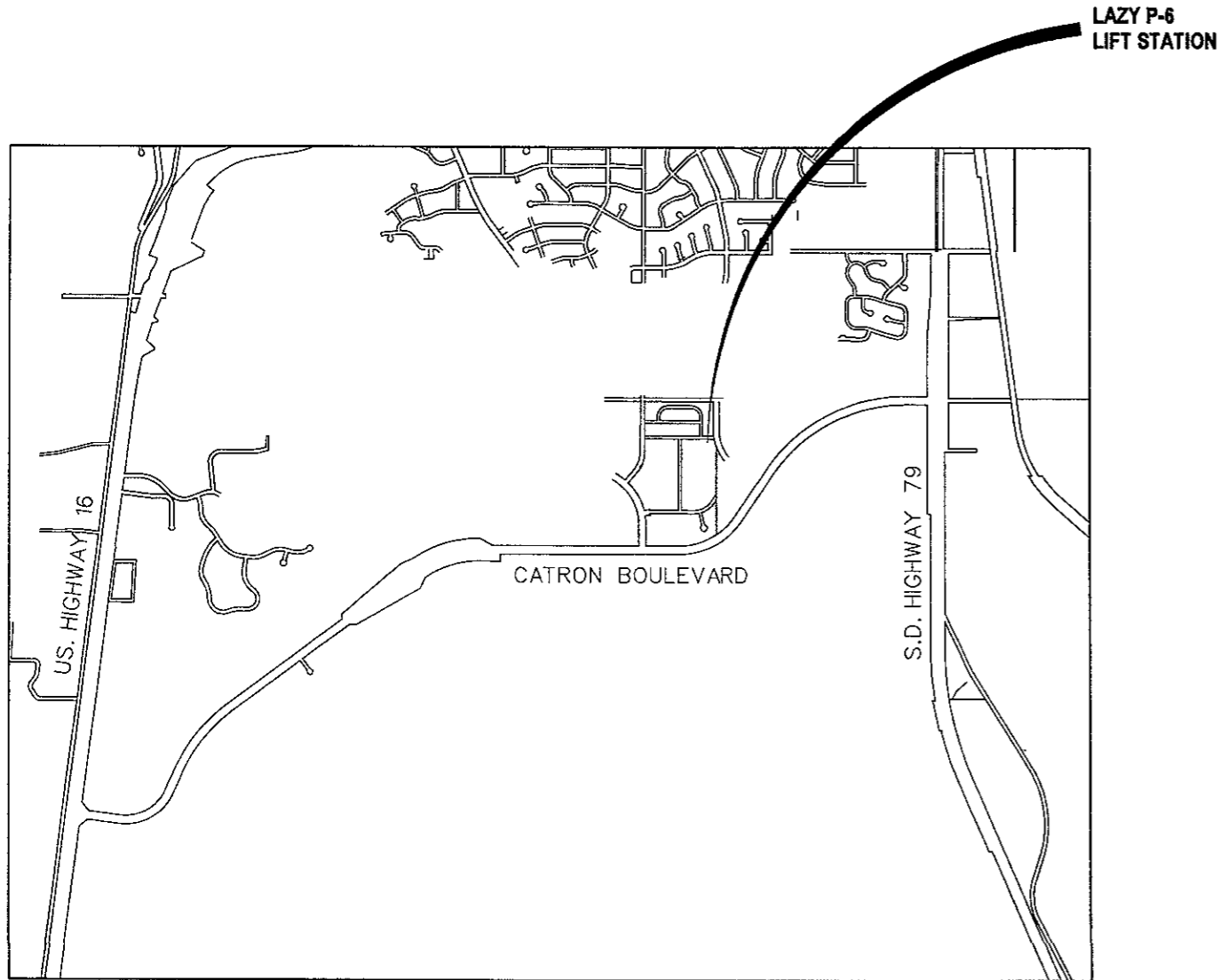


LAZY P-6 DEVELOPMENT LIFT STATION PENNINGTON COUNTY, SOUTH DAKOTA

AAE PROJECT NO. 04-1053

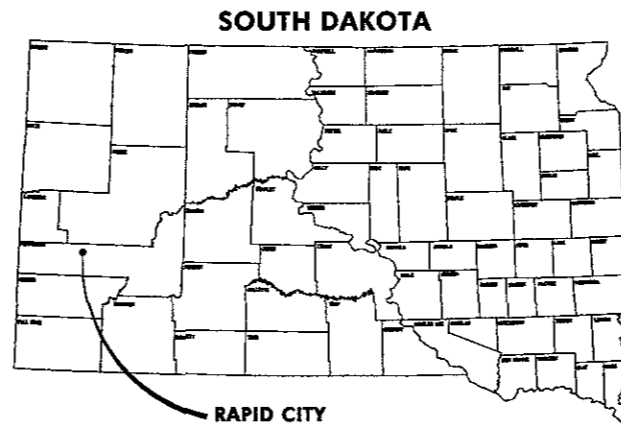
INDEX OF SHEETS

- 1 COVER
- 2 GENERAL NOTES AND LIFT STATION SITE PLAN
- 3 DETAILS
- 4 LIFT STATION AND VALVE MANHOLE DETAILS
- 5 LIFT STATION SHELTER DETAILS
- 6 ELECTRICAL PLANS
- 7 ELECTRICAL ELEVATIONS
- 8 ELECTRICAL PANEL, DIAGRAM, AND SYMBOLS
- 9 ELECTRICAL SPECIFICATIONS



PROJECT LOCATION MAP

NOT TO SCALE

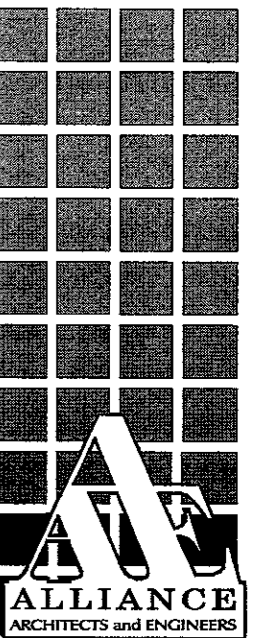


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ONE CALL
 BEFORE DIGGING
 1-800-781-7474

SET #



706 WEST BOULEVARD
 RAPID CITY, SOUTH DAKOTA
 PH: 605-342-9470 FAX: 605-342-2377

GENERAL NOTES:

05SR029

1. SPECIFICATIONS TO BE USED
CITY OF RAPID CITY STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 2004 EDITION, REQUIRED PROVISIONS, SUPPLEMENTAL SPECIFICATIONS AND/OR SPECIAL PROVISIONS AS PER PLANS AND PLAN NOTES, EXCEPT AS NOTED.
2. PROPOSED WATER, SANITARY SEWER AND UTILITY LINE LOCATIONS ARE BASED UPON DESIGN, CONTRACTOR SHALL VERIFY LOCATIONS AND DEPTH OF ALL EXISTING LINES AND UTILITIES PRIOR TO CONSTRUCTION.
3. OTHER UTILITIES WILL BE CONSTRUCTED AT THE SAME TIME IN THE VICINITY OF THE SITE. THE CONTRACTOR SHALL COORDINATE WITH THE OTHER UTILITY CONTRACTORS.
4. CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES INCLUDING SD ONE CALL 72 HOURS PRIOR TO BEGINNING CONSTRUCTION TO HAVE UTILITIES MARKED.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD INSPECT THE PROJECT LIMITS PRIOR TO BID TO BE FAMILIAR WITH THE SITE CONDITIONS.
6. ANY NECESSARY RE-STAKING DUE TO THE DESTRUCTION BY THE CONTRACTOR SHALL BE CHARGED TO THE CONTRACTOR.
7. CONTRACTOR SHALL MAINTAIN ELEVATIONS AS SHOWN ON THE PLANS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
8. THE CONTRACTOR SHALL PROTECT ALL EXISTING IMPROVEMENTS FROM DAMAGE. ANY DEBRIS ENCOUNTERED DURING CLEARING OPERATIONS SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE AT A LOCATION APPROVED BY THE ENGINEER. REMOVAL OF THESE ITEMS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM BID ITEM FOR MISCELLANEOUS AND INCIDENTAL.
9. ALL DISTURBED AREAS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AFTER EXCAVATION AND BACKFILL.
10. IF WATER FROM TEMPORARY DEWATERING WILL BE DISCHARGED TO WATERS OF THE STATE DURING CONSTRUCTION, CONTRACTOR MUST FIRST GET COVERAGE UNDER THE DEPARTMENT'S GENERAL PERMIT FOR TEMPORARY DEWATERING. FOR MORE INFORMATION CONTACTAL SPANGLER AT (605) 773-3351.
11. ALL DEWATERING REQUIRED TO INSTALL THE LIFT STATION WILL BE INCIDENTAL TO AND INCLUDED IN "MISCELLANEOUS AND INCIDENTAL".
12. ALL NEW SEWER LINE SHALL BE IN ACCORDANCE WITH ASTM D-3034, SDR35, PVC RUBBER- GASKET PIPE.
13. ALL NEW SEWER FORCE MAIN SHALL BE IN ACCORDANCE WITH AWWA C900, CLASS 150. ALL FORCE MAIN SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 8, "WATER PIPING SYSTEMS" OF THE CITY OF RAPID CITY STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 2004 EDITION. ALL FORCE MAIN SHALL HAVE MECHANICAL THRUST RESTRAINTS AT ALL BENDS, INCREASERS, VALVES AND PIPE JOINTS. ALL MECHANICAL THRUST RESTRAINTS SHALL BE INCIDENTAL TO THE BID ITEM THAT IT RESTRAINS.
14. A 4-FOOT ORANGE CONSTRUCTION FENCE SHALL BE INSTALLED AROUND THE EXCAVATION OR EQUIPMENT DURING PERIODS WHEN THERE IS NO WORK ACTIVITY (NIGHTS, WEEKENDS, WEATHER DELAY DAYS, ETC.).
15. WORK LIMITS SHALL BE KEPT NEAT AND ORDERLY DURING NONWORKING HOURS, EQUIPMENT AND MATERIALS SHALL BE KEPT AWAY FROM TRAVELED ROADWAYS.
16. THE UNIT PRICES INCLUDE ALL NECESSARY MATERIALS, EQUIPMENT, LABOR AND TOOLS TO SATISFACTORILY COMPLETE THIS WORK.
17. THE BID ITEM "VALVE PIT AND PIPING" SHALL INCLUDE THE NECESSARY PIPING BETWEEN THE LIFT STATION AND VALVE PIT; ALL PIPING AND APPURTENANCES IN THE VALVE PIT; AND THE PIPING NEEDED TO CONNECT TO THE PROPOSED 4" GATE VALVE ON THE WEST SIDE OF VALVE PIT.

EXCAVATION NOTES:

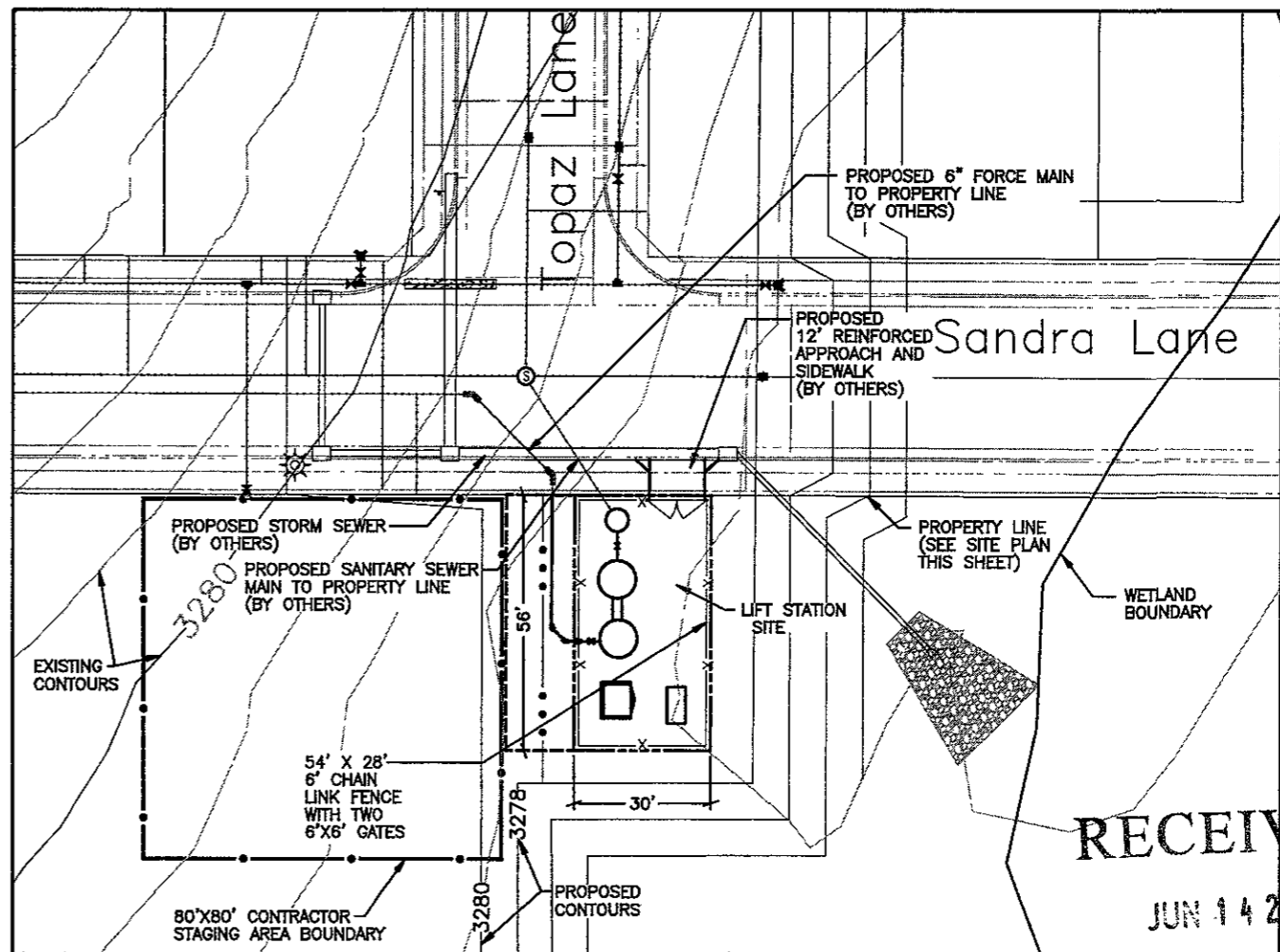
18. THE CONTRACTOR SHALL BE RESPONSIBLE TO INSURE THAT ALL EXCAVATION, TRENCHING AND SHORING, AND THE LIKE SHALL BE PERFORMED IN A MANNER THAT MEETS WITH THE OSHA DEPARTMENT OF LABOR, SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION.
19. WHEN SOFT OR UNSTABLE MATERIAL OR ROCK IS ENCOUNTERED AT THE SUBGRADE WHICH WILL NOT UNIFORMLY SUPPORT THE PIPE, SUCH MATERIAL SHALL BE EXCAVATED TO AN ADDITIONAL DEPTH AS DIRECTED BY THE ENGINEER AND BACK FILLED WITH TYPE 3 FOUNDATION MATERIAL.
20. ANY ROCK REMOVED DURING CONSTRUCTION SHALL BE INCIDENTAL TO THE BID ITEM REQUIRING THE REMOVAL. NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR ROCK EXCAVATION.

