MECHANICAL ELEMENTS / VALVING

- EXISTING EQUIPMENT OR PIPE TO BE REMOVED.
- GATE VALVE
- GLOBE VALVE
- PLUG VALVE
- BUTTERFLY VALVE
- BALL VALVE
- SWING CHECK VALVE
- LIFT CHECK VALVE
- GATE VALVE, ANGLE
- GLOBE VALVE, ANGLE
- DIAPHRAGM VALVE
- BALANCING VALVE
- CBV — CIRCUIT SETTING BALANCING VALVE
- THREE WAY CONTROL VALVE
- TWO WAY CONTROL VALVE
- S — SOLENOID VALVE
- PRESSURE REDUCING VALVE (PRV)
- TPV — TEMPERATURE/PRESSURE RELIEF VALVE
- AIR VENT — HYDRAULIC SEPARATOR
- RELIEF/SAFETY VALVE
- GAS COCK
- AUTOMATIC FILL VALVE
- MV — MANUAL AIR VENT
- AV — AUTOMATIC AIR VENT (EXTEND DISCHARGE TO DRAIN)
- FLOW METER-VENTURI
- FLOW METER-ORIFICE
- DIRECTION OF FLOW
- R D — DIRECTION OF PITCH-RISE OR DROP
- STRAINER
- STRAINER WITH BLOW OFF VALVE
- PIPE RISING UP
- PIPE DROPPING DOWN
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- UNION - SCREWED OR FLANGED
- STEAM LEAK DETECTOR
- FSD — FIRE SMOKE DAMPER
- CO — CARBON MONOXIDE
- CD — CARBON DIOXIDE
- AIR SEPARATOR
- A — ANCHOR
- G — GUIDE
- EJ — EXPANSION JOINT
- FS — FLOW SWITCH
- TT — TEMPERATURE TRANSMITTER
- PT/PS — PRESSURE TRANSMITTER OR PRESSURE SWITCH
- TH — THERMOMETER
- GAUGE WITH GAUGE COCK & SYPHON (STEAM)
- AQUASTAT
- GAS PRESSURE REGULATOR
- FLOAT OPERATED CONTROL VALVE
- STEAM TRAP
- EXPANSION LOOP
- VB — VACUUM BREAKER
- T — THERMOSTAT
- S — DIGITAL SENSOR
- OR — PUMP
- HEAT EXCHANGER

HVAC & DUCTWORK SYMBOLS

- SECTION THROUGH RETURN DUCT
- SECTION THROUGH EXHAUST AIR DUCT
- SECTION THROUGH SUPPLY OR OUTSIDE AIR DUCT
- FSD — FIRE / SMOKE DAMPER
- SD — SMOKE DAMPER
- SUPPLY OR OUTSIDE AIR DUCT
- ACCESS DOOR (BOTTOM OR SIDE)
- ACOUSTICALLY LINED DUCT
- FD - SD - FSD — FIRE DAMPER, SMOKE DAMPER, FIRE/SMOKE DAMPER
- VD — MANUAL VOLUME DAMPER
- D — INCLINED DROP IN DIRECTION OF ARROW
- R — INCLINED RISE IN DIRECTION OF ARROW
- TRANSITION, RECTANGULAR TO ROUND
- FLEXIBLE DUCT
- IN-LINE FAN
- TRANSITION, RECTANGULAR
- SPIN-IN COLLAR INTO ADAPTER ON TOP OF DUCT
- CEILING SUPPLY AIR REGISTER/GRILLE
- SIDEWALL SUPPLY AIR REGISTER (SR)
- ELBOW TURNED DOWN
- ELBOW TURNED UP
- ELBOW, RADIUS TYPE
- ELBOW, SQUARE OR RECTANGULAR TYPE WITH AIRFOIL TURNING VANES
- CEILING RETURN AIR REGISTER (RR)
- SIDEWALL RETURN AIR REGISTER (RR)
- OPEN END DUCT
- FXC — FLEXIBLE CONNECTION

LINE DESIGNATION SYMBOLS

- CHWR — CHILLED WATER RETURN
- CHWS — CHILLED WATER SUPPLY
- CA — COMPRESSED AIR
- CR — CONDENSER WATER RETURN
- CS — CONDENSER WATER SUPPLY
- D — DRAIN
- HPR — HEAT PUMP RETURN
- HPS — HEAT PUMP SUPPLY
- HWR — HOT WATER RETURN
- HWS — HOT WATER SUPPLY
- G — NATURAL GAS
- RH — REFRIGERANT HIGH PRESSURE VAPOR
- R — REFRIGERANT LIQUID AND VAPOR LINE
- RS — REFRIGERANT SUCTION / VAPOR
- SMR — SNOWMELT RETURN
- SMS — SNOWMELT SUPPLY
- V — VENT PIPING

RESPONSIBLE DIVISION:

UNLESS OTHERWISE INDICATED ALL HEATING, VENTILATING, AIR CONDITIONING, PLUMBING, AND OTHER MECHANICAL EQUIPMENT, MOTORS, AND CONTROLS SHALL BE FURNISHED, SET IN PLACE AND WIRED AS FOLLOWS:

ITEM	FURNISHED	SET	POWER WIRED	CONTROL WIRED
EQUIPMENT	23	23	26	--
COMBINATION MAGNETIC MOTOR STARTERS, MAGNETIC MOTOR STARTERS, VFD'S AND CONTACTORS	23(1)	26	26(2)	23
FUSED AND UNFUSED DISCONNECT SWITCHES, THERMAL OVERLOAD SWITCHES AND HEATERS, MANUAL MOTOR STARTERS	26	26	26	--
MANUAL-OPERATING AND MULTI-SPEED SWITCHES	23	26	26	26
CONTROLS, RELAYS, TRANSFORMERS	23	23	26	23
THERMOSTATS (LOW VOLTAGE) AND TIME SWITCHES	23	23	26	23
THERMOSTATS (LINE VOLTAGE)	23	23	26	26
TEMPERATURE CONTROL PANELS	23	23	26	23
MOTOR AND SOLENOID VALVES, DAMPER MOTORS, PE & EP SWITCHES	23	23(2)	--	23(2)
PUSH-BUTTON STATIONS AND PILOT LIGHTS	23	23(2)	--	23(2)
HEATING, COOLING, VENTILATION AND AIR CONDITIONING CONTROLS	23	23	26	23
EXHAUST FAN SWITCHES	23	26	26	23(2)

SUBSCRIPT FOOTNOTES:
1. MOTOR STARTER TO INCLUDE CONTROL TRANSFORMER, HOA SWITCH, (1) NO AND (1)NC AUXILIARY CONTACT, AND "ON" AND "OFF" PILOT LIGHTS.
2. IF ITEM IS FOR LINE VOLTAGE, SET IN PLACE AND CONNECT UNDER DIVISION 26. WHERE FACTORY MOUNTED ON EQUIPMENT OR ATTACHED TO PIPING OR DUCTS AND USING LINE VOLTAGE FURNISH AND SET UNDER DIVISION 23, CONNECT UNDER DIVISION 26.

ABBREVIATIONS:

44" FINISHED FLOOR TO CENTER OF DEVICE	MOUNTING HEIGHT ABOVE	DIFF	DIFFERENTIAL	HR	HOUR	PTAC	PACKAGED TERMINAL AIR CONDITIONER
A	AMPS	DISCH	DISCHARGE	HT	HEIGHT	PV	PLUG VALVE
A.D.	ACCESS DOOR	DIV	DIVISION	HTR	HEATER	PVC	POLYVINYL CHLORIDE
AAV	AIR ADMITTANCE VALVE	DN	DOWN	HWR	HEATING WATER RETURN	QTY	QUANTITY
ABV	ABOVE	DS	DUCT SILENCER	HWS	HEATING WATER SUPPLY	RA	RETURN AIR GRILLE / REGISTER
AC	AIR CONDITIONING UNIT	DWG	DRAWING	HX	HEAT EXCHANGER	RCP	REFLECTED CEILING PLAN
AC	ABOVE COUNTER	DX	DIRECT EXPANSION	HZ	HERTZ	RD	ROOF DRAIN
AD	AREA DRAIN (SEE SYMBOLS)	(E)	EXISTING	ID	INSIDE DIAMETER	REL	RELIEF
A.F.C.	ABOVE FINISHED CEILING	EA	EXHAUST AIR GRILLE/REGISTER	IG	ISOLATED GROUND	REQD	REQUIRED
A.F.G.	ABOVE FINISHED GRADE	EAT	ENTERING AIR TEMPERATURE	IN	INCHES	RF	RETURN FAN
AIC	AMPS INTERRUPTING CAPACITY	EC	ELECTRICAL CONTRACTOR	INV	INVERT	RH	RELATIVE HUMIDITY
A.F.F.	ABOVE FINISHED FLOOR	ECC	ECCENTRIC	JBOX	JUNCTION BOX	RHC	REHEAT COIL
AHU	AIR HANDLING UNIT	EF	EXHAUST FAN	K	KELVIN	RLA	RATED LOAD AMPS
ALUM	ALUMINUM	EFF	EFFICIENCY	KW	KILOWATT	RM	ROOM
AP	ACCESS PANEL OR DOOR	EL	ELEVATION	KVA	KILO VOLT - AMPS	RPM	REVOLUTIONS PER MINUTE
ATS	AUTOMATIC TRANSFER SWITCH	ELEC	ELECTRIC	L	LENGTH	SA	SUPPLY AIR GRILLE / REGISTER
AV	AUDIO / VIDEO	ELEV	ELEVATOR	LAT	LEAVING AIR TEMPERATURE	SC	SHORT CIRCUIT
AVG	AVERAGE	EM	EMERGENCY FUNCTION	LV	LAVATORY	SCA	SHORT CIRCUIT AVAILABLE
AWG	AMERICAN WIRE GAGE	ENT	ENTERING	LB	POUND	SCCR	SHORT CIRCUIT CURRENT RATING
BAS	BUILDING AUTOMATION SYSTEM	EMT	ELECTRIC METALLIC TUBE	LD	LINEAR DIFFUSER	SCH	SCHEDULE
BB	BASEBOARD	EQ	EQUAL	LF	LINEAR FEET	SD	SMOKE DAMPER
BD	BACK DRAFT DAMPER	EQUIP	EQUIPMENT	LIN	LINEAR	SEF	SMOKE EXHAUST FAN
BFP	BACK FLOW PREVENTOR	EQUIV	EQUIVALENT	LIQ	LIQUID	SF	SUPPLY FAN
BL	BOILER	ES	END SWITCH	LM	LUMEN	SH	SENSIBLE HEAT
BLDG	BUILDING	ESP	EXTERNAL STATIC PRESSURE	LRA	LOCKED ROTOR AMPS	SH	SHOWER
BLW	BELOW	ET	EXPANSION TANK	LV	LOUVER	SP	STATIC PRESSURE
BOB	BOTTOM OF BEAM	EWC	ELECTRIC WATER COOLER	LVG	LEAVING	SPD	SURGE PROTECTION DEVICE
BOD	BOTTOM OF DUCT	EWT	ENTERING WATER TEMPERATURE	LWT	LEAVING WATER TEMPERATURE	SPEC	SPECIFICATION
BOP	BOTTOM OF PIPE	EX	EXHAUST	MBH	THOUSANDS OF BTU PER HOUR	SQ	SQUARE
BSMT	BASEMENT	EXPAN	EXPANSION	MC	MECHANICAL CONTRACTOR	SS	STAINLESS STEEL
BTU	BRITISH THERMAL UNIT	EXT	EXTERNAL	MCA	MINIMUM CIRCUIT AMPACITY	SS	SAFETY SHOWER
C	CHILLER	F	DEGREES FAHRENHEIT	MCB	MAIN CIRCUIT BREAKER	STD	STANDARD
CAP	CAPACITY	FA	FREE AREA	MD	MOTORIZED DAMPER	STL	STEEL
CB	CIRCUIT BREAKER	FC	FAN COIL UNIT	MDP	MAIN DISTRIBUTION PANEL	SYS	SYSTEM
CBV	CIRCUIT BALANCING VALVE	FC	FOOTCANDLE	MED	MEDIUM	TEMP	TEMPERATURE
CCT	CORRELATED COLOR TEMPERATURE	FCV	FLOW CONTROL VALVE	MFR	MANUFACTURER	TR	TRANSFER GRILLE / REGISTER
CKT	CIRCUIT	FD	FIRE DAMPER	MIN	MINIMUM	TR	TAMPER RESISTANT
CFH	CUBIC FEET PER HOUR	FD	FLOOR DRAIN	MISC	MISCELLANEOUS	TT	TEMPERATURE TRANSMITTER
CFM	CUBIC FEET PER MINUTE	FIN	FINISHED	MLO	MAIN LUG ONLY	TTB	TELECOMMUNICATIONS TERMINAL BACKBOARD
CHWR	CHILLED WATER RETURN	FLA	FULL LOAD AMPS	MOCP	MAXIMUM OVERCURRENT PROTECTION	TYP	TYPICAL
CHWS	CHILLED WATER SUPPLY	FLEX	FLEXIBLE	MTD	MOUNTED	TX	TRANSFORMER
CI	CAST IRON	FLR	FLOOR	MUA	MAKE-UP AIR UNIT	UC	UNDERCUT DOOR
CL	CENTER LINE	FOB	FLAT ON BOTTOM	N	NEUTRAL	UH	UNIT HEATER
CLG	CEILING	FOT	FLAT ON TOP	NC	NORMALLY CLOSED	UNO	UNLESS NOTED OTHERWISE
CMU	CONCRETE MASONRY UNIT	FP	FIRE PROTECTION	NEG	NEGATIVE	UNOCC	UNOCCUPIED
CO	CLEAN OUT	FP	FIRE PUMP	NIC	NOT IN CONTRACT	UR	URINAL
COL	COLUMN	FPM	FEET PER MINUTE	NL	NIGHT / SECURITY LIGHT - DO NOT SWITCH	V	VOLTS
COMP	COMPRESSOR	FPS	FEET PER SECOND	NO	NORMALLY OPEN	VA	VOLT AMPERE
CONC	CONCRETE	FS	FLOW SWITCH	NOM	NOMINAL	VA	VALVE
COND	CONDENSATE	FSD	FIRE/SMOKE DAMPER	NTS	NOT TO SCALE	VAV	VARIABLE AIR VOLUME UNIT
CONN	CONNECTION	FT	FEET	OA	OUTSIDE AIR	VFD	VARIABLE FREQUENCY DRIVE
CONT	CONTINUATION	FXC	FLEXIBLE CONNECTION	OBD	OPPOSED BLADE DAMPER	VRF	VARIABLE REFRIGERANT FLOW
CONTR	CONTRACTOR	GND	GROUND	OC	ON CENTER	VOLT	VOLTAGE
CRI	COLOR RENDERING INDEX	GA	GAUGE	OCC	OCCUPIED	VTR	VENT THROUGH ROOF
CT	COOLING TOWER	GAL	GALLON	OCP	OVER CURRENT PROTECTION	W	WIDTH
CT	CURRENT TRANSFORMER	GALV	GALVANIZED	OD	OUTSIDE DIAMETER	W	WATTS
CU	CONDENSING UNIT	GEC	GROUND ELECTRODE CONDUCTOR	OL	OVERLOAD	W	WITH
CU	COPPER	GFCI / GFI	GROUND FAULT CIRCUIT INTERRUPTER	ORD	OVERFLOW ROOF DRAIN	W/O	WITHOUT
CUH	CABINET UNIT HEATER	GC	GENERAL CONTRACTOR	OZ	OUNCE	WB	WET BULB
CVB	CONSTANT VOLUME BOX	GPH	GALLONS PER HOUR	PBD	PARALLEL BLADE DAMPER	WC	WATER COLUMN
CWR	CONDENSER WATER RETURN	GPM	GALLONS PER MINUTE	PD	PRESSURE DROP	WC	WATER CLOSET
CWS	CONDENSER WATER SUPPLY	GRS/LB	GRAINS PER POUND	PH	PHASE	WG	WATER GAUGE
DB	DRY BULB	H 2O	WATER	POS	POSITIVE PRESSURE	WP	WEATHERPROOF
DEPT	DEPARTMENT	HB	HOSE BIBB	POS	POINT OF SALES	WPIU	WEATHERPROOF IN-USE
DF	DRINKING FOUNTAIN	HD	HEAD (SEE SCHEDULES)	PRV	PRESSURE REDUCING VALVE	WSR	WITHSTAND RATING
DIA	DIAMETER	HP	HEAT PUMP	PS	PRESSURE SWITCH	XFMR	TRANSFORMER
DIAG	DIAGRAM	HP	HORSEPOWER	PSI	POUNDS PER SQUARE INCH		
				PT	PRESSURE TRANSMITTER		

MECHANICAL SHEET LIST

Sheet Number	Sheet Name
M0-1	MECHANICAL COVER SHEET
M1-1	MECHANICAL PLANS
M1-2	RADIANT PLANS
M3-1	MECHANICAL - SCHEDULES
M3-2	MECHANICAL DETAILS
M3-3	MECHANICAL DETAILS

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SUBSTITUTIONS:

A. SUBSTITUTIONS: SUBSTITUTION OF SPECIFIED EQUIPMENT WILL BE ALLOWED THROUGH A PRIOR APPROVAL PROCESS INITIATED BY THE CONTRACTOR. CONTRACTOR SHALL SUBMIT INTENDED SUBSTITUTION AT LEAST FIVE DAYS PRIOR TO BID FOR APPROVAL FROM ENGINEER. SUBMITTAL SHALL INCLUDE CAPACITIES, DIMENSIONS AND OPERATING INSTRUCTIONS FOR EACH PIECE OF EQUIPMENT. SUBSTITUTION SHALL OCCUR AT NO COST TO THE OWNER. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF APPROVED SUBSTITUTION AND SHALL INCUR ALL COSTS ASSOCIATED WITH THE SUBSTITUTION INCLUDING STRUCTURAL MODIFICATIONS, SPACE LAYOUT AND REDESIGN COSTS. SEE ALSO DIVISION I GENERAL REQUIREMENTS.

EXAMINATION OF SITE, DRAWINGS, SPECIFICATIONS:

A. EXAMINE CAREFULLY THE SITE AND CONDITIONS OF THE SITE. PROVIDE ALL NECESSARY EQUIPMENT AND LABOR TO INSTALL A COMPLETE WORKING SYSTEM WITHIN THE SITE CONDITIONS.

B. EXAMINE THE DRAWINGS AND SPECIFICATIONS AND 5 DAYS PRIOR TO BIDDING REPORT ANY ERRORS, OMISSIONS, INCONSISTENCIES, AND CONFLICTS TO THE ENGINEER TO BE REMEDIED IN AN ADDENDUM TO THE PROJECT PRIOR TO BID TIME.

C. DRAWINGS ARE DIAGRAMMATIC AND CATALOG NUMBERS GIVEN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE CAPACITY OF THE EQUIPMENT MEETS THE DRAWING REQUIREMENTS AND SHALL NOT DIMENSION FROM THE MECHANICAL, PLUMBING, OR PIPING DRAWINGS.

D. THE LATEST ADOPTED VERSIONS OF THE INTERNATIONAL BUILDING CODES SHALL BE USED AS REQUIRED. THIS WILL ALSO INCLUDE THE LATEST ADOPTED VERSIONS OF THE MECHANICAL, PLUMBING AND ENERGY CONSERVATION CODES. ALL METHODS AND MATERIALS REQUIRED BY THESE CODES SHALL BE REQUIRED BY THESE SPECIFICATIONS UNLESS INDICATED OTHERWISE. OTHER APPLICABLE LOCAL CODES AND ORDINANCES SHALL BE AS REQUIRED AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO BE KNOWLEDGEABLE OF THESE REQUIREMENTS.

E. WHERE INSTALLATION PROCEDURES OR ANY PART THEREOF ARE REQUIRED TO BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL BEING INSTALLED, PRINTED COPIES OF THESE RECOMMENDATIONS SHALL BE FURNISHED TO THE ENGINEER PRIOR TO INSTALLATION. INSTALLATION OF THE ITEM WILL NOT BE ALLOWED TO PROCEED UNTIL THE RECOMMENDATIONS ARE RECEIVED. FAILURE TO FURNISH THESE RECOMMENDATIONS CAN BE CAUSE FOR REJECTION OF THE MATERIAL.

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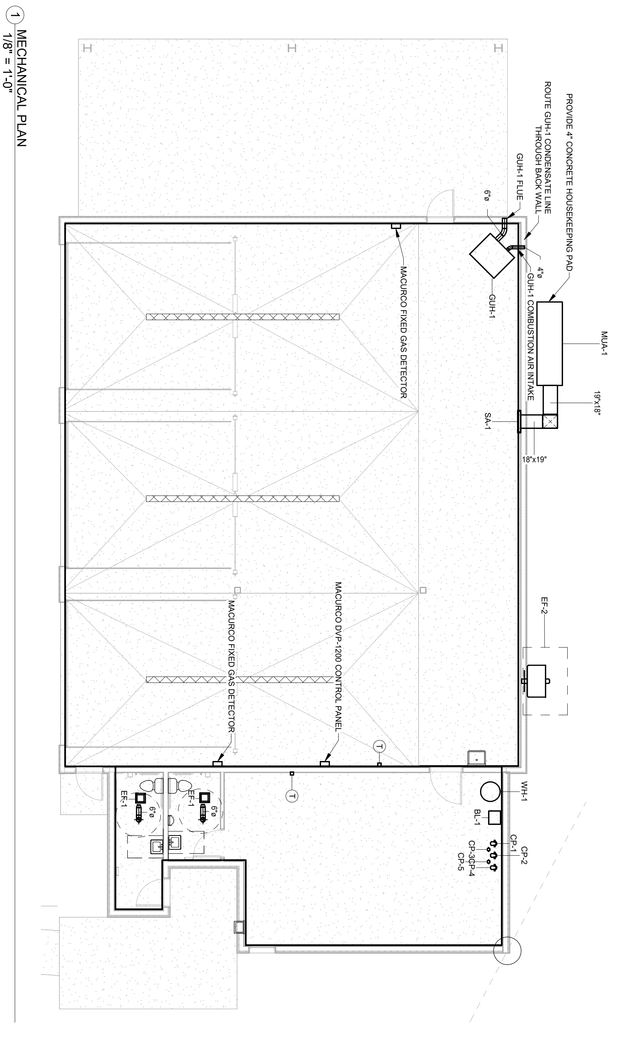
RICO ROAD & BRIDGE MAINTENANCE FACILITY
PICKER STREET
RICO, COLORADO

Project number	22-108
Drawn By	WG
Checked By	JWA
Issue	100% CD
Date	2/24/2023

M0-1
MECHANICAL COVER SHEET



1 MECHANICAL PLAN
1/8" = 1'-0"

M1-1
MECHANICAL PLANS

Project number	22-108
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RICO ROAD & BRIDGE
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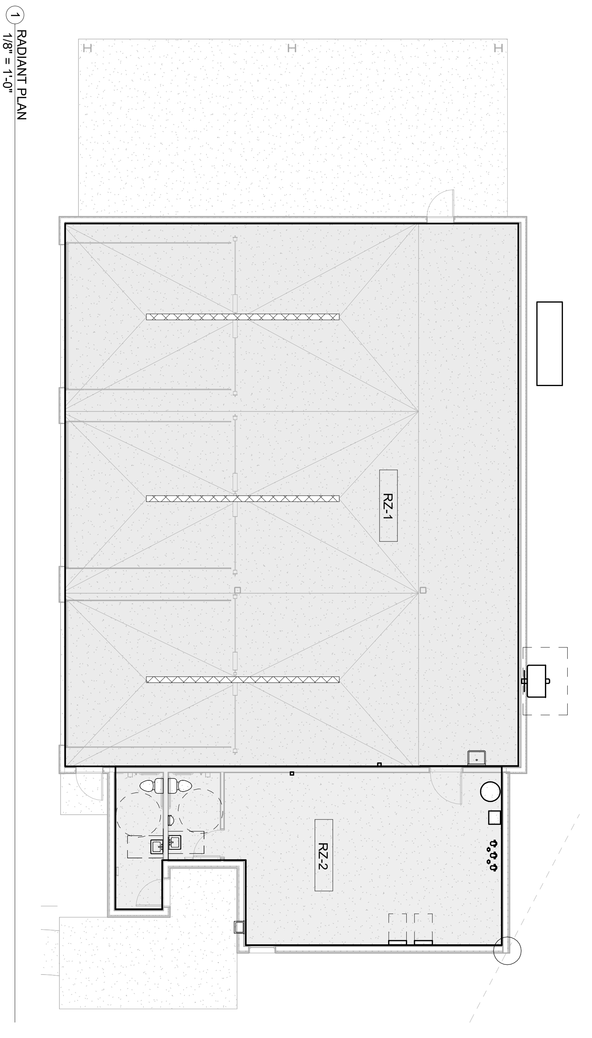
1 RADIANT PLAN
1/8" = 1'-0"



RADIANT ZONES

RZ-1

RZ-2

M1-2
RADIANT PLANS

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MECHANICAL PROVISIONS

1. SCOPE OF WORK

A. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIALS, AND LABOR TO SATISFY A COMPLETE WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.
B. ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH ALL LOCAL CODES AND ALL OTHER REGULATION GOVERNING WORK OF THIS NATURE.
C. THE CONTRACTOR SHALL, BEFORE SUBMITTING ANY PROPOSAL, EXAMINE THE PROPOSED SITE AND SHALL DETERMINE FOR HIMSELF THE CONDITIONS THAT MAY EFFECT THE WORK. NO ALLOWANCE SHALL BE MADE IF THE CONTRACTOR FAILS TO MAKE SUCH EXAMINATIONS.
D. ALL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED OR "APPROVED EQUAL" BY THE ENGINEER OR ARCHITECT.

