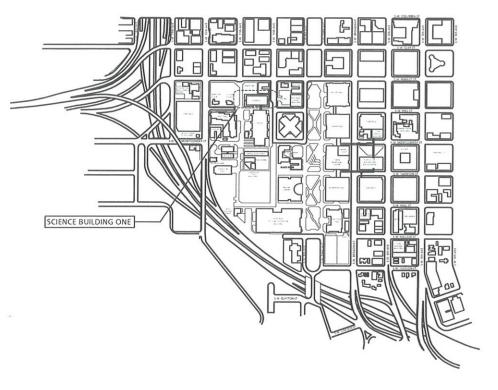
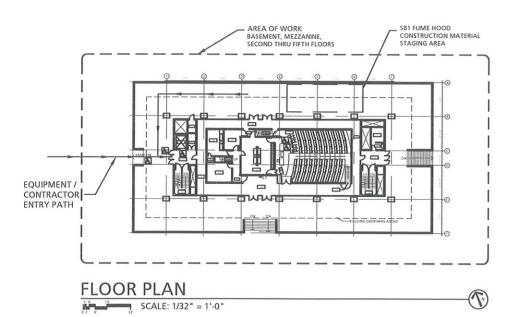
# PSU - Science Building One 2011 SB1 EDA - Fume Hood Replacement



VICINITY MAP





# LEGAL DESCRIPTION

PORTLAND ADDITION, BLOCK 242 TAX LOT R667726740, R667726760, R667726780 1025 SW MILL STREET PORTLAND, OREGON 97201

# **CODE INFORMATION**

OCCUPANCY TYPE A3
BUILDING CONSTRUCTION TYPE - EXISTING

### MECHANICAL SYMBOLS

	GENERAL EXHAUST AIR
	FUME EXHAUST / LAB EXHAUST AIR
	DEMOLISH EXISTING
	EXISTING COLD DUCT SUPPLY AIR (CSA)
	EXISTING HOT DUCT SUPPLY AIR (HSA)
$\Box$ / $\Box$	EXISTING / NEW
	CONNECT TO EXISTING /

# DRAWING INDEX

M0.1	COVER SHEET, LEGENDS, ABBREVIATIONS, SCHEDULES AND NOTES
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M2.1	SECOND FLOOR PLAN - MECHANICAL
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M2.5	FIFTH FLOOR PLAN - MECHANICAL

### **ABBREVIATIONS**

	ADDITEVI	ATIONS	_
AF	AIRFOIL	ID	INSIDE(DIAMETER/DIMENSION)
AFF	ABOVE FINISHED FLOOR	IE	INVERT ELEVATION
AHP	APPARATUS HOUSING PLENUM	IN	INCH(ES)
ALT	ALTERNATIVE	INSUL	INSULATION
AL	ALUMINUM	ISOL	ISOLAT(OR)(ION)
APD	AIR PRESSURE DROP	KW	KILOWATT
APPROX	APPROXIMATELY ARCHITECT(URAL)	KWH	KILOWATT HOUR
AUTO	AUTOMATIC	L	LENGTH LEAVING AIR TEMP
BDD	BACKDRAFT DAMPER	LB	POUND
BI	BACKWARD INCLINED	LDB	LEAVING DRY BULB
BLDG	BUILDING	LEA	LABORATORY EXHAUST AIR
BSMT	BASEMENT	LF	LINEAR FEET
BTU	BRITISH THERMAL UNIT	LFT	LEAVING FLUID TEMPERATURE
втин	BRITISH THERMAL UNITS PER HOUR	LVG	LEAVING
CFH	CUBIC FEET PER HOUR	LWB	LEAVING WET BULB
CFM	CUBIC FEET PER MINUTE	LWT	LEAVING WATER TEMPERATURE
CFS	CUBIC FEET PER SECOND	MAX	MAXIMUM
CONC	CEILING OR COOLING CONCRETE	MBH	THOUSAND BTU PER HOUR MECHANICAL
CONN	CONNECT(ION)	MFR	MANUFACTURER
CONT	CONTINUE(ED)(UATION)	MIN	MINIMUM
CL	CENTERLINE	MISC	MISCELLANEOUS
CSA	COLD SUPPLY AIR	MOD	MOTOR OPERATED DAMPER
DDC	DIRECT DIGITAL CONTROL	MTD	MOUNTED
DEFL	DEFLECTION	NC	NORMALLY CLOSED
DN	DOWN	NIC	NOT IN CONTRACT
DP	DEW POINT	NO	NORMALLY OPEN
DWDI	DOUBLE WIDTH DOUBLE INLET	OAD	OUTSIDE AIR DAMPER
DWG EA	DRAWING	oc	ON CENTER DISTANCE
EAD	EXHAUST AIR EXHAUST AIR DAMPER	OSA	OUTSIDE AIR PHASE
EAT	ENTERING AIR TEMPERATURE	PP	POLYPROPYLENE
EDB	ENTERING DRY BULB	PSI	POUNDS PER SQUARE INCH
EFF	EFFICIENCY	PVC	POLYVINYL CHLORIDE
EFT	ENTERING FLUID TEMPERATURE	PVS	PVC COATED STEEL
ELEC	ELECTRIC(AL)	R (RAD)	RADIUS
ELEV	ELEVATION	RA	RETURN AIR
ENGR	ENGINEER	RAD	RETURN AIR DAMPER
EQ	EQUAL	REV	REVISION
EQUIP	EQUIPMENT	RH	RELATIVE HUMIDITY
ESP EWB	EXTERNAL STATIC PRESSURE ENTERING WET BULB	RPM SA	REVOLUTIONS PER MINUTE SUPPLY AIR
EWT	ENTERING WATER TEMPERATURE	SCFM	STANDARD CUBIC FEET PER MINUTE
EX	EXTRACTOR	SD	SMOKE DAMPER
EXH	EXHAUST	SECT	SECTION
EXIST/(E)	EXISTING	SENS	SENSIBLE
EXP	EXPANSION	SIM	SIMILAR
F	DEGREES FAHRENHEIT	SP	STATIC PRESSURE
FC	FORWARD CURVED	SPEC	SPECIFICATION
FE	FUME EXHAUST	SQ	SQUARE
FIG FILT	FIGURE FILTER	SF	SQUARE FOOT(FEET)
FLEX	FLEXIBLE	SQ IN	SQUARE INCH(ES)
FPD	FLUID PRESSURE DROP	SS STL	STAINLESS STEEL STEEL
FPM	FEET PER MINUTE	STRUCT	STRUCTUR(E)(AL)
FPS	FEET PER SECOND	SWP	SINGLE WALL PLENUM
FT	FEET/FOOT	SWSI	SINGLE WIDTH SINGLE INLET
FU	FIXTURE UNIT	TA	TRANSFER AIR
FUT	FUTURE	TBD	TO BE DETERMINED
FV	FACE VELOCITY	TEMP	TEMPERATURE
GA	GAGE/GAUGE	THRU	THROUGH
GAL GALV	GALVANIZED	TSP	TOTAL STATIC PRESSURE
GE	GENERAL EXHAUST	TYP	TYPICAL
GLY	GLYCOL	UPS V	UNITERRUPTED POWER SUPPLY VOLTS
GPH	GALLONS PER HOUR	VD	VOLUME DAMPER
GPM	GALLONS PER MINUTE	VEL	VELOCITY
н	HEIGHT	VERT	VENTICAROUGH ROOF
HORIZ	HORIZONTAL	VTR	
HP	HORSEPOWER	W	WIDTH
HTG	HEATING	WG	WATER BRESGIERE DROP
HSA	HOT SUPPLY AIR	WPD	
		W/	WITH



JOB NO.: SB112C01
DRAWN: IQ
CHECKED: MF
DATE: 12/21/2011
ISSUED FOR
BID / PERMIT: 3/21/2012

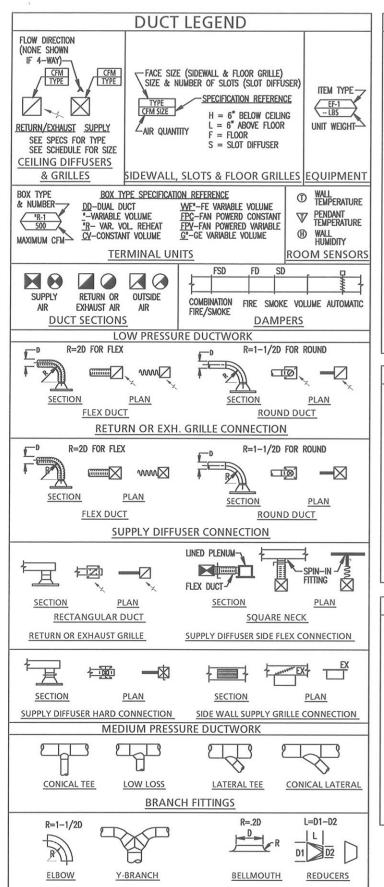
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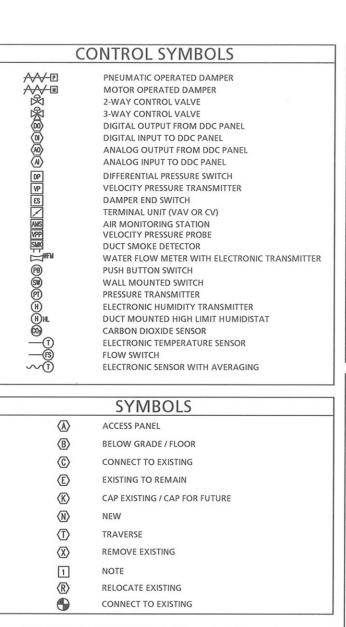
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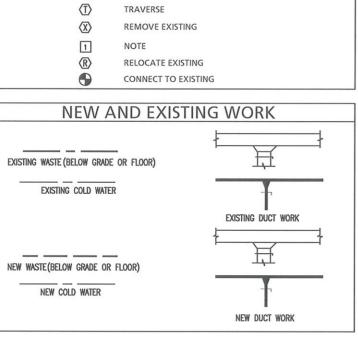
SHEET TITLE
PLANS, SECTIONS,
ELEVATIONS, DETAILS,
NOTES, SCHEDULES

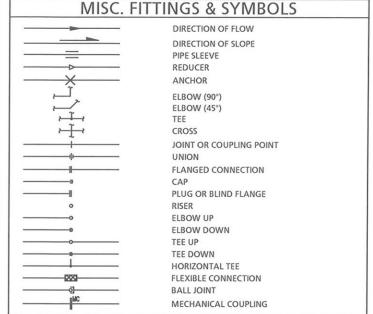
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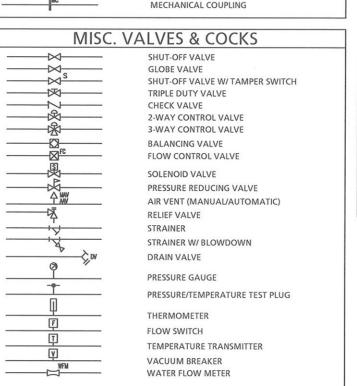
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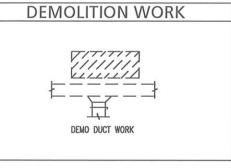


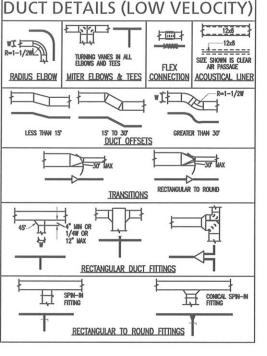














ENCE BUILDING 1 (ONE), 1025 S.W. MILL, Portland, Oregon 97201

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FUME-HOOD-REPLACEMENT

EDA

IOD NO	CD442504
JOB NO.:	SB112C01
DRAWN:	IQ
CHECKED:	MF
DATE:	12/21/201
ISSUED FOR	
BID / PERMIT	3/21/2012
REVI	SIONS
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NOTES, SCHEDULES
BID/PERMIT SET

LEGENDS, SYMBOLS,

DEMO, NEW, DETAILS.

