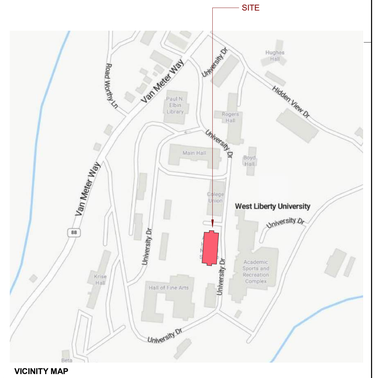
ARNETT HALL
THIRD FLOOR LAB RENOVATION

CONSTRUCTION DOCUMENTS - AUGUST 2, 2024

DRAWING LIST

GENERAL		
G-001	COVER SHEET	08/02/24
G-002	CODE PLANS	08/02/24
ARCHITECTURAL		
A-103	THIRD FLOOR PLAN	08/02/24
A-103c	THIRD FLOOR REFLECTED CEILING PLAN	08/02/24
A-401	EXISTING INTERIOR PHOTOS	08/02/24
A-402	EXISTING INTERIOR PHOTOS	08/02/24
A-501	DETAILS	08/02/24
A-900L	THIRD FLOOR LAB PLAN	08/02/24
A-910L	LAB DETAILS	08/02/24
A-911L	LAB DETAILS	08/02/24
A-912L	LAB DETAILS	08/02/24

Grand total: 11



VICINITY MAP

PERFIDO WEISKOPF WAGSTAFF + GOETTEL

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ARCHITECT

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CLIENT

WEST LIBERTY UNIVERSITY

208 UNIVERSITY DRIVE
WEST LIBERTY, WV 26074

LAB PLANNER

JACOBS CONSULTANTS, INC.

777 MAIN STREET
FORT WORTH, TX 76102

PWWG PROJECT NUMBER	22304.00
CONSTRUCTION DOCUMENTS	08/02/24

REVISIONS

NO.	DESCRIPTION	DATE

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

COVER SHEET

G-001

G-001 - COVER SHEET
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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 (NEW, EXIST) — SECTION HATCH (NEW, EXIST) — SURFACE HATCH (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	GWB	Gypsum Wall Board
ACC	Accessible	GYP	Gypsum
ACW	Aluminum Clad Wood	GYP BD	Gypsum Board
ADA	Americans with Disbilities Act	HC	Hollow Core
ADJ	Adjacent	HDWD	Hardwood
AFF	Above Finished Floor	HM	Hollow Metal
ALT	Alternate	HT	Height
ALUM	Aluminum	IHM	Insulated Hollow Metal
ANSI	American National Standards Institute	INCL	Includ(es)(ing)
		INSUL	Insulation
APC	Acoustic Panel Ceiling	INT	Interior
APPROX	Approximate	KIT	Kitchen
ASF	Above Sub-Floor	LAU	Laundry
B.O.	Bottom of ___	LAV	Lavatory
BD	Board	LF	Linear Feet
BH	Bulkhead	LH	Left-Hand
BLW	Below	LSF	Light Gauge Steel Framing
BOD	Basis of Design	MAS	Masonry
BOH	Back of House	MATL	Material
BR	Bedroom	MAX	Maximum
BRG	Bearing	MDF	Medium Density Fiberboard
BTW	Between	MECH	Mechanical
BTWN	Between	MFR	Manufacturer
BYND	Beyond	MIN	Minimum
C TO C	Center to Center	MISC	Miscellaneous
CFS	Clear Floor Space	MO	Masonry Opening
CIP	Cast-in-Place	MTL	Metal
CJ	Control Joint	N	North
CL	Center Line	N/A	Not Applicable
CLG	Ceiling	NIC	Not in Contract
CLO	Closet	NRC	Noist Reduction Coefficient
CLR	Clear	NTS	Not to Scale
CMU	Concrete Masonry Unit	O TO O	Out to Out
CO	Clean-Out	OA	Overall
COL	Column	OC	On Center
CONC	Concrete	OFCI	Owner Furnished / Contractor Installed
CONST	Construction		
CONT	Continuous	OFOI	Owner Furnished / Owner Installed
CORR	Corridor		
CPT	Carpet	OH	Opposite Hand
CPTY	Capacity	OPNG	Opening
CT	Ceramic Tile	OPP	Opposite (Hand)
CTR	Center	PT	Paint(ed)
DAFS	Direct-Applied Finish System	PTL	Pressure Treated Lumber
DBL	Double	PVC	Polyvinyl Chloride
DEMO	Demolition	R	Radius, Riser, Thermal Resistance Value
DH	Double-Hung (Window)		
DIA	Diameter	RB	Resilient Base
DIM	Dimension	RCP	Reflected Ceiling Plan
DN	Down	RD	Roof Drain
DWGS	Drawings	REQ'D	Required
E	East	REQ'S	Requirements
EA	Each	RF	Resilient Flooring
EIFS	Exterior Insulation and Finish System	RH	Right-Hand
		RM	Room
EJ	Expansion Joint	RO	Rough Opening
ELEC	Electrical	RWC	Rainwater Conductor
ELEV	Elevator	S	South
ELEV	Elevation	SC	Solid Core
EOS	Edge of Structure/Slab	SF	Square Feet
EOS	Edge of Slab	SFRM	Spray-Applied Fire-Resistive Materials
EPS	Expanded Polystyrene Board (Insulation)		
		SH	Single Hung
EQ	Equal	SIM	Similar
EQUIP	Equipment	SPEC	Specification
ETR	Existing to Remain	SQ	Square
EX	Existing	SST	Stainless Steel
EXIST	Existing	STC	Sound Transmission Class
EXT	Exterior	STF	Storefront
FBG	Fiberglass	STL	Steel
FE	Fire Extinguisher	STO	Storage
FIN	Finish	STRUCT	Structure
FLR	Floor	T	Tread
FND	Foundation	T&G	Tongue and Groove
FOH	Front of House	T/	Top of ___
FRJS	Fire Resistant Joint System	TRNSP	Transparent
FRMG	Framing	TYP	Typical
FRP	Fiber Reinforced Plastic	UNO	Unless Noted Otherwise
FRR	Fire Resistance Rating	VAR	Varies
FT	Foot, Feet	VCT	Vinyl Composition Tile
FTG	Footing	VIF	Verify in Field
FX	Fixed (Window)	W	West
GA	Gage	W/	With
GALV	Galvanized	W/O	Without
GC	General Contractor	WD	Wood
GL	Glass	WWF	Welded Wire Fabric
GR	Guest Room	XPS	Extruded Polystyrene Board (Insulation)

SYMBOLS

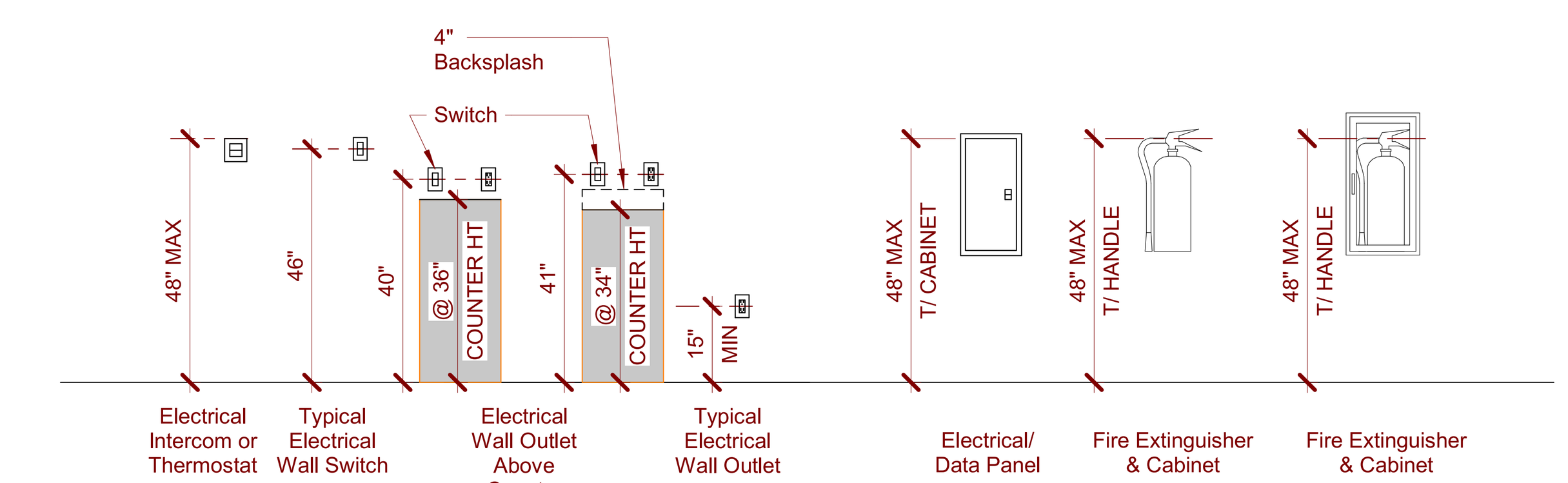
1 / A-101 / 1 / 1 / 1	INTERIOR / EXTERIOR ELEVATION
1 / A101 SIM	BUILDING / WALL SECTION
1 / A101 SIM	DETAIL
1 / A101 SIM	DETAIL / ENLARGED PLAN
1	COLUMN LINE
FLOOR 100'-0"	FLOOR ELEVATION LINE
100'-0"	SPOT ELEVATION
ROOM NAME 101	ROOM NAME AND NUMBER
101 / A1.1 120 / S2 22	DOOR NUMBER / DOOR TYPE | 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

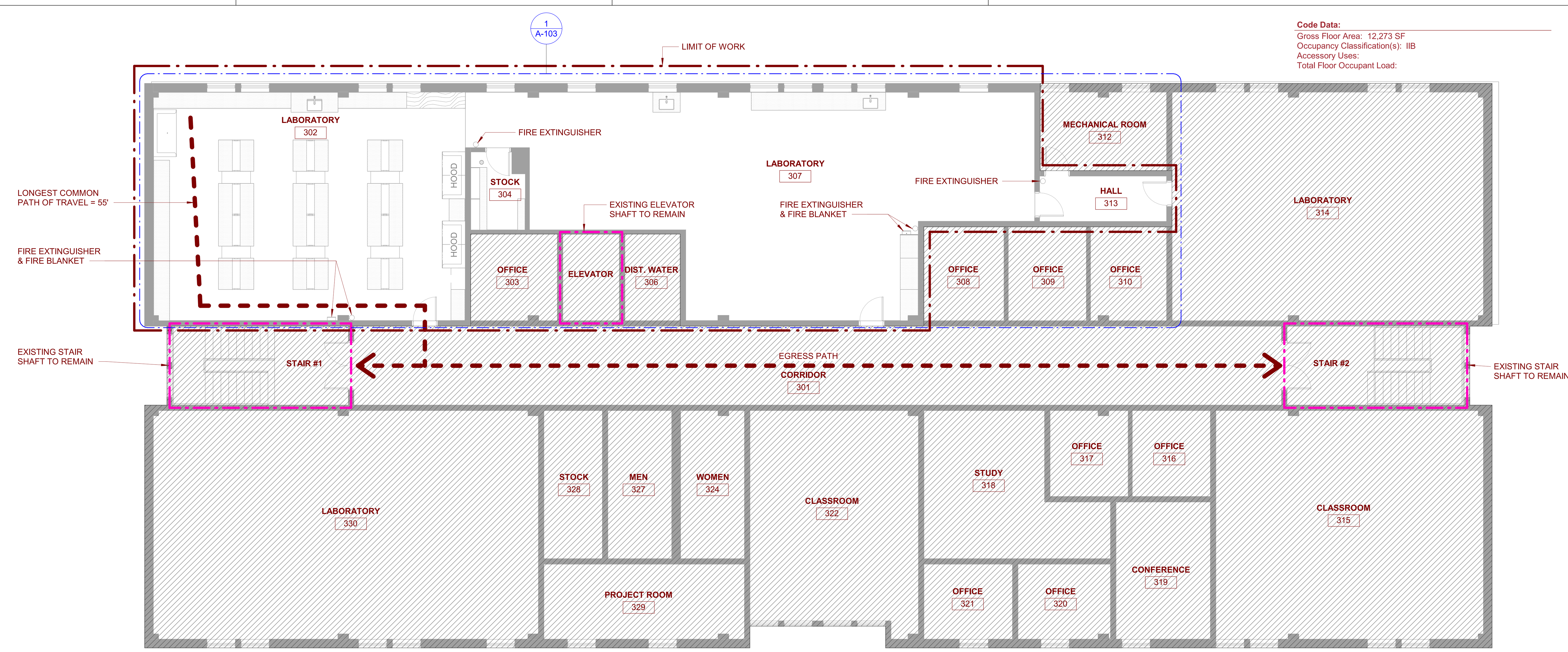
1. The Contractor is responsible for complying with all applicable codes.
2. The Contractor shall verify all dimensions in the field. Report discrepancies to the architect for decisions prior to proceeding with the work. Do not scale the drawings.
3. The Third Floor Top of Slab Elevation of 100'- 0" 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



