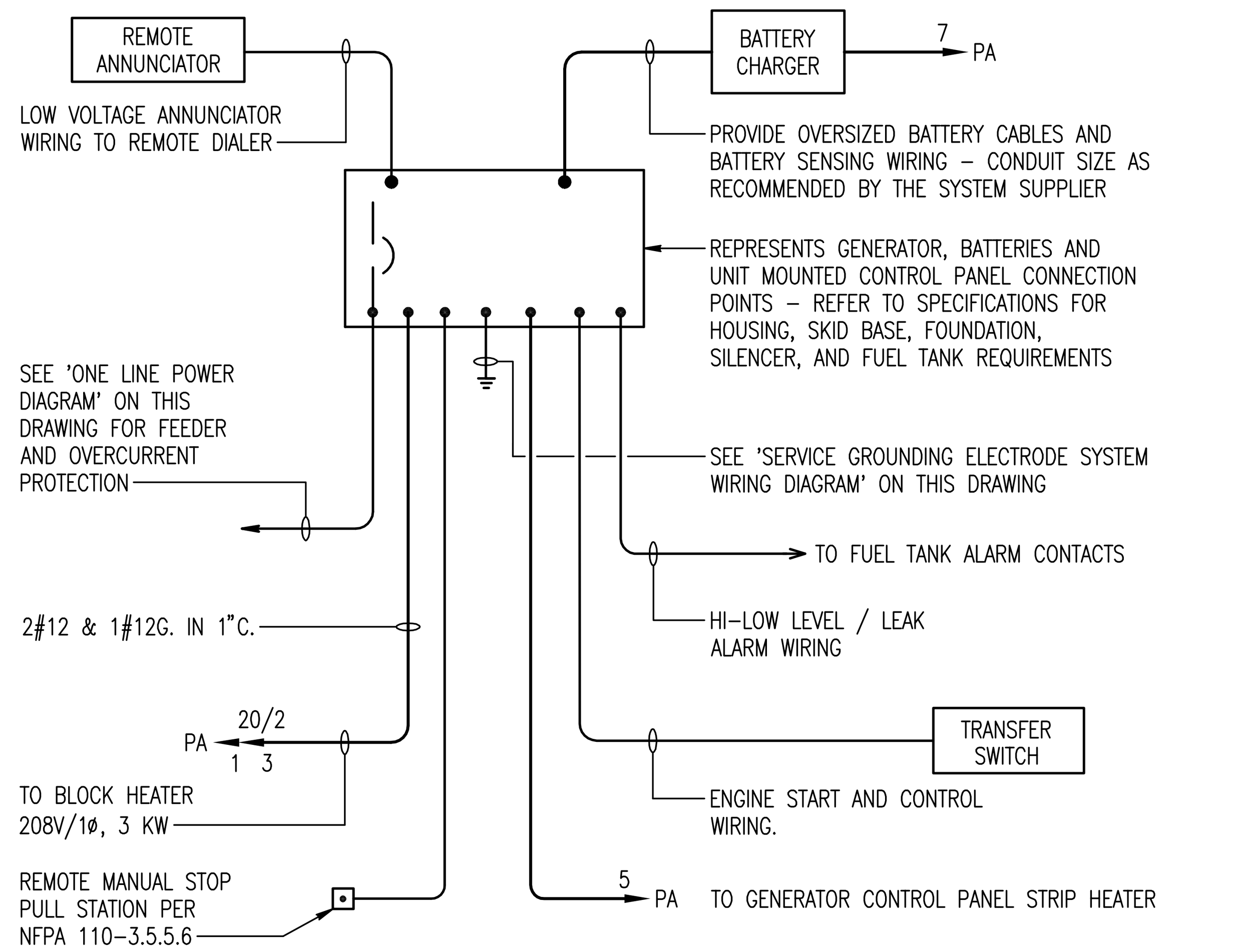


EMERGENCY / STANDBY GENERATOR WIRING DIAGRAM

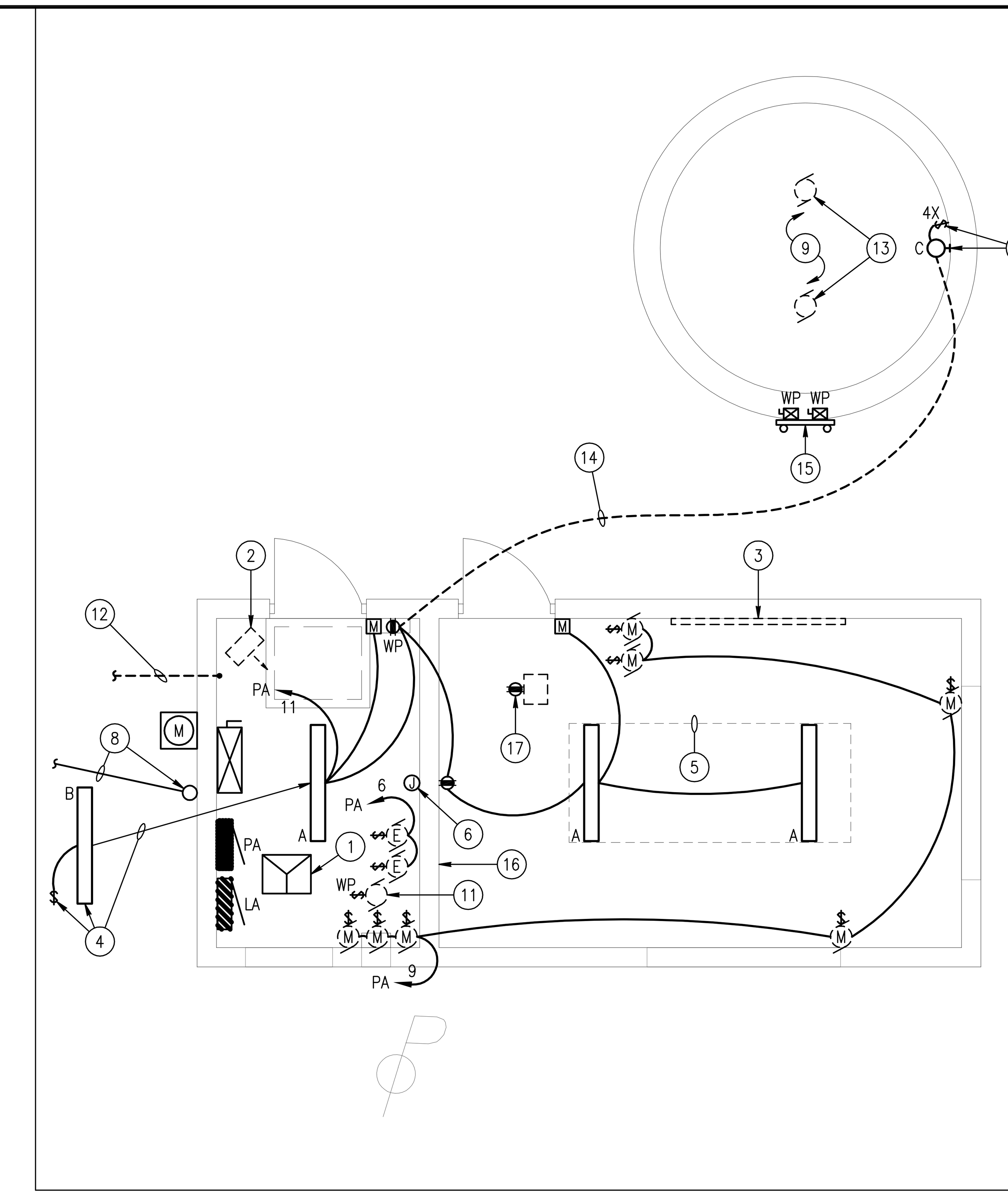
SCALE: NONE

NOTES:

1. THIS DIAGRAM INDICATES TYPICAL REQUIREMENTS AND IS NOT INTENDED FOR INSTALLATION. SYSTEM SUPPLIER SHALL PROVIDE INSTALLATION DRAWINGS AND WIRING DIAGRAMS. EXACT SYSTEM REQUIREMENTS SHALL BE COORDINATED WITH THE SYSTEM SUPPLIER.
2. SYSTEM SUPPLIER SHALL SUPERVISE SYSTEM INSTALLATION.
3. ALL WIRING SHALL BE VERIFIED WITH SYSTEM SUPPLIER. CONDUIT SHALL BE 1" MINIMUM, SIZED PER THE NATIONAL ELECTRICAL CODE. FLEXIBLE LIQUID TIGHT CONDUIT SHALL BE USED FOR FINAL CONNECTIONS AT THE GENERATOR.
4. REFER TO 'SERVICE GROUNDING ELECTRODE SYSTEM WIRING DIAGRAM' ON THIS DRAWING FOR GROUNDING REQUIREMENTS.
5. REFER TO 'ONE LINE POWER DIAGRAM' ON THIS DRAWING FOR FEEDER AND OVERCURRENT PROTECTION REQUIREMENTS.
6. REFER TO SPECIFICATIONS FOR ADDITIONAL SYSTEM REQUIREMENTS.

ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION
1 A	HOMERUN TO A 20 AMPERE, SINGLE POLE CIRCUIT BREAKER (PANEL 'A', CIRCUIT NUMBER '1'), UON. PROVIDE QUANTITY OF CONDUCTORS TO ACCOMMODATE CIRCUITING AND CONTROL INDICATED.
	CONDUIT INSTALLED BELOW GRADE OR BELOW FINISHED FLOOR, UON
	CONDUIT TURNED UP
$	SWITCH – 20A, 120/277V, SINGLE POLE, UON ('4X' = NEMA 4X RATED)
M	LIGHTING CONTROL OCCUPANCY SENSOR – WALL MOUNTED AT 48" AFF, UON
	DUPLEX RECEPTACLE (20A, 125V) GROUND FAULT CIRCUIT INTERRUPTER TYPE AT 18" AFF, UON ('WP' = WEATHERPROOF)
J	JUNCTION BOX – MOUNTING HEIGHT AND SIZE AS REQUIRED BY CODE OR AS NOTED ON DRAWINGS
	FUSED DISCONNECT SWITCH – SIZE AND FUSING AS INDICATED ('WP' = WEATHERPROOF)
	BRANCH CIRCUIT BREAKER PANELBOARD (208Y/120V, 3ø, 4 WIRE)
	BRANCH CIRCUIT BREAKER PANELBOARD (480Y/277V, 3ø, 4 WIRE)
	TRANSFORMER
M	METER
E	EXHAUST FAN (120V, 0.1KW) – CONNECT CONTROL WIRING TO MOTOR OPERATED DAMPERS PER MANUFACTURER'S RECOMMENDATIONS
M	MOTOR OPERATED DAMPER (120V, 0.1KW) – CONNECT CONTROL WIRING FROM EXHAUST FAN OR GENERATOR PER MANUFACTURER'S RECOMMENDATIONS
	SINGLE OR THREE PHASE MOTOR – SEE DRAWINGS FOR DESCRIPTION



ELECTRICAL PLAN

SCALE: 1/4" = 1'–0"

PLAN NOTES:

(1) TRANSFORMER SHALL BE MOUNTED ON WALL NEAR CEILING.

(2) ELECTRIC UNIT HEATER (208V/1ø, 3.0KW) – MARKEL #HF3326TD–RP WITH INTEGRAL THERMOSTAT. EC SHALL CONNECT TO CIRCUIT #2 & #4 IN PANEL 'PA' WITH 20/2 CIRCUIT BREAKER.

(3) ELECTRIC BASEBOARD HEATER (120V, 1.5KW) – MARKEL #E2915–072S WITH INTEGRAL THERMOSTAT AND DISCONNECT SWITCH. EC SHALL CONNECT TO CIRCUIT #10 IN PANEL 'PA'.

(4) FIXTURE SHALL BE MOUNTED TO UNDERSIDE OF FLOOR FOR LIGHTING OF PUMP PIT BELOW. SWITCH SHALL BE LOCATED AT PIT ENTRANCE. EC SHALL CONNECT TO LIGHTING BRANCH CIRCUIT ABOVE.

(5) EMERGENCY STANDBY GENERATOR – REFER TO 'ONE LINE POWER DIAGRAM' AND 'GENERATOR WIRING DIAGRAM' ON THIS DRAWING.

(6) SANITARY PUMP SYSTEM CONTROL PANEL – VERIFY LOCATION AND MOUNTING HEIGHT. REFER TO 'ONE LINE POWER DIAGRAM' ON THIS DRAWING.

(7) UTILITY COMPANY POLE MOUNTED TRANSFORMER – REFER TO 'ONE LINE POWER DIAGRAM' ON DRAWING 'E2'.

(8) EC SHALL PROVIDE MAST WITH WEATHERHEAD AT 17' AFG AND COIL WIRING. PROVIDE ADEQUATE SLACK FOR UTILITY CONNECTION. OVERHEAD FEEDERS TO UTILITY SERVICE POLE (60') BY UTILITY COMPANY. REFER TO 'ONE LINE POWER DIAGRAM' ON DRAWING 'E2' FOR ADDITIONAL INFORMATION.

(9) ALL ELECTRICAL EQUIPMENT IN WET WELL SHALL BE NEMA 4X RATED AND ALL CONDUITS SHALL BE SEALED INSIDE AND OUT FOR CLASS I, DIVISION 1 HAZARDOUS ENVIRONMENT (TYPICAL).

(10) VERIFY LIGHTING FIXTURE AND SWITCH LOCATION. SWITCH SHALL BE AT WELL ENTRANCE.

(11) SUMP PUMP (120V, ¼HP) IN PIT BELOW – EC SHALL CONNECT TO CIRCUIT #8 IN PANEL 'PA' THROUGH WEATHERPROOF SWITCH.

(12) INCOMING UNDERGROUND TELECOMMUNICATIONS SERVICE – COORDINATE LOCATION AND REFER TO SPECIFICATION SECTION 13960 FOR ADDITIONAL INFORMATION. REQUIREMENTS SHALL BE SIMILAR TO SECONDARY DUCT BANK – REFER TO 'SECONDARY DUCT BANK DETAIL' ON DRAWING 'E3'. EC SHALL PROVIDE CONDUIT TO AUTOMATIC DIALER LOCATION.

(13) SUBMERSIBLE SANITARY PUMPS (480V/3ø, 40HP EACH) – EC SHALL CONNECT TO 90/3 CIRCUIT BREAKERS IN PANEL 'LA' THROUGH FUSED DISCONNECT SWITCHES ON STANCHION. REFER TO 'ONE LINE POWER DIAGRAM' ON DRAWING 'E2' FOR WIRE AND CONDUIT SIZES.

(14) CONDUIT SHALL BE RUN UNDERGROUND. REFER TO 'UNDERGROUND RACEWAY DETAIL' ON DRAWING 'E2'.

(15) (2) FUSED DISCONNECT SWITCHES ON UNISTRUT STANCHION FOR SANITARY PUMPS. REFER TO 'ONE LINE DIAGRAM' ON DRAWING 'E2' FOR SIZES AND ADDITIONAL INFORMATION.

(16) AUTOMATIC TRANSFER SWITCH – REFER TO 'ONE LINE POWER DIAGRAM' ON DRAWING 'E2' FOR REQUIREMENTS.

(17) DEDICATED RECEPTACLE MOUNTED ON CEILING FOR RADIANT HEATER (120V, 0.6KW) – EC SHALL CONNECT TO CIRCUIT #12 IN PANEL 'PA'.

LIGHTING FIXTURE SCHEDULE

TIMOTHY J. NORRIS & ASSOCIATES

FIXTURE TYPE	LAMP(S)	BALLAST(S)	FIXTURE WATTAGE	FIXTURE VOLTAGE	FIXTURE DESCRIPTION	CATALOG NUMBER	NOTES
A	(2) 32W T8	(1) E	60	120	FLUORESCENT, 4' LONG INDUSTRIAL FIXTURE WITH DIE–FORMED COLD ROLLED STEEL HOUSING, REFLECTOR AND CHANNEL COVER AND HIGH–GLOSS, BAKED WHITE ENAMEL FINISH.	LITHONIA L232–MV	1
B	(2) 32W T8	(1) E	60	120	FLUORESCENT, GASKETED, SURFACE MOUNTED INDUSTRIAL FIXTURE WITH FIBERGLASS REINFORCED POLYESTER HOUSING, HIGH IMPACT ACRYLIC DIFFUSER AND HIGH–GLOSS, BAKED WHITE ENAMEL FINISH.	LITHONIA DMW–232–MVOLT–GEB10IS	
C	(1) 150W INC	NA	150	120	INCANDESCENT, WALL MOUNTED GLOBE WITH CAST ALUMINUM HOUSING AND GUARD AND CLEAR GLASS GLOBE. LISTED FOR USE IN CLASS I, DIVISION 1 HAZARDOUS LOCATION.	GUTH EXW300IG	2

LIGHTING FIXTURE SCHEDULE NOTES:

(1) EC SHALL SUSPEND FIXTURE AT 8'–0" AFF, UON, WITH ERICO CABLE CLAMPS (CADDY SPEED LINK #SLD15L SERIES).

