

MSU- WIMU 2155 ANALYSIS DR RENOVATION

CONSTRUCTION DOCUMENTS - MARCH 28, 2018

PPA NO. 18-2004



MSU-CPDC
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BOZEMAN, MONTANA
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CONSTRUCTION DOCUMENTS
WIMU - 2155 ANALYSIS DR
RENOVATION

ABBREVIATIONS

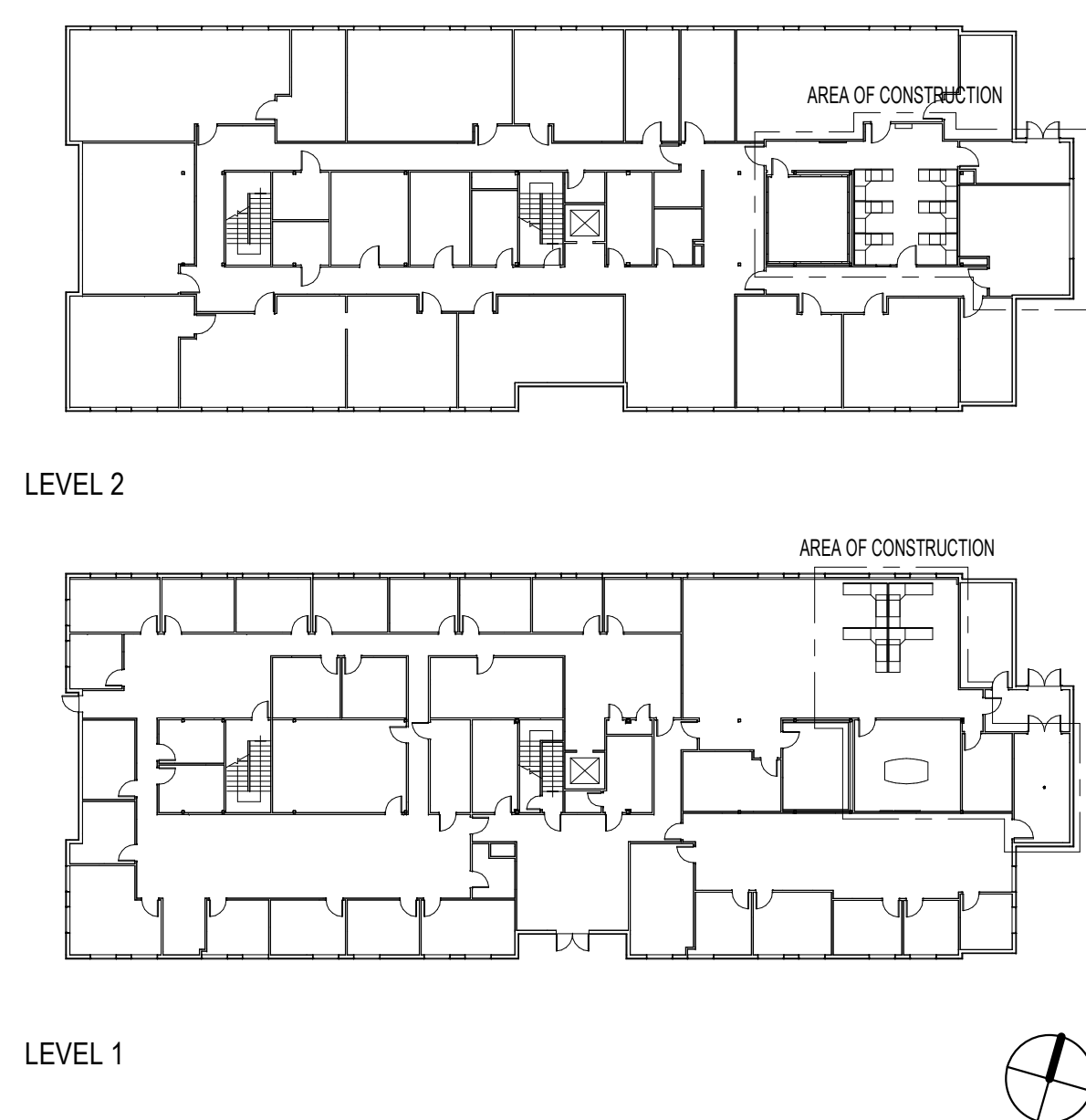
AB	Anchor Bolt	FEC	Fire Extinguisher	PL	Plate
A/C	Air Conditioning	FEX	Fire Extinguisher Cabinet	PLAM	Plastic Laminate
ACT	Acoustical Ceiling Tile	FIN	Finish(ed)	PLWD	Plywood
ADDL	Additional	FIX	Fixture	PNL	Panel
ADDM	Addendum	FLEX	Flexible	PNT	Paint
ADJ	Adjacent	FLR	Floor Drain	PREFAB	Prefabricated
AFF	Above Finished Floor	FLUOR	Fluorescent	PREFIN	Prefinished
AHU	Air Handling Unit	FO	Face Of	PSF	Pounds per Square Foot
AIB	Air Infiltration Barrier	FT	Foot (Feet)	PSI	Pounds per Square Inch
ALT	Alternative	FTG	Footing	PSL	Parallel Strand Lumber
ALUM	Aluminum	FV	Field Verify	PT	Point
ANOD	Anodized	GA	Gauge	PTD	Paper Towel Dispenser
APPROX	Approximate(y)	GB	Grab Bar	PVC	Polyvinyl Chloride
ARCH	Architectural	GC	General Contractor	PVMT	Pavement
AUTO	Automatic	GALV	Galvanized	QTY	Quantity
AV	Audio / Visual	GL	Glass	R	Riser
AVG	Average	GLU LAM	Glue Laminated Beam	RAD	Radius
BD	Board	GWB	Gypsum Wall Board	RCP	Reflected Ceiling Plan
BO	Bottom Of	HB	Hose Bibb	RD	Roof Drain
BLDG	Building	HCC	Hollow Core	RDRWD	Railwood
BLKG	Blocking	HO BD	Hard Board	RE	Regarding
BRG	Bearing	HDR	Header	RECP	Receptacle
BSMT	Basement	HDRW	Hardware	REF	Reference
BTWN	Between	HM	Hollow Metal	REFG	Refrigerator
BOW	Bottom of Wall	HORZ	Horizontal	RENF	Reinforced, (ing)
BUR	Built Up Roof	HR	Hour	REQD	Required
		HT	Height	RES	Resilient
CAB	Cabinet	HTG	Heating	REV	Revision, Revised
CB	Catch Basin	HTR	Heater	RM	Room
CC	Center to Center	HVAC	Heating, Ventilating, Air Conditioning	RO	Rough Opening
CDX	Exterior Grade Plywood	HWC	Hot Water	SAN	Sanitary
CF	Cubic Feet	HW	Hot Water	SCHED	Schedule
CH	Channel	ID	Inside Diameter	SD	Soap Dispenser
CIP	Cast In Place	IN	Inch	SF	Square Feet
CIRC	Circumference	INC	Include	SFT	Supply Fitting
CJ	Control Joint	INFO	Information	SHT	Sheet
CL	Centerline	INSUL	Insulation	SHTG	Sheathing
CLG	Clearing	INT	Interior	SHWR	Shower
CLR	Clear	JST	Joist	SM	Similar
CMU	Concrete Masonry Unit	JT	Joint	SIP	Structural Insulated Panel
CO	Clean Out	CONC	Concrete	SMT	Sealant
COL	Column	CONST	Construction	SOG	Slab on Grade
CONC	Concrete	CONT	Continuous	SPEC	Specifications
CONTR	Contractor	L	Length	SS	Stainless Steel
COORD	Coordinate	LAV	Lavatory	SSD	See Structural Drawings
CPT	Carpent	LB	Pound	STD	Standard
CT	Ceramic Tile	LF	Linear/Linear Feet	STL	Steel
CTR	Center	LL	Level/Load	STOR	Storage
CTRD	Centered	LWT	Lightweight	STRUCT	Structural
CW	Cold Water	LVL	Laminated Veneer Lumber	SUB FLR	Subfloor
		MAG	Magnetic	T	Tread
DBL	Double	MANUF	Manufacturer	T&G	Tongue and Groove
DEG	Degree	MAS	Masonry	TB	Test Bore
DEMO	Demolish, Demolition	MATL	Material	TEL	Telephone
DEPT	Department	MAX	Maximum	THRU	Through
DF	Drinking Fountain	MECH	Mechanical	TJ	Truss Joist Incorporated
DIAM	Diameter	MED	Medium	TO	Top Of
DIM	Dimension	MEMB	Membrane	TOW	Top of Wall
DISP	Dispenser	MEZZ	Mezzanine	TP	Toilet Paper Dispenser
DL	Dead Load	MDF	Medium Density Fiberboard	TSTAT	Thermostat
DN	Down	MIN	Minimum	TV	Television
DR	Door	MIR	Mirror	TYP	Typical
DS	Downspout	MISC	Miscellaneous	UNFIN	Unfinished
DTL	Detail	MO	Masonry Opening	UG	Underground
DWG	Drawing	MTD	Mounted	UNO	Unless Noted Otherwise
		MTL	Metal	VAC	Vacuum Outlet
EA	Each	N/A	Not Applicable	VCT	Vinyl Composite Tile
EFS	Exterior Insulation	NIC	Not In Contract	VERT	Vertical
EJ	Finish System	#	Number	VB	Vapor Barrier
ELEV	Elevation	NOM	Nominal	W	Width
ELECT	Electrical	NTS	Not to Scale	WI	With
ENCL	Enclosure	OC	On Center	WB	White Board
EQ	Equipment	OD	Outside Diameter	WC	Water Closet
EQUIP	Equipment	OH	Overhead	WC	Water Closet
(E) EXIST	Existing	OPNG	Opening	WD	Wood
EST	Estimate	OPP	Opposite	WIDW	Window
ETR	Existing to Remain	PART BD	Particle Board	WO	Without
EW	Electric Water Cooler	PERF	Perforated	WP	Waterproof
EXP	Expansion	PERIM	Perimeter	WR	Water Resistant
EXT	Exterior	PERP	Perpendicular	WT	Weight
FBO	Furnished By Others	PKG	Parking	WWF	Welded Wire Fabric
FD	Floor Drain	PL	Property Line	YD	Yard
FDN	Foundation				

VICINITY MAP

2155 ANALYSIS DR, BOZEMAN, MT



KEY PLAN



PROJECT TEAM

OWNER Montana State University P.O. Box 172760, Bozeman, MT 59717 Contact: Jaslyn Letscher, 406.994.5970	PLUMBING Three Rivers Engineering 24 S. Wilson Ave, Suite A, Bozeman, MT 59715 Contact: Joe Miller, 406.562.8288
ARCHITECT Architecture118 115 East Oak Street, Bozeman, MT 59715 Contact: Scott Heiglin or Ryan Regard, 406.404.1777	ELECTRICAL Three Rivers Engineering 24 S. Wilson Ave, Suite A, Bozeman, MT 59715 Contact: John Terault, 406.562.8288
MECHANICAL Three Rivers Engineering 24 S. Wilson Ave, Suite A, Bozeman, MT 59715 Contact: Joe Miller, 406.562.8288	

CODE INFORMATION

APPLICABLE CODES	PROJECT INFORMATION
International Building Code (IBC) 2012	Jurisdiction: City of Bozeman
International Mechanical Code (IMC) 2012	Zoning: Business Park
National Electrical Code (NEC) 2014	Type of Project: Renovation
Uniform Plumbing Code (UPC) 2012	Type of Construction: Existing
International Fire Code (IFC) 2012	Occupancy Group (Use): B
International Energy Conservation Code (IECC) 2012	Automatic Sprinkler System: Yes
International Fuel Gas Code (IFGC) 2012	Fire Alarm System: Yes
	Affected Area: 2,175 sq ft
	Occupant Load: (100 gross) 28 occupants
	Exits: Reg'd no change
	See floor plans for exiting concept & travel distance analysis.

GENERAL NOTES

- Do not scale drawings. If critical dimensions do not appear on the drawings, notify the Architect.
- Contractor to field verify all dimensions and existing conditions prior to beginning work. Start of work indicates acceptance of existing conditions.
- If discrepancies exist between drawings or between the drawings and the specifications, notify the Architect immediately for clarification.
- All dimensions are to face of framing, finished face of existing wall, centerline of column, or finished floor, unless noted otherwise.
- Provide all components and accessories needed for a complete and finished installation. Coordinate all work with Subcontractors prior to beginning work.
- Provide blocking for all wall-mounted casework, millwork, grab bars, hardware, equipment, etc.
- Penetrations occurring in rated construction assemblies are to be sealed appropriately to maintain fire-rating integrity.
- The specifications included are an integral part of these Construction Documents. It is the responsibility of the Contractor to review all information.
- Maintain a clean and safe work site at all times.
- Notify Owner in writing of any expected disruptions in service or changes in construction schedule at least 72 hours in advance.
- Do not block any roads, sidewalks or access to garbage dumpsters.
- Owner and residents will occupy portions of building immediately adjacent to work area. Conduct work activities so Owner's operations will not be disrupted.
- All work, material storage, and staging shall occur within Construction Limits shown (except incidental work in adjacent areas).
- Clean construction area at conclusion of work. Return construction area to cleanliness existing before work began.
- Items indicated to be removed and salvaged remain Owner's property. Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.
- Protect walls, ceilings, floors, and other existing finish work that are to remain. Cover and protect, furniture, furnishings, and equipment not to be removed.
- Neatly cut openings and holes - plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.
- Contractor to remove all demolition waste materials from Project site.
- Leave jobsite in clean/occupiable condition at turnover to the owner.

HAZARDOUS MATERIALS

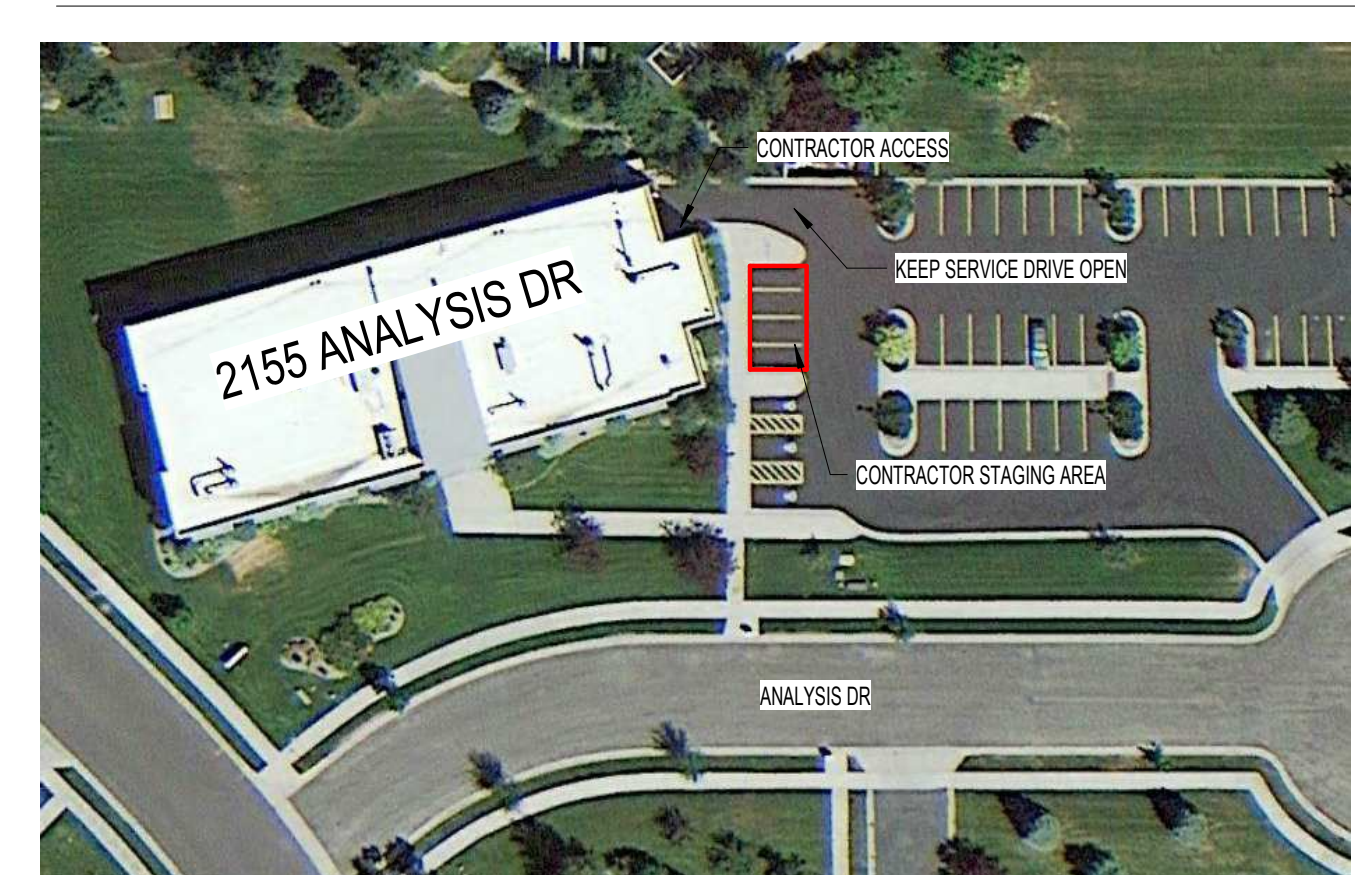
NOTICE:
1. SPECIFIC MATERIALS WITHIN THE PROJECT LIMITS HAVE NOT BEEN TESTED FOR HAZARDOUS MATERIALS. IF SUSPECT MATERIALS ARE ENCOUNTERED, DO NOT DISTURB AND NOTIFY MSU PROJECT MANAGER IMMEDIATELY.

DRAWING INDEX

GENERAL A0.1 COVER / GENERAL INFORMATION	PLUMBING P1.0 FIRST LEVEL PLUMBING DEMO P1.1 SECOND LEVEL PLUMBING DEMO P2.0 FIRST LEVEL PLUMBING P2.1 SECOND LEVEL PLUMBING
ARCHITECTURAL A1.1 DEMO PLANS A2.1 FLOOR PLANS A2.2 REFLECTED CEILING PLANS A2.3 FINISH PLANS	ELECTRICAL E1.1 FIRST LEVEL ELECTRICAL DEMO E1.2 SECOND LEVEL ELECTRICAL DEMO E2.1 FIRST LEVEL ELECTRICAL E2.2 SECOND LEVEL ELECTRICAL E3.1 ELECTRICAL SCHEDULES
MECHANICAL M1.0 SECOND LEVEL MECHANICAL DEMO M2.0 FIRST LEVEL MECHANICAL M2.1 SECOND LEVEL MECHANICAL M3.0 MECHANICAL LEGEND & SCHEDULES	

SITE MAP

2155 ANALYSIS DR, BOZEMAN, MT



NOTE: THERE IS AN ACCESS DOOR ON THE EAST SIDE TO LEVEL 1 & LEVEL 2. HOWEVER THERE ARE NO STAIRS TO LEVEL 2 IN THIS AREA. IT WILL BE THE CONTRACTORS RESPONSIBILITY TO KEEP THE AREA SAFE IF THE LEVEL 2 ACCESS IS USED.

SUMMARY OF WORK

Interior renovation of existing office, conference, and laboratory workroom space for the relocation of WIMU. Renovation to include, but not limited to, relocating equipment from the current facility to the new facility, removal and replacement of plumbing, mechanical, fire and electrical components as needed.

Bid Alternate #1: Provide and install new shelving in the Prep / Anatomy Lab.

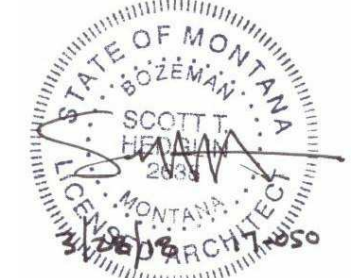


THREE RIVERS ENGINEERING, INC.
MECHANICAL-ELECTRICAL-ENERGY
118 ARCHITECTURE

DRAWN BY: RER

REVIEWED BY: STH

REV. DESCRIPTION DATE



PPA#18-2004

A118 #17-050

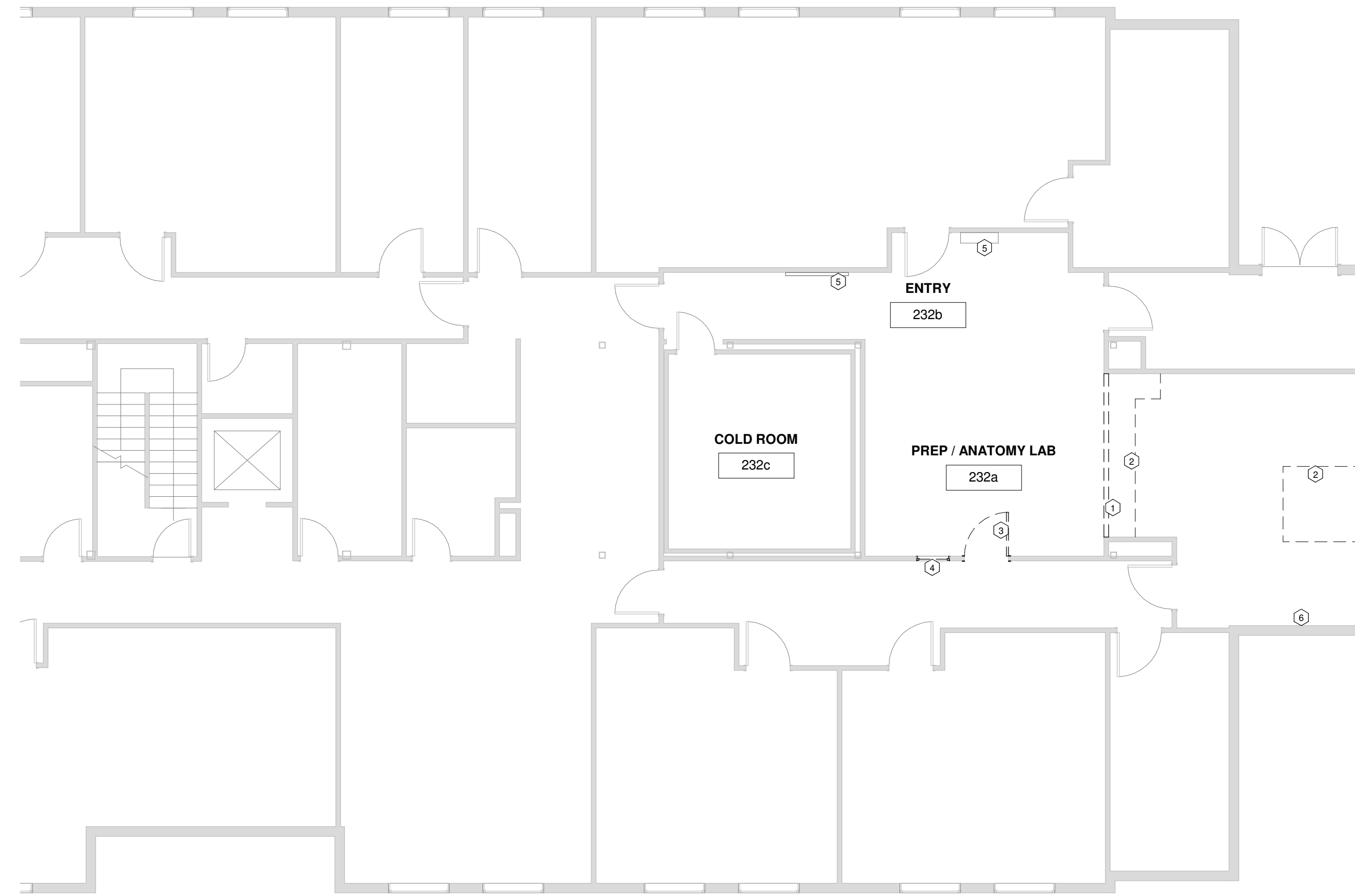
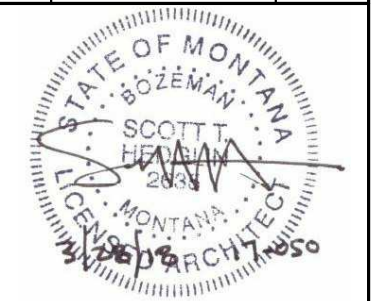
SHEET TITLE
COVER /
GENERAL INFO

SHEET
A0.1

DATE
03/28/18

CONSTRUCTION DOCUMENTS
**WIMU - 2155 ANALYSIS DR
RENOVATION**

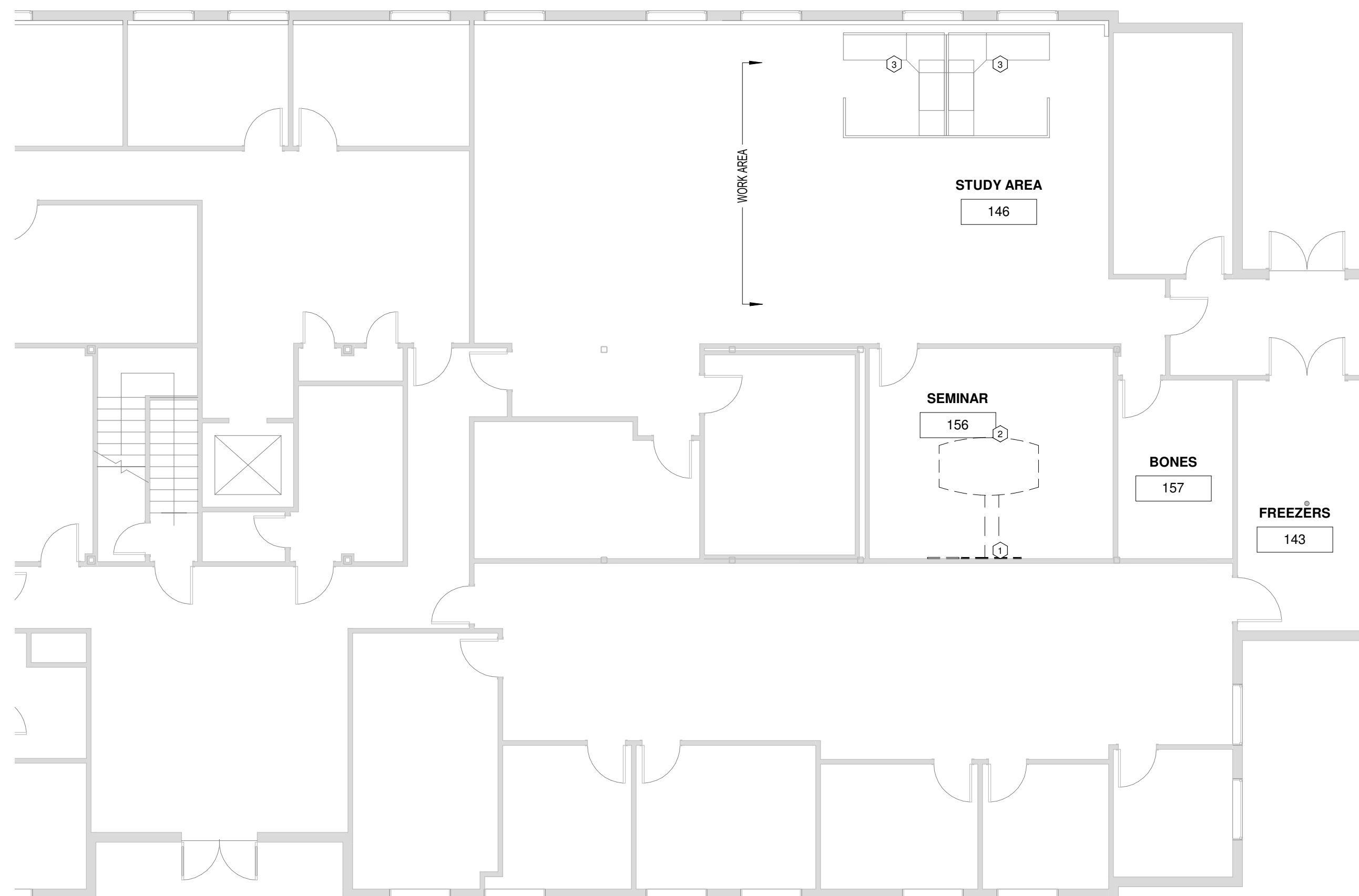
REV.	DESCRIPTION	DATE



- PLAN NOTES**
- A. ALL WALLS & DOORS TO REMAIN U.N.O.
 - B. REMOVE & SALVAGE ALL EXISTING FURNITURE & EQUIPMENT FROM AREA BEING RENOVATED PRIOR TO THE START OF CONSTRUCTION. CONSULT w/ OWNER WHERE TO STORE.
 - C. PROVIDE A DUST BARRIER AROUND WORK AREA SO OWNERS OPERATIONS WILL NOT BE DISRUPTED.