CODE PLAN 1
1/8" = 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)

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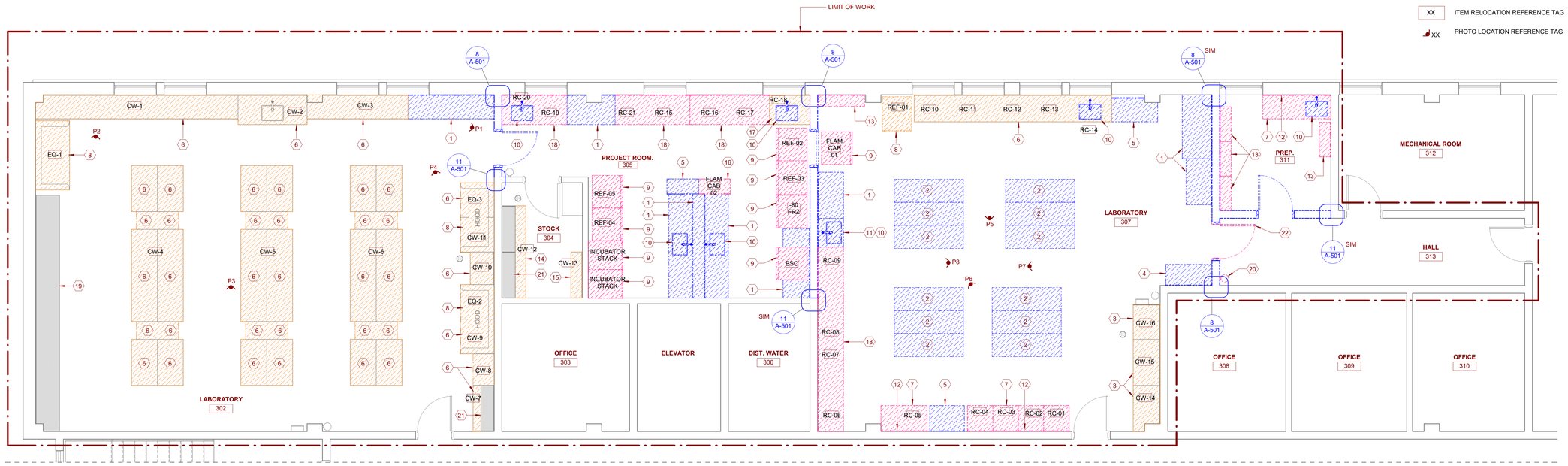
CODE PLANS

G-002

REFERENCE LEGEND

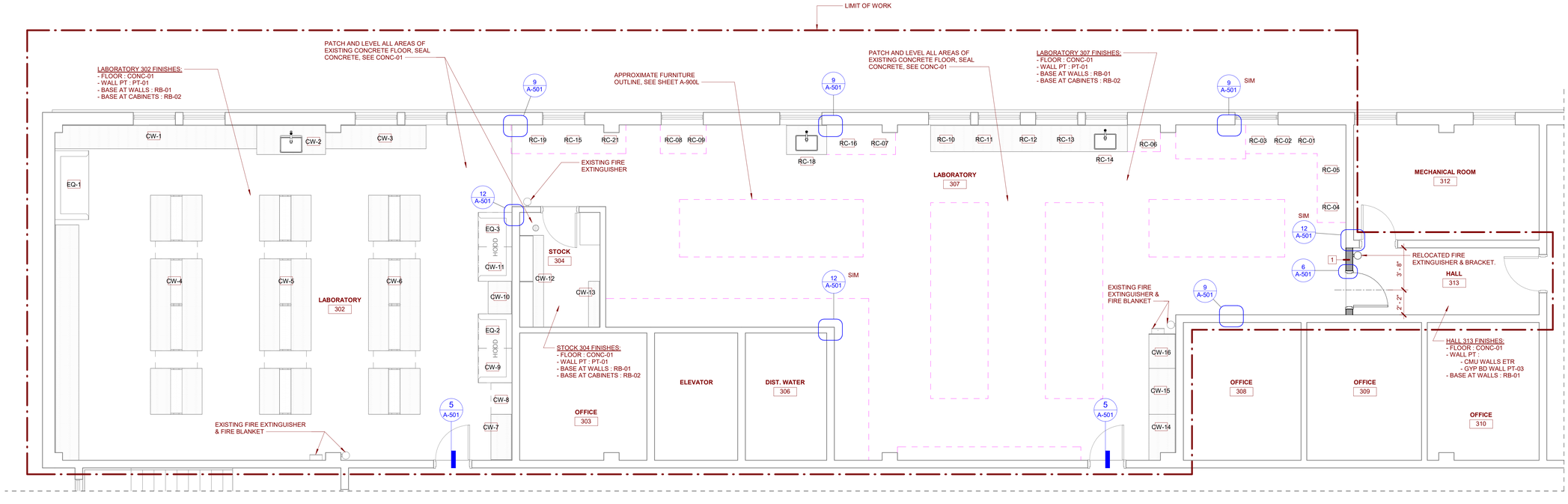
- EXISTING ITEM TO REMAIN IN PLACE
- EXISTING ITEM TO BE SALVAGED & REINSTALLED IN SAME LOCATION
- EXISTING ITEM TO BE SALVAGED & REINSTALLED IN NEW LOCATION. SEE LAB SHEETS FOR NEW LOCATIONS
- EXISTING ITEM TO BE DEMOLISHED
- XX ITEM RELOCATION REFERENCE TAG
- XX PHOTO LOCATION REFERENCE TAG



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

SHEET KEYNOTES - DEMO

1. DEMOLISH BASE CABINETS & COUNTERTOP.
2. DEMOLISH ROLLING TABLE.
3. SALVAGE BASE CABS, WALL CABS & COUNTERTOP. REINSTALL CABINETS & COUNTERTOP IN SAME LOCATION.
4. DEMOLISH BASE AND WALL CABINETS.
5. DEMOLISH TALL STORAGE.
6. SALVAGE BASE CABS & COUNTERTOPS. REINSTALL CABINETS & COUNTERTOP 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 CABS & COUNTERTOP. REINSTALL CABINETS & COUNTERTOP 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 CABS & COUNTERTOPS. REINSTALL CABINETS IN NEW LOCATION.
19. EXISTING WALL MOUNTED COUNTERTOP TO REMAIN IN PLACE.
20. RELOCATE EXISTING FIRE EXTINGUISHER & BRACKET.
21. EXISTING WALL CABS TO REMAIN IN PLACE.
22. SALVAGE EXISTING WOOD DOOR & HARDWARE FOR REUSE.



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

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THIRD FLOOR PLAN

A-103

A-103 - THIRD FLOOR PLAN
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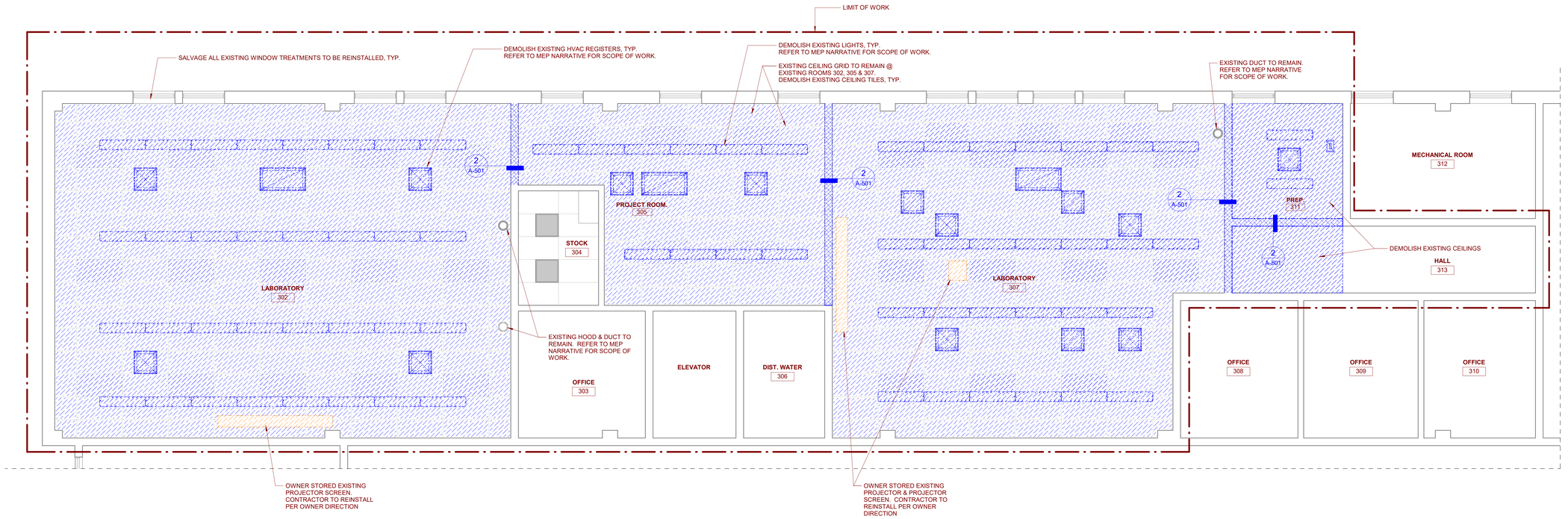
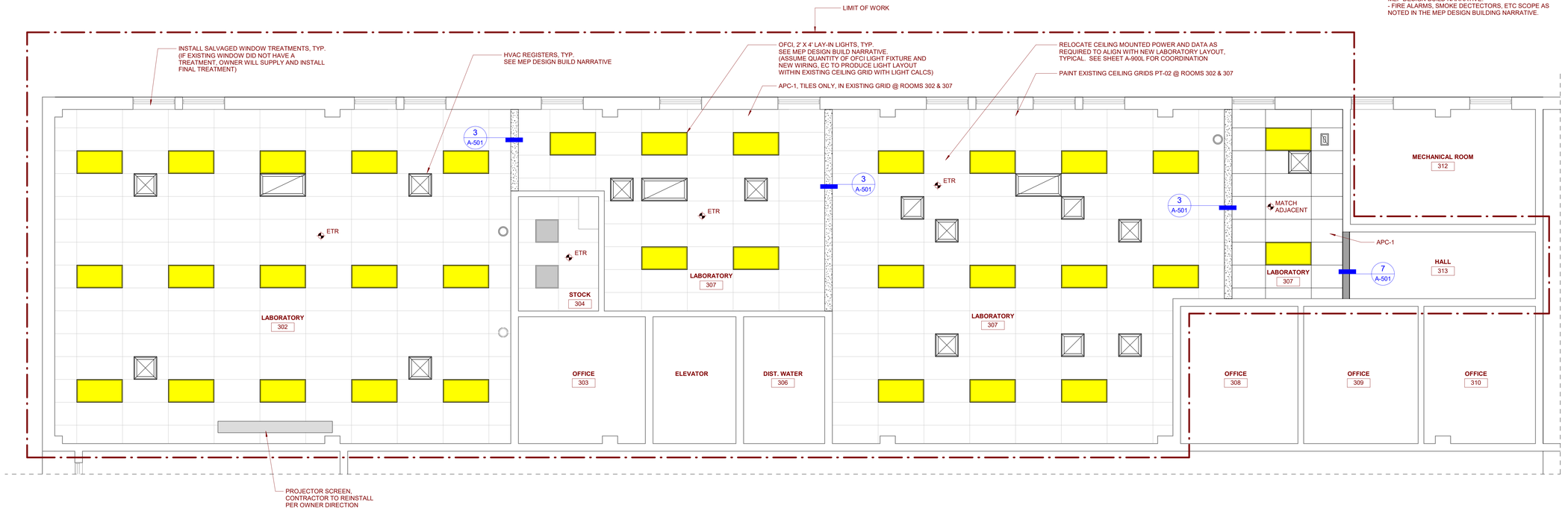


