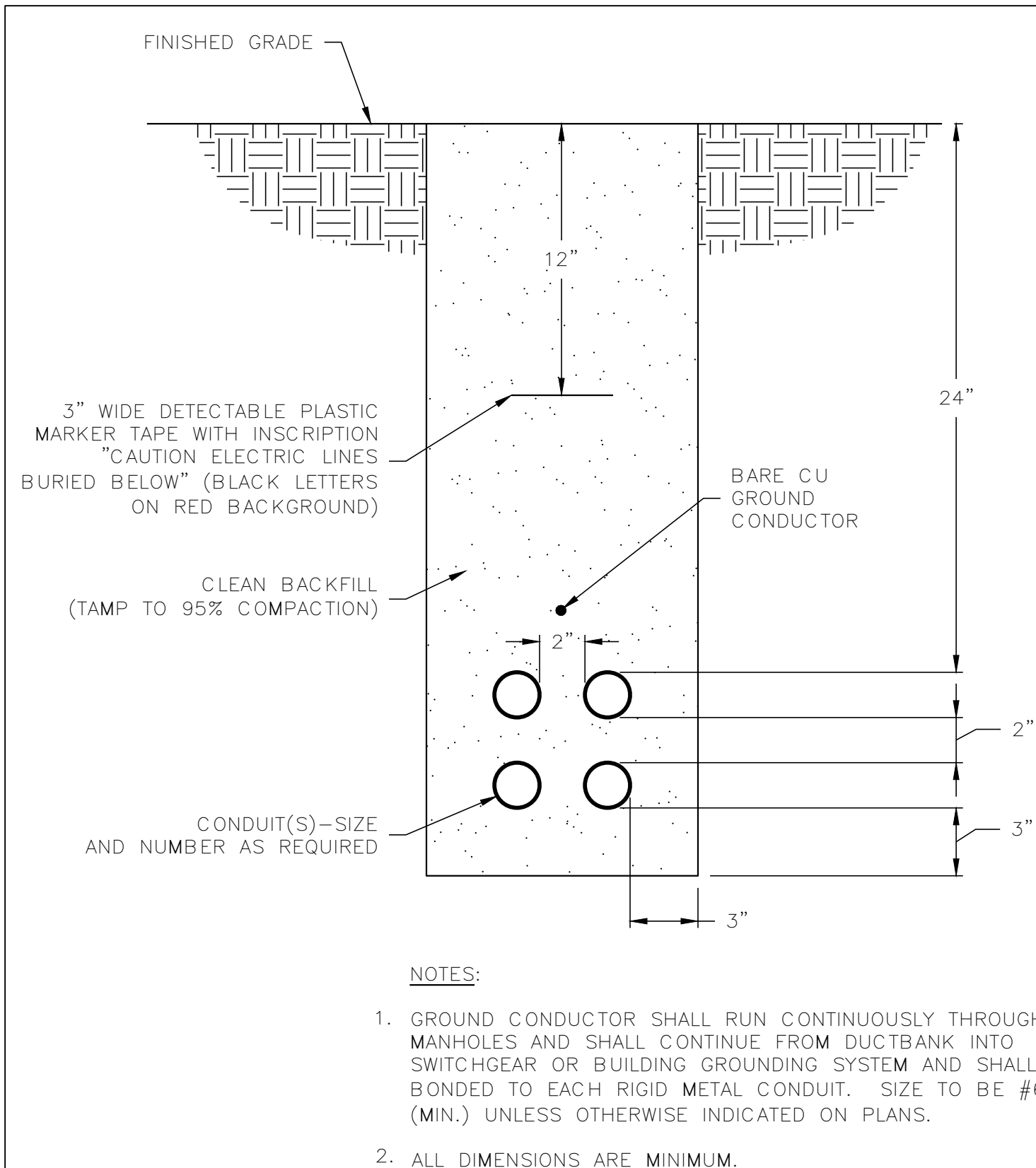


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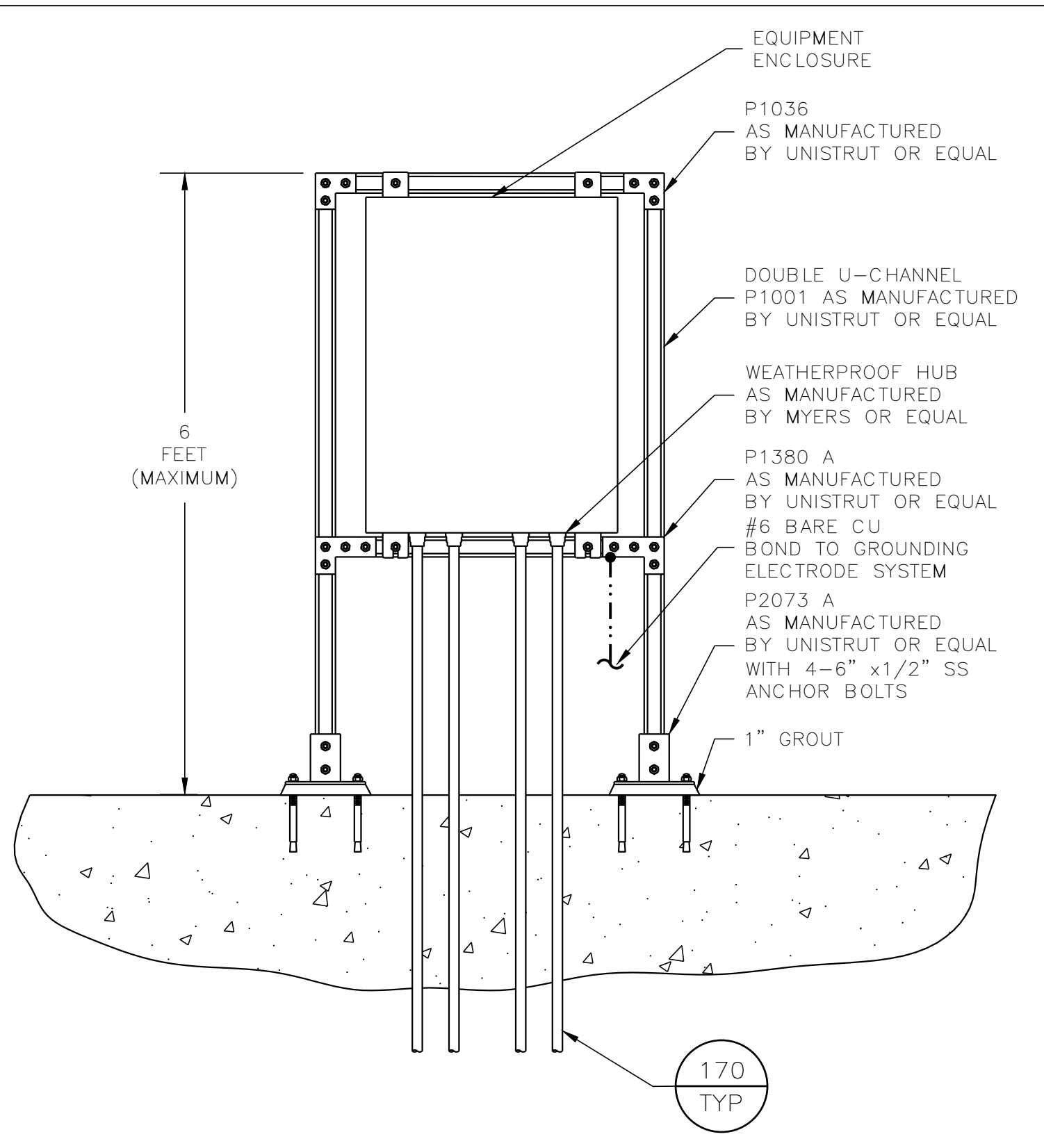
E-07
Sheet 16 of 19



