



PLANS

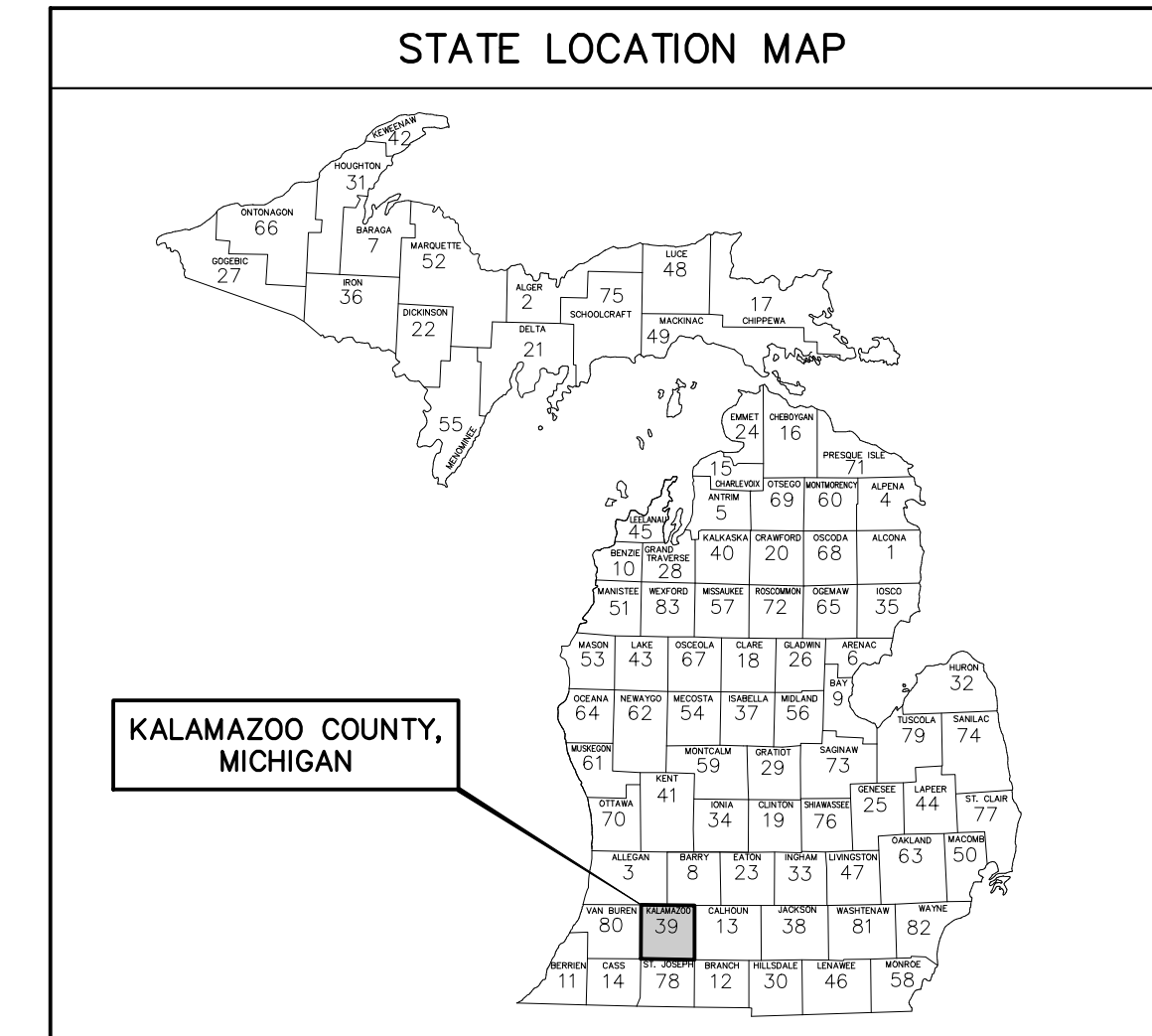
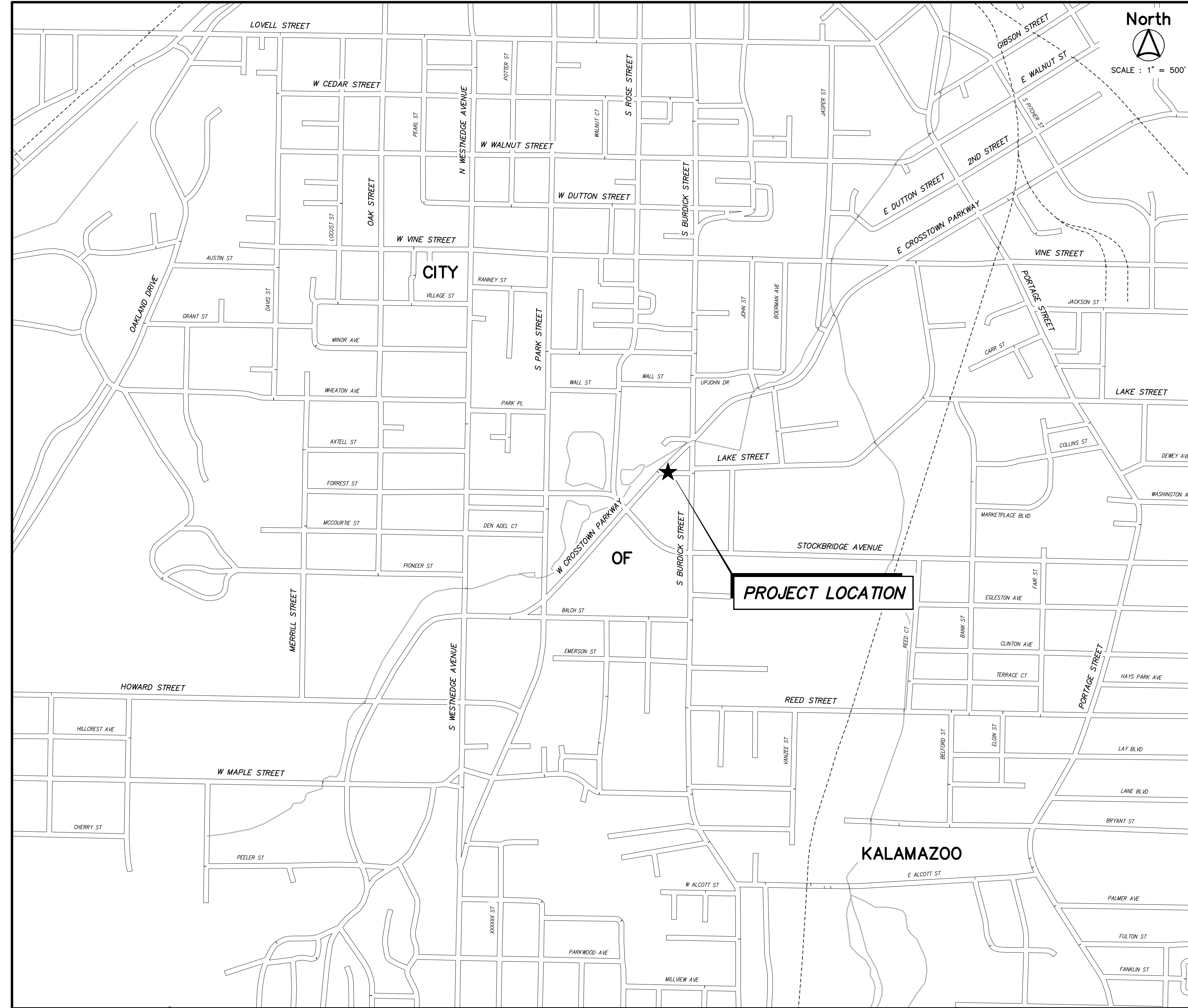
BORN COURT WELL 1-7

Bid Reference #: 91244-044.0

May 2025

CITY OF KALAMAZOO KALAMAZOO COUNTY, MICHIGAN

WATER SUPPLY SYSTEM IMPROVEMENTS BORN COURT WELL 1-7



SOIL BORING GENERAL NOTES

WITHIN EACH SOIL BORING, WHERE SHOWN, SOIL SAMPLES WERE OBTAINED BY THE STANDARD PENETRATION TEST METHOD, ASTM D1586, WHEREBY A SPLIT-SPOON SAMPLER IS DRIVEN THREE SUCCESSIVE 6-INCH INCREMENTS WITH A 140 POUND WEIGHT FALLING 30 INCHES. THE NUMBER OF BLOWS REQUIRED TO DRIVE THE SAMPLER FOR EACH INCREMENT IS PRESENTED ON THE SOIL BORING LOGS.