(2) VERIFY MOUNTING WITH ARCHITECT PRIOR TO PROCUREMENT.

LIGHTING FIXTURE SCHEDULE KEY:

1. LAMP TYPE:
   INC = INCANDESCENT
   T8 = LINEAR FLUORESCENT
2. BALLAST TYPE:
   E = ELECTRONIC BALLAST
   NA = NOT APPLICABLE

ELECTRICAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
A	AMPERES
AF	AMP FUSED
AFF	ABOVE FINISHED FLOOR
AS	AMP SWITCH
AWG	AMERICAN WIRE GAUGE
C.	CONDUIT
C/B	CIRCUIT BREAKER
EC	ELECTRICAL CONTRACTOR
EMT	ELECTRICAL METALLIC TUBING
G.	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER – PERSON PROTECTION
HP	HORSE POWER
KAIC	KILOAMPERES INTERRUPTING CURRENT RATING
KW	KILOWATTS
LTG	LIGHTING
MCB	MAIN CIRCUIT BREAKER
MLO	MAIN LUGS ONLY
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER ASSOCIATION
OBC	OHIO BUILDING CODE
P	POLE
REC	RECEPTACLE
SUSE	SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT
UON	UNLESS OTHERWISE NOTED
V	VOLTS
W	WIRE
WP	WEATHERPROOF
ø	PHASE

STATE OF OHIO
TIMOTHY J. NORRIS
E–40336
REGISTERED PROFESSIONAL ENGINEER

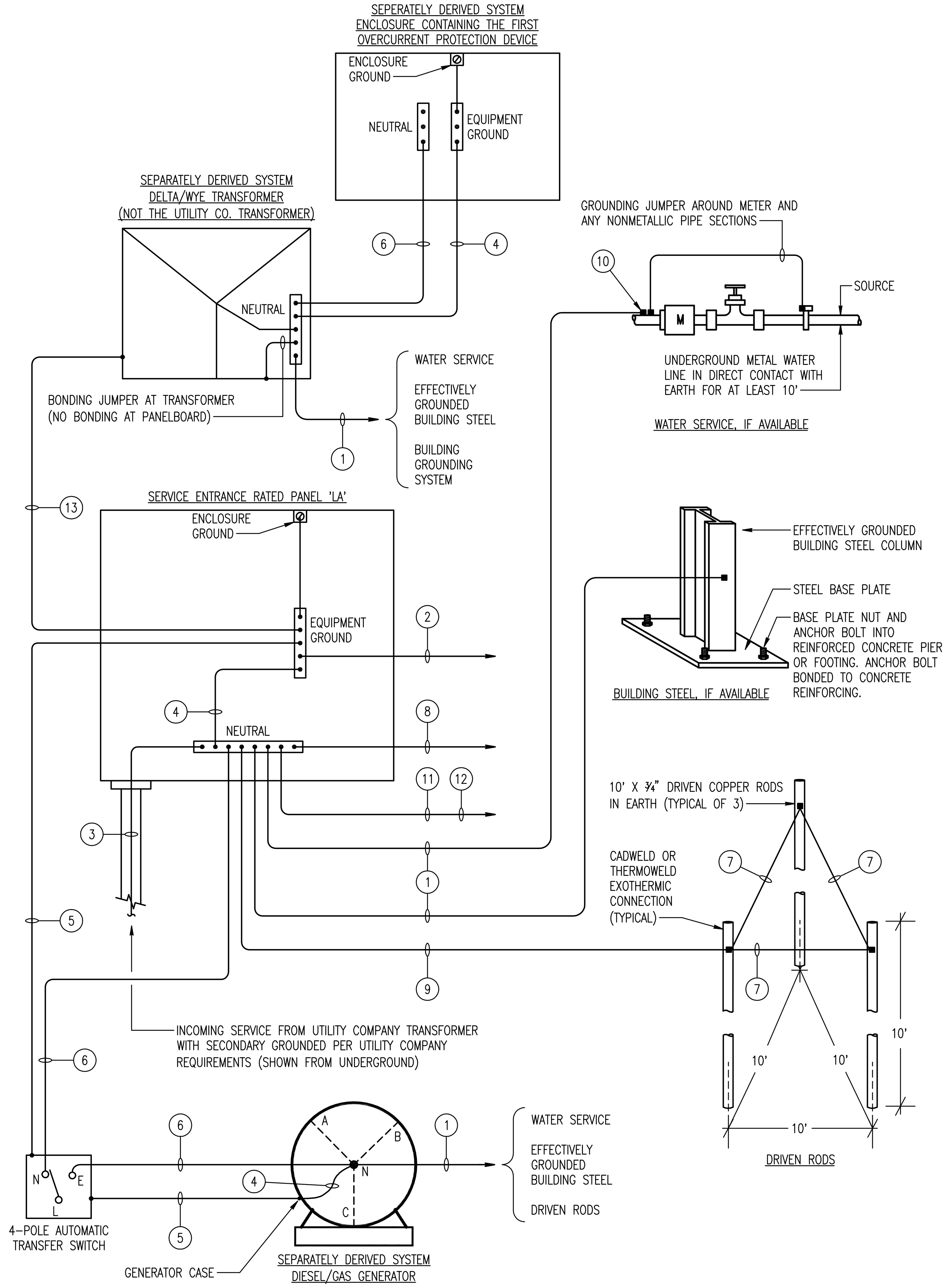
REV. NO.	DATE	CALCULATED	CHECKED
ADDENDUM 2	09\30\11	S.P.K.	T.J.N.

GGL inc. consulting engineers
35585 Curtis Blvd., Unit C Eastlake, Ohio 44095
Ph: 440.953.1567 Fx: 440.953.0580
Email: ggl@gglengineers.com www.gglengineers.com

PUMP STATION #1 & FORCE MAIN IMPROVEMENTS
ELECTRICAL PLAN, SCHEDULES AND DIAGRAMS

VILLAGE OF WELLSVILLE

E1
X



SERVICE GROUNDING ELECTRODE SYSTEM WIRING DIAGRAM

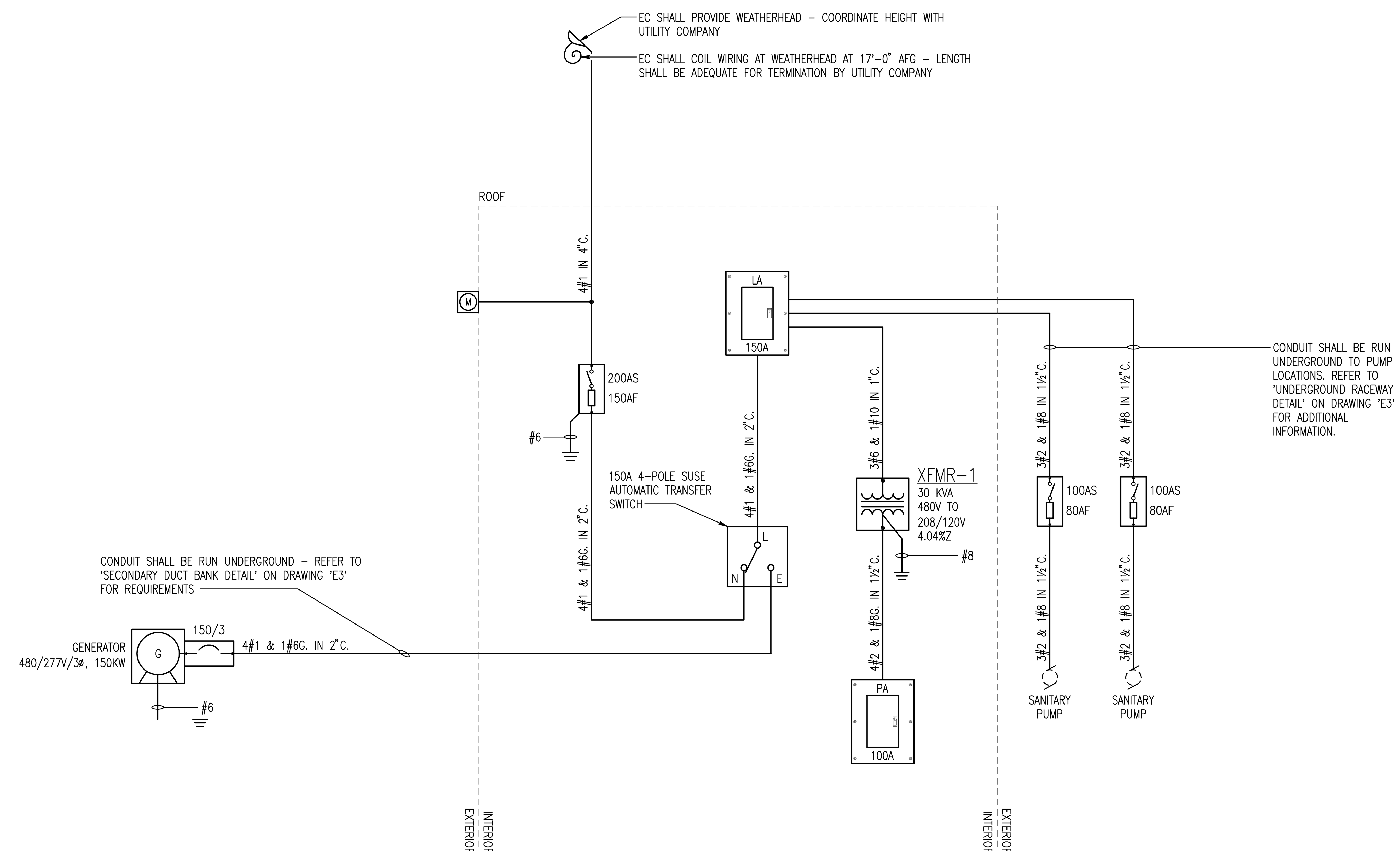
SCALE: NONE

NOTES:

1. THE GROUNDING ELECTRODE CONDUCTORS SHALL BE #6 PER TABLE 250.66 OF THE NEC. THE CONDUCTOR SHALL BE CONNECTED TO AN APPROVED GROUNDING ELECTRODE.
2. GROUND CONDUCTORS TO OTHER POINTS AND EQUIPMENT, AS REQUIRED BY NEC ARTICLE 250 AND SPECIFICATIONS SECTION 16050.
3. SERVICE ENTRANCE PHASE CONDUCTORS WITH GROUNDED (NEUTRAL) CONDUCTOR.
4. MAIN BONDING JUMPER SHALL BE SIZED PER TABLE 250.66 OF THE NEC.
5. EQUIPMENT GROUND CONDUCTOR SHALL BE #6 PER TABLE 250.122 OF THE NEC.
6. GROUNDED (NEUTRAL) CONDUCTOR.
7. BONDING CONDUCTOR SHALL BE #6 PER TABLE 250.66 OF THE NEC.
8. GROUND CONDUCTOR TO TELECOMMUNICATIONS MAIN GROUNDING BUSBAR – SIZED PER TECHNOLOGY SYSTEM SUPPLIER REQUIREMENTS, #3/0 MINIMUM.
9. GROUND ROD ELECTRODE – PROVIDE #6 AWG COPPER GROUNDING ELECTRODE CONDUCTOR, PER NEC 250.66(A).
10. CONNECTION SHALL BE MADE WITHIN 5' OF BUILDING ENTRANCE PER NEC 250.52(A)(1)
11. METAL WATER PIPING AND STRUCTURAL STEEL NOT INTENTIONALLY GROUNDED SHALL BE BONDED PER NEC 250.104 AND NEC TABLE 250.66.
12. OTHER METAL PIPING (GAS, ETC.) SHALL BE BONDED PER NEC 250.104 AND NEC TABLE 250.122.
13. EQUIPMENT GROUND CONDUCTOR FOR SEPARATELY DERIVED SYSTEM SHALL BE #10 PER NEC TABLE 250.122.

ONE LINE DIAGRAM LEGEND

SYMBOL	DESCRIPTION
	BRANCH PANELBOARD
M	METER
	TRANSFORMER
	GROUND
	COMBINTATION FUSED DISCONNECT SWITCH
E N L	AUTOMATIC TRANSFER SWITCH
G	EMERGENCY STANDBY GENERATOR
	CIRCUIT BREAKER IN AN ENCLOSURE



ONE LINE POWER DIAGRAM

SCALE: NONE

STATE OF OHIO
TIMOTHY J. NORRIS
E-40336
REGISTERED PROFESSIONAL ENGINEER

REV. NO.	DATE
ADDENDUM 2	09\30\11

CALCULATED S.P.K.
CHECKED T.J.N.

GGJ inc. consulting engineers
35585 Curtis Blvd., Unit C Eastlake, Ohio 44095
Ph: 440.953.1567 Fx: 440.953.0580
Email: ggj@ggjengineers.com www.ggjengineers.com

PUMP STATION #1 & FORCE MAIN IMPROVEMENTS
GROUNDING AND ONE LINE POWER DIAGRAMS

VILLAGE OF WELLSVILLE

E2
X

BRANCH CIRCUIT BREAKER PANEL SCHEDULE

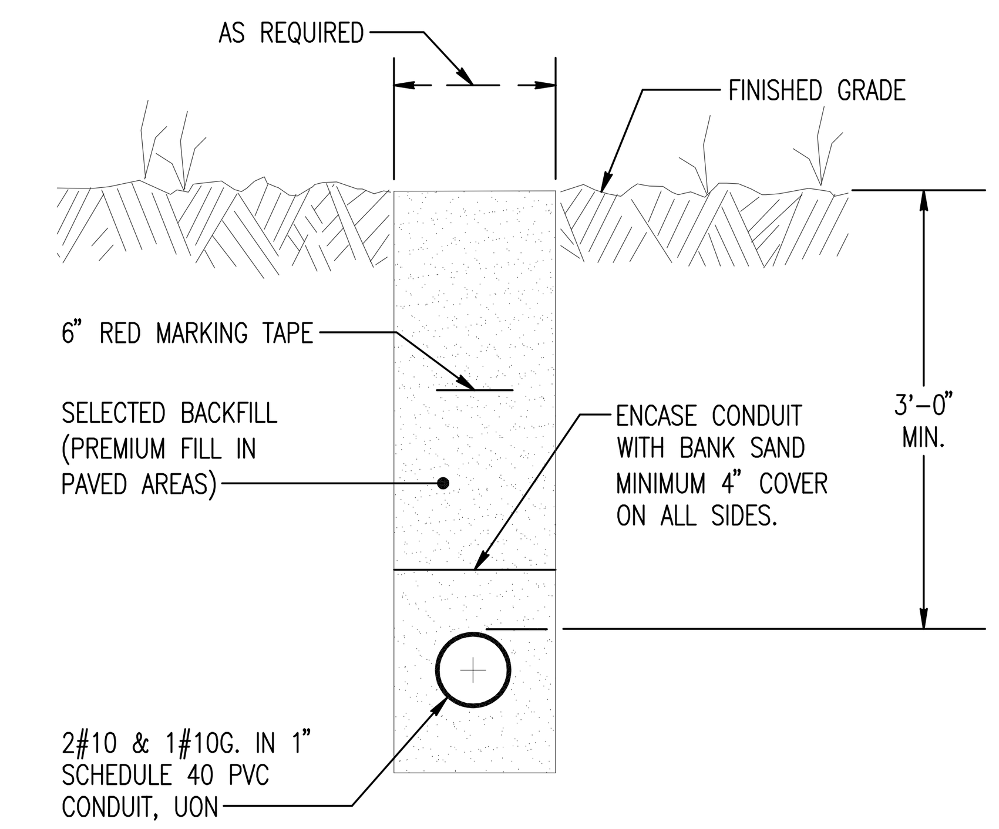
PANEL:	**LA**	BUSSING:	150A
VOLTAGE:	480/277V, 3P, 4W	MAIN DEVICE:	MLO
MOUNTING:	SURFACE	CONNECTED LOAD:	98.1 KW
BRACING:	35 KAIC	DEMAND LOAD:	70.4 KW