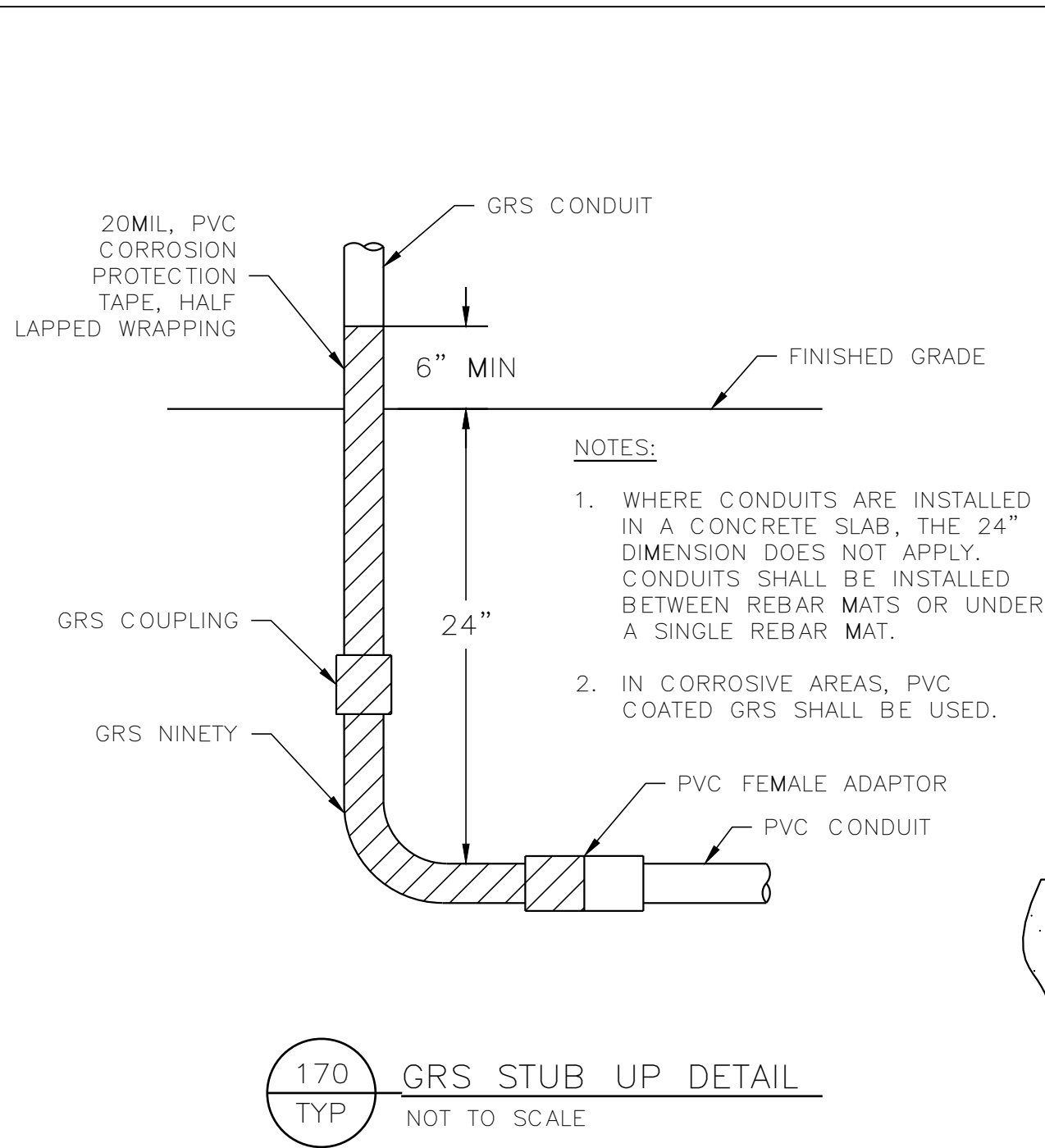
EXPIRATION DATE: 12/31/24



