Montana State University Tietz Hall Cage Washer Replacement, PPA 22-0541

100% Construction Drawings

07/31/23



1 Vicinity Map - Montana State University NTS

- TIETZ HALL

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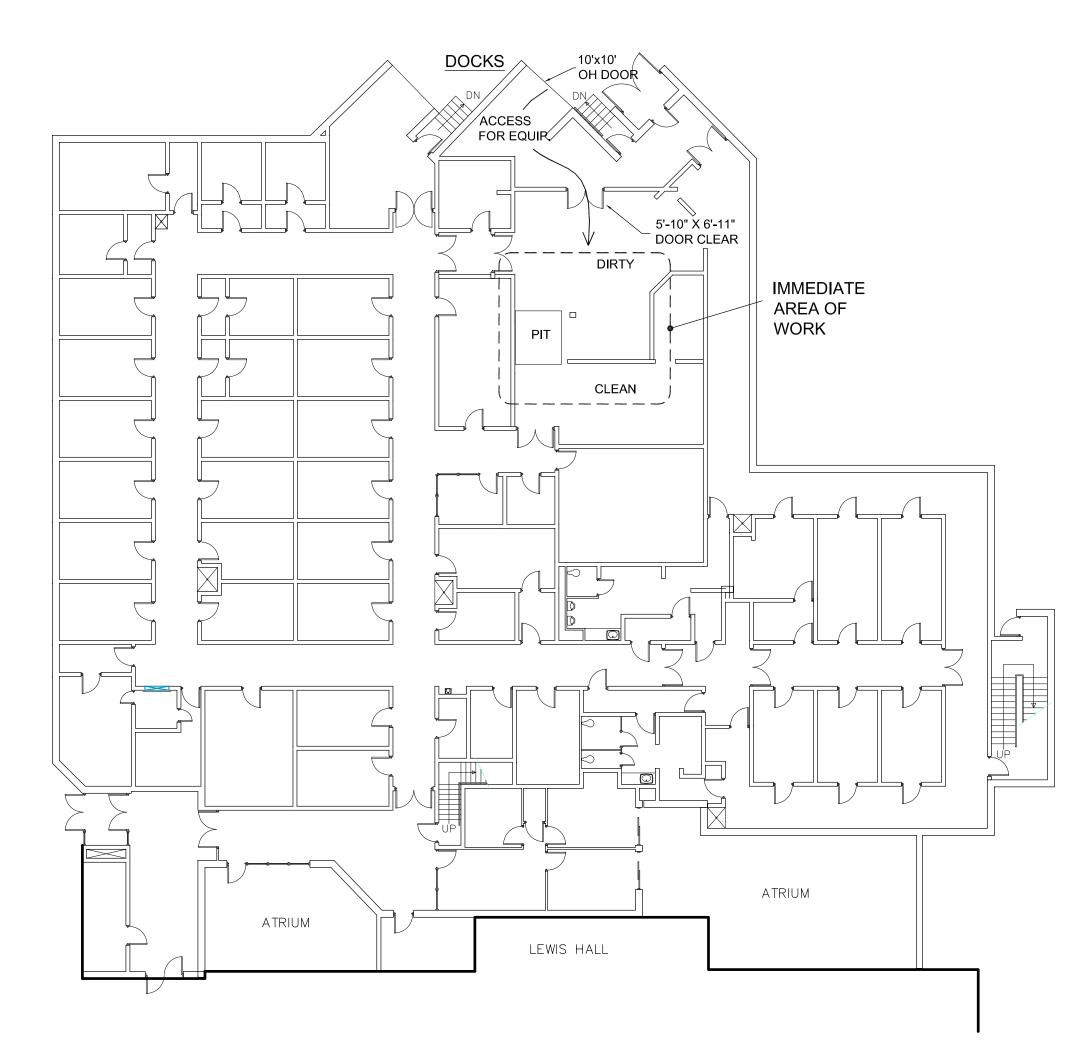
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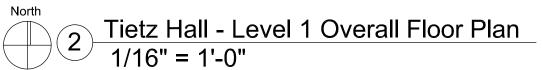
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CAGE WASHER REP



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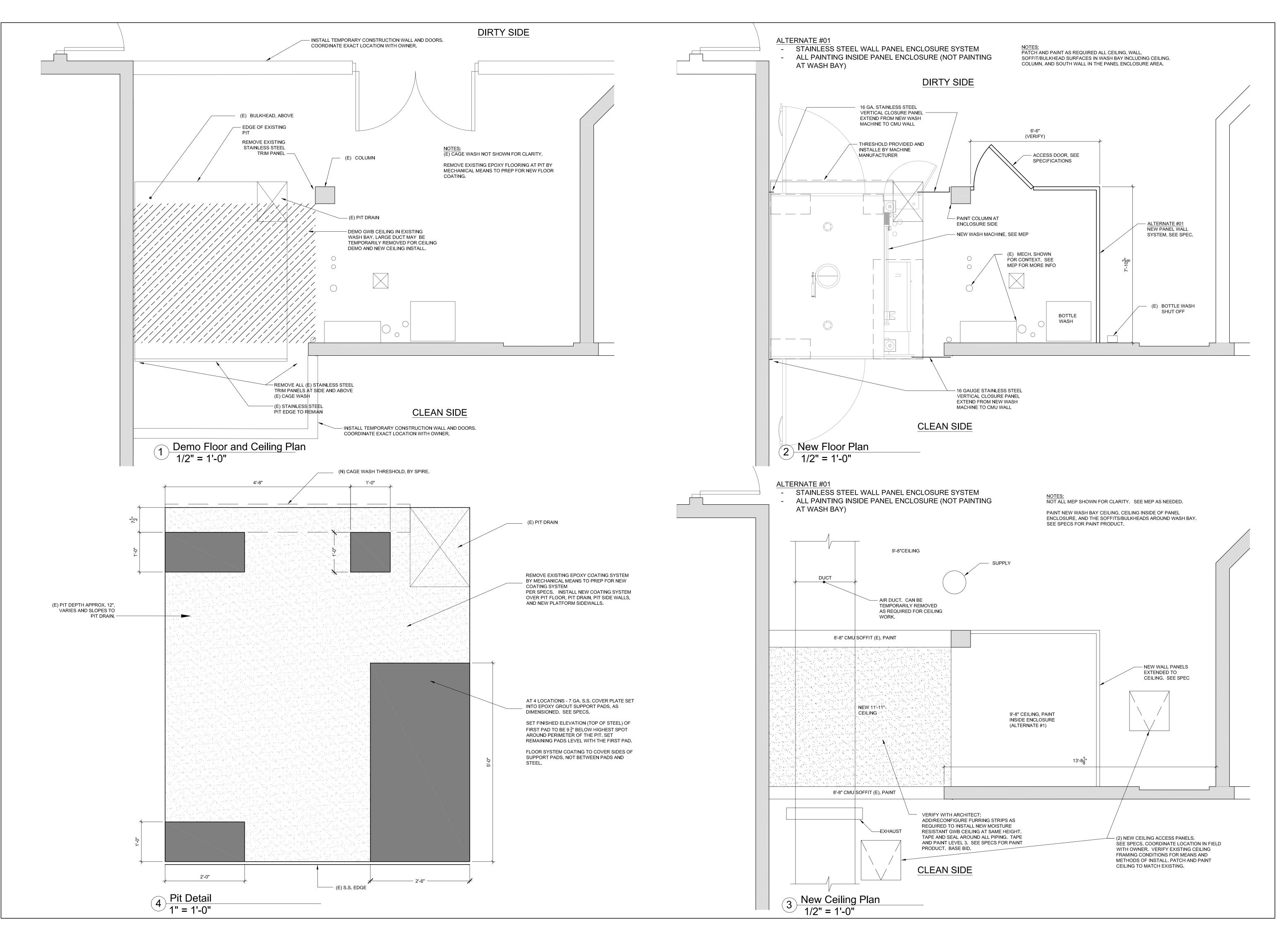
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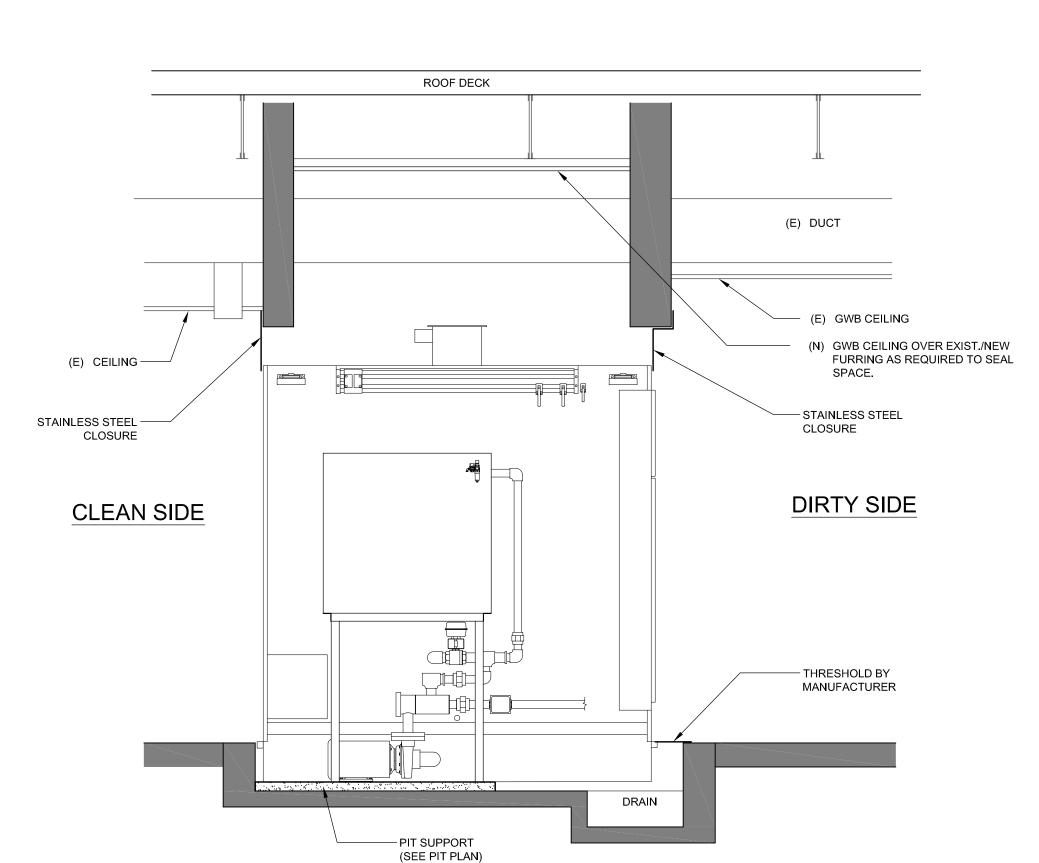
PLAN VIEWS

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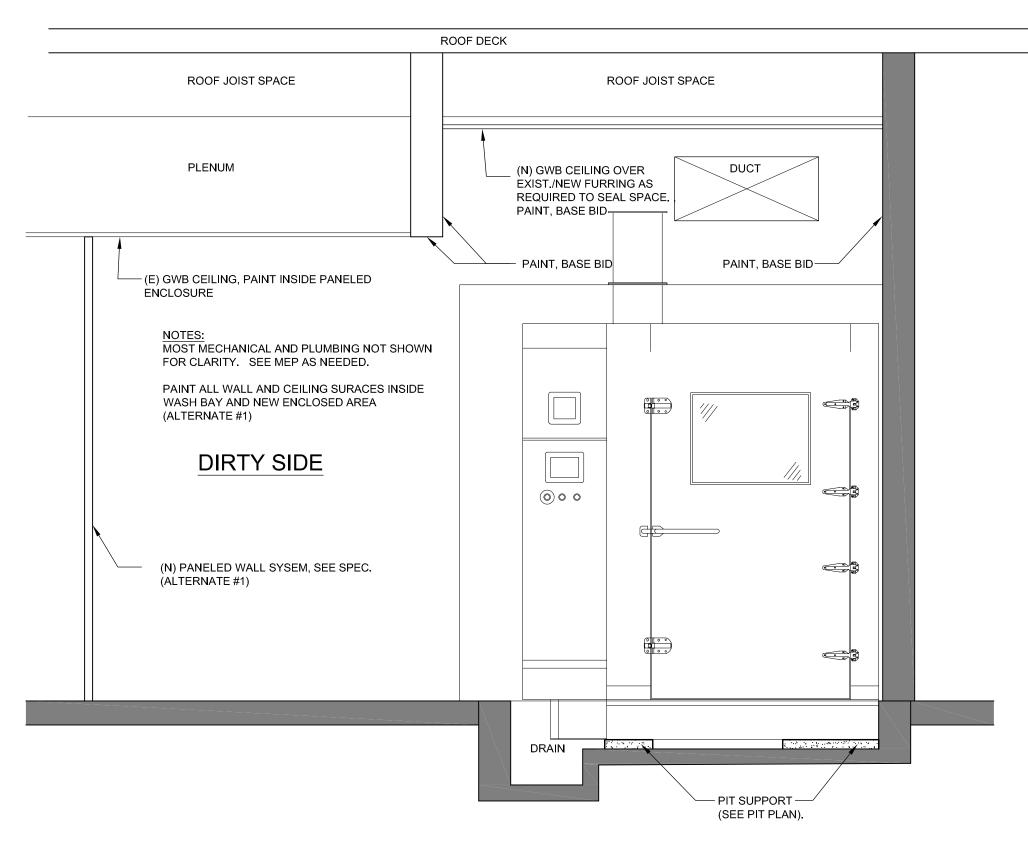
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ALTERNATE #01

