FIRE PROTECTION PIPING

CHILLED WATER RETURN

CHILLED WATER SUPPLY

HEATING WATER RETURN

HEATING WATER SUPPLY

GLYCOL HEATING RETURN

GLYCOL HEATING SUPPLY

EXHAUST AIR

OUTSIDE AIR

RETURN AIR

SUPPLY AIR

TRANSFER AIR

FIRE-SMOKE DAMPER

BALANCING DAMPER

BACK DRAFT DAMPER

FIRE DAMPER

FIRE DEPARTMENT CONNECTION

FDC

HWR

HWS

GHR

GHS

O/A, OA

R/A, RA

S/A, SA

T/A, TA

FD

FSD

BDD

BD

HYDRONIC SYSTEMS

DUCT WORK SYSTEMS

GAL GALLON GALV. GALVANIZED GPH **GALLON PER HOUR** GPM GALLON PER MINUTE HEPA HIGH EFFICIENCY PARTICULATE ARREST (FILTER) HP HORSEPOWER (ELEC.) Hz HERTZ (ELEC.) IAQ INDOOR AIR QUALITY IN.W.C. INCH, WATER COLUMN KW KILOWATT KWH KILOWATT HOUR LAT LEAVING AIR TEMPERATURE

FEET PER MINUTE

FIXTURE UNIT

FEET PER SECOND

FPS

FU

PG

LB POUND LGT LEAVING GLYCOL TEMPERATURE LWT LEAVING WATER TEMPERATURE MAT MIXED AIR TEMPERATURE MAX MAXIMUM MBH 1,000 BTU PER HOUR MECH **MECHANICAL** MIN. MISC. MINIMUM MISCELLANEOUS MMBH 1,000,000 BTU PER HOUR NC NORMALLY CLOSED NIC NOT IN CONTRACT NO NTS NORMALLY OPEN NOT TO SCALE OAT **OUTSIDE AIR TEMPERATURE** OFCI OWNER FURNISHED CONTRACTOR INSTALL OFOI OWNER FURNISHED OWNER INSTALL PD PRESSURE DROP

PHASE (ELEC) PH **PRES** PRESSURE POUND PER SQUARE INCH PSI PSIA PSI ABSOLUTE **PSIG** PSI GAUGE RH **RELATIVE HUMIDITY** REVOLUTION PER MINUTE RPM SWITCH (SYMBOLIC) SEC. SECOND STAINLESS STEEL THERMOSTAT (SYMBOLIC) TEMP. TEMPERATURE TYP. TYPICAL

PROPYLENE GLYCOL

UON UNLESS OTHERWISE NOTED VOLT (ELEC.) VEL. VELOCITY VARIABLE FREQUENCY DRIVE VFD WITH W/

W/O WITHOUT WET BULB WB

ADDITIONAL ABBREVIATIONS NOTED BY EQUIPMENT TAGS, SYSTEM SYMBOLS, AND ACRONYMS GENERALLY ACCEPTED BY THE INDUSTRY SHALL BE APPLICABLE.

DUCT WORK AND PIPING COLOR LEGEND

DUCT WORK SYSTEMS:

SUPPLY AIR DUCT WORK RETURN AIR DUCT WORK EXHAUST AIR DUCT WORK OUTSIDE AIR DUCT WORK

PIPING SYSTEMS: DOMESTIC COLD WATER PIPING DOMESTIC HOT WATER PIPING DOMESTIC HOT WATER CIRCULATION PIPING HYDRONIC SUPPLY PIPING HYDRONIC RETURN PIPING REFRIGERANT PIPING FUEL OIL PIPING **FUEL GAS PIPING**

CERTAIN EQUIPMENT CONNECTIONS MAY VARY. INTERPRET DRAWINGS FOR INTENDED INSTALLATION OR REQUEST CLARIFICATION AS NEEDED.

COLOR VERSION OF THESE DRAWINGS IN ELECTRONIC FORMAT (INCLUDING PDF, JPEG, ETC.) MAY BE AVAILABLE FOR DOWNLOAD FOR PROJECT PERSONNEL UPON REQUEST.

MECHANICAL DESIGN PARAMETERS

BUILDING DOMESTIC WATER SYSTEM

TOTAL BUILDING WATER SERVICE LOAD: 78.0 FIXTURE UNITS **BUILDING WATER SERVICE PRESSURE:**

OVER 60 PSI **BUILDING WATER SERVICE ENTRANCE:** 4 INCH MIN., FIRE SERVICE (FROM UTILITY SERVICE) DESIGN SYSTEM LENGTH (UPC, TABLE 6-6): 100 FEET

THE SIZING OF THE DOMESTIC WATER PIPING SYSTEM SHALL CONFORM TO UNIFORM PLUMBING CODE, 2012 ED., **SECTION 610.8,**

FIXTURE UNIT LOAD
FIXTURE CONNECTION ONLY 3/4" 1-1/4" 1-1/2" 151 370

DRAIN, WASTE, AND VENT SYSTEMS

TOTAL BUILDING SEWER SERVICE LOAD: 69 FIXTURE UNITS **BUILDING SEWER SERVICE ENTRANCE:** 4 INCH

THE SIZING OF THE BUILDING SANITARY DRAIN, WASTE, AND VENT PIPING SYSTEMS SHALL CONFORM TO UNIFORM PLUMBING CODE, 2012 ED., CHAPTER 7,

HEATING GENERATION SYSTEMS

DESIGN CONDITION (WINTER/SUMMER): ASHRAE 99% / 2%, KODIAK AIRPORT, ALASKA WINTER DESIGN OUTDOOR AMBIENT: 12.9 DEGREES F DRY BULB SUMMER DESIGN OUTDOOR AMBIENT: 62.4 DEGREES F DRY BULB 54.9 DEGREES F WET BULB

HYDRONIC PIPING SYSTEMS

MAXIMUM FLUID VELOCITY 5 FEET PER SECOND HYDRONIC FLUID: **HOT WATER**

UNLESS OTHERWISE NOTED IN DRAWINGS, USE THE FOLLOWING TABLE AS GUIDE TO SELECT PIPING SIZES BASED ON THE FLOW RATE LIMITATIONS,

PIPE SIZE	FLOW RATE LIMITATION (MAX GPI
3/4"	3.0
1"	6.0
1-1/4"	12.0
1-1/2"	18.0
2"	35.0

VENTILATION SYSTEMS

DWELLING UNITS: VENTILATION SHALL BE PROVIDED BY EXHAUST VENTILATION SYSTEMS FOR INDIVIDUAL DWELLING UNITS PER INTERNATIONAL MECHANICAL CODE, 2012 ED., TABLE 403.3, AND SECTIONS 403.

VENTILATION COMPLIANCE:

BEDROOMS: 15 CFM OUTSIDE AIR LIVING ROOM/KITCHEN/DINING: 30 CFM OUTSIDE AIR EXHAUST FAN HIGH/LOW CFM: 50 CFM / 30 CFM

OFFICE WING GENERAL VENTILATION: VENTILATION PROVIDED THROUGH HEAT RECOVERY VENTILATOR WITH CENTRAL RESTROOM EXHAUST SYSTEM.

VENTILATION COMPLIANCE:

DESIGN SUPPLY AIR VOLUME: OUTSIDE AIR PERCENT: 25%(ROOM OUTSIDE AIR RATIO DESIGN MINIMUM) ACTUAL OUTSIDE AIR: 400 CFM (FOR EXHAUST OFFSET) ACTUAL OUTSIDE AIR PERCENT:

GATHERING ROOM VENTILATION: VENTILATION PROVIDED THROUGH OUTSIDE AIR PROVISIONS TO HEAT PUMP SYSTEM INDOOR TERMINAL UNITS.

VENTILATION COMPLIANCE:

820 SF SPACE AREA: SPACE TYPE (IMC TABLE 403.3): CONFERENCE ROOM TYPE OCCUPANCY OCCUPANCY LOAD: 50 OCCUPANTS (EST.) VENTILATION RATE REQUIRED: 5 CFM/OCC, 0.06 CFM/SF

OUTSIDE AIR REQUIRED: 299 CFM DESIGN OUTSIDE AIR: 300 CFM

CONFERENCE ROOM VENTILATION: VENTILATION PROVIDED THROUGH OUTSIDE AIR PROVISIONS TO HEAT PUMP SYSTEM INDOOR TERMINAL UNITS.

VENTILATION COMPLIANCE:

SPACE AREA: SPACE TYPE (IMC TABLE 403.3): CONFERENCE ROOM TYPE OCCUPANCY

OCCUPANCY LOAD: 50 OCCUPANTS (EST.) **VENTILATION RATE REQUIRED:** 5 CFM/OCC, 0.06 CFM/SF OUTSIDE AIR REQUIRED: 294 CFM

DESIGN OUTSIDE AIR: 300 CFM

MECHANICAL ROOM: COMBUSTION AIR FOR FUEL-FIRED APPLIANCES PROVIDED THROUGH DEDICATED COMBUSTION AIR INTAKE.

SMALL LOCAL EXHAUST FANS IN INCIDENTAL SPACES PROVIDED TO PREVENT HIGH HUMIDITY LEVEL.

HEAT EXTRACTION FAN PROVIDED FOR TELE/COMM ROOM.

EXHAUST BOOSTER FANS PROVIDED FOR LAUNDRY ROOM CLOTHES DRYERS.

GENERAL MECHANICAL INFORMATION

APPLICABLE CODES AND STANDARDS

INTERNATIONAL CODE COUNCIL (ICC) SERIES MODEL CODES, 2012 ED., AS ADOPTED INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS (IAPMO), UNIFORM PLUMBING CODE (UPC), 2012 ED.

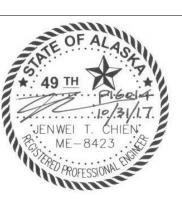
SEISMIC/WIND RESTRAINT DESIGN FOR MAJOR EQUIPMENT INSTALLATION:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DEFERRED SUBMITTAL OF THE SEISMIC AND WIND LOAD DESIGN DRAWINGS AND CALCULATIONS PREPARED BY A LICENSED STRUCTURAL ENGINEER FOR APPROVAL FOR MAJOR EQUIPMENT INCLUDING,

- HEATING AND VENTILATION UNIT. HRV-1
- WATER HEATERS (SEISMIC RESTRAINTS)
- **BOILERS (ANCHORAGE)**
- **FUEL OIL TANK (ANCHORAGE)** PROPANE TANK (SEISMIC RESTRAINTS)

NOTES: DETERMINATION OF COMPONENT IMPORTANCE FACTOR FOR MECHANICAL AND ELECTRICAL COMPONENTS: REFERENCE ASCE STANDARD 7, CHAPTER 13 FOR APPLICABLE DESIGN REQUIREMENTS EXCEPT, UNLESS OTHERWISE DETERMINED, COMPONENT IMPORTANCE FACTOR OF 1.5 SHALL BE USED IN ALL DESIGN SEISMIC FORCE CALCULATIONS.

- SPRINKLER SYSTEMS:
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND PERMITTING OF THE FIRE PROTECTION SPRINKLER SYSTEMS. THE SPRINKLER SYSTEMS SHALL BE DESIGNED AND CERTIFIED BY PERSON(S) HOLDING CURRENT NICET IV CERTIFICATIONS.



UNDICTION OF THE PROPERTY OF T

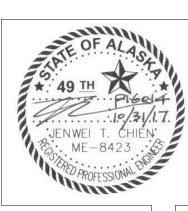
Ш

0 \bigcirc \geq OUZINKIE

CK: DT: UB:

DOMESTIC HOT WATER CIRCULATION:

CONDENSATE DRAIN: RADIANT SYSTEM LOOP RUNOUT/TAIL:



1" INSULATION WITH ALL PURPOSE JACKET

1" INSULATION WITH ALL PURPOSE JACKET

NONE
1" CLOSED-CELL FOAM INSULATION

SANITARY WASTE PIPING:
HYDRONIC HEATING PIPING SYSTEM:
REFRIGERANT LINE, LIQUID AND SUCTION:

1" INSULATION WITH ALL PURPOSE JACKET
1" CLOSED-CELL FOAM INSULATION

COR OUZINKIE NATIVE

Q. ID DESCRIPTION	SERVICE C	CONNECTION	S		BASIS OF DESIGN: PRIMARY	/ FIXTURE	BASIS OF DESIGN: SECOND	ARY FIXTURE	COMMENT(S)
	CW	HW	W	V	MANUFACTURER	MODEL	MANUFACTURER	MODEL	
P-1 WATER CLOSET	1/2"		3"	2"					WITH OPEN-FRONT SEAT, LESS LID
P-1A WATER CLOSET, ADA COMPLIANT	1/2"		3"	2"					WITH OPEN-FRONT SEAT, LESS LID
P-1R WATER CLOSET, RESIDENT UNITS	1/2"		3"	2"					WITH CLOSED-FRONT SEAT AND LID
P-2 URINAL	3/4"		2"	2"					WITH SLOAN FLUSH VALVE (186 SERIES)
P-3 LAVATORY	1/2"	1/2"	2"	1-1/2"					WITH ASSE A1070 COMPLIANT FAUCET
P-3A LAVATORY	1/2"	1/2"	2"	1-1/2"					WITH ASSE A1070 COMPLIANT FAUCET
P-3R LAVATORY, RESIDENT UNITS	1/2"	1/2"	2"	1-1/2"					
P-4 BAR SINK, SINGLE-COMPARTMENT	1/2"	1/2"	2"	1-1/2"					WITH ASSE A1070 COMPLIANT FAUCET
P-4R KITCHEN SINK, DOUBLE-COMPARTMENT, RESIDENT UNITS	1/2"	1/2"	2"	1-1/2"					
P-5R TUB/SHOWER, RESIDENT UNITS	1/2"	1/2"	2"	2"					WITH PRESSURE-BALANCED SHOWER VALVE
P-6 LAVATORY	1/2"	1/2"	2"	1-1/2"					WITH ASSE A1070 COMPLIANT FAUCET
P-7 CLOTHES WASHER OUTLET BOX	1/2"	1/2"	2"	2"					WITH WATER HAMMER ARRESTORS
P-8 JANITOR'S SINK	1/2"	1/2"	2"	2"					
P-9 LAUNDRY TUB	1/2"	1/2"	2"	2"					
P-10 3-COMPARTMENT SINK, WARMING KITCHEN	3/4"	3/4"	2"	2"					

MISC	ELLANEOUS PLUMBING EQUIF	PMEN	T SCHE	DULE	<u> </u>					
EQ. ID	DESCRIPTION		C	ONNECTION	NS		BASIS (OF DESIGN		COMMENTS
		CW	HW	W	V	RL	MANUFACTURER		MODEL	
GI-1	GREASE INTERCEPTOR, RATED FOR 15 GPM FLOW, WITH FLOW CONTROL VALVE						JR SMITH	8015		
TP-1	TRAP PRIMER	1/2"					PRECISION PLUMBING PRODUCTS	P1-500		
FD-1	FLOOR DRAIN			2"	2"					
FS-1	FLOOR SINK			2"	2"					

WAT	ER HEATER SCHEDULE															
EQ. ID	DESCRIPTION	FUEL INPUT		TEMP.		TANK SIZE	PERFORMA	ANCE	ELECTRICAL	_			BASIS OF DESIGN			COMMENT(S)
		FUEL TYPE	MBH GPH	EWT	LWT	(GAL)	1ST HR	CONTI.	W/KW	AMPS	VOLTAGE	PHASE	MANUFACTURER		MODEL	
							(GAL)	(GPH)								
WH-1	STORAGE TANK INDIRECT WATER HEATER	INDIRECT	91	50 °F	115 °F	80	270			·		·	HTP	·	CONTENDER SERIES, SSC-80	
WH-2	STORAGE TANK INDIRECT WATER HEATER	INDIRECT	91	50 °F	115 °F	80	270						HTP		CONTENDER SERIES, SSC-80	

