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CIVIL ENGINEERS & LAND SURVEYORS

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April 15, 2024

Re: Water System Improvements South Shore, South Dakota A-9102

Bid Opening: Tuesday, April 30, 2024 4:00 pm Local Time

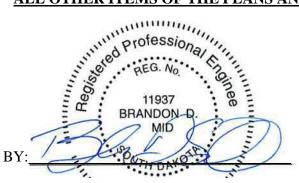
ADDENDUM NUMBER 1

The following modifications become a part of the original plans and specifications, taking precedence over the items that may conflict. The bidder shall note receipt and make acknowledgement of the addendum on his bid form, incorporating its provisions in his bid.

CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS

1. PLAN SHEETS: *Please attach the following pages to the plan sheet set. In total, there are 26 pages.*

ALL OTHER ITEMS OF THE PLANS AND SPECIFICATIONS REMAIN UNCHANGED



PROJECT ENGINEER - HELMS & ASSOCIATES

Acknowledge receipt of the Addendum by inserting its number on the Bid Form. Failure to do so may subject bidder to disqualification. This Addendum forms a part of the Contract Documents. It modifies them as above.

ELECTRICAL LEGEND

MECHANICAL LEGEND

	MLGHANIGA	
SYMBOL	DESCRIPTION (ABBREVIATION)	TD RD FS CO FD
<u> </u>	WASTE (SANITARY SEWER) (W)	TRENCH DRAIN
— AW —	ACID WASTE (AW)	PIPE RISE OR DROP - CO ROOF DRAIN FLOOR SINK CLEAN OUT FLOOR DRAIN
AV	ACID VENT (AV)	PIPE ELBOW DOWN C PIPE ELBOW UP + DOWN SPOUT HB+C HOSE BIBB
	VENT PIPING (V)	TRIPLE DUTY VALVE
₽	VENT THROUGH ROOF (VTR)	TOP OLD BOTTOM CO
V	VENT (V)	CATE VALVE
	DOMESTIC COLD WATER (CW)	GLOBE VALVE - PIPE CONNECTION CLEANOUT SIDE PLUG
	DOMESTIC HOT WATER 120°F (HW)	BALANCING VALVE
	DOMESTIC HOT WATER RECIRCULATED 120°F (DHWR)	SOLENOID VALVE — SOLENOID VALVE — VALVE
	REVERSE OSMOSIS COLD WATER (RO)	MOTOR III
	DOMESTIC SOFTENED WATER (SOFT)	
— CA —	COMPRESSED AIR (CA)	BALL VALVE (IV)
— st —	STORM DRAIN (ST)	PLUG VALVE ————————————————————————————————————
OST	OVERFLOW STORM DRAIN (OST)	A @Y .A.
— CD —	CONDENSATE DRAIN (CD)	FLEXIBLE PRESSURE PRESSURE WATER HAMMER PRESSURE
- PD	PUMP DISCHARGE LINE (PD)	STRAINER PIPE RELIEF GAUGE TEMPERATURE ARRESTER REDUCING
	PUMP & INDICATED FLOW	CONNECTION VALVE TAP (WHA) VALVE
— G —	NATURAL GAS (G)	
— — UG — —	UNDERGROUND NATURAL GAS (UG)	2X2 2X4 2X4 CP ELEMENT LENGTH AIR BASE MOUNTED
— LP —	LIQUID PROPANE (LP)	
- ULP	UNDERGROUND LIQUID PROPANE (LP)	MOTORIZED SMOKE & FIRE
	GEOTHERMAL SUPPLY (GTS)	SMOKE C ZONE SEEPING LAB O HUMIDISTAT
— — GTR — —	GEOTHERMAL RETURN (GTR)	ZONE/SMART SENSOR
— CWS —	CHILLED WATER SUPPLY (CWS)	SENSOR
— — CWR — —	CHILLED WATER RETURN (CWR)	E FIRE VOLUME ROOF VENTILATOR INTAKE
— HWS —	HEATING WATER SUPPLY (HWS)	BAROMETRIC BACKORAFT
— — HWR — —	HEATING WATER RETURN (HWR)	ROOF VENTILATOR EXHAUST
- LPS -	LOW PRESSURE STEAM SUPPLY (LPS)	CEM CEM
LPC	LOW PRESSURE STEAM CONDENSATE (LPC)	REGISTERS, GRILLES, DIFFUSERS, RETURN AIR GRILLE
<u> </u>	F&T STEAM TRAP	A BRANCH DUCTS INTO SIDE OF MAIN CEM
- HPS -	HIGH PRESSURE STEAM SUPPLY (HPS)	
HPC	HIGH PRESSURE STEAM CONDENSATE (HPC)	20/16 16/16 DUCT CHANGE OF ELEVATION
RL	REFRIGERANT LIQUID PIPE (RL)	RISE (R) DROP (D) ATTENTIVE
RS	REFRIGERANT SUCTION PIPE (RS)	
	CONNECT TO EXISTING	ROUND FLEX FLEXIBLE DUCT
N R	TH OF SECTION (7)-# OF DETAIL	DUCT CONNECTION RECT. DUCT NEG.
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	SHEET INDEX	SCH
SHEET NUMBER	ELECTRICAL & MECHANICAL SHEET TITLE	
EM1	Legends & Sheet Index	dex
EM2	Electrical & Mechanical Specifications	Legends & Sheet Index
EM3	Electrical Details & LP Gas Piping Diagram	shee
EM4 EM5	Alternate Bid Schedule A - Pump House Electrical Site Plan Alternate Bid Schedule A - Pump House Electrical Plan	05 05
		spue
EM6	Alternate Bid Schedule A - Panel & Fixture Schedule	ege
EM7	Alternate Bid Schedule B- UWBPS Electrical Site Plan	
EM8	Alternate Bid Schedule B - UWBPS Electrical Plan	
EM9	Alternate Bid Schedule B - UWBPS Panel & Fixture Schedule UNDERGROUND WATER BOOSTER PUMPING STATION (UWBPS)	
HEDULES. TSIDE THE SCOPE OF TH OWNER - LP GAS SYSTE L PRESSURE REGULATORS NK(S), PAD(S), FUEL R	DTES: ENTS FOR LIST OF ALTERNATE BID IS PROJECT/CONTRACT AND DIRECT M WORK INCLUDING LP GAS FILL, SHUT OFF VALVES, 1000 GALLON LP UN/UNDERGROUND TUBING (WITH LOCATE CTION TO LP GENERATOR AND UNIT GAS PIPING DIAGRAM. INSTALLATION	South Shore Water System Improvements South Shore, South Dakota
ALL COMPLY WITH ALL C ECTRIC UTILITY CONTAC SON BEAR 5-949-2654 ear@otpco.com TURAL GAS UTILITY CON NATURAL GAS AVAILABL	TACT:	End Revised bate END Revised bate PENDE Revised bate OF-9 PROCED BY OF-9 OF-0 PROCETNO. DATE 230200786 03/28/24 C-1608

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ELECTRICAL SPECIFICATIONS

SCOPE THE CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS REQUIRED TO COMPLETE THE ELECTRICAL INSTALLATION OF THE PROJECT AS SHOWN ON THE PLANS AND DESCRIBED IN THE SPECIFICATIONS. DRAWINGS: ALL DRAWINGS ACCOMPANYING THESE SPECIFICATIONS SHALL BE CO A PART OF THESE SPECIFICATIONS.

GENERAL TERMS AND CONDITIONS OF ARCHITECTURAL SPECIFICATIONS SHALL BE CONSIDERED PART OF THESE SPECIFICATIONS. INSPECTION OF SITE: BEFORE SUBMITTING A PROPOSAL ON THE WORK CONTAINED IN THESE SPECIFICATIONS, EACH BIDDER SHALL EXAMINE THE SITE AND FAMILIARIZE THEMSELVES WITH ALL OF THE EXISTING CONDITIONS AND LIMITATIONS. NO EXTRAS WILL BE ALLOWED RECAUSE OF

MISUNDERSTANDING OF THE ELECTRICAL CONTRACTOR AS TO THE AMOUNT OF WORK INVOLVED OR LACK OF KNOWLEDGE OF ANY PRE-EXISTING CONDITIONS WORKMANSHIP: ALL WORK ON THE PROJECT SHALL BE INSTALLED BY CRAFTSMEN SKILLED AND LICENSED IN THE TRADE. WORK SHALL BE COMPLETED IN A NEAT AND WORKMAN LIKE MANNER, ALL TO THE SATISFACTION OF THE PROJECT ENGINEER AND OWNER, MODIFICATIONS MADE TO SATISFY THIS REQUIREMENT SHALL BE MADE AT THE EXPENSE OF THE CONTRACTOR.PERMITS AND INSPECTION FEES: THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND INSPECTION FEES. ALL WORK SHALL BE COMPLETED PER LOCAL CODES AND THE 2023 NATIONAL ELECTRICAL CODE (NEPA 70)

ELECTRICAL DRAWINGS

ELECTRICAL PLANS DIAGRAMMATICALLY INDICATE THE SCOPE OF WORK TO BE PROVIDED BY THE ELECTRICAL CONTRACTOR. THE CONTRACTOR SHALL REFER TO ARCHITECTURAL, STRUCTURAL, MECHANICAL AND EQUIPMENT DRAWINGS FOR EXACT DIMENSIONS AND LOCATIONS. NOTIFY THE A/E IN THE EVENT OF CONFLICTING DIMENSIONS AND ACTUAL FIELD MEASUREMENTS.EQUIPMENT SHOWN ON DRAWINGS AS EXISTING ARE BASED ON EXISTING PLANS AND LIMITED FIELD INVESTIGATION. THE FIELD SURVEY WAS CONDUCTED TO VERIFY, AS MUCH AS POSSIBLE, THE ACCURACY OF THE LOCATIONS SHOWN. THE CONTRACTOR SHALL VERIFY THE ACCURACY OF THE "EXISTING CONDITIONS" AS SHOWN ON THE DRAWINGS. AS THE DEMOLITION WORK PROGRESSES PERFORM MODIFICATIONS AND ADDITIONS AS NECESSARY TO CORRECT FOR THESE HIDDEN CONDITIONS AND ALLOW FOR COMPLETION OF THE NEW WORK

PRIOR APPROVAL REQUESTS

SUBMITTALS FOR SUBSTITUTIONS FOR SPECIFIED MATERIALS OR PRODUCTS MUST ARRIVE AT THE OFFICE OF THE ENGINEER NO LATER THAN SEVEN DAYS RIOR TO THE BID DATE. ANY APPROVALS WILL BE NOTED IN AN ADDENDUM.

