



Town of Surfside

ITB 2024-01

Abbott Avenue Stormwater Improvements Project

Addendum No. 4

Date Issued: May 31, 2024

To All Proposers:

Proposers for the above-referenced ITB shall take note of the following changes, additions, deletions or clarifications to ITB No. 2024-01, which in accordance with the ITB Documents shall become a part of and have precedence over anything shown or described otherwise in the ITB.

THE FOLLOWING CHANGES, ADDITIONS, DELETIONS, RESPONSES AND CLARIFICATIONS TO ITB NO. 2024-01 ARE PROVIDED BY THE TOWN BELOW:

- 1. The following dates and times have been changed:

Event	Date*	Time* (EDT)
Deadline to Submit Questions / Requests for Clarification	June 5, 2024	5:00 PM

* Time indicated for all Bid events, reflect the time for the current U.S. Eastern Time Zone

- 2. With this Addendum, the Town is hereby submitting amended Electrical Plan sheets, dated 5/31/2024 to replace Electrical Plan Sheets in Attachment B. These Electrical Plan sheets supersede the prior Electrical plan sheets. See attached Electrical Plan Sheet Index Log.

Summary of Revisions to the Electrical Plan Sheets:

- 1. The Electrical Plan revisions reflect the change to a single pump, simplex operation at each of the two Pump Stations.
- 2. The Power services were changed to 200 Amp Services.

Responses to Bidders Questions

- 3. **Question/Comment Received:**. addendum #3. Sheets E-300 & E-400 still show (1) 140HP & (1) 35HP pumps, but the new add 3 pumps are now proposed at 45hp, one for each pump

station. Please confirm.

Town Response: See Amended Electrical Plan Sheets issued with this addendum.

- 4. Question/Comment Received: Plans page CP-401- Top left of the page show stormwater PS #1 dimensions as 10'x15'. Right side of the page show 8'x8' including concrete walls. Confirm allowable sump dimensions for pump design flow of 9,034 GPM @ 8.01'.**

Town Response: Dimensions in Detail are correct. On Plan Sheet CP-401 the first line in the plan note in the Stormwater Pump Station Location plan is revised to read: "CONST. STORMWATER PS #1".

- 5. Question/Comment Received: Are the Formed Suction Intakes shown as grey and black dotted lines on CP-401 & CP-404 required?**

Town Response: Pump Suction Intakes are per the pump manufacturer recommendation for the design pump.

- 6. Question/Comment Received: Confirm sump floor BOT. EL on CP-404. Currently shown (-)6.00' however pump off is shown as (-)6.50'?**

Town Response: The sump floor elevation is to be (-)10.5'. Modify sump label on plan sheet CP-404 to be "BOT.EL = (-)10.5'.

- 7. Question/Comment Received: Per your Add 3 response to Question 8 we are asking for approval to provide the alternative pump which is Made in USA and meets or exceeds the materials specified.**

Town Response: Submit Contractor proposed Pump Specification prior to Deadline to Submit Questions for bid. The intent is to issue Response on alternate pump acceptance within 48 hours after Deadline to Submit Questions for bid.

- 8. Question/Comment Received: Control Panel Sheets E-300 & E-400 still show (1) 140HP & (1) 35HP pumps, will there be updated drawings supplied? Since the pump stations are now designed for a 1 pump operation, are the control panels to be set up for simplex operation or duplex operation with the same newly specified pump 45HP? Possibly for future installation of secondary pump. Need clarification.**

Town Response: See Amended Electrical Plan Sheets issued with this addendum. Intent is single pump, simplex operation at each station.

- 9. Question/Comment Received: Can we discharge water from the well point systems into the pump stations at the end of 91 and 92 streets?**

Town Response: Contractor is responsible for the dewatering permit. The Town will allow use of the Town's drainage system for dewatering discharge, so long as discharge meets the dewatering permit criteria, and commits to clean all portions of the drainage system used in the dewatering operation, after the de-watering operation is completed.

10. Question/Comment Received: Is there a DERM permit being provided by the through the Town?

Town Response: Yes.

11. Question/Comment Received: If the Town is not providing a DERM permit how does the contractor protect itself from any issues that may arise from DERM during or after the project?

Town Response: Town is providing DERM permit for the Designed system.

PROPOSER:

NAME: _____

TITLE: _____

DATE: _____



Electrical Plan Sheet Index Log (Contains all Electrical sheets in Plan Set)

Project Number: 11494.01
 Status: BID

Project Name: Abbott Avenue Stormwater Drainage Design

Date: 05/31/2024

Sheet No.	Sheet ID Designators	Sheet Title	Issued Date	Rev #	Revision Date	Brief Revision Description	CAD Drawing Filename (.dwg)
	E-100-91 ST	ELECTRICAL GENERAL NOTES-91 ST STREET	5/31/2024		5/31/2024	BID Addendum #4	
	E-200-91 ST	ELECTRICAL SITE AND DETAIL PLAN-91 ST STREET	5/31/2024		5/31/2024	BID Addendum #4	
	E-300-91 ST	ELECTRICAL RISER DIAGRAM, NOTES AND LOAD CALCULATION-91 ST STREET	5/31/2024		5/31/2024	BID Addendum #4	
	E-400-91 ST	CONTROL DETAILS-91 ST STREET	5/31/2024		5/31/2024	BID Addendum #4	
	E-500-91 ST	CONTROL PANEL DETAILS-91 ST STREET	5/31/2024		5/31/2024	BID Addendum #4	
	E-600-91 ST	ELECTRICAL DETAILS-91 ST STREET	5/31/2024		5/31/2024	BID Addendum #4	
	E-100-92 ND	ELECTRICAL GENERAL NOTES-92 ND STREET	5/31/2024		5/31/2024	BID Addendum #4	
	E-200-92 ND	ELECTRICAL SITE AND DETAIL PLAN-92 ND STREET	5/31/2024		5/31/2024	BID Addendum #4	
	E-300-92 ND	ELECTRICAL RISER DIAGRAM, NOTES AND LOAD CALCULATION-92 ND STREET	5/31/2024		5/31/2024	BID Addendum #4	
	E-400-92 ND	CONTROL DETAILS-92 ND STREET	5/31/2024		5/31/2024	BID Addendum #4	
	E-500-92 ND	CONTROL PANEL DETAILS-92 ND STREET	5/31/2024		5/31/2024	BID Addendum #4	
	E-600-92 ND	ELECTRICAL DETAILS-92 ND STREET	5/31/2024		5/31/2024	BID Addendum #4	

1.0 BASIC ELECTRICAL REQUIREMENTS

- 1.1 SCOPE OF WORK
A. FOR PURPOSE OF LEGIBILITY, DRAWINGS ARE DIAGRAMMATIC AND ALTHOUGH LOCATION OF EQUIPMENT IS SHOWN TO SCALE, THE CONTRACTOR SHALL VERIFY ALL INFORMATION AT THE SITE BEFORE BIDDING THE JOB.
B. WHEN DRAWINGS, NOTES AND THESE REQUIREMENTS ARE IN CONFLICT, THE MOST STRINGENT CONDITION SHALL APPLY UNLESS OTHERWISE APPROVED BY THE ENGINEER.
C. THE WORK CONSISTS OF ALL SUPERVISION, LABOR, MATERIALS, EQUIPMENT AND INSTALLATION REQUIRED FOR THE COMPLETE ELECTRICAL SYSTEMS AS SHOWN ON THE DRAWINGS OR CALLED FOR IN THESE REQUIREMENTS.
D. FURNISH, INSTALL AND MAINTAIN TEMPORARY ELECTRICAL POWER AND LIGHTING REQUIRED FOR ALL TRADES.
E. CONNECT ELECTRICAL EQUIPMENT FURNISHED BY OTHER TRADES EVEN IF NOT SHOWN ON ELECTRICAL DRAWINGS.

1.2 CODES AND STANDARDS

PERFORM WORK AND FURNISH EQUIPMENT COMPLYING WITH CURRENT EDITIONS OF THE FOLLOWING CODES:

- 1) NATIONAL ELECTRICAL CODE (NEC 2017)
- 2) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
- 3) UNDERWRITERS' LABORATORIES (UL)
- 4) NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
- 5) AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
- 6) INSULATED POWER CABLE ENGINEERS ASSOCIATION (IPCEA)
- 7) FLORIDA BUILDING CODE (FBC 2020)
- 8) INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)

1.3 SHOP DRAWINGS

WITHIN 30 DAYS AFTER THE DATE OF THE AWARD OF THE CONTRACT, AND BEFORE ANY MATERIAL OR EQUIPMENT IS PURCHASED, SUBMIT TO THE ENGINEER FOR APPROVAL, A COMPLETE LIST IN QUANTIFIABLE ELECTRICAL MATERIALS, AND EQUIPMENT TO BE INCORPORATED IN THE WORK. INCLUDE CATALOG NUMBER, DIMENSIONS, INTERCONNECTION DIAGRAMS AND INSTALLATION INSTRUCTIONS.

1.4 OPERATION AND MAINTENANCE MANUALS

- 0 & M MAINTENANCE MANUALS MUST CONTAIN BUT NOT LIMITED TO THE FOLLOWING:
- 1) SYSTEM DESCRIPTION, AND OPERATING AND MAINTENANCE INSTRUCTIONS.
 - 2) MANUFACTURER'S NAME AND MODEL NUMBER OF ALL COMPONENTS.
 - 3) CONTROL AND WIRING DIAGRAMS WITH SEQUENCE OF OPERATION.
 - 4) LIST OF RECOMMENDED SPARE PARTS.

1.5 AS BUILT DRAWINGS

AFTER FINAL INSPECTION, FURNISH A SET OF REPRODUCIBLE "AS BUILT" DRAWINGS SHOWING DEPTHS AND ROUTING OF CONCEALED ELECTRICAL BELOW GRADE INSTALLATIONS AND ALL VARIATIONS BETWEEN THE ACTUAL WORK AND AS IT WAS SHOWN ON THE CONTRACT DRAWINGS.

1.6 MATERIALS

- A. FURNISH EQUIPMENT AND MATERIALS THAT ARE NEW AND LATEST DESIGN OF STANDARD PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF SUCH EQUIPMENT.
B. ALL MATERIALS SHALL BEAR THE LABEL OF UNDERWRITER'S LABORATORY FOR THE INTENDED USE.
C. EQUIPMENT ENCLOSURES SHALL BE NEMA 12 FOR INDOOR USE, AND NEMA 4X (STAINLESS STEEL) OR AS SHOWN ON DRAWINGS FOR OUTDOOR USE.
D. FURNISH LIGHTING FIXTURES WITH LAMPS AND 10 PERCENT (TWO MINIMUM) SPARE LAMPS OF EACH TYPE.
E. FURNISH FUSIBLE EQUIPMENT WITH FUSES AND 10 PERCENT (THREE MINIMUM) OF SPARE FUSES OF EACH TYPE.
1.7 INSTALLATION
A. INSTALL EQUIPMENT AT THE LOCATIONS SHOWN ON THE DRAWINGS FOLLOWING THE MANUFACTURER'S RECOMMENDATIONS.
B. COORDINATE INSTALLATION OF UNDERGROUND DUCTS AND CONDUITS WITH EXISTING UNDERGROUND UTILITIES. FIELD VERIFY ROUTING AND BURIAL DEPTH, DRAIN DUCTS AWAY FROM BUILDINGS TOWARD MANHOLES. LOW POINTS IN DUCT BANK RUNS ARE NOT ACCEPTABLE.
C. INSTALL FLOOR MOUNTED SELF SUPPORTED EQUIPMENT ON 4-INCHES HIGH CONCRETE PADS WITH STEEL REINFORCING. USE REQUIRED BOLTS, ANCHORS, INSERTS AND JOINT SLEEVES.
D. MAKE OPENINGS THROUGH WALLS, CEILING, ROADWAYS, FLOOR SLABS, ETC. REQUIRED FOR THE INSTALLATION OF ELECTRICAL EQUIPMENT, BUT CUTTING, WELDING, OR OTHER WEAKENING OF BUILDING STRUCTURE TO SIMPLIFY ELECTRICAL EQUIPMENT AND MATERIALS INSTALLATION ARE NOT PERMITTED, WHERE EXISTING WALLS, CEILING OR FLOOR SLABS HAVE TO BE CUT, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER BEFORE MAKING SUCH CUTS. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE DONE WHILE PROVIDING SUCH OPENINGS AND SHALL PATCH THE SURFACE TO MATCH ADJACENT MATERIALS AND FINISHES.
E. NO CONDUITS, SLEEVES, PIPES OR ANY OTHER ITEM SHALL BE EMBEDDED IN CONCRETE ALONG OR THROUGH ANY BEAM, COLUMN, FOOTING, GRADE BEAM, SLAB, WALL OR ANY OTHER STRUCTURAL MEMBER WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.
F. COORDINATE SHIPPING LENGTHS OF SWITCH GEARS AND MOTOR CONTROL CENTERS. THOSE ITEMS SHALL BE ABLE TO BE REMOVED AND REPLACED IN THE FUTURE THROUGH THE PERMANENT ACCESS PROVIDED IN THE STRUCTURE.
G. PROVIDE 36-INCHES WIDE, 3/16-INCHES THICK RUBBER MATS IN THE FRONT AND REAR OF SWITCH GEARS, MOTOR CONTROL CENTERS AND SWITCHBOARDS. MATS TO COMPLY WITH FEDERAL SPEC'S ZZ-F-416A.

1.8 TESTING

UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL ENERGIZE, START-UP AND TEST OPERATE ALL THE SYSTEMS AND EQUIPMENT IN THE PRESENCE OF THE ENGINEER. INSULATION RESISTANCE TESTS SHALL BE MADE ON 240 VOLT FEEDER WITH A 500 VOLT DC MEGGER. DEFECTS FOUND SHALL BE CORRECTED.

2.0 RACEWAYS

- 2.1 RIGID CONDUIT
A. STEEL: HOT DIPPED ZINC COATED, GALVANIZED, THREADED RIGID STEEL CONFORMING TO ANSI C80, AND FED. SPEC. WW-C-581. USE THREADED GALVANIZED STEEL FITTINGS.
B. ALUMINUM: CONTAINING LESS THAN 0.1 PERCENT COPPER AND CONFORMING TO FEDERAL SPECIFICATION WW-C-540C. USE THREADED ALUMINUM FITTINGS.
C. PLASTIC: RIGID, SCHEDULE 40, 90 DEGREES C., UL RATED, PVC PLASTIC CONFORMING TO UL 651, FED. SPEC. W-C-1094 AND NEMA TC-2. FITTINGS TO CONFORM WITH UL3 514 AND NEMA TC-3.
2.2 FLEXIBLE METAL CONDUIT
LIQUID-TIGHT: FLEXIBLE ZINC COATED CONFORMING TO UL 1 TYPE WITH LIQUID-TIGHT FLEXIBLE PLASTIC SHEATH, CONFORMING TO UL 360 STANDARD. FITTINGS, PER FED. SPEC. W-R-406B AND UL 514.

4.0 OUTLET, PULL AND JUNCTION BOXES

- A. OUTLET BOXES IN INDOOR FINISHED WALLS TO BE GALVANIZED STEEL, 4" X 4" X 1-1/2" CONFORMING TO FEDERAL SPECIFICATIONS WC-583 AND ANSI-C33.65.
B. EXTERIOR OUTLET BOXES, BOXES AND FITTINGS EMBEDDED IN CONCRETE, AND BOXES FOR EXPOSED CONDUIT RUNS SHALL BE CAST OF RUST RESISTING METAL, WITH FULL THREADED HUBS, AND SCREW TYPE RUBBER GASKET COVERS.
C. INSTALL BOXES FOR LIGHT SWITCHES LOCATED NEAR DOORS ON THE LOCK SIDE, EVEN WHERE THE SYMBOLS ARE INDICATED ON THE HINGE SIDES.
D. PULL AND JUNCTION BOXES SHALL BE OF 12 GAUGE WELDED ALUMINUM WITH HINGED COVER, NEMA 12 FOR INDOOR USE AND NEMA 4X FOR OUTDOOR USE. MINIMUM DIMENSIONS SHALL BE 12" X 12" X 6".
E. IN CORROSIVE AREAS OR WHERE CALLED FOR ON DRAWINGS, FURNISH PULL AND JUNCTION BOXES OF 14 GAUGE STAINLESS STEEL.
F. WHEN SPLICING CONTROL CONDUCTORS IN BOXES USE SCREW TYPE TERMINAL STRIP BLOCKS CLASS 9080 (C) AS MANUFACTURED BY SQUARE D OR EQUAL, IDENTIFY EVERY WIRE AT BOTH SIDES AND PROVIDE SPADE TYPE LUGS FOR TERMINATION.
G. PROVIDE PULL AND JUNCTION BOXES WHERE REQUIRED TO REDUCE LENGTH OF CABLE PULL OR REDUCE NUMBER OF ELBOWS BETWEEN OUTLETS.

5.0 SWITCHES AND RECEPTACLES

- A. FURNISH WALL SWITCHES OF THE QUIET AND TOTALLY ENCLOSED TUMBLER TYPE, WITH BODIES OF PHENOLIC COMPOUND. WIRING TERMINALS SHALL BE OF THE SCREW TYPE. NO MORE THAN ONE SWITCH SHALL BE INSTALLED IN A SINGLE-GANG POSITION. SWITCHES SHALL CONFORM TO FEDERAL SPECIFICATIONS WS-5896E, HUBBEL 1221 AND 1223, OR APPROVED EQUAL.
B. USE 20A, 125 V, DUPLEX, U-SLOTTED, GROUNDING TYPE RECEPTACLES THAT CONFORM TO FEDERAL SPECIFICATIONS WS-5960, HUBBEL 5362, OR EQUAL.
C. AMOUNT DUPLEX RECEPTACLES VERTICALLY. BOXES MOUNTED BACK TO BACK ARE NOT PERMITTED. GANGED RECEPTACLES AND SWITCHES SHALL HAVE SINGLE MULTI-GANG COVER PLATE.
D. FURNISH HOSPITAL GRADE GROUND FLOOR INTERRUPTER WITH DIFFERENTIAL CURRENT TRANSFORMER, SLOD STATE SENSING CIRCUITRY AND CIRCUIT INTERRUPTER. SENSITIVITY TO BE 5 MA, TRIPPING TIME 1/30TH OF A SECOND.
E. WHEN INSTALLING RECEPTACLES IN OUTDOOR LOCATIONS USE CAST-METAL OUTLET BOXES WITH GASKET WEATHERPROOF CAST-METAL COVER PLATES AND SPRING-FLAP CAP OVER EACH RECEPTACLE.
F. USE STAINLESS STEEL COVER PLATES FOR SWITCHES AND RECEPTACLES EXCEPT IN NON-INDUSTRIAL AREAS SUCH AS OFFICES, REST ROOMS, LABORATORIES, ETC.

6.0 MOTOR DISCONNECT SWITCHES & STARTERS

- A. PROVIDE EACH MOTOR WITH A DISCONNECTING MEANS MEETING THE REQUIREMENTS OF N.E.C. ARTICLE 430. SWITCHES SHALL BE HEAVY DUTY, HORSEPOWER RATED, SUITABLE TO BE PADLOCKED IN "OFF" POSITION AND CONFORM TO FEDERAL SPEC'S W-5-865, NEMA K51 AND ANSI C33.64. IF FUSES ARE REQUIRED, THEY SHALL BE CURRENT LIMITING TYPE.
B. SIZE DISCONNECTS AND STARTERS FOR THE FULL LOAD OF THE CONTROLLED MOTOR. THE HORSEPOWER RATINGS INDICATED ON THE DRAWINGS ARE SHOWN FOR THE BENEFIT OF THE CONTRACTOR AND DO NOT LIMIT EQUIPMENT SIZE.
C. FOR SINGLE-PHASE FRACTIONAL HORSEPOWER MOTORS, A SINGLE OR DOUBLE-POLE TOGGLE SWITCH WILL BE ACCEPTABLE PROVIDED THE AMPERE RATING OF THE SWITCH IS AT LEAST 125 PERCENT OF MOTOR RATING.
D. SWITCHES SHALL BE THE QUICK-BREAK TYPE AND DISCONNECT ALL UNGROUNDED CONDUCTORS.
E. FOR MOTORS LARGER THAN 1/4 HORSEPOWER, FURNISH STARTERS SPECIFICALLY DESIGNED FOR THE PURPOSE AND HAVING A HORSEPOWER RATING EQUAL TO THE MOTOR CONTROLLED.
F. PROVIDE MOTORS OF 1/8 HORSEPOWER OR LARGER WITH THERMAL-OVERLOAD PROTECTION. THE OVERLOAD PROTECTION DEVICE, OF THE MANUAL RESET TYPE AND WITH CONTACTS ON EACH PHASE, SHALL BE PART OF THE STARTER. SIZE THE OVERLOAD HEATER ELEMENTS ACCORDING TO THE MOTOR MANUFACTURER'S RECOMMENDATIONS AND BASED ON THE ACTUAL MOTOR NAMEPLATE FULL-LOAD CURRENT.
G. PROVIDE EACH MOTOR WITH A SUITABLE CONTROLLER OR DEVICE TO MAKE IT PERFORM AS REQUIRED. AUTOMATIC CONTROL DEVICES SUCH AS THERMOSTATS, FLOAT OR PRESSURE SWITCHES MAY DIRECTLY CONTROL THE START-STOP OF MOTORS UP TO 1/4 HORSEPOWER, PROVIDED THE DEVICES USED ARE DESIGNED FOR THE PURPOSE AND HAVE AN ADEQUATE HORSEPOWER RATING. WHEN THE AUTOMATIC-CONTROL DEVICE DOES NOT HAVE SUCH A RATING, A MAGNETIC STARTER SHALL BE USED WITH THE AUTOMATIC CONTROL DEVICE ACTIVATING THE COIL OF THE CONTACTOR.
H. PROVIDE 3 POSITION MANUAL-OFF-AUTO SWITCH WHEN MANUAL AND AUTOMATIC CONTROL IS REQUIRED. CONNECT THE SELECTOR SWITCH SO THAT ONLY THE AUTOMATIC DEVICES ARE BY-PASSED WHEN THE SWITCH IS IN THE "MANUAL" POSITION. ALL SAFETY DEVICES SUCH AS PRESSURE AND TEMPERATURE SWITCHES, MOTOR OVERLOAD AND SAFETY SWITCHES SHALL BE ACTIVE IN "MANUAL" AND "AUTOMATIC" POSITIONS.
I. MOTOR CONTROL CIRCUITS SHALL OPERATE AT 120V DERIVED, OBTAINED FROM THE LOAD SIDE OF THE MOTOR-DISCONNECT MEANS. IF THE MOTOR CIRCUIT IS MORE THAN 120V TO GROUND, FURNISH A CONTROL TRANSFORMER WITH FUSED PRIMARY AND SECONDARY CIRCUITS. STARTERS FOR MOTORS WITH SPACE HEATERS SHALL HAVE CONTROL TRANSFORMERS SIZED FOR THE ADDITIONAL LOAD.
J. FURNISH COMBINATION MOTOR STARTERS OF THE MOLDED CASE, MOTOR CIRCUIT PROTECTOR, CIRCUIT BREAKER TYPE, THREE PHASE, OF THE VOLTAGE AND SIZE AS SHOWN ON THE DRAWINGS BUT NOT SMALLER THAN THE SIZE REQUIRED BY THE CONTROLLED MOTOR, 120 VOLT CONTROL CIRCUIT, 3 THERMAL INTERCHANGEABLE OVERLOAD RELAYS, "HAND-OFF-AUTO" OR "ON-OFF" SWITCH AS REQUIRED BY THE APPLICATION, RED AND GREEN PLOT LIGHTS AND FOUR NORMALLY CLOSED AND NORMALLY OPEN INTERLOCK CONTACTS.
K. THE STARTER DISCONNECT SHALL BE OPERABLE BY AN EXTERNAL "ON-OFF" LABELED HANDLE, INTERLOCKED TO PREVENT OPENING THE ENCLOSURE DOOR WHILE THE DISCONNECT IS IN THE "ON" POSITION EXCEPT WHEN CONSCIOUSLY OPERATING A PERMISSIVE RELEASE DEVICE.
L. FURNISH STARTERS MANUFACTURED BY SQUARE D, CLASS 8536, ALLEN BRADLEY BULLETIN NO. 509, OR EQUAL.

