



ARCHITECTURE

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NEW SMITH MIDDLE SCHOOL
Troy School District - Troy, Michigan 48098

2022 BOND PROGRAM - BID BACKAGE 03B

Project Number 22102
CONSTRUCTION DOCUMENTS

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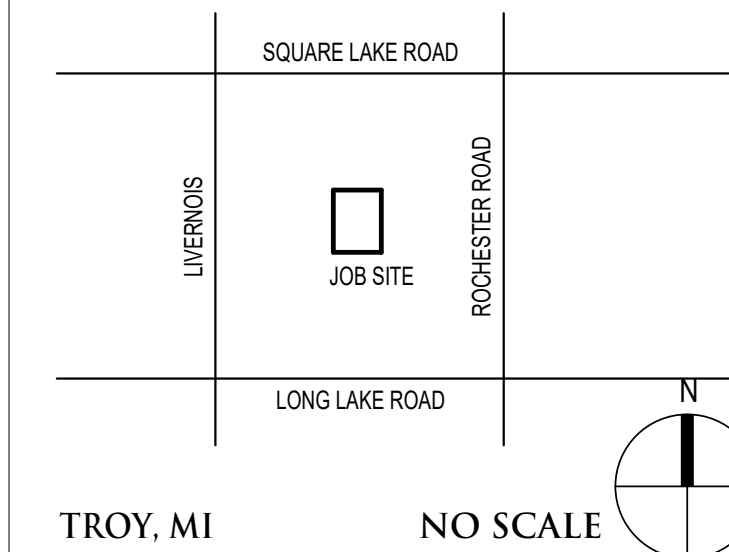
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THEATRICAL
TE1.1 Theatrical Electrical Location Plan View
TR1.1 Theatrical Rigging Plan View
TR1.2 Theatrical Rigging Section View at Centerline and Details

PROJECT DATA:
LOCATION MAP:



TROY, MI

NO SCALE

ADDRESS: NEW SMITH MIDDLE SCHOOL
5850 Livernois Road
Troy, Michigan 48098

BUILDING:

BUILDING AREA(S) = 103,803 SF (FIRST LEVEL)
810 SF (MEZZANINE)
21,312 SF (SECOND LEVEL)
125,725 SF (TOTAL)

CODE:

- GOVERNING CODES:
• 2016 SCHOOL FIRE SAFETY RULES (2012 Life Safety Code, plus amendments)
• 2015 MICHIGAN BUILDING CODE
• 2021 MICHIGAN PLUMBING CODE
• 2015 MICHIGAN ENERGY CODE (ANSI/ASHRAE/IESNA Standard 90.1-2013)
• 2022 MICHIGAN ELECTRICAL CODE (ASME A17.1-2010, ASME A18.1-2011)
• MICHIGAN BARRIER FREE CODE (Michigan Building Code 2015 and ICC A117.1-2009)
• 2013 MICHIGAN BOILER CODE RULES (ASME Boiler and Pressure Vessel Code, 2019 edition) (National Board Inspection Code (NBIC), 2019 edition)

USE GROUP CLASSIFICATION: "E" EDUCATION

CONSTRUCTION TYPE: TYPE II (000) LSC
TYPE II-B (MBC)

ISSUE DATES

Table with 2 columns: Issue Date, Description. Includes a row for 06-18-2024 CONSTRUCTION DOCUMENTS.

DATE: ISSUED FOR:

LICENSEE'S STATEMENT:

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REGISTRATION SEALS

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PROJECT TITLE
NEW SMITH MIDDLE SCHOOL

PROJECT NO.
22102
DRAWING NO.
TS.2-03B

















































































































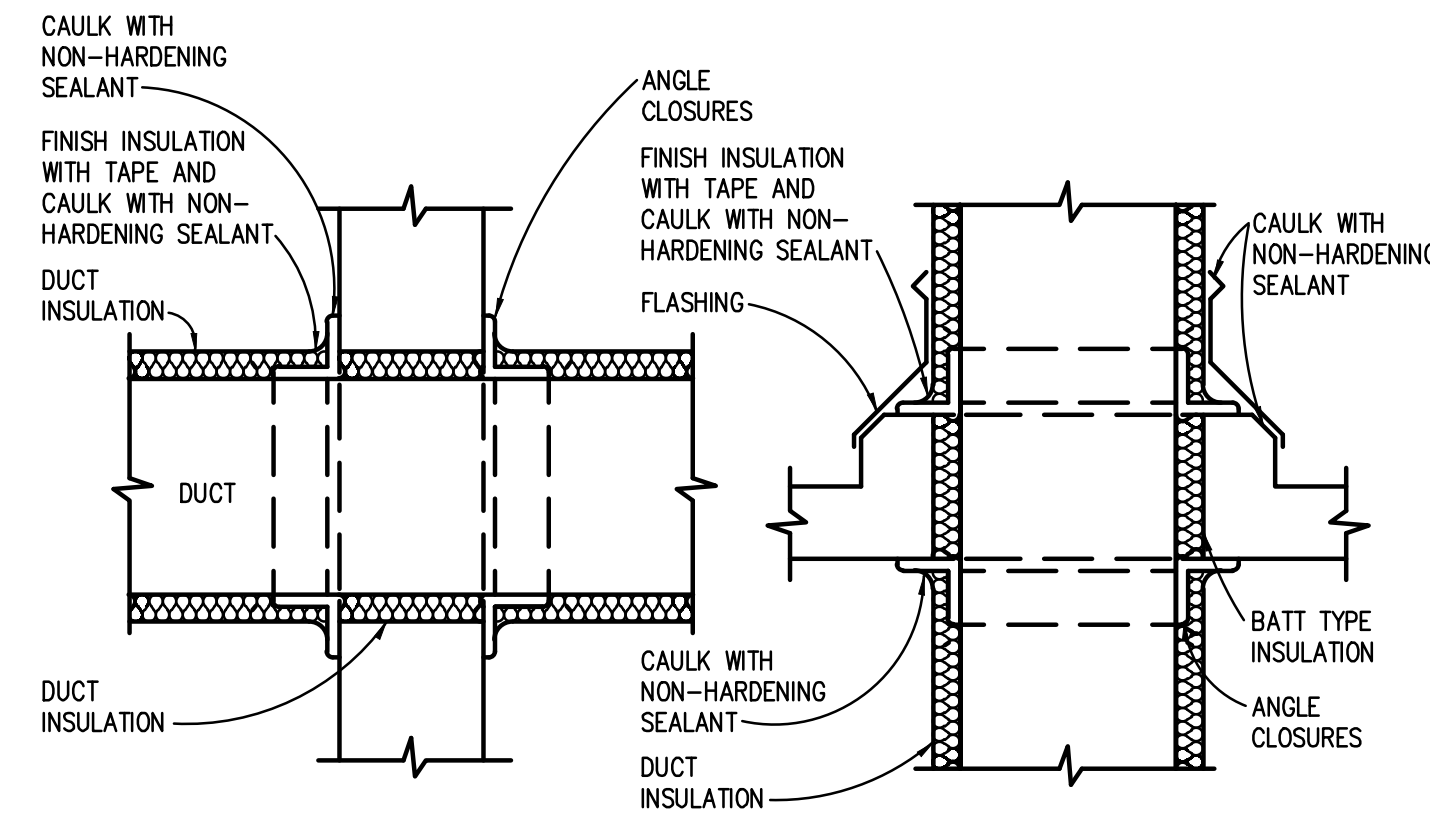




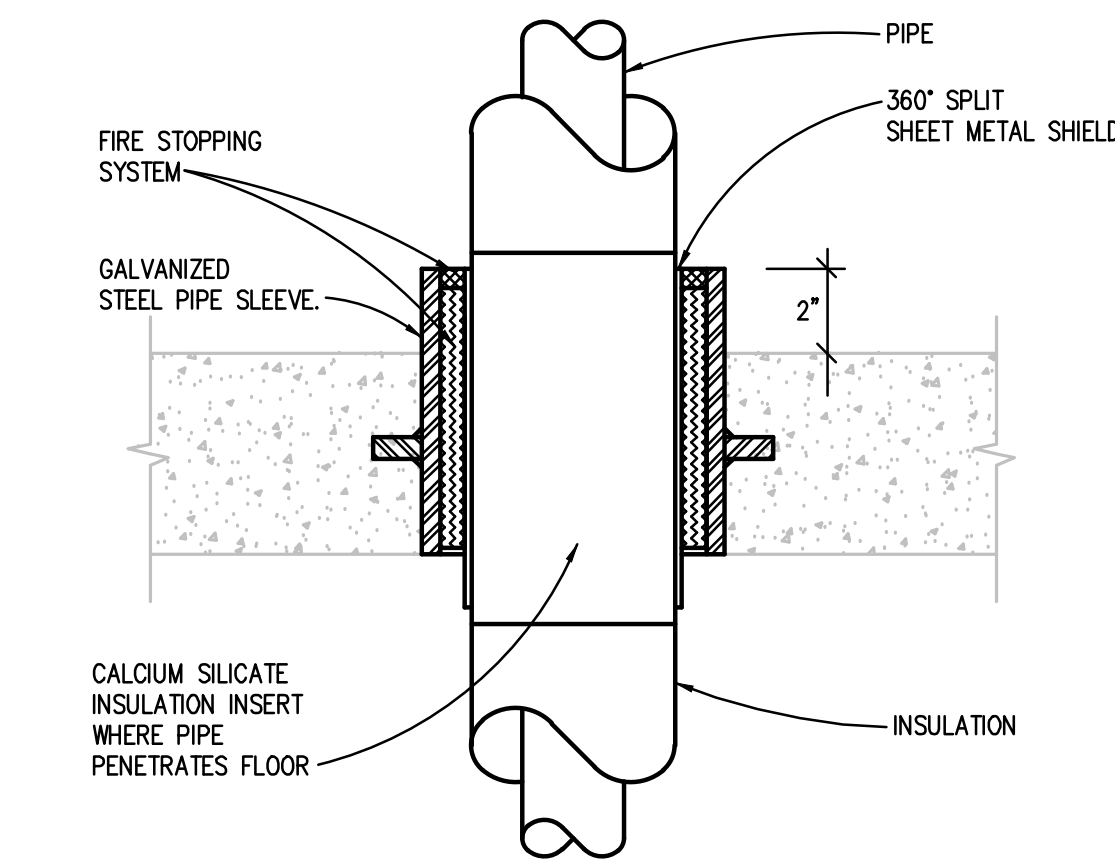




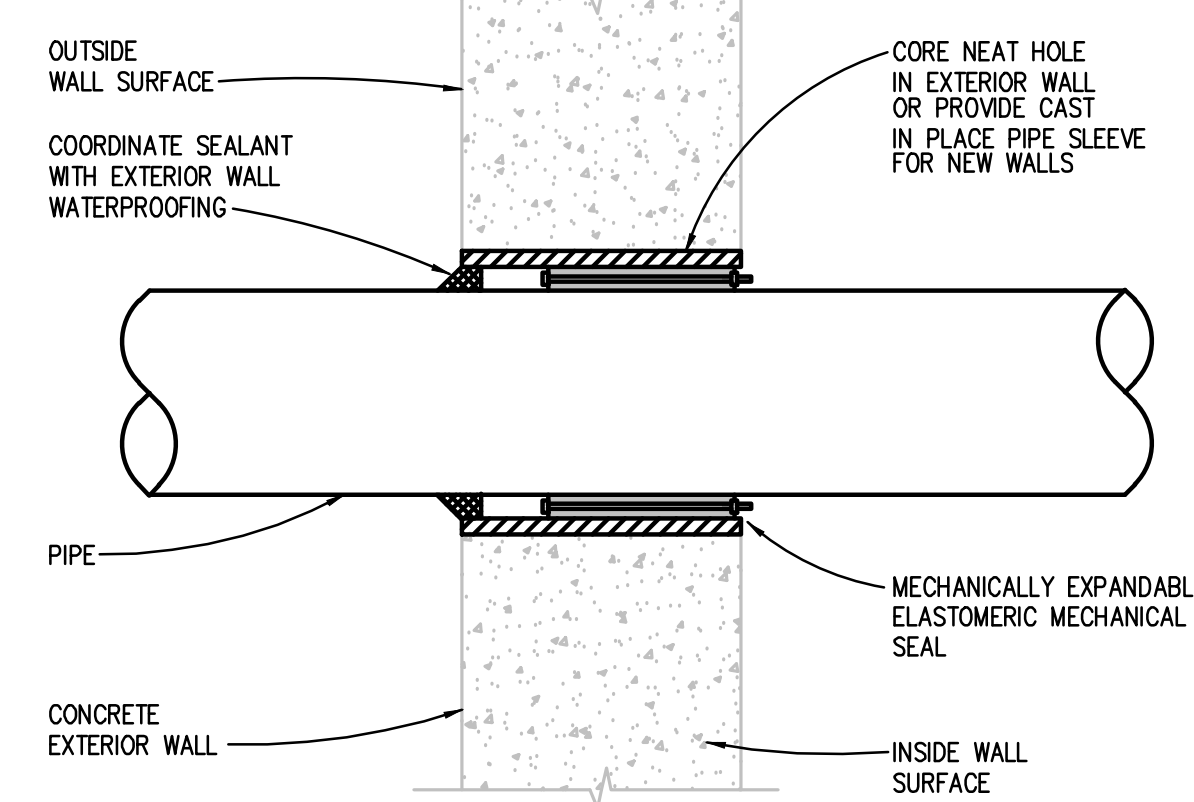




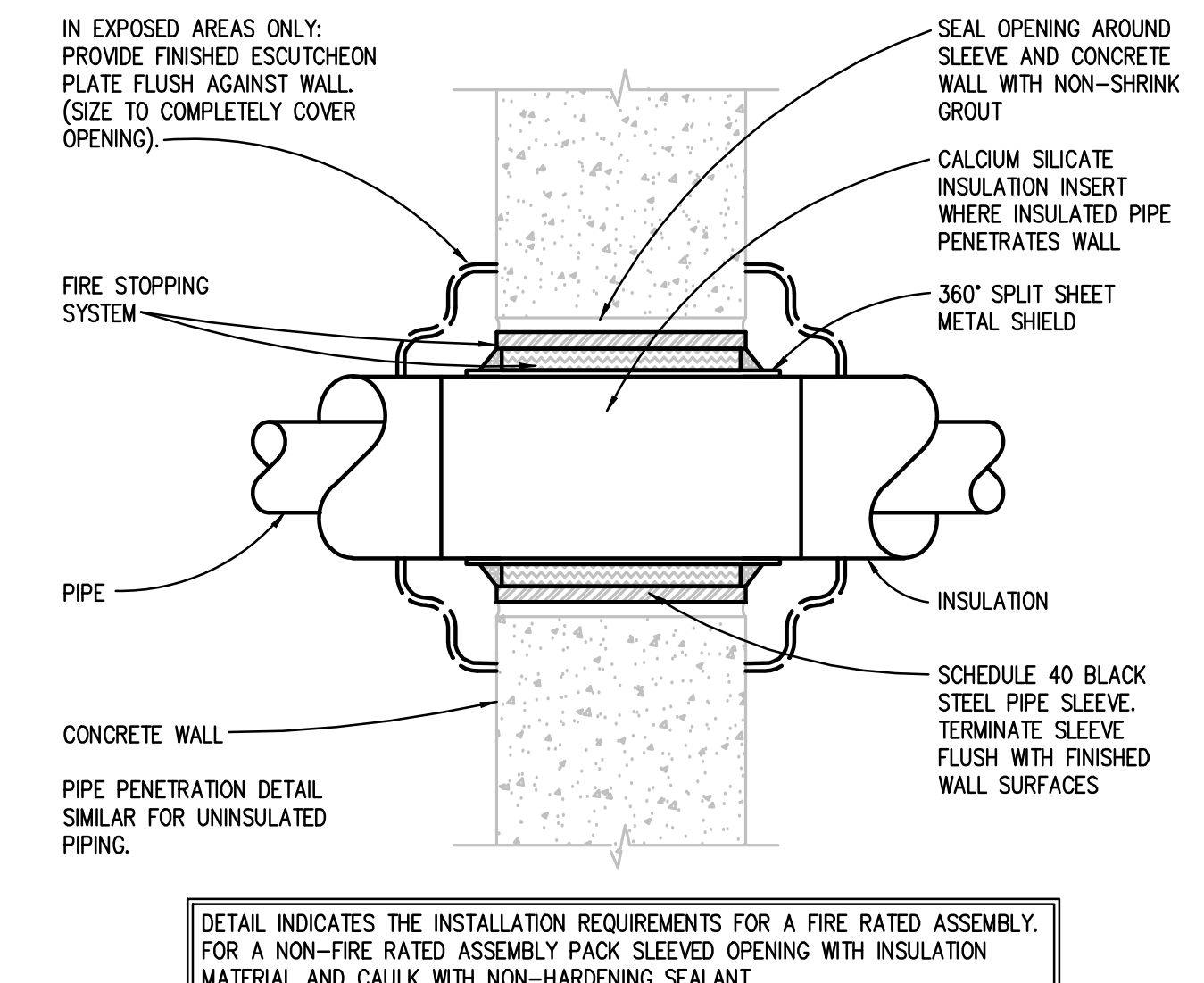
**VERTICAL OR HORIZONTAL (NON FIRE RATED ASSEMBLY) DUCT PENETRATION DETAIL**  
NO SCALE



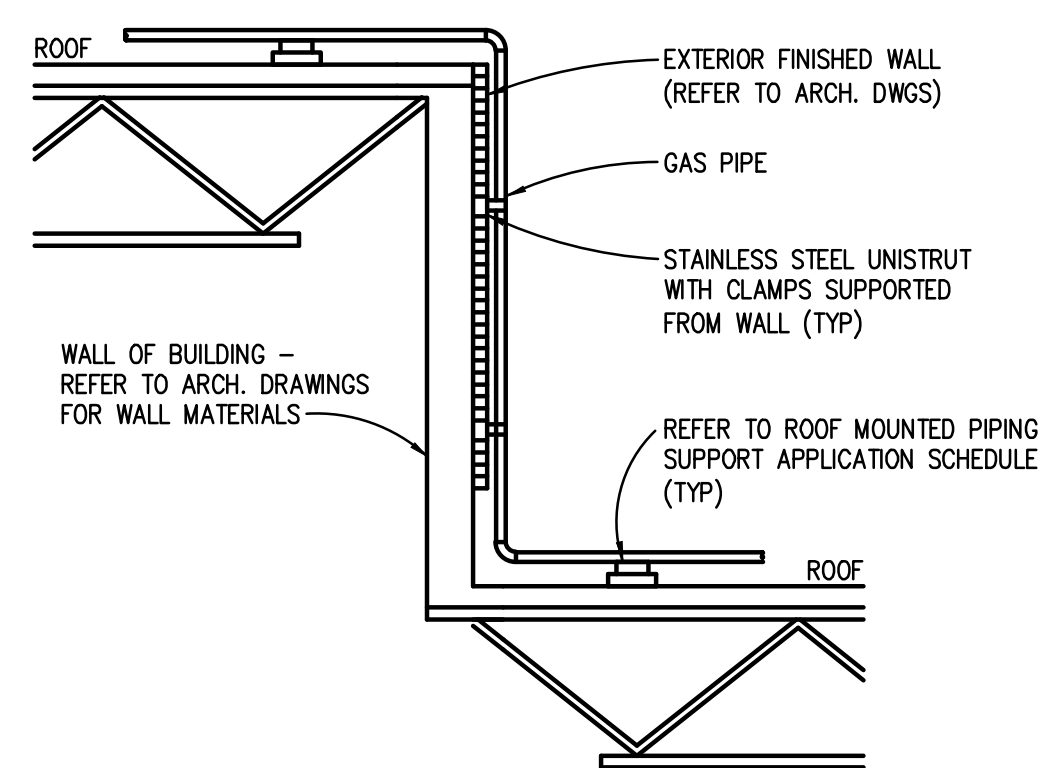
**NEW FLOOR PIPE PENETRATION DETAIL**  
NO SCALE



**EXTERIOR BELOW GRADE WALL PIPE PENETRATION DETAIL**  
NO SCALE



**FIRE RATED AND NON-FIRE RATED POURED CONCRETE OR BLOCK WALL PIPE PENETRATION DETAIL**  
NO SCALE



**GAS PIPE MOUNTING DETAIL**  
NO SCALE



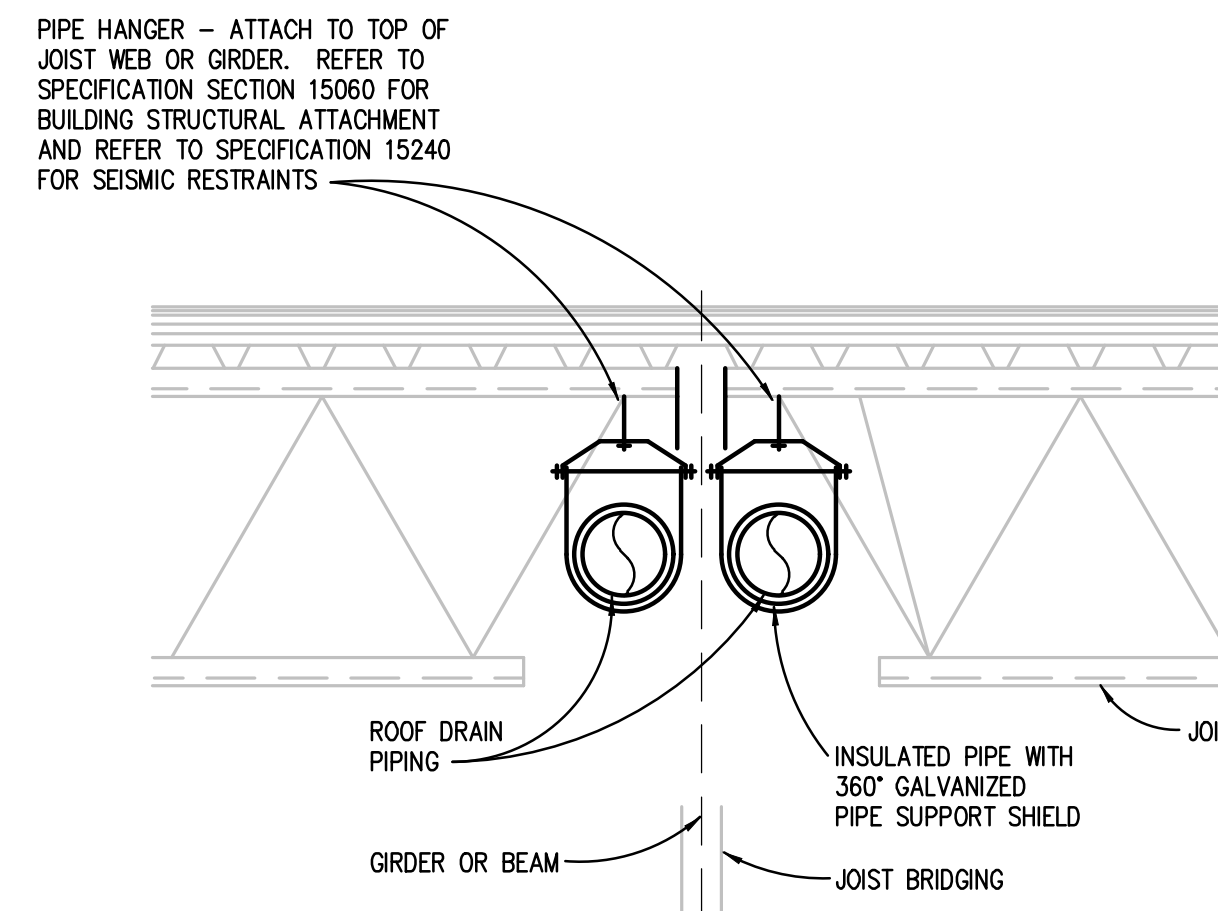
**BRANCH CONNECTION OFF TOP**

APPLIES TO THE FOLLOWING SYSTEMS:  
DOMESTIC WATER  
STEAM & CONDENSATE  
LABORATORY GASES  
LABORATORY VACUUM  
COMPRESSED AIR  
NATURAL GAS

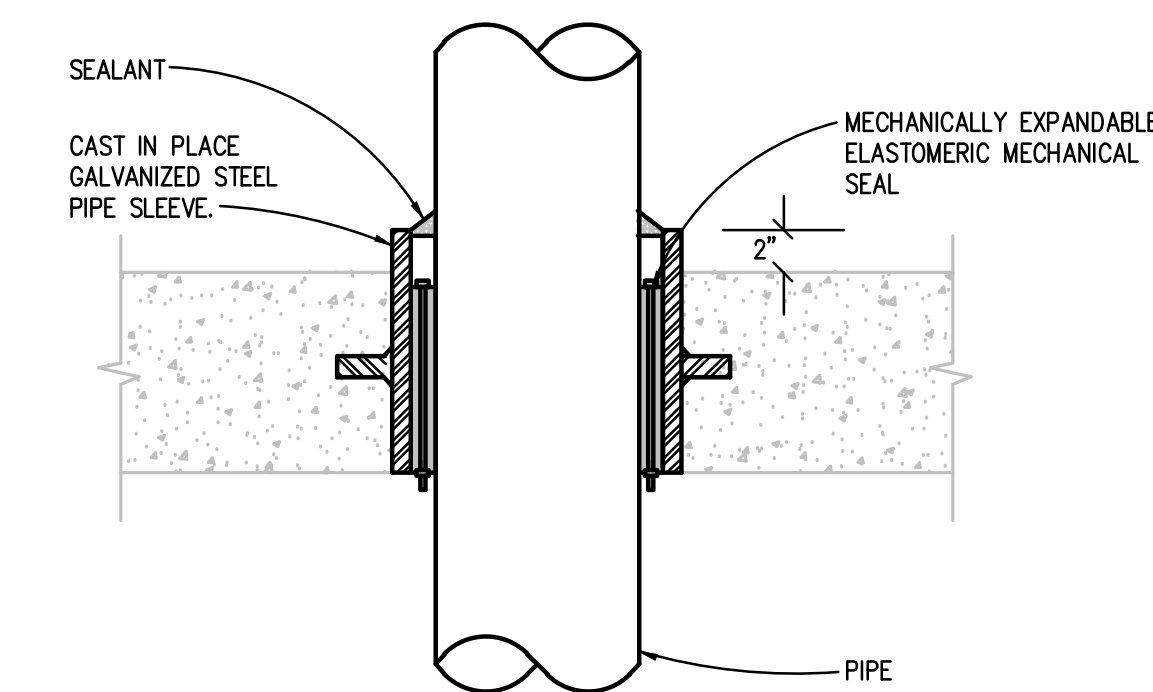
**BRANCH CONNECTION OFF BOTTOM**

APPLIES TO THE FOLLOWING SYSTEMS:  
HOT WATER HEATING  
CHILLED WATER  
CONDENSER WATER  
ENERGY RECOVERY  
PROCESS COOLING WATER

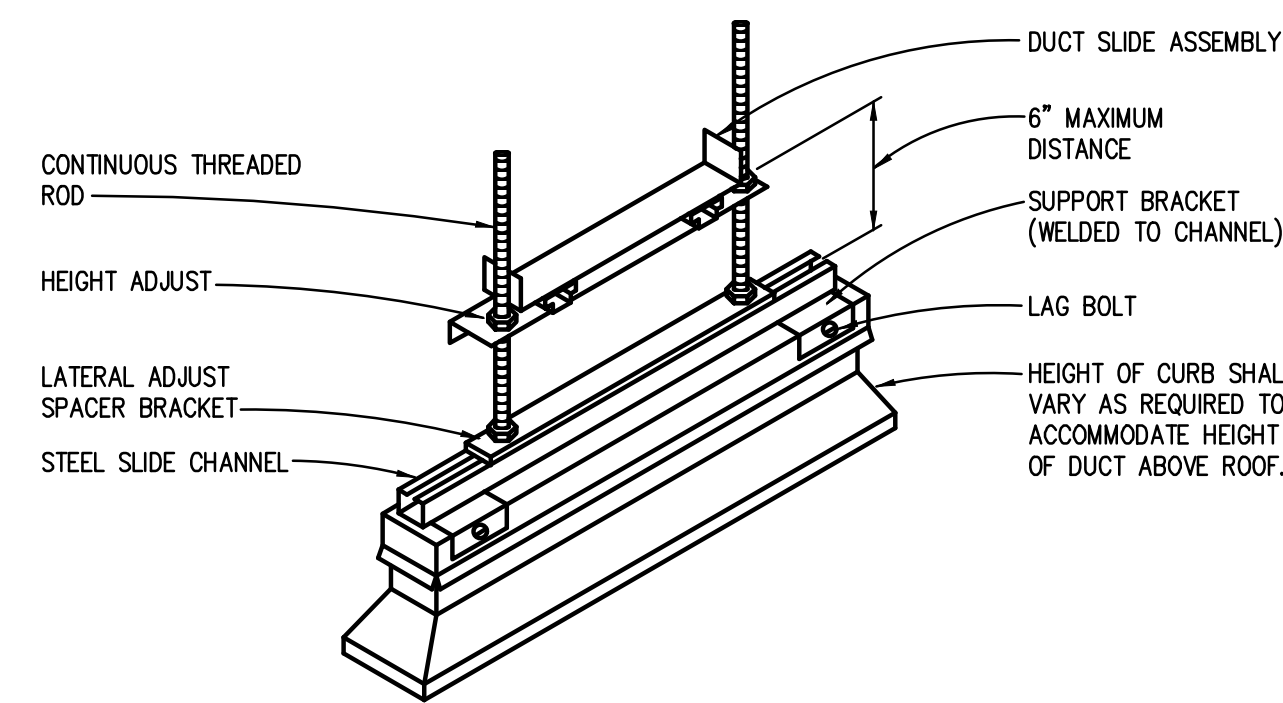
NOTE: BOTTOM AS INDICATED OR SIDE CONNECTION IS ACCEPTABLE. CONNECTION ABOVE CENTERLINE OF MAINS IS NOT ACCEPTABLE.