- KEY NOTES** (X)
- 1. DEMO EXISTING PARTITION WALL.
 - 2. REMOVE & DISPOSE EXISTING CASEWORK & SHELVING.
 - 3. DISMANTLE & SALVAGE EXISTING DOOR TO INSTALL IN NEW PARTITION WALL.
 - 4. REMOVE & DISPOSE EXISTING WINDOW.
 - 5. EXISTING WHITEBOARD, COAT RACK & SHELVES TO REMAIN.
 - 6. EXISTING POWER STRIP ON WALL TO REMAIN.

② DEMO PLAN - LEVEL 2
1/8" = 1'-0"

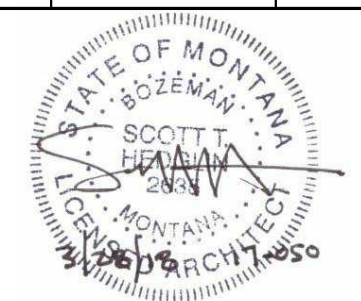


- PLAN NOTES**
- A. ALL WALLS & DOORS TO REMAIN U.N.O.
 - B. REMOVE & SALVAGE ALL EXISTING FURNITURE & EQUIPMENT FROM AREA BEING RENOVATED PRIOR TO THE START OF CONSTRUCTION. CONSULT w/ OWNER WHERE TO STORE.
 - C. PROVIDE A DUST BARRIER AROUND WORK AREA SO OWNERS OPERATIONS WILL NOT BE DISRUPTED.

- KEY NOTES** (X)
- 1. DEMO EXISTING MONITORS, HARDWARE & DATA ALONG WALL AND FLOOR. REMOVE & DISPOSE.
 - 2. REMOVE & DISPOSE EXISTING CONFERENCE TABLE & DATA.
 - 3. EXISTING CUBICLES TO REMAIN.

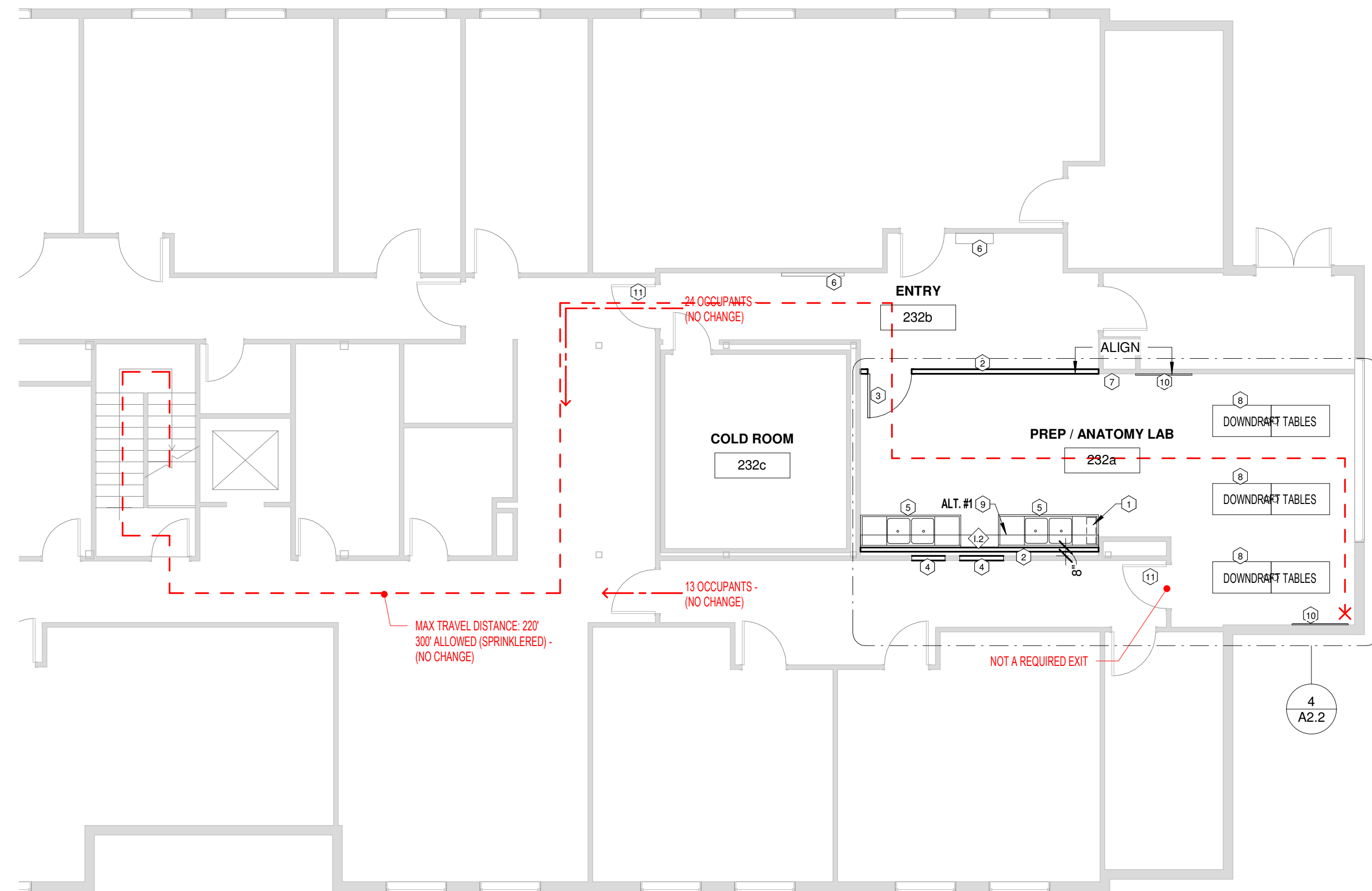
① DEMO PLAN - LEVEL 1
1/8" = 1'-0"

REV.	DESCRIPTION	DATE



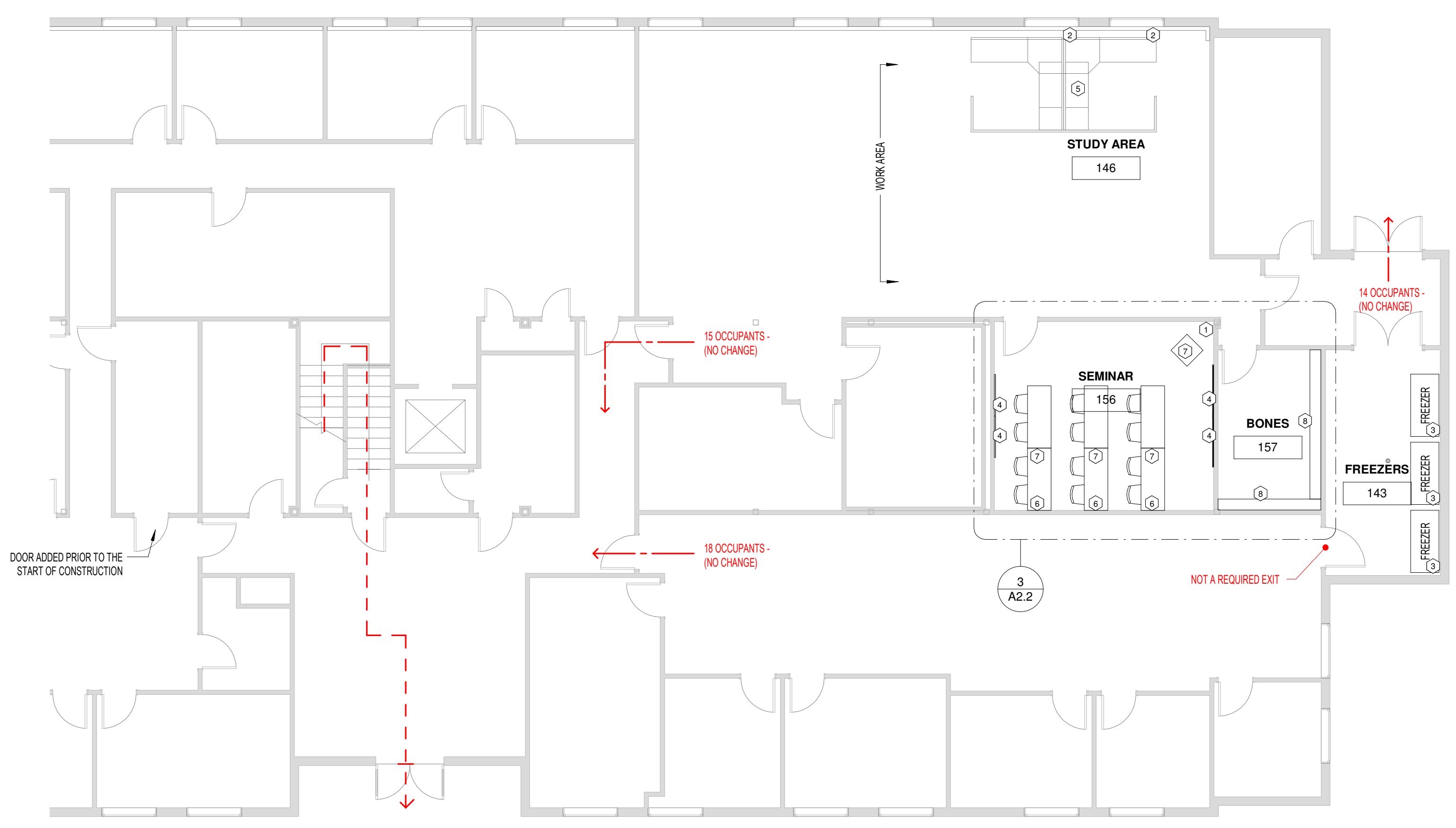
- PLAN NOTES**
- ALL WALLS & DOORS EXISTING U.N.O.
 - ALL FURNITURE AND EQUIPMENT TO BE PROVIDED BY OWNER U.N.O.
 - ALL NEW PARTITION WALLS TO BE TYPE I U.N.O.
 - RELOCATED ITEMS WILL BE MOVED FROM THE MOLECULAR BIOSCIENCES BUILDING (MBB) AT 960 RESEARCH DR.
 - PROVIDE A DUST BARRIER AROUND WORK AREA SO OWNERS OPERATIONS WILL NOT BE DISRUPTED.

- KEY NOTES** (X)
- RELOCATE RETRACTABLE HOSE FROM MBB. MOUNT TO FLOOR UNDER DRAINBOARD AND PLUMB.
 - NEW PARTITION WALLS.
 - RELOCATE EXISTING DOOR TO NEW PARTITION WALL.
 - INFILL OPENINGS.
 - RELOCATE & INSTALL SINKS FROM MBB.
 - EXISTING WHITEBOARD, COAT RACK & SHELVES TO REMAIN.
 - PROVIDE POWER & ROUGH IN DATA FOR DESK. OWNER TO RUN DATA LINES & PROVIDE DESK. CONSULT W/ OWNER ABOUT LOCATION.
 - RELOCATE AND HOOK UP DOWNDRAFT TABLES FROM MBB. FLEX HOSE TO BE RELOCATED WITH TABLES.
 - BID ALT. #1 - MOUNT ADJUSTABLE SHELVING W/ BRACKETS AT 24" O.C. USE 2x BLOCKING IN WALL OR BUTTERFLY ANCHORS INTO STEEL STUDS. CONTRACTOR TO SUPPLY BRACKETS & SHELVES.
 - RELOCATE MONITORS & MOUNTING BRACKETS FROM MBB & INSTALL. PROVIDE POWER & ROUGH IN DATA FOR MONITORS. TOP OF MONITOR AT 6'-6" ABOVE F.F. OWNER TO RUN DATA LINES.
 - ADD PEMCO S88 OR SIM. DOOR SEAL AND PEMCO 18100, NB OR SIM. BRUSH SEAL TO EXISTING DOOR.

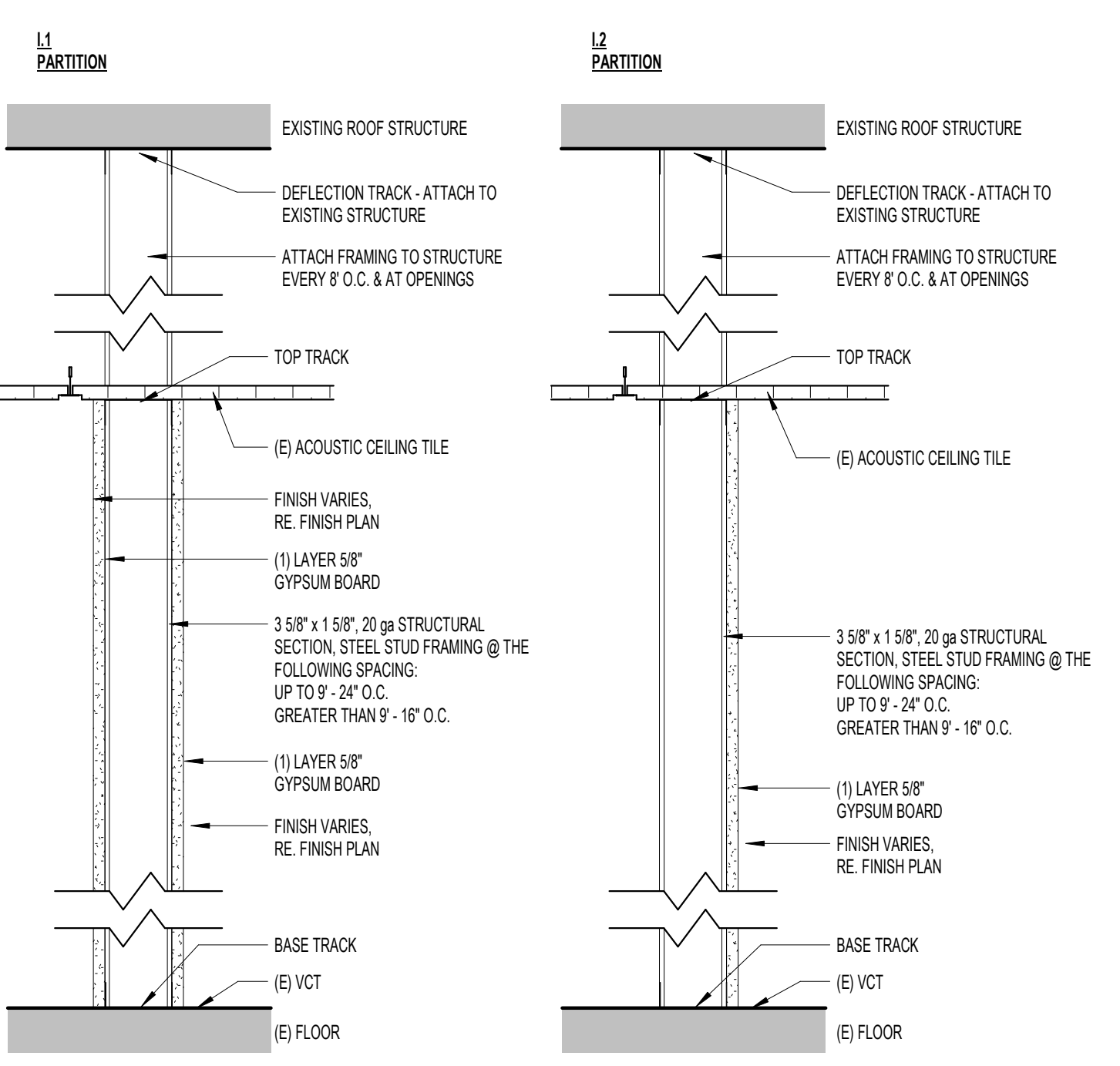


- PLAN NOTES**
- ALL WALLS & DOORS EXISTING U.N.O.
 - RELOCATED ITEMS WILL BE MOVED FROM THE MOLECULAR BIOSCIENCES BUILDING (MBB) AT 960 RESEARCH DR.
 - PROVIDE A DUST BARRIER AROUND WORK AREA SO OWNERS OPERATIONS WILL NOT BE DISRUPTED.

- KEY NOTES** (X)
- PROVIDE POWER & ROUGH IN DATA ON WALL BEHIND PODIUM. OWNER TO RUN DATA LINES.
 - BLINDS IN STUDY AREA BY OWNER IF NEEDED.
 - PROVIDE POWER FOR CHEST FREEZERS. OWNER WILL BE RESPONSIBLE FOR RELOCATING FREEZERS FROM MBB.
 - RELOCATE MONITORS FROM MBB & INSTALL. PROVIDE POWER & ROUGH IN DATA. OWNER TO PERFORM TERMINATIONS & PROVIDE NEW MOUNTING BRACKETS FOR MONITORS.
 - CUBICLES TO REMAIN.
 - PROVIDE POWER FOR DESKS.
 - OWNER WILL BE RESPONSIBLE FOR RELOCATING DESK, CHAIRS & PODIUM FROM MBB.
 - ADJUSTABLE SHELVING W/ BRACKETS AT 24" O.C. USE 2x BLOCKING IN WALL OR BUTTERFLY ANCHORS INTO STEEL STUDS. CONTRACTOR TO PROVIDE BRACKETS & SHELVES.



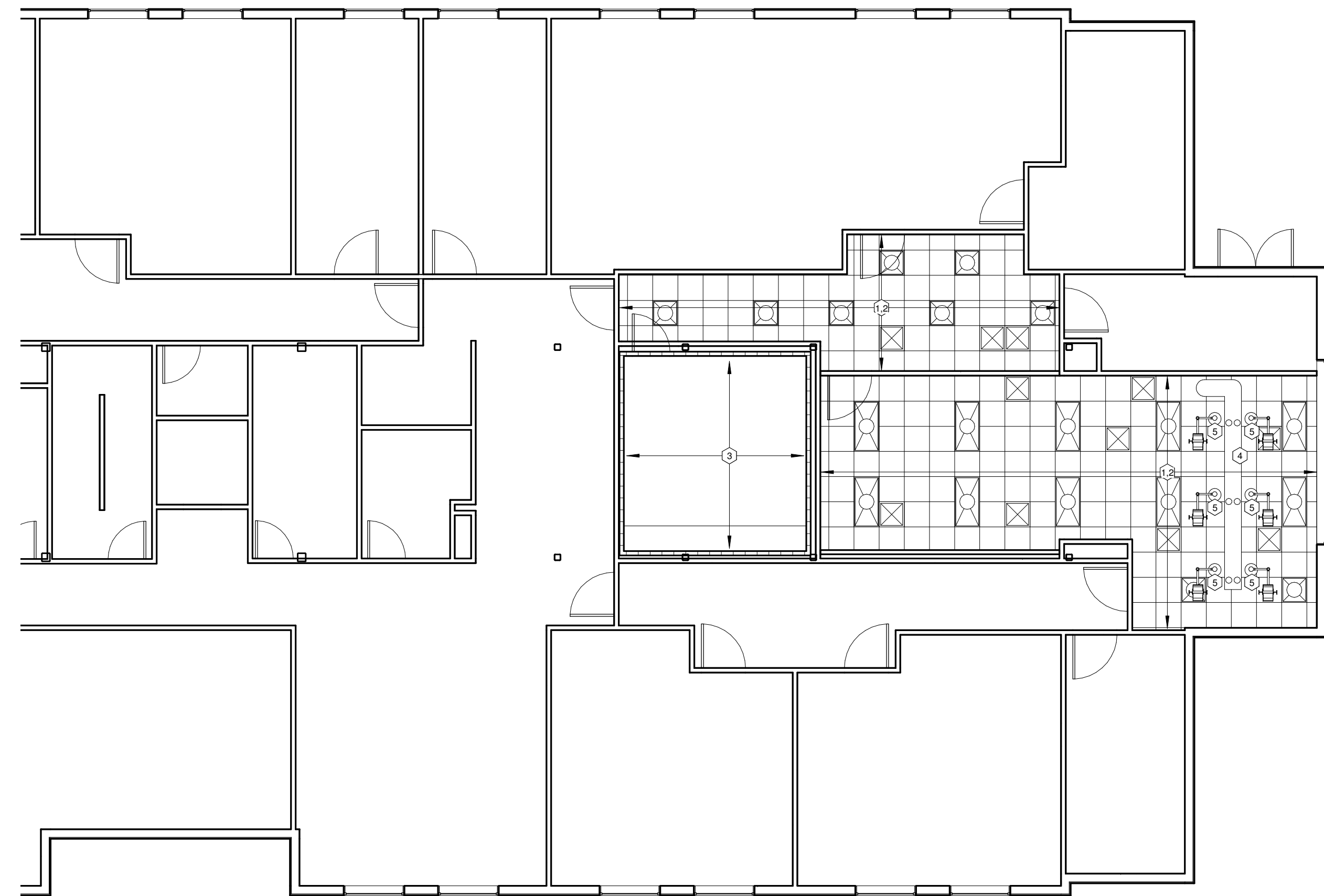
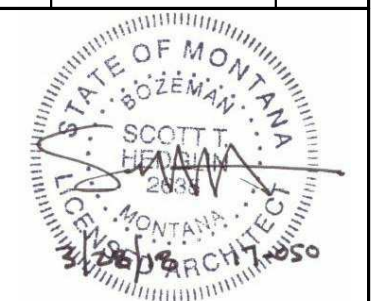
INTERIOR



3 TYPICAL NEW PARTITION WALL
1 1/2" = 1'-0"

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② RCP - LEVEL 2
 1/8" = 1'-0"



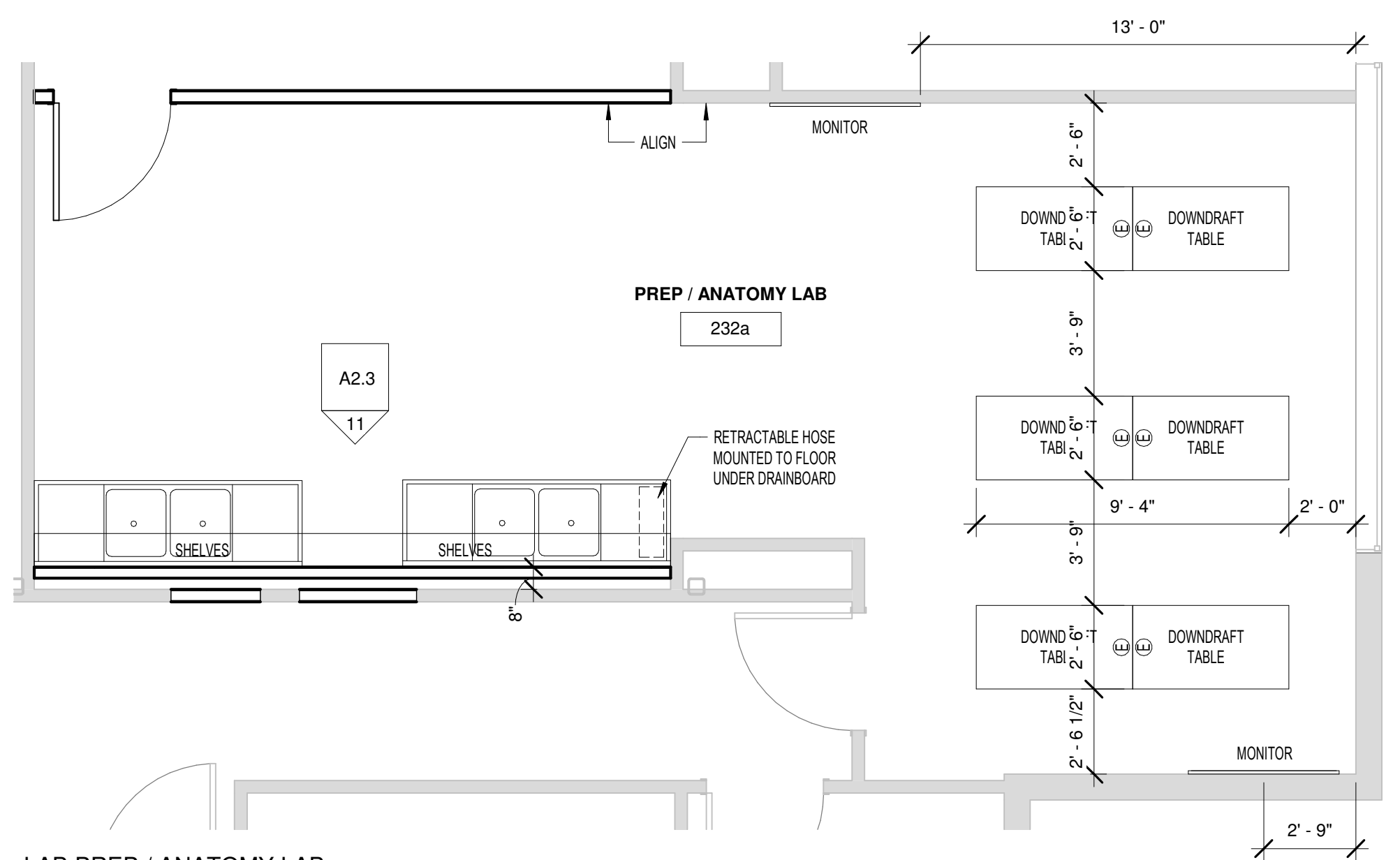
① RCP - LEVEL 1
 1/8" = 1'-0"

- PLAN NOTES**
- EXISTING ACOUSTICAL CEILING PANELS ARE CERTAINTED BOCL-224, 2X4, 15/16" TEGULAR.
 - CEILING GRID CONTINUOUS THROUGHOUT THIS AREA. MAINS RUN EAST - WEST.