MATERIALS NOTES:

21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MATERIAL FURNISHED BY HIM/HER AND SHALL REPLACE AT HIS/HER OWN EXPENSE ALL SUCH MATERIAL FOUND DEFECTIVE IN MANUFACTURE OR DAMAGED IN HANDLING AFTER DELIVERY BY THE MANUFACTURER. THIS SHALL INCLUDE THE FURNISHING OF ALL MATERIALS AND LABOR REQUIRED FOR THE REPLACEMENT OF INSTALLED MATERIAL DISCOVERED DAMAGED OR DEFECTIVE PRIOR TO THE FINAL ACCEPTANCE OF THE WORK, OR DURING THE GUARANTEE PERIOD.
22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFE AND PROPER STORAGE OF MATERIAL FURNISHED BY HIM/HER OR TO HIM/HER AND ACCEPTED BY HIM/HER, AND INTENDED FOR THE WORK, UNTIL IT HAS BEEN INCORPORATED IN THE COMPLETED PROJECT. THE INTERIOR OF ALL PIPE AND OTHER ACCESSORIES SHALL BE KEPT FREE FROM DIRT AND FOREIGN MATTER AT ALL TIMES.

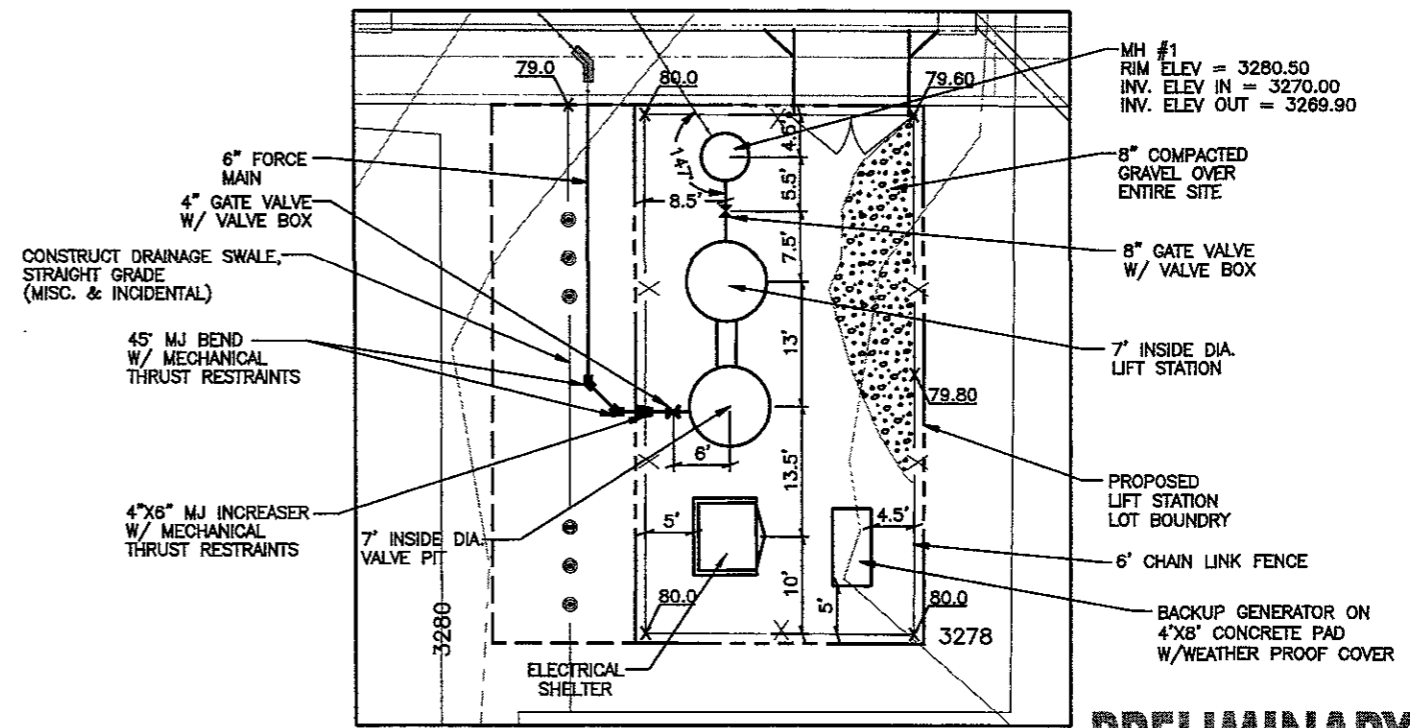
PIPE INSTALLATION NOTES:

23. BEFORE INSTALLATION, THE PIPE AND PIPE COATING SHALL BE INSPECTED FOR DEFECTS. ANY DAMAGE TO PIPE COATINGS SHALL BE REPAIRED WITH THE SAME MATERIALS USED FOR THE ORIGINAL COATING BEFORE LAYING THE PIPE.
24. ALL PIPE SHALL BE LAID AND MAINTAINED TO THE REQUIRED LINES AND GRADES WITH FITTINGS AT THE REQUIRED LOCATIONS.
25. EVERY PRECAUTION SHALL BE TAKEN TO PREVENT FOREIGN MATERIAL FROM ENTERING THE PIPE WHILE IT IS BEING PLACED IN THE LINE. DURING LAYING OPERATIONS NO DEBRIS, TOOLS, CLOTHING OR OTHER MATERIAL SHALL BE PLACED IN THE PIPE. AT TIMES WHEN PIPE LAYING IS NOT IN PROGRESS, THE OPEN ENDS OF THE PIPE SHALL BE CLOSED BY A WATERTIGHT PLUG OR OTHER MEANS APPROVED BY THE ENGINEER.



LIFT STATION LOCATION

SCALE: 1" = 40'



LIFT STATION SITE PLAN

SCALE: 1" = 20'

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LIFT STATION**

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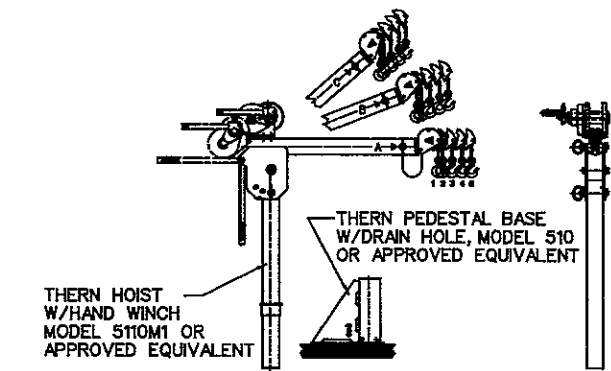
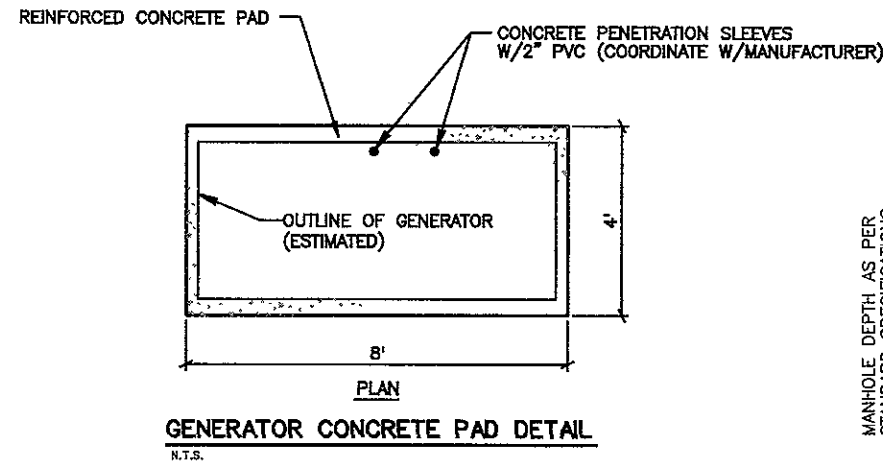
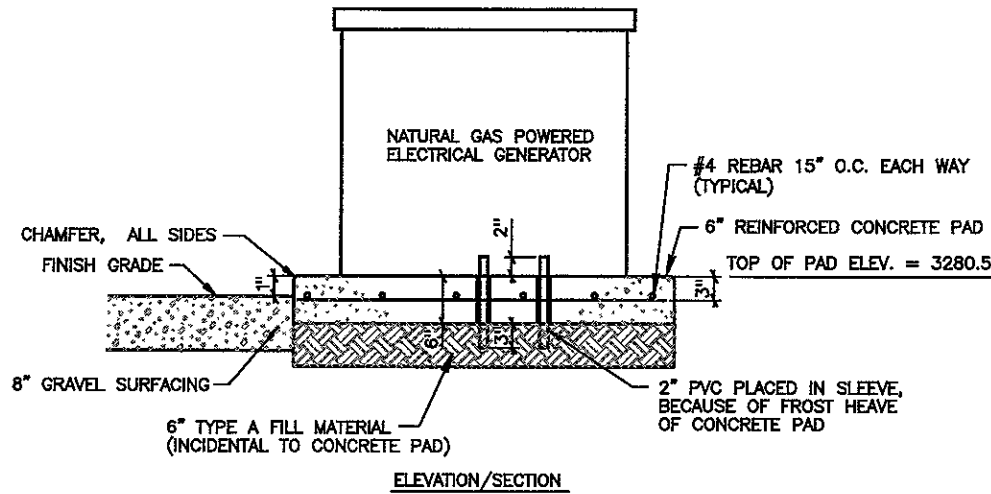
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File Name: 1053DET03.DGN	
Revisions:	

