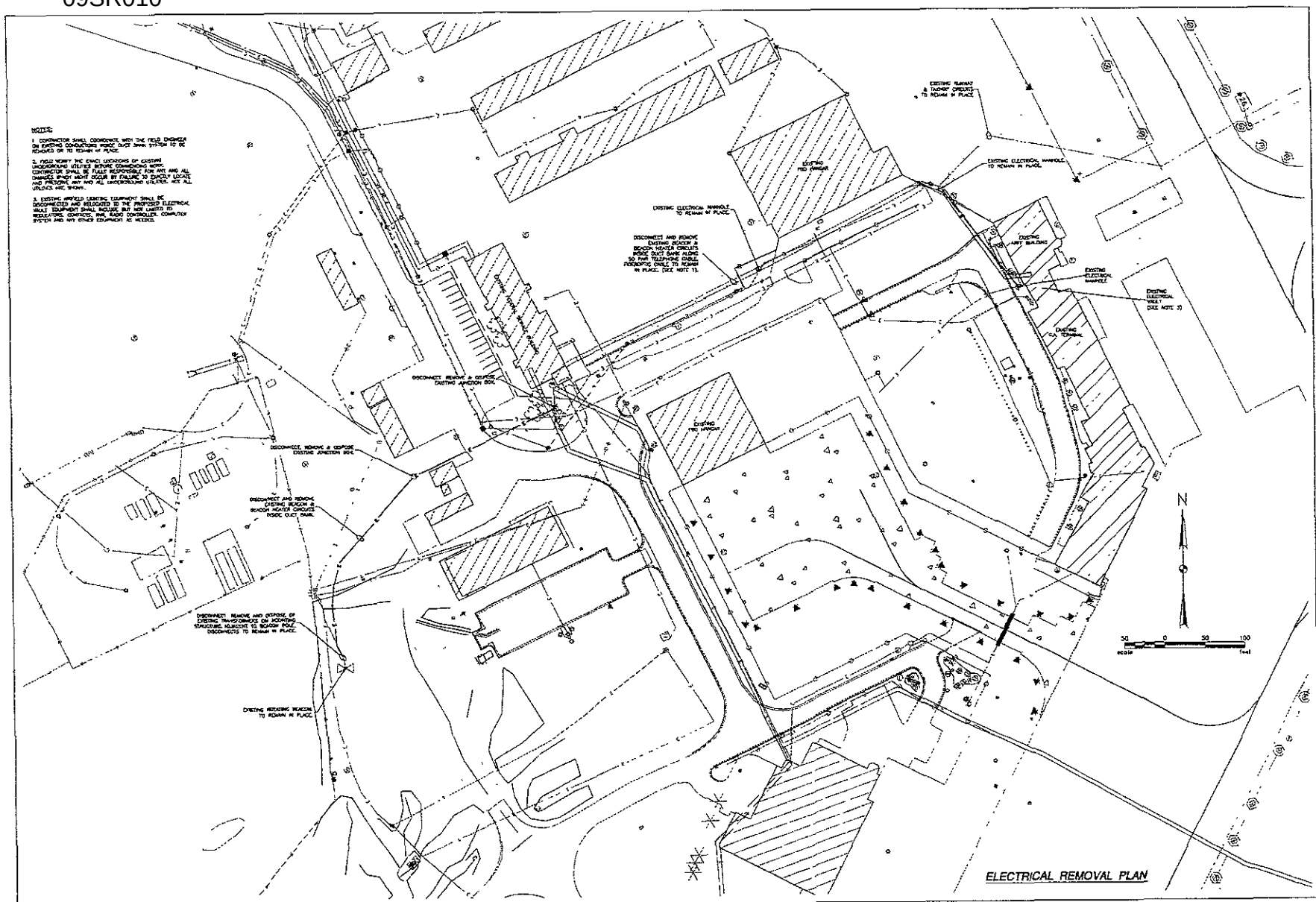
09SR010



KADRMAS, LEE & JACKSON, INC.
ENGINEERS, SURVEYORS & PLANNERS
RAPID CITY, NORTH DAKOTA 57709

PRAIRIE ENGINEERING, P.C.
MECHANICAL ENGINEERS
BISMARCK, NORTH DAKOTA 58501

RAPID CITY REGIONAL AIRPORT
ELECTRICAL VAULT BUILDING
RAPID CITY, PENNINGTON COUNTY, SOUTH DAKOTA