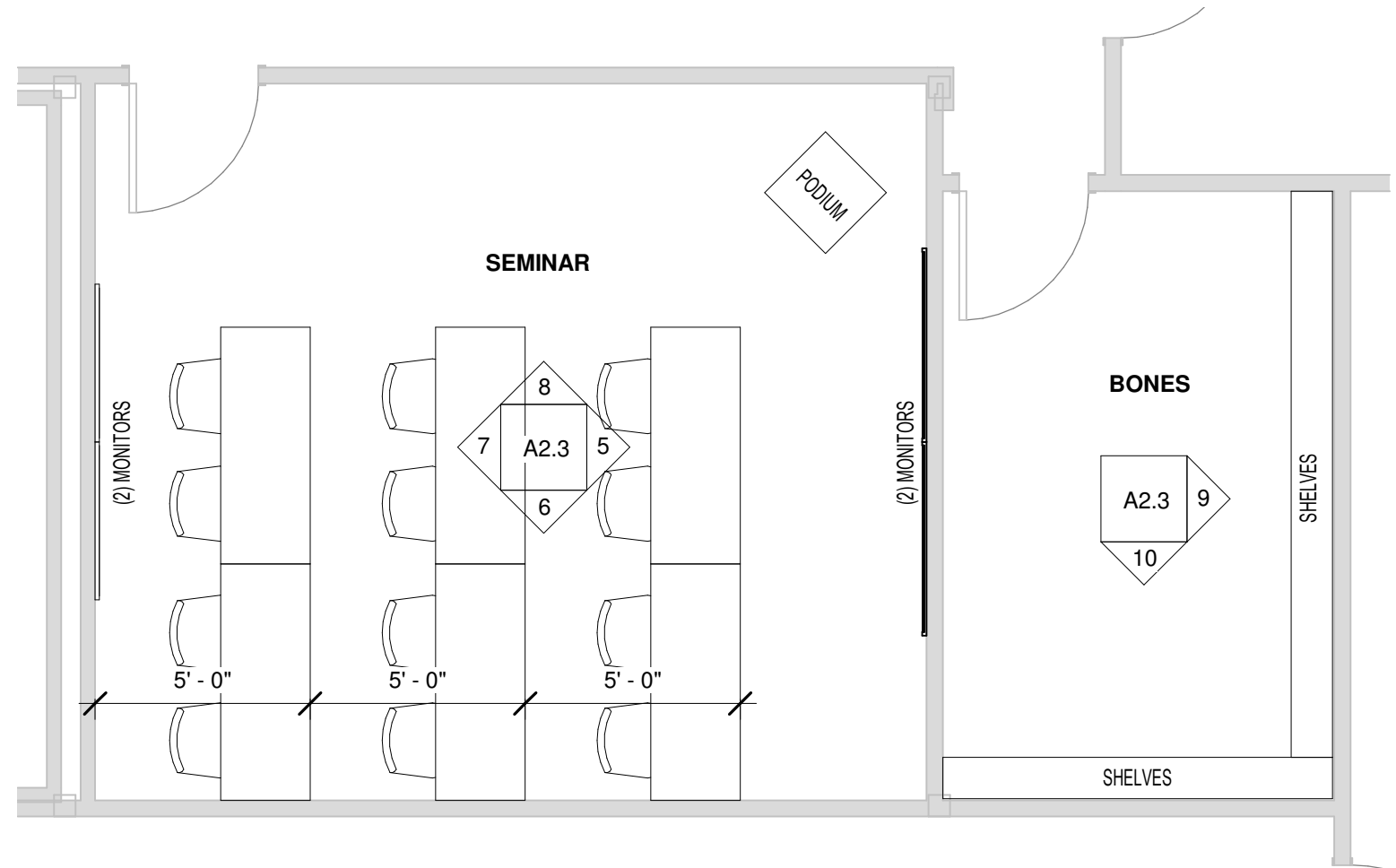
- KEY NOTES** (⊗)
- EXISTING ACOUSTICAL PANEL CEILING ASSEMBLIES AT 9'-0" AFF IN THIS REGION TO REMAIN. REPAIR AND/OR MODIFY AS NEEDED.
 - EXISTING CEILING ASSEMBLY TO REMAIN. RELOCATE LIGHTING AS DRAWN.
 - EXISTING COOLER CEILING AT TO REMAIN.
 - NEW DUCTWORK FOR DOWN DRAFT TABLES.
 - PROVIDE POWER, BRACING/SUPPORT CEILING MOUNTED WORK LIGHTS. RELOCATE FROM MBB. BRACING/SUPPORT SIMILAR TO EXISTING.

- GENERAL NOTES**
- EXISTING ACOUSTICAL CEILING PANELS ARE CERTAINTED BOCL-224, 2X4, 15/16" TEGULAR.

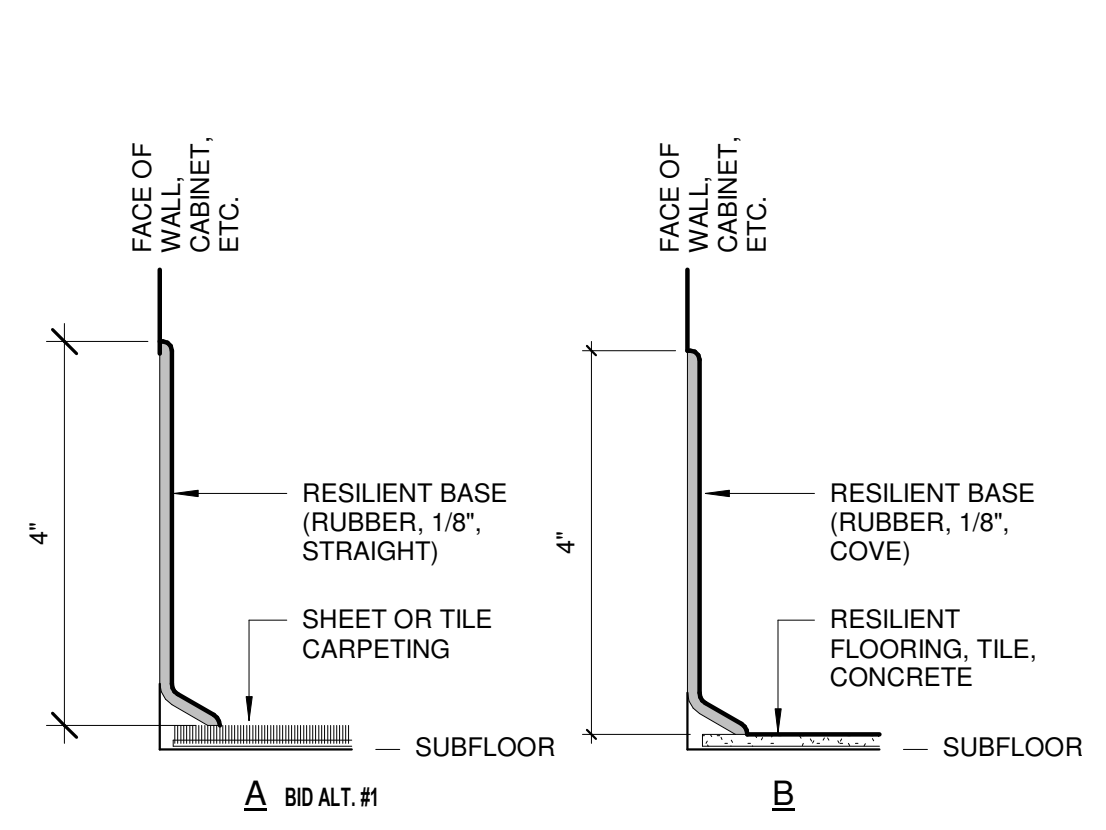
- KEY NOTES** (⊗)
- EXISTING ACOUSTICAL PANEL CEILING ASSEMBLIES AT 9'-0" AFF IN THIS REGION TO REMAIN. REPAIR AND/OR MODIFY AS NEEDED.
 - EXISTING GYP BOARD CEILING AT 11'-2" AFF IN THIS REGION TO REMAIN. REPAIR AND/OR MODIFY AS NEEDED.
 - EXISTING DUCTWORK TO REMAIN.
 - BOTTOM OF WIDE FLANGE BEAM +/- 3" BELOW GYP BOARD FINISH.



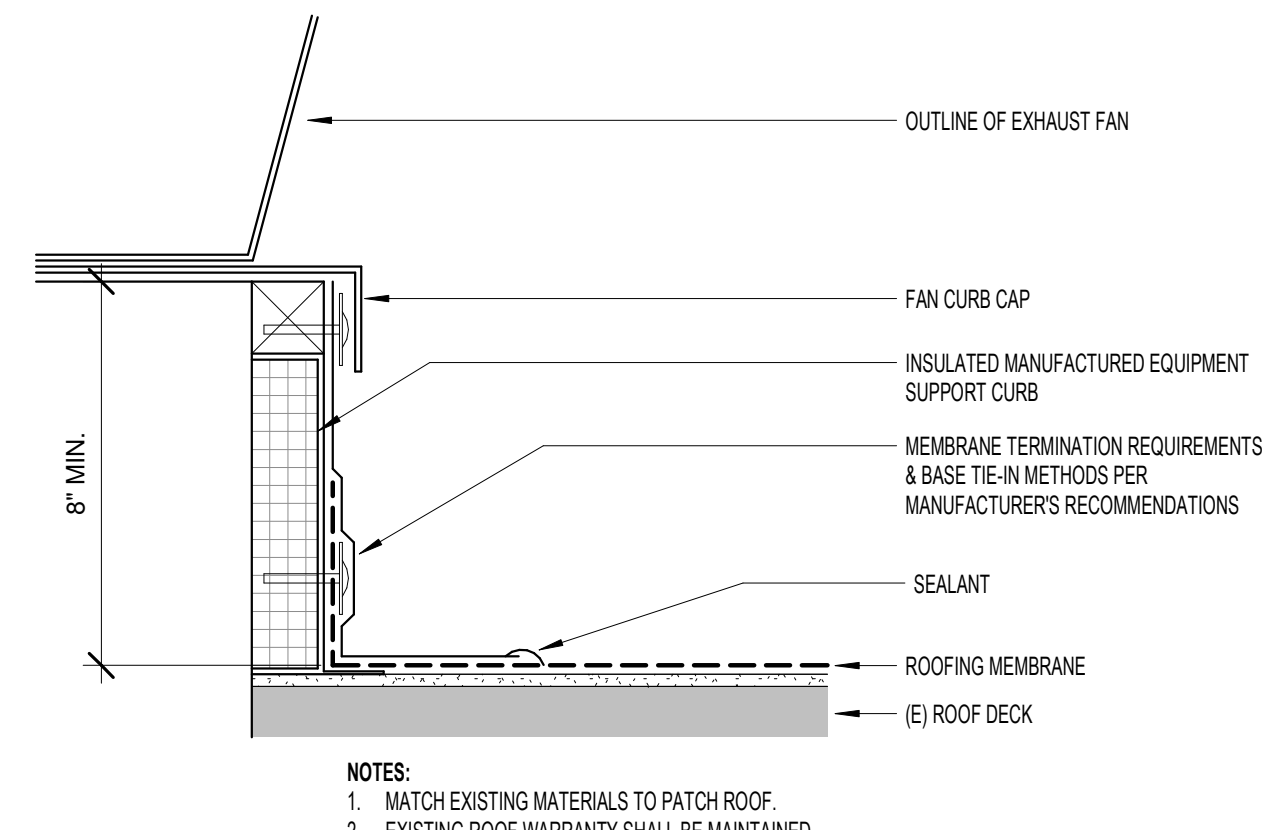
④ LAB PREP / ANATOMY LAB
 1/4" = 1'-0"



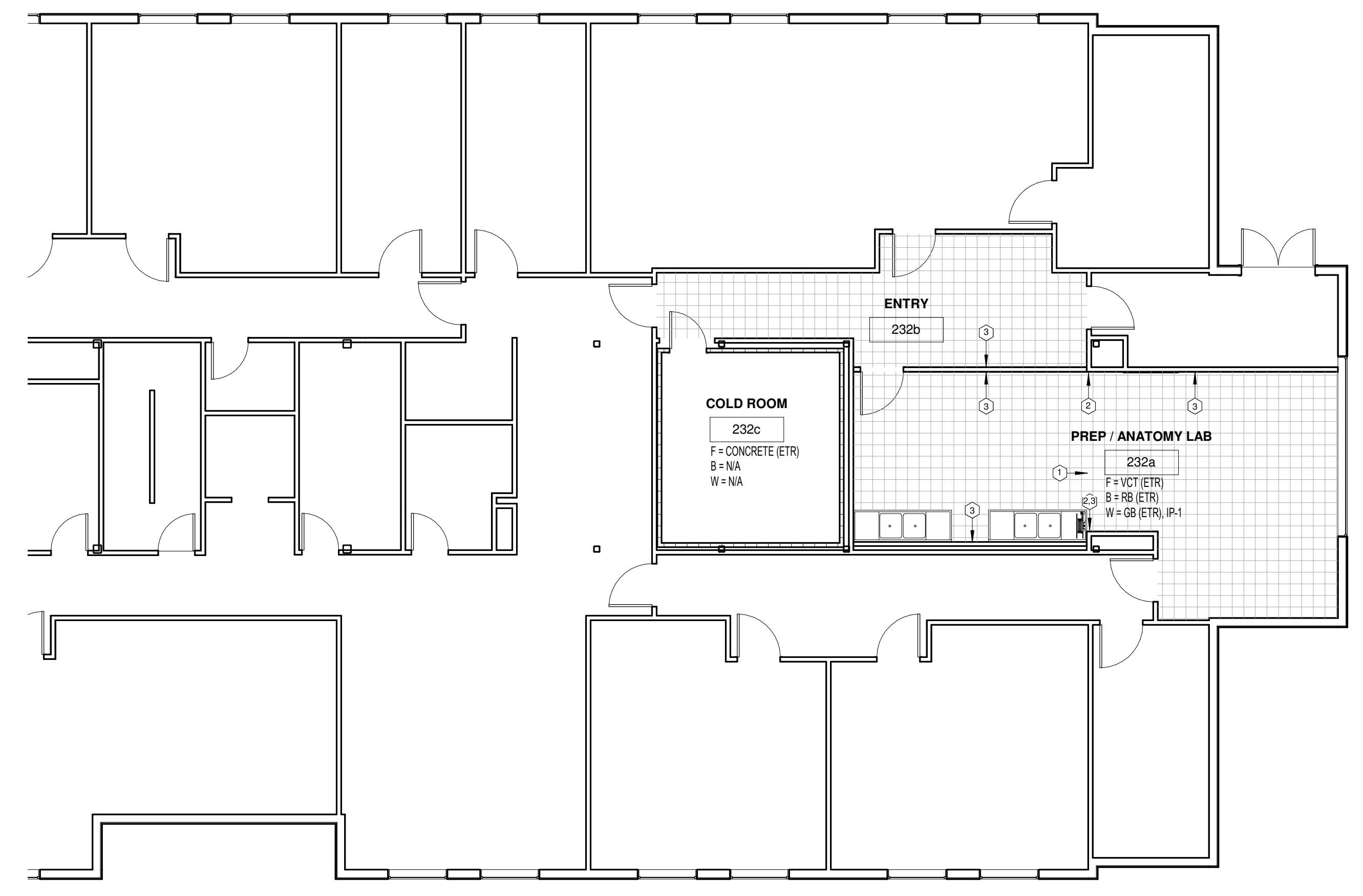
③ SEMINAR / BONES ROOM
 1/4" = 1'-0"



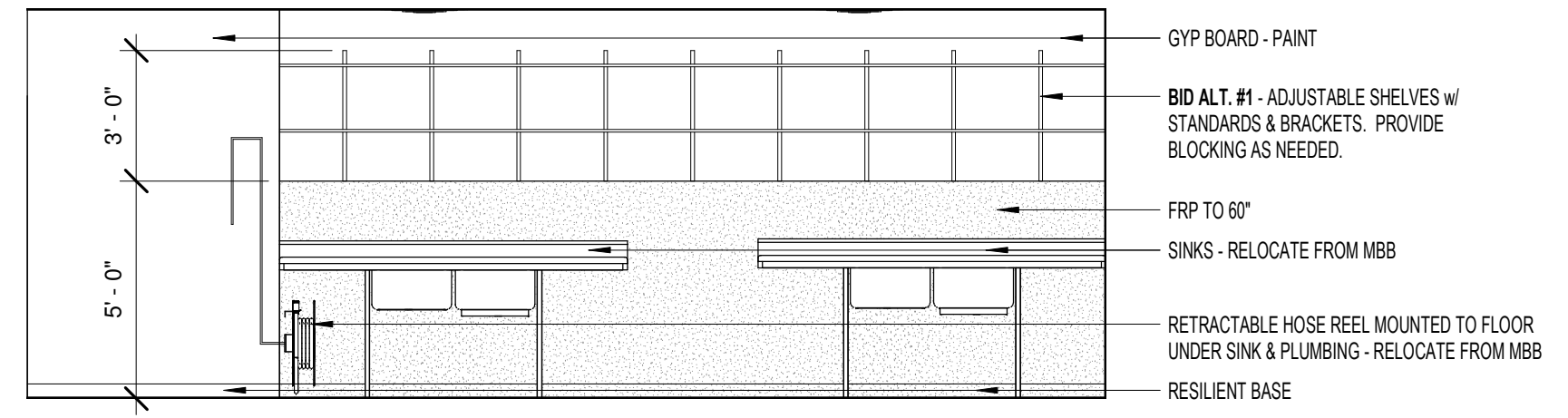
3 WALL BASE DETAILS
6" = 1'-0"



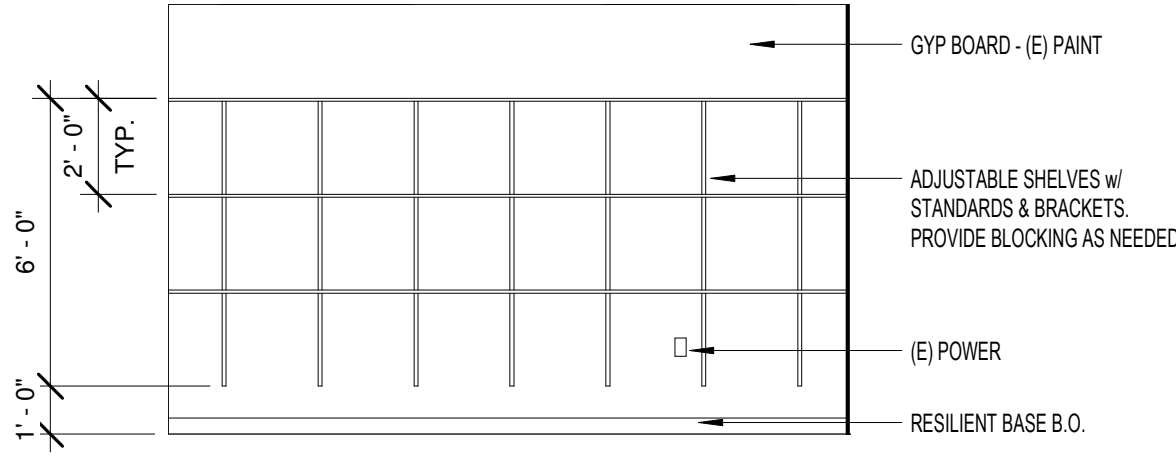
4 ROOF CURB
3" = 1'-0"



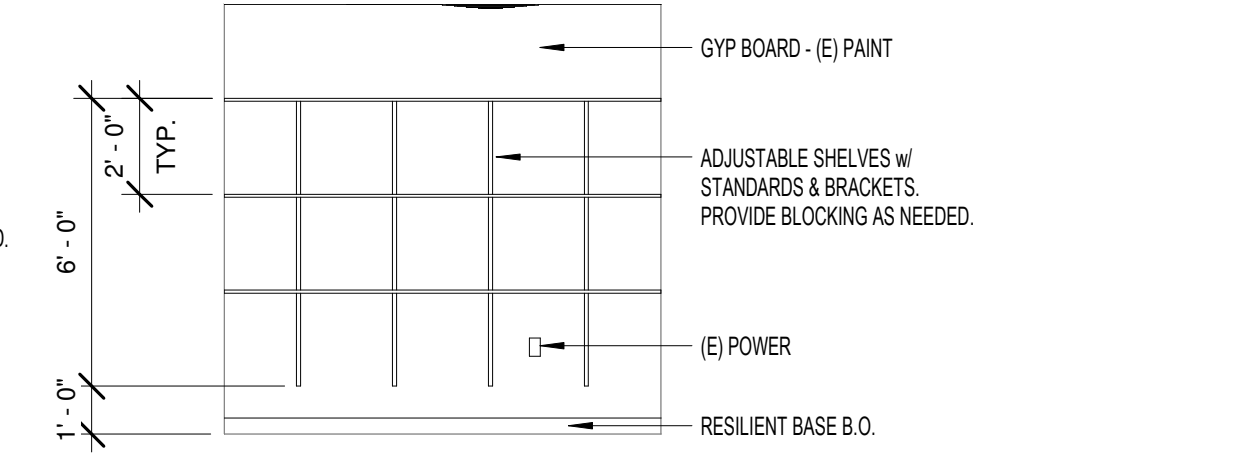
2 FINISH PLAN - LEVEL 2
1/8" = 1'-0"



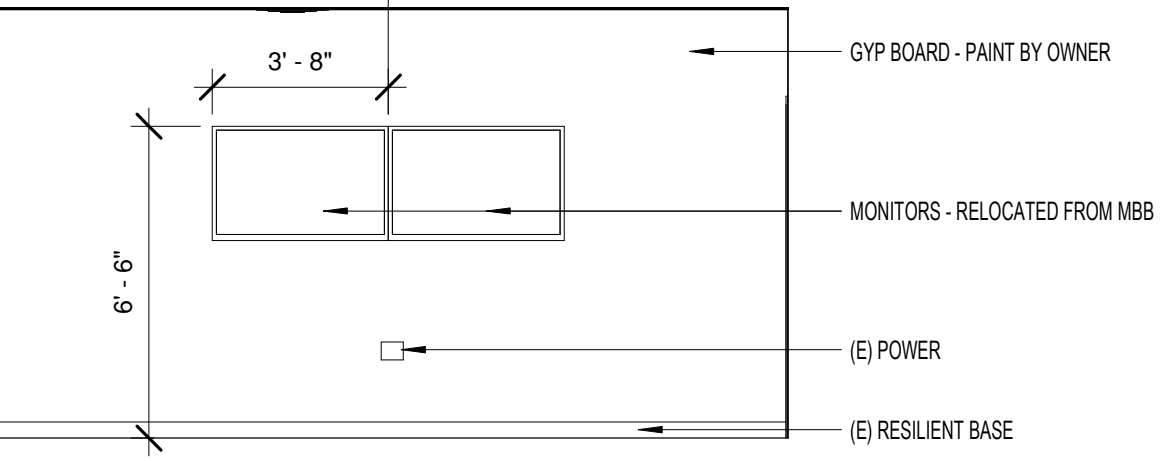
11 PREP AREA
1/4" = 1'-0"



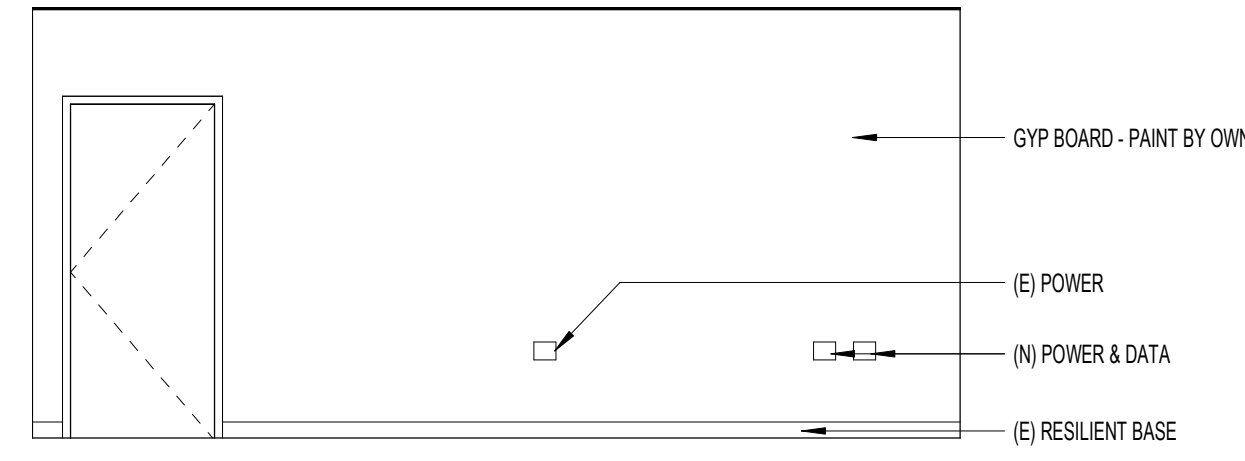
9 BONES - EAST WALL
1/4" = 1'-0"



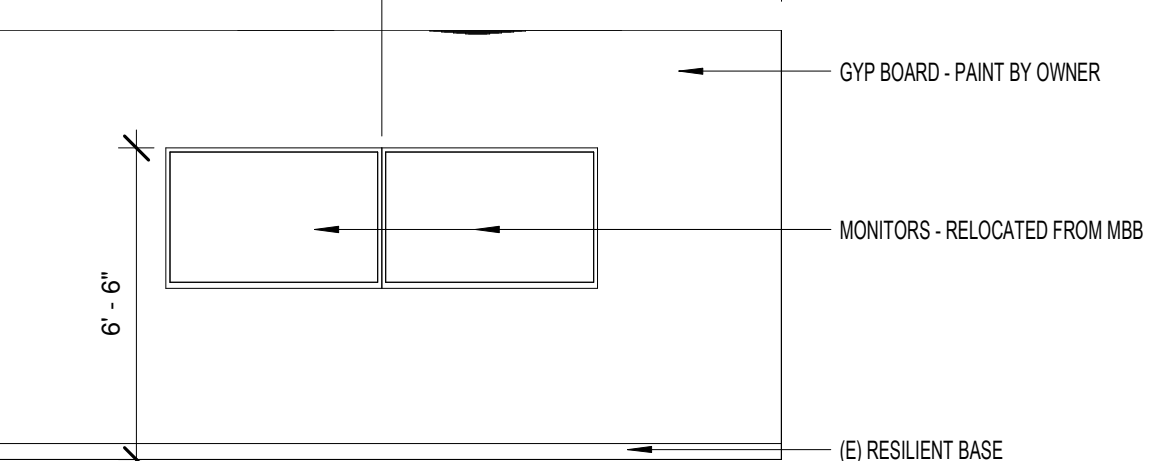
10 BONES - SOUTH WALL
1/4" = 1'-0"



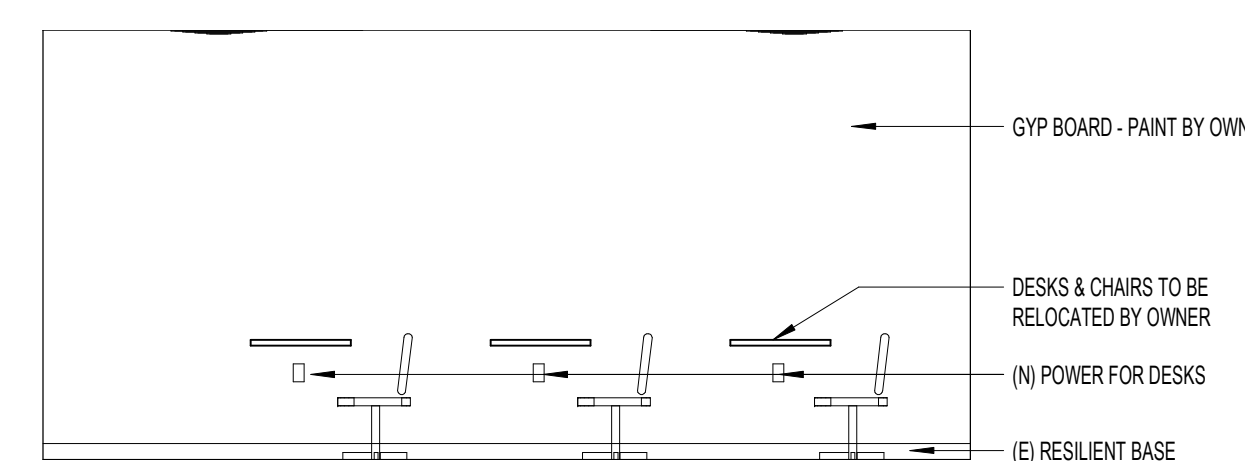
7 SEMINAR - WEST WALL
1/4" = 1'-0"