2. PERMITS

A. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES.

3. SHOP DRAWINGS

A. SUBMIT MATERIAL LIST AND SHOP DRAWINGS FOR MAJOR EQUIPMENT TO THE ARCHITECT/ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL SUBMIT FIVE SETS OF SHOP DRAWINGS AND THEY SHALL BE CLEARLY LABELED.

4. FLEXIBLE DUCT WORK

A. FLEXIBLE TYPE DUCT SHALL BE OF TWO ELEMENT SPIRAL CONSTRUCTION COMPOSED OF A CORROSION RESISTANT METAL SUPPORTING SPIRAL AND COATED FABRIC WITH A MINERAL BASE. FLEXIBLE DUCT CONNECTORS SHALL BE LISTED BY U.L., CLASS 1 DUCTS, AND SHALL HAVE A FLAME SPREAD RATING NOT EXCEEDING 25 AND A SMOKE DEVELOPED RATING NOT EXCEEDING 50.
B. USE OF FLEXIBLE DUCTWORK SHALL BE LIMITED TO NO MORE THAN 6 LINEAR FEET PER RUN.
C. CONTRACTOR SHALL BE CAREFUL SO AS NOT TO KINK OR COLLAPSE FLEXIBLE DUCT.

5. REFRIGERANT

A. PIPING CONTRACTOR SHALL PROVIDE AND INSTALL REFRIGERANT PIPING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND IN SUCH A WAY AS TO BE INCONSPICUOUS AND FREE FROM ANY POSSIBLE CONDENSATION.
B. INSULATE REFRIGERANT LINES WITH ARMOUR-FLEX TYPE INSULATION, SHALL BE TYPE "K" COPPER TUBING, WITH WROUGHT COPPER SOLDER TYPE FITTINGS SUITABLE FOR CONNECTION WITH SILVER SOLDER.

6. DUCTWORK

A. THE DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "SMACNA" APPLICABLE MANUALS.
B. ALL DUCTWORK SHALL BE THE LOW VELOCITY TYPE, UNLESS SPECIFIED OTHERWISE.
C. CONTRACTOR SHALL PROVIDE AND INSTALL APPROVED FIRE DAMPERS AND ACCESS PANELS IN ANY AND ALL DUCTWORK WHICH PENETRATES A HORIZONTAL OR VERTICAL FIRE PARTITION, OR AS OTHERWISE SHOWN ON DRAWINGS.
D. ALL BRANCH DUCTS TO HAVE VOLUME DAMPERS, SMOOTH TURN RADIUS DUCTWORK OR TURNING VANES SHALL BE USED THROUGHOUT WHERE FLOW EXCEEDS 150 CFM.
E. ALL DUCT JOINTS TO BE SEALED IN ACCORDANCE WITH "SMACNA" STANDARDS AND ACCEPTED GOOD PRACTICE.
F. ALL DUCT DIMENSIONS SHOWN ARE NET INSIDE VALUES.DIMENSIONS MAY BE CHANGED SO LONG AS THE NET FREE FACE AREA IS MAINTAINED.
G. ALL CONCEALED DUCTWORK SHALL BE INSULATED WITH 1-1/2" FIBERGLASS INSULATING BLANKET WITH ALUMINUM FOIL FACING.
H. ALL SUPPLY AND RETURN DUCTWORK 15 FEET DOWNSTREAM OF THE HVAC UNIT SHALL BE INTERNALLY LINED WITH A 1/2" ACOUSTICAL DUCT LINER UNLESS OTHERWISE NOTED ON THE DRAWINGS.

7. DRAINAGE PIPING

A. (CONDENSATE) SHALL BE SCHEDULE 40 PVC PIPE WITH SOLVENT JOINTS. PITCH HORIZONTAL LINES 1" IN 10'-0". CONDENSATE DRAINS SHALL BE ROUTED TO FLOOR DRAIN, ROOF DRAIN OR INDIRECT WASTE DRAIN.

8. HVAC CONTROLS

A. CONTRACTOR TO SUPPLY AND INSTALL ALL CONTROL WIRING AND THERMOSTATS AS REQUIRED.

9. ELECTRICAL

A. CONTRACTOR TO COORDINATE WITH ELECTRICAL CONTRACTOR FOR LOCATION OF WIRING FOR EACH HVAC UNIT.

10. PIPE SUPPORTS

A. ALL PIPE SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN A NEAT AND WORKMANLIKE MANNER. THE USE OF WIRE OR METAL STRAP TO SUPPORT PIPES WILL NOT BE PERMITTED. SPACING OF PIPE SUPPORTS SHALL NOT EXCEED 8 FEET FOR ALL PIPING. PLASTIC PIPING TO BE SUPPORTED EVERY 4 FEET.

11. GAS PIPING

A. PIPING SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH MALLEABLE IRON FITTINGS.
WHERE GAS PIPE CONNECTS TO EQUIPMENT, IT SHALL BE PROVIDED WITH A DRIP LEG THE FULL SIZE OF THE RUNOUT, A 100% SHUT-OFF VALVE AND A UNION. GAS PIPING CONTAINING PRESSURE GREATER THAN 9" W.G. SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH WELDED JOINTS.

12. MISCELLANEOUS

A. ALL EXTERIOR OPENINGS TO BE PROPERLY CAULKED AND SEALED WITH A SEALANT OF HIGH QUALITY AND LONG LIFE, TO PREVENT INFILTRATION OF OUTSIDE AIR INTO CONDITIONED SPACE.
COORDINATE INSTALLATION OF ALL ROOF FLASHING AT ROOF PENETRATION.
B. DO NOT SCALE THIS DRAWING FOR EXACT DIMENSIONS.
C. VERIFY ALL FIGURES, CONDITIONS, AND DIMENSIONS AT THE JOB SITE.
D. THE MECHANICAL PLANS ARE INTENDED TO BE DIAGRAMMATIC AND ARE BASED ON ONE MANUFACTURE'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION, THE EXACT DIMENSIONS, OR ALL THE DETAILS OF THE EQUIPMENT.
E. THE CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT IN THE AVAILABLE SPACE.
D. PEX TUBING, IF PEX TUBING IS USED AS AN APPROVED ALTERNATE FOR APPLICATIONS WHERE METALLIC PIPING IS THE BASIS OF DESIGN. THE PEX MANUFACTURER SHALL SUBMIT SHOP DRAWINGS CLEARLY INDICATING THAT THE DESIGN HAS BEEN ANALYZED AND MODIFIED, AS REQUIRED TO MAINTAIN SCHEDULED HYDRONIC SYSTEM PARAMETERS. ANY DESIGN RESULTING IN INCREASED SYSTEM PRESSURE DROP AS A RESULT OF IMPROPER PEX SIZING OR DESIGN SHALL NOT BE PERMITTED.

13. TESTING AND BALANCING

A. THE HVAC SYSTEM SHALL BE TESTED AND AND BALANCED BY AN INDEPENDENT AGENCY, UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. A SEALED TYPE WRITTEN REPORT SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER FOR REVIEW AND APPROVAL.

14. GUARANTEE

A. MATERIALS, EQUIPMENT AND INSTALLATION SHALL BE GUARANTEED FOR A PERIOD OF ONE(1) YEAR FROM DATE OF ACCEPTANCE. DEFECTS WHICH APPEAR DURING THAT PERIOD SHALL BE CORRECTED AT THIS CONTRACTOR'S EXPENSE
B. FOR THE SAME PERIOD, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO PREMISES CAUSED BY DEFECTS IN WORKMANSHIP OR IN THE WORK OR EQUIPMENT FURNISHED AND/OR INSTALLED BY HIM.

MECHANICAL GENERAL NOTES:

1. DRAWING IS DIAGRAMMATIC IN NATURE. LOCATIONS AND SIZES MAY VARY. DURING FIELD COORDINATION & INSTALLATION OF MECHANICAL, PLUMBING, & ELECTRICAL. DRAWINGS DO NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. DRAWINGS ARE NOT TO BE SCALED FOR DIMENSIONS. TAKE ALL DIMENSIONS FROM ARCHITECTURAL DRAWINGS, CERTIFIED EQUIPMENT DRAWINGS AND FROM THE STRUCTURE ITSELF BEFORE FABRICATING ANY WORK, VERIFY ALL SPACE REQUIREMENTS COORDINATING WITH OTHER TRADES, AND INSTALL THE SYSTEMS IN THE SPACE PROVIDED WITHOUT EXTRA CHARGES TO THE OWNER.

2. DUCT DIMENSIONS DO NOT REFLECT ADDITIONAL DIMENSIONS FOR INSULATION. ALL DUCTING SHALL BE INSULATED PER 2018 IECC CODE REQUIREMENTS. (SUPPLY AND RETURN AIR DUCTS AND PLENUMS SHALL BE INSULATED WITH NOT LESS THAN R-6 INSULATION WHERE LOCATED IN UNCONDITIONED SPACES AND WHERE LOCATED OUTSIDE THE BUILDING WITH NOT LESS THAN R-8 INSULATION IN CLIMATE ZONES 1 THROUGH 4 AND NOT LESS THAN R-12 INSULATION IN CLIMATE ZONES 5 THROUGH 8. WHERE LOCATED WITHIN A BUILDING ENVELOPE ASSEMBLY, THE DUCT OR PLENUM SHALL BE SEPARATED FROM THE BUILDING EXTERIOR OR UNCONDITIONED OR EXEMPT SPACES BY NOT LESS THAN R-8 INSULATION IN CLIMATE ZONES 1 THROUGH 4 AND NOT LESS THAN R-12 INSULATION IN CLIMATE ZONES 5 THROUGH 8. DOLORES COUNT**CLIMATE ZONE 6B**)

3. COORDINATE FINAL LOCATION OF THERMOSTAT WITH OWNER PRIOR TO INSTALLATION. IF THERMOSTAT IS LOCATED ON EXTERIOR WALL PROVIDE THERMOSTAT WITH INSULATED BACKING.

4. CONDENSING WATER HEATER, GAS FURNACE, AND BOILER VENT MATERIAL SHALL COMPLY WITH MANUFACTURER'S LISTED AND APPROVED MATERIALS. PVC SHALL NOT BE USED FOR FLUE/COMBUSTION AIR VENTING MATERIAL. ENGINEERS PREFERRED MATERIAL IS PRESSURE RATED, DOUBLE WALL, GASKETED, 316 STAINLESS STEEL CONDENSING FLUE VENTING MATERIAL. RECOMMENDED MANUFACTURER'S SELKIRK OR JERMIAS.

5. ALL REFRIGERANT LINES SHALL BE INSULATED IN A WORKMAN LIKE MANNER PER MANUFACTURER'S INSTRUCTIONS. REFRIGERANT LINESET LONGEST LENGTHS SHALL BE 75'.

6. ROUTE CONDENSATE FROM CONDENSING MECHANICAL EQUIPMENT TO CONDENSATE NEUTRALIZATION KITS. CONDENSATE FROM NEUTRALIZATION KITS SHALL BE DISCHARGED INDIRECTLY THROUGH AIR GAP TO NEAREST FLOOR DRAIN.

7. ALL MOTORIZED DAMPERS ON OUTDOOR AIR INTAKES AND EXHAUST SHALL BE PROVIDED WITH CLASS IA MOTORIZED DAMPERS WITH A MAXIMUM LEAKAGE RATE OF 4 CFM/FT² AT 1.0 INCH WATER GAUGE WHEN TESTED IN ACCORDANCE WITH AMCA 500D. (PER 2012 IECC)

8. MECHANICAL CONTRACTOR SHALL FIELD LOCATE EXISTING DUCTWORK PRIOR TO CONSTRUCTION. MECHANICAL CONTRACTOR SHALL COORDINATE TIE IN CONNECTION POINTS OF NEW SUPPLY DIFFUSERS WITH EXISTING DUCTWORK AS NECESSARY.

9. CONTRACTOR SHALL CLEAN AND SERVICE ALL EXISTING EQUIPMENT TO REMAIN. CONTRACTOR SHALL VERIFY ALL EQUIPMENT TO REMAIN IS PROPERLY FUNCTIONING PRIOR TO RE-USING EQUIPMENT. CONTRACTOR TO INSURE THAT FINAL MECHANICAL SYSTEM WILL OPERATE AS INTENDED ON PROVIDED DRAWINGS.

10. MECHANICAL EQUIPMENT MANUFACTURERS AS SCHEDULED ON MECHANICAL DRAWINGS ARE SUGGESTED MANUFACTURER'S. UNLESS NOTED OTHERWISE DUE TO OWNER/CLIENT REQUIREMENTS AND PREFERENCES. MECHANICAL CONTRACTOR CAN SUBMIT EQUIVALENT EQUIPMENT FROM MANUFACTURERS THAT DIFFER FROM SCHEDULED MECHANICAL EQUIPMENT. ALTERNATE MANUFACTURERS OF MECHANICAL EQUIPMENT WILL BE REVIEWED FOR EQUIVALENCE OF PERFORMANCE AND FUNCTIONALITY BY ENGINEER.

11. THREE PHASE VRF HEAT PUMP CONDENSER MODULES SHALL BE PROVIDED WITH LOCAL PHASE MONITOR PROTECTION BEFORE EACH INDIVIDUAL CONDENSER MODULE. PHASE PROTECTION DEVICE SHALL BE BETWEEN MAIN POWER SUPPLIED TO THE UNIT AND INTERNAL COMPONENTS. PHASE PROTECTION DEVICE SHALL PROVIDE PROTECTION FROM VOLTAGE SAG, PHASE IMBALANCE AND SPORADIC FREQUENCY. PHASE PROTECTION DEVICE SHALL AUTOMATICALLY SHUT OFF CONDENSER MODULE UPON DETECTION OF POWER EVENT. PHASE PROTECTION DEVICE SHALL AUTOMATICALLY ENERGIZE AND START UP CONDENSER MODULE UPON POWER EVENT ENDING. PHASE MONITOR PROTECTION DEVICE SHALL BE SIMILAR/EQUIVALENT TO ICM #450.

12. SINGLE PHASE VRF HEAT PUMP CONDENSER MODULES SHALL BE PROVIDED WITH LOCAL POWER SOURCE PROTECTION. POWER SOURCE PROTECTION DEVICE SHALL BE BETWEEN MAIN POWER SUPPLIED TO THE UNIT AND INTERNAL COMPONENTS. POWER PROTECTION DEVICE SHALL PROVIDE PROTECTION FROM VOLTAGE SAG AND SPORADIC FREQUENCY. POWER PROTECTION DEVICE SHALL AUTOMATICALLY SHUT OFF CONDENSER MODULE UPON DETECTION OF POWER EVENT. PHASE PROTECTION DEVICE SHALL AUTOMATICALLY ENERGIZE AND START UP CONDENSER MODULE UPON POWER EVENT ENDING. POWER MONITOR PROTECTION DEVICE SHALL BE SIMILAR/EQUIVALENT TO ICM #492 WITH 2-POLE CONFIGURATIONS.

MAKE UP AIR UNIT SCHEDULE

TYPE MARK	SERVICE	SUPPLY AIRFLOW (CFM)	OUTSIDE AIRFLOW (CFM)	SUPPLY E.S.P.	HEATING		FILTERS	ELECTRICAL					WEIGHT (LBS)	MANUFACTURER	MODEL #	NOTES
					INPUT (MBH)	OUTPUT (MBH)		VOLTS	PHASE	FREQUENCY	MCA (A)	MOCP (A)				
MUA-1	GARAGE	2310	2310	0.5	137	126	NONE	208 V	3	60 Hz	9 A	15 A	720.00 lbf	GREENHECK	DGX-1100H12	NOTE-1

NOTES:
1. PROVIDE WITH VFD CONTROL ON SUPPLY FAN, POWER DISCONNECT, MODULATING GAS VALVE.

EXHAUST FAN SCHEDULE

Type Mark	SERVICE	LOCATION	EXHAUST AIRFLOW (CFM)	EXHAUST E.S.P.	MOTOR					MANUFACTURER	MODEL #	NOTES
					EXHAUST FAN MOTOR POWER	EXHAUST FAN SPEED (RPM)	VOLTS	PHASE	ELECTRICAL FREQUENCY			
EF-1	RESTROOM	CEILING	50	0.1	3.1 W	722	120 V	1	60 Hz	PANASONIC	FV-0511VK2	NOTE-1
EF-2	GARAGE	WALL	2310	0.1	1/4 HP	865	115 V	1	60 Hz	GREENHECK	CUBE-160	NOTE-2

NOTES:
1. PROVIDE WITH MULTISTAGE MODULE WITH TIME DELAY AND MOTION SENSOR.
2. PROVIDE WITH VFD SPEED CONTROL AND USE IN CONJUNCTION WITH MACURCO CONTROL PANEL, GAS DETECTION SENSORS AND MAKE UP AIR UNIT

PUMP SCHEDULE

Mark	SERVICE	LOCATION	FLUID FLOW RATE (GPM)	WATER PRESSURE DROP (FT)	MOTOR						MANUFACTURER	MODEL #	NOTES
					POWER (W)	RPM	VOLTS	PHASE	FREQUENCY	FLA (A)			
CP-1	BOILER	MECH ROOM	6.2	26.3	480 W	VARIABLE	208 V	1	60 Hz	6 A	TACO	VR15M	NOTE-1
CP-2	SYSTEM CIRCULATOR	MECH ROOM	26	2.5	480 W	VARIABLE	208 V	1	60 Hz	6 A	TACO	VR15M	NOTE-1
CP-3	RADIANT INJECTION	MECH ROOM	4	1	170 W	VARIABLE	110 V	1	60 Hz	1 A	TACO	003ée-F2	NOTE-1
CP-4	RADIANT CIRCULATOR	MECH ROOM	9.5	12.5	480 W	VARIABLE	208 V	1	60 Hz	6 A	TACO	VR15M	NOTE-1
CP-5	DOMESTIC RECIRCULATION	MECH ROOM	0.5	1	170 W	VARIABLE	110 V	1	60 Hz	1 A	TACO	0034e-SF2	NOTE-3

NOTES:
1. PROVIDE WITH CAST IRON CASING, POWER DISCONNECT, MOTOR STARTER, NON METALLIC IIMPELLER, STAINLESS STEEL SHAFT, CARBON SLEEVE TYPE BEARING, FLANGED CONNECTIONS, INTEGRAL FLOW CHECK VALVE. MOTOR HORSEPOWER SHALL BE GREATER THAN NON-OVERLOADING BRAKE HORSEPOWER.
2. PROVIDE WITH CAST IRON CASING, POWER DISCONNECT, MOTOR STARTER, NON METALLIC IIMPELLER, CERAMIC SHAFT, CERAMIC BEARING, FLANGED CONNECTIONS, INTEGRAL FLOW CHECK VALVE. MOTOR HORSEPOWER SHALL BE GREATER THAN NON-OVERLOADING BRAKE HORSEPOWER.
3. PROVIDE WITH STAINLESS STEEL CASING, POWER DISCONNECT, MOTOR STARTER, NON METALLIC IIMPELLER, CERAMIC SHAFT, CERAMIC BEARING, FLANGED CONNECTIONS, INTEGRAL FLOW CHECK VALVE. MOTOR HORSEPOWER SHALL BE GREATER THAN NON-OVERLOADING BRAKE HORSEPOWER.

GAS FIRED UNIT HEATER SCHEDULE

TYPE MARK	SERVICE	SUPPLY AIRFLOW (CFM)	HEATING		GAS PIPE CONNECTION SIZE	VENT SIZE	AIR INLET SIZE	ELECTRICAL			FLA (A)	ELECTRICAL		MANUFACTURER	MODEL #	OPTIONS/ ACCESSORIES
			INPUT (BTU/H)	OUTPUT (BTU/H)				VOLTS	PHASE	FREQUENCY		MOCP (A)	MOTOR HP			
GUH-1	GARAGE	2458	175,000	159,250	1/2"	4"	6"	115 V	1	60 Hz	6.3 A	15 A	1/4	REZNOR	UEZ 180	NOTE-1

NOTES:
1. PROVIDE WITH WALL PROPANE CONVERSION KIT, WALL MOUNTED THERMOSTAT

GAS BOILER SCHEDULE

TYPE MARK	SERVICE	INPUT CAPACITY (BTU/HR)	OUTPUT CAPACITY (BTU/HR)	BOILER VOLUME (GALLONS)	FLUE/ COMB. AIR SIZE (IN)	ELECTRICAL				MANUFACTURER	MODEL #	OPTIONS/ ACCESSORIES
						AMPS	VOLTS	PHASE	FREQUENCY			
BL-1	DOMESTIC HW / RADIANT	94,000	88,000	1.02	2-3/8 / 4	12 A	120 V	1	60 Hz	VIESSMANN	VITODENS 200-W B2HB 94	NOTE-1

NOTES:
1. PROVIDE WITH ASME RELIEF VALVE, LOW-WATER CUTOFF WITH MANUAL RESET & TEST, FLOW SWITCH, ADJUSTABLE HIGH LIMITH WITH MANUAL RESET, MODULATING TEMERATURE CONTROL, CONDENSATE NEUTRALIZING KIT.

GRILLE-REGISTER-DIFFUSER SCHEDULE

TYPE MARK	DIFFUSER DIMENSIONS			FINISH	MANUFACTURER	MODEL #	NOTES
	DUCT HEIGHT	DUCT WIDTH	OVERALL SIZE				
SA-1	18' - 0"	19' - 0"	30X24	WHITE	PRICE	300	NOTE-1

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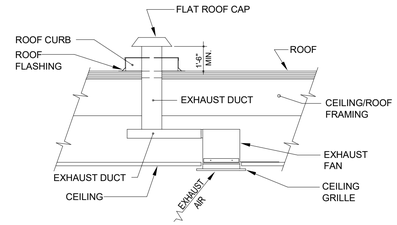
RICO ROAD & BRIDGE
MAINTENANCE FACILITY
PICKER STREET
RICO, COLORADO

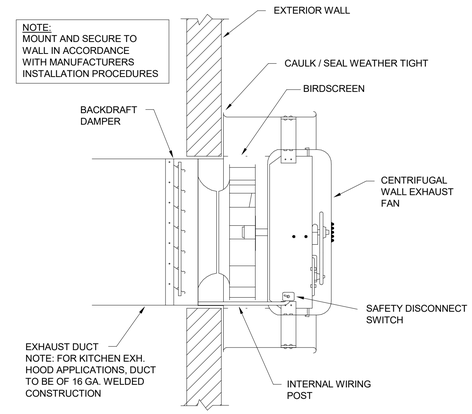
22-108 Project number
JWA Author
Drawn By
Checked By
100% CD Issue
2/24/2023 Date

M3-1
MECHANICAL - SCHEDULES



CEILING EXHAUST FAN DETAIL

NOT TO SCALE



CENTRIFUGAL WALL EXHAUST FAN DETAIL

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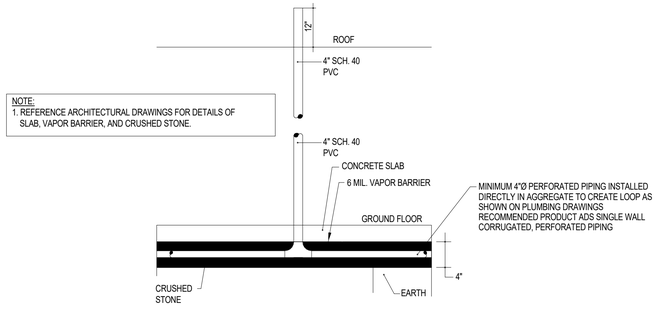
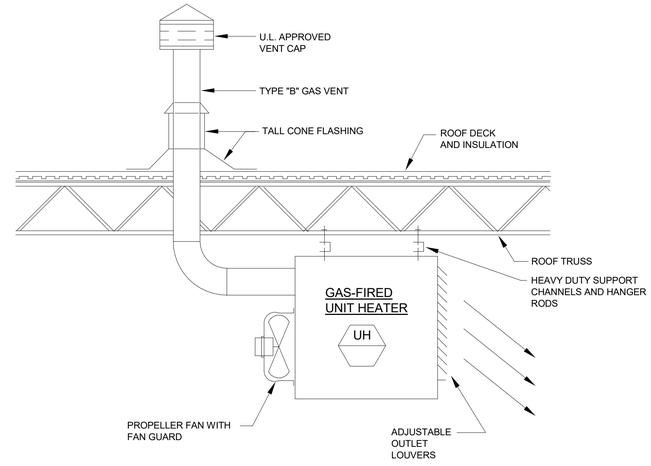


RADON VENT DETAIL

NOT TO SCALE



GAS FIRED UNIT HEATER DETAIL

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RICO ROAD & BRIDGE MAINTENANCE FACILITY PICKER STREET

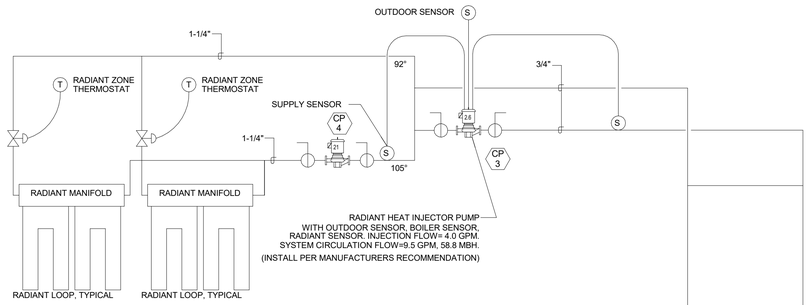
RICO, COLORADO

Project number	22-108
Drawn By	Author JWA
Checked By	
Issue	100% CD
Date	2/24/2023

M3-2
MECHANICAL DETAILS

GENERAL TUBING NOTES:

RADIANT FLOOR
TUBING IS 1/2" HEATPEX
SPACING IS 9" OC
SUPPLY=105°F
TEMPERATURE DROP=13°
SOLUTION IS WATER.
INSTALL TUBING UNDER FIREPLACES, TUBS AND SHOWERS AS SHOWN ON THE FLOOR PLANS.
SEE DETAILS FOR RECOMMENDED TUBING PRACTICES.
PROVIDE A MINIMUM R-5 INSULATION UNDER RADIANT FLOOR SLAB.

