CHILLED BEAM SCHEDULE

PLAN CODE	MFR	MODEL	STYLE	SERVES	AIR SIDE: CFM	DUCT CONNECTION SIZE (IN)	NOZZLE TYPE	EAT (°F)	SPACE COOLING (°F)	SPACE RH	SPACE HEATING (°F)	SPACE RH	AIR SP (IN WG)	BEAM CAPACITY: SENSIBLE COOLING (BTUH)	LATENT COOLING (BTUH)	HEATING (BTUH)	FLOW RATE: COOLING (GPM)	HEATING (GPM)	WATER TEMP (EWT / LWT): COOLING (°F)	HEATING (°F)	WATER PRESSURE: COOLING (FT WG)	HEATING (FT WG)	UNIT LENGTH	REMARKS
CB-102-A1	TROX	DID632-HC-4-G	4-PIPE	HR 102	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	5,668	1.5	0.50	58 /63.9	120 / 88.9	1.6	0.5	8'-0"	1 , 2
CB-102-A2	TROX	DID632-HC-2-G	2-PIPE	HR 102	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	-	1.5	-	58 /63.9	-	1.6	-	8'-0"	1 , 2
CB-102-B1	TROX	DID632-HC-4-G	4-PIPE	HR 102	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	5,668	1.5	0.50	58 /63.9	120 / 88.9	1.6	0.5	8'-0"	1 , 2
CB-102-B2	TROX	DID632-HC-2-G	2-PIPE	HR 102	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	-	1.5	-	58 /63.9	-	1.6	-	8'-0"	1 , 2
CB-137-A1	TROX	DID632-HC-4-G	4-PIPE	HR 137	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	5,668	1.5	0.50	58 /63.9	120 / 88.9	1.6	0.5	8'-0"	1 , 2
CB-137-A2	TROX	DID632-HC-2-G	2-PIPE	HR 137	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	-	1.5	-	58 /63.9	-	1.6	-	8'-0"	1 , 2
CB-137-B1	TROX	DID632-HC-4-G	4-PIPE	HR 137	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	5,668	1.5	0.50	58 /63.9	120 / 88.9	1.6	0.5	8'-0"	1 , 2
CB-137-B2	TROX	DID632-HC-2-G	2-PIPE	HR 137	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	-	1.5	-	58 /63.9	-	1.6	-	8'-0"	1 , 2
CB-152-A1	TROX	DID632-HC-4-G	4-PIPE	HR 152	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	5,668	1.5	0.50	58 /63.9	120 / 88.9	1.6	0.5	8'-0"	1 , 2
CB-152-A2	TROX	DID632-HC-2-G	2-PIPE	HR 152	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	-	1.5	-	58 /63.9	-	1.6	-	8'-0"	1 , 2
CB-152-B1	TROX	DID632-HC-4-G	4-PIPE	HR 152	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	5,668	1.5	0.50	58 /63.9	120 / 88.9	1.6	0.5	8'-0"	1 , 2
CB-152-B2	TROX	DID632-HC-2-G	2-PIPE	HR 152	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	-	1.5	-	58 /63.9	-	1.6	-	8'-0"	1 , 2
CB-172-A1	TROX	DID632-HC-4-G	4-PIPE	HR 172	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	5,668	1.5	0.50	58 /63.9	120 / 88.9	1.6	0.5	8'-0"	1 , 2
CB-172-A2	TROX	DID632-HC-2-G	2-PIPE	HR 172	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	-	1.5	-	58 /63.9	-	1.6	-	8'-0"	1 , 2
CB-172-B1	TROX	DID632-HC-4-G	4-PIPE	HR 172	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	5,668	1.5	0.50	58 /63.9	120 / 88.9	1.6	0.5	8'-0"	1 , 2
CB-172-B2	TROX	DID632-HC-2-G	2-PIPE	HR 172	125	6	G	54	75	55%	70	50%	0.41	6,693	2,329	-	1.5	-	58 /63.9	-	1.6	-	8'-0"	1 , 2

