GENERAL PROJECT DESCRIPTION

Renovation of a research laboratory within Arnett Hall, built in 1973. Existing structure consists of cmu walls, brick and cast stone veneer, and concrete floors & roof slabs.

APPLICABLE CODES

(With West Virginia Fire Commision Amendments)

WV Title 87, Series 1 Fire Code:	National Fire Codes, NFPA 1, 2021
WV Title 87, Series 4 State Building Code:	2018 International Building Code (IBC)
Including but not limited to:	
Life Safety Code:	NFPA 101 Life Safety Code, 2021
Plumbing Code:	2018 International Plumbing Code (IPC)
Mechanical Code:	2018 International Mechanical Code (IMC)
Electrical Code:	National Electric Code, NFPA 70, 2020
Energy Code (commercial):	ANSI/ASHRAE/IESNA Standard 90.1, 2013
Gas Code:	2018 International Fuel Gas Code (IFGC)
Accessibility Code:	ICC/ANSI A117.1, 2017 plus 2010 ADA Standards for Accessible Design
Applicable BOA Approvals	
Supplemental Standards	

EXISTING BUILDING CODE	Reference	Proposed	Existing	Required / Allowed	Notes
Historic Status	IEBC 1201	no change	No		
Classification of the Work	IEBC 501	Level 2	-		
Energy Conservation	IEBC 907	New Work Only	-		Compliance with IECC limited to New Const

BUILDING DATA	Reference	Proposed	Existing	Required / Allowed	Notes
Construction Type	IBC 602	no change	IIB		
Occupancy Classification	IBC 302	no change	B	-	
Height	IBC 504	no change	<40'	75' Max	
Stories Above Grade Plane	IBC 504	no change	3	3 Max	
Stories Below Grade Plan (Occ)	IBC 504	no change	0	-	
Max Building Area per Floor	IBC 506	no change	12,273	43,500	
Building Area Below Grade	IBC 506	no change	0	-	
Total Building Area	IBC 506	no change	36,819	130,500	
Total Occupied Stories	IBC 504	no change	3		
HT to Highest Occupied Floor	PGH Amend	no change	<40'		
High-Rise Status	PGH Amend	no change	No		

LIFE SAFETY SYSTEMS	Reference	Proposed	Existing	Required / Allowed	Notes
Sprinkler System	IBC 903	no change	NFPA 13	NFPA 13 Minimum	
Standpipe System	IBC 905	no change	Automatic / Wet	n/a	No work required under level 2

MEANS OF EGRESS SYSTEMS	Reference	Proposed	Existing	Required / Allowed	Notes
Number of Exits per Floor	IBC 1006.1	no change	2 Stairs	Existing to remain	
Common Path of Travel	IBC 1029.8	See Plans	-	100' Max	
Exit Access Travel Distance	IBC 1017	no change	-	300' Max	

FIRE RATINGS	Reference	Proposed	Existing	Required / Allowed	Notes
Primary Structural Frame	IBC 602	no change	None	None	
Exterior Bearing Walls	IBC 602	no change	None	None	
Interior Bearing Walls	IBC 602	no change	None	None	
Floor Construction/Structure	IBC 602	no change	None	None	
Roof Construction/Structure	IBC 602	no change	None	None	
Exit Enclosures	IBC 1023.2	no change	1-HR	1-HR	
Shaft Enclosures < 4 Stories	IBC 713.4	no change	1-HR	1-HR	
Corridors	IBC 708.3/1020.1	no change	None	None	

PROJECT LINE SYMBOLS LEGEND

Note: See Sheet Legends for sheet-specific line types not represented below.

Existing Items to Remain.
New Construction
Hidden or Overhead Items
Existing Items to be Removed
Existing Items to be Salvaged (reinst. same loc.)
Existing Items to be Salvaged (reinst. diff. loc.)
Not in Contract
Furniture Outline

Center Lines / Column Line
Limit of Work
Property Line

Egress Path
Accessible Route

Smoke Rated Wall / Partition
Smoke Barrier (1-HR)
30-Min Rated Wall / Partition
1-HR Rated Wall / Partition
2-HR Rated Wall / Partition
3-HR Rated Wall / Partition

WRB (Integral to Sheathing)
WRB (Separate Product)
Flashing / Flashing Tape

PROJECT MATERIALS LEGEND

Note: See Sheet Legends for sheet-specific material / hatch patterns not represented below.

SIMPLE SECTION		SECTION HATCH		SURFACE HATCH		
NEW	EXIST	NEW	EXIST	NEW	EXIST	
	■		▨			Undisturbed Earth
	■	▨	▨			Compacted Fill
	■	▨	▨			Topsoil
	■	▨	▨	▨	▨	Gravel
■	■	▨	▨			Batt Insulation
■	■	▨	▨			Board Insulation / Acoustic Board
■	■	▨	▨			Spray Insulation or SFRM
■	■	▨	▨	▨	▨	Sand, Grout, Gyp, Parging, Stucco
■	■	▨	▨	▨	▨	Wood
■	■	▨	▨	▨	▨	Concrete
■	■	▨	▨	▨	▨	Brick
■	■	▨	▨	▨	☐	Stone Cladding
■	■	▨	▨	▨	▨	Concrete Masonry (or EXIST MAS / SCT)
■	■	▨	▨	☐	☐	Metal
■	■	■	■	☐	☐	GYP / Stud Wall (or Generic Existing Wall)
	☐		☐		▨	Existing Partition to be Removed
	▨		▨		▨	Existing MAS to be Removed
					▨	Existing FLR / Area to be Removed.

ABBREVIATIONS

ABV	Above
ACC	Accessible
ACW	Aluminum Clad Wood
ADA	Americans with Disbilities Act
ADJ	Adjacent
AFF	Above Finished Floor
ALT	Alternate
ALUM	Aluminum
ANSI	American National Standards Institute
APC	Acoustic Panel Ceiling
APPROX	Approximate
ASF	Above Sub-Floor
B.O.	Bottom of ___
BD	Board
BH	Bulkhead
BLW	Below
BOD	Basis of Design
BOH	Back of House
BR	Bedroom
BRG	Bearing
BTW	Between
BTWN	Between
BYND	Beyond
C TO C	Center to Center
CFS	Clear Floor Space
CIP	Cast-in-Place
CJ	Control Joint
CL	Center Line
CLG	Ceiling
CLO	Closet
CLR	Clear
CMU	Concrete Masonry Unit
CO	Clean-Out
COL	Column
CONC	Concrete
CONST	Construction
CONT	Continuous
CORR	Corridor
CPT	Carpet
CPTY	Capacity
CT	Ceramic Tile
CTR	Center
DAFS	Direct-Applied Finish System
DBL	Double
DEMO	Demolition
DH	Double-Hung (Window)
DIA	Diameter
DIM	Dimension
DN	Down
DWGS	Drawings
E	East
EA	Each
EIFS	Exterior Insulation and Finish System
EJ	Expansion Joint
ELEC	Electrical
ELEV	Elevator
ELEV	Elevation
EOS	Edge of Structure/Slab
EOS	Edge of Slab
EPS	Expanded Polystyrene Board (Insulation)
EQ	Equal
EQUIP	Equipment
ETR	Existing to Remain
EX	Existing
EXIST	Existing
EXT	Exterior
FBG	Fiberglass
FE	Fire Extinguisher
FIN	Finish
FLR	Floor
FND	Foundation
FOH	Front of House
FRJS	Fire Resistant Joint System
FRMG	Framing
FRP	Fiber Reinforced Plastic
FRR	Fire Resistance Rating
FT	Foot, Feet
FTG	Footing
FX	Fixed (Window)
GA	Gage
GALV	Galvanized
GC	General Contractor
GL	Glass
GR	Guest Room
GWB	Gypsum Wall Board
GYP	Gypsum
GYP BD	Gypsum Board
HC	Hollow Core
HDWD	Hardwood
HM	Hollow Metal
HT	Height
IHM	Insulated Hollow Metal
INCL	Includ(es)(ing)
INSUL	Insulation
INT	Interior
KIT	Kitchen
LAU	Laundry
LAV	Lavatory
LF	Linear Feet
LH	Left-Hand
LSF	Light Gauge Steel Framing
MAS	Masonry
MATL	Material
MAX	Maximum
MDF	Medium Density Fiberboard
MECH	Mechanical
MFR	Manufacturer
MIN	Minimum
MISC	Miscellaneous
MO	Masonry Opening
MTL	Metal
N	North
N/A	Not Applicable
NIC	Not in Contract
NRC	Noist Reduction Coefficient
NTS	Not to Scale
O TO O	Out to Out
OA	Overall
OC	On Center
OFCI	Owner Furnished / Contractor Installed
OFOI	Owner Furnished / Owner Installed
OH	Opposite Hand
OPNG	Opening
OPP	Opposite (Hand)
PT	Paint(ed)
PTL	Pressure Treated Lumber
PVC	Polyvinyl Chloride
R	Radius, Riser, Thermal Resistance Value
RB	Resilient Base
RCP	Reflected Ceiling Plan
RD	Roof Drain
REQ'D	Required
REQ'S	Requirements
RF	Resilient Flooring
RH	Right-Hand
RM	Room
RO	Rough Opening
RWC	Rainwater Conductor
S	South
SC	Solid Core
SF	Square Feet
SFRM	Spray-Applied Fire-Resistive Materials
SH	Single Hung
SIM	Similar
SPEC	Specification
SQ	Square
SST	Stainless Steel
STC	Sound Transmission Class
STF	Storefront
STL	Steel
STO	Storage
STRUCT	Structure
T	Tread
T&G	Tongue and Groove
T/	Top of ___
TRNSP	Transparent
TYP	Typical
UNO	Unless Noted Otherwise
VAR	Varies
VCT	Vinyl Composition Tile
VIF	Verify in Field
W	West
W/	With
W/O	Without
WD	Wood
WWF	Welded Wire Fabric
XPS	Extruded Polystyrene Board (Insulation)

SYMBOLS

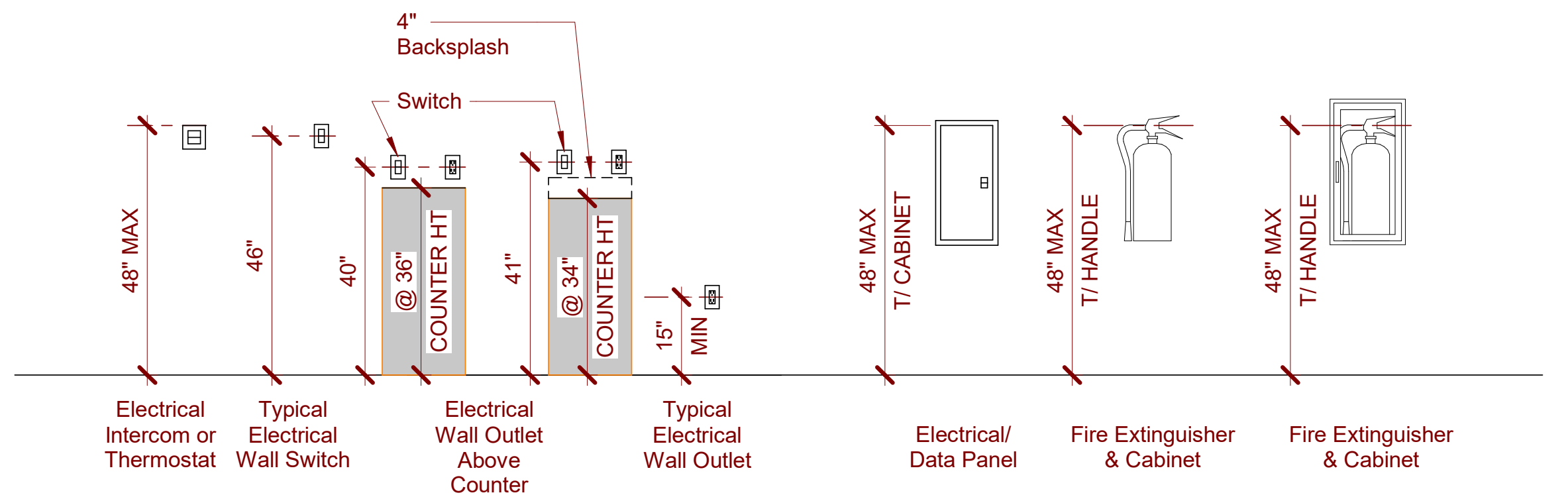
1 1 A-101 1 1	INTERIOR / EXTERIOR ELEVATION
1 A101 SIM	BUILDING / WALL SECTION
1 A101 SIM	DETAIL
1 A101 SIM	DETAIL / ENLARGED PLAN
1	COLUMN LINE
FLOOR 100'-0"	FLOOR ELEVATION LINE
100'-0"	SPOT ELEVATION
ROOM NAME 101	ROOM NAME AND NUMBER
101 A1.1 | 120 S2 | 22	DOOR NUMBER DOOR TYPE | FIRE RATING SIGN TYPE | HDWE SET — DOOR TAG (PLAN)
101 A1.1	DOOR NUMBER DOOR TYPE — DOOR TAG (ELEVATION)
A1	WINDOW OR STOREFRONT TAG
3G	WALL TYPE TAG (WALL TYPE #, MODIFIER LETTER)
31.A	KEYNOTE
X OR 1	SHEET KEYNOTE
1 / A-101	DRAWING REFERENCE
ACP-1	FINISH TAG (SEE FINISH SCHEDULE)
DW-1	APPLIANCE / ACCESSORY TAG (SEE SCHEDULES)

GENERAL PROJECT NOTES

1. The Contractor is responsible for complying with all applicable codes.
2. The Contractor shall verify all dimensions in the field. Report discrepancies to the architect for decisions prior to proceeding with the work. Do not scale the drawings.
3. The Third Floor Top of Slab Elevation of 100'- 0" on the architectural drawings.
4. Provide suitable blocking in MTL stud walls for all wall mounted materials, equipment, fixtures, and accessories.

NON-STRUCTURAL DEMOLITION NOTES

1. Remove all loose items and debris in the limit of work area. Salvage any historic items, including Owner's stored / salvaged materials.
2. The structural framing and bearing conditions shown on the drawings are based on limited existing building drawings and limited access to and observation of structural members. Verify walls are non structural prior to demolition. Where structural conditions not shown on the drawings are discovered, the contractor shall report any discrepancies between the drawings and actual conditions to the architect promptly before proceeding.
3. Refer to materials symbols legend & reference symbols legend, and Specification Section 024119 for items to be removed or to remain. Demolition Keynotes are intended to provide additional information but are not all· inclusive.
4. All equipment locations are approximate.
5. Provide safety barricades per OSHA regulations.
6. Owner to abate floot tile from work area. Owner will remove, salvage and store all casework and wall cabinets at a nearby storage area. Contractor to verify this location.
7. Reference Only - Third Floor Original Lab Casework & Equipment Layout Plan - see drawing 2 on A-103. All items will be stored at a nearby storage area. Items shown on drawing 2 on A-103 are shown for reference for re-installation, if required.
8. Refer to sheet A-401 for additional wall mounted items that are to remain.



TYPICAL MOUNTING HEIGHTS 2
3/8" = 1'-0" G-002

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KEYNOTE LEGEND

GENERAL CODE PLAN NOTES

1. Fire ratings are shown based on code mininum requirements for fire barriers, fire walls and partitions. Penetrations through fire-rated construction and fire-rated joint system shall match or exceed these ratings.

CODE PLAN LEGEND

Limit of Work
Property Line

Egress Path
Accessible Route

Smoke Rated Wall / Partition
Smoke Barrier (1-HR)
30-Min Rated Wall / Partition
1-HR Rated Wall / Partition
2-HR Rated Wall / Partition
3-HR Rated Wall / Partition

ROOM TAG LEGEND

ROOM NAME — Room Name
101 — Room Number
150 SF — Room Area
100 OCC — Occupant Load (when individually calculated)

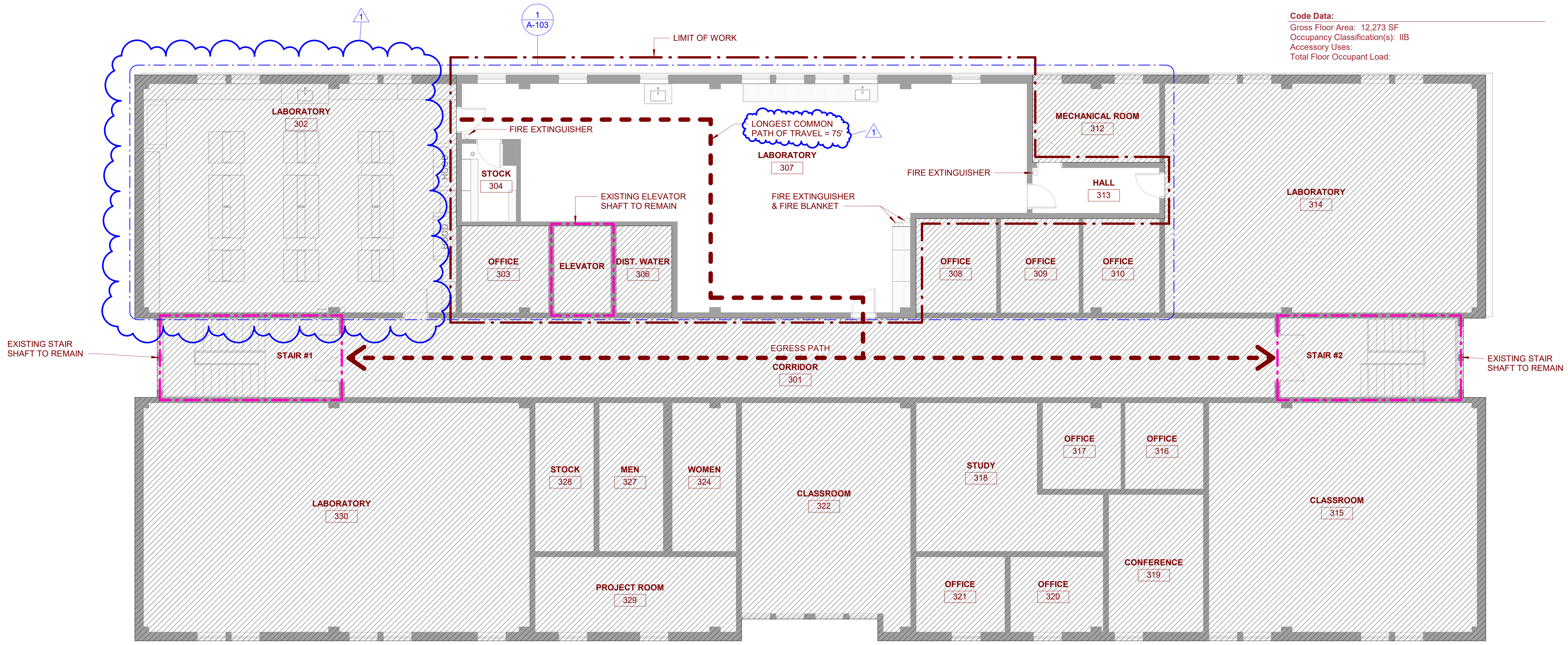
PWWG PROJECT NUMBER		22304.00
CONSTRUCTION DOCUMENTS		08/02/24
REVISIONS		
NO.	DESCRIPTION	DATE
1	Addendum #3	09/25/2024

