

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

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

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

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

1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

October 17, 2024 - 4:36:16pm

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

PLUMBING ELEMENTS / VALVING			
LINE TYPE	DESCRIPTION	LINE TYPE	DESCRIPTION
	PRESSURE REDUCING VALVE (PRV)		PIPE RISING UP
	GATE VALVE		PIPE DROPPING DOWN
	GLOBE VALVE		UNION - SCREWED OR FLANGED
	PLUG VALVE		PRESSURE TRANSMITTER OR PRESSURE SWITCH
	BUTTERFLY VALVE		THERMOMETER/TEMPERATURE INDICATOR
	BALL VALVE		GAUGE WITH GAUGE COCK/ PRESSURE INDICATOR
	SWING CHECK VALVE		BACKFLOW PREVENTOR (REDUCED ZONE)
	LIFT CHECK VALVE		BACKFLOW PREVENTOR (DOUBLE CHECK VALVE ASSEMBLY)
	GATE VALVE, ANGLE		WATER HAMMER ARRESTER
	GLOBE VALVE, ANGLE		CIRCUIT SETTING
	TEMPERATURE AND PRESSURE RELIEF VALVE		HOSE BIBB
	RELIEF/SAFETY VALVE		ROOF DRAIN
	GAS COCK		FLOOR DRAIN
	GAS PRESSURE REGULATOR		AREA DRAIN
	STRAINER		FLOOR CLEAN OUT
	STRAINER WITH BLOW OFF VALVE		FLOOR SINK
	WATER HEATER		CLEAN OUT TO GRADE
	WATER METER		WALL CLEAN OUT
	PRESSURE GAGE		FLEXIBLE-CONNECTION
	TEMPERATURE GAGE		CHECK VALVE
			VACUUM BREAKER

RESPONSIBLE DIVISION:

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

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

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

ABBREVIATIONS:

44" MOUNTING HEIGHT ABOVE FINISHED FLOOR TO CENTER OF DEVICE	DIA DIAMETER	HP HORSEPOWER	PTAC PACKAGED TERMINAL AIR CONDITIONER
A AMPS	DIAG DIAGRAM	HR HOUR	PV PLUG VALVE
A.D. ACCESS DOOR	DIFF DIFFERENTIAL	HT HEIGHT	PVC POLYVINYL CHLORIDE
AAV AIR ADMITTANCE VALVE	DISCH DISCHARGE	HTR HEATER	QTY QUANTITY
ABV ABOVE	DIV DIVISION	HWR HEATING WATER RETURN	RA RETURN AIR GRILLE / REGISTER
AC AIR CONDITIONING UNIT	DN DOWN	HWS HEATING WATER SUPPLY	RCR REFLECTED CEILING PLAN
AC ABOVE COUNTER	DSW DRAWING	HX HEAT EXCHANGER	RD ROOF DRAIN
AD AREA DRAIN (SEE SYMBOLS)	DX DIRECT EXPANSION	HZ HERTZ	REL RELIEF
A.F.C. ABOVE FINISHED CEILING	(E) EXISTING	ID INSIDE DIAMETER	REOD REQUIRED
A.F.G. ABOVE FINISHED GRADE	EA EXHAUST AIR GRILLE/REGISTER	IG ISOLATED GROUND	RF RETURN FAN
AIC AMPERE INTERRUPTING CAPACITY	EAT ENTERING AIR TEMPERATURE	INV INVERT	RH RELATIVE HUMIDITY
AFCI ARC FAULT CIRCUIT INTERRUPTERS	EC ELECTRICAL CONTRACTOR	JBOX JUNCTION BOX	RHC REHEAT COIL
A.F.F. ABOVE FINISHED FLOOR	ECC ECCENTRIC	K KELVIN	RLA RATED LOAD AMPS
AHU AIR HANDLING UNIT	EF EXHAUST FAN	KW KILOWATT	RM ROOM
ALUM ALUMINUM	EFF EFFICIENCY	KVA KILO VOLT - AMPS	RPM REVOLUTIONS PER MINUTE
AP ACCESS PANEL OR DOOR	EL ELEVATION	L LENGTH	SA SUPPLY AIR GRILLE / REGISTER
ATS AUTOMATIC TRANSFER SWITCH	ELEV ELEVATOR	LAT LEAVING AIR TEMPERATURE	SC SHORT CIRCUIT
AV AUDIO / VIDEO	EM EMERGENCY FUNCTION	LV LAVATORY	SCA SHORT CIRCUIT AVAILABLE
AVG AVERAGE	ENT ENTERING	LB POUND	SCCR SHORT CIRCUIT CURRENT RATING
AWG AMERICAN WIRE GAGE	EMT ELECTRIC METALLIC TUBE	LD LINEAR DIFFUSER	SCH SCHEDULE
BAS BUILDING AUTOMATION SYSTEM	EQ EQUAL	LF LINEAR FEET	SD SMOKE DAMPER
BB BASEBOARD	EQUIP EQUIPMENT	LIN LINEAR	SEF SMOKE EXHAUST FAN
BD BACK DRAFT DAMPER	EQUIV EQUIVALENT	LIQ LIQUID	SF SUPPLY FAN
BFP BACK FLOW PREVENTOR	ES END SWITCH	LRA LOOKED ROTOR AMPS	SH SENSIBLE HEAT
BL BOILER	ESP EXTERNAL STATIC PRESSURE	LV LOUVER	SH SHOWER
BLDG BUILDING	ET EXPANSION TANK	LVG LEAVING	SP STATIC PRESSURE
BLW BELOW	EWC ELECTRIC WATER COOLER	LWT LEAVING WATER TEMPERATURE	SPD SURGE PROTECTION DEVICE
BOB BOTTOM OF BEAM	EWI ENTERING WATER TEMPERATURE	MBH THOUSANDS OF BTU PER HOUR	SPEC SPECIFICATION
BOD BOTTOM OF DUCT	EX EXHAUST	MC MECHANICAL CONTRACTOR	SQ SQUARE
BOP BOTTOM OF PIPE	EXPN EXPANSION	MCA MINIMUM CIRCUIT AMPACITY	SS STAINLESS STEEL
BSMT BASEMENT	EXT EXTERNAL	MCB MAIN CIRCUIT BREAKER	SS SAFETY SHOWER
BTU BRITISH THERMAL UNIT	F DEGREES FAHRENHEIT	MD MOTORIZED DAMPER	STD STANDARD
C CHILLER	FA FREE AREA	MDP MAIN DISTRIBUTION PANEL	STL STEEL
CAFCI COMBINATION ARC FAULT CIRCUIT INTERRUPTERS	FAN FAN COIL UNIT	MED MEDIUM	SYS SYSTEM
CAP CAPACITY	FC FOOTCANDLE	MFR MANUFACTURER	TEMP TEMPERATURE
CB CIRCUIT BREAKER	FCV FLOW CONTROL VALVE	MIN MINIMUM	TR TRANSFER GRILLE / REGISTER
CBV CIRCUIT BALANCING VALVE	FD FIRE DAMPER	MISC MISCELLANEOUS	TR TAMPER RESISTANT
CCT CORRELATED COLOR TEMPERATURE	FD FLOOR DRAIN	MLO MAIN LUG ONLY	TT TEMPERATURE TRANSMITTER
CKT CIRCUIT	FIN FINISHED	MOCP MAXIMUM OVERCURRENT PROTECTION	TTB TELECOMMUNICATIONS TERMINAL BACKBOARD
CFH CUBIC FEET PER HOUR	FLA FULL LOAD AMPS	MTD MOUNTED	Typ TYPICAL
CFM CUBIC FEET PER MINUTE	FLEX FLEXIBLE	MUA MAKE-UP AIR UNIT	TX TRANSFORMER
CHWR CHILLED WATER RETURN	FLR FLOOR	N NEUTRAL	UC UNDERCUT DOOR
CHWS CHILLED WATER SUPPLY	FOB FLAT ON BOTTOM	NC NORMALLY CLOSED	UH UNIT HEATER
CI CAST IRON	FOT FLAT ON TOP	NEG NEGATIVE	UNO UNLESS NOTED OTHERWISE
CL CENTER LINE	FP FIRE PROTECTION	NIC NOT IN CONTRACT	UNOCC UNOCCUPIED
CLG CEILING	FPM FEET PER MINUTE	NL NIGHT / SECURITY LIGHT - DO NOT SWITCH	UR URINAL
CMU CONCRETE MASONRY UNIT	FPS FEET PER SECOND	NO NORMALLY OPEN	V VOLTS
COL COLUMN	FSO FIRE/SMOKE DAMPER	NOM NOMINAL	VA VOLT AMPERE
COMP COMPRESSOR	FT FEET	NTS NOT TO SCALE	VA VALVE
CONC CONCRETE	FXC FLEXIBLE CONNECTION	OA OUTSIDE AIR	VAV VARIABLE AIR VOLUME UNIT
COND CONDENSATE	GND GROUND	OBD OPPOSED BLADE DAMPER	VFD VARIABLE FREQUENCY DRIVE
CONN CONNECTION	GAL GALLON	OC ON CENTER	VRF VARIABLE REFRIGERANT FLOW
CONT CONTINUATION	GALV GALVANIZED	OCC OCCUPIED	VOLT VOLTAGE
CONTR CONTRACTOR	GEC GROUND ELECTRODE CONDUCTOR	OCPP OVER CURRENT PROTECTION	VTR VENT THROUGH ROOF
CRI COLOR RENDERING INDEX	GFCI / GFI GROUND FAULT CIRCUIT INTERRUPTER	OD OUTSIDE DIAMETER	W WIDTH
CT COOLING TOWER	OG GENERAL CONTRACTOR	OL OVERLOAD	W WATTS
CT CURRENT TRANSFORMER	GPH GALLONS PER HOUR	ORD OVERFLOW ROOF DRAIN	W/ WITH
CU CONDENSING UNIT	GPM GALLONS PER MINUTE	OZ OUNCE	WIO WITHOUT
CUP COPPER	GRSIB GRAINS PER POUND	PBD PARALLEL BLADE DAMPER	WB WET BULB
CUH CABINET UNIT HEATER	H2O WATER	PD PRESSURE DROP	WC WATER COLUMN
CVB CONSTANT VOLUME BOX	HB HOSE BIBB	PH PHASE	WC WATER CLOSET
CWR CONDENSER WATER RETURN	HD HEAD (SEE SCHEDULES)	POS POSITIVE PRESSURE	WG WATER GAUGE
CWS CONDENSER WATER SUPPLY	HP HEAT PUMP	POS POINT OF SALES	WP WEATHERPROOF
DB DRY BULB		PRV PRESSURE REDUCING VALVE	WPIU WEATHERPROOF IN-SUE
DEPT DEPARTMENT		PS PRESSURE SWITCH	WSR WITHSTAND RATING
DF DRINKING FOUNTAIN		PSI POUNDS PER SQUARE INCH	XFMR TRANSFORMER
		PT PRESSURE TRANSMITTER	

SUBSTITUTIONS:

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

EXAMINATION OF SITE, DRAWINGS, SPECIFICATIONS:

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

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

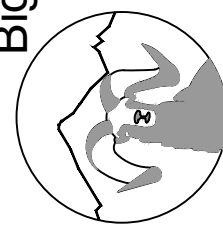
C. DRAWINGS ARE DIAGRAMMATIC AND CATALOG NUMBERS GIVEN ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE CAPACITY OF THE EQUIPMENT MEETS THE DRAWING REQUIREMENTS AND SHALL NOT DIMENSION FROM THE MECHANICAL, PLUMBING, OR PIPING DRAWINGS.

