Mechanical Ventilation

ROOM #	ROOM NAME	SF	Occupant Density (People per 1000 sq.ft.)	ASHRAE 62.1 OCCUPANCY	Occupancy	Area Outdoor Air Rate (Ra)	People Outdoor Air Rate (Rp)	EZ	ASHRAE	120.1-A.15*S F	DESIGN OSA
101	CHEMISTRY CLASSROOM	1315	25	62-Educational Facilities - Science Laboratories	33	0.18	10	0.8	567	197	575
102	CHEMISTRY CLASSROOM	1315	25	62-Educational Facilities - Science Laboratories	33	0.18	10	0.8	567	197	575
103	PREP	387	25	62-Educational Facilities - Science Laboratories	10	0.18	10	0.8	170	58	175
104	OFFICE	120	5	62-Office Buildings - Office Space	1	0.06	5	0.8	12	18	25
105	WORK	465	25	62-General - Break Rooms	12	0.06	5	0.8	88	70	100
106	BIO-TECH CLASSROOM	1245	25	62-Educational Facilities - Science Laboratories	32	0.18	10	0.8	544	187	550
107	PREP	162	25	62-Educational Facilities - Science Laboratories	5	0.18	10	0.8	79	24	100
108	BIO-TECH CLASSROOM	1243	25	62-Educational Facilities - Science Laboratories	32	0.18	10	0.8	544	186	550
109	HALLWAY 1	1633	0	62-General - Corridor	0	0.06	0	0.8	98	245	100
110	HALLWAY 2	1197	0	62-General - Corridor	0	0.06	0	0.8	72	180	75
111	BIOLOGY CLASSROOM	1308	25	62-Educational Facilities - Science Laboratories	33	0.18	10	0.8	565	196	575
112	BIOLOGY CLASSROOM	1303	25	62-Educational Facilities - Science Laboratories	33	0.18	10	0.8	565	195	575
113	PHYSICS CLASSROOM	1408	25	62-Educational Facilities - Science Laboratories	36	0.18	10	0.8	613	211	625
114	GROUP STUDY	128	50	62-General - Conference/Meeting	7	0.06	5	0.8	43	19	50
115	GROUP STUDY	129	50	62-General - Conference/Meeting	7	0.06	5	0.8	43	19	50
116	PHYSICS CLASSROOM	1403	25	62-Educational Facilities - Science Laboratories	36	0.18	10	0.8	613	210	625
117	BIOLOGY CLASSROOM	1305	25	62-Educational Facilities - Science Laboratories	33	0.18	10	0.8	565	196	575
118	BIOLOGY CLASSROOM	1306	25	62-Educational Facilities - Science Laboratories	33	0.18	10	0.8	565	196	575
119	ELEC	114		(none)				0.8		17	

REMARKS:
O.W STANDS FOR OPERABLE WINDOW

EXHAUST FAN SCHEDULE

MARK	MFR	MODEL NO	AIRFLOW	FAN RPM	INLET SONES	ELECTRICAL DATA MOTOR HP	OPER. HP	V-Ø-Hz	WEIGHT	SERVICE	REMARKS
EF 1	GREENHECK	G-143-VG	1600 CFM	932	7.9	1/2	0.16	115-1-60	51 lb	CHEMISTRY CLASSROOM 101	1,2,5,6,7,9
EF 2	GREENHECK	G-143-VG	1600 CFM	932	7.9	1/2	0.16	115-1-60	51 lb	CHEMISTRY CLASSROOM 102	1,2,5,6,7,9
EF 3	GREENHECK	G-143-VG	1600 CFM	932	7.9	1/2	0.16	115-1-60	51 lb	BIO-TECH CLASSROOM 106	1,2,5,6,7,9
EF 4	GREENHECK	G-143-VG	1600 CFM	932	7.9	1/2	0.16	115-1-60	51 lb	BIO-TECH CLASSROOM 108	1,2,5,6,7,9
EF 5	GREENHECK	G-143-VG	1600 CFM	932	7.9	1/2	0.16	115-1-60	51 lb	BIOLOGY CLASSROOM 111	1,2,5,6,7,9
EF 6	GREENHECK	G-143-VG	1600 CFM	932	7.9	1/2	0.16	115-1-60	51 lb	BIOLOGY CLASSROOM 112	1,2,5,6,7,9
EF 7	GREENHECK	G-143-VG	1600 CFM	932	7.9	1/2	0.16	115-1-60	51 lb	PHYSYCS CLASSROOM 113	1,2,5,6,7,9
EF 8	GREENHECK	G-143-VG	1600 CFM	932	7.9	1/2	0.16	115-1-60	51 lb	BIOLOGY CLASSROOM A118	1,2,5,6,7,9
EF 9	GREENHECK	G-143-VG	1600 CFM	932	7.9	1/2	0.16	115-1-60	51 lb	BIOLOGY CLASSROOM A117	1,2,5,6,7,9
EF 10	GREENHECK	G-143-VG	1600 CFM	932	7.9	1/2	0.16	115-1-60	51 lb	PHYSYCS CLASSROOM 116	1,2,5,6,7,9
EF FH1	GREENHECK	CUE-101-VG	850 CFM	1508	7.6	1/4	0.25	120-1-60	70 lb	FUME HOOD SAD --CEMISTRY 101	2,3,4,6,9
EF FH2	GREENHECK	CUE-101-VG	850 CFM	1508	7.6	1/4	0.25	120-1-60	70 lb	FUME HOOD SAD --CEMISTRY 102	2,3,4,6,9
EF FH3	GREENHECK	CUE-101-VG	850 CFM	1508	7.6	1/4	0.25	120-1-60	70 lb	FUME HOOD SAD --PREP ROOM 103	2,3,4,6,9
EF FH4	GREENHECK	CUE-101-VG	850 CFM	1508	7.6	1/4	0.25	120-1-60	70 lb	FUME HOOD SAD --BIOTECH 106	2,3,4,6,9
EF FH5	GREENHECK	CUE-101-VG	850 CFM	1508	7.6	1/4	0.25	120-1-60	70 lb	FUME HOOD SAD --BIOTECH 108	2,3,4,6,9

REMARKS:
1. PROVIDE W/ WALL MOUNTED 30MIN TIMER LABELED "PURGE FAN".
2. PROVIDE W/ SPEED CONTROLLER FOR BALANCING.
3. CONNECT TO FAN SWITCH ON HOOD FOR ON/OFF CONTROL.
4. EPOXY COATED.
5. CONNECT TO WALL SWITCH (S.E.D).
6. PROVIDE W/ ROOF CURB.
7. PROVIDE LINE VOLTAGE TOGGLE DISCONNECT SWITCH FACTORY WIRE FROM MOTOR TO SWITCH JUNCTION BOX WITHIN THE MOTOR COMPARTMENT.
8. OCCUPANT SENSOR CONTROL W/ 10 MIN DELAY. (SED)
9. MOUNT PER B/M4.1