7.0 PANEL BOARDS

- A. PROVIDE DEAD FRONT CIRCUIT BREAKER TYPE PANEL BOARDS WITH COPPER BUS AND AS SCHEDULED ON DRAWINGS. EACH PANEL BOARD SHALL BE PROVIDED WITH A SEPARATE GROUND BUS IN ADDITION TO THE NEUTRAL BUS. CIRCUIT BREAKERS SHALL BE BOLT-ON AND HAVE A MINIMUM INTERRUPTING RATING OF 10,000 AMPERES AT 120 VOLTS, AND 14,000 AMPERES AT 277 VOLTS. A TYPEWRITTEN DIRECTORY SHALL CLEARLY IDENTIFY THE LOAD SERVED BY EACH CIRCUIT AND SHALL BE MOUNTED INSIDE THE DOOR IN A METAL FRAME WITH PLASTIC COVER. CIRCUIT NUMBERS SHALL BE PERMANENTLY INDICATED ADJACENT TO EACH CIRCUIT BREAKER.
2.6 METAL FRAMING (CONTINUOUS SLOT METAL CHANNEL SYSTEM)
A. CONFIGURATION. SINGLE CHANNEL OR TWO SINGLE CHANNELS WELDED TOGETHER, WITH CONTINUOUS 7/8-INCH SLOT AND TO ACCEPT SPRING-HELD STEEL NUTS.
B. DIMENSIONS: FOR SINGLE CHANNEL, 1-5/8 INCHES BY 1-5/8 INCHES. FOR DOUBLE CHANNEL, 1-5/8 INCHES BY 3-1/4 INCHES BOTH 12-GAUGE. FITTINGS TO BE 1-5/8 INCHES WIDE BY 1/4 INCH-THICK MINIMUM.
C. FINISHING OF CHANNELS, PIPE CLAMPS AND FITTINGS TO BE HOT DIP GALVANIZED AFTER FABRICATION CONFORMING TO ASTM A123 OR A153, AS APPLICABLE MINIMUM WEIGHT OF COATING, 2.0 OUNCES PER SQUARE FOOT. NUTS, BOLTS AND SCREW TO BE ELECTRO GALVANIZED.

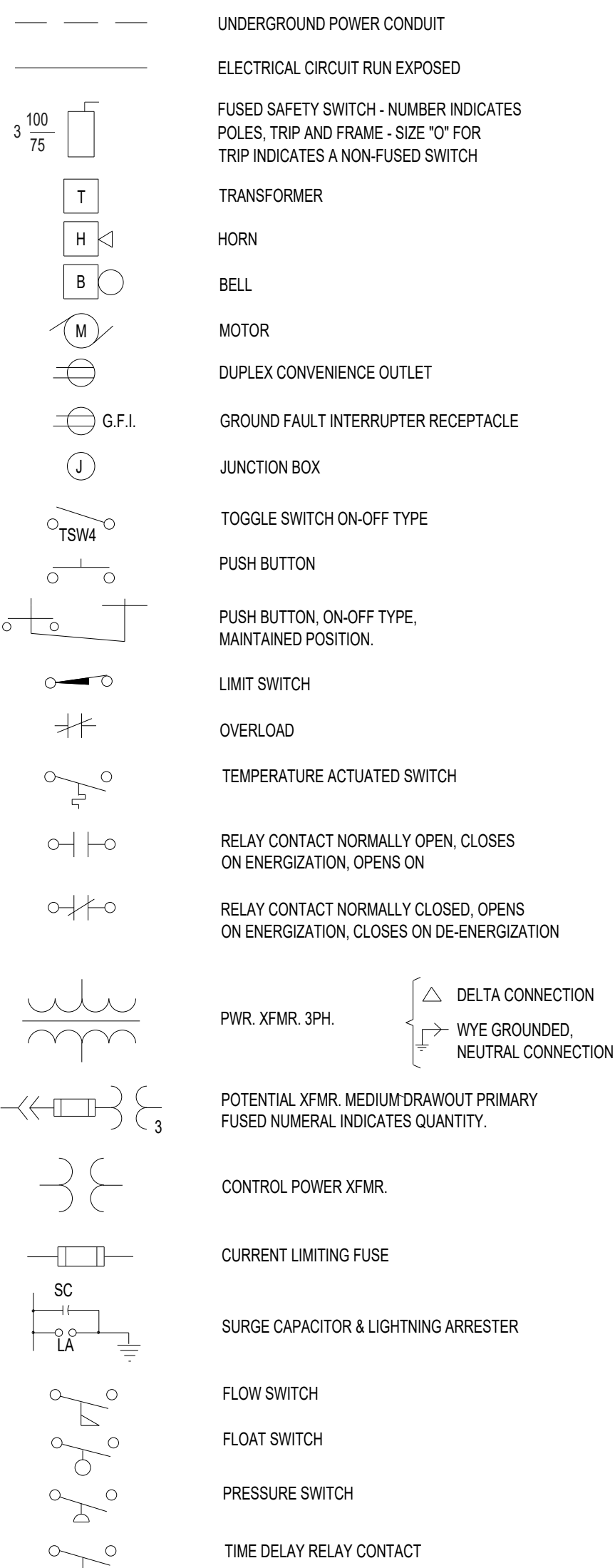
3.0 CONDUCTORS (600 VOLTS)

- 3.1 MATERIAL
A. FURNISH CONDUCTORS OF 98 % ANNEALED COPPER, 600 VOLT CLASS B, HEAT AND MOISTURE RESISTANT, THERMOPLASTIC TYPE THHN/THHW (SIZED BY THW RATING), WITH A POLYVINYL CHLORIDE INSULATION RESISTANT TO OIL, GASOLINE AND WEATHER. INSULATION SHALL MEET STANDARD 83.
B. CONDUCTORS TO BE STRANDED; #8 THROUGH #2 SHALL BE 7 STRAND; #1 THROUGH 4/0, 19 STRAND AND 250 MCM THROUGH 500 MCM, 37 STRAND.
3.2 IDENTIFICATION
A. COLOR CODE POWER CONDUCTORS AS FOLLOWS:
1) 120/240 VOLT SYSTEM: WHITE-NEUTRAL, BLACK-PHASE A, BLUE-PHASE B, RED-PHASE C.
2) 277/480 VOLT SYSTEM: GRAY-NEUTRAL, YELLOW-PHASE A, BROWN-PHASE B, ORANGE-PHASE C.
B. GROUNDING CONDUCTOR GREEN.
C. IDENTIFY FEEDERS, BRANCH CIRCUITS AND INSTRUMENTATION AND CONTROL WIRES AT TERMINATIONS, JUNCTION AND PULL BOXES.
3.3 INSTALLATION
A. DO NOT USE CONDUCTORS SMALLER THAN AWG #12 FOR POWER AND #14 FOR CONTROL UNLESS SPECIFICALLY INDICATED ON DRAWINGS.
B. DO NOT PULL CONDUCTORS INTO CONDUITS UNTIL THE MECHANICAL WORK HAS BEEN COMPLETED.
C. GROUP AND THE CONDUCTORS IN PANEL BOARDS, JUNCTION BOXES, PULL BOXES, ETC. FOR A NEAT AND ORDERLY APPEARANCE.
D. USE CONNECTORS, TERMINALS AND SPLICES THAT ARE DESIGNED AND APPROVED FOR THE SPECIFIC TYPE AND SIZE OF THE CONDUCTORS BEING CONNECTED.
E. FIREPROOF FEEDERS WHERE NOT PROTECTED BY CONDUITS LIKE IN MANHOLES, SWITCH GEARS, ETC.

8.0 GROUNDING

- A. INSTALL GROUNDING AS SHOWN ON DRAWINGS. WHERE NOT INDICATED, INSTALL IN COMPLIANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE. DO NOT USE CONDUCTORS SMALLER THAN SIZE AWG #12.
B. INACCESSIBLE CONNECTIONS SHALL BE MADE WITH THE EXOTHERMIC WELDING PROCESS USING EQUIPMENT MANUFACTURED BY BURUNDY OR ERICO PRODUCTS OR EQUAL.
C. ACCESSIBLE CONNECTIONS SHALL BE MADE WITH BURUNDY, MULTIPLE BOLT CONNECTORS SPECIFICALLY APPROVED FOR THE APPLICATION.
D. TO ASSURE ELECTRICAL CONTINUITY, INSTALL JUMPERS ACROSS METAL PARTS SEPARATED BY NON-CONDUCTING MATERIALS OR ATTACHED TOGETHER BY HIGH RESISTANCE JOINTS.
E. DO NOT EMBED GROUNDING CABLES DIRECTLY IN CONCRETE. USE SLEEVES WHEN PASSING CABLES THROUGH CONCRETE. BARE COPPER CABLES BURIED IN EARTH SHALL BE TINNED.

SYMBOL-LEGEND:



NOTES (CONTINUED):

- 18- ALL ELECTRICAL EQUIPMENT AND APPURTENANCES SHALL COMPLY WITH NEC 110.
19- MINIMUM CONDUIT SIZE TO BE 3/4" AND WIRE TO BE #12 CU.
20- LIGHTNING ARRESTER AND SURGE CAPACITOR SHALL BE INSTALLED IN PANEL AND CONNECTED TO A MULTI-WIRE LUG IN MAIN CIRCUIT BREAKER BY CONTROL PANEL MANUFACTURER.
21- GROUNDING AND NEUTRAL CONDUCTORS SHALL BE BONDED AT ENTRANCE POINT ONLY.
22- PROVIDE PANEL MANUFACTURER'S RECOMMENDED SPARE PARTS FOR TWO YEARS.
23- A. THE CONTRACTOR SHALL FURNISH SHORT-CIRCUIT AND PROTECTIVE DEVICE COORDINATION STUDIES AS PREPARED BY THE ELECTRICAL EQUIPMENT MANUFACTURER OR AN APPROVED ENGINEERING FIRM.
B. THE CONTRACTOR SHALL FURNISH AN ARC FLASH HAZARD ANALYSIS STUDY PER THE REQUIREMENTS SET FORTH IN NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE, AND NEC 110. THE ARC FLASH ANALYSIS SHALL BE PERFORMED ACCORDING TO THE IEEE 1584 EQUATIONS THAT ARE PRESENTED IN THE LATEST CURRENT EDITION OF THE NFPA-70E.
C. THE CONTRACTOR OF THE ARC FLASH HAZARD ANALYSIS SHALL PROVIDE WARNING LABEL INDICATING SEVERITY OF POTENTIAL EXPOSURE AND LEVEL OF PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIRED. LABEL TO BE AS PER DETAIL IN SHEET E-3.
24- RTU ANTENNA FOUNDATION, POLE SUPPORT AND CONDUIT TO RTU PANEL, PROVIDED AND INSTALLED BY CONTRACTOR.
25- AS PER NEC ARTICLE 409.110 REQUIREMENTS, THE CONTROL PANEL SHALL BE MARKED WITH A SHORT CIRCUIT RATING THAT IS DETERMINED BY BEING A LISTED AND LABELED ASSEMBLY OR BY ANOTHER APPROVED METHOD.
26- SCADA RTU AND COMMUNICATION EQUIPMENT WILL BE BY MISSION.
27- FINISHED FLOOR ELEVATIONS (FFE) AND TOP OF SLABS MUST BE TWO (2) FEET ABOVE BASE FLOOR ELEVATION AS ESTABLISHED BY THE AREA'S FEM FIRM MAP/PANEL.
28- AN ADDITIONAL 6" MAY BE REQUIRED IN AREAS WHERE SEA LEVEL RISE IMPACTS MAY BE EXPECTED.
29- PROVIDE NEMA 6 J. BOX AND HARD WIRE TO THE VALVE PIT SUMP PUMP. FLOAT SWITCH TO BE INSTALLED INSIDE THE VALVE VAULT TO SEND SIGNAL TO RTU AND TO CONTROL PANEL FOR LOCAL SIGNAL AS IT IS SHOWN ON CONTROL WIRING DIAGRAM AND RTU TERMINAL BLOCK ON SHEET E-600.



301 East Atlantic Blvd.
Pompano Beach, FL 33060
PH: (954) 788-3400

Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: L68860
Florida Landscape Architecture Business License: LC26000457

M.E. Engineering Consultants, Inc.
11401 SW 40TH Street Suite 301
Ph:(786)275-4635
CA 29121

REVISIONS

NO.	DESCRIPTION	DATE

PRELIMINARY PLAN NOT FOR CONSTRUCTION

THESE PLANS ARE NOT FULLY PERMITTED AND ARE SUBJECT TO REVISIONS MADE DURING THE PERMITTING PROCESS.

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE: 05/31/2024

DESIGNED BY: ZM

DRAWN BY: MT

CHECKED BY: ZM

BID-CONTRACT:

Zoila Morales, P.E.
P.E. NO. 64981

CLIENT



PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

ELECTRICAL GENERAL NOTES-91ST STREET

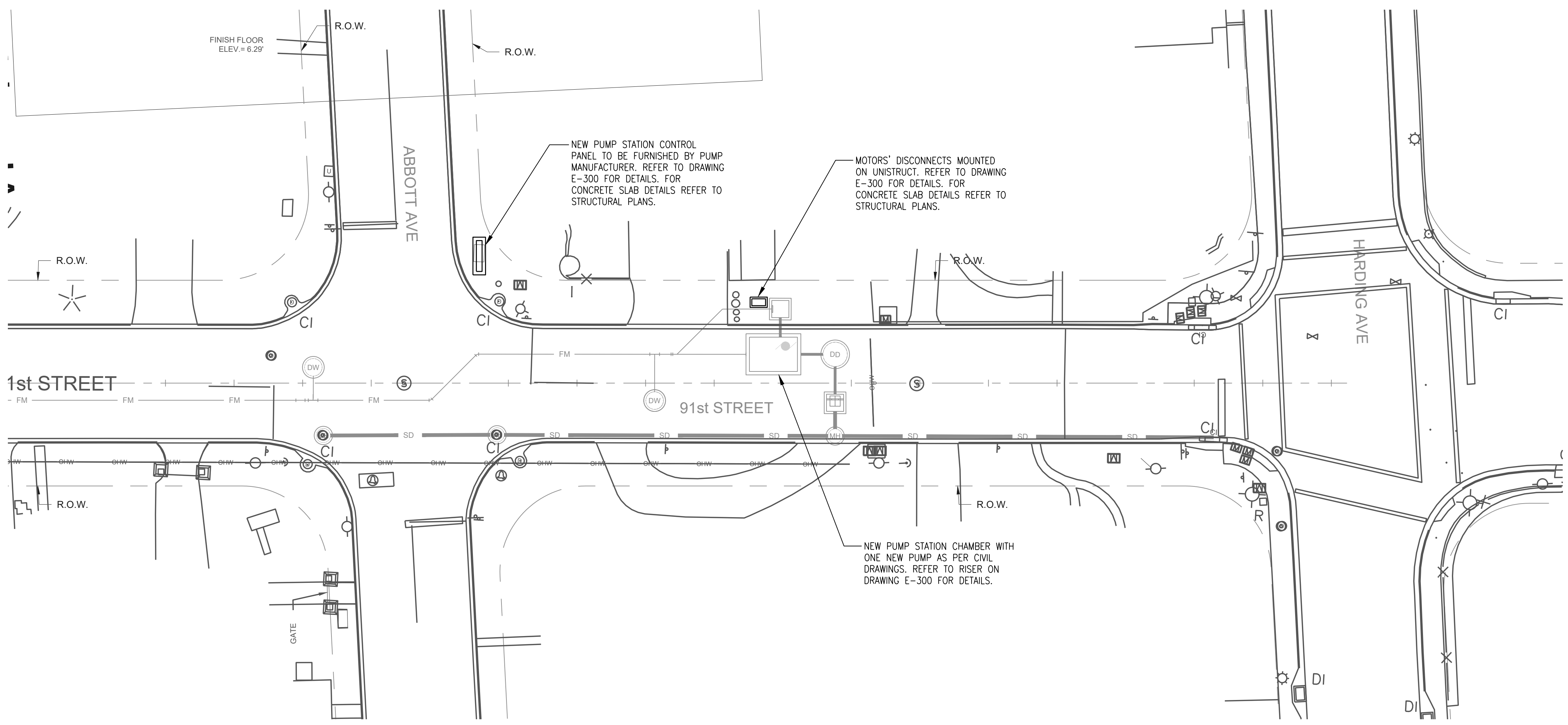
SHEET NUMBER E-100

PROJECT NUMBER 11494.01

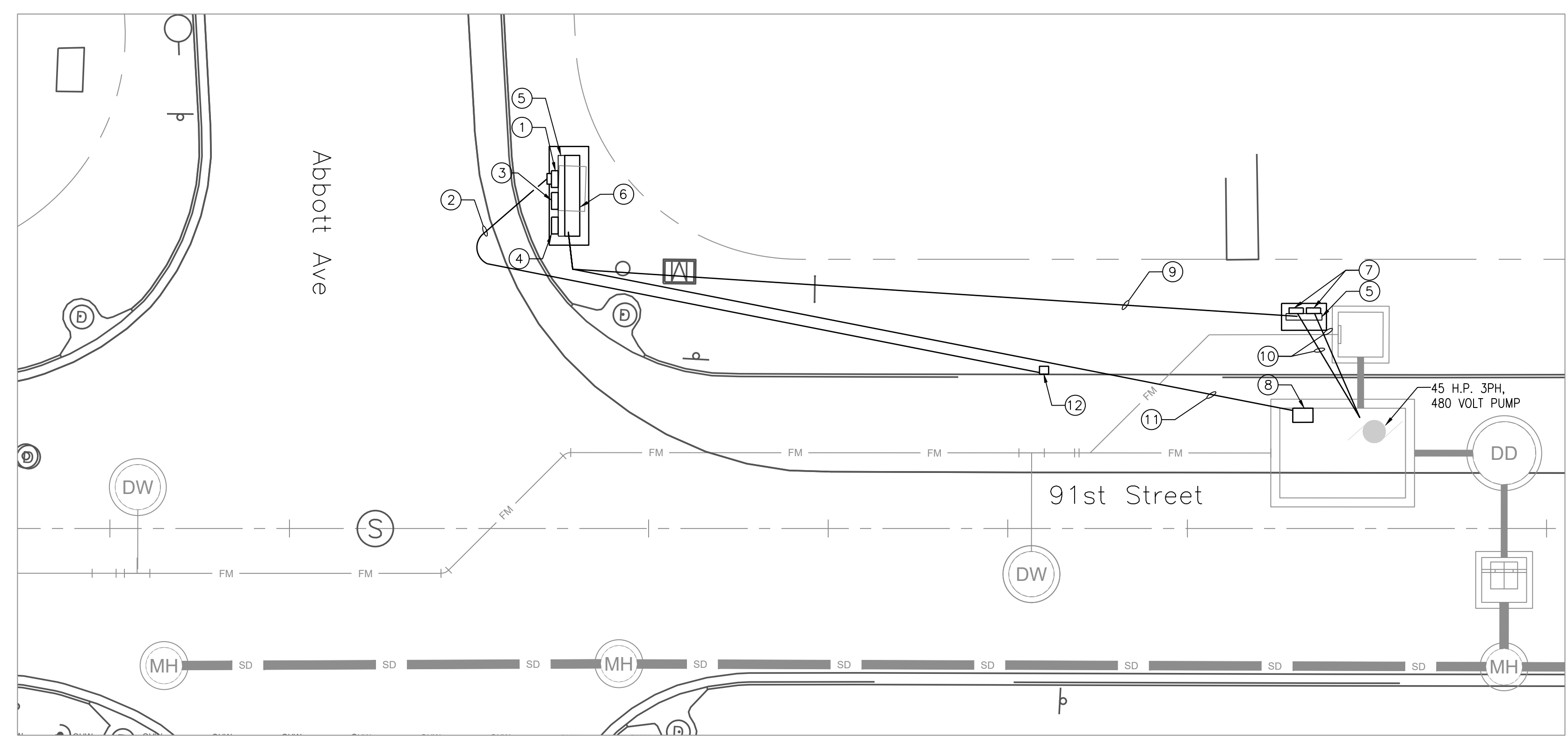
STATUS: PERMIT SET

Plotted by: me engineering cons On: 5/31/2024 12:03 PM

Drawing name: D:\Projects\2022\220616-Abbott Avenue Stormwater Improvements\MEP11494.01 GP-1XX-1-91stMEPRev-1.rvt.dwg



ELECTRICAL SITE PLAN
SCALE: 1"=20'-0"



ELECTRICAL PLAN
SCALE: 1"=10'-0"

CODED NOTES:

- ① PROPOSED LOCATION OF 200 AMP METER. COORDINATE WITH F.P.L. SEE RISER ON DRAWING E-300.
- ② NEW ELECTRICAL SERVICE. SEE DETAILS ON RISER ON DRAWING E-300. COORDINATE WITH FPL.
- ③ NEW 200 AMP 480 V 3 PHASE, NEMA 4X (PAD LOCKABLE) 14K AIC SERVICE ENTRANCE RATED, FUSED DISCONNECT SWITCH. FUSE 200 A, 600 V BUSSMAN TYPE LPS-RK OR APPROVED EQUAL.
- ④ MANUAL TRANSFER SWITCH 200 AMP, 600 V IN NEMA 4X ENCLOSURE FOR CONNECTION TO A PORTABLE GENERATOR.
- ⑤ GALVANIZED UNISTRUCT. SEE DETAIL ON DRAWING E-300. FOR EXACT PAD LOCATION SEE CIVIL DRAWING.
- ⑥ CONTROL PANEL IN NEMA 4X ENCLOSURE INCLUDING MOUNTING HARDWARE TO BE PROVIDED BY PUMP MANUFACTURER. REFER TO DETAILS ON DRAWING E-500.
- ⑦ 200 AMP 480 V, 3 PHASE NEMA 4X (PAD LOCKABLE) 150 A FUSED DISCONNECT SWITCH.
- ⑧ NEMA 6P WATERTIGHT JUNCTION BOX 6"x6"x6" WITH CONDUIT NUT TO RUN SENSOR CABLES. RUN FLOAT SWITCH SIGNAL CABLES AS PER MANUFACTURER RECOMMENDATIONS FROM FLOAT SWITCHES AT MANHOLE TO RTU AT CONTROL PANEL. TYPICAL OF 2.
- ⑨ POWER WIRES IN RIGID STEEL CONDUITS FROM CONTROL PANEL TO EACH PUMP DISCONNECT. REFER TO RISER ON DRAWING E-300.
- ⑩ PUMP POWER CABLES IN RIGID STEEL CONDUITS FROM EACH PUMP DISCONNECT TO EACH PUMP. CABLES PROVIDED BY MANUFACTURER. REFER TO RISER ON DRAWING E-300 FOR DETAILS.
- ⑪ TWO 2" AND TWO 1" RIGID STEEL CONDUITS. REFER TO RISER ON DRAWING E-300 FOR DETAILS.
- ⑫ PROPOSED FPL POINT OF SERVICE. PROVIDE PULL BOX AT BASE OF POLE AS PER FPL STANDARDS. COORDINATE WITH FPL REPRESENTATIVE FOR EXACT LOCATION AND REQUIREMENTS PRIOR TO INSTALLATION.

