BARNARD ROOM 8 QUANTUM FOUNDRY RENOVATION

BARNARD HALL, ROOMS 008, 234 - BOZEMAN, MT 59717

100% CONSTRUCTION DOCUMENTS

CLIENT:

MONTANA STATE UNIVERSITY

ABBREVIATIONS

AB	ANCHOR BOLT	FEC	FIRE EXTINGUISHER CABINET	P.L.	PROPERTY LINE
A/C	AIR CONDITIONING	FLR	FLOOR (ING)	QT	QUARRY TILE
ACT	ACOUSTICAL CEILING TILE (PANEL)	FD	FLOOR DRAIN	QTR RND	QUARTER ROUND
ADJ	ADJUSTABLE	FTNG	FOOTING	RAD	RADIUS
AD	AREA DRAIN	FDN	FOUNDATION	R	RISER
AFF	ABOVE FINISH FLOOR	FURN	FURNACE	REINF	REINFORCEMENT (ING)
AFG	ABOVE FINISH GRADE	GALV	GALVANIZED	REQD	REQUIRED
AHU	AIR HANDLING UNIT	GA	GAUGE	RA	RETURN AIR
ALT	ALTERNATE	GL	GLASS	REV	REVISIONED
ALUM	ALUMINUM	GB	GYPSUM BOARD	RD	ROOF DRAIN
∠A	ANGLE	HD	HEAD	RM	ROOM
APPROX	APPROXIMATE	HDR	HEADER	RO	ROUGH OPENING
ARCH	ARCHITECT (URE) (URAL)	HVAC	HEATING, VENTILATING & AIR	RND	ROUND
AUTO	AUTOMATIC		CONDITIONING	RB	RUBBER BASE
BSMT	BASEMENT	HT	HEIGHT	SHTNG	SHEATHING
BR	BEDROOM	HC	HOLLOW CORE	STOR	STORAGE
BM	BENCH MARK	HM	HOLLOW METAL	SD	SMOKE DETECTOR
BTWN	BETWEEN	HORIZ	HORIZONTAL	SIM	SIMILAR
BLKG	BLOCKING	HB	HOSE BIBB	SC	SOLID CORE
BD	BOARD	HW	HOT WATER	S	SOUTH
B/	BOTTOM OF	IN OR "	INCH	SPEC	SPECIFICATIONS
BOT	BOTTOM	INCL INFO	INCLUDE (D) (ING) INFORMATION	S.F.	SQUARE FOOT
BTU	BRITISH THERMAL UNIT	INSUL	INSULATION	SPKLR	SPRINKLER
BLDG	BUILDING	INT	INTERIOR	S/S	STAINLESS STEEL
CPT	CARPET	JAN	JANITOR	STD	STANDARD
CAB	CABINET	JT	JOINT	STL	STEEL
CB	CATCH BASIN	JB	JUNCTION BOX	STRUCT	STRUCTURAL
CLG	CEILING	KIT	KITCHEN	SUSP	SUSPENDED
CL	CENTER LINE	LT	LIGHT	SW	SWITCH
CT	CERAMIC TILE	LR	LIVING ROOM	T/	TOP OF
C.O.	CLEAN OUT	LBS OR #	POUNDS	TEL	TELEPHONE
CLR	CLEAR	MH	MANHOLE	TV	TELEVISION
CLO	CLOSET	MFR	MANUFACTURER	TEMP	TEMPERATURE
CW	COLD WATER	MAS	MASONRY	TSTAT	THERMOSTAT
COL	COLUMN	MO MATL	MASONRY OPENING MATERIAL (S)	THK	THICK
CONC	CONCRETE	MAX	MAXIMUM	T & G	TONGUE & GROOVE
CMU	CONCRETE MASONRY UNIT	MECH	MECHANICAL	T	TREAD
CONT	CONTINUOUS	MTL	METAL	TYP	TYPICAL
CJ	CONTROL JOINT	M	METER	UNO	UNLESS NOTED OTHERWISE
DEMO	DEMOLISH, DEMOLITION	MIN	MINIMUM	VB	VAPOR BARRIER
DTL	DETAIL	MISC	MISCELLANEOUS	VTR	VENT THRU ROOF
DIA	DIAMETER	MTD	MOUNTED	VIF	VERIFY IN FIELD
Φ	DIAMETER	MULL	MULLION	VERT	VERTICAL
DIM	DIMENSION	NOM	NOMINAL	VG	VERTICAL GRAIN
DW	DISHWASHER	N	NORTH	VB	VINYL BASE
DR	DOOR	NIC	NOT IN CONTRACT	VCT	VINYL COMPOSITE TILE
DBL	DOUBLE	NTC	NOT TO SCALE	VWC	VINYL WALL COVERING
DN	DOWN	NO.OR #	NUMBER	VOL	VOLUME
DS	DOWNSPOUT	OC	ON CENTER	W	WASHER
DWR	DRAWER	OPNG	OPENING	WC	WATER CLOSET
DF	DRINKING FOUNTAIN	OPP	OPPOSITE	WH	WATER HEATER
D	DRYER	OH	OVERHEAD	WP	WATERPROOF
EA	EACH	PNT	PAINT	WT	WEIGHT
E	EAST	PR	PAIR	WWF	WELDED WIRE FABRIC
EWC	ELECTRIC WATER COOLER	PNL	PANEL	W	WEST
EL	ELEVATION	PT BD	PARTICLE BOARD	WDW	WINDOW
ELEV	ELEVATOR	PLAS	PLASTER	WM	WIRE MESH
ENCL	ENCLOSURE			W/	WITH
EQ	EQUAL	PLAM	PLASTIC LAMINATE	W/O	WITHOUT
EXH	EXHAUST	PL OR ℄	PLATE	WD	WOOD
EXIST OR EX	EXISTING	PLYWD	PLYWOOD	WB	WOODBASE
EJ	EXPANSION JOINT	PVC	POLYVINYL CHLORIDE	W.P.	WORK POINT
EXP	EXPOSED	PSF	POUNDS PER SQUARE FOOT	XFMR	TRANSFORMER
EXT	EXTERIOR	PSI	POUNDS PER SQUARE INCH		
FAB	FABRICATED				
FT OR '	FEET/FOOT				
FC	FIBER CEMENT SIDING				
FIN	FINISH				
FF	FINISHED FLOOR				
FA	FIRE ALARM				
FE	FIRE EXTINGUISHER				

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MATERIAL DESIGNATIONS

UNDISTURBED SOIL
DISTURBED SOIL
SAND
GRAVEL
CONCRETE
BRICK SECTION
CMU SECTION
STONE SECTION
WOOD BLOCKING
WOOD FRAMING
OSB
PLYWOOD
PARTICLE BOARD
GYPSUM BOARD
WOOD FINISH CARPENTRY
BATT INSULATION
RIGID INSULATION
SIP INSULATION
BLOWN-IN-INSULATION
SPRAY FOAM INSULATION
STEEL

GRAPHIC SYMBOLS

ROOM NAME/NUMBER SYMBOL
ROOM ← ROOM NAME
101 ← ROOM NUMBER
150 SF ← ROOM AREA

DETAIL SYMBOL
SIM — SIMILAR INDICATOR
1 — DETAIL DRAWING NUMBER
A5.1 — DETAIL SHEET NUMBER

GRID NUMBER/LETTER SYMBOL
A
GRID LINE
LAYOUT GRID
STRUCTURAL OR ARCHITECTURAL GRID REFERENCE LETTER OR NUMBER

CALLOUT SYMBOL
SIM — SIMILAR INDICATOR
1 — CALLOUT DRAWING NUMBER
A5.2 — CALLOUT SHEET NUMBER
CALLOUT AREA

DOOR NUMBER /NAME SYMBOL
100.1 ← DOOR NUMBER

DRAWING NAME SYMBOL
1 — DRAWING NUMBER
FLOOR PLAN — DRAWING NAME
1/8" = 1'-0" ← DRAWING SCALE
A2.1 — DRAWING SHEET NUMBER

WINDOW NUMBER/NAME SYMBOL
1 ← WINDOW DESIGNATION

LEVEL SYMBOL
FIRST FLOOR ← LEVEL NAME
100' - 0" ← LEVEL ELEVATION

EXTERIOR ELEVATION SYMBOL
SIM ← SIMILAR INDICATOR
1 — ELEVATION DRAWING NUMBER
A5.1 — ELEVATION SHEET NUMBER

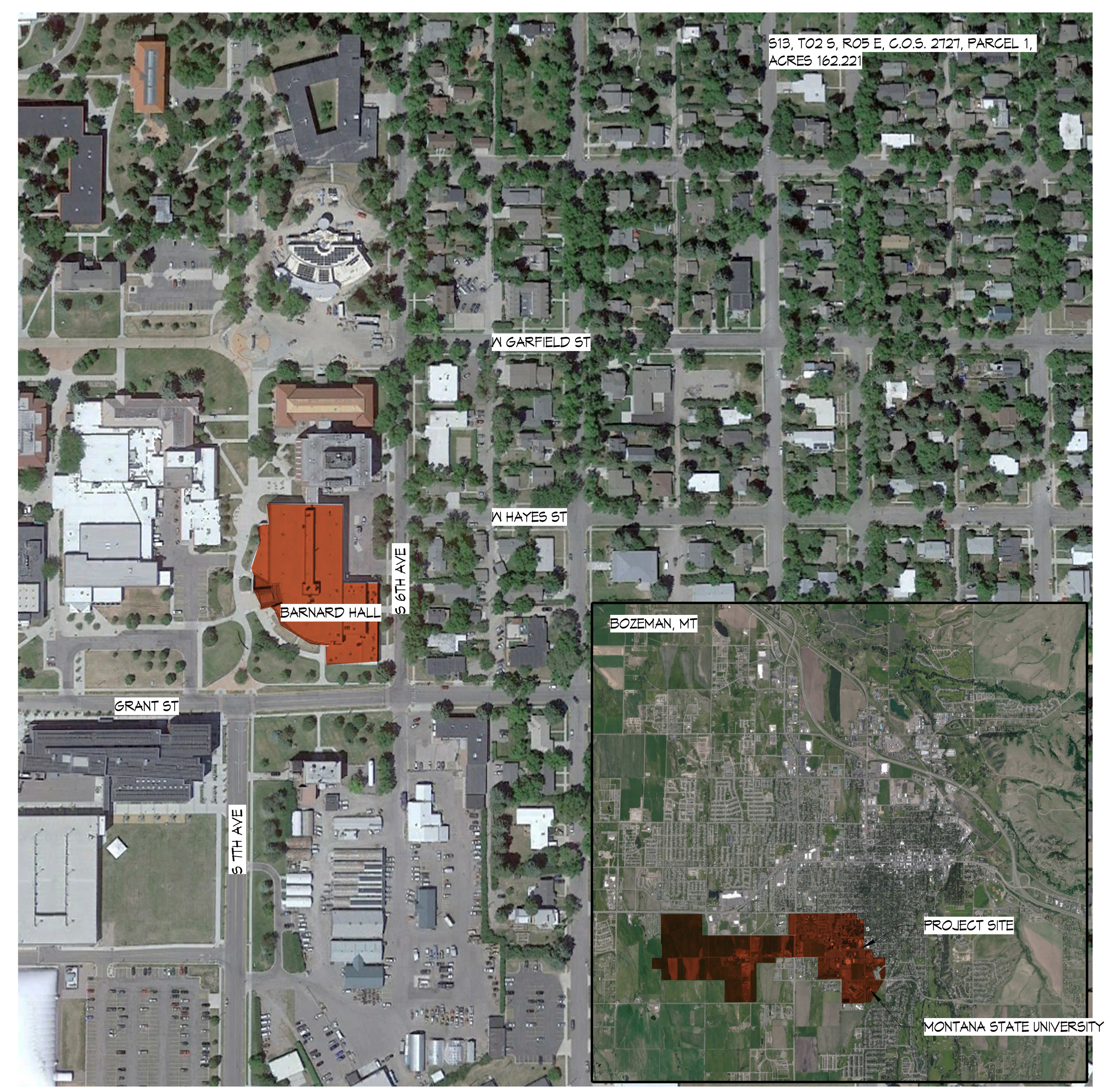
NOTE LABEL SYMBOL
1 — REVISION NOTE
2 — CONSTRUCTION NOTE
5 — DEMOLITION SPECIFIC NOTE
N1A — WALL TYPE
4/12 — ROOF PITCH

INTERIOR ELEVATION SYMBOL
1 A ← ELEVATION DRAWING NUMBER
1B, 1 D, 1 C
A6.1 — ELEVATION SHEET NUMBER

BUILDING SECTION SYMBOL
SIM — SIMILAR INDICATOR
1 / A5.1
SECTION DRAWING NUMBER
SECTION SHEET NUMBER

DRAWING NUMBERING ON SHEET

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20



1 VICINITY MAP
AR-1 NTS

SHEET INDEX

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Existing Building Code (International Existing Building Code–2021, plus applicable sections of 2021 IBC)

1. CLASSIFICATION OF WORK (603.1): Level 2 alterations include the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment, and shall apply where the *work area* is equal to or less than 50 percent of the building area.

2. Application (603.2): Level 2 alterations shall comply with the provisions of Chapter 7 for Level 1 alterations as well as the provisions of Chapter 8.

3. INTERIOR FINISHES (702.1): Newly installed interior wall and ceiling finishes shall comply with Chapter 8 of the International Building Code.

4. INTERIOR FLOOR FINISH (702.2): New interior floor finish, including new carpeting used as an interior floor finish material, shall comply with Section 804 of the International Building Code.

5. ALTERATIONS—LEVEL 2 (Chapter 8):

6. COMPLIANCE (801.4): New construction elements, components, systems and spaces shall comply with the requirements of the International Building Code.

7. EXISTING VERTICAL OPENINGS (802.2.1): Existing interior vertical openings connecting two or more floors shall be enclosed with approved assemblies having a fire-resistance rating of not less than 1 hour with approved opening protectives. *Provided: Existing vertical openings are 2-hour fire rated.*

8. INTERIOR FINISH (802.4): The interior finish and trim of walls and ceilings in exits and corridors in any work area shall comply with the requirements of the International Building Code.

9. CORRIDOR RATINGS (803.1.1): Where an approved automatic sprinkler system is installed throughout the story, the required fire-resistance rating for any corridor located on the story shall be permitted to be reduced in accordance with the International Building Code. In order to be considered for a corridor rating reduction, such system shall provide coverage for the stairway landings serving the floor and the intermediate landings immediately below. *Provided: Per Table 1020.2, Fire resistance rating is not required.*

10. NUMBER OF EXITS (804.4): The number of exits shall be in accordance with Sections 804.4.1 through 804.4.3. 804.5 Egress Doorways. *Provided: Building occupancy has not changed. 2 exists are required, 2 existing exits remain.*

11. EGRESS DOORWAYS (804.5): egress doorways in any work area shall comply with Sections 804.5.1 through 804.5.5.

12. OCCUPANT LOAD AND TRAVEL DISTANCE (804.5.1.1): In any work area, all rooms and spaces having an occupant load greater than 50 or in which the travel distance to an exit exceeds 75 feet (22 860 mm) shall have not fewer than two egress doorways. *Provided: Occupant Load = 15 and Occupant Load < 50 and travel distance to an exit < 75 ft.*

13. DOOR CLOSING (804.5.3): In any work area, all doors opening onto an exit passageway at grade or an exit stairway shall be self-closing or automatic-closing by listed closing devices. *Provided: Doors do not open to an exit or stairway however, existing double doors to be relocated will be equipped with existing closers.*

14. DOOR SWING (804.5.2): In the work area and in the egress path from any work area to the exit discharge, all egress doors serving an occupant load greater than 50 shall swing in the direction of exit travel. *Provided: Occupant load is less than 50 and need not swing in the direction of egress travel.*

15. DOOR CLOSING (804.5.3): In any work area, all doors opening onto an exit passageway at grade or an exit stairway shall be self-closing or automatic-closing by listed closing devices. Exceptions: Where exit enclosure is not required by the International Building Code Means of egress within or serving only a tenant space that is entirely outside the work area.

16. OPENINGS IN CORRIDOR WALLS (804.6): Openings in corridor walls in any work area shall comply with Sections 804.6.1 through 804.6.4. Exception: Openings in corridors where such corridors are not required to be rated in accordance with the International Building Code.

17. DEAD-END CORRIDORS (804.7): Dead-end corridors in any work area shall not exceed 35 feet (10 670 mm). Exceptions: Where dead-end corridors of greater length are permitted by the International Building Code. *Provided: The International Building Code 1020.5 states Exception 2. In occupancies in Groups B, E, F, I-1, M, R-1, R-2, S and U, where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the length of the dead-end corridors shall not exceed 50 feet. The dead end corridor complies because it is less than 50 feet.*

18. WORK AREAS (804.9.1): Means of egress in all work areas shall be provided with exit signs in accordance with the requirements of the International Building Code.

19. ELECTRICAL NEW INSTALLATIONS (806.1): Newly installed electrical equipment and wiring relating to work done in any work area shall comply with all applicable requirements of NFPA 70 except as provided for in Section 806.4.

20. ALTERED EXISTING SYSTEMS (807.2) In mechanically ventilated spaces, existing mechanical ventilation systems that are altered, reconfigured or extended shall provide not less than 5 cubic feet per minute (cfm) (0.0024 m3/s) per person of outdoor air and not less than 15 cfm (0.0071 m3/s) of ventilation air per person, or not less than the amount of ventilation air determined by the Indoor Air Quality Procedure of ASHRAE 62.1.

21. LOCAL EXHAUST (807.3): Newly introduced devices, equipment or operations that produce airborne particulate matter, odors, fumes, vapor, combustion products, gaseous contaminants, pathogenic and allergenic organisms, and microbial contaminants in such quantities as to affect adversely or impair health or cause discomfort to occupants shall be provided with local exhaust.

22. ENERGY CONSERVATION MINIMUM REQUIREMENTS (809.1): Level 2 alterations to existing buildings or structures are permitted without requiring the entire building or structure to comply with the energy requirements of the International Energy Conservation Code or International Residential Code. The alterations shall conform to the energy requirements of the International Energy Conservation Code or International Residential Code as they relate to new construction only.

I. Building Code (International Building Code–2021)

1. OCCUPANCY GROUPS (Chapter 3): Proposed Building: Basement Room 008 and 008B and Second Floor Room 234 being remodeled to accommodate new university laboratories. All spaces remain B occupancies.

	Existing Occupancies	Proposed Occupancies
Basement	B	B
Second Floor	B	B

2. HIGHER EDUCATION LABORATORIES SCOPE *(428) Provided: Hazardous materials do not exceed quantities in tables 307.1(1) and 307.1(2)*

3. CONSTRUCTION TYPE (602.5): Construction Type II-A 1 hour

4. ALLOWABLE HEIGHT, NUMBER OF STORIES, AND AREA – TYPE II-A (TABLES 504.3, 504.4, 506.2):

Existing Building: 3 stories (plus basement); Approximately 46 ft in height

Story	Occupancy	Allowable Area per Story	Allowable Area w/ Frontage	Provided Area	Allow. Height	Allow. Stories
		Table 506.2	Sect. 506.3		Table 504.3	Table 504.4
Basement	B	112,500		13,181 Basement total	85	6
Second Floor	B	112,500		43,907 2nd floor total	85	6

5. FIRE RESISTIVE REQUIREMENTS for Type II-A (Tables 601 &602):

a.	Structural Frame –	Required:	1
		Provided:	1
b.	Bearing Walls, Exterior –	Required:	1
		Provided:	1
c.	Bearing Walls, Interior –	Required:	1
		Provided:	1
d.	Non-bearing Walls, Exterior –	Required:	0
		Provided:	0
e.	Non-bearing Partitions –	Required:	0
		Provided:	0
f.	Floor Construction -	Required:	1
		Provided:	1
g.	Roof Construction –	Required:	1
		Provided:	1

6. FIRE PARTITIONS – FIRE RESISTANCE RATING (708.3): Fire partitions shall have a fire-resistance rating of not less than one hour. *Provided: Fire sprinklers provided throughout and corridor walls not required to be fire resistance rated by Table 1020.2.*

7. FIRE PARTITIONS – CONTINUITY (708.4): Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below and be securely attached to one of the following: 1) The underside of the floor or roof sheathing, deck, or slab above; or 2) The underside of the floor/ceiling or roof/ceiling assembly having a fire -resistance rating that is not less than the fire-resistance rating of the fire partition. *Provided: Fire sprinklers provided throughout and corridor walls not required to be fire resistance rated by Table 1020.2.*

8. SHAFT ENCLOSURES (713.1): The provisions of this section shall apply to shafts to protect openings and penetrations through floor/ceilings and roof/ceiling assemblies. Interior exit stairways shall be protected in accordance with the requirements of Section 1023. *Provided: Interior exit stairways are protected according to 1023.*

9. SHAFT FIRE-RESISTANCE RATING (713.4): Shaft enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more, and not less than 1 hour where connecting less than four stories. The number of stories connected by the shaft enclosure shall include any basements but not any mezzanines. Shaft enclosures shall have a fire-resistance rating not less than the floor assembly penetrated but need not exceed 2 hours. *Provided: No new shafts are provided.*

10. SCOPE (801.1) The provisions of this chapter shall govern the use of materials used as interior finishes, trim and decorative materials.

11. INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY (TABLE 803.13):

GROUP	SPRINKLERED		
	Interior exit stairways and exit passageways	Corridors and exit access stairway enclosure	Rooms and enclosed spaces
B	B	C	C

12. ACOUSTICAL CEILING SYSTEMS (808.1): The quality, design, fabrication and erection of metal suspension systems for acoustical tile and lay-in panel ceilings in buildings or structures shall conform to generally accepted engineering practice, the provisions of this chapter and other applicable requirements of this code.

13. MATERIALS AND INSTALLATION (808.1.1): Acoustical materials complying with the *interior finish* requirements of Section 803 shall be installed in accordance with the manufacturer's recommendations and applicable provisions for applying *interior finish*.

14. SUSPENDED ACOUSTICAL CEILINGS (808.1.1.1): Suspended acoustical ceiling systems shall be installed in accordance with the provisions of ASTM C635 and ASTM C636.

15. Fire-Resistance-Rated Construction (808.1.1.2): Acoustical ceiling systems that are part of fire-resistance-rated construction shall be installed in the same manner used in the assembly tested and shall comply with the provisions of Chapter 7.

16. SPRINKLER SYSTEM – ALARMS (903.4.2): An approved audible device, located on the exterior of the building in an approved location, shall be connected to each automatic sprinkler system.

17. PORTABLE FIRE EXTINGUISHERS (906.1): Portable fire extinguishers shall be installed in Group A, B, and R-2 occupancies.

18. PORTABLE FIRE EXINGUISHER SIZE AND DISTRIBUTION (Table 906.3(1)): Portable fire extinguishers shall be installed in Groups A, B, and R-2 are regarded as ordinary hazard and shall have min. 2-A-rated extinguishers for a max. of 1,500 SF per unit of A, a maximum of 11,250 sq. ft. per extinguisher, and maximum travel distance of 75 feet. *Provided*

19. FIRE ALARM AND DETECTION SYSTEMS – GROUP B (907.2.2): A manual fire alarm system shall be installed in Group B occupancies where one of the following conditions exists:

    1) The combined Group B occupant load of all floors is 500 or more.

    2) The Group B occupant load is more than 100 persons above or below the lowest level of exist discharge.

    3) The fire area includes an ambulatory care facility.

    Exception: Manual fire alarm boxes are not required where the building is equipped through with an automatic sprinkler system and the occupant notification appliance will activate throughout the notification zones upon sprinkler waterflow.

    Provided: Per the exception, a manual fire alarm boxes are not required because the building has a sprinkler system throughout the building.

20. OCCUPANT NOTIFICATION SYSTEMS (907.5): A fire alarm system shall annunciate at the fire alarm control unit and shall initiate occupant notification upon activation, in accordance with Sections 907.4.1 through 907.5.2.3.3. Where a fire alarm system is required by another section of this code, it shall be activated by:
    1. Automatic fire detectors
    2. Automatic sprinkler system waterflow devices
    3. Manual fire alarm boxes
    4. Automatic fire-extinguishing systems.

    Provided: The building's automatic sprinkler system requires a notification system, per 907.2.2 .

21. OCCUPANT LOAD CALCULATIONS (Table 1004.5): (Note, per the Ch. 2 definition, the building area is within the exterior walls.) Note: FLOOR AREA, NET. The actual occupied area not including unoccupied accessory areas such as corridors, stairways, toilet rooms, mechanical rooms and closets.

FLOOR	OCCUPANCY CLASSIFICATION	FUNCTION OF SPACE	AREA (SF)	LOAD FACTOR	OCCUPANT LOAD
BASEMENT	B	B- Laboratory	2,254	150 gross	15
2nd FLOOR	B	B- Laboratory	808	150 gross	6

Provided: Occupancy Load did not increase.

22. MINIMUM REQUIRED EGRESS WIDTH (1005.3.1 and 1005.3.2):

    a. Other egress components: 0.2 x 15 = 3"; 0.2 X 6 = 1.2" *Provided: The egress doors from each lab provide a minimum of 72" of egress width.*

23. SPACES WITH ONE EXIT OR EXIST ACCESS DOORWAY (TABLE 1006.2.1): Two exits or exit access doorways from any space shall be provided where the design occupant load or the common path of egress travel distance exceeds the values listed in Table 1006.2.1

Occupancy	Max. Occupant Load of Space	Max. Common Path of Egress in sprinklered building
B	49	100

Provided: Room 234 and Basement 008 require only one exit

24. MEANS OF EGRESS ILLUMINATION (1008.2.1): The means of egress illumination level shall not be less than 1 foot-candle at the floor level.

25. SIZE OF DOORS (1010.1.1): The required capacity of each door opening shall be sufficient for the occupant load thereof and shall provide a minimum clear opening width of 32 inches. *Proposed: Doors will have > 32" clear width.*

26. DOOR SWING (1010.1.2.1): Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons. *Provided: Occupant Load is less than 50 and need not swing in the direction of egress travel.*

27. EXIT ACCESS TRAVEL DISTANCE (Table 1017.2): In Group B in a sprinklered building, the maximum exit access travel distance is 300 ft. *Provided: The Max exit access travel distance is < 300 ft.*

28. CORRIDORS (TABLE 1020.1): Where a building has sprinklers, corridors are not required to be fire-resistant rated in Groups A and B. *Provided: No corridors have rated walls.*

29. CORRIDOR WIDTH (TABLE 1020.2): Corridor widths shall be a minimum of 44 inches wide unless they serve an occupant load less than 50, in which case they shall be a minimum of 36 inches wide. *Provided:* Corridors are >44 inches

30. DEAD ENDS (1020.4): Where more than one exit or exit access doorway is required, the exit access shall be arranged such that there are no dead ends occupancies that are more than 20 feet in length. Exception 2: In occupancies B and R-2 in a building sprinklered throughout, the length of the dead-end shall not exceed 50 feet. *Provided: Building is sprinklered and dead-end corridor is less than 50 feet.*

31. PLUMBING REQUIREMENTS (Table 2902.1, ARM 24.301.351):

OCCU-PANCY	OCC. LOAD	WATER CLOSETS (and urinals, which can make up to 50% of male WC)				LAVATORIES		
		Male Ratio	Male	Female Ratio	Female	Ratio	Male	Female
B	15	1:25	0.3	1:25	0.3	1:2	0.15	0.15
B	6	1:25	0.24	1:25	0.24	1:2	0.12	0.12

Provided: Occupancy has not increased. No new fixtures are required.

2010 ADA Standards for Accessible Design

DINING SURFACES AND WORK SURFACES (226)

GENERAL (226.1): Where dining surfaces are provided for the consumption of food or drink, at least 5 percent of the seating spaces and standing spaces at the dining surfaces shall comply with 902. In addition, where work surfaces are provided for use by other than employees, at least 5 percent shall comply with 902.

ADVISORY (226.1) In facilities covered by the ADA, this requirement does not apply to work surfaces used only by employees. However, the ADA and, where applicable, Section 504 of the Rehabilitation Act of 1973, as amended, provide that employees are entitled to "reasonable accommodations." With respect to work surfaces, this means that employers may need to procure or adjust work stations such as desks, laboratory and work benches, fume hoods, reception counters, teller windows, study carrels, commercial kitchen counters, and conference tables to accommodate the individual needs of employees with disabilities on an "as needed" basis. Consider work surfaces that are flexible and permit installation at variable heights and clearances.

DINING SURFACES AND WORK SURFACES (902)

GENERAL (902.1). Dining surfaces and work surfaces shall comply with 902.2 and 902.3.

ADVISORY (902.1): Dining surfaces include, but are not limited to, bars, tables, lunch counters, and booths. Examples of work surfaces include writing surfaces, study carrels, student laboratory stations, baby changing and other tables or fixtures for personal grooming, coupon counters, and where covered by the ABA scoping provisions, employee work stations.

CLEAR FLOOR OR GROUND SPACE (902.2): A clear floor space complying with 305 positioned for a forward approach shall be provided. Knee and toe clearance complying with 306 shall be provided.

HEIGHT (902.3): The tops of dining surfaces and work surfaces shall be 28 inches (710 mm) minimum and 34 inches (865 mm) maximum above the finish floor or ground.

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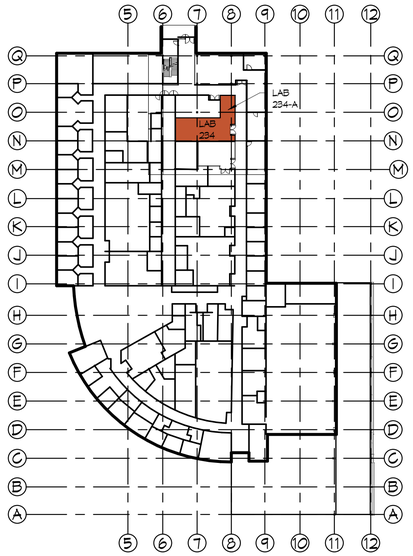
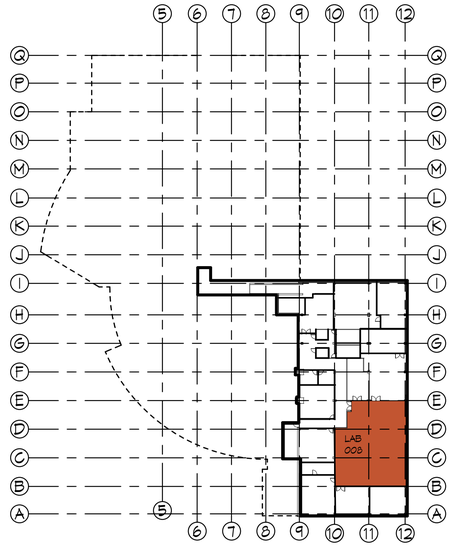
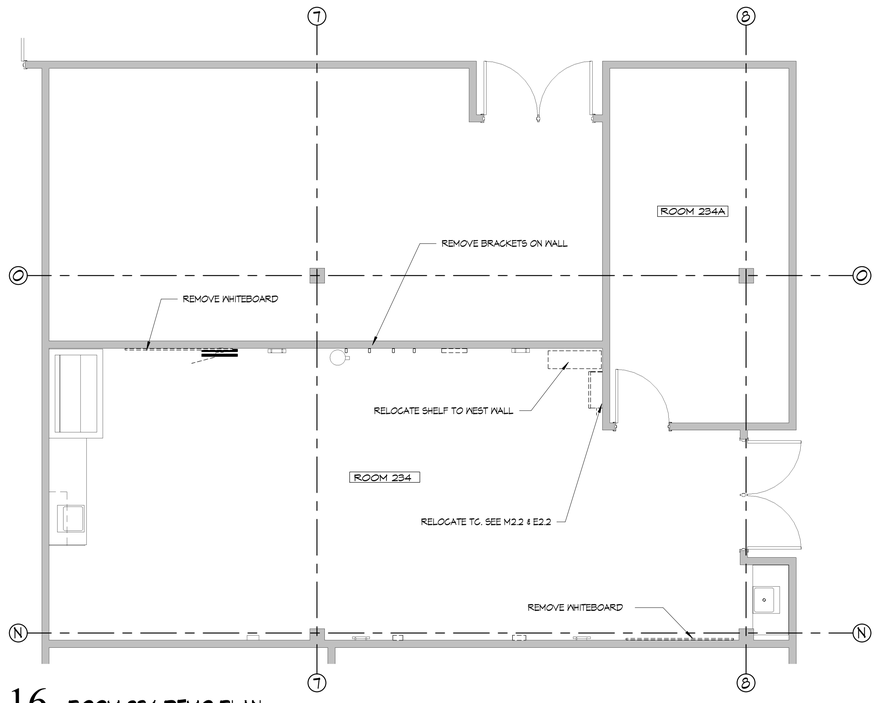


6 SECOND FLOOR DEMO KEY PLAN
D2.1 1" = 50'-0"



7 BASEMENT DEMO KEY PLAN
D2.1 1" = 50'-0"

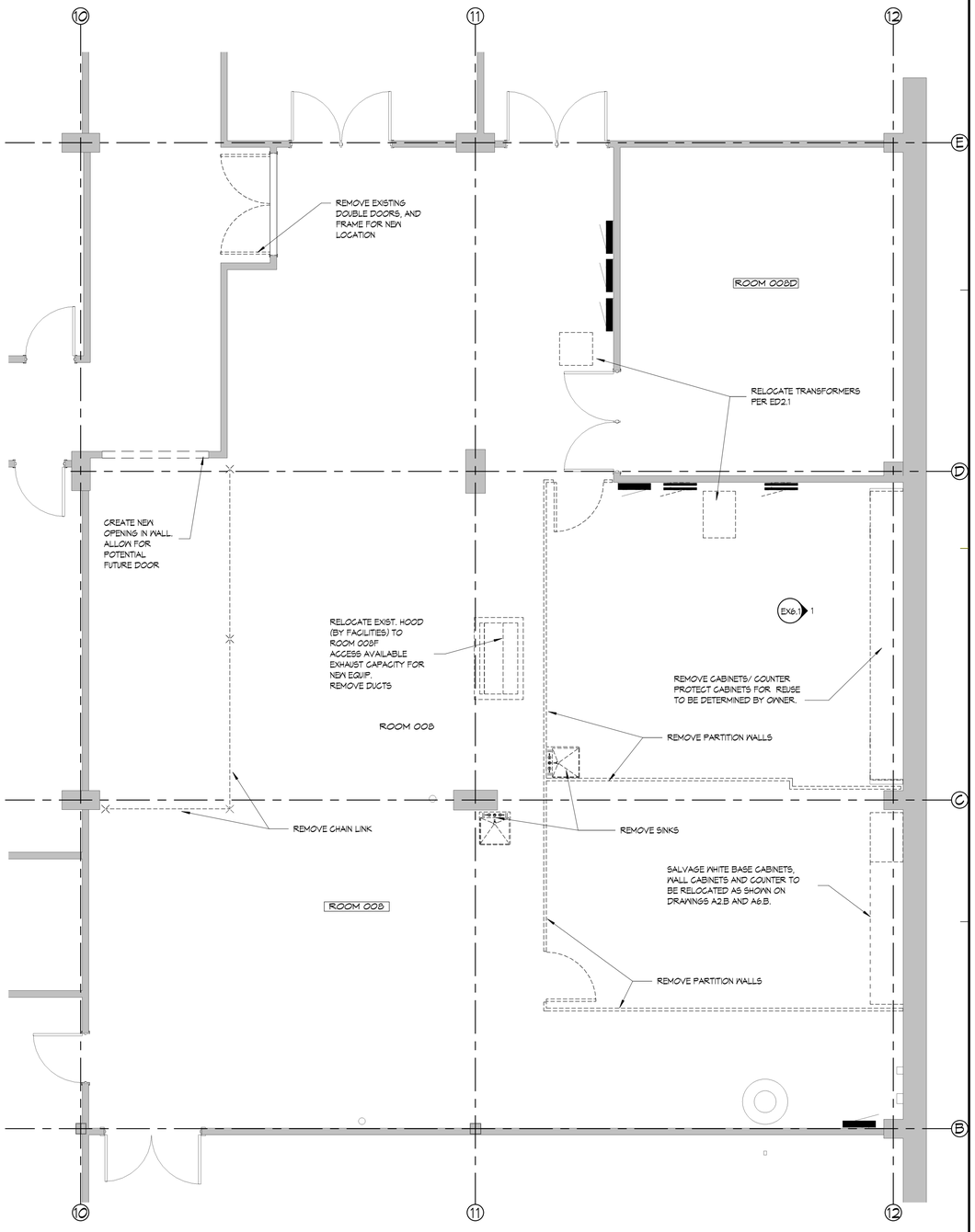


16 ROOM 234 DEMO PLAN
D2.1 1/4" = 1'-0"

DEMOLITION NOTES

1. PROTECT ALL SURFACES DURING DEMOLITION
2. REMOVE INDICATED EXISTING DOOR, HARDWARE AND KEYPAD. PROTECT AND STORE FOR RELOCATION.
3. ALL EQUIPMENT AND FURNITURE TO BE RELOCATED TO BE COORDINATED WITH OWNER

DEMOLITION NOTES



19 ROOM 008 DEMO PLAN
D2.1 1/4" = 1'-0"

STATE OF MONTANA
HIGH PLAINS ARCHITECTS
RANDY PARENT
9665
BILLINGS, MONTANA
LICENSED ARCHITECT

DEMOLITION PLANS

BARNARD ROOM & QUANTUM FOUNDRY RENOVATION

100% CONSTRUCTION DOCUMENTS

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PROJECT#: 22210
DATE: 04/18/2024

D2.1

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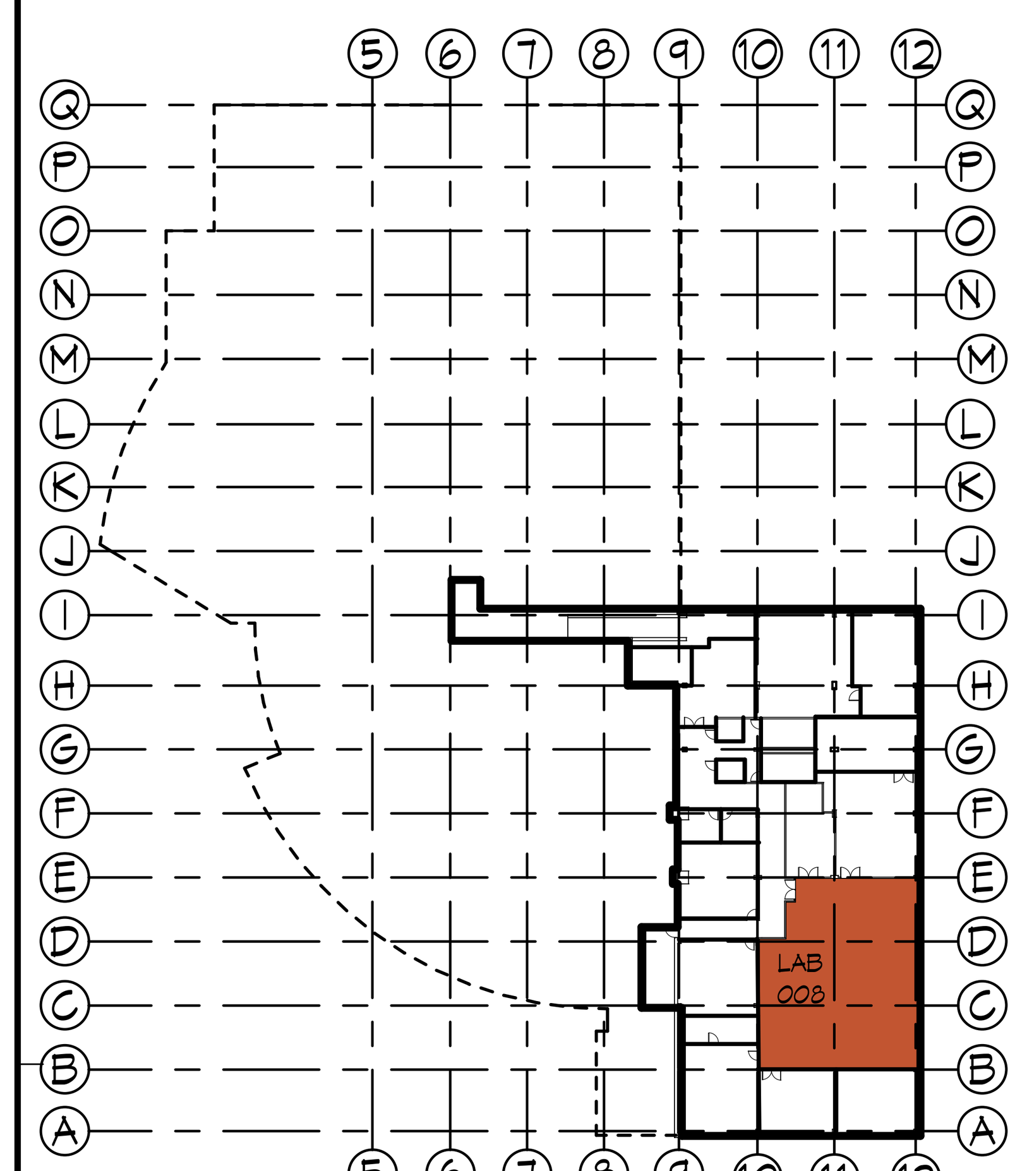
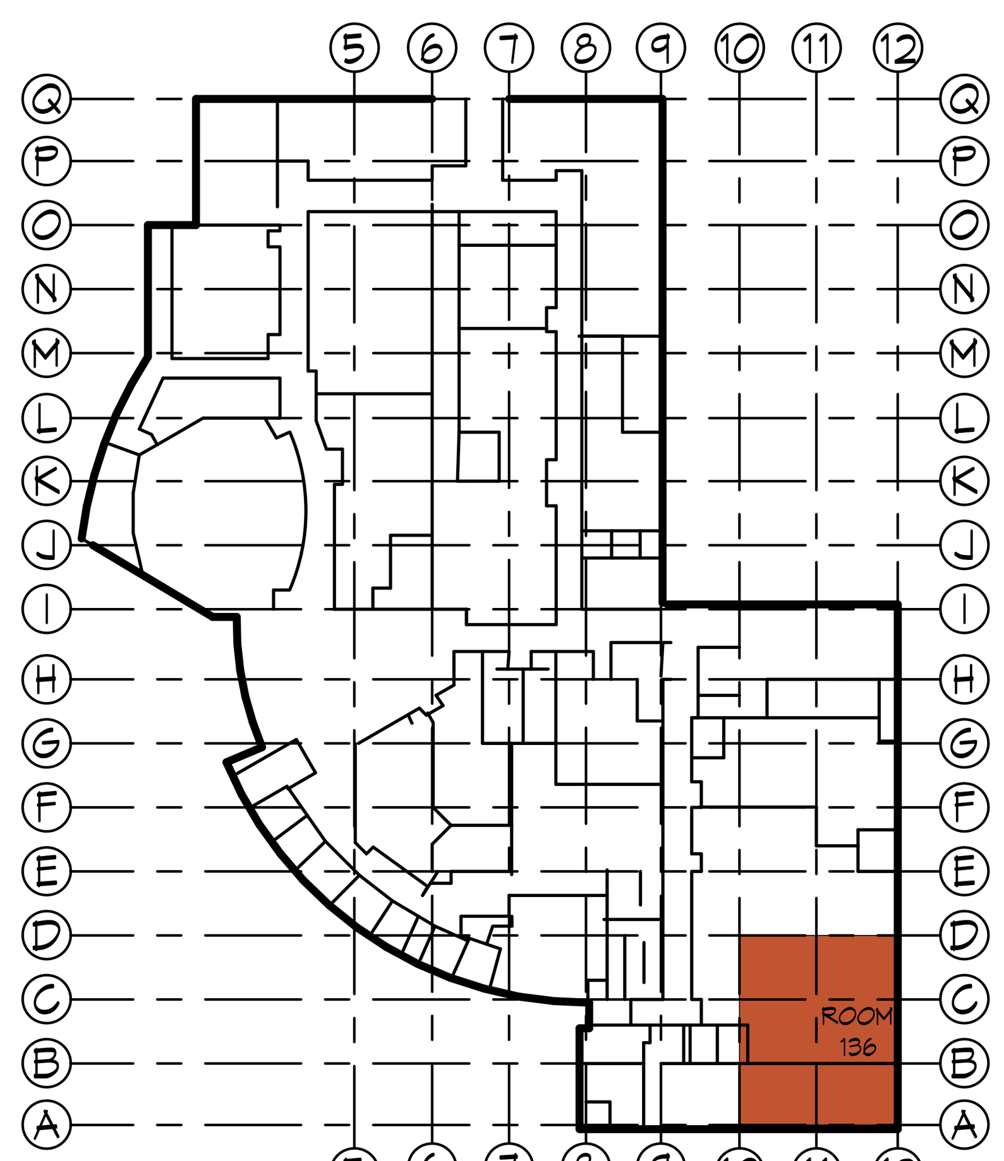
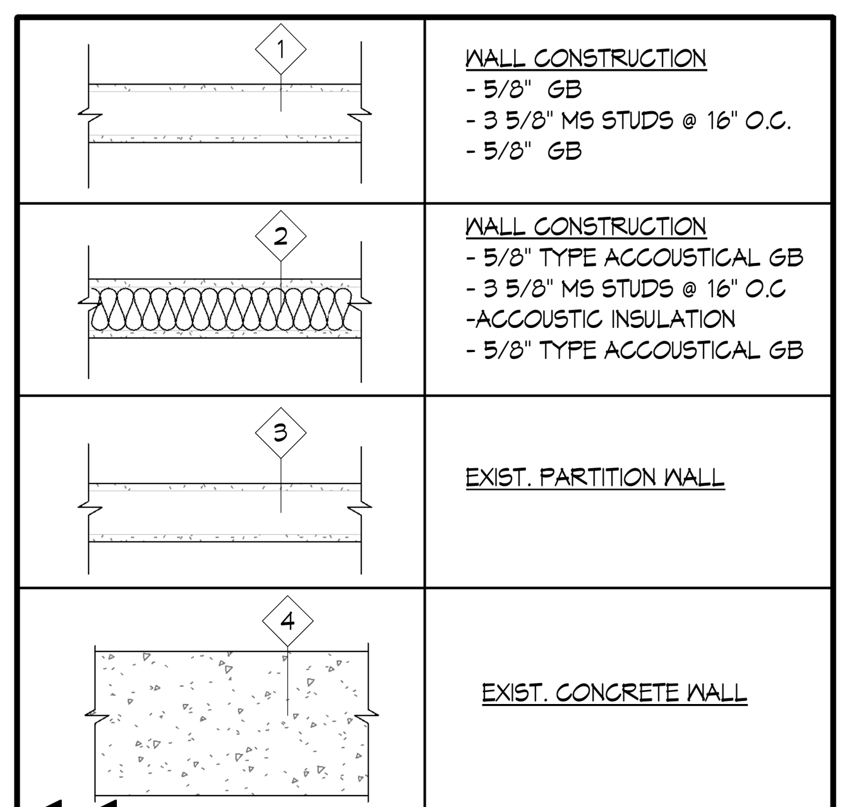