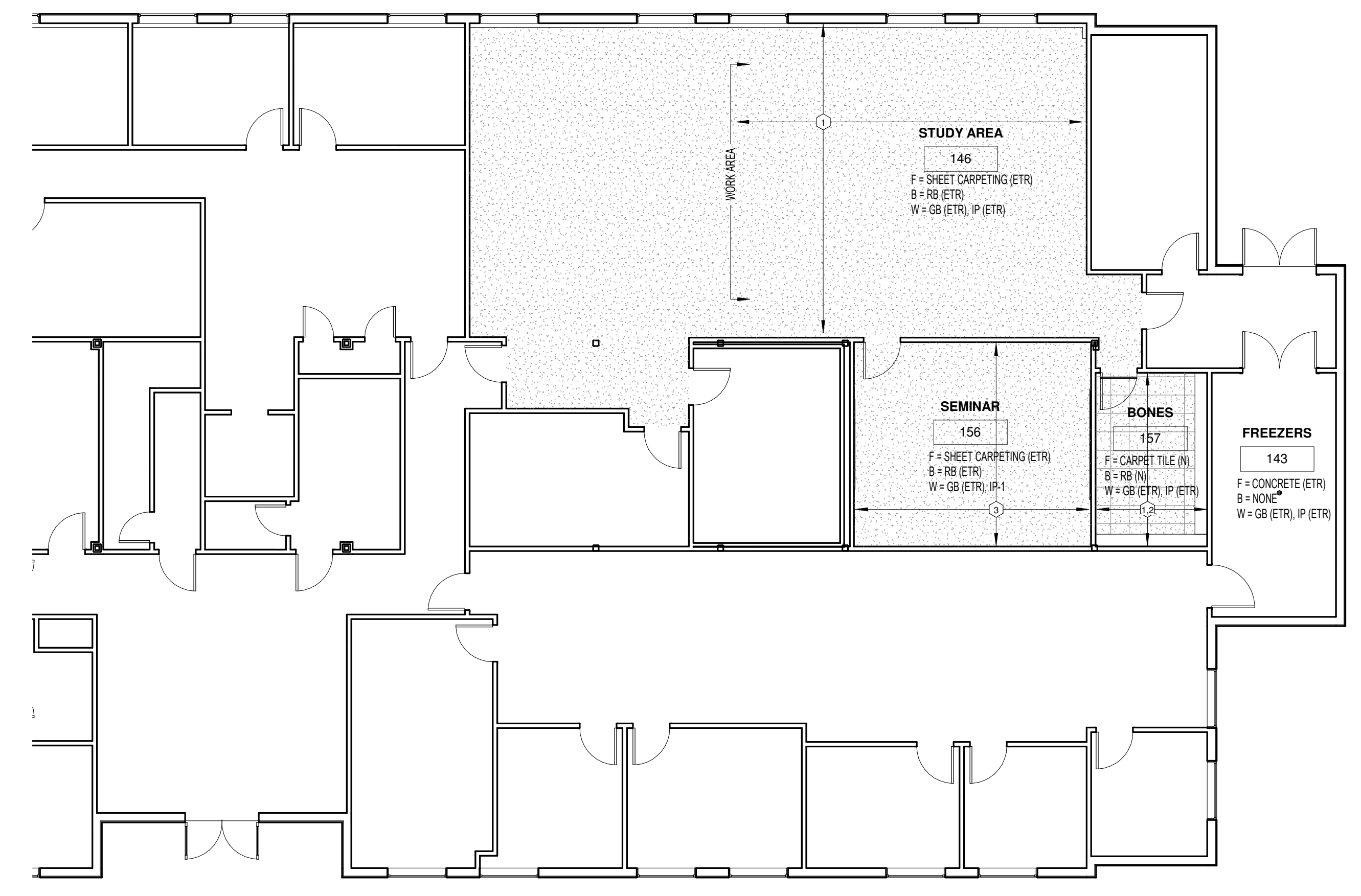
8 SEMINAR - NORTH WALL
1/4" = 1'-0"



5 SEMINAR - EAST WALL
1/4" = 1'-0"



6 SEMINAR - SOUTH WALL
1/4" = 1'-0"



1 FINISH PLAN - LEVEL 1
1/8" = 1'-0"

ABBREVIATIONS
 B = BASE (WALL)
 ETR = EXISTING TO REMAIN
 F = FLOORING
 GB = GYPSUM BOARD
 IP = INTERIOR PAINT
 N = NEW
 RB = RESILIENT BASE
 VCT = VINYL COMPOSITION TILE
 W = WALLS

GENERAL NOTES
 A. OWNER TO PATCH AND REPAIR EXISTING FINISHES THAT REMAIN PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR TO PATCH & REPAIR FINISH AS REQUIRED FOR DEMO & CONSTRUCTION.
 B. PROVIDE TRANSITION STRIPS WHERE DIFFERENT TYPES OF FLOORING MEET.
 C. OWNER TO PROVIDE COLOR CODE TO MATCH PAINT.

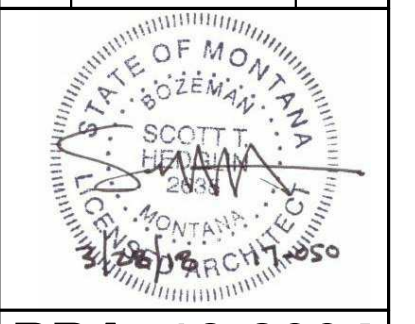
KEY NOTES
 1. PATCH AND REPAIR EXISTING VCT WHERE EXISTING WALL WAS REMOVED.
 2. PATCH AND REPAIR EXISTING WALL FINISHES WHERE EXISTING WALL WAS REMOVED.
 3. NEW RESILIENT BASE AT NEW PARTITION WALLS - EXTEND TO CORNER (REMOVE & REPLACE AS NEEDED).

ABBREVIATIONS
 B = BASE (WALL)
 ETR = EXISTING TO REMAIN
 F = FLOORING
 GB = GYPSUM BOARD
 IP = INTERIOR PAINT
 N = NEW
 RB = RESILIENT BASE
 VCT = VINYL COMPOSITION TILE
 W = WALLS

GENERAL NOTES
 A. OWNER TO PATCH AND REPAIR EXISTING FINISHES THAT REMAIN PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR TO PATCH & REPAIR FINISH AS REQUIRED FOR DEMO & CONSTRUCTION.
 B. PROVIDE TRANSITION STRIPS WHERE DIFFERENT TYPES OF FLOORING MEET.
 C. OWNER WILL PROVIDE COLOR CODE TO MATCH EXISTING PAINT.

KEY NOTES
 1. THIS AREA WILL BE PATCHED & PAINTED PRIOR TO CONSTRUCTION. PATCH & PAINT ANY AREAS DAMAGED DURING CONSTRUCTION.
 2. OWNER TO PROVIDE & INSTALL NEW CARPET AND RESILIENT BASE IN THIS AREA.
 3. OWNER TO PAINT SEMINAR ROOM AFTER CONSTRUCTION HAS FINISHED.

REV.	DESCRIPTION	DATE

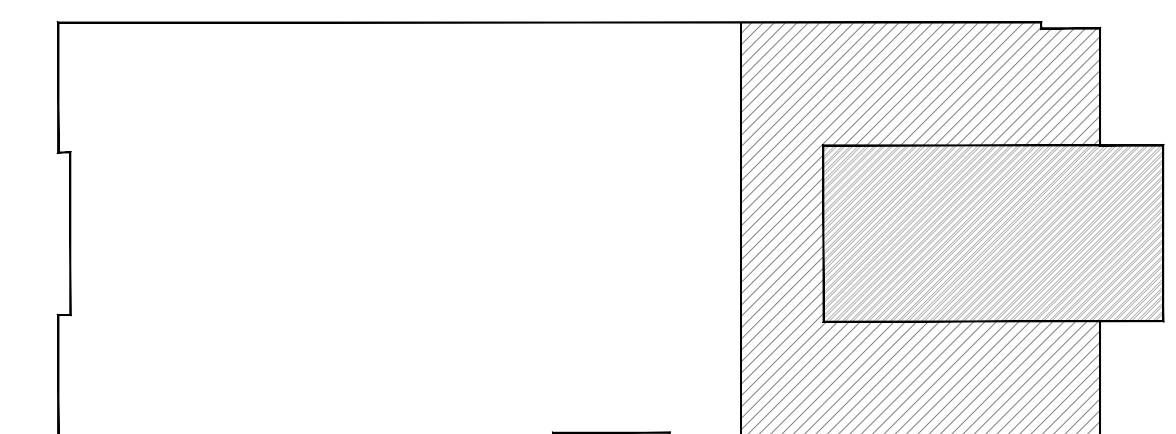
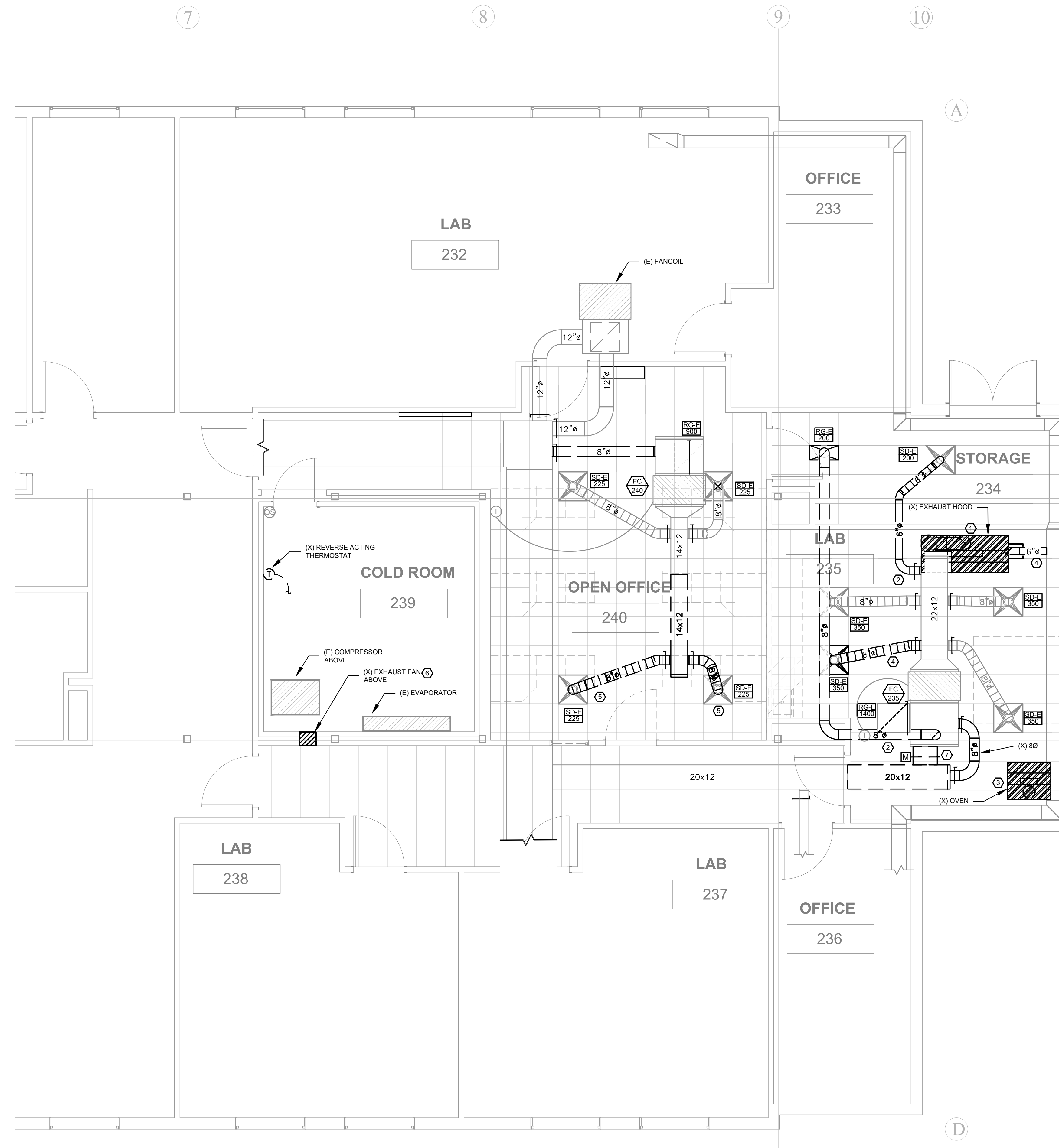


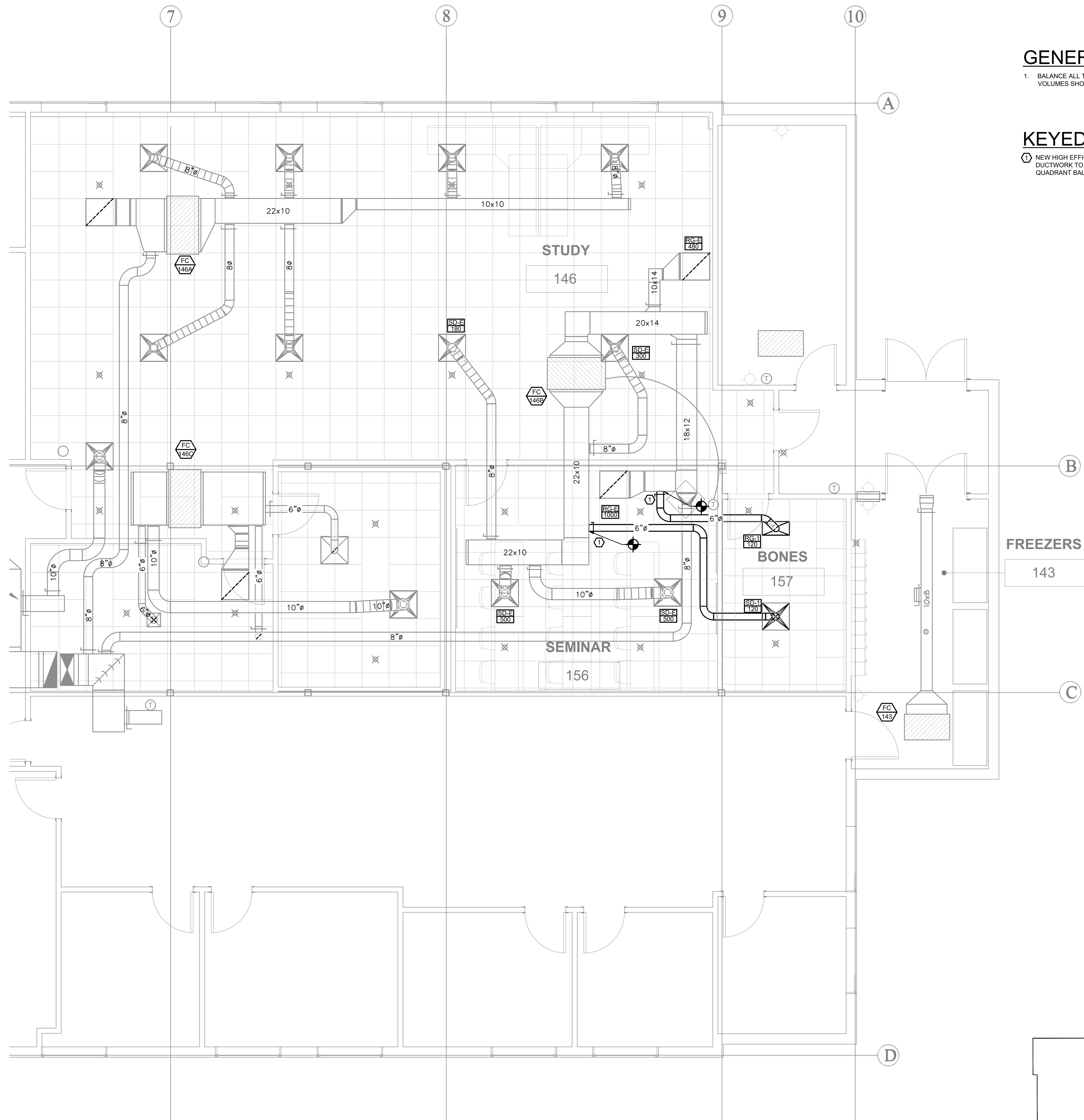
GENERAL NOTES:

1. DEMOLITION ITEMS SHOWN BY DARK DASHED LINE OR CALLED OUT BY (X).
2. MECHANICAL DEMOLITION SCOPE INCLUDES SECOND FLOOR ONLY. NO FIRST FLOOR WORK REQUIRED.
3. ADDITIONAL DEMOLITION AND RELOCATION WORK NOT DEPICTED ON THESE DRAWINGS IS INCLUDED IN THE SCOPE OF THIS PROJECT. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING THE EXTENT OF WORK AT THE MOLECULAR BIOSCIENCE BUILDING. (BUILDING LOCATION SHOWN ON A0.1)

KEYED NOTES:

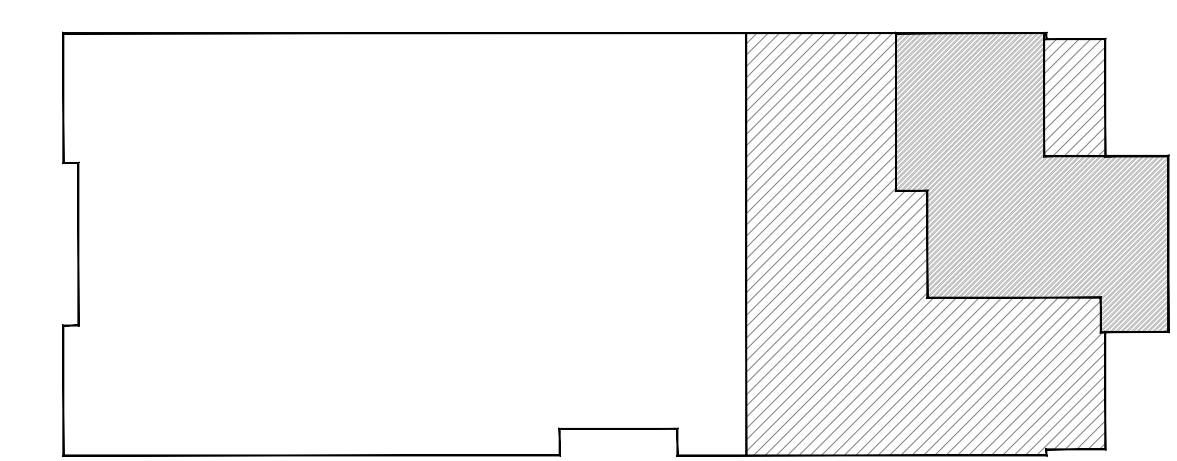
- ① DEMO EXHAUST HOOD AND ASSOCIATED 100 EXHAUST DUCT. 140 TO ROOF TO REMAIN FOR NEW CONNECTION. SEE 2/M2.1 FOR NEW WORK.
- ② DEMO TAKEOFF AND ASSOCIATED DUCTWORK. CAP DUCT AT MAIN. SUPPLY/RETURN DIFFUSERS TO REMAIN FOR FUTURE WORK.
- ③ DEMO OVEN AND FLUE THROUGH ROOFTOP. PATCH ROOF WEATHERTIGHT. COORDINATE WITH G.C.
- ④ DEMO TAKEOFF. ASSOCIATED DUCTWORK AND AIR TERMINAL.
- ⑤ DIFFUSER TO REMAIN. SEE NEW WORK ON M2.1 FOR NEW CONNECTIONS.
- ⑥ DEMO EXHAUST FAN ABOVE COOLER. PATCH WALL AT LOCATION.
- ⑦ DEMO TAKEOFF. CAP AT PLENUM RETURN.





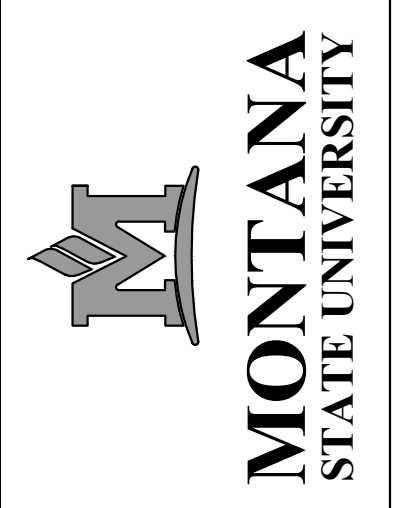
GENERAL NOTES:
 1. BALANCE ALL TERMINALS ASSOCIATED WITH FANCOIL 146B TO LISTED AIRFLOW VOLUMES SHOWN ON DRAWING.

KEYED NOTES:
 ① NEW HIGH EFFICIENCY TAKEOFF FOR SUPPLY / RETURN SYSTEM. EXTEND DUCTWORK TO NEW DIFFUSER / GRILLE IN BONES 157. PROVIDE WITH LOCKING QUADRANT BALANCING DAMPER.



1
 M2.0
 1/4"=1'-0"
1ST LEVEL - MECHANICAL

KEY PLAN



MSU - CPDC
 MONTANA STATE UNIVERSITY
 BOZEMAN, MONTANA
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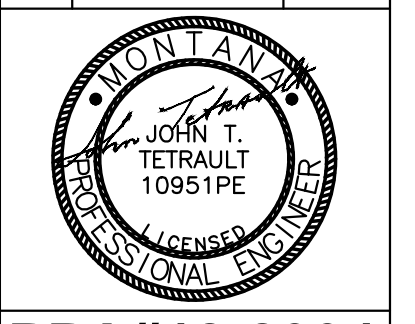
ISSUED FOR CONSTRUCTION

**WIMU - 2155 ANALYSIS DR
 RENOVATION**

THREE RIVERS
 ENGINEERING, INC.
 MECHANICAL - ELECTRICAL - ENERGY
 243 S. WILSON, STE. A1, BOZEMAN, MT 59715
 406.562.6099 www.TREMT.com

DRAWN BY: AM
 REVIEWED BY: JT

REV.	DESCRIPTION	DATE
-	DD	02/16/18



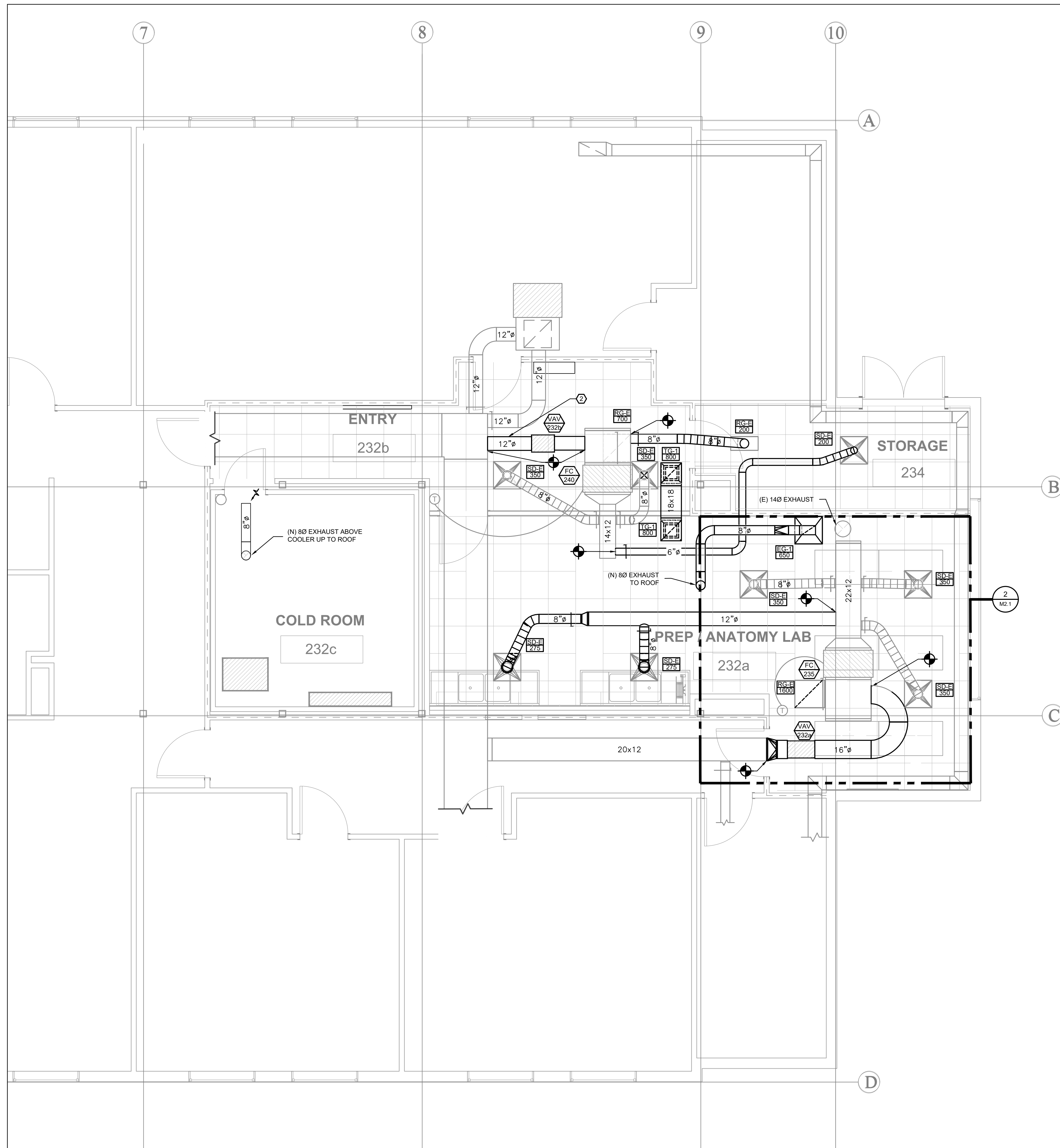
PPA#18-2004

TRE #1802

SHEET TITLE
 FIRST LEVEL
 MECHANICAL

SHEET
M2.0

DATE
03/28/18



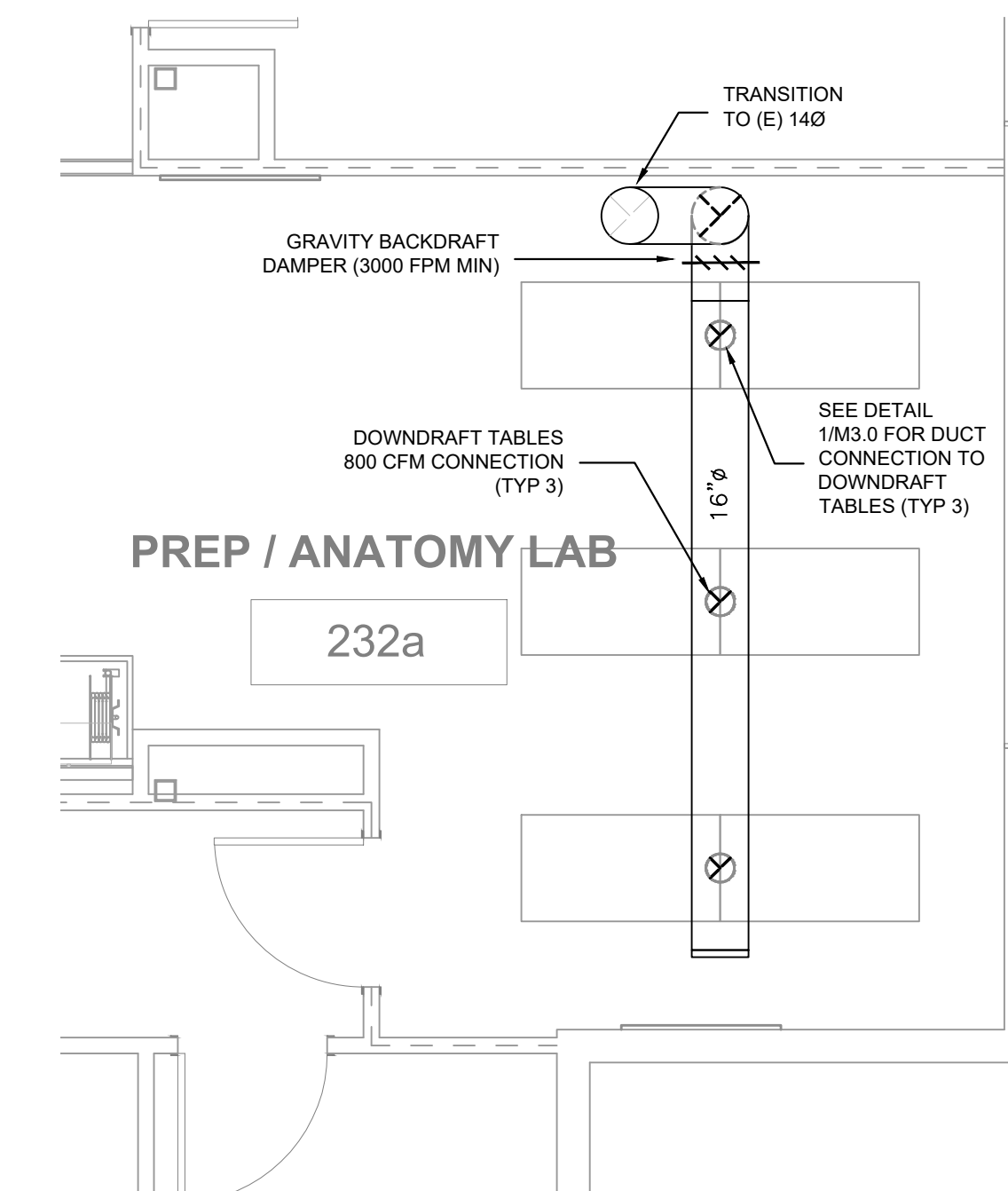
1
M2.1
1/4"=1'-0"
2ND LEVEL - MECHANICAL