KEITH
301 East Atlantic Blvd.
Pompano Beach, FL 33060
PH: (954) 788-3400

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CLIENT

**ABBOTT AVENUE
DRAINAGE
IMPROVEMENTS**

SHEET TITLE

**ELECTRICAL SITE AND
DETAIL PLAN-91ST
STREET**

SHEET NUMBER **E-200**
PROJECT NUMBER 11494.01

Drawing name: D:\Projects\2022\2026-Abbott Avenue Stormwater Improvements\MEP\11494_01_CP_1XX - 91stMEPRev_1-VE.dwg STATUS: PERMIT SET

REVISIONS		
NO.	DESCRIPTION	DATE

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PROJECT

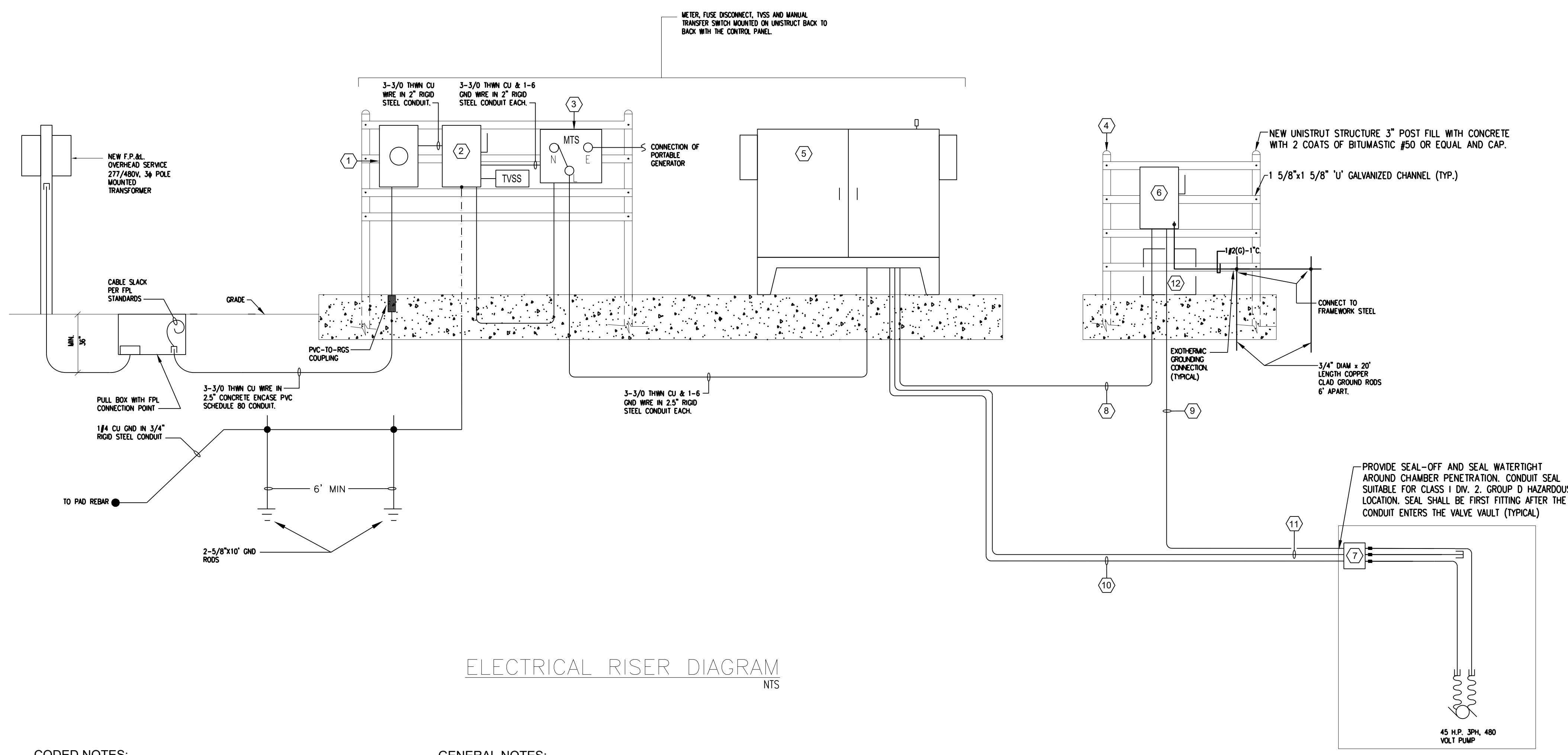
**ABBOTT AVENUE
 DRAINAGE
 IMPROVEMENTS**

SHEET TITLE

**ELECTRICAL RISER
 DIAGRAM, NOTES AND
 LOAD CALCULATION-
 91ST STREET**

SHEET NUMBER **E-300**

PROJECT NUMBER 11494.01



ELECTRICAL RISER DIAGRAM
 NTS

CODED NOTES:

- NEW 200 AMP METER. COORDINATE WITH F.P.L. AND FOLLOW THEIR STANDARDS.
- NEW 200 AMP 480 V 3 PHASE, NEMA 4X (PAD LOCKABLE) 14K AIC SERVICE ENTRANCE RATED, FUSED DISCONNECT SWITCH. FUSE 200 A, 600 V BUSSMAN TYPE LPS-RK OR APPROVED EQUAL.
- MANUAL TRANSFER SWITCH 200 AMP, 600 V IN NEMA 4X ENCLOSURE FOR CONNECTION OF A PORTABLE GENERATOR.
- GALVANIZED UNISTRUT FOR EXACT PAD LOCATION SEE CIVIL DRAWING.
- CONTROL PANEL IN NEMA 4X TYPE 316 STAINLESS STEEL ENCLOSURE (CONTINUOUS HINGE, PADLOCKABLE DOOR HANDLE). ENCLOSURE TO INCLUDE MOUNTING HARDWARE TO BE PROVIDED BY PUMP MANUFACTURER. REFER TO DETAILS ON DRAWING E-500.
- 200 AMP 480 V, 3 PHASE NEMA 4X (PAD LOCKABLE) 150 AMP FUSED DISCONNECT SWITCH. COORDINATE FUSE SIZE WITH MANUFACTURER SPECS.
- NEMA 6P WATERTIGHT JUNCTION BOX 6"x6"x6" WITH CONDUIT NUT TO RUN SENSOR CABLES. RUN FLOAT SWITCH SIGNAL CABLES AS PER MANUFACTURER RECOMMENDATIONS FROM FLOAT SWITCHES AT MANHOLE TO RTU AT CONTROL PANEL. TYPICAL OF 2. REFER TO DETAIL ON DRAWING E-400.
- POWER WIRES (3-#2 & 1-#6 GND) IN 2" RIGID STEEL CONDUITS FROM CONTROL PANEL TO EACH PUMP DISCONNECT. SIZE AS SHOWN.
- PUMP POWER CABLES (3-#2 & 1-#6 GND) IN 1.5" RIGID STEEL CONDUITS FROM PUMP DISCONNECT TO PUMP. CABLES PROVIDED BY MANUFACTURER. PROVIDE MINIMUM 10 FT OF SLACK CABLE INSIDE STRUCTURE.
- MANUFACTURER PROVIDED PUMP MONITORING PILOT CABLE IN 2" RIGID STEEL CONDUIT. PROVIDE MINIMUM 10FT OF SLACK CABLE INSIDE STRUCTURE.
- MANUFACTURER RECOMMENDED TUBING FOR BUBBLER TUBE IN 1" RIGID STEEL CONDUIT. INSTALL TUBING AND CONDUIT IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
- MOTOR CONNECTION BOX. REFER TO DETAIL ON DRAWING E-600.

GENERAL NOTES:

- CONTRACTOR SHALL PROVIDE ENOUGH SLACK CABLE FOR CONNECTION INSIDE PROPOSED PULLBOX AT BASE OF FPL SERVICE POLE. CONTRACTOR TO COORDINATE WITH FPL AND FOLLOW THEIR STANDARDS.
- CONTRACTOR TO PROVIDE CONTROL PANEL SHOP DRAWINGS SHOWING WIRING DIAGRAMS WITH ALL POWER AND CONTROL INTERCONNECTIONS.
- CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR DISCONNECT SWITCHES, TVSS, GROUND ROD, CONDUCTOR, CONDUITS, ETC.
- CONTRACTOR TO KEEP LENGTH OF TRANSIENT VOLTAGE SURGE SUPPRESSOR LEADS TO A MINIMUM.

1- 45 H.P. PUMP	77_AMPS.
ENCLOSURES' AIR CONDITIONERS	14_AMPS
MISCELLANEOUS BASE LOAD	30_AMPS.
25% OF LARGEST MOTOR	19.25_AMPS.
TOTAL	140.25_AMPS.

PROVIDE SERVICE SIZE: 200 AMP. 277/480 VOLT, 3φ, 4W

LOAD CALCULATION

CONTRACTOR TO PROVIDE ARC FLASH LABEL AS PER ANSI REQUIREMENTS. REFER TO EXAMPLE BELOW.



**FAULT CURRENT CALCULATION
 MAIN DISCONNECT**

10,746 SYMM. S.C.A. AVAILABLE AT F.P.&L. Co. TRANSFORMER SECONDARY AS PER FPL LETTER ON THIS DRAWING

90 FEET #3/0 Cu. CONDUCTORS IN PVC CONDUIT

$$f = \frac{1.73 \times L \times I}{C \times E_{L-L}} = \frac{(1.73)(90)(10,746)}{(13,923)(480)} = 0.250$$

$$M = \frac{1}{1 + f} = \frac{1}{1 + 0.250} = 0.8$$

$$I_{SCA} = \text{AVAILABLE FROM UTILITY} \times M = (10,746)(0.8) = 9,596.8 \text{ Amps}$$

PROVIDE 14k S.C.A. RATED FUSE AT THE MAIN

**FAULT CURRENT CALCULATION
 AT CONTROL PANEL**

9,918.5 SYMM. S.C.A. AT MAIN

10 FEET #3/0 Cu. CONDUCTORS IN PVC CONDUIT

$$f = \frac{1.73 \times L \times I}{C \times E_{L-L}} = \frac{(1.73)(10)(9,596.8)}{(13,923)(480)} = 0.0248$$

$$M = \frac{1}{1 + f} = \frac{1}{1 + 0.0248} = 0.976$$

$$I_{SCA} = I_{SCA} \text{ AT MAIN} \times M = (9,596.8)(0.976) = 9,366.5 \text{ Amps}$$

PROVIDE 14k S.C.A. RATED BREAKERS AT CONTROL PANEL



January 31, 2023

Zoila Morales, P.E.
 11401 SW 40th St, Suite 301
 Miami, FL 33165

Re: Available Fault Current for Abbott Ave Stormwater Improvements - 91st ST

Dear Zoila Morales, P.E.:

Thank you for contacting FPL about the available fault current at Abbott Ave Stormwater Improvements - 91st ST. Based on the plans you have provided dated July 22, 2022, the maximum available fault current at the transformer secondary terminals is estimated to be 10,746 symmetrical amperes at 277/480 volts. The protective device on the line side of the transformer currently in place or to be installed and serving your property located at the subject location is a 10 amp type KS fuse. The primary service voltage is 13.2kV L-L. This calculated symmetrical fault current is not intended for use as the basis for motor starting calculations and does not include:

- Consideration for any motor contribution or
- Fault current asymmetry.

The FPL equipment currently serving or planned to serve your facility may change over time as a result of any number of factors, including but not limited to transformer replacements due to load growth, electrical grid changes or emergencies. As a result, although we are providing you with this information for the sole purpose of assisting you in the completion of your study, you and your client should not design, install or operate your system in reliance upon any expectation that the specific size and type of equipment currently in place will remain so. If and when the size and type of the equipment changes, our employees are not always in a position to immediately notify customers.

As the construction project progresses, any questions or information you may need can be communicated through me. I have enclosed my business card for easy reference and look forward to hearing from you in the near future.

Sincerely,

Isabella Arcos

Isabella Arcos
 Distribution Engineer
 Central Dade Service Center, Florida Power & Light
 Phone: (Call) 786-719-0535 (Office) 305-377-6087
 Email: Isabella.Arcos@fpl.com or imaat@fpl.com
 Office: 122 SW 3rd St, Miami, FL, 33130

REVISIONS		
NO.	DESCRIPTION	DATE

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 DRAWN BY: MT
 CHECKED BY: ZM
 BID-CONTRACT:

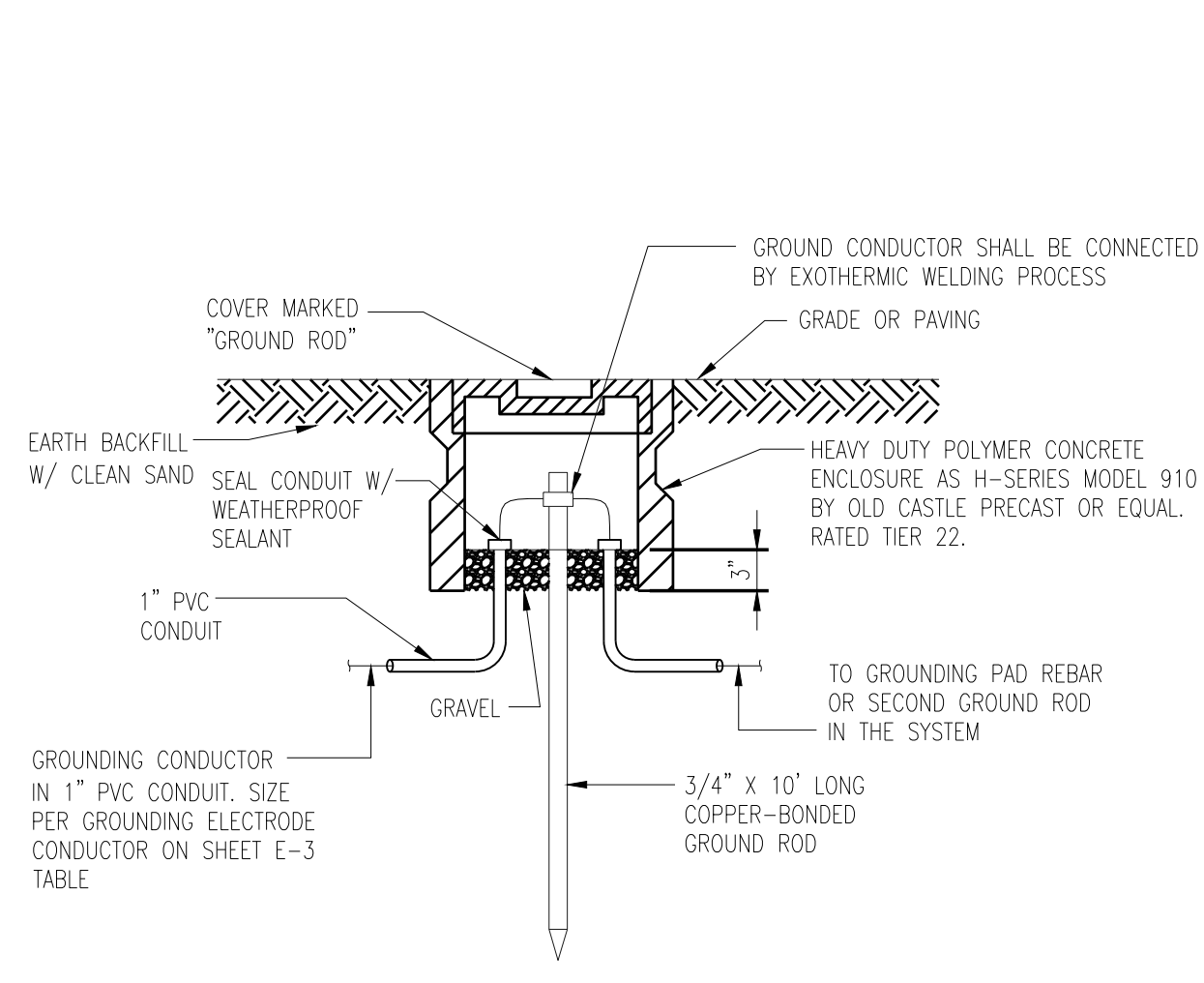
Zoila Morales, P.E.
 P.E. NO. 64981



PROJECT
**ABBOTT AVENUE
 DRAINAGE
 IMPROVEMENTS**

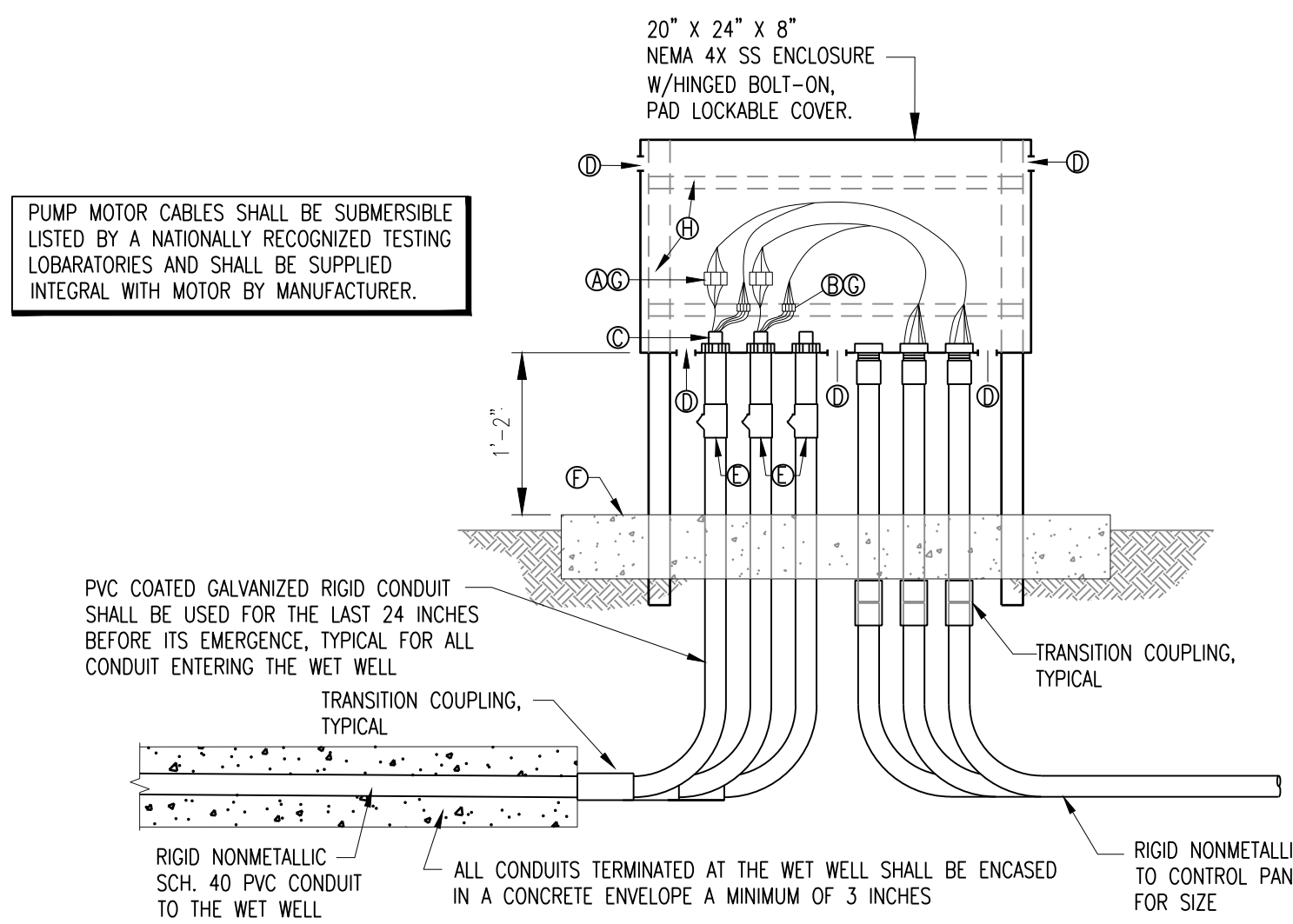
SHEET TITLE
**ELECTRICAL DETAILS
 -91ST STREET**

SHEET NUMBER **E-600**
 PROJECT NUMBER **11494.01**



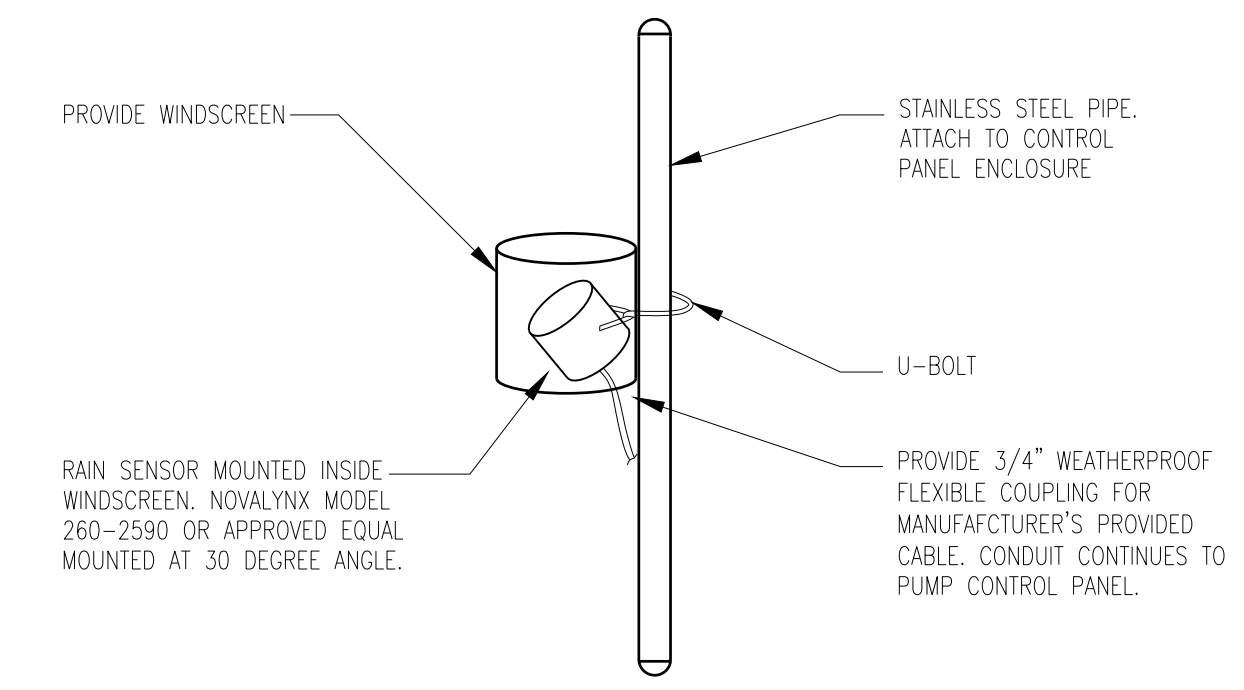
NOTE:
 SEE GROUNDING NOTES ON SHEET E-5.

TYPICAL GROUND ROD INSTALLATION DETAIL
 N.T.S.

