



# Wayne State University

## CHEMISTRY LABORATORY 150 MODIFICATION CHEMISTRY BUILDING

PROJECT NO. 007-286023

ISSUE: BID ISSUE 11-23-2016

OWNER: WAYNE STATE UNIVERSITY  
Design & Construction Services  
5454 Cass Avenue  
Detroit, Michigan 48202

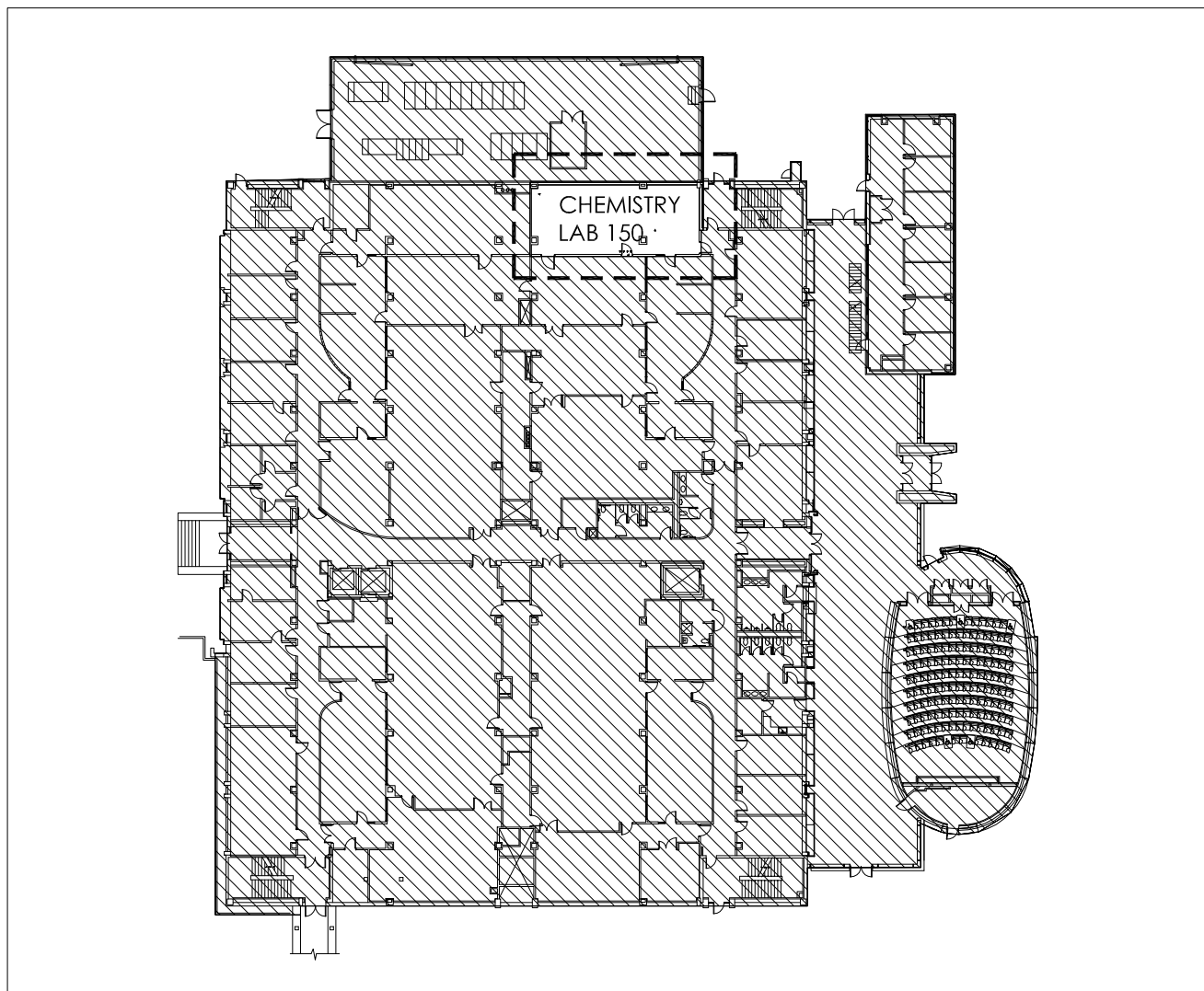
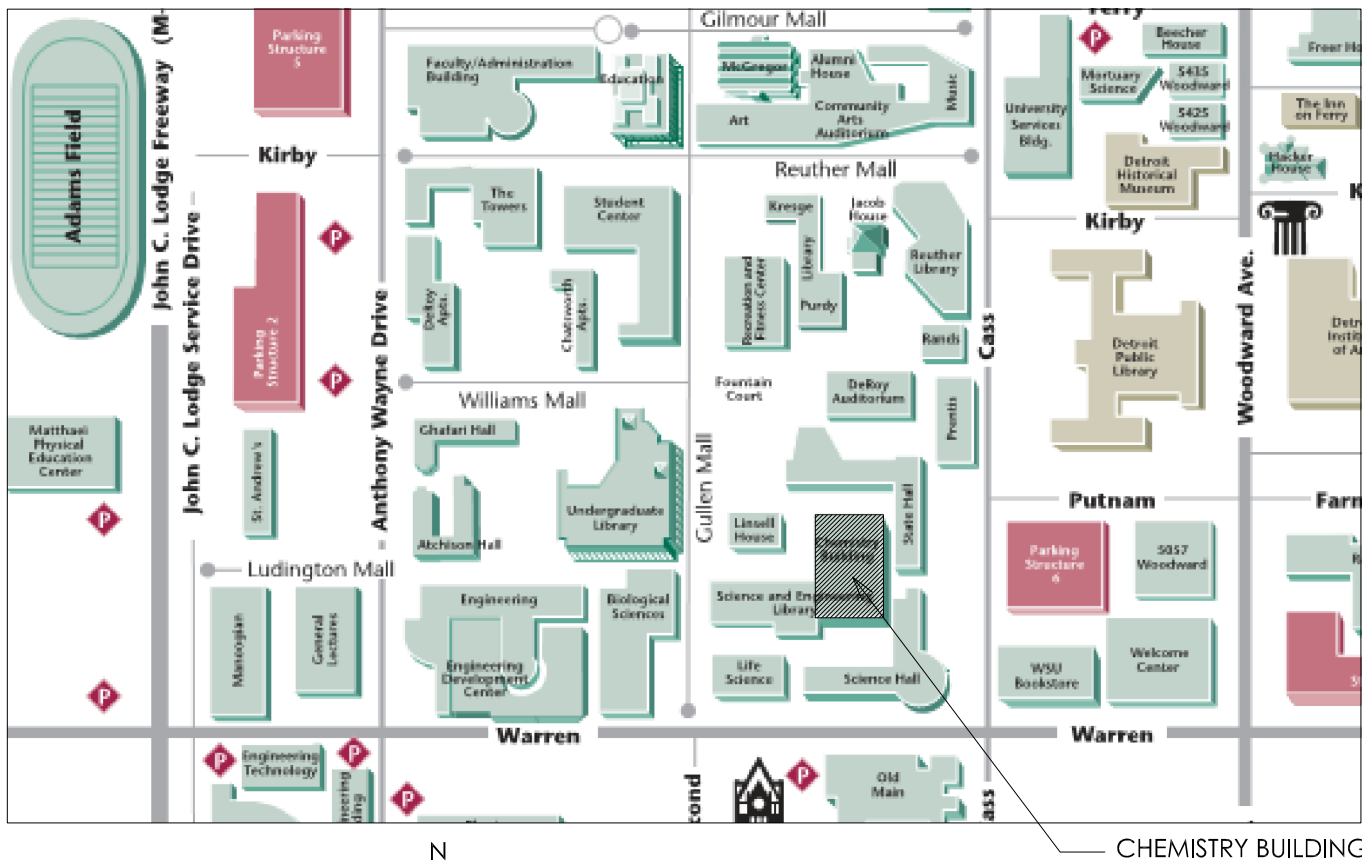
PROJECT LOCATION: Chemistry Building  
Room No. 150  
5101 Cass Avenue  
Detroit, Michigan 48202

ARCHITECT: iDesign Solutions  
2531 Ridge Road, Suite 100  
White Lake, MI 48383  
Tel: 248.440.7310  
www.iDesign-Solutions.info

MECH / ELECT ENGINEER: MAEngineering  
200 E. Brown Street  
Birmingham, MI 48009  
Tel: 248.258.1610  
www.ma-engineering.com

Alternate No. 1: Provide a stacked Vacuum pump cabinet for (4) vacuum pumps. See Laboratory Equipment Plan Sheet A201, Elevation 5 Sheet A301, Detail Sheet 402 and Specification 12 36 53.13 PAINTED METAL LABORATORY CASEWORK Sheet G-04.

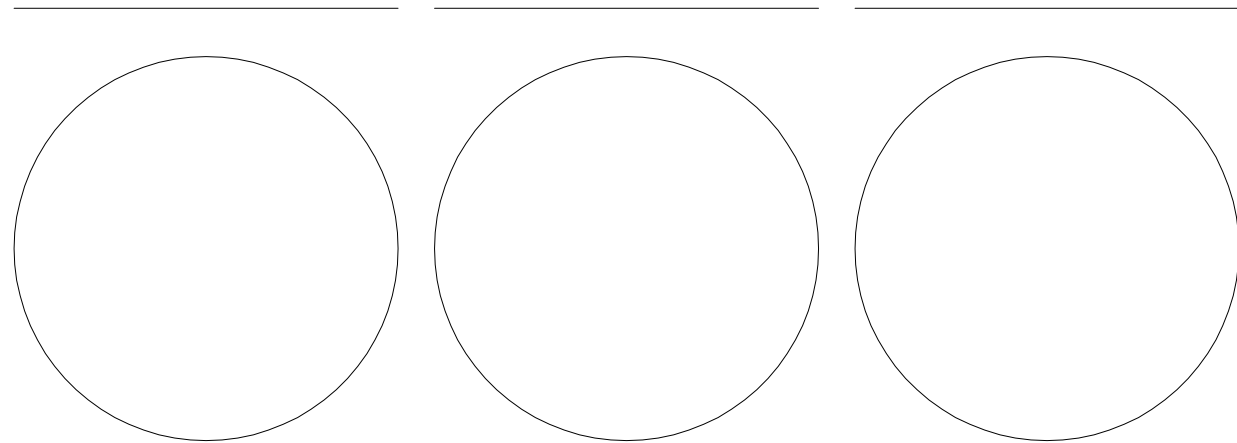
Alternate No. 2: Paint all walls and Gypsum Board ceiling soffit in Chemistry Lab150. See Finish Schedule Sheet A401 and Specification 09 91 00 PAINTS on Sheet G-02.



### DRAWING INDEX

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A201	PARTIAL 1ST FLOOR LABORATORY EQUIPMENT PLAN AND PARTIAL 1ST FLOOR REFLECTED CEILING PLAN
A301	PARTIAL 1ST FLOOR INTERIOR ELEVATIONS
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E-202	ELECTRICAL SPECIFICATIONS - 2

### PROFESSIONAL SEALS



## WAYNE STATE UNIVERSITY

5454 Cass Avenue, Detroit, MI 48202

### Project Location:

WAYNE STATE UNIVERSITY  
CHEMISTRY BUILDING  
5101 CASS AVENUE  
DETROIT MICHIGAN 48202

CONTACT: ASHLEY FLINTOFF



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coordination checked:	RLB
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approved:	LAC

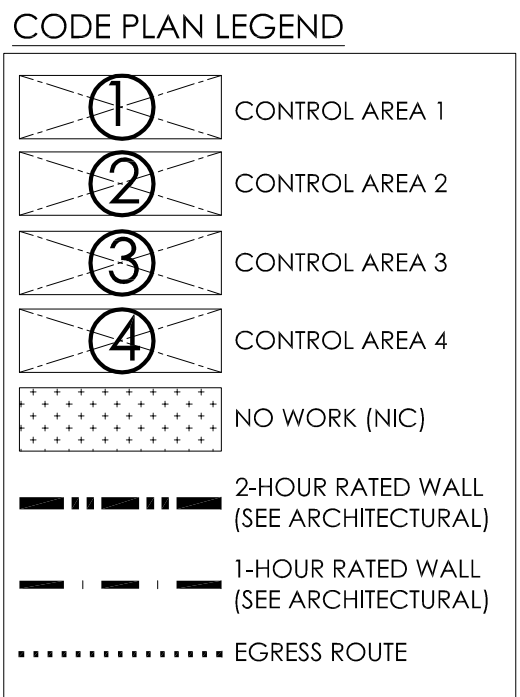
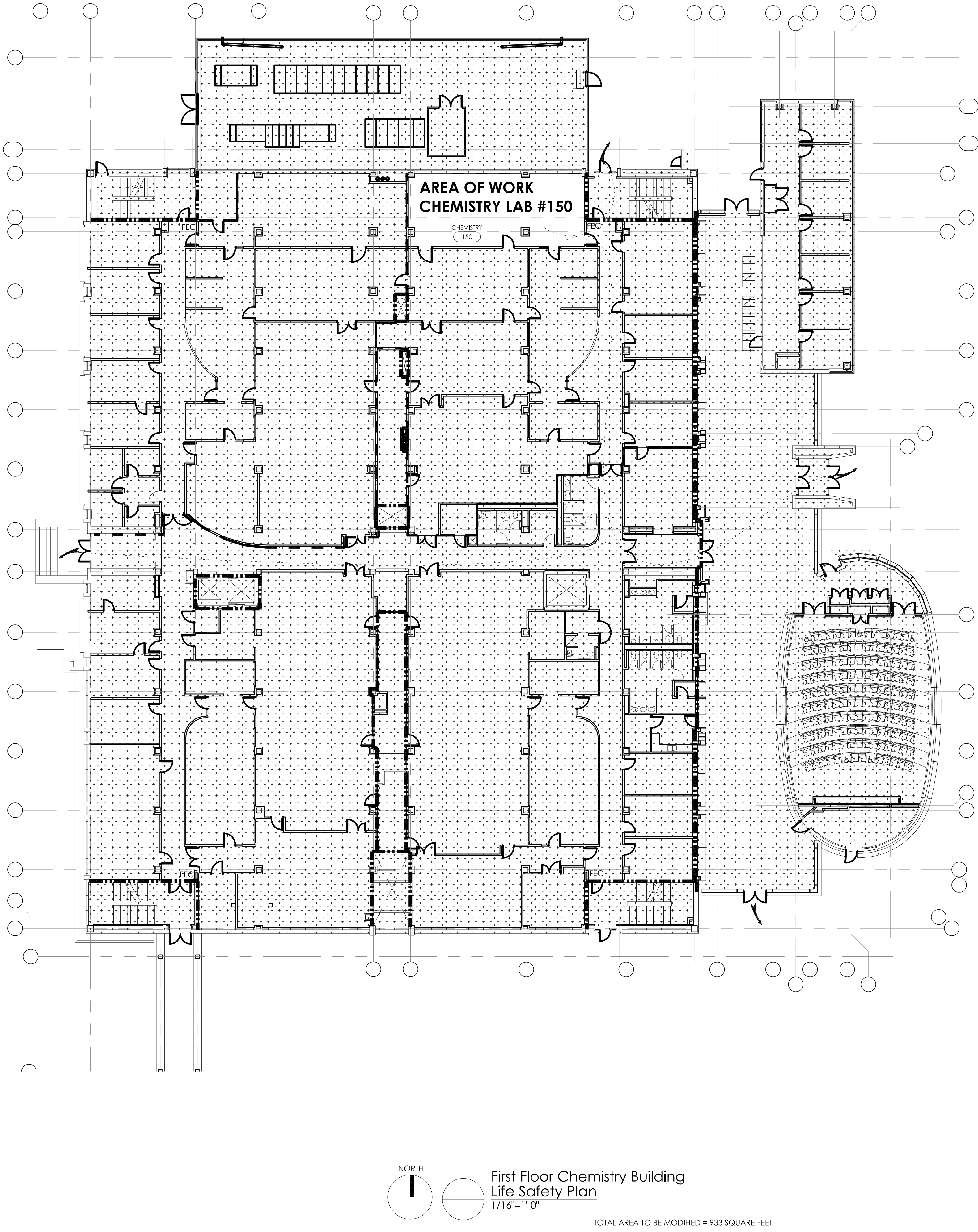
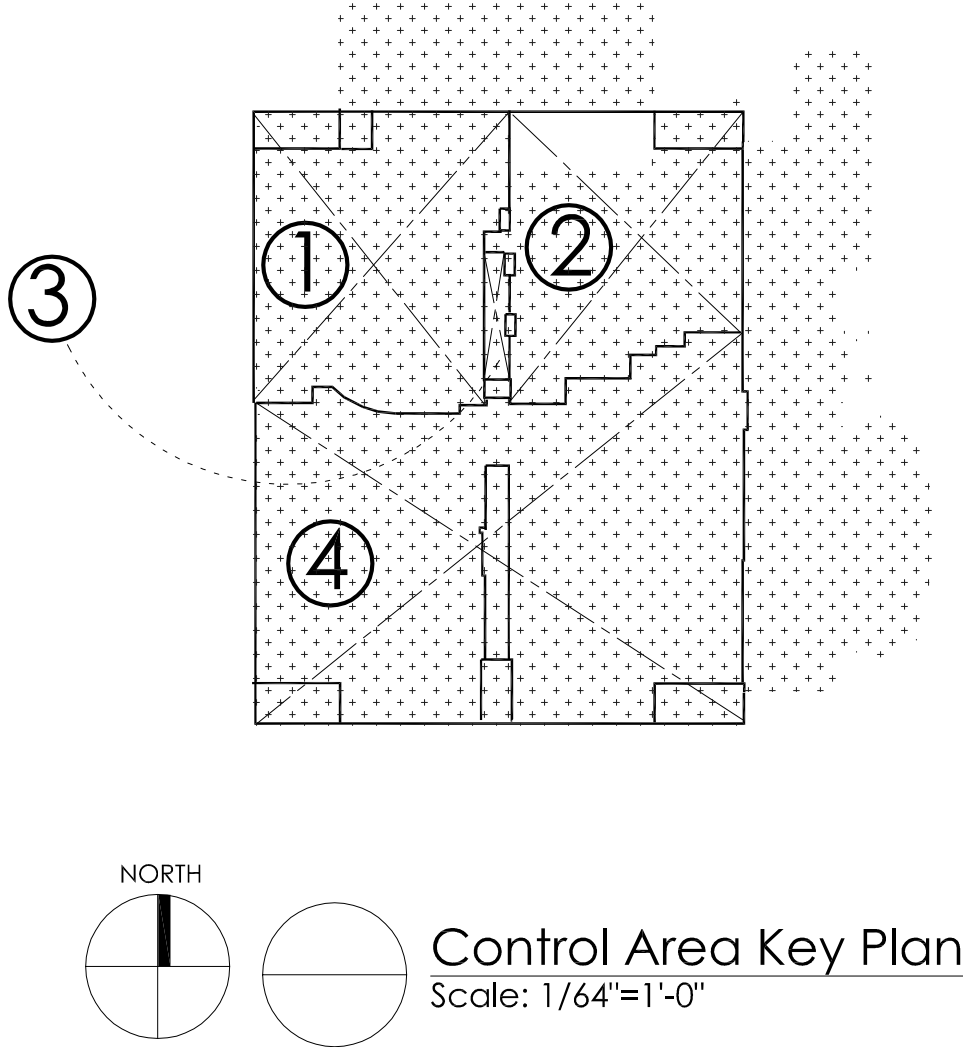
project:  
CHEMISTRY LAB 150  
1st Floor  
Modification

sheet title:  
Cover Sheet

project number:	sheet number:
007-286023	G-00
(1156-7 : iDesign project number)	



CODE WORKSHEET				Reference
Item				
1.	APPLICABLE CODES			
	Michigan Building Code			2012
	Michigan Rehabilitation Building Code			2012
	Michigan Mechanical Code			2012
	National Electrical Code With Michigan Electrical Code			2014
	Michigan Plumbing Code			2012
	Michigan Uniform Energy Code			2009
	Natl. Fire Protection Assoc., 101 - Life Safety			2012
	ANSI A117.1			2009
2.	Project Description			
	The project is for the interior modification of one room totaling approximately 933 SF on the first floor of the Chemistry Building located on the campus of Wayne State University in Detroit Michigan.			
	The purpose of this project is to modify an existing Chemistry Lab to accommodate the installation of new equipment for the chemistry laboratory.			
	The room shall be adapted to accommodate the addition of (2) new gas cylinder cabinets, vacuum pump cabinet (alternate #1), an eye wash, add supporting services and modify utilities as required for the new experiment. This project removes one existing door and includes painting the room as alternate #2. This room has an existing finished ceiling and shall continue to utilize existing light fixtures. The demolition is limited to the two interior island benches and a small bench in the Northeast corner. The existing casework and fume hoods along the perimeter including a sink & fixture, the emergency shower, general HVAC shall remain in place. The compressed cylinder gases, house Nitrogen gas, electrical service and equipment exhaust will be modified to support the new equipment.			
	The project does not change the occupancy or use. The work proposed will not alter fire separation boundaries, means of egress or the building structure.			
3.	Occupancy			
	Existing Building - Use Group Business	Existing B	Provided No Change	MBC 304
4.	Construction Classification			
	Type I-B	Existing	Provided	
	Fire Suppression: Partially Suppressed (Sprinkler System)		No Change	MBC 601
5.	Allowable Height			
	Number of Stories Above Grade	Existing 5	Provided No Change	MBC 503
6.	Allowable Area			
	Sub Basement	16,877 sf	Provided No Change	MBC 503
	Basement	35,196 sf	No Change	MBC 503
	First Floor	33,105 sf	No Change	MBC 503
	Second Floor	33,105 sf	No Change	MBC 503
	Third Floor	33,105 sf	No Change	MBC 503
	Fourth Floor	33,105 sf	No Change	MBC 503
	Penthouse Floor	111,011 sf	No Change	MBC 503
	Total Area	195,604 sf	No Change	MBC 503
7.	Occupant Load			
	First Floor	Existing 331 (Existing)	Provided No Change	MBC1004.1.2
8.	Egress			
	Egress Stairs (not req'd to be enclosed)	Existing 4 existing	Provided No Change	MBC 1009.3
9.	Number of Exits and Exit Access			
	First floor - number of exits	Required 4 (Existing)	Provided No Change	MBC 1021
10.	Exit Access Travel Distance			
	Dead End Limit - 50'-0" Max	Actual No Change	Provided No Change	MBC 1016.1
	Travel Distance to Exit - 300'-0" Max (Sprinklered)	No Change	No Change	MBC 1014.3
	Common Path of Travel - 100'-0" Max	No Change	No Change	MBC 1018.4
11.	Fire Protection Systems			
	Automatic Sprinkler System	Existing Bldg	Provided new flam gas cabinet to tie into exist system	
	Portable extinguishers - in Common Corridors	Existing	No Change	
	Fire Alarm System	Existing	No Change	MBC 903
12.	Accessibility - New Work			
	Comply with Chapter 11, and Appendix E	Existing Bldg	Provided Compliant	MBC Ch 11
	Comply with Americans w/ Disabilities Act Accessibility Guidelines	Compliant	Compliant	ADAAG2010
13.	Control Area - Allowable			
	First Floor	Allowable 4	Provided 4 (no change)	MBC 414.2.2



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checked: CTW

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project:

CHEMISTRY LAB 150

1st Floor

Modification

sheet title:

Life Safety Plan and


Code Review

project number: sheet number:

007-286023 G-01

(1156-7 : iDesign project number)