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

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

DO NOT REPRODUCE THESE DRAWINGS AND SPECIFICATIONS WITHOUT THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER. THE DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF THE SERVICE AND SHALL REMAIN THE PROPERTY OF THE DESIGNER. WHETHER THE PROJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. THESE DRAWINGS AND SPECIFICATIONS SHALL NOT BE USED BY ANYONE, ON ANY OTHER PROJECTS FOR ADDITIONS TO THIS PROJECT BY OTHERS EXCEPT BY THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER.

Bighorn Consulting Engineers, Inc.
Mechanical & Electrical Engineers
386 Indian Road
Grand Junction, CO 81501
Phone: (970) 241-8709



RIVERFRONT INDUSTRIAL PARK

PLUMBING - COVER SHEET

1522 SHIELD DRIVE

STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT



DATE:	09/06/2024
JOB NO:	24-056
DRAWN BY:	---
CHECKED BY:	---
SCALE:	---
SHEET NUMBER:	P0-1

WhisperComfort[®] 60 Energy Recovery Ventilator

Specification Submittal Data / Panasonic ERV

Description
UL Listed ceiling or wall mount Energy Recovery Ventilator provides a tempered fresh air supply and balanced exhaust air flow to maintain neutral pressure throughout the home. Panasonic's WhisperComfort[®] 60 is not for use in a bathroom.

- Motor/Blower:**
- ERV supply and exhaust rates shall be manually adjustable for 20 - 30 - 40 - 50 CFM
 - Two fully enclosed Panasonic DC Electronic Commutated Motors (ECM) rated for continuous run.
 - ERV shall have Hi / Lo speed occupant boost capability
 - Power rating shall be 120 volts and 60 Hz.
 - Two highly efficient blower wheels running on two motors for lower power consumption and decreased noise.
 - Motors are equipped with thermal cut-off fuse control.

- Housing:**
- Corrosion Resistant and Galvanized steel body
 - 2 Pressure ports allow for easy airflow verification.
 - Dual 4" intake and exhaust ducts. 5" Duct connections are also available.
 - Built in backdraft damper on exhaust duct.
 - Filters on supply and exhaust air extend the life of the ERV core.
 - Expandable mounting bracket up to 16" on center.

Performance Specifications : WhisperComfort [®] 60 FV-06VE1							
Mode	Supply Temperature		Net Air Flow		Power Consumption (w)	Sensible Recovery Efficiency	Adjusted Sensible Recovery Efficiency
	°F	°C	L/s	CFM			
Heating	32	0	9	20	39	70%	73%
	32	0	28	60	39	60%	63%
Cooling	95	35	13	27	12		
					Total Recovery Efficiency		
					60%		

Sound Specifications: WhisperComfort [®] 60 FV-06VE1				
4" Duct	Static Pressure "W.G.	Exhaust(CFM)	Supply(CFM)	Score
	0.1"	40	40	0.9
	0.25"	30	30	1.2
	0.1"	30	60	1.5
	0.25"	40	62	2.0
	0.1"	60	60	2.5
	0.25"	50	62	2.5

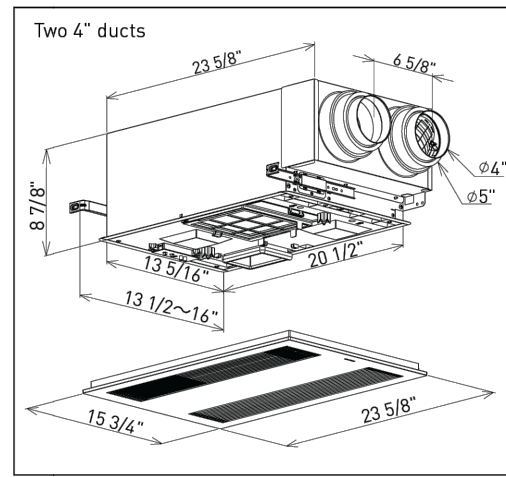
For complete Installation Instructions visit na.panasonic.com/us/iaq

Panasonic
IAQ Division
Two Riverfront Plaza
Newark, NJ 07102
na.panasonic.com/us/iaq



IAQ230A25T R14

FV-06VE1



FV-06VE1
Optional Exterior WhisperVent[™] Wall Cap (See next page)

Maintenance:

MERV 13 filter included, replacements available

ERV Core Technology:

- Indoor and outdoor air passes through Panasonic's capillary core technology. This process tempers supply air while transferring moisture and energy.
- Built in Frost Prevention Mode prevents the core from freezing. Frost Prevention Mode is free of interaction and operates without intervention.

Panasonic

WhisperComfort[®] 60 Energy Recovery Ventilator

Specification Submittal Data / Panasonic ERV

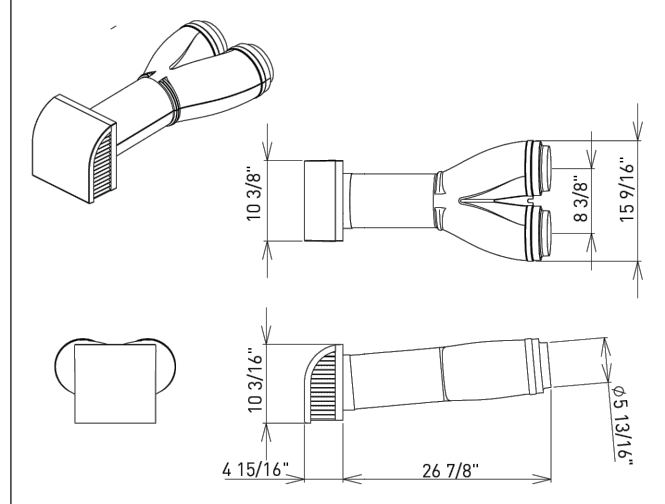
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			Location:
			Architect:
			Engineer:
			Contractor:
			Submitted by:
			Date:

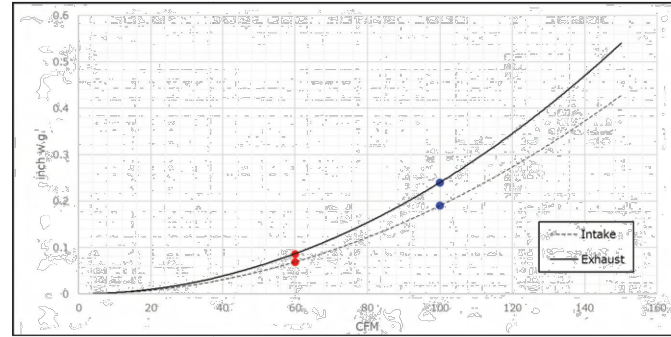
Optional Accessories

WhisperVent[™] Wall Cap

Optional Exterior Wall Cap



Pressure drop curve: FV-WC10VE1 WhisperVent[™] Wall Cap



FV-WC10VE1			
Pressure drops intake (inch w.g.)*	60	0.7	
	100	0.19	
Pressure drops exhaust (inch w.g.)*	60	0.09	
	100	0.24	

*measured value

Exterior Wall Cap

FV-WC10VE1 polystyrene wall cap with polystyrene adaptor allows both exhaust (from the right) and supply (from the left) airflow through a 7.5" hole in the building envelope. The dividers inside the bottom portion of the Y shape chamber and the new wall cap help prevent cross contamination.