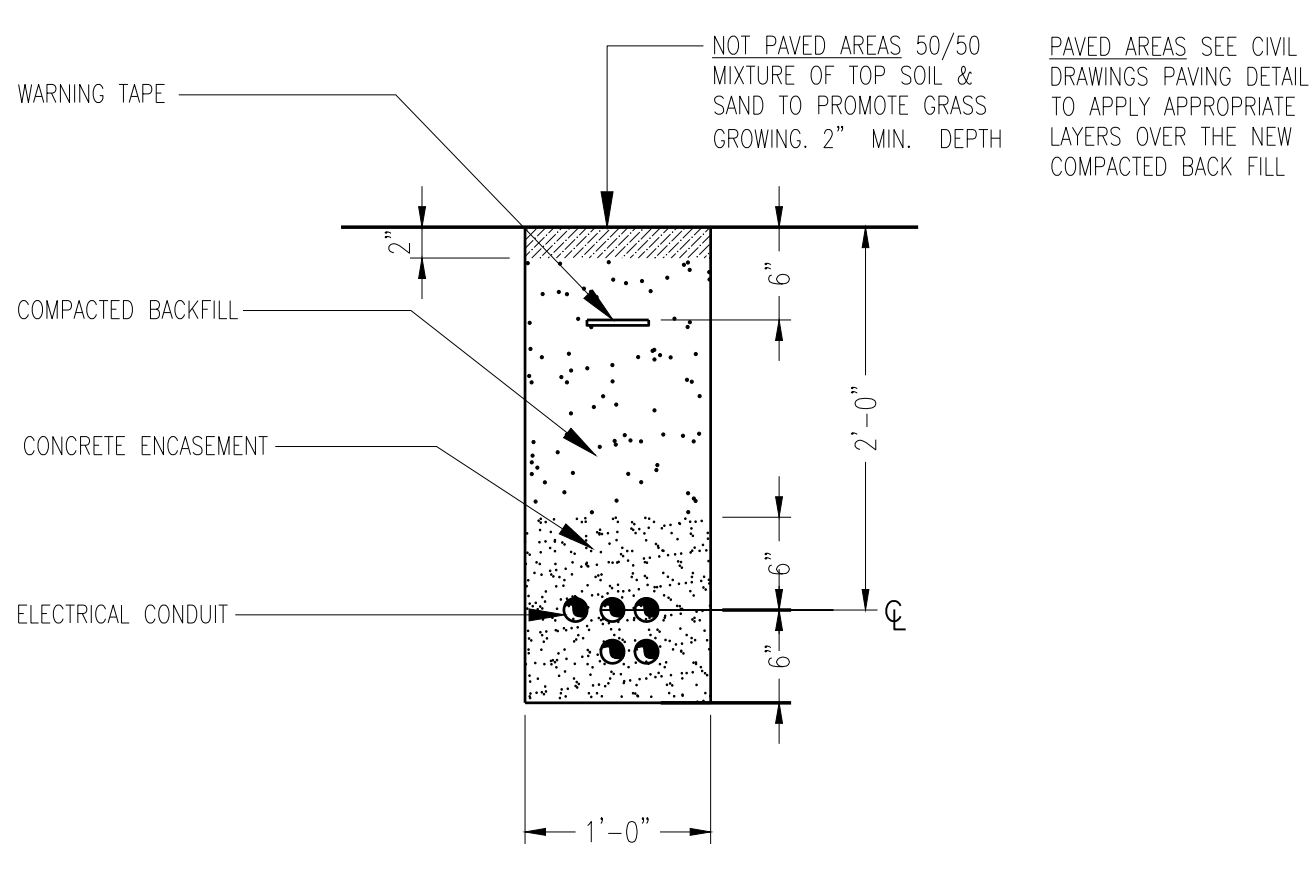


- Ⓐ 6-POLE POWER INSULATED TERM BLOCK PANEL MOUNT ALLEN BRADLEY BULLETIN 1492 SIZED AS REQUIRED.
- Ⓑ 6-CIRCUIT CONTROL INSULATED TERM BLOCK PANEL MOUNT ALLEN BRADLEY BULLETIN 1492
- Ⓒ CABLE CORD FITTING WITH GLAND NUT & NEOPRENE BUSHING EQUAL TO CROUSE HINDS COFF SIZE OR AS REQUIRED FOR CABLE O.D.
- Ⓓ 1/8" DRAIN AND VENTILATION HOLES
- Ⓔ CONDUIT SEAL SUITABLE FOR CLASS 1, DIV. 1, GROUP D HAZ. LOCATION WITHIN 18" OF ENCLOSURE AS PER NEC 501.1
- Ⓕ 3' x 3' x 6" CONCRETE SLAB. SEE STRUCTURAL DRAWINGS
- Ⓖ COAT WITH CLEAR URETHANE SEAL ELECTRICAL-ELECTRONIC INSULATOR AS CRC 1" 02049
- Ⓗ 2" POST GALV. STL. PIPE SCH. 40 FILLED WITH CONCRETE AND 1-5/8" X 1-5/8" SS UNISTRUT CHANNELS FOR SUPPORT

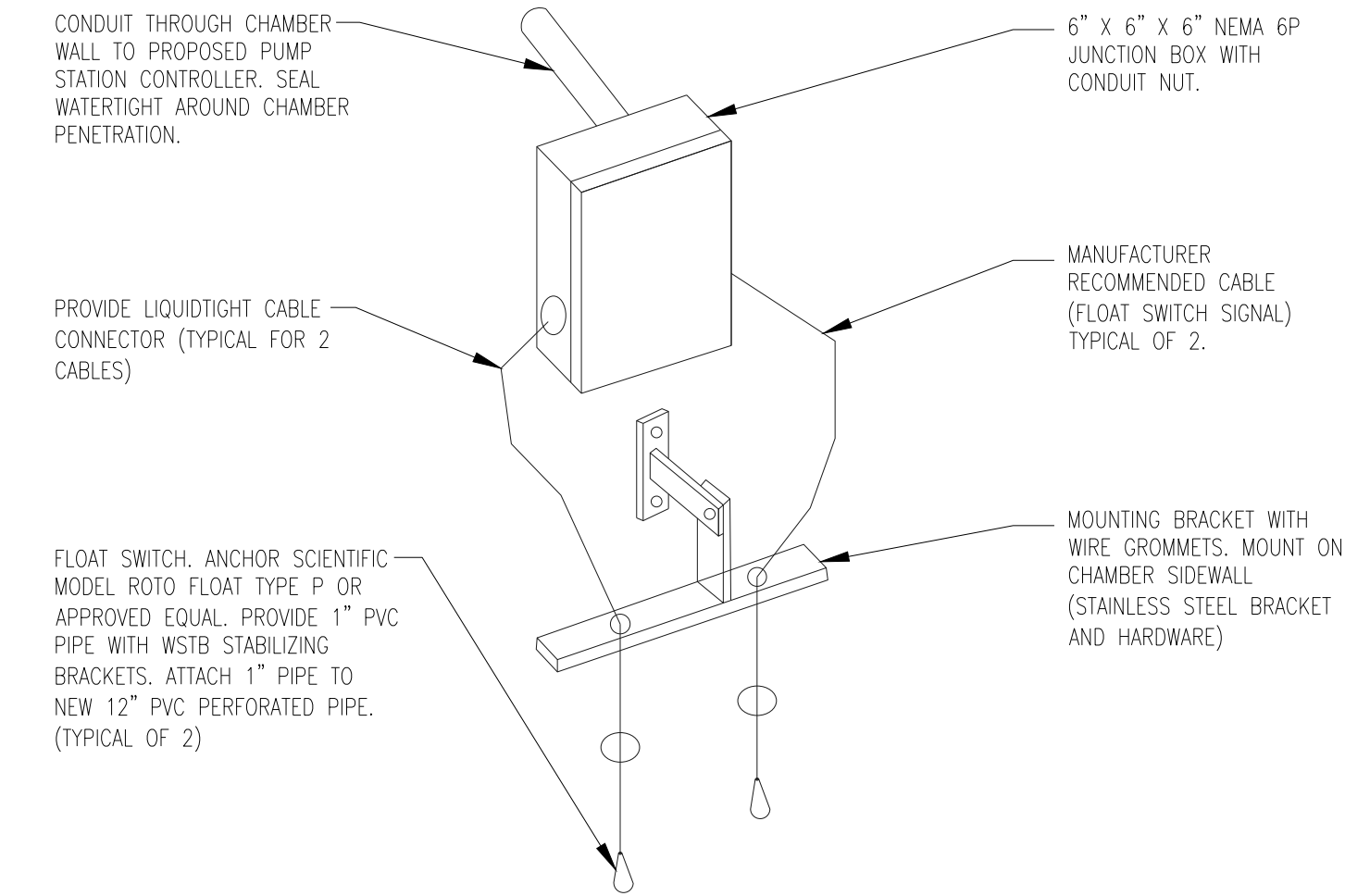
TYPICAL MOTOR CONNECTION BOX DETAIL
 N.T.S.



RAIN SENSOR
 N.T.S.



TRENCH DETAIL
 N.T.S.



FLOAT SWITCH INSTALLATION DETAIL
 N.T.S.

NOVALYNX CORPORATION
260-2590 Precipitation Detector
260-2591 Leaf Wetness Sensor

The Model 260-2590 Precipitation Detector is used to determine the extent to which a wetting agent has accumulated on the grid. The presence of a wetting agent is indicated by a change in the grid's electrical resistance. The detector is used to determine the extent to which a wetting agent has accumulated on the grid. The presence of a wetting agent is indicated by a change in the grid's electrical resistance. The detector is used to determine the extent to which a wetting agent has accumulated on the grid. The presence of a wetting agent is indicated by a change in the grid's electrical resistance.



Specifications
 Sensor: Gold plated grid 4" dia
 Output: Relay (0.5 amp)
 Sensitivity: 0.1 mm (0.004 in)
 Output: Relay (0.5 amp)
 Sensitivity: 0.1 mm (0.004 in)
 Output: Relay (0.5 amp)
 Sensitivity: 0.1 mm (0.004 in)

Ordering Information
 260-2590 Precipitation Detector, 100-240 Vac, 25' cable
 260-2591 Leaf Wetness Sensor, 100-240 Vac, 25' cable
 260-2592 Precision Wetness Sensor, 100-240 Vac, 25' cable
 260-2593 Leaf Wetness Sensor, 100-240 Vac, 25' cable
 330-0524 Leaf Wetness Sensor with heater control, 100-240 Vac, 25' cable, per foot
 330-0524 Additional Cable, per foot

1.0 BASIC ELECTRICAL REQUIREMENTS

- 1.1 SCOPE OF WORK
A. FOR PURPOSE OF LEGIBILITY, DRAWINGS ARE DIAGRAMMATIC AND ALTHOUGH LOCATION OF EQUIPMENT IS SHOWN TO SCALE, THE CONTRACTOR SHALL VERIFY ALL INFORMATION AT THE SITE BEFORE BIDDING THE JOB.
B. WHEN DRAWINGS, NOTES AND THESE REQUIREMENTS ARE IN CONFLICT, THE MOST STRINGENT CONDITION SHALL APPLY UNLESS OTHERWISE APPROVED BY THE ENGINEER.
C. THE WORK CONSISTS OF ALL SUPERVISION, LABOR, MATERIALS, EQUIPMENT AND INSTALLATION REQUIRED FOR THE COMPLETE ELECTRICAL SYSTEMS AS SHOWN ON THE DRAWINGS OR CALLED FOR IN THESE REQUIREMENTS.
D. FURNISH, INSTALL AND MAINTAIN TEMPORARY ELECTRICAL POWER AND LIGHTING REQUIRED FOR ALL TRADES.
E. CONNECT ELECTRICAL EQUIPMENT FURNISHED BY OTHER TRADES EVEN IF NOT SHOWN ON ELECTRICAL DRAWINGS.

1.2 CODES AND STANDARDS

PERFORM WORK AND FURNISH EQUIPMENT COMPLYING WITH CURRENT EDITIONS OF THE FOLLOWING CODES:

- NATIONAL ELECTRICAL CODE (NEC 2017)
- NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
- UNDERWRITERS' LABORATORIES (UL)
- AMERICAN ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
- AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
- INSULATED POWER CABLE ENGINEERS ASSOCIATION (IPCEA)
- FLORIDA BUILDING CODE (FBC 2020)
- INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)

1.3 SHOP DRAWINGS

WITHIN 30 DAYS AFTER THE DATE OF THE AWARD OF THE CONTRACT, AND BEFORE ANY MATERIAL OR EQUIPMENT IS PURCHASED, SUBMIT TO THE ENGINEER FOR APPROVAL, A COMPLETE LIST IN QUANTIFIABLE OF ELECTRICAL MATERIALS, AND EQUIPMENT TO BE INCORPORATED IN THE WORK. INCLUDE CATALOG NUMBER, DIMENSIONS, INTERCONNECTION DIAGRAMS AND INSTALLATION INSTRUCTIONS.

1.4 OPERATION AND MAINTENANCE MANUALS

- O & M MAINTENANCE MANUALS MUST CONTAIN BUT NOT LIMITED TO THE FOLLOWING:
- SYSTEM DESCRIPTION, AND OPERATING AND MAINTENANCE INSTRUCTIONS.
 - MANUFACTURER'S NAME AND MODEL NUMBER OF ALL COMPONENTS.
 - CONTROL AND WIRING DIAGRAMS WITH SEQUENCE OF OPERATION.
 - LIST OF RECOMMENDED SPARE PARTS.

1.5 AS BUILT DRAWINGS

AFTER FINAL INSPECTION, FURNISH A SET OF REPRODUCIBLE "AS BUILT DRAWINGS" SHOWING DEPTHS AND ROUTING OF CONCEALED ELECTRICAL BELOW GRADE INSTALLATIONS AND ALL VARIATIONS BETWEEN THE ACTUAL WORK AND AS IT WAS SHOWN ON THE CONTRACT DRAWINGS.

1.6 MATERIALS

- FURNISH EQUIPMENT AND MATERIALS THAT ARE NEW AND LATEST DESIGN OF STANDARD PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF SUCH EQUIPMENT.
- ALL MATERIALS SHALL BEAR THE LABEL OF UNDERWRITER'S LABORATORY FOR THE INTENDED USE.
- EQUIPMENT ENCLOSURES SHALL BE NEMA 12 FOR INDOOR USE, AND NEMA 4X (STAINLESS STEEL) OR 3R AS SHOWN ON DRAWINGS FOR OUTDOOR USE.
- FURNISH LIGHTING FIXTURES WITH LAMPS AND 10 PERCENT (TWO MINIMUM) SPARE LAMPS OF EACH TYPE.
- FURNISH FUSIBLE EQUIPMENT WITH FUSES AND 10 PERCENT (THREE MINIMUM) OF SPARE FUSES OF EACH TYPE.

1.7 INSTALLATION

- INSTALL EQUIPMENT AT THE LOCATIONS SHOWN ON THE DRAWINGS FOLLOWING THE MANUFACTURER'S RECOMMENDATIONS.
- COORDINATE INSTALLATION OF UNDERGROUND DUCTS AND CONDUITS WITH EXISTING UNDERGROUND UTILITIES. FIELD VERIFY ROUTING AND BURIAL DEPTH. DRAIN DUCTS AWAY FROM BUILDINGS TOWARD MANHOLES. LOW POINTS IN DUCT BANK RUNS ARE NOT ACCEPTABLE.
- INSTALL FLOOR MOUNTED SELF SUPPORTED EQUIPMENT ON 4-INCHES HIGH CONCRETE PADS WITH STEEL REINFORCING. USE REQUIRED BOLTS, ANCHORS, INSERTS AND CONDUIT SLEEVES.
- MAKE OPENINGS THROUGH WALLS, CEILING, ROADWAYS, FLOOR SLABS, ETC. REQUIRED FOR THE INSTALLATION OF ELECTRICAL EQUIPMENT, BUT CUTTING, WELDING, OR OTHER WEAKENING OF BUILDING STRUCTURE TO SIMPLY ELECTRICAL EQUIPMENT AND MATERIALS' INSTALLATION ARE NOT PERMITTED, WHERE EXISTING WALLS, CEILING OR FLOOR SLABS HAVE TO BE CUT, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER BEFORE MAKING SUCH CUTS. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE DONE WHILE PROVIDING SUCH OPENINGS AND SHALL PATCH THE SURFACE TO MATCH ADJACENT MATERIALS AND FINISHES.
- NO CONDUITS, SLEEVES, PIPES OR ANY OTHER ITEM SHALL BE EMBEDDED IN CONCRETE ALONG OR THROUGH ANY BEAM, COLUMN, FOOTING, GRADE BEAM, SLAB, WALL OR ANY OTHER STRUCTURAL MEMBER WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.
- COORDINATE SHIPPING LENGTHS OF SWITCH GEARS AND MOTOR CONTROL CENTERS. THOSE ITEMS SHALL BE ABLE TO BE REMOVED AND REPLACED IN THE FUTURE THROUGH THE PERMANENT ACCESS PROVIDED IN THE STRUCTURE.
- PROVIDE 36-INCHES WIDE, 3/16-INCHES THICK RUBBER MATS IN THE FRONT AND REAR OF SWITCH GEARS, MOTOR CONTROL CENTERS AND SWITCHBOARDS. MATS TO COMPLY WITH FEDERAL SPECS ZF-416A.

1.8 TESTING

UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL ENERGIZE, START-UP AND TEST OPERATE ALL THE SYSTEMS AND EQUIPMENT IN THE PRESENCE OF THE ENGINEER. INSULATION RESISTANCE TESTS SHALL BE MADE ON 240 VOLT FEEDER WITH A 500 VOLT DC MEGGER. DEFECTS FOUND SHALL BE CORRECTED.

2.0 RACEWAYS

- RIGID CONDUIT
A. STEEL: NOT DIPPED ZINC COATED, GALVANIZED, THREADED RIDG STEEL CONFORMING TO ANSI C80, AND FED. SPEC. WW-C-581. USE THREADED GALVANIZED STEEL FITTINGS.
B. ALUMINUM: CONTAINING LESS THAN 0.1 PERCENT COPPER AND CONFORMING TO FEDERAL SPECIFICATION WW-C-540C. USE THREADED ALUMINUM FITTINGS.
C. PLASTIC: RIDG, SCHEDULE 40, 90 DEGREES C, UL RATED, PVC PLASTIC CONFORMING TO UL 651, FED. SPEC. W-C-1094 AND NEMA TC-2. FITTINGS TO CONFORM WITH UL3 514 AND NEMA TC-3.

2.2 FLEXIBLE METAL CONDUIT

LIQUID-TIGHT: FLEXIBLE ZINC COATED CONDUITING TO UL 1 TYPE WITH LIQUID-TIGHT FLEXIBLE PLASTIC SHEATH, CONFORMING TO UL 360 STANDARD. FITTINGS, PER FED. SPEC. W-R-406B AND UL 514.

2.3 LOCATION AND USE OF EACH TYPE OF CONDUIT

- USE RIGID ALUMINUM CONDUIT FOR ABOVE GROUND EXPOSED INSTALLATIONS.
A. EXCEPT IN CORROSIVE AREAS WHERE PVC COATED RIDG GALVANIZED STEEL SHALL BE USED.
B. USE GALVANIZED THREADED RIDG STEEL CONDUIT AS FOLLOWS:
1) WHEREVER SPECIFICALLY CALLED FOR ON DRAWINGS.
2) WHERE RACEWAY ELBOWS FROM DUCT BANKS STUB-UP.
3) FOR UNDERGROUND WORK BEYOND TRENCHES WHERE CONCRETE ENCASED PLASTIC CONDUITS HAVE NOT BEEN SPECIFIED. COAT BURIED GALVANIZED STEEL CONDUITS AND FITTINGS WITH TWO COATS OF CARBOLIN'S BITUMASTIC NO. 50 OR EQUAL.
C. USE PLASTIC CONDUIT AS FOLLOWS:
1) WHEN INSTALLED IN POURED CONCRETE SLABS OR WALLS.
2) FOR UNDERGROUND WORK UNDER SLABS.
3) IN DUCT BANKS OR, IF SPECIFICALLY CALLED FOR, IN TRENCHES. BACK-FILL TRENCHES WITH STRUCTURAL FILL 90 % COMPACTED (PROCTOR DENSITY) AND RESO TO ORIGINAL CONDITION.
D. USE FLEXIBLE METAL CONDUIT (24 TO 60 INCHES LONG) FOR CONNECTIONS TO ROTATING OR VIBRATING EQUIPMENT.

2.4 INSTALLATION

- DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW ALL BENDS, FITTINGS, BOXES, AND SPECIALITIES WHICH MAY BE REQUIRED OR THE EXACT LOCATION OF CONDUITS. EXAMINE THE STRUCTURAL AND FINISH CONDITIONS AFFECTING ALL OF THE WORK AND PLAN IT ACCORDINGLY. FURNISHING SUCH FITTINGS AS MAY BE REQUIRED TO MEET SUCH CONDITIONS. ARRANGE CONDUIT RUNS TO CLEAR BEAMS, PIPES AND OTHER OBSTRUCTIONS AND AVOID INTERFERENCES WITH OTHER TRADES WORK. ANY CHANGES FROM LOCATIONS SHOWN ON THE DRAWINGS MUST BE APPROVED BY THE ENGINEER.
B. INSTALL RACEWAYS PARALLEL OR PERPENDICULAR TO WALLS, STRUCTURAL MEMBERS, OR INTERSECTIONS OF VERTICAL PLANES AND CEILINGS. INSTALL HORIZONTAL RACEWAYS CLOSE TO CEILING OR CEILING BEAMS, AND ABOVE PIPES AND DUCTS.
C. SIZE RACEWAY ACCORDING TO NEC, BUT IN NO CASE SHALL BE LESS THAN INDICATED ON DRAWINGS. MINIMUM SIZE SHALL BE 3/4-INCH, EXCEPT FLEXIBLE CONDUITS TO LIGHT FIXTURES CAN BE 3/8" BUT NOT EXCEEDING SIX FEET LONG.
D. INSTALL CONDUITS PASSING THROUGH WALLS AND SLABS IN PVC SLEEVES. EXTEND SLEEVES THROUGH FULL CONCRETE THICKNESS AND PROVIDE 1/2-INCH CLEARANCE AROUND CONDUITS TO FACILITATE SEALING.
E. SEAL ANY OPENING MADE IN SLABS OR WALLS TO PREVENT SMOKE OR FIRE SPREAD AND THE PASSAGE OF WATER. USE SEALING COMPOUND APPROVED FOR THE PURPOSE.
F. USE EXPANSION FITTINGS WHEN CONDUITS CROSS STRUCTURAL EXPANSION JOINTS.
G. EXCEPT WHERE BOXES, PANELS AND OTHER EQUIPMENT HAVE THREADED OPENINGS, MAKE CONDUIT CONNECTIONS AS FOLLOWS:
1) DOUBLE LOCKNUTS, ONE INSIDE AND ONE OUTSIDE.
2) PROVIDE MALLEABLE, IRON OR STEEL BUSHING WITH BAKELITE LINER MOLDED AND BONDED INTO THE BUSHING.
3) PLACE GROUNDING BUSHING ON END OF CONDUIT IN ADDITION TO LOCKNUTS.
D. SUPPORT OF RACEWAY
A. INSTALL WALL MOUNTED ELECTRICAL EQUIPMENT, WIRING TROUGHS, JUNCTION BOXES AND GROUPS OF TWO OR MORE CONDUITS ON A SYSTEM OF EXTRUDED, GAUGE 12, 1-5/8 INCHES WIDE, ALUMINUM CHANNELS. ATTACH CHANNELS TO WALL WITH STAINLESS STEEL MACHINE BOLTS AND EXPANSION SHIELDS. CHANNELS TO BE SERIES P-1000 WITH COMPATIBLE HARDWARE AND FITTINGS AS MANUFACTURED BY UNISTRUT MFG. CO. OR EQUAL.
B. FASTEN VERTICAL AND HORIZONTAL RUNS OF RACEWAYS AT INTERVALS OF NOT MORE THAN 8 FEET AND WITHIN 3 FEET OF BENDS, OUTLETS AND JUNCTION BOXES.
C. SUPPORT SINGLE CONDUITS NOT LARGER THAN 1-1/2 INCHES IN DIAMETER BY MEANS OF TWO-HOLE PIPE STRAPS OR INDIVIDUAL PIPE HANGERS. FOR CONDUITS LARGER THAN 1-1/2 INCHES IN DIAMETER USE INDIVIDUAL PIPE HANGERS.
D. SPACE CONDUITS INSTALLED AGAINST CONCRETE SURFACES NOT LESS THAN 1/4 INCH AWAY FROM THE SURFACES BY CLAMP BACKS OR OTHER APPROVED MEANS. FURNISH HANGER RODS MADE OF GALVANIZED STEEL OF NOT LESS THAN 1/4 INCH IN DIAMETER. WHEN CONCEALED ABOVE A SUSPENDED CEILING, GALVANIZED PERFORATED STEEL STRAPPING IS ACCEPTABLE.
F. SUPPORT BRANCH CIRCUIT RACEWAYS INSTALLED ABOVE SUSPENDED CEILING INDEPENDENTLY OF THE CEILING SUPPORT SYSTEM. WHEREVER POSSIBLE, THEY SHALL BE FASTENED TO THE UNDERSIDE OF THE SLAB ABOVE.

2.6 METAL FRAMING (CONTINUOUS SLOT METAL CHANNEL SYSTEM)

- CONFIGURATION: SINGLE CHANNEL OR TWO SINGLE CHANNELS WELDED TOGETHER, WITH CONTINUOUS 7/8-INCH SLOT AND TO ACCEPT SPRING-HELD STEEL NUTS.
B. DIMENSIONS: FOR SINGLE CHANNEL, 1-5/8 INCHES BY 1-5/8 INCHES. FOR DOUBLE CHANNEL, 1-5/8 INCHES BY 3-1/4 INCHES. BOTH 12-GAUGE. FITTINGS TO BE 1-5/8 INCHES WIDE BY 1/4 INCH-THICK MINIMUM.
C. FINISHING OF CHANNELS, PIPE CLAMPS AND FITTINGS TO BE HOT DIP GALVANIZED AFTER FABRICATION CONFORMING TO ASTM A123 OR A153, AS APPLICABLE MINIMUM WEIGHT OF COATING: 2.0 OUNCES PER SQUARE FOOT. NUTS, BOLTS AND SCREW TO BE ELECTRO GALVANIZED.

3.0 CONDUCTORS (600 VOLTS)

- MATERIAL
A. FURNISH CONDUCTORS OF 98 % ANNEALED COPPER, 600 VOLT CLASS B. HEAT AND MOISTURE RESISTANT, THERMOPLASTIC TYPE THHN/THHW (SIZED BY THW RATING), WITH A POLYVINYL CHLORIDE INSULATION RESISTANT TO OIL, GASOLINE AND WEATHER. INSULATION SHALL MEET UL STANDARD 83.
B. CONDUCTORS TO BE STRANDED; #8 THROUGH #2 SHALL BE 7 STRAND; #1 THROUGH 4/0, 19 STRAND AND 250 MCM THROUGH 500 MCM, 37 STRAND.