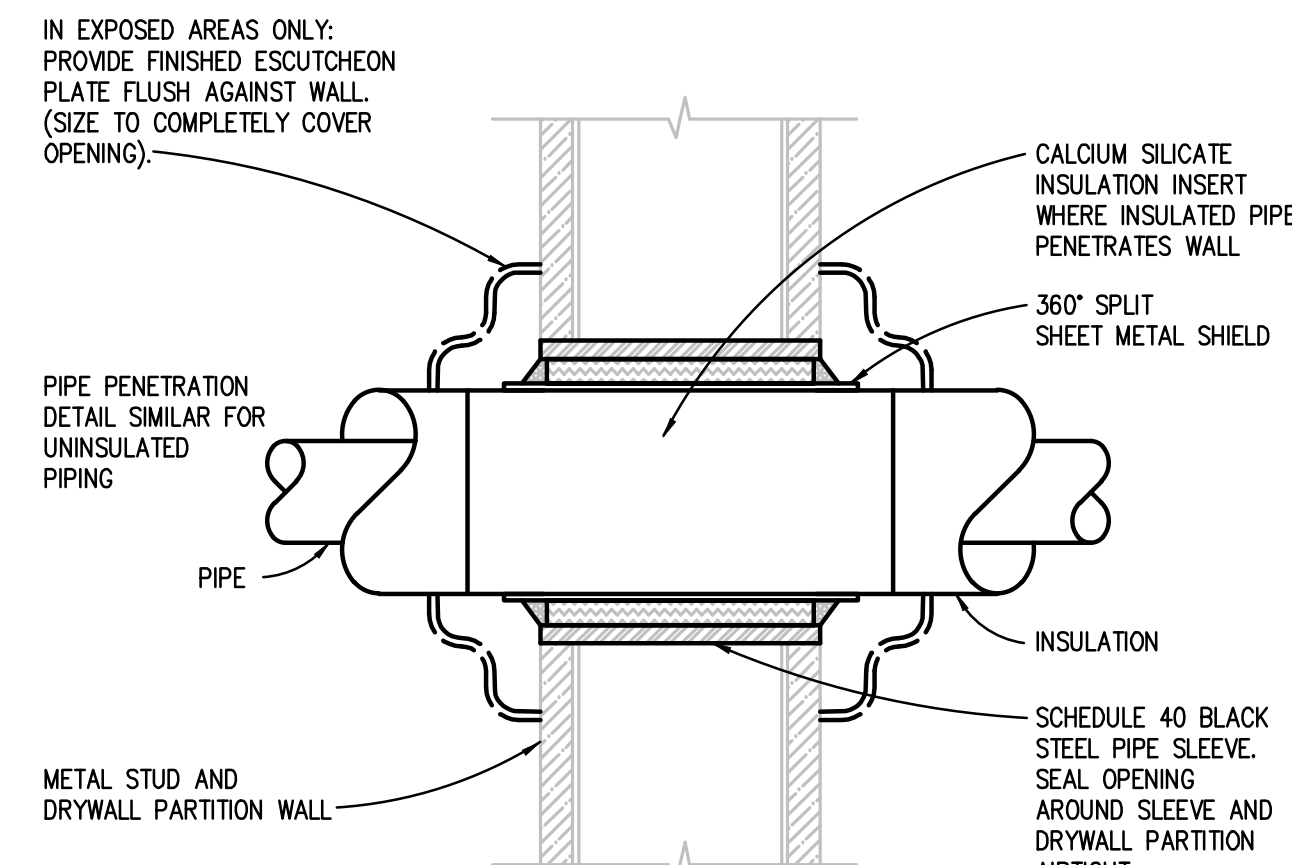
**ROOF DRAIN PIPING DETAIL**  
NO SCALE



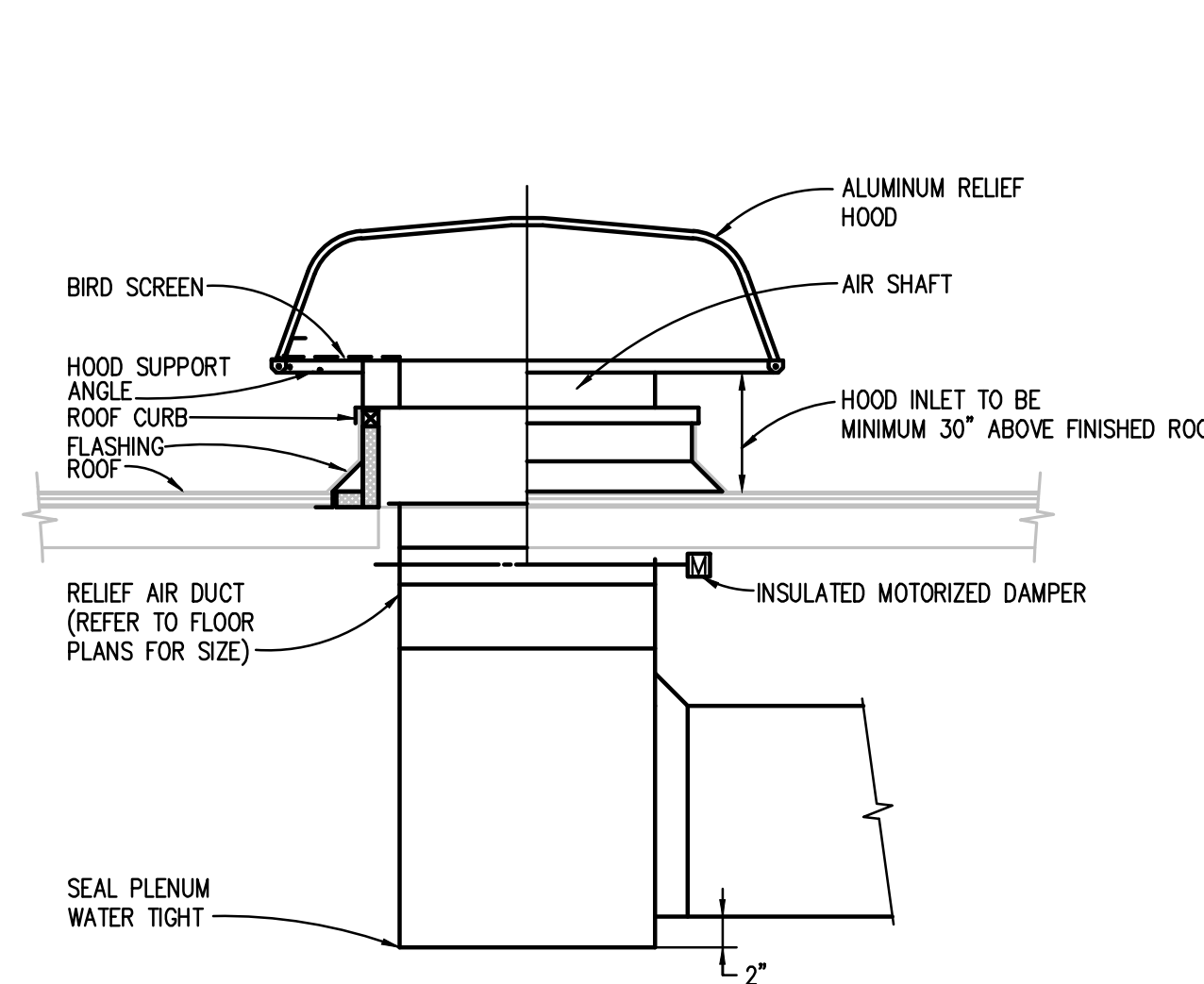
**NEW SLAB ON GRADE FLOOR PIPE PENETRATION DETAIL**  
NO SCALE



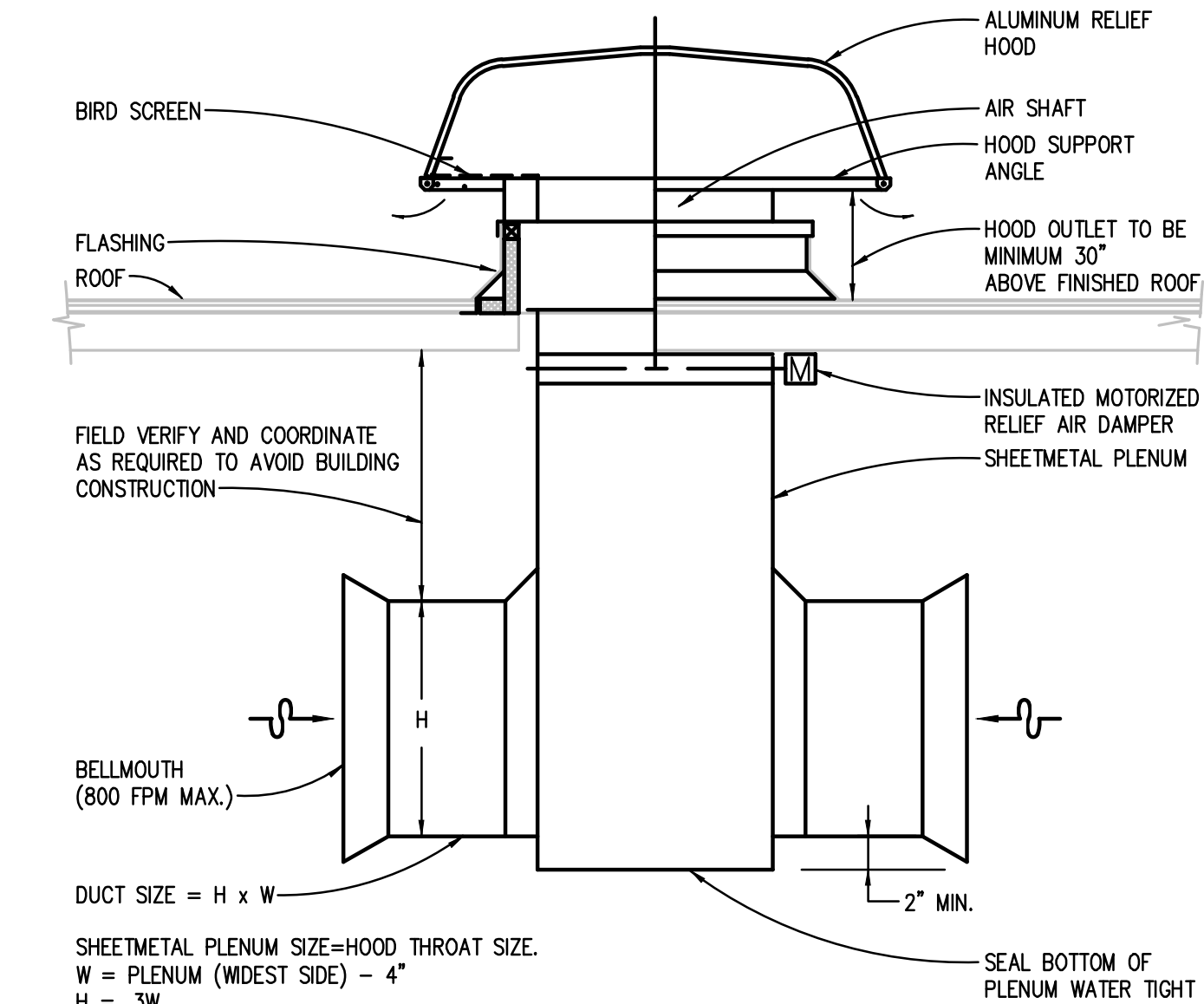
**DUCT MOUNTING PEDESTAL DETAIL (ROOF MOUNTED DUCTWORK)**  
NO SCALE



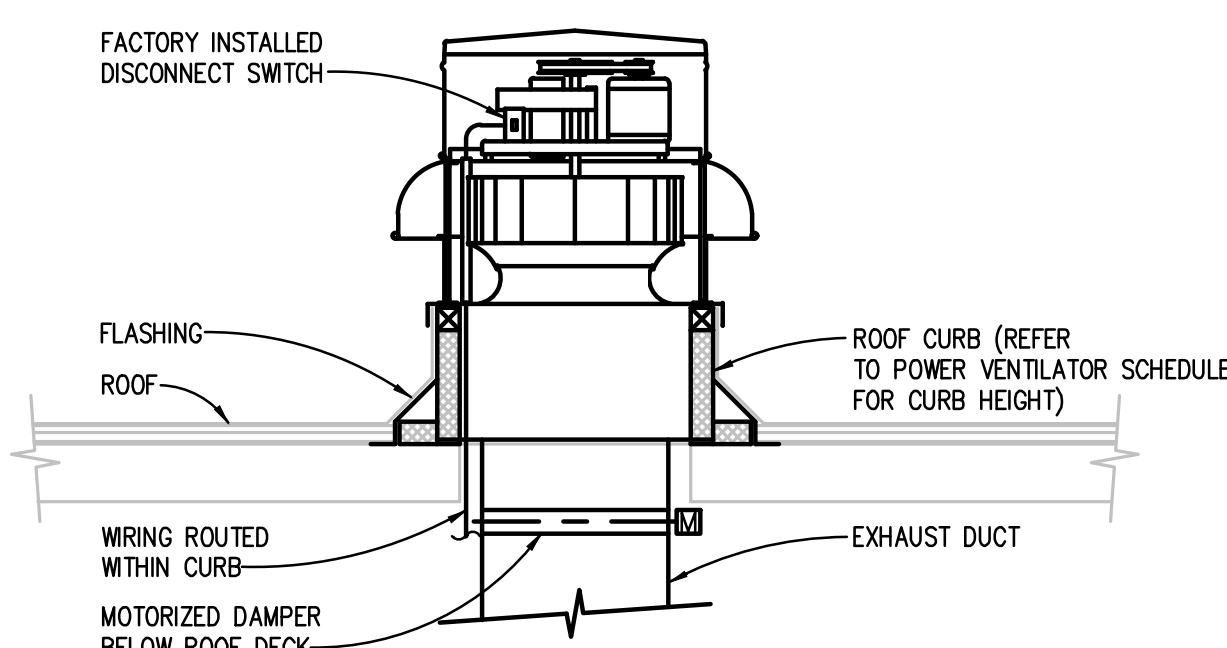
**FIRE RATED AND NON-FIRE RATED METAL STUD AND DRYWALL PARTITION WALL PIPE PENETRATION DETAIL**  
NO SCALE



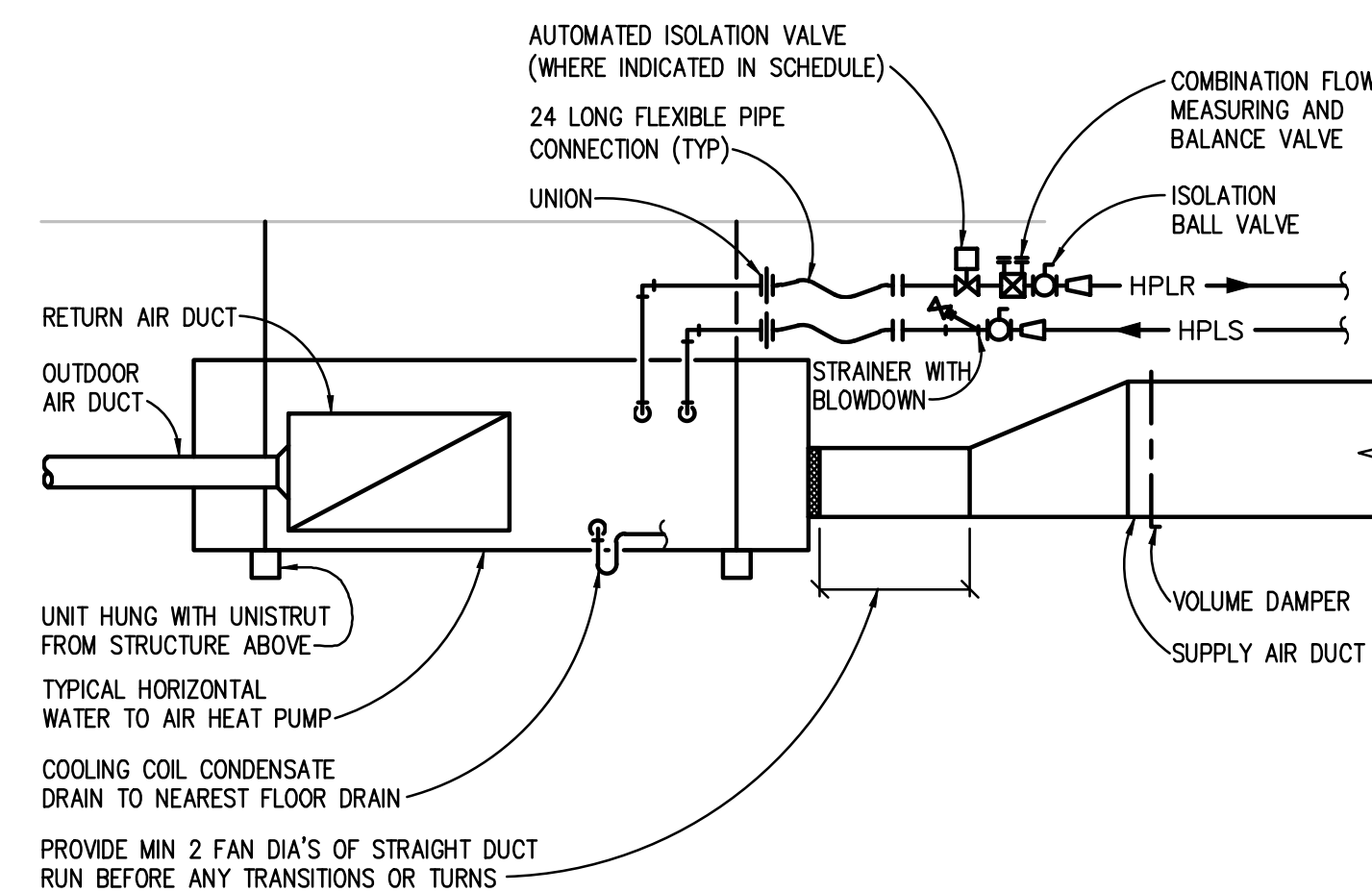
**DUCTED INTAKE OR RELIEF HOOD INSTALLATION DETAIL**  
NO SCALE



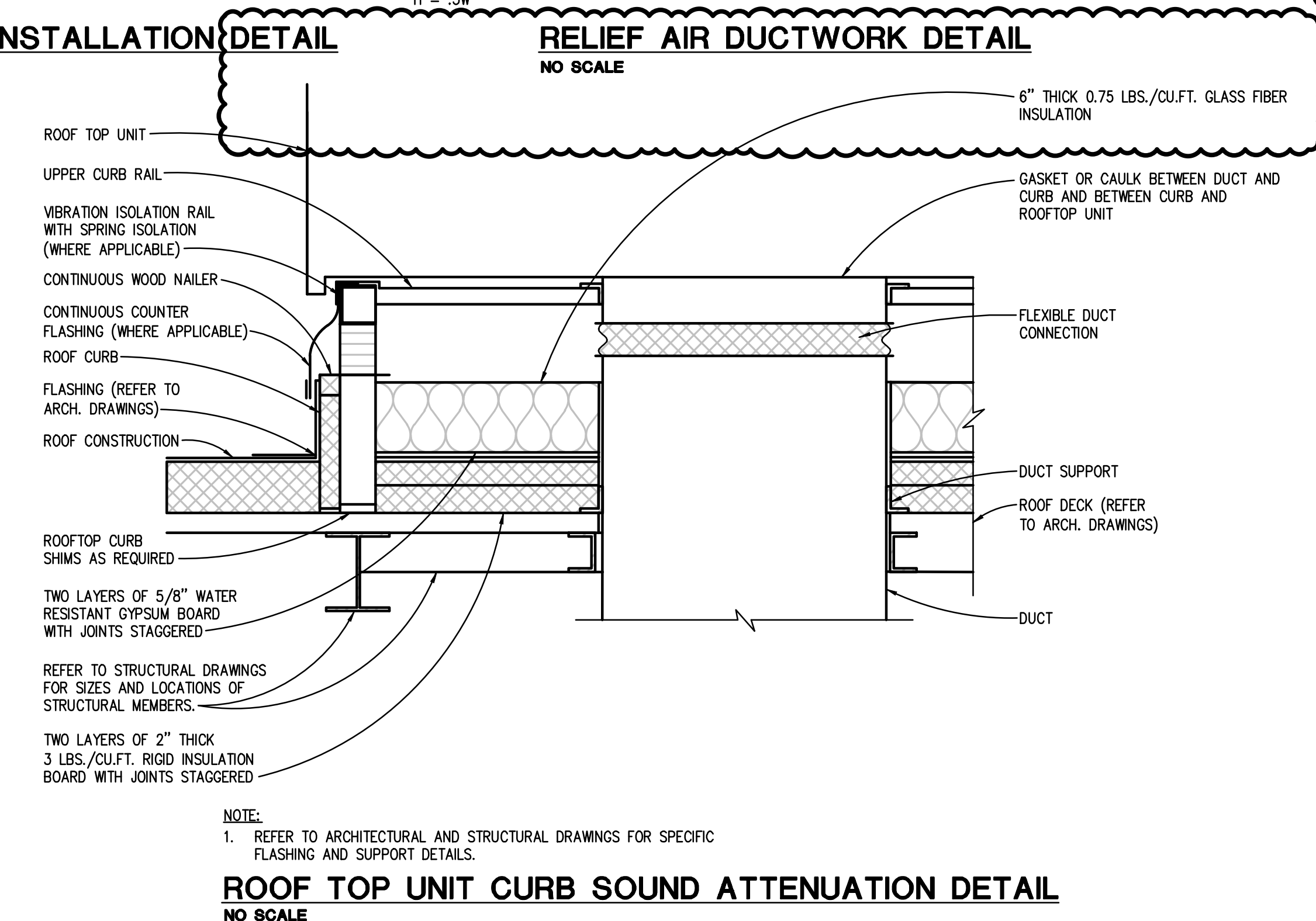
**RELIEF AIR DUCTWORK DETAIL**  
NO SCALE



**ROOF MOUNTED POWER VENTILATOR EXHAUST FAN DETAIL**  
NO SCALE



**HORIZONTAL HEAT PUMP PIPING DIAGRAM AND INSTALLATION DETAIL**  
NO SCALE



NOTE:  
1. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR SPECIFIC FLASHING AND SUPPORT DETAILS.

**ROOF TOP UNIT CURB SOUND ATTENUATION DETAIL**  
NO SCALE



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PBA Project No. 20230354

PROJECT TITLE

**NEW SMITH MIDDLE SCHOOL**  
Bid Package No. 03B

Troy School District  
Troy, Michigan

DRAWING TITLE  
**MECHANICAL DETAILS**

ISSUE DATES

07-12-2024 ADDENDUM #

06-16-2024 CONSTRUCTION DOCUMENTS

DATE: ISSUED FOR:

DRAWN: JRB

CHECKED: KLH

APPROVED: SVM

PROJECT NO.

**22102**

DRAWING NO.

**M6.1**













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PBA Project No. 20230354

PROJECT TITLE  
**NEW SMITH  
MIDDLE SCHOOL**  
Bid Package No. 03B

Troy School District  
Troy, Michigan

DRAWING TITLE  
**MECHANICAL DETAILS**

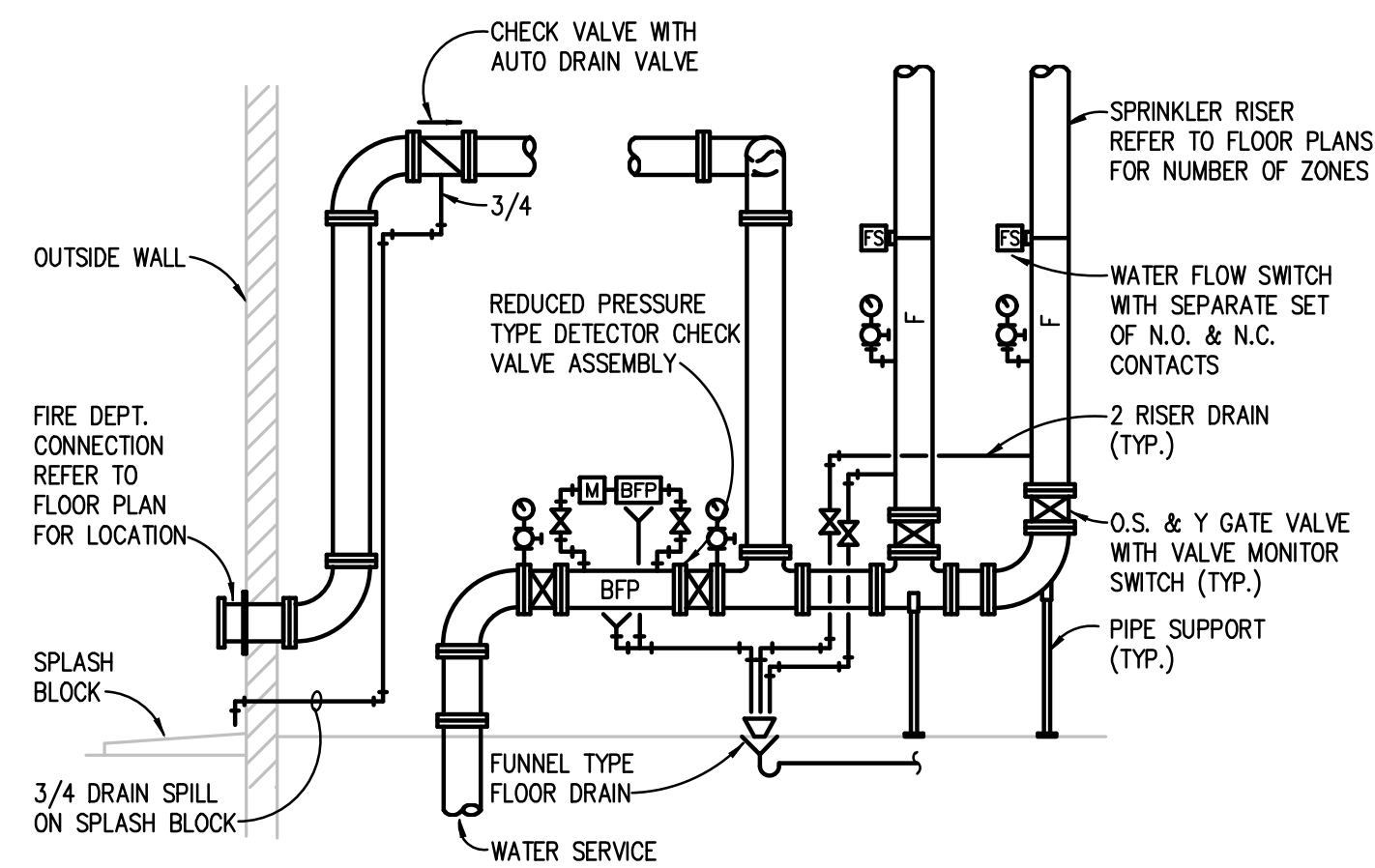
ISSUE DATES

96-18-2024 CONSTRUCTION DOCUMENTS  
DATE: ISSUED FOR:

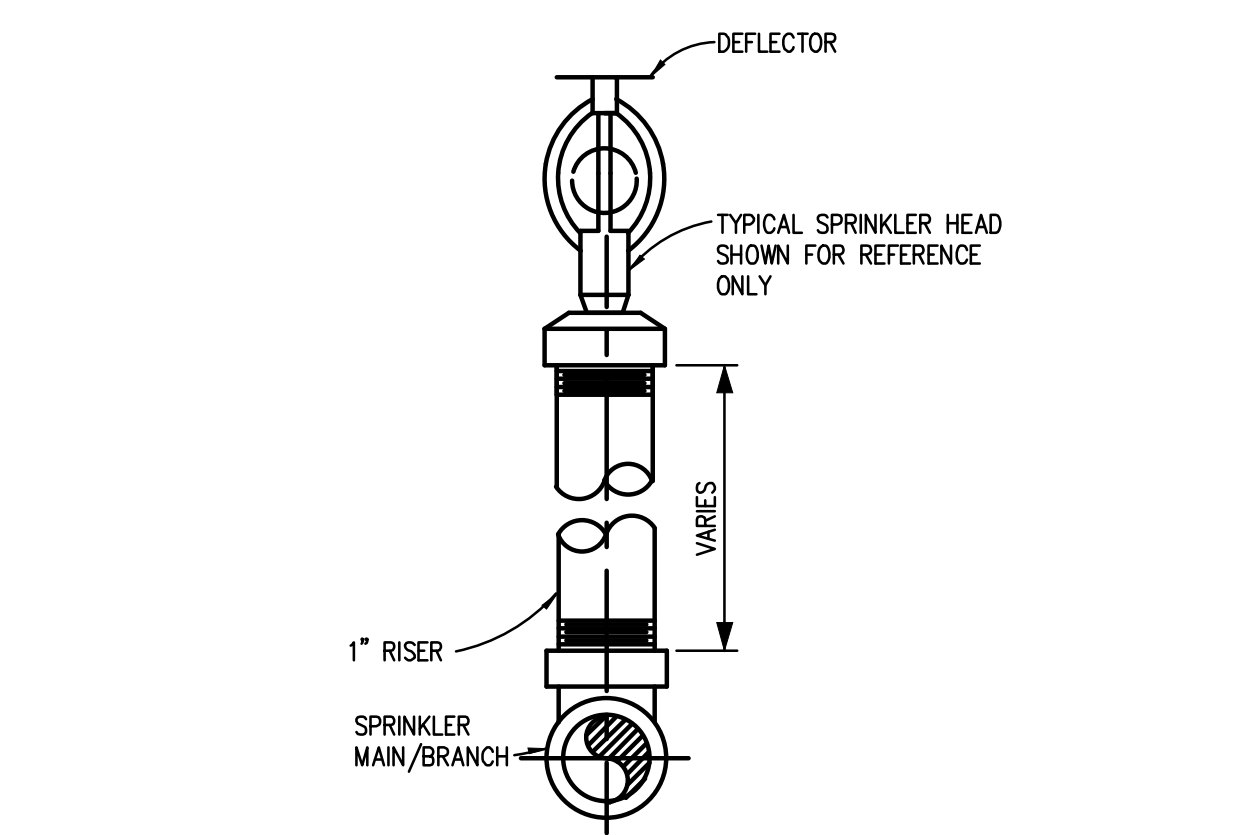
DRAWN JRB  
CHECKED KLH  
APPROVED SVM

PROJECT NO.  
**22102**

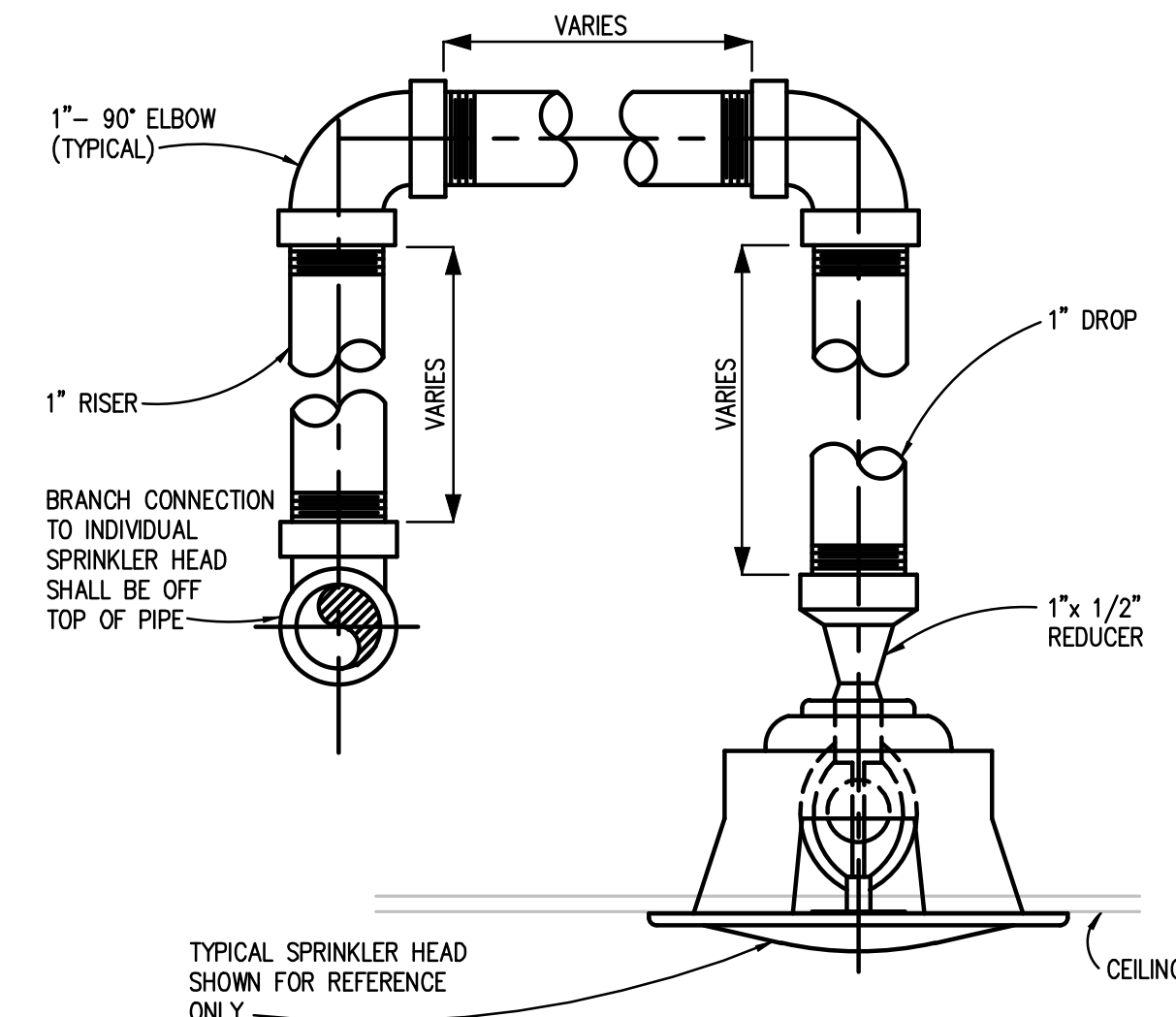
DRAWING NO.  
**M6.4**



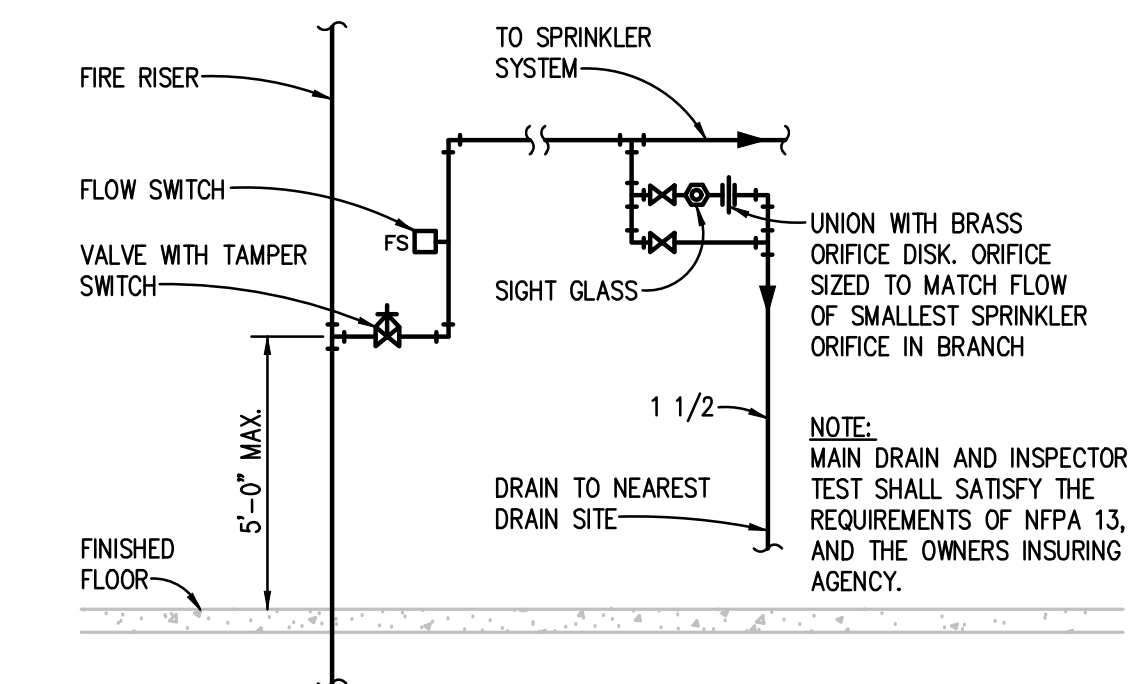
**AUTOMATIC SPRINKLER RISER PIPING DIAGRAM**  
NO SCALE



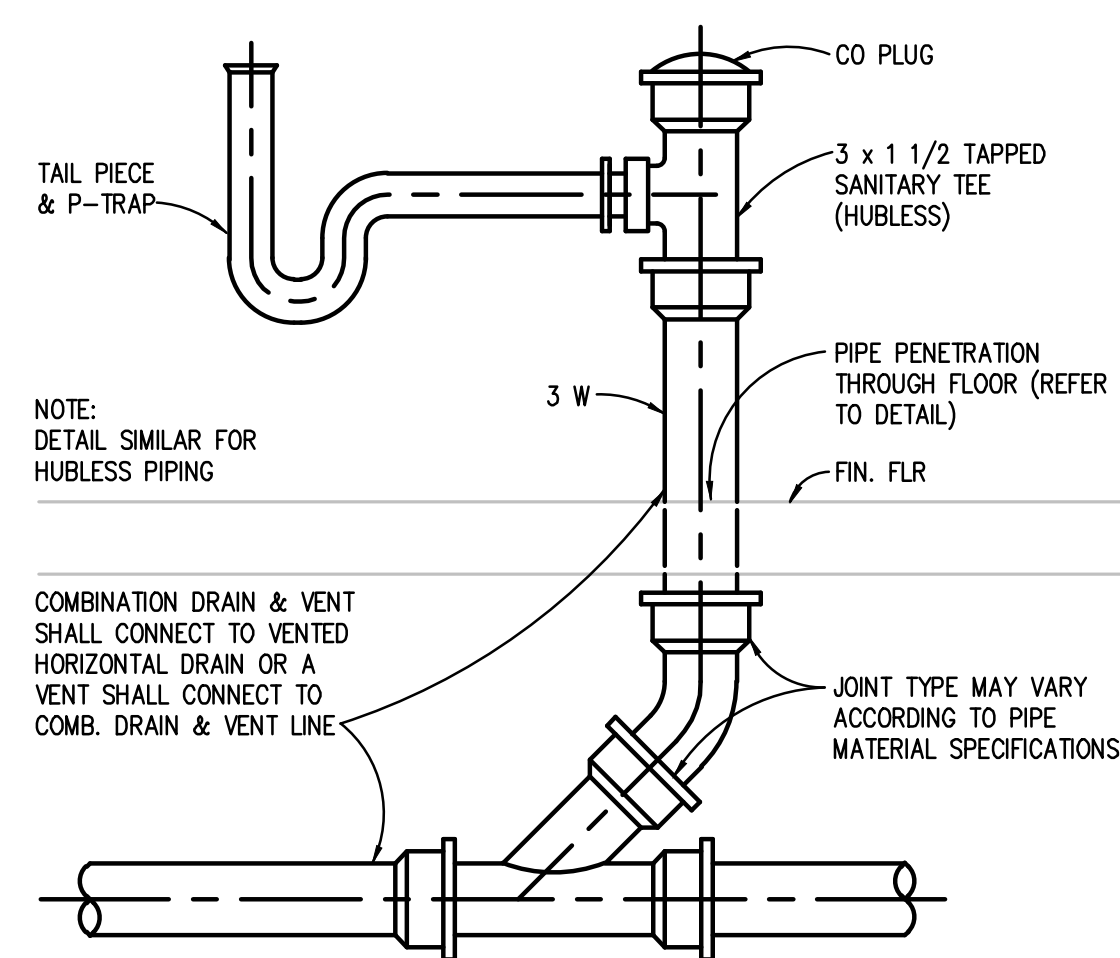
**TYPICAL UPRIGHT SPRINKLER PIPING DETAIL**  
NO SCALE



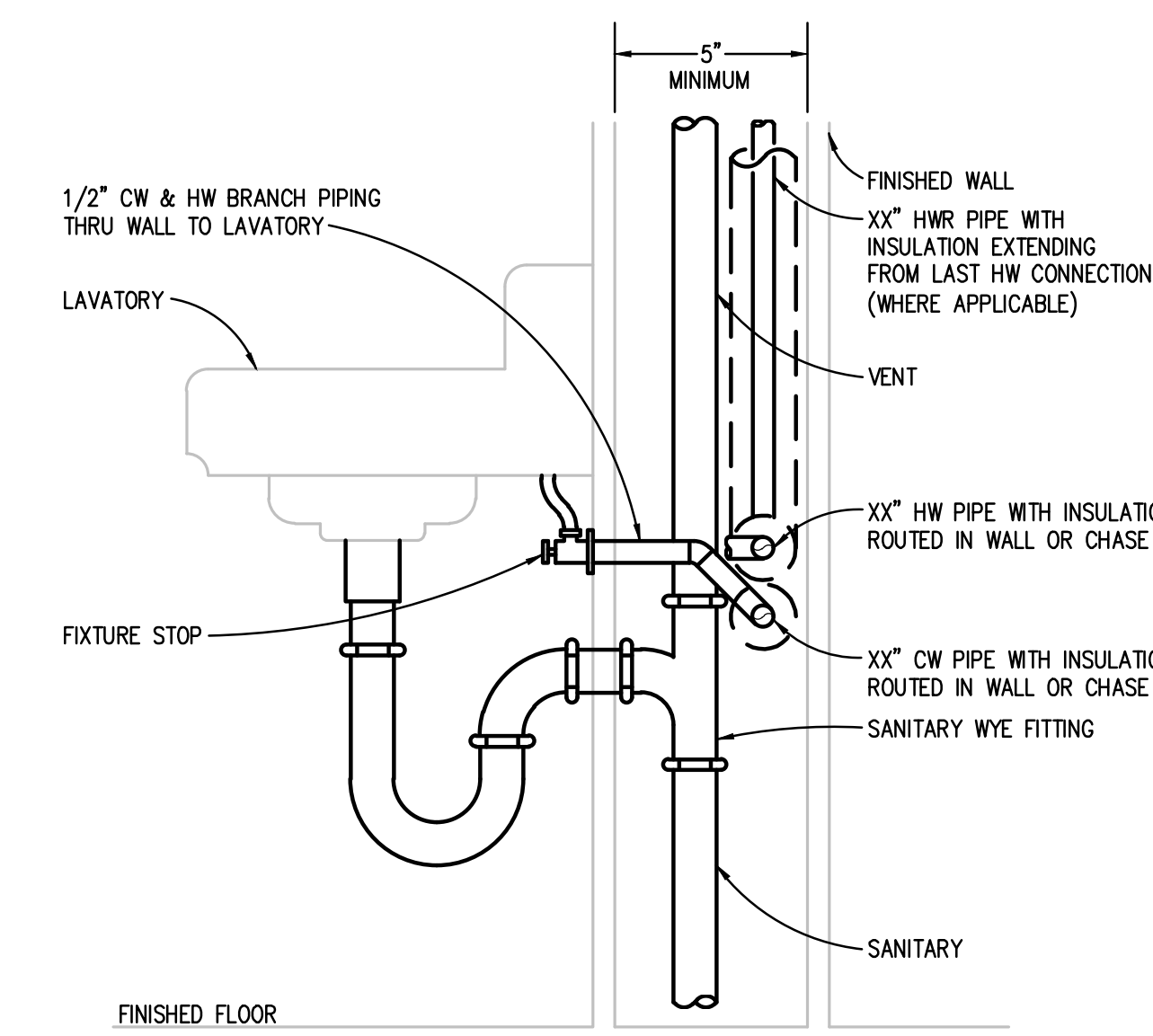
**TYPICAL SPRINKLER PIPING DETAIL**  
NO SCALE



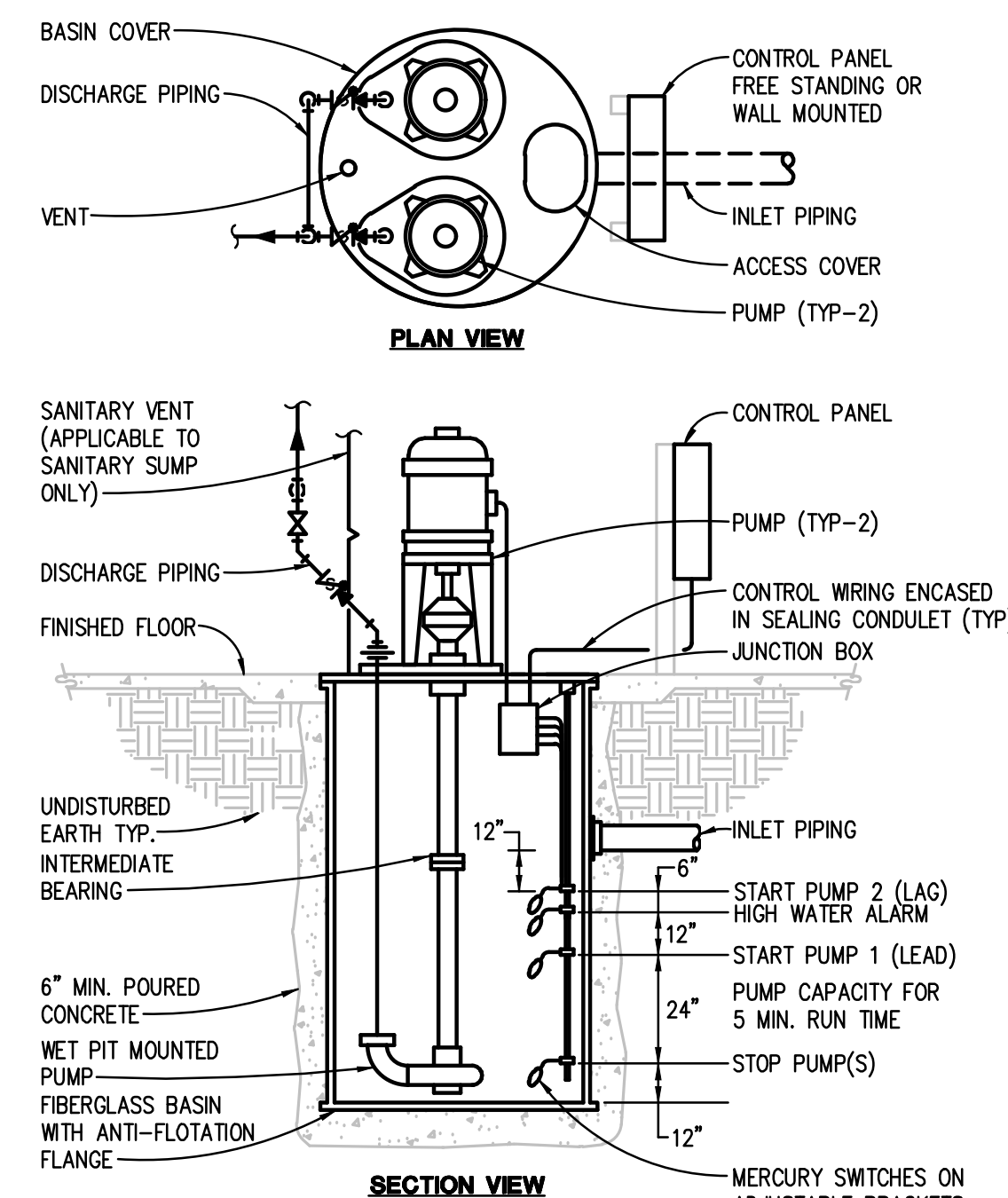
**DRAIN/INSPECTORS TEST DETAIL**  
NO SCALE



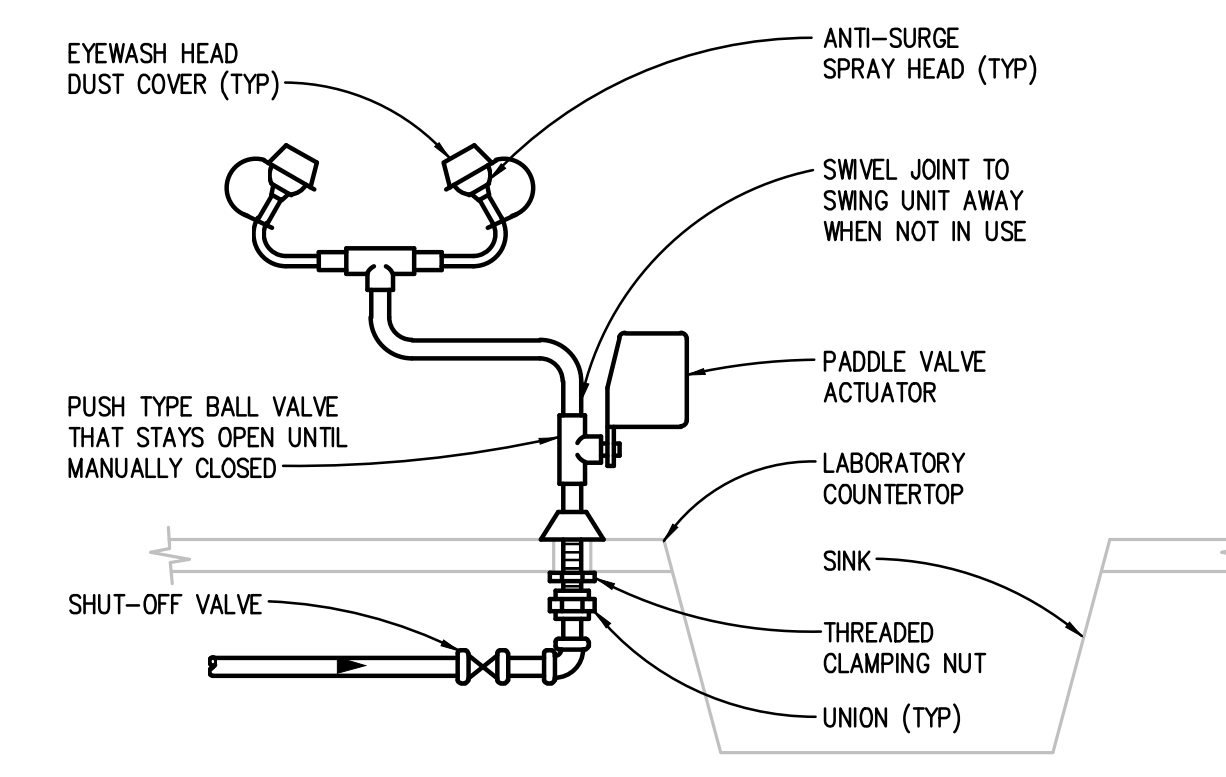
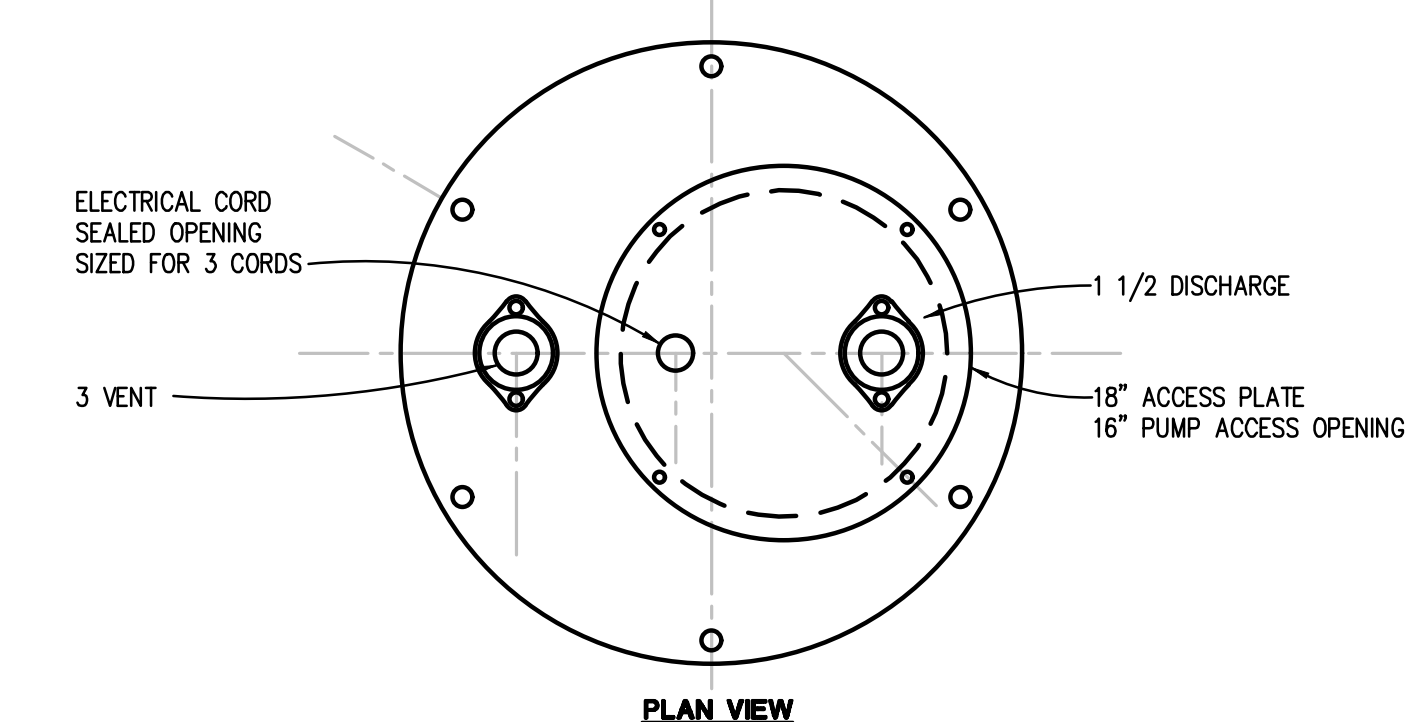
**ISLAND SINK WASTE DETAIL FOR COMBINATION DRAIN & VENT SYSTEM**  
NO SCALE



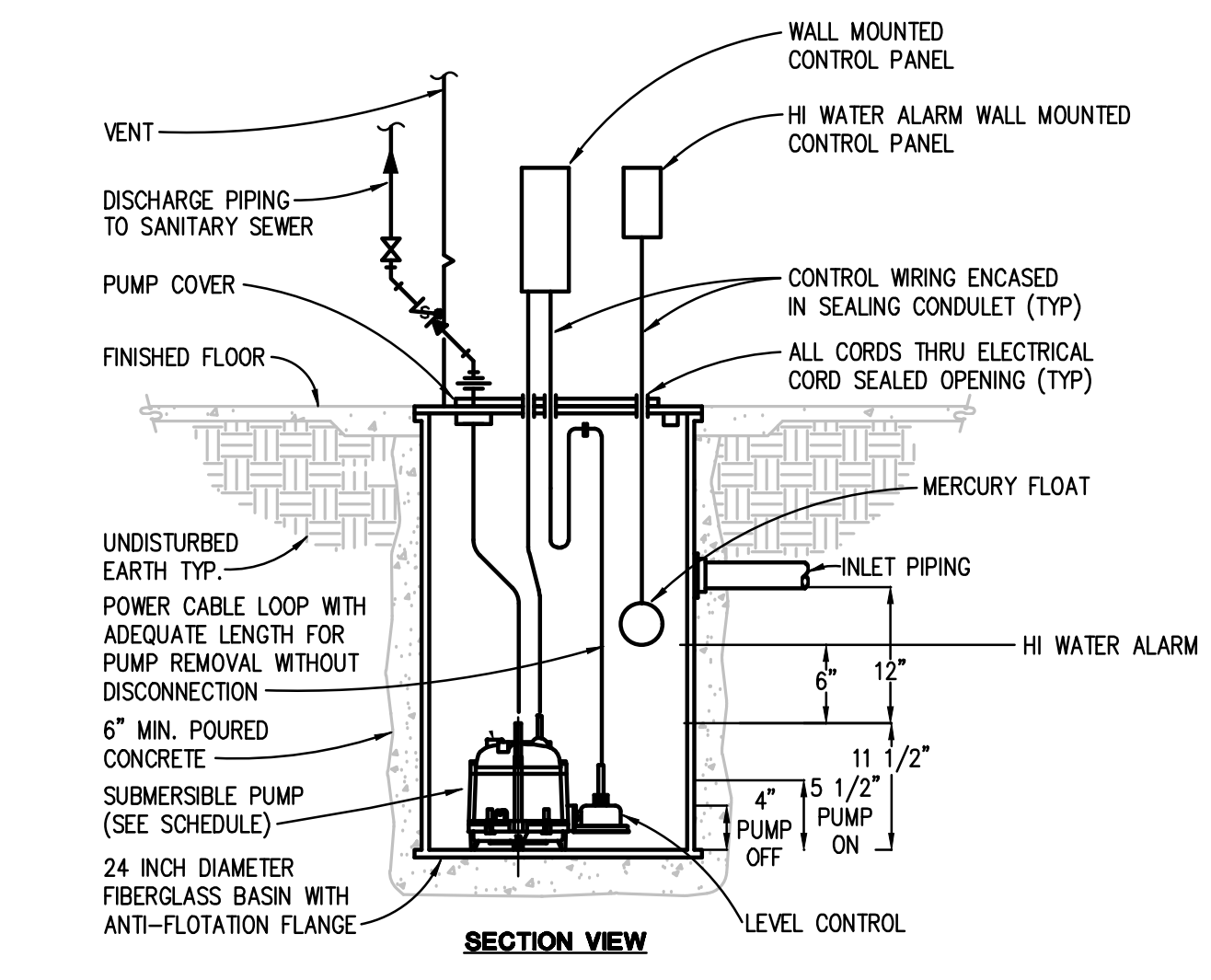
**TYPICAL LAVATORY DETAIL**  
NO SCALE



**DUPLIX SUMP PUMP (SP-1) PIPING DIAGRAM**  
NO SCALE



**EMERGENCY EYEWASH PIPING DIAGRAM**  
NO SCALE



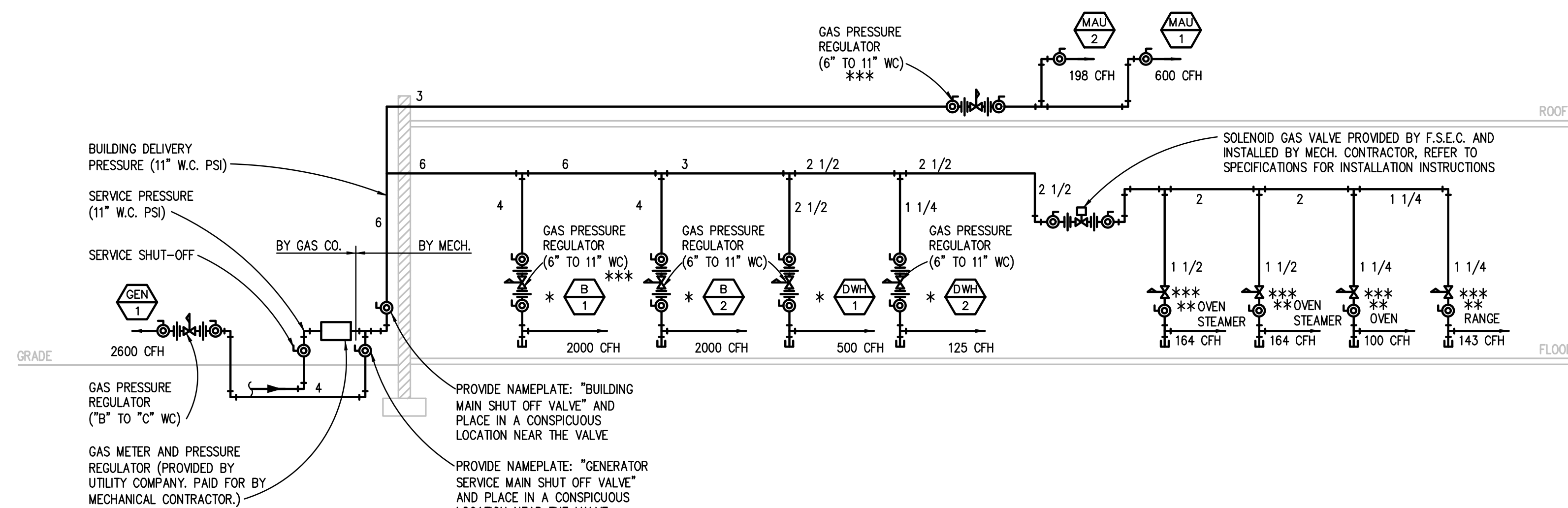
**SIMPLEX SUMP PUMP (SP-2) PIPING DIAGRAM**  
NO SCALE

**GAS LOAD SCHEDULE**

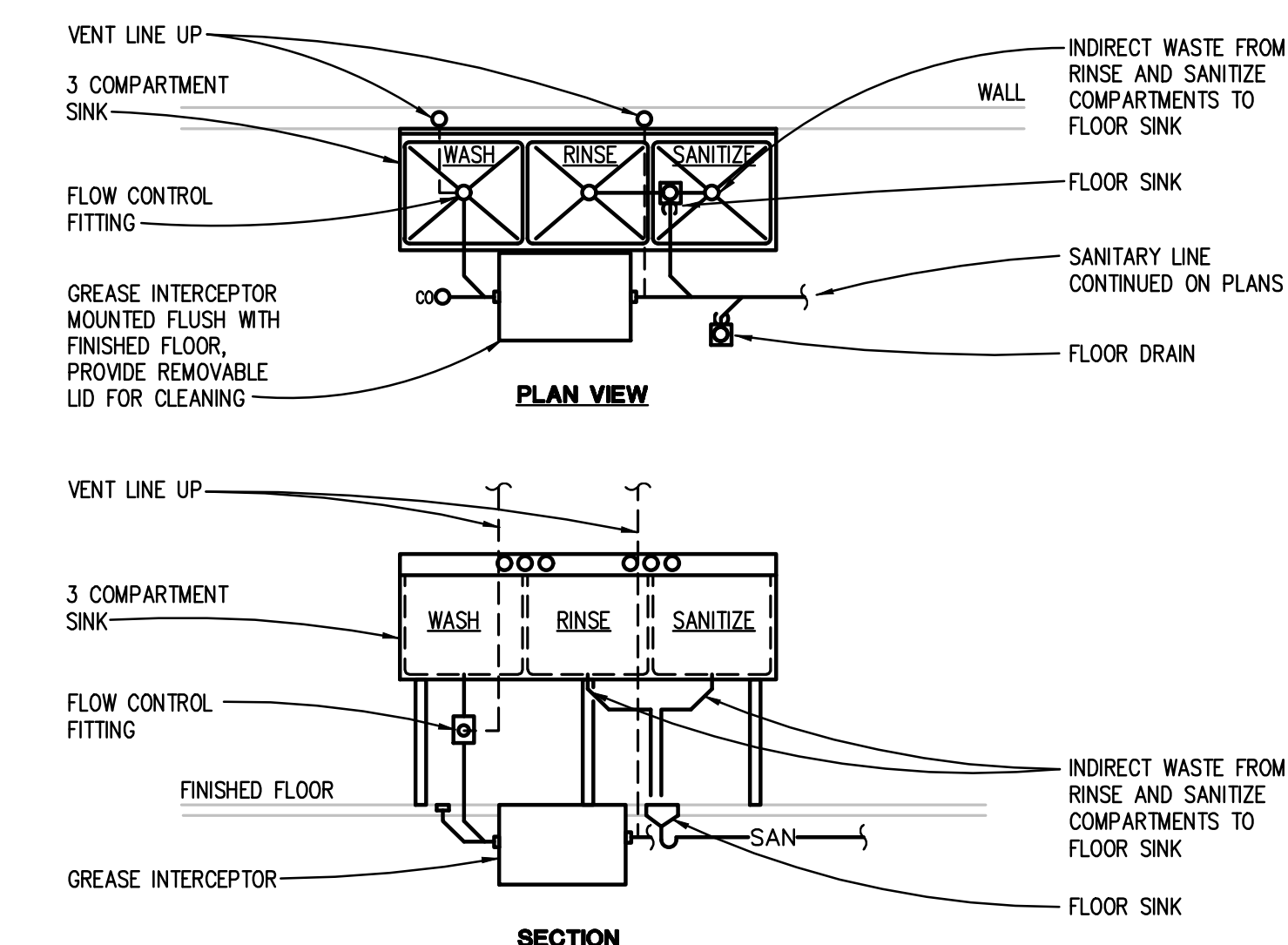
ITEM	TOTAL CFH
EMERGENCY GAS GENERATOR	2600
BOILER 1	2000
BOILER 2	2000
WATER HEATER 1	500
WATER HEATER 2	125
MAKE-UP AIR UNIT 1	600
MAKE-UP AIR UNIT 2	198
<b>KITCHEN EQUIPMENT</b>	
OVEN STEAMER	164
OVEN STEAMER	164
CONVECTION OVEN	100
RANGE	143
CONNECTED GAS LOAD =	8594 @ 11 IN. W.C.

