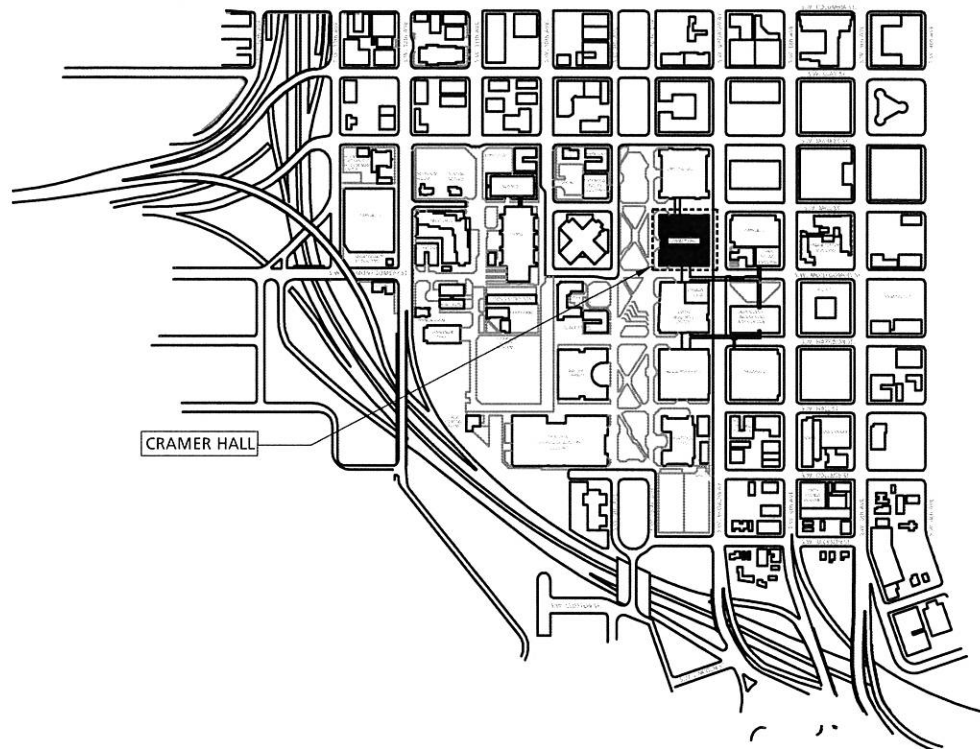


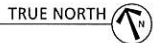
PSU - Cramer Hall (CH) Room S42 Telecom HVAC Upgrade



Cramer Hall - Room S42 Telecom HVAC Remodel
 Cover Sheet
 1721 SW Broadway, Portland, Oregon 97201
PORTLAND STATE UNIVERSITY
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VICINITY MAP



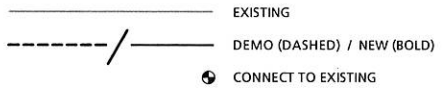
LEGAL DESCRIPTION

PORTLAND ADDITION,
BLOCK 201, PROPERTY ID: R246397
1721 SW BROADWAY
PORTLAND, OREGON 97201

CODE INFORMATION

OCCUPANCY TYPE B
BUILDING CONSTRUCTION TYPE - EXISTING

MECHANICAL SYMBOLS

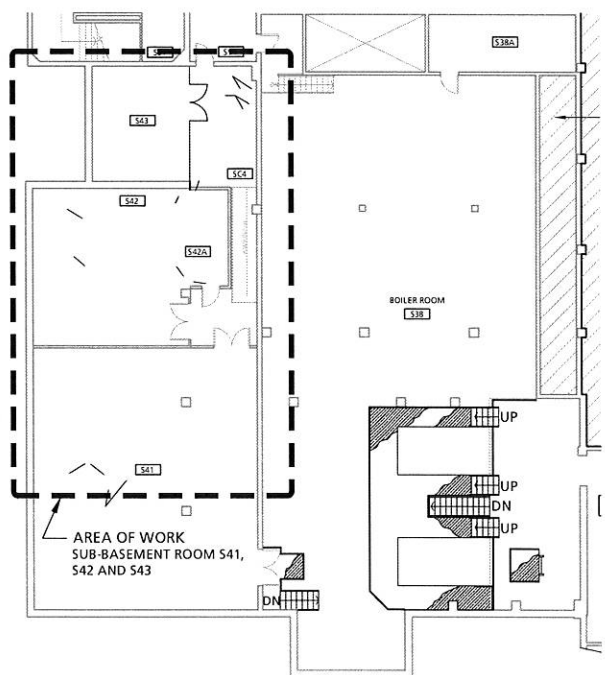


DRAWING INDEX

M0.1 COVER SHEET, LEGENDS, ABBREVIATIONS, SITE CONDITIONS
 M0.2 PROJECT SPECIFICATIONS
 M1 DEMO PLAN
 M2 HVAC PLAN - NEW WORK