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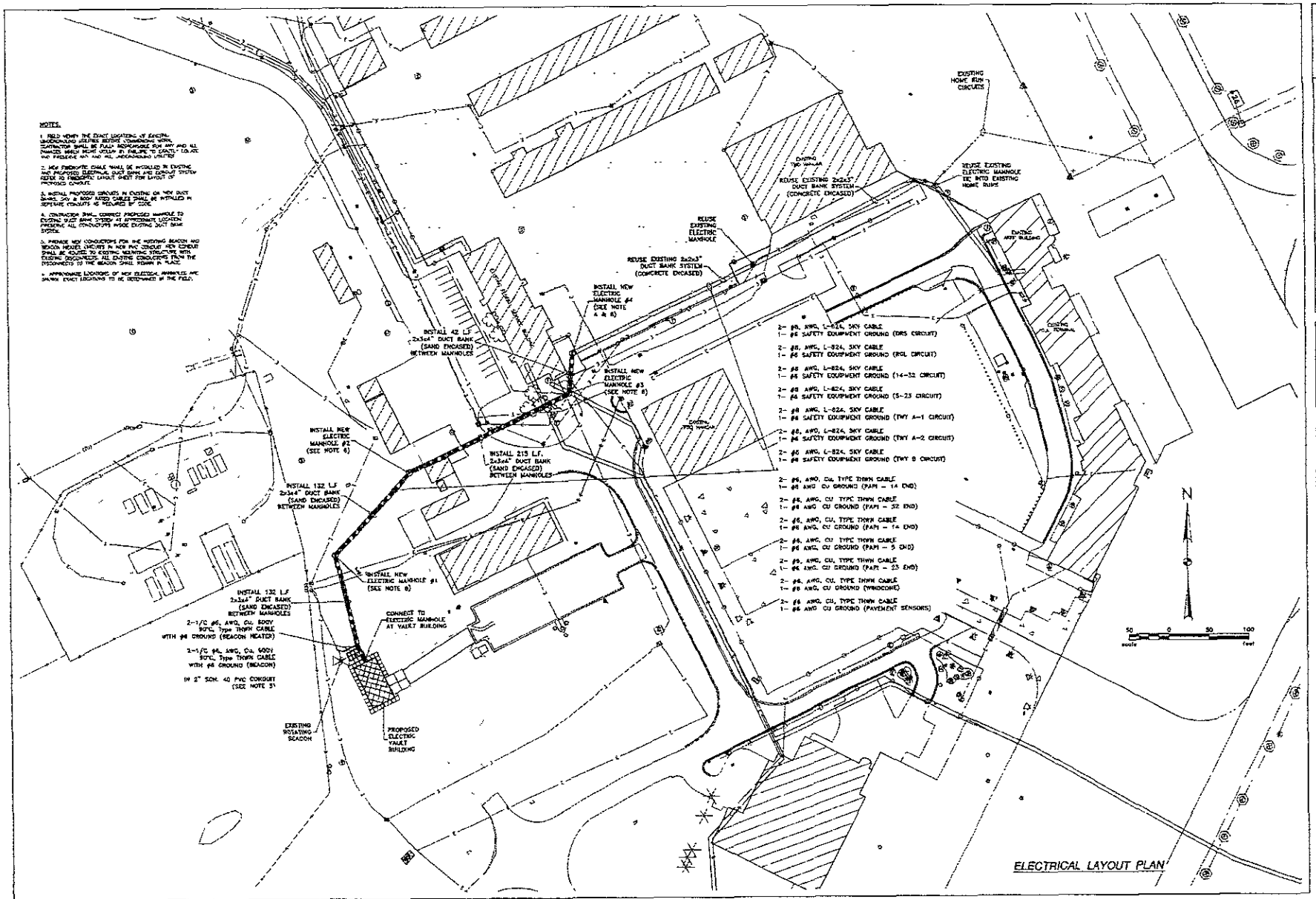
OF 9



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RAPID CITY, PENNINGTON COUNTY, SOUTH DAKOTA

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NOTES.

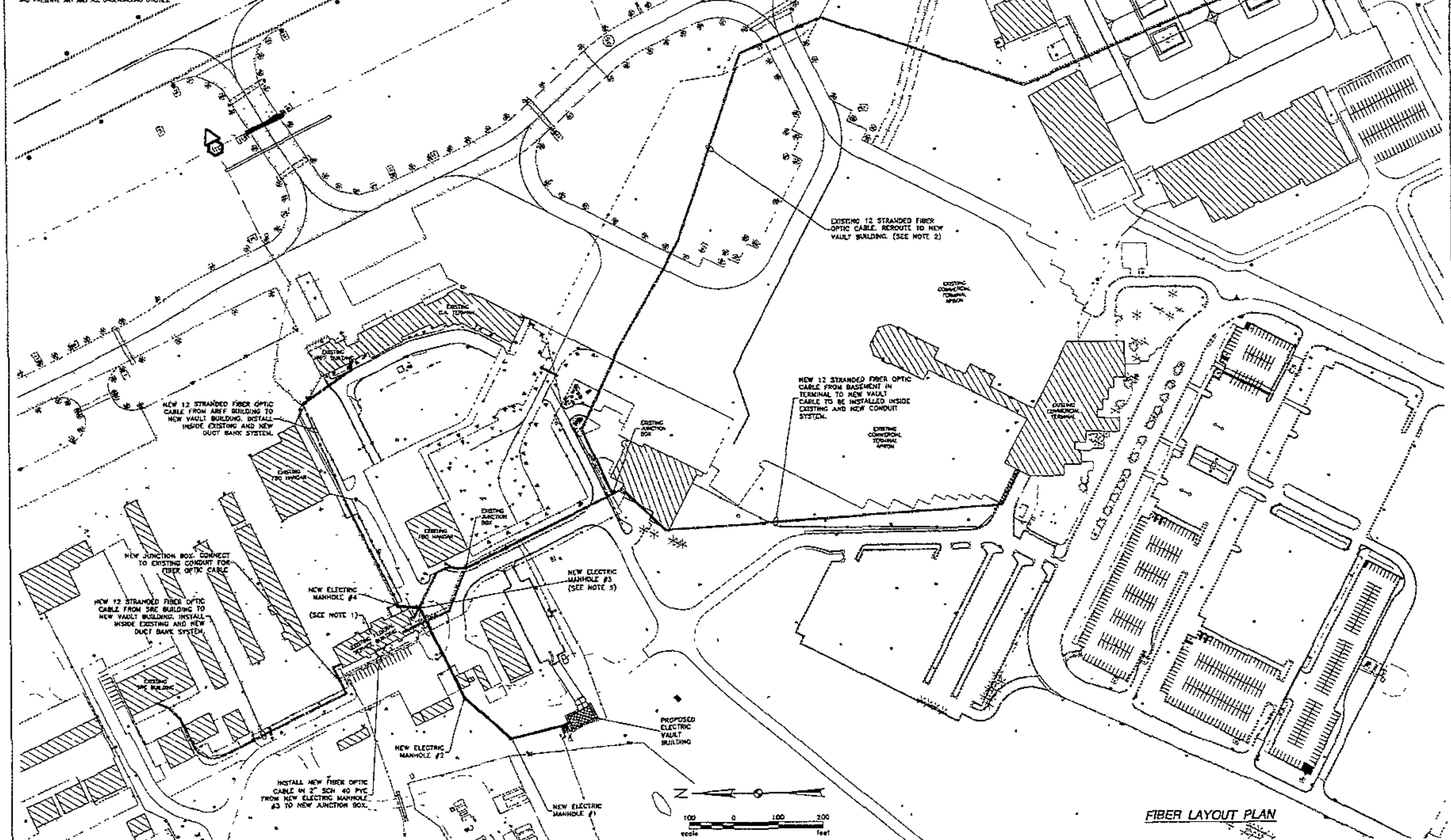
1. PATCH PANEL LOCATED IN THE FEDERAL SERVICE BUILDING SHALL BE RELOCATED TO THE NEW VAULT BUILDING.