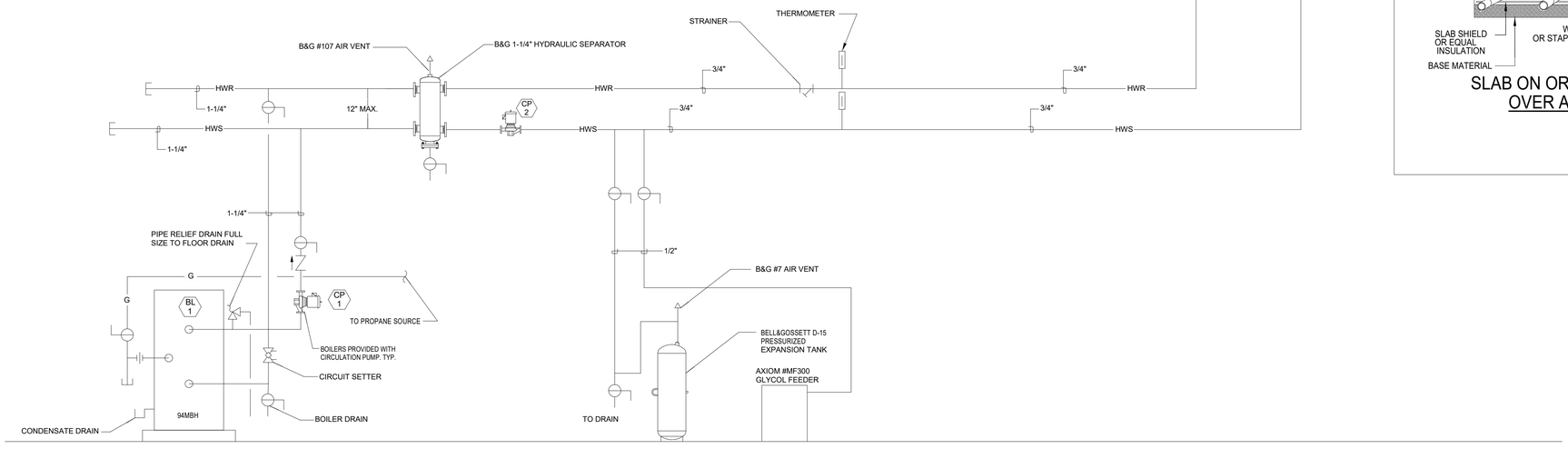


SEQUENCE OF OPERATION:

ON A CALL FOR HEATING FROM ANY ZONE THERMOSTAT, THE SYSTEM PUMP CP-2 SHALL START AND THE BOILER CONTROL SYSTEM SHALL BE ENABLED TO FIRE AND SEQUENCE THE BOILERS. AT THE SAME TIME, THE PUMP CP-3 AND CP-4 WILL RECEIVE A DEMAND SIGNAL WHICH WILL ALLOW IT TO START OPERATION AND MAINTAIN RADIANT FLOOR SET POINT TEMPERATURE (ADJ).

THE BOILER CONTROL SYSTEM SHALL CONTROL THE FIRING AND SEQUENCING OF THE BOILERS. THE CONTROLS SHALL MONITOR OUTSIDE AIR, HOT WATER SUPPLY AND HOT WATER RETURN TEMPERATURES. THE BOILER CONTROLS SHALL START/STOP THE BOILER CIRCULATION PUMP CP-1.

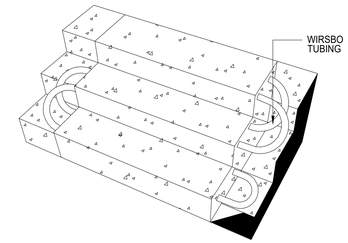
WALL MOUNTED ZONE THERMOSTATS SHALL CONTROL ZONE VALVES AT EACH ZONE MANIFOLD TO MAINTAIN SPACE TEMPERATURE.



BUILDING HEATING BOILER PIPING DETAIL

SCALE: NTS

NOTE: FINAL FILL OF SYSTEM SHALL BE WITH SOLUTION OF 30% PROPYLENE GLYCOL.



STAIR PATTERN
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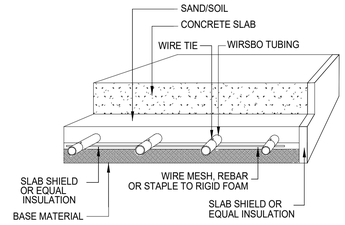

SLAB ON OR BELOW GRADE
OVER A SAND BED
N.T.S.

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RICO ROAD & BRIDGE
MAINTENANCE FACILITY
PICKER STREET
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M3-3
MECHANICAL DETAILS

PLUMBING PIPE DESIGNATIONS

LINE TYPE	DESCRIPTION
140	HIGH TEMPERATURE (140°) WATER PIPE
	COLD WATER PIPE (CW)
CA	COMPRESSED AIR
DC	DECONTAMINATION PIPING
DER	DEIONIZED WATER RETURN
DES	DEIONIZED WATER SUPPLY
DIS	DISTILLED WATER SUPPLY
DIR	DISTILLED WATER RETURN
CD	EQUIPMENT CONDENSATE DRAIN
FP	FIRE MAIN
GW	GREASE WASTE PIPE
HE	HELIUM
HPS	HIGH PRESSURE STEAM
HPC	HIGH PRESSURE CONDENSATE
	HOT WATER RECIRCULATION (HWR)
	HOT WATER PIPE (HW)
H2	HYDROGEN
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
MA	MEDICAL AIR
G	NATURAL GAS PIPE
N2	NITROGEN
N2O	NITROUS OXIDE
ORD	OVERFLOW STORM WATER PIPE
O2	OXYGEN
PG	PROPANE GAS
RD	ROOF DRAIN PIPE
	SOIL OR WASTE PIPE
S/O	SOIL / OIL WASTE PIPE
TWR	TOWER WATER RETURN
TWS	TOWER WATER SUPPLY
VAC	VACUUM
	VENT PIPE (V)

PLUMBING ELEMENTS / VALVING

LINE TYPE	DESCRIPTION
	PRESSURE REDUCING VALVE (PRV)
	GATE VALVE
	GLOBE VALVE
	PLUG VALVE
	BUTTERFLY VALVE
	BALL VALVE
	SWING CHECK VALVE
	LIFT CHECK VALVE
	GATE VALVE, ANGLE
	GLOBE VALVE, ANGLE
TPV	TEMPERATURE AND PRESSURE RELIEF VALVE
	RELIEF/SAFETY VALVE
	GAS COCK
	GAS PRESSURE REGULATOR
	STRAINER
	STRAINER WITH BLOW OFF VALVE
WH	WATER HEATER
M	WATER METER
	PRESSURE GAGE
	TEMPERATURE GAGE

LINE TYPE	DESCRIPTION
	PIPE RISING UP
	PIPE DROPPING DOWN
	UNION - SCREWED OR FLANGED
PT/PS	PRESSURE TRANSMITTER OR PRESSURE SWITCH
TH/TI	THERMOMETER/TEMPERATURE INDICATOR
PI/GA	GAUGE WITH GAUGE COCK/ PRESSURE INDICATOR
	BACKFLOW PREVENTOR (REDUCED ZONE)
	BACKFLOW PREVENTOR (DOUBLE CHECK VALVE ASSEMBLY)
SA	WATER HAMMER ARRESTER
	CIRCUIT SETTING
HB	HOSE BIBB
RD	ROOF DRAIN
FD	FLOOR DRAIN
AD	AREA DRAIN
CO	FLOOR CLEAN OUT
FS	FLOOR SINK
COG	CLEAN OUT TO GRADE
CO	WALL CLEAN OUT
	FLEXIBLE-CONNECTION
	CHECK VALVE
	VACUUM BREAKER

RESPONSIBLE DIVISION:

UNLESS OTHERWISE INDICATED ALL HEATING, VENTILATING, AIR CONDITIONING, PLUMBING, AND OTHER MECHANICAL EQUIPMENT, MOTORS, AND CONTROLS SHALL BE FURNISHED, SET IN PLACE AND WIRED AS FOLLOWS:

ITEM	FURNISHED	SET	POWER WIRED	CONTROL WIRED
EQUIPMENT	23	23	26	--
COMBINATION MAGNETIC MOTOR STARTERS, MAGNETIC MOTOR STARTERS, VFD'S AND CONTACTORS	23(1)	26	26(2)	23
FUSED AND UNFUSED DISCONNECT SWITCHES, THERMAL OVERLOAD SWITCHES AND HEATERS, MANUAL MOTOR STARTERS	26	26	26	--
MANUAL-OPERATING AND MULTI-SPEED SWITCHES	23	26	26	26
CONTROLS, RELAYS, TRANSFORMERS	23	23	26	23
THERMOSTATS (LOW VOLTAGE) AND TIME SWITCHES	23	23	26	23
THERMOSTATS (LINE VOLTAGE)	23	23	26	26
TEMPERATURE CONTROL PANELS	23	23	26	23
MOTOR AND SOLENOID VALVES, DAMPER MOTORS, PE & EP SWITCHES	23	23(2)	--	23(2)
PUSH-BUTTON STATIONS AND PILOT LIGHTS	23	23(2)	--	23(2)
HEATING, COOLING, VENTILATION AND AIR CONDITIONING CONTROLS	23	23	26	23
EXHAUST FAN SWITCHES	23	26	26	23(2)

SUBSCRIPT FOOTNOTES:
1. MOTOR STARTER TO INCLUDE CONTROL TRANSFORMER, HOA SWITCH, (1) NO AND (1)NC AUXILIARY CONTACT, AND "ON" AND "OFF" PILOT LIGHTS.

2. IF ITEM IS FOR LINE VOLTAGE, SET IN PLACE AND CONNECT UNDER DIVISION 26. WHERE FACTORY MOUNTED ON EQUIPMENT OR ATTACHED TO PIPING OR DUCTS AND USING LINE VOLTAGE FURNISH AND SET UNDER DIVISION 23, CONNECT UNDER DIVISION 26.

ABBREVIATIONS:

44" FINISHED FLOOR TO CENTER OF DEVICE	MOUNTING HEIGHT ABOVE
A	AMPS
A.D.	ACCESS DOOR
AAV	AIR ADMITTANCE VALVE
ABV	ABOVE
AC	AIR CONDITIONING UNIT
AC	ABOVE COUNTER
AD	AREA DRAIN (SEE SYMBOLS)
A.F.C.	ABOVE FINISHED CEILING
A.F.G.	ABOVE FINISHED GRADE
AIC	AMPS INTERRUPTING CAPACITY
A.F.F.	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALUM	ALUMINUM
AP	ACCESS PANEL OR DOOR
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIO / VIDEO
AVG	AVERAGE
AWG	AMERICAN WIRE GAGE
BAS	BUILDING AUTOMATION SYSTEM
BB	BASEBOARD
BD	BACK DRAFT DAMPER
BFP	BACK FLOW PREVENTOR
BL	BOILER
BLDG	BUILDING
BLW	BELOW
BOB	BOTTOM OF BEAM
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BSMT	BASEMENT
BTU	BRITISH THERMAL UNIT
C	CHILLER
CAP	CAPACITY
CB	CIRCUIT BREAKER
CBV	CIRCUIT BALANCING VALVE
CCT	CORRELATED COLOR TEMPERATURE
CKT	CIRCUIT
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CI	CAST IRON
CL	CENTER LINE
CLG	CEILING
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
COMP	COMPRESSOR
CONC	CONCRETE
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CONTR	CONTRACTOR
CRI	COLOR RENDERING INDEX
CT	COOLING TOWER
CT	CURRENT TRANSFORMER
CU	CONDENSING UNIT
CU	COPPER
CUH	CABINET UNIT HEATER
CVB	CONSTANT VOLUME BOX
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
DB	DRY BULB
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGRAM
DIFF	DIFFERENTIAL
DISCH	DISCHARGE
DIV	DIVISION
DN	DOWN
DS	DUCT SILENCER
DWG	DRAWING
DX	DIRECT EXPANSION
(E)	EXISTING
EA	EXHAUST AIR GRILLE/REGISTER
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECC	ECCENTRIC
EF	EXHAUST FAN
EFF	EFFICIENCY
EL	ELEVATION
ELEC	ELECTRIC
ELEV	ELEVATOR
EM	EMERGENCY FUNCTION
ENT	ENTERING
EMT	ELECTRIC METALLIC TUBE
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ES	END SWITCH
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EX	EXHAUST
EXPAN	EXPANSION
EXT	EXTERNAL
F	DEGREES FAHRENHEIT
FA	FREE AREA
FC	FAN COIL UNIT
FC	FOOTCANDLE
FCV	FLOW CONTROL VALVE
FD	FIRE DAMPER
FD	FLOOR DRAIN
FIN	FINISHED
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FP	FIRE PROTECTION
FP	FIRE PUMP
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FS	FLOW SWITCH
FSD	FIRE/SMOKE DAMPER
FT	FEET
FXC	FLEXIBLE CONNECTION
GND	GROUND
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GEC	GROUND ELECTRODE CONDUCTOR
GFCI / GFI	GROUND FAULT CIRCUIT INTERRUPTER
GC	GENERAL CONTRACTOR
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRS/LB	GRAINS PER POUND
H 2O	WATER
HB	HOSE BIBB
HD	HEAD (SEE SCHEDULES)
HP	HEAT PUMP
HP	HORSEPOWER
HR	HOUR
HT	HEIGHT
HTR	HEATER
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
HX	HEAT EXCHANGER
HZ	HERTZ
ID	INSIDE DIAMETER
IG	ISOLATED GROUND
IN	INCHES
INV	INVERT
JBOX	JUNCTION BOX
K	KELVIN
KW	KILOWATT
KVA	KILO VOLT - AMPS
L	LENGTH
LAT	LEAVING AIR TEMPERATURE
LV	LAVATORY
LB	POUND
LD	LINEAR DIFFUSER
LF	LINEAR FEET
LIN	LINEAR
LIQ	LIQUID
LM	LUMEN
LRA	LOCKED ROTOR AMPS
LV	LOUVER
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSANDS OF BTU PER HOUR
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MD	MOTORIZED DAMPER
MDP	MAIN DISTRIBUTION PANEL
MED	MEDIUM
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUG ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MTD	MOUNTED
MUA	MAKE-UP AIR UNIT
N	NEUTRAL
NC	NORMALLY CLOSED
NEG	NEGATIVE
NIC	NOT IN CONTRACT
NL	NIGHT / SECURITY LIGHT - DO NOT SWITCH
NO	NORMALLY OPEN
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OCC	OCCUPIED
OCP	OVER CURRENT PROTECTION
OD	OUTSIDE DIAMETER
OL	OVERLOAD
ORD	OVERFLOW ROOF DRAIN
OZ	OUNCE
PBD	PARALLEL BLADE DAMPER
PD	PRESSURE DROP
PH	PHASE
POS	POSITIVE PRESSURE
POS	POINT OF SALES
PRV	PRESSURE REDUCING VALVE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TRANSMITTER
PTAC	PACKAGED TERMINAL AIR CONDITIONER
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RA	RETURN AIR GRILLE / REGISTER
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REL	RELIEF
REQD	REQUIRED
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RLA	RATED LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR GRILLE / REGISTER
SC	SHORT CIRCUIT
SCA	SHORT CIRCUIT AVAILABLE
SCCR	SHORT CIRCUIT CURRENT RATING
SCH	SCHEDULE
SD	SMOKE DAMPER
SEF	SMOKE EXHAUST FAN
SF	SUPPLY FAN
SH	SENSIBLE HEAT
SH	SHOWER
SP	STATIC PRESSURE
SPD	SURGE PROTECTION DEVICE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
SS	SAFETY SHOWER
STD	STANDARD
STL	STEEL
SYS	SYSTEM
TEMP	TEMPERATURE
TR	TRANSFER GRILLE / REGISTER
TR	TAMPER RESISTANT
TT	TEMPERATURE TRANSMITTER
TTB	TELECOMMUNICATIONS TERMINAL BACKBOARD
TYP	TYPICAL
TX	TRANSFORMER
UC	UNDERCUT DOOR
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UNOCC	UNOCCUPIED
UR	URINAL
V	VOLTS
VA	VOLT AMPERE
VA	VALVE
VAV	VARIABLE AIR VOLUME UNIT
VFD	VARIABLE FREQUENCY DRIVE
VRF	VARIABLE REFRIGERANT FLOW
VOLT	VOLTAGE
VTR	VENT THROUGH ROOF
W	WIDTH
W	WATTS
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER COLUMN
WC	WATER CLOSET
WG	WATER GAUGE
WP	WEATHERPROOF
WPIU	WEATHERPROOF IN-USE
WSR	WITHSTAND RATING
XFMR	TRANSFORMER

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SUBSTITUTIONS:

A. SUBSTITUTIONS: SUBSTITUTION OF SPECIFIED EQUIPMENT WILL BE ALLOWED THROUGH A PRIOR APPROVAL PROCESS INITIATED BY THE CONTRACTOR. CONTRACTOR SHALL SUBMIT INTENDED SUBSTITUTION AT LEAST FIVE DAYS PRIOR TO BID FOR APPROVAL FROM ENGINEER. SUBMITTAL SHALL INCLUDE CAPACITIES, DIMENSIONS AND OPERATING INSTRUCTIONS FOR EACH PIECE OF EQUIPMENT. SUBSTITUTION SHALL OCCUR AT NO COST TO THE OWNER. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF APPROVED SUBSTITUTION AND SHALL INCUR ALL COSTS ASSOCIATED WITH THE SUBSTITUTION INCLUDING STRUCTURAL MODIFICATIONS, SPACE LAYOUT AND REDESIGN COSTS. SEE ALSO DIVISION I GENERAL REQUIREMENTS.

EXAMINATION OF SITE, DRAWINGS, SPECIFICATIONS:

A. EXAMINE CAREFULLY THE SITE AND CONDITIONS OF THE SITE. PROVIDE ALL NECESSARY EQUIPMENT AND LABOR TO INSTALL A COMPLETE WORKING SYSTEM WITHIN THE SITE CONDITIONS.

B. EXAMINE THE DRAWINGS AND SPECIFICATIONS AND 5 DAYS PRIOR TO BIDDING REPORT ANY ERRORS, OMISSIONS, INCONSISTENCIES, AND CONFLICTS TO THE ENGINEER TO BE REMEDIED IN AN ADDENDUM TO THE PROJECT PRIOR TO BID TIME.

C. DRAWINGS ARE DIAGRAMMATIC AND CATALOG NUMBERS GIVEN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE CAPACITY OF THE EQUIPMENT MEETS THE DRAWING REQUIREMENTS AND SHALL NOT DIMENSION FROM THE MECHANICAL, PLUMBING, OR PIPING DRAWINGS.

D. THE LATEST ADOPTED VERSIONS OF THE INTERNATIONAL BUILDING CODES SHALL BE USED AS REQUIRED. THIS WILL ALSO INCLUDE THE LATEST ADOPTED VERSIONS OF THE MECHANICAL, PLUMBING AND ENERGY CONSERVATION CODES. ALL METHODS AND MATERIALS REQUIRED BY THESE CODES SHALL BE REQUIRED BY THESE SPECIFICATIONS UNLESS INDICATED OTHERWISE. OTHER APPLICABLE LOCAL CODES AND ORDINANCES SHALL BE AS REQUIRED AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO BE KNOWLEDGEABLE OF THESE REQUIREMENTS.

E. WHERE INSTALLATION PROCEDURES OR ANY PART THEREOF ARE REQUIRED TO BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL BEING INSTALLED, PRINTED COPIES OF THESE RECOMMENDATIONS SHALL BE FURNISHED TO THE ENGINEER PRIOR TO INSTALLATION. INSTALLATION OF THE ITEM WILL NOT BE ALLOWED TO PROCEED UNTIL THE RECOMMENDATIONS ARE RECEIVED. FAILURE TO FURNISH THESE RECOMMENDATIONS CAN BE CAUSE FOR REJECTION OF THE MATERIAL.

PLUMBING SHEET LIST

Sheet Number	Sheet Name
P0-1	PLUMBING COVER SHEET
P1-1	PLUMBING PLANS
P1-2	PLUMBING PLANS
P1-3	RADON VENT LAYOUT
P3-1	PLUMBING SCHEDULES

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RICO ROAD & BRIDGE
MAINTENANCE FACILITY
PICKER STREET
RICO, COLORADO

Project number 22-108
Drawn By WG
Checked By JWA

Issue 100% CD
Date 2/24/2023

P0-1
PLUMBING
COVER SHEET

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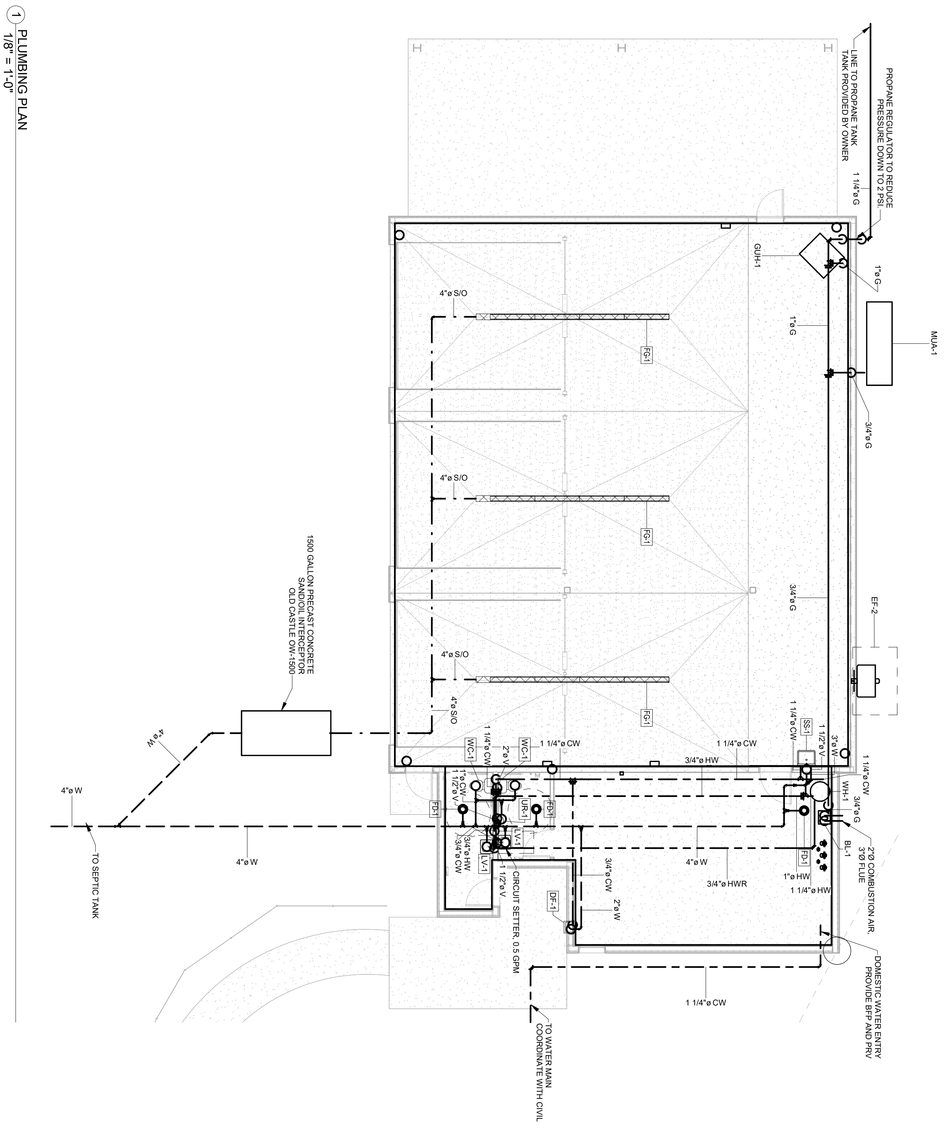
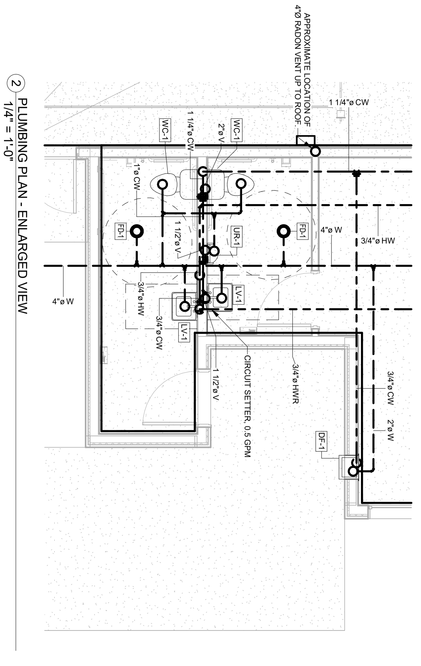


1 PLUMBING PLAN
1/8" = 1'-0"



2 PLUMBING PLAN - ENLARGED VIEW
1/4" = 1'-0"

P1-1
PLUMBING PLANS

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1 ROOF DRAIN LAYOUT
1/8" = 1'-0"

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P1-2
PLUMBING PLANS

1 RADON VENT LAYOUT
1/8" = 1'-0"

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P1-3
RADON VENT LAYOUT

PLUMBING SPECIFICATION

1. SCOPE OF WORK

A. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIALS, AND LABOR TO SATISFY A COMPLETE WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.