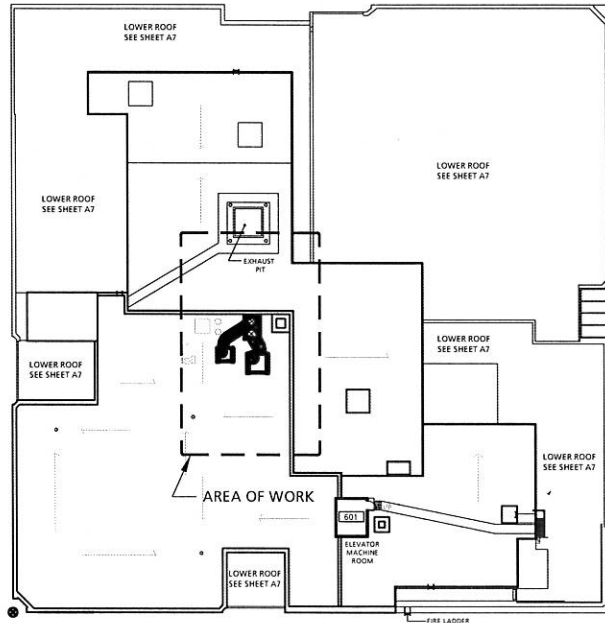
ABBREVIATIONS

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	KWH	KILOWATT HOUR
ARCH	ARCHITECT(URAL)	L	LENGTH
AUTO	AUTOMATIC	LAT	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
BTUH	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
CLG	CEILING OR COOLING	MBH	THOUSAND BTU PER HOUR
CONC	CONCRETE	MECH	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
DFL	DEFLECTION	MUA	MAKE UP AIR
DN	DOWN	NC	NORMALLY CLOSED
DP	DEW POINT	NIC	NOT IN CONTRACT
DWDI	DOUBLE WIDTH DOUBLE INLET	NO	NORMALLY OPEN
DWG	DRAWING	OAD	OUTSIDE AIR DAMPER
EA	EXHAUST AIR	OC	ON CENTER DISTANCE
EAD	EXHAUST AIR DAMPER	OSA	OUTSIDE AIR
EAT	ENTERING AIR TEMPERATURE	PH	PHASE
EDB	ENTERING DRY BULB	PI	PRESSURE INDICATOR
EFF	EFFICIENCY	PP	POLYPROPYLENE
EFT	ENTERING FLUID TEMPERATURE	PSI	POUNDS PER SQUARE INCH
ELEC	ELECTRIC(AL)	PVC	POLYVINYL CHLORIDE
ELEV	ELEVATION	PVS	PVC COATED STEEL
ENGR	ENGINEER	R (RAD)	RADIUS
EQ	EQUAL	RA	RETURN AIR
EQUIP	EQUIPMENT	RAD	RETURN AIR DAMPER
ESP	EXTERNAL STATIC PRESSURE	REV	REVISION
EWR	ENTERING WET BULB	RH	RELATIVE HUMIDITY
EWT	ENTERING WATER TEMPERATURE	RPM	REVOLUTIONS PER MINUTE
EX	EXTRACTOR	SA	SUPPLY AIR
EXH	EXHAUST	SCFM	STANDARD CUBIC FEET PER MINUTE
EXIST(E)	EXISTING	SD	SMOKE DAMPER
EXP	EXPANSION	SECT	SECTION
F	DEGREES FAHRENHEIT	SENS	SENSIBLE
FC	FORWARD CURVED	SIM	SIMILAR
FE	FUME EXHAUST	SPEC	SPECIFICATION
FIG	FIGURE	SQ	SQUARE
FILT	FILTER	SF	SQUARE FOOT(FEET)
FLEX	FLEXIBLE	SQ IN	SQUARE INCH(ES)
FPD	FLUID PRESSURE DROP	SS	STAINLESS STEEL
FPM	FEET PER MINUTE	STL	STEEL
FPS	FEET PER SECOND	STRUCT	STRUCTUR(E)(AL)
FT	FEET/FOOT	SWP	SINGLE WALL PLENUM
FU	FIXTURE UNIT	SWSI	SINGLE WIDTH SINGLE INLET
FUT	FUTURE	TA	TRANSFER AIR
FV	FACE VELOCITY	TBD	TO BE DETERMINED
GA	GAGE/GAUGE	TEMP	TEMPERATURE
GAL	GALLON	THRU	THROUGH
GALV	GALVANIZED	TSP	TOTAL STATIC PRESSURE
GE	GENERAL EXHAUST	TYP	TYPICAL
GLY	GLYCOL	UPS	UNINTERRUPTED POWER SUPPLY
GPH	GALLONS PER HOUR	V	VOLTS
GPM	GALLONS PER MINUTE	VD	VOLUME DAMPER
H	HEIGHT	VEL	VELOCITY
HORIZ	HORIZONTAL	VERT	VERTICAL
HP	HORSEPOWER	VTR	VENT THROUGH ROOF
HTG	HEATING	W	WIDTH
HSA	HOT SUPPLY AIR	WG	WATER GAUGE
		WPD	WATER PRESSURE DROP
		W/	WITH
		W/O	WITHOUT