SPLIT SYSTEM INDOOR UNIT

MARK	MFR	MODEL	TYPE.	CFM.	DESIGN OSA CFM	TOTAL COOLING BTU/H	SENSIBLE COOLING BTU/HR	TOTAL HEATING BTU/HR.	ELECTRICAL DATA V-Ø-HZ	MCA	MOCP	FILTER	WEIGHT	SERVICE	REMARKS
FC 1	DAIKIN	FXMQ54PAVJU	CONCEAL	1600	575	54000	40300	60000	208-230/1/60	3.4	15	DACA-FXMQ48131K	102 lb	CHEMISTRY CLASSROOM 101	1,4,7
FC 2	DAIKIN	FXMQ54PAVJU	CONCEAL	1600	575	54000	40300	60000	208-230/1/60	3.4	15	DACA-FXMQ48131K	102 lb	CHEMISTRY CLASSROOM 102	1,4,7
FC 3	DAIKIN	FTKN12NMVJU	WALL	424	0	12000	9780	-	208-230/1/60	8.6	15	WASHABLE	18 lb	ELEC 119	1,2,3
FC 4	DAIKIN	FXMQ12PBVJU	CONCEAL	450	175	12000	9700	13500	208-230/1/60	1.4	15	MERV 13	62 lb	PREP 103	1,4
FC 5	DAIKIN	FFQ09Q2VJU	CASSETTE	378	25	9000	7990	10000	208-230/1/60	0.23	15	WASHABLE	36 lb	OFFICE 104	1,5,6
FC 6	DAIKIN	FXMQ12PBVJU	CONCEAL	450	100	12000	9700	13500	208-230/1/60	1.4	15	MERV 13	62 lb	WORK ROOM 105	1,4
FC 7	DAIKIN	FXMQ54PAVJU	CONCEAL	1600	600	54000	40300	60000	208-230/1/60	3.4	15	DACA-FXMQ48131K	102 lb	BIO-TECH CLASSROOM 106/PREP 107	1,4,7
FC 8	DAIKIN	FXMQ54PAVJU	CONCEAL	1600	600	54000	40300	60000	208-230/1/60	3.4	15	DACA-FXMQ48131K	102 lb	BIO-TECH CLASSROOM 108/PREP 107	1,4,7
FC 9	DAIKIN	FXMQ54PAVJU	CONCEAL	1600	575	54000	40300	60000	208-230/1/60	3.4	15	DACA-FXMQ48131K	102 lb	BIOLOGY CLASSROOM 111	1,4,7
FC 10	DAIKIN	FXMQ54PAVJU	CONCEAL	1600	575	54000	40300	60000	208-230/1/60	3.4	15	DACA-FXMQ48131K	102 lb	BIOLOGY CLASSROOM 112	1,4,7
FC 11	DAIKIN	FXMQ54PAVJU	CONCEAL	1600	625	54000	40300	60000	208-230/1/60	3.4	15	DACA-FXMQ48131K	102 lb	PHYSICS CLASSROOM 113	1,4,7
FC 12	DAIKIN	FXMQ24PBVJU	CONCEAL	688	100	24000	15600	27000	208-230/1/60	1.8	15	MERV 13	80 lb	HALLWAY 1	1,4
FC 13	DAIKIN	FFQ09Q2VJU	CASSETTE	378	50	9000	7990	10000	208-230/1/60	0.23	15	WASHABLE	36 lb	GROUP STUDY 114	1,5,6
FC 14	DAIKIN	FXMQ12PBVJU	CONCEAL	450	75	12000	9700	13500	208-230/1/60	1.4	15	MERV 13	62 lb	HALLWAY 2	1,4
FC 15	DAIKIN	FFQ09Q2VJU	CASSETTE	378	50	9000	7990	10000	208-230/1/60	0.23	15	WASHABLE	36 lb	GROUP STUDY 115	1,5,6
FC 16	DAIKIN	FXMQ54PAVJU	CONCEAL	1600	575	54000	40300	60000	208-230/1/60	3.4	15	DACA-FXMQ48131K	102 lb	BIOLOGY CLASSROOM 117	1,4,7
FC 17	DAIKIN	FXMQ54PAVJU	CONCEAL	1600	575	54000	40300	60000	208-230/1/60	3.4	15	DACA-FXMQ48131K	102 lb	BIOLOGY CLASSROOM 118	1,4,7
FC 18	DAIKIN	FXMQ54PAVJU	CONCEAL	1600	625	54000	40300	60000	208-230/1/60	3.4	15	DACA-FXMQ48131K	102 lb	PHYSICS CLASSROOM 116	1,4,7

REMARKS:
1. PROVIDE W/ WIRED THERMOSTAT CONTROLLER & CONDENSATE PUMP
2. COOLING ONLY CONTROLLER.
3. PER FAN COIL MOUNTED ON WALL STUD SEE DETAIL J/M4.1
4. PER FAN COIL CONCEAL AT CEILING SEE DETAIL D/M4.1
5. PER CEILING CASSETTE FAN COIL MOUNTING DETAIL SEE DETAIL C/M4.1
6. INTERLOCK WITH SUPPLY FAN FANTECH FC4;120-1-60, 0.19 AMPS.
7. PROVIDE WITH ECONOMIZER AND CO2 SENSOR FOR DEMAND CONTROL VENTILATION

CONDESING UNIT.

MARK	MFR.	MODEL NO.	UNIT CAPACITIES (BTU) COOLING	ELECTRICAL DATA V-Ø-HZ	Max Overcurrent Protection (MOP) (A)	Min. Circuit Amps MCA (A)	WEIGHT	SERVICE	REMARKS
CU 1	DAIKIN	RRKN12NMVJU	13000.0	208-230-1-60	15	8.6	60	FC 3	1,2,3

REMARKS:
1. MOUNT PER DETAIL A/M4.1.
2. PROVIDE WITH R-410A REFRIGERANT.
3. SEE DIAGRAM AT E/M5.2

HEAT PUMP UNIT.

MARK	MFR	MODEL NO.	COOLING (BTU) RATED HEATING	TOTAL COOLING	ELECTRICAL DATA V-Ø-HZ	Min. Circuit Amps MCA (A)	Max Overcurrent Protection (MOP) (A)	WEIGHT	SERVICE	REMARKS
HP 1	DAIKIN	REYQ192TTJU	200000.0	192000.0	208-230-3-60	30.2+43.0	35+50	1210 lb	BS 1	1,2,3
HP 2	DAIKIN	REYQ192TTJU	200000.0	192000.0	208-230-3-60	30.2+43.0	35+50	1210 lb	BS 2	1,2,4
HP 3	DAIKIN	REYQ192TTJU	200000.0	192000.0	208-230-3-60	30.2+43.0	35+50	1210 lb	BS 3	1,2,5

REMARKS:
1. MOUNT PER DETAIL B/M4.2.
2. PROVIDE WITH R-410A REFRIGERANT.
3. SEE DIAGRAMS A,D/M5.1
4. SEE DIAGRAMS B,E/M5.1
5. SEE DIAGRAMS C,F/M5.1

BRANCH CONTROLLER SCHEDULE

MARK	MFR	MODEL NUMBER	ELECTRICAL DATA V-Ø-HZ	MCA	MOCP	WEIGHT	FC'S SERVISE	REMARKS.
BS-1	DAIKIN	BS6Q54TVJ	208-1-60	0.6	15	68.00 lb	1,2,3,5,6,7,8	1,2,3
BS-2	DAIKIN	BS6Q54TVJ	208-1-60	0.6	15	68.00 lb	9,10,11,12,13	1,2,4
BS-3	DAIKIN	BS6Q54TVJ	208-1-60	0.6	15	68.00 lb	14, 15,16,17,18	1,2,5

REMARKS:
1. MOUNT PER DETAIL D/M4.1.
2. PROVIDE WITH R-410A REFRIGERANT.
3. SEE DIAGRAMS A,D/M5.1
4. SEE DIAGRAMS B,E/M5.1
5. SEE DIAGRAMS C,F/M5.1

LIST OF APPLICABLE CODES AND STANDARDS:

TITLE 24, PART 2: 2016 CALIFORNIA BUILDING CODE (VOLUMES 1 & 2)
TITLE 24, PART 3: 2016 CALIFORNIA ELECTRICAL CODE
TITLE 24, PART 4: 2016 CALIFORNIA MECHANICAL CODE
TITLE 24, PART 5: 2016 CALIFORNIA PLUMBING CODE
TITLE 24, PART 6: 2016 CALIFORNIA ENERGY CODE
TITLE 24, PART 9: 2016 CALIFORNIA FIRE CODE
TITLE 24, PART 12: 2016 CALIFORNIA REFERENCED STANDARDS CODE

MEP COMPONENT ANCHORAGE NOTE:

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA APPROVED CONSTRUCTION DOCUMENTS. WHERE NO DETAIL IS INDICATED, THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2016 CBC, SECTIONS 1616A.1.18 THROUGH 1616A.1.26 AND ASCE 7-10 CHAPTER 13, 26, AND 30.

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY OR MOVABLE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER.
3. MOVABLE EQUIPMENT WHICH IS STATIONED IN ONE PLACE FOR MORE THAN 8 HOURS AND HEAVIER THAN 400 POUNDS ARE REQUIRED TO BE ANCHORED WITH TEMPORARY ATTACHMENTS.

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT THE ATTACHMENT NEED NOT BE DETAILED ON THE PLANS. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.

A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVE A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.
B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

FOR THOSE ELEMENTS THAT DO NOT REQUIRE DETAILS ON THE APPROVED DRAWINGS, THE INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND THE DSA DISTRICT STRUCTURAL ENGINEER. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH ABOVE REQUIREMENTS.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE:

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-10 SECTION 13.3 AS DEFINED IN ASCE 7-10 SECTION 13.6.8, 13.6.7, 13.6.5.6, AND 2016 CBC, SECTIONS 1616A.1.24, 1616A.1.25, AND 1616A.1.26.

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEMS ARE AS NOTED BELOW. WHEN BRACING AND ATTACHMENTS ARE BASED ON PRE APPROVED INSTALLATION GUIDE (e.g. SMACNA OR OSHPD OPM), COPIES OF THE BRACING SYSTEM INSTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF AND DURING THE HANGING AND BRACING OF THE DISTRIBUTION SYSTEM. THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS.

