



WSU REUTHER LIBRARY MEP PROJECT No. 2164076

REUTHER LABOR ARCHIVES BUILDING No. 036

5401 CASS AVENUE, DETROIT, MICHIGAN
DESIGN DEVELOPMENT PACKAGE



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ARCHITECTURAL SHEET INDEX

SHEET	DESCRIPTION
G-0.01	COVER SHEET
A-0.1	SHT. INDEX, SYMBOL LIST, LEGENDS, ABBREVIATIONS, & OVERVIEW OF SCOPE
A-1.1	PARTIAL BASEMENT AND FIRST FLOOR PLANS - DEMOLITION & NEW WORK
A-5.1	DETAILS

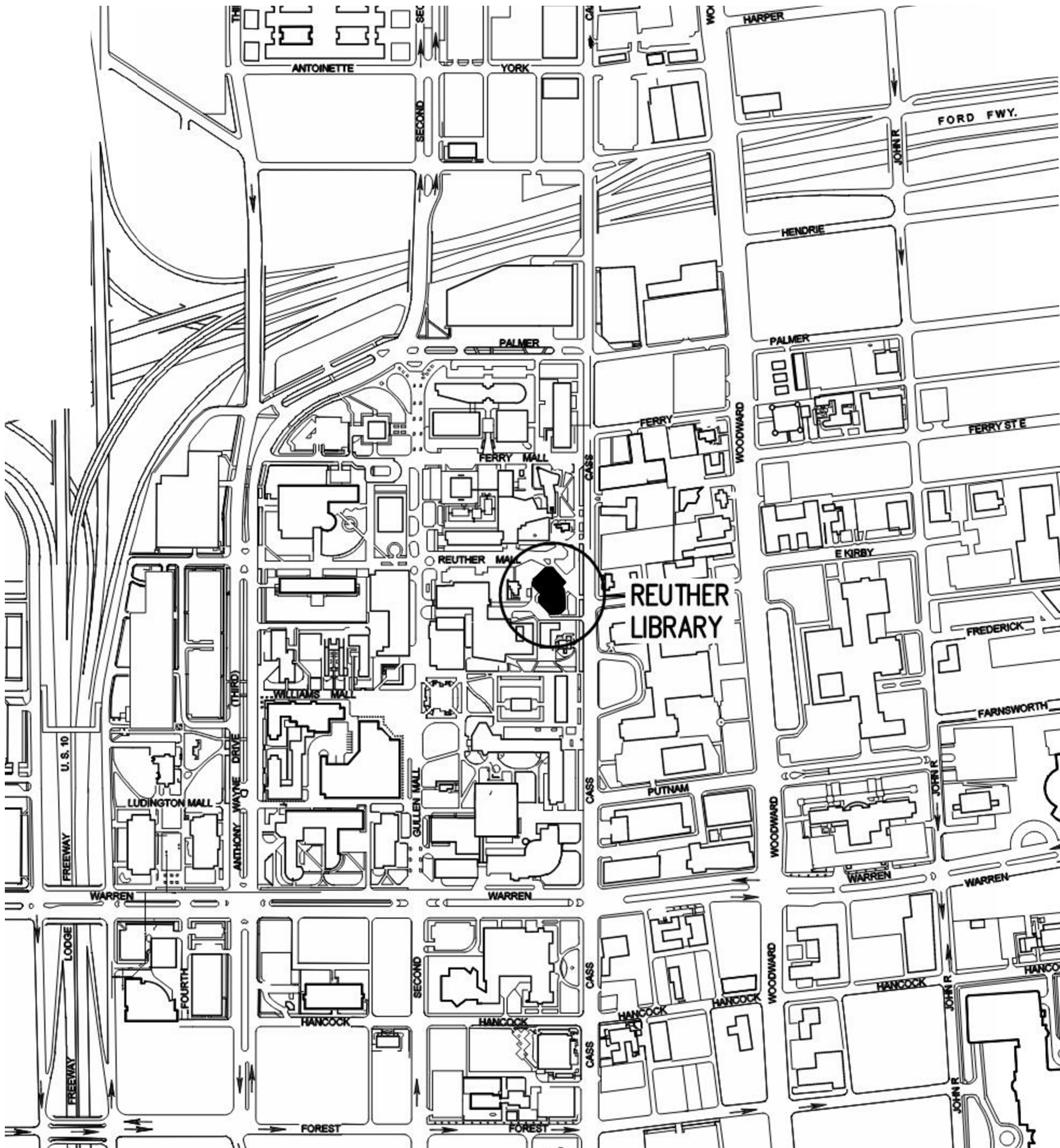
MECHANICAL SHEET INDEX

SHEET	DESCRIPTION
M-0.1	MECHANICAL GENERAL INFORMATION & SYMBOLS
M-1.0	MECHANICAL BASEMENT PLAN - HVAC DEMOLITION
M-1.1	MECHANICAL FIRST FLOOR PLAN - HVAC DEMOLITION
M-1.2	MECHANICAL SECOND FLOOR PLAN - HVAC DEMOLITION
M-1.3	MECHANICAL THIRD FLOOR PLAN - HVAC DEMOLITION
M-1.4	MECHANICAL FOURTH FLOOR PLAN - HVAC DEMOLITION
M-2.0	MECHANICAL BASEMENT FLOOR PLAN - HYDRONIC DEMOLITION
M-2.1	MECHANICAL FIRST FLOOR PLAN - HYDRONIC DEMOLITION
M-2.2	MECHANICAL SECOND FLOOR PLAN - HYDRONIC DEMOLITION
M-2.3	MECHANICAL THIRD FLOOR PLAN - HYDRONIC DEMOLITION
M-2.4	MECHANICAL FOURTH FLOOR PLAN - HYDRONIC DEMOLITION
M-3.0	MECHANICAL BASEMENT PLAN - HVAC NEW
M-3.1	MECHANICAL FIRST FLOOR PLAN - HVAC NEW
M-3.2	MECHANICAL SECOND FLOOR PLAN - HVAC NEW
M-3.3	MECHANICAL THIRD FLOOR PLAN - HVAC NEW
M-3.4	MECHANICAL FOURTH FLOOR PLAN - HVAC NEW
M-4.0	MECHANICAL BASEMENT FLOOR PLAN - HYDRONIC NEW
M-4.1	MECHANICAL FIRST FLOOR PLAN - HYDRONIC NEW

M-4.2	MECHANICAL SECOND FLOOR PLAN - HYDRONIC NEW
M-4.3	MECHANICAL THIRD FLOOR PLAN - HYDRONIC NEW
M-4.4	MECHANICAL FOURTH FLOOR PLAN - HYDRONIC NEW
M-5.1	DETAILS
M-5.2	DETAILS
M-6.1	MECHANICAL SCHEDULES
M-7.1	MECHANICAL CONTROLS
M-7.2	MECHANICAL CONTROLS
M-7.3	MECHANICAL CONTROLS
M-7.4	MECHANICAL CONTROLS
M-7.5	MECHANICAL CONTROLS
M-7.6	MECHANICAL CONTROLS

ELECTRICAL SHEET INDEX

SHEET	DESCRIPTION
E-0.1	ELECTRICAL SYMBOL, ABBREVIATIONS, NOTES & SCHEDULES
E-1.0	ELECTRICAL BASEMENT FLOOR PLAN - DEMOLITION
E-1.1	ELECTRICAL FIRST FLOOR PLAN - DEMOLITION
E-1.2	ELECTRICAL SECOND FLOOR PLAN - DEMOLITION
E-1.3	ELECTRICAL THIRD FLOOR PLAN - DEMOLITION
E-1.4	ELECTRICAL FOURTH FLOOR PLAN - DEMOLITION
E-2.0	ELECTRICAL BASEMENT FLOOR PLAN - NEW
E-2.1	ELECTRICAL FIRST FLOOR PLAN - NEW
E-2.2	ELECTRICAL SECOND FLOOR PLAN - NEW
E-2.3	ELECTRICAL THIRD FLOOR PLAN - NEW
E-2.4	ELECTRICAL FOURTH FLOOR PLAN - NEW
E-6.1	ELECTRICAL PANEL SCHEDULES



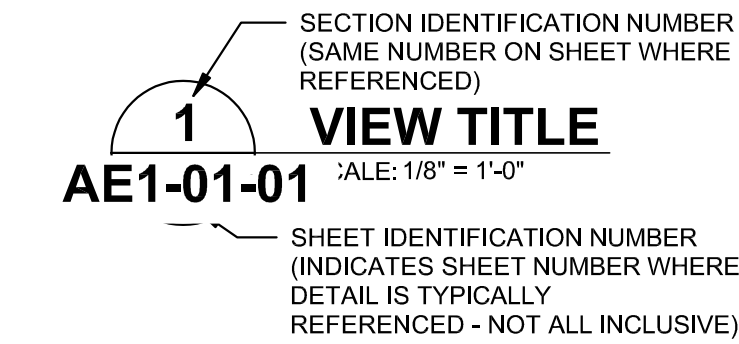
SHEET: G-0.01
ACADFILE: 2164076-036-G-0.01
ISSUED FOR: DOC REL 06 - ADDENDUM A
DATE: 07/02/24

REFERENCE SYMBOLS

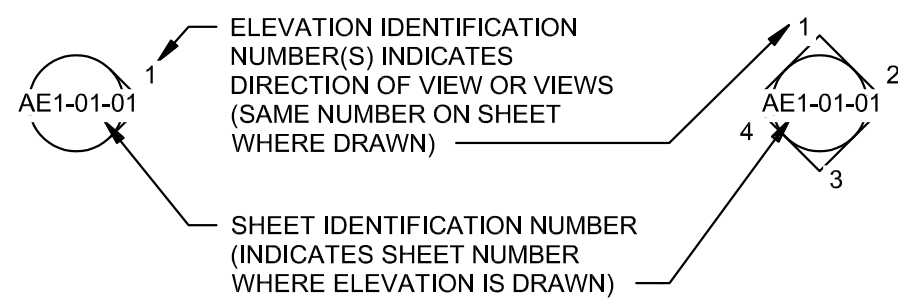
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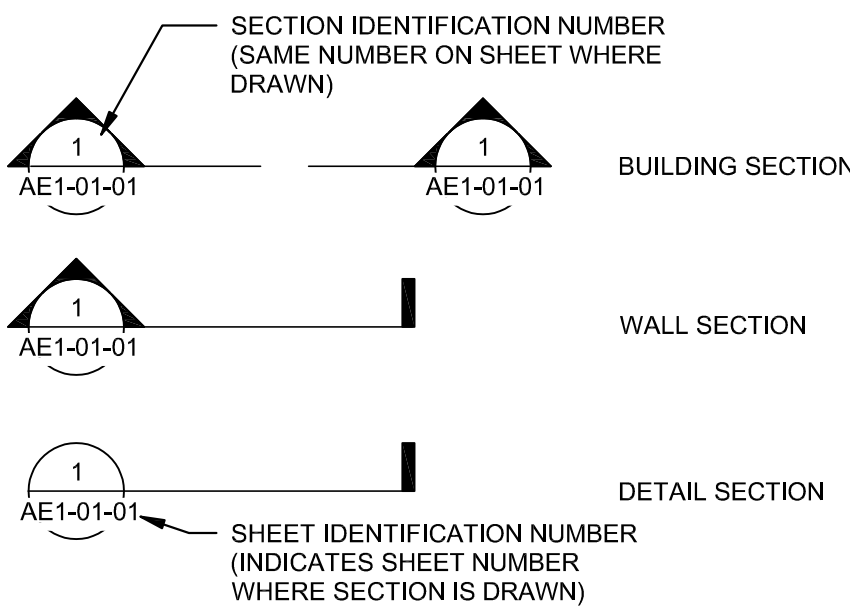
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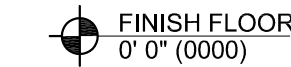
ELEVATION LOCATION IDENTIFICATION



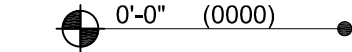
SECTION LOCATION IDENTIFICATION



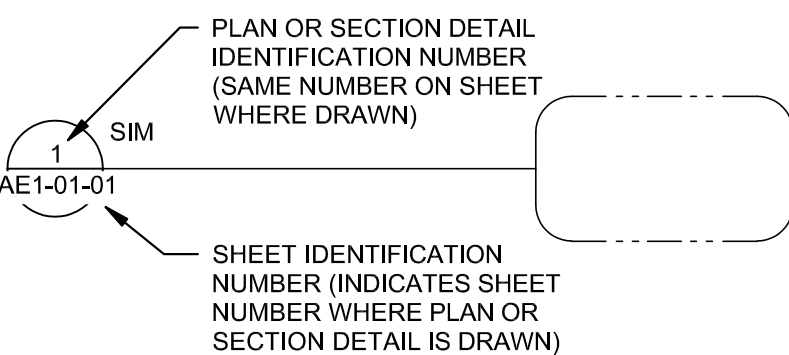
ELEVATION INDICATION - (FLOORS, ETC...)