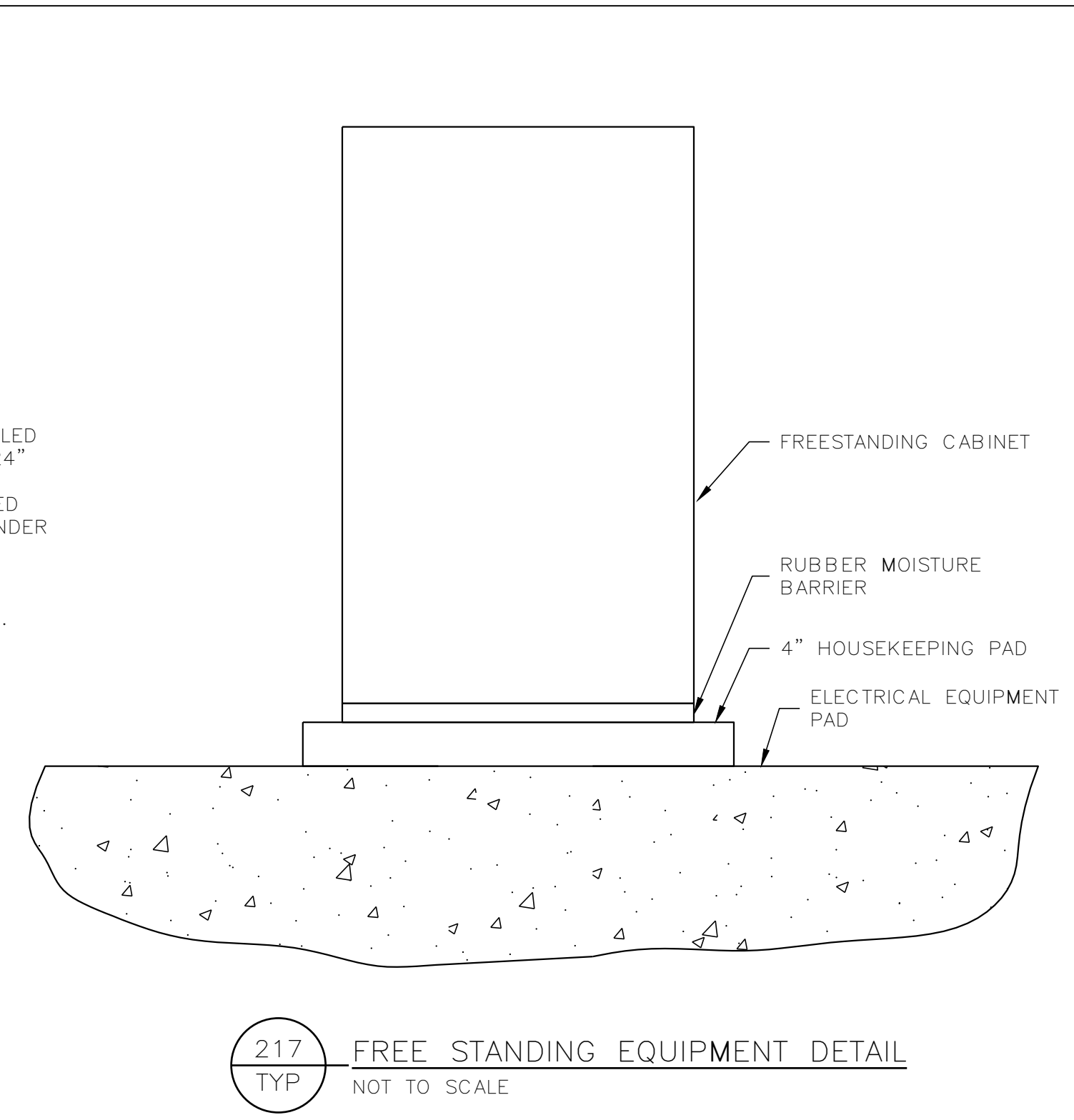
101 TYP DUCTBANK - DIRECT BURIED
NOT TO SCALE