**GENERAL NOTES
AND
LIFT STATION SITE PLAN**

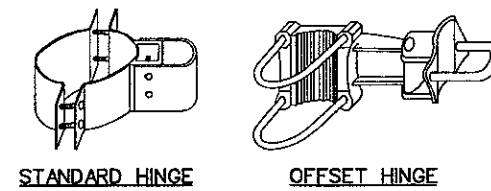
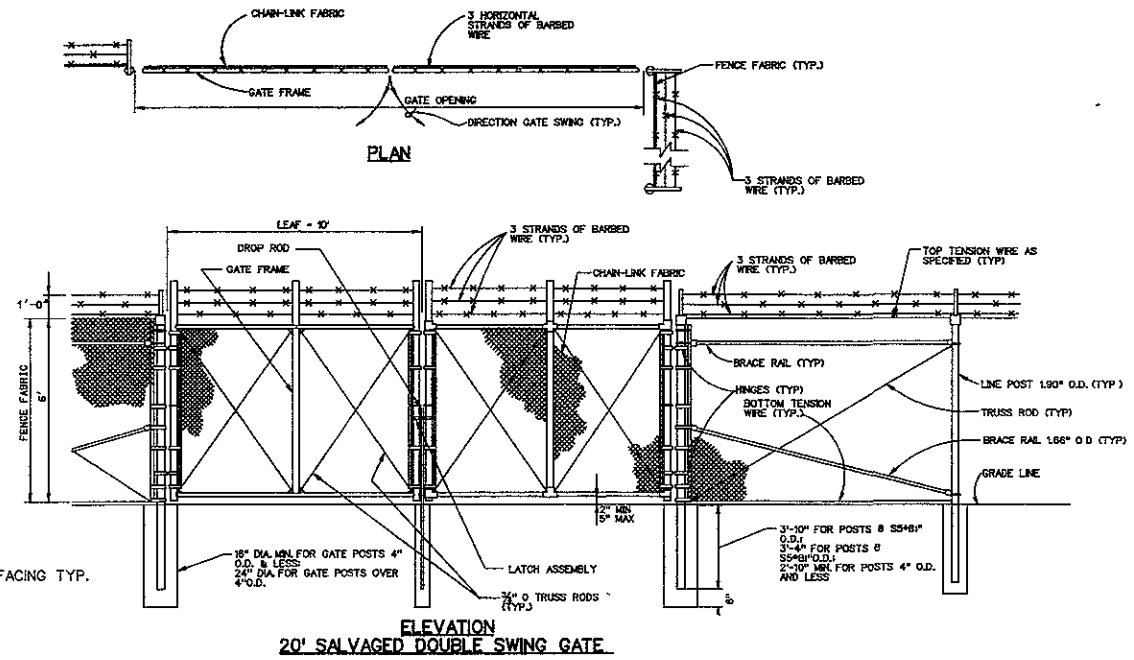
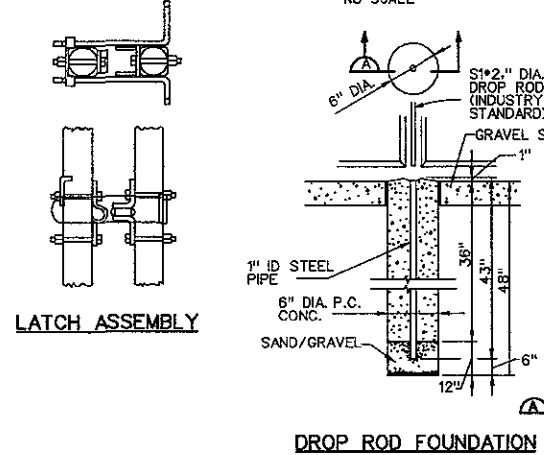
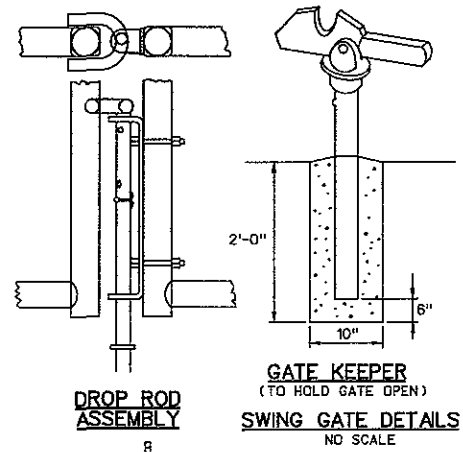
GENERATOR AND CONCRETE PAD NOTES:

1. CONCRETE SHALL BE CLASS M-6. ALL CONCRETE SHALL BE PROTECTED FROM COLD OR HOT WEATHER IN ACCORDANCE TO AMERICAN CONCRETE INSTITUTE (ACI) RECOMMENDATIONS. APPLY SEALER TO CONCRETE. BROOM FINISH. SLOPE TO EXTERIOR AT 1/8" IN 1 FT.
2. ASSUMED SOIL BEARING CAPACITY TO BE 2000 PSF.
3. REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. SPLICES SHALL BE LAPPED A MINIMUM OF 24 BAR DIAMETERS.
4. PROVIDE ENGRAVED RED METAL SIGN WITH LETTERS "DANGER HIGH VOLTAGE". SIGN SHALL BE 12" WIDE BY 9" HIGH. SECURE TO GENERATOR HOUSING WITH BRASS SCREWS.
5. CONTRACTOR SHALL COORDINATE WITH BLACK HILLS POWER & LIGHT PRIOR TO POURING CONCRETE.
6. CONTRACTOR SHALL LOCATE PVC PENETRATION WITH IN CONCRETE PAD AS NECESSARY (FOR GAS AND ELECTRICAL LINE).

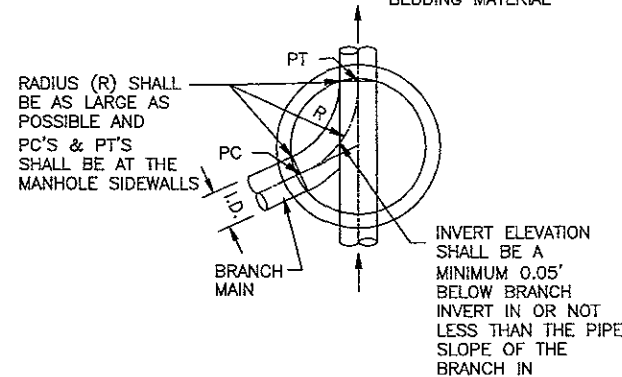
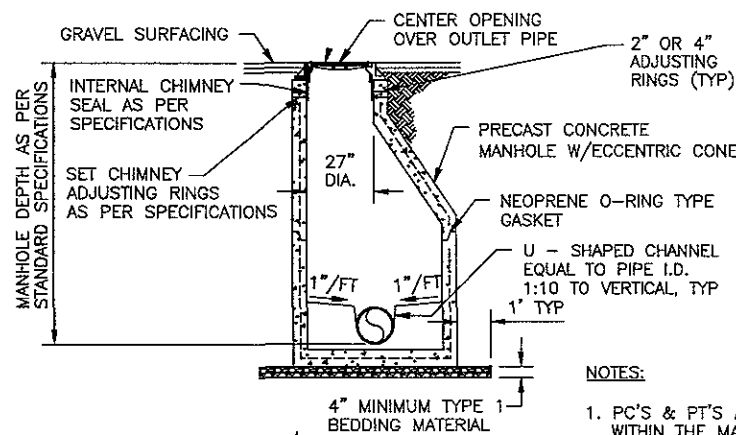
05SR029



NOTE:
CONTRACTOR SHALL VERIFY W/HOIST MANUFACTURER THE CORRECT LOCATION OF THE PEDESTAL BASE.
CONTRACTOR TO SUPPLY STAINLESS STEEL CHAIN AND PAD LOCK ADEQUATE TO SECURE HOIST.

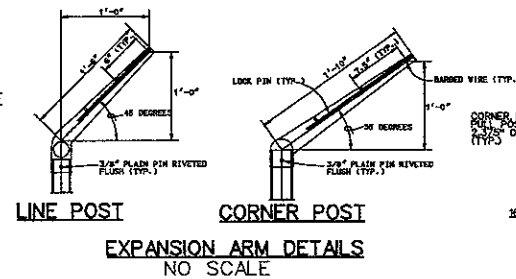


GATE POST SCHEDULE	
GATE LEAF WIDTH (NOMINAL)	OUTSIDE DIMENSION (NOMINAL)
6' OR LESS	4.0" OD
MORE THAN 6' TO 13'	4.0" OD



NOTES:

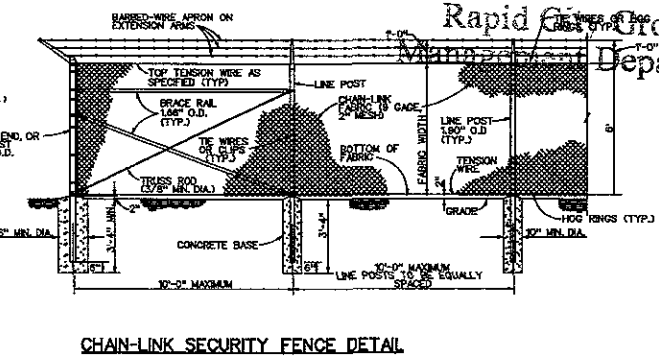
1. PC'S & PT'S ARE TO BE WITHIN THE MANHOLE.
2. ALL INVERTS TO BE U-SHAPED CHANNEL EQUAL TO PIPE I.D. AND SHALL BE CONSTRUCTED WITH SWEEPS.
3. A MINIMUM RADIUS (R) OF 2.5 TIMES THE I.D. OF THE BRANCH MAIN IS REQUIRED FOR ALL SWEEPS. IF THE 2.5 TIMES THE I.D. OF THE BRANCH CAN'T BE MET, A LARGER DIAMETER MANHOLE SHALL BE REQUIRED. SEE DETAIL SHEET 9-3.
4. MANHOLE PIPE CONNECTOR SHALL BE A RESILIENT WATER TIGHT SEAL.



NOTES:

1. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPE OF FENCE SECTIONS AND METHODS OF INSTALLATION.
2. SWING GATES SHALL BE CONSTRUCTED WITH DROP RODS, LATCH ASSEMBLY AND GATE KEEPERS EXCEPT AS NOTED.
3. ALL GATE FRAMES SHALL BE A MINIMUM 1.90" NOMINAL (ROUND) OR 2.00" NOMINAL (SQUARE). GATE FRAMES SHALL BE OF WELDED CONSTRUCTION OR SHALL BE ASSEMBLED USING HEAVY FITTINGS. AT CONTRACTOR'S OPTION A WELDED HORIZONTAL BRACE MAY BE USED IN LIEU OF TRUSS RODS TO BRACE ALL WELDED GATE FRAMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER RIGID CONSTRUCTION OF ALL GATES SUPPLIED.

CHAIN LINK FENCE DETAIL
N.T.S.



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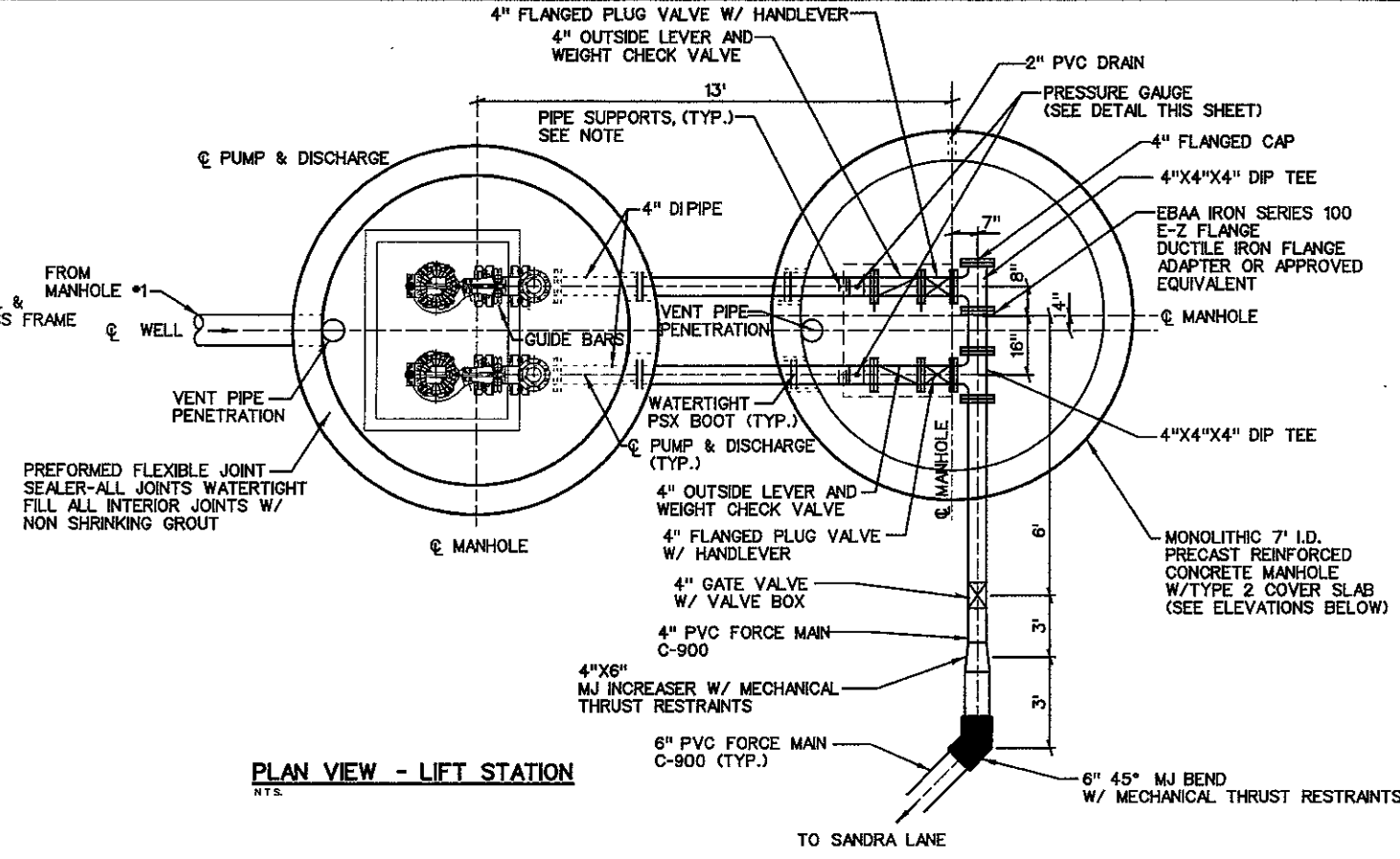
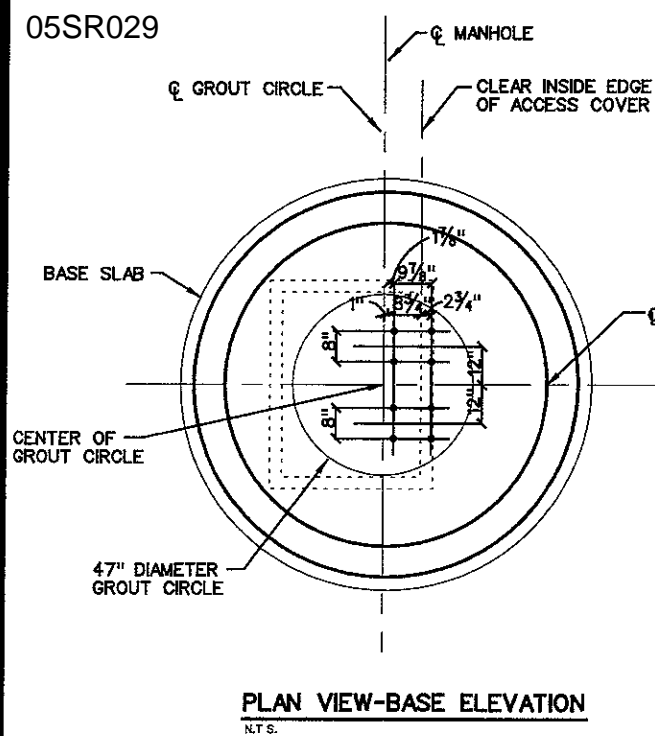
LAZY P-6 DEVELOPMENT
LIFT STATION