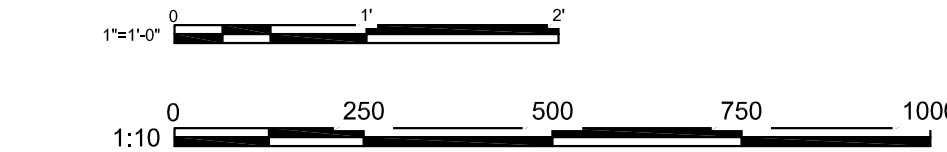
SPOT ELEVATION



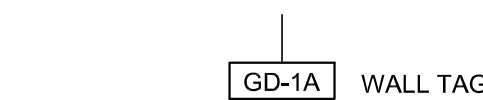
DETAIL LOCATION IDENTIFICATION



GRAPHIC SCALE



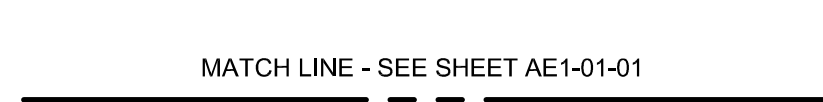
PARTITION TYPE INDICATION



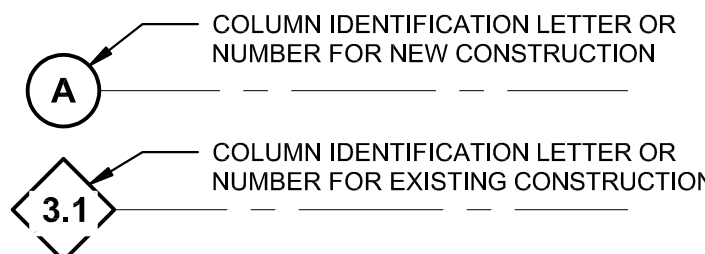
MATERIAL OR WORK DIVISION INDICATION



MATCH LINE INDICATION



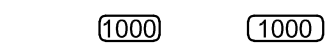
COLUMN INDICATION



ROOM NAME AND NUMBER INDICATION



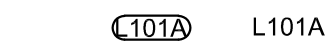
DOOR NUMBER INDICATION



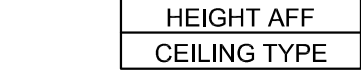
WINDOW NUMBER INDICATION



LOUVER NUMBER INDICATION



CEILING TAG



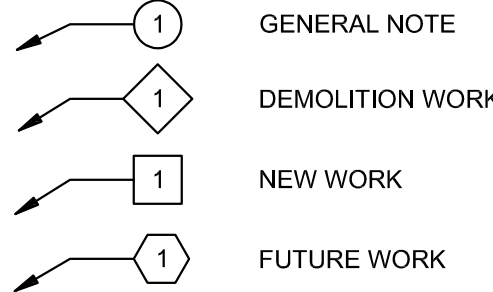
ROOF OR RAMP PITCH INDICATION



ROOF OR RAMP SLOPE INDICATION



KEYED NOTE SYMBOLS

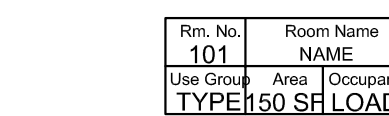


LIFE SAFETY SYMBOLS

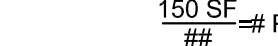
FIRE EXTINGUISHER TAG



OCCUPANCY TAG OPTION 1



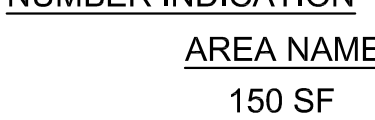
OCCUPANCY TAG OPTION 2



OCCUPANCY DOOR EXIT



AREA NAME AND NUMBER INDICATION



FLOOR FINISH TAG



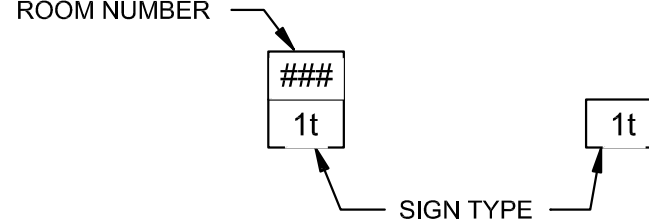
CASEWORK TAG



PLUMBING ACCESSORY TAG



SIGNAGE TAG



REVISION INDICATION



ARCHITECTURAL GENERAL NOTES

- ALL WORK IS TO BE COMPLETED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS WHICH INCLUDES THE DRAWINGS AND SPECIFICATIONS. THE SPECIFICATIONS INCLUDE ADDITIONAL INFORMATION AND REQUIREMENTS WHICH AUGMENT THE DRAWINGS.
- SUBMIT IN WRITING ALL DRAWING AND SPECIFICATION RELATED QUESTIONS, CLARIFICATIONS, SUBSTITUTIONS AND REQUEST FOR CHANGES TO THE ARCHITECT/ENGINEER AND OWNER, FOLLOW PROCEDURES OUTLINED WITHIN THE GENERAL CONDITIONS.
- THE WORK INSTALLED AS PART OF THIS CONTRACT SHALL COMPLY WITH ALL APPLICABLE BUILDING CODES AND ORDINANCES.
- DRAWING INFORMATION WITHIN EXISTING BUILDINGS MAY NOT BE COMPLETE DUE TO CONCEALED CONDITIONS AND LACK OF PRIOR BUILDING ACCESS. FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. WHERE EXISTING CONDITIONS DEVIATE AND WILL AFFECT THE PROPOSED WORK, SUBMIT FOR CLARIFICATION. EXISTING CONDITIONS SHOWN OUTSIDE OF THE CONTRACT AREA ARE RELATIVE AND FOR REFERENCE ONLY.
- DRAWINGS ARE NOT TO SCALE, DO NOT SCALE THE DRAWINGS.
- THE CONTRACT DOCUMENTS INCLUDE DRAWINGS AND SPECIFICATIONS FOR NUMEROUS DISCIPLINES: CIVIL, STRUCTURAL, ARCHITECTURAL, MECHANICAL, FIRE PROTECTION, ELECTRICAL, PLUMBING, VOICE/DATA AND OTHER SYSTEMS. REVIEW AND COORDINATE WITH ALL DRAWINGS AND SPECIFICATIONS.
- SECTIONS AND DETAILS ARE INTENDED TO BE TYPICAL (TYP), UNLESS NOTED OTHERWISE. DEVIATIONS ARE NOTED AS SIMILAR (SIM).
- REFER TO THE APPROVED SUBMITTAL DRAWINGS FOR EQUIPMENT, FURNITURE AND FURNISHING DIMENSIONS AND OTHER DETAILED INFORMATION.
- DIMENSIONS FOR WALLS AND PARTITIONS FOR CRITICAL HOLD OR CLEAR DIMENSIONS ARE IDENTIFIED ON THE DRAWINGS. WALL THICKNESSES LISTED ARE ACTUAL AND DO NOT INCLUDE SURFACE FINISHES.
- PROVIDE FIRE EXTINGUISHERS THROUGHOUT THE DEMOLITION AND CONSTRUCTION AREAS AS REQUIRED BY CODE FOR THE DURATION OF WORK. REMOVE AT THE END OF CONSTRUCTION AND REPLACE WITH NEW.

SELECTIVE DEMOLITION, CUTTING AND PATCHING

- WHERE PORTIONS OF WALLS AND CEILINGS ARE REMOVED, RESTORE THE REMAINING PORTIONS TO MATCH THE ORIGINAL CONSTRUCTION INCLUDING SMOKE AND FIRE RATINGS.
- WHERE PORTIONS OF MASONRY WALLS ARE REMOVED: RESTORE THE REMAINING PORTIONS USING NEW BRICK AND/OR CMU TO MATCH EXISTING, INCLUDING COLOR, SIZES AND COURSING. SUBMIT BRICK SAMPLES TO ARCHITECT/ENGINEER AND OWNER FOR APPROVAL. TOOTH NEW MASONRY INTO EXISTING, MATCH EXISTING BOND PATTERNS.
- WHERE CEILINGS ARE INDICATED TO BE REMOVED, ALSO REMOVE FRAMING MEMBERS, HANGERS AND OTHER RELATED ITEMS. WHERE SELECTIVE DEMOLITION IS INDICATED CONTRACTOR TO PATCH AND REPAIR CEILING AS REQUIRED TO INSTALL NEW MECHANICAL EQUIPMENT.
- WHERE FLOOR FINISHES ARE INDICATED TO BE REMOVED, INCLUDE REMOVAL OF ALL FINISH LAYERS TO EXPOSE THE UNDERLYING SUBSTRATE. FIELD VERIFY NUMBER OF LAYERS.
- SPRAY APPLIED FIRE RESISTIVE MATERIALS WHICH ARE DAMAGED DURING DEMOLITION AND NEW CONSTRUCTION SHALL BE REPAIRED. FIELD VERIFY MATERIAL TYPE AND THICKNESS. MATCH EXISTING FIRE RATING.

FIRE AND SMOKE RATED ASSEMBLIES

- FIRE AND SMOKE RATED ASSEMBLIES ARE TO BE CONTINUOUS FOR THE ENTIRE LENGTH AND HEIGHT OF THE ASSEMBLY. INSTALL IN FULL ACCORDANCE WITH ALL REQUIREMENTS PER THE LISTED TEST. REFER TO THE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR CONSTRUCTION DETAILS AND OTHER INFORMATION.
- STRUCTURAL MEMBERS WHICH SUPPORT FIRE RATED WALLS REQUIRE THE SAME FIRE RATING AS THE WALL, UNLESS NOTED OTHERWISE.
- RECESSED CABINETS, PANELS, AND BACK BOXES WHICH ARE LOCATED IN FIRE RATED ASSEMBLIES SHALL BE INSTALLED TO MAINTAIN THE FIRE RATING. INCLUDING INTUMESCENT FIRE STOP PADS FOR LARGE ITEMS.

PENETRATIONS

- SEAL ALL UTILITY AND STRUCTURAL STEEL PENETRATIONS THROUGH FLOOR AND WALLS AS FOLLOWS:
 - FLOORS WITH FIRE RATING: FIRESTOPPING SYSTEM, MATCH FIRE RATING OF FLOOR
 - FLOORS WITHOUT FIRE RATING: ONE HOUR FIRESTOPPING SYSTEM
 - WALLS WITH FIRE RATING: FIRESTOPPING SYSTEM, MATCH FIRE RATING OF WALL
 - WALLS WITHOUT FIRE RATING: ACOUSTICAL SEALANT BOTH SIDES OF WALL; EXCEPT ONE HOUR FIRESTOPPING SYSTEM AT CABLE TRAYS, ELECTRICAL BUSWAYS AND CONDUIT SLEEVES WITH LOW VOLTAGE CABLES
 - SMOKE BARRIERS: SMOKE AND FIRESTOPPING SYSTEM, TESTED AND APPROVED PER CODE REQUIREMENTS
 - SOUND RATED ASSEMBLIES: ACOUSTICAL SEALANT BOTH SIDES OF WALL, REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

APPLICABLE CODES:

MICHIGAN MECHANICAL CODE 2015
MICHIGAN PLUMBING CODE 2015
MICHIGAN ELECTRICAL CODE BASED ON 2017
NATIONAL ELECTRIC CODE (N.E.C.) WITH PART 8
STATE OF MICHIGAN AMENDMENTS.
INSTITUTE OF ELECTRICAL AND ELECTRONIC
ENGINEERS – IEEE
NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
AMERICAN NATIONAL STANDARDS INSTITUTE – ANSI
MICHIGAN FIRE PREVENTION CODE
MICHIGAN ENERGY CODE
N.F.P.A. (WITH MICHIGAN AMENDMENTS)
70– 2017 NATIONAL ELECTRICAL CODE (NEC)
72– NATIONAL FIRE AND SIGNALING CODE
101– LIFE SAFETY CODE
110– STANDARD FOR EMERGENCY AND
STANDBY POWER SYSTEMS
M.I.O.S.H.A. STANDARDS

BUILDING INFORMATION:

USE GROUP	B
TYPE OF CONSTRUCTION	II B
NUMBER OF STORIES	4
TOTAL BUILDING AREA	73,955 S.F.
FIRE ALARM SYSTEM	YES
SUPPRESSED SPRINKLER SYSTEM (THROUGHOUT)	YES

BUILDING SCOPE:

THE REUTHER LIBRARY IS A 73,955 SF, 4 STORY FACILITY. THE ORIGINAL BUILDING WAS BUILT IN 1974 AND A MAJOR ADDITION WAS ADDED IN 1990. THE FACILITY CONTAINS PAPER AND DIGITAL ARCHIVES. THE SCOPE OF WORK INCLUDES REMOVING AND INSTALLING TWO NEW AIR HANDLING UNITS IN THE BASEMENT AND REMOVING NINE EXISTING HUMIFICATION MANIFOLDER THAT ARE IN THE EXISTING SUPPLY DUCTWORK.

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REGISTRATION SEAL

NOT FOR
CONSTRUCTION

	DOC REL 07 – IFB	07/02/24
	DOC REL 05 – IFB	04/08/24
	DOC REL 04–95% REVIEW	03/13/24
	DOC REL 03 – 100% DD	02/08/24
	DOC REL 02 – 60% DD	08/10/23

MARK	ISSUE	DATE
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DESIGNER	A. GAUTHIER
DRAWN	A. GAUTHIER
CHECKED	R. BARRY
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

TITLE: WSU REUTHER
LIBRARY MEP

REUTHER LIBRARY
5401 CASS AVENUE
DETROIT, MICHIGAN

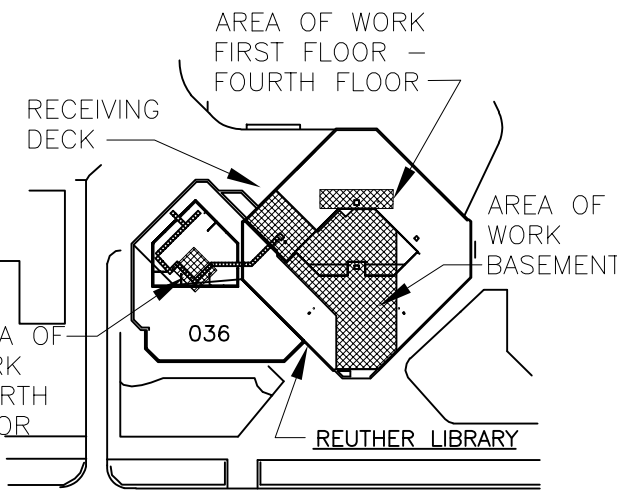
SYMBOL LIST, LEGENDS,
ABBREVIATIONS &
OVERVIEW OF SCOPE

WSU PROJECT #: 036–350464
WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

A/E PROJECT NO.
2164076

SHEET NO.
A –0.1

DSD FILE NAME
2164076–036–A001



KEY PLAN
NO SCALE

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DSD FILE NAME
2164076-036-A101

REGISTRATION SEAL

NOT FOR
CONSTRUCTION

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	DOC REL 05 – IFB	04/08/24
	DOC REL 04–95% REVIEW	03/13/24
	DOC REL 03 – 100% DD	02/08/24
	DOC REL 02 – 60% DD	08/10/23

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DESIGNER	A. GAUTHIER	
DRAWN	A. GAUTHIER	
CHECKED	R. BARRY	
DEPT MGR	V. LALONDE	
PROJECT MGR	K. RUPP	