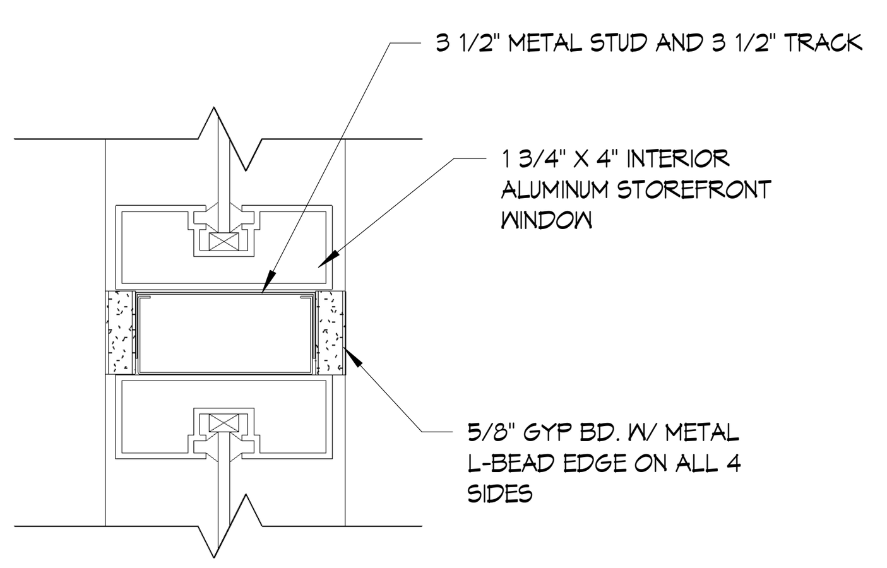
6 BASEMENT KEY PLAN
A2.B 1" = 60'-0"



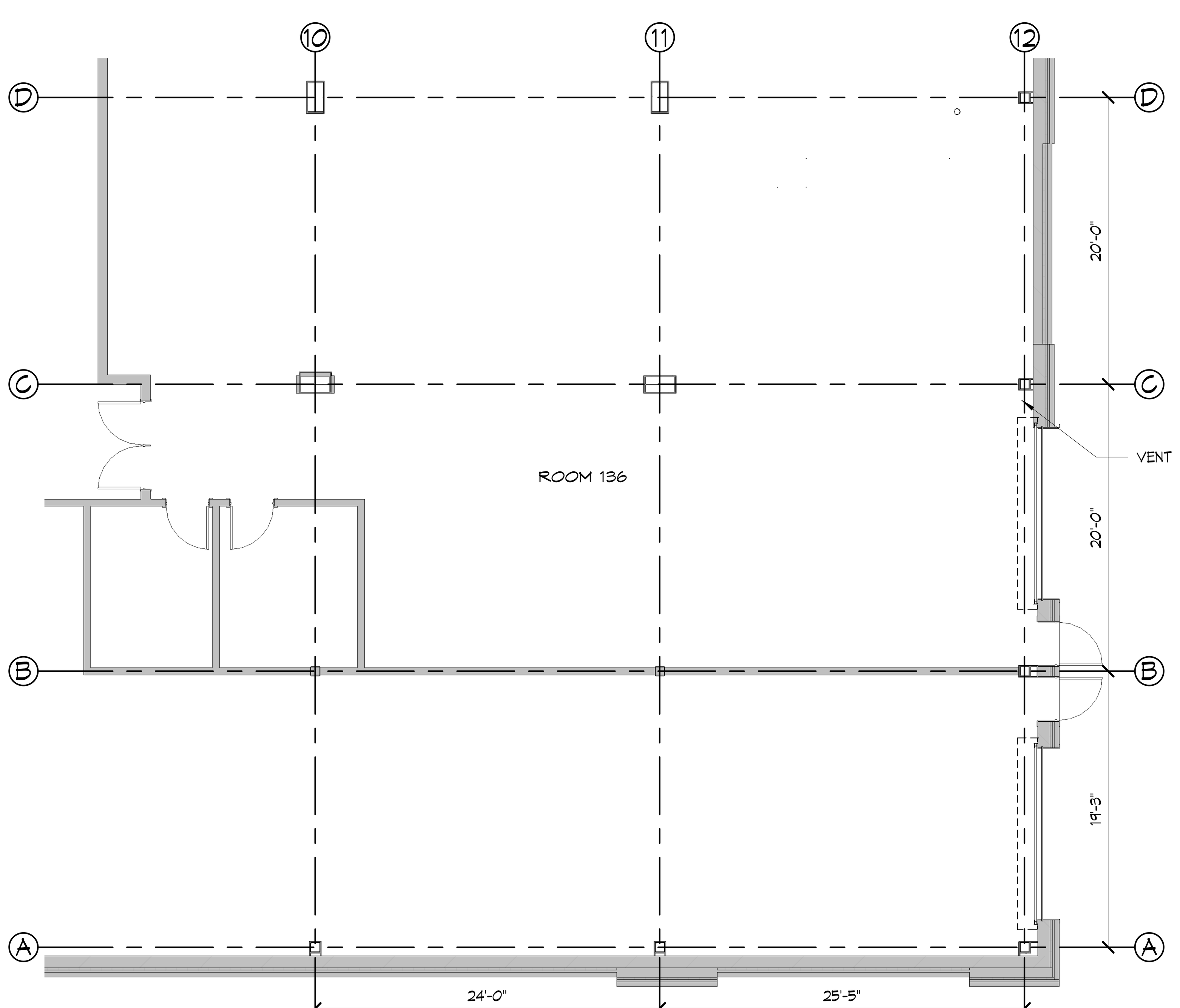
7 FIRST FLOOR KEY PLAN
A2.B 1" = 60'-0"



11 WALL TYPES
A2.B 3/4" = 1'-0"

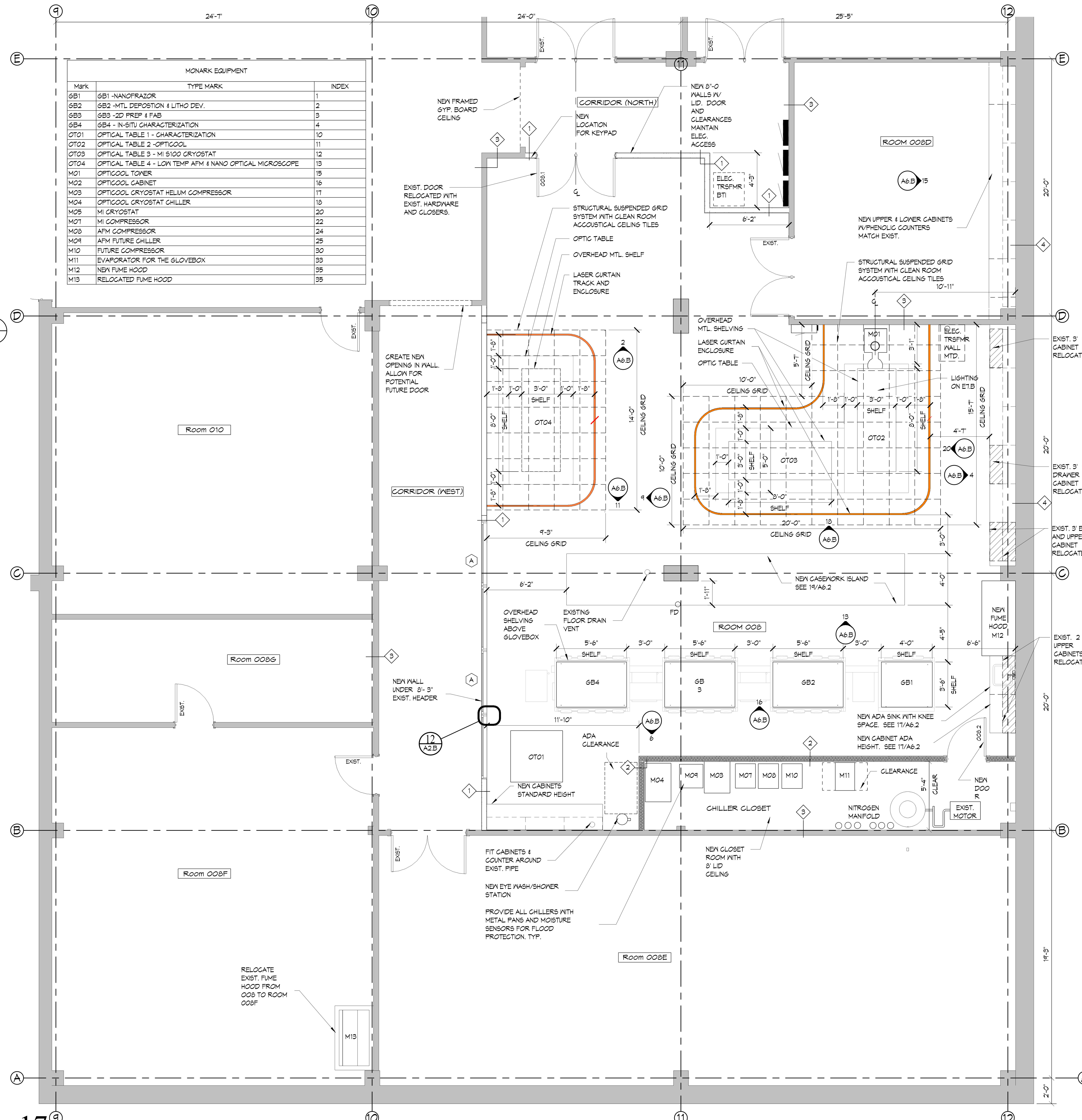


12 PLAN DETAIL @ WINDOW FRAMING
A2.B 3" = 1'-0"



16 FIRST FLOOR - VENT LOCATION PLAN
A2.B 1/8" = 1'-0"

MONARK EQUIPMENT		
Mark	TYPE MARK	INDEX
GB1	GB1 -NANOFRAZOR	1
GB2	GB2 -MTL DEPOSTION & LITHO DEV.	2
GB3	GB3 -2D PREP & FAB	3
GB4	GB4 - IN-SITU CHARACTERIZATION	4
OT01	OPTICAL TABLE 1 - CHARACTERIZATION	10
OT02	OPTICAL TABLE 2 -OPTICOOL	11
OT03	OPTICAL TABLE 3 - MI S100 CRYOSTAT	12
OT04	OPTICAL TABLE 4 - LOW TEMP AFM & NANO OPTICAL MICROSCOPE	13
M01	OPTICOOL TOWER	15
M02	OPTICOOL CABINET	16
M03	OPTICOOL CRYOSTAT HELIUM COMPRESSOR	17
M04	OPTICOOL CRYOSTAT CHILLER	18
M05	MI CRYOSTAT	20
M07	MI COMPRESSOR	22
M08	AFM COMPRESSOR	24
M09	AFM FUTURE CHILLER	25
M10	FUTURE COMPRESSOR	30
M11	EVAPORATOR FOR THE GLOVEBOX	33
M12	NEW FUME HOOD	35
M13	RELOCATED FUME HOOD	35



17 BASEMENT REMODEL PLAN - MonArk LAB FACILITY
A2.B 1/4" = 1'-0"

STATE OF MONTANA
RANDY HAFERT
LICENSED ARCHITECT

ROOM 008 BASEMENT REMODEL PLAN
BARNARD ROOM 8 QUANTUM FOUNDRY RENOVATION
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PROJECT#:	22210
DATE:	04/18/2024

A2.B

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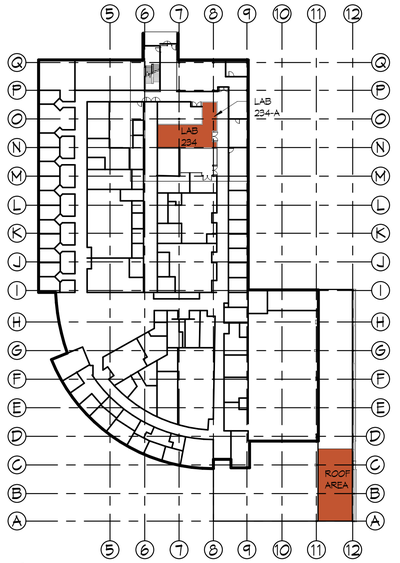
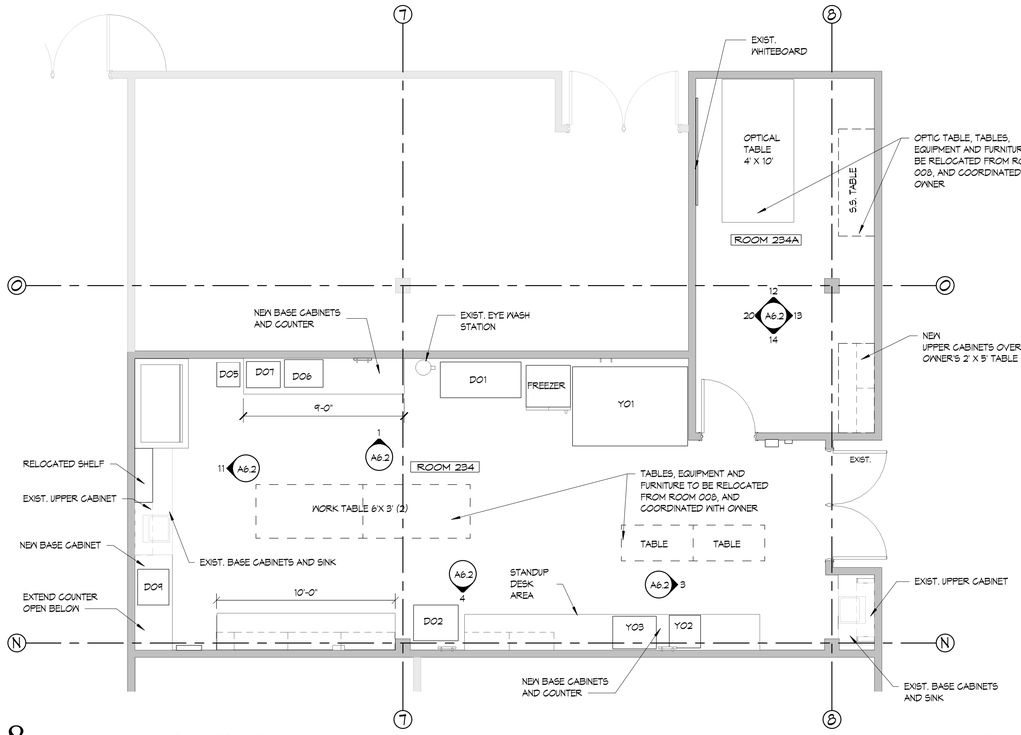


6 SECOND FLOOR KEY PLAN
A2.2 1" = 50'-0"



8 ROOM 234 REMODEL PLAN
A2.2 1/4" = 1'-0"

NEW DOOR SCHEDULE

DOOR MARK	DOOR SIZE			FRAME		HEAD DETAIL	JAMB DETAIL	SILL DETAIL	MISC. HARDWARE GROUP	FIRE RATING	DOOR NOTES
	WIDTH	HEIGHT	THICK	MATL	FINISH						
BASEMENT LEVEL											
008.2	3' - 0"	7' - 0"	1 3/4"	HMTL	PAINT				PASSAGE		
008.1	6' - 1"	6' - 8"	1 3/4"								EXIST. RELOCATED

ROOM FINISH SCHEDULE

ROOM NAME	FLOOR		WALLS				CEILING		FINISH NOTES
	MATERIAL	BASE	NORTH	SOUTH	EAST	WEST	FINISH	HEIGHT	
SECOND FLOOR									
ROOM 234	EXIST	EXIST	GB/PNT#	GB/PNT#	GB/PNT#	GB/PNT#	EXP	14' - 0"	
ROOM 234A	EXIST	EXIST	GB/PNT#	GB/PNT#	GB/PNT#	GB/PNT#	EXP	14' - 0"	
BASEMENT LEVEL									
ROOM 008	CONC	RB	GB/PNT#	GB/PNT#	CONC	GB/PNT#	EXP/ SACT	14' - 3"	
ROOM 008D	CONC	RB	GB/PNT#	GB/PNT#	CONC	GB/PNT#	EXP/ SACT	14' - 3"	
CHILLER CLOSET	CONC		GB/PNT#	GB/PNT#	CONC	GB/PNT#	GB/PNT#	8' - 0"	
CORRIDOR (NORTH)	EXIST	RB	EXIST	GB/PNT#	EXIST	EXIST	GB/PNT#	8' - 0"	
CORRIDOR (WEST)	EXIST	RB	EXIST	GB/PNT#	GB/PNT#	EXIST	EXIST, SACT	15' - 0"	

FLOOR
CONC STAINED CONCRETE (SEE ALTERNATE 1)
EXIST EXISTING

BASE
RB 4" RUBBER BASE

WALL
CONC CONCRETE
GB/PNT# GYPSUM BOARD/PAINT COLOR # TO BE DETERMINED

CEILING
SACT SUSPENDED ACOUSTICAL CEILING TILE
EXP EXPOSED STRUCTURE
GB/PNT# GYPSUM BOARD/PAINT COLOR # TO BE DETERMINED

COMMENTS
FINISH SCHEDULE APPLIES TO GENERAL AREA.
THERE MAYBE SPECIFIC FINISH REQUIREMENTS SHOWN ON DETAILS, DRAWINGS OR SPECIFICATIONS.

VERIFY BASE LOCATIONS ARE SHOWN ACCURATELY-IS BASE NEEDED AT CASEWORK, ETC?

ALTERNATE 1:
FLUID APPLIED FLOORING

DILPREET BAJWA EQUIPMENT

Mark	EQUIPMENT	Description
D01	WEATHER-O-METER	
D02	HOT PRESS	
D05	ULTRASONIC EQUIP.	
D06	SMALL OVEN	
D07	HERMA THERM OVEN	
D09	UNIVERSAL TESTING MACHINE	

YAOFA LI EQUIPMENT

Mark	EQUIPMENT	Description
Y01	DUST FREE ROOM	
Y02	VWR OVEN	
Y03	LINDBERG OVEN	

STATE OF MONTANA
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LICENSED ARCHITECT
BILLINGS, MONTANA

ROOM 234 REMODEL PLAN
BARNARD ROOM & QUANTUM FOUNDRY RENOVATION
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A2.2

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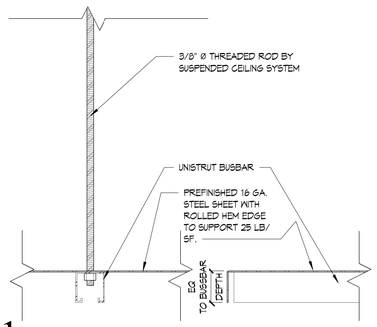
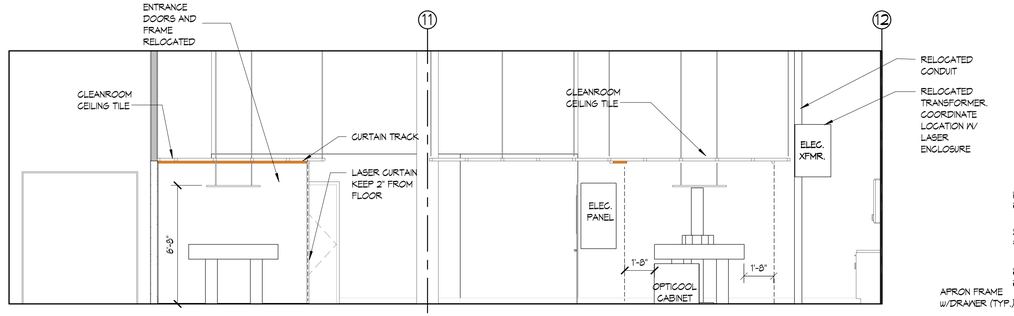
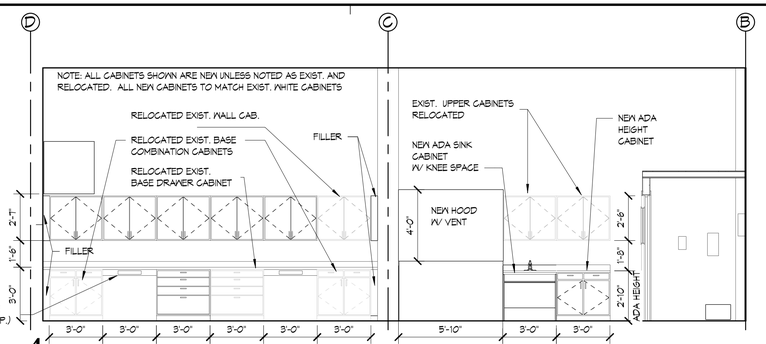


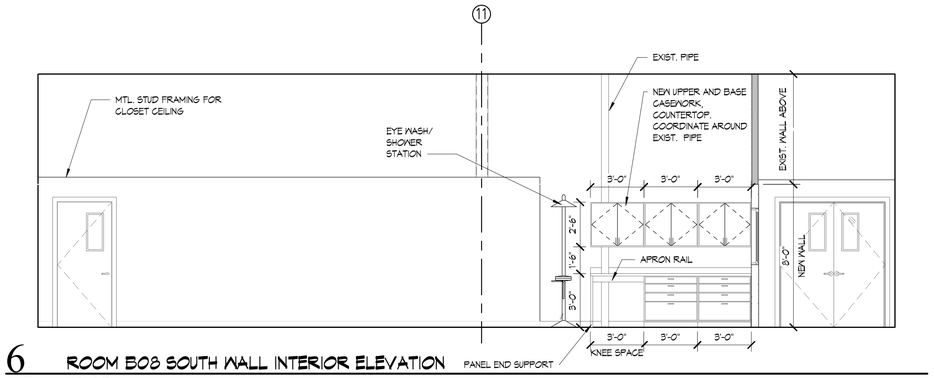
1 SHELF SUSPENSION DETAIL
A6.B 3" = 1'-0"



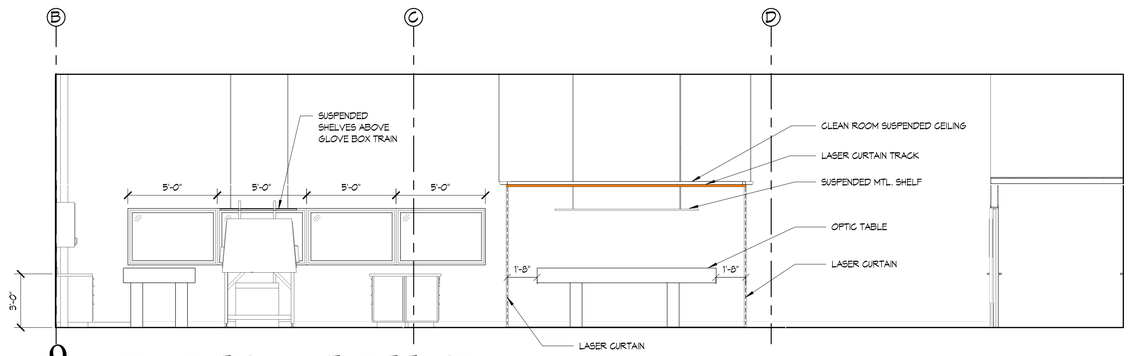
2 ROOM 008 NORTH INTERIOR ELEVATION
A6.B 1/4" = 1'-0"



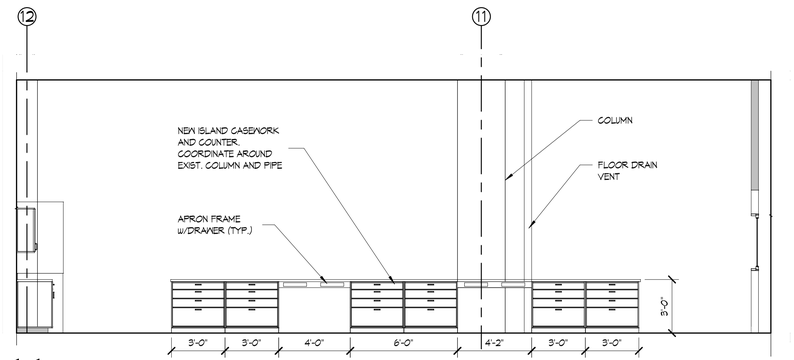
4 ROOM 008 EAST WALL INTERIOR ELEVATION
A6.B 1/4" = 1'-0"



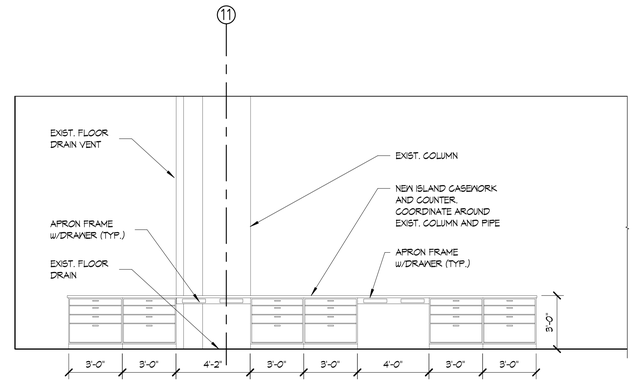
6 ROOM 008 SOUTH WALL INTERIOR ELEVATION
A6.B 1/4" = 1'-0"



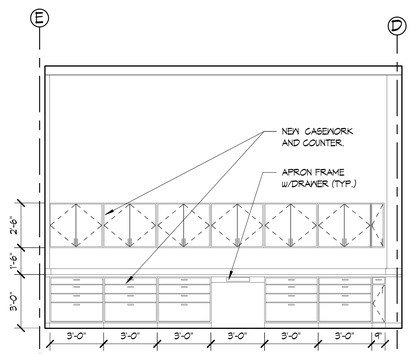
9 ROOM 008 WEST WALL INTERIOR ELEVATION
A6.B 1/4" = 1'-0"



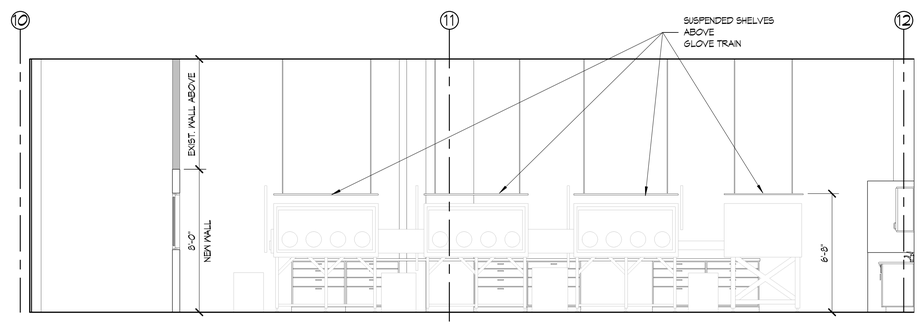
11 ISLAND CABINETS INTERIOR ELEVATION - NORTH
A6.B 1/4" = 1'-0"



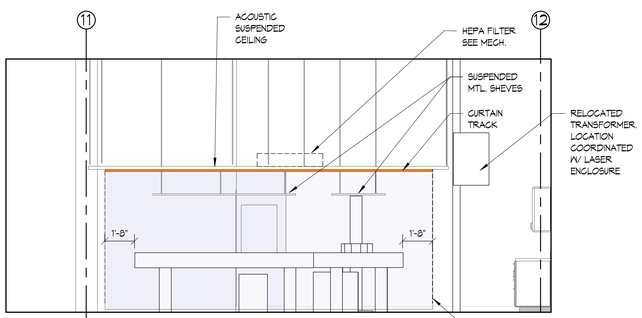
13 ISLAND CABINETS INTERIOR ELEVATION -SOUTH
A6.B 1/4" = 1'-0"



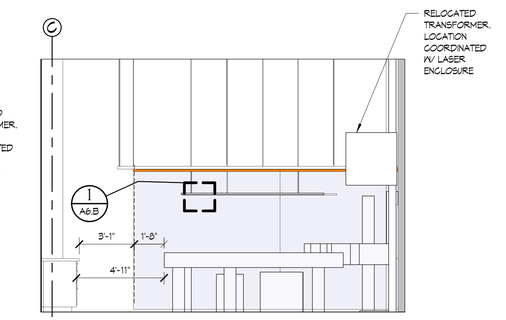
15 ROOM 008D EAST ELEVATION
A6.B 1/4" = 1'-0"



16 GLOVEBOX ELEVATION
A6.B 1/4" = 1'-0"



18 OPTICAL TABLE 2 & 3 ELEVATION
A6.B 1/4" = 1'-0"



20 OPTICAL TABLE 2 ELEVATION
A6.B 1/4" = 1'-0"

STATE OF MONTANA
HIGH PLAINS ARCHITECTS
RANDY PARENT
LICENSED ARCHITECT
BILLINGS, MONTANA

ROOM 008 BASEMENT INTERIOR ELEVATIONS
BARNARD ROOM & QUANTUM FOUNDRY RENOVATION
100% CONSTRUCTION DOCUMENTS

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A6.B

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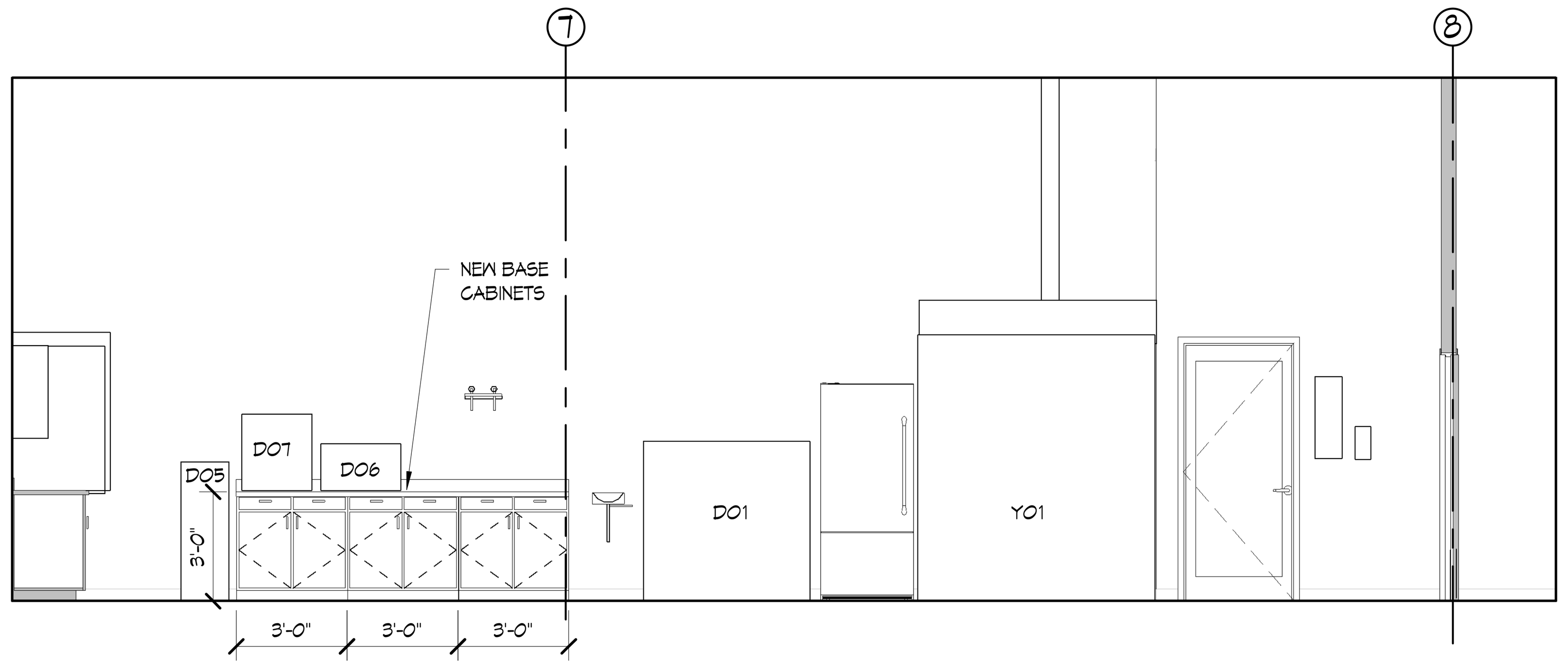
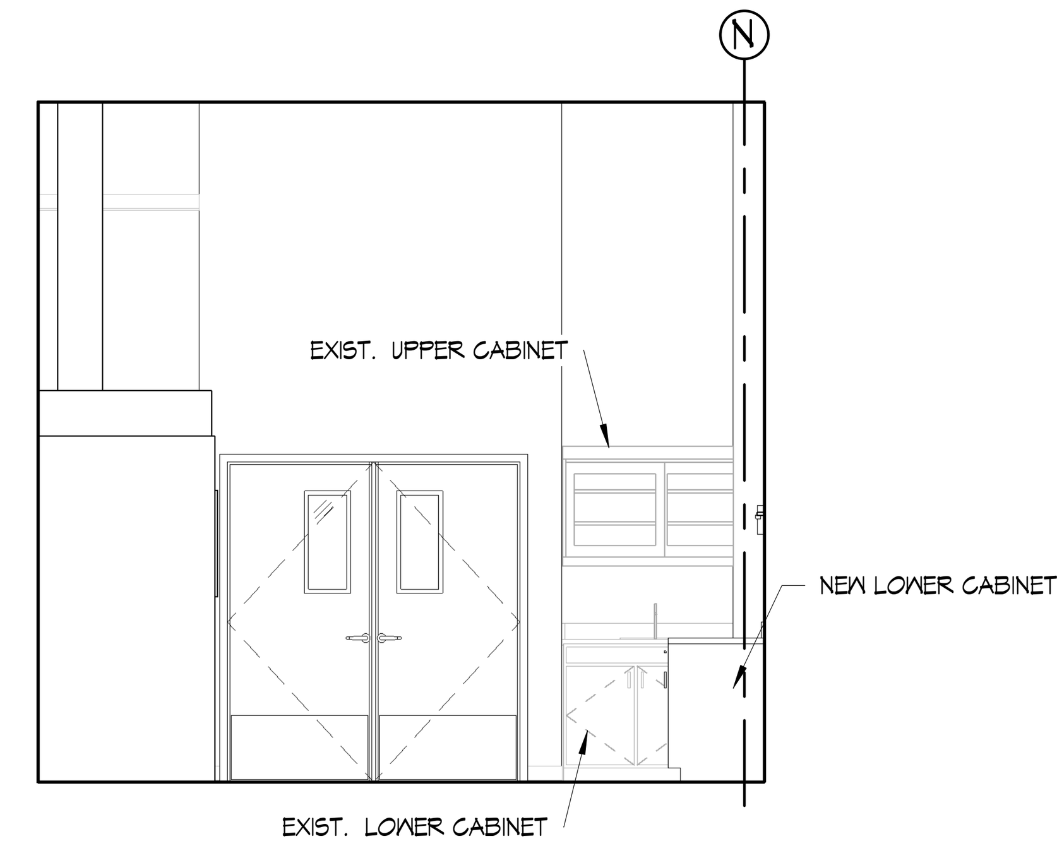
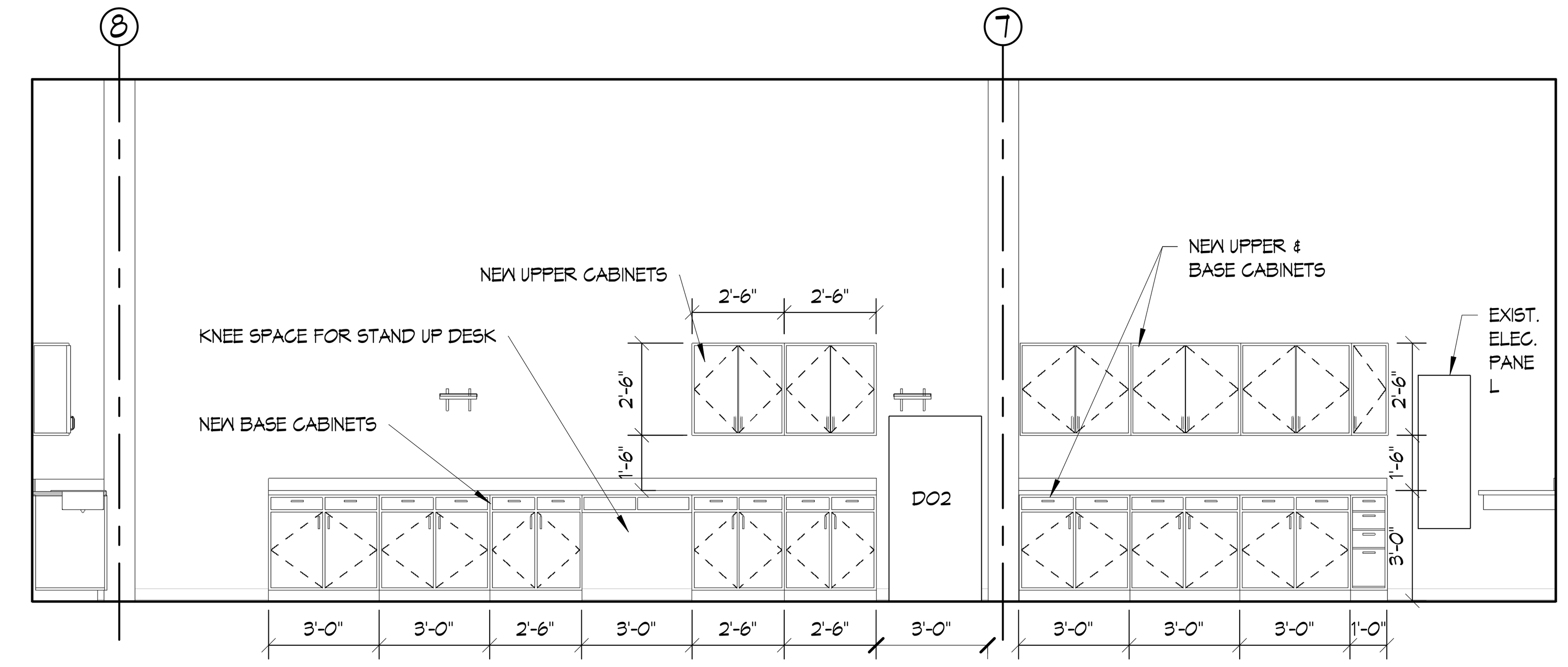


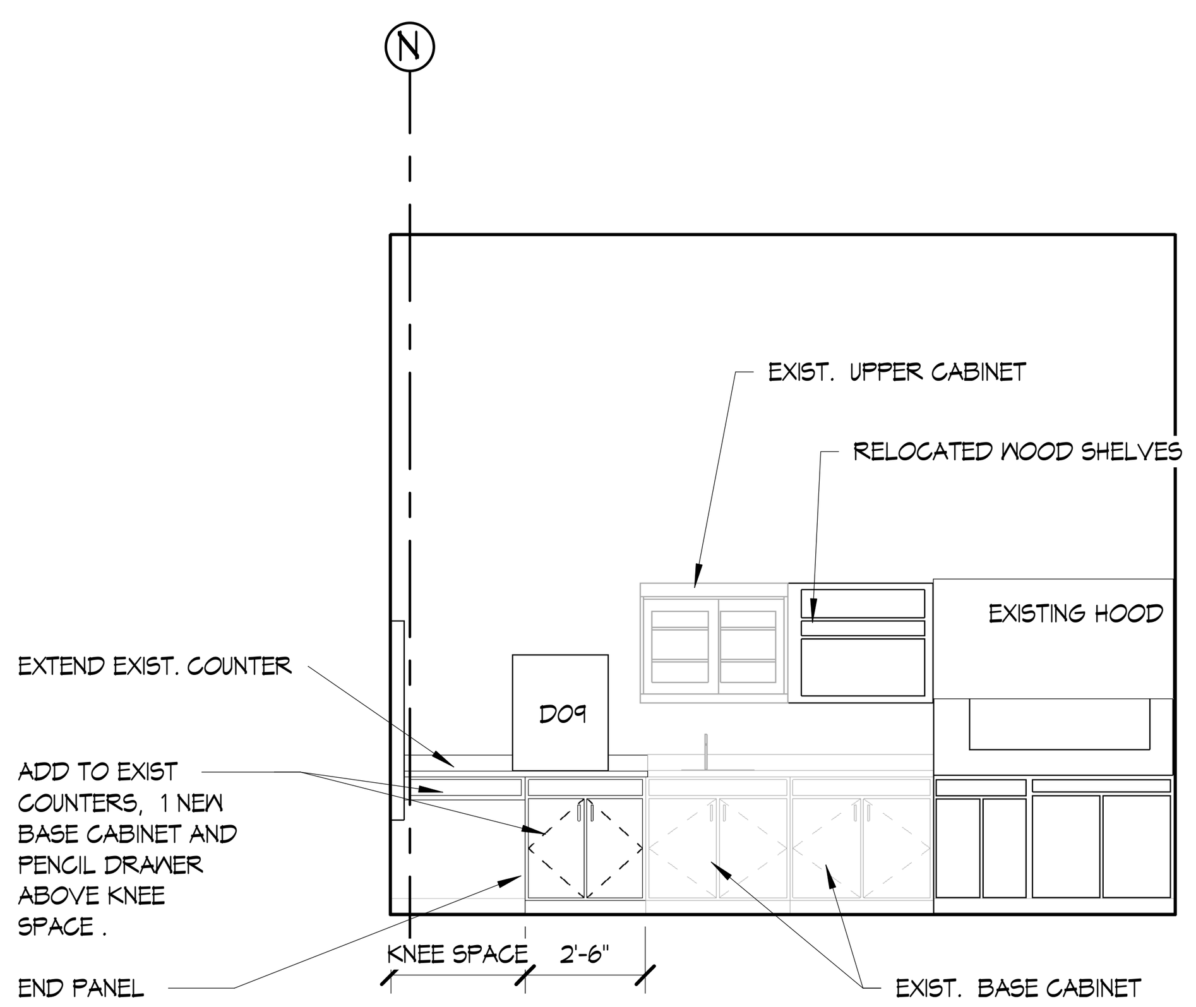
1 ROOM 234 NORTH INTERIOR ELEVATION
A6.2 1/4" = 1'-0"



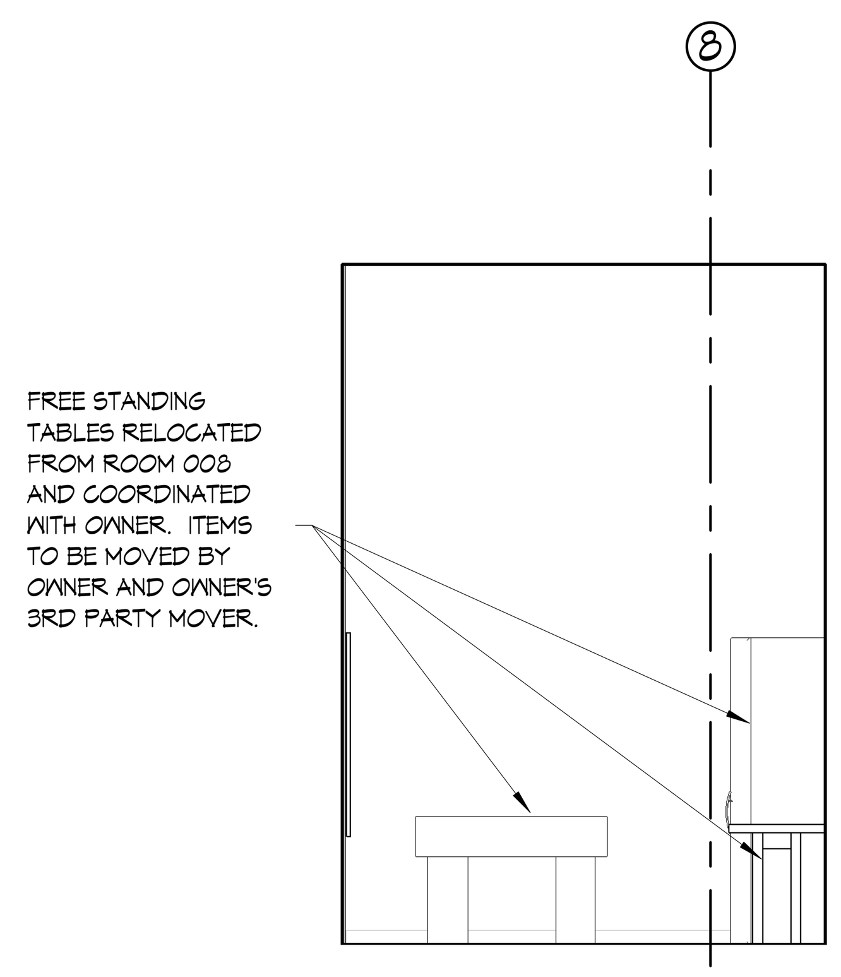
3 ROOM 234 EAST INTERIOR ELEVATION
A6.2 1/4" = 1'-0"