For complete Installation Instructions visit na.panasonic.com/us/iaq

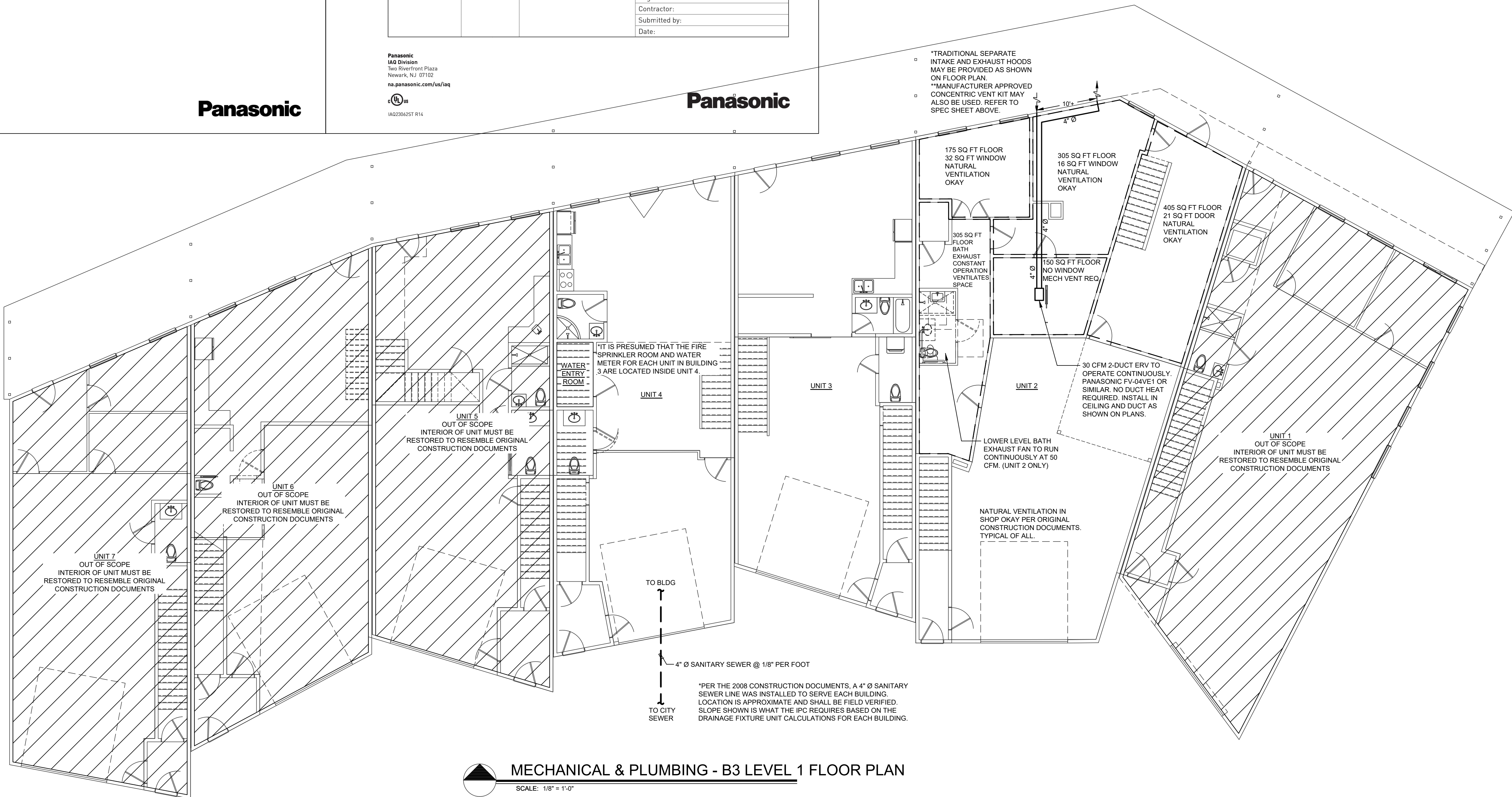
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			Contractor:
			Submitted by:
			Date:

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Two Riverfront Plaza
Newark, NJ 07102
na.panasonic.com/us/iaq



IAQ230A25T R14

Panasonic



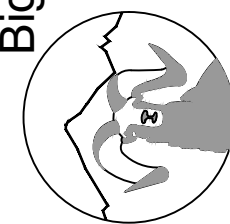
MECHANICAL & PLUMBING - B3 LEVEL 1 FLOOR PLAN

SCALE: 1/8" = 1'-0"

*PER THE 2008 CONSTRUCTION DOCUMENTS, A 4" Ø SANITARY SEWER LINE WAS INSTALLED TO SERVE EACH BUILDING. LOCATION IS APPROXIMATE AND SHALL BE FIELD VERIFIED. SLOPE SHOWN IS WHAT THE IPC REQUIRES BASED ON THE DRAINAGE FIXTURE UNIT CALCULATIONS FOR EACH BUILDING.

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RIVERFRONT INDUSTRIAL PARK
MECHANICAL & PLUMBING - B3 LEVEL 1 FLOOR PLAN
1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

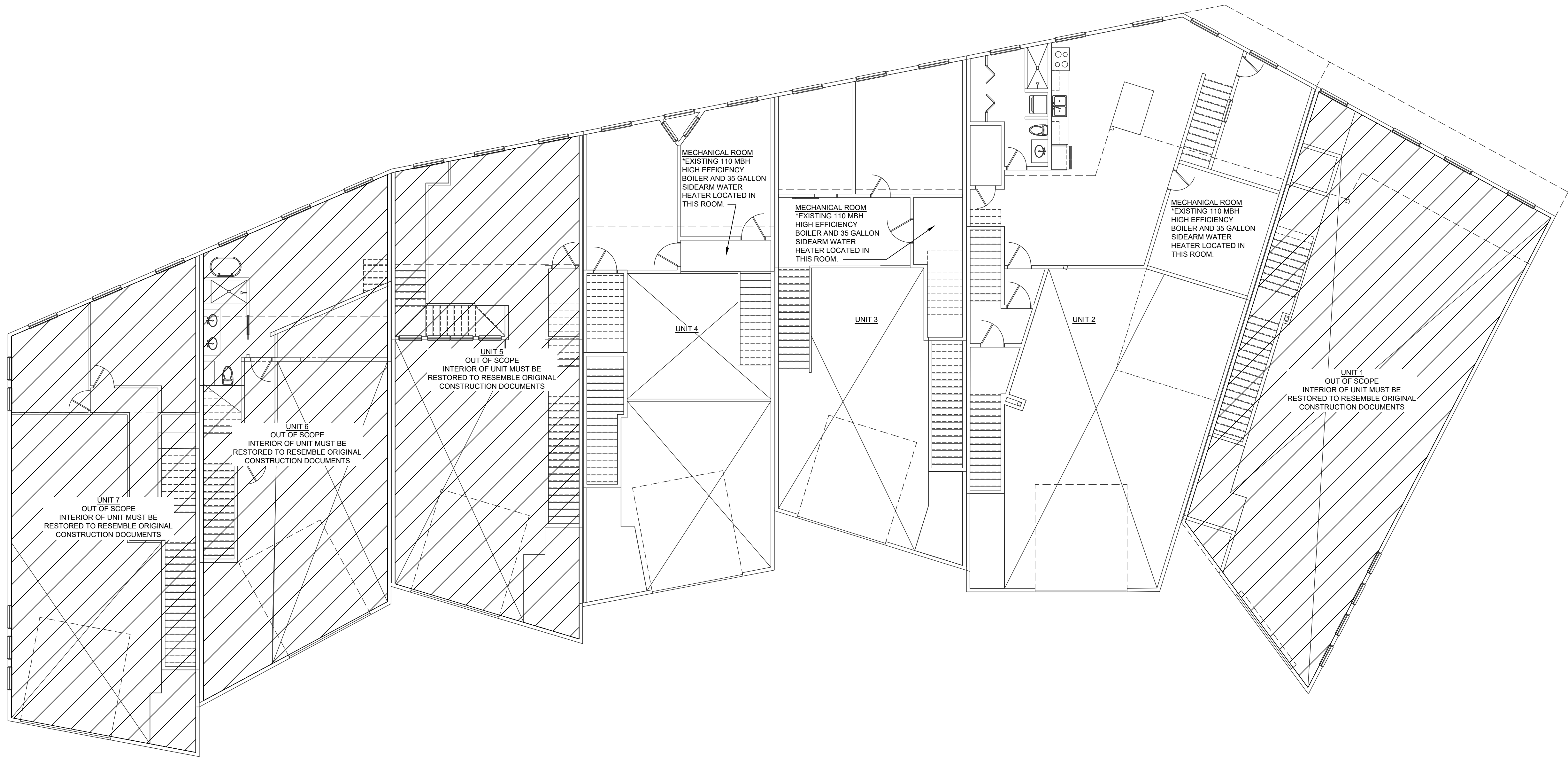
DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT



DATE:	09/06/2024
JOB NO:	24-056
DRAWN BY:	---
CHECKED BY:	---
SCALE:	AS SHOWN
SHEET NUMBER:	

MP1-1

October 17, 2024 - 4:36:17pm

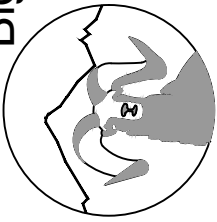


MECHANICAL & PLUMBING - B3 LEVEL 2 FLOOR PLAN

SCALE: 1/8" = 1'-0"

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Bighorn Consulting Engineers, Inc.
Mechanical & Electrical Engineers
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Grand Junction, CO 81501
Phone: (970) 241-8709

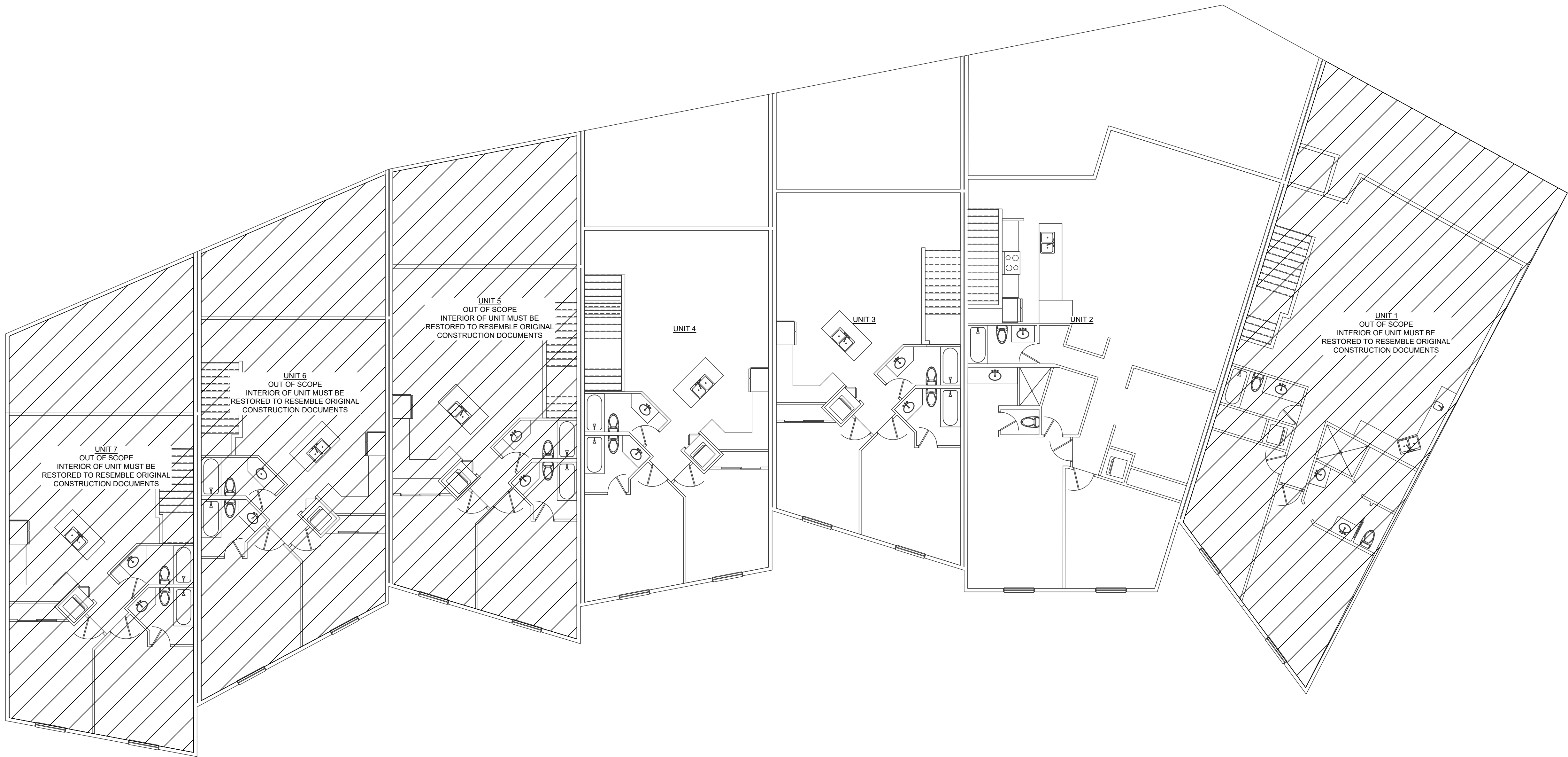


RIVERFRONT INDUSTRIAL PARK
MECHANICAL & PLUMBING - B3 LEVEL 2 FLOOR PLAN
1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT



DATE:	09/06/2024
JOB NO:	24-056
DRAWN BY:	---
CHECKED BY:	---
SCALE:	AS SHOWN
SHEET NUMBER:	MP1-2

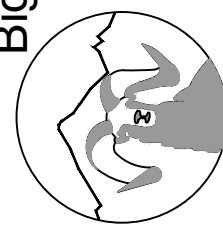


MECHANICAL & PLUMBING - B3 LEVEL 3 FLOOR PLAN

SCALE: 1/8" = 1'-0"

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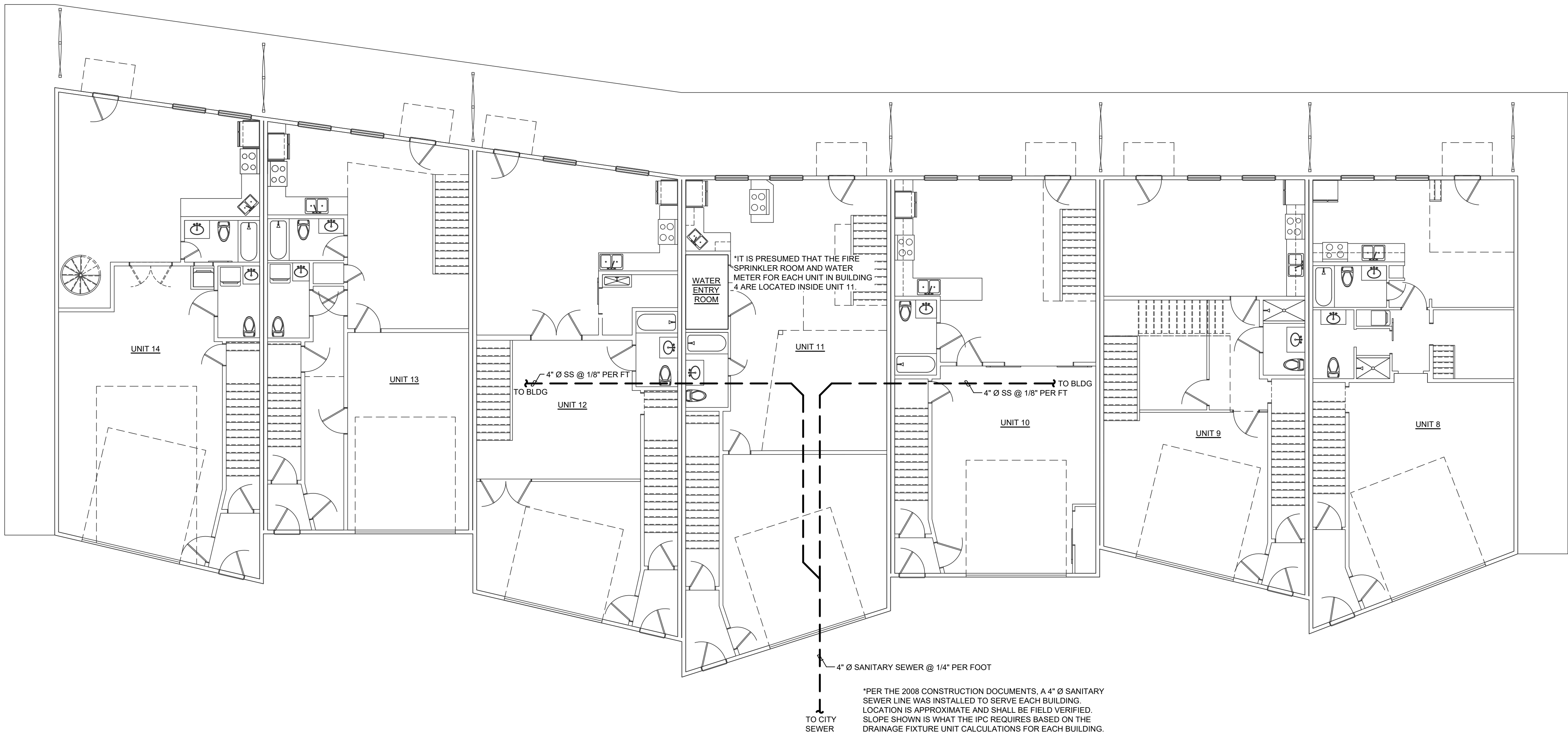


RIVERFRONT INDUSTRIAL PARK MECHANICAL & PLUMBING - B3 LEVEL 3 FLOOR PLAN 1522 SHIELD DRIVE STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT



DATE:	09/06/2024
JOB NO:	24-056
DRAWN BY:	---
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SCALE:	AS SHOWN
SHEET NUMBER:	MP1-3

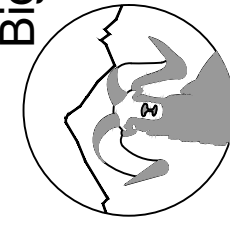


MECHANICAL & PLUMBING - B4 LEVEL 1 FLOOR PLAN

SCALE: 1/8" = 1'-0"

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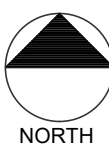
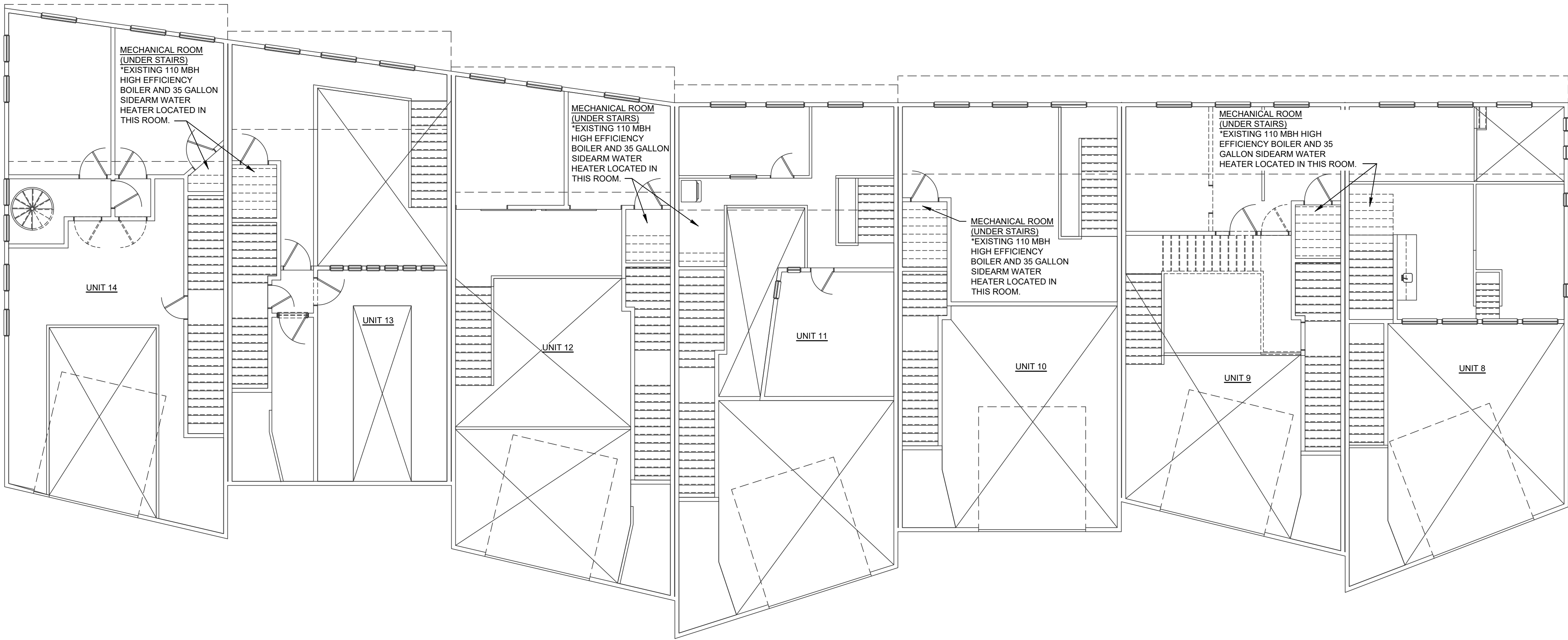


RIVERFRONT INDUSTRIAL PARK
MECHANICAL & PLUMBING - B4 LEVEL 1 FLOOR PLAN
1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
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10/17/2024	ALL UNITS - PERMIT



DATE:	09/06/2024
JOB NO:	24-056
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CHECKED BY:	---
SCALE:	AS SHOWN
SHEET NUMBER:	MP1-4

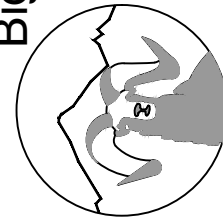


MECHANICAL & PLUMBING - B4 LEVEL 2 FLOOR PLAN

SCALE: 1/8" = 1'-0"