GENERAL NOTES:

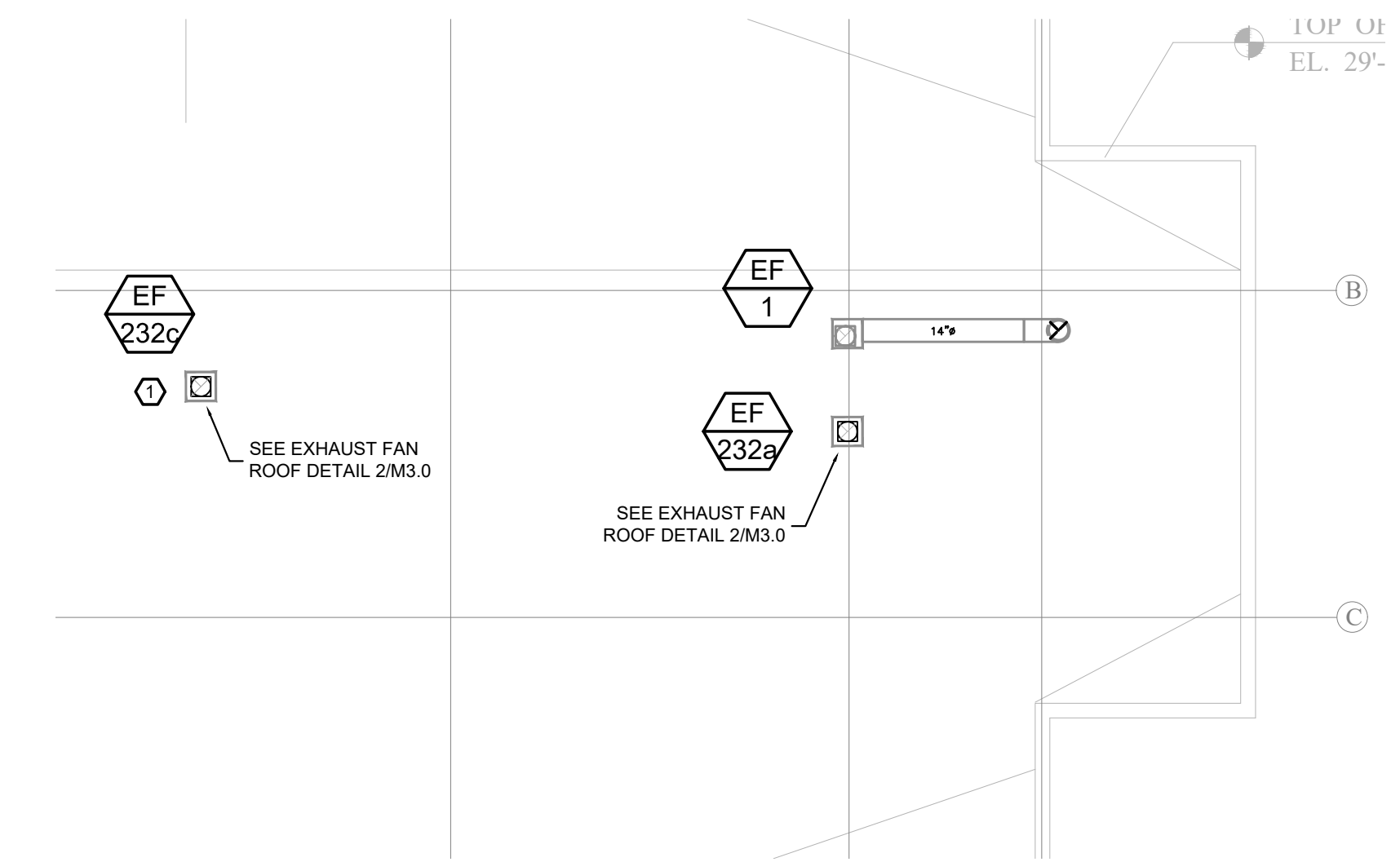
- BALANCE ALL TERMINALS TO LISTED QUANTITIES SHOWN ON DRAWING.

KEYED NOTES:

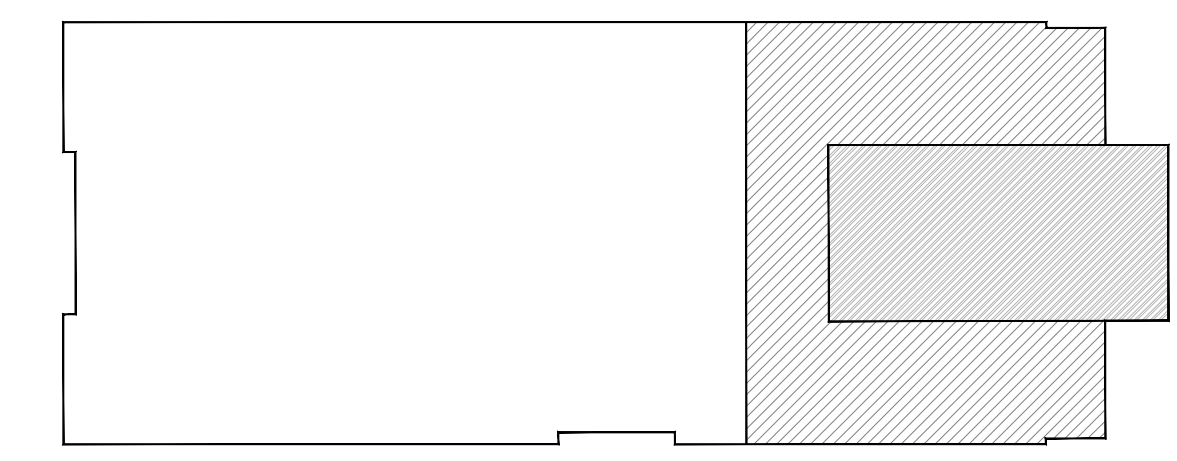
- BALANCE EF-239 TO 200 CFM.
- PROVIDE 3 DUCT DIAMETER LENGTHS BEFORE VAV INLET CONNECTION.



2
M2.1
1/4"=1'-0"
BELOW CEILING DUCTWORK DETAIL



3
M2.1
1/8"=1'-0"
ROOFTOP EF LOCATION



KEY PLAN

MECHANICAL LEGEND

ABBREVIATIONS

AC	AIR CONDITIONING	MS	MOP SINK
AD	ACCESS DOOR	(N)	NEW
AFF	ABOVE FINISHED FLOOR	NC	NORMALLY CLOSED
AHU	AIR HANDLING UNIT	NO	NORMALLY OPEN
BDD	BACKDRAFT DAMPER	OA	OUTSIDE AIR
CA	COMBUSTION AIR	OC	ON CENTER
CO	CLEAN OUT	PRV	PRESSURE REDUCING VALVE
CONN.	CONNECTION	RA	RETURN AIR
CONT.	CONTINUATION	RDL	ROOF DRAIN LEADER
COTG	CLEAN OUT TO GRADE	RM	ROOM
CWS	CHILLED WATER SUPPLY	SA	SUPPLY AIR
CWR	CHILLED WATER RETURN	SF	SUPPLY FAN
DDC	DIRECT DIGITAL CONTROL	SFD	SMOKE FIRE DAMPER
DF	DRINKING FOUNTAIN	SH	SHOWER
ELEC.	ELECTRIC/ELECTRICAL	SK	SINK
EXH	EXHAUST	SS	SANITARY SEWER
EA	EXHAUST AIR	TC	TEMPERATURE CONTROL
(E)	EXISTING	TYP	TYPICAL
FC	FANCOIL	UR	URINAL
FCO	FLOOR CLEAN OUT	V	SANITARY VENT
FD	FLOOR DRAIN	V OR VOLT	VOLTAGE
HW	DOMESTIC HOT WATER	VTR	VENT THROUGH ROOF
HWS	HEATING WATER SUPPLY	VD	VOLUME DAMPER
HWR	HEATING WATER RETURN	WC	WATER CLOSET
LAV	LAVATORY	WCO	WALL CLEAN OUT
MBH	1000 BTUHR	(X)	EXISTING TO BE REMOVED
MECH.	MECHANICAL		

PLUMBING & PIPING SYMBOLS

SYMBOL	DESCRIPTION
	DOMESTIC COLD WATER
	DOMESTIC HOT WATER
	RECIRC. HOT WATER
	BELOW GRADE SANITARY WASTE
	ABOVE GRADE SANITARY WASTE
	SANITARY VENT
	ACID WASTE
	ACID VENT
	BELOW GRADE STORM SEWER
	ABOVE GRADE STORM SEWER
	HEATING WATER SUPPLY
	HEATING WATER RETURN
	CHILLED WATER SUPPLY
	CHILLED WATER RETURN
	NATURAL GAS
	COMPRESSED AIR
	LIQUEFIED PROPANE GAS
	REFRIGERANT SUCTION
	REFRIGERANT LIQUID
	REFRIGERANT HOT GAS BYPASS
	HEAT PUMP SUPPLY
	HEAT PUMP RETURN
	FIRE SPRINKLER
	OXYGEN
	NITROGEN
	NITROUS OXIDE
	VACUUM
	SCAVENGER VACUUM
	DISTILLED WATER
	DEIONIZED WATER
	REVERSE OSMOSIS
	WELL WATER SUPPLY
	WELL WATER RETURN
	GATE VALVE OR BALL VALVE
	GLOBE VALVE
	PLUG VALVE
	CHECK VALVE
	BUTTERFLY VALVE
	BALL VALVE
	RELIEF VALVE
	PRESSURE REGULATING VALVE
	PIPE TURNING DOWN
	PIPE TURNING UP
	PIPE CAP
	UNION
	REDUCER
	WYE STRAINER

MISC. AND HVAC SYMBOLS

SYMBOL	DESCRIPTION
	KEYED NOTE
	EQUIPMENT MARK INDICATES EQUIP
	DIFFUSER MARK FLOW RATE
	CEILING SUPPLY DIFFUSER
	CEILING RETURN/EXHAUST REGISTER/GRILLE
	SHEET METAL DUCT (FIRST NUMBER INDICATES FACING SIDE)
	ROUND DUCT (18" DIA.)
	ELBOW WITH TURNING VANES
	SQUARE TO ROUND TRANSITION
	FLEXIBLE DUCT CONNECTION
	MISCELLANEOUS EQUIPMENT
	VERTICAL SMOKE/FIRE DAMPER
	VERTICAL FIRE DAMPER
	MANUAL DAMPER
	MOTORIZED DAMPER
	SUPPLY AIR
	RETURN/EXHAUST AIR
	HUMIDISTAT OR HUMIDITY SENSOR
	THERMOSTAT OR TEMPERATURE SENSOR
	THERMOSTAT OR TEMPERATURE SENSOR WITH TAMPERPROOF ENCLOSURE
	NEGATIVE PRESSURE DUCT SECTION (EXHAUST OR RETURN)
	POSITIVE PRESSURE DUCT SECTION (SUPPLY)
	CONNECT NEW PIPE OR DUCT TO EXISTING AT THIS POINT

FANCOIL SCHEDULE

MARK	MANUFACTURER	MODEL NUMBER	SERVES	CFM	OUTSIDE AIR CFM	EXTERNAL STATIC "W.C.	FAN HP	COOLING COIL					HEATING COIL					ELECTRICAL DATA			NOTES
								CAPACITY (MBH)		ROWS	GPM	WPD	CAPACITY MBH	ROWS	GPM	WPD	EAT 'F	VOLT/PH	FLA		
TOTAL	SENS	TOTAL	SENS																		
FC 143	EXISTING	4 PHBC-41	RECEIVING ROOM 143	320	0	0.1	1/12	7.1	5.9	4	2.0	8.9'	9.3	1	1.0	4.5'	70	120/1	1.1		
FC 146A	EXISTING	16 PHYB-41	TENANT SPACE 146	1600	165	0.2	1/5	29.2	29.2	4	5.0	1.6'	25.7	1	1.5	5'	70	120/1	5.2		
FC 146B	EXISTING	16 PHYB-41	TENANT 146 CONF RM 156	1600	165	0.2	1/5	29.2	29.2	4	5.0	1.6'	25.7	1	1.5	5'	70	120/1	5.2		
FC 146C	EXISTING	16 PHYB-41	FILE RM 154 CONF RM 155	1600	165	0.2	1/5	29.2	29.2	4	5.0	1.6'	25.7	1	1.5	5'	70	120/1	5.2		
FC 235	EXISTING	16 PHYB-41	LAB SPACE 232a	1600	165	0.2	1/5	29.2	29.2	4	5.0	1.6'	25.7	1	1.5	5'	70	120/1	5.2	1	
FC 240	EXISTING	10 PHBC-41	OPEN OFFICE CORRIDOR 232b	900	145	0.2	1/4	13.7	13.7	4	2.5	2.0'	16.9	1	0.8	3.8'	60	120/1	3.6	1	

GENERAL NOTES:
 - ALL SCHEDULED FANCOILS ARE EXISTING AND SHALL REMAIN.
 - ALL PHBC TYPE FANCOILS SHALL HAVE LINE VOLTAGE THERMOSTAT.
 - ALL PHYB TYPE FANCOILS SHALL HAVE LOW VOLTAGE THERMOSTAT.

KEYED NOTES:
 1.) SEE AIR TERMINAL UNIT SCHEDULE FOR OUTSIDE AIR CFM RATES.

GRILLES - REGISTERS - DIFFUSERS

MARK	MANUFACTURER	TYPE AND LOCATION	MODEL NUMBER	FRAME	MOUNTING TYPE	DAMPER TYPE	NOMINAL SIZE	NECK SIZE	COLOR	NOTES
SD-E	EXISTING	VARIOUS	-	-	-	-	-	-	-	
RG-E	EXISTING	VARIOUS	-	-	-	-	-	-	-	
EG-1	KRUEGER	EXHAUST GRILLE ANATOMY LAB 232a	EGC5	FRAME 23	LAY-IN	NO DAMPER	24 x 24	12 x 8	WHITE	
SD-1	KRUEGER	CEILING SUPPLY BONES 103	51240	FRAME 23	LAY-IN	FACE ADJ VOL DAMPER	24 x 24	6 x 6	WHITE	
TG-1	KRUEGER	TRANSFER GRILLE CORRIDOR / PREP AREA	EGC5	FRAME 23	LAY-IN	NO DAMPER	24 x 24	18 x 18	WHITE	
RG-1	KRUEGER	CEILING RETURN BONES 103	EGC5	FRAME 23	LAY-IN	MANUAL DAMPER	24 x 24	6	WHITE	

GENERAL NOTES:
 - PROVIDE DUCT TRANSITION AS NEEDED.

KEYED NOTES:
 1.) ---

FAN SCHEDULE

MARK	MANUFACTURER	MODEL NUMBER	SERVES	LOCATION	FAN TYPE	CFM	STATIC PRESS "W.C.	DRIVE	FAN RPM	FAN CONTROL SWITCH	ELEC			NOTES
											VOLT/PH	AMPS	HP	
EF-1	EXISTING	QBR 161	RM 235 (E) EXH. HOOD	ROOFTOP	EXHAUST FAN	2400	0.5	BELT	1590	ON HOOD	115/1	18.6	1-1/2	1
EF-232a	LOREN COOK	101R15D	LAB SPACE RM 232a	ROOFTOP	EXHAUST FAN	650	0.25	DIRECT	1426	FSC	115/1	-	1/8	
EF-232c	LOREN COOK	90R15DH	ABOVE COOLER RM 232c	ROOFTOP	EXHAUST FAN	400	0.25	DIRECT	1373	FSC	115/1	-	1/8	

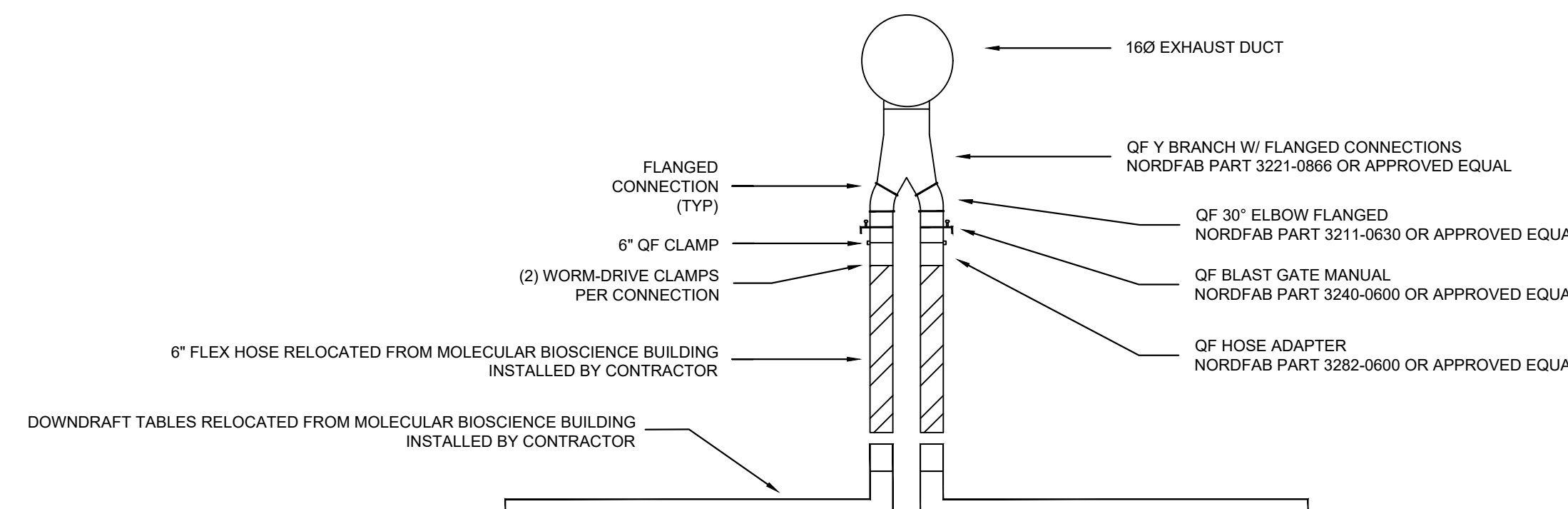
GENERAL NOTES:
 - PROVIDE FACTORY MOUNTED NEMA 3R DISCONNECT.
 - PROVIDE WITH 14" FACTORY ROOF CURB.
 - PROVIDE BACKDRAFT DAMPER ON OUTLET SIDE OF FAN WITH ACCESS DOOR.

KEYED NOTES:
 1) FAN IS EXISTING AND TO REMAIN. BALANCE TO SCHEDULED AIRFLOW.

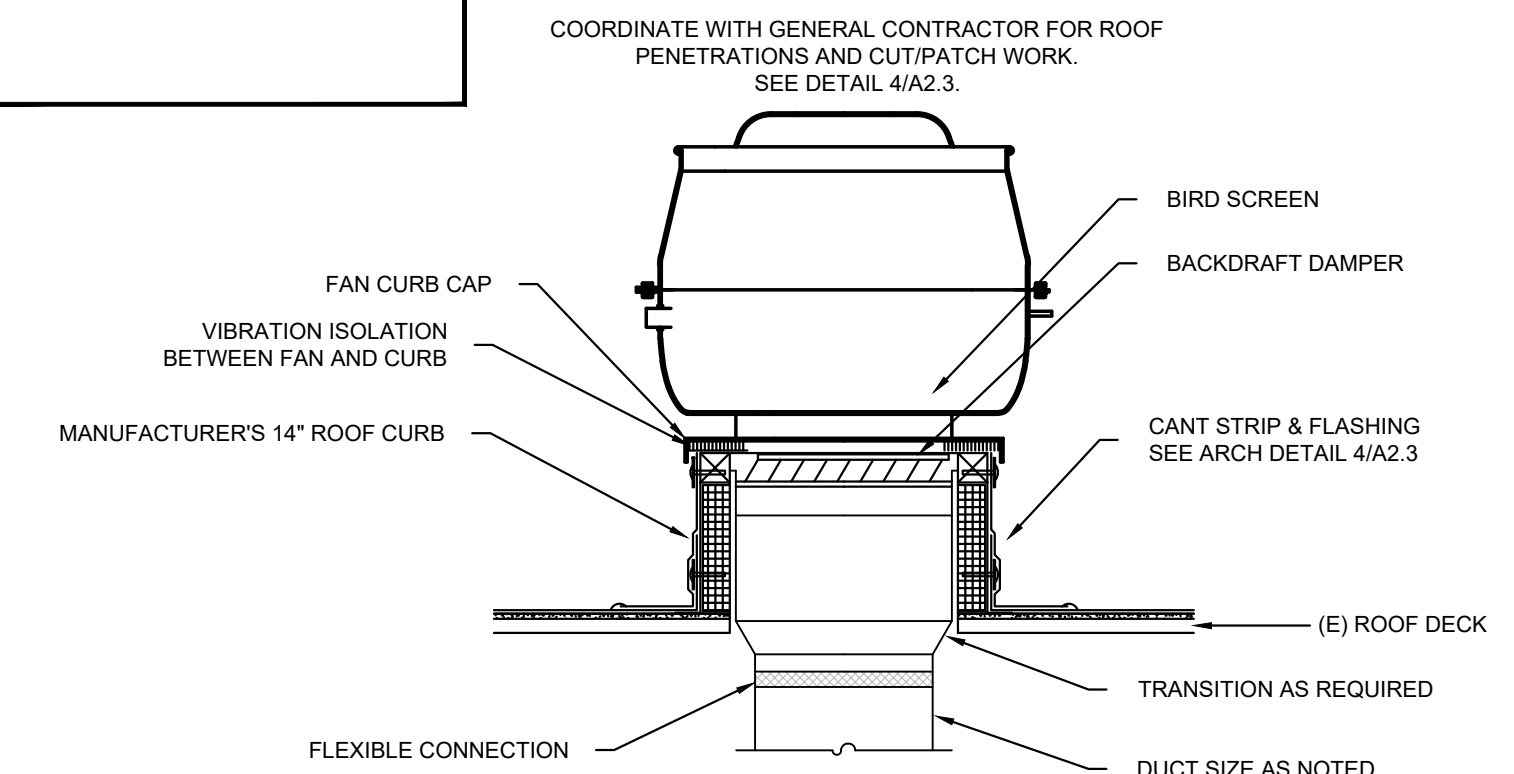
AIR TERMINAL UNIT SCHEDULE

MARK	MANUFACTURER	MODEL NUMBER	UNIT SIZE	SERVES	AIRFLOW		CONTROL TYPE	MAX APD (IN)	NOTES
					MAXIMUM CFM	MINIMUM CFM			
VAV 232a	KRUEGER	RVE	16	FANCOIL 235	1600	500	DDC	0.25"	
VAV 232b	KRUEGER	RVE	12	FANCOIL 240	800	100	DDC	0.25"	

GENERAL NOTES:
 -DDC CONTROL PROVIDED BY CONTROLS CONTRACTOR
 -COORDINATE LEFT/RIGHT HAND SIDE CONTROL WITH FIELD CONDITIONS.



1 LAB SPACE - DOWNDRAFT TABLE CONNECTION DETAIL
 M3.0 NO SCALE



2 ROOF EXHAUST FAN DETAIL
 M3.0 No Scale



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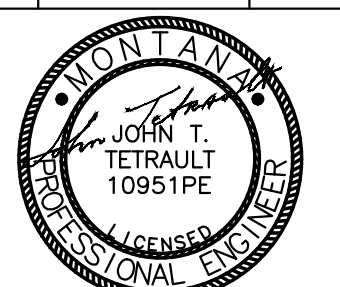
WIMU - 2155 ANALYSIS DR
RENOVATION

ISSUED FOR CONSTRUCTION

THREE RIVERS
 ENGINEERING, INC.