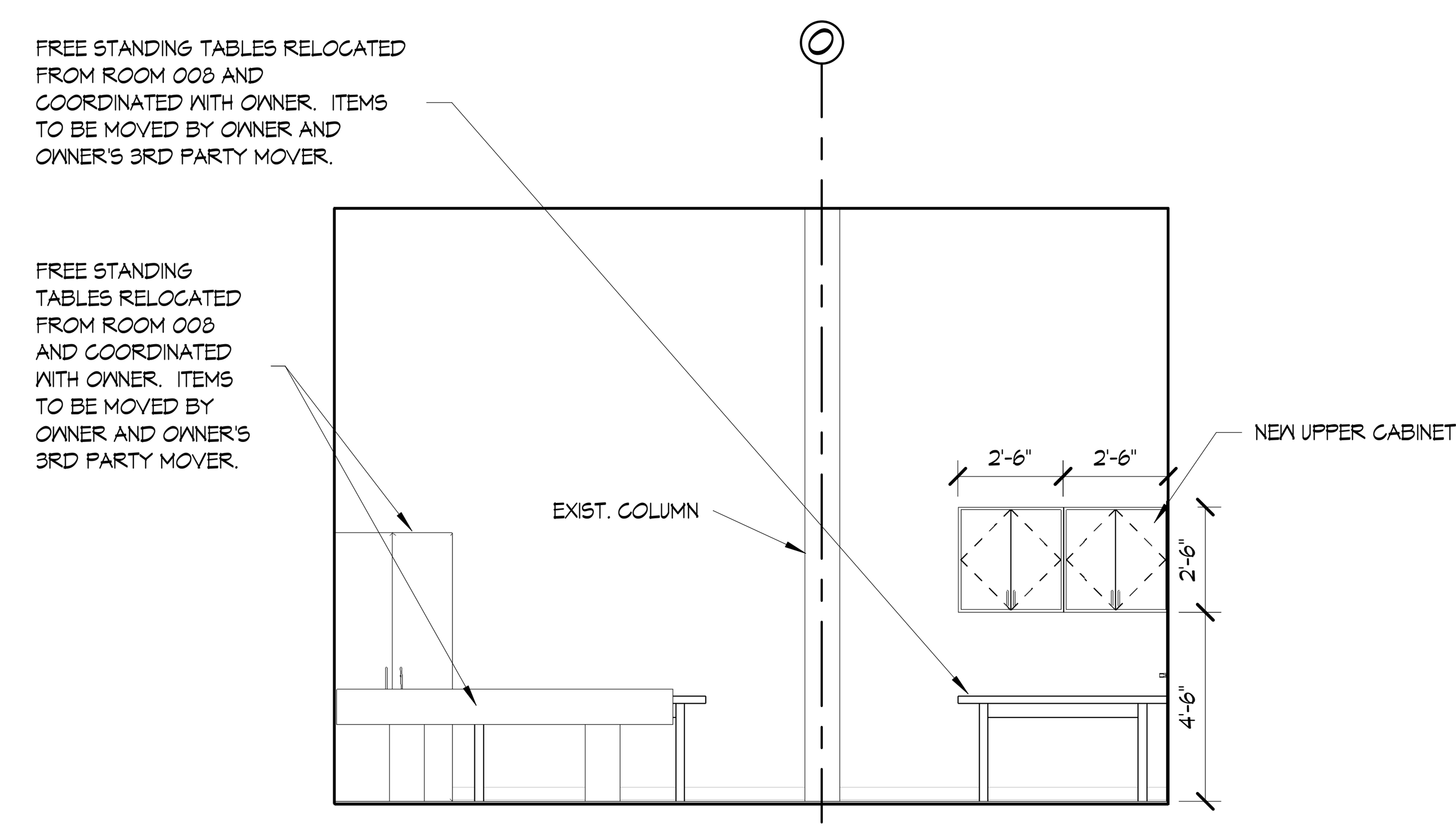
4 ROOM 234 SOUTH INTERIOR ELEVATION
A6.2 1/4" = 1'-0"



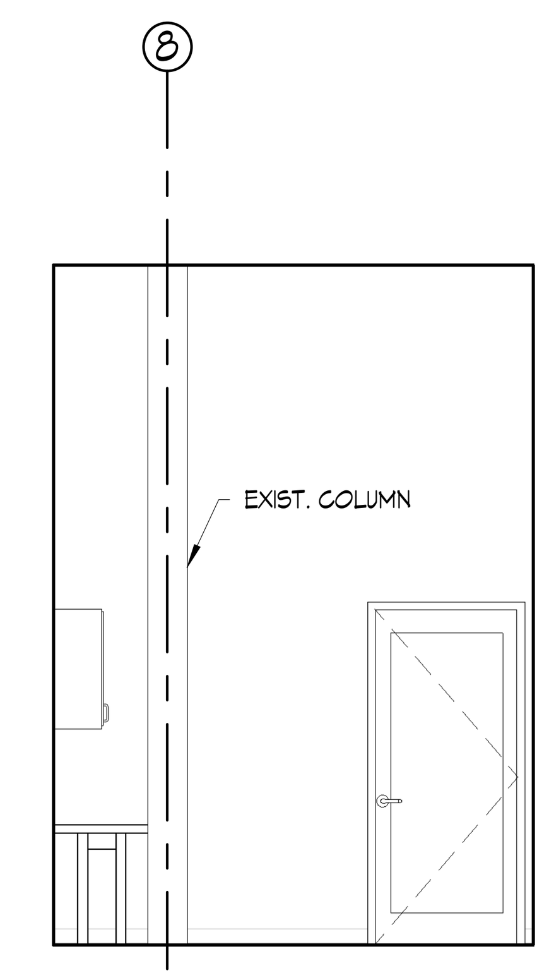
11 ROOM 234 WEST INTERIOR ELEVATION
A6.2 1/4" = 1'-0"



12 ROOM 234-A NORTH INTERIOR ELEVATION
A6.2 1/4" = 1'-0"

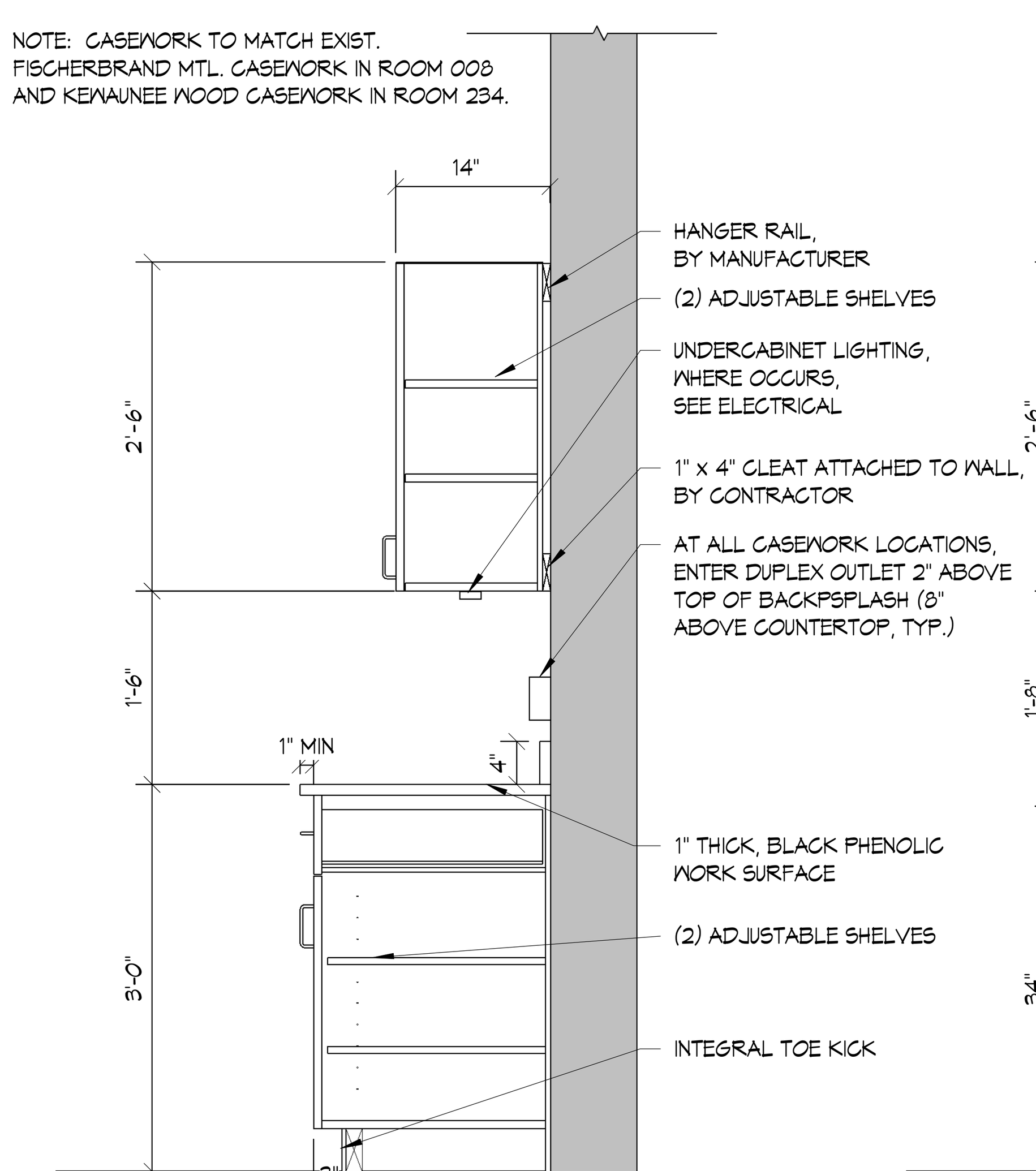


13 ROOM 234-A EAST INTERIOR ELEVATION
A6.2 1/4" = 1'-0"

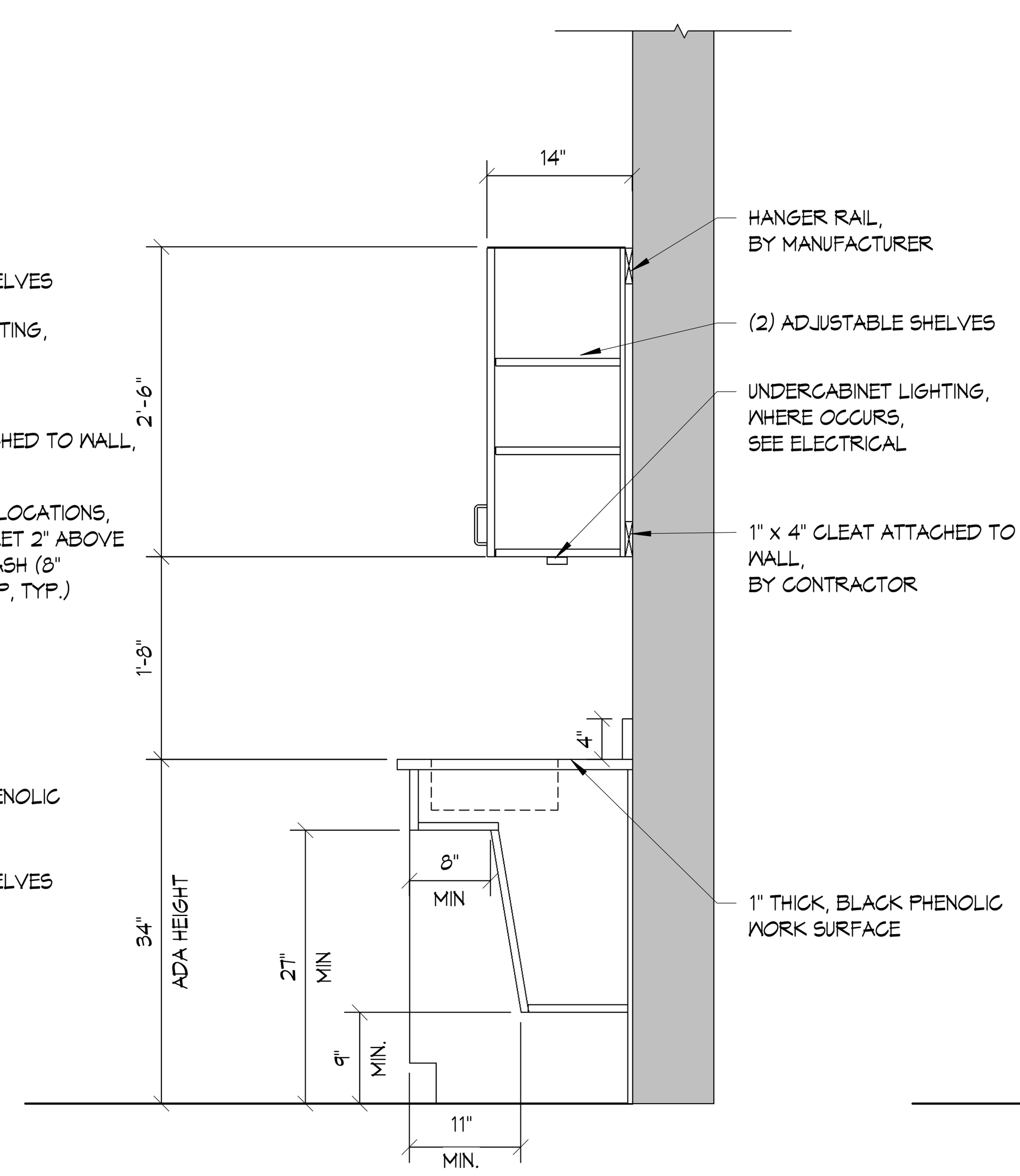


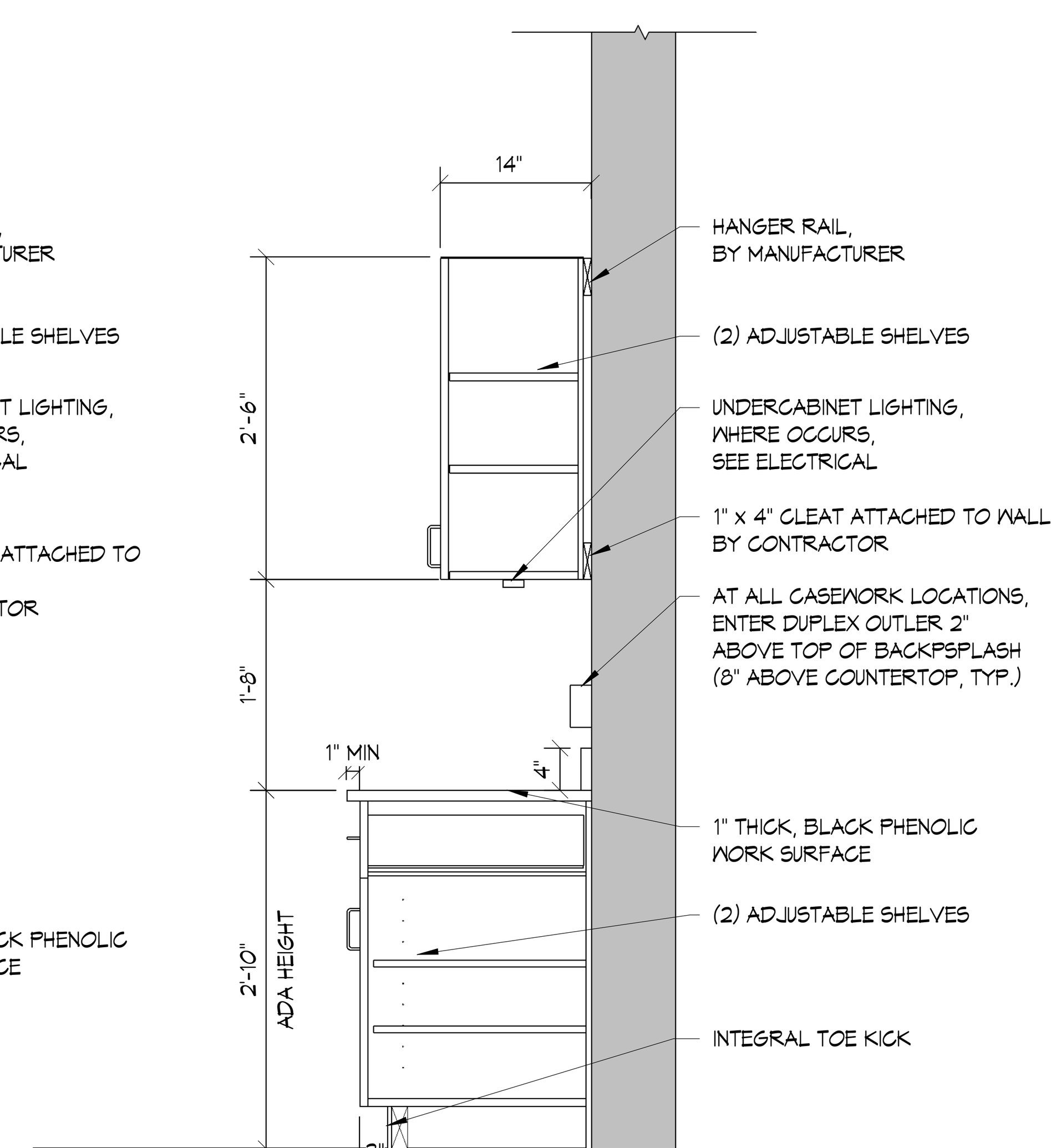
14 ROOM 234-A SOUTH INTERIOR ELEVATION
A6.2 1/4" = 1'-0"

NOTE: CASEWORK TO MATCH EXIST. FISCHERBRAND MTL. CASEWORK IN ROOM 008 AND KEWAUNEE WOOD CASEWORK IN ROOM 234.

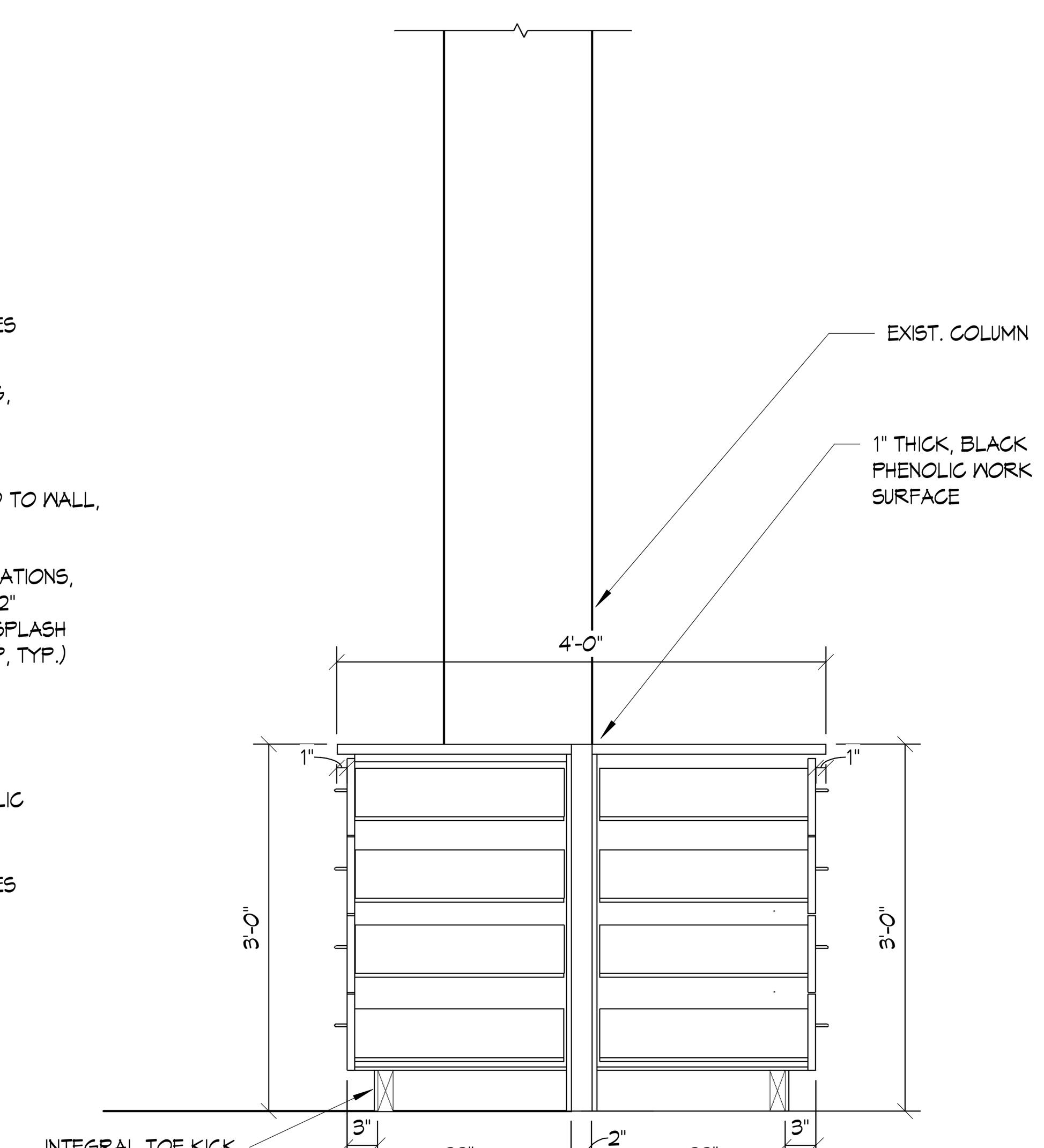


16 STANDARD CASEWORK
A6.2 3/4" = 1'-0"

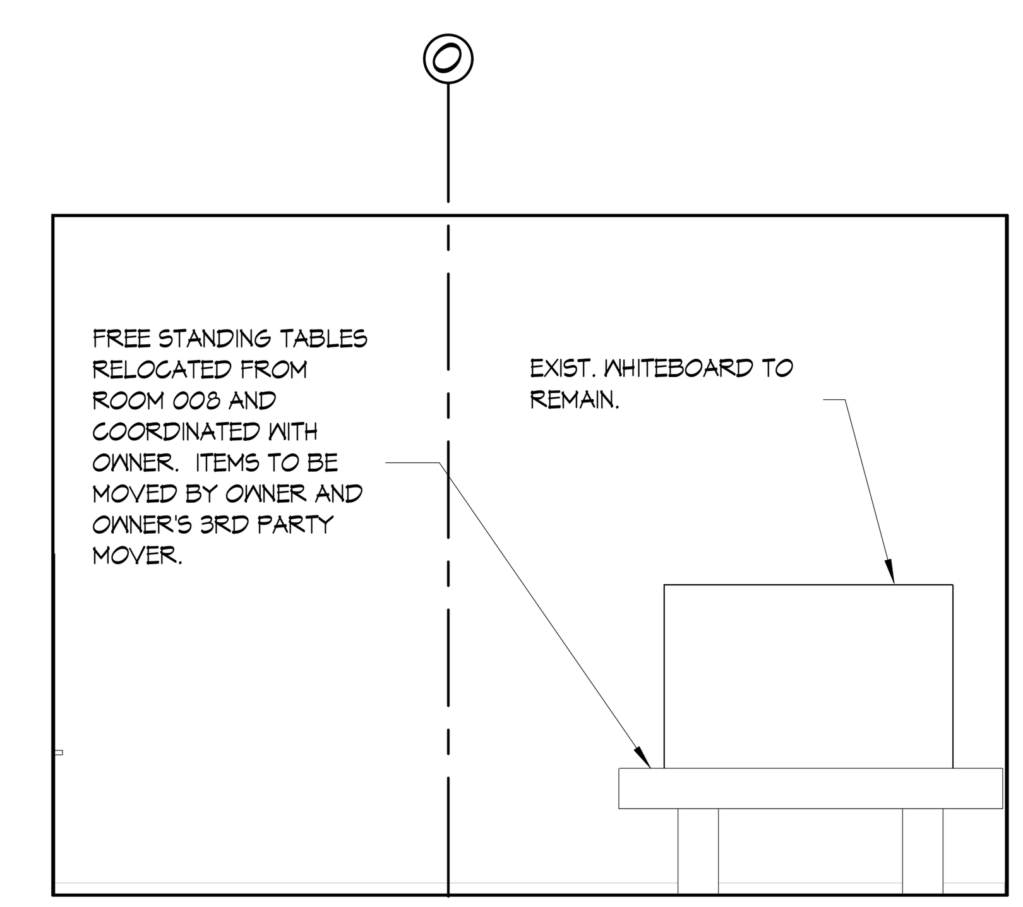




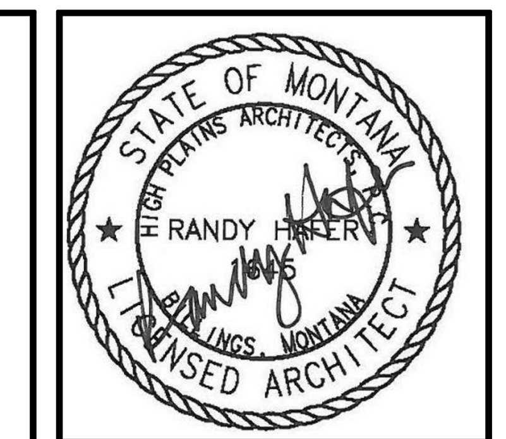
17 ADA SINK AND ADA BASE CABINET, ROOM 008
A6.2 3/4" = 1'-0"



19 CASEWORK AT ISLAND, ROOM 008
A6.2 3/4" = 1'-0"



20 ROOM 234-A WEST INTERIOR ELEVATION
A6.2 1/4" = 1'-0"



ROOM 234 INTERIOR ELEVATIONS

BARNARD ROOM 8 QUANTUM FOUNDRY RENOVATION

100% CONSTRUCTION DOCUMENTS

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WWW.HIGHPLAINSARCHITECTS.COM

DRAWN BY: JW
PROJECT#: 22210
DATE: 04/18/2024

A6.2

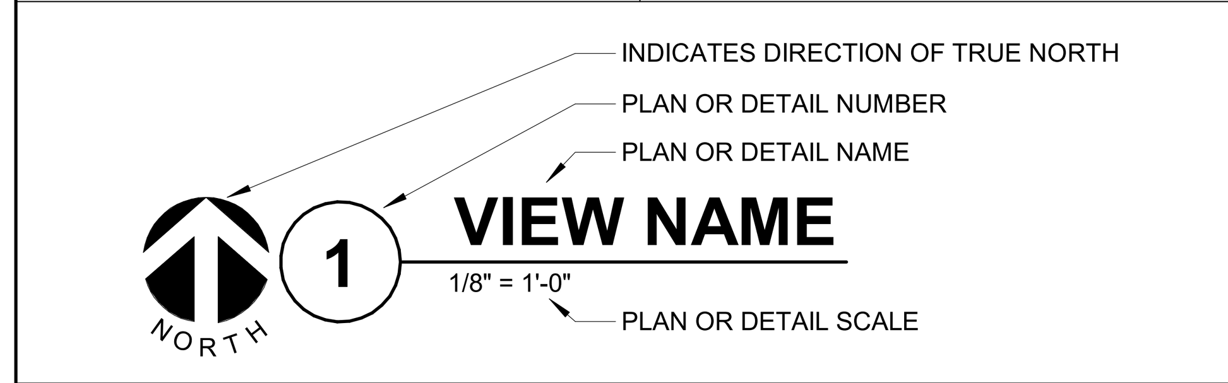
MECHANICAL ABBREVIATION KEY

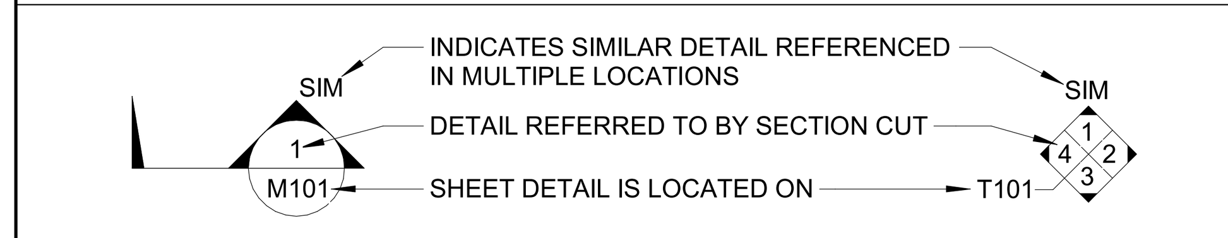
ABBR:	DESCRIPTION:
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BT	BATHTUB
C	COMMON
CB	CATCH BASIN
CD-E	CEILING DIFFUSER - EXISTING
CFSD	CONTROL/FIRE/SMOKE DAMPER
CI	CAST IRON
CO	CLEANOUT
CS	CLINICAL SINK
DB	DIALYSIS BOX
DF	DRINKING FOUNTAIN
DI	DUCTILE IRON
DPG (0-2")	DIFFERENTIAL PRESSURE GAUGE (RANGE)
DPS	DIFFERENTIAL PRESSURE SWITCH
E	EXISTING
EA	EXHAUST/RELIEF AIR
ECFSD	EXISTING CONTROL FIRE SMOKE DAMPER
EE	EMERGENCY EYEWASH
EFD	EXISTING FIRE DAMPER
EFSD	EXISTING FIRE SMOKE DAMPER
EP	ELECTRICAL TO PNEUMATIC VALVE
ES	EMERGENCY SHOWER
ESD	EXISTING SMOKE DAMPER
ESE	EMERGENCY SHOWER/EYEWASH
EWC	ELECTRIC WATER COOLER
FCO	FLOOR CLEANOUT
FD	FIRE DAMPER
FM	FLOW METER
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FS	FLOOR SINK
FSD	FIRE/SMOKE DAMPER
GD	GARBAGE DISPOSER
GI	GREASE INTERCEPTOR
HB	HOSE BIBB
I.E.	INVERT ELEVATION (FOR REFERENCE ONLY)
LAV	LAVATORY
MA	MIXED AIR
MB	MOP BASIN
MH	MANHOLE
MV	MIXING VALVE
NC	NEW CONNECTION
N.C.	NORMALLY CLOSED
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
NT	NEUTRALIZATION TANK
OA	OUTSIDE AIR
OS	OIL SEPARATOR
PS	PRESSURE SWITCH
RA	RETURN AIR
RD	ROOF DRAIN
SA	SUPPLY AIR
SD	SMOKE DAMPER
SH	SHOWER
SK	SINK
SS	SERVICE SINK
TAB	TERMINAL AIR BOX
TD	TRANSFER DUCT
TP	TRAP PRIMER
TYP	TYPICAL
UB	UTILITY BOX
UC-1	DOOR UNDERCUT BY OTHERS (1" TYPICAL)
UNO	UNLESS NOTED OTHERWISE
UR	URINAL
VTR	VENT THROUGH ROOF
WC	WATER CLOSET
WCO	WALL CLEANOUT
WF	WASH FOUNTAIN
WH	WATER HEATER
WMF	WASHING MACHINE FIXTURE
WM	WATER METER
WS	WATER SOFTENER
YCO	YARD CLEANOUT

VIEW KEY

NAME ← LEVEL NAME
10'-0" ← HEIGHT ABOVE PROJECT 0'-0"

(1) ← INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL





LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
- NEW
- EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
- NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
- EXISTING
- EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
- EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E	TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING
TAG-1	UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST
⊕	INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

PROJECT ALTITUDE:	5000 FT. ABOVE SEA LEVEL

MECHANICAL DESIGN CONDITIONS:

DESIGN CONDITIONS: **BASED ON WEATHER DATA FOR: {BOZEMAN, MT}**

SUMMER:	##°F DRY BULB, ##°F WET BULB
WINTER:	##°F DRY BULB
WINTER: (AIR SYSTEM'S OUTSIDE AIR STREAM)	##°F DRY BULB

TYPICAL ROOM SETPOINTS:

SUMMER DESIGN:	##°F DRY BULB, ##% RELATIVE HUMIDITY {NO HUMIDITY REQUIREMENT}
WINTER DESIGN:	##°F DRY BULB, ##% RELATIVE HUMIDITY {NO HUMIDITY REQUIREMENT}
SUMMER SETBACK:	##°F DRY BULB, ##% RELATIVE HUMIDITY {NO HUMIDITY REQUIREMENT}
WINTER SETBACK:	##°F DRY BULB, ##% RELATIVE HUMIDITY {NO HUMIDITY REQUIREMENT}

REFER TO CONTROL DIAGRAMS FOR ROOM SPECIFICS.

APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

BUILDING CODE:	IBC 2021 EDITION
FIRE CODE:	IFC 2021 EDITION
FIRE ALARM CODE:	NFPA 72 2019 EDITION
PLUMBING CODE:	UPC 2021 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LIFE SAFETY CODE:	NFPA 101 2021 EDITION
ENERGY CONSERVATION CODE:	IECC 2021
LOCAL BUILDING CODE:	CURRENT EDITION

VENTILATION GENERAL NOTES:

1. THE SIZE OF EACH BRANCH DUCT TO A TERMINAL AIR BOX (TAB) SHALL MATCH THE TAB'S INLET SIZE UNLESS THE BRANCH IS GREATER THAN 6 FEET IN LENGTH, IN WHICH CASE THE BRANCH SHOULD BE INCREASED ONE DUCT SIZE, OR NOTED OTHERWISE.
2. ALIGN TEMPERATURE SENSORS WITH LIGHT SWITCHES AND WHEN IN CLOSE PROXIMITY TO EACH OTHER.
3. PROVIDE ACCESS DOORS AT ALL DUCT MOUNTED EQUIPMENT.
4. EXISTING AIR INLET AND OUTLET CFM SHOWN ON DRAWINGS ARE FROM EXISTING DRAWINGS, AND ARE FOR REFERENCE ONLY. CONTRACTOR SHALL USE PRE-BALANCE VALUES, AND NOT EXISTING CFM SHOWN ON DRAWINGS.
5. CONTRACTOR MAY REUSE PORTIONS OF EXISTING DUCT PROVIDED SIZES AND PRESSURE CLASSES ARE CORRECT, DUCT IS THOROUGHLY CLEANED AND FREE OF DEFECTS, AND ALL TRANSVERSE JOINTS, LONGITUDINAL SEAMS, AND DUCT WALL PENETRATIONS ARE SEALED AS SPECIFIED FOR NEW DUCTWORK.

MECHANICAL GENERAL NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, FIRE PROTECTION, PLUMBING, MEDICAL GAS, VENTILATION, PIPING AND TEMPERATURE CONTROL.

1. DRAWINGS SHOWING LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, ETC. ARE DIAGRAMMATIC AND MAY NOT ALWAYS REFLECT EXACT INSTALLATION CONDITIONS. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT, ETC., AND MAY NOT INCLUDE ALL OFFSETS AND FITTINGS REQUIRED FOR COMPLETE INSTALLATION. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHERS WILL PERMIT.
2. DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SUBMITTALS, AND OTHER APPROPRIATE DRAWINGS OR PHYSICALLY AT SITE. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
3. COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, CODE COMPLIANCE, AND TO VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF NECESSARY CLEARANCES FOR ALL TRADES. BRING ANY INTERFERENCES OR CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH FABRICATION OR EQUIPMENT ORDERS.
4. REVIEW SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKE REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
5. ANY CHANGES REQUIRED TO ELIMINATE CONFLICTS OR THAT RESULT FROM A FAILURE TO COORDINATE SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COST OR EXPENSE TO OTHERS.
6. EACH CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT PROPOSED THAT DIFFERS FROM THE BASIS OF DESIGN.
7. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY AUDIO/VISUAL, AND OTHER MECHANICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
8. EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
9. IN AREAS WITH DRYWALL CEILINGS COORDINATE LOCATIONS OF ACCESS PANELS WITH THE GC FOR ACCESS TO VALVES, DUCTWORK ACCESSORIES, DAMPERS, ETC. COORDINATE PANEL TYPE AND COLOR WITH ARCHITECT. NOTIFY THE GC OF THE REQUIRED ACCESS PANELS PRIOR TO BIDDING.
10. SEAL ALL FLOOR, WALL, AND ROOF PENETRATIONS AIRTIGHT WHERE CONDUITS, PIPING, AND DUCTS PENETRATE. PENETRATIONS THROUGH EXTERIOR WALLS AND ROOF SHALL BE SEALED AIRTIGHT WITH WATERPROOFING MATERIALS RECOMMENDED BY MANUFACTURER FOR OUTDOOR USE.
11. CAULK ALL PIPE AND DUCT PENETRATIONS OF FULL HEIGHT NON-FIRE RATED WALL, PARTITION, FLOOR, AND ROOF ASSEMBLIES. THIS IS ESSENTIAL TO PREVENT NOISE TRANSMISSION FROM ONE ROOM TO ANOTHER AND TO PROVIDE THE DESIRED NC LEVELS WITHIN ROOMS.
12. WHERE PIPES AND DUCTS ARE SHOWN TO PENETRATE FLOORS, PROVIDE SLEEVED OPENINGS WITH THE TOP EDGE RAISED ABOVE FLOOR SURFACE IN ACCORDANCE WITH ALL RELEVANT SPEC SECTIONS. SEAL SLEEVE PERIMETER TO BE WATERTIGHT.
13. EQUIPMENT SIZES AND SERVICE CLEARANCE REQUIREMENTS VARY AMONG DIFFERENT MANUFACTURERS. CONSULT APPROVED SHOP DRAWINGS FOR EQUIPMENT SIZES AND REQUIRED SERVICE CLEARANCES. COORDINATE WITH LAYOUT OF EQUIPMENT PADS, PIPING, DUCTWORK, ETC.
14. DO NOT BLOCK TUBE PULL OR EQUIPMENT SERVICE CLEARANCES.
15. MAINTAIN MINIMUM 3'-6" CLEARANCE IN FRONT OF ALL ELECTRICAL PANELS, MOTOR STARTERS, SWITCHES, AND DISCONNECTS.
16. PROVIDE CONCRETE EQUIPMENT PAD FOR ALL FLOOR MOUNTED EQUIPMENT. PAD SHALL EXTEND MINIMUM 6" BEYOND ALL SIDES OF EQUIPMENT.
17. DO NOT SUPPORT EQUIPMENT, PIPING, OR DUCTWORK FROM METAL DECKING OR OTHER NON-STRUCTURAL BUILDING ELEMENTS. ANCHORS EMBEDDED IN CONCRETE SHALL BE CRACKED CONCRETE APPROVED IN ACCORDANCE WITH SPECIFICATIONS.

FIRE PROTECTION GENERAL NOTES:

1. THE SYMBOLS AND THE MATERIAL LIST ARE FOR THE CONVENIENCE OF THE CONTRACTOR. CONTRACTOR SHALL VERIFY QUANTITIES AND FURNISH ALL MATERIALS REQUIRED FOR FULLY OPERATIONAL SYSTEMS, WHETHER SPECIFIED OR NOT.
2. CATALOG NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR A COMPLETE DESCRIPTION OF MATERIAL ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL TAKES PRECEDENCE OVER THE CATALOG NUMBER. THE FIRST MANUFACTURER IS THE BASIS OF DESIGN.
3. FIRE PROTECTION PIPE ROUTING IS SHOWN FOR GENERAL LAYOUT. DETERMINE EXACT NUMBER OF SPRINKLERS, PIPE SIZING, AND PIPE ROUTING.
4. CENTER SPRINKLERS IN CEILING TILES IN BOTH DIRECTIONS IN ALL AREAS. IN AREAS WITH 2'X4' CEILING TILES CENTERING USING A 2'X2' CEILING PATTERN IS ACCEPTABLE.
5. NEW SPRINKLERS SHALL BE QUICK RESPONSE TYPE, UNLESS OTHERWISE NOTED. CONTRACTOR SHALL NOT MIX STANDARD RESPONSE SPRINKLERS WITH QUICK RESPONSE SPRINKLERS IN UNPARTITIONED SPACES.
6. PROVIDE COVERAGE ABOVE AND BELOW ALL DUCTWORK GREATER THAN 48" WIDE.
7. PROVIDE COVERAGE ABOVE AND BELOW FLOATING CEILINGS. REFER TO ARCHITECTURAL PLANS.

PLUMBING GENERAL NOTES:

1. THE SYMBOLS AND THE MATERIAL LIST ARE FOR THE CONVENIENCE OF THE CONTRACTOR. CONTRACTOR SHALL VERIFY QUANTITIES AND FURNISH ALL MATERIALS REQUIRED FOR FULLY OPERATIONAL SYSTEMS, WHETHER SPECIFIED OR NOT.
2. CATALOG NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR A COMPLETE DESCRIPTION OF MATERIAL ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL TAKES PRECEDENCE OVER THE CATALOG NUMBER. THE FIRST MANUFACTURER LISTED IS THE BASIS OF DESIGN.
3. CONTRACTOR SHALL VERIFY THAT FIXTURES SUPPLIED ARE APPROVED PER ALL APPLICABLE STATE, LOCAL AND GOVERNING AUTHORITIES.
4. ALL FIXTURES SHALL CONFORM TO FEDERAL ACT S.3874
5. INVERT ELEVATIONS ARE FROM EXISTING DRAWINGS AND MAY NOT BE ACCURATE. VERIFY ALL ELEVATIONS BEFORE BEGINNING WORK.
6. VERIFY UNDERGROUND PIPE SIZES, INVERT ELEVATIONS, AND LOCATIONS PRIOR TO BEGINNING ANY WORK.
7. REFER TO THE PLUMBING ROUGH-IN SCHEDULE FOR THE SIZES OF BRANCH PIPES TO PLUMBING FIXTURES.
8. FOR CLARITY, NOT ALL VALVES HAVE BEEN SHOWN. PROVIDE SHUTOFF VALVES IN DOMESTIC WATER PIPING SERVING EACH ROOM WITH FIXTURES. ANGLE STOPS SHALL NOT BE CONSIDERED SHUTOFF VALVES.
9. EXISTING CONDITIONS ON DEMOLITION PLANS ARE PROVIDED TO INDICATE THE GENERAL SCOPE OF ITEMS TO BE REMOVED. REFER TO SPECIFICATION SECTION 22 05 05 FOR ADDITIONAL DEMOLITION INFORMATION.
10. P.C. SHALL CUT AND PATCH EXISTING AS REQUIRED FOR NEW OR DEMOLITION WORK UNLESS NOTED OTHERWISE. REFER TO SPECIFICATION SECTION 22 05 05 FOR ADDITIONAL INFORMATION.

PIPING GENERAL NOTES:

1. THE SIZE OF BRANCH PIPING TO TERMINAL HEATING DEVICES AND COILS SHALL BE 3/4" UNLESS NOTED OTHERWISE.
2. PIPE DRAIN LINES FROM EQUIPMENT TO NEAREST FLOOR DRAIN.
3. INSTALL ALL REFRIGERANT LIQUID AND SUCTION PIPING SIZED PER EQUIPMENT MANUFACTURER RECOMMENDATIONS.

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MECHANICAL SYMBOL LIST

NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
AV	ACID VENT
AW	ACID WASTE
CA	COMPRESSED AIR
CHWR	CONDENSER WATER RETURN
CHWS	CONDENSER WATER SUPPLY
CW	COLD WATER - POTABLE
LCWR	LAB CHILLED WATER RETURN
LCWS	LAB CHILLED WATER SUPPLY
D	DRAIN - PLUMBING
FP	FIRE PROTECTION
G	NATURAL GAS
GRV	GAS REGULATOR VENT
GRV	GAS VENT
GSAN	SANITARY DRAINAGE (GREASE SANITARY DRAINAGE)
GV	GREASE VENT
HCR	HEATING/CHILLED WATER RETURN
HCS	HEATING/CHILLED WATER SUPPLY
HG	REFRIGERANT HOT GAS
HPC	HIGH PRESSURE CONDENSATE
HW	HOT WATER - POTABLE
HWC	HOT WATER CIRCULATING - POTABLE
HW140	HOT WATER - POTABLE NUMBER INDICATES TEMP
HWC140	HOT WATER CIRC. - POTABLE NUMBER INDICATES TEMP
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
LIQ	REFRIGERANT LIQUID
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
LWR	LOOP WATER RETURN
LWS	LOOP WATER SUPPLY
P	PROPANE GAS
PC	PUMPED CONDENSATE
PD	PUMPED DISCHARGE
RO	REVERSE OSMOSIS WATER
SAN	SANITARY DRAINAGE
ST(1,000)	STORM DRAINAGE (ROOF SQUARE FOOTAGE)
STS	STORM DRAINAGE (SECONDARY)
STW	SOFT TEMPERED WATER
SUC	REFRIGERANT SUCTION
SV	SAFETY RELIEF VENT
TW	TEMPERED WATER
V	VENT
W	SERVICE WATER - POTABLE
	PIPE CAP
	PIPE DOWN
	PIPE UP OR UP/DOWN
FD	PIPE SERVING FIXTURE ON FLOOR ABOVE (EXAMPLE: FD = FLOOR DRAIN)
	DIRECTION OF FLOW IN PIPE
	ROUTE TO DRAIN
RD-1 6"(1000)	ROOF DRAIN PROPERTIES SYMBOL SIZE (ROOF SQ. FT.)