208 University Drive,
West Liberty, WV 26074
West Liberty University - Arnett Hall

CODE PLANS

G-002

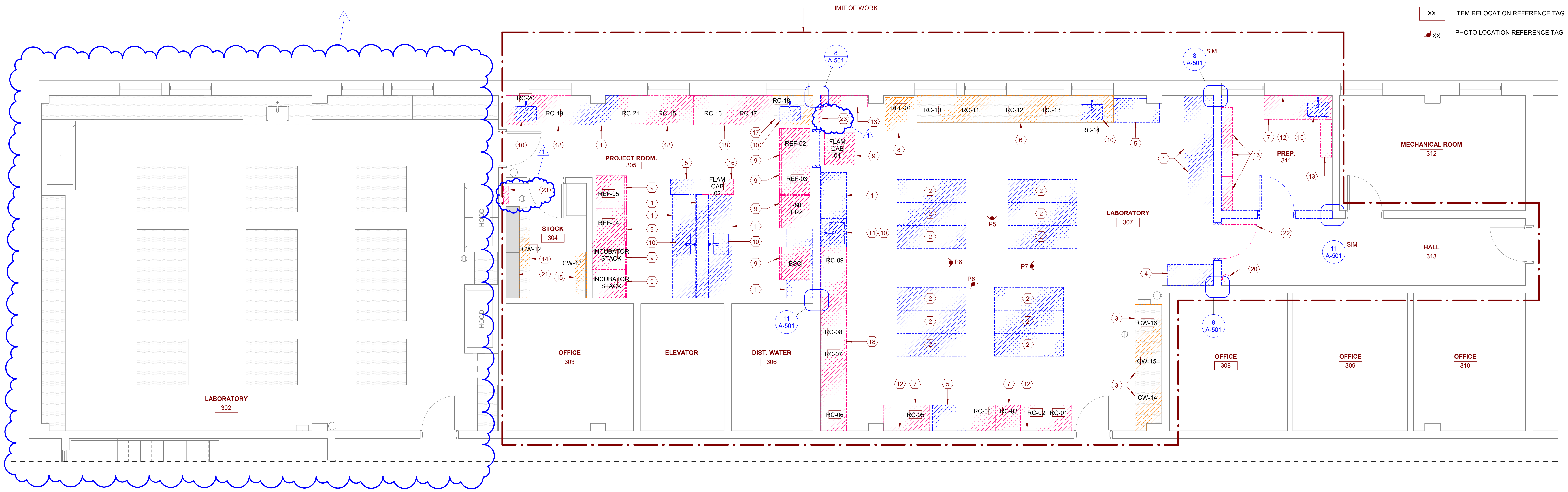
Code Data:
Gross Floor Area: 12,273 SF
Occupancy Classification(s): IIB
Accessory Uses:
Total Floor Occupant Load:



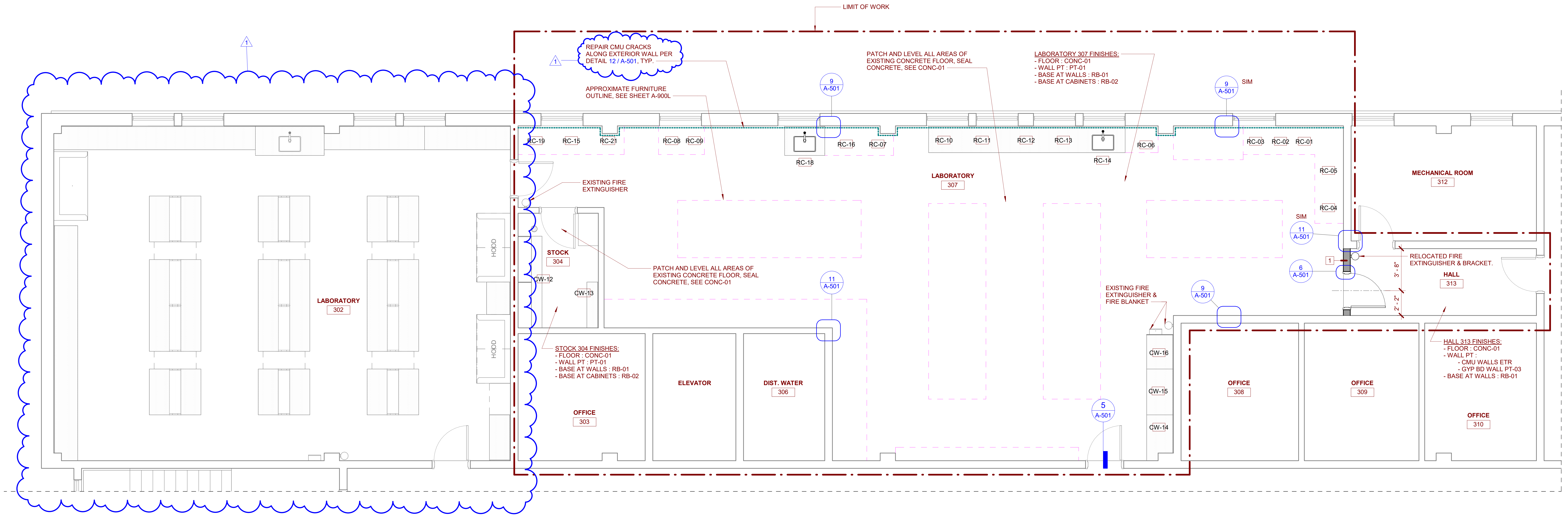
CODE PLAN 1
1/8" = 1'-0" G-002

REFERENCE LEGEND

▨	EXISTING ITEM TO REMAIN IN PLACE
▨	EXISTING ITEM TO BE SALVAGED & REINSTALLED IN SAME LOCATION
▨	EXISTING ITEM TO BE SALVAGED & REINSTALLED IN NEW LOCATION. SEE LAB SHEETS FOR NEW LOCATIONS
▨	EXISTING ITEM TO BE DEMOLISHED
XX	ITEM RELOCATION REFERENCE TAG
XX	PHOTO LOCATION REFERENCE TAG



REFERENCE ONLY - THIRD FLOOR ORIGINAL LAB CASEWORK & EQUIPMENT LAYOUT PLAN 2
1/4" = 1'-0" A-103



THIRD FLOOR PLAN 1
1/4" = 1'-0" A-103

A-103 - THIRD FLOOR PLAN, REV #1 (Addendum #2)

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SHEET KEYNOTES - DEMO

1 DEMOLISH BASE CABINETS & COUNTERTOP.
2 DEMOLISH ROLLING TABLE.
3 SALVAGE BASE CABS, WALL CABS . REINSTALL CABINETS & COUNTERTOP IN SAME LOCATION.
4 DEMOLISH BASE AND WALL CABINETS.
5 DEMOLISH TALL STORAGE
6 SALVAGE BASE CABINETS & REINSTALL CABINETS IN SAME LOCATION.
7 SALVAGE BASE CABS. DEMO COUNTERTOP. REINSTALL BASE CABINET IN NEW LOCATION.
8 EXISTING EQUIPMENT TO REMAIN IN EXISTING LOCATION.
9 EXISTING EQUIPMENT TO BE RELOCATED.
10 DEMOLISH SINK.
11 DEMOLISH SINK BASE CABINET.
12 DEMOLISH WALL CABINETS.
13 SALVAGE AND RELOCATE TALL CABINET.
14 SALVAGE BASE CABINET. REINSTALL CABINET IN SAME LOCATION.
15 SALVAGE TALL CABINET. REINSTALL TALL CABINET IN SAME LOCATION.
16 SALVAGE AND RELOCATE STORAGE CABINET.
17 SALVAGE SINK BASE CABINET. DEMO COUNTERTOP. REINSTALL SINK BASE CABINET IN SAME LOCATION.
18 SALVAGE BASE CABINETS. REINSTALL CABINETS IN NEW LOCATION.
20 RELOCATE EXISTING FIRE EXTINGUISHER & BRACKET.
21 EXISTING WALL CABS TO REMAIN IN PLACE.
22 SALVAGE EXISTING WOOD DOOR & HARDWARE FOR REUSE.
23 REMOVE AND RELOCATE ELECTRICAL SUBPANEL AS NOTED IN LAB SHEETS AND MEP NARRATIVE.

PWWG PROJECT NUMBER 22304.00
CONSTRUCTION DOCUMENTS 08/02/24
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NO.	DESCRIPTION	DATE
1	Addendum #3	09/25/2024

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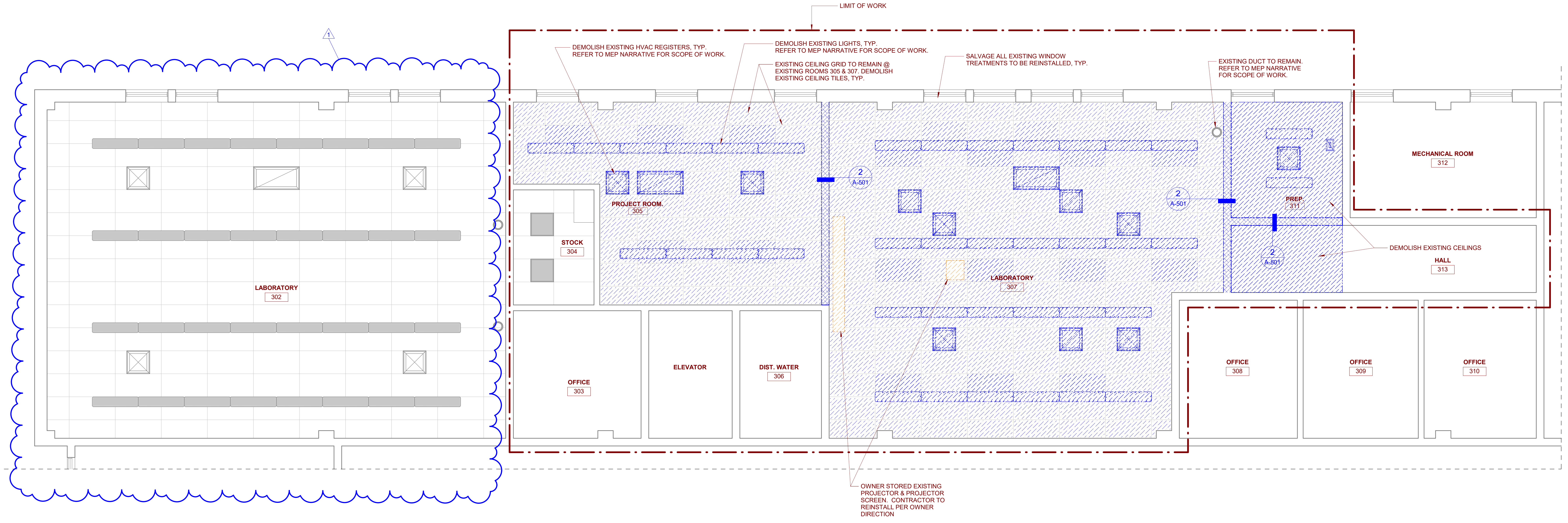
West Liberty University - Arnett Hall

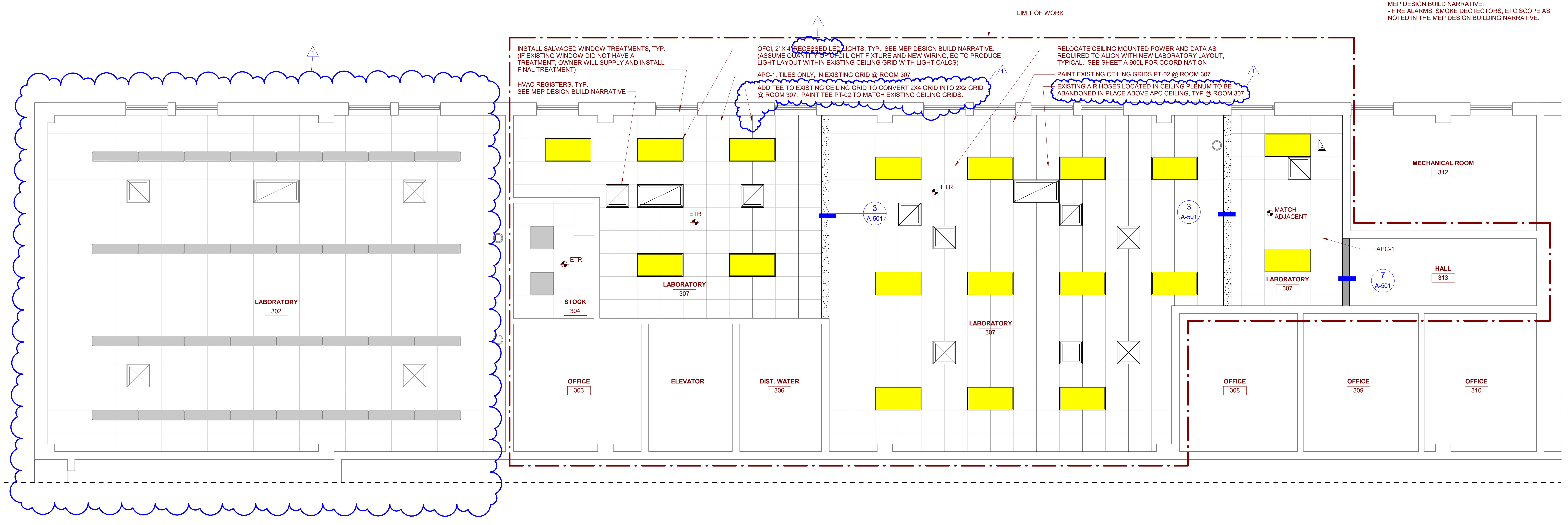
THIRD FLOOR PLAN

A-103



THIRD FLOOR REFLECTED CEILING DEMOLITION PLAN 2
1/4" = 1'-0" A-103c

NOTES:
- EXISTING SPRINKLERS ARE TO REMAIN IN PLACE AND BE FIT INTO THE NEW CEILINGS, TYPICAL. SEE MEP DESIGN BUILD NARRATIVE.
- FIRE ALARMS, SMOKE DECTECTORS, ETC SCOPE AS NOTED IN THE MEP DESIGN BUILDING NARRATIVE.



PROPOSED THIRD FLOOR REFLECTED CEILING PLAN 1
1/4" = 1'-0" A-103c

A-103c - THIRD FLOOR REFLECTED CEILING PLAN, REV #1 (Addendum #2)

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THIRD FLOOR REFLECTED CEILING PLAN

A-103c

EXISTING LIGHT FIXTURES, SEE NOTES ON A-103c FOR SCOPE, TYP.

EXISTING SIGNAGE TO BE REMOVED AND SALVAGED BY OWNER, TYP.

EXISTING PROJECTOR SCREEN, SEE NOTES ON A-103c FOR SCOPE, TYP.

EXISTING CEILING MOUNTED ELECTRICAL TO BE RELOCATED TO MATCH NEW LABORATORY LAYOUT, SEE PLANS AND RCP'S, TYPICAL

PHOTO - P8

EXISTING HVAC REGISTERS, SEE NOTES ON A-103c FOR SCOPE, TYP.

EXISTING CEILING MOUNTED OUTLETS, SEE NOTES ON A-103c FOR SCOPE, TYP.

EXISTING DUCT TO REMAIN AND RECEIVE PAINT

RELOCATE ELECTRICAL ITEMS LOCATED IN WALLS TO BE DEMOLISHED, TYPICAL

PHOTO - P7

EXISTING SURFACE MOUNTED RACEWAYS AND ELECTRICAL BOXES TO REMAIN, TAPE OFF AND PAINT AROUND AS REQUIRED, TYPICAL

MISC. EXISTING SURFACE MOUNTED ITEMS TO REMAIN, TAPE OFF AND PAINT AROUND AS REQUIRED, TYPICAL

EXISTING CMU WALLS TO RECEIVE PAINT, TYPICAL

PHOTO - P6

1

EXISTING AIR HOSES LOCATED IN CEILING PLENUM TO BE ABANDONED IN PLACE ABOVE APC CEILING, TYP.

EXISTING SPRINKLER HEADS, SEE NOTES ON A-103c FOR SCOPE, TYP.

