

# Development Services

## From Concept to Construction

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More Contact Info (<http://www.portlandoregon.gov/bds/article/519984>)



### APPEAL SUMMARY

**Status:** Decision Rendered

**Appeal ID:** 21902

**Project Address:** 10160 N Lombard St #700

**Hearing Date:** 9/25/19

**Appellant Name:** Bob Phillips

**Case No.:** B-002

**Appellant Phone:** 303-886-6184

**Appeal Type:** Building

**Plans Examiner/Inspector:** Alice Johnson, Renay Radtke-Butts

**Project Type:** commercial

**Stories:** 1 **Occupancy:** F-1 **Construction Type:** V-B

**Building/Business Name:**

**Fire Sprinklers:** Yes - throughout

**Appeal Involves:** Alteration of an existing structure

**LUR or Permit Application No.:** 19-193797-CO

**Plan Submitted Option:** pdf [File 1] [File 2] [File 3] [File 4]

**Proposed use:** Factory - Indoor Agricultural

### APPEAL INFORMATION SHEET

#### Appeal item 1

**Code Section**

N5003.2.1, PFC 5003.2.3

**Requires**

Equipment associated with the use, storage or handling of hazardous materials shall be listed or approved.

**Proposed Design**

Extracted material moved beyond the C1D1 environment to not be considered harardous, due to LEL level, therefore Vac Ovens are not required to be listed for a classified environment. Vac Ovens/pumps are vented to the exterior. Refer to attached M sheet with highlighted notation. Vac Oven cut sheet and manual attached for reference.

**Reason for alternative**

Operational procedures developed for the extraction of plant oils require that the material reach a level below 10% LEL rendering them non-hazardous therefore Vac Ovens shall not be required to be listed for hazardous material.

Excerpt from Proprietary SOP's (SOP Attached):

10 - Procedures

10.1. Material removed from the Hydrocarbon Botanical Extraction System (HBES) is laden with flammable solvent that must be de-gassed within the extraction room prior to removal from the room.

10.2. Material will be spread on parchment lined baking sheets and set on racks to dry.

10.3. Material can be removed from the extraction room once the concentration is verified to be below 10% of the LEL using a portable hand-held combustible gas monitor. For Butane, the LEL is 1.6% by volume in air.

10.3.1. Material must not register any butane when the portable gas monitor is held directly above

the center of a tray of materials, the distance between the material and the monitor shall be no more than 2" during the LEL check.

10.3.2. Extracted product is verified to be "dry" before it can be removed from the C1D1 area for transfer to vacuum ovens.

10.3.3. Spent Material is verified to be "dry" before it can be removed from the C1D1 area.

10.4. In the event of a failed test, the material shall continue to be dried until it can pass the test.

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## APPEAL DECISION

**Use of unlisted vacuum ovens: Granted provided the ovens are exhausted to the exterior and provided the degassing procedure occurs before the materials are removed from the extraction room and provided the full degassing procedure is included within the required technical opinion report. Appellant may contact John Butler (503 823-7339) with questions.**

The Administrative Appeal Board finds with the conditions noted, that the information submitted by the appellant demonstrates that the approved modifications or alternate methods are consistent with the intent of the code; do not lessen health, safety, accessibility, life, fire safety or structural requirements; and that special conditions unique to this project make strict application of those code sections impractical.

Pursuant to City Code Chapter 24.10, you may appeal this decision to the Building Code Board of Appeal within 90 calendar days of the date this decision is published. For information on the appeals process, go to [www.portlandoregon.gov/bds/appealsinfo](http://www.portlandoregon.gov/bds/appealsinfo), call (503) 823-7300 or come in to the Development Services Center.