AREA OF WORK - CH SUB BASEMENT

SCALE: 1/32" = 1'-0"



AREA OF WORK - CH ROOF TOP

SCALE: 1/64" = 1'-0"



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M0.1

GENERAL NOTES

- DRAWINGS ARE DIAGRAMMATIC. DRAWINGS ARE NOT INTENDED TO BE ABSOLUTELY PRECISE, AND DO NOT SPECIFY OR SHOW EVERY 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.
- FIELD VERIFY ALL SIZES, DIMENSIONS AND EQUIPMENT LOCATIONS PRIOR TO CONSTRUCTION OR MATERIAL PROCUREMENT.
- 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.
- DEMOLISHED DUCTWORK OPENING SHALL BE CAPPED, SEALED AND INSULATED TO MATCH EXISTING.
- SEAL ALL DUCTWORK CONNECTIONS AND JOINTS WITH HARDCAST INDOOR OR OUTDOOR ADHESIVE OR PRESSURE SENSITIVE TAPE.
- 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.
- COORDINATE FLOOR / BUILDING SHUT DOWN WITH FACILITY DEPARTMENT.
- VERIFY EXISTING CONDITIONS INCLUDING ELECTRICAL, PIPING AND DUCTWORK ETC. PRIOR TO DEMOLITION AND CONNECTING TO NEW EQUIPMENTS.
- 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.
- PAINT DUCTWORK TO MATCH ADJACENT DUCTWORK COLOR IN EXPOSED AREA.
- COORDINATE WITH OTHER TRADES, PSU DEPARTMENTS, AND FACILITY DEPARTMENT PRIOR TO CONSTRUCTION. PRESENT CONSTRUCTION PLAN TO CM AND PSU FOR REVIEW AND COORDINATION.
- DUCTWORK CONNECTION SIZES TO THE TERMINAL UNITS AND DIFFUSERS ARE THE SAME AS TERMINAL UNITS AND DIFFUSERS CONNECTION / NECK SIZES.
- PROVIDE ESCUTCHEON RING AT THE ROOM FINISH SIDE FOR PIPING OR DUCT WORK PENETRATING FINISH SURFACE.
- COORDINATE WITH CM FOR FLOOR OR BUILDING SHUT DOWN FOR DEMOLITION AND INSTALLATION WORK. THE BUILDING SHUT DOWN REQUESTS NEED TO BE SUBMIT TO PSU 10 BUSINESS DAYS PRIOR TO SHUT DOWN. BUILDING SHUT-DOWN TO EXISTING SYSTEM SHALL BE PERFORMED AFTER HOURS.

MECHANICAL SPECIFICATION

DUCTWORK

A. MATERIALS

- STEEL DUCTS: ASTM A 525, ASTM A 527 G90 GALVANIZED STEEL.
 - STEEL SHEET, LOCK-FORMING QUALITY. FASTENERS: RIVETS, BOLTS, OR SHEET METAL SCREWS FOR STEEL DUCTS.
 - HANGER ROD: STEEL, GALVANIZED; THREADED BOTH ENDS, THREADED ONE END, OR CONTINUOUSLY THREADED. USE DOUBLE NUTS AND LOCK WASHERS ON THREADED ROD SUPPORTS.

B MINIMUM STANDARDS.

- GENERAL EXHAUST AND ALL SUPPLY AIR DUCTWORK TO BE GALVANIZED STEEL.

2. FITTINGS

- CONSTRUCT TEES, BENDS, AND ELBOWS WITH RADIUS OF NOT LESS THAN 1 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 IS INDICATED.

- INCREASE DUCT SIZES GRADUALLY, NOT EXCEEDING 15-DEGREE TRANSITION ANGLE WHEREVER POSSIBLE NOT TO EXCEED 45 DEGREES ON CONCENTRIC TRANSITIONS AND 30 DEGREES ON ECCENTRIC TRANSITIONS.
- 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.
- MEDIUM PRESSURE SUPPLY AIR (SA): +6" WATER COLUMN.

- FABRICATE AND SUPPORT DUCTWORK IN ACCORDANCE WITH SMACNA - HVAC DUCT CONSTRUCTION STANDARDS. PROVIDE DUCT MATERIAL, GAUGES, AND REINFORCING FOR OPERATING PRESSURES INDICATED.