M0.2

- 2. SEE GENERAL CONDITIONS PROVIDED WITH THE BID PACKAGE FOR ADDITIONAL PROJECT REQUIREMENTS. WHERE CONFLICT EXIST BETWEEN THE GENERAL CONDITIONS INCLUDED IN BID PACKAGE AND GENERAL CONDITIONS INCLUDED IN BID PACKAGE AND GENERAL CONDITIONS IDENTIFIED ON THE DRAWINGS, THE FORMER SHALL TAKE
- 3. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL, AND EQUIPMENT NECESSARY TO PROVIDE THE OWNER WITH COMPLETE AND FULLY OPERATIONAL SYSTEMS. ANY WORK NOT SPECIFICALLY INDICATED BUT
- STATE CODES AND REGULATIONS AND PSU STANDARDS. PSU STANDARDS ARE AVAILABLE AT PSU WEB SITE.
- 5 PSU WILL ORTAIN RUILDING AND HVAC PERMITS THROUGH THE FACILITY SO WILL OBTAIN BUILDING AND HYAC PERMITS THROUGH THE FACILITY
  PERMIT PROGRAM. CONTRACTOR IS RESPONSIBLE FOR ALL OTHER PERMITS
  AND COORDINATION OF TRADE INSPECTIONS WITH THE CITY AND OBTAIN
  FINAL OCCUPANCY PERMIT FROM THE CITY.
- 6. THE BUILDING CONTAINS ASBESTOS. SEE PSU 2008 ASBESTOS SURVEY REPORT FOR DETAILED INFORMATION. CONTRACTOR SHALL HIRE A SEPARATE ASRESTOS ARATEMENT CONTRACTOR PERFORMING REMOVAL AND DISPOSE
- CONTRACTOR TO WALK JOB SITE WITH OWNER PRIOR TO DEMOLITION AND CONSTRUCTION TO IDENTIFY AREAS OF ASBESTOS AREAS.
- 8. ALL SIZES, DIMENSIONS, EQUIPMENT MOUNTING HEIGHTS AND LOCATIONS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO INSTALLATION
- 9. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AT THE TIME OF DISCOVERY
- 10. THE CONTRACTOR SHALL PREPARE AND SUBMIT TO THE OWNER FOR A CONSTRUCTION SCHEDULE.
- 11. ALL CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE APPROVED
- FOR ANY WORK THAT MAY AFFECT BUILDING FIRE DETECTION AND FIRE PROTECTION DEVICES. TAG OUT SYSTEM IF REQUIRED.
- 13 ALL CONSTRUCTION SHALL BE DONE IN A NEAT AND WORKMANLIKE ALL CONSTRUCTION SHALL BE DONE IN A NEAT AND WORKMANLIKE
  MANNER, KEEPING NOISE AND DUST PRODUCED TO A MINIMUM LEVEL.
  PROVIDE TEMPORARY PROTECTION (PLYWOOD, PLASTIC SHIELD...) TO SHIELD
  OFF LABORATORY EQUIPMENT SPACE, AND VACUUM SPACE CLEAN AS REQUIRED TO MAINTAIN A CLEAN SPACE.
- 14. CONTRACTOR SHALL MAINTAIN THE SITE IN AN ORDERLY AND BROOM-CLEAN CONDITION AT ALL TIMES. CLEANUP AND DEBRIS REMOVAL SHALL BE DONE AT THE END OF EACH WORKING DAY. ALL DEMOLITION DEBRIS, AND ALL MATERIAL AND EQUIPMENT INDICATED TO BE REMOVED, SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR, UNLESS OTHERWISE DIRECTED BY THE OWNER. REMOVALS OR INSTALLATION OF NEW WORK SHALL BE PATCHED. ALL WALLS, CEILING, AND FLOORS FROM HICH PARTITIONS, EQUIPMENT, PIPES AND CONDUITS, ETC. HAVE BEEN REMOVED SHALL BE PATCHED.
- 15. REMOVED ITEMS ARE PROPERTY OF PSU. VERIFY WITH CONSTRUCTION MANAGER PRIOR TO DISPOSE OF EQUIPMENT. FOLLOW PSU DISPOSE GUIDELINE FOR DISPOSING OF EQUIPMENT.
- 16 ALL SURFACES WHICH HAVE BEEN DAMAGED DUE TO PATCHING EXTENSIONS, REPLACEMENTS, ETC. SHALL BE PATCHED, MATCHED AND ALIGNED WITH ALL EXISTING WORK SURFACES.
- 17. PENETRATIONS THROUGH RATED WALLS SHALL BE SEALED TO RESTORE THE EXISTING RATING WITH HILTI UL FIRE PROTECTION PRODUCTS. PERFORM SUCH WORK IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, IN ACCORDANCE WITH UL REQUIREMENTS, FIRE PROTECTION PRODUCTS SHALL BE HILTI OR APPROVED EQUAL
- 18. PROVIDE SLEEVES AT ALL WALL PENETRATIONS, UNLESS INDICATED OTHERWISE. ALL CONSTRUCTION MATERIALS, FINISHES, AND EQUIPMENT SHOWN ON DRAWINGS ARE NEW UNLESS NOTED OTHERWISE.
- 19. ALL NEW MATERIAL, FINISHES, EQUIPMENT, AND MISCELLANEOUS ITEMS TO BE USED SHALL BE AS SPECIFIED IN THE CONSTRUCTION DOCUMENTS. ALL SUCH ITEMS TO BE USED THAT ARE NOT SPECIFIED IN THE CONSTRUCTION DOCUMENTS SHALL BE SUBMITTED TO THE OWNER OR HIS REPRESENTATIVE
- 20. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, SAMPLES, AND CATALOG CUTS TO THE OWNER FOR REVIEW. SUBMIT 3 COPIES OF ALL SUBMITTALS. ALLOW 2 WEEKS FOR INITIAL REVIEW OF EACH SUBMITTAL. DO NOT PROCEED WITH INSTALLATION UNTIL SUBMITTAL HAS OWNER'S FINAL APPROVAL. CONTRACTOR IS TO SUBMIT THE FOLLOWING ITEMS: DOORS, FRAMES, AND HARDWARE
- EXHAUST FANS, PIPING AND FITTINGS, DIFFUSERS, PUMPS, TERMINAL
- UNITS AND CONTROLS ELECTRICAL TRANSFORMERS VED MOTORS
- UME HOOD LOCATION PLANS AND ELEVATIONS
- CONDITION OF THE PROJECT. THESE DRAWINGS SHALL BE SUBMITTED TO THE OWNER WITHIN 2 WEEKS AFTER THE FINAL PUNCH LIST IS ISSUED.
- 22. THE CONTRACTOR SHALL MEET ALL INSURANCE BONDING AND THE CONTRACTOR SHALL MEET ALL INSURANCE BONDING AND REGISTRATION REQUIREMENTS AS REQUIRED BY OWNER AS WELL AS THOSE REQUIRED BY STATE AND LOCAL AUTHORITIES. THERE WILL BE ONLY ONE PRE-BID MEETING. CONTRACTOR MAY REQUEST ADDITIONAL MEETING.
- 23. DIMENSIONS CONDITIONS INVOLVED, OR DUE TO THE DIFFERENCES BETWEEN ACTUAL SHOWN ON THE DRAWINGS ARE APPROXIMATE AND MUST RE VERIFIED AT THE SITE. THE CONTRACTOR SHALL ADAPT THE WORK TO COMPENSATE FOR INCONSISTENCIES BETWEEN EXISTING CONDITIONS A CONTRACT DOCUMENTS WITHOUT ADDITIONAL COST TO THE OWNER.
- 24. SYSTEM TIE-INS OR DEMOLITION REQUIRES SYSTEM SHUT-DOWN SHALL BE PERFORMED AFTER BUSINESS HOURS.