2. EXISTING FIBER OPTIC FROM THE CONTROL TOWER TO THE FEDERAL SERVICE BUILDING SHALL BE REROUTED TO THE NEW VAULT. DISCONNECT FROM PATCH PANEL IN FEDERAL SERVICE BUILDING. PULL OUT OF CRAWL SPACE AND INTO NEW DUCT BANK SYSTEM TO VAULT.

3. TIE EXISTING CONDUIT INTO PROPOSED MANHOLE. PROVIDE ADDITIONAL 2" CONDUIT AS NEEDED TO ROUTE TO MANHOLE.

4. CONTRACTOR SHALL PROVIDE NEW FIBER OPTIC CABLE AS INDICATED. FIBER OPTIC CABLE SHALL BE CONNECTED UP TO PATCH PANELS AS CURRENTLY CONNECTED.

5. FIELD VERIFY THE EXACT LOCATIONS OF EXISTING UNDERGROUND UTILITIES BEFORE COMMENCING WORK. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR BY FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.



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RAPID CITY PENNINGTON COUNTY, SOUTH DAKOTA

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OF 9

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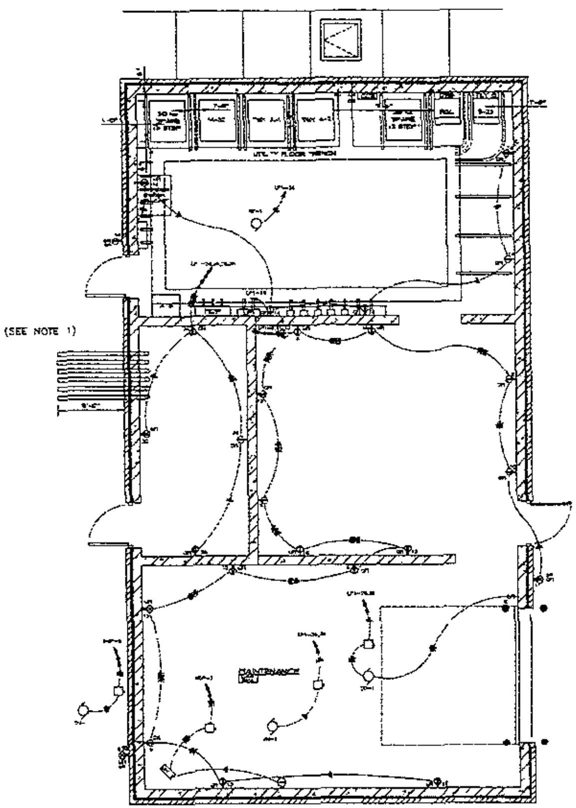


ELECTRICAL LAYOUT PLAN

1/4" = 1'-0"

NOTE.

1. PROVIDE 6-4" SCH. 80 SPARE CONDUIT STUBS FOR TELEPHONE EQUIPMENT IN COMMUNICATION ROOM.

2. PROVIDE A #6 AWG GROUND WIRE WITH THE BUILDING FOR THE QWEST TO UTILIZE FOR THE TELEPHONE EQUIPMENT.

ELECTRICAL LEGEND

LUMINAIRES

WALL MOUNTED LIGHT FIXTURE: CAPITAL LETTER INDICATES FIXTURE TYPE, SMALL LETTER INDICATES SWITCHING, NUMBER INDICATES CIRCUIT

SURFACE FLUORESCENT FIXTURE: CAPITAL LETTER INDICATES FIXTURE TYPE, SMALL LETTER INDICATES SWITCHING, NUMBER INDICATES CIRCUIT

WALL EXIT SIGN: CAPITAL LETTER INDICATES FIXTURE TYPE, SMALL LETTER INDICATES SWITCHING, NUMBER INDICATES CIRCUIT

CIRCUITING

CONDUIT

HOME RUN TO PANELBOARD, CROSS MARKS INDICATE QUANTITY OF CONDUCTORS, NO MARKS INDICATE TWO #12 AND #12 GROUND IN 1/2" CONDUIT. NUMBERS INDICATE PANEL AND CIRCUITS

SWITCHES

SINGLE POLE - MOUNT AT 42" A.F.F.

3-WAY - MOUNT AT 42" A.F.F.

PHOTO CELL

RECEPTACLES

DUPLEX RECEPTACLE - WP DENOTES WEATHERPROOF, GFI DENOTES GROUND FAULT INTERRUPTER, SS DENOTES SURGE SUPPRESSION - MOUNT AT 15" A.F.F. OR AS NOTED

CEILING JUNCTION BOX

WALL JUNCTION BOX

MISCELLANEOUS

ELECTRICAL HEAT - SEE ELECTRIC HEAT SCHEDULE

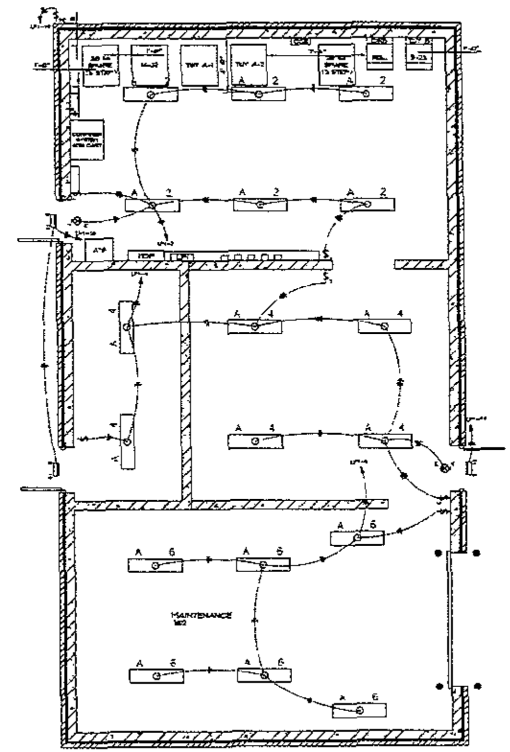
PANELBOARD

MOTOR - DESIGNATION REFERS TO MOTOR AND EQUIPMENT SCHEDULE

DISCONNECT - F INDICATES FUSED WHEN SHOWN

ARROW

WALL MOUNT THERMOSTAT - MOUNT AT 48" A.F.F.