CKT	DESCRIPTION	LTG	REC	DATA	HVAC	MISC	C/B	ø	C/B	MISC	HVAC	DATA	REC	LTG	DESCRIPTION	CKT
1					1.5	2.4		A		14.4						2
3	PANEL 'PA'				3.0	2.2	60/3	B	90/3	14.4					SANITARY PUMP #1	4
5		0.4	0.4		0.6	1.2		C		14.4						6
7	SPACE							A		14.4						8
9	SPACE							B	90/3	14.4					SANITARY PUMP #2	10
11	SPACE							C		14.4						12
13	SPACE							A							SPACE	14
15	SPACE							B							SPACE	16
17	SPACE							C							SPACE	18
19	SPACE							A							SPACE	20
21	SPACE							B							SPACE	22
23	SPACE							C							SPACE	24

BRANCH CIRCUIT BREAKER PANEL SCHEDULE

PANEL:	**PA**	BUSSING:	100A
VOLTAGE:	208/120V, 3P, 4W	MAIN DEVICE:	100A MCB
MOUNTING:	SURFACE	CONNECTED LOAD:	10.8 KW
BRACING:	10 KAIC	DEMAND LOAD:	9.3 KW

CKT	DESCRIPTION	LTG	REC	DATA	HVAC	MISC	C/B	ø	C/B	MISC	HVAC	DATA	REC	LTG	DESCRIPTION	CKT
1	GEN. BLOCK HEATER					1.5	20/2	A	20/2		1.5				UNIT HEATER	2
3						1.5		B			1.5					4
5	CONTROL PANEL HEATER					1.0	20/1	C	20/1	0.2					EXHAUST FANS	6
7	BATTERY CHARGER					0.2	20/1	A	20/1	0.7					SUMP PUMP	8
9	MOTOR OP. DAMPERS					0.7	20/1	B	20/1		1.5				BASEBOARD HEATER	10
11	LIGHTING & RECEPTACLES	0.4	0.4				20/1	C	20/1		0.6				RADIANT HEATER	12
13	SPARE						20/1	A	20/1						SPARE	14
15	SPARE						20/1	B	20/1						SPARE	16
17	SPACE							C							SPACE	18
19	SPACE							A							SPACE	20
21	SPACE							B							SPACE	22
23	SPACE							C							SPACE	24

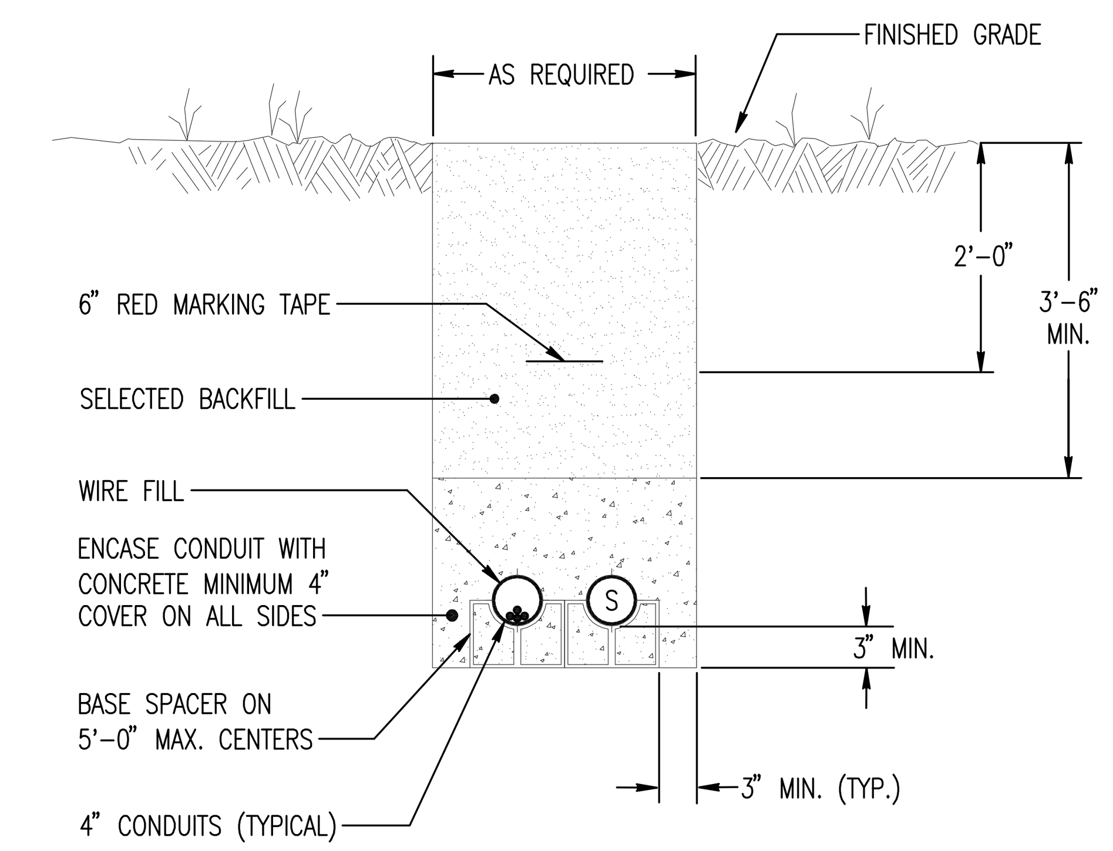


UNDERGROUND RACEWAY DETAIL

SCALE: NONE

NOTES:

1) MINIMUM SEPARATION BETWEEN CONDUITS SHALL BE 3".
2) CONCRETE ENCASE CONDUITS UNDER ROADWAYS.



SECONDARY DUCT BANK DETAIL

SCALE: NONE

NOTES:

1) MINIMUM SEPARATION BETWEEN CONDUITS SHALL BE 3".
2) REFER TO 'ONE LINE POWER DIAGRAM' ON DRAWING 'E2' FOR WIRE FILL.
3) CONCRETE ENCASE CONDUITS UNDER ROADWAYS.

STATE OF OHIO
TIMOTHY J. NORRIS
E-40336
REGISTERED PROFESSIONAL ENGINEER

CALCULATED	CHECKED
S.P.K.	T.J.N.

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PUMP STATION #1 & FORCE MAIN IMPROVEMENTS
ELECTRICAL PANEL SCHEDULES AND DETAILS

VILLAGE OF WELLSVILLE

E3
X

ELECTRICAL SPECIFICATIONS

ELECTRICAL GENERAL PROVISIONS

1. THE PROVISIONS OF THE INSTRUCTIONS TO BIDDERS, GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, ALTERNATES, ADDENDA AND DIVISION 1 ARE A PART OF THIS SPECIFICATION. ELECTRICAL, ARCHITECTURAL, MECHANICAL AND ALL OTHER DRAWINGS AS WELL AS THE SPECIFICATIONS FOR ALL THE DIVISIONS SHALL BE DEFINED AS THE CONTRACT DOCUMENTS. CONTRACTOR SHALL REVIEW ENTIRE SET OF CONTRACT DOCUMENTS PRIOR TO BIDDING.

2. VISIT THE SITE OF THE WORK AND BECOME FAMILIAR WITH THE CONDITIONS AFFECTING THE INSTALLATION. THIS CONTRACTOR SHALL FIELD VERIFY THAT ALL ELECTRICAL WORK CAN BE INSTALLED AS SHOWN ON THE DRAWINGS. ANY DISCREPENCY SHALL BE COMMUNICATED IN WRITING TO THE ARCHITECT OR ENGINEER PRIOR TO SUBMISSION OF A PROPOSAL. SUBMISSION OF A PROPOSAL SHALL PRESUPPOSE KNOWLEDGE OF SUCH CONDITIONS AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED WHERE EXTRA LABOR OR MATERIALS ARE REQUIRED BECAUSE OF IGNORANCE OF THESE CONDITIONS.

3. "CONTRACTOR" AS USED WITHIN THE CONTEXT OF THE ELECTRICAL CONTRACT DOCUMENTS SHALL EXPLICITLY REFER TO THE "ELECTRICAL CONTRACTOR" AND THE ELECTRICAL CONTRACTOR'S "SUBCONTRACTORS". THE TERM "FURNISH" SHALL MEAN TO SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS. THE TERM "INSTALL" SHALL MEAN WORK WHICH INCLUDES THE ACTUAL UNLOADING, UNPACKING, ASSEMBLY, ERECTING, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS. THE TERM "PROVIDE" SHALL MEAN TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE. THE TERM "EQUAL" SHALL MEAN TO MEET OR EXCEED THE STANDARDS OF THE SPECIFIED PRODUCTS OR LISTED MANUFACTURERS.

4. INCLUDE ALL LABOR, MATERIAL, EQUIPMENT, SERVICES AND PERMITS NECESSARY FOR THE PROPER COMPLETION OF ALL ELECTRICAL WORK SHOWN. ITEMS OMITTED, BUT NECESSARY TO MAKE THE ELECTRICAL SYSTEM COMPLETE AND WORKABLE, SHALL BE UNDERSTOOD TO FORM PART OF THE WORK. SECURE AND PAY FOR PERMITS AND INSPECTIONS REQUIRED FOR ELECTRICAL WORK.

5. IT IS THE PURPOSE OF THE ELECTRICAL DRAWINGS TO INDICATE THE APPROXIMATE LOCATION OF ALL EQUIPMENT, DEVICES, ETC. ASCERTAIN EXACT LOCATIONS AND ARRANGE WORK ACCORDINGLY. THE RIGHT IS RESERVED TO EFFECT REASONABLE CHANGES IN THE LOCATION OF DEVICES UP TO THE TIME OF ROUGHING-IN, WITHOUT ADDITIONAL COST TO THE OWNER. CHANGES IN LOCATION OF DEVICES RESULTING FROM THE CONTRACTOR'S FAILURE TO COMPLY WITH THE CONTRACT DRAWING OR SPECIFICATION REQUIREMENTS SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER.

6. TEMPERATURE AND INTERLOCK CONTROLS SHALL BE PROVIDED AND WIRED BY A CONTROLS CONTRACTOR UNDER DIVISION 15. DIVISION 16 CONTRACTOR SHALL PROVIDE NECESSARY 120 VOLT POWER, TERMINATED AT JUNCTION BOXES, AS DIRECTED BY DIVISION 15 CONTRACTOR. LINE VOLTAGE (120 VOLT OR HIGHER) CONTROL DEVICES, SUCH AS THERMOSTATS AND AQUASTATS, WHICH CONTROL FRACTIONAL HORSEPOWER, 120 VOLT MOTORS, SHALL BE PROVIDED BY THE DIVISION 15 CONTRACTOR, AND SHALL BE WIRED BY THE DIVISION 16 CONTRACTOR.

7. RACEWAY SYSTEMS, CONDUIT, BOXES, GROUNDING, BUSBARS, HARDWARE, ETC. REQUIRED FOR TECHNOLOGY SYSTEMS, CABLING AND DEVICES SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL FULLY COORDINATE ALL REQUIREMENTS WITH THE TECHNOLOGY SYSTEMS CONTRACTOR.

8. WORK SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE PROVISIONS OF LOCAL AND STATE CODES, AS WELL AS THE NATIONAL ELECTRICAL CODE (NEC), AS INTERPRETED BY THE LOCAL AUTHORITY HAVING JURISDICTION.

9. CONSULT THE DRAWINGS, PRODUCT DATA, WIRING DIAGRAMS AND SHOP DRAWINGS COVERING THE WORK FOR VARIOUS OTHER TRADES, THE FIELD LAYOUTS OF THE CONTRACTORS FOR THE TRADE AND MAKE ADJUSTMENTS ACCORDINGLY IN LAYING OUT THE ELECTRICAL WORK.

10. WARRANT THAT EQUIPMENT AND ALL WORK IS INSTALLED IN ACCORDANCE WITH GOOD ENGINEERING PRACTICE AND THAT ALL EQUIPMENT WILL MEET THE REQUIREMENTS SPECIFIED. GUARANTEE AGAINST DEFECTS IN WORKMANSHIP AND MATERIALS; REPAIR OR REPLACE ANY DEFECTIVE WORK, MATERIAL OR EQUIPMENT WITHIN ONE YEAR FROM DATE OF FORMAL WRITTEN ACCEPTANCE BY THE OWNER.

11. BIDS SHALL BE BASED UPON THE SPECIFIED PRODUCTS OR LISTED ALTERNATIVES. WHERE ONLY ONE MAKE IS NAMED, IT SHALL BE PROVIDED. VERBAL REQUESTS OR APPROVALS SHALL NOT BE BINDING ON THE ARCHITECT, ENGINEER OR OWNER.

12. EQUIPMENT AND MATERIALS USED ON THIS PROJECT SHALL BE NEW AND U.L. LABELED FOR THE APPLICATION.

13. PREPARE SHOP DRAWINGS AND PRODUCT DATA FOR LIGHTING FIXTURES, PANELBOARDS, AND ALL OTHER SPECIFIED SYSTEMS AND COMPONENTS. THE SUBMITTALS THAT ARE RETURNED SHALL BE USED FOR PROCUREMENT. WHERE ADDITIONAL INSTALLATION DRAWINGS, WIRING DIAGRAMS OR OTHER DRAWINGS ARE SPECIFIED AS A PART OF THE SUBMITTAL, THEY SHALL BE SUBMITTED AT THE SAME TIME WITH SHOP DRAWINGS AND PRODUCT DATA.

14. THE CONTRACTOR SHALL KEEP ONE COMPLETE SET OF THE CONTRACT DRAWINGS ON THE PROJECT SITE ON WHICH SHALL BE RECORDED ANY DEVIATIONS OR CHANGES FROM SUCH CONTRACT DRAWINGS MADE DURING CONSTRUCTION. THE UPDATED CONTRACT DRAWINGS SHALL BECOME "RECORD DRAWINGS" OF THE COMPLETED CONSTRUCTION. AFTER THE PROJECT IS COMPLETED, THE RECORD DRAWINGS SHALL BE DELIVERED TO THE ARCHITECT IN GOOD CONDITION, AS A PERMANENT RECORD OF THE INSTALLATION AS CONSTRUCTED.

15. PROVIDE NAMEPLATES ON PANELBOARDS, SAFETY SWITCHES, CONTROL PANELS, AND RECEPTACLE COVERPLATES. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, LETTERING SHALL INCLUDE THE NAME OR DESIGNATION OF EQUIPMENT, HORSEPOWER, VOLTAGE RATING AND SERVICE DESIGNATION. NAMEPLATES SHALL BE LAMINATED PHENOLIC WITH A BLACK SURFACE AND WHITE CORE. IDENTIFICATION WITH A DYMO TYPE INSTRUMENT IS NOT PERMISSIBLE. THE INSIDE COVER OF ALL RECEPTACLE COVERPLATES SHALL BE PERMANENTLY MARKED TO INDICATE THE PANEL AND CIRCUIT NUMBER OF THE RECEPTACLE. THE OUTSIDE OF THE COVERPLATES FOR ALL JUNCTION BOXES SHALL BE PERMANENTLY MARKED TO INDICATE THE SYSTEM. IDENTIFICATION SHALL BE ON THE INSIDE OF COVERPLATES FOR ALL JUNCTION BOXES IF THEY ARE LOCATED IN FINISHED AREAS. IDENTIFICATION OF BRANCH CIRCUITS SHALL BE TYPEWRITTEN ON DIRECTORY CARDS FURNISHED WITH ALL PANELS AND PLACED IN THE CARD HOLDER ON THE DOOR.

16. IDENTIFY SPARE CONDUITS AND CONDUIT STUBS AS FOLLOWS: IDENTIFY SYSTEM AND/OR PURPOSE AT SOURCE, IF POSSIBLE, AND AT TERMINATION END. ALSO, AT TERMINATION END, INDICATE LOCATION OF CONDUIT ORIGINATION.

17. AFTER INSTALLATION, TEST FOR GROUNDS, SHORT CIRCUITS AND PROPER FUNCTION OF EACH NEW SYSTEM AND RELATED WIRING. FAULTS IN THE INSTALLATION SHALL BE CORRECTED.