REMARKS:
1. SEE PLANS FOR ACTUAL CHILLED BEAM COUNT IN EACH HEARING ROOM
2. MC RESPONSIBLE FOR PRE-CHECK OF EQUIPMENT, TAGGING AND DOCUMENTING SERIAL AND MODEL NUMBERS FOR EACH BEAM UPON DELIVERY TO SITE

PUMP SCHEDULE

PLAN CODE	TYPE	MFR	MODEL	SERVICE	FLUID	GPM	HEAD (FT)	HP	POWER (V/Ph/Hz)	REMARKS
TCWP-1	INLINE CIRCULATOR	GRUNDFOS	MAGNA 32-100	TEMPERED LOOP-WEST CHILLED BEAMS	WATER	24	20	FRACT	208/1/60	1 , 2, 3
TCWP-2	INLINE CIRCULATOR	GRUNDFOS	MAGNA 32-100	TEMPERED LOOP-WEST CHILLED BEAMS	WATER	24	20	FRACT	208/1/60	1 , 2, 3
TCWP-3	INLINE CIRCULATOR	GRUNDFOS	MAGNA 32-100	TEMPERED LOOP-EAST CHILLED BEAMS	WATER	24	20	FRACT	208/1/60	1 , 2, 3
TCWP-4	INLINE CIRCULATOR	GRUNDFOS	MAGNA 32-100	TEMPERED LOOP-EAST CHILLED BEAMS	WATER	24	20	FRACT	208/1/60	1 , 2, 3
THWP-1	INLINE CIRCULATOR	GRUNDFOS	ALPHA-15- 55	TEMPERED-CHILLED BEAMS	WATER	4	15	FRACT	115/1/60	1 , 2, 4
THWP-2	INLINE CIRCULATOR	GRUNDFOS	ALPHA-15- 55	TEMPERED-CHILLED BEAMS	WATER	4	15	FRACT	115/1/60	1 , 2, 4
THWP-3	INLINE CIRCULATOR	GRUNDFOS	ALPHA-15- 55	TEMPERED-CHILLED BEAMS	WATER	4	15	FRACT	115/1/60	1 , 2, 4
THWP-4	INLINE CIRCULATOR	GRUNDFOS	ALPHA-15- 55	TEMPERED-CHILLED BEAMS	WATER	4	15	FRACT	115/1/60	1 , 2, 4

REMARKS:
1. SUBSTITUTION SHALL HAVE EQUAL OR BETTER MECHANICAL EFFICIENCIES AND SIMILAR PUMP CURVE PERFORMANCE
2. 100% REDUNDANT PUMPS
3. INTEGRAL SPEED CONTROL-VARIABLE FREQUENCY DRIVE PROVIDED WITH PUMP, CONTROLLED BY ANALOG SIGNAL
4. INTEGRAL SPEED CONTROL-VARIABLE FREQUENCY DRIVE PROVIDED WITH PUMP