BOIL	ER SCHEDULE												
		PERFORMANCE				ELECTRICAL				BASIS OF DESIGN			
					OUTPUT								
EQ. ID	DESCRIPTION	FUEL TYPE	INPUT (MBH)	INPUT (GPH)	(MBH)	W/KW	AMPS	VOLTAGE	PHASE	MANUFACTURER	MODEL	COMMENT(S)	
BLR-1	OIL-FIRED CAST IRON SECTIONAL BOILER	FUEL OIL	203	1.45	152		15	120	1	WEIL MCLAIN	WGO-5		
BLR-2	OIL-FIRED CAST IRON SECTIONAL BOILER	FUEL OIL	203	1.45	152		15	120	1	WEIL MCLAIN	WGO-5		

EQ. ID	DESCRIPTION	FLUID TYPE	PERFORMA	NCE	PUMP INFO	DRMATION	VFD	MOT	OR	ELECTRICA	AL.			BASIS OF DESIGN		COMMENT(S)
			FLOW	HEAD	SIZE	IMPELLER	(YES/NO)	HP	RPM	W/KW	AMPS '	VOLT	PHASE	MANUFACTURER	MODEL	
CP-1A	PRIMARY HYDRONIC PUMP	PG 50	31.40 GPM	35.0 FT			YES			800		115	1	TACO	VIRIDIAN VR20	
CP-1B	PRIMARY HYDRONIC PUMP	PG 50	31.40 GPM	35.0 FT			YES			800		115	1	TACO	VIRIDIAN VR20	
CP-21	BOILER CIRCULATION PUMP	PG 50	15.60 GPM	10.0 FT			NO	1/6				120	1	TACO	0013	
CP-22	BOILER CIRCULATION PUMP	PG 50	15.60 GPM	10.0 FT			NO	1/6				120	1	TACO	0013	
CP-31	WATER HEATER HEATING CIRCULATION PUMP	PG 50	12.00 GPM	10.0 FT			NO	1/6				120	1	TACO	0013	
CP-32	WATER HEATER HEATING CIRCULATION PUMP	PG 50	12.00 GPM	10.0 FT			NO	1/6				120	1	TACO	0013	
CP-41	DOMESTIC HOT WATER CIRCULATION PUMP	DHW	2.00 GPM	15.0 FT			NO							TACO	008	
GT-1	GLYCOL MAKE-UP TANK PACKAGE	PG 50								50		120	1	AXIOM INDUSTRY	MF-200	WITH LOW LEVEL ALARM MODULE. COORDINATE FO DUPLEX ELECTRICAL OUTLET ADJACENT TO UNIT.
RMB-1	RADIANT FLOOR SYSTEM ZONE PUMP	PG 50									2.0	120	1	TACO	RMB-1	SEE RADIANT SYSTEM SCHEDULE FOR ADDITIONAL INFORMATION
RMB-2	RADIANT FLOOR SYSTEM ZONE PUMP	PG 50									2.0	120	1	TACO	RMB-1	SEE RADIANT SYSTEM SCHEDULE FOR ADDITIONAL INFORMATION
RMB-3	RADIANT FLOOR SYSTEM ZONE PUMP	PG 50									2.0	120	1	TACO	RMB-1	SEE RADIANT SYSTEM SCHEDULE FOR ADDITIONA INFORMATION
RMB-4	RADIANT FLOOR SYSTEM ZONE PUMP	PG 50									2.0	120	1	TACO	RMB-1	SEE RADIANT SYSTEM SCHEDULE FOR ADDITIONA INFORMATION

EQ. ID DESCRIPTION	OUTPUT	AIRFLOW	HYDRONIC					MOTOR	W/KW AMP	VOLT P	HASE BASIS OF DESIGN		COMMENT(S)	
	(MBH)	(CFM)	FLUID TYPE	FLOW (GPM)	PRES. (W.C.)	EFT	LFT H	RPM			MANUFACTURER	MODEL		
UH-1 HYDRONIC UNIT HEATER	7.1	340 CFM	PG 50	0.80 GPM	0.50 FT	180 °F	160 °F 1/6	0		120	1 MODINE	HC-18		
		7 0 10 01 111	1000	0.00 OI III	0.0011	100 1	100 1 1/0	0		120	1 WODINE	110-10		
HEATING AND COOLING (.E									I MODINE			
HEATING AND COOLING (CAP F	.E LOW SP	EAT	LAT FL	UID FLOV	V PD	EFT		BASIS OF DESIGN			COMMENT(S)		
	CAP F	.E	EAT	LAT FL	UID FLOV		EFT		BASIS OF DESIGN MANUFACTURER		MODEL			

EQ. ID	DESCRIPTION		PERFORMANCE (RATED)	REFRIG	GERANT		ELECTRICAL		BASIS OF DESIGN		COMMENT	
		CLG CAP	CLG HTG CAP HTG COP	TYPE	CHARGE	VOLTAGE	PHASE	MCA/MOP	MANUFACTUER	MODEL		
		(MBH)	SEER/IEER (MBH)		(LB)			(AMP)				
ACCU-1	HEAT PUMP OUTDOOR UNIT	57.0	57.0			240	1	29/35	DAIKIN	RXTQ60TAVJU		
ACCU-2	HEAT PUMP OUTDOOR UNIT	57.0	57.0			240	1	29/35	DAIKIN	RXTQ60TAVJU		

EQ. ID	DESCRIPTION		PERFORMA	NCE (RATED)		REFRIGERANT		ELECTRICAL		BASIS OF DESIGN		COMMENT	
		CLG CAP (MBH)	HTG CAP (MBH)	CLG LOAD (KW)	HTG LOAD (KW)	TYPE	VOLTAGE	PHASE	MCA/MOP (AMP)	MANUFACTUER	MODEL		
FCU-11	CEILING RECESSED CASSETTE FAN COIL UNIT	9.5	11.1				240	1	0.8/15	DAIKIN	FXZQ09		
FCU-12	CEILING RECESSED CASSETTE FAN COIL UNIT	9.5	11.1				240	1	0.8/15	DAIKIN	FXZQ09		
FCU-13	CEILING RECESSED CASSETTE FAN COIL UNIT	9.5	11.1				240	1	0.8/15	DAIKIN	FXZQ09		
FCU-21	CEILING RECESSED CASSETTE FAN COIL UNIT	9.5	11.1				240	1	0.8/15	DAIKIN	FXZQ09		
FCU-22	CEILING RECESSED CASSETTE FAN COIL UNIT	9.5	11.1				240	1	0.8/15	DAIKIN	FXZQ09		
FCU-23	CEILING RECESSED CASSETTE FAN COIL UNIT	9.5	11.1				240	1	0.8/15	DAIKIN	FXZQ09		

EQ. ID	DESCRIPTION	PERFOI	RMANCE	FAN INFORMA	ΓΙΟΝ	VFD	MOTOR		ELECTI	RICAL		BASIS OF DESIGN		COMMENT(S)
		CFM	ESP (in-wc)	DRIVE R	РМ ((YES/NO)	HP RPM	W/KW	AMPS	VOLTAGE	PHAS	E MANUFACTURER	MODEL	
CEF-1	CRAWL SPACE VENTILATION FAN	100	0.25					20W		120	1	FANTECH	FR 100	WITH ON/OFF CONTROL BY DEDICATED CRAWL SPACE HUMIDISTAT
EF-1	EXHAUST FAN, RESTROOMS	100	0.25						0.27	120	1	PANASONIC	WHISPERGREEN SELECT FV-05-11VKS1	AUTOMATIC HIGH-LOW FAN CFM CONTROL WITH OCCUPANCY SENSOR.
EF-1R	EXHAUST FAN, RESIDENT UNITS	50	0.25						0.27	120	1	PANASONIC	WHISPERGREEN SELECT FV-05-11VKS1	HIGH-LOW FAN CFM CONTROL WITH WALL SWITCH (COODINATE WITH ELECTRICAL) AND WITH HUMIDITY SENSOR FOR HIGH HUMIDITY LEVEL OVERRIDE TO HIGH CFM.
EF-2	EXHAUST FAN, KITCHEN	200	0.25					42W		120	1	PANASONIC	WHISPERCEILING FV-20VQ3	
EF-3	PANTRY/STORAGE	50	0.25						0.27	120	1	PANASONIC	WHISPERGREEN SELECT FV-05-11VKS1	HIGH-LOW FAN CFM CONTROL WITH HUMIDITY SENSOR FOR HIGH HUMIDITY LEVEL OVERRIDE TO HIGH CFM.
EF-4	LAUNDRY ROOM	50	0.25						0.27	120	1	PANASONIC	WHISPERGREEN SELECT FV-05-11VKS1	HIGH-LOW FAN CFM CONTROL WITH HUMIDITY SENSOR FOR HIGH HUMIDITY LEVEL OVERRIDE TO HIGH CFM.
EF-5	CENTRAL EXHAUST FAN, INLINE	350	0.00						1.10	120	1	PANASONIC	WHISPERLINE FV-40IFL	
EF-6	LAUNDRY DRYER BOOSTER FANS	200							0.54	120	1	FANTECH	DBF 110	
EF-7	TRANSFER FAN / IT ROOM	100	0.10						0.23	120	1	PANASONIC	WHISPERCEILING FV-15VQ5	WITH CEILING MOUNTED CONTROL THERMOSTAT
HD-1	KITCHEN HOOD	500	0.00							120	1	GREENHECK	GRRS-36	INTERLOCK WITH KEF-1
HD-1R	KITCHEN EXHAUST HOOD, RESIDENT UNITS	200							2.0	120	1	NUTONE	RL6200 SERIES OR EQUAL	
HRV-1	HEAT RECOVERY VENTILATOR	1160	0.60						18.8	120	1	LIFEBREATH	1200 FD	
KEF-1	KITCHEN HOOD EXHAUST FAN	500							2.10	120	1	FANTECH	FG 12 EC	

	TEDI	AINIAI	SCHEDI	
Δ IR		///////////////////////////////////////	~ (

EQ. ID	DESCRIPTION	TERMINAL TYPE	Ē			PERFORMANC	Ε		BASIS OF DESIGN		COMMENT(S)
		FACE SIZE	NECK SIZE	NUM. OF SLOTS	SLOT SIZE	AIRFLOW (CFM)	TSP (IN. W.C.)	NOISE	MANUFACTURER	MODEL	
_V-1											
SA-1	SQUARE PLAQUE DIFFUSER WITH CEILING GRID PANEL	12"X12" (24"X24" GRID PANEL)	6"						PRICE	SPD SERIES	
SA-2	SQUARE PLAQUE DIFFUSER WITH CEILING GRID PANEL	12"X12" (24"X24" GRID PANEL)	8"						PRICE	SPD SERIES	
SA-3	SIDEWALL NOZZLES, DUAL NOZZLE WITH FRAME	24"X12"	8"(X2)						PRICE	AND SERIES DUPLEX WITH WALL PLATE	
SA-4	SQUARE PLAQUE DIFFUSER	12"X12"	6"						PRICE	SPD SERIES	
SA-5	LINEAR SLOT DIFFUSER	48"	8"						PRICE	TBD2 (2 SLOTS)	
RA-1	RETURN AIR DIFFUSER, EGG CRATE CORE	12"X12"	6"						PRICE	80 SERIES	
RA-2	LINEAR SLOT DIFFUSER	48"	8"						PRICE	TBD2 (2 SLOTS)	
RA-3	RETURN AIR DIFFUSER	16"	12"						PRICE	RECG-RR SERIES	
EA-1	EXHAUST AIR DIFFUSER	8"X8"	5"						PRICE	80 SERIES	
EA-2	EXHAUST AIR DIFFUSER	12"X12"	8"						PRICE	80 SERIES	
EA-3	KHD-1 EXHAUST OUTLET		12"						SEIHO	SFX SERIES	REMOVE INTERNAL GRILLE, PROVIDE BACKDRAFT DAMPER AT DIFFUSER
EA-4	CLOTHES DRYER OUTLET WITH BACKDRAFT DAMPE	R	4"						SEIHO	SFB SERIES	
EA-5	GENERAL EXHAUST OUTLET WITH BACKDRAFT DAMPER		6"						SEIHO	SFB SERIES	
EA-6	GENERAL EXHAUST OUTLET		10"						SEIHO	SFX SERIES	REMOVE INTERNAL GRILLE, PROVIDE BACKDRAFT DAMPER AT DIFFUSER
ГА-1	WALL TRANSFER GRILLE / IT ROOM	12"X6"							PRICE	80 SERIES	
ГА-2	WALL TRANSFER GRILLE / IT ROOM	12"X6"							PRICE	80 SERIES	
OA-1	OUTSIDE AIR (INTERIOR), RESIDENT UNIT VENTILATION		4"						SEIHO	TT SERIES	WITH ADJUSTABLE CORE FOR BALANCING
DA-2	OUTSIDE AIR (EXTERIOR), RESIDENT UNIT VENTILATION		4"						PRICE	80 SERIES	
DA-3	OUTSIDE AIR (EXTERIOR), OFFICE, GATHERING, CONF RM	20"X8"							PRICE	80 SERIES	
_V-1	LOUVER WITH DRAINAGE CHANNELS								RUSKIN	ELF6425DD	PROVIDE BIRD SCREEN ON INTERIOR SIDE OF LOUVER

MISCELLANEOUS MECHANICAL EQUIPMENT SCHEDULE

EQ. ID	DESCRIPTION	PERFORMANCE/ADDITIONAL INFORMATION	ELECTRICA	λL		BASIS OF DESIGN 1					COMMENT(S)
			HP	KW	WATTS	AMPS	VOLTAGE	PHASE	MANUFACTURER	MODEL	
AS-1	HYDRONIC AIR SEPARATOR								SPIROTHERM	VJR 200TM	ROUTE AIR VENT OUTLET TO GT-1 W/ 1/2" TUBING.
ET-1	EXPANSION TANK, HYDRONIC SYSTEM								AMTROL	MODEL ST-42V	
ET-2	EXPANSION TANK, DOMESTIC HOT WATER SYSTEM								AMTROL	MODEL ST-5	
FOT-1	FUEL OIL STORAGE TANK, 1000-GAL								ANCHORAGE TANK	FIREGUARD SERIES OR EQUAL	PROVIDE CONCRETE PAD FOR TANK ANCHORAGE.
PT-1	PROPANE TANK, 45.6-GAL										COORDINATE WITH PROPANE SUPPLIER FOR ADDITIONAL STANDBY TANK(S) AS APPROPRIATE.
	ELECTRIC HEAT TRACE THAW CABLE				100		120	1	THERMON	RGS SERIES	PROVIDE APPORX. 100 WATTS OF CABLE PER DRAIN PAN AT EACH HEAT PUMP OUTDOOR UNIT SUPPORT STAND. SEE SEQUENCE OF OPERATION FOR ADDITIONAL INFORMATION.

