

**Addendum No. 3**  
**August 31, 2022**

Project: **St. Mary Catholic School Addition & Remodel**  
812 N. State Avenue  
Dell Rapids, South Dakota 57022  
Architecture Incorporated Project #2788

Architect: Architecture Incorporated

Letting: September 8, 2022  
2:00 PM  
St. Mary Catholic Church  
Parish Hall  
608 East 8<sup>th</sup> Street  
Dell Rapids, South Dakota 57022

Scope of this Addendum:

To all bidders and all others to whom drawings and specifications have been issued by Architecture Incorporated, this Addendum forms a part of the Contract Documents. Acknowledge receipt of this addendum by listing its number and date in the bidder's Form of Proposal. Failure to do so may subject bidder to disqualification. This addendum modifies the drawings and specifications as follows:

**GENERAL ITEMS:**

1. GENERAL
2. SECTION 012300:
  - a. 3.1 Add Alternate No. 3: Replacement of existing High School Windows includes the following elevations:
    - i. 11 / 5.10
    - ii. 12 / 5.10
    - iii. 13 / 5.10
    - iv. Windows:
      1. D1
      2. F1
      3. G1
3. SECTION 312300:
  - a. PART 2 – PRODUCTS 2.2. E omit section for termite treatment
4. SHEET 4.23 FIRST & SECOND FINISH FLOOR PLAN – AREA B
  - a. Omit reference to (1) 4' Markerboard and (2) 4' Tackboards at the west side of B201.
5. SHEET 4.50 – INTERIOR ELEVATIONS
  - a. Refer to attached SD-03 for clarification of wall mounted display casework as shown on 7/4.50.

6. SHEET 4.17 – ALT #5 – SCIENCE ROOM

- a. Provide plastic laminate shelving at Science Storage A207.

7. SHEET 7.20 – CASEWORK SECTIONS

- a. Detail 10/7.20, coordinate the lighting fixture installation at the art case on the sides and upper lighting – see electrical

**MECHANICAL ITEMS:**

DRAWING SHEET 8.12 – SCHEDULES

1. PLUMBING FIXTURE SCHEDULE:  
ESH-1: Add emergency shower test cone. Refer to revised drawing sheet 8.12, Addendum 2, dated 8/30/22.
2. UNIT HEATER SCHEDULE:
  - a) Remove cabinet unit heater CUH-A24. Refer to revised drawing sheet 8.12, Addendum 2, dated 8/30/22
  - b) Add unit heater UH-A24. Refer to revised drawing sheet 8.12, Addendum 2, dated 8/30/22.
  - c) Add unit heater UH-B002. Refer to revised drawing sheet 8.12, Addendum 2, dated 8/30/22.

DRAWING SHEET 8.31 – ENLARGED GROUND FLOOR PLAN – AREA B – PLUMBING & HEATING

1. MECHANICAL ROOM B001:
  - a) Add interconnecting piping for boilers, chiller, pumps, air separator & expansion tank. Refer to revised drawing sheet 8.31, Addendum 2, dated 8/30/22.
  - b) Add hose bibb & associated ¾” cold water piping. Refer to revised drawing sheet 8.31, Addendum 2, dated 8/30/22.
  - c) Plumbing Note #18: Add “317 gallon” dual water system vertical expansion tank.
2. ELECTRICAL ROOM B002:  
Add unit heater UH-B002 & associated piping. Refer to revised drawing sheet 8.31, Addendum 2, dated 8/30/22.
3. HEATING/COOLING SYSTEM DIAGRAM: Modify Boiler B-1, B-2, P-1 & P-2 labels. Refer to revised drawing sheet 8.31, Addendum 2, dated 8/30/22.

DRAWING SHEET 8.32 – GROUND FLOOR PLAN – AREA A – PLUMBING & HEATING

1. STORAGE A24: Modify location of 2 ½” DWS & 2 ½” DWR piping serving AHU-2. Refer to revised drawing sheet 8.32, Addendum 2, dated 8/30/22.
2. RESTROOM A33: Add hydronic 24” x 48” radiant ceiling panel & associated piping. Refer to revised drawing sheet 8.32, Addendum 2, dated 8/30/22.
3. STORAGE A38: Modify location of 6” DS piping drop. Refer to revised drawing sheet 8.32, Addendum 2, dated 8/30/22.

DRAWING SHEET 8.33 – FIRST FLOOR PLAN – AREA A – PLUMBING & HEATING

1. PRACTICE A108: Modify location of 2 ½” drawings & 2 ½ DWR piping serving AHU-2. Refer to revised drawing sheet 8.33, Addendum 2, dated 8/30/22.
2. CONCESSIONS A111: Add ¾” DWS & ¾” DWR piping serving FCU-210A. Refer to revised drawing sheet 8.33, Addendum 2, dated 8/30/22.
3. ART A115: Modify location of 6” DS piping drop. Refer to revised drawing sheet 8.33, Addendum 2, dated 8/30/22.

DRAWING SHEET 8.35 – SECOND FLOOR PLAN – AREA A – PLUMBING & HEATING

1. STAGE: Modify 2 ½” DWS & 2” DWR piping serving AHU-2. Refer to revised drawing sheet 8.35, Addendum 2, dated 8/30/22.
2. STORAGE A210A: Add fan coil unit FCU-A210A & associated piping. Refer to revised drawing sheet 8.35, Addendum 2, dated 8/30/22.
3. CLASSROOM A212: Modify location of 6” DS piping drop. Refer to revised drawing sheet 8.35, Addendum 2, dated 8/30/22.

ELECTRICAL ITEMS:

2.4. HEAT TRACE CABLES

- A. Provide UL listed heat trace cable for all exterior exposed water pipes to the chiller. Heating cables shall be equal to Raychem XL-Trace Self-Regulating Heating Cable, 8 watts per foot, powered by 120VAC and adjust it’s power along piping as required with the use of a Raychem C910 controller and a remote RTD sensor for sensing ambient temperature (turn on heat trace when the ambient temperature is below 33°F). The system shall include all necessary components, including Raychem Rayclic PC power connection and Raychem Rayclic LE end of circuit light kits (verify pipe sizes with mechanical contractor).
  1. The controller shall include internal ground-fault sensing, alarm, and trip functionality.
  2. The heating cable shall consist of flat, flexible electric heater of parallel circuit construction with a continuous core of self-regulating polymer material. The core shall be insulated with fluoro-polymer over-jacked and covered with metal braid shield. The cable shall be cut to length in the field. Fasten linearly installed cable to the bottom of the pipe inside insulation with Raychem GT-66 fiberglass tape at 12” intervals. Valves shall have cable spiraled around each side of the valve. Install manufacturer furnished heat trace caution signs at 10’ intervals.
  3. Extended Warranty: Manufacturer shall provide a ten (10) year warranty for all heating cables and components. Provide one (1) year warranty for all heat trace controllers.
  4. Contractor shall submit to owner results of installation tests as required by the manufacturer.
  5. Equal products by Bylin, Chromalox, Delta Therm, Pyrotenax, and Thermon shall be considered equal for bidding purposes.

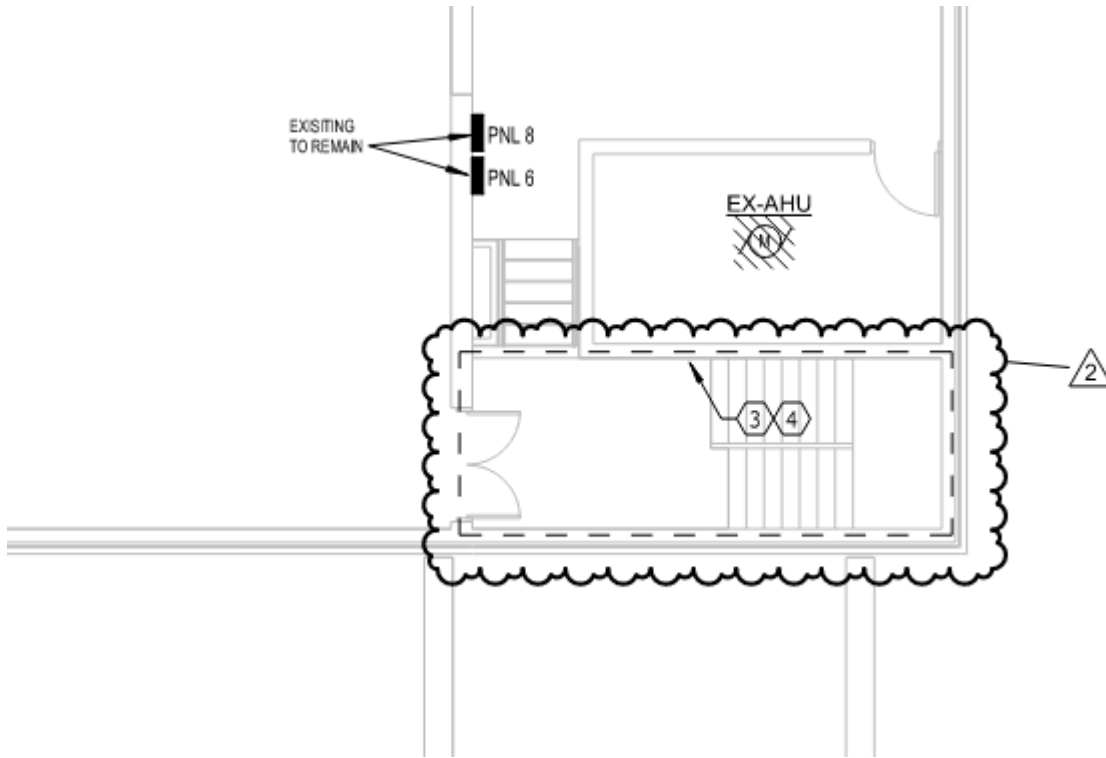
SECTION 277350 – SYNCHRONIZED MASTER-SATELLITE TIME SYSTEM

1. See the attached specification.

DRAWING ITEMS:

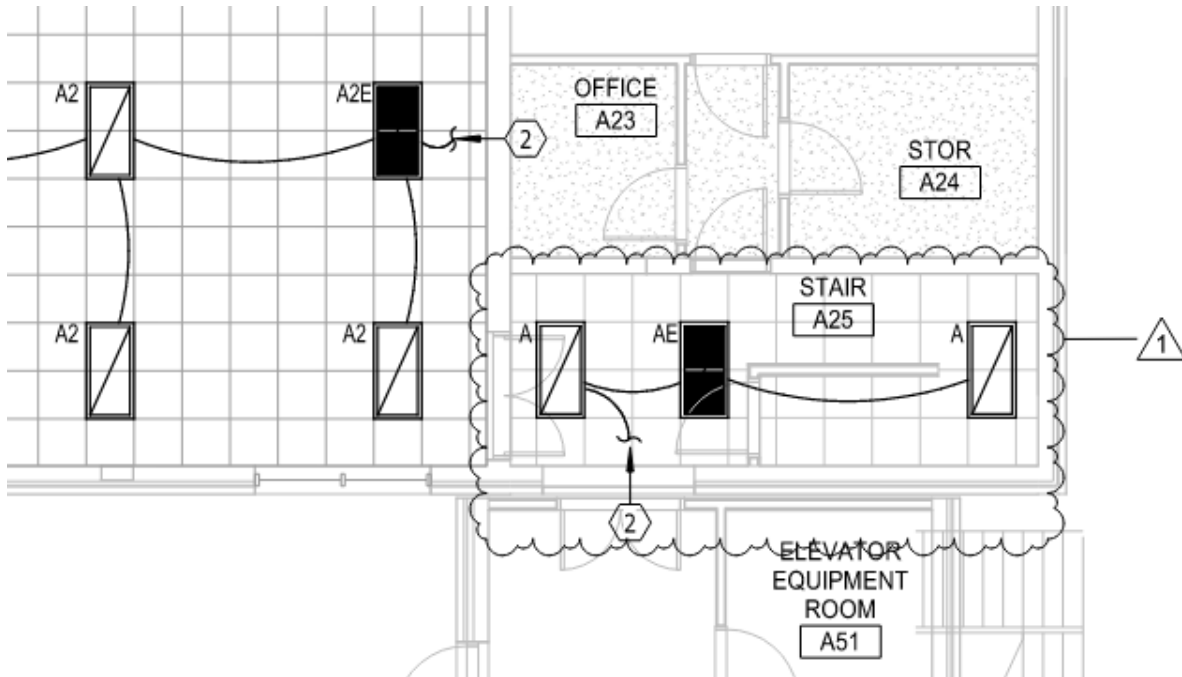
DRAWING SHEET 9.21 – FIRST FLOOR PLAN – DEMO – ELECTRICAL

1. See snip below for revision.



DRAWING SHEET 9.30 – BASEMENT FLOOR PLAN – AREA A - LIGHTING

1. See snip below for revision.



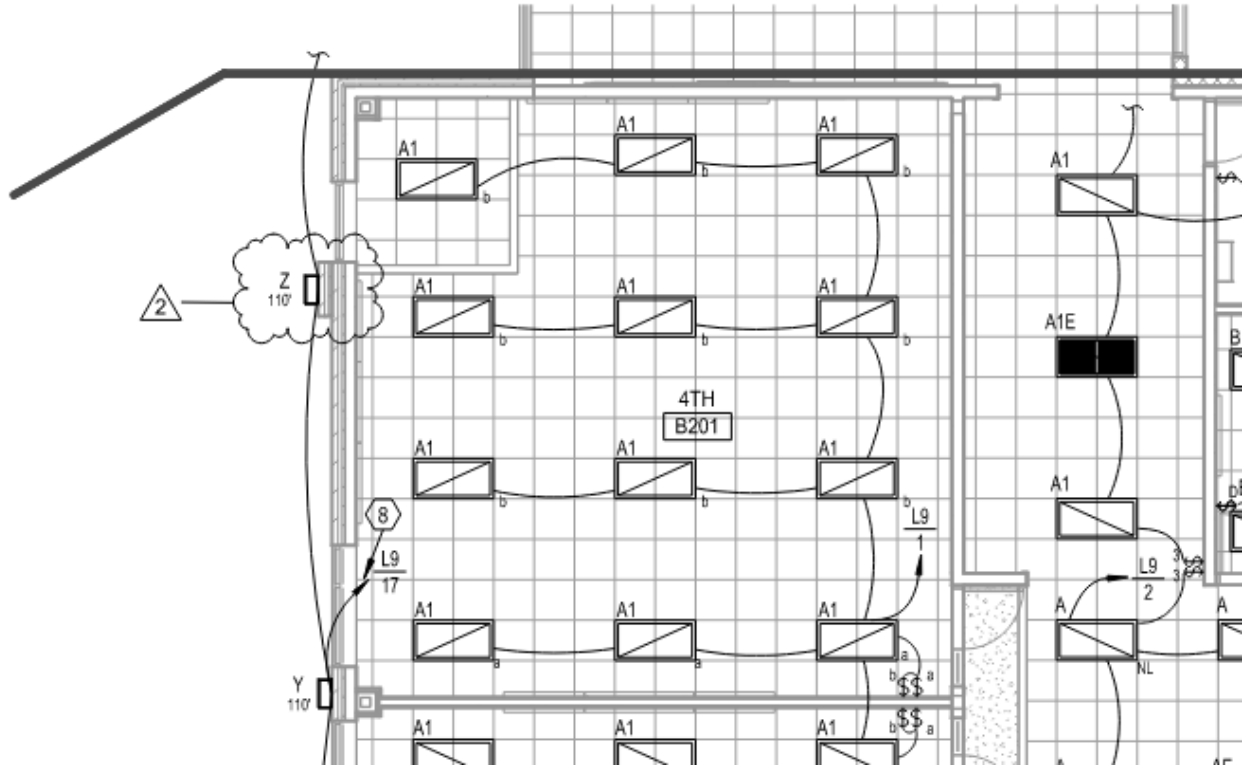
DRAWING SHEET 9.34 – FIRST FLOOR PLANS – AREA B - ELECTRICAL

1. Electrical note #1: For clarification, this note applies to all A/V outlets.

2. Electrical notes: Add note #10: Communications outlet shall consist of a single gang outlet with .75" conduit to the accessible ceiling space in the room in which the outlet is location, typical.
3. Room B105: Add electrical note #10 at the communications outlet on the south wall.