☒ MECHANICAL/PLUMBING/DUCTS

M☐	PP☐	D☐	-OPTION 1:☐	DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS.
M☒	PP☐	D☒	-OPTION 2:☒	SHALL COMPLY WITH THE OSHPD PRE-APPROVAL (OPM #) # 0043-13
M☐	PP☐	D☐	-OPTION 3:☐	SHALL COMPLY WITH THE SMACNA SEISMIC RESTRAINT

MANUAL, OSHPD EDITION (2009), INCLUDING ANY ADDENDA. FASTENERS AND OTHER ATTACHMENTS NOT SPECIFICALLY IN THE SMACNA SEISMIC RESTRAINT MANUAL, OSHPD EDITION, ARE DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS. THE DETAILS SHALL ACCOUNT APPLICABLE SEISMIC HAZARD LEVEL ____ AND CONNECTIONS LEVEL ____ FOR THE PROJECT AND CONDITIONS.

AIR TERMINAL SCHEDULE

MANUFACTURER: TITUS (EXCEPT AS NOTED)

CD-1		CEILING DIFFUSER	TDC - COMPLETE WITH EQUALIZING GRID, THROW-REDUCING VANES, STEEL CONSTRUCTION
WSR		EXPOSED SUPPLY DIFFUSER	300RL - STEEL CONSTRUCTION, DOUBLE DEFLECTION HORIZONTAL BLADES, EQUALIZING GRID
WRG		WALL RETURN GRILLE	355R - LOUVERS ON 1/2" CENTERS, STEEL CONSTRUCTION, LOUVERS PARALLEL WITH LONG DIMENSION
CR		CEILING RETURN	SAME AS CD EXCEPT NO EQUALIZING GRID
EG		EXHAUST GRILLE CEILING RETURN	50F5 - 1/2" x 1/2" x 1/2" EGGCRATE, ALUMINUM GRID
DL		DOOR LOUVER	T700 - STEEL CONSTRUCTION WITH FLANGED AND AUXILIARY FRAME
TG		TRANSFER GRILLE	355R - LOUVERS ON 1/2" CENTERS, STEEL CONSTRUCTION, LOUVERS PARALLEL WITH LONG DIMENSION

NOTES:
1. ADAPTER NEEDED FOR TRANSITION FROM SQUARE NECK TO ROUND DUCT.
2. SIZE (NECK/FACE) TYPE CFM (NO. OF THROW) FACE SIZE FOR T-BAR CEILING ONLY

MECHANICAL LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
X / X		EQUIPMENT TYPE / EQUIPMENT NUMBER
X / X-X		DETAIL / DRAWING NUMBER / SHEET NUMBER
	SA OR OA	SECTION THRU SUPPLY AIR OR OUTSIDE AIR DUCT
	RA OR EA	SECTION THRU RETURN AIR OR EXHAUST AIR DUCT
DN		ROUND DUCT DOWN
DN	DN OR UP	SLOPE DUCT DOWN OR UP IN DIRECTION OF FLOW
	AL	ACOUSTICAL LINING
	FC	FLEXIBLE DUCT CONNECTION
	VD	VOLUME DAMPER
	FD	FIRE DAMPER
	TV	TURNING VANES
		FLEXIBLE DUCT
		45° ROUND DUCT TAKE-OFF
		45° RECTANGULAR DUCT TAKE-OFF
		90° TURN - ROUND DUCT
		90° RADIUS TURN - ROUND OR RECTANGULAR DUCT
		SQUARE TO ROUND DUCT TRANSITION
		DUCT TRANSITION
		RECTANGULAR DUCT 90° SPLIT
T		THERMOSTAT @ 46" AFF MAX TO CENTER LINE
	AP	ACCESS PANEL
	POC	POINT OF CONNECTION
	POD	POINT OF DEMOLITION
	BHP	BRAKE HORSEPOWER
	HP	HORSEPOWER
	SAD	SEE ARCHITECTURAL DRAWINGS
	SSD	SEE STRUCTURAL DRAWINGS
	SCD	SEE CIVIL DRAWINGS
	AFC	ABOVE FINISH CEILING

BLDG 'MECHANICAL' SHEET LIST

M1.1	MECHANICAL SCHEDULE & LEGENDS
M2.0	MECHANICAL FLOOR PLAN
M2.1	REFRIGERATION PIPING PLAN
M2.2	MECHANICAL ROOF PLAN
M3.1	HVAC SECTIONS AND ISOMETRICS
M4.1	MECHANICAL DETAILS
M4.2	MECHANICAL DETAILS
M4.3	OPM MECHANICAL REFERENCE DETAILS
M5.1	PIPING AND WIRING VRV DIAGRAMS
M5.2	CONTROL DIAGRAMS

GRAVITY INTAKE SCHEDULE

MARK	MFR	MODEL NO	AIRFLOW	SP	WEIGHT	REMARKS
GRSI 1	GREENHECK	GRSR 18	1600 CFM	0.07 in-wg	19 lb	
GRSI 2	GREENHECK	GRSI 8	175 CFM	0.04 in-wg	7 lb	

GRAVITY RELIEF SCHEDULE Copy 1

MARK	MFR	MODEL NO	AIRFLOW	SP	WEIGHT	REMARKS
GRSR 1	GREENHECK	GRSR-20	1600 CFM	0.07 in-wg	24 lb	
GRSR 2	GREENHECK	GRSR-12	450 CFM	0.04 in-wg	10 lb	

QUATTROCCHI KWOK ARCHITECTS
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Pleasanton Office:
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COSTA ENGINEERS INC.
REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER J. COSTA
NO. 21600
Exp. 12-31-18
MECHANICAL
STATE OF CALIFORNIA
SIGNED:11-1-2018

SAN MARIN HIGH SCHOOL

NEW STEM BUILDING

15 SAN MARIN DR
NOVATO, CA 94945

NOVATO UNIFIED SCHOOL DISTRICT

ARCH PROJECT NO:	1682.00
DRAWN BY:	MQ
DRAWING SCALE:	12" = 1'-0"
PTN:	65417-131

100% CD's

MAY 7, 2019

SHEET TITLE

MECHANICAL SCHEDULE & LEGENDS

SHEET NUMBER

M1.1

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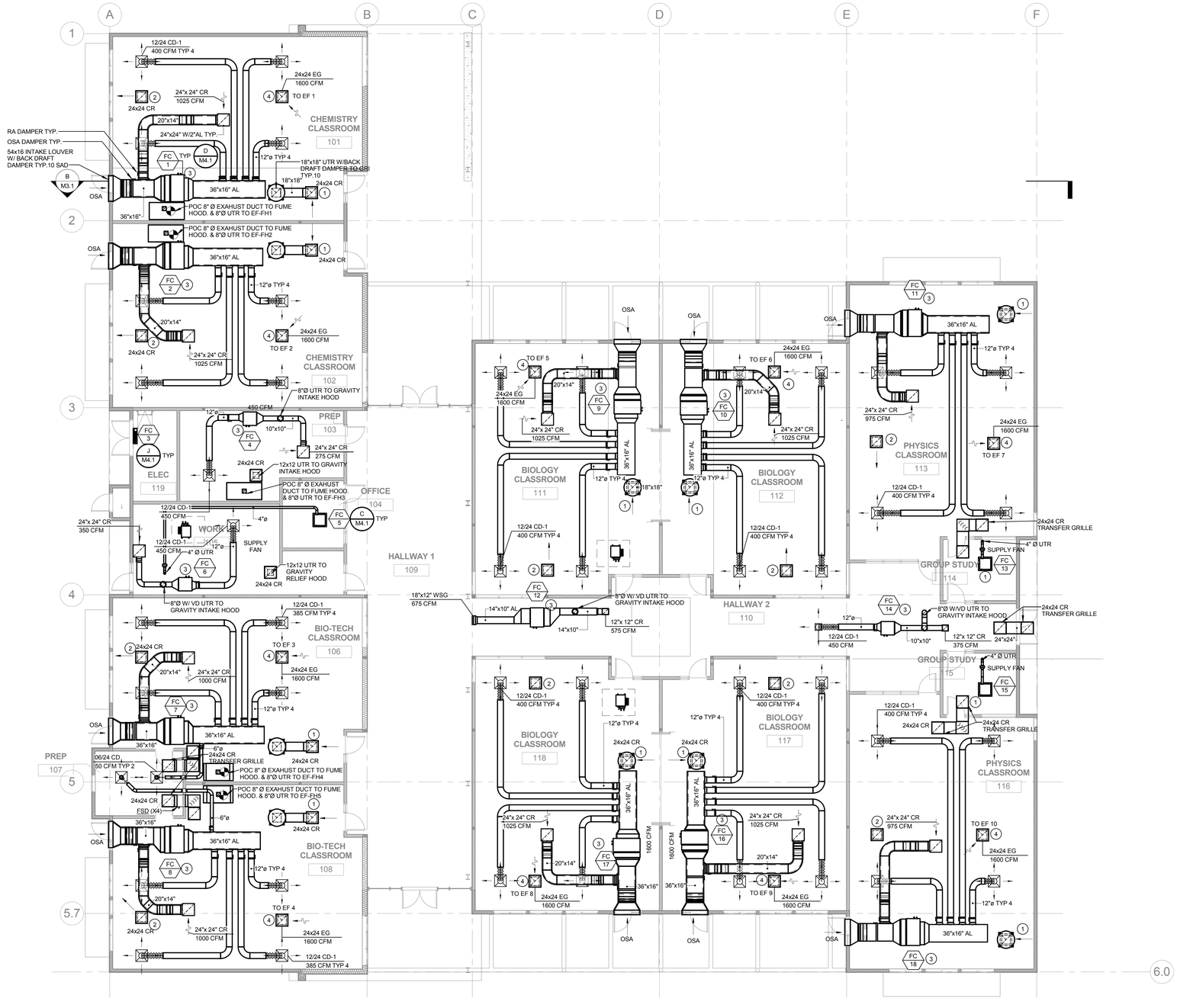