<h1 style="text-align: center;">WAYNE STATE UNIVERSITY</h1>	
5454 Cass Avenue, Detroit, MI 48202	
<b>Project Location:</b>	
WAYNE STATE UNIVERSITY CHEMISTRY BUILDING 5101 CASS AVENUE DETROIT MICHIGAN 48202	
<b>CONTACT: ASHLEY FLINTOFF</b>	
 <b>iDesign</b>	
<b>iDesign Solutions, LLC</b> Scientific Facilities & Laboratory Design 2531 Ridge Road, Suite 100 White Lake, MI 48383 248-440-7310 info@iDesign-Solutions.info www.iDesign-Solutions.info	
 <b>MAENGINEERING</b> MECHANICAL ELECTRICAL 200 E. Brown Street Birmingham, MI 48009 t   248   258   1610 www.ma-engineering.com	
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project: CHEMISTRY LAB 150 1st Floor Modification	
sheet title: Architectural Specifications	
project number:	sheet number:
007-286023	G-02
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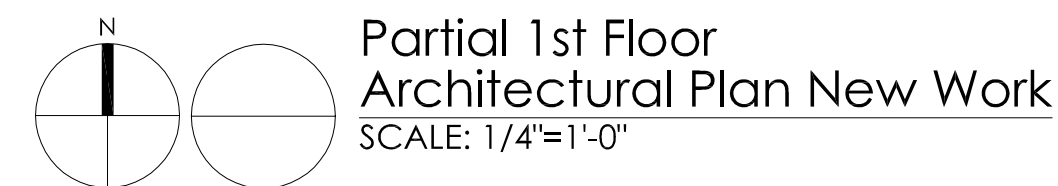
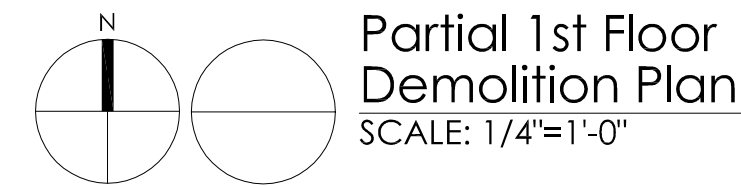








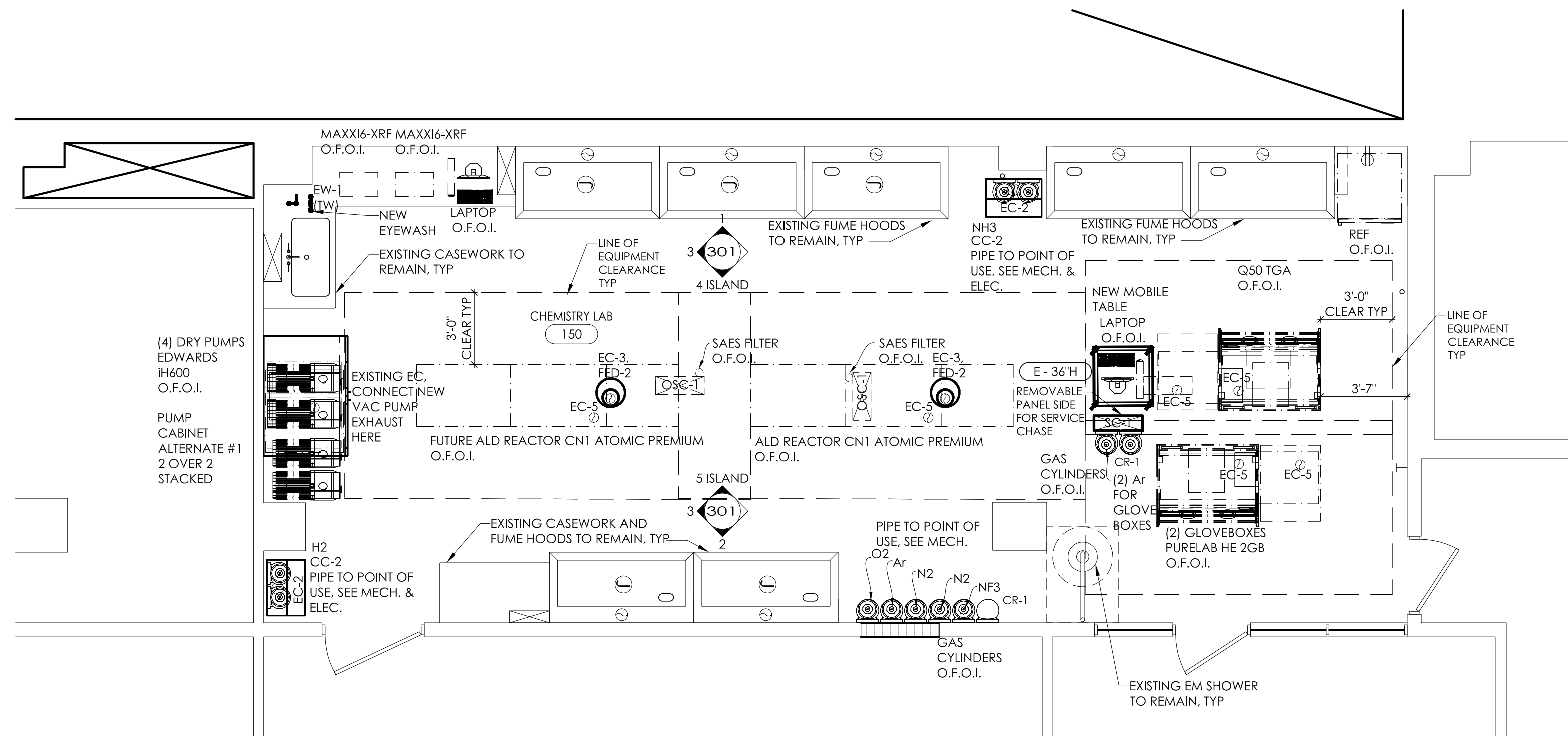




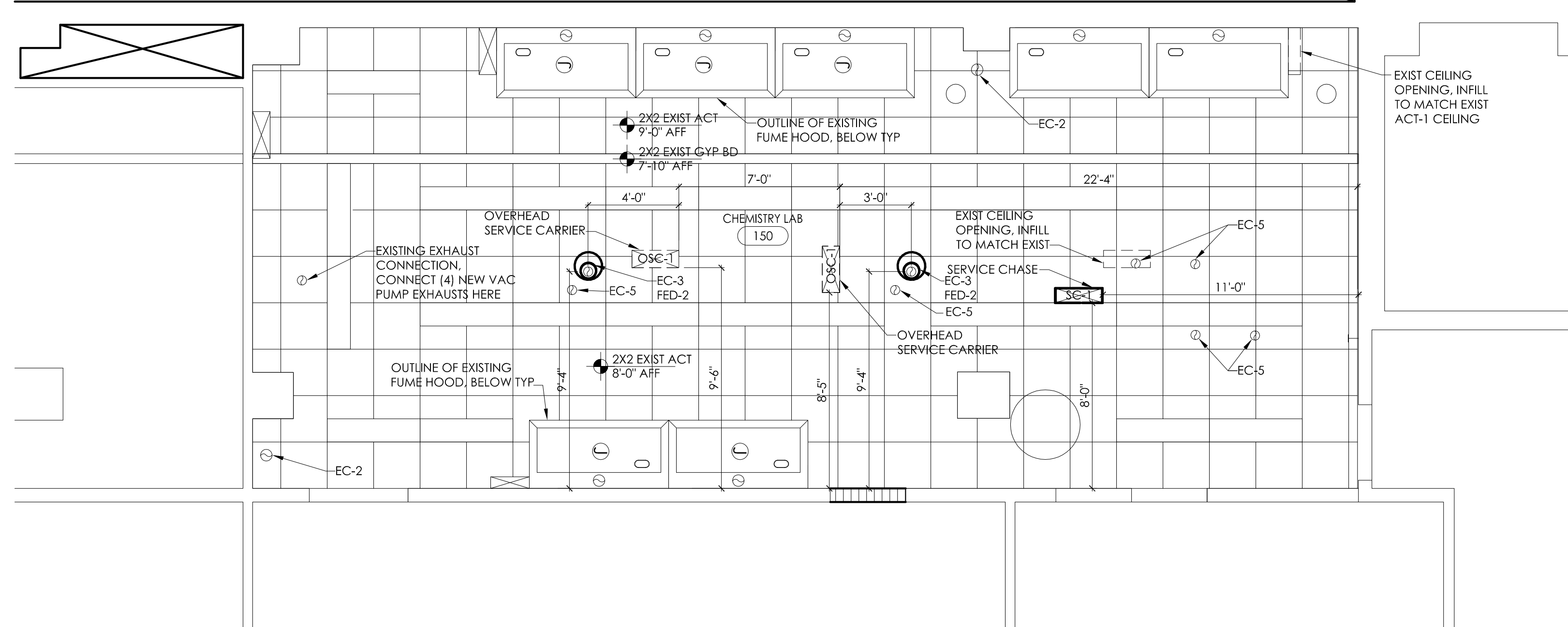
- 1 REMOVE DOOR, FRAME AND ALL ASSOCIATED HARDWARE. SALVAGE, VERIFY AND COORDINATE WITH OWNER MEANS FOR PROTECTING, RELOCATING AND STORAGE OF DOOR AND FRAME.
- 2 REMOVE LAB CASEWORK, SALVAGE, VERIFY AND COORDINATE WITH OWNER MEANS FOR PROTECTING AND PALLETIZATION OF LAB CASEWORK FOR RELOCATION AND STORAGE.
- 3 REMOVE LAB SERVICE CHASE. VERIFY AND COORDINATE WITH OWNER MEANS FOR PROTECTING AND PALLETIZATION OF EXISTING LAB SERVICE CHASE FOR RELOCATION AND STORAGE.
- 4 REMOVE LAB BENCHTOP, SINKS AND SINK FIXTURES, AND EYEWASH. REFER TO ELECTRICAL AND MECHANICAL DRAWINGS FOR ADDITIONAL DEMO REQUIREMENTS AND COORDINATION. VERIFY AND COORDINATE WITH OWNER MEANS FOR PROTECTING AND PACKAGING FIXTURES FOR RELOCATION AND STORAGE.
- 5 REMOVE LAB GAS FITTINGS. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL DEMO REQUIREMENTS AND COORDINATION. VERIFY AND COORDINATE WITH OWNER MEANS FOR PROTECTING AND PACKAGING FIXTURES FOR RELOCATION AND STORAGE.
- 6 REMOVE FLEXIBLE TRUNK SNORKEL. VERIFY AND COORDINATE WITH OWNER MEANS FOR PROTECTING AND PACKAGING FIXTURES FOR RELOCATION AND STORAGE. EXHAUST PORT TO REMAIN AND TO BE REWORKED TO EXHAUST (4) VACUUM PUMP CABINETS. REFER TO MECHANICAL & ELECTRICAL DRAWINGS FOR ADDITIONAL DEMO REQUIREMENTS AND COORDINATION.
- 7 DISCONNECT EXISTING LAB EQUIPMENT EXHAUST, ELECTRICAL AND PIPED CONNECTIONS. COORDINATE WITH OWNER FOR RELOCATION AND STORAGE.
- 8 DISCONNECT AND REMOVE LAB GAS CYLINDERS RESTRAINTS, PIPING, VALVES AND GAGES. COORDINATE WITH OWNER FOR ITEMS TO BE RETAINED PRIOR TO DISPOSAL.
- 9 ALTERNATE #1 - REMOVE EXISTING SECTION OF WIREMOLD SO THAT THE NEW VACUUM PUMP CABINET CAN BE SECURED TO THE WALL.





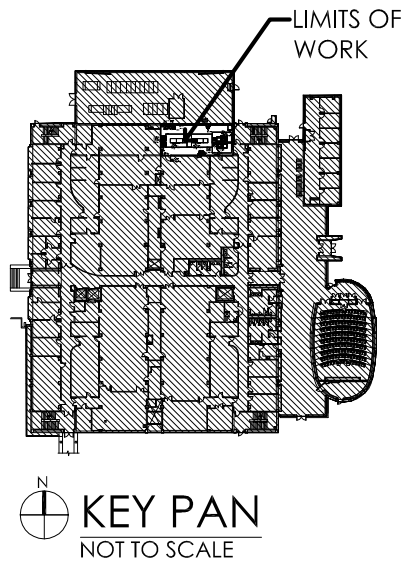
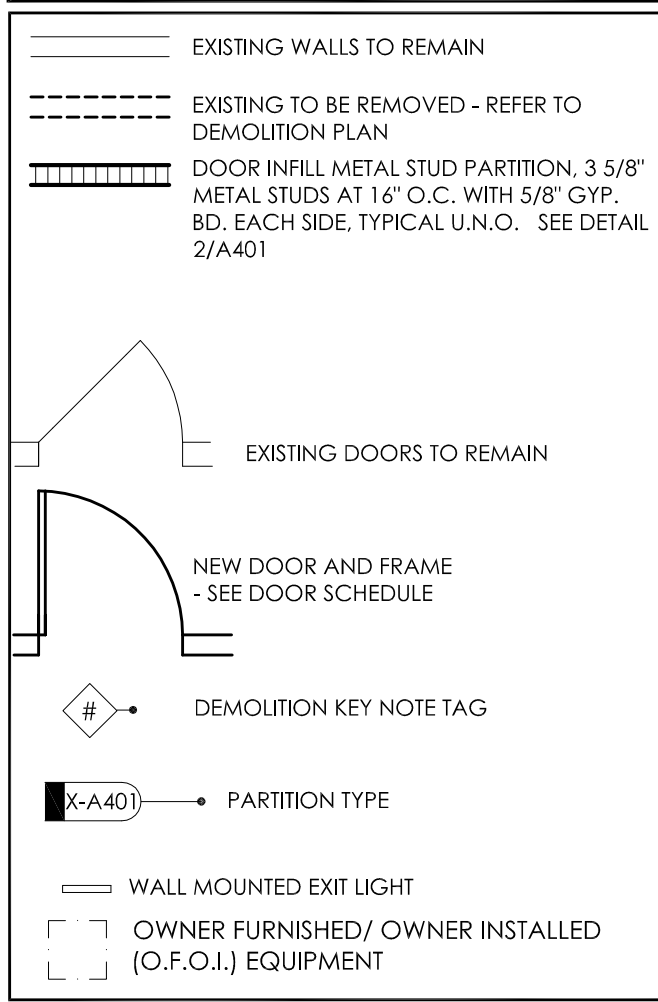


Partial 1st Floor  
Laboratory Equipment Plan  
SCALE: 1/4"=1'-0"



Partial 1st Floor  
Reflected Ceiling Plan  
SCALE: 1/4"=1'-0"

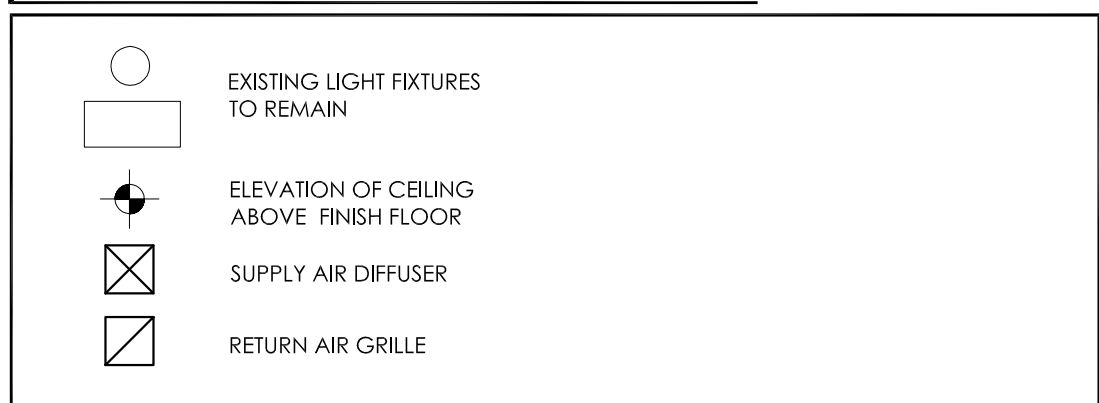
DEMO / FLOOR PLAN LEGEND



GENERAL CONSTRUCTION NOTES

1. FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION, TYPICAL.
2. REFER TO TYPICAL PARTITION CONSTRUCTION DETAILS, SHEET A401, FOR WALL/ PARTITION CONSTRUCTION INFORMATION.
3. REFER TO LABORATORY DRAWINGS FOR LABORATORY CASEWORK COMPONENTS AND EQUIPMENT LOCATIONS.
4. MAINTAIN EXISTING FLOOR AND WALL RATINGS. REFER TO SHEET G-01.
5. PATCH AND REPAIR ANY MISSING FIRESTOPPING OR DAMAGED FLOOR AND WALL CONSTRUCTION TO MAINTAIN EXISTING FIRE RATINGS.

REFLECTED CEILING PLAN LEGEND



AIR & GAS LEGEND

- AR ARGON GAS (INERT)  
CA COMPRESSED AIR (120 PSI)  
H2 HYDROGEN (FLAMMABLE)  
N2 NITROGEN (INERT)  
NF3 NITROGEN TRIFLOURIDE  
NH3 AMMONIA (TOXIC)  
O2 OXYGEN (OXIDIZER)

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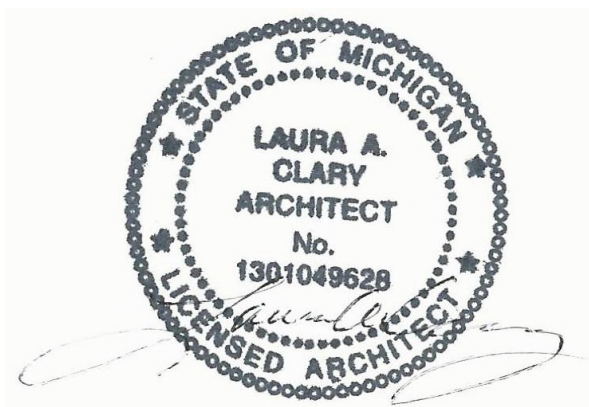
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checked: CTW

approved: LAC

project:  
CHEMISTRY LAB 150  
1st Floor  
Modification

sheet title:  
Partial 1st Floor Laboratory  
Equipment Plan and Partial 1st  
Floor Reflected Ceiling Plan

project number: sheet number:

007-286023 A201

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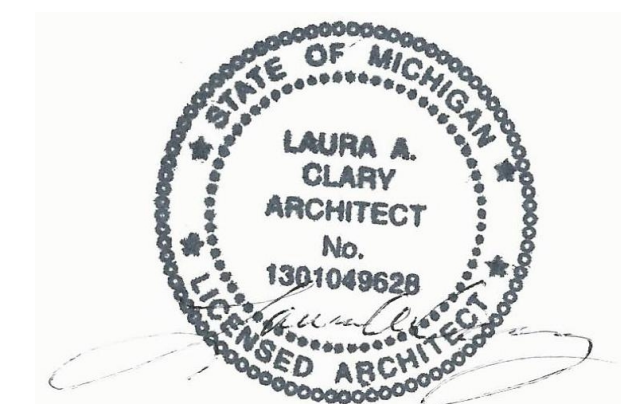
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CHEMISTRY LAB 150

1st Floor

Modification

sheet title:

Partial 1st Floor

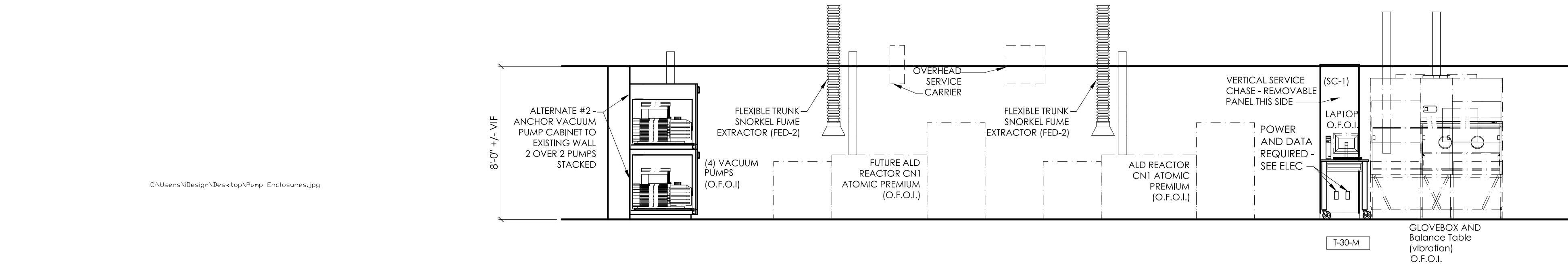
Interior Elevations

project number: sheet number:

007-286023

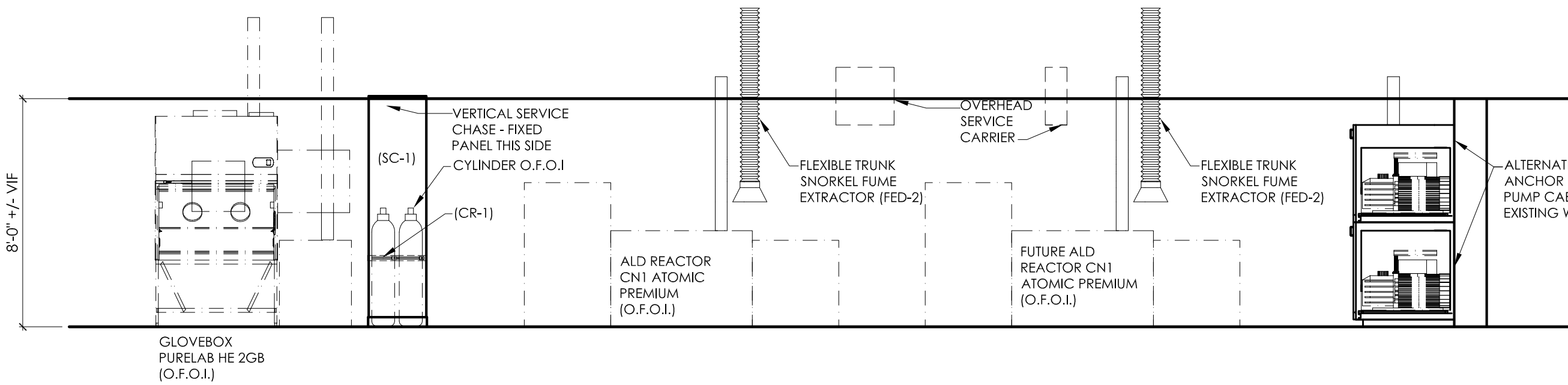
A301

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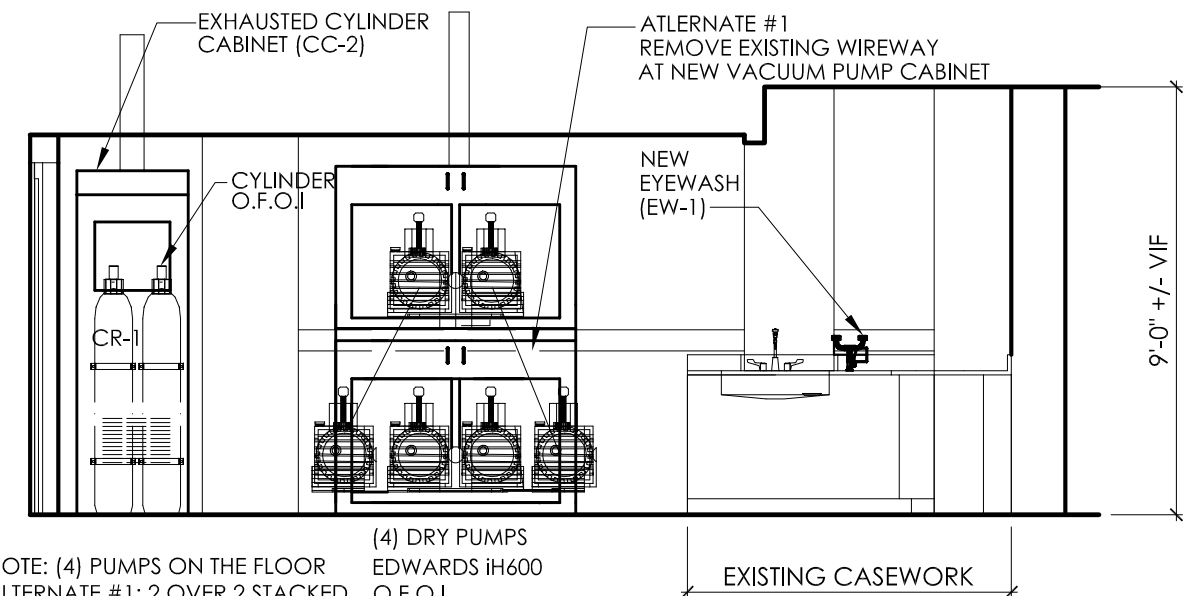