SHOP DRAWINGS SUBMIT ELECTRONIC PDF SHOP DRAWINGS FOR THE PRODUCTS AND MATERIALS THAT ARE IDENTIFIED FOR REVIEW IN EACH SECTION OF THESE SPECIFICATIONS. ONLY COMPLETE SUBMITTALS WILL BE REVIEWED. SIGN AND DATE EACH SET INDICATING THE CONTRACTOR HAS CHECKED FOR COMPLIANCE WITH SPECIFICATION REQUIREMENTS

AND SPACE LIMITATIONS. PROVIDE SHOP DRAWINGS FOR

WIRING DEVICES & FACEPLATES

SWITCHGEAF

AS-BUILT DRAWINGS THE CONTRACTOR SHALL MAINTAIN A SET OF AS-BUILT DRAWINGS AT THE PROJECT. NOTE THE FINAL LOCATION OF CIRCUIT AND CONDUIT ROUTES AND ANY CHANGES DUE TO CHANGE ORDERS. SUBMIT AS-BUILT DRAWINGS WITH O AND M MANUALS

BUILDING STRUCTURE PENETRATIONS

DROVIDE PRINTMANNE ENLEMENTATION OF THE BUILDING STRUCTURE AS REQUIRED FOR INSTALLATION, WHERE EXISTING OR TEMPORARY SYSTEMS ARE BEING DEMOLISHED AND THE DEMOLITION LEAVES OPENINGS IN THE EXISTING BUILDING STRUCTURE, THEN THE BUILDING STRUCTURE SHALL BE PATCHED TO MATCH THE EXISTING CONSTRUCTION AND MAINTAIN THE EXISTING BUILDING FIRE RATINGS.

GUARANTEE

THE CONTRACTOR SHALL PROVIDE A ONE-YEAR WARRANTY, BEGINNING AT THE DATE OF SUBSTANTIAL COMPLETION, FOR ALL NEW WORK, ANY WORK THAT IS DEFECTIVE WITHIN THAT ONE-YEAR PERIOD SHALL BE REPLACED BY THE CONTRACTOR WITHOUT CHARGE. THIS DOES NOT INCLUDE INCANDESCENT LAMPS. IF LONGER WARRANTIES ARE NOTED ELSEWHERE IN THE SPECIFICATIONS, THOSE WARRANTIES SHALL APPLY.

QUALITY ASSURANCE

ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE To AUTHORI COMPONENTS, DEVELOS, AND ACCESSIONES. LOS LO AND BABELLO AS DEL MEDIAN PARA, ANTIGEL IN TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE. DEVICES FOR UTILITY COMPANY ELECTRICITY METERING: COMPLY WITH UTILITY COMPANY PUBLISHED STANDARDS. COMPLY WITH NFPA 70.

COORDINATION

COORDINATE CHASES, SLOTS, INSERTS, SLEEVES, AND OPENINGS FOR ELECTRICAL SUPPORTS, RACEWAYS, AND CABLE WITH GENERAL CONSTRUCTION WORK. SEQUENCE, COORDINATE, AND INTEGRATE INSTALLING ELECTRICAL MATERIALS AND EQUIPMENT FOR EFFICIENT FLOW OF THE WORK. COORDINATE INSTALLING LARGE EQUIPMENT THAT REQUIRES POSITIONING BEFORE CLOSING IN THE BUILDING. COORDINATE ELECTRICAL SERVICE CONNECTIONS TO COMPONENTS FURNISHED BY UTILITY COMPANIES, COORDINATE INSTALLATION AND CONNECTION OF EXTERIOR UNDERGROUND AND OVERHEAD UTILITIES AND SERVICES, INCLUDING PROVISION FOR SERVICE ENTRANCES AND ELECTRICITY-METERING COMPONENTS. COORDINATE LOCATION OF ACCESS PANELS AND DOORS FOR ELECTRICAL ITEMS THAT ARE CONCEALED BY FINISHED SURFACES. ACCESS DOORS AND PANELS ARE SPECIFIED IN DIVISION 8 SECTION "ACCESS DOORS AND FRAMES." WHERE ELECTRICAL IDENTIFICATION DEVICES ARE APPLIED TO FIELD-FINISHED SURFACES, COORDINATE INSTALLATION OF IDENTIFICATION DEVICES WITH COMPLETION OF FINISHED SURFACE.

SUPPORTING DEVICES

MATERIAL: COLD-FORMED STEEL. WITH CORROSION-RESISTANT COATING. METAL ITEMS FOR USE OUTDOORS OR IN DAMP LOCATIONS: HOT-DIP GALVANIZED STEEL. SLOTTED-STEEL CHANNEL: FLANGE EDGES TURNED TOWARD WEB, AND 9/16-INCH- DIAMETER SLOTTED HOLES AT A MAXIMUM OF 2 INCHES O.C., IN WEBS. STRENGTH RATING TO SUIT STRUCTURAL LOADING. SLOTTED CHANNEL FITTINGS AND ACCESSORIES: RECOMMENDED BY THE MANUFACTURER FOR USE WITH THE TYPE AND SIZE OF CHANNEL WITH WHICH USED. RACEWAY AND CABLE SUPPORTS: MANUFACTURED CLEVIS HANGERS, RISER CLAMPS, STRAPS, THREADED C-CLAMPS WITH RETAINERS, CEILING TRAPEZE HANGERS, WALL BRACKETS, AND SPRING-STEEL CLAMPS OR CLICK-TYPE HANGERS. EXPANSION ANCHORS: CARBON-STEEL WEDGE OR SLEEVE TYPE. TOGGLE BOLTS: ALL-STEEL SPRINGHEAD TYPE. POWDER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL.

ELECTRICAL IDENTIFICATION

IDENTIFICATION DEVICE CC	LORS: USE THOSE PRESCRIBED BY ANSIA	A13.1, NEPA 70, AND THESE SPECIFICATION	NS:
	120/208 V	120/240V DELTA	277/480V
PHASE A	BLACK	BLACK	BROWN
PHASE B	RED	ORANGE	ORANGE
PHASE C	BLUE	BLUE	YELLOW
NEUTRAL	WHITE	WHITE	GREY
GROUND	GREEN	GREEN	GREEN

COLORED ADHESIVE MARKING TAPE FOR RACEWAYS, WIRES, AND CABLES: SELF-ADHESIVE VINYL TAPE, NOT LESS THAN 1 INCH WIDE BY 3 MILS THICK. TAPE MARKERS FOR CONDUCTORS: VINYL OR VINYL-CLOTH, SELF-ADHESIVE, WRAPAROUND TYPE WITH PREPRINTED NUMBERS AND LETTERS UNDERGROUND WARNING TAPE: PERMANENT, BRIGHT-COLORED, CONTINUOUS-PRINTED, VINYL TAPE COMPOUNDED FOR PERMAMENT DIRECT BURIAL SERVICE, AND WITH THE FOLLOWING FEATURES: NOT LESS THAN 6 INCHES WIDE BY 4 MILS THICK AND PRINTED LEGEND THAT INDICATES TYPE OF UNDERGROUND ITNE ENGRAVED PLASTIC LARELS STONS AND INSTRUCTION PLATES. ENGRAVING STOCK MELANINE PLASTIC LANINATE PUNCHED OR DRILLED FOR MECHANICAL FASTENERS 1/16-INCH MINIMUM THICKNESS FOR SIGNS UP TO 20 SQ. IN. AND 1/8-INCH MINIMUM THICKNESS FOR LARGER SIZES. ENGRAVED LEGEND IN BLACK LETTERS ON WHITE BACKGROUND, FASTENERS FOR NAMEPLATES AND SIGNS: SELF-TAPPING. GALVANIZED SCREWS OR NO. 10/32 GALVANIZED MACHINE SCREWS WITH NUTS AND FLAT AND LOCK WASHERS.

ELECTRICAL EQUIPMENT INSTALLATION

HEADROOM MAINTENANCE: IF MOUNTING HEIGHTS OR OTHER LOCATION CRITERIA ARE NOT INDICATED, ARRANGE AND INSTALL COMPONENTS AND EQUIPMENT TO PROVIDE MAXIMUM POSSIBLE HEADROOM. MATERIALS AND COMPONENTS: INSTALL LEVEL, PLUMB, AND PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS, UNLESS OTHERWISE INDICATED. EQUIPMENT: INSTALL TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS. CONNECT FOR EASE OF DISCONNECTING, WITH MINIMUM INTERFERENCE WITH OTHER INSTALLATIONS. RIGHT OF WAY: GIVE TO RACEWAYS AND PIPING SYSTEMS INSTALLED AT A REQUIRED SLOPE.

WIRING DEVICES SWITCHES AND OUTLETS COMMERCIAL GRADE, 20A, COLOR GRAY.

RACEWAY AND CABLE INSTALLATION

CONCEAL RACEWAYS AND CABLES, UNLESS OTHERWISE INDICATED, WITHIN FINISHED WALLS, CEILINGS, AND FLOORS. KEEP LEGS OF RACEWAY BENDS IN THE SAME PLANE AND KEEP STRAIGHT LEGS OF OFFSETS PARALLEL. USE RMC ELBOWS WHERE RNC TURNS OUT OF SLAB. CONNECT MOTORS AND FOUTPMENT SUBJECT TO VIBRATION. NOISE TRANSMISSION. OR MOVEMENT WITH A MAXIMUM OF 72-INCHES. FLEXIBLE CONDUCT. INSTALL LFMC IN WET OR DAMP LOCATIONS. INSTALL SEPARATE GROUND CONDUCTOR ACROSS FLEXIBLE CONNECTIONS. SET FLOOR BOXES LEVEL AND TRIM AFTER INSTALLATION TO FIT FLUSH TO FINISHED FLOOR SURFACE.

<u>WIRING METHODS FOR POWER, LIGHTING, AND CONTROL CIRCUITS</u> APPLICATION: USE WIRING METHODS SPECIFIED BELOW TO THE EXTENT PERMITTED BY APPLICABLE CODES AS INTERPRETED BY AUTHORITIES HAVING JURISDICTION. EXPOSED FEEDERS: INSULATED SINGLE CONDUCTORS IN ENT OR FINC RACEWAY. CONCEALED FEEDERS IN CEILINGS, AND WALLS: INSULATED SINGLE CONDUCTORS IN ENT RACEWAY. CONCEALED FEEDERS IN CONCRETE AND BELOW

FLOORS ON GRADE: INSULATED SINGLE CONDUCTORS IN RAW OR RMC RACEWAY. EXPOSED BRANCH CIRCUITS INCLUDING IN CRAWLSPACES: INSULATED SINGLE CONDUCTORS IN RMC ORI RACEWAY, WHERE PERMITTED BY NEC. CONCEALED BRANCH CIRCUITS IN CEILINGS AND WALLS: INSULATED SINGLE CONDUCTORS IN EMT RACEWAY, WHERE PERMITTED BY NEC. CONCEALED BRANCH CIRCUITS IN CONCRETE AND BELOW FLOORS ON GRADE: INSULATED SINGLE CONDUCTORS IN RNC OR RNC RACEWAY. UNDERGROUND FEEDERS AND BRANCH CIRCUITS: INSULATED SINGLE CONDUCTORS IN RACEWAY. FIRE ALARM. REMOTE-CONTROL SIGNALING AND POWER-LIMITED CIRCUITS, CLASSES 1, 2, AND 3: FIRE ALARM CABLE IN CONDUIT

<u>WIFING INSTALLATION</u> MAKE SPLICES AND TAPS THAT ARE COMPATIBLE WITH CONDUCTOR MATERIAL AND THAT POSSESS EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATINGS THAN UNSPLICED CONDUCTORS.