REMOVE EXISTING UNUSED WALL MOUNTED WINDOW TREATMENT BRACKETS, PAINT , TYPICAL

PHOTO - P5

EXISTING LABORATORY 307 IMAGES | 2
1 1/2" = 1'-0" | A-401

1

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1	Addendum #3	09/25/2024

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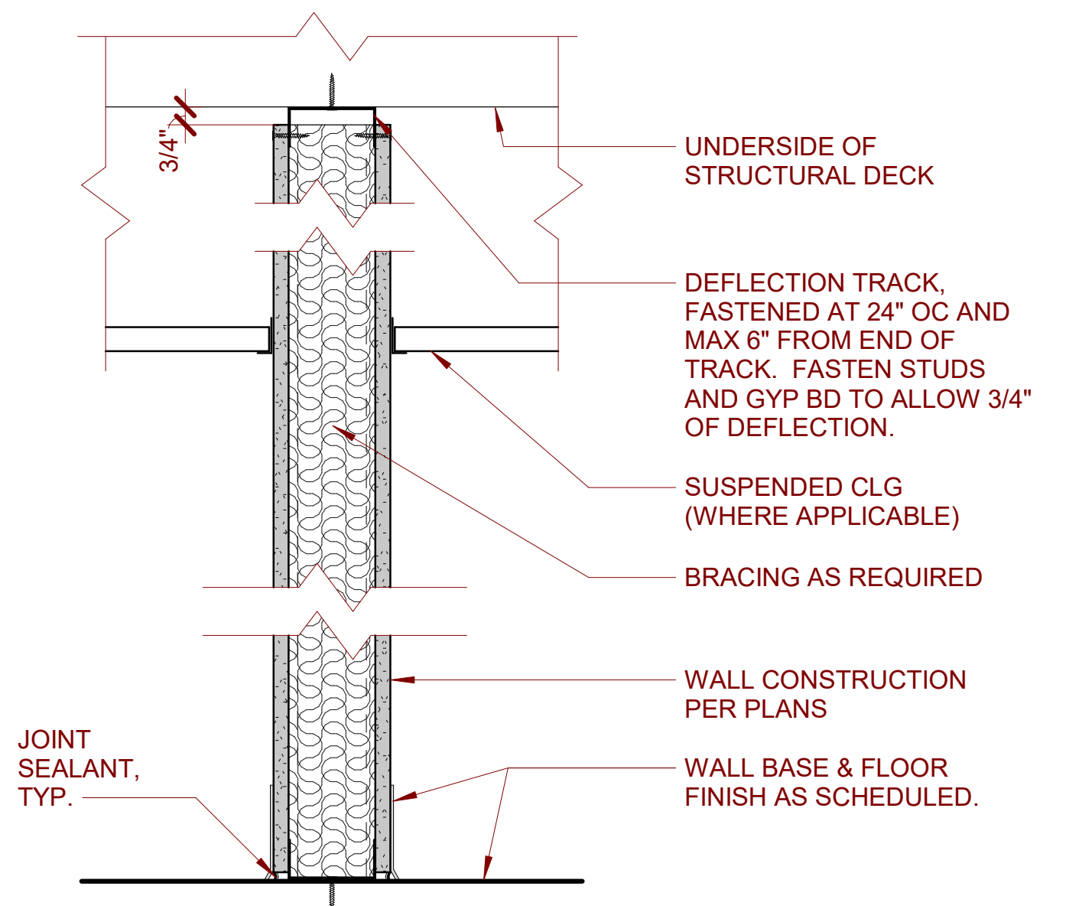
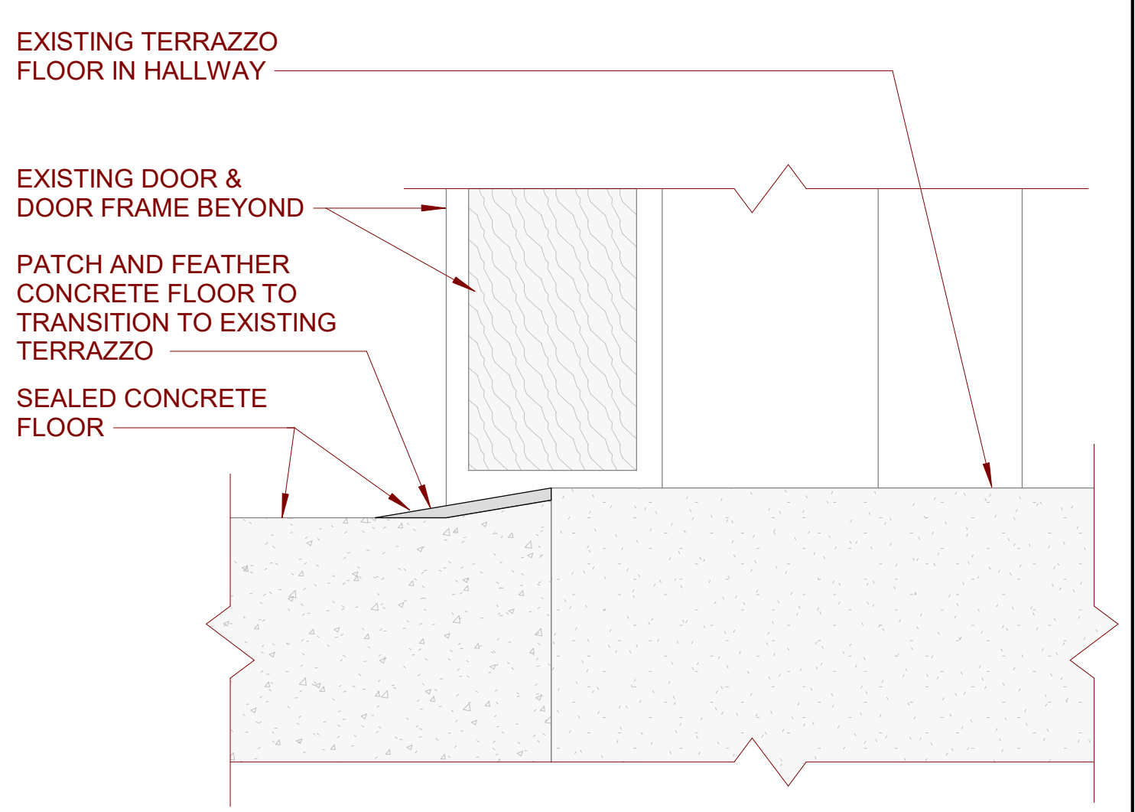
EXISTING INTERIOR PHOTOS

A-401

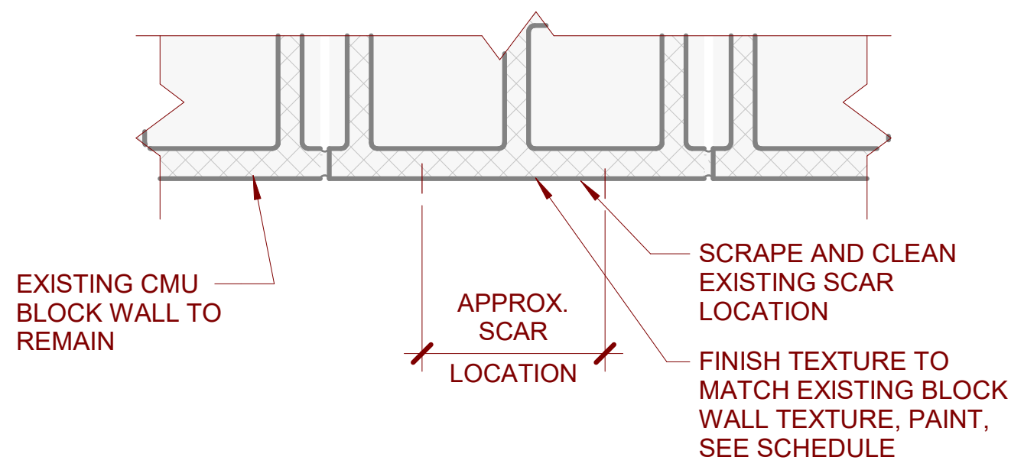
FINISHES					
TYPE MARK	FINISH DESCRIPTION	MANUFACTURER	PRODUCT LINE	COLOR/STYLE	NOTES
PAINT					
PT-01	PAINT	SHERWIN WILLIAMS		TBD	WALL COLOR
PT-02	PAINT	SHERWIN WILLIAMS		BLACK	CEILING GRID AND TEE COLOR
PT-03	PAINT	SHERWIN WILLIAMS		MATCH EXISTING	MATCH CMU WALL COLOR IN HALL 313
MC-01	CLEAR MASONRY SEALER	SEE SPECIFICATIONS	SEE SPECIFICATIONS	SEE SPECIFICATIONS	
FLOORING					
CONC-01	SEALED CONCRETE			NATURAL	SEE MC-01
CEILING					
APC-01	ACOUSTIC PANEL CEILING	ARMSTRONG	ULTIMA	WHITE - TEGULAR	24" X 24" GRID WIDTH AND PERIMETER WALL ANGLE TO MATCH EXISTING GRID DIMENSION IN LAB 307
WALL BASE					
RB-01	RUBBER WALL BASE	JOHNSONITE	THERMOSET RUBBER	TBD	4" TALL BASE AT WALLS
RB-02	RUBBER WALL BASE	JOHNSONITE	THERMOSET RUBBER	TBD	3" TALL BASE AT EXISTING / SALVAGED CABINETS



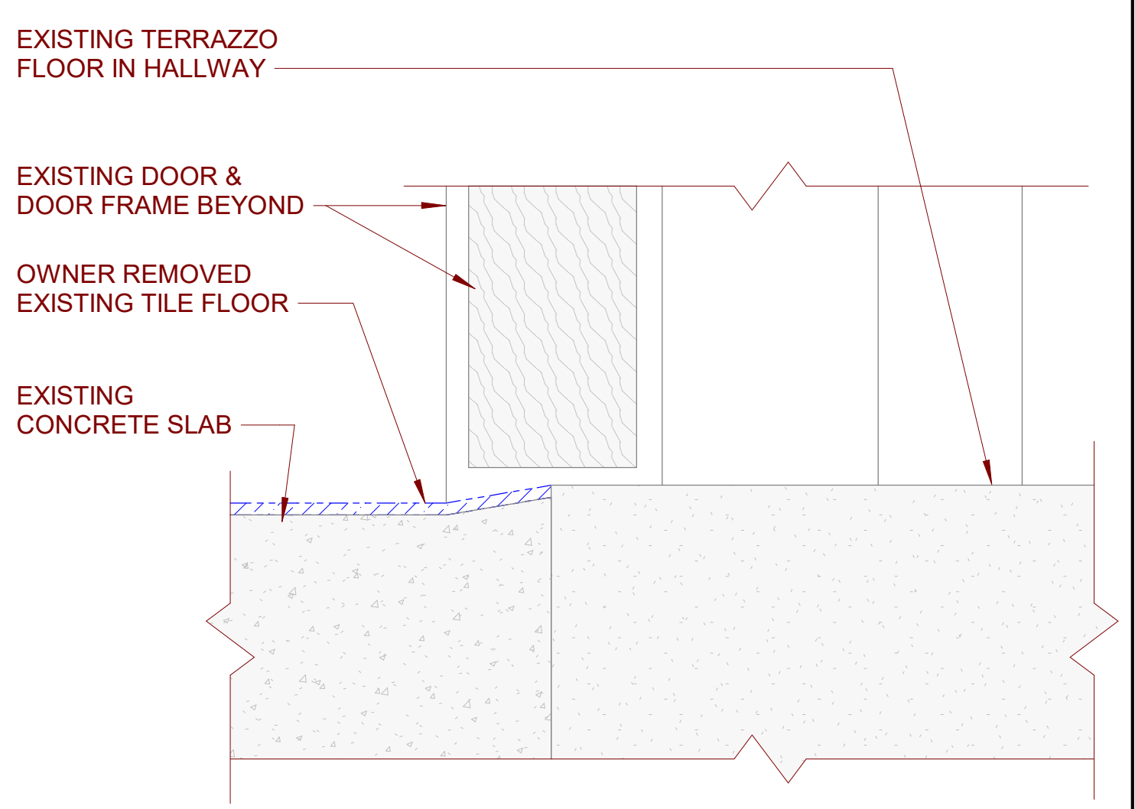
INTERIOR WALL SECTION - GYP BD TO DECK 10
1 1/2" = 1'-0" A-501



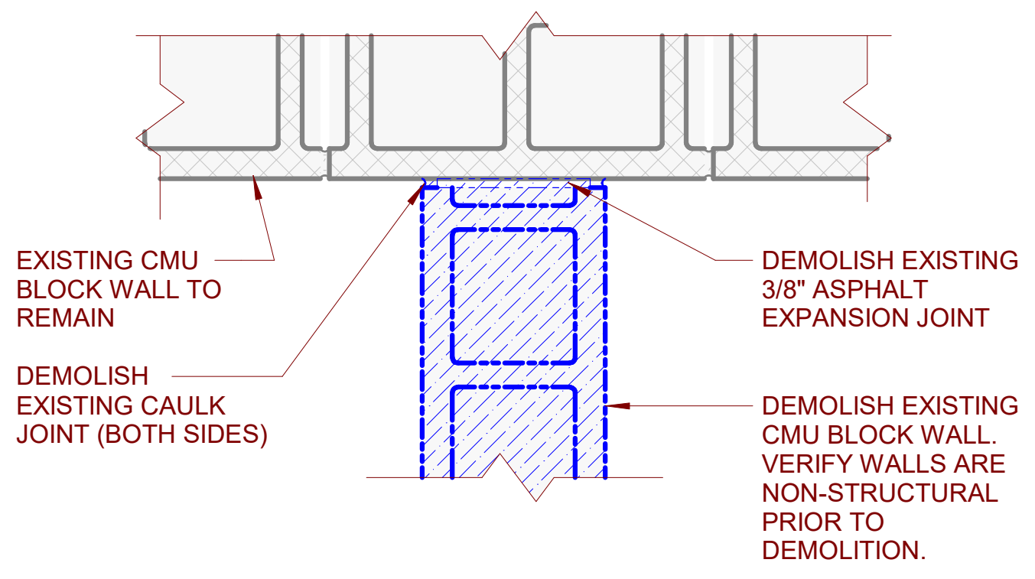
TERRAZZO TO CONCRETE FLOOR TRANSITION 5
6" = 1'-0" A-501



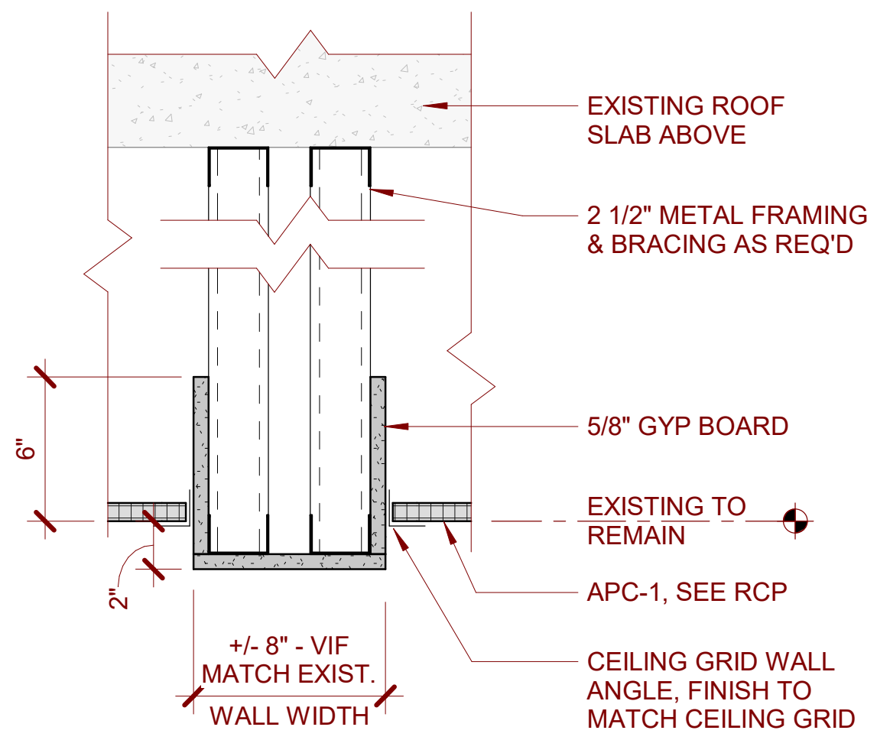
CMU WALL PATCH DETAIL 9
1 1/2" = 1'-0" A-501



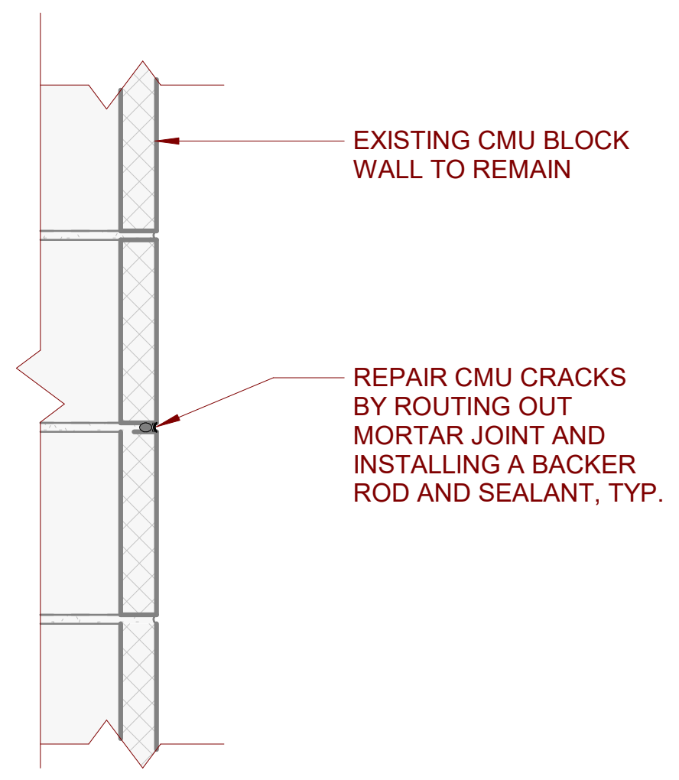
TERRAZZO TO CONCRETE FLOOR TRANSITION 4
6" = 1'-0" A-501



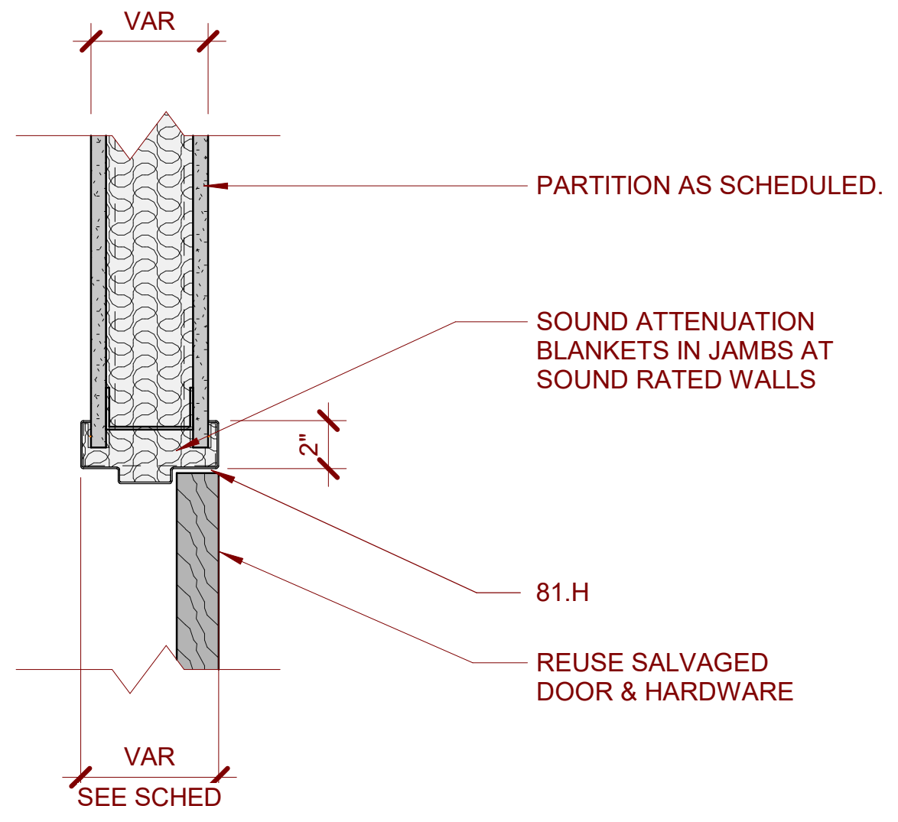
DEMO CMU WALL DETAIL 8
1 1/2" = 1'-0" A-501