GRANULAR SOILS (COARSE-GRAINED) HAVE MORE THAN 50% OF THEIR DRY WEIGHT RETAINED ON A #200 SEVE. THEY ARE DESCRIBED AS: BOULDERS, COBBLES, GRAVEL OR SAND. FINE-GRAINED SOILS HAVE LESS THAN 50% OF THEIR DRY WEIGHT RETAINED ON A #200 SEVE. THEY ARE DESCRIBED AS: CLAYS OR CLAYEY SILTS IF THEY ARE COHESIVE, AND SILTS IF THEY ARE NON-COHESIVE. IN ADDITION TO GRAIN SIZE, GRANULAR SOILS ARE DEFINED BASED ON THEIR IN-SITU DENSITY; FINE-GRAINED SOILS ARE FURTHER DEFINED BASED ON THEIR STRENGTH OR CONSISTENCY, AND ON THEIR PLASTICITY.

MAJOR SOIL COMPONENT	GRADATION RANGE	DESCRIPTION TERMS (OF MINOR SOIL CONSTITUENTS)	PERCENT OF DRY WEIGHT
BOULDERS	OVER 12 INCHES (305mm)		1 - 10
COBBLES	12 INCHES TO 3 INCHES (305mm TO 76mm)		10 - 20
GRAVEL COARSE	3 INCHES TO 3/4 INCHES (76mm TO 19mm)	LITTLE	20 - 35
FINE	3/4 INCHES TO #4 SEVE (19mm TO 4.75mm)	SOME	35 - 50
SAND COARSE	#4 SEVE TO #10 SEVE (4.75mm TO 2.00mm)	AND	
MEDIUM	#10 SEVE TO #40 SEVE (2.00mm TO 0.425mm)		
FINE	#40 SEVE TO #200 SEVE (0.425mm TO 0.075mm)		
SILT	PASSING #200 SEVE (0.075mm) TO 0.0075mm	CONSISTENCY OF COHESIVE SOILS:	
CLAY	SMALLER THAN 0.0075mm		

UNCOMPACTED COMP. STRENGTH, Qu (kgf)	CONSISTENCY
< 25	VERY SOFT
0.25 - 0.50	SOFT
0.50 - 1.00	MEDIUM (FIRM)
1.00 - 2.00	STIFF
2.00 - 4.00	VERY STIFF
4.00 - 8.00	HARD
> 8.00	VERY HARD

IN-SITU DENSITY OF GRANULAR SOILS

N - BLOWS/FT	IN-SITU DENSITY	CONSISTENCY
0 - 4	VERY LOOSE	VERY SOFT
5 - 10	LOOSE	SOFT
11 - 30	MEDIUM DENSE	MEDIUM (FIRM)
31 - 50	DENSE	STIFF
50 +	VERY DENSE	VERY STIFF

WATER LEVELS INDICATED ON THE BORING LOGS ARE THE LEVELS MEASURED IN THE BORING AT THE TIMES INDICATED. IT SHOULD BE NOTED THAT GROUNDWATER LEVELS OBSERVED DURING DRILLING IN PREDOMINANTLY COHESIVE SOILS ARE NOT NECESSARILY INDICATIVE OF THE STATIC GROUNDWATER LEVEL. THIS IS DUE TO THE RELATIVELY LOW PERMEABILITY OF CLAY SOILS AND THE TENDENCY OF DRILLING OPERATIONS TO TEMPORARILY SEAL OFF NATURAL PATHS OF GROUNDWATER MOTION INTO THE BORING. ADDITIONALLY, FLUCTUATIONS IN GROUNDWATER LEVELS SHOULD BE ANTICIPATED WITH SEASONAL VARIATIONS AND FOLLOWING PERIODS OF HEAVY OR PROLONGED PRECIPITATION.

THE SOIL BORING LOGS SHOWN ON THE CONSTRUCTION PLANS ARE BEING FURNISHED FOR YOUR CONVENIENCE AND GENERAL INFORMATION ONLY. THE DATA SHOWN ON THE BORING LOGS REPRESENTS TEST AND GROUNDWATER CONDITIONS ENCOUNTERED AT THE RESPECTIVE BORING LOCATIONS. VARIATIONS MAY OCCUR BETWEEN THESE LOCATIONS. ADDITIONALLY, THE STRATIGRAPHIC LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES; HOWEVER, THE TRANSITION MAY BE MORE GRADUAL THAN WHAT IS SHOWN. THE BIDDOR WILL BE RESPONSIBLE FOR MAKING THEMSELVES FAMILIAR WITH SUBSURFACE CONDITIONS BY WHATEVER MEANS THEY DEEM NECESSARY AND SHALL MAKE THEIR OWN DETERMINATIONS THEREON.

THE BIDDOR BY SUBMITTING A BID, WAIVES ALL CLAIMS FOR DAMAGES WHICH THEY MAY SUFFER BY REASON OF THE INADEQUACIES OR DISCREPANCIES OF THE INFORMATION SHOWN ON THESE SOIL BORING LOGS AND UNDERSTANDS THAT NO COMPENSATION WILL BE PAID TO THEM DUE TO AN INADEQUACY OR DISCREPANCY IN THIS DATA.

GENERAL NOTES

1. THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH THE 2012 MICHIGAN DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR CONSTRUCTION EXCEPT WHERE OTHERWISE INDICATED ON THESE PLANS. IN THE PROPOSAL, SUPPLEMENTAL SPECIFICATIONS, OR SPECIAL PROVISIONS FOR THIS PROJECT.
2. CONTRACTOR TO CALL MISS DIG (CALL TOLL FREE 1-800-482-7171) OR 811 THREE WORKING DAYS BEFORE STARTING YOUR PROJECT. (EXCLUDING WEEKENDS AND HOLIDAYS)
3. THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE IN DONE IN ACCORDANCE WITH THE 2011 MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
4. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE CITY OF KALAMAZOO STANDARD SPECIFICATIONS FOR WATER MAIN AND SERVICE INSTALLATION 2021.

UTILITIES

WATER & SANITARY

CITY OF KALAMAZOO
415 STOCKBRIDGE AVE
KALAMAZOO, MI 49001
PHONE: (269) 337-8558
ATTN: DEBBIE JUNG

STORM SEWER

CITY OF KALAMAZOO
415 E STOCKBRIDGE AVENUE
KALAMAZOO, MI 49001
PHONE: (269) 337-8697
ATTN: TOM PALUMBO

GAS

CONSUMERS ENERGY
2500 E CORK ST
KALAMAZOO, MI 49001
PHONE: (269) 337-2366
ATTN: KYLE OAK

ELECTRIC-DISTRIBUTION

CONSUMERS ENERGY
2500 E CORK ST
KALAMAZOO, MI 49001
PHONE: (269) 337-2245
ATTN: ANDRE TAYLOR

FIBER OPTIC

CHARTER SPECTRUM
4176 COMMERCIAL AVE
KALAMAZOO, MI 49002
PHONE: (269) 207-9648
ATTN: JASON TILLER

CABLE TELEVISION

CHARTER SPECTRUM
4176 COMMERCIAL AVE
KALAMAZOO, MI 49002
PHONE: (269) 207-9648
ATTN: JASON TILLER

PROJECT DATUM INFORMATION

COORDINATE SYSTEM : STATE PLANE GRID
ZONE : MICHIGAN SOUTH 2113
ELLIPSOID : GRS 80
HORIZONTAL DATUM : NAD 83 (2011)
VERTICAL DATUM : NAVD 88
GEOID : GEOID 18
UNITS : INTERNATIONAL FEET

PROJECT COMBINED SCALE FACTOR (PCSF) = 0.999962554581
GROUND DISTANCE = GRID DISTANCE/PCSF

APPROVED BY:
THE CITY OF KALAMAZOO

— *John Randall* — DATE: 05/16/2025
DEPARTMENT OF PUBLIC SERVICES
ASSISTANT CITY ENGINEER

Peter W. Brink
5/15/25



SHEET INDEX

SHEET No.	DESCRIPTION
1	COVER SHEET
2	EXISTING SITE PLAN
3	PROPOSED SITE & YARD PIPING PLAN
4	ELECTRICAL SITE PLAN
5	ELECTRICAL POWER PLAN
6	ELECTRICAL SITE PLAN & DETAILS
7	ELECTRICAL WRING DIAGRAM
8	ELECTRICAL SINGLE-LINE DIAGRAM

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PROJECT NO.
2220555

SHEET NO.