Example of Vacuum Pump Cabinet  
ALTERNATE #2

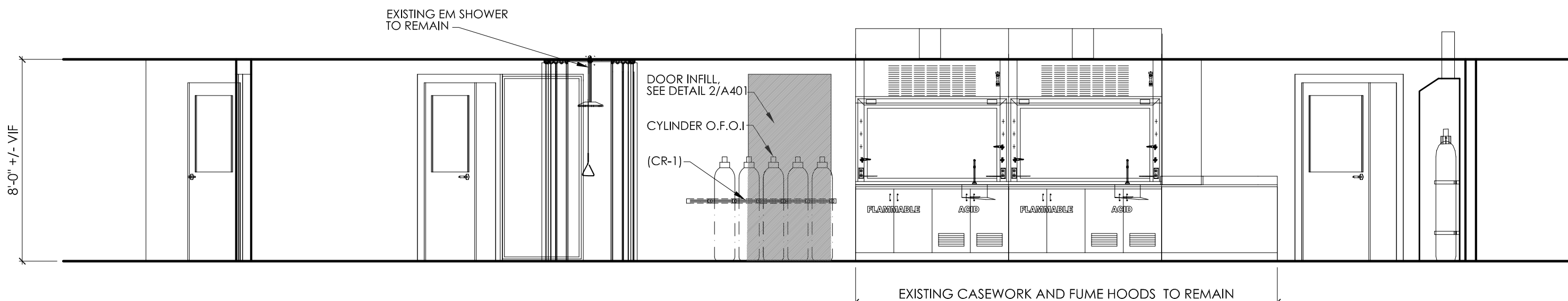
150 CHEMISTRY LAB  
North Island  
5 A201  
1/4" = 1'-0"



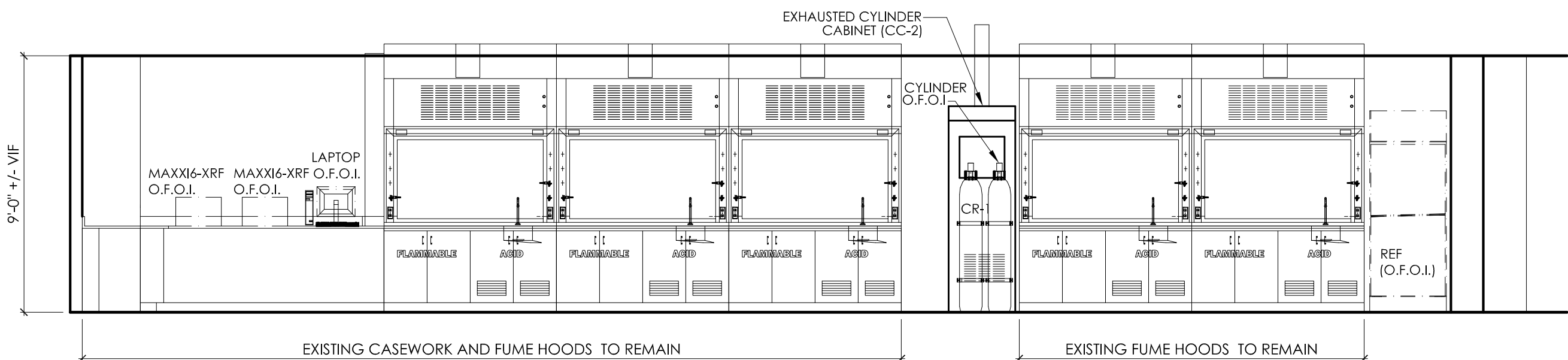
150 CHEMISTRY LAB  
South Island  
4 A201  
1/4" = 1'-0"



150 CHEMISTRY LAB  
West Elevation  
3 A201  
1/4" = 1'-0"



150 CHEMISTRY LAB  
South Elevation  
2 A201  
1/4" = 1'-0"

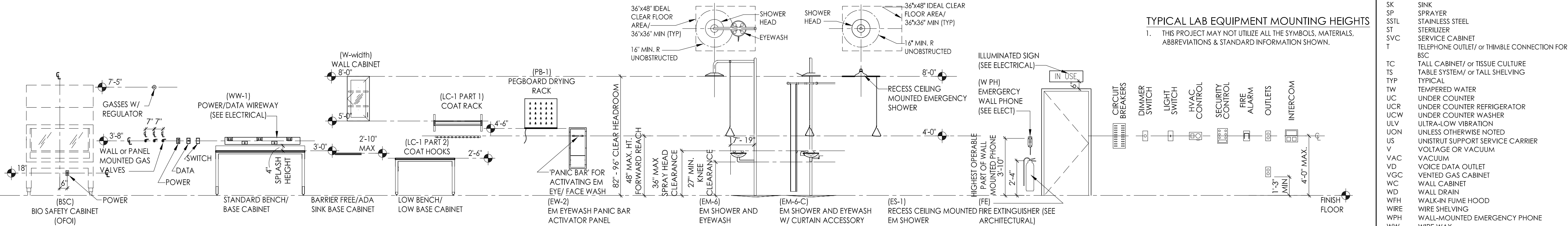
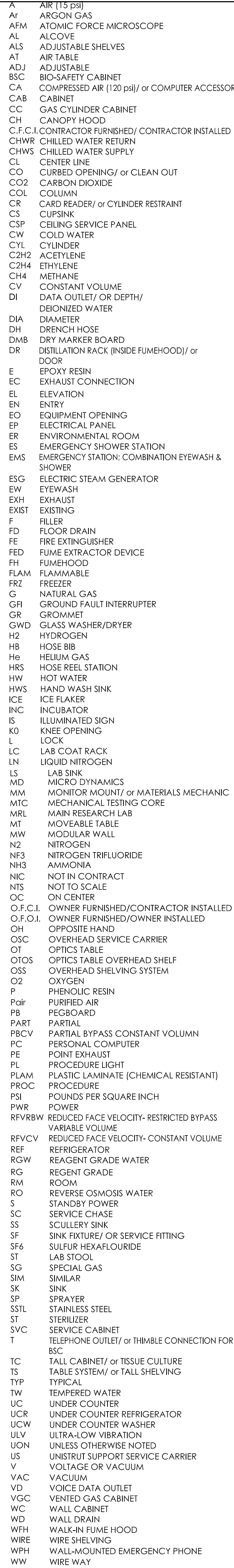


150 CHEMISTRY LAB  
North Elevation  
1 A201  
1/4" = 1'-0"





<p><b>FINISH SCHEDULE REMARKS</b></p> <p>1. INSPECT, PREP, CLEAN AND INSTALL ALL MATERIALS ACCORDING TO MANUFACTURE'S INSTRUCTIONS.</p>
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(1156-7 : iDesign project number)



007-266023 A401

007-200025 7/10/1

(1156-7 : iDesign project number)



LABORATORY CASEWORK

TABLES and TABLE ACCESSORIES

NOTE: MANUF. TO DESIGN AND PROVIDE DOOR LOUVERS CAPABLE OF PROVIDING 300 CFM AIR FLOW WITHOUT EXCESSIVE NOISE.

BP-48-M-SP

- SPECIAL CABINET SIZE
- VENTED DOORS
- STATIONARY ON LEVELERS
- SOUND DAMPENING INTERIOR AND DOOR
- 3\"/>

7

ALTERNATE #2  
Vacuum Pump Cabinet  
NTS

5

4

4201

(CR-1)  
Cylinder Restraint Typical Detail  
1/2" = 1'-0"

3

(SC-1) Vertical Service Chase (Full Height)  
1/4" = 1'-0"

6

(FED-2) Unistrut Support  
(EC-3) Snorkel Connection  
1/4" = 1'-0"

2

(OSC-1) Unistrut Support  
Service Column @ Equipment  
1/4" = 1'-0"

EMERGENCY SAFETY EQUIPMENT FIXTURES SCHEDULE			
ID	SYMBOL	DESCRIPTION	SPECIFICATION
EM-1		EMERGENCY EYE WASH & DRENCH HOSE, DECK MOUNTED (@ SINK)	WATERSAVER EW1028VB

VERTICAL SERVICE CHASE SCHEDULE				
ID	SYMBOL	NOMINAL SIZE	LOCATION (REFER TO LAB PLAN FOR ACTUAL LOCATIONS)	DETAIL
SC-1		24" x 7" DEEP	FULL HEIGHT FLOOR-TO-CEILING	3/A402

BENCHTOP SCHEDULE		
EXAMPLE: E - 36"TH		
MATERIAL - HEIGHT (inches)		
ID	MATERIAL	THICKNESS
E	EPOXY RESIN	1"

NOTES

CASEWORK NOMENCLATURE CODE:

CODE EXAMPLE

(B3D)-(30)-(XS)

CODE SYMBOL

B3D-30-XS

ACCESSORY CODES

CABINET WIDTH (in.)

CABINET TYPE AND DOOR / DRAWER STYLE CODE

GENERAL NOTES

- THIS PROJECT MAY NOT UTILIZE ALL THE SYMBOLS, MATERIALS, ABBREVIATIONS AND STANDARD INFORMATION SHOWN ON THIS SHEET.
- ALL BENCHTOPS TO BE EPOXY RESIN UNLESS OTHERWISE NOTED ON PLAN.
- ALL BENCHTOPS TO BE 30" DEEP UNLESS OTHERWISE NOTED ON PLAN.
- ALL BENCHTOPS TO BE 36" HIGH UNLESS OTHERWISE NOTED.

CASEWORK NOTES

- LABORATORY EQUIPMENT CONTRACTOR IS RESPONSIBLE FOR FURNISHING, INSTALLING AND COORDINATING WITH BUILDING TRADES.
- ANY DISCREPANCIES OR INTERFERENCE BETWEEN UNISTRUT, SERVICE CARRIERS, BRACES, SERVICE CHASES, FUME HOODS AND EXHAUST DEVICES SHALL BE BROUGHT TO THE LABORATORY ARCHITECT'S ATTENTION.
- REFER TO ARCHITECTURAL PLANS FOR ROOM DIMENSIONS AND FIELD VERIFY FOR ACTUAL DIMENSIONS PRIOR TO FABRICATION.
- BENCHTOP LENGTHS SHALL BE DETERMINED BY CASEWORK AND DIMENSIONS INDICATED ON PLANS AND ELEVATIONS. ALL BENCHTOPS SHALL OVERHANG CASEWORK BY 1" AT ALL EXPOSED EDGES U.O.N.
- ALL EXPOSED EDGES AT BENCHTOPS AND SPLASHES SHALL HAVE AN EASED EDGE & UNDERSIDE DRIP GROOVE @ BENCHTOPS.
- ALL BENCHTOP MATERIAL SEAMS SHALL BE FILLED FLUSH TO PROVIDE AN EVEN SMOOTH SURFACE.
- BENCHTOPS AND BACK SPLASHES SHALL BE SCRIBED TO WALL TO CONFORM TO IRREGULARITIES OF THE WALL PLANE.
- ALL BENCHTOPS FLANKED BY FUME HOODS, TALL CABINETS AND SIDE WALLS SHALL HAVE SIDE SPLASHES.
- LAB EQUIPMENT CONTRACTOR SHALL USE AN ACID-RESISTANT SEALANT AT SPLASHES AND ALL PENETRATIONS THROUGH BENCHTOP.
- CASEWORK INSTALLATION SHALL BEGIN AT THE HIGH POINT OF THE ROOM FOR EACH RUN OR ISLAND WITH THE LEVELERS SET AS SHORT AS POSSIBLE.
- PROVIDE FILLERS, SIDE PANELS, END PANELS, BACK PANELS AND CLOSURE PANELS TO COMPLETE INSTALLATION WITH SAME MATERIAL AND FINISH AS CASEWORK.
- ALL CASEWORK AND FREESTANDING UTILITY SHELVING SHALL BE SECURED TO ADJACENT WALLS.
- ALL INTERSECTIONS BETWEEN FIXED CASEWORK AND ADJACENT SURFACES SUCH AS WALLS ARE TO BE FILLED SOLID WITH ACID-RESISTANT SEALANT.
- COORDINATE DIMENSIONS OF CASEWORK WITH TABLE STRUCTURE TO ENSURE THAT THE CASEWORK ATTACHED TO TABLE FRAMES SHALL FIT AND FUNCTION WITHOUT IMPEDEMENT.
- FUME HOOD AND CONTROLS CONTRACTOR TO COORDINATE AND DOCUMENT ALL INTERFACES BETWEEN FUME HOODS AND CONTROLS.
- FUME HOOD CONTRACTOR TO PROVIDE AND COORDINATE DUCT TRANSITION AND CONNECTION REECE WITH MECHANICAL TRADES.

GENERAL NOTES:

- THIS PROJECT MAY NOT UTILIZE ALL THE SYMBOLS, MATERIALS, ABBREVIATIONS & STANDARD INFORMATION SHOWN ON THIS SHEET.
- FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION. DO NOT SCALE DRAWINGS.
- REFER TO SHEET A-402 FOR LABORATORY CASEWORK SCHEDULE AND NOTES.
- REFER TO SHEET A-402 FOR LABORATORY CASEWORK, FIXTURE AND ACCESSORY DETAILS.
- REFER TO SHEET A-402 FOR LABORATORY EXHAUST AND BENCH SERVICE CHASE EQUIPMENT DETAILS.
- REFER TO SHEET A-402 FOR LABORATORY EQUIPMENT SUPPORT DETAILS.
- REFER TO FLOOR PLAN FOR ROOM DIMENSIONS.
- ALL DIMENSIONS ARE NOMINAL. COORDINATE VARIATIONS BASED ON MANUFACTURER OR CLOSEST MANUFACTURER STANDARD, SUBJECT TO LAB ARCHITECT'S AND/ OR LABORATORY CONSULTANT'S APPROVAL.
- PROVIDE BLOCKING OR BACKING PLATE FOR WALL REINFORCEMENT AND SUPPORT FOR WALL MOUNTED EQUIPMENT, SHELVING AND CABINETS IN SHEET A401.

1

Unistrut Support for (FED-2) Flexible Trunk Fume Extraction Device Mounting Bracket  
1" = 1'-0"

LABORATORY ACCESSORY, CASEWORK, FUME HOOD, AND SERVICE FITTING FINISH SCHEDULE					
I.D.	ITEM	MATERIAL & FINISH	COLOR	NOTES	DETAIL
ACCESSORIES					
(ALS-2)	ADJUSTABLE LAB SHELVES SHELF BRACKETS & SUPPORT STANDARDS	PHENOLIC RESIN PAINTED METAL	MFR. STD. BLACK T&D	TRESPA TOP LAB (DESIGN STD) SLOTTED STANDARD SUPPORT/ STEEL BRACKETS, ADJ. 1" INCREMENTS, SEE SPEC	-
(OSC-1)	PREFABRICATED OVERHEAD SERVICE CARRIER WITH UNISTRUT SUPPORTS	PAINTED STEEL	MATCH CASEWORK	FINISH EXPOSED MEMBERS ONLY	2/A402
(SC-1)	SERVICE CHASE (SERVICE DROP)	PAINTED METAL	MATCH CASEWORK		3/A402
	ELECTRICAL RECEPTACLES & SWITCHES	MANUFACTURER STANDARD	STANDARD BLACK	EMERGENCY POWER = RED (SEE ELECTRICAL DOCUMENTS)	-
(CA-1)	KEYBOARD TRAY	MFR. STD.	BLACK	HUMANSCALE, 900-STD KEYBD W/ MOUSE CLIP (DESIGN STD) SEE SPEC	-
(CA-2)	CPU HOLDER	MFR. STD.	BLACK	HUMANSCALE, CPU555 (DESIGN STD) SEE SPEC	-
(CA-4)	WIRE MANAGEMENT	J SHAPE MFR. STD.	BLACK	APPLY ALONG BACK RAIL OF TABLES	-
BENCHTOPS, SINKS & CUP SINKS					
(E)	EPOXY RESIN	EPOXY RESIN, MATTE	MFR. STD. BLACK	DURCON (DESIGN STD)	-
CASEWORK					
	BASE CABINETS	PAINTED METAL, SEMI-GLOSS	SIGMA FLEX IN DOVE GRAY OR SIM	MOTT PAINTED STEEL (DESIGN STD)	-
	WALL & TALL CABINETS	PAINTED METAL, SEMI-GLOSS	SIGMA FLEX IN DOVE GRAY OR SIM	MOTT PAINTED STEEL (DESIGN STD)	-
	FLAMMABLE CABINETS	PAINTED METAL, SEMI-GLOSS	SIGMA FLEX IN DOVE GRAY OR SIM	MOTT PAINTED STEEL (DESIGN STD)	-
	ACID CABINETS	PAINTED METAL, SEMI-GLOSS	SIGMA FLEX IN DOVE GRAY OR SIM	MOTT PAINTED STEEL (DESIGN STD)	-
	INSTRUMENT TABLE FRAMES	PAINTED METAL, SEMI-GLOSS	SIGMA FLEX IN DOVE GRAY OR SIM	MOTT PAINTED STEEL (DESIGN STD)	-
	CASEWORK HARDWARE, DOOR & DRAWER PULLS	STAINLESS STEEL, SATIN FINISH	NATURAL	-	-
	CASEWORK LETTERING	PAINTED	RED	-	-
EMERGENCY FIXTURES, SINK FIXTURES AND SERVICE FITTINGS					
(EM-1)	EMERGENCY FIXTURE	CHROME, SATIN FINISH	NATURAL	WITH CLEAR EPOXY COATING	-
EXHAUST CONNECTIONS LEGEND					
ID	DESCRIPTION	NOTE: SEE MECHANICAL DOCUMENTS FOR ALL DUCTWORK AND CONNECTIONS (COORDINATE WITH MECHANICAL)			
EC-1	EXHAUST CONNECTION AND DUCTWORK BY MECHANICAL TRADES ROUTED VERTICALLY FROM THE CEILING AND HORIZONTALLY BEHIND CASEWORK TO VENTED BASE CABINETS (BC-#, BV-# & BP-#).				
EC-2	EXHAUST CONNECTION AND DUCTWORK BY MECHANICAL TRADES ROUTED VERTICALLY TO VENTED CABINETS (UC-#, UV-# & CC-#).				
EC-3	DIRECT VERTICAL EXHAUST CONNECTION TO (FED-1) EXHAUST PORT, (FED-2) FLEX TRUNK SNORKEL AND (FED-4) AA FUME EXTRACTOR.				
EC-4	(NOT USED)				
EC-5	DEDICATED EXHAUST CONNECTION FOR EQUIPMENT. CONNECTIONS AND DUCTWORK BY MECHANICAL TRADES. SEE MECHANICAL.				
LABORATORY SYMBOL LEGEND					
ID	SYMBOL	DESCRIPTION	NOTES		
CR-#		CYLINDER RESTRAINT			
EC-#		EXHAUST CONNECTION	SEE SCHEDULE THIS SHEET. COORDINATE WITH MECHANICAL		
HH-#		FUME HOOD	REFER TO LAB DOCUMENTS FOR LOCATIONS AND DETAILS		
FE-#		FIRE EXTINGUISHER	REFER TO LAB DOCUMENTS FOR LOCATIONS AND ARCHITECTURAL SPECIFICATIONS		
LC-#		LAB COAT RACK	REFER TO LAB DOCUMENTS FOR LOCATIONS, LAB ELEVATIONS FOR WIDTH AND SHEET A401 FOR TYPICAL MOUNTING HEIGHT		
PWR		DUPLEX POWER OUTLET	REFER TO ELECTRICAL DOCUMENTS		
PWR		SPECIAL POWER OUTLET	REFER TO ELECTRICAL DOCUMENTS		
VD		VOICE/ DATA OUTLET	REFER TO ELECTRICAL DOCUMENTS		
W PH		EM WALL-MOUNTED PHONE	COORDINATE WITH ELECTRICAL DOCUMENTS		
CO		CURBED OPENING (BENCHTOP)	REFER TO LAB DOCUMENTS FOR LOCATIONS AND BENCHTOP DETAIL.		

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designed by: LAC

drawn by: RLB

coordination checked: RLB

checked: CTW

approved: LAC

project:  
CHEMISTRY LAB 150  
1st Floor  
Modification

sheet title:  
Laboratory Schedules  
and Details

project number: sheet number:  
007-286023 A402  
(1156-7 : iDesign project number)



ABBREVIATIONS

AAV	AUTOMATIC AIR VENT	FP	FIRE PUMP	OD	OUTSIDE DIAMETER
ACC	AIR COOLED CONDENSER	FPB	FAN POWERED BOX	OED	OPEN ENDED DUCT
ACCU	AIR COOLED CONDENSING UNIT	FPI	FINS PER INCH	OF	OVERFLOW
AD	ACCESS DOOR	FPM	FEET PER MINUTE	OS&Y	OUTSIDE SCREW AND YOKE
AFF	ABOVE FINISHED FLOOR	FS	FLOOR SINK	OX	OXYGEN
AHU	AIR HANDLING UNIT	FS	FLOW SWITCH	P	PUMP
AP	ACCESS PANEL	FT	FOOT	PCHW	PROCESS CHILLED WATER
APD	AIR PRESSURE DROP	FTR	FINNED TUBE RADIATION	PCHWR	PROCESS CHILLED WATER RETURN
ARCH	ARCHITECTURAL	FV	FACE VELOCITY	PCHWS	PROCESS CHILLED WATER SUPPLY
ASR	AUTOMATIC SPRINKLER RISER	G	NATURAL GAS	PD	PRESSURE DROP
B	BOILER	GA	GAUGE	PPM	PARTS PER MILLION
BAL	BALANCE	GAL	GALLON	PRESS	PRESSURE
BCU	BLOWER COIL UNIT	GPH	GALLONS PER HOUR	PRV	PRESSURE REDUCING VALVE
BFP	BACKFLOW PREVENTER	GPM	GALLONS PER MINUTE	PSI	POUNDS PER SQUARE INCH
BHP	BRAKE HORSEPOWER	GWH	GAS WATER HEATER	PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
BOD	BOTTOM OF DUCT	HB	HOSE BIBB	PSIG	POUNDS PER SQUARE INCH - GAUGE
BOP	BOTTOM OF PIPE	HC	HEATING COIL	RA	RETURN AIR
BTU	BRITISH THERMAL UNIT	HHW	HEATING HOT WATER	RAT	RETURN AIR TEMPERATURE
BTUH	BRITISH THERMAL UNIT PER HOUR	HHWR	HEATING HOT WATER RETURN	RCP	RADIANT CEILING PANEL
CA	COMPRESSED AIR	HHWS	HEATING HOT WATER SUPPLY	RD	ROOF DRAIN
CAV	CONSTANT AIR VOLUME	HO	HUB OUTLET	REQ'D	REQUIRED
CC	COOLING COIL	HOA	HAND/OFF/AUTO	RF	RETURN FAN
CFH	CUBIC FEET PER HOUR	HP	HEAT PUMP	RG	RETURN AIR GRILLE
CFM	CUBIC FEET PER MINUTE	HP	HORSEPOWER	RH	RELATIVE HUMIDITY
CH	CHILLER	HR	HOUR	RHC	REHEAT COIL
CHW	CHILLED WATER	HTG	HEATING	RL	REFRIGERANT LIQUID
CHWR	CHILLED WATER RETURN	HVAC	HEATING, VENTILATING, AIR CONDITIONING	RPM	REVOLUTIONS PER MINUTE
CHWS	CHILLED WATER SUPPLY	HW	DOMESTIC HOT WATER	RS	REFRIGERANT SUCTION
CO	CLEAN OUT	HWR	DOMESTIC HOT WATER RETURN	RTU	ROOFTOP UNIT
CO2	CARBON DIOXIDE	HX	HEAT EXCHANGER	SA	SUPPLY AIR
COND	CONDENSATE	HZ	HERTZ	SA	SOUND ATTENUATOR
CONT	CONTINUATION	ID	INSIDE DIAMETER	SAN	SANITARY WASTE
CRAC	COMPUTER ROOM AIR CONDITIONER	IE	INVERT ELEVATION	SAT	SUPPLY AIR TEMPERATURE
CT	COOLING TOWER	IN	INCHES	SD	SMOKE DETECTOR
CUH	CABINET UNIT HEATER	IR	INFRARED HEATER	SD	SUPPLY AIR DIFFUSER
CW	DOMESTIC COLD WATER	IW	INDIRECT WASTE	SF	SUPPLY FAN
CWR	CONDENSER WATER RETURN	JC	JANITOR'S CLOSET	SH	SHOWER
CWS	CONDENSER WATER SUPPLY	KW	KILOWATT	SK	SINK
DB	DRY BULB	KWH	KILOWATT-HOUR	SP	STATIC PRESSURE
DDC	DIRECT DIGITAL CONTROL	LAB	LABORATORY	SPEC	SPECIFICATION
DEG	DEGREE	LAT	LEAVING AIR TEMPERATURE	SS	SERVICE SINK
DFU	DRAINAGE FIXTURE UNITS	LAV	LAVATORY	ST	STORM
DIA	DIAMETER	LBS	POUNDS	STK	STACK
DN	DOWN	LPC	LOW PRESSURE CONDENSATE	STM	STEAM
DWG	DRAWING	LPS	LOW PRESSURE STEAM	STP	STAND PIPE
DWH	DOMESTIC WATER HEATER	LRA	LOCKED ROTOR AMPS	TA	TRANSFER AIR
EA	EACH	LWT	LEAVING WATER TEMPERATURE	TC	TEMPERATURE CONTROL
EA	EXHAUST AIR	MAT	MIXED AIR TEMPERATURE	TD	TRENCH DRAIN
EAT	ENTERING AIR TEMPERATURE	MAU	MAKE-UP AIR UNIT	TEMP	TEMPERATURE
ECUH	ELECTRIC CABINET UNIT HEATER	MAX	MAXIMUM	TEMP	TEMPORARY
EF	EXHAUST FAN	MBH	1,000 BRITISH THERMAL UNITS PER HOUR	TG	TRANSFER AIR GRILLE
EFF	EFFICIENCY	MCA	MEDICAL COMPRESSED AIR	TSP	TOTAL STATIC PRESSURE
EG	EXHAUST GRILLE	MCA	MINIMUM CIRCUIT AMPS	TYP	TYPICAL
EHC	ELECTRIC HEATING COIL	MECH	MECHANICAL	UH	UNIT HEATER
ELEC	ELECTRICAL	MEZZ	MEZZANINE	UON	UNLESS OTHERWISE NOTED
ESP	EXTERNAL STATIC PRESSURE	MFR	MANUFACTURER	UR	URINAL
EUH	ELECTRIC UNIT HEATER	MIN	MINIMUM	V	VALVE
EWG	ELECTRIC WATER COOLER	MISC	MISCELLANEOUS	V	VENT
EWH	ELECTRIC WATER HEATER	MOC	MAXIMUM OVER-CURRENT PROTECTION	VAC	VACUUM
EWT	ENTERING WATER TEMPERATURE	MV	MANUAL AIR VENT	VAY	VARIABLE AIR VOLUME
EX	EXISTING	MVAC	MEDICAL VACUUM	VDF	VOLUME DAMPER
EXH	EXHAUST	N	NITROGEN	VFD	VARIABLE FREQUENCY DRIVE
F	FIRE PROTECTION	N2O	NITROUS OXIDE	VOL	VOLUME
F	DEGREES FAHRENHEIT	NC	NOISE CRITERIA	VTR	VENT THROUGH ROOF
F&B	FACE AND BYPASS	NC	NORMALLY CLOSED	W	WASTE
FCO	FLOOR CLEANOUT	NFWH	NON-FREEZE WALL HYDRANT	WADG	WASTE ANESTHETIC GAS DISPOSAL
FCU	FAN COIL UNIT	NIC	NOT IN CONTRACT	WB	WET BULB
FD	FLOOR DRAIN	NK	NECK	WC	WATER CLOSET
FFD	FUNNEL FLOOR DRAIN	NO	NORMALLY OPEN	WC	WATER COLUMN
FHC	FIRE HOSE CABINET	NOM	NOMINAL	WCO	WALL CLEANOUT
FLA	FULL LOAD AMPS	NPW	NON POTABLE WATER	WG	WATER GAUGE
FLR	FLOOR	OA	OUTSIDE AIR	WH	WALL HYDRANT
FM	FLOW MEASURING DEVICE	OAT	OUTSIDE AIR TEMPERATURE	WPD	WATER PRESSURE DROP
FMS	FLOW MEASURING STATION				