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AAE Project No.: 04-1053
File Name: 1053DET04.DGN
Revisions:

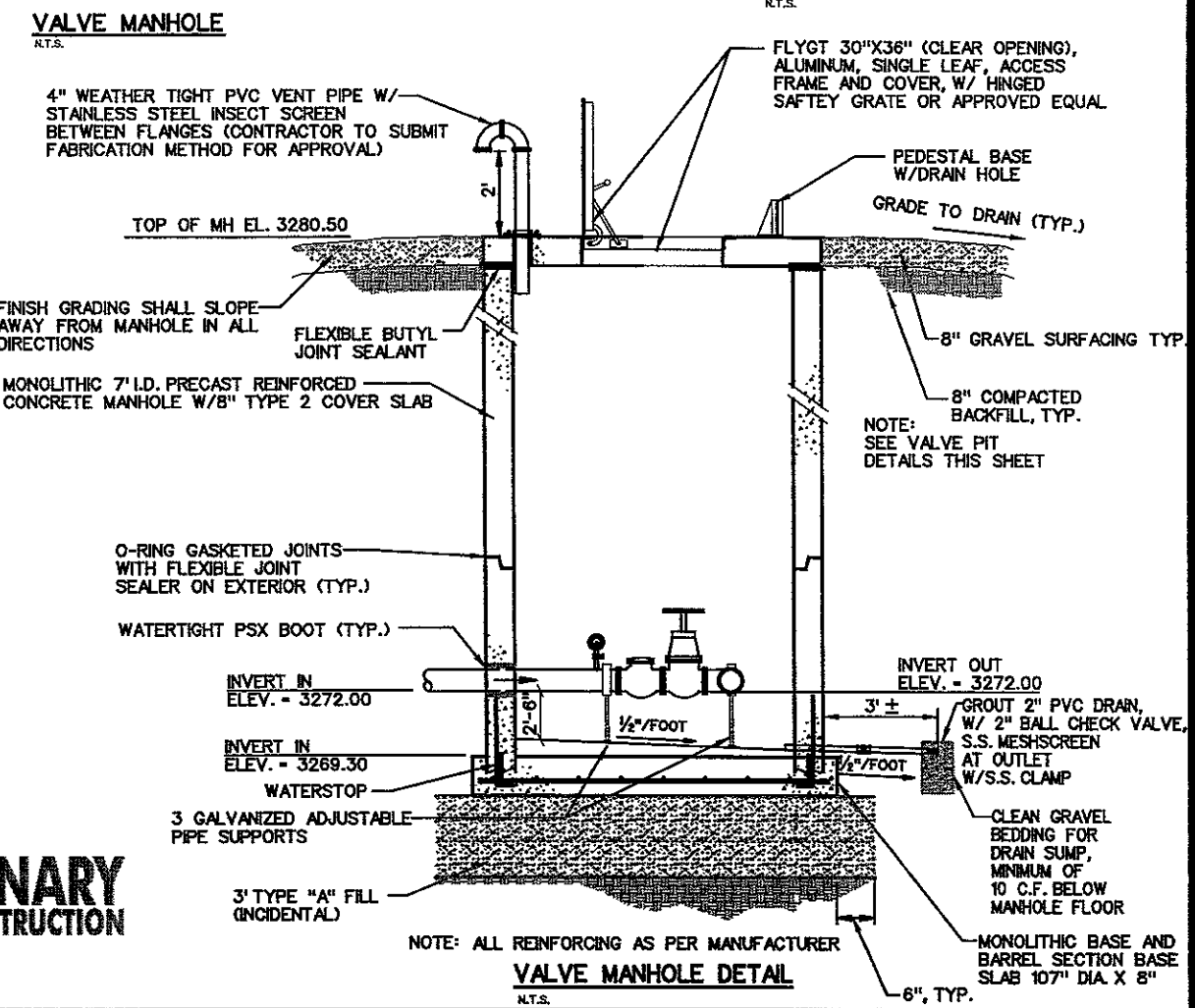
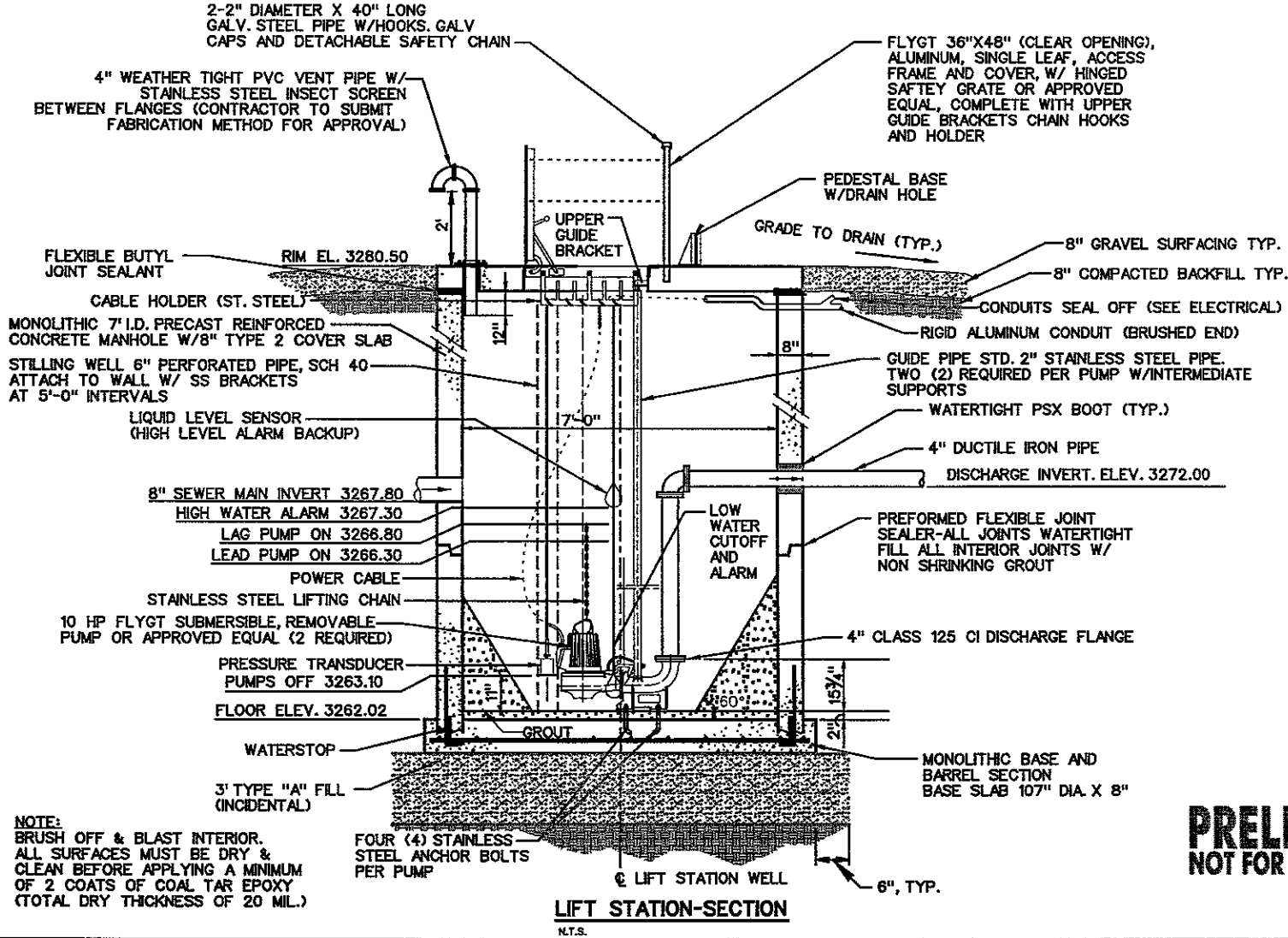
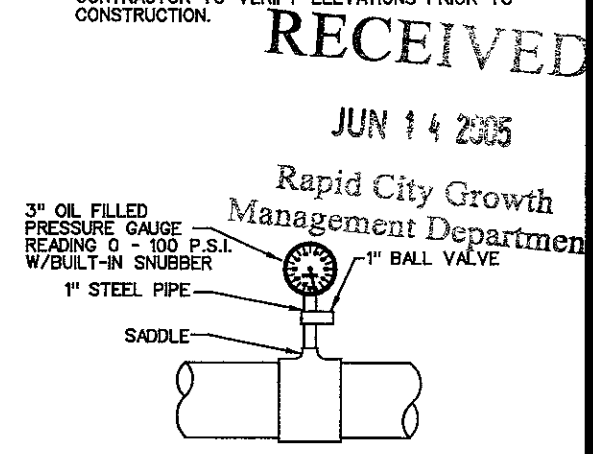
JUN 14 2005

Rapid City, South Dakota
Rapid City Sewer Management Department

DETAILS



NOTES:
LIQUID LEVEL SENSOR CONDUCTORS & PUMP POWER CABLES SHALL BE CONTINUOUS (WITHOUT SPLICES) FROM LIFT STATION TERMINATIONS TO CONTROL PANEL ENCLOSURE.
PUMPS ALTERNATE LEAD-LAG SEQUENCE.
AT ALL LOCATIONS WHERE PIPE ENTERS OR EXITS THE LIFT STATION OR VALVE PIT, WATERTIGHT PSX RUBBER BOOTS SHALL BE INSTALLED TO PREVENT INFILTRATION.
CONTRACTOR SHALL SUPPLY AND INSTALL GALVANIZED, ADJUSTABLE PIPE SUPPORTS TO SUPPORT 400 LBS TOTAL, SPACED AS APPROVED BY THE ENGINEER (3 MINIMUM).
CONTRACTOR TO VERIFY ELEVATIONS PRIOR TO CONSTRUCTION.