1 **MECHANICAL FLOOR PLAN**
1/8" = 1'-0"

GENERAL NOTES

1. FOR MECHANICAL GENERAL NOTES, LEGENDS, AND SYMBOLS, REFER TO SHEET M-1.1
2. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE MECHANICAL WORK WITH OTHER TRADES. MAKE ANY OFFSETS AS REQUIRED TO AVOID CONFLICT WITH PIPING, LIGHT FIXTURES, SKYLIGHTS, ETC.
3. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO PROCEEDING WITH INSTALLATION. NOTIFY ARCHITECT/ENGINEER OF ANY EXISTING CONDITIONS WHICH CONFLICT WITH INFORMATION PROVIDED IN CONSTRUCTION DOCUMENTS.
4. CONTRACTOR SHALL COORDINATE ALL GRILLE LOCATIONS AND CEILING TYPES PRIOR TO ORDERING GRILLES, SEE ARCHITECTURAL CEILING PLANS AND ELECTRICAL LIGHTING PLANS,
5. ALL BRACING OF DUCTS AND PIPING SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA GUIDELINES, HAZARD LEVEL 'A'.
6. WHERE BRACING DETAILS ARE NOT SHOWN ON THE DRAWING OR IN THE GUIDELINES, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT, MECHANICAL ENGINEER AND FIELD INSPECTOR OF THE GOVERNING AUTHORITY.
7. SUPPORT AND BRACING OF ALL PIPING AND DUCTWORK SHALL BE IN ACCORDANCE WITH THE SMACNA "GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS" OR NO R-003 THE "SUPERSTRUT SEISMIC RESTRAINT SYSTEM" FOR PIPING ONLY.

SHEET NOTES

1. 24"x24" RELIEF GRILLE AND 18"x18" DUCT UTR TO GRATIVITY RELIEF HOOD.
2. 24x24 CR & 18x18 DUCT UP THRU ROOF TO GRAVITY INTAKE HOOD.
3. INSTALL FAN COIL WITH FLEX DUCT & PIPING TO BRANCH SELECTOR. SEE PROPER DIAGRAM FOR PIPE SIZES AND WIRING AT SHEET M5.1
4. 24x24 EG & 18x18 DUCT UP THRU ROOF TO EXHAUST FAN ON ROOF.

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COSTA ENGINEERS INC.

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER J. DIS COSTA NO. 21600 Exp. 12-31-18 MECHANICAL STATE OF CALIFORNIA
SIGNED:11-1-2018

SAN MARIN HIGH SCHOOL

NEW STEM BUILDING

15 SAN MARIN DR
NOVATO, CA 94945

NOVATO UNIFIED SCHOOL DISTRICT

ARCH PROJECT NO:	1682.00
DRAWN BY:	MQ
DRAWING SCALE:	1/8" = 1'-0"
PTN:	65417-131

100% CD's

MAY 7, 2019

SHEET TITLE

MECHANICAL FLOOR PLAN

SHEET NUMBER

M2.0

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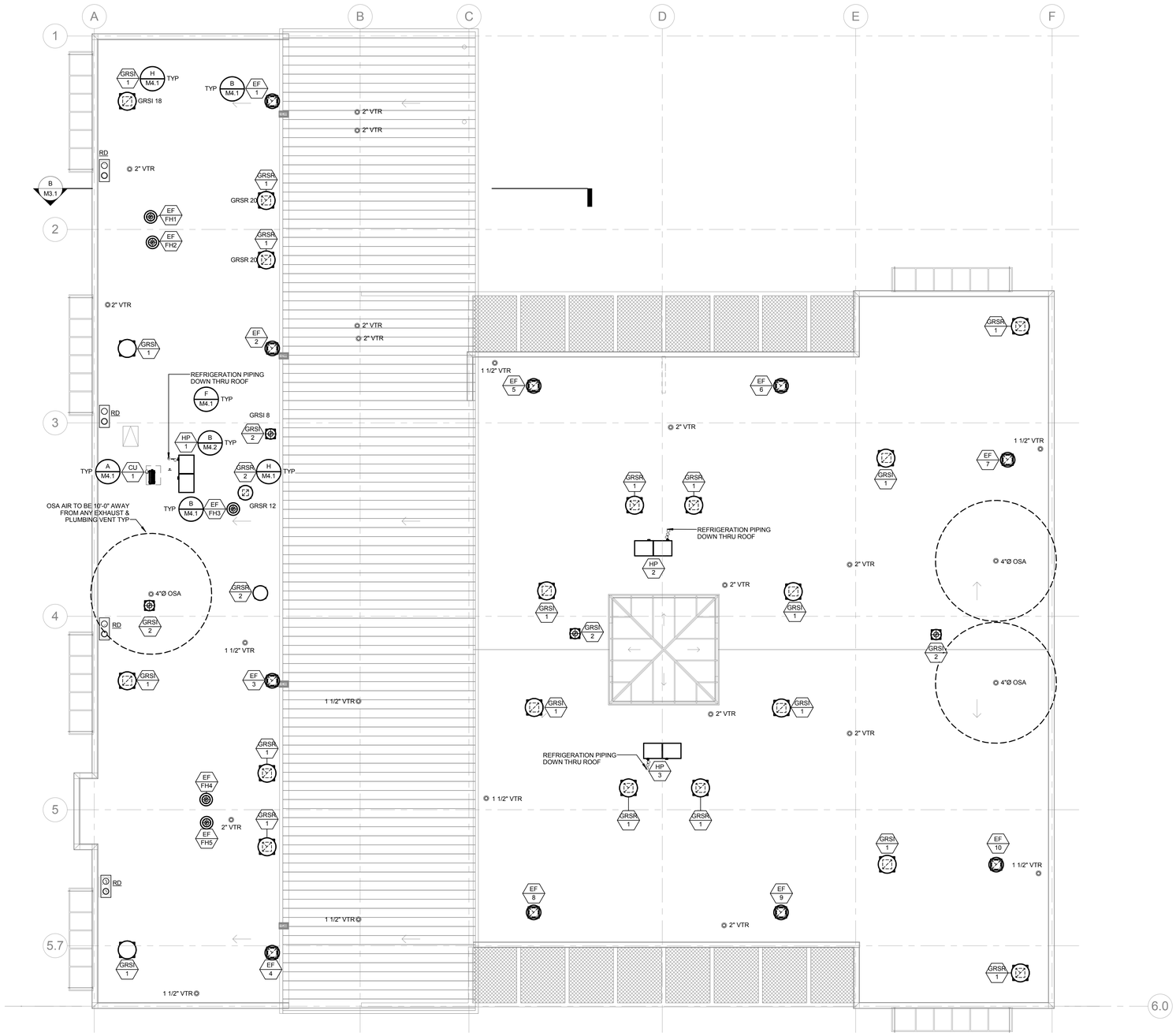

1 MECHANICAL ROOF PLAN

1/8" = 1'-0"

GENERAL NOTES

1. FOR MECHANICAL GENERAL NOTES, LEGENDS, AND SYMBOLS, REFER TO SHEET M1.1
2. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE MECHANICAL WORK WITH OTHER TRADES.