PIPING SYMBOL LIST

SYMBOL	DESCRIPTION
	AIR ADMITTANCE VALVE
	AIR VENT - AUTOMATIC
	AIR VENT - MANUAL
	BACKFLOW PREVENTER
	BACKFLOW PREVENTER - REDUCED PRESSURE
	CIRCULATING PUMP
	CIRCULATING PUMP
	CLEANOUT - FLANGE
	CLEANOUT - FLOOR
	CLEANOUT - WALL
	DIRECTION OF FLOW
	DIRECTION OF SLOPE - DOWN
	FIRE DEPARTMENT CONNECTION - FREE STANDING
	FIRE DEPARTMENT CONNECTION - WALL MOUNTED
	FIRE PROTECTION - SPRINKLER HEAD, PENDANT
	FIRE PROTECTION - SPRINKLER HEAD, UPRIGHT
	FLOOR DRAIN
	FLOOR DRAIN - FUNNEL
	FLOW SWITCH
	HOSE BIBB
	NON-FREEZE WALL HYDRANT
	PIPE - ALIGNMENT GUIDE
	PIPE - ANCHOR
	PIPE - CAP OR PLUG
	PIPE - CONCENTRIC REDUCER
	PIPE - ELBOW DOWN
	PIPE - ELBOW UP
	PIPE - EXPANSION JOINT
	PIPE - FLEXIBLE CONNECTION
	PIPE - TEE DOWN
	PIPE - TEE UP
	PIPE - TRAP
	PIPE - UNION
	PRESSURE GAUGE
	PRESSURE/TEMPERATURE TEST PLUG
	VENT THROUGH ROOF
	ROOF/OVERFLOW DRAIN
	STEAM TRAP
	STRAINER
	THERMOMETER
	VALVE - ANGLE
	VALVE - BALANCING
	VALVE - CHECK
	VALVE - GAS
	VALVE - ISOLATION
	VALVE - OS&Y
	VALVE - PRESSURE REGULATING
	VALVE - RELIEF
	VALVE - THREE-WAY MODULATING CONTROL
	VALVE - TWO-WAY MODULATING CONTROL

HVAC SYMBOL LIST

SYMBOL	DESCRIPTION
	AIR TERMINAL UNIT
	AIR TERMINAL UNIT W/ HEATING COIL
	DAMPER - VERTICAL FIRE (EXISTING, NEW)
	DAMPER - HORIZONTAL FIRE (EXISTING, NEW)
	DAMPER - COMBINATION FIRE/SMOKE
	DAMPER - MOTORIZED
	DAMPER - MANUAL VOLUME CONTROL
	DIFFUSER - SQUARE
	DIFFUSER - LINEAR SLOT
	DIFFUSER - ROUND
	DUCT CROSS SECTION - SUPPLY
	DUCT CROSS SECTION - RETURN OR EXHAUST
	DUCT CROSS SECTION - EXHAUST
	DUCT - FLEXIBLE CONNECTION
	DUCT - FLEXIBLE DUCT (5'-0" MAXIMUM)
	DUCT TAKE OFF - SPIN-IN W/ VOLUME DAMPER
	DUCT TAKE OFF - ROUND CONICAL
	DUCT TAKE OFF - RECTANGULAR W/ SHOE TAP
	ELBOW - RECTANGULAR W/ TURNING VANES
	ELBOW - RECTANGULAR SMOOTH RADIUS
	ELBOW - RECTANGULAR
	ELBOW - ROUND
	HEATING COIL
	INCLINED DROP IN DIRECTION OF AIRFLOW
	INCLINED RISE IN DIRECTION OF AIRFLOW
	TRANSITION - CONCENTRIC
	TRANSITION - ECCENTRIC
	TRANSITION - RECTANGULAR TO ROUND
TEMPERATURE CONTROLS	
	CARBON DIOXIDE SENSOR
	CARBON MONOXIDE SENSOR
	NITROGEN OXIDE SENSOR
	DUCT SMOKE DETECTOR
	HUMIDISTAT/HUMIDITY SENSOR
	THERMOSTAT/TEMPERATURE SENSOR
NOTE: THIS IS ONLY A PARTIAL LIST OF SYMBOLS, REFER TO TEMPERATURE CONTROL DRAWINGS FOR A LEGEND OF ADDITIONAL SYMBOLS THAT MAY BE USED.	

MECHANICAL SHEET INDEX

M000	MECHANICAL LEGEND & SHEET INDEX
M001	MECHANICAL SPECIFICATIONS
MD101	PARTIAL 1ST FLOOR PLUMBING DEMOLITION PLAN
MD201	PARTIAL 1ST FLOOR HVAC DEMOLITION PLAN
M101	PARTIAL 1ST FLOOR PLUMBING NEW WORK PLAN
M201	PARTIAL 1ST FLOOR HVAC NEW WORK PLAN
M300	MECHANICAL SCHEDULES & DETAILS
M400	TEMPERATURE CONTROLS
M401	TEMPERATURE CONTROLS

METHODS OF NOTATION

	POINT OF NEW CONNECTION
	DEMOLITION KEY NOTE
	NEW WORK KEY NOTE
	INDICATES 100 CFM OF TRANSFER AIR FLOWING FROM ONE SPACE TO ANOTHER, TYPICALLY UNDER DOORWAYS.
	INDICATES SUPPLY DIFFUSER, SCHEDULE TYPE S-1 TYPICAL OF (3) 12 INCH DIAMETER NECK SIZE BALANCE TO 450 CFM
	INDICATES RETURN GRILLE, SCHEDULE TYPE R-1 12 INCH BY 12 INCH NECK SIZE BALANCE TO 500 CFM
	INDICATES TERMINAL UNIT TYPE (VAV, CAV, FPB, ETC.) MAXIMUM/MINIMUM CFM REHEAT COIL CAPACITY (HOT WATER OR ELECTRIC)
	NEW WORK - HEAVY LINE WEIGHT
	EXISTING - LIGHT LINE WEIGHT
	DEMOLITION WORK - DASHED LINE W/ HATCHING
	INDICATES RECTANGULAR DUCT 18 INCHES WIDE AND 6 INCHES DEEP (NET INSIDE DIMENSIONS). SIZE PERTAINS TO THE ENTIRE RUN OF DUCT UNLESS OTHERWISE NOTED.
	INDICATES FLAT OVAL DUCT 18 INCHES WIDE AND 6 INCHES DEEP (NET INSIDE DIMENSIONS). SIZE PERTAINS TO THE ENTIRE RUN OF DUCT UNLESS OTHERWISE NOTED.
	INDICATES ROUND DUCT 12 INCHES IN DIAMETER (NET INSIDE DIMENSION). SIZE PERTAINS TO THE ENTIRE RUN OF DUCT UNLESS OTHERWISE NOTED.
	SECTION VIEW/ENLARGED PLAN TAG, REFER TO DETAIL NUMBER 2 ON SHEET NUMBER M-601 FOR CORRESPONDING SECTION VIEW/ENLARGED PLAN

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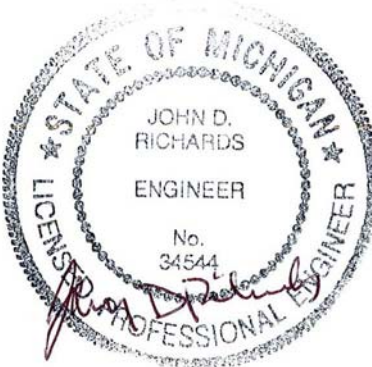
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designed by: DH

drawn by: DH

coordination checked: JR

checked: JR

approved: JR

project:

CHEMISTRY LAB 150

1st Floor

Modification

sheet title:

Mechanical Legend  
& Sheet Index

project number: sheet number:

007-286023

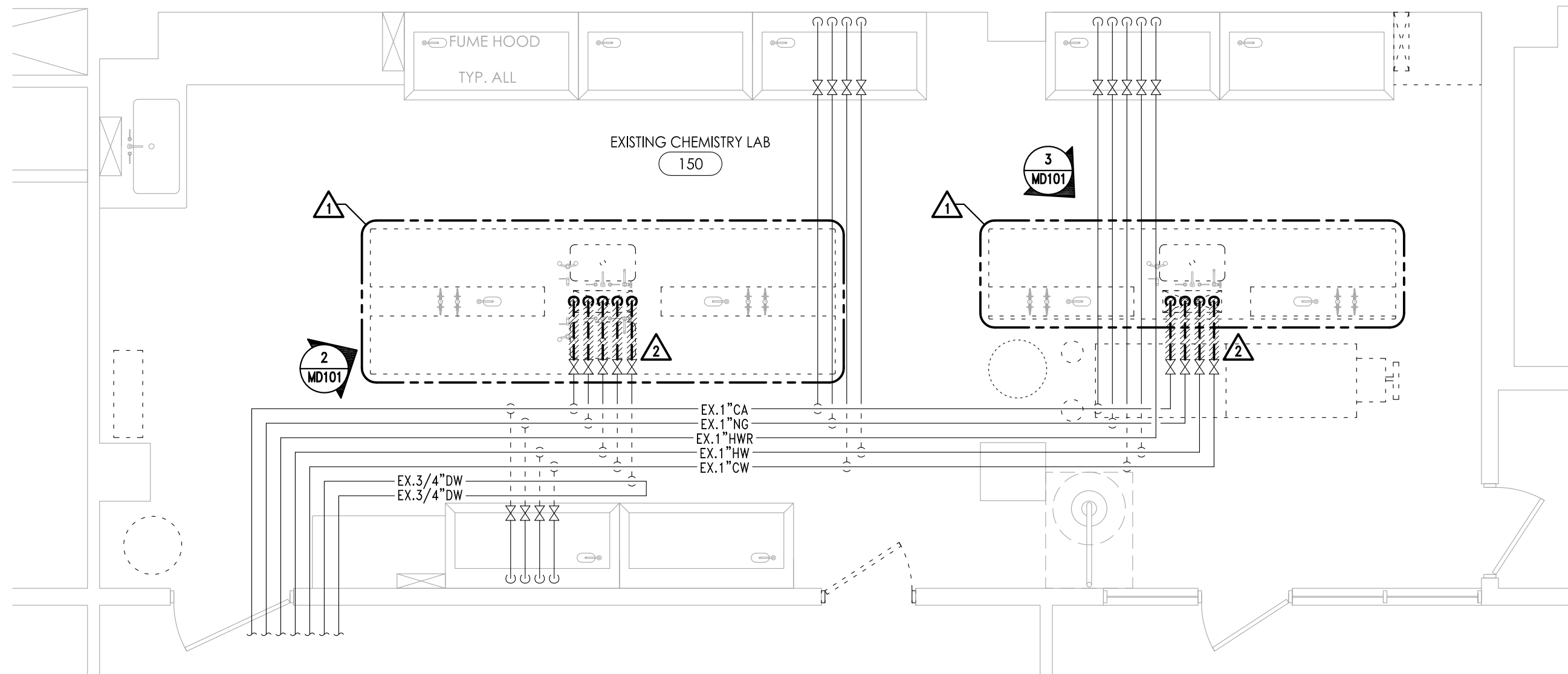
M000

(1156-7 : iDesign project number)









Partial 1st Floor  
Plumbing Demolition Plan  
SCALE: 1/4"=1'-0"



Existing Lab Table Fixtures  
SCALE: NONE



Existing Lab Table Fixtures  
SCALE: NONE

#### DEMOLITION GENERAL NOTES:

- THE FOLLOWING GENERAL NOTES APPLY TO ALL MECHANICAL DEMOLITION SHEETS INCLUDED WITHIN THIS DOCUMENT SET, EXCEPT WHERE OTHERWISE INDICATED.
- COORDINATE ALL DEMOLITION WORK WITH ARCHITECTURAL AND ELECTRICAL DEMOLITION AND PHASING PLANS, WITH OWNER'S PROJECT REPRESENTATIVE AND WITH OWNER'S FACILITY MANAGER.
  - THESE DEMOLITION PLANS ARE DIAGRAMMATIC AND DO NOT FULLY REPRESENT THE EXTENT OF DEMOLITION WORK REQUIRED TO INSTALL NEW WORK. REFER TO ARCHITECTURAL, ELECTRICAL AND MECHANICAL DRAWINGS FOR LOCATIONS OF INCIDENTAL DEMOLITION WORK NOT INDICATED ON THIS PLAN.
  - COORDINATE THE USE OF SALVAGED ITEMS AND COMPONENTS THAT ARE TO BE REUSED ON NEW WORK AS INDICATED ON DRAWINGS AND WITHIN SPECIFICATIONS.
  - COORDINATE ANY SHUTDOWNS OF EXISTING SERVICES OR EQUIPMENT WITH OWNER. PERFORM SHUTDOWNS AT A SCHEDULED TIME AS TO MINIMIZE DISRUPTION OF BUILDING OPERATIONS.
  - REMOVE ALL PIPING, DUCTWORK AND EQUIPMENT COMPLETELY INCLUDING ALL RELATED ITEMS INCLUDING HANGERS, SUPPORTS, CONTROLS AND ACCESSORIES. DISPOSE OF ALL MATERIALS IN A LEGAL MANNER.
  - CAP ALL OPEN ENDED PIPING AND DUCTWORK. DO NOT LEAVE ANY ABANDONED PIPING OR DUCTWORK IN THE AREA OF WORK.

#### DEMOLITION KEY NOTES:

- REMOVE ALL EXISTING LAB TABLE FIXTURES. DEMOLISH ASSOCIATED PIPING, HANGERS, SUPPORTS AND ACCESSORIES. CAP DRAIN WASTE AND VENT PIPING AT SOURCE.
- CAP PIPING AT LOCAL ISOLATION VALVE.

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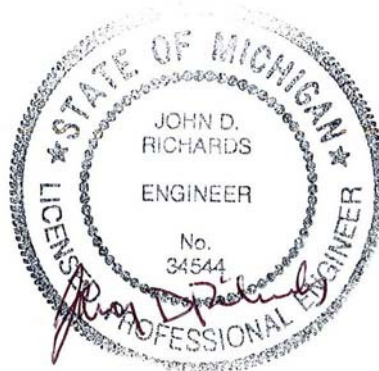
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designed by: DH

drawn by: DH

coordination checked: JR

checked: JR

approved: JR

project:

CHEMISTRY LAB 150

1st Floor

Modification

sheet title:

Partial 1st Floor

Plumbing

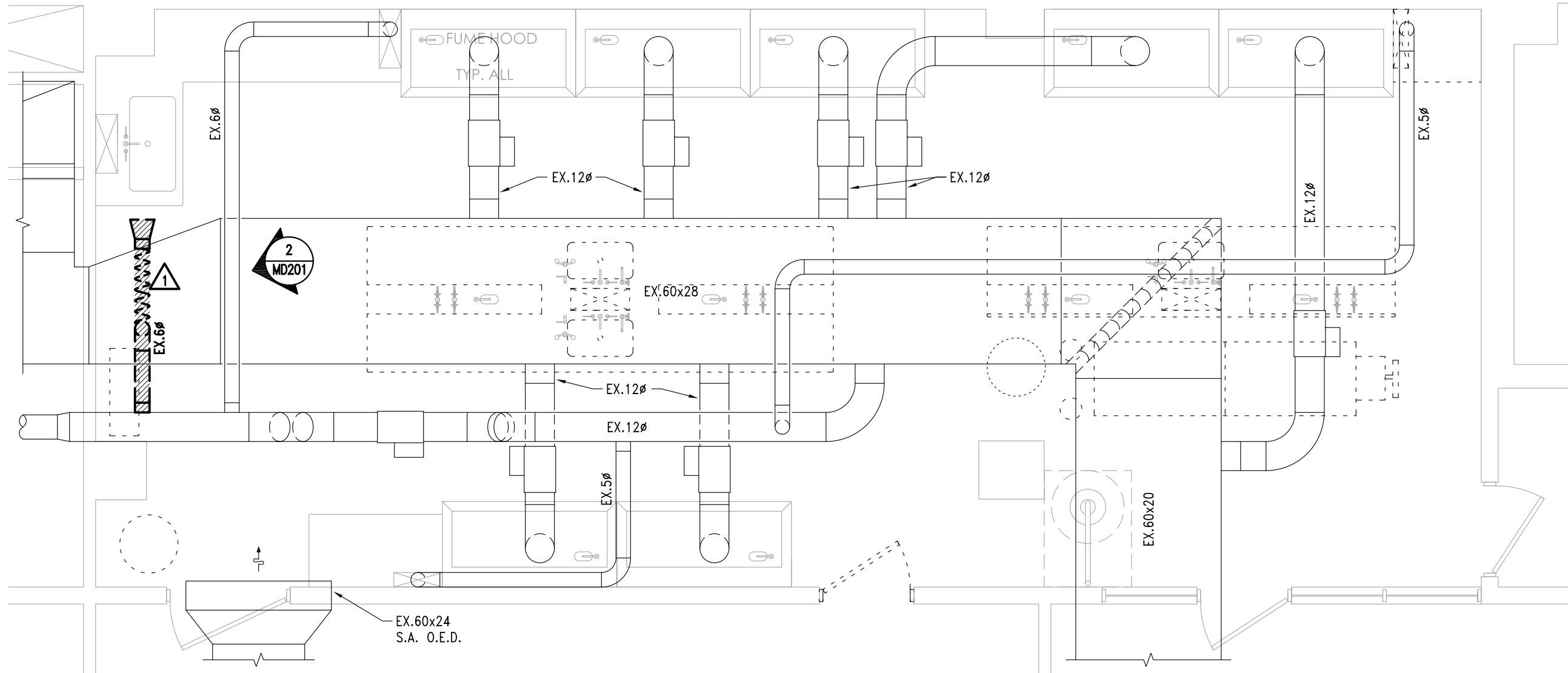
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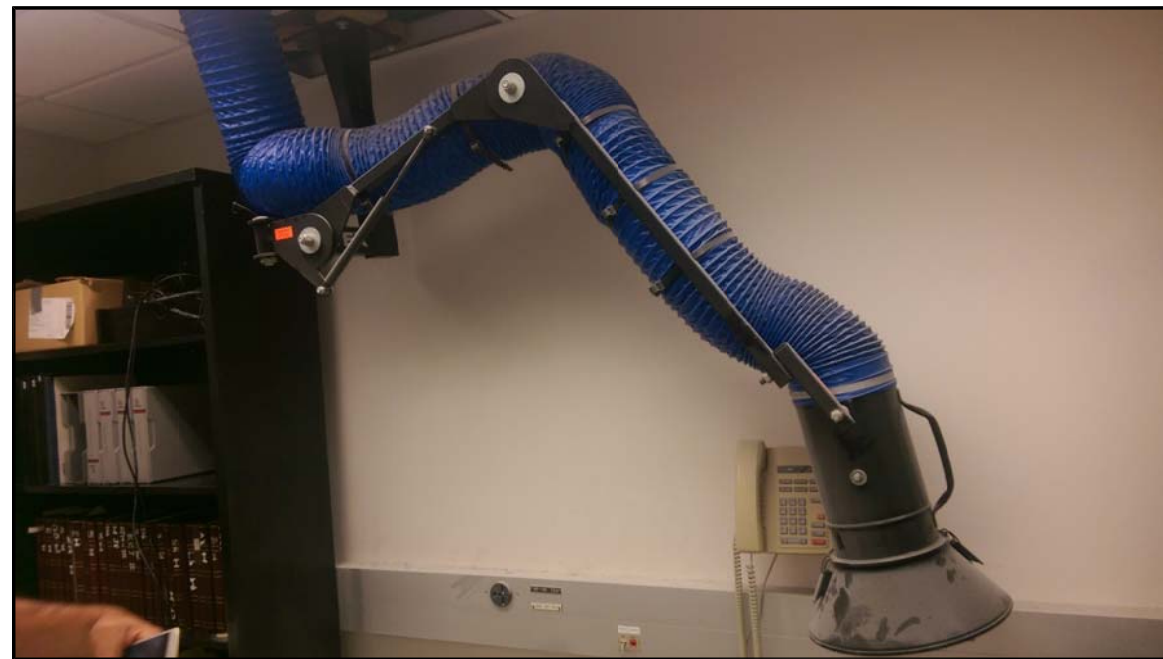
007-286023 MD101

(1156-7 : iDesign project number)





Partial 1st Floor  
HVAC Demolition Plan  
SCALE: 1/4"=1'-0"



Existing Exhaust Snorkel  
SCALE: NONE

DEMOLITION GENERAL NOTES:

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  - COORDINATE THE USE OF SALVAGED ITEMS AND COMPONENTS THAT ARE TO BE REUSED ON NEW WORK AS INDICATED ON DRAWINGS AND WITHIN SPECIFICATIONS.
  - COORDINATE ANY SHUTDOWNS OF EXISTING SERVICES OR EQUIPMENT WITH OWNER. PERFORM SHUTDOWNS AT A SCHEDULED TIME AS TO MINIMIZE DISRUPTION OF BUILDING OPERATIONS.
  - REMOVE ALL PIPING, DUCTWORK AND EQUIPMENT COMPLETELY INCLUDING ALL RELATED ITEMS INCLUDING HANGERS, SUPPORTS, CONTROLS AND ACCESSORIES. DISPOSE OF ALL MATERIALS IN A LEGAL MANNER.
  - CAP ALL OPEN ENDED PIPING AND DUCTWORK. DO NOT LEAVE ANY ABANDONED PIPING OR DUCTWORK IN THE AREA OF WORK.