- STAINLESS STEEL WALL PANEL ENCLOSURE SYSTEM
- ALL PAINTING INSIDE PANEL ENCLOSURE (NOT PAINTING AT WASH BAY)



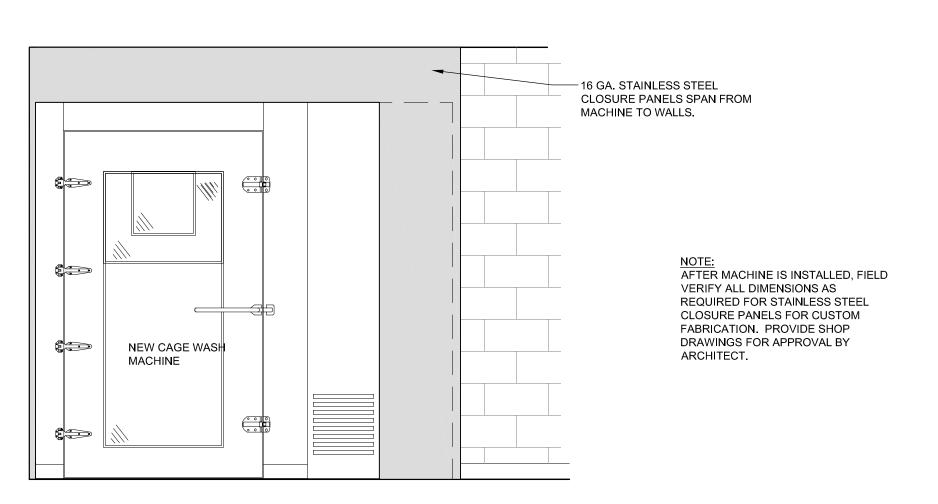
1 Clean / Dirty Wall Section 1/2" = 1'-0"



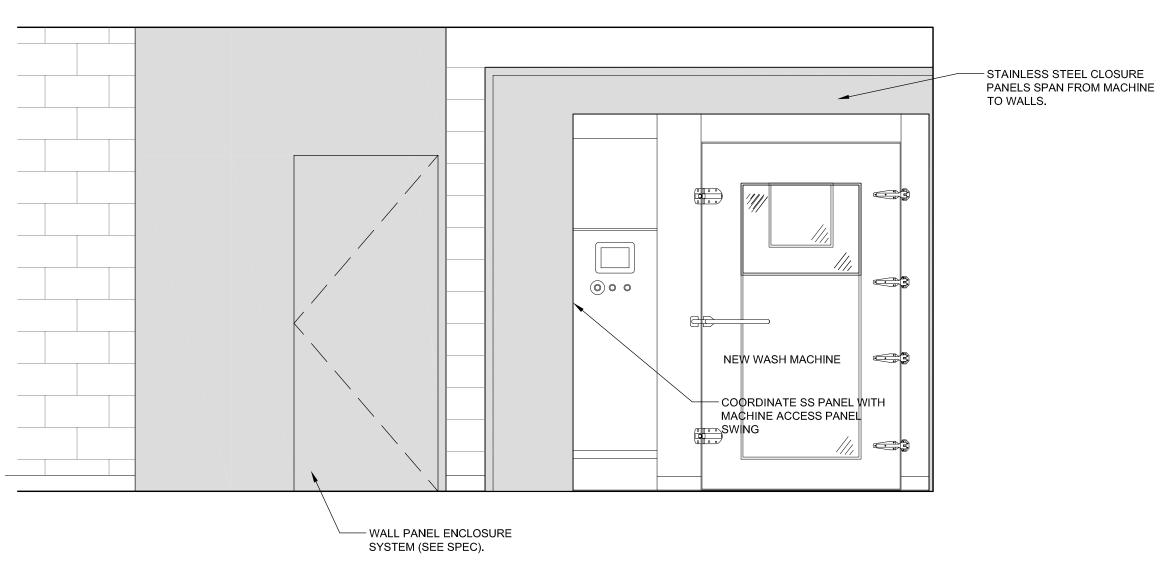
Dirty Side Wall Section

ALTERNATE #01

STAINLESS STEEL WALL PANEL ENCLOSURE SYSTEM
 ALL PAINTING INSIDE PANEL ENCLOSURE (NOT PAINTING AT WASH BAY)



3 Clean Side South Wall Elevation 1/2" = 1'-0"



4 Dirty Side North Wall Elevation
1/2" = 1'-0"

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A1.2

GENERAL WORK SEQUENCE NOTES:

THIS IS AN ACTIVE RESEARCH ANIMAL HOUSING FACILITY THAT DEPENDS UPON DIRECTIONAL AIRFLOW PATTERNS TO CONTROL AND PREVENT DISEASE IN THE ANIMAL POPULATIONS. IT IS CRITICAL THAT DISRUPTIONS TO HVAC SYSTEMS OPERATIONS AND DISRUPTIONS TO CRITICAL AIRLFOW ORIENTATIONS ARE MINIMZED. IT IS INTENDED THAT THE ENTIRE INSTALLATION CAN OCCUR WITH LIMITED OUTAGES AND AVOID AIRFLOW REVERSAL IN CRITICAL LOCATIONS. CAGEWASH OPERATIONS WILL BE MAINTAINED IN THE AREAS SURROUNDING THE WORK. THE CONTRACTOR(S) SHALL DO EVERYTHING POSSIBLE TO CONTROL ODORS AND DUST, SHALL CLEAN THE PREMISES DAILY, AND SHALL PERFORM WORK IN A MANNER AND AT TIMES THAT DO NOT UNDULY DISRUPT OPERATION OF THE BUILDING OR THE WORK OF ITS STAFF.

ALTERNATE BID ITEM #1

AS PART OF ALTERNATE BID ITEM # 1, FIRE SPRINKLER HEAD(S) SHALL BE ADDED AS DESCRIBED ON SHEET M3.1. A TRANSFER AIR GRILLE, AS SCHEDULED ON THIS SHEET, SHALL BE INSTALLED AS SHOWN ON SHEET M3.2. SEE COMPLETE DRAWING SET AND SPECIFICATIONS FOR A MORE DETAILED OVERVIEW OF ALTERNATE BID ITEM #1.

PLUMBING & MECHANICAL LEGEND PIPING SYMBOLS GENERAL MECHANICAL SYMBOLS NOTE DESIGNATION DOMESTIC COLD WATER ———DHW——— DOMESTIC HOT WATER PROCESS COLD WATER SECTION REFERENCE -----PHW------PROCESS HOT WATER DETAIL REFERENCE COMPRESSED AIR SANITARY SEWER EQUIPMENT IDENTIFICATION MARK SANITARY VENT STORM DRAIN GRILLE OR DIFFUSER MARK — BALANCE CFM CONDENSATE SPECIALTY EQUIPMENT DRAIN **DUCT WORK AND SPECIALTIES** SHEET METAL DUCT 12"x8" (FIRST FIGURE INDICATES GUIDE TO LINE WEIGHTS FOR MECHANICAL ITEMS FACING SIDE) ITEMS SHOWN LIGHT ARE EXISTING RECTANGULAR DUCT TAKEOFF AND TO REMAIN WITH VOLUME DAMPER ITEMS SHOWN BOLD AND SOLID ARE NEW ITEMS SHOWN BOLD AND DASHED _____ CONICAL SPIN-IN WITH ARE TO BE REMOVED VOLUME DAMPER ACCESS DOOR TURNING VANES RADIUSED ELBOW MOTORIZED DAMPER **OTHER ABBREVIATIONS** PIPE FITTINGS AND SPECIALTIES ACCESS DOOR ABOVE FINISH FLOOR (ELEVATION) ARCHITECT OR ARCHITECTURAL PLANS BACKDRAFT DAMPER CONCENTRIC REDUCER OR INCREASER CLEANOUT ECCENTRIC REDUCER OR INCREASER DUCTILE IRON PIPE VALVE IN VERTICAL PIPE DOWN BALL VALVE EXHAUST AIR FLOOR CLEANOUT FIRE DAMPER MOTORIZED TWO-WAY VALVE FIRE/SMOKE DAMPER MOTORIZED THREE-WAY VALVE IN JOIST SPACE IN WALL SPACE BACKFLOW PREVENTOR LIQUIFIED PETROLEUM GAS FLOW BALANCE DEVICE OUTSIDE (FRESH) AIR PRESSURE REDUCING VALVE MECHANICAL (CONTRACTOR) MANUFACTURER STRAINER NORMALLY CLOSED STEAM TRAP NORMALLY OPEN FLOW SWITCH RETURN AIR DIFFERENTIAL PRESSURE SENSOR SMOKE DAMPER MANUAL AIR VENT SHEET METAL AUTOMATIC AIR VENT STAINLESS STEEL INSTRUMENT GUAGE WELL (PETE'S PLUG) VOLUME DAMPER THERMOMETER/TEMPERATURE GAUGE WALL CLEANOUT WATER HAMMER ARRESTOR HOSE BIBB

GRILLES — REGISTERS — DIFFUSERS										
MARK	MFR		CA	ATALOG NO.		MATERIAL	FINISH	SIZE	NOTES	
INITINI	IVII IX	MODEL	FRAME	DAMPER	DEFLECTOR	MATERIAL	1 1101311	SIZL	NOTES	
1	KRUEGER	CRNRR	DUCT MOUNT	1	CONCENTRIC RINGS	STEEL	WHITE	10"ø NECK	1 STUB DUCT MOUNT SUPPLY DIFFUSER	
2	KRUEGER	91620	SURFACE MOUNT	OBD	15 DEGREE FIXED	STAINLESS STEEL	STANDARD #3 FINISH	12"x12"	2 TRANSFER AIR GRILLE	
ALL STEEL CONSTRUCTION SUPPLY DIFFUSER WITH DIRECTIONAL AIR PATTERN CONTROL OF 60 DEGREE AXIAL ADJUSTMENT AND 360 DEGREE ROTATION. THE DIFFUSER SHALL HAVE AN INTEGRATED ROUND DUCT REDUCER THAT FITS INSIDE THE END OF THE DUCTING.										

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(P) OR (/)

THERMOSTAT / SENSOR

RELIEF VALVE

PRESSURE GAUGE

(2) ITEM IS PART OF ADD ALTERNATE BID ITEM #1. HEAVY DUTY TRANSFER AIR GRILLE CONSTRUCTED OF 14 GAUGE 304 STAINLESS STEEL WITH 1/8" BARS AT 1/2" SPACING AND 20 GAUGE STAINLESS STEEL OPPOSED BLADE DAMPER WELDED TO GRILLE AND OPERATED BY SCREWDRIVER.

MISCELLANEOUS EQUIPMENT SCHEDULE

CAGE WASHER COLD WATER PRESSURE REDUCING VALVE (PRV-1):

2" CALEFFI PRESCAL 535H SERIES PRE-ADJUSTABLE PRESSURE REDUCING VALVE WITH THREADED CONNECTIONS, DRZ LOW-LEAD BRASS BODY, GLASS REINFORCED NYLON HOUSING, PRESSURE BALANCED SEATS, EPDM DIAPHRAGM AND SEALS, PTFE COMPENSATION PISTON RINGS, STAINLESS STEEL STEM AND SEAT, 35MESH STAINLESS STEEL INTEGRAL STRAINER, 16 FPT DOWNSTREAM PRESSURE PORT WITH FACTORY INSTALLED 0-100PSIG PRESSURE GAUGE, AND DIAL INDICATOR WITH DIRECT READOUT FOR EASY ADJUSTMENT. UNIT SHALL BE RATED FOR A MAX WORKING PRESSURE OF 300PSI, A MAX WORKING TEMPERATURE OF 180°F, AND A 15-90PSI DOWNSTREAM PRESSURE ADJUSTMENT. UNIT SHALL HAVE NO MORE THAN A 9.0 PSI PRESSURE DROP AT 60GPM. PROVIDE CALEFFI MODEL NUMBER '535391HA' PRESSURE REDUCING VALVE OR APPROVED EQUAL.

CAGE WASHER COLD WATER PRESSURE REDUCING VALVE (PRV-2):

2" CALEFFI PRESCAL 535H SERIES PRE-ADJUSTABLE PRESSURE REDUCING VALVE WITH THREADED CONNECTIONS, DRZ LOW-LEAD BRASS BODY, GLASS REINFORCED NYLON HOUSING, PRESSURE BALANCED SEATS, EPDM DIAPHRAGM AND SEALS, PTFE COMPENSATION PISTON RINGS, STAINLESS STEEL STEM AND SEAT, 35MESH STAINLESS STEEL INTEGRAL STRAINER, 16" FPT DOWNSTREAM PRESSURE PORT WITH FACTORY INSTALLED 0-100PSIG PRESSURE GAUGE, AND DIAL INDICATOR WITH DIRECT READOUT FOR EASY ADJUSTMENT. UNIT SHALL BE RATED FOR A MAX WORKING PRESSURE OF 300PSI, A MAX WORKING TEMPERATURE OF 180°F, AND A 15-90PSI DOWNSTREAM PRESSURE ADJUSTMENT. UNIT SHALL HAVE NO MORE THAN A 8.0 PSI PRESSURE DROP AT 50GPM. PROVIDE CALEFFI MODEL NUMBER '535391HA' PRESSURE REDUCING VALVE OR APPROVED EQUAL.