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LIFT STATION AND VALVE MANHOLE DETAILS

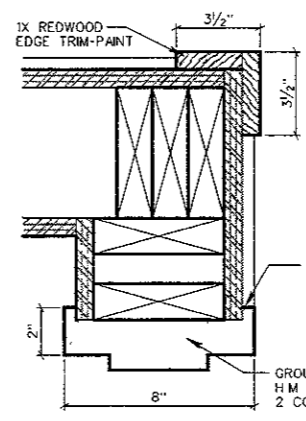
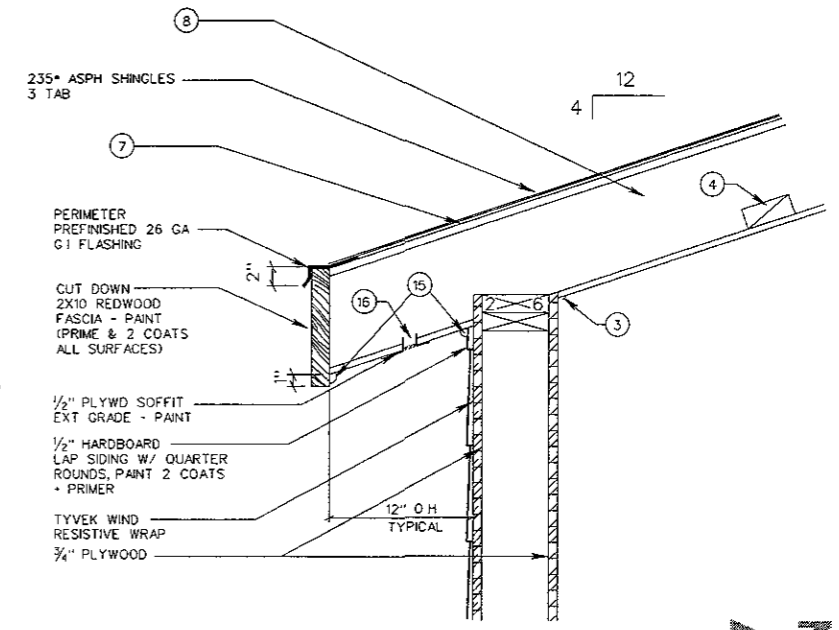
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SAM	SAM
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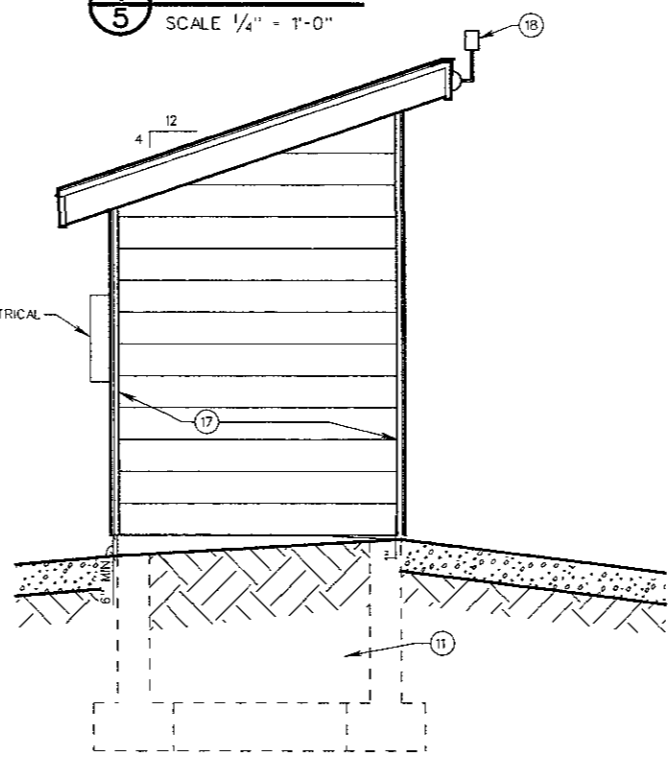
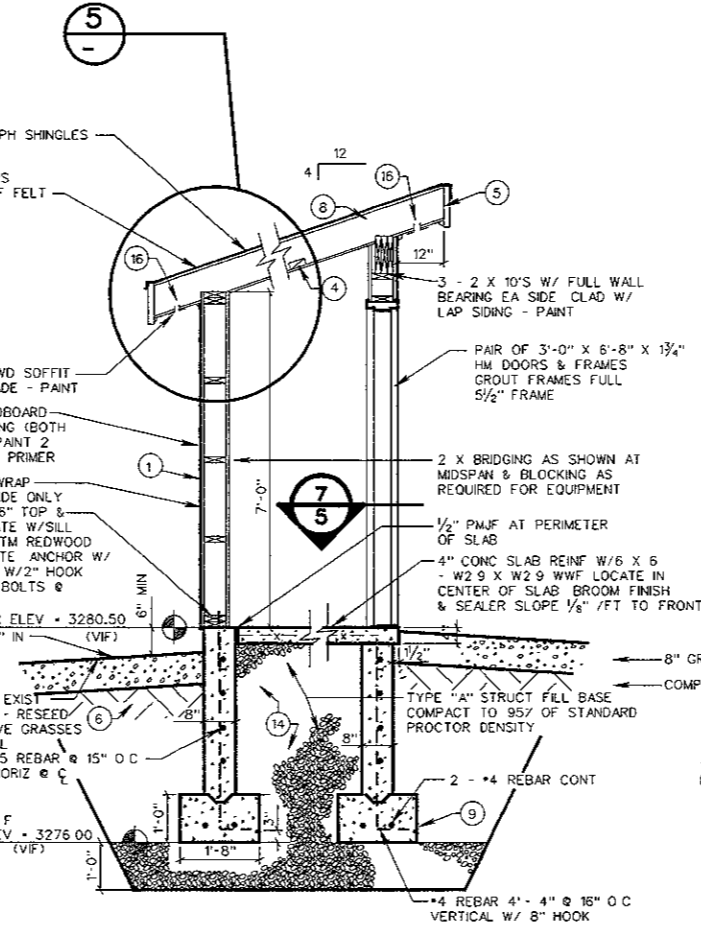
5 SOFFIT DETAIL
SCALE: 3/4" = 1'-0"



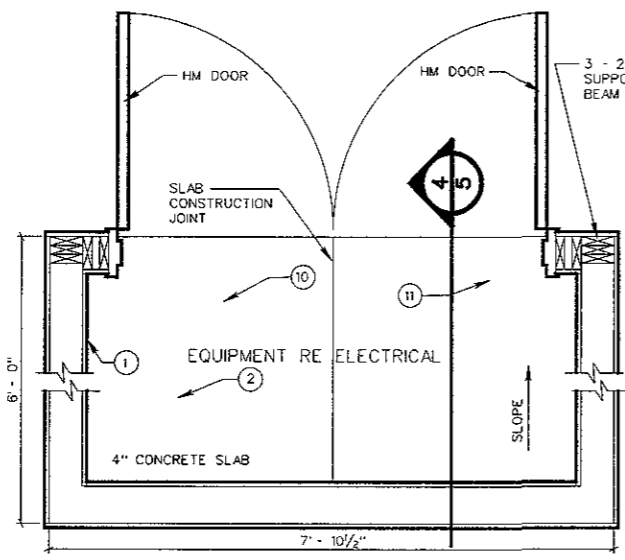
7 JAMB DETAIL
SCALE: 1 1/2" = 1'-0"
ANCHOR INTO STUD WALL

6 SILL DETAIL
SCALE: N T S

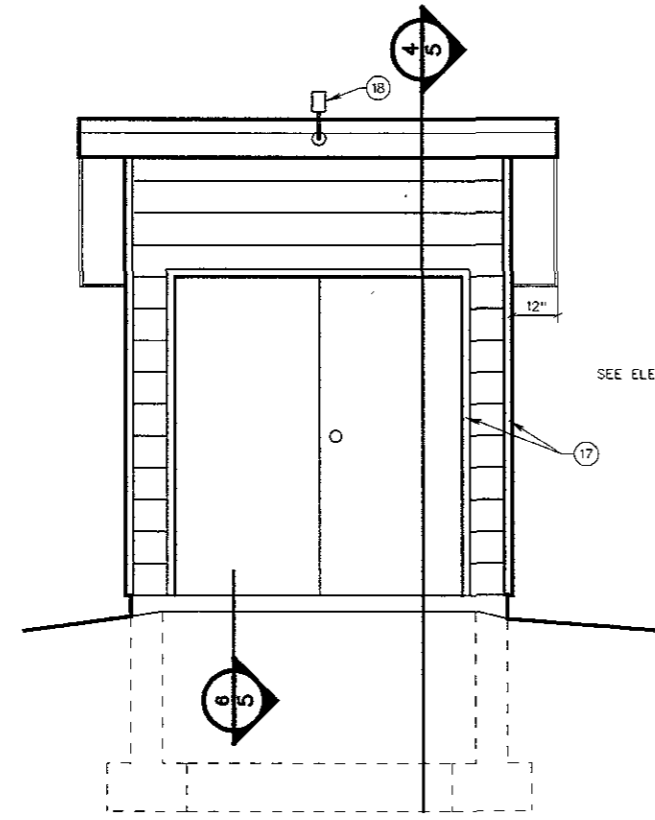
4 SECTION
SCALE: 1/4" = 1'-0"



3 SIDE ELEVATION
SCALE: 1/4" = 1'-0"



1 ELECTRICAL SHELTER PLAN
SCALE: 3/8" = 1'-0"
EXACT LOCATION VIF W/ENGINEER RE-SHEET ?



2 FRONT ELEVATION
SCALE: 1/4" = 1'-0" (W/O DOORS SHOWN)

NOTES:

- 2X6 STUDS AT 16" O.C WITH 1/4" EXTERIOR GRADE PLYWOOD SHEATHING BOTH SIDES WALL FRAMING SHALL BE SPRUCE - PINE - FIR WITH F8 - 1000 PSI, E - 1300 PSI. PROVIDE SEASONED LUMBER WITH 19% MAXIMUM MOISTURE AT TIME OF DRESSING AND SHIPMENT
- THIS PROJECT SHALL NOT CONTAIN ASBESTOS OR PCB'S
- CONTINUOUS BEAD SEALANT.
- 2X4 ON EDGE BETWEEN 2X8'S
- CUT DOWN 2X10 REDWOOD FASCIA - PAINT
- CONFORM TO OSHA REQUIREMENTS FOR EXCAVATION
- CDX STRUCTURAL II PLYWOOD (5/8" SHEATHING PANELS OVER ROOF TRUSSES AND 2 LAYERS OF 15° FELT
- 2X8'S AT 12' O.C, NOTCH AT WALLS & BEAMS AS SHOWN
- CONCRETE STRENGTH SHALL BE 4000 PSI SLUMP SHALL BE FROM 2" TO 4" CONCRETE SHALL NOT BE SUBJECT TO FREEZING AND THAWING SHALL HAVE 4% TO 6% ENTRAINED AIR ALL OTHER CONCRETE SHALL HAVE 2% TO 4% ENTRAINED AIR. ALL CONCRETE SHALL BE PROTECTED FROM COLD OR HOT WEATHER IN ACCORDANCE TO AMERICAN CONCRETE INSTITUTE (ACI) RECOMMENDATIONS SLAB ON GRADE CONTROL JOINTS SHALL BE SAW CUT OR TOOLED 1/4 THE DEPTH OF THE 4" SLAB AND AS SOON AFTER FINISHING AS POSSIBLE APPLY SEALER TO CONCRETE BROOM FINISH SLOPE TO EXTERIOR AT 1/8" IN 1 FT
- CONFORM TO LATEST APPLICABLE IBC CODES.
- ASSUMED SOIL BEARING CAPACITY TO BE 2000 PSF
- REINFORCING STEEL SHALL BE ASTM A615 GRADE 60 SPLICES SHALL BE LAPPED A MINIMUM OF 24 BAR DIAMETERS AT CORNERS OF FOOTINGS AND WALLS PROVIDE L SHAPED BARS WITH 24 BAR DIAMETERS FOR EACH LEG.
- CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION METHODS AND SAFETY PRECAUTIONS DURING THE WORK ON THIS PROJECT CONFORM TO ALL APPLICABLE MECHANICAL AND ELECTRICAL CODES PROTECT FINISH WORK AS NECESSARY
- BACK FILLING AND STRUCTURAL FILL**
BACKFILL AREAS TO CONTOURS AND ELEVATIONS WITH UNFROZEN MATERIALS DO NOT BACKFILL OVER POROUS, WET, FROZEN OR SPONGY SUBGRADE SURFACES. TYPE "A" GRANULAR FILL PLACE AND COMPACT MATERIALS IN CONTINUOUS LAYERS NOT EXCEEDING 8" COMPACTED DEPTH TYPE "B" SOIL FILL PLACE AND COMPACT MATERIAL ON CONTINUOUS LAYERS NOT EXCEEDING 8" COMPACTED DEPTH
USE TYPE "A" FILL, PLACE 1' BELOW FOOTINGS TO 95% (STANDARD PROCTOR DENSITY), AS SHOWN (INCIDENTAL TO ELECTRICAL SHELTER)
USE SUBSOIL TYPE "B" FILL, TO SUBGRADE ELEVATION, EACH LIFT COMPACTED TO 95% FOR FOUNDATION WALLS, AND AROUND STRUCTURE
USE A PLACEMENT METHOD THAT DOES NOT DISTURB OR DAMAGE NEW UTILITIES IN TRENCHES VERIFY FILL MATERIALS TO BE REUSED ARE ACCEPTABLE WITH A/E PROVIDE SOILS TEST TO VERIFY CONFORMANCE TO DESIGN REQUIREMENTS MAINTAIN OPTIMUM MOISTURE CONTENT OF BACKFILL MATERIALS TO ATTAIN REQUIRED COMPACTION DENSITY BACKFILL SIMULTANEOUSLY ON EACH SIDE OF UNSUPPORTED FOUNDATION WALLS SLOPE GRADE AWAY FROM BUILDING MINIMUM 1 INCH IN 1 FOOT OR AS SHOWN
SAMPLES SUBMIT 10 LB SAMPLE OF EACH TYPE OF FILL TO TESTING LABORATORY, IN AIR-TIGHT CONTAINERS - FOR WRITTEN APPROVAL BY TESTING LAB
TESTS AND ANALYSIS OF FILL MATERIAL TO BE PERFORMED IN ACCORDANCE WITH ANSI/ASTM D698 IF TESTS INDICATE WORK DOES NOT MEET SPECIFIED REQUIREMENTS REMOVE WORK, REPLACE AND RETEST AT NO COST TO OWNER
- FILL MATERIALS**
TYPE A - GRAVEL PIT RUN, NATURAL STONE, FREE OF SHALE, CLAY, FRIABLE MATERIAL, AND DEBRIS. GRADED IN ACCORDANCE WITH ANSI/ASTM C136 WITHIN THE FOLLOWING LIMITS