MECHANICAL SYMBOL LIST

NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
	NEW CONNECTION
	DIELECTRIC CONNECTION
	UNION/FLANGE
	SHUTOFF VALVE NORMALLY OPEN
	SHUTOFF VALVE NORMALLY CLOSED
	THROTTLING VALVE
	BALANCING VALVE (NUMBER INDICATES GPM)
	AUTOMATIC BALANCING VALVE
	MIXING VALVE
	CONTROL VALVE (THREE-WAY)
	CONTROL VALVE (TWO-WAY)
	SOLENOID VALVE
	CHECK VALVE
	SAFETY/RELIEF VALVE
	PRESSURE REDUCING VALVE (LIQUID/GAS)
	PRESSURE REDUCING VALVE (STEAM)
	TRIPLE DUTY VALVE (ANGLE TYPE)
	TRIPLE DUTY VALVE (IN-LINE TYPE)
	PUMP
	VACUUM BREAKER
	"WYE" - STRAINER
	"WYE" - STRAINER W/SHUTOFF VALVE AND HOSE CONNECTION WITH CAP
	AUTOMATIC DRAIN VALVE
	AIR PRESSURE MAINTENANCE DEVICE
	AIR SUPERVISORY SWITCH
	ANGLE VALVE
	BUTTERFLY VALVE WITH MONITOR SWITCH
	INSPECTOR TEST AND DRAIN VALVE
	OS&Y GATE VALVE
	OS&Y GATE VALVE WITH MONITOR SWITCH
	CHECK VALVE
	SAFETY/RELIEF VALVE
	PRESSURE REDUCING VALVE (LIQUID/GAS)
	BASKET STRAINER
	FLEXIBLE CONNECTION
	PRESSURE/TEMPERATURE TEST PLUG
	REDUCER - REFERENCE SPECIFICATION FOR CONCENTRIC/ECCENTRIC AND FOT/FOB
	SUCTION DIFFUSER WITH SUPPORT FOOT
	AUTOMATIC AIR VENT
	MANUAL AIR VENT
	DRAIN VALVE WITH HOSE CONNECTION AND CAP
T-*	STEAM TRAP (REFER TO SCHEDULE)
T-*	F&T STEAM TRAP (REFER TO SCHEDULE)
T-*	INVERTED BUCKET STEAM TRAP (REFER TO SCHEDULE)
	ALIGNMENT GUIDE
	PIPE ANCHOR

MECHANICAL SYMBOL LIST

NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
	EXPANSION JOINT
M	METER
	VALVE BOX
	DIRECTION OF AIR FLOW
	FLEXIBLE DUCT
	MANUAL VOLUME DAMPER
R	RISE IN DIRECTION OF AIR FLOW
D	DROP IN DIRECTION OF AIR FLOW
	DUCT CAP
	DUCT DOWN
	DUCT UP
	SUPPLY/OUTSIDE AIR DUCT SECTION
	RETURN AIR DUCT SECTION
	EXHAUST/RELIEF AIR DUCT SECTION
	4-WAY DIFFUSER WITH BLANKOFF IN ONE DIRECTION
CD-1 6/115	AIR TERMINAL PROPERTIES SYMBOL NECK SIZE/CFM
###	TERMINAL AIR BOX (REFER TO SCHEDULE)
###	TERMINAL AIR BOX w/REHEAT COIL (REFER TO SCHEDULE)
	SERIES FAN POWERED TERMINAL AIR BOX w/REHEAT COIL (REFER TO SCHEDULE)
	PARALLEL FAN POWERED TERMINAL AIR BOX w/REHEAT COIL (REFER TO SCHEDULE)
H	HUMIDIFIER
	OPPOSED BLADE DAMPER (REFER TO SCHEDULE)
	PARALLEL BLADE DAMPER (REFER TO SCHEDULE)
XX-Y	AIRFLOW MEASUREMENT SYMBOL XX - AHU SYMBOL Y - SEQUENTIAL NUMBER

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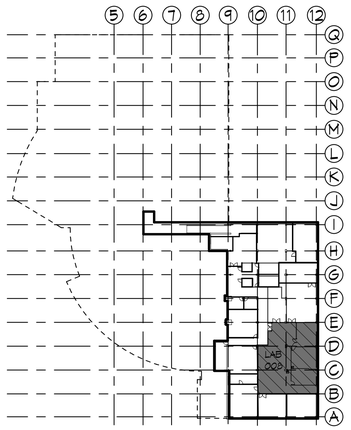
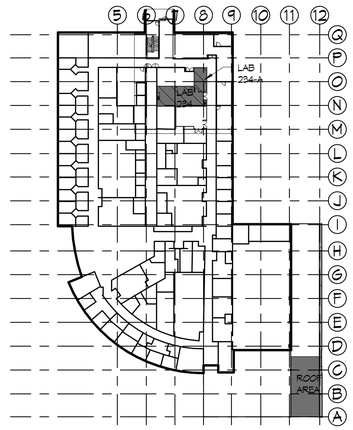


6 BASEMENT KEY PLAN
MD2.1 1" = 60'-0"

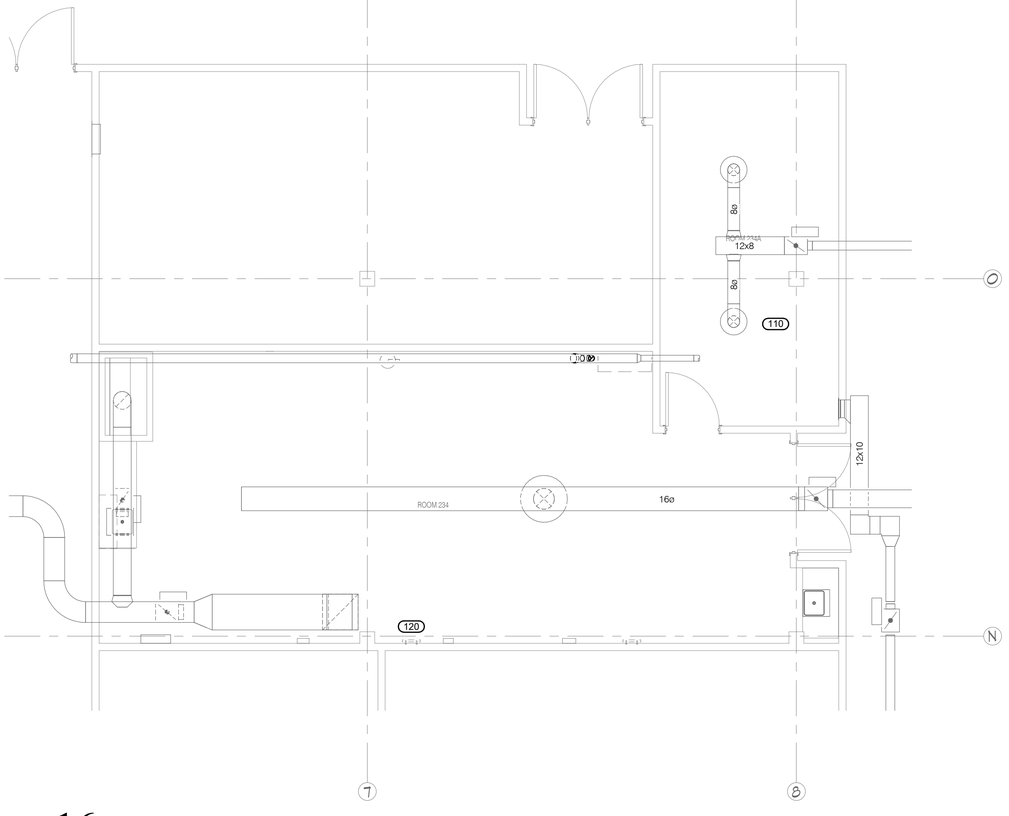


7 SECOND FLOOR KEY PLAN
MD2.1 1" = 60'-0"

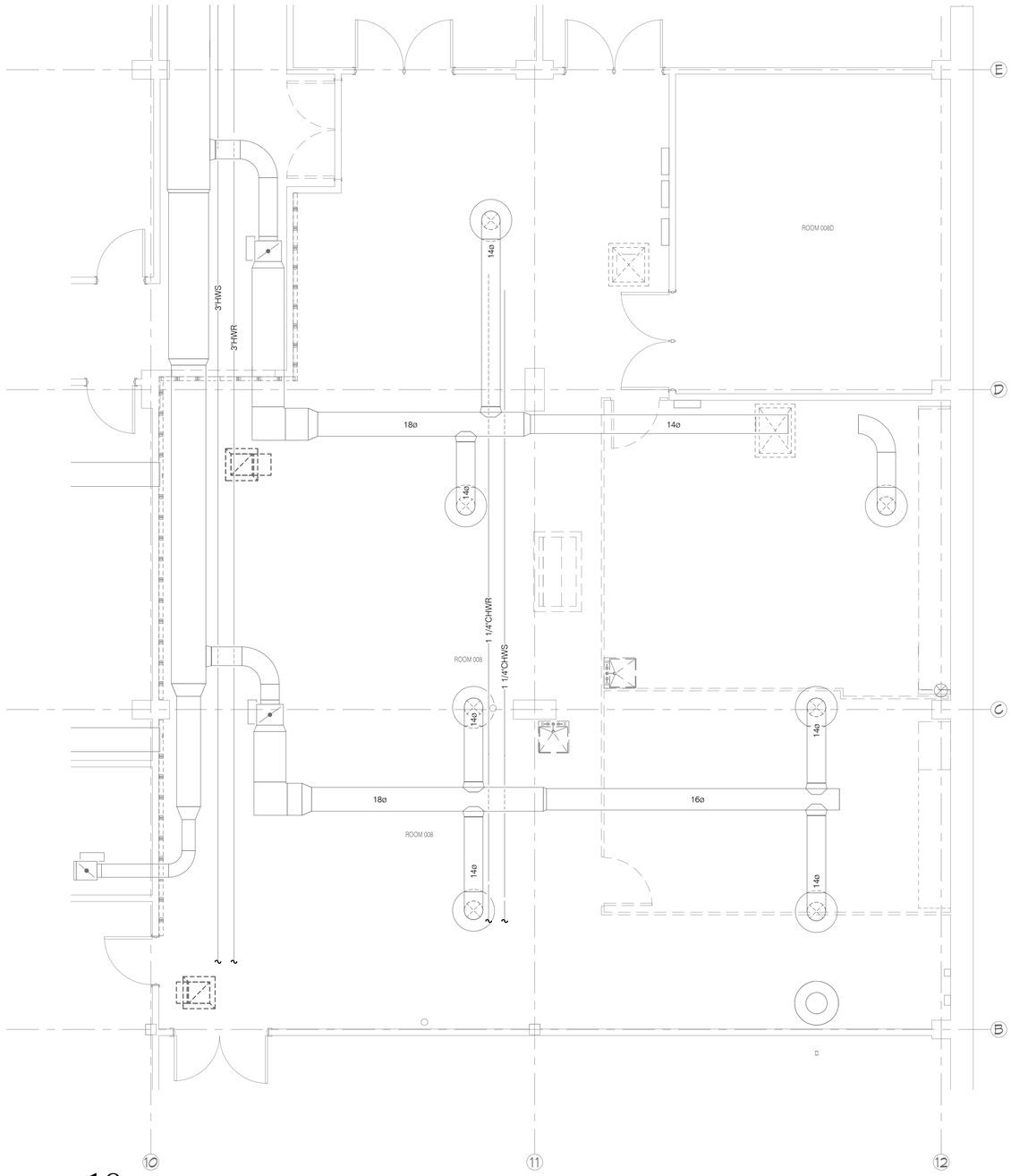
KEYNOTES

110 EXISTING HVAC TO REMAIN AND BE REUSED.

120 REMOVE EXISTING WATER FILTER ASSEMBLY AT LAB CHILLED WATER ROUGH IN.



16 SECOND FLOOR ROOM 234 DEMO MECHANICAL PLAN
MD2.1 1/4" = 1'-0"



18 BASEMENT ROOM 008 DEMO MECHANICAL PLAN
MD2.1 1/4" = 1'-0"

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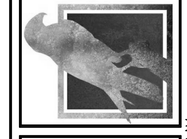

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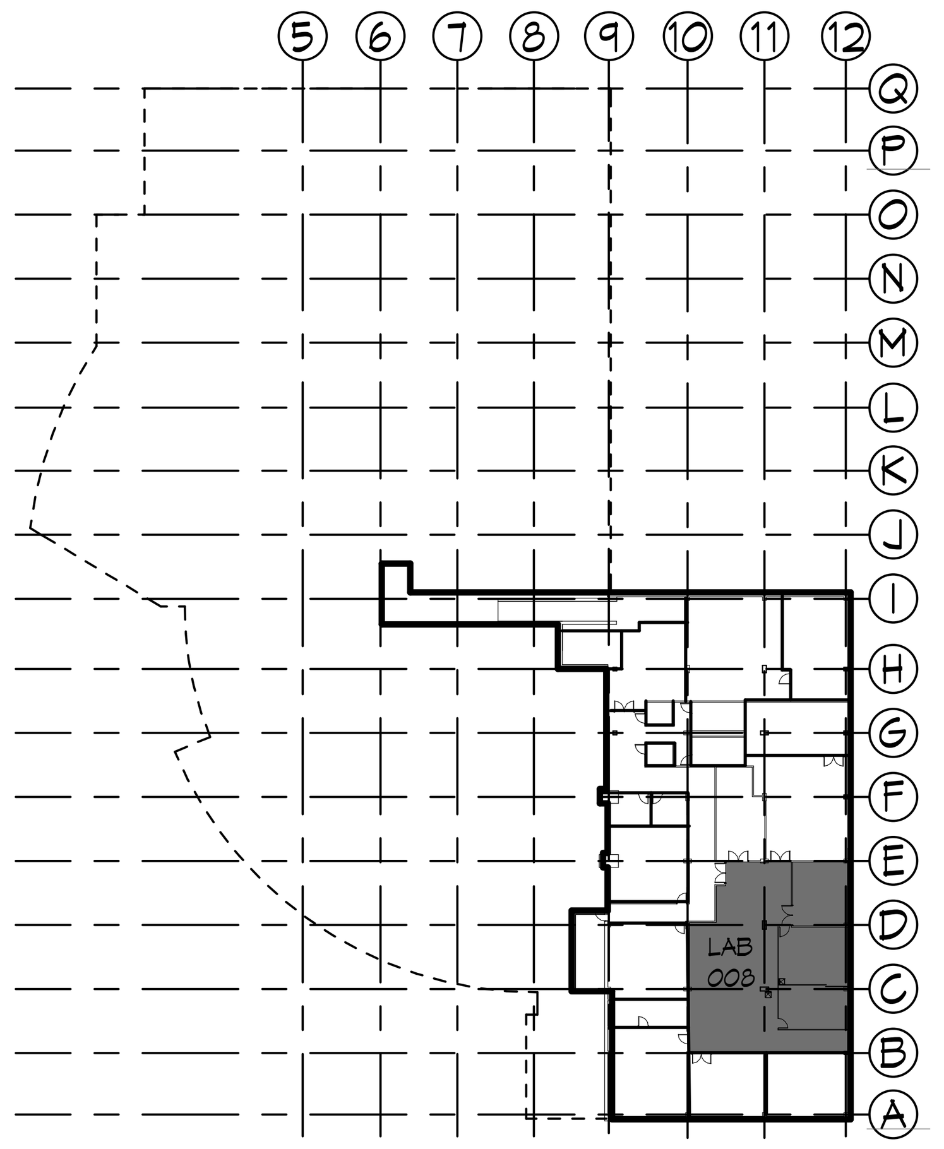
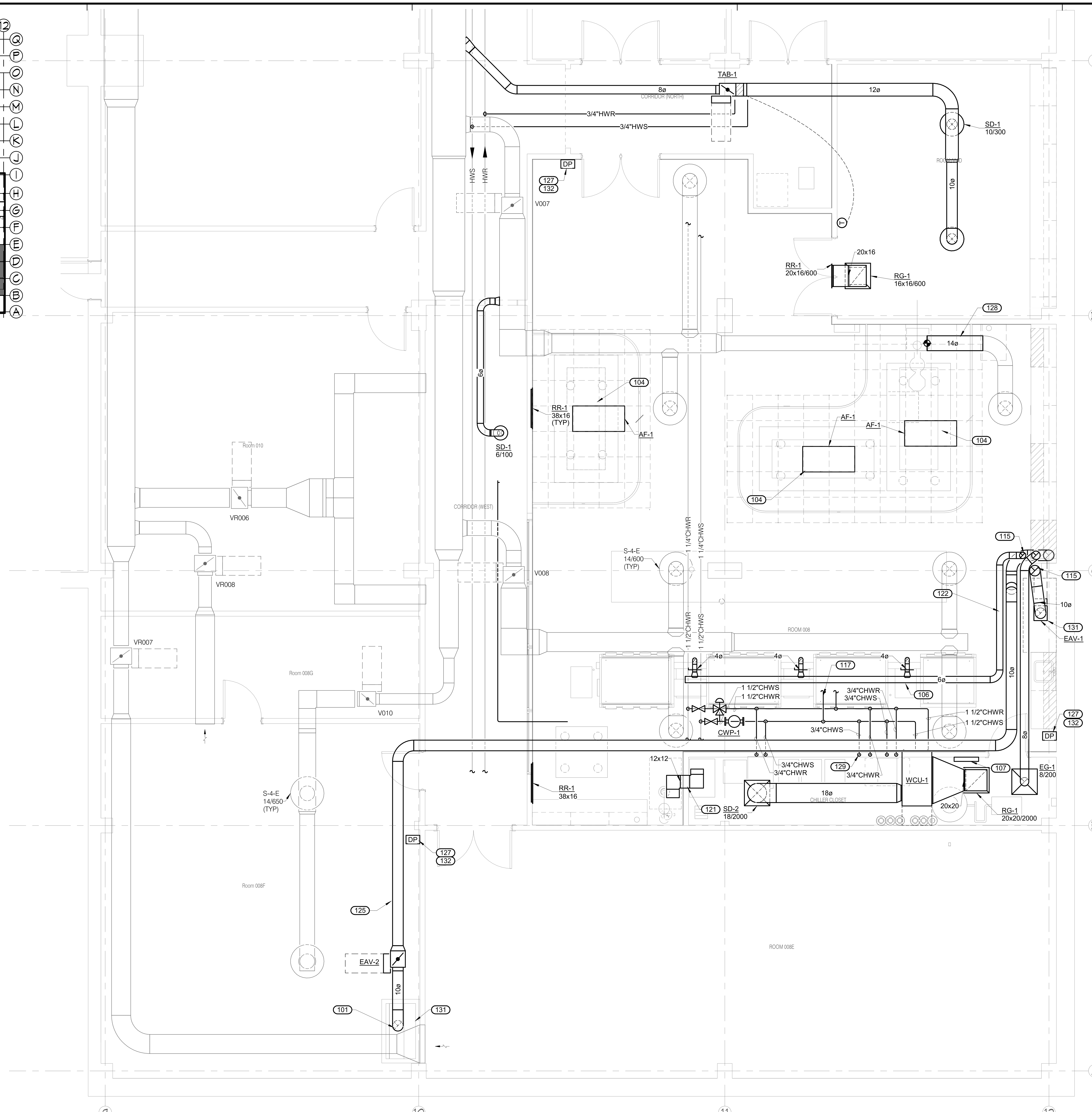


6 BASEMENT KEY PLAN
M2.B 1" = 60'-0"



16 BASEMENT ROOM 008 MECHANICAL PLAN
M2.B 1/4" = 1'-0"

KEYNOTES

101	CONNECT NEW EXHAUST DUCT TO RELOCATED FUME HOOD.
104	2' X 4' AIR FILTRATION UNIT RATED FOR 500 CFM, TYPICAL.
106	8" ROUND EXHAUST WITH 3 FLEX DUCT CONNECTIONS SERVING GLOVE BOXES.
107	OXYGEN DEPLETION MONITOR.
115	EXHAUST DUCTWORK TO ROUTE UP THROUGH FIRST FLOOR TO ROOF. TYPICAL.
117	LAB CHILLED WATER PIPING TO GLOVE BOX CHILLER.
121	PROVIDE TRANSFER DUCT.
122	PROVIDE VAV AIRFLOW CONTROLLER AND CONNECT FUME HOOD TO EXISTING EXHAUST DUCTWORK ABOVE.
125	COORDINATE WITH EXISTING CONDITION.
127	PROVIDE WALL MOUNTED DIFFERENTIAL PRESSURE SENSOR.
128	EXTEND EXISTING DUCTWORK BEYOND NEW CEILING SYSTEM.
129	ROUTE CHWS/R TO NEW WALL OUTLET FOR EACH NEW COMPRESSOR. TYPICAL.
131	PROVIDE NEW CONTROLLER FOR FUME HOOD EXHAUST AIR VALVE. SEE FUME HOOD EXHAUST AIR SEQUENCE OF OPERATION.
132	SEE AIR VALVE CONTROL W/HOT WATER REHEAT AND ROOM PRESURE CONTROL SEQUENCE OF OPERATION.

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BASEMENT ROOM 008 MECHANICAL PLAN

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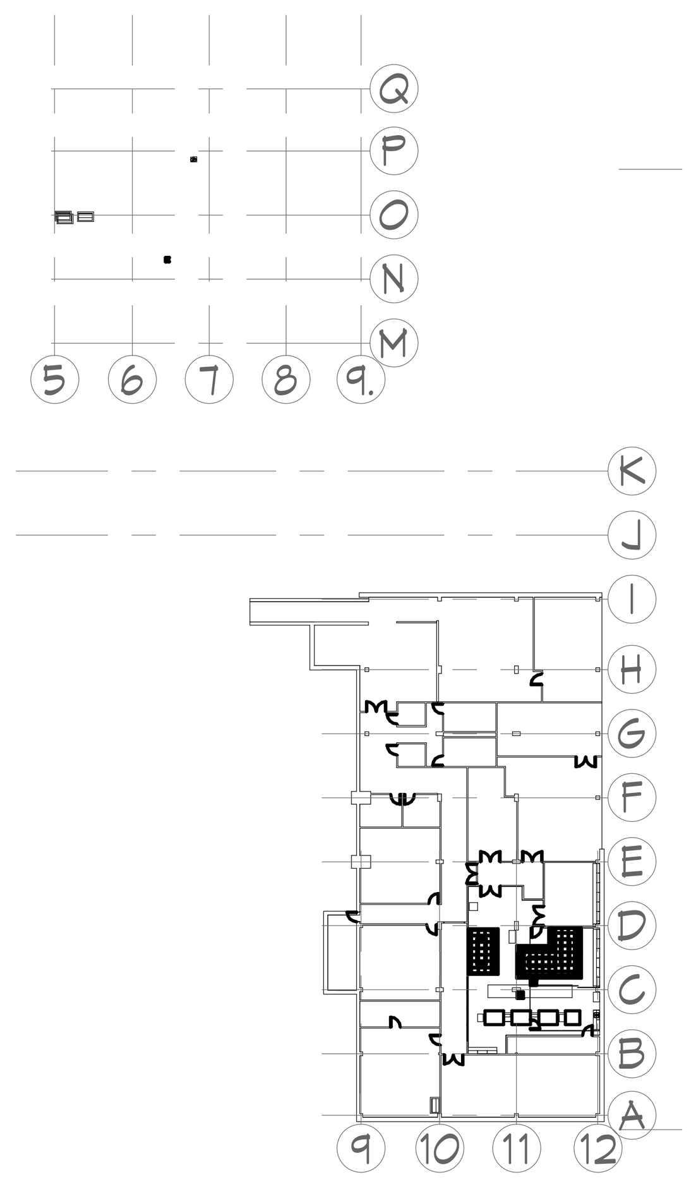
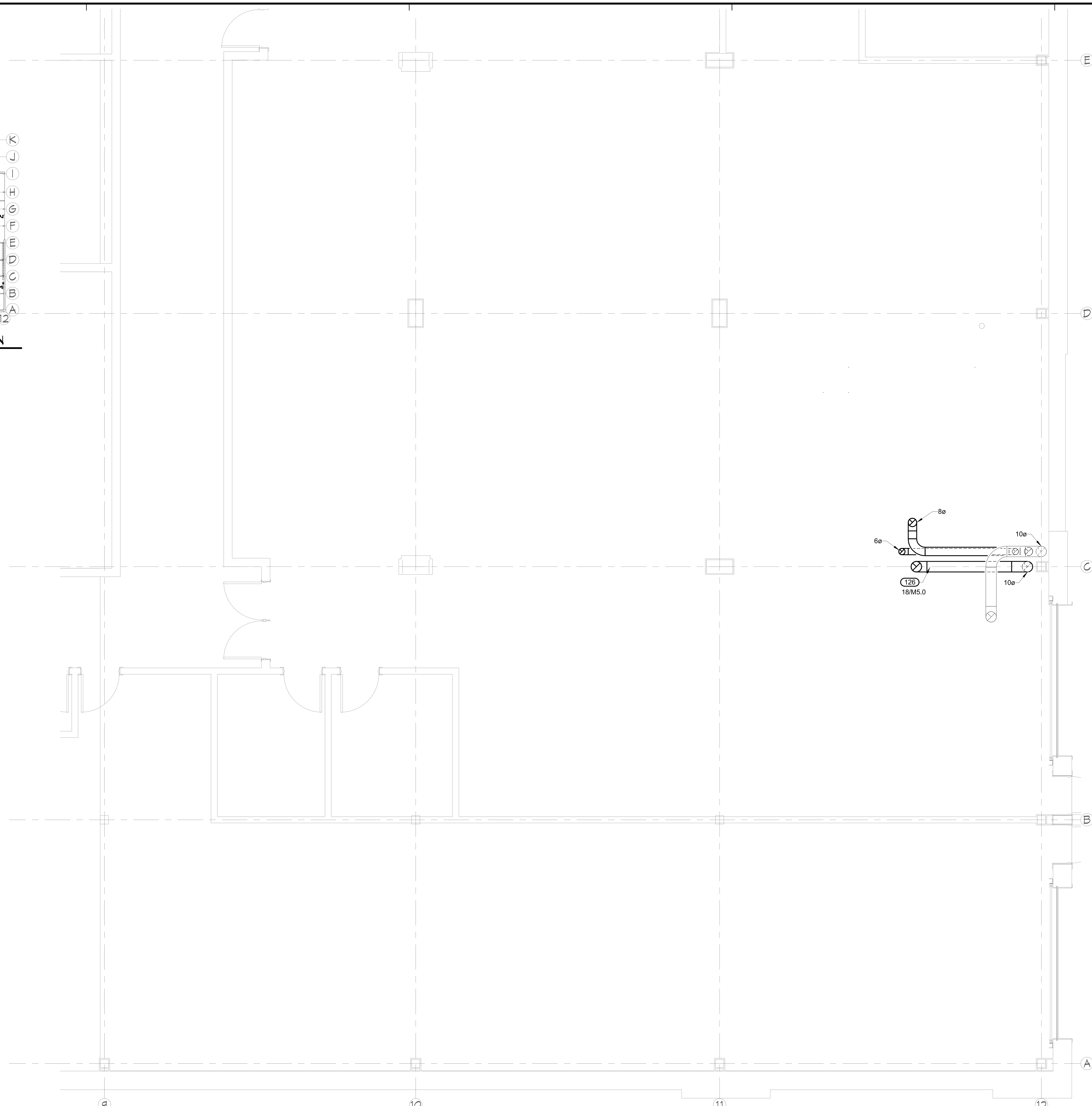


6 FIRST FLOOR KEY PLAN
M2.1 1" = 60'-0"



16 FIRST FLOOR MECHANICAL PLAN
M2.1 1/4" = 1'-0"

KEYNOTES

126 DUCT UP TO EXHAUST FAN ON ROOF, SEE DETAIL FOR MORE INFORMATION.

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0 1 2 3
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PROJECT #22006970.00

FIRST FLOOR MECHANICAL PLAN

BARNARD ROOM & QUANTUM FOUNDRY RENOVATION

100% CONSTRUCTION DOCUMENTS

HIGH PLAINS
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PROJECT#: 22210
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M2.1

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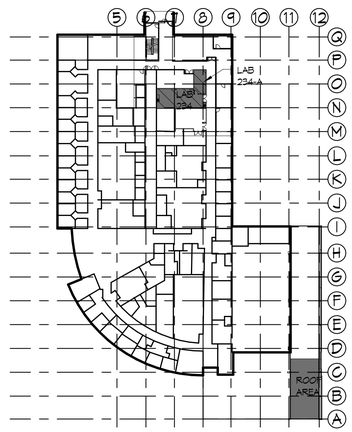
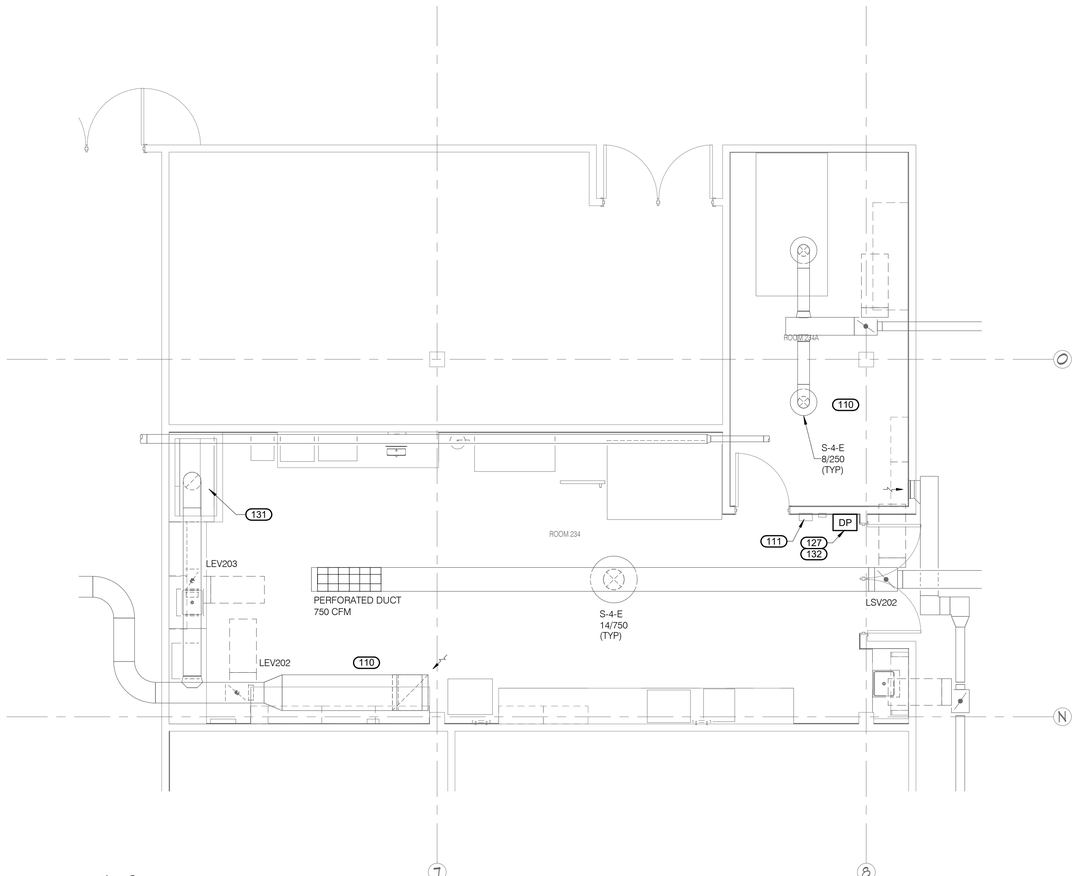


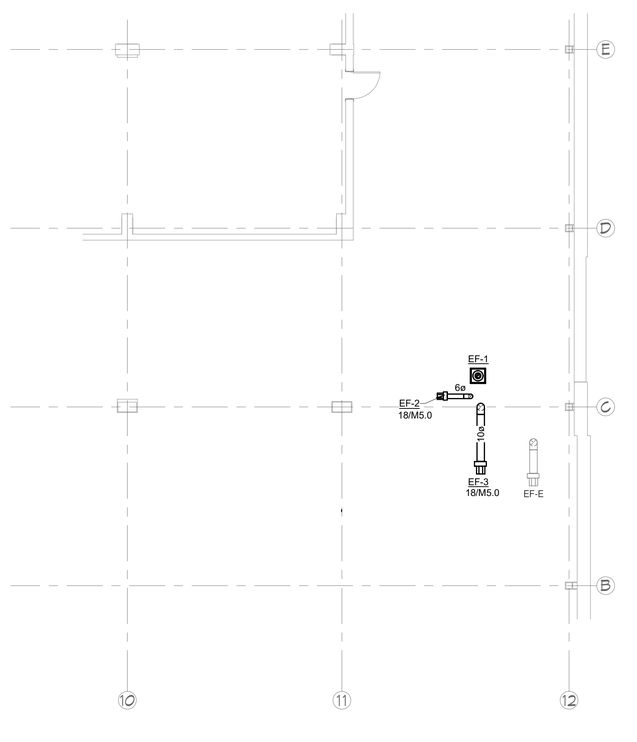
6 SECOND FLOOR KEY PLAN
M2.2 1" = 60'-0"

KEYNOTES

110 EXISTING HVAC TO REMAIN AND BE REUSED.
111 RELOCATE EXISTING TC PANEL TO THIS LOCATION.
127 PROVIDE WALL MOUNTED DIFFERENTIAL PRESSURE SENSOR.
131 PROVIDE NEW CONTROLLER FOR FUME HOOD EXHAUST AIR VALVE. SEE FUME HOOD EXHAUST AIR SEQUENCE OF OPERATION.
132 SEE AIR VALVE CONTROL W/HOT WATER REHEAT AND ROOM PRESURE CONTROL SEQUENCE OF OPERATION.



16 SECOND FLOOR ROOM 234 MECHANICAL PLAN
M2.2 1/4" = 1'-0"



19 ROOF MECHANICAL PLAN
M2.2 1/8" = 1'-0"

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PROJECT #220997/0.00

SECOND FLOOR ROOM 234 MECHANICAL PLAN
BARNARD ROOM & QUANTUM FOUNDRY RENOVATION
100% CONSTRUCTION DOCUMENTS

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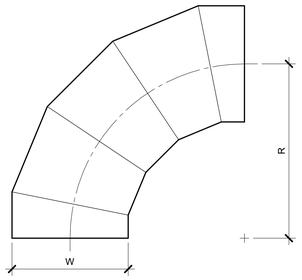
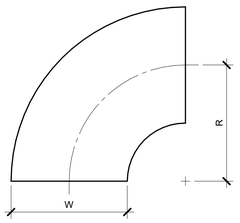
M2.2

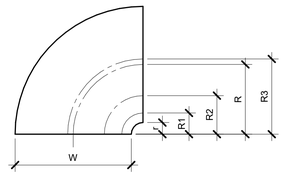
PLOT STAMP: 4/18/2024 9:40:01 AM



OVAL / ROUND
RADIUS ELBOW
SMOOTH OR 5 GORE (MINIMUM)
R/W = 1.5 (MINIMUM)

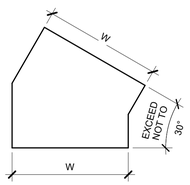


RECTANGULAR
RADIUS ELBOW
TYPE RE1
R/W = 1.0 (MINIMUM)
R/W < 1.0 SHALL BE TYPE RE3



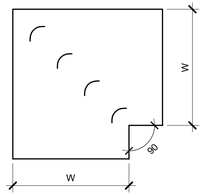
RECTANGULAR
RADIUS ELBOW WITH VANES
TYPE RE3

REFER TO SMACNA HVAC SYSTEMS DUCT DESIGN MANUAL, FOURTH EDITION, SECTION 5.14 "SPLITTER VANES" AND SMACNA HVAC DUCT CONSTRUCTION STANDARDS, THIRD EDITION, FIGURES 4-2 AND 4-9 AND CHARTS 4-1 AND 4-1M. ELBOW SHALL HAVE THREE SPLITTER VANES AND r/W = 0.10 (R/W = 0.60) UNLESS NOTED OTHERWISE.

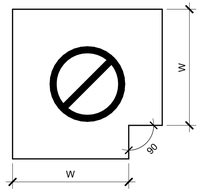


RECTANGULAR
MITERED ELBOW
TYPE RE6

USE ONLY AS PART OF OFFSETS AND TRANSITIONS PER FIGURE 4-7 TYPE 2 OR AS SHOWN ON DRAWINGS. OFFSETS ABOVE 30° SHALL BE TYPE RE1.

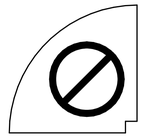


RECTANGULAR
MITERED ELBOW
WITH VANES
TYPE RE2



RECTANGULAR / OVAL / ROUND
MITERED ELBOW
WITHOUT VANES
TYPE RE4

NOT ALLOWED



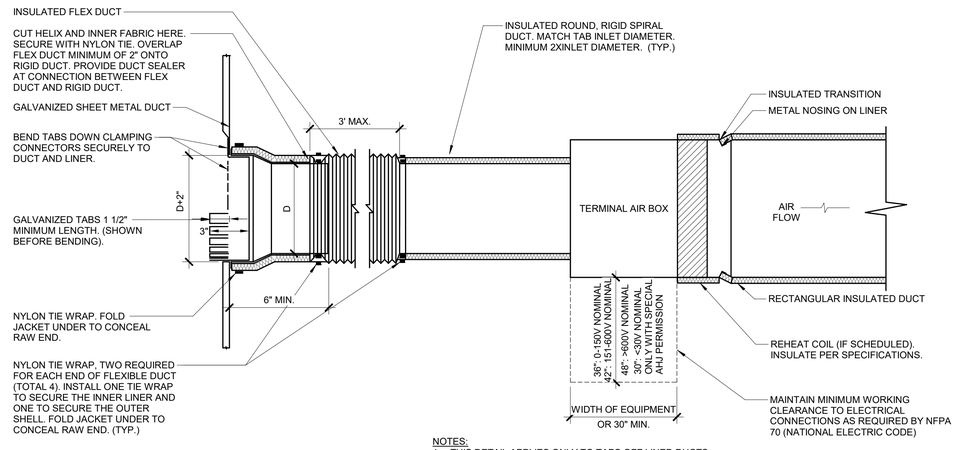
RECTANGULAR
RADIUS ELBOW WITH
SQUARE THROAT

NOT ALLOWED

NOTES:

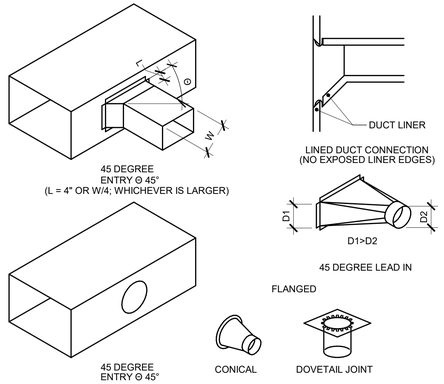
1. BEAD, CROSSBREAK, AND REINFORCE FLAT SURFACES AS IN STRAIGHT DUCT.
2. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
3. DEFAULT ELBOW SHALL BE TYPE "RE1".
4. ELBOW TYPES SHALL BE INSTALLED AS SHOWN AND NOT BE SUBSTITUTED WITHOUT PERMISSION. EXCEPTION: RE1 OR RE3 MAY BE SUBSTITUTED FOR RE2.

11 DUCT - ELBOW CONSTRUCTION
M5.0 NO SCALE



NOTES:
1. THIS DETAIL APPLIES ONLY TO TAPS OFF LINED DUCTS.
2. THIS DETAIL APPLIES TO TERMINAL AIR BOXES WITH ROUND INLETS AND RECTANGULAR OUTLETS.
3. DUCT LEADING TO TAB INLET MUST BE STRAIGHT FOR 1.5 DIAMETERS UPSTREAM.

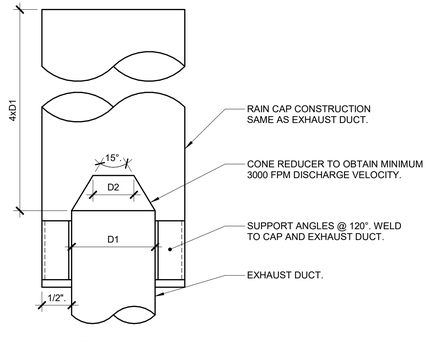
8 TERMINAL AIR BOX - SINGLE DUCT - LINED
M5.0 NO SCALE



NOTES:

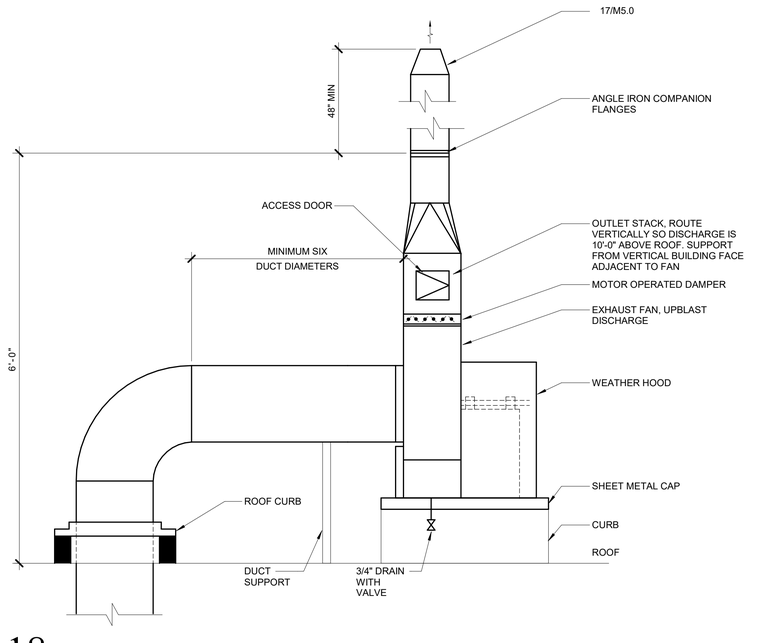
1. DO NOT USE CONNECTIONS WITH SCOOPS.
2. FIT ALL CONNECTIONS TO AVOID VISIBLE OPENINGS AND SECURE THEM SUITABLY FOR THE PRESSURE CLASS.
3. ADDITIONAL MECHANICAL FASTENERS ARE REQUIRED FOR 4"W.G. AND OVER.
4. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

16 DUCT - BRANCH CONNECTIONS
M5.0 NO SCALE



D1 = STACK SIZE FROM FUME HOOD SCHEDULE.
D2 = DISCHARGE SIZE FROM FUME HOOD SCHEDULE.

17 DUCT - FUME HOOD RAIN PROTECTION CAP
M5.0 NO SCALE



18 ROOF MOUNTED EXHAUST FAN
M5.0 NO SCALE

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HVAC DETAILS
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M5.0

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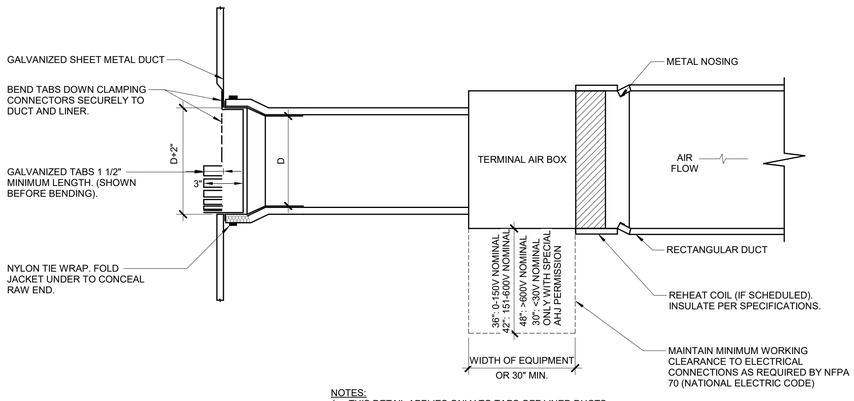
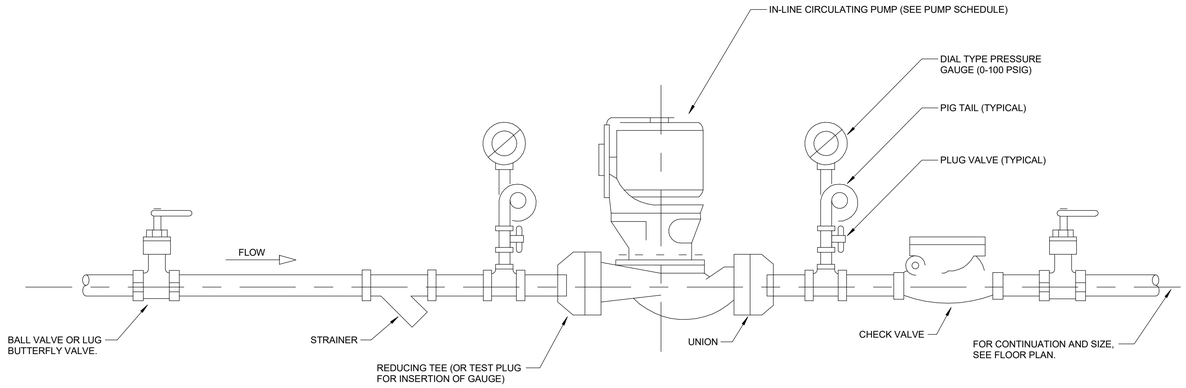
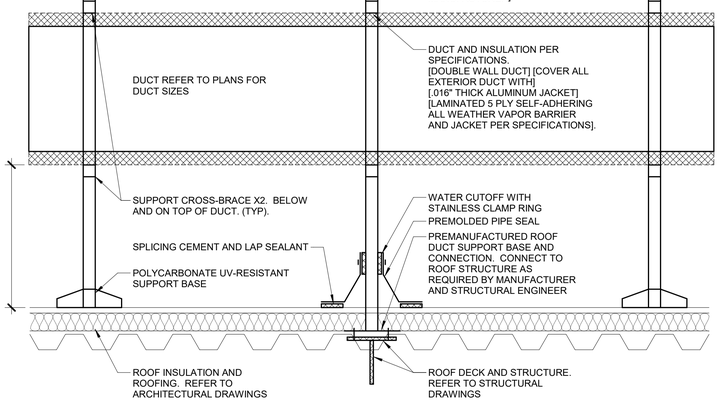


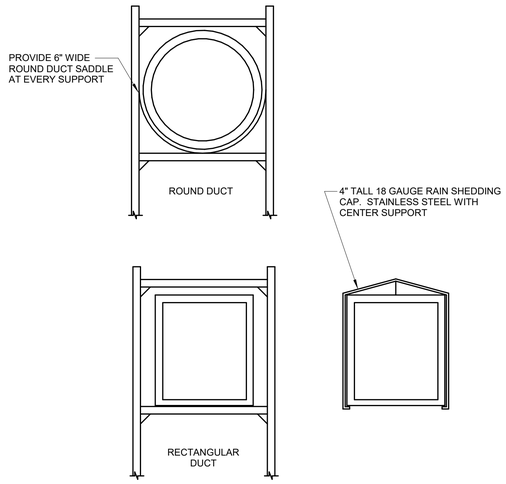
NOTES:
1. THIS DETAIL APPLIES ONLY TO TAPS OFF LINED DUCTS.
2. THIS DETAIL APPLIES TO TERMINAL AIR BOXES WITH ROUND INLETS AND RECTANGULAR OUTLETS.
3. DUCT LEADING TO TAB INLET MUST BE STRAIGHT FOR 1.5 DIAMETERS UPSTREAM.

6 TERMINAL AIR BOX - RETURN
M5.1 NO SCALE

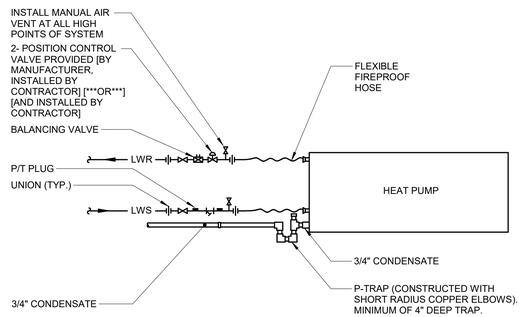


8 INLINE PUMP DETAIL
M5.1 NO SCALE



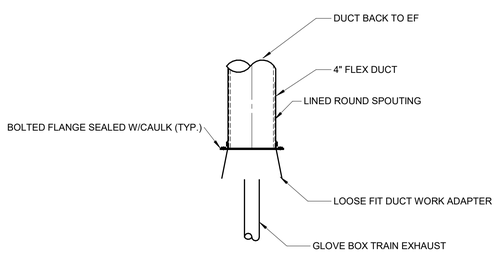


11 ROOF SUPPORT - EXPOSED DUCT (PREMANUFACTURED)
M5.1 NO SCALE



NOTES:
1. INSTALL PIPING PER MANUFACTURER'S RECOMMENDATIONS.