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MECHANICAL EQUIPMENT SCHEDULE - PROCESSING														
QTY	TYPE MARK	DESCRIPTION	MANUFACTURER	MODEL	COOLING	HEATING	CFM	STATIC PRESSURE	VOLTAGE	AMPS	MOP	WEIGHT (LBS)	COMMENTS	
1	AC	AIR COMPRESSOR	SULLAIR	ST1109R			30 CFM		460 V			1288	INCLUDE PERFORMANCE AIR SYSTEM. CONTRACTOR TO VERIFY ELECTRICAL REQUIREMENTS	
2	AH	WALL MOUNT MINI SPLIT AIR HANDLER	Daikin	FTKN18NMVJU	1.5 ton		430 CFM		208 V	13.2 A	20 A	31	CONTRACTOR MAY SELECT COMPARABLE MODEL. SEE NOTE [1]	
1	AH	WALL MOUNT MINI SPLIT AIR HANDLER	Daikin	FTXN12NMVJU	1.0 ton		360 CFM		208 V	8.0 A	15 A	20	CONTRACTOR MAY SELECT COMPARABLE MODEL. SEE NOTE [1]	
1	CHL	PROCESS CHILLER 10L, 25F	MTA	TEAEVO M 10					230 V	13.0 A	15 A	150	ALSO [EQ-2]	
1	CU	WALK-IN FREEZER CONDENSING UNIT	KOLPAK	KPC248LZOP					208 V	19.1 A	25 A	300	FUTURE WALK-IN FREEZER CONDENSING UNIT. CONTRACTOR TO VERIFY WEIGHT. NOT PERMITTED FOR INSTALLATION UNDER THIS PERMIT. A SEPARATE PERMIT IS REQUIRED.	
2	CU	ROOFTOP AC CONDENSING UNIT - MINI SPLIT	Daikin	RKN18NMVJU	1.5 ton				208 V	1.0 A	20 A	82	CONTRACTOR MAY SELECT COMPARABLE MODEL	
1	CU	ROOFTOP HEAT PUMP - MINI SPLIT	Daikin	RXN12NMVJU	1.0 ton				208 V	1.0 A	20 A	57	CONTRACTOR MAY SELECT COMPARABLE MODEL	
2	DH	PACKAGED DEHUMIDIFIER	QUEST	205					208 V			160	SEE NOTE [1]	
1	EEW	EMERGENCY EYE WASH	FENDALL	PURE FLOW 1000 MODEL A									OR SIMILAR BY OWNER	
1	EF	BATHROOM EXHAUST FAN	BY CONTRACTOR	BY CONTRACTOR			100 CFM	0.25 in-wg	115 V					
1	EF	BOOTH EXHAUST FAN	HAL EXTRACTION BOOTHS	BY HAL			1500 CFM	1.50 in-wg	208 V				SUPPLIED BY BOOTH MANUFACTURER - UPGRADE EXHAUST FAN TO 1HP MODEL FROM BOOTH MFGR. SEE NOTE [3]	
1	EF	PROCESSING ROOM EXHAUST FAN	GREENHECK	CUBE-099-3			900 CFM		208 V			107	SPARKPROOF CLASS B, INCLUDE CONTROL DAMPER, ROOF CURB, AND TEFC MOTOR, INTERLOCK WITH MAU-1 AND HAL BOOTH FANS	
1	EF	AIR COMP. ROOM EXHAUST FAN	GREENHECK	G-123-A			1500 CFM	0.50 in-wg	115 V			58	INCLUDE CONTROL DAMPER AND ROOF CURB, SEE NOTE [2]	
1	EXM	HYDROCARBON EXTRACTION SYSTEM	EXTRACTION TEK SOLUTIONS	MINI MEP										
1	FRZ	WALK-IN FREEZER	KOLPAK	KF7-0810-FR					208 V	10.8 A	15 A	1253	ALSO [EQ-10], SEE ARCHITECTURAL PACKAGE. NOT PERMITTED FOR INSTALLATION UNDER THIS PERMIT. A SEPARATE PERMIT IS REQUIRED.	
1	GIH	FILTERED GRAVITY INTAKE HOOD	GREENHECK	FGI-18X18			1500 CFM	0.17 in-wg	115 V			81	INCLUDE CONTROL DAMPER, ROOF CURB, AND FILTERS SEE NOTE [5]	
1	HTR	PROCESS HEATER / CIRCULATOR	JULABO	CORIO CD-8C4					220 V	11.0 A	20 A	20	ALSO [EQ-3], SEE ARCHITECTURAL PACKAGE	
1	MAU	MAKEUP AIR UNIT	GREENHECK	IGX-1104H12-5-E	5.0 ton	120000.0 Btu/h	1700 CFM	0.30 in-wg	208 V	4.0 A	15 A	1677	CONSTANT VOLUME, PROVIDE CONTROL DAMPER, ROOF CURB, MERV 13 FILTERS, INTERLOCK WITH EF-3 AND HAL BOOTH FANS, SEE NOTE [6]	
1	RTU	EXISTING ROOFTOP UNIT	JCI	J12ZJN24R4B5NAA2A1	10.0 ton	240000.0 Btu/h	3800 CFM		460 V			2116	ADJUST ECONOMIZER AS NEEDED TO ACCOMMODATE ADDITIONAL SUPPLY AIR	
1	SF	AIR COMP. ROOM SUPPLY FAN	GREENHECK	AS-14-428-A4			1500 CFM	0.50 in-wg	115 V			78	INCLUDE CONTROL DAMPER AND ROOF CURB, SEE NOTE [2]	
1	SF	BOOTH SUPPLY FAN	HAL EXTRACTION BOOTHS	BY HAL			1500 CFM	1.00 in-wg	208 V				SUPPLIED BY BOOTH MANUFACTURER, SEE NOTE [3]	
1	SVP	EXTRACTION SOLVENT VAPOR PUMP	HASKEL	EXT-420			30 CFM							
1	TK	GAS CYLINDER - N2 - 100#	PROVIDED BY OWNER / SUPPLIER	GAS CYLINDER - N2 - 100LB.										
4	TK	GAS CYLINDER - LPG - 50#	PROVIDED BY OWNER / SUPPLIER	Gas Cylinder - N-BUTANE - 50LB.										
2	TK	GAS CYLINDER - LPG - 120#	PROVIDED BY OWNER / SUPPLIER	Gas Cylinder - N-BUTANE - 120LB.										
6	VO	VACUUM OVEN	CASCADE SCIENCES	TVO-5B					208 V	7.0 A	15 A	250	VENT TO EXTERIOR RE: 2/M6.0 AND PER MFG. DIRECTION - (3) FUTURE	
6	VP	DIAPHRAM VACUUM PUMP	WELCH	67000062					115 V	3.5 A	10 A	40	VENT TO EXTERIOR RE: 2/M6.0 AND PER MFG. DIRECTION - (3) FUTURE	

MECHANICAL EQUIPMENT - SPLIT SYSTEM SCHEDULE														
QTY	TYPE MARK	MARK	DESCRIPTION	MANUFACTURER	MODEL	COOLING	HEATING	CFM	VOLTAGE	AMPS	MOP	PHASE	WEIGHT (LBS)	COMMENTS
1	AH	1	WALL MOUNT MINI SPLIT AIR HANDLER	Daikin	FTKN18NMVJU	1.5 ton		430 CFM	208 V	13.2 A	20 A		31	CONTRACTOR MAY SELECT COMPARABLE MODEL. SEE NOTE [1]
1	AH	2	WALL MOUNT MINI SPLIT AIR HANDLER	Daikin	FTKN18NMVJU	1.5 ton		430 CFM	208 V	13.2 A	20 A		31	CONTRACTOR MAY SELECT COMPARABLE MODEL. SEE NOTE [1]
1	AH	3	WALL MOUNT MINI SPLIT AIR HANDLER	Daikin	FTXN12NMVJU	1.0 ton	11300.0 Btu/h	360 CFM	208 V	8.0 A	15 A		20	CONTRACTOR MAY SELECT COMPARABLE MODEL. SEE NOTE [1]
1	CU	1	ROOFTOP AC CONDENSING UNIT - MINI SPLIT	Daikin	RKN18NMVJU	1.5 ton			208 V	1.0 A	20 A		82	CONTRACTOR MAY SELECT COMPARABLE MODEL
1	CU	2	ROOFTOP AC CONDENSING UNIT - MINI SPLIT	Daikin	RKN18NMVJU	1.5 ton			208 V	1.0 A	20 A		82	CONTRACTOR MAY SELECT COMPARABLE MODEL
1	CU	3	ROOFTOP HEAT PUMP - MINI SPLIT	Daikin	RXN12NMVJU	1.0 ton			208 V	1.0 A	20 A		57	CONTRACTOR MAY SELECT COMPARABLE MODEL

MECHANICAL EQUIPMENT - FAN SCHEDULE														
TYPE MARK	MARK	DESCRIPTION	MANUFACTURER	MODEL	CFM	STATIC PRESSURE	VOLTAGE	AMPS	MOP	WEIGHT (LBS)	COMMENTS			
EF	1	BOOTH EXHAUST FAN	HAL EXTRACTION BOOTHS	BY HAL	1500 CFM	1.50 in-wg	208 V				SUPPLIED BY BOOTH MANUFACTURER - UPGRADE EXHAUST FAN TO 1HP MODEL FROM BOOTH MFGR. SEE NOTE [3]			
EF	2	PROCESSING ROOM EXHAUST FAN	GREENHECK	CUBE-099-3	900 CFM	0.75 in-wg	208 V			107	SPARKPROOF CLASS B, INCLUDE CONTROL DAMPER, ROOF CURB, AND TEFC MOTOR, INTERLOCK WITH MAU-1 AND HAL BOOTH FANS			
EF	3	AIR COMP. ROOM EXHAUST FAN	GREENHECK	G-123-A	1500 CFM	0.50 in-wg	115 V			58	INCLUDE CONTROL DAMPER AND ROOF CURB, SEE NOTE [2]			
EF	4	BATHROOM EXHAUST FAN	BY CONTRACTOR	BY CONTRACTOR	100 CFM	0.25 in-wg	115 V							
SF	1	BOOTH SUPPLY FAN	HAL EXTRACTION BOOTHS	BY HAL	1500 CFM	1.00 in-wg	208 V				SUPPLIED BY BOOTH MANUFACTURER, SEE NOTE [3]			
SF	2	AIR COMP. ROOM SUPPLY FAN	GREENHECK	AS-14-428-A4	1500 CFM	0.50 in-wg	115 V			78	INCLUDE CONTROL DAMPER AND ROOF CURB, SEE NOTE [2]			