- 1. REFER TO SHEET M-0.X FOR PROJECT GENERAL CONDITIONS, M-0.X IS A SENERAL LEGEND PAGE, NOT ALL ITEMS ON THE SHEET WILL BE USED
- 2. REFER TO 1964 DRAWINGS FOR ADDITIONAL BUILDING / SYSTEMS
- 3. DRAWINGS ARE DIAGRAMMATIC. DRAWINGS ARE NOT INTENDED TO BE ABSOLUTELY PRECISE. AND DO NOT SPECIFY OR SHOW EVERY OFFSET ABSOLUTELY FREEZE, AND ON ON SPECIF OR SHOW EVERT OFFSET, FITTING, AND COMPONENT. THE PURPOSE OF THE DRAWINGS IS TO INDICATE A SYSTEM CONCEPT, THE MAIN COMPONENTS OF THE SYSTEMS, AND THE APPROXIMATE GEOMETRICAL RELATIONSHIPS. BASED ON THE SYSTEMS CONCEPT, THE MAIN COMPONENTS AND THE GEOMETRICAL RELATIONSHIPS THE CONTRACTOR SHALL PROVIDE ALL OTHER COMPONENTS AND MATERIALS NECESSARY TO MAKE THE SYSTEM FULLY COMPLETE AND OPERATIONAL CONTRACTOR SHALL ROUTE PIPING OR PROVIDE OFFSETS TO AVOID INTERFERENCE WITH STRUCTURAL ELEMENTS, ELECTRICAL PANELS AND JUNCTION BOXES ETC. VERIFY LOCATIONS, DIMENSIONS, EXISTING FLOW DIRECTIONS, ETC. BEFORE CONSTRUCTION.
- 4. FIELD VERIFY ALL SIZES, DIMENSIONS AND EQUIPMENT LOCATIONS PRIOR TO CONSTRUCTION OR MATERIAL PROCUREMENT
- 5. PROVIDE FIRE-SAFING TO MAINTAIN WALL RATINGS, AND SYSTEM INTEGRITY.
  PROVIDE CHROME ESCUTCHEON RINGS WHERE DUCTS AND PIPES PENETRATE THE FINISHED SIDE OF WALLS AND CEILINGS.
- 6. FLEXIBLE DUCT CONNECTION SHALL BE LIMITED TO 5'-0" MAXIMUM
- 7. DEMOLISHED DUCTWORK OPENING SHALL BE CAPPED, SEALED AND
- 8. SEAL ALL DUCTWORK CONNECTIONS AND JOINTS WITH HARDCAST INDOOR OR OUTDOOR ADHESIVE OR PRESSURE SENSITIVE TAPE.
- 9. ALL CONSTRUCTION TO MEET OR EXCEED CODE AND PER MANUFACTURER'S SPECIFICATION AND RECOMMENDATIONS. COORDINATE CONSTRUCTION WITH ALL CONTRACT DOCUMENTS, TESTING AND BALANCING, ABATEMENT, INSPECTIONS, AND SITE OBSERVATION REQUIREMENTS
- 10. COORDINATE FLOOR / BUILDING SHUT DOWN WITH FACILITY DEPARTMENT
- 11. VERIFY EXISTING FUME HOOD LOCATIONS, CONDITIONS, COUNTER HEIGHT, D NEW FUME HOOD ROUGH-IN REQUIREMENTS PRIOR TO INSTALLING NEW EQUIPMENTS.
- 12. VERIFY EXISTING CONDITIONS INCLUDING ELECTRICAL PIPING AND DUCTWORK ETC. PRIOR TO DEMOLITION AND CONNECTING TO NEW
- 13. REMOVE UNUSED WIRING, TUBING, PIPING, DUCTWORK RELATED TO THE SCOPE WORK TO MAIN OR PANEL. DO NOT ABANDON WIRING, DUCTWORK. PIPING AND ACCESSORIES IN PLACE REMOVE AND CAP AT MAIN
- 14 BUILDING FUME HOOD AND DEMOLITION FOLIPMENT MAY CONTAIN ASBESTOS. COORDINATE WITH PSU CONSTRUCTION MANAGER PRIOR TO STARTING DEMOLITION WORK AND DISPOSE OF THE DEMOLISHED EQUIPMENT. FOLLOW PSU STANDARD PROCEDURES FOR DEMOLITION AND DISPOSE OF EQUIPMENTS CONTAINING ASBESTOS.
- 15 PATCH WALL TO MATCH CONDITION ORIGINAL RATING AND PAINT WALL TO
- 16. PROVIDE FINAL CLOSEOUT DOCUMENTS ON A CD AND THREE HARD COPIES OF THE O&M MANUAL. CLOSEOUT DOCUMENTS INCLUDE PUNCH LIST, AS-BUILT DOCUMENT, AND OPERATIONS AND MAINTENANCE MANUALS. THE DRAWINGS SHALL BE IN ACAD DWG AND PDF FORMAT. ALL OTHER DOCUMENTS SHALL BE IN PDF FORMAT.
- 17. BALANCE THE LAB TO MAXIMUM OF 200 CFM NEGATIVE AIR PRESSURE TO HALLWAY / ADJACENT SPACE.
- 18. CONTRACTOR IS RESPONSIBLE FOR REMOVING AND REINSTALLING, LIGHT, CEILING ELEMENTS, CEILING GRID AND CEILING TILE DUE TO THE DEMOLITION
- 19 COORDINATE WITH OTHER TRADES, PSU DEPARTMENTS, PSU PROFESSORS AND FACILITY DEPARTMENT PRIOR TO CONSTRUCTION. THE MAXIMUM SHUT DOWN TIME FOR DEMOLITION AND INSTALLATION OF NEW EQUIPMENT IN EACH LABORATORY IS TWO WEEK / TEN BUSINESS DAYS.
- 20. CONTRACTOR REQUIRES SUBMITTING WORK PLAN AND IDENTIFYING AREA TO LABORATORY DEPARTMENTS AND FACILITY DEPARTMENT TEN BUSINESS DAYS PRIOR TO START CONSTRUCTIONS. CONTRACTOR IS REQUIRED TO IDENTIFY AND DETAILED IMPACT IN THE WORK PLAN. CONTRACTOR IS REQUIRED TO IDENTIFY WORK HOURS IF THE WORK IS NOT DONE DURING BUSINESS HOURS. SEE GENERAL CONDITIONS FOR PROJECT COMPLETION
- 21. NOT USED.
- 22. IDENTIFY IN THE WORK PLAN IF THE LABORATORY IS REQUIRED TO BE SHUT DOWN FOR THE FUME HOOD REPLACEMENT WORK. SEE LABORATORY SCHEDULES.
- 23. COORDINATE WITH LABORATORY OWNER AND FACILITY DEPARTMENT FOR REMOVING LABORATORY EXPERIMENT RELATED FOUIPMENT IN TH LABORATORY. REMOVING SUCH EXPERIMENT RELATED EQUIPMENT IN THE LABORATORY IS DONE BY PSU. COVERING EQUIPMENT IN THE LABORATORY IS DONE BY THE CONTRACTOR. CONTRACTOR IS RESPONSIBLE TO REMOVE DEMOLISHED EQUIPMENT AS SHOWN ON DEMOLISH DRAWINGS
- 24. RELOCATE AND REINSTALL LIGHT FIXTURES / CEILING ELEMENTS AS REQUIRED
- 25. DUCTWORK CONNECTION SIZES TO THE TERMINAL UNITS AND DIFFUSERS ARE THE SAME AS TERMINAL UNITS AND DIFFUSERS CONNECTION / NECK SIZES.
- 26. ROUTE DUCTWORK IN STRUCTURAL SPACE. FIFLD VERIEV EXISTING STRUCTURAL BEAM OPENINGS. PROVIDE TRANSITION AS REQUIRED FOR DUCTWORK THROUGH EXISTING BEAM OPENING.
- 27. PROVIDE SEISMIC ANCHOR TO FUME HOOD AND FUME HOOD CABINET (EXISTING OR NEW).
- 28. COORDINATE WITH CONSTRUCTION MANGER FOR FLOOR / BUILDING SHUT DOWN FOR DEMOLITION AND INSTALLATION WORK. THE REQUEST NEED TO SUBMIT TO PSU 10 BUSINESS DAYS PRIOR TO SHUT DOWN OF SERVICE FOR THE FLOOR / RUIL DING

### MECHANICAL SPECIFICATION

A. MATERIALS

- - STEEL DUCTS: ASTM A 525, ASTM A 527 G90 GALVANIZED OR 304 STAINLESS
  - STEEL
    A. STEEL SHEET, LOCK-FORMING QUALITY. FASTENERS: RIVETS, BOLTS, OR SHEET METAL SCREWS FOR STEEL DUCTS.
    B. WELD JOINTS IN STAINLESS STEEL DUCTWORK.
  - HANGER ROD: STEEL, GALVANIZED: THREADED BOTH ENDS, THREADED ONE END, OR CONTINUOUSLY THREADED. USE DOUBLE NUTS AND LOCK WASHERS ON THREADED ROD SUPPORTS
  - I ARORATORY FXHALIST DUCTWORK TO BE 304 STAINLESS STEEL AS BASE BID. D. LABORATORY EXHAUST DUCTWORN TO BE SESTIMILED AND A CASE OF SUBMIT BID ALTERNATE FOR LABORATORY EXHAUST DUCTWORK.

    LABORATORY EXHAUST DUCTS SHALL BE CONSTRUCTED TO SMACNA SEAL CLASS
  - B MINIMUM STANDARDS. SINGLE WALL, ROUND SPIRAL LOCKSEAM, TYPE 316 STAINLESS STEEL DUCTWORK
  - DUCTS FOR VENTILATING CHEMICAL FUME HOODS AND SPECIAL EXHAUST
  - PVC COATED GALVANIZED STEEL AND OF RIGID CONSTRUCTION.

    -UNI-COAT SINGLE-WALL (SPIRAL LOCKSEAM), ROUND DUCT
  - (POLYVINYL-CHLORIDE-COATED GALVANIZED STEEL) IS PREFERED FOR GENERAL LABORATORY HOOD EXHAUST E. GENERAL EXHAUST AND ALL SUPPLY AIR DUCTWORK TO BE GALVANIZED STEEL

- CONSTRUCT TEES, BENDS, AND ELBOWS WITH RADIUS OF NOT LESS THAN 1/2 TIMES WIDTH OF DUCT ON CENTERLINE. WHERE NOT POSSIBLE WHERE RECTANGULAR ELBOWS ARE USED, PROVIDE DOUBLE THICKNESS TURNING VANES PROVIDE TURNING VANES TO PREVENT LINER DAMAGE WHERE ACOUSTICAL LINING
- INCREASE DUCT SIZES GRADUALLY, NOT EXCEEDING 15-DEGREE TRANSITION B. INCREASE DOT SIZES GRANDALLT, NOT EXCEED 45 DEGREES ON CONCENTRIC TRANSITIONS AND 30 DEGREES ON ECCENTRIC TRANSITIONS.
  C. PROVIDE STANDARD 45-DEGREE ENTRY TAKEOFFS UNLESS OTHERWISE INDICATED AS A 90-DEGREE CONICAL TEE CONNECTION.
- 3. PRESSURE CLASSIFICATIONS
- LOW PRESSURE SUPPLY AIR (SA): +2" WATER COLUMN
- A. LOW PRESSURE SUPPLY AIR (SA): 42" WATER COLUMN.

  B. MEDIUM PRESSURE SUPPLY AIR (CSA, HSA): 44 WATER COLUMN.

  C. GENERAL EXHAUST AIR (EA): -2" WATER COLUMN.

  D. LABORATORY EXHAUST AIR (LEA): -3" WATER COLUMN.

REINFORCING FOR OPERATING PRESSURES INDICATED.