DEMOLITION KEY NOTES:

- REMOVE EXISTING EXHAUST SNORKEL. DEMOLISH ASSOCIATED DUCTWORK, HANGERS, SUPPORTS AND CONTROLS. CAP DUCTWORK AT SOURCE.

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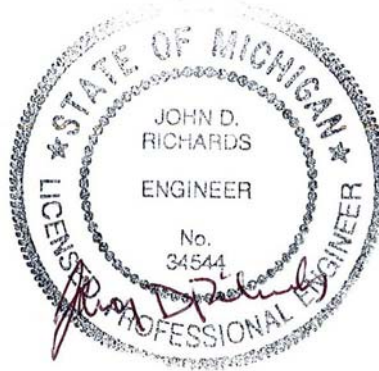
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CHEMISTRY LAB 150

1st Floor

Modification

sheet title:

Partial 1st Floor

HVAC

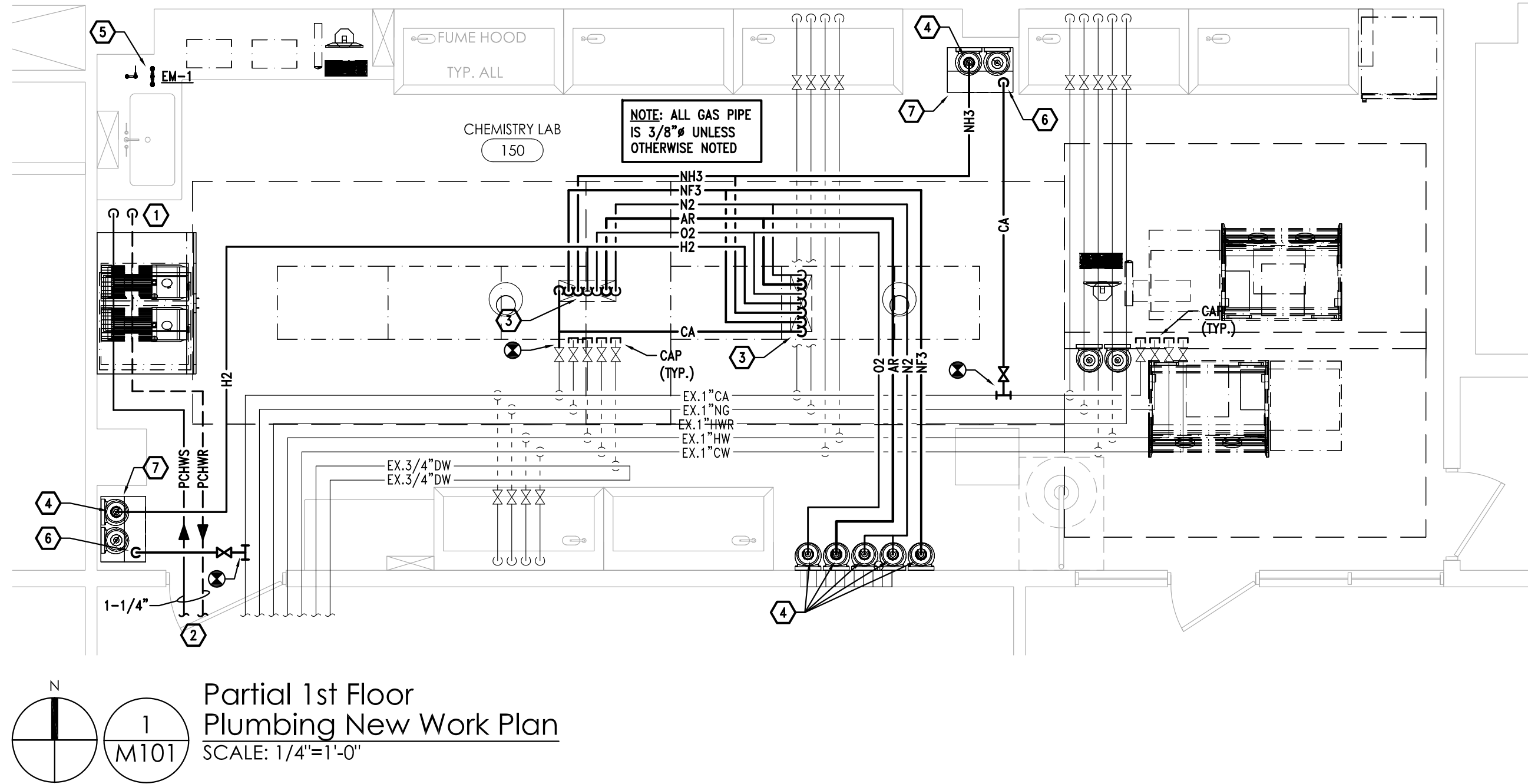
Demolition Plan

project number: sheet number:

007-286023 MD201

(1156-7 : iDesign project number)





PLUMBING GENERAL NOTES:

- THE FOLLOWING GENERAL NOTES APPLY TO ALL PLUMBING SHEETS INCLUDED WITHIN THIS DOCUMENT SET, EXCEPT WHERE OTHERWISE INDICATED.
1. PIPING OFFSETS ARE SHOWN TO PROVIDE INDICATION OF PHYSICAL CONDITIONS WITHIN THE SPACE. IT IS NOT THE INTENT OF THE DRAWINGS TO SHOW ALL REQUIRED OFFSETS. THE CONTRACTOR SHALL FULLY COORDINATE THE MECHANICAL WORK WITHIN ITSELF AND WITH THE WORK OF ALL TRADES TO PROVIDE COMPLETE AND OPERABLE SYSTEMS WITHOUT INTERFERENCES.
  2. COORDINATE ANY SHUTDOWNS OF EXISTING SERVICES OR EQUIPMENT WITH OWNER. PERFORM SHUTDOWNS AT A SCHEDULED TIME AS TO MINIMIZE DISRUPTION OF BUILDING OPERATIONS.
  3. ALL NEW PIPING IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN A WALL, FURRED CHASE OR SUSPENDED CEILING, UNLESS OTHERWISE NOTED.
  4. FOR PIPE SIZES TO INDIVIDUAL PLUMBING FIXTURES AND VARIOUS PIECES OF EQUIPMENT, REFER TO SPECIFICATIONS.
  5. MAINTAIN REQUIRED CLEARANCES IN FRONT OF ELECTRICAL PANELS/EQUIPMENT. DO NOT ROUTE PIPING ABOVE ELECTRICAL PANELS/EQUIPMENT.
  6. THE CONTRACTOR SHALL FURNISH AND INSTALL CLEANOUTS IN ALL SANITARY DRAINAGE PIPING AS REQUIRED BY THE GOVERNING PLUMBING CODE (IN ADDITION TO CLEANOUTS INDICATED ON DRAWINGS).

NEW WORK KEY NOTES:

- ① 1-1/4" PROCESS CHILLED WATER SUPPLY AND RETURN DOWN TO VACUUM PUMP CABINET. REFER TO VACUUM PUMP PIPING DETAIL FOR ADDITIONAL INFORMATION.
- ② EXTEND NEW 1-1/4" PROCESS CHILLED WATER SUPPLY AND RETURN LINES TO EXISTING PROCESS CHILLED WATER LOOP IN BUILDING. ESTIMATE 150 FT. DISTANCE TO TIE-IN POINT INCLUDING ISOLATION VALVES AND MAIN SYSTEM SHUTDOWN COSTS.
- ③ ROUTE NEW 1/4" LABORATORY GAS PIPING AND 1/2" COMPRESSED AIR PIPING DOWN THROUGH SERVICE CHASE. REFER TO ALD REACTOR PIPING DETAIL FOR ADDITIONAL INFORMATION.
- ④ ROUTE NEW 3/8" LABORATORY GAS PIPING DOWN TO CYLINDER. PROVIDE REGULATOR AND SHUT-OFF VALVE.
- ⑤ NEW EMERGENCY EYEWASH WITH MIXING VALVE BELOW COUNTER. CONNECT TO EXISTING SUPPLY LINES SERVING ADJACENT SINK.
- ⑥ ROUTE NEW 3/8" COMPRESSED AIR PIPING DOWN TO CYLINDER CABINET. TERMINATE WITH THREADED CONNECTION AND CAP.
- ⑦ EXTEND NEW SPRINKLER LINE FROM EXISTING FIRE PROTECTION SYSTEM DOWN TO SPRINKLER HEAD IN CYLINDER CABINET.

LABORATORY GAS LEGEND

ABBREVIATION	GAS
AR	ARGON
CA	COMPRESSED AIR (LAB GRADE)
H2	HYDROGEN
N2	NITROGEN
NF3	NITROGEN TRIFLUORIDE
NH3	AMMONIA
O2	OXYGEN

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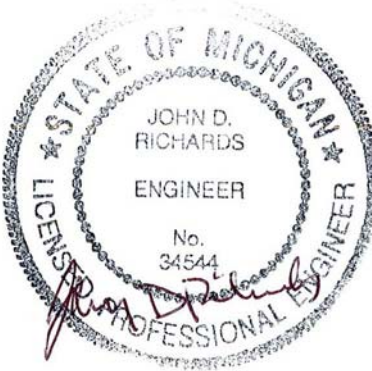
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CHEMISTRY LAB 150

1st Floor

Modification

sheet title:

Partial 1st Floor

Plumbing

New Work Plan

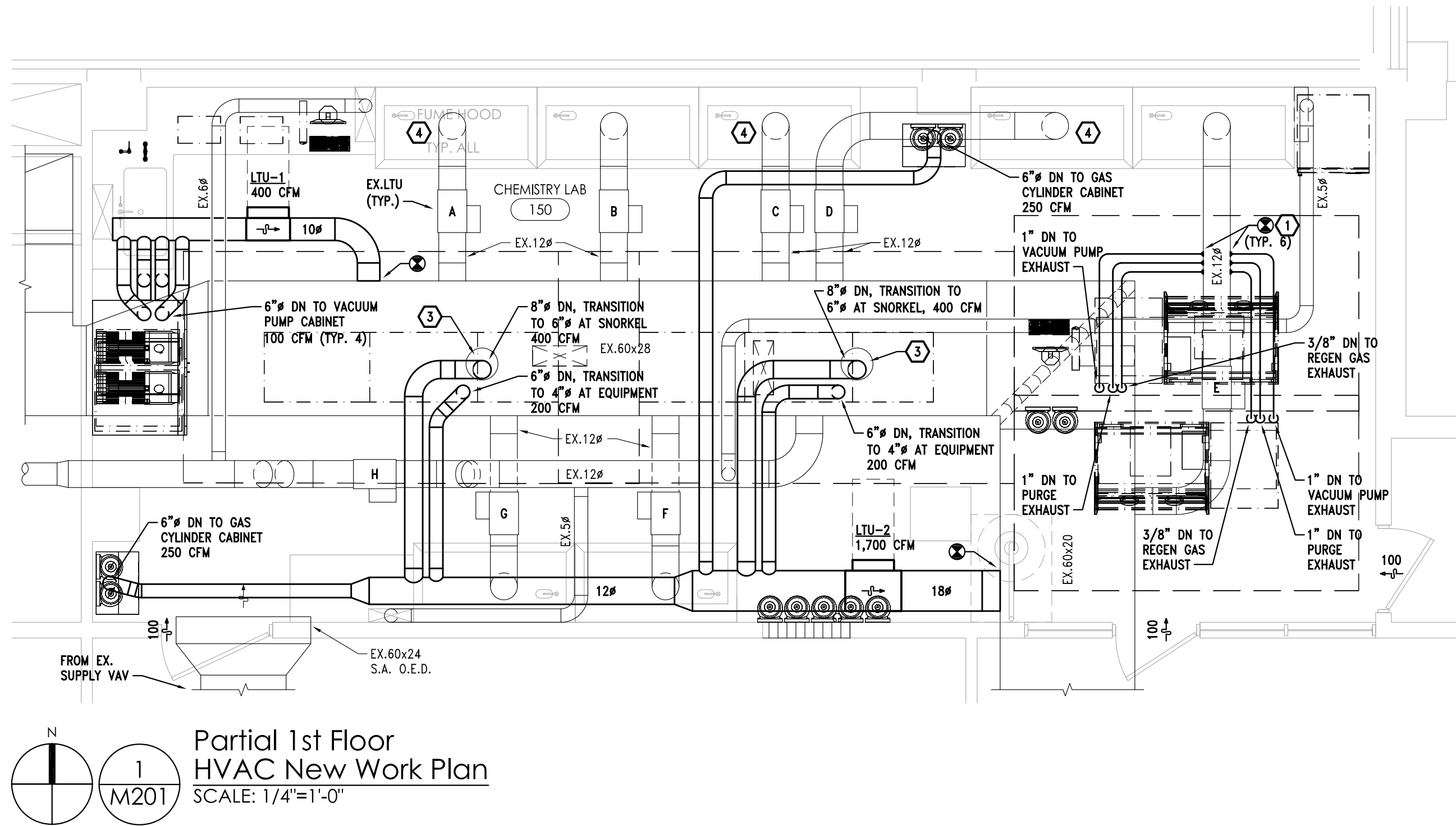
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M101

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Partial 1st Floor  
HVAC New Work Plan  
SCALE: 1/4"=1'-0"

HVAC GENERAL NOTES:

- THE FOLLOWING GENERAL NOTES APPLY TO ALL HVAC SHEETS INCLUDED WITHIN THIS DOCUMENT SET, EXCEPT WHERE OTHERWISE INDICATED.
- NOTE THAT PLENUM SPACE IS EXTREMELY CONGESTED. SHEET METAL OFFSETS AND TRANSITIONS ARE SHOWN TO PROVIDE INDICATION OF PHYSICAL CONDITIONS WITHIN THE SPACE. IT IS NOT THE INTENT OF THE DRAWINGS TO SHOW ALL REQUIRED OFFSETS AND TRANSITIONS. THE CONTRACTOR SHALL FULLY COORDINATE THE MECHANICAL WORK WITHIN ITSELF AND WITH THE WORK OF ALL TRADES TO PROVIDE COMPLETE AND OPERABLE SYSTEMS WITHOUT INTERFERENCES.
  - COORDINATE ANY SHUTDOWNS OF EXISTING SERVICES OR EQUIPMENT WITH OWNER. PERFORM SHUTDOWNS AT A SCHEDULED TIME AS TO MINIMIZE DISRUPTION OF BUILDING OPERATIONS.
  - COORDINATE GRILLE, REGISTER AND DIFFUSER LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLAN.
  - ALL NEW DUCTWORK IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN A FURRED CHASE OR SUSPENDED CEILING, UNLESS OTHERWISE NOTED.
  - ALL DUCT PENETRATIONS THROUGH FIRE-RATED ASSEMBLIES SHALL BE PROVIDED WITH FIRE DAMPERS AND ACCESS DOORS.
  - ALL EXHAUST GRILLES SHALL BE HARD DUCT CONNECTION.
  - ALL ROUND DUCT RUNOUTS AND DROPS TO DIFFUSERS SHALL BE THE SAME NOMINAL SIZE AS INDICATED BY THE DIFFUSER TAG ON THE DRAWINGS.
  - SUPPLY DUCTWORK PRESSURE CONSTRUCTION SHALL BE 3" W.G. UPSTREAM OF TERMINAL UNITS AND 2" W.G. DOWNSTREAM OF TERMINAL UNITS.
  - MAINTAIN REQUIRED CLEARANCES IN FRONT OF ELECTRICAL PANELS/EQUIPMENT. DO NOT ROUTE DUCTWORK ABOVE ELECTRICAL PANELS/EQUIPMENT.
  - ACCESS PANELS AND DOORS ARE REQUIRED THROUGHOUT BUILDING CONSTRUCTION ASSEMBLIES SUCH AS WALLS, HARD CEILINGS, PARTITIONS AND FLOORS TO SERVICE AND MAINTAIN TERMINAL UNITS, BALANCING DAMPERS, CONTROL MOTORS, ETC. ACCESS PANELS AND DOORS SHALL BE PROVIDED AND INSTALLED PER ARCHITECTURAL SPECIFICATIONS. MECHANICAL CONTRACTOR SHALL VERIFY THE EXACT QUANTITY, SIZE, FIRE-RATING AND LOCATION OF ACCESS PANELS AND DOORS FOLLOWING INSTALLATION OF SYSTEMS AND COMPONENTS REQUIRING ACCESS, BUT PRIOR TO THE CLOSURE OF THE AFFECTED CEILING AND BUILDING ASSEMBLIES. MINIMUM ACCESS PANEL AND DOOR SIZE SHALL BE 24 INCHES BY 18 INCHES, UNLESS OTHERWISE NOTED.
  - WHERE VOLUME DAMPERS OCCUR ABOVE CEILINGS WITHOUT REMOVABLE TILE OR ACCESS PANEL, PROVIDE A FLUSH-MOUNTED CONCEALED DAMPER REGULATOR TO ALLOW FOR DAMPER ADJUSTMENT BELOW CEILING. UNIT TO BE EQUAL TO VENTLOCK NO. 666 IN 1/2" OR 3/8" ROD SIZE.

NEW WORK KEY NOTES:

- ① CONNECT NEW EXHAUST PIPING TO EXISTING HOOD EXHAUST DUCT.
- ② NOT USED.
- ③ REFER TO ARCH SHEET A402 FOR SNORKEL INSTALLATION DETAIL.
- ④ HOOD TO BE DECOMMISSIONED. VERIFY WHICH THREE (3) HOODS TO BE DECOMMISSIONED WITH OWNER. LOCK HOOD IN CLOSED POSITION. DISABLE ALL ASSOCIATED ALARMS. PROVIDE 12x12 PLASTIC LAMINATE SIGN THAT READS "DO NOT USE HOOD, NO EXHAUST AIR".

LAB 150 AIRFLOW SCHEDULE				
TAG	INLET SIZE (IN.)	SUPPLY AIRFLOW TO ROOM (MAX.)	EXHAUST AIRFLOW FROM ROOM (MAX.)	NOTES/ACCESSORIES
LTU-1	10	N/A	400	
LTU-2	18	N/A	1,700	
EX.LTU-A	12	N/A	0	A
EX.LTU-B	12	N/A	775	
EX.LTU-C	12	N/A	0	A
EX.LTU-D	12	N/A	0	A
EX.LTU-E	12	N/A	775	
EX.LTU-F	12	N/A	775	
EX.LTU-G	12	N/A	775	
EX.LTU-H	12	N/A	350	B
EX.SUPPLY VAV	24x16	5,250	N/A	C
TOTAL		5,250	5,550	
NOTES AND ACCESSORIES DESIGNATION				
A	HOOD TO BE DECOMMISSIONED			
B	EXHAUST AIRFLOW BASED ON 50 CFM PER FUME HOOD CABINET			
C	BALANCE EXISTING SUPPLY VAV BOX MAXIMUM TO AIRFLOW INDICATED			

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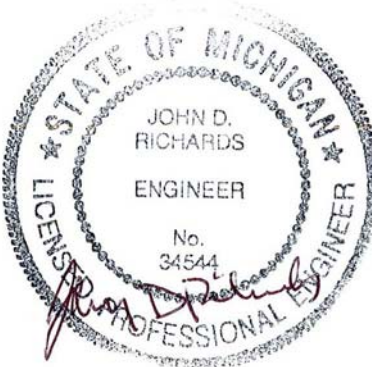
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CHEMISTRY LAB 150