AIR TERMINAL SCHEDULE									
TYPE MARK	MARK	DESCRIPTION	MANUFACTURER	MODEL	SIZE	FLOW	STATIC PRESSURE (I)	COMMENTS	
EG	1	EGG CRATE FILTERED EXHAUST GRILLE	PRICE INDUSTRIES	80FF SERIES	10"ø	450 CFM	0.50 in-wg	10"x20" - INCLUDE AEROSTAR SERIES 750 PLEATED CARBON FILTER	
EG	2	EGG CRATE FILTERED EXHAUST GRILLE	PRICE INDUSTRIES	80FF SERIES	10"ø	450 CFM	0.50 in-wg	10"x20" - INCLUDE AEROSTAR SERIES 750 PLEATED CARBON FILTER	
EG	3	EXHAUST GRILLE	PRICE INDUSTRIES	80 Series	12"x12"	1500 CFM	0.50 in-wg	18"x18" DIFFUSER - 12"x12" CONNECTION (OR 12"Ø	
RA	1	RETURN AIR TRANSFER	BY CONTRACTOR	BY CONTRACTOR	6"x6"	50 CFM	0.05 in-wg		
RA	2	RETURN AIR TRANSFER	BY CONTRACTOR	BY CONTRACTOR	6"x6"	50 CFM	0.05 in-wg		
RA	3	RETURN AIR TRANSFER	BY CONTRACTOR	BY CONTRACTOR	10"x6"	120 CFM	0.05 in-wg		
RA	4	RETURN AIR TRANSFER	BY CONTRACTOR	BY CONTRACTOR	10"x6"	100 CFM	0.05 in-wg		
RG	1	FILTERED RETURN AIR GRILLE	EXISTING	24"x24"	270 CFM		0.10 in-wg	EXISTING CARBON FILTERED RETURN AIR TO RTU-2	
RG	2	RETURN AIR GRILLE	PRICE INDUSTRIES	80 Series	10"x6"	270 CFM	0.10 in-wg		
SD	2	SUPPLY DIFFUSER	BY CONTRACTOR	BY CONTRACTOR	6"x6"	100 CFM	0.10 in-wg	IN WALL AIR TERMINAL	
SD	3	SUPPLY DIFFUSER	BY CONTRACTOR	BY CONTRACTOR	6"x6"	50 CFM	0.05 in-wg	IN WALL AIR TERMINAL	
SD	4	SUPPLY DIFFUSER	BY CONTRACTOR	BY CONTRACTOR	6"ø	100 CFM	0.10 in-wg		
SD	5	SUPPLY DIFFUSER	BY CONTRACTOR	BY CONTRACTOR	6"ø	50 CFM	0.05 in-wg		
SD	6	SUPPLY DIFFUSER	BY CONTRACTOR	BY CONTRACTOR	6"ø	120 CFM	0.10 in-wg		
SD	7	SUPPLY DIFFUSER	BY CONTRACTOR	BY CONTRACTOR	10"x4"	140 CFM	0.10 in-wg	ON DUCT AIR TERMINAL	
SD	8	SUPPLY DIFFUSER	BY CONTRACTOR	BY CONTRACTOR	12"x6"	340 CFM	0.10 in-wg	ON DUCT AIR TERMINAL	
SD	9	SUPPLY DIFFUSER	BY CONTRACTOR	BY CONTRACTOR	12"x6"	340 CFM	0.10 in-wg	ON DUCT AIR TERMINAL	
SD	10	SUPPLY DIFFUSER	BY CONTRACTOR	BY CONTRACTOR	12"x6"	340 CFM	0.10 in-wg	ON DUCT AIR TERMINAL	
SD	11	SUPPLY DIFFUSER	BY CONTRACTOR	BY CONTRACTOR	12"x6"	340 CFM	0.10 in-wg	ON DUCT AIR TERMINAL	
SD	12	SUPPLY DIFFUSER	BY CONTRACTOR	BY CONTRACTOR	12"x6"	340 CFM	0.10 in-wg	ON DUCT AIR TERMINAL	
SD	13	SUPPLY DIFFUSER	PRICE INDUSTRIES	150	14"ø	1500 CFM	0.50 in-wg	18"x18" DIFFUSER - 14"Ø CONNECTION	
SD	14	SUPPLY DIFFUSER	PRICE INDUSTRIES	SCD-15	16"ø	750 CFM	0.05 in-wg		
SD	15	SUPPLY DIFFUSER	PRICE INDUSTRIES	SCD-15	16"ø	750 CFM	0.05 in-wg		

SEE NOTE 4 BELOW

DUCT ACCESSORY SCHEDULE							
QTY	TYPE MARK	MARK	DESCRIPTION	MANUFACTURER	MODEL	STATIC PRESSURE (I)	COMMENTS
7	BD		BALANCE DAMPER	GREENHECK	MHDR-50		OR SIMILAR, ADJUST AS REQUIRED TO ACHIEVE AIRFLOW SHOWN ON PLANS
1	CF	1	CARBON FILTER - EXT. BOOTH	CAMFIL	CAMFIL HOUSING FOR CAMSORB CARTRIDGE FILTERS	0.60 in-wg	INCLUDE MAGNAHELIC GAUGE, REPLACE FILTERS WHEN READING EXCEEDS 0.8 IN-WG
1	VC	1	VENT CAP / INTAKE HOOD	GENSCO	BY CONTRACTOR		

STANDBY GENERATOR SCHEDULE						
QTY	TYPE MARK	MARK	DESCRIPTION	MANUFACTURER	MODEL	WEIGHT (LBS)
1	GEN	4	Diesel Standby Generator	Generac	SD010	3226

GENERATOR NOT PERMITTED FOR INSTALLATION UNDER THIS PERMIT. SEPARATE PERMIT REQUIRED. 240V 1PH, PROVIDE AUTOMATIC TRANSFER SWITCH, DEDICATED PANEL PROVIDE FILL TUBE SPILL PROTECTION. ELECTRICAL CONTRACTOR TO VERIFY VOLTAGE AND PHASE REQUIREMENTS FOR CONNECTED EQUIPMENT. VFD's MAY BE REQUIRED.