B. ALL WORK IS TO BE PREFORMED IN STRICT COMPLIANCE WITH THE INTERNATIONAL PLUMBING CODE (LATEST EDITION), ALL LOCAL CODES AND ALL OTHER REGULATION GOVERNING WORK OF THIS NATURE.

C. THE CONTRACTOR SHALL, BEFORE SUBMITTING ANY PROPOSAL, EXAMINE THE PROPOSED SITE AND SHALL DETERMINE FOR HIMSELF THE CONDITIONS THAT MAY AFFECT THE WORK. NO ALLOWANCE SHALL BE MADE IF THE CONTRACTOR FAILS TO MAKE SUCH EXAMINATIONS.

D. ALL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED OR "APPROVED AS EQUAL" BY THE ENGINEER OR ARCHITECT.

2. PERMITS

A. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES.

3. SHOP DRAWINGS

A. SUBMIT MATERIAL LIST AND SHOP DRAWINGS FOR MAJOR EQUIPMENT TO THE ARCHITECT/ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL SUBMIT FIVE SETS OF SHOP DRAWINGS AND THEY SHALL BE CLEARLY LABELED.

4. DOMESTIC WATER SUPPLY PIPING

A. UNDERGROUND: PROVIDE TYPE "K" SOFT DRAWN COPPER TUBING WITH BRAZED CONNECTIONS.

B. ABOVE GROUND: PROVIDE TYPE "L" HARD DRAWN COPPER TUBING WITH 125 PSI SOLDER JOINTS, COPPER OR BRASS FITTINGS. ALL SOLDER TO BE "NO LEAD" TYPE.

C. ALL HOT WATER PIPING TO BE INSULATED WITH 1" FIBERGLASS INSULATION.

D. ALL COLD WATER PIPING TO BE INSULATED WITH $\frac{1}{2}$" FOAM INSULATION.

5. SANITARY/STORM DRAINAGE AND VENT PIPING

A. ABOVE GRADE:

-2" BELOW: SCHEDULE 40 GALV. STEEL PIPE WITH SCREWED ENDS OR SOLID CORE SCHEDULE 40 PVC WITH SOLVENT JOINTS OR DWV COPPER WITH SOLDER JOINTS. ALL SOLDER TO BE "NO LEAD" TYPE.

-3" AND ABOVE: SERVICE WT. CAST IRON WITH NO-HUB OR BELL AND SPIGOT JOINTS; OR SOLID CORE SCHEDULE 40 PVC WITH SOLVENT JOINTS.

B. BELOW GRADE: SERVICE WT. CAST IRON WITH NO-HUB OR BELL AND SPIGOT JOINTS; OR SOLID CORE SCHEDULE 40 PVC WITH SOLVENT JOINTS.

C. PVC PIPING SHALL NOT BE USED IN AIR PLENUM CEILINGS AND SHALL NOT CROSS FIRE RATED WALLS, CEILINGS, OR FLOORS.

D. DRAINAGE PIPING SHALL BE RUN AS STRAIGHT AS POSSIBLE AND SHALL HAVE LONG TURN FITTINGS.

E. DRAINAGE PIPING 3" SIZE AND SMALLER SHALL RUN AT A UNIFORM GRADE OF AT LEAST $\frac{1}{4}$" PER FOOT. AND PIPING LARGER THAN 3" SHALL BE RUN AT A GRADE OF NO LESS THAN $\frac{1}{8}$" PER FOOT.

F. ALL VENT PIPING SHALL BE SLOPED TO DRAIN BACK TO FIXTURES.

G. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER FLASHING OF THE VENT PIPING RUN THROUGH THE ROOF.

H. PVC USED TO BE SOLID CORE TYPE SCHEDULE 40 PVC.

7. PIPE SUPPORTS

A. ABOVE GRADE: ALL PIPE SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN A NEAT AND WORKMANLIKE MANNER. THE USE OF WIRE AND PERFORATED METAL TO SUPPORT PIPES WILL NOT BE PERMITTED. SPACING OF PIPE SUPPORTS SHALL BE A S SPECIFIED IN INTERNATIONAL PLUMBING CODE (LATEST EDITION).

B. BELOW GRADE: EARTH SHALL BE EXCAVATED TO A MINIMUM DEPTH WITH AN EVEN SURFACE TO INSURE SOLID BEARING OF PIPE FOR ITS ENTIRE LENGTH.

-INTERIOR: THE PIPE SHALL BE INSTALLED (UNLESS OTHERWISE SPECIFIED) A MINIMUM OF 4 INCHES BELOW THE BOTTOM OF THE SLAB AND SHALL NOT BE IN ANY DIRECT CONTACT WITH THE CONCRETE AT ANY POINT.

-EXTERIOR: THE WATER PIPE SHALL HAVE A MINIMUM OF 60" OF COVER AND THE SANITARY WASTE PIPE SHALL HAVE A MINIMUM OF 24" OF COVER.

8. MISCELLANEOUS

A. COORDINATE INSTALLATION OF ALL ROOFS FLASHING AT ROOF PENETRATIONS.

B. DO NOT SCALE THIS DRAWING FOR EXACT DIMENSIONS. VERIFY ALL FIGURES, CONDITIONS AND DIMENSIONS AT THE JOB SITE.

C. THE PLUMBING PLANS ARE INTENDED TO BE DIAGRAMMATIC AND ARE BASED ON ONE MANUFACTURER'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION. THE EXACT DIMENSIONS OR ALL THE DETAILS OF THE EQUIPMENT. THE CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT THE AVAILABLE SPACE.

9. TESTING

A. PLUMBING SYSTEM SHALL BE FLOW AND PRESSURE TESTED IN ACCORDANCE WITH THE INTERNATIONAL PLUMBING CODE (LATEST EDITION).

10 GUARANTEE

A. MATERIALS, EQUIPMENT AND INSTALLATION SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM DATE OF ACCEPTANCE. DEFECTS WHICH APPEAR DURING THAT PERIOD SHALL BE CORRECTED AT THIS CONTRACTORS EXPENSE.

B. FOR THE SAME PERIOD THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO PREMISES CAUSED BY DEFECTS IN WORKMANSHIP OR IN THE WORK OR EQUIPMENT FURNISHED AND/OR INSTALLED BY HIM.

PLUMBING GENERAL NOTES:

1. DRAWING IS DIAGRAMMATIC IN NATURE. LOCATIONS AND SIZES MAY VARY DURING FIELD COORDINATION & INSTALLATION OF MECHANICAL, PLUMBING, & ELECTRICAL. DRAWINGS DO NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. DRAWINGS ARE NOT TO BE SCALED FOR DIMENSIONS. TAKE ALL DIMENSIONS FROM ARCHITECTURAL DRAWINGS, CERTIFIED EQUIPMENT DRAWINGS AND FROM THE STRUCTURE ITSELF BEFORE FABRICATING ANY WORK. VERIFY ALL SPACE REQUIREMENTS COORDINATING WITH OTHER TRADES, AND INSTALL THE SYSTEMS IN THE SPACE PROVIDED WITHOUT EXTRA CHARGES TO THE OWNER.
2. PIPE DIMENSIONS DO NOT REFLECT ADDITIONAL DIMENSIONS FOR INSULATION. ALL PIPING SHALL BE INSULATED PER 2018 IECC CODE REQUIREMENTS.
3. CONDENSING WATER HEATER, GAS FURNACE, AND BOILER VENT MATERIAL SHALL COMPLY WITH MANUFACTURER'S LISTED AND APPROVED MATERIALS. PVC SHALL NOT BE USED FOR FLUE/COMBUSTION AIR VENTING MATERIAL. ENGINEERS PREFERRED MATERIAL IS PRESSURE RATED, DOUBLE WALL, GASKETED, 316 STAINLESS STEEL CONDENSING FLUE VENTING MATERIAL. RECOMMENDED MANUFACTURER'S SELKIRK OR JERMIAS.
4. ROUTE CONDENSATE FROM CONDENSING MECHANICAL EQUIPMENT TO CONDENSATE NEUTRALIZATION KITS. CONDENSATE FROM NEUTRALIZATION KITS SHALL BE DISCHARGED INDIRECTLY THROUGH AIR GAP TO NEAREST FLOOR DRAIN.
5. ALL PLUMBING FIXTURES WITH QUICK CLOSING VALVES ON DOMESTIC COLD/HOT WATER SHALL BE PROVIDED WITH WATER HAMMER ARRESTOR.
6. PROVIDE ISOLATION VALVES AT GROUP RESTROOMS TO ALLOW FOR TOTAL ISOLATION OF THE ENTIRE RESTROOM GROUP FROM THE REST OF THE DOMESTIC COLD, HOT AND HOT RE-CIRCULATION SYSTEMS.
7. ALL PLUMBING FIXTURES SHALL BE VENTED BY PLUMBING CONTRACTOR PER IPC REQUIREMENTS.
8. ELEVATOR SUMP PUMP SHALL OPERATE AT 50 GPM PER ELEVATOR CAR. ELEVATOR SUMP PUMP SHALL BE PROVIDED WITH OIL DETECTION ALARM AND MEET ASME A17.1 ELEVATOR CODE REQUIREMENTS. ELEVATOR SUMP PUMP SHALL BE PROVIDED WITH INLINE CHECK VALVE, ISOLATION VALVES AND DISCHARGE INDIRECTLY THROUGH AIR GAP SIZED PER IPC TO NEARBY FLOOR SINK.
9. CONTRACTOR SHALL CLEAN AND SERVICE ALL EXISTING EQUIPMENT/PLUMBING FIXTURES TO REMAIN. CONTRACTOR SHALL VERIFY ALL EQUIPMENT/PLUMBING FIXTURES ARE PROPERLY FUNCTIONING PRIOR TO RE-USING EQUIPMENT/FIXTURES. CONTRACTOR TO INSURE THAT FINAL PLUMBING SYSTEM WILL OPERATE AS INTENDED ON PROVIDED DRAWINGS.
10. 10 P.S.I. PROPANE ROUTED TO TANK. TOTAL CONNECTED LOAD IS APPROXIMATELY 406,000 BTU/H. LONGEST EQUIVALENT LINE LENGTH OF PIPING IS APPROXIMATELY 150 FEET. INLET PRESSURE
11. PLUMBING FIXTURE MANUFACTURERS AS SCHEDULED ON PLUMBING DRAWINGS ARE SUGGESTED MANUFACTURER'S AND MODELS. UNLESS NOTED OTHERWISE DUE TO OWNER/CLIENT REQUIREMENTS AND PREFERENCES. PLUMBING CONTRACTOR CAN SUBMIT EQUIVALENT FIXTURES FROM MANUFACTURERS THAT DIFFER FROM SCHEDULED PLUMBING FIXTURES. ALTERNATE MANUFACTURERS OF PLUMBING FIXTURES WILL BE REVIEWED FOR EQUIVALENCE OF PERFORMANCE AND FUNCTIONALITY BY ENGINEER.
12. ALL EXTERIOR METALLIC NATURAL GAS PIPING SHALL BE TREATED WITH CORROSIVE INHIBITOR COATING. COATING SHALL BE APPLIED PER MANUFACTURER'S RECOMMENDATION SO THAT COATING MAINTAINS INTEGRITY OF GAS PIPING. COATING SHALL BE UV RESISTANT.

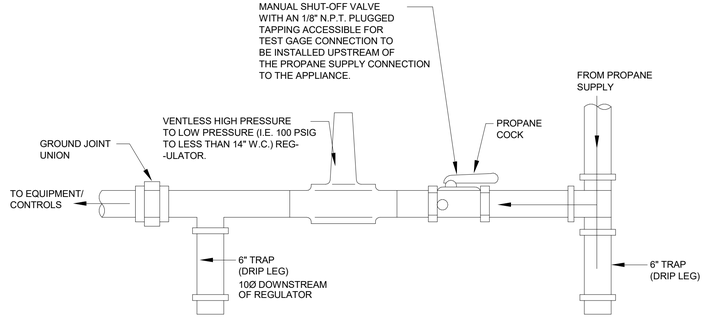
PLUMBING FIXTURE SCHEDULE

TYPE MARK	MANUFACTURER	MODEL #	TRIM	PIPE CONNECTIONS				OPTIONS/ ACCESSORIES
				S/W	VENT	CW	HW	
DF-1	ELKAY	VRCDWSK		1-1/4"		3/8"	-	
FD-1	ZURN	Z415B		3"	2"	-	-	PROVIDE 6" NICKEL BRONZE STRAINER
FG-1	ZURN	P6-GDC	GALVANIZED SLOTTED FLOOR GRATE	4"	-	-	-	GRATES INSTALLED OVER FORMED TRENCHES
LV-1	KOHLER	K-2030	FAUCET #K-800T20-5ANA	1 1/2"	1 1/2"	1/2"	1/2"	
RD-1	ZURN	Z100F		4"	-	-	-	
RDO-1	ZURN	Z100F		4"	-	-	-	
SS-1	PROFLO	PFLT2123	FAUCET PF1119	2"	2"	1/2"	1/2"	
UR-1	KOHLER	K-4991-ER	0.125 GPF FLUSH VALVE K-80UM00D20	2"	2"	3/4"	-	
WC-1	KOHLER	K-PR96057-T4D	1.28 GPF FLUSH VALVE	3"	2"	1/2"	-	

ELECTRIC TANK WATER HEATER SCHEDULE

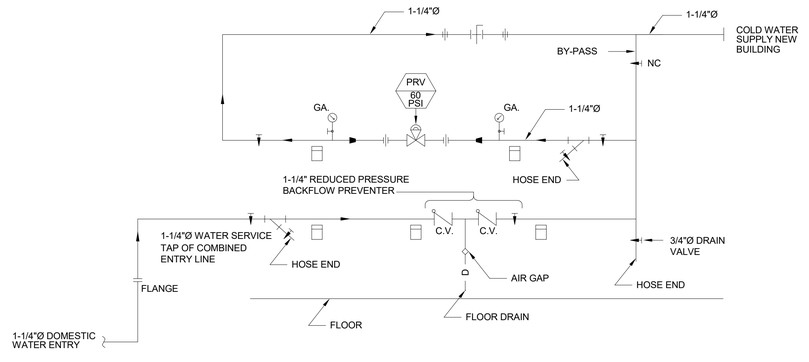
MARK	TANK SIZE (GAL)	WATER CONNECTION SIZE	ELECTRICAL				MANUFACTURER	MODEL #	NOTES
			HEATING ELEMENT (KW)	VOLTS	PHASE(S)	FREQUENCY (Hz)			
WH-1	20	3/4"	2	120 V	1	60 Hz	RHEEM	XE20P06PU20U0	NOTE-1

NOTES:
1. PROVIDE WITH TEMPERATURE AND PRESSURE RELIEF VALVE.



BUILDING PROPANE REGULATOR DETAIL

NOT TO SCALE



DOMESTIC WATER PRESSURE REDUCING STATION DETAIL

NOT TO SCALE

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PICKER STREET
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P3-1
PLUMBING SCHEDULES

FIRE ALARM EQUIPMENT LEGEND

FACP	FIRE ALARM CONTROL PANEL
F	FIRE ALARM PULL STATION
	FIRE ALARM HORN
	FIRE ALARM STROBE
	FIRE ALARM HORN/STROBE
	CEILING MOUNTED SPEAKER
D	DUCT DETECTOR
R	REMOTE LAMP
S P	SMOKE DETECTOR - PHOTOELECTRIC
H 135°	135° STANDARD HEAT DETECTOR
PIR	PIR DETECTOR
DH	DOOR HOLD - MAGNETIC HOLD
FS	FLOW SWITCH
TS	TAMPER SWITCH

COMMUNICATION LEGEND

	CLOCK ONLY
CS	CLOCK / PA SPEAKER WALL MOUNTED
S	ROUND CEILING MOUNTED SPEAKER
S	SQUARE SPEAKER
C	INTERCOM PUSH TO CALL SWITCH
WAP	WIRELESS ACCESS POINT ABOVE THE CEILING
PROJECTOR	ABOVE THE CEILING PROJECTOR CONNECTION
HDMI	WALL MOUNTED HDMI
	PLAIN DATA OUTLET
80"	PLAIN DATA OUTLET WITH MOUNTING HEIGHT
	COMBINATION DATA/TELEPHONE
	FLOOR MOUNTED COMBINATION DATA/TELEPHONE
	CEILING MOUNTED COMBINATION DATA/TELEPHONE
	TELEVISION OUTLET

SECURITY SYSTEM LEGEND

	SECURITY CAMERA
HC	ADA DOOR OPERATOR PUSH BUTTON
DS	ELECTRIC DOOR STRIKE
CR	CARD READER FOR DOOR OPERATOR

GENERAL ELECTRICAL NOTES:

1. ALL ELECTRICAL WORK TO COMPLY WITH LATEST EDITION OF NEC, IECC AND ALL APPLICABLE GOVERNING CODES.
2. FIELD COORDINATION DURING CONSTRUCTION IS IMPERATIVE. CONTRACTORS BIDDING THIS WORK MUST MAKE REASONABLE ALLOWANCES FOR UNFORESEEN CONTINGENCIES.
3. ELECTRIC UTILITY TO ADVISE OWNER AND/OR THE ELECTRICAL ENGINEER PRIOR TO SERVICE MODIFICATION REQUIRING COST TO THE OWNER.

WIRING:

1. ALL WIRING IS SHOWN DIAGRAMMATICALLY ON DRAWING, FIELD VERIFY ALL CONDITIONS PRIOR TO ROUGH-IN.
2. ALL CONDUITS AND CONVEYANCES SHALL BE CONCEALED. IN THE EVENT THAT A NEW DEVICE IS BEING INSTALLED IN AN EXISTING DRYWALL PARTITION, PROVIDE A CUT IN TYPE BOX AND FISH FLEXIBLE CONDUIT DOWN INSIDE THE WALL FROM ABOVE THE CEILING AND REPAIR THE DRYWALL AROUND THE CONDUIT. TRANSITION TO EMT ONCE ABOVE THE CEILING.
3. SIZES OF WIRE AND CABLES ARE BASED UPON COPPER CONDUCTORS, UNLESS OTHERWISE INDICATED. ALL CIRCUITS SHALL CONTAIN (2) #12 AWG WITH (1) #12 GND IN 1/2" CONDUIT UNLESS NOTED OTHERWISE.
4. ALL BRANCH CIRCUITS WITH HOME RUNS OVER 50 FEET, WILL BE SIZED ONE SIZE LARGER.
5. ALL PENETRATIONS IN OR THROUGH FIRE RATED PARTITIONS SHALL BE FIRE STOPPED IN SUCH A WAY THAT THE PENETRATION MATCHES THE FIRE RATING OF THE WALL.
6. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL COORDINATION BETWEEN THE APPROPRIATE DISCIPLINES AND CONTRACTORS.
7. COORDINATE ALL DEVICE, FIXTURE AND HARDWARE COLOR SELECTIONS WITH THE ARCHITECT PRIOR TO MAKING SHOP DRAWING SUBMITTALS.
8. COORDINATE THE MOUNTING HEIGHTS OF ALL RECEPTACLES MOUNTED ABOVE COUNTERS, CASEWORK AND APPLIANCE RECEPTACLES WITH ARCHITECTURAL ELEVATIONS.
9. BRANCH CIRCUIT AND SPECIAL SYSTEMS WIRING FOR DEVICES ON WALLS IN FINISHED AREAS WHICH CANNOT BE CONCEALED SHALL BE INSTALLED IN SURFACE MOUNTED RACEWAY.
10. ALL EXPOSED CONDUITS, BOXES, ETC. IN ROOMS TO BE PAINTED SHALL BE PAINTED TO MATCH THE SURROUNDING SURFACE. EXPOSED CONDUITS, BOXES, ETC. IN ROOMS WHICH ARE NOT PAINTED MAY BE LEFT UN-PAINTED. EXPOSED CONDUIT, BOXES, ETC. ON THE EXTERIOR OF BUILDINGS SHALL BE PAINTED TO MATCH THE SURROUNDING SURFACE AS CLOSELY AS POSSIBLE.
11. THE CONTRACTOR IS RESPONSIBLE FOR PATCHING, PAINTING, REPAIRING OR REPLACEMENT OF ALL WALLS, CEILING OR OTHER BUILDING ELEMENTS WHICH ARE DISTURBED AS PART OF THE DEMOLITION AND/OR INSTALLATION OF ELECTRICAL WORK.
12. PROVIDE ELECTRICAL CONNECTION TO ALL FIRE, SMOKE, AND FIRE / SMOKE DAMPERS INCLUDING POWER AND FIRE ALARM. VERIFY EXACT SIZE AND FINAL LOCATION OF ALL DAMPERS WITH THE MECHANICAL CONTRACTOR. ALL ROOFTOP UNITS RATED AT MORE THAN 2000 CFM WILL BE OUTFITTED WITH A DUCT DETECTOR IN THE RETURN DUCT. ALL ROOFTOP UNITS RATED AT MORE THAN 15000 CFM WILL BE OUTFITTED WITH A DUCT DETECTOR IN BOTH THE SUPPLY AND RETURN DUCT AT ROOFTOP LEVEL AND IN THE RETURN DUCT AT EVERY LEVEL THAT IS SERVED. ELECTRICAL CONTRACTOR WILL PROVIDE A REMOTE TEST STATION AND ALL WIRING NECESSARY TO COMPLETE INSTALLATION.
13. REFER TO THE MECHANICAL EQUIPMENT SCHEDULE FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH PLUMBING AND HVAC EQUIPMENT AND OWNER/GENERAL CONTRACTOR FURNISHED EQUIPMENT.

LIGHTING LEGEND

NOTES:

SYMBOLS SHOWN ARE STANDARD. VARIATION AND/OR COMBINATIONS MAY BE USED ON THE PLANS. THIS LIST SHOWS STANDARD SYMBOLS AND ALL MAY NOT APPEAR ON THE PROJECT DRAWINGS; HOWEVER, WHEREVER THE SYMBOL ON THE PROJECT DRAWINGS OCCUR, THE ITEM SHALL BE PROVIDED AND INSTALLED.

VARIATION AND/OR COMBINATION MAY BE USED ON THE PLANS.

A NUMBER NEXT TO A RECEPTACLE OR DEVICE INDICATES A CIRCUIT NUMBER.

AN UPPER CASE LETTER NEXT TO A SWITCH INDICATES THE FUNCTION OF THE SWITCH. A LOWER CASE LETTER INDICATES THE SWITCH CIRCUIT.

AN UPPER CASE LETTER NEXT TO A LIGHT FIXTURE INDICATES THE TYPE OF FIXTURE. REFER TO THE LUMINAIRE SCHEDULE FOR FIXTURE SPECIFICATIONS. A LOWER CASE LETTER NEXT TO A LIGHT CORRESPONDS TO THE SWITCH DESIGNATION.