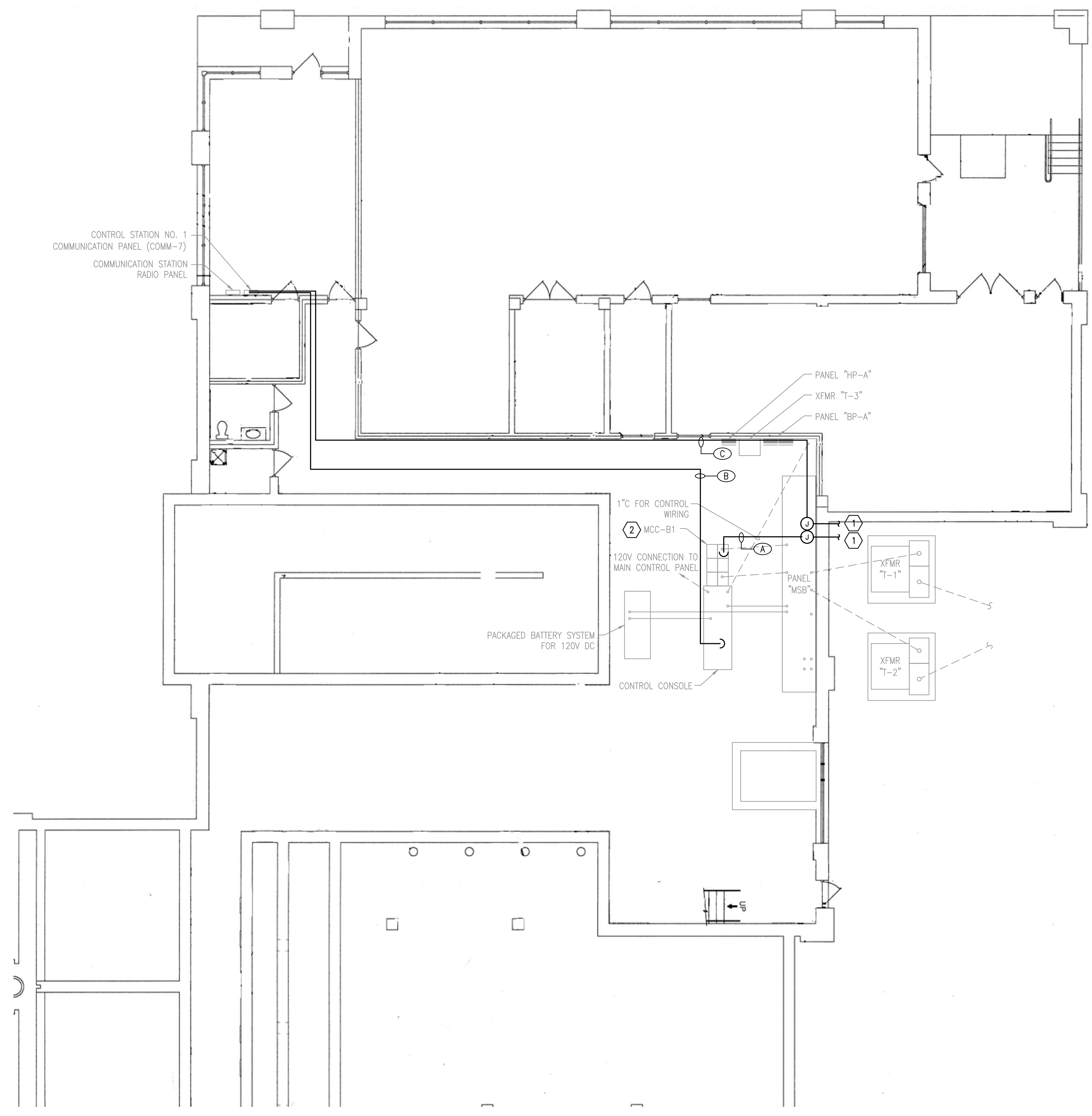
1 OF 8



UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.

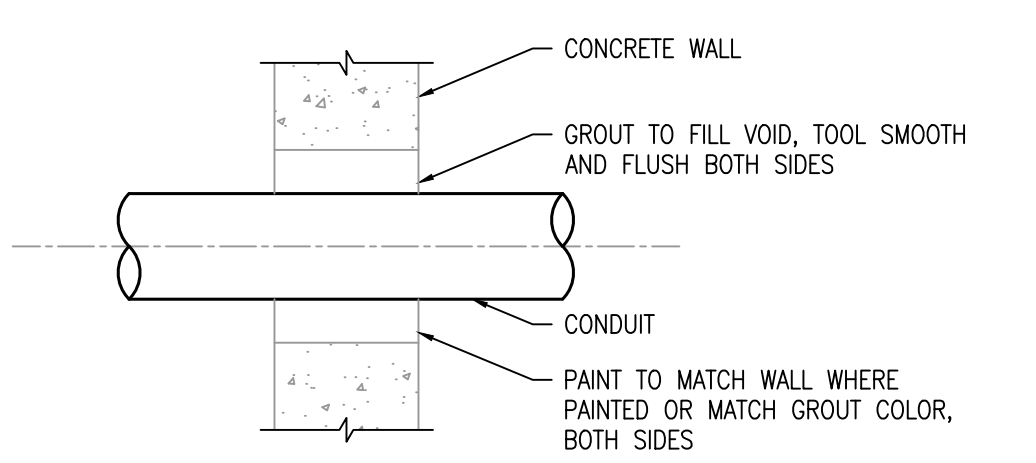
CONDUIT AND CABLE SCHEDULE

MARK	DESCRIPTION
ⓐ	
A	2 SETS OF 3#250KCMIL, #1/GND - 4°C
B	6-STR SINGLE-MODE FIBER - 3/4°C
C	24-STR SINGLE-MODE FIBER - 2°C
NOTE:	

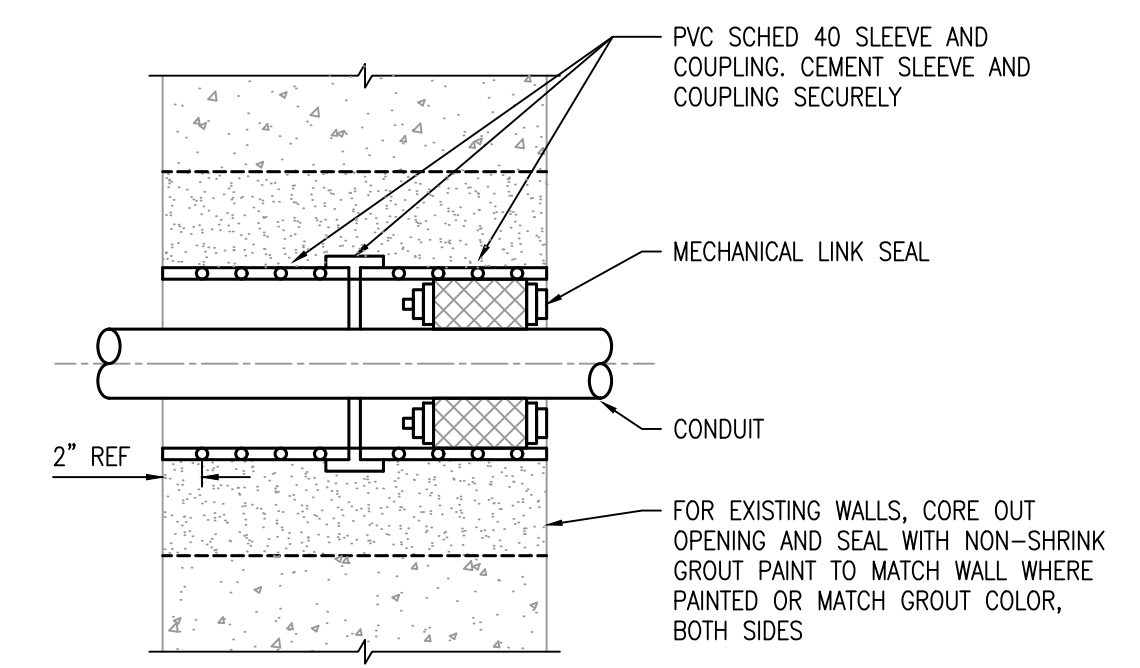


ELECTRICAL POWER PLAN
SCALE : 1/4" = 1'-0"
North

- PLAN NOTES:** (ⓐ) (SYMBOL DENOTES PLAN NOTE)
- SEE CONTINUATION ON SHEET 4.
 - REFER TO SINGLE-LINE DIAGRAM ON SHEET 8.
 - PROVIDE COMPONENTS AS REQUIRED FOR TERMINATION. COORDINATE REQUIREMENTS WITH CITY OF KALAMAZOO.