1st Floor

Modification

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Partial 1st Floor

HVAC

New Work Plan

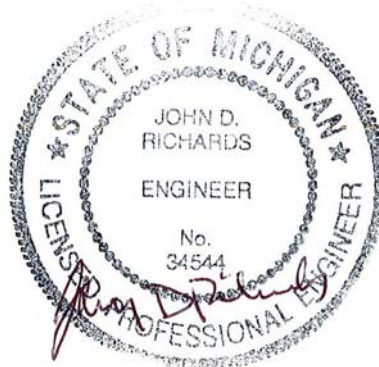
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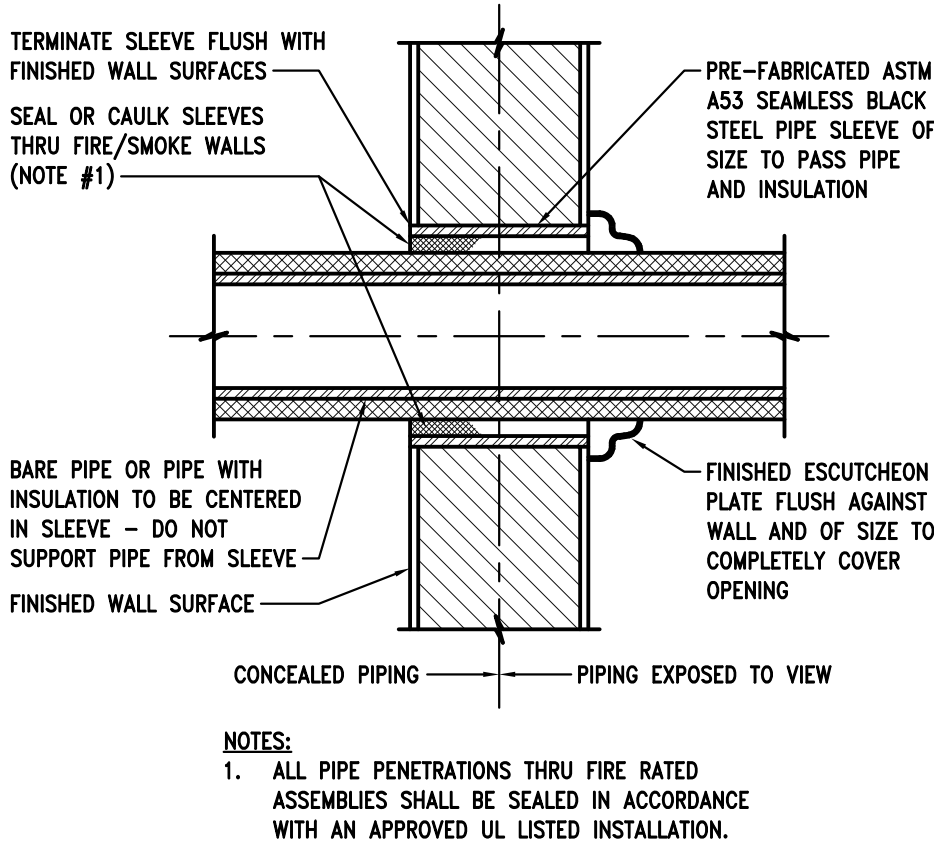
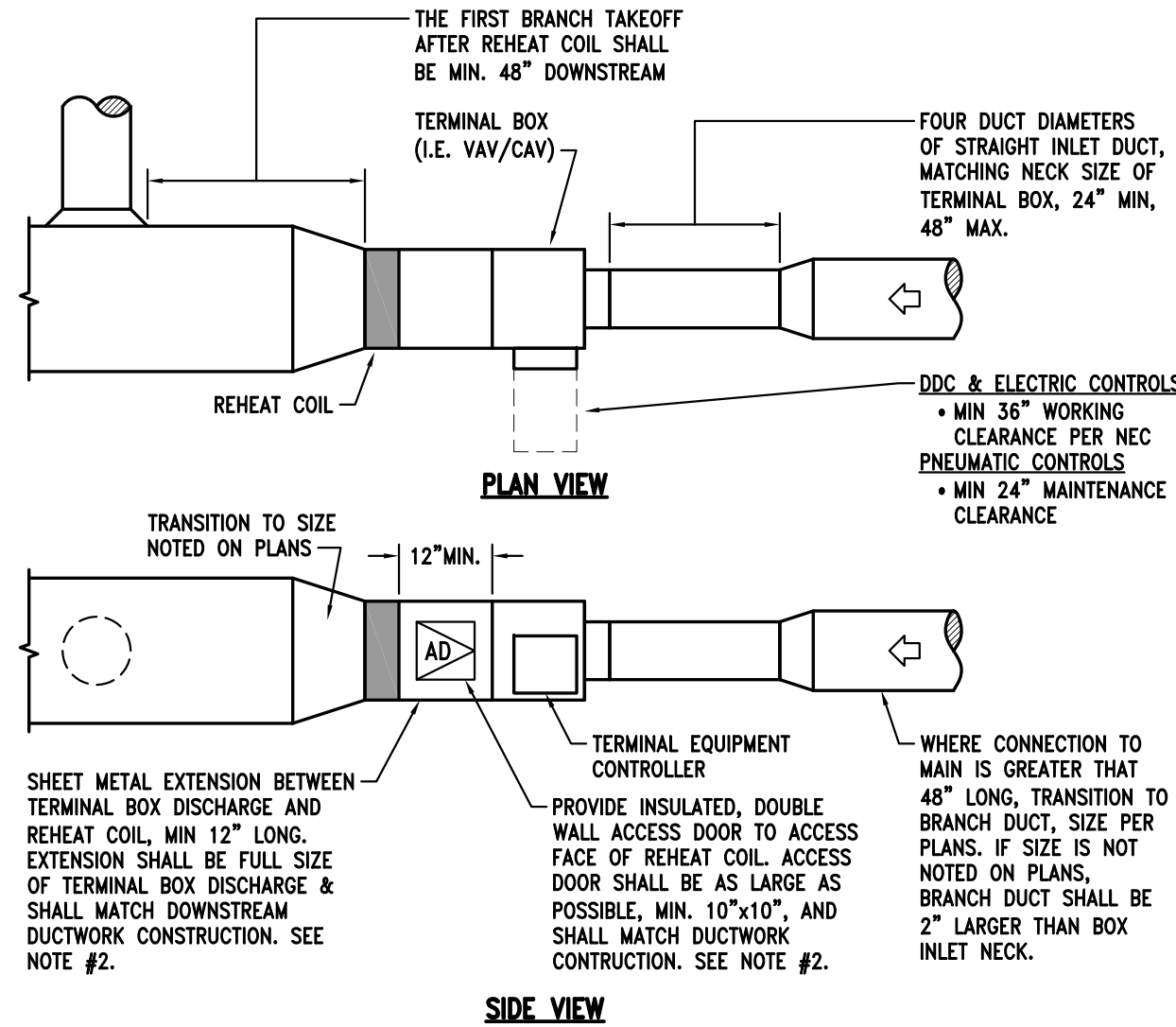
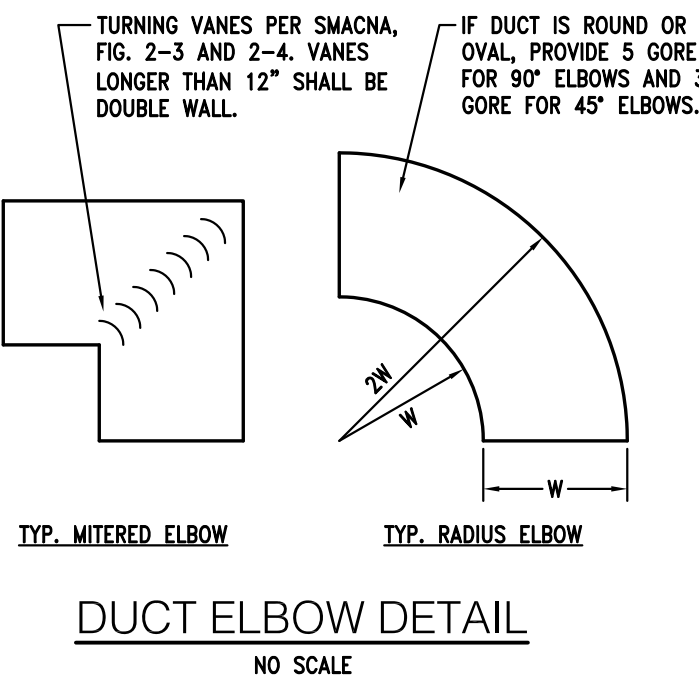
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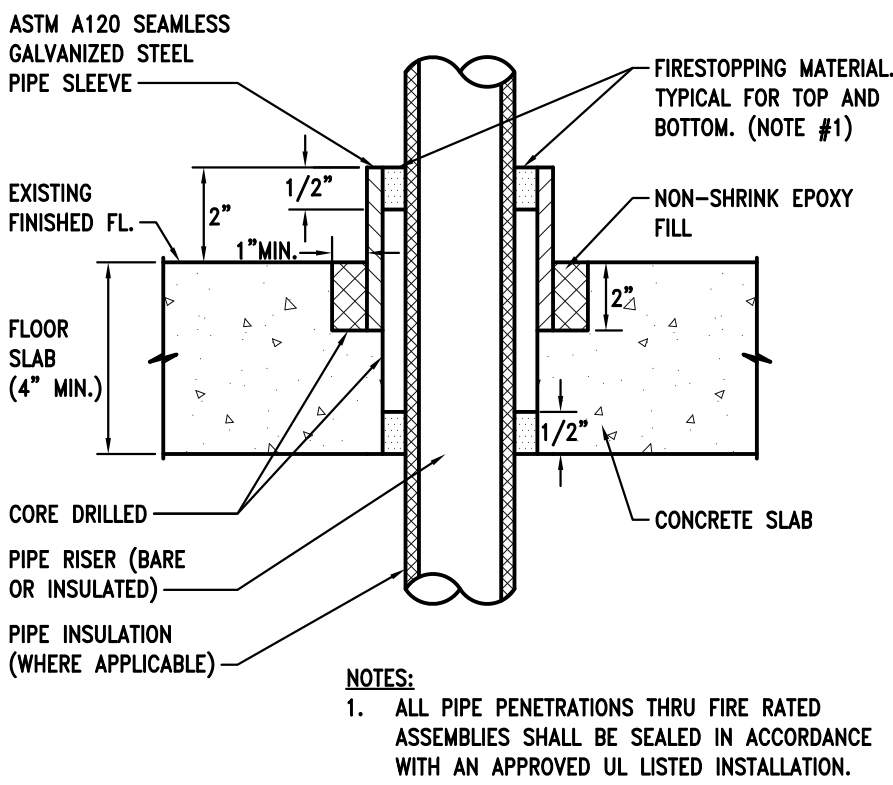




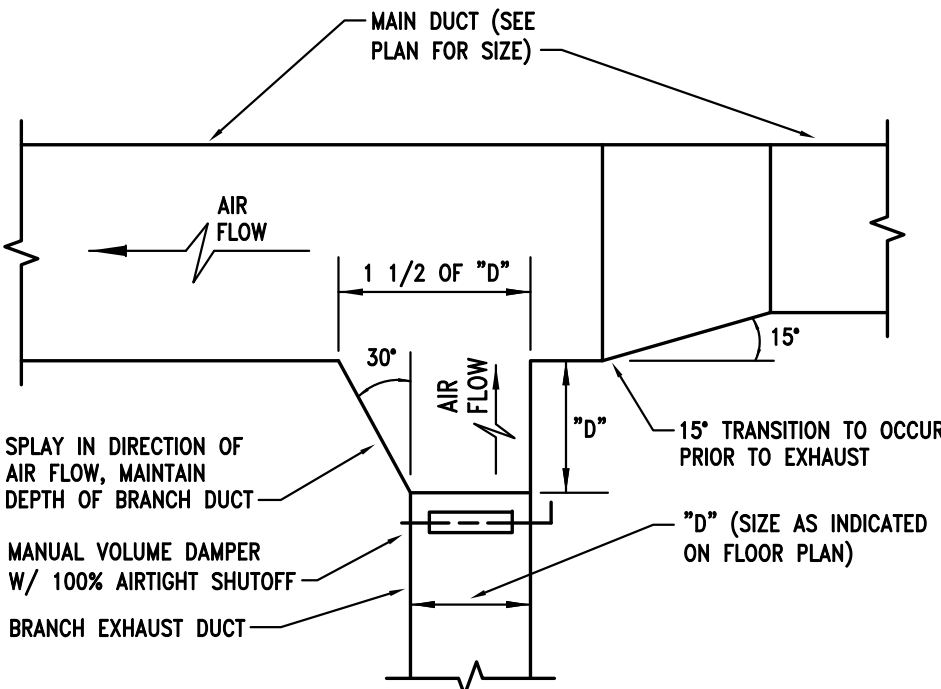
LABORATORY EXHAUST AIR TERMINAL UNIT SCHEDULE							
TAG	MANUFACTURER & MODEL NO.	AREA SERVED	INLET SIZE (N.)	OUTLET SIZE (N.)	MAXIMUM CFM	MINIMUM CFM	NOTES/ACCESSORIES
LTU-1	SIEMENS LGE	SEE PLAN	10	10	400	400	A B C
LTU-2	SIEMENS LGE	SEE PLAN	18	18	1,700	1,700	A B C
NOTES AND ACCESSORIES DESIGNATION							
A	ALL CONTROLS BY SIEMENS						
B	INTEGRATE BOX WITH EXISTING ROOM 150 LAB CONTROL PANEL, HIGH TEMP ALARM TO BMS						
C	PROVIDE ALL REQUIRED POWER AND WIRING						



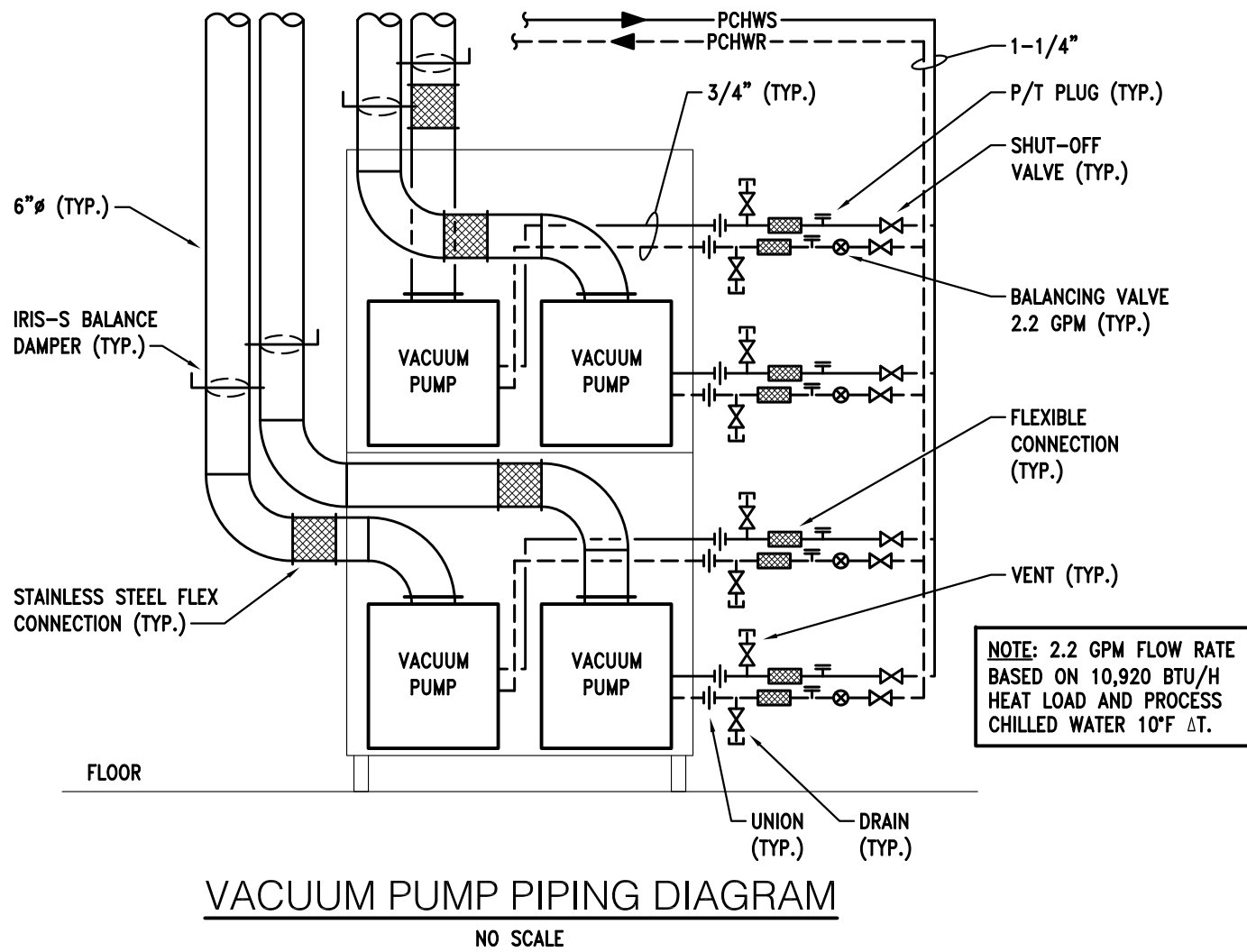
PIPE SLEEVE THRU INTERIOR WALL  
NO SCALE



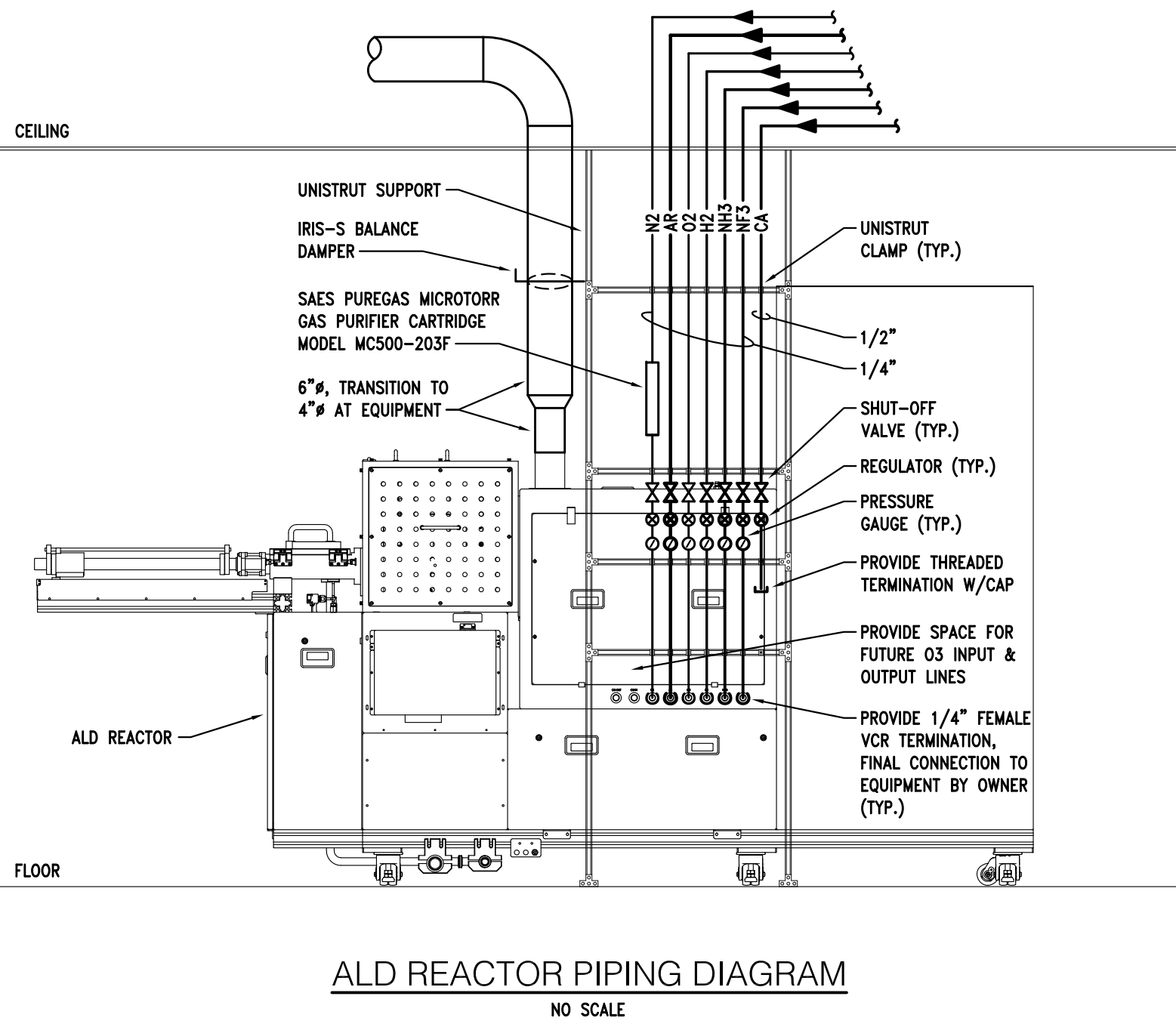
PIPE SLEEVE THRU FLOOR  
NO SCALE



EXHAUST AIR BRANCH  
DUCT CONNECTION DETAIL  
NO SCALE



VACUUM PUMP PIPING DIAGRAM  
NO SCALE



ALD REACTOR PIPING DIAGRAM  
NO SCALE





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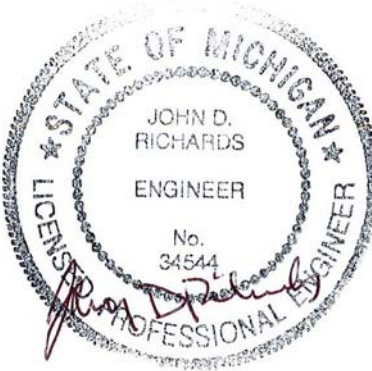
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1st Floor  
Modification

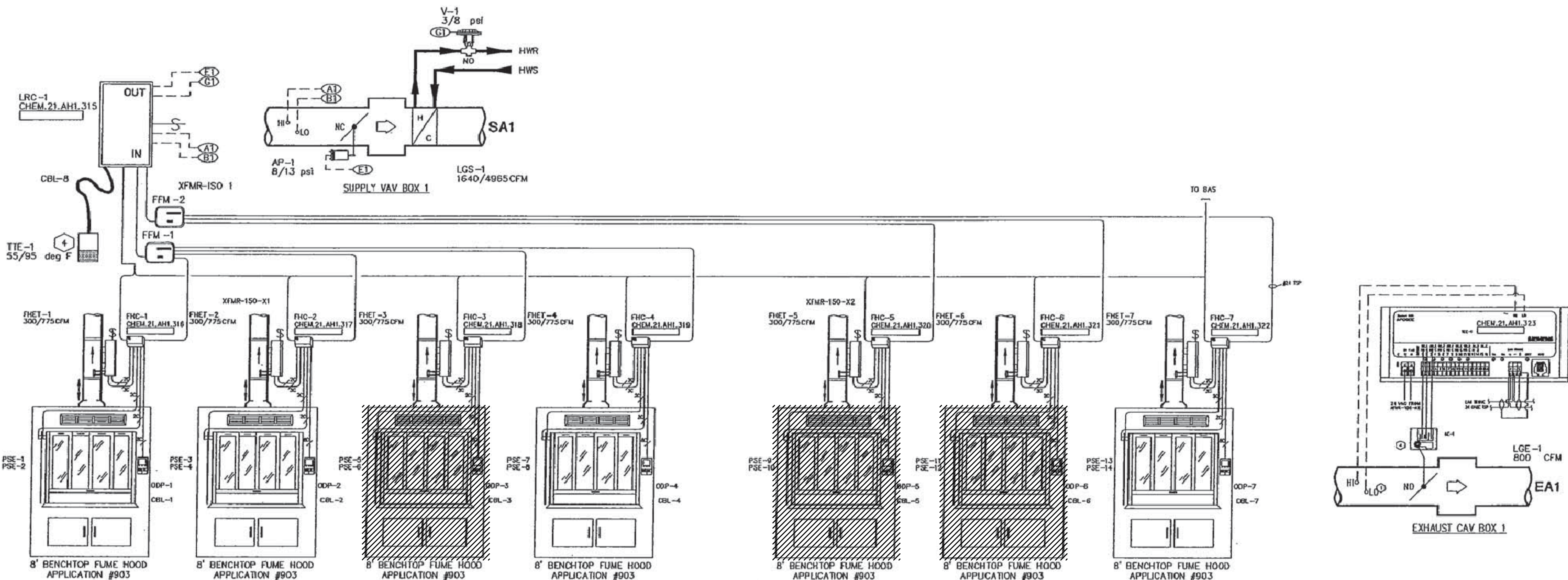
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Temperature  
Controls

project number: sheet number:

007-286023 M400

(1156-7 : iDesign project number)



ROOM 150 CONTROL DIAGRAM

HOOD TO BE DECOMMISSIONED  
(TYP. 3), VERIFY WHICH HOODS TO  
BE DECOMMISSIONED WITH OWNER

FOR REFERENCE ONLY

TEMPERATURE CONTROLS:

NOTE THAT ALL CONTROLS ARE BY SIEMENS FACTORY BRANCH ONLY

MODIFY THE EXISTING ROOM 150 LAB CONTROL SYSTEM TO INCLUDE TWO ADDITIONAL CONSTANT VOLUME EXHAUST BOXES. CONNECT THE EXHAUST BOX CONTROLLERS TO THE EXISTING LAB CONTROL PANEL. WORK WITH THE BALANCING CONTRACTOR TO DEVELOP FINAL AIR VOLUME. THE LAB PANEL SHALL CONTINUE TO PROVIDE THE REQUIRED AIR FLOW DIFFERENTIAL IN THE SPACE AND INCLUDE THE NEW EXHAUST BOXES IN THE ROOM CALCULATION TO MAINTAIN NEGATIVE SPACE PRESSURE RELATIVE TO ADJACENT CORRIDORS. DECOMMISSION THREE (3) EXISTING HOODS. SEE THE ATTACHED EXISTING LAB CONTROL DIAGRAMS FOR REFERENCE.

PROVIDE ALL HARDWARE, WIRING, SOFTWARE AND PROGRAMMING FOR A FULLY FUNCTIONAL LAB CONTROL SYSTEM.



Control Device		Qty	Product Number	Manufacturer	SD Number	Document Number	Description
Field Mounted Devices							
AE	1-2	2	GMA131.1P	SIEMENS		155 315	3PT SR 24V,62LBIN PLM
AP	1	1	54600020	SIEMENS		155 146	AP331 FHC ACT 8-13 PSI 2 3/8
CBL	1-7	7	537 773	SIEMENS	S600-64	149 245	CABLE, 25FT MODULAR
CBL	8-9	2	588100B	SIEMENS		149 957	6-WIRE 2-RJ11 RS CABLE 50'PLMN
FFM	1-2	2	54600351	SIEMENS	S600-67	149 318	FUME HOOD FLOW MODULE
FHC	1-7	7	54600555	SIEMENS		149 245	FH CNTLRL DAMPR APPL SASH SE
FHET	1-7	7	LGEG815R12BAS	SIEMENS			GENEXH 12 GVFL ENC#3LAB AOPSI0
LGE	1	1	LGSR906R12BAS	SIEMENS			GENEXH 12 SSSL ENCL CVTEC GMA
LGS	1	1	LGSJ820R18ABB0	HART & COOLEY		149 319	SUPSNGL 18 1RRHLRCE #3
LGS	2	1	LGSR916R12ABB0	SIEMENS			SUPSNGL 12 1LRHCV TEC GMA
LRC	1	1	54600360	SIEMENS	S600-67	149 318	LRC - PNEUMATIC ACTUATION
ODP	1-7	7	537 720	SIEMENS	S600-64	149 245	FUME HOOD ODP W/MTG BRACKET KT
PSE	1-14	14	54600488	SIEMENS		149 269	VERT UNI-TRAK TOP ASSY,36"
TEC	1-2	2	540 103	SIEMENS	S600-16	149 177	CONSTANT VOL CTLR ELEC OUT
TTE	1-2	2	540 660A	SIEMENS		149 312	TEC RM SNSR-BEIGE
V							SEE VALVE SUBMITTAL
XFMR ISO 1		1	024-024-040-TF	CORE		12-02-D12	ISOLATION XFMR 24V 40VA 1HUB
XFMR 150-X1-150-X2		2	120-24-100CB-TF				

SEQUENCE OF OPERATION

The max and min values for each VAV device for the occupied mode are indicated on the HVAC plans. All control valves will utilize air flow measurement sensors and all control components will be DDC. Control system will maintain flow requirements to within +/-5% of design CFM.

Total lab exhaust equals measured exhaust at all fume hoods plus constant volume fume hood vented cabinet exhaust plus all constant volume snorkel exhaust devices in lab.

The total supply to the lab equals total measured exhaust in lab minus constant volume make-up air from the adjacent

rooms minus fixed offset (transfer under doors).

Fume hood VAV will modulate to maintain 100FPM average face velocity across the sash opening, as sensed by the sash position sensors. If the face velocity falls below 100FPM average, and/or calculated maximum allowable sash opening is exceeded, then the face velocity monitor will initiate a local alarm. The local alarm mute function will silence the alarm for 15 minutes (adjustable).

Supply air flow will track changes in exhaust air flow to maintain fixed offset via flow tracking for proper room pressurization for each lab unit.

The DDC will modulate the supply air reheat coil control valve to maintain the space temperature set point, as sensed by the room thermostat.

Miscellaneous exhaust devices will be served by constant volume boxes as indicated on the plans.