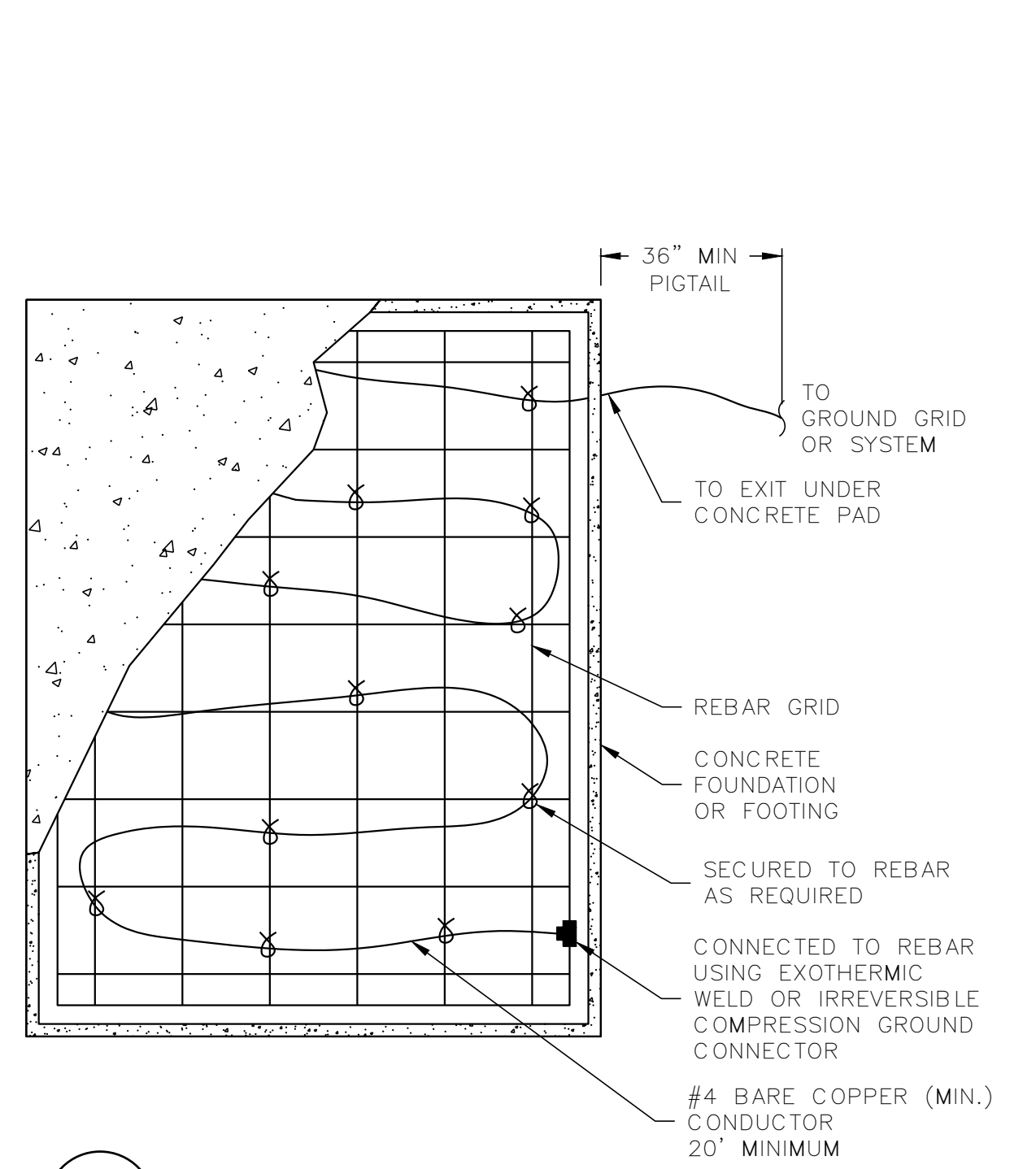
207 TYP EQUIPMENT RACK DETAIL - NON-CLASSIFIED AREAS
NOT TO SCALE



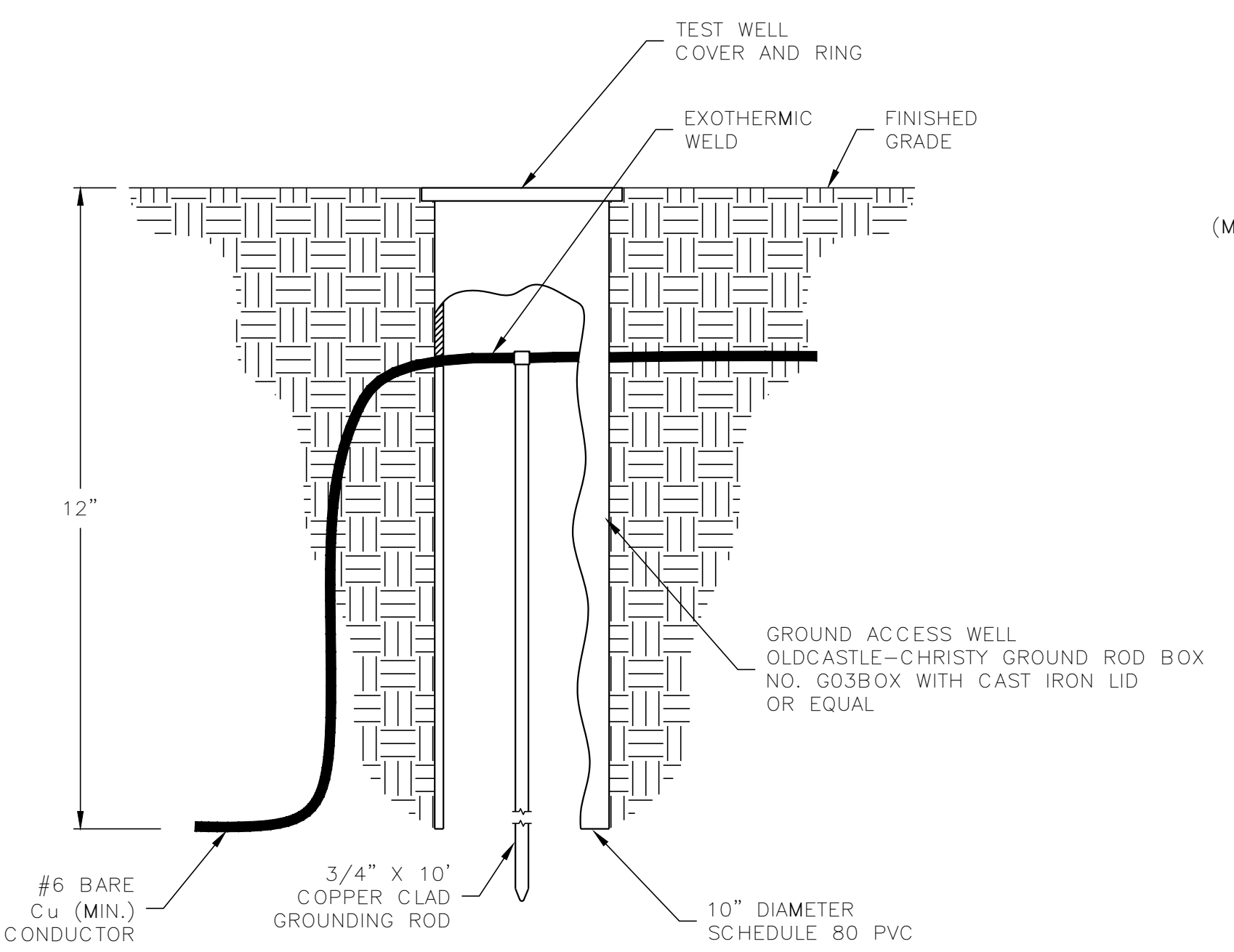
170 TYP GRS STUB UP DETAIL
NOT TO SCALE



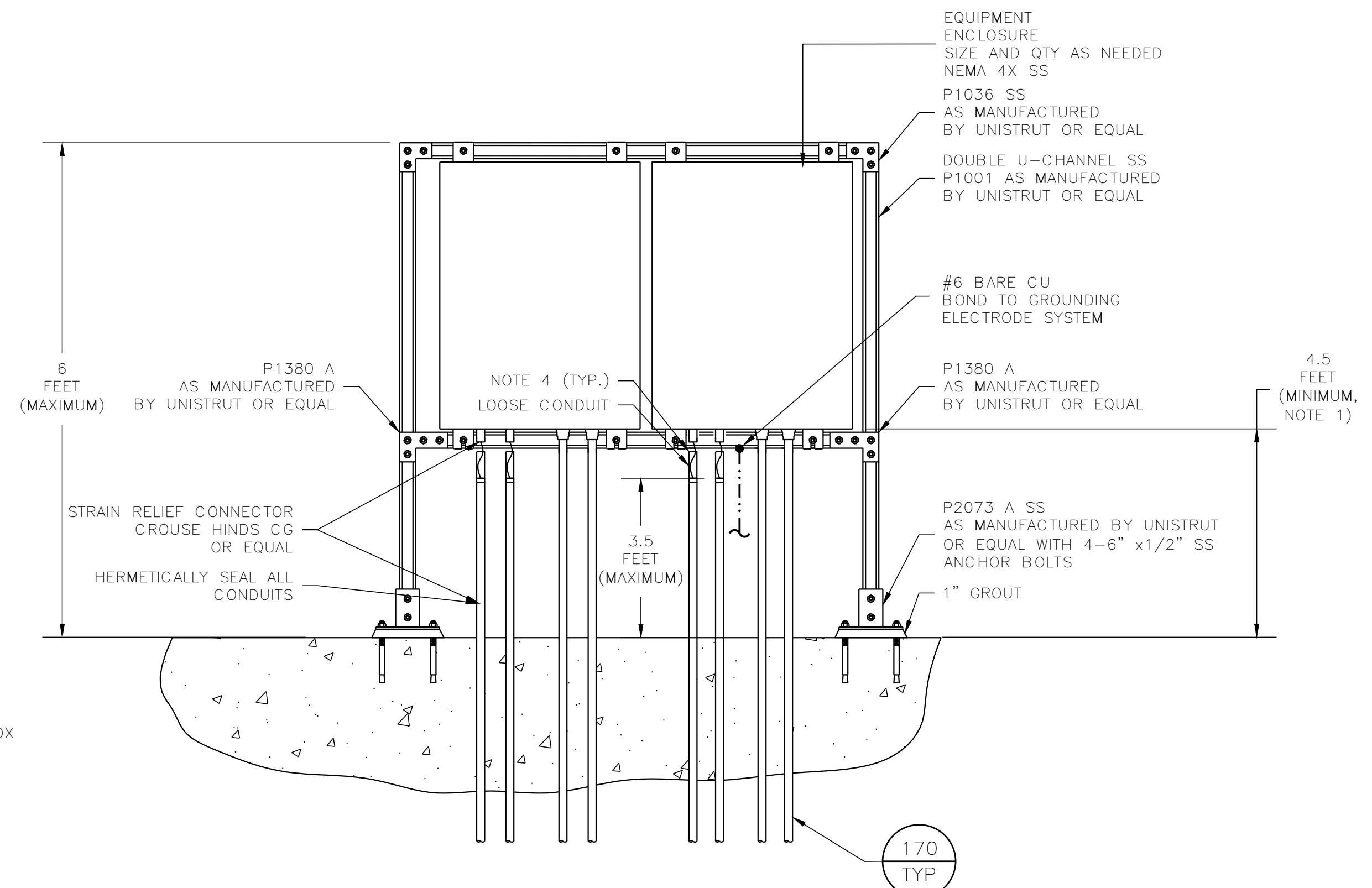
217 TYP FREE STANDING EQUIPMENT DETAIL
NOT TO SCALE



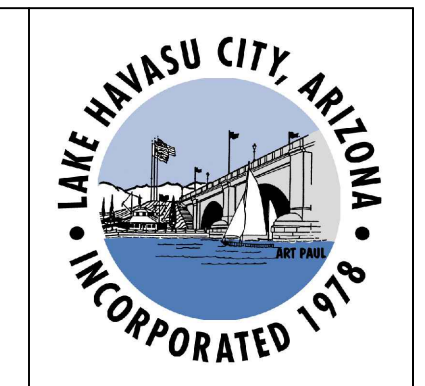
402 TYP 'UFER' GROUNDING DETAIL