CAGE WASHER COMPRESSED AIR PRESSURE REDUCING VALVE (PRV-3):

BRASS BODY HIGH FLOW REGULATOR FOR COMPRESSED AIR, FACTORY PRECLEANED FOR OXYGEN SERVICE, WITH 1/2" NPT CONNECTIONS RATED FOR 100 SCFM FOR A 0-250 PSIG INLET PRESSURE AND 0-150 PSIG OUTLET PRESSURE. PROVIDE AMICO MODEL R10 OR EQUAL PRESSURE REGULATOR VALVE ASSEMBLY WITH ADJUSTMENT KNOB & 0-300 PSIG DIAL GAUGE. SEE SECTION 226313 FOR ADDITIONAL REQUIREMENTS.

IRIS STYLE BALANCE DAMPER WITH AIRTIGHT CONSTRUCTION, DUAL PRESSURE TAPS, ±5% MEASUREMENT ACCURACY, AND LINEAR RESPONSE FLOW CONTROL. PROVIDE FANTECH MODEL NUMBER 'IR10' OR APPROVED EQUAL. SEE SHEET M3.2 FOR LOCATIONS.

BALANCE DAMPER BD-3:

INTERNALLY DUCT MOUNTED OPPOSED BLADE DAMPER WITH REMOTE MOUNTED OPERATOR. PROVIDE INTERNALLY DUCT MOUNTED DAMPER FOR 18"WIDE BY 8"TALL DUCT PER REQUIREMENTS IN SPECIFICATIONS AND YOUNG REGULATOR REMOTE DAMPER OPERATOR MODEL NUMBER '270—315BC' CEILING TERMINATION OR APPROVED EQUAL. SEE SHEET M2.1 FOR LOCATION.

OPPOSED BLADE BALANCE DAMPER FOR TRANSFER AIR OPENING, SEE SPECIFICATIONS FOR REQUIREMENTS AND SHEET M2.1 FOR LOCATION.

SUBMIT COMPLETE MANUFACTURER'S DATA FOR ALL MISCELLANEOUS EQUIPMENT SCHEDULED ON THIS SHEET AND COMPLY WITH ALL GENERAL SUBMITTAL REQUIREMENTS AS FOUND IN SECTION 230000 OF SPECIFICATIONS.

FLOW BALANCE DEVICE SCHEDULE													
UNIT SERVED	DEVICE TYPE	MANUFACTURER	BRANCH SIZE	SUPPLY DEVICE	RETURN DEVICE	FLOW (GPM)	PRESSURE DROP	NOTES					
CAGE WASHER	MANUAL	IMI FLOW DESIGN	11⁄4"	UAZ125		60.0	0.78 PSIG	1 CAGE WASHER COLD WATER					
CAGE WASHER	MANUAL	IMI FLOW DESIGN	11⁄4"	UAZ125		50.0	0.54 PSIG	1 CAGE WASHER HOT WATER					

1) BALANCING VALVE WITH FIXED (VENTURI) ORIFICE, NPT FEMALE BY FEMALE THREADED CONNECTIONS, LOW-LEAD BRASS BODY (< 0.25% LEAD CONTENT) COMPLYING WITH NSF/ANSI 372, 316 STAINLESS STEEL BALL AND BLOWOUT PROOF STEM, PTFE SEATS AND PACKING NUT, SHUTOFF HANDLE WITH MEMORY STOP AND VINYL COATED GRIP, AND DUAL TEMPERATURE AND PRESSURE PORTS. VENTURI CV SHALL BE NO LESS THAN 65. LISTED FLOWS ARE SPECULATIVE.

	BACKFLOW PREVENTER SCHEDULE												
MARK	MANUFACTURER	MODEL	SIZE	TYPE	FLOW (GPM)	DP (PSIG)	LOCATION	NOTES					
BFP 1	WATTS	009	11⁄4"	RPZ	60	15	CAGEWASH 123A	1 CAGE WASHER COLD WATER					
BFP 2	WATTS	009	11⁄4"	RPZ	50	15	CAGEWASH 123A	1 CAGE WASHER HOT WATER					

1) ASSE 1013, LEAD—FREE, REDUCED PRESSURE ZONE BACKFLOW PREVENTER WITH BRONZE BODY CONSTRUCTION, BRONZE BALL VALVE SHUTOFFS, AND AIR GAP DRAIN CONNECTION. UNIT SHALL BE RATED FOR 175 PSI AND 140°F. PROVIDE WITH AIR GAP DRAIN CONNECTION AND INLET STRAINER. PROVIDE WATTS MODEL LF009QT OR APPROVED EQUAL.

	FAN SCHEDULE												
					RMANCE			мот	OR				
NO.	MANUFACTURER	MODEL	DISCHARGE	CFM	S.P.	RPM	DBA	HP	V/PH/HZ	ENCL.	NOTES		
EF 3	LOREN COOK	ACRUD-HP 210R17D	UPBLAST	3100	2.00	1445	71	5	460V/3/60	TEFC	1 CAGE WASH HRV EXHAUST		
EF 4	LOREN COOK	ACRUD 135R17DOR70	UPBLAST	450	1.00	2139	73	3/4	460V/3/60	TEFC	2 CAGE WASHER EXHAUST		

1) ROOF MOUNTED, UPBLAST, CENTRIFUGAL EXHAUST FAN WITH DIRECT DRIVE FAN, ALL ALUMINUM HOUSING, BACKWARD INCLINED ALL ALUMINUM WHEEL, TWO PIECE TOP CAP WITH STAINLESS STEEL QUICK RELEASE LATCHES, WELDED CURB CAP CORNERS, STAINLESS STEEL BIRDSCREEN, PERMANENTLY LUBRICATED BALL BEARING MOTOR, CORROSION RESISTANT FASTENERS, AND WELDED ALUMINUM DRAIN TUBE. PROVIDE WITH ROOF CURB ADAPTER, DAMPER TRAY, GRAVITY BACKDRAFT DAMPER, AND NEMA 3 DISCONNECT. SEE SPECIFICATION 23400 FOR FAN REQUIREMENTS. FAN VFD SHALL BE PROVIDED BY THE TEMPERATURE CONTROLS CONTRACTOR.

(2) SAME AS NOTE 1 WITH THE FOLLOWING NOTE ADDED. PROVIDE UNIT WITH 24INCH SQUARE INSULATED, SEISMICALLY RATED, ROOF CURB EXTENSION. TOP OF ROOF CURB SHALL BE NO LESS THAN 36" ABOVE FINISHED ROOF LEVEL.

DATUM ELEVATION IS 4,900 FEET, STATIC PRESSURE IS IN INCHES WATER COLUMN, DBA IS THE A-RATED INLET/OUTLET SOUND PRESSURE LEVEL IN DECIBELS DURING NORMAL OPERATION ACCORDING TO AMCA STANDARD 301.

	STEAM TRAP SCHEDULE											
TRAP	UNIT SERVED	LOCATION	MFR	MODEL	TYPE	PIPE SIZE	ORIFICE SIZE	LBS./ HOUR	PRESS. DIFF.	NOTES		
ST 1	STEAM DRIP	CAGEWASHER 123A	SPIRAX/SARCO	FT-75	FLOAT & THERM.	3/4"	0.166"	1120	40 PSID	1		
ST 2	CAGE WASHER HEAT EXCHANGER	CAGEWASHER 123A	SPIRAX/SARCO	FT-75	FLOAT & THERM.	2"	0.421"	1100	1/2 PSID	1		

1) FLOAT AND THERMOSTATIC TRAP WITH STAINLESS STEEL INTERNALS. MAXIMUM OPERATING PRESSURE RATING UP TO 75 PSIG. BODY RATED FOR 125 PSIG AND 450°F.

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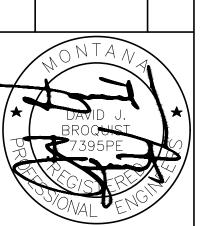
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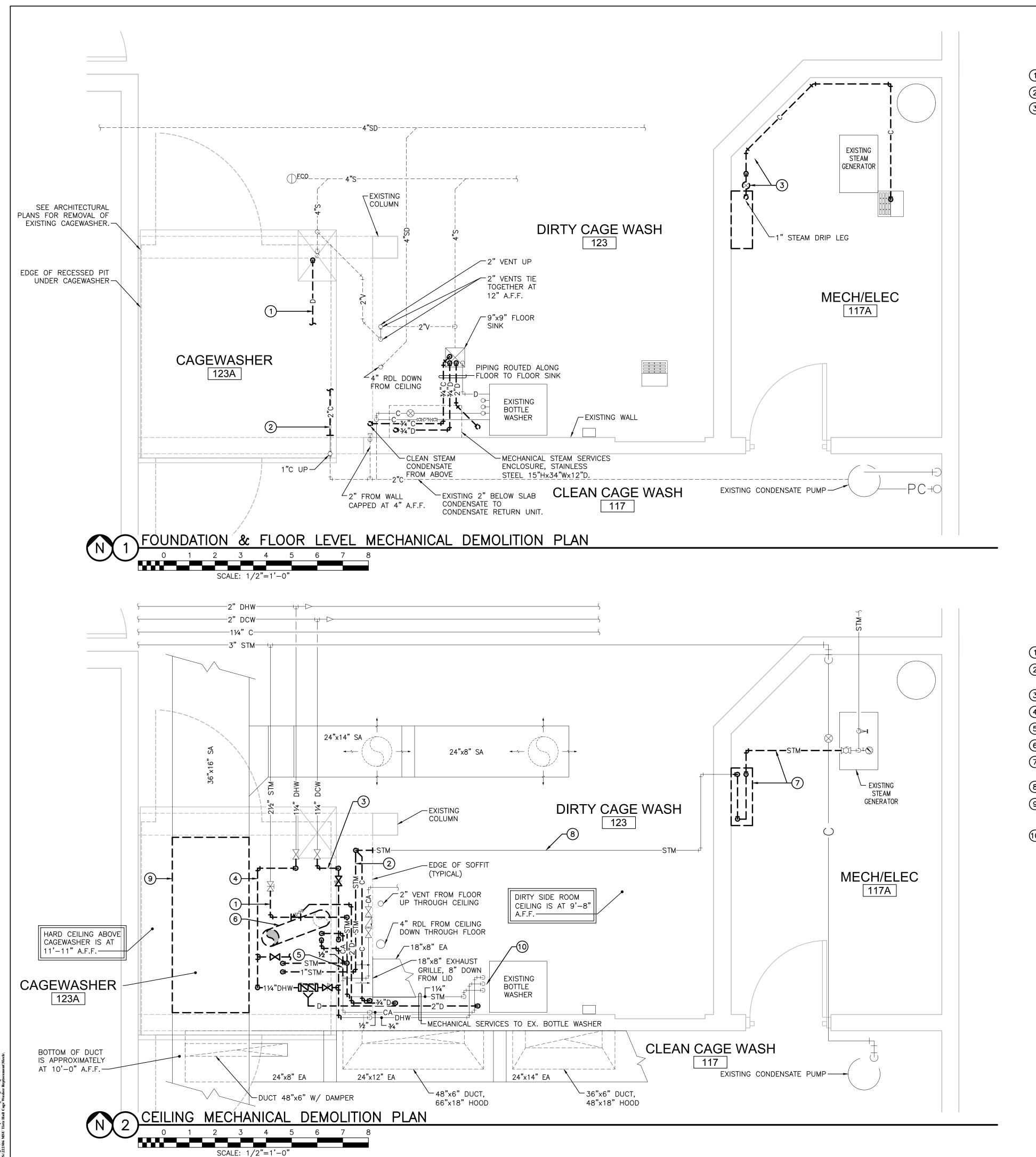
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MECHANICAL LEGEND
& SCHEDULES

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MECHANICAL NOTES:

- (1) REMOVE DRAIN SERVING EXISTING CAGEWASHER COMPLETE TO RECESSED PIT DRAIN SINK.
- (2) REMOVE 2" CONDENSATE SERVING EXISTING CAGEWASHER BACK TO EXTENT SHOWN.
- 3 REMOVE EXISTING STEAM TRAP, STEAM PIPING, AND CONDENSATE PIPING COMPLETE FOR 1" STEAM SERVING EXISTING CAGEWASHER BEING REMOVED.

NO DEMOLITION WORK SHALL START UNTIL INITIAL TEST AND BALANCE READINGS HAVE BEEN TAKEN BY THE TEST AND BALANCE CONTRACTOR.

- 2. CONTRACTOR SHALL FIELD VERIFY ALL PIPE AND DUCT SIZES AND LOCATIONS.
- 3. THINLY DASHED PIPING LINES ARE EXISTING UNDERSLAB PIPING. ALL UNDERSLAB PIPING SHALL REMAIN.