LIGHTING LAYOUT PLAN

1/4" = 1'-0"

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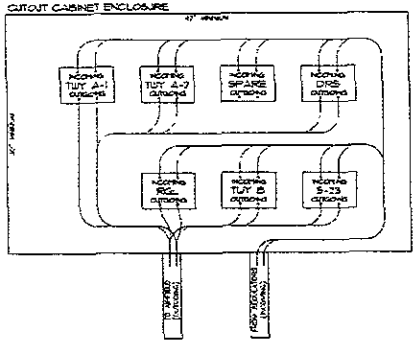
CUTOUT CABINET ENCLOSURE



NOTES:

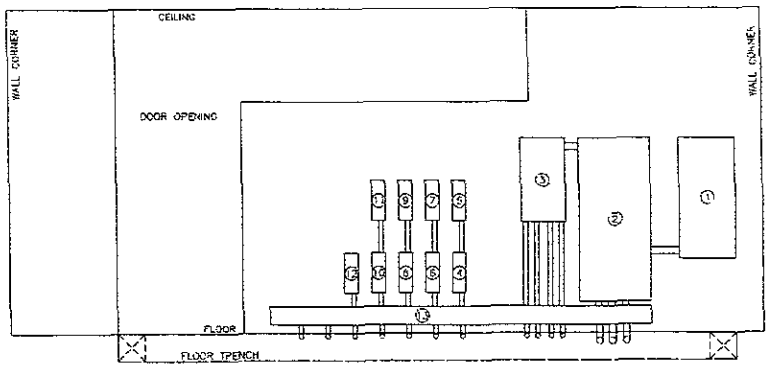
1. SIZE CABINET AS NEEDED TO FIT THE CUTOUTS AS SHOWN WITH THE POSSIBILITY OF ADDING ANOTHER FOR FUTURE USE. CABINET SHALL BE A LOCKABLE NEMA TYPE 1 ENCLOSURE.
2. ALL WIRES SHALL BE LABELED FOR WHAT CIRCUIT AND WHETHER INCOMING FROM REGULATOR OR OUTGOING TO THE AIRFIELD. PROVIDE EXTRA CONDUCTOR SPARE FOR THE OUTGOING CIRCUIT TO ALTERNATE TO THE SPARE CUTOUT.
3. CABINET SHALL BE LABELED WITH THE FOLLOWING: "DANGER" HIGH VOLTAGE SERIES CIRCUIT CUTOUTS
4. CUTOUT CABINET SHALL BE FOR THE MEDIUM INTENSITY 5-STEP SERIES CIRCUITS ONLY

CUTOUT CABINET ENCLOSURE DETAIL

1. ATS (NEW)
2. MDP (NEW)
3. LP1 (NEW)
4. SETUP TRANSFORMER PAPI 14 (NEW)
5. CONTACT RELAY PAPI 14 (NEW)
6. SETUP TRANSFORMER PAPI 32 (NEW)
7. CONTACT RELAY PAPI 32 (NEW)
8. SETUP TRANSFORMER PAPI 5 (NEW)
9. CONTACT RELAY PAPI 5 (NEW)
10. SETUP TRANSFORMER PAPI 23 (NEW)
11. CONTACT RELAY PAPI 23 (NEW)
12. LARGE WINDCONE TRANSFORMER (NEW)
13. WIREWAY (NEW)

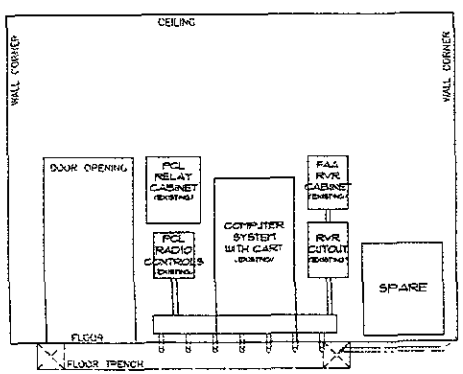
NOTE:

1. EXTERNAL INTERFACE UNITS ARE NOT SHOWN, CONTRACTOR SHALL REUSE EXISTING UNITS AND RELOCATE TO NEW VAULT



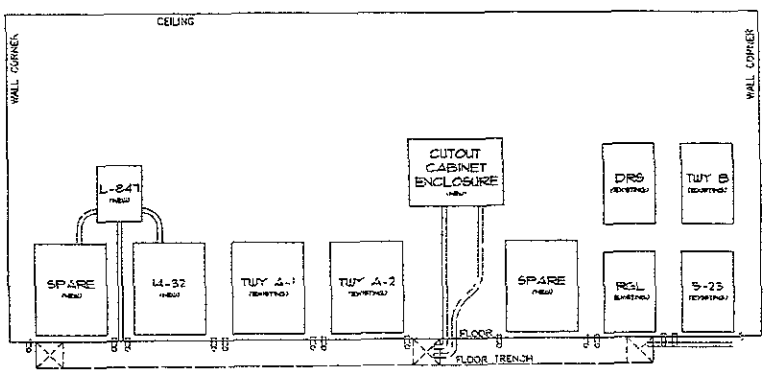
REGULATOR ROOM SOUTH WALL

1/2" = 1'-0"