SEQUENCE OF OPERATIONS

HEAT GENERATION SYSTEMS

SYSTEM DELIVERY (BUILDING HYDRONIC LOOP) TEMPERATURE RESET BASED ON OUTDOOR AIR TEMPERATURE AS FOLLOWS,

OUTDOOR TEMPERATURE: SUPPLY GLYCOL TEMPERATURE

ABOVE 65 DEG F (SYSTEM OFF)
65 DEG F* 120 DEG F
32 DEG F* 180 DEG F
BELOW 32 DEG F 180 DEG F

*: LINEAR SCHEDULE BETWEEN 65 DEG F AND 32 DEG F OUTDOOR AIR TEMPERATURE

INTERLOCK WITH WATER HEATING SYSTEM FOR PRIORITY SYSTEM SUPPLY TEMPERATURE OVERRIDE FOR DOMESTIC WATER HEATING.

BOILER SYSTEM LEAD-LAG ALTERNATING (PROGRAM FOR WEEKLY SWITCH-OVER).

DOMESTIC WATER HEATING SYSTEMS

WATER HEATER CIRCULATION PUMP TO CYCLE TO MAINTAIN WATER HEATER CONTENT TEMPERATURE SETPOINT: 120 DEG F.

HOT WATER RECIRCULATION SYSTEM PUMP TO RUN CONTINUOUSLY.

HYDRONIC SYSTEMS

PROVIDE PROGRAMMABLE ALTERNATING (WEEKLY) CONTROL OF HYDRONIC SYSTEM MAIN CIRCULATORS.

BOILER CIRCULATION PUMPS SHALL OPERATE FROM BOILER INTEGRAL CONTROLS.

RADIANT HEATING SYSTEMS

RADIANT MIXING BLOCKS (RMB) TO OPERATE ON SUBZONE CALL FOR HEAT AND MODULATE INJECTION TO MAINTAIN RADIANT SYSTEM SUPPLY TEMPERATURE (SEE RADIANT SYSTEM ZONE INFORMATION).

INDIVIDUAL SUBZONE THERMOSTAT SHALL CYCLE MANIFOLD MOUNTED CONTROL VALVE(S) TO MAINTAIN SPACE TEMPERATURE SETPOINT: 68 DEG F.

OFFICE AREA VENTILATION SYSTEMS, HRV-1/EF-5/HC-1

OFFICE AREA VENTILATION SYSTEMS, HRV-1 AND EF-5, SHALL OPERATE ON SCHEDULE DURING NORMAL BUSINESS HOUR.

HEAT COIL, HC-1, CONTROLS SHALL MODULATE HYDRONIC FLOW TO MAINTAIN LEAVING AIR TEMPERATURE OF 68 DEG F.

PROVIDE OVERRIDE SWITCH IN LOBBY RECEPTION AREA TO OPERATE SYSTEM (1-HOUR DURATION FOR EACH ACTIVATION) DURING OFF HOURS.

TYPICAL RESTROOM GENERAL EXHAUST FANS, EF-1

EXHAUST FAN SHALL OPERATE IN HI-LO MODE ON INTEGRAL OCCUPANCY SENSOR.

TYPICAL AREA EXHAUST FANS, EF-2/EF-3/EF-4

EXHAUST FAN SHALL OPERATE ON LOCAL ON-OFF SWITCH.

CLOTHES DRYER EXHAUST BOOSTER FAN, EF-6

INTERLOCK CLOTHES DRYER EXHAUST BOOSTER FANS WITH CLOTHES DRYERS.

IT ROOM HEAT TRANSFER FAN, EF-7

IT ROOM HEAT TRANSFER FAN TO OPERATE ON THERMOSTAT TO MAINTAIN SETPOINT: 85 DEG F.

WARMING KITCHEN HOOD EXHAUST FAN, HD-1/KEF-1

EXHAUST FAN KEF-1 TO OPERATE FROM EXHAUST HOOD ON/OFF CONTROL.

RESIDENT UNIT EXHAUST FANS, EF-1R

EXHAUST FAN SHALL OPERATE IN HI-LO-OFF MODE ON LOCAL HI-LO-OFF SWITCH.

RESIDENT UNIT EXHAUST HOODS, HD-1R

EXHAUST HOOD TO OPERATE ON UNIT ON-OFF SWITCH.

HEAT PUMP SYSTEMS

PROVIDE AUTOMATIC CONTROLS TO OPERATE

- INDOOR FAN COIL UNITS TO OPERATE CONTINUOUSLY AND CYCLE COOLING FUNCTIONS TO MAINTAIN ROOM TEMPERATURE SETPOINT: 70 DEG F.
- OUTDOOR UNIT DEFROST DRAIN PAN THAWING CABLE WHEN OUTDOOR TEMPERATURE IS

 BELOW 33 DEC. F.

 OUTDOOR UNIT DEFROST DRAIN PAN THAWING CABLE WHEN OUTDOOR TEMPERATURE IS

 BELOW 33 DEC. F.

 OUTDOOR UNIT DEFROST DRAIN PAN THAWING CABLE WHEN OUTDOOR TEMPERATURE IS

 BELOW 33 DEC. F.

 OUTDOOR THAWING CABLE WHEN OUTDOOR TEMPERATURE IS

 OUTDOOR THAWING CABLE WHEN OUTDOOR THAWING CABLE WHEN OUTDOOR TEMPERATURE IS

 OUTDOOR THAWING CABLE WHEN OUTDOOR THAWING CAB
- BELOW 32 DEG F.

 LOCKOLT HEAT PLIMP OUTDOOR LINITS WHEN OUTDOOR TEMPERATURE IS BELOW 10 DEG F.
- LOCKOUT HEAT PUMP OUTDOOR UNITS WHEN OUTDOOR TEMPERATURE IS BELOW 10 DEG F. (ALLOW INDOOR UNITS TO OPERATE).

CRAWL SPACE VENTILATION

CRAWL SPACE HUMIDISTAT SHALL CYCLE CRAWL SPACE VENTILATION FANS TO MAINTAIN CRAWL SPACE HUMIDITY LEVEL AT 60% OR BELOW.

JENWEI T. CHIEN

ME-8423

AROFESSIONAL TRANSPORT

REV NO: XX DATE

SAJJ ARCHITECTURE, LLC

SAULIS DRIVE, ANCHORAGE, ALASKA 99502

OUZINKIE NATIVE CORP

DR: JTC
CK: JTC/TLT
DT: JB: OUZINKIE
DWG: MECHANICAL
EQUIPMENT
SCHEDULES

M1.2

MECHANICAL AND PLUMBING SPECIFICATIONS

Z1020 - ADMINISTRATIVE REQUIREMENTS

- 1. GENERAL REQUIREMENTS FOR MECHANICAL AND PLUMBING SYSTEMS: ALL WORK SHALL CONFORM TO THE CURRENTLY ADOPTED CODES AND STANDARDS AND AS AMENDED AND/OR REFERENCED.
- BASIS OF DESIGN: "BASIS OF DESIGN EQUIPMENT IS IDENTIFIED FOR THE PURPOSE OF ESTABLISHING SIGNIFICANT QUALITY. PERFORMANCE, FUNCTION, DIMENSIONS, PHYSICAL PROPERTIES, APPEARANCE, AND OTHER RELEVANT MATERIAL AND PERFORMANCE CHARACTERISTICS. UNLESS OTHERWISE NOTED, THE IDENTIFICATION OF THE "BASIS OF DESIGN" EQUIPMENT IS NOT INTENDED TO PRECLUDE ALTERNATIVE MATERIAL AND EQUIPMENT SELECTIONS. HOWEVER, THE OWNER RETAINS THE RIGHT TO REJECT MATERIAL AND EQUIPMENT DEVIATING FROM THE BASIS OF DESIGN. WHERE MATERIAL AND EQUIPMENT DEVIATION IS ALLOWED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MODIFICATIONS NECESSARY TO INCORPORATE THE EQUIPMENT INTO THE PROJECT.
- DRAWINGS: DRAWINGS ARE INTENDED TO BE DIAGRAMMATIC AND DO NOT NECESSARILY SHOW THE COMPLETE INSTALLATION. INFORMATION HEREIN MAY BE PARTIALLY BASED ON EXISTING BUILDING RECORDS, THE EXTENT OF WHICH MAY NOT REFLECT CURRENT BUILDING CONDITIONS. CONTRACTOR SHALL VERIFY ACTUAL CONDITIONS AND ADJUST AS APPROPRIATE TO
- 4. EQUIPMENT START-UP SERVICES: PROVIDE EQUIPMENT START-UP SERVICES BY THE MANUFACTURER'S QUALIFIED PERSONNEL FOR THE FOLLOWING:
- BOILERS
- WATER HEATERS HEAT PUMP SYSTEMS
- OPERATION AND MAINTENANCE DOCUMENT AND TRAINING: SUBMIT OPERATION AND MAINTENANCE MANUALS FOR THE MECHANICAL EQUIPMENT AND SYSTEMS. PROVIDE TRAINING OF OWNER IN OPERATION AND MAINTENANCE OF BUILDING

NUMBER OF O&M MANUALS: 2 (TWO) COPIES NUMBER OF SESSION(S): 1 (ONE) SESSION TIME DURATION ANTICIPATED: 2 (TWO) HOURS PER SESSION

D2000 - PLUMBING SYSTEMS

- 1. GENERAL REQUIREMENTS
- A. HANGERS AND SUPPORTS: HANGERS AND SUPPORTS SHALL CONFORM TO THE REQUIREMENTS OF UNIFORM PLUMBING
- CODE, 2012 ED. SECTION 314. B. SEISMIC AND VIBRATION CONTROLS: PROVIDE SEISMIC AND VIBRATION CONTROLS IN ACCORDANCE WITH THE
- REQUIREMENTS OF AMERICAN SOCIETY OF CIVIL ENGINEERS, STANDARD 7-10, CHAPTER 13. C. INSULATION: UNLESS OTHERWISE NOTED IN THE INSULATION SCHEDULE, PROVIDE INSULATION ON PIPING SYSTEMS IN
- ACCORDANCE WITH THE REQUIREMENTS OF INTERNATIONAL ENERGY CONSERVATION CODE. 2012 ED.
- D. IDENTIFICATION: PROVIDE COMMERCIALLY AVAILABLE PIPING AND EQUIPMENT LABELING SYSTEMS. PAINT STENCILING NOT ALLOWED.
- E. FIRESTOP AND SEALANT SYSTEMS: PENETRATIONS OF PIPING THROUGH RATED ASSEMBLIES SHALL BE PROTECTED BY LISTED FIRESTOP AND SEALANT SYSTEMS.

2. SUBMITTAL REQUIREMENTS

- A. PROVIDE PRODUCT SUBMITTALS FOR ALL EQUIPMENT IDENTIFIED IN THE DRAWING EQUIPMENT SCHEDULES AND PRODUCTS IDENTIFIED IN THESE SPECIFICATIONS.
- B. SUBMIT FIRESTOP ASSEMBLY SCHEDULE AND MANUFACTURER'S LISTING AND INSTALLATION INFORMATION FOR FIRESTOP SYSTEMS TO BE USED FOR THIS PROJECT

D2010 - DOMESTIC WATER SYSTEMS

1. GENERAL REQUIREMENTS

- A. THIS SECTION INCLUDES THE DOMESTIC WATER SYSTEMS AND ACCESSORIES
- B. SPECIAL REQUIREMENTS FOR COMPLIANCE WITH NSF 61: DOMESTIC WATER SYSTEM PIPING AND EQUIPMENT SHALL
- CONFORM TO THE REQUIREMENTS OF NSF 61 FOR POTABLE WATER SERVICE.
- C. SPECIAL PROVISION FOR STEEL PIPING SYSTEMS: UNLESS OTHERWISE NOTED, STEEL PIPING SYSTEMS SHALL BE LIMITED TO BUILDING WATER SERVICE ENTRANCE
- D. SPECIAL PROVISION FOR NON-METALLIC PIPING SYSTEMS: UNLESS OTHERWISE NOTED, USE OF NON-METALLIC PIPING SYSTEMS SHALL BE SUBJECT TO APPROVAL BY THE OWNER.

2. PRODUCTS

A. DOMESTIC WATER PIPING SYSTEMS

- 1. ABOVEGROUND PIPING SYSTEMS: HARD COPPER TUBE: ASTM B 88, TYPE L, WATER TUBE, DRAWN TEMPER, COPPER PRESSURE FITTINGS: ASME B16.18, CAST-COPPER ALLOY OR ASME B16.22, WROUGHT-COPPER, SOLDER-JOINTS.
- 2. UNDERGROUND PIPING SYSTEMS: SOFT COPPER TUBE: ASTM B 88, TYPE K, WATER TUBE, DRAWN TEMPER. COPPER PRESSURE FITTINGS: ASME B16.18, CAST-COPPER ALLOY OR ASME B16.22, WROUGHT-COPPER, SOLDER-JOINTS. 3. NON-METALLIC PIPING SYSTEMS: POLYETHYLENE CROSS-LINK (PEX) PIPING: ASTM F 877, SDR 9 TUBING LISTED FOR
- POTABLE WATER SERVICES (IDENTIFIED WITH "-PW" MARK AND NSF-61). FITTINGS FOR PEX TUBE: ASTM F 1807, METAL-INSERT TYPE WITH COPPER OR STAINLESS-STEEL CRIMP RINGS AND MATCHING PEX TUBE DIMENSIONS.

B. DOMESTIC WATER SYSTEM VALVES AND SPECIALTIES

- 1. VALVES: VALVE PRESSURE AND TEMPERATURE RATINGS SHALL MEET THE REQUIRED SERVICE CONDITIONS.
- 2. WATER HAMMER ARRESTORS: MECHANICAL BELLOW OR PISTON WATER HAMMER ARRESTORS ONLY. AIR CHAMBER NOT

3. EXECUTION

- A. WATER HAMMER ARRESTORS: PROVIDE MECHANICAL WATER HAMMER ARRESTORS WHERE SHOWN IN THE DRAWINGS OR AT INDIVIDUAL FIXTURE SERVICES.
- B. CLEANING, DISINFECTING, AND TESTING: CLEAN AND DISINFECT DOMESTIC WATER SYSTEM IN ACCORDANCE WITH EITHER
- AWWA C651 OR AWWA C652 OR FOLLOW PROCEDURES DESCRIBED BELOW:
- 1. FLUSH PIPING SYSTEM WITH CLEAN, POTABLE WATER UNTIL DIRTY WATER DOES NOT APPEAR AT OUTLETS.
- 2. FILL SYSTEM OR PART THEREOF WITH WATER/CHLORINE SOLUTION WITH AT LEAST 50 PPM OF CHLORINE, ISOLATE WITH VALVES AND ALLOW TO STAND FOR 24 HOURS, OR, FILL SYSTEM OR PART THEREOF WITH WATER/CHLORINE SOLUTION WITH AT LEAST 200 PPM OF CHLORINE, ISOLATE AND ALLOW TO STAND FOR THREE HOURS.
- 3. FLUSH SYSTEM WITH CLEAN, POTABLE WATER UNTIL NO CHLORINE IS IN WATER COMING FROM SYSTEM AFTER THE
- STANDING TIME. 4. REPEAT PROCEDURES IF BIOLOGICAL EXAMINATION SHOWS CONTAMINATION.
- C. SUBMIT WATER QUALITY TEST REPORT TO THE OWNER FOR DOCUMENTATION AND AUTHORITIES HAVING JURISDICTION.