IDENTIFICATION MATERIALS AND DEVICES INSTALL AT LOCATIONS FOR MOST CONVENIENT VIEWING WITHOUT INTERFERENCE WITH OPERATION AND MAINTENANCE OF EQUIPMENT. COORDINATE NAMES, ABBREVIATIONS, COLORS, AND OTHER DESIGNATIONS USED FOR ELECTRICAL IDENTIFICATION WITH CORRESPONDING DESIGNATION INDICATED IN THE CONTRACT DOCUMENTS OR REQUIRED BY CODES AND STANDARDS. USE CONSISTENT DESIGNATIONS THROUGHOUT PROJECT. INSTALL ENGRAVED-LAMINATED EMERGENCY-OPERATING SIGNS WITH WHITE LETTERS ON RED BACKGROUND WITH MINIMUM 3/8-INCH- HIGH LETTERING FOR EMERGENCY INSTRUCTIONS ON POWER TRANSFER, LOAD SHEDDING, AND OTHER EMERGENCY OPERATION

CUTTING AND PATCHING

CUT, CHANNEL, CHASE, AND DRILL FLOORS, WALLS, PARTITIONS, CEILINGS, AND OTHER SURFACES REQUIRED TO PERMIT ELECTRICAL INSTALLATIONS. PERFORM CUTTING BY SKILLED MECHANICS OF TRADES INVOLVED. REPAIR, REFINISH AND TOUCH UP DISTURBED FINISH MATERIALS AND OTHER SURFACES TO MATCH ADJACENT UNDISTURBED SURFACES.

METAL CONDUIT AND TUBING

RIGID METAL CONDUIT SHALL BE GALVANIZED STEEL WITH STEEL FITTINGS (ANSI C80.1). EMT AND FITTINGS: ELECTRICAL METALLIC TUBING SHALL BE GALVANIZED STEEL (ANSI C80.3.) FITTINGS DRY LOCATION: STEEL SET-SCREW TYPE SUCH AS RACO SERIES 2000. FITTINGS WET LOCATION: STEEL COMPRESSION TYPE SUCH AS RACO SERIES 2002. FIFXTRLE METAL CONDUIT SHALL BE ZINC-COATED STEEL, 1/2" MINIMUM SIZE

FITTINGS DRY LOCATION: STEEL SQUEEZE TYPE SUCH AS RACO SERIES 2100. LIQUID TIGHT ELEXIBLE METAL CONDUIT WITH PVC. JACKET LEMC:

FITTINGS: STEEL COMPRESSION TYPE SUCH AS RACO SERIES 3500.

NONMETALLIC CONDUIT AND TUBING

RIGID NON-METALLIC CONDUIT SCHEDULE 40 UNLESS OTHERWISE SPECIFIED ON THE PLANS. FITTINGS AND CONDUIT BODIES COMPATIBLE AND OF EQUAL WALL STRENGTH AS THE CONDUIT

BOXES, ENCLOSURES, AND CABINETS

SHEET METAL OUTLET & DEVICE BOXES: USE WELDED STEEL METAL BOXES - MIN. SIZE 4"x4"x11/x", SIZE AS REQUIRED TO MEET NEC. PROVIDE APPROPRIATE DEVICE RINGS AND COVERS. HINGED-COVER ENCLOSURES: NEMA 250, TYPE 1, WITH CONTINUOUS HINGE COVER AND FLUSH LATCH. METAL ENCLOSURES STEEL, FINISHED INSIDE AND OUT WITH MANUFACTURER'S STANDARD ENAMEL. CABINETS: NEMA 250, TYPE 1, GALVANIZED STEEL BOX WITH REMOVABLE INTERIOR PANEL AND REMOVABLE FRONT, FINISHED INSIDE AND OUT WITH MANUFACTURER'S STANDARD ENAMEL. HINGED DOOR IN FRONT COVER WITH FLUSH LATCH AND CONCELLED HINGE. KEY LATCH TO MATCH PANELBOARDS. INCLUDE METAL BARRIERS TO SEPARATE WIRING OF DIFFERENT SYSTEMS AND VOLTAGE AND INCLUDE ACCESSORY FEET WHERE REQUIRED FOR FREESTANDING EQUIPMENT.

RACEWAY APPLICATION

EXPOSED: RIGID STEEL OR IMC. CONCEALED: RIGID STEEL OR IMC UNDERGROUND, SINGLE RUN: RNC. UNDERGROUND, GROUPED: RNC. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): LFMC. BOXES AND ENCLOSURES: NEMA 250, TYPE 3R.

TNDOORS.

EXPOSED: RMC, IMC OR EMT.

CONCEALED: EMT, WHERE PERMITTED BY NEC. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): FMC; EXCEPT USE LFMC IN DAMP OR WET LOCATIONS. DAMP OR WET LOCATIONS: RIGID STEEL CONDUIT. BOXES AND ENCLOSURES: NEMA 250, TYPE 1, EXCEPT AS FOLLOWS:

DAMP OR WET LOCATIONS: NEMA 250, TYPE 3R.

MINIMUM RACEWAY SIZE: 2 TRADE SIZE ABOVE GROUND, %" BELOW GROUND OR UNDER FLOOR OR IN POURED CONCRETE

KEEP RACEWAYS AT LEAST 6 INCHES AWAY FROM PARALLEL RUNS OF FLUES AND STEAM OR HOT WATER PIPES. INSTALL HORIZONTAL RACEWAY RUNS ABOVE WATER AND STEAM PIPING. COMPLETE RACEWAY INSTALLATION BEFORE STARTING CONDUCTOR INSTALLATION. INSTALL TEMPORARY CLOSURES TO PREVENT FOREIGN MATTER FROM ENTERING RACEWAYS. PROTECT STUB-UPS FROM DAMAGE WHERE CONDUITS RISE THROUGH FLOOR SLABS. ARRANGE SO CURVED PORTIONS OF BENDS ARE NOT VISIBLE ABOVE FINISHED SLAB. MAKE BENDS AND OFFSETS SO ID IS NOT REDUCED. KEEP LEGS OF BENDS IN SAME PLANE AND KEEP STRAIGHT LEGS OF OFFSETS PARALLEL, UNLESS OTHERWISE INDICATED. CONCEAL CONDUIT AND EMT WITHIN FINISHED WALLS, CEILINGS, AND FLOORS, UNLESS OTHERWISE INDICATED.

INSTALL CONCEALED RACEWAYS WITH A MINIMUM OF BENDS IN SHORTEST PRACTICAL DISTANCE. CONSIDERING TYPE OF BUILDING CONSTRUCTION AND OBSTRUCTIONS, UNLESS OTHERWISE INDICATED. RACEWAYS EMBEDDED IN SLABS: INSTALL IN MIDDLE 1/3 OF SLAB THICKNESS WHERE PRACTICAL AND LEAVE AT LEAST 2 INCHES OF CONCRETE COVER. SECURE RACEWAYS TO REINFORCING RODS TO PREVENT SAGGING OR SHIFTING DURING CONCRETE PLACEMENT. SPACE RACEWAYS LATERALLY TO PREVENT VOIDS IN CONCRETE. RUN CONDUIT LARGER THAN 1-INCH TRADE SIZE PARALLEL OR AT RIGHT ANGLES TO MAIN REINFORCEMENT. WHERE AT RIGHT ANGLES TO REINFORCEMENT, PLACE CONDUIT CLOSE TO SLAB SUPPORT.

CHANGE FROM NONMETALLIC CONDUIT TO RIGID STEEL CONDUIT BEFORE RISING ABOVE FLOOR. INSTALL EXPOSED RACEWAYS PARALLEL OR AT RIGHT ANGLES TO NEARBY SURFACES OR STRUCTURAL MEMBERS AND FOLLOW SURFACE CONTOURS AS MUCH AS POSSIBLE. RUN PARALLEL OR BANKED RACEWAYS TOGETHER ON COMMON SUPPORTS. MAKE PARALLEL BENDS IN PARALLEL OR BANKED RUNS. USE FACTORY ELBOWS ONLY WHERE ELBOWS CAN BE INSTALLED PARALLEL; OTHERWISE, PROVIDE FIELD BENDS FOR PARALLEL RACEWAYS. JOIN RACEWAYS WITH FITTINGS DESIGNED AND APPROVED FOR THAT PURPOSE AND MAKE JOINTS TIGHT. USE INSULATING BUSHINGS TO PROTECT CONDUCTORS. IN ANY RACEWAY 1 1/2" OR LARGER.

TERMINATIONS:

HERE RACEWAYS ARE TERMINATED WITH LOCKNUTS AND BUSHINGS, ALIGN RACEWAYS TO ENTER SQUARELY AND INSTALL LOCKNUTS WITH DISHED PART AGAINST BOX. USE TWO LOCKNUTS, ONE INSIDE AND ONE OUTSIDE BOX.

WHERE RACEWAYS ARE TERMINATED WITH THREADED HUBS, SCREW RACEWAYS OR FITTINGS TIGHTLY INTO HUB SO END BEARS AGAINST WIRE PROTECTION SHOULDER. WHERE CHASE NIPPLES ARE USED, ALIGN RACEWAYS SO COUPLING IS SQUARE TO BOX; TIGHTEN CHASE NIPPLE SO NO THREADS ARE EXPOSED. FLEXIBLE CONNECTIONS: USE MAXIMUM OF 72 INCHES OF FLEXIBLE CONDUIT FOR RECESSED AND SEMI RECESSED LIGHTING FIXTURES: FOR EQUIPMENT SUBJECT TO VIBRATION, NOISE TRANSMISSION, OR MOVEMENT; AND FOR ALL MOTORS. USE LFMC IN

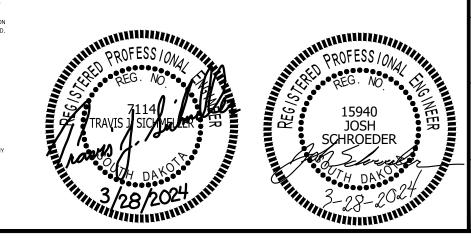
DAMP OR WET LOCATIONS. INSTALL SEPARATE GROUND CONDUCTOR ACROSS FLEXIBLE CONNECTIONS. SURFACE RACEWAYS: INSTALL A SEPARATE BOTTO TO THE DEVICE THE RECEIPTION TO THE RECEIPTION TO A SUPPLY IN BRACEWAYS TO RECEIPTACE OF FIXTURE GROUND TERMINALS. SET FLOOR BOXES LEVEL AND FLUSH WITH FINISHED FLOOR SURFACE. SET FLOOR BOXES LEVEL. TRIM AFTER INSTALLATION TO FIT FLUSH WITH FINISHED FLOOR SURFACE, INSTALL HINGED-COVER ENCLOSURES AND CABINETS PLUMB, SUPPORT AT EACH CORNER.