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SHEET TITLE

MECHANICAL ROOF PLAN

SHEET NUMBER

M2.2

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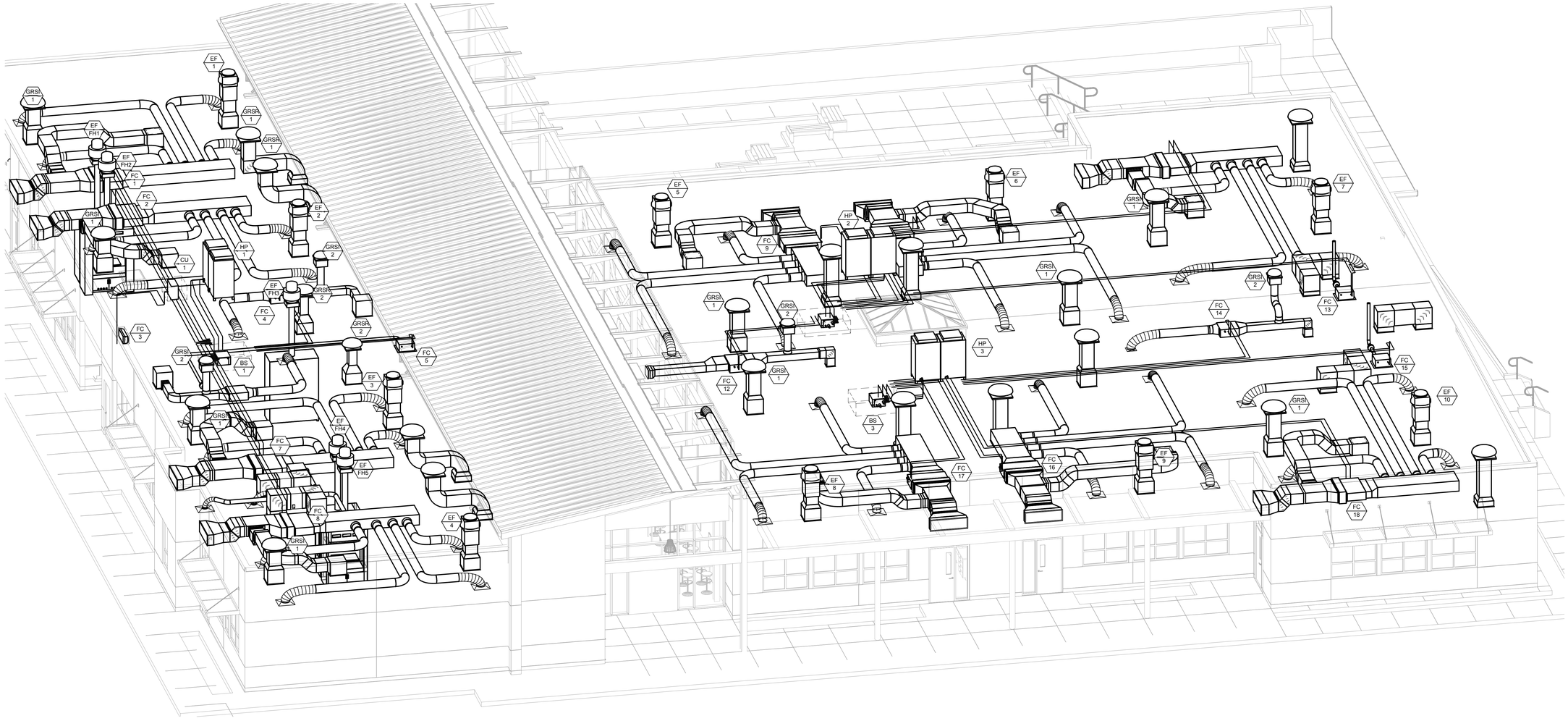
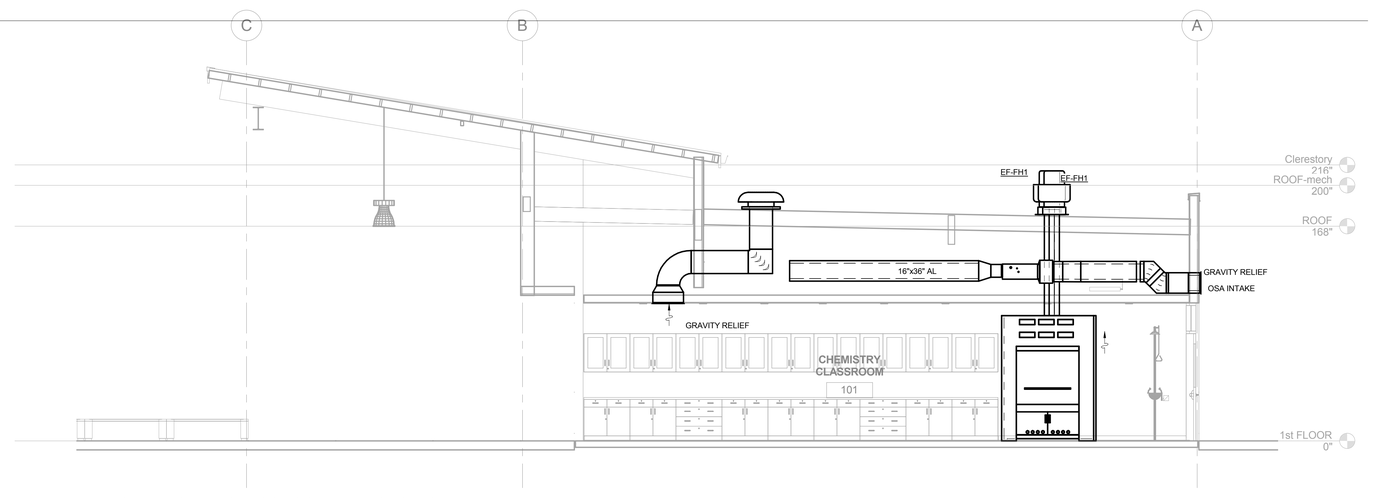


A HVAC ISOMETRIC VIEW



B CHEMISTRY CLASSROOM 101 SECTION

1/4" = 1'-0"

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MAY 7, 2019

SHEET TITLE

HVAC SECTIONS AND ISOMETRICS

SHEET NUMBER

M3.1

LIST OF APPLICABLE CODES AND STANDARDS:

TITLE 24, PART 2: 2016 CALIFORNIA BUILDING CODE (VOLUMES 1 & 2)
TITLE 24, PART 3: 2016 CALIFORNIA ELECTRICAL CODE
TITLE 24, PART 4: 2016 CALIFORNIA MECHANICAL CODE
TITLE 24, PART 5: 2016 CALIFORNIA PLUMBING CODE
TITLE 24, PART 6: 2016 CALIFORNIA ENERGY CODE
TITLE 24, PART 9: 2016 CALIFORNIA FIRE CODE
TITLE 24, PART 12: 2016 CALIFORNIA REFERENCED STANDARDS CODE

MEP COMPONENT ANCHORAGE NOTE:

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA APPROVED CONSTRUCTION DOCUMENTS. WHERE NO DETAIL IS INDICATED, THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2016 CBC, SECTIONS 1616A.1.18 THROUGH 1616A.1.26 AND ASCE 7-10 CHAPTER 13, 26, AND 30.

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY OR MOVABLE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER.
3. MOVABLE EQUIPMENT WHICH IS STATIONED IN ONE PLACE FOR MORE THAN 8 HOURS AND HEAVIER THAN 400 POUNDS ARE REQUIRED TO BE ANCHORED WITH TEMPORARY ATTACHMENTS.

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT THE ATTACHMENT NEED NOT BE DETAILED ON THE PLANS. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.

A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVE A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.
B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

FOR THOSE ELEMENTS THAT DO NOT REQUIRE DETAILS ON THE APPROVED DRAWINGS, THE INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND THE DSA DISTRICT STRUCTURAL ENGINEER. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH ABOVE REQUIREMENTS.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE:

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-10 SECTION 13.3 AS DEFINED IN ASCE 7-10 SECTION 13.6.8, 13.6.7, 13.6.5.6, AND 2016 CBC, SECTIONS 1616A.1.24, 1616A.1.25, AND 1616A.1.26.

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEMS ARE AS NOTED BELOW. WHEN BRACING AND ATTACHMENTS ARE BASED ON PRE APPROVED INSTALLATION GUIDE (e.g. SMACNA OR OSHPD OPM), COPIES OF THE BRACING SYSTEM INSTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF AND DURING THE HANGING AND BRACING OF THE DISTRIBUTION SYSTEM. THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS.

☒ MECHANICAL/PLUMBING/DUCTS

M☐	PP☐	D☐	-OPTION 1:☐	DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS.
M☒	PP☐	D☒	-OPTION 2:☒	SHALL COMPLY WITH THE OSHPD PRE-APPROVAL (OPM #) # 0043-13
M☐	PP☐	D☐	-OPTION 3:☐	SHALL COMPLY WITH THE SMACNA SEISMIC RESTRAINT

MANUAL, OSHPD EDITION (2009), INCLUDING ANY ADDENDA. FASTENERS AND OTHER ATTACHMENTS NOT SPECIFICALLY IN THE SMACNA SEISMIC RESTRAINT MANUAL, OSHPD EDITION, ARE DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS. THE DETAILS SHALL ACCOUNT APPLICABLE SEISMIC HAZARD LEVEL ____ AND CONNECTIONS LEVEL ____ FOR THE PROJECT AND CONDITIONS.