18. AFTER ALL TESTS AND ADJUSTMENTS HAVE BEEN COMPLETED, CLEAN ALL EQUIPMENT LEAVING EVERYTHING IN WORKING ORDER AT THE COMPLETION OF THIS WORK.

19. PROVIDE A TEMPORARY ELECTRICAL SERVICE ADEQUATE IN SIZE FOR HEATING, FOR THE USE OF ALL TRADES AND FOR THE LIGHTING OF EACH ROOM DURING CONSTRUCTION. TEMPORARY SERVICE CAN BE EXTENDED FROM THE OWNER'S EXISTING POWER DISTRIBUTION SYSTEM. THE OWNER MUST APPROVE OF THE POINT OF SUPPLY, THE METHOD OF EXTENSION AND THE ROUTING OF NECESSARY TEMPORARY FEEDERS. INSTALLATION SHALL CONFORM TO ARTICLE 590 OF THE NEC.

20. ALL CUTTING AND PATCHING IN CONSTRUCTION AS NECESSARY FOR INSTALLATION OF THIS WORK SHALL BE THE RESPONSIBILITY OF THIS DIVISION. HAVE CUTTING DONE BY SKILLED MECHANICS AS CAREFULLY AS POSSIBLE AND WITH AS LITTLE DAMAGE AS POSSIBLE.

21. DEMOLITION OF EXISTING ELECTRICAL EQUIPMENT IS A PART OF THE ELECTRICAL WORK. ALL CUTTING, PATCHING, FINISHING, ETC., FOR REMOVED AND RELOCATED ELECTRICAL EQUIPMENT AND DEVICES SHALL BE INCLUDED AS PART OF THE ELECTRICAL WORK. REFER TO THE CONTRACT DRAWINGS FOR EXACT REQUIREMENTS. PROPERLY DISPOSE OF ALL FLUORESCENT AND HID LAMPS, BALLASTS, IONIZATION TYPE SMOKE DETECTORS, BATTERIES AND PCB CONTAMINATED MATERIALS DURING DEMOLITION WORK AS REQUIRED BY LOCAL, STATE, AND REGIONAL CODES. IF ADDITIONAL INTERPRETATION IS REQUIRED REGARDING THE SCOPE OF DEMOLITION INTENT, CONTACT THE ENGINEER PRIOR TO BID.

BASIC MATERIALS AND METHODS

1. ALL BOXES AND COVERPLATES SHALL BE SUITABLE FOR THE APPLICATIONS, RIGIDLY SUPPORTED FROM THE BUILDING STRUCTURE INDEPENDENT OF THE CONDUIT SYSTEM. ALL BOXES SHALL BE 4"x4"x2" DEEP MINIMUM WITH COVERPLATES SUITABLE FOR THEIR INTENDED USE. BOX STABILIZERS SHALL BE UTILIZED TO PROPERLY SUPPORT BOXES IN METAL STUD CONSTRUCTION.

2. EXTERIOR UNDERGROUND CONDUITS SHALL BE SCHEDULE 40 PVC, ENCASED IN CONCRETE UNDER DRIVES AND ROADWAYS WITH A MINIMUM 3" ENVELOPE. CONDUITS IN CONCRETE FLOORS, DAMP OR WET LOCATIONS, OR EXPOSED HIGH TRAFFIC AREAS WHERE SUBJECT TO PHYSICAL ABUSE SHALL BE HEAVY WALL RIGID GALVANIZED STEEL. ALL OTHER INTERIOR CONDUITS SHALL BE ELECTRICAL METALLIC TUBING (EMT), UNLESS OTHERWISE NOTED ON THE DRAWINGS OR WITHIN THESE SPECIFICATIONS. CONDUITS SHALL BE 3/4" TRADE SIZE, MINIMUM, UNLESS OTHERWISE NOTED ON THE DRAWINGS OR WITHIN THESE SPECIFICATIONS. ALL EMT CONDUITS SHALL HAVE COLD-ROLLED STEEL DOUBLE SET SCREW FITTINGS.

3. CONDUITS THAT PASS FROM THE INTERIOR TO THE EXTERIOR OF THE BUILDING, OR ARE SUBJECT TO DIFFERENT TEMPERATURES, SHALL BE SEALED WITH AN APPROVED MATERIAL SUCH AS DUCT-SEAL TO PREVENT THE CIRCULATION OF COLD AIR TO A WARMER SECTION OF THE CONDUIT.

   A. CONDUITS THAT STUB THROUGH THE ROOF SHALL BE SUPPLIED WITH PIPE SEALS AS MANUFACTURED BY THE PATE CO. AND SHALL BE INSTALLED AS RECOMMENDED BY THE MANUFACTURER. PIPE SEALS SHALL BE ONE PIECE ALUMINUM BASE TYPE WITH FIVE INCH SLOPED ROOF SURFACE FLANGES, GRADUATED STEPPED PVC BOOTS AND ADJUSTABLE STAINLESS STEEL CLAMPS. RPS CORPORATION AND THYCURB CORPORATION ARE APPROVED EQUIVALENT MANUFACTURERS. THE ELECTRICAL CONTRACTOR SHALL COORDINATE AND VERIFY EXACT REQUIREMENTS WITH THE ROOFING CONTRACTOR BEFORE PROCUREMENT AND INSTALLATION OF THE PIPE SEALS.

   B. CONDUITS THAT STUB THROUGH THE FOUNDATION WALLS SHALL BE SUPPLIED WITH PIPE SEALS AS MANUFACTURED BY LINK-SEAL, OR BY EQUIVALENT METHOD AS APPROVED BY THE ARCHITECT. PIPE SEALS SHALL BE EPDM (BLACK) WITH STAINLESS STEEL HARDWARE. THE ELECTRICAL CONTRACTOR SHALL COORDINATE AND VERIFY EXACT REQUIREMENTS WITH THE ARCHITECT BEFORE PROCUREMENT AND INSTALLATION OF THE PIPE SEALS.

4. ALL BRANCH CIRCUIT CONDUITS SHALL BE EMT CONDUIT. METAL CLAD (TYPE MC) CABLE OR ARMORED (TYPE AC) CABLE MAY BE UTILIZED IN LIEU OF BRANCH CIRCUIT EMT CONDUIT IN CONCEALED WALL SPACES. A SECURING CLIP SHALL BE PROVIDED TO SECURE THE MC OR AC CABLE TO THE WALL CONSTRUCTION AT A MINIMUM OF 16" ON CENTER. A GREEN EQUIPMENT GROUNDING CONDUCTOR SHALL BE PROVIDED IN ALL EMT CONDUIT, MC CABLE AND AC CABLE. THE CONDUIT OR METAL SHEATH SHALL ITSELF QUALIFY AS AN EQUIPMENT GROUNDING RETURN PATH IN ACCORDANCE WITH NEC 250.118. WIRING SHALL BE AS SPECIFIED ELSEWHERE IN THIS SECTION.

5. FLEXIBLE METAL CONDUIT SHALL BE USED FROM OUTLET BOXES TO RECESSED LIGHTING FIXTURES, 6 FT. IN LENGTH.

6. CONDUIT CONNECTIONS TO MOTORS, TRANSFORMERS, AND OTHER VIBRATING EQUIPMENT SHALL BE FLEXIBLE METAL "SEAL-TITE" TYPE "UA" CONDUIT AS MANUFACTURED BY THE AMERICAN BRASS COMPANY OR EQUIVALENT AND SHALL BE OF THE SAME SIZE AS THE FEEDER CONDUIT.

7. LOCAL LIGHT SWITCHES SHALL BE 20 AMPERE, 120/277 VOLTS, AC SPECIFICATION GRADE, WITH GROUNDING TERMINAL – HUBBELL #HBL-122 SERIES, PASS AND SEYMOUR #PS20AC SERIES, OR LEVITON #122 SERIES.

8. WALL MOUNTED OCCUPANCY SENSORS SHALL BE ADAPTIVE TECHNOLOGY OCCUPANCY SENSORS WITH OVERRIDE CAPABILITY AT THE SENSOR – HUBBELL #ATD1277 OR EQUAL BY PASS & SEYMOUR OR LEVITON.

9. DUPLEX RECEPTACLES SHALL BE 20A, 125V, 2 POLE, 3 WIRE GROUNDING.

   A. GENERAL PURPOSE "SPECIFICATION GRADE" DUPLEX RECEPTACLES: HUBBELL #5352, LEVITON #5362 OR PASS & SEYMOUR #5362.

10. DUPLEX RECEPTACLES, WHERE INDICATED ON THE DRAWINGS OR WHERE REQUIRED BY CODE, SHALL HAVE INTEGRAL GROUND FAULT CIRCUIT INTERRUPTER (GFCI) PROTECTION AND SHALL BE 20A, 125V, 2 POLE, 3 WIRE GROUNDING: HUBBELL #GF5352, PASS & SEYMOUR #2091 OR LEVITON #8899. GFCI RECEPTACLES SHALL NOT BE THROUGH-WIRED. PROVIDE INDIVIDUAL DUPLEX GFCI RECEPTACLES AS SHOWN ON THE DRAWINGS.

11. ALL RECEPTACLES SHALL BE PROVIDED WITH A SELF-GROUNDING CLIP AT THE MOUNTING SCREW.

12. ALL SWITCHES AND RECEPTACLES SHALL BE IVORY UNLESS OTHERWISE INDICATED WITHIN THESE SPECIFICATIONS. VERIFY COLOR WITH THE ARCHITECT PRIOR TO PROCUREMENT OF THE DEVICES. ALL COVERPLATES SHALL BE CADMIUM PLATED, ROUND CORNER, STEEL COVERPLATES FOR SURFACE MOUNTED OUTLET BOXES. BOTH THE WIRING DEVICES AND THE COVERPLATES SHALL BE BY THE SAME MANUFACTURER.

13. WIRE AND CABLE FOR BRANCH CIRCUITS AND FOR FEEDERS SHALL BE 90 DEGREES C., 600VOLT, TYPE THHN/THWN, COPPER ONLY, UNLESS OTHERWISE NOTED ON THE DRAWINGS. TYPE XHHW SHALL ALSO BE ACCEPTABLE FOR FEEDERS. MINIMUM SIZE FOR POWER AND LIGHTING BRANCH CIRCUITS SHALL BE #12.

14. SAFETY SWITCHES SHALL BE HEAVY DUTY FUSIBLE OR NONFUSIBLE TYPE AS INDICATED ON THE DRAWINGS, AND SHALL BE SUITABLE FOR THE VOLTAGE AND CURRENT RATINGS AS SHOWN ON THE DRAWINGS.

15. FUSES RATED 600 AMPERES OR LESS, 600 VOLTS OR LESS, SERVING ALL LOADS SHALL BE U.L. CLASS RK-1, BUSSMANN DUAL ELEMENT, TIME DELAY "LOW PEAK", TYPE LPN-RK (250 VOLT) OR TYPE LPS-RK (600 VOLT), OR APPROVED EQUIVALENT. TYPE J FUSES ARE ALSO ACCEPTABLE. FUSES OF EQUIVALENT OVERLOAD AND SHORT-CIRCUIT INTERRUPTING PERFORMANCE, AS MANUFACTURED BY RELIANCE FUSE, FERRAZ-SHAWMUT, LITTELFUSE, GENERAL ELECTRIC OR S & C ARE ACCEPTABLE. EXACT FUSE TYPE REQUIRED FOR MOTOR PROTECTION SHALL BE PROVIDED AS RECOMMENDED BY THE STARTER MANUFACTURER.

16. DISCONNECT SWITCHES SHALL BE MANUFACTURED BY SQUARE 'D', GENERAL ELECTRIC, SIEMENS/ITE, OR CUTLER HAMMER/WESTINGHOUSE.

17. CONDUITS SHALL BE CONTINUOUS AND SECURED TO ALL BOXES IN SUCH A MANNER THAT EACH CONDUIT SYSTEM SHALL BE ELECTRICALLY CONTINUOUS FROM THE POINT OF SERVICE TO ALL DEVICE BOXES. RUN CONDUITS CONCEALED UNLESS OTHERWISE INDICATED. THE ACTUAL ROUTING OF CONDUITS SHALL BE INSTALLED TO SUIT THE VARIOUS FIELD CONDITIONS.

18. INDIVIDUAL BRANCH CIRCUITS ARE SHOWN ON THE DRAWINGS FOR CLARITY. LIGHTING AND RECEPTACLE CIRCUITS LESS THAN OR EQUAL TO 100 AMPERES MAY BE GROUPED FOR HOMERUNS, WITH A MAXIMUM OF THREE (3) CIRCUITS PER HOMERUN. NEUTRAL CONDUCTORS SHALL NOT BE SHARED.

19. ALL ENCLOSURES CONTAINING EMERGENCY CIRCUITS SHALL BE PERMANENTLY MARKED WITH A RED LABEL INDICATING "CONTAINS EMERGENCY CIRCUITS".

20. FOR 120 VOLT BRANCH CIRCUITS WHERE SIZE IS NOT SHOWN, CONDUCTOR SIZE #12 MINIMUM SHALL BE USED FOR CIRCUITS LESS THAN 125 FEET, AND SIZE #10 MINIMUM SHALL BE USED FOR CIRCUITS 125 FEET OR GREATER. GROUND CONDUCTORS SHALL ALSO BE INCREASED TO #10 ACCORDINGLY.

21. IDENTIFY WIRE AND CABLE FOR BRANCH CIRCUITS AS CALLED FOR IN THE NATIONAL ELECTRICAL CODE. IDENTIFICATION OF FEEDERS SHALL BE BY MEANS OF COLORED TAPE AT TERMINALS.

22. ADJACENT DEVICES OF THE SAME VOLTAGE CLASS SHALL BE MOUNTED IN GANGED BOXES.

23. MOUNTING HEIGHTS TO THE CENTER OF OUTLET BOXES SHALL BE AS INDICATED ON THE DRAWINGS.

24. VERIFY MOUNTING HEIGHTS AND LOCATIONS WITH THE ARCHITECT PRIOR TO ROUGH-IN. REFER TO DETAILS AND INTERIOR WALL ELEVATIONS SHOWN ON THE ARCHITECTURAL DRAWINGS.

25. OUTLETS SHALL NOT BE INSTALLED BACK TO BACK.

26. ALL RECEPTACLES SHALL BE MOUNTED WITH THE GROUND OPENING ABOVE THE PHASE AND NEUTRAL OPENINGS.

27. ALL DEVICES SHALL BE SECURED WITH MORE THAN A SINGLE SCREW.

28. ALL HARDWARE, SUPPORTS, HANGERS, BRACKETS, ANGLE IRON, CHANNELS, RODS AND CLAMPS NECESSARY TO INSTALL ELECTRICAL EQUIPMENT SHALL BE PROVIDED TO SUIT THE FIELD CONDITIONS AND THE APPLICATIONS INTENDED AS SHOWN ON THE DRAWINGS. THE USE OF PERFORATED STRAPS IS NOT PERMITTED.

29. ALL EQUIPMENT MOUNTED ON INTERIOR EQUIPMENT ROOM WALLS WHERE ADDITIONAL SUPPORT IS REQUIRED SHALL BE ATTACHED TO 3/4" PAINTED PLYWOOD FIRE RATED BOARDS FURRED OUT 1" FROM WALL. BOARDS SHALL BE PAINTED TO MATCH WALL FINISHES.

POWER DISTRIBUTION

1. THE ELECTRICAL SERVICE TO THE BUILDING AND THE BUILDING'S GROUNDING ELECTRODE SYSTEM SHALL BE PROVIDED AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.

2. GROUND ALL ELECTRICAL SYSTEM CONDUITS, RACEWAYS, MOTORS, PANELS, CABINETS, FIXTURES, METAL BOXES, AND OTHER EXPOSED NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ALL PROVISIONS OF THE NEC, STATE BUILDING CODE AND LOCAL OR REGIONAL CODES.

3. GROUNDING OF THE ELECTRICAL SYSTEM SHALL BE BY MEANS OF AN INSULATED GROUNDING CONDUCTOR INSTALLED WITH FEEDER AND BRANCH CIRCUIT CONDUCTORS IN ALL CONDUITS, SIZED IN ACCORDANCE WITH NEC ARTICLE 250.122.

4. WHERE GROUNDING CONDUCTORS ARE SUBJECT TO MECHANICAL DAMAGE PROTECT SUCH CONDUCTORS BY ENCASEMENT IN CONCRETE OR INSTALLATION IN A RIGID METALLIC RACEWAY.