TITLE: WSU REUTHER
LIBRARY MEP

REUTHER LIBRARY
5401 CASS AVENUE
DETROIT, MICHIGAN

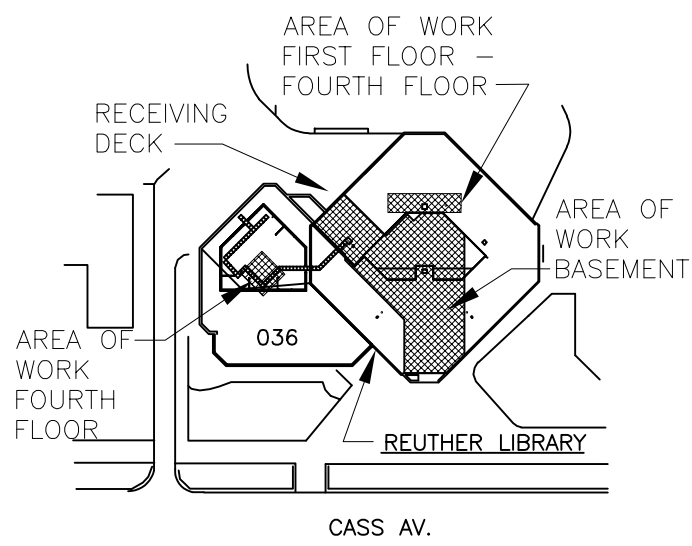
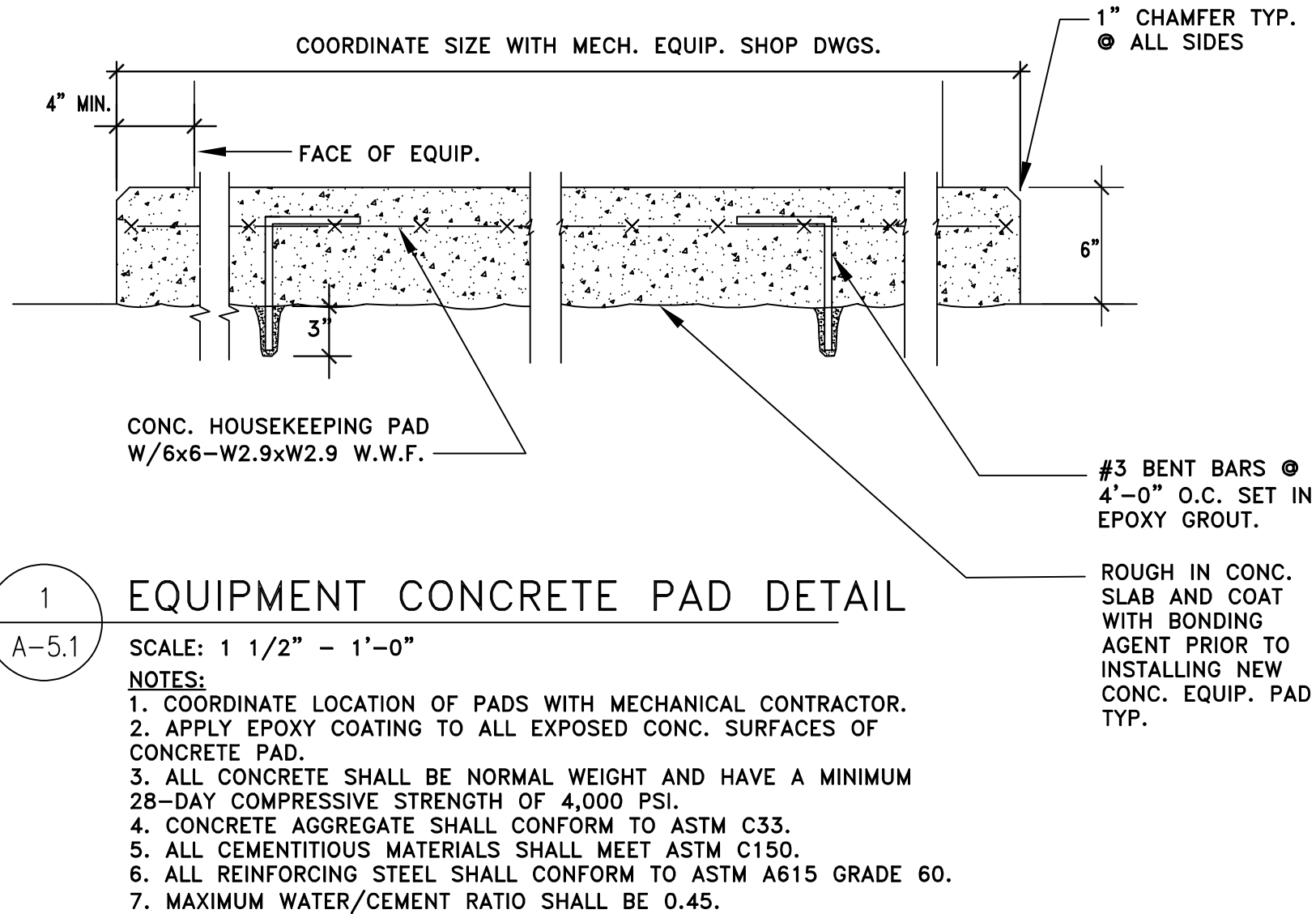
DETAILS

WSU PROJECT #: 036–350464
WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

A/E PROJECT NO.
2164076

SHEET NO.
A – 5.1

DSF FILE NAME
2164076–036–A501



KEY PLAN
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A	DOC REL 06-ADDENDUM A	05/30/24
	DOC REL 05 - IFB	04/08/24
	DOC REL 04-95% REVIEW	03/13/24
	DOC REL 03 - 100% DD	02/08/24
	DOC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
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DESIGNER	E. ERNVALL
DRAWN	E. ERNVALL
CHECKED	C. TRIERWEILER
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

TITLE: WSU REUTHER LIBRARY MEP

REUTHER LIBRARY
5401 CASS AVENUE
DETROIT, MICHIGAN

MECHANICAL GENERAL
INFORMATION & SYMBOLS

WSU PROJECT #: 036-350464
WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

A/E PROJECT NO.
2164076

SHEET NO.
M-0.1

DSD FILE NAME
2164076-036-M-0.1

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MECHANICAL ABBREVIATIONS

AFF	ABOVE FINISH FLOOR	ID	INSIDE DIAMETER
AC	AIR COMPRESSOR	I.E.	INVERT ELEVATION
AHU	AIR HANDLING UNIT	IAH	INTAKE HOOD
AS	AIR SEPARATOR		
A.T.C.	ARCHITECTURAL TRADES CONTRACTOR	LAT	LEAVING AIR TEMPERATURE
		LH	LATENT HEAT (MBH)
B	BOILER	LWT	LEAVING WATER TEMPERATURE
B.A.S.	BUILDING AUTOMATION SYSTEM		
		MAX	MAXIMUM
CAF	COMBUSTION AIR FAN	BTU	BTU PER HOUR (THOUSAND)
CC	COOLING COIL	MIN	MINIMUM
CFM	CUBIC FEET PER MINUTE	M.T.C.	MECHANICAL TRADES CONTRACTOR
CHLR	CHILLER		
CHP	CONSOLE HEAT PUMP	N.C.	NOISE CRITERIA
CONV	CONVECTOR	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
CT	COOLING TOWER	NTS	NOT TO SCALE
CU	CONDENSING UNIT		
CUH	CABINET UNIT HEATER	P	PUMP
CV	CONTROL VALVE	PCR	PUMPED CONDENSATE RETURN
CWP	CHILLED WATER PUMP	PD	PRESSURE DROP
DB	DRY BULB	RCP	RADIANT CEILING PANEL
DFU	DUCT FURNACE	REQ'D	REQUIRED
DIA	DIAMETER	RG	RETURN GRILLE
DN	DOWN	RH	RELATIVE HUMIDITY
DPR	DAMPER	RLH	RELIEF HOOD
DS	DUCT SILENCER	RTU	ROOF TOP UNIT
EAT	ENTERING AIR TEMPERATURE	SD	SUPPLY DIFFUSER
EF	EXHAUST FAN	SF	SUPPLY FAN
EG	EXHAUST GRILLE	SG	SUPPLY GRILLE
E.T.C.	ELECTRICAL TRADES CONTRACTOR	SH	SENSIBLE HEAT (MBH)
EVR	EVAPORATOR	SM	SHEET METAL
EWT	ENTERING WATER TEMPERATURE	SQ. FT.	SQUARE FEET
EXH	EXHAUST	SST	SATURATED SUCTION TEMPERATURE
EXIST	EXISTING	STR	STRAINER
FF	FINISH FLOOR	TC	TOTAL COOLING (MBH)
FFM	FEET PER MINUTE	TCL	TEMPERATURE CONTROL
FT	FEET	T&P	TEMPERATURE & PRESSURE RELIEF VALVE
FTR	FINNED TUBE RADIATION	TYP	TYPICAL
FU	FURNACE		
		UH	UNIT HEATER
GAL	GALLON	VAV	VARIABLE AIR VOLUME BOX
GFRH	GAS FRED RADIANT HEATER	VRH	VARIABLE AIR VOLUME REHEAT BOX
GR	GRILLE	FPVAV	FAN POWERED VARIABLE AIR VOLUME BOX
		V.F.D	VARIABLE FREQUENCY DRIVE
H	HUMIDIFIER		
HC	HEATING COIL		
HD	HEAD (FT)		
HP	HORSE POWER		
HHP	HORIZONTAL HEAT PUMP		
HTG	HEATING		
HVAC	HEATING, VENTILATION, & AIR CONDITIONING		
HWP	HEATING WATER PUMP		
HX	HEAT EXCHANGER		

MECHANICAL SYMBOLS LEGEND

HVAC DUCTWORK SYMBOLS

	SUPPLY AIR DUCT RISER
	RETURN AIR DUCT RISER
	OUTSIDE AIR DUCT RISER (AS NOTED)
	EXHAUST AIR DUCT
	INSULATED DUCTWORK (AS NOTED)
	SUPPLY AIR DIFFUSER (SQUARE)
	SUPPLY AIR DIFFUSER (INLINE)
	TURNING VANES
	SURFACE MTD. GRILLE
	SUPPLY AIR DIFFUSER (ROUND)
	90° TEE W/45° APPROACH
	CONICAL TAKE-OFF
	CONICAL TAKE-OFF W/ DAMPER
	BALANCE DAMPER
	RETURN AIR DUCT BOOT
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER
	VERTICAL FIRE DAMPER
	EXISTING VERTICAL FIRE DAMPER
	HORIZONTAL FIRE DAMPER
	EXISTING HORIZONTAL FIRE DAMPER
	VERTICAL SMOKE DAMPER
	HORIZONTAL SMOKE DAMPER
	VERTICAL FIRE / SMOKE DAMPER
	HORIZONTAL FIRE / SMOKE DAMPER
	DUCT SMOKE DETECTOR, INSTALLED BY M.T.C., PROVIDED & WIRED BY E.T.C.
	UNIT HEATER
	CEILING EXHAUST FAN
	ROOF MOUNTED EXHAUST FAN
	DEMOLITION

HVAC DUCTWORK & DIFFUSER TAGS

SD-1	250	TAG	CFM
8"		NECK	REMARKS
		SIZE	

MISCELLANEOUS NOTES

	POINT OF CONNECTION BETWEEN NEW AND EXISTING
	POINT OF EXISTING TO REMAIN AND EXISTING TO BE REMOVED
	INDICATES PLAN NOTE
	INDICATES DEMOLITION NOTE
	DETAIL BUBBLE
	DETAIL NUMBER
	PAGE LOCATION INDICATES
	DIRECTION OF DETAIL SECTION

GENERAL HVAC NOTES

- LOCATE EXHAUST OUTLETS OF VENTILATION SYSTEMS, COMBUSTION EQUIPMENT STACKS, & PLUMBING VENTS AT LEAST 10 FEET FROM OUTDOOR AIR INTAKES.
- INSTALL ALL EQUIPMENT, MATERIALS, AND ACCESSORIES PER MANUFACTURERS WRITTEN INSTRUCTIONS.
- ALL EXISTING SYSTEMS (INCLUDING EXHAUST FANS, AIR HANDLING UNITS, PUMPS) THAT SERVES AREAS BEING RENOVATED SHALL BE REBALANCED AS REQUIRED.
- NOTIFY OWNER OF ANY PIPING OR DUCTWORK DEMOLITION THAT MAY AFFECT NORMAL OPERATION OF OTHER AREAS.
- FIELD VERIFY LOCATIONS OF EXISTING PIPING THAT MAY CONFLICT WITH NEW CONSTRUCTION AND RELOCATE AS NEEDED.
- PROVIDE BALANCE DAMPERS FOR EACH DIFFUSER/GRILLE AND BRANCH DUCT.
- PROVIDE FLEXIBLE DUCT IN ACCESSIBLE CEILINGS. 6 FT MAX LENGTH. KEEP BENDS TO A MINIMUM.
- FIRE DAMPERS & COMBINATION FIRE/SMOKE DAMPERS SHALL MATCH RATING OF WALL. UNLESS NOTED OTHERWISE.
- INTERLOCK FIRE/SMOKE DAMPERS BY ELECTRICAL TRADES. PROVE OPEN BEFORE AIR HANDLING UNITS FAN(S) START.
- SMOKE DETECTORS SHALL BE FURNISHED AND CONNECTED BY ELECTRICAL CONTRACTOR. INSTALLATION BY MECHANICAL CONTRACTOR.
- ALL REHEAT COIL HS&R RUNOUT PIPES SHALL BE 3/4" UNLESS OTHERWISE NOTED.
- PROVIDE ACCESS PANELS ON EACH SIDE OF REHEAT COILS.
- PROVIDE 5 FT MIN BEFORE ANY DUCT TAKEOFF FOR DUCTWORK DOWNSTREAM OF VAV BOXES.
- PROVIDE 1 1/2 DUCT DIAMETERS MIN. DUCT LENGTH OF HIGH PRESSURE BRANCH DUCTWORK ON THE UPSTREAM SIDE OF VAV BOXES.
- COORDINATE LOUVER SIZES WITH ARCHITECTURAL TRADES PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER DISCIPLINES PRIOR TO CONSTRUCTION TO AVOID CONFLICTS.
- PROVIDE MANUAL AIR VENTS WITH 3/4" HOSE CONNECTION AT ALL HIGH POINTS.
- OFFSET PIPING TO ACCOMMODATE LARGE DUCTWORK.
- THE CONTRACTOR SHALL FIELD VERIFY THE SIZES, LOCATION, ELEVATIONS, AND DETAILS OF ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE INTEGRITY OF ALL EQUIPMENT AND MATERIALS IN A "NEW" CONDITION DURING CONSTRUCTION.
- ALL WORK SHALL BE PERFORMED BY LICENSED CONTRACTORS AND SUBCONTRACTORS AS REQUIRED BY LAW.
- ALL WORK SHALL CONFORM TO MICHIGAN MECHANICAL CODE, LATEST APPLICABLE EDITION.
- CONTRACTOR SHALL USE LOW PRESSURE LOSS DUCT FITTINGS IN ACCORDANCE WITH SMACNA. (WYES, RADIUSSED OR VANED TEES, ETC.) DUCTWORK SHALL BE GALVANIZED SHEET METAL, MIN. 26 GA.
- ALL DUCT DIMENSIONS SHOWN ARE INSIDE CLEAR DIMENSION. INCREASE DUCT SIZE FOR LINING.
- CONSTRUCT ALL TRANSFER DUCTS W/ 1-INCH THICK LINING.
- ALL EXPOSED ROUND DUCTWORK SHALL BE SPIRAL.
- LINE 10'-0" OF SUPPLY DUCTWORK AFTER EACH VAV BOX.
- ALL EXTERNALLY ISOLATED HVAC EQUIPMENT SHALL HAVE FLEXIBLE DUCT CONNECTORS.
- ALL CONDENSATE DRAIN PIPING SET @ MIN. 1% SLOPE.
- ALL CONDENSATE DRAIN PIPING TO TERMINATE TO DRAIN VIA AIR GAP.
- IF THERE IS CONFLICTING INFORMATION IN THE PLANS OR SPECIFICATIONS THE MORE STRINGENT AND GREATER COST ITEM SHALL BE USED.
- DRAWINGS INDICATE REQUIRED SIZES AND POINTS OF TERMINATION OF PIPES AND DUCTS AND SUGGESTED ROUTES. IT IS NOT INTENTION OF DRAWINGS TO INDICATE ALL NECESSARY OFFSETS. INSTALL WORK IN MANNER TO CONFORM TO STRUCTURE, AVOID OBSTRUCTIONS, PRESERVE HEADROOM AND KEEP OPENINGS AND PASSAGEWAYS CLEAR. DO NOT SCALE FROM DRAWINGS.
- ABUSE OF THE REQUEST FOR INFORMATION (RFI) PROCESS WILL NOT BE TOLERATED. RFIS REQUESTING INFORMATION ALREADY CONTAINED IN THE DESIGN DOCUMENTS, INVOLVING MEANS AND METHODS OF CONSTRUCTION, COORDINATION OF WORK BETWEEN TRADES, OR ITEMS NOT PREVIOUSLY AND THOROUGHLY INVESTIGATED AND RESEARCHED BY THE GENERAL CONTRACTOR WILL BE RETURNED UNANSWERED TO THE GENERAL CONTRACTOR. ALLOW TWO WEEKS FOR RFI RESPONSES FROM THE DESIGN TEAM.