INTERIOR WALL PENETRATION DETAIL
SCALE : NONE



EXTERIOR WALL CONDUIT SLEEVE DETAIL
SCALE : NONE

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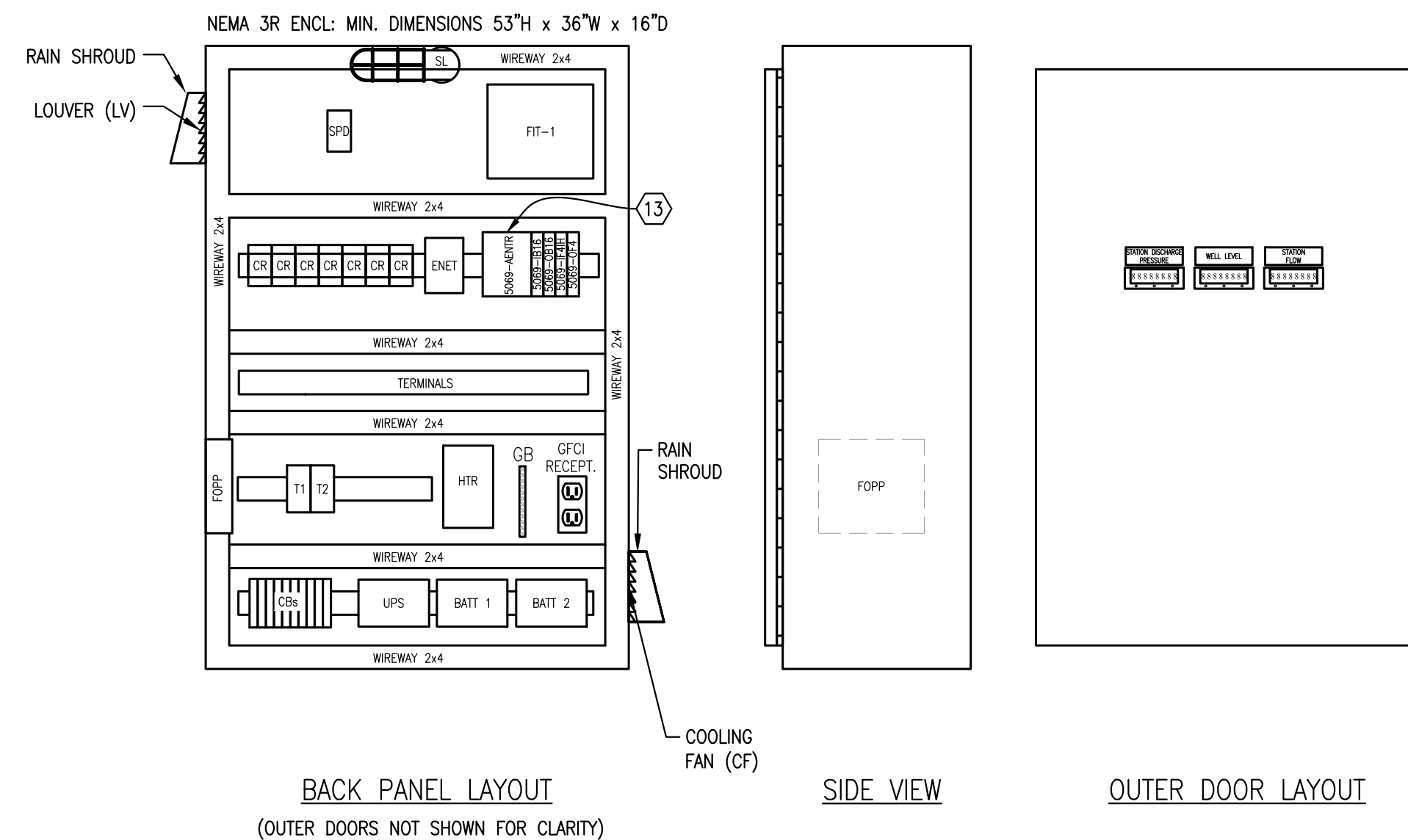
NO.	REVISIONS	BY	DATE	DRAWN
				JZJ
				DATE MAY '25
				CHECKED MAT
				DATE MAY '25

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CITY OF KALAMAZOO DWRP
KALAMAZOO COUNTY, MICHIGAN
WATER SUPPLY SYSTEM IMPROVEMENTS
ELECTRICAL POWER PLAN

PROJECT NO.
2220555
SHEET NO.
5 OF 8



WELL CONTROL PANEL 1-7 (CP) DETAIL (15)

GENERAL NOTES:

- PROVIDE THESE CONDUIT TYPES IN THE FOLLOWING LOCATIONS:
 - RMC - OUTDOOR ABOVE GRADE.
 - SCH. 40 PVC - BELOW GRADE AND IN-SLAB.
 - SCH. 80 PVC - BELOW GRADE UNDER AREAS EXPOSED TO VEHICULAR TRAFFIC.
- PROVIDE RMC CONDUIT AND ELBOWS FOR ALL STUB UPS TO EQUIPMENT EXTENDING UP THRU CONCRETE SLABS FOR TRANSITION FROM CONCEALED/UNDERGROUND TO EXPOSED CONDUIT INSTALLATION. PROVIDE SCH. 40 PVC SLEEVES FOR ALL CONDUITS EXTENDING UP THROUGH CONCRETE SLABS.
- USE RMC CONDUIT ELBOWS IN ALL UNDERGROUND CONDUIT INSTALLATIONS.
- ALL INSTRUMENTATION DEVICES FURNISHED BY THE INSTRUMENTATION CONTRACTOR ARE INSTALLED BY THE ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL PROVIDE FIELD WIRING, CONDUIT & TERMINATIONS FOR THOSE DEVICES AS REQUIRED.
- FOR GENERAL USE 20A RECEPTACLES, PROVIDE MINIMUM 2#12, #12GND - 3/4".

DEMOLITION NOTES: (SYMBOL DENOTES PLAN NOTE)

- DEMOLISH EXISTING WELL-BUILDING ELECTRICAL SERVICE. COORDINATE REQUIREMENTS WITH CONSUMERS ENERGY.
- CONTRACTOR SHALL COORDINATE WITH OWNER TO CONNECT PORTABLE GENERATOR TO VERIFY PHASE & ROTATION.
- COORDINATE INSTALLATION AND WIRING WITH PIPE INSULATION SYSTEM.
- LOOP ADDITIONAL HEAT TRACE CABLE AT PIPE COUPLINGS, VALVES, AND JOINT LOCATIONS.
- ROUTE RTD SENSOR CONDUCTORS IN CONDUIT FROM SENSOR HEAD TO CONTROLLER.
- LOCATE TEMPERATURE SENSORS IN PIPING OUTSIDE OF THE TEMPERATURE INFLUENCE OF ADJACENT BUILDING OR TANKAGE. LOCATE SENSORS TO BE IN LOCATIONS THAT ARE REPRESENTATIVE OF THE TEMPERATURE OF THE MAJORITY OF THE PROCESS FLUID BEING MEASURED. COORDINATE WITH SYSTEM SUPPLIER.
- UTILIZE PIPE STAND OFF TO EXTEND CONNECTION POINT ABOVE INSTALLATION.
- ALL PIPING THAT TRANSITIONS TO BELOW GRADE SHALL BE TRACED TO 36" BELOW GRADE. PROVIDE INSULATION UP TO 1'-0" BELOW GRADE. NO SPLICES OR END SEAL KITS SHALL BE LOCATED BELOW GRADE.
- FOR PIPES 6" OR LARGER, ROUTE HEAT TRACE DOWN PROCESS PIPING AND BACK SUCH THAT END SEAL KIT IS LOCATED ADJACENT TO POWER CONNECTION KIT. ENSURE END SEAL KIT IS READILY ACCESSIBLE WITHOUT ADDITIONAL EQUIPMENT.
- PROVIDE SMALL LIU SPLICE BOX FOR FIBER TERMINATIONS. COORDINATE EXACT LOCATION WITH CITY OF KALAMAZOO.
- PROVIDE 30'+ ADDITIONAL CONDUCTOR SERVICE LOOP AND ENCLOSURE TO HOUSE EXCESS CABLE ADJACENT TO DISCONNECT.
- PROVIDE 24 STRAIGHT-THRU SPLICES WITHIN EXISTING HANDHOLE.
- PROVIDE 50' OF ADDITIONAL FIBER LOOPED WITHIN HANDHOLE FOR FUTURE TERMINATION LOCATION MODIFICATIONS.
- PROVIDE W/ FOUR (4) 5069-RTB18-SCREW AND ONE (1) 5069-RTB5-SCREW
- PROVIDE DIE-CAST PADLOCKABLE WHILE-IN-USE WEATHERPROOF RECEPTACLE COVER.
- CONTROL PANEL SHALL HAVE INTEGRAL PADLOCK HASP.