5. ALL TERMINATIONS OF THE GROUNDING CONDUCTORS SHALL BE BY MEANS OF SOLDERLESS CONNECTIONS.

6. GROUND ALL TRANSFORMERS IN ACCORDANCE WITH NEC ARTICLE 250.30. THE BONDING JUMPER SHALL BE DIRECTLY CONNECTED TO A GROUNDING ELECTRODE. THE TRANSFORMER CASE SHALL BE BONDED TO THE GROUNDING ELECTRODE CONDUCTOR, BUT SHALL NOT BE USED AS THE GROUNDING ELECTRODE. THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED WITHIN RIGID METALLIC CONDUIT. NEUTRAL CONDUCTORS SHALL NOT BE USED FOR EQUIPMENT GROUNDING. A BONDING JUMPER SHALL NOT BE PROVIDED IN PANELBOARDS.

7. FURNISH AND INSTALL BRANCH CIRCUIT BREAKER PANELBOARDS EQUIPPED WITH CIRCUIT BREAKERS, WITH FRAME AND TRIP RATINGS LISTED ON THE DRAWINGS. CIRCUIT BREAKERS SHALL BE THERMAL-MAGNETIC, MOLDED CASE BOLT-ON TYPE. PROVIDE HVAC "HACR" TYPE AS REQUIRED. ALL CURRENT CARRYING PARTS OF THE BUS STRUCTURE SHALL BE TIN-PLATED ALUMINUM. EACH PANEL SHALL CONTAIN A 100% RATED NEUTRAL BUS AND A GROUNDING BUS. PANELS SHALL HAVE "DOOR-WITHIN-DOOR" TRIM, HINGED BOX TO FRONT TYPE WITH LATCH ON OUTER DOOR. ALL LOCKS SHALL BE KEYED ALIKE.

8. EACH PANEL, AS A COMPLETE UNIT, SHALL HAVE A MINIMUM SYMMETRICAL SHORT CIRCUIT CURRENT RATING OF 10,000 AMPERES FOR 208Y/120 VOLT RATED PANELS AND 35,000 AMPERES FOR 480Y/277 VOLT RATED PANELS. CIRCUIT BREAKERS SHALL BE FULLY RATED. SERIES RATINGS ARE NOT PERMITTED.

9. EACH PANEL SERVED DIRECTLY BY A TRANSFORMER SECONDARY SHALL HAVE A MAIN CIRCUIT BREAKER OR OTHER MAIN OVERCURRENT PROTECTION.

10. PANELS SHALL BE AS MANUFACTURED BY SQUARE D, SIEMENS/ITE, GENERAL ELECTRIC OR CUTLER HAMMER/WESTINGHOUSE.

11. PANELS SHALL BE MOUNTED SO THAT TOP OF THE CABINET IS AT 6'-0" ABOVE FLOOR. A GLAZED DIRECTORY FRAME SHALL BE PROVIDED INSIDE EACH PANEL DOOR AND SHALL BE OF SUFFICIENT SIZE TO GIVE A COMPLETE DESCRIPTION OF EACH CIRCUIT. TYPED DIRECTORY CARDS SHALL BE PROVIDED LISTING EACH CIRCUIT SERVED.

12. THE BRANCH CIRCUIT NUMBERS USED ON THE DRAWINGS SHALL BE APPLIED FOR THE CONSTRUCTION. HOWEVER, AT THE COMPLETION OF THE WORK, CIRCUIT NUMBER ADJUSTMENTS SHALL BE MADE AS REQUIRED TO PROVIDE BALANCED PHASE LOADING ON EACH PANEL.

13. SPARE CIRCUIT BREAKERS SHALL BE IDENTIFIED AS SUCH ON THE PANEL DIRECTORY CARDS AND SHALL BE LEFT IN THE "OFF" POSITION.

14. TRANSFORMERS SHALL BE 115 DEGREES C. TEMPERATURE RISE ABOVE A 40 DEGREES C. AMBIENT. INSULATION SYSTEM SHALL BE UL RECOGNIZED FOR 220 DEGREES C. TRANSFORMERS SHALL HAVE (4) 2-1/2% ABOVE NORMAL, FULL CAPACITY PRIMARY TAPS.

15. TRANSFORMERS SHALL BE AS MANUFACTURED BY ACME, SQUARE D, SIEMENS/ITE, GENERAL ELECTRIC, OR CUTLER HAMMER/WESTINGHOUSE.

16. PROVIDE WALL MOUNTING PLATFORMS OR STRUCTURE MOUNTED PLATFORMS FOR EACH TRANSFORMER RATED BELOW 112.5 KVA ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS, UNLESS OTHERWISE NOTED ON THE DRAWINGS.

LIGHTING

1. LIGHTING FIXTURES SHALL BE PROVIDED AS SPECIFIED IN THE LIGHTING FIXTURE SCHEDULE ON THE DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR PROVIDING PROPER MOUNTING ACCESSORIES. CONTRACTOR SHALL REFER TO THIS SPECIFICATION FOR LAMP AND BALLAST REQUIREMENTS. SUBMITTALS SHALL INCLUDE PRODUCT INFORMATION FOR FIXTURES, LAMPS, AND BALLASTS.

2. FLUORESCENT ELECTRONIC BALLASTS SHALL BE ADVANCE "CENTIUM" PARALLEL INSTANT START FOR T8 LAMPS OR EQUAL BY VALMONT, MOTOROLA, OSRAM SYLVANIA, ESI OR MAGNETEK/TRIAD. BALLASTS SHALL HAVE A MINIMUM POWER FACTOR OF 98%, A MINIMUM BALLAST FACTOR OF 85%, A MAXIMUM CREST FACTOR OF 1.7, AND A MAXIMUM TOTAL HARMONIC DISTORTION OF 10%. BALLASTS SHALL OPERATE ABOVE 42 KHZ TO REDUCE POTENTIAL INTERFERENCE WITH INFRARED REMOTE CONTROL SYSTEMS.

3. INCANDESCENT LAMPS SHALL BE 130 VOLT RATED, WHEN AVAILABLE. A-LAMPS SHALL BE FROSTED, UNLESS OTHERWISE INDICATED. PROVIDE OTHER TYPES OF INCANDESCENT LAMPS AS LISTED IN THE LIGHTING FIXTURE SCHEDULE AND AS RECOMMENDED BY THE FIXTURE MANUFACTURER. WHENEVER POSSIBLE, THE MOST EFFICIENT LAMP TYPE SHALL BE USED, BASED ON LUMENS PER WATT. FOR EXAMPLE, LOWER WATTAGE INFRARED COATED TUNGSTEN-HALOGEN OR MR TYPE LAMPS SHALL BE PROVIDED IN LIEU OF STANDARD HIGHER WATTAGE LAMPS.

4. FLUORESCENT LINEAR LAMPS SHALL BE 800 SERIES, T-8, SPX, 3500 K, LOW MERCURY TYPE.

5. ALL LAMPS SHALL BE MANUFACTURED BY GENERAL ELECTRIC, SYLVANIA, OR PHILIPS.

6. SURFACE MOUNTED FIXTURES MOUNTED ON CEILINGS OTHER THAN ACCESSIBLE LAY-IN CEILING SYSTEMS, OR TO THE BUILDING STRUCTURE, SHALL BE SECURELY SUPPORTED IN A MANNER APPROVED BY THE ARCHITECT.

7. ALL EXPOSED FLUORESCENT LINEAR LAMPS SHALL BE FURNISHED WITH CLEAR, LEXAN LAMP SLEEVES WITH END CAPS TO COORDINATE WITH LAMP TYPE. LAMP SLEEVES SHALL BE LISTED FOR THE TYPE OF LAMPS PROTECTED.

8. SPARE LAMPS AMOUNTING TO 10% (MINIMUM OF 3) OF EACH TYPE AND SIZE OF EACH LAMP USED ON THE PROJECT SHALL BE SUPPLIED BY THE ELECTRICAL CONTRACTOR.

9. LIGHTING FIXTURES SHALL BE INSTALLED IN ACCORDANCE WITH NEC ARTICLE 410. LOW VOLTAGE LIGHTING FIXTURES AND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH NEC ARTICLE 411.

COMMUNICATIONS

1. NEW TELECOMMUNICATIONS BACKBOARDS SHALL BE 4' WIDE X 8' HIGH X ¾" THICK AC PLYWOOD, PAINTED WITH (2) COATS OF FIRE RETARDANT WHITE PAINT ON BOTH SIDES PRIOR TO INSTALLATION. BACKBOARDS SHALL BE MOUNTED 6 INCHES ABOVE THE FINISHED FLOOR. THE RECEPTACLES SHOWN ON THE BACKBOARDS SHALL BE MOUNTED AT 18 INCHES ABOVE THE FINISHED FLOOR AND SHALL BE INSTALLED IN SURFACE MOUNTED, SINGLE GANG OUTLET BOXES WITH STAMPED, SHEET METAL COVER PLATES. VERIFY EXACT REQUIREMENTS WITH THE OWNER'S TECHNOLOGY SYSTEM SUPPLIER PRIOR TO INSTALLATION.

2. COMBINATION VOICE/DATA OUTLET BOXES SHALL BE 4 INCHES SQUARE WITH SINGLE GANG PLASTER RINGS. VOICE-ONLY, DATA-ONLY, FAX AND PAY TELEPHONE OUTLETS SHALL BE SIMILAR. BLANK COVERPLATES SHALL BE PROVIDED FOR ALL UNUSED OUTLETS. VERIFY EXACT REQUIREMENTS WITH THE OWNER'S TECHNOLOGY SYSTEM SUPPLIER PRIOR TO INSTALLATION.

3. ALL CONDUITS REQUIRED FOR COMBINATION VOICE/DATA OUTLETS AS SHOWN ON THE DRAWINGS SHALL BE INSTALLED COMPLETE WITH PULLWIRES. CONDUITS SHALL BE 1" MINIMUM.

STATE OF OHIO
TIMOTHY J. NORRIS
E-40336
REGISTERED PROFESSIONAL ENGINEER

CALCULATED S.P.K.	CHECKED T.J.N.

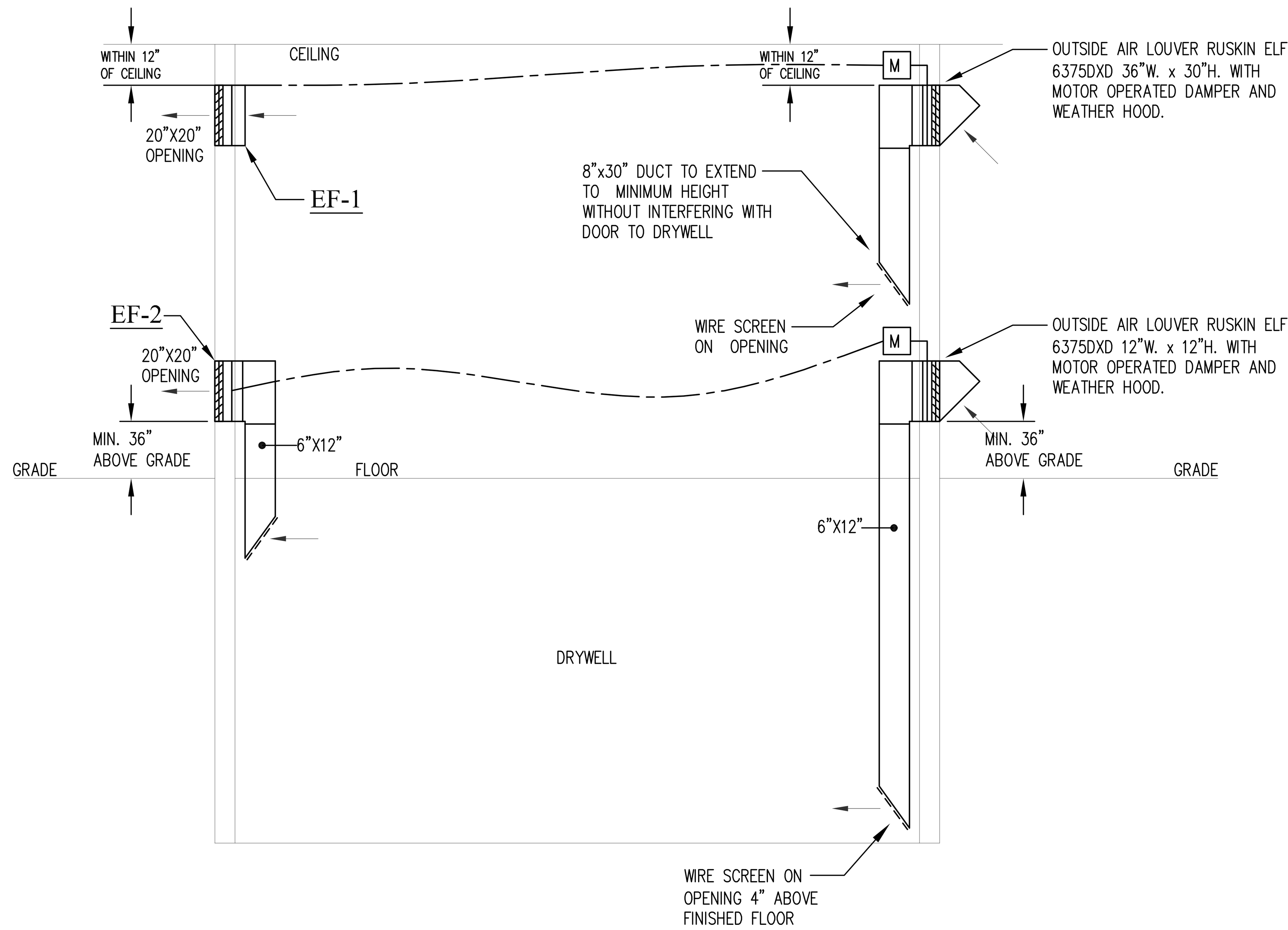
REV. NO.	DATE
ADDENDUM 2	09\30\11

GGJ inc. consulting engineers
35585 Curtis Blvd., Unit C Eastlake, Ohio 44095
Ph: 440.953.1567 Fx: 440.953.0580
Email: ggj@ggjengineers.com www.ggjengineers.com