DRAWING SHEET 9.37 – SECOND FLOOR PLAN – AREA B – LIGHTING

1. See snip below for revision.



DRAWING SHEET 9.31 – BASEMENT FLOOR PLAN – AREA B – POWER & SIGNAL

1. Room B001: The heat trace controller (note #24) shall be connected to circuit L2-27.

DRAWING SHEET 9.40 – ELECTRICAL SYMBOLS & ABBREVIATIONS

1. Power Riser Diagram:
  - a. The available fault current at “MDP-CH” is 50,000A.
  - b. The available fault current at “MDS-MDP1” is 18,000A.
  - c. The available fault current at “MDS-MDP2” is 42,000A.
  - d. The available fault current at the existing Parish Hall MDP is 20,000A.

DRAWING SHEET 9.42 – ELECTRICAL SCHEDULES

1. Lighting Fixture Schedule: Add type “N” luminaire and associated notes.

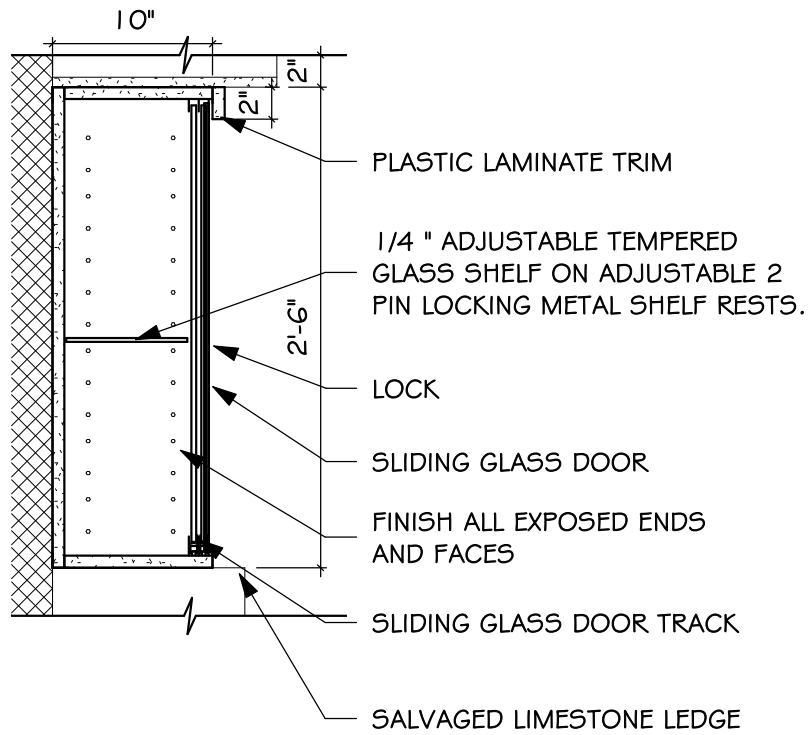
N	OMNILIGHT	GEN2-41-HO-# LED TAPE LIGHT WITH OCH-45-#-FR-WH ANGLED CHANNEL	LED/4000K	120	ANODIZED FINISH, APPROXIMATELY 12,000 LUMENS. LED TAPE LIGHTING WITH ANGLED CHANNEL AND REQUIRED POWER SUPPLY(S). APPROX. 400 LUMENS PER FOOT. PROVIDE AT TOP AND SIDES OF DISPLAY CASE.	5,6
	REACOM					

**GENERAL APPROVALS:**

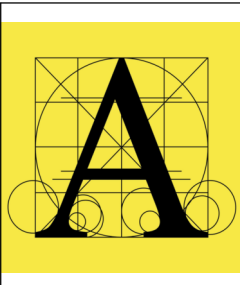
The following material or equipment furnished by the manufacturers listed may be substituted as equal, providing that each item, material, and piece of equipment conforms to the design and requirements of the Drawings and Project Manual.

<u>SECTION</u>	<u>ITEM</u>	<u>MANUFACTURER</u>
033000	Cast-in-place concrete	ISI Building Products, Viper Vaporcheck II 15 – MIL “Class A” Vapor Barrier
055000	Metal Bollards – Concrete Bollard Top Cap	TopGard Pipe Bollard Caps
142400	Hydraulic Elevators	Schumacker Elevators Holeless Hydraulic Elevators
265110/265210	Interior Lighting/Exterior Lighting	
	Type A Series	Elite
	Type B Series	Lithonia, Metalux
	Type C, CE	Lithonia, Metalux
	Type D Series	Lithonia, Williams
	Type E, E1, E2, E3, E4, E5	Emergi-Lite, Lithonia
	Type E6	Lithonia, Mule
	Type F, FE	Axis, Mark
	Type G, GE	Lithonia, Williams
	Type H Series	Lithonia
	Type J#, J#E	Peerless
	Type L	Lithonia, Portfolio
	Type M	
	Type Y, Y1	Lithonia, McGraw-Edison
	Type Z	Kim, Lithonia, Lumark
	Type AA	Beacon, Lithonia, Lumark

END OF ADDENDUM



1 ENTRY DISPLAY  
 SD-03 SCALE: 1" = 1'-0"

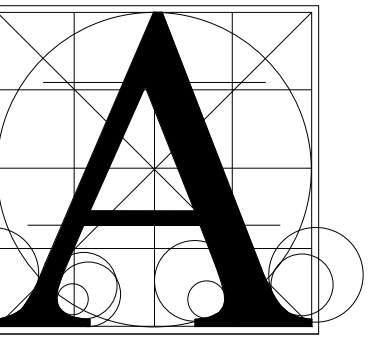


project ST. MARY CATHOLIC SCHOOL ADDITION & REMODEL  
 number 0413.2788.18 drawn BJO checked TLM  
 date AUGUST 30, 2022 revision ADDENDUM #3

**Architecture Incorporated**  
 sioux falls and rapid city, south dakota

DRAWING

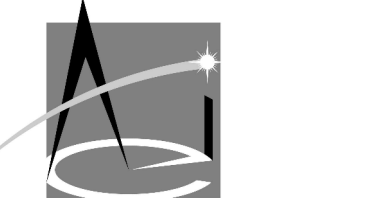
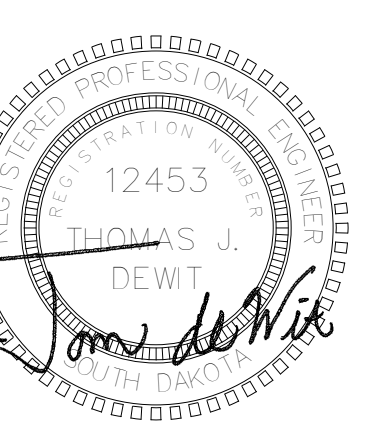
**SD-03**



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### PLUMBING FIXTURE SCHEDULE

FIXTURE SYMBOL	TYPE	MANUFACTURER	MODEL NO.	TRIM	SUPPLIES	WASTE	REMARKS
WC-1	WATER CLOSET FLUSH VALVE FLOOR MOUNTED YOUTH	AMERICAN STANDARD	2599.001	SLOAN 8111 BATTERY OPERATOR	---	---	CHURCH 9500SCT SEAT
WC-2	WATER CLOSET FLUSH VALVE FLOOR MOUNTED ELONG-HANDI	AMERICAN STANDARD	3043.001	SLOAN 8111 BATTERY OPERATOR	---	---	CHURCH 9500SCT SEAT TRIP LEVER TO WIDE SIDE OF STALL
WC-3	WATER CLOSET FLUSH VALVE WALL HUNG ELONG	AMERICAN STANDARD	2634.101	SLOAN 152-128 ES-S SOLENOID OPERATOR	---	---	CHURCH 9500SCT SEAT 152-128 ES-S SOLENOID OPERATOR
UR-1	URINAL WASHOUT WALL HUNG	AMERICAN STANDARD	6515.001	SLOAN 195-1 ES-S SOLENOID OPERATOR	---	---	JOSAM SERIES 17000 CARRIER BACK SPUD
L-1	LAVATORY WALL HUNG HANDI.	AMERICAN STANDARD	0355.012	SYMMONS S-6080 BATTERY OPERATOR	BRASSCRAFT KTSR19C	GRID DRAIN	17 GA. C.P. P-TRAP JOSAM SERIES 17000 CARRIER W/TRUBRO WASTE & WATER PIPE PROTECTOR, OFFSET WASTE ARM
L-2	LAVATORY 3-PERSON SEMI-CIRCULAR W/OP SINK FLOOR MOUNTED	WILLOUGHBY INDUSTRIES	WAF-3603-PPB1	---	BRASSCRAFT KTSR19C	GRID DRAIN	17 GA. C.P. P-TRAP
MSK	NOF SINK FLOOR MOUNTED	ZURN	Z1996-24-SDL-HH-MM	Z843M1-RC-CS W/VACUUM BREAKER	---	---	CW HB MTD 5'-0" AFF
SK-1	SINK-STAINLESS STEEL, SINGLE COMPARTMENT	ELKAY	PSR-1716	CHICAGO 895-317-E3	BRASSCRAFT KTSR19C	LK-35 STRAINER	17 GA. C.P. P-TRAP
SK-2	SINK-STAINLESS STEEL DOUBLE COMPARTMENT	ELKAY	PSR-3319	CHICAGO 786-GNBA-317-E3 GNBKJCP SPOUT	BRASSCRAFT KTSR19C	LK-35 STRAINER	17 GA. C.P. P-TRAP
SK-3	SINK-STAINLESS STEEL, SINGLE COMPART ROOM	ELKAY	PSR-1919	CHICAGO 895-317-E3	BRASSCRAFT KTSR19C	LK-35 STRAINER	STRIEM SIDICKICK SOLIDS INTERCEPTOR 17 GA. C.P. P-TRAP
SK-4	SINK-STAINLESS STEEL, SINGLE COMPART ROOM	ELKAY	LRAD-1919-0CD	CHICAGO 895-317-E3	BRASSCRAFT KTSR19C	LK-35 STRAINER	STRIEM SIDICKICK SOLIDS INTERCEPTOR, MAX AFF IN REAR OF CASEWORK, OFFSET WASTE, TRUBRO WASTE & WATER & INTERCEPTOR PROTECTOR 17 GA. C.P. P-TRAP
SK-5	SINK-INTEGRAL BOWL SCIENCE ROOM	---	---	CHICAGO 930-369	BRASSCRAFT KTSR19C	BASKET STRAINER	ACID RESISTANT P-TRAP STRIEM LB-2 NEUTRALIZATION TANK SET ON FLOOR OF CABINET
SK-6	SINK WALL HUNG HANDI.	AMERICAN STANDARD	0355.012	CHICAGO 895-317	BRASSCRAFT KTSR19C	GRID DRAIN	17 GA. C.P. P-TRAP JOSAM SERIES 17000 CARRIER W/TRUBRO WASTE & WATER PIPE PROTECTOR, OFFSET WASTE ARM
SH-1	SHOWER HANDI	BEST BATH	LSS3838AB6	POWERS E710-0-0-1-0-W	---	---	ALL METAL TRIM, SHOWER HEAD ON SLIDE BAR, SS HORZ GRAB BAR, FOLDUP SEAT, FLEXIBLE DAM, REMOVABLE THRESHOLD
EWC-1	ELECTRIC WATER COOLER WALL MTD DUAL HEIGHT W/BOTTLE FILL	ELKAY	LZSTLWBS5F	---	BRASSCRAFT KTSR19C	---	LKAPREZL APRON
ESH-1	COMBINATION EYEWASH & SHOWER	BRADLEY	S19-120SS S19-220SS S19-330ST	---	---	---	MIXING VALVE LAWLOR MODEL NO. 911E, INLET CHECK VALVES
GT-1	GAS TURRET	CHICAGO FAUCETS	982-909-696	---	---	---	GAS SERVICE
UB-1	ICE MACHINE UTILITY BOX	SIoux CHIEF	696-G1010MF	---	---	---	SHOUL AT 36" AFF MOUNT ABSORBERS
UB-2	WASHING MACHINE UTILITY BOX	SIoux CHIEF	696-G2313MF	---	---	---	P-TRAP, SHOCK ABSORBERS

- REMARKS:  
1. HANDICAPPED FLUSH VALVES SHALL BE ADA COMPLIANT.  
2. FLUSH VALVES SHALL HAVE A VANDAL RESISTANT STOP CAP.  
3. FLUSH VALVE ESCUTCHEONS SHALL BE CHROME PLATED WITH HEAVY WALL THICKNESS AND SET SCREW.  
4. PROVIDE & INSTALL (1) SLOAN TRANSFORMER MODEL EL-154 PER 8 FIXTURES IN PLUMBING CHASE.  
PROVIDE & INSTALL INTERCONNECTING LOW VOLTAGE WIRING AND CONNECTIONS TO SENSORS.