3.2 IDENTIFICATION

- COLOR CODE POWER CONDUCTORS AS FOLLOWS:
1) 120/240 VOLT SYSTEM: WHITE-NEUTRAL, BLACK-PHASE A, BLUE-PHASE B, RED-PHASE C.
2) 277/480 VOLT SYSTEM: GRAY-NEUTRAL, YELLOW-PHASE A, BROWN-PHASE B, ORANGE-PHASE C.
3) BONDING CONDUCTOR GREEN.
B. IDENTIFY FEEDERS, BRANCH CIRCUITS AND INSTRUMENTATION AND CONTROL WIRES AT TERMINATIONS, JUNCTION AND PULL BOXES.

3.3 INSTALLATION

- DO NOT USE CONDUCTORS SMALLER THAN AWG #12 FOR POWER AND #14 FOR CONTROL UNLESS SPECIFICALLY INDICATED ON DRAWINGS.
B. DO NOT PULL CONDUCTORS INTO CONDUITS UNTIL THE MECHANICAL WORK HAS BEEN COMPLETED.
C. GROUP AND THE CONDUCTORS IN PANEL BOARDS, JUNCTION BOXES, PULL BOXES, ETC., FOR A NEAT AND ORDERLY APPEARANCE.
D. USE CONNECTORS, TERMINALS AND SPLICES THAT ARE DESIGNED AND APPROVED FOR THE SPECIFIC TYPE AND SIZE OF THE CONDUCTORS BEING CONNECTED.
E. FIREPROOF FEEDERS WHERE NOT PROTECTED BY CONDUITS LIKE IN MANHOLES, SWITCH GEARS, ETC.

4.0 OUTLET, PULL AND JUNCTION BOXES

- OUTLET BOXES IN INDOOR FINISHED WALLS TO BE GALVANIZED STEEL, 4" X 4" X 1-1/2" CONFORMING TO FEDERAL SPECIFICATIONS WS-585 AND ANSI-C33.65.
B. EXTERIOR OUTLET BOXES, BOXES AND FITTINGS EMBEDDED IN CONCRETE, AND BOXES FOR EXPOSED CONDUIT RUNS SHALL BE CAST OF RUST RESISTING METAL, WITH FULL THREADED HUBS, AND SCREW TYPE RUBBER GASKET COVERING.
C. INSTALL BOXES FOR LIGHT SWITCHES LOCATED NEAR DOORS ON THE LOCK SIDE. EVEN WHERE THE SYMBOLS ARE INDICATED ON THE HINGE SIDES.
D. PULL AND JUNCTION BOXES SHALL BE OF 12 GAUGE WELDED ALUMINUM WITH HINGED COVER. NEMA 12 FOR INDOOR USE AND NEMA 4X FOR OUTDOOR USE. MINIMUM DIMENSIONS SHALL BE 12" X 12" X 6".
E. IN CORROSIVE AREAS OR WHERE CALLED FOR ON DRAWINGS, FURNISH PULL AND JUNCTION BOXES OF 14 GAUGE STAINLESS STEEL.
F. WHEN SPLICING CONTROL CONDUCTORS IN BOXES USE SCREW TYPE TERMINAL STRIP BLOCKS CLASS 9080 (G) AS MANUFACTURED BY SQUARE D OR EQUAL. IDENTIFY EVERY WIRE AT BOTH SIDES AND PROVIDE SPADE TYPE LUGS FOR TERMINATION.
G. PROVIDE PULL AND JUNCTION BOXES WHERE REQUIRED TO REDUCE LENGTH OF CABLE PULL OR REDUCE NUMBER OF ELBOWS BETWEEN OUTLETS.

5.0 SWITCHES AND RECEPTACLES

- FURNISH WALL SWITCHES OF THE QUIET AND TOTALLY ENCLOSED TUMBLER TYPE, WITH BODIES OF PHENOLIC COMPOUND. WIRING TERMINALS SHALL BE OF THE SCREW TYPE. NO MORE THAN ONE SWITCH SHALL BE INSTALLED IN A SINGLE GANG POSITION. SWITCHES SHALL CONFORM TO FEDERAL SPECIFICATIONS WS-5896E, HUBBELL 1221 AND 1223, OR APPROVED EQUAL.
B. USE 20A, 125 V. DUPLEX, U-SLOTTED, GROUNDING TYPE RECEPTACLES THAT CONFORM TO FEDERAL SPECIFICATIONS WC-5960, HUBBELL 5362, OR EQUAL. AMOUNT DUPLEX RECEPTACLES VERTICALLY. BOXES MOUNTED BACK TO BACK ARE NOT PERMITTED. GANGED RECEPTACLES AND SWITCHES SHALL HAVE SINGLE MULTI-GANG COVER PLATE.
C. FURNISH HOSPITAL GRADE GROUND FAULT INTERRUPTER WITH DIFFERENTIAL CURRENT TRANSFORMER, SOLID STATE SENSING CIRCUITRY AND CIRCUIT INTERRUPTER. SENSITIVITY TO BE 5 MA, TRIPPING TIME 1/30TH OF A SECOND.
E. WHEN INSTALLING RECEPTACLES IN OUTDOOR LOCATIONS USE CAST-METAL OUTLET BOXES WITH GASKET WEATHERPROOF CAST-METAL COVER PLATES AND SPRING-FLAP CAP OVER EACH RECEPTACLE.
F. USE STAINLESS STEEL COVER PLATES FOR SWITCHES AND RECEPTACLES EXCEPT IN NON-INDUSTRIAL AREAS SUCH AS OFFICES, REST ROOMS, LABORATORIES, ETC.

6.0 MOTOR DISCONNECT SWITCHES & STARTERS

- PROVIDE EACH MOTOR WITH A DISCONNECTING MEANS MEETING THE REQUIREMENTS OF N.E.C. ARTICLE 430. SWITCHES SHALL BE HEAVY DUTY, HORSE POWER RATED, SUITABLE TO BE PADLOCKED IN "OFF" POSITION AND CONFORM TO FEDERAL SPECS WS-5865, NEMA KST AND ANSI C33.64. IF FUSES ARE REQUIRED, THEY SHALL BE CURRENT LIMITING TYPE.
B. SIZE DISCONNECTS AND STARTERS FOR THE FULL LOAD OF THE CONTROLLED MOTOR. THE HORSEPOWER RATINGS INDICATED ON THE DRAWINGS ARE SHOWN FOR THE BENEFIT OF THE CONTRACTOR AND DO NOT LIMIT EQUIPMENT SIZE.
C. FOR SINGLE-PHASE FRACTIONAL HORSEPOWER MOTORS, A SINGLE OR DOUBLE-POLE TOGGLE SWITCH WILL BE ACCEPTABLE PROVIDED THE AMPERE RATING OF THE SWITCH IS AT LEAST 125 PERCENT OF MOTOR RATING.
D. SWITCHES SHALL BE THE QUICK-BREAK TYPE AND DISCONNECT ALL UNGROUNDED CONDUCTORS.
E. FOR MOTORS LARGER THAN 1/4 HORSEPOWER, FURNISH STARTERS SPECIFICALLY DESIGNED FOR THE PURPOSE AND HAVING A HORSEPOWER RATING EQUAL TO THE MOTOR CONTROLLED.
F. PROVIDE MOTORS OF 1/8 HORSEPOWER OR LARGER WITH THERMAL-OVERLOAD PROTECTION. THE OVERLOAD PROTECTION DEVICE, OF THE MANUAL RESET TYPE AND WITH CONTACTS ON EACH PHASE, SHALL BE PART OF THE STARTER. SIZE THE OVERLOAD HEATER ELEMENTS ACCORDING TO THE MOTOR MANUFACTURER'S RECOMMENDATIONS AND BASED ON THE ACTUAL MOTOR NAMEPLATE FULL-LOAD CURRENT.
G. PROVIDE EACH MOTOR WITH A SUITABLE CONTROLLER OR DEVICE TO MAKE IT PERFORM AS REQUIRED. AUTOMATIC CONTROL DEVICES SUCH AS THERMOSTATS, FLOAT OR PRESSURE SWITCHES MAY DIRECTLY CONTROL THE START-STOP OF MOTORS UP TO 1/4 HORSEPOWER. PROVIDED THE DEVICES USED ARE DESIGNED FOR THE PURPOSE AND HAVE AN ADEQUATE HORSEPOWER RATING. WHEN THE AUTOMATIC-CONTROL DEVICE DOES NOT HAVE SUCH A RATING, A MAGNETIC STARTER SHALL BE USED WITH THE AUTOMATIC CONTROL DEVICE ACTIVATING THE COIL OF THE CONTACTOR.
H. PROVIDE 3 POSITION MANUAL-OFF-AUTO SWITCH WHEN MANUAL AND AUTOMATIC CONTROL IS REQUIRED. CONNECT THE SELECTOR SWITCH SO THAT ONLY THE AUTOMATIC DEVICES ARE BY-PASSED WHEN THE SWITCH IS IN THE "MANUAL" POSITION. ALL SAFETY DEVICES SUCH AS PRESSURE AND TEMPERATURE SWITCHES, MOTOR OVERLOAD AND SAFETY SWITCHES SHALL BE ACTIVE IN "MANUAL" AND "AUTOMATIC" POSITIONS.
I. MOTOR CONTROL CIRCUITS SHALL OPERATE AT 120V GROUNDING, OBTAINED FROM THE LOAD SIDE OF THE MOTOR-DISCONNECT MEANS. IF THE MOTOR CIRCUIT IS MORE THAN 120V TO GROUND, FURNISH A CONTROL TRANSFORMER WITH FUSED PRIMARY AND SECONDARY CIRCUITS. STARTERS FOR MOTORS WITH SPACE HEATERS SHALL HAVE CONTROL TRANSFORMERS SIZED FOR THE ADDITIONAL LOAD.
J. FURNISH COMBINATION MOTOR STARTERS OF THE MOLDED CASE, MOTOR CIRCUIT PROTECTOR, CIRCUIT BREAKER TYPE, THREE PHASE, OF THE VOLTAGE AND SIZE AS SHOWN ON THE DRAWINGS BUT NOT SMALLER THAN THE SIZE REQUIRED BY THE CONTROLLED MOTOR, 120 VOLT CONTROL CIRCUIT, 3 THERMAL INTERCHANGEABLE OVERLOAD RELAYS, "HAND-OFF-AUTO" OR "ON-OFF" SWITCH AS REQUIRED BY THE APPLICATION, RED AND GREEN PILOT LIGHTS AND FOUR NORMALLY CLOSED AND NORMALLY OPEN INTERLOCK CONTACTS.
K. THE STARTER DISCONNECT SHALL BE OPERABLE BY AN EXTERNAL "ON-OFF" LABELED HANDLE, INTERLOCKED TO PREVENT OPENING THE ENCLOSURE DOOR WHILE THE DISCONNECT IS IN THE "ON" POSITION EXCEPT WHEN CONSCIOUSLY OPERATING A PERMISSIVE RELEASE DEVICE.
L. FURNISH STARTERS MANUFACTURED BY SQUARE D, CLASS 8536, ALLEN BRADLEY BULLETIN NO. 509, OR EQUAL.

7.0 PANEL BOARDS

- PROVIDE DEAD FRONT CIRCUIT BREAKER TYPE PANEL BOARDS WITH COPPER BUS AND AS SCHEDULED ON DRAWINGS. EACH PANEL BOARD SHALL BE PROVIDED WITH A SEPARATE GROUND BUS IN ADDITION TO THE NEUTRAL BUS. CIRCUIT BREAKERS SHALL BE BOLT-ON AND HAVE A MINIMUM INTERRUPTING RATING OF 10,000 AMPERES AT 120 VOLTS, AND 14,000 AMPERES AT 277 VOLTS. A TYPEWRITTEN DIRECTORY SHALL CLEARLY IDENTIFY THE LOAD SERVED BY EACH CIRCUIT AND SHALL BE MOUNTED INSIDE THE DOOR IN A METAL FRAME WITH PLASTIC COVER. CIRCUIT NUMBERS SHALL BE PERMANENTLY INDICATED ADJACENT TO EACH CIRCUIT BREAKER.

8.0 GROUNDING

- INSTALL GROUNDING AS SHOWN ON DRAWINGS. WHERE NOT INDICATED, INSTALL IN COMPLIANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.
B. DO NOT USE CONDUCTORS SMALLER THAN SIZE AWG #12.
C. GROUP AND THE CONDUCTORS IN PANEL BOARDS, JUNCTION BOXES, PULL BOXES, ETC., FOR A NEAT AND ORDERLY APPEARANCE.
D. USE CONNECTORS, TERMINALS AND SPLICES THAT ARE DESIGNED AND APPROVED FOR THE SPECIFIC TYPE AND SIZE OF THE CONDUCTORS BEING CONNECTED.
E. DO NOT EMBED GROUNDING CABLES DIRECTLY IN CONCRETE. USE SLEEVES WHEN PASSING CABLES THROUGH CONCRETE. BARE COPPER CABLES BURIED IN EARTH SHALL BE TINNED.

- FURNISH GROUND RODS OF COPPER CLAD STEEL, 3/4 INCH IN DIAMETER, 10 FEET LONG, DRIVEN FULL LENGTH INTO THE EARTH. MAXIMUM RESISTANCE TO GROUND IS LIMITED TO 25 OHMS. ADDITIONAL GROUND RODS SHALL BE DRIVEN IF REQUIRED TO MAINTAIN THIS LEVEL.
PARTS TO BE GROUND: SWITCH GEAR AND PANEL BOARD FRAMES, FIXTURES AND DEVICES, CABLE SHEATHS, NEUTRAL OF TRANSFORMERS, BOXES AND RACEWAYS, MOTOR FRAMES, STREET LIGHTS, NON-CURRENT CARRYING PARTS OF APPLIANCES AND DEVICES, AND ALL OTHER PARTS AND EQUIPMENT AS REQUIRED BY NEC. NEVER USE A NEUTRAL WIRE AS GROUNDING MEANS.
H. BOND EQUIPMENT WITH CONDUCTORS INSTALLED IN SAME CIRCUIT RACEWAY AND SIZED AS FOLLOWS:
1) EQUIPMENT RATED 50 AMPERES OR UNDER WITH ONE AWG #8.
2) EQUIPMENT RATED 50 TO 125 AMPERES WITH ONE AWG #6.
3) EQUIPMENT RATED OVER 125 AMPERES WITH ONE AWG #6 AND ONE# 1/0 IN 3/4 INCH CONDUIT TO BUILDING GROUND LOOP OR GROUND ROD.
I. PROVIDE POWER AND LIGHTING CIRCUIT AND 120 VOLT GROUNDING RECEPTACLE WITH A GREEN GROUNDING CONDUCTOR OF THE SAME SIZE AND TYPE AS THE PHASE CONDUCTOR AND RUNNING IN THE SAME CONDUIT.
J. MAKE BONDING TO EQUIPMENT WITH APPROVED SOLDERLESS CONNECTOR. CONTACT SURFACE SHALL BE UNPAINTED AND THOROUGHLY CLEANED BEFORE CONNECTION IS MADE TO INSURE A GOOD METAL CONTACT.

9.0 TRANSFORMERS

- FURNISH DRY TYPE, THREE OR SINGLE PHASE TRANSFORMERS OF THE SIZE AND VOLTAGE INDICATED ON THE DRAWINGS, WITH FOUR (TWO ABOVE AND TWO BELOW) 2-1/2" PROOF ENCLOSURE WITH FRONT ACCESSIBLE WIRING COMPARTMENT AND CONFORMING TO THE APPLICABLE REQUIREMENTS OF ANSI, IEEE, AND NEMA STANDARDS.
B. CORE AND COIL ASSEMBLY TO BE VACUUM IMPREGNATED WITH CLASS H INSULATION. TEMPERATURE RISE NOT TO EXCEED 115 DEGREE C.
C. TRANSFORMERS SOUND LEVEL NOT TO EXCEED FOLLOWING VALUES: 0 TO 9 KVA, 36 DB; 10 TO 45 KVA, 42 DB; 50 TO 100 KVA, 45 DB.
D. BOLT FLOOR MOUNTED TRANSFORMERS TO FLOOR: WHEN WALL MOUNTED, PROVIDE STEEL BRACKET ANGLES AND BOLT TRANSFORMER TO BRACKET. USE NEOPRENE ISOLATION PADS TO ISOLATE VIBRATIONS.
E. ADJUST PRIMARY TAPS TO PROVIDE A SECONDARY VOLTAGE WITHIN +5 OF NOMINAL VOLTAGE.

10.0 DUCT BANKS

- DUCT BANKS OF THE SIZE INDICATED ON DRAWINGS, SHALL CONSIST OF A NUMBER OF INDIVIDUAL PVC DUCTS AS INDICATED, ENCASED IN A REINFORCED CONCRETE ENVELOPE.
B. USE PVC SCHEDULE 40 CONDUITS WITH MOLDED INTERLOCKING SPACERS. CONCRETE TO BE CLASS C, 2500 POUNDS PSI. PROVIDE # 12 AWG PULL WIRE IN ALL EMPTY CONDUITS.
C. SLOPE DUCTS A MINIMUM OF 3 INCHES PER 100 FEET. SLOPE TO BE AWAY FROM BUILDINGS, FROM ONE MANHOLE TO THE NEXT OR BOTH WAYS FROM A HIGH POINT BETWEEN MANHOLES. KEEP THE HIGHEST POINT NOT LESS THAN 24 INCHES BELOW THE FINISHED GRADE.

NOTES:

- ALL CIRCUITS TO CARRY A FULL GROUND WIRE PER N.E.C. ARTICLE 250.
- ELECTRICAL SERVICE TO WITHSTAND UTILITY AVAILABLE FAULT CURRENT AND BUILT PER FPL STANDARD. CONTACT YAREMS SANTOS PHONE (786) 449-6053 F.P.L. REPRESENTATIVE IN THIS AREA.
- SEE STRUCTURAL DRAWINGS FOR INSTALLATION DETAILS.
- THE SHORT CIRCUIT CURRENT RATING (SCCR) OF THE ELECTRICAL PANEL SHALL BE ADEQUATE TO WITHSTAND THE MAXIMUM SHORT CIRCUIT CURRENT AT THE EQUIPMENT TERMINALS. USE STANDARD VALUE XX KA. REFER TO FPL CORRESPONDING FAULT CURRENT LETTER ON DRAWING E-XX. PANELS SHALL BE FULLY RATED.
- METER CAN AND MAIN DISCONNECT TO BE MOUNTED ON UNISTRUT.
- MOTOR CIRCUIT BREAKER TO BE CAPABLE OF BEING PADLOCKED IN THE OPEN POSITION AND NOT OBSTRUCT CLOSING OR OPENING OF DEAD FRONT.
- TELEMETRY ANTENNA FOUNDATION TO BE MAAMI DEAD STANDARD AND COMPLIES WITH FBC.
- AC AND MISCELLANEOUS BREAKERS ARE FACTORY FURNISHED AS AN INTEGRAL PART OF THE CONTROL PANEL.
- MOTOR CIRCUIT PROTECTOR INDICATED IS AN ADJUSTABLE INSTANTANEOUS-TRIP MAGNETIC ONLY CIRCUIT BREAKERS FOR SINGLE MOTOR CIRCUIT PROTECTION AND ARE INTENDED FOR USE IN COMBINATION WITH MOTOR STARTERS WITH OVERLOAD RELAYS FOR THE PROTECTION OF MOTOR CIRCUITS FROM SHORT CIRCUITS AND OVERLOADS.
- ALL CABLES SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY. MOTOR WIRES SHOWN ARE MOTOR POWER AND GROUND ONLY. SUBMERSIBLE PUMP CABLES MULTICONDUCTOR TO BE FURNISHED BY THE MANUFACTURER AS AN INTEGRAL PART OF THE MOTOR. IF THE PUMP IS FURNISHED WITH SEPARATED POWER AND CONTROL CABLES; CONTRACTOR SHALL INCREASE THE SIZE OF THE CONDUITS AS REQUIRED.
- PUMP CONTROL PANEL SHALL BE MANUFACTURED AND LABELED PER UL 698A AND SUITABLE FOR SERVICE ENTRANCE USE.
- PRESSURE TRANSDUCER TO BE SLX 130 OR EQUIVALENT.
- WET WELL IS A CLASS 1 DIVISION 2 AND VALVE BOX IS A CLASS 1 DIVISION 2 HAZARDOUS LOCATION AS PER NFPA 820. SEAL OFF SHALL COMPLY WITH NEC 501. PRESSURE TRANSDUCER AND FLOAT SWITCHES TO BE ADEQUATE FOR CLASS 1 DIVISION 2 LOCATION. ELECTRICAL EQUIPMENT IN VALVE VAULT TO BE ADEQUATE FOR CLASS 1 DIVISION 2 LOCATION.
- MAIN DISCONNECT SWITCH SIZED TO MATCH MAIN CIRCUIT BREAKER AND IN A PAD LOCKABLE SERVICE RATED, xx kA.I.C., MIN. NEMA 4X STAINLESS STEEL ENCLOSURE. TOP SHALL NOT BE HIGHER THAN THE TOP OF THE CABINET.
- CONTROL PANEL SHALL INCORPORATE TAMPER/INTRUSION SWITCH(ES) THAT ACTIVATES AN ALARM TO THE RTU WHENEVER THE PANEL IS OPENED. THE SWITCH SHALL BE LOCATED ON EACH PANEL DOOR WHERE A DOOR HANDLE IS PROVIDED.
- TEMPERATURE RATING ASSOCIATED WITH THE AMPACITY OF A CONDUCTOR SHALL COMPLY WITH NEC 110.
- MAXIMUM GROUND RESISTANCE SHALL NOT EXCEED 25 OHMS PER ELECTRODE AS PER NEC ARTICLE 250.

SYMBOL-LEGEND:

	UNDERGROUND POWER CONDUIT
	ELECTRICAL CIRCUIT RUN EXPOSED
	FUSED SAFETY SWITCH - NUMBER INDICATES POLES, TRIP AND FRAME - SIZE 'O' FOR TRIP INDICATES A NON-FUSED SWITCH
	TRANSFORMER
	HORN
	BELL
	MOTOR
	DUPLEX CONVENIENCE OUTLET
	GROUND FAULT INTERRUPTER RECEPTACLE
	JUNCTION BOX
	TOGGLE SWITCH ON-OFF TYPE
	PUSH BUTTON
	PUSH BUTTON, ON-OFF TYPE, MAINTAINED POSITION.
	LIMIT SWITCH
	OVERLOAD
	TEMPERATURE ACTUATED SWITCH
	RELAY CONTACT NORMALLY OPEN, CLOSSES ON ENERGIZATION, OPENS ON DE-ENERGIZATION
	RELAY CONTACT NORMALLY CLOSED, OPENS ON ENERGIZATION, CLOSSES ON DE-ENERGIZATION
	PWR XFMR 3PH. DELTA CONNECTION WYE GROUNDED, NEUTRAL CONNECTION
	POTENTIAL XFMR MEDIUM/DRAWOUT PRIMARY FUSED NUMERICAL INDICATES QUANTITY
	CONTROL POWER XFMR.
	CURRENT LIMITING FUSE
	SURGE CAPACITOR & LIGHTNING ARRESTER
	FLOW SWITCH
	FLOAT SWITCH
	PRESSURE SWITCH
	TIME DELAY RELAY CONTACT

NOTES (CONTINUED):

- ALL ELECTRICAL EQUIPMENT AND APPURTENANCES SHALL COMPLY WITH NEC 110.
- MINIMUM CONDUIT SIZE TO BE 3/4" AND WIRE TO BE #12 CU.
- LIGHTNING ARRESTER AND SURGE CAPACITOR SHALL BE INSTALLED IN PANEL AND CONNECTED TO A MULTI-WIRE LUG IN MAIN CIRCUIT BREAKER BY CONTROL PANEL MANUFACTURER.
- GROUNDING AND NEUTRAL CONDUCTORS SHALL BE BONDED AT ENTRANCE POINT ONLY.
- PROVIDE PANEL MANUFACTURER'S RECOMMENDED SPARE PARTS FOR TWO YEARS.
- A. THE CONTRACTOR SHALL FURNISH SHORT-CIRCUIT AND PROTECTIVE DEVICE COORDINATION STUDIES AS PREPARED BY THE ELECTRICAL EQUIPMENT MANUFACTURER OR AN APPROVED ENGINEERING FIRM.
B. THE CONTRACTOR SHALL FURNISH AN ARC FLASH HAZARD ANALYSIS STUDY PER THE REQUIREMENTS SET FORTH IN NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE, AND NEC 110. THE ARC FLASH ANALYSIS SHALL BE PERFORMED ACCORDING TO THE IEEE 1584 EQUATIONS THAT ARE PRESENTED IN THE LATEST CURRENT EDITION OF THE NFPA-70E.
C. THE CONTRACTOR OF THE ARC FLASH HAZARD ANALYSIS SHALL PROVIDE WARNING LABEL INDICATING SEVERITY OF POTENTIAL EXPOSURE AND LEVEL OF PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIRED. LABEL TO BE AS PER DETAIL IN SHEET E-3.
- RTU ANTENNA FOUNDATION, POLE SUPPORT AND CONDUIT TO RTU PANEL, PROVIDED AND INSTALLED BY CONTRACTOR.
- AS PER NEC ARTICLE 409.110 REQUIREMENTS, THE CONTROL PANEL SHALL BE MARKED WITH A SHORT CIRCUIT RATING THAT IS DETERMINED BY BEING A LISTED AND LABELED ASSEMBLY OR BY ANOTHER APPROVED METHOD.
- SCADA RTU AND COMMUNICATION EQUIPMENT WILL BE BY MISSON.
- FINISHED FLOOR ELEVATIONS (FFE) AND TOP OF SLABS MUST BE TWO (2) FEET ABOVE BASE FLOOR ELEVATION AS ESTABLISHED BY THE AREA'S FEMA FIRM MAP/PANEL.
- AN ADDITIONAL 6" MAY BE REQUIRED IN AREAS WHERE SEA LEVEL RISE IMPACTS MAY BE EXPECTED.
- PROVIDE NEMA 6 J. BOX AND HARD WIRE TO THE VALVE PIT SUMP PUMP. FLOAT SWITCH TO BE INSTALLED INSIDE THE VALVE VAULT TO SEND SIGNAL TO RTU AND TO CONTROL PANEL FOR LOCAL SIGNAL AS IT IS SHOWN ON CONTROL WIRING DIAGRAM AND RTU TERMINAL BLOCK ON SHEET E-600.