THIRD FLOOR REFLECTED CEILING DEMOLITION PLAN | 2
1/4" = 1'-0" | A-103c

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

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THIRD FLOOR REFLECTED CEILING PLAN

A-103c

A-103c - THIRD FLOOR REFLECTED CEILING PLAN

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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

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

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

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

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

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

EXISTING CEILING TILE TO BE REPLACED, SEE NOTES ON A-103c FOR SCOPE

EXISTING CEILING GRID, ETR, SEE NOTES ON A-103c FOR SCOPE

EXISTING DUCTS TO REMAIN AND RECEIVE PAINT

OWNER TO ABATE FLOOR TILE FROM WORK AREA PRIOR TO CONSTRUCTION, TYP.

SELECT EXISTING WALL MOUNTED CABINETS TO REMAIN, TAPE OFF AND PAINT AROUND AS REQUIRED

EXISTING BULLETIN BOARD AND CHALK BOARDS TO REMAIN, TAPE OFF AND PAINT AROUND AS REQUIRED

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

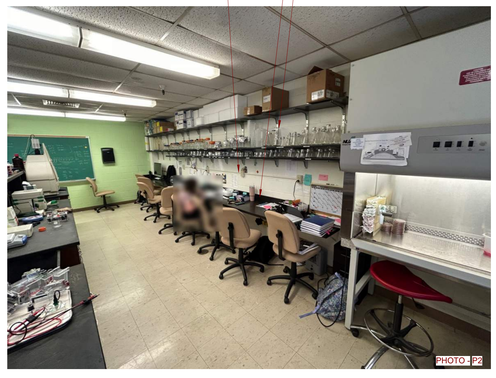
EXISTING GREEN CMU WALLS TO RECEIVE PAINT, TYPICAL

SEE 2 / A-103 FOR SALVAGED VS DEMOLISHED VS ETR CASEWORK AND EQUIPMENT, TYP.

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

EXISTING WALL MOUNTED COUNTERTOP TO REMAIN, TAPE OFF AND PAINT AROUND AS REQUIRED, TYPICAL

EXISTING WALL MOUNTED VERTICAL SHELF TRACKS TO REMAIN, TAPE OFF AND PAINT AROUND AS REQUIRED, TYPICAL



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

WINDOW TREATMENTS SEE SHEET A-103C FOR NOTES, TYPICAL

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

EXISTING LABORATORY 302 IMAGES | 1
1 1/2" = 1'-0" | A-401

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EXISTING INTERIOR PHOTOS

A-401

A-401 - EXISTING INTERIOR PHOTOS

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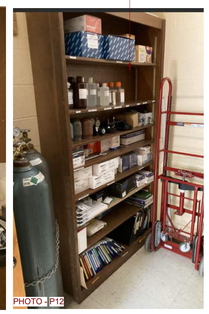
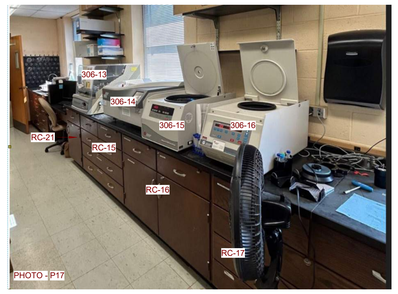
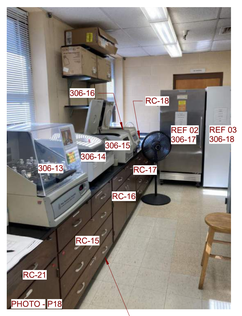
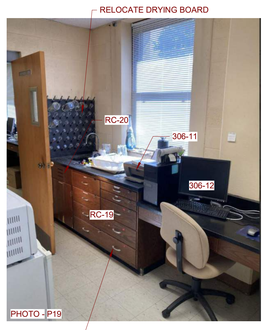








EXISTING WOOD BASE CABINETS TO BE SALVAGED AND RE-INSTALLED IN A DIFFERENT LOCATION

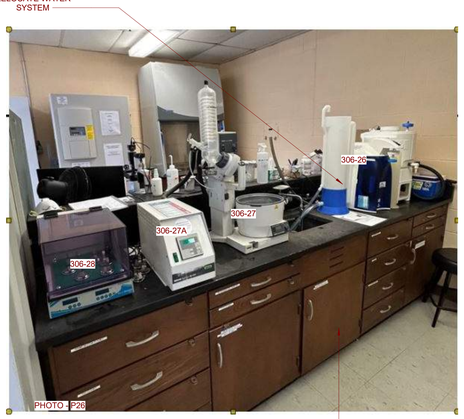
DEMOLISH WOOD CASEWORK

DEMOLISH EXISTING WOOD BASE CABINETS, COUNTERTOP, ISLAND SHELF AND SINKS.

RELOCATE FLAM CABINET

DEMOLISH TALL METAL CABINET

RELOCATE WATER SYSTEM



DEMOLISH EXISTING WOOD BASE CABINETS, COUNTERTOP, ISLAND SHELF AND SINKS.

EXISTING LABORATORY 302 IMAGES | 1

1 1/2" = 1'-0" | A-402

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PWWG PROJECT NUMBER	22304.00
CONSTRUCTION DOCUMENTS	08/02/24

REVISIONS

NO.	DESCRIPTION	DATE

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

EXISTING INTERIOR PHOTOS

A-402

A-402 - EXISTING INTERIOR PHOTOS

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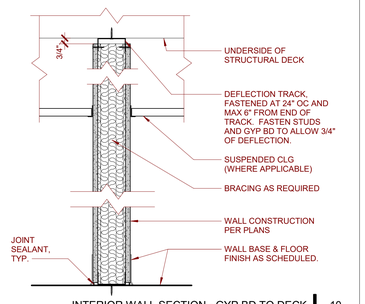
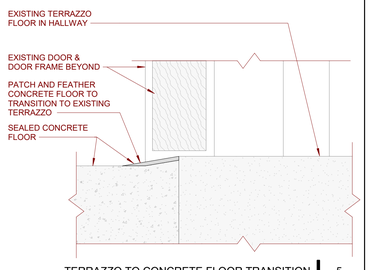
FINISHES

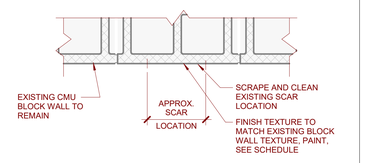
TYPE MARK	FINISH DESCRIPTION	MANUFACTURER	PRODUCT LINE	COLOR/STYLE	NOTES
PAINT					
PT-01	PAINT	SHERWIN WILLIAMS		TBD	WALL COLOR
PT-02	PAINT	SHERWIN WILLIAMS		WHITE - TBD	CEILING GRID COLOR
PT-03	PAINT	SHERWIN WILLIAMS		MATCH EXISTING	MATCH CMU WALL COLOR IN HALL 313
MC-01	CLEAR MASONRY SEALER	PROSOCO	INTERIOR MASONRY DUSTPROOFER	CLEAR	
FLOORING					
CONC-01	SEALED CONCRETE			NATURAL	SEE MC-01
CEILING					
APC-01	ACOUSTIC PANEL CEILING	ARMSTRONG	ULTIMA	WHITE - TEGULAR	24" X 48" - 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



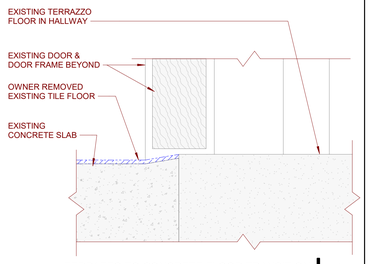
INTERIOR WALL SECTION - GYP BD TO DECK 10
1 1/2" = 1'-0" A-501



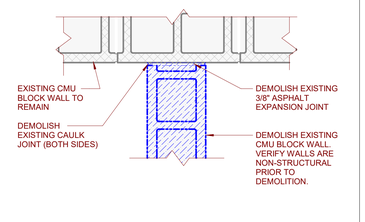
TERRAZZO TO CONCRETE FLOOR TRANSITION 5
6" = 1'-0" A-501



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
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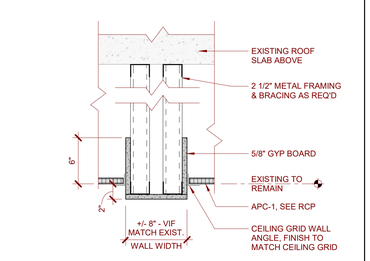
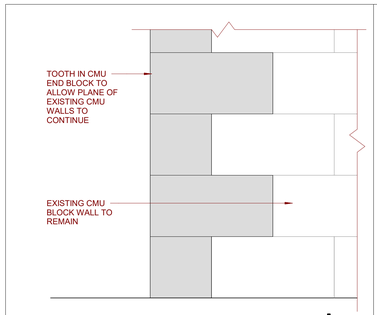
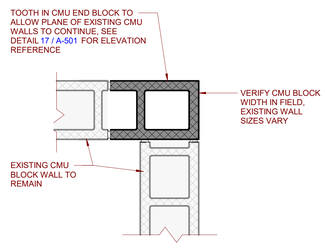


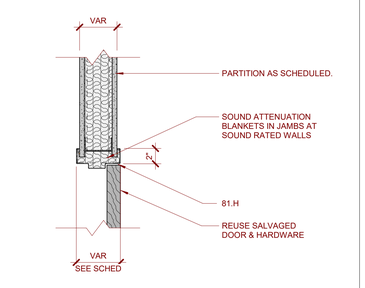
GYP HEADER DETAIL 3
1 1/2" = 1'-0" A-501



CMU WALL ELEVATION DETAIL 17
1 1/2" = 1'-0" A-501



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



TYP HM HEAD DETAIL 7
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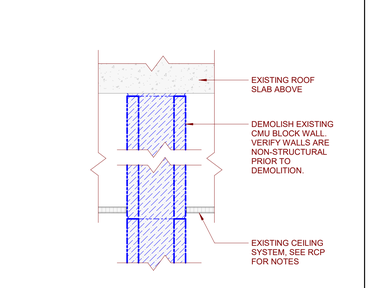