PLUMBING FIXTURE SCHEDULE

MARK	W	V	CW	HW	REMARKS
P-5A	2"	1 1/2"	3/4"	0"	EPOXY RESIN CLASSROOM SINK ADA COMPLIANT CW ONLY, GOOSENECK W/ VACUUM BREAKER.
P-5B	2"	1 1/2"	3/4"	3/4"	EPOXY RESIN TEACHER SINK WITH (1)GT-1 & (2) HW&CW GOOSENECK FAUCETS W/ VACUUM BREAKER.
P-5C	2"	1 1/2"	3/4"	3/4"	EPOXY RESIN CHEMESTRY TEACHER SINK WITH (1)GT-1 & (2) HW&CW GOOSENECK FAUCETS & LOCAL ACID DELUTION TRAP UNDER CABINET
P-5D	2"	1 1/2"	3/4"	0"	EPOXY RESIN CHEMESTRY SINK LOCAL ACID DELUTION TRAP UNDER CABINET, (4) GT-1 & (2) GOOSENECK CW FAUCETS
P-5E	2"	1 1/2"	3/4"	3/4"	SINGLE COMPARTMENT EPOZY RESIN PREP SINK WITH ACID DELUTION TRAP & (1)HW/CW FAUCET ADA COMPLIANT
P-8	2"	1 1/2"	1 1/4"	0"	EMERGENCY COMBINATION EYE WASH STATION AND SHOWER HEAD.
RD					ROOF DRAIN SEE PLAN FOR PIPE SIZES
FS	2"	1 1/2"			FLOOR SINK WITH TRAP PRIMMER CONNECTION
FD-1	2"	1 1/2"	1/2"	0"	FLOOR DRAIN WITH TRAP PRIMMER CONNECTION
GT-1					COUNTER MOUNTED GAS TURRET
HB-1			1/2"		EXTERIOR HOSE BIBB
TP-1	0"	0"	1/2"	0"	TRAP PRIMMER WITH ACCESS PANEL
EG-1	0"	0"	0"	0"	GAS ISOLATION VALVE IN VALVE BOX
WB-1	0"	0"	1/2"	0"	WALL BOX FOR ICE MAKER
WB-2	2"	1 1/2"	1/2"	1/2"	WALL BOX FOR IDISH WASHER

1.CW FIXTURES AND VALVES SHALL BE AB1953 COMPLIANT.
2.SEE ARCHITECTURAL PLANS FOR FIXTURE EXACT LOCATION AND ADA COMPLIANCE REMARKS.

ELECTRIC WATER HEATER SCHEDULE

MARK	MANUF./MODEL	TYPE	STORAGE CAPACITY	ELECTRICAL V-Ø-HZ	ELECTRICAL No. Elements	ELECTRICAL WATTS	OPER. WEIGHT	LOCATION	REMARKS
EWH 1	CHRONOMITE SR-20L/208	INSTANTANEOUS	N/A	208-1-60	1		5 lb	COUNTERMOUNTED SINK AT CHEMISTRY CLASSROOM 101	2
EWH 2	CHRONOMITE SR-20L/208	INSTANTANEOUS	N/A	208-1-60	1		5 lb	COUNTERMOUNTED SINK AT CHEMISTRY CLASSROOM 102	2
EWH 3	CHRONOMITE CMT-2.5	TANK	2.5 gal	110/120-1-60	1	1,440 W	39 lb	COUNTERMOUNTED SINK AT PREP ROOM 103	1,3
EWH 4	CHRONOMITE CMT-2.5	TANK	2.5 gal	110/120-1-60	1	1,440 W	39 lb	COUNTERMOUNTED SINK AT PREP ROOM 103	1,3
EWH 5	CHRONOMITE SR-20L/208	INSTANTANEOUS	N/A	208-1-60	1		5 lb	COUNTERMOUNTED SINK AT BIO-TECH CLASSROOM 106	2
EWH 6	CHRONOMITE SR-20L/208	INSTANTANEOUS	N/A	208-1-60	1		5 lb	COUNTERMOUNTED SINK AT BIO-TECH CLASSROOM 108	2
EWH 7	CHRONOMITE SR-20L/208	INSTANTANEOUS	N/A	208-1-60	1		5 lb	COUNTERMOUNTED SINK AT BIOLOGY CLASSROOM 111	2
EWH 8	CHRONOMITE SR-20L/208	INSTANTANEOUS	N/A	208-1-60	1		5 lb	COUNTERMOUNTED SINK AT BIOLOGY CLASSROOM 112	2
EWH 9	CHRONOMITE SR-20L/208	INSTANTANEOUS	N/A	208-1-60	1		5 lb	COUNTERMOUNTED SINK AT BIOLOGY CLASSROOM 118	2
EWH 10	CHRONOMITE SR-20L/208	INSTANTANEOUS	N/A	208-1-60	1		5 lb	COUNTERMOUNTED SINK AT BIOLOGY CLASSROOM 117	2
EWH 11	CHRONOMITE SR-20L/208	INSTANTANEOUS	N/A	208-1-60	1		5 lb	COUNTERMOUNTED SINK AT PHYSICS CLASSROOM 113	2
EWH 12	CHRONOMITE SR-20L/208	INSTANTANEOUS	N/A	208-1-60	1		5 lb	COUNTERMOUNTED SINK AT PHYSICS CLASSROOM 116	2

REMARKS:
1. PROVIDE W/ PRV
2. SEE DETAIL **B/P4.1** FOR MOUNTING INSTANTANEOUS WATER HEATER.
3. SEE DETAIL **C/P4.1** FOR MOUNTING UNDERCOUNTER TANK TYPE WATER HEATER .

PLUMBING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
X / X		EQUIPMENT TYPE / EQUIPMENT NUMBER
X / X-X		DETAIL / DRAWING NUMBER / SHEET NUMBER
X-XX		FIXTURE TYPE/NUMBER
	(N)	NEW PLUMBING AND PIPING SHOWN HEAVY
	(E)	EXISTING PLUMBING AND PIPING SHOWN LIGHT
	SS	SANITARY WASTE ABOVE GROUND
	SS	SANITARY WASTE BELOW GROUND
	V	VENT PIPE
	DCW	DOMESTIC COLD WATER PIPE
	DHW	DOMESTIC HOT WATER PIPE
	HWR	HOT WATER RETURN PIPE
110°	110°	TEMPERED HOT WATER PIPE
CA	CA	COMPRESSED AIR
CD	CD	CONDENSATE DRAIN
FW	FW	FILTERED WATER
G	G	NATURAL GAS PIPE
ID	ID	INDIRECT WASTE
LPG	LPG	LIQUID PROPANE GAS
N2	N2	NITROGEN
N20	N20	NITROUS OXIDE
OA	OA	OIL FREE AREA
O2	O2	OXYGEN
PW	PW	PROCESS WASTE PIPE
RVD	RVD	RELIEF VALVE DISCHARGE
RWL	RWL	RAIN WATER LEADER
SD	SD	STORM DRAIN PIPE
VAC	VAC	VACUUM LINE
	GV	GATE VALVE
		GLOBE VALVE
	BV	BALL VALVE
	BFV	BUTTERFLY VALVE
	CV	CHECK VALVE
		BALANCING VALVE
		GAS COCK OR STOP
	PRV	PRESSURE REDUCING VALVE
	TV	TEMPERING VALVE
		STRAINER
		UNION
		PRESSURE GAUGE AND COCK
	P	PUMP
		THERMOMETER
	CO	CLEANOUT
	WCO	WALL CLEANOUT
	FCO	FLOOR CLEANOUT
	COTG	CLEANOUT TO GRADE
		PRESSURE GUAGE WELL ONLY (PETE'S PLUG)
	HB	HOSE BIBB
		PIPE UP
		PIPE DOWN
		BRANCH TOP CONNECTION
		BRANCH BOTTOM CONNECTION
		BRANCH SIDE CONNECTION
		CAP ON END OF PIPE
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		VALVE IN RISER
		POINT OF CONNECTION
		POINT OF DEMOLITION
℄		CENTER LINE
	AFC	ABOVE FINISHED CEILING
	AFF	ABOVE FINISHED FLOOR
	AFG	ABOVE FINISHED GRADE
	AP	ACCESS PANEL
	AW	ACID WASTE
	BFF	BELOW FINISHED FLOOR
	BG	BELOW GRADE
	CI	CAST IRON
	COTG	CLEANOUT TO GRADE
	DIW	DOWN IN WALL
	DMV	DRAIN, WASTE, AND VENT
	DN	DOWN
	DW	DISHWASHER
	DWG	DRAWING
	(E)	EXISTING
	FCO	FLOOR CLEANOUT
	IE	INVERT ELEVATION
	IW	INDIRECT WASTE
	(N)	NEW
	NIC	NOT IN CONTRACT
	NTS	NOT TO SCALE
	SA	SHOCK ABSORBER
	SAD	SEE ARCHITECTURAL DRAWINGS
	SCD	SEE CIVIL DRAWINGS
	SED	SEE ELECTRICAL DRAWINGS
	SMD	SEE MECHANICAL DRAWINGS
	SSD	SEE STRUCTURAL DRAWINGS
	TYP	TYPICAL
	UIW	UP IN WALL
	UMC	UNIFORM MECHANICAL CODE
	UPC	UNIFORM PLUMBING CODE
	UNO	UNLESS NOTED OTHERWISE
	V	VENT
	VTR	VENT THROUGH ROOF
	WCO	WALL CLEANOUT