PROVIDE FINAL PROTECTION AND MAINTAIN CONDITIONS THAT ENSURE COATINGS, FINISHES, AND CABINETS ARE WITHOUT DAMAGE OR DETERIORATION AT TIME OF SUBSTANTIAL COMPLETION. REPAIR DAMAGE TO GALVANIZED FINISHES WITH ZINC-RICH PAINT RECOMMENDED BY MANUFACTURER. REPAIR DAMAGE TO PVC OR PAINT FINISHES WITH MATCHING TOUCHUP COATING RECOMMENDED BY MANUFACTURER.

GUARANTEE

THE CONTRACTOR SHALL PROVIDE A ONE-YEAR WARRANTY, BEGINNING AT THE DATE OF SUBSTANTIAL COMPLETION, FOR ALL NEW WORK. ANY WORK THAT IS DEFECTIVE WITHIN THAT ONE YEAR PERIOD SHALL BE REPLACED BY THE CONTRACTOR WITHOUT CHARGE. THIS DOES NOT INCLUDE INCANDESCENT LAMPS

IF LONGER WARRANTIES ARE NOTED ELSEWHERE IN THE SPECIFICATIONS. THOSE WARRANTIES SHALL APPLY



MECHANICAL SPECIFICATIONS

THE MECHANICAL CONTRACTOR TO RESOLVE.

ALL PENETRATIONS FOR PIPING, DUCTWORK, ETC. WHICH PENETRATE FLOORS, FIRE AND/OR SMOKE WALLS, ROOFS, FULL HEIGHT PARTITIONS AND SIMILAR STRUCTURES SHALL BE SEALED BY THE MECHANICAL CONTRACTOR WITH A UL SYSTEM SPECIFICALLY APPROVED FOR THE APPLICATION. THIS SYSTEM MUST MAINTAIN THE REQUIRED FIRE RATING. THE GENERAL ARRANGEMENT OF THE MECHANICAL SYSTEMS SHALL BE AS SHOWN ON DRAWINGS. FINAL LOCATIONS OF FOULTPMENT MAY DIFFER FROM THOSE SHOWN ON PLANS COORDINATE EXACT LOCATION OF FOULTPMENT WITH FOULTPMENT SUPPLIER, STRUCTURAL MEMBERS, FURNITURE LAYOUT AND OTHER TRADES BEFORE ROUGH IN AND ADJUST ACCORDINGLY. CONTRACTORS SHALL VISIT THE SITE AND FAMILIARIZE THEMSELVES WITH ALL CONDITIONS SURROUNDING THE WORK.ALL PIPING AND DUCTWORK SHALL BE TESTED/CLEANED AS REQUIRED, BY ALL LOCAL, STATE, AND FEDERAL CODES.

THE MECHANICAL CONTRACTOR SHALL WARRANT HIS WORK AGAINST FAILURE AND WORKMANSHIP FOR A PERIOD OF AT LEAST ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION, FOR ALL NEW WORK. ANY WORK THAT IS DEFECTIVE WITHIN THAT ONE-YEAR PERIOD SHALL BE REPLACED BY THE CONTRACTOR WITHOUT CHARGE. IF LONGER/SPECIAL WARRANTIES ARE NOTED ELSEWHERE IN THE SPECIFICATIONS. THOSE WARRANTIES SHALL APPLY.

CODE COMPLIANCE

INSTALLATION WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION

BASIC MATERIALS AND METHODS

INSTALLATION OF NEW SYSTEMS AND EQUIPMENT.

THIS SUBSTITUTION OF EQUIPMENT

SHOP DRAWING SUBMITTAL

- OPERATING SYSTEM 3 TRANSITIONS IN DUCTWORK AS REQUIRED FOR A COMPLETE INSTALLATION.
- DEVELOPED 50
 - ALL OUTSIDE AIR DUCTWORK 5.1.
 - ALL EXHAUST DUCTWORK ROUTED WITHIN ATTIC
 - SCHEDULED.

GENERAL CONDITIONS THE MECHANICAL CONTRACTOR SHALL PERFORM ALL WORK AND FURNISH ALL MATERIALS AS INDICATED IN THE MECHANICAL PLANS AND SPECIFICATIONS AS NECESSARY FOR THE SUCCESSFUL COMPLETION OF THIS PROJECT. COORDINATE WORK WITH LOCAL UTILITY, OWNER, AND OTHER CONTRACTORS TO MINIMIZE DISRUPTION AND DOWNTIME. THE NECHANICAL CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR COORDINATING HIS WORK WITH OTHER TRADES TO AVOID CONFLICTS IN SPACE REQUIREMENTS, CLEARANCES, ETC. PROBLEMS ARISING DUE TO LACK OF COORDINATION WILL BE THE RESPONSIBILITY OF

ALL MECHANICAL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL CODES AND SHALL BE COMPLETED IN A NEAT WORKMAN LIKE MANNER. CONTRACTOR BEARS ULTIMATE RESPONSIBILITY FOR COMPLIANCE OF THE

PERMIT, FEES, & LICENSES THE MECHANICAL CONTRACTOR SHALL OBTAIN ALL PERMITS AND ARRANGE ALL INSPECTIONS, GIVE NOTICES, AND PAY ALL FEES AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION. THIS CONTRACTOR SHALL COORDINATE ANY NECESSARY SITE JTILITIES INCLUDING WATER, NATURAL GAS, AND SEWER WORK WITH LOCAL UTILITY, OWNER, AND OTHER CONTRACTORS TO MINIMIZE DISRUPTION AND DOWNTIME. CLARIFICATION TO THE BIDDING ANY NATURAL GAS UTILITY COSTS FROM NORTHWESTERN ENERGY WILL BE PAID DIRECTLY BY THE OWNER AND SHALL NOT BE INCLUDED AS PART OF THIS CONTRACT. WITH THE EXCEPTION OF THE NATURAL GAS, ANY AND ALL CHARGES ASSESSED BY THE UTILITY OR CITY OF ABERDEEN TO ACCOMMODATE THE REQUIREMENTS OF THIS PROJECT ARE THE SOLE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. VERIFY ALL CHARGES AND COORDINATE ALL EQUIPMENT NECESSARY WITH THE UTILITY BEFORE SUBMITTING BID.

ALL MATERIAL AND EQUIPMENT SHALL BE NEW AND FREE OF DEFECTS. DESIGN AND INSTALL PIPING AND DUCTWORK TO PRESENT A NEAT ORDERLY APPEARANCE. ROUTE PARALLEL WITH BUILDING WALLS AND CONSTRUCTION. PROVIDE VIBRATION ISOLATION AND FLEXIBLE CONNECTIONS ON ALL MOVING EQUIPMENT. PROVIDE ALL CUTTING AND PATCHING NECESSARY FOR

APPROVAL OF SUBSTITUTED EQUIPMENT SUBSTITUTED EQUIPMENT SHALL BE PRIOR APPROVED BY SICHMELLER ENGINEERING ONE WEEK IN ADVANCE OF THE BID OPENING. MECHANICAL CONTRACTOR SHALL PAY, PROVIDE, INSTALL AND BE RESPONSIBLE FOR ANY EXTRA MATERIALS REQUIRED DUE TO HIS USE OF ALTERNATE ACCEPTED EQUIPMENT WHICH HAS INSTALLATION REQUIREMENTS DIFFERENT THAN THE SPECIFIED EQUIPMENT. THIS INCLUDES PAYING OTHER TRADES FOR ANY EXTRA WORK THEY ARE INVOLVED IN DUE TO

BEFORE ORDERING ANY ITEM, CONTRACTOR SHALL REVIEW, STAMP WITH HIS APPROVAL AND SUBMIT SHOP DRAWINGS OF EQUIPMENT AS TO BE FURNISHED UNDER THIS CONTRACT. ELECTRONIC SUBMITTALS ARE REQUIRED. ELECTRONIC SUBMITTALS CAN BE ONE COMBINED PDF FOR EACH OF THE FOLLOWING MECHANICAL TRADES: HVAC AND PLUMBING.

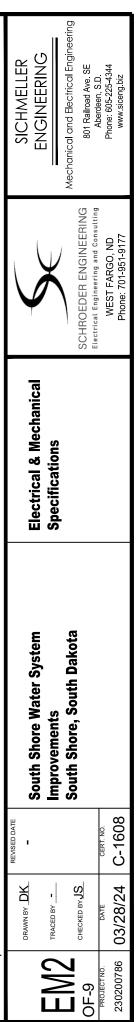
DIVISION 23 - HEATING, VENTILATING AND AIR COND. 1. MECHANICAL CONTRACTOR SHALL FAMILIARIZE HIMSELF/HERSELF WITH THE SITE AND ANY CONDITIONS WHICH MAY PRESENT UNUSUAL ASPECTS TO THE WORK INVOLVED. VERIFY EXISTING CONDITIONS, EQUIPMENT, AND DIMENSIONS PRIOR TO QUOTING OR CONSTRUCTION INCLUDING PIPE AND/OR DUCT ROUTING; POTENTIAL OBSTACLES; ETC. THE AIR DISTRIBUTION SYSTEM SHALL BE FABRICATED AS RECOMMENDED IN THE LATEST EDITION OF THE SMACNA LOW VELOCITY DUCT MANUAL AND INSTALLED WHERE SHOWN ON PLAN. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL REQUIRED DAMPERS, TRANSITIONS AND CONNECTIONS TO AIR TERMINALS NECESSARY FOR A COMPLETE