REVISED AIRFLOWS FOR EXISTING VARIABLE AIR VOLUME BOXES

PLAN CODE	SERVES	ZONE/UNIT	INITIAL MIN AIRFLOW (CFM)	INITIAL MAX AIRFLOW (CFM)	REVISED MIN AIRFLOW (CFM)	REVISED MAX AIRFLOW (CFM)
V-4-1	RM 04, 04A & 04B	AH-04	90	360	100	100
V-104-1	RM 111	AH-04	130	520	125	250
V-108E-1	RM 136	AH-04	135	540	100	250
V-202A-1	RM 202 & 202A	AH-04	130	520	125	270
V-203B-1	RM 203	AH-04	70	260	100	260
V-203E-1	RM 204A 7 204B	AH-04	110	410	100	310
V-212C-1	RM 231	AH-04	120	480	100	215
V-213-1	RM 232	AH-04	50	150	50	110
V-214-1	RM 233	AH-04	50	150	50	110
V-215-1	RM 234	AH-04	150	580	150	350
				-		-
V-25B-1	KITCHEN	AH-03	800	800	250	800
V-32-1	RM 53 & 53	AH-03	30	100	30	100
V-59A	RM 74, 74A, & 75	AH-03	200	800	150	560
V-61	COPY ROOM 76	AH-03	250	1000	250	750
V-100-1	ENTRANCE 100	AH-03	60	250	80	150
V-112-1	ENTRANCE 112	AH-03	80	300	80	150
V-118-1	RM 155	AH-03	50	200	50	115
V-118-2	RM 154	AH-03	50	150	50	80
V-138-1	RM 171	AH-03	140	550	100	350
V-138-2	RM 172A	AH-03	50	150	50	110
V-140E-1	RM 172	AH-03	50	100	50	100
V-219A-1	RM 250	AH-03	80	300	80	200
V-220A	RM 251	AH-03	50	200	50	100
V-221	RM 252	AH-03	50	150	50	80
V-200	RM 200	AH-03	60	250	60	150
V-235-1	RM 276	AH-03	50	200	110	110
V-236-1	RM 277	AH-03	50	150	85	85

REMARKS:
1. ALL REVISED MINIMUM AIRFLOW SET POINTS IN THE SCHEDULE ARE "VENTILATION" AIRFLOWS. SOME LISTED MAY BE TOO LOW TO MEASURE WITH THE EXISTING VAV TERMINAL SIZE AND MIN MEASURABLE FLOWS, IN WHICH CASE THE INITIAL MINIMUM SET POINT SHALL BE USED.
2. THESE VAV TAG REFERENCES DIFFER FROM CURRENT ROOM NUMBERS. SEE SHEET IN THIS SET FOR CROSS-REFERENCE TABLE.

GRILLES, REGISTERS & DIFFUSERS SCHEDULE

PLAN CODE	MFR	MODEL	NOMINAL FACE SIZE	NECK SIZE	CFM	MATERIAL	FINISH	FRAME STYLE	REMARKS
R-1	KRUEGER	6490	24x24	12x12	450	STEEL	MATCH EXISTING	LAY-IN	1

REMARKS:
1. MC TO CONFIRM FINISH (FIELD PAINT OR FACTORY) WITH INTERIOR FINISH PLANS.

VARIABLE AIR VOLUME BOX SCHEDULE

PLAN CODE	SERVES	ZONE/UNIT	MFR	MODEL	NOMINAL INLET DIA. SIZE	MAX COOLING (CFM)	MIN (CFM)	MAX APD (IN. WC)	MAX SOUND LEVEL (NC)	REMARKS
V-1	RM 10D	03 / AH-005	KRUEGER	LMHS	07	500	150	0.06	20	
V-2	RM 09 & 10	04 / AH-005	KRUEGER	LMHS	12	1,430	430	0.06	21	
V-3	RM 07A	02 / AH-005	KRUEGER	LMHS	04	200	60	0.14	20	
V-4	RM 07	04 / AH-005	KRUEGER	LMHS	12	1,800	540	0.10	23	
V-5	RM 105A	01 /AH-005	KRUEGER	LMHS	16	2,790	840	0.08	22	
V-6	RM 317	AH-505	KRUEGER	LMHS	12	1,400	420	0.06	21	
V-7	RM 310	AH-505	KRUEGER	LMHS	05	280	85	0.1	16	
V-8	RM 317	AH-505	KRUEGER	LMHS	12	1,940	580	.11	25	
V-9	RM 317	AH-505	KRUEGER	LMHS	12	1,420	425	0.06	21	
V-10	3RD FLR EAST EXT OFFICES	AH-505	KRUEGER	LMHS	16	2,720	815	0.06	25	
V-11	3RD FLR SOUTH EXT OFFICES	AH-505	KRUEGER	LMHS	12	1,800	540	0.07	23	
V-12	RM 213	AH-505	KRUEGER	LMHS	14	2,100	630	0.1	19	
V-13	RM 330, 331, 332	AH-505	KRUEGER	LMHS	09	935	280	0.08	20	
V-14	1ST FLOOR AUDIT OFFICES	AH-001	KRUEGER	LMHS	22	4,800	1,440	0.08	36	
V-15	RM 262	AH-001	KRUEGER	LMHS	22	4,810	1,440	0.06	36	
V-102	CHILLED BEAM, HEARING ROOM 102	AH-04	KRUEGER	LMHS	10	1,000	250	0.07	19	
V-137	CHILLED BEAM, HEARING ROOM 137	AH-04	KRUEGER	LMHS	10	1,000	250	0.07	19	
V-152	CHILLED BEAM, HEARING ROOM 152	AH-03	KRUEGER	LMHS	10	1,000	250	0.07	19	
V-172	CHILLED BEAM, HEARING ROOM 172	AH-03	KRUEGER	LMHS	10	1,000	250	0.07	19	