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REVISIONS		
NO.	DESCRIPTION	DATE

**PRELIMINARY PLAN
NOT FOR CONSTRUCTION**

THESE PLANS ARE NOT FULLY PERMITTED AND ARE SUBJECT TO REVISIONS MADE DURING THE PERMITTING PROCESS.

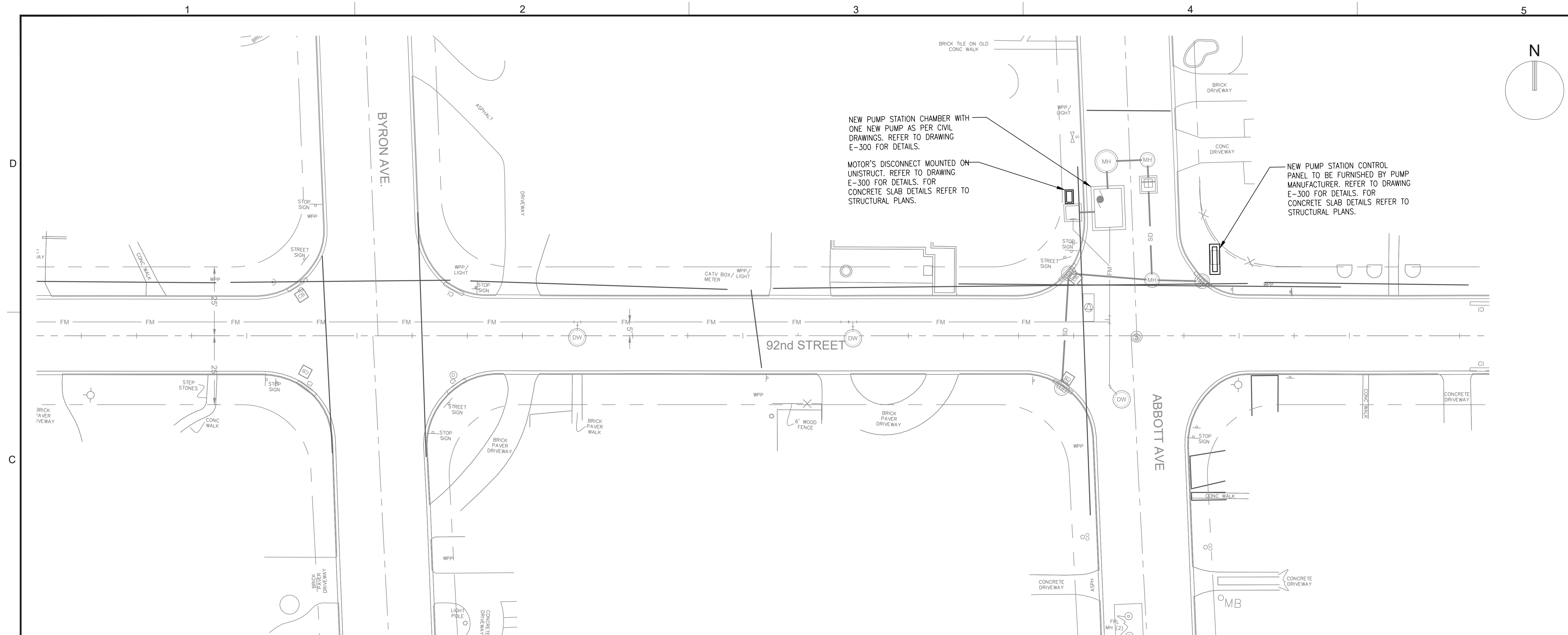
RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

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DESIGNED BY:	ZM
DRAWN BY:	MT
CHECKED BY:	ZM
BID-CONTRACT:	

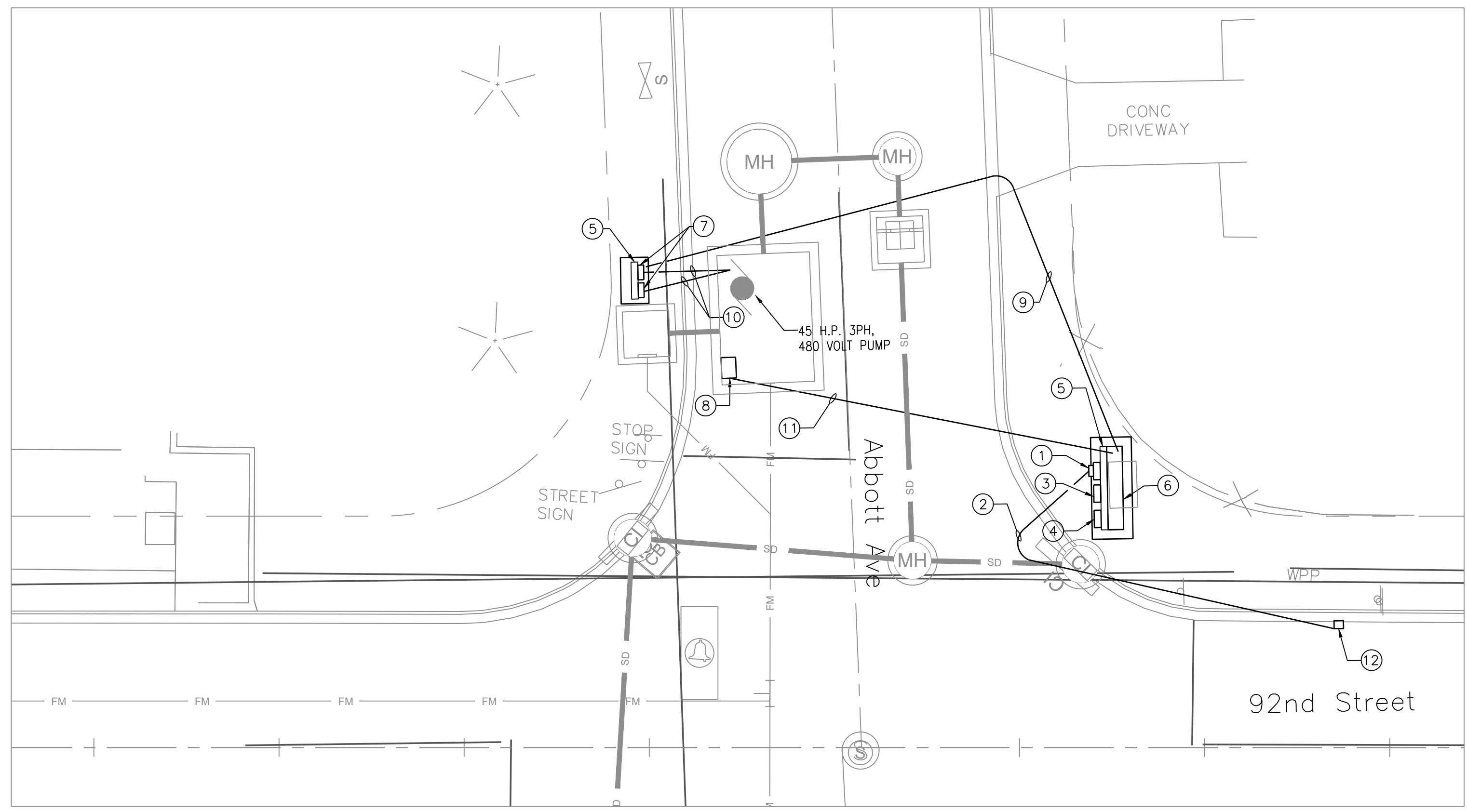
Zoila Morales, P.E.
P.E. NO. 64981

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- PROVIDE PANEL MANUFACTURER'S RECOMMENDED SPARE PARTS FOR TWO YEARS.
- A. THE CONTRACTOR SHALL FURNISH SHORT-CIRCUIT AND PROTECTIVE DEVICE COORDINATION STUDIES AS PREPARED BY THE ELECTRICAL EQUIPMENT MANUFACTURER OR AN APPROVED ENGINEERING FIRM.
B. THE CONTRACTOR SHALL FURNISH AN ARC FLASH HAZARD ANALYSIS STUDY PER THE REQUIREMENTS SET FORTH IN NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE, AND NEC 110. THE ARC FLASH ANALYSIS SHALL BE PERFORMED ACCORDING TO THE IEEE 1584 EQUATIONS THAT ARE PRESENTED IN THE LATEST CURRENT EDITION OF THE NFPA-70E.
C. THE CONTRACTOR OF THE ARC FLASH HAZARD ANALYSIS SHALL PROVIDE WARNING LABEL INDICATING SEVERITY OF POTENTIAL EXPOSURE AND LEVEL OF PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIRED. LABEL TO BE AS PER DETAIL IN SHEET E-3.
- RTU ANTENNA FOUNDATION, POLE SUPPORT AND CONDUIT TO RTU PANEL, PROVIDED AND INSTALLED BY CONTRACTOR.
- AS PER NEC ARTICLE 409.110 REQUIREMENTS, THE CONTROL PANEL SHALL BE MARKED WITH A SHORT CIRCUIT RATING THAT IS DETERMINED BY BEING A LISTED AND LABELED ASSEMBLY OR BY ANOTHER APPROVED METHOD.
- SCADA RTU AND COMMUNICATION EQUIPMENT WILL BE BY MISSON.
- FINISHED FLOOR ELEVATIONS (FFE) AND TOP OF SLABS MUST BE TWO (2) FEET ABOVE BASE FLOOR ELEVATION AS ESTABLISHED BY THE AREA'S FEMA FIRM MAP/PANEL.
- AN ADDITIONAL 6" MAY BE REQUIRED IN AREAS WHERE SEA LEVEL RISE IMPACTS MAY BE EXPECTED.
- PROVIDE NEMA 6 J. BOX AND HARD WIRE TO THE VALVE PIT SUMP PUMP. FLOAT SWITCH TO BE INSTALLED INSIDE THE VALVE VAULT TO SEND SIGNAL TO RT



ELECTRICAL SITE PLAN
SCALE: 1"=20'-0"



ELECTRICAL PLAN
SCALE: 1"=10'-0"

- CODED NOTES:**
- 1 PROPOSED LOCATION OF 200 AMP METER. COORDINATE WITH F.P.L. SEE RISER ON DRAWING E-300.
 - 2 NEW ELECTRICAL SERVICE. SEE DETAILS ON RISER ON DRAWING E-300. COORDINATE WITH FPL.
 - 3 NEW 200 AMP 480 V 3 PHASE, NEMA 4X (PAD LOCKABLE) 14K AIC SERVICE ENTRANCE RATED, FUSED DISCONNECT SWITCH. FUSE 200 A, 600 V BUSSMAN TYPE LPS-RK OR APPROVED EQUAL.
 - 4 MANUAL TRANSFER SWITCH 200 AMP, 600 V IN NEMA 4X ENCLOSURE FOR CONNECTION TO A PORTABLE GENERATOR.
 - 5 GALVANIZED UNISTRUCT. SEE DETAIL ON DRAWING E-300. FOR EXACT PAD LOCATION SEE CIVIL DRAWING.
 - 6 CONTROL PANEL IN NEMA 4X ENCLOSURE INCLUDING MOUNTINH HARDWARE TO BE PROVIDED BY PUMP MANUFACTURER. REFER TO DETAILS ON DRAWING E-500.
 - 7 200 AMP 480 V, 3 PHASE NEMA 4X (PAD LOCKABLE) 150 A FUSED DISCONNECT SWITCH.
 - 8 NEMA 6P WATERTIGHT JUNCTION BOX 6"x6"x6" WITH CONDUIT NUT TO RUN SENSOR CABLES. RUN FLOAT SWITCH SIGNAL CABLES AS PER MANUFACTURER RECOMMENDATIONS FROM FLOAT SWITCHES AT MANHOLE TO RTU AT CONTROL PANEL. TYPICAL OF 2.
 - 9 POWER WIRES IN RIGID STEEL CONDUITS FROM CONTROL PANEL TO EACH PUMP DISCONNECT. REFER TO RISER ON DRAWING E-300.
 - 10 PUMP POWER CABLES IN RIGID STEEL CONDUITS FROM EACH PUMP DISCONNECT TO EACH PUMP. CABLES PROVIDED BY MANUFACTURER. REFER TO RISER ON DRAWING E-300 FOR DETAILS.
 - 11 TWO 2" AND TWO 1" RIGID STEEL CONDUITS. REFER TO RISER ON DRAWING E-300 FOR DETAILS.
 - 12 PROPOSED FPL POINT OF SERVICE. PROVIDE PULL BOX AT BASE OF POLE AS PER FPL STANDARDS. COORDINATE WITH FPL REPRESENTATIVE FOR EXACT LOCATION AND REQUIREMENTS PRIOR TO INSTALLATION.

KEITH
301 East Atlantic Blvd.
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PH: (954) 788-3400

Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC2600457

M.E. Engineering Consultants, Inc.
11401 SW 40TH Street Suite 301
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CA 29121

REVISIONS		
NO.	DESCRIPTION	DATE

**PRELIMINARY PLAN
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RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE: 05/31/2024
DESIGNED BY: ZM
DRAWN BY: MT
CHECKED BY: ZM
BID-CONTRACT:

Zoila Morales, P.E.
P.E. NO. 64981



CLIENT

PROJECT

**ABBOTT AVENUE
DRAINAGE
IMPROVEMENTS**

SHEET TITLE

**ELECTRICAL SITE AND
DETAIL PLAN-92ND
STREET**

SHEET NUMBER **E-201**
PROJECT NUMBER 11494.01

M.E. Engineering Consultants, Inc.
11401 SW 40TH Street Suite 301
Ph:(786)275-4635
CA 29121

Plotted by: me engineering cons On: 5/31/2024 12:04 PM
Drawing name: D:\Projects\2022\2026-Abbott Avenue Stormwater Improvements\MEP\11494.01-CP-1X-92nd-MEP-Rev 1.rvt.dwg STATUS: PERMIT SET

REVISIONS		
NO.	DESCRIPTION	DATE

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DESIGNED BY: ZM
DRAWN BY: MT
CHECKED BY: ZM
BID-CONTRACT:

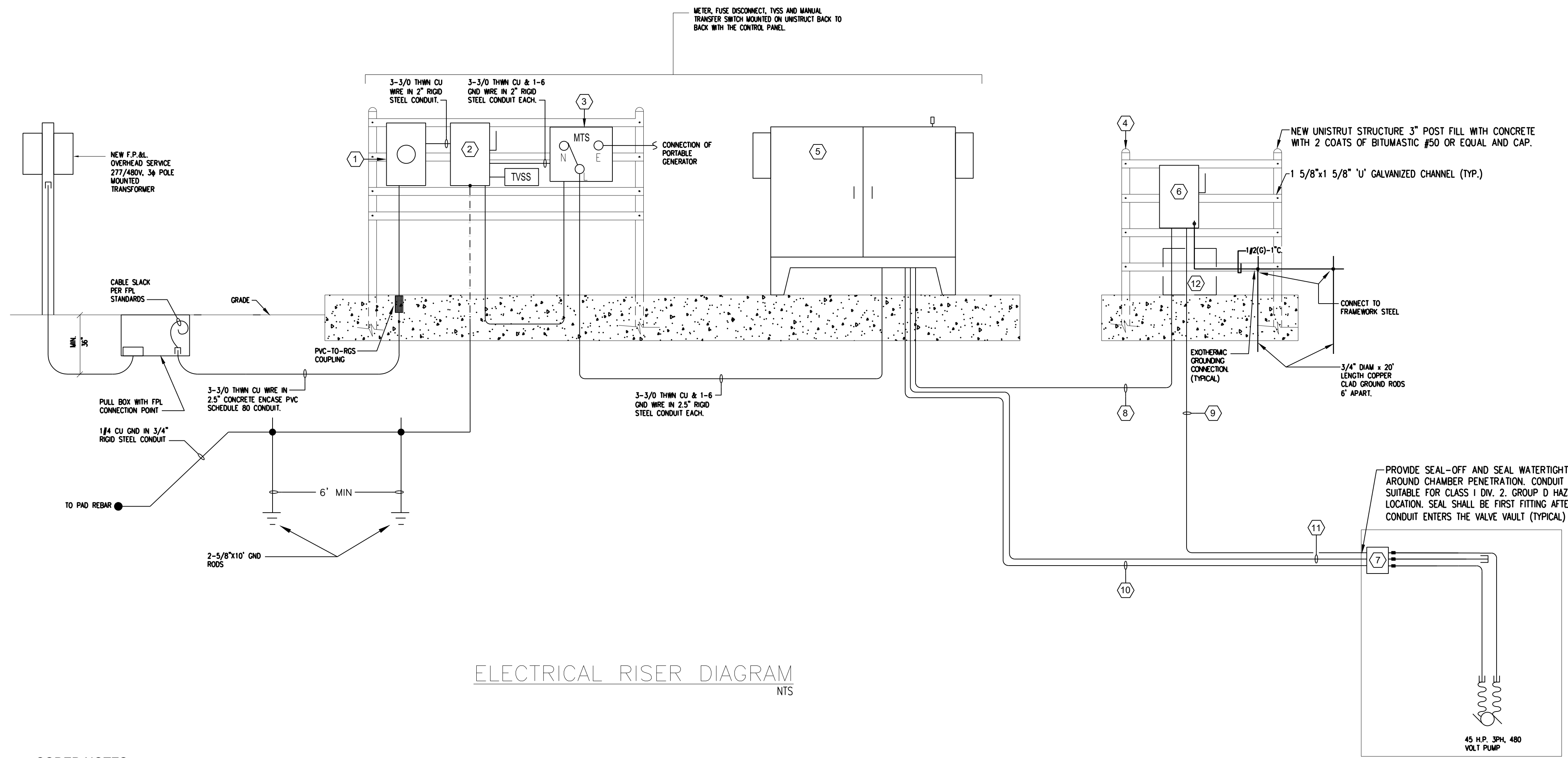
Zoila Morales, P.E.
P.E. NO. 64981



PROJECT
**ABBOTT AVENUE
DRAINAGE
IMPROVEMENTS**

SHEET TITLE
**ELECTRICAL RISER
DIAGRAM, NOTES AND
LOAD CALCULATION-
92ND STREET**

SHEET NUMBER E-301
PROJECT NUMBER 11494.01



ELECTRICAL RISER DIAGRAM
NTS

- CODED NOTES:**
- NEW 200 AMP METER. COORDINATE WITH F.P.L. AND FOLLOW THEIR STANDARDS.
 - NEW 200 AMP 480 V 3 PHASE, NEMA 4X (PAD LOCKABLE) 14K AIC SERVICE ENTRANCE RATED, FUSED DISCONNECT SWITCH. FUSE 200 A, 600 V BUSSMAN TYPE LPS-RK OR APPROVED EQUAL.
 - MANUAL TRANSFER SWITCH 200 AMP, 600 V IN NEMA 4X ENCLOSURE FOR CONNECTION OF A PORTABLE GENERATOR. GALVANIZED UNISTRUT FOR EXACT PAD LOCATION SEE CIVIL DRAWING. CONTROL PANEL IN NEMA 4X TYPE 316 STAINLESS STEEL ENCLOSURE (CONTINUOUS HINGE, PADLOCKABLE DOOR HANDLE). ENCLOSURE TO INCLUDE MOUNTING HARDWARE TO BE PROVIDED BY PUMP MANUFACTURER. REFER TO DETAILS ON DRAWING E-500.
 - 200 AMP 480 V, 3 PHASE NEMA 4X (PAD LOCKABLE) 150 AMP FUSED DISCONNECT SWITCH. COORDINATE FUSE SIZE WITH MANUFACTURER SPECS.
 - NEMA 6P WATERTIGHT JUNCTION BOX 6"x6"x6" WITH CONDUIT NUT TO RUN SENSOR CABLES. RUN FLOAT SWITCH SIGNAL CABLES AS PER MANUFACTURER RECOMMENDATIONS FROM FLOAT SWITCHES AT MANHOLE TO RTU AT CONTROL PANEL. TYPICAL OF 2. REFER TO DETAIL ON DRAWING E-400.
 - POWER WIRES (3-#2 & 1-#6 GND) IN 2" RIGID STEEL CONDUITS FROM CONTROL PANEL TO EACH PUMP DISCONNECT. SIZE AS SHOWN.
 - PUMP POWER CABLES (3-#2 & 1-#6 GND) IN 1.5" RIGID STEEL CONDUITS FROM PUMP DISCONNECT TO PUMP. CABLES PROVIDED BY MANUFACTURER. PROVIDE MINIMUM 10 FT OF SLACK CABLE INSIDE STRUCTURE.
 - MANUFACTURER PROVIDED PUMP MONITORING PILOT CABLE IN 2" RIGID STEEL CONDUIT. PROVIDE MINIMUM 10 FT OF SLACK CABLE INSIDE STRUCTURE.
 - MANUFACTURER RECOMMENDED TUBING FOR BUBBLER TUBE IN 1" RIGID STEEL CONDUIT. INSTALL TUBING AND CONDUIT IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
 - MOTOR CONNECTION BOX. REFER TO DETAIL ON DRAWING E-600.

- GENERAL NOTES:**
- CONTRACTOR SHALL PROVIDE ENOUGH SLACK CABLE FOR CONNECTION INSIDE PROPOSED PULLBOX AT BASE OF FPL SERVICE POLE. CONTRACTOR TO COORDINATE WITH FPL AND FOLLOW THEIR STANDARDS.
 - CONTRACTOR TO PROVIDE CONTROL PANEL SHOP DRAWINGS SHOWING WIRING DIAGRAMS WITH ALL POWER AND CONTROL INTERCONNECTIONS.
 - CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR DISCONNECT SWITCHES, TVSS, GROUND ROD, CONDUCTOR, CONDUITS, ETC.
 - CONTRACTOR TO KEEP LENGTH OF TRANSIENT VOLTAGE SURGE SUPPRESSOR LEADS TO A MINIMUM.