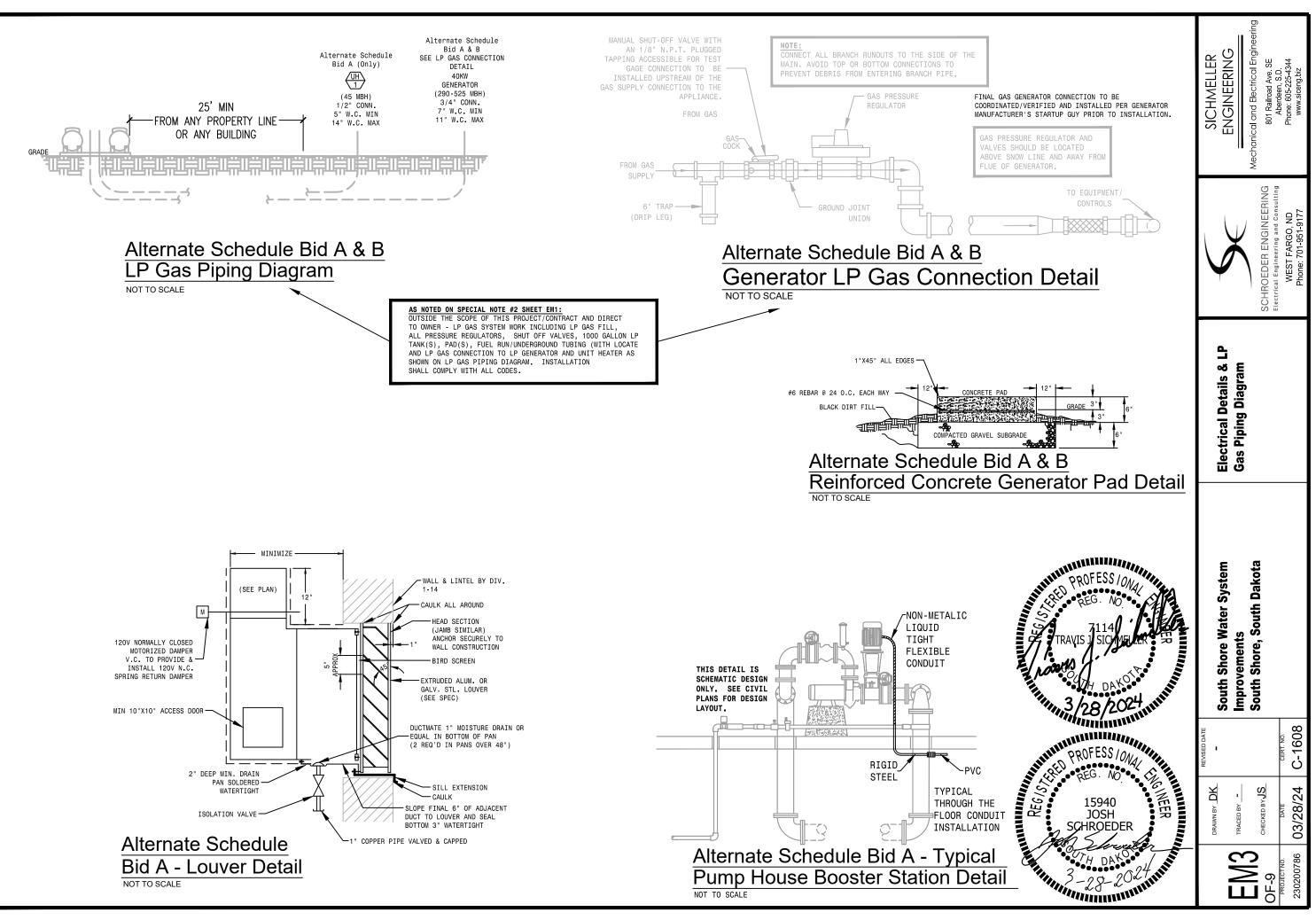
ALL DUCTWORK SHALL BE GALVANTZED STEEL UNLESS OTHERWISE SPECIFIED, WITH GAUGES AND RETNEORCING IN ACCORDANCE WITH SMACNA. CONSTRUCT AND SUPPORT NEW DUCTWORK IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS FOR UP TO 2-INCH W.G. SECURELY ATTACH ALL DUCTWORK TO THE BUILDING CONSTRUCTION IN A MANNER TO BE FREE FROM VIBRATION AND SWAYING UNDER OPERATING CONDITIONS. PROVIDE OFFSETS, ELBOWS AND

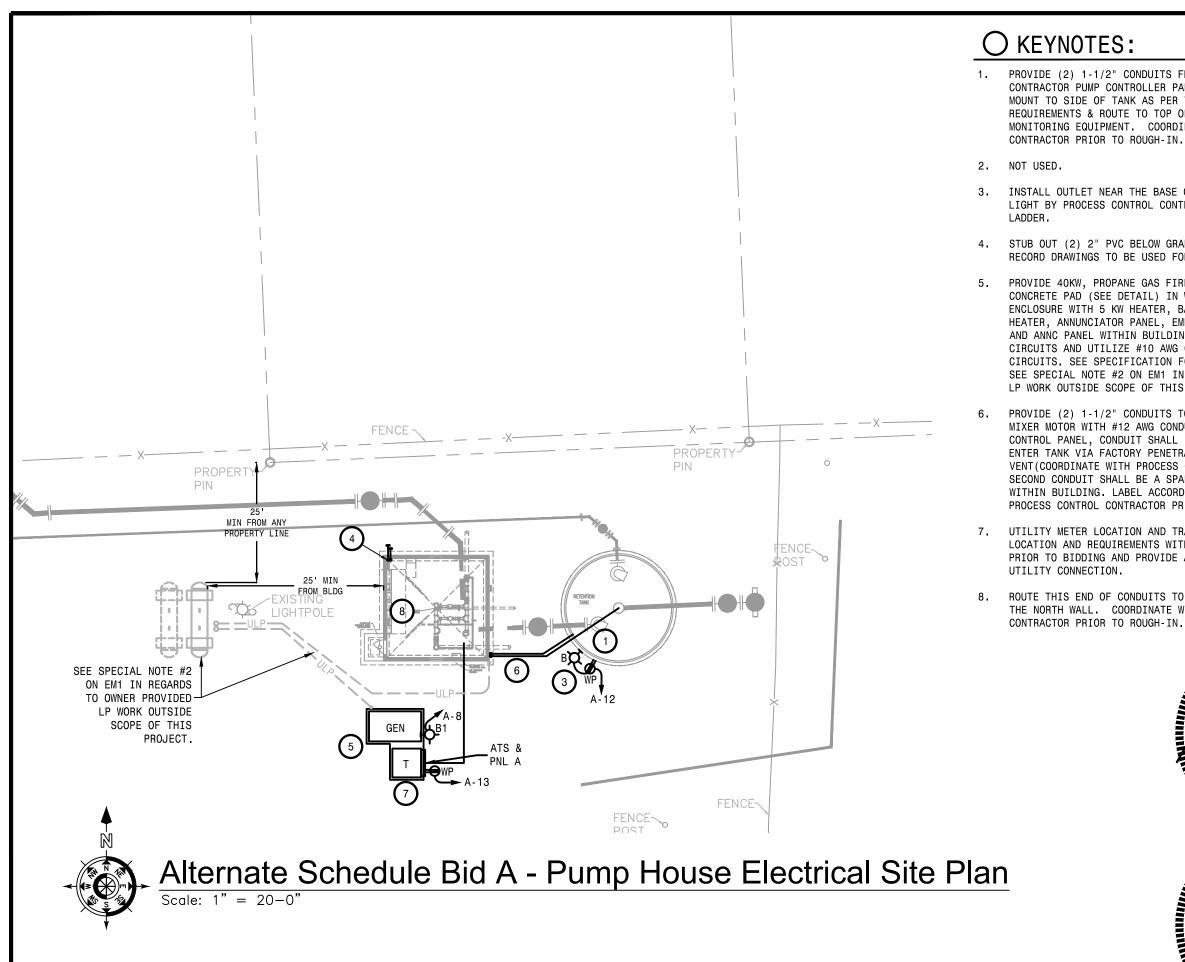
INSULATION OF OUTSIDE AIR AND EXHAUST AIR: ALL INSULATION MATERIALS SHALL HAVE FIRE AND SMOKE HAZARD RATINGS AS TESTED BY PROCEDURE ASTM E-84, NFPA 255, AND UL 723 NOT EXCEEDING FLAME SPREAD 25 AND SMOKE

THE FOLLOWING EXPOSED DUCTWORK SHALL BE INSULATED WITH EXTERIOR DUCT WRAP, 1-1/2" THICK.

PROVIDE EQUIPMENT WHERE SHOWN ON DRAWINGS AND AS DESCRIBED. MODEL AND CAPACITIES & OPTIONS AS







PROVIDE (2) 1-1/2" CONDUITS FROM PROCESS CONTROL CONTRACTOR PUMP CONTROLLER PANEL WITHIN BUILDING TO TANK. MOUNT TO SIDE OF TANK AS PER TANK MANUFACTURER'S REQUIREMENTS & ROUTE TO TOP OF TANK FOR LEVEL CONTROL & MONITORING EQUIPMENT. COORDINATE WITH PROCESS CONTROL

INSTALL OUTLET NEAR THE BASE OF THE LADDER & INSTALL THE LIGHT BY PROCESS CONTROL CONTRACTOR NEAR THE TOP OF THE

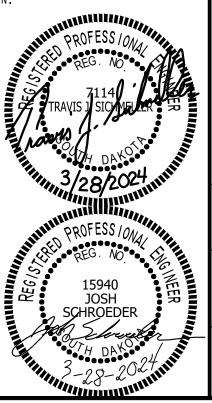
4. STUB OUT (2) 2" PVC BELOW GRADE & MARK END LOCATION ON RECORD DRAWINGS TO BE USED FOR FUTURE COMMUNICATIONS.

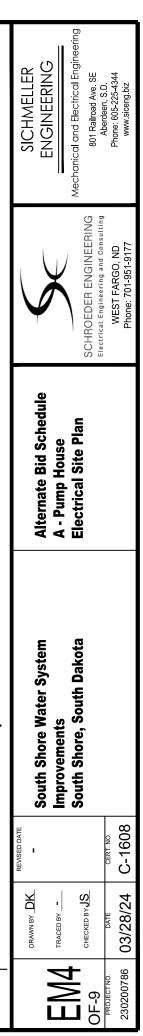
5. PROVIDE 40KW, PROPANE GAS FIRED GENERATOR ON REINFORCED CONCRETE PAD (SEE DETAIL) IN WEATHERPROOF SOUND REDUCTION ENCLOSURE WITH 5 KW HEATER, BATTERY CHARGER, BLOCK HEATER, ANNUNCIATOR PANEL, EMERGENCY STOP BUTTONS ON UNIT AND ANNC PANEL WITHIN BUILDING. SEE PANEL A FOR BRANCH CIRCUITS AND UTILIZE #10 AWG CONDUCTORS FOP BRANCH CIRCUITS. SEE SPECIFICATION FOR ADDITIONAL INFORMATION. SEE SPECIAL NOTE #2 ON EM1 IN REGARDS TO OWNER PROVIDED LP WORK OUTSIDE SCOPE OF THIS PROJECT.