### PUMP SCHEDULE

PUMP NO.	MANUF.	MODEL	DESCRIPTION	STYLE	SIZE	GPM	HEAD (FT)	MOTOR (HP)	ELEC. VOLTS	PH	SUCTION SIZE	DISCH. SIZE	REMARKS		
P-1	B & G	80	PRIMARY HEATING	IN-LINE	3X3X7C	120	25	1.5	111	1750	208	3	3	1	
P-2	B & G	80	PRIMARY HEATING	IN-LINE	3X3X7C	120	25	1.5	111	1750	208	3	3	1	
P-3	B & G	1510	SECONDARY HEATING	BASE	2BD	210	80	7.5	5.76	1750	208	3	2 1/2	1,2,6	
P-4	B & G	1510	SECONDARY HEATING	BASE	2BD	210	80	7.5	5.76	1750	208	3	2 1/2	1,2,6	
P-5	B & G	PL-36	RHW (HW)	IN-LINE	---	20	20	1.6	---	3300	115	1	3/4	3,4	
P-6	B & G	PL-30	RHW (140 HW)	IN-LINE	---	10	15	1/12	---	2650	115	1	3/4	3,4	
P-7	WEIL	1422	DRAIN TILE SUMP	SUBMERSIBLE	---	20	25	3/4	---	1750	115	1	---	1,12	5
P-8	WEIL	1422	DRAIN TILE SUMP	SUBMERSIBLE	---	20	25	3/4	---	1750	115	1	---	1,12	5
P-9	WEIL	1411	SEWAGE EJECTOR	SUBMERSIBLE	09DLS	30	20	1/2	---	1750	115	1	---	2	4
P-10	WEIL	1422	ELEVATOR SUMP	SUBMERSIBLE	---	10	27	3/4	---	1750	115	1	---	1,12	4
P-11	-	-	CHILLER	BASE	---	209	62	7.5	---	3600	208	3	---	---	---

- REMARKS:  
1. PUMP CAPACITY IS BASED UPON 70% WATER/30% PROPYLENE GLYCOL.  
2. PUMP SHALL BE NON-OVERLOADING.  
3. BRONZE BODY.  
4. OIL GUARD PUMP SWITCH AND PANEL SYSTEM WITH OIL RESISTANT CORD AND PLUG.  
5. PROVIDE CONTROLLER WITH NORMAL AND HIGH WATER FLOAT SWITCHES, AUDIBLE ALARM, BEACON, ALARM OUTPUT TO BAS, ELECTRICAL DISCONNECT AND APPLICABLE SIMPLEX OR DUPLEX CONTROL.  
6. PROVIDE A VFD.

### FIN TUBE RADIATION SCHEDULE

UNIT NO.	MANUFACTURER	STYLE	MODEL NO.	CAPACITY (BTU/HF)	EWT	GPM	ROWS	ENCL. HEIGHT	INSTALL HEIGHT	REMARKS
FT-1	STERLING	JVB-S	C34-435	2280	180	4.5	3	24	84	1,2
FT-2	STERLING	BARE	C34-435	575	180	2.5	1	NA	84	1,2

- REMARKS:  
1. CAPACITY IS BASED ON 70% WATER/30% PROPYLENE GLYCOL.  
2. REFER TO CONSTRUCTION DOCUMENTS FOR LENGTHS OF RADIATION.

### UNIT HEATER SCHEDULE

UNIT NO.	MANUFACTURER	UNIT SIZE	TYPE	INTAKE LOCATION	DISCHARGE LOCATION	CFM	FAN MOTOR(S) RPM	FAN HP-1	FAN HP-2	V/PH	HEATING CAPACITY (BTU/HF)	EWT	GPM	WPD	REMARKS
CUH-A16	BEACONMORRIS	06	RC	FT	FB	630	1050	1/10	---	115/1	35.6	180	150	2.8	5', 1,2
CUH-A18	BEACONMORRIS	04	WI	FT	FB	430	1050	1/10	---	115/1	22.1	180	150	1.8	5', 1,2
CUH-A19	BEACONMORRIS	04	WI	FT	FB	430	1050	1/10	---	115/1	22.1	180	150	1.8	5', 1,2
CUH-A22	BEACONMORRIS	08	WI	FT	FB	860	1050	1/15	1/10	115/1	40.4	180	150	3.2	5', 1,2,4
CUH-A25	BEACONMORRIS	06	RC	FT	FB	630	1050	1/10	---	115/1	35.6	180	150	2.8	5', 1,2
CUH-A32	BEACONMORRIS	04	WI	FT	FB	430	1050	1/10	---	115/1	22.1	180	150	1.8	5', 1,2
CUH-A34	BEACONMORRIS	06	RC	FT	FB	630	1050	1/10	---	115/1	35.6	180	150	2.8	5', 1,2
CUH-A35	BEACONMORRIS	04	WI	FT	FB	430	1050	1/10	---	115/1	22.1	180	150	1.8	5', 1,2
CUH-A100	BEACONMORRIS	04	WI	FT	FB	430	1050	1/10	---	115/1	22.1	180	150	1.8	5', 1,2
CUH-A119	BEACONMORRIS	08	SEMI FT	FB	FB	845	1050	1/15	1/10	115/1	64.9	180	150	5.2	5', 1,2,4
UH-A11	BEACONMORRIS	HB-60	HP	R	F	900	1000	1/20	---	115/1	32.3	200	170	2.6	5', 1,3
UH-A24	BEACONMORRIS	HB-60	HP	R	F	900	1000	1/20	---	115/1	32.3	200	170	2.6	5', 1,3
UH-A38	BEACONMORRIS	HB-60	HP	R	F	900	1000	1/20	---	115/1	32.3	200	170	2.6	5', 1,3
UH-B001	BEACONMORRIS	HB-60	HP	R	F	900	1000	1/20	---	115/1	32.3	200	170	2.6	5', 1,3
UH-B002	BEACONMORRIS	HB-60	HP	R	F	900	1000	1/20	---	115/1	32.3	200	170	2.6	5', 1,3

MODEL TYPE: F - FLOOR; FI - FLOOR INVERTED FLOW; W - WALL; WI - WALL INVERTED FLOW; FRW - FULLY RECESSED WALL  
C - CEILING; RC - RECESSED CEILING; HP - HORIZONTAL PROPELLER UNIT

LOCATIONS: F - FRONT; R - REAR; B - BOTTOM; M - TOP

- REMARKS:  
1. HEATING CAPACITY BASED ON 70% WATER/30% PROPYLENE GLYCOL.  
2. PROVIDE TAMPER RESISTANT FASTENERS FOR ACCESS DOOR.  
3. HANG UNIT FROM STRUCTURE WITH NEOPRENE ISOLATORS.  
4. UNIT SHALL HAVE A TWO ROW COIL.

### AIR COOLED CHILLER SCHEDULE

UNIT NO.	MANUFACTURER	MODEL NO.	MBH CAPACITY	AMB AIR TEMP	EVAP BUNDLE EWT	LWT	WPD	GPM	ELEC VOLTS	PH	MCA	MOC P	STEPS UNLOAD	EER/PLV	SOUND (dB)	OPER WEIGHT	REMARKS
CH-1	DAIKIN	AGZ101E	1200	95	56	44	11.8	210	208	3	456	500	4	10.33/16.1	92	7500	1-5

REMARKS:  
1. CAPACITY IS BASED ON 70% WATER/30% PROPYLENE GLYCOL.  
2. EER IS BASED ON ARI STANDARD CONDITIONS.  
3. SOUND RATING BASED ON ARI-370 OVERALL "A" WEIGHTED SOUND POWER LEVEL.  
4. UNIT SHALL BE MOUNTED ON NEOPRENE OR SPRING TYPE VIBRATION ISOLATORS AS DESIGNED BY THE MANUFACTURER.  
5. UNIT SHALL INCLUDE A PUMP PACKAGE. SEE PUMP SCHEDULE FOR PUMP REQUIREMENTS. PUMP SHALL BE FIELD WIRED.  
6. PROVIDE 6K SCR RATING.

### BOILER SCHEDULE

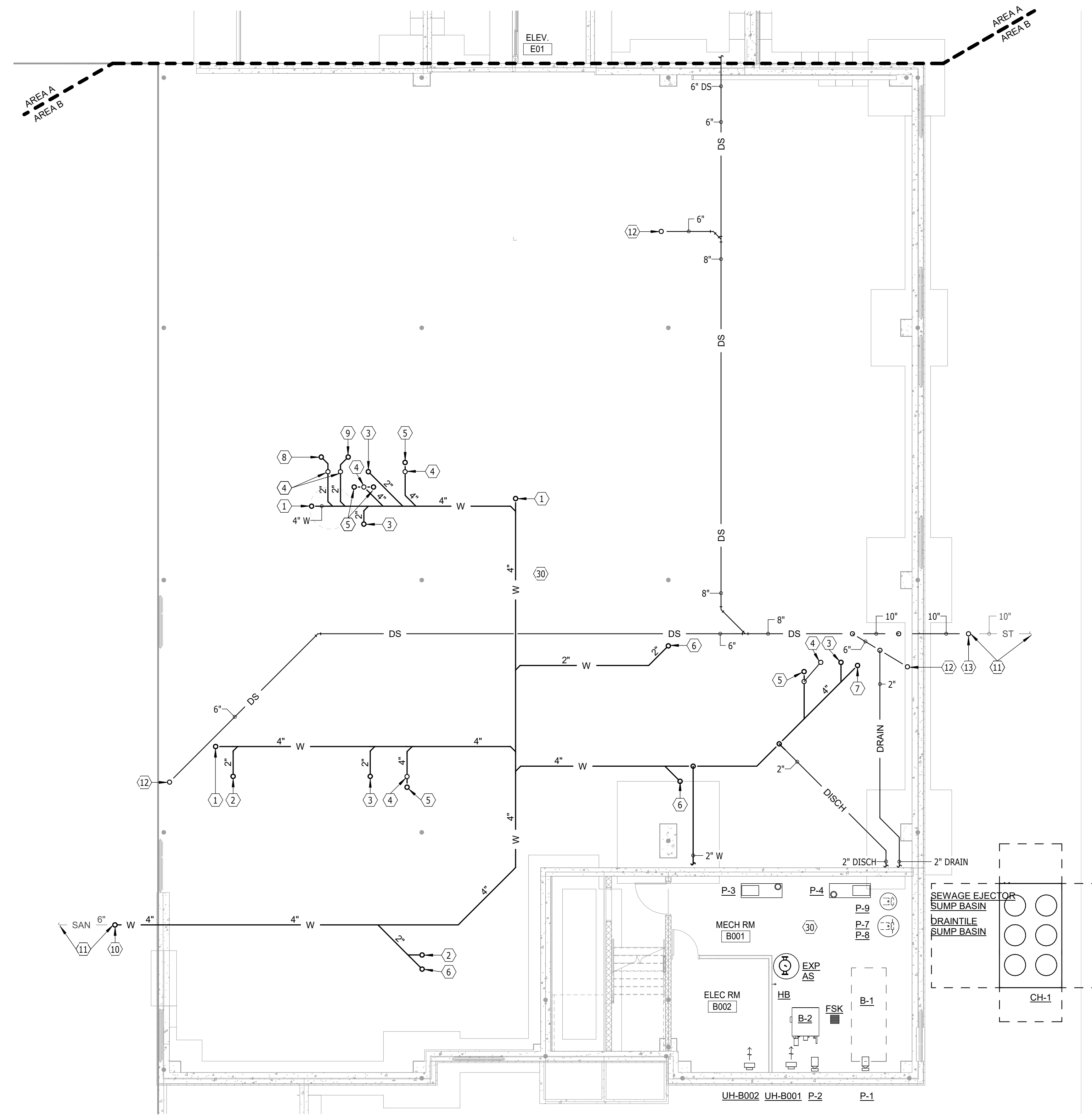
BOILER NO.	MANUFACTURER	MODEL NO.	AGA INPUT (MBH)	AGA OUTPUT (MBH)	OPER EFF (%)	BURNER VOLTS	PH	AMPS	OPER WT. (LBS)	REMARKS
B-2	THERMAL SOLUTIONS	EVS-2000	2000	1700	85	208	1	6.6	1615	1

- REMARKS:  
1. PROVIDE CONDENSATE NEUTRALIZER.  
(PROVIDE EMERGENCY SHUT-OFF MUSHROOM SWITCH)