SWITCHES

$	SINGLE POLE SWITCH
$2	TWO POLE SWITCH
$3	THREE-WAY SWITCH
$4	FOUR-WAY SWITCH
$D	DIMMER SWITCH
$3D	3 WAY DIMMER SWITCH - (4D INDICATES A 4WAY DIMMER)
$DR	DOOR ACTIVATED SWITCH
$MA	WALL MOUNTED DUAL TECHNOLOGY MANUAL ON / AUTO OFF VACANCY SENSOR SWITCH
$LV	LOW VOLTAGE LIGHT SWITCH
$TO	MANUAL MOTOR STARTER
$P	PILOT LIGHT SWITCH
$DS	AUTO ON / AUTO OFF LIGHT SWITCH
$MO	DUAL TECHNOLOGY MOTION / OCCUPANCY SENSOR LIGHT SWITCH
$DMA	MANUAL ON / AUTO OFF DIMMING LIGHT SWITCH
$K	KEY OPERATED LIGHT SWITCH
$T	MANUAL ON - TIMED OFF LIGHT SWITCH
OS OS	CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR SWITCH
MA MA	CEILING MOUNTED DUAL TECHNOLOGY MANUAL ON / AUTO OFF VACANCY SENSOR
$SC	SCENE CONTROL STATION
$MS	UNIT LIGHTING MANAGEMENT CONTROL STATION,

LIGHT FIXTURES

A	1'x4' LED TROFFER OR DIRECT/INDIRECT TYPE FIXTURE GRID, FLANGE OR SURFACE MOUNTED
A	2'x4' LED TROFFER OR DIRECT/INDIRECT TYPE FIXTURE GRID, FLANGE OR SURFACE MOUNTED
A	2'x2' LED TROFFER OR DIRECT/INDIRECT TYPE FIXTURE GRID, FLANGE OR SURFACE MOUNTED
	OPEN STRIP FIXTURE
	WALL BRACKET LINEAR FIXTURE
A	WALL MOUNTED SCONCE LIGHT FIXTURE
A	RECESSED DOWNLIGHT CAN FIXTURE
A	SURFACE CEILING OR PENDANT MOUNTED FIXTURE
EX2	DOUBLE FACE EXIT SIGN, WALL AND CEILING MOUNTED
EX1	SINGLE FACE EXIT SIGN, WALL AND CEILING MOUNTED
EM	WALL MOUNTED EMERGENCY LIGHT
EMR	EMERGENCY EXTERIOR EGRESS FIXTURE

LUMINAIRES:

1. COORDINATE THE LOCATION OF ALL LIGHTING EQUIPMENT INCLUDING BUT NOT LIMITED TO THE LUMINAIRES, SWITCHES WITH THE ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS AND ALL OTHER TRADES AS REQUIRED. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLANS FOR DIMENSIONAL LOCATION OF LIGHT FIXTURES.
2. LIGHTING FIXTURES SHALL BE SUPPORTED FROM THE STRUCTURE ABOVE AND SHALL NOT BE SUPPORTED FROM THE T-BAR CEILING GRID.
3. THE ELECTRICAL CONTRACTOR IS TO CONFIRM THE LIGHT FIXTURES ORDERED WILL BE COMPATIBLE WITH THE CEILING TYPES AS SHOWN ON THE ARCHITECTURAL REFLECTED CEILING PLANS. NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING THE FIXTURES.
4. VERIFY LUMINAIRE MOUNTING REQUIREMENTS AND OVERALL HEIGHT OF ALL PENDANT MOUNTED FIXTURES PRIOR TO ORDERING.
5. ALL LIGHT FIXTURES NEED TO BE COMPATIBLE WITH THE SWITCHES AND CONTROLS BEING PROVIDED.
6. THE LIGHTING PACKAGE SHALL BE APPROVED BY BOTH THE ARCHITECT AND ENGINEER AS APPROVED EQUAL BEFORE BID. NO LIGHT FIXTURE SHALL BE ORDERED UNTIL THE LIGHT FIXTURE SUBMITTAL PACKAGE HAS BEEN APPROVED IN WRITING BY THE ARCHITECT, GENERAL CONTRACTOR AND ELECTRICAL ENGINEER.
7. COORDINATE LUMINAIRE MOUNTING REQUIREMENTS PRIOR TO PLACING ORDER.

EMERGENCY AND EXIT LIGHTS:

1. PROVIDE EMERGENCY AND EXIT SIGNS AS PER ALL GOVERNING CODES.
2. EXIT SIGNS CONNECTED TO A REMOTE EMERGENCY HEAD REQUIRE EXTRA BATTERY CAPACITY TO OPERATE THE REMOTELY LOCATED EMERGENCY HEAD FOR EGRESS AWAY FROM THE BUILDING.
3. REFER TO THE PLANS FOR THE NUMBER OF FACES REQUIRED AT EACH EXIT. FIELD ADJUST THE LOCATION OF THE EXIT SIGNS AND NUMBER OF FACES FOR THE BEST VISIBILITY POSSIBLE.
4. ALL LIGHTING FIXTURES DENOTED WITH "EM" SHALL BE PROVIDED WITH AN ENGINEER APPROVED EMERGENCY LED DRIVER OR INVERTER TO OPERATE THE FIXTURE IN AN EMERGENCY MODE TO MEET ALL CURRENT GOVERNING CODES AND WILL BE CIRCUITED TO THE UNSWITCHED SIDE OF THE LIGHTING CIRCUIT.
5. ALL LIGHT FIXTURES DESIGNATED WITH "EM" OR SPECIFIED WITH AN EMERGENCY FUNCTION SHALL BE PROVIDE WITH ONE OF THE FOLLOWING.
   a. INTEGRAL TEST SWITCH
   b. REMOTE INFRARED HANDHELD DEVICE
   c. INTEGRAL ELECTRONIC DEVICE THAT AUTOMATICALLY PERFORMS CODE REQUIRED TESTS.
6. ALL STAIRWELLS AND PATHS OF EGRESS TO THE EXTERIOR DOORS AND THE EXTERIOR PATH OF EGRESS AWAY FROM THE BUILDING SHALL RECEIVE EMERGENCY LIGHTING PER CODE.

ELECTRICAL EQUIPMENT LEGEND

	BRANCH CIRCUIT PANELBOARD
	TELEPHONE TERMINAL BOARD
	ELECTRIC MOTOR
F	FUSED SAFETY SWITCH / DISCONNECT COMBINATION
	MOTOR STARTER
	CONTACTOR
LA-7	CIRCUITRY HOMERUN: PANEL LA - CIR. #7
	CONDUIT OR WIRE CONCEALED IN WALL/CLG. (SOLID LINE TYPE)
	CONDUIT OR WIRE UNDERFLOOR/UNDERGND. (CENTER LINE TYPE)

MAIN DISTRIBUTION GEAR

	CIRCUIT BREAKER IN A PANEL BOARD
	PAD MOUNTED UTILITY TRANSFORMER
100 A 2 POLE FUSED DISCONNECT	FUSED DISCONNECT 100A = AMP RATING 2P = NUMBER OF POLES
M	ELECTRICAL METER SHOWN ON ONE-LINE DIAGRAMS
PP1 225A MCB 120/208V 3PH, 4W	ELECTRICAL POWER PANEL WITH MAIN LUG OR MAIN BREAKER PP1= PANEL NAME 225A MLO = MAIN LUG OR BREAKER SIZE 120/208V = PANEL VOLTAGE 3PH, 4 WIRE = PANEL PHASE, DISTRIBUTION TYPE
PP1 225A MLO 120/208V 3PH, 4W	

ELECTRICAL DEVICE LEGEND

	CEILING JUNCTION BOX - SURFACE/FLUSH
	WALL JUNCTION BOX - SURFACE/FLUSH
	DUPLEX RECEPTACLE
	FLOOR MOUNTED RECEPTACLE
	SPLIT WIRED DUPLEX RECEPTACLE
	CEILING MOUNTED DUPLEX RECEPTACLE
	FLOOR MOUNTED FOURPLEX RECEPTACLE
	APPLIANCE RECEPTACLE - 3 WIRE
	DUPLEX RECEPTACLE
	FOURPLEX RECEPTACLE

ABBREVIATIONS PERTAIN TO ALL DUPLEX AND FOURPLEX RECEPTACLES:

AC	ABOVE COUNTER
AC GF	ABOVE COUNTER - GROUND FAULT CIRCUIT INTERRUPTER
AC USB	ABOVE COUNTER WITH USB PORT
AF	ARC FAULT PROTECTED
AF USB	ARC FAULT PROTECTED WITH USB PORT
AF GF	ARC FAULT WITH GROUND FAULT CIRCUIT INTERRUPTER
D	DEDICATED RECEPTACLE
D USB	DEDICATED RECEPTACLE WITH USB PORT
EM	RECEPTACLE CIRCUITED TO THE EMERGENCY PANEL WITH RED COVER PLATE
GF	GROUND FAULT CIRCUIT INTERRUPTER
GF WP	WEATHER PROOF GROUND FAULT CIRCUIT INTERRUPTER
PL	PLUG LOAD
72"	GENERAL PURPOSE WITH MOUNTING HEIGHT.

	ELECTRIC HAND DRYER
T	THERMOSTAT
	OPEN/CLOSE/STOP PUSH BUTTON
1	DRAWING KEY NOTES
ROOM 100	ROOM DESIGNATION

RESPONSIBLE DIVISION:

UNLESS OTHERWISE INDICATED ALL HEATING, VENTILATING, AIR CONDITIONING, PLUMBING, AND OTHER MECHANICAL EQUIPMENT, MOTORS, AND CONTROLS SHALL BE FURNISHED, SET IN PLACE AND WIRED AS FOLLOWS:

ITEM	FURNISHED	SET	POWER WIRED	CONTROL WIRED
EQUIPMENT	23	23	26	--
COMBINATION MAGNETIC MOTOR STARTERS, MAGNETIC MOTOR STARTERS, VFD'S AND CONTACTORS	23(1)	26	26(2)	23
FUSED AND UNFUSED DISCONNECT SWITCHES, THERMAL OVERLOAD SWITCHES AND HEATERS, MANUAL MOTOR STARTERS	26	26	26	--
MANUAL-OPERATING AND MULTI-SPEED SWITCHES	23	26	26	26
CONTROLS, RELAYS, TRANSFORMERS	23	23	26	23
THERMOSTATS (LOW VOLTAGE) AND TIME SWITCHES	23	23	26	23
THERMOSTATS (LINE VOLTAGE)	23	23	26	26
TEMPERATURE CONTROL PANELS	23	23	26	23
MOTOR AND SOLENOID VALVES, DAMPER MOTORS, PE & EP SWITCHES	23	23(2)	--	23(2)
PUSH-BUTTON STATIONS AND PILOT LIGHTS	23	23(2)	--	23(2)
HEATING, COOLING, VENTILATION AND AIR CONDITIONING CONTROLS	23	23	26	23
EXHAUST FAN SWITCHES	23	26	26	23(2)

SUBSCRIPT FOOTNOTES:
1. MOTOR STARTER TO INCLUDE CONTROL TRANSFORMER, HOA SWITCH, (1) NO AND (1)NC AUXILIARY CONTACT, AND "ON" AND "OFF" PILOT LIGHTS.
2. IF ITEM IS FOR LINE VOLTAGE, SET IN PLACE AND CONNECT UNDER DIVISION 26. WHERE FACTORY MOUNTED ON EQUIPMENT OR ATTACHED TO PIPING OR DUCTS AND USING LINE VOLTAGE FURNISH AND SET UNDER DIVISION 23, CONNECT UNDER DIVISION 26.

ABBREVIATIONS:

44" FINISHED	MOUNTING HEIGHT ABOVE FLOOR TO CENTER OF DEVICE
A	AMPS
A.D.	ACCESS DOOR
AAV	AIR ADMITTANCE VALVE
ABV	ABOVE
AC	AIR CONDITIONING UNIT
AC	ABOVE COUNTER
AD	AREA DRAIN (SEE SYMBOLS)
A.F.C.	ABOVE FINISHED CEILING
A.F.G.	ABOVE FINISHED GRADE
AIC	AMPS INTERRUPTING CAPACITY
A.F.F.	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALUM	ALUMINUM
AP	ACCESS PANEL OR DOOR
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIO / VIDEO
AVG	AVERAGE
AWG	AMERICAN WIRE GAGE
BAS	BUILDING AUTOMATION SYSTEM
BB	BASEBOARD
BD	BACK DRAFT DAMPER
BFP	BACK FLOW PREVENTOR
BL	BOILER
BLDG	BUILDING
BLW	BELOW
BOB	BOTTOM OF BEAM
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BSMT	BASEMENT
BTU	BRITISH THERMAL UNIT
C	CHILLER
CAP	CAPACITY
CB	CIRCUIT BREAKER
CBV	CIRCUIT BALANCING VALVE
CCT	CORRELATED COLOR TEMPERATURE
CKT	CIRCUIT
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CI	CAST-IRON
CL	CENTER LINE
CLG	CEILING
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
COMP	COMPRESSOR
CONC	CONCRETE
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CONTR	CONTRACTOR
CRI	COLOR RENDERING INDEX
CT	COOLING TOWER
CT	CURRENT TRANSFORMER
CU	CONDENSING UNIT
CU	COPPER
CUH	CABINET UNIT HEATER
CVB	CONSTANT VOLUME BOX
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
DB	DRY BULB
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGRAM
DIFF	DIFFERENTIAL
DISCH	DISCHARGE
DIV	DIVISION
DN	DOWN
DS	DUCT SILENCER
DWG	DRAWING
DX	DIRECT EXPANSION
(E)	EXISTING
EA	EXHAUST AIR GRILLE/REGISTER
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECC	ECCENTRIC
EF	EXHAUST FAN
EFF	EFFICIENCY
EL	ELEVATION
ELEC	ELECTRIC
ELEV	ELEVATOR
EM	EMERGENCY FUNCTION
ENT	ENTERING
EMT	ELECTRIC METALLIC TUBE
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ES	END SWITCH
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EX	EXHAUST
EXPAN	EXPANSION
EXT	EXTERNAL
F	DEGREES FAHRENHEIT
FA	FREE AREA
FC	FAN COIL UNIT
FC	FOOTCANDLE
FCV	FLOW CONTROL VALVE
FD	FIRE DAMPER
FD	FLOOR DRAIN
FIN	FINISHED
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FP	FIRE PROTECTION
FP	FIRE PUMP
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FS	FLOW SWITCH
FSD	FIRE/SMOKE DAMPER
FT	FEET
FXC	FLEXIBLE CONNECTION
GND	GROUND
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GEC	GROUND ELECTRODE CONDUCTOR
GFCI / GFI	GROUND FAULT CIRCUIT INTERRUPTER
GC	GENERAL CONTRACTOR
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRS/LB	GRAINS PER POUND
H 2O	WATER
HB	HOSE BIBB
HD	HEAD (SEE SCHEDULES)
HP	HEAT PUMP
HP	HORSEPOWER
HR	HOUR
HT	HEIGHT
HTR	HEATER
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
HX	HEAT EXCHANGER
HZ	HERTZ
ID	INSIDE DIAMETER
IG	ISOLATED GROUND
IN	INCHES
INV	INVERT
JBOX	JUNCTION BOX
K	KELVIN
KW	KILOWATT
KVA	KILO VOLT - AMPS
L	LENGTH
LAT	LEAVING AIR TEMPERATURE
LV	LAVATORY
LB	POUND
LD	LINEAR DIFFUSER
LF	LINEAR FEET
LIN	LINEAR
LIQ	LIQUID
LM	LUMEN
LRA	LOCKED ROTOR AMPS
LV	LOUVER
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSANDS OF BTU PER HOUR
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MD	MOTORIZED DAMPER
MDP	MAIN DISTRIBUTION PANEL
MED	MEDIUM
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUG ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MTD	MOUNTED
MUA	MAKE-UP AIR UNIT
N	NEUTRAL
NC	NORMALLY CLOSED
NEG	NEGATIVE
NIC	NOT IN CONTRACT
NL	NIGHT / SECURITY LIGHT - DO NOT SWITCH
NO	NORMALLY OPEN
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OCC	OCCUPIED
OCP	OVER CURRENT PROTECTION
OD	OUTSIDE DIAMETER
OL	OVERLOAD
ORD	OVERFLOW ROOF DRAIN
OZ	OUNCE
PBD	PARALLEL BLADE DAMPER
PD	PRESSURE DROP
PH	PHASE
POS	POSITIVE PRESSURE
POS	POINT OF SALES
PRV	PRESSURE REDUCING VALVE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TRANSMITTER
PTAC	PACKAGED TERMINAL AIR CONDITIONER
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RA	RETURN AIR GRILLE / REGISTER
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REL	RELIEF
REQD	REQUIRED
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RLA	RATED LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR GRILLE / REGISTER
SC	SHORT CIRCUIT
SCA	SHORT CIRCUIT AVAILABLE
SCCR	SHORT CIRCUIT CURRENT RATING
SCH	SCHEDULE
SD	SMOKE DAMPER
SEF	SMOKE EXHAUST FAN
SF	SUPPLY FAN
SH	SENSIBLE HEAT
SH	SHOWER
SP	STATIC PRESSURE
SPD	SURGE PROTECTION DEVICE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
SS	SAFETY SHOWER
STD	STANDARD
STL	STEEL
SYS	SYSTEM
TEMP	TEMPERATURE
TR	TRANSFER GRILLE / REGISTER
TR	TAMPER RESISTANT
TT	TEMPERATURE TRANSMITTER
TTB	TELECOMMUNICATIONS TERMINAL BACKBOARD
TYP	TYPICAL
TX	TRANSFORMER
UC	UNDERCUT DOOR
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UNOCC	UNOCCUPIED
UR	URINAL
V	VOLTS
VA	VOLT AMPERE
VA	VALVE
VAV	VARIABLE AIR VOLUME UNIT
VFD	VARIABLE FREQUENCY DRIVE
VRF	VARIABLE REFRIGERANT FLOW
VOLT	VOLTAGE
VTR	VENT THROUGH ROOF
W	WIDTH
W	WATTS
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER COLUMN
WC	WATER CLOSET
WG	WATER GAUGE
WP	WEATHERPROOF
WPIU	WEATHERPROOF IN-USE
WSR	WITHSTAND RATING
XFMR	TRANSFORMER

ELECTRICAL SHEET LIST

Sheet Number	Sheet Name
E0-1	ELECTRICAL COVER SHEET
E1-1	LIGHTING PLANS
E1-2	LIGHTING - DETAILS
E2-1	POWER PLANS
E3-1	ELECTRICAL SCHEDULES
E3-2	ELECTRICAL DETAILS
E4-1	ELECTRICAL SPECIFICATIONS

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SUBSTITUTIONS:

A. SUBSTITUTIONS: SUBSTITUTION OF SPECIFIED EQUIPMENT WILL BE ALLOWED THROUGH A PRIOR APPROVAL PROCESS INITIATED BY THE CONTRACTOR. CONTRACTOR SHALL SUBMIT INTENDED SUBSTITUTION AT LEAST FIVE DAYS PRIOR TO BID FOR APPROVAL FROM ENGINEER. SUBMITTAL SHALL INCLUDE CAPACITIES, DIMENSIONS AND OPERATING INSTRUCTIONS FOR EACH PIECE OF EQUIPMENT. SUBSTITUTION SHALL OCCUR AT NO COST TO THE OWNER. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF APPROVED SUBSTITUTION AND SHALL INCUR ALL COSTS ASSOCIATED WITH THE SUBSTITUTION INCLUDING STRUCTURAL MODIFICATIONS, SPACE LAYOUT AND REDESIGN COSTS. SEE ALSO DIVISION I GENERAL REQUIREMENTS.

EXAMINATION OF SITE, DRAWINGS, SPECIFICATIONS:

A. EXAMINE CAREFULLY THE SITE AND CONDITIONS OF THE SITE. PROVIDE ALL NECESSARY EQUIPMENT AND LABOR TO INSTALL A COMPLETE WORKING SYSTEM WITHIN THE SITE CONDITIONS.

B. EXAMINE THE DRAWINGS AND SPECIFICATIONS AND 5 DAYS PRIOR TO BIDDING REPORT ANY ERRORS, OMISSIONS, INCONSISTENCIES, AND CONFLICTS TO THE ENGINEER TO BE REMEDIED IN AN ADDENDUM TO THE PROJECT PRIOR TO BID TIME.

C. DRAWINGS ARE DIAGRAMMATIC AND CATALOG NUMBERS GIVEN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE CAPACITY OF THE EQUIPMENT MEETS THE DRAWING REQUIREMENTS AND SHALL NOT DIMENSION FROM THE MECHANICAL, PLUMBING, OR PIPING DRAWINGS.

D. THE LATEST ADOPTED VERSIONS OF THE INTERNATIONAL BUILDING CODES SHALL BE USED AS REQUIRED. THIS WILL ALSO INCLUDE THE LATEST ADOPTED VERSIONS OF THE MECHANICAL, PLUMBING AND ENERGY CONSERVATION CODES. ALL METHODS AND MATERIALS REQUIRED BY THESE CODES SHALL BE REQUIRED BY THESE SPECIFICATIONS UNLESS INDICATED OTHERWISE. OTHER APPLICABLE LOCAL CODES AND ORDINANCES SHALL BE AS REQUIRED AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO BE KNOWLEDGEABLE OF THESE REQUIREMENTS.

E. WHERE INSTALLATION PROCEDURES OR ANY PART THEREOF ARE REQUIRED TO BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL BEING INSTALLED, PRINTED COPIES OF THESE RECOMMENDATIONS SHALL BE FURNISHED TO THE ENGINEER PRIOR TO INSTALLATION. INSTALLATION OF THE ITEM WILL NOT BE ALLOWED TO PROCEED UNTIL THE RECOMMENDATIONS ARE RECEIVED. FAILURE TO FURNISH THESE RECOMMENDATIONS CAN BE CAUSE FOR REJECTION OF THE MATERIAL.

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RICO ROAD & BRIDGE MAINTENANCE FACILITY
PICKER STREET
RICO, COLORADO

Project number	22-108
Drawn By	WG
Checked By	JWA
Issue	100% CD
Date	2/24/2023

E0-1
ELECTRICAL COVER SHEET

2/27/2023 4:26:51 PM

1 LIGHTING PLAN
1/8" = 1'-0"

LIGHTING FIXTURE SCHEDULE

Type Mark	MANUFACTURER	MODEL	LAMP	DESCRIPTION
D1	Acuity Brands Lighting	LDN4 35/20 MVOLT GZ10 HSG	2000LM,3500K, 80 CRI, 22W LED	4"DIA NEW CONSTRUCTION NON-IC LED HOUSING, 10% 0-10V DIMMING, ENERGY STAR RATED, WET LOCATION STANDARD, IP65 RATED,
LB1	Acuity Brands Lighting	UFIT L96 8000LM HEF MVOLT GZ10 35K 80CRI	8000LM,3500K, 80 CRI, 57.2W LED	8' LED LOW BAY PENDANT LIGHT, HIGH EFFICENCY, DAMP LOCATION LISTED, 0-10V DIMMING, WHITE FINISH
SW1	Acuity Brands Lighting	ARC1 LED P3 30K MVOLT DDBXD	2859LM,3000K, 80 CRI, 25W LED	LED ARCHITECTURAL WALL LUMINAIRE, DARK SKY APPROVED, ZERO UPLIGHT.

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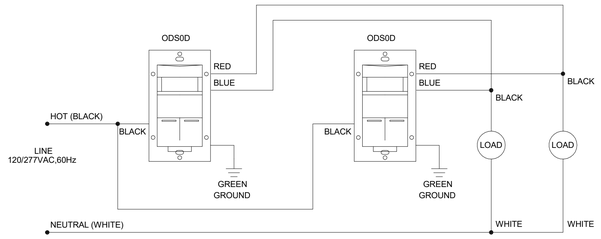
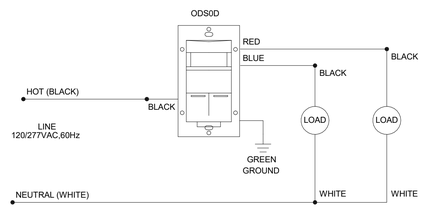
RICO ROAD & BRIDGE MAINTENANCE FACILITY
PICKER STREET
RICO, COLORADO

Project number 22-108
Drawn By Author
Checked By JWA

Issue 100% CD
Date 2/24/2023

E1-1
LIGHTING PLANS

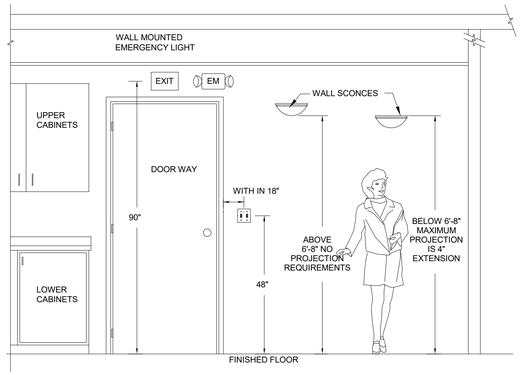




BI-LEVEL SWITCHING DETAIL

NOT TO SCALE

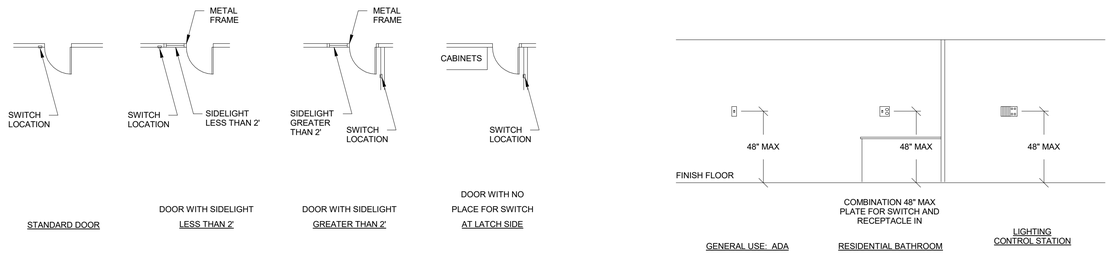
DETAIL NOTES:
1. PROVIDE SWITCHERS THAT ARE COMPATIBLE WITH THE LIGHT FIXTURES THAT ARE BEING INSTALLED.
2. PROVIDE DUAL CONTROL IN THE CORRIDORS AND ALL ROOMS WITH MORE THAN ONE DOOR.
3. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE EXACT LOCATION OF THE SWITCHES WITH THE ARCHITECTURAL DETAILS OF THE SPACE.