PLAN NOTES: (SYMBOL DENOTES PLAN NOTE)

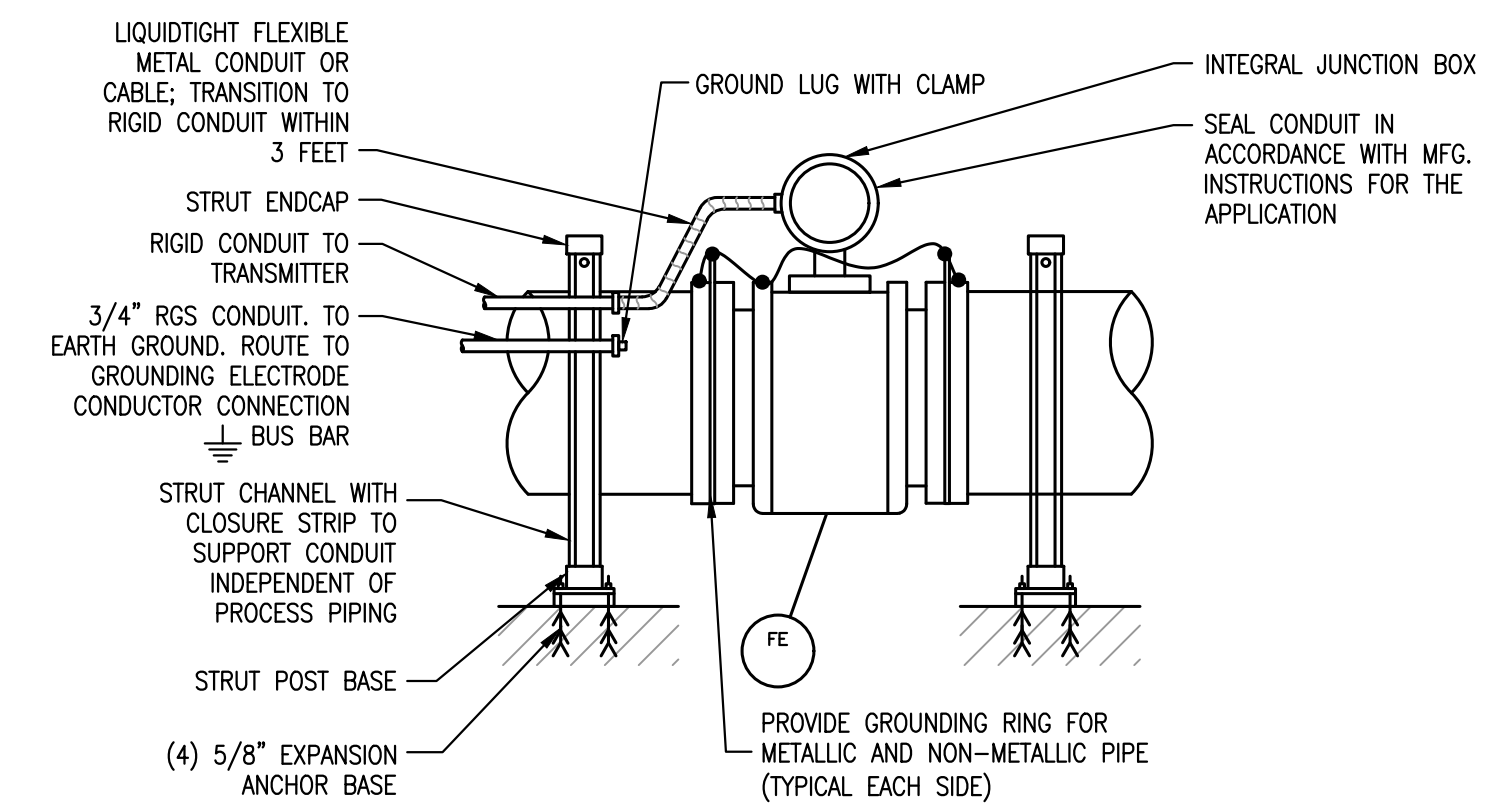
CONDUIT AND CABLE SCHEDULE

MARK	DESCRIPTION
(15)	
A	2 SETS OF 3#250KCMIL, 2#1/0GND - 4" C
B	6-STR MULTI-MODE FIBER - 3" C (SCH. 40 PVC)
C	INSTRUMENT MANUFACTURER'S CABLE - 1-1/4" C
D	PUMP MFG. POWER CABLE, INCLUDES SENSOR CONDUCTORS 2-1/2" C
E	2#12, #12GND - 3/4" C
F	8#14, #14GND - 3/4" C

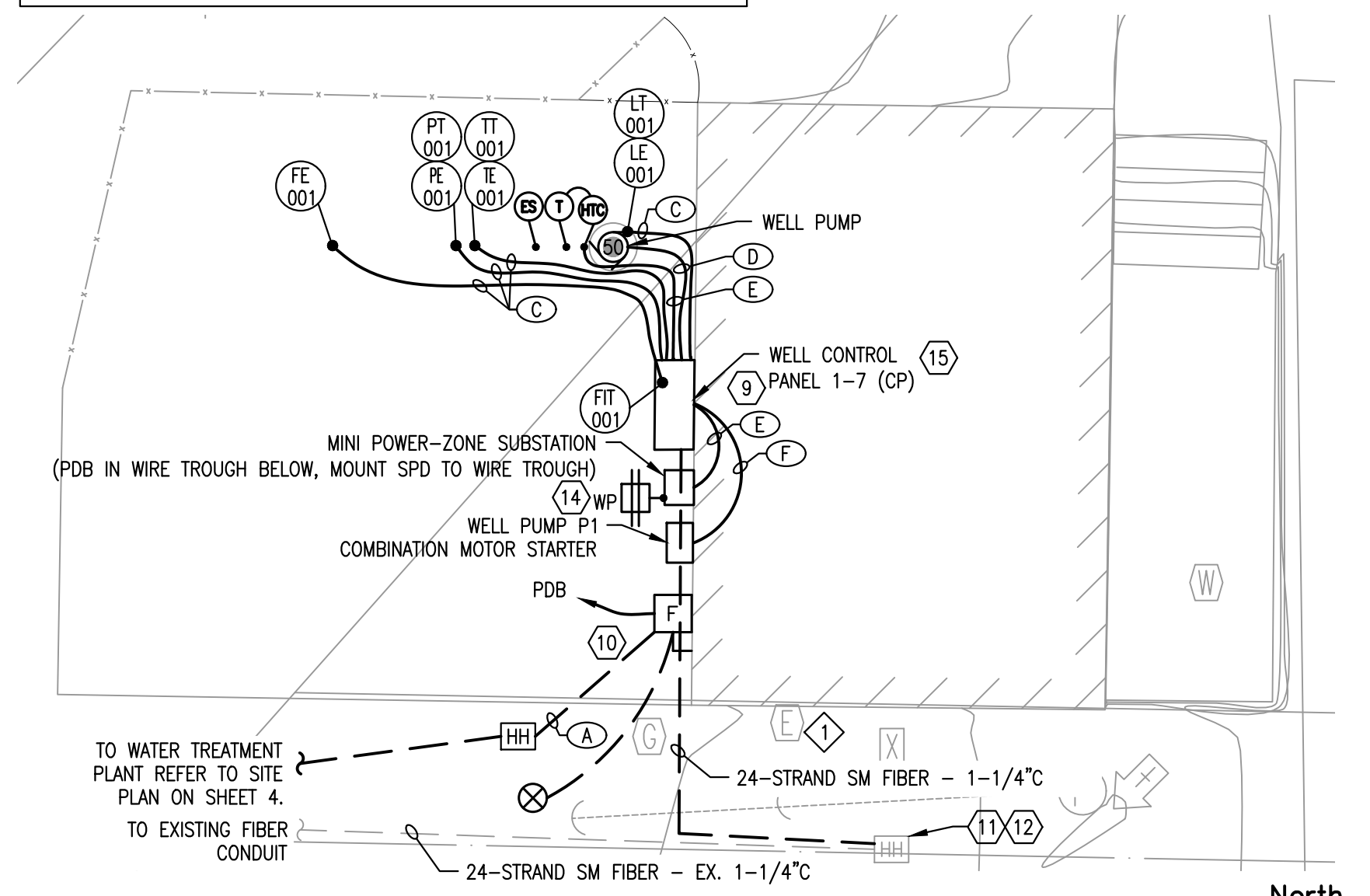
NOTE:

PIPE HEAT TRACE SCHEDULE													
DESCRIPTION	FUNCTION	PIPE			INSULATION		HEAT CABLE			TEMPERATURE SENSOR		POWER	
		SIZE	LENGTH (FT.)	MATERIAL	THICKNESS	TYPE	LENGTH (FT.)	WATTS (W/FT)	TYPE	TYPE	SETTING	VOLTAGE	CIRCUIT
WATER PIPING	FREEZE PROTECTION	8"	21	150# STAINLESS	2"	POLYISOCYANURATE W/ SS JACKET	100	8	CHROMALOX MODEL# SRLB-1CT, OR EQUAL	LINE SENSING	50°F	120V	CB11 (20A GFPE CB)
HEAT TRACE	SELF-REGULATING HEATING CABLE THAT VARIES ITS POWER OUTPUT RELATIVE TO TEMPERATURE. NICKEL-PLATED COPPER BUS WIRES WITH TINNED COPPER BRAID AND FLUOROPOLYMER CORROSION RESISTANT OVERJACKET. CHROMALOX SRLB-1CT OR EQUAL. QTY. 50 FT MINIMUM.												
LIGHTED END SEAL KIT	TERMINATION DEVICE WITH RED INDICATING LIGHT AND PIPE STANDOFF WITH CABLE GROMMET. CHROMALOX UESL OR EQUAL. QTY. 1 MINIMUM.												
METAL PIPE STRAP	CHROMALOX PS-10 OR EQUAL. QTY. PS-10, 2 MINIMUM.												
CAUTION LABEL PACK	WEATHER RESISTANT WARNING LABEL. CHROMALOX CL-1, OR EQUAL, 5 PER PACK. QTY. 1 MINIMUM.												
FIBERGLASS TAPE	FOR USE WITH METALLIC PIPE, INSTALL BELOW AND ABOVE HEAT TRACE: GLASS CLOTH TAPE WITH PRESSURE-SENSITIVE THERMOSETTING ADHESIVE, 66 FT. ROLL. CHROMALOX FT-3, OR EQUAL. QTY. 3 ROLLS MINIMUM.												
PHENOLIC LABEL	DEVICE NAMETAG LABEL. LABEL EACH CONTROLLER, RTD SENSOR HEAD, AND END LIGHT WITH CONTROLLER AND CIRCUIT NUMBER. QTY. 3 MINIMUM.												
NOTE: QUANTITY OF SOME COMPONENTS DEPENDS PARTIALLY ON INSTALLATION CONFIGURATION. MORE QUANTITY MAY BE REQUIRED, LESS SHOULD NOT BE UTILIZED.													

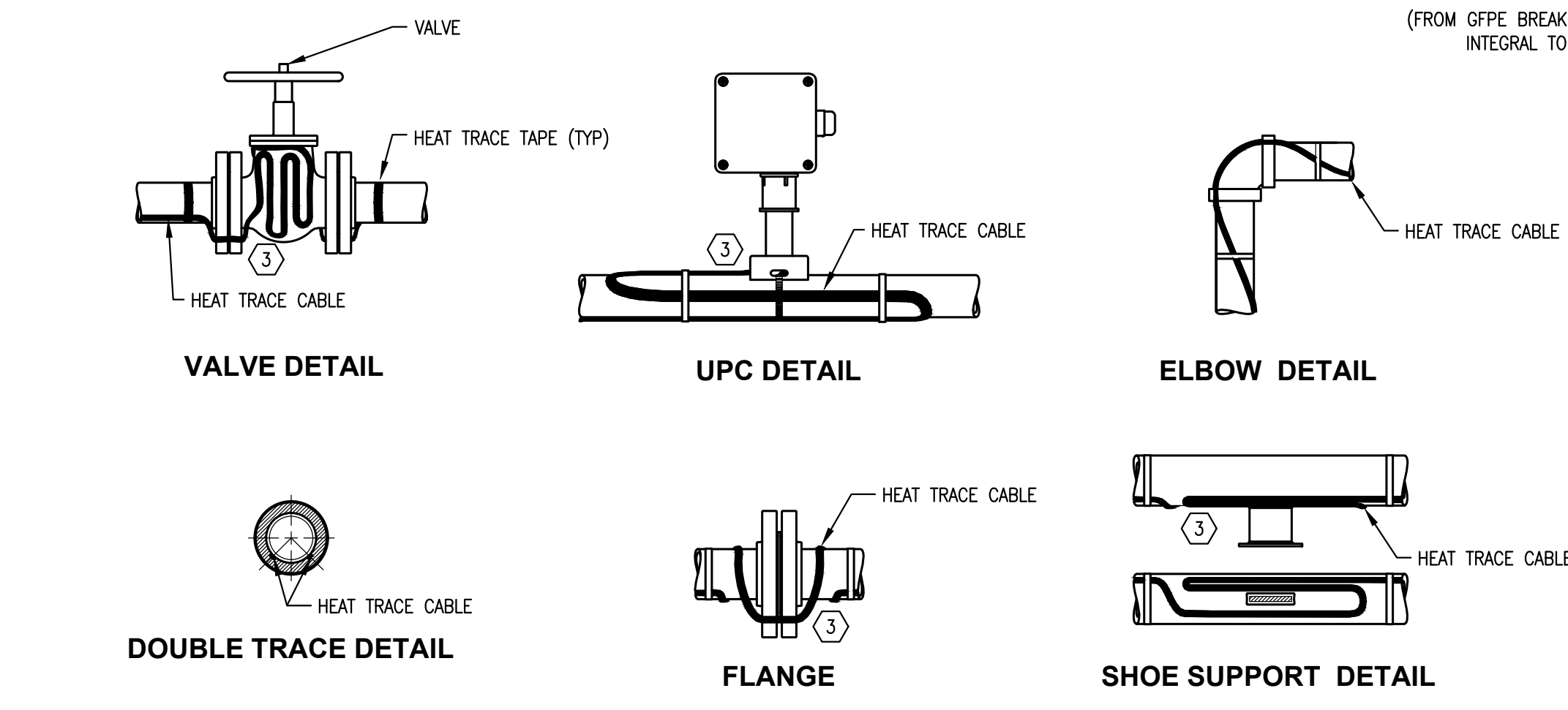
- HEAT TRACE SPECIFICATION:**
- SELF REGULATING HEAT TRACE:**
- SHALL BE CHROMALOX SRLB-1CT OR EQUAL, 8 WATT/FOOT, 120V WITH FLUOROPOLYMER JACKET OVER BRAID. MUST BE RATED FOR MAINTAINED TEMPERATURES OF 150F WITH POWER OFF EXPOSURE OF 185F. CABLE, AND ACCESSORIES. FIBERGLASS TAPE CHROMALOX MODEL FT-1 OR EQUAL MUST BE APPLIED TO THE PIPE ABOVE THE HEAT TRACE EVERY FOOT. SERVICE LOOPS SHALL BE INSTALLED AT ALL PIPE SUPPORTS, POWER CONNECTIONS AND END SEALS PER MANUFACTURER INSTRUCTIONS. ADDITIONAL CABLE MUST BE APPLIED TO ALL VALVES AND FLANGES PER MANUFACTURER INSTRUCTIONS.
- HEAT TRACE ACCESSORIES:**
- SHALL BE CHROMALOX U SERIES OR EQUAL. END SEALS SHALL BE CHROMALOX MODEL UESL OR EQUAL, LIGHTED END SEAL KITS. CAUTION LABELS "WARNING ELECTRIC HEAT TRACE" MUST BE APPLIED EVERY 10 FT OF PIPE.
- HEAT TRACE CONTROLS:**
- SHALL BE CHROMALOX MODEL DTS/HAZ OR EQUAL. SHALL BE RATED FOR 30 AMPS AT 120V TO 277V. SHALL PROVIDE BUILT IN SOFT START, LINE SENSING RTD, LED DISPLAY AND ALARM CONTACT.