HVAC PIPING

—CWS—	CHILLED WATER SUPPLY
—CWR—	CHILLED WATER RETURN
—CD—	CONDENSATE DRAIN
—CTS—	CONDENSER WATER SUPPLY
—CTR—	CONDENSER WATER RETURN
—CS—	COOLING TOWER WATER SUPPLY
—CR—	COOLING TOWER WATER RETURN
—DX—	DIRECT EXPANSION
—HPS—	HEAT PUMP WATER SUPPLY
—HPR—	HEAT PUMP WATER RETURN
—HS—	HEATING WATER SUPPLY
—HR—	HEATING WATER RETURN
—S—	SUCTION (REFRIGERANT)
—L—	LIQUID (REFRIGERANT)
—DXS—	SUCTION (DIRECT EXPANSION)
—DXL—	LIQUID (DIRECT EXPANSION)
—LPS—	LOW PRESSURE STEAM (0-20 LBS.)
—MPS—	MEDIUM PRESSURE STEAM (21-75 LBS.)
—HPS—	HIGH PRESSURE STEAM (76 LBS. & ABV.)
—SC—	STEAM CONDENSATE (GRAVITY)
—SCP—	PUMPED STEAM CONDENSATE
—SC (BF)—	STEAM CONDENSATE BOILER FEED
—RO—	REVERSE OSMOSIS WATER
—CW—	COLD WATER

HVAC PIPING VALVES

	GATE VALVE
	GAS COCK
	CHECK VALVE
	BALANCE COCK
	CIRCUIT SETTER
	TWO-WAY CONTROL VALVE
	THREE-WAY CONTROL VALVE
	GLOBE VALVE
	BALL VALVE
	SOLENOID VALVE
	EXPANSION VALVE WITH THERMOSTATIC BULB
	PLUG VALVE
	BUTTERFLY VALVE
	RELIEF VALVE
	HOSE & DRAIN END VALVE
	PRESSURE RELIEF VALVE
	PRESSURE REDUCING VALVE
	TRIPLE DUTY VALVE
	GAS PRESSURE REGULATOR
	STRAINER (BLOW-OFF)

HVAC DUCTWORK

—SA—	SUPPLY AIR DUCT
—X-SA—	EXIST SUPPLY AIR DUCT
—RA—	RETURN AIR DUCT
—X-RA—	EXIST RETURN AIR DUCT
—OA—	OUTSIDE AIR DUCT
—X-OA—	EXIST OUTSIDE AIR DUCT
—EA—	EXHAUST AIR DUCT
—X-EA—	EXIST EXHAUST AIR DUCT

HVAC PIPING SYMBOLS

	FLOW DIRECTION
	PIPING DROP
	PIPING RISE
	INLINE PIPING DROP
	INLINE PIPING RISE
	PIPING TEE
	PIPING ELBOW
	THERMOMETER
	PUMP
	UNION
	PIPE ANCHOR
	PIPE GUIDE
	BACK FLOW PREVENTER
	PIPE CAP
	PIPE BREAK
	THERMOMETER WELL
	EXPANSION LOOP
	EXPANSION COMPENSATOR
	FLOAT & THERMOSTATIC STEAM TRAP
	INVERTED BUCKET STEAM TRAP

TEMPERATURE CONTROL SYMBOLS

	THERMOSTAT
	PROGRAMMABLE THERMOSTAT
	THERMOSTAT (W NIGHT SETBACK)
	ROOM SENSOR
	HUMIDISTAT
	PRESSURE GAUGE
	DAMPER (ELECTRIC OPERATION)
	DAMPER (PNEUMATIC OPERATION)
	DAMPER BLADES

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	DOC REL 04-95% REVIEW	03/13/24
	DOC REL 03 - 100% DD	02/08/24
	DOC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
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DESIGNER	E. ERNVALL
DRAWN	E. ERNVALL
CHECKED	C. TRIERWEILER
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

TITLE: WSU REUTHER
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BASEMENT FLOOR PLAN
HVAC DEMOLITION

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WSU BLDG #: 036

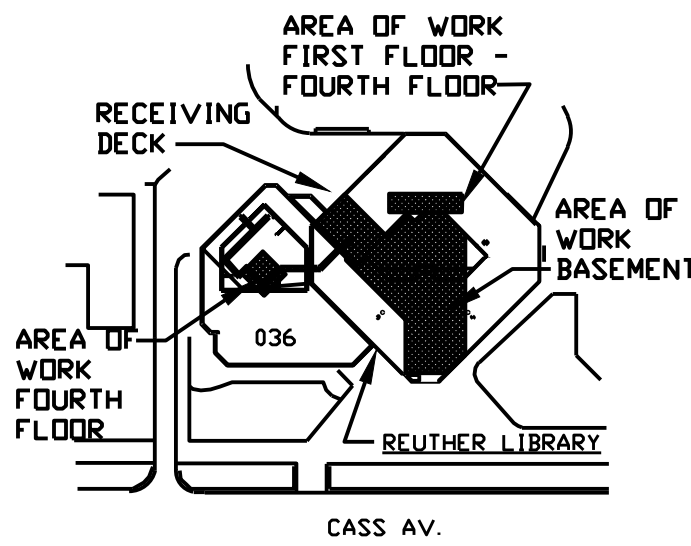
A/E PROJECT NO.
2164076

SHEET NO.
M-1.0

DSD FILE NAME
2164076-036-M-1.0

DEMOLITION NOTES

- DISCONNECT, REMOVE, & DEMO EXISTING AIR HANDLING UNIT ENTIRELY, INCLUDING ALL ACCESSORIES & CONTROLS ENTIRELY. PREPARE AREA FOR REPLACEMENT.
- DISCONNECT, REMOVE, & DEMO EXISTING RETURN FAN ENTIRELY. PREPARE AREA FOR REPLACEMENT.
- DISCONNECT, REMOVE, AND DEMO EXISTING CONSTANT VOLUME REHEAT BOX AT LOCATION SHOWN.
- DISCONNECT, REMOVE, AND DEMO EXISTING REHEAT COIL AT LOCATION SHOWN. PREPARE AREA FOR REPLACEMENT WITH FPAVAV BOX.
- DISCONNECT, REMOVE, AND DEMO EXISTING HUMIDIFIER MANIFOLD AT LOCATION SHOWN.
- DISCONNECT, REMOVE, AND DEMO EXISTING SUPPLY DUCTWORK TO EXTENTS SHOWN.



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BASEMENT FLOOR PLAN - HVAC DEMOLITION

0 1 5 10 20
SCALE: 1/8" = 1'-0"

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	DOC REL 02 - 60% DD	08/10/23
MARK	ISSUE	DATE

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DRAWN	E. ERNVALL
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PROJECT MGR	K. RUPP

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FIRST FLOOR PLAN HVAC DEMOLITION

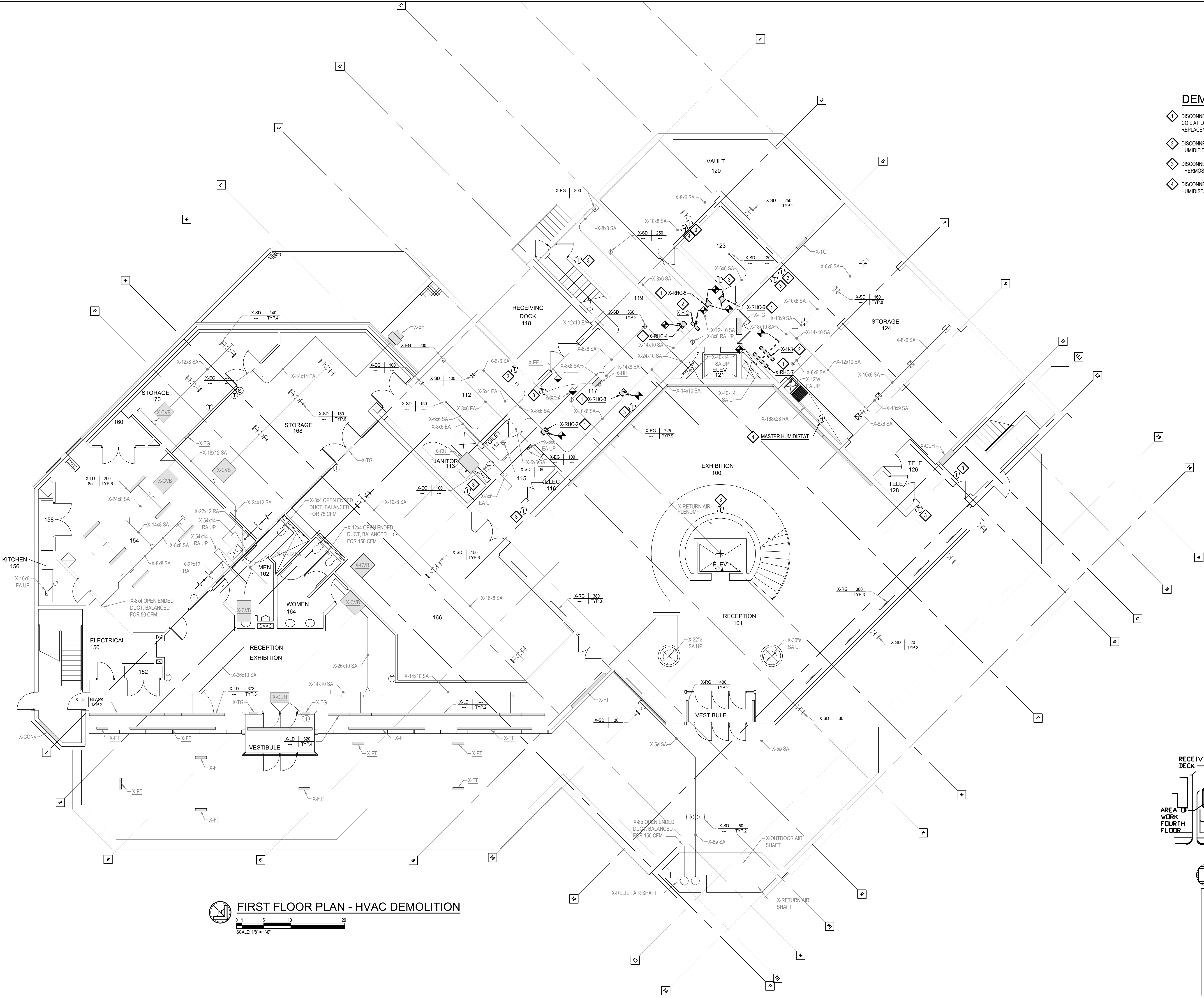
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SHEET NO. M-1.1

OSD FILE NAME
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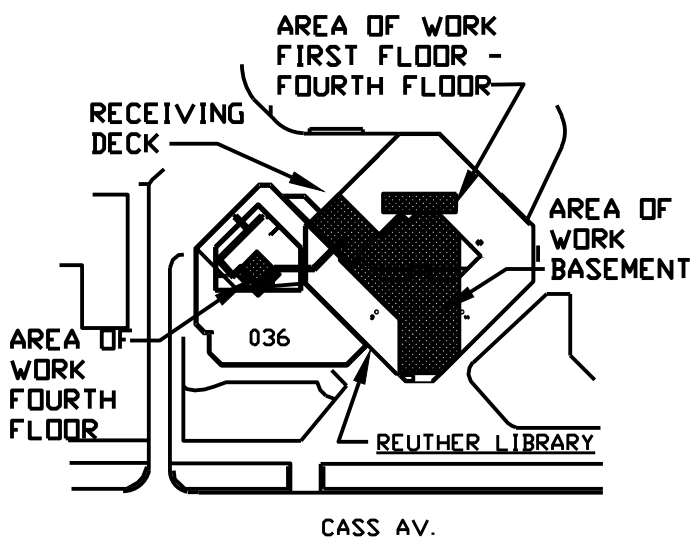
- 1 DISCONNECT, REMOVE, AND DEMO EXISTING REHEAT COIL AT LOCATION SHOWN. PREPARE AREA FOR REPLACEMENT WITH PPVAV BOX.
- 2 DISCONNECT, REMOVE, AND DEMO EXISTING HUMIDIFIER MANIFOLD AT LOCATION SHOWN.
- 3 DISCONNECT, REMOVE, AND DEMO EXISTING THERMOSTAT AT LOCATION SHOWN.
- 4 DISCONNECT, REMOVE, AND DEMO EXISTING HUMIDISTAT AT LOCATION SHOWN.