- 4. FABRICATE AND SUPPORT DUCTWORK IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS. PROVIDE DUCT MATERIAL, GAUGES, AND
- 5. REINFORCE DUCTS TO PREVENT BUCKLING, BREATHING, VIBRATIONS, OR UNNECESSARY NOISES, AS DURING STARTUP, SHUTDOWN, AND CONTINUOUS OPERATION OF AIR HANDLING SYSTEM, REINFORCING SHALL BE AS RECOMMENDED IN ASHRAE GUIDE AND DATA BOOK AND SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE.
- 6 CLEAN DUCT SYSTEM AND FORCE AIR AT HIGH VELOCITY THROUGH DUCT TO 6. CLEAN DUCT STSTEM AND FORCE AIR AT HIGH VELOCITY THROUGH DUCT TO REMOVE ACCUMULATED DUST. TO OBTAIN SUFFICIENT AIR, CLEAN HALF SYSTE AT A TIME. PROTECT EQUIPMENT WHICH MAY BE HARMED BY EXCESSIVE DIRT WITH TEMPORARY FILTERS, OR BYPASS DURING CLEANING.
- 7. ALL SHEET METAL WORK, INCLUDING OVERHEAD DUCTS SHALL BE FABRICATED TO ELIMINATE ALL SHARP CORNERS AND SCREW POINTS FROM BECOMING POSSIBLE SAFETY HAZARD. WHERE GRILLES OR REGISTERS ARE ATTACHED TO TAKEOFFS FROM THE DUCTWORK, THE EDGES OF THE GRILLE OR REGISTERS SHALL NOT EXTEND PAST THE SHEET METAL FLANGE SO DAS TO CAUSE A SAFETY HAZARD. THIS IS ALSO TRUE OF THE RETURN GRILLES AND ECONOMIZER GRILLES. SHEET METAL FLANGES FOR GRILLS AND REGISTERS SHALL BE TURNED IN RATHER THAN TURNED OUT TO PREVENT SHARP EDGES.
- B DUCTWORK ACCESSORIES
- B. DUCTWORK ACCESSORIES

  1. FABRICATE MOTOR CONTROL DAMPERS IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE" AND AS INDICATED.

  2. PROVIDE BALANCING DAMPERS AS SHOWN AND AS REQUIRED TO BALANCE
- B. PROVIDE DUCT SEALANT TO ALL JOINTS: HARDCAST UL 723 FOILED TAPE OF HARDCAST DUCT SEAL OR EQUAL

- IARDCAST DUCT SEAL OR EQUAL.

  I. FIRE DAMPRE: MEETS NFPA 90A AND UL 555 STANDARDS.

  PROVIDE ACCESS PANELS UPSTREAM OF ALL NEW OR RELOCATED FERMINAL UNITS. PANELS TO BE MINIMUM 12\*X12\* OR TO SUIT DUCT SIZE.

  TERMINAL UNITS AND FUME HOOD EXHAUST DAMPERS. SIEMENS OR APPROVED EQUAL. SEE SCHEDULE ON PLANS.
- C. INSULATION DUCTWORK
- INSULATION SHALL BE MANUFACTURED BY OWENS, CORNING FIRERGLASS CORPORATION, CERTAINTEED CORPORATION, KNAUF FIBER GLASS, MANVILLE CORPORATION.
- 2. INSULATION SHALL BE FLEXIBLE GLASS FIBER; ASTM C 553; COMMERCIAL GRADE K' VALUE OF 0.29 AT 75 DEGREES F; 1.0 LB/CU FT MINIMUM DENSITY; 0.002 INCH FOIL SCRIM KRAFT FACING FOR AIR DUCTS. TWO INCHES THICK.
- ADHESIVES: WATERPROOF VAPOR BARRIER TYPE, CHILDERS CP-82. AUGUST (COTH AND TAPE: COMPLY WITH MIL-C-20079H, TYPE I FOR CLOTH AND TYPE II FOR TAPE. WOVEN GLASS-FIBER FABRICS, PLAIN WEAVE, PRESIZED A MINIMUM OF 8 OZ. / 50, VD.

  MINIMUM OF 8 OZ. / 50, VD.

  MPALE ANCHORS: GALVANIZED STEEL, 12 GAGE SELF-ADHESIVE PAD.
- 6. TIE WIRE: ANNEALED STEEL, 16 GAGE.
- D. PIPING INSULATION
- 1. 1.5" THICK WITH 3.5 PCF HEAVY DENSITY FIBERGLASS PIPE INSULATION WITH PROTECTIVE REINFORCED AND SELF ADHESIVE JACKET.
- E. AIR OUTLETS AND INLETS . MANUFACTURERS SHALL BE METALAIRE, KRUEGER MANUFACTURING COMPANY, OR TITUS PRODUCTS, OR AS SPECIFIED IN PLANS.

TYPE. FUME HOOD SHALL BE HORIZONTAL LAMINAR HIGH-PERFORMANCE AIRFLOW TYPE. FUME HOOD SHALL MEET THE LATEST ASHRAE 110-95, UL 1805, 3101 AND OSHA 60 FPM FACE VELOCITY STANDARDS. FUME HOOD AND CABINET SHALL BE CHEMICAL RESISTANT WITH FIBERGLASS REINFORCED COMPOSITE PANEL LINER. WORK SURFACE SHALL BE DISHED TO CONTAIN SPILLS. AND A MINIMUM 1 1/2 THICK MOLDED SOLID EPOXY. SEE SCHEDULE FOR ADDITIONAL REQUIREM UL AND ETL LISTED. MANUFACTURERS SHALL BE LABCONCO XSTREAM, KEWAUNEE SUPREME OR APPROVED EQUAL. PROVIDE SUBMITTAL FOR REVIEW AND

- COPPER TUBE AND FITTINGS
- DRAWN-TEMPER COPPER TUBING: ASTM B 88, TYPE L.
  ANNEALED-TEMPER COPPER TUBING: ASTM B 88, TYPE K.
  WROUGHT-COPPER ITINIGS: ASME B16 22.
  WROUGHT-COPPER UNIONS: ASME B16.22.
- E. SOLDER FILLER METALS: ASTM B 32, 95-5 TIN ANTIMONY

### 2. STEEL PIPE AND FITTINGS

- STEEL PIPE: ASTM ASS OR A120 SCHEDULE 40 BLACK STEEL
- FITTINGS: ANSI B16.3 MALLEABLE IRON OR ASTM A234 FORGED STEEL
  WELDING TYPE. JOINTS: THREAD TO ANSI B31.2

### MECHANICAL SPECIFICATION (CONT)

- B. GLASS PIPE AND FITTINGS
- GLASS PIPE: BORODRAIN BOROSILICATE GLASS ACID DRAIN LINE SYSTEM WITH FITTINGS AND PIPE. ASTM C1053-90, AND C1053-00.
- 4. PVDF PLASTIC PIPE (SUBMIT AS AN ALTERNATE TO GLASS PIPE A. PIPE AND DWV FITTINGS: GF SYGEF PVDF FUSEAL FLAME RETARDANT DWV SOLVENT AND ACID FITTINGS AND PIPE.
- 5 PIPING APPLICATIONS
- 5. PHIMO APPLICATIONS
  A. ABOVE GROUND, WITHIN BUILDING, FOR COLD WATER, SAFETY SHOWER COLD
  WATER, CONDENSATE DRAIN, AND AIR. TYPE L HARD DRAWN COPPER TUBING,
  C. ABOVE GROUND, WITHIN BUILDING, FOR LABORATORY WASTE: GLASS PIPE AND
- D. AIR (A) TYPE L COPPER BRAZED AND PURGED
- E. GAS PIPING STEEL PIPE OR TYPE L COPPER TUBING.

A. 3 PIECES BRONZE BODY, TFE SEAL, TFE PACKING. SOLDER OR THREADED CONNECTION. APOLLO 82-20X, WATTS B-6801 OR EQUAL.
 B. AIR VALVES TO BE BROZE BALL VALVES, APPOLO, WATTS OR EQUAL.

### 7. PIPING INSTALLATION

- A. INSTALL DRAINS, CONSISTING OF A TEE FITTING, NPS 3/4 BALL VALVE, AND A. INSTALL DRAINS, CONSISTING OF A LEE PTI INING, NP 3 3/4 DALL VALVE, AND SHORT NP 3/4 THREADED NIPPLE WITH CAP, AT LOW POINTS IN PIPING SYSTEM MAINS AND ELSEWHERE AS REQUIRED FOR SYSTEM DRAINAGE.

  B. INSTALL WASTE AND VENT PIPING AT A UNIFORM GRADE OF 0.2 PERCENT
- UPWARD IN DIRECTION OF FLOW C. REDUCE PIPE SIZES USING ECCENTRIC REDUCER FITTING INSTALLED WITH LEVEL
- D. UNLESS OTHERWISE INDICATED. INSTALL BRANCH CONNECTIONS TO MAINS D. ONCESS OTHERWISE INJURIES, INSTALL THE TAKEOFF COMING OUT THE BOTTOM OF THE MAIN PIPE. FOR UP-FEED RISERS, INSTALL THE TAKEOFF COMING OUT THE TOP OF THE MAIN PIPE.
- E. ANCHOR PIPING FOR PROPER DIRECTION OF EXPANSION AND CONTRACTION
- G. HANGERS AND SUPPORTS
- ADJUSTABLE STEEL CLEVIS HANGERS FOR INDIVIDUAL HORIZONTAL PIPING LESS
  THAN 20 FEET LONG.
- G HANGERS TO SUPPORT VERTICAL PLINS
- NPS 34. MAXIMUM SPAN, 5 FEET, MINIMUM ROD SIZE, 1/4 INCH.
   PROVIDE PIPING SUPPORT PER UPC TABLE 3-1 AND 3-2.
- H. TERMINAL EQUIPMENT CONNECTIONS
- SIZE FOR SUPPLY AND RETURN PIPING CONNECTIONS SHALL BE SAME AS FOR FOUIPMENT CONNECTIONS
- INSTALL VALVES IN ACCESSIBLE LOCATIONS CLOSE TO CONNECTED EQUIPMENT STALL PORTS FOR PRESSURE AND TEMPERATURE GAGES AT COIL INLE

- PERFORM THESE ADJUSTMENTS BEFORE OPERATING THE SYSTEM.
- OPEN VALVES TO FULLY OPEN POSITION, CLOSE COIL BYPASS VALVES B. SET TEMPERATURE CONTROLS SO ALL COILS ARE CALLING FOR FULL FLOW.
- INSTALL HVAC UNIT UNITS LEVEL AND PLUMB. MAINTAIN SUFFICIENT CLEARANCE FOR NORMAL SERVICE AND MAINTENANCE.
- 2. SLOPE LABORATORY EXHAUST DUCT TO FUME HOOD INSTALL PIPING ADJACENT TO AIR TERMINAL UNITS TO ALLOW SERVICE AND
- PERFORM THE FOLLOWING FIELD TESTS AND INSPECTIONS AND PREPARE TEST
- A AFTER INSTALLING HVAC LINITS/AIR TERMINAL LINITS AND AFTER ELECTRICAL A. AF ER INSTALLAGE HAVE ONLY IN THE REMINIAL UNITS AND AFTER ELECTRIC CIRCUITRY HAS BEEN ENERGIZED, TEST FOR COMPLIANCE WITH REQUIREMENT B. LEAK TEST: AFTER INSTALLATION, FILL WATER COILS AND TEST FOR LEAKS. REPAIR LEAKS AND RETEST UNTIL NO LEAKS EXIST. C. TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO
- CONFIRM PROPER MOTOR ROTATION AND UNIT OPERATION D. ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND FOUIPMENT
- 2. REMOVE AND REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED

- 1. THE CONTRACTOR SHALL PROVIDE AND INSTALL PHENOLIC NAMEPLATES TO DESIGNATE EQUIPMENT. THE NAMEPLATES SHALL HAVE 5/8" WHITE LETTERING ON BLACK BACKGROUND. TAGS SHALL BE PROVIDED FOR THE FOLLOW
- EQUIPMENT: A. HVAC AND PLUMBING EQUIPMENT
- C. OTHER ITEMS AS CALLED FOR ON THE DRAWING.
- D. TAGS SHALL BE SCREW MOUNTED AND LOCATED SO AS TO BE EASILY READABLE FROM A NORMALLY OCCUPIED POSITION.
- 2. LABEL ALL UTILITY, PIPING AND DUCTWORK WITH ANSI LABELS OF THE APPROPRIATE SIZE, COLOR AND LOCATION.
- M. TESTING, ADJUSTING, AND BALANCING
- 1. REQUIREMENTS INCLUDE MEASUREMENT AND ESTABLISHMENT OF THE FLUID QUANTITIES OF THE MECHANICAL SYSTEMS AS REQUIRED MEETING DESIGN SPECIFICATIONS, AND RECORDING AND REPORTING THE RESULTS
- 2. TEST, ADJUST, AND BALANCE THE FOLLOWING MECHANICAL SYSTEMS: A. SUPPLY AIR SYSTEMS, ALL PRESSURE RANGES.
- B. RETURN AIR SYSTEMS.
- C. EXHAUST SYSTEMS.
- D. FUME HOOD EXHAUST SYSTEMS
- D. FOME HOUD EARHOUST STSTEMS.
  PROVIDE MINIMUM AND MAXIMUM AIRFLOW VALUES TO CONTROL
  CONTRACTOR FOR SETTING FUME HOOD. SET FINAL NORMAL OPERATING
  CONDITION FOR FUME HOOD AT 18" SASH OPENING.
  E. GENERAL LABORATORY ROOM EXHAUST SYSTEMS. ENTIRE BUILDING SUPPLY, RETURN AND EXHAUST AIR SYSTEMS THAT IS NOT
- PART OF THE FUME HOOD REPLACEMENT PROJECT. 3. PROVIDE FINAL BALANCING REPORT UPON THE COMPLETION OF THE PROJECT

1. SCOPE: CONTROLS DESIGN SHALL BE A "TURNKEY" DESIGN-BUILD PROJECT BY THE CONTROLS CONTRACTOR/VENDOR. SIEMENS OR APPROVED EQUAL THE CONTROLS CONTRACTOR/VENDOR. SIEMENS OR APPROVED EQUAL.

A CONTROLS SCOPE FOR PROJECT SPACES INCLUDE REPLACEMENT ADDITION FOR

EXISTING SYSTEM TO ENSURE ALL UNITS WITHIN THE PROJECT AREA ARE

FUNCTIONAL AND OPERATE AS INTENDED. PROVIDE AND/OR RELOCATE

CONTROLS AS REQUIRED ACCOMMODATING THE FINAL TEMPERATURE ZONE

CONTROL SCHEME. FEATURES OF THE NEW CONTROLLERS SHALL COMPLY WITH THE CURRENT VERSION OF THE ENERGY CODE. PROVIDE SETUP AND PROGRAMMING FOR ALL CONTROLLERS AFFECTED BY THE PROJECT PADGRAMMINION DO RALL CONTROLLERS AFFECTED BY THE PROJECT.

B. PLANS DO NOT SHOW ELECTRICAL POWER TO ALL CONTROL DEVICES; THE
CONTROLS CONTRACTOR/VENDOR SHALL PROVIDE POWER TO ALL CONTROLS
COMPONENTS AS REQUIRED FOR A COMPLETE AND PLLLY FUNCTIONAL SYSTE
COORDINATE WITH CONSTRUCTION MANAGER FOR ELECTRICAL CONNECTION

C. MATERIALS AND CONTROL SCHEME SHALL MATCH EXISTING BUILDING SYSTEMS.

### MECHANICAL SPECIFICATION (CONT)

- D. SUBMITTALS: INCLUDE COMPLETE SYSTEM CONTROL DIAGRAMS / SCHEMATIC AND SPECIFICATION SHEET ON ALL HARDWARE; INCLUDING PHYSICAL DIMENSIONS, SERVICE CLEARANCE, AMBIENT TEMPERATURE SUITABILITY, VIBRATION SUITABILITY, ACCURACY OVER NORMAL OPERATING RANGE, DESCRIPTION OF FIELD ADJUSTMENT AND FIELD PROGRAMMABILITY, DAMPER SCHEDULES WITH AIR PRESSURE DROPS, VALVE SCHEDULES WITH WATER DROPS, PART NUMBER AND PROVIDE MONITORING AND CONTROL FOR THE FOLLOWING MECHANICAL

  - SUPPLY AIR SYSTEMS
  - II. RETURN AIR SYSTEMS.

    III. EXHAUST AIR SYSTEMS.
  - IV. FUME HOOD EXHAUST SYSTEMS AND FUME HOOD SASH HEIGHT.
  - V. GENERAL LABORATORY ROOM EXHAUST SYSTEMS
- VI. TERMINAL UNITS. LABORATORY ROOM THERMOSTAT
- SEE LABORATORY AIRFLOW CONTROL SYSTEM FOR ADDITIONAL CONTROL
- INFORMATION.

  G. TECHNICAL SERVICES: TECH LABOR SERVICES INCLUDE CALIBRATION
- FUNCTIONAL CHECKOUT AND COMMISSIONING NECESSARY FOR COMPLETE AND FULLY OPERATIONAL CONTROL SYSTEM. H. O&M DOCUMENTATION: THE CONTRACTOR SHALL PROVIDE 3 COPIES OF AN OPERATOR'S MANUAL AND ON A COMPACT DISC DESCRIBING ALL OPERATING AND OPERATOR'S MINIORAL AND ON A COMPACT DISC DESCRIBING ALL OPERATING AN ROUTINE MAINTENANCE SERVICE PROCEDURES TO BE USED WITH THE TEMPERATURE CONTROL. THE CONTRACTOR SHALL INSTRUCT THE OWNER'S DESIGNATED REPRESENTATIVE IN THESE PROCEDURES DURING THE STARTUP AND
- I. WARRANTY AND SERVICES: AT THE END OF THE FINAL STARTUP / TESTING, IF EQUIPMENT AND SYSTEMS ARE OPERATING SATISFACTORILY TO THE OWNER AND ENGINEER SATISFACTION, THE OWNER SHALL SIGN DOCUMENT CERTIFYING THAT THE CONTROL SYSTEM'S OPERATION HAS BEEN TESTED AND ACCEPTED. PROVIDIONEY SAR PARTS AND LABOR WARRANTY MAINTENANCE AGREEMENT ON ALL CONTROLS FROM THE DATE OF ACCEPTANCE.

- PROVIDE TEST PLAN AND TEST PROCEDURES FOR THE PERFORMANCE A. PROVIDE 1831 PLAN AND 1831 PROCEDURES POR THE PERFORMANCE 
  VERIFICATION TESTS FOR OWNER APPROVAL. EXPLAIN IN DETAIL ACTIONS AND 
  EXPECTED RESULTS TO DEMONSTRATE COMPLIANCE WITH THE PROJECT 
  REQUIREMENTS AND THE METHOD FOR SIMULATING THE NECESSARY CONDITIONS 
  OF OPERATION TO DEMONSTRATE PERFORMANCE OF THE SYSTEM. B. BUILDING MAINTAINCE CONTROL SYSTEM (BMCS) INSTALLER SHALL BE COMPLETELY CHECKOUT, CALIBRATE, AND TEST ALL CONNECTED HARDWARE AND SOFTWARE TO INSURE THAT SYSTEM PERFORMS IN ACCORDANCE WITH APPROVED SPECIFICATIONS AND SEQUENCES OF OPERATIONS. CALIBRATION TO BE SPECIFICATIONS AND SEQUENCES OF OPERATIONS. CALIBRATION TO BE
  DEMONSTRATED BY THE BMCS INSTALLER IN THE PRESENCE OF THE OWNER.
  SHOULD RANDOM SAMPLING INDICATE IMPROPER COMMISSIONING, THE OWNER.
  RESERVES THE RIGHT TO SUBSEQUENTLY WITNESS COMPLETE CALIBRATION OF THE SYSTEM AT NO ADDITIONAL COST TO THE OWNER.
- . COMMISSIONING SHALL BE PERFORMED BY AN INDEPENDENT COMMISSIONING AGENT. THE AGENT SHALL BE APPRROVED BY PSU.

MECHANICAL SEQUENCE OF OPERATIONS CONTRACTOR TO PROVIDE CONTROL DEVICES AND ADDITIONAL LOCAL CONTROL PANEL(S) COMPATIBLE WITH THE EXISTING BMCS TO ACCEPT ALL NEW CONTROLS AS DESCRIBED HEREIN. NEW CONTROL SEQUENCES ARE AS FOLLOWS:

### 1.1 AIR TERMINAL UNITS / EXHAUST DAMPERS

THE BASES OF DESIGN.

- A. GENERAL: 1. AIRFLOW REQUIREMENTS FOR VARIABLE VOLUME AIR TERMINAL UNITS
- AND EXHAUST DAMPERS a AS INDICATED ON THE SCHEDULE **b.UNLESS INDICATED OTHERWISE, THE MINIMUM AIR FLOW PERCENTAGE**
- FOR DD-# UNITS SHALL BE 30%. C.UNLESS INDICATED OTHERWISE, THE MINIMUM AIR FLOW PERCENTAGE FOR VV-# UNITS SHALL BE 0%.
- 2. WHERE A SPACE HAS MULTIPLE TERMINAL UNITS WITH ONE TEMPERATURE SENSOR THE SENSOR SHALL CONTROL ALL TERMINAL UNITS. 3. FOLLOW CONTROL CONTRACTOR LABORATORY FUME HOOD CONTROL GUIDELINES FOR LABORATORY ROOM AIRFLOW CONTROLS. SIEMENTS IS
- 4. OCCUPANCY SENSOR CONTROLS THE TERMINAL UNITS AND EXHAUST DAMPERS DURING USAGE. WHEN THE LABORATORY IS NOT OCCUPIED DURING SCHOOL SCHEDULED HOURS. THE SYSTEM WILL MAINTAIN 4 AIR CHANGES / HOUR OF SUPPLY AIR TO THE LABORATORY
- B. CONTROL FOR DUAL DUCT AND/OR VARIABLE AIR VOLUME TERMINAL UNITS

CFM RELATIVE TO ADJACENT SPACE.