14 HEAT PUMP PIPING
M5.1 NO SCALE



16 GLOVE BOX TRAIN - DUCT CONNECTION
M5.1 NO SCALE

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M5.1

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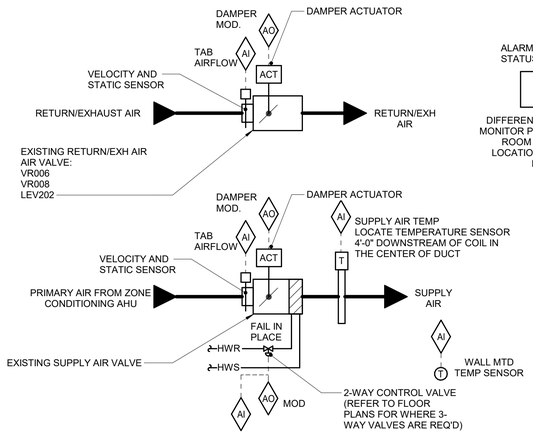


SEQUENCE OF OPERATION:

- FMCS AIR VALVE CONTROLLER SHALL MODULATE THE TAB DAMPER AND TAB HW REHEAT COIL CONTROL VALVE TO MAINTAIN SPACE TEMPERATURE OF 72°F (ADJ.) WITH 5°F (ADJ.) DEAD BAND BASED ON A SIGNAL FROM A WALL MOUNTED TEMPERATURE SENSOR. SEE DRAWINGS FOR TEMPERATURE SENSOR REQUIREMENTS. SPACES WITH ADJUSTABLE THERMOSTATS WILL ALLOW A +/- 3°F (ADJ.) OFFSET FROM THE DDC SETPOINT.
- AT FULL COOLING, THE TAB SHALL BE OPEN TO MAXIMUM CFM POSITION. THE REHEAT COIL CONTROL VALVE SHALL BE CLOSED.
- UPON A FALL IN SPACE TEMPERATURE, THE TAB SHALL MODULATE CLOSED UNTIL SPACE SETPOINT IS MAINTAINED, OR UNTIL IT REACHES ITS MINIMUM CFM POSITION.
- UPON A FURTHER FALL IN SPACE TEMPERATURE, THE REHEAT COIL CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN SPACE SETPOINT UNTIL THE SUPPLY AIR TEMPERATURE IS 20°F ABOVE ROOM TEMPERATURE SETPOINT.
- UPON A FURTHER FALL IN SPACE TEMPERATURE, TAB SHALL OPEN TO MAINTAIN SETPOINT UNTIL TAB AIRFLOW REACHES ITS MAXIMUM HEATING SETTING. THE REHEAT CONTROL VALVE SHALL CONTINUE TO MODULATE OPEN TO MAINTAIN MAXIMUM DELTA T LISTED ABOVE.

RETURN/EXHAUST TAB SEQUENCE OF OPERATION:

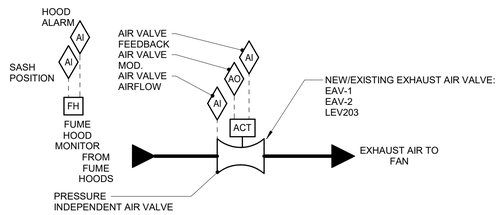
- FMCS SHALL MODULATE RETURN/EXHAUST TAB DAMPER TO ACHIEVE THE ROOM AT MINIMUM -0.010 OR +0.010.
- FMCS SHALL MONITOR EACH ROOM DIFFERENTIAL PRESSURE (DP) AND SHALL DISPLAY THE VALUE ON THE TAB GRAPHICAL SCREEN AT THE OPERATOR WORKSTATION.

ALARMS, INTERLOCKS & SAFETIES:

- SEND AN ALARM TO THE FMCS OPERATOR INTERFACE IF THE SPACE TEMPERATURE IS MORE THAN 10°F (ADJ.) ABOVE OR BELOW SETPOINT.
- DIFFERENTIAL PRESSURE MONITOR SHALL INDICATE A LOCAL ALARM IN THE EVENT THE ROOM PRESSURE IS GREATER THAN -0.010 OR +0.010.

11 AIR VALVE CONTROL W/ HOT WATER REHEAT AND ROOM PRESSURE AIR VALVE CONTROL

M9.0 NO SCALE



SEQUENCE OF OPERATION:

THE FMCS SHALL MODULATE THE EXHAUST AIR VALVE TO MAINTAIN THE MINIMUM FACE VELOCITY ACROSS THE FUME HOOD OPENING FACE VELOCITIES SHALL BE PER THE MANUFACTURERS IOM REQUIREMENTS.

ALARMS, INTERLOCKS AND SAFETIES:

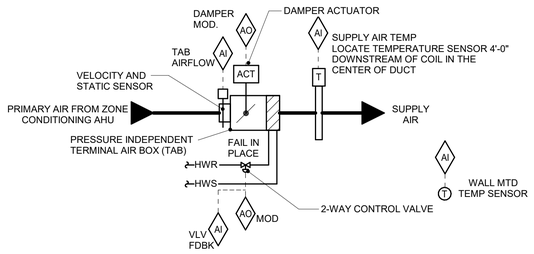
- THE FUME HOOD MONITOR SHALL BE CAPABLE OF COMMUNICATING THE FOLLOWING AUDIO (ALL AUDIO ALARMS SHALL BE CAPABLE OF BEING SILENCED) AND VISUAL

ALARMS:

- LOW AIR FLOW
- LOW DIFFERENTIAL STATIC PRESSURE
- SASH OPENING ABOVE 18"
- SEND AN ALARM TO THE FMCS OPERATOR INTERFACE IF THE DIFFERENTIAL PRESSURE ACROSS THE AIR VALVE DROPS BELOW 0.4" W.C. (ADJ.)

8 FUME HOOD EXHAUST AIR VALVE

M9.0 NO SCALE



SEQUENCE OF OPERATION:

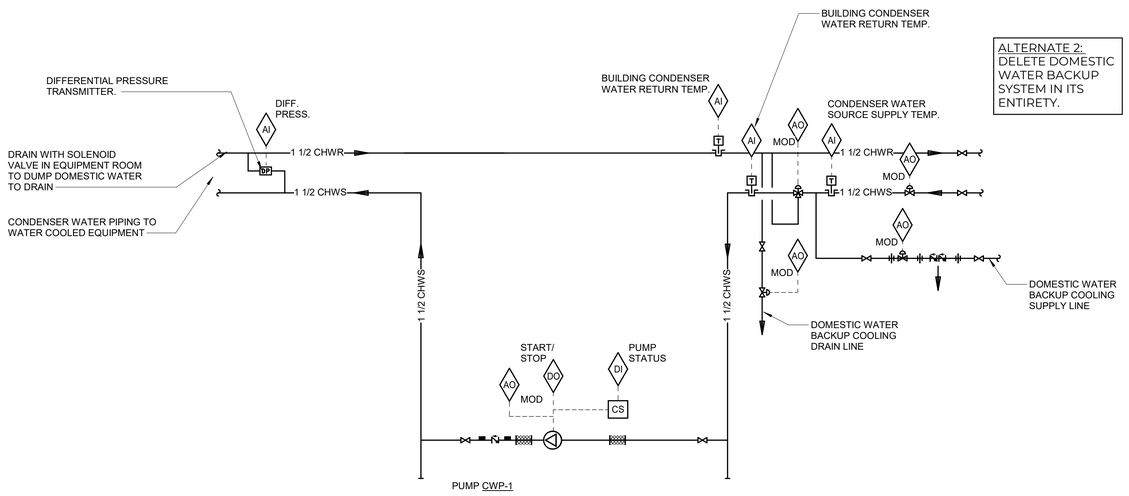
- FMCS TAB CONTROLLER SHALL MODULATE THE TAB DAMPER AND TAB HW REHEAT COIL CONTROL VALVE TO MAINTAIN SPACE TEMPERATURE OF 72°F (ADJ.) WITH 5°F (ADJ.) DEAD BAND BASED ON A SIGNAL FROM A WALL MOUNTED TEMPERATURE SENSOR. SEE DRAWINGS FOR TEMPERATURE SENSOR REQUIREMENTS. SPACES WITH ADJUSTABLE THERMOSTATS WILL ALLOW A +/- 3° F (ADJ.) OFFSET FROM THE DDC SETPOINT.
- AT FULL COOLING, THE TAB SHALL BE OPEN TO MAXIMUM CFM POSITION. THE REHEAT COIL CONTROL VALVE SHALL BE CLOSED.
- UPON A FALL IN SPACE TEMPERATURE, THE TAB SHALL MODULATE CLOSED UNTIL SPACE SETPOINT IS MAINTAINED, OR UNTIL IT REACHES ITS MINIMUM SCHEDULED CFM POSITION PER THE TAB SCHEDULE. THE REHEAT COIL CONTROL VALVE SHALL BE CLOSED.
- UPON A FURTHER FALL IN SPACE TEMPERATURE, THE REHEAT COIL CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN SPACE SETPOINT UNTIL THE SUPPLY AIR TEMPERATURE IS 20°F ABOVE ROOM TEMPERATURE SETPOINT.
- UPON A FURTHER FALL IN SPACE TEMPERATURE, TAB SHALL OPEN TO MAINTAIN SETPOINT UNTIL TAB AIRFLOW REACHES ITS MAXIMUM HEATING SETTING. THE REHEAT CONTROL VALVE SHALL CONTINUE TO MODULATE OPEN TO MAINTAIN MAXIMUM DELTA T LISTED ABOVE.
- WHEN FLOATING CV'S ARE USED, FMCS SHALL PERFORM AN AUTO-ZERO FUNCTION EVERY NIGHT DURING UNOCCUPIED TIMES. THE FMCS SHALL STAGGER AUTO-ZERO SEQUENCES SO THAT ALL VALVES DO NOT SIMULTANEOUSLY CLOSE.

ALARMS, INTERLOCKS & SAFETIES:

SEND AN ALARM TO THE FMCS OPERATOR INTERFACE IF THE SPACE TEMPERATURE IS MORE THAN 10°F (ADJ.) ABOVE OR BELOW SETPOINT.

9 CONTROL W/ HOT WATER REHEAT - TAB-1

M9.0 NO SCALE



SEQUENCE OF OPERATION

ON A CALL FOR COOLING FROM THE HEAT PUMP OR THE LAB PROCESS EQUIPMENT, THE CONDENSER WATER SUPPLY VALVE SHALL OPEN AND THE CONDENSER WATER PUMP CWP-1 SHALL BE ENABLED. THE 3-WAY VALVE SHALL MODULATE TO MAINTAIN 70 F (ADJ) CONDENSER WATER SUPPLY TEMPERATURE. WHEN THE CALL FOR COOLING IS SATISFIED, THE CONDENSER WATER SUPPLY VALVE SHALL CLOSE AND THE PUMP SHALL BE DISABLED AFTER A 2 MINUTE DELAY. IF THE CONDENSER WATER SUPPLY TEMPERATURE RISES ABOVE 75 F FOR MORE THAN 10 MINUTES, THE FMCS SHALL GENERATE AN ALARM, CLOSE THE CONDENSER WATER SUPPLY VALVE, AND MODULATE THE DOMESTIC WATER BACKUP COOLING SUPPLY AND DRAIN VALVES TO MAINTAIN THE CONDENSER WATER SUPPLY TEMPERATURE AT 70 F.

THE FMCS SHALL MODULATE THE PUMPS SPEED TO MAINTAIN THE DIFFERENTIAL PRESSURE SET POINT. THE DIFFERENTIAL PRESSURE SET POINT SHALL BE DETERMINED BY THE TAB CONTRACTOR DURING SYSTEM BALANCING.

ALARMS

- GENERATE AN ALARM THROUGH THE FMCS IF THE PUMP IS ENABLED AND THE PUMP STATUS INDICATES THE PUMP IS NOT RUNNING.
- GENERATE AN ALARM THROUGH THE FMCS IF THE CONDENSER WATER TEMPERATURE IS ABOVE 75 F FOR MORE THAN 10 MINUTES.
- GENERATE AN ALARM THROUGH THE FMCS IF THE DOMESTIC WATER BACK UP VALVE IS OPEN FOR MORE THAN 3 HOURS.

18 CONDENSER WATER LOOP CONTROL

M9.0 NO SCALE

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HVAC DIAGRAMS
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DRAWN BY: KAH
PROJECT#: 22210
DATE: 04/18/2024

M9.0

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WATER SOURCE HEAT PUMP

NOTES:
1.PROVIDE UNIT WITH TWO-STAGE FUNCTIONALITY.

TAG NAME	AREA SERVED	CONFIGURATION	NOMINAL TONNAGE	CFM	EXT. S.P. IN. W.C.	COOLING MBH BASED ON ***F ENTERING WATER TEMPERATURE. EAT DB °F	EAT WB °F	MBH TOTAL	MBH SEN.	MIN. EER	COND. GPM	W.P.D. FT. HEAD	ELECTRICAL VOLTAGE	PHASES	FLA	MCA	MOCP	DISCONNECT BY (NOTE A)	DISCONNECT TYPE (NOTE B)	CONTROLLER/ STARTER BY (NOTE A)	CONTROLLER/ STARTER SCCR	MAX. DIMENSIONS (IN) LENGTH	WIDTH	HEIGHT	MANUFACTURER	MODEL (NOTE 1)	NOTES
WCU-1	CHILLER ROOM	HORIZONTAL	5	2000	0.25	75.0	63.0	56	40	16.9	15.0	5.88	208	1	36.5	43.3	60	MFR	NF	MFR	0	58.5	25	32.5	DAIKIN	WGTH0641	1

FAN SCHEDULE

NOTES:
1.UNIT TO BE CONTROLLED FROM WALL SWITCH.
2.UNIT TO OPERATE CONTINUOUSLY.

TAG NAME	AREA SERVED	CFM	S.P. IN. W.C.	FAN RPM (NOTE F)	DRIVE TYPE	MAX. AMCA SONES	ELECTRICAL (NOTE 1) MHP (NOTE E)	VOLTAGE	PHASES	DISCONNECT BY (NOTE A)	DISCONNECT TYPE (NOTE B)	CONTROLLER/ STARTER BY (NOTE A)	CONTROLLER/ STARTER TYPE (NOTE C)	CONTROLLER/ STARTER SCCR	WEIGHT	MANUFACTURER	MODEL	NOTES
EF-1	CHILLER ROOM	200	0.40	1300	DIRECT	5.8	0.125	115	1	MFR	NF	MFR	FV	0	22	COOK	90C15DH	
EF-2	GLOVE BOX TRAIN	100	0.50	1176	DIRECT	10	0.25	115	1	MFR	NF	MFR	FV	0	233	Greenheck	SFD-6	1
EF-3	NEW HOOD	1350	0.50	1176	DIRECT	10	0.5	115	1	MFR	NF	MFR	FV	0	233	Greenheck	SFD-9	1

FILTER SCHEDULE

NOTES:
1.UNIT OPERATION TO BE CONTROLLED FROM WALL SWITCH.
2.PROVIDE WITH HANGING MOUNTING BRACKET.

TAG NAME	FINISH	OVERALL FILTER BANK SIZE HEIGHT	WIDTH	EFFICIENCY % AT.3 MICRONS	CFM	MANUFACTURER	MODEL	FILTER TYPE	NOTES
AF-1	WHITE EPOXY COATED STEEL	24	48	99.97	500	PURAIRSKY	SKY-48	HEPA/CARBON	1,2

TERMINAL AIR BOX SCHEDULE - SINGLE DUCT

NOTES:
1.NEITHER RADIATED NOR DISCHARGE SOUND LEVELS SHALL EXCEED NC 35 AT 1.5" INLET STATIC PRESSURE WHEN TESTED PER AHRI STANDARD 885-2008 USING 5/8" 20-LB DENSITY MINERAL FIBER CEILING TILE.
2.TOTAL AIR PRESSURE DROP OF TAB SHALL NOT EXCEED 0.50" WC.

TAG NAME	AREA SERVED	CFM COOLING MAX.	CFM HEATING MAX.	CFM MIN.	HEATING COIL (NOTES 5, 6) EAT °F	LAT °F	EWT °F	LWT °F	MAX. GPM	MIN. INLET SIZE (IN.) DIA.	SENSOR TYPE (NOTE 4)	WEIGHT	MANUFACTURER	MODEL (NOTES 1, 2)	NOTES
TAB-1	008D	600	450	125	55.0	85.0	180	160	3.5	8"	1	15	PRICE	SDV	1,2

EXHAUST AIR VALVE SCHEDULE

NOTES:
1.NEITHER RADIATED NOR DISCHARGE SOUND LEVELS SHALL EXCEED NC 35 AT 1.5" INLET STATIC PRESSURE WHEN TESTED PER AHRI STANDARD 885-2008 USING 5/8" 20-LB DENSITY MINERAL FIBER CEILING TILE.
2.TOTAL AIR PRESSURE DROP OF TAB SHALL NOT EXCEED 0.50" WC.
3.SEE SEQUENCE OF OPERATION FOR CONTROL

TAG NAME	AREA SERVED	CFM MAX.	CFM MIN.	MIN. INLET SIZE (IN.) DIA.	WEIGHT	MANUFACTURER	MODEL (NOTES 1, 2)	NOTES
EAV-1	008	1350	270	10"	25	PRICE	VENTURI	3
EAV-2	008F	1350	270	10"	25	PRICE	VENTURI	3

AIR TERMINAL SCHEDULE

NOTES:
1.CONTRACTOR SHALL DETERMINE PROPER BORDER TYPE TO MATCH CEILING CONSTRUCTION.
2.REFER TO DRAWINGS FOR NECK SIZE. ALL BRANCH DUCTWORK TO AIR TERMINALS SHALL BE NECK SIZE UNLESS NOTED OTHERWISE.
3.COLOR SELECTION DETERMINED BY ARCHITECT.

TAG NAME	FACE SIZE (IN.) (NOTE 2)	TYPE	BORDER (NOTE 1)	MATERIAL	FINISH	VOLUME DAMPER REQUIRED	MANUFACTURER	MODEL	NOTES
EG-1	24x24	EGG CRATE	LAY-IN	ALUMINUM	WHITE	NO	PRICE	80	1,2,3
RG-1	24x24	PERFORATED FACE	LAY-IN	STEEL	WHITE	NO	PRICE	80	1,2,3
RR-1	SEE DWG	35 DEGREE DEFLECTION	SURFACE MOUNT	STEEL	WHITE	NO	PRICE	500	1,2
SD-1	13	LOUVER FACE	LAY-IN	STEEL	WHITE	NO	PRICE	RCD	2,3
SD-1	22.5	LOUVER FACE	LAY-IN	STEEL	WHITE	NO	PRICE	RCD	2,3
SD-2	24x24	LOUVERED	LAY-IN	STEEL	WHITE	NO	PRICE	AMD	1,2,3

PUMP SCHEDULE

NOTES:
1.PROVIDE WITH VARIABLE SPEED ECM MOTOR.

TAG NAME	AREA SERVED	GPM	PUMP FT. HEAD AT DESIGN	MINIMUM PUMP EFFICIENCY	INLET SIZE	IMPELLER SIZE	ELECTRICAL (NOTE 1) HP (NOTE E)	RPM	VOLTAGE	PHASES	DISCONNECT BY (NOTE A)	DISCONNECT TYPE (NOTE B)	CONTROLLER/ STARTER BY (NOTE A)	CONTROLLER/ STARTER TYPE (NOTE C)	MAX. DIMENSIONS (IN) LENGTH	WIDTH	HEIGHT	WEIGHT	MANUFACTURER	MODEL	NOTES
CWP-1		15.0	20.00	50	2 1/2"	7.000	0.16	3800	115	1	EC	NF	MFR	ECM	7.05	6.22	8.05	0	TACO	0026e	1

SCHEDULE GENERAL NOTES:

A. DISCONNECT AND CONTROLLER STARTER FURNISHED AND INSTALLED BY:
MFR = MANUFACTURER
EC = ELECTRICAL CONTRACTOR.
MC = FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR.
MFR/EC = FURNISHED LOOSE BY MANUFACTURER INSTALLED BY ELECTRICAL CONTRACTOR.
ATC = AUTOMATIC TEMPERATURE CONTROL CONTRACTOR

B. DISCONNECT TYPE:
CB = CIRCUIT BREAKER
F = FUSED
NF = NON-FUSED

C. CONTROLLER STARTER TYPE:
FV = FULL VOLTAGE
WYE = WYE-DELTA
SS = SOLID STATE (SOFT START)
MS = MANUAL STARTER
VFD = VARIABLE FREQUENCY DRIVE
VFD/B = VARIABLE FREQUENCY DRIVE WITH BYPASS
YD = WYE - DELTA

D. FAN RPM SHALL NOT EXCEED 110% OF SCHEDULED VALUE, WITH THE SCHEDULED WHEEL TYPE. SUBSTITUTION OF BI OR BIA FANS FOR FC IS ACCEPTABLE IF EFFICIENCY IS NOT LOWER.

E. NO EQUIPMENT SHALL BE SELECTED ABOVE 90% OF MOTOR NAME PLATE RATING.

F. MUST BE WITHIN +/- 10% OF SCHEDULED RPM.

G. CURB TYPE:
MFR = STANDARD CURB BY MANUFACTURER
GC = BY GENERAL CONTRACTOR
SAC = SOUND ATTENUATOR CURB

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HVAC SCHEDULES
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100% CONSTRUCTION DOCUMENTS

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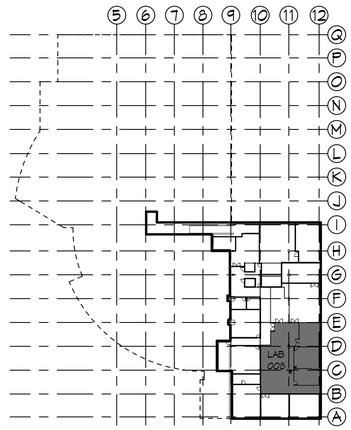
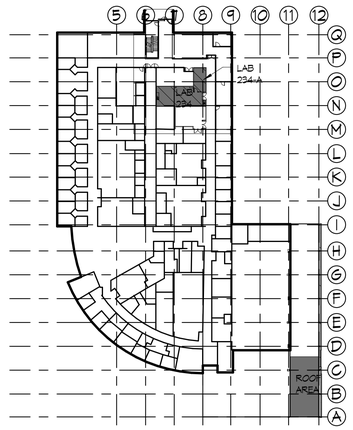


6 BASEMENT KEY PLAN
FD2.1 1" = 60'-0"



7 SECOND FLOOR KEY PLAN
FD2.1 1" = 60'-0"

KEYNOTES

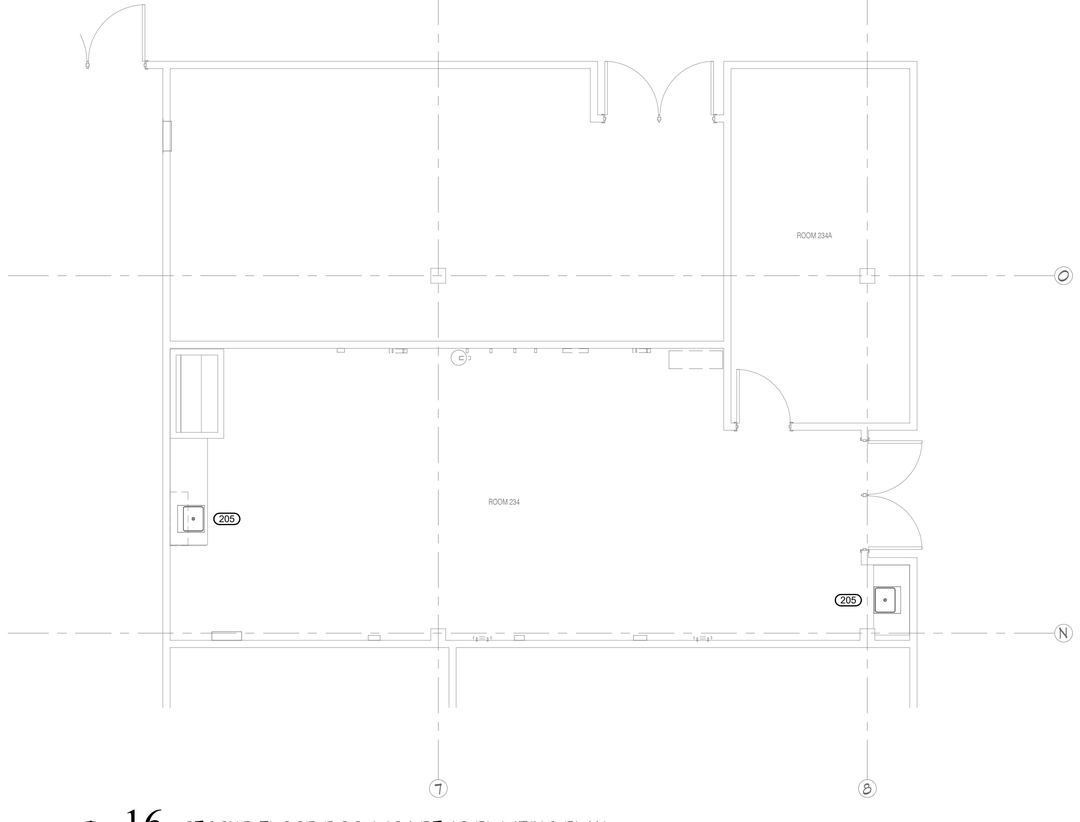
200 DEMO EXISTING SINK AND ASSOCIATED VENT AND SEWER PIPE. DEMO DOMESTIC COLD AND HOT WATER SUPPLY PIPING BACK TO MAIN AND CAP.

201 EXISTING FLOOR DRAIN AND VENT PIPING TO REMIAN. TRAP PRIMER TO REMAIN SERVING THE FLOOR DRAIN.

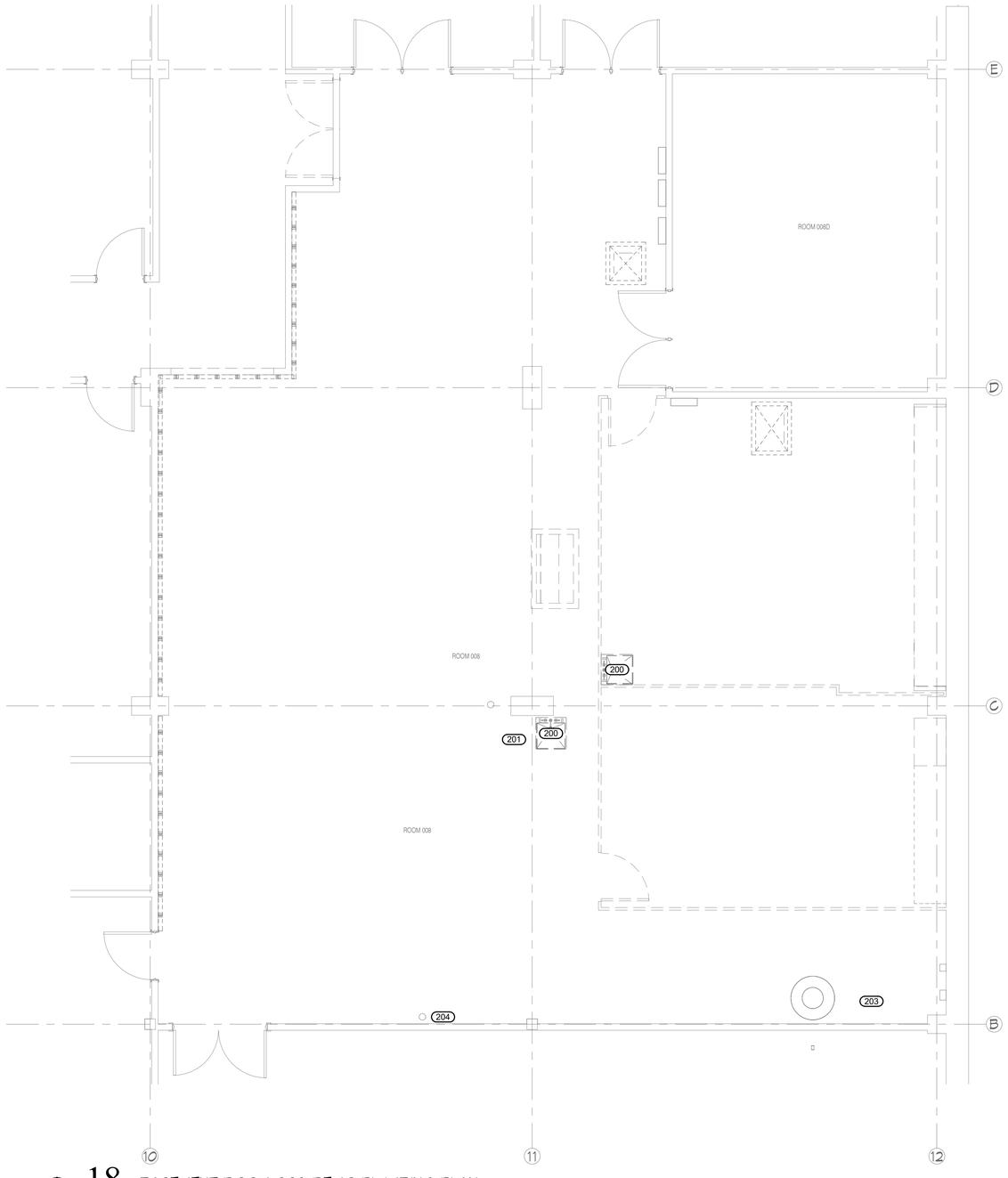
203 EXISTING EQUIPMENT TO REMAIN.

204 ALL PIPING TO REMAIN UNLESS OTHERWISE NOTED.

205 EXISTING SINKS TO REMAIN.



16 SECOND FLOOR ROOM 234 DEMO PLUMBING PLAN
FD2.1 1/4" = 1'-0"



18 BASEMENT ROOM 008 DEMO PLUMBING PLAN
FD2.1 1/4" = 1'-0"

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PLUMBING DEMOLITION PLANS
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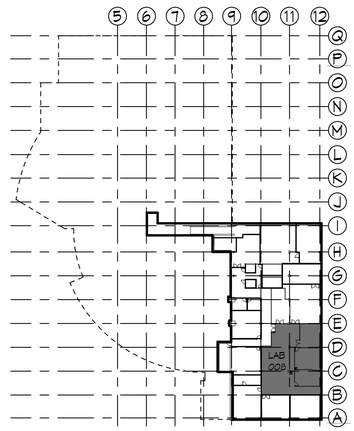
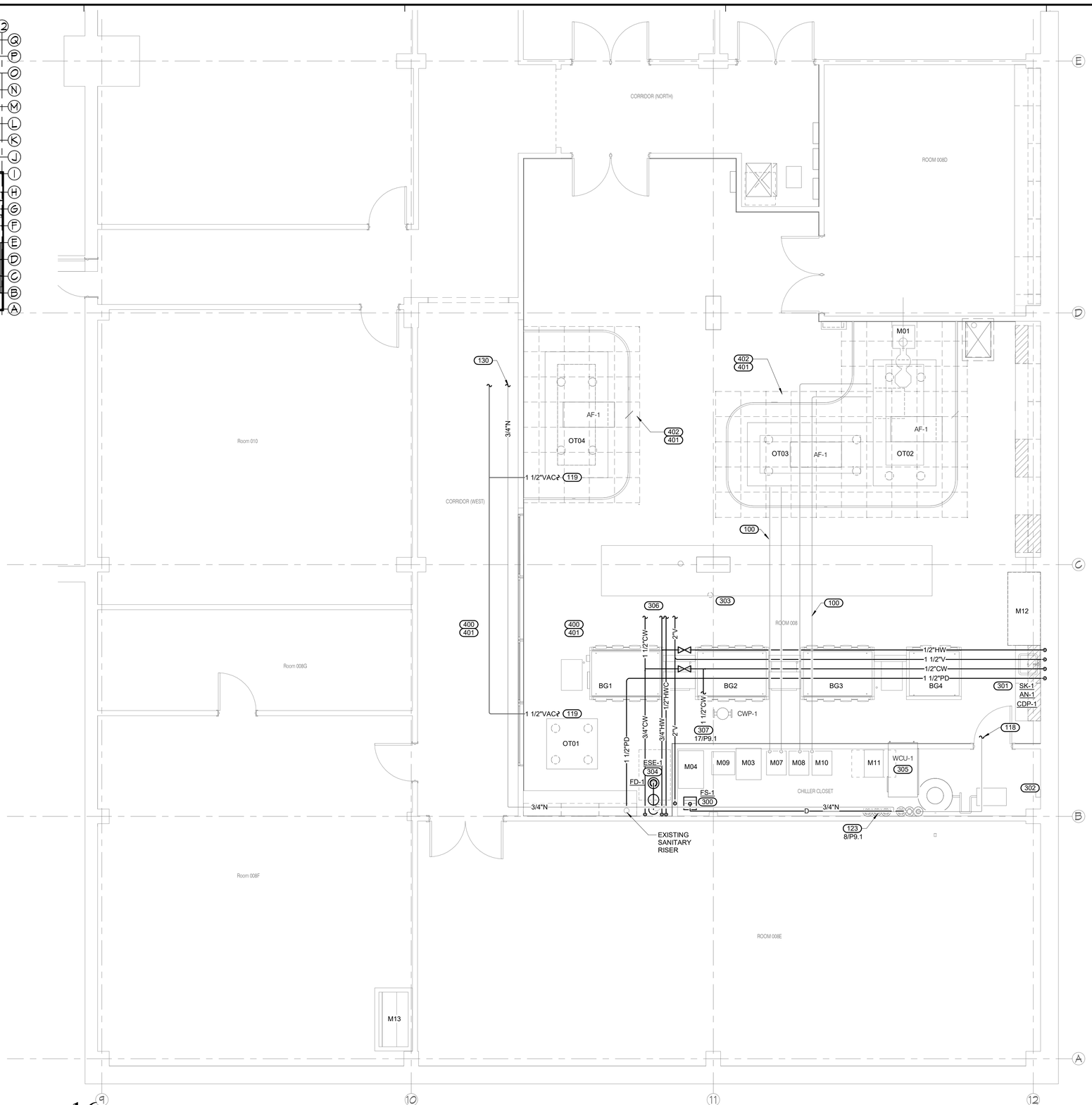


6 BASEMENT KEY PLAN
P2.B 1" = 60'-0"



16 BASEMENT ROOM 008 PLUMBING PLAN
P2.B 1/4" = 1'-0"

KEYNOTES

100 PROVIDE HIGH PRESSURE FLEXIBLE STAINLESS STEEL HELIUM LINES.

118 ROUTE 1/2" N OVERHEAD TO EACH OPTICAL TABLE AND PROVIDE QUICK DISCONNECT. ROUTE 1/2" N TO EACH GLOVE BOX AND PROVIDE CONNECT TO LAB EQUIPMENT PER MANUFACTURES INSTALLATION INSTRUCTIONS.

119 ROUTE 1-1/2" VAC OVERHEAD TO EACH OPTICAL TABLE AND PROVIDE QUICK DISCONNECT.

123 PROVIDE NITROGEN GAS MANIFOLD, SEE DETAILS FOR MORE INFORMATION.

130 ROUTE BACK TO EXISTING NITROGEN MAIN.

300 ROUTE SANITARY PIPING FROM FLOOR SINK (FS-1) AND CONNECT INTO EXISTING SANITARY PIPING. SAWCUT AND PATCH CONCRETE AS NEEDED FOR CONNECTION. ROUTE VENT PIPING FROM FLOOR SINK INTO EXISTING VENT PIPING SYSTEM.

301 PROVIDE DRAIN PUMP IN CABINET SPACE NEXT TO SINK AND ROUTE PUMPED SANITARY TO EXISTING SANITARY DRAIN.

302 PROVIDE MOISTURE DETECTION DEVICE WITH ALARM.

303 REROUTE EXISTING CONDENSATE PIPE THAT DRAINED TO EXISTING FLOOR DRAIN, TO NEW FLOOR SINK.

304 PROVIDE FLOOR DRAIN FOR EMERGENCY SHOWER. SAWCUT AND PATCH FLOOR AS NEEDED TO CONNECT NEW SANITARY PIPING FROM THE EMERGENCY SHOWER AND FLOOR DRAIN TO EXISTING SANITARY SYSTEM. ROUTE VENT FROM FLOOR DRAIN AND EMERGENCY SHOWER TO EXISTING VENT SYSTEM. ROUTE 3/4" COLD AND HOT WATER FROM MAINS TO EMERGENCY SHOWER MIXING VALVE. ISOLATION VALVES SHALL BE LOCKED OPEN. CONNECT RECIRCULATION PIPE INTO BUILDING RECIRCULATION SYSTEM. PROVIDE BALLANCING VALVE WITH CHECK VALVE AND SET RECIRCULATION FLOW TO 0.5 GPM

305 ROUTE CONDENSATE FROM HEAT PUMP (WCU-1) TO NEW FLOOR SINK AT A MINIMUM SLOPE OF 1/8 INCH PER FOOT.

306 ROUTE DOMESTIC COLD, HOT AND HOT RECIRC TO NEAREST MAINS AND TAP MAINS WITH ISOLATION VALVES. COLD WATER TO BE ROUTED TO 1-1/2" OR LARGER COLD WATER MAIN.

307 SEE CONDENSER WATER LOOP (DOMESTIC) DETAIL FOR COLD WATER SUPPLY AND DRAIN INFORMATION FOR CONDENSER WATER LOOP.

400 ADJUST SPRINKLER HEADS AND PIPING FOR NEW CEILING AND WALLS. COORDINATE LAYOUT WITH EXISTING AND NEW MECHANICAL AND LIGHTING EQUIPMENT.

401 NEW FIRE PROTECTION WORK AND MATERIALS ARE TO MATCH THE EXISTING SYSTEM, UNLESS OTHERS BE REQUIRED BY THE AHJ. THIS SHALL INCLUDE BUT IS NOT LIMITED TO PIPING, FITTINGS, SPRINKLERS AND PIPE IDENTIFICATION. ALL MATERIALS SHALL BE UL LISTED AND INSTALLED PER NFPA.

402 PROVIDE SPRINKLER COVERAGE ABOVE AND BELOW CLOUD CEILINGS, IN ACCORDANCE WITH NFPA 13. PROTECTION ABOVE CLOUD CEILINGS TO BE PROVIDED FROM EXISTING SYSTEM/SPRINKLERS. EXISTING SPRINKLERS TO BE RELOCATED ONLY AS REQUIRED BY NFPA 13. FOR SPRINKLER PROTECTION BELOW THE CLOUD CEILING, ROUTE HARD LINES FROM EXISTING BRANCH LINES TO THE CLOUD CEILINGS AND INSTALL QUICK RESPONSE PENDANT SPRINKLERS.

PLUMBING GENERAL NOTES:

A. SEE ARCHITECTURAL PLANS FOR LOCATION OF LAB EQUIPMENT.
B. CONTRACTOR TO COORDINATE WITH LAB EQUIPMENT FOR EXACT LOCATION OF CONNECTIONS TO EQUIPMENT. EQUIPMENT WILL INCLUDE THE FOLLOWING
   - GLOVEBOX TRAIN
   - OPTICOOL CRYOSTAT AND OPTICAL TABLE
   - CHARACTERIZATION BOX AND OPTICAL TABLE
   - MONTANA INSTERMENTS S100 CRYOSTAT AND OPTICAL TABLE
   - LOW-TEMPERATURE AFM, NANO-OPTICAL MICROSCOPE AND OPTICAL TABLE

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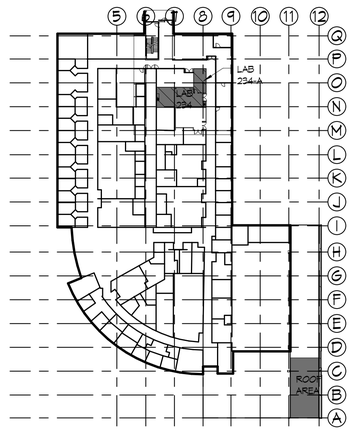


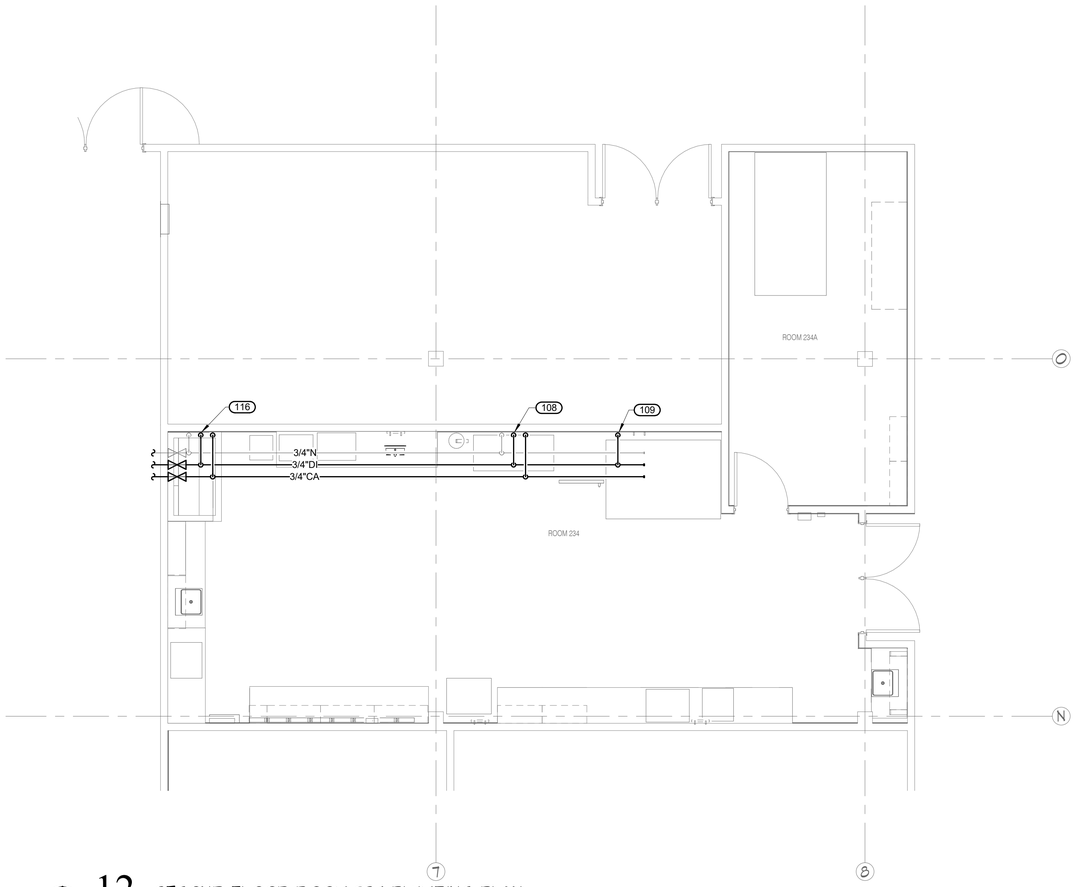
6 SECOND FLOOR KEY PLAN
P2.2 1" = 60'-0"

KEYNOTES

108 CONNECT TO OVERHEAD DI WATER, N AND CA AND ROUTE TO WEATHER-O-METER.

109 CONNECT TO OVERHEAD DI WATER AND ROUTE TO DUST FREE ENCLOSURE.

116 CONNECT TO OVERHEAD DI WATER, NG AND N PIPING AND ROUTE TO EXISTING HOOD.



12 SECOND FLOOR ROOM 234 PLUMBING PLAN
P2.2 1/4" = 1'-0"

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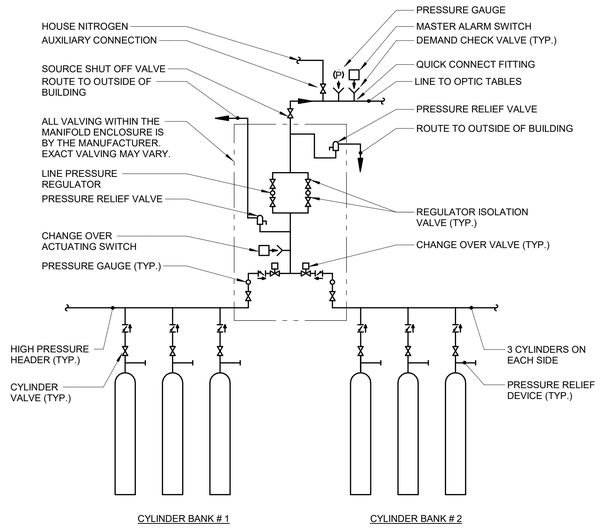


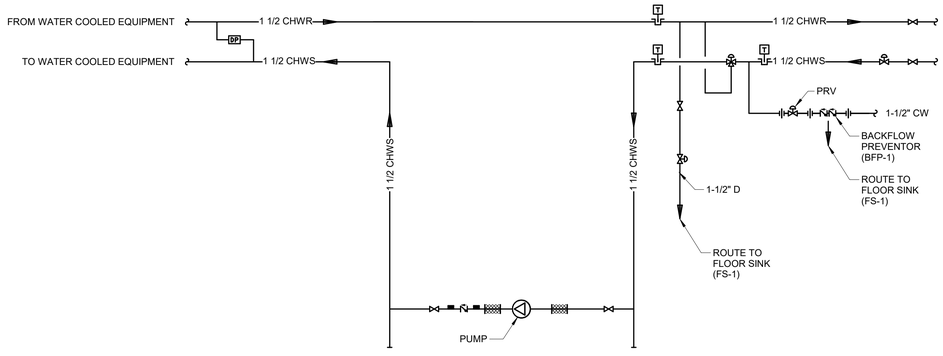
NOTES:

1. ALL CYLINDERS, THOSE IN SERVICE AND THOSE IN STORAGE, MUST BE INDIVIDUALLY SECURED AND LOCATED IN A WAY TO PREVENT THEM FROM FALLING OR BEING KNOCKED OVER PER NFPA 99.
2. NUMBER OF CYLINDERS MAY VARY BASED ON FACILITY CHANGE-OVER RATE.