LIGHTING DEVICE MOUNTING HEIGHT DETAIL

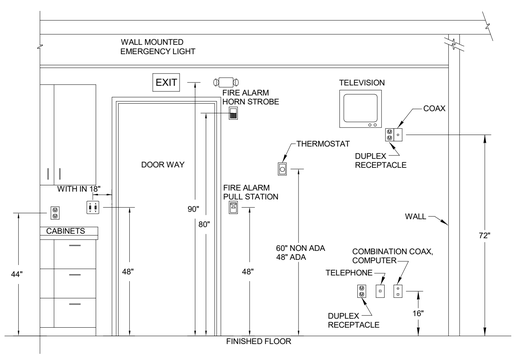
NOT TO SCALE

DETAIL NOTES:
1. ALL DEVICES SHOWN ON THIS DETAIL ARE FOR REFERENCES OF MOUNTING HEIGHTS ONLY. THE ELECTRICAL CONTRACTOR SHALL FIELD ADJUST THE HEIGHTS AND LOCATIONS OF THE DEVICES AS REQUIRED FOR PROPER MOUNTING.
2. ALL DEVICES REQUIRED FOR THIS PROJECT MAY NOT APPEAR ON THIS DETAIL. ALL ITEMS SHOWN ON THIS DETAIL MAY NOT BE REQUIRED FOR THIS PROJECT.
3. THE AMERICANS WITH DISABILITIES ACT, KNOWN AS ADA, AFFECTS LIGHT FIXTURES USED IN CIRCULATION OR EGRESS SPACES. IN PRACTICE THIS MEANS THAT WALL MOUNTED FIXTURES LOCATED BELOW 6'-8" AFF IN HALLS, CORRIDORS, PASSAGEWAYS OR AISLES, MUST BE NO GREATER THAN 4" DEEP. THE ADA AFFECTS CONSTRUCTION FOR BOTH NEW AND EXISTING BUILDINGS.



SWITCH MOUNTING DETAILS

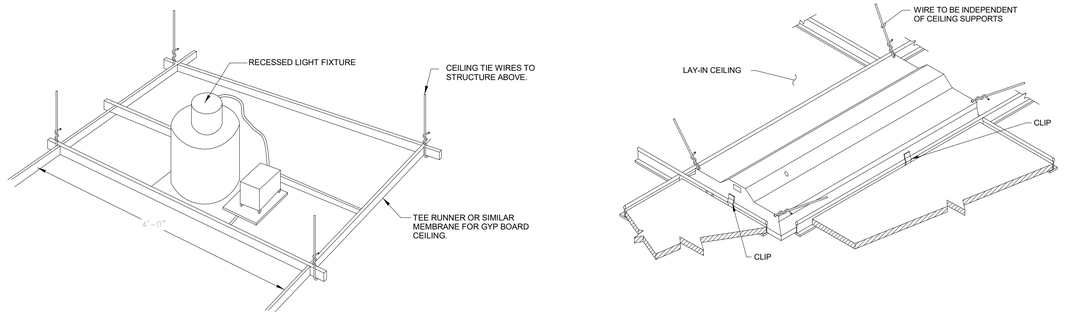
SCALE: NOT TO SCALE



DEVICE MOUNTING HEIGHT DETAIL

NOT TO SCALE

NOTES:
1. THE ELECTRICAL CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL TELEVISION OUTLETS WITH THE ARCHITECT PRIOR TO INSTALLATION.
2. ALL DEVICES SHOWN ON THIS DETAIL ARE FOR REFERENCES OF MOUNTING HEIGHTS ONLY. THE ELECTRICAL CONTRACTOR SHALL FIELD ADJUST THE HEIGHTS OF THE DEVICES AS REQUIRED FOR PROPER MOUNTING OF THE DEVICES.
3. ALL DEVICES REQUIRED FOR THIS PROJECT MAY NOT APPEAR ON THIS DETAIL. ALL ITEMS SHOWN ON THIS DETAIL MAY NOT BE REQUIRED FOR THIS PROJECT.



RECESSED LIGHT FIXTURE DETAIL

SCALE: NOT TO SCALE

NOTE:
1. ALL GRID MOUNTED FIXTURES ARE TO BE SUPPORTED FROM THE STRUCTURE ABOVE.
2. 200lb TEST WIRE HANGER AT EACH CORNER OF FIXTURE (TOTAL OF 4) OR 1 CADDY CLIP 515 PER SIDE (TOTAL OF 4)
3. TYPICAL ALL GRID MOUNTED FIXTURES.

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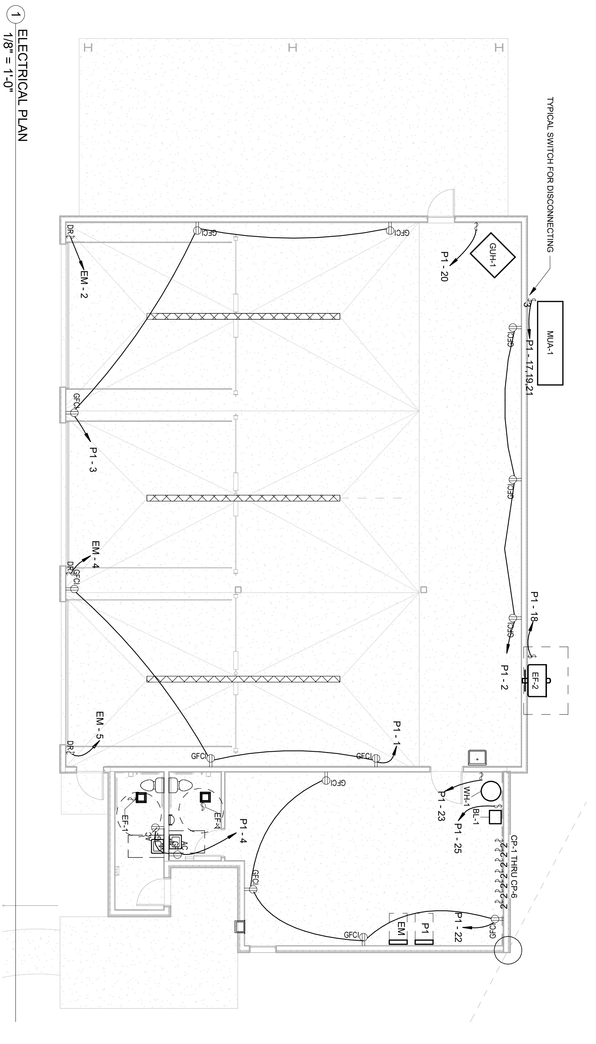
RICO ROAD & BRIDGE
MAINTENANCE FACILITY
PICKER STREET
RICO, COLORADO

Project number 22-108
Drawn By Author
Checked By JWA
Issue 100% CD
Date 2/24/2023

E1-2
LIGHTING - DETAILS



Project number	22-108
Drawn By	Author
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E2-1
POWER PLANS

RICO ROAD & BRIDGE
MAINTENANCE FACILITY
PICKER STREET

RICO, COLORADO

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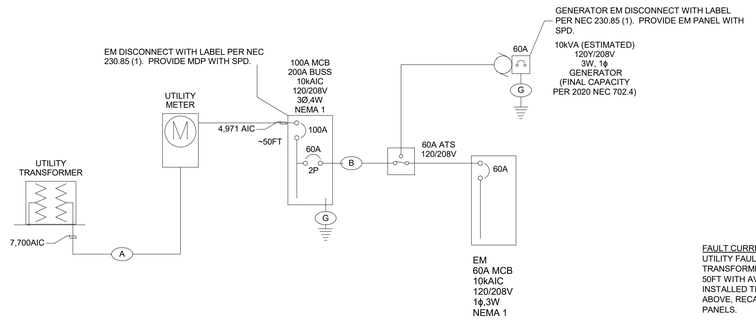

ONE-LINE DIAGRAM

NOT TO SCALE

NOTES:
1. PROVIDE GROUNDING AND BONDING TO MEET THE REQUIREMENTS OF 2020 NEC 250.

WIRE SCHEDULE:

(A) 1-1/2"C - (4#1/0AWG(AL,XHHW))

(B) 1-1/2"C - (3#4AWG(AL) + 1#8AWG(AL))

(G) #6AWG CU TO METAL WATER PIPES AND STRUCTURAL STEEL
#4AWG CU TO 20' UNCOATED CONCRETE ENCASED ELECTRODE
#6AWG CU TO GROUND ROD MEETING NEC 250.53

FAULT CURRENT NOTES:
UTILITY FAULT CURRENT VALUES BASED UPON AN ANTICIPATED TRANSFORMER OF 45kVA LOCATED AT AN ESTIMATED DISTANCE OF 50FT WITH AVAILABLE SECONDARY FAULT CURRENT OF 7,700A. IF INSTALLED TRANSFORMER IS DIFFERENT THAN DESCRIBED VALUES ABOVE, RECALCULATE THE FAULT CURRENT TO VERIFY AIC VALUES OF PANELS.

FAULT CURRENT CALCULATIONS:
F =1.732xLxI
NxCxE
L - LENGTH OF CABLE IN FEET
I - AVAILABLE FAULT CURRENT
N - NUMBER OF CONDUCTORS PER PHASE
C - CONDUCTANCE CONSTANT
- 1/0AWG AL: 5,838
E - VOLTAGE LINE TO LINE
F - INTERMEDIARY VALUE FOR COMPUTATION
M = 1/(1+F)
M - MULTIPLIER TO ACHIEVE AVAILABLE FAULT
I(SC) = I(SC)*M

SERVICE DISCONNECT TO P1
F = 1.732xLxI = 1.732 x 50FT x 7,700 A = 0.549
NxCxE 1 x 5,506 x 208 V
M = 1 = 1 = 0.646
1+F 1+0.549
I(SC) = IxM = 7,700A x 0.646 = 4,971 A

Branch Panel: P1

Location: Space 5
Supply From:
Mounting: Surface
Enclosure: Indoor

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 10kA
Mains Type: MCB
Mains Rating: 100 A
MCB Rating: 100 A

Notes:

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1	Receptacle Space 3	20 A	1	540 VA	540 VA					1	20 A	Receptacle Space 4	2
3	Receptacle Space 3	20 A	1			540 VA	360 VA			1	20 A	Receptacle Space 6	4
5	Power CP-1	20 A	2					720 VA	120 VA	2	20 A	Power CP-6	6
7	--	--	--	720 VA	120 VA					--	--	--	8
9	Power CP-5	20 A	2			720 VA	120 VA			2	20 A	Power CP-4	10
11	--	--	--					720 VA	120 VA	--	--	--	12
13	Power CP-3	20 A	2	720 VA	720 VA					2	20 A	Power CP-2	14
15	--	--	--			720 VA	720 VA			--	--	--	16
17	Power MUA-1	15 A	3					1081...	1392...	1	20 A	EF-2	18
19	--	--	--	1081...	1440...					1	15 A	GUH-1	20
21	--	--	--			1081...	720 VA			1	20 A	Receptacle Storage Room	22
23	WH-1	25 A	1					2000...					24
25	BL-1	20 A	1	1440...									26
27	EM	60 A	2			2896...							28
29	--	--	--					1622...					30
31													32
33													34
35													36
37													38
39													40
41													42
		Total Load:		7321 VA		7876 VA		7774 VA					
		Total Amps:		61 A		66 A		65 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Heating	1440 VA	100.00%	1440 VA		
Lighting	1025 VA	100.00%	1025 VA	**Total Conn. Load:**	22971 VA
Motor	4884 VA	100.00%	4884 VA	**Total Est. Demand:**	22971 VA
Other	0 VA	0.00%	0 VA	**Total Conn.:**	64 A
Power	12922 VA	100.00%	12922 VA	**Total Est. Demand:**	64 A
Receptacle	2700 VA	100.00%	2700 VA		

Notes:

Branch Panel: EM

Location: Space 5
Supply From: P1
Mounting: Surface
Enclosure: Indoor

Volts: 120/208
Phases: 1
Wires: 3

A.I.C. Rating: 10kA
Mains Type: MCB
Mains Rating: 60 A
MCB Rating: 60 A

Notes:

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1	Lighting - OFFICE/BATHROOMS	20 A	1			224 VA	1164...			1	20 A	BAY DOOR 1	2
3	Lighting - BAYS	20 A	1					458 VA	1164...	1	20 A	BAY DOOR 2	4
5	BAY DOOR 3	20 A	1			1164...	343 VA			1	20 A	Lighting- BAYS	6
7													8
9													10
11													12
13													14
15													16
17													18
		Total Load:		0 VA		2896 VA		1622 VA					
		Total Amps:		0 A		26 A		16 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting	1025 VA	100.00%	1025 VA		
Motor	3492 VA	100.00%	3492 VA	**Total Conn. Load:**	4517 VA
Other	0 VA	0.00%	0 VA	**Total Est. Demand:**	4517 VA
				Total Conn.:	22 A
				Total Est. Demand:	22 A

Notes:

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22-108
Author JWA
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Checked By
100% CD
2/24/2023
Issue
Date

E3-1
ELECTRICAL SCHEDULES

GROUNDING ELECTRODE SYSTEM DETAIL

NOT TO SCALE

NOTES:
1. SEE ONE LINE DIAGRAM FOR GROUNDING CONDUCTOR SIZES REQUIRED.
2. PROVIDE A MINIMUM OF TWO SEPARATE GROUND SOURCES, U.O.N. ON ONE LINE DIAGRAM.

DISTRIBUTION TRANSFORMER BASE DETAIL

NOT TO SCALE

TYPICAL RECEPTACLE WIRING DIAGRAM

NOT TO SCALE

INSTALLATION OF UNDERGROUND CONDUITS

NOT TO SCALE

ROOFTOP HVAC UNIT DUCT MOUNTED SMOKE DETECTOR DETAIL

NOT TO SCALE

INSTALLATION OF PVC CONDUIT EMERGING FROM CONCRETE SLAB

NOT TO SCALE

ISOLATED GROUND RECEPTACLE

NOT TO SCALE:

TRANSFORMER GROUNDING DETAIL

NOT TO SCALE

NOTES:
1. THE ELECTRICAL CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL TELEVISION OUTLETS WITH THE ARCHITECT PRIOR TO INSTALLATION.
2. ALL DEVICES SHOWN ON THIS DETAIL ARE FOR REFERENCES OF MOUNTING HEIGHTS ONLY. THE ELECTRICAL CONTRACTOR SHALL FIELD ADJUST THE HEIGHTS OF THE DEVICES AS REQUIRED FOR PROPER MOUNTING OF THE DEVICES.
3. ALL DEVICES REQUIRED FOR THIS PROJECT MAY NOT APPEAR ON THIS DETAIL. ALL ITEMS SHOWN ON THIS DETAIL MAY NOT BE REQUIRED FOR THIS PROJECT.

DEVICE MOUNTING HEIGHT

COMMUNICATIONS BACKBOARD DETAIL

NOT TO SCALE

NOTES:
1. PROVIDE A #6 AWG GROUND WIRE AT THE BACKBOARD TIED TO THE COMMON POWER GROUND PER NEC ART. #250.
2. PROVIDE SWEEPS OR FIELD BENDS FOR ALL UNDERGROUND CONDUIT DIRECTIONAL CHANGES.

NOTES:
1. PROVIDE ALL DEVICES U.L. LISTED FOR USE IN GATEGORY 6 INSTALLATIONS.
2. PROVIDE INSTALLATION AND LABELLING IN ACCORDANCE WITH ANSI/TIA/EIA STANDARDS 568A AND 606.

TYPICAL TELECOMMUNICATIONS OUTLET

NOT TO SCALE

NOTES:
1. PROVIDE ALL DEVICES U.L. LISTED FOR USE IN CATEGORY 6 INSTALLATIONS.
2. PROVIDE INSTALLATION AND LABELLING IN ACCORDANCE WITH ANSI/TIA/EIA STANDARDS 568A AND 606.

TYPICAL TELECOMMUNICATIONS OUTLET

NOT TO SCALE

FIRE ALARM SPEAKER/STROBE LIGHT MOUNTING DETAIL

NOT TO SCALE

TYPICAL SMOKE DETECTOR MOUNTING DETAIL

NOT TO SCALE

ACCESS CONTROL CONDUIT FOR CARD READER SYSTEM DETAIL

NOT TO SCALE

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RICO ROAD & BRIDGE MAINTENANCE FACILITY
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RICO, COLORADO

Project number 22-108
Drawn By Author
Checked By JWA

Issue 100% CD
Date 2.24.2023

E3-2
ELECTRICAL DETAILS

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SECTION 260000
GENERAL PROVISIONS

SECTION 26010
GENERAL PROVISIONS
A. THE ARCHITECTURAL GENERAL AND SPECIAL CONDITIONS FOR THE CONSTRUCTION OF THIS PROJECT SHALL BE A PART OF THE ELECTRICAL SPECIFICATIONS. THE ELECTRICAL CONTRACTOR SHALL EXAMINE THE GENERAL AND SPECIAL CONDITIONS BEFORE SUBMITTING THEIR PROPOSAL.
B. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK INCLUDED IN THIS SECTION AND THE DELEGATION OF WORK TO THE ELECTRICAL CONTRACTOR SHALL NOT RELIEVE THEM OF THIS RESPONSIBILITY. THE ELECTRICAL CONTRACTOR AND THEIR SUBCONTRACTORS WHO PERFORM WORK UNDER THIS SECTION SHALL BE RESPONSIBLE TO THE GENERAL CONTRACTOR.
C. WHERE ITEMS OF THE GENERAL CONDITIONS OR OF THE SPECIAL CONDITIONS ARE REPEATED IN THIS SECTION OF THE SPECIFICATIONS, IT IS INTENDED TO CALL PARTICULAR ATTENTION TO OR QUALIFY THEM; IT IS NOT INTENDED THAT ANY OTHER PARTS OF THE GENERAL CONDITIONS OR SPECIAL CONDITIONS SHALL BE ASSUMED TO BE OMITTED IF NOT REPEATED HEREIN.
D. THE NAMING OF A CERTAIN BRAND OR MAKE OR MANUFACTURER IN THE SPECIFICATIONS IS TO ESTABLISH A QUALITY STANDARD FOR THE ARTICLE DESIRED. THE CONTRACTOR IS NOT RESTRICTED TO THE USE OF THE SPECIFIC BRAND OF THE MANUFACTURER NAMED UNLESS SO INDICATED IN THE SPECIFICATIONS.
E. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND PRESENT FIVE (5) COPIES OF SHOP DRAWINGS OR BROCHURES FOR ALL FIXTURES, EQUIPMENT, AND ACCESSORIES TO THE ARCHITECT AND OWNER FOR APPROVAL. CHECKING IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE SHOWN IS SUBJECT TO THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR: DIMENSIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE; FABRICATION PROCESSES AND TECHNIQUES; CONSTRUCTION COORDINATION OF THEIR WORK WITH THAT OF ALL OTHER TRADES AND THE SATISFACTORY PERFORMANCE OF THEIR WORK.
F. THE ELECTRICAL CONTRACTOR SHALL EXAMINE DRAWINGS RELATING TO WORK OF ALL TRADES AND BECOME FULLY INFORMED AS TO EXTENT AND CHARACTER OF WORK REQUIRED AND ITS RELATION TO ALL OTHER WORK IN THE PROJECT.
G. BEFORE SUBMITTING BID, CONTRACTOR SHALL VISIT THE SITE AND EXAMINE ALL ADJOINING EXISTING BUILDINGS, EQUIPMENT AND SPACE CONDITIONS ON WHICH THEIR WORK IS IN ANY WAY DEPENDENT FOR THE BEST WORKMANSHIP AND OPERATION ACCORDING TO THE INTENT OF SPECIFICATIONS AND DRAWINGS. THEY SHALL REPORT TO THE ARCHITECT ANY CONDITION WHICH MIGHT PREVENT THEM FROM INSTALLING THEIR EQUIPMENT IN THE MANNER INTENDED.
H. NO CONSIDERATION OR ALLOWANCE WILL BE GRANTED FOR FAILURE TO VISIT SITE, OR FOR ANY ALLEGED MISUNDERSTANDING OF MATERIALS TO BE FURNISHED OR WORK TO BE DONE. CERTIFYING ENGINEER RESERVES THE RIGHT TO PROVIDE INTERPRETATION OF DESIGN DRAWINGS AND THE INTENT OF WHAT IS BEING SHOWN AND THIS INTERPRETATION SHALL BE FINAL.
I. REFER TO DIVISION I FOR ADDITIONAL REQUIREMENTS. EXISTING CONDUITS, PIPES, UTILITY LINES, TANKS, EQUIPMENT, OR OTHER OBSTRUCTIONS WHETHER UNDERGROUND, CONCEALED, OR EXPOSED ARE NOT IN GENERAL INDICATED ON DRAWINGS. PRIOR TO START OF WORK, HAVE EXISTING UTILITY OBSTRUCTIONS CLEARLY MARKED BY UTILITIES LOCATOR SERVICE. PLAN WORK SO AS TO ROUTE AND LOCATE ALL NEW WORK TO AVOID THESE OBSTRUCTIONS. REPAIR OR REPLACE, AT NO COST TO OWNER, EXISTING INSTALLATIONS WHERE DAMAGED, OCCURRING DURING THE COURSE OF CONSTRUCTION.
END OF SECTION 26010

SECTION 26015
ELECTRICAL DRAWINGS AND REFERENCE SYMBOLS
A. THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERALLY THE LOCATIONS OF MATERIAL AND EQUIPMENT. THESE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE WORK UNDER THIS SECTION WITH THE ARCHITECTURAL, STRUCTURAL, PLUMBING, HEATING AND AIR CONDITIONING, AND THE DRAWINGS OF OTHER TRADES FOR EXACT DIMENSIONS, CLEARANCES AND ROUGHING-IN LOCATIONS: THIS CONTRACTOR SHALL COOPERATE WITH ALL OTHER TRADES IN ORDER TO MAKE MINOR FIELD ADJUSTMENTS TO ACCOMMODATE THE WORK OF OTHERS. DO NOT RELY ON THE SCALE OF THE DRAWINGS FOR ROUGH-IN MEASUREMENTS, NOR USE THEM AS SHOP DRAWINGS.
B. THE DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY, EACH TO THE OTHER, AND THE WORK REQUIRED BY EITHER SHALL BE INCLUDED IN THE CONTRACT AS IF CALLED FOR BY BOTH.
C. IF DIRECTED BY THE ARCHITECT, THE CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE REASONABLE MODIFICATIONS IN THE LAYOUT AS NEEDED TO PREVENT CONFLICT WITH WORK OF OTHER TRADES OR FOR PROPER EXECUTION OF THE WORK.
D. ELECTRICAL SYMBOLS USED ON THIS PROJECT ARE SHOWN IN A SYMBOL LIST ON THE ACCOMPANYING WORKING DRAWINGS. THIS LIST SHOWS STANDARD SYMBOLS AND ALL MAY NOT APPEAR ON THE PROJECT DRAWINGS; HOWEVER, WHEREVER THE SYMBOL ON PROJECT DRAWINGS OCCURS, THE ITEM SHALL BE PROVIDED AND INSTALLED.
END OF SECTION 26015

SECTION 26020
WORK INCLUDED
A. THE SCOPE OF THE WORK CONSISTS OF ELECTRICAL INSTALLATION AND MODIFICATION AT THE PROJECT LOCATION INDICATED ON THE ACCOMPANYING WORKING DRAWINGS. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: ELECTRICAL DISTRIBUTION INSTALLATION; POWERING OF MECHANICAL EQUIPMENT; POWERING OF OWNER PROVIDED EQUIPMENT; AND OTHER ITEMS AS CALLED OUT ON THE DRAWINGS. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL SUPERVISION, LABOR, MATERIALS, EQUIPMENT, MACHINERY, AND ANY AND ALL OTHER ITEMS NECESSARY TO COMPLETE THE INSTALLATION OF SYSTEMS WITHIN SCOPE OF WORK. THE ELECTRICAL CONTRACTOR SHALL NOTE THAT ALL ITEMS OF EQUIPMENT ARE SPECIFIED IN THE SINGULAR; HOWEVER, THE CONTRACTOR SHALL PROVIDE AND INSTALL THE NUMBER OF ITEMS OF EQUIPMENT AS INDICATED ON THE DRAWINGS AND AS REQUIRED FOR COMPLETE SYSTEMS.
B. IT IS THE INTENTION OF THE SPECIFICATIONS AND DRAWINGS TO CALL FOR FINISHED WORK, TESTED, AND READY FOR OPERATION.
C. ANY APPARATUS, APPLIANCE, MATERIAL OR WORK NOT SHOWN ON THE DRAWINGS BUT MENTIONED IN THE SPECIFICATIONS, OR VICE VERSA, OR ANY INCIDENTAL ACCESSORIES NECESSARY TO MAKE THE WORK COMPLETE AND PROFESSIONAL IN ALL RESPECTS AND READY FOR OPERATION, EVEN IF NOT PARTICULARLY SPECIFIED, SHALL BE FURNISHED, DELIVERED, AND INSTALLED BY THE CONTRACTOR WITHOUT ADDITIONAL EXPENSE TO THE OWNER. WITH SUBMISSION OF BID, THE ELECTRICAL CONTRACTOR SHALL GIVE WRITTEN NOTICE TO THE ARCHITECT OF ANY MATERIALS OR APPARATUS BELIEVED INADEQUATE OR UNSUITABLE, IN VIOLATION OF LAWS, ORDINANCES, RULES; ANY NECESSARY ITEMS OR WORK OMITTED. IN THE ABSENCE OF SUCH WRITTEN NOTICE, IT IS MUTUALLY AGREED THAT THE CONTRACTOR HAS INCLUDED THE COST OF ALL REQUIRED ITEMS IN THEIR PROPOSAL, AND THAT THEY WILL BE RESPONSIBLE FOR THE APPROVED SATISFACTORY FUNCTIONING OF THE ENTIRE SYSTEM WITHOUT EXTRA COMPENSATION.