1. OCCUPIED COOLING AND HEATING MODE: a.MODULATE DAMPERS AS REQUIRED TO MAINTAIN ROOM SENSOR SETPOINT AND UNIFORM SPACE TEMPERATURE THROUGHOUT THE ROOM **b.MODULATE DAMPER AS REQUIRED TO MAINTAIN DIFFERENTIAL PRESSURE** SET POINT BETWEEN THE SPACE AND THE REFERENCE. LABORATORY ROOM DIFFERENTIAL PRESSURE SETPOINT IS TO BE NEGATIVE 100 - 200

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SSHEERTITILEE GENERAL NOTES, CONDITIONS AND SPECIFICATIONS

**BID/PERMIT SET** 

									FUM	E HO	DD SC	HEDU	LE								
					SI	IZE		MAX		MIN		SER	VICE FIXTU	JRE (NOTE	3, 8)				ELEC REC	'TS (NOTE	
								EXHAUST	EXHAUST	EXHAUST									3	3)	
							MAX	AIR	AIR	AIR	COLD	HOT			PASS	CUP	ELEC				
				MODEL		1	FACE	VOLUME	VOLUME	VOLUME	WATER	WATER			THRU	SINK	OUTLETS			BREAKER	4
		LAB		(NOTE 4, 9, 10)	LENGTH	DEPTH	VELOCITY	28" SASH	18" SASH	(CLOSED)	(NOTE 5)	(NOTE 6)	GAS	AIR	OUTLET	(NOTE 7)	GFCI	WEIGHT		SIZE	
TAG NO.	BUILDING	SERVED	MANUFACTURER	(NOTE 11, 12)	(IN)	(IN)	(FPM)	(CFM)	(CFM)	(CFM)	(QT'Y)	(QT'Y)	(QT'Y)	(QT'Y)	(QT'Y)	(QT'Y)	(QT'Y)	(LB)	(V/PH)	(AMPS)	REMARKS
SB1-FH-204A	SCIENCE BUILDING 1	204	LABCONCO	XSTREAM	72	39.2	60	710	450	310	2	-	-	2	2	2	4	475	115/1PH	20	
SB1-FH-204B	SCIENCE BUILDING 1	204	LABCONCO	XSTREAM	72	39.2	60	710	450	310	2	-	-	2	2	2	4	475	115/1PH	20	
SB1-FH-204C	SCIENCE BUILDING 1	204	LABCONCO	XSTREAM	96	39.2	60	1000	640	420	2	-	-	2	2	2	4	610	115/1PH	20	
SB1-FH-309D	SCIENCE BUILDING 1	309	LABCONCO	XSTREAM	96	39.2	60	1000	640	420	4	-	-	2	2	2	4	610	115/1PH	20	
SB1-FH-323C	SCIENCE BUILDING 1	323	LABCONCO	XSTREAM	72	39.2	60	710	450	310	4	-	-	2	2	2	4	475	115/1PH	20	
SB1-FH-504A	SCIENCE BUILDING 1	504	LABCONCO	XSTREAM	72	39.2	60	710	450	450	2	-	-	2	2	2	4	475	115/1PH	20	ABI #1 - SEE NOTE 2
SB1-FH-540A	SCIENCE BUILDING 1	540A	LABCONCO	XSTREAM	48	39.2	60	440	280	280	2	-	-	2	2	2	4	355	115/1PH	20	ABI #2 - SEE NOTE 2

NOTES:

NOT USED

- 2. BID ALTERNATE. PROVIDE SEPARATE ITEMIZED COST FOR REVIEW AND EVALUATION. SEE DRAWINGS FOR BID ALTERNATE NUMBER.
- 3. SINGLE POINT UTILITY AND ELECTRICAL CONNECTION.
- 4. PROVIDE NEW SPILL STOPPER WORK SURFACE. NEW WORK SURFACE TO BE FLUSH WITH EXISTING COUNTERTOP SURFACE. FIELD VERIFY EXACT HEIGHT.
- 5. PROVIDE COLD WATER GOOSENECK FAUCET KIT WITH GREEN EPOXY-COATED BRASS RIGID / SWIVEL GOOSENECK AND ELEVATED VACUUM BREAKER. CHICAGO FAUCET AND VALVE ONLY.
- 6. PROVIDE HOT / COLD WATER MIXING GOOSENECK FAUCET WITH WHITE EPOXY-COATED BRASS RIGID/ SWIVEL GOOSENECK ELEVATED VACUUM BREAKER. CHICAGO FAUCET AND VALVE ONLY.
- 7. PROVIDE 1.5" LABORATORY WASTE CONNECTION FOR CUP SINK WITH TRAP. CONNECT LAB WASTE AND VENT TO EXISTING SYSTEM. FIELD VERIFY EXACT PIPING AND CUP SINK LOCATION.
- 8. SINGLE POINT PLUMBING CONNECTION TO COLD WATER, HOT WATER AND GAS.

SEE DRAWINGS FOR BID ALTERNATE NUMBER.

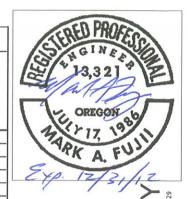
- 9. PROVIDE FRONT CEILING ENCLOSURE SUITABLE FOR 9 FEET CEILING HEIGHT. SEE M2.X DRAWING FOR SIDE PANEL NOTE. FIELD VERIFY EXACT ENCLOSURE HEIGHT. PROVIDE SEISMIC ANCHOR TO HOOD AND CABINET.
- 10. PROVIDE SASH STOP KITS AS PART OF THE HOOD. SET SASH STOP AT 18" HEIGHT.
- 11. PROVIDE MATCHING SOLVENT STORAGE CABINET WITH VENT KIT AS PART OF THE PACKAGE.
- 12. FUME HOOD SHALL BE ABLE TO FIT THROUGH A 34" CLEAR DOOR TO THE LAB SPACE AND 78"x41" ELEVATOR CART CLEARANCE EXCEPT AS NOTED ON PLAN AND FIELD VERIFY EXACT TRAVEL PATH.

			DUAL DUC	T VAV	<b>TERM</b>	IINAL	UNIT S	SCHED	ULE		
										UNOCCUPIED	
							OCCUPIE	D PERIOD		PERIOD	
						COLD	DUCT	НОТ	DUCT		
				HOT	COLD	MAX	MIN	MAX	MIN		
				INLET	INLET	SUPPLY	SUPPLY	SUPPLY	SUPPLY	SUPPLY	
		LAB	MANUFACTURER	SIZE	SIZE	VOLUME	VOLUME	VOLUME	VOLUME	VOLUME	
TAG NO.	BUILDING	SERVED	MODEL	(IN)	(IN)	(CFM)	(CFM)	(CFM)	(CFM)	(CFM)	REMARKS
SB1-DD-504	SCIENCE BUILDING 1	504	SIEMENS / APOGEE	8	8	600	200	520	160	250	ABI#1 - SEE NOTE 1
SB1-DD-540A	SCIENCE BUILDING 1	540A	SIEMENS / APOGEE	8	8	450	130	370	340	170	ABI#2 - SEE NOTE 1
SB1-DD-204	SCIENCE BUILDING 1	204	SIEMENS / APOGEE	10	10	1140	640	1000	640	940	
NOTES:	1. BID ALTERNATE. PF	ROVIDE SEF	PARATE ITEMIZED COST	FOR REVIEW	V AND EVA	ALUATION.	COORDIN	ATE WITH	OWNER / F	ACILITY PRIOR	R TO START WORK.

		F	UME HOOD	EXHAL	JST TE	RMIN	AL UNIT SCHEDULE
				EXHAUST	MAX	MIN	
				CONNECT	EXHAUST	EXHAUST	
		LAB	MANUFACTURER	SIZE	VOLUME	VOLUME	
TAG NO.	BUILDING	SERVED	MODEL	(IN)	(CFM)	(CFM)	REMARKS
SB1-FVV-204A	SCIENCE BUILDING 1	204	SIEMENS / APOGEE	9	710	310	SEE NOTE 2
SB1-FVV-204B	SCIENCE BUILDING 1	204	SIEMENS / APOGEE	9	710	310	SEE NOTE 2
SB1-FVV-204C	SCIENCE BUILDING 1	204	SIEMENS / APOGEE	10	1000	420	
SB1-FVV-309D	SCIENCE BUILDING 1	309D	SIEMENS / APOGEE	10	1000	420	
SB1-FVV-323C	SCIENCE BUILDING 1	323	SIEMENS / APOGEE	9	710	310	SEE NOTE 2
SB1-FVV-504	SCIENCE BUILDING 1	504	SIEMENS / APOGEE	9	710	310	ABI #1 - SEE NOTE 1 & 2
SB1-FVV-540A	SCIENCE BUILDING 1	540A	SIEMENS / APOGEE	7	440	190	SEE NOTE 2

NOTES:

- 1. BID ALTERNATE. PROVIDE SEPARATE ITEMIZED COST FOR REVIEW AND EVALUATION. COORDINATE WITH OWNER / FACILITY PRIOR TO START WORK. SEE DRAWINGS FOR BID ALTERNATE NUMBER.
- 2. FUME HOOD EXHAUST OPENING IS 12". PROVIDE TRANSITION FITTING AT EXHAUST CONNECTION. COORDINATE WITH SIEMENS CONTROLS FOR FINAL EXHAUST TERMINAL UNIT SIZE.



SCIENCE BUILDING 1 (ONE), 1025 S.W. MILL, Portland, Oregon 97201

- FUME-HOOD-REPLACEMENT

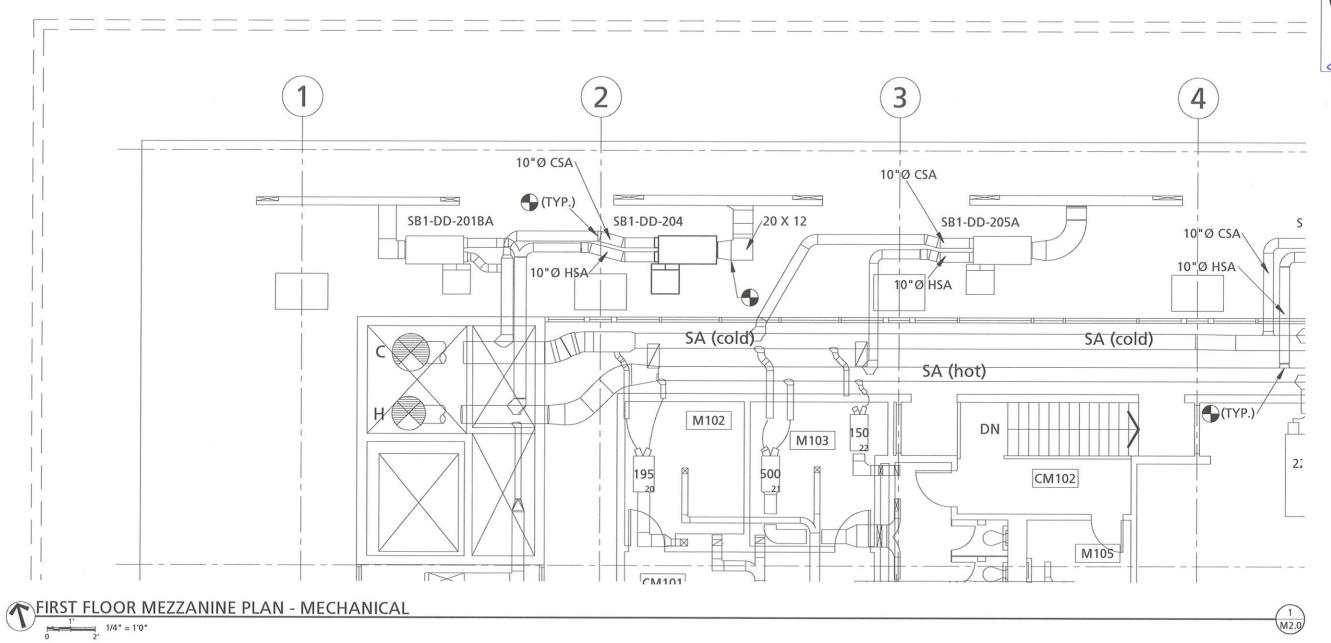
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**BID/PERMIT SET** 

M0.4



- A SEE M0.1 TO M0.5 FOR LEGENDS, ABBREVIATIONS, GENERAL CONDITIONS, SPECIFICATIONS AND MECHANICAL GENERAL NOTES.
- B RETAIN ABATEMENT CONTRACTOR FOR ITEMS DEMOLISHED THAT CONTAIN ASBESTOS. TYP OF ALL.