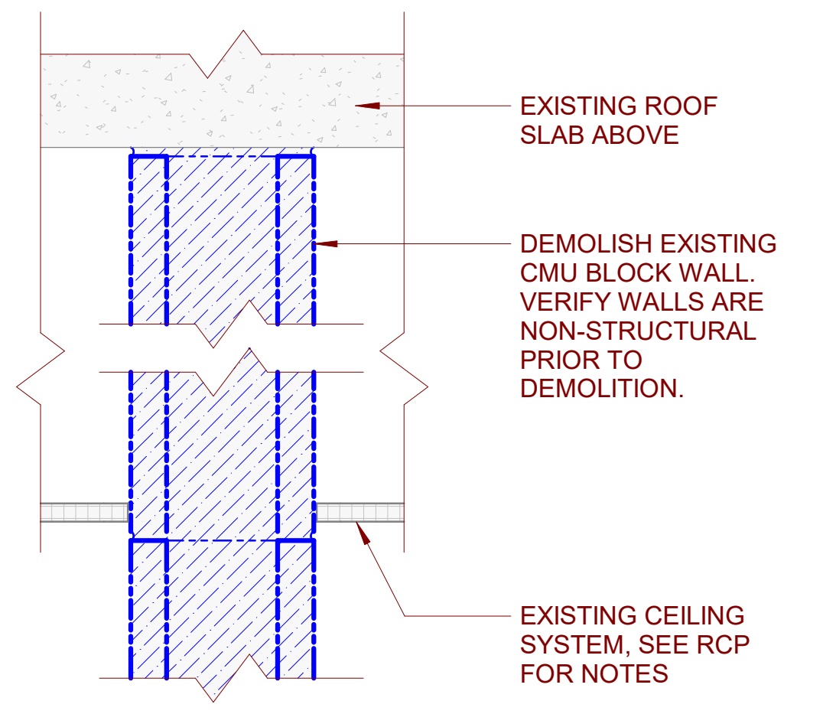
GYP HEADER DETAIL 3
1 1/2" = 1'-0" A-501



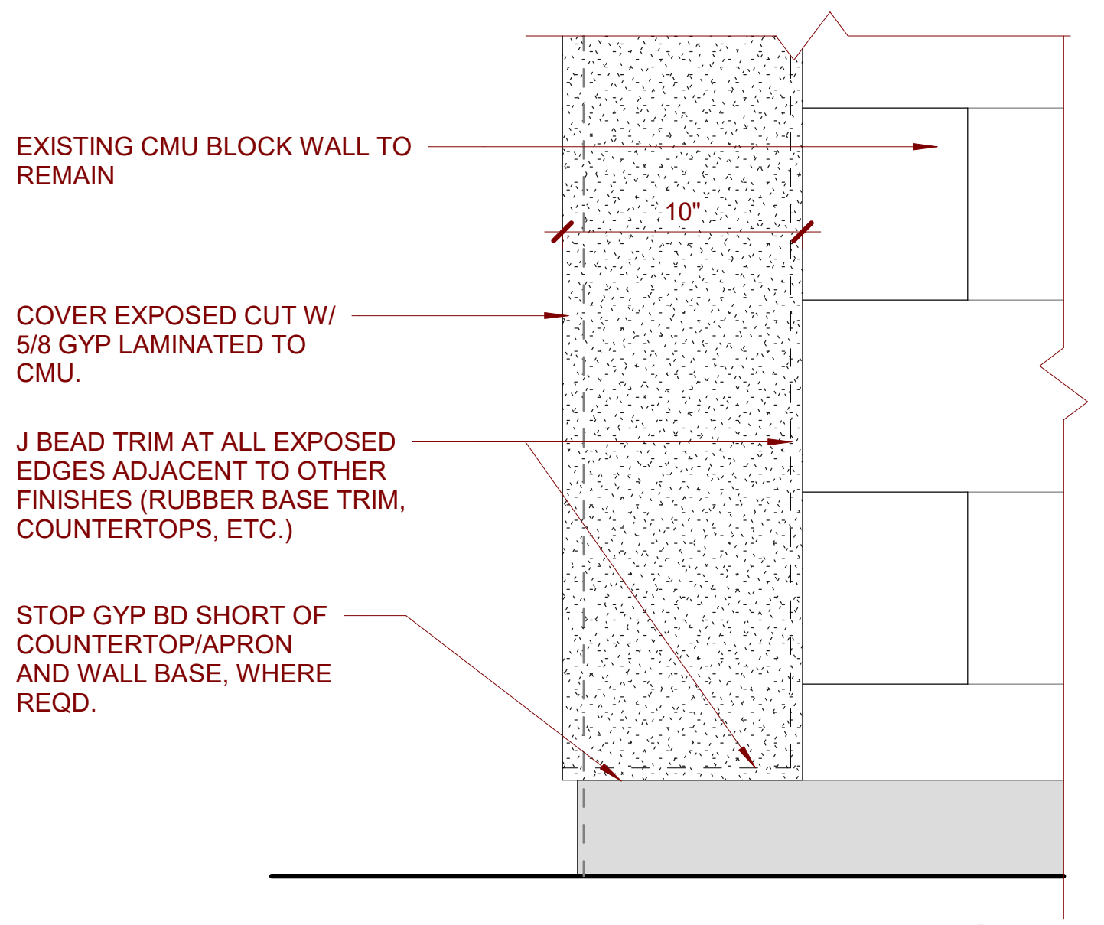
CMU WALL CRACK REPAIR DETAIL 12
1 1/2" = 1'-0" A-501



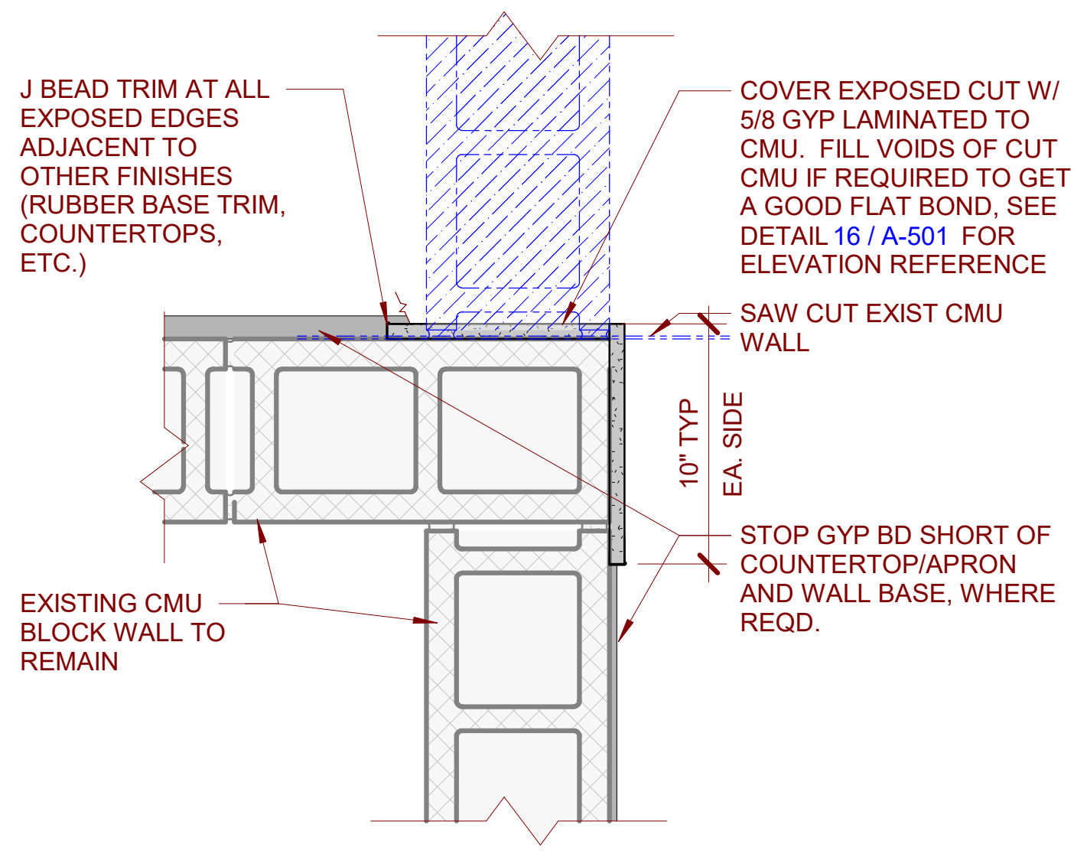
TYP HM HEAD DETAIL 7
1 1/2" = 1'-0" A-501



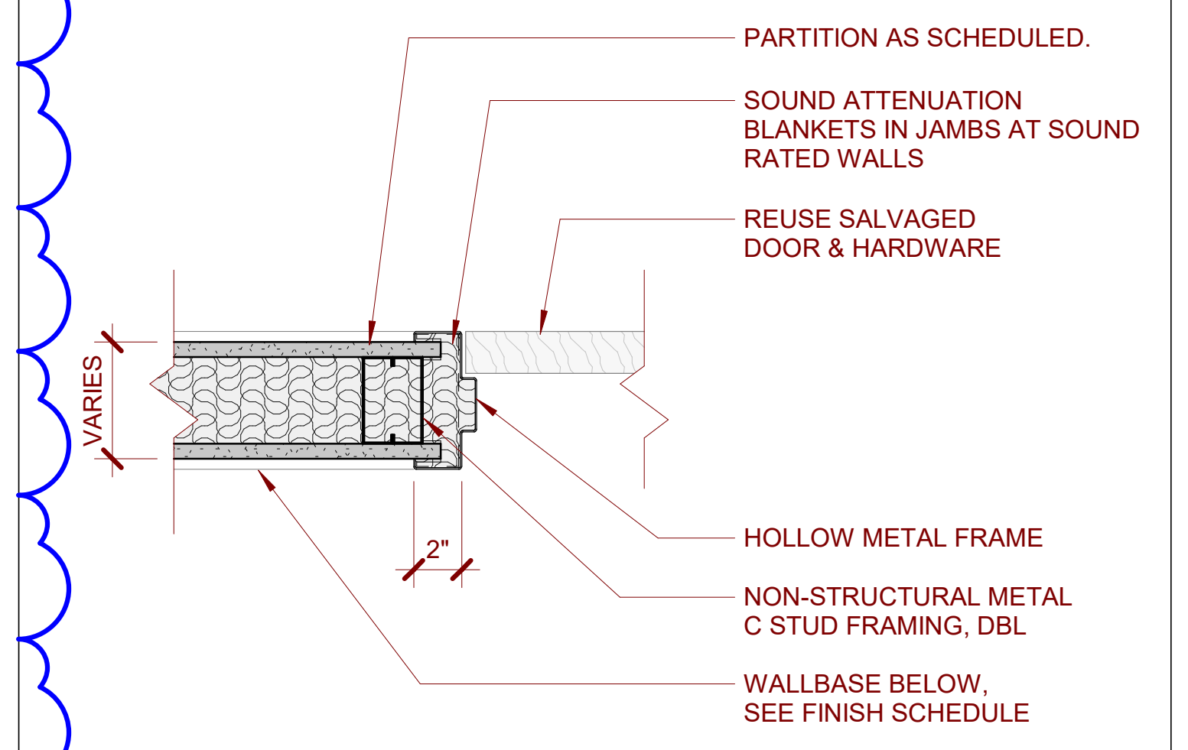
DEMO CMU WALL DETAIL 2
1 1/2" = 1'-0" A-501



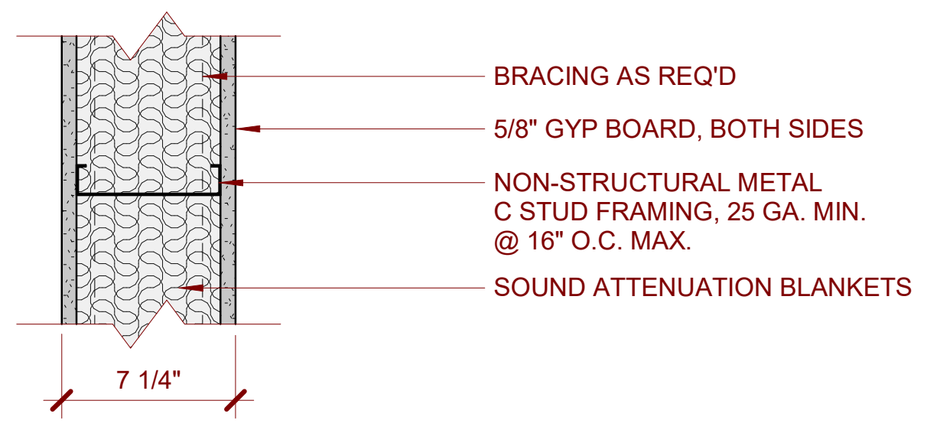
CMU WALL ELEVATION DETAIL 16
1 1/2" = 1'-0" A-501



CMU WALL PLAN DETAIL 11
1 1/2" = 1'-0" A-501



TYP HM JAMB DETAIL 6
1 1/2" = 1'-0" A-501



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GYP BD PARTITION 1

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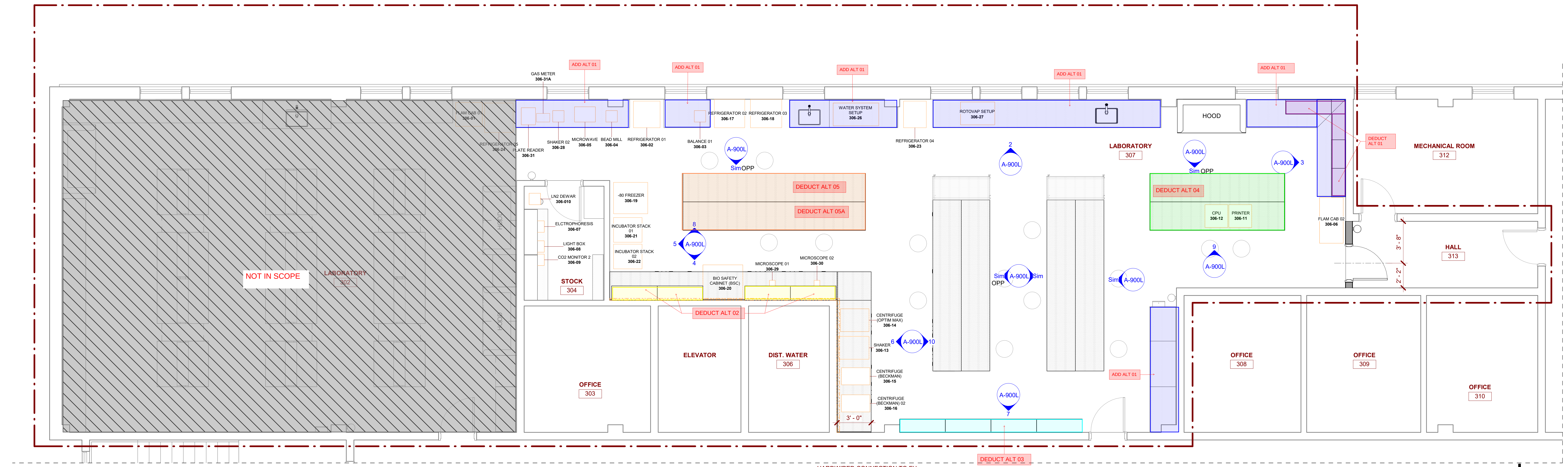
KEYNOTE LEGEND	
81.H	Hollow Metal Frame / Mullion

PWWG PROJECT NUMBER		22304.00
CONSTRUCTION DOCUMENTS		08/02/24
REVISIONS		
NO.	DESCRIPTION	DATE
1	Addendum #3	09/25/2024

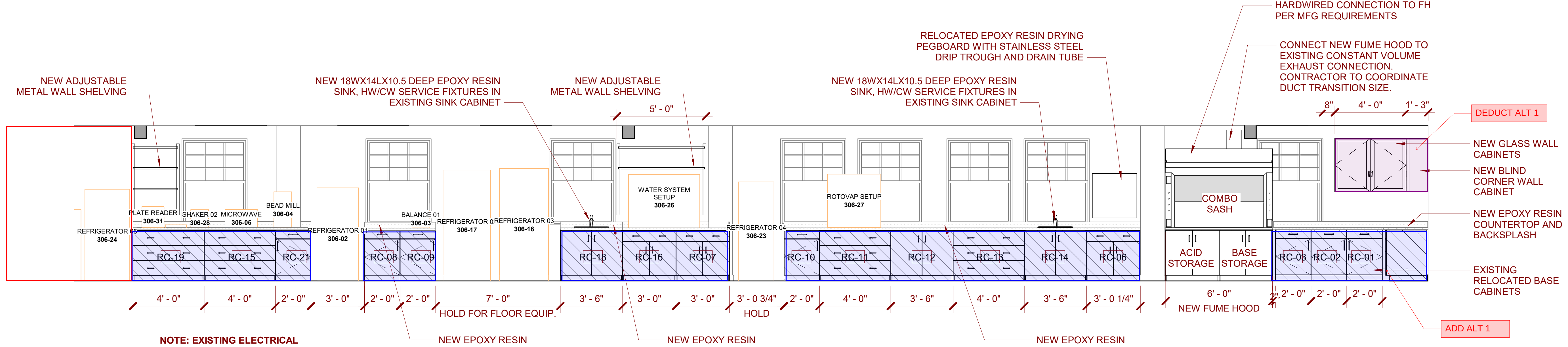
208 University Drive,
West Liberty, WV 26074
West Liberty University - Arnett Hall