PUMP STATION #1 & FORCE MAIN IMPROVEMENTS
ELECTRICAL SPECIFICATIONS

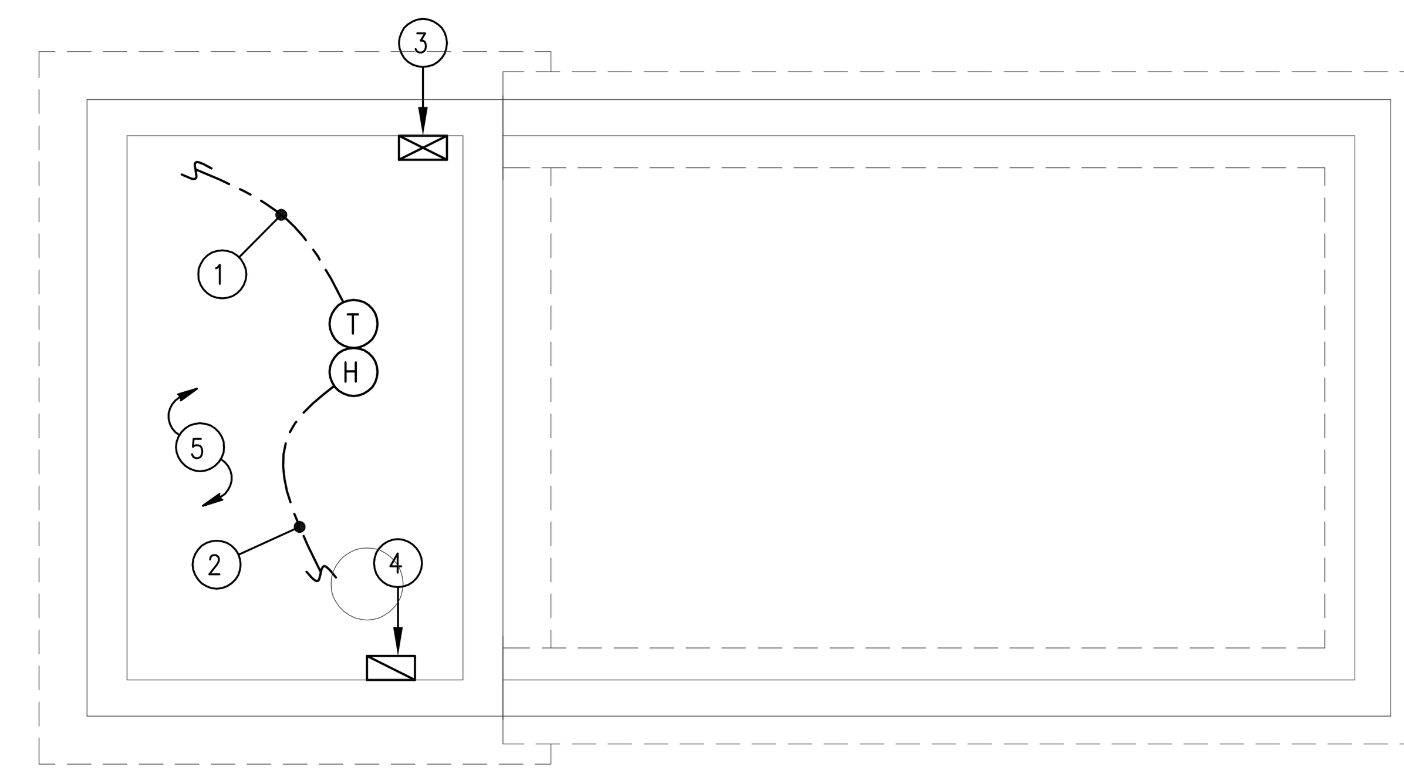
VILLAGE OF WELLSVILLE

E4
X



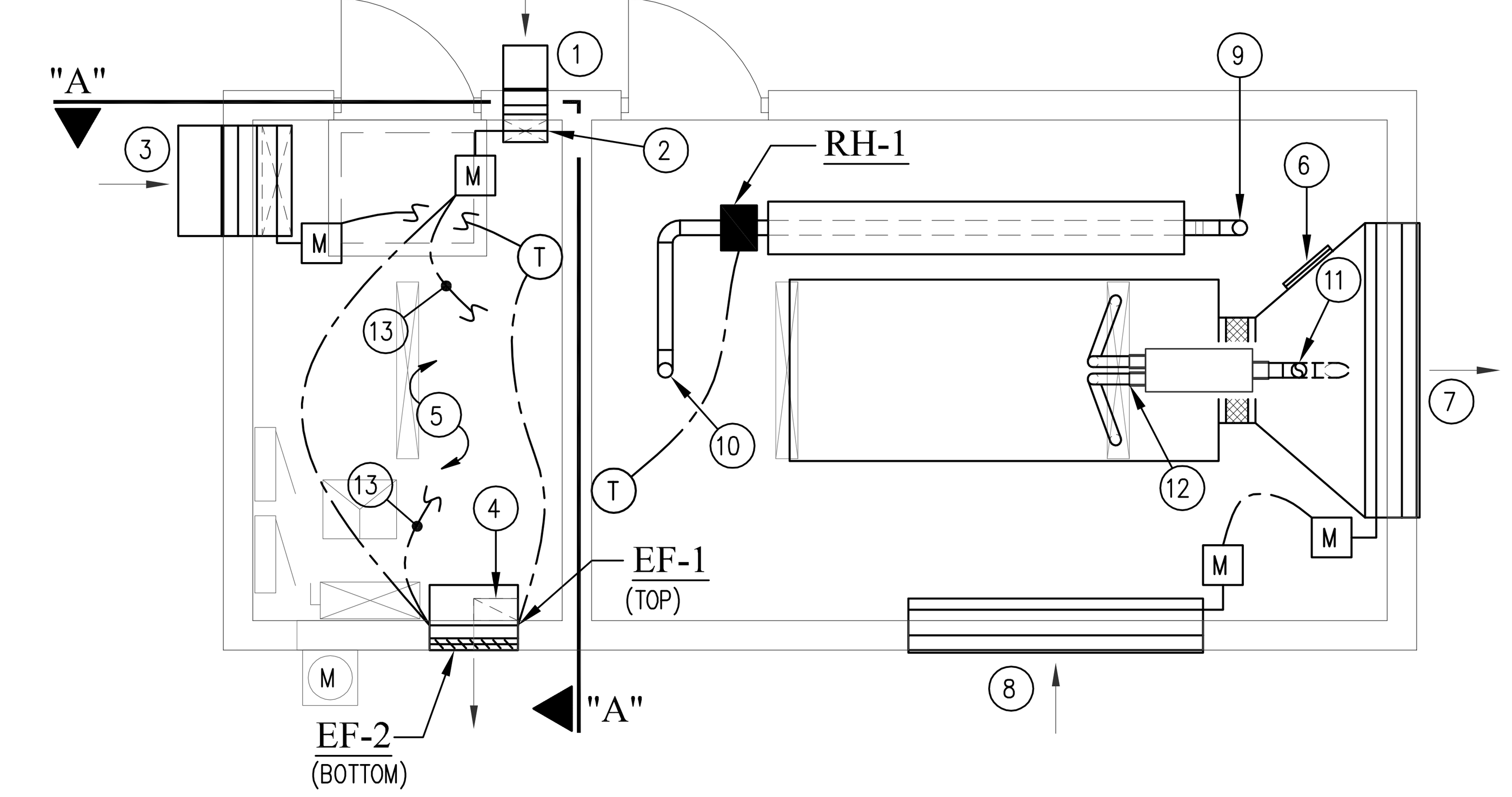
SECTION "A-A"

SCALE: 1/4"=1'-0" (DIAGRAMTIC)



MECHANICAL FOUNDATION PLAN

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



MECHANICAL GROUND FLOOR PLAN

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

PLAN NOTES: (FOUNDATION PLAN)

1. TO EF-2, SEE MECHANICAL GROUND FLOOR PLAN ON THIS DRAWING.
2. TO MOTOR OPERATED DAMPER INTERLOCKED WITH EXHAUST FAN (EF-2)
3. 12"X6" OUTSIDE AIR DUCT UP, SEE MECHANICAL GROUND FLOOR PLAN ON THIS DRAWING FOR CONTINUATION.
4. 12"X6" EXHAUST AIR DUCT UP, SEE MECHANICAL GROUND FLOOR PLAN ON THIS DRAWING FOR CONTINUATION.
5. SEE ELECTRIC DRAWINGS FOR ELECTRIC HEAT IN THIS ROOM.

PLAN NOTES: (GROUND FLOOR PLAN)

1. OUTSIDE AIR LOUVER RUSKIN ELF 6375DXD 12"W. x 12"H. WITH MOTOR OPERATED DAMPER AND WEATHER HOOD.
2. 12"X6" OUTSIDE AIR DUCT DOWN, SEE MECHANICAL FOUNDATION PLAN ON THIS DRAWING FOR CONTINUATION.
3. OUTSIDE AIR LOUVER RUSKIN ELF 6375DXD 36"W. x 30"H. WITH MOTOR OPERATED DAMPER AND WEATHER HOOD.
4. 12"X6" EXHAUST AIR DUCT DOWN, SEE MECHANICAL FOUNDATION PLAN ON THIS DRAWING FOR CONTINUATION.
5. SEE ELECTRIC DRAWINGS FOR ELECTRIC HEAT IN THIS ROOM.
6. ACCESS DOOR
7. 80" WIDE x 80" HIGH EXHAUST LOUVER RUSKIN MODEL ELC 675DAF WITH MOTOR OPERATED DAMPER AND BIRD SCREEN. MOTOR OPERATED DAMPER INSTALLED TO INSURE FAIL OPEN OPERATION. CONNECT LOUVER TO EXHAUST SIDE OF GENERATOR AS REQUIRED COMPLETE. PROVIDE FLEXIBLE CONNECTION AT GENERATOR. (17,400 CFM) BOTTOM OF DISCHARGE LOUVER SHALL BE MOUNTED A MINIMUM 22" ABOVE FINISHED GRADE. (VERIFY DISCHARGE SIDE WITH GENERATOR CONTRACTOR)
8. 80"x80" INTAKE LOUVER RUSKIN MODEL ELC 675DAF WITH MOTOR OPERATED DAMPER AND BIRD SCREEN. MOTOR OPERATED DAMPER INSTALLED TO INSURE FAIL OPEN OPERATION. (17,400 CFM) BOTTOM OF INTAKE LOUVER SHALL BE MOUNTED A MINIMUM 22" ABOVE FINISHED GRADE.
9. 4"~ VENT PIPE FROM GAS-FIRED RADIANT HEATER UP THRU ROOF. SEE DETAIL-A ON THIS DRAWING.
10. 4"~ INTAKE PIPE TO GAS-FIRED RADIANT HEATER UP THRU ROOF. SEE DETAIL-B ON THIS DRAWING.
11. TERMINATE 4"~ EXHAUST PIPE UP THRU ROOF. FURNISH AND INSTALL A THIMBLE WHERE EXHAUST PIPES PENETRATE ROOF. INSTALL IN ACCORDANCE WITH MANUFACTURE'S RECOMMENDATIONS. GENERATOR EXHAUST PIPES SHALL FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL VERIFY TYPE OF MATERIAL USED WITH GENERATOR MANUFACTURE. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL WORK CONCERNING THE GENERATOR.
12. MECHANICAL CONTRACTOR SHALL CONNECT TO INTAKE AND DISCHARGE OF EXHAUST MUFFLER AS REQUIRED COMPLETE. (VERIFY)
13. TO THERMOSTAT AND HUMIDISTAT BELOW, SEE MECHANICAL FOUNDATION PLAN ON THIS DRAWING.

GAS-FIRED RADIANT HEATER SCHEDULE

MARK	MANUFACTURER MODEL NUMBER	MBH	ELECTRICAL	LENGTH	REMARKS
RH-1	VANTAGE CTH2-40	40.0	5.0 AMPS 120/60/1-VOLTAGE	11' - 6"	1 - REQUIRED

RADIANT HEATERS SHALL BE VANTAGE OR APPROVED EQUAL

EXHAUST FAN (EF) SCHEDULE

MARK	MANUFACTURER MODEL NUMBER	CFM	S.P.	FAN MOTOR		TYPE	REMARKS
				HP	VOLTAGE		
EF-1	COOK 10 SWD	600	0.25"	1/25	120/60/1	SIDEWALL PROP	1,2,3,4,5
EF-2	COOK 8 SWD	140	0.25"	1/80	120/60/1	SIDEWALL PROP	1,2,3,4,5,6

ACCESSORIES
1 - DISCONNECT SWITCH
2 - 20" x 20" GRAVITY BACK PRESSURE DAMPER
3 - SOLID STATE SPEED CONTROLLER
4 - REVERSE ACTING THERMOSTAT
5 - FAN GUARD
6 - REVERSE ACTING HUMIDISTAT

DUCTS

A. PROVIDE AND INSTALL ALL SUPPLY RETURN AND EXHAUST DUCTS. CONNECTION TO EQUIPMENT TO BE MADE WITH DOUBLE CANVAS. AIR DUCTS SHALL BE BUILT OF THE FOLLOWING GAUGE GALVANIZED IRON AND TO CONFORM TO SMACNA STANDARDS:

RECTANGULAR:		ROUND DUCTS	
MAXIMUM SIDE UP TO 12"	26 GA.	12" DIA.	24 GA.
MAXIMUM SIDE UP TO 30"	24 GA.	30" DIA.	22 GA.
MAXIMUM SIDE UP TO 60"	22 GA.		

B. JOINT TO BE STRAIGHT, TYPE TO BE BEST SUITED FOR PARTICULAR SIZE, SECTIONS TO BE NO LONGER THAN 8 FEET. ALL SURFACES 15" OR WIDER SHALL BE CROSS BROKEN. WHERE DUCTS PASS THROUGH FLOOR, ROOF OR WALLS, SPACE AROUND DUCT SHALL BE PACKED WITH FIREPROOF MATERIAL. ALL SUPPLY ELBOWS ARE TO BE CURVED VANES. ALL GRILLES SHALL BE SCREWED TO FLANGED DUCTS WITH SPONGE RUBBER GASKETS AND MADE AIRTIGHT. ALL GRILLES ARE TO HAVE PRIME COAT FINISH.

DUCT INSULATION

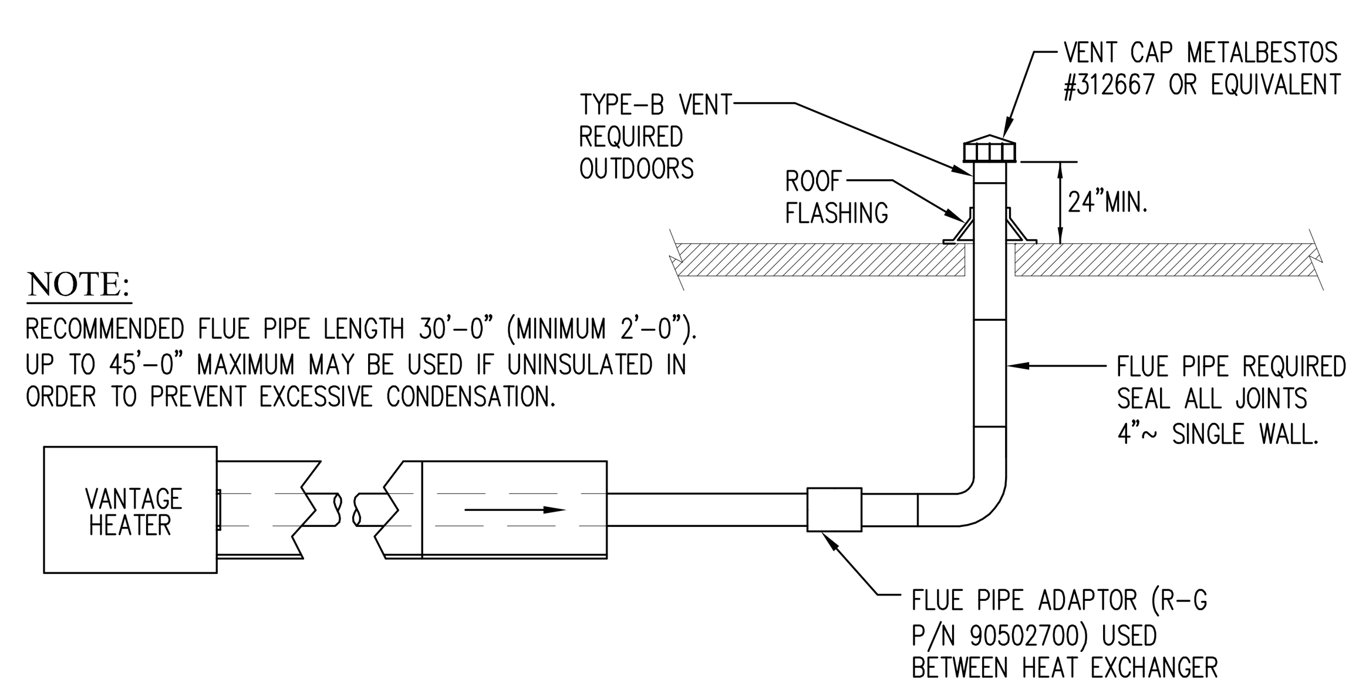
A. ALL INTAKE AIR DUCTS TO BE WRAPPED AND INSULATED USING OWENS CORNING FIBERGLASS. ALL SERVICE FACED DUCT WRAP OR APPROVED EQUAL.