DEMO CMU WALL DETAIL 2
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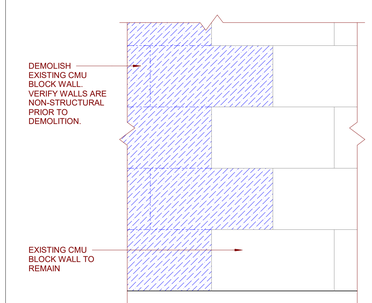

DEMO CMU WALL ELVATION DETAIL 16
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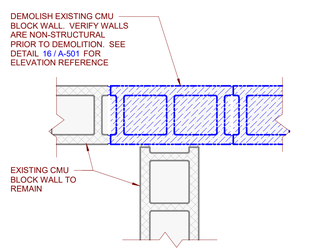

DEMO CMU WALL PLAN DETAIL 11
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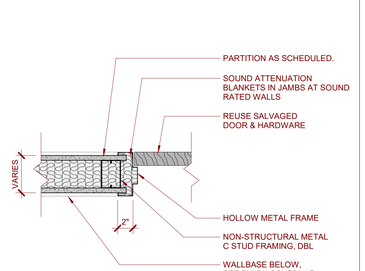

TYP HM JAMB DETAIL 6
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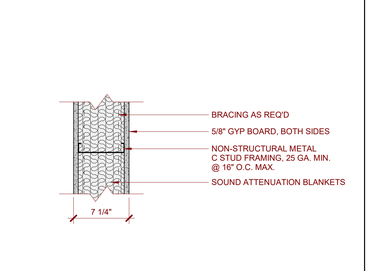

USG-150919: STC 44

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

208 University Drive,
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West Liberty University - Arnett Hall

DETAILS

A-501

A-501 - DETAILS

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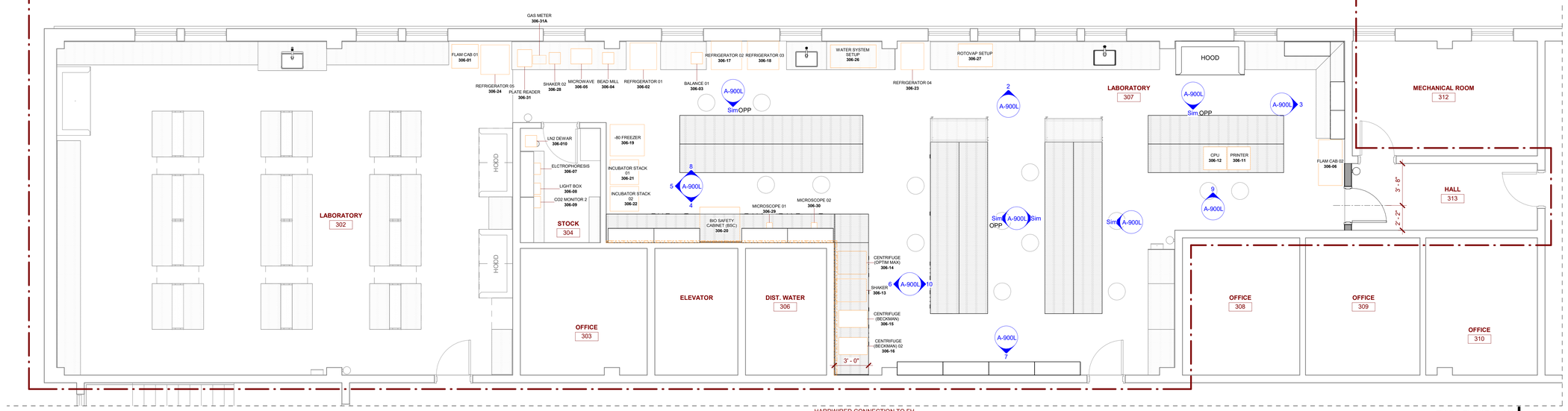
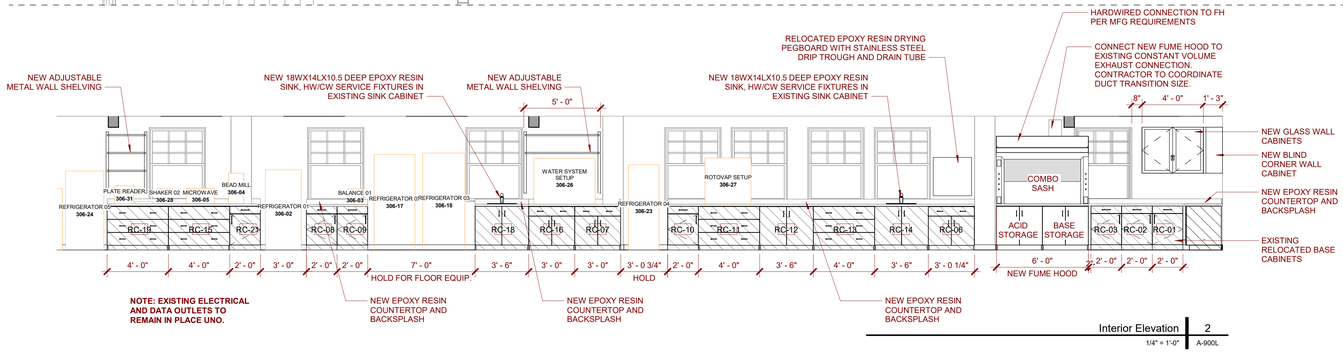
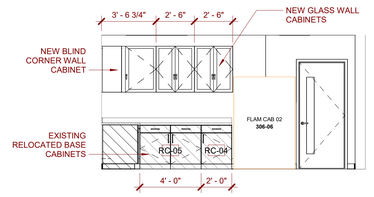


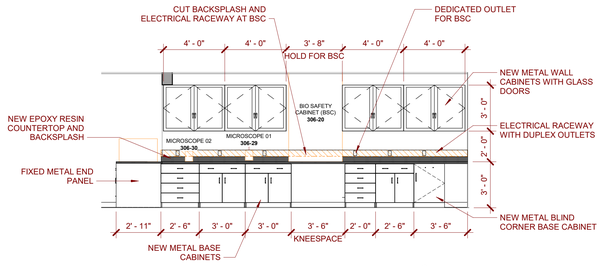
THIRD FLOOR PLAN | 1
1/4" = 1'-0" | A-900L



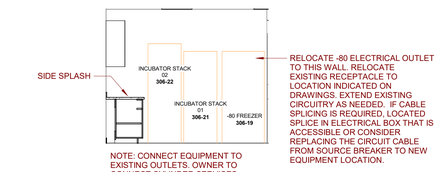
Interior Elevation | 2
1/4" = 1'-0" | A-900L



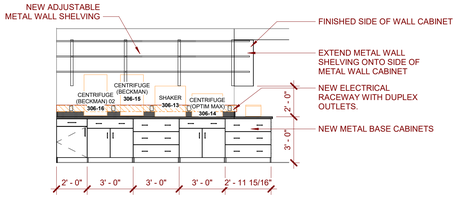
Interior Elevation | 3
1/4" = 1'-0" | A-900L



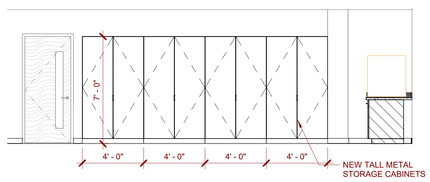
Interior Elevation | 4
1/4" = 1'-0" | A-900L



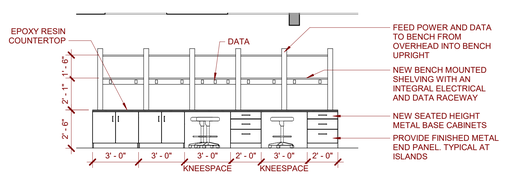
Interior Elevation | 5
1/4" = 1'-0" | A-900L



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

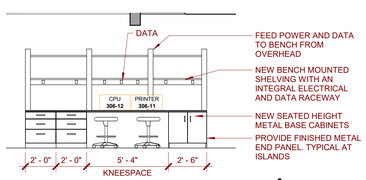


Interior Elevation | 7
1/4" = 1'-0" | A-900L



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

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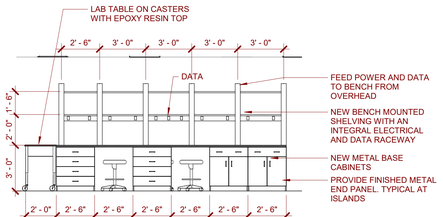

Interior Elevation | 10
1/4" = 1'-0" | A-900L

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.

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208 University Drive,
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West Liberty University - Arnett Hall

THIRD FLOOR LAB PLAN

A-900L

A-900L - THIRD FLOOR LAB PLAN
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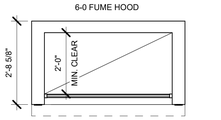

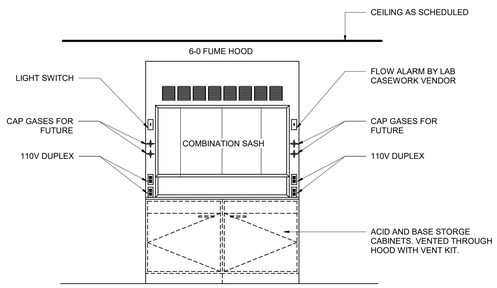

LAB INFORMATION

LAB COMPONENTS AND FINISHES

CODE:	DESCRIPTION:	MANUFACTURER:	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

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.
11610-FH-10 07/22
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
11610-FH-13 07/22
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 AI 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
WEISKOPF
WAGSTAFF +
GOETTEL

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NOT FOR CONSTRUCTION

PWWG PROJECT NUMBER	22304.00
CONSTRUCTION DOCUMENTS	08/02/24

REVISIONS

NO.	DESCRIPTION	DATE

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

LAB DETAILS

A-910L

A. Minimum sheen level shall be between 10-70 GU at 60°.

2.03 WORKSURFACES

A. MATERIALS

1. Epoxy Resin Tops (Kemresin): Epoxy Resin tops shall consist of modified epoxy resin that has been especially compounded and cured to provide the optimum physical and chemical resistance properties required of a heavy-duty laboratory table top. Tops and curbs shall be a uniform mixture throughout their full thickness, and shall not depend upon a surface coating that is readily removed by chemical and/or physical abuse. Tops shall be 1" thick, exposed edges with a 1/8", 45 degree bevel on top and bottom and drip grooves provided on the underside at all exposed edges. 4" high curbs at the backs and ends of tops shall be 1" thick and bonded to the deck to form a square watertight joint. Sink cutouts shall be smooth and uniform without saw marks with the top edge beveled. The bottom edge of the sink opening shall be finished smooth with the edge broken to prevent sharpness. Corners of sink cutouts shall be radiused not less than 3/4".

Color to be Black

2.04 Accessories

A. Manufacturer to provide a full range of matching epoxy products including but not limited to; single poured dished fume hood counter tops, sinks, cupsinks, troughs and pegboards.

B. Molded Epoxy Resin Sinks (Kemresin)

1. Sinks shall be molded of modified epoxy resin, carefully compounded with selected materials to provide maximum physical and chemical properties.

2. Sinks shall possess a high resistance to mechanical and thermal shock.

3. All inside corners to be coved and the bottom pitched to the drain outlet.

4. Manufacturer shall supply a full range of epoxy poured, single piece epoxy sinks available in manufacturers' standard colors.

5. Sinks shall be one piece and be available in under-mount or drop-in configurations.

6. Sink outlets shall be supplied loose and to be installed by respective trades.

7. Sink traps to be furnished and installed under Division 23 trade.

G. Molded Epoxy Resin Drain Troughs

1. Molded Epoxy Resin drain troughs shall be molded of the same resin as specified for Molded Epoxy Resin sinks.

2. Troughs shall have not less than 1/8" per foot pitch to the drain or discharge end.

3. For ease of cleaning, the junction between the sides and bottom shall be seamless and have not less than a 3/4" radius.