REMARKS:
1.

PLUMBING FIXTURE SCHEDULE

PLAN CODE	DESCRIPTION	
RPBP-1	REDUCED PRESSURE BACKFLOW PREVENTE: 4" BUILDING DOMESTIC WATER SUPPLY	
	TYPE:	LEAD FREE, FDA EPOXY-COATED CAST IRON CHECK HOUSINGS, STAINLESS STEEL SEATS AND TRIM, RELIEF LEAD FREE COPPER ALLOY TEST COCKS, STRAINER AND AIR GAP, SHUT-OFF VALVES
	MFR:	WATTS MODEL SERIES LF909, 4"
RPBP-2	REDUCED PRESSURE BACKFLOW PREVENTER: BY-PASS	
	TYPE:	LEAD FREE, FDA EPOXY-COATED CAST IRON CHECK HOUSINGS, STAINLESS STEEL SEATS AND TRIM, RELIEF LEAD FREE COPPER ALLOY TEST COCKS, STRAINER AND AIR GAP, SHUT-OFF VALVES
	MFR:	WATTS MODEL SERIES LF909, 2"
PRV-1	DOMESTIC WATER BY-PASS PRESSURE REDUCING VALVE	
	MFR:	LEAD FREE, WATTS SERIES LF25AUB-Z3, WITH INTEGRAL STRAINER, 2" PIPE

DEDICATED OUTSIDE AIR- HEAT RECOVERY UNIT SCHEDULE

PLAN CODE	MFR	MODEL	LOCATION	SERVICE	SUPPLY FAN: AIRFLOW (CFM)	ESP (IN WC)	FAN TYPE	HP	DRIVE	RPM	POWER (V/PH/Hz)	EXHAUST FAN: AIRFLOW (CFM)	ESP (IN WC)	FAN TYPE	HP	DRIVE	RPM	POWER (V/PH/HZ)
AH-003	DAIKIN	CAH012GDGC	MECH RM 29	1ST FLR WEST & HEARING ROOMS	6,375	3.0	CENT PLUG	15.0	VFD	3500	460/3/60	5,205	1.00	CENT DWDI	5.0	VFD	1750	460/3/60
AH-004	DAIKIN	CAH010GDGC	MECH RM 54	1ST FLR EAST & HEARING ROOMS	4,275	2.0	CENT PLUG	7.5	VFD	3500	460/3/60	4,075	1.00	CENT DWDI	5.0	VFD	1750	460/3/60

PLAN CODE	HEATING COIL: MbH	GPM	WPD (FT)	EAT/LAT (F°)	EWT/LWT (F°)	COOLING COIL: SENSIBLE (MbH)	TOTAL (MbH)	GPM	WPD (FT)	EAT Tdb/Twb (F°)	LAT Tdb/Twb (F°)	EWT/LWT (F°)
AH-003	355.0	35.5	1.9	26.0 / 85.1	180/160	196.85	289.84	57.3	9.8	84.0 / 67.0	51.3 / 51.1	45.0 / 55.1
AH-004	219.9	21.4	5.8	32.0 / 86.6	180/159.4	127.1	192.16	31.7	14.8	83.0 / 67.0	51.5 / 51.3	45.0 / 57.1