- REINFORCE DUCTS TO PREVENT BUCKLING, BREATHING, VIBRATIONS, OR UNNECESSARY NOISES, AS

MECH. SPECIFICATION (CONT)

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.

- CLEAN DUCT SYSTEM AND FORCE AIR AT HIGH VELOCITY THROUGH DUCT TO REMOVE ACCUMULATED DUST. TO OBTAIN SUFFICIENT AIR, CLEAN HALF SYSTEM AT A TIME. PROTECT EQUIPMENT WHICH MAY BE HARMED BY EXCESSIVE DIRT WITH TEMPORARY FILTERS, OR BYPASS DURING CLEANING.

- 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 REGISTER SHALL NOT EXTEND PAST THE SHEET METAL FLANGE SO AS 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

- FABRICATE MOTOR CONTROL DAMPERS IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE" AND AS INDICATED.
- PROVIDE BALANCING DAMPERS AS SHOWN AND AS REQUIRED TO BALANCE SYSTEM PROPERLY.
- PROVIDE DUCT SEALANT TO ALL JOINTS: HARDCAST UL 723 FOILED TAPE OR HARDCAST DUCT SEAL OR EQUAL.

C. INSULATION - DUCTWORK AND PIPING

- INSULATION SHALL BE MANUFACTURED BY OWENS-CORNING FIBERGLASS CORPORATION, CERTAINTTEED CORPORATION, KNAUF FIBER GLASS, MANVILLE CORPORATION.
- 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.
- GLASS CLOTH 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. / SQ. YD.
- IMPALE ANCHORS: GALVANIZED STEEL, 12 GAGE SELF-ADHESIVE PAD.
- TIE WIRE: ANNEALED STEEL, 16 GAGE.
- 2" THICK WITH 3.5 PCF MINIMUM HEAVY DENSITY FIBERGLASS PIPE INSULATION WITH PROTECTIVE REINFORCED AND SELF ADHESIVE JACKET. JOHNS MANVILLE MICRO-LOK OR APPROVED EQUAL.

D. AIR OUTLETS AND INLETS

- MANUFACTURERS SHALL BE METALAIRE, KRUEGER MANUFACTURING COMPANY, OR TITUS PRODUCTS, OR AS SPECIFIED IN PLANS.

E. PIPING

1. COPPER TUBE AND FITTINGS

- DRAWN-TEMPER COPPER TUBING: ASTM B 88, TYPE L.
- ANNEALED-TEMPER COPPER TUBING: ASTM B 88, TYPE K.
- WROUGHT-COPPER FITTINGS: ASME B16.22.
- WROUGHT-COPPER UNIONS: ASME B16.22.
- SOLDER FILLER METALS: ASTM B 32, 95-5 TIN ANTIMONY
- CAST IRON PIPE: HUBLESS CISPI 301. FITTINGS TO BE CAST IRON. COUPLING: COUPLING SHALL BE HEAVY DURY NEOPRENE GASKET WITH 4 STAINLESS STEEL CLAMP AND SHIELD ASSEMBLIES. CLAMP-ALL OR HUSKY.

2. STEEL PIPE AND FITTINGS

- STEEL PIPE: ASTM A53 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.

3. PIPING APPLICATIONS

- ABOVE GROUND, WITHIN BUILDING, FOR HYDRONIC HEATING SUPPLY AND RETURN, CONDENSATE DRAIN, PUMPED CONDENSATE DRAIN, AND AIR: TYPE L HARD DRAWN COPPER TUBING. SOLDER JOINT.
- AIR (A) - TYPE L COPPER - BRAZED AND PURGED.
- ABOVE GROUND, WITHIN BUILDING, FOR STORM DRAIN: CAST IRON PIPING. HEAVY DUTY 4 BANDS STAINLESS STEEL COUPLING.

4. VALVES

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

5. PIPING INSTALLATION

- INSTALL DRAINS, CONSISTING OF A TEE FITTING, NPS 3/4 BALL VALVE, AND SHORT NPS 3/4 THREADED NIPPLE WITH CAP, AT LOW POINTS IN PIPING SYSTEM MAINS AND ELSEWHERE AS REQUIRED FOR SYSTEM DRAINAGE.
- INSTALL HYDRONIC PIPING AT A UNIFORM GRADE OF UPWARD IN DIRECTION OF FLOW.
- REDUCE PIPE SIZES USING ECCENTRIC REDUCER FITTING INSTALLED WITH LEVEL SIDE UP.
- UNLESS OTHERWISE INDICATED, INSTALL BRANCH CONNECTIONS TO MAINS USING TEE FITTINGS IN MAIN PIPE, WITH 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.
- INSULATE PIPING PER MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE DIELECTRIC FITTING'S AND ANY ADDITIONAL MEANS AND METHODS AS REQUIRED TO PREVENT ELECTROLYSIS.