 **FIRST FLOOR PLAN - HVAC DEMOLITION**

0 1 5 10 20

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



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DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

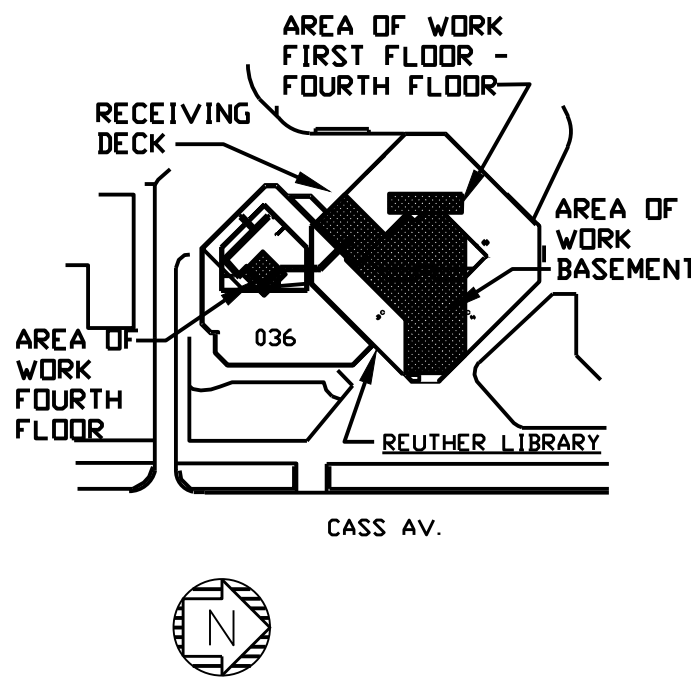
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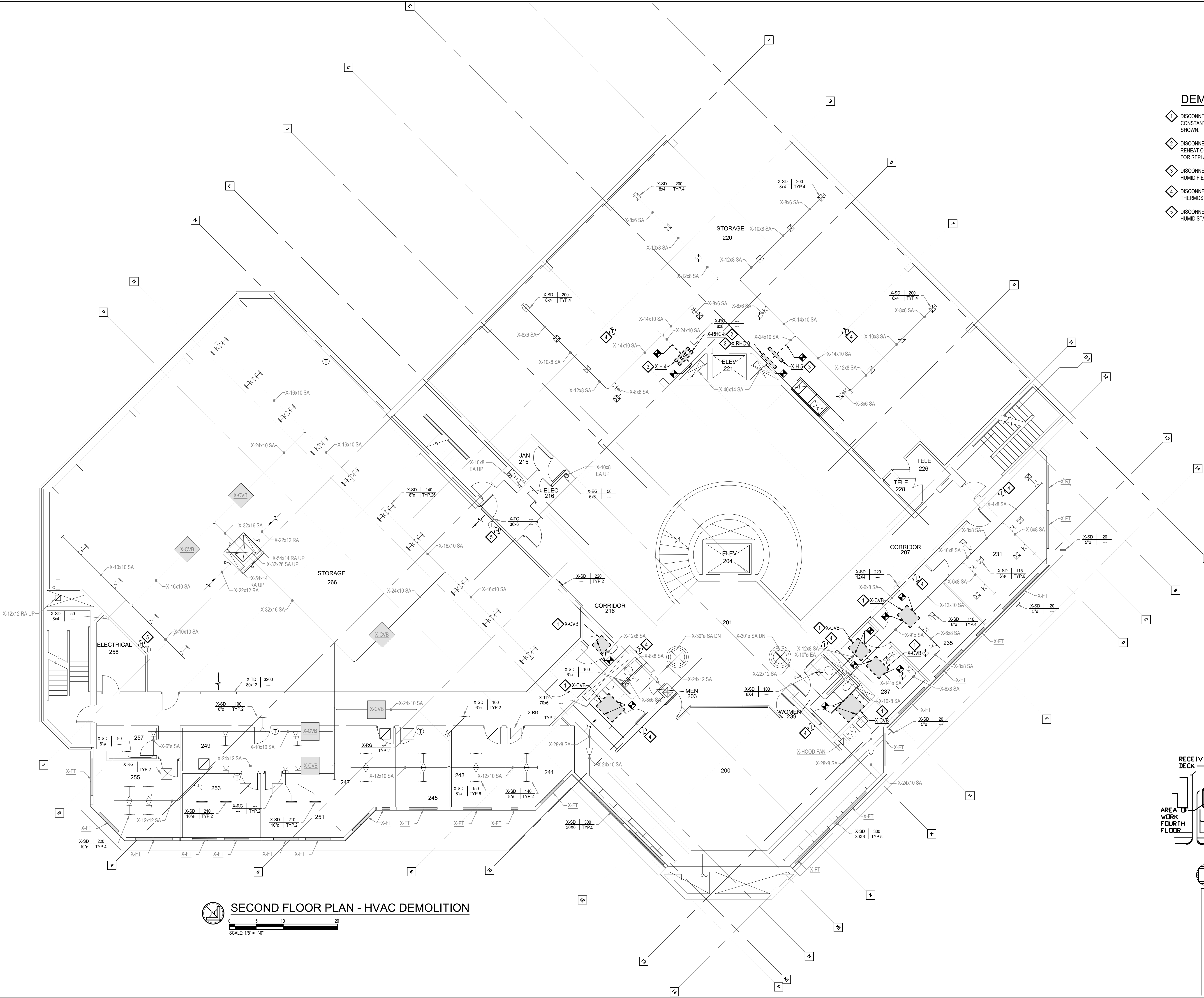
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	DOC REL 02 - 60% DD	08/10/23
MARK	ISSUE	DATE

DESIGNER	E. ERNVALL
DRAWN	E. ERNVALL
CHECKED	C. TRIERWEILER
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

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THIRD FLOOR PLAN HVAC DEMOLITION

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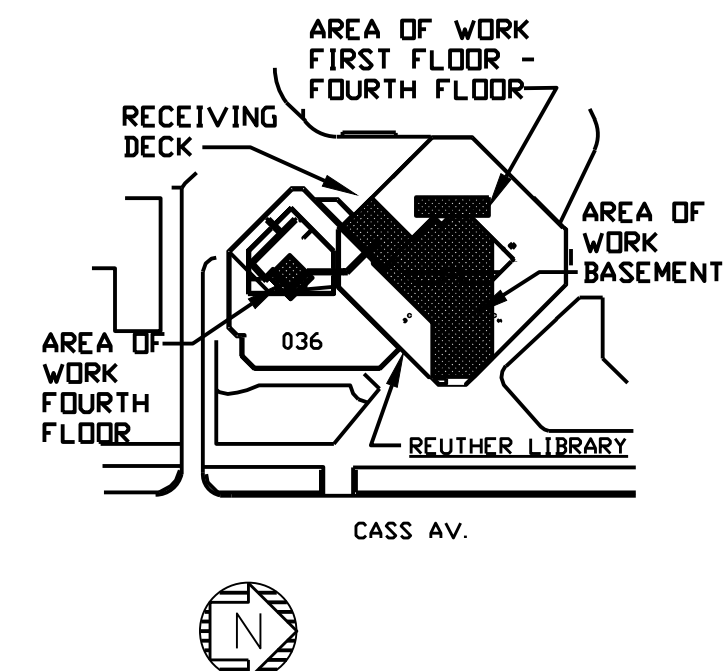
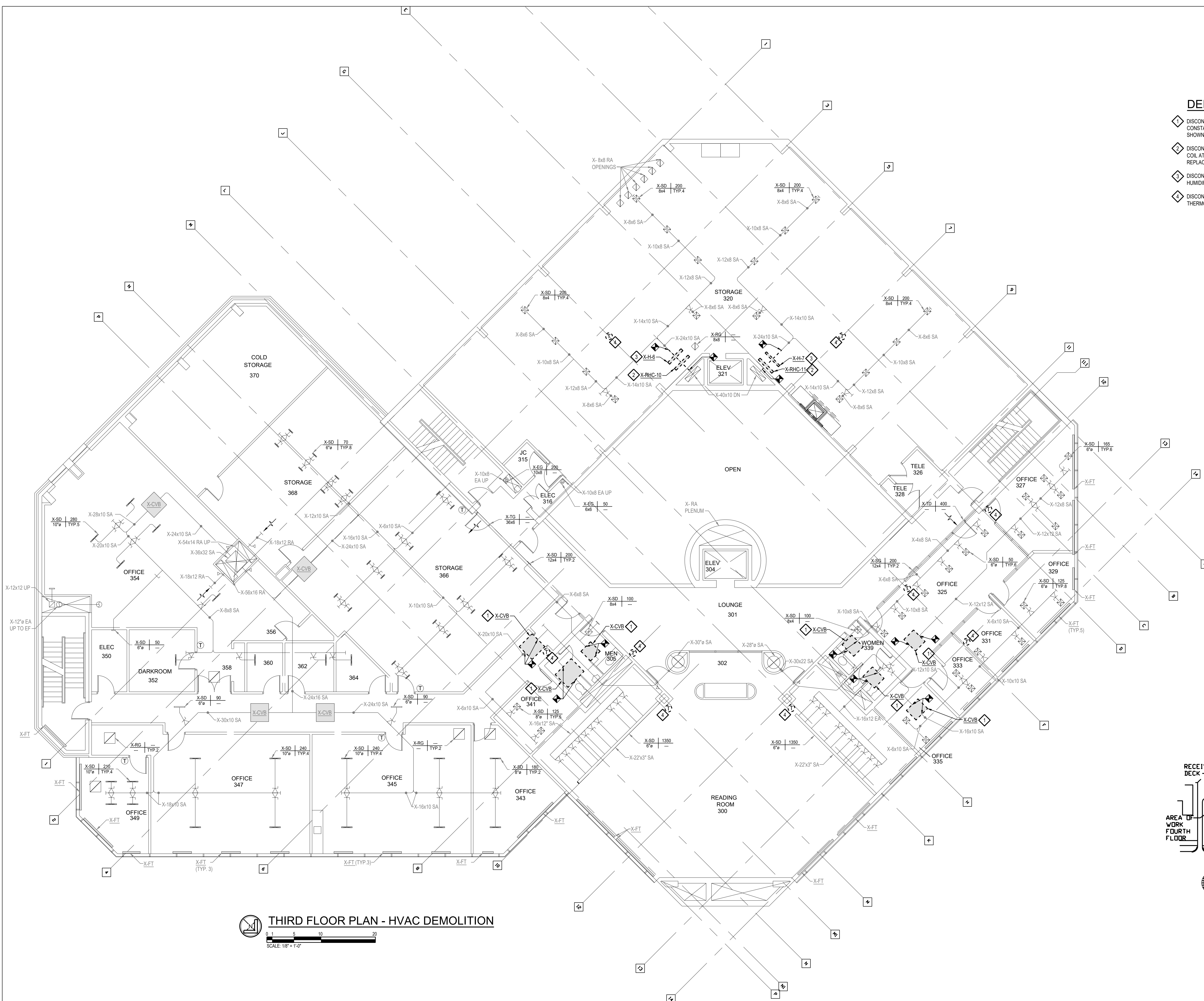
A/E PROJECT NO.
2164076

SHEET NO.

M-1.3

DSD FILE NAME	2164076-036-M-1.3
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- 1 DISCONNECT, REMOVE, AND DEMO EXISTING CONSTANT VOLUME REHEAT BOX AT LOCATION SHOWN.
- 2 DISCONNECT, REMOVE, AND DEMO EXISTING REHEAT COIL AT LOCATION SHOWN. PREPARE AREA FOR REPLACEMENT WITH PFAV BOX.
- 3 DISCONNECT, REMOVE, AND DEMO EXISTING HUMIDIFIER MANIFOLD AT LOCATION SHOWN.
- 4 DISCONNECT, REMOVE, AND DEMO EXISTING THERMOSTAT AT LOCATION SHOWN.



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 **THIRD FLOOR PLAN - HVAC DEMOLITION**

0 1 5 10 20
SCALE: 1/8" = 1'-0"

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	DOC REL 02 - 60% DD	08/10/23

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DRAWN	E. ERNVALL
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PROJECT MGR	K. RUPP

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FOURTH FLOOR PLAN
HVAC DEMOLITION

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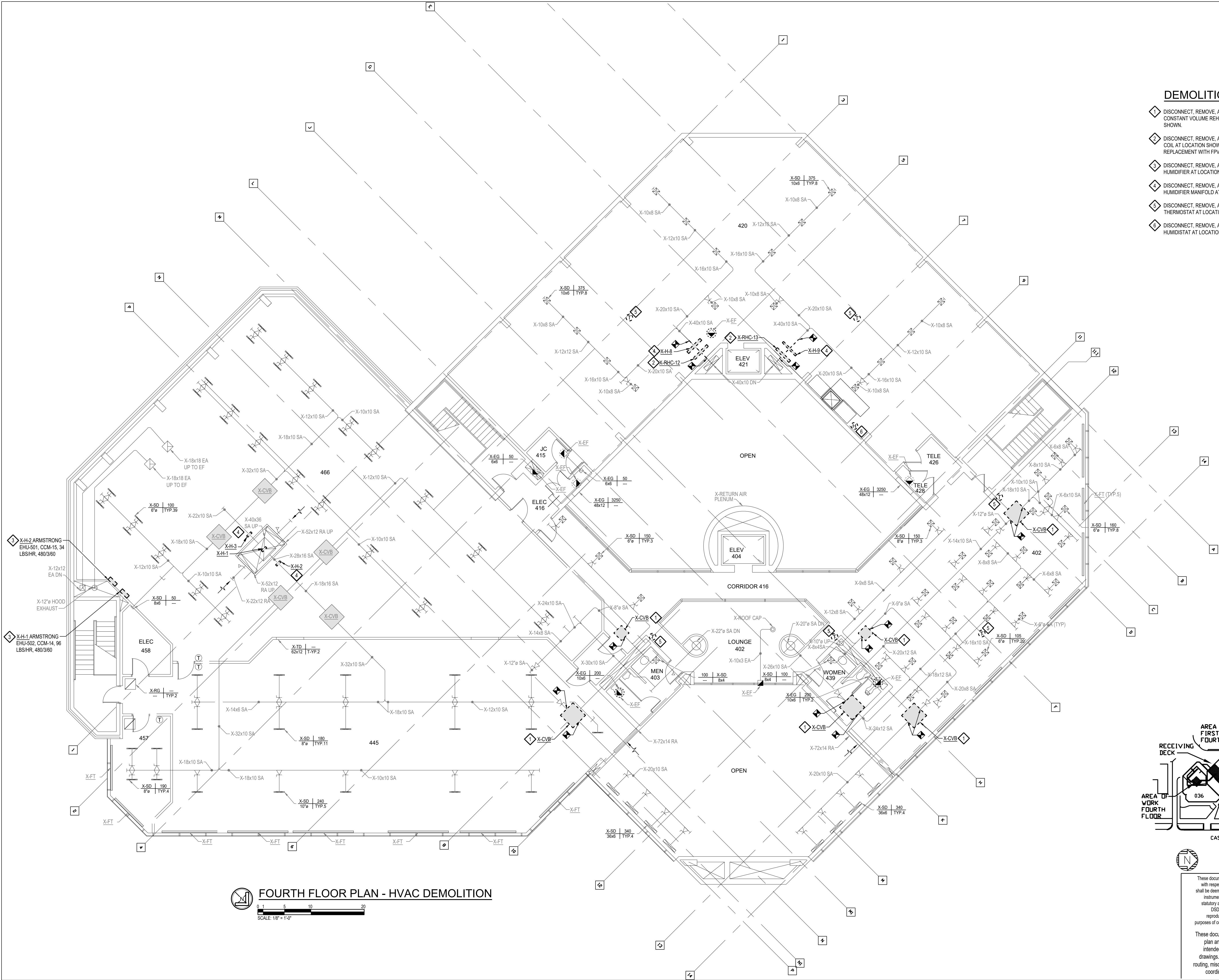
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SHEET NO.
M-1.4