PLAN CODE	HEAT RECOVERY WHEEL: OUTSIDE AIR- SUMMER , WINTER (EAT wb/db)	RETURN AIR- SUMMER, WINTER (EAT wb/db)	SUPPLY AIR- SUMMER , WINTER (LAT wb/db)	EXHAUST AIR- SUMMER, WINTER (LAT wb/db)	TOTAL ENERGY RECOVERED SUMMER / WINTER (MbH)	POWER (V/PH/HZ)	FILTERS: RETURN AIR FILTER	SUPPLY AIR FILTER	REMARKS
AH-003	95.0 / 63.0, -30.0 / -30.5	75.0 / 62.0, 75.0 / 62.0	84.2 / 69.2, 41.0 / 41.0	88.5 / 70.6, 18.0 / 18.0	20.3 / 671.8	115/1/60	PLEATED 2", MERV 8	PLEATED 2", MERV 8	1,2
AH-004	95.0 / 63.0, -30.0 / -30.5	75.0 / 62.0, 75.0 / 62.0	82.6 / 69.8, 47.3 / 47.3	88.2 / 70.6, 20.2 / 20.2	15.5 / 515.9	115/1/60	PLEATED 2", MERV 8	PLEATED 2", MERV 8	1,2

REMARKS:
1. HEATING AND CHILLED WATER COIL FLUID IS WATER
2. UNIT DE-MOUNT DIMENSIONS ARE CRITICAL FOR CLEARANCE THROUGH EXISTING DOORWAYS. MC SHALL CONFIRM EXISTING CONDITIONS BEFORE SHOP SUBMITTAL SUBMISSION.

MECHANICAL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SURFACE MOUNTED SUPPLY DIFFUSER SEE SCHEDULE FOR SIZE		ELECTRIC THERMOSTAT
	RETURN OR EXHAUST GRILLE SEE SCHEDULE FOR SIZE		ELECTRIC THERMOSTAT W/GUARD
	SIDEWALL RETURN OR EXHAUST GRILLE SEE SCHEDULE FOR SIZE		PNEUMATIC THERMOSTAT OR DDC TEMPERATURE SENSOR (JOB SPECIFIC)
HWS	HEATING WATER SUPPLY		CONTROL WIRE
HWR	HEATING WATER RETURN	24x12	DUCT SIZES ARE OUTSIDE SHEET MTL DIMENSIONS. FIRST NUMBER IS SIZE OF THE SURFACE SHOWN.
THWS	TEMPERED HEATING WATER SUPPLY		SECTION THROUGH SUPPLY DUCT
THWR	TEMPERED HEATING WATER RETURN		SECTION THROUGH RETURN OR EXHAUST DUCT
CWS	CHILLED WATER SUPPLY		ACOUSTICALLY LINED SHEET METAL DUCT
CWR	CHILLED WATER RETURN	VD	MANUAL BALANCING DAMPER
TCWS	TEMPERED CHILLED WATER SUPPLY		FLEX CONNECTOR
TCWR	TEMPERED CHILLED WATER RETURN	AD	ACCESS DOORS
D	DRAIN	FD	FIRE DAMPER
CD	CONDENSATE DRAIN	FSD	FIRE/SMOKE DAMPER
GCS	GLYCOL CHILLED WATER SUPPLY		MOTORIZED DAMPER
GCR	GLYCOL CHILLED WATER RETURN		RECTANGULAR SWEEP (LONG)
GHS	GLYCOL HEATING WATER SUPPLY		45° LOW-LOSS TAKE-OFF FITTING W/ DAMPER & FLEX DUCT
GHR	GLYCOL HEATING WATER RETURN		45° LOW-LOSS TAKE-OFF FITTING W/ DAMPER & RIGID ROUND DUCT
	GATE VALVE		SQUARE-TO-ROUND TRANSITION
	BALL VALVE		BELOW GRADE DUCTWORK SHOWN AS HEAVY DASHED OUTLINE
	BUTTERFLY VALVE	SD-1 (PLAN CODE) 200 (CFM)	DIFFUSER, REGISTER, OR GRILLE
	SWING CHECK VALVE	CX	CONNECT NEW WORK TO EXISTING
	STRAINER (WITH BLOWDOWN)	NO	NORMALLY OPEN
	FLEX CONNECTOR	NC	NORMALLY CLOSED
	HOSE END DRAIN VALVE	C	COMMON
	PRESSURE REDUCING VA.	(E)	EXISTING
	SAFETY RELIEF VALVE		TEE UP
	PRESSURE RELIEF VALVE		TEE DOWN
	UNION		ELBOW UP
	MOTORIZED T.C. VALVE/2-WAY		ELBOW DOWN
	MOTORIZED T.C. VALVE/3-WAY		
	AUTOMATIC CONTROL VALVE (ELEC)		
	AUTOMATIC CONTROL VALVE		
	ECCENTRIC PLUG BALANCING VALVE OR PLUG VALVE		
	MANUAL FLOW BALANCING VALVE (CIRCUIT SETTER)		
	AUTOMATIC FLOW BALANCING VALVE		
	PIPE SIZE CHANGE OR REDUCER/INCREASER		
	PIPE SLEEVE		
	PIPE GUIDE		
	PIPE ANCHOR		
	PRESSURE/TEMP. TEST PLUG		
	DIAL THERMOMETER OR TEMPERATURE GAUGE		
	PRESSURE GAUGE (W/ SNUBBER)		