H. Pegboards

1. Manufacturer shall supply epoxy pegboards matching epoxy counter tops.

2. Pegboards to be 1" thick.

3. Exposed edges with 1/8", 45 degree beveled chamfer and finished.

4. Back of pegboard, when exposed, to be finished.

5. Pegboard to be factory machined to accept polypropylene pegs. Pegs shall be supplied with pegboard.

6. Standard line of products shall include an applied drip trough made of epoxy resin or stainless steel.

7. Drip trough shall include a means to attach a drain tube. Drain tube shall be included when a drip trough is purchased.

2.05 PERFORMANCE

A. WORK TOP PERFORMANCE REQUIREMENTS:

1. Molded Epoxy Resin (Kemresin and EarthResin):

a. Physical Properties:

Flexural Strength (A.S.T.M. Method D790-90) = 15,000 PSI
Compressive Strength (A.S.T.M. MethodD695-90) = 30,000 PSI
Hardness, Rockwell E (A.S.T.M. Method D785-89) = 100
Water Absorption (A.S.T.M. Method D570-81)% by weight, 24 Hours = 0.04
% by weight, 7 Days = 0.05
% by weight, 2 Hour Boil = 0.04
Specific Gravity = 1.97
Tensile Strength = 8,500 PSI
Burn Characteristics = Class 0, A
Thermal Expansion = 34 10-6
Fire Resistance = Self Extinguishing
Heat Deflection = Should not be exposed to dry ice or liquid nitorgen

Kewaunee Scientific

12345 – LABORATORY COUNTER TOPS, SINKS AND PEGBOARDS 05/21

b. Performance Test Results (Heat Resistance):

A high form porcelain crucible, size 0, 15 ml capacity, shall be heated over a Bunsen burner until the crucible bottom attains an incipient red heat. Immediately, the hot crucible shall be transferred to the top surface and allowed to cool to room temperature. Upon removal of the cooled crucible, there shall be no blisters, cracks or any breakdown of the top surface whatsoever.

c. Performance Test Results (Chemical Resistance):

Tops shall resist chemical attacks from normally used laboratory reagents. Weight change of top samples submerged in the reagents* listed in the next paragraph for a period of seven (7) days shall be less than one-tenth of one percent, except that the weight change for those reagents marked with ** shall be less than one percent. (Tests shall be performed in accordance with A.S.T.M. Method D543-67 at 77o F.).

*Where concentrations are indicated, percentages are by weight.

Acetic Acid, Glacial Iso-Octane
Acetic Acid, 5% Kerosene
Acetone Methyl Alcohol
Ammonium Hydroxide, 28% Mineral Oil
Ammonium Hydroxide, 10% Methyl Ethyl Ketone
Aniline Oil Nitric Acid, 70%**
Benzene Nitric Acid, 40%
Carbon Tetrachloride Nitric Acid, 10%
Chromic Acid, 40%** Oleic Acid
Citric Acid, 10% Olive Oil
Cottonseed Oil Phenol, 5%
Dichromate Cleaning Solution** Soap Solution, 1%
Diethyl Ether Sodium Carbonate, 20%
Dimethyl Formamide Sodium Carbonate, 2%
Distilled Water Sodium Chloride, 10%
Detergent Solution, 1/4% Sodium Hydroxide, 50%
Ethyl Acetate Sodium Hydroxide, 10%
Ethyl Alcohol, 95% Sodium Hydroxide, 1%
Ethyl Alcohol, 50% Sodium Hypochlorite,5%
Ethylene Dichloride Sulfuric Acid, 85%
Heptane Sulfuric Acid, 30%
Hydrochloric Acid, 37% Sulfuric Acid, 3%
Hydrochloric Acid, 10% Toluene
Hydrogen Peroxide, 28% Transformer Oil
Hydrogen Peroxide, 3% Turpentine

NOTE: Dichromate cleaning solution is a formula from Lange's Handbook of Chemistry.

d. Performance Test Results (Chemical Spot Tests - 24 Hours):

Chemical spot tests 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. 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.

SECTION 123553 13 – STEEL LABORATORY CASEWORK AND RELATED PRODUCTS

PART 1 — DESCRIPTION OF WORK

1.00 SUMMARY AND SCOPE

A. Section Includes:

1. Using Kewaunee Scientific Corporation, RESEARCH COLLECTION Laboratory Furniture as a steel casework specification standard, furnish all cabinets and casework, including tops, ledges, supporting structures, and miscellaneous items of equipment as listed in these specifications, equipment schedules, and drawings. Include delivery to the building, set in place, level, and scribe to walls and floors as required. Furnish and install all filler panels, knee space panels and scribes as shown on drawings.

2. Furnish and deliver all utility service outlet accessory fittings, electrical receptacles and switches as listed in these specifications, equipment schedules, and drawings, as mounted on the laboratory furniture. All plumbing and electrical fittings, not preinstalled in equipment, shall be packaged separately and properly marked for delivery to the appropriate contractor.

3. Furnish and deliver, 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 these specifications, equipment schedules, and drawings. All tailpieces shall be furnished less the couplings required to connect them to the drain piping system.

4. Furnish service strip supports where specified, and set in place, service tunnels, service turrets, supporting structures and reagent racks of the type shown on the drawings.

5. Remove 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 broom 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 22: Plumbing
5. Division 26: Electrical Fittings and Connections
6. Division 27: Communications

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 D522 - Bending Test

1.01 BASIS OF WORK

A. It is the intent of this specification to use Kewaunee Scientific Corporation – RESEARCH COLLECTION 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 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 beobtained seven (7) days before the quotation deadline. Procedures for obtaining approval for an alternate manufacturer are defined in section 1.03.B 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's 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 steel laboratory furniture contractor shall also provide worktops 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.

C. Finish Performance: Provide independent test lab certification that furniture shall meet the performance requirements described in section 2.05 of these specifications.

1.03 SUBMITTALS

A. Manufacturer's Data: Submit manufacturer's data and installation instructions for each type of casework.

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. One 18" combination (1) drawer and (1) cupboard base unit showing complete construction details, including (1) shelf.
2. One 36" acid storage base cabinet typical of specified elevations
3. One sample of all top materials shown or called for, of sufficient size to perform finish requirement tests
4. Sample of all mechanical service fittings, locks, door pulls, hinges, and interior hardware

The architect or owner will retain the above samples of the successful manufacture to insure that material delivered to jobsite conforms in every respect to the samples submitted.

C. Shop Drawings: Submit shop drawings for furniture assemblies showing plans, elevations, ends, cross-sections, 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 steel casework manufactured according to the standards used by KewauneeScientific Corporation, 2700 Front Street, Statesville, North Carolina. The specified design is Research Collection. 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 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
6. SEFA member in Good Standing

B. The selected manufacturer shall warrant that all products be free of defects in material and workmanship for a period of one year. The period shall start at the date of acceptance or occupation, whichever comes first. 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 CABINET MATERIAL:

A. Steel: Cabinet bodies, drawer bodies, shelves, drawer heads and door assemblies shall be fabricated from cold rolled steel. (Note: All Drawer and Door Styles are available)

2.02 DRAWER AND DOOR STYLE:

A. Inset – Square Edge Drawers and doors, when closed, shall be recessed to create an overall flush face with 1/8" reveals. The outer drawer and door head shall have a channel formation on all four sides to eliminate sharp raw edges of steel. The top front corners of the door shall be welded and ground smooth.

2.03 MATERIALS

A. General Requirements: It is the intent of this specification to provide a high quality steel cabinet specifically designed for the laboratory environment.

B. Steel:

1. Cold Rolled Steel: Cold rolled sheet steel shall be prime grade 12, 14, 16, 18 and 20 gauge U.S. Standard; roller leveled, and shall be treated at the mill to be free of scale, ragged edges, deep scratches or other injurious effects.

C. Hardware and Trim:

1. Drawer and Door Pulls: Match existing or provide all options for Architect to confirm.

a. Drawer and door pulls shall be mounted on 4" centers, offering a comfortable hand grip, and be securely fastened to doors and drawers.

2. Hinges: (Note: not all hinges meet SEFA 8 specifications)

a. Inset 5-Knuckle Hinges: Inset style cabinets shall use 5-Knuckle hinges made of Type 304 stainless steel .089 thick, 2-1/2" high, with brushed satin finish, and shall be the institutional type with a five-knuckle bullet-type barrel. Hinges shall be attached to both door and case with two screws through each leaf. Welding of hinges to door or case will not be accepted. Doors under 36" in height shall be hung on one pair of hinges, and doors over 36" in height shall be hung on three hinges. (Note: meets SEFA 8 specifications)

3. Drawer Slide:Heavy duty, full extension, soft-close, self-closing, zinc plated, ball bearing slides, rated for 100 pound loads.

4. Catches – For steel casework with 5-knuckle hinges: Positive Catch: A two-piece heavy-duty cam action positive catch Main body of the catch shall be confined within an integral cabinet top or divider rail, while latching post shall be mounted on the hinge side of door. Polyethylene roller type catches are not acceptable.

5. Shelf Adjustment Clips: Shelf adjustment clips shall be die formed, nickel-plated steel.

6. Leg Shoes: Leg shoes shall be a pliable, black vinyl material and shall be provided on all table legs, unless otherwise specified, to conceal leveling device. Use of a leg shoe, which does not conceal leveling device, will not be acceptable.

7. Base Molding: Base molding shall be provided by others.

8. Sink Supports: Sink supports shall be the hanger type, suspended from end panels of sink cabinet by four 1/4" dia. rods, threaded at bottom end and offset at top to hang from two full-depth reinforcements, welded to the top of end panels. Two 3/4" x 1-1/2" x 12 gauge channels shall be hung on the threaded rods to provide an adjustable sink cradle for supporting sinks.

9. Support Struts: Support struts shall consist of two 16 gauge channel uprights fastened top and bottom by two adjustable 12 gauge "U" shaped spreaders, each, 1-1/2" x length required, formed from galvanized steel. Struts shall be furnished to support drain troughs, and to support worktop at plumbing space under fume hood superstructures or other heavy loads. Support struts can be furnished with hangers at extra cost when specified, to support mechanical service piping and drain lines.

2.04 CONSTRUCTION

A. Steel Cabinet Construction:

1. General:

a. The steel furniture shall be of modern design and shall be constructed in accordance with the best practices of the Scientific Laboratory Equipment Industry. First class quality casework shall be insured by the use of proper machinery, tools, dies, fixtures and skilled workmanship to meet the intended quality and quantity for the project.

b. All cabinet bodies shall be flush front construction with intersection of vertical and horizontal case members, such as end panels, top rails, bottoms and vertical posts in same plane without overlap. Exterior corners shall be spot welded with heavy back up reinforcements.

c. Each cabinet shall be complete so that units can be relocated at any subsequent time without requiring field application of finished ends or other such parts.

d. Case openings of Inset style cabinets shall be rabbeted on all four sides for both hinged and sliding doors to provide a dust resistant case.

e. All cabinets shall have a cleanable smooth interior. Bottoms shall be formed down on sides and back to create easily cleanable corners with no burrs or sharp edges.

f. Cabinets shall be designed using a standardized grid pattern to allow reconfiguration of doors and drawers.

2. Steel Gauges: Gauges of steel used in construction of cases shall be 18 gauge, except as follows:

a. Leveling bolt reinforcements 12 gauge.

b. Top and intermediate front horizontal rails, apron rails, hinge reinforcements, and reinforcement gussets, 16 gauge.

c. Drawer assemblies, door assemblies, bottom, bottom back rail, toe space rail, and adjustable shelves, 20 gauge.