MECHANICAL NOTES:

- 1) REMOVE 21/2" STEAM FROM EXISTING CAGEWASHER BACK TO ISOLATION VALVE.
- 2 REMOVE 1" STEAM SERVING EXISTING CAGEWASHER BACK TO SOFFIT PENETRATION. TERMINATE PIPING AND ABANDON IN PLACE ABOVE THE CEILING.
- (3) REMOVE 1" DOMESTIC COLD WATER BACK TO ISOLATION VALVE.
- (4) REMOVE 11/4" DOMESTIC HOT WATER BACK TO ISOLATION VALVE.
- (5) REMOVE 1/2" COMPRESSED AIR SERVING EXISTING CAGEWASHER BACK TO BRANCH CONNECTION.
- 6 REMOVE EXISTING 8" Ø CAGEWASHER EXHAUST COMPLETE.
- 7 REMOVE EXISTING STEAM PIPING SERVING CAGEWASHER BEING REMOVED ALONG WITH METAL ENCLOSURE AND SUPPORTS COMPLETE BACK TO ISOLATION VALVE AT STEAM GENERATOR HEADER.
- (8) ABANDON EXISTING 1" STEAM PIPING IN PLACE ABOVE CEILING. LABEL BOTH ENDS.
- 9 REMOVE SECTION OF 36"x16" SUPPLY AIR DUCT, AND PROTECT FOR REINSTALLATION. SEE SHEET M2.1 FOR CAPPING OF DUCT ENDS AND TEMPORARY SUPPLY AIR DUCT SERVING OPERATIONAL DIRTY CAGEWASH
- (10) RESTORE ALL SERVICES TO BOTTLE WASHER.

NOTE:

SEE SHEET M2.1 AND M3.1 FOR DUCTWORK DEMOLITION ASSOCIATED WITH EXISTING ABANDONED EF-4.

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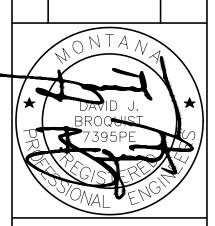
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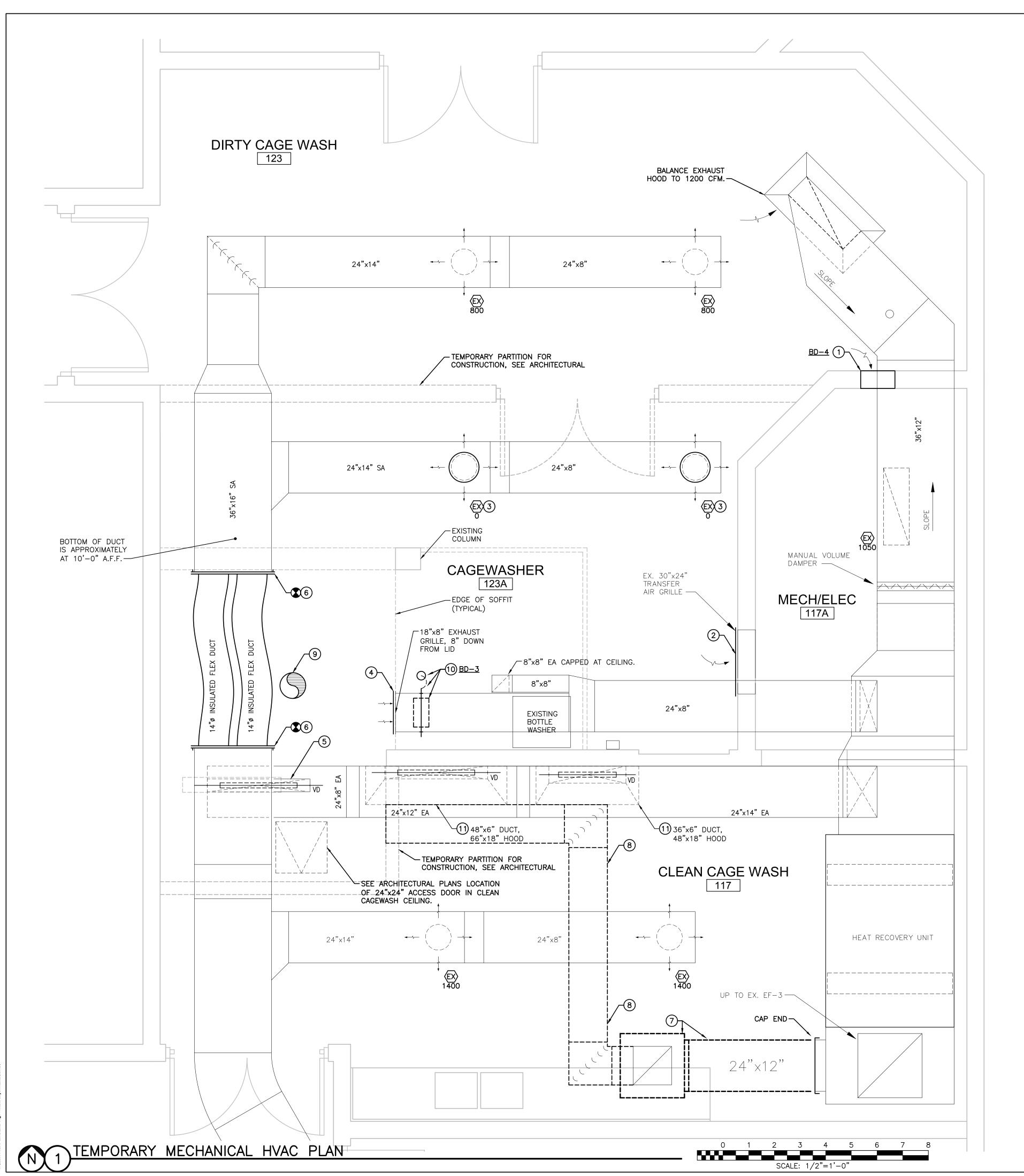
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MECHANICAL
DEMOLITION PLANS

SHEET

M1.1



MECHANICAL NOTES:

- 1) REMOVE 16" SQUARE SECTION OF CMU WALL. AT APPROXIMATELY 36" ABOVE FINISHED FLOOR. INSTALL OPPOSED BLADE DAMPER IN OPENING.
- 2 CAP EXISTING 30"x24" AIR TRANSFER OPENING AIR TIGHT.
- 3 CLOSE VOLUME DAMPER ON SUPPLY AIR DIFFUSER AND CAP DIFFUSER AIR TIGHT. SUPPLY AIR DIFFUSERS SHALL BE PROTECTED FROM CONSTRUCTION VAPORS, DUST AND DEBRIS. SUPPLY AIR DIFFUSERS PROTRUDE FROM THE CEILING IN A CYLINDRICAL FASHION.
- 4 CAP EXHAUST DUCT/GRILLE AIR AND WATER TIGHT TO PREVENT THE TRANSMISSION OF CONSTRUCTION DEBRIS, DUST OR VAPOR INTO LABORATORY EXHAUST SYSTEM.
- 5 CLOSE VOLUME DAMPER ON DUCT AND CAP DUCT TO BE AIR AND WATER TIGHT.
- 6 INSTALL FLANGED DUCTMATE CONNECTIONS ON OPEN ENDS OF EXISTING 36"x16" SUPPLY AIR DUCT. CAP OPEN DUCT ENDS. CONNECT FLEX DUCTS TO RECTANGULAR DUCT CAPS TO CONVEY SUPPLY AIR TO OPERATING SIDE OF DIRTY CAGEWASH. TEMPORARY SUPPLY AIR DUCTS SHALL BE AIR AND WATER TIGHT. THE INTENT OF INSTALLING FLEX DUCT IS TO ALLOW FOR CEILING REPLACEMENT.
- 7 REMOVE PORTION OF EXHAUST DUCT SERVING EXISTING EF-4 COMPLETE. SEE SHEET M4.1 FOR REMOVAL OF EXISTING EF-4.
- 8 POTENTIAL ROUTING OF VENTILATION DUCT FOR CONSTRUCTION PARTITION. IF MECHANICAL CONTRACTOR CHOOSES TO USE EXISTING EXHAUST DUCTWORK TO CONVEY SUPPLY AIR TO PARTITIONED CONSTRUCTION AREA, DUCTWORK SHALL BE CLEANED AND DISINFECTED BEFOREHAND. ROUTE DUCT TIGHT TO HARDLID CEILING TO SERVE CONSTRUCTION PARTITION.
- 9 EXISTING 8" EXHAUST DUCT ROOF PENETRATION CAN BE ENLARGED TO 12" AND USED FOR VENTILATION DURING DEMOLITION AND CONSTRUCTION.
- WHILE CAGEWASHER AREA SOFFIT IS REMOVED, INSTALL VOLUME DAMPER WITH REMOTE ACTUATOR IN 18"x8" EXHAUST AIR DUCT. INSTALL VOLUME DAMPER AS FAR DOWNSTREAM FROM EXISTING EXHAUST AIR GRILLE AS POSSIBLE. SEE MISCELLANEOUS EQUIPMENT SCHEDULE.
- 11) BALANCE EXISTING HOOD TO 425 CFM.

||NOTES: ||1. THIS PLAN DEPICTS TEMPORARY CONSTRUCTION DURING DEMOLITION AND NEW WORK.

2. CONSTRUCTION SHALL BE LIMITED TO THE GREATEST EXTENT POSSIBLE UNTIL TEST AND BALANCE CONTRACTOR HAS ACHIEVED AN AIR PRESSURE CASCADE AS DEPICTED ON SHEET M6.2 OR AS DIRECTED BY THE OWNER. THE INTENT IS TO MINIMIZE CONSTRUCTION DUST OR VAPORS FROM DISPERSING THROUGH THE FACILITY HVAC SYSTEM.



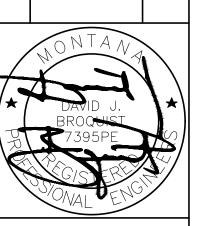
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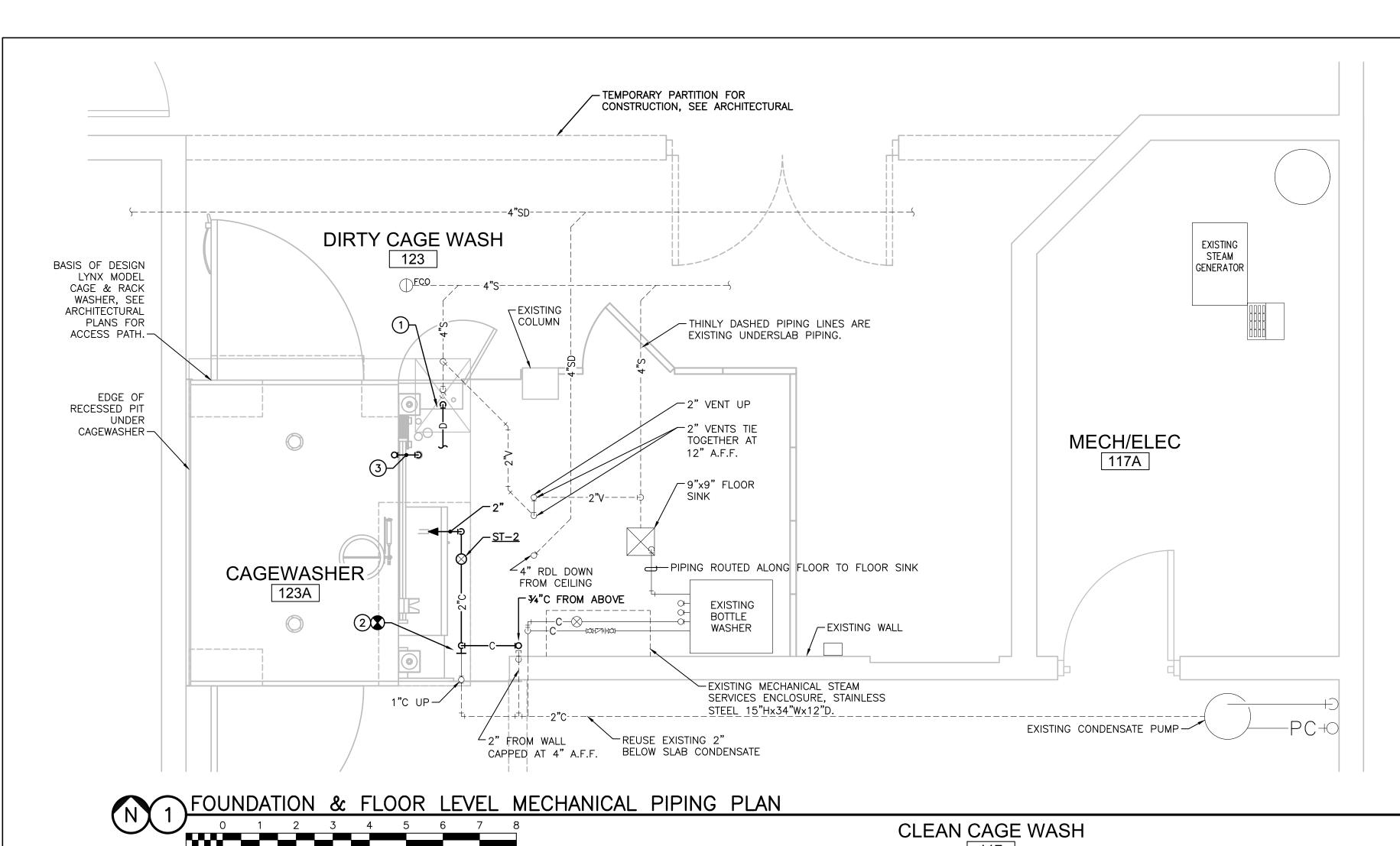
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SHEET TITLE CONSTRUCTION HVAC PLANS

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M2.1



117 -2" DCW-- TEMPORARY PARTITION FOR CONSTRUCTION, SEE ARCHITECTURAL −11⁄4" C-DIRTY CAGE WASH 123 FOR CAGEWASHER PIPING CAP END - FIXTH S INSTALLATION DIAGRAM, SEE / 1 BASIS OF DESIGN LYNX MODEL - EXISTING CAGE & RACK STEAM WASHER -GENERATOR COLUMN ·1" STEAM PIPE ABANDONED IN PLACE. -EDGE OF SOFFIT (TYPICAL) MECH/ELEC ~2" VENT FROM FLOOR 117A UP THROUGH CEILING __4" RDL FROM CEILING DOWN THROUGH FLOOR CAGEWASHER **EXISTING** BOTTLE WASHER PHW MECHANICAL SERVICES TO EX. BOTTLE WASHER **6 CLEAN CAGE WASH** EXISTING CONDENSATE PUMP ----117

MECHANICAL NOTES:

- 1) INSTALL CAGEWASHER DRAIN FROM EQUIPMENT CONNECTION AND SLOPE CONTINUOUSLY TO AIRGAP AT RECESSED PIT DRAIN.
- 2 CONNECT TO EXISTING 2" CONDENSATE ROUTED IN RECESSED PIT AREA.
- 3 21/2" STEAM DOWN FROM ABOVE TO CONNECTION ON NEW CAGEWASHER. FOR MORE INFORMATION, SEE CAGEWASHER PIPING DIAGRAM 1/M5.1.