MECHANICAL EQUIPMENT - PROCESSING LPG TANK SCHEDULE					
TYPE MARK	MARK	DESCRIPTION	MANUFACTURER	MODEL	
TK	1	GAS CYLINDER - LPG - 120#	PROVIDED BY OWNER / SUPPLIER	Gas Cylinder - N-BUTANE - 120LB.	
TK	2	GAS CYLINDER - LPG - 120#	PROVIDED BY OWNER / SUPPLIER	Gas Cylinder - N-BUTANE - 120LB.	
TK	3	GAS CYLINDER - LPG - 50#	PROVIDED BY OWNER / SUPPLIER	Gas Cylinder - N-BUTANE - 50LB.	
TK	4	GAS CYLINDER - LPG - 50#	PROVIDED BY OWNER / SUPPLIER	Gas Cylinder - N-BUTANE - 50LB.	
TK	5	GAS CYLINDER - LPG - 50#	PROVIDED BY OWNER / SUPPLIER	Gas Cylinder - N-BUTANE - 50LB.	
TK	6	GAS CYLINDER - LPG - 50#	PROVIDED BY OWNER / SUPPLIER	Gas Cylinder - N-BUTANE - 50LB.	
TK	7	GAS CYLINDER - N2 - 100#	PROVIDED BY OWNER / SUPPLIER	GAS CYLINDER - N2 - 100LB.	

- NOTES:
- PROVIDE CONDESATE PUMP (SUGGESTED MODEL: LITTLE GIANT VCMA-15 OR SIMILAR). DRAIN TO NEAREST MOP SINK OR OTHER APPROVED DRAIN.
  - PROVIDE ACTIVATION CONTROL SYSTEM FROM THERMOSTAT FOR COMPRESSOR ROOM FANS. VENTILATE SPACE WHEN TEMPERATURE REACHES 85°F.
  - PROVIDE WITH EMERGENCY POWER FED FROM STANDBY GENERATOR.
  - DIFFUSERS MAY BE RE-SPECIFIED BY CONTRACTOR WITH COMPARABLE MODELS, MATCH AIRFLOW AND PRESSURE.
  - PROVIDE WITH EMERGENCY POWER FED FROM STANDBY GENERATOR AND CONTROLS AS NECESSARY FOR FUNCTIONALITY. FGIH-1 CONTROL DAMPER TO ACTUATE OPEN DURING AN LEL ALARM EVENT TRIGGERED BY HAL EXTRACTION BOOTH, OR IN THE EVENT OF A POWER FAILURE.
  - CONNECT INTO BUILDING NATURAL GAS SUPPLY. CONTRACTOR TO VERIFY EQUIPMENT REQUIREMENTS, SIZE GAS SUPPLY LINE AND REGULATOR, AND VERIFY GAS METER CAPACITY IS ADEQUATE FOR ADDITIONAL LOAD.

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PROJECT ABBREVIATION LEGEND	
ABBR.	DESCRIPTION
AC	AIR COMPRESSOR
AH	AIR HANDLER
BD	BALANCE DAMPER
CF	CARBON FILTER
CHL	CHILLER
CU	CONDENSING UNIT
DH	DEHUMIDIFIER
EEW	EMERGENCY EYEWASH
EF	EXHAUST FAN
EG	EXHAUST GRILLE
EXM	EXTRACTION MACHINE
FRZ	FREEZER
GEN	STANDBY GENERATOR
GIH	GRAVITY INTAKE HOOD
HTR	PROCESS HEATER
MAU	MAKEUP AIR UNIT
RA	RETURN AIR TRANSFER
REG	REGULATOR
RG	RETURN AIR GRILLE
RTU	ROOFTOP UNIT
SD	SUPPLY DIFFUSER
SF	SUPPLY FAN
SVP	SOLVENT VAPOR PUMP
TK	PROCESS TANK
VC	VENT CAP
VO	VACUUM OVEN
VP	VACUUM PUMP

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PROJECT NAME

QUALITY PRODUCTS SOLUTIONS

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Job No.: 2019-018

ISSUE DATE: 8/28/19

AUTHOR: Lucas Hill

CHECKED: Checker

DESIGNED: Designer

STATUS

FOR PERMIT SUBMISSION

SHEET TITLE  
MECH  
SCHEDULES

Revisions

NO.	DATE	ITEM
1	8/28/19	CORRECTION NOTICES MECHANICAL, STRUCTURAL, SOURCE CONTROL

SHEET SIZE FOR SCALE APPLICATION IS 24" X 36"



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PROJECT ABBREVIATION LEGEND	
ABBR.	DESCRIPTION
AC	AIR COMPRESSOR
AH	AIR HANDLER
BD	BALANCE DAMPER
CF	CARBON FILTER
CHL	CHILLER
CU	CONDENSING UNIT
DH	DEHUMIDIFIER
EEW	EMERGENCY EYEWASH
EF	EXHAUST FAN
EG	EXHAUST GRILLE
EXM	EXTRACTION MACHINE
FRZ	FREEZER
GEN	STANDBY GENERATOR
GIH	GRAVITY INTAKE HOOD
HTR	PROCESS HEATER
MAU	MAKEUP AIR UNIT
RA	RETURN AIR TRANSFER
REG	REGULATOR
RG	RETURN AIR GRILLE
RTU	ROOFTOP UNIT
SD	SUPPLY DIFFUSER
SF	SUPPLY FAN
SVP	SOLVENT VAPOR PUMP
TK	PROCESS TANK
VC	VENT CAP
VO	VACUUM OVEN
VP	VACUUM PUMP

PIPING SYSTEMS LEGEND	
ABBR.	DESCRIPTION
AIR	COMPRESSED AIR
CHL RTN	CHILLER RETURN
CHL SUPPLY	CHILLER SUPPLY
HTR RTN	HEATER RETURN
HTR SUPPLY	HEATER SUPPLY
N2 GAS	NITROGEN GAS
NG	NATURAL GAS
PRV VENT	PRESSURE RELIEF VALVE VENT
VP VENT	VACUUM PUMP VENT

- 1 REMOVE AND SEAL ALL EXISTING SUPPLY VENTILATION TO PROCESSING ROOM FROM RTU-1. NEW RTU-1 DUCTING TO REMAIN OUTSIDE NEW 1HR FIRE ENVELOPE FOR CONTROL AREA-1.
- 2 DUCTING PENETRATION THROUGH MASONRY WALL MUST REMAIN ABOVE EXIT CORRIDOR IN ORDER TO MAINTAIN THE FIRE RATED ENVELOPE. ALTERNATIVELY INSTALL FIRE DAMPERS AS REQUIRED.