### FAN POWERED VAV TERMINAL SCHEDULE

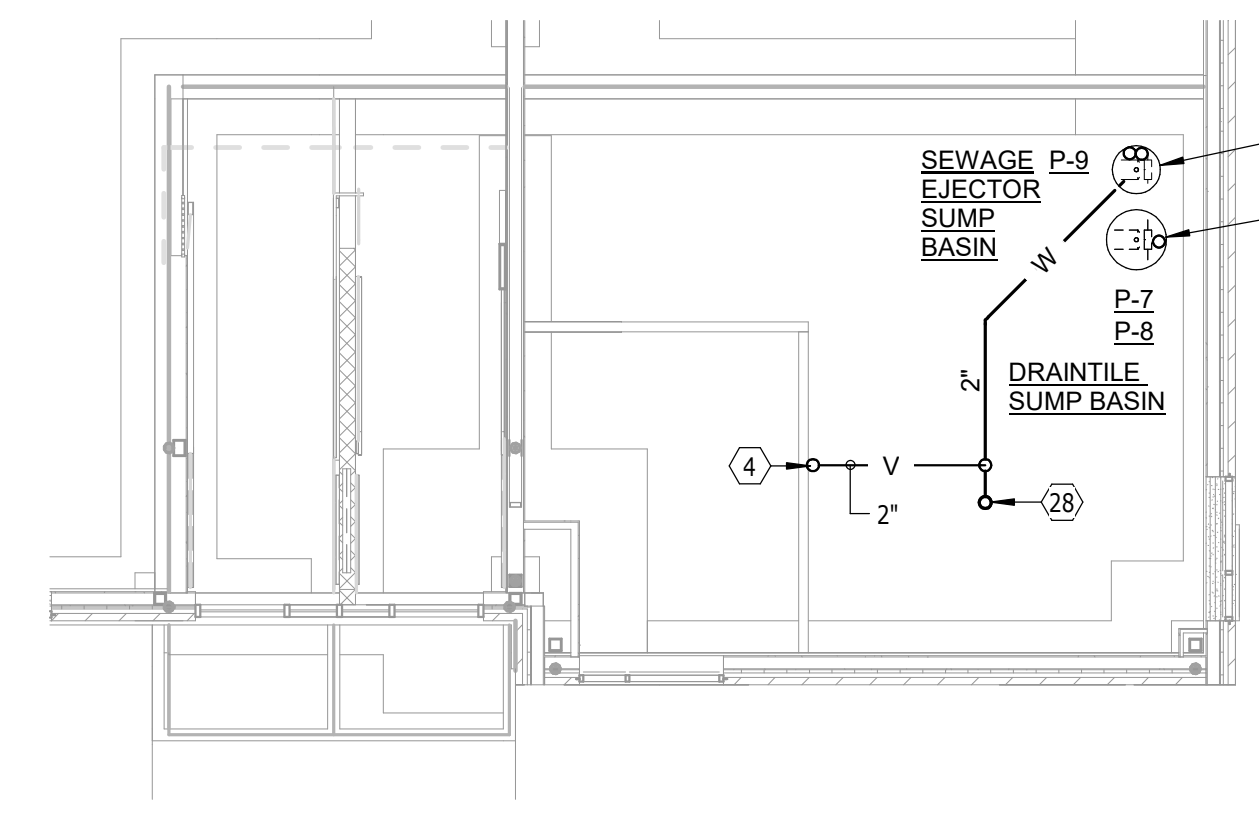
UNIT NO.	MANUF.	MODEL NO.	SIZE	CFM	MIN CFM	TERM S.P.	EXT S.P.	RAD NC	DISCH NC	MOTOR HP	HEATING COIL MBH	GPM	WPD	EWT	LWT	REMARKS		
FP-A116	PRICE	FDCLP2	1006	840	125	0.25	0.5	26	24	1/3	1201	69	12.4	1.3	5	180	150	1,2,3
FP-A203	PRICE	FDCLP2	5010	1110	340	0.25	0.5	37	21	2 @ 1/3	1201	69	29.4	2.3	5	180	150	1,2,3
FP-A213	PRICE	FDCLP2	1006	400	120	0.25	0.5	26	24	1/3	1201	69	12.3	1.3	5	180	150	1,2,3
FP-B101	PRICE	FDCLP2	1008	575	180	0.25	0.5	33	29	1/3	1201	69	17.7	2.3	5	180	110	1,2,3
FP-B102	PRICE	FDCLP2	1006	290	90	0.25	0.5	22	21	1/3	1201	69	8.3	0.7	5	180	150	1,2,3
FP-B105	PRICE	FDCLP2	1006	500	150	0.25	0.5	30	28	1/3	1201	69	11.7	1	5	180	150	1,2,3
FP-B112	PRICE	FDCLP2	5010	950	290	0.25	0.5	35	20	2 @ 1/3	1201	69	29.1	2.5	5	180	150	1,2,3
FP-B115	PRICE	FDCLP2	1006	380	120	0.25	0.5	25	22	1/3	1201	69	7.7	0.5	5	180	110	1,2,3
FP-B118	PRICE	FDCLP2	5010	1040	320	0.25	0.5	38	20	2 @ 1/3	1201	69	31.6	2.8	5	180	150	1,2,3
FP-B121A	PRICE	FDCLP2	5010	950	290	0.25	0.5	35	20	2 @ 1/3	1201	69	24.8	1.8	5	180	150	1,2,3
FP-B121B	PRICE	FDCLP2	3010	820	250	0.25	0.5	30	26	1/2	1201	69	20.9	1.9	5	180	150	1,2,3
FP-B123A	PRICE	FDCLP2	3010	900	270	0.25	0.5	31	27	1/2	1201	69	24.9	2.7	5	180	110	1,2,3
FP-B123B	PRICE	FDCLP2	3010	900	270	0.25	0.5	31	27	1/2	1201	69	18.8	1.5	5	180	150	1,2,3
FP-B123C	PRICE	FDCLP2	3010	900	270	0.25	0.5	31	27	1/2	1201	69	18.8	1.5	5	180	150	1,2,3
FP-B201	PRICE	FDCLP2	5010	965	290	0.25	0.5	35	20	2 @ 1/3	1201	69	20.5	1.3	5	180	150	1,2,3
FP-B202	PRICE	FDCLP2	5010	935	290	0.25	0.5	35	20	2 @ 1/3	1201	69	17.6	1	5	180	110	1,2,3
FP-B203	PRICE	FDCLP2	5010	935	290	0.25	0.5	35	20	2 @ 1/3	1201	69	17.6	1	5	180	150	1,2,3
FP-B204	PRICE	FDCLP2	5010	1115	340	0.25	0.5	37	21	2 @ 1/3	1201	69	27.3	2	5	180	150	1,2,3
FP-B205A	PRICE	FDCLP2	5010	960	290	0.25	0.5	35	20	2 @ 1/3	1201	69	30.3	2.7	5	180	150	1,2,3
FP-B205B	PRICE	FDCLP2	5010	960	290	0.25	0.5	35	20	2 @ 1/3	1201	69	30.3	2.7	5	180	150	1,2,3
FP-B205C	PRICE	FDCLP2	5010	960	290	0.25	0.5	35	20	2 @ 1/3	1201	69	41.3	6.2	5	180	150	1,2,3
FP-B206	PRICE	FDCLP2	1006	380	120	0.25	0.5	25	22	1/3	1201	69	7.7	0.5	5	180	150	1,2,3
FP-B207	PRICE	FDCLP2	5010	960	290	0.25	0.5	35	20	2 @ 1/3	1201	69	24.8	0.5	5	180	110	1,2,3
FP-B211	PRICE	FDCLP2	3010	910	280	0.25	0.5	31	27	1/2								





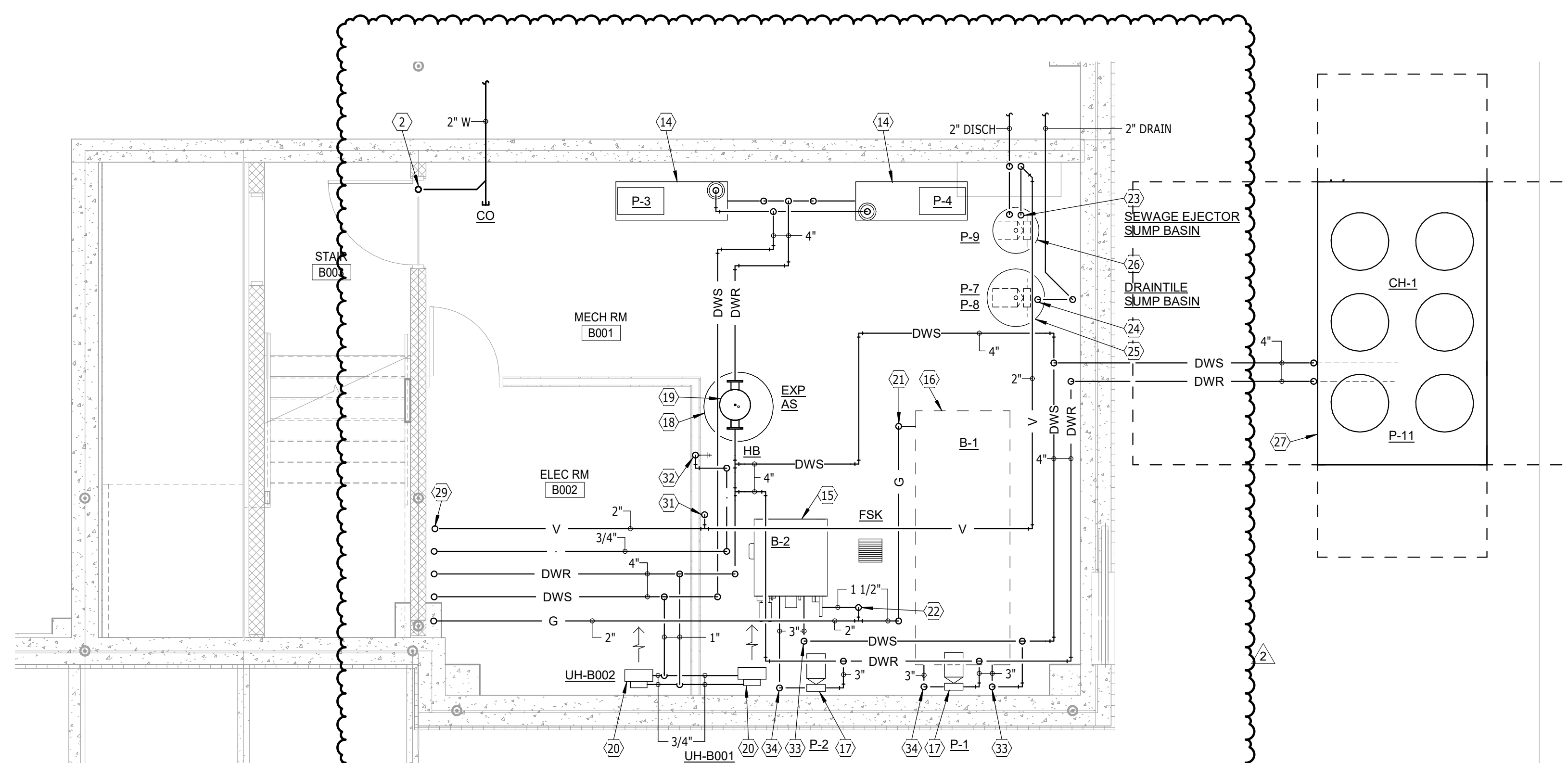
**GROUND FLOOR PLAN - AREA B - PLUMBING & HEATING**

SCALE 0 4 8 12 16



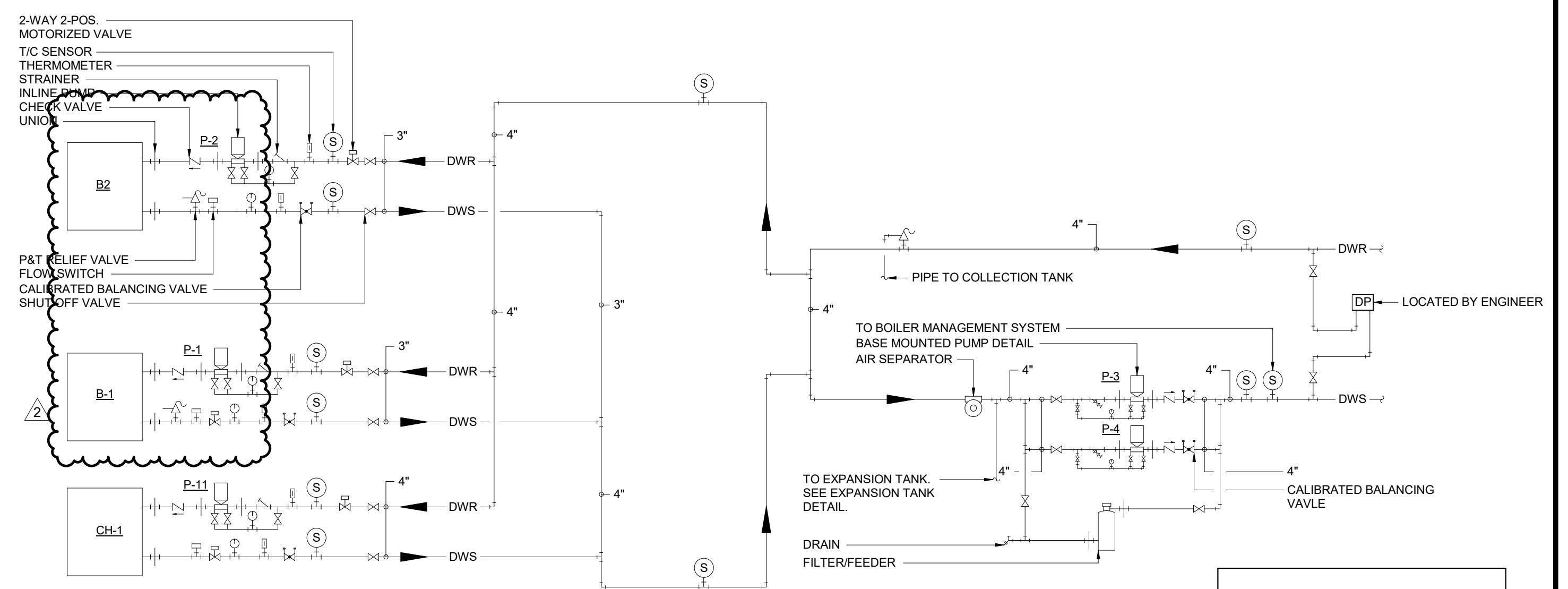
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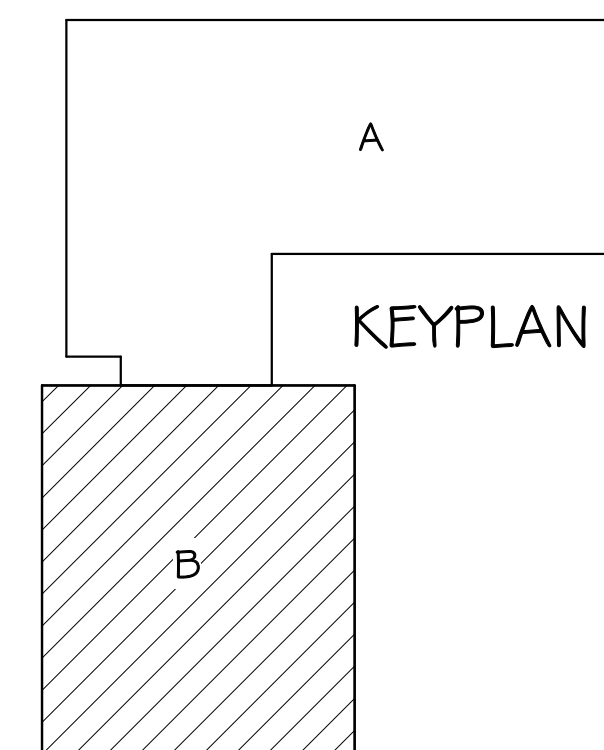


**ENLARGED GROUND FLOOR PLAN - AREA B - PLUMBING & HEATING**

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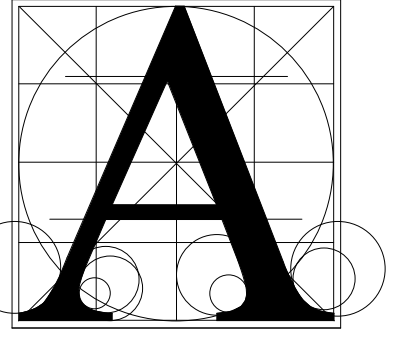