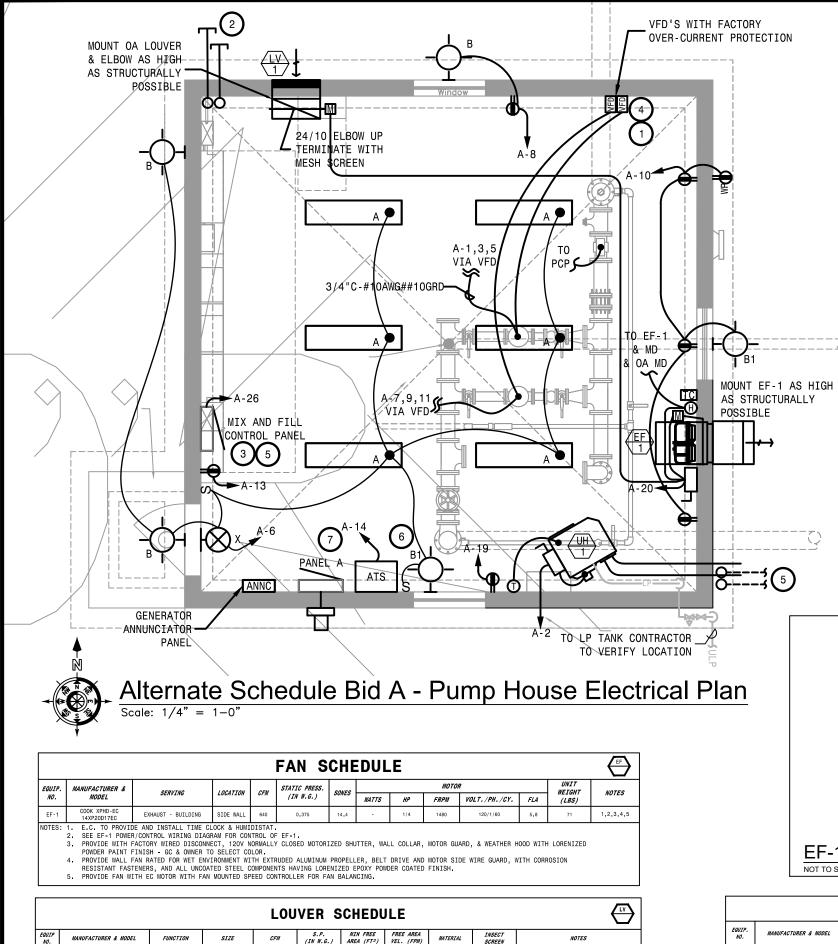
PROVIDE (2) 1-1/2" CONDUITS TO TANK FROM BUILDING. ONE TO MIXER MOTOR WITH #12 AWG CONDUCTORS FROM MIX AND FILL CONTROL PANEL, CONDUIT SHALL EXTEND TO TOP OF TANK AND ENTER TANK VIA FACTORY PENETRATION IN FROST FREE VENT(COORDINATE WITH PROCESS CONTROLS CONTRACTOR). THE SECOND CONDUIT SHALL BE A SPARE FROM BASE OF TANK TO WITHIN BUILDING. LABEL ACCORDINGLY. COORDINATE WITH PROCESS CONTROL CONTRACTOR PRIOR TO ROUGH-IN.

7. UTILITY METER LOCATION AND TRANSFORMER. COORDINATE LOCATION AND REQUIREMENTS WITH OTTERTAIL POWER COMPANY PRIOR TO BIDDING AND PROVIDE ALL FEES ASSOCIATED WITH

ROUTE THIS END OF CONDUITS TO PUMP CONTROLLER LOCATED ON THE NORTH WALL. COORDINATE WITH PROCESS CONTROL







INTAKE AIR BUILDING SPACE

24"WX24"HX6"

LOUVER TO HAVE BAKED ENAMEL FINISH, GC & OWNER TO SELECT COLOR. PROVIDE WITH EXTENDED SILL & BIRD SCREEN. EC TO PROVIDE & INSTALL IZOVAC CN GMORIZED DAMPER AND INSTALL CONTROL WIRING TO OPEN WITH EF-1 FAN OPERATION

640

0.02

1.89

339

ALUM.

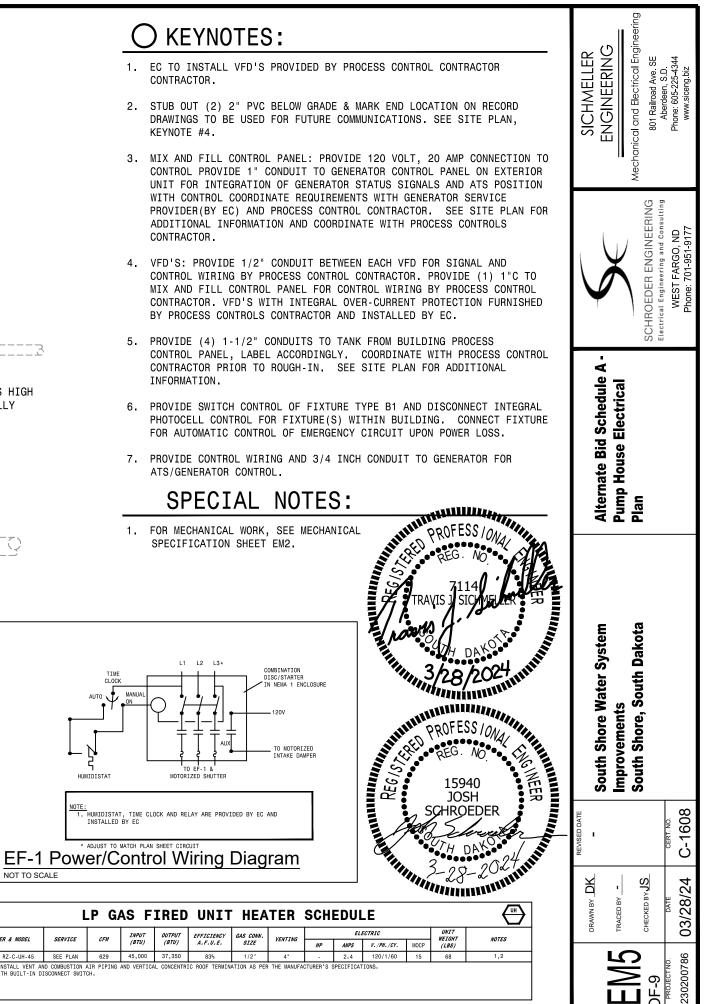
NO

1,2,3

RUSKIN ELF 6375DX

- CONTRACTOR.
- KEYNOTE #4.
- CONTRACTOR.
- INFORMATION.
- ATS/GENERATOR CONTROL.

SPECIFICATION SHEET EM2.



			L	LP GAS FIRED UNIT HE						
EQUIP. NO.			SERVICE	CFM	INPUT (BTU)	OUTPUT (BTU)	EFFICIENCY A.F.U.E.	GAS CONN. SIZE	VENTING	
UH - 1		REZNOR UDAS RZ-C-UH-45	SEE PLAN	629	45,000	37,350	83%	1/2"	4 "	
NOTES:	1. 2.	PROVIDE & INSTALL VENT AN EQUIPPED WITH BUILT-IN D			AND VERTICA	L CONCENTRI	IC ROOF TERMIN	ATION AS PEF	THE MANUFA	

FIXTURE SCHEDULE

TYPE	MANUFACTURERS	CAT. NO.	LAMPS	REMARKS	FI
А	COLUMBIA, LITHONIA, METALUX, LSI	LITHONIA CSVT L48 4000LM MVOLT	36W LED 4000K		STUB DOWN TWO
В	COLUMBIA, LITHONIA, METALUX, LSI	EVENLITE WLAC BZ CT	11W LED 5000K		2 3" SCH 80 PVC 3 3" SCH 80 PVC
	DUAL-LITE, SURE-LITES, LITHONIA, LSI, MULE LIGHTING	EVENLITE WLEM BZ CT	11W LED 5000K	GENERAL AND WITH BATTERY BACKUP	<u> </u>
	DUAL-LITE, SURE-LITES, LITHONIA, LSI, MULE LIGHTING	LITHONIA EXRG EL	LED	EXIT SIGN, NO BATTERY BACKUP	

SPECIFICATIONS:

- A. PROVIDE GENSET WITH WEATHER PROOF ENCLOSURE AND ALL NECESSARY ACCESSORIES FOR WINTER OPERATION WHICH WILL INCLUDE, BUT NOT LIMITED TO, ENGINE HEATER, BATTERY CHARGER, ENCLOSURE HEATER (IF REQUIRED BY MANUFACTURER TO GUARANTEE WINTER PERFORMANCE)
- B. TO BE MOUNTED ON CONCRETE PAD THAT IS 6" THICK AND 6" LARGER THAN GENERATOR SET ON ALL SIDES.
- C. INCLUDE ALL REQUIRED 120V CIRCUITS FROM EXISTING PANEL FOR GENSET AND ALL NECESSARY CONTROL WIRING FROM GENSET TO ATS.
- D. GENERATOR WILL BE FUELED BY LP GAS, GENERATOR TO BE SUPPLIED WITH FLEX CONNECTION. GENERATOR START-UP REPRESENTATIVE TO PROVIDE EXACT GAS PIPING REQUIREMENTS (FOR SUPPLY SUFFICIENT PIPE VOLUME REQUIRED BY GENERATOR START-UP REQUIRED FOR PROPER OPERATION) TO OWNER FOR OWNER'S LP SUPPLIER OUTSIDE OF THIS CONTRACT, SEE SPECIAL NOTE #2 SHEET EM1.
- E. INCLUDE REMOTE MONITORING EQUIPMENT TO NOTIFY CITY PERSONNEL OF GENSET STATUS AND ATS POSITION. THIS SHALL BE CAPABLE OF COMPUTER WORKSTATION AND SMART PHONE VIEWING. PROVIDE COMMUNICATION INTERCONNECT WITH PROCESS CONTROL CONTRACTOR CONTROL PANEL FOR MONITORING AND CONTROL.
- F. GENSET SHALL PERFORM AN AUTOMATIC WEEKLY LOAD TEST FOR NO LESS THAN 30 MINUTES.
- G. INCLUDE GENERATOR EMERGENCY SHUTDOWN AT GENSET ENCLOSURE AND INSIDE THE PUMP HOUSE.
- H. INCLUDE ON-SITE FACTORY TECHNICIAN STARTUP AND TESTING. ON-SITE TRAINING OF OWNER REPRESENTATIVE SHALL HAPPEN AT THIS TIME AND BE DOCUMENTED.
- I. DESIGN BASIS: MTU MODEL 4R0063 GS40 WITH ENCLOSURE.