NO.	NARRATIVE
DU1	DUCT JOINTS, SEAMS, & CONNECTIONS (IMC 603.9). METALLIC & NONMETALLIC DUCTS SHALL BE CONSTRUCTED AS SPECIFIED IN SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE AND NAIMA FIBROUS GLASS DUCT CONSTRUCTION STANDARDS. DUCTWORK SHALL BE SECURELY FASTENED AND SEALED WITH WELDS, GASKET, MASTICS, ADHESIVES, MASTIC-PLUS-EMBEDDED FABRIC SYSTEMS, LIQUID SEALANT OR TAPES.
DU2	DUCT SHALL BE SUPPORTED (603.10) AT INTERVALS NOT TO EXCEED 12 FEET AND SHALL BE IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE. FLEXIBLE AND OTHER FACTORY MADE DUCTS SHALL BE SUPPORTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
H5	ANY EQUIPMENT THAT IS SUBSTITUTED SHALL FIT IN THE SPACE PROVIDED WITH ADEQUATE ROOM FOR SERVICING, INCLUDING SUBSTITUTE EQUIPMENT NAMED IN THE SPECIFICATIONS. CONTRACTOR SHALL SUBMIT A 1/4" SCALE DRAWING OF ALL EQUIPMENT SUBSTITUTED FOR APPROVAL PRIOR TO INSTALLATION, INCLUDING BUT NOT LIMITED TO STRUCTURAL AND ARCHITECTURAL IMPACT CLEARANCE REQUIREMENTS AND UTILITY REQUIREMENTS.

NO.	NARRATIVE
H12	ALL BRANCH DUCTS FEEDING INDIVIDUAL DIFFUSERS SHALL HAVE BALANCE DAMPERS AT THE TAKEOFF POINT. DIFFUSERS SHALL HAVE OPPOSED BLADE DAMPER AT AIRFLOW DEVICE AT AREAS WHERE THE CEILING IS INACCESSIBLE.
H27	UPC INDIRECT WASTES CHAPTER 8: 814.1 CONDENSATE DISPOSAL. CONDENSATE FROM AIR WASHERS, AIR-COILS, CONDENSING APPLIANCES, AND THE OVERFLOW FROM EVAPORATIVE COOLERS AND SIMILAR WATER-SUPPLIED EQUIPMENT OR SIMILAR AIR-CONDITIONING EQUIPMENT SHALL BE COLLECTED AND DISCHARGED TO AN APPROVED PLUMBING FIXTURE OR DISPOSAL AREA. WHERE DISCHARGED INTO THE DRAINAGE SYSTEM, EQUIPMENT SHALL DRAIN BY MEANS OF AN INDIRECT WASTE PIPE. THE WASTE PIPE SHALL HAVE A SLOPE OF NOT LESS THAN 1/8 INCH PER FOOT OR 1 PERCENT SLOPE AND SHALL BE OF APPROVED CORROSION-RESISTANT MATERIAL NOT SMALLER THAN THE OUTLET SIZE OF IN ACCORDANCE WITH SECTION 814.3 OR SECTION 814.4 FOR AIR COOLING COILS OR CONDENSING APPLIANCES, RESPECTIVELY. CONDENSATE OR WASTEWATER SHALL NOT DRAIN OVER A PUBLIC WAY.
M8	UNDERCUT RESTROOM AND OFFICE DOORS A MINIMUM OF 3/4" FOR TRANSFER AIR.
M17	NFPA 91 CHAPTER 6 AIR-MOVING DEVICES 6.2 FLAMMABLE OR COMBUSTIBLE MATERIALS. WHERE FLAMMABLE OR COMBUSTIBLE MATERIALS ARE CONVEYED AT CONCENTRATIONS GREATER THAN 1 PERCENT OF THE LFL, THE ROTATING ELEMENT OF THE AIR-MOVING DEVICE SHALL BE NONFERROUS. OR THE AIR-MOVING DEVICES SHALL BE CONSTRUCTED SOT THAT A SHIFT OR THE ROTATING ELEMENT OR SHAFT DOES NOT PERMIT TWO FERROUS PARTS TO RUB OR STRIKE.
M18	NFPA 91 CHAPTER 8 IGNITION SOURCES 8.1 ELECTRICAL EQUIPMENT. ALL ELECTRICAL EQUIPMENT AND INSTALLATIONS SHALL COMPLY WITH THE REQUIREMENTS OF NFPA 70.
OREN-1	SUPPLY AND RETURN DUCTS SHALL BE INSULATED WITH A MINIMUM OF R-5 INSULATION WHEN LOCATED IN UNCONDITIONED SPACES AND A MINIMUM OF R-8 INSULATION WHEN LOCATED OUTSIDE THE BUILDING PER OESC SECTION 503.2.7

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Job No.: 2019-018

ISSUE DATE: 8/28/19

AUTHOR: Lucas Hill

CHECKED: Checker

DESIGNED: Designer

STATUS

FOR PERMIT SUBMISSION

SHEET TITLE  
MECH FLOOR PLAN

Revisions

NO.	DATE	ITEM
1	8/28/19	CORRECTION NOTICES MECHANICAL, STRUCTURAL, SOURCE CONTROL

M 4.0

1 MECH LEVEL 1 FLOOR PLAN  
1/4" = 1'-0"

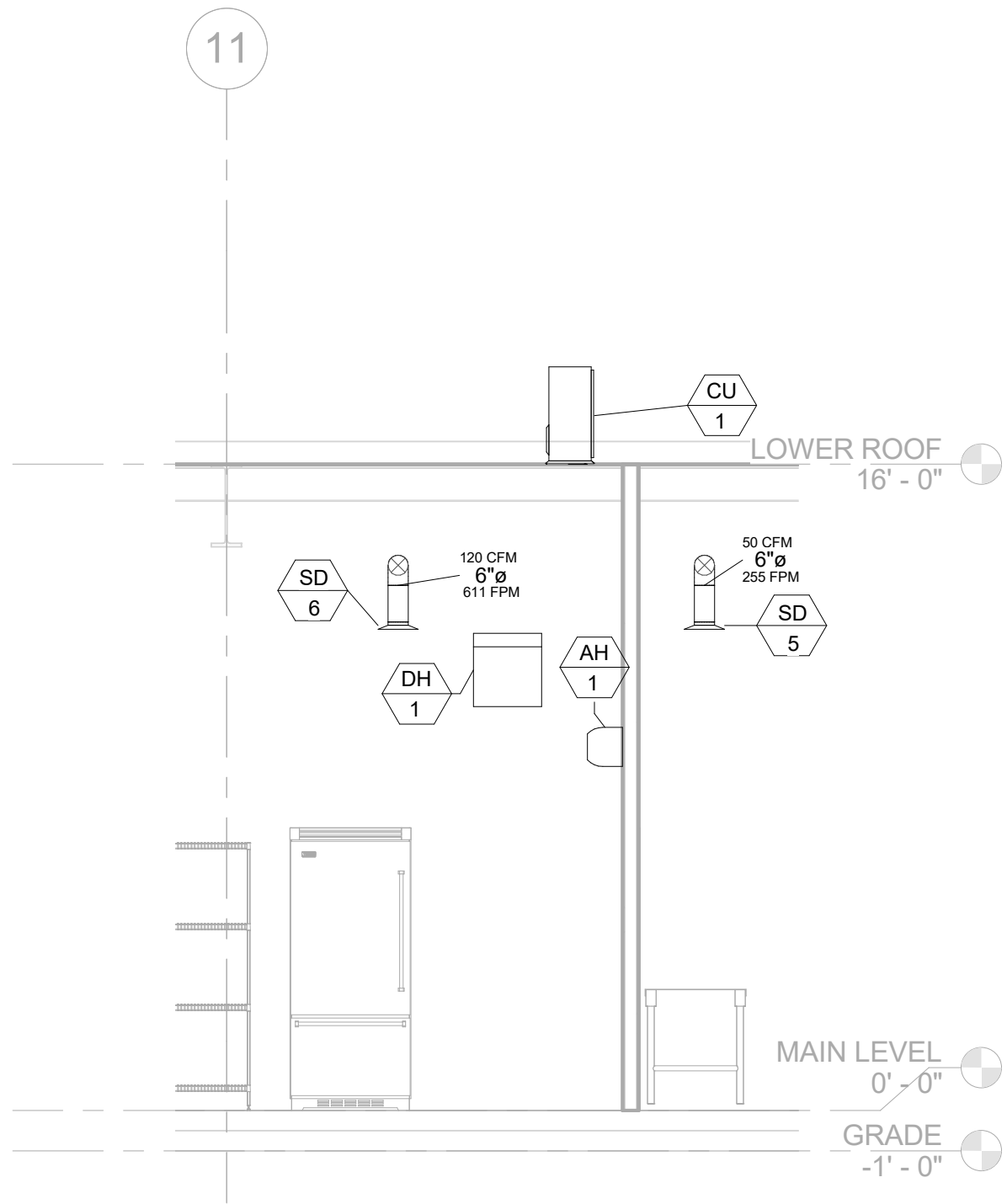
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SHEET SIZE FOR SCALE APPLICATION IS 24" X 36"