MECHANICAL - ELECTRICAL - ENERGY
 248 S. WILSON, DR. #1, BOZEMAN, MT 59715
 406.592.8099 www.threerivers.com

DRAWN BY: AM
 REVIEWED BY: JT
 REV. DESCRIPTION DATE
 - DD 02/16/18



PPA#18-2004

TRE #1802

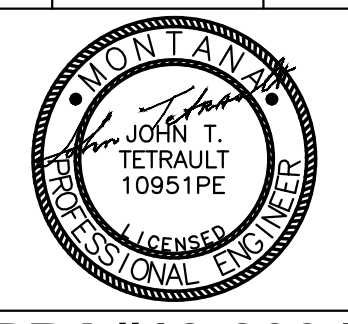
SHEET TITLE
 MECHANICAL
 LEGEND &
 SCHEDULES

SHEET
M3.0

DATE
03/28/18

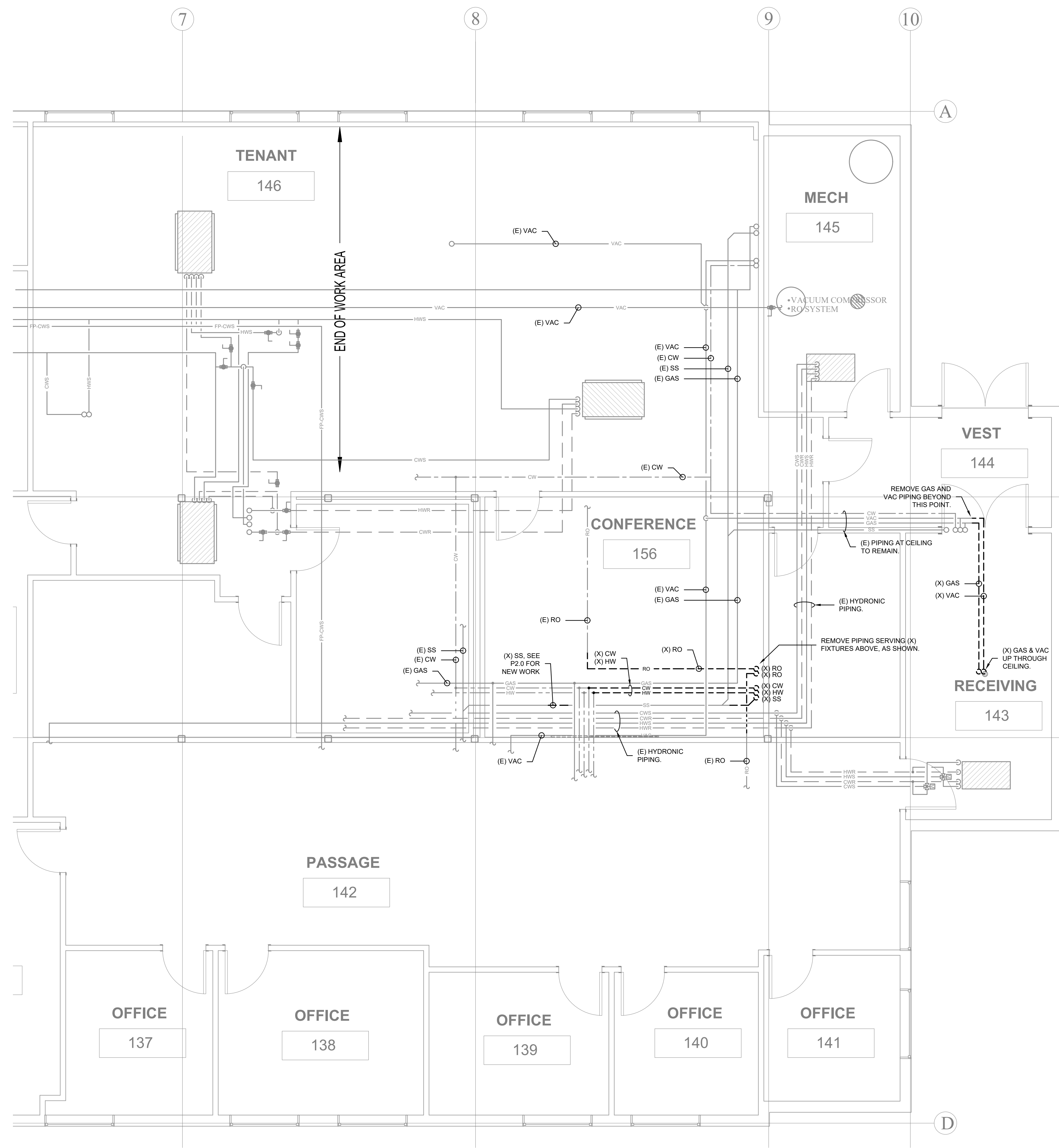
ISSUED FOR CONSTRUCTION

REV.	DESCRIPTION	DATE
-	DD	02/16/18



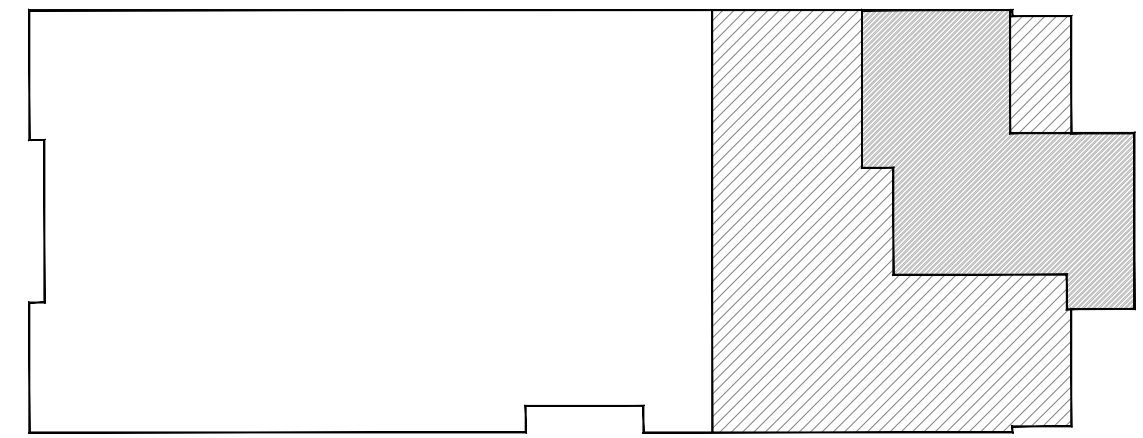
GENERAL NOTES:

- 1.) DEMOLITION ITEMS SHOWN AS DARK DASHED LINES OR CALLED OUT BY (X).
- 2.) PLUMBING DRAWINGS ARE SCHEMATIC IN NATURE. COORDINATE EXACT LOCATIONS AS NECESSARY DURING PROJECT WORK.
- 3.) CONTRACTOR SHALL VISIT THE PROJECT SITE AND THE MOLECULAR BIOSCIENCES BUILDING (EXISTING LAB) TO INVESTIGATE THE EXISTING CONDITIONS AND SCOPE OF WORK REQUIRED TO INSTALL THE SYSTEMS DEPICTED IN THESE DRAWINGS PRIOR TO SUBMISSION OF BIDS.
- 4.) ADDITIONAL DEMOLITION AND RELOCATION WORK NOT DEPICTED ON THESE DRAWINGS IS INCLUDED IN THE SCOPE OF THIS PROJECT. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING THE EXTENT OF WORK AT THE MOLECULAR BIOSCIENCES BUILDING. (BUILDING LOCATION SHOWN ON A0.1.)



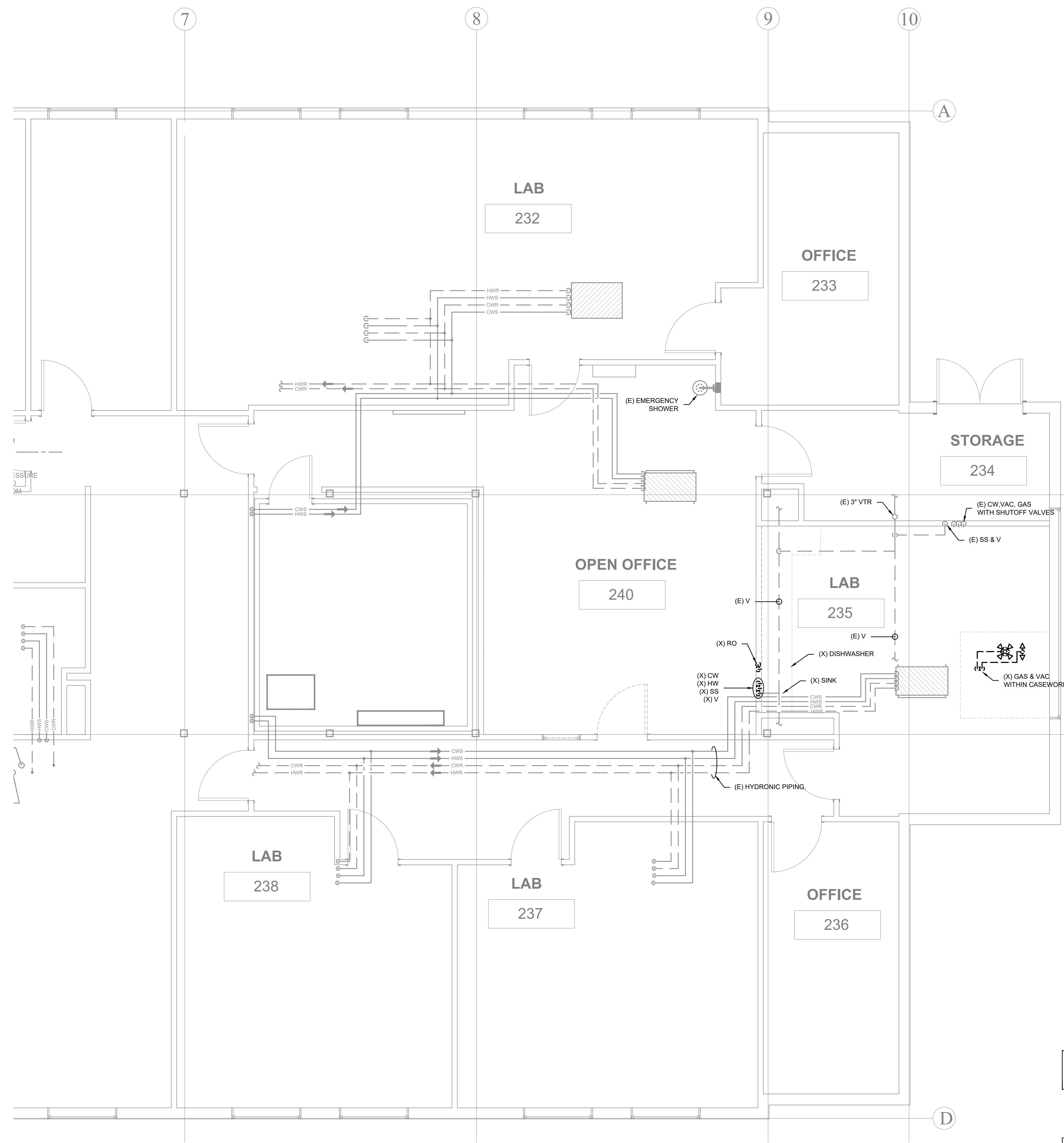
PLUMBING & PIPING PHASING

SYMBOL	STATUS
—	(E) EXISTING - TO REMAIN
- - - - -	(X) DEMOLISH - REMOVE



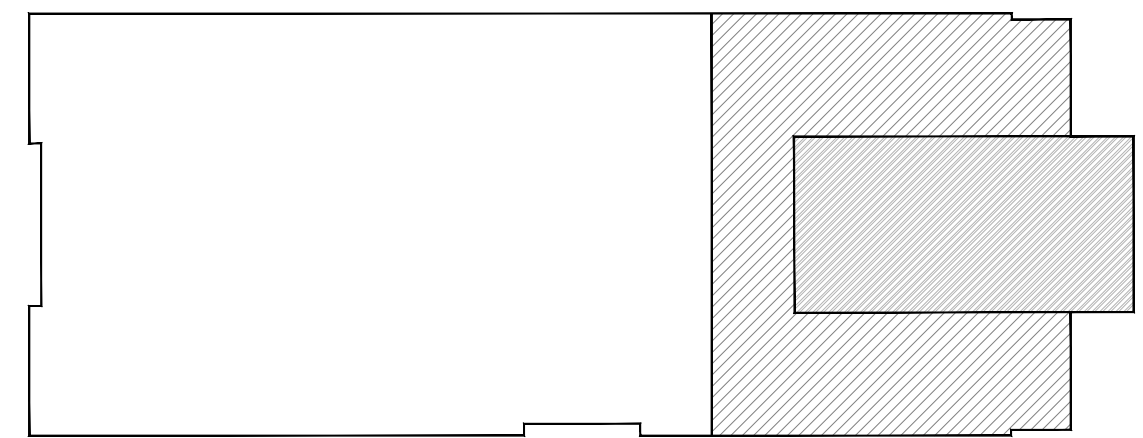
GENERAL NOTES:

- 1.) DEMOLITION ITEMS SHOWN AS DARK DASHED LINES OR CALLED OUT BY (X).
- 2.) PLUMBING DRAWINGS ARE SCHEMATIC IN NATURE. COORDINATE EXACT LOCATIONS AS NECESSARY DURING PROJECT WORK.
- 3.) CONTRACTOR SHALL VISIT THE PROJECT SITE AND THE MOLECULAR BIOSCIENCES BUILDING (EXISTING LAB) TO INVESTIGATE THE EXISTING CONDITIONS AND SCOPE OF WORK REQUIRED TO INSTALL THE SYSTEMS DEPICTED IN THESE DRAWINGS PRIOR TO SUBMISSION OF BIDS.
- 4.) ADDITIONAL DEMOLITION AND RELOCATION WORK NOT DEPICTED ON THESE DRAWINGS IS INCLUDED IN THE SCOPE OF THIS PROJECT. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING THE EXTENT OF WORK AT THE MOLECULAR BIOSCIENCES BUILDING. (BUILDING LOCATION SHOWN ON A0.1.)



PLUMBING & PIPING PHASING

SYMBOL	STATUS
—	(E) EXISTING - TO REMAIN
- - - - -	(X) DEMOLISH - REMOVE

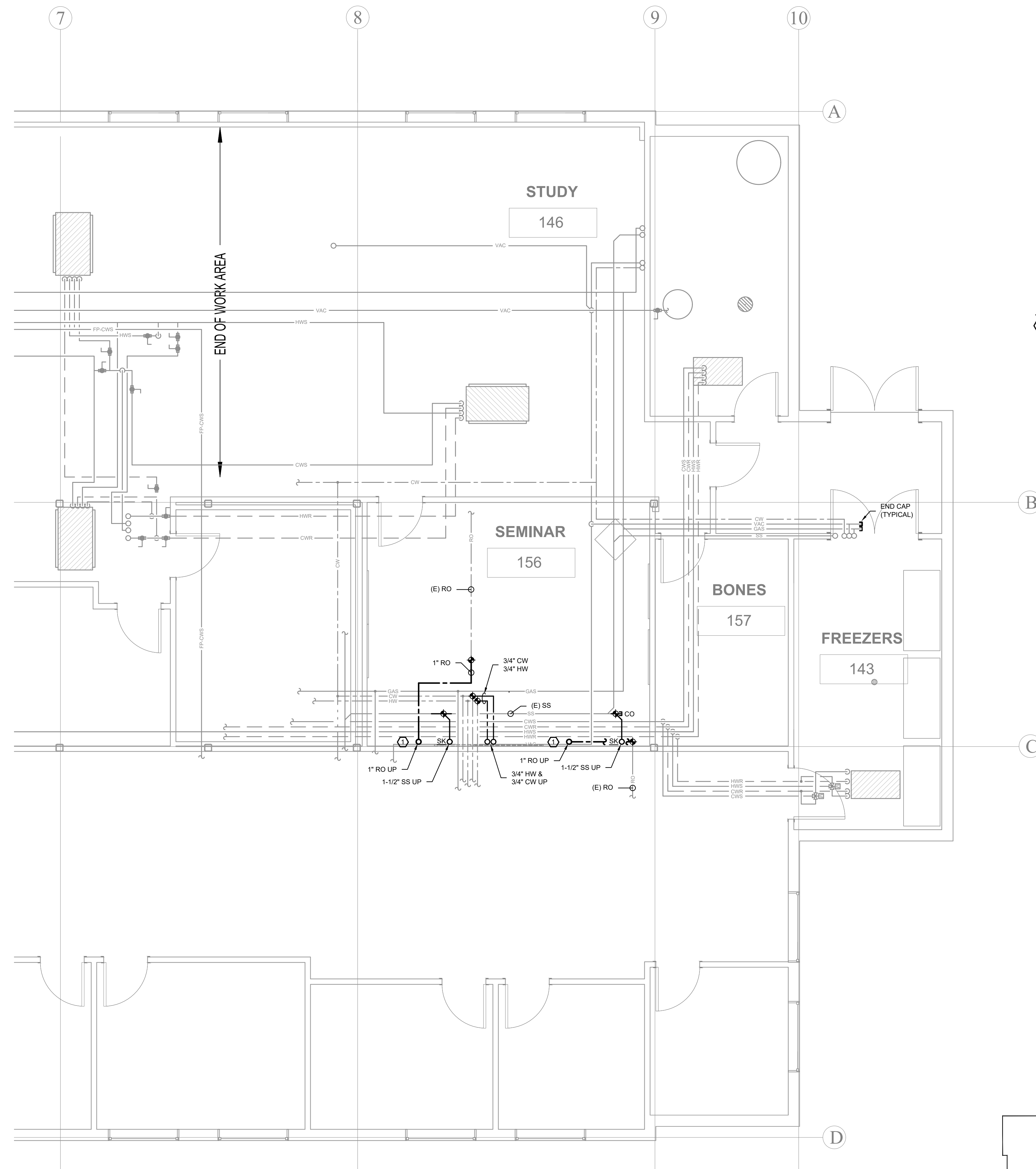


GENERAL NOTES:

- COORDINATE LOCATIONS OF EQUIPMENT, PIPING, AND APPURTENANCES WITH ALL TRADES PRIOR TO ROUGH-IN.
- PENETRATIONS OF FIRE RATED ASSEMBLIES SHALL BE CAULKED/SEALED TO MAINTAIN RATING. (PROTECT AS REQUIRED PER IBC SECTION 713.)
- PENETRATIONS OF STRUCTURAL MEMBERS AND EXISTING BUILDING ELEMENTS SHALL BE COORDINATED AND VERIFIED WITH STRUCTURAL ENGINEER AND ARCHITECT PRIOR TO COMMENCEMENT OF WORK.
- CONTRACTOR SHALL VISIT THE SITE TO INVESTIGATE THE EXISTING CONDITIONS AND SCOPE OF WORK REQUIRED TO INSTALL THE SYSTEMS DEPICTED IN THESE DRAWINGS PRIOR TO SUBMISSION OF BIDS.
- WHERE NEW CONNECTIONS ARE MADE TO EXISTING UTILITIES OR PIPING, THIS CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR TO SCHEDULE THE INTERRUPTION TO SERVICE WITH ADJACENT TENANTS AND OPERATIONS.

KEYED NOTES:

- REVERSE OSMOSIS (RO) PIPING SHALL BE PLUMBED TO MAINTAIN CONTINUOUS CIRCULATING FLOW THROUGH THE SYSTEM. KEEP BRANCH PIPING TO FIXTURES AS SHORT AS POSSIBLE.

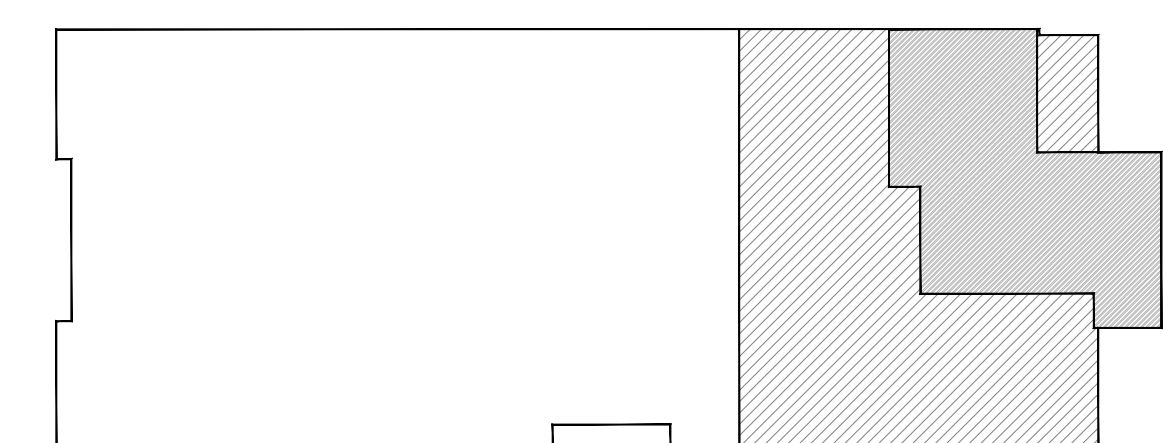


MISCELLANEOUS SYMBOLS

SYMBOL	DESCRIPTION
	KEYED NOTE
	EQUIPMENT MARK INDICATES EQUIP#
	FIXTURE TAG
	CONNECT NEW PIPE OR DUCT TO EXISTING AT THIS POINT

PLUMBING & PIPING PHASING

SYMBOL	STATUS
	(E) EXISTING - TO REMAIN
	(N) NEW



ISSUED FOR CONSTRUCTION

THREE RIVERS ENGINEERING, INC.

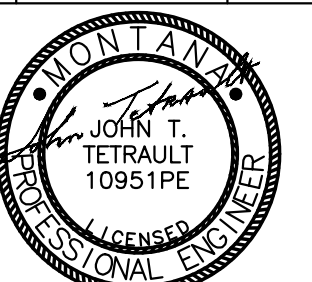
MECHANICAL - ELECTRICAL - ENERGY
 244 S. WILSON, SUITE 41, BOZEMAN, MT 59715
 406.562.6099 www.TREENT.com

DRAWN BY: AM

REVIEWED BY: JT

REV. DESCRIPTION DATE

- DD 02/16/18



PPA#18-2004

TRE #1802

SHEET TITLE
 SECOND LEVEL
 PLUMBING

SHEET
P2.1

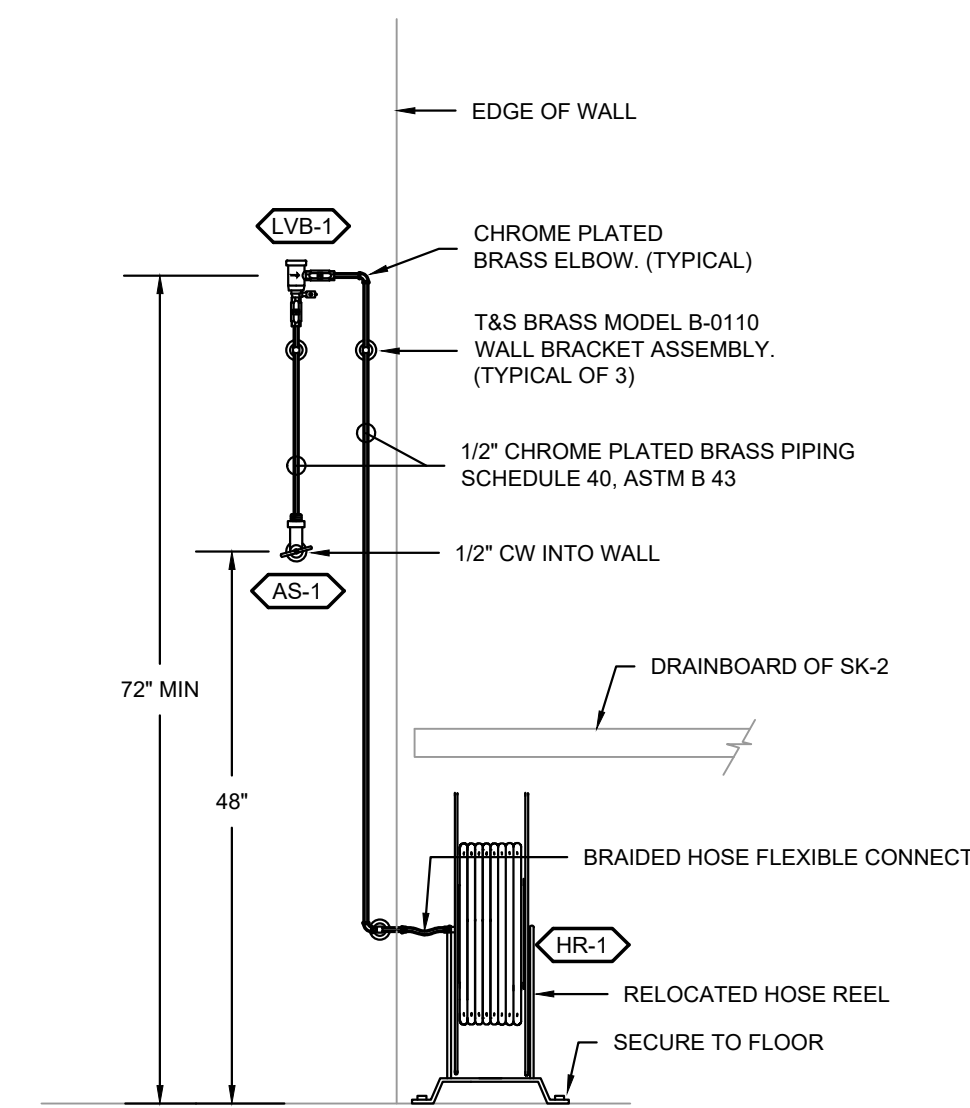
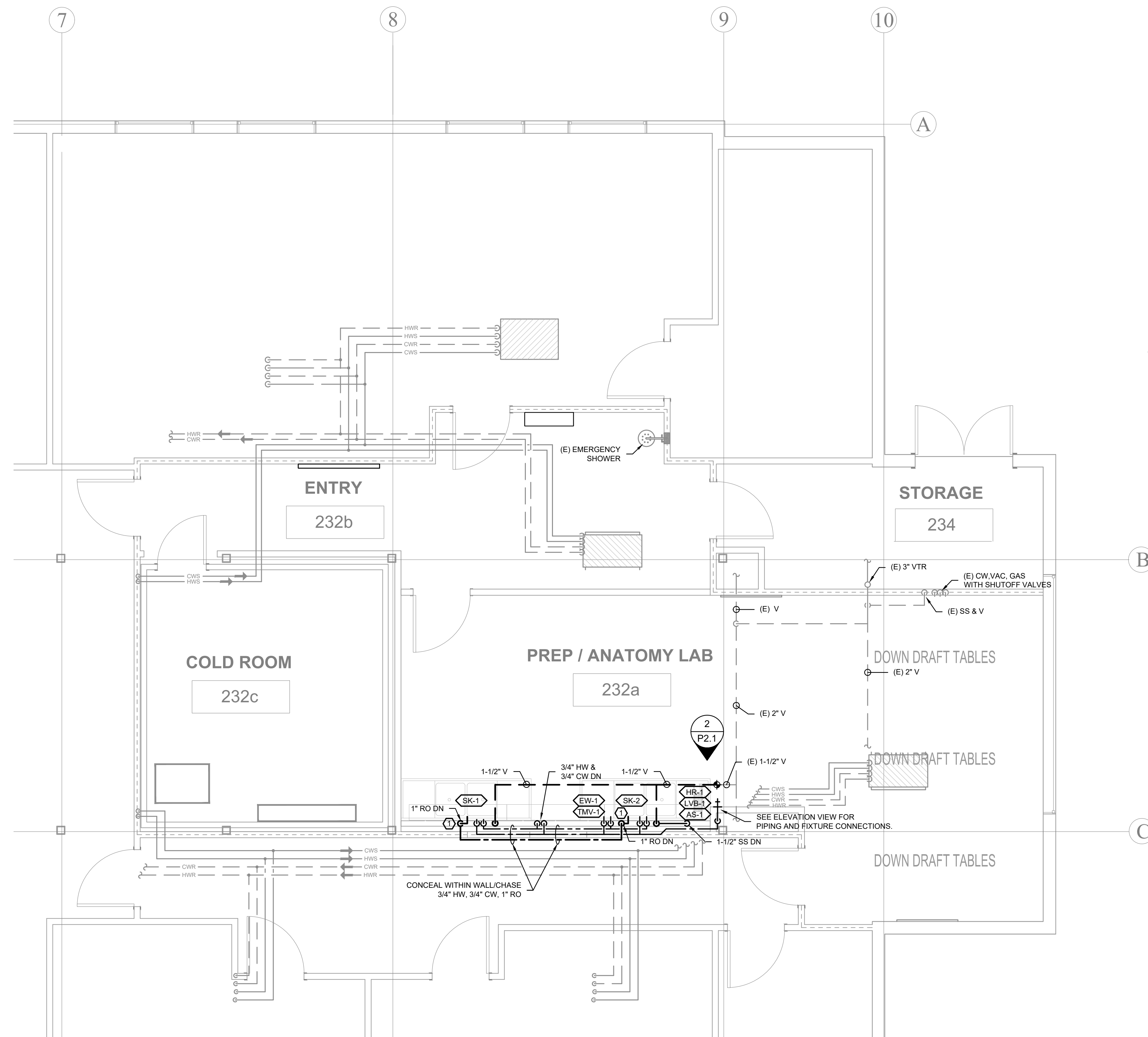
DATE
 03/28/18

GENERAL NOTES:

- COORDINATE LOCATIONS OF EQUIPMENT, PIPING, AND APPURTENANCES WITH ALL TRADES PRIOR TO ROUGH-IN.
- PENETRATIONS OF FIRE RATED ASSEMBLIES SHALL BE CAULKED/SEALED TO MAINTAIN RATING. (PROTECT AS REQUIRED PER IBC SECTION 713.)
- PENETRATIONS OF STRUCTURAL MEMBERS AND EXISTING BUILDING ELEMENTS SHALL BE COORDINATED AND VERIFIED WITH STRUCTURAL ENGINEER AND ARCHITECT PRIOR TO COMMENCEMENT OF WORK.
- CONTRACTOR SHALL VISIT THE SITE TO INVESTIGATE THE EXISTING CONDITIONS AND SCOPE OF WORK REQUIRED TO INSTALL THE SYSTEMS DEPICTED IN THESE DRAWINGS PRIOR TO SUBMISSION OF BIDS.
- WHERE NEW CONNECTIONS ARE MADE TO EXISTING UTILITIES OR PIPING, THIS CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR TO SCHEDULE THE INTERRUPTION TO SERVICE WITH ADJACENT TENANTS AND OPERATIONS.