B. Base Cabinets:

1. End uprights shall be formed into not less than an L formation at top, bottom, back and a 3/4" wide front C formation. A pilaster shall be added to the inside front of the upright for cabinet and hinge reinforcement and shall be perforated for the support of drawer channels, intermediate rails, hinge screws, and shelf adjustment holes.

2. A 7/8" high top horizontal rail shall interlock with the flange at top of end panels for strength, but shall be flush at face of unit. Top rails not flush with face of end uprights are not acceptable.

3. Intermediate rails shall be provided between doors and drawers, but shall not be provided between drawers unless made necessary by locks in drawers. Intermediate rails shall be recessed behind doors and drawer fronts, and designed so that security panels may be added as required.

4. Intermediate vertical uprights shall be furnished to enclose cupboards when used in a unit in combination with a half width bank of drawers.

5. Cabinet bottom shall be formed of one piece of steel, except in corner units, and shall be formed down on sides and back to create a square edge transition welded to cabinet end panels. Front edge shall include a C formation to form a 7/8" high bottom front rail and shall be flush with face of end uprights. Cabinet bottom front rails not flush with face of end uprights are not acceptable.

6. Toe space rail shall extend up and forward to engage bottom panel to form a smooth surfaced fully enclosed toe space, 3" deep x 4" high.

7. Back construction shall be one piece with integral channel formed for maximum strength and welded to back of top and bottom flanges of end uprights.

8. Each bottom corner of base cabinets shall have a 3/8"-16 leveling bolt, 2-1/2" long capable of supporting 500 lbs. Access to the leveling bolts shall be through plug buttons in the cabinet bottom. Access to leveling bolts through toe space or leveling bolts requiring special tools to adjust are not acceptable.

9. Adjustable shelves shall be formed down 3/4", returned back 7/8" and up 1/4" into a channel formation front and rear and formed down 3/4" at each end. Shelves over 42" long shall be further reinforced with a channel formation welded to underside of shelf. Shelves shall be adjustable on not more than 1" increments.

10. Steel Door assembly (two-piece) for solid panel swinging doors shall consist of an inner and outer door pan. Outer door pan shall be formed at all four sides. The corners on the pull side of the outer door pan shall be welded and ground smooth to prevent exposure of sharp edges if steel at these critical points. Inner door pan shall be flanged at all four sides with hinge reinforcements welded in place. The door assembly shall be 3/4" thick and contains sound deadening material. Door assemblies shall be painted prior to assembly, and shall be punched for attaching pulls. Inner pan formation of door shall be indented for in-field installation of locks when required.

11. Doors shall be readily removable and hinges easily replaceable. Hinges shall be applied to the cabinet and door with screws. Welding of hinges to either cabinet or door will not be acceptable.

12. Drawer Assemblies: Drawer bodies shall be made in one-piece construction including the bottom, two sides, back and front. They shall be fully coved at interior bottom on all four sides for easy cleaning. The top front of the inner drawer body shall be offset to interlock with the channel formation in drawer head providing a 3/4" thick drawer head.

13. Knee space panels, where shown or specified, shall be 20 gauge, finished same as casework cabinets, and easily removable for access to mechanical service areas.

C. Special Purpose Storage Cabinets:

1. Acid Storage Fume Hood Cabinets: Acid storage fume hood cabinets shall utilize the same gauges of steel and construction features as other base cabinets except they shall be completely lined with a one piece polyethylene corrosion resistant liner. The liner shall be 1/4" thick, molded into a seamless tub, including top, sides and bottom, with a 1" lip at the bottom front to contain spills. Tubs shall include integral cleats at both ends and back to support an optional shelf. Each door shall have a set of louvers at the top and bottom, and have a 1/8" sheet polyethylene liner. Where specified, each cabinet shall be vented into the fume hood with a 1-1/2" vent pipe allowing a positive airflow directly into the fume hood exhaust system. When specified or shown on drawings, cabinet shall include a full-depth phenolic resin.

D. Upper Cabinet Construction:

1. Upper cabinets shall have a completely finished interior same as exterior and shall be designed so that no mounting hardware is visible when installed.

2. End uprights shall be formed at front, bottom and back to provide maximum strength and rigidity. Front edge of end upright shall be 3/4" wide. A pilaster shall be added to the inside front of the upright for cabinet and hinge reinforcement and shall be perforated for hinge screws, and shelf adjustment holes.

3. Cabinet tops shall be formed with a 7/8" high C formation at the front edge and turned down at the back to engage a wall hanging rail.

4. Cabinet flush bottoms shall be formed with a 7/8" high C formation at the front edge.

5. Cabinet false bottoms shall be formed down on all four edges and shall be removable.

6. Cabinet backs shall be welded to the top, bottom and ends. Backs shall be perforated for shelf adjustment holes. Holes shall be enclosed by end uprights.

7. Adjustable shelves shall be formed down 3/4", returned back 7/8" and up 1/4" into a channel formation front and rear, formed down 3/4" at each end. Shelves over 42" long shall be further reinforced with a channel formation welded to underside of shelf. Shelves shall be adjustable on not more than 1" increments.

8. Glazed doors shall be 3/4" thick and consist of an inner and outer door pan welded together to form a single unit. Outer door pan shall be 18 gauge steel, formed into a channel or flanged shape at all four sides. It shall be pierced and formed to create a 3" wide frame with a beveled edge around the glass opening in the center of the door. Inner door pan shall be 18 gauge steel, flanged at all four sides, and pierced for a glass opening in center of the door. Glass shall be held in place by a rubber or vinyl gasket around the entire edge of the glass. Doors shall be glazed with: 1/8" float glass.

9. Solid panel doors shall consist of an inner and outer door pan. Outer door pan shall be formed into a channel or flanged shape at all four sides. The corners on the pull side of the outer door pan shall be welded and ground smooth to prevent exposure of sharp edges of steel at these critical points. Inner door pan shall be flanged at all four sides with hinge reinforcements welded in place. The door assembly shall be 3/4" thick and contains sound deadening material.

10. Swinging doors under 36" high shall be hung on one pair of hinges, doors over 36" high shall be hung on three hinges.

E. Steel Full Height Cabinet Construction:

1. Full height storage cabinets shall have a completely finished interior same as exterior.

2. End uprights shall be formed at front, bottom and back to provide maximum strength and rigidity. Front fascia of upright shall be 1-1/4" wide with inside edge formed in a channel 1/2" x 3/8". A full height box reinforcement shall be fitted to the channel, formed to provide a recessed strike for door and to reinforce the cabinet. The backside of the reinforcement shall be perforated with shelf adjustment holes spaced at not more than 1" centers. Back of upright shall be formed in a 2-1/2" formation. 16 gauge hinge reinforcement shall be welded to inner side of front uprights.

3. Cabinet tops shall be formed into a channel shape at front with flange at rear and sides for electro-welding cabinet top to cabinet back and ends. Front fascia channel shall be strengthened with electro-weld reinforcements.

4. Cabinet bottoms for storage cabinets shall be formed down on sides and back to create a square edge transition welded to cabinet end panels, and front edge shall be offset to create a seamless door recess rabbet for dust stop. Cabinet bottoms shall be formed to provide a flush 1" face rail with a return flange to give a 9/16" deep x 5" high toe space. All cabinets shall have a cleanable smooth interior.

5. Toe space rails shall interlock in back of bottom rail and with end panel to provide a welding plate, and shall extend to the floor with a flange turned back and up for support.

6. Cabinet backs shall be welded to the top, bottom and ends. Backs shall be perforated for shelf adjustment holes on not more than 1" centers. Holes shall be enclosed by a formation in cabinet back and enclosed by end uprights.

7. Adjustable shelves shall be formed down 3/4", returned back 7/8" and up 1/4" into a channel formation front and rear; formed down 3/4" at each end. Shelves over 42" long shall be further reinforced with a channel formation electro-welded to underside of shelf. Shelves shall be adjustable on not more than 1" increments.

8. Glazed doors shall be 3/4" thick and consist of an inner and outer door pan welded together to form a single unit. Outer door pan shall be 18 gauge steel, formed into a channel or flanged shape at all four sides. It shall be pierced and formed to create a 3" wide frame with a beveled edge around the glass opening in the center of the door. Inner door pan shall be 18 gauge steel, flanged at all four sides, and pierced for a glass opening in center of the door. Door glazing shall be held in place by a rubber or vinyl gasket around the entire edge of the glass. Doors shall be glazed with: 1/8" float glass.

9. Swinging doors under 36" high shall be hung on one pair of hinges, doors over 36" high shall be hung on three hinges.

2.05 PERFORMANCE REQUIREMENTS

A. Steel Casework Construction Performance:

1. Base cabinets shall be constructed to support at least a uniformly distributed load 200 pounds per square foot of cabinet top area, including working surface without objectionable distortion of interference with door and drawer operation.

2. Base cabinet leveling bolts shall support 500 pounds per corner, at 1-1/2" projection of the leveling bolt below the cabinet bottom.

3. Each adjustable and fixed shelf 4 feet or shorter in length shall support an evenly distributed load of 40 pounds per square foot up to a maximum of 200 pounds, with nominal temporary deflection, but without permanent set.

4. Full extension soft-close, self-closing ball bearing zinc plated drawer slide shall be rated for 100 pound loads.

5. Swinging doors on floor-mounted inset style casework shall support 200 pounds suspended at a point 12" from hinged side, with door swung through an arc of 160 degrees. Weight load test shall allow only a temporary deflection, without permanent distortion or twist. Door shall operate freely after test and assume a flat plane in a closed position.

B. Steel Paint System Finish and Performance Specification:

1. Steel Paint System Finish: After Cold Rolled Steel and Textured Steel 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.

2. 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. mmediately 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.
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 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.

3. 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.

4. 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.

5. Performance Test Results (Bending Test): An 18 gauge steel strip, finished as specified, when bent 180 over a 1/2" diameter mandrel, shall show no peeling or flaking off of the finish.

6. 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".

7. 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 upture the film, is then used to express or designate the hardness.

PART 3 — EXECUTION

3.00 SITE EXAMINATION

A. The owner and/or his representative shall assure all building conditions conducive to the installation of a finished goods product; all critical dimensions and conditions previously checked have been adhered to by other contractors (general, mechanical, electrical, etc.) to assure a quality installation.

3.01 INSTALLATION

A. Preparation: Prior to beginning installation of casework, 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 prepared 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:

1. Casework:

a. Set casework components plumb, square, and straight with no distortion and securely anchor to building structure. Shim as required using concealed shims.

b. Bolt continuous cabinets together with joints flush, tight and uniform, and with alignment of adjacent units within 1/16" tolerance.

c. Secure wall cabinets to solid supporting material, not to plaster, lath or gypsum board.

d. Abut top edge surfaces in one true plane. Provide flush joints not to exceed 1/8".

2. Worksurfaces:

a. Where required due to field conditions, scribe to abutting surfaces.

b. Only factory prepared field joints, located per approved shop drawings, shall be permitted. Secure the joints in the field, where practical, in the same manner as in the factory.

c. Secure worksurfaces to casework and equipment components with materials and procedures recommended by the manufacturer.

D. Adjust and Clean:

1. Repair or remove and replace defective work, as directed by owner and/or his representative upon completion of installation.

2. Adjust doors, drawers and other moving or operating parts to function smoothly.

3. Clean shop finished casework; touch up as required.

4. Clean worksurfaces and leave them free of all grease and streaks.

5. Casework to be left broom clean and orderly.

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.