MECHANICAL NOTES:

- (1) CONNECT NEW 21/2" STEAM AT EXISTING ISOLATION VALVE.
- 2 CONNECT NEW 1" DOMESTIC COLD WATER AT EXISTING ISOLATION VALVE.
- (3) CONNECT NEW 114" DOMESTIC HOT WATER AT EXISTING ISOLATION VALVE.
- (4) CONNECT NEW 1/2" COMPRESSED AIR. INSTALL ISOLATION VALVE AT POINT OF CONNECTION.
- (5) CONNECT TO EXISTING 3/4" PROCESS HOT WATER SERVING EXISTING BOTTLE WASHER.
- (6) CONNECT EXISTING 11/4" STEAM SERVING EXISTING BOTTLE WASHER.
- 7 NEW FIRE SPRINKLER HEAD TO BE INSTALLED AS PART OF ALTERNATE BID ITEM #1. CENTER FIRE SPRINKLER IN JUT OUT ARE CREATED BY NEW PANEL SYSTEM. NEW FIRE SPRINKLER HEADS SHALL MATCH EXISTING WHERE POSSIBLE.

ADD ALTERNATE BID ITEM #1:

IN ROOMS 'DIRTY CAGE WASH 123' AND 'CAGEWASHER 123A', FIRE SPRINKLER SYSTEM WORK MUST BE ACCOMPLISHED IN ACCORDANCE WITH NFPA STANDARDS AND COMPLYING WITH THE REQUIREMENTS OF THE OWNERS INSURANCE CARRIER, STATE/LOCAL BUILDING CODES, AND THE FIRE DEPARTMENT.



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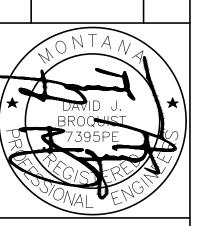
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AGE WASHER REPLACEMENT



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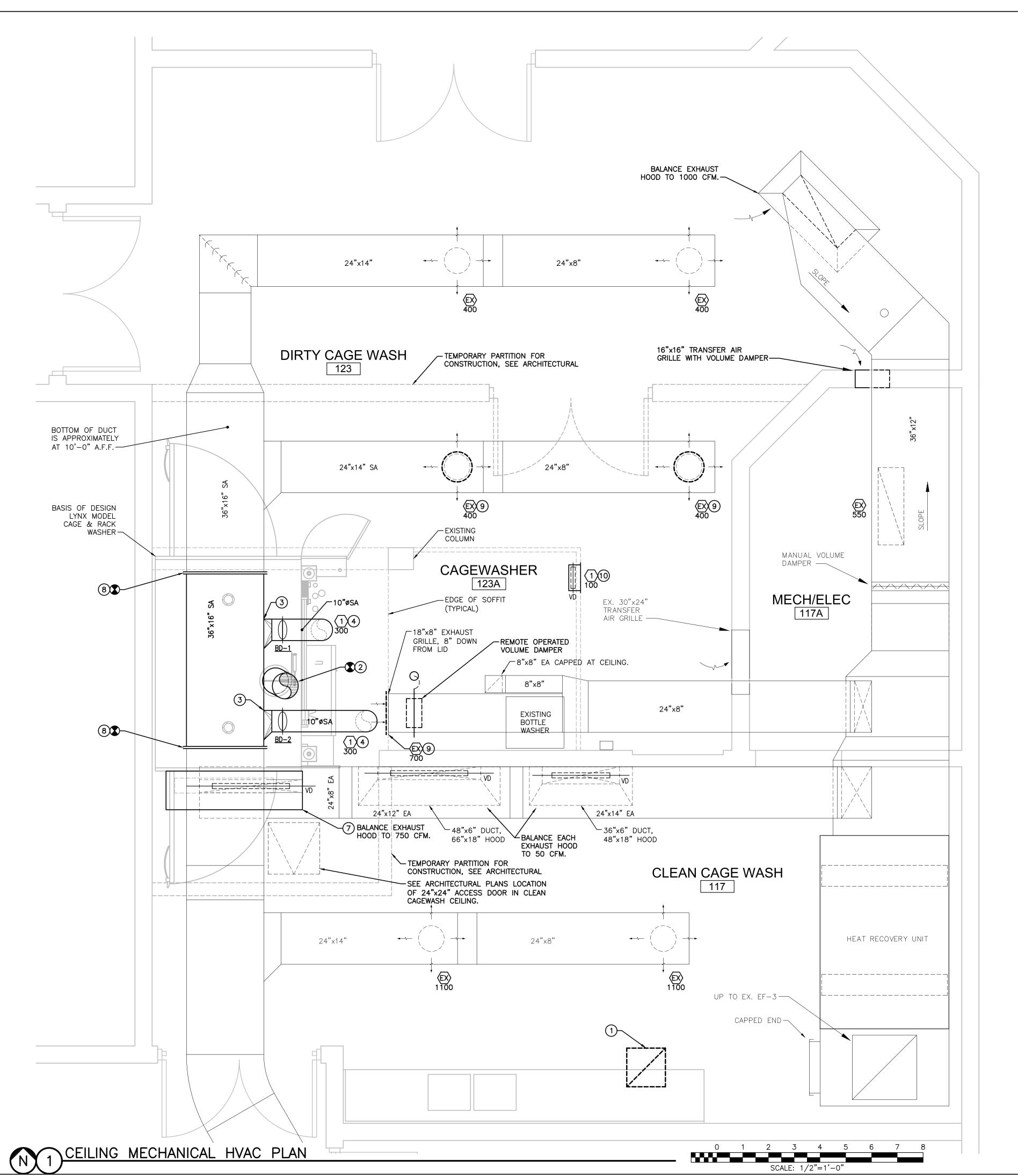
SHEET TITLE MECHANICAL PIPING PLANS

SHEET

M3.1

DATE 07-31-23

SCALE: 1/2"=1'-0"



MECHANICAL NOTES:

- 1 REMOVE ANY DUCTING ASSOCIATED WITH PROVIDING VENTILATION TO TEMPORARY CONSTRUCTION PARTITION. EXISTING DUCT TO REMAIN FROM CEILING TO TOP OF ROOF CURB. FILL DUCT WITH INSULATION AND CAP AIRTIGHT. CAP ROOF CURB AIR AND WATER TIGHT.
- 2 INSTALL NEW 16 GAUGE 304 STAINLESS STEEL 12"Ø CAGEWASHER EXHAUST DUCT UP TO CAGEWASHER EXHAUST FAN ON ROOF. INSULATE EXHAUST DUCT.
- 3 CONNECT TO DUCT WITH LOW LOSS TAP CONNECTION. INSTALL VOLUME DAMPER NEAR LOCATION OF TAP. SEE MISCELLANEOUS EQUIPMENT SCHEDULE.
- 4) DIRECT DIFFUSER NOZZLE TO PROVIDE COOLING FOR CAGEWASHER CONTROL PANEL.
- 5) WHILE CAGEWASHER AREA SOFFIT IS REMOVED, INSTALL VOLUME DAMPER IN 18"x8" EXHAUST AIR DUCT. INSTALL VOLUME DAMPER AS FAR DOWNSTREAM FROM EXISTING EXHAUST AIR GRILLE.
- 6 INSTALL YOUNG REGULATOR REMOTE DAMPER OPERATOR MODEL 270-315BC CEILING TERMINATION OR APPROVED EQUAL. REMOTE DAMPER SHALL OPERATE NEW VOLUME DAMPER INSTALLED IN 18"x8" EXHAUST AIR DUCT.
- 7 CONNECT NEW CAGEWASHER HOOD TO EXISTING 48"x6" DUCT TAP WITH DAMPER. SEE DETAIL 4/M4.1 FOR EXHAUST HOOD INSTALLATION.
- 8 REMOVE TEMPORARY SUPPLY AIR DUCTING AND REINSTALL SECTION OF 36"x16" SUPPLY AIR DUCT USING FLANGED DUCTMATE CONNECTIONS.
- 9 REMOVE TEMPORARY COVERS FROM DIFFUSER REGISTER OR GRILLE AND BALANCE TO INDICATED VALUES.
- (10) AS PART OF ADD ALTERNATE BID ITEM #1, INSTALL TRANSFER AIR GRILLE AT 24" ABOVE FINISHED FLOOR.

OTES:
PLAN REPRESENTS THE FINAL CONDITIONS FOLLOWING REMOVAL OF THE TEMPORARY CONSTRUCTION

2. AIRFLOWS LISTED ARE BASED ON PREVIOUS BALANCE REPORTS AND SHALL BE ADJUSTED BASED ON THE INITIAL READINGS TAKEN BEFORE WORK BEGAN AND AS NECESSARY TO ACHIEVE THE FINAL AIRFLOW ORIENTATIONS INDICATED ON SHEET M6.3.



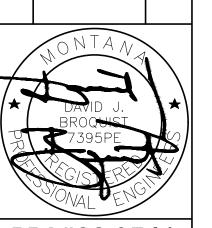
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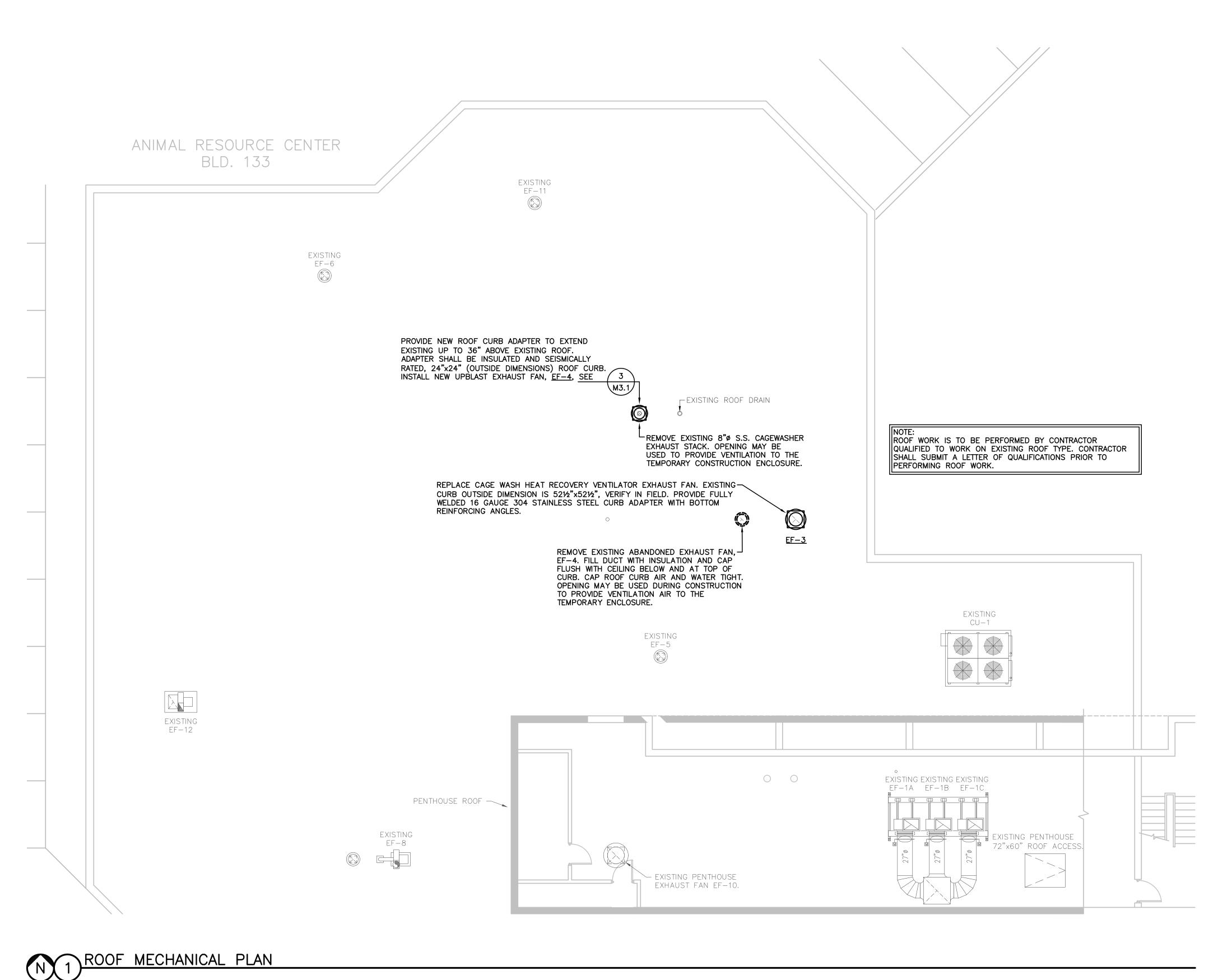
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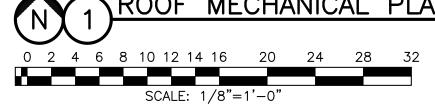
GPD# 222506