KEYED NOTES:

- ① REVERSE OSMOSIS (RO) PIPING SHALL BE PLUMBED TO MAINTAIN CONTINUOUS CIRCULATING FLOW THROUGH THE SYSTEM. KEEP BRANCH PIPING TO FIXTURES AS SHORT AS POSSIBLE.



2 HOSE REEL SUPPLY PIPING DETAIL
 P2.1 No Scale

1 2ND FLOOR - PLUMBING
 P2.1 1/4"=1'-0"

MARK	TYPE	RM NAME RM NUMBER	FIXTURE MANUFACTURER	MODEL	TRIM	ACCESSORIES			CONNECTIONS				KEYED NOTES	
						SUPPLIES	TRAP	WASTE	WASTE	VENT	CW	HW		RO
EW-1	EMERGENCY EYEWASH	PREP AREA	RELOCATED	-	TMV-1	-	-	-	-	-	-	-	-	3,4,5,6,7
AS-1	ANGLE STOP	PREP AREA	T&S BRASS	B-1350	T-HANDLE WITH SCREW	INTEGRAL STOP	-	-	-	-	1/2"	-	-	5
HR-1	HOSE REEL	PREP AREA	RELOCATED	-	RELOCATED	-	-	-	-	-	1/2"	-	-	3,5,6
LVB-1	LABORATORY VACUUM BREAKER	PREP AREA	T&S BRASS	B-0963	-	INTEGRAL STOPS	-	-	-	-	1/2"	-	-	1,5
SK-1	LABORATORY SINK	PREP AREA	RELOCATED	-	EXISTING RELOCATED	WITH STOPS	WITH TRAP	BASKET STRAINER	1-1/2"	1-1/2"	1/2"	1/2"	1/2"	3,6
SK-2	LABORATORY SINK	PREP AREA	RELOCATED	-	EXISTING RELOCATED	WITH STOPS	WITH TRAP	BASKET STRAINER	1-1/2"	1-1/2"	1/2"	1/2"	1/2"	3,6
TMV-1	MIXING VALVE	PREP AREA	ACORN	ET71-1-BVS-OTG	SEMI-RECESS CABINET	INTEGRAL STOPS	-	-	-	-	1/2"	1/2"	1/2"	2,4

GENERAL NOTES:
 1.) CONTRACTOR MUST SUBMIT CUT SHEETS TO OWNER AND RECEIVE WRITTEN APPROVAL FROM OWNER PRIOR TO ORDERING OR INSTALLING PLUMBING FIXTURES.
 2.) COORDINATE COLOR AND FINISH OF ALL PLUMBING FIXTURES WITH OWNER.
 3.) PROVIDE CAULK AND ESCUTCHEON AT PIPING PENETRATIONS OF ARCHITECTURAL FINISHES.

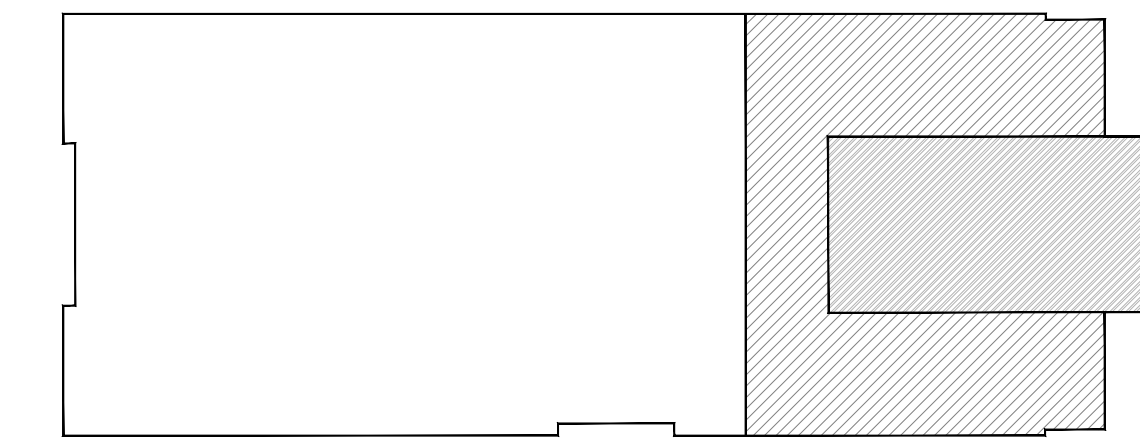
KEYED NOTES:
 1.) MOUNT FIXTURE AT MINIMUM 72" AFF AND A MINIMUM OF 12" ABOVE TOP OF HOSE REEL. EXTEND 1/2" CHROME PLATED BRASS PIPING FROM OUTLET TO HOSE REEL INLET.
 2.) STAINLESS STEEL FINISH WITH DOOR VIEWPORT. MOUNT CABINET WITHIN WALL NEAR THE EMERGENCY EYE WASH FIXTURE.
 3.) PROVIDE ALL INCIDENTAL FIXTURE APPURTENANCES REQUIRED FOR PROPER OPERATION AT NEW LOCATION.
 4.) EXTEND 1/2" TEPID WATER FROM TMV-1 TO EMERGENCY EYE WASH FIXTURE (EW-1).
 5.) SEE ELEVATION VIEW, 2-P2.1, FOR HOSE REEL PIPING AND FIXTURE CONNECTIONS.
 6.) THIS FIXTURE SHALL BE RELOCATED FROM THE MOLECULAR BIOSCIENCES BUILDING BY THIS CONTRACTOR UNDER THE SCOPE OF THIS PROJECT. SEE SPECIFICATIONS.
 7.) THIS FIXTURE IS TO REMAIN ATTACHED TO SK-2.

MISCELLANEOUS SYMBOLS

	KEYED NOTE
	EQUIPMENT MARK INDICATES EQUIP#
	FIXTURE TAG
	CONNECT NEW PIPE OR DUCT TO EXISTING AT THIS POINT

PLUMBING & PIPING PHASING

	STATUS
	(E) EXISTING - TO REMAIN
	(N) NEW



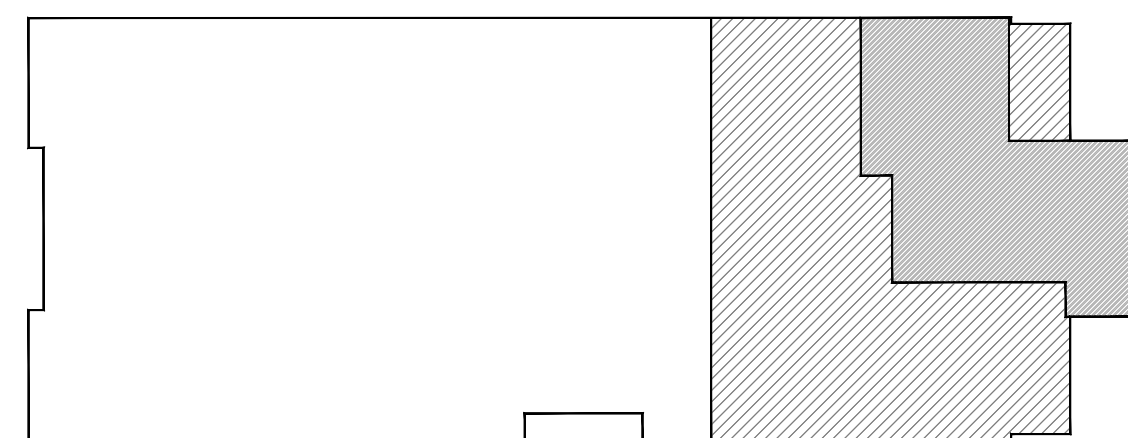
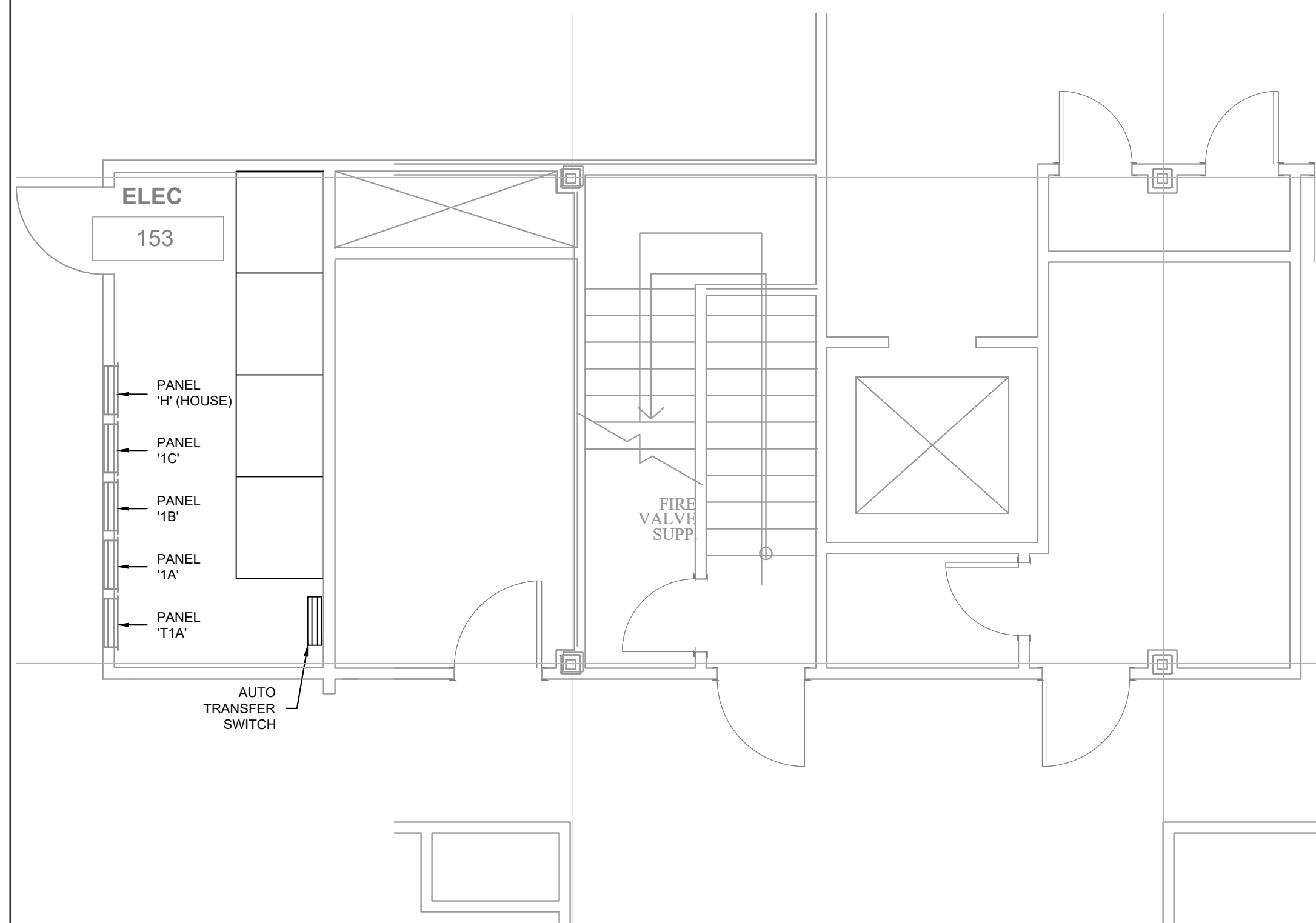
KEY PLAN

GENERAL NOTES:

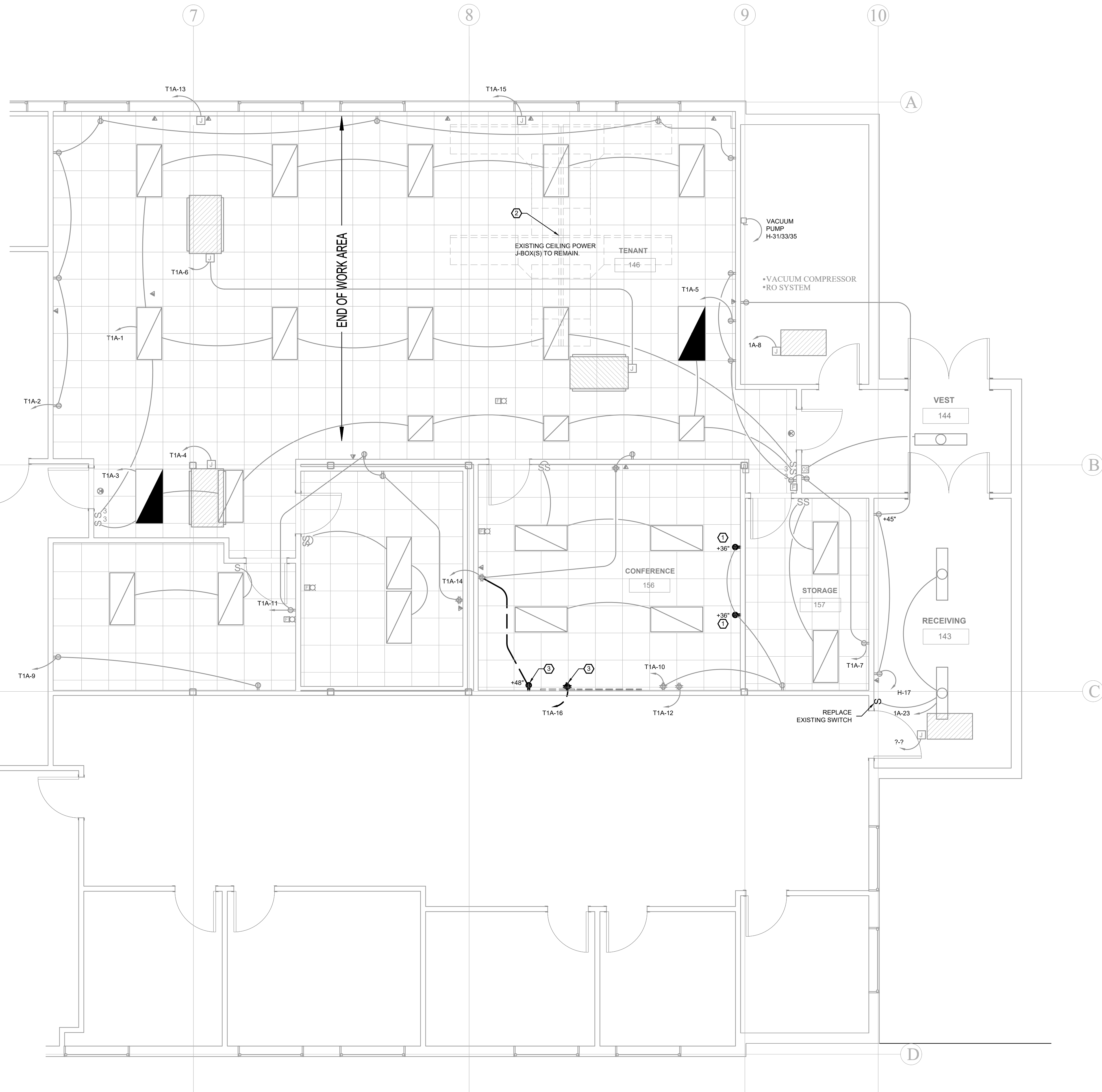
1. LIGHT AND POWER CIRCUITS SHOWN ARE INTENDED TO INDICATE RELATIVE ARRANGEMENT ONLY. ACTUAL LOCATION OF CONDUIT/CONDUCTORS HAS NOT BEEN VERIFIED. ELECTRICAL CONTRACTOR TO FIELD VERIFY CONDUIT/CONDUCTORS PRIOR TO COMMENCING WORK.
2. REMOVE ITEMS AS NOTED AND INDICATED (DARK-DASHED).
3. ITEMS SHOWN TO BE (X) REMOVED SHALL BE REMOVED IN THEIR ENTIRETY. NO MATERIALS OR EQUIPMENT SHALL BE ABANDONED IN PLACE.

KEYED NOTES:

- ① RELOCATE EXISTING POWER OUTLET.
- ② DISCONNECT EXISTING POWER FEED TO OUTER TWO CUBICLES. POWER IS FED THROUGH INTERNAL RACEWAY. TWO CUBICLES CLOSEST TO EXTERIOR WALL TO REMAIN.
- ③ REMOVE EXISTING POWER OUTLET.



KEY PLAN



1
E1.1

1ST LEVEL - ELECTRICAL DEMOLITION

1/4"=1'-0"



MSU - CPDC
MONTANA STATE UNIVERSITY
BOZEMAN, MONTANA
PHONE: 406.994.5413
FAX: 406.994.5665

**WIMU - 2155 ANALYSIS DR
RENOVATION**

ISSUED FOR CONSTRUCTION

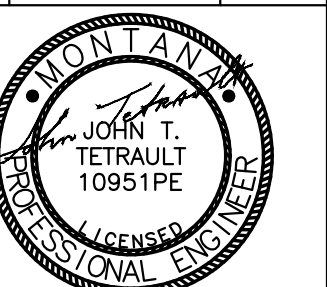
THREE RIVERS
ENGINEERING, INC.

MECHANICAL - ELECTRICAL - ENERGY
2415 WILSON, STE. A1, BOZEMAN, MT 59719
406.562.8288 WWW.TREDFI.COM

DRAWN BY: AM

REVIEWED BY: JT

REV.	DESCRIPTION	DATE
-	DD	02/16/18



PPA#18-2004

TRE #1802

SHEET TITLE
FIRST LEVEL
ELEC. DEMO

SHEET

E1.1

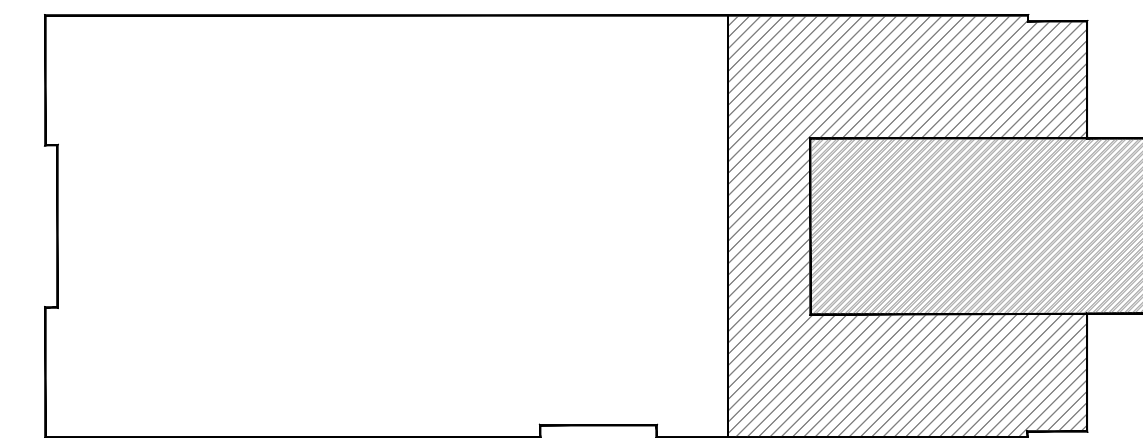
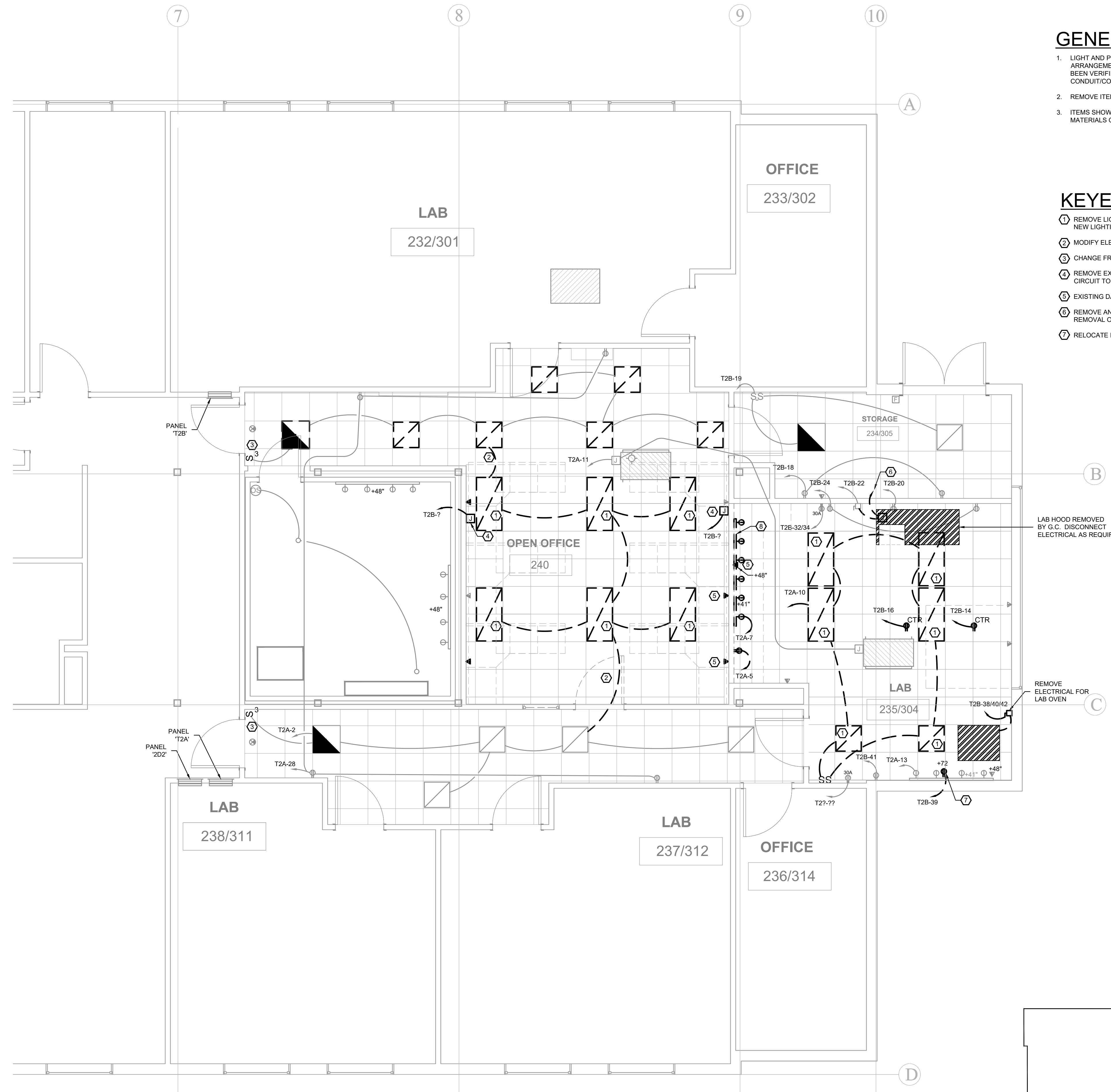
DATE
03/28/18

GENERAL NOTES:

1. LIGHT AND POWER CIRCUITS SHOWN ARE INTENDED TO INDICATE RELATIVE ARRANGEMENT ONLY. ACTUAL LOCATION OF CONDUIT/CONDUCTORS HAS NOT BEEN VERIFIED. ELECTRICAL CONTRACTOR TO FIELD VERIFY CONDUIT/CONDUCTORS PRIOR TO COMMENCING WORK.
2. REMOVE ITEMS AS NOTED AND INDICATED (DARK-DASHED).
3. ITEMS SHOWN TO BE (X) REMOVED SHALL BE REMOVED IN THEIR ENTIRETY. NO MATERIALS OR EQUIPMENT SHALL BE ABANDONED IN PLACE.

KEYED NOTES:

- ① REMOVE LIGHT FIXTURE. MODIFY ELECTRICAL AS REQUIRED FOR INSTALLATION OF NEW LIGHTING.
- ② MODIFY ELECTRICAL CIRCUITING AS REQUIRED FOR NEW SWITCHING.
- ③ CHANGE FROM 3-WAY SWITCHING TO SINGLE TOGGLE SWITCH.
- ④ REMOVE EXISTING HARD WIRED POWER FEED FROM WALL TO CUBICLES. RELOCATE CIRCUIT TO NEW HALLWAY FOR NEW COOLER.
- ⑤ EXISTING DATA JACK TO BE RELOCATED.
- ⑥ REMOVE AND REINSTALL ELECTRICAL SERVICE TO ROOF FAN AS REQUIRED FOR REMOVAL OF EXHAUST HOOD AND INSTALLATION OF NEW WALL SWITCH.
- ⑦ RELOCATE POWER RECEPTACLE. SEE SHEET E2.2 FOR NEW LOCATION.



1
E1.2

2ND LEVEL - ELECTRICAL DEMOLITION
1/4"=1'-0"



KEY PLAN

ISSUED FOR CONSTRUCTION

**WIMU - 2155 ANALYSIS DR
RENOVATION**

THREE RIVERS
ENGINEERING, INC.