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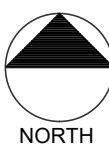
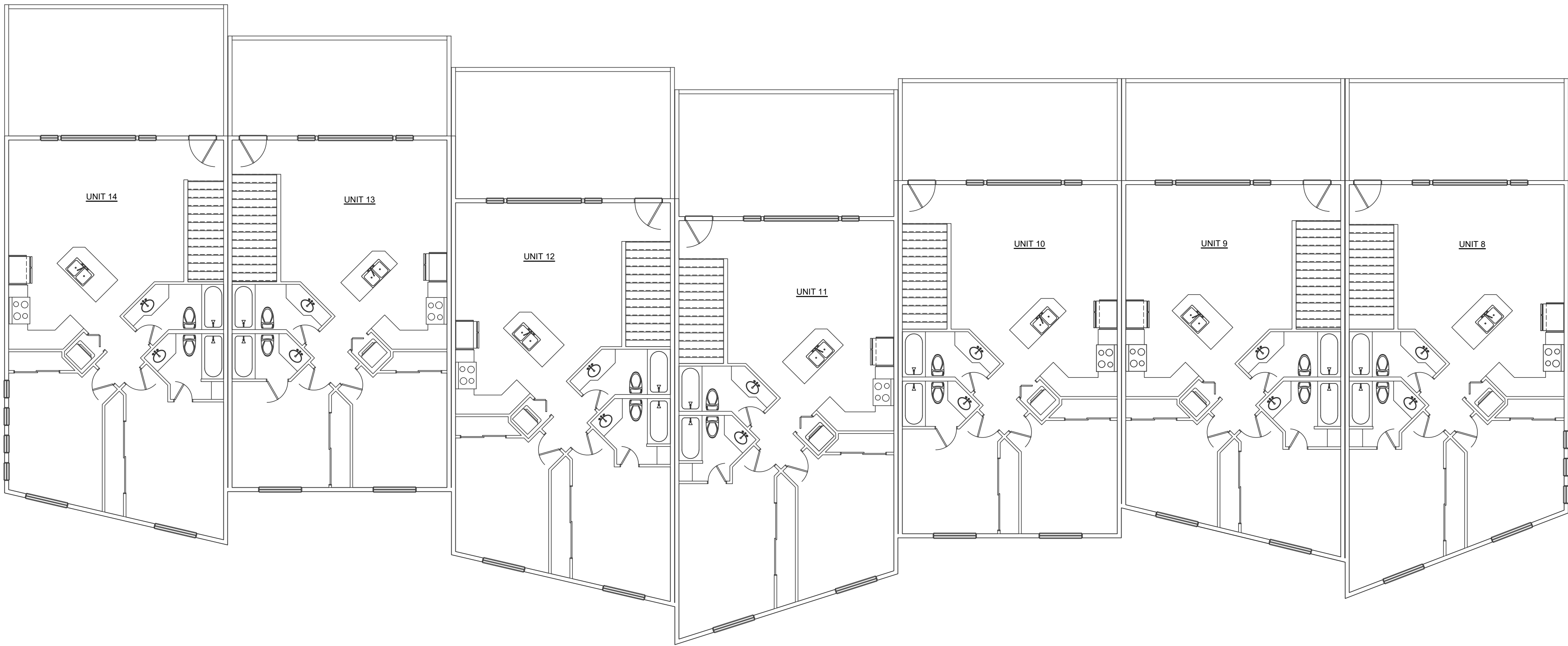


RIVERFRONT INDUSTRIAL PARK
MECHANICAL & PLUMBING - B4 LEVEL 2 FLOOR PLAN
1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
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10/17/2024	ALL UNITS - PERMIT



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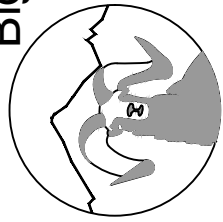


MECHANICAL & PLUMBING - B4 LEVEL 3 FLOOR PLAN

SCALE: 1/8" = 1'-0"

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RIVERFRONT INDUSTRIAL PARK
MECHANICAL & PLUMBING - B4 LEVEL 3 FLOOR PLAN
1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

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SHEET NUMBER:	MP1-6

DRAINAGE FIXTURE FIXTURE CALCULATIONS BASED ON 2015 IPC TABLE 709.1			
PROJECT: RIVERFRONT PARK - BUILDING 3 - EXISTING CONDITIONS	DATE: SEPTEMBER 2024		
FIXTURE TYPE	DRAINAGE FIXTURE UNIT	PLUMB FIX QNTY	TOTAL DRAINAGE FIXTURE UNITS
AUTOMATIC CLOTHES WASHERS, RESIDENTIAL	2	9	18
BATHROOM GROUP AS DEFINED IN SECTION 202 (1.6 GPF WATER CLOSET)	5	21	105
DISHWASHING MACHINE, DOMESTIC	2	7	14
KITCHEN SINK, DOMESTIC	2	1	2
KITCHEN SINK, DOMESTIC WITH FOOD WASTE DISPOSER AND OR DISHWASHER	2	11	22
LAVATORY	1	5	5
WATER CLOSET, PRIVATE (1.6 GPF)	3	5	15
	APPROXIMATE GPM	TOTAL DRAINAGE FIXTURE UNITS	
	90.50	181	

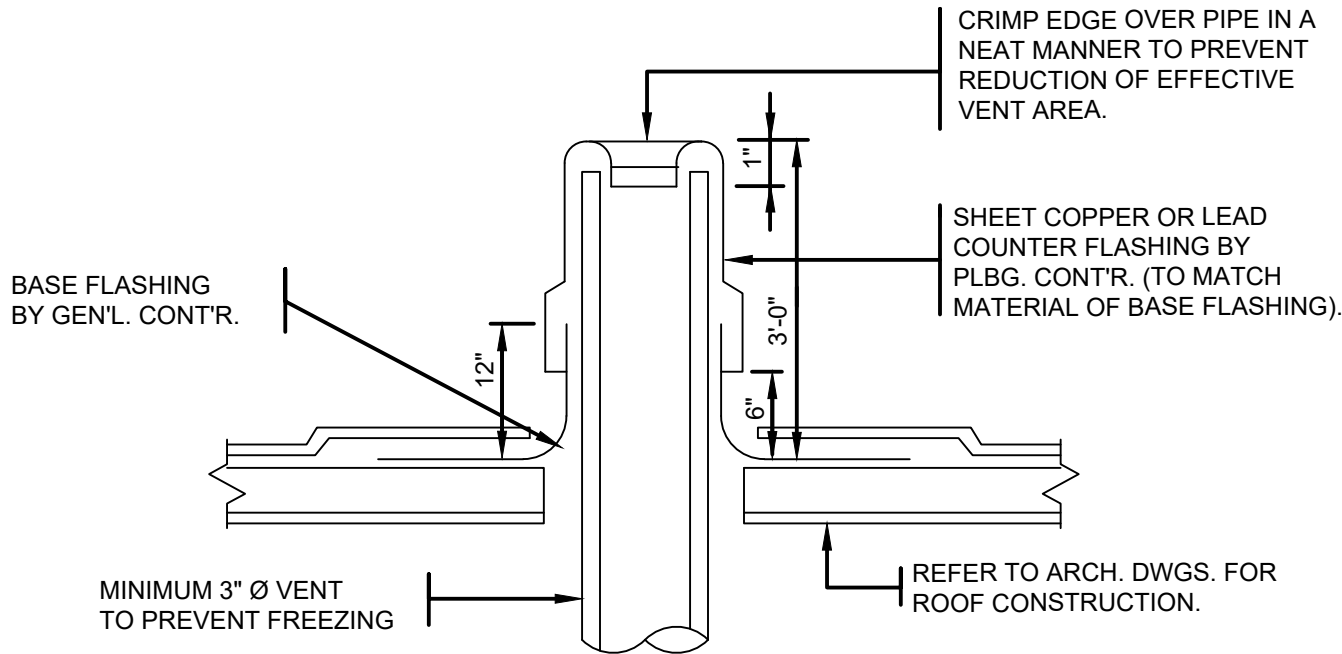
DRAINAGE FIXTURE FIXTURE CALCULATIONS BASED ON 2015 IPC TABLE 709.1			
PROJECT: RIVERFRONT PARK - BUILDING 3 - FIXTURES TO REMAIN AFTER PERMITTING	DATE: SEPTEMBER 2024		
FIXTURE TYPE	DRAINAGE FIXTURE UNIT	PLUMB FIX QNTY	TOTAL DRAINAGE FIXTURE UNITS
AUTOMATIC CLOTHES WASHERS, RESIDENTIAL	2	9	18
BATHROOM GROUP AS DEFINED IN SECTION 202 (1.6 GPF WATER CLOSET)	5	18	90
DISHWASHING MACHINE, DOMESTIC	2	7	14
KITCHEN SINK, DOMESTIC	2	1	2
KITCHEN SINK, DOMESTIC WITH FOOD WASTE DISPOSER AND OR DISHWASHER	2	10	20
LAVATORY	1	6	6
WATER CLOSET, PRIVATE (1.6 GPF)	3	6	18
	APPROXIMATE GPM	TOTAL DRAINAGE FIXTURE UNITS	
	84.00	168	

DRAINAGE FIXTURE FIXTURE CALCULATIONS BASED ON 2015 IPC TABLE 709.1			
PROJECT: RIVERFRONT PARK - BUILDING 4 - EXISTING CONDITIONS	DATE: SEPTEMBER 2024		
FIXTURE TYPE	DRAINAGE FIXTURE UNIT	PLUMB FIX QNTY	TOTAL DRAINAGE FIXTURE UNITS
AUTOMATIC CLOTHES WASHERS, RESIDENTIAL	2	12	24
BATHROOM GROUP AS DEFINED IN SECTION 202 (1.6 GPF WATER CLOSET)	5	22	110
DISHWASHING MACHINE, DOMESTIC	2	7	14
KITCHEN SINK, DOMESTIC	2	1	2
KITCHEN SINK, DOMESTIC WITH FOOD WASTE DISPOSER AND OR DISHWASHER	2	14	28
LAVATORY	1	2	2
SERVICE SINK	2	1	2
WATER CLOSET, PRIVATE (1.6 GPF)	3	2	6
	APPROXIMATE GPM	TOTAL DRAINAGE FIXTURE UNITS	
	94.00	188	