REGULATOR ROOM WEST WALL

1/2" = 1'-0"



REGULATOR ROOM NORTH WALL

1/2" = 1'-0"

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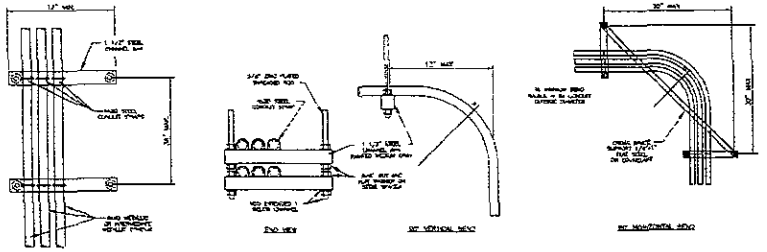
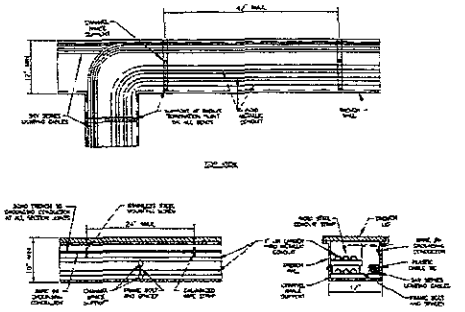


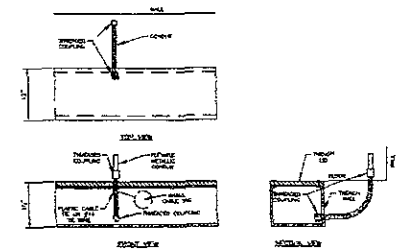
OVERHEAD CHANNEL RACKING DETAIL
NO SCALE



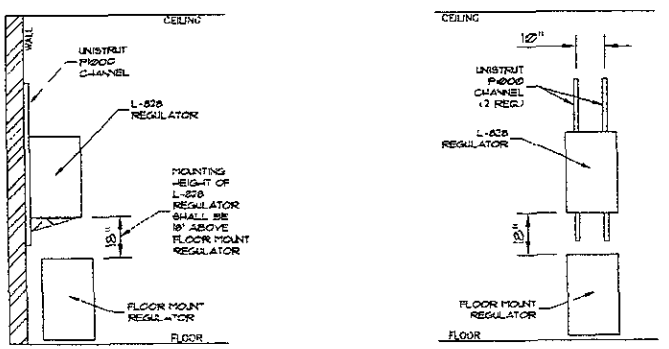
FLOOR TRENCH DETAIL
NO SCALE

NOTES:

1. EACH REGULATOR SUPPORTS SHALL BE CAPABLE OF SUPPORTING 400 LBS EACH
2. SUPPORT SHALL HAVE A DESIGNED SAFETY FACTOR OF 2
3. PROVIDE SUBMITTED OR SUPPORTING BRACKETS FOR REVIEW DURING SHOP DRAWING PROCESS



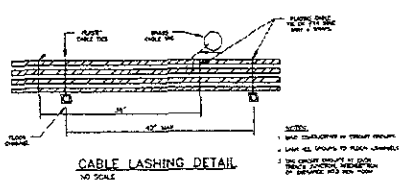
CABLE ATTACHMENT TRENCH DETAIL
NO SCALE



SIDE VIEW

FRONT VIEW

L-828 REGULATOR MOUNTING DETAIL



CABLE LASHING DETAIL
NO SCALE

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RAPID CITY, SOUTH DAKOTA 57709

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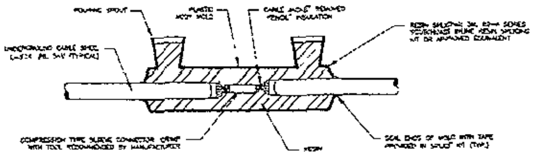
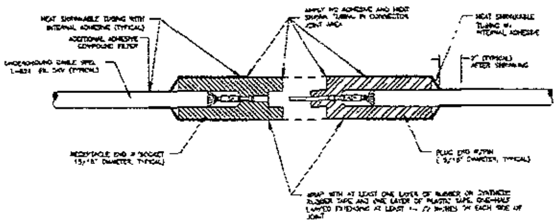


TYPE 'A' CABLE SPLICE DETAIL FOR INSULATED CONDUCTORS

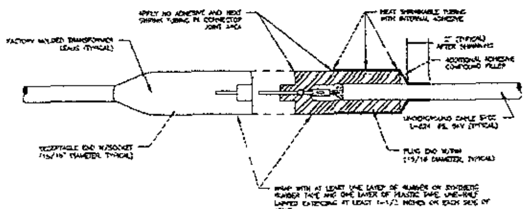
FOR SPLICES IN HOMERUNS AND FOR EXTENSIONS TO EXISTING CABLES ONLY
(FOR UNINSULATED CONDUCTORS USE THERMO-WELD TYPE CABLE SPLICING)

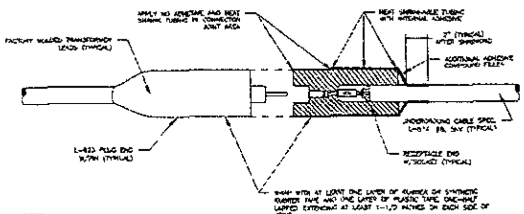


FOR CONNECTIONS FOR USE AT JUNCTION OF HOMERUN WITH LOOP CIRCUIT

TYPE 'B' CABLE CONNECTION DETAIL

NO SCALE



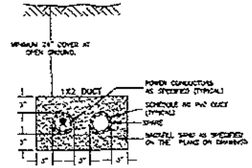


NOTES:
1. SEE LAYOUT SHEET FOR SPLICE TYPE.
2. INSIDE DIAMETER OF CONNECTOR SHALL PROPERLY MATCH THE OUTSIDE DIAMETER OF CABLE.