HVAC ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	NTS	NOT TO SCALE
AHU	AIR HANDLING UNIT	NO	NUMBER
AMP	AMPERE (AMP,AMPS)	OBD	OPPOSED BLADE DAMPER
B.O.D.	BOTTOM OF DUCT	OA	OUTSIDE AIR
BTU	BRITISH THERMAL UNIT	%	PERCENT
MBH	BTU PER HOUR (THOUSAND)	PH	PHASE(ELECTRICAL)
CLG	COOLING	LBS	POUNDS
DIA	DIAMETER	PSI	POUNDS PER SQUARE INCH
DBT	DRY-BULB TEMPERATURE	R/O	RUN OUT
EAT	ENTERING AIR TEMPERATURE	RA	RETURN AIR
E.C.	ELECTRICAL CONTRACTOR	RPM	REVOLUTIONS PER MINUTE
F	FAHRENHEIT	SH	SENSIBLE HEAT
FA	FROM ABOVE	SPEC	SPECIFICATION
FT	FOOT OR FEET	STD	STANDARD
G.C.	GENERAL CONTRACTOR	SP	STATIC PRESSURE
HP	HORSEPOWER	SA	SUPPLY AIR
HTG	HEATING	TEMP	TEMPERATURE
KW	KILOWATT	T.O.D.	TOP OF DUCT
LAT	LEAVING AIR TEMPERATURE	TD	TEMPERATURE DIFFERENCE
LF	LINEAR FEET	T.STAT	THERMOSTAT
MAX	MAXIMUM	U/C	UNDER CUT
M.C.	MECHANICAL CONTRACTOR	VEL	VELOCITY
MIN	MINIMUM	V	VOLT
N/A	NOT APPLICABLE	VOL	VOLUME
		W/	WITH

REVISIONS:

STATE OF MONTANA - A/E#2013-30-02
UPGRADE CAPITOL HVAC SYSTEMS
HELENA, MONTANA

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MECHANICAL SCHEDULES AND LEGEND

SHEET
M001