D2020 - SANITARY DRAINAGE AND VENT SYSTEMS

GENERAL REQUIREMENTS

A. THIS SECTION INCLUDES THE SANITARY DRAINAGE AND VENT SYSTEMS AND ACCESSORIES.

2. PRODUCTS

- A. SANITARY WASTE AND VENT PIPING SYSTEMS
- 1. ABOVEGROUND PIPING SYSTEMS: ASTM A 888 OR CISPI 301. COUPLINGS: ASTM C 1277 ASSEMBLY OF METAL HOUSING, CORROSION-RESISTANT FASTENERS, AND ASTM C 564 RUBBER SLEEVE WITH INTEGRAL, CENTER PIPE STOP.
- 2. UNDERGROUND PIPING SYSTEMS: HEAVY-DUTY, TYPE 304, STAINLESS-STEEL COUPLINGS: ASTM A 666, TYPE 304, STAINLESS-STEEL SHIELD; STAINLESS-STEEL BANDS; AND SLEEVE. NPS 1-1/2 TO NPS 4: 3-INCH (W) SHIELD WITH BANDS.
- 3. NON-METALLIC PIPING SYSTEMS: PLASTIC (ABS) PIPING SYSTEM SHALL BE LIMITED TO NON-PRESSURIZED WASTE AND
- VENT PIPING ONLY. ABS SOCKET FITTINGS: ASTM D 2661, MADE TO ASTM D 3311 DRAIN, WASTE, AND VENT PATTERNS.

3. EXECUTION

A. TESTING: TEST SANITARY DRAINAGE AND VENT PIPING SYSTEMS AS FOLLOWS:

1. GENERAL TEST PROCEDURE: CLOSE OPENINGS IN PIPING SYSTEM AND FILL WITH WATER TO POINT OF OVERFLOW, BUT NOT LESS THAN 10-FOOT HEAD OF WATER. FROM 15 MINUTES BEFORE INSPECTION STARTS TO COMPLETION OF INSPECTION, WATER LEVEL MUST NOT DROP. INSPECT JOINTS FOR LEAKS AND REPAIR ACCORDINGLY.

D2040 - FUEL GAS PIPING SYSTEMS

1. GENERAL REQUIREMENTS

- A. THIS SECTION INCLUDES THE FUEL GAS SYSTEMS AND ACCESSORIES
- B. UNDERGROUND FUEL GAS PIPING INSIDE BUILDING NOT ALLOWED UNLESS OTHERWISE DIRECTED. C. FUEL GAS PIPING IN VENTILATION SYSTEM PLENUM SHALL BE WELDED THROUGHOUT.

2. PRODUCTS

- A. FUEL GAS PIPING SYSTEMS:
- 1. ABOVEGROUND PIPING SYSTEMS: STEEL PIPE, ASTM A 53/A 53M, BLACK STEEL, SCHEDULE 40, TYPE E OR S, GRADE B. MALLEABLE-IRON THREADED FITTINGS: ASME B16.3, CLASS 150, STANDARD PATTERN WELDED FITTINGS: ASTM A 234/A 234M FOR BUTT WELDING AND SOCKET WELDING.
- 2. UNDERGROUND PIPING SYSTEMS (OUTDOOR, DOWNSTREAM OF GAS METER/REGULATOR): STEEL PIPE, ASTM A 53/A 53M, BLACK STEEL, SCHEDULE 40, TYPE E OR S, GRADE B, WROUGHT-STEEL FITTINGS AND WELDED JOINTS. COAT PIPE AND FITTINGS WITH PROTECTIVE COATING FOR STEEL PIPING
- B. UNDERGROUND PIPING SYSTEMS (OUTDOOR ONLY, ANNEALED OR DRAWN-TEMPER COPPER TUBE WITH WROUGHT-COPPER FITTINGS AND BRAZED JOINTS. COAT PIPE AND FITTINGS WITH PROTECTIVE COATING FOR COPPER TUBING.
- C. FUEL GAS SYSTEM VALVES AND SPECIALTIES:
- 1. VALVES: VALVE PRESSURE AND TEMPERATURE RATINGS SHALL MEET THE REQUIRED SERVICE CONDITIONS.

3. EXECUTION

A. TESTING: TEST, INSPECT, AND PURGE NATURAL GAS ACCORDING TO THE INTERNATIONAL FUEL GAS CODE, SECTION 406, AND APPLICABLE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.

D2050 - FUEL OIL PIPING SYSTEMS

- 1. GENERAL REQUIREMENTS
- A. THIS SECTION INCLUDES THE FUEL OIL SYSTEMS AND ACCESSORIES.
- B. DIRECT BURIAL OF SINGLE-WALL FUEL OIL PIPING NOT ALLOWED UNLESS OTHERWISE DIRECTED

2. PRODUCTS

A. FUEL OIL PIPING SYSTEMS

- 1. ABOVEGROUND PIPING SYSTEMS: STEEL PIPE: ASTM A 53/A 53M, BLACK STEEL, SCHEDULE 40, TYPE E OR S, GRADE B. MALLEABLE-IRON THREADED FITTINGS: ASME B16.3, CLASS 150, STANDARD PATTERN. WROUGHT-STEEL WELDING FITTINGS: ASTM A 234/A 234M, FOR BUTT AND SOCKET WELDING.
- 2. ABOVEGROUND PIPING SYSTEMS: DRAWN OR ANNEALED-TEMPER COPPER TUBE: COMPLY WITH ASTM B 88, TYPE K. COPPER FITTINGS: ASME B16.22, WROUGHT COPPER, STREAMLINED PATTERN. BRONZE FLANGES AND FLANGED FITTINGS: ASME B16.24, CLASS 150.

B. FUEL OIL SYSTEM VALVES AND SPECIALTIES:

- VALVES: VALVE PRESSURE AND TEMPERATURE RATINGS SHALL MEET THE REQUIRED SERVICE CONDITIONS.
- 2. FUEL OIL SAFETY VALVE: UL LISTED FUSIBLE LINK EMERGENCY SHUT-OFF VALVE. MORRISON BROTHERS CO. FIGURE 939 OR 346 SERIES, SIZE TO MATCH SERVICE.

3. EXECUTION

- A. TESTING: ISOLATE STORAGE TANKS IF TEST PRESSURE IN PIPING WILL CAUSE PRESSURE IN STORAGE TANKS TO EXCEED 10
- B. FUEL-OIL PIPING DESIGNED TO OPERATE UNDER PRESSURE: MINIMUM 5 PSIG FOR MINIMUM OF 2 HOURS.
- C. FUEL OIL DESIGNED TO OPERATE UNDER VACUUM: MINIMUM 20-IN. HG FOR MINIMUM OF 2 HOURS.

D3000 - HEATING, VENTILATION, AND AIR-CONDITIONING SYSTEMS

GENERAL REQUIREMENTS

- A. HANGERS AND SUPPORTS: HANGERS AND SUPPORTS SHALL CONFORM TO THE REQUIREMENTS OF APPLICABLE CODES AND STANDARDS.
- B. SEISMIC AND VIBRATION CONTROLS: PROVIDE SEISMIC AND VIBRATION CONTROLS IN ACCORDANCE WITH THE REQUIREMENTS OF AMERICAN SOCIETY OF CIVIL ENGINEERS, STANDARD 7-10, CHAPTER 13.
- C. INSULATION: UNLESS OTHERWISE NOTED IN INSULATION SCHEDULE, PROVIDE INSULATION ON PIPING AND DUCTWORK SYSTEMS IN ACCORDANCE WITH THE REQUIREMENTS OF INTERNATIONAL ENERGY CONSERVATION CODE, 2012 ED.
- D. IDENTIFICATION: PROVIDE COMMERCIALLY AVAILABLE PIPING, DUCTWORK, AND EQUIPMENT LABELING SYSTEMS. PAINT
- STENCILING NOT ALLOWED. E. FIRESTOP AND SEALANT SYSTEMS: PENETRATIONS OF PIPING AND DUCTWORK THROUGH RATED ASSEMBLIES SHALL BE PROTECTED BY LISTED FIRESTOP AND SEALANT SYSTEMS.

2. SUBMITTAL REQUIREMENTS:

- A. PROVIDE PRODUCT SUBMITTALS FOR ALL EQUIPMENT IDENTIFIED IN THE DRAWING EQUIPMENT SCHEDULES AND PRODUCTS
- IDENTIFIED IN THESE SPECIFICATIONS.
- B. SUBMIT FIRESTOP ASSEMBLY SCHEDULE AND MANUFACTURER'S LISTING AND INSTALLATION INFORMATION FOR FIRESTOP SYSTEMS TO BE USED FOR THIS PROJECT.

<u>D3050 - HYDRONIC SYSTEMS</u>

A. GENERAL REQUIREMENTS

A. THIS SECTION INCLUDES THE HYDRONIC SYSTEMS AND ACCESSORIES.

B. PRODUCTS

A. HYDRONIC PIPING SYSTEMS

- 1. ABOVEGROUND PIPING SYSTEMS: HARD COPPER TUBE: ASTM B 88, TYPE L, WATER TUBE, DRAWN TEMPER. COPPER PRESSURE FITTINGS: ASME B16.18, CAST-COPPER ALLOY OR ASME B16.22, WROUGHT-COPPER, SOLDER/BRAZED-JOINTS.
- 2. UNDERGROUND PIPING SYSTEMS: SOFT COPPER TUBE: ASTM B 88, TYPE K, WATER TUBE, DRAWN TEMPER. COPPER PRESSURE FITTINGS: ASME B16.18, CAST-COPPER ALLOY OR ASME B16.22, WROUGHT-COPPER, SOLDER/BRAZED-JOINTS.

B. HYDRONIC SYSTEM VALVES AND SPECIALTIES

- VALVES: VALVE PRESSURE AND TEMPERATURE RATINGS SHALL MEET THE REQUIRED SERVICE CONDITIONS.
- 2. BALANCING VALVES: FIELD ADJUSTABLE CALIBRATED BALANCING VALVE FOR THE FLOW RATE INDICATED. BASIS OF DESIGN: BELL AND GOSSETT, WATTS, TACO, OR EQUAL
- 3. FLOW CONTROL VALVE: FACTORY PRESET CALIBRATED FLOW CONTROL VALVES FOR THE FLOW RATE INDICATED. BASIS OF DESIGN: GRISWOLD CONTROLS, FLOW DESIGN, INC., OR EQUAL.
- 4. AIR VENTS: UNLESS OTHERWISE DIRECTED, TERMINAL AIR VENTS SHALL BE MANUAL TYPE. AUTOMATIC AIR VENTS SHALL
- BE LIMITED TO MECHANICAL EQUIPMENT SPACES WHERE DRAIN RECEPTOR IS NEARBY TO RECEIVE AIR VENT DISCHARGE. 5. DRAIN VALVES: DRAIN VALVES SHALL INCLUDE HOSE-END THREADS AT DISCHARGE.
- C. PROPYLENE GLYCOL: PRE-MIXED, CONCENTRATION BY WEIGHT PER SCHEDULE INFORMATION OR AS DIRECTED, PROPYLENE GLYCOL WITH CORROSION INHIBITOR ADDITIVES FOR HYDRONIC HEATING SERVICE.

EXECUTION

- A. AIR VENTS: PROVIDE AIR VENTS AT SYSTEM HIGH POINTS AND AT TERMINAL EQUIPMENT SERVICES.
- B. DRAIN VALVES: PROVIDE DRAIN VALVES TO ALLOW TERMINAL EQUIPMENT SERVICE AND FOR DRAINING SECTIONS OF THE DISTRIBUTION PIPING.
- C. CLEANING AND FLUSHING OF HYDRONIC PIPING SYSTEMS: CLEAN AND FLUSH HYDRONIC PIPING SYSTEMS AS FOLLOWS.
- 1. FILL SYSTEM WITH FRESH WATER AND ADD LIQUID ALKALINE COMPOUND WITH EMULSIFYING AGENTS AND DETERGENTS TO REMOVE GREASE AND PETROLEUM PRODUCTS FROM PIPING. CIRCULATE SOLUTION FOR A MINIMUM OF 24 HOURS, DRAIN, CLEAN STRAINER SCREENS, AND REFILL WITH SERVICE HYDRONIC FLUID.

D. TESTING: TEST THE HYDRONIC SYSTEM AS FOLLOWS,

- 1. ISOLATE EQUIPMENT DURING TESTING AS APPROPRIATE TO PREVENT DAMAGE
- 2. SUBJECT PIPING SYSTEM TO HYDROSTATIC TEST PRESSURE THAT IS NOT LESS THAN 1.5 TIMES THE SYSTEM'S WORKING PRESSURE. TEST PRESSURE SHALL NOT EXCEED MAXIMUM PRESSURE FOR ANY VESSEL, PUMP, VALVE, OR OTHER COMPONENT IN SYSTEM UNDER TEST. VERIFY THAT STRESS DUE TO PRESSURE AT BOTTOM OF VERTICAL RUNS DOES NOT EXCEED 90 PERCENT OF SPECIFIED MINIMUM YIELD STRENGTH OR 1.7 TIMES THE "SE" VALUE IN APPENDIX A IN ASME B31.9. "BUILDING SERVICES PIPING."
- 3. AFTER HYDROSTATIC TEST PRESSURE HAS BEEN APPLIED FOR AT LEAST 10 MINUTES, EXAMINE PIPING, JOINTS, AND CONNECTIONS FOR LEAKAGE. ELIMINATE LEAKS BY TIGHTENING, REPAIRING, OR REPLACING COMPONENTS, AND REPEAT HYDROSTATIC TEST UNTIL NO FURTHER LEAK IS OBSERVED.

D3060 - DUCTWORK SYSTEMS

1. GENERAL REQUIREMENTS

- A. THIS SECTION INCLUDES THE DUCTWORK SYSTEMS AND ACCESSORIES.
- 1. DUCTS SHALL CONFORM TO THE REQUIREMENTS OF SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS-METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESS, AND DUCT CONSTRUCTION METHODS.

2. PRODUCTS

A. DUCTWORK SYSTEMS

- 1. SHEETMETAL DUCT MATERIAL SHALL BE GALVANIZED SHEET STEEL, COMPLYING WITH ASTM A 653/A 653M AND HAVING
- G90 COATING DESIGNATION. 2. FLEXIBLE DUCTS SHALL BE THERMAFLEX SERIES GKM (R4.2) FLEXIBLE DUCT OR EQUAL

B. DUCTWORK SYSTEMS ACCESSORIES:

1. DUCTWORK ACCESSORIES INCLUDING BALANCING DAMPERS, CONTROL DAMPERS, EQUIPMENT FLEXIBLE CONNECTORS, ETC. SHALL CONFORM TO APPLICABLE SMACNA DUCTWORK CONSTRUCTION STANDARDS.

3. EXECUTION

- A. FLEXIBLE DUCT CONNECTORS TO AIR INTAKE AND OUTLET DIFFUSERS: DIFFUSER FLEXIBLE DUCT CONNECTORS LENGTH
- SHALL BE LIMITED TO MAXIMUM OF 5 FEET WITH NO MORE THAN 90 DEGREES COMBINED CHANGED OF DIRECTION. B. CLEANING: CLEAN DUCTWORK SYSTEMS THROUGHOUT IN PREPARATION FOR LEAKAGE TESTING AND TESTING, ADJUSTING,
- C. TESTING: LEAKAGE TESTS: COMPLY WITH SMACNA'S "HVAC AIR DUCT LEAKAGE TEST MANUAL"

D3090 - TESTING, ADJUSTING, AND BALANCING

1. GENERAL REQUIREMENTS

- λ . $\,$ THIS SECTION INCLUDES TESTING, ADJUSTING, AND BALANCING OF THE MECHANICAL SYSTEMS.
- B. PROVIDE SERVICES OF AN AABC OR NEBB CERTIFIED TESTING, ADJUSTING, AND BALANCING AGENT TO PERFORM THE TESTING, ADJUSTING, AND BALANCING OF THE FOLLOWING SYSTEMS:
- 1. HYDRONIC SYSTEMS 2. VENTILATION SYSTEMS
- PRODUCT (NOT USED)

EXECUTION

A. SUBMIT PRELIMINARY TAB REPORT TO THE OWNER FOR REVIEW AS PART OF THE SUBSTANTIAL COMPLETION PROCESS. SUBMIT FINAL TAB REPORT AFTER THE CORRECTION OF ANY DEFICIENCIES DISCOVERED DURING THE PREPARATION OF THE PRELIMINARY TAB REPORT, IF ANY, AS PART OF THE OPERATION AND MAINTENANCE DOCUMENTATION.