F. HANGERS AND SUPPORTS

- ADJUSTABLE STEEL CLEVIS HANGERS FOR INDIVIDUAL HORIZONTAL PIPING LESS THAN 20 FEET LONG.
- SPRING HANGERS TO SUPPORT VERTICAL RUNS
- NPS 3/4. MAXIMUM SPAN, 5 FEET, MINIMUM ROD SIZE, 1/4 INCH.
- PROVIDE PIPING SUPPORT PER UPC TABLE 3-1 AND 3-2.

G. TERMINAL EQUIPMENT CONNECTIONS

- SIZE FOR SUPPLY AND RETURN PIPING CONNECTIONS SHALL BE SAME AS FOR EQUIPMENT

MECH. SPECIFICATION (CONT)

CONNECTIONS.
 2. INSTALL VALVES IN ACCESSIBLE LOCATIONS CLOSE TO CONNECTED EQUIPMENT.
 3. INSTALL PORTS FOR PRESSURE AND TEMPERATURE GAGES AT COIL INLET CONNECTIONS.

H. ADJUSTING

- PERFORM THESE ADJUSTMENTS BEFORE OPERATING THE SYSTEM.
- OPEN VALVES TO FULLY OPEN POSITION. CLOSE COIL BYPASS VALVES.
- SET TEMPERATURE CONTROLS SO ALL COILS ARE CALLING FOR FULL FLOW.

J. HVAC INSTALLATION

- INSTALL HVAC UNIT UNITS LEVEL AND PLUMB. MAINTAIN SUFFICIENT CLEARANCE FOR NORMAL SERVICE AND MAINTENANCE.
- INSTALL PIPING ADJACENT TO AIR TERMINAL UNITS TO ALLOW SERVICE AND MAINTENANCE.

K. FIELD QUALITY CONTROL

- PERFORM THE FOLLOWING FIELD TESTS AND INSPECTIONS AND PREPARE TEST REPORTS:
 - AFTER INSTALLING HVAC UNITS/AIR TERMINAL UNITS AND AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, TEST FOR COMPLIANCE WITH REQUIREMENTS.
 - 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.

- ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.

- REMOVE AND REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED ABOVE.

M. TESTING, ADJUSTING, AND BALANCING

- REQUIREMENTS INCLUDE MEASUREMENT AND ESTABLISHMENT OF THE FLUID QUANTITIES OF THE MECHANICAL SYSTEMS AS REQUIRED MEETING DESIGN SPECIFICATIONS, AND RECORDING AND REPORTING THE RESULTS.

- TEST, ADJUST, AND BALANCE THE FOLLOWING MECHANICAL SYSTEMS:

- SUPPLY AIR SYSTEMS, ALL PRESSURE RANGES.

- PROVIDE FINAL BALANCING REPORT UPON THE COMPLETION OF THE PROJECT. SUBMIT TEST AND BALANCE REPORT TO OWNER FOR APPROVAL.

N. CONTROLS

- SCOPE: PERFORM BY OWNER

- PROVIDE MONITORING AND CONTROL FOR THE FOLLOWING MECHANICAL SYSTEMS:

- SUPPLY AIR SYSTEMS.



Cramer Hall - Room S42 Telecom HVAC Remodel
 Project Specifications
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SHEET TITLE