**HEATING/COOLING SYSTEM DIAGRAM**



**KEYPLAN**

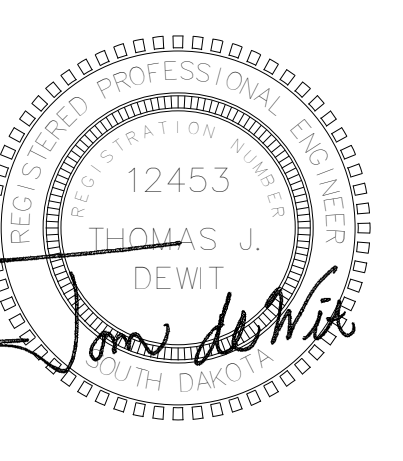
- GENERAL SHEET NOTES**
- THE CEILING SPACE AVAILABLE REQUIRES COORDINATION WITH OTHER TRADES. THE CONTRACTORS SHALL PROVIDE ALL OFFSETS AND RELOCATE AS REQUIRED TO COORDINATE THE INSTALLATION OF ALL MATERIALS AND EQUIPMENT WITH OTHER TRADES.
  - ON DEMO DRAWINGS, ITEMS SHOWN LIGHT ARE EXISTING TO REMAIN, ITEMS SHOWN BOLD ARE EXISTING TO BE REMOVED.
  - ON NEW CONSTRUCTION DRAWINGS, ITEMS SHOWN LIGHT ARE EXISTING TO REMAIN, ITEMS SHOWN BOLD ARE NEW WORK.
- PLUMBING & HEATING NOTES**
- 4" W UP TO CO
  - 2" W UP TO SK
  - 2" W UP TO LAV
  - 2" V UP
  - 4" W UP TO WC
  - 2" W STACK UP
  - 4" W STACK UP
  - 2" W UP TO SH
  - 2" W UP TO FD
  - 4" W UP TO GRADE CO
  - CONNECT TO PIPING PROVIDED BY SITE UTILITY CONTRACTOR. SEE SITE UTILITY DRAWINGS FOR CONTINUATION
  - 6" DS UP
  - 4" DS UP TO GRADE CO
  - BASE MOUNTED DUAL WATER SYSTEM PUMPS. SEE BASE MOUNTED PUMP PIPING DETAIL
  - GAS FIRED BOILER. SEE BOILER PIPING DETAIL
  - RELOCATED GAS FIRED BOILER. SEE BOILER PIPING DETAIL
  - IN-LINE BOILER CIRC PUMP. SEE BOILER PIPING DETAIL
  - 317 GALLON DUAL WATER SYSTEM VERTICAL EXPANSION TANK. SEE EXPANSION TANK PIPING DETAIL
  - HYDRONIC PROP TYPE UNIT HEATER HUNG FROM STRUCTURE. SEE UNIT HEATER PIPING DETAIL
  - 1 1/2" G DN WITH GAS COCK, PRESSURE REDUCING VALVE & UNION TO BOILER
  - 1 1/2" G DN WITH GAS COCK, PRESSURE REDUCING VALVE & UNION TO BOILER
  - 2" DISCH & 2" V DN TO SEWAGE EJECTOR SUMP BASIN
  - 2" DRAIN DN TO DRAINTILE SUMP BASIN
  - 30" DIA X 9'-6" DEEP DRAINTILE SUMP BASIN WITH SUMP PUMPS P-7 & P-8
  - 24" DIA X 5'-0" DEEP SEWAGE EJECTOR SUMP BASIN WITH SEWAGE EJECTOR PUMP P-9
  - AIR COOLED CHILLER WITH BASE MOUNTED PUMP. SEE CHILLER PIPING DETAIL
  - 2" W UP TO FSK
  - 2" V UP, 3/4" CW UP, 4" DWR UP, 4" DWS UP, 2" G UP
  - SEE ENLARGED PLAN ON THIS SHEET FOR CONTINUATION
  - 2" V DN
  - 3/4" CW DN TO HB MTD 24" AFF
  - 3" DWS DN TO BOILER
  - 3" DWR DN TO BOILER



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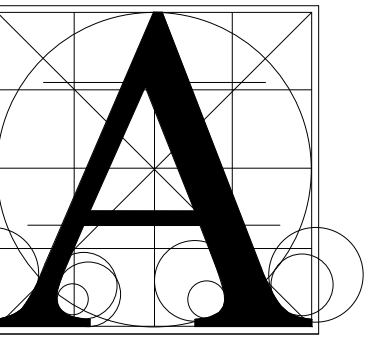
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**ST. MARY'S CATHOLIC SCHOOL**  
**UNDERFLOOR PLAN - AREA B - PLUMBING & HEATING**

Project	number	0413.2786.16
date	7-31-2022	
revision	drawn	DWM checked Td
NO.	DATE	DESCRIPTION
1	6/23/22	ADDENDUM 1
2	6/30/22	ADDENDUM 2

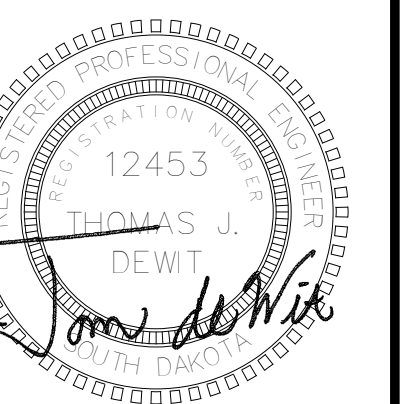
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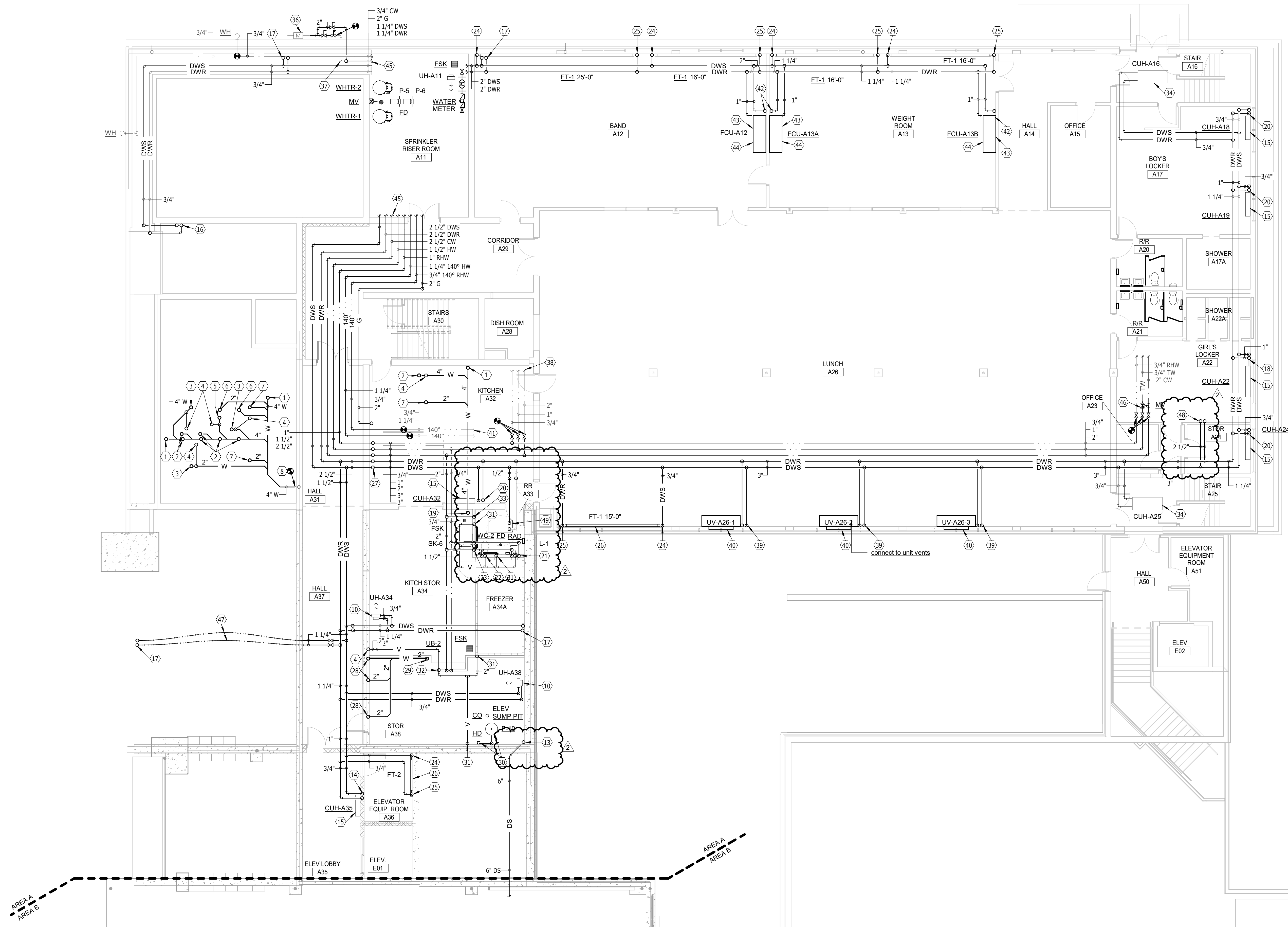
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GENERAL SHEET NOTES

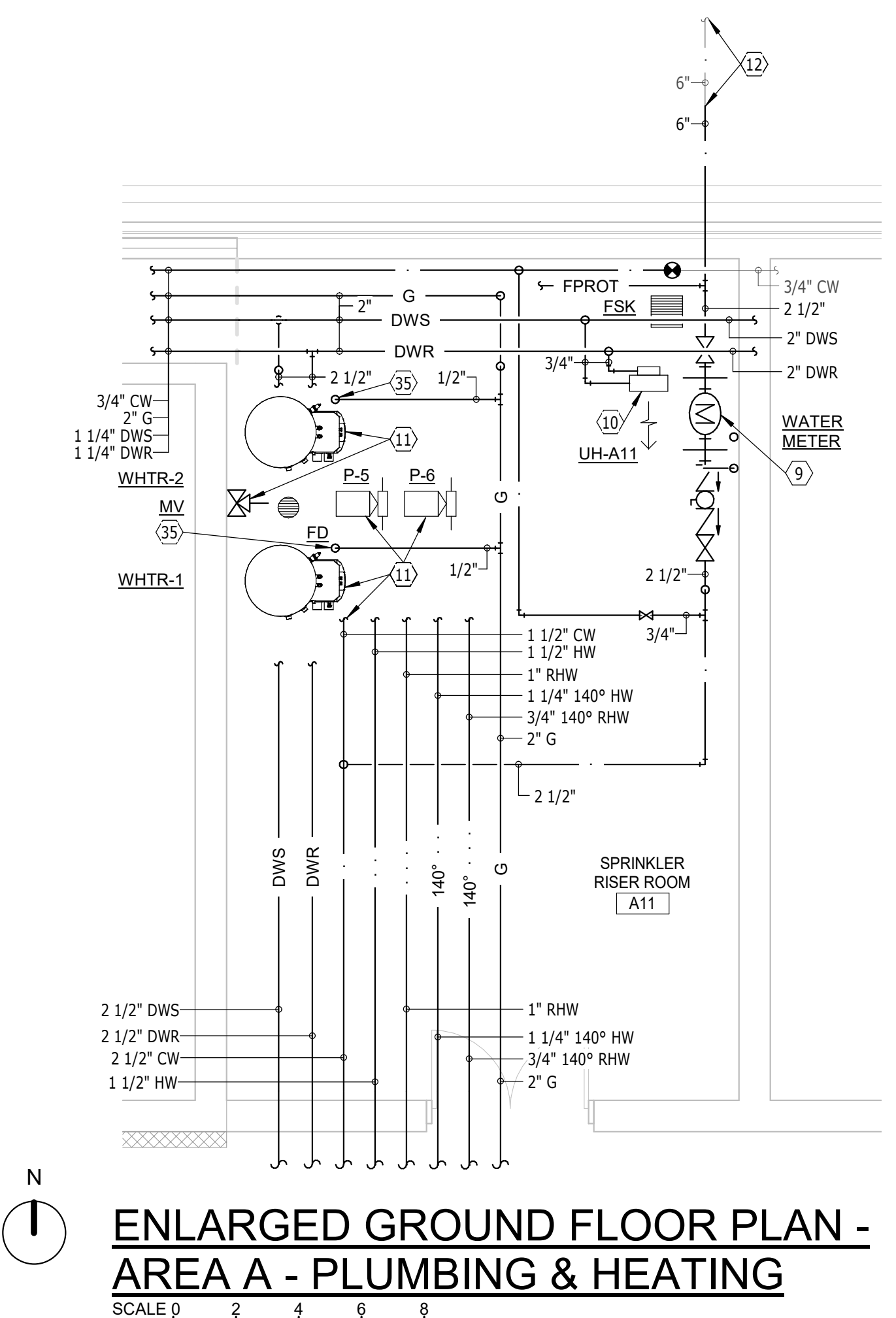
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- B. ON DEMO DRAWINGS, ITEMS SHOWN LIGHT ARE EXISTING TO REMAIN, ITEMS SHOWN BOLD ARE EXISTING TO BE REMOVED.
- C. ON NEW CONSTRUCTION DRAWINGS, ITEMS SHOWN LIGHT ARE EXISTING TO REMAIN, ITEMS SHOWN BOLD ARE NEW WORK.