D8000 - CONTROLS AND INSTRUMENTATIONS

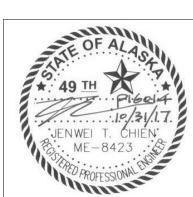
1. GENERAL REQUIREMENTS

- A. THIS SECTION INCLUDES REQUIREMENTS FOR THE CONTROL SYSTEMS.
- B. SUBMITTAL REQUIREMENTS: PROVIDE SYSTEM CONTROL AND WIRING DIAGRAMS, SEQUENCE OF OPERATIONS, AND PRODUCT DATA FOR COMPONENTS FOR SYSTEMS IDENTIFIED IN THESE SPECIFICATIONS.

2. PRODUCTS (NOT USED)

EXECUTION

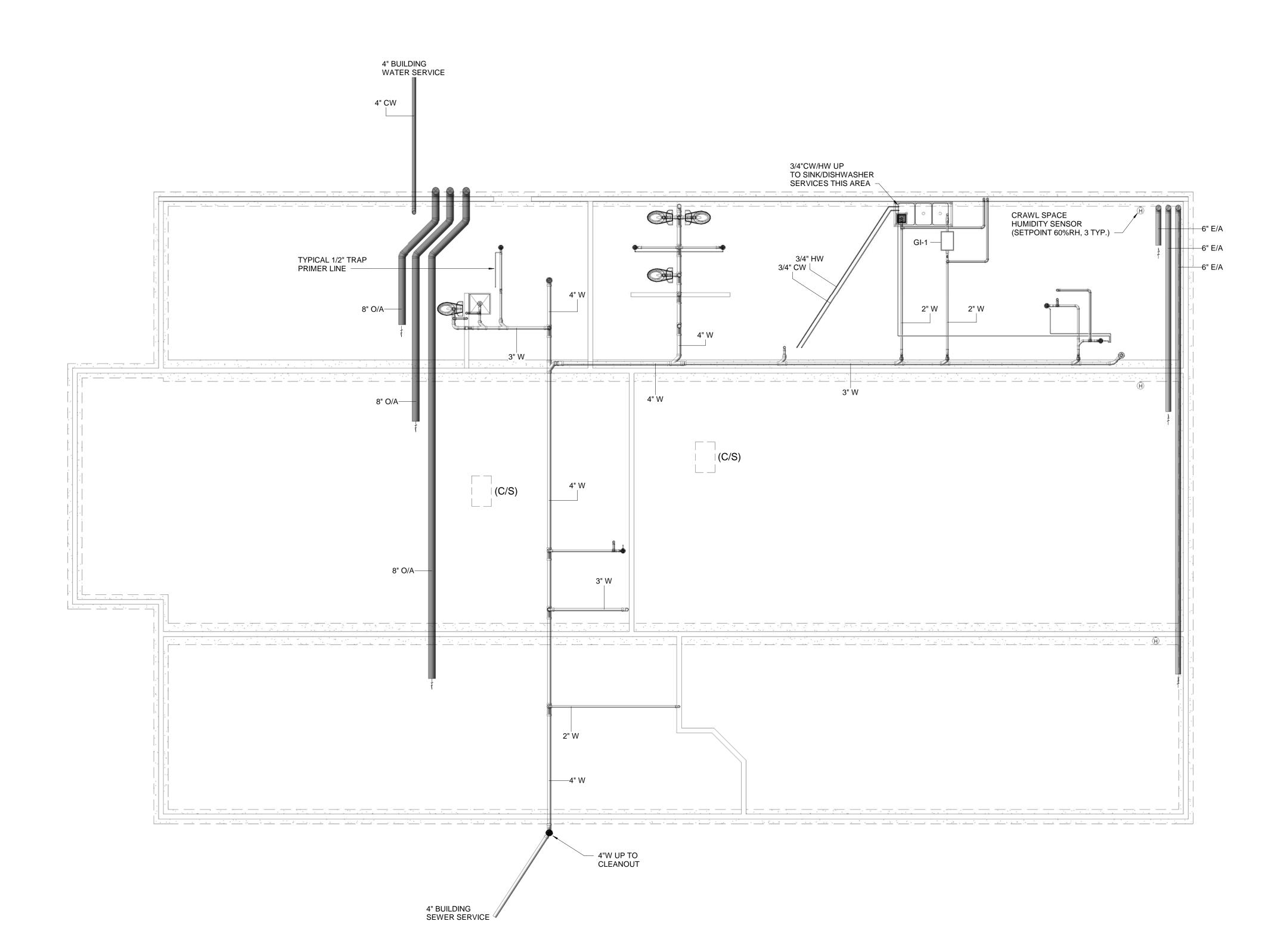
- A. COORDINATE WITH ELECTRICAL TO PROVIDE ALL POWER AND CONTROL CIRCUITS AND CONDUITS TO COMPLETE THE
- B. COORDINATE WITH ALL INTEGRAL EQUIPMENT CONTROLLERS FOR CONTROL INTERFACE REQUIREMENTS.



100 100

 \bigcirc \bigcirc > UZINKIE

유 공 등 등

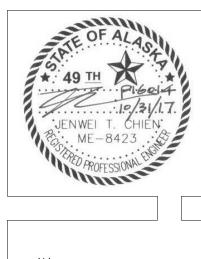


MECHANICAL PLAN - UNDERFLOOR

Scale: 3/16" = 1'-0"

"IIXI7 DRAWINGS ARE HALF THE INDICATED SCALE"

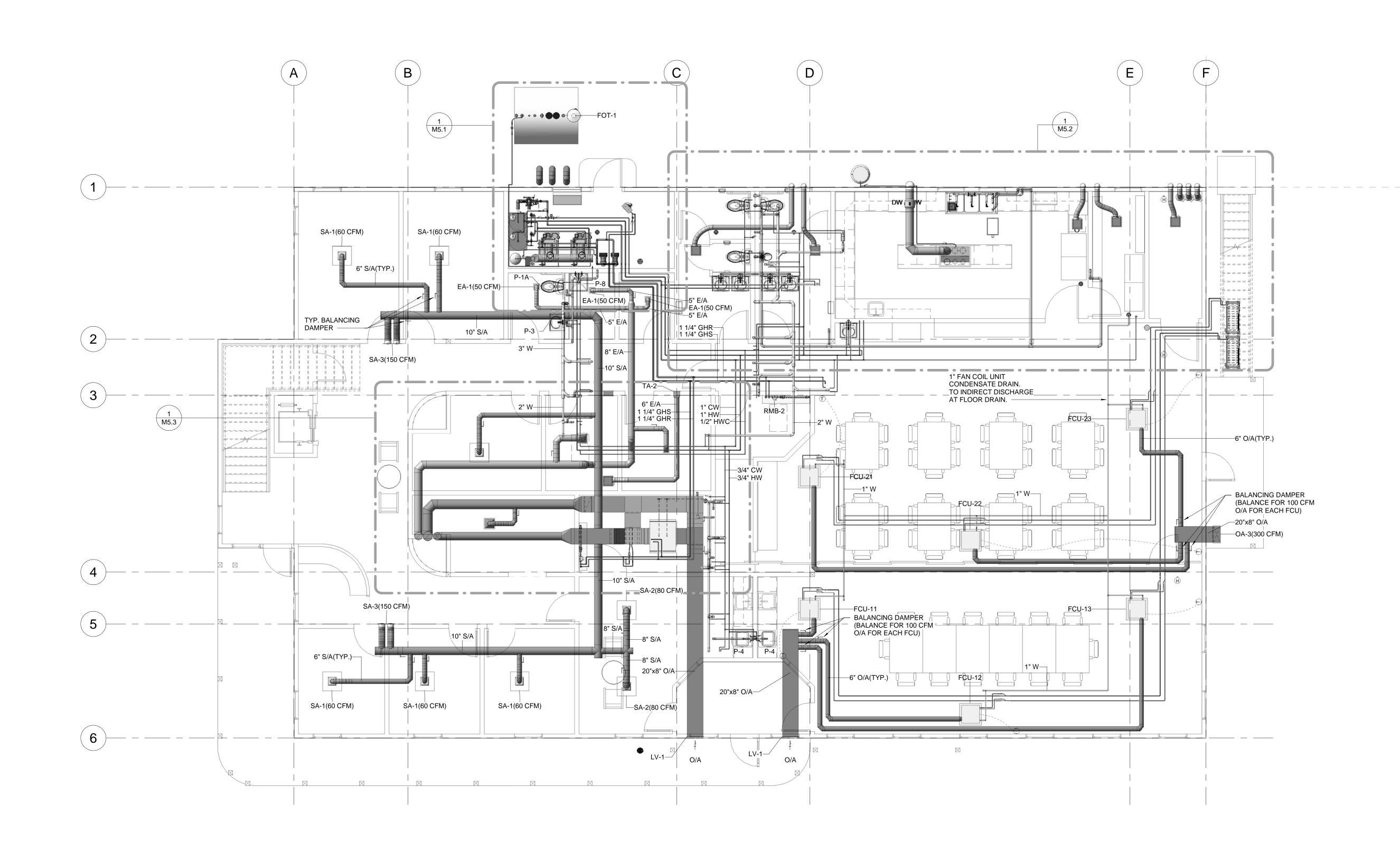
* 31 OCTOBER 2017 * BID SET *



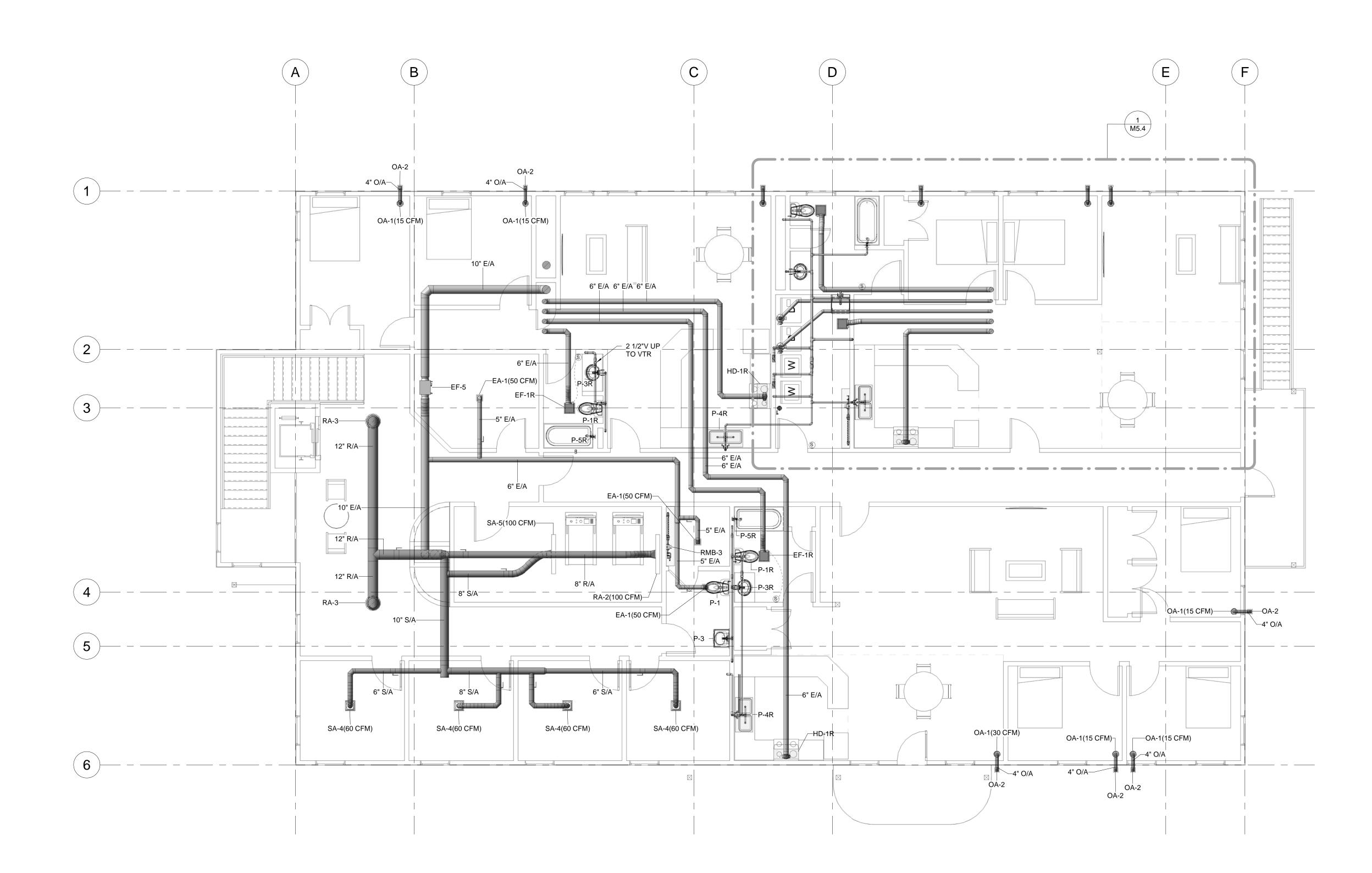
COR OUZINKIE NATIVE

DR: CK: DT: JB: DWG:

M2.1

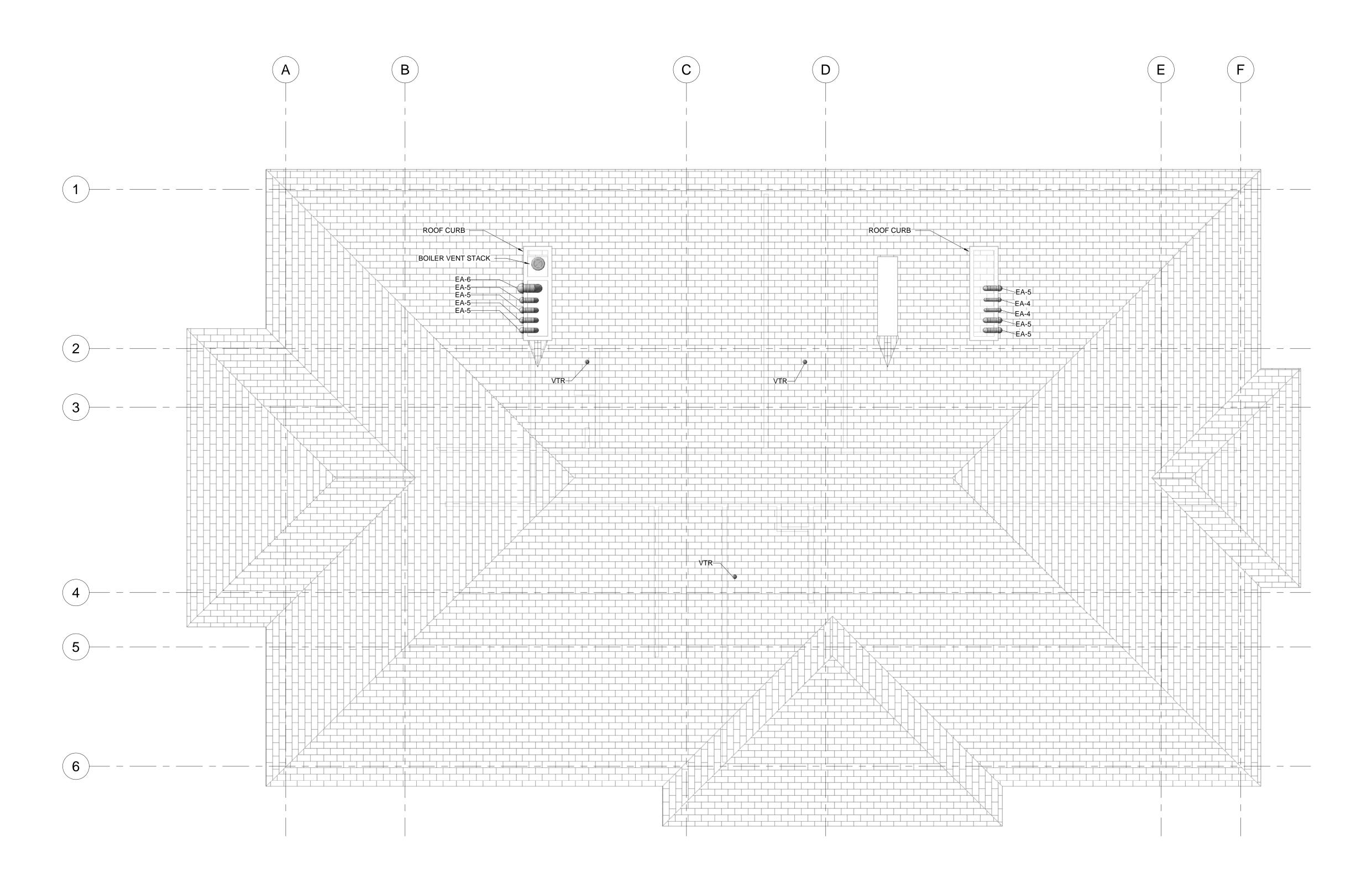


1 MECHANICAL PLAN - MAIN LEVEL
Scale: 3/16" = 1'-0"

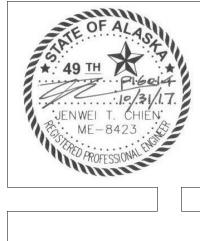


1 MECHANICAL PLAN - UPPER LEVEL
Scale: 3/16" = 1'-0"

M2.3



1 MECHANICAL PLAN - ROOF
Scale: 3/16" = 1'-0"

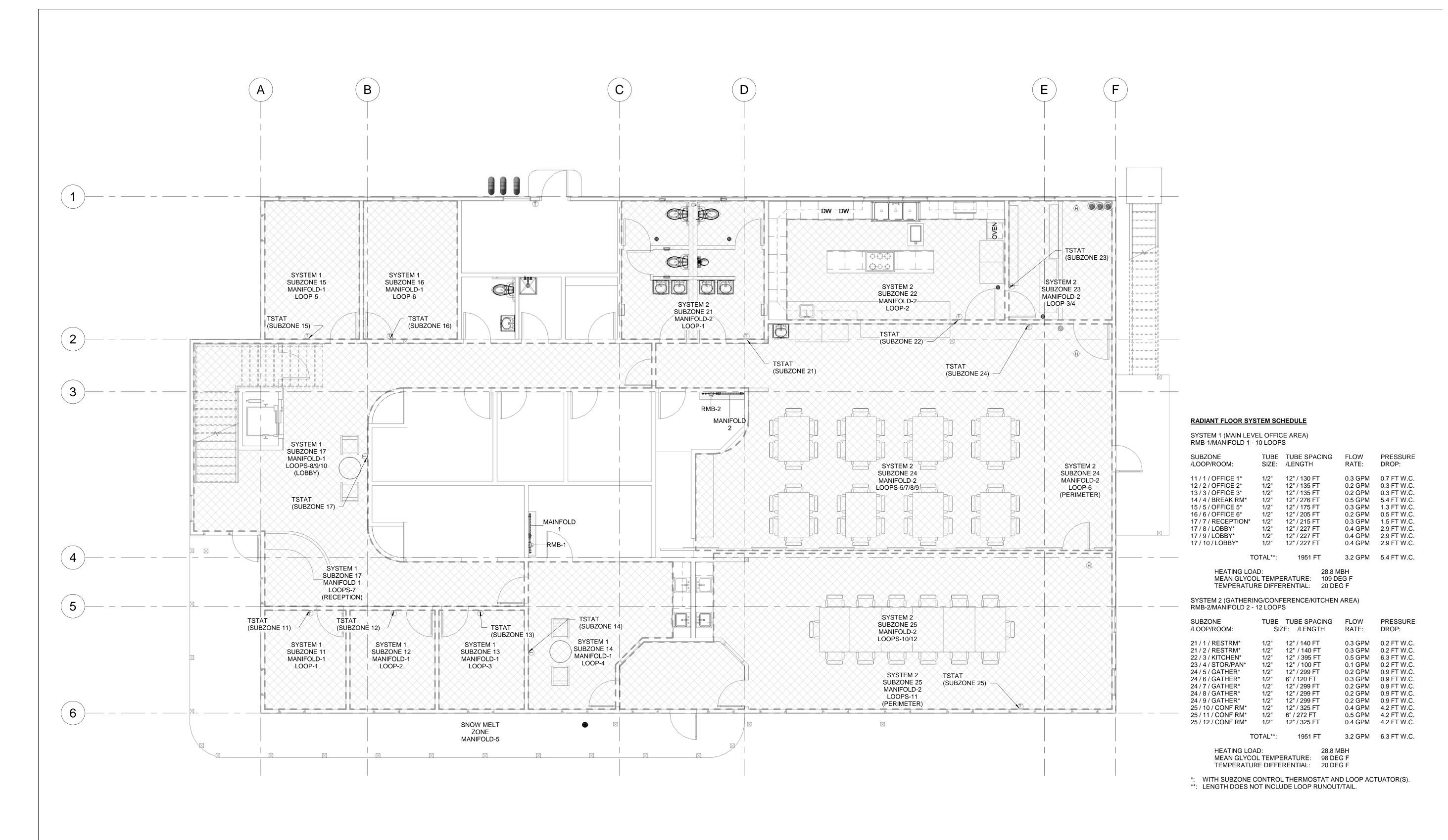


UND OFFICE Standard Control of the standard Control of

COR NATIVE OUZINKIE

DR: DT: DW:

M3.1



RADIANT SYSTEM PLAN - MAIN LEVEL

Scale: 3/16" = 1'-0"

"IIXI7 DRAWINGS ARE HALF THE INDICATED SCALE"

* 31 OCTOBER 2017 * BID SET *



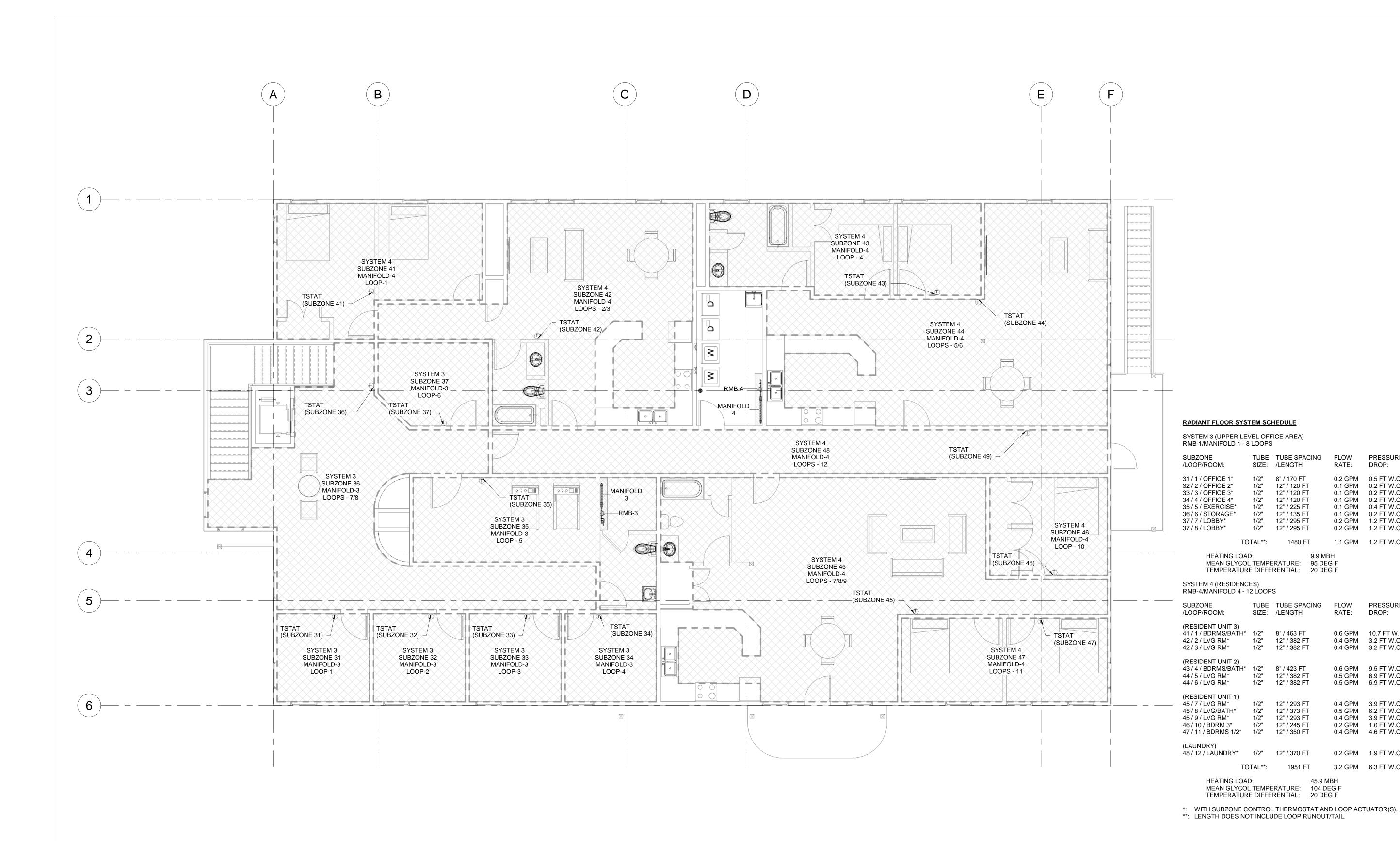
UND OFFICE Standard Control of the standard Control of

COR NATIVE OUZINKIE

DR: DD: DW

FLOW PRESSURE RATE: 0.2 GPM 0.5 FT W.C. 0.1 GPM 0.2 FT W.C. 0.1 GPM 0.2 FT W.C. 0.1 GPM 0.2 FT W.C. 0.1 GPM 0.4 FT W.C. 0.1 GPM 0.2 FT W.C. 0.2 GPM 1.2 FT W.C. 0.2 GPM 1.2 FT W.C. 1.1 GPM 1.2 FT W.C. PRESSURE RATE: 0.6 GPM 10.7 FT W.C. 0.4 GPM 3.2 FT W.C. 0.4 GPM 3.2 FT W.C. 0.6 GPM 9.5 FT W.C. 0.5 GPM 6.9 FT W.C. 0.5 GPM 6.9 FT W.C. 0.4 GPM 3.9 FT W.C. 0.5 GPM 6.2 FT W.C. 0.4 GPM 3.9 FT W.C. 0.2 GPM 1.0 FT W.C. 0.4 GPM 4.6 FT W.C. 0.2 GPM 1.9 FT W.C. 3.2 GPM 6.3 FT W.C.

M3.2



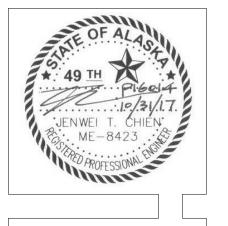
RADIANT SYSTEM PLAN - UPPER LEVEL

Scale: 3/16" = 1'-0"

"IIXI7 DRAWINGS ARE HALF THE INDICATED SCALE"