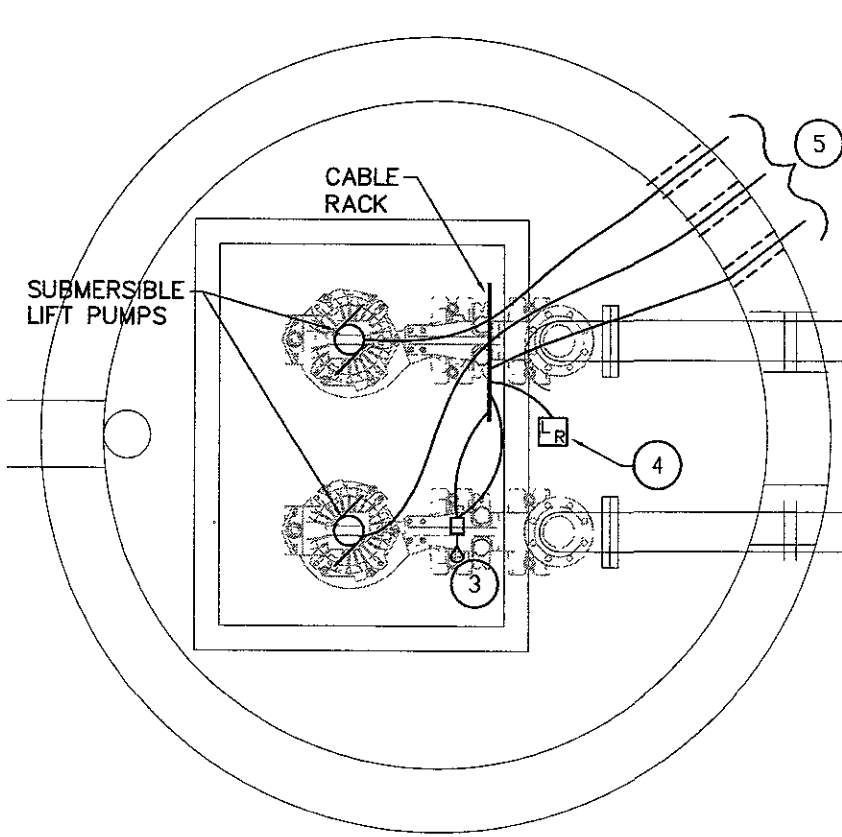
SIEVE SIZE	PERCENT PASSING
2 INCHES	100
1 INCH	95
3/4 INCH	95 TO 100
3/8 INCH	75 TO 100
3/16 INCH	55 TO 85
NO 4	35 TO 60
NO 10	15 TO 35
NO 20	10 TO 25
NO 40	5 TO 10

 TYPE B - SUBSOIL REUSED EXISTING MATERIAL SCREENED 3/4 MINUS AND CLEAN OF DEBRIS AS APPROVED BY A/E. COMPACT TO 95% SPD AND USED AROUND THE PERIMETER OF FOUNDATION WALLS
 CONTRACTOR TO EMPLOY AND PAY FOR AN INDEPENDENT TESTING AGENCY TO TEST AND APPROVE SOILS MAKEUP (TYPE A AND B) AND APPROVE THE SUITABILITY OF SAME AGENCY SHALL TEST SAMPLES AND VERIFY THE COMPACTION RESULTS AS HEREIN SPECIFIED FOR A/E REVIEW
 SEE ELEC FOR UTILITY CONNECTIONS TO STRUCTURE & EQUIPMENT
- QUARTER ROUND CONTINUOUS TRIM - PAINT (PRIME AND 2 COATS)
- PREFINISHED 3" SOFFIT VENT 3" CONT (PLASTIC OR METAL) EAVE VENT ON FRONT & REAR OVERHANG @ 2'-0" O.C
- SIDING - CORNER TRIM - LAP SIDING CORNER TRIM TYP ALL CORNERS - PAINT (PRIME AND 2 COATS)
- RED LIGHT AS PER SPECS

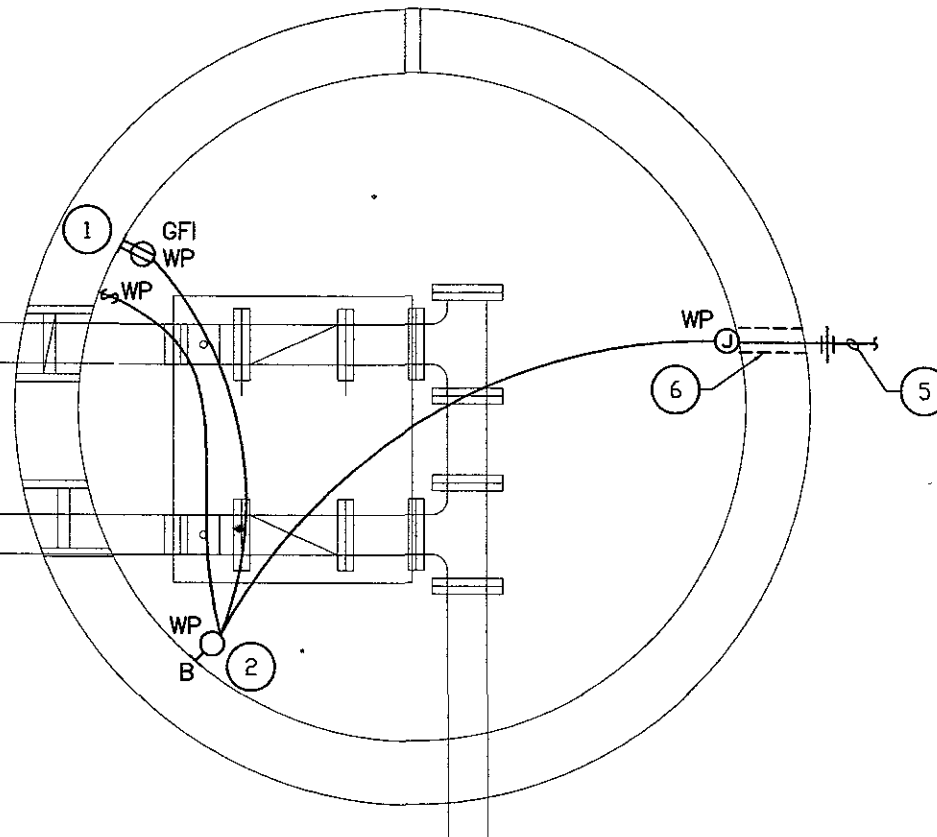
DOOR NOTES:

- DOORS TO BE: PAIR
3'-0" X 6'-8" X 1 1/4" INSULATED
HM DOOR & FRAME BY
NORTH CENTRAL SUPPLY OR EQ
SDI-100, GRADE III MODELS 2 & 3
W/ RUBBER SILENCERS
- DOOR TO HAVE:
6 HINGES, CB1900 4 5x4 5 US10 x NRP STANLEY
1 LOCKSET, MATCH EXISTING DEPARTMENT KEYED ALIKE (V.I.F.)
1 CYLINDER, MATCH EXISTING DEPARTMENT LOCKSET
1 DOOR STOP, 1201ES 612 TRIMCO
1 THRESHOLD, ALUMINUM - 1/2" HT
1 DOOR SWEEP, 180620P x LAR
1 WEATHERSTRIP, 588D HEAD & JAMBS PEMCO

05SR029



PLAN VIEW - LIFT STATION SUMP
SCALE: 1/2" = 1'-0"



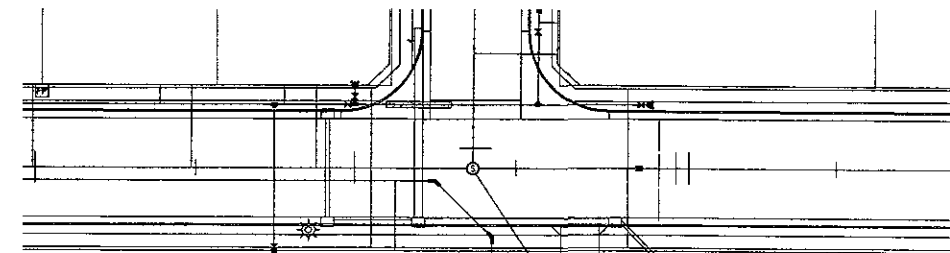
PLAN VIEW - VALVE MANHOLE
SCALE: 1/2" = 1'-0"

MISCELLANEOUS ELECTRICAL NOTES:

- A. SEE SPECIFICATIONS FOR MATERIALS AND METHODS.
- B. ALL EXTERIOR ELECTRICAL EQUIPMENT SHALL HAVE A MINIMUM RATING OF NEMA 3R, AND HIGHER AS NOTED.
- C. ALL CONDUIT BETWEEN THE PUMP CONTROL PANEL AND THE LIFT STATION SUMP AND VALVE MANHOLE SHALL BE PLASTIC COATED STEEL. PROVIDE SEAL OFF'S AT THE MAIN CONTROL PANEL FOR CONDUITS EXTENDING TO THE LIFT STATION SUMP, AS SHOWN.

SPECIFIC ELECTRICAL NOTES: #

- 1. PROVIDE WP/GFI RECEPTACLE. (2 SUCH)
- 2. FIXTURE TYPE "B" SHALL BE A WALL MOUNTED VAPOR TIGHT INCANDESCENT FIXTURE WITH (1) 100 WATT LAMP, EQUIVALENT TO HUBBELL #VWX-152, WITH GLOBE GUARD. PROVIDE INTEGRAL WALL BOX.
- 3. REDUNDANT HIGH LEVEL FLOAT SWITCH.
- 4. SUBMERSIBLE LEVEL SENSOR/TRANSDUCER HEAD, MOUNTED INSIDE SUMP STILLING WELL.
- 5. EXTEND CONDUIT AND WIRE TO PUMP CONTROL PANEL.
- 6. GROUT AND SEAL CONDUIT PENETRATIONS WATERTIGHT.



ELECTRICAL ENCLOSURE
GENERATOR

ELECTRICAL SITE PLAN
SCALE: 1" = 60'-0"

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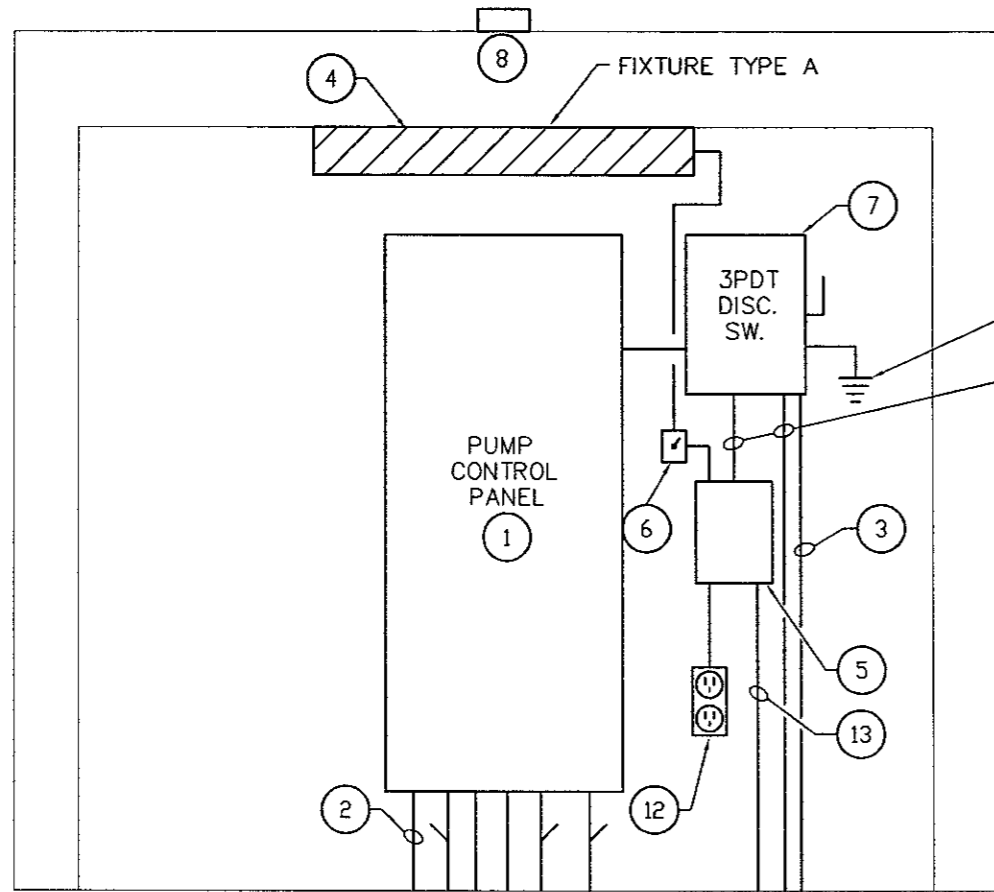
WPE WEST PLAINS ENGINEERING
CONSULTING ENGINEERS
1750 RAND ROAD - RAPID CITY, SD 57702
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**LAZY P6 DEVELOPMENT
LIFT STATION
RAPID CITY,
SOUTH DAKOTA**

Scale:	AS NOTED
Designed By:	Drawn By:
SAH	VLS
Design Date:	Print Date:
06-10-2005	06-10-2005
WPE Project No.:	
R05016	
File Name:	
R05016E1-E4	
Submitted for Review:	