\* GAS TRAIN PROVIDED BY EQUIPMENT MANUFACTURER - SEE SPECIFICATIONS  
\*\* GAS PRESSURE REGULATOR PROVIDED BY FOOD SERVICE MANUFACTURER  
\*\*\* THE GAS SERVICE COMPONENTS SHALL BE RATED IN ACCORDANCE WITH THE FOLLOWING CHART

METER OUTLET PRESSURE (psig)	MINIMUM SYSTEM PRESSURE RATING (psig)
0.4	0.5
1 OR 2	10
3 OR 30	DELIVERY +10
33 TO 100	DELIVERY +20
101 TO 200	DELIVERY +30



**NATURAL GAS PIPING DIAGRAM**  
NO SCALE



**DEDICATED GREASE INTERCEPTOR DETAIL**  
NO SCALE

















GRILLE, REGISTER, AND DIFFUSER SCHEDULE											
UNIT IDENTIFICATION	DES.	NO.	TYPE	FACE SIZE	NECKSIZE	FRAME TYPE	ACCESSORY	CONSTRUCTION	FINISH	MODEL NUMBER	KEYED NOTES
S	1		DIFFUSER	24x24	SEE PLANS	NOTE 2	-	STEEL	WHITE	SCDA	1
S	2		DIFFUSER	24x24	SEE PLANS	NOTE 2	-	STEEL	WHITE	SCDA	2
S	3		DIFFUSER	48x4.5	SEE PLANS	NOTE 2	-	STEEL	WHITE	SDS75	3
S	4		DIFFUSER	72x4.5	SEE PLANS	NOTE 2	-	STEEL	WHITE	SDS75	3
S	5		DIFFUSER	48x5	SEE PLANS	NOTE 2	-	STEEL	WHITE	SDS100	3
S	6		DIFFUSER	72x5	SEE PLANS	NOTE 2	-	STEEL	WHITE	SDS100	3
S	7		DIFFUSER	48x5	SEE PLANS	NOTE 2	-	STEEL	METALIC GREY	SDS100	3,4
S	8		GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	STEEL	WHITE	510	
S	9		DIFFUSER	-	SEE PLANS	DUCT MOUNTED	-	STEEL	WHITE	RCD	
S	10		DIFFUSER	24x24	SEE PLANS	NOTE 2	-	ALUMINIUM	WHITE	ASCDA	1
S	11		GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	ALUMINIUM	WHITE	610	
S	12		DIFFUSER	24x24	SEE PLANS	NOTE 2	-	STEEL	WHITE	VPD	
S	13		DIFFUSER	24x24	SEE PLANS	NOTE 2	-	STEEL	WHITE	RAVD	
R	1		GRILLE	24x24	SEE PLANS	NOTE 2	-	STEEL	WHITE	PDDR	
R	2		GRILLE	24x12	SEE PLANS	NOTE 2	-	STEEL	WHITE	PDDR	
R	3		GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	STEEL	WHITE	530	
R	4		GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	STEEL	NOTE 3	90	4
R	5		GRILLE	72x4	SEE PLANS	NOTE 2	SIGHT BAFFLE	STEEL	NOTE 3	SDR50	2,4
T	1		GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	STEEL	WHITE	530	
E	1		GRILLE	24x24	SEE PLANS	NOTE 2	-	STEEL	WHITE	PDDR	
E	2		GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	STEEL	WHITE	530	
E	3		GRILLE	NECK SIZE + 1"	SEE PLANS	DUCT MOUNTED	-	ALUMINIUM	WHITE	SDGER	
E	4		GRILLE	24x24	SEE PLANS	NOTE 2	-	ALUMINIUM	WHITE	PDDR	
E	5		GRILLE	NECK SIZE + 1-1/4"	SEE PLANS	NOTE 2	-	ALUMINIUM	WHITE	630	

GENERAL NOTES:  
1. MODEL NUMBERS ARE PRICE UNLESS OTHERWISE NOTED.  
2. COORDINATE EXACT FRAME TYPE WITH ARCHITECTURAL TRADES.  
3. COLOR SELECTION BY ARCHITECT.

KEYED NOTES:  
1. HORIZONTAL THROW PATTERN  
2. VERTICAL THROW PATTERN  
3. 2 SLOT  
4. PROVIDE COLOR SAMPLE TO ARCHITECT PRIOR TO ORDERING.

SEWAGE PUMP AND SUMP PUMP SCHEDULE																			
UNIT IDENTIFICATION		SYSTEM SERVED	SIMPLEX OR DUPLEX	PUMP					BASIN				ELECTRICAL						
DES.	NO.			QUANTITY	FLOW EACH GPM	W.P.D. FT. HEAD	HP EACH	RPM	CONSTRUCTION	DIAMETER INCHES	DEPTH INCHES	COVER TYPE	MODULATION / CONTROL TYPE	VOLTS	PHASE	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
SP	1	DRAIN TILE	DUPLEX	2	13.0	20.0	0.75	1750	FIBERGLASS	36	72	GRATE	AUTO	208	3	5		1607	
SP	2	ELEVATOR	SIMPLEX	1	50.0	20.0	0.75	1750	FIBERGLASS	36	36	GRATE	AUTO	120	1	5		1601	

GENERAL NOTES:  
1. REFER TO SCHEDULES GENERAL NOTES.  
2. MODEL NUMBERS ARE WELL UNLESS OTHERWISE NOTED.

FUEL FIRED DOMESTIC WATER HEATER SCHEDULE																		
UNIT IDENTIFICATION		STORAGE CAPACITY GALLONS	TYPE	FUEL				RECOVERY GPH	E.W.T. °F	L.W.T. °F	MODULATION / CONTROL TYPE	ELECTRICAL						
DES.	NO.			MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN	MIN	MAX	INPUT MBH					INITIAL PSIG	PRE-CHARGE PSIG	MAX (OPERATING) PSIG	MINIMUM °F	MAXIMUM °F	EXPANSION VOLUME GALLONS	MINIMUM TANK VOLUME GALLONS
DWH	1	650.0	NATURAL GAS	8	14	650	772	40	140	AUTO	120	1	0	0	5		AWH0650NFM	1
DWH	2	65.0	NATURAL GAS	8	14	125	145	40	140	AUTO	120	1	0	0	5		SWR125N	

GENERAL NOTES:  
1. REFER TO SCHEDULES GENERAL NOTES.  
2. MODEL NUMBERS ARE LOCHINVAR UNLESS OTHERWISE NOTED.

KEYED NOTES:  
1. PROVIDE 650 GALLON HOT WATER STORAGE TANK.

DOMESTIC HOT WATER SYSTEM EXPANSION TANK SCHEDULE															
UNIT IDENTIFICATION		SYSTEM SERVED	ESTIMATED TOTAL SYSTEM VOLUME GALLONS	TYPE	OPERATING PRESSURES AT EXPANSION TANK			SYSTEM OPERATING TEMPERATURES		EXPANSION VOLUME GALLONS	MINIMUM TANK VOLUME GALLONS	DIMENSIONS		MODEL NUMBER	KEYED NOTES
DES.	NO.				INITIAL PSIG	PRE-CHARGE PSIG	MAX (OPERATING) PSIG	MINIMUM °F	MAXIMUM °F			DIAMETER INCHES	HEIGHT INCHES		
ET	1	DOMESTIC	80	BLADDER	40	40	125	40	240	80	60	24	55	WTA-448	
ET	2	KITCHEN	40	DIAPHRAGM	40	40	150	40	240	3.5	2.5	10	14	PTA-5	

GENERAL NOTES:  
1. MODEL NUMBERS ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.  
2. THE CONTRACTOR SHALL PRE-CHARGE THE TANK TO THE VALUE INDICATED IN THE SCHEDULE. FOR TANKS THAT ARE SUPPLIED PRE-CHARGED BY THE MANUFACTURER, THE CONTRACTOR SHALL CONFIRM THE PRESSURE AND MAKE ADJUSTMENTS AS REQUIRED.

THERMOSTATIC MIXING VALVE SCHEDULE						
UNIT IDENTIFICATION		MINIMUM FLOW GPM	MAXIMUM FLOW GPM	PRESSURE DROP AT MAXIMUM FLOW PSIG	MODEL	KEYED NOTES
DES.	NO.					
MV	1	1	226	50.00	6NB-LF	

GENERAL NOTES:  
1. MODEL NUMBERS ARE LEONARD UNLESS OTHERWISE NOTED.

DUCT SILENCER SCHEDULE																												
UNIT IDENTIFICATION		SYSTEM TYPE	SYSTEM SERVED	AIRFLOW CFM	A.P.D. IN. W.G.	MAX P.D. IN. W.G.	VELOCITY AT DIL RATING FPM	DYNAMIC INSERTION LOSS (DIL) dB								TARGET NOISE CRITERIA	DIMENSIONS						CONSTRUCTION				MODEL NUMBER	KEYED NOTES
DES.	NO.							63	125	250	500	1K	2K	4K	8K		W INCHES	H INCHES	L INCHES	TYPE	OUTER CASING TYPE	FILL MATERIAL	LINER	CASING MATERIAL				
DS	1R-A	RA	ERU-1	6150	0.16	0.25	769	7	14	25	40	42	35	24	16	25	48	24	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL60/2D			
DS	1R-B	RA	ERU-1	6150	0.16	0.25	769	7	14	25	40	42	35	24	16	25	48	24	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL60/2D			
DS	1S-A	SA	ERU-1	5125	0.19	0.25	941	6	12	21	38	43	38	25	18	25	28	28	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/2E			
DS	1S-B	SA	ERU-1	7175	0.21	0.25	879	7	12	22	38	40	35	24	17	25	42	28	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL60/2D			
DS	2R-A	RA	ERU-2	11300	0.17	0.25	1529	5	7	15	33	36	29	20	16	30	36	42	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/1B			
DS	2R-B	RA	RF-101	1560	0.14	0.25	802	7	14	25	40	42	32	20	14	25	20	16	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/4E			
DS	2R-C	RA	RF-102	2390	0.15	0.25	1024	7	11	21	41	50	41	23	18	25	24	16	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/1D			
DS	2S-A	SA	ERU-2	11300	0.16	0.25	1529	5	8	15	31	40	30	23	17	30	38	28	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RH60/1D			
DS	2S-B	SA	FPB-101	1560	0.11	0.25	876	5	10	19	34	40	32	21	16	25	16	16	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/2D			
DS	2S-C	SA	FPB-102	2060	0.21	0.25	742	8	14	25	40	40	35	23	16	25	20	20	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL60/4E			
DS	2S-D	SA	FPB-103	1800	0.21	0.25	720	8	15	25	43	44	39	25	17	25	20	18	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/4F			
DS	3R	RA	ERU-3	2550	0.17	0.25	900	7	14	25	39	44	34	22	15	30	34	12	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/3E			
DS	3S	SA	ERU-3	2550	0.16	0.25	937	6	10	20	37	41	33	25	17	30	28	14	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RH60/2F			
DS	4R	RA	ERU-4	11000	0.24	0.25	1269	7	12	21	41	51	41	23	18	40	48	26	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/1D			
DS	4S	SA	ERU-4	11000	0.24	0.25	1269	6	10	28	38	46	41	24	19	40	48	26	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/1D			
DS	5R	RA	ERU-5	2100	0.22	0.25	741	9	17	29	45	49	41	26	17	30	34	12	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/3F			
DS	5S	SA	ERU-5	2100	0.21	0.25	982	6	12	22	38	37	29	19	14	30	22	14	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/5E			
DS	6E	EA	ERU-6	1850	0.05	0.25	925	5	8	14	27	22	15	11	9	40	24	12	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/6B			
DS	6S	SA	ERU-6	1850	0.05	0.25	925	5	8	16	28	24	15	11	9	40	24	12	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/6B			
DS	7E	EA	ERU-7	6400	0.23	0.25	1067	7	13	25	36	35	25	18	13	40	48	18	60	RS	STANDARD	GLASS FIBER	NO	ALUMINIUM	RH60/6F			
DS	7S-A	SA	ERU-7	3400	0.19	0.25	920	7	11	20	40	48	45	29	21	30	38	14	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/1E			
DS	7S-B	SA	ERU-7	3000	0.19	0.25	1029	6	10	20	27	23	15	11	10	40	30	14	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RH60/9F			
DS	8R	RA	ERU-8	15000	0.18	0.25	1125	9	12	18	23	18	13	10	8	30	48	40	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL60/XC			
DS	8S-A	SA	ERU-8	5760	0.19	0.25	1595	5	8	15	30	28	20	15	11	30	20	26	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RH60/4D			
DS	8S-B	SA	ERU-8	11470	0.19	0.25	1639	5	8	15	29	26	18	14	11	30	42	24	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RH60/5D			
DS	9R	RA	ERU-9	15000	0.14	0.25	1071	5	10	18	32	31	22	16	12	30	72	28	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RL60/3B			
DS	9S	SA	ERU-9	15000	0.21	0.25	1385	5	9	17	34	37	29	21	15	30	60	26	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RH60/2E			
DS	10R	RA	ERU-10	15000	0.18	0.25	1125	6	12	22	37	44	32	20	15	30	56	30	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RM60/2D			
DS	10S-A	SA	ERU-10	5760	0.19	0.25	1595	5	8	15	30	28	20	15	11	30	20	26	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RH60/4D			
DS	10S-B	SA	ERU-10	11470	0.16	0.25	1496	5	8	15	31	34	25	19	14	30	46	24	60	RS	STANDARD	GLASS FIBER	NO	22 GA GALVANIZED	RH60/2D			

GENERAL NOTES:  
1. DUCT SILENCER MODEL NUMBERS ARE BASED ON VIBRO-Acoustics UNLESS OTHERWISE NOTED.  
2. LENGTH SHOWN FOR ELBOW SILENCERS IS CENTERLINE LENGTH.  
3. VELOCITY SHOWN IS + (FORWARD FLOW) OR - (REVERSE FLOW) AS DEFINED BY ASTM E477-99.  
4. PRESSURE DROP, DYNAMIC INSERTION LOSS AND SELF GENERATED NOISE PER ASTM E477-99.  
5. MAXIMUM PRESSURE DROP WITH SYSTEM EFFECTS = SILENCER PRESSURE DROP PER ASTM E477-99 + SYSTEM EFFECTS FOR NEARBY DUCT ELEMENTS.  
6. TYPE: RS = RECTANGULAR STRAIGHT; RE = RECTANGULAR ELBOW; REC = RECTANGULAR EXTENDED ELBOW; CS = CIRCULAR STRAIGHT; CE = CIRCULAR ELBOW.  
7. FABRICATE SILENCER CASINGS OF STAINLESS STEEL WHERE SILENCERS ARE CONNECTED TO A PVC COATED OR STAINLESS STEEL DUCT SYSTEM.

WATER SOURCE HEAT PUMP SCHEDULE																															
UNIT IDENTIFICATION		FAN				LOOP WATER		COOLING MODE (90 °F ENT. WATER TEMP.)					HEATING MODE (70 °F ENT. WATER TEMP.)					COMPRESSORS			ELECTRICAL										
DES.	NO.	NOMINAL SIZE (TONS)	AIRFLOW CFM	ESP IN. W.G.	HP	FLOW GPM	FLUID TYPE	MAX W.P.D. FT. HEAD	AIR		TOTAL CAPACITY MBH	SENS. CAPACITY MBH	THR MBH	MINIMUM E.E.R.	AIR		TOTAL CAPACITY MBH	THA MBH	MINIMUM C.O.P.	NO. OF COMP.	R.L.A. EA.	L.R.A. EA.	ARRANGEMENT	VOLTS	PHASE	FLA	MOP	SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
HP	101	6	2000	0																											



**ENERGY RECOVERY UNIT WITH INTEGRAL HEAT PUMP SCHEDULE (A)**

UNIT IDENTIFICATION		AREA/SYSTEM SERVED	SUPPLY FAN									EXHAUST FAN			HEAT EXCHANGER (SUMMER)						HEAT EXCHANGER (WINTER)															
DES.	NO.		CFM	MIN. OA CFM	ESP"	TSP"	CONROL TYPE	QUANTITY	BHP	HP	CFM	ESP"	TSP"	QUANTITY	BHP	HP	SUPPLY SIDE			EXHAUST SIDE			SUPPLY SIDE			EXHAUST SIDE										
																	E.A.T. D.B. °F	E.A.T. W.B. °F	L.A.T. D.B. °F	L.A.T. W.B. °F	A.P.D. IN. WG.	E.A.T. D.B. °F	L.A.T. D.B. °F	L.A.T. W.B. °F	A.P.D. IN. WG.	E.A.T. D.B. °F	E.A.T. W.B. °F	L.A.T. D.B. °F	L.A.T. W.B. °F	A.P.D. IN. WG.	E.A.T. D.B. °F	L.A.T. D.B. °F	L.A.T. W.B. °F	A.P.D. IN. WG.	EFFIC. (%)	
ERU	1	GYMNASIUM	12300	7600	2.75	4.29	SZVAV	2	11.80	15.00	12300	1.25	2.78	2	8.40	10.00	91.0	74.0	76.4	63.7	0.53	72.0	86.6	71.0	0.53	77	-10.0	-10.9	52.9	43.8	0.53	72.0	9.1	8.9	0.53	77
ERU	2	CLASSROOMS	11300	6400	3.25	5.03	DAT-DSP VAV	2	13.00	15.00	11300	1.25	2.66	2	6.80	10.00	91.0	74.0	82.6	69.0	0.41	72.0	86.3	70.0	0.41	65	-10.0	-10.9	26.1	23.9	0.41	72.0	10.4	10.3	0.41	71
ERU	3	MEDIA CENTER	2560	1450	2.25	3.78	DAT-DSP VAV	1	2.20	3.00	2560	1.25	2.60	1	1.50	2.00	91.0	74.0	78.3	65.6	0.35	72.0	84.7	69.3	0.35	64	-10.0	-10.9	44.8	38.4	0.35	72.0	17.2	16.7	0.35	67
ERU	4	DINING COMMONS	11000	3900	3.25	4.99	SZVAV	2	12.60	15.00	11000	1.25	2.67	2	7.40	10.00	91.0	74.0	78.8	66.0	0.42	72.0	84.2	69.0	0.42	61	-10.0	-10.9	42.7	37.0	0.42	72.0	19.3	18.6	0.42	64
ERU	5	OFFICES	2100	800	2.25	3.76	DAT-DSP VAV	1	1.90	3.00	2100	1.25	2.53	1	1.20	1.50	91.0	74.0	78.6	65.7	0.28	72.0	86.0	70.0	0.28	71	-10.0	-10.9	43.3	37.3	0.28	72.0	11.7	11.6	0.28	73
ERU	6	KITCHEN	1850	1250	2.25	4.18	SZVAV	1	2.00	3.00	1850	1.25	2.69	1	1.10	2.00	91.0	74.0	79.6	67.0	0.44	72.0	84.3	68.8	0.44	58	-10.0	-10.9	39.0	33.8	0.44	72.0	18.8	18.7	0.44	64
ERU	7	LOCKER ROOMS	6400	6400	1.00	3.32	CAV-DAT	1	4.60	7.50	7040	1.25	2.88	1	4.60	7.50	91.0	74.0	76.9	64.3	0.63	72.0	86.1	63.6	0.63	73	-10.0	-10.9	51.0	42.4	0.63	72.0	11.0	10.9	0.63	74
ERU	8	CLASSROOMS	15000	8900	3.25	5.03	DAT-DSP VAV	2	16.80	20.00	15000	1.25	2.83	2	9.80	15.00	91.0	74.0	80.2	67.1	0.58	72.0	88.4	71.7	0.58	80	-10.0	-10.9	36.4	31.9	0.58	72.0	1.3	1.1	0.58	84
ERU	9	CLASSROOMS	15000	8900	3.25	5.03	DAT-DSP VAV	2	16.80	20.00	15000	1.25	2.58	2	9.80	15.00	91.0	74.0	79.3	66.1	0.33	72.0	89.4	72.9	0.33	80	-10.0	-10.9	40.5	35.4	0.33	72.0	-3.2	-4.0	0.33	84
ERU	10	CLASSROOMS	15000	8900	3.25	5.03	DAT-DSP VAV	2	16.80	20.00	15000	1.25	2.83	2	8.30	15.00	91.0	74.0	80.2	67.1	0.58	72.0	88.4	71.7	0.58	92	-10.0	-10.9	36.4	31.9	0.58	72.0	1.3	1.3	0.58	93

**ENERGY RECOVERY UNIT WITH INTEGRAL HEAT PUMP SCHEDULE (B)**

UNIT IDENTIFICATION		COOLING MODE										HEATING MODE															
DES.	NO.	AIR				TOTAL CAPACITY MBH	SENS. CAPACITY MBH	THR MBH	E.W.T. °F	L.W.T. °F	FLOW GPM	HOT GAS REHEAT		COOLING MODE			AIR			TOTAL CAPACITY MBH	THA MBH	E.W.T. °F	L.W.T. °F	FLOW GPM	HEATING MODE		CONTROL VALVE W.P.D. FT. HEAD
		E.A.T. D.B. °F	E.A.T. W.B. °F	L.A.T. D.B. °F	L.A.T. W.B. °F							Y/N	MBH	MINIMUM E.E.R.	MAX W.P.D. FT. HEAD	CONTROL VALVE W.P.D. FT. HEAD	E.A.T. °F	L.A.T. °F	MINIMUM C.O.P.						MAX W.P.D. FT. HEAD		
ERU	1	74.7	62.4	54.8	53.5	318	268.3	418.6	90	100	87.4	Y	176.9	14.8	4.2	11.5	63.8	96.4	434.2	372.6	70	61	87.4	5.9	4.2	11.5	
ERU	2	78.0	65.4	55.3	54.4	377.2	280.9	457	90	100	95.4	N	-	15.7	7.1	11.5	52.5	89.6	454.2	411.3	70	61	95.4	6.5	7.1	11.5	
ERU	3	75.6	63.3	52.8	51.6	86.4	63.7	92.9	90	100	19.4	N	-	15.3	2.1	11.5	58.7	92.7	94	83.6	70	61	19.4	6.1	2.1	11.5	
ERU	4	74.4	62.3	55.1	54.0	263.8	232.8	330	90	100	68.9	Y	166.7	17.5	4.1	11.5	60.6	89.3	320.3	293.7	70	61	68.9	7.6	4.1	11.5	
ERU	5	74.8	62.6	55.0	54.1	51.9	45.5	66.6	90	100	13.9	N	-	17.8	2.8	11.5	55.5	85.1	67.3	61.3	70	61	13.9	8.2	2.8	11.5	
ERU	6	77.6	65.2	55.2	54.3	61.2	45.4	84.8	90	100	17.7	Y	29	16.1	6.5	11.5	47.1	88.9	83.7	73.8	70	61	17.7	6.8	6.5	11.5	
ERU	7	76.9	64.3	54.9	53.8	199.9	154	277.3	90	100	57.9	N	-	15.6	4.7	11.5	40.8	81.9	285	252.4	70	61	57.9	7.2	4.7	11.5	
ERU	8	76.9	64.4	55.4	54.5	446	353.9	555.2	90	100	115.9	N	-	15.6	6.8	11.5	23.5	58.7	572.5	538.5	70	60	115.9	8.2	6.8	11.5	
ERU	9	76.3	63.7	55.1	54.2	446	348.9	555.2	90	100	115.9	N	-	15.6	6.8	11.5	23.5	58.7	572.5	538.5	70	60	115.9	8.2	6.8	11.5	
ERU	10	76.9	64.4	55.4	54.5	423.8	343.9	555.2	90	100	115.9	N	-	15.6	6.8	11.5	23.5	58.7	572.5	538.5	70	60	115.9	8.2	6.8	11.5	

**ENERGY RECOVERY UNIT WITH INTEGRAL HEAT PUMP SCHEDULE (C)**

UNIT IDENTIFICATION		PRE-FILTERS		RETURN FILTERS		ELECTRICAL				MAXIMUM UNIT DIMENSIONS				MODEL NUMBER	KEYED NOTES		
DES.	NO.	EFF. (%)	SP" TOTAL	EFF. (%)	SP" TOTAL	VOLTS	PHASE	MCA	MOP	SCCR KA	OPTIONS / ACCESSORIES	UNIT WEIGHT (LBS.)	LENGTH INCHES			WIDTH INCHES	HEIGHT INCHES
ERU	1	85	0.7	85	0.70	480	3	84	90	10	B	20750	282.0	127.0	98.0	ERU-SS-WH-12300-HP-460	
ERU	2	85	0.7	85	0.70	480	3	89	110	10	B	16700	259.0	117.0	98.0	ERU-SS-WH-11300-HP-460	
ERU	3	85	0.7	85	0.70	480	3	22	30	5	B	10800	251.0	83.0	72.0	ERU-SS-WH-2600-HP-460	
ERU	4	85	0.7	85	0.70	480	3	74	90	10	B	18000	256.0	116.0	92.0	ERU-SS-WH-11000-HP-460	
ERU	5	85	0.7	85	0.70	480	3	19	25	5	B	8700	186.0	83.0	72.0	ERU-SS-WH-2100-HP-460	
ERU	6	85	0.7	85	0.70	480	3	20	25	5	B	10000	251.0	83.0	54.0	ERU-SS-WH-1800-HP-460	
ERU	7	85	0.7	85	0.70	480	3	51	60	5	B	14900	263.0	106.0	86.0	ERU-SS-WH-6400-HP-460	
ERU	8	85	0.7	85	0.70	480	3	108	125	10	B	19300	263.0	127.0	110.0	ERU-SS-WH-15000-HP-460	
ERU	9	85	0.7	85	0.70	480	3	108	125	22	B	19750	266.0	127.0	110.0	ERU-SS-WH-15000-HP-460	
ERU	10	85	0.7	85	0.70	480	3	108	125	22	B	19300	263.0	127.0	110.0	ERU-SS-WH-15000-HP-460	

- GENERAL NOTES:**  
1. REFER TO SCHEDULES GENERAL NOTES.  
2. MODEL NUMBERS ARE INNOVENT UNLESS OTHERWISE NOTED.  
3. DESIGN MINIMUM OUTSIDE AIRFLOW CFM (VENTILATION) LISTED IS BASED ON THE ESTIMATED MAXIMUM OCCUPANT LOAD. REFER TO TEMPERATURE CONTROL DRAWINGS FOR OUTSIDE AIR CONTROL SEQUENCE.  
4. MERV DESIGNATES THE "MINIMUM EFFICIENCY REPORTING VALUE" AS EVALUATED UNDER ASHRAE STANDARD 52.2 1999.  
5. AIR HANDLING UNIT TOTAL STATIC PRESSURE FOR CONSTANT AIR VOLUME SYSTEMS IS BASED ON THE AVERAGE/MIDLIFE FILTER AIR PRESSURE DROP UNLESS NOTED OTHERWISE.

- KEYED NOTES:**  
1. PROVIDE SINGLE POINT ELECTRICAL CONNECTION WITH MAIN DISCONNECT.

**ELECTRIC PROPELLER FAN UNIT HEATER SCHEDULE**

UNIT IDENTIFICATION		CAPACITY MBH	FAN		HEATING ELEMENT KW	FINAL AIR TEMPERATURE °F	MODULATION / CONTROL TYPE	ELECTRICAL				SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES
DES.	NO.		CFM	HP				VOLTS	PHASE	FLA	MOP				
EUH	101	11.2	400	3.3	26	AUTO	480	3	4.0	15	5	A	P3PUH03CA1		
EUH	102	17	400	5	40	AUTO	480	3	6.1	15	5	A	P3PUH05CA1		
EUH	103	11.2	400	3.3	26	AUTO	480	3	4.0	15	5	A	P3PUH03CA1		
EUH	104	11.2	400	3.3	26	AUTO	480	3	4.0	15	5	A	P3PUH03CA1		
EUH	201	17	400	5	40	AUTO	480	3	6.1	15	5	A	P3PUH05CA1		
EUH	202	11.2	400	3.3	26	AUTO	480	3	4.0	15	5	A	P3PUH03CA1		

- GENERAL NOTES:**  
1. REFER TO SCHEDULES GENERAL NOTES.  
2. MODEL NUMBERS ARE MARKEL UNLESS OTHERWISE NOTED.

**ELECTRIC CENTRIFUGAL FAN CABINET UNIT HEATER SCHEDULE**

UNIT IDENTIFICATION		CAPACITY MBH	AIR		FAN		HEATING ELEMENT TOTAL KW	DIMENSIONS			REGCESS DEPTH INCHES	FILTER		MODULATION / CONTROL TYPE	ELECTRICAL				SCCR KA	OPTIONS / ACCESSORIES	MODEL NUMBER	KEYED NOTES	
DES.	NO.		AIRFLOW CFM	E.D.B. °F	L.D.B. °F	HP		RPM	LENGTH INCHES	HEIGHT INCHES		DEPTH INCHES	TYPE		AREA SQ. FT.	VOLTS	PHASE	FLA					MOP
ECUH	101	27.3	500	60	111	0	0	8	46	26	10	4	THROWAWAY	-	AUTO	480	3	11.7	20	5	A	6346D084833	
ECUH	102	20.5	500	60	98	0	0	6	46	26	10	4	THROWAWAY	-	AUTO	480	3	8.1	15	5	A	6346D064833	
ECUH	103	34.1	500	60	123	0	0	10	46	26	10	4	THROWAWAY	-	AUTO	480	3	15.4	20	5	A	6346D104833	
ECUH	104	34.1	500	60	123	0	0	10	46	26	10	4	THROWAWAY	-	AUTO	480	3	15.4	20	5	A	6346D104833	
ECUH	105	27.3	500	60	111	0	0	8	46	26	10	4	THROWAWAY	-	AUTO	480	3	11.7	20	5	A	6346D084833	
ECUH	106	13.6	250	60	110	0	0	4	33	26	10	4	THROWAWAY	-	AUTO	480	3	6.0	15	5	A	6333D044833	
ECUH	107	13.6	250	60	110	0	0	4	33	26	10	4	THROWAWAY	-	AUTO	480	3	6.0	15	5	A	6333D044833	
ECUH	108	13.6	250	60	110	0	0	4	33	26	10	4	THROWAWAY	-	AUTO	480	3	6.0	15	5	A	6333D044833	

- GENERAL NOTES:**  
1. REFER TO SCHEDULES GENERAL NOTES.  
2. MODEL NUMBERS ARE MARKEL UNLESS OTHERWISE NOTED.



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REGISTRATION SEAL

CONSULTANT



Peter Basso Associates Inc  
CONSULTING ENGINEERS





AIR TERMINAL TYPE									
DUCT CONNECTIONS		DISCHARGE SOUND POWER/RADIATED SOUND POWER - dB						MODEL NUMBER	KEYED NOTES
INLET SIZE INCHES	OUTLET SIZE INCHES	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz		
6Ø	12x8	73/66	69/63	62/52	56/42	53/40	49/36	SDV	A
8Ø	12x10	72/68	70/59	66/53	63/47	57/46	53/46	SDV	B
10Ø	14x12-1/2	78/71	70/61	65/56	61/50	58/47	53/45	SDV	C
12Ø	16x15	76/72	73/63	69/59	65/53	61/48	57/46	SDV	D
16Ø	24x18	78/70	73/63	70/58	68/53	64/52	59/50	SDV	E
24x16	38x18	83/74	81/69	76/63	74/54	73/48	68/41	SDV	F

- GENERAL NOTES:  
1. MODEL NUMBERS ARE PRICE UNLESS OTHERWISE NOTED.  
2. MAXIMUM SOUND POWER LEVEL BASED ON 2" PRESSURE DROP ACROSS UNIT WITH NO ALLOWANCE FOR EXTERNAL ATTENUATION.