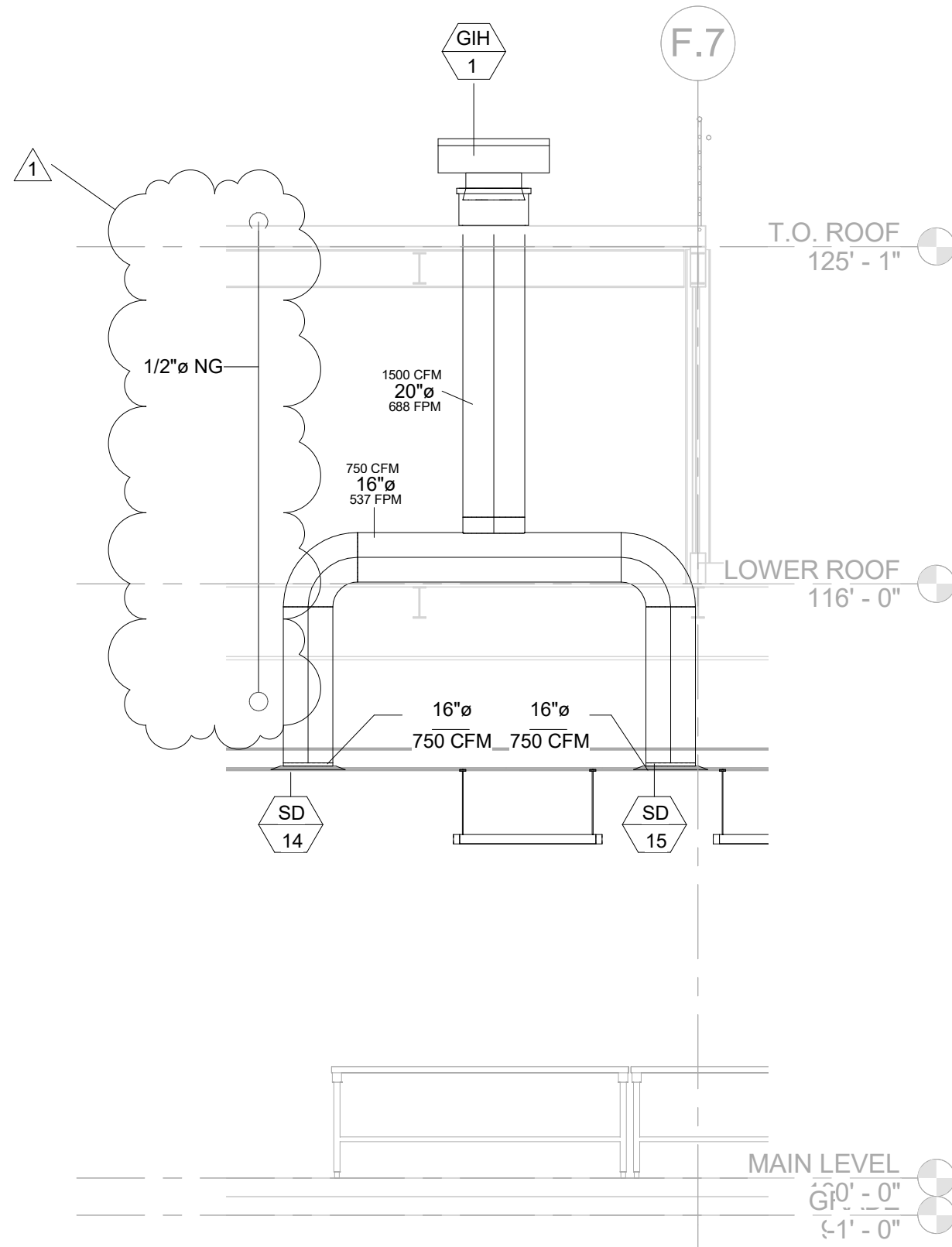


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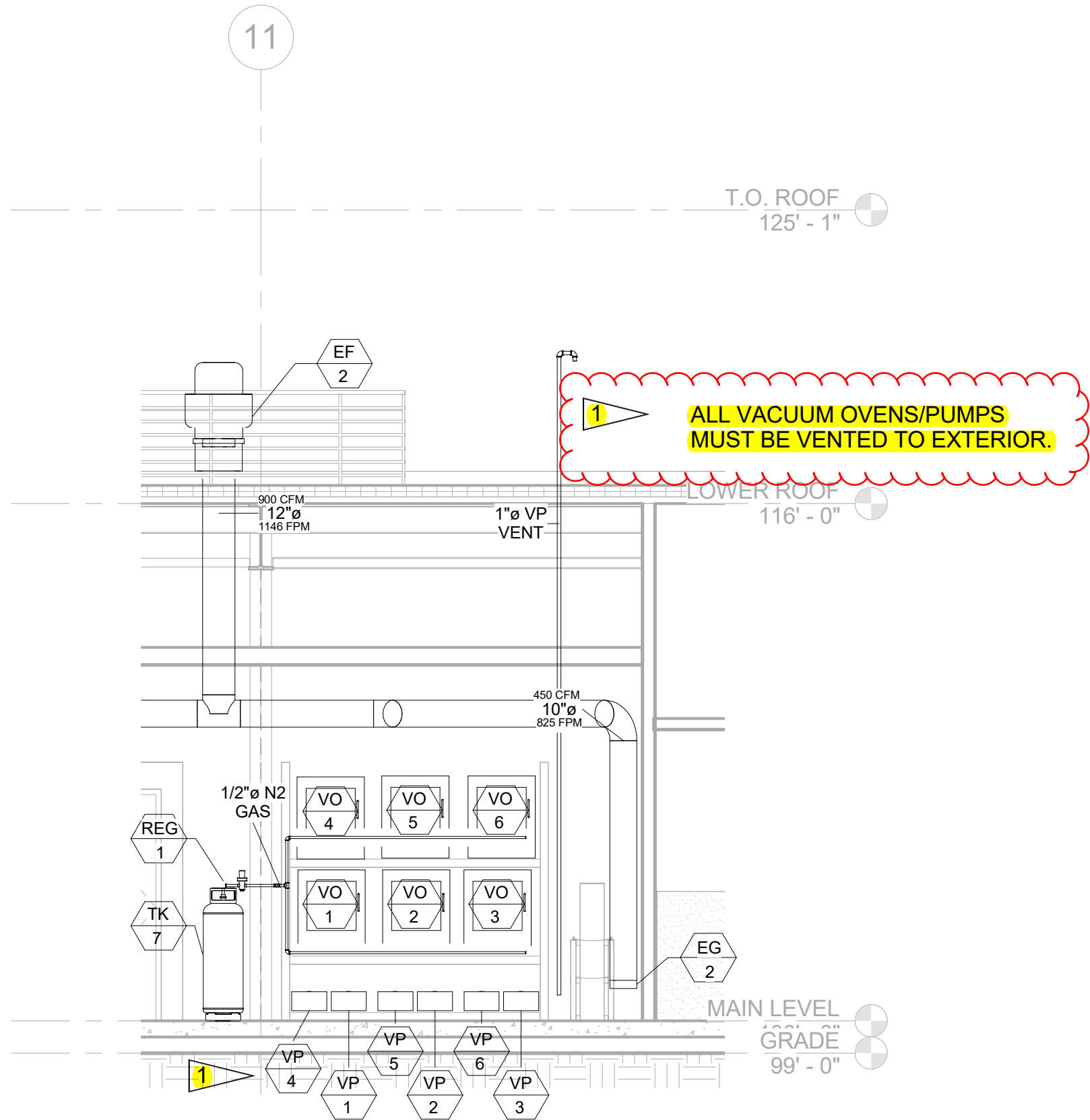
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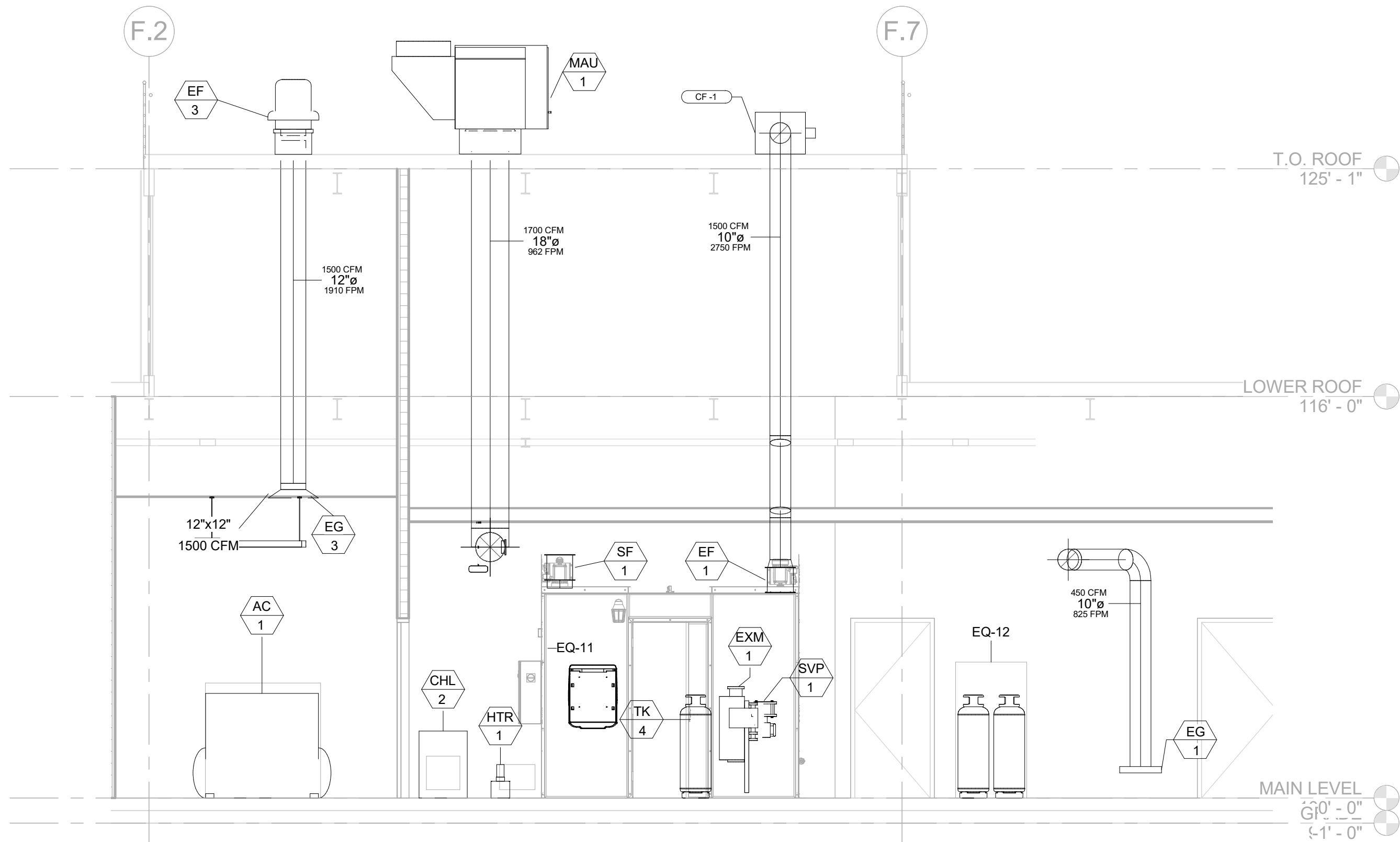
1 MECH ELEVATION VAULT EQUIPMENT  
1/4" = 1'-0"



4 MECH ELEVATION GRAVITY INTAKE  
HOOD SUPPLY DUCTING  
1/4" = 1'-0"



2 MECH ELEVATION VACUUM OVENS  
1/4" = 1'-0"



3 MECH ELEVATION EXTRACTION BOOTH  
DUCTING  
1/4" = 1'-0"

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## SHEET TITLE MECH ELEVATIONS

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1	8/28/19	CORRECTION NOTICES MECHANICAL, STRUCTURAL, SOURCE CONTROL

SHEET SIZE FOR SCALE  
APPLICATION IS 24" X 36"

M 6.0

# VACUUM OVENS



- OPTIMIZED PURGING, DRYING OF SENSITIVE MATERIAL
- PROFESSIONAL GRADE
- MADE IN USA
- NRTL CERTIFIED

Cascade's vacuum ovens offer incredible temperature stability for vacuum drying or purging of pharmaceuticals, botanicals, slurries, or any temperature sensitive material.