FOR CONNECTIONS RUNWAY/TAXIWAY LIGHTS

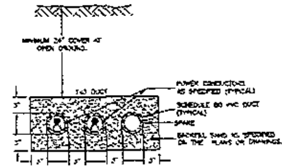
TYPE 'C' CABLE CONNECTION DETAIL

NO SCALE



END VIEW

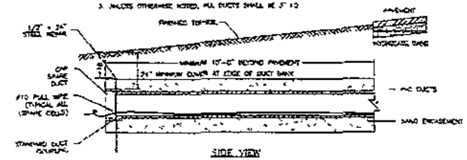
1x2 DUCT DETAIL



END VIEW

1x3 DUCT DETAIL

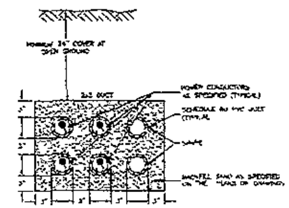
NOTES:
1. SLOPE PVC DUCTS TO DRAIN AWAY FROM CENTER OF RUN.
2. ANY ADDITIONAL CONDUIT INSTALLED IN DUCT BANK SHALL BE INCIDENTAL TO THE COST OF THE DUCT.
3. UNLESS OTHERWISE NOTED, ALL DUCTS SHALL BE 3" I.D.



SIDE VIEW

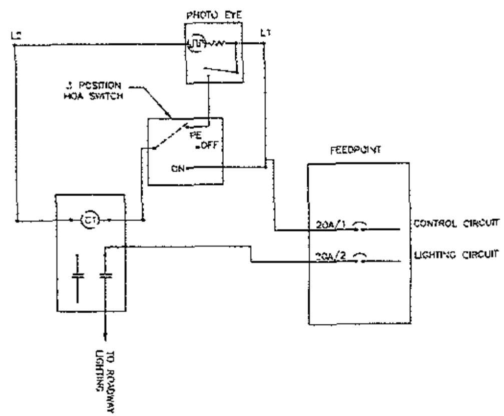
SAND ENCASED UNDERGROUND DUCT DETAIL

NO SCALE



END VIEW

2x3 DUCT DETAIL



CONTROL & PANEL BOARD DETAIL

KADRMAS, LEE & JACKSON, INC.
ENGINEERS SURVEYORS & PLANNERS
RAPID CITY, SOUTH DAKOTA 57702

PRAIRIE ENGINEERING, P.C.
MECHANICAL ENGINEERS
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ELECTRICAL VAULT BUILDING
RAPID CITY PENNINGTON COUNTY, SOUTH DAKOTA

E-7

LIGHTING SCHEDULE (OR APPROVED EQUIVALENT)

	FIXTURE							BALLAST						LAMP								
DESIGNATION	MANUFACTURER	MODEL	NO. LAMPS	FINISH	MOUNTING	MTG. HT.	REMARKS	MANUFACTURER	MODEL	VOLTS	B.F.	INPUT WATTS	INPUT AMPS	MANUFACTURER	MODEL	CCT	CRI	AVG. LAMP LIFE	INIT. LUMENS	MEAN LUMENS	FINISH	BASE
A	LITHONIA	AF 3 4-32-MVOLT-GEB	3	WHITE	SURFACE/ SUSPENDED	VARIES	4' HEAVY-DUTY INDUSTRIAL FLOURESCENT STRIP LIGHT	SYLVANIA	QTP3X32T8/UNV-ISN-SC	120	0.88	87	0.73	SYLVANIA	F032/741	4100	75	20000	2800	2580		MED. BIPIN
B	LITHONIA	TWAC 100M-120-DMB	1	MEDIUM BRONZE	SURFACE	8'	CUTOFF WALL PACK WITH 100W MH LAMP	SYLVANIA	M100AMULTHOT	120		130	2.16	SYLVANIA	MP100/U/MED	3000	75	10000	8500	5525	CLEAR	E17 MED.
F	LITHONIA	LHQM S-W-1-R-120/277-N	1	WHITE	SURFACE	8'	THERMOPLASTIC EXIT SIGNS WITH EMERGENCY LIGHTS AND BACKUP			120/277									-	-		

MAIN DISTRIBUTION PANEL MDP

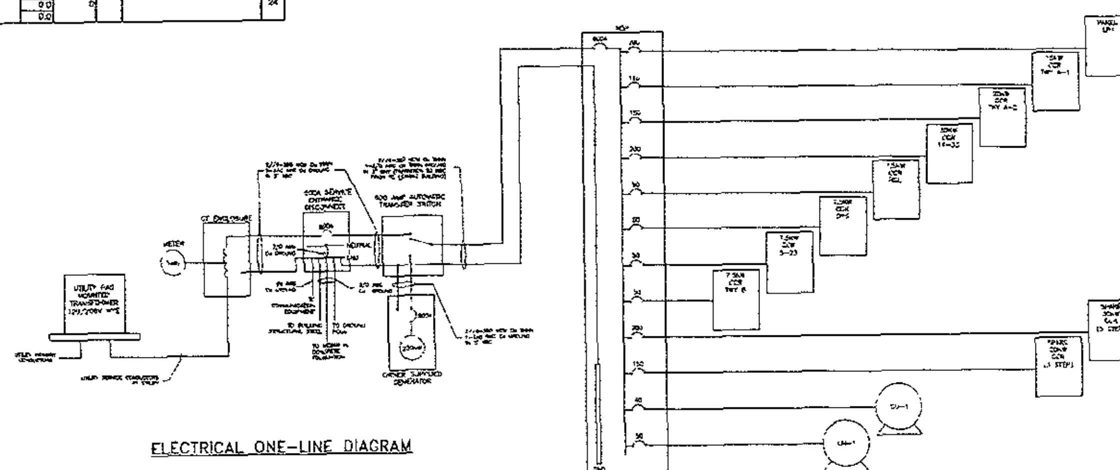
600 MCB 120/208 Volt WYE 3 Phase, 5-Wire Fed from Meter/Utility Transformer Using 2 Parallel (3-350KCM Cu THHN & 1-3/0 AWG Cu THHN Ground) in each 3" SCH 40 PVC