- KEYED NOTES:  
A. BASED ON 360 CFM  
B. BASED ON 650 CFM  
C. BASED ON 900 CFM  
D. BASED ON 1500 CFM  
E. BASED ON 2000 CFM  
F. BASED ON 5300 CFM

ELECTRIC RADIANT WALL PANEL SCHEDULE										
UNIT IDENTIFICATION		CAPACITY WATTS	DIMENSIONS		ELECTRICAL				MODEL NUMBER	KEYED NOTES
DES.	NO.		LENGTH INCHES	WIDTH INCHES	VOLTS	PHASE	MOP	SCCR KA		
ERWP	101	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	102	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	103	879	72	4.5	208	1	15	5	EB3-208D	
ERWP	104	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	105	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	106	879	72	4.5	208	1	15	5	EB3-208D	
ERWP	107	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	108	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	109	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	110	1319	108	4.5	208	1	15	5	EB3-208D	
ERWP	111	1319	108	4.5	208	1	15	5	EB3-208D	
ERWP	112	1319	108	4.5	208	1	15	5	EB3-208D	
ERWP	113	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	114	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	115	440	36	4.5	208	1	15	5	EB3-208D	
ERWP	116	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	117	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	118	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	119	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	120	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	121	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	122	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	123	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	124	1172	96	4.5	208	1	15	5	EB3-208D	
ERWP	125	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	126	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	127	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	128	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	129	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	130	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	131	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	132	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	133	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	201	1172	96	4.5	208	1	15	5	EB3-208D	
ERWP	202	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	203	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	204	586	48	4.5	208	1	15	5	EB3-208D	
ERWP	205	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	206	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	207	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	208	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	209	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	210	1466	120	4.5	208	1	15	5	EB3-208D	
ERWP	211	586	48	4.5	208	1	15	5	EB3-208D	

- GENERAL NOTES:  
1. REFER TO SCHEDULES GENERAL NOTES.  
2. MODEL NUMBERS ARE RENTAL UNLESS OTHERWISE NOTED.

AIR TERMINAL UNIT WITH ELECTRIC COIL SCHEDULE																					
UNIT IDENTIFICATION				AIR FLOW						ELECTRICAL						MODEL NUMBER	KEYED NOTES	PBA Schedule ID			
DES.	NO.	INLET SIZE INCHES	AREA SERVED	UNIT SERVED FROM	COOLING MAXIMUM CFM	MINIMUM CFM	HEATING MAXIMUM CFM	MAXIMUM A.P.D. IN. W.G.	E.D.B. °F	L.D.B. °F	CAPACITY KW	CAPACITY MBH	NUMBER OF STAGES	VOLTS	PHASE				MCA	MOP	SCCR KA
TU	101	6Ø	B104 MEETING	ERU-5	380	145	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	102	6Ø	B119 CONFERENCE	ERU-5	150	80	150	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	103	6Ø	B105 ASST PRINCIPAL	ERU-5	125	80	125	0.75	55	80	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	104	6Ø	B106 PRINCIPAL	ERU-5	125	80	125	0.75	55	80	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	105	6Ø	B107 SPEECH	ERU-5	125	80	125	0.75	55	80	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	106	6Ø	B113 COUNSELING WAITING	ERU-5	200	80	150	0.75	55	76	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	107	6Ø	B108 PSYCHOLOGY	ERU-5	125	80	125	0.75	55	80	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	108	6Ø	B109 RECORDS & STORAGE	ERU-5	100	80	100	0.75	55	87	1.0	5.1	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	109	6Ø	B112 COUNSELING	ERU-5	100	80	100	0.75	55	87	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	110	6Ø	B114 COUNSELING	ERU-5	100	80	100	0.75	55	87	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	111	6Ø	B129 OFFICE	ERU-5	100	80	100	0.75	55	87	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	112	6Ø	B124 WORKROOM	ERU-5	150	80	150	0.75	55	76	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	113	6Ø	B122 ZEN DEN	ERU-5	200	80	150	0.75	55	76	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	114	6Ø	B115 SOCIAL WORKER	ERU-5	100	80	100	0.75	55	87	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	115	6Ø	B116 CLINIC	ERU-5	100	80	100	0.75	55	87	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	116	6Ø	B102 WELCOME CENTER	ERU-5	300	90	200	0.75	55	87	2.0	6.8	SCR	480	3	3.3	15.0	5	B	SDV	015
TU	117	6Ø	B125 GALLERY	ERU-2	300	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	118	6Ø	B139 TEACHER COLLAB	ERU-2	300	80	200	0.75	55	87	2.0	6.8	SCR	480	3	3.3	15.0	5	B	SDV	015
TU	119	12Ø	B144 VISUAL ARTS	ERU-2	1120	785	1120	0.75	55	83	10.0	34.1	SCR	480	3	16.4	20.0	5	B	SDV	015
TU	120	8Ø	B126 PASSAGE	ERU-2	400	400	400	0.75	55	91	4.5	15.4	SCR	480	3	7.4	15.0	5	B	SDV	015
TU	121	12Ø	B135 STEM-TEACHING	ERU-2	1150	720	1150	0.75	55	78	8.5	29.0	SCR	480	3	13.9	15.0	5	B	SDV	015
TU	122	12Ø	B136 STEM TECH	ERU-2	950	480	700	0.75	55	80	5.5	18.8	SCR	480	3	9.0	15.0	5	B	SDV	015
TU	123	16Ø	C103 LIFE SKILLS	ERU-2	1780	1080	1080	0.75	55	84	10.0	34.1	SCR	480	3	16.4	20.0	5	B	SDV	015
TU	124	6Ø	C107 PRACTICE	ERU-2	160	80	160	0.75	55	75	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	125	6Ø	C108 PRACTICE	ERU-2	160	80	160	0.75	55	75	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	126	6Ø	C106 ENSEMBLE	ERU-2	230	135	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	127	6Ø	C109 ENSEMBLE	ERU-2	230	135	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	128	8Ø	D102 MEDIA CENTER	ERU-3	500	350	350	0.75	55	87	3.5	11.9	SCR	480	3	5.7	15.0	5	B	SDV	015
TU	129	6Ø	D105 SMALL GROUP	ERU-3	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	130	6Ø	D104 SMALL GROUP	ERU-3	350	80	180	0.75	55	73	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	131	6Ø	D108 OFFICE/STORAGE	ERU-3	100	80	100	0.75	55	87	1.0	3.4	SCR	480	1	2.8	15.0	5	B	SDV	015
TU	132	12Ø	D102 MEDIA CENTER	ERU-3	1480	920	920	0.75	55	83	8.0	27.3	SCR	480	3	13.1	15.0	5	B	SDV	015
TU	133	8Ø	F101 PASSAGE	ERU-8	550	400	550	0.75	55	84	5.0	17.1	SCR	480	3	8.2	15.0	5	B	SDV	015
TU	134	8Ø	F105 RESOURCE	ERU-8	500	300	370	0.75	55	89	4.0	13.6	SCR	480	3	6.6	15.0	5	B	SDV	015
TU	135	8Ø	F106 ESL	ERU-8	500	300	370	0.75	55	89	4.0	13.6	SCR	480	3	6.6	15.0	5	B	SDV	015
TU	136	12Ø	F138 ACTIVE LAB	ERU-8	1300	700	1300	0.75	55	79	10.0	32.4	SCR	480	3	16.4	20.0	5	B	SDV	015
TU	137	12Ø	F121 ACTIVE LAB	ERU-8	1200	700	1200	0.75	55	80	9.5	32.4	SCR	480	3	15.6	20.0	5	B	SDV	015
TU	138	12Ø	F109 LEARNING STUDIO	ERU-8	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV	015
TU	139	16Ø	F115 LEARNING COMMONS	ERU-8	1800	1450	1450	0.75	55	79	11.0	37.5	SCR	480	3	18.0	20.0	5	B	SDV	015
TU	140	12Ø	F111 LEARNING STUDIO	ERU-8	955	570	650	0.75	55	87	6.5	22.2	SCR	480	3	10.7	15.0	5	B	SDV	015
TU	141	6Ø	F113 TEACHER COLLAB	ERU-8	350	80															











REGISTRATION SEAL

CONSULTANT



PROJECT TITLE  
**NEW SMITH MIDDLE SCHOOL**  
Bid Package No. 03B

Troy School District  
Troy, Michigan

DRAWING TITLE  
**TEMPERATURE CONTROLS**

ISSUE DATES

06-18-2024 CONSTRUCTION DOCUMENTS

DATE: ISSUED FOR:

DRAWN DJT  
CHECKED KLH  
APPROVED SVM

PROJECT NO.

**22102**

DRAWING NO.

**M8.2**

**SEQUENCE OF OPERATION**

**HEAT PUMP LOOP SYSTEM:**

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, MODE POINTS, ETC., INCLUDING TIME-OF-DAY HOURS OF OPERATION AND SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION. PROVIDE CONTROL STATEMENTS TO PREVENT "LOOP WINDUP".

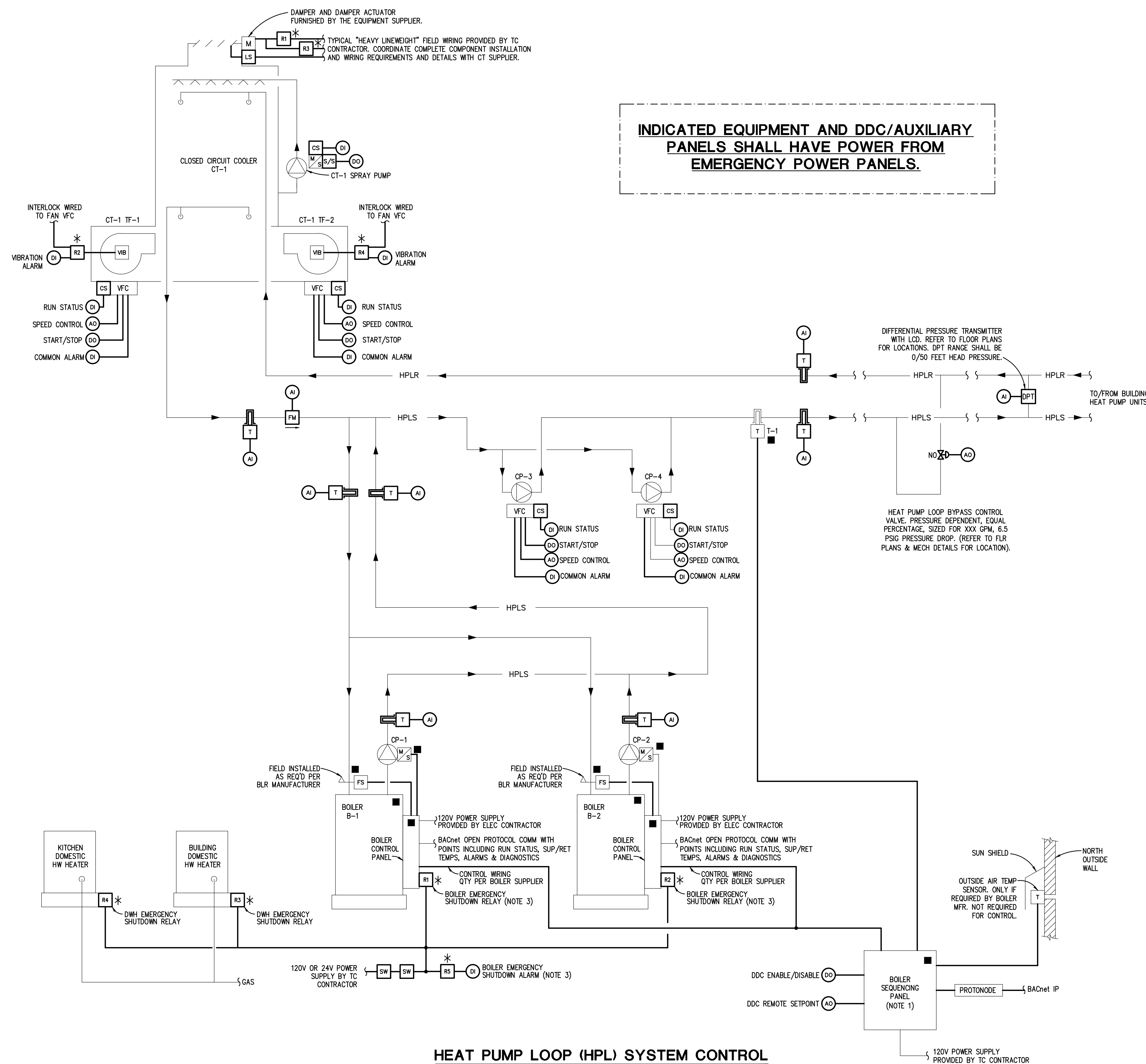
- HEAT PUMP LOOP SYSTEM SHALL BE ACTIVATED FOR CONTINUOUS OPERATION EYAR ROUND.
- HEAT PUMP LOOP (HPL) ORC PUMPS CP-3 & CP-4 SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. ONE OF THE TWO PUMPS SHALL BE ACTIVATED BY DDC AS "LEAD" TO OPERATE CONTINUOUSLY. THE OTHER WILL SERVE AS "STANDBY" PUMP.
- DDC SHALL ALTERNATE HPL CP OPERATION AT THE BEGINNING OF EACH MONTH - OPERATOR SELECTABLE.
- DDC SHALL MONITOR OPERATING STATUS OF EACH HPL CP. UPON "LEAD" PUMP FAILURE, DDC SHALL ACTIVATE FAILURE ALARM AND AUTOMATICALLY START THE "STANDBY" PUMP. DDC SHALL TOTALIZE EACH PUMP'S RUN TIME HOURS OF OPERATION.
- VFC COMMON FAILURE ALARM FOR EACH HPL CP SHALL BE MONITORED BY DDC THRU VARIABLE FREQUENCY CONTROLLER (VFC) INTERFACE.
- DDC SHALL MODULATE THE VFC OF THE "ACTIVE" HPL CP TO MAINTAIN LOOP DIFFERENTIAL PRESSURE SETPOINT TO BE DETERMINED BY TAB CONTRACTOR. INITIAL SETPOINT SHALL BE 20 FEET HEAD DIFFERENTIAL PRESSURE.
- WHEN "ACTIVE" HPL CP SPEED IS REDUCED TO THE PUMP'S LOW FLOW LIMIT SETPOINT, BASED ON MFR'S PUMP CURVE, AND THE REMOTE DIFFERENTIAL PRESSURE (DP) IS ABOVE DP SETPOINT, DDC SHALL MODULATE THE HPL LOOP BYPASS VALVE TO ACHIEVE DP SETPOINT WHILE HPL CP SPEED MAINTAINS THE HPLS FLOW LOW LIMIT SETPOINT VIA HPL FLOW METER. WHEN HPL LOOP BYPASS VALVE MODULATES TO FULL CLOSED POSITION, AND DP IS LESS THAN DP SETPOINT, DDC MODULATES CP SPEED HIGHER TO MAINTAIN DP SETPOINT.
- THE HPL SUPPLY TEMPERATURE (T-1) SHALL BE MAINTAINED BETWEEN 70°F & 85°F BY DDC. THE FOLLOWING SETPOINTS SHALL BE USED TO ENABLE/DISABLE THE COOLING TOWER AND HHW SYSTEMS:
  - COOLING TOWER SYSTEM IS ENABLED WHEN T-1 RISES ABOVE 85°F.
  - COOLING TOWER SYSTEM IS DISABLED WHEN T-1 DROPS BELOW 80°F FOR A 30 MINUTE PERIOD.

**COOLING TOWER (CT) CONTROL:**

- CT FANS TF-1 & TF-2 SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. ONE OF THE TWO FANS SHALL BE ACTIVATED BY DDC AS "LEAD" TO OPERATE. THE OTHER WILL SERVE AS "LAG" PUMP.
- DDC SHALL MONITOR OPERATING STATUS OF EACH CT FAN. UPON "LEAD" CT FAN FAILURE, DDC SHALL ACTIVATE A FAILURE ALARM AND AUTOMATICALLY START THE "LAG" CT FAN. DDC SHALL TOTALIZE EACH FAN'S RUN TIME HOURS OF OPERATION.
- VFC COMMON FAILURE ALARM FOR CT FAN SHALL BE MONITORED BY DDC THRU RESPECTIVE VFC INTERFACE.
- WHEN CT SYSTEM IS ENABLED AND THE "LEAD" HPL CP IS PROVEN RUNNING VIA CURRENT SWITCH, DDC SHALL START THE CT SPRAY PUMP. START THE "LEAD" CT FAN, AND MODULATE "LEAD" CT FAN SPEED TO MAINTAIN CT LEAVING WATER (HPLS) TEMPERATURE SETPOINT OF 85°F. IF CT FAN SPEED DECREASES MINIMUM SPEED (BASED ON MFR. FAN CURVE) AND HPLS TEMPERATURE DROPS TO 80°F, DDC SYSTEM SHALL CYCLE "LEAD" CT FAN OFF UNTIL HPLR TEMPERATURE RISES ABOVE 85°F.
- UPON INCREASE IN HPLS TEMPERATURE, "LEAD" CT FAN SPEED MAY INCREASE TO 95% OF DESIGN SPEED. WHEN HPLS TEMPERATURE INCREASES ABOVE 90°F SETPOINT, DDC SHALL START THE "LAG" CT FAN. WHILE DECREASING "LEAD" CT FAN SPEED, DDC SHALL INCREASE "LAG" CT FAN SPEED, UNTIL BOTH FANS ARE CONTROLLED BY DDC AT THE SAME SPEED SIGNAL TO MAINTAIN HPLS TEMPERATURE SETPOINT OF 85°F. BOTH CT FANS MAY INCREASE TO MAXIMUM DESIGN SPEED TO MAINTAIN CT HPLS TEMPERATURE SETPOINT.

- UPON DECREASE OF HPLS TEMPERATURE BELOW 82°F SETPOINT, DDC SHALL RAMP BOTH CT FANS DOWN TO 45% DESIGN SPEED SIGNAL. UPON FURTHER DROP IN HPLS TEMPERATURE, DDC SHALL COMMAND THE "LAG" CT FAN OFF AND MAINTAIN HPLS TEMPERATURE SETPOINT WITH THE "LEAD" CT FAN.
- DDC SHALL MONITOR COOLING TOWER SPRAY PUMP OPERATION THRU CURRENT SWITCH. UPON PUMP FAILURE, DDC SHALL PROVIDE AN ALARM.
- WHEN COOLING TOWER IS DISABLED, DDC SHALL DEACTIVATE SPRAY PUMP.
- BASIN HEATER SHALL BE CONTROLLED BY PACKAGED THERMOSTAT. BASIN HEATER SHALL BE DISABLED THRU HARDWIRED CUT-OUT INTERLOCK WHENEVER SPRAY PUMP IS ACTIVATED.
- CT BASIN LEVEL IS CONTROLLED BY MFR'S BASIN WATER LEVEL CONTROL AND MAKE-UP WATER VALVE.
- DDC SHALL ENABLE THE HOT WATER HEATING (HHW) SYSTEM 24/7 YEAR-ROUND. MFR'S OA TEMP SENSOR SHALL BE WIRED ONLY IF THE BOILER SEQUENCING PANEL REQUIRES THE SENSOR INPUT FOR OPERATION. OTHERWISE IT IS NOT REQUIRED.
- THE BOILER SEQUENCING PANEL SHALL ACTIVATE OR DEACTIVATE BOILERS AND CONTROL BOILER STAGES/FIRING RATES AS REQUIRED TO MAINTAIN HPLS TEMPERATURE (T-1) SETPOINT OF 50°F.
- HHW SYSTEM IS DISABLED WHEN T-1 RISES ABOVE 55°F FOR A 30 MINUTE PERIOD WHEN OUTSIDE AIR TEMPERATURE IS GREATER THAN 55°F.
- BOILER ORC PUMPS CP-1 & CP-2 SHALL HAVE START/STOP CAPABILITY FROM THE RESPECTIVE BOILERS LOCAL CONTROL PANEL.
- THE BOILER SEQUENCING PANEL SHALL INCLUDE OPERATOR SELECTABLE BOILER LEAD/LAG OPERATION OR FIRST ON/FIRST OFF OPERATION.
- WHENEVER A BOILER CIRCUIT IS ACTIVATED, ITS RESPECTIVE ORC PUMP SHALL BE ACTIVATED BY FACTORY WIRED PUMP RELAY. BOILER SHALL NOT FIRE UNTIL FLOW IS PROVEN BY FLOW SWITCH.
- WHENEVER A BOILER IS DEACTIVATED, A BOILER SYSTEM CONTROLLED TIME DELAY SHALL KEEP PUMP RUNNING FOR A FEW MINUTES (TIME BASED ON BOILER MANUFACTURER RECOMMENDATION) TO DISSIPATE HEAT FROM THE DEACTIVATED BOILER.
- EACH BOILER SAFETY CONTROLS SHALL INCLUDE AN AUTO-RESET HI-LIMIT (BOILER OPERATOR) WITH SETPOINT AND A MANUAL-RESET HI-LIMIT WITH SETPOINT BASED ON BOILER SUPPLIER'S RECOMMENDATIONS.
- DDC SHALL MONITOR BOILER RUN STATUS AND COMMON ALARM FOR EACH BOILER THROUGH DRY CONTACTS AVAILABLE IN RESPECTIVE BOILER CONTROL PANEL.
- FOR DIAGNOSTIC PURPOSES, DDC SHALL MONITOR EACH BOILER'S SUPPLY TEMPERATURE BOILER COMMON HEADER SUPPLY AND RETURN, AND HPL SUPPLY AND RETURN TEMPERATURES.
- WHEN ONE OF THE REMOTE BOILER SHUTDOWN SWITCHES IS PUSHED, BURNER CONTROLS FOR ALL BOILERS SHALL BE DE-ENERGIZED THRU HARDWIRED INTERLOCK. DDC SHALL MONITOR SWITCH CIRCUIT AND ACTIVATE ALARM WHEN REMOTE BOILER SHUTDOWN CONDITION OCCURS.
- WHEN EACH COOLING TOWER'S VIBRATION SWITCH ALARM IS SENSED, DDC SHALL SHUTDOWN THE RESPECTIVE TOWER IN AN ORDERLY MANNER AND PROVIDE THE BAS WITH AN ALERT THAT "SYSTEM CAPACITY IS REDUCED." VIBRATION SWITCH SHALL BE HARDWIRED INTERLOCKED TO THE RESPECTIVE TOWER'S VFC SAFETY CIRCUIT.
- DDC SHALL MONITOR GLYCOL FILL STATION AND PROVIDE AN ALARM ON LOW PRESSURE.

INDICATED EQUIPMENT AND DDC/AUXILIARY PANELS SHALL HAVE POWER FROM EMERGENCY POWER PANELS.



**HEAT PUMP LOOP (HPL) SYSTEM CONTROL**

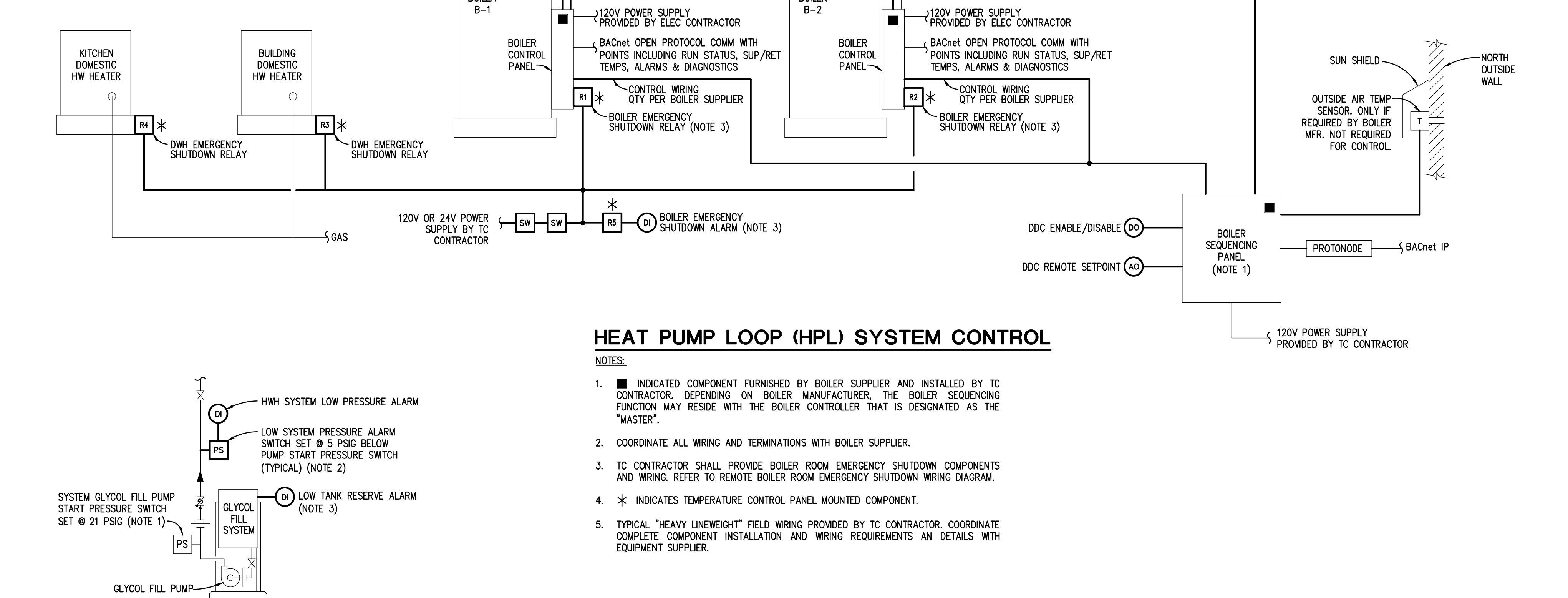
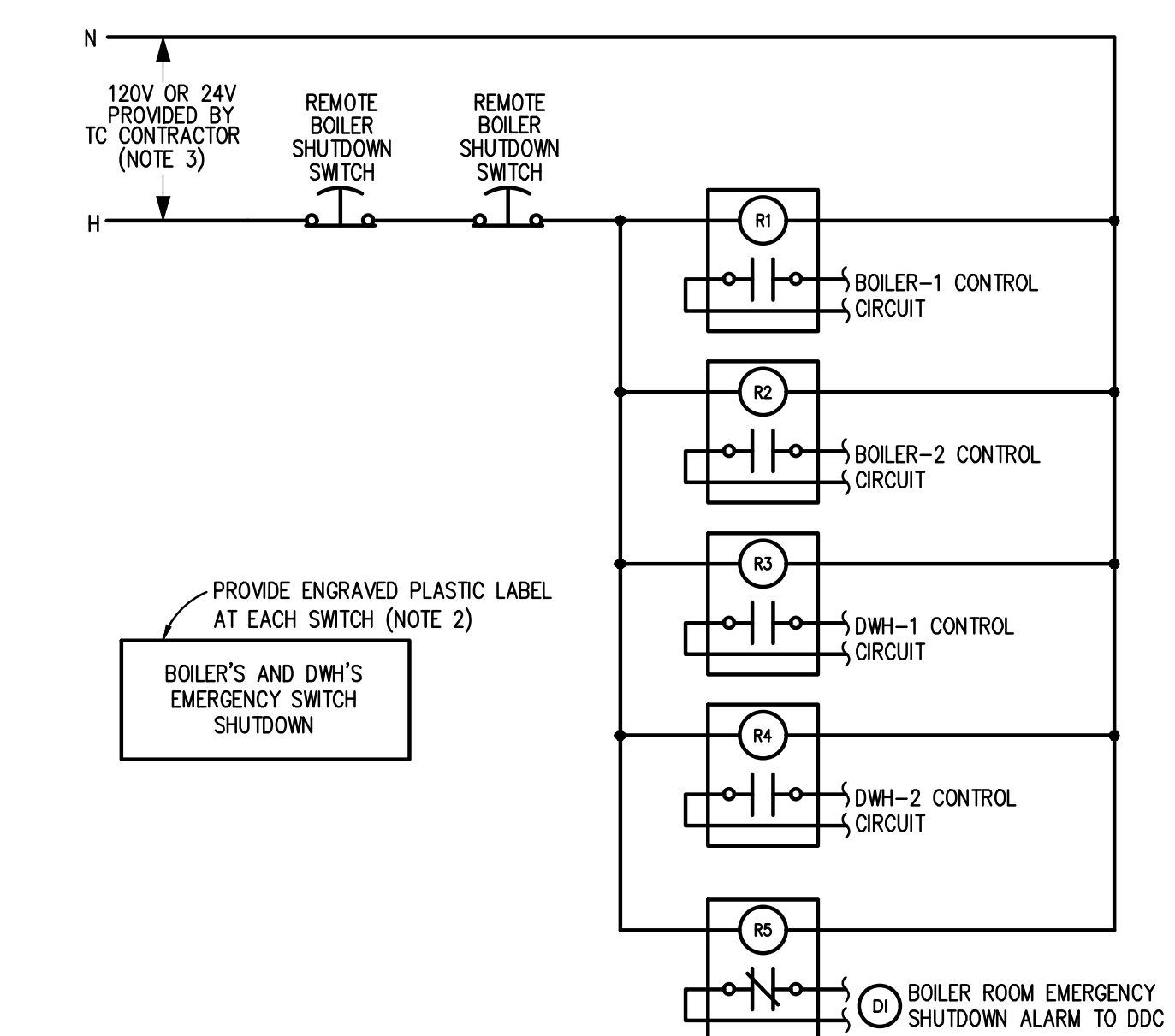
- NOTES:
- INDICATED COMPONENT FURNISHED BY BOILER SUPPLIER AND INSTALLED BY TC CONTRACTOR. DEPENDING ON BOILER MANUFACTURER, THE BOILER SEQUENCING FUNCTION MAY RESIDE WITH THE BOILER CONTROLLER THAT IS DESIGNATED AS THE "MASTER".
  - COORDINATE ALL WIRING AND TERMINATIONS WITH BOILER SUPPLIER.
  - TC CONTRACTOR SHALL PROVIDE BOILER ROOM EMERGENCY SHUTDOWN COMPONENTS AND WIRING. REFER TO REMOTE BOILER ROOM EMERGENCY SHUTDOWN WIRING DIAGRAM.
  - \* INDICATES TEMPERATURE CONTROL PANEL MOUNTED COMPONENT.
  - TYPICAL "HEAVY LINEWEIGHT" FIELD WIRING PROVIDED BY TC CONTRACTOR. COORDINATE COMPLETE COMPONENT INSTALLATION AND WIRING REQUIREMENTS AN DETAILS WITH EQUIPMENT SUPPLIER.

**GLYCOL FILL STATION MONITORING**

- FOR HHW SYSTEM
- NOTE:
- PUMP CONTROL PRESSURE SWITCH AND ASSOCIATED CONTROL WIRING ARE PROVIDED WITH GLYCOL FILL STATION.
  - PRESSURE SWITCH FOR ALARM MONITORING SHALL BE FURNISHED BY TC CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.
  - DRY CONTACTS FOR REMOTE MONITORING OF LOW TANK RESERVE ALARM PROVIDED WITH GLYCOL FILL STATION.