1- 45 H.P. PUMP	77 AMPS.
ENCLOSURES' AIR CONDITIONERS	14 AMPS
MISCELLANEOUS BASE LOAD	30 AMPS.
25% OF LARGEST MOTOR	19.25 AMPS.
TOTAL	140.25 AMPS.
PROVIDE SERVICE SIZE: 200 AMP, 277/480 VOLT, 3φ, 4W	

LOAD CALCULATION

**FAULT CURRENT CALCULATION
MAIN DISCONNECT**

10,746 SYMM. S.C.A. AVAILABLE AT F.P.L. Co. TRANSFORMER SECONDARY AS PER FPL LETTER ON THIS DRAWING

60 FEET #3/0 Cu. CONDUCTORS IN PVC CONDUIT

$$f = \frac{1.73 \times L \times I}{C \times E_{L-L}} = \frac{(1.73)(60)(10,746)}{(13,923)(480)} = 0.167$$

$$M = \frac{1}{1+f} = \frac{1}{1+0.167} = 0.857$$

Isca = AVAILABLE FROM UTILITY x M = (10,746)(0.857) = 9,209.3 Amps

PROVIDE 14k S.C.A. RATED FUSE AT THE MAIN

**FAULT CURRENT CALCULATION
AT CONTROL PANEL**

9,918.5 SYMM. S.C.A. AT MAIN

10 FEET #3/0 Cu. CONDUCTORS IN PVC CONDUIT

$$f = \frac{1.73 \times L \times I}{C \times E_{L-L}} = \frac{(1.73)(10)(9,209.3)}{(13,923)(480)} = 0.0238$$

$$M = \frac{1}{1+f} = \frac{1}{1+0.0238} = 0.977$$

Isca = Isca AT MAIN x M = (9,209.3)(0.977) = 8,997.5 Amps

PROVIDE 14k S.C.A. RATED BREAKERS AT CONTROL PANEL

CONTRACTOR TO PROVIDE ARC FLASH LABEL AS PER ANSI REQUIREMENTS. REFER TO EXAMPLE BELOW.

⚠ DANGER
Arc Flash Hazard.
Follow requirements in NFPA 70E for safe work practices and appropriate PPE. Failure to comply can result in death or injury.

FPL

January 31, 2023

Zoila Morales, P.E.
11401 SW 40th St, Suite 301
Miami, FL 33165

Re: Available Fault Current for Abbott Ave Stormwater Improvements - 92nd and Abbott

Dear Zoila Morales, P.E.:

Thank you for contacting FPL about the available fault current at Abbott Ave Stormwater Improvements - 92nd and Abbott. Based on the plans you have provided dated July 22 2022, the maximum available fault current at the transformer secondary terminals is estimated to be 10746 symmetrical amperes at 277/480 volts. The protective device on the line side of the transformer currently in place or to be installed and serving your property located at the subject location is a 10 amp type KS fuse. The primary service voltage is 13.2kV L-L. This calculated symmetrical fault current is not intended for use as the basis for motor starting calculations and does not include:

- Consideration for any motor contribution or
- Fault current asymmetry.

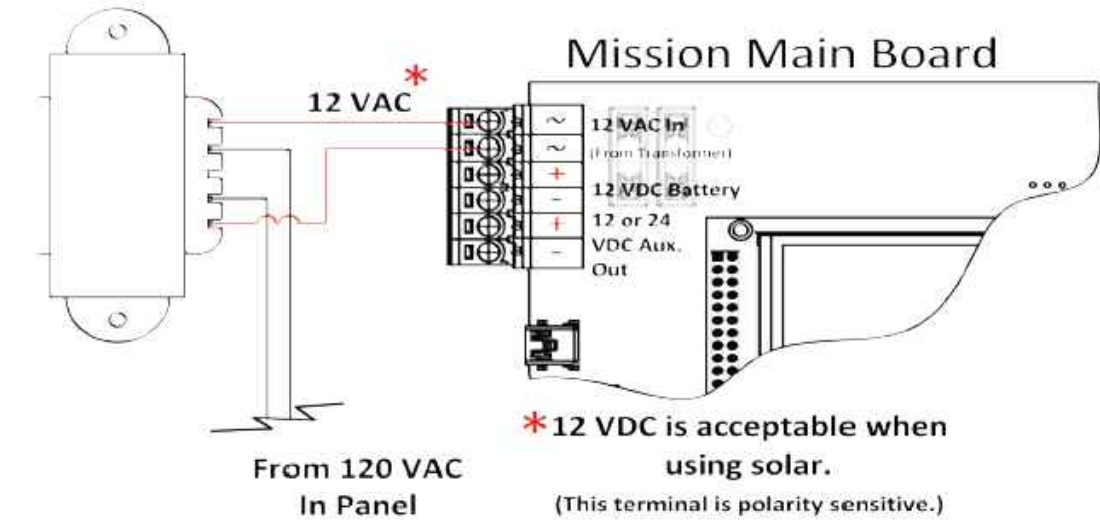
The FPL equipment currently serving or planned to serve your facility may change over time as a result of any number of factors, including but not limited to transformer replacements due to load growth, electrical grid changes or emergencies. As a result, although we are providing you with this information for the sole purpose of assisting you in the completion of your study, you and your client should not design, install or operate your system in reliance upon any expectation that the specific size and type of equipment currently in place will remain so. If and when the size and type of the equipment changes, our employees are not always in a position to immediately notify customers.

As the construction project progresses, any questions or information you may need can be communicated through me. I have enclosed my business card for easy reference and look forward to hearing from you in the near future.

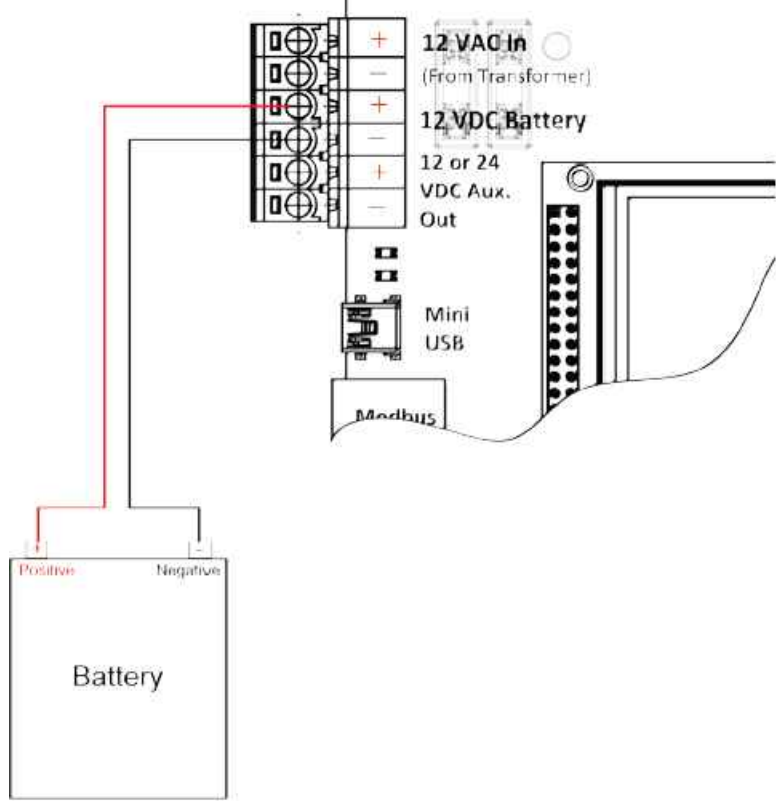
Sincerely,
Isabella Arcos

Isabella Arcos
Distribution Engineer
Central Dade Service Center, Florida Power & Light
Phone: [Cell] 786-719-0535 [Office] 305-377-6087
Email: Isabella.Arcos@fpl.com or ima0ati@fpl.com
Office: 122 SW 3rd St, Miami, FL, 33130

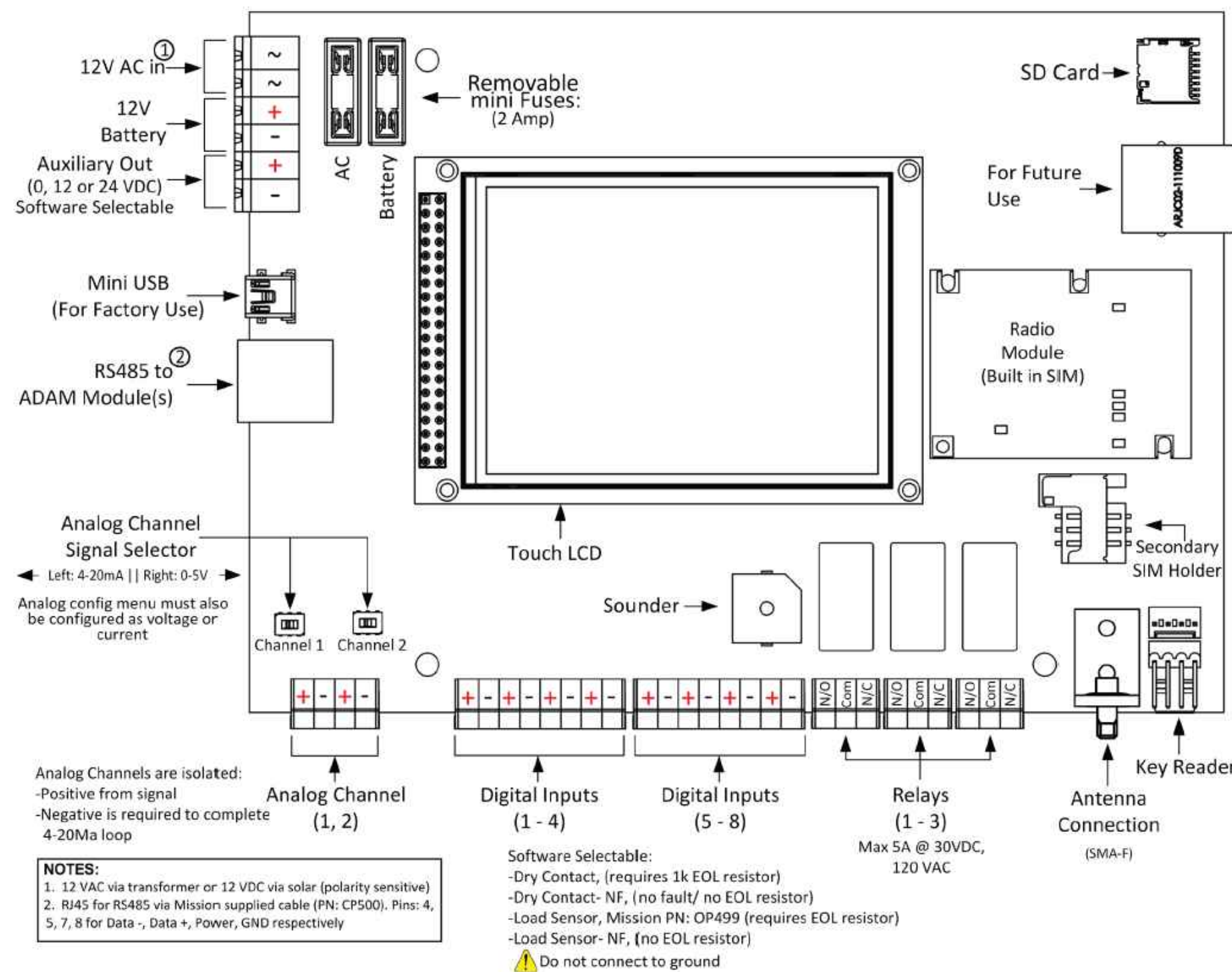
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Drawing name: D:\Projects\2022\20220226-Abbott Avenue Stormwater Improvements\MEP\11494_01-CP-1XX-92nd-MEP-Rev 1-V.E.dwg STATUS: PERMIT SET



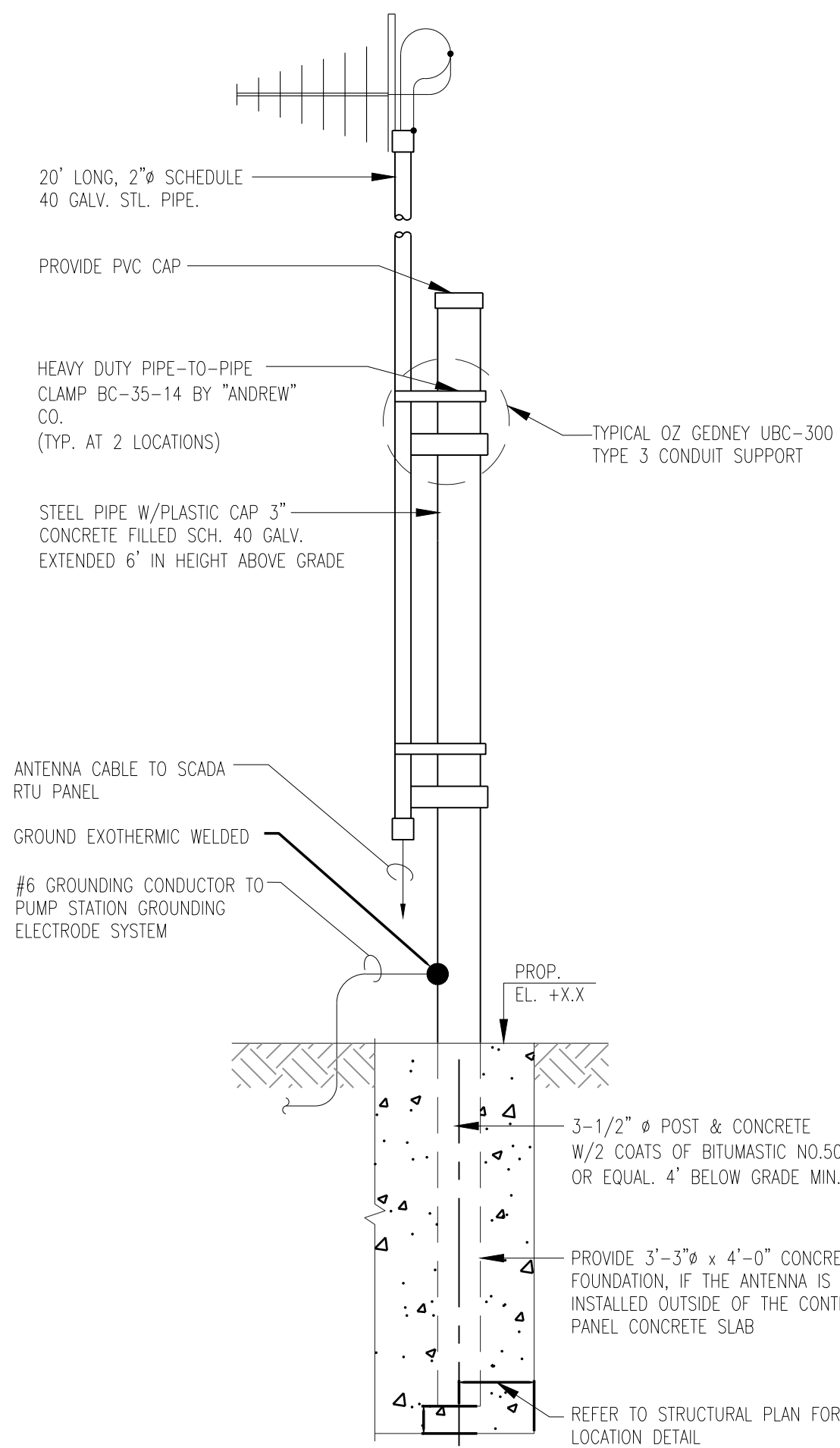
RTU TRANSFORMER WIRING
NOT TO SCALE



RTU BATTERY WIRING
NOT TO SCALE

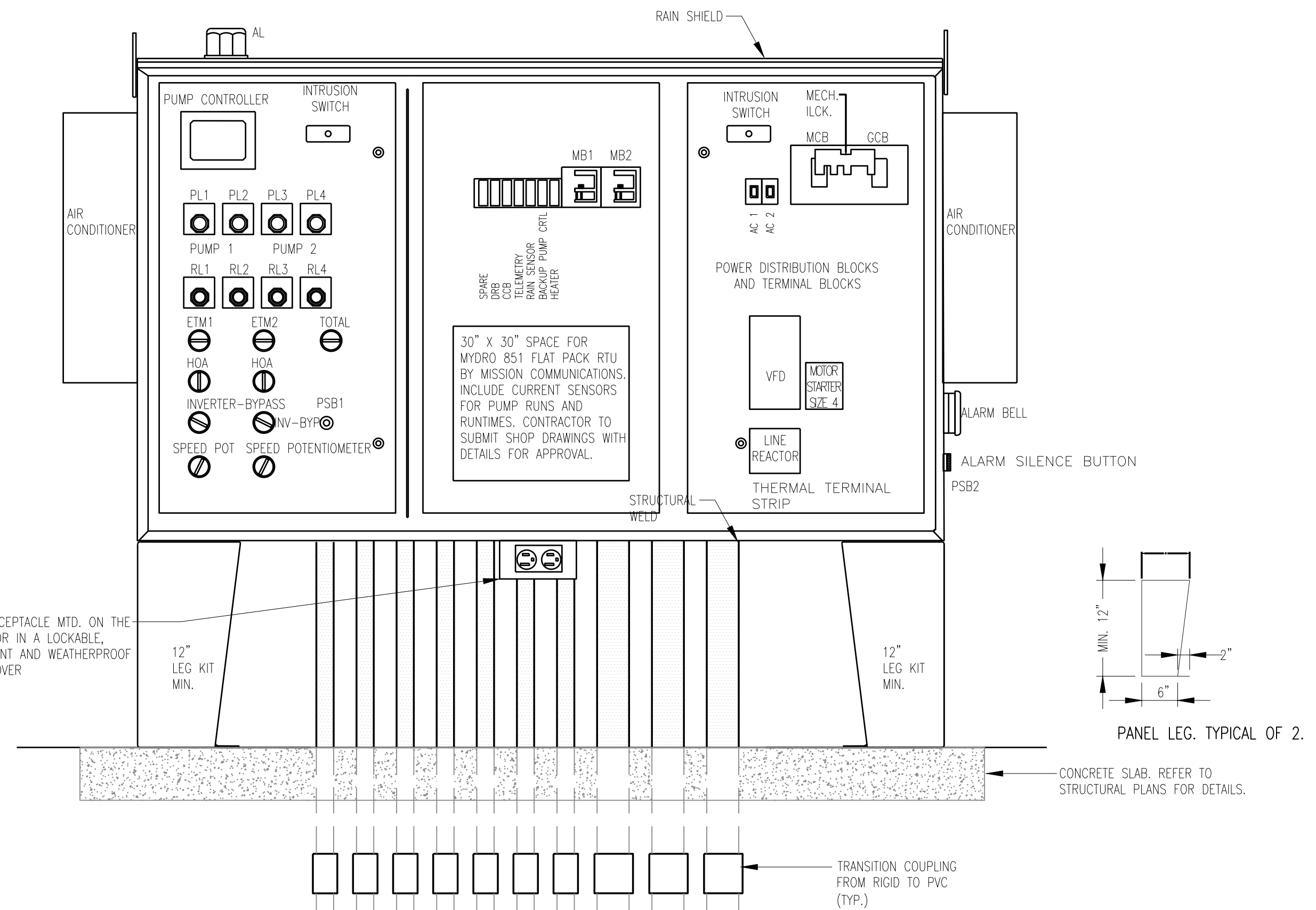


RTU MAIN BOARD CONNECTIONS
NOT TO SCALE



ANTENNA MOUNTING DETAIL
N.T.S.

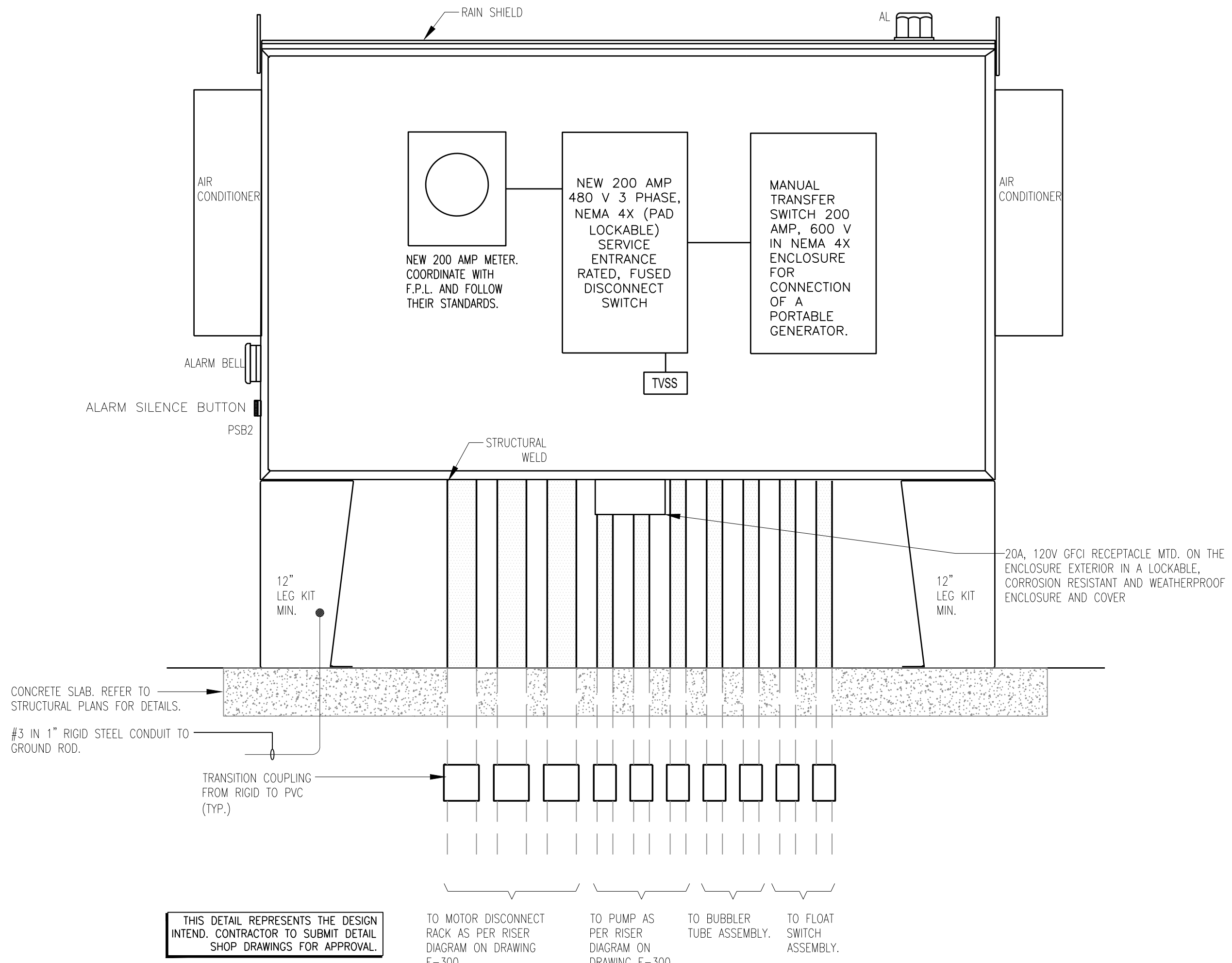
- NOTE:
- 1- RUN ANTENNA WIRE FROM SCADA RTU PANEL TO ANTENNA THROUGH 2" POST.
 - 2- TELEMETRY ANTENNA FOUNDATION PER MISSION STANDARD AND COMPLIES WITH FBC CHAPTER 16.



CONTROL PANEL DETAIL
NOT TO SCALE

THIS DETAIL REPRESENTS THE DESIGN INTEND. CONTRACTOR TO SUBMIT DETAIL SHOP DRAWINGS FOR APPROVAL.

- NOTES:
1. OUTER DOORS REMOVED TO SHOW DEADFRONT
 2. PROVIDE INNER AND OUTER DOOR STOP KITS
 3. CONTROL CABINET DEPTH SHALL NOT EXCEED 12 IN.
 4. SUPPORTS SHALL MEET LATEST WIND LOAD REQUIREMENTS OF THE LATEST FLORIDA BUILDING CODE.
 5. TOP OF CONTROL PANEL, RTU, AND ELECTRICAL SERVICE EQUIPMENT SHALL BE AT THE SAME ELEVATION



THIS DETAIL REPRESENTS THE DESIGN INTEND. CONTRACTOR TO SUBMIT DETAIL SHOP DRAWINGS FOR APPROVAL.