* 31 OCTOBER 2017 * BID SET *

45.9 MBH

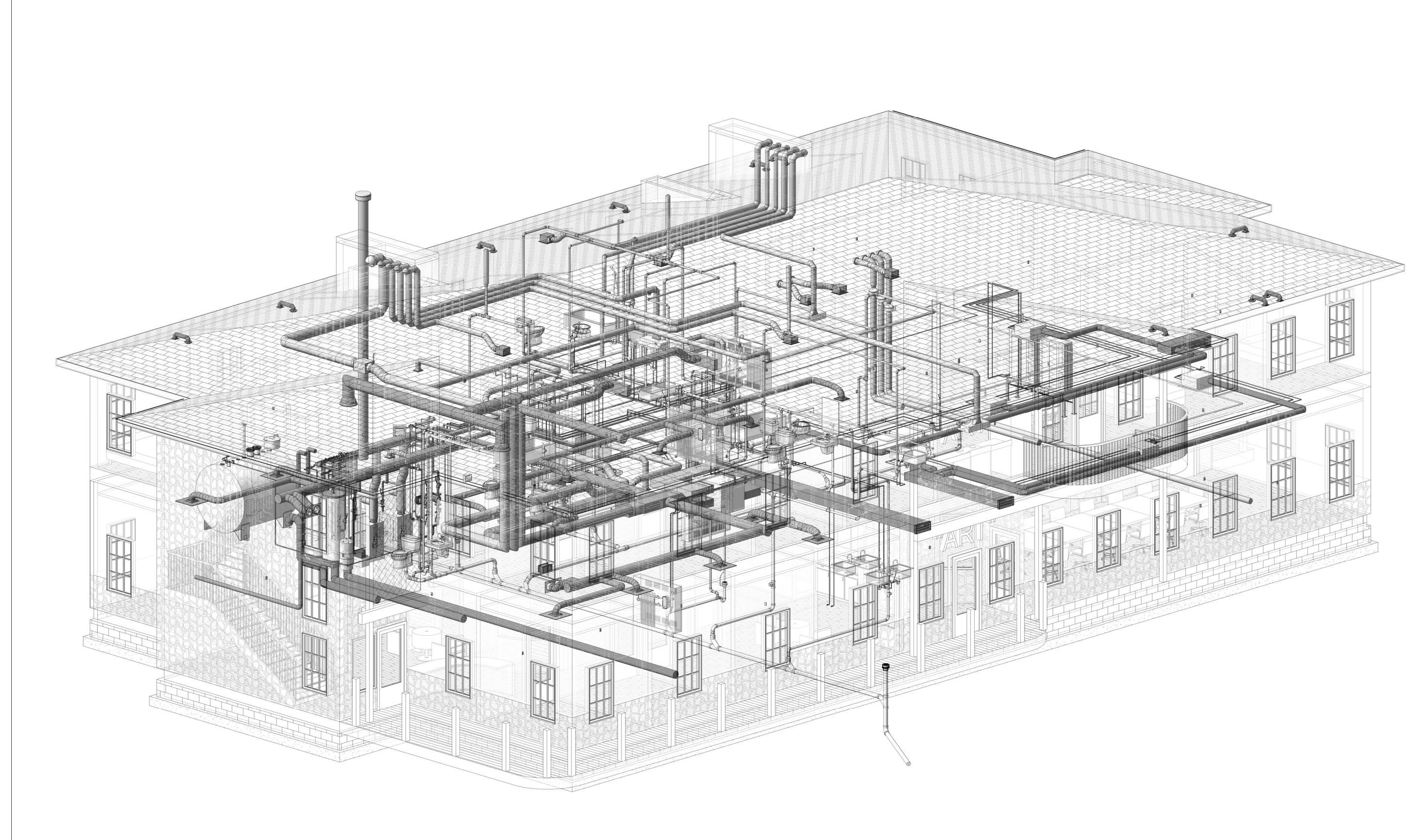


CORF

OUZINKIE NATIVE

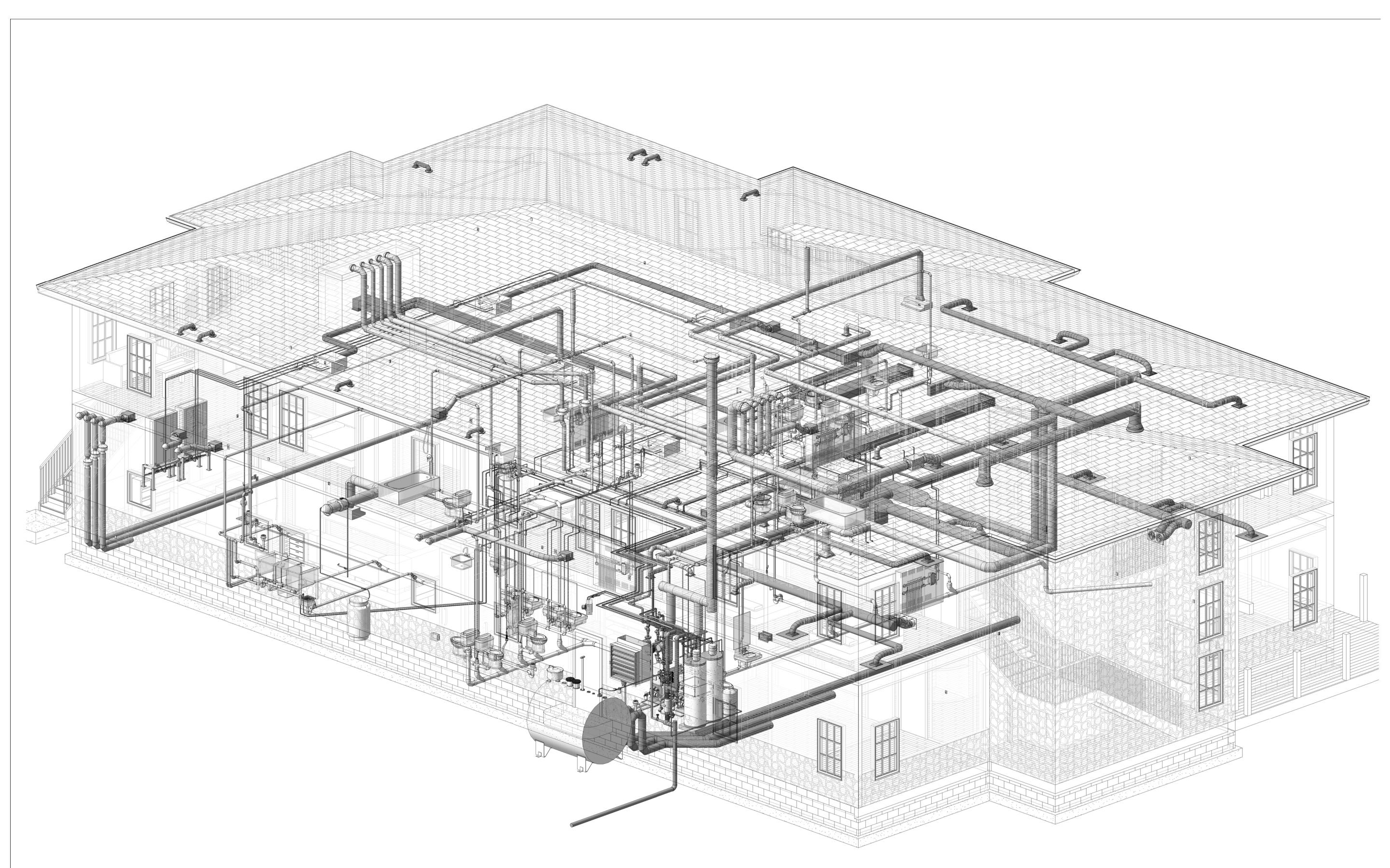
DR: CK: DT: JB: DWG:

M4.1



MECHANICAL VIEW - BUILDING (VIEW ANGLE 1)
Scale:

"IIXI7 DRAWINGS ARE HALF THE INDICATED SCALE"



CORF OUZINKIE NATIVE

DR: CK: DT: DWG:

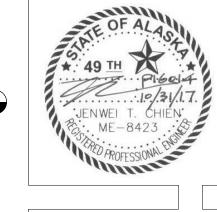
"IIXI7 DRAWINGS ARE HALF THE INDICATED SCALE"

MECHANICAL VIEW - BUILDING (VIEW ANGLE 2)

Scale:

* 31 OCTOBER 2017 * BID SET *

M4.2





TYPICAL BOILER CIRCULATION PUMP AND ISOLATION VALVE.

TYPICAL COMBINSATION

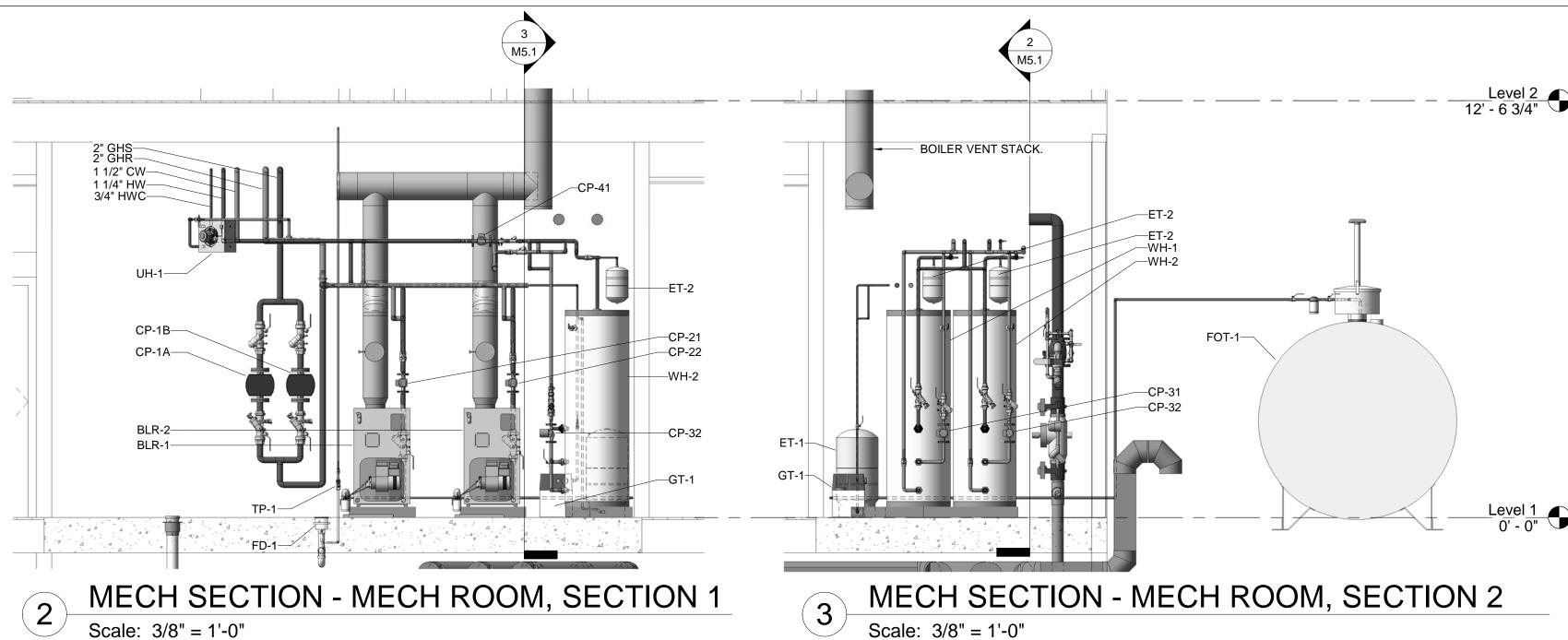
FLOW CONTROL/ISOLATION VALVE.

COR NATIVE

OUZINKIE

OR: UB: DWC

M5.1

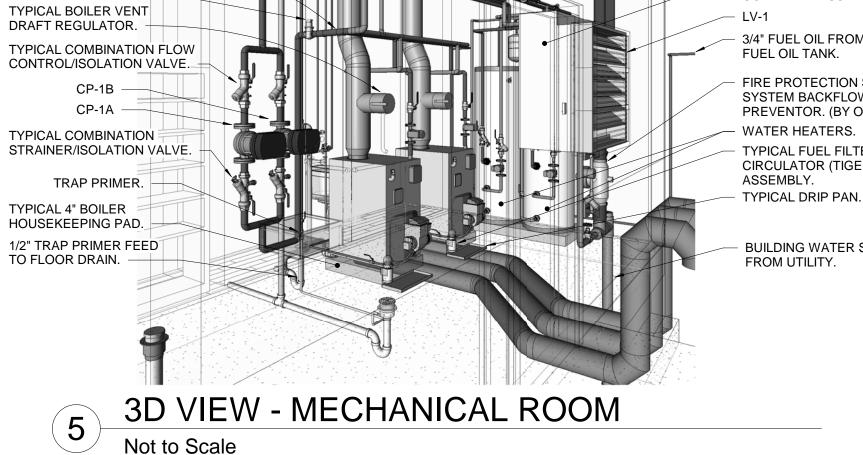


- FIRE PROTECTION SPRINKLER MAIN AND FIRE DEPARTMENT CONNECTION TO BEYOND. HYDRONIC PRIMARY-SECONDARY JUNCTION. (BY OTHERS) 36"X12" INSULATED COLD TRAP ASSEMBLY - 3/4" FUEL OIL FROM FUEL OIL TANK. FIRE PROTECTION SPRINKLER SYSTEM BACKFLOW CP-1A PREVENTOR. (BY OTHERS) WATER HEATERS.

TYPICAL FUEL FILTER/ CIRCULATOR (TIGERLOOP) ASSEMBLY. TYPICAL DRIP PAN. BUILDING WATER SERVICE FROM UTILITY.

> 2" BUILDING DOMESTIC WATER SERVICE.

3D VIEW - REAR OF BOILERS Not to Scale



Not to Scale

-1" CW

–2" GHS –2" GHR

-1 1/2" CW

-3/4" HWC

8" CRAWL SPACE **VENTILATION AIR**

___1 1/4" GHS ___1 1/4" GHR__ ___CP-21

<u> ~CP-41</u> -CP-22 -BLR-2

MECHANICAL AREA PLAN - MECHANICAL ROOM

INTAKE GOOSENECK(3 TYP.)

-CP-1B

36"X12" COMBUSTION AIR INTAKE PLENUM W/INSULATED

COLD TRAP ASSEMBLY.

BUILDING SANITARY

YARD CLEANOUT.

CP-41 TYPICAL THERMAL 1-1/2"CW TO BUILDING SERVICES. EXPANSION TANK. TYPICAL 1"HW OUTLET 1-1/4"CW TO WATER HEATERS. ROUTE OVERHEAD TO ESTABLISH A THERMAL TRAP TO PREVENT HOT FROM WATER HEATER. WATER BACKFEED. TYPICAL 1"HGS/R TO WATER HEATER. TYPICAL COMBINATION STRAINER/ ISOLATION VALVE. -BUILDING FIRE PROTECTION TYPICAL COMBINATION FLOW CONTROL/ISOLATION VALVE. -SPRINKLER SERVICE (BY OTHERS). CP-31/CP-32 -WH-1/WH-2 TYPICAL 1"CW SUPPLY TO WATER HEATER. 4" HOUSEKEEPING PAD.

3D VIEW - WATER HEATERS Not to Scale

MECHANICAL VIEW - MECHANICAL ROOM AREA Not to Scale

"IIXI7 DRAWINGS ARE HALF THE INDICATED SCALE"

CP-21— CP-1B—

CP-1A-

3/4" FUEL OIL SUPPLY

W/FLEXIBLE CONNECTOR,

AND ISOLATION VALVES.

BUILDING WATER SERVICE

CONNECTION.

ENTRANCE AND SPRINKLER

SYSTEM BACKFLOW PREVENTER, ALARM RISER, AND FIRE DEPART.

M5.1

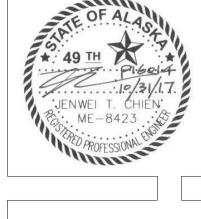
WH-2-CP-32-

WH-1-CP-31-

FUEL FILTER/WATER SEPARATOR

3/4"FOS---

* 31 OCTOBER 2017 * BID SET *





JODO O'Malley Road, Sulte 200 Archivege, Inc.

1000 O'Malley Road, Sulte 200 Archivege, Masko 99515

1907 345-3647 F907 345-3649 www. unigroupengineers, com
State Of Alasa Derification of Authorisation No. 1447