B. CONSTRUCTION:

1. Water Fittings: Water fittings shall be provided with a renewable unit containing all operating parts which are subject to wear. The renewable unit shall contain an integral volume control device and all faucets shall be capable of being readily converted from compression to self-closing, without disturbing the faucet body proper. Four (4) arm forged brass handles shall contain plastic screwon type colored service index buttons.

2. Gooseneck Type Outlets:Gooseneck outlets shall have a separate brazed coupling to provide a full thread attachment of anti-splash, serrated tip or filter pump fittings.

3. Waste Lines:Waste lines shall be furnished by other trades.

4. Traps:Traps shall be furnished by other trades.

5. Electrical Fittings:Electrical fittings shall contain 20 Amp., 125 Volt AC, 3-wire polarized grounded receptacles, unless otherwise specified. Pedestal and line-type boxes shall be of aluminum, metallic finish with stainless steel flush plates. Receptacle boxes shall be of plated steel. All electrical or conduit fittings called for or to be furnished under these specifications shall meet the requirements of the National Electrical Code.

C. PERFORMANCE:

1. Maximum Line Pressures:

Laboratory Ball Valves (Gas and Air)...... 75 PSI
Needle Point Cocks (Gas and Air).......... 65 PSI
Vacuum... 28.5" Mercury
Hot and Cold Water............................... 80 PSI
Steam .... 30 PSI

2. Sepia Bronze Finish Performance: Finish shall show no rupture, other than a slight discoloration or possible softening when subjected to the following fumes for approximately six (6) days: Plastic coated fittings shall be suspended in a container, 6 cu. ft. capacity 12" above open beakers, each containing 199 cc. of 70% Nitric Acid, 94% Sulphuric Acid, 37-38% Hydrochloric Acid, respectively. Finish shall also withstand direct contact of reagents dropped from a burette at a rate of 60 drops/min. for a period of 10 minutes. Chemicals are shown below:

Concentrated Hydrochloric Acid 37-38%*
Concentrated Nitric Acid 70%*
Concentrated Sulphuric Acid 94%
12345-SF-3 05/18
Glacial Acetic Acid 99.5%*
Ethyl and Other Alcohols
Toulene and Other Hydrocarbons
Carbon - Tetrachloride
Mineral Oil

*Percentages are by weight.

SECTION 12345 – LABORATORY COUNTER TOPS, SINKS AND PEGBOARDS

Part 1: General

1. 1 SUMMARY - This specification section covers counter tops specifically manufactured for laboratory use.

A. Section Includes:

1. Work surfaces: Epoxy resin work surfaces
2. Accessories
o Sinks
o Pegboards
o Joint adhesive

B. Related Sections;

1. Division 06 Millwork and Rough Carpentry
2. Division 11 Laboratory Fume Hoods
3. Division 12 Laborartory Casework
4. Division 12 Laboratory Fixtures

1.2 REFERENCES

A. SEFA 3 – Scientific Equipment and Furniture Association
B. ASTM International

1.3 SUBMITTALS

A. Shop Drawings:

1. Approval drawings shall be submitted on pages no less than 11" x 17" and 3/8" scale.

2. Drawings shall include but not be limited to:
1. overall counter top size
2. dotted-in base cabinet and knee space locations
3. sink size and sink cutout locations
4. fixture drilling size and locations
5. column cutouts
6. all counter top cutout and drilling size and locations and seam locations

3. As most practical, seams shall be located at the intersection of base cabinets.

4. Seams shall not be placed in knee space areas and as far from sinks as practical.

5. Counter top sizes shall be of the largest practical size while allowing delivery into the building, floor and room.

6. Any one particular counter top piece should weigh no more than 350 lbs.

B. Field Dimensions

1. Dimensions shall be field verified prior to fabrication by qualified factory or dealer representative to ensure proper fit of fabricated and delivered materials.

2. Field dimensions are to be transferred to production and final drawings.

C. Product Data

1. Submit product data that details material origin and design, thickness, durability, performance test results, specification, edge design and color availability.

D. Samples

1. Epoxy samples shall be no less than 1" thick x 4" x 4".

2. Samples shall be clearly marked with manufacturer name and product specifics.

E. Test Reports

1. Submit 3rd party test reports showing evaluations and adherence to SEFA 3 qualifications.

F. Closeout Submittals:

1. Submit owner's manual and recommended maintenance information.

1.4 DELIVERY, STORAGE AND HANDLING

A. Delivery

1. Materials shall only be delivered to a jobsite after internal atmosphere condition has occurred, ceiling grid is installed and drywall has been painted.

2. Storage of epoxy tops in outside conditions is only acceptable when extreme temperatures and weather conditions are not present.

3. Tops must be covered and away from UV exposure.

B. Storage

1. Epoxy tops shall be stored vertically or horizontally as per manufacturers' recommendations.

2. In all cases, tops shall be properly supported to eliminate bending and warping of stored materials.

3. Tops shall be stored on oversized pallets of a size suitable to support the size and weight of all combined materials.

4. Top corners and edges are to be additionally protected using heavy thickness cardboard or plastic material.

C. Handling

1. Epoxy tops are heavy and shall be handled by qualified machinery or personnel to ensure personal, product and peripheral safety.

2. Tops are to be removed from pallets without causing scratches or damage to other tops.

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.

A. Minimum sheen level shall be between 10-70 GU at 60°.

2.03 WORKSURFACES

A. MATERIALS

1. Epoxy Resin Tops (Kemresin): Epoxy Resin tops shall consist of modified epoxy resin that has been especially compounded and cured to provide the optimum physical and chemical resistance properties required of a heavy-duty laboratory table top. Tops and curbs shall be a uniform mixture throughout their full thickness, and shall not depend upon a surface coating that is readily removed by chemical and/or physical abuse. Tops shall be 1" thick, exposed edges with a 1/8", 45 degree bevel on top and bottom and drip grooves provided on the underside at all exposed edges. 4" high curbs at the backs and ends of tops shall be 1" thick and bonded to the deck to form a square watertight joint. Sink cutouts shall be smooth and uniform without saw marks with the top edge beveled. The bottom edge of the sink opening shall be finished smooth with the edge broken to prevent sharpness. Corners of sink cutouts shall be radiused not less than 3/4".

Color to be Black

2.04 Accessories

A. Manufacturer to provide a full range of matching epoxy products including but not limited to; single poured dished fume hood counter tops, sinks, cupsinks, troughs and pegboards.

B. Molded Epoxy Resin Sinks (Kemresin)

1. Sinks shall be molded of modified epoxy resin, carefully compounded with selected materials to provide maximum physical and chemical properties.

2. Sinks shall possess a high resistance to mechanical and thermal shock.

3. All inside corners to be coved and the bottom pitched to the drain outlet.

4. Manufacturer shall supply a full range of epoxy poured, single piece epoxy sinks available in manufacturers' standard colors.

5. Sinks shall be one piece and be available in under-mount or drop-in configurations.

6. Sink outlets shall be supplied loose and to be installed by respective trades.

7. Sink traps to be furnished and installed under Division 23 trade.

G. Molded Epoxy Resin Drain Troughs

1. Molded Epoxy Resin drain troughs shall be molded of the same resin as specified for Molded Epoxy Resin sinks.

2. Troughs shall have not less than 1/8" per foot pitch to the drain or discharge end.

3. For ease of cleaning, the junction between the sides and bottom shall be seamless and have not less than a 3/4" radius.

H. Pegboards

1. Manufacturer shall supply epoxy pegboards matching epoxy counter tops.

2. Pegboards to be 1" thick.

3. Exposed edges with 1/8", 45 degree beveled chamfer and finished.

4. Back of pegboard, when exposed, to be finished.

5. Pegboard to be factory machined to accept polypropylene pegs. Pegs shall be supplied with pegboard.

6. Standard line of products shall include an applied drip trough made of epoxy resin or stainless steel.

7. Drip trough shall include a means to attach a drain tube. Drain tube shall be included when a drip trough is purchased.

2.05 PERFORMANCE

A. WORK TOP PERFORMANCE REQUIREMENTS:

1. Molded Epoxy Resin (Kemresin and EarthResin):

a. Physical Properties:

Flexural Strength (A.S.T.M. Method D790-90) = 15,000 PSI
Compressive Strength (A.S.T.M. MethodD695-90) = 30,000 PSI
Hardness, Rockwell E (A.S.T.M. Method D785-89) = 100
Water Absorption (A.S.T.M. Method D570-81)% by weight, 24 Hours = 0.04
% by weight, 7 Days = 0.05
% by weight, 2 Hour Boil = 0.04
Specific Gravity = 1.97
Tensile Strength = 8,500 PSI
Burn Characteristics = Class 0, A
Thermal Expansion = 34 10-6
Fire Resistance = Self Extinguishing
Heat Deflection = Should not be exposed to dry ice or liquid nitorgen

b. Performance Test Results (Heat Resistance):

A high form porcelain crucible, size 0, 15 ml capacity, shall be heated over a Bunsen burner until the crucible bottom attains an incipient red heat. Immediately, the hot crucible shall be transferred to the top surface and allowed to cool to room temperature. Upon removal of the cooled crucible, there shall be no blisters, cracks or any breakdown of the top surface whatsoever.

c. Performance Test Results (Chemical Resistance):

Tops shall resist chemical attacks from normally used laboratory reagents. Weight change of top samples submerged in the reagents* listed in the next paragraph for a period of seven (7) days shall be less than one-tenth of one percent, except that the weight change for those reagents marked with ** shall be less than one percent. (Tests shall be performed in accordance with A.S.T.M. Method D543-67 at 77o F.).

*Where concentrations are indicated, percentages are by weight.

Acetic Acid, Glacial Iso-Octane
Acetic Acid, 5% Kerosene
Acetone Methyl Alcohol
Ammonium Hydroxide, 28% Mineral Oil
Ammonium Hydroxide, 10% Methyl Ethyl Ketone
Aniline Oil Nitric Acid, 70%**
Benzene Nitric Acid, 40%
Carbon Tetrachloride Nitric Acid, 10%
Chromic Acid, 40%** Oleic Acid
Citric Acid, 10% Olive Oil
Cottonseed Oil Phenol, 5%
Dichromate Cleaning Solution** Soap Solution, 1%
Diethyl Ether Sodium Carbonate, 20%
Dimethyl Formamide Sodium Carbonate, 2%
Distilled Water Sodium Chloride, 10%
Detergent Solution, 1/4% Sodium Hydroxide, 50%
Ethyl Acetate Sodium Hydroxide, 10%
Ethyl Alcohol, 95% Sodium Hydroxide, 1%
Ethyl Alcohol, 50% Sodium Hypochlorite,5%
Ethylene Dichloride Sulfuric Acid, 85%
Heptane Sulfuric Acid, 30%
Hydrochloric Acid, 37% Sulfuric Acid, 3%
Hydrochloric Acid, 10% Toluene
Hydrogen Peroxide, 28% Transformer Oil
Hydrogen Peroxide, 3% Turpentine

NOTE: Dichromate cleaning solution is a formula from Lange's Handbook of Chemistry.

d. Performance Test Results (Chemical Spot Tests - 24 Hours):

Chemical spot tests 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. 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.

Rating Description
0 = No Effect: No detectable change in the material surface.
1 = Excellent: Slight detectable change in color or gloss but no change in function or life of the surface.
2 = Good: A clearly discernible change in color or gloss but no significant impairment of surface life or function.
3 = Fair: Objectionable change in appearance due to discoloration or etch, possibly resulting in deterioration of function over an extended period of time.