If the fixed offset between exhaust and supply airflow cannot be maintained, or upon a failure of any device, the control system will initiate a "laboratory control system general fault" alarm at the building management system.

ADJACENT SPACE SEQUENCE

The VAV supply air box will modulate to compensate for supply air system pressure variances, to maintain the fixed constant supply airflow to the space. If the fixed space airflow cannot be maintained, a "low airflow" local alarm will be initiated by the BMS.

The DDC will modulate the supply air reheat coil control valve to maintain the space temperature set point, as sensed by the space temperature sensor.

The adjacent space supply air is transferred and utilized for lab make-up air and will not be included in total calculated air to lab.

Control Priority

A priority structure applies to the above control applications to ensure that safety is maintained as the highest control priority when HVAC systems or individual components cannot meet all demands placed upon the system.

- FUME HOOD CONTROL is the highest control priority.
- ROOM PRESSURIZATION is the second level of priority.
- ROOM TEMPERATURE CONTROL is the third level of priority.

FOR REFERENCE ONLY

Project Location:

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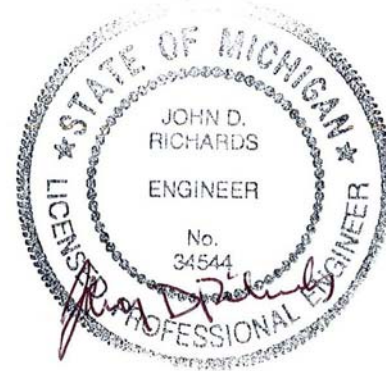
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CHEMISTRY LAB 150

1st Floor

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Controls

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ELECTRICAL DEMOLITION GENERAL NOTES :

- A. DEMOLITION GENERAL NOTES APPLY TO ALL ELECTRICAL DEMOLITION PLANS INCLUDED WITHIN THIS DOCUMENT SET.
- B. COORDINATE ALL DEMOLITION WORK WITH MECHANICAL AND ARCHITECTURAL DEMOLITION PLANS, OWNER'S FACILITY MANAGER, AND ALL TRADE CONTRACTORS PERFORMING DEMOLITION.
- C. THESE DEMOLITION NOTES AND PLAN DO NOT FULLY REPRESENT ALL DEMOLITION WORK REQUIRED TO INSTALL NEW WORK IN ACCORDANCE WITH CONTRACT DOCUMENTS, BUT ARE INTENDED TO SERVE AS GENERAL DEMOLITION GUIDELINES. REFER TO ARCHITECTURAL AND MECHANICAL DRAWINGS FOR LOCATIONS OF INCIDENTAL DEMOLITION WORK NOT INDICATED ON THIS PLAN.
- D. WHERE ITEMS ARE REMOVED, PATCH SURFACES TO MATCH ADJACENT SURFACES OR TO RECEIVE NEW FINISHES WHERE SCHEDULED. PATCHING OF NEW OR EXISTING FINISHES SHALL EXTEND TO NEAREST CORNER OR NATURAL TERMINATION FOR A CONSISTENT, SMOOTH, INVISIBLE TRANSITION FINISHES AT THE END OF CONSTRUCTION.
- E. COORDINATE ANY SERVICE SHUTDOWNS WITH OWNER. A MINIMUM OF 7 DAYS NOTICE IS REQUIRED FOR SERVICE SHUTDOWN.
- F. WHERE DEMOLITION IS SPECIFIED OR INDICATED, REMOVE WORK AS NOTED BELOW AND PATCH SURFACE TO MATCH EXISTING OR NEW FINISH AS APPLICABLE. FIRE STOP ALL PENETRATIONS LEFT IN FLOORS AND FIRE/SMOKE-RATED WALLS. POWER, LIGHTING CONTROLS, BLANK OUTLET BOXES: REMOVE WIRING DEVICE. REMOVE WIRING BACK TO SOURCE OR TO THE NEAREST EXISTING TO REMAIN JUNCTION BOX IF CIRCUIT SERVES EXISTING TO REMAIN ACTIVE LOADS. REMOVE OUTLET BOX – DO NOT PROVIDE BLANK COVERPLATES. ABANDON CONDUIT CONCEALED IN WALLS. CUT OFF CONDUIT WHERE IT EMERGES FROM WALL ABOVE CEILING AND PLUG OR CAP END. REMOVE CONDUIT BACK TO SOURCE WHERE OTHERWISE ACCESSIBLE, INCLUDING ABOVE FINISHED CEILINGS. PLUG OPENINGS IN PANELS AND BOXES FROM REMOVED CONDUIT. REMOVE FLEXIBLE CONDUIT IN WALLS COMPLETELY. TELECOMMUNICATIONS/DATA: IT CONTRACTOR TO DISCONNECT AT SOURCE IN COMMUNICATIONS ROOM AND AT EACH OUTLET. ELECTRICAL CONTRACTOR TO REMOVE CABLE, OUTLET BOX AND CONDUIT AS NOTED FOR POWER AND LIGHTING CONTROLS.
- G. REFER TO DRAWINGS FOR EXISTING BUILDING COMPONENTS TO BE REMOVED, SALVAGED, AND REUSED IN NEW WORK. THE CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS TO BE SALVAGED AND RELOCATED, THROUGHOUT THE CONSTRUCTION PERIOD, INCLUDING SAFE STORAGE OF SAME. UPON DEMOLITION, THE OWNER SHALL RETAIN THOSE ITEMS DEEMED SALVAGEABLE. ITEMS NOT RETAINED SHALL BECOME THE PROPERTY OF THE CONTRACTOR, WHO SHALL LEGALLY DISPOSE OF SAME.

ELECTRICAL GENERAL NOTES :

- A. ELECTRICAL GENERAL NOTES APPLY TO ALL ELECTRICAL SHEETS.
- B. WIRING DEVICE COVERPLATES FOR NORMAL POWER SWITCHES, DIMMERS, RECEPTACLES AND MANUAL MOTOR SWITCHES ARE TO BE BRUSHED STAINLESS STEEL. LABEL WIRING DEVICE COVERPLATES (SWITCHES, RECEPTACLES, DIMMERS) WITH PANEL AND BRANCH CIRCUIT NUMBERS USING WATERPROOF CLEAR PLASTIC LETTERED TAPE AND BLACK MACHINE PRINTED LETTERING. LOCATE LABEL CENTERED ON BOTTOM OF COVERPLATE. FOR WEATHERPROOF APPLICATIONS LOCATE LABEL INSIDE WEATHERPROOF COVER. LABEL MOTORIZED DOOR OPERATORS AND HARDWIRED ELECTRICAL UTILIZATION EQUIPMENT IN THE SAME MANNER AS WIRING DEVICE COVERPLATES. TYPICAL FOR ALL NEW, RELOCATED AND EXISTING TO REMAIN WIRING DEVICE COVERPLATES AND EQUIPMENT WITHIN THE AREA OF WORK. LABEL OUTLET BOX COVERPLATES SERVING FLEXIBLE WHIPS FOR SYSTEMS FURNITURE, EQUIPMENT, AND FOODSERVICE LOADS WITH PANEL AND CIRCUIT NUMBERS SIMILAR TO WIRING DEVICES. LABEL LIGHTING CONTROLS AND RECEPTACLES (FACTORY AND FIELD-INSTALLED) IN SYSTEMS FURNITURE, EQUIPMENT AND POWER POLES WITH PANEL AND CIRCUIT NUMBERS SIMILAR TO WIRING DEVICES.
- C. PROVIDE IDENTIFICATION AND COLOR CODING OF ELECTRICAL EQUIPMENT AND WORK PER OWNER'S STANDARDS.
- D. ALL NECESSARY ELECTRICAL EQUIPMENT REQUIRED FOR THE WORK PROPOSED SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
- E. REMOVE AND REINSTALL CEILINGS AS REQUIRED TO PERFORM WORK.
- F. MOUNTING HEIGHTS TO CENTER UNLESS OTHERWISE NOTED:  
– REFER TO ARCHITECTURAL ELEVATIONS OF ALL AREAS PRIOR TO INSTALLATION OF ELECTRICAL WORK. MOUNT AS INDICATED ON ARCHITECTURAL ELEVATIONS. IF ANY DISCREPANCY EXISTS BETWEEN ELECTRICAL AND ARCHITECTURAL ELEVATIONS. THE ELEVATIONS TAKE PRECEDENCE.  
– RECEPTACLES & VOICE/DATA OUTLETS: 18" AFF UNLESS OTHERWISE NOTED.  
– WALL MOUNTED FIRE ALARM VISIBLE ONLY AND AUDIBLE/VISIBLE COMBINATION DEVICES: MOUNT SUCH THAT ENTIRE LENS IS NOT LESS THAN 80" AFF AND NOT GREATER THAN 96" AFF. MOUNT ALL SIMILAR DEVICES AT THE SAME HEIGHT.  
– WALL MOUNTED FIRE ALARM AUDIBLE ONLY DEVICES: MOUNT SUCH THAT THE TOP OF THE DEVICE IS A MINIMUM OF 90"AFF AND A MINIMUM OF 6" BELOW THE FINISHED CEILING. MOUNT ALL SIMILAR DEVICES AT THE SAME HEIGHT.  
– COORDINATE THE LOCATION OF ALL FIRE ALARM DEVICES IN THE AREA OF WORK OF ANY WORK, AND NOTIFY A/E OF ANY MOUNTING LOCATION DISCREPANCIES PRIOR TO THE INSTALLATION OF ANY FIRE ALARM WORK.  
– SWITCHES AND FIRE ALARM PULL STATIONS: 48" AFF.  
– DISCONNECT SWITCHES AND CIRCUIT BREAKERS: MOUNT SUCH THAT THE CENTER OF THE GRIP OF THE OPERATING HANDLE OF THE SWITCH OR CIRCUIT BREAKER, WHEN IN ITS HIGHEST POSITION, IS NOT MORE THAN 6 FEET 7 INCHES ABOVE FINISHED FLOOR.
- G. UNLESS OTHERWISE NOTED, TYPICAL BRANCH CIRCUIT WIRING IS 3/4"C, 2#12 + 1#12GRD. FOR CIRCUITS UP TO 100 FT. IN LENGTH. PROVIDE #10 WIRE FOR CIRCUITS GREATER THAN 100 FT. IN LENGTH. PROVIDE DEDICATED NEUTRAL CONDUCTORS FOR ALL BRANCH CIRCUITS. PROVIDE RIGID STEEL CONDUIT FOR ALL WORK IN SLAB AND FOR ANY CONDUITS IN CHASES.
- H. CIRCUIT NUMBERS ON PLANS ARE BASED ON FIELD OBSERVATION AND ON THE OWNERS EXISTING DRAWINGS. CIRCUIT TRACE TO VERIFY ALL EXISTING BRANCH CIRCUITS IN AREA OF WORK. INDICATE ACTUAL CIRCUIT TRACED BRANCH CIRCUIT NUMBERS ON AS-BUILT DOCUMENTS FOR EACH CIRCUIT AFFECTED BY WORK (DEMOLITION, NEW AND RELOCATED).
- I. WHERE EXISTING SPARES OR SPACES IN PANELBOARDS ARE INDICATED FOR USE IN THE PROJECT, REMOVE THE PANEL COVERS PRIOR TO INSTALLING ANY CONDUIT AND WIRING RELATED TO THE PANEL AND CONFIRM THAT SPARES ARE AVAILABLE (NO WIRING TO UNLABELED BREAKERS), AND CONFIRM THAT POSITIONS INDICATED AS SPACES CONTAIN BUSSING SUITABLE FOR THE ADDITION OF BREAKERS. SEND PHOTOGRAPHS TO A/E OF ANY CONDITIONS FOUND WHICH ARE NOT CONSISTENT WITH USABLE SPARES AND SPACES.
- J. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO BEGINNING WORK OR SUPPLYING MATERIALS OR COMPONENTS.
- K. PROVIDE FLUSH INSTALLATION OF OUTLET BOXES AND CONCEAL CONDUIT FOR ALL SYSTEMS IN FINISHED AREAS WITH GYP WALL CONSTRUCTION UNLESS OTHERWISE INDICATED. WORK MAY BE EXPOSED IN MECHANICAL AND ELECTRICAL SPACES, AND ON EXISTING TO REMAIN BLOCK WALLS. CUT AND PATCH EXISTING SURFACES AS REQUIRED AND REFINISH TO MATCH FINAL ARCHITECTURAL FINISH OF SPACE, UNLESS OTHERWISE INDICATED, OR PRE-CONSTRUCTION CONDITIONS IF NO OTHER ARCHITECTURAL FINISH WORK IS PERFORMED IN THE AREA. REFER TO ARCHITECTURAL DRAWINGS TO DETERMINE LOCATIONS OF INCIDENTAL ADDITIONAL FINISH WORK ASSOCIATED WITH RESTORATION OF EXISTING FINISHES WHERE ALTERED BY ELECTRICAL WORK. FINISH ANY DAMAGED/ALTERED SURFACES PER ARCHITECT'S DIRECTION.
- L. CONTRACTOR IS TO DETERMINE ROUTING OF ALL CIRCUITS ABOVE FINISHED CEILING AS MEANS AND METHODS. FIELD SURVEY TO DETERMINE ROUTING. PROVIDE CONCEALED ROUTING FOR ALL WORK. REMOVE AND REINSTALL CEILING AS REQUIRED TO PERFORM WORK.
- M. PROVIDE A LOCAL DISCONNECTING MEANS FOR ALL EQUIPMENT AND LOADS WHICH ARE NOT CORD-AND-PLUG CONNECTED.
- N. ALL WIRING IS TO BE PERFORMED BY LICENSED ELECTRICIANS.
- O. EXISTING DEVICES/EQUIPMENT TO REMAIN ARE SHOWN WITH LIGHT LINE WEIGHT, NEW DEVICES/EQUIPMENT ARE SHOWN WITH DARK LINE WEIGHT AND DEVICES/EQUIPMENT SHOWN HATCHED ARE TO BE REMOVED.
- P. MAINTAIN INTEGRITY OF ALL EXISTING FIRE RATED PARTITIONS. REFER TO ARCHITECTURAL DOCUMENTS FOR RATINGS.
- U. INSTALL WORK AND EQUIPMENT AS INDICATED ON DRAWINGS, PER NEC, STANDARDS AND DESIGN GUIDELINES.
- V. MAKE FINAL CONNECTION TO ALL EQUIPMENT INDICATED PER MANUFACTURER'S INSTALLATION INSTRUCTION. COORDINATE LOCATION OF SERVICE TO ALL EQUIPMENT WITH APPROVED SUBMITTALS AND WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS PRIOR TO INSTALLATION.

- W. PROVIDE UL LISTED SYSTEM FOR FIRE STOPPING PENETRATIONS THROUGH FIRE RATED ASSEMBLIES. PROVIDE SYSTEM WITH EQUAL OR GREATER RATING THAN ASSEMBLY. REFER TO ARCHITECTURAL DOCUMENTS FOR RATINGS AND LOCATIONS OF ASSEMBLIES. FIRE STOPPING MUST BE INSTALLED BY CERTIFIED PERSONNEL.
- X. EXISTING CONDUIT SIZES NOTED ARE APPROXIMATE ONLY. CONFIRM ACTUAL DIMENSIONS AND MATCH FOR ANY EXTENSION OF CIRCUITS UNLESS OTHERWISE NOTED.
- Y. PROVIDE ACCESS PANELS WHERE REQUIRED FOR ELECTRICAL WORK. PANELS ARE NOT SHOWN. COORDINATE LOCATION WITH ARCHITECT PRIOR TO INSTALLATION OF PANEL AND RELATED ELECTRICAL WORK.
- Z. AT ALL WORKSTATIONS, COORDINATE LOCATION OF POWER AND TELECOMMUNICATIONS OUTLETS WITH APPROVED WORKSTATION/FURNITURE/MILLWORK SUBMITTALS PRIOR TO INSTALLATION OF BOXES AND RACEWAYS. LOCATE OUTLETS IN ACCESSIBLE KNEESPACE OF WORKSTATIONS UNLESS OTHERWISE NOTED. ALSO AVOID INTERFERENCES WITH FILING CABINETS AND WORKSTATION ACCESSORIES SUCH AS COMPUTER LOCATIONS AS APPLICABLE.
- AA. WHERE "TYPICAL" IS NOTED, THE CONDITION APPLIES FOR ALL ROOMS ALL SHEETS IN THE WORK.
- AB. COORDINATE ALL WORK RELATING TO THE FIRE ALARM SYSTEM WITH FIRE ALARM DESIGNER/INSTALLER.
- AC. SYNCHRONIZE ALL EXISTING TO REMAIN AND NEW FIRE ALARM VISUAL DEVICES. ADD SYNCHRONIZATION MODULES/BOOSTER AS REQUIRED.
- AD. COORDINATE AND ATTEND A COORDINATION MEETING BETWEEN CONTRACTOR TRADES PRIOR TO CONSTRUCTION. REVIEW AND PLAN EQUIPMENT LOCATIONS AND ROUTING OF MECHANICAL AND ELECTRICAL WORK TO AVOID INTERFERENCES AND MAINTAIN WORKING CLEARANCES. OBTAIN INSPECTOR APPROVAL OF PLANNED INSTALLATION LOCATIONS PRIOR TO INSTALLATION. VERIFY THAT CONDENSER LINES, DUCTWORK AND OTHER MECHANICAL ITEMS DO NOT INTERFERE WITH ELECTRICAL WORKING CLEARANCES.

# Wayne State University

5454 Cass Avenue, Detroit, MI 48202

Project Location:

WAYNE STATE UNIVERSITY  
CHEMISTRY BUILDING  
5101 CASS AVENUE  
DETROIT MICHIGAN 48202

CONTACT: ASHLEY FLINTOFF

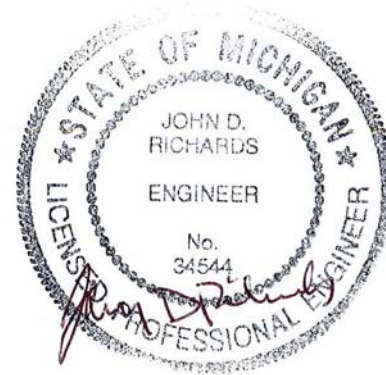


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issue:	date:
OWNER REVIEW	10/20/16
OWNER REVIEW	10/28/16
OWNER REVIEW	11/03/16
BID AND CONSTRUCTION ISSUE	11/23/16



designed by:	TR
drawn by:	TR
coordination checked:	ES
checked:	ES
approved:	ES

project:

CHEMISTRY LAB 150  
1st Floor  
Modification

sheet title:

Electrical General Notes

project number:      sheet number:

007-286023      E001

(1156-7 : iDesign project number)





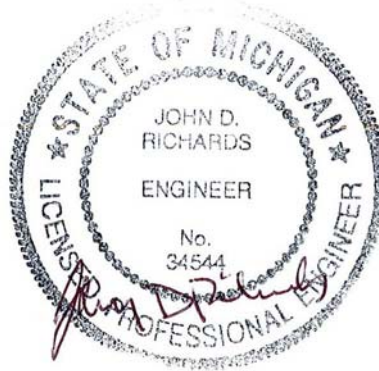
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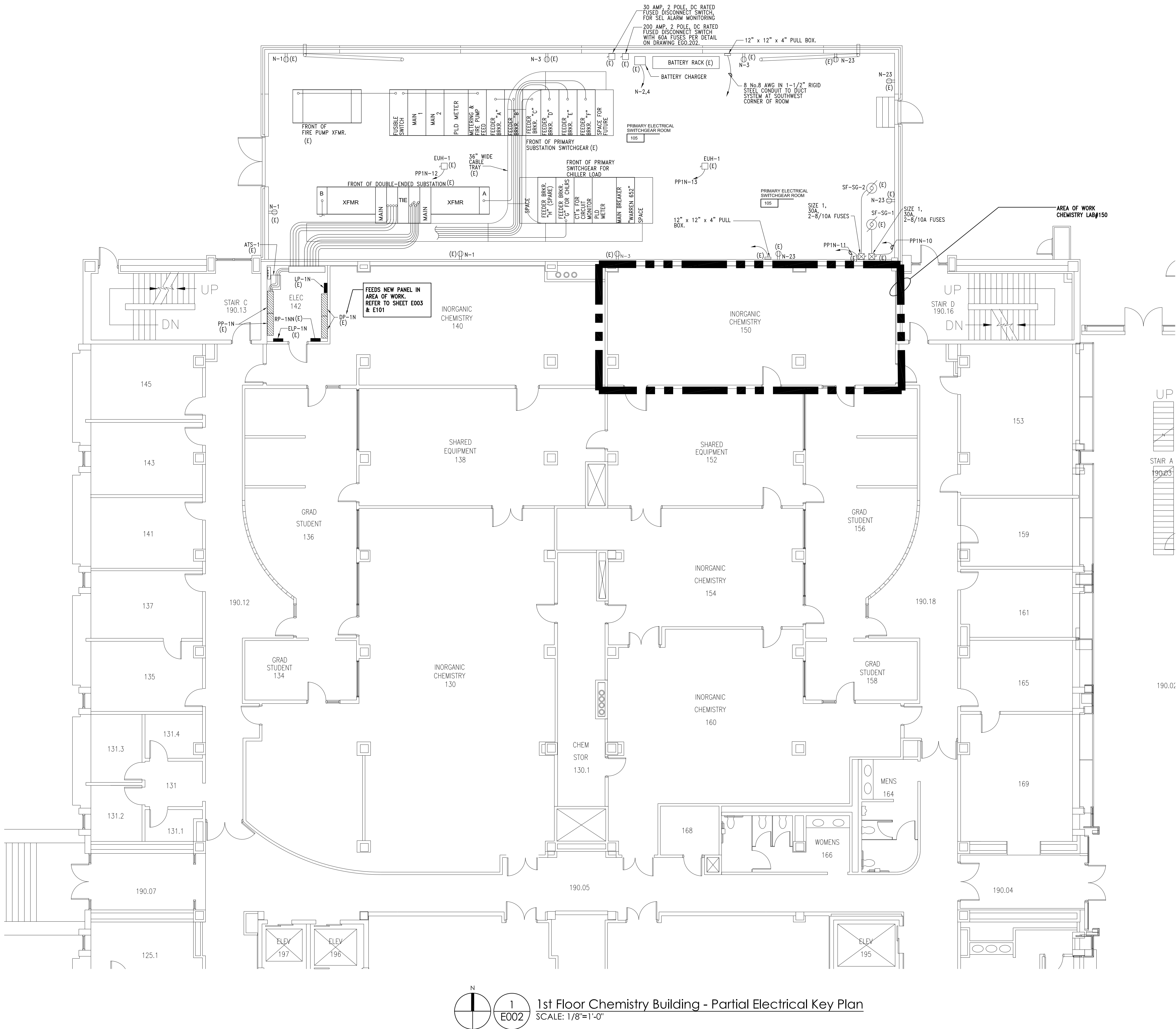


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drawn by:	TR
coordination checked:	ES
checked:	ES
approved:	ES

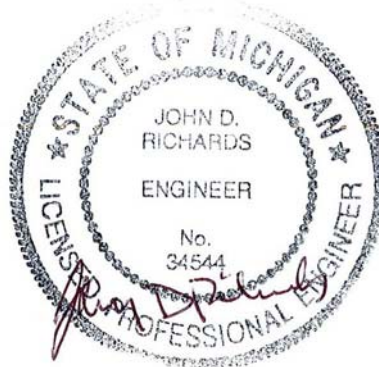
project:  
CHEMISTRY LAB 150  
1st Floor  
Modification

sheet title:  
1st Floor Chemistry Building  
- Electrical Key Plan

project number: 007-286023  
sheet number: E002  
(1156-7 : iDesign project number)



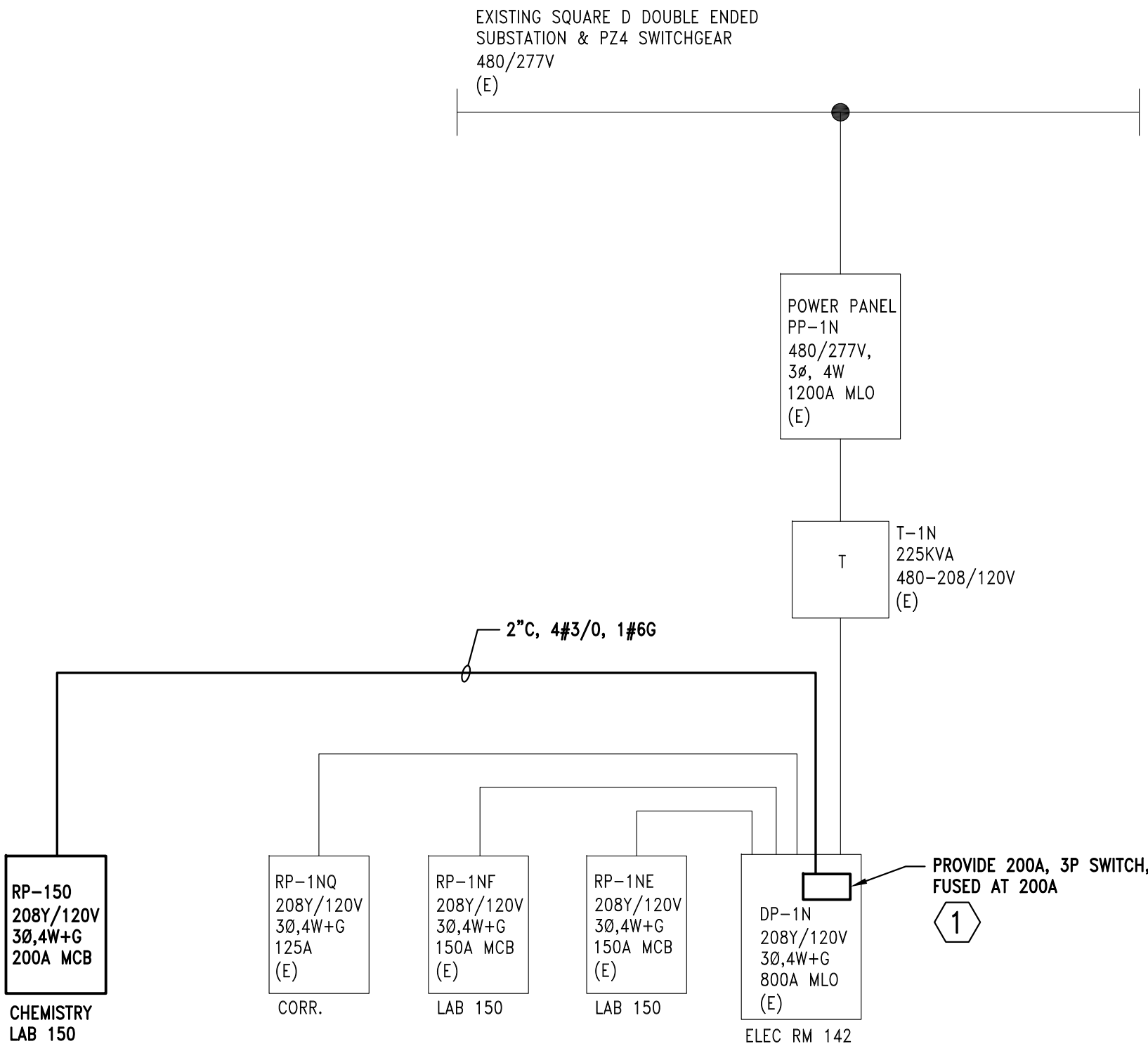




NEW WORK KEY NOTES :

1

WSU ELECTRICIAN CONFIRMED SPACE AVAILABILITY IN DP-1N FOR NEW 200A, 3P FUSED SWITCH. CONTRACTOR TO VERIFY OPEN SPACE AND BUSSING PRIOR TO ORDERING. INCLUDE COST IN BID TO RELOCATE EXISTING 200A SWITCH AND EXTEND EXISTING FEEDER IF REQUIRED TO ADD NEW FUSIBLE SWITCH.