8 NITROGEN GAS - MANIFOLD SOURCE PIPING SYSTEM

P9.1 NO SCALE

ALTERNATE 2:
DELETE DOMESTIC WATER BACKUP SYSTEM IN ITS ENTIRETY.



17 CONDENSER WATER LOOP (DOMESTIC)

P9.1 NO SCALE

PLUMBING ROUGH-IN SCHEDULE

NOTES: (APPLIES TO ALL PLUMBING FIXTURES LISTED BELOW)
1) SIZES SHOWN ARE MINIMUMS. LARGER SIZES SHOWN ON THE DRAWING SHALL DICTATE THE ROUGH-IN SIZE.
2) SANITARY RISERS UP IN WALL TO FIXTURES SHALL BE A MINUMUM OF 2".
3) DOMESTIC WATER BRANCH PIPING OUTSIDE OF THE WALL/CHASE SHALL BE A MINIMUM OF 3/4" UNLESS NOTED OTHERWISE. ONLY THE FINAL RISE-DROP SHALL BE SMALLER.
4) FINAL SANITARY SIZE SHALL MATCH P-TRAP SIZE (REFER TO MATERIAL LIST).

TAG NAME	DESCRIPTION	COLD WATER	HOT WATER	SANITARY	VENT
AN-1	ACID NEUTRALIZATION	-	-	1 1/2"	-
CDP-1	COMPACT DRAIN PUMP	-	-	1 1/2"	1 1/2"
ESE-1	EMERGENCY SHOWER EYE-FACE WASH			2"	1 1/2"
FD-1	FLOOR DRAIN	-	-	4"	2"
FS-1	FLOOR SINK			4"	2"
SK-1	SINK	1/2"	1/2"	1 1/2"	1 1/2"

PLUMBING MATERIAL LIST

TAG NAME	DESCRIPTION	MANUFACTURER AND MODEL
AN-1	ACID NEUTRALIZATION CARTRIDGE SYSTEM. IDUSTIRAL STRENGTH GLASS-FILLED POLYPROPYLENE BODY. REMOVABLE UPPER NEUTRALIZATION CHAMBER. AND LOWER SEDIMENT COLLECTION CHAMBER.	ZURN - Z91-PHIX
BFP-1	BACK FLOW PREVENTER - REDUCED PRESSURE ZONE, LEAD FREE ALLOY CONSTRUCTION, SIZE SAME AS PIPE, NON-CORROSIVE INTERNAL PARTS, STAINLESS STEEL SPRINGS, DIFFERENTIAL PRESSURE RELIEF VALVE BETWEEN SPRING-LOADED CHECK VALVES, BALL STYLE SHUT-OFF VALVES ON INLET AND OUTLET OF UNIT, AIR GAP DRAIN FITTING, TEST PORTS WITH SHUT-OFF VALVES, RATED FOR 175 PSI AT 33°F TO 140°F, 15 PSI (MAXIMUM) PRESSURE DROP AT 10 FPS, FACTORY TESTED. ROUTE DRAIN PIPE FROM AIR GAP FITTING TO FLOOR DRAIN. PROVIDE AND INSTALL BRONZE OR EPOXY COATED STRAINER UPSTREAM OF EACH UNIT AND ADDITIONAL VALVE UPSTREAM OF EACH STRAINER.	WATTS (LF009), WILKINS (375XL), FEBCO (LF860), APOLLO (RPLF4A)
CDP-1	COMPACT DRAIN PUMP - DRAIN PUMP SHALL BE RATED AT 1/6 HP, 120 VOLTS, 60 HZ, 3450 RPM. THE DRAIN PUMP SHALL BE CAPABLE OF HANDLING EFFLUENT WITH 1/8" SOLID HANDLING CAPABILITY. THE DRAIN PUMP SHALL HAVE A MAX TOTAL DYNAMIC HEAD OF 12 GPM @ 27 FEET. THE MOTOR HOUSING SHALL BE CONSTRUCTED OF ABS. ALL MATING PARTS SHALL BE SEALED WITH AN ENGINEERED GASKET. ALL FASTENERS SHALL BE STAINLESS STEEL. THE MOTOR AND SWITCH SHALL BE PROTECTED ON THE TOP SIDE WITH AN ABS ACCESS COVER. THE MOTOR SHALL BE PROTECTED ON THE LOWER SIDE WITH BOTH AN ENGINEERED LIP SEAL AND TWO-PIECE CARBON CERAMIC MECHANICAL SEAL WITH STAINLESS STEEL SPRINGS. THE TANK SHALL BE MADE OF ABS. THE DRAIN PUMP SHALL BE SUPPLIED WITH 9 FEET OF MULTI-CONDUCTOR POWER CORD. THE POWER CORD SHALL BE SIZED FOR THE RATED FULL LOAD AMPS OF THE PUMP IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE. ALL MOTORS SHALL BE AIR-FILLED AND CLASS B INSULATED NEMA B DESIGN, RATED FOR CONTINUOUS DUTY. AT MAXIMUM LOAD, THE WINDING TEMPERATURE SHALL NOT EXCEED 130°C UNSUBMERGED. THE PUMP MOTOR SHALL HAVE AN INTEGRAL THERMAL OVERLOAD SWITCH IN THE WINDINGS FOR PROTECTING THE MOTOR. THE CAPACITOR CIRCUIT SHALL BE MOUNTED INTERNALLY IN THE PUMP.	PUMP - LIBERTY PUMPS (406)
ESE-1	EMERGENCY SHOWER & EYE/FACE WASH - ACCESSIBLE, COMBINATION UNIT, FREESTANDING, FLOOR MOUNTED WITH TOP INLET, STAINLESS STEEL SHOWER HEAD, BRASS/BRONZE STAY OPEN BALL VALVE, STAINLESS STEEL/ALUMINUM PULL ROD, STAINLESS STEEL BOWL WITH HINGED DUST COVER, PLASTIC SPRAY HEADS WITH CAPS AND RETAINING CHAINS/STRAPS, BRASS SUPPLY ARMS, BRASS/BRONZE STAY OPEN BALL VALVE, METAL FLAG, INTEGRAL FLOW CONTROL FITTINGS, STAINLESS STEEL SUPPLY PIPING AND FITTINGS, UNIVERSAL IDENTIFICATION SIGN, ANSI Z358.1-2004 COMPLIANT. MINIMUM FLOW RATE OF SHOWER SHALL BE 20 GPM AT 30 PSI. MINIMUM FLOW RATE OF EYE/FACE WASH SHALL BE 3.0 GPM AT 30 PSI. ACTIVATION TIME SHALL BE 1 SECOND OR LESS. BRASS/BRONZE PIPING, FITTINGS, AND VALVES SHALL BE CHROME-PLATED OR CHEMICAL-RESISTANT POWDER COATED. MOUNT SHOWER HEAD BETWEEN 80"-96" AND PULL ROD AT MAXIMUM 48" ABOVE FINISH FLOOR. EYE/FACE WASH OUTLET HEADS SHALL BE AT MAXIMUM 36" ABOVE FINISH FLOOR WITH MINIMUM 27" OF KNEE CLEARANCE BELOW, AND MINIMUM OF 19" OF CLEARANCE FROM CENTER OF BOWL TO WALL OR OBSTRUCTION. IN COMPLIANCE WITH LATEST ADA AND ANSI 117.1 STANDARDS MIXING VALVE - THERMOSTATIC MIXING VALVE FOR EMERGENCY SHOWER OR COMBINATION SHOWER/EYEWASH FIXTURE, BRONZE BODY CONSTRUCTION, COLD WATER BYPASS, INLET AND OUTLET THERMOMETERS, COMBINATION CHECK STOPS OR SEPARATE SUPPLY CHECK VALVES AND SHUT OFF VALVES, OUTLET ISOLATION VALVE, MOUNTING BRACKET. SUPPLY SHUT OFF VALVES SHALL BE LOCKED OPEN TO PREVENT UNAUTHORIZED CLOSURE. DUAL THERMOSTATIC MIXING AND PRESSURE REGULATING VALVE TO DELIVER 25 GPM OF TEMPERED WATER (60-100 DEGREE F) WITH 10 PSI PRESSURE DIFFERENTIAL. UNIT SHALL BE ASSE 1071 LISTED AND APPROVED. VALVE SHALL COMPLY WITH FEDERAL ACT S.3874.	EMERGENCY SHOWER - GUARDIAN (GBF1900 SERIES), BRADLEY (S19314BF SERIES), ACORN SAFETY (S13/S23 SERIES), HAWS (8300 SERIES), SPEAKMAN (SE-1200 SERIES), ENCON MIXING VALVE - LEONARD (TM-LF), ACORN CONTROLS (ET71 SERIES), ARMSTRONG (Z358), BRADLEY (S19), HAWS (9201H), LAWLER (911), POWERS (ETV400), GUARDIAN (G6040), OR PRE-PACKAGED WITH EMERGENCY SHOWER FROM SAME MANUFACTURER.
FD-1	FLOOR DRAIN - CAST IRON BODY, NICKEL BRONZE ADJUSTABLE TOP, 6" ROUND 4" BOTTOM OUTLET, FLASHING COLLAR. TRAP SEAL - 4", PLASTIC HOUSING WITH FLEXIBLE DIAPHRAGM, SEALING GASKETS, RECLOSES AND SEALS WHEN DISCHARGE IS COMPLETED, ASSE 1072.	FLOOR DRAIN - ZURN (Z-415), SMITH (2005), WADE (1100), JOSAM (30000), WATTS (FD-100), MIFAB (F1100), SUN (FD1000) TRAP SEAL - SURE SEAL (SS), PROVENT (TRAP GUARD), SMITH (QUAD CLOSE), GREEN DRAIN, MIFAB (MI-GARD), ZURN (Z1072)
FS-1	FLOOR SINK - CAST IRON BODY, NICKEL BRONZE RIM AND GRATE, 12" SQUARE, 4" BOTTOM OUTLET, 6" DEEP RECEPTOR WITH STAINLESS STEEL MESH SEDIMENT BUCKET, ACID RESISTANT COATED INTERIOR, SEEPAGE FLANGE WITH CLAMP.	ZURN (Z1901), SMITH (3151), WADE (9140), JOSAM (49340A), WATTS (FS-740), SIOUX CHIEF (861-2xXFNWC), SUN (FS2000), MIFAB (FS1730)
SK-1	SINK - ACCESSIBLE, SELF-RIMMING EXTRA DEEP SINGLE COMPARTMENT WITH FAUCET DECK, 18 GAUGE TYPE 316 STAINLESS STEEL, 25" (SIDE-TO-SIDE) x 22" (FRONT-TO-BACK) OVERALL SIZE, 21" x 15-3/4" x 6-1/8" DEEP BOWL, SOUND DEADENING ON BOTTOM AND SIDES OF BASIN, 3-1/2" DIAMETER DRAIN OUTLET LOCATION OFF-CENTERED REAR IN BOWL, PERFORATED TYPE 316 STAINLESS STEEL GRID STRAINER. SINK TRIM - TWO HANDLE MIXING FAUCET, BRASS CONSTRUCTION, CHROME-PLATED FINISH, GOOSENECK SWING SPOUT, NOMINAL 6" REACH, LAMINAR FLOACCESSIBLE,W OUTLET, 6" WRISTBLADE HANDLES AT 8" CENTERS, 1/4-TURN OPERATION CERAMIC DISC CARTRIDGE. MAXIMUM FLOW TO BE 2.2 GPM. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. PROVIDE RESTRICTIVE DEVICE AND ESCUTCHEON PLATE AS REQUIRED. ACCESSORIES - QUARTER-TURN BALL VALVE TYPE 3/8" CHROME-PLATED BRASS ANGLE SUPPLIES WITH STOPS, CHROME-PLATED SOFT COPPER SUPPLY LINES.	SINK - ELKAY (LKAD252265) SINK TRIM - DELTA (27C2), AMERICAN STANDARD (6540), CHICAGO FAUCET (786), SPEAKMAN (SC-3000 SERIES), SYMMONS (S-254), ZURN (Z831-XL)

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0 1 2 3

PLUMBING DETAILS & SCHEDULES
BARNARD ROOM & QUANTUM FOUNDRY RENOVATION
100% CONSTRUCTION DOCUMENTS

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PROJECT#: 22210
DATE: 04/18/2024

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CONDUIT INSTALLATION SCHEDULE

THE FOLLOWING SCHEDULE SHALL BE ADHERED TO UNLESS THEY CONSTITUTE A VIOLATION OF APPLICABLE CODES OR ARE NOTED OTHERWISE ON THE DRAWINGS. THE INSTALLATION OF RMC CONDUIT WILL BE PERMITTED IN PLACE OF ALL CONDUIT SPECIFIED IN THIS SCHEDULE. REFER TO CONDUIT AND BOXES SPECIFICATION 26 05 33 FOR ADDITIONAL INFORMATION.

INSTALLATION TYPE	RMC	IMC	EMT	PVC	PVC COATED RMC
FEEDERS: SWITCHBOARDS, DISTRIBUTION PANELS, PANELBOARDS, MOTOR CONTROL CENTERS, ETC.		X	X		
BRANCH CIRCUITS: LIGHTING, RECEPTACLES, CONTROLS, ETC.		X	X		
MECHANICAL EQUIPMENT FEEDERS: PUMPS, CHILLERS, AIR HANDLING UNITS, ETC.		X	X		
FLOOR MOUNTED EQUIPMENT FEEDERS: PUMPS, ETC. (INCLUDE NO MORE THAN 6 FEET OF LFMC TO PUMP)		X	X		
CONTROLS (LIGHTING, POWER, BUILDING AUTOMATION, ETC.)		X	X		
WET AND DAMP LOCATIONS: (CONDUIT, BOXES, FITTINGS, INSTALLED AND EQUIPPED TO PREVENT WATER ENTRY)	X				
CORROSIVE LOCATIONS					X
ELEVATED CONCRETE SLABS (ABOVE GRADE)	X			X	
INTERIOR LOCATIONS WITH FINISHED CEILING AND WALLS: CONCEALED IN WALLS AND ABOVE FINISHED CEILINGS			X		
INTERIOR LOCATIONS WITHOUT FINISHED CEILINGS: CONCEALED IN WALL, EXPOSED ABOVE CEILINGS		X	X		
EXISTING INTERIOR LOCATIONS WITH FINISHED CEILINGS AND WALLS: CONCEALED IN WALLS AND ABOVE FINISHED CEILING UNLESS OTHERWISE NOTED			X		

ELECTRICAL SYMBOL LIST

SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
E	ECONN	26 05 33	ELECTRICAL CONNECTION CD = CORD DROP
J	JB	26 05 33	JUNCTION BOX
	FB-# or PT-#	26 27 26	FLOOR BOX or POKE THROUGH
RI	RI-TECH	26 05 33	TECHNOLOGY OUTLET ROUGH-IN
RI	RI-TECH-C	26 05 33	TECHNOLOGY ROUGH-IN, CEILING
	WM-#	26 05 35	MULTI OUTLET SYSTEM
	WW-#	26 05 35	ELECTRICAL WIREWAY w/ DEVICES SHOWN
	PANEL '###'	26 24 16	PANELBOARD - RECESS MOUNT
	PANEL '###'	26 24 16	PANELBOARD - SURFACE MOUNT
	MX-#/MS-#	26 24 19	MANUAL SWITCH / STARTER / COMBINATION STARTER.
	ATF-#	26 22 00	AUTOMATIC TRANSFER SWITCH
	TR-#/DTR-#	26 22 00	TRANSFORMER.
	DS-#/FDS-#/DSS-#	26 28 16	DISCONNECT.

ELECTRICAL SYMBOL LIST

SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
O	REC-DUP-O	26 27 26	DUPLEX RECEPTACLE CONTROLLED BY OCCUPANCY
O	REC-QUAD-O	26 27 26	QUAD RECEPTACLE CONTROLLED BY OCCUPANCY
	REC-DUP	26 27 26	DUPLEX RECEPTACLE, 125V
	REC-DUP-GFI	26 27 26	DUPLEX GFI RECEPTACLE, 125V
	REC-SIM-520R	26 27 26	SIMPLEX RECEPTACLE, 125V
	REC-QUAD	26 27 26	QUAD RECEPTACLE, 125V
	REC-QUAD-GFI	26 27 26	QUAD GFI RECEPTACLE, 125V
	PP#	26 27 23	POWER POLE
	REC-SIMP-LOCK	26 27 26	SIMPLEX RECEPTACLE - TWISTLOCK - 125V
	REC-SIMP-LOCK	26 27 26	SIMPLEX RECEPTACLE - TWISTLOCK - 208V, 3PH
	REC-SIMP	26 27 26	SIMPLEX RECEPTACLE, 208V, 1PH
	REC-SIMP	26 27 26	SIMPLEX RECEPTACLE, 125V
	REC-SIM-1520R	26 27 26	RECEPTACLE, 15-20R, 250V, 3PH
F # F #	FA-211	28 31 00	COMBINATION AUDIO HORN/CHIME AND VISUAL ALARM DEVICE, CEILING OR WALL MOUNTED # = CANDELA RATING CD = CANDELA RATING SELECTED BY NICET DESIGNER

APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

BUILDING CODE:	IBC 2021 EDITION
FIRE CODE:	IFC 2021 EDITION
FIRE ALARM CODE:	NFPA 72 2019 EDITION
PLUMBING CODE:	UPC 2021 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LIFE SAFETY CODE:	NFPA 101 2021 EDITION
ENERGY CONSERVATION CODE:	IECC 2021
LOCAL BUILDING CODE:	CURRENT EDITION

ELECTRICAL SYMBOL LIST

SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
S	SW-1P	26 09 33	SWITCH - SINGLE POLE
S_3	SW-3W	26 09 33	SWITCH - THREE WAY
D_D	SW-D-LED	26 09 33	DIMMER - LED
D_{D3}	SW-D3-LED	26 09 33	DIMMER - LED - 3-WAY
OC_D	SW-OC-D	26 09 33	OCCUPANCY SENSOR - DUAL TECHNOLOGY
OC_D	SW-OC-D-W	26 09 33	OCCUPANCY SENSOR - DUAL TECHNOLOGY - WALL MOUNTED
S_{LV}	SW-LV	26 09 33	LOW VOLTAGE SWITCH

ELECTRICAL SYMBOL LIST

SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
	REFER TO LUMINAIRE SCHEDULE		LINEAR LUMINAIRES
			TROFFER
			WALL SCONCE LUMINAIRE
			DOWNLIGHT LUMINAIRE
			AIMABLE OR WALL WASH LUMINAIRE
			INDUSTRIAL LUMINAIRE
			WALL BRACKET LUMINAIRE
			POLE MOUNTED LUMINAIRE
			SINGLE FACE EXIT SIGN
			DOUBLE FACE EXIT SIGN
			WALL/CEILING EMERGENCY EXIT SIGN
			EMERGENCY UNIT

VIEW KEY

NAME ← LEVEL NAME
10'-0" ← HEIGHT ABOVE PROJECT 0'-0"

(1) ← INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL

INDICATES DIRECTION OF TRUE NORTH
PLAN OR DETAIL NUMBER
PLAN OR DETAIL NAME
NORTH
1
VIEW NAME
1/8" = 1'-0"
PLAN OR DETAIL SCALE

SIM
INDICATES SIMILAR DETAIL REFERENCED IN MULTIPLE LOCATIONS
SIM
1
DETAIL REFERRED TO BY SECTION CUT
1 4 2 3
M101
SHEET DETAIL IS LOCATED ON
T101

LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
NEW
EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
EXISTING
EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E — TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 — UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

ELECTRICAL GENERAL NOTES:

1. SHADED LUMINAIRE OR DEVICE INDICATES LUMINAIRE OR DEVICE IS CONNECTED TO AN EMERGENCY CIRCUIT OR CONTAINS INTEGRAL EMERGENCY POWER SOURCE.
2. REFER TO SHEET E-9.1 FOR LUMINAIRE SCHEDULE.
3. { L##} DENOTES THE LIGHTING SEQUENCE OF OPERATIONS FOR THIS SPACE. REFER TO SHEET E-9.1.
4. VACANCY/OCCUPANCY SENSOR LAYOUT: SENSORS ARE SHOWN ON THE PLANS FOR DESIGN INTENT AND MAY NOT REPRESENT EVERY DEVICE. PROVIDE MANUFACTURER SPECIFIC FLOOR PLAN LAYOUTS SHOWING LOCATION, ORIENTATION, AND COVERAGE AREA OF EACH CONTROL DEVICE, SENSOR, AND CONTROLLER/INTERFACE. AREAS REQUIRING MULTIPLE SENSOR DEVICES FOR APPROPRIATE COVERAGE, SUBMIT SPECIFIC MANUFACTURER-APPROVED SENSOR LAYOUT AS AN OVERLAY DIRECTLY ON THE PROJECT DRAWINGS, EITHER IN PRINT OR APPROVED ELECTRONIC FORM.

LUMINAIRE KEY:

LUMINAIRE
F1 = FIXTURE TAG
1 = CIRCUIT NUMBER
a = SWITCH DESIGNATION
NL = SUBSCRIPT (IF APPLICABLE)
Z = ZONE DESIGNATION

*IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: F1 / 1 / a / NL

DEVICE KEY:

DEVICE
A = MOUNTING (IF APPLICABLE)
1 = CIRCUIT NUMBER

*IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: A / 1

ELECTRICAL MOUNTING SUBSCRIPT KEY:

A	MOUNT AT +6" TO CENTERLINE ABOVE COUNTER OR BACKSPLASH
C	MOUNT AT CEILING
H	MOUNT ORIENTED HORIZONTALLY
EWC	ELECTRIC WATER COOLER

ELECTRICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL ELECTRICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, LIGHTING, POWER, AND SYSTEMS.

1. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
2. NOT ALL EXISTING EQUIPMENT, LUMINAIRES, AND CONDUIT ARE SHOWN. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS WITH NEW WORK BEFORE STARTING WORK.
3. FIELD VERIFY THE AVAILABLE CLEARANCES FOR CABLE TRAY, BUSWAY AND CONDUITS BEFORE FABRICATION. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
4. EACH CONTRACTOR SHALL FIELD VERIFY ACCESSIBILITY TO THE AREA OF THEIR WORK AND SHALL NOTIFY THE GENERAL CONTRACTOR. PRIOR TO BIDDING IF OTHER UTILITIES ARE REQUIRED TO BE REMOVED OR RELOCATED TO ALLOW ACCESS TO THEIR AREA OF WORK.
5. WHERE EXISTING ELECTRICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, CONDUIT, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING ELECTRICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.

ELECTRICAL INSTALLATION NOTES:

1. THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE ADA STANDARDS FOR ACCESSIBLE DESIGN.
2. CIRCUIT NUMBERS ARE SHOWN FOR CIRCUIT IDENTIFICATION. CIRCUITING SHALL AGREE WITH NUMBERING ON THE PANEL PROVIDED. COMMON NEUTRALS MAY NOT BE USED FOR BRANCH CIRCUITS. BALANCE THE LOAD ON PANEL AS EVENLY AS POSSIBLE BETWEEN EACH PHASE.
3. EMERGENCY BRANCH WIRING FOR FEEDERS AND BRANCH CIRCUITS SHALL BE ROUTED IN SEPARATE RACEWAY, JUNCTION BOXES, PULL BOXES, AND CABINETS. WIRING FOR EACH BRANCH SHALL BE INDEPENDENT FROM OTHER BRANCHES, INCLUDING THE NORMAL BRANCH.
4. FLUSH MOUNT ALL LIGHTING CONTROL DEVICES AT +42" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED. DEVICES MAY BE SURFACE MOUNTED WHEN CONDUIT IS SPECIFIED EXPOSED.
5. FLUSH MOUNT ALL DUPLEX RECEPTACLES AND TECHNOLOGY OUTLETS AT +18" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED. RECEPTACLES AND OUTLETS MAY BE SURFACE MOUNTED WHEN CONDUIT IS SPECIFIED EXPOSED. MOUNT EXTERIOR LOCATED RECEPTACLES WITH WHILE-IN-USE COVERS AT +20" FROM FINISHED GRADE (CENTER DIMENSIONS) TO MAINTAIN INSTALLATION ADA COMPLIANCE.
6. ALL MATERIALS USED TO SEAL PENETRATIONS OF FIRE RATED WALLS AND FLOORS SHALL BE TESTED AND CERTIFIED AS A SYSTEM PER ASTM E814 STANDARDS FOR FIRE TESTS OF THROUGH-PENETRATION FIRESTOPS. REFER TO 26 05 03 FOR ADDITIONAL INFORMATION AND REQUIREMENTS SPECIFIC TO FIRESTOPPING.
7. INSTALL ALL WALL MOUNTED FIRE ALARM NOTIFICATION DEVICES AT 90" ABOVE FINISHED FLOOR OR 6" BELOW THE CEILING, WHICHEVER IS LOWER, EXCEPT WHERE OTHERWISE NOTED. HEIGHT SHALL BE MEASURED TO THE TOP OF THE DEVICE.
8. CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL CEILING MOUNTED DEVICES AND EQUIPMENT WITH LUMINAIRES, SPRINKLER, AND CEILING DIFFUSERS. CENTER ALL DEVICES IN CEILING TILE PATTERN. SMOKE DETECTORS AND OCCUPANCY/VACANCY SENSORS SHALL BE LOCATED NO CLOSER THAN 3 FEET TO AN AIR SUPPLY DIFFUSER OR RETURN GRILLE.
9. CONTRACTOR SHALL VERIFY ALL FURNITURE, MODULAR FURNITURE, AND EQUIPMENT LOCATIONS WITH ARCHITECTURAL PLANS, ELEVATIONS, AND REVIEWED SHOP DRAWINGS. PRIOR TO MAKING THE ACTUAL ELECTRICAL INSTALLATION, THIS CONTRACTOR SHALL ADJUST RECEPTACLES, OUTLETS, OR CONNECTION LOCATIONS TO ACCOMMODATE FURNITURE AND/OR EQUIPMENT.
10. ELECTRICAL AND TECHNOLOGY EQUIPMENT SHALL BE MOUNTED TO AVOID IMPEDANCE OF, OPERATION OF, AND/OR ACCESS TO ELECTRICAL AND MECHANICAL EQUIPMENT. ALL MOUNTING OF ELECTRICAL AND TELECOMMUNICATIONS EQUIPMENT, ON EQUIPMENT SUPPLIED BY ANOTHER CONTRACTOR, SHALL BE APPROVED IN ADVANCE BY THE OTHER CONTRACTOR.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OPENINGS REQUIRED IN WALLS. ALL OPENINGS SHALL BE REPAIRED TO MATCH EXISTING BY A QUALIFIED CONTRACTOR AT THE EXPENSE OF THIS CONTRACTOR. ALL CONDUITS THROUGH WALLS SHALL BE GROUTED OR SEALED INTO OPENINGS.
12. ALL WELDING SHALL BE ACCORDING TO AMERICAN WELDING SOCIETY STANDARDS. CONTRACTOR SHALL FURNISH TO THE ARCHITECT/ENGINEER CERTIFICATES QUALIFYING EACH WELDER, PRIOR TO START OF WORK. THE ARCHITECT/ENGINEER RESERVES THE RIGHT TO REQUIRE QUALIFYING DEMONSTRATION, AT THE CONTRACTOR'S EXPENSE, OF ANY WELDERS ASSIGNED TO THE JOB.
13. EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO THE WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
14. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY AUDIO/VISUAL, AND OTHER ELECTRICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
15. ELECTRICAL IDENTIFICATION. REFER TO SPECIFICATION SECTION 26 05 53 FOR COLOR/LABEL REQUIREMENTS FOR CONDUIT, BOX, CABLE/WIRE, AND EQUIPMENT.
16. ALL NEW WORK SHALL MATCH EXISTING SEISMIC BRACING AND CODE REQUIREMENTS USED FOR PREVIOUS WORK FOR THIS BUILDING.

4/18/2024

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ELECTRICAL COVERSHEET
BARNARD ROOM & QUANTUM FOUNDRY RENOVATION
100% CONSTRUCTION DOCUMENTS

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DATE: 04/18/2024

E.CVR

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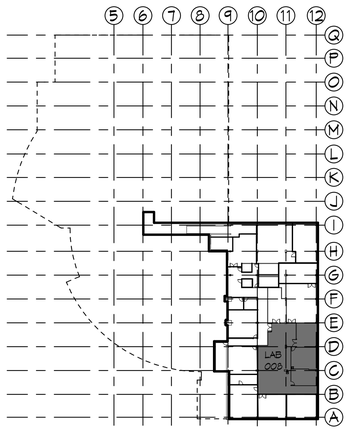
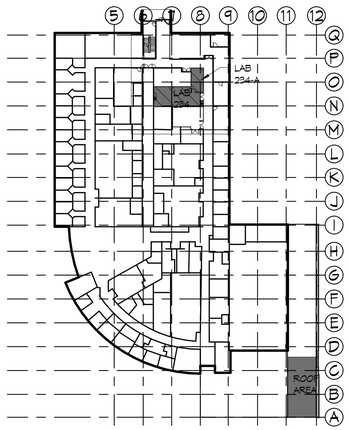


6 BASEMENT KEY PLAN
ED2.1 1" = 60'-0"



7 SECOND FLOOR KEY PLAN
ED2.1 1" = 60'-0"

KEYNOTES

1000 REMOVE EXISTING SURFACE RACEWAY WITH DUPLEX RECEPTACLES AND DATA AT +54" AFF. DISCONNECT AND REMOVE ALL ASSOCIATED WIRES AND CONDUIT BACK TO PANEL.

1001 EXISTING 75kVA TRANSFORMER SHALL BE REMOVED, SAVED AND PROTECTED FOR RELOCATION. ALL PRIMARY AND SECONDARY WIRING SHALL BE REPLACED. REMOVE ALL EXISTING WIRING BACK TO THE PANELBOARDS.

1002 EXISTING 45kVA TRANSFORMER SHALL BE REMOVED, SAVED AND PROTECTED FOR RELOCATION. TRANSFORMER SHALL BE REFED FROM EXISTING PANEL BN2H. ALL PRIMARY AND SECONDARY WIRING SHALL BE REPLACED. REMOVE ALL EXISTING WIRING BACK TO THE PANELBOARDS.

1003 EXISTING HOOD AND ASSOCIATED DISCONNECT SWITCH SHALL BE REMOVED, SAVED AND PROTECTED FOR RELOCATION. SAVE AND PROTECT EXISTING CIRCUIT FOR EXTENSION AND RECONNECTION OF HOOD AT NEW LOCATION.

1004 DISCONNECT AND REMOVE EXISTING DROP CORD, SAVE AND PROTECT FOR RELOCATION. SAVE AND PROTECT EXISTING CIRCUIT FOR EXTENSION AND RECONNECTION AT NEW LOCATION.

1005 EXISTING EXIT SIGN SHALL BE REMOVED, SAVED AND PROTECTED FOR RELOCATION. SAVE AND PROTECT EXISTING CIRCUIT FOR EXTENSION AND RECONNECTION AT NEW LOCATION.

1006 DISCONNECT POWER TO MODULAR FURNITURE WALLS, REMOVE ALL ASSOCIATED WIRES AND CONDUITS.

1007 DISCONNECT EXISTING 2'x4' TROFFER LUMINAIRES FROM ROOM 008 LIGHTING CIRCUIT.

1008 EXISTING 30A DISCONNECT SWITCH TO BE REMOVED. DISCONNECT AND REMOVE ALL ASSOCIATED WIRE AND CONDUIT BACK TO PANEL.

1009 EXISTING WATER HEATER AND ASSOCIATED 60A DISCONNECT SWITCH TO REMAIN.

1010 EXISTING PUMP AND ASSOCIATED 30A DISCONNECT SWITCH TO REMAIN.

1011 EC TO FIELD VERIFY THE EQUIPMENT SERVED BY EXISTING 30A DISCONNECT SWITCHES. DISCONNECTS SHALL BE LABELED WITH CIRCUIT AND EQUIPMENT SERVED. IF DISCONNECTS SERVE NO PURPOSE, THEY SHALL BE REMOVED DURING DEMOLITION AND ALL ASSOCIATED WIRE AND CONDUIT SHALL BE REMOVED BACK TO PANEL.

KEYNOTES

1012 EXISTING PANEL 2N19L TO REMAIN. REMOVE EXISTING (2) 50A3P, (2) 100A3P, AND (1) 150A6P CIRCUIT BREAKERS FROM PANEL.

1013 EXISTING DISCONNECT SWITCH SHALL BE REMOVED. DISCONNECT AND REMOVE ALL ASSOCIATED WIRE AND CONDUIT BACK TO PANEL.

1014 EXISTING 120V CONNECTION TO HOOD TO REMAIN.

1015 EXISTING POWER OUTLET(S) SHALL BE RELOCATED TO ABOVE NEW COUNTER. EXTEND WIRE AND CONDUIT AS NECESSARY FOR RELOCATION. EXISTING DATA OUTLET SHALL BE REMOVED IN ITS ENTIRETY.

1016 REMOVE EXISTING LUMINAIRE CONNECTED TO EMERGENCY LIGHTING CIRCUIT. SAVE AND PROTECT CIRCUIT FOR RECONNECTION TO NEW LUMINAIRE.

KEYNOTES

1017 EXISTING 100A DISCONNECT SHALL BE REMOVED. DISCONNECT AND REMOVE ALL ASSOCIATED WIRE AND CONDUIT BACK TO PANEL.

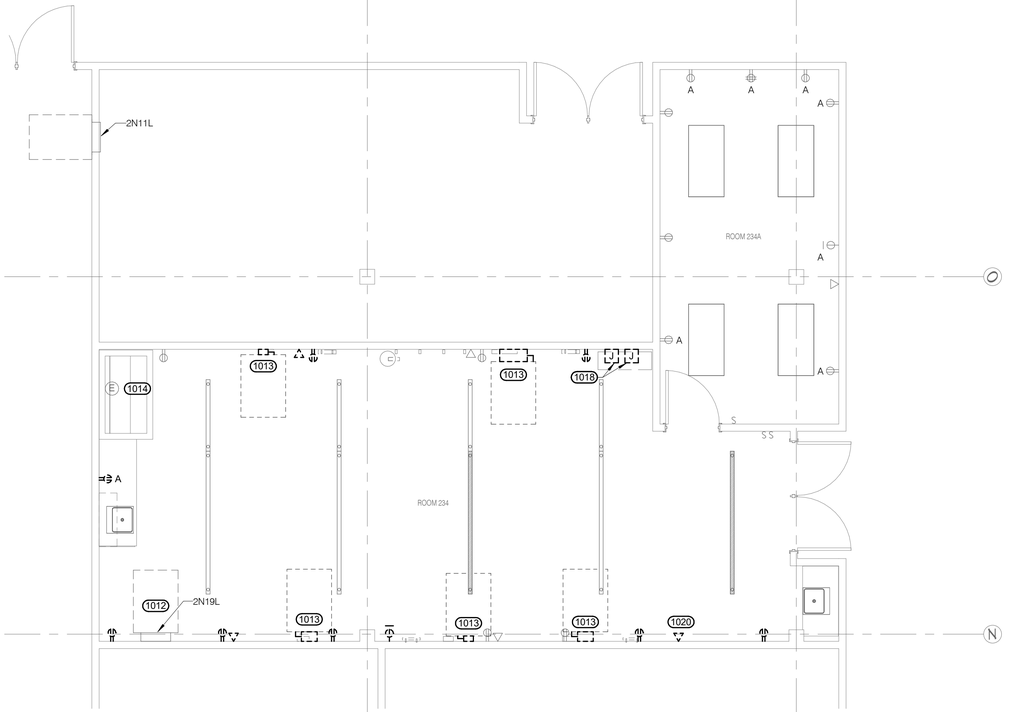
1018 EXISTING TC CONTROL PANEL AND THERMOSTAT TO BE RELOCATED BY MC. EC SHALL DISCONNECT POWER AND RECONNECT AT NEW LOCATION. EXTENDED EXISTING CIRCUIT AS NECESSARY.

1019 EXISTING FIRE ALARM HORN STROBE TO BE REMOVED. SAVE AND PROTECT FIRE ALARM DEVICE AND WIRING DURING DEMOLITION. DEVICE SHALL BE RELOCATED DURING NEW CONSTRUCTION.

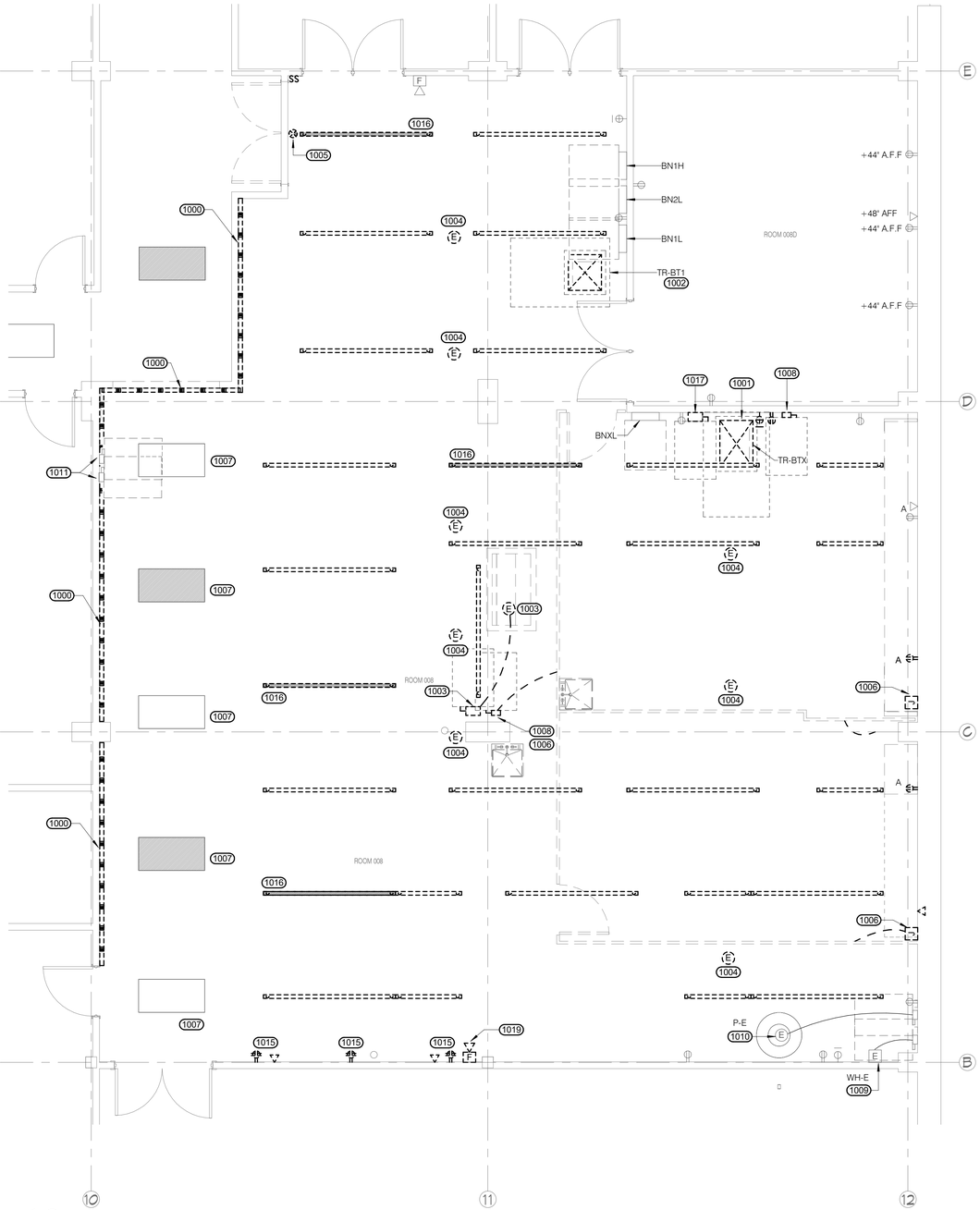
1020 EXISTING DATA OUTLET SHALL BE REMOVED IN ITS ENTIRETY.

DEMOLITION GENERAL NOTES:

1. E.C. SHALL DISCONNECT THE POWER FROM ANY EQUIPMENT BEING REMOVED OR RELOCATED BY OTHERS FOR SAFE REMOVAL.
2. MAINTAIN CIRCUIT CONTINUITY FOR EXISTING ITEMS THAT ARE REMAINING OR BEING RELOCATED.
3. ITEMS THAT ARE SHOWN TO BE REMOVED SHALL BE REMOVED IN THEIR ENTIRETY INCLUDING ALL ASSOCIATED CONDUIT, WIRE, AND HANGERS BACK TO POINT OF ORIGIN OR THE NEAREST EXISTING ITEM THAT IS REMAINING. UNLESS NOTED OTHERWISE. WHERE EXISTING DEVICES, SWITCHES, MOTOR CONNECTIONS, ETC. ARE TO BE REMOVED FROM WALLS WHICH ARE REMAINING, WALLS SHALL BE PATCHED TO MATCH ORIGINAL FINISH, AFTER CONDUCTORS HAVE BEEN REMOVED.
4. UNLESS OTHERWISE NOTED, FOR ALL LUMINAIRES SHOWN TO BE REMOVED, EC SHALL SAVE AND PROTECT CIRCUIT FOR RECONNECTION TO NEW LUMINAIRE.
5. EXISTING WIRELESS ACCESS POINTS SHALL BE REMOVED, SAVED AND PROTECTED FOR REINSTALLATION.
6. ALL EXISTING TECHNOLOGY CABLING WITHIN THE REMODEL AREA SHALL BE INVESTIGATED BY UNIVERSITY I.T. AND UPGRADED AS NECESSARY. COORDINATE ACCESS AND PHASING WITH UNIVERSITY I.T.



16 SECOND FLOOR ROOM 234 DEMO ELECTRICAL PLAN
ED2.1 1/4" = 1'-0"



18 BASEMENT ROOM 008 DEMO ELECTRICAL PLAN
ED2.1 1/4" = 1'-0"

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ELECTRICAL DEMOLITION PLANS
BARNARD ROOM 8 QUANTUM FOUNDRY RENOVATION
100% CONSTRUCTION DOCUMENTS

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ED2.1

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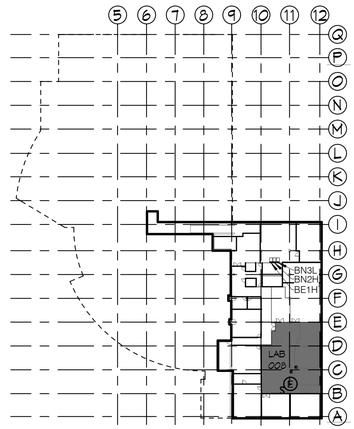
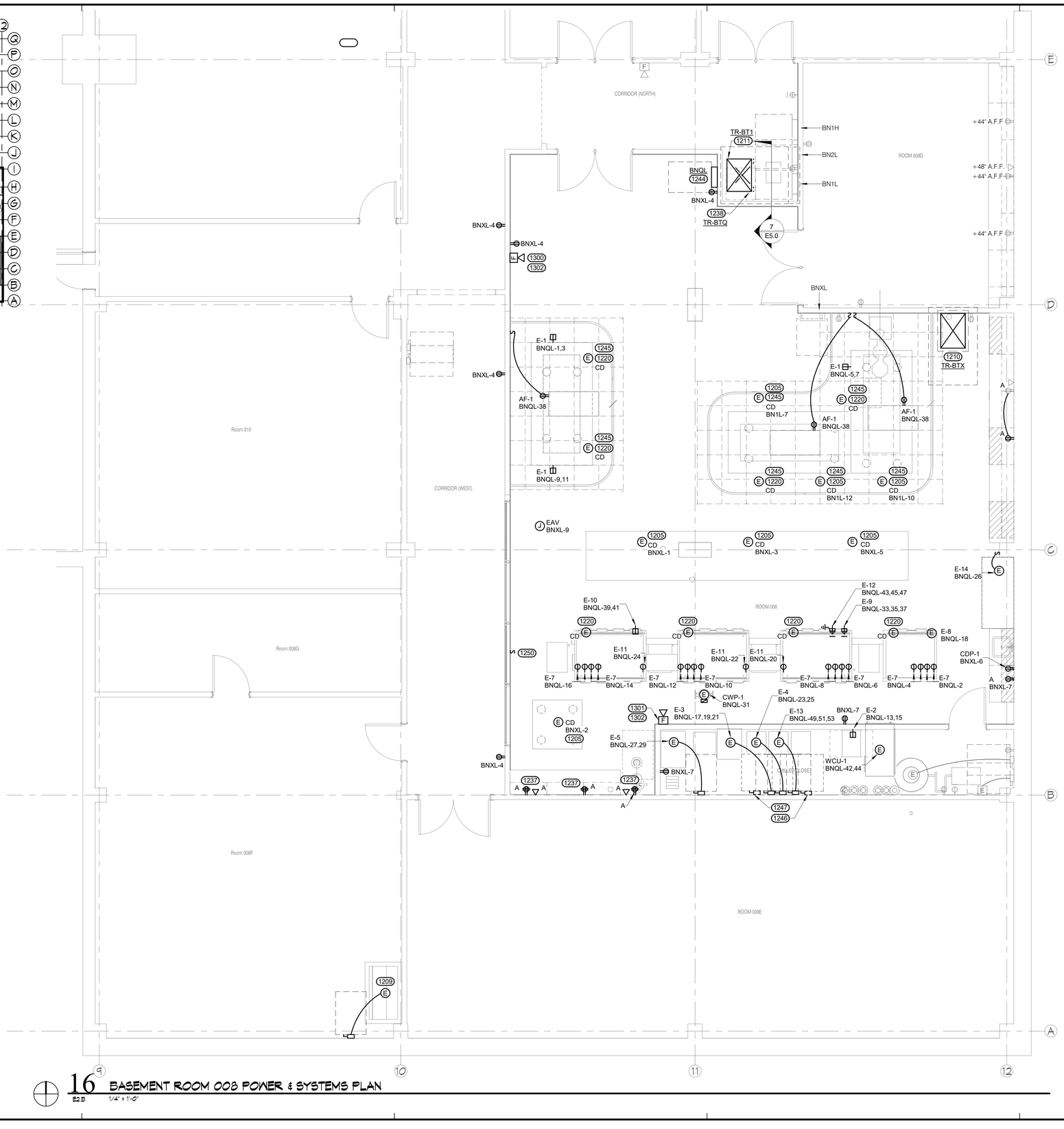


6 BASEMENT KEY PLAN
E2.B 1" = 60'-0"



16 BASEMENT ROOM 008 POWER & SYSTEMS PLAN
E2.B 1/4" = 1'-0"

ELECTRICAL GENERAL NOTES:

1. NEW DEVICES SHOWN SHALL BE SURFACE MOUNTED AND FED WITH SURFACE MOUNTED CONDUIT.
2. EC SHALL VERIFY ALL CONNECTION TYPES WITH LAB EQUIPMENT AND PROVIDE MOCK UP OF LAB EQUIPMENT FOR APPROVAL BY MSU PRIOR TO FINAL INSTALLATION.
3. ALL NEW WORK SHALL MATCH EXISTING SEISMIC BRACING AND CODE REQUIREMENTS USED FOR PREVIOUS WORK FOR THIS BUILDING.
4. DEVICES MOUNTED TO TABLES OR SUPPORTING STRUCTURES SHALL HAVE LOCATIONS AND CONDUIT ROUTING COORDINATED WITH MSU.
5. REINSTALL EXISTING WIRELESS ACCESS POINTS SAVED DURING DEMOLITION.
6. ALL EXISTING TECHNOLOGY CABLING WITHIN THE REMODEL AREA SHALL BE INVESTIGATED BY UNIVERSITY I.T. AND UPGRADED AS NECESSARY. COORDINATE ACCESS AND PHASING WITH UNIVERSITY I.T.