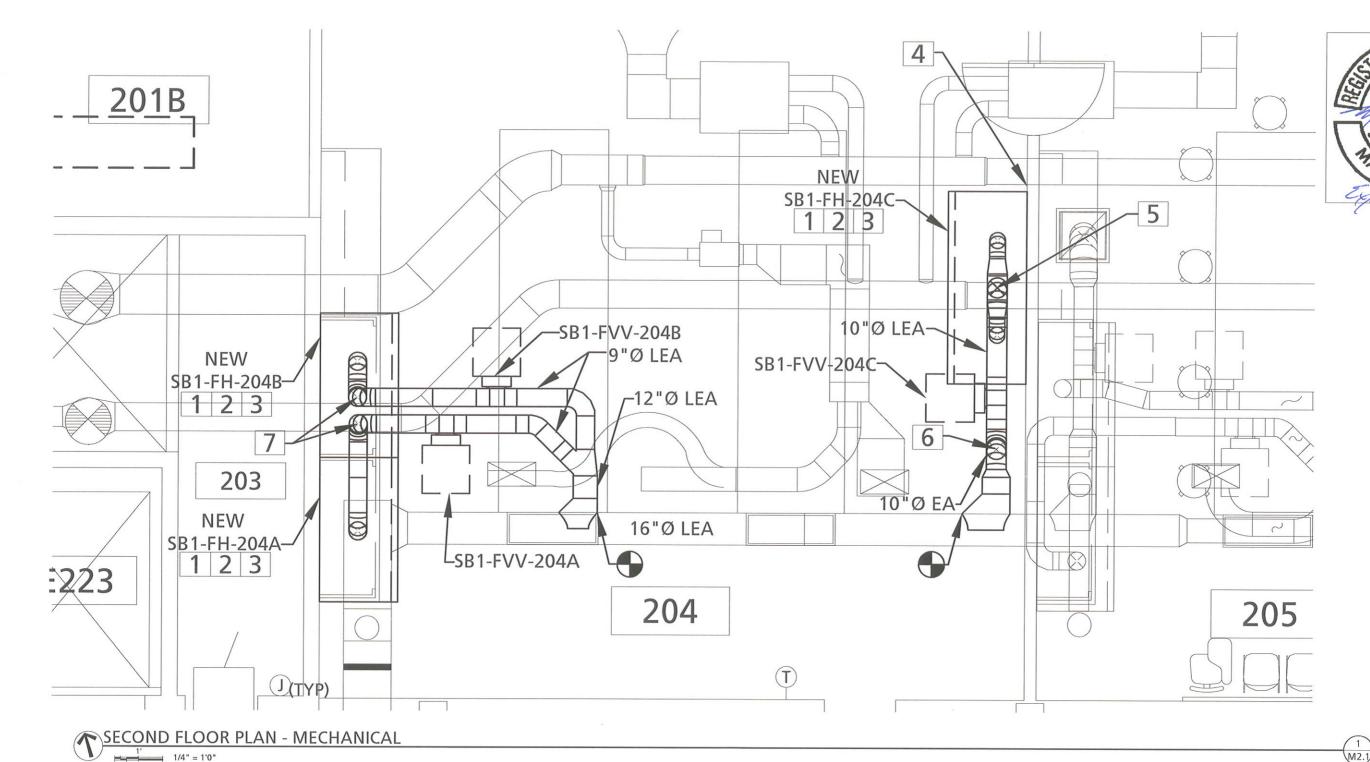
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M2.0

SHEET TITLE

**BID/PERMIT SET** 



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### **GENERAL NOTES**

- A SEE M0.1 TO M0.5 FOR LEGENDS, ABBREVIATIONS, GENERAL CONDITIONS, SPECIFICATIONS AND MECHANICAL GENERAL NOTES.
- B RETAIN ABATEMENT CONTRACTOR FOR ITEMS DEMOLISHED THAT CONTAIN ASBESTOS. TYP OF ALL.

### **KEYED NOTES**

- 21 EXTEND COLD WATER, AIR, WASTE, GAS, AND ELECTRICAL FROM EXISTING CAP TO NEW FUME HOOD. FIELD VERIFY EXACT CONNECTION LOCATIONS.
- PROVIDE PANEL TO ENCLOSE SPACE ABOVE FUME HOOD. PRIME AND PAINT PANEL TO MATCH FUME HOOD. FIELD VERIFY EXACT PANEL LOCATION AND SIZE.
- 3 FURNISH AND INSTALL NEW FUME HOOD WITH BASE CABINETS.
- RELOCATE EXIST. ELECTRICAL RECEPTACLE IF REQ'D.
- 5 10" DUCT DROPS BELOW CEILING IN FUME HOOD SHROUD, THEN SPLITS TO 8" DUCTS TO TERMINATION POINTS.
- 6 DUCTS DROPS TO PASS EXIST. BEAM

7 ROUTE NEW DUCT BELOW CEILING IN FUME HOOD SHROUD, THEN TO TERMINATION POINTS.

2011 SB1 EDA - FUME-HOOD-REPLACE

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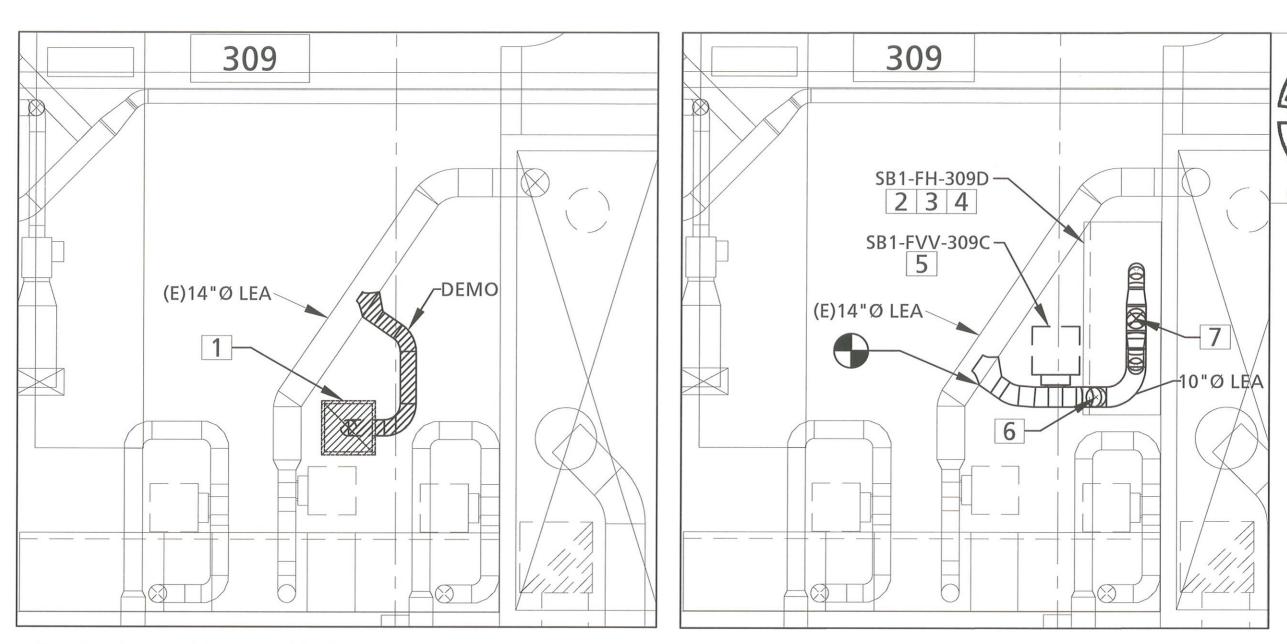
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ISSUED FOR BID / PERMIT: 3/21/2012

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**BID/PERMIT SET** 



THIRD FLOOR PLAN - MECHANICAL PLAN

### **GENERAL NOTES**

- A SEE M0.1 TO M0.5 FOR LEGENDS, ABBREVIATIONS, GENERAL CONDITIONS, SPECIFICATIONS AND MECHANICAL GENERAL
- B RETAIN ABATEMENT CONTRACTOR FOR ITEMS DEMOLISHED THAT CONTAIN ASBESTOS. TYP OF ALL.