DETAILS

A-501

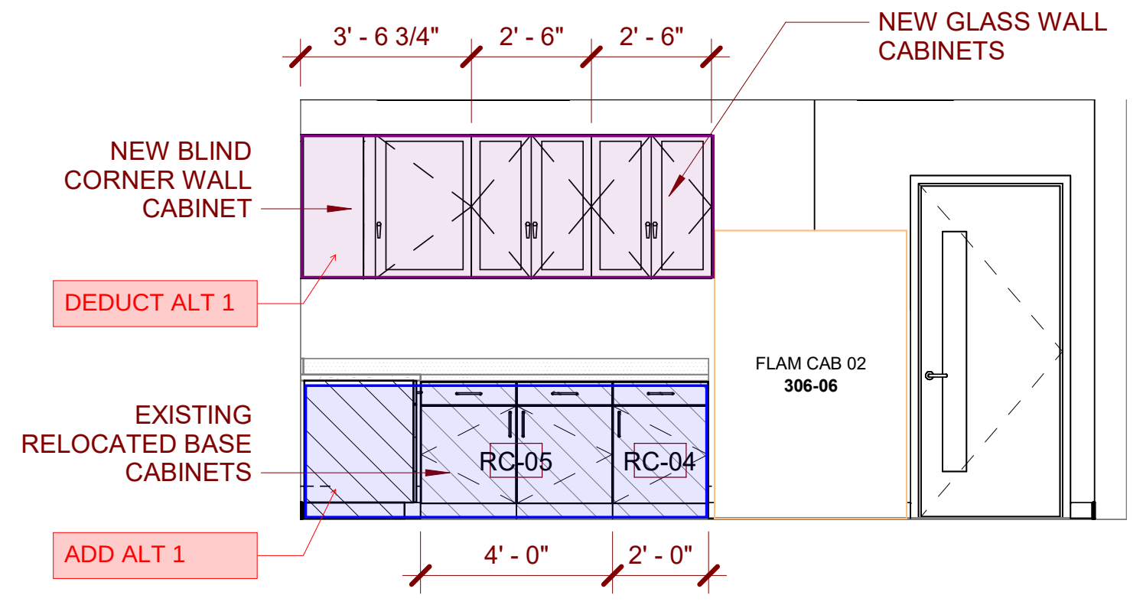


THIRD FLOOR PLAN | 1
1/4" = 1'-0" | A-900L



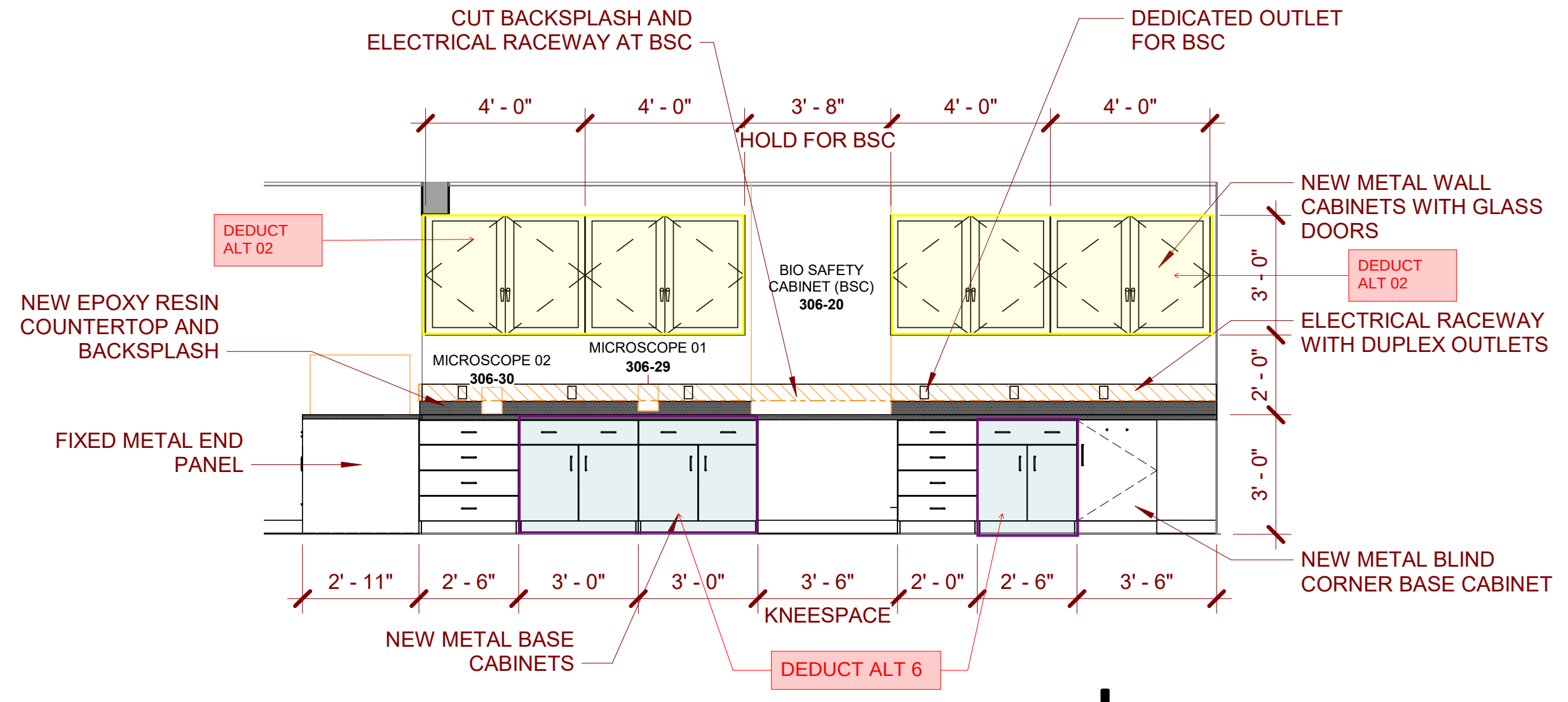
NOTE: EXISTING ELECTRICAL AND DATA OUTLETS TO REMAIN IN PLACE UNO.

Interior Elevation | 2
1/4" = 1'-0" | A-900L

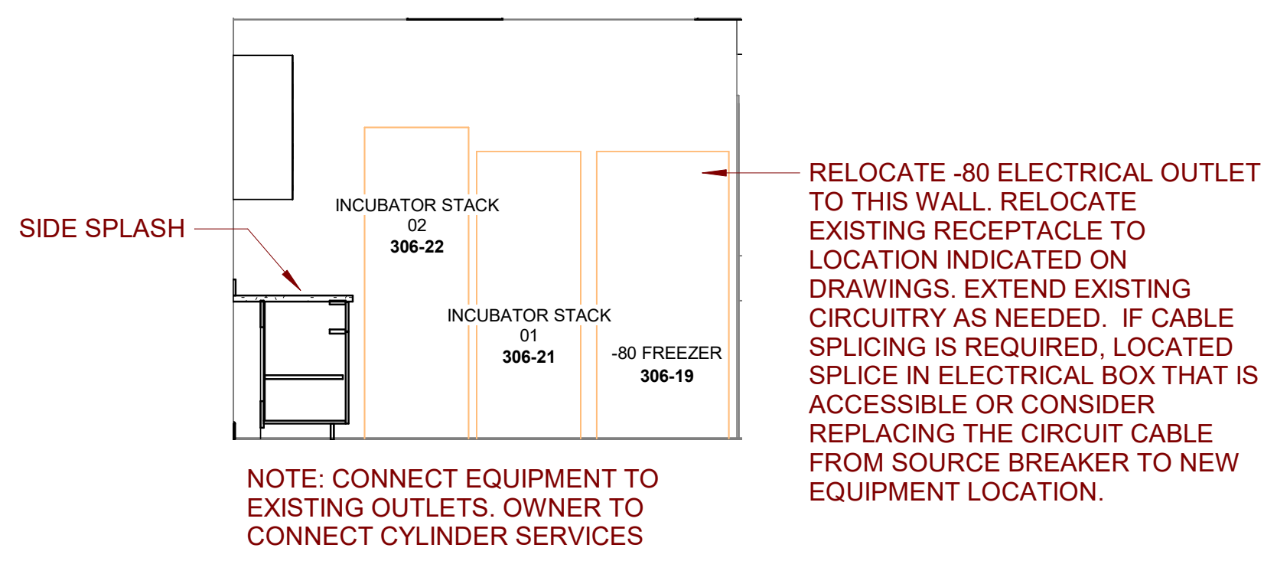


NOTE: EXISTING ELECTRICAL AND DATA OUTLETS TO REMAIN IN PLACE UNO.

Interior Elevation | 3
1/4" = 1'-0" | A-900L



Interior Elevation | 4
1/4" = 1'-0" | A-900L



Interior Elevation | 5
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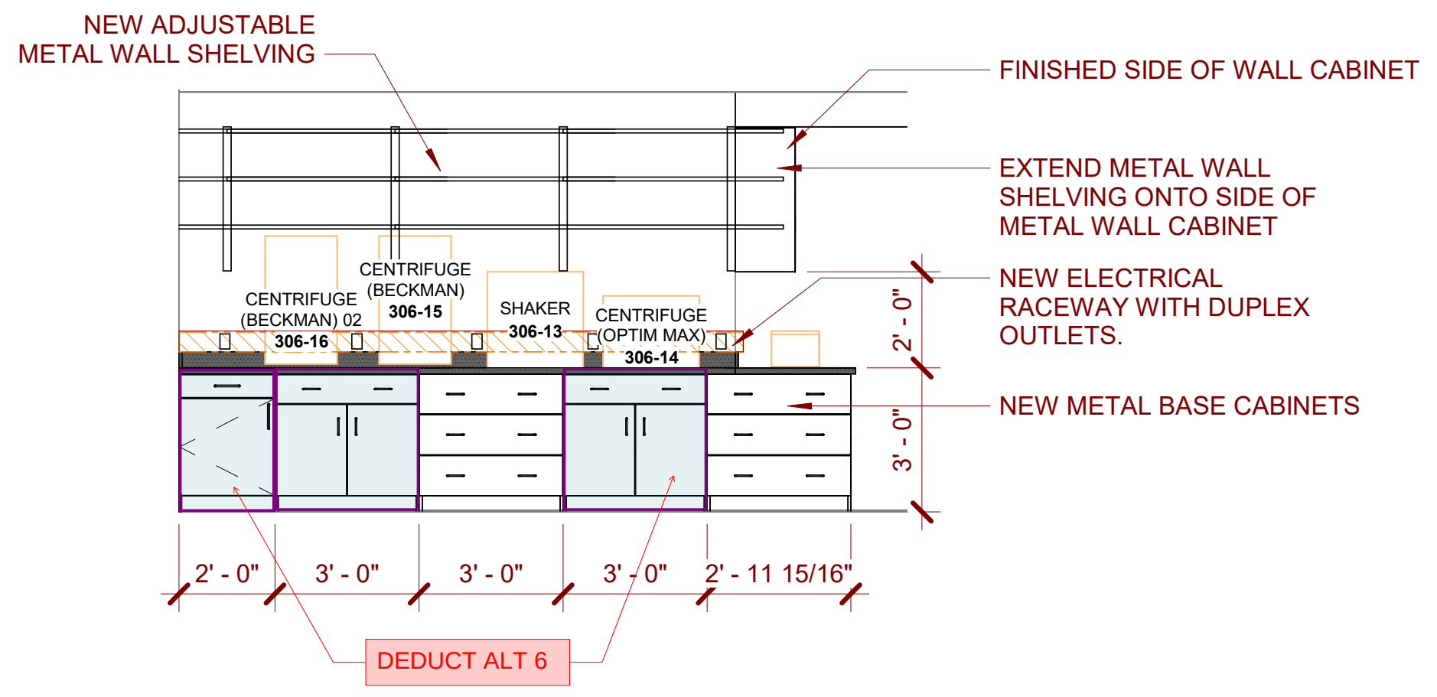
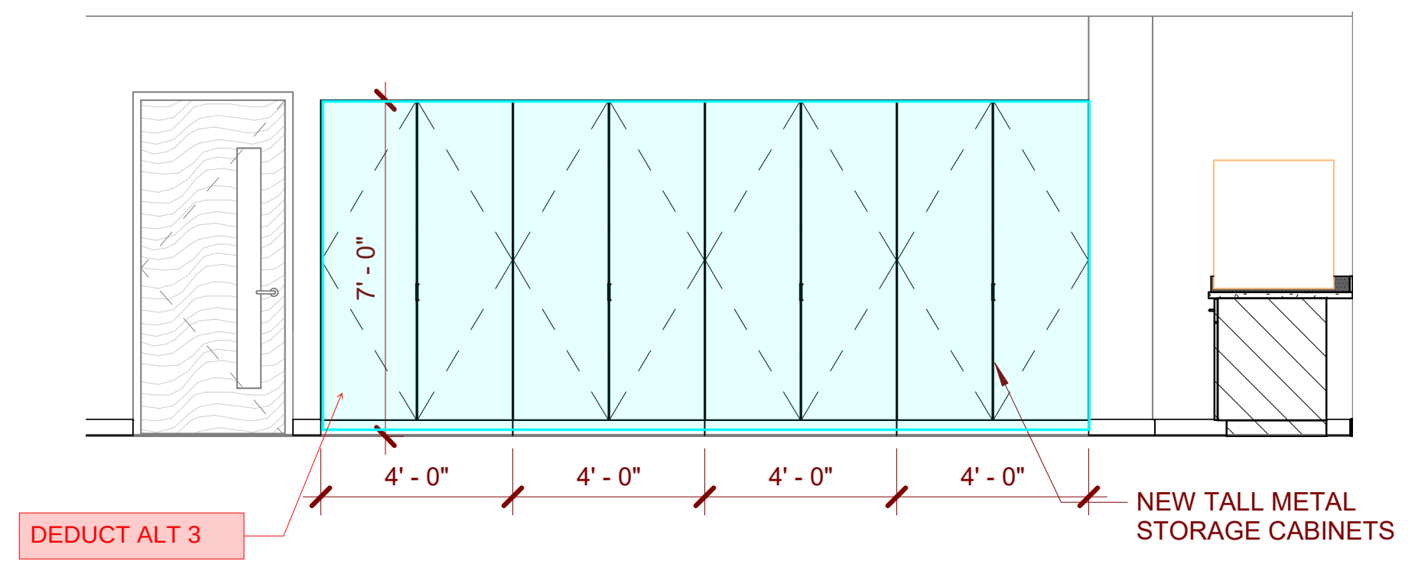


Interior Elevation | 6
1/4" = 1'-0" | A-900L



Interior Elevation | 7
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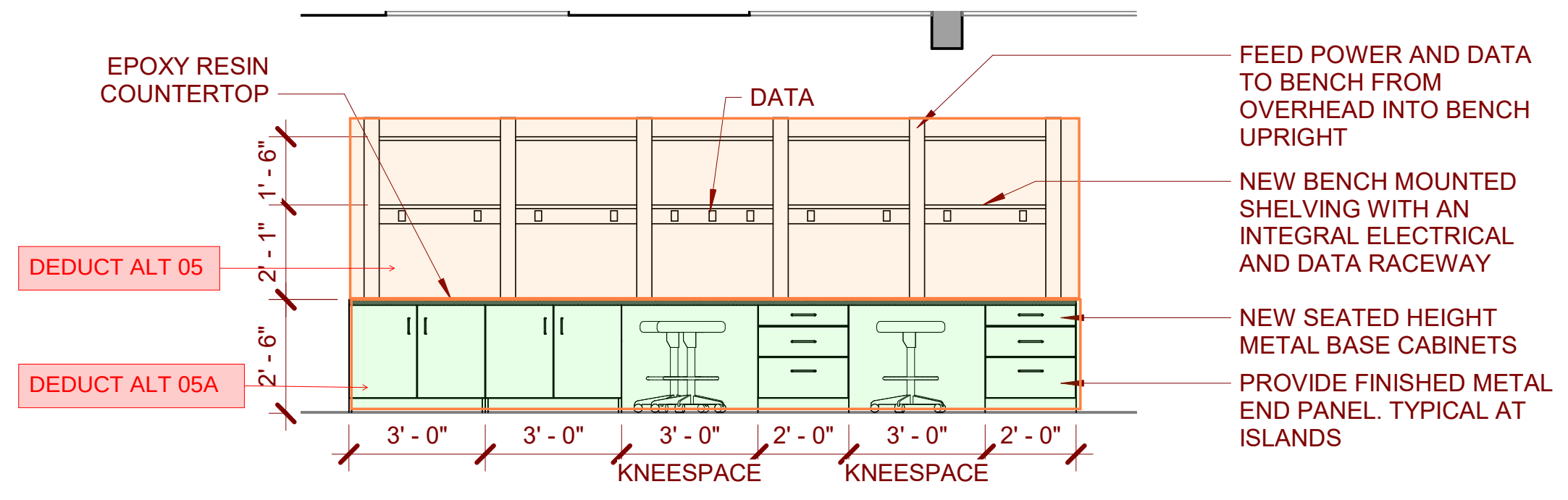
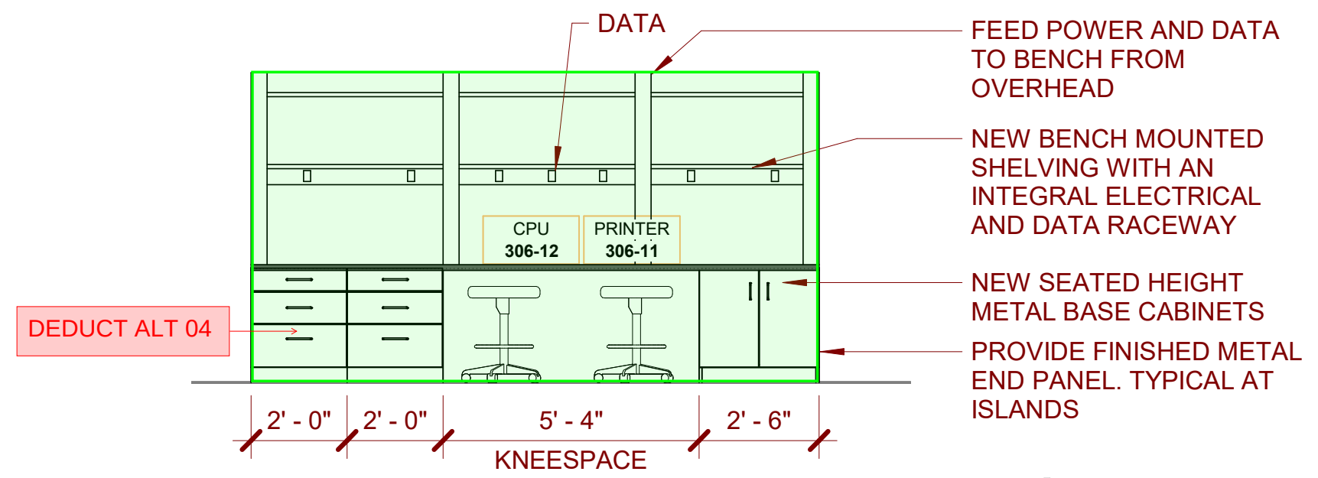


Interior Elevation | 8
1/4" = 1'-0" | A-900L

NOTE FOR FEEDING ISLAND BENCHES:
DEMOLISH WIRE AND CONDUIT BACK TO SOURCE PANEL AND PROVIDING NEW WIRE AND CONDUIT. AT OWNER'S DISCRETION, CONTRACTOR SHALL FIELD-VERIFY CONDITION OF EXISTING CONDUIT / CABLE RUN AND ASSESS SERVICEABILITY FOR REUSE.