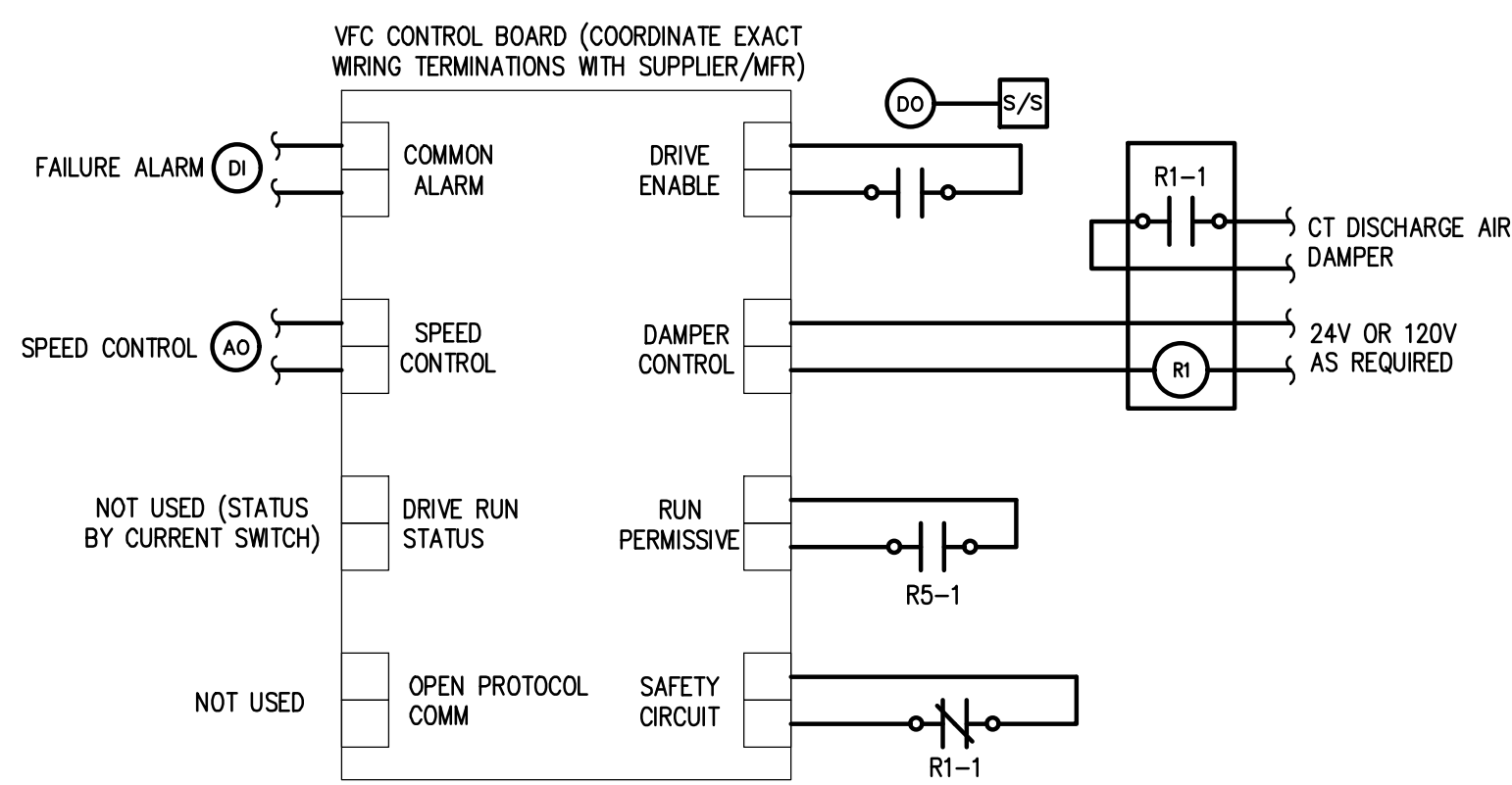
**REMOTE BOILER ROOM EMERGENCY SHUTDOWN WIRING**

- NOTES:
- LOCATE SWITCH AT EACH ENTRANCE OUTSIDE OF ROOM IF POSSIBLE; LOCATE JUST INSIDE ENTRANCE FOR EXTERIOR WALLS. REFER TO FLOOR PLANS FOR ENTRY LOCATIONS AND FIELD VERIFY INSTALLATION REQUIREMENTS.
  - TC CONTRACTOR SHALL PROVIDE SIGN (NAME PLATE) TO BE PLACED DIRECTLY ABOVE OR BELOW EACH PUSHBUTTON SWITCH THAT READS: "EMERGENCY BOILER SHUTDOWN". COORDINATE LOCATION WITH ALL OTHER TRADES.
  - TC CONTRACTOR SHALL SUPPLY POWER TO EMERGENCY CIRCUIT PUSHBUTTONS AND CONTROL RELAYS. REFER TO ELECTRICAL PANEL SCHEDULES AND COORDINATE WITH ELECTRICAL CONTRACTOR AS NECESSARY.
  - TC CONTRACTOR SHALL WIRE BOILERS' CONTROL CIRCUITS (POWER FROM SECONDARY SIDE OF CONTROL TRANSFORMERS) AND DOMESTIC HOT WATER HEATERS' SHUTDOWN CIRCUIT THRU NORMALLY OPEN RELAY CONTACTS. TC CONTRACTOR SHALL COORDINATE EXACT WIRING AND TERMINATION REQUIREMENTS WITH BOILER MANUFACTURER.
  - TC CONTRACTOR SHALL MOUNT SHUTDOWN CONTROL RELAYS IN AUXILIARY CONTROL PANEL.
  - TC CONTRACTOR SHALL PROVIDE PUSHBUTTON SWITCH (PUSH TO LATCH - TURN KEY TO RELEASE) WITH MUSHROOM HEAD OPERATOR, FLIP-UP PLASTIC GUARD, AND NORMALLY CLOSED (NC) CONTACTS. PROVIDE WITH PROPER ENCLOSURE.
- SEQUENCE OF OPERATION:
- UNDER NORMAL OPERATING CONDITIONS THE CIRCUIT SHALL BE ENERGIZED AND THE RELAY'S NORMALLY OPEN (NO) CONTACTS SHALL BE CLOSED. WHEN A SWITCH IS PUSHED (LATCHED) THE RELAY CONTACTS SHALL OPEN AND INTERRUPT BOILERS' CONTROL CIRCUIT AND DOMESTIC HOT WATER HEATERS' SHUTDOWN CIRCUIT. WHEN THE KEY IS TURNED TO RELEASE THE SWITCH, THE RELAYS SHALL BE ENERGIZED AND ITS NORMALLY OPEN CONTACTS SHALL CLOSE, RE-ENERGIZING ALL CONTROL CIRCUITS.
  - DDC SHALL ACTIVATE AN ALARM WHEN A REMOTE SWITCH HAS BEEN PUSHED.



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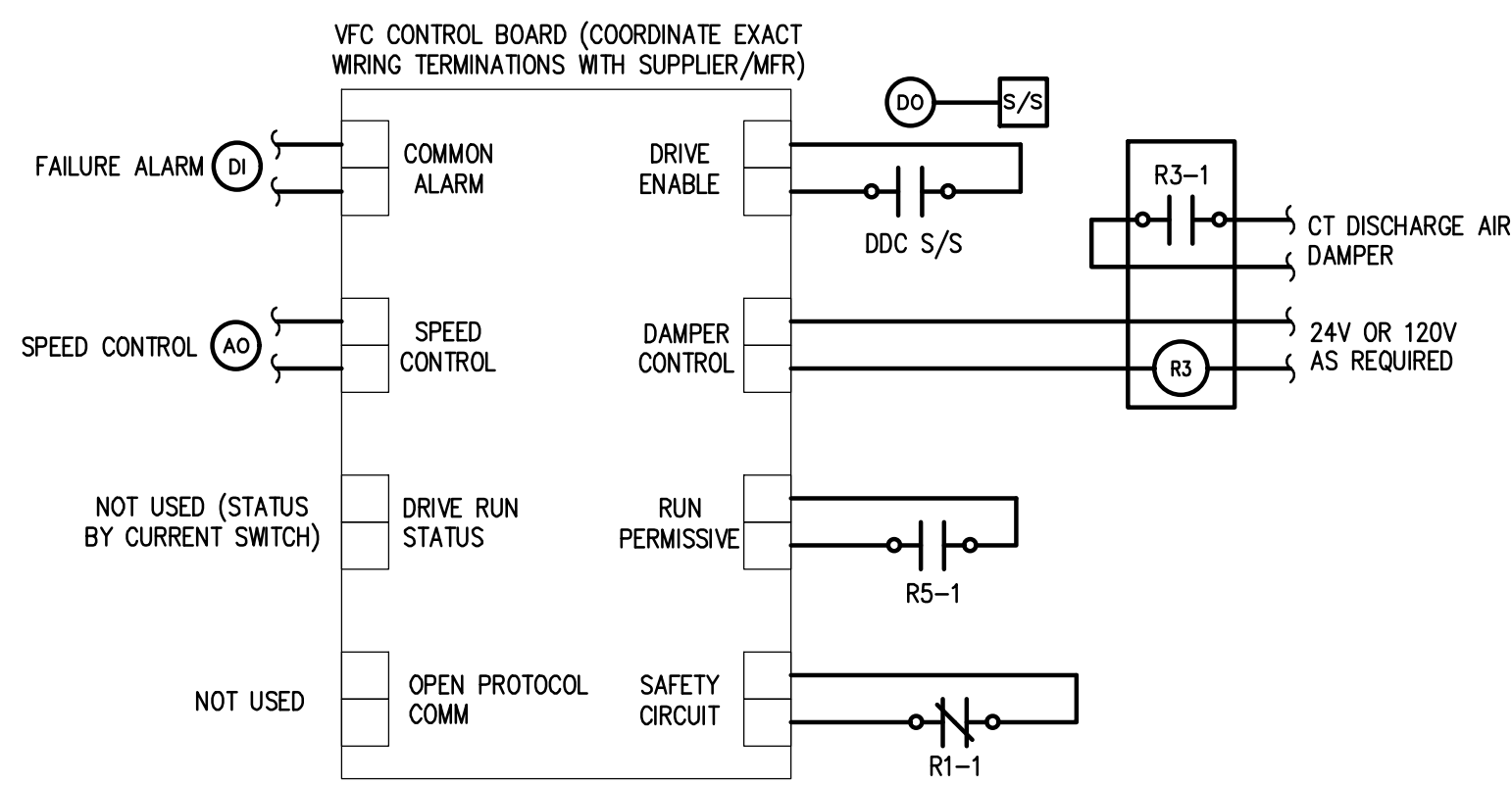


**CT-1 TF-1 VFC WIRING**

- NOTES:
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH VFC SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
  2. MOUNT CURRENT SWITCH ON MOTOR LEADS.

**SEQUENCE OF OPERATION**

- TOWER FAN TF-1 & VIBRATION SWITCH CONTROLS:
1. REFER TO COOLING TOWER SEQUENCE OF OPERATION FOR TOWER FAN CONTROL.
  2. IF THE TOWER FAN VIBRATION SWITCH (BY MFR.) ACTIVATES, INTERLOCK WIRING SHALL ENERGIZE CONTROL RELAY.
  3. CONTROL RELAY WIRING SHALL SHUTDOWN (RUN PERMISSIVE) THE RESPECTIVE VFC FOR THE TOWER FAN, PROVIDE AN ALARM TO THE BAS, AND TURN ON INDICATING LIGHT ON THE CONTROL PANEL DOOR.
  4. WHEN VIBRATION SWITCH IS RESET AT THE TOWER, WIRING INTERLOCK SHALL ENABLE THE VFC (RUN PERMISSIVE, BAS ALARM SHALL RETURN TO NORMAL, AND TURN OFF INDICATING LIGHT ON THE CONTROL PANEL DOOR.
  5. INTERLOCK WIRING WITH DDC DO POINT SHALL ENABLE AND DISABLE THE TOWER FAN MOTOR'S SPACE HEATER.

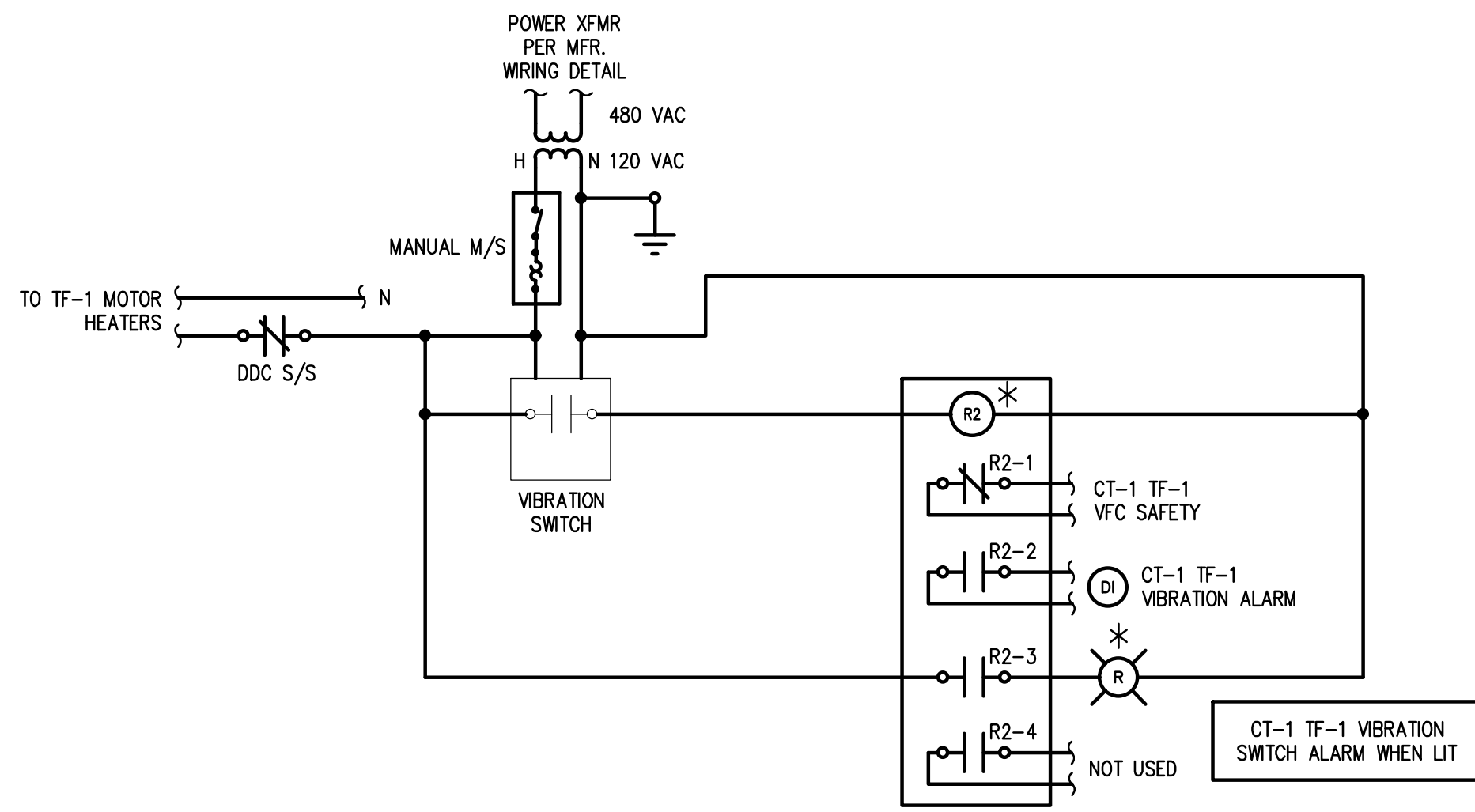


**CT-1 TF-2 VFC WIRING**

- NOTES:
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH VFC SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
  2. MOUNT CURRENT SWITCH ON MOTOR LEADS.

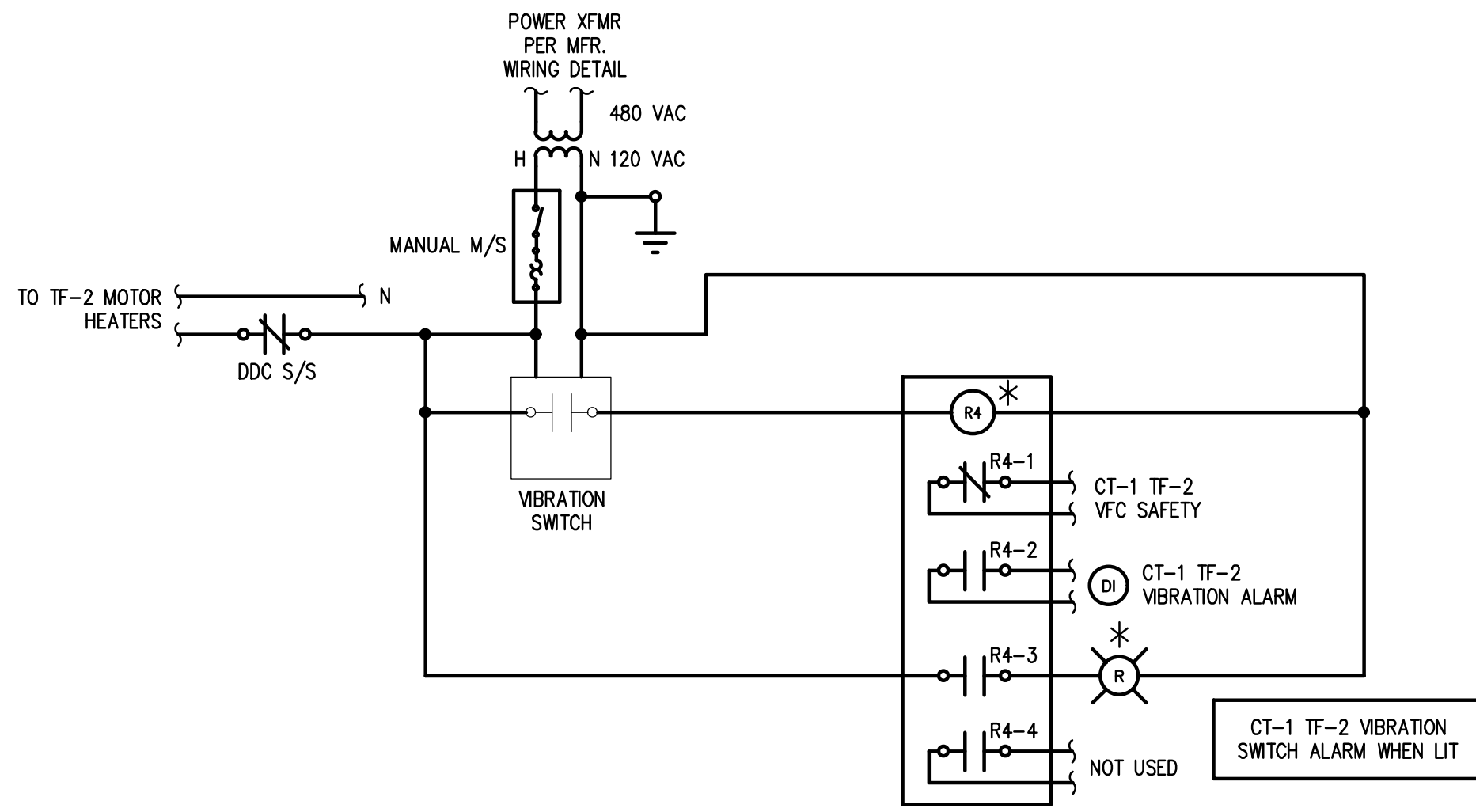
**SEQUENCE OF OPERATION**

- TOWER FAN TF-2 & VIBRATION SWITCH CONTROLS:
1. REFER TO COOLING TOWER SEQUENCE OF OPERATION FOR TOWER FAN CONTROL.
  2. IF THE TOWER FAN VIBRATION SWITCH (BY MFR.) ACTIVATES, INTERLOCK WIRING SHALL ENERGIZE CONTROL RELAY.
  3. CONTROL RELAY WIRING SHALL SHUTDOWN (RUN PERMISSIVE) THE RESPECTIVE VFC FOR THE TOWER FAN, PROVIDE AN ALARM TO THE BAS, AND TURN ON INDICATING LIGHT ON THE CONTROL PANEL DOOR.
  4. WHEN VIBRATION SWITCH IS RESET AT THE TOWER, WIRING INTERLOCK SHALL ENABLE THE VFC (RUN PERMISSIVE, BAS ALARM SHALL RETURN TO NORMAL, AND TURN OFF INDICATING LIGHT ON THE CONTROL PANEL DOOR.
  5. INTERLOCK WIRING WITH DDC DO POINT SHALL ENABLE AND DISABLE THE TOWER FAN MOTOR'S SPACE HEATER.



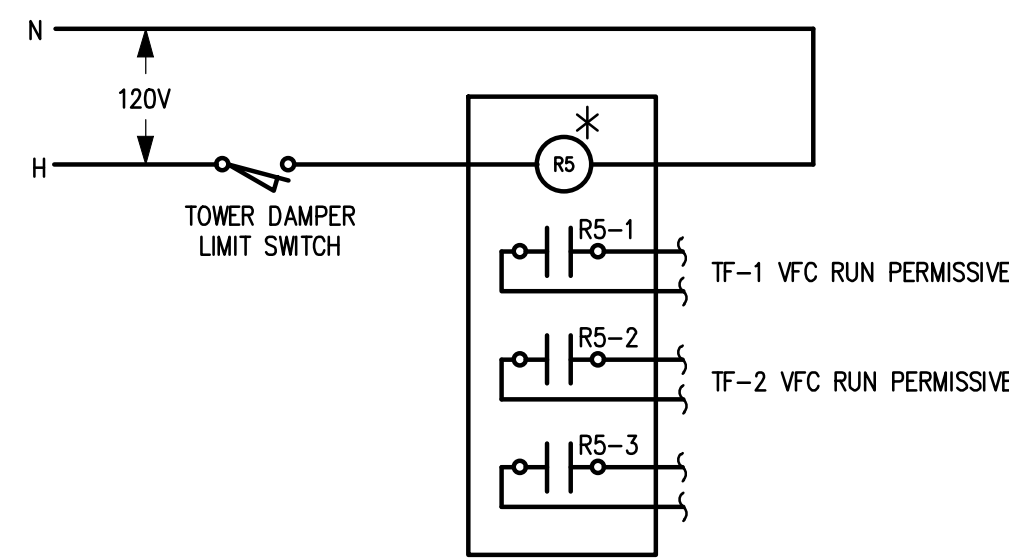
**CT-1 TF-1 VIBRATION INTERLOCK WIRING**

- NOTES:
1. \* INDICATES PANEL MOUNTED COMPONENT. MOUNT RED INDICATING LIGHT ON PANEL DOOR.
  2. ALL WORK SHOWN SHALL BE BY TEMPERATURE CONTROLS CONTRACTOR. PROVIDE CONTROL PANEL WITH NEMA RATING BASED ON PANEL LOCATION.
  3. VIBRATION SWITCH IS FURNISHED AND MOUNTED AT TOWER FAN BY TOWER MFR.
  4. RED INDICATING LIGHT, WIRING, AND CONTROL DEVICES (OTHER THAN VIBRATION SWITCH), SHALL BE INSTALLED IN TC AUX. PANEL BY TCC AND LABELED "TF-1 VIBRATION TRIP".



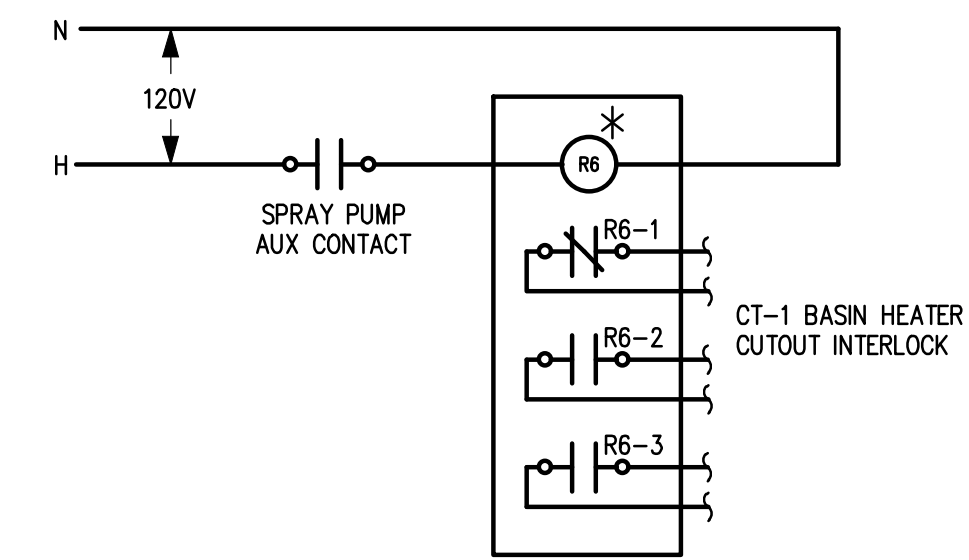
**CT-1 TF-2 VIBRATION INTERLOCK WIRING**

- NOTES:
1. \* INDICATES PANEL MOUNTED COMPONENT. MOUNT RED INDICATING LIGHT ON PANEL DOOR.
  2. ALL WORK SHOWN SHALL BE BY TEMPERATURE CONTROLS CONTRACTOR. PROVIDE CONTROL PANEL WITH NEMA RATING BASED ON PANEL LOCATION.
  3. VIBRATION SWITCH IS FURNISHED AND MOUNTED AT TOWER FAN BY TOWER MFR.
  4. RED INDICATING LIGHT, WIRING, AND CONTROL DEVICES (OTHER THAN VIBRATION SWITCH), SHALL BE INSTALLED IN TC AUX. PANEL BY TCC AND LABELED "TF-1 VIBRATION TRIP".



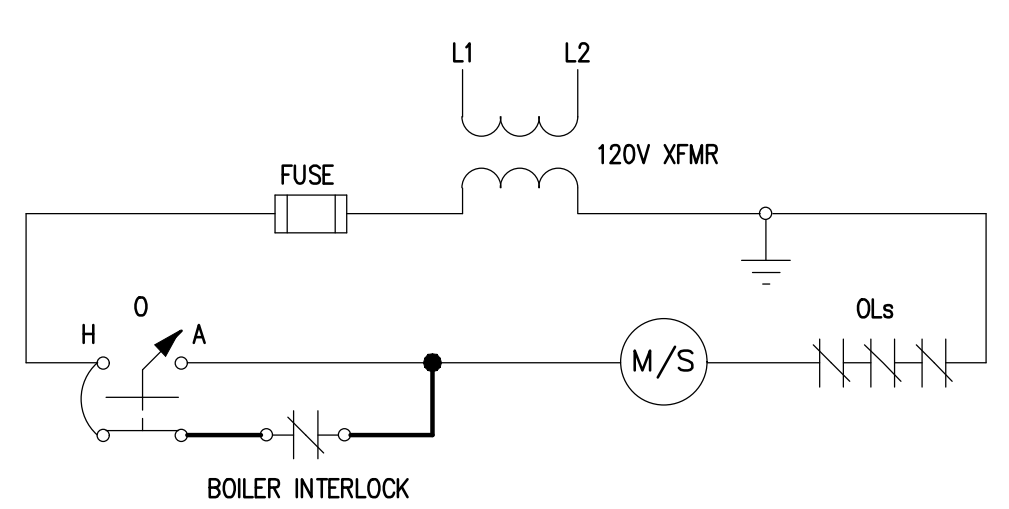
**CT-1 TF-1/2 RUN PERMISSIVE CIRCUIT**

- NOTE:
1. CONSULT WITH VFC SUPPLIER FOR THE WIRING REQUIREMENTS.



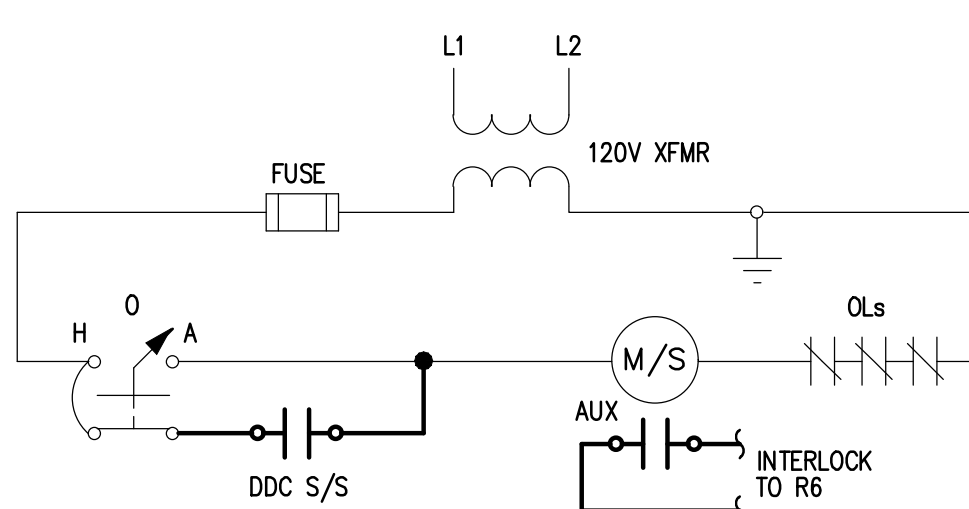
**CT-1 BASIN HEATER CUTOFF CIRCUIT**

- NOTE:
1. CONSULT WITH COOLING TOWER SUPPLIER FOR THE WIRING REQUIREMENTS.



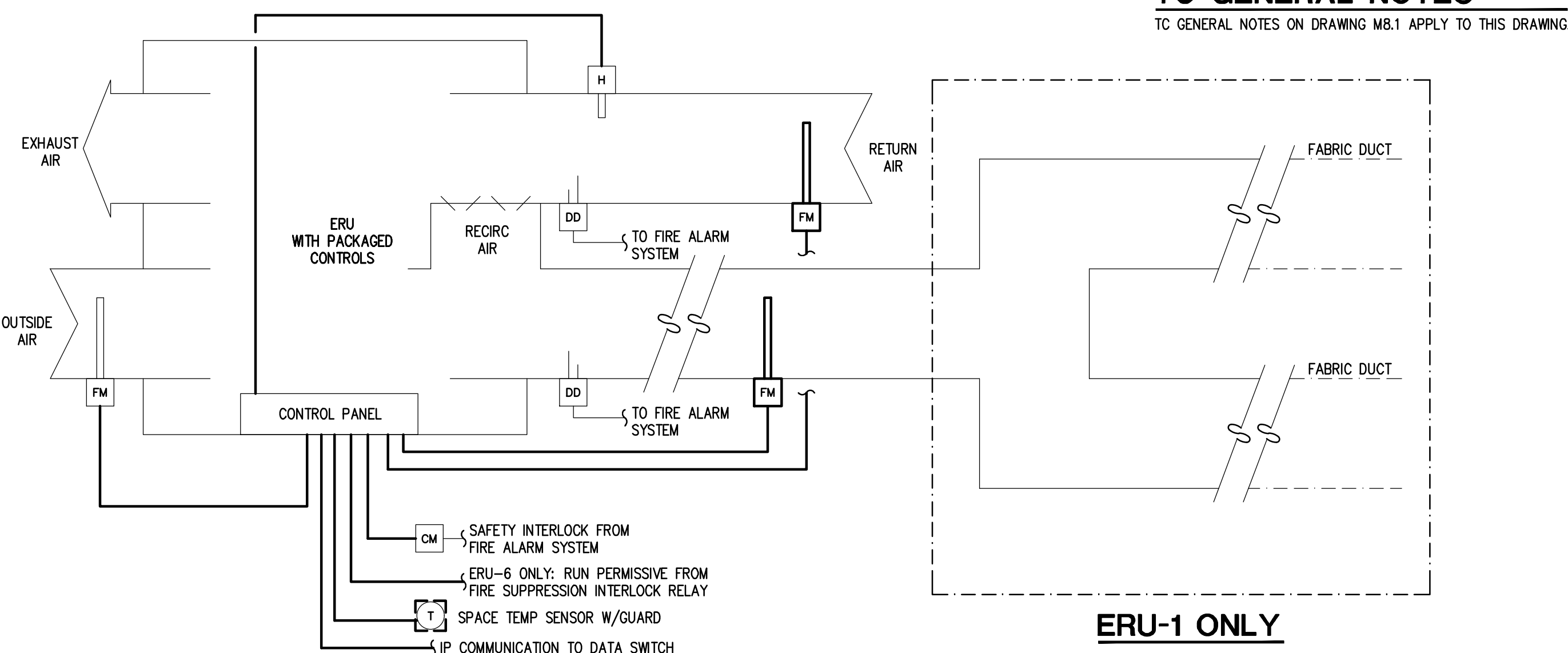
**BOILER CIRC PUMPS CP-1 & CP-2 M/S WIRING**

- NOTES:
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH M/S SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
  2. MOUNT CURRENT SWITCH ON MOTOR LEADS.