1  
E003 Partial Electrical Riser Diagram  
SCALE: N.T.S

Volt Drop 600

Project Name: WSU Chemistry  
Project Number: 70800  
Designed By:  
Item Name:  
Notes:

Feeder to DP-1N to RP-150  
116 feet  
Target: Limit feeder voltage drop to 2%

AC Calculation for Voltage Percent

Voltage: 208

Load: 180 Amperes

Load Circuit: 3-PH, 4-W, Wye

Power Factor: 0.9

Insulation Temp: 90°C/194°F

Conductor: Copper

Conductors per Phase: 1

Conduit: EMT

Cable Length: 116 Feet

Conductor Gauge: 3/0

Results:

1.47%

3.08 Volts Line-to-Line

1.77 Volts Line-to-Neutral

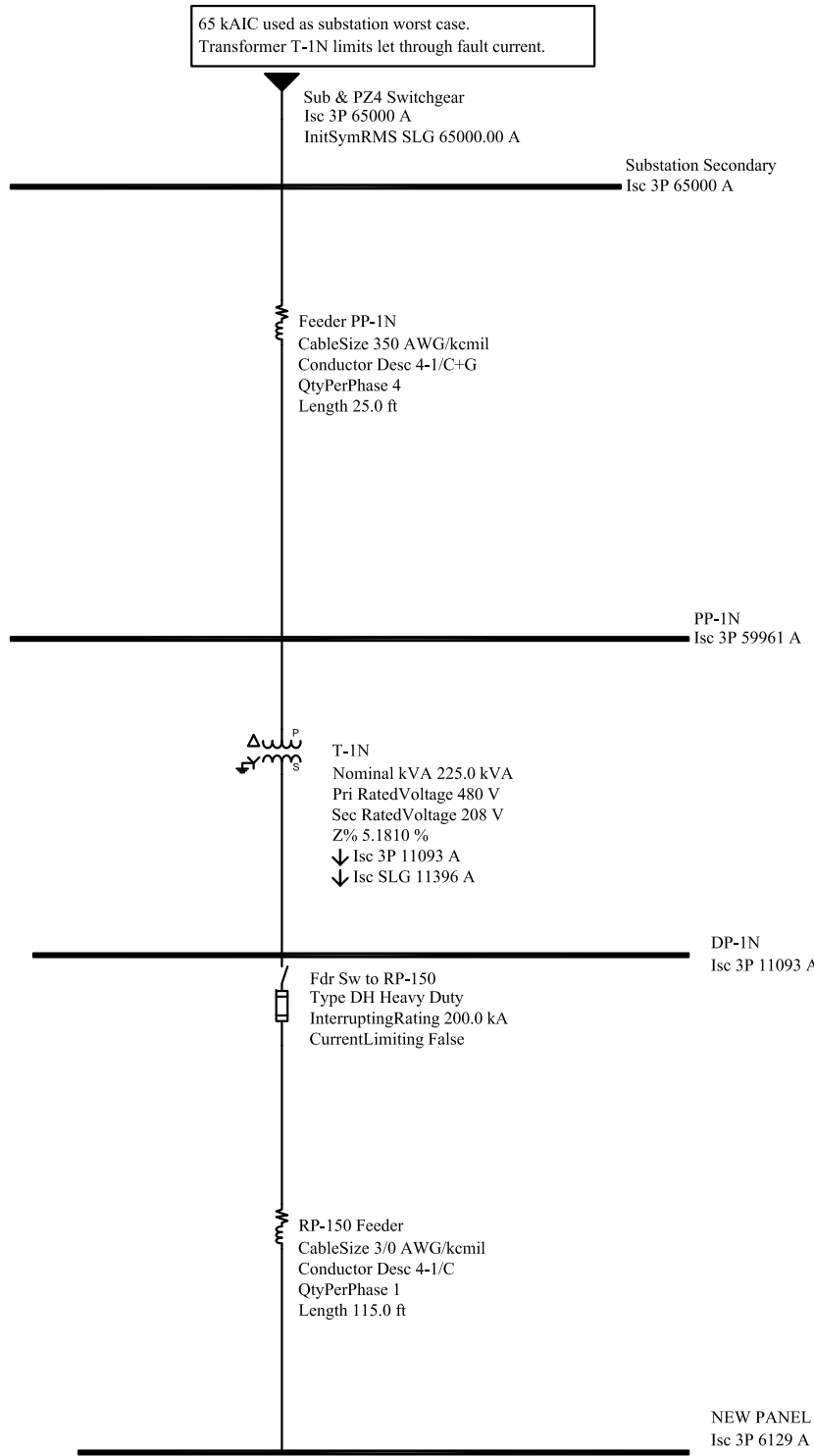
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Date Created: 2/24/2016 1:15:55 PM

Date Modified: 11/22/2016 3:41:32 PM

Source: EDR, Electrical Designer's Reference  
Software Version: 3.0 (Build 1). Based on the 2005 NEC®.  
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2  
E003 RP-150 FEEDER VOLTAGE DROP  
SCALE: N.T.S



3  
E003 RP-150 SHORT CIRCUIT CALCULATION  
SCALE: N.T.S



Project Location:

WAYNE STATE UNIVERSITY  
CHEMISTRY BUILDING  
5101 CASS AVENUE  
DETROIT MICHIGAN 48202

CONTACT: ASHLEY FLINTOFF



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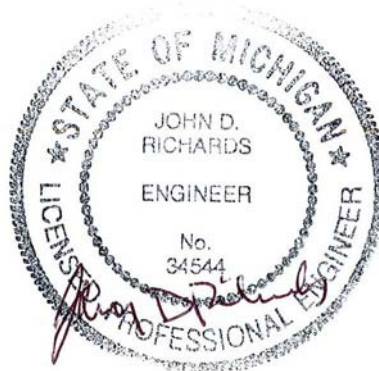
ISSUE: date:

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OWNER REVIEW 10/28/16

OWNER REVIEW 11/03/16

BID AND CONSTRUCTION ISSUE 11/23/16



designed by: TR

drawn by: TR

coordination checked: ES

checked: ES

approved: ES

project:  
CHEMISTRY LAB 150  
1st Floor  
Modification

sheet title:  
Electrical Panel Schedule

project number: sheet number:

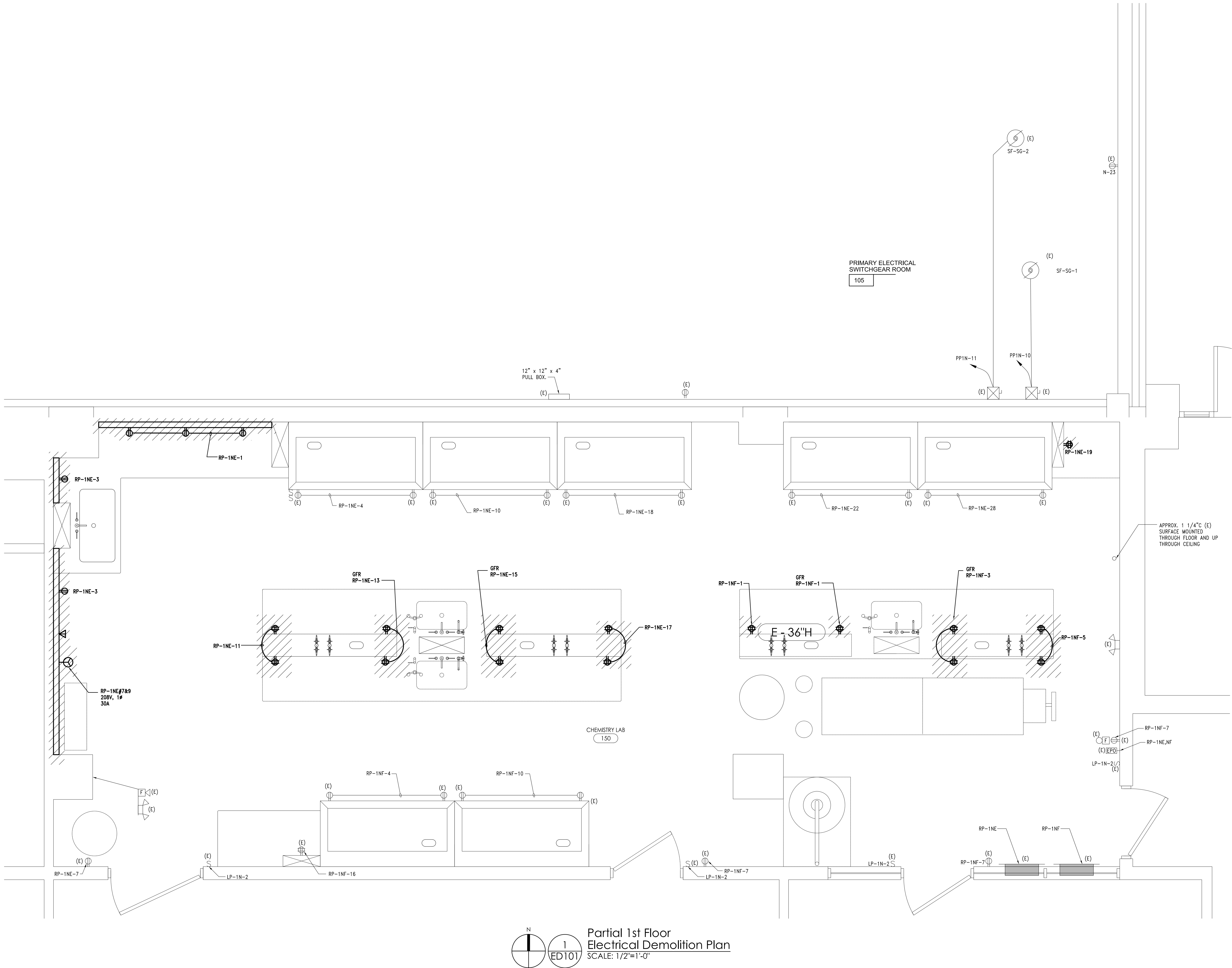
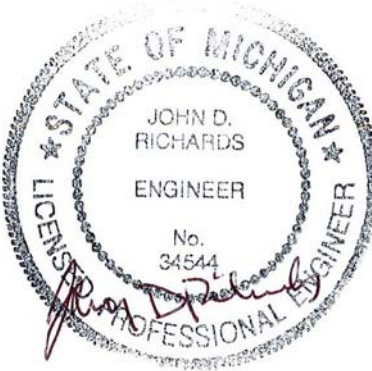
007-286023 E004

(1156-7 : iDesign project number)

PANELBOARD: RP-1NE EXISTING CONDITION										MOUNTING: AS INDICATED			
VOLTAGE: 208Y/120V, 3 PHASE, 4 WIRE + G													
MAIN: 150 A MCB													
LOCATION: LAB 150													
Circ No	Breaker Pole	Trip	Location	Load Information Description	Code	Connected Watts							
						Phase A	Phase B	Phase C					
1	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES		540							
3	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES			360						
5	1	30	LAB 150	EQUIPMENT									
7	2	30	LAB 150	EQUIPMENT									
9	1	30	LAB 150	GENERAL PURPOSE RECEPTACLES				720					
11	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES		720							
13	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES			720						
15	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES				720					
17	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES				720					
19	1	20	LAB 150	EQUIPMENT		900							
21	1	20	SPARE										
23	1	20	SPARE										
25	1	20	SPARE										
27	1	20	SPARE										
29	1	20	SPARE										
31	1	20	SPARE										
33	1	SPACE											
35	1	SPACE											
37	1	SPACE											
39	1	SPACE											
41	1	SPACE											
2	1	20	LAB 150	LTS/ALARM			360						
4	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES				360					
6	1	20	LAB 151	GENERAL PURPOSE RECEPTACLES									
8	1	20	LAB 152	VAC PUMP		1000							
10	1	20	LAB 153	GENERAL PURPOSE RECEPTACLES			360						
12	1	20	LAB 154	VAC PUMP				1000					
14	1	20	LAB 155	GENERAL PURPOSE RECEPTACLES				1000					
16	1	20	LAB 156	VAC PUMP					1000				
18	1	20	LAB 157	GENERAL PURPOSE RECEPTACLES					360				
20	1	20	LAB 158	GENERAL PURPOSE RECEPTACLES					360				
22	1	20	LAB 159	GENERAL PURPOSE RECEPTACLES					360				
24	1	20	LAB 160	GENERAL PURPOSE RECEPTACLES					360				
26	1	20	LAB 161	VAC PUMP		1000							
28	1	20	LAB 162	GENERAL PURPOSE RECEPTACLES			360						
30	1	20	LAB 163	VAC PUMP				1000					
32	1	20	LAB 164	GENERAL PURPOSE RECEPTACLES									
34	1	SPACE											
36	1	SPACE											
38	1	SPACE											
40	1	SPACE											
42	1	SPACE											
CONNECTED KW: 11						Phase Watts: 4,160		3,520	3,800				
CONNECTED AMPS: 32						Phase Watts: 4,160		3,520	3,800				
DEMAND KW: 11						Phase Watts: 4,160		3,520	3,800				
DEMAND AMPS: 32						Phase Watts: 4,160		3,520	3,800				
						27% Loaded							

PANELBOARD: RP-1NF EXISTING CONDITION						MOUNTING: AS INDICATED			
VOLTAGE: 208Y/120V, 3 PHASE, 4 WIRE + G									
MAIN: 150 A MCB									
LOCATION: LAB 150									
Circ	Breaker		Location	Load Information	Code	Connected Watts			
	Pole	Trip		Description		Phase A	Phase B	Phase C	
1	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES		720			
3	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES			720		
5	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES				720	
7	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES		540			
9	1	20	GRAD STUDENT 156	GENERAL PURPOSE RECEPTACLES					
11	1	20	GRAD STUDENT 156	GENERAL PURPOSE RECEPTACLES					
13	1	20	GRAD STUDENT 156	GENERAL PURPOSE RECEPTACLES					
15	1	20	GRAD STUDENT 156	GENERAL PURPOSE RECEPTACLES					
17	1	20	GRAD STUDENT 156	GENERAL PURPOSE RECEPTACLES					
19	1	20	GRAD STUDENT 156	GENERAL PURPOSE RECEPTACLES					
21	1	20	GRAD STUDENT 156	GENERAL PURPOSE RECEPTACLES					
23	1	20	GRAD STUDENT 156	GENERAL PURPOSE RECEPTACLES					
25	1	20	GRAD STUDENT 156	GENERAL PURPOSE RECEPTACLES					
27	1	20	GRAD STUDENT 156	GENERAL PURPOSE RECEPTACLES					
29	1	20	GRAD STUDENT 156	DISPOER					1200
31	1	20	CORRL 103/RM 156	GENERAL PURPOSE RECEPTACLES					
33	1		SPACE						
35	1		SPACE						
37	1	20	SPACE						
39	1		SPACE						
41	1		SPACE						
2	1	20	LAB 150	LTS/ALARM					
4	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES			360		
6	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES					
8	1	20	LAB 150	VAC PUMP		1000			
10	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES			360		
12	1	20	LAB 150	VAC PUMP					1000
14	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES					
16	1	20	LAB 150	GENERAL PURPOSE RECEPTACLES			360		
18	1	20	SPARE						
20	1	20	SPARE						
22	1	20	SPARE						
24	1	20	SPARE						
26	1	20	SPARE						
28	1		SPACE						
30	1		SPACE						
32	1		SPACE						
34	1		SPACE						
36	1		SPACE						
38	1		SPACE						
40	1		SPACE						
42	1		SPACE						
CONNECTED KW: 7									
CONNECTED AMPS: 19						Phase Watts: 2,260		1,800	2,920
DEMAND KW: 7									
DEMAND AMPS: 19						16% Loaded			







5454 Cass Avenue, Detroit, MI 48202

**Project Location:**

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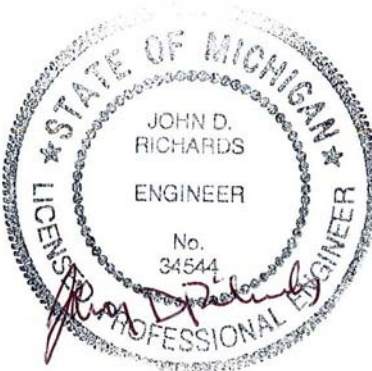
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designed by: TR

drawn by: TR

coordination checked: ES

checked: ES

approved: ES

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project:

CHEMISTRY LAB 150

CHEMISTRY LAB 130

1st Floor

## Modification

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sheet title:

# Partial 1st Floor Electrical

## New Work Plan

1. **THEORY OF THE CASE**

project number:                  sheet number:

007 000000 101

007-286023 E101

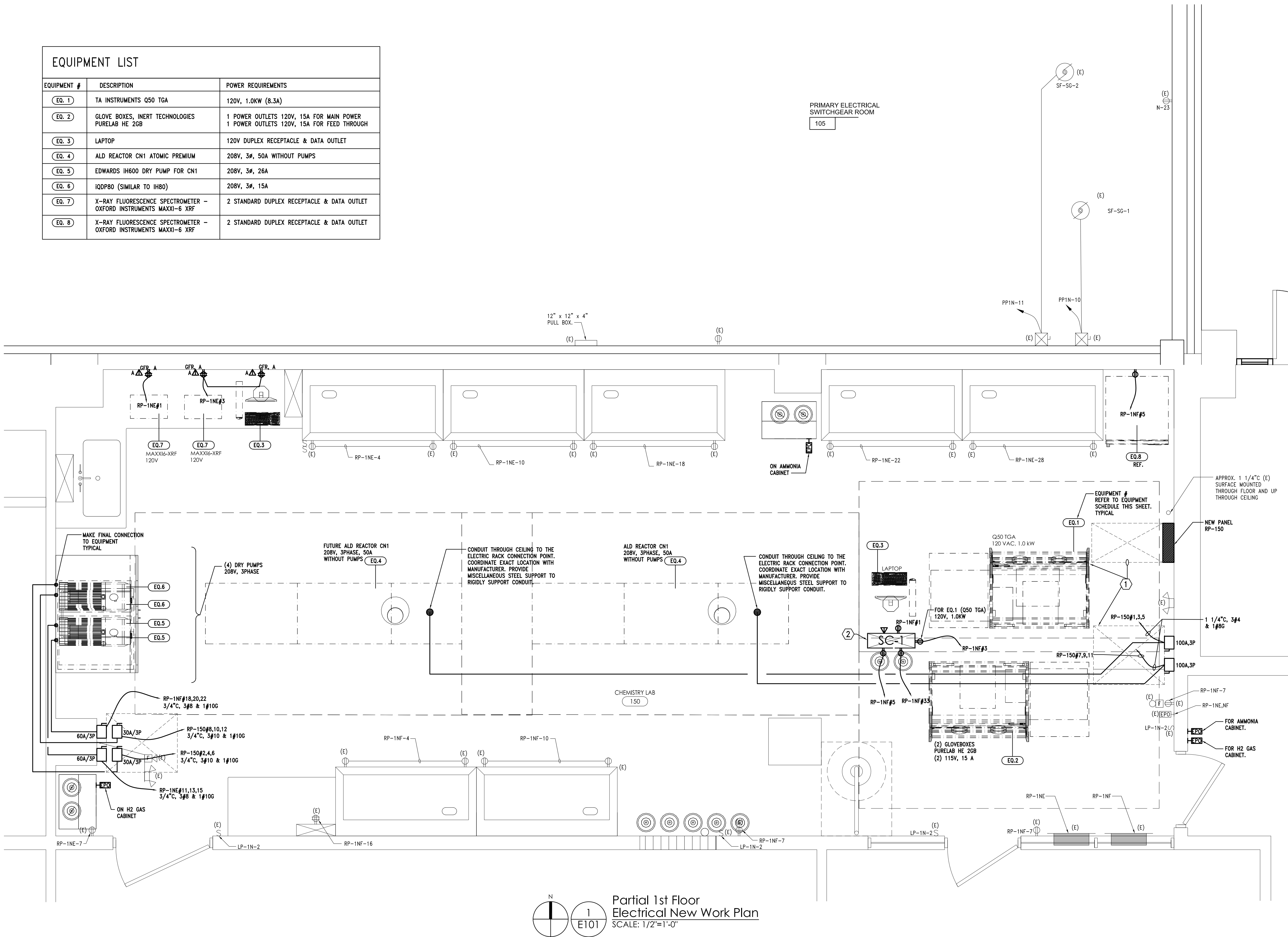
(1156-7 : iDesign project number)

12" x 12" x 4"  
PULL BOX. 

PRIMARY ELECTRICAL SWITCHGEAR ROOM	
105	

### NEW WORK KEY NOTES :

- 1 COORDINATE WITH EQUIPMENT INSTALLER TO MAINTAIN ADEQUATE EQUIPMENT WORKING CLEARANCE.
- 2 MOUNT OUTLETS IN UTILITY SERVICE COLUMN. COORDINATE WITH ARCHITECT/LAB PLANNER FOR RACEWAY ROUTING AND MOUNTING LOCATIONS.



H:\ACAD\FILES\70\70800-WSU Chemistry Lab 150\CAD\ELEC\70800-E-101 ELEC NEW WORK PLAN.dwg Wed, 23 Nov 2016 - 2:14pm