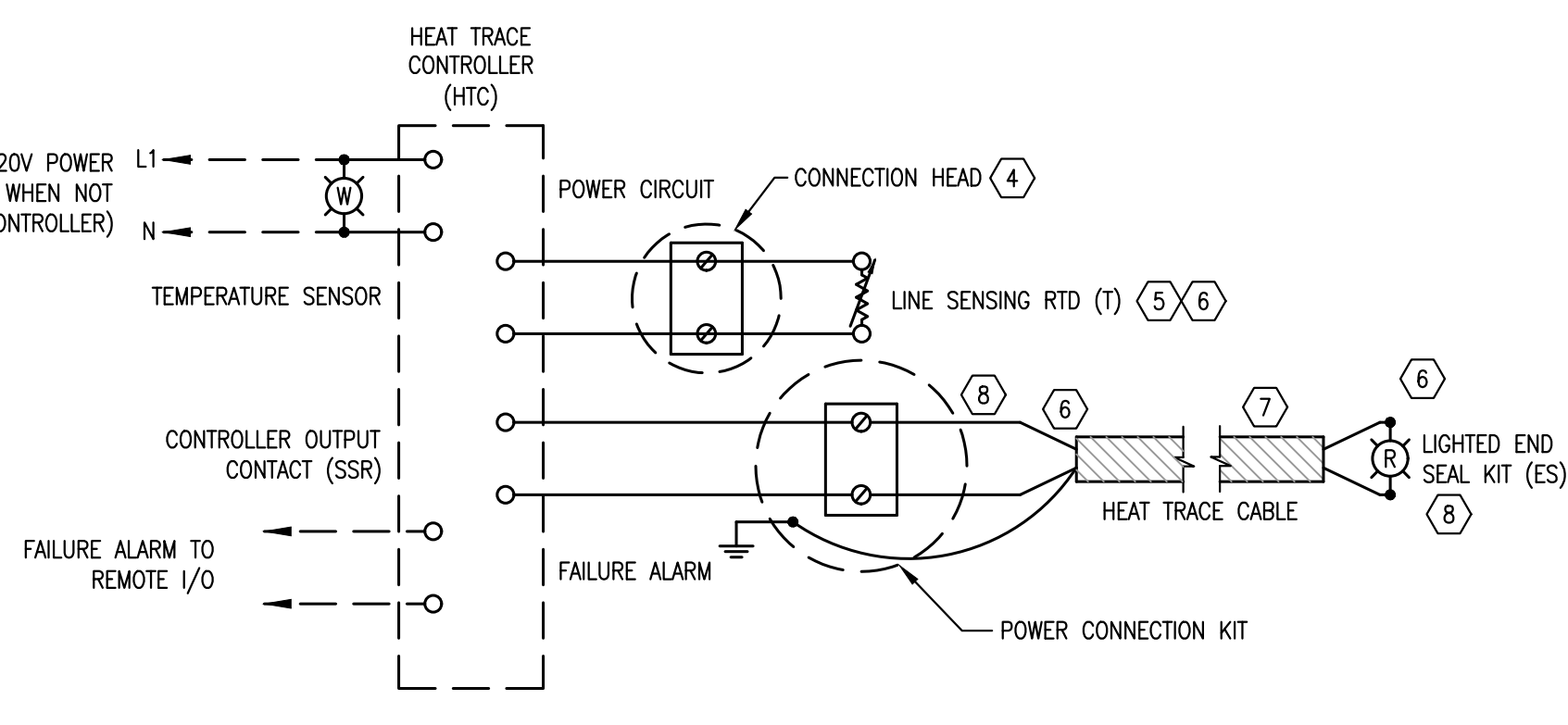
MAGNETIC FLOWMETER INSTALLATION DETAIL (REMOTE TRANSMITTER)
SCALE: NONE
NOTE: PROVIDE DRIP LEG FOR CONDUITS TO/FROM ABOVE.



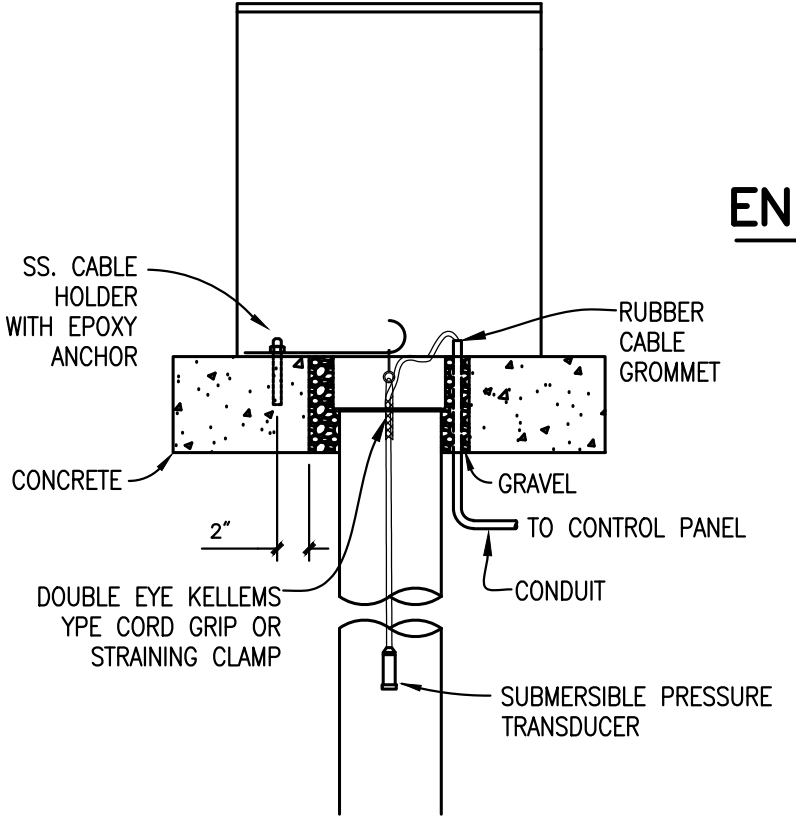
ENLARGED WELLHOUSE ELECTRICAL SITE PLAN - PROPOSED
SCALE: 1" = 5'



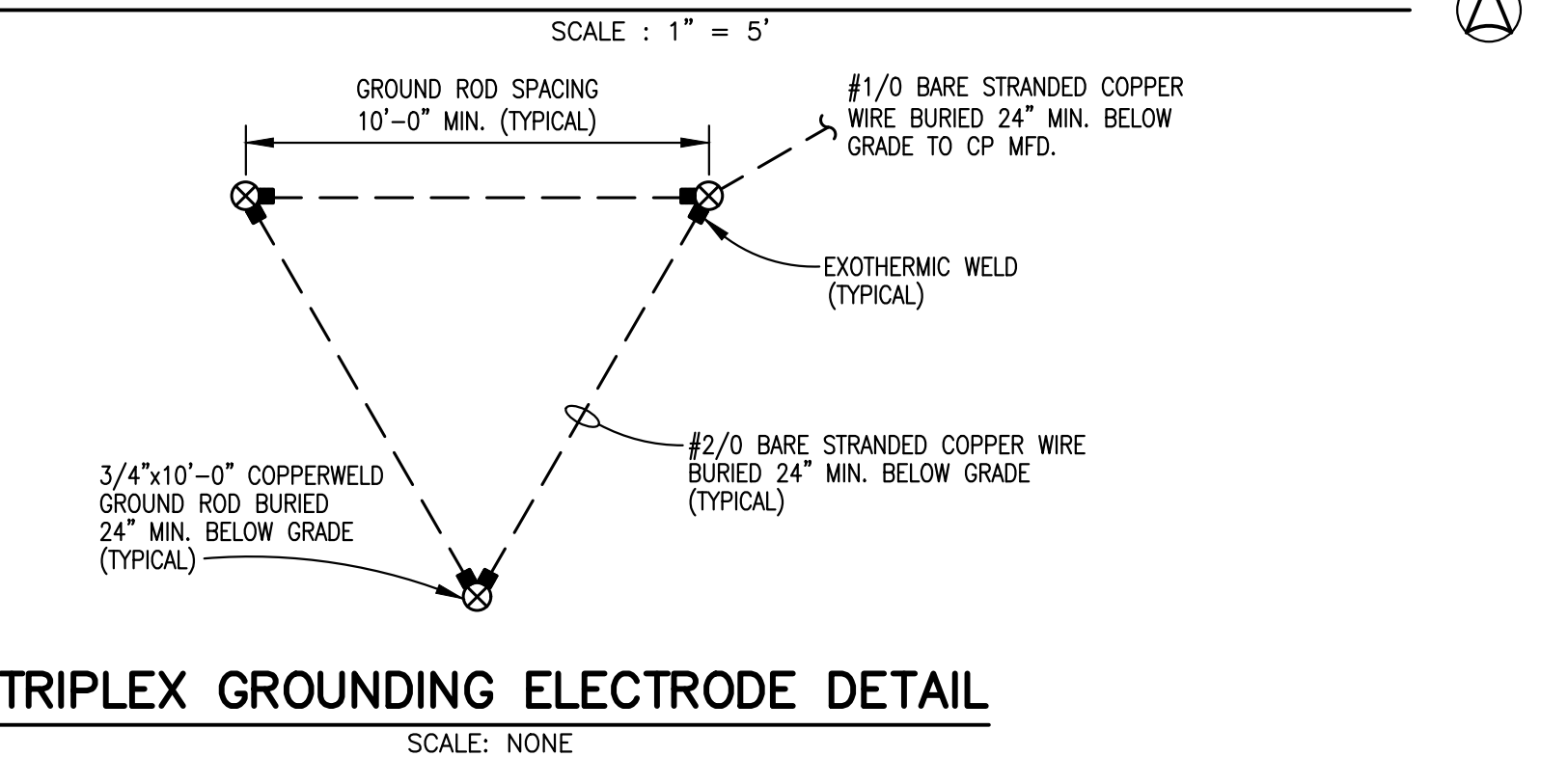
HEAT TRACE INSTALL DETAILS (2/8)
SCALE: NONE



HEAT TRACE WIRING DIAGRAM (2/8)
PROVIDE ALL ASSOCIATED POWER CONNECTIONS, END TERMINATIONS AND MATERIALS FOR A COMPLETE INSTALLATION OF THE HEAT TRACE SYSTEM. SEE HEAT TRACE SCHEDULE ON THIS SHEET. COORDINATE WITH OTHER TRADES.