							PANEL	'A' ALTERI	NATI	E BID SCHED	ULE A							
VOL	TAGE:	2	208/120, 3	P, 4W	BUS	RATING:	2	225 AMP	_	ENCL. TYPE:	NEM	/A 1	. L(OCATION:	PUMP HO	DUSE	-	
	TYPE:		MCB	200A	AIC	RATING:		35,000	_	MOUNTING:	SUR	FACE	F	ED FROM:	ATS		-	
CRKT BRKR					CONNECT	ED LOAD (V	A)		ТТ		CO	CONNECTED LOAD				CRKT BRK		1
#	AMPS	POLE	LIGHTING	MOTORS	HVAC	HEAT	RECPT	DESCRIPTION	PH	DESCRIPTION	RECPT	HEAT	HVAC	MOTORS	LIGHTING	AMPS	POLE	#
1				1320					A	HEATER						20	1	2
3	20	3		1320				PUMP #1	В	SPARE						20	1	4
5				1320				1	С	LIGHTS					600	20	1	6
7				1320					A	OUTLETS/EM LT	400					20	1	8
9	20	3		1320				PUMP #2	В	E RECP	800					20	1	10
11				1320				1	С	LHT/RECP TANK	200				100	20	1	12
13	20	1					200	RECPTACLE	A	ATS CONTROL	250					20	1	14
15	20	1					200	RECPTACLE	В	GEN BLK HTR		1500				20	1	16
17	20	1				1500		TANK HTR	С	GENERTOR BATT	200					20	1	18
19	20	1						SPARE	A	EF - 1				720		20	1	20
21	20	1						SPARE	В	MIX/FIL CNTRL	500					20	1	22
23	20	1						SPARE	С	UH - 1		5000				60	0	24
25									A	01-1		5000					2	26
27	30	3						SPARE	В	GEN ENCL HTR		2500				30	2	28
29								1	С	GEN ENCL HIR		2500				30	2	30
31									A	SPARE						50	1	32
33	60	3						SPARE (NOTE 2)	В	SPARE						30	1	34
35									С	SPARE						00	2	36
37									A	SPARE						20	2	38
39	20	3						SPARE	В	SPARE						20*	1	40
41								1	С	SPARE						20*	1	42
										AMPS:	64	CONNE	CTED VA:	30090	CALCULA	TED VA:	23103	

PROVIDE AS REQUIRED FOR CB CONNECTION

#4 CU

WATER SERVICE

#4 CU

SERVICE

RATED

ATS

200 AMP

4 POLE

NOT TO SCALE

NOTES:

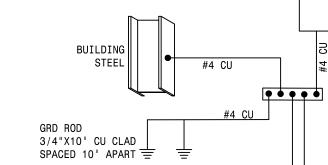
1. BREAKERS NOTED WITH * SHALL BE GFCI

2. GENERATOR ENCLOSURE MAY INCLUDE PANEL FOR ENCLOSURE LOADS, PROVIDE APPROPRIATE FEEDER AND COORDIATE CB SIZE.

3. PROVIDE DEDICATED BRANCH CIRCUITS TO GENERATOR AND TANK AS SHOWN IN DISCRIPTION

COORDINATE FINAL REQUIREMENTS IN FIELD WITH SUPPLIERS.

TO UTILITY XFMR



CONNECT TO

REBAR IN FOOTING

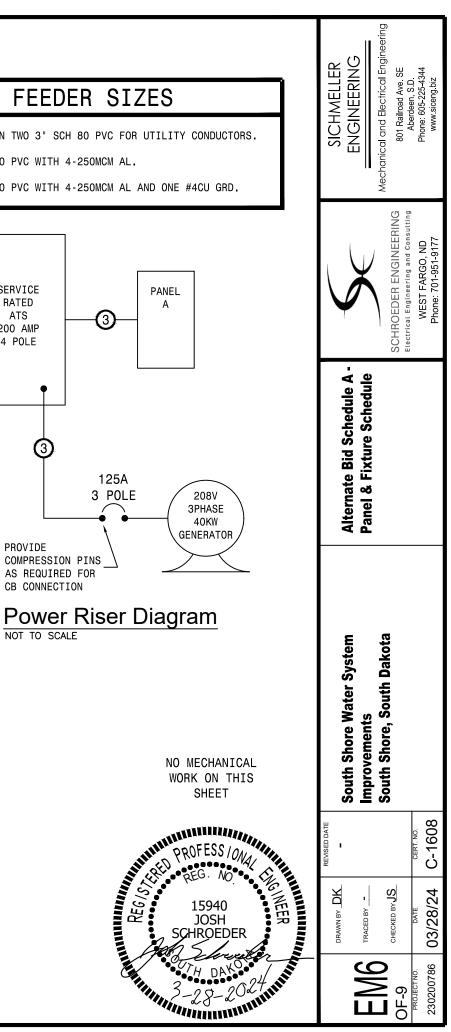
200A

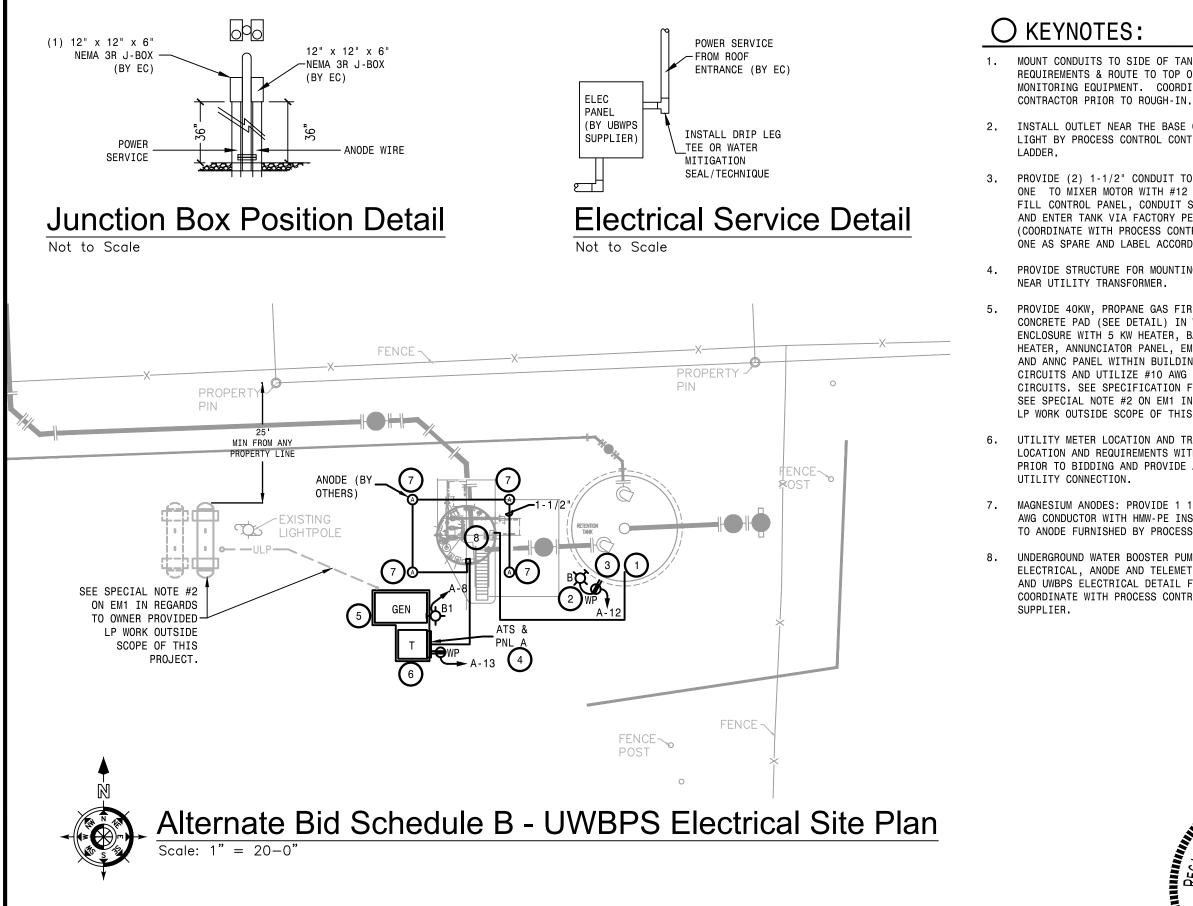
3Ø URD

METER

SOCKET

@





MOUNT CONDUITS TO SIDE OF TANK AS PER TANK MANUFACTURER'S REQUIREMENTS & ROUTE TO TOP OF TANK FOR LEVEL CONTROL & MONITORING EQUIPMENT. COORDINATE WITH PROCESS CONTROL

INSTALL OUTLET NEAR THE BASE OF THE LADDER & INSTALL THE LIGHT BY PROCESS CONTROL CONTRACTOR NEAR THE TOP OF THE

PROVIDE (2) 1-1/2" CONDUIT TO TANK FROM VAULT. PROVIDE ONE TO MIXER MOTOR WITH #12 AWG CONDUCTORS FROM MIX AND FILL CONTROL PANEL, CONDUIT SHALL EXTEND TO TOP OF TANK AND ENTER TANK VIA FACTORY PENETRATION IN FROST FREE VENT (COORDINATE WITH PROCESS CONTROLS CONTRACTOR). PROVIDE ONE AS SPARE AND LABEL ACCORDINGLY.

PROVIDE STRUCTURE FOR MOUNTING ATS, PANEL A AND METER

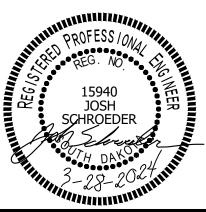
PROVIDE 40KW, PROPANE GAS FIRED GENERATOR ON REINFORCED CONCRETE PAD (SEE DETAIL) IN WEATHERPROOF SOUND REDUCTION ENCLOSURE WITH 5 KW HEATER, BATTERY CHARGER, BLOCK HEATER, ANNUNCIATOR PANEL, EMERGENCY STOP BUTTONS ON UNIT AND ANNC PANEL WITHIN BUILDING. SEE PANEL A FOR BRANCH CIRCUITS AND UTILIZE #10 AWG CONDUCTORS FOP BRANCH CIRCUITS. SEE SPECIFICATION FOR ADDITIONAL INFORMATION. SEE SPECIAL NOTE #2 ON EM1 IN REGARDS TO OWNER PROVIDED LP WORK OUTSIDE SCOPE OF THIS PROJECT.