Specifications

2 OF 4

M0.2

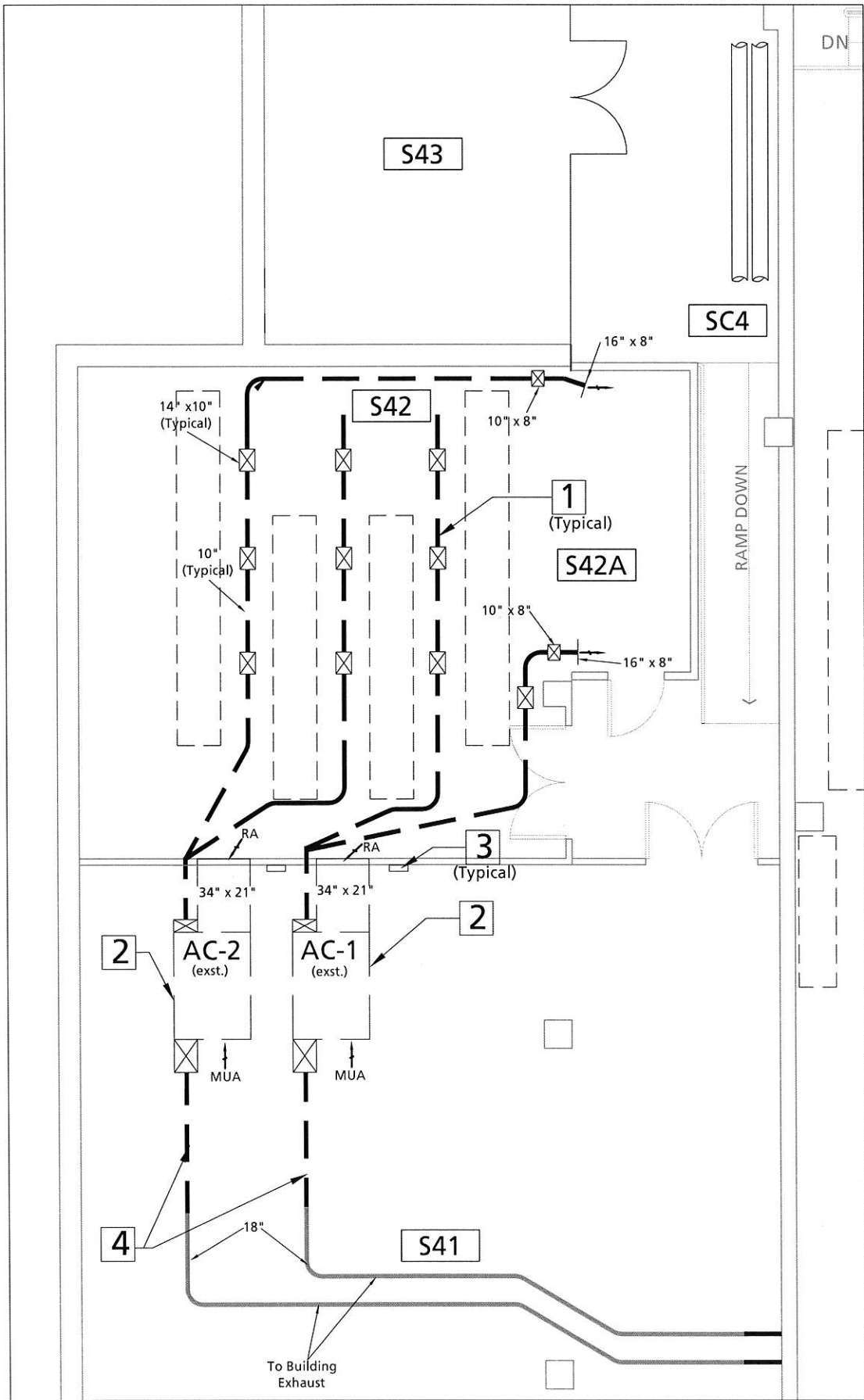


Important General Notes

- i Due to the importance of the space contractor required to create a logistics plan which outlines the execution of the applicable demolition and construction of the work. This space needs to be in full operation throughout the project. Owner to approve logistics plan prior to work commencing.
- ii Contractor required to create a job specific safety plan. Owner to approve prior to work commencing.
- iii Under no circumstances can this space be without a minimum of 10 tons of cooling. Contractor to provide a minimum 10 tons of temporary cooling during construction. Contractor required to monitor room temperature. Room temperature must not exceed 80 F, if this occurs contractor to stop work until room normalizes.
- iv Contractor to not de-energize any pieces of equipment without advanced written PSU approval. This excludes the applicable project HVAC equipment.
- v During the demolition and construction of any overhead work contractor is required to provide plastic covering under the immediate area in which work is being performed and which covers the equipment and equipment racks. No more than two server racks can be covered at one time due to the cooling requirements of the equipment. During demolition duct work is to be demolished / installed in 3' - 5' sections in which are manageable and will not potentially damage the rooms equipment. A shop vac needs to be in use during all work in order to capture debris.
- vi PSU control technicians to provide all new components, wiring and programming related to DDC controls.

Plan Notes

- 1 Contractor to demo all existing supply duct work and corresponding supply grilles.
- 2 Contractor to demo existing air conditioning units AC-1 and AC-2. Existing control devices and wiring to be demolished by PSU crews, existing discharge air temperature sensor to be salvaged and re-used for new units.
- 3 Contractor to demo existing electrical disconnect and control panel. Demo corresponding wiring back to existing panel 2TC.
- 4 Contractor to demo existing exhaust duct work.