NOT TO SCALE



406 TYP GROUND ROD WITH TEST ACCESS WELL
NOT TO SCALE



216 TYP JUNCTION BOX MOUNTING DETAIL
NOT TO SCALE

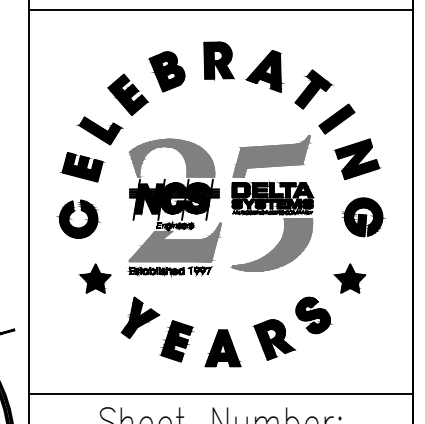


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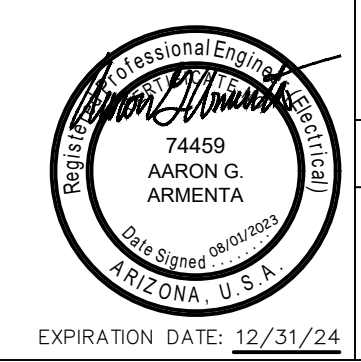
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ELECTRICAL DETAILS