HTECTURE,

SAJJ ARCHITECTURE,

SAJJ ARCHITECTURE,

SAJJ ARCHITECTURE,

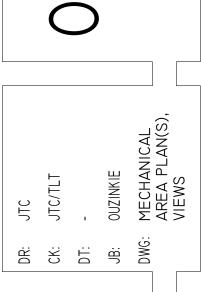
SAJJ ARCHITECTURE,

SAJJ ARCHITECTURE,

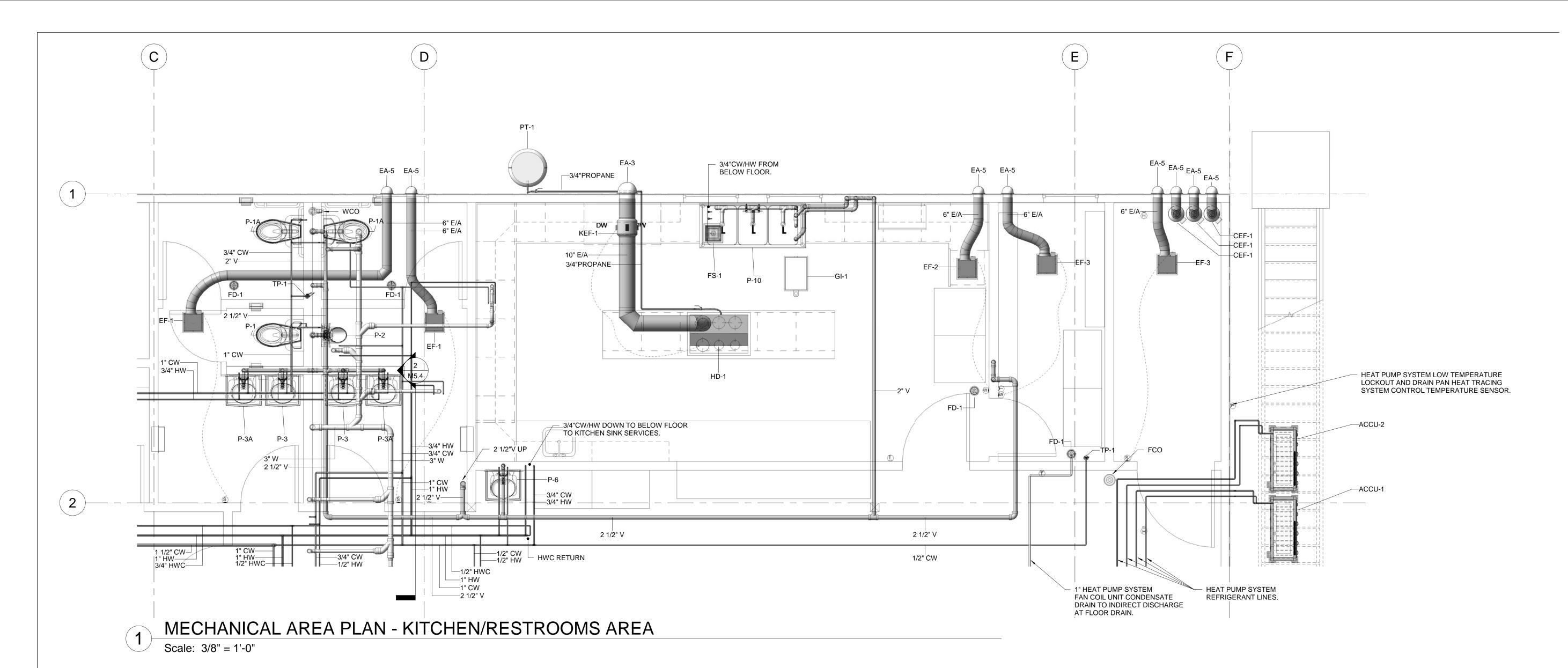
SAJJ ARCHITECTURE,

SAJJ ARCHORAGE, ALASKA 99502

ZINKIE NATIVE CORP



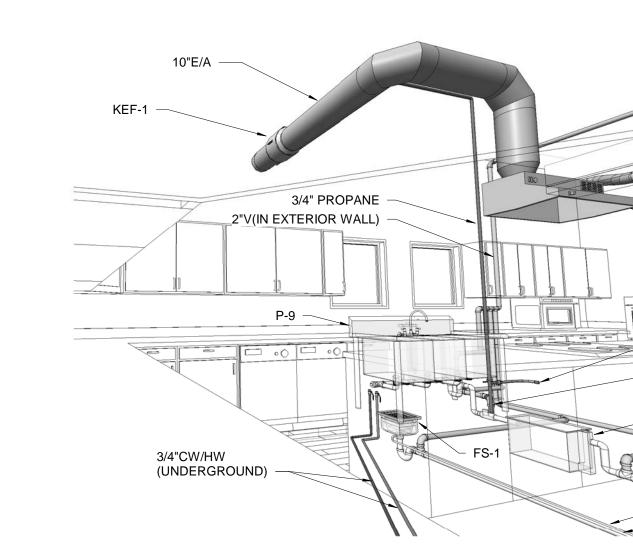




EF-1

2 3D VIEW - RESTROOMS AREA

Not to Scale



3 3D VIEW - WARMING KITCHEN AREA
Not to Scale

4 3D VIEW - HEAT PUMP OUTDOOR UNITS

Not to Scale

ACCU-2

ACCU-1

TUBE-STEEL STAND TO ELEAVATE CONDENSING 18" ABOVE GRADE.

SLOPED DRAIN PLATE W/ ELECTRIC HEAT TRACING.

CONNECT PROPANE SERVICE TO RANGE.

3/4" PROPANE SERVICE DIRT LEG.

2"V(UNDERGROUND)

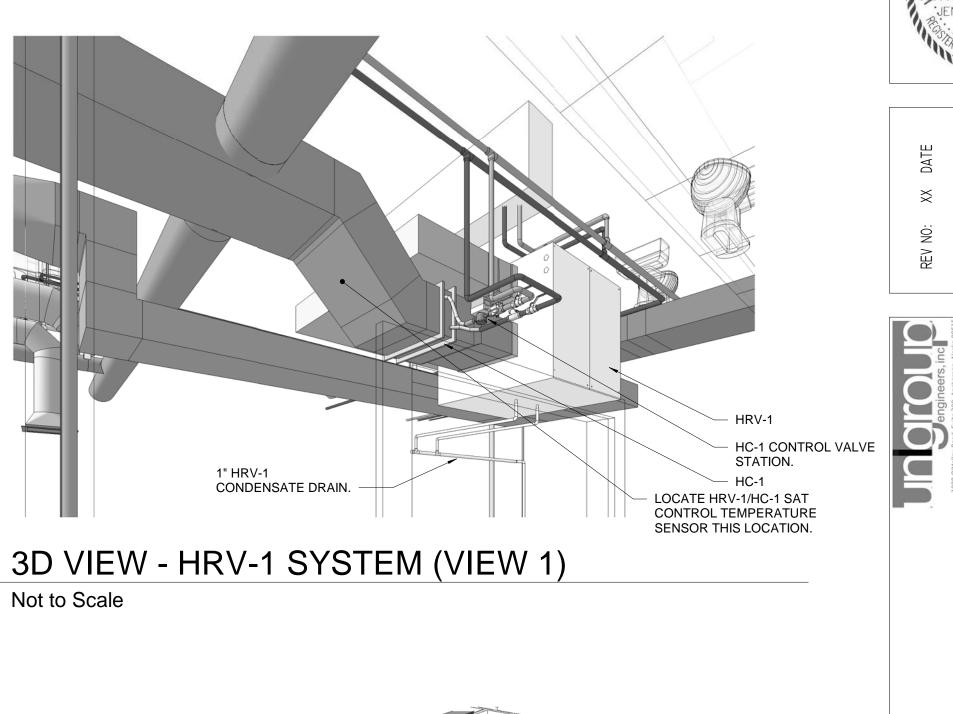
2"W(UNDERGROUND)

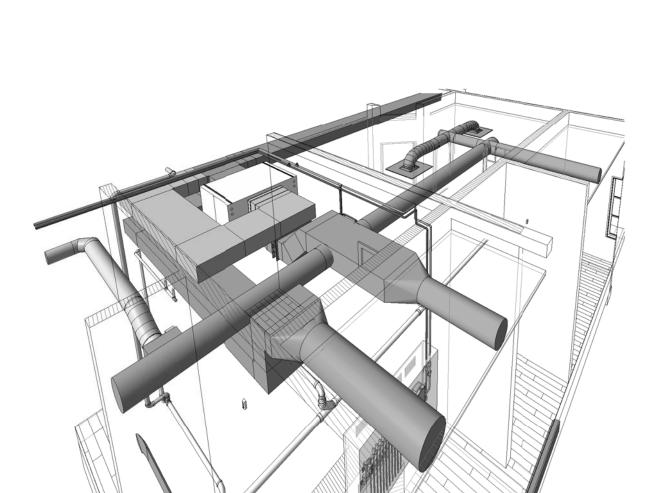
1/2"TP(UNDERGROUND)

"IIXI7 DRAWINGS ARE HALF THE INDICATED SCALE"

* 31 OCTOBER 2017 * BID SET *

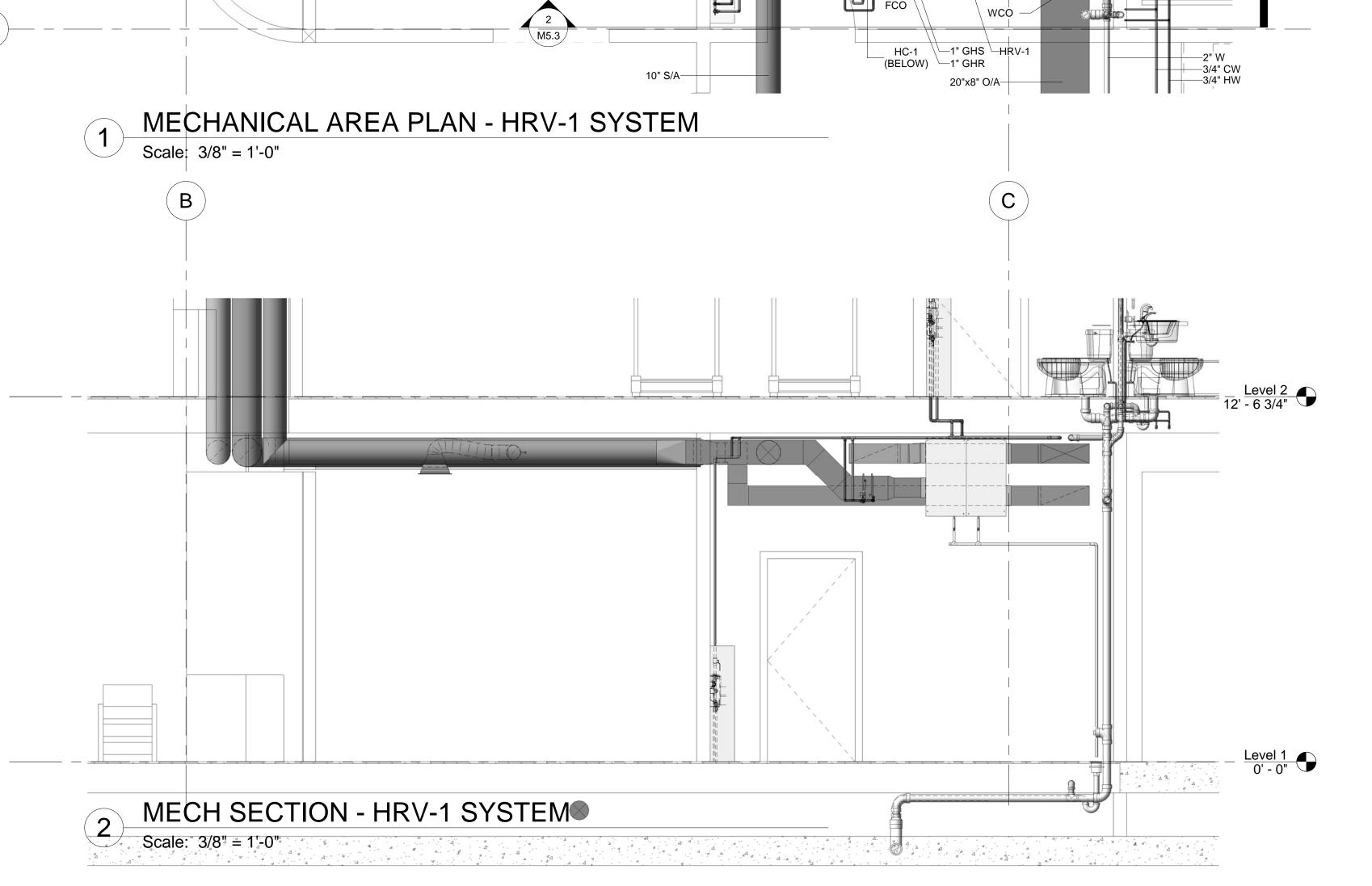
HEAT PUMP LOW TEMPERATURE LOCKOUT AND DRAIN PAN HEAT TRACING SYSTEM CONTROL TEMPERATURE SENSOR.





3D VIEW - HRV-1 SYSTEM (VIEW 2)

Not to Scale



EF-7-

EA-2(100 CFM)—

HWC RETURN

20"x8" R/A— 20"x8" E/A—

10" S/A---

6" S/A-

SA-1(50 CFM)-

─10" S/A ─-8" E/A

EA-1(50 CFM)-

1"W TO INDIRECT DISCHARGE AT FLOOR DRAIN. —

6" E/A— 1 1/4" GHR— 1 1/4" GHS— —1/2" HWC —1" HW —1" CW

—3/4" CW —3/4" HW

HRV-1 RETURN BYPASS BALANCING DAMPER

HRV-1 OUTSIDE AIR BALANCING DAMPER

-1" GHR

DR: JTC
CK: JTC/TLT
DT: JB: OUZINKIE
DWG: MECHANICAL
AREA PLAN(S),
VIEWS

CORF

OUZINKIE NATIVE

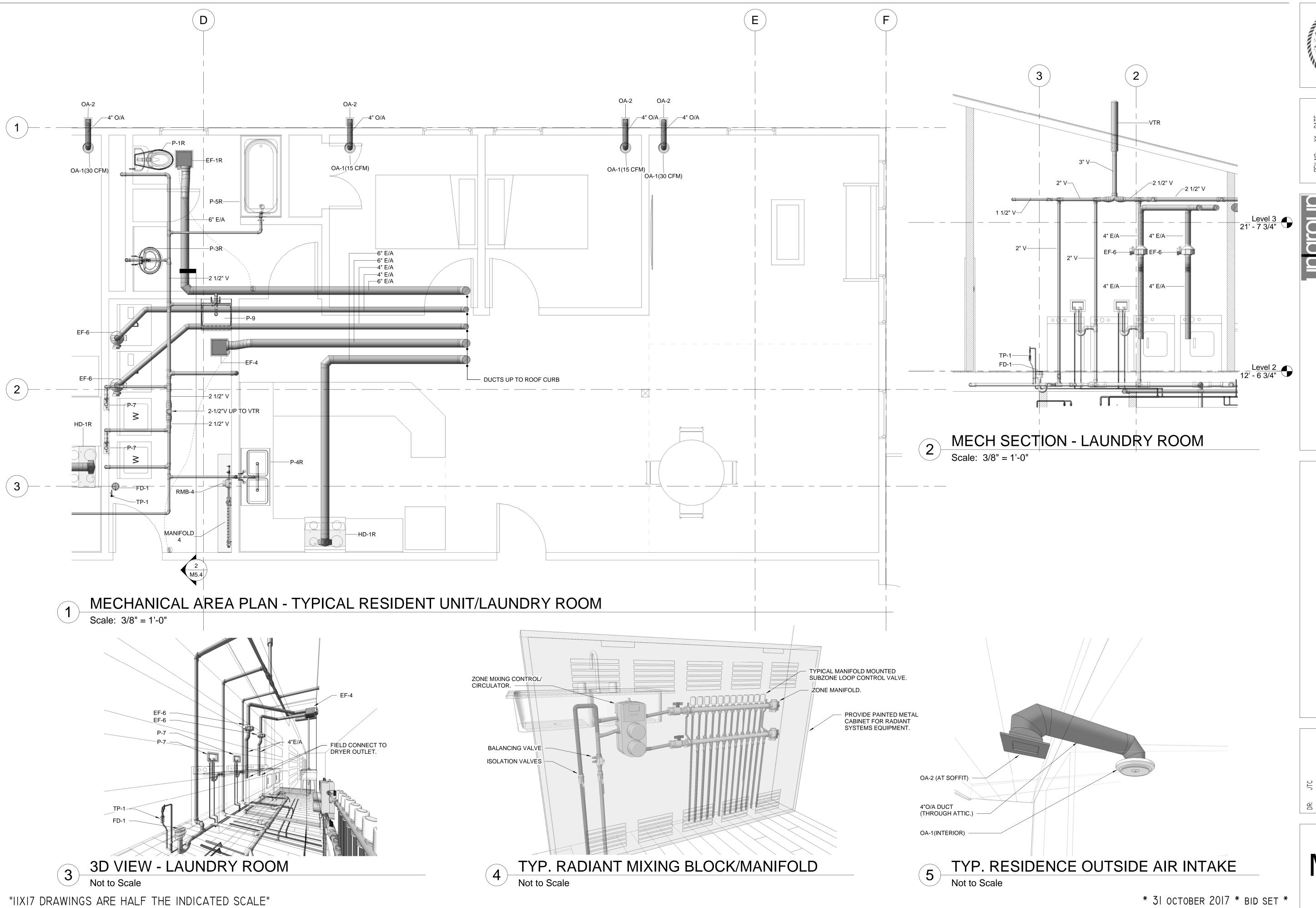
M5.3

B

12" R/A— 10" S/A—

DUCTS UP THROUGH ARCHITECTURAL CHASE

(3)



COR OUZINKIE

DR: CK: DT: JB: DWG

M5.4