- TO MOTOR DISCONNECT RACK AS PER RISER DIAGRAM ON DRAWING E-300.
- TO PUMP AS PER RISER DIAGRAM ON DRAWING E-300.
- TO BUBBLER TUBE ASSEMBLY.
- TO FLOAT SWITCH ASSEMBLY.

REVISIONS		
NO.	DESCRIPTION	DATE

**PRELIMINARY PLAN
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ISSUE DATE: 05/31/2024
DESIGNED BY: ZM
DRAWN BY: MT
CHECKED BY: ZM
BID-CONTRACT:

Zoila Morales, P.E.
P.E. NO. 64981



PROJECT

**ABBOTT AVENUE
DRAINAGE
IMPROVEMENTS**

SHEET TITLE

**CONTROL PANEL
DETAILS -
92ND STREET**

SHEET NUMBER **E-501**
PROJECT NUMBER 11494.01

REVISIONS		
NO.	DESCRIPTION	DATE

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 DRAWN BY: MT
 CHECKED BY: ZM
 BID-CONTRACT:

Zoila Morales, P.E.
 P.E. NO. 64981



PROJECT
**ABBOTT AVENUE
 DRAINAGE
 IMPROVEMENTS**

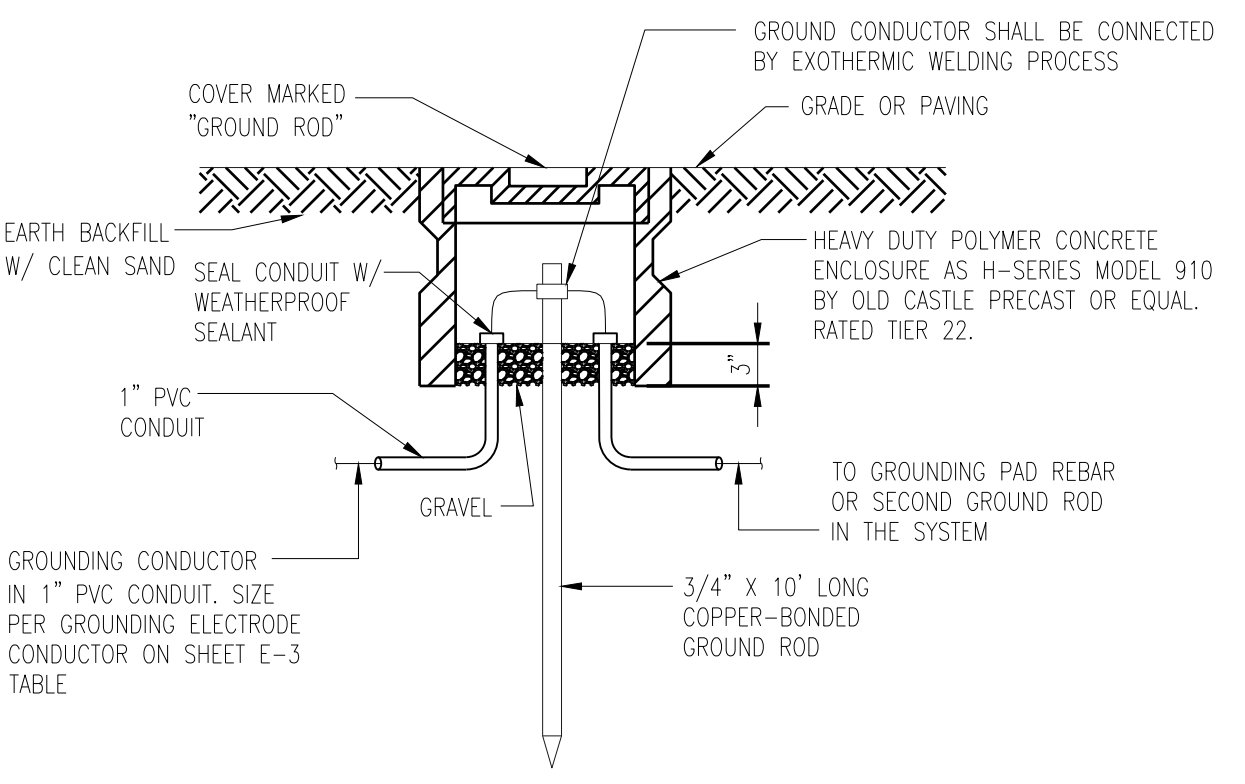
SHEET TITLE
**ELECTRICAL DETAILS
 -92ND STREET**

SHEET NUMBER **E-601**
 PROJECT NUMBER 11494.01

STATUS: PERMIT SET

Plotted by: me engineering cons On: 5/31/2024 12:04 PM

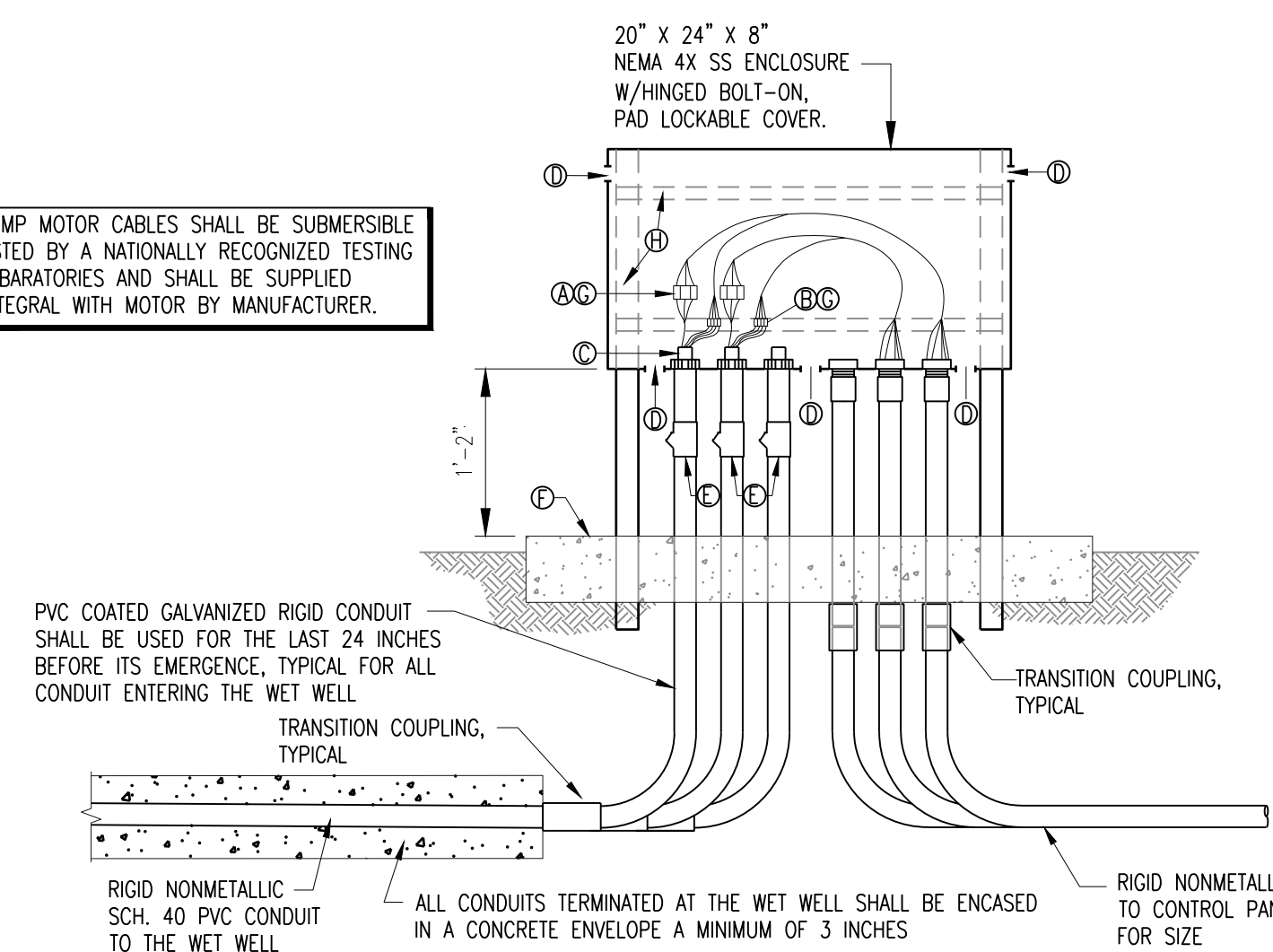
Drawing name: D:\Projects\2022\202206-Abbott Avenue Stormwater Improvements\MEP\11494.01-CP-1XX-92nd-MEP-Rev.1\VE.dwg



NOTE:
 SEE GROUNDING NOTES ON SHEET E-5.

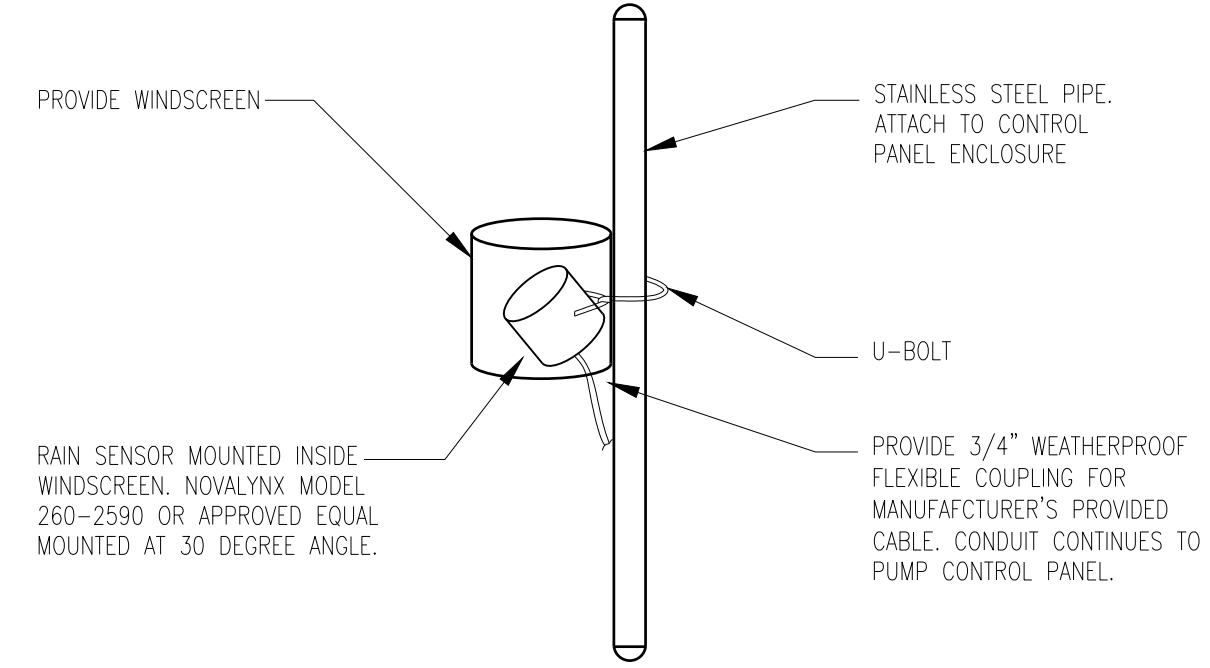
TYPICAL GROUND ROD INSTALLATION DETAIL
 N.T.S.

PUMP MOTOR CABLES SHALL BE SUBMERSIBLE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORIES AND SHALL BE SUPPLIED INTEGRAL WITH MOTOR BY MANUFACTURER.

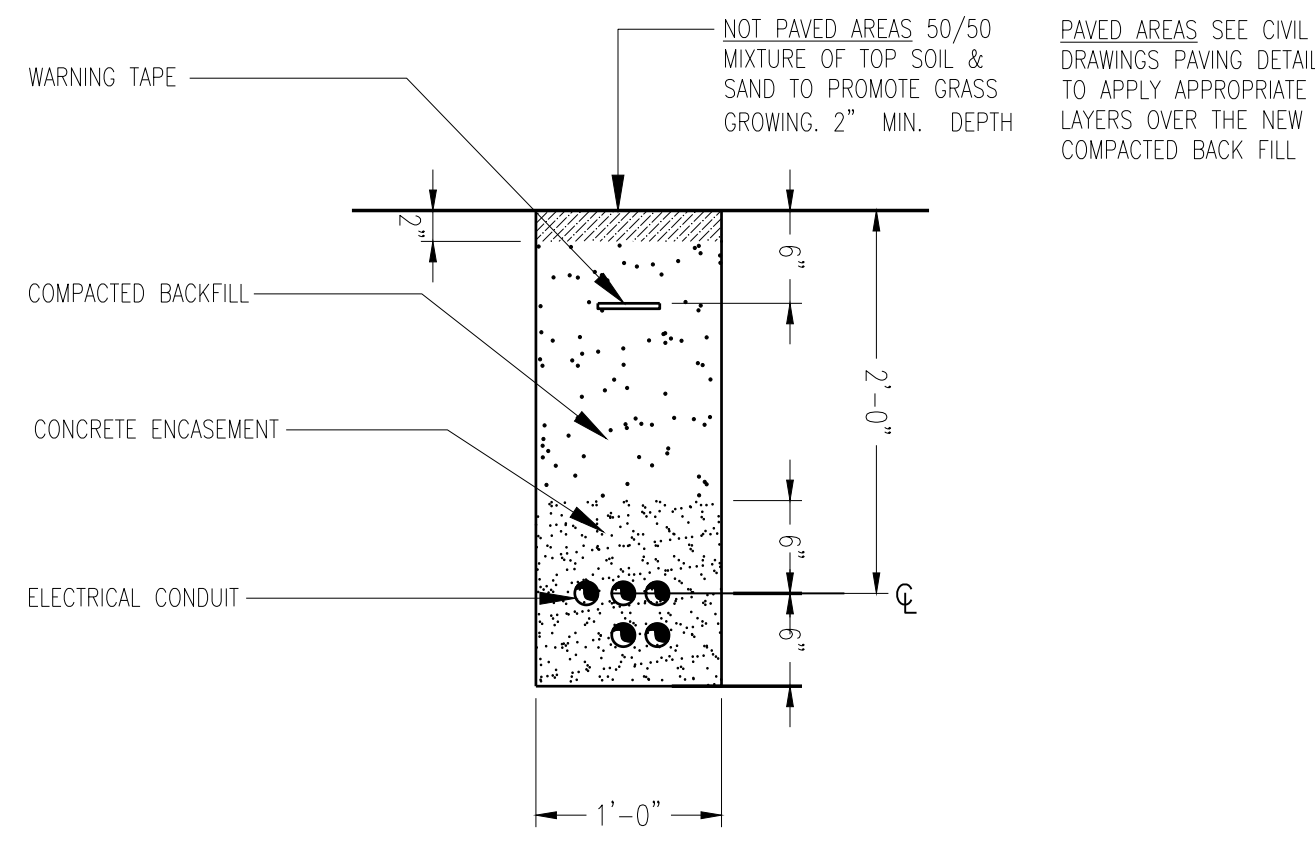


TYPICAL MOTOR CONNECTION BOX DETAIL
 N.T.S.

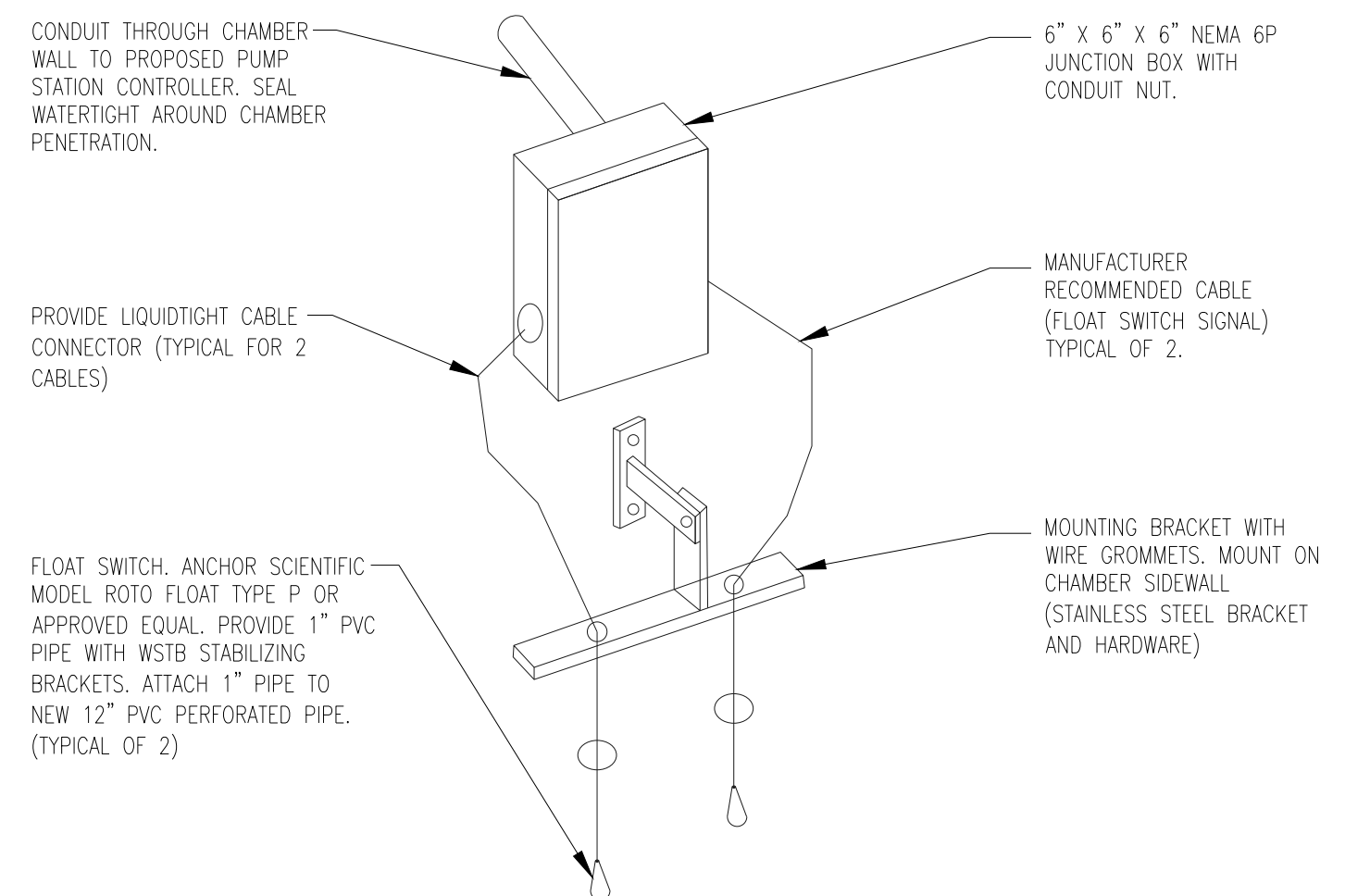
- Ⓐ 6-POLE POWER INSULATED TERM BLOCK PANEL MOUNT ALLEN BRADLEY BULLETIN 1492 SIZED AS REQUIRED.
- Ⓑ 6-CIRCUIT CONTROL INSULATED TERM BLOCK PANEL MOUNT ALLEN BRADLEY BULLETIN 1492
- Ⓒ CABLE CORD FITTING WITH GLAND NUT & NEOPRENE BUSHING EQUAL TO CROUSE HINDS CGFP SIZE OR AS REQUIRED FOR CABLE O.D.
- Ⓓ 1/8" DRAIN AND VENTILATION HOLES
- Ⓔ CONDUIT SEAL SUITABLE FOR CLASS I, DIV. 1, GROUP D HAZ. LOCATION WITHIN 18" OF ENCLOSURE AS PER NEC 501.1
- Ⓕ 3' X 3' X 6" CONCRETE SLAB. SEE STRUCTURAL DRAWINGS
- Ⓖ COAT WITH CLEAR URETHANE SEAL ELECTRICAL-ELECTRONIC INSULATOR AS CRC 'U' 02049
- Ⓗ 2" POST GALV. STL. PIPE SCH. 40 FILLED WITH CONCRETE AND 1-5/8" X 1-5/8" SS UNISTRUT CHANNELS FOR SUPPORT



RAIN SENSOR
 N.T.S.



TRENCH DETAIL
 N.T.S.

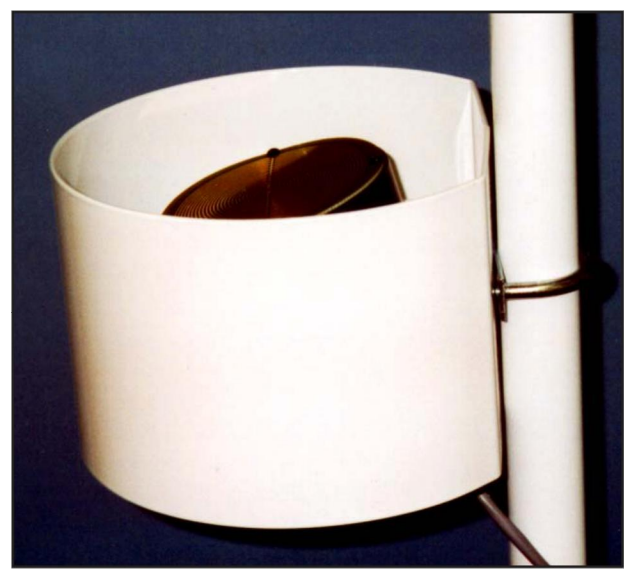


FLOAT SWITCH INSTALLATION DETAIL
 N.T.S.

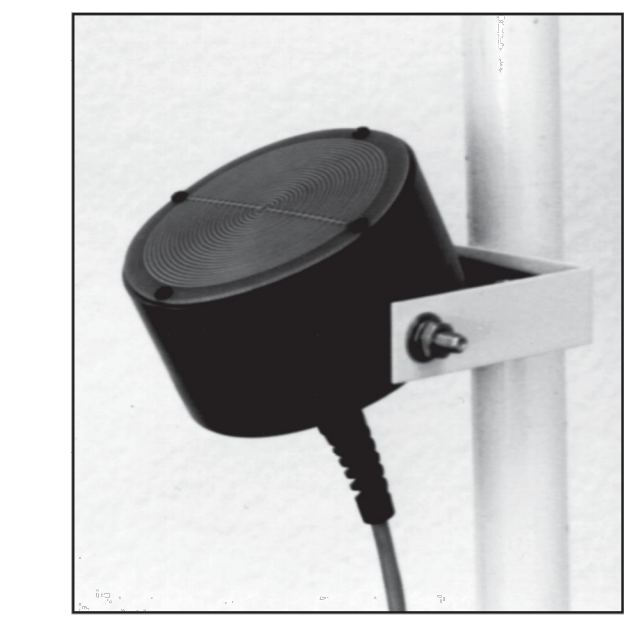


260-2590 Precipitation Detector 260-2591 Leaf Wetness Sensor

The Model 260-2590 Precipitation Detector is used to detect the onset of rainfall. A gold plated grid sensor activates the circuit when water is deposited onto the grid. The presence of water activates an internal relay that may be used to operate larger capacity external relays, alarms, doors, or may be used as an input to a data acquisition system.



An internal heater constantly dries the grid to prevent relay activation during times of dew, fog, or light moisture that is not actual precipitation. During periods of normal precipitation the heater is unable to dry the grid and the relay is activated. The heater power may be disconnected allowing the detector to be operated as a leaf wetness sensor.



The solid state electronics are mounted in a sealed weatherproof enclosure. The precipitation detector may be tilted to allow water to drain off. A mounting bracket is provided with the sensor to allow mounting onto a 1-inch pipe by a U-bolt. The wind screen may be used to prevent premature drying of the grid during precipitation events accompanied by high winds.

The unit requires +12 Vdc power for operation. A 100-240 Vac power adapter is provided with each unit.

- Specifications**
- Sensor: Gold plated grid 4" dia
 - Output: Relay (0.5 amps)
 - Heater: Resistive element
 - Power: 12 Vdc (235 mA max.) 100-240 Vac 50-60 Hz adapter supplied
 - Size: Overall 4" dia x 2" high
 - Weight/shipping: 4 lbs/5 lbs (1.8 Kg/2.3 Kg)

- Ordering Information**
- 260-2590 Precipitation Detector, 100-240 Vac, 25' cable
 - 260-2591 Leaf Wetness Sensor, 100-240 Vac, 25' cable
 - 260-2592 Vac, 25' cable
 - 330-0524 Additional Cable, per foot