KEYNOTES

1205 PROVIDE CORD DROP WITH DOUBLE DUPLEX RECEPTACLE, SEE DROP CORD DETAIL ON E5.0. COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH IN.

1209 INSTALL EXISTING DISCONNECT FOR RELOCATED FUME HOOD SAVED DURING DEMOLITION. EXTEND EXISTING CIRCUIT SAVED DURING DEMOLITION AND RECONNECT FUME HOOD. COORDINATE EXACT LOCATION WITH ARCHITECT.

1210 EXISTING TRANSFORMER SHALL BE MOUNTED AGAINST PARTIAL WALL WITH TRAPEZE MOUNTING SUPPORTS. ELEVATION AND CLEARANCES SHALL BE COORDINATED WITH ARCHITECT PRIOR TO THE START OF WORK. PROVIDE NEW SECONDARY WIRING TO BNXL. REFER TO TRANSFORMER MOUNTING DETAIL ON SHEET E5.0 AND ONE-LINE DIAGRAM FOR ADDITIONAL ELECTRICAL REQUIREMENTS AND INFORMATION.

1211 EXISTING 45KVA TRANSFORMER SAVED DURING DEMOLITION SHALL BE REFED FROM NEW 70A3P BREAKER IN EXISTING PANEL BN2H LOCATED IN ROOM 001. TRANSFORMER SHALL BE TRAPEZE MOUNTED ABOVE THE NEW 112.5KVA TRANSFORMER. ELEVATION AND CLEARANCES SHALL BE COORDINATED WITH ARCHITECT PRIOR TO THE START OF WORK. PROVIDE NEW SECONDARY WIRING TO PANELS BN1L AND BN2L. REFER TO TRANSFORMER ELEVATION DETAIL, TRANSFORMER MOUNTING TRAPEZE DETAIL ON E5.0 AND ONE-LINE DIAGRAM FOR ADDITIONAL ELECTRICAL REQUIREMENTS AND INFORMATION.

1220 REINSTALL EXISTING DROP CORD SAVED DURING DEMOLITION AND EXTEND EXISTING CIRCUIT SAVED DURING DEMOLITION AND RECONNECT. COORDINATE EXACT LOCATIONS WITH ARCHITECT AND OWNER PRIOR TO ROUGH IN.

1237 RELOCATE EXISTING POWER OUTLET(S) TO ABOVE COUNTER. EXTEND WIRE AND CONDUIT AS NECESSARY FOR RELOCATION. FOR TELECOM OUTLET, PROVIDE 4"X4" BACKBOX WITH SINGLE GANG MUDRING AND 1-1/4" C WITH PULL STRING TO CEILING SPACE FOR FUTURE MSU I.T. CABLING. COORDINATE EXACT REQUIREMENTS WITH MSU I.T. PRIOR TO START OF WORK.

1238 PROVIDE NEW TRANSFORMER MOUNTED SECURELY TO THE FLOOR, UNDER TRAPEZE MOUNTED 45KVA TRANSFORMER. REFER TO TRANSFORMER ELEVATION DETAIL, ON E5.0 AND ONE-LINE DIAGRAM FOR ADDITIONAL ELECTRICAL REQUIREMENTS AND INFORMATION.

1244 PROVIDE NEW PANEL BNQL. REFER TO ONE-LINE DIAGRAM FOR ADDITIONAL ELECTRICAL REQUIREMENTS AND INFORMATION.

1245 DROP CORD TO BYPASS OVERHEAD SHELVING. COORDINATE RECEPTACLE HEIGHT WITH OWNER PRIOR TO INSTALLATION.

1246 SPACE FOR FUTURE DISCONNECT FOR FUTURE AFM COMPRESSOR.

1247 SPACE FOR FUTURE DISCONNECT FOR FUTURE AFM CHILLER.

1250 PROVIDE ON/OFF WALL SWITCH TO CONTROL GLOVE TRAIN EXHAUST FAN. PROVIDE NON FADING LABEL ON SWITH "GLOVE TRAIN EXHAUST". COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR AND OWNER.

1300 MATCH EXISTING DEVICE MANUFACTURER AND TIE INTO EXISTING BUILDING FIRE ALARM SYSTEM.

1301 RELOCATE EXISTING FIRE ALARM HORN STROBE SAVED DURING DEMOLITION. EXTEND EXISTING CONDUITS AND WIRES AS NECESSARY TO MAKE SYSTEM FULLY OPERATIONAL.

1302 VERIFY THAT THE EXISTING FIRE ALARM SYSTEM IS OPERATING PROPERLY AND DOCUMENT ALL DEFICIENCIES PRIOR TO CONSTRUCTION. CONFIRM THAT THERE IS ADEQUATE CAPACITY ON EXISTING CIRCUITS FOR THIS WORK AND UPGRADE THE PANEL AS NECESSARY. PROVIDE BATTERY AND CIRCUIT LOAD CALCULATIONS AS REQUIRED. COMPLETE THE FIRE ALARM PROGRAMMING, UPDATE RELATED GRAPHIC DISPLAYS, AND THEN TEST THE NEW CIRCUITS AT THE END OF THE PROJECT.

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BASEMENT ROOM 008 POWER & SYSTEMS PLAN
BARNARD ROOM & QUANTUM FOUNDRY RENOVATION
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E2.B

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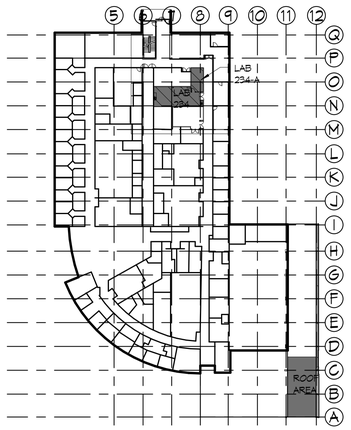


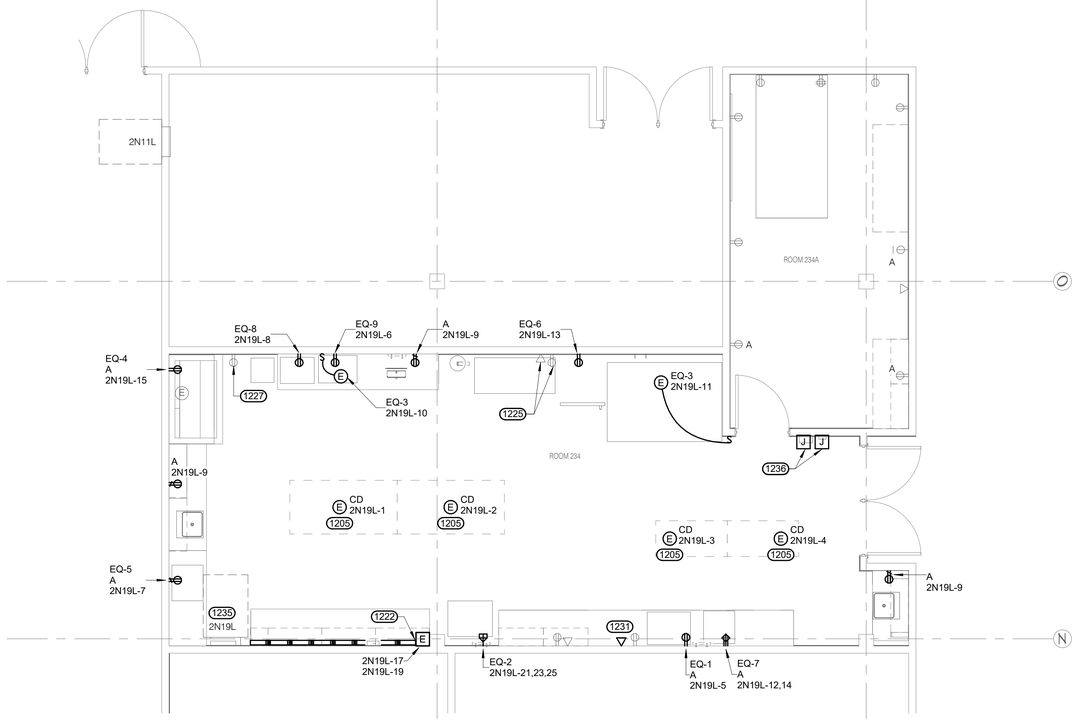
6 SECOND FLOOR KEY PLAN
E2.2 1" = 60'-0"

ELECTRICAL GENERAL NOTES:

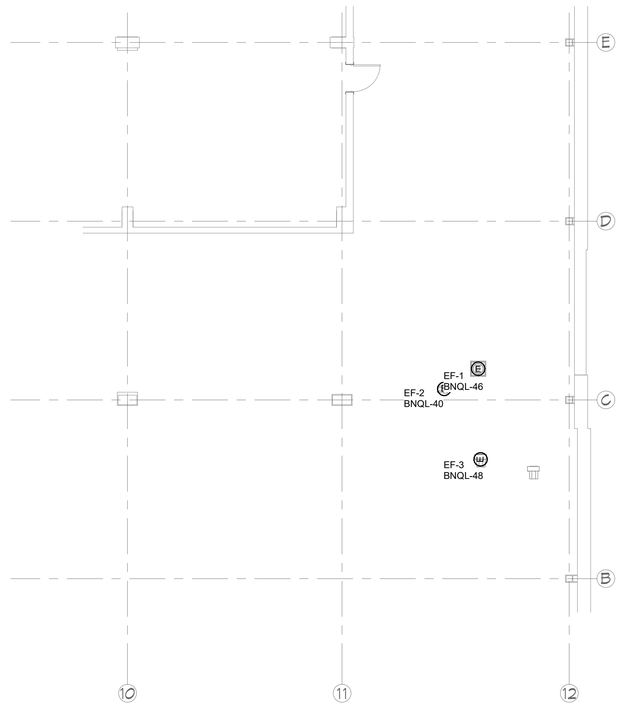
1. NEW DEVICES SHOWN SHALL BE SURFACE MOUNTED AND FED WITH SURFACE MOUNTED CONDUIT.
2. EC SHALL VERIFY ALL CONNECTION TYPES WITH LAB EQUIPMENT AND PROVIDE MOCK UP OF LAB EQUIPMENT FOR APPROVAL BY MSU PRIOR TO FINAL INSTALLATION.
3. EXISTING DEVICES TO REMAIN ARE CURRENTLY CIRCUITED TO PANEL 2N11L.
4. ALL NEW WORK SHALL MATCH EXISTING SEISMIC BRACING AND CODE REQUIREMENTS USED FOR PREVIOUS WORK FOR THIS BUILDING.

KEYNOTES

1205	PROVIDE CORD DROP WITH DOUBLE DUPLEX RECEPTACLE, SEE DROP CORD DETAIL ON E5.0. COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH IN.
1222	PROVIDE LEGRAND 2000 SERIES PLUGMOLD OR APPROVED EQUAL WITH SIMPLEX RECEPTACLES SPACED AT 2' O.C. WITH ALTERNATING CIRCUITS. MOUNT ABOVE COUNTER.
1225	EXISTING RECEPTACLE AND DATA JACK TO REMAIN FOR USE WITH NEW WEATHER-O-METER.
1227	EXISTING RECEPTACLE TO REMAIN FOR USE WITH ULTRASONIC EQUIPMENT.
1231	PROVIDE 4"X4" BACKBOX WITH SINGLE GANG MUDRING AND 1-1/4" C WITH PULL STRING TO CEILING SPACE FOR FUTURE MSU I.T. CABLING. COORDINATE EXACT REQUIREMENTS WITH MSU I.T. PRIOR TO START OF WORK.
1235	PROVIDE NEW CIRCUIT BREAKERS WITHIN PANEL TO SUPPORT RENOVATION. PROVIDE FILLER PLATES WHERE NECESSARY FOR UNUSED SPACES WHERE PREVIOUS CIRCUIT BREAKERS HAVE BEEN REMOVED. SEE PANEL SCHEDULE FOR ADDITIONAL INFORMATION.
1236	EXISTING TC CONTROL PANEL AND THERMOSTAT RELOCATED BY MC. EC TO RECONNECT AND EXTEND EXISTING BRANCH CIRCUIT TO POWER AS NEEDED TO MAKE SYSTEMS OPERATIONAL.



16 SECOND FLOOR ROOM 234 POWER & SYSTEMS PLAN
E2.2 1/4" = 1'-0"



19 ROOF ELECTRICAL PLAN
E2.2 1/8" = 1'-0"

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SECOND FLOOR RM. 234 POWER & SYSTEMS PLAN
BARNARD ROOM & QUANTUM FOUNDRY RENOVATION
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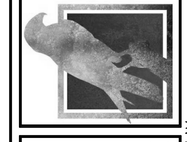

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E2.2

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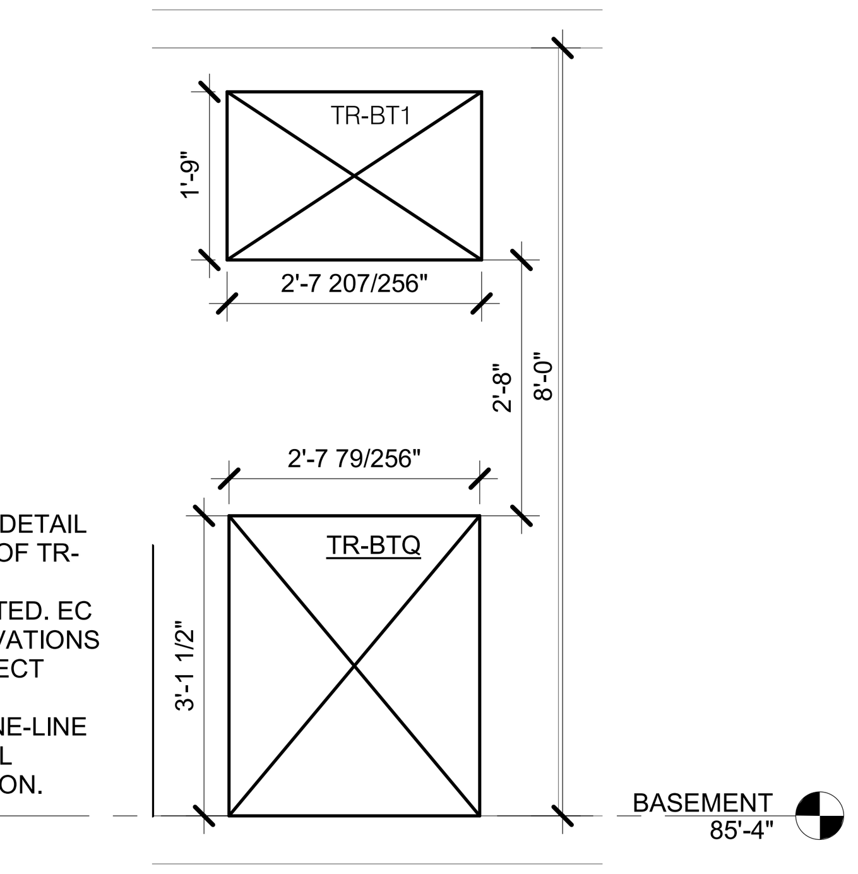
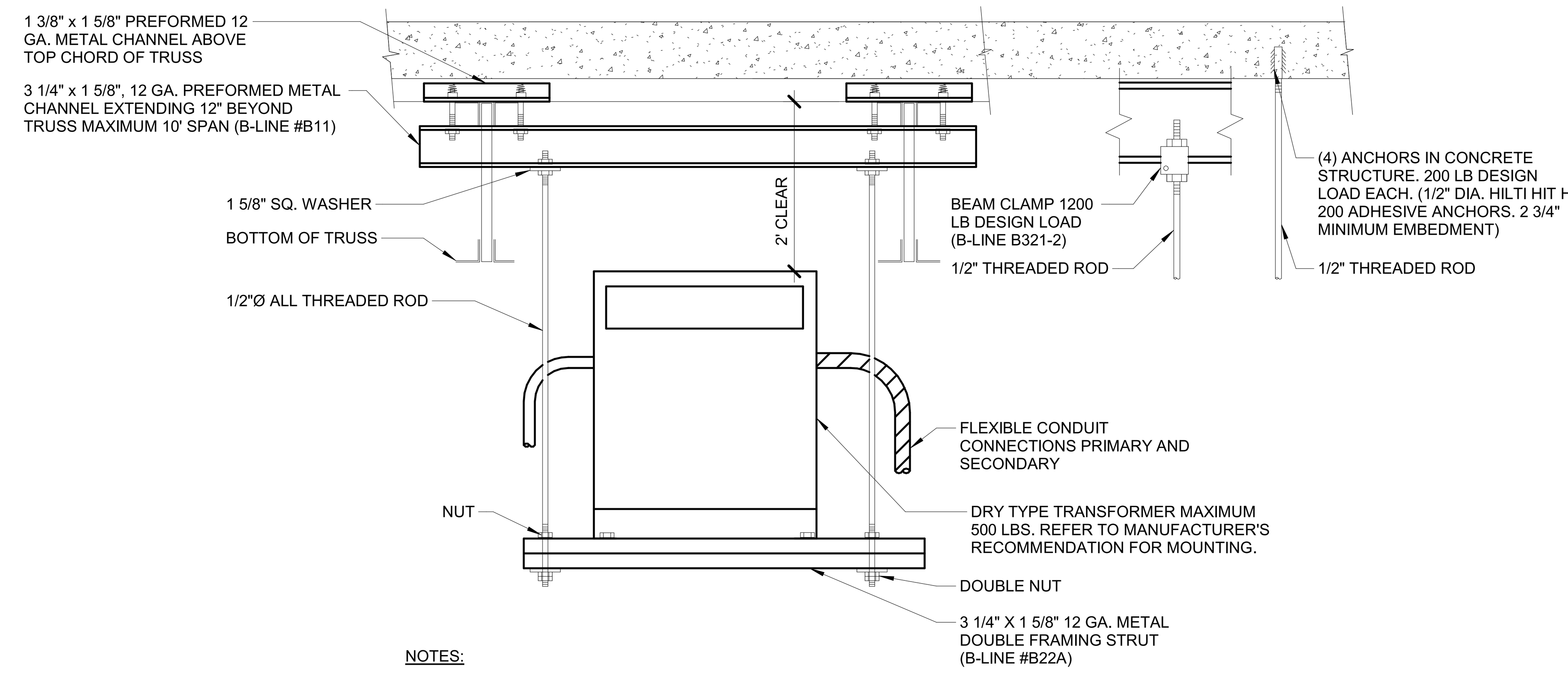
NOTES:
1. REFER TO TRAPEZE MOUNTING DETAIL ON THIS SHEET FOR MOUNTING OF TR-BT1.
2. DIMENSIONS OF TR-BTQ ESTIMATED. EC SHALL COORDINATE EXACT ELEVATIONS AND CLEARANCES WITH ARCHITECT PRIOR TO INSTALLATION.
3. REFER TO FLOOR PLANS AND ONE-LINE DIAGRAM FOR MORE ELECTRICAL REQUIREMENTS AND INFORMATION.



7 TRANSFORMER ELEVATION VIEW

E5.0 1/2" = 1'-0"

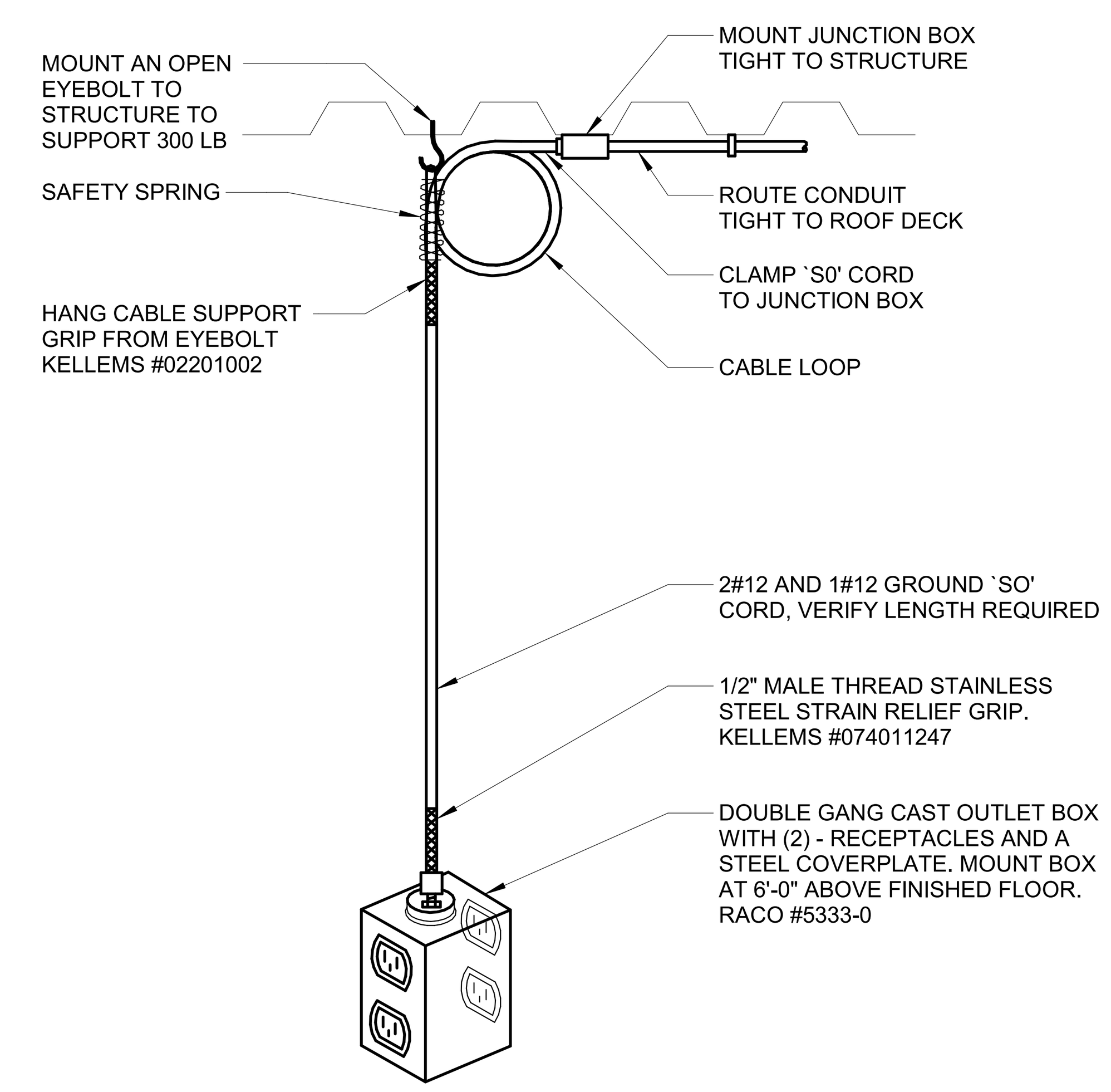


NOTES:

1. (2) - HANGER ASSEMBLIES SHALL BE REQUIRED FOR EACH TRANSFORMER.

8 TRANSFORMER MOUNTING TRAPEZE

E5.0 NO SCALE



14 DROP CORD MOUNTING

E5.0 NO SCALE

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ELECTRICAL DETAILS

BARNARD ROOM & QUANTUM FOUNDRY RENOVATION

100% CONSTRUCTION DOCUMENTS

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E5.0

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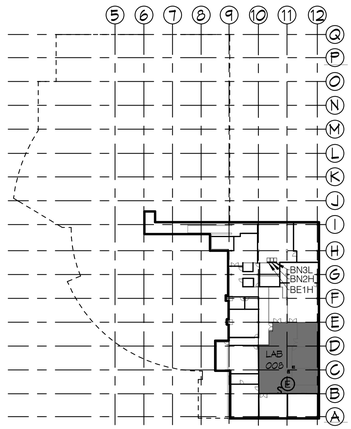
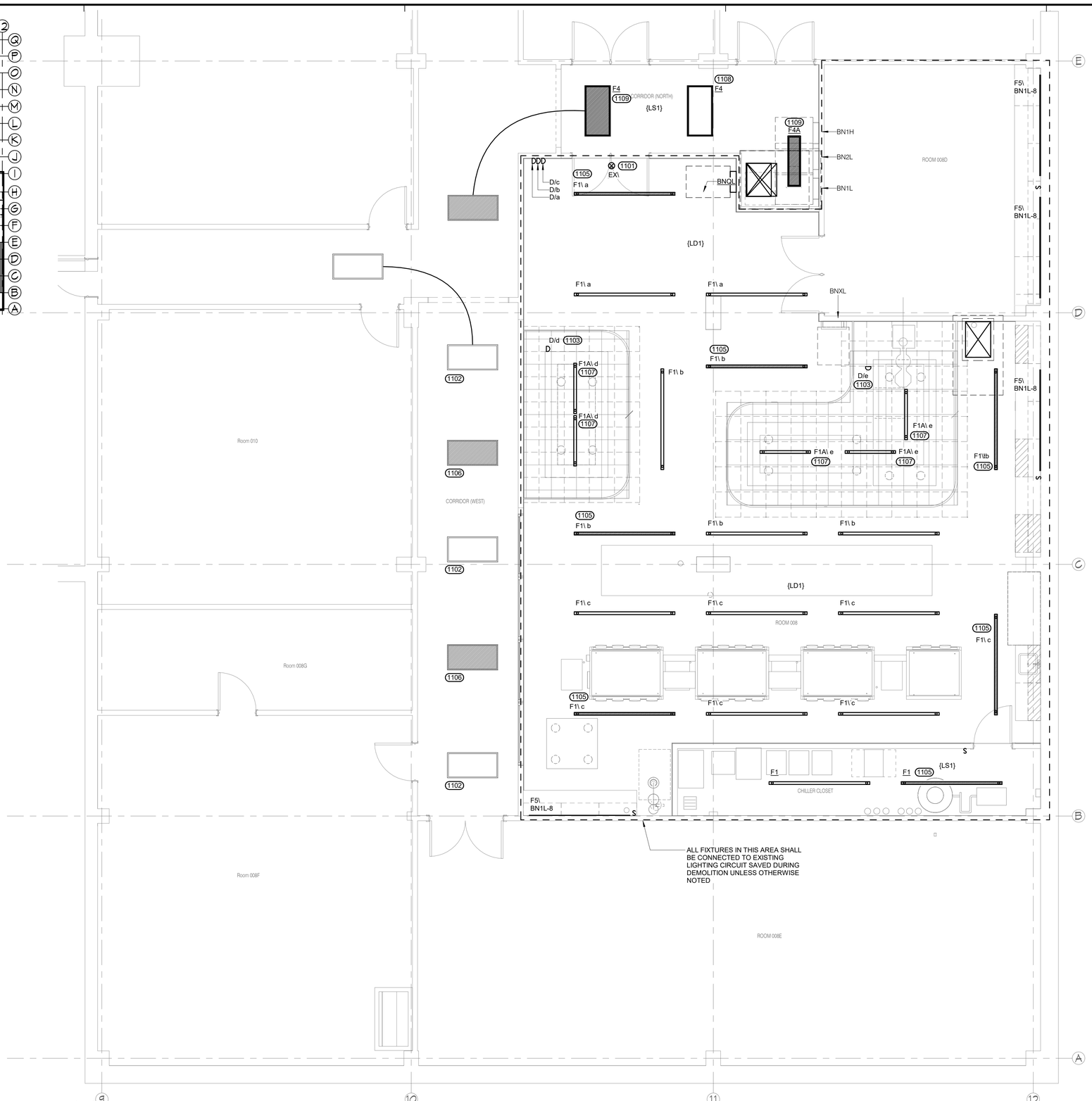


6 BASEMENT KEY PLAN
E1.B 1" = 60'-0"



16 BASEMENT ROOM 008 LIGHTING PLAN
E1.B 1/4" = 1'-0"

GENERAL NOTES:

1. A UL924 DEVICE SHALL BE PROVIDED AT ALL EMERGENCY EGRESS FIXTURES AND SHALL BE SWITCHED WITH LOCAL ROOM NORMAL POWER LIGHTS UNLESS OTHERWISE NOTED.
2. CIRCUIT ALL EXIT SIGNS AND UL924 DEVICE SENSING LEADS AHEAD OF ANY LOCAL SWITCHING.
3. ALL NEW WORK SHALL MATCH EXISTING SEISMIC BRACING AND CODE REQUIREMENTS USED FOR PREVIOUS WORK FOR THIS BUILDING.

KEYNOTES

1101 REINSTALL EXISTING EXIT SIGN SAVED DURING DEMOLITION.

1102 CONNECT EXISTING LUMINAIRE TO EXISTING CORRIDOR LIGHTING CIRCUIT AND CONTROL.

1103 PROVIDE SENSOR SWITCH SPODMRA JOT WIRELESS DIMMER OR APPROVED EQUIVALENT FOR F1A FIXTURES. LOCATE ON UNDERSIDE ON TABLE.

1105 CONNECT NEW LUMINAIRE AS NOTED TO EXISTING EMERGENCY LIGHTING CIRCUIT SAVED DURING DEMOLITION.

1106 RECONNECT EXISTING LUMINAIRE TO EXISTING EMERGENCY LIGHTING CIRCUIT SERVING CORRIDOR. FIXTURE SHALL BE CONTROLLED WITH EXISTING CORRIDOR LIGHTING.

1107 FIXTURE F1A TO BE MOUNTED TO THE UNDERSIDE OF OVERHEAD SHELVING. LUMINAIRE TO BE SUSPENDED AT 7'6" A.F.F. COORDINATE ROUTING FOR POWER TO LUMINAIRE WITH OWNER AND MILLWORK CONTRACTOR.

1108 CONNECT NEW LUMINAIRE TO EXISTING CORRIDOR LIGHTING CIRCUIT AND CONTROL.

1109 CONNECT NEW LUMINAIRE TO EMERGENCY LIGHTING CIRCUIT AND CONTROL SERVING CORRIDOR.

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BASEMENT ROOM 008 LIGHTING PLAN
BARNARD ROOM & QUANTUM FOUNDRY RENOVATION
100% CONSTRUCTION DOCUMENTS

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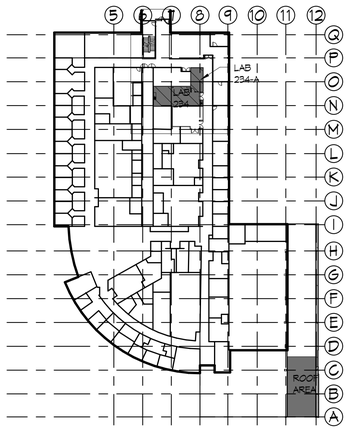
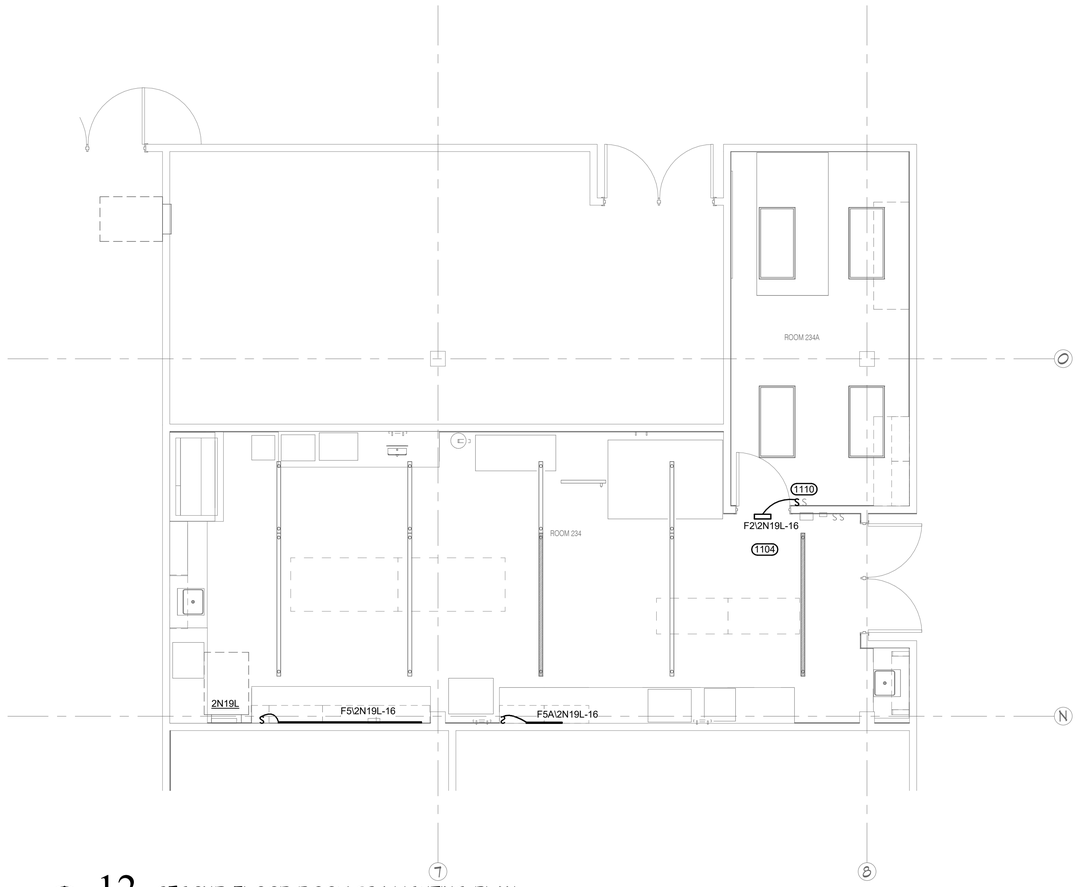


6 SECOND FLOOR KEY PLAN
E1.2 1" = 60'-0"



12 SECOND FLOOR ROOM 234 LIGHTING PLAN
E1.2 1/4" = 1'-0"

GENERAL NOTES:

1. ALL NEW WORK SHALL MATCH EXISTING SEISMIC BRACING AND CODE REQUIREMENTS USED FOR PREVIOUS WORK FOR THIS BUILDING.

KEYNOTES

1104 PROVIDE THERMOPLASTIC SIGN TO READ 'IN USE' ABOVE DOOR. SIGN TO BE CONTROLLED VIA NEW WALL SWITCH WITHIN ROOM 234A.

1110 NEW F2 FIXTURE SHALL BE TIED TO EXISTING SWITCH AND BE INTEGRATED TO IN ROOM LUMINAIRE SWITCHING SEQUENCE.

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SECOND FLOOR ROOM 234 LIGHTING PLAN
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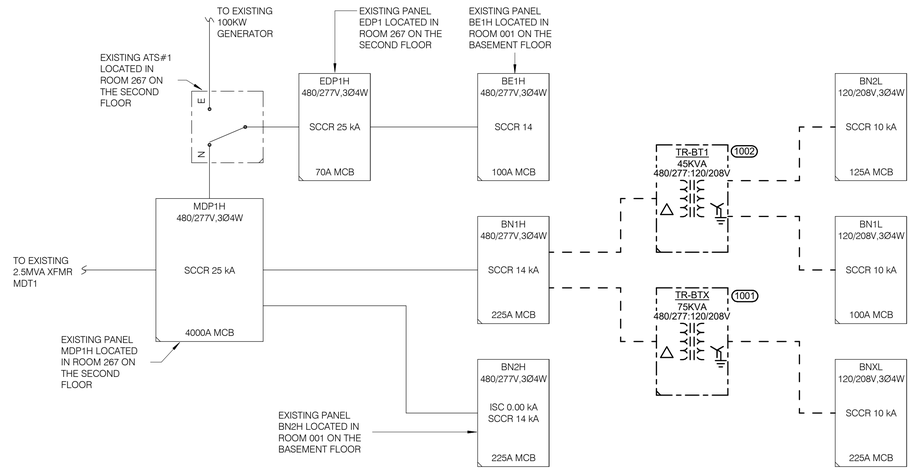
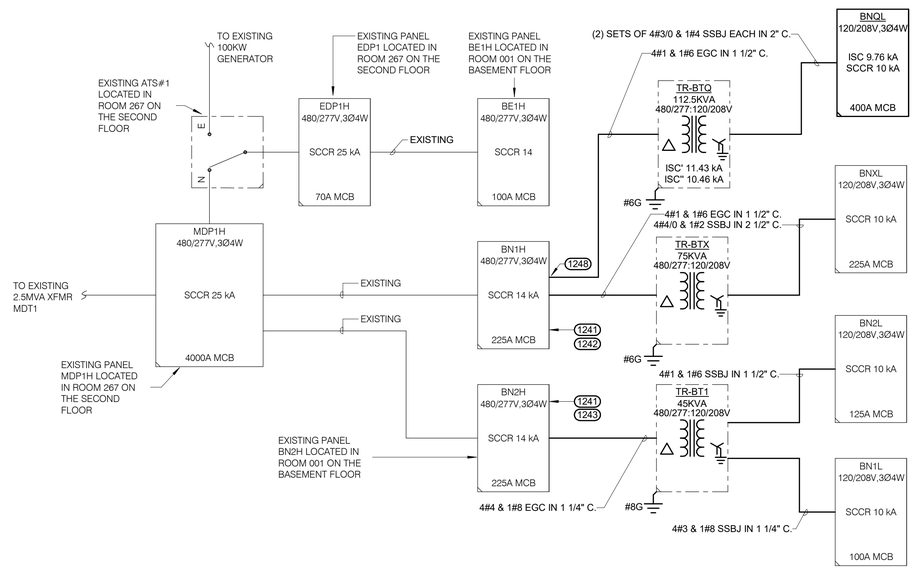


7 PARTIAL ONE LINE - DEMOLITION
E8.0 NO SCALE



17 PARTIAL ONE LINE - NEW CONSTRUCTION
E8.0 NO SCALE

KEYNOTES

1001 EXISTING 75kVA TRANSFORMER SHALL BE REMOVED, SAVED AND PROTECTED FOR RELOCATION. ALL PRIMARY AND SECONDARY WIRING SHALL BE REPLACED. REMOVE ALL EXISTING WIRING BACK TO THE PANELBOARDS.

1002 EXISTING 45kVA TRANSFORMER SHALL BE REMOVED, SAVED AND PROTECTED FOR RELOCATION. TRANSFORMER SHALL BE REFED FROM EXISTING PANEL BN2H. ALL PRIMARY AND SECONDARY WIRING SHALL BE REPLACED. REMOVE ALL EXISTING WIRING BACK TO THE PANELBOARDS.

1241 EC SHALL PROVIDE THIRTY (30) DAY METERING ON EXISTING BN1H AND BN2H TO DETERMINE EXISTING LOAD. CONTRACTOR SHALL PROVIDE REPORT AT SEVEN (7) DAYS AND ANOTHER REPORT AT THIRTY (30) DAYS TO ENGINEER OF RECORD FOR REVIEW. EC TO BEGIN METERING WITHIN FIVE (5) DAYS OF AWARD OF CONTRACT.

1242 PROVIDE NEW 125A, 3P CIRCUIT BREAKER IN EXISTING PANEL BN1H SPACES 2,4,6 TO SERVE NEW TRANSFORMER TR-BTQ AND ASSOCIATED PANEL BNQL. POLES CURRENTLY MARKED AS (1) 70A, 3P FOR 45KVA TRANSFORMER TO BE REMOVED TO MAKE SPACE FOR NEW CIRCUIT BREAKER. NEW CIRCUIT BREAKER SHALL MATCH EXISTING PANEL MANUFACTURER AND AIC RATING. VERIFY PANEL CAPACITY ON SITE PRIOR TO DEMOLITION OR CHANGES AND CONTACT ENGINEER OF RECORD IN CASES OF DISCREPANCIES.

1243 PROVIDE NEW 70A, 3P CIRCUIT BREAKER IN EXISTING PANEL BN2H SPACES 7,9,11 TO SERVE NEW TRANSFORMER TR-BT1 AND ASSOCIATED PANELS BN1L AND BN2L. POLES CURRENTLY MARKED AS (3) 20A, 1P SPARE CIRCUIT TO BE REMOVED TO MAKE SPACE FOR NEW CIRCUIT BREAKER. NEW CIRCUIT BREAKER SHALL MATCH EXISTING PANEL MANUFACTURER AND AIC RATING. VERIFY PANEL CAPACITY ON SITE PRIOR TO DEMOLITION OR CHANGES AND CONTACT ENGINEER OF RECORD IN CASES OF DISCREPANCIES.

1248 PANEL BN1H HAS BEEN ESTIMATED AT 14,000 AIC WITH NEW TRANSFORMER BTQ-112.5kVA LOCATED AN ESTIMATED 25' AWAY FROM PANEL BN1H. CONTRACTOR TO FIELD VERIFY EXACT AIC RATING AND ADJUST SHORT CIRCUIT CALCULATION BASED ON FIELD VERIFIED INFORMATION.

MDP1H LOAD SUMMARY

EXISTING LOAD	643 kW / .8 pf x 125% = 1005 kVA
TOTAL LOAD REMOVED	35 kVA
TOTAL LOAD ADDED	125 kVA
TOTAL LOAD	1165 kVA @ 480V/3P = 1402A

PANEL MDP1H AND ASSOCIATED FEEDER ARE RATED FOR 4000 AMPS AND HAVE ADEQUATE CAPACITY TO ACCOMMODATE THE REMODEL

NOTES:
EXISTING LOAD BASED ON A PEAK DEMAND OF 643 kW PROVIDED BY MSU OVER THE LAST 18 MONTHS.