SHEET TITLE MECHANICAL HVAC PLANS

SHEET

M3.2







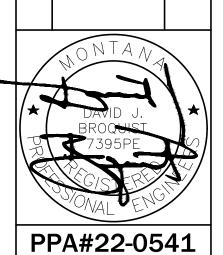
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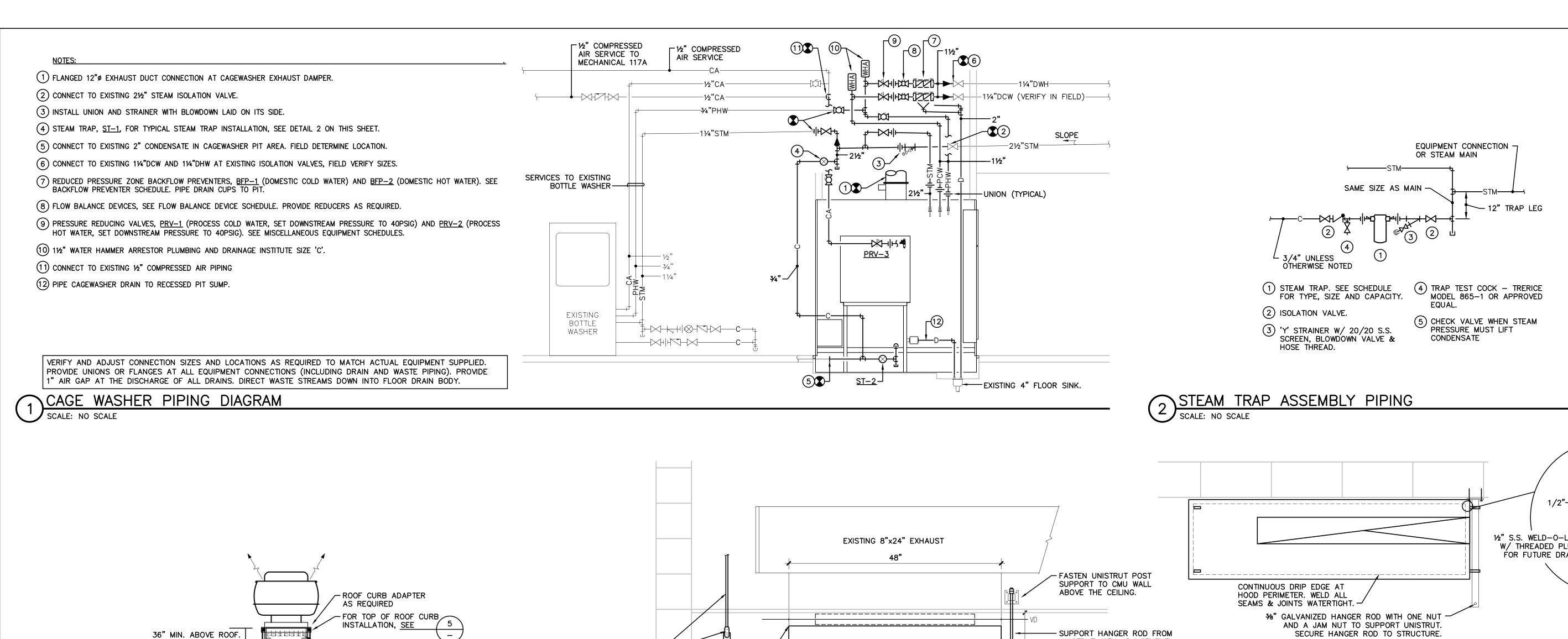
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GPD# 222506

SHEET TITLE
ROOF MECHANICAL

SHEET

M4.1



CAGEWASH EXHAUST HOOD

CAGEWASH EXHAUST FAN INSTALLATION

SCALE: NO SCALE

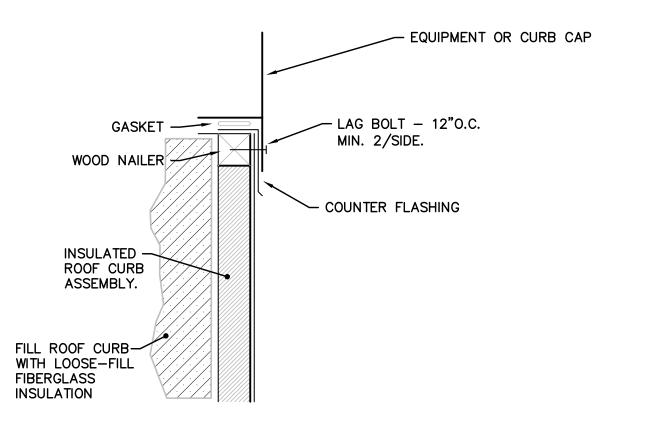
ENLARGE ROOF OPENING TO ACCOMMODATE NEW EXHAUST DUCT

STAINLESS STEEL WELDED DUCT.

12"ø 16 GAUGE 304

POINT OF CONNECTION TO EXISTING ROOF — CURB SHALL AIR AND WATER TIGHT AND

CONSTRUCTED IN A MANNER TO SHED WATER.



→ GRAVITY BACKDRAFT DAMPER AND

- INSULATED SEISMICALLY RATED

ROOF CURB EXTENSION

EXTENSION DIMENSIONS.

- INSULATE EXHAUST DUCT UP

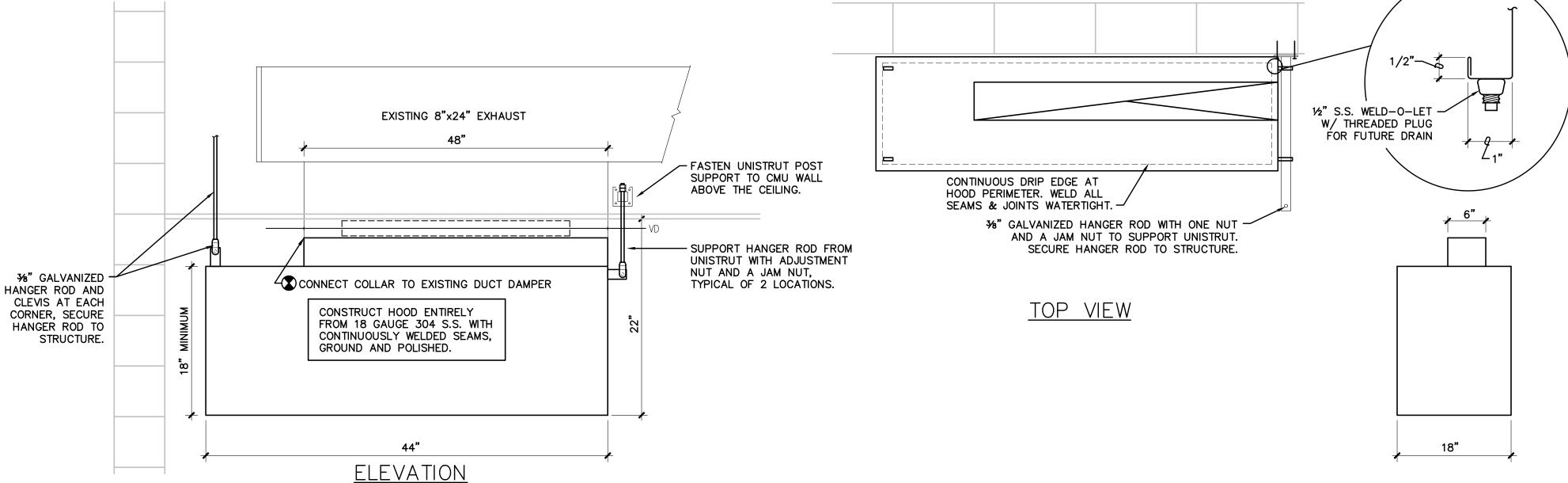
LROOFING

└ INSULATION. └ ROOF DECKING.

- STRUCTURE.

DAMPER TRAY PROVIDED WITH UNIT.

TRANSITION DUCT TO INTERNAL CURB



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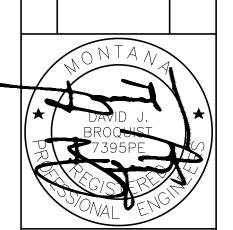
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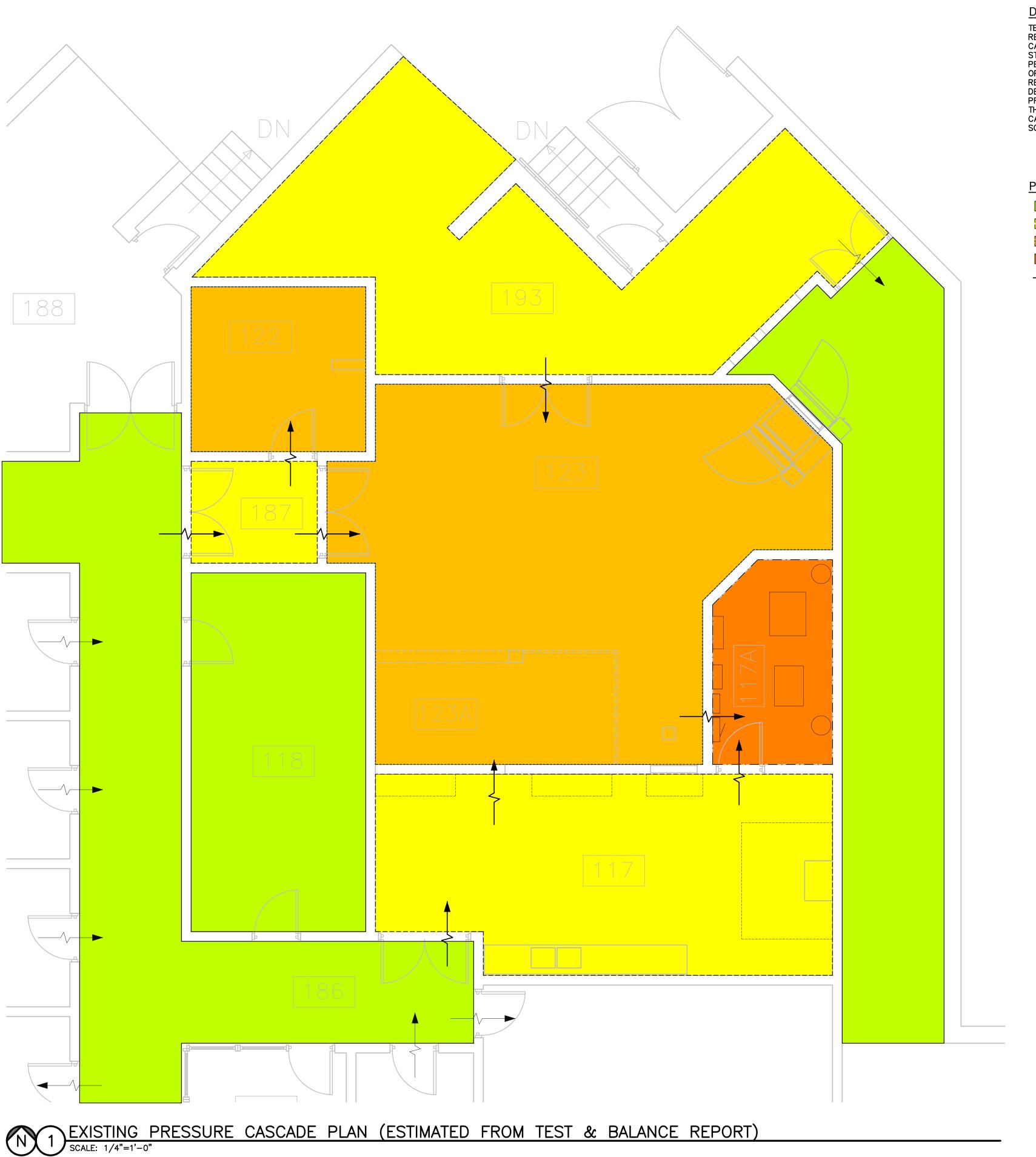
A/E# -

GPD# 222506 SHEET TITLE MECHANICAL

SHEET

DETAILS

M5.1



DESCRIPTION

TEST AND BALANCE CONTRACTOR SHALL MAKE AIRFLOW READINGS ON ALL SUPPLY DIFFUSERS, EXHAUST GRILLES, CANOPY HOODS, EXISTING HEAT RECOVERY UNIT, AIRFLOW STATION ASSOCIATED WITH EXISTING DAMPER D-123 IN PENTHOUSE MECHANICAL ROOM PRIOR IN ALL MODES OF OPERATION AS WELL AS ROOM PRESSURE DIFFERENTIAL READINGS IN ALL MODES OF OPERATION PRIOR TO ANY DEMOLITION. THIS WILL BE USED TO DETERMINE THE FINAL PRESSURIZATION SCHEME OF THE CAGEWASH AREA. ENSURE THAT AIRFLOW ORIENTATION IS FROM THE CLEAN SIDE OF CAGEWASH TO THE DIRTY SIDE IN ALL OPERATING SCENARIOS FOLLOWING FINAL BALANCE.