DRAINAGE FIXTURE FIXTURE CALCULATIONS BASED ON 2015 IPC TABLE 709.1			
PROJECT: RIVERFRONT PARK - BUILDING 4 - FIXTURES TO REMAIN AFTER PERMITTING	DATE: SEPTEMBER 2024		
FIXTURE TYPE	DRAINAGE FIXTURE UNIT	PLUMB FIX QNTY	TOTAL DRAINAGE FIXTURE UNITS
AUTOMATIC CLOTHES WASHERS, RESIDENTIAL	2	12	24
BATHROOM GROUP AS DEFINED IN SECTION 202 (1.6 GPF WATER CLOSET)	5	22	110
DISHWASHING MACHINE, DOMESTIC	2	7	14
KITCHEN SINK, DOMESTIC	2	1	2
KITCHEN SINK, DOMESTIC WITH FOOD WASTE DISPOSER AND OR DISHWASHER	2	14	28
LAVATORY	1	2	2
SERVICE SINK	2	1	2
WATER CLOSET, PRIVATE (1.6 GPF)	3	2	6
	APPROXIMATE GPM	TOTAL DRAINAGE FIXTURE UNITS	
	94.00	188	

TABLE 710.1(1) BUILDING DRAINS AND SEWERS					
DIAMETER OF PIPE (inches)	MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS CONNECTED TO ANY PORTION OF THE BUILDING DRAIN OR THE BUILDING SEWER, INCLUDING BRANCHES OF THE BUILDING DRAIN ^a				
	Slope per foot				
	1/16 inch	1/8 inch	1/4 inch	1/2 inch	
1 1/4	—	—	1	1	
1 1/2	—	—	3	3	
2	—	—	21	26	
2 1/2	—	—	24	31	
3	—	36	42	50	
4	—	180	216	250	
5	—	390	480	575	
6	—	700	840	1,000	
8	1,400	1,600	1,920	2,300	
10	2,900	2,900	3,500	4,200	
12	3,900	4,600	5,600	6,700	
15	7,000	8,300	10,000	12,000	

WATER HEATER SIZING PER 2011 ASHRAE HANDBOOK: REFERENCE TABLE FOR GPH												
PROJECT: RIVERFRONT PARK - UNIT WITH LARGEST HOT WATER DEMAND					DATE: SEPTEMBER 2024							
SPECIFIC HEAT WATER (BTU/LB°F)	ENTERING WATER TEMPERATURE (F)	LEAVING WATER TEMPERATURE (F)	TEMPERATURE DIFFERENTIAL (F)	DENSITY OF WATER (LB/GAL)	BUILDING TYPE							
1	40	140	100	8.34	PRIVATE RESIDENCE							
FIXTURE	FIXTURE DEMAND GPH	QUANTITY	GPH	TOTAL GPH	DEMAND FACTOR	STORAGE CAPACITY FACTOR	CORRECTED TOTAL GPH	EFFICIENCY	REQ. BTUH	REQ. KW		
BATHROOM SINK	2	5	10	215	0.4	0.7	86	100%	71724			
SHOWER	30	4	120					90%	79693			
WASHER MACHINE	20	2	40					80%	89655			
KITCHEN SINK	10	3	30					70%	102463			
DISHWASHER	15	1	15					60%	119540			
								STORAGE REQUIREMENT (GAL)				
								60.2				



PLUMBING VENT THROUGH FLAT ROOF DETAIL
NOT TO SCALE

ASHRAE HVAC APPLICATIONS FIGURE 27 BOILER CALC		
PROJECT: RIVERFRONT PARK - ALL UNITS		
LOAD TYPE	BTU/HR	BOILER DEMAND FACTOR
SNOWMELT	0	0.80586451
RADIANT	98900	
DOM. HEATING	79700	
FAN COILS	0	
CORRECTION FACTOR FROM FIGURE 27	SUMMED BTU/HR	CORRECTED TOTAL AFTER DEMAND FACTOR
0.68	178600	153096
ALTITUDE (FT)	EFFICIENCY OF BOILER	TOTAL BTU/HR AFTER ELEVATION AND EFFICIENCY
6800	0.95	188078.62
EXISTING BOILER CAPACITY (BTU/HR)		110000
RECOMMENDED BOILER SIZE (BTU/HR)		199000
EXISTING WATER HEATER TANK SIZE (GAL)		35
RECOMMENDED WATER HEATER TANK SIZE (GAL)		60



Riverfront Park Post-Construction Permitting Process
Relevant Codes: 2021 IMC & 2021 IPC

Included Units: 2, 3, 4, 8, 9, 10, 12, 13, 14
Excluded Units: 1, 5, 6, 7, 11

“Included Units” are the individual units that are expected to show code compliance and obtain permits for modification that have already been completed. For these units to show compliance, they will have to comply with these mechanical and plumbing drawings and supplementary documents. The M&P drawings do not reflect any other changes that must be made according to other disciplines (i.e. structural or electrical).

“Excluded Units” are the individual units that are expected to restore their units to how they were originally permitted per the 2008 construction documents. Only the spaces, walls, appliances and plumbing fixtures originally shown on the drawings are permitted in these units. Generally speaking, this will mean that the typical “original” unit will comprise of a main level warehouse space with a powder room and an upper level two-bedroom and two-bathroom apartment. “Excluded Units” will not require any modification to their existing plumbing or mechanical infrastructure.

The following pertains to only the “Included Units”:

No major modifications are expected to be made for the “Included Units” in terms of drainage piping. The drainage fixture calculations show that a 4” line is still satisfactory for the number of plumbing fixtures installed. It is worth noting that on Building 4, the 4” Ø sanitary line leaving the building should be sloped at 1/4” per linear foot of drain piping (see note on drawings for explanation). All other 3” Ø and 4” Ø sanitary lines should be sloped at 1/8” per foot. This is the minimum per the IPC (International Plumbing Code) and while it is expected that these lines were installed under these guidelines, this should still be field verified.

All plumbing fixtures, original and added, shall be vented per the IPC.

No modifications to the floor drains in the warehouse spaces should have been made, nor are any anticipated. The 1,000-gallon sand/oil interceptor installed outside each building is sufficiently sized for its original intended purpose. It is recommended that the sand/oil interceptor be cleaned and inspected if it is not already part of the HOAs routine maintenance plan. It shall also be verified that no black waste is being routed into the sand/oil interceptor.

Total (maximum) domestic flow rate for Building 3 is 61 GPM and for Building 4 is 65 GPM. Our plumbing fixture calcs call for each building having a 2” Ø domestic water entry with a 1-1/4” Ø cold water line serving each “Included Unit”. These sizes are what we would call for if the building were being built today, however these pipe diameters have not been field verified. If a minimum of a 2” Ø water entry is not present in either building, a pressure and flow test must be completed in each water entry room. The test should be conducted after the pressure reducing valve, backflow preventer and water meter, but before any reduction in pipe sizes or branching off from the main line occurs. The tests should yield a minimum flowrate of 61 or 65 GPM (depending on the building) at 65 PSI. If each unit is not supplied by a 1-1/4” Ø domestic cold water supply line, then it should be expected that tub fill times and general flow rates out of plumbing fixtures may experience a reduction in typical flow and pressure due to the pipe diameter being too small. If individual unit owners are experiencing any cases of reduced flow or feel any of their plumbing fixtures are underserved,

the size of the domestic supply line to each unit is likely the culprit. Increasing the size of the line between the water entry room and the individual unit would be the solution. Coordinating the replacement/up sizing of the supply line shall be coordinated between the indivual units’ owners and a licensed plumber. Code will not require upsizing the lines to the individual units, however if the building’s pressure and flow test yields less than favorable results, it may be desired by the individual unit owners to come up with a solution for increasing building water pressure and flow. If results do not meet or exceed suggested values (above) please consult with mechanical engineer.

Deck snowmelt was originally installed on the upper-level deck; however, it should have been disconnected in all 14 units and shall remain disconnected.

Each unit is heated using in-floor hydronic heat. The heat source for the radiant heat is a 110 MBH gas-fired boiler. This boiler is also responsible for generating domestic hot water via an “sidearm” indirect water heater. The tank size in each unit is only 35 gallons. Both the hot water tank and boiler are undersized for each “Included Unit” given the additional plumbing fixtures and square footage that was added in many of these units. Code will not require these boilers or water heaters be replaced. However, if unit owners find that their boilers cannot keep up with heating demand (radiant or hot water) it would be recommended they replace their current boiler with a 199 MBH boiler and their water heater with a 60-gallon indirect hot water heater. Considering the age of the existing mechanical equipment at almost 20 years old, it may be wise to consider replacement of these items in the near future.

Gas meter and line sizing is anticipated to remain untouched. Each unit should be served by a typical 250 CFH residential style low pressure gas meter. This meter is sufficient for current conditions and each unit’s gas load. Increasing boiler size (as mentioned above) should not cause any issues with the gas line sizing or the meter itself. If gas pressure at any appliance (namely the boiler) is too low, it is likely the gas pressure being delivered by the meter is too low. Each meter should be delivering 8”-10” W.C with a minimum pressure of 6” W.C. at each appliance.

An exhaust fan shall be present in all bathrooms that include either a water closet (toilet), shower or bathtub. Each exhaust fan shall be ducted to the outside and be capable of exhausting a minimum of 50 CFM. If exhaust fans are not present in any bathroom, original or added, one should be added and installed in compliance with the IMC. Panasonic’s “WhisperFit” fan is a quiet and cost-effective option that is intended for retrofit applications. The exhaust fan in each restroom may be controlled by a dedicated switch, a timer, a motion-occupancy sensor or be wired to come on with the lights.

Residential kitchen exhaust must be provided in each kitchen. The IMC calls for 50 CFM of continuous ventilation or 100 CFM of intermittent ventilation. The original kitchens installed upstairs should have exhaust hoods that vent to the outside, thus satisfying this requirement. The other kitchen installed in various other locations within the “Included Units” should have an exhaust fan (similar to the recommended bathroom fan above) or a vent hood that exhausts to the exterior installed. That being said, no exhaust fans or hoods have been field verified.

As mentioned above, the individual units are slightly underserved in terms of heating. It also may be the case that added spaces do not have supplementary heat sources. Additional heat in non-original spaces may be added at the individual unit owner’s request (pending available electrical capacity) to any added room(s). For open areas or rooms with exterior windows, a few feet of electric baseboard under the window should be sufficient. For bathrooms without supplementary or original heat, an electric heated towel warmer is often the best choice for getting more heat into the space as wall space is often limited in smaller restrooms.

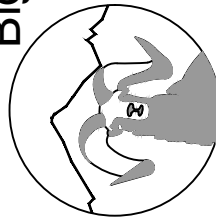
Some units have installed mini-split air conditioning systems. These are acceptable to remain so long as the electrical capacity is available to accommodate these units.