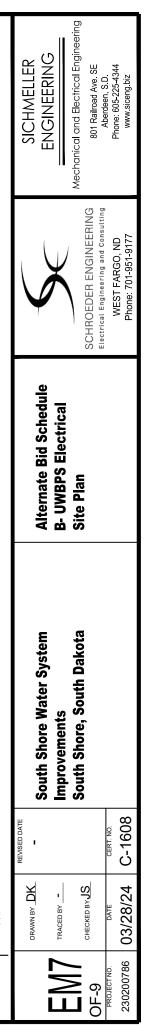
UTILITY METER LOCATION AND TRANSFORMER. COORDINATE LOCATION AND REQUIREMENTS WITH OTTERTAIL POWER COMPANY PRIOR TO BIDDING AND PROVIDE ALL FEES ASSOCIATED WITH

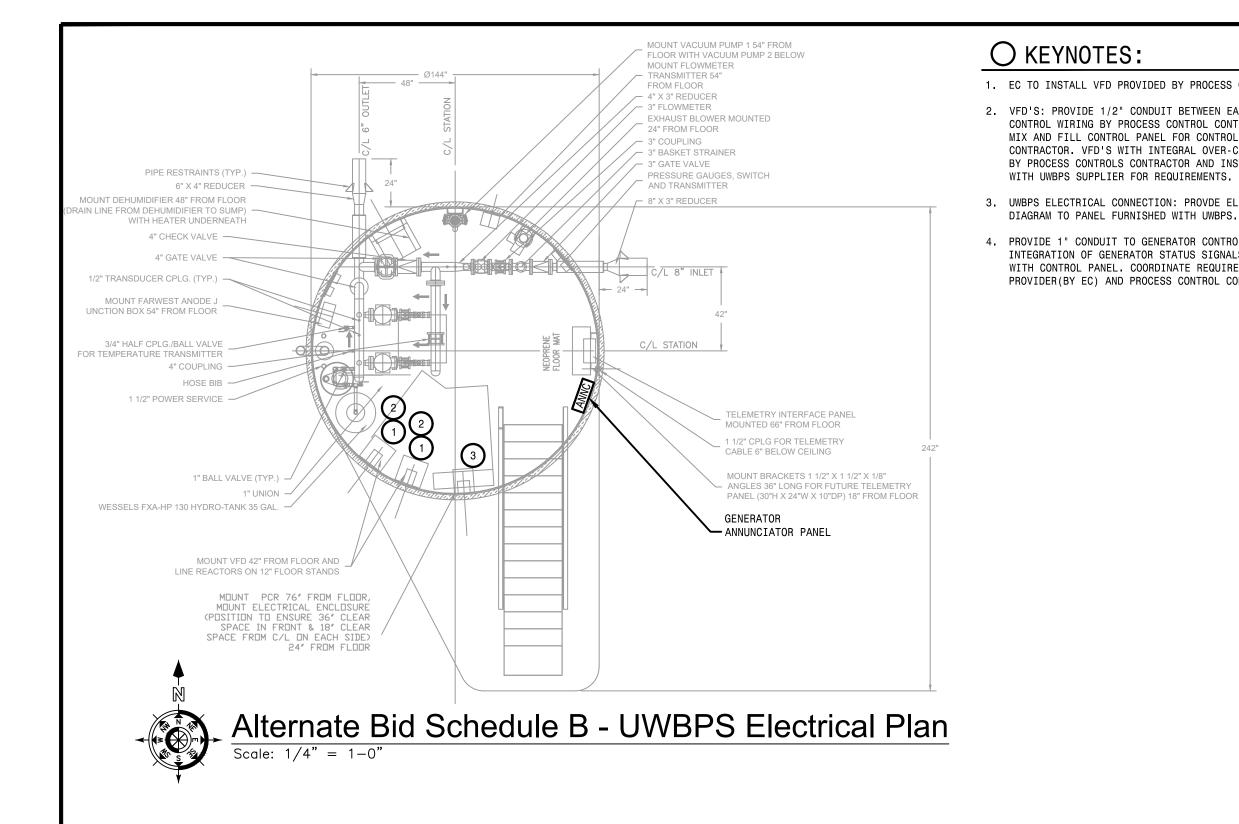
MAGNESIUM ANODES: PROVIDE 1 1/2 INCH PVC CONDUIT WITH #6 AWG CONDUCTOR WITH HMW-PE INSULATION AND EXOTHERMIC WELD TO ANODE FURNISHED BY PROCESS CONTROL CONTRACTOR.

UNDERGROUND WATER BOOSTER PUMP STATION (UWBPS): ELECTRICAL. ANODE AND TELEMETRY CONNECTION. SEE DETAILS AND UWBPS ELECTRICAL DETAIL FOR ADDITIONAL INFORMATION; COORDINATE WITH PROCESS CONTROL CONTRACTOR AND UWBPS

> NO MECHANICAL WORK ON THIS SHEET





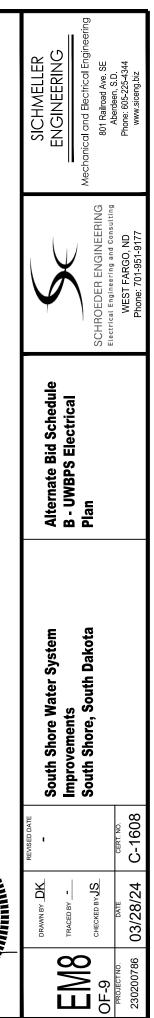


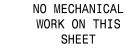
1. EC TO INSTALL VFD PROVIDED BY PROCESS CONTROL CONTRACTOR.

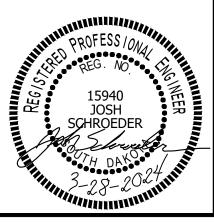
2. VFD'S: PROVIDE 1/2" CONDUIT BETWEEN EACH VFD FOR SIGNAL AND CONTROL WIRING BY PROCESS CONTROL CONTRACTOR. PROVIDE (1) 1"C TO MIX AND FILL CONTROL PANEL FOR CONTROL WIRING BY PROCESS CONTROL CONTRACTOR. VFD'S WITH INTEGRAL OVER-CURRENT PROTECTION FURNISHED BY PROCESS CONTROLS CONTRACTOR AND INSTALLED BY EC. COORDINATE

3. UWBPS ELECTRICAL CONNECTION: PROVDE ELECTRICAL FEEDER PER RISER

4. PROVIDE 1" CONDUIT TO GENERATOR CONTROL PANEL ON EXTERIOR UNIT FOR INTEGRATION OF GENERATOR STATUS SIGNALS AND ATS POSITION WITH CONTROL PANEL. COORDINATE REQUIREMENTS WITH GENERATOR SERVICE PROVIDER(BY EC) AND PROCESS CONTROL CONTRACTOR.







FIXTURE SCHEDULE

TYPE	MANUFACTURERS	CAT. NO.	LAMPS	REMARKS	
В	COLUMBIA, LITHONIA, METALUX, LSI	EVENLITE WLAC BZ CT	11W LED 5000K		() 1 1/2" SC
	DUAL-LITE, SURE-LITES, LITHONIA, LSI, MULE LIGHTING	EVENLITE WLEM BZ CT	11W LED 5000K	GENERAL AND WITH BATTERY BACKUP	

KEYNOTES:

1. PANEL FURNISHED BY UNDERGROUND SUBSTATION SUPPLIER. COORDINATE REQUIREMENTS FOR PANEL OVER-CURRENT DEVICE WITH UWBPS SUPPLIER PRIOR TO ORDERING AND VERIFY FIELD REQUIREMENTS WITH UWBPS AND PROCESS CONTROLS CONTRACTOR PRIOR TO ROUGH-IN OF ELECTRICAL FEEDED.

SPECIFICATIONS:

- A. PROVIDE GENSET WITH WEATHER PROOF ENCLOSURE AND ALL NECESSARY ACCESSORIES FOR WINTER OPERATION WHICH WILL INCLUDE, BUT NOT LIMITED TO, ENGINE HEATER, BATTERY CHARGER, ENCLOSURE HEATER (IF REQUIRED BY MANUFACTURER TO GUARANTEE WINTER PERFORMANCE)
- B. TO BE MOUNTED ON CONCRETE PAD THAT IS 6" THICK AND 6" LARGER THAN GENERATOR SET ON ALL SIDES.
- C. INCLUDE ALL REQUIRED 120V CIRCUITS FROM EXISTING PANEL FOR GENSET AND ALL NECESSARY CONTROL WIRING FROM GENSET TO ATS.
- D. GENERATOR WILL BE FUELED BY LP GAS, GENERATOR TO BE SUPPLIED WITH FLEX CONNECTION. GENERATOR START-UP REPRESENTATIVE TO PROVIDE EXACT GAS PIPING REQUIREMENTS (FOR SUPPLY SUFFICIENT PIPE VOLUME REQUIRED BY GENERATOR START-UP REQUIRED FOR PROPER OPERATION) TO OWNER FOR OWNER'S LP SUPPLIER OUTSIDE OF THIS CONTRACT, SEE SPECIAL NOTE #2 SHEET EM1.
- E. INCLUDE REMOTE MONITORING EQUIPMENT TO NOTIFY CITY PERSONNEL OF GENSET STATUS AND ATS POSITION. THIS SHALL BE CAPABLE OF COMPUTER WORKSTATION AND SMART PHONE VIEWING. PROVIDE COMMUNICATION INTERCONNECT WITH PROCESS CONTROL CONTRACTOR CONTROL PANEL FOR MONITORING AND CONTROL.
- F. GENSET SHALL PERFORM AN AUTOMATIC WEEKLY LOAD TEST FOR NO LESS THAN 30 MINUTES.
- G. INCLUDE GENERATOR EMERGENCY SHUTDOWN AT GENSET ENCLOSURE AND INSIDE UWBPS.
- H. INCLUDE ON-SITE FACTORY TECHNICIAN STARTUP AND TESTING. ON-SITE TRAINING OF OWNER REPRESENTATIVE SHALL HAPPEN AT THIS TIME AND BE DOCUMENTED.
- I. DESIGN BASIS: MTU MODEL 4R0063 GS40 WITH ENCLOSURE.

							PANEL	'A' ALTERN	AT	E BID SCHED	ULE B							
VOLTAGE: 2		208/120, 3	0, 3P, 4W BUS RATING:		225 AMP			ENCL. TYPE:	NEMA 3R		L	OCATION:	EXTERIOR		-			
	TYPE:		MCB 200A		AIC RATING:		35,000		-	MOUNTING:	SURFACE		F	ED FROM:	ATS			
	CRKT BR	KR			CONNECT	ED LOAD (V	A)				100	NECTED LOA	AD (VA)			CRI	CRKT BRKP	
#	AMPS	POLE	LIGHTING	MOTORS	HVAC	HEAT	RECPT	DESCRIPTION	PH	DESCRIPTION	RECPT	HEAT	HVAC	MOTORS	LIGHTING	AMPS	POLE	#
1				5000		7500	4000	LINDDO	Α									2
3	125	3	1000	5000		7500	4000	— (NOIE 6) —	В	SPARE (NOTE 5)						60	3	4
5			1000	5000			4000		С							1		6
7									Α	LIGHT					100	20	1	8
9	30	3						SPARE	В	TANK HEATER	800					20	1	10
11									С	LHT/RECP TANK	200				100	20	1	12
13	20	1					200	RECPTACLE	Α	ATS CONTROL	250					20	1	14
15	20	1					250	GEN DAMPERS	В	GEN BLK HTR		1500				20	1	16
17	30	2				2500		GEN ENCL HTR	С	GENERTOR BATT	200					20	1	18
19	00	-				2500			Α	SPARE						20*	1	20
										AMPS:	116	CONNE	CTED VA:	52600	CALCULA	TED VA:	41600	
	NOTES:							_										ſ
			S NOTED WI			Ι												
			LOCKABLE F															
								TS MOUNTING.										
								SHOWN IN DISCRIF	PTION	1								
			INAL REQUIR				-											
1	5. GEN	ERATOR	ENCLOSURE	MAY INCLUDE	E PANEL FO	R ENCLOSUR	E LOADS, I	PROVIDE APPROPR	[ATE	FEEDER AND COORD	DINATE CB	SIZE.						

6. COORDINATE OVER-CURRENT SIZE WITH UWBPS SUPPLIER PRIOR TO ORDERING.