4/18/2024

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PROJECT #22209/70.00
0 1 2 3
REF. SCALE IN INCHES

ONE LINE DIAGRAM
BARNARD ROOM & QUANTUM FOUNDRY RENOVATION
100% CONSTRUCTION DOCUMENTS

HIGH PLAINS ARCHITECTS
PHONE (406) 896-0250 | FAX (406) 896-0255
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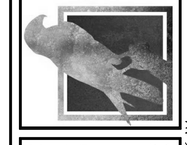


DRAWN BY: KJC
PROJECT#: 22210
DATE: 04/18/2024

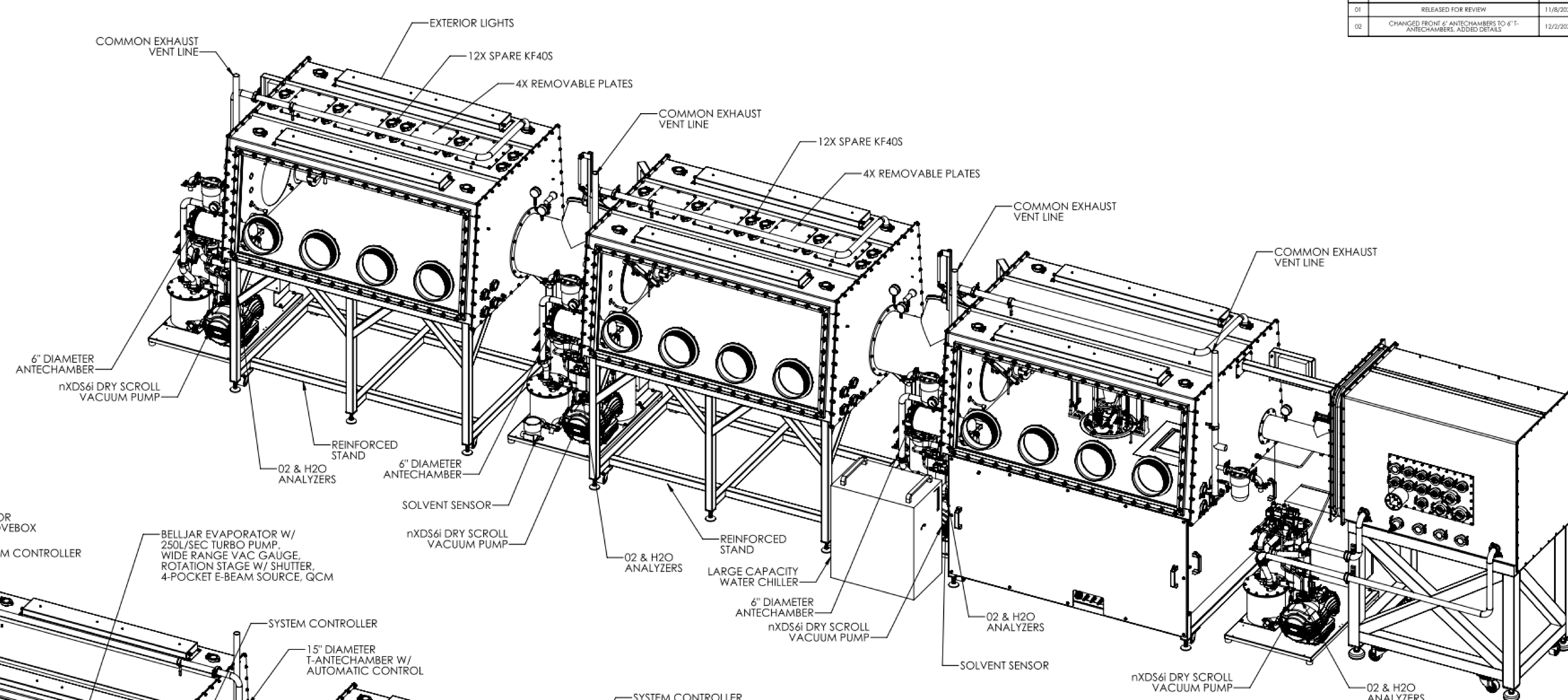
E8.0

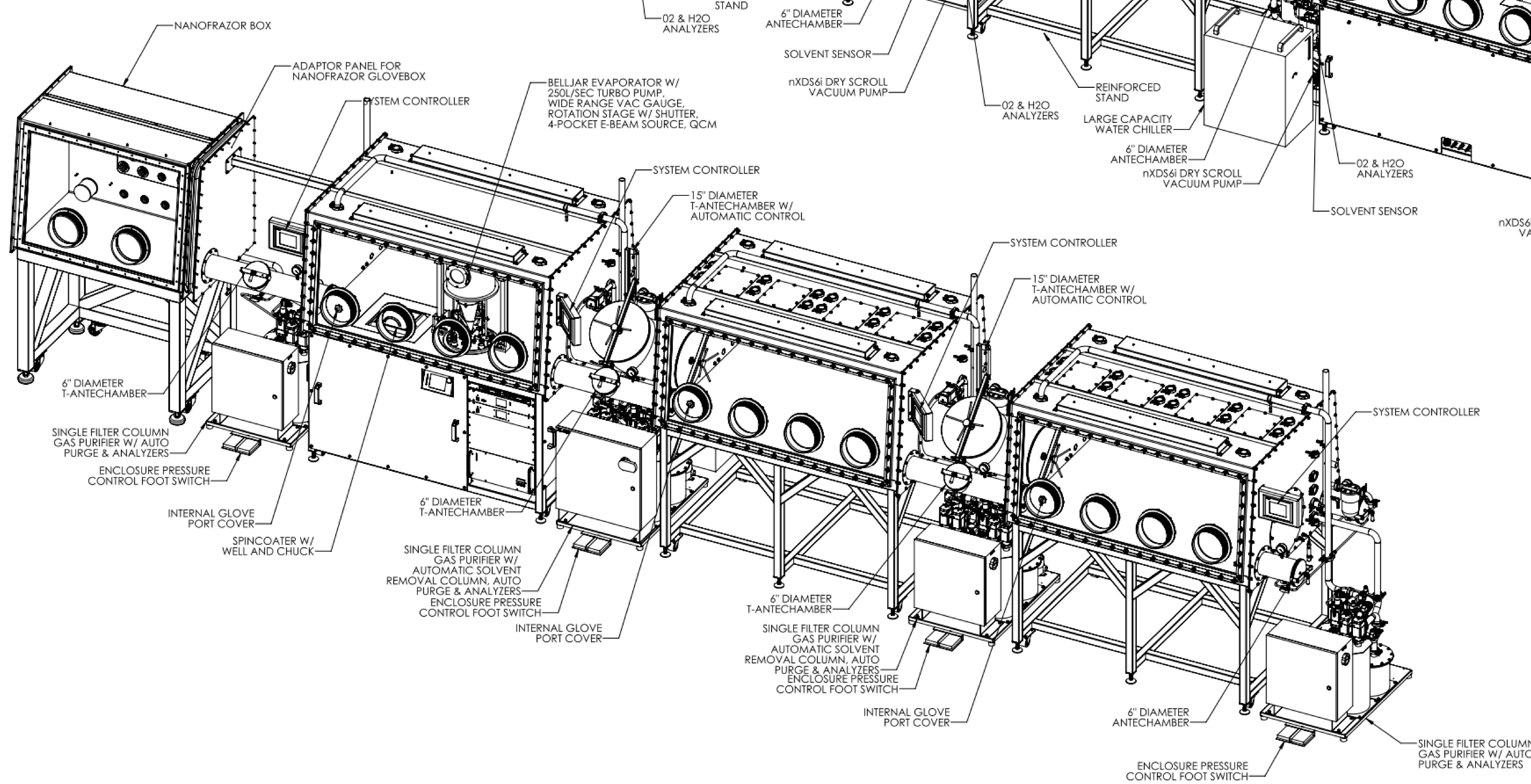
PLOT STAMP: 5/15/2024 11:19:46 AM

SYSTEM REQUIREMENTS		
ELECTRICAL		
COMPONENT	**POWER**	**PLUG**
GAS PURIFIER	115V, 15 AMP	NEMA 5-15
EVAPORATOR	208V 3-PHASE 25 AMP	NEMA L21-30
GAS PURIFIER	208V 3-PHASE 30 AMP	NEMA L21-30
GAS PURIFIER	115V, 15 AMP	NEMA 5-15
GAS PURIFIER	115V, 15 AMP	NEMA 5-15
CHILLER	220V, 5 AMP	NEMA 6-20
3X POWER STRIP	115V, 10 AMP	NEMA 5-15
GASES		
GAS	**PRESSURE**	**FITTING**
4X AR/N2	60-80 PSI (4-5 BAR)	3/8" (10MM)
REGENERATION	15 PSI (1 BAR)	3/8" (10MM)
VENTILATION		
COMPONENT	**CONNECTION**	**MAX EXHAUST**
4X SYSTEM	1-1/2" (38.1MM) TUBE	200 LITERS/MINUTE

SYSTEM PROPERTIES	
TOTAL WEIGHT	5000 LBS
TOTAL WIDTH	382 IN
TOTAL DEPTH	57 IN
TOTAL HEIGHT	84 IN
# OF CRATES	3
ESTIMATED PURGE TIME	240 MINUTES/BOX
ESTIMATED PURGE USAGE	50000 LITERS/BOX

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
01	RELEASED FOR REVIEW	11/8/2022	M. GAGER
02	CHANGED FRONT 6" ANTECHAMBERS TO 6" T-ANTECHAMBERS, ADDED DETAILS	12/2/2022	M. GAGER





NOTE: ALL WINDOWS UV & ESD COATED

FOR REFERENCE ONLY

UNLESS OTHERWISE SPECIFIED: GENERAL TOLERANCES: 0.0 ± .015; 0.00 ± .010; 0.000 ± .005; 0.0000 ± .0025; ANGLES ± .500°	
DIMENSIONS ARE IN INCHES; MINIMUM BEND RELIEF PERMISSIBLE; REMOVE ALL BURRS AND SHARP EDGES	
DRAWN: Michael Gager	DATE: 11/8/2022
CHECKED:	DATE:
STOCK #: **FLATTEN**	FINISH: N/A
MATERIAL: N/A	TYPE: ASSEMBLED

QUALITY CONTROL - RIGHT TO REJECT
LC TECHNOLOGY SOLUTIONS INC. RESERVES THE RIGHT TO REJECT ANY PART(S) WITH SCRATCHES, CHIPS, NICKS, ABRASIONS AND/OR ANY OTHER DEFECT(S) CAUSED BY MANUFACTURING OR BY SHIPPING AND NOT CONFORMING TO REQUIREMENTS LISTED. TAG WITH LC TECHNOLOGY SOLUTIONS INC. PART #, REVISION AND VENDOR I.D.

LC TECHNOLOGY SOLUTIONS INC.

DESCRIPTION: LAYOUT, SYSTEM, LARGE, EVAP
SIZE: D | DWG. NO. 22-0079 | REV: 02
SCALE: 1:16 | DO NOT SCALE | SHEET 1 OF 2

4/18/2024

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PROJECT #22006970.00

ELECTRICAL DIAGRAMS
BARNARD ROOM & QUANTUM FOUNDRY RENOVATION
100% CONSTRUCTION DOCUMENTS

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PROJECT#: 22210
DATE: 04/18/2024

E9.0

MECHANICAL CONNECTION SCHEDULE

ITEM	DESCRIPTION	VOLTAGE	APPARENT LOAD	MOCP	WIRE AND RACEWAY	DISCONNECT BY	DISCONNECT TYPE	COMMENTS
AF-1	AIR FILTER	120 V, 1Ø	0.50 kVA	20 A	2#12 & 1#12 EGC IN 3/4" C.	MFR	NF	PROVIDE ON/OFF SWITCH AT LAB TABLE FOR CONTROL. COORDINATE EXACT LOCATION WITH MC AND ARCHITECT PRIOR TO ROUGH IN.
CDP-1	DRAIN PUMP	120 V, 1Ø	0.51 kVA	20 A	2#12 & 1#12 EGC IN 3/4" C.	--	--	PROVIDE DUPLEX RECEPTACLE IN CABINET ON DEDICATED CIRCUIT FOR DRAIN PUMP. COORDINATE EXACT LOCATION WITH PC PRIOR TO ROUGH IN.
CWP-1	PUMP	120 V, 1Ø	0.53 kVA	20 A	2#12 & 1#12 EGC IN 3/4" C.	EC	NF	PROVIDE MANUAL DISCONNECT SWITCH AT UNIT.
EAV	TERMINAL AIR BOX	120 V, 1Ø	0.50 kVA	20 A	2#12 & 1#12 EGC IN 3/4" C.	MFR	NF	PROVIDE 120V CONNECTION TO TRANSFORMER TO SERVE TAB-1, EAV-1, EAV-2. ALL SECONDARY WIRING FROM TRANSFORMER BY MC. REFER TO MECHANICAL PLANS FOR MORE INFORMATION. COORDINATE EXACT LOCATION WITH MC PRIOR TO ROUGH IN.
EF-1	CHILLER ROM EXHAUST FAN	120 V, 1Ø	0.53 kVA	20 A	2#12 & 1#12 EGC IN 3/4" C.	MFR	NF	EXHAUST FAN TO RUN CONTINUOUSLY.
EF-2	GLOVE TRAIN EXHAUST FAN	120 V, 1Ø	0.70 kVA	20 A	2#12 & 1#12 EGC IN 3/4" C.	MFR	NF	PROVIDE ON/OFF SWITCH AT GLOVE TRAIN FOR CONTROL. COORDINATE EXACT LOCATION WITH MC AND ARCHITECT PRIOR TO ROUGH IN.
EF-3	FUME HOOD EXHAUST FAN	120 V, 1Ø	1.18 kVA	20 A	2#12 & 1#12 EGC IN 3/4" C.	MFR	NF	LV CONTROLS PROVIDED BY MC.
WCU-1	WATER SOURCE HEAT PUMP	208 V, 1Ø	7.59 kVA	60 A	2#6 & 1#10 EGC IN 3/4" C.	MFR	NF	NF DISCONNECT PROVIDED BY MFR.

BASEMENT LAB EQUIPMENT CONNECTION SCHEDULE

ITEM	Description	VOLTAGE	APPARENT LOAD	WIRE AND RACEWAY	DISCONNECT BY	DISCONNECT TYPE	COMMENTS
E-1	CRYOSTAT CABINET	208 V, 1Ø	3.33 kVA	2#12 & 1#12 EGC IN 3/4" C.	--	--	PROVIDE A L6-20R RECEPTACLE AT TABLE.
E-2	EVAPORATOR WATER CHILLER.	208 V, 1Ø	1.04 kVA	2#12 & 1#12 EGC IN 3/4" C.	--	--	PROVIDE A L6-20R RECEPTACLE.
E-3	OPTICOOL CRYOSTAT COMPRESSOR	208 V, 3Ø	11.50 kVA	3#8 & 1#10 EGC IN 3/4" C.	EC	F	PROVIDE A HARDWIRED CONNECTION. EC TO PROVIDE 60A3P DISCONNECT SWITCH WITH (3)40A FUSES AT UNIT.
E-4	MI CRYOSTAT COMPRESSOR	208 V, 1Ø	3.33 kVA	2#12 & 1#12 EGC IN 3/4" C.	EC	F	PROVIDE A HARDWIRED CONNECTION. EC TO PROVIDE 30A2P DISCONNECT SWITCH WITH (3)20A FUSES AT UNIT.
E-5	OPTICOOL CRYOSTAT CHILLER	208 V, 1Ø	2.50 kVA	2#12 & 1#12 EGC IN 3/4" C.	EC	F	PROVIDE A HARDWIRED CONNECTION. EC TO PROVIDE 30A2P DISCONNECT SWITCH WITH (3)20A FUSES AT UNIT.
E-7	GLOVE BOX	120 V, 1Ø	0.72 kVA	2#12 & 1#12 EGC IN 3/4" C.	--	--	PROVIDE (4) NEMA 5-15R RECEPTACLE AT EACH GLOVEBOX.
E-8	NANOFRAZOR	120 V, 1Ø	1.20 kVA	2#12 & 1#12 EGC IN 3/4" C.	--	--	PROVIDE 120V, 20A HARDWIRED CONNECTION.
E-9	EVAPORATOR	208 V, 3Ø	8.64 kVA	4#10 & 1#10 EGC IN 3/4" C.	--	--	PROVIDE A L21-30R RECEPTACLE.
E-10	EVAPORATOR CHARACTERIZATION BOX	208 V, 1Ø	3.33 kVA	2#12 & 1#12 EGC IN 3/4" C.	--	--	PROVIDE A L6-20R RECEPTACLE.
E-11	GAS PURIFIER	120 V, 1Ø	1.40 kVA	2#12 & 1#12 EGC IN 3/4" C.	--	--	PROVIDE NEMA 5-15R RECEPTACLE.
E-12	PURIFICATION SYSTEM	208 V, 3Ø	8.64 kVA	4#10 & 1#10 EGC IN 3/4" C.	--	--	PROVIDE L21-30R RECEPTACLE WITH 3/4" BY 10' GROUND ROD. BOND EQUIPMENT AS DIRECTED BY MSU. VERIFY RESISTANCE OF GROUND ROD REQUIRED FOR LAB EQUIPMENT WITH MSU
E-13	AFM COMPRESSOR	208 V, 3Ø	11.50 kVA	3#8 & 1#10 EGC IN 3/4" C.	EC	F	PROVIDE A HARDWIRED CONNECTION. EC TO PROVIDE 60A DISCONNECT SWITCH WITH (3)40A FUSES AT UNIT.
E-14	FUME HOOD	120 V, 1Ø	0.50 kVA	2#12 & 1#12 EGC IN 3/4" C.	--	--	PROVIDE 120V CONNECTION TO NEW FUME HOOD. PROVIDE ON / OFF SWITCH LOCATED ON NEARBY WALL

SECOND FLOOR LAB EQUIPMENT CONNECTION SCHEDULE

ITEM	Description	VOLTAGE	APPARENT LOAD	WIRE AND RACEWAY	COMMENTS
EQ-1	LINDBERG OVEN	120 V, 1Ø	1.80 kVA	2#12 & 1#12 EGC IN 3/4" C.	PROVIDE DEDICATED 120V, 20A CIRCUIT.
EQ-2	HOT PRESS	208 V, 3Ø	5.40 kVA	3#12 & 1#12 EGC IN 3/4" C.	PROVIDE 208V, 3-PHASE RECEPTACLE ON DEDICATED CIRCUIT FOR HOT PRESS, COORDINATE EXACT NEMA CONFIGURATION WITH OWNER. ASSUME 20AMP RATED.
EQ-3	FUME HOOD EXHAUST FAN	120 V, 1Ø	1.80 kVA	2#12 & 1#12 EGC IN 3/4" C.	PROVIDE 120V ELECTRICAL CONNECTION TO POWER HOOD FAN. PROVIDE ON/OFF SWITCH LOCATED ON NEARBY WALL.
EQ-4	HOT PLATE	120 V, 1Ø	1.80 kVA	2#12 & 1#12 EGC IN 3/4" C.	PROVIDE DUPLEX RECEPTACLE ON DEDICATED CIRCUIT. LOCATE WITHIN EXISTING HOOD.
EQ-5	UNIVERSAL TESTING MACHINE	120 V, 1Ø	1.80 kVA	2#12 & 1#12 EGC IN 3/4" C.	PROVIDE DEDICATED 120V, 20A CIRCUIT.
EQ-6	FREEZER	120 V, 1Ø	1.80 kVA	2#12 & 1#12 EGC IN 3/4" C.	PROVIDE DEDICATED 120V, 20A CIRCUIT.
EQ-7	VWR OVEN	208 V, 1Ø	3.12 kVA	3#12 & 1#12 EGC IN 3/4" C.	PROVIDE 208V, 1-PHASE RECEPTACLE ON DEDICATED CIRCUIT FOR OVEN, COORDINATE EXACT NEMA CONFIGURATION WITH OWNER. ASSUME 20AMP RATED.
EQ-8	HERMATHERM OVEN	120 V, 1Ø	1.80 kVA	2#12 & 1#12 EGC IN 3/4" C.	PROVIDE DEDICATED 120V, 20A CIRCUIT.
EQ-9	SMALL OVEN	120 V, 1Ø	1.80 kVA	2#12 & 1#12 EGC IN 3/4" C.	PROVIDE DEDICATED 120V, 20A CIRCUIT.

GENERAL NOTES FOR ALL EQUIPMENT:

1. MATCH NEMA CONFIGURATION WITH CORD AND PLUG PROVIDED WITH EQUIPMENT.
2. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT OF ALL ELECTRICAL OUTLETS AND HARDWIRED CONNECTIONS FOR EQUIPMENT WITH ARCHITECT AND OWNER PRIOR TO ROUGH IN.
3. LOCATE ALL EQUIPMENT DISCONNECTS AT A LOCATION THAT ALLOWS FOR THE REQUIRED NEC CLEARANCES.

LED LUMINAIRE SCHEDULE

(DESC) DOOR:
FA - FLAT ALUMINUM
FS - FLAT STEEL
RA - REGRESSED ALUMINUM
RS - REGRESSED STEEL

FINISH:
PAF - PAINT AFTER FABRICATION
CFSA - COLOR-FINISH SELECTION BY ARCHITECT

DISTRIBUTION:
II - ANSI/IES TYPE 2 DISTRIBUTION
III - ANSI/IES TYPE 3 DISTRIBUTION
IV - ANSI/IES TYPE 4 DISTRIBUTION
V - ANSI/IES TYPE 5 DISTRIBUTION

BEAMWIDTH:
NSP - VERY NARROW SPOT
SP - SPOT
MD - MEDIUM
WD - WIDE
VWD - VERY WIDE
WW - WALL WASH

(L/L) LENS/LOUVER:
A - .125" ACRYLIC
B - BAFFLE/LOUVER
C - CLEAR ALZAK
F - FROSTED ACRYLIC
G - TEMPERED GLASS
K - KSH12 .125" ACRYLIC
K19 - KSH19 .156" ACRYLIC
M - MATTE DIFFUSE CLEAR
N - NONE
P - POLYCARBONATE
R - HIGH IMPACT DR ACRYLIC
SS - SEMI-SPECULAR CLEAR
O - OTHER (SEE DESCRIPTION)
[DESIGN SPECIFIC BLANKS]

(MTG) MOUNTING:
CL - CEILING SURFACE
CV - COVE
FR - FLANGED RECESSED
P - PERIMETER
PL - POLE
RE - RECESSED
SP - SUSPENDED
SU - SURFACE
UC - UNDER CABINET
WL - WALL
O - OTHER (SEE DESCRIPTION)

(WATT) PER: FIX - FIXTURE, FT - FOOT, LAMP

(TYPE) LED
LED - LIGHT EMITTING DIODE
TLED - TUBULAR LED LAMP
OLED - ORGANIC LED
DLED - DYNAMIC TUNABLE LED
RGB - COLOR CHANGING LED
RGBW - COLOR CHANGING + WHITE
RGBA - COLOR CHANGING + AMBER
RLED - RETROFIT LED
WLED - WARM DIM LED

(TYPE) DRIVER:
0-10V - 0-10V DIMMING
DALI - DIGITAL ADDRESSABLE
DMX - DIGITAL MULTIPLEX
EB - ELECTRONIC
ELV - ELECTRONIC LOW VOLTAGE
EM - EMERGENCY BATTERY
HL - HIGH/LOW (100%/50%) STEP DIM
LINE - LINE VOLTAGE DIMMING
ML - MULTI-LEVEL SWITCHING
MV - MULTI-VOLTAGE ELECTRONIC
REM - REMOTE
O - OTHER (SEE DESCRIPTION)

CATALOG NUMBER SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND CATALOG NUMBER ONLY. THE COMPLETE DESCRIPTION AND THE SPECIFICATION SHALL BE COORDINATED WITH THE CATALOG NUMBER TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE FIRST MANUFACTURER LISTED IS THE BASIS OF DESIGN.

VERIFY AND COORDINATE ALL CEILING TYPES WITH LUMINAIRE MOUNTING AND TRIM REQUIREMENTS PRIOR TO THE RELEASE OF THE LUMINAIRE ORDER.
CONFIRM ALL COLORS AND FINISHES OF ALL LUMINAIRE COMPONENTS WITH ARCHITECT AND INTERIOR DESIGNER PRIOR TO THE RELEASE OF THE LUMINAIRE ORDER.
UNLESS INDICATED ON LIGHTING PLANS OR BELOW, REFER TO ARCHITECTURAL AND INTERIOR DESIGN ELEVATIONS, SECTIONS AND DETAILS FOR ALL SUSPENDED AND WALL MOUNTED LUMINAIRE MOUNTING HEIGHTS.

REFER TO SPECIFICATION SECTION LED LIGHTING 26 51 19 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
INTERIOR CORRELATED COLOR TEMPERATURE 4000 K, COLOR RENDERING INDEX (CRI) AT OR ABOVE 80, UNLESS NOTED OTHERWISE.

				DIMENSIONS				WATT		LED			DRIVER		
ITEM	DESCRIPTION	L/L	MTG	L	W	H	DIA.	ANSI WATTS	PER	TYPE	QTY	DELIVERED LUMENS (MIN)	VOLTS	TYPE	MANUFACTURER AND MODEL
EX	EXISTING EXIT SIGN	O	CL	1'-1"	2"	9"		1 W	FIX	LED	1	L.E.D.	277 V	EM	-
F1	8' SUSPENDED INDUSTRIAL LED STRIP WITH WIRE GUARD AND 4000K COLOR TEMPERATURE. MOUNT AT 9'6" A.F.F. UNLESS OTHERWISE NOTED.	N	SP	8'-0"	2 159/256"	2 7/32"		64 W	FIX	LED	2	8000	277 V	0-10V	LITHONIA LIGHTING, CSS
F1A	4' SUSPENDED INDUSTRIAL LED STRIP WITH WIRE GUARD, WIRELESS SWITCHING COMPATABLE, AND 4000K COLOR TEMPERATURE. MOUNTED UNDER CURTAIN ENCLOSING OPTICAL TABLE. COORDINATE EXACT MOUNTING HEIGHT WITH ARCHITECT.	N	SP	4'-0"	2 159/256"	2 7/32"		36 W	FIX	LED	2	4000	277 V	0-10V	LITHONIA LIGHTING, CSS
F2	IN USE SIGN, RECESSED,RED , SIGNAGE TO READ "IN USE"	O	CL	11"	3 1/8"	8"		2 W	FIX	LED	1	LED	120 V	LED	EVENLITE, SOVEREIGN II
F4	2'X4' FLAT PANEL	A	CL	4'-0"	2'-0"	4"		23 W	FIX	LED	1	3000	277 V	0-10V	LITHONIA LIGHTING, EPANL LED
F4A	1'X4' FLAT PANEL	A	CL	4'-0"	1'-0"	4"		14 W	FIX	LED	1	1500	277 V	0-10V	LITHONIA LIGHTING, EPANL LED
F5	UNDER CABINET UNIT WITH SOLID FRONT & CLEAR LENS. FINAL FINISH BY ARCHITECT AND OWNER	A	UC	8'-0"	179/256"	27/64"		32 W	FIX	LED	1	2600	120 V	LED	DALS 120V POWERLED LINEAR
F5A	SAME AS F5 BUT 2' LENGTH	A	UC	2'-0"	179/256"	27/64"		8 W	FIX	LED	1	675	120 V	LED	DALS 120V POWERLED LINEAR

LIGHTING SEQUENCE OF OPERATION

NOTES:
1. {L##} DENOTES THE LIGHTING SEQUENCE OF OPERATIONS FOR THIS SPACE.
2. [#B] PUSH BUTTON REFERS TO SCENE QUANTITY. CONTROL STATION SHALL BE CAPABLE OF [RAISE/LOWER AND] SWITCHING ON/OFF FOR MULTIPLE SCENES AS INDICATED ON SHEETS AND THE LIGHTING SEQUENCE OF OPERATIONS {L##}. COORDINATE QUANTITIES OF BUTTONS FOR CONTROL STATIONS WITH LIGHTING CONTROL MANUFACTURER.
3. [Z#] DENOTES LIGHTING CONTROL ZONE. PROVIDE SEPARATE CONTROL OF EACH CONTROLLED ZONE. LUMINAIRES ASSOCIATED WITH THE SAME ZONE SHALL OPERATE TOGETHER WITHIN THE SAME PROGRAMMED SCENE.
4. a = SWITCH DESIGNATION FOR LIGHTING CONTROL
5. VERIFY AND COORDINATE ALL TIME CLOCK SETTINGS WITH OWNER PRIOR TO FINAL PROGRAMMING.
6. VERIFY AND COORDINATE ALL PUSH BUTTON WALL DEVICES AND QUANTITIES OF INDIVIDUAL BUTTONS WITH SCENES AND ZONES PER LOCATION.
7. VERIFY AND COORDINATE ALL PUSH BUTTON QUANTITIES AND SCENE NAMES WITH OWNER PRIOR TO SUBMITTING ENGRAVING TEMPLATE TO MANUFACTURER.

PLAN ID	LIGHTING SWITCHED
{LD1}	Sequence: Dimmed lights are controlled in this space. ON: The lights turned on using a wall control. ADJUST: The dimming luminaires are raised / lowered using a controller. OFF: The lights turn off using a wall controller.
{LS1}	Sequence: Switched lights are controlled in this space. ON: The lights turn on using switches. OFF: The lights turn off using switches.

4/18/2024

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REF. SCALE IN INCHES 0 1 2 3
PROJECT #22006970.00

ELECTRICAL SCHEDULES
BARNARD ROOM 8 QUANTUM FOUNDRY RENOVATION
100% CONSTRUCTION DOCUMENTS

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DRAWN BY: KJC
PROJECT#: 22210
DATE: 04/18/2024

E9.1

©

PLOT STAMP: 5/15/2024 11:19:48 AM

EXISTING PANEL BN2H

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 225 A/3P @ MDP1H
LOCATION: ROOM 001

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 225 A MCB
VOLTS: 480/277 Wye
PHASE: 3
WIRE: 4
SCCR: 14 kA

NOTES:

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	OCPD P	A	A	B	B	C	C	OCPD P	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY
--	1	(E) LTG	20 A	1	0	0					1	20 A	(E) LTG-CORRIDOR	2	--
--	3	(E) LTG-008A.006.007.009.010.008G	20 A	1			0	0			1	20 A	SPARE	4	--
--	5	(E) LTG	20 A	1					0.98	0	1	20 A	SPARE	6	--
[1]	7	**45KVA XFMR - BT1**	**70 A**	**3**	1.67	0					--	--	SPACE	8	--
--	9	--	--	--			2.24	0			--	--	SPACE	10	--
--	11	--	--	--					1.16	0	--	--	SPACE	12	--
--	13	SPACE	--	--	0	0					--	--	SPACE	14	--
--	15	SPACE	--	--			0	0			--	--	SPACE	16	--
--	17	SPACE	--	--					0	0	--	--	SPACE	18	--
--	19	SPACE	--	--	0	0					--	--	SPACE	20	--
--	21	SPACE	--	--			0	0			--	--	SPACE	22	--
--	23	SPACE	--	--					0	0	--	--	SPACE	24	--
--	25	SPACE	--	--	0	0					--	--	SPACE	26	--
--	27	SPACE	--	--			0	0			--	--	SPACE	28	--
--	29	SPACE	--	--					0	0	--	--	SPACE	30	--
			Total Load:		1.67 kVA		2.24 kVA		2.15 kVA						
			Total Amps:		6.01		8.37		8.01						

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
Lighting	1.124 kVA	100.00%	1.124 kVA		
Power	0.25 kVA	100.00%	0.25 kVA	TOTAL CONNECTED LOAD:	6.05 kVA
Receptacles	4.68 kVA	100.00%	4.68 kVA	TOTAL ESTIMATED DEMAND LOAD:	6.054 kVA
				TOTAL CONNECTED AMPS:	7.28 A
				TOTAL ESTIMATED DEMAND AMPS:	7.3 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES: [1] PROVIDE NEW 70A, 3P CIRCUIT BREAKER TO RECONNECT EXISTING TRANSFORMER BT-1 TO PANEL BN2H. CIRCUIT BREAKER TO MATCH EXISTING MANUFACTURER AND AIC RATING

EXISTING PANEL BN1H

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 225 A/3P @ MDP1H
LOCATION: NEW CORRIDOR

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 225 A MCB
VOLTS: 480/277 Wye
PHASE: 3
WIRE: 4
SCCR: 14 kA

NOTES: PROVIDE CIRCUIT BREAKERS AS INDICATED IN PANEL SCHEDULE.

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	OCPD P	A	A	B	B	C	C	OCPD P	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY
--	1	SPACE	--	--	0	30.99					**3**	**125 A**	**TR-BTQ 112.5KVA XFMR**	2	[1]
--	3	SPACE	--	--			0	27.14			--	--	--	4	--
--	5	SPACE	--	--					0	31.79	--	--	--	6	--
--	7	(E) SPARE	20 A	1	0	0					3	20 A	(E) 480V RECPS WALL RM 008A	8	--
--	9	(E) SPARE	20 A	1			0	0			--	--	--	10	--
--	11	(E) SPARE	20 A	1					0	0	--	--	--	12	--
--	13	SPACE	--	--	0	0					3	30 A	(E) DISC WIND TUNNEL RM008	14	--
--	15	SPACE	--	--			0	0			--	--	--	16	--
--	17	SPACE	--	--					0	0	--	--	--	18	--
--	19	SPACE	--	--	0	0					3	30 A	(E) DISK LOW SPEED WIND TUNNEL RM 008A	20	--
--	21	SPACE	--	--			0	0			--	--	--	22	--
--	23	SPACE	--	--					0	0	--	--	--	24	--
--	25	SPACE	--	--	0	1.26					3	125 A	(E) TR-BTX 75 KVA XFMR	26	
--	27	SPACE	--	--			0	1.76			--	--	--	28	--
--	29	(E) SPARE	20 A	1					0	0.87	--	--	--	30	--
--	31	(E) SPARE	20 A	1	0	0					3	60 A	(E) TANKLESS WATER HEATER	32	
--	33	(E) SPARE	20 A	1			0	0			--	--	--	34	--
--	35	(E) SPARE	20 A	1					0	0	--	--	--	36	--
--	37	(E) SPARE	20 A	1	0	0					1	20 A	(E) SPARE	38	--
--	39	(E) SPARE	20 A	1			0	0			1	20 A	(E) SPARE	40	--
--	41	(E) SPARE	20 A	1					0	0	1	20 A	(E) SPARE	42	--
			Total Load:		32.25 kVA		28.90 kVA		32.66 kVA						
			Total Amps:		118.27		104.32		119.77						

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
Power	58.83 kVA	100.00%	58.83 kVA		
Receptacles	34.97 kVA	64.30%	22.485 kVA	TOTAL CONNECTED LOAD:	93.80 kVA
				TOTAL ESTIMATED DEMAND LOAD:	81.315 kVA
				TOTAL CONNECTED AMPS:	112.82 A
				TOTAL ESTIMATED DEMAND AMPS:	97.8 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES: [1] REPLACE 70A, 3P CIRCUIT BREAKER SERVING EXISTING 45KVA TRANSFORMER BT-1 WITH NEW 125A, 3P CIRCUIT BREAKER FOR 112.5 KVA TRANSFORMER BTQ AS SHOWN. NEW CIRCUIT BREAKER TO MATCH EXISTING MANUFACTURER AND AIC RATING.

EXISTING PANEL BN1L

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 100 A/3P @ TR-BT1
LOCATION: NEW CORRIDOR

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 100 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 10 kA

NOTES:

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	OCPD P	A	A	B	B	C	C	OCPD P	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY
--	1	(E) REC RM 008E S WALL WMOLD E	20 A	1	0	0.36					1	20 A	(E) R- SOUTH WALL ROOM 008 128	2	--
--	3	(E) REC RM 008E S WALL WMOLD C	20 A	1			0	0.36			1	20 A	(E) R- SOUTH WALL ROOM 008 128	4	--
--	5	(E) REC RM 008E S WALL WMOLD W	20 A	1					0	0.36	1	20 A	(E) R- SOUTH WALL ROOM 008 128	6	--
[1]	7	**DROP CORD ROOM 008 128**	20 A	1	0.36	0.14					1	20 A	**L-UNDER COUNTER**	8	[1]
--	9	**SPARE [2]**	20 A	1			0	0.36			1	20 A	**DROP CORD ROOM 008 128**	10	[1]
--	11	**SPARE [2]**	20 A	1					0	0.36	1	20 A	**DROP CORD ROOM 008 128**	12	[1]
--	13	(E) DROP CORD ROOM 008 128	20 A	1	0.36	0.36					1	20 A	(E) DROP CORD ROOM 008 128	14	--
--	15	(E) DROP CORD ROOM 008 128	20 A	1			0.36	0.36			1	20 A	(E) DROP CORD ROOM 008 128	16	
--	17	(E) DROP CORD ROOM 008 128	20 A	1					0.36	0	1	20 A	(E) REC BY PANEL RM 008	18	--
--	19	(E) REC RM 008E S , E WALL	20 A	1	0	0					1	20 A	(E) SPARE	20	--
--	21	(E) R- ROOM 008 128	20 A	1			0.72	0			1	20 A	(E) REC R, 008D N. W CNR-5	22	--
--	23	(E) REC RM 008E WALL	20 A	1					0	0	1	20 A	(E) REC R, 008E S. W CRNR	24	--
--	25	(E) REC RM 008E N WALL	20 A	1	0	0					1	20 A	(E) REC R, 008E N. W CRNR	26	--
--	27	(E) REC RM 008S WALL C	20 A	1			0	0			2	20 A	(E) REC N WALL W SIDE RM 008E	28	--
--	29	(E) REC RM 008E S WALL C	20 A	1					0	0	--	--	--	30	--
--	31	(E) 208V S WALL ROOM 008E	20 A	2	0	0					3	20 A	(E) PUMP P-E	32	
--	33	--	--	--			0	0			--	--	--	34	--
--	35	(E) REC E SIDE N WALL ROOM 8E	20 A	2					0	0	--	--	--	36	--
--	37	--	--	--	0	0.08					3	20 A	HOOD AND DISCONNECT - 008F	38	
--	39	(E) RM 8 W WALL REC	20 A	1			0	0.08			--	--	--	40	--
--	41	(E) RM 8 E WALL REC	20 A	1					0	0.08	--	--	--	42	--
			Total Load:		1.67 kVA		2.24 kVA		1.16 kVA						
			Total Amps:		14.52		19.34		9.69						

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
Lighting	0.142 kVA	100.00%	0.142 kVA		
Power	0.25 kVA	100.00%	0.25 kVA	TOTAL CONNECTED LOAD:	5.07 kVA
Receptacles	4.68 kVA	100.00%	4.68 kVA	TOTAL ESTIMATED DEMAND LOAD:	5.072 kVA
				TOTAL CONNECTED AMPS:	14.08 A
				TOTAL ESTIMATED DEMAND AMPS:	14.1 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES: [1] REUSE EXISTING CIRCUIT BREAKER AS INDICATED.
[2] EXISTING CIRCUIT REMOVED DURING DEMOLITION. EXISTING CIRCUIT BREAKER SHALL REMAIN AND BE RELABLED AS SPARE IN PANEL DIRECTORY

EXISTING PANEL BNXL

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 225 A/3P @ TR-BTX
LOCATION: ROOM 008

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 225 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 10 kA

NOTES: PROVIDE CIRCUIT BREAKERS AS INDICATED IN PANEL SCHEDULE.

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	OCPD P	A	A	B	B	C	C	OCPD P	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY
[1]	1	**DROP CORD ROOM 008**	**20 A**	**1**	0.36	0.36					**1**	**20 A**	**DROP CORD ROOM 008**	2	[1]
[1]	3	**DROP CORD ROOM 008**	**20 A**	**1**			0.36	0.9			**1**	**20 A**	**R-HALL/008**	4	[1]
[1]	5	**DROP CORD ROOM 008**	**20 A**	**1**					0.36	0.51	**1**	**20 A**	**SK-1 SINK PUMP ROOM 008**	6	[1]
[1]	7	**R- ROOM 008**	**20 A**	**1**	0.54	0					2	20 A	(E) FURNACE 3	8	--
[1]	9	**VAV**	**20 A**	**1**			0.5	0			--	--	--	10	--
--	11	(E) 010 COUNTER REC	20 A	1					0	0	1	20 A	(E) EXISTING CIRCUIT	12	--
--	13	SPARE	20 A	1	0	0					2	20 A	(E) 208 OUTLET ROOM 010	14	--
	15							0			--	--	--	16	--
--	17	(E) HOOD/INCUBATOR 010	20 A	2					0	0	2	20 A	(E) 220 OUTLET NORTH WALL 010	18	--
--	19	--	--	--	0	0					--	--	--	20	--
--	21	(E) OUTLETS TISSUR ROOM 010	20 A	2			0	0			2	20 A	(E) FREEZER 010	22	--
--	23	--	--	--					0	0	--	--	--	24	--
--	25	(E) PLUGMOLD 010	20 A	3	0	0					3	20 A	(E) PLUG MOLD 010	26	--
--	27	--	--	--			0	0			--	--	--	28	--
--	29	--	--	--					0	0	--	--	--	30	--
--	31	(E) PLUGMOLD 010	20 A	3	0	0					2	20 A	(E) PLUG MOLD 010	32	--
--	33	--	--	--			0	0			--	--	--	34	--
--	35	--	--	--					0	0	1	20 A	(E) COUNTER 010	36	--
--	37	(E) OUTLET END OF COUNTER 010	20 A	1	0	0					3	20 A	(E) PUMP & DISCONNECT SE CORNER	38	--
--	39	(E) SOUTHWEST DROP CORD	20 A	2			0	0			--	--	--	40	--
--	41	--	--	--					0	0	--	--	--	42	--
			Total Load:		1.26 kVA		1.76 kVA		0.87 kVA						
			Total Amps:		11.00		15.17		7.25						

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
Power	0.5 kVA	100.00%	0.5 kVA		
Receptacles	3.39 kVA	100.00%	3.39 kVA	TOTAL CONNECTED LOAD:	3.89 kVA
				TOTAL ESTIMATED DEMAND LOAD:	3.89 kVA
				TOTAL CONNECTED AMPS:	10.80 A
				TOTAL ESTIMATED DEMAND AMPS:	10.8 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES: [1] REMOVE EXISTING CIRCUIT BREAKERS. PROVIDE NEW CIRCUIT BREAKERS MATCHING EXISTING MANUFACTURER AND AIC RATING

4/18/2024

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NEW PANEL BNQL

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 400 A/3P @ TR-BTQ
LOCATION: NEW CORRIDOR

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 400 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 10 kA

NOTES:

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	A		B		C		OCPD P	AMPS	LOAD DESCRIPTION	CKT NO.	KEY
	1	E-1 CRYOSTAT CABINET	20 A	2	1.67	1.44					1	15 A	E-7 GLOVE PORT	2	
--	3	--	--	--			1.67	1.44			1	15 A	E-7 GLOVE PORT	4	
	5	E-1 CRYOSTAT CABINET	20 A	2					1.67	1.44	1	15 A	E-7 GLOVE PORT	6	
--	7	--	--	--	1.67	1.44					1	15 A	E-7 GLOVE PORT	8	
	9	E-1 CRYOSTAT CABINET	20 A	2			1.67	1.44			1	15 A	E-7 GLOVE PORT	10	
--	11	--	--	--					1.67	1.44	1	15 A	E-7 GLOVE PORT	12	
	13	E-2 EVAP. WATER CHILLER	20 A	2	0.52	1.44					1	15 A	E-7 GLOVE PORT	14	
--	15	--	--	--			0.52	1.44			1	15 A	E-7 GLOVE PORT	16	
	17	E-3 OPTICOOL CRYOSTAT COMPRESSOR	40 A	3					3.83	1.2	1	15 A	E-8 NANOFRAZOR	18	
--	19	--	--	--	3.83	1.4					1	20 A	E-11 GAS PURIFIER	20	
--	21	--	--	--			3.83	1.4			1	20 A	E-11 GAS PURIFIER	22	
	23	E-4 MII CRYOSTAT COMPRESSOR	20 A	2					1.67	1.4	1	20 A	E-11 GAS PURIFIER	24	
--	25	--	--	--	1.67	0.5					1	20 A	E-14 FUME HOOD	26	
	27	E-5 OPTICOOL CRYOSTAT CHILLER	20 A	2			1.25	0			3	40 A	SPARE (FUTURE COMPRESSOR)	28	--
--	29	--	--	--					1.25	0	--	--	--	30	--
	31	CWP-1	15 A	1	0.53	0					--	--	--	32	--
	33	E-9 EVAPORATOR	30 A	3			2.88	0			2	20 A	SPARE (FUTURE CHILLER)	34	--
--	35	--	--	--					2.88	0	--	--	--	36	--
--	37	--	--	--	2.88	1.5					1	20 A	AF-1 AIR FILTER	38	
	39	E-10 EVAP. CHAR. BOX	20 A	2			1.67	0.7			1	20 A	EF-2 GLOVE TRAIN EXHAUST FAN	40	
--	41	--	--	--					1.67	3.8	2	60 A	WCU-1 CHILLER CLOSET	42	
	43	E-12 PURIFICATION SYSTEM	30 A	3	2.88	3.8					--	--	--	44	--
--	45	--	--	--			2.88	0.53			1	15 A	EF-1 CHILLER ROOM EXHAUST	46	
--	47	--	--	--					2.88	1.18	1	20 A	EF-3 FUME HOOD EXHAUST	48	
	49	E-13 AFM COMPRESSOR	40 A	3	3.83	0					1	20 A	SPARE	50	--
--	51	--	--	--			3.83	0			1	20 A	SPARE	52	--
--	53	--	--	--					3.83	0	1	20 A	SPARE	54	--
--	55	SPARE	20 A	1	0	0					1	20 A	SPARE	56	--
--	57	SPARE	20 A	1			0	0			1	20 A	SPARE	58	--
--	59	SPARE	20 A	1					0	0	1	20 A	SPARE	60	--
			Total Load:		30.99 kVA		27.14 kVA		31.79 kVA						
			Total Amps:		263.15		226.13		269.84						

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
Power	58.33 kVA	100.00%	58.33 kVA
Receptacles	31.58 kVA	65.83%	20.79 kVA

TOTALS*	
TOTAL CONNECTED LOAD:	89.91 kVA
TOTAL ESTIMATED DEMAND LOAD:	79.12 kVA
TOTAL CONNECTED AMPS:	249.57 A
TOTAL ESTIMATED DEMAND AMPS:	219.6 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES:

EXISTING PANEL 2N19L

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 100 A/3P @
LOCATION: ROOM 234

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 100 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 14 kA

NOTES: PANEL TO BE GUTTED COMPLETLY AND PROVIDE CIRCUIT BREAKERS AS INDICATED IN PANEL SCHEDULE. NEW CIRCUIT BREAKERS TO MATCH EXISTING MANUFACTURER AND AIC RATING. EXISTING (2) 50A3P, (2)100A3P, AND (1) 150A BREAKERS TO BE REMOVED.

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	A		B		C		OCPD P	AMPS	LOAD DESCRIPTION	CKT NO.	KEY
	1	R- CORD REEL	20 A	1	0.36	0.36					1	20 A	R- CORD REEL	2	
	3	R- CORD REEL	20 A	1			0.36	0.36			1	20 A	R- CORD REEL	4	
	5	EQ-1 LINDBERG OVEN	20 A	1					1.8	1.8	1	20 A	EQ-9 SMALL OVEN	6	
	7	EQ-5 UNIVERSAL TESTING MACHINE	20 A	1	1.8	1.8					1	20 A	EQ-8 HERMATHERM OVEN	8	
	9	R- ROOM 234	20 A	1			0.54	1.8			1	20 A	EQ-3 FUME EXHAUST FAN	10	
	11	EQ-3 FUME EXHAUST FAN	20 A	1					1.8	1.56	2	20 A	EQ-7 VWR OVEN	12	
	13	EQ-6 FREEZER	20 A	1	1.8	1.56					--	--	--	14	--
	15	EQ-4 HOT PLATE	20 A	1			1.8	0.05			1	20 A	L - IN USE SIGN / UNDERCOUNTER LIGHTS	16	
	17	PLUGMOLD	20 A	1					0.9	0	1	20 A	SPARE	18	--
	19	PLUGMOLD	20 A	1	0.9	0					1	20 A	SPARE	20	--
	21	EQ-2 HOT PRESS	20 A	3			1.8	0			1	20 A	SPARE	22	--
--	23	--	--	--					1.8	0	1	20 A	SPARE	24	--
--	25	--	--	--	1.8	0					1	20 A	SPARE	26	--
--	27	SPARE	20 A	1			0	0			1	20 A	SPARE	28	--
--	29	SPARE	20 A	1					0	0	1	20 A	SPARE	30	--
--	31	SPARE	20 A	1	0	0					1	20 A	SPARE	32	--
--	33	SPARE	20 A	1			0	0			1	20 A	SPARE	34	--
--	35	SPARE	20 A	1					0	0	1	20 A	SPARE	36	--
--	37	SPARE	20 A	1	0	0					1	20 A	SPARE	38	--
--	39	SPARE	20 A	1			0	0			1	20 A	SPARE	40	--
--	41	SPARE	20 A	1					0	0	1	20 A	SPARE	42	--
			Total Load:		10.38 kVA		6.71 kVA		9.66 kVA						
			Total Amps:		90.29		55.88		84.29						

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
Lighting	0.046 kVA	100.00%	0.046 kVA
Power	6.84 kVA	100.00%	6.84 kVA
Receptacles	19.86 kVA	75.18%	14.93 kVA

TOTALS*	
TOTAL CONNECTED LOAD:	26.75 kVA
TOTAL ESTIMATED DEMAND LOAD:	21.816 kVA
TOTAL CONNECTED AMPS:	74.24 A
TOTAL ESTIMATED DEMAND AMPS:	60.6 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES:

4/18/2024

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