B. INSULATION MAY BE JOHN MANVILLE, PITTSBURGH PLATE GLASS OR OWENS-CORNING.

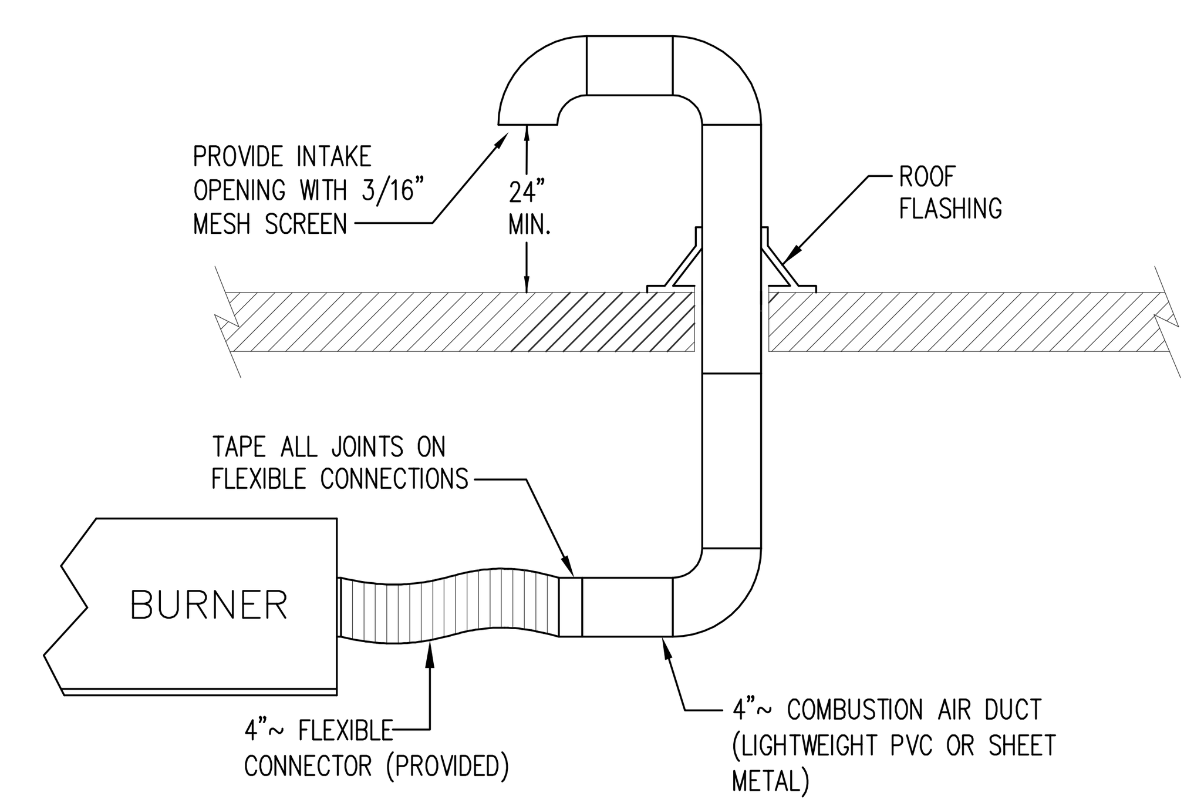
LOUVERS

A. FURNISH EXTRUDED ALUMINUM AIR INTAKE STORMPROOF LOUVERS AS INDICATED ON DRAWINGS AND MADE BY AEROLITE MODEL CB630 OR APPROVED EQUAL. REMOVAL SCREEN WITH 1/2" MESH HAVING SAME FINISH AS LOUVERS SHALL BE NEATLY FITTED AND SECURED TO THE INSIDE FACE OF INTAKE. LOUVERS MUST HAVE MINIMUM 55% FREE OPENING. LOUVER SIZES GIVEN ARE NET CORE DIMENSIONS AND DO NOT INCLUDE ANY FRAME THICKNESS. FINISH LOUVERS DURANODIC MEDIUM BRONZE.

NOTE:
RECOMMENDED FLUE PIPE LENGTH 30'-0" (MINIMUM 2'-0"). UP TO 45'-0" MAXIMUM MAY BE USED IF UNINSULATED IN ORDER TO PREVENT EXCESSIVE CONDENSATION.



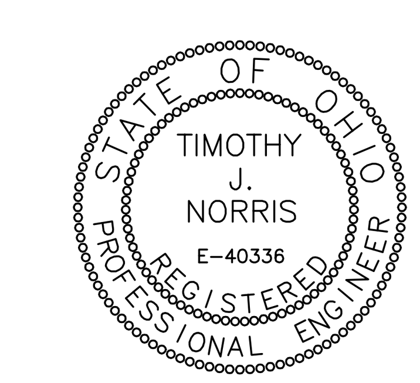
DETAIL-A



DETAIL-B

GAS FIRED RADIANT HEATER DETAILS

NO SCALE



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ADDENDUM 2	09\30\11

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CHECKED T.J.N.

GGJ inc. consulting engineers
35585 Curtis Blvd., Unit C Eastlake, Ohio 44095
Ph: 440.953.1567 Fx: 440.953.0580
Email: ggj@ggjengineers.com www.ggjengineers.com

PUMP STATION #1 & FORCE MAIN IMPROVEMENTS
ELECTRICAL PLAN

VILLAGE OF WELLSVILLE

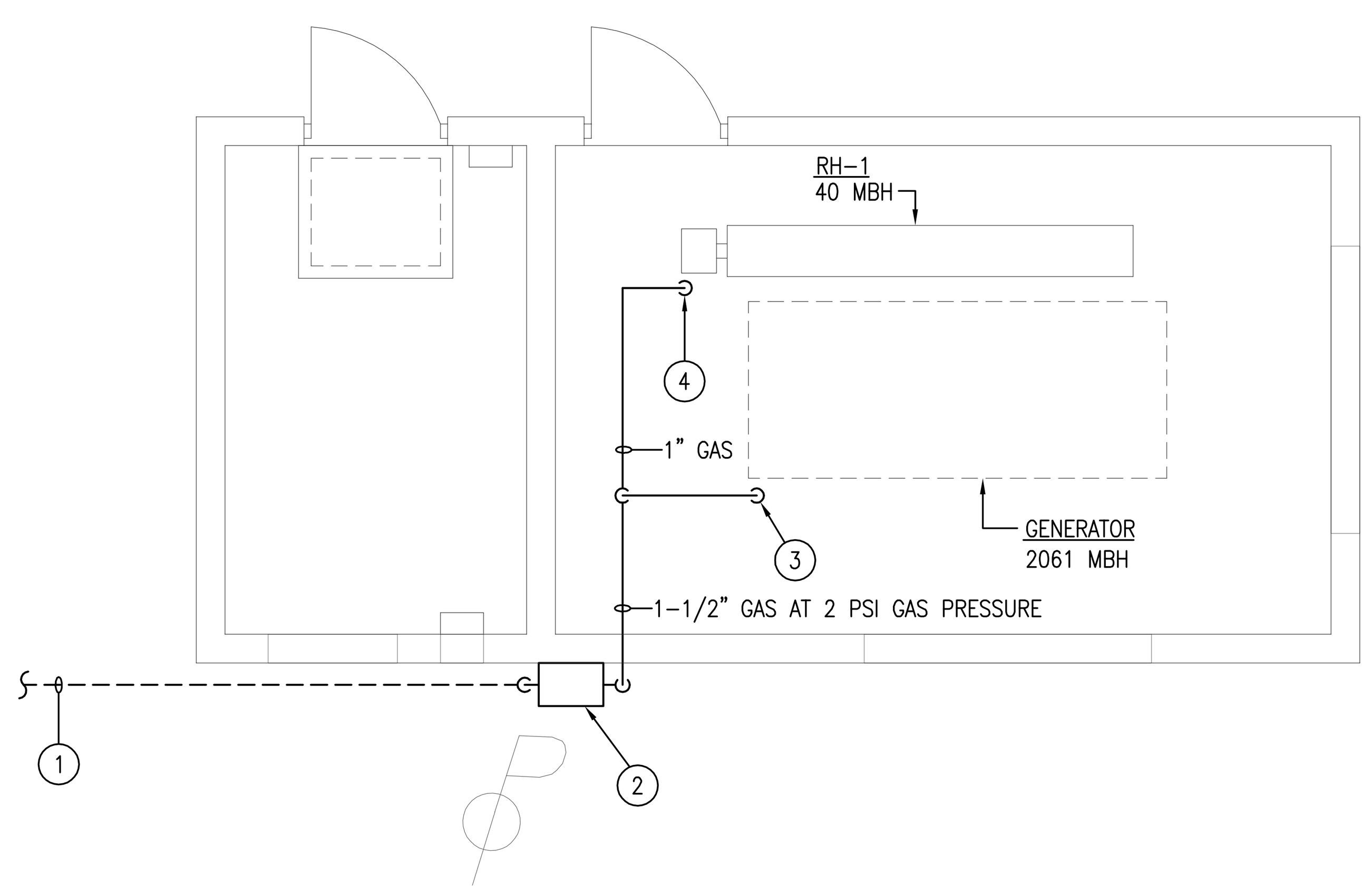
M1
X

PLUMBING SYMBOL LEGEND

Symbol	Description
—— G ——	GAS LINE
	GAS COCK
	UNION
DP, DN	TEE LOOKING DOWN
UP	TEE LOOKING UP
DP, DN	ELBOW DOWN OR DROP
UP	ELBOW UP OR RISE
	SHUT-OFF VALVE IN RISER

PLUMBING ABBREVIATIONS

MBH	THOUSAND BTU PER HOUR
PC	PLUMBING CONTRACTOR



PLUMBING PLAN

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

PLAN NOTES:

(1) NEW GAS SERVICE LINE. FOR CONTINUATION OF GAS SERVICE LINE REFER TO SITE UTILITIES DRAWING. GAS SERVICE LINE SHALL BE SIZED BY COLUMBIA GAS OF OHIO BASED ON AVAILABLE GAS PRESSURE. ALSO REFER TO GAS CONTACT NOTE ON THIS DRAWING.

(2) PROPOSED LOCATION OF GAS METER. FINAL LOCATION SHALL BE BY COLUMBIA GAS OF OHIO. FOR NEW GAS METER, PROVIDE VALVE EACH SIDE OF METER, ALL REQUIRED FITTINGS & REGULATOR (IF REQUIRED, SET REGULATOR TO MEDIUM GAS PRESSURE DOWN TO 2 PSI GAS PRESSURE, RUN 2 PSI THRU GAS METER) FOR COMPLETE INSTALLATION. PROVIDE MANIFOLD FOR GAS LOAD OF 2101 MBH. INSTALLATION & LOCATION SHALL BE PER COLUMBIA GAS OF OHIO'S RULES AND REQUIREMENTS. ALSO REFER TO GAS CONTACT NOTE ON THIS DRAWING. RUN 1-1/2" GAS LINE AT 2 PSI FROM GAS METER UP ALONG WALL & THRU WALL. BUILDING DISTRIBUTION HOUSE LINE GAS PRESSURE SHALL BE 2 PSI. P.C. SHALL COORDINATE EXACT ROUTING OF ALL GAS PIPING WITH THE OWNER & ARCHITECT PRIOR TO INSTALLATION.

(3) 1-1/2" GAS DOWN TO GENERATOR, 2061 MBH. PROVIDE GAS COCK, UNION, DIRT LEG & REGULATOR, FISHER OR APPROVED EQUAL, 2 PSI GAS PRESSURE DOWN TO 13" WATER COLUMN.

(4) 1" GAS DOWN TO RADIANT HEATER, 40 MBH. PROVIDE GAS COCK, UNION, DIRT LEG & REGULATOR, FISHER OR APPROVED EQUAL, 2 PSI GAS PRESSURE DOWN TO 7" WATER COLUMN OR 4 OUNCES.

GENERAL PLUMBING NOTES:

1. GENERAL NOTES, SYMBOLS LIST AND DETAILS ARE APPLICABLE TO ALL SHEETS MARKED "P".
2. SHEETS ARE DIAGRAMMATIC: DETERMINE LOCATIONS OF SYSTEMS AND COMPONENTS IN FIELD.
3. DIMENSIONS SHOWN ON PLAN ARE HORIZONTAL. DIMENSIONS SHOWN IN ELEVATION ARE VERTICAL EXCEPT THAT, IN WAY OF STRUCTURAL DIMENSIONS ARE MEASURED PERPENDICULAR TO FLANGE.
4. NEITHER ACCURACY NOR COMPLETION OF UTILITY LOCATIONS SHOWN ON SHEETS ARE GUARANTEED. DETERMINE EXACT LOCATIONS OF EXISTING UTILITIES IN FIELD, WHETHER OR NOT SHOWN ON DRAWINGS. EXERCISE CAUTION AND IDENTIFY LOCATIONS OF UNMARKED UTILITY LINES AS NECESSARY TO PERFORM WORK OF THIS SECTION.
5. ALL PLUMBING WORK SHALL BE IN ACCORDANCE WITH THE OHIO PLUMBING CODE & ALL APPLICABLE LOCAL CODES.
6. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO COORDINATE HIS WORK WITH THAT OF ALL OTHER TRADES, INCLUDING (BUT NOT LIMITED TO), ELECTRICAL, HVAC, PROCESS PIPING, STRUCTURAL AND GENERAL TRADES.
7. ANY INTERFERENCE SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND THE OWNER'S REPRESENTATIVE, AND SHALL BE RESOLVED PRIOR TO THE INSTALLATION OF THE WORK INVOLVED.
8. NO WORK SHALL BE INSTALLED IN VIOLATION OF ANY GOVERNING CODES. ANY WORK SHOWN ON THE DRAWINGS WHICH IS IN VIOLATION OF SUCH CODES SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND THE OWNER'S REPRESENTATIVE AND SHALL BE RESOLVED PRIOR TO THE INSTALLATION OF THE WORK INVOLVED.
9. MANUFACTURERS' MODEL NUMBERS ARE SPECIFIED SOLELY TO ESTABLISH STANDARDS OF QUALITY FOR PERFORMANCE AND MATERIALS.
10. PRODUCT INSTALLATION SHALL ADHERE TO MANUFACTURERS' RECOMMENDATIONS.
11. PROVIDE ACCESS PANELS FOR EQUIPMENT THAT REQUIRES PERIODIC SERVICE.
12. ALL PIPING ABOVE GRADE SHALL BE PROPERLY SUPPORTED BY THE BUILDING STRUCTURE AND SHALL NOT REST ON CEILING TILES OR CEILING STRUCTURE.
13. ALL SLEEVES THROUGH CONCRETE FLOORS AND ALL CORE DRILLING OF CONCRETE FLOORS AND WALLS SHALL BE BY THIS CONTRACTOR.
14. CONCRETE PADS AND PLATFORMS FOR WORK OF THIS SECTION WILL BE PROVIDED BY GENERAL CONTRACTOR. PROVIDE INFORMATION AND HARDWARE AS NECESSARY TO COORDINATE WORK.
15. SCHEDULE WORK OF THIS SECTION TO AVOID INTERFERING WITH FIREPROOFING WORK.
16. RUN PIPING CONCEALED, UNLESS SPECIFIED OTHERWISE, AND CLEAR OF CEILING INSERTS.
17. STRUCTURAL WELDING SHALL BE 1/4-INCH FILLET UNLESS REQUIRED OTHERWISE.
18. PROVIDE CLAMPS, OFFSETS, EXPANSION JOINTS, ANCHORS AND GUIDES AS NECESSARY TO PREVENT STRESS ON PIPING.
19. PITCH PRESSURE PIPING IN DIRECTION OF FLOW.
20. PLUMBING SYSTEM PIPING SHALL BE TESTED AND INSPECTED PER OHIO PLUMBING CODE SECTION 312.
21. ALL PLUMBING PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH OHIO PLUMBING CODE SECTION 308.
22. GAS PIPING AND ALL RELATED INSTALLATIONS SHALL COMPLY WITH THE INTERNATIONAL FUEL GAS CODE.
23. INSTALL ALL THREADED CLEANOUT PLUGS WITH PIPE DOPE TO ALLOW FOR EASY REMOVAL IN THE FUTURE.
24. IT WILL BE THE RESPONSIBILITY OF THE PLUMBING CONTRACTOR TO INSURE THAT ITEMS TO BE FURNISHED UNDER PLUMBING CONTRACT WILL FIT THE SPACE AVAILABLE – PLUMBING CONTRACTOR SHALL MAKE NECESSARY FIELD MEASUREMENTS TO ASCERTAIN SPACE REQUIREMENTS, INCLUDING THOSE FOR CONNECTIONS AND SHALL FURNISH AND INSTALL SUCH SIZES AND SHAPES OF EQUIPMENT THAT ARE THE TRUE INTENT OF THE DRAWINGS AND SPECIFICATIONS.
25. PLUMBING CONTRACTOR SHALL SUPPLY AND INSTALL GAS PIPING AS SHOWN ON PLANS. PROVIDE GAS COCK, UNION AND DIRT LEG TO EACH PIECE OF GAS FIRED EQUIPMENT. ALL GAS PIPING SHALL COMPLY WITH LOCAL CODES. PLUMBING CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS TO ALL GAS EQUIPMENT. PROVIDE/INSTALL REGULATORS AT HVAC AND WATER HEATER EQUIPMENT WHERE REQUIRED OR AS SHOWN ON PLUMBING DRAWINGS TO REDUCE TO NORMAL OPERATING PRESSURE OF THE EQUIPMENT AS INDICATED ON THE EQUIPMENT NAME PLATES. PRESSURE CHECK GAS LINES WHEN HOOKED UP TO EQUIPMENT OR HVAC UNITS. FINAL LEAK TEST FROM SHUT-OFF TO EQUIPMENT SHALL BE DONE UNDER NORMAL PRESSURE WITH SOAP/WATER SOLUTION AFTER GAS PIPING IS CONNECTED.
26. VENTED GAS PRESSURE REGULATORS SHALL HAVE AN INDEPENDENT VENT TO THE OUTSIDE PER THE INTERNATIONAL FUEL GAS CODE (I.F.G.C.) SECTION 410.3.