BLDG 'PLUMBING' SHEET LIST

P1.0	GAS SITE PLAN
P1.1	PLUMBING SCHEDULES & LEGENDS
P2.1	PLUMBING WASTE & VENT
P2.2	PLUMBING WATER & GAS
P3.1	ENLARGED WASTE & VENT FLOOR PLAN NE
P3.2	ENLARGED WASTE & VENT FLOOR PLAN SE
P3.3	ENLARGED WASTE & VENT FLOOR PLAN NW
P3.4	ENLARGED WASTE & VENT FLOOR PLAN SW
P3.5	ENLARGED WATER & GAS FLOOR PLAN NE
P3.6	ENLARGED WATER & GAS FLOOR PLAN SE
P3.7	ENLARGED WATER & GAS FLOOR PLAN NW
P3.8	ENLARGED WATER & GAS FLOOR PLAN SW
P4.1	PLUMBING DETAILS
P4.2	OPM PLUMBING REFERENCE DETAILS

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PTN:	65417-131

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SHEET TITLE

PLUMBING SCHEDULES & LEGENDS

SHEET NUMBER

P1.1

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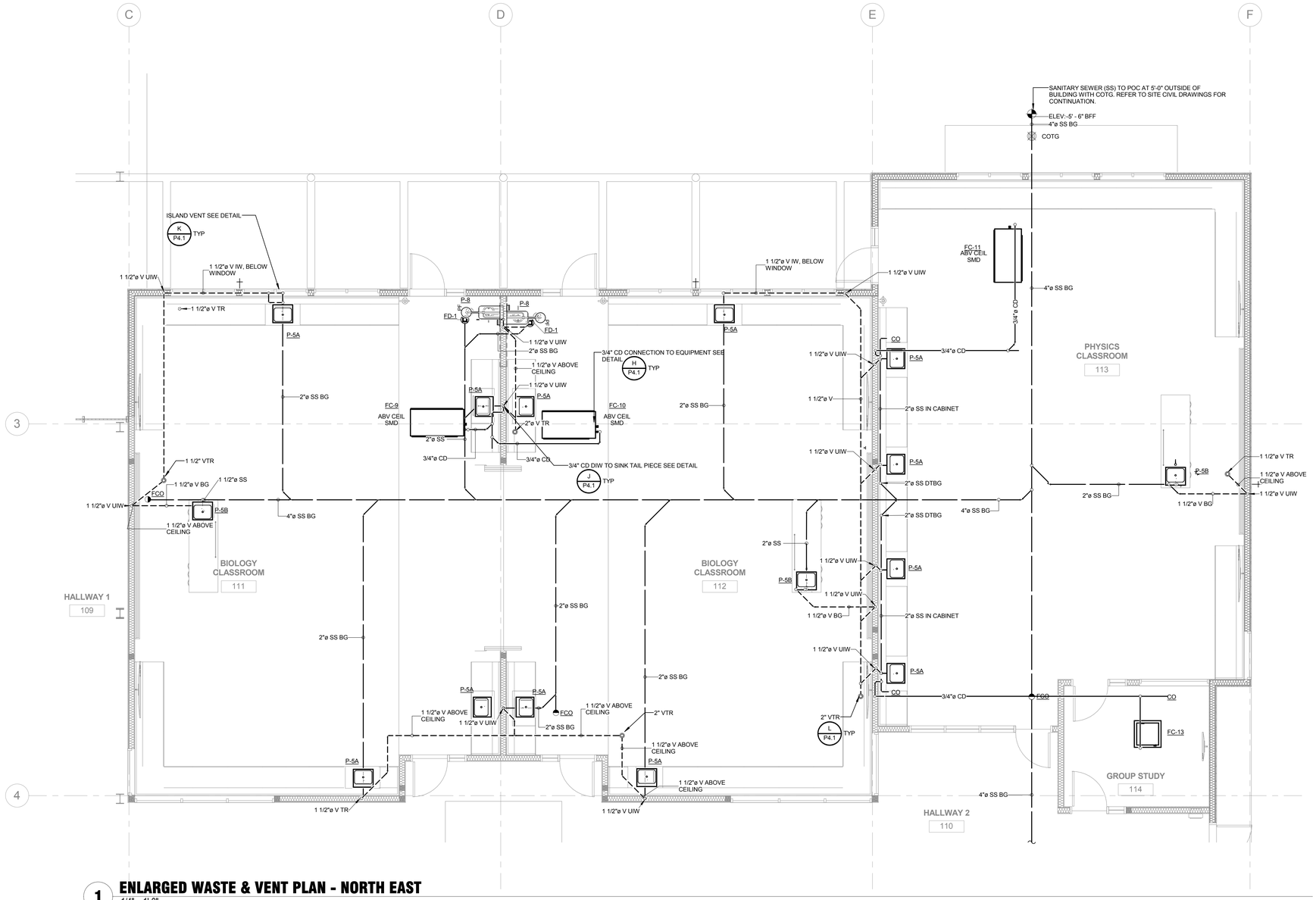

1 ENLARGED WASTE & VENT PLAN - NORTH EAST

1/4" = 1'-0"

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SHEET TITLE

ENLARGED WASTE & VENT FLOOR PLAN NE

SHEET NUMBER

P3.1

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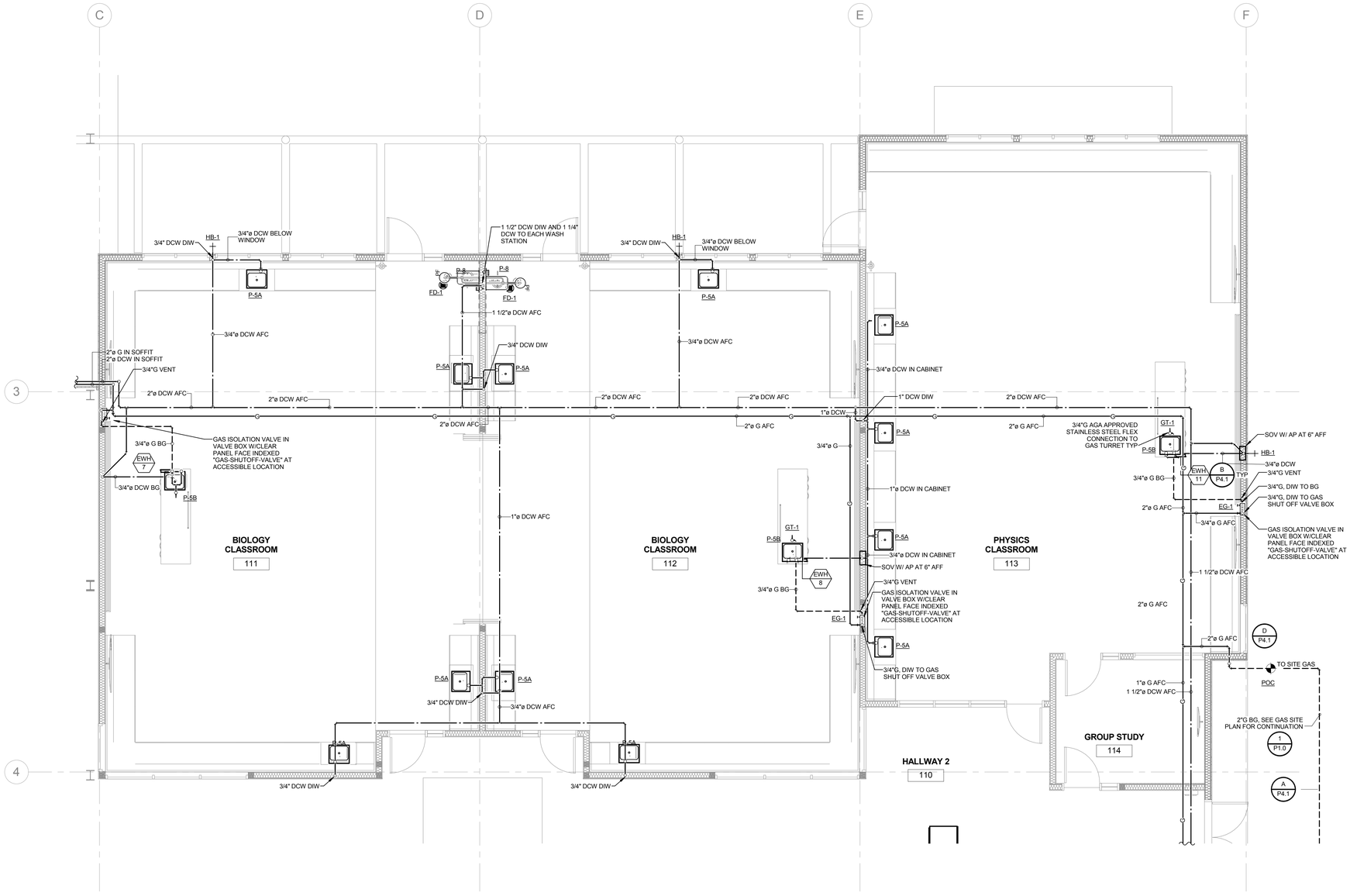