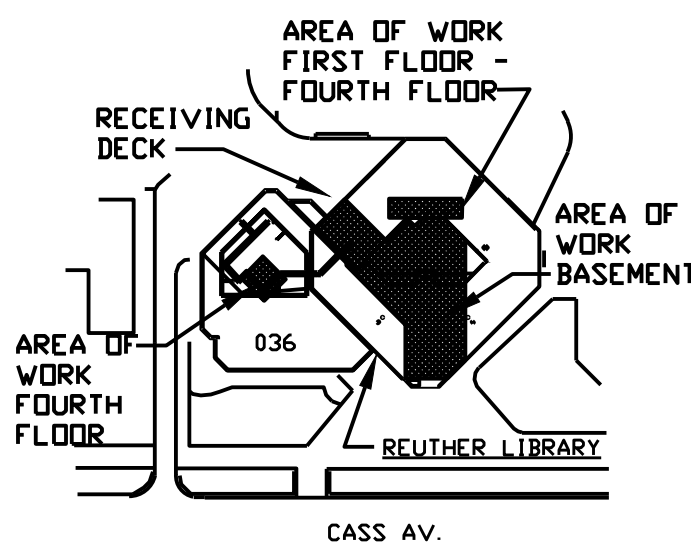
DSD FILE NAME
2164076-036-M-1.4

DEMOLITION NOTES

- 1 DISCONNECT, REMOVE, AND DEMO EXISTING
CONSTANT VOLUME REHEAT BOX AT LOCATION
SHOWN.
- 2 DISCONNECT, REMOVE, AND DEMO EXISTING REHEAT
COIL AT LOCATION SHOWN. PREPARE AREA FOR
REPLACEMENT WITH FPVAV BOX.
- 3 DISCONNECT, REMOVE, AND DEMO EXISTING
HUMIDIFIER AT LOCATION SHOWN.
- 4 DISCONNECT, REMOVE, AND DEMO EXISTING
HUMIDIFIER MANIFOLD AT LOCATION SHOWN.
- 5 DISCONNECT, REMOVE, AND DEMO EXISTING
THERMOSTAT AT LOCATION SHOWN.
- 6 DISCONNECT, REMOVE, AND DEMO EXISTING
HUMIDISTAT AT LOCATION SHOWN.



FOURTH FLOOR PLAN - HVAC DEMOLITION
SCALE: 1/8" = 1'-0"



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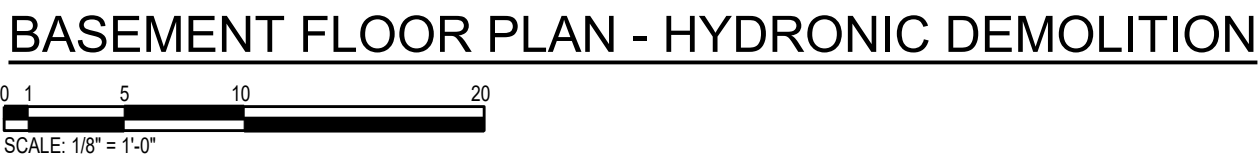
OSD FILE NAME
2164076-036-M-2.0

1	DISCONNECT, REMOVE, AND DEMOLISH EXISTING AIR HANDLING UNIT AT LOCATION SHOWN. DISCONNECT ASSOCIATED CHILLED WATER SUPPLY AND RETURN PIPING AS REQUIRED FOR REPLACEMENT.
2	DISCONNECT, REMOVE, AND DEMOLISH EXISTING STEAM BOILER, CONDENSATE RETURN/FEEDEWATER SYSTEM, AND BLOWDOWN SEPARATOR INCLUDING ALL ASSOCIATED PIPING, FITTINGS, SUPPORTS, ACCESSORIES AND ANCHILLAGES. SALVAGE ALL USEFUL PARTS AND RETURN TO OWNER.
3	DISCONNECT, REMOVE, AND DEMOLISH EXISTING CONSTANT VOLUME REHEAT BOX AT LOCATION SHOWN. DEMOLISH ASSOCIATED HEATING SUPPLY AND RETURN PIPING AS REQUIRED TO PREPARE FOR VAV BOX INSTALLATION.
4	DISCONNECT, REMOVE, AND DEMOLISH EXISTING REHEAT COIL AT LOCATION SHOWN. DEMOLISH ASSOCIATED HEATING SUPPLY AND RETURN PIPING AS REQUIRED TO PREPARE FOR FAN POWERED VAV BOX INSTALLATION.
5	DISCONNECT, REMOVE, AND DEMOLISH EXISTING HUMIDIFIER MANIFOLD AT LOCATION SHOWN. DEMOLISH ALL ASSOCIATED PIPING.
6	EXISTING BOILERS TO BE REPLACED AS OWNER'S WORK SCOPE.
7	DISCONNECT, REMOVE, AND DEMOLISH EXISTING CONTROL VALVE. REPLACE WITH NEW CONTROL VALVE. SEE NEW WORK SHEETS.
8	DISCONNECT, REMOVE, AND DEMOLISH EXISTING CONDENSATE RETURN PUMP INCLUDING ALL ASSOCIATED PIPING, ACCESSORIES, AND CONTROLS.



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DESIGNER	E. ERNVALL
DRAWN	E. ERNVALL
CHECKED	C. TRIERWEILER
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

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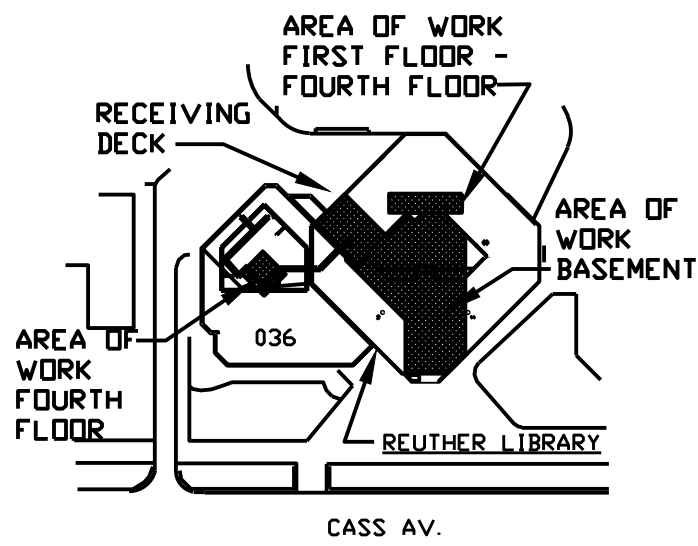
SHEET NO.

M-2.1

OSD FILE NAME
2164076-036-M-2.1

1 DISCONNECT, REMOVE, AND DEMO EXISTING REHEAT COIL AT LOCATION SHOWN. DEMOLISH ASSOCIATED PIPING, FITTINGS, AND ASSOCIATED ACCESSORIES (INCLUDING CONTROL VALVES) AS REQUIRED TO PREPARE FOR FAN POWERED VAV BOX INSTALLATION

- 2 DISCONNECT, REMOVE, AND DEMO EXISTING HUMIDIFIER MANIFOLD AT LOCATION SHOWN. DEMO EXISTING STEAM AND STEAM CONDENSATE PIPING IN THEIR ENTIRETY.
- 3 DISCONNECT REMOVE AND DEMOLISH EXISTING CONTROL VALVE AT LOCATION SHOWN. DEMOLISH ASSOCIATED HEATING SUPPLY PIPING AS REQUIRED FOR REPLACEMENT.



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FIRST FLOOR PLAN

0 1 5 10 20
SCALE: 1/8" = 1'-0"

REGISTRATION SEAL

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	DOC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
DESIGNER	E. ERNVALL	
DRAWN	E. ERNVALL	
CHECKED	C. TRIERWEILER	
DEPT MGR	V. LALONDE	
PROJECT MGR	K. RUPP	

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SECOND FLOOR PLAN
HYDRONIC DEMOLITION

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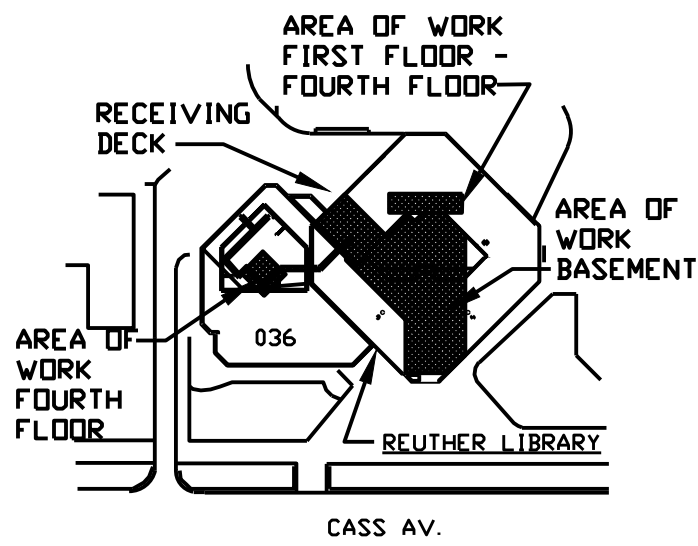
A/E PROJECT NO.
2164076

SHEET NO.

M-2.2

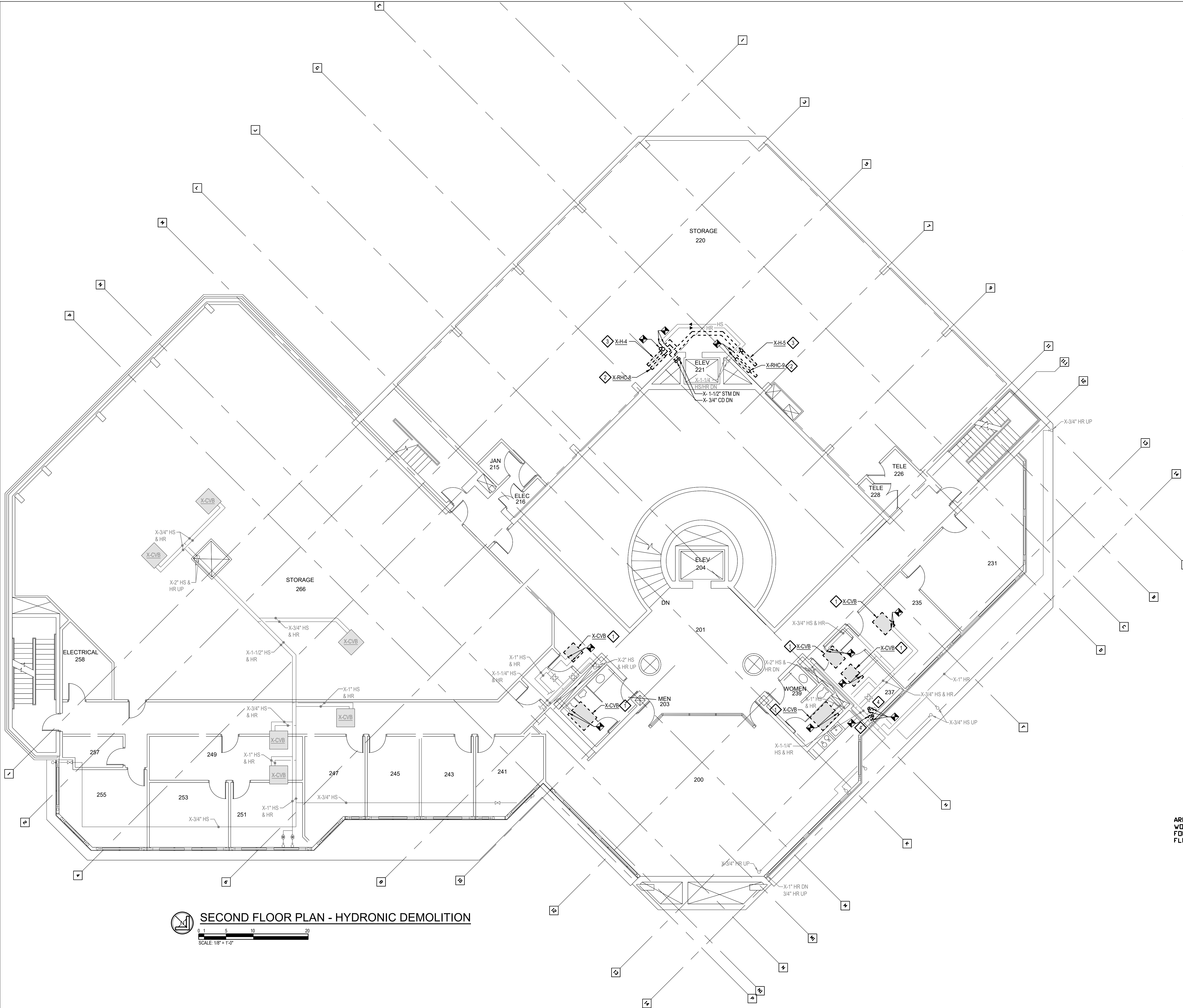
OSD FILE NAME
2164076-036-M-2.2

1. DISCONNECT, REMOVE, AND DEMOLISH EXISTING CONSTANT VOLUME REHEAT BOX AT LOCATION SHOWN. DEMOLISH ASSOCIATED PIPING, FITTINGS, AND ASSOCIATED ACCESSORIES (INCLUDING CONTROL VALVES) AS REQUIRED TO PREPARE FOR VAV BOX INSTALLATION.
2. DISCONNECT, REMOVE, AND DEMOLISH EXISTING REHEAT COIL AT LOCATION SHOWN. DEMOLISH ASSOCIATED PIPING, FITTINGS, AND ASSOCIATED ACCESSORIES (INCLUDING CONTROL VALVES) AS REQUIRED TO PREPARE FOR FAN POWERED VAV BOX INSTALLATION.
3. DISCONNECT, REMOVE, AND DEMO EXISTING HUMIDIFIER MANIFOLD AT LOCATION SHOWN. DEMO EXISTING STEAM AND STEAM CONDENSATE PIPING IN THEIR ENTIRETY.
4. DISCONNECT REMOVE AND DEMOLISH EXISTING CONTROL VALVE AT LOCATION SHOWN. DEMOLISH ASSOCIATED HEATING SUPPLY PIPING AS REQUIRED FOR REPLACEMENT.