PRESSURE CASCADE LEGEND

CASCADE 0

CASCADE -1

CASCADE -2

CASCADE -3

— AIR FLOW DIRECTION

MONTANA STATE UNIVERSITY

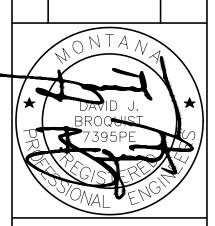
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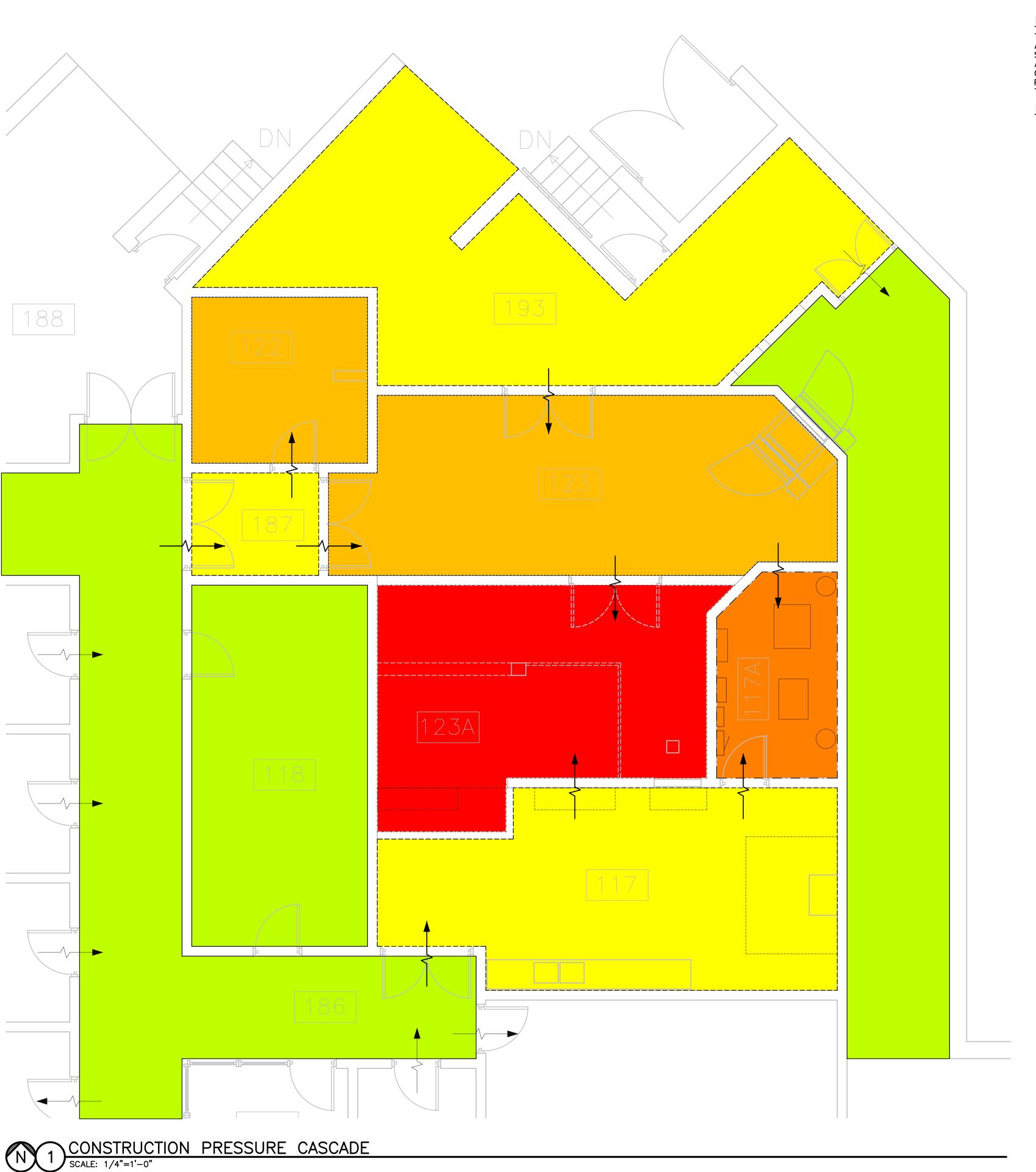
SHEET TITLE
EXISTING PRESSURE
CASCADE

SHEET

M6.1

DATE 07-31-23

24, 2023 - 5:10pm - 222506_M61_B8.dwg



DESCRIPTION

TEST AND BALANCE CONTRACTOR SHALL MAKE AIRFLOW ADJUSTMENT TO ACHIEVE AIR PRESSURE CASCADES AS SHOWN IN ALL MODES OF OPERATION. ENSURE THAT AIRFLOW ORIENTATION IS FROM THE CLEAN SIDE OF CAGEWASH TO THE DIRTY SIDE AND THE CONSTRUCTION PARTITION IN ALL OPERATING SCENARIOS TO PREVENT THE TRANSFER OF CONSTRUCTION DEBRIS, DUST, OR FUMES.

PRESSURE CASCADE LEGEND

CASCADE 0

CASCADE -1

CASCADE -2

CASCADE -3

CASCADE -4

— AIR FLOW DIRECTION

MONTANA STATE UNIVERSITY

MSU-CPDC

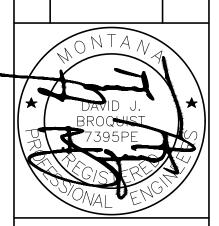
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TIETZ HALI CAGE WASHER REPLACEM



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GPD# 222506

SHEET TITLE
CONSTRUCTION PRESSURE
CASCADE

SHEET

M6.2



DESCRIPTION

TEST AND BALANCE CONTRACTOR SHALL ENSURE THAT AIRFLOW ORIENTATION IS FROM THE CLEAN SIDE OF CAGEWASH TO THE DIRTY SIDE AS SHOWN IN ALL OPERATING SCENARIOS FOLLOWING FINAL BALANCE.

PRESSURE CASCADE LEGEND

CASCADE 0

CASCADE -2

CASCADE -3

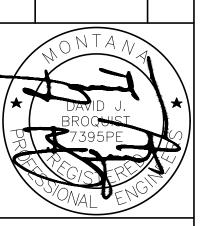
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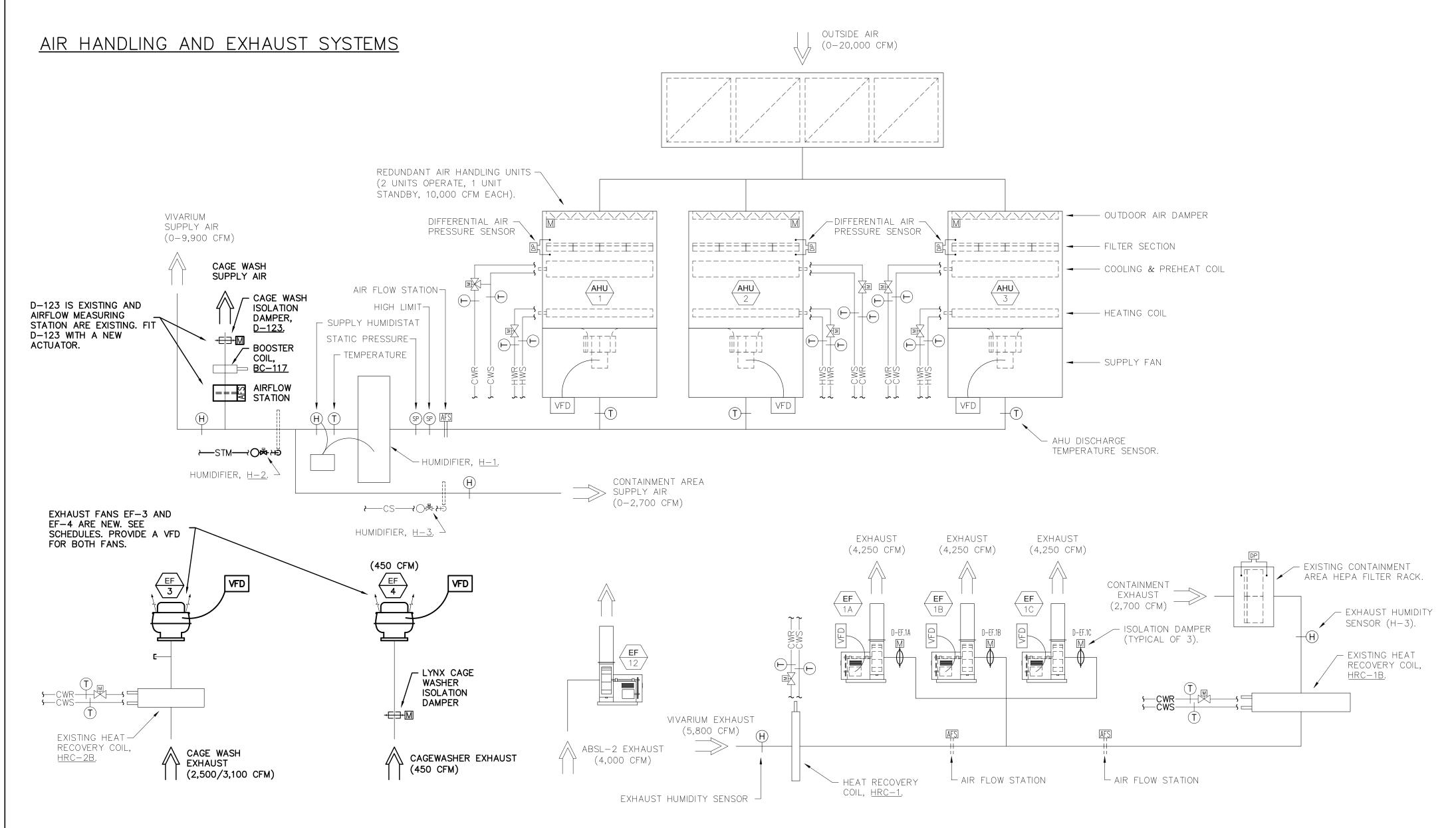
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SHEET TITLE FINAL PRESSURE CASCADE

SHEET

M6.3

TEMPERATURE CONTROLS



EQUIPMENT TO BE CONTROLLED: EXISTING BOOSTER COIL (BC-117), NEW CAGEWASH MACHINE EXHAUST FAN EF-4 AND ASSOCIATED VFD, NEW CAGEWASH AREA EXHAUST FAN EF-3 AND ASSOCIATED VFD. THE AIR HANDLING UNIT SUPPLY FANS (AHU-1/2/3) AND OTHER EXHAUST FANS, DAMPERS AND EQUIPMENT DEPICTED HERE ARE EXISTING.

DUTY: TO EXHAUST THE CAGEWASH MACHINE, CLEAN AND DIRTY CAGEWASH AREAS AND PROVIDE CONDITIONED OUTDOOR AIR TO THESE SPACES WHILE MAINTAINING ROOM PRESSURIZATION CASCADES (PROPER AIRFLOW ORIENTATION) IN TIETZ HALL CAGEWASH ROOMS 117, 117A, 123, 123A.

SCHEDULE: THE MAIN BUILDING SYSTEMS OPERATE CONTINUOUSLY. NEW CAGEWASH MACHINE EXHAUST FAN WILL OPERATE INTERMITTENTLY WITH THE CAGEWASH MACHINE DURING VARIOUS CYCLES. CAGEWASH AREA EXHAUST FAN EF-3 WILL OPERATE CONTINUOUSLY AND WILL VARY SPEED ACCORDING TO OPERATION OF EF-4. AIRFLOW CONTROL DAMPER D-123 WILL MODULATE DEPENDING UPON THE OPERATIONAL CONDITIONS OF EF-4.

APPLIED CONTROL EQUIPMENT TO BE PROVIDED BY THE TEMPERATURE CONTROL (THIS) CONTRACTOR: THE TEMPERATURE CONTROL CONTRACTOR WILL PROVIDE VFD'S FOR EF-3 AND EF-4, A NEW MODULATING ELECTRIC DAMPER ACTUATOR FOR D-123, FAN RELAYS AS REQUIRED AND A SPACE DIFFERENTIAL PRESSURE TRANSMITTER.