GAS CONTACT NOTE:

GAS COMPANY: COLUMBIA GAS OF OHIO

CONTACT: BECKY RINYO

PHONE: 1-(800) 440-6111 EXT. 3109

EMAIL: RRINYO@NISOURCE.COM

PLUMBING SPECIFICATIONS

GENERAL SPECIFICATIONS/PLUMBING

1. PERFORM WORK, PROVIDE MATERIALS AND EQUIPMENT FOR SYSTEMS SHOWN, SPECIFIED AND DESCRIBED ON DRAWINGS. COMPLETELY COORDINATE WORK OF THIS CONTRACT WITH WORK OF OTHER CONTRACTORS AND PROVIDE COMPLETE AND FULLY FUNCTIONAL INSTALLATION. REMOVE ALL DEBRIS CAUSED BY THIS CONTRACTOR'S WORK.
2. ADDRESS QUESTIONS REGARDING DRAWINGS TO ARCHITECT IN WRITING BEFORE AWARD OF CONTRACT. OTHERWISE, ARCHITECT'S INTERPRETATION OF MEANING AND INTENT OF SHEETS SHALL BE FINAL.
3. SHEETS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED IN THE CONTRACT. IT IS NOT INTENDED TO SPECIFY OR SHOW EVERY OFFSET, FITTING OR COMPONENT, HOWEVER, CONTRACT DOCUMENTS REQUIRE COMPONENTS AND MATERIALS WHETHER OR NOT INDICATED OR SPECIFIED AS NECESSARY TO MAKE THE SYSTEMS BEING INSTALLED COMPLETE, TESTED AND OPERATIONAL. DETERMINE EXACT LOCATIONS OF UTILITIES, SYSTEMS AND COMPONENTS IN FIELD.
4. GIVE NOTICES, FILE PLANS, OBTAIN PERMITS AND LICENSES, PAY FEES AND BACK CHARGES AND OBTAIN NECESSARY APPROVALS FROM AUTHORITIES THAT HAVE JURISDICTION.
5. GUARANTEE WORK OF THIS CONTRACTOR IN WRITING FOR ONE YEAR FROM THE DATE OF OWNER'S ACCEPTANCE OF CERTIFICATE OF SUBSTANTIAL COMPLETION. PROMPTLY, REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATIONS THAT DEVELOP DEFECTS WITHIN THIS PERIOD. PROMPTLY AND TO OWNERS SATISFACTION, CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE AT NO ADDITIONAL COST TO OWNER.
6. ALL MATERIALS, EQUIPMENT AND METHOD OF INSTALLATION SHALL BE IN ACCORDANCE WITH THE STANDARDS, REGULATIONS, CODES, ORDINANCES, AND LAWS OF LOCAL, STATE, AND FEDERAL GOVERNMENTS, AND OTHER AUTHORITIES THAT HAVE LAWFUL JURISDICTION.
7. PRIOR TO COMMENCING WORK, CONTRACTOR SHALL SUBMIT SIX COPIES OF THE SHOP DRAWINGS AND EQUIPMENT DATA FOR MATERIALS AND EQUIPMENT TO THE ARCHITECT FOR REVIEW AND APPROVAL. MATERIALS AND EQUIPMENT SHALL NOT BE INSTALLED BEFORE SHOP DRAWINGS ARE REVIEWED AND APPROVED.
8. MATERIALS AND EQUIPMENT SHALL BE LISTED BY UNDERWRITERS LABORATORIES (UL) AND APPROVED BY NFPA, ASME, AND AGA FOR INTENDED SERVICE.
9. GENERAL NOTES, SYMBOLS LIST AND DETAILS ARE APPLICABLE TO ALL PLUMBING DRAWINGS.
10. WORK SHALL BE EXECUTED IN A WORKMANLIKE MANNER AND SHALL PRESENT NEAT, RECTILINEAR APPEARANCE WHEN COMPLETED. MAINTAIN MAXIMUM HEADROOM AT ALL TIMES. DO NOT RUN PIPES, CONDUITS, OR DUCTS EXPOSED UNLESS SHOWN AND NOTED TO BE EXPOSED ON DRAWINGS. MATERIALS AND EQUIPMENT SHALL BE NEW AND INSTALLED ACCORDING TO MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS, SO THAT COMPLETED INSTALLATION SHALL OPERATE SAFELY AND EFFICIENTLY. COORDINATE INSTALLATION WITH OTHER TRADES.
11. AS WORK PROGRESSES AND FOR DURATION OF CONTRACT, MAINTAIN COMPLETE SET OF PRINTS OF CONTRACT DRAWINGS AT JOB SITE AT ALL TIMES. RECORD WORK COMPLETED AND ALL CHANGES FROM ORIGINAL CONTRACT DRAWINGS CLEARLY AND ACCURATELY INCLUDING WORK INSTALLED AS A MODIFICATION OR ADDITION TO THE ORIGINAL DESIGN.
12. ALL EQUIPMENT, PIPING, WIRING AND INSULATION, ETC., INSTALLED IN HVAC AIR PLENUM SPACES SHALL MEET CODE REQUIREMENTS FOR SMOKE AND COMBUSTIBILITY.
13. ALL SLEEVES THROUGH CONCRETE FLOORS AND FIRE RATED WALLS OR PARTITIONS SHALL BE FIRESTOPPED WITH UL RATED ASSEMBLIES WITH EQUAL FIRE RATING.

PLUMBING SYSTEMS & EQUIPMENT

1. GAS PIPING: FURNISH AND INSTALL COMPLETE DISTRIBUTION OF GAS PIPING. ALL CONNECTIONS TO HAVE BRASS UNIONS. AT EACH APPLIANCE INSTALL LEVER HANDLE GAS COCK AND 6" LONG DIRT LEG IN GAS LINE. CONSTRUCT METER MANIFOLD IN ACCORDANCE WITH GAS COMPANY REQUIREMENTS. ALL GAS PIPING SHALL BE PAINTED. COORDINATE WITH THE ARCHITECT.
2. HANGERS, ANCHORS, CLAMPS AND INSERTS
   a. PROVIDE ADJUSTABLE CLEVIS HANGERS FOR PIPING 2" AND LARGER, AND CAST BRASS SPLIT-RING HINGED HANGERS FOR SMALLER PIPING. SUPPORT PIPING FROM BUILDING STRUCTURE TO MAINTAIN REQUIRED GRADE AND PITCH OF PIPE LINES, PREVENT VIBRATION, SECURE PIPING IN PLACE. SECURE HANGERS TO INSERTS WHERE PRACTICAL. HANGER RODS SHALL HAVE MACHINE THREADS.
   b. HANGER RODS SHALL BE CONNECTED TO BEAM CLAMP, UL-APPROVED CONCRETE INSERTS OR PHILLIPS OR APPROVED EQUAL EXPANSION SHIELDS. RAMSET OR POWER DRIVEN INSERTS WILL NOT BE ALLOWED.
   c. HANGER SPACING SHALL MEET REQUIREMENTS OF STATE AND LOCAL CODES.
3. SLEEVES AND PENETRATIONS
   a. PIPE SLEEVES THROUGH FIRE-RATED CONSTRUCTION SHALL BE SCHEDULE 40 STEEL. SLEEVES THROUGH PARTITIONS AND NON-FIRE-RATED CONSTRUCTION SHALL BE 26 GAUGE GALVANIZED STEEL WITH LOCK LONGITUDINAL SEAMS.
   b. FIRE STOP PENETRATION SEALS IN FIRE-RATED CONSTRUCTION SHALL BE CERAMIC FIBRE, MINERAL FIBRE, OR SILICONE FOAM. PROVIDE MINERAL FIBRE BOARD, MATTING OR PUTTY FOR DAMMING AND FORMING. FINISH SEALS FLUSH TO WALL SURFACE AND FILL GAPS WITH SILICONE ADHESIVE SEALANT CAULKING.
   c. PACKING FOR SLEEVES THAT DO NOT REQUIRE MAINTENANCE OF FIRE RATING SHALL BE OAKUM, SILICATE FOAM, CERAMIC FIBRE WITH APPROVED SEALANT. PACK OR FOAM TO WITHIN ONE INCH OF BOTH WALL SURFACES. SEAL PENETRATION PACKING WITH APPROVED CAULKING AND PAINTABLE WATER-PROOF MASTIC SURFACE FINISH OR SILICONE CAULKING.
4. ACCESS
   a. PROVIDE PROPER ACCESS TO EQUIPMENT THAT REQUIRE INSPECTION, REPLACEMENT OR REPAIR. ACCESS PANELS SHALL BE A MINIMUM OF 12"x12".
5. CLEANING
   a. CLEAN SYSTEMS THOROUGHLY BEFORE TESTING. FIXTURES, EQUIPMENT, PIPE, VALVES, AND FITTINGS SHALL BE FREE OF GREASE, METAL CUTTINGS, DIRT AND OTHER FOREIGN MATERIAL.
   b. REPAIR STOPPAGE, DISCOLORATION AND DAMAGE TO PARTS OF BUILDING, FINISH AND FURNISHINGS DUE TO FAILURE TO PROPERLY CLEAN PIPING SYSTEM.
6. GAS PIPING UNDERGROUND: SCHEDULE 40 BLACK STEEL PIPE MILL WRAPPED WITH HILL-HUBBELL SERIES MGA-2 SEMI-PLASTIC RED ENAMEL OR SERIES OGA-2 PLASTIC RED ENAMEL, BOTH ENAMELS USING GLASS MAT AND FELT. THE TYPE OF WRAPPING USED SHALL BE DETERMINED BY OUTSIDE AIR TEMPERATURE AT THE TIME OF INSTALLATION OF PIPING. THE SERIES MGA BEING USED IF THE TEMPERATURE IS BELOW 32 DEGREES. ALL FITTINGS AND TEARS IN THE WRAPPING SHALL BE WRAPPED WITH 20 MILT THICK POLYKEN NO. 940 POLYETHYLENE OR SCOTCH NO. 51 POLYVINYL PRESSURE SENSITIVE TAPE. UNDERGROUND PIPING SHALL BE CONNECTED TO ABOVE GROUND PIPING WITH A MALONEY FLANGE INSULATION KIT OR STYLE 39 DRESSER COUPLING. FITTING SHALL BE FORGED LONG RADIUS WELDING FITTINGS. PROVIDE CATHODIC PROTECTION OF UNDERGROUND GAS PIPING BY USE OF MAGNESIUM ANODES OF NUMBER AND IN LOCATION APPROVED BY THE LOCAL GAS COMPANY PRIOR TO INSTALLATION OF ANY PIPING.
7. GAS PIPING ABOVE GROUND: GAS PIPING SHALL BE SCHEDULE 40 BLACK STEEL PIPE. FITTINGS IN 1-1/2" SMALLER PIPE SHALL BE CAST IRON SCREWED FITTINGS; FITTINGS IN 2-1/2" AND LARGER PIPE SHALL BE FORGED LONG RADIUS WELDING FITTINGS.
8. AT THE CONTRACTOR'S OPTION AND WHERE PERMITTED BY LOCAL CODE, THE CONTRACTOR MAY USE FOR GAS PIPING MATERIAL "TRACPIPE" FLEXIBLE GAS PIPING CORRUGATED STAINLESS STEEL TUBING (CSST) BY OMEGAFLEX, INC. OR APPROVED EQUAL FOR ABOVE GROUND AND UNDERGROUND GAS PIPING. GAS PRESSURE CARRIER SHALL BE SERIES 300 STAINLESS STEEL PER ASTM A240; NO ANNEALING OR HEAT-TRACING PERMITTED AFTER CORRUGATING OPERATION. FITTINGS SHALL BE AUTOFLARE MECHANICAL ATTACHMENT FITTINGS, MATERIAL: YELLOW BRASS WITH SERIES 300 STAINLESS STEEL INSERT. FITTINGS SHALL TERMINATE IN CLEANLY CUT TAPER PIPE THREADS CONFORMING TO THE STANDARD FOR PIPE THREADS, GENERAL PURPOSE, ANSI/ASME B1.20.1. A FLARED METAL-TO-METAL SEAT SHALL BE USED TO ACCOMPLISH GAS SEALING. NO ELASTOMER SEALING RINGS OR FIBER GASKETS PERMITTED. NON-METALLIC JACKET SHALL BE COLORED YELLOW TO VISIBLY INDICATE CONVEYANCE OF FUEL GAS. JACKET MATERIAL SHALL BE NON-HALOGENATED, FIRE RETARDANT POLYETHYLENE. POLYVINYL CHLORIDE (PVC) IS NOT PERMITTED. ASTM E84 RATINGS SHALL BE LESS THAN 14 FOR FLAME SPREAD AND SMOKE. PIPE SIZING AND ALL INSTALLATION REQUIREMENTS SHALL BE PER TRACPIPE DESIGN AND INSTALLATION GUIDE.
9. CAULKED JOINTS: CAULKED JOINTS IN CAST IRON PIPING SHALL BE CAULKED SOLID WITH CLEAN SPUN OAKUM, THEN RUN FULL WITH PURE LEAD AT ONE POURING. LEAD SHALL THEN BE CAULKED SOLID AND TIGHT WITH PROPER TOOLS AND FINISHED SLIGHTLY BELOW THE TOPS OF THE HUBS.
10. SCREWED JOINTS: SCREWED JOINTS SHALL BE MADE BY SCREWING THE PIPE WELL INTO THE SEAT TO GIVE THE PIPE A LONG GRIP. ALL SCREWED JOINTS SHALL BE MADE TIGHT WITHOUT THE USE OF FILLING SUBSTANCES OR BY CAULKING. A COAT OF RED LEAD OR GRAPHITE AND OIL MAY BE USED ON THE MALE THREAD ONLY.
11. UNION JOINTS: UNION JOINTS SHALL BE PROVIDED IN THE WATER CONNECTIONS TO ALL FIXTURES AND IN THE WASTE CONNECTIONS TO LAVATORIES, SINKS, ETC. WHERE UNIONS ARE NOT SUPPLIED AS A PART OF THE FIXTURE TRIMMING, CRANE ALL BRASS GROUND JOINTS UNIONS SHALL BE USED. UNIONS SHALL ALSO BE PLACED IN THE CONNECTION TO WATER, ETC., AND AT INTERVALS THROUGHOUT SO THAT ANY PORTION OF THE PIPING CAN BE REMOVED FOR REPAIRS WITHOUT CUTTING OR BREAKING THE PIPE. UNIONS MAY BE NIBCO, NATIONAL OR EQUAL.
12. VALVES:
    F. FUEL GAS COCKS – CRANE 254, HAYS 7005 OR MUELLER H-11003
13. CONTRACTOR SHALL PROVIDE ALL ROUGH-INS FOR "OWNER FURNISHED" EQUIPMENT AND MAKE FINAL CONNECTIONS. PROVIDE ALL PIPING, VALVES AND ACCESSORIES AS REQUIRED FOR COMPLETE INSTALLATION OF SYSTEM.
14. ALL PLUMBING PIPING SHALL BE PROPERLY IDENTIFIED WITH RELATED COLOR CODED ID PIPE MARKERS AS MANUFACTURED BY SETON OR APPROVED EQUAL.

STATE OF OHIO
TIMOTHY J. NORRIS
E-40336
REGISTERED PROFESSIONAL ENGINEER

CALCULATED	CHECKED
M.S.K.	T.J.N.

REV. NO.	DATE
ADDENDUM 2	09\30\11

GGJ inc. consulting engineers
35585 Curtis Blvd., Unit C Eastlake, Ohio 44095
Ph: 440.953.1567 Fx: 440.953.0580
Email: ggj@ggjengineers.com www.ggjengineers.com

PUMP STATION #1 & FORCE MAIN IMPROVEMENTS
PLUMBING PLAN

VILLAGE OF WELLSVILLE

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