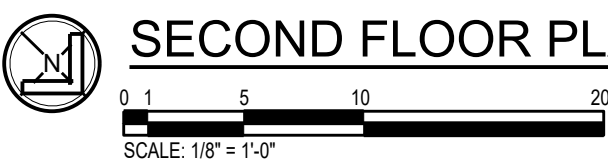


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SECOND FLOOR PLAN - HYDRONIC DEMOLITION





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DRAWN		E. ERNVALL
CHECKED		C. TRIERWEILER
DEPT MGR		V. LALONDE
PROJECT MGR		K. RUPP

REUTHER LIBRARY
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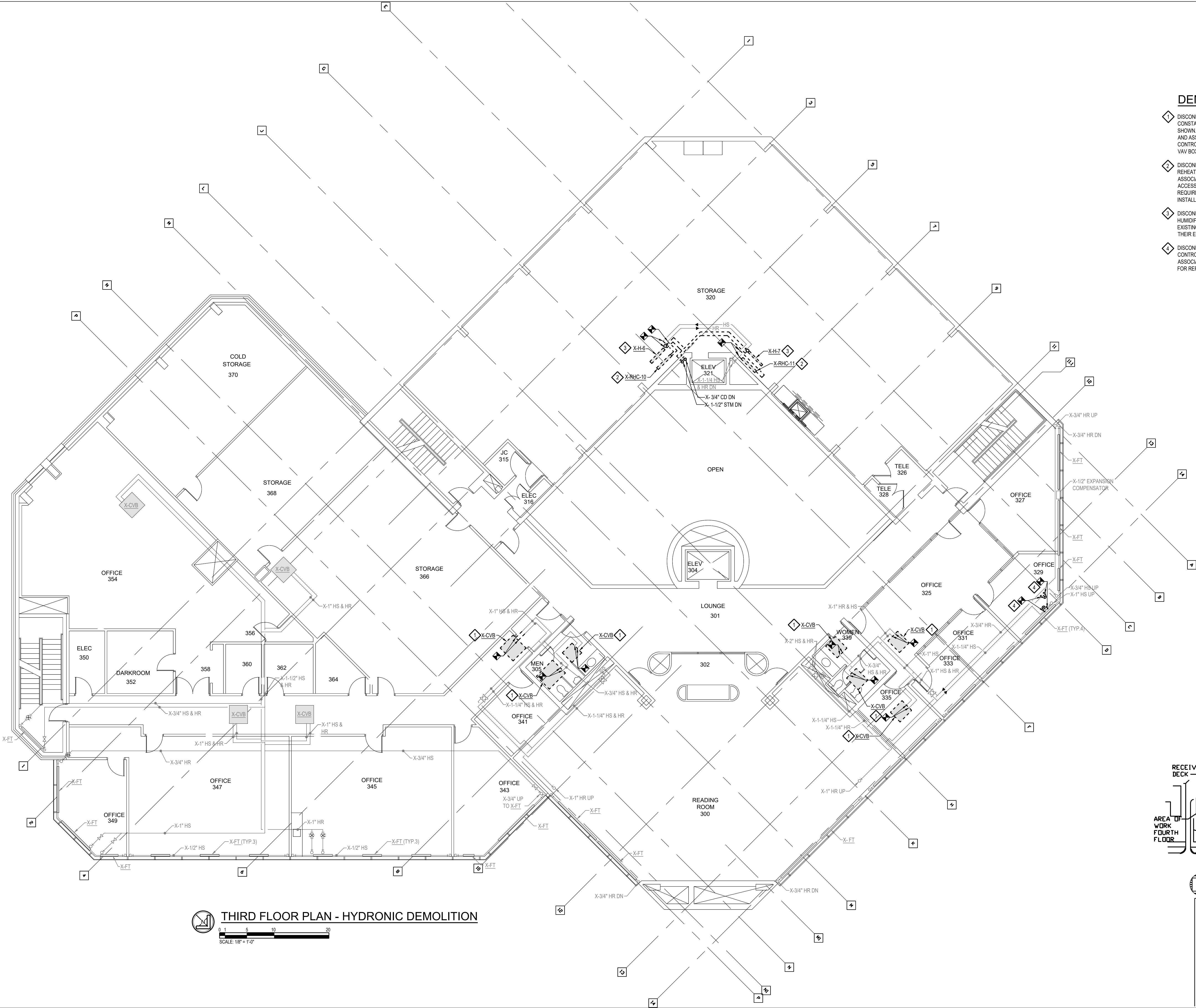
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WSU BLDG #: 036

OSD FILE NAME
2164076-036-M-2.3

1. DISCONNECT, REMOVE, AND DEMOLISH EXISTING CONSTANT VOLUME REHEAT BOX AT LOCATION SHOWN. DEMOLISH ASSOCIATED PIPING, FITTINGS, AND ASSOCIATED ACCESSORIES (INCLUDING CONTROL VALVES) AS REQUIRED TO PREPARE FOR VAV BOX INSTALLATION.
2. DISCONNECT, REMOVE, AND DEMOLISH EXISTING REHEAT COIL AT LOCATION SHOWN. DEMOLISH ASSOCIATED PIPING, FITTINGS, AND ASSOCIATED ACCESSORIES (INCLUDING CONTROL VALVES) AS REQUIRED TO PREPARE FOR FAN POWERED VAV BOX INSTALLATION.
3. DISCONNECT, REMOVE, AND DEMO EXISTING HUMIDIFIER MANIFOLD AT LOCATION SHOWN. DEMO EXISTING STEAM AND STEAM CONDENSATE PIPING IN THEIR ENTIRETY.
4. DISCONNECT REMOVE AND DEMOLISH EXISTING CONTROL VALVE AT LOCATION SHOWN. DEMOLISH ASSOCIATED HEATING SUPPLY PIPING AS REQUIRED FOR REPLACEMENT.



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 **THIRD FLOOR PLAN - HYDRONIC DEMOLITION**

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	DOC REL 03 - 100% DD	02/08/24
	DOC REL 02 - 60% DD	08/10/23

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DESIGNER	E. ERNVALL
DRAWN	E. ERNVALL
CHECKED	C. TRIERWEILER
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

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FOURTH FLOOR PLAN
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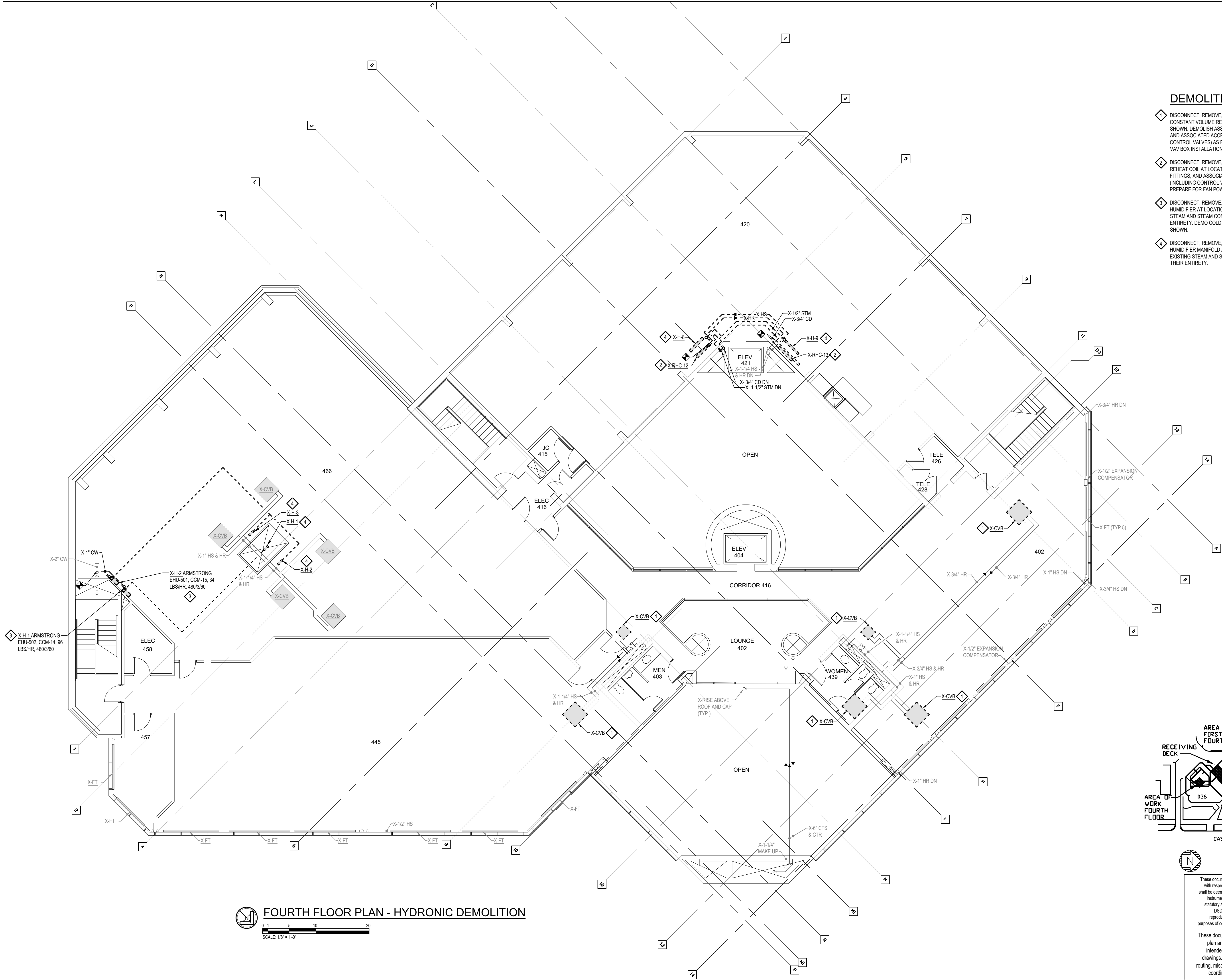
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SHEET NO.
M-2.4

DSD FILE NAME
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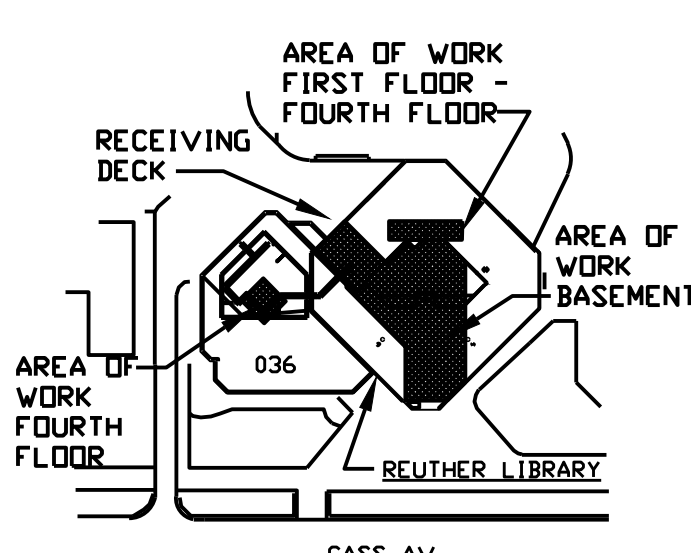
DEMOLITION NOTES

- DISCONNECT, REMOVE, AND DEMOLISH EXISTING CONSTANT VOLUME REHEAT BOX AT LOCATION SHOWN. DEMOLISH ASSOCIATED PIPING, FITTINGS, AND ASSOCIATED ACCESSORIES (INCLUDING CONTROL VALVES) AS REQUIRED TO PREPARE FOR VAV BOX INSTALLATION.
- DISCONNECT, REMOVE, AND DEMOLISH EXISTING REHEAT COIL AT LOCATION SHOWN. DEMOLISH PIPING, FITTINGS, AND ASSOCIATED ACCESSORIES (INCLUDING CONTROL VALVES) AS REQUIRED TO PREPARE FOR FAN POWERED VAV BOX INSTALLATION.
- DISCONNECT, REMOVE, AND DEMO EXISTING HUMIDIFIER AT LOCATION SHOWN. DEMO ASSOCIATED STEAM AND STEAM CONDENSATE PIPING IN THEIR ENTIRETY. DEMO COLD WATER PIPING TO EXTENTS SHOWN.
- DISCONNECT, REMOVE, AND DEMO EXISTING HUMIDIFIER MANIFOLD AT LOCATION SHOWN. DEMO EXISTING STEAM AND STEAM CONDENSATE PIPING IN THEIR ENTIRETY.



FOURTH FLOOR PLAN - HYDRONIC DEMOLITION

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DRAWN	E. ERNVALL	
CHECKED	C. TRIERWEILER	
DEPT MGR	V. LALONDE	
PROJECT MGR	K. RUPP	

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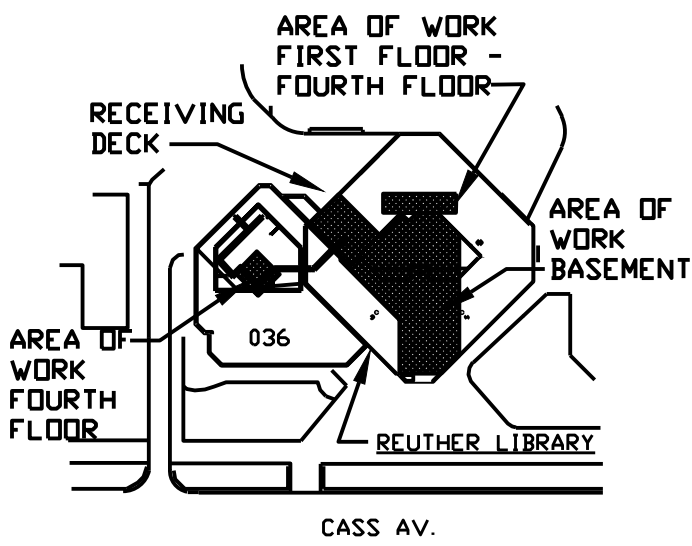
SHEET NO.