CKT	DESCRIPTION	BRK	V-A	AMPS	WIRE AND CONDUIT	Φ	WIRE AND CONDUIT	AMPS	V-A	BRK	DESCRIPTION	CKT
1	Panel LP1	200	27,752	89.4	4-4/0 AWG Cu THHN	A	2-#2 AWG Cu THHN	79.0	16,432	110	Taxiway A-1 (15KW Regulator)	2
				76.3	1-#2 AWG Cu THHN Ground	B	1-#8 AWG Cu THHN Ground	79.0				
				65.6	in 2.5" EMT	C	in 1.5" EMT	0.0				
3	15KW Electric Coil	50	14,990	41.6	3-#8 AWG Cu THHN	A	2-#1/0 AWG Cu THHN	0.0	22,048	150	Taxiway A-2 (20KW Regulator)	4
				41.6	1-#10 AWG Cu THHN Ground	B	1-#6 AWG Cu THHN Ground	106.0				
				41.6	in 3/4" EMT	C	in 1.5" EMT	106.0				
5	Condensing Unit	40	19,944	24.0	3-#8 AWG Cu THHN	A	2-4/0 AWG Cu THHN	165.0	34,320	200	Runway 14-32 (30KW Regulator)	6
				24.0	1-#10 AWG Cu THHN Ground	B	1-#6 AWG Cu THHN Ground	0.0				
				24.0	in 3/4" EMT	C	in 2" EMT	165.0				
7			0	0.0		A	2-#8 AWG Cu THHN	40.0	8,320	50	RGL (7.5KW Regulator)	8
				0.0		B	1-#10 AWG Cu THHN Ground	40.0				
				0.0		C	in 3/4" EMT	0.0				
9			0	0.0		A	2-#8 AWG Cu THHN	0.0	8,320	50	ORS (7.5KW Regulator)	10
				0.0		B	1-#10 AWG Cu THHN Ground	40.0				
				0.0		C	in 3/4" EMT	40.0				
11			0	0.0		A	2-#8 AWG Cu THHN	0.0	8,320	50	Runway 5-23 (7.5KW Regulator)	12
				0.0		B	1-#10 AWG Cu THHN Ground	40.0				
				0.0		C	in 3/4" EMT	40.0				
13			0	0.0		A	2-#8 AWG Cu THHN	40.0	8,320	50	Taxiway B (7.5KW Regulator)	14
				0.0		B	1-#10 AWG Cu THHN Ground	40.0				
				0.0		C	in 3/4" EMT	0.0				
15			0	0.0		A	2-#3/0 AWG Cu THHN	0.0	0	200	Spare 30KW Regulator (5-Step)	16
				0.0		B	1-#6 AWG Cu THHN Ground	0.0				
				0.0		C	in 2" EMT	0.0				
17			0	0.0		A	2-#1/0 AWG Cu THHN	0.0		150	Spare 20KW Regulator (3-Step)	18
				0.0		B	1-#6 AWG Cu THHN Ground	0.0				
				0.0		C	in 1.5" EMT	0.0				
19			0	0.0		A		0.0	0			20
				0.0		B		0.0				
				0.0		C		0.0				
21			0	0.0		A		0.0	0			22
				0.0		B		0.0				
				0.0		C		0.0				
23			0	0.0		A		0.0	0			24
				0.0		B		0.0				
				0.0		C		0.0				
	Total Connected KVA and Amps To MDP		173,782	479.0								
				486.9								
				462.2								

PANEL LP1

300 Amp Main Breaker 120/208 Volt Wye, Three Phase, 5-Wire, MDP
4-4/0 AWG Cu THHN & 1-#2 AWG Cu THHN Ground in each 2.5" EMT

CKT	DESCRIPTION	BRK	V-A	AMPS	WIRE AND CONDUIT	Φ	WIRE AND CONDUIT	AMPS	V-A	BRK	DESCRIPTION	CKT
1	PAPI 14	20	1600	8.7	4-#6 AWG Cu THHN in 1/2" EMT	A	3-#12 AWG Cu THHN in 1/2" EMT	5.0	600	20	Lights - Regulator RM	2
3				8.7		B	3-#12 AWG Cu THHN in 1/2" EMT	5.0	600	20	Lights - Equipment & Comm RM	4
5	PAPI 32	20	1600	8.7	4-#6 AWG Cu THHN in 1/2" EMT	C	3-#12 AWG Cu THHN in 1/2" EMT	5.0	600	20	Lights - Maintenance RM	6
7				8.7		A	3-#12 AWG Cu THHN in 1/2" EMT	7.5	900	20	Receptacles - Equipment/Maintenance RM	8
9	PAPI 5	20	1600	8.7	4-#6 AWG Cu THHN in 1/2" EMT	B	3-#12 AWG Cu THHN in 1/2" EMT	7.5	900	20	Receptacles - Equipment/Maintenance RM	10
11				8.7		C	3-#12 AWG Cu THHN in 1/2" EMT	7.5	900	20	Receptacles - Equipment/Maintenance RM	12
13	PAPI 23	20	1600	8.7	4-#6 AWG Cu THHN in 1/2" EMT	A	3-#12 AWG Cu THHN in 1/2" EMT	9.0	1,080	20	Receptacles - Regulator RM	14
15				8.7		B	3-#12 AWG Cu THHN in 1/2" EMT	1.0	120	20	Exterior Lights	16
17	Large Windcone	20	960	8.0	3-#12 AWG Cu THHN in 1/2" EMT	C	3-#12 AWG Cu THHN in 1/2" EMT	2.0	240	20	Lighting Control Circuit	18
19	Beacon Heater	20	480	4.0	3-#6 AWG Cu THHN in 1/2" EMT	A	3-#10 AWG Cu THHN in 1/2" EMT	8.8	1800.4	25	Overhead Door Operator	20
21	Rotating Beacon	20	984	8.2	3-#6 AWG Cu THHN in 1/2" EMT	B		8.8				22
23	L-854 Selector Switch	20	240	2.0	3-#12 AWG Cu THHN in 1/2" EMT	C	3-#12 AWG Cu THHN in 1/2" EMT	5.0	600	20	Receptacles - Communication RM	24
25	Pavement Sensors	20	1000	8.3	3-#12 AWG Cu THHN in 1/2" EMT	A	3-#12 AWG Cu THHN in 1/2" EMT	5.0	600	20	Receptacles - Communication RM	26
27	Radio Controls	20	600	5.0	3-#12 AWG Cu THHN in 1/2" EMT	B	3-#12 AWG Cu THHN in 1/2" EMT	5.0	600	20	Receptacles - Communication RM	28
29	Computer Control	20	600	5.0	3-#12 AWG Cu THHN in 1/2" EMT	C	3-#12 AWG Cu THHN in 1/2" EMT	5.0	600	20	Receptacles - Communication RM	30
31	RDM - HYR	20	600	5.0	3-#12 AWG Cu THHN in 1/2" EMT	A	3-#12 AWG Cu THHN in 1/2" EMT	2.0	240	20	Damper Actuator (Relief/Intake HP)	32
33			0			B	3-#12 AWG Cu THHN in 1/2" EMT	9.8	1,176	25	Relief Fan (1/2 HP Motor)	34
35			0			C	3-#10 AWG Cu THHN in 1/2" EMT	8.8	1830.4	25	AH-1	36
37			0			A		8.8				38
39			0			B			0			40
41			0			C			0			42
	Total Connected KVA and Amps		27,752	89.4								
				76.3								
				65.6								