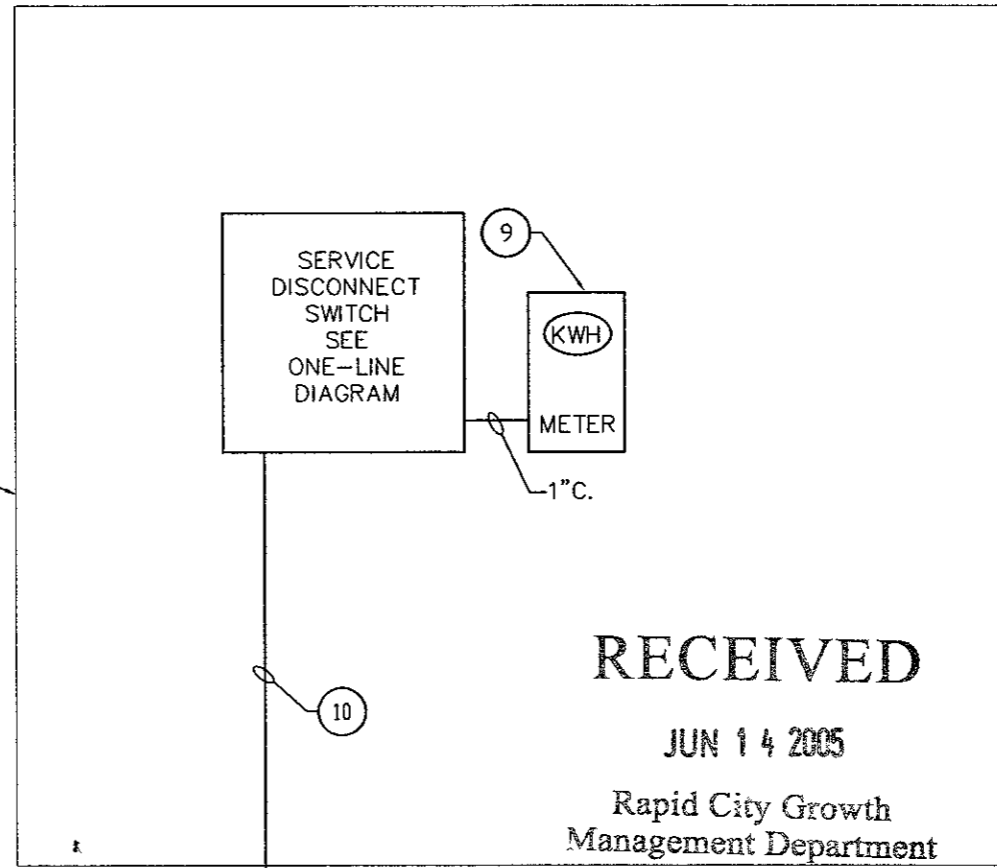
**ELECTRICAL
PLANS**



1-1/2" C W/ SEALOFF FOR SUMP CONTROL CABLES
 (1) 1" C. TO VALVE MANHOLE

(2) 1-1/2" C W/ SEALOFFS TO SEWAGE LIFT PUMPS. PULL IN SUBMERSIBLE CABLES FROM PUMPS.

FRONT (PROTECTED)



BACK

LIFT STATION ELECTRICAL ENCLOSURE ELEVATIONS
 SCALE: 1/2" = 1'-0"

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MISCELLANEOUS ELECTRICAL NOTES:

- A. SEE SPECIFICATIONS FOR MATERIALS AND METHODS. ALL PUMP CONTROLS AND PUMP CONTROLLER IS FURNISHED BY OTHERS, INSTALLED AND WIRED BY THIS CONTRACTOR. START UP BY CONTROLS SUPPLIER. PROVIDE AND TERMINATE ALL WIRING AS REQUIRED. SUBMERSIBLE CABLES ARE FURNISHED BY OTHERS AND SHALL BE PULLED IN CONDUIT (UNSPliced) TO CONTROLLER.
- B. ALL EXTERIOR ELECTRICAL EQUIPMENT SHALL HAVE A MINIMUM RATING OF NEMA 3R, AND HIGHER AS NOTED.
- C. ALL CONDUIT BETWEEN THE PUMP CONTROL PANEL AND THE LIFT STATION SUMP AND VALVE MANHOLE SHALL BE PLASTIC COATED STEEL. PROVIDE SEAL OFFS AT THE MAIN CONTROL PANEL FOR CONDUITS EXTENDING TO THE LIFT STATION SUMP, AS SHOWN.

SPECIFIC ELECTRICAL NOTES: (#)

- 1. PUMP CONTROL PANEL FURNISHED BY OTHERS, INSTALLED AND WIRED BY THIS CONTRACTOR. ALL PUMP POWER CABLES AND LEVEL CONTROL CABLES SHALL BE RUN UNSPLICED FROM THE LIFT STATION SUMP TO THE CONTROL PANEL AND TERMINATED AS REQUIRED.

- 2. PROVIDE 12" SQUARE BY 6" DEEP, NEMA 4 ENCLOSURE FOR TELEPHONE SERVICE TERMINATION. PROVIDE 2" PVC CONDUIT UNDERGROUND TO 5' BEYOND PROTECTIVE ENCLOSURE. COORDINATE WITH QWEST.
- 3. PROVIDE 4 - #12 CU. IN 3/4 INCH CONDUIT TO GENERATOR (FOR START CONTROL SIGNAL).
- 4. FIXTURE TYPE 'A' SHALL BE SURFACE MOUNTED FLUORESCENT GASKETED FIXTURE WITH 2/F32T8 LAMPS AND ELECTRONIC BALLAST. EQUIVALENT TO WILLIAMS #8622-A-DR, WITH 0°F RATED BALLAST SUITABLE FOR OUTDOOR OPERATION.
- 5. PROVIDE 7.5KVA PACKAGE POWER SUPPLY IN WEATHER-RESISTANT ENCLOSURE, TO PROVIDE 120V POWER FOR LIGHTS, RECEPTACLES, CONTROLS, ETC.
- 6. PROVIDE 20AMP, SINGLE POLE WEATHERPROOF SWITCH TO CONTROL TYPE 'A' LIGHT FIXTURE.
- 7. AUTO TRANSFER SWITCH IN NEMA 3R ENCLOSURE. SEE ONE-LINE DIAGRAM.

- 8. PROVIDE RED ALARM LIGHT EQUAL TO RAB MODEL VA100DG WITH GL100R. PROVIDE 100 WATT, 130V LAMP. PROVIDE WIRING TO CONTROL PANEL AS REQUIRED.
- 9. PROVIDE NEMA 3R METER BASE PER UTILITY REQUIREMENTS. METER BY UTILITY. COORDINATE WITH BHP.
- 10. SECONDARY BY UTILITY. SEE ONE-LINE DIAGRAM.
- 11. 4-SIDED PROTECTIVE ENCLOSURE WITH SHED ROOF, BY GENERAL CONTRACTOR.
- 12. PROVIDE WP/GFI RECEPTACLE. (2 SUCH).
- 13. PROVIDE 3 - #10 CU. IN 3/4" CONDUIT TO GENERATOR (FOR MISCELLANEOUS 120V REQUIREMENTS).

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LAZY P6 DEVELOPMENT
 LIFT STATION
 RAPID CITY,
 SOUTH DAKOTA

Scale:	AS NOTED
Designed By:	SAH
Drawn By:	VLS
Design Date:	06-10-2005
Print Date:	06-10-2005
WPE Project No.:	R05016
File Name:	R05016E1-E4
Submitted for Review:	

ELECTRICAL
 ELEVATIONS

PANEL P		VOLTS: 120/240		PHASE: 1		WIRE: 3		MAIN CAP. 40		AMPERES				
		MOUNTING: SURFACE		FEEDER SIZE: SEE ONE-LINE DIAGRAM				MAIN CONNECTION: MCB						
CCT NO	ITEM FED	DISTRIBUTION WATTS	WIRE SIZE	CIRCUIT BREAKER AMPS	POLES	FRAME	NEUTRAL	CIRCUIT BREAKER FRAME	POLES	AMPS	WIRE SIZE	DISTRIBUTION WATTS	ITEM FED	CCT NO
1	SPARE	-	-	20	1	-	L1	-	1	20	12	300	LIGHTING/RECEPACLE	2
3	SPARE	-	-	20	1	-	L2	-	1	30	10	2900	GENERATOR MISC. POWER	4
5	SPACE	-	-	-	-	-	L1	-	1	20	-	-	SPACE	6
7	SPACE	-	-	-	-	-	L2	-	1	20	-	-	SPACE	8
9	SPACE	-	-	-	-	-	L1	-	-	-	-	-	SPACE	10

APPROXIMATE CONNECTED LOAD
 L1 1 KW
 L2 3 KW

ELECTRICAL SYMBOLS

THESE SYMBOLS COMPRISE A STANDARD LIST; NOT ALL SYMBOLS MAY APPEAR ON THIS PROJECT.

	WALL FIXTURE		MOTOR THERMAL SWITCH
	POLE LIGHT FIXTURE		TRANSFORMER
	SINGLE POLE SWITCH		GROUND
	LOADCENTER OR ELECTRICAL PANEL		CONDUIT IN WALL OR CEILING SPACE, CROSS MARKS INDICATE NUMBER OF WIRES, NO MARKS INDICATE TWO WIRES. ARROWS INDICATE HOME RUNS TO PANEL. NUMBERS INDICATE PANEL AND CIRCUIT IN PANEL.
	SPECIAL PURPOSE OUTLET OR CONNECTION		SWITCHLEG
	JUNCTION BOX		TRAVELER
	MOTOR CONNECTION		NEUTRAL WIRE
	DISCONNECT SWITCH		HOT
	COMBINATION STARTER/DISCONNECT		INDICATES SEPARATE GROUND WIRE TO BE INSTALLED IN RACEWAY

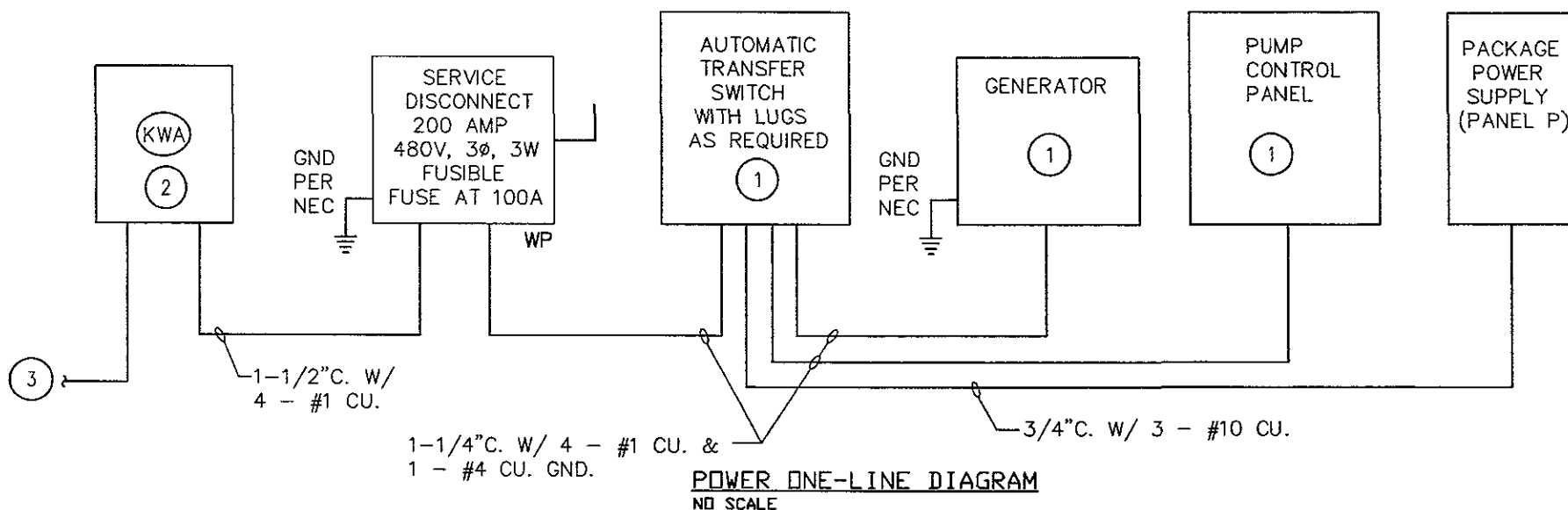
ABBREVIATIONS

A STANDARD LIST. NOT ALL WORDS APPEAR IN THESE DRAWINGS.