SEQUENCE OF OPERATION:

CAGEWASH AREA: THE CAGEWASH AREA SHALL OPERATE ACCORDING TO AN OCCUPIED/UNOCCUPIED SCHEDULE AS PROGRAMMED ON THE DDC. WHEN IN THE UNOCCUPIED MODE, EXHAUST FAN EF-4 SHALL BE DISABLED, DAMPER D-123 SHALL MODULATE TO REDUCE THE CAGEWASH SUPPLY AIR TO A LESSER FIELD-DETERMINED VOLUME AS MEASURED WITH THE AIRFLOW STATION AND CAGEWASH AREA EXHAUST FAN EF-3 SHALL RAMP IN SPEED/VOLUME AND DAMPER D-123 SHALL MODULATE OPEN TO PRODUCE AN INCREASED AIR EXCHANGE RATE IN THE CAGEWASH AREA. EXHAUST FAN EF-4 SHALL OPERATE ANYTIME THE CAGEWASH MACHINE CALLS FOR EXHAUST AT ITS CONTROL PANEL FAN CONTACTS AND SHALL RAMP TO A FIELD DETERMINED SPEED TO PRODUCE 450 CFM. WHEN EF-4 IS ACTIVATED, DAMPER D-123 SHALL MODULATE FURTHER OPEN TO PROVIDE MORE MAKEUP AIR TO THE CLEAN CAGEWASH (THE AIR EXHAUSTED FROM THE CAGEWASH BY EF-4 IS DRAWN FROM THE CLEAN CAGEWASH ROOM). COORDINATE ALL SETTINGS AND RAMP SPEEDS IN CONJUNCTION WITH THE BALANCER IN ORDER TO MAINTAIN THE PROPER AIRFLOW ORIENTATIONS IN ALL CAGEWASH AREAS DURING ALL OPERATING MODES AND SEQUENCES.

AIRFLOW ORIENTATIONS IN THE CAGEWASH AREA ARE KEY TO MAINTAINING BIOLOGICAL SAFETY IN THE BUILDING. SHOULD THE AIR HANDLING UNITS ALL FAIL TO OPERATE, THE CAGEWASH AREA CONTROLS SHALL GO TO THE UNOCCUPIED MODE OF OPERATION.

MONITORING AND ALARMS:

MONITOR THE STATUS AND SPEED OF EXHAUST FANS EF-3 AND EF-4 AND ALARM FAN FAILURE THROUGH THEIR COMPANION VFD'S
ALARM FAILURE OF EF-3, EF-4 OR D-123 IF ANY FAIL TO GO TO THEIR COMMANDED CONDITION OR POSITION FOR LONGER THAN AN 10 SECONDS (ADJUSTABLE).
ALARM SPACE DIFFERENTIAL PRESSURIZATION REVERSAL GREATER THAN 0.01" W.C. (ADJUSTABLE) LASTING LONGER THAN 20 SECONDS (ADJUSTABLE).

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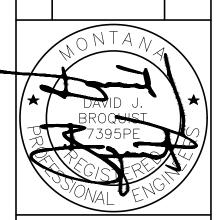
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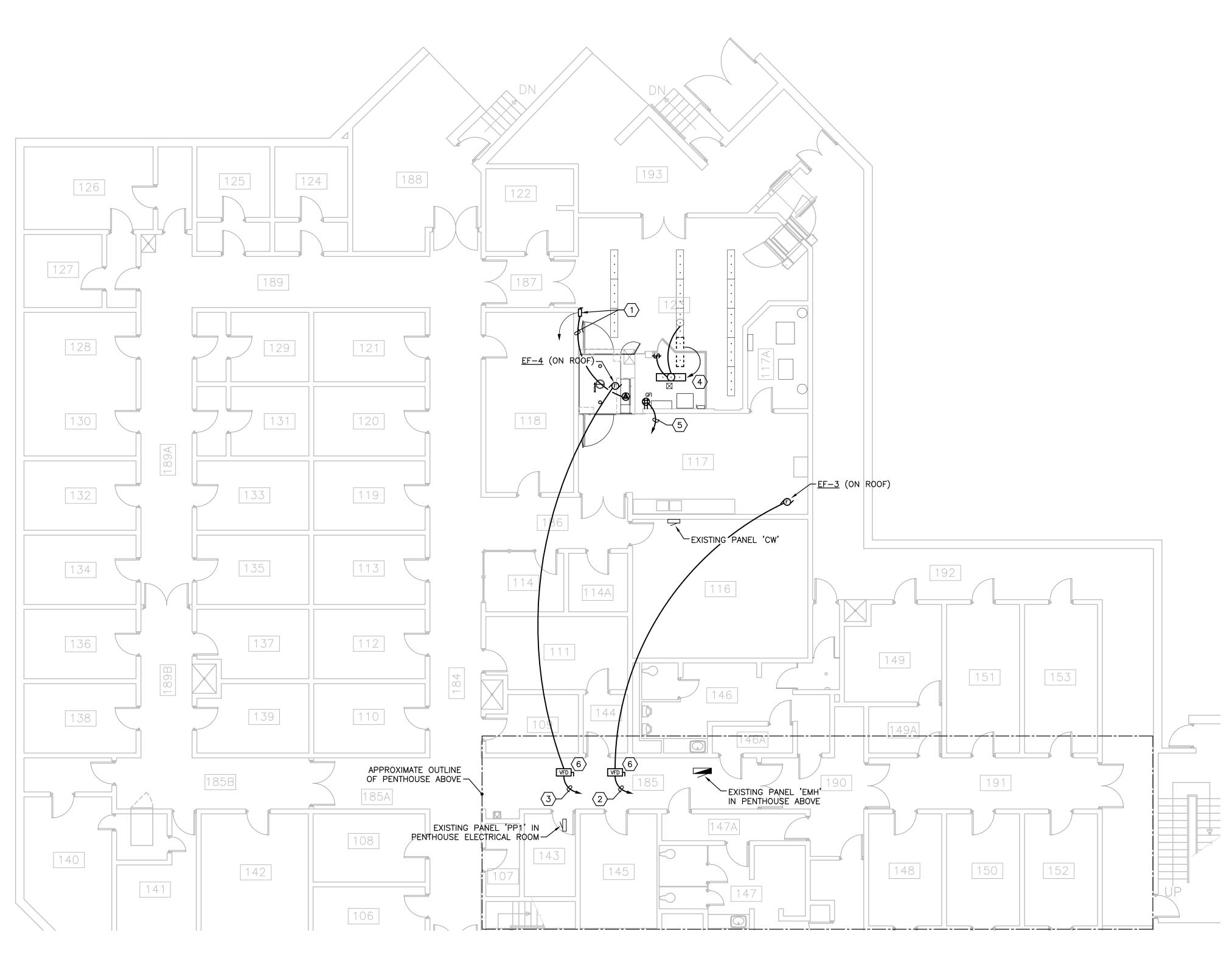
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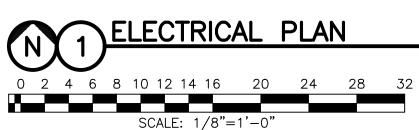
A/E# -

GPD# 222506
SHEET TITLE
TEMPERATURE
CONTROLS

SHEET

M7.1





MECHANICAL EQUIPMENT CONNECTION SCHEDULE														
—			HP/		STARTER	& CONTR	OLS				S	AFETY DIS	SCONNE	CT SWITCH
UNIT	VOLTAGE	Ø	LÖÁD	TYPE	MCP/ FUSED	NEMA ENCLOS.	NEMA SIZE	POLES	SWITCH	PILOT	SIZE	NEMA ENCLOS.	FUSED	NOTE
EF-3	480	3	5 HP	VFD										12
EF-4	480	3	3/4 HP	VFD										12
NOTEO														

NOTES:

1 INSTALL VFD'S (FURNISHED BY OTHERS) AND PROVIDE CONNECTIONS BETWEEN VFD'S AND MOTORS.

2 UNIT FURNISHED WITH DISCONNECT SWITCH.

ECTRICAL LEGEND								
DESCRIPTION								
POWER PANEL VARIABLE FREQUENCY DRIVE								
DISCONNECT SWITCH								
BRANCH CIRCUIT CONCEALED IN WALL OR CEILING								
BRANCH CIRCUIT CONCEALED IN OR UNDER FLOOR								
CONDUIT RUN — NUMBER OF ARROWHEADS INDICATES THE NUMBER OF CIRCUITS REQUIRED.								
CONDUIT STUB								
DUPLEX CONVENIENCE RECEPTACLE								
MOTOR (M - MOTOR, F - FAN, P - PUMP)								
SPECIAL EQUIPMENT CONNECTION OR OUTLET AS NOTED								
DESCRIPTION								
AMPS INTERRUPTING CURRENT								
AUTOMATIC TRANSFER SWITCH								
CONDUIT								
EXISTING								
GROUND								
GROUND FAULT CIRCUIT INTERRUPTER								
HORSEPOWER								
OWNER FURNISHED, CONTRACTOR INSTALLED								
TRANSFORMER								
VARIABLE FREQUENCY DRIVE								
WEATHERPROOF								
WITH								
WEIGHTS FOR ELECTRICAL ITEMS								
ITEMS SHOWN LIGHT ARE EXISTING AND TO REMAIN								
ITEMS SHOWN BOLD AND SOLID ARE NEW								
ITEMS SHOWN BOLD AND DASHED ARE TO BE REMOVED								

GENERAL SHEET NOTES:

- A. THE ELECTRICAL CONTRACTOR SHALL BE COGNIZANT THAT THIS IS A REMODEL PROJECT AND AS SUCH, ELECTRICAL PANELS, DEVICES, CIRCUITS, ETC. SHOWN ARE DRAWN FROM EXISTING DRAWINGS AND FIELD OBSERVATIONS AND SHALL BE USED AS A REFERENCE ONLY. THERE MAY BE ADDITIONAL ELECTRICAL DEVICES THAT NEED TO BE REMOVED AND THEIR REMOVAL SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
- B. ELECTRICAL DEVICES SHOWN LIGHT AND SOLID ARE EXISTING TO REMAIN. DEVICES SHOWN HEAVY AND DASHED ARE EXISTING TO BE REMOVED.
- C. ABANDONED CONDUIT, WIRE, J-BOXES AND SIGNALING WIRE IS TO BE REMOVED WHERE ACCESSIBLE.
- D. PATCH ALL HOLES FROM REMOVED CONDUIT AND CABLING WITH GROUT OR CAULK (FIRE RATED AS REQUIRED).
- E. ANY CIRCUITS (POWER, SYSTEMS, LIGHTING, FIRE ALARM, ETC.) THAT ARE IN THE WAY OF DEMOLITION SHALL BE EXTENDED/RE-ROUTED AS REQUIRED. ELECTRICIAN SHALL VISIT SITE PRIOR TO BID TO VERIFY THAT ALL REQUIRED DEMOLITION AND RE-ROUTING IS IN HIS BID.

SPECIFIC SHEET NOTES:

- DISCONNECT EXISTING CAGE WASH, MAINTAINING FUSED DISCONNECT AND CIRCUITING BACK TO PANEL 'CW'. PROVIDE CONNECTION TO NEW CAGE WASH VIA 3#6 AND #10G IN 1" CONDUIT AND PROVIDE NEW FUSES IN EXISTING DISCONNECT SWITCH, COORDINATING FUSE SIZE WITH MANUFACTURER NAMEPLATE.
- DISCONNECT EXISTING EXHAUST FAN AND REMOVE ALL CONDUIT AND WIRE BACK TO PANEL 'PP1'. PROVIDE CONNECTION TO NEW EXHAUST FAN AND ASSOCIATED VFD. CONNECT TO EXISTING PANEL 'EMH' VIA 3#12 AND #12G IN 3/4" CONDUIT. PROVIDE NEW 20A-3P CIRCUIT BREAKER IN PANEL.
- DISCONNECT EXISTING EXHAUST FAN AND REMOVE ALL CONDUIT AND WIRE BACK TO PANEL 'PP1'. PROVIDE CONNECTION TO NEW EXHAUST FAN AND ASSOCIATED VFD. CONNECT TO EXISTING PANEL 'EMH' VIA 3#12 AND #12G IN 3/4" CONDUIT. PROVIDE NEW 15A-3P CIRCUIT BREAKER IN PANEL
- ALTERNATE BID ITEM #1: RELOCATE EXISTING 4'-0" LIGHT FIXTURE INTO NEW ROOM. ADD NEW LIGHT SWITCH TO CONTROL FIXTURE SEPARATE FROM ADJACENT ROOM. EXTEND EXISTING WIRING AS REQUIRED VIA 2#12 AND #12 GROUND IN 1/2" CONDUIT.
- PROVIDE NEW GFI RECEPTACLES AND CONNECT TO PANEL 'PP1' VIA 2#12 AND #12G IN 1/2" CONDUIT. PROVIDE NEW 20A-1P CIRCUIT BREAKER IN PANEL. VERIFY MOUNTING HEIGHT AND FINAL LOCATION WITH CHEMICAL SYSTEM EQUIPMENT SUPPLIER.
- 6 LOCATE NEW VFD IN MECHANICAL PENTHOUSE, COORDINATING LOCATION WITH EXISTING GEAR.



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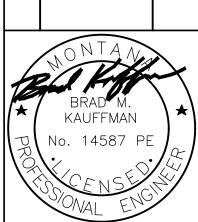
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AGE WASHER REPLACEMEN



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SHEET TITLE ELECTRICAL PLAN

SHEET

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