ELECTRICAL ONE-LINE DIAGRAM

KADRMAS, LEE & JACKSON, INC.
ENGINEERS SURVEYORS & PLANNERS
RAPID CITY, SOUTH DAKOTA 57709

PRAIRIE ENGINEERING, P.C.
MECHANICAL ENGINEERS
BISMARCK, NORTH DAKOTA 58501

RAPID CITY REGIONAL AIRPORT
ELECTRICAL VAULT BUILDING
RAPID CITY PENNINGTON COUNTY SOUTH DAKOTA

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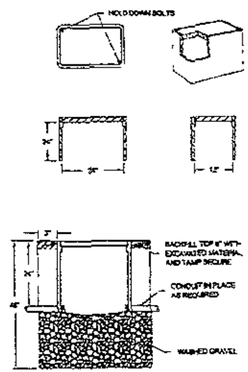
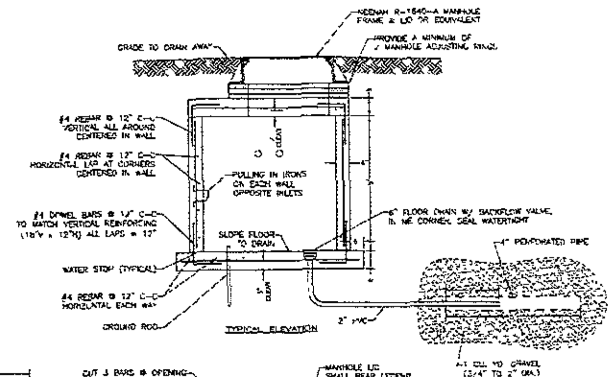
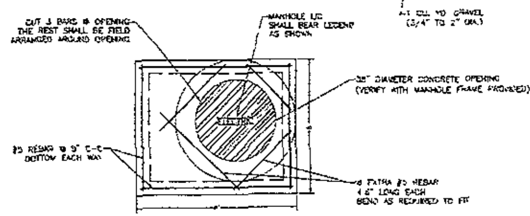




TYPICAL ELEVATION



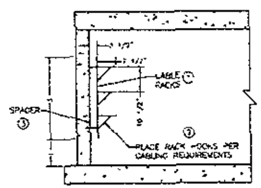
TOP VIEW

ELECTRICAL MANHOLE DETAIL

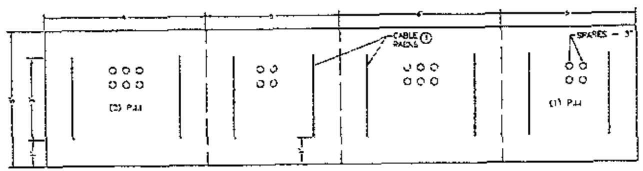
NO SCALE

NOTES:
1. REFER TO SECTION ???? FOR CONCRETE AND STEEL REQUIREMENTS.
2. PLACE END BELLS ON ALL CONDUIT ENTERING MANHOLES.
3. SPARE CONDUITS FROM MANHOLES SHALL BE SLEEVED AND BLOCKED WATERTIGHT.
4. CONDUIT MINIMUM 6" OFF OF MANHOLE.
5. GRADE DUCT BANK TO DRAIN INTO MANHOLE.
6. CAST MANHOLES IN PLACE AFTER ALL DUCT BANK GRADED TO DRAIN TO MANHOLES. ACTUAL MANHOLE DEPTH SHALL BE AS REQUIRED FOR DUCT BANK DRAINAGE.

MATERIALS:
1. CONDUX BRAND OR EQUIVALENT #[illegible] (RACKS). [illegible] HOT DIP GALVANIZED
2. CONDUX BRAND OR EQUIVALENT #[illegible] [illegible] RACK HOOKS
3. CONDUX BRAND OR EQUIVALENT #[illegible] [illegible] EXTENDERS HOT DIP GALVANIZED
4. BOLTS, WASHERS, & EXPANSION SHIELDS HOT DIP GALVANIZED OR STAINLESS STEEL



SIDE VIEW



NORTH EAST SOUTH WEST

MANHOLE # ?

CABLE RACKING DETAILS

NO SCALE

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