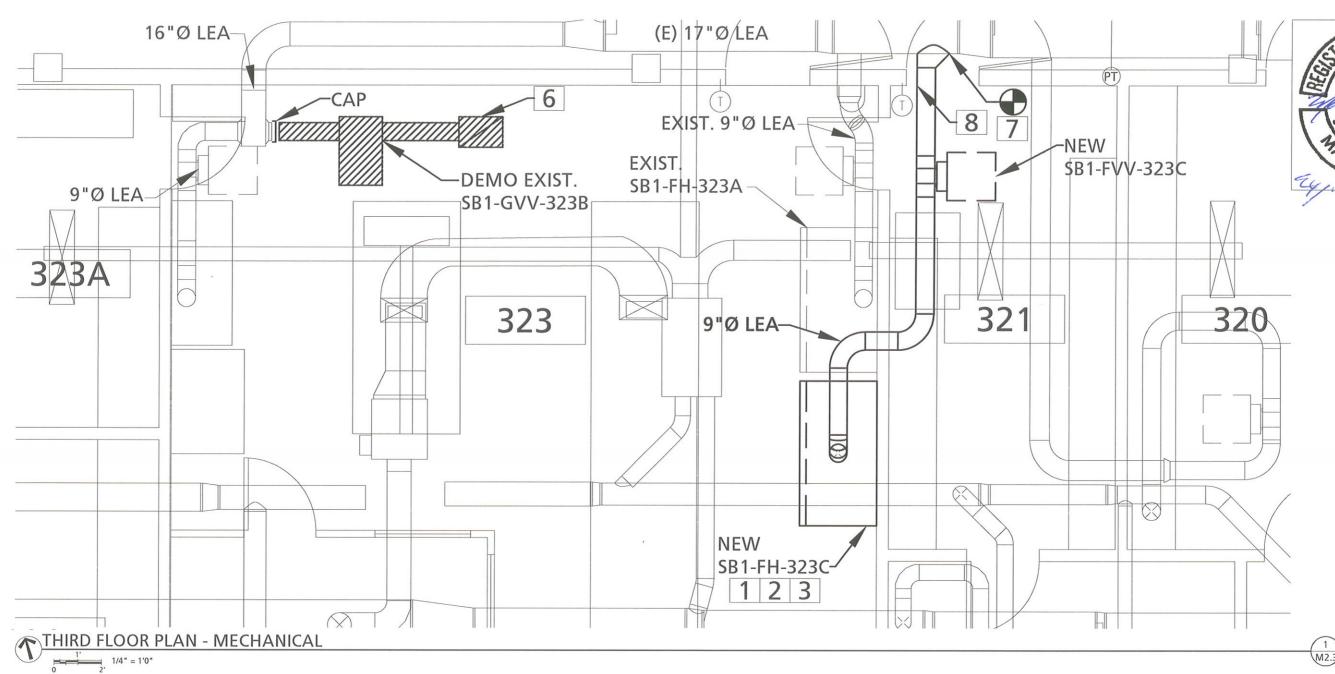
### **KEYED NOTES**

- DEMO EXISTING CEILING EXHAUST GRILLE AND DUCT. REPLACE WITH CEILING TILE TO MATCH.
- EXTEND COLD WATER, AIR WASTE, GAS AND ELECTRICAL FROM EXISTING CAP TO NEW FUME HOOD. FIELD VERIFY EXACT CONNECTION LOCATIONS.
- 3 PROVIDE PANEL TO ENCLOSE SPACE ABOVE FUME HOOD. PRIME AND PAINT PANEL TO MATCH FUME HOOD.
- 4 FURNISH AND INSTALL NEW FUME HOOD.
- 5 REPLACE EXISTING GVV-309C WITH NEW FVV-309C.
- ROUTE NEW EXHAUST DUCT BELOW CEILING IN FUME HOOD SHROUD. RELOCATE WATER UTILITIES AS REQ'D.
- 7 10" DUCT DROPS AND SPLITS TO 8" DUCTS TO TERMINATION POINTS.

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SEE M0.1 TO M0.5 FOR LEGENDS, ABBREVIATIONS, GENERAL CONDITIONS, SPECIFICATIONS AND MECHANICAL GENERAL NOTES.

B RETAIN ABATEMENT CONTRACTOR FOR ITEMS DEMOLISHED THAT CONTAIN ASBESTOS. TYP OF ALL.

### **KEYED NOTES**

- 2 EXTEND COLD WATER, AIR WASTE, GAS AND ELECTRICAL FROM EXISTING CAP TO NEW FUME HOOD. FIELD VERIFY EXACT CONNECTION LOCATIONS.
- 2 PROVIDE PANEL TO ENCLOSE SPACE ABOVE FUME HOOD. PRIME AND PAINT PANEL TO MATCH FUME HOOD.
- 3 FURNISH AND INSTALL NEW FUME HOOD.
- 4 REPLACE EXISTING GVV-309C WITH NEW FVV-309C.
- 5 DEMO EXISTING CEILING EXHAUST GRILLE AND DUCT. REPLACE WITH CEILING TILE TO MATCH.
- 6 REPLACE EXISTING RETURN AIR GRILLE WITH CEILING TILE.
- 7 INCLUDE BALANCING DAMPER AT CONNECTION TO EXISTING DUCTING.
- 8 SEAL PENETRATIONS

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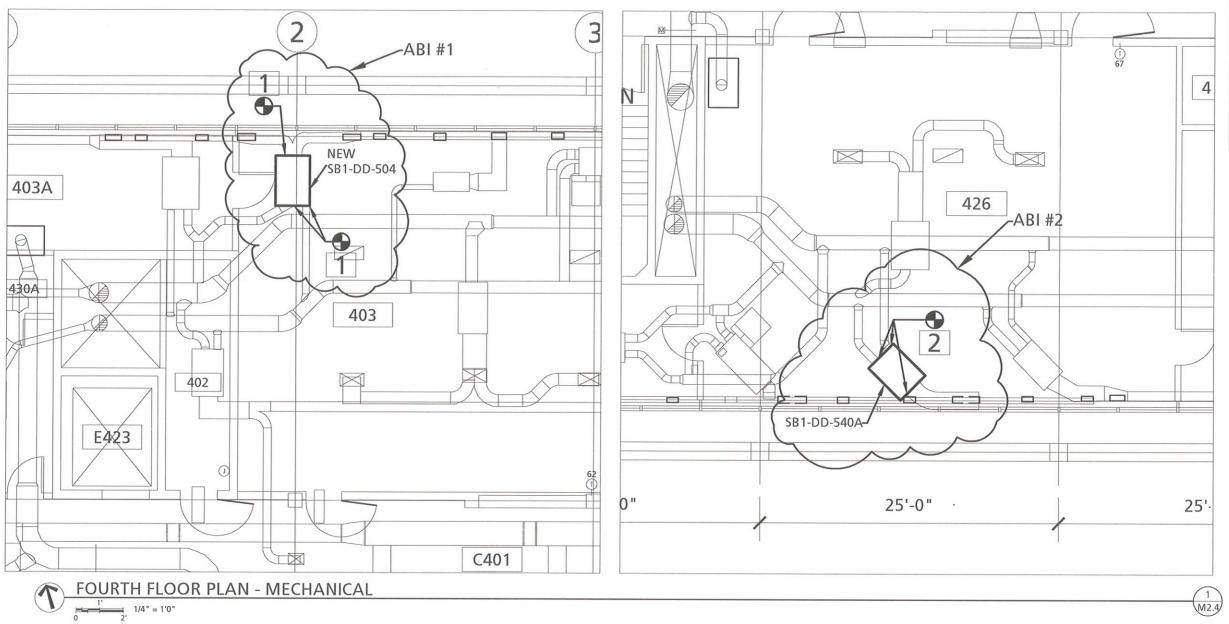
2011 SB1 EDA - FUME-HOOD-REPLACEMENT

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SHEET TITLE

**BID/PERMIT SET** 



- A SEE M0.1 TO M0.5 FOR LEGENDS, ABBREVIATIONS, GENERAL CONDITIONS, SPECIFICATIONS AND MECHANICAL GENERAL NOTES.
- B RETAIN ABATEMENT CONTRACTOR FOR ITEMS DEMOLISHED THAT CONTAIN ASBESTOS. TYP OF ALL.

# **KEYED NOTES**

- 1 RECONNECT DUCT TO NEW SB1-DD-504.
- 2 RECONNECT EXIST. DUCT TO NEW SB1-DD-540A.

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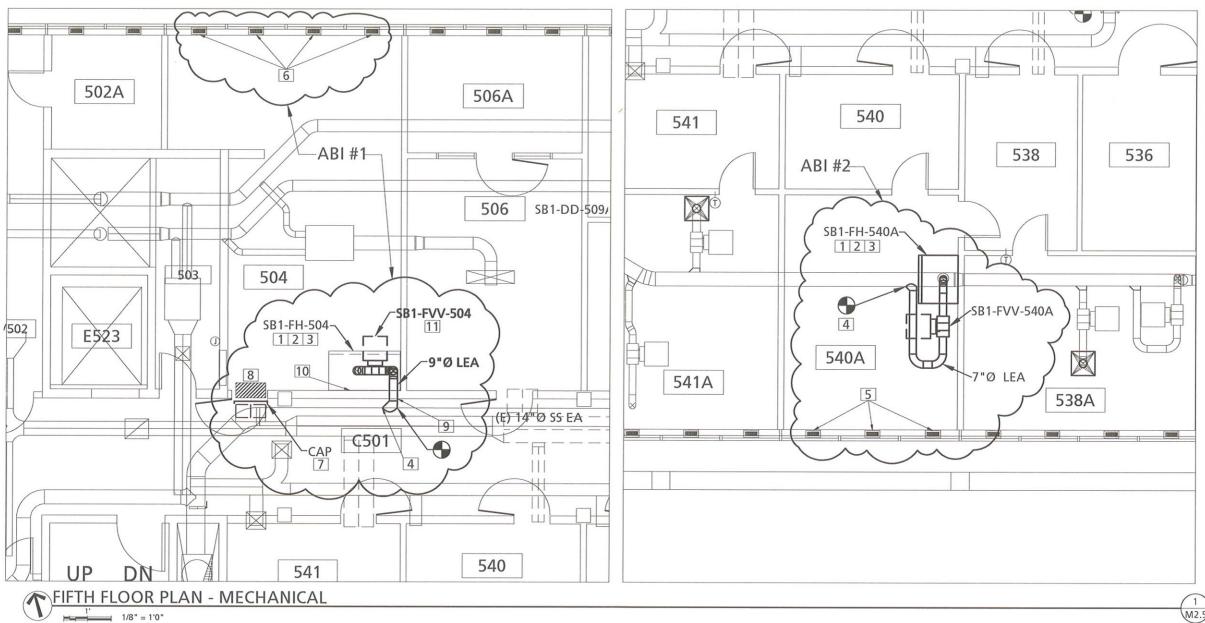
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SHEET TITLE

BID/PERMIT SET



1' 1/8" = 1'0"

- A SEE M0.1 TO M0.5 FOR LEGENDS, ABBREVIATIONS, GENERAL CONDITIONS, SPECIFICATIONS AND MECHANICAL GENERAL
- B RETAIN ABATEMENT CONTRACTOR FOR ITEMS DEMOLISHED THAT CONTAIN ASBESTOS. TYP OF ALL.

# **KEYED NOTES**

- CONNECT EXISTING UTILITIES TO NEW FUME HOOD. EXTEND COLD WATER, AIR, WASTE, GAS AND ELECTRICAL FROM EXISTING CAP TO NEW FUME HOOD. FIELD VERIFY EXACT CONNECTION LOCATIONS.
- PROVIDE PANEL TO ENCLUSE SPACE ASSESSMENT PANEL TO MATCH FUME HOOD. PROVIDE PANEL TO ENCLOSE SPACE ABOVE FUME HOOD. PRIME
- $\begin{tabular}{c} {\bf 3} \end{tabular}$  furnish and install new fume hood.
- PROVIDE BALANCING DAMPER AT POINT OF CONNECTION 4
- BALANCE DIFFUSER TO 70 CFM (TYP. 3)
- BALANCE DIFFUSER TO 100 CFM (TYP. 4) 6
- 7 DEMO RETURN AIR DUCT AND CAP AT MAIN.
- 8 REMOVE RA GRILLE, DRYWALL AND PAINT TO MATCH.
- 9 FIRE SEAL PENETRATION.
- 10 DEMO EXIST. UPPER AND LOWER CABINET.
- 11 ROUTE NEW DUCT THROUGH EXIST. OPENING IN STEEL BEAM.

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**BID/PERMIT SET**