Sheet Number:
E-08
Sheet 17 of 19



CONSTRUCTION DRAWINGS

| ISA INSTRUMENT IDENTIFICATION TABLE | | | | |
|-------------------------------------|---------------------|-----------------------------|---|---------------|
| FIRST LETTERS | | SUCCEEDING LETTERS | | |
| MEASURED OR INITIATING VARIABLE | MODIFIER | READOUT OR PASSIVE FUNCTION | OUTPUT FUNCTION | MODIFIER |
| A ANALYZER | | ALARM | | AUTO |
| B BURNER, COMBUSTION | | | | |
| C CONDUCTIVITY | | | CONTROL | CLOSED |
| D DENSITY | DIFFERENTIAL | | | |
| E VOLTAGE | | ELEMENT | | |
| F FLOW | RATIO | | | |
| G GAUGE | | GLASS, VIEWING DEVICE | | |
| H HAND | | | | HIGH |
| I CURRENT | | INDICATE | | |
| J POWER | SCAN | | | |
| K TIME, TIME SCHED. | TIME RATE OF CHANGE | | CONTROL STATION | |
| L LEVEL | | LIGHT | | LOW |
| M MOTION | | | | MIDDLE |
| N INTRUSION | | | | NORMAL |
| O TORQUE | | ORIFICE, RESTRICTION | | OPEN |
| P PRESSURE | | POINT CONNECTION | | STOP |
| Q QUANTITY | INTEGRATE, TOTALIZE | | | |
| R RADIATION | | RECORD, OR PRINT | | RUN OR REMOTE |
| S SPEED, FREQUENCY | SAFETY | | SWITCH | START |
| T TEMPERATURE | | | TRANSMIT | |
| U MULTIVARIABLE | | MULTIFUNCTION | MULTIFUNCTION | MULTIFUNCTION |
| V VIBRATION | | | VALVE, LOUVER | |
| W WEIGHT | | WELL | | |
| X MOTOR | X-AXIS | UNCLASSIFIED | UNCLASSIFIED | UNCLASSIFIED |
| Y EVENT, STATE, OR PRESENCE | Y-AXIS | | RELAY, COMPUTE, CONVERT | |
| Z POSITION | Z-AXIS | | DRIVER, ACTUATOR, FINAL CONTROL ELEMENT | |

| P&ID ABBREVIATIONS | | | |
|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| A AMPERE | AFD ADJUSTABLE FREQUENCY DRIVE | AI ANALOG INPUT | AIC AMPS INTERRUPTING CAPACITY |
| ARV AIR RELIEF VALVE | AO ANALOG OUTPUT | AS AIR SUPPLY | ATS AUTOMATIC TRANSFER SWITCH |
| AUTO AUTOMATIC | CB CIRCUIT BREAKER | CL2 CHLORINE | CON CONTACTOR |
| CU COPPER | CV CONTROL VALVE | DCS DISTRIBUTED CONTROL SYSTEM | DI DISCRETE INPUT |
| DO DISSOLVED OXYGEN, DISCRETE OUTPUT | DP DIFFERENTIAL PRESSURE | DWG DRAWING | EGO EMERGENCY GAS OFF |
| ETM ELAPSED TIME METER | ETMf ELAPSED TIME METER (FAST SPEED) | ETMs ELAPSED TIME METER (SLOW SPEED) | EOL ELECTRONIC OVERLOAD |
| EXIST EXISTING | FA FOUL AIR | FC FAIL CLOSED | FE FINAL EFFLUENT |
| FR FORWARD-REVERSE | FS FLOAT SWITCH | FVNR FULL VOLTAGE NON-REVERSING | FW FINISHED WATER |
| GND GROUND | GAL GALLONS | GPD GALLONS PER DAY | GPH GALLONS PER HOUR |
| GPM GALLONS PER MINUTE | H, HI HIGH | H2S HYDROGEN SULFIDE | HMI HUMAN MACHINE INTERFACE |
| HOA HAND-OFF-AUTO | IO INPUT/OUTPUT | IOE INTERNAL-OFF-EXTERNAL | |
| JB JUNCTION BOX | L, LO LOW | LAN LOCAL AREA NETWORK | LC LOOP CONTROLLER |
| LCP LOCAL CONTROL PANEL | LOS LOCK-OFF-STOP | LOC/REMOTE LOCAL/REMOTE | LS LEVEL (i.e., FLOAT) SWITCH |
| M MOTOR | MA MANUAL/AUTO | mA MILLIAMPS | MC MANUFACTURE CABLE |
| MCC MOTOR CONTROL CENTER | MCP MOTOR CIRCUIT PROTECTOR | MFR(S) MANUFACTURER(S) | MGD MILLION GALLONS PER DAY |
| MILLIGRAMS PER LITER | MH MANHOLE | MLR MIXED LIQUOR RETURN | MO MOISTURE |
| MOD MODULATED | MTU MASTER TELEMETRY UNIT | NPW NON-POTABLE WATER | NS NITROGEN SUPPLY |
| NTU TURBIDITY | O/C OPEN / CLOSE | OCA OPEN-CLOSE-AUTO | OCS SOLID STATE STARTER (SOFT START) |
| OIT OPERATOR INTERFACE TERMINAL | OL OVERLOAD | OO ON/OFF (MAINTAINED) | OOA ON-OFF-AUTO |
| OOR ON-OFF-REMOTE | OSC OPEN-STOP-CLOSE | PAH PRESSURE ALARM HIGH | PER PERMISSIVE |
| PLC PROGRAMMABLE LOGIC CONTROLLER | PNL PANEL | PO PULSE OUTPUT | POS POSITION |
| POT POTENTIOMETER | PPG POUNDS PER GALLON | PPH POUNDS PER HOUR | PPM PARTS PER MILLION |
| PAIR PAIR | PRES PRESSURE | PS PRESSURE SWITCH | PSI POUNDS PER SQUARE INCH |
| PV PROCESS VARIABLE | RAS RETURN ACTIVATED SLUDGE | RAW RAW WATER | REM REMOTE |
| RF RADIO FREQUENCY | RIO REMOTE INPUT OUTPUT | RS RAW SEWAGE | RSP RAW SEWAGE PUMP |
| RST RESET | RTD RESISTANCE TEMPERATURE DETECTOR | RTU REMOTE TELEMETRY UNIT | RUNf RUN (FAST SPEED) |
| RUNs RUN (SLOW SPEED) | SB SLUDGE BLANKET | SEQ SERVICE ENTRANCE EQUIPMENT | SES SERVICE ENTRANCE SECTION |
| SINGLE LOOP CONTROLLER | SLS SOLID STATE STARTER | SO2 SULFUR DIOXIDE | SOV SOLENOID OPERATED VALVE |
| SP SET POINT | SPD SPEED | SPR SPARE | SS START/STOP (MAINTAINED) |
| SSS SOLID STATE STARTER (SOFT START) | STR MOTOR STARTER | TAH TEMPERATURE ALARM HIGH | T/M TEMPERATURE AND/OR MOISTURE |
| TEMP TEMPERATURE | TS TEMPERATURE SWITCH | TSS TOTAL SUSPENDED SOLIDS | UG UNDERGROUND |
| USD UP/STOP/DOWN | V VOLT | VFD VARIABLE FREQUENCY DRIVE | W WATER |
| WAS WASTE ACTIVATED SLUDGE | WW WASTEWATER | WMTR WASTEWATER TRANSMITTER | ZS POSITION (i.e., LIMIT) SWITCH |