## FEATURES

Temperature probe INSIDE oven for accurate readings

Full KF-25 port available for reduced purge times

Bright LED lights & large tempered safety glass viewing window

Microprocessor Control

Digital Vacuum Gauge

Solvent resistant BUNA-N door gasket

Top-quality, easy turn valves by Swagelok®

## NRTL CERTIFICATION

CAN/CSA-C22.2 No. 61010-1:2012

ULPD No. 1:2015-04 E-ULPD No. 2:2016-04

CAN/CSA-C22.2 No. 61010-2-010:2015

UL 61010-1:2012/R:2016-04

UL 61010-2-010:2015

EN 61010-1:2010

EN 61010-2-010:2014



Made in USA



MODEL TVO-2B



MODEL TVO-5B



MODEL CVO-10



## WANT TO LEARN MORE?

503.847.9047

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# VACUUM OVENS



## NRTL CERTIFICATION

CAN/CSA-C22.2 No. 61010-1:2012  
+ UPD No. 1:2015-07 + UPD No. 2:2016-04

CAN/CSA-C22.2 No. 61010-2-010:2015

UL 61010-1:2012/R:2016-04

UL 61010-2-010:2015

EN 61010-1:2010

EN 61010-2-010:2014



MODEL TVO-2B



MODEL TVO-5B



MODEL CVO-10

## CAPACITY

Volume:	Benchtop	Benchtop	Freestanding
Interior:	1.7 Cubic Ft	4.5 Cubic Ft	9.3 Cubic Ft
Exterior:	12"W x 20"D x 12"H	18.25" W x 24" D x 18.25" H	28"W x 24"H x 24"D
	18.75"W x 26.5" D x 24.5"H	25" W x 30.5" D x 30.5" H	42.3"W x 43"D x 42.3"H
			67.6"H with stand

## SHELVING

	5 Each. Flexible Config 1" High, 2" High and 3" High	5 Each. Adjustable 8 Max	9 Each. Fixed. Removable 9 Max
Surface Area:	12"W x 19.5"D	18"W x 24"D	28"W x 24"D
Weight Capacity:	50 lbs	50 lbs	50 lbs

## TEMPERATURE

Stability:	± 0.4° @105°F	± 0.4° @105°F	± 0.4° @105°F
Uniformity:	+1.5° @ 105°F	+1.5° @ 105°F	+1.5° @ 105°F

## CONNECTIONS

Vacuum:	3/8" barb	3/8" barb	KF-25, 1" Lines, 1" Valve
Vent:	1/4" barb	1/4" barb	1/2" barb
KF-25 Port:	YES (1" Dia)	YES (1" Dia)	YES (1" Dia)

## FACILITIES

Power:	120V / 1ph / 9 FLA	120V / 1ph / 14 FLA	220-240V / 1ph / 10 FLA
Options:	208V - 220V / 1ph / 4.5 AMP	208V - 220V / 1ph / 7FLA	Will Run on 208V Service
Standard Cord:	110 - 120V NEMA 5-15 international options	110 - 120V NEMA 5-15 international options	NEMA 6-15R 220 - 240V international options

## WEIGHT

	145 lbs	249 lbs	663 lbs
Shipping:	180 lbs	449 lbs	775 lbs



**WANT TO LEARN MORE?**

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Confidential Information

# **Standard Operation Procedure Off-Gassing Material**

## **Document Number [####]**



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## 1. Purpose

The purpose of this SOP is to provide instruction on how to properly off-gas or boil off all of the butane from material removed from the HBES before removing the material from the extraction room.

## 2. Scope

This document is applicable to laboratory operations.

## 3. Terminology

This section should include abbreviations, definitions, acronyms, key words, or other special terms contained within the procedure.

Term	Definition
HBES	Hydrocarbon Botanical Extraction System
PPE	Personal Protective Equipment
SOP	Standard Operating Procedure
LEL	Lower Explosive Limit; the minimum concentration of a specific gas or vapor molecule needed to support its combustion in air
C1D1	Class 1 Division 1 Explosion Proof Area Hazardous Area Classification

## 4. Safety

PPE required includes the following:

Flame Resistant long-sleeved shirts and jeans or pants.

Latex/Nitrile disposable gloves

Closed-toe shoes that are chemical resistant and have non-skid soles

Safety glasses with side shields

Goggles (where there is a potential for splashing liquids)

## 5. Equipment

Personal or handheld gas detector (Butane).

Baking sheet pans

Baking racks, or similar racks that allow for airflow over and under sheet pans



## 6. Materials

Butane

Parchment paper

## 7. Chain of Custody

Not applicable to this procedure.

## 8. Record Keeping

Results of tests shall be documented. Test information shall include the following

- Date and time of test
- Operator
- Make, Model, and Serial Number of the detector used to test
- Result of test (Pass/Fail)

## 9. Equipment Set-Up

Gas detector to be used shall have passed bump test that day, per the Bump Test SOP, prior to use.

## 10. Procedure

- 10.1. Material removed from the HBES is laden with flammable solvent that must be de-gassed within the extraction room prior to removal from the room.
- 10.2. Material will be spread on parchment lined baking sheets and set on racks to dry.
- 10.3. Material can be removed from the extraction room once the concentration is verified to be below 10% of the LEL using a portable hand-held combustible gas monitor. For Butane, the LEL is 1.6% by volume in air.
  - 10.3.1. Material must not register any butane when the portable gas monitor is held directly above the center of a tray of materials, the distance between the material and the monitor shall be no more than 2" during the LEL check.
  - 10.3.2. Extracted product is verified to be "dry" before it can be removed from the C1D1 area for transfer to vacuum ovens.
  - 10.3.3. Spent Material is verified to be "dry" before it can be removed from the C1D1 area.
- 10.4. In the event of a failed test, the material shall continue to be dried until it can pass the test.
- 10.5. Once all material has been completely off-gassed and removed from the C1D1 extraction room, the HBES can be loaded for a new cycle.

## 11. Waste Handling

Spent waste shall be handled according to the Lab Waste Handling Procedure.

## 12. Calculations

Not applicable to this procedure.

## 13. References

Bump Test SOP

Lab Waste Handling SOP

## 14. Appendices

Not applicable to this procedure.