Please do not hesitate to reach out with questions or if additional information is needed.

Kyle Krauland
kyle@bighorneng.com
(970) 312-8643

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RIVERFRONT INDUSTRIAL PARK
MECHANICAL & PLUMBING - DETAILS
1522 SHIELD DRIVE
STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
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10/17/2024	ALL UNITS - PERMIT



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MP3-1

MECHANICAL PROVISIONS

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

B. ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH ALL LOCAL CODES AND ALL OTHER REGULATION GOVERNING WORK OF THIS NATURE.

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

D. ALL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED OR "APPROVED EQUAL" BY THE ENGINEER OR ARCHITECT.
2. PERMITS
- A. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES.
3. SHOP DRAWINGS
- A. SUBMIT MATERIAL LIST AND SHOP DRAWINGS FOR MAJOR EQUIPMENT TO THE ARCHITECT/ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL SUBMIT FIVE SETS OF SHOP DRAWINGS AND THEY SHALL BE CLEARLY LABELED.
4. FLEXIBLE DUCT WORK
- A. FLEXIBLE TYPE DUCT SHALL BE OF TWO ELEMENT SPIRAL CONSTRUCTION COMPOSED OF A CORROSION RESISTANT METAL SUPPORTING SPIRAL AND COATED FABRIC WITH A MINERAL BASE. FLEXIBLE DUCT CONNECTORS SHALL BE LISTED BY U.L., CLASS 1 DUCTS, AND SHALL HAVE A FLAME SPREAD RATING NOT EXCEEDING 25 AND A SMOKE DEVELOPED RATING NOT EXCEEDING 50.

B. USE OF FLEXIBLE DUCTWORK SHALL BE LIMITED TO NO MORE THAN A LINEAR FEET PER RUN.

C. CONTRACTOR SHALL BE CAREFUL, SO AS NOT TO KINK OR COLLAPSE FLEXIBLE DUCT.
5. REFRIGERANT
- A. PIPING CONTRACTOR SHALL PROVIDE AND INSTALL REFRIGERANT PIPING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND IN SUCH A WAY AS TO BE INCONSPICUOUS AND FREE FROM ANY POSSIBLE CONDENSATION.

B. INSULATE REFRIGERANT LINES WITH ARMOUR-FLEX TYPE INSULATION, SHALL BE TYPE "K" COPPER TUBING, WITH WROUGHT COPPER SOLDER TYPE FITTINGS SUITABLE FOR CONNECTION WITH SILVER SOLDER.
6. DUCTWORK
- A. THE DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "SMACNA" APPLICABLE MANUALS.

B. ALL DUCTWORK SHALL BE THE LOW VELOCITY TYPE, UNLESS SPECIFIED OTHERWISE.

C. CONTRACTOR SHALL PROVIDE AND INSTALL APPROVED FIRE DAMPERS AND ACCESS PANELS IN ANY AND ALL DUCTWORK WHICH PENETRATES A HORIZONTAL OR VERTICAL FIRE PARTITION, OR AS OTHERWISE SHOWN ON DRAWINGS.

D. ALL BRANCH DUCTS TO HAVE VOLUME DAMPERS, SMOOTH TURN RADIUS DUCTWORK OR TURNING VANES SHALL BE USED THROUGHOUT WHERE FLOW EXCEEDS 150 CFM.

E. ALL DUCT JOINTS TO BE SEALED IN ACCORDANCE WITH "SMACNA" STANDARDS AND ACCEPTED GOOD PRACTICE.

F. ALL DUCT DIMENSIONS SHOWN ARE NET INSIDE VALUES DIMENSIONS MAY BE CHANGED SO LONG AS THE NET FREE FACE AREA IS MAINTAINED.

G. ALL CONCEALED DUCTWORK SHALL BE INSULATED WITH 1-1/2" FIBERGLASS INSULATING BLANKET WITH ALUMINUM FOIL FACING.

H. ALL SUPPLY AND RETURN DUCTWORK 15 FEET DOWNSTREAM OF THE HVAC UNIT SHALL BE INTERNALLY LINED WITH A 1/2" ACOUSTICAL DUCT LINER UNLESS OTHERWISE NOTED ON THE DRAWINGS.
7. DRAINAGE PIPING
- A. (CONDENSATE) SHALL BE SCHEDULE 40 PVC PIPE WITH SOLVENT JOINTS. PITCH HORIZONTAL LINES 1" IN 10'-0". CONDENSATE DRAINS SHALL BE ROUTED TO FLOOR DRAIN, ROOF DRAIN OR INDIRECT WASTE DRAIN.
8. HVAC CONTROLS
- A. CONTRACTOR TO SUPPLY AND INSTALL ALL CONTROL WIRING AND THERMOSTATS AS REQUIRED.
9. ELECTRICAL
- A. CONTRACTOR TO COORDINATE WITH ELECTRICAL CONTRACTOR FOR LOCATION OF WIRING FOR EACH HVAC UNIT.
10. PIPE SUPPORTS
- A. ALL PIPE SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN A NEAT AND WORKMANLIKE MANNER. THE USE OF WIRE OR METAL STRAP TO SUPPORT PIPES WILL NOT BE PERMITTED. SPACING OF PIPE SUPPORTS SHALL NOT EXCEED 8 FEET FOR ALL PIPING. PLASTIC PIPING TO BE SUPPORTED EVERY 4 FEET.
11. GAS PIPING
- A. PIPING SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH MALLEABLE IRON FITTINGS. WHERE GAS PIPE CONNECTS TO EQUIPMENT, IT SHALL BE PROVIDED WITH A DRIP LEG THE FULL SIZE OF THE RUNOUT. A 100% SHUT-OFF VALVE AND A UNION. GAS PIPING CONTAINING PRESSURE GREATER THAN 9" W.G. SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH WELDED JOINTS.
12. MISCELLANEOUS
- A. ALL EXTERIOR OPENINGS TO BE PROPERLY CAULKED AND SEALED WITH A SEALANT OF HIGH QUALITY AND LONG LIFE, TO PREVENT INFILTRATION OF OUTSIDE AIR INTO CONDITIONED SPACE. COORDINATE INSTALLATION OF ALL ROOF FLASHING AT ROOF PENETRATION.

B. DO NOT SCALE THIS DRAWING FOR EXACT DIMENSIONS.

C. VERIFY ALL FIGURES, CONDITIONS, AND DIMENSIONS AT THE JOB SITE.

D. THE MECHANICAL PLANS ARE INTENDED TO BE DIAGRAMMATIC AND ARE BASED ON ONE MANUFACTURE'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION, THE EXACT DIMENSIONS, OR ALL THE DETAILS OF THE EQUIPMENT.

E. THE CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT IN THE AVAILABLE SPACE.

F. PEX TUBING, IF PEX TUBING IS USED AS AN APPROVED ALTERNATE FOR APPLICATIONS WHERE METALLIC PIPING IS THE BASIS OF DESIGN, THE PEX MANUFACTURER SHALL SUBMIT SHOP DRAWINGS CLEARLY INDICATING THAT THE DESIGN HAS BEEN ANALYZED AND MODIFIED, AS REQUIRED TO MAINTAIN SCHEDULED HYDRONIC SYSTEM PARAMETERS. ANY DESIGN RESULTING IN INCREASED SYSTEM PRESSURE DROP AS A RESULT OF IMPROPER PEX SIZING OR DESIGN SHALL NOT BE PERMITTED.
13. TESTING AND BALANCING
- A. THE HVAC SYSTEM SHALL BE TESTED AND AND BALANCED BY AN INDEPENDENT AGENCY, UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. A SEALED TYPE WRITTEN REPORT SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER FOR REVIEW AND APPROVAL.
14. GUARANTEE
- A. MATERIALS, EQUIPMENT AND INSTALLATION SHALL BE GUARANTEED FOR A PERIOD OF ONE(1) YEAR FROM DATE OF ACCEPTANCE. DEFECTS WHICH APPEAR DURING THAT PERIOD SHALL BE CORRECTED AT THIS CONTRACTOR'S EXPENSE.

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

PLUMBING SPECIFICATION

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

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

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

D. ALL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED OR "APPROVED AS EQUAL" BY THE ENGINEER OR ARCHITECT.
2. PERMITS
- A. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES.
3. SHOP DRAWINGS
- A. SUBMIT MATERIAL LIST AND SHOP DRAWINGS FOR MAJOR EQUIPMENT TO THE ARCHITECT/ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL SUBMIT FIVE SETS OF SHOP DRAWINGS AND THEY SHALL BE CLEARLY LABELED.
4. DOMESTIC WATER SUPPLY PIPING
- A. UNDERGROUND: PROVIDE TYPE "K" SOFT DRAWN COPPER TUBING WITH BRAZED CONNECTIONS.

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

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

D. ALL COLD WATER PIPING TO BE INSULATED WITH ¾" FOAM INSULATION.
5. SANITARY/STORM DRAINAGE AND VENT PIPING
- A. ABOVE GRADE:

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

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

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

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

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

E. DRAINAGE PIPING 3" SIZE AND SMALLER SHALL RUN AT A UNIFORM GRADE OF AT LEAST 1/8" PER FOOT, AND PIPING LARGER THAN 3" SHALL BE RUN AT A GRADE OF NO LESS THAN 1/8" PER FOOT.

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

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

H. PVC USED TO BE SOLID CORE TYPE SCHEDULE 40 PVC.
7. PIPE SUPPORTS
- A. ABOVE GRADE: ALL PIPE SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN A NEAT AND WORKMANLIKE MANNER. THE USE OF WIRE AND PERFORATED METAL TO SUPPORT PIPES WILL NOT BE PERMITTED. SPACING OF PIPE SUPPORTS SHALL BE A S SPECIFIED IN INTERNATIONAL PLUMBING CODE (LATEST EDITION).

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

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

B.B. EXTERIOR: THE WATER PIPE SHALL HAVE A MINIMUM OF 60" OF COVER AND THE SANITARY WASTE PIPE SHALL HAVE A MINIMUM OF 24" OF COVER.
8. MISCELLANEOUS
- A. COORDINATE INSTALLATION OF ALL ROOFS FLASHING AT ROOF PENETRATIONS.