MECHANICAL - ELECTRICAL - ENERGY
2415 WILSON, STE. A1, BOZEMAN, MT 59719
406.562.8288 www.threerivers.com

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REVIEWED BY: JT

REV.	DESCRIPTION	DATE
-	DD	02/16/18

PPA#18-2004

TRE #1802

SHEET TITLE

FIRST LEVEL

ELECTRICAL

SHEET

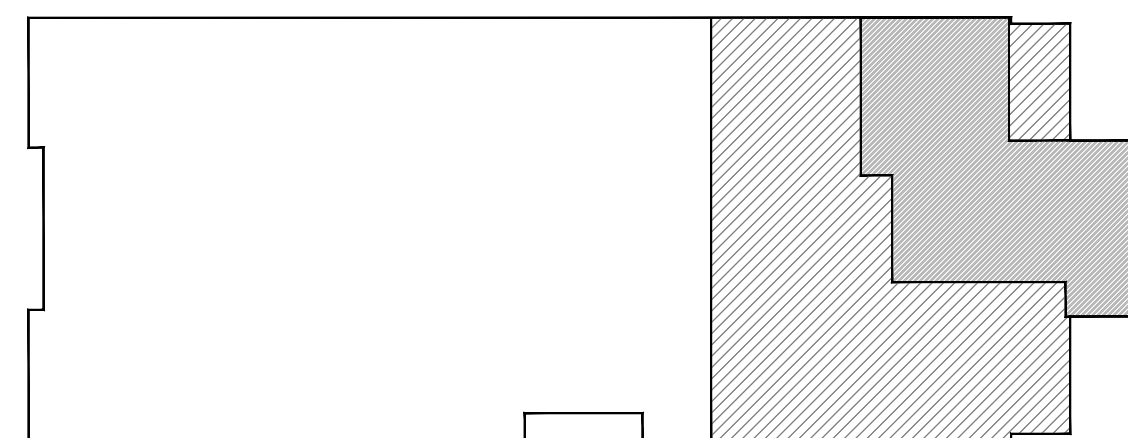
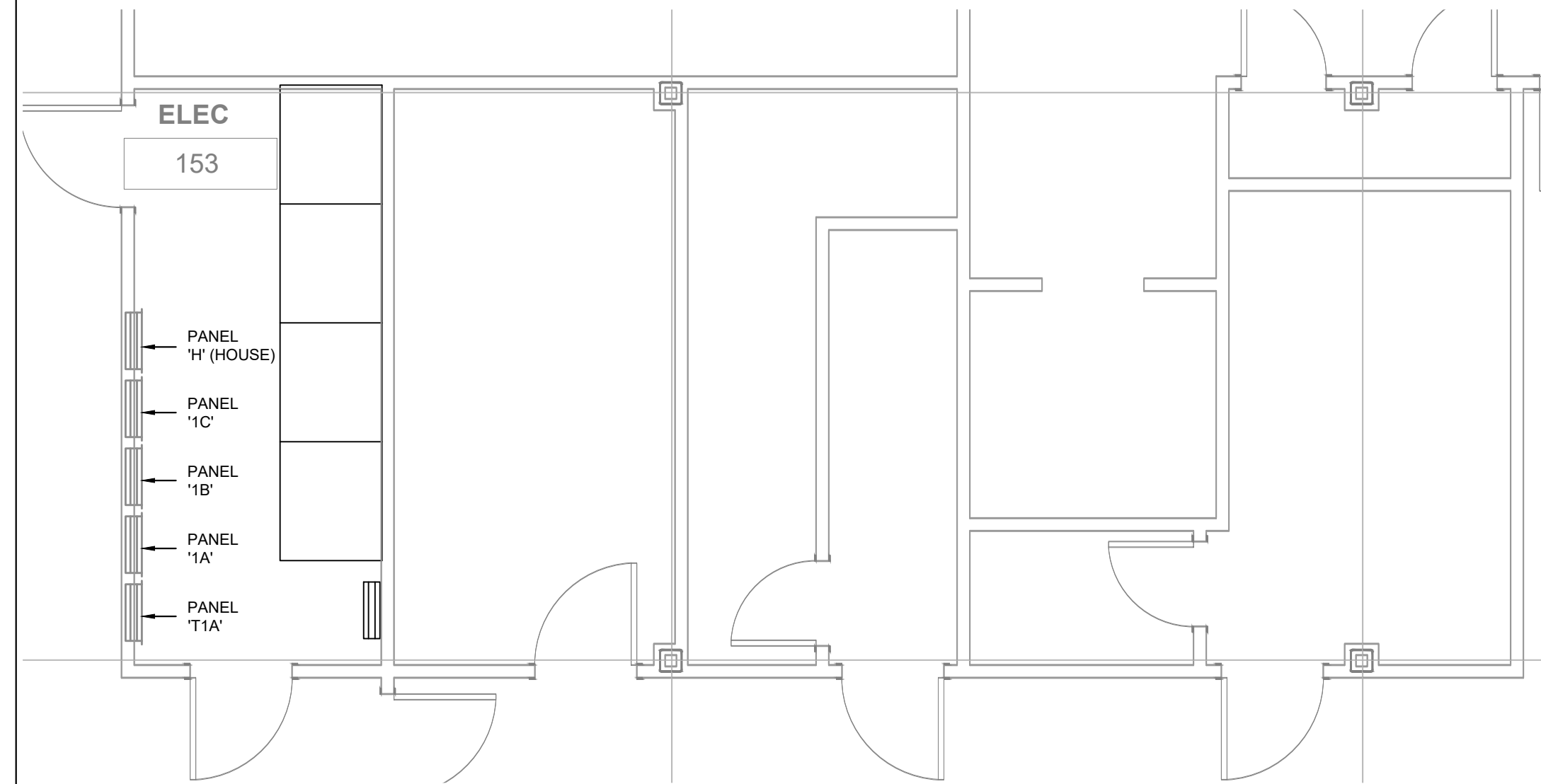
E2.1

DATE

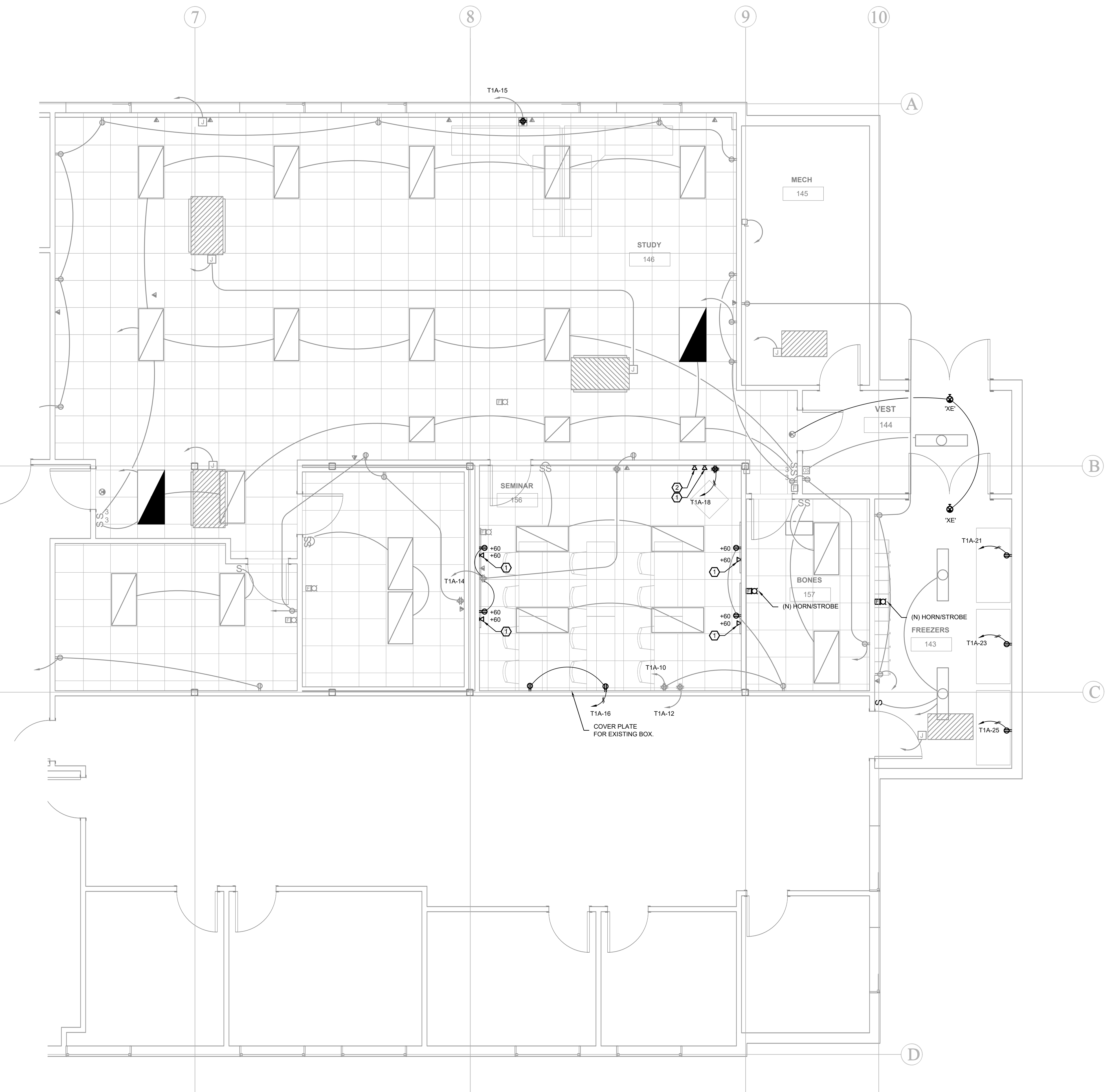
03/28/18

KEYED NOTES:

- ① PROVIDE 4x4 BOX FOR DATA PORT WITH 1" EMT UP TO CEILING PLENUM.
- ② PROVIDE 4x4 BOX WITH 2" EMT UP TO CEILING PLENUM FOR (4) MONITOR CORDS.



KEY PLAN



1
E2.1

1ST LEVEL - ELECTRICAL

1/4"=1'-0"

**WIMU - 2155 ANALYSIS DR
 RENOVATION**

ISSUED FOR CONSTRUCTION

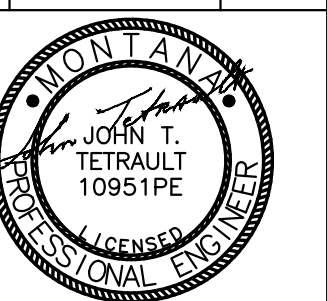
THREE RIVERS
 ENGINEERING, INC.

MECHANICAL - ELECTRICAL - ENERGY
 2415 W. WILSON, STE. A1, BOZEMAN, MT 59715
 406.562.8288 www.threerivers.com

DRAWN BY: AM

REVIEWED BY: JT

REV.	DESCRIPTION	DATE
-	DD	02/16/18



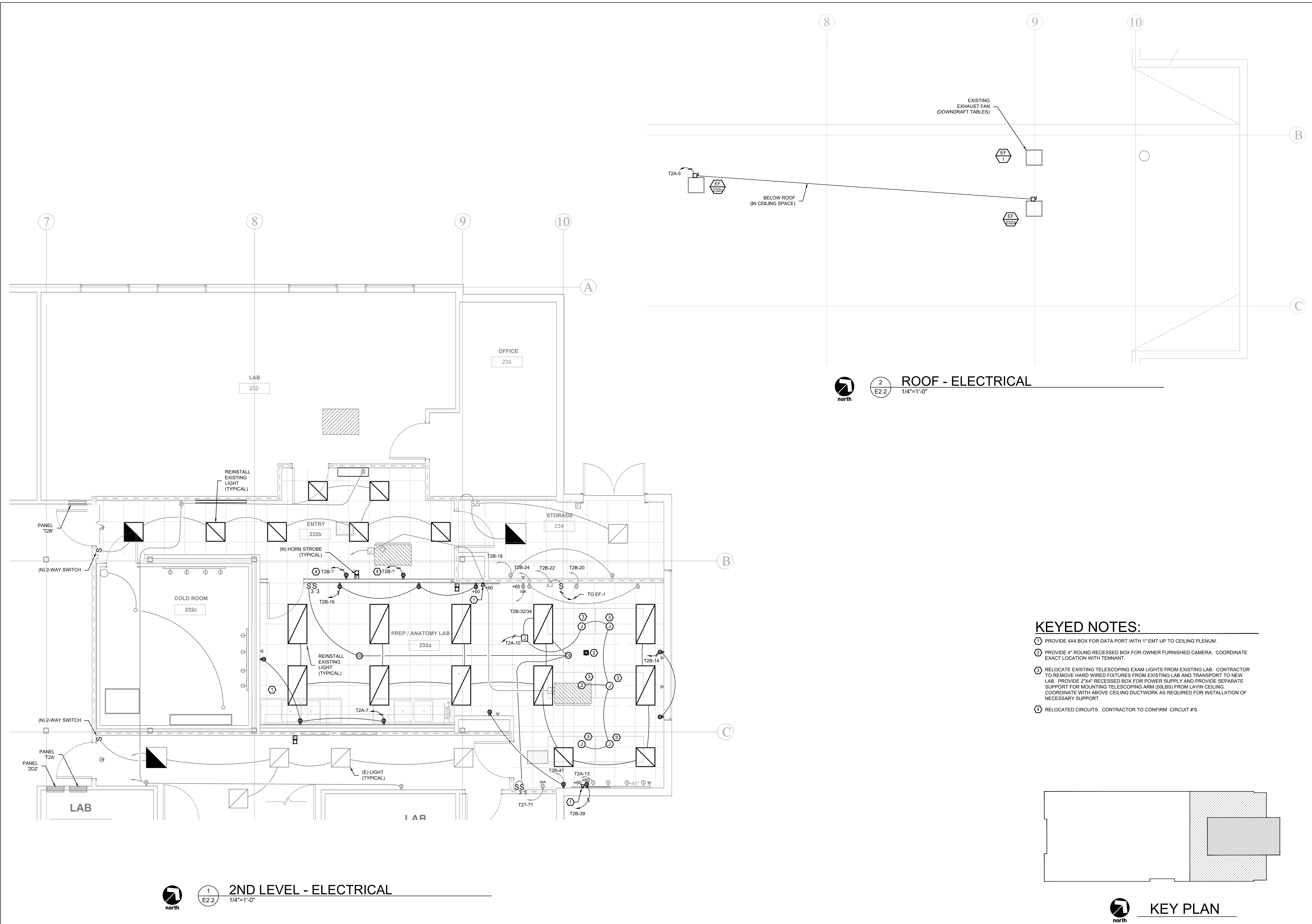
PPA#18-2004

TRE #1802

SHEET TITLE
 SECOND LEVEL
 ELECTRICAL

SHEET
E2.2

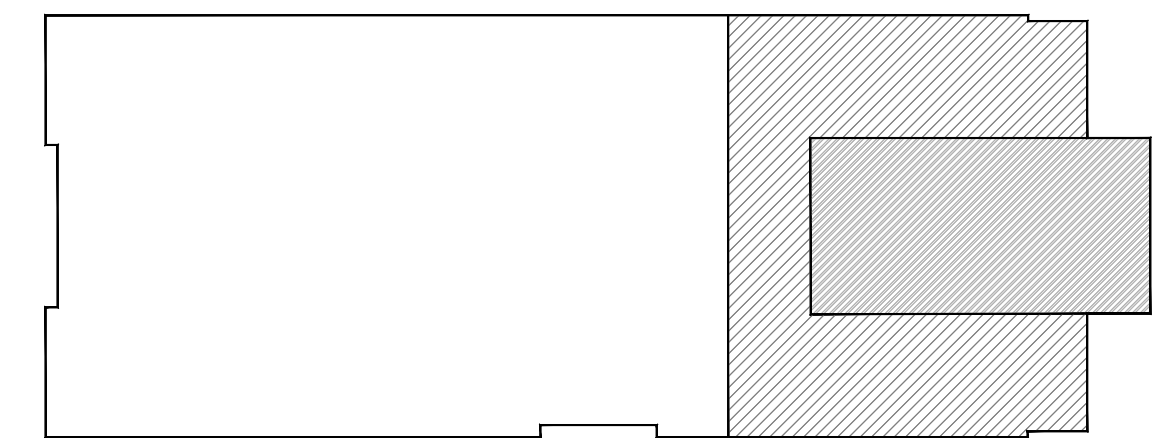
DATE
 03/28/18



2 ROOF - ELECTRICAL
 1/4"=1'-0"

KEYED NOTES:

- ① PROVIDE 4X4 BOX FOR DATA PORT WITH 1" EMT UP TO CEILING PLENUM.
- ② PROVIDE 4" ROUND RECESSED BOX FOR OWNER FURNISHED CAMERA. COORDINATE EXACT LOCATION WITH TENNANT.
- ③ RELOCATE EXISTING TELESCOPING EXAM LIGHTS FROM EXISTING LAB. CONTRACTOR TO REMOVE HARD WIRED FIXTURES FROM EXISTING LAB AND TRANSPORT TO NEW LAB. PROVIDE 2"X4" RECESSED BOX FOR POWER SUPPLY AND PROVIDE SEPARATE SUPPORT FOR MOUNTING TELESCOPING ARM (S/LBS) FROM LAYIN CEILING. COORDINATE WITH ABOVE CEILING DUCTWORK AS REQUIRED FOR INSTALLATION OF NECESSARY SUPPORT.
- ④ RELOCATED CIRCUITS. CONTRACTOR TO CONFIRM CIRCUIT #S.



KEY PLAN

1 2ND LEVEL - ELECTRICAL
 1/4"=1'-0"

ELECTRICAL LEGEND

ABBREVIATIONS

a,b,c, etc.	SWITCH DESIGNATION	GC	GENERAL CONTRACTOR
AFF	ABOVE FINISHED FLOOR	GND	GROUND
AG	CIRCUIT DESIGNATION	MC	MECHANICAL CONTRACTOR
BN1L-2,4,6	PANELBOARD BN1L, CIRCUITS 2,4,6	MTS	MANUAL TRANSFER SWITCH
C	CONDUIT	NL	NIGHT LIGHT
EC	ELECTRICAL CONTRACTOR	UG	UNDER GROUND
		W/	WITH
		WP	WEATHER PROOF

MISCELLANEOUS

SYMBOL	DESCRIPTION
	BRANCH CIRCUIT CONCEALED IN WALL OR CEILING
	BRANCH CIRCUIT CONCEALED IN OR UNDER FLOOR
	HOMERUN TO PANEL
	CIRCUIT, NUMBER OF HASH MARKS INDICATES NUMBER OF CONDUCTORS. NO HASH MARKS INDICATE TWO CONDUCTORS.

LIGHTING

SYMBOL	DESCRIPTION
	FLUORESCENT LIGHT FIXTURE (SURFACE)
	FLUORESCENT LIGHT FIXTURE (RECESSED)
	EMERGENCY LIGHT FIXTURE
	RECESSED LIGHT FIXTURE
	WALL MOUNTED LIGHT FIXTURE
	PENDANT OR SURFACE MOUNTED FLUORESCENT LIGHT FIXTURE
	EXIT LIGHTS (WALL OR CEILING)

TELECOMMUNICATIONS

SYMBOL	DESCRIPTION
	OUTLET, DATA ONLY
	OUTLET, VOICE/DATA
	OUTLET, VOICE ONLY
	OUTLET, CEILING

FIRE ALARM

SYMBOL	DESCRIPTION
	FIRE ALARM CONTROL PANEL
	FIRE ALARM - PULL STATION
	FIRE ALARM STROBE
	FIRE ALARM HORN
	FIRE ALARM HORN AND STROBE
	SMOKE DETECTOR
	HEAT DETECTOR
	MAGNETIC DOOR HOLDER
	MAGNETIC DOOR HOLDER - INTEGRAL WITH CLOSER
	FIRE ALARM PANEL

DEVICE & POWER

SYMBOL	DESCRIPTION
	SWITCH, SINGLE POLE
	SWITCH, THREE WAY
	SWITCH - TIMER
	SWITCH - WITH PILOT
	SWITCH - MOMENTARY CONTACT
	SWITCH - DIMMER
	MOTOR SENTINEL - FRACTIONAL H.P.
	SWITCH - KEYED
	RECEPTACLE - SIMPLEX
	OUTLET, DUPLEX
	OUTLET, GROUND FAULT INTERRUPTER
	OUTLET, FOURPLEX
	SPECIAL POWER OUTLET
	EXISTING DEVICE TO BE REMOVED
	EXISTING DEVICE TO REMAIN
	NEW DEVICE
	CEILING DUPLEX RECEPTACLE

	DISCONNECT SWITCH
	STARTER-COMBINATION MAGNETIC
	STARTER-MAGNETIC
	PANEL OR LOAD CENTER
	JUNCTION BOX
	EQUIPMENT CONNECTION
	MOTOR
	CEILING OCCUPANCY SENSOR
	CEILING OCCUPANCY SENSOR - DUAL CIRCUIT
	WALL OCCUPANCY SENSOR
	WALL OCCUPANCY SENSOR - DUAL CIRCUIT
ALL OCCUPANCY SENSORS SHALL BE DUAL TECHNOLOGY - ULTRASONIC & INFRA-RED	

PANEL H (HOUSE)

EXISTING	L-LV 208	AMPS 200	NOTES:
LOC.	L-N V 120	BUS	
MOUNT	PHASE 3	M.C.B. MLO	
AIC	WIRES 4	NEMA 1	
		MAKE/MODEL	

REMARKS:

CKT NO.	WIRE SIZE	BREAKER POLE	BREAKER AMP	LOAD DESCRIPTION	LOAD (VA)			LOAD DESCRIPTION	BREAKER AMP	BREAKER POLE	WIRE SIZE	CKT NO.
					L1	L2	L3					
1		1	20	EXISTING - NOT VERIFIED	0			EXISTING - NOT VERIFIED	20	1		2
3		1	20	EXISTING - NOT VERIFIED		0		EXISTING - NOT VERIFIED	20	1		4
5		1	20	EXISTING - NOT VERIFIED			0	EXISTING - NOT VERIFIED	20	1		6
7		1	20	EXISTING - NOT VERIFIED	0			EXISTING - NOT VERIFIED	20	1		8
9		1	20	EXISTING - NOT VERIFIED		0		EXISTING - NOT VERIFIED	20	1		10
11		1	20	EXISTING - NOT VERIFIED			0	EXISTING - NOT VERIFIED	20	1		12
13		1	20	EXISTING - NOT VERIFIED	0			EXISTING - NOT VERIFIED	20	1		14
15		1	20	EXISTING - NOT VERIFIED		0		EXISTING - NOT VERIFIED	20	1		16
17		1	20	R - RECEIVING RM			720	EXISTING - NOT VERIFIED	20	1		18
19		1	20	EXISTING - NOT VERIFIED	0			EXISTING - NOT VERIFIED	20	1		20
21		1	20	EXISTING - NOT VERIFIED		0		EXISTING - NOT VERIFIED	20	1		22
23		1	20	EXISTING - NOT VERIFIED			0	EXISTING - NOT VERIFIED	20	1		24
25		1	20	EXISTING - NOT VERIFIED	0			EXISTING - NOT VERIFIED	20	1		26
27		1	20	EXISTING - NOT VERIFIED		0		EXISTING - NOT VERIFIED	20	1		28
29		1	20	EXISTING - NOT VERIFIED			0	EXISTING - NOT VERIFIED	20	1		30
31					0			EXISTING - NOT VERIFIED	20	1		32
33		3	30	VACUUM PUMP		0		EXISTING - NOT VERIFIED	20	1		34
35							0	EXISTING - NOT VERIFIED	20	1		36
37		1	20	EXISTING - NOT VERIFIED	0			EXISTING - NOT VERIFIED	20	1		38
39		1	20	EXISTING - NOT VERIFIED		0		EXISTING - NOT VERIFIED	20	1		40
41		1	20	EXISTING - NOT VERIFIED			0					42
					0	0	720	TOTAL CONNECTED LOAD: TOTAL DEMAND LOAD DEMAND AMPS		720 VA 720 VA 2 AMPS		

PANEL T2A

EXISTING	L-LV 208	AMPS 200	NOTES: CONTRACTOR TO VERIFY ALL BREAKER SIZES WITH FINAL EQUIPMENT SUBMITTALS
LOC.	L-N V 120	M.C.B.	
MOUNT SURFACE	PHASE 3	NEMA 1	NOTE 1: PROVIDE PHOTOCELL ON / TIMER OFF.
AIC 22000	WIRES 4	MAKE/MODEL	

REMARKS:

ALL CIRCUITS SHALL INCLUDE SAME SIZE NEUTRAL WIRE.

CKT NO.	WIRE SIZE	BREAKER POLE	BREAKER AMP	LOAD DESCRIPTION	LOAD (VA)			LOAD DESCRIPTION	BREAKER AMP	BREAKER POLE	WIRE SIZE	CKT NO.
					L1	L2	L3					
1		1	20	EXISTING - NOT VERIFIED				L - CORRIDOR & OPEN OFFICE	20	1		2
3		1	20	EXISTING - NOT VERIFIED				L - EGRESS & EXITS?	20	1		4
5	#12	1	20	R - RM 305DW ROOF EF 232a/232c				EXISTING - NOT VERIFIED	20	1		6
7	#12	1	20 G	R - RM 305 RM 232a WEST SIDE				EXISTING - NOT VERIFIED	20	1		8
9		1	20	EXISTING - NOT VERIFIED				L - RM 305 235 & 240	20	1	#12	10
11		1	20	FANCOIL RM 305 232a&b				EXISTING - NOT VERIFIED	20	1		12
13		1	20	R - RM 305 232a (PLUGMOLD)				EXISTING - NOT VERIFIED	20	1		14
15		1	20	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	20	1		16
17		1	20	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	20	1		18
19		1	20	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	20	1		20
21		1	20	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	20	1		22
23		1	20	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	20	1		24
25		1	20	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	20	1		26
27		1	20	EXISTING - NOT VERIFIED				R - CORRIDOR 303	20	1		28
29		1	20	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	30	2		30
31		1	20	EXISTING - NOT VERIFIED								32
33		1	20	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	30	2		34
35												36
37		1	20	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	20	1		38
39		1	20	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	20	2		40
41		1	20	EXISTING - NOT VERIFIED								42

PANEL T1A

EXISTING	L-LV 208	AMPS 200	NOTES:
LOC.	L-N V 120	BUS	
MOUNT	PHASE 3	M.C.B. MLO	
AIC	WIRES 4	NEMA 1	
		MAKE/MODEL	

REMARKS:

PROVIDE SAME SIZE NEUTRAL FOR ALL NEW CIRCUITS

CKT NO.	WIRE SIZE	BREAKER POLE	BREAKER AMP	LOAD DESCRIPTION	LOAD (VA)			LOAD DESCRIPTION	BREAKER AMP	BREAKER POLE	WIRE SIZE	CKT NO.
					L1	L2	L3					
1		1	20	L - ROOM 104	0			R - ROOM 104 WEST&NORTH	20	1		2
3		1	20	L - ROOM 104, 103, 102, 101		0		FANCOIL	20	1		4
5		1	20	R - ROOM 104 EAST WALL			0	FANCOILS	20	1		6
7		1	20	R - ROOM 104 EAST WALL	0			EXISTING - NOT VERIFIED	20	1		8
9		1	20	R - FILE ROOM		0		R - CLASSROOM	20	1		10
11		1	20	R - CONF ROOM			0	R - CLASSROOM	20	1		12
13		1	20	RM 104 CUBICLES WEST	0			R - CLASSROOM	20	1		14
15		1	20	RM 104 CUBICLES 146 STUDY		0		R - CLASSROOM	20	1		16
17		1	20	EXISTING - NOT VERIFIED			1500	R - CLASSROOM 156	20	1	#10	18
19					0							20
21	#10	1	20	RM 143 FREEZER		1500						22
23	#10	1	20	RM 143 FREEZER			1500					24
25	#10	1	20	RM 143 FREEZER	1500							26
27						0						28
29							0					30
31					0							32
33						0						34
35							0					36
37					0							38
39						0						40
41							0					42
					1500	1500	3000	TOTAL CONNECTED LOAD: TOTAL DEMAND LOAD DEMAND AMPS		6000 VA 6000 VA 17 AMPS		

PANEL T2B

EXISTING	L-LV 208	AMPS 200	NOTES: CONTRACTOR TO VERIFY ALL BREAKER SIZES WITH FINAL EQUIPMENT SUBMITTALS
LOC.	L-N V 120	M.C.B.	
MOUNT SURFACE	PHASE 3	NEMA 1	NOTE 1: PROVIDE PHOTOCELL ON / TIMER OFF.
AIC 22000	WIRES 4	MAKE/MODEL	

REMARKS:

ALL CIRCUITS SHALL INCLUDE SAME SIZE NEUTRAL WIRE.

CKT NO.	WIRE SIZE	BREAKER POLE	BREAKER AMP	LOAD DESCRIPTION	LOAD (VA)			LOAD DESCRIPTION	BREAKER AMP	BREAKER POLE	WIRE SIZE	CKT NO.
					L1	L2	L3					
1		1	20	EXISTING - NOT VERIFIED					20	1		2
3		1	20	EXISTING - NOT VERIFIED					20	1		4
5		1	20	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	20	1		6
7		1	20 G	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	20	1		8
9		1	20	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	20	1		10
11		1	20	EXISTING - NOT VERIFIED				EXISTING - NOT VERIFIED	20	1		12
13		1	20	EXISTING - NOT VERIFIED				(X) 235 BENCH (N) 232a LAB	20	1		14
15		1	20	EXISTING - NOT VERIFIED				(X) 235 BENCH (N) 232a LAB	20	1		16
17		1	20	EXISTING - NOT VERIFIED				R - RM 305 234	20	1		18