PLUMBING & HEATING NOTES

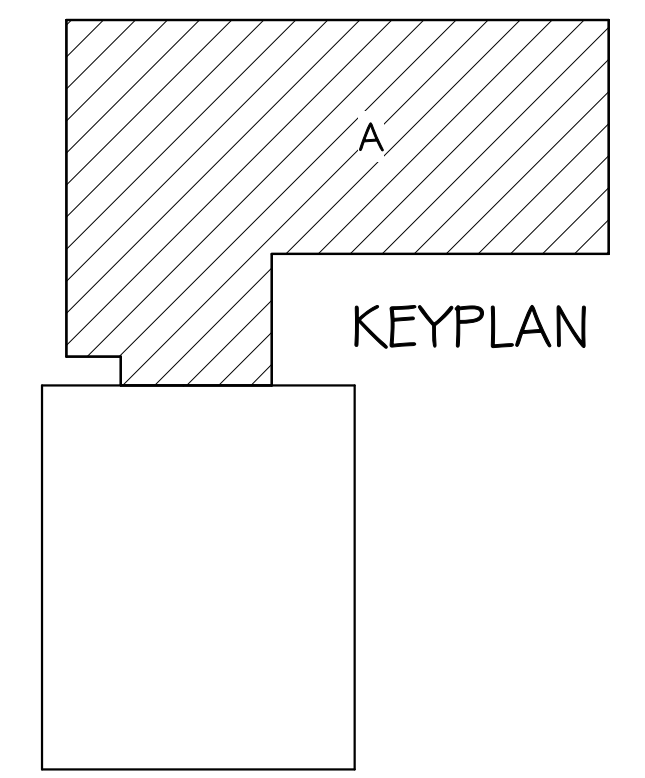
- 1 4" W UP TO CO
- 2 4" W UP TO WC
- 3 2" W UP TO FD
- 4 2" V UP
- 5 3" W UP TO MSK
- 6 2" W UP TO UR
- 7 2" W UP TO LAV
- 8 CONNECT TO EXISTING PIPING. VERIFY SIZE & LOCATION PRIOR TO ASSOCIATED WORK.
- 9 2 1/2" WATER METER WITH 2" REDUCED PRESSURE BACKFLOW PREVENTER
- 10 HYDRONIC PROP TYPE UNIT HEATER HUNG FROM STRUCTURE. SEE UNIT HEATER PIPING DETAIL
- 11 GAS FIRED 100 GALLON WATER HEATER, MIXING VALVE & RECIRC PUMPS. SEE WATER HEATER PIPING DETAIL
- 12 CONNECT TO PIPING PROVIDED BY SITE UTILITY CONTRACTOR. SEE SITE UTILITY DRAWINGS FOR CONTINUATION
- 13 6" DS UP
- 14 3/4" DWS DN, 3/4" DWR DN
- 15 HYDRONIC WALL MOUNTED INVERTED FLOW CABINET UNIT HEATER. SEE CABINET UNIT HEATER DETAIL
- 16 1" DWS & 1" DWR UP TO CABINET UNIT HEATER
- 17 1 1/4" DWS & 1 1/4" DWR UP TO UNIT VENTILATOR
- 18 1" DWS & 1" DWR DN TO CABINET UNIT HEATER
- 19 4" W DN W/CO 24" AFF
- 20 3/4" DWS & 3/4" DWR DN TO CABINET UNIT HEATER
- 21 1/2" CW DN, 1 1/2" V/2" W DN, 1/2" HW DN
- 22 1 1/4" CW DN, 2" V DN
- 23 1/2" HW DN, 1 1/2" V/2" W DN, 1/2" CW DN
- 24 3/4" DWS DN TO FIN TUBE RADIATION
- 25 3/4" DWR DN TO FIN TUBE RADIATION
- 26 HYDRONIC WALL MOUNTED FIN TUBE RADIATION. SEE FIN TUBE RADIATION PIPING DETAIL
- 27 2" G UP, 3/4" RHW UP, 1 1/4" HW UP, 2 1/2" CW UP, 4" DWR UP, 4" DWS UP
- 28 2" W UP TO SK
- 29 2" W DN W/CO 24" AFF
- 30 24" DIA X 6" DEEP ELEVATOR SUMP BASIN & PUMP. EXTEND 4" PVC DRAIN MTD FLUSH WITH BOTTOM OF ELEVATOR PIT TO BASIN. EXTEND 2" DISCH FROM SUMP PUMP WITH INDIRECT CONNECTION TO HUB DRAIN STUBBED AFF
- 31 2" V DN
- 32 1 1/2" V/2" W DN, 1/2" CW DN, 1/2" HW DN
- 33 1/2" CW DN OUT THRU WALL WITH ESCUTHEON & SHUTOFF VALVE TO ICE MAKER
- 34 HYDRONIC CEILING MOUNTED CABINET UNIT HEATER. SEE CABINET UNIT HEATER PIPING DETAIL
- 35 1/2" G DN WITH GAS COCK, PRESSURE REDUCING VALVE & UNION TO WATER HEATER
- 36 EXISTING GAS METER, GAS PIPING SIZED AT 2 POUND. ADDITION GAS PIPING SIZED AT 400' TOTAL LENGTH, 4400 MBH AT 2 PSIG, PRESSURE DROP 1 PSIG. (BOILERS & WATER HEATER)
- 37 EXISTING GAS SERVING KITCHEN & SCIENCE ROOMS
- 38 TO EXISTING SECOND FLOOR FIXTURES
- 39 1 1/4" DWS & 1 1/4" DWR DN TO UNIT VENTILATOR
- 40 HYDRONIC UNIT VENTILATOR. SEE UNIT VENTILATOR PIPING DETAIL
- 41 TO EXISTING KITCHEN SINKS AND DISHWASHING
- 42 1" DWS & 1" DWR DN TO FCU
- 43 EXTEND 1" FCU COND TO FSK
- 44 HYDRONIC FAN COIL UNIT. SEE FAN COIL UNIT PIPING DETAIL
- 45 SEE ENLARGED PLAN ON THIS SHEET FOR CONTINUATION
- 46 UNUSUAL VAP
- 47 INSULATED 1 1/4" TYPE K SOFT COPPER PIPING WITH NO JOINTS BELOW FLOOR
- 48 2 1/2" DWS UP, 2 1/2" DWR UP
- 49 HYDRONIC 24"X48" RADIANT CEILING PANEL. SEE RADIANT PANEL PIPING DETAIL



GROUND FLOOR PLAN - AREA A - PLUMBING & HEATING  
SCALE 0 4 8 12 16



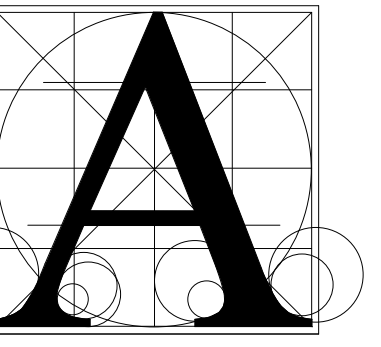
ENLARGED GROUND FLOOR PLAN - AREA A - PLUMBING & HEATING  
SCALE 0 2 4 6 8



ST. MARY'S CATHOLIC SCHOOL  
GROUND FLOOR PLAN - AREA A - PLUMBING & HEATING

Project	number	0413.2786.16
	date	7-31-2022
	revision	
drawn	DWM	checked Td
NO.	DATE	DESCRIPTION
1	6/23/22	ADDENDUM 1
2	6/30/22	ADDENDUM 2

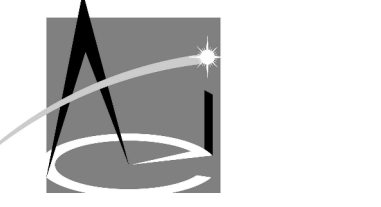
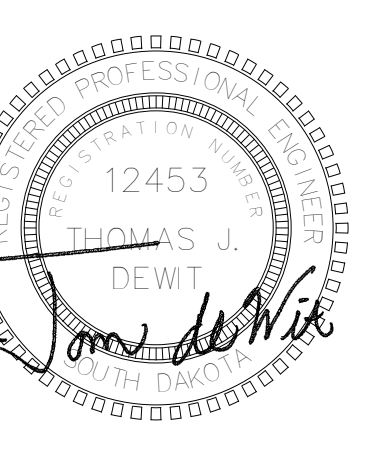
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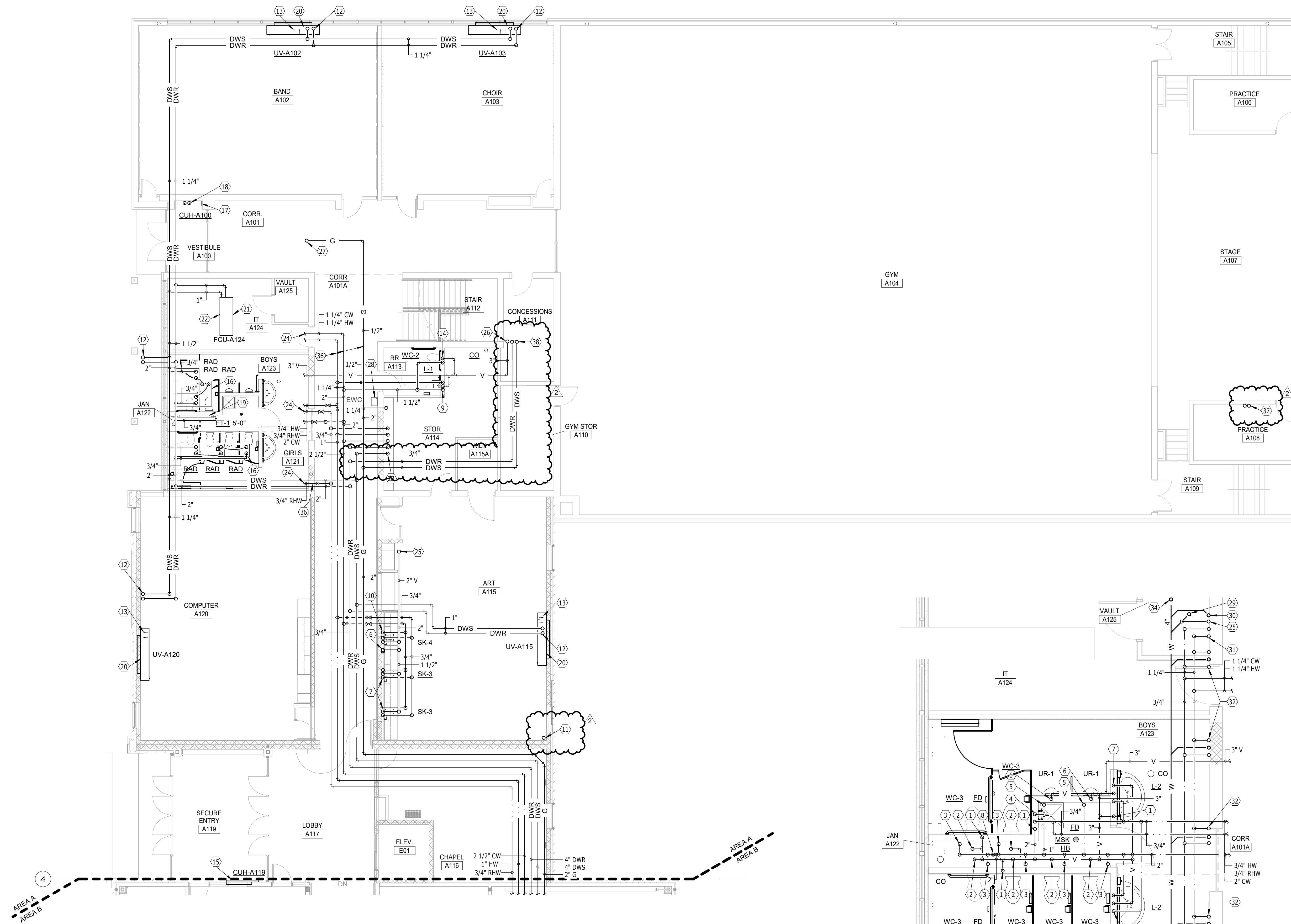
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GENERAL SHEET NOTES

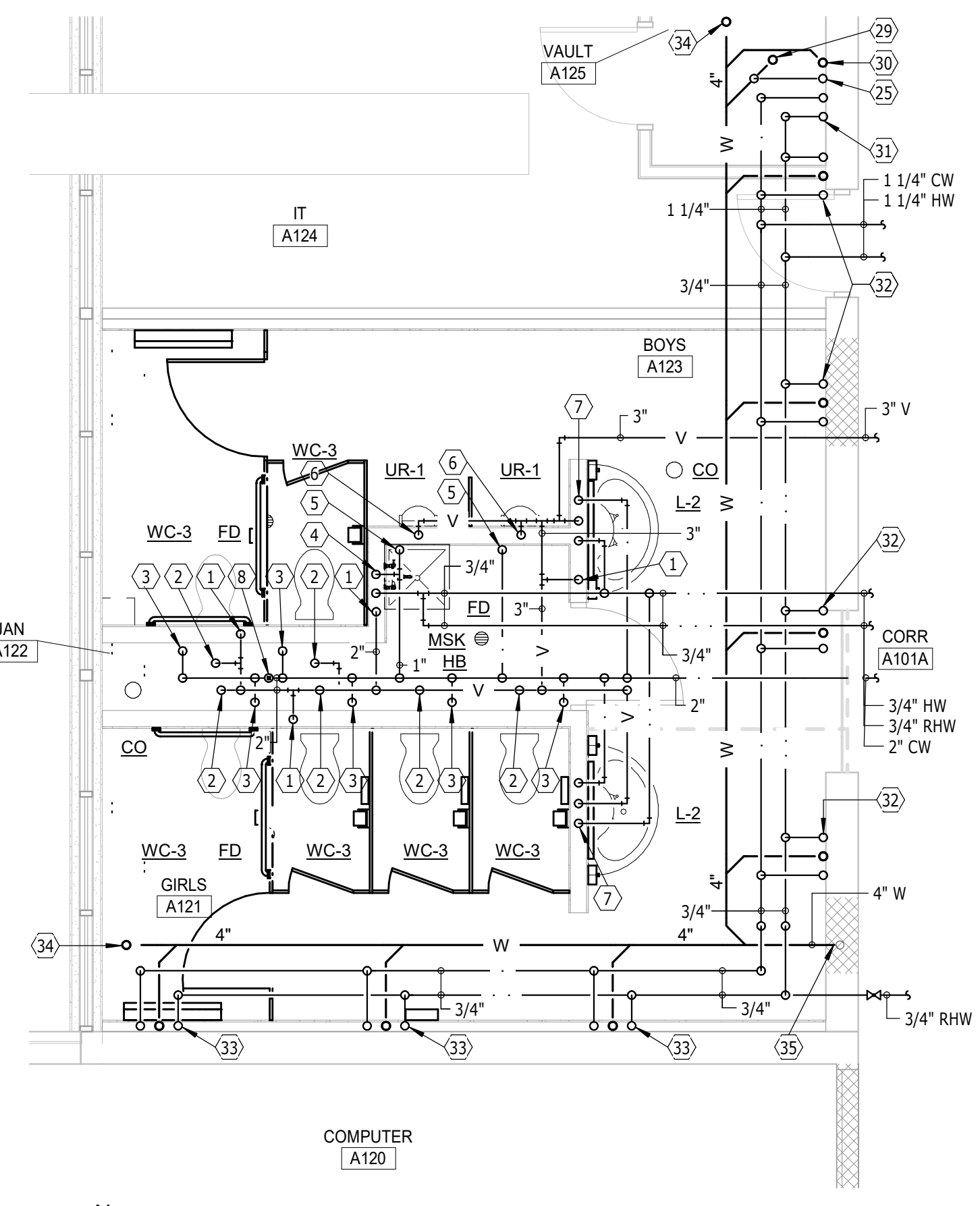
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PLUMBING & HEATING NOTES