| TAG NUMBERS AND DESIGNATIONS | | LINE SYMBOLS | |
|---------------------------------|---|--------------|---|
| | FIRST LETTER SUCCEEDING LETTER(S) LOOP DESIGNATION NUMBER | | MAJOR PROCESS PIPING OR FLOW CHANNEL |
| | | | EXISTING SECONDARY PROCESS PIPING |
| | | | ELECTRICAL SIGNAL |
| | | | PNEUMATIC SIGNAL |
| | | | SIGNAL CONNECTION POINT |
| | | | PROCESS OR SIGNAL LINE GOING TO ANOTHER SHEET (MATCH LETTERS) |
| | | | PROCESS LINES CROSSING (NOT CONNECTED) |
| | | | INTERNAL SYSTEM SIGNAL LINK (SOFTWARE OR DATA LINK) |
| HAND SWITCH DESIGNATIONS | | | |
| ES EMERGENCY STOP | HOA HAND-OFF-AUTO | | |
| HOR HAND-OFF-REMOTE | HORA HAND-OFF-REMOTE-AUTO | | |
| JOA JOG-OFF-AUTO | LOR LOCAL-OFF-REMOTE | | |
| LR LOCAL-REMOTE | OC OPEN-CLOSE | | |
| OO ON-OFF | S/S START STOP PUSH BUTTONS | | |

| P&ID VALVE SYMBOLS | |
|--------------------|---|
| | GATE OR GENERIC VALVE |
| | 3-WAY VALVE |
| | 4-WAY VALVE |
| | ANGLE VALVE |
| | BUTTERFLY VALVE |
| | PLUG VALVE |
| | ECCENTRIC PLUG VALVE |
| | BALL VALVE |
| | CHECK VALVE |
| | SWING CHECK VALVE |
| | STOP CHECK VALVE |
| | BALL CHECK VALVE |
| | PINCH VALVE |
| | DIAPHRAGM VALVE |
| | DIAPHRAGM VALVE (ALTERNATE) |
| | GLOBE VALVE |
| | HAND VALVE |
| | KNIFE VALVE |
| | MOTORIZED VALVE ACTUATOR |
| | SOLENOID VALVE 2-WAY |
| | SOLENOID VALVE 3-WAY |
| | PUMP CONTROL VALVE |
| | FLOW CONTROL VALVE |
| | PRESSURE RELIEF VALVE |
| | VACUUM RELIEF VALVE |
| | PRESSURE REGULATOR WITH REMOTE PROCESS CONNECTION |
| | PRESSURE REGULATOR SELF CONTAINED |
| | AIR RELEASE VALVE |

| P&ID EQUIPMENT AND PROCESS SYMBOLS | |
|------------------------------------|--|
| | METERING PUMP WITH MANUAL STROKE CONTROL |
| | ROTARY LUBE PUMP |
| | SUBMERSIBLE MIXER |
| | AERATOR |
| | SUBMERSIBLE PUMP |
| | DIESEL GENERATOR |
| | CENTRIFUGAL PUMP |
| | BLOWER |
| | LIFT PUMP |
| | MOTOR OR MOTOR ACTUATOR |
| | PNEUMATIC ACTUATOR |
| | SOLENOID |
| | VERTICAL TURBINE PUMP |
| | CHLORINE TANK |
| | WEIGHT SCALE |
| | AIR COMPRESSOR |
| | SLUICE GATE |
| | SAMPLER |
| | PROPELLER FLOWMETER ELEMENT |
| | MAGNETIC FLOWMETER ELEMENT |
| | CL2 FLOWMETER |
| | MASS FLOW METER |
| | INSERTION TYPE MASS FLOW METER |
| | MASS FLOW METER ANNUBAR TYPE |
| | DRAIN |
| | OUTLET SILENCER |
| | INLET SILENCER |
| | ROTAMETER |
| | AIR RELIEF VALVE |
| | EJECTOR |
| | DIAPHRAGM SEAL |
| | DIFFUSER |
| | DIAPHRAGM |
| | Y-TYPE STRAINER |
| | IPS CORPORATION STOP |
| | PVC DIFFUSER WITH IPS CORPORATION STOP |

| SENSING, INDICATION, AND CONTROL SYMBOLS | |
|--|---|
| | ULTRASONIC LEVEL TRANSDUCER |
| | FLOAT SWITCH |
| | BEACON R=RED, A=AMBER, B=BLUE, G=GREEN |
| | STOP INDICATING LIGHT |
| | HOA HAND SWITCH |
| | ORP ANALYZER |
| | pH ANALYZER |
| | ANALYZER ELEMENT |
| | DO SENSOR |
| | ORP SENSOR |
| | pH SENSOR |
| | DO ANALYZER |
| | RESIDUAL CL2 CHLORINE SENSOR |
| | RESIDUAL CL2 CHLORINE ANALYZER |

| P&ID INTERFACE SYMBOLS | |
|------------------------|---|
| | PILOT LIGHT X=LENS COLOR, R=RED, G=GREEN, A=AMBER B=BLUE |
| | FIELD DEVICE |
| | PANEL DEVICE |
| | DEVICE MOUNTED IN SUBPANEL |
| | REMOTE I/O TERMINAL |
| | HMI OR OIT FUNCTION |
| | INTERLOCK DEVICE OR RELAY X=NOTE REF. |
| | DUAL CHANNEL CURRENT ISOLATOR |
| | DISCRETE INPUT |
| | DISCRETE OUTPUT |
| | ANALOG INPUT |
| | ANALOG OUTPUT |
| | PULSE INPUT |