1 WATER & GAS FLOOR PLAN - NORTH EAST

1/4" = 1'-0"

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SHEET TITLE

ENLARGED WATER & GAS FLOOR PLAN NE

SHEET NUMBER

P3.5

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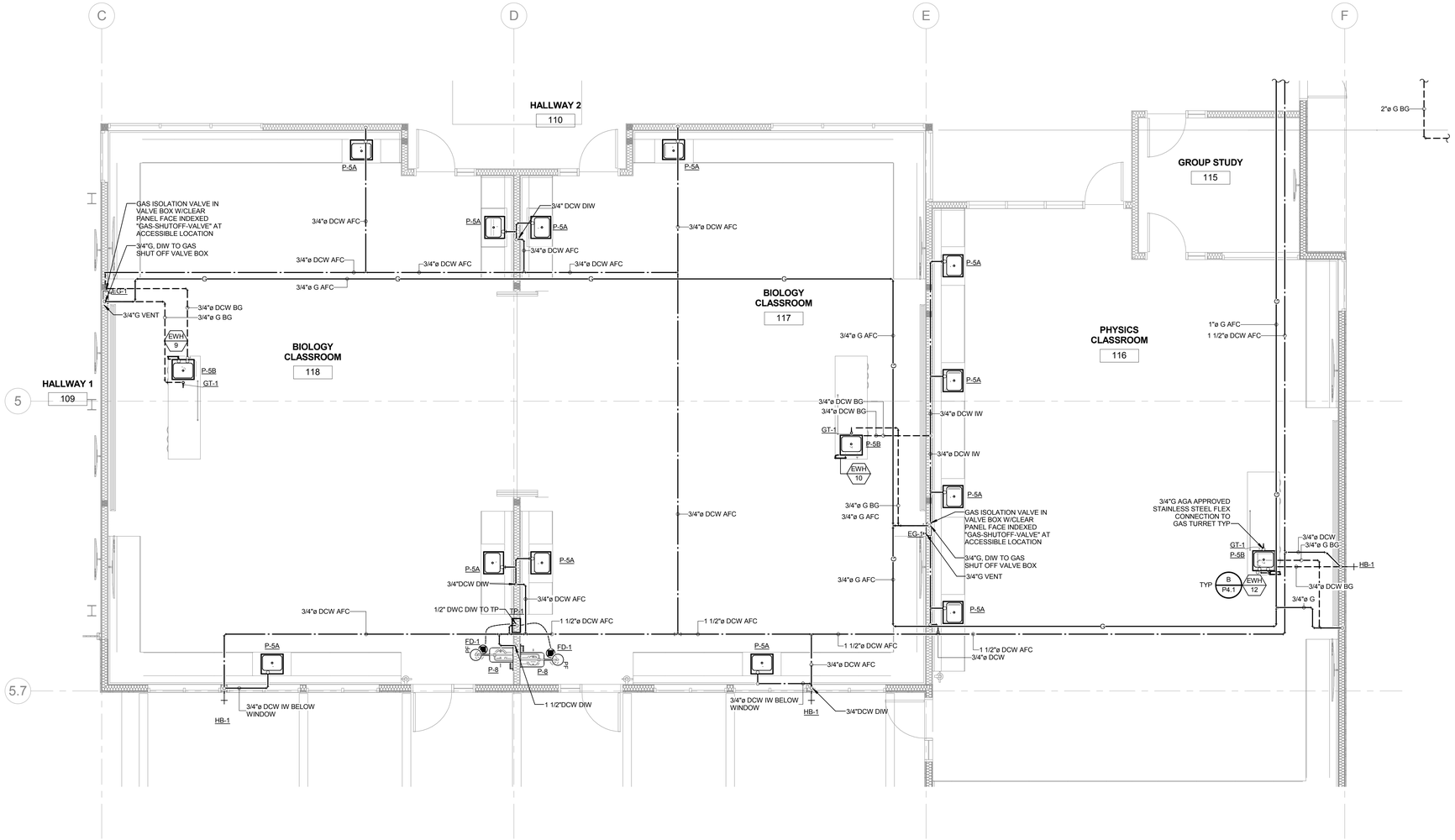

1 WATER & GAS FLOOR PLAN - SOUTH EAST

1/4" = 1'-0"

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SHEET TITLE

ENLARGED WATER & GAS FLOOR PLAN SE

SHEET NUMBER

P3.6

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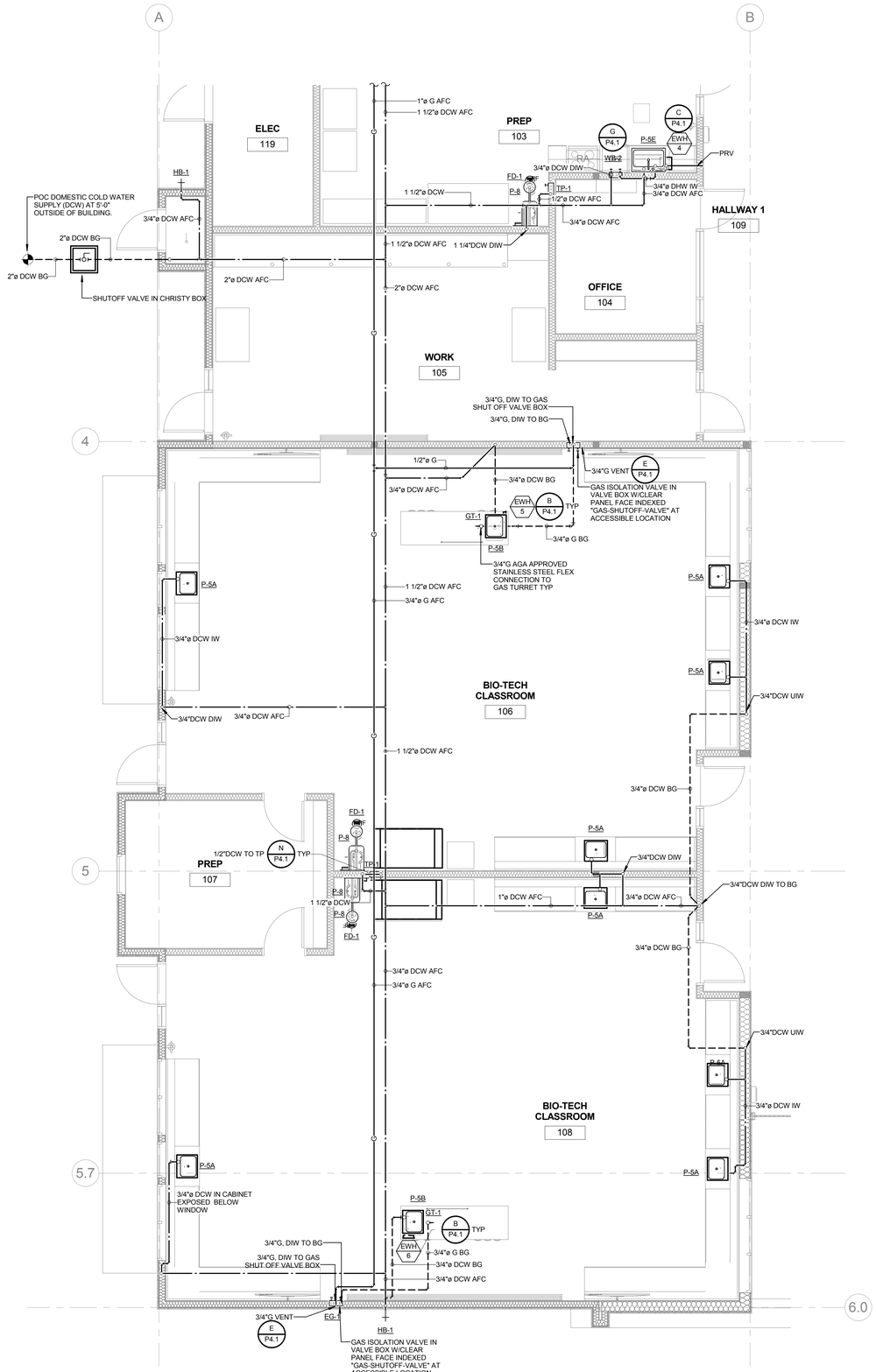

1 WATER & GAS FLOOR PLAN - SOUTH WEST

1/4" = 1'-0"

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ENLARGED WATER & GAS FLOOR PLAN SW

SHEET NUMBER

P3.8