**CT-1 SPRAY PUMP M/S WIRING**

- NOTES:
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH M/S SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
  2. MOUNT CURRENT SWITCH ON MOTOR LEADS.



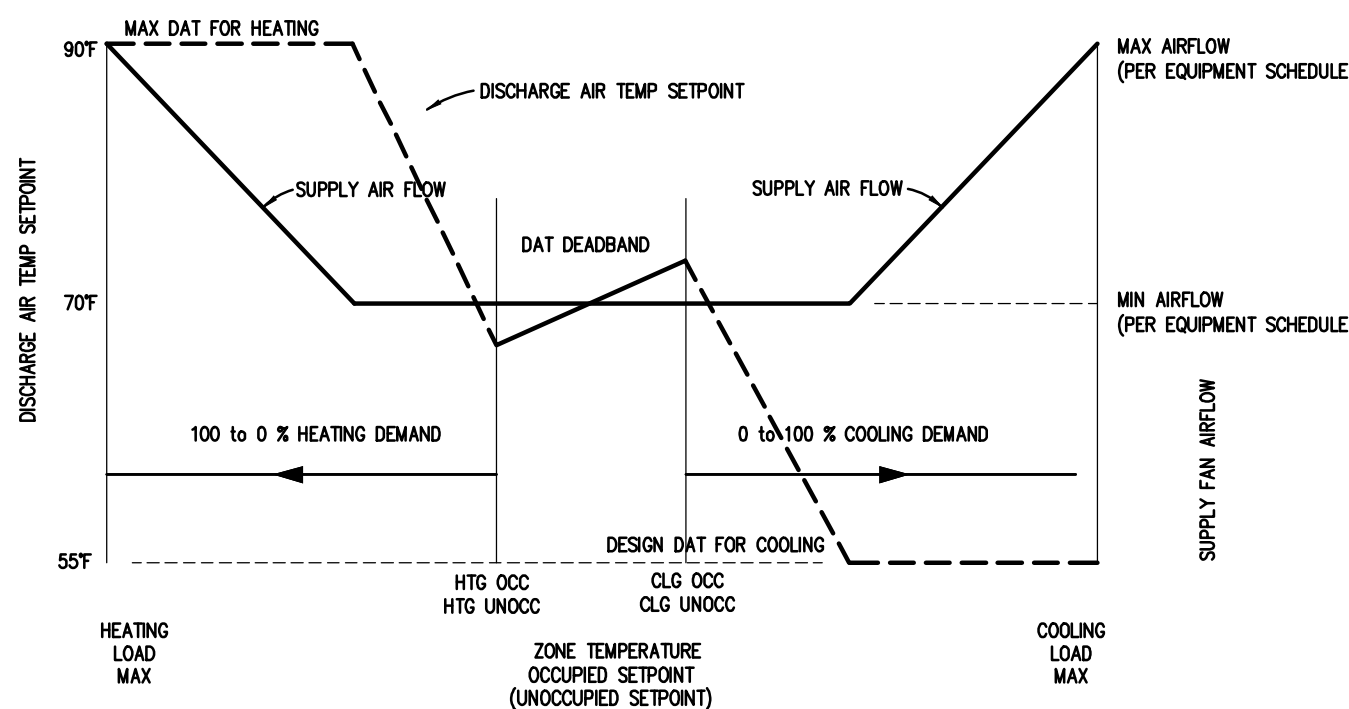
**SINGLE-ZONE VAV AHU CONTROLS**

- ERU-1 SERVES THE GYMNASIUM  
ERU-4 SERVES DINING COMMONS  
ERU-6 SERVES THE KITCHEN
- NOTES:
1. ENERGY RECOVERY UNIT SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE PACKAGED CONTROLS FROM MANUFACTURER INCLUDING DDC CONTROLLER, IP BACNET COMMUNICATION INTERFACE FOR BAS SCHEDULING, ALL SENSORS & DEVICES FOR CONTROLS, CONTROL DAMPERS, SPACE AND HUMIDITY SETPOINT ADJUSTMENT AND UNIT MONITORING.
  2. TC CONTRACTOR SHALL INSTALL SPACE TEMPERATURE AND RETURN AIR DUCT HUMIDITY SENSORS FURNISHED BY UNIT SUPPLIER AND PROVIDE CONTROL FIELD WIRING FOR UNIT AS INDICATED PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR PACKAGED UNIT THAT IS NOT SHOWN. TC CONTRACTOR SHALL PROVIDE PROTECTIVE GUARDS FOR SPACE SENSORS. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS.
  3. TC CONTRACTOR SHALL MOUNT STATIC REFERENCE PROBES AS SHOWN ON DRAWINGS AND PROVIDE INSTRUMENT AIR TUBING TO THE STATIC PRESSURE TRANSMITTER PROVIDED BY THE UNIT MANUFACTURER AND LOCATED IN THE UNIT CONTROLS PANEL.
  4. TC CONTRACTOR SHALL PROVIDE BACNET COMMUNICATION INTERFACE WIRING FROM ERU CONTROL PANEL TO BAS NETWORK SUPERVISORY CONTROLLER.
  5. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.
  6. ERU SUPPLIER REPRESENTATIVE SHALL PROVIDE PERSONNEL FOR START-UP, PROGRAMMING, AND COORDINATION WITH TC CONTRACTOR FOR INTEGRATION TO THE BAS.

**SEQUENCE OF OPERATION**

- NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, DELAY TIMERS, ETC., DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.
1. ERU WITH PACKAGED CONTROLS SHALL PROVIDE SINGLE-ZONE VAV AHU CONTROL OF SPACE TEMPERATURE AND VOLUME BASED ON THE DIAGRAM HEREIN, DUAL ENTHALPHY ECONOMIZER, MINIMUM OUTSIDE AIRFLOW CONTROL, HOT GAS REHEAT CONTROL FOR DEHUMIDIFICATION, HEAT RECOVERY WHEEL FROST PROTECTION CONTROL, AND OPTIMUM START/STOP CONTROL.
  2. PACKAGED CONTROLS SHALL PREVENT SF AND EF FROM REDUCING BELOW THE RESPECTIVE FAN CURVE'S MINIMUM CFM.
  3. FOR ERU-1: TAB CONTRACTOR SHALL PROVIDE SF AIRFLOW CFM LOW LIMIT SETPOINT TO PREVENT FABRIC DUCT FROM FLUTTERING. PACKAGED CONTROLS SHALL MAINTAIN CFM LOW LIMIT SETPOINT.
  4. PACKAGED CONTROLS SHALL MONITOR AIRFLOW MEASURING DEVICES AND MODULATE EF VFC SPEED CONTROL TO PROVIDE EF CFM SETPOINT CONTROL THAT EQUALS SF ACTUAL AIRFLOW CFM MINUS AN OFFSET CFM AIRFLOW.
  5. PACKAGED CONTROLS SHALL MODULATE MIXED AIR DAMPERS (OA & RECIRCULATION) TO MAINTAIN OA MINIMUM AIRFLOW CFM SETPOINT REGARDLESS OF SF AIRFLOW CFM.
  6. BACNET COMMUNICATION INTERFACE BY MFR. SHALL ALLOW UNIT OCCUPIED/UNOCCUPIED SCHEDULING & TEMPERATURE SETPOINTS, FAN STATUSES, DAT & DUCT STATIC PRESSURE SETPOINT ADJUSTMENT, AND ADDITIONAL UNIT MONITORING AS AVAILABLE, FROM THE BAS.
  7. IN OCCUPIED MODE, PACKAGED CONTROLLER SHALL RUN SF/EF CONTINUOUSLY AND PROVIDE HOT GAS REHEAT CONTROL FOR DEHUMIDIFICATION. DEHUMIDIFICATION SETPOINT SHALL BE 50% RH.
  8. IN UNOCCUPIED MODE, PACKAGED CONTROLLER SHALL CYCLE SF ON/OFF WITH THE RECIRCULATION AIR DAMPER OPEN, EF IS OFF, AND OA DAMPER CLOSED.
  9. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE UNIT THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
  10. SPACE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:  
HEATING UNOCCUPIED SETPOINT = 60°F  
HEATING OCCUPIED SETPOINT = 70°F  
COOLING OCCUPIED SETPOINT = 74°F  
COOLING UNOCCUPIED SETPOINT = 80°F
  11. PACKAGED CONTROLLER SHALL COMMUNICATE, BUT NOT LIMITED TO, THE FOLLOWING POINTS AS AVAILABLE:  
- OCCUPANCY MODE SCHEDULE (FROM BAS)

- EFFECTIVE OCCUPANCY MODE (TO BAS)
- OCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE HEATING TEMP SETPOINT (FROM BAS)
- OCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- UNOCCUPIED SPACE COOLING TEMP SETPOINT (FROM BAS)
- SUPPLY FAN ON/OFF/ALARM STATUS (TO BAS)
- SUPPLY FAN VFC SPEED SETTING (TO BAS)
- SUPPLY FAN VFC ALARM (TO BAS)
- EXHAUST FAN ON/OFF/ALARM STATUS (TO BAS)
- EXHAUST FAN VFC SPEED SETTING (TO BAS)
- SUPPLY FAN VFC ALARM (TO BAS)
- OA DAMPER AIRFLOW SETPOINT (FROM BAS)
- OA DAMPER POSITION (%) (TO BAS)
- OA AIRFLOW AIRFLOW (TO BAS)
- SUPPLY AIRFLOW CFM (TO BAS)
- EXHAUST AIRFLOW CFM (TO BAS)
- EXHAUST FAN CFM OFFSET SETPOINT (TO BAS)
- DUCT STATIC PRESSURE LOW LIMIT SETPOINT (FROM BAS)
- DUCT STATIC PRESSURE "W.G. (TO BAS)
- DISCHARGE, SPACE, AND OUTSIDE AIR TEMPERATURE (TO BAS)
- ENERGY WHEEL STATUS (TO BAS)
- HEAT PUMP HEAT/COOL STATUS (TO BAS)
- ECONOMIZER MODE STATUS (TO BAS)
- DEHUMIDIFICATION SETPOINT (FROM BAS)
- DEHUMIDIFICATION MODE ACTIVE (TO BAS)
- DIRTY FILTER STATUSES/ALARMS (TO BAS)
- MISC UNIT TEMPERATURE MONITORING (TO BAS)
- TEMP SENSOR FAILURE ALARMS (TO BAS)
- UNIT SAFETY CUTOFF ALARMS (TO BAS)
- OTHER MISC ALARMS (TO BAS)
- ERU DIAGNOSTIC CODES (TO BAS)
- CONTROL SETPOINTS, DEADBANDS, & TIME DELAYS



ERU-1, 4, & 6 TEMPERATURE/AIRFLOW RESET SCHEDULE DIAGRAM



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PBA Project No. 20230354

PROJECT TITLE

**NEW SMITH  
MIDDLE SCHOOL**  
Bid Package No. 03B

**Troy School District**  
Troy, Michigan

DRAWING TITLE  
**TEMPERATURE CONTROLS**

ISSUE DATES

06-18-2024 CONSTRUCTION DOCUMENTS

DATE: ISSUED FOR:

DRAWN DJT

CHECKED KLH

APPROVED SVM

PROJECT NO.

**22102**

DRAWING NO.

**M8.3**

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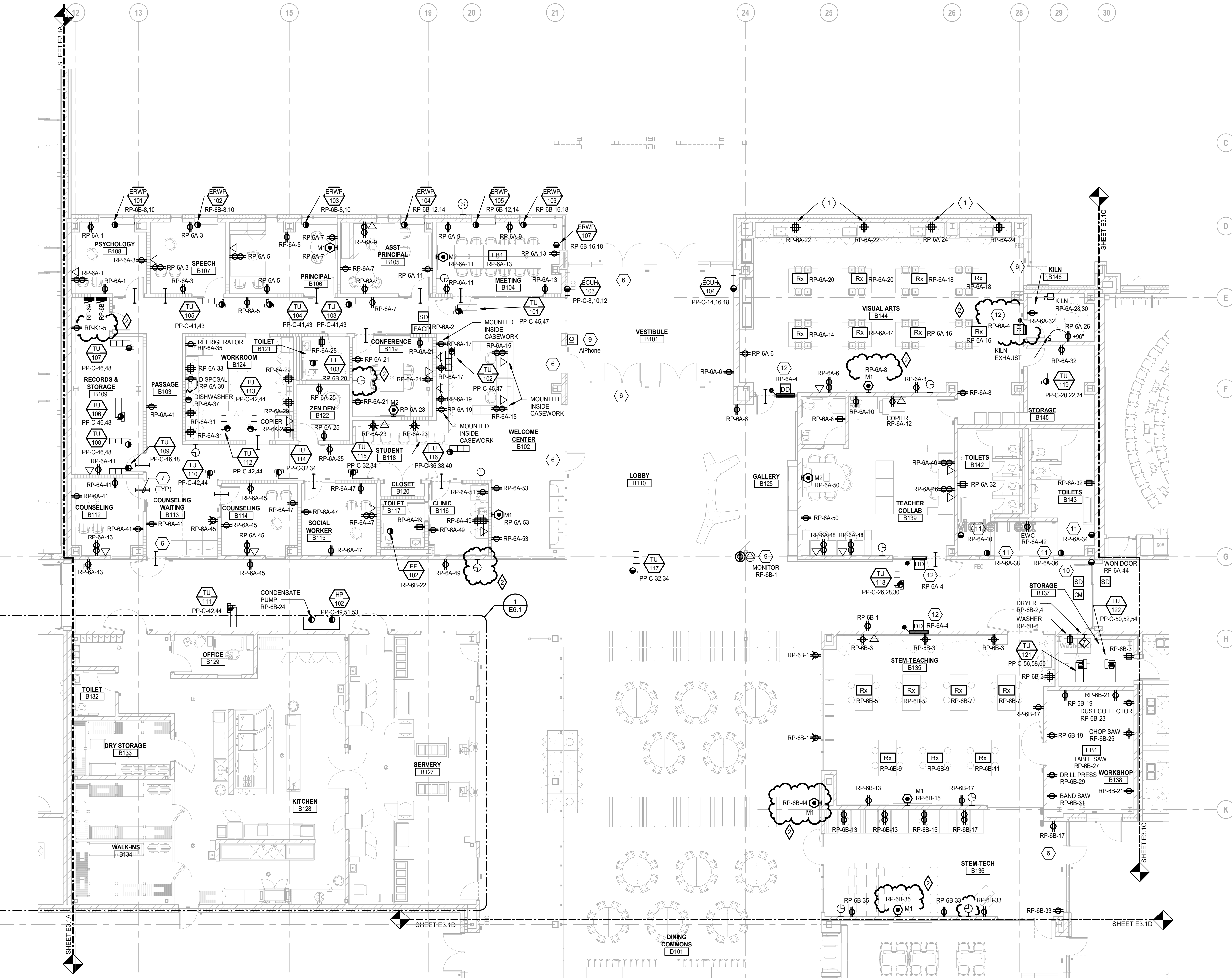








THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



**FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'B'**  
SCALE: 1/8" = 1'-0"

**ELECTRICAL GENERAL NOTES:**

- THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS, COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
- INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
- COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
- PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
- TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
- MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
- COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.
- COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.
- REFER TO MECHANICAL SCHEDULE SHEETS FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT. PROVIDE ALL CONNECTIONS, STARTERS, DISCONNECTS, ETC. AS REQUIRED BY SCHEDULES AND WHERE NOTED ELSEWHERE. VERIFY REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH SHOP DRAWINGS SUBMITTALS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN EQUIPMENT SUBMITTALS AND ELECTRICAL DRAWINGS. WHERE CIRCUIT SIZES ARE SHOWN ON THE ELECTRICAL DRAWINGS THAT DIFFER FROM WHAT IS INDICATED ON THE MECHANICAL SCHEDULES, PROVIDE THE CIRCUIT OF HIGHER AMPACITY.
- REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
- THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF CEILING HEIGHT BY THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.
- REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.
- CONNECT EXIST SIGNS TO EMERGENCY LIGHTING BRANCH CIRCUIT SERVICE THE AREA. CONNECT AHEAD OF ANY LIGHTING CONTROL DEVICE OR SYSTEM.
- PROVIDE SINGLE GANG JUNCTION BOX WITH 3/4" C. PULL STRING AND BUSHING TO ACCESSIBLE CEILING SPACE AT SPEAKER AND CLOCK LOCATIONS. COORDINATE MOUNTING HEIGHT WITH TECHNOLOGY CONTRACTOR.

**# CONSTRUCTION KEY NOTES:**

- MOUNT RECEPTACLES HORIZONTALLY
- ELECTRICAL CONTRACTOR SHALL INSTALL 4" SQUARE JUNCTION BOX WITHIN 3'-0" OF ELECTRICAL BACKBOX WING UP IN CEILING SPACE. ALSO INSTALL 4" RIGID TWIST LOCK, SINGLE RECEPTACLE, PROVIDED BY WINCH MANUFACTURERS, INTO THE JUNCTION BOX.
- ELECTRICAL CONTRACTOR SHALL INSTALL ALL CONTROLS, PUSHBUTTONS, KEY SWITCHES ETC. (PROVIDED WITH EACH BASKETBALL BACKBOARD) FOR A COMPLETE OPERABLE SYSTEM. KEY SWITCHES GANGED IN Pairs IN ONE COVER PLATE TO CONTROL THE BACKSTOP SWING AND HEIGHT ADJUSTER.
- HEAT TRACE, BY OTHERS.
- DUCT SMOKE DETECTOR SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. COORDINATE MOUNTING LOCATION AND QUANTITY WITH THE MECHANICAL DUCTWORK CONTRACTOR. ELECTRICAL CONTRACTOR SHALL WIRE DUCT SMOKE DETECTOR SUPPLY/RETURN FAN MOTOR STARTER SO THAT UPON DETECTION OF SMOKE, THE SUPPLY/RETURN FAN WILL SHUT DOWN. THIS SHALL BE ACCOMPLISHED VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS. COORDINATE WITH THE TEMPERATURE CONTROL/FIRE ALARM CONTRACTOR. PROVIDE WEATHER PROOF ENCLOSURES AS REQUIRED.
- REFER TO ARCHITECTURAL FLOOR PLANS, DOOR HARDWARE SCHEDULE ON ARCHITECTURAL DRAWINGS, ACCESS CONTROL SYSTEM SPECIFICATION SECTION AND ACCESS CONTROL DOOR DIAGRAM(S) ON E7 SERIES FOR RACEWAY AND BACK BOX REQUIREMENTS FOR DOOR OR BANK OF DOORS INDICATED. PROVIDE ALL RACEWAYS AND BACK BOXES REQUIRED. COORDINATE WITH DOOR HARDWARE AND SECURITY CONTRACTORS.
- PROVIDE 2" AND 1-1/4" U.O.N. CONDUITS FOR TECHNOLOGY AND AUXILIARY SYSTEM WIRE AS INDICATED. STUB CONDUITS FROM CEILING SPACE. PROVIDE PLASTIC BUSHINGS AT EACH END. PROVIDE REMOVABLE/RESEALABLE FIRE STOP PUTTY IN EACH CONDUIT AND FIRE STOP AROUND EACH CONDUIT. COORDINATE WITH TECHNOLOGY CONTRACTOR FOR EXACT LOCATION OF CONDUIT. PROVIDE MINIMUM OF 1" CONDUIT FOR ALL OTHER AREAS REQUIRING SLEEVES.
- PROVIDE 1/2" CONDUIT WITH PULL STRING AND BUSHINGS FOR TECHNOLOGY. ROUTE UNDER BUILDING AND TERMINATE AT EXTERIOR OF BUILDING.
- COORDINATE MOUNTING LOCATION WITH TECHNOLOGY CONTRACTOR.
- CONNECT FIRE ALARM DEVICES TO ELECTRIC COILING DOOR AND FIRE ALARM SYSTEM. ROLL UP DOOR SHALL CLOSE UPON ACTIVATION OF THE SMOKE DETECTORS ASSOCIATED WITH THE COILING FIRE DOOR. COORDINATE WITH COILING DOOR CONTRACTOR FOR ALL SMOKE DETECTORS AND CONTROL MODULES REQUIRED FOR A COMPLETE SYSTEM.
- HAND DRYERS FURNISHED BY OTHERS AND INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL TRADES.
- SMOKE DAMPER DUCT SMOKE DETECTOR. SMOKE DETECTOR SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR SO THAT UPON DETECTION OF SMOKE THE SUPPLY/RETURN FAN WILL SHUT DOWN. ELECTRICAL CONTRACTOR SHALL WIRE DUCT DETECTOR TO FIRE ALARM SYSTEM AND CIRCUIT DAMPER ACTUATOR. PROVIDE A 20A-1P SWITCH AT EACH ACTUATOR. CONTROL OF AIR HANDLING EQUIPMENT IS VIA THE FIRE ALARM CONTROL PANEL. PROVIDE ALL REQUIRED CONTROL MODULES AND RELAYS. COORDINATE WORK WITH THE TEMPERATURE CONTROLS CONTRACTOR AND FIRE ALARM MANUFACTURER. DAMPER SHALL CLOSE UPON DETECTION OF SMOKE AND SHUT DOWN ASSOCIATED AIR HANDLER. DAMPER SHALL ALSO CLOSE UPON NORMAL SHUTDOWN OF AIR HANDLER.
- CARBON MONOXIDE DETECTOR. COORDINATE QUANTITY WITH FIRE MARSHAL.
- SCOREBOARD. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO ROUGH IN.
- WALL MOUNT TRANSFORMER.
- ELECTRIC RANGE. PROVIDE WALL MOUNTED GFCI MODULE ABOVE COUNTER.
- LIGHTING RELAY PANEL FOR THEATRICAL LIGHTING SYSTEM. REFER TO THEATRICAL LIGHTING EQUIPMENT DRAWINGS.



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REGISTRATION SEAL

CONSULTANT

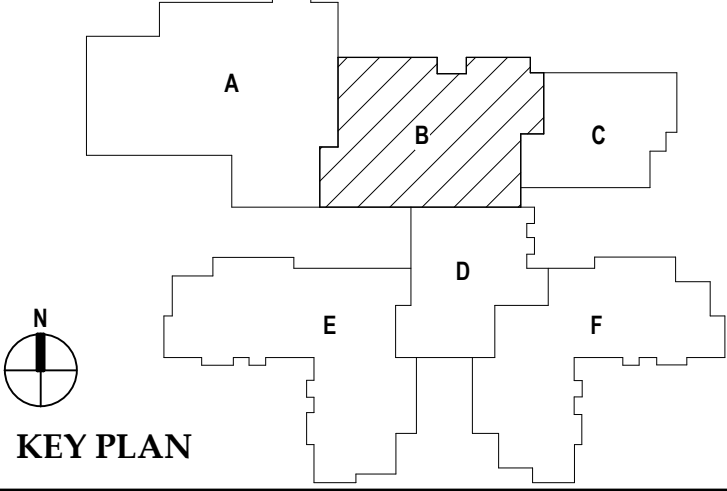


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PBA Project No. 2023.0154

PROJECT TITLE  
**NEW SMITH MIDDLE SCHOOL**  
Bid Package No. 03B

Troy School District  
**TROY, MI**

DRAWING TITLE  
**FIRST LEVEL POWER AND AUXILIARY SYSTEMS PLAN - ZONE 'B'**



ISSUE DATES

DATE	ISSUED FOR:
07-12-2024	ADDENDUM #2
08-16-2024	CONSTRUCTION DOCUMENTS
DATE:	ISSUED FOR:
DRAWN: DDB	
CHECKED: ZDB	
APPROVED: STP	

PROJECT NO.  
**22102**  
DRAWING NO.  
**E3.1B**



































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PROJECT TITLE  
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Bid Package No. 03B

Troy School District  
**TROY, MI**

DRAWING TITLE  
**PANEL SCHEDULES**

ISSUE DATES

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06-16-2024 CONSTRUCTION DOCUMENTS

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APPROVED: STP

PROJECT NO.  
**22102**

DRAWING NO.  
**E5.3**

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	B	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	NC	RANGE HOOD		20	600	600		20		RANGE HOOD	NC	2
3	NC	RANGE HOOD		20				20		RANGE HOOD	NC	4
5	K	ELECTRIC RANGE	GFCI	50	3625	3625		50	GFCI	ELECTRIC RANGE	K	8
9	K	ELECTRIC RANGE	GFCI	50	3625	3625		50	GFCI	ELECTRIC RANGE	K	10
11	NC	RANGE HOOD		20	600	3625		20		ELECTRIC RANGE	K	14
13	NC	RANGE HOOD		20	600	3625		50	GFCI	ELECTRIC RANGE	K	16
15	K	ELECTRIC RANGE	GFCI	50		3625		20		RANGE HOOD	NC	18
17	K	ELECTRIC RANGE	GFCI	50	3625	175		15		RF-103	NC	20
21	K	ELECTRIC RANGE	GFCI	50		3625	175			RF-102	NC	24
23	NC	RANGE HOOD		20	300	560		15		RF-101	NC	26
25	NC	ERWP-109		15		300	560			EF-107	M	28
27	NC	ERWP-108		15	300	156		15		SPARE	M	30
29	M	EF-104		15		348	0			SPARE	M	32
31	M	EF-105		15			284	0		SPARE	M	34
35	NC	HEAT TRACE		20	750	0		20		SPARE	M	36
37	R	SERVICE RECEPTACLE		20			360	0		SPARE	M	38
39	M	EF-106		15				348	0	SPARE	M	40
41	M	EF-106		15						SPARE	M	42
43	--	SPACE	--	--	--	--	--	--	--	SPACE	--	44
45	--	SPACE	--	--	--	--	--	--	--	SPACE	--	46
47	--	SPACE	--	--	--	--	--	--	--	SPACE	--	48
49	--	SPACE	--	--	--	--	--	--	--	SPACE	--	50
51	--	SPACE	--	--	--	--	--	--	--	SPACE	--	52
53	--	SPACE	--	--	--	--	--	--	--	SPACE	--	54
55	--	SPACE	--	--	--	--	--	--	--	SPACE	--	56
57	--	SPACE	--	--	--	--	--	--	--	SPACE	--	58
59	--	SPACE	--	--	--	--	--	--	--	SPACE	--	60
					18541	21088	21337					
					0A	0B	0C					

**PANELBOARD INFORMATION**      **BRANCH CIRCUIT CONNECTED LOAD**      **DEMAND FACTOR**      **CALCULATED LOAD**      **FEEDER AND OVERCURRENT**      **NOTES**

VOLTAGE: 208Y/120V      CONTINUOUS LOAD (C): 0      100% 0      125% 0  
BUS AMPACITY: 200A      ELECTRIC HEAT (E): 0      100% 0      100% 0  
MAIN TYPE: 200A MCB      NON-CONTINUOUS LOAD (NC): 8740      100% 8740  
MINIMUM A.I.C.: 22,000      KITCHEN LOAD (K): 50750      65.00% 32967.5      100% 32967.5  
MOUNTING: SURFACE      RECEPT BASE LOAD (R): 360      100% 360      100% 360  
RECEPT DEMAND LOAD (R): 0      100% 0      100% 0  
LIGHTING LOAD (L): 0      100% 0      100% 0  
ADDITIONAL TRACK LIGHTING...      0      100% 0  
MOTORS, HIGHEST LOAD (M): 348      125 % 435      100% 435  
MOTORS, REMAINING      768      100 % 768      100 % 768

**PANELBOARD LOCATION**      NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...      **TOTAL (kVA): 43.29**      **TOTAL... 120.16**

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	B	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#		
1	L	ELEVATOR PIT LIGHTS		20	90	1080		20		RECEPTACLES	R	2		
3	K	ELECTRIC RANGE	GFCI	50		3640	180	20	GFCI	REFRIGERATOR	R	4		
5	NC	RANGE HOOD		20	250	1080		20		RECEPTACLES	R	6		
7	NC	RANGE HOOD		20			3640	180	20	RECEPTACLES	R	8		
9	K	RECEPTACLES		20			360	900	20	RECEPTACLES	R	10		
11	K	REFRIGERATOR	GFCI	20				180	720	20	RECEPTACLES	R	12	
13	R	RECEPTACLES		20	540	1080		20		RECEPTACLES	R	14		
15	R	RECEPTACLES		20			720	1080	20	RECEPTACLES	R	16		
17	R	RECEPTACLES		20				900	900	20	RECEPTACLES	R	18	
19	R	RECEPTACLES		20	540	900		20		RECEPTACLES	R	20		
21	NC	WON DOOR		20			100	540	20	RECEPTACLES	R	22		
23	R	RECEPTACLES		20				900	900	20	RECEPTACLES	R	24	
25	NC	SOUND RACK		20	360	1080		20		RECEPTACLES	R	26		
27	R	RECEPTACLES		20			540	540	20	RECEPTACLES	R	28		
29	NC	ERWP-110		15				700	750	20	COPIER	R	30	
31	NC	ERWP-111		15				700	180	20	REFRIGERATOR	R	32	
33	NC	ERWP-112		15				700	720	20	RECEPTACLES	R	34	
35	NC	ERWP-112		15				700	900	20	RECEPTACLES	R	36	
37	NC	ERWP-112		15				700	720	20	RECEPTACLES	R	38	
39	R	VENDING MACHINE		20			700	720	20	RECEPTACLES	R	40		
41	R	VENDING MACHINE		20			500	900	20	RECEPTACLES	R	42		
43	R	RECEPTACLES		20	180	720		20		RECEPTACLES	R	44		
45	NC	DISHWASHER	GFCI	20			250	1080	20	RECEPTACLES	R	46		
47	NC	DISPOSAL	GFCI	20				180	1080	20	RECEPTACLES	R	48	
49	R	REFRIGERATOR	GFCI	20	180	395		15		EF-116	M	50		
51	M	EF-114		15			696	395	15		EF-114	M	52	
53	M	EF-115		15				264	264	15		EF-201	M	54
55	M	EF-117		15	395	395		15		EF-202	M	56		
57	R	RECEPTACLES		20			395	395	15		EF-203	M	58	
59	R	SERVICE RECEPTACLES		20	360	395		15		HEAT TRACE	NC	60		
63	NC	HEAT TRACE		20			250	250	20	HEAT TRACE	NC	64		
65	--	SPARE	--	--	--	--	--	--	--	SPARE	--	66		
67	--	SPARE	--	--	--	--	--	--	--	SPARE	--	68		
69	--	SPARE	--	--	--	--	--	--	--	SPARE	--	70		
71	--	SPARE	--	--	--	--	--	--	--	SPARE	--	72		
					12501	15152	15313							
					0A	0B	0C							

**PANELBOARD INFORMATION**      **BRANCH CIRCUIT CONNECTED LOAD**      **DEMAND FACTOR**      **CALCULATED LOAD**      **FEEDER AND OVERCURRENT**      **NOTES**

VOLTAGE: 208Y/120V      CONTINUOUS LOAD (C): 0      100% 0      125% 0  
BUS AMPACITY: 200A      ELECTRIC HEAT (E): 0      100% 0      100% 0  
MAIN TYPE: 200A MCB      NON-CONTINUOUS LOAD (NC): 5840      100% 5840  
MINIMUM A.I.C.: 10,000      KITCHEN LOAD (K): 7820      80.00% 6256      100% 6256  
MOUNTING: SURFACE      RECEPT BASE LOAD (R): 10000      100% 10000      100% 10000  
RECEPT DEMAND LOAD (R): 14830      50% 7415      100% 7415  
LIGHTING LOAD (L): 90      100% 90      100% 90  
ADDITIONAL TRACK LIGHTING...      0      100% 0  
MOTORS, HIGHEST LOAD (M): 790.4      125 % 988      100% 988  
MOTORS, REMAINING      3959.2      100 % 3959.2      100 % 3959.2

**PANELBOARD LOCATION**      NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...      **TOTAL (kVA): 34.18**      **TOTAL... 94.95**

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	B	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	NC	TU-201		15	833	29930		125	STB	ERU-9	NC	2
3	NC	TU-201		15		833	29930			SPACE	NC	4
5	NC	TU-202		15	2167	--		2167	29930	--	NC	6
7	NC	TU-202		15		2167	29930			SPACE	NC	8
9	NC	TU-203		15	833	29930		2167	29930	125	NC	10
11	NC	TU-203		15		833	1500			TU-211,213,214	NC	12
13	NC	TU-204		15	1333	2333		1333	2333	15	NC	14
15	NC	TU-204		15		1333	2333			TU-212	NC	16
17	NC	TU-205		15	2333	3667		2333	3667	20	NC	18
19	NC	TU-206		20	3167	1109		3167	1109	15	M	20
21	NC	TU-206		20		3167	1109			EUH-202	M	22
23	NC	TU-207		20	3167	2167		3167	2167	15	M	24
25	NC	TU-208		15	2167	2167		2167	2167	15	M	26
27	NC	TU-209		20	3667	1500		3667	1500	15	M	28
29	NC	TU-210		15	2167	2333		2167	2333	15	M	30
31	--	SPARE	--	--	--	--	--	--	--	SPARE	--	32
33	--	SPARE	--	--	--	--	--	--	--	SPARE	--	34
35	--	SPARE	--	--	--	--	--	--	--	SPARE	--	36
37	--	SPARE	--	--	--	--	--	--	--	SPARE	--	38
39	--	SPARE	--	--	--	--	--	--	--	SPARE	--	40
41	--	SPARE	--	--	--	--	--	--	--	SPARE	--	42
43	--	SPARE	--	--	--	--	--	--	--	SPARE	--	44
45	--	SPARE	--	--	--	--	--	--	--	SPARE	--	46
47	--	SPARE	--	--	--	--	--	--	--	SPARE	--	48
49	--	SPARE	--	--	--	--	--	--	--	SPARE	--	50
51	--	SPARE	--	--	--	--	--	--	--	SPARE	--	52
53	--	SPARE	--	--	--	--	--	--	--	SPARE	--	54
55	--	SPARE	--	--	--	--	--	--	--	SPARE	--	56
57	--	SPARE	--	--	--	--	--	--	--	SPARE	--	58
59	--	SPARE	--	--	--	--	--	--	--	SPARE	--	60
					96668	86468	96668					
					0A	0B	0C					

**PANELBOARD INFORMATION**      **BRANCH CIRCUIT CONNECTED LOAD**      **DEMAND FACTOR**      **CALCULATED LOAD**      **FEEDER AND OVERCURRENT**      **NOTES**

VOLTAGE: 480Y/277V      CONTINUOUS LOAD (C): 0      100% 0      125% 0  
BUS AMPACITY: 800A      ELECTRIC HEAT (E): 0      100% 0      100% 0  
MAIN TYPE: MLO      NON-CONTINUOUS LOAD (NC): 255079.02      100% 255079.02  
MINIMUM A.I.C.: 42,000      KITCHEN LOAD (K): 0      100% 0      100% 0  
MOUNTING: SURFACE      RECEPT BASE LOAD (R): 0      100% 0      100% 0  
RECEPT DEMAND LOAD (R): 0      50% 0      100% 0  
LIGHTING LOAD (L): 0      100% 0      100% 0  
ADDITIONAL TRACK LIGHTING...      0      100% 0  
MOTORS, HIGHEST LOAD (M): 11000      125 % 13750      100% 13750  
MOTORS, REMAINING      26325.54      100 % 26325.54      100 % 26325.54

**PANELBOARD LOCATION**      NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...      **TOTAL (kVA): 295.15**      **TOTAL... 355.02**

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	B	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	NC	EUH-201		15	333	3242		20		EUH-105	NC	2
3	NC	EUH-201		15		333	3242			EUH-105	NC	4
5	NC	TU-124,125,126,127		15	2680	4268		20		EUH-103	NC	6
7	NC	FPB-101		25	5293	4268		20		EUH-104	NC	8
9	NC	FPB-102		35	7290	4540		20		TU-119	NC	10
11	NC	FPB-103		30	6137	667		15		TU-118	NC	12
13	NC	TU-123		20	3333	2010		15		TU-114,115,117	NC	14
15	NC	TU-120		15	1500	667		15		TU-116	NC	16
17	NC	TU-103,104,105		15	1500	2680		15		TU-110,111,112,113	NC	







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Troy School District  
TROY, MI

DRAWING TITLE  
**PANEL SCHEDULES**

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PROJECT NO.