Interior Elevation | 9
1/4" = 1'-0" | A-900L

NOTE FOR FEEDING ISLAND BENCHES:
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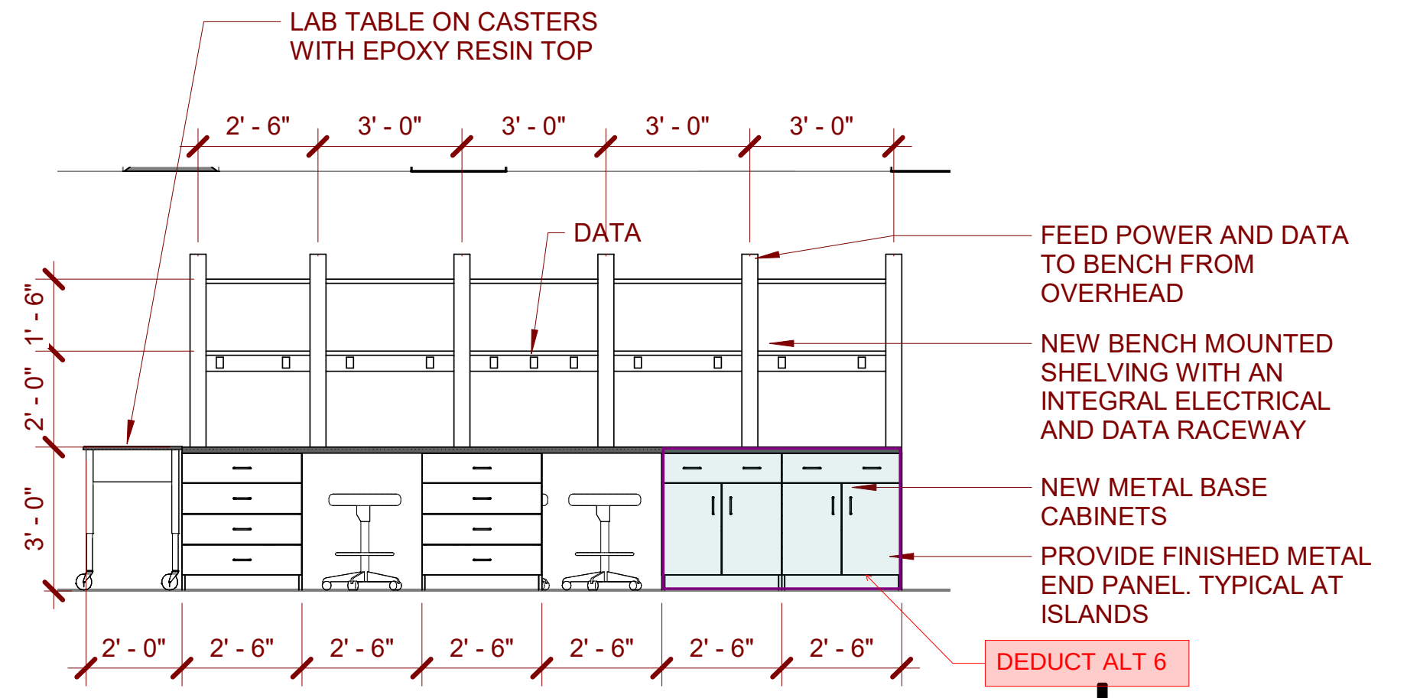

Interior Elevation | 10
1/4" = 1'-0" | A-900L

NOTE FOR FEEDING ISLAND BENCHES:
DEMOLISH WIRE AND CONDUIT BACK TO SOURCE PANEL AND PROVIDING NEW WIRE AND CONDUIT. AT OWNER'S DISCRETION, CONTRACTOR SHALL FIELD-VERIFY CONDITION OF EXISTING CONDUIT / CABLE RUN AND ASSESS SERVICEABILITY FOR REUSE.

A-900L - THIRD FLOOR LAB PLAN

8/2/2024 4:30:54 PM

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PWWG PROJECT NUMBER 22304.00
CONSTRUCTION DOCUMENTS 08/02/24

REVISIONS

NO.	DESCRIPTION	DATE
1	Addendum #3	09/25/2024

208 University Drive,
West Liberty, WV 26074
West Liberty University - Arnett Hall

THIRD FLOOR LAB PLAN

A-900L

LAB INFORMATION

LAB COMPONENTS AND FINISHES

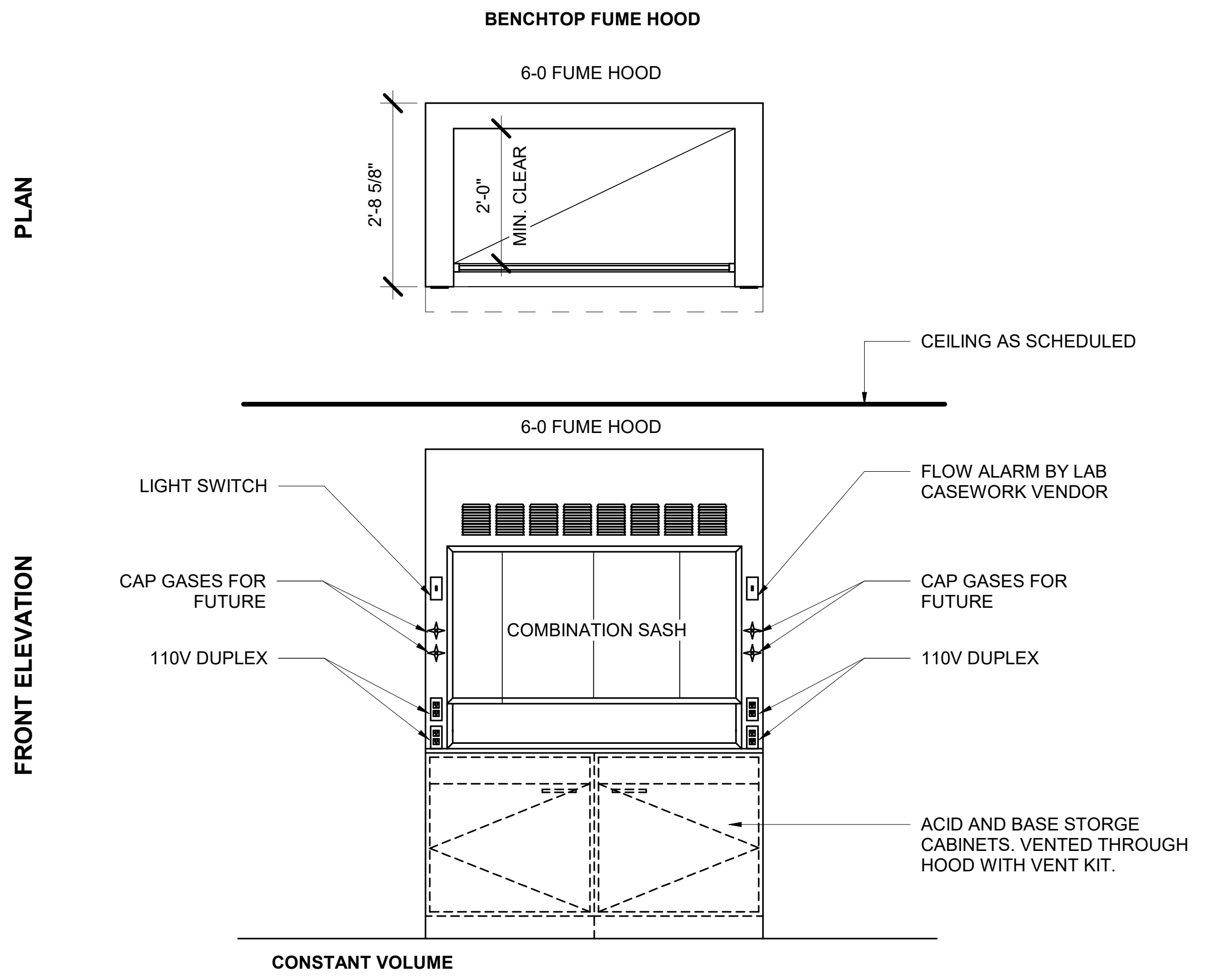
ADD ALT 01

CODE:	DESCRIPTION: PHENOLIC RESIN	MANUFACTURER: FUNDERMAX OR TRESPA	STYLE:	COLOR/FINISH:
ERS	~~EPOXY~~ RESIN COUNTERTOP AND SINKS	~~DURCON OR KEMRESIN~~	1" THICK	BLACK
LT-X	LABORATORY TABLE	KEWAUNEE SCIENTIFIC	FREESTANDING TABLE	BRIGHT WHITE WITH EPOXY TOP
LC-X	BENCH MOUNTED SHELF UPRIGHTS	KEWAUNEE SCIENTIFIC	ALPHA BENCH MOUNTED	BRIGHT WHITE - METAL SHELVING
RC-X	SALVAGED WOOD LAB CASEWORK	KEWAUNEE SCIENTIFIC	EXISTING	EXISTING
LC-X	NEW METAL LAB CASEWORK	KEWAUNEE SCIENTIFIC	INSET STEEL FIXED CASEWORK	BRIGHT WHITE
-	LAB CASEWORK HARDWARE	KEWAUNEE SCIENTIFIC	MATCH EXISTING	MATCH EXISTING
-	LAB SINK FIXTURES	WATERSAVER / KEWAUNEE SCIENTIFIC	COLORTECH	CHROME
LS-X	WALL MOUNTED LAB SHELVING	KEWAUNEE SCIENTIFIC	KEWAUNEE SCIENTIFIC	BRIGHT WHITE METAL SHELVING
▨	ELECTRICAL RACEWAY	LEGRAND	DUAL CHANNEL DATA/POWER ALS5200	WHITE

NOTE REGARDING PANELS
1. CONTRACTOR TO RING OUT EACH CIRCUT TO SOURCE PANEL AND CIRCUIT LOCATION FOR ALL EQUIPMENT.
2. RELOCATE EXISTING SUB-PANEL. EXTEND THE WIRING FROM FEEDER SOURCE TO EACH CIRCUIT.

LAB DETAILS

FUME HOOD



MEP NOTES

ELECTRICAL DESIGN BUILD NOTES

1. MEP DEMOLITION SHOWN ON THE CONTRACT DRAWINGS PROVIDES GENERAL REPRESENTATION OF DEMOLITION WORK, AND MAY NOT INDICATE FULL EXTENT OF REMOVALS REQUIRED TO COMPLETE WORK.
2. CONTRACTOR SHALL PROVIDE EQUIPMENT, LABOR, MATERIALS, AND SERVICES IN ORDER TO MAINTAIN EXISTING CIRCUITS TO EQUIPMENT LOCATED OUTSIDE THE SCOPE OF WORK AREAS.
3. CONTRACTOR SHALL PROVIDE NOTIFICATION TO THE OWNER AT LEAST THREE WEEKS IN ADVANCE PRIOR TO COMMENCEMENT OF ANY WORK. DEMOLITION WORK SHALL BE SUBJECT TO DIRECTION AND APPROVAL OF THE OWNER, AND SHALL NOT INTERFERE WITH OPERATIONS LOCATED IN OTHER BUILDING AREAS.
4. CONTRACTOR SHALL COORDINATE WITH THE OWNER AND OBTAIN APPROVAL FOR ANY REQUIRED SHUTDOWNS OR SERVICE INTERRUPTIONS.
5. CONTRACTORS SHALL REMOVE THE DEVICES AS SHOWN ON THE DEMOLITION PLAN. ALL CONDUCTORS, RACEWAYS, AND ABANDONED EQUIPMENT SHALL BE REMOVED BACK TO
6. DEVICE SOURCE PANEL, UNLESS OTHERWISE NOTED. REMOVAL INCLUDES ALL HANGARS, JUNCTION BOXES, AND FASTENERS WHICH ARE NO LONGER REQUIRED.
7. CONTRACTOR SHALL COORDINATE ELECTRICAL DEMOLITION WORK WITH OTHER TRADES AS INDICATED ON CONTRACT DRAWINGS. CONTRACTOR SHALL INVESTIGATE, IDENTIFY, AND MARK ALL ELECTRICAL EQUIPMENT TO REMAIN AND SHALL TRANSMIT TO OTHER TRADES FOR INCLUSION IN COORDINATION DRAWINGS FOR ALL TRADES.
8. CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING EXISTING POWER, FIRE ALARM, AND TELECOMMUNICATIONS WIRING AND CABLING. IF UTILITIES ARE CUT OR DAMAGED DURING DEMOLITION OR CONSTRUCTION, CONTRACTOR WILL REPLACE THEM AT NO ADDITIONAL COST.
9. CONTRACTOR IS TO MAINTAIN EMERGENCY LIGHTING CIRCUITS, CONTROLS AND NECESSARY DEVICES DURING CONTRUCTION. THIS INCLUDES PATH OF EGRESS LIGHTING AND EXIT SIGNAGE. UTILIZE EMERGENCY LIGHTING CIRCUITS IDENTIFIED DURING DEMOLITION TO PROVIDE EMERGENCY EGRESS LIGHTING.
10. PROVIDE / REPLACE CIRCUIT BREAKERS IN THE EXISTING PANELBOARDS AS REQUIRED. MATCH THE KAIC RATING OF THE CIRCUIT BREAKERS WITH THE EXISTING BREAKERS IN THE EXISTING PANELBOARDS.
11. UPDATE THE PANELBOARD DIRECTORIES FOR THE EXISTING PANELS AS REQUIRED.
12. ELECTRICAL CONTRACTOR TO TAKE LOAD READINGS OF EXISTING PANEL VIA RECORDING AMMETER TO VERIFY NEC COMPLIANT LOADING PER 220.87 AND VERIFY IF THE EXISTING PANEL IS CAPABLE OF NEW LOAD. REPORT RESULTS LOAD READINGS TO ENGINEER PRIOR TO PERFORMING ANY WORK.
13. PROVIDE EACH 120V, 20A BRANCH CIRCUIT FROM LIGHTING AND APPLIANCE PANELBOARDS WITH A SEPARATE NEUTRAL FOR EACH PHASE CONDUCTOR. NO SHARED NEUTRALS ARE PERMITTED UNLESS OTHERWISE INDICATED. BRANCH CIRCUIT HOME RUN WIRING MAY BE COMBINED UP TO MAXIMUM OF (9) CURRENT CARRYING CONDUCTORS IN A CONDUIT SIZED PER NFPA 70. NEUTRALS SHALL BE INCLUDED AS CURRENT CARRYING CONDUCTORS.
14. ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATION OF DEVICES WITH OTHER TRADES.
15. UNLESS OTHERWISE NOTED, INCORPORATE NEW DEVICE(S) INTO EXISTING CIRCUITRY FOR SPACE. CONFIRM THAT BRANCH CIRCUIT DOES NOT EXCEED 80% OF BRANCH CIRCUIT BREAKER RATING. REFER TO EXISTING PANEL SCHEDULES.

MECHANICAL DESIGN BUILD NOTES

1. CONSTANT VOLUME FUME HOOD TO REPLACE EXISTING FUME HOOD LOCATION. CONNECT EXISTING DUCTWORK TO NEW FUME HOOD. PROVIDE NEW TRANSITIONS AS NECESSARY.
2. PERFORM WORK IN ACCORDANCE WITH THE LATEST EDITIONS, REVISIONS, AMENDMENTS OF SUPPLEMENTS OF APPLICABLE STATUTES, ORDINANCES, CODES, OR REGULATIONS OF FEDERAL, STATE AND LOCAL AUTHORITIES HAVING JURISDICTION IN EFFECT ON THE DATE BIDS ARE RECEIVEDNEW
3. PROVIDE MATERIALS AND METHODS IN ACCORDANCE WITH EXISTING INSTALLATION.
4. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH THE MANUFACTURERS' RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
5. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH STRUCTURAL, CIVIL, AND ELECTRICAL TRADES SHOWN WITHIN THESE CONTRACT DOCUMENTS.
6. LOCATE ALL MECHANICAL EQUIPMENT FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS, AND VALVING.
7. VERIFY AND DOCUMENT EXISTING CONDITIONS AND DIMENSIONS ON THE JOB SITE PRIOR TO STARTING ANY WORK.
8. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD. IN EVENT OF ANY DISCREPANCIES CONTACT PROJECT MANAGER IMMEDIATELY.
9. IT IS THE INTENT OF THE CONTRACT PLANS TO PROVIDE AN INSTALLATION COMPLETE IN EVERY RESPECT. IN THE EVENT THAT ADDITIONAL DETAILS OR SPECIAL CONSTRUCTION MAY BE REQUIRED FOR WORK INDICATED, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE THE SAME, AS WELL AS, TO PROVIDE MATERIAL AND EQUIPMENT USUALLY FURNISHED WITH SUCH SYSTEMS OR REQUIRED TO COMPLETE THE INSTALLATION WHETHER MENTIONED OR NOT, AT NO ADDITIONAL EXPENSE TO THE OWNER.