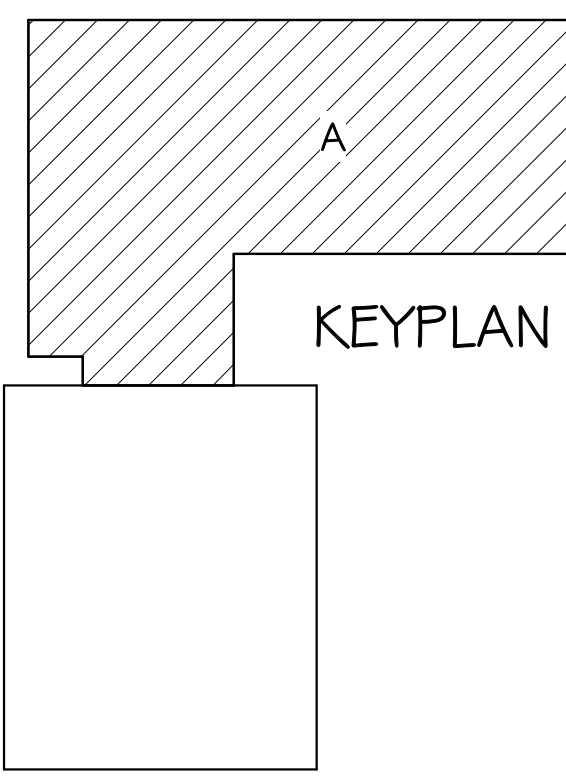
- 1 2" V DN
- 2 2" V/4" W DN
- 3 1 1/4" CW DN
- 4 3/4" CW DN TO HBMSK, 1/2" HW DN TO MSK
- 5 1" CW DN
- 6 1 1/2" V/2" W DN
- 7 1/2" CW DN, 1 1/2" V/2" W DN, 1/2" HW DN
- 8 WATER HAMMER ARRESTOR
- 9 1/2" HW DN, 1 1/2" V/2" W DN, 1/2" CW DN
- 10 1/2" CW DN, 1/2" HW DN
- 11 6" DS DN W/CO 24" AFF
- 12 1 1/4" DWS & 1 1/4" DWR UP TO UNIT VENTILATOR
- 13 1 1/4" DWS & 1 1/4" DWR DN TO UNIT VENTILATOR
- 14 2" V DN, 1 1/4" CW DN
- 15 HYDRONIC SEMI-RECESSED INVERTED FLOW CABINET UNIT HEATER
- 16 HYDRONIC 24"X48" RADIANT CEILING PANEL. SEE RADIANT PANEL PIPING DETAIL
- 17 HYDRONIC FLOOR MOUNTED INVERTED FLOW CABINET UNIT HEATER. SEE CABINET UNIT HEATER PIPING DETAIL
- 18 3/4" DWS & 3/4" DWR DN TO CABINET UNIT HEATER
- 19 HYDRONIC WALL MOUNTED FINETUBE RADIATION. SEE FINETUBE RADIATION PIPING DETAIL
- 20 HYDRONIC UNIT VENTILATOR. SEE UNIT VENTILATOR PIPING DETAIL
- 21 EXTEND 1" FCU DRAIN TO MSK
- 22 HYDRONIC FAN COIL UNIT. SEE FAN COIL UNIT PIPING DETAIL
- 23 2" G DN, 3/4" RHW DN, 1 1/4" HW DN, 2 1/2" CW DN, 4" DWR DN, 4" DWS DN
- 24 SEE ENLARGED PLAN ON THIS SHEET FOR CONTINUATION
- 25 2" V UP
- 26 3" V UP
- 27 1/2" G UP, PROVIDE UNDER ADD ALTERNATE #5
- 28 ELECTRIC WATER COOLER & ASSOCIATED PIPING TO REMAIN CONNECTED
- 29 2" W UP TO FD
- 30 2" W UP TO ESH
- 31 1 1/4" CW UP, 1 1/4" HW UP
- 32 1/2" HW UP, 2" W UP TO SK, 1/2" CW UP
- 33 1/2" CW UP, 2" W UP TO SK, 1/2" HW UP
- 34 4" W UP TO CO
- 35 CONNECT TO EXISTING PIPING. VERIFY SIZE & LOCATION PRIOR TO ASSOCIATED WORK
- 36 PIPING TO BE PROVIDED UNDER ADD ALTERNATE #5
- 37 2 1/2" DWS UP/DN, 2 1/2" DWR UP/DN
- 38 3/4" DWR UP, 3/4" DWS UP



N  
**FIRST FLOOR PLAN - AREA A - PLUMBING & HEATING**  
 SCALE 0 4 8 12 16

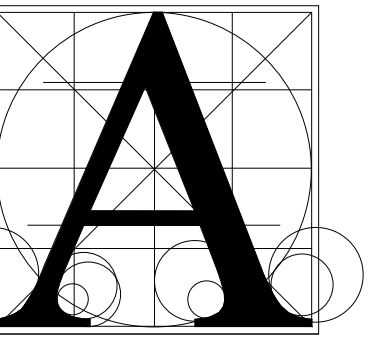


N  
**ENLARGED FIRST FLOOR PLAN - AREA A - PLUMBING & HEATING**  
 SCALE 0 2 4 6 8



ST. MARY'S CATHOLIC SCHOOL  
 FIRST FLOOR PLAN - AREA A - PLUMBING &  
 HEATING

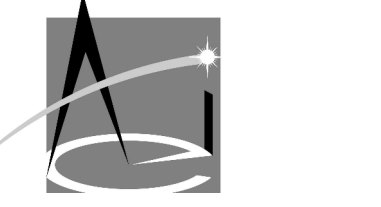
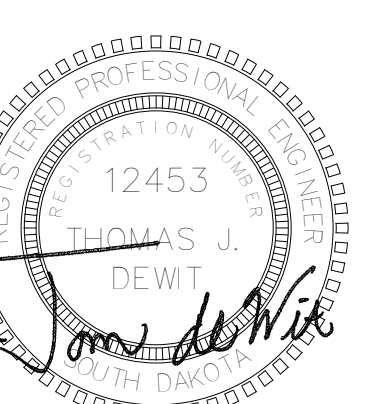
Project number	0413.2788.18	
date	7-31-2022	
revision		
drawn	DWM	
checked	Td	
NO.	DATE	DESCRIPTION
1	6/23/22	ADDENDUM 1
2	6/30/22	ADDENDUM 2



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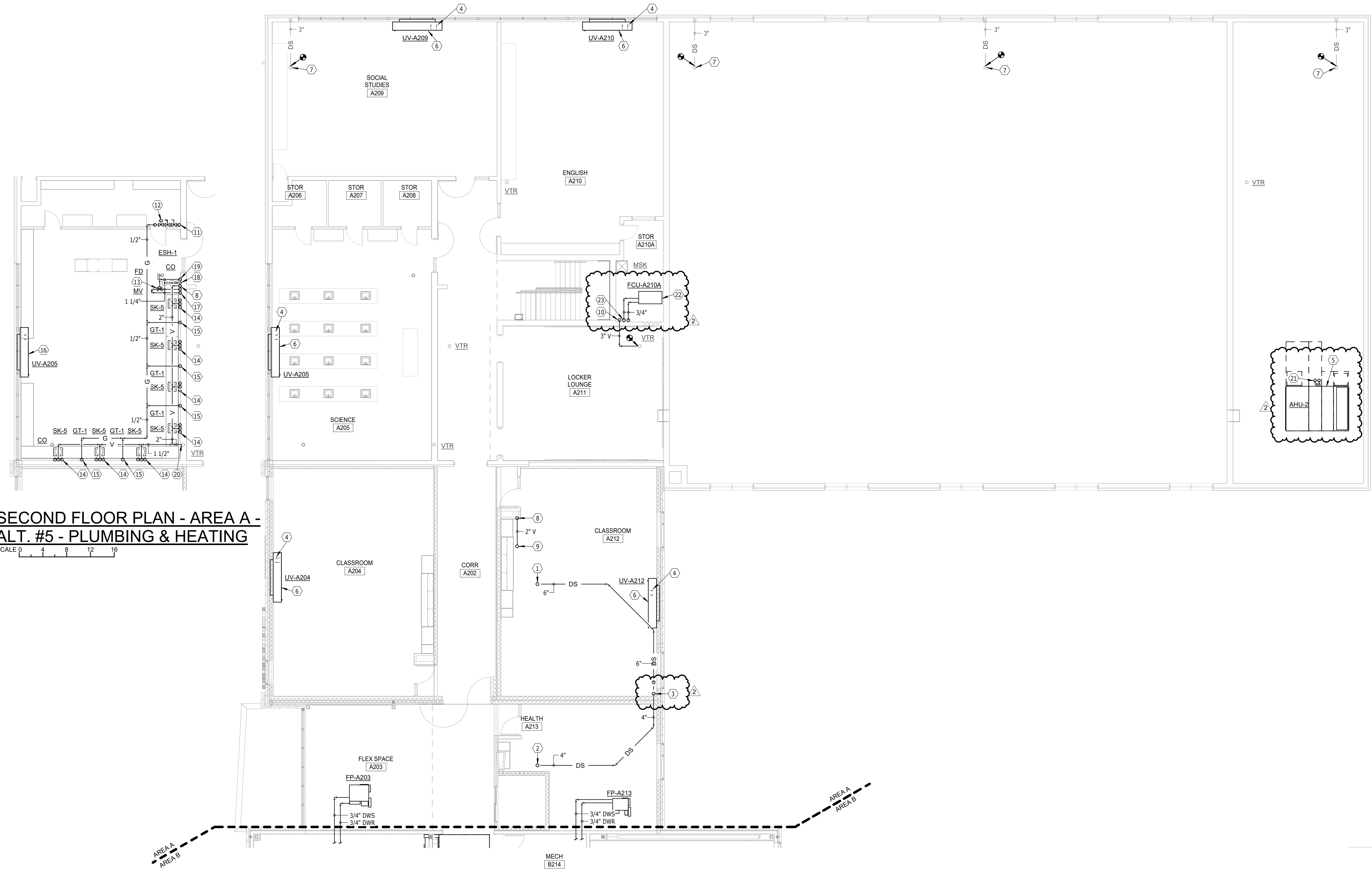
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- B. ON DEMO DRAWINGS, ITEMS SHOWN LIGHT ARE EXISTING TO REMAIN, ITEMS SHOWN BOLD ARE EXISTING TO BE REMOVED.
- C. ON NEW CONSTRUCTION DRAWINGS, ITEMS SHOWN LIGHT ARE EXISTING TO REMAIN, ITEMS SHOWN BOLD ARE NEW WORK.

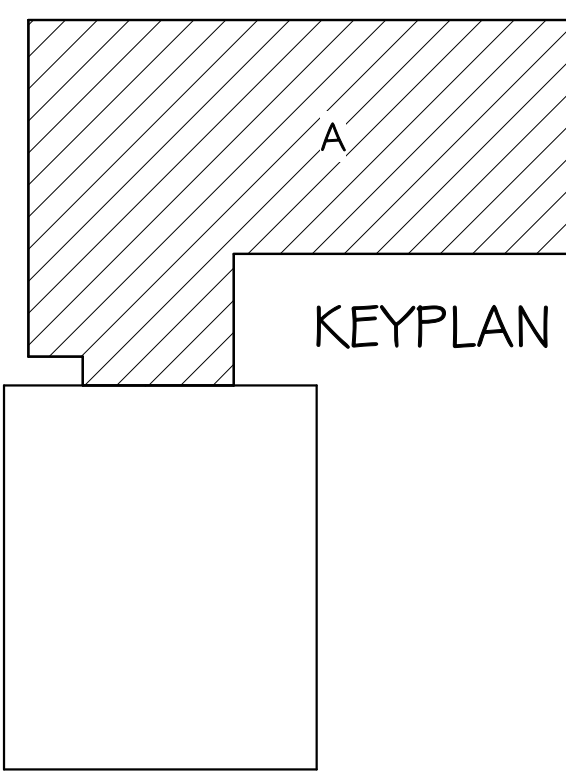
PLUMBING & HEATING NOTES

- 1 6" DS UP TO 6" RD
- 2 4" DS UP TO 4" RD
- 3 6" DS DN
- 4 1 1/4" DWS & 1 1/4" DWR DN TO UNIT VENTILATOR
- 5 EXTEND AHU CONDENSATE PIPING TO FIXTURE BELOW
- 6 HYDRONIC UNIT VENTILATOR. SEE UNIT VENTILATOR PIPING DETAIL
- 7 PROVIDE NEW 3" ROOF DRAIN DURING REROOFING. CONNECT TO EXISTING PIPING
- 8 2" V DN
- 9 4" V UP (4" VTR)
- 10 3" V DN
- 11 1/2" G DN
- 12 GAS EMERGENCY SHUTOFF PUSH BUTTON CONNECTED TO SOLENOID VALVE (MTO BELOW CEILING) SERVING CLASSROOM. VALVE ASCO MODEL 8215-EXPLOSION PROOF, 120 VOLT OR EQUAL
- 13 EMERGENCY EYEWASH/SHOWER MIXING VALVE. SEE PIPING DETAIL
- 14 1/2" HW DN, 1 1/2" W/2" W DN, 1/2" CW DN
- 15 1/2" G DN TO COUNTERTOP MOUNTED DOUBLE GAS TURRET
- 16 UNIT VENTILATOR & ASSOCIATED PIPING INSTALLED UNDER BASE BID
- 17 1 1/4" CW DN, 1 1/4" HW DN
- 18 1 1/2" V/2" W DN
- 19 1 1/4" TW DN TO ESH
- 20 VERIFY SIZE & LOCATION PRIOR TO ASSOCIATED WORK
- 21 2 1/2" DWR DN, 2 1/2" DWS DN
- 22 EXTEND 1" FCU DRAIN TO MSK
- 23 3/4" DWS DN, 3/4" DWR DN



SECOND FLOOR PLAN - AREA A -  
ALT. #5 - PLUMBING & HEATING  
SCALE 0 4 8 12 16

SECOND FLOOR PLAN - AREA A - PLUMBING & HEATING  
SCALE 0 4 8 12 16



ST. MARY'S CATHOLIC SCHOOL  
SECOND FLOOR PLAN - AREA A - PUMBING &  
HEATING

number	0413.2788.18	
date	7-31-2022	
revision		
drawn	DWM	
checked	Td	
NO.	DATE	DESCRIPTION
1	6/23/22	ADDENDUM 1
2	6/30/22	ADDENDUM 2

8.35

## SECTION 277350 – SYNCHRONIZED WIRELESS MASTER-SATELLITE TIME SYSTEM

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SCOPE

- A. This Section includes all labor, materials, tools, equipment, and related services to furnish and install a Synchronized Wireless Master-Satellite Time System, as shown on the drawings and specified herein.
- B. This Contractor shall furnish, install, and place into operation a complete and operating system, as specified herein. This system shall include, but not be limited to a GPS receiver, wireless master transmitter, software, FCC wireless operating license, wireless system clocks, conduits, cables and wire necessary to form a complete system.
- C. Related Sections include the following:
  - 1. Division 27 Section "School Paging Intercom System".

#### 1.3 QUALITY ASSURANCE

- A. Product Quality
  - 1. Manufacturer shall specialize in manufacturing commercial time systems with a minimum of 10 continuous years of documented experience.
  - 2. All basic electronic equipment shall be listed by Underwriter's Laboratories, Inc. for the application and shall be products of manufacturers of established reputation and experience.
- B. Contractor Qualifications
  - 1. The Installing Contractor shall be a firm with documented experience in the installation of commercial time systems.
  - 2. The Installing Contractor (and any Subcontractors working for the Installing Contractor) shall be licensed, in accordance with local, regional and state authorities having jurisdiction, to complete the work that they are contracted to perform.

#### 1.4 SUBMITTALS, SHOP DRAWINGS & MAINTENANCE MANUALS

- A. Submittals shall be provided in accordance with Division 1 and as further described herein.
- B. Submittals shall include major equipment material lists, summarizing every item to be provided, by manufacturer, part number, quantity, and include a brief summary of each item. Manufacturer's product data sheets, describing each of the major components shall also be provided. Submit brochure or color card showing available colors and finishes of clocks.