LEVEL TRANSDUCER (LT) SUPPORT DETAIL
SCALE: NONE



TRIPLEX GROUNDING ELECTRODE DETAIL
SCALE: NONE

NO.	REVISIONS	BY	DATE	DRAWN
				JZJ
				MAY '25
				CHECKED MAT
				DATE MAY '25

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KALAMAZOO COUNTY, MICHIGAN
WATER SUPPLY SYSTEM IMPROVEMENTS
ELECTRICAL SITE PLAN AND DETAILS

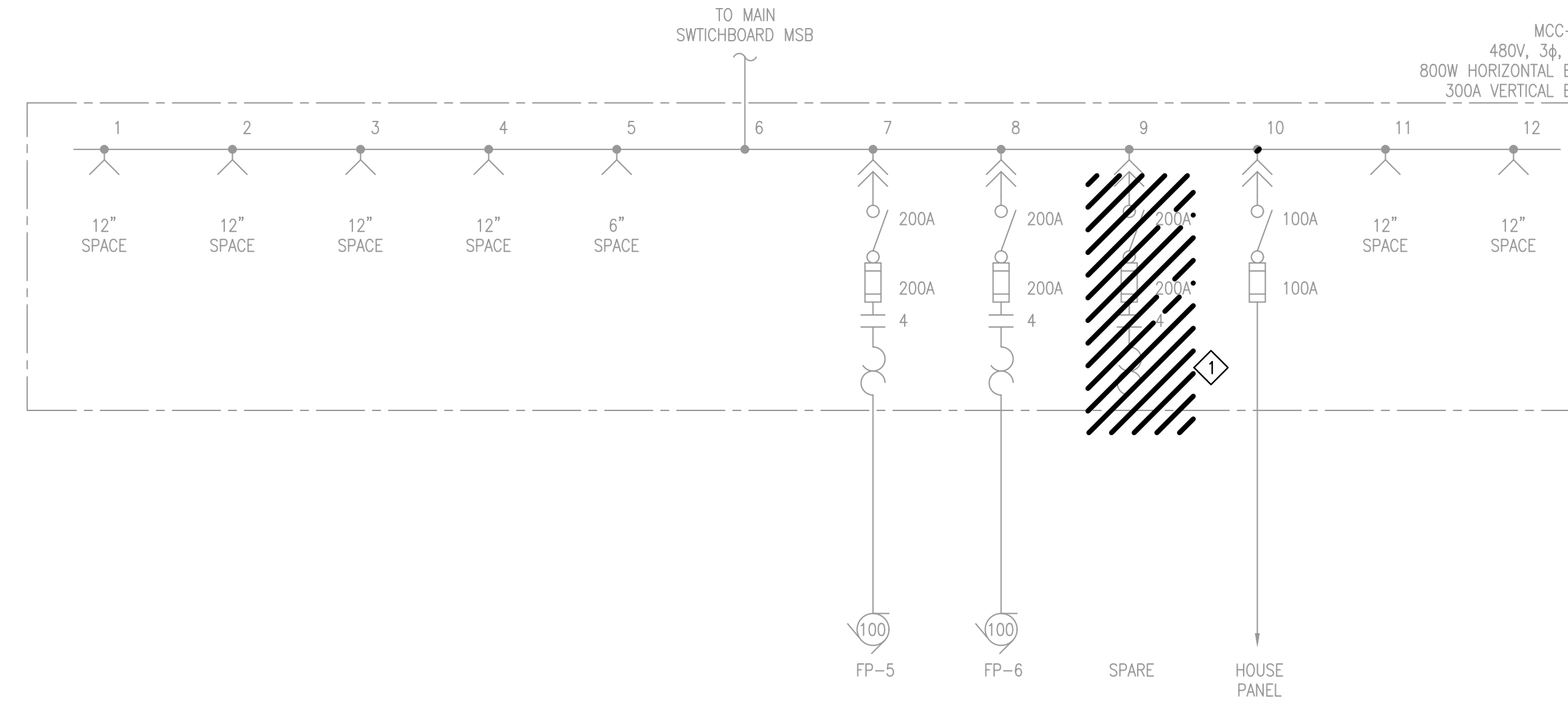
PROJECT NO.
2220555
SHEET NO.
6 OF 8

DEMOLITION NOTES: (Symbol denotes plan note)

1. PREPARE SPACE FOR PROPOSED FEEDER BUCKET. PROVIDE COVER FOR EXISTING CONTROLS.

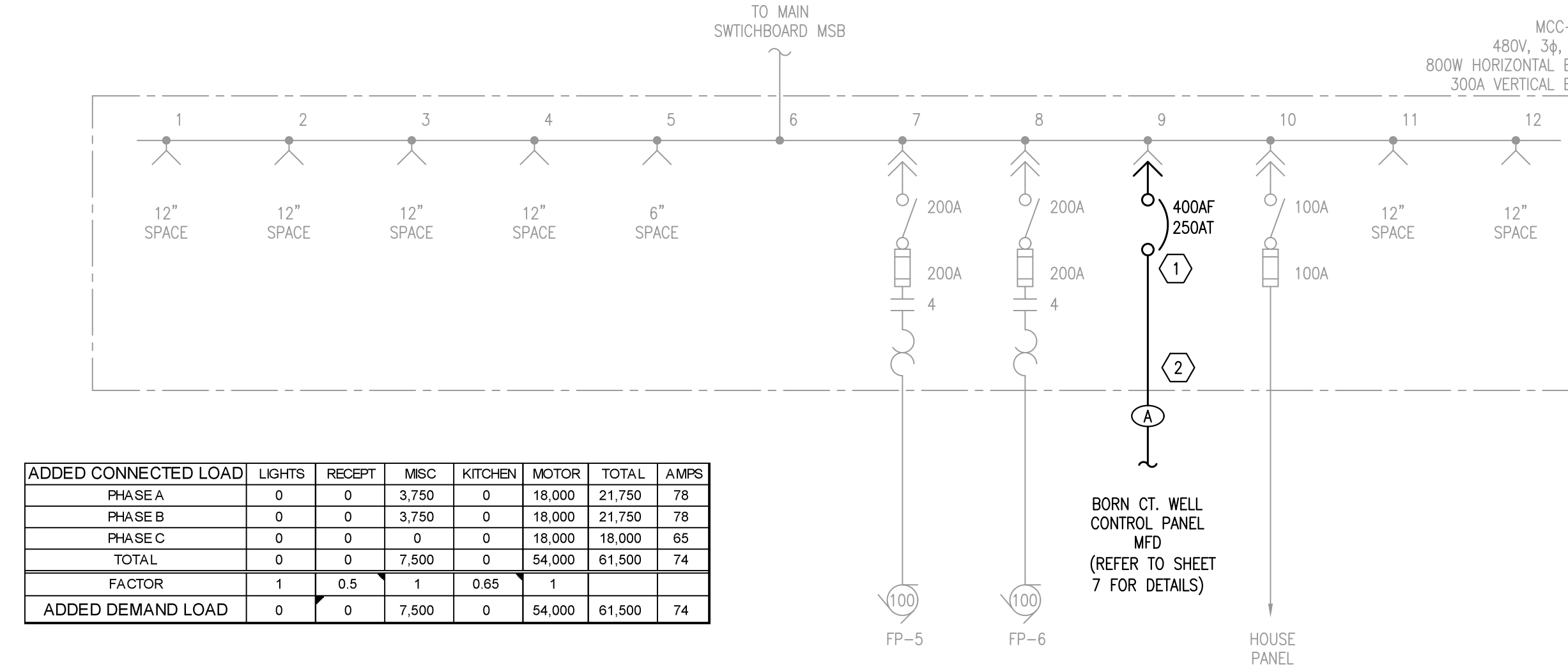
PLAN NOTES: (Symbol denotes plan note)

1. PROVIDE PROPOSED FEEDER BUCKET WITHIN EXISTING ALLEN BRADLEY BULLETIN 2100 MOTOR CONTROL CENTER.
2. PROVIDE DOUBLE-LUG KIT AND/OR ENCLOSED POWER DISTRIBUTION BLOCK WITHIN BUCKET AS REQUIRED FOR UPSIZED FEEDER CONDUCTORS.



SINGLE-LINE DIAGRAM – EXISTING

SCALE : N.T.S.



SINGLE-LINE DIAGRAM – PROPOSED

SCALE : N.T.S.

CONDUIT AND CABLE SCHEDULE

MARK	DESCRIPTION
①	
A	2 SETS OF 3#250KCMIL, #1/0GND – 4°C
NOTE:	

F:\PROJECTS\PM070A\CAD\ELECTRICAL\PM070A ELEC ONE-LINE DIAGRAM.DWG - JONES - May 13, 2025 - 05:11pm - Prein&Newhof

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				DATE: MAY '25
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WATER SUPPLY SYSTEM IMPROVEMENTS
ELECTRICAL SINGLE-LINE DIAGRAM

PROJECT NO.
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SHEET NO.
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