1 CH Room S41 and S42 - Demo Plan

SCALE: 1/8"=1'-0"

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Cramer Hall - Room S42 Telecom HVAC Remodel Demo Plan
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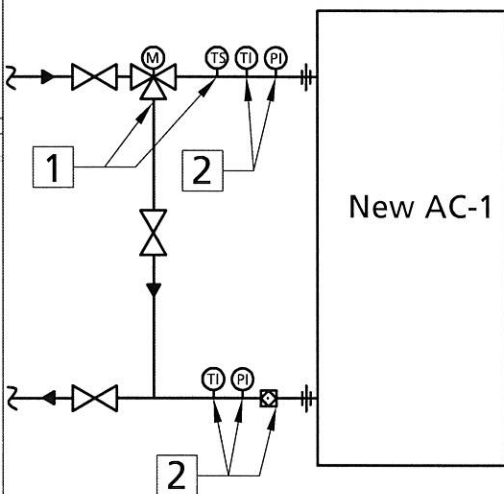
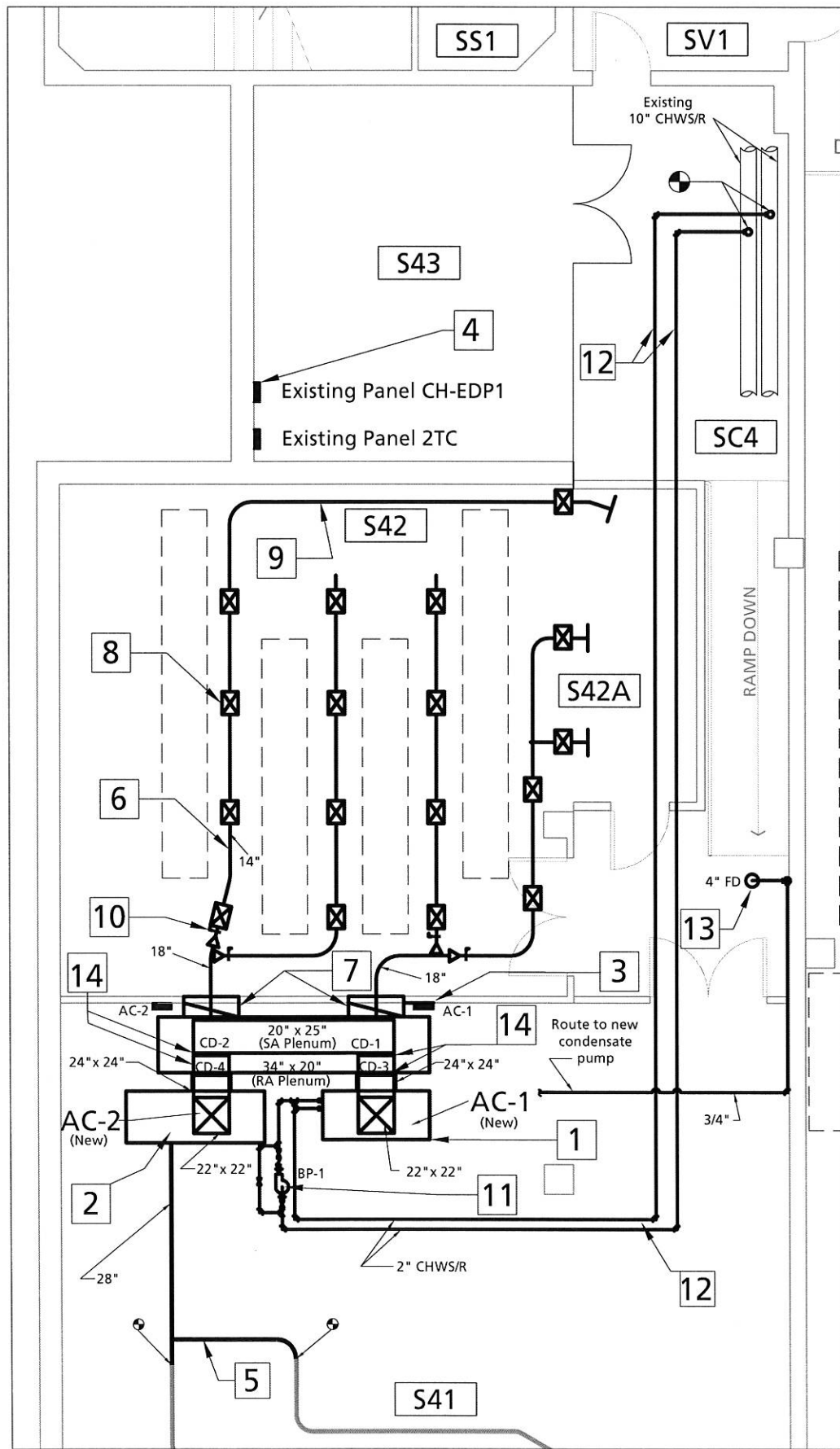
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SHEET TITLE

Demo Plan
3 OF 4





2 CH - AC-1 UNIT SCHEMATIC
M2 SCALE: NTS

Plan Notes 2/M2

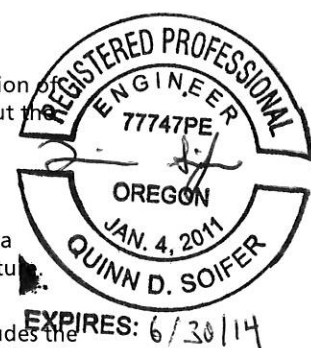
- 1 Owner to provide new 3-way valve and temperature sensor contractor to install. 3-way valve to maintain 65 F condenser water temperature to AC-1.
- 2 Provide new temperature and pressure gauges, shut off valve's and circuit setter. Circuit setter to be B&G or approved equal, size to meet flow requirements.