**22102**

DRAWING NO.

**E5.5**

PANELBOARD RP-6B													
#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	B	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#	
1	R	RECEPTACLES		20	720	1500				DRYER	R	2	
3	R	RECEPTACLES		20		900	1500			WASHER	R	4	
5	R	CORD REELS		20				720	1200	20	R	6	
7	R	CORD REELS		20	720	1050				15	NC	8	
9	R	CORD REELS		20		720	1050			15	NC	10	
11	R	CORD REELS		20			360	600		15	NC	12	
13	R	RECEPTACLES		20	900	600				15	NC	14	
15	R	RECEPTACLES		20		720	750			15	NC	16	
17	R	RECEPTACLES		20			900	750		15	NC	18	
19	R	RECEPTACLES		20	1380	36				15	NC	20	
21	R	RECEPTACLES		20		360	36			15	NC	22	
23	R	DUST COLLECTOR		20			1200	250		20	NC	24	
25	R	CHOP SAW		20	1200	720				20	R	26	
27	R	TABLE SAW		20		1200	250			20	NC	28	
29	R	DRILL PRESS		20			1200	250		20	NC	30	
31	R	BAND SAW		20	1200	250				20	NC	32	
33	R	RECEPTACLES		20		540	520			15	NC	34	
35	R	RECEPTACLES		20			540	520		15	M	36	
37				20	2567	520				15	NC	38	
39	NC	MAU-2 CONDENSER		20		2567	520			20	NC	40	
41				20			2567	700		15	NC	42	
43				20	577	360				20	R	44	
45	NC	MAU-2 FAN		15		577	0			20	--	46	
47				20			577	0		20	--	48	
49	NC	MAU-2 CONTROLS		15	240	0				20	--	50	
51	--	SPARE		20		0	0			20	--	52	
53	--	SPARE		20		0	0			20	--	54	
55	--	SPARE		20	0	0				20	--	56	
57	--	SPARE		20		0	0			20	--	58	
59	--	SPARE		20		0	0			20	--	60	
					14539	12209	12333						
				DA	DB	DC							
PANELBOARD INFORMATION													
BRANCH CIRCUIT CONNECTED LOAD													
VOLTAGE: 208Y/120V CONTINUOUS LOAD (C): 0 100% 0 125% 0													
BUS AMPACITY: 225A ELECTRIC HEAT (E): 0 100% 0 100% 0													
MAIN TYPE: MLO NON-CONTINUOUS LOAD (NC): 15470 100% 15470 100% 15470													
MINIMUM A.I.C.: 0 100% 0 100% 0													
MOUNTING: SURFACE KITCHEN LOAD (K): 0 100% 0 100% 0													
RECEPT BASE LOAD (R): 10000 100% 10000 100% 10000													
RECEPT DEMAND LOAD (RD): 10760 50% 5380 100% 5380													
LIGHTING LOAD (L): 0 100% 0 125% 0													
ADDITIONAL TRACK LIGHTING... 0 100% 0 100% 0													
MOTORS, HIGHEST LOAD (M): 1040 125% 1300 100% 1300													
MOTORS, REMAINING 1812 100% 1812 100% 1812													
TOTAL (kVA): 33.96 TOTAL: 94.27													
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...													

PANELBOARD RP-4B													
#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	B	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#	
1	R	EWC		20	180	750				ERWP-122	NC	2	
3	NC	HAND DRYER		20		750	750			15	NC	4	
5	NC	HAND DRYER		20			750	300		15	NC	6	
7	NC	HAND DRYER		20	750	300				15	NC	8	
9	NC	HAND DRYER		20		750	36			15	M	10	
11	R	RECEPTACLES		20			540	83		15	M	12	
13	R	RECEPTACLES		20	1080	83				15	M	14	
15	R	RECEPTACLES		20		900	250			20	NC	16	
17	R	RECEPTACLES		20			720	360		20	R	18	
19	R	RECEPTACLES		20	900	250				20	NC	20	
21	R	RECEPTACLES		20		720	264			15	M	22	
23	R	RECEPTACLES		20			720	395		15	M	24	
25	R	COPIER		20	180	395				15	M	26	
27	R	REFRIGERATOR		20		180	395			15	M	28	
29	R	RECEPTACLES		20			720	395		20	R	30	
31	R	RECEPTACLES		20	720	720		1050	1080	20	R	32	
33	NC	ERWP-116,117		15			1050	900		20	R	34	
37	M	EF-112		15	36	1080				20	R	36	
39	NC	ERWP-118		15		750	1000			20	NC	40	
41				20			750	0		20	--	42	
43	NC	ERWP-119		15	750	0		750	0	20	--	44	
45	NC	ERWP-120		15		750	0			20	--	46	
47	NC	ERWP-120		15	750	0		750	0	20	--	48	
49				20			750	0		20	--	50	
51	NC	ERWP-121		15			750	0		20	--	52	
53	--	SPARE		20	0	0		750	0	20	--	54	
55	--	SPARE		20	0	0		0	0	20	--	56	
57	--	SPARE		20		0	0			20	--	58	
59	--	SPARE		20		0	0			20	--	60	
					8924	10375	9184						
				DA	DB	DC							
PANELBOARD INFORMATION													
BRANCH CIRCUIT CONNECTED LOAD													
VOLTAGE: 208Y/120V CONTINUOUS LOAD (C): 0 100% 0 125% 0													
BUS AMPACITY: 200A ELECTRIC HEAT (E): 0 100% 0 100% 0													
MAIN TYPE: 200A MCB NON-CONTINUOUS LOAD (NC): 14700 100% 14700 100% 14700													
MINIMUM A.I.C.: 10,000 KITCHEN LOAD (K): 0 100% 0 100% 0													
MOUNTING: SURFACE RECEPT BASE LOAD (R): 10000 100% 10000 100% 10000													
RECEPT DEMAND LOAD (RD): 1700 50% 850 100% 850													
LIGHTING LOAD (L): 0 100% 0 125% 0													
ADDITIONAL TRACK LIGHTING... 0 100% 0 100% 0													
MOTORS, HIGHEST LOAD (M): 790.4 125% 988 100% 988													
MOTORS, REMAINING 1292.8 100% 1292.8 100% 1292.8													
TOTAL (kVA): 27.83 TOTAL: 77.25													
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...													

PANELBOARD RP-5B													
#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A	B	C	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#	
1	R	RECEPTACLES		20	1080	1080				RECEPTACLES	R	2	
3	R	RECEPTACLES		20		900	540			20	R	4	
5	R	RECEPTACLES		20				900	1080	20	R	6	
7	NC	HAND DRYER		20	750	720				20	R	8	
9	NC	HAND DRYER		20		750	720			20	R	10	
11	NC	HAND DRYER		20			750	720		20	R	12	
13	NC	HAND DRYER		20	750	720				20	R	14	
15	R	RECEPTACLES		20		180	720			20	R	16	
17	R	RECEPTACLES		20			900	180		20	R	18	
19	NC	ERWP-124,125		15	900	180				GFCI	R	20	
21	M	EF-116		15		36	720			20	R	22	
23	NC	ERWP-128,127		15			1050	900		20	R	24	
25	NC	ERWP-128		15	1050	720		750	720	20	R	26	
27	NC	ERWP-128		15		750	720			20	R	28	
29	NC	ERWP-129		15			750	720		20	R	30	
31	NC	ERWP-129		15	750	720		750	720	20	R	32	
33	NC	ERWP-130		15		750	720			20	R	34	
35	NC	ERWP-130		15	750	720		750	900	20	R	36	
37	NC	ERWP-131		15		750	900			20	R	38	
39	NC	ERWP-131		15			750	900		20	R	40	
41	NC	ERWP-131		15			750	900		20	R	42	
43	NC	ERWP-132,133		15	1050	900		1050	1080	20	R	44	
45	M	EF-119		15		1050	1080			20	R	46	
47	M	EF-119		15			36	900		20	R	48	
49	M	RF-105		20	83	900				20	R	50	
51	M	RF-105		20		83	720			20	R	52	
53	M	RF-201		15	83	1080		83	180	20	R	54	
55	M	RF-201		15	83	1080		250	720	20	R	56	
57	NC	SMOKE DAMPER		20			36	900		20	R	58	
59	M	EF-205		20						20	NC	60	
61	NC	ERWP-210,211		20	1050	750		1050	750	20	NC	62	
63	NC	ERWP-206		20			750	750		20	M	64	
65	NC	ERWP-206		20			750	750		20	M	66	
67	NC	ERWP-206		20			750	750		20	M	68	
69	NC	ERWP-209		20			750	750		20	M	70	
71	--	SPARE		20	0	0		750	0	20	--	72	
73	--	SPARE		20	0	0		0	0	20	--	74	
75	--	SPARE		20		0	0			20	--	76	
77	--	SPARE		20		0	0			20	--	78	
79	--	SPARE		20	0	0		0	0	20	--	80	
81	--	SPARE		20		0	0			20	--	82	
83	--	SPARE		20		0	0			20	--	84	
					18286	16359	15455						
				DA	DB	DC							
PANELBOARD INFORMATION													
BRANCH CIRCUIT CONNECTED LOAD													
VOLTAGE: 208Y/120V CONTINUOUS LOAD (C): 0 100% 0 125% 0													
BUS AMPACITY: 225A ELECTRIC HEAT (E): 0 100% 0 100% 0													
MAIN TYPE: 225A MCB NON-CONTINUOUS LOAD (NC): 21100 100% 21100 100% 21100													
MINIMUM A.I.C.: 0 100% 0 100% 0													
MOUNTING: SURFACE KITCHEN LOAD (K): 0 100% 0 100% 0													
RECEPT BASE LOAD (R): 10000 100% 10													



































TMP ARCHITECTURE INC  
 1191 WEST SQUARE LAKE ROAD  
 BLOOMFIELD HILLS - MICHIGAN 48302  
 PH: 248.338.4551 FX: 248.338.0223  
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REGISTRATION SEAL

CONSULTANT



PROJECT TITLE  
**NEW SMITH  
 MIDDLE SCHOOL**  
 Bid Package No. 03B

Troy School District  
 Troy, Michigan

DRAWING TITLE  
 New Smith Middle School  
 Troy School District  
 Troy, Mi.  
 Theatrical Electrical  
 Location Plan View

ISSUE DATES


06-18-24 CONSTRUCTION DOCUMENTS

DATE: ISSUED FOR:

DRAWN BE

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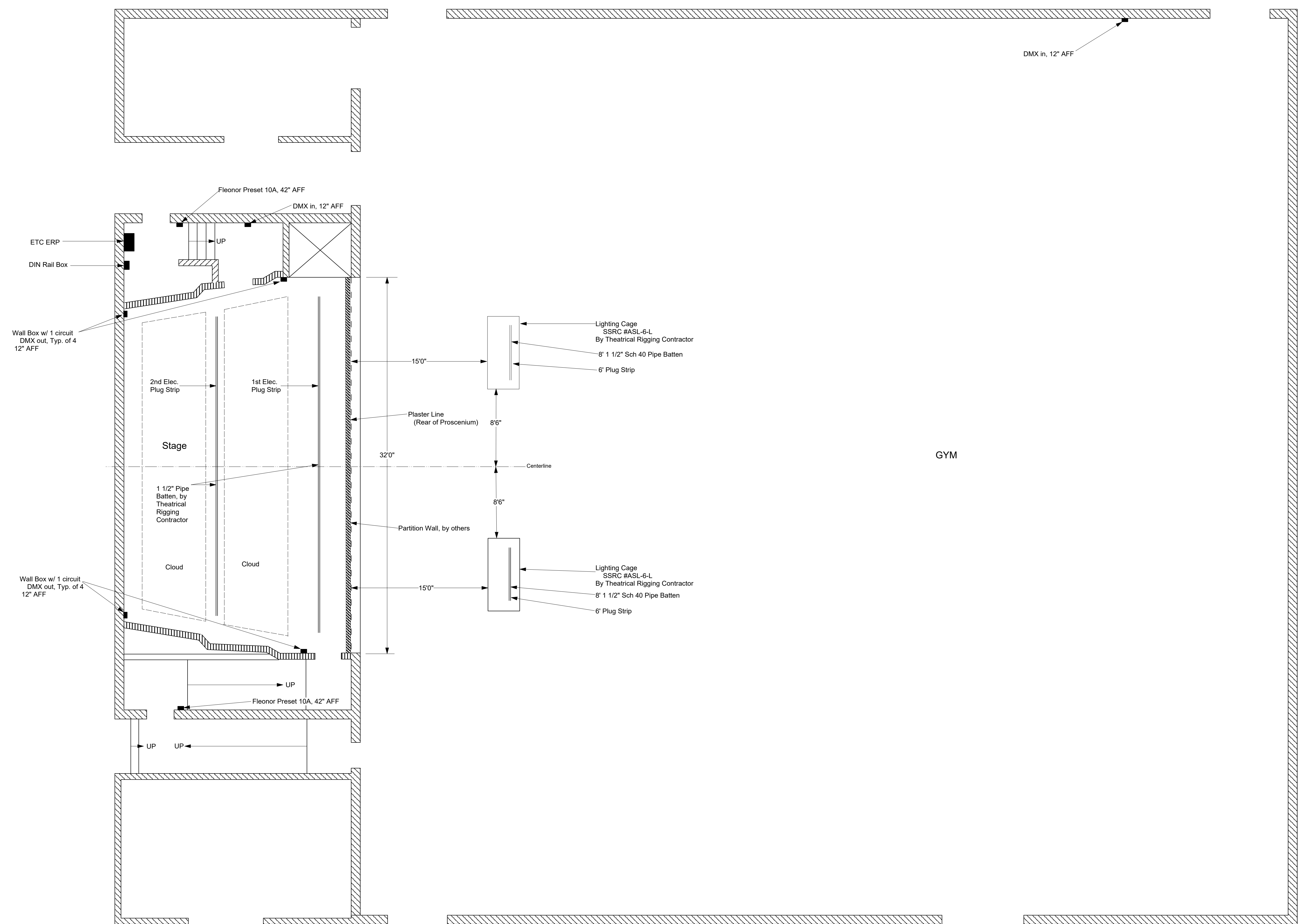
APPROVED

PROJECT NO.

**22102**

DRAWING NO.

**TE1.1**



Theatrical Electrical Equipment Plan View

Scale: 3/16" = 1'0"

New Smith Middle School  
 Troy School District  
 Troy, Mi





TMP ARCHITECTURE INC

1191 WEST SQUARE LAKE ROAD  
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REGISTRATION SEAL

CONSULTANT



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PROJECT TITLE

**NEW SMITH  
MIDDLE SCHOOL**  
Bid Package No. 03B

Troy School District  
Troy, Michigan

DRAWING TITLE

**New Smith Middle  
School**  
Troy School District  
Troy, Mi.  
Theatrical Electrical  
Location Section at  
Centerline and Details

ISSUE DATES


06-18-24 CONSTRUCTION DOCUMENTS

DATE: ISSUED FOR:

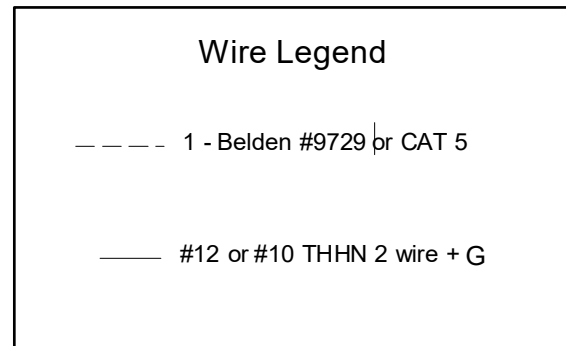
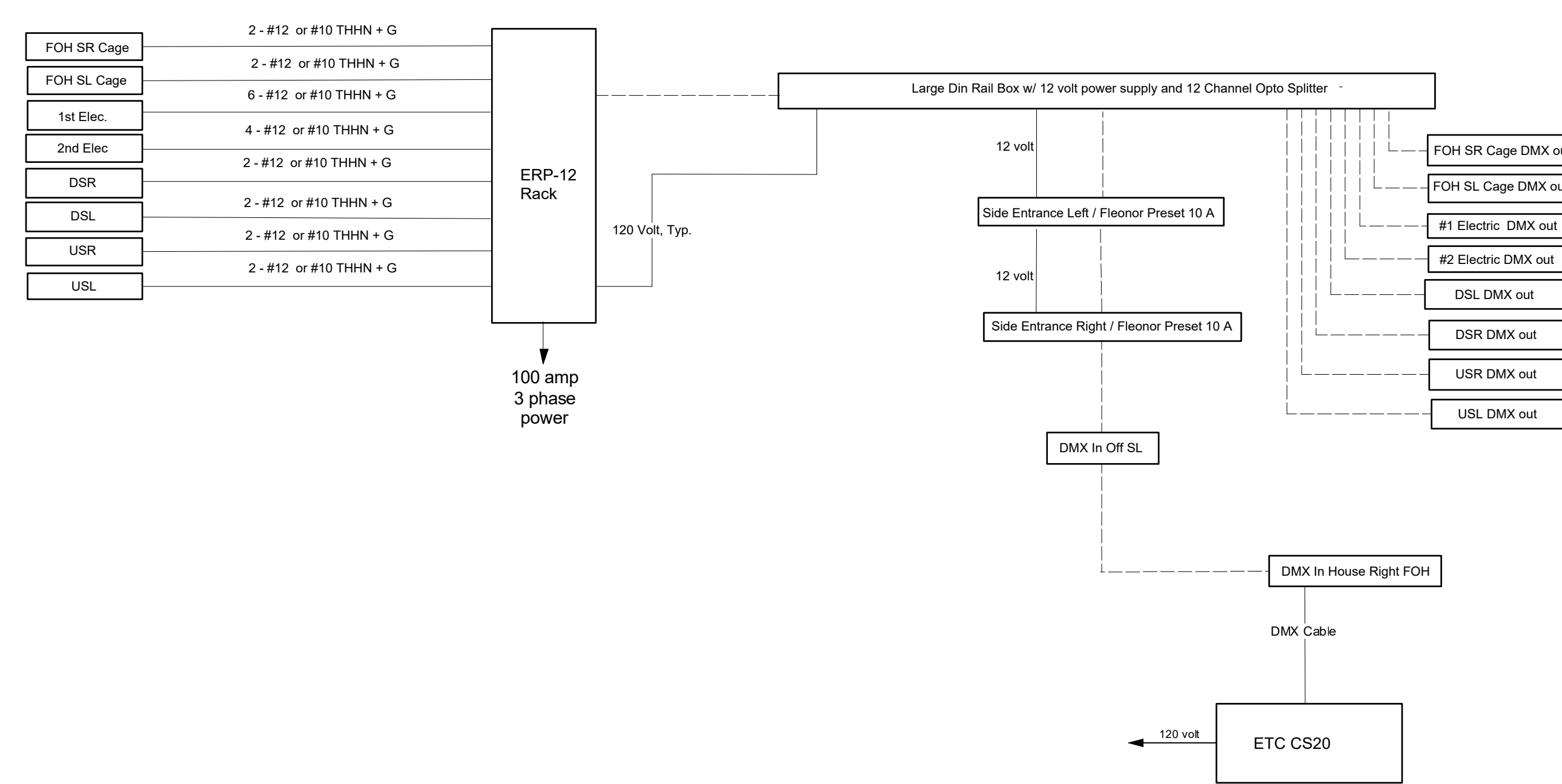
DRAWN: BE  
CHECKED:  
APPROVED:

PROJECT NO.

**22102**

DRAWING NO.

**TE1.2**



Loc #	Qty #	Module	Location
1	1	20 amp Relay	FOH SR Cage
2	2		FOH SL Cage
3	3		
4	4		1st Electric
5	5		
6	6		2nd Electric
7	7		
8	8		DSR
9	9		DSL
10	10		USR
11	11		USL
12	12		spare future use
13	13	20 amp Breaker	DIN Box Power
14	14		
15	15		As Needed
16	16		
17	17		
18	18		

Relay / Breaker Schedule

- FOH - 1 / Relay #1
- FOH - 2 / Relay #2
- #1 Electric / Relay #3
- #1 Electric / Relay #4
- #1 Electric / Relay #5
- #2 Electric / Relay #6
- #2 Electric / Relay #7
- DSR / Relay #8
- DSL / Relay #9
- USR / Relay #10
- USL / Relay #11

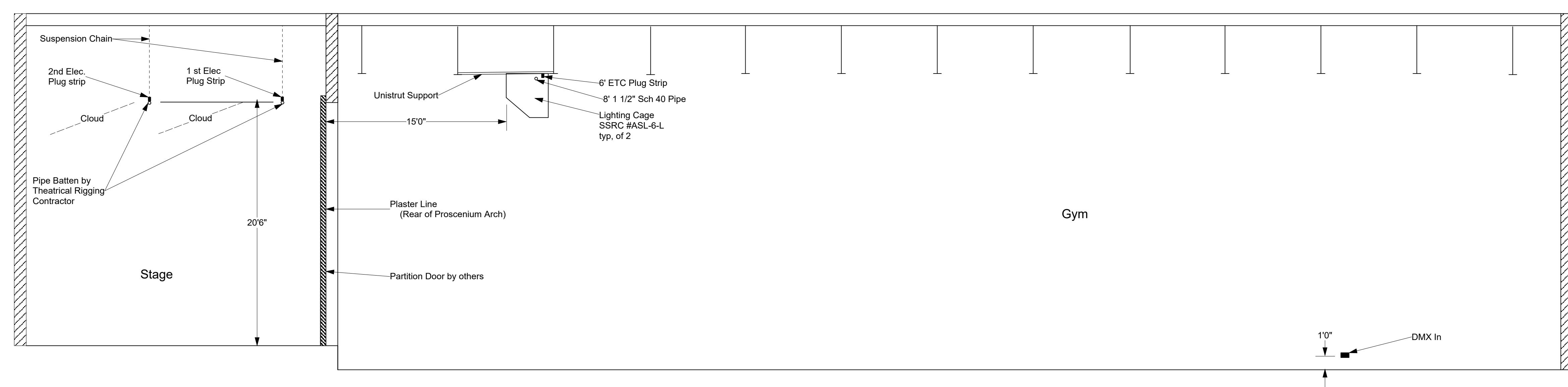
Fixture Hang Position

- FOH SR Cage / 6 - CSSPOTy
- FOH SL Cage / 6 - CSSPOTy
- 1st Electric / 10 - CSPAR
- 2nd Electric / 4 - CSCYC
- Portable LED Followspot

Fixture Allocation

Fixture Count	
CSSPOTy	-12
CSPAR Medium	+10
CSCYC	-4
Followspot	-1

Theatrical Electrical Distribution and Control Riser Diagram



Theatrical Electrical Equipment Section at Centerline scale 3/16" = 1'0"

New Smith Middle School  
Troy School District  
Troy, Mi



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REGISTRATION SEAL

CONSULTANT



PROJECT TITLE  
**NEW SMITH MIDDLE SCHOOL**  
 Bid Package No. 03B

Troy School District  
 Troy, Michigan

DRAWING TITLE  
 New Smith Middle School  
 Troy School District  
 Troy, Mi.  
 Theatrical Rigging  
 Plan View

ISSUE DATES


06-18-24 CONSTRUCTION DOCUMENTS

DATE: ISSUED FOR:

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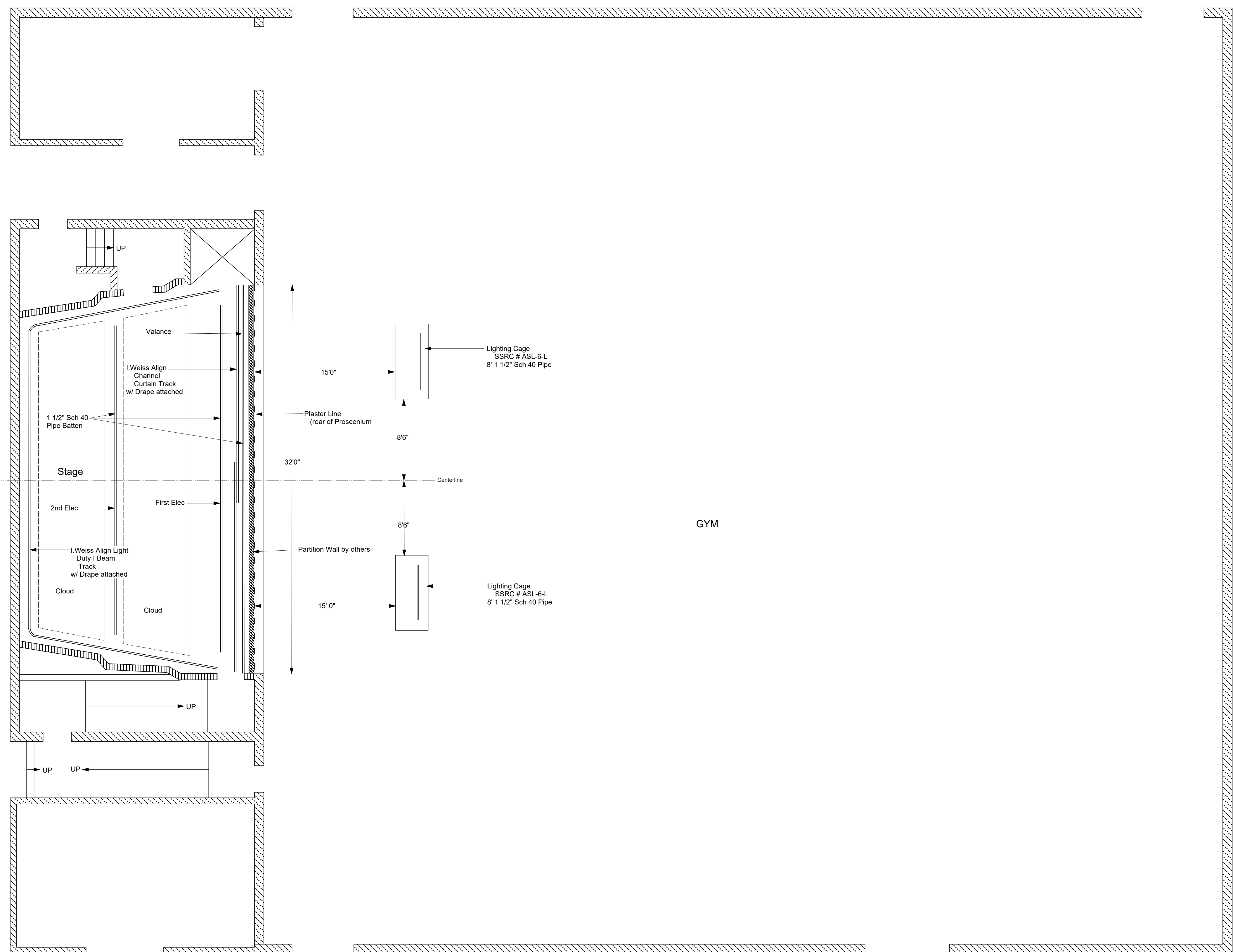
APPROVED

PROJECT NO.

**22102**

DRAWING NO.

**TR1.1**



Theatrical Rigging Plan View

Scale : 3/16" = 1'0"

New Smith Middle School  
 Troy School District  
 Troy, Mi