NOTE:
REFER TO ISA INSTRUMENT IDENTIFICATION TABLE FOR DEFINITION OF LETTERS BBB INSIDE THE BUBBLES. CCC REPRESENTS LOOP ID (IF USED). SEE ABBREVIATIONS LIST FOR SUPERScript AAA.



LAKE HAVASU CITY
PUBLIC WORKS DEPARTMENT
PARK AVENUE LIFT STATION
RENOVATION

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DRAWN BY: CFL
CHECKED BY: ACA
DATE: 08/01/23
Dwg scale: AS NOTED

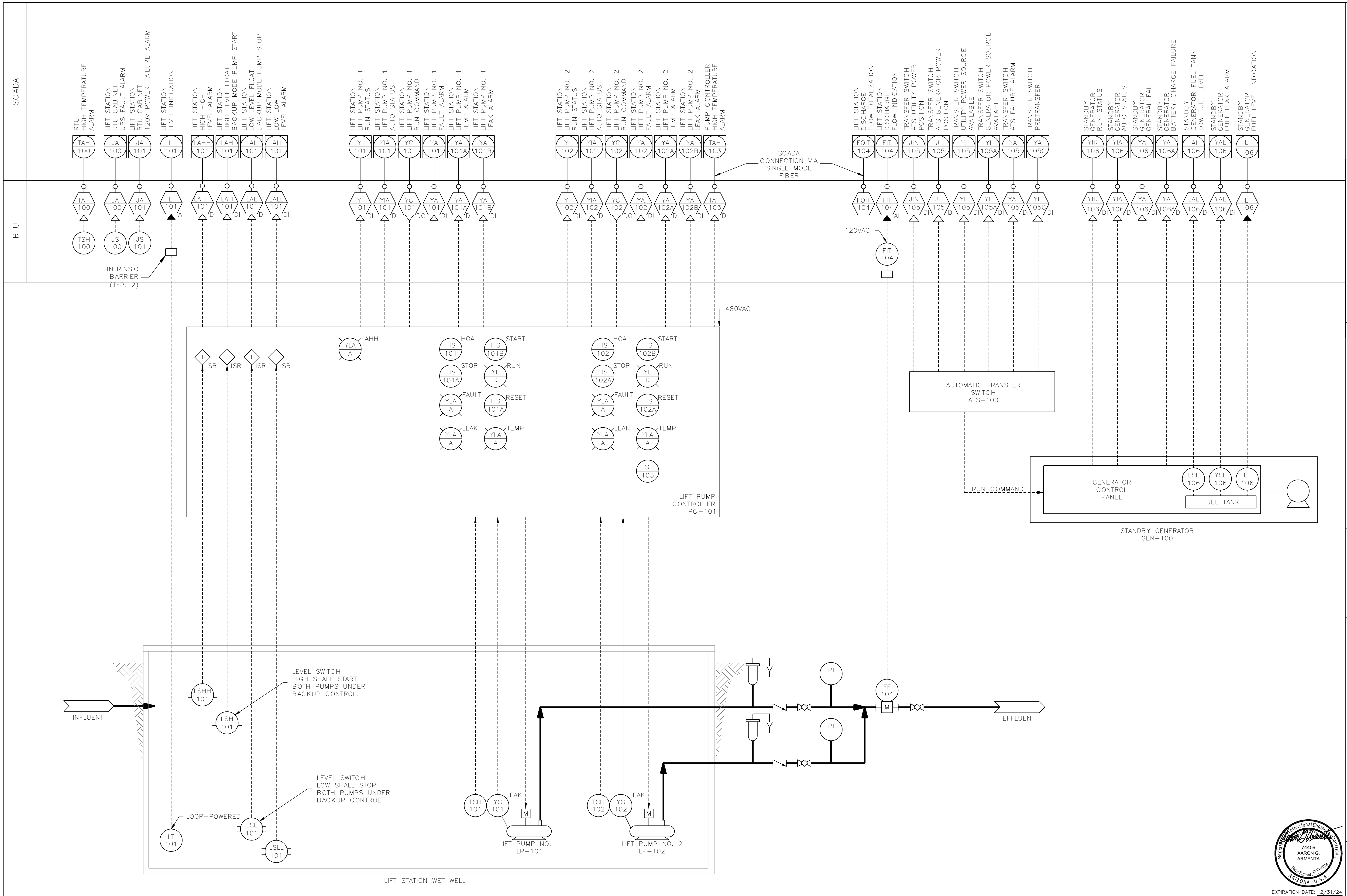
P&ID SYMBOLS AND LEGEND



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74459
AARON G. ARMENTA
ARIZONA, U.S.A.
EXPIRATION DATE: 12/31/24

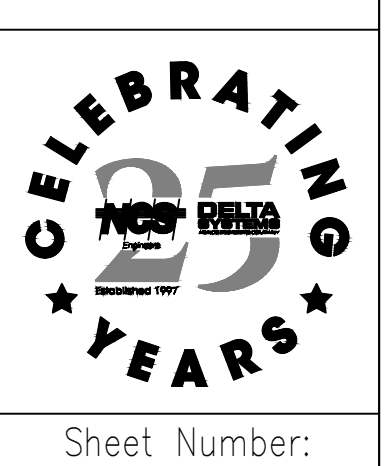


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LAKE HAVASU CITY
PUBLIC WORKS DEPARTMENT
PARK AVENUE LIFT STATION
RENOVATION
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P&ID



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