END OF SECTION 26020

SECTION 26030
CODES AND FEES
A. ALL MATERIALS AND WORKMANSHIP SHALL COMPLY WITH ALL APPLICABLE CODES, SPECIFICATIONS, LOCAL ORDINANCES, INDUSTRY STANDARDS. UTILITY COMPANY AND FIRE INSURANCE CARRIER'S REQUIREMENTS. CONTACT PROPER AUTHORITIES, OBTAIN AND PAY FOR REQUIRED PERMITS, INSPECTIONS AND UTILITY SERVICE CONNECTIONS. DO NOT INCLUDE ANY UTILITY COMPANY CHARGES THAT CAN BE BILLED DIRECTLY TO THE OWNER.
B. IN CASE OF DIFFERENCE BETWEEN THE BUILDING CODES, SPECIFICATIONS, STATE LAWS, LOCAL ORDINANCES, INDUSTRY STANDARDS, UTILITY COMPANY REGULATIONS, FIRE INSURANCE CARRIER'S REQUIREMENTS, AND THE CONTRACT DOCUMENTS, THE MOST STRINGENT SHALL GOVERN. THE CONTRACTOR SHALL PROMPTLY NOTIFY THE ARCHITECT IN WRITING OF ANY SUCH DIFFERENCE.
C. NONCOMPLIANCE: SHOULD THE CONTRACTOR PERFORM ANY WORK THAT DOES NOT COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE BUILDING CODES, STATE LAWS, LOCAL ORDINANCES, INDUSTRY STANDARDS, FIRE INSURANCE CARRIER'S REQUIREMENTS, AND UTILITY COMPANY REGULATIONS, THEY SHALL BEAR THE COST ARISING IN CORRECTING ANY SUCH DEFICIENCY.
END OF SECTION 26030

SECTION 26100
BASIC METHODS AND MATERIALS

SECTION 26101
GENERAL
A. PROTECTION: ALL WORK, MATERIALS AND EQUIPMENT SHALL BE COMPLETELY AND ADEQUATELY PROTECTED AT ALL TIMES. PAY FOR ALL DAMAGE, INJURY OR LOSS, EXCEPT SUCH AS MAY BE DIRECTLY DUE TO ERRORS IN THE CONTRACT DOCUMENTS OR BE CAUSED BY AGENTS OR EMPLOYEES OF THE OWNER. POST EFFECTIVE DANGER SIGNS WARNING AGAINST HAZARDS CREATED BY THE WORK.
B. TRENCHING AND BACKFILLING: PERFORM ALL TRENCHING AND BACKFILL REQUIRED BY WORK UNDER THIS DIVISION OF THE SPECIFICATIONS. TRENCHING AND BACKFILLING SHALL BE DONE IN ACCORDANCE WITH THE "SITE WORK" DIVISION OF THE SPECIFICATIONS AND AS HEREIN SPECIFIED. THIS PORTION OF THE WORK SHALL BE EXECUTED UNDER THE DIRECT SUPERVISION OF THE GENERAL CONTRACTOR. TRENCHES SHALL BE EXCAVATED TO THE DEPTH REQUIRED FOR THE UTILITIES INVOLVED. THE TRENCH BOTTOM SHALL BE GRADED TRUE AND FREE FROM DEBRIS, STONES AND SOFT SPOTS. WHERE DIRECT BURIAL CABLES ARE USED FOUR INCHES OF FINE SAND SHALL BE PLACED IN THE BOTTOM OF THE TRENCH PRIOR TO CABLE PLACEMENT.
C. EQUIPMENT, MATERIALS, INSTALLATION:
1. ALL EQUIPMENT, ACCESSORIES, AND SPECIALTIES CONNECTED TO EQUIPMENT, AND ALL ITEMS OF MATERIAL SHALL BE INSTALLED AS RECOMMENDED BY THEIR MANUFACTURERS UNLESS SPECIFICALLY STATED OTHERWISE. PROVIDE PROPER SUPPORTS, MOUNTS, ETC., AS REQUIRED.
2. COORDINATE WITH THE GENERAL CONTRACTOR.
3. OBTAIN INSTRUCTIONS FROM THE ARCHITECT FOR INSTALLATION OF ITEMS NOT COMPLETELY COVERED BY CONTRACT DOCUMENTS OR PUBLISHED MANUFACTURER'S RECOMMENDATIONS.
D. EQUIPMENT FINISH: ALL ELECTRICAL EQUIPMENT SHALL BE FURNISHED FACTORY PAINTED OR FINISHED WITH TWO COATS OF HIGH-GRADE ENAMEL AND IN THE MANUFACTURER'S STANDARD COLORS UNLESS OTHERWISE SPECIFIED.
1. UNPAINTED EQUIPMENT AND MATERIALS, EXCEPT CONDUIT IN CONCEALED SPACES, SHALL BE CLEANED AND PRIMED TO BE PAINTED BY THE PAINTING CONTRACTOR IN ACCORDANCE WITH THE PAINTING SECTION OF THESE SPECIFICATIONS.
2. THE COLORS OF ALL EXPOSED ELECTRICAL MATERIAL AND APPARATUS SHALL BE AS SELECTED BY THE OWNER.
E. CHASES, SLEEVES, CUTTING, PATCHING
1. PROVIDE FOR NECESSARY CHASES, HOLES, SLEEVES, BOXES, INSERTS AND HANGERS BY ARRANGEMENT WITH CONTRACTORS OF THE OTHER APPROPRIATE TRADES. PROVIDE "FLAMESEAL" OR OTHER APPROVED AND RATED FIRESTOPPING MATERIAL AT ALL PENETRATIONS THROUGH RATED WALLS, FLOORS AND CEILINGS.
2. PROVIDE FOR ALL CUTTING AND PATCHING OF HOLES, OPENINGS, AND NOTCHES. OBTAIN WRITTEN APPROVAL OF THE ARCHITECT BEFORE NOTCHING, BORING, CHIPPING, BURNING, DRILLING, OR WELDING TO STRUCTURAL MEMBERS.
F. INSPECTION
1. ALL WORK AND MATERIALS COVERED BY DRAWINGS AND SPECIFICATIONS SHALL BE SUBJECT TO INSPECTION AT ANY AND ALL TIMES BY REPRESENTATIVES OF THE ARCHITECT AND OWNER. IF ANY MATERIAL OR INSTALLATION DOES NOT CONFORM TO THE DRAWINGS AND SPECIFICATIONS, WITHIN THREE DAYS AFTER BEING NOTIFIED BY THE ARCHITECT, REMOVE THE MATERIALS FROM THE PREMISES AND CORRECT THE INSTALLATION TO THE SATISFACTION OF THE ARCHITECT. ASSUME THE ENTIRE COST OF REMOVING AND REPLACING THE MATERIAL AND CORRECTING THE INSTALLATION, INCLUDING CUTTING AND PATCHING THAT MAY BE NECESSARY.
2. WORK SHALL NOT BE CLOSED IN NOR COVERED BEFORE INSPECTION AND APPROVAL BY THE ARCHITECT. PROVIDE FOR UNCOVERING AND MAKING REPAIRS, AT NO EXTRA COST, WHEN UNINSPECTED WORK HAS BEEN CLOSED IN. NOTIFY THE ARCHITECT WHEN WORK IS READY FOR INSPECTION.
3. NOTIFY PROPER AUTHORITIES WHEN WORK IS READY FOR ANY INSPECTIONS REQUIRED BY APPLICABLE CODES, RULES AND REGULATIONS, ALLOWING SUFFICIENT TIME FOR INSPECTIONS TO BE MADE WITHOUT HINDERING PROGRESS OF THE WORK, AND FURNISH THE OWNER, WITHOUT ADDITIONAL COSTS, PROPER CERTIFICATES OF ACCEPTANCE FROM SUCH AUTHORITIES.
4. UPON COMPLETION OF ALL WORK AND ADJUSTMENT OF ALL EQUIPMENT, FINAL INSPECTION SHALL BE MADE UNDER DIRECTION OF THE ARCHITECT. THE CONTRACTOR SHALL TEST AND OPERATE ALL DEVICES, EQUIPMENT AND SYSTEMS TO DEMONSTRATE THAT THE ELECTRICAL SYSTEM IS COMPLETE AND FUNCTIONAL IN THE MANNER REQUIRED.
G. CLEAN UP
1. DURING THE COURSE OF THE WORK REMOVE ANY MATERIALS NOT INSTALLED IN THE WORK WHICH CONFLICT WITH THE WORK OF OTHERS IF SO DIRECTED BY THE ARCHITECT.
2. AT COMPLETION OF WORK CLEAN UP AND REMOVE FROM THE PREMISES ALL DEBRIS AND MATERIALS NOT INSTALLED IN THE WORK SO THE PREMISES WILL BE LEFT CLEAN. WASH AND WIPE CLEAN ALL LIGHTING FIXTURES AND LAMPS WHICH MAY HAVE BECOME SOILED DURING INSTALLATION.
H. RECORD DRAWINGS: AT COMPLETION OF THE WORK FURNISH TO THE ARCHITECT TWO COMPLETE SETS OF ELECTRICAL PRINTS MARKED TO SHOW THE WORK "AS-BUILT".
I. MAINTENANCE AND OPERATING PROCEDURES: UPON COMPLETION OF ALL WORK AND ADJUSTMENT OF ALL EQUIPMENT INSTRUCT THE OWNER ON THE CORRECT OPERATION AND MAINTENANCE PROCEDURE FOR THE ELECTRICAL SYSTEM IN TOTAL. FURNISH 3 SETS OF TYPED MAINTENANCE MANUALS CONTAINING CUT SHEETS ON ALL EQUIPMENT, TABLES OF FUSES AND FOR WHAT EQUIPMENT, TABLE OF LAMPS AND BALLASTS AND FOR WHAT FIXTURES. INCLUDE A LIST OF CONTACTS WITH PHONE NUMBERS FOR ALL SYSTEMS FOR OWNERS' USE, IN THE EVENT THE ELECTRICAL SYSTEM REQUIRES SERVICE WORK WITHIN THE WARRANTY PERIOD.
J. GUARANTEE: GUARANTEE THAT ALL WORK GOVERNED BY THIS DIVISION SHALL BE NEW AND FREE OF DEFECTIVE WORK, MATERIALS, AND COMPONENTS FOR A PERIOD OF ONE YEAR AFTER WRITTEN ACCEPTANCE. REPAIR, REVISE AND REPLACE DEFECTS AS DIRECTED, WITH NO ADDITIONAL COST TO THE OWNER. (INCANDESCENT LAMPS, FUSES AND ANY EXISTING EQUIPMENT ARE EXEMPT).
END OF SECTION 26101

SECTION 26111

CONDUITS
A. PVC CONDUIT SHALL BE USED FOR ALL UNDERGROUND FEEDERS AND BRANCH CIRCUITS UNLESS OTHERWISE DIRECTED ON PLANS OR AS APPROVED BY NEC. ALL CONDUIT SHALL BE UL APPROVED.
B. CONDUIT SIZES SHALL BE AS INDICATED ON THE DRAWINGS, OR MINIMUM IN ACCORDANCE WITH THE NEC, INCLUDING PROVISION FOR GREEN EQUIPMENT GROUNDING CONDUCTOR USING 3/4 INCH MINIMUM CONDUIT. THE USE OF 1/2 INCH CONDUIT ELSEWHERE MAY BE APPROVED IF CONDITIONS WARRANT.
C. SPECIAL CONDUIT FITTINGS SHALL BE APPROPRIATE FOR EACH APPLICATION AND SHALL BE MANUFACTURED BY T & B OR APPROVED EQUAL.
D. CONDUIT SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NEC AND SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.
E. THE ENTIRE CONDUIT SYSTEM SHALL BE INSTALLED TO PROVIDE A CONTINUOUS BOND THROUGHOUT THE SYSTEM.
F. ELECTRICAL METALLIC TUBING (EMT) MAY BE USED FOR BRANCH CIRCUITS AND RACEWAYS OTHER THAN FOR SERVICE ENTRANCE AND MAIN FEEDERS UNLESS PROHIBITED BY THE NEC OR LOCAL ORDINANCES. EMT SHALL BE UL APPROVED, GALVANIZED INSIDE AND OUTSIDE, COMPLYING WITH ASA C-80.3 FOR ZINC COATED EMT WITH FITTINGS OF THE SAME TYPE MATERIAL AND FINISH, OF THE PRESSURE CONNECTED TYPE FOR EXTERIOR INSTALLATION AND OF THE SET SCREW TYPE FOR INTERIOR INSTALLATION.
G. ALL CONDUIT JOINTS SHALL BE CUT SQUARE, REAMED SMOOTH, AND DRAWN UP TIGHT. BENDS OR OFFSETS SHALL BE MADE WITH AN APPROVED BENDER OR HICKEY, OR HUB-TYPE CONDUIT FITTINGS. NUMBER OF BENDS PER RUN SHALL CONFORM TO THE NEC LIMITATIONS.
H. CONCEALED CONDUITS SHALL BE RUN IN A DIRECT LINE WITH LONG SWEEP BENDS AND OFFSETS. EXPOSED CONDUITS SHALL BE PARALLEL TO AND AT RIGHT ANGLES TO BUILDING LINES, USING CONDUIT FITTINGS FOR ALL TURNS AND OFFSETS.
I. TRANSITIONS BETWEEN NONMETALLIC CONDUITS AND CONDUITS OF OTHER MATERIALS SHALL BE MADE WITH THE MANUFACTURER'S STANDARD ADAPTERS DESIGNED FOR SUCH PURPOSE.
J. EXPOSED CONDUITS SHALL BE SECURELY FASTENED IN PLACE ON MAXIMUM 10 FOOT INTERVALS (OR AS DIRECTED BY MANUFACTURERS INSTALLATION GUIDELINES); AND HANGERS, SUPPORTS OR FASTENERS SHALL BE PROVIDED AT EACH ELBOW AND AT THE END OF EACH STRAIGHT RUN TERMINATING AT A BOX OR CABINET.
END OF SECTION 26111

SECTION 26120
WIRES AND CABLES
A. WIRE AND CABLE SHALL MEET ALL STANDARDS AND SPECIFICATIONS APPLICABLE AND SHALL BE IN CONFORMANCE WITH THE LATEST EDITION OF THE NEC. INSULATED WIRE AND CABLE SHALL HAVE SIZE, TYPE OF INSULATION, VOLTAGE AND MANUFACTURER'S NAME PERMANENTLY MARKED ON OUTER COVERING AT REGULAR INTERVALS NOT EXCEEDING FOUR FEET. WIRE AND CABLE SHALL BE DELIVERED IN COMPLETE COILS OR REELS WITH IDENTIFYING TAGS, STATING SIZE, TYPE OF INSULATION, ETC.
B. WIRE AND CABLE SHALL BE SUITABLY PROTECTED FROM WEATHER AND OTHER DAMAGE DURING STORAGE AND HANDLING AND SHALL BE IN FIRST CLASS CONDITION AFTER INSTALLATION.
C. WIRE AND CABLE SHALL BE FACTORY COLOR CODED WITH A SEPARATE COLOR FOR EACH PHASE AND NEUTRAL USED CONSISTENTLY THROUGHOUT THE SYSTEM. COLOR CODING SHALL BE AS REQUIRED BY THE NEC.
D. ALL CONDUCTORS SHALL BE RATED 600 VOLTS, UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS, OR FOR ELECTRONIC OR COMMUNICATION USE.
E. WIRE AND CABLE FOR VARIOUS APPLICATIONS SHALL BE AS FOLLOWS UNLESS OTHERWISE DESIGNATED:
1. WIRE #10 AND SMALLER SHALL BE SOLID; WIRE #8 AND LARGER SHALL BE STRANDED.
2. #12 THRU #6 DRY LOCATIONS: TYPE THHN, 90 DEGREES C.
3. #12 THRU #6 IN SLABS, UNDERGROUND, OR WET LOCATIONS: TYPE THWN OR TYPE XHHW, 75 DEGREES C.
4. #4 AND LARGER: TYPE XHHW OR TYPE THWN 75 DEGREES C.
F. WIRE AND CABLE SHALL BE AS MANUFACTURED BY GENERAL ELECTRIC, ANACONDA WIRE & CABLE, ROME CABLE, TRIANGLE CONDUIT & CABLE, OR APPROVED EQUAL. SUBSTITUTION OF WIRE AND CABLE MANUFACTURER SHALL BE ONLY WITH THE APPROVAL OF THE ARCHITECT/ENGINEER.
G. FOR ANY SPECIFIC USE NOT COVERED HERE ABOVE, COMPLY WITH THE NEC IN CONDUCTOR USE.
H. ALL CIRCUITS SHALL BE 2#12+G UNLESS OTHERWISE NOTED ON DRAWINGS OR IN SCHEDULES.
I. ALL 15- AND 20-AMP CIRCUITS WITH LENGTHS OVER 100 FT. SHALL HAVE THEIR CONDUCTOR SIZE INCREASED TO #10 FOR VOLTAGE DROP.
END OF SECTION 26120

SECTION 26121
WIRE CONNECTIONS
A. JOINTS ON BRANCH CIRCUITS SHALL OCCUR ONLY WHERE SUCH CIRCUIT DIVIDE AS INDICATED ON PLANS AND SHALL CONSIST OF ONE THROUGH CIRCUIT TO WHICH SHALL BE SPLICED THE BRANCH FROM THE CIRCUIT. IN NO CASE SHALL JOINTS IN BRANCH CIRCUITS BE LEFT FOR THE FIXTURE HANGER TO MAKE. NO SPLICES SHALL BE MADE IN CONDUCTOR EXCEPT AT OUTLET BOXES, JUNCTION BOXES, OR SPLICE BOXES.
B. ALL JOINTS OR SPLICES FOR #10 AWG OR SMALLER SHALL BE MADE WITH UL APPROVED WIRE NUTS OR COMPRESSION TYPE CONNECTORS.
C. ALL JOINTS OR SPLICES FOR #8 AWG OR LARGER SHALL BE MADE WITH A MECHANICAL COMPRESSION CONNECTOR. AFTER THE CONDUCTORS HAVE BEEN MADE MECHANICALLY AND ELECTRICALLY SECURE, THE ENTIRE JOINT OR SPLICE SHALL BE COVERED WITH SCOTCH #33 TAPE OR APPROVED EQUAL TO MAKE THE INSULATION OF THE JOINT OR SPLICE EQUAL TO THE INSULATION OF THE CONDUCTORS. THE CONNECTOR SHALL BE UL APPROVED.
END OF SECTION 26121

SECTION 26125
PULLING CABLES
A. INSTALL CONDUCTORS IN ALL RACEWAYS AS REQUIRED, UNLESS OTHERWISE NOTED, IN A NEAT AND WORKMANLIKE MANNER. ALL EMPTY CONDUITS SHALL HAVE A #14 GALVANIZED PULL WIRE OR NYLON PULLCORD LEFT IN PLACE FOR FUTURE USE.
B. CONDUCTORS SHALL BE COLOR CODED IN ACCORDANCE WITH THE NEC. MAINS, FEEDERS, SUBFEEDERS SHALL BE TAGGED IN ALL PULL, JUNCTION, AND OUTLET BOXES AND IN THE GUTTER OF PANELS WITH APPROVED CODE TYPE WIRE MARKERS.
C. NO LUBRICANT OTHER THAN POWDERED SOAPSTONE OR APPROVED PULLING COMPOUND MAY BE USED TO PULL CONDUCTORS.
D. AT LEAST EIGHT (8) INCHES OF SLACK WIRE SHALL BE LEFT IN EVERY OUTLET BOX WHETHER IT BE IN USE OR LEFT FOR FUTURE USE.
E. ALL CONDUCTORS AND CONNECTIONS SHALL TEST FREE OF GROUNDS SHORTS AND OPENS BEFORE TURNING THE JOB OVER TO THE OWNER.
F. PULL BOXES SHALL BE REQUIRED IN RUNS OVER 100 FEET OR WHEN MORE THAN THREE 90-DEGREE BENDS ARE USED, OR AS INDICATED ON THE DRAWINGS.
G. FEEDERS ARE TO BE RUN ABOVE GROUND TO ALL POWER PANELS AND LIGHTING PANELS, UNLESS INDICATED OTHERWISE ON DRAWINGS.
H. WHERE MOTORS HAVE CONDUIT TERMINAL BOXES, FEEDERS SHALL BE CONNECTED TO SAME BY FLEXIBLE MEANS.
I. ALL MOTORS WITH SLIDING BASE MOUNTINGS SHALL HAVE NOT LESS THAN 18 INCHES NOR MORE THAN 6 FEET OF CONDUIT CONNECTING RIGID CONDUIT FEED TO MOTOR TERMINAL BOX.
J. CONDUCTOR SPLICES SHALL BE MADE ONLY IN JUNCTION BOXES, TERMINAL BOXES, OR PULL BOXES.
END OF SECTION 26125

SECTION 26133
OUTLET BOXES
ALL OUTLET BOXES FOR CONCEALED WIRING SHALL BE SHEET METAL,
A. GALVANIZED OR CADMIUM PLATED, AT LEAST 1 « INCHES DEEP, SINGLE OR GANGED, OF SIZE TO ACCOMMODATE DEVICES AND NUMBER OF CONDUCTORS NOTED. BOXES SHALL BE EQUIPPED WITH PLASTER RING OR COVER AS NECESSARY. ALL OUTLET BOXES SHALL BE MANUFACTURED BY STEEL CITY OR APPROVED EQUAL.
B. BOXES FOR EXPOSED WIRING SHALL BE MALLEABLE IRON, CADMIUM FINISH, OR CAST ALUMINUM ALLOY, AS MANUFACTURED BY STEEL CITY, AND SHALL NOT BE LESS THAN 4 INCHES SQUARE BY 1 « INCHES DEEP UNLESS OTHERWISE NOTED.
C. FIXTURE OUTLET BOXES SHALL BE MINIMUM 4 IN OCTAGONAL AND, WHERE REQUIRED AS OUTLET AND JUNCTION BOXES, THEY SHALL BE 4 11/16 INCHES BY 2 1/8 INCHES DEEP.
END OF SECTION 26133

SECTION 26190
SUPPORTING DEVICES
A. THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL METALLIC SUPPORTS AS REQUIRED FOR THE PROPER INSTALLATION OF RACEWAY SYSTEMS AND ALL OTHER EQUIPMENT INSTALLED UNDER THIS DIVISION OF THE CONTRACT CONFORMING TO THE LATEST EDITION OF THE NEC.
B. CONDUIT SHALL BE SUPPORTED ON APPROVED TYPES OF WALL-BRACKETS, CEILING TRAPEZES, STRAP HANGERS OR PIPE SUPPORTS, SECURED BY MEANS OF TOGGLE BOLTS IN HOLLOW MASONRY WALLS OR UNITS. EXPANSION BOLTS WILL BE USED IN CONCRETE OR BLOCK MACHINE SCREWS ON METAL SURFACES AND WOOD SCREWS ON WOOD CONSTRUCTION.
C. CONDUIT SHALL BE SECURELY FASTENED TO ALL SHEET METAL OUTLETS, JUNCTION AND PULL BOXES WITH TWO GALVANIZED LOCKNUTS AND BUSHING, CARE BEING TAKEN TO SEE THAT THE FULL NUMBER OF THREADS PROJECT THROUGH TO PERMIT THE BUSHING TO BE DRAWN TIGHT AGAINST THE END OF THE CONDUIT, AFTER WHICH THE LOCKNUTS SHALL BE MADE TIGHT SUFFICIENTLY TO DRAW THEM INTO FIRM ELECTRICAL CONTACT WITH THE OUTLET BOX. INSTALL A PLASTIC BUSHING ON END OF PIPE THREADS PROTRUDING INTO JUNCTION BOXES AND OTHER ENCLOSURES TO PROTECT CABLING.
D. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SUPPORTS REQUIRED FOR THE ELECTRICAL EQUIPMENT AND CONDUIT.
END OF SECTION 26190