- C. Submittals shall be tab divided to aid in identifying the various sections of the submittal.
- D. Shop drawings shall include functional block diagrams and complete termination diagrams, showing all headend, control and typical field devices, shall also accompany the submittal.
- E. Manufacturers Instructions: Submit complete installation, set-up, and maintenance manuals.
- F. Operators License: Submit evidence of application for operating license prior to installing equipment. Furnish the license, or if the license has not been received, a copy of the application for the license, to the Owner prior to operating the equipment. When the license is received, deliver original license to the owner.
- G. Maintenance manuals shall be compiled in accordance with the Division 1, shall include all information provided as part of the original submittal and shall also be updated to include installation notes, manufacturer's manuals, etc. Manuals shall also include:
  - 1. Descriptions of all equipment and normal operations
  - 2. Field test reports shall be provided, indicating and interpreting test results for compliance with performance requirements of the Project.
  - 3. Maintenance data shall be included for all major pieces of equipment, as per the requirements specified in Division 1.
  - 4. Copy of major equipment manufacturer's standard warranty statements, for future reference and use, should claims need to be submitted.

#### 1.5 SYNCHRONIZED WIRELESS MASTER-SATELLITE TIME SYSTEM DESCRIPTION

- A. The system shall provide wireless synchronized precision time that is traceable through GPS satellites to the US Government's official NIST time standard (coordinated universal time).
- B. The system shall be a synchronized master-satellite time system. The system shall synchronize all clocks to each other and utilize either GPS technology or a defined NTP server that the transmitter can access via the customer Local Area Network (LAN) to provide atomic clock. The system shall not require hard wiring. Clocks shall automatically adjust for daylight savings time.
  - 1. The wireless transmitter shall obtain current atomic time from either satellite or the customer LAN and transmit time to all clocks and tone generators in the system. Clocks shall be synchronized to within 1 second, 6 times per day, and the system shall have an internal oscillator that maintains plus or minus one second per day between synchronizations, so that clock accuracy shall not exceed plus or minus .2 seconds. The transmitter shall operate on FCC licensed frequencies that have good building penetration and that are regulated by the FCC to minimize interference on the selected channel.
  - 2. The system shall include an internal clock so that failure of the GPS or LAN signal shall not cause the clocks to fail in indicating time.
  - 3. The system shall incorporate fail-safe design so that failure of any component shall not cause failure of the system. Upon restoration of power or repair of failed component, the system shall resume normal operation without the need to reset the system or any component thereof.
  - 4. Clock locations shall be as indicated, and clocks shall be fully portable, capable of being relocated at any time.

#### 1.6 REGULATORY REQUIREMENTS

- A. Transmitter and receiver shall comply with Part 15 and Part 90 of FCC rules, as follows.
  - 1. The equipment shall not cause harmful interference.
  - 2. The equipment shall not accept interference that will cause adverse effects to equipment operation.
  - 3. The transmitter frequency shall be governed by FCC Part 90.35.
  - 4. The transmitter output power shall be governed by FCC Part 90.257 (b).
- B. System shall be installed in compliance with local and state authorities having jurisdiction.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver all components to the site in the manufacturer's original packaging. Packaging shall contain manufacturer's name and address, product identification number, and other related information.
- B. Store equipment indoors in clean, dry space with uniform temperature to prevent condensation. Protect equipment from weather, dirt, dust, corrosive substances, and physical damage.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

#### 2.2 APPROVALS

- A. The equipment specified herein is the manufacture of Primex Wireless, N3211 County Road H, Lake Geneva WI 53147, (800)-537-0464. Similar equipment shall be considered for approval, provided the equipment is manufactured of equivalent materials that meet or exceed specified requirements of this sections and requests for approval are received at least seven (7) days prior to bid date and a full explanation of the proposed product substitution is offered.
  - 1. American Time, Bogen, and Sapling are approved as equal for bidding purposes.
- B. Products that are to be provided to form the system described herein are defined both functionally and descriptively. It is to be understood that these explanations are provided to establish minimum acceptable standards of performance and appearance. Product make and model numbers have also been provided to further define and more closely describe specific operational characteristics and/ or to make the contractor aware of the owner's preference for particular products.
  - 1. Systems requiring wiring and/or conduit between master and clocks will not be acceptable.
- C. Any exceptions to specifications, in terms of product appearance, configuration, operation or capabilities, which alter a potential bidders ability to meet these specifications shall be fully disclosed to the Architect/ Engineer at the time a request for approval to bid is received.
  - 1. Operational features and characteristics which exceed the requirements set forth in this specification as a minimum standard need not be disclosed at the time of product consideration for approval.

- D. Notice of all bidder and product approvals shall be by addendum issued prior to bid date.

## 2.3 SEQUENCE OF OPERATION

- A. Transmitter Operation: When power is first applied to the transmitter, it checks for and displays the software version, then it checks the position of the switches and stores their position in memory. The transmitter then looks for the GPS time signal. Once the transmitter has received the GPS time, it sets its internal clock to that time. The transmitter then starts to transmit its internal time once every second. The transmitter updates its internal clock every time it receives valid time data from the GPS.
  - 1. Transmitter Programming: After the transmitter has been set up and is operating correctly, it is programmed to transmit a signal to the wireless tone generator receiver switch at predetermined intervals. The equipment supplier shall coordinate programming with the owner and provide system training as required in part 3 of this specification.
- B. Clock Operation:
  - 1. When the batteries are inserted into the clock, pressing the red button as the second hand gets to the 12:00 position will lock the location of the second hand, and the microprocessor will know the location of the second hand. When the red button is pressed as the second hand is passing the hash mark that locks the location of the minute hand in the microprocessor, and the microprocessor will know the location of the minute hand. The microprocessor then assume the location of the hour hand.
  - 2. After the red button has been pressed twice, the microprocessor will start searching the valid time signal channels. If no signal is detected, the receiver will shut off and try again later. If a valid time signal is received, the microprocessor will set the clock to the receive time, then for the next minute, the clock will beep every time that it receives a valid time signal.
  - 3. After initial set, the clock will shut off the receiver. On a pre-scheduled basis, the microprocessor will turn the receiver back on and look for a valid time signal to set the clock.
  - 4. If the clock has not decoded a valid time signal for seven days, then it will go back to the double step mode. Non signal reception can be caused by low battery voltage. If this occurs, replace the clock batteries.

## 2.4 EQUIPMENT

- A. Transmitter: Primex Wireless Model FM-72, consisting of wireless transmitter with GPS receiver. Unit shall obtain current atomic time from satellite and transmit time continuously to all clocks and wireless tone generator receiver switch. Provide multiple transmitters as required to provide a functioning system throughout the facility.
  - 1. Transmission:
    - a. Frequency Range: One watt at 72.1 to 72.4 MHz.
    - b. Transmission Range: One mile, open field.
    - c. Radio Technology: Narrowband FM.
    - d. Number of Channels: 16.
    - e. Channel Bandwidth: 20KHz maximum.
    - f. Transition Mode: One-way communication.
    - g. Data Rate: 2 KBps.
    - h. Operating Range: 0 degrees Celsius to 70 degrees Celsius.
  - 2. Transmitter:
    - a. Frequency Deviation: +/- 4 KHz.



- b. Power Requirements: 120VAC, 60Hz. Provide duplex receptacle at the transmitter location.
  - c. Housing Dimensions: Metal, 16-3/4" x 12" x 1-7/8".
  - d. Antenna: 46" high, commercial type, mounted on top center of housing. Gain shall be greater than 110 dBm with data logic polarization, 0 to 5 volts.
  - e. Transmitter housing shall incorporate a display which shall include the following:
    - 1) Time readout.
    - 2) AM and PM indicator if 12 hour time display is set.
    - 3) Day and date readout.
    - 4) Indicator for daylight savings or standard time.
    - 5) Red LED to indicate reception problem.
    - 6) GPS reception indicator.
  - f. Transmitter shall contain an internal clock such that failure of reception from the GPS will not disable the system operation.
  - g. Power supply shall be model number Q11666, 120V, 60Hz, .4A input with 9VDC, 1.5 amp output.
  - h. Transmitter shall have 16 selectable channels to assure interference-free reception.
  - i. Transmitter shall have the following switches:
    - 1) Time zone adjust switches for all US time zones: Eastern, Central, Mountain, Pacific, Alaska and Hawaii.
    - 2) Daylight saving time bypass switch.
    - 3) 12-hour or 24-hour display.
- B. GPS Receiver: Primex Model Q11722, GPS roof mounted with Primex Wireless coaxial cable of length required to route to the receiver location. Cabling shall be installed in raceway.
- 1. The receiver shall be enclosed in a weatherproof case, 3-7/8" x 4-13/16" x 2", designed for roof mounting. Provide mounting bracket for attachment to roof structure.
- C. Software: Primex Model 14003 scheduler software for installation on owner furnished PC. The manufacturer's factory authorized representative shall coordinate PC system requirements and provision with the owner. Programming shall be accomplished by the factory authorized representative.
- 1. Software shall be in the form of a CD, suitable for operation in standard CD-ROM drives.
  - 2. Provide one cable, RS232 with USB-to-serial adapter if required for use in downloading programmed software to the wireless tone generator switch.
- D. Clocks: Primex wireless clocks. 12-1/2" diameter or 16" diameter (in gymnasiums and other areas as indicated on the plans), polycarbonate frame and lens, white face, black hour and minute hands, red sweep second hand, with frame color and finish as selected from manufacturer's standard colors and finishes. Clocks shall be double faced where noted on the plans.
- 1. Clocks shall be battery operated, and shall have a 5 year battery life. Provide 2 alkaline "D" cell batteries with each clock.
  - 2. Clocks shall be capable of automatically adjusting for daylight savings time. An on-off switch located on the transmitter shall disable this function if desired.
  - 3. Time shall be automatically updated from the transmitter 6 times per day via an internal antenna. If the transmitter stops transmitting valid time signals due to power failure, the clocks shall continue to function as accurate quartz clocks until a valid time signal is decoded.
  - 4. Clocks shall remember the time during changing of batteries.
  - 5. Theft resistant hangers and slots shall be provided in the backs of the clocks.

- E. Wire Guards: Provide wire guards for clocks located in gymnasiums and other areas as indicated on the plans. Wire guards shall be painted to match the finish of the surface to which they are mounted.
  - 1. Guards for 12-1/2" clocks shall be Primex Model 14131, 14" x 14".
  - 2. Guards for 16" clocks shall be Primex Model 14123, 18" x 18".
- F. Cable Connection Sealant: Radio Shack Coaxial Cable Connector Sealant 278-1645, or approved silicone sealant.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that construction is near completion in spaces to receive equipment and that rooms are clean and dry.
- B. Verify that 120V receptacles are located within 6' of the transmitter and tone generator switch locations, and that the outlets are operational and properly grounded.
- C. Verify that a compatible PC is available for dedicated use during software installation and system testing.

### 3.2 INSTALLATION

- A. The installation shall be in accordance with the latest requirements of the NEC, State, and Local Codes, ordinances and regulations of any other governing body having jurisdiction
- B. All equipment shall be installed in a neat and workmanlike manner and to the satisfaction of the Project Engineer.
- C. Install GPS receiver unit (if customer LAN is not being utilized) on roof in location indicated, in clear view of the sky. Install unit in location free from standing water, and above accumulations of leave or debris. Seal coaxial cable connection to GPS with cable connection sealant. Coordinate installation with roof work so that the bracket and related fasteners are watertight.
- D. Locate the transmitter where indicated, a minimum of 3 feet above the floor, away from large metal objects such as filing cabinets, lockers, or metal framed walls.
  - 1. Attach the GPS receiver to the transmitter using coaxial cable.
  - 2. Connect the antenna to transmitter, using care not to strip threads.
  - 3. Connect power supply to the transmitter.
  - 4. Set the channel number on the display to correspond to the FCC license.
  - 5. Plug the power supply into electrical outlet.
- E. Install the clocks at locations indicated on the plans (verify locations with the owner). Clocks shall not be installed until painting and other finish work in each room is complete.
  - 1. Install "D" cell batteries.
  - 2. Set clock to correct time in accordance with manufacturer's instructions.
  - 3. Observe clock until valid signals are received and clock adjusts itself to correct time.

4. Install the clock on the wall in the indicated location, plumb, level, and tight against the wall. Attach using Clock-Lock hanging method and suitable fasteners as approved by clock manufacturer.
  5. Where wire guards are provided, attach guards secure to the wall, using approved theft-resistant fasteners..
- F. Install cable without damaging conductors, shield, or jacket.
- G. Pull cables without exceeding cable manufacturer's recommended pulling tensions.
1. Pull cables simultaneously if more than one is being installed in the same raceway.
  2. Use pulling compound or lubricant if necessary. Use compounds that will not damage conductor or insulation.
  3. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage media or raceway.
- H. Use splice and tap connectors compatible with media types.

### 3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory authorized representative to inspect field-assembled components and equipment installations, including connections.
1. Program the scheduler software for time synchronization of this system with the Paging Intercom System master. Coordinate requirements with the Paging Intercom System equipment supplier.

### 3.4 TESTING

- A. The System shall be tested, prior to acceptance, by a factory authorized representative of the manufacturer, at a time designated by the Architect/Engineer or owner. Manufacturer's representative shall provide a letter detailing the date and scope of all tests conducted and shall certify in writing that all tests have been performed and that results of these tests are satisfactory.
- B. General testing:
1. Visually inspect all system components for correct operation. Replace all parts which are found to be defective.

### 3.5 CLEANING

- A. Prior to final acceptance, clean exposed surfaces of all system components using cleaning methods recommended by the manufacturer. Remove temporary labels from clock faces. Do not remove labels from backs of clocks.
- B. Protect finished installation until final acceptance of the system.

### 3.6 TRAINING

- A. The owner's representative and key staff personnel shall be trained in proper operation of the system.
- B. Training is to be conducted by a factory authorized representative, who is familiar with the installation and the intended use of the system.
- C. The contractor shall provide a minimum of one training session, to last no more than two (2) hours, prior to final acceptance of the system, at a date and time desired by the owner.
- D. Separate maintenance type training sessions shall be conducted to familiarize the owner's maintenance staff with routine maintenance and field programming features of the system. A minimum of two (2) hours of training shall be provided.

### 3.7 WARRANTY

- A. The entire installation shall be guaranteed against all defects in materials and workmanship for a period of one (1) year from date of installation & final acceptance. Factory-trained personnel, employed by the equipment supplier, shall provide first response to a problem during the warranty year. This response is to include maintenance, repair, or replacement of any equipment found to be defective, provided the defect is not caused by misuse, abuse, neglect, or unauthorized tampering or modification. All labor, shipping, transportation and related expenses are to be at no additional cost to the owner for any guarantee service provided.

END OF SECTION 277350