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

C. THE PLUMBING PLANS ARE INTENDED TO BE DIAGRAMMATIC AND ARE BASED ON ONE MANUFACTURER'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION, THE EXACT DIMENSIONS OR ALL THE DETAILS OF THE EQUIPMENT. THE CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT THE AVAILABLE SPACE.
9. TESTING
- A. PLUMBING SYSTEM SHALL BE FLOW AND PRESSURE TESTED IN ACCORDANCE WITH THE INTERNATIONAL PLUMBING CODE (LATEST EDITION).
10. GUARANTEE
- A. MATERIALS, EQUIPMENT AND INSTALLATION SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM DATE OF ACCEPTANCE. DEFECTS WHICH APPEAR DURING THAT PERIOD SHALL BE CORRECTED AT THIS CONTRACTORS EXPENSE.

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

PLUMBING GENERAL NOTES:

1. DRAWING IS DIAGRAMMATIC IN NATURE. LOCATIONS AND SIZES MAY VARY DURING FIELD COORDINATION & INSTALLATION OF MECHANICAL, PLUMBING, & ELECTRICAL. DRAWINGS DO NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. DRAWINGS ARE NOT TO BE SCALED FOR DIMENSIONS. TAKE ALL DIMENSIONS FROM ARCHITECTURAL DRAWINGS, CERTIFIED EQUIPMENT DRAWINGS AND FROM THE STRUCTURE ITSELF BEFORE FABRICATING ANY WORK. VERIFY ALL SPACE REQUIREMENTS COORDINATING WITH OTHER TRADES, AND INSTALL THE SYSTEMS IN THE SPACE PROVIDED WITHOUT EXTRA CHARGES TO THE OWNER.
2. PIPE DIMENSIONS DO NOT REFLECT ADDITIONAL DIMENSIONS FOR INSULATION. ALL PIPING SHALL BE INSULATED PER 2018 IECC CODE REQUIREMENTS.
3. CONDENSING WATER HEATER, GAS FURNACE, AND BOILER VENT MATERIAL SHALL COMPLY WITH MANUFACTURER'S LISTED AND APPROVED MATERIALS. PVC SHALL NOT BE USED FOR FLUE/COMBUSTION AIR VENTING MATERIAL. ENGINEERS PREFERRED MATERIAL IS PRESSURE RATED, DOUBLE WALL, GASKETED, 316 STAINLESS STEEL CONDENSING FLUE VENTING MATERIAL. RECOMMENDED MANUFACTURER'S SELKIRK OR JERMAS.
4. ROUTE CONDENSATE FROM CONDENSING MECHANICAL EQUIPMENT TO CONDENSATE NEUTRALIZATION KITS. CONDENSATE FROM NEUTRALIZATION KITS SHALL BE DISCHARGED INDIRECTLY THROUGH AIR GAP TO NEAREST FLOOR DRAIN.
5. ALL PLUMBING FIXTURES WITH QUICK CLOSING VALVES ON DOMESTIC COLD/HOT WATER SHALL BE PROVIDED WITH WATER HAMMER ARRESTOR.
6. PROVIDE ISOLATION VALVES AT GROUP RESTROOMS. TO ALLOW FOR TOTAL ISOLATION OF THE ENTIRE RESTROOM GROUP FROM THE REST OF THE DOMESTIC COLD, HOT AND HOT RE-CIRCULATION SYSTEMS.
7. ALL PLUMBING FIXTURES SHALL BE VENTED BY PLUMBING CONTRACTOR PER IPC REQUIREMENTS.
8. CONTRACTOR SHALL CLEAN AND SERVICE ALL EXISTING EQUIPMENT/PLUMBING FIXTURES TO REMAIN. CONTRACTOR SHALL VERIFY ALL EQUIPMENT/PLUMBING FIXTURES ARE PROPERLY FUNCTIONING PRIOR TO RE-USING EQUIPMENT/FIXTURES. CONTRACTOR TO INSURE THAT FINAL PLUMBING SYSTEM WILL OPERATE AS INTENDED ON PROVIDED DRAWINGS.
9. ALL EXTERIOR METALLIC NATURAL GAS PIPING SHALL BE TREATED WITH CORROSIVE INHIBITOR COATING. COATING SHALL BE APPLIED PER MANUFACTURER'S RECOMMENDATION SO THAT COATING MAINTAINS INTEGRITY OF GAS PIPING. COATING SHALL BE UV RESISTANT.

MECHANICAL GENERAL NOTES:

1. DRAWING IS DIAGRAMMATIC IN NATURE. LOCATIONS AND SIZES MAY VARY DURING FIELD COORDINATION & INSTALLATION OF MECHANICAL, PLUMBING, & ELECTRICAL. DRAWINGS DO NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. DRAWINGS ARE NOT TO BE SCALED FOR DIMENSIONS. TAKE ALL DIMENSIONS FROM ARCHITECTURAL DRAWINGS, CERTIFIED EQUIPMENT DRAWINGS AND FROM THE STRUCTURE ITSELF BEFORE FABRICATING ANY WORK. VERIFY ALL SPACE REQUIREMENTS COORDINATING WITH OTHER TRADES, AND INSTALL THE SYSTEMS IN THE SPACE PROVIDED WITHOUT EXTRA CHARGES TO THE OWNER.
2. DUCT DIMENSIONS DO NOT REFLECT ADDITIONAL DIMENSIONS FOR INSULATION. ALL DUCTING SHALL BE INSULATED PER 2021 IECC CODE REQUIREMENTS. (SUPPLY AND RETURN AIR DUCTS AND PLENUMS SHALL BE INSULATED WITH NOT LESS THAN R-6 INSULATION WHERE LOCATED IN UNCONDITIONED SPACES AND WHERE LOCATED OUTSIDE THE BUILDING WITH NOT LESS THAN R-8 INSULATION IN CLIMATE ZONES 9 THROUGH 4 AND NOT LESS THAN R-12 INSULATION IN CLIMATE ZONES 5 THROUGH 8. DUCTS LOCATED UNDERGROUND BENEATH BUILDINGS SHALL BE INSULATED AS REQUIRED IN THIS SECTION OR HAVE AN EQUIVALENT THERMAL DISTRIBUTION EFFICIENCY. UNDERGROUND DUCTS UTILIZING THE THERMAL DISTRIBUTION EFFICIENCY METHOD SHALL BE LISTED AND LABELED TO INDICATE THE R-VALUE EQUIVALENCY. WHERE LOCATED WITHIN A BUILDING ENVELOPE ASSEMBLY, THE DUCT OR PLENUM SHALL BE SEPARATED FROM THE BUILDING EXTERIOR OR UNCONDITIONED OR EXEMPT SPACES BY NOT LESS THAN R-8 INSULATION IN CLIMATE ZONES 0 THROUGH 4 AND NOT LESS THAN R-12 INSULATION IN CLIMATE ZONES 5 THROUGH 8. ROUTT COUNTY IS CLIMATE ZONE 7).
3. COORDINATE FINAL LOCATION OF THERMOSTAT WITH OWNER PRIOR TO INSTALLATION. IF THERMOSTAT IS LOCATED ON EXTERIOR WALL PROVIDE THERMOSTAT WITH INSULATED BACKING.
4. CONDENSING WATER HEATER, GAS FURNACE, AND BOILER VENT MATERIAL SHALL COMPLY WITH MANUFACTURER'S LISTED AND APPROVED MATERIALS. PVC SHALL NOT BE USED FOR FLUE/COMBUSTION AIR VENTING MATERIAL. ENGINEERS PREFERRED MATERIAL IS PRESSURE RATED, DOUBLE WALL, GASKETED, 316 STAINLESS STEEL CONDENSING FLUE VENTING MATERIAL. RECOMMENDED MANUFACTURER'S SELKIRK OR JERMAS.
5. ROUTE CONDENSATE FROM CONDENSING MECHANICAL EQUIPMENT TO CONDENSATE NEUTRALIZATION KITS. CONDENSATE FROM NEUTRALIZATION KITS SHALL BE DISCHARGED INDIRECTLY THROUGH AIR GAP TO NEAREST FLOOR DRAIN.
6. MECHANICAL CONTRACTOR SHALL FIELD LOCATE EXISTING DUCTWORK PRIOR TO CONSTRUCTION. MECHANICAL CONTRACTOR SHALL COORDINATE TIE IN CONNECTION POINTS OF NEW SUPPLY DIFFUSERS WITH EXISTING DUCTWORK AS NECESSARY.
7. CONTRACTOR SHALL CLEAN AND SERVICE ALL EXISTING EQUIPMENT TO REMAIN. CONTRACTOR SHALL VERIFY ALL EQUIPMENT TO REMAIN IS PROPERLY FUNCTIONING PRIOR TO RE-USING EQUIPMENT. CONTRACTOR TO INSURE THAT FINAL MECHANICAL SYSTEM WILL OPERATE AS INTENDED ON PROVIDED DRAWINGS.
8. MECHANICAL EQUIPMENT MANUFACTURERS AS SCHEDULED ON MECHANICAL DRAWINGS ARE SUGGESTED MANUFACTURER'S. UNLESS NOTED OTHERWISE DUE TO OWNER/CLIENT REQUIREMENTS AND PREFERENCES, MECHANICAL CONTRACTOR CAN SUBMIT EQUIVALENT EQUIPMENT FROM MANUFACTURERS THAT DIFFER FROM SCHEDULED MECHANICAL EQUIPMENT. ALTERNATE MANUFACTURERS OF MECHANICAL EQUIPMENT WILL BE REVIEWED FOR EQUIVALENCE OF PERFORMANCE AND FUNCTIONALITY BY ENGINEER.

DO NOT REPRODUCE THESE DRAWINGS AND SPECIFICATIONS WITHOUT THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER. THE DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF THE SERVICE AND SHALL REMAIN THE PROPERTY OF THE DESIGNER. WHETHER THE PROJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. THESE DRAWINGS AND SPECIFICATIONS SHALL NOT BE USED BY ANYONE, ON ANY OTHER PROJECTS FOR ADDITION TO THIS PROJECT BY OTHERS EXCEPT BY THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER.

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RIVERFRONT INDUSTRIAL PARK

MECHANICAL & PLUMBING - GENERAL NOTES

1522 SHIELD DRIVE

STEAMBOAT SPRINGS, COLORADO

DATE:	ISSUED FOR:
09/17/2024	UNIT 2 - PERMIT
10/17/2024	ALL UNITS - PERMIT



DATE:	09/06/2024
JOB NO:	24-056
DRAWN BY:	---
CHECKED BY:	---
SCALE:	
SHEET NUMBER:	

MP3-2