PLUMBING DESIGN BUILD NOTES

1. ALL WORK TO BE PERFORMED, DESIGNED, AND INSTALLED IN ACCORDANCE WITH ALL REFERENCED CODES, STANDARDS, AND REGULATIONS.
2. CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT, AND MATERIALS AS REQUIRED TO PROVIDE A COMPLETE INSTALLATION.
3. PLANS INDICATE GENERAL ARRANGEMENT ONLY. REFER TO ARCHITECTURAL, HVAC AND ALL ASSOCIATED CONTRACT DRAWINGS FOR ACTUAL SPACE AVAILABLE. MODIFICATIONS TO ACTUAL SPACE AND OTHER TRADES ARE PART OF THIS CONTRACT.
4. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL PIPING, DRAINS, AND CLEANOUTS WITH ALL TRADES AND DRAWINGS PRIOR TO COMMENCING INSTALLATION. NO ADDITIONAL COST TO THE OWNER WILL BE ALLOWED IF ATTRIBUTED TO A FAILURE TO COORDINATE.
5. PLUMBING CONTRACTOR SHALL REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF SINKS AND FIXTURES.
6. ALL SANITARY AND LAB WASTE PIPING 4" AND LARGER SHALL SLOPE 1 PERCENT MINIMUM. ALL SANITARY AND LAB WASTE PIPING 3" AND LESS SHALL SLOPE 2 PERCENT MINIMUM UNLESS OTHERWISE NOTED.
7. ALL VENTS THAT CONNECT TO HORIZONTAL DRAINAGE PIPES SHALL HAVE ITS INVERT TAKEN OFF ABOVE THE DRAINAGE CENTER LINE. ALL VENT PIPING SHALL HAVE A POSITIVE SLOPE TOWARDS THE DRAINS THAT THEY SERVE.
8. REFER TO AND COORDINATE FINISH ROOM SCHEDULE FOR FLOORING TYPES BEFORE INSTALLING CLEANOUTS AND FLOOR DRAINS.
9. CONTRACTOR SHALL PROVIDE AND INSTALL DIELECTRIC UNIONS WHEN CONNECTING PIPING AND/OR EQUIPMENT OF DISSIMILAR MATERIALS.
10. ALL DIMENSIONS, ELEVATIONS, AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY CONTRACTOR AT THE SITE BEFORE PROCEEDING WITH WORK.
11. PROVIDE ALL NECESSARY TEMPORARY OR PERMANENT CAPS OR PLUGS FOR PIPING. DO NOT LEAVE PIPING OPEN ENDED.
12. CONTRACTOR TO VERIFY ALL PIPE LOCATIONS, SIZES, AND APPURTENANCES BEFORE BID.

SECTION 11610 – LABORATORY FUME HOODS AND RELATED PRODUCTS

PART 1: DESCRIPTION OF WORK

1.00 SUMMARY AND SCOPE
A. Section Includes: Based on Kewaunee Scientific Corporation's Supreme Air Series fume hood design, furnish and install all fume hoods, work tops, and understructures. Furnishing and installing all filler panels, knee space panels and scribes as shown on drawings.
B. Accessorization: Furnishing and delivering all service outlets, accessory fittings, electrical receptacles and Switches, as listed in these specifications, equipment schedules or as shown on drawings. Plumbing fixtures mounted on the fume hood superstructures shall be preplumbed per section 2.01.I. Electrical fixtures shall be prewired per section 2.01.J. The fume hood superstructure shall be listed to UL Standards for Safety by Underwriters Laboratories Inc. (UL). Final plumbing and electrical connections are the responsibility of those contractors fulfilling requirements of Divisions 15 and 16.

C. Removal of all debris, dirt and rubbish accumulated as a result of the installation of the fume hoods to an on-site container provided by others, leaving the premises clean and orderly.
D. Related Divisions:
1. Division 12: Laboratory Casework
2. Division 15: Plumbing and Exhaust Ducting
3. Division 16: Electrical Fittings and Connections
E. Related Publications:
1. ASHRAE Standard 110.1995 - Method of Testing Performance of Laboratory Fume Hoods
2. NSF STD#49 – Photometric Method of Testing
3. NIH03-112C - National Institute of Health Specification
4. UL – Underwriters Laboratories
5. ASTM D552 – Bending Test
6. NFPA-45 – National Fire Protection Association

1.01 BASIS OF WORK
A. It is the intent of this specification to use Kewaunee Scientific Corporation, Statesville, North Carolina, as the standard of construction for laboratory fume hoods. The construction standards of the Kewaunee Supreme Air product line shall provide the basis for quality and functional installation. 11610-FH-2 07/22
B. Supply all equipment in accordance with this specification. The offering of a product differing in materials and construction from this specification requires written approval. This approval must be obtained seven (7) days before the proposal deadline. Procedures for obtaining approval for an alternate manufacturer are defined in section 2.00 C. in this specification.
C. General Contractors should secure a list of approved fume hood manufacturers from the architect as a protection against non-conformance to these specifications.
D. The owner/architect reserves the right to reject qualified or alternate proposals and to award based on product value where such action assures the owner greater integrity of product.
E. Submittals:
1. Manufacturer's Data: Submit manufacturer's data and installation instructions for each type of fume hood. Provide data indicating compliance with ASHRAE Standard 110.1995.
2. Samples: Samples if called for will be reviewed for color, texture, and pattern only.
Submit the following:
a. Hood interior lining, 6 by 6 inches.
b. Hood enclosure, 6 by 6 inches, of color selected.
c. Operation sign(s).
d. Shop Drawings:
Submit shop drawings for fume hoods showing plans, elevations, ends, crosssections, service run spaces, location and type of service fittings:
1) Coordinate shop drawings with other work involved.
2) Provide roughing-in drawings for mechanical and electrical services when required.
3) Provide face opening, air volume, and static pressure drop data.

1.02 STANDARD FUME HOOD PERFORMANCE REQUIREMENTS
A. Fume hoods shall be of complete airfoil design to insure maximum operating efficiency. Foil sections at the front facias of the hood shall minimize eddying of air currents at the hood face and the rear baffle system shall minimize turbulence in the upper portion of the hood interior.
B. Standard Fume Hood Types: Open Bypass:The hoods shall be of the bypass type. The fume hood design shall allow for automatic air bypass above the sash opening. The bypass shall limit the maximum air velocity through the face of the hood and provide for a constant volume of air through the hood regardless of sash position. The bypass shall control the increase in face velocity as the sash is lowered to limit the maximum velocity to not more than three and one-half, times the velocity with the sash full open.
C. Containment
1. Purpose: The purpose of this specification is to prequalify the performance of the bidder's laboratory fume hood before award of contract. At his option, the owner or his representative may require the same tests to be performed and the same performance be achieved before acceptance of the hood after award of contract. The owner or his representative shall witness the tests. Failure to meet the performance specified shall be cause for rejection of the bidder.
2. Test Method: The hood shall be tested per the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Standard 110-1995 and by the Auxiliary Air Capture Test (Auxiliary Air hoods only).
3. Location of Tests and Test Facility: All tests referenced herein shall be performed in the bidder's fume hood test facility. Field testing is described in Section 3.01.F. The test facility shall meet the following requirements:
a. The test facility shall have sufficient area so that a minimum of 5 feet of clear space is available in front of and on both sides of the hood for viewing tests.
b. The facility's ventilation system shall have adequate heating and air conditioning so that room air temperatures can be maintained within the desired ranges.11610-FH-4 07/22
c. Room air currents in the test area shall be less than 20 FPM.
d. The hood exhaust system shall be properly calibrated so that the desired exhaust air volumes can be easily attained.
4. Instrumentation, Equipment and Test Personnel: Qualified personnel to perform the tests shall be supplied by the bidder. instrumentation and equipment required shall be supplied by the bidder at his expense.
Required instrumentation shall include but not be limited to the following items:
a. Thermal anemometer capable of measuring air velocities from 10 to 600 ft./minute
b. Three dozen one-half minute smoke candles
c. Four ounces of Titanium Tetrachloride
d. Supply of cotton throat swabs
e. ITI Leakmeter 120 calibrated to indicate concentration of sulfur hexafluoride or equivalent
f. Flowmeter – 150 ml/minute capacity
g. Flowmeter – 15 L/minute capacity
h. Four gas sampling bags – 8 liter capacity
i. Two vacuum pumps – 1 CFM capacity
j. Two flow regulating valves
k. Two size 3 tanks of sulfur hexafluoride with a two-stage regulator or other tracer gas suitable for detector to be used.
l. Three-way gas valve
m. Mannequin, 5'7" in height, or reasonable human proportions with arms hanging at its side
n. ASHRAE 110-1995 tracer gas ejector.
5. ASHRAE Standard 110-1995 Test: Hood shall be tested with a face velocity of 100 FPM full open vertically and at 100 FPM right, left and center 100% open horizontally. If horizontal openings are present, additional sash configurations and face velocities may be specified. The hood shall have a performance rating of 4.0 AM 0.01 or better wherein:
4.0 = tracer gas release in liters/minute
AM = as manufactured
0.01 = level of control of tracer gas in parts per million (ppm).
1.03 QUALITY ASSURANCE
11610-FH-5 07/22
A. The laboratory fume hood manufacturer shall provide fume hood work tops and casework all manufactured or shipped from the same geographic location to assure proper staging, shipment and single source responsibility.
B. General Performance: Provide certification that fume hoods meet the performance requirements described in section 1.02.C

PART 2 – PRODUCTS

2.00 MANUFACTURERS
A. The basis of this specification is the Supreme Air fume hood as manufactured by Kewaunee Scientific Corporation, 2700 West Front Street, Statesville, North Carolina.
B. All laboratory equipment covered by the specification shall be the product of one manufacturer and be fabricated at one geographic location to assure shipping continuity and single-source responsibility. All quotations from a manufacturer other than Kewaunee Scientific shall contain a review of the following capabilities:
1. List of shop facilities
2. List of engineering and manufacturing personnel
3. Proof of financial ability to fulfill the contract
4. List of a minimum of ten installations over the last five years of comparable scope
5. Proof of project management and installation capabilities
C. The selected manufacturer must warrant for a period of one-year starting (date of acceptance or occupancy, whichever comes first) that all products sold under the contract referenced above shall be free from defects in material and workmanship. Purchaser shall notify the manufacturer's representative immediately of any defective product. The manufacturer shall have a reasonable opportunity to inspect the goods. The purchaser shall return no product until receipt by purchaser of written shipping instructions from the manufacturer.

2.01 MATERIALS AND CONSTRUCTION
A. Fume Hood Superstructure Frame:
A free-standing rigid frame structure of steel angle shall be provided to support exterior panels and interior liner and baffle panels. To allow for maintenance and replacements, the interior liner panels shall be removable without disassembly of the frame structure and outer steel panels. Likewise, the exterior steel panels shall be removable without disassembly of the frame structure and inner liner panels. Fume hoods that require disassembly of the superstructure for liner replacement are not acceptable.
B. Fume Hood Interior Walls:
Double wall ends, not more than 4" wide, shall be provided to maximize interior working area. The area between the double wall ends shall be closed to house the remote control valves. The front vertical fascia section shall have a full 135 degree 1" radius at the front leading edge to provide a streamlined section and insure smooth even flow of air into the hood. The vertical facias shall contain the required service controls, electrical switches and receptacles. The hood interior end panels and sash track shall be flush with the fascia to prevent eddy currents and back flow of air.
C. Fume Hood Airfoil: A streamlined airfoil shall be integral at the bottom of the hood opening on bench and distillation hoods. This foil shall provide a nominal 1" open space between the foil and the top front edge of the work surface to direct an air stream across the work surface to prevent back flow of air. The airfoil shall extend back under the sash, so that the sash does not close the 1" opening. The foil shall be removable to allow large equipment into the hood. The foil shall be of 12-gauge steel to resist denting and flexing. Walk-in hoods shall have a stop located at the bottom of the sash track that will ensure a nominal 1" opening between the bottom of the sash and the floor.
D. Fume Hood Top Panel:Standard Grille Bypass Configuration: The top front panel shall be of the same material as the exterior fascia. It shall have an integral grille stamped into the upper portion. The top front panel of the hood shall have an integral vision panel. It shall be located directly above the sash opening and in such a manner that it allows viewing into the top portion of the hood without the operator having to stoop or place their face inside the hood.
E. Fume Hood Baffles (select one):
1. A stable, non-adjustable baffle with three fixed horizontal slots shall be provided to aid in distributing the flow of air into and through the hood. The baffle shall be spaced out 21/4" from the back liner. The baffle shall be removable for cleaning.
F. Fume Hood Duct Collar: A 12" diameter polyethylene bell-mouthed duct collar shall be located in the top of the hood plenum chamber. Coated common steel duct collars are not acceptable.
G. Fume Hood Lighting: A one-tube, energy-efficient, T-5 fluorescent light fixture of the size given below shall be rovided in the hood roof. Illumination at 13" above the worksurface shall be at least 100 footcandles. Hood Size, Ft. Nominal Fixture Length, Ft. 6 4. The light fixtures shall be isolated from the hood interior by a 1/4" thick tempered glass panel sealed from the hood cavity. Fixture shall be UL labeled.
H. Fume Hood Sash:Combination Sash: A combination sash shall be provided. The sash shall have horizontal sliding glass panels in a vertical rising steel frame. The bottom of the sash frame shall have a full length metal handle. The sash track shall be a neutral colored polyvinyl chloride set flush with the interior liner panels to minimize turbulence. The sash shall be counterbalanced with a single weight to prevent tilting and binding during operation. The glass panels shall be 1/4" laminated safety float glass mounted on metal rollers in an aluminum track.
J. Fume Hood Electrical Services: The hood superstructure shall be pre-wired and contain a UL label certifying acceptable wire gauge, connections, fixtures and wire color coding. Wiring electrical services shall consist of two duplex receptacles and a light switch. The duplex receptacles shall be 20 Amp., 125 volt AC, and 3-wire polarized grounded with ground fault interruption. The receptacles shall be of specification grade, side wired only, to insure a positive connection. The light switch shall be 20 Amp., 125 volt AC, and 3-wire polarized grounded. Wiring shall terminate in one 6" x 6" x 4" service junction box located on the fume hood roof. Final wiring and circuit dedication shall be by others.
K. Hood Work Surface Epoxy Resin: Hood work surface shall be 1-1/4" thick molded epoxy resin made in the form of a watertight pan, not less than 3/8" deep to contain spillage with a 6" wide safety ledge across the front edge. Top shall be manufactured at the same manufacturing location as the fume hood to assure proper cutout alignment and coordinated shipping. A cup drain flush with the recessed work surface shall be provided. The work surface and cup drain shall be available in either black or grey.
M. Fume Hood Finish: After the component parts have been completely welded together and before finishing, they shall be given a pre-paint treatment to provide excellent adhesion of the finish system to the steel and to aid in the prevention of corrosion. Physical and chemical cleaning of the steel shall be accomplished by washing with an alkaline cleaner, followed by a spray treatment with a complex metallic phosphate solution to provide a uniform fine grained crystalline phosphate surface that shall provide both an excellent bond for the finish and enhance the protection provided by the finish against humidity and corrosive chemicals. After the phosphate treatment, the steel shall be dried and all steel surfaces shall be coated with a chemical and corrosion-resistant, environmentally friendly, electrostatically applied powder coat finish. All components shall be individually painted, insuring that no area be vulnerable to corrosion due to lack of paint coverage. The coating shall then be cured by baking at elevated temperatures to provide maximum properties of corrosion and wear resistance. The completed finish system in standard colors shall meet the performance test requirements specified under PERFORMANCE TEST RESULTS.