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1 CH - HVAC PLAN-NEW WORK
M2 SCALE: 1/8"=1'-0"

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- vi PSU control technicians to provide all new components, wiring and programming related to DDC controls.



Plan Notes 1/M2

- 1 Contractor to provide new air conditioning units AC-1. New AC-1 unit shall be Trane 10 ton midrange vertical self-contained unit model: SCWH100 or approved equal. AC units fans to be rated for 4000 CFM at 0.7 in wg. Unit is sized for 65 F entering condenser water and 70 F DB / 62 F WB entering air temperature and weighs 984 pounds Configuration to be vertical discharge front return. Contractor to provide structural / seismic calculation for City of Portland, anchor to structure accordingly. Provide two speed motor and unit mounted thermostat these are to be field installed. Relocate overhead lighting accordingly in order to install new units, coordinate new light locations with owner. PSU controls to provide discharge temperature sensor, contractor to install.
- 2 Contractor to provide new air conditioning units AC-2. New AC-2 unit shall be Trane 10 ton commercial self-contained integral air-cooled unit model: SCIJ100 or approved equal. AC units fans to be rated for 4000 CFM at 0.7 in wg. Unit is sized for 65 F entering condenser water and 70 F DB / 62 F WB entering air temperature and weighs 1342 pounds. Configuration to be vertical discharge front return. Contractor to provide structural / seismic calculation for City of Portland, anchor to structure accordingly. Provide two speed motor and unit mounted thermostat these are to be field installed. Relocate overhead lighting accordingly in order to install new units, coordinate new light locations with owner. PSU controls to provide discharge temperature sensor, contractor to install.
- 3 Contractor to provide new service disconnects for AC-1 and AC-2. Wire new service disconnects to panel EDP-1.
- 4 Contractor to provide new 208V plugs for 5 ton temporary cooling unit wire into panel CH-EDP-1. Contractor to provide temporary cooling as required.
- 5 Provide new 28" duct work and connect to new AC-2 condenser. Tie in existing 20" duct work into new 28" header. Air balance condenser air to 6000 CFM, re-sheave existing exhaust fan accordingly. Insulate per code.
- 6 All new supply air duct work in telecom room to be 14" in diameter unless otherwise noted.
- 7 Existing 34" x 20" return air openings to remain. Tie existing openings into new return air plenum.
- 8 All new supply diffusers to be 14" x 6" shoemaker SD-34-O or approved equal. Air balance to 285 CFM and direct flow towards server racks.
- 9 Provide transitions to equivalent 14" round rectangular ducting in this area as needed in order to avoid existing obstructions.
- 10 Contractor to provide new 14" manual balancing dampers. New balancing dampers shall be a Shoemaker 300P-R series or approved equal. Typical of four.
- 11 Provide new booster pump, BP-1. BP-1 shall be Grundfos model: CR 10-1 or approved equal. BP-1 are sized for 38.5 GPM and 42 ft of head. Provide 2" bypass, unions, check valve and butterfly valves. PSU crews to install start / stop control on new pumps.
- 12 Contractor to provide hot taps in order to take off of existing 10" CHWS/R piping with new. Route new 2" CHWS/R piping to AC-1. New piping shall be schedule 40 black iron with screwed fittings route as high as possible to structure. New piping to be insulated and labeled per code. Provide drain valves at piping low points and provide dielectric fitting's where applicable.
- 13 Contractor to provide new condensate pump that serves AC-1 and AC-2, route new condensate piping to existing 4" floor drain. New condensate piping to be type L copper, wirzbo or approved equal.
- 14 Contractor to provide new control damper's CD-1, CD-2, CD-3 and CD-4. New dampers shall be Ruskin CD-36, opposed blade, or approved equal. Owner to provide all actuators, control wiring and programming. CD-1 and CD-2 shall be 22" x 22" and installed on the discharge side of AC-1 and AC-2. CD-3 and CD-4 shall be 24" x 24" and installed on the return side of AC-1 and AC-2. All new duct work in room S41 to be insulated per code.

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 HVAC Plan - New Work
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SHEET TITLE