A or AMP	AMPERE	LT.	LIGHT
C. or COND.	CONDUIT	LTG.	LIGHTING
CB or C/B	CIRCUIT BREAKER	N.E.C.	NATIONAL ELECTRIC CODE
CCT	CIRCUIT	NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
CU	COPPER	NEUT.	NEUTRAL
DISC.	DISCONNECT	PH.	PHASE
E.C.	ELECTRICAL CONTRACTOR	PVC	PLASTIC CONDUIT
EM	EMERGENCY	PWR.	POWER
EMT	ELECTRICAL METALLIC TUBING	REC or RECEPT	RECEPTACLE
G.C.	GENERAL CONTRACTOR	TR. or TRANS.	TRANSFORMER
GEN.	GENERATOR	U.G.	UNDERGROUND
GND or GRND	GROUND	V	VOLT
HZ	HERTZ (CYCLES)	W.	WATT or WIRE
JB	JUNCTION BOX	W/	WITH
KCMIL	THOUSAND CIRCULAR MIL	WP	WEATHERPROOF
KV	KILOVOLT	Y	WYE Connected
KVA	KILOVOLT-AMPERE	φ	PHASE
KW	KILOWATT		

SPECIFIC NOTES:

- SEE PLANS FOR ADDITIONAL REQUIREMENTS. ALL EQUIPMENT SHALL BE NEMA 3R.
- COORDINATE ALL REQUIREMENTS WITH UTILITY (BHP). PROVIDE METER SOCKET PER UTILITY REQUIREMENTS. CONTACT: GREG, BHP AT 721-2223.
- SECONDARY SERVICE WIRE BY UTILITY. ELECTRICAL CONTRACTOR SHALL PROVIDE TRENCH PER UTILITY REQUIREMENTS. COORDINATE WITH UTILITY (BHP).



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LAZY P6 DEVELOPMENT
 LIFT STATION
 RAPID CITY,
 SOUTH DAKOTA

Scale: AS NOTED
 Designed By: SAH
 Drawn By: VLS
 Design Date: 06-10-2005
 Print Date: 06-10-2005
 WPE Project No.: R05016
 File Name: R05016E1-E4
 Submitted for Review:

ELECTRICAL PANEL, DIAGRAM,
 AND SYMBOLS

ELECTRICAL SPECIFICATIONS

DRAWINGS AND MEASUREMENTS: The drawings are not intended to be scaled for roughing-in measurements nor to serve as shop drawings. The Contractor shall consult existing conditions and equipment drawings for dimensions, obstructions and locations of equipment.

ORDINANCES AND CODES: All work shall be executed in accordance with the current edition of the City Electrical Ordinances, OSHA, State Electrical Laws and Statutes and National Electrical Code (NEC) and be subject to the inspection of these departments.

WORKMANSHIP: The installation work included in this specification shall be performed in a neat workmanlike manner by men experienced and skilled in the Electrical trade. Only the best quality workmanship will be accepted.

GUARANTEE: This Contractor shall assume responsibility for any defects which may develop in any part of his work caused by faulty workmanship, material or equipment, and agrees to replace, repair, or alter, at his expense, any such faulty workmanship, material or equipment that has been brought to his attention during a period of one year from the date of the final certificate for payment.

QUALITY ASSURANCE: All materials and equipment shall be new and of best quality, of the type best suited for the purpose intended, and be made by nationally recognized and substantially established manufacturers.

EQUIPMENT IDENTIFICATION AND CLEARANCE: All electrical equipment shall be provided with identification indicating its use or function. Equipment to be identified shall include panelboards, special panels, motor starters, special control switches, special receptacles, junction boxes and empty conduits provided for future use.

RACEWAY: All wiring shall be installed in raceway, rigid metal conduit, flexible metal conduit, or PVC. Heavy wall, galvanized steel, or intermediate steel conduit shall be used in all runs where required for mechanical protection.

RACEWAY FITTINGS: Where rigid conduit is connected to a threaded box, double locknut method shall be used. All conduit fittings shall be of steel construction.

RACEWAY INSTALLATIONS: Conduits shall be sized as noted or as required by NEC for number and size of conductors installed. Each shall be minimum size for branch circuit homeruns. All conduit and raceways shall be securely positioned by galvanized steel straps, clamps, and hangers with suitable fasteners.

WIRE AND CABLE: All wire and cable for feeder and branch circuits shall conform to the requirements of the current edition of the NEC and shall meet all relevant ASTM Specifications. Conductors shall be 600 volt rated, coated soft-drawn copper and unsoft-drawn copper unless otherwise noted.

CONNECTIONS TO SPECIAL EQUIPMENT: Special equipment is hereby defined as all equipment that is not specified under this contract, but requires connections by this Contractor, as indicated on the drawings. Such connections shall be performed by this Contractor.

PULL BOXES AND JUNCTION BOXES: Pull boxes and junction boxes are generally not indicated on drawings except for special requirements. This Contractor shall install pull boxes or junction boxes as required to facilitate wire pulling.

OUTLET BOXES: Outlet boxes shall be at least 1-1/2 inches deep, or gong style type of size to accommodate devices noted. Outlet boxes on exposed conduit runs in unfinished areas and equipment rooms shall be 4 inch square.

SAFETY SWITCHES: Shall be heavy duty 600 volt, quick-make, quick-break operation, horsepower rated, NEMA-1 enclosure non-fused unless noted fused, and of the size shown on the drawings or as required by code.

FUSES: All motors shall be protected by dual-element fuses able to carry 500% of rating for a minimum of 10 seconds, and sized at 125% of the actual name plate ampere rating.

EMERGENCY GENERATOR NATURAL GAS (30KWH):

The generator covered by these specifications shall be designed, tested, rated, assembled and installed in strict accordance with all applicable standards of ANSI, NEC, ISD, U.L., IEEE and NEMA. The work includes supplying and installing a complete integrated emergency generator system to provide an alternate source of power to the lift station in the event of a utility outage.

The equipment supplied and installed shall meet the requirements of the NEC and all applicable local codes and regulations. All equipment shall be of new and current production by a Manufacturer who has 20 years of experience building this type of equipment.

Proposed deviations from the specifications shall be treated as follows: The emergency power system has been designed to the specified manufacturer's electrical and physical characteristics. The equipment sizing, spacing, amounts, electrical wiring, ventilation equipment, fuel and exhaust components have all been sized and designed around Caterpillar equipment.

Submittals: 6 copies of engine-generator shop drawing submittals shall include the following information: 1) Factory published specification sheet indicating standard and optional accessories, ratings, etc. 2) Manufacturer's catalog cut sheets of all auxiliary components such as isolators, battery charger, silencer, exhaust flex, main circuit breaker, etc.

The automatic transfer switch specified in another section shall be supplied by the engine-generator manufacturer in order to establish and maintain a single source of system responsibility and coordination.

The manufacturer's standard warranty shall in no event be for a period of less than two (2) year from date of initial start-up of the system and shall include repair parts, labor, reasonable travel expense necessary for repairs at the job site, and expendables (lubricating oil, filters, antifreeze, and other service items made unusable by the defect) used during the course of repair.

The generator set shall be standby rated at 30 kW, 37.5 kVA, 1800 RPM, 0.91 power factor, 480 VAC, 3 phase, 3 wire, 60 hertz, including radiator fan and all parasitic loads. Shall be equal to Caterpillar/Olypan model G30F3 with weatherproof enclosure model GAMB (including critical silencer). Entire system shall be equipped and rated for exterior use in applicable climate.

Provide a weatherproof enclosure, designed to allow for full load operation of the engine generator system and all of its accessories at a full load sound level of 75 dBA at 7 meters, sized for the exact unit being supplied. The enclosure shall be sized and equipped with adequate doors for ease of inspection and servicing.

The synchronous three phase generator shall be a single bearing, self-ventilated, drip-proof design in accordance with NEMA MG 1 and directly connected to the engine flywheel housing with a flex coupling. The automatic voltage regulator (AVR) shall maintain generator output voltage within +/- 0.5% for any constant load between no load and full load.

Provide a generator mounted circuit breaker, molded case or insulated case construction, 100 amp trip, 3 pole, NEMA 1P22.

Provide a generator mounted control panel for complete control and monitoring of the engine and generator set functions. Panel shall include automatic start/stop operation; adjustable cycle cranking, analog AC metering (0.5% true rms accuracy) with phase selector switch, shutdown sensors and alarms with horn and reset, adjustable cooldown timer and emergency stop push-button.

A critical type silencer, companion flanges, and flexible stainless steel exhaust fitting properly sized shall be furnished and installed according to the manufacturer's recommendation. Mounting shall be provided by the contractor as shown on the drawings.

A unit mounted thermal circulation type water heater. The heater Watt rating shall be sized by the manufacturer to maintain jacket water temperature at 90 degrees F, and shall be a 120 volt, single phase, 60 hertz.

Start up and Testing: 1) Coordinate all start-up and testing activities with the Engineer and Owner. 2) After installation is complete and normal power is available, the manufacturer's local dealer shall perform the following: a) Verify that the equipment is installed properly.

Provide four (4) sets of operation and maintenance manuals covering the generator, switchgear, and auxiliary components. Include parts manuals, final as-built wiring interconnect diagrams and recommended preventative maintenance schedules.

Provide one day of on-site training to instruct the owner's personnel in the proper operation and maintenance of the equipment. Review operation and maintenance manuals, parts manuals, and emergency service procedures

Automatic Transfer Switch:

Furnish and install automatic transfer switches (ATS) with number of poles, amperage, voltage, withstand and close-on ratings as shown on the plans. Each automatic transfer switch shall consist of an inherently double throw power transfer switch mechanism and a microprocessor controller to provide automatic operation.

- A. UL 1008 - Standard for Transfer Switch Equipment
B. IEC 947-6-1 Low-voltage Switchgear and Controlgear; Multifunction equipment; Automatic Transfer Switching Equipment
C. NFPA 70 - National Electrical Code
D. NFPA 110 - Emergency and Standby Power Systems
E. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
F. NEMA Standard ICS10-1993 (formerly ICS2-447) - AC Automatic Transfer Switches
G. UL 508 Industrial Control Equipment

Automatic transfer switches shall be Caterpillar Series CTG or equal. The transfer switch shall be electrically operated and mechanically held. The electrical operator shall be a momentarily energized, single-solenoid mechanism.

The switch shall be positively locked and unaffected by momentary outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life.

The controller's sensing and logic shall be provided by a single built-in microprocessor for maximum reliability, minimum maintenance, and the ability to communicate serially through an optional serial communication module.

The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:

- 1. IEEE472 (ANSI C37.90A) Ring Wave Test.
2. ENCS5011 1991 Class A Conducted and Radiated Emission.
3. EN61000-4-2 Electrostatic Discharge Immunity, Direct Contact & Air Discharge.
4. EN61000-4-3 Radiated Electromagnetic Field Immunity.
5.
6. EN61000-4-4 Electrical Fast Transient Immunity.
7. EN61000-4-5 Surge Immunity.
8. ENV50141 HF Conducted Disturbances Immunity.
The ATS shall be furnished in a NEMA type 3R enclosure.

A four line, 20 character LCD display and keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through the serial communications input port.

Voltage and frequency on both the normal and emergency sources (as noted below) shall be continuously monitored, with the following pickup, dropout, and trip setting capabilities (values shown as % of nominal unless otherwise specified):

Table with 4 columns: Parameter, Source, Dropout/Trip, Pickup/Reset. Rows include Undervoltage, Overvoltage, Underfrequency, Overfrequency, and Voltage unbalance.

Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keypad or remotely via serial communications port access. Source status sirens shall be provided for both normal & emergency to provide digital readout of voltage on all 3 phases, frequency, and phase rotation.

An adjustable time delay of 0 to 6 seconds shall be provided to override momentary normal source outages and delay all transfer and engine starting signals.

A time delay shall be provided on transfer to emergency, adjustable from 0 to 60 minutes, for controlled timing of transfer of loads to emergency.

Two time delay modes (which are independently adjustable) shall be provided on re-transfer to normal. One time delay shall be for actual normal power failures and the other for the test mode function. The time delays shall be adjustable from 0 to 60 minutes.

A time delay shall be provided on shut down of engine generator for cool down, adjustable from 0 to 60 minutes. A three position momentary-type test switch shall be provided for the test/automatic/reset modes.

A set of DPDT gold-flashed contacts rated 10 amps, 32 VDC shall be provided for a low-voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down setting, regardless of whether the normal source restores before the load is transferred.

Auxiliary contacts, rated 10 amps, 250 VAC shall be provided consisting of one contact, closed when the ATS is connected to the normal source and one contact closed, when the ATS is connected to the emergency source.

An inphase monitor shall be provided in the controller. The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources.

Engine Exerciser - The controller shall provide an internal engine exerciser. The engine exerciser shall allow the user to program up to seven different exercise routines. For each routine, the user shall be able to: 1. Enable or disable the routine.

- 2. Enable or disable transfer of the load during routine.
3. Set the start time.
- time of day
- day of week
- week of month (1st, 2nd, 3rd, 4th, alternate or every)
4. Set the duration of the run.

At the end of the specified duration the switch shall transfer the load back to normal and run the generator for the specified cool down period. 10-year life battery that supplies power to the real time clock in the event of a power loss will maintain all time and date information.

The ATS shall be rated to close on and withstand the available RMS symmetrical short circuit current at the ATS terminals with the type of overcurrent protection shown on the plans. The ATS shall be UL listed in accordance with UL 1008 and be labeled in accordance with that standard's 1 1/2 and 3 cycle, long-time ratings.

The complete ATS shall be factory tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the specification requirements.



LAZY P6 DEVELOPMENT LIFT STATION RAPID CITY, SOUTH DAKOTA

Scale: AS NOTED
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Rapid City Growth Management Department

ELECTRICAL SPECIFICATIONS

PRELIMINARY DO NOT USE FOR CONSTRUCTION

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