N. Performance Test Results (Chemical Spot Tests):
a. Testing Procedure: Chemical spot tests for non-volatile chemicals shall be made by applying 5 drops of each reagent to the surface to be tested and covering with a 1-1/4" dia. watch glass, convex side down to confine the reagent. Spot tests of volatile chemicals shall be tested by placing a cotton ball saturated with reagent on the surface to be tested and covering with an inverted 2-ounce wide mouth bottle to retard evaporation. All spot tests shall be conducted in such a manner that the test surface is kept wet throughout the entire test period, and at a temperature of 77° ±3°
F. For both methods, leave the reagents on the panel for a period of one hour. At the end of the test period, the reagents shall be flushed from the surface with water, and the surface scrubbed with a soft bristle brush under running water, rinsed and dried. Volatile solvent test areas shall be cleaned with a cotton swab soaked in the solvent used on the test area. Immediately prior to evaluation, 16 to 24 hours after the reagents are removed, the test surface shall be scrubbed with a damp paper towel and dried with paper towels.
b. Test Evaluation: Evaluation shall be based on the following rating system.
Level 0 – No detectable change.
Level 1 – Slight change in color or gloss.
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Level 2 – Slight surface etching or severe staining.
Level 3 – Pitting, cratering, swelling, or erosion of coating. Obvious and significant deterioration. After testing, panel shall show no more than three (3) Level 3 conditions.
c. Test Reagents
Test No. Chemical Reagent Test Method
1. Acetate, Amyl Cotton ball & bottle
2. Acetate, Ethyl Cotton ball & bottle
3. Acetic Acid, 98% Watch glass
4. Acetone Cotton ball & bottle
5. Acid Dichromate, 5% Watch glass
6. Alcohol, Butyl Cotton ball & bottle
7. Alcohol, Ethyl Cotton ball & bottle
8. Alcohol, Methyl Cotton ball & bottle 9. Ammonium Hydroxide, 28% Watch glass
10. Benzene Cotton ball & bottle
11. Carbon Tetrachloride Cotton ball & bottle
12. Chloroform Cotton ball & bottle
13. Chromic Acid, 60% Watch glass
14. Cresol Cotton ball & bottle
15. Dichlor Acetic Acid Cotton ball & bottle
16. Dimethylformanide Cotton ball & bottle
17. Dioxane Cotton ball & bottle
18. Ethyl Ether Cotton ball & bottle
19. Formaldehyde, 37% Cotton ball & bottle
20. Formic Acid, 90% Watch glass
21. Furfural Cotton ball & bottle
22. Gasoline Cotton ball & bottle
23. Hydrochloric Acid, 37% Watch glass
24. Hydrofluoric Acid, 48% Watch glass
25. Hydrogen Peroxide, 3% Watch glass
26. Iodine, Tincture of Watch glass
27. Methyl Ethyl Ketone Cotton ball & bottle
28. Methylene Cloride Cotton ball & bottle
29. Mono Chlorobenzene Cotton ball & bottle
30. Naphthalene Cotton ball & bottle
31. Nitric Acid, 20% Watch glass
32. Nitric Acid, 30% Watch glass
33. Nitric Acid, 70% Watch glass
34. Phenol, 90% Cotton ball & bottle
35. Phosphoric Acid, 85% Watch glass
36. Silver Nitrate, Saturated Watch glass
37. Sodium Hydroxide, 10% Watch glass
38. Sodium Hydroxide, 20% Watch glass
39. Sodium Hydroxide, 40% Watch glass
40. Sodium Hydroxide, Flake Watch glass
41. Sodium Sulfide, Saturated Watch glass
42. Sulfuric Acid, 33% Watch glass
43. Sulfuric Acid, 77% Watch glass
44. Sulfuric Acid, 96% Watch glass
45. Sulfuric Acid, 77% and Nitric Acid, 70%, equal parts Toluene Watch glass
46. Toluene Cotton ball & bottle
47. Trichloroethylene Cotton ball & bottle
48. Xylene Cotton ball & bottle
49. Zinc Chloride, Saturated Watch glass
* Where concentrations are indicated, percentages are by weight.
O. Performance Test Results (Heat Resistance): Hot water (190° F - 205° F) shall be allowed to trickle (with a steady stream at a rate not less than 6 ounces per minute) on the finished surface, which shall be set at an angle of 45° from horizontal, for a period of five minutes. After cooling and wiping dry, the finish shall show no visible effect from the hot water treatment.
P. Performance Test Results (Impact Resistance):A one-pound ball (approximately 2" diameter) shall be dropped from a distance of 12 inches onto the finished surface of steel panel supported underneath by a solid surface. There shall be no evidence of cracks or checks in the finish due to impact upon close eye-ball examination.
Q. Performance Test Results (Bending Test):An 18 gauge steel strip, finished as specified, when bent 180o over a 1/2" diameter mandrel,shall show no peeling or flaking off of the finish.
R. Performance Test Results (Adhesion): Ninety or more squares of the test sample shall remain coated after the scratch adhesion test. Two sets of eleven parallel lines 1/16" apart shall be cut with a razor blade to intersect at right angle thus forming a grid of 100 squares. The cuts shall be made just deep enough to go through the coating, but not into the substrate. They shall then be brushed lightly with a soft brush. Examine under 100 foot-candles of illumination. Note: This test is based on ASTM D2197-68, "Standard Method of Test for Adhesion of Organic Coatings".
S. Performance Test Results (Hardness): The test sample shall have a hardness of 4-H using the pencil hardness test. Pencils, regardless of their brand are valued in this way: 8-H is the hardest, and next in order of diminishing hardness are 7-H, 6-H, 5-H, 4-H, 3-H, 2-H, F, HB, B (soft), 2-B, 3-B, 4-B, 5-B (which is the softest). The pencils shall be sharpened on emery paper to a wide sharp edge. Pencils of increasing hardness shall be pushed across the paint film in a chisel-like manner until one is found that will cut or scratch the film. The pencil used before that one-that is, the hardest pencil that will not rupture the film-is then used to express or designate the hardness.
T. Fume Hood Dimensions: Double wall end panel thickness shall not exceed 4". Interior clear working height shall be not less than 41-3/4" at any location in the interior of the hood on bench hoods and 76" on walk-in and distillation hoods. Interior depth from the back of the sash to the front of the rear baffle shall not be less than 25-1/4". The sash opening shall be not less than 28" in height above the work surface on bench hoods and 60" on walk-in and distillation hoods.
U. Fume Hood Liners:11610-FH-12 07/22 KEMGLASS Reinforced Polyester Lining: Interior liner panels shall be 1/4" thick fiberglass reinforced polyester sheet. Interior liner panels shall be fastened using stainless steel screws with plastic covered heads.
Q. Liner Tests – Chemical Spot Tests – 24 Hours
1. Chemical spot test shall be made by applying 10 drops (approximately 1/2 cc) of each reagent to the surface to be tested. Each reagent (except those marked **) shall be covered with a 1-1/2" diameter watch glass, convex side down to confine the reagent. Spot tests of volatile solvents marked ** shall be tested as follows: A 1" or larger ball of cotton shall be saturated with the solvent and placed on the surfaces to be tested. The cotton ball shall then be covered by an inverted 2-ounce, wide mouth bottle to retard evaporation. All spot tests shall be conducted in such a manner that the test surface is kept wet throughout the entire 24-hour test period and at a temperature of 77 degrees F. + 3 degrees F.
2. At the end of the test period, the reagents shall be flushed from the surfaces with water and the surface scrubbed with a soft bristle brush under running water, rinsed, and dried. Volatile solvent test areas shall be cleaned with a cotton swab soaked in the solvent used on the test area. Spots where dyes have dried shall be cleaned with a cotton swab soaked in alcohol to remove the surface dye. The test panel shall then be evaluated immediately after drying.

3. Ratings/Legend:
1 – KMER (Kewaunee Modified Epoxy Resin) DISCONTINUED
A = No effect or slight change in gloss
2 – Glass Reinforced Polyester B = Slight change in gloss or color
3 – Stainless Steel 304 C = Slight etching or severe staining
4 – Stainless Steel 316 D = Swelling, pitting, or severe etching
5 – Reinforced Phenolic Resin
RESULTS: 1 2 3 4 5
1. Acetic Acid 98% A C B B A
2. Acetone ** A A A A A
3. Acid Dichromate A B A A A
4. Ammonium Hydroxide ** 28% A A B B A
5. Amyl Acetate ** A A A A A
6. Benzene ** A A A A A
7. Butyl Alcohol ** A A A A A
8. Carbon Tetrachloride ** A B A A A
9. Chloroform ** A B A A A
10. Chromic Acid 60% B C C C A
11. Cresol A A A A A
12. Dichloroacetic Acid A A B A A
13. Dimethylformamide A A A A A
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14. Dioxane ** A A A A A
15. Ethyl Acetate ** A A A A A
16. Ethyl Ether ** A A A A A
17. Ethyl Alcohol ** A A A A A
18. Formaldehyde A A A A A
19. Formic Acid 90% A B A A A
20. Furfural ** B C A A C
21. Gasoline ** A A A A A
22. Hydrochloric Acid 37% A A B B A
23. Hydrofluoric Acid 48% B A D D A
24. Hydrogen Peroxide 30% A A A A A
25. Methyl Ethyl Ketone ** A A A A A
26. Methyl Alcohol ** A A A A A
27. Methylene Chloride ** A B A A A
28. Monochlorobenzene ** A A A A A
29. Naphthalene ** A A A A A
30. Nitric Acid 20% B A B A A
31. Nitric Acid 30% B B B A A
32. Nitric Acid 70% B B B A A
33. Phenol ** 85% A A A A A
34. Phosphoric Acid 85% A A B A A
35. Silver Nitrate B C A A C
36. Sodium Hydroxide 40% A A A A A
37. Sodium Hydroxide 20% A A A A A
38. Sodium Hydroxide 10% A A A A A
39. Sodium Hydroxide Flake A A A A A
40. Sodium Sulfide A A A A A
41. Sulfuric Acid 77% A A C A A
42. Sulfuric Acid 96% C B C A C
43. Sulfuric Acid 33% A A C A A
44. Tincture of Iodine A C B B A
45. Toluene ** A A A A A
46. Trichlorethylene ** A A A A A
47. Xylene ** A A A A A
48. Zinc Chloride A A B A A
49. Nitric 70%/Sulfuric Acid 77%* B B B A A
* Equal parts of Nitric Acid 70% and Sulfuric Acid 77%.
** Indicates these solvents tested with cotton and jar method
S. Fume Hood Base Cabinets
1. Standard Steel
a. Unless otherwise indicated base units under hoods shall be fabricated of cold rolled prime grade roller leveled furniture steel. Gauges of steel used in construction shall be 18 gauge except as follows:
b. Corner gussets for leveling bolts and apron corner braces, 12 gauge.
c. Hinge reinforcements, 14 gauge.
d. Top and intermediate front horizontal rails, apron rails and reinforcement gussets, 16 gauge.
e. Door assemblies and adjustable shelves, 20 gauge.
f. Performance of the painted surfaces shall match that of the fume hood outer panels.

2. Special Purpose Cabinets for Use Under Fume Hoods:
a. Acid Storage Cabinets: Where indicated acid storage cabinets shall use the same gauges of steel and construction features as other base cabinets. In addition, they shall have a one-piece liner insert made of linear low-density polyethylene. The liner insert shall form a oneinch pan at the bottom to retain spillage. Each door will have a set of louvers at the top and bottom. The door shall be lined with a polyethylene sheet. Each cabinet shall be vented into the fume hood with a 1-1/2" vent pipe. Providing a positive airflow directly into the fume hood exhaust system.
T. Accessories:
1. Filters and Housings: Where called for, a filter housing shall be provided above the hoods. The housing shall contain an absolute filter (99.97% efficient for 0.3 micron particles) and a furnace type pre-filter. The housing shall form a rigid, self-supporting assembly and have a gasketed front cover to allow replacement of the filters without disturbing the ductwork. The filter housing shall be fabricated of cold rolled steel with a chemical resistant finish.
2. Alarms (Optional – Choose One):
a. Low Face Velocity Alarm: Fume hoods shall be provided with an electronic alarm system to detect low hood face velocities. The alarm system shall sense the actual face velocity of the hood regardless of sash position. The system shall have air velocity sensing thermistor located in the monitor on the face of the hood. The monitor shall have a green light activated when the face velocity is above the set point and a red light and audible alarm which are activated when the face velocity is below the set point. The audible alarm can be acknowledged and silences with mute switch on panel. When the mute is activated, it automatically resets itself when face velocity again rises above calibrated set point. The set point is to be factory set and calibrated at approximately 70 FPM. Field calibration is possible with adjustment of recessed zero potentiometer on front of unit.

PART 3 – EXECUTION – SUPREME AIR SERIES FUME HOOD AND RELATED PRODUCTS

3.00 SITE EXAMINATIONThe owner and/or his representative shall certify building conditions conducive to the installation of a finished goods product, including all critical dimensions.

3.01 INSTALLATION
A. Preparation: Prior to beginning installation of fume hood, check and verify that no irregularities exist that would affect quality of execution of work specified.
B. Coordination: Coordinate the work of the Section with the schedule and other requirements of other work being performed in the area at the same time both with regard to mechanical and electrical connections to and in the fume hoods and the general construction work.
C. Performance: Install fume hoods, plumb, level, rigid, securely anchored to building and adjacent furniture in proper location, in accordance with manufacturer's instructions and the approved shop drawings. Provide filler panels between top of hood and ceiling. Securely attach access panels but provide for easy removal and secure reattachment. Do not install any damaged units.
D. Adjust and Clean:
1. After installations are complete, adjust all moving parts for smooth operation.
2. Remove all packing materials and debris resulting from this work, and turn over the fume hoods to the Owner clean and polished both inside and out.
3. Repair or remove and replace defective work, as directed by owner and/or his representative upon completion of installation.
E. Protection:
1. Provide reasonable protective measures to prevent casework and equipment from being exposed to other construction activity.
2. Advise owner and/or his representative of procedures and precautions for protection of material, installed laboratory casework and fixtures from damage by work of other trades.
F. Certification:
1. Fume Hood Manufacturer shall field test a random sample of 20% of the installed units using ANSI/ASHRAE 110-1995 to a control level of Al 0.01 ppm or better.
2. Project substantial completion shall be withheld until all required fume hood certification letters, tests, and reports have been submitted to and approved by the Architect.

SECTION 12345 - LABORATORY CASEWORK AND RELATED PRODUCTS (ALPHA SYSTEM)

PART 1: DESCRIPTION OF WORK

1.00 SUMMARY AND SCOPE
A. Section Includes:
1. Using Kewaunee Scientific Corporation, ALPHA SYSTEM Laboratory Furniture as a modular component system used to create work space and storage assemblies. Furnish all cabinets and casework, including tops, ledges, supporting structures, and miscellaneous items equipment as listed in these specifications, or equipment schedules, including delivery to the building, setting in place, leveling, scribing to walls and floors as required. Furnishing and installing all filler panels, knee space panels and scribes as shown on drawings.
2. Furnishing and delivering all utility service outlet accessory fittings, electrical receptacles and switches, as listed in these specifications, equipment schedules or as shown on drawings as mounted on the laboratory furniture. The above-defined items shall be furnished with supply tank nipples and lock nuts, loose in boxes and properly marked. All plumbing and electrical fittings will be packaged separately and properly marked for delivery to the appropriate contractor.
3. Furnishing and delivering, packed in boxes for installation by the mechanical contractor, all laboratory sinks, cup sinks or drains, drain troughs, overflows and sink outlets with integral tailpieces, which occur above the floor, and where these items are part of the equipment or listed in the specifications, equipment schedules or shown on the drawings. Integral tailpieces when required shall be in accordance with the manufacturer's standards. All tailpieces shall be furnished less the couplings required to connect them to the drain piping system.
4. Furnishing service strip supports where specified, and setting in place service tunnels, service turrets, supporting structures and reagent racks of the type shown on the details.
5. Removal of all debris, dirt and rubbish accumulated as a result of the installation of the laboratory furniture to an onsite container provided by others, leaving the premises clean and orderly.
B. Related Divisions:
1. Divisions 5 & 6: Behind-the-Wall Blocking and Studs
2. Division 9: Base Molding
3. Division 11: Chemical Fume Hoods
4. Division 15: Plumbing
5. Division 16: Electrical Fittings and Connections
C. Related Publications:
1. SEFA 3 – Scientific Equipment and Furniture Association
2. SEFA 8 - Scientific Equipment and Furniture Association
3. NFPA 30 - National Fire Protection Association
4. NFPA-45 - National Fire Protection Association
5. UL - Underwriters Laboratories
6. ASTM D552 - Bending Test

1.01 BASIS OF WORK
A. It is the intent of this specification to use Kewaunee Scientific Corporation , ALPHA SYSTEM Laboratory Furniture as the standard of construction for laboratory furniture. The construction standards of this product line shall provide the basis for quality and functional 12345-A-2 08/07 installation.
B. Supply all equipment in accordance with this specification. The offering of a product differing in materials and construction from this specification requires written approval from the owner/architect. This approval must be obtained seven (7) days before the quotation deadline. Procedures for obtaining approval for an alternate manufacturer are defined in section 2.00.C in this specification.
C. General Contractors should secure a list of approved laboratory furniture manufacturers from the architect as a protection against non-conformance to these specifications.
D. Participants in the quotation process have the option of clarifying deviations to the specified design, construction, or materials. Without such clarifications, sealed quotations to the owner or owner representative will be construed as being in total conformance to the requirements of the specification.
E. The owner / owner representative reserves the right to reject qualified or alternate proposals and to award based on product value where such action assures the owner greater integrity of product.
1.02 QUALITY ASSURANCE
A. The modular component system laboratory furniture contractor shall also provide work tops and fume hoods all manufactured or shipped from the same geographic location to assure proper staging, shipment and single source responsibility.
B. General Performance: Provide certification that furniture shall meet the performance requirements described in SEFA 8.

1.03 SUBMITTALS
A. Manufacturer's Data: Submit manufacturer's data and installation instructions for each type of casework. Provide data indicating compliance with SEFA Standard#8.
B. Samples:
Samples from non-specified manufacturers will be required and reviewed per specification. Samples shall be delivered, at no cost to the architect or owner to a destination set forth by the architect or owner. This must be done seven (7) days before quotation deadline as a condition of approval of each bidder. Samples shall be full size, production type samples. Miniature, or "Show Room" type samples are not acceptable. Furnish the following:
1. Support structure, suspended cabinet and required hardware.
2. One sample of all top materials shown or called for, of sufficient size to perform finish requirement tests.
3. Sample of all mechanical service fittings, locks, door pulls, hinges, and interior hardware.
C. Shop Drawings:
Submit shop drawings for furniture assemblies showing plans, elevations, ends, crosssections, service run spaces, location and type of service fittings.
1. Coordinate shop drawings with other work involved.
2. Provide roughing-in drawings for mechanical and electrical services when required.

PART 2 – PRODUCTS

2.00 MANUFACTURERS

A. The basis of this specification is a modular component system manufactured according to the standards used by Kewaunee Scientific Corporation, 2700 Front Street, Statesville, North Carolina. The specified design is Alpha System. All laboratory equipment covered by the 12345-A-3 08/07 specification shall be the product of one manufacturer and be fabricated at one geographic location to assure shipping continuity and single-source responsibility. All quotations from a manufacturer other than Kewaunee Scientific Corporation shall contain a review of the following capabilities:
1. List of shop facilities
2. List of engineering and manufacturing personnel
3. Proof of financial ability to fulfill the contract
4. List of a minimum of ten (10) installations over the last five (5) years of comparable scope
5. Proof of project management and installation capabilities
B. The selected manufacturer must warrant for a period of one-year starting (date of acceptance or occupancy, whichever comes first) that all products sold under the contract referenced above shall be free from defects in material and workmanship. Purchaser shall notify the manufacturer's representative immediately of any defective product. The manufacturer shall have a reasonable opportunity to inspect the goods. The purchaser shall return no product until receipt by purchaser of written shipping instructions from the manufacturer.
C. All manufacturers other than those mentioned in section 2.00.A. must submit samples made in accordance with this specification. Samples shall be delivered at no cost to the architect or owner to a destination set forth by the architect or owner. Sample delivery must be done seven (7) days before the quotation deadline. Samples shall be full size, production type samples. Miniature, or "Show Room" type samples are not acceptable.
1. One full support module with specified shelving, support frame, countertop and hardware.
2. One 48" base cabinet with two doors and drawers.
D. The above samples of the successful manufacturer will be impounded by the architect or owner to insure that material delivered to jobsite conforms in every respect to the samples submitted.

2.01 MATERIALS
A. General Requirements:
It is the intent of this specification to provide a high quality adjustable casework system designed for the laboratory environment. Major structural components are made from a combination of extruded aluminum and high quality cold rolled steel.
B. Sheet Steel: Cold rolled sheet steel shall be prime grade; roller leveled, and shall be treated at the mill to be free of scale, ragged edges, deep scratches or other injurious effects. All gauges shall be U.S. Standard.

PART 2 – PRODUCTS

2.01 MANUFACTURERS
A. Epoxy counter tops shall be Kemresin as supplied by Kewaunee Scientific located in Statesville, NC. Substitutions may be accepted after following the substitution request as found in Division 1 documentation. In all cases, counter tops shall be manufactured by the same Division 12 casework and Div 11 fume hoods manufacturer.
B. Qualified manufacturers shall have 10+ years of documented and successful installations. Manufacturers shall have United States based modern production facility consisting of loading docks, material handling, raw material formulation, pour, bake, setting, CNC manufacturing and storage capabilities. Qualified manufacturer shall employ the use of a closed mold system.
2.02 MATERIALS
2.03 Epoxy resin shall be a monolithic poured material consistent throughout material thickness. The finished surface shall have a smooth finish resulting in enhanced stain, scratch and abrasion resistance.

PERFIDO
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NOT FOR CONSTRUCTION

PWWG PROJECT NUMBER		22304.00
CONSTRUCTION DOCUMENTS		08/02/24
REVISIONS		
NO.	DESCRIPTION	DATE
1	Addendum #3	09/25/2024

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West Liberty, WV 26074
West Liberty University - Arnett Hall

LAB DETAILS

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