Chemical Reagent Rating
Amyl Acetate 1
Ethyl Acetate 0
Acetic Acid, 98% 0
Acetone 1
Acid Dichromate, 5% 2
Butyl Alcohol 0
Ethyl Alcohol 0
Methyl Alcohol 0
Aluminum Hydroxide, 28% 0
Benzene 0
Carbon Tetrachloride 0
Chloroform 1
Chromic Acid, 60% 2
Cresol 1
Dichlor Acetic Acid 1
Dimethylformanide 1
Dioxane 1
Ethyl Ether 1
Formaldehyde, 37% 0
Formic Acid, 90% 1
Furfural 1
Gasoline 0
Hydrochloric Acid, 37% 1
Hydrofluoric Acid, 48% 2
Hydrogen Peroxide, 3% 0
Tincture of Iodine 0
Methyl Ethyl Ketone 1
Methylene Chloride 1
Mono Chlorobenzene 0
Naphthalene 0
Nitric Acid, 20% 0
Nitric Acid, 30% 0
Nitric Acid, 70% 1
Phenol, 90% 1
Phosphoric Acid, 85% 0
Silver Nitrate, Saturated 0
Sodium Hydroxide, 10% 0
Kewaunee Scientific
Sodium Hydroxide, 20% 0
Sodium Hydroxide, 40% 0
Sodium Hydroxide, Flake 0
Sodium Sulfide, Saturated 0
Sulfuric Acid, 33% 0
Sulfuric Acid, 77% 0
Sulfuric Acid, 96% 0
Sulfuric Acid, 77% & Nitric Acid, 70%, Equal Parts 1
Toluene 0
Trichloroethylene 0
Xylene 0
Zinc Chloride, Saturated 0

PART 3 – INSTALLATION

3.01 Installation

A.Tops are to be installed only after base cabinets or support systems have been installed, leveled and secured. Tops are to be adhered to cabinets using screws, silicone or 2 part epoxy adhesivechoice dependent upon application. Counter tops are to be installed to achieve a uniform alignment at the front edge of the tops. Overhang of counter top edges are to be consistent and as indicated on approved shop drawings.

B.Shim tops as necessary to produce level joints and seams but no more than 1/8". Joint width is to be consistent through the length of each joint with no gap greater than 1/8". Use 2 part joint epoxy cement mixed per manufacturers recommendations. Prior to setting up, clean and remove excess joint adhesive from counter top and from above joint line. Finished joints should be clean and level with adjacent counter tops. Dips and bumps in joints are not acceptable. Installed tops should be free of uneven surfaces, waves or warping.

C.Installed counter tops are to be protected using heavy gauge paper or cardboard. Each top is to be affixed with a sign warning other trades that finished tops reside below.

D.Manufacturers' protective oil is to remain on countertops after installation and under protective paper and only to be cleaned off by others prior to owner acceptance and move in.

3.02 Sink Installation

A.The installer responsible for the installation of sinks shall follow good plumbing practice.

B.Sinks to be installed following manufacturer's best recommended practices.

3.03 Plumbing Fixture Installation

A.The installer responsible for the installation of laboratory service fittings shall follow good plumbing practice.

B.Prior to fixture final connection, plumber to flush supply lines to remove pipe shavings, scale and other debris to eliminate foreign matter from damaging valve components and interfering with the proper operation of fittings.

C.Fittings to be secured to counter tops using manufacturer supplied locknut and lock washer. Do not over tighten.

D.Fixtures are to be installed without scratching the surface finish of faucets, valves or counter tops.

3.04 Installer Qualifications

A.Qualified installers shall have 10+ years and $50 million of installed product.

B. Installers shall be directly trained by the epoxy top manufacturer and certified to install epoxy tops to manufacturers recommended practices and tolerances.

3.05 Cleaning

A.Tops are to be cleaned using manufacturers recommended practices;

a. Clean Kemresin surfaces using a general purpose detergent and warm water.

b. Apply a coat of linseed oil or furniture polish after cleaning to maintain the top and to hide minor scratches.

c. Regular applications of linseed oil or furniture polish will enhance the appearance of your work top.

PERFIDO
WEISKOPF
WAGSTAFF +
GOETTEL

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NOT FOR CONSTRUCTION

PWWG PROJECT NUMBER	22304.00
CONSTRUCTION DOCUMENTS	08/02/24

REVISIONS

NO.	DESCRIPTION	DATE

208 University Drive,
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West Liberty University - Arnett Hall

LAB DETAILS

A-911L

PERFIDO
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NOT FOR CONSTRUCTION

PROJECT INFORMATION
PROJECT NAME: WLU Arnett Hall
JACOBS PROJECT #

		EQUIPMENT GENERAL INFORMATION						EQUIPMENT POWER INFORMATION							PLUMBING INFORMATION								
MOUNTING LOCATION	**EQUIP TAG (###-##)**	**DESCRIPTION**	**MANUFACTURER**	**MODEL NUMBER**	**LENGTH (INCHES)**	**DEPTH (INCHES)**	**HEIGHT (INCHES)**	**VOLTS (V)**	**Hz**	**AMPS (A)**	**WATTS**	**PHASE (1 OR 3)**	**STANDBY (BUILDING EPOWER) (SB)**	**NEMA PLUG TYPE**	**HOT WATER (HW)**	**COLD WATER (CW)**	**DEIONIZED WATER (HOUSE FED) (DI)**	**OWNER PROVIDED WATER POLISHER**	POLISHER DRAIN, WATER CONNECTION	**DOMESTIC DRAIN (TYPE)**	**CYLINDER GAS SERVICE CO2 99.995%**	CO2 CONNECTION TYPE (END FITTING DESCRIPTION)	CO2 REGULATOR REQUIRED AT FIXTURE (R)
FLOOR	**306-01**	FLAMMABLE CABINET-01	-	-	28	25	29	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLOOR	**306-02**	REFRIGERATOR 01	WHIRLPOOL	-	28	28	63	120	60			1	NO	-	-	-	-	-	-	-	-	-	-
BENCH	**306-03**	BALANCE 01	FISHER	A-160	12	12	12	120	-	-	-	1	NO	-	-	-	-	-	-	-	-	-	-
BENCH	**306-04**	BEAD MILL	MP	FAST PREP 24	12	12	2	120	-	-	-	1	NO	-	-	-	-	-	-	-	-	-	-
BENCH	**306-05**	MICROWAVE	SAMSUNG	-	22	16	12	120	-	-	-	1	NO	-	-	-	-	-	-	-	-	-	-
FLOOR	**306-06**	FLAMMABLE CABINET-02	-	-	48	14	60	N/A	-	-	-	1	NO	-	-	-	-	-	-	-	-	-	-
BENCH	**306-07**	ELECTROPHORESIS	FISHER	BIO-TECH	24	12	6	120	-	-	-	1	NO	-	-	-	-	-	-	-	-	-	-
BENCH	**306-08**	LIGHT BOX	FISHER	BIO TECH	24	12	6	120	60	3		1	NO	-	-	-	-	-	-	-	-	-	-
BENCH	**306-09**	CO2 MONITOR	-	-	6	6	6	120	-	-	-	1	NO	-	-	-	-	-	-	-	-	-	-
FLOOR	**306-10**	LN2 DEWAR	-	BIO CANE	24	-	-	N/A	-	-	-	1	NO	-	-	-	-	-	-	-	-	-	-
BENCH	**306-11**	PRINTER	HP	-	12	8	12	120	-	-	-	1	NO	-	-	-	-	-	-	-	-	-	-
BENCH	**306-12**	COMPUTER	DELL	-	12	12	12	120	-	-	-	1	NO	-	-	-	-	-	-	-	-	-	-
BENCH	**306-13**	SHAKER 01	NEW BRUNSWICK	EXCELLA E24	24	32	24 WITH LID OPEN	120	60	-	-	1	NO	-	-	-	-	-	-	-	-	-	-
BENCH	**306-14**	CENTRIFUGE	OPTIMAX	MAX-XP ULTRA CENTRIFUGE	24	30	18	120	60			1	NO	-	-	-	-	-	-	-	-	-	-	-
BENCH	**306-15**	CENTRIFUGE	BECKMAN	ALLEGRA X-30R	18	30	32 WITH LID OPEN	120	60	-	-	1	NO	-	-	-	-	-	-	-	-	-	-	-
BENCH	**306-16**	CENTRIFUGE	BECKMAN	ALLEGRA 21R	18	39=0	18 WITH LID OPEN	120	60	-	-	1	NO	-	-	-	-	-	-	-	-	-	-	-
FLOOR	**306-17**	REFRIGERATOR 02	FRIDGIDAIRE	COMMERCIAL	32	30	75	120	60	-	-	1	NO	-	-	-	-	-	-	-	-	-	-	-
FLOOR	**306-18**	REFRIGERAOR 03	MIDEA	-	33	30	76	120	60	-	-	1	NO	-	-	-	-	-	-	-	-	-	-	-
FLOOR	**306-19**	-80 FREEZER	THERMO	IU1386A	32	36	72	120	60	16	-	1	NO	-	-	-	-	-	-	-	-	-	-	-
BENCH	**306-20**	BIO SAFETY CABINET (BSC)	LABCONCO	LOGIC +	42"			120	60	-		1	NO	-	-	-	-	-	-	-	-	-	-	-
FLOOR	**306-21**	INCUBATOR STACK	PHCBI	MCO-170AICULV-PA	26"	30	72	120	60	-	-	1	NO	-	-	-	-	-	-	-	YES	-	BY OWNER	BY OWNER
FLOOR	**306-22**	INCUBATOR STACK	SANYO/THERMO	MCO-18AIC / HERACELL 150i	26	30	78	120	60	-	-	1	NO	-	-	-	-	-	-	-	YES	-	BY OWNER	BY OWNER
FLOOR	**306-23**	REFRIGERATOR 04	CROSLEY	-	24	28	67	120	60	-	-	1	NO	-	-	-	-	-	-	-	-	-	-	-
FLOOR	**306-24**	REFRIGERATOR 05	WHIRLPOOL	-	30	31	62	120	60	-		1	NO	-	-	-	-	-	-	-	-	-	-	-
FLOOR	**306-25**	REFRIGERATOR 06	UNDERCOUNTER - TBD	-	-	-	-	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENCH	**306-26**	WATER SYSTEM	MILLIPORE	DIREC-Q 5 UV WITH 30 L TANK	36	30	26	120	60	-	-	1	NO	-	-	YES	-	YES	DRAIN IN ADJACENT SINK	-	-	-	-	-
BENCH	**306-27**	ROTOVAP SETUP	BUCHI	R-200	36	30	26	120	60	-	-	1	NO	-	-	-	-	-	-	-	-	-	-	-
BENCH	**306-27A**	WATER BATH	VEVOR		13	15	26	120	60	-		1	NO	-	-	-	-	-	-	-	-	-	-	-
BENCH	**306-28**	SHAKER 02	BENCHMARK	INCU-SHAKER MINI	12	12	8	120	-	-	-	1	NO	-	-	-	-	-	-	-	-	-	-	-
BENCH	**306-29**	MICROSCOPE 01	-	-	-	-	-	120	-	-	-	1	NO	-	-	-	-	-	-	-	-	-	-	-
BENCH	**306-30**	MICROSCOPE 02	-	-	-	-	-	120	-	-	-	1	NO	-	-	-	-	-	-	-	-	-	-	-
BENCH	**306-31**	PLATE READER	AGILENT BIOTEK	SYNERGY H1	15	18	14		-	-	-	-	NO	-	-	-	-	-	-	-	-	-	-	-
BENCH	**306-31A**	GAS METER	AGILENT BIOTEK	-	14	9	2	120	-	-	-	-	NO	-	-	-	-	-	-	-	-	-	-	-

PWWG PROJECT NUMBER	22304.00
CONSTRUCTION DOCUMENTS	08/02/24

REVISIONS

NO.	DESCRIPTION	DATE

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

LAB DETAILS

A-912L

A-912 - LAB DETAILS

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