SECTION 26195
ELECTRICAL IDENTIFICATION
A. THE ELECTRICAL CONTRACTOR SHALL MAINTAIN ACCURATE RECORDS OF ALL DEVIATIONS IN WORK AS ACTUALLY INSTALLED FROM WORK INDICATED ON THE DRAWINGS. UPON COMPLETION OF THE PROJECT, TWO (2) COMPLETE SETS OF MARKED-UP PRINTS SHALL BE DELIVERED TO THE ARCHITECT.
B. IDENTIFICATION OF EQUIPMENT
1. PROVIDE AND INSTALL LAMINATED BLACK AND WHITE LAMACOID NAMEPLATES FOR ALL SERVICE SWITCHES, DISTRIBUTION SWITCHES, DISTRIBUTION SWITCHBOARDS, BRANCH CIRCUIT PANELBOARDS, SAFETY SWITCHES, CABINETS, STARTERS, AND OTHER EQUIPMENT WITH THEIR CORRECT DESIGNATION. LABEL EQUIPMENT IN AREAS ACCESSIBLE TO THE PUBLIC ON INSIDE OF ENCLOSURE ONLY. NAMEPLATES SHALL BE FIRMLY SECURED TO FRONT COVER OR DOOR WITH TWO PROPERLY SIZED POP RIVETS.
2. MOUNT A TYPEWRITTEN DIRECTORY BEHIND PLASTIC ON THE INSIDE OF EACH BRANCH CIRCUIT PANEL DOOR, GIVING THE NUMBER, DESCRIPTION AND LOCATION OF THE CIRCUIT CONTROLLED BY EACH CIRCUIT BREAKER. REVISE EXISTING DIRECTORIES TO REFLECT CIRCUIT MODIFICATIONS UNDER THIS CONTRACT.
3. ALL FUSED SAFETY SWITCHES AND FUSED SWITCH UNITS IN SWITCHBOARDS SHALL INDIVIDUALLY BEAR A FUSE LABEL SHOWING PROPER SIZE AND TYPE OF FUSE TO BE USED.
4. INSTALL WIRING DIAGRAMS ON THE INSIDE COVER OF ALL STARTERS, SWITCHES AND OTHER SUCH EQUIPMENT. SUCH DIAGRAMS SHALL NOT BE HANDWRITTEN.
5. ALL JUNCTION BOXES WITH BLANK COVERS SHALL HAVE CIRCUITS CONTAINED THEREIN IDENTIFIED BY MEANS OF PERMANENT BLACK "MAGIC MARKER" ON THE COVER.
END OF SECTION 26195

SECTION 26199
ELECTRONIC EQUIPMENT
A. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND CONNECTION OF A PROPER POWER SUPPLY TO ALL ELECTRONIC EQUIPMENT FURNISHED BY OTHERS. HE SHALL VERIFY ALL VOLTAGE, FREQUENCY, ETC., REQUIREMENTS PRIOR TO ENERGIZING THE CIRCUIT. THOSE INSTALLING THE EQUIPMENT WILL BE RESPONSIBLE FOR THE PROPER OPERATION OF THE EQUIPMENT PROVIDED THE PROPER POWER SUPPLY CIRCUIT IS INSTALLED BY THE ELECTRICAL CONTRACTOR.
B. PROVIDE TELEPHONE LINES TO EQUIPMENT CONTROL PANELS WITH MODEM ACCESS. COORDINATE WITH MECHANICAL CONTRACTOR.
END OF SECTION 26199

SECTION 26400
SERVICE AND DISTRIBUTION

SECTION 26401
GENERAL
A. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL RELATED DISTRIBUTION EQUIPMENT AS INDICATED ON THE FLOOR PLAN, DIAGRAMS, SCHEDULES, AND NOTES. ALL EQUIPMENT SHALL BE NEW AND UL LISTED.
B. RELATED DOCUMENTS: DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATIONS SECTION, APPLY TO WORK OF THIS SECTION.
END OF SECTION 26401

SECTION 26440
DISCONNECT SWITCHES
A. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL SAFETY SWITCHES AS INDICATED ON THE DRAWINGS OR AS REQUIRED. ALL SAFETY SWITCHES SHALL BE UL LISTED.
1. THE SWITCHES SHALL BE FUSED SAFETY SWITCHES (FSS) OR NON-FUSED SAFETY SWITCHES (NFSS) AS SHOWN ON THE DRAWINGS OR REQUIRED AND SHALL BE MANUFACTURED BY SIEMENS, SQUARE D, OR APPROVED EQUAL.
2. SWITCHES SHALL HAVE A QUICK-MAKE AND QUICKBREAK OPERATING HANDLE AND MECHANISM WHICH SHALL BE AN INTEGRAL PART OF THE BOX. PADLOCKING PROVISIONS SHALL BE PROVIDED FOR PADLOCKING IN THE OFF POSITION WITH AT LEAST THREE PADLOCKS. SWITCHES SHALL BE HORSEPOWER RATED FOR 250 VOLTS AC OR DC OR 600 VOLTS AC AS REQUIRED. LUGS SHALL BE UL LISTED FOR COPPER AND ALUMINUM CABLE.
3. SWITCHES SHALL BE FURNISHED IN NEMA I GENERAL PURPOSE ENCLOSURES WITH KNOCKOUTS UNLESS OTHERWISE NOTED OR REQUIRED. SWITCHES LOCATED ON THE EXTERIOR OF THE BUILDING OR IN "WET" LOCATIONS SHALL HAVE NEMA 3R ENCLOSURES (WP).
4. THE SAFETY SWITCHES SHALL BE SECURELY MOUNTED IN ACCORDANCE WITH THE NEC. THE CONTRACTOR SHALL PROVIDE ALL MOUNTING MATERIALS AND INSTALL FUSES IN THE FSS. THE FUSES SHALL BE DUAL ELEMENT TIME DELAY ON MOTOR CIRCUITS.
END OF SECTION 26440

SECTION 26450
GROUNDING
A. THE CONDUIT SYSTEMS AND NEUTRAL CONDUCTOR FOR THE WIRING SYSTEM, AND THE TELEPHONE SYSTEM SHALL BE SECURELY GROUNDED. THE GROUNDS SHALL BE NEC GROUNDS IN EACH CASE.
B. A GROUND SHALL BE ESTABLISHED AND TESTS CARRIED OUT TO INDICATE THAT SATISFACTORY GROUND HAS BEEN ESTABLISHED IN ACCORDANCE WITH THE NEC.
C. WRITTEN RESULTS OF THIS TEST SHALL BE FORWARDED TO THE ENGINEER BEFORE CONNECTION TO THE SERVICE.
END OF SECTION 26450

SECTION 26470
PANELBOARDS
A. FURNISH AND INSTALL DISTRIBUTION AND POWER PANELBOARDS AS INDICATED IN THE PANELBOARD SCHEDULE AND WHERE SHOWN ON THE DRAWINGS. PANELBOARDS SHALL BE DEAD-FRONT SAFETY TYPE, EQUIPPED WITH QUICK-MAKE, QUICK-BREAK FUSIBLE BRANCH SWITCHES AND APPROVED FOR SERVICE ENTRANCE. THE ACCEPTABLE MANUFACTURERS OF THE PANELBOARD ARE SIEMENS, SQUARE D, AND GE, PROVIDED THEY ARE FULLY EQUAL TO THE TYPE LISTED ON THE DRAWINGS. THE PANELBOARD SHALL BE UL LISTED AND BEAR THE UL LABEL.
B. ALL FUSIBLE BRANCH SWITCHES SHALL BE QUICK-MAKE, QUICK BREAK, WITH VISIBLE BLADES AND DUAL HORSEPOWER RATINGS SWITCH HANDLES SHALL PHYSICALLY INDICATE ON AND OFF POSITIONS. SUCH HANDLES SHALL ALSO BE ABLE TO ACCEPT THREE PADLOCKS HAVING HEAVY-DUTY INDUSTRIAL TYPE SHACKLES. COVERS SHALL BE INTERLOCKED WITH THE SWITCH HANDLES TO PREVENT OPENING IN THE ON POSITION. A MEANS SHALL BE PROVIDED TO ALLOW AUTHORIZED PERSONNEL TO RELEASE THE INTERLOCK FOR INSPECTION PURPOSES WHEN A SWITCH IS ON. A CARDHOLDER, PROVIDING CIRCUIT IDENTIFICATION, SHALL BE MOUNTED ON EACH BRANCH SWITCH. SWITCHES SHALL BE PROVIDED WITH FUSES OR AS NOTED ON THE DRAWINGS.
C. PANELBOARD BUS STRUCTURE AND MAIN LUGS OR MAIN SWITCH SHALL HAVE CURRENT RATINGS AS SHOWN ON THE PANELBOARD SCHEDULE. THE BUS STRUCTURE SHALL ACCOMMODATE PLUG-ON OR BOLTED BRANCH SWITCHES AND MOTOR STARTERS AS INDICATED IN THE PANELBOARD SCHEDULE WITHOUT MODIFICATION TO THE BUS ASSEMBLY. PROVIDE SOLID NEUTRAL ASSEMBLY (S/N).
D. SWITCHES AND PANELBOARD BUS STRUCTURE SHALL SAFELY AND WITHOUT FAILURE WITHSTAND SHORT CIRCUITS ON THE SYSTEMS CAPABLE OF DELIVERING UP TO 100,000 AMPERES RMS SYMMETRICAL, UNLESS OTHERWISE NOTED.
E. PANELBOARD ASSEMBLY SHALL BE ENCLOSED IN A STEEL CABINET. THE RIGIDITY AND GAUGE OF STEEL TO BE AS SPECIFIED IN UL STANDARD FOR CABINETS. THE SIZE OF WIRING GUTTERS SHALL BE IN ACCORDANCE WITH UL STANDARD. CABINETS SHALL BE EQUIPPED WITH A FRONT DOOR AND HAVE FULLY CONCEALED, SELF-ALIGNING TRIM CLAMPS. FRONTS SHALL BE FULL-FINISHED STEEL WITH RUST INHIBITING PRIMER AND BAKED ENAMEL FINISH.
F. TERMINALS FOR FEEDER CONDUCTORS TO THE PANELBOARD MAINS AND NEUTRAL SHALL BE SUITABLE FOR THE TYPE OF CONDUCTOR SPECIFIED. TERMINALS FOR BRANCH CIRCUIT WIRING, BOTH BREAKER AND NEUTRAL, SHALL BE SUITABLE FOR THE TYPE OF CONDUCTOR SPECIFIED.
G. BEFORE INSTALLING PANELBOARDS CHECK ALL OF THE ARCHITECTURAL DRAWINGS FOR POSSIBLE CONFLICT OF SPACE AND ADJUST THE LOCATION OF THE PANELBOARD TO PREVENT SUCH CONFLICT WITH OTHER ITEMS.
H. THE PANELBOARDS SHALL BE MOUNTED IN ACCORDANCE WITH THE NEC. THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL MATERIAL FOR MOUNTING THE PANELBOARDS.
END OF SECTION 26470

SECTION 26471
BRANCH CIRCUIT PANELBOARD
A. POWER AND LIGHTING PANELS SHALL BE OF THE DEAD-FRONT, SAFETY TYPE, WITH THERMAL MAGNETIC, QUICKMAKE, QUICK-BREAK, TRIP FREE, BOLTED-TYPE MOLDED CASE CIRCUIT BREAKERS. VOLTAGE RATINGS NUMBER OF POLES, FRAME SIZE, TRIP RATINGS, MAIN BREAKER OR LUGS, NEUTRAL BUS, AND GROUND BUS ARE ALL AS SHOWN ON THE DRAWINGS. BUS BARS SHALL BE RECTANGULAR, SOLID COPPER, SECURELY MOUNTED AND BRACED. ALL CONNECTIONS TO BUS BARS SHALL BE SECURELY BOLTED. CABINET BOXES SHALL BE CONSTRUCTED OF CODE GRADE GALVANIZED STEEL, SIZED TO PROVIDE MINIMUM 4-INCH WIDE WIRING GUTTERS ON SIDES, TOP AND BOTTOM. FRONTS SHALL BE CONSTRUCTED OF CODE GRADE STEEL, ADJUSTABLE INDICATING TRIM CLAMPS AND WITH DOOR PROVIDED WITH CONCEALED HINGES AND CYLINDER TYPE LOCK AND CATCH. TWO KEYS PER PANEL SHALL BE FURNISHED, AND ALL LOCKS KEYED ALIKE. FRONT SHALL BE FINISH PAINTED BLUE-GRAY.
B. POWER PANELS SHALL BE SIEMENS, TYPE S1, S2, S3, SE, OR ENGINEER APPROVED EQUAL, WITH BRANCH BREAKERS, MAIN BREAKERS OR LUGS, NEUTRAL AND GROUND BUSES, ETC., ALL AS SHOWN ON THE DRAWINGS.
C. POWER AND LIGHTING PANEL CONSTRUCTION DETAILS SHALL BE IN ACCORDANCE WITH UL STANDARDS AND SHALL CONFORM TO NEMA STANDARDS. THEY SHALL BEAR THE UL LABEL. PANELS SHALL MEET USASI SPECIFICATIONS W-P-115A, TYPE 1, CLASS I.
D. ALL PANEL DIRECTORIES SHALL BE TYPED AND TERMINOLOGY APPROVED BY THE OWNER.
END OF SECTION 26471

SECTION 26475
OVERCURRENT PROTECTIVE DEVICES
A. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL WHERE INDICATED ON THE DRAWINGS OR AS REQUIRED BY THE NEC MOLDED CASE CIRCUIT BREAKERS IN A NEMA TYPE 1 ENCLOSURE. BREAKERS SHALL BE MANUALLY OPERATED, TRIP-FREE AND DESIGNED SO THAT ALL POLES OPEN SIMULTANEOUSLY. TRIPPING MECHANISM SHALL BE (THERMALLY, MAGNETICALLY) OPERATED, SHALL OPEN INSTANTANEOUSLY ON SHORT CIRCUITS AND HAVE TIME DELAY ON OVERLOADS, AND HAVE EFFECTIVE SCALING AGAINST TAMPERING. BREAKERS SHALL BE AS CALLED FOR ON THE DRAWINGS OR IN THE PANELBOARD SCHEDULE AND AS MANUFACTURED BY SIEMENS, SQUARE D, OR APPROVED EQUAL.
B. FUSES, UNLESS INDICATED OTHERWISE, SHALL BE DUAL ELEMENT, TIME LAG, CARTRIDGE TYPE AS MANUFACTURED BY BUSSMAN. FUSES FOR MOTOR CIRCUITS SHALL BE SIZED IN ACCORDANCE WITH THE NEC. LABELS INDICATING THE SIZE AND TYPE OF REPLACEMENT FUSES SHALL BE GLUED TO INSIDE OF DOOR ON ALL FUSIBLE SWITCHES AND PANELBOARDS.
C. ALL FUSES SHALL BE OF THE CURRENT AND VOLTAGE RATING AS REQUIRED OR INDICATED.
D. SPARES: SPARE FUSES AMOUNTING TO 10% (MINIMUM THREE) OF EACH TYPE AND RATING SHALL BE SUPPLIED BY THE ELECTRICAL CONTRACTOR. THESE SHALL BE TURNED OVER TO THE OWNER UPON PROJECT COMPLETION.
END OF SECTION 26475

SECTION 26800
ELECTRIC RESISTANCE HEATING

SECTION 26851
GENERAL

A. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ELECTRIC HEATING EQUIPMENT AS INDICATED ON THE DRAWINGS, IN THE ELECTRIC HEATING SCHEDULES OR NOTED ELSEWHERE IN THE CONSTRUCTION DOCUMENTS. THE INSTALLATION OF ALL SUCH EQUIPMENT SHALL BE IN STRICT CONFORMANCE TO THE NEC AND APPLICABLE LOCAL ORDINANCES.
B. ALL CIRCUITS FEEDING THE ELECTRIC HEATING EQUIPMENT SHALL AS INDICATED ON THE DRAWINGS AND ALL CONNECTIONS TO THE HEATER JUNCTION BOX SHALL BE MADE WITH AN APPROVED TYPE OF CONNECTOR.
C. UNLESS OTHERWISE SPECIFIED, ALL ELECTRIC HEATING EQUIPMENT SHALL BE MANUFACTURED BY NELSON, OR APPROVED EQUAL AND SHALL BE FOR OPERATION ON A 208 VOLT, 3 PHASE, WIRE DISTRIBUTION SYSTEM.
D. ALL EQUIPMENT SHALL BE FURNISHED COMPLETE WITH REQUIRED BLANK SECTIONS, CORNER AND TRIM ACCESSORIES TO PROVIDE AN INSTALLATION AS SHOWN ON THE DRAWINGS.
E. ALL ELECTRIC HEATING EQUIPMENT SHALL BE AUTOMATICALLY CONTROLLED BY THERMOSTATS INSTALLED WHERE INDICATED ON THE PLANS OR IN SOME CASES BUILT INTO THE INDIVIDUAL UNITS AS CALLED FOR IN THE SCHEDULE.
END OF SECTION 26851

SECTION 26900
CONTROLS AND INSTRUMENTATION

SECTION 26901
GENERAL
A. ALL EQUIPMENT AND MATERIALS USED IN RELATION TO CONTROL WORK FOR THE PROJECT SHALL BE NEW AND SHALL BEAR THE MANUFACTURER'S NAME AND TRADE NAME. THE EQUIPMENT AND MATERIAL SHALL BE ESSENTIALLY THE STANDARD PRODUCT OF A MANUFACTURER REGULARLY ENGAGED IN THE PRODUCTION OF THE REQUIRED TYPE OF EQUIPMENT AND SHALL BE THE MANUFACTURER'S LATEST APPROVED DESIGN.
B. THE ELECTRICAL CONTRACTOR SHALL RECEIVE AND PROPERLY STORE THE EQUIPMENT AND MATERIAL PERTAINING TO THE ELECTRICAL WORK. THE EQUIPMENT SHALL BE TIGHTLY COVERED AND PROTECTED AGAINST DIRT, WATER, CHEMICAL OR MECHANICAL INJURY AND THEFT. THE MANUFACTURER'S DIRECTIONS SHALL BE FOLLOWED COMPLETELY IN THE DELIVERY, STORAGE, PROTECTION AND INSTALLATION OF ALL EQUIPMENT AND MATERIALS.
C. THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL ITEMS NECESSARY FOR THE COMPLETE INSTALLATION OF THE EQUIPMENT AS RECOMMENDED OR AS REQUIRED BY THE MANUFACTURER OF THE EQUIPMENT OR REQUIRED BY CODE WITHOUT ADDITIONAL COST TO THE OWNER, REGARDLESS OF WHETHER THE ITEMS ARE SHOWN ON THE PLANS OR COVERED IN THE SPECIFICATIONS.
D. IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO CLEAN THE ELECTRICAL EQUIPMENT, MAKE NECESSARY ADJUSTMENTS AND PLACE THE EQUIPMENT INTO OPERATION BEFORE TURNING EQUIPMENT OVER TO OWNER. ANY PAINT THAT WAS SCRATCHED DURING CONSTRUCTION SHALL BE "TOUCHED-UP" WITH FACTORY COLOR PAINT TO THE SATISFACTION OF THE ARCHITECT. ANY ITEMS THAT WERE DAMAGED DURING CONSTRUCTION SHALL BE REPLACED.
E. GENERAL
1. UNLESS OTHERWISE INDICATED ALL HEATING, VENTILATING, AIR CONDITIONING, PLUMBING, AND OTHER MECHANICAL EQUIPMENT, MOTORS, AND CONTROLS SHALL BE FURNISHED, SET IN PLACE AND WIRED PER COVER SHEET MATRIX.

2. VERIFY LOCATION AND NAMEPLATE DATA OF ALL MECHANICAL EQUIPMENT WITH THE MECHANICAL CONTRACTOR PRIOR TO INSTALLING ELECTRICAL FACILITIES. BE RESPONSIBLE FO COORDINATION OF REVISIONS AND MODIFICATIONS NECESSARY TO PROPERLY SUPPLY ELECTRICAL FACILITIES TO HEATING, VENTILATING, AIR CONDITIONING, PUMPS, MOTORS, CONTROLS, AND OTHER MECHANICAL EQUIPMENT INSTALLED IN PLACE OF EQUIPMENT SPECIFIED. REQUIRED ELECTRICAL FACILITIES CHANGES SHALL BE CONSIDERED TO BE A PART OF THE MECHANICAL CONTRACT.
3. PROVIDE EACH MOTOR WITH A HORSEPOWER RATED DISCONNECT SWITCH AND MOTOR RUNNING OVERCURRENT PROTECTION PER N.E.C. 430-37. TO FACILITATE EASE AND SAFETY OF OPERATION AND MAINTENANCE OF MECHANICAL EQUIPMENT, LOCATE THE DISCONNECT SWITCH IMMEDIATELY ADJACENT TO THE MOTOR, UNLESS OTHERWISE INDICATED. SIZE THERMAL OVERLOAD HEATER UNITS FOR APPROXIMATELY 115% OF FULL LOAD MOTOR CURRENT. SIZE FUSES IN ACCORDANCE WITH THE ACTUAL MOTOR NAMEPLATE RATING AND AS RECOMMENDED BY THE BUSSMAN MFG. CO. CHECK AND COORDINATE ALL STARTERS, FUSES, AND OTHER MOTOR-RUNNING PROTECTIVE DEVICES WITH THE EQUIPMENT THEY CONTROL, AND PROVIDE AND INSTALL THE CORRECT SIZE PROTECTIVE ELEMENTS AS REQUIRED.
4. DO NOT CONNECT MOTORS WHICH ARE OF A VOLTAGE RATING DIFFERENT THAN SUPPLY VOLTAGE. REPORT SAME TO THE ARCHITECT IN WRITING AND OBTAIN WRITTEN INSTRUCTIONS FOR RESOLUTION.
5. USE FLEXIBLE CONDUIT FOR ALL CONNECTIONS TO DEVICES DIRECTLY ATTACHED TO DUCTS, PIPING AND MECHANICAL EQUIPMENT.
END OF SECTION 26901

SECTION 26950
TESTING
A. AS SOON AS ELECTRIC POWER IS AVAILABLE AND CONNECTED TO SERVE THE EQUIPMENT IN THE BUILDING, AND EVERYTHING IS READY FOR FINAL TESTING AND PLACING IN SERVICE, A COMPLETE OPERATIONAL TEST SHALL BE MADE. THE CONTRACTOR SHALL FURNISH ALL NECESSARY INSTRUMENTS AND EQUIPMENT AND MAKE ALL TESTS, ADJUSTMENTS, AND TRIAL OPERATIONS REQUIRED TO PLACE THE SYSTEM IN BALANCED AND SATISFACTORY OPERATING CONDITION; FURNISH ALL NECESSARY ASSISTANCE AND INSTRUCTIONS TO PROPERLY INSTRUCT THE OWNER'S AUTHORIZED PERSONNEL IN THE OPERATION AND CARE OF THE SYSTEM.
B. PRIOR TO TESTING THE SYSTEM, THE FEEDERS AND BRANCH CIRCUITS SHALL BE CONTINUOUS FROM MAIN FEEDERS TO MAIN PANELS, TO SUBPANELS, TO OUTLETS, WITH ALL BREAKERS AND FUSES IN PLACE. THE SYSTEM SHALL BE TESTED FREE FROM SHORTS AND GROUNDS. SUCH TESTS SHALL BE MADE IN THE PRESENCE OF THE ENGINEER'S REPRESENTATIVE.
C. NO CIRCUITS SHALL BE ENERGIZED WITHOUT THE OWNER'S APPROVAL.
D. THE RIGHT IS RESERVED TO INSPECT AND TEST ANY PORTION OF THE EQUIPMENT AND/OR MATERIALS DURING THE PROGRESS OF ITS ERECTION. THE CONTRACTOR SHALL FURTHER TEST ALL WIRING AND CONNECTIONS FOR CONTINUITY AND GROUNDS BEFORE CONNECTING ANY FIXTURES OREQUIPMENT.
E. THE CONTRACTOR SHALL TEST THE ENTIRE SYSTEM IN THE PRESENCE OF THE ARCHITECT OR HIS ENGINEER WHEN THE SYSTEM IS FINALLY COMPLETED TO INSURE THAT ALL PORTIONS ARE FREE FROM SHORT CIRCUITS OR GROUND FAULTS.
END OF SECTION 26950

SECTION 26980
DEMONSTRATION OF ELECTRICAL EQUIPMENT
A. THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE ARCHITECT WITH CERTIFICATION OF THE INSPECTION AND APPROVAL OF AN ACTIVE MEMBER OF THE INTERNATIONAL ASSOCIATION OF ELECTRICAL INSPECTORS OF ALL WORK COMPLETED AND INCLUDED IN THE SECTION, IF REQUIRED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE INSPECTOR WHEN WORK REACHES INSPECTION STAGE.
B. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE LOCAL AUTHORITY HAVING JURISDICTION IN ORDER THAT LOCAL INSPECTION MAY BE CARRIED OUT AT THE PROPER STAGE.
C. THE ELECTRICAL CONTRACTOR SHALL PAY FOR ALL PERMITS, INSPECTION FEES, AND INSTALLATION FEES AS REQUIRED TO COMPLETE THE WORK UNDER THIS SECTION OF THE CONTRACT.
D. THIS CONTRACTOR SHALL GUARANTEE THE MATERIALS AND WORKMANSHIP FOR A PERIOD OF TWELVE (12) MONTHS FROM THE TIME THE INSTALLATION IS ACCEPTED BY THE OWNER. IF, DURING THIS TIME, ANY DEFECTS SHOULD SHOW UP DUE TO ANY DEFECTIVE MATERIALS, WORKMANSHIP, NEGLIGENCE OR WANT OF PROPER CARE ON THE PART OF THIS CONTRACTOR, HE SHALL FURNISH ANY NEW MATERIALS AS NECESSARY, REPAIR SAID DEFECTS, AND PUT THE SYSTEM IN ORDER AT HIS OWN EXPENSE ON RECEIPT OF NOTICE OF SUCH DEFECTS FROM THE ARCHITECT. THIS SPECIFICATION IS NOT INTENDED TO IMPLY THAT THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR NEGLIGENCE OF THE OWNER.
END OF SECTION 26980
END OF DIVISION

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