M-3.0

OSD FILE NAME
2164076-036-M-3.0

HVAC KEY NOTES

1. CONTRACTOR SHALL DISASSEMBLE AHU ON SITE UNDER THE SUPERVISION OF A REPRESENTATIVE OF THE MANUFACTURER AND SHALL BE REASSEMBLED IN THE BASEMENT LOCATION SHOWN PER MANUFACTURER SPECIFICATIONS. NEW INSTALLATION SHALL COORDINATE WITH ALL TRADES. CONTRACTOR SHALL MODIFY EXISTING SYSTEMS AS REQUIRED FOR INSTALLATION OF AHU AND SHALL MAINTAIN THE INTENDED OPERATION OF ALL MODIFIED SYSTEMS. AHU SHALL BE ASSEMBLED ON 6" CONCRETE PAD WITH 2" OVERLAP. SEE ARCHITECTURAL SHEETS FOR PAD.
2. INSTALL RETURN FAN AT LOCATION SHOWN. COORDINATE WITH ALL TRADES. MODIFY ALL UTILITIES AS REQUIRED FOR COMPLETE INSTALLATION.
3. INSTALL FAN POWERED VARIABLE AIR VOLUME BOX AT LOCATION SHOWN. MODIFY DUCTWORK AS REQUIRED.
4. INSTALL HUMIDIFIER MANIFOLD AT LOCATION SHOWN.
5. INSTALL HUMIDIFIER AT LOCATION SHOWN.
6. EXISTING LOUVER AND AREAWAY TO BE UTILIZED FOR EQUIPMENT MOBILIZATION. COORDINATE WITH OWNER PRIOR TO REMOVAL. RE-INSTALL AND RE-CONNECT UPON COMPLETION OF WORK.
7. INSTALL VARIABLE AIR VOLUME BOX AT LOCATION SHOWN. MODIFY DUCTWORK AS REQUIRED.



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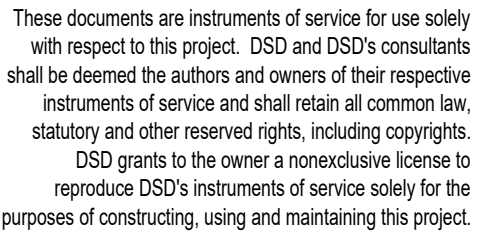
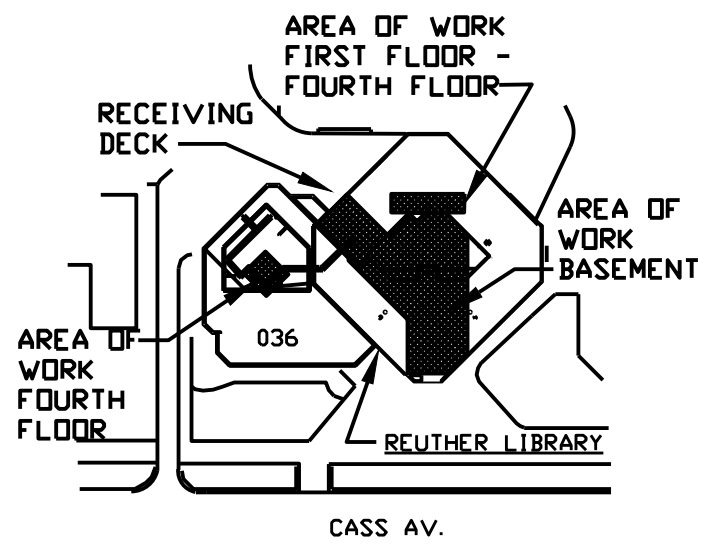
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SHEET NO.

M-3.1

DSD FILE NAME
2164076-036-M-3.1

- 1 INSTALL FAN POWERED VARIABLE AIR VOLUME BOX AT LOCATION SHOWN. MODIFY DUCTWORK AS REQUIRED.
- 2 INSTALL THERMOSTAT AT LOCATION SHOWN. MODIFY/EXTEND/REPLACE EXISTING CONTROLS WIRING AS REQUIRED FOR COMPLETE INSTALLATION.
- 3 INSTALL HUMIDISTAT IN EXISTING RETURN AIR MAIN. MODIFY/EXTEND/REPLACE EXISTING WIRING REQUIRED FOR COMPLETE INSTALLATION.



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DOC REL 04-95% REVIEW	03/13/24
DOC REL 03 - 100% DD	02/08/24
DOC REL 02 - 60% DD	08/10/23

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DESIGNER	E. ERNVALL
DRAWN	E. ERNVALL
CHECKED	C. TRIERWEILER
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

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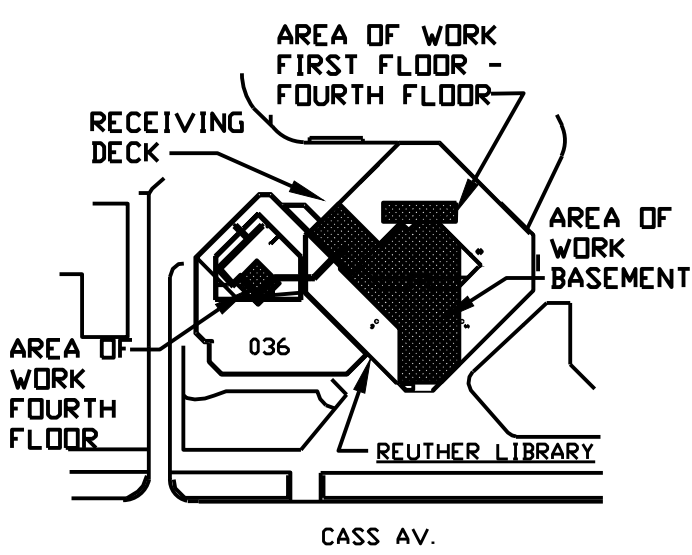
A/E PROJECT NO.
2164076

SHEET NO.
M-3.2

DSD FILE NAME
2164076-036-M-3.2

HVAC KEY NOTES

1. INSTALL FAN POWERED VARIABLE AIR VOLUME BOX AT LOCATION SHOWN. MODIFY DUCTWORK AS REQUIRED.
2. INSTALL THERMOSTAT IN LOCATION SHOWN. MODIFY/EXTEND/REPLACE EXISTING CONTROLS WIRING AS REQUIRED FOR COMPLETE INSTALLATION.
3. INSTALL HUMIDISTAT IN EXISTING RETURN AIR MAIN. MODIFY/EXTEND/REPLACE EXISTING WIRING REQUIRED FOR COMPLETE INSTALLATION.
4. INSTALL VARIABLE AIR VOLUME BOX AT LOCATION SHOWN. MODIFY DUCTWORK AS REQUIRED.



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SECOND FLOOR PLAN - HVAC NEW
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SCALE: 1/8" = 1'-0"

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DRAWN	E. ERNVALL
CHECKED	C. TRIERWEILER
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

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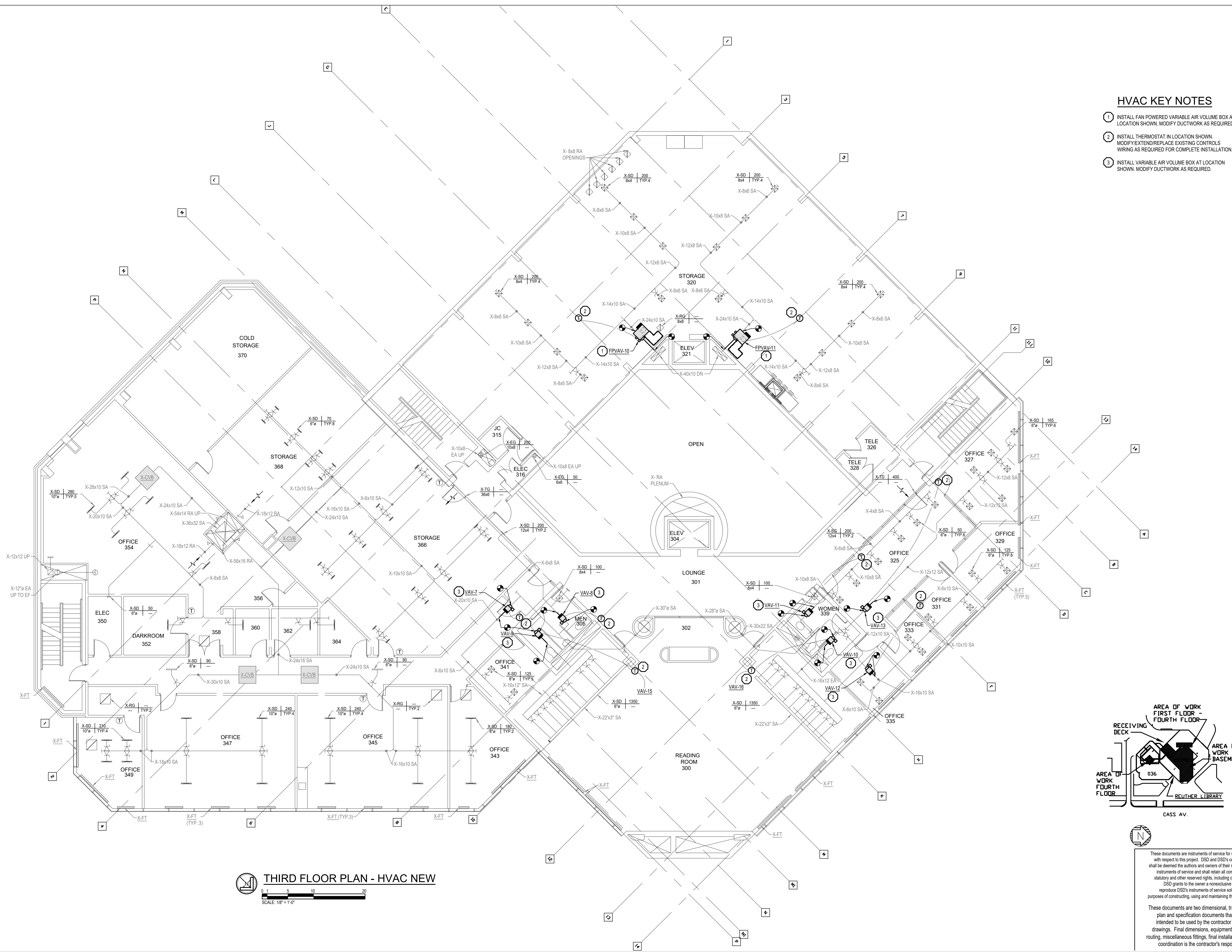
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SHEET NO.
M-3.3

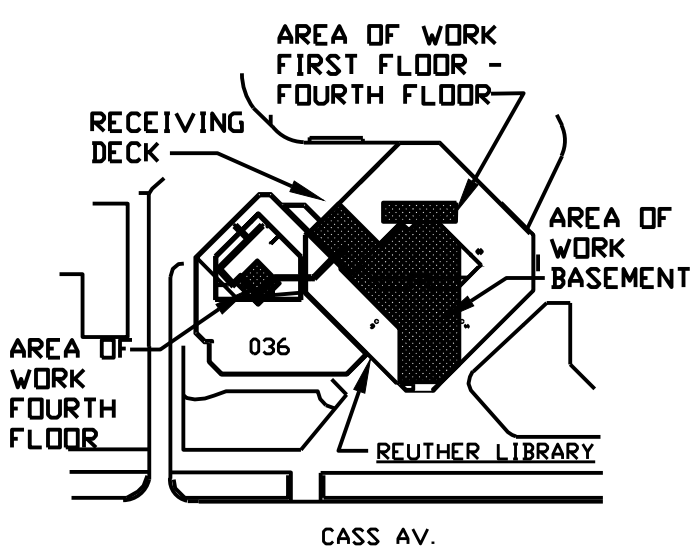
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HVAC KEY NOTES

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2. INSTALL THERMOSTAT IN LOCATION SHOWN. MODIFY/EXTEND/REPLACE EXISTING CONTROLS WIRING AS REQUIRED FOR COMPLETE INSTALLATION.
3. INSTALL VARIABLE AIR VOLUME BOX AT LOCATION SHOWN. MODIFY DUCTWORK AS REQUIRED.



THIRD FLOOR PLAN - HVAC NEW
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PROJECT MGR	K. RUPP	

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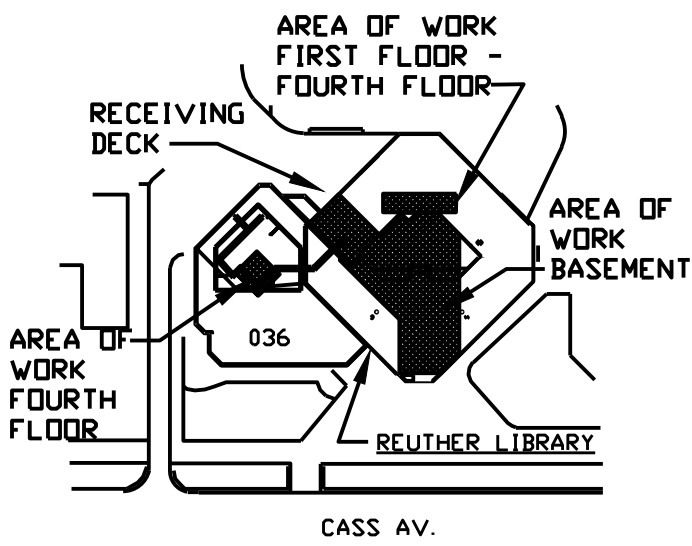
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OSD FILE NAME	2164076-036-M-3.4
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HVAC KEY NOTES

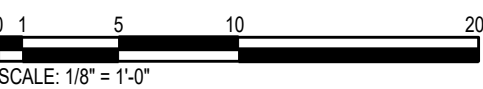
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2. INSTALL HUMIDIFIER AT LOCATION SHOWN.
3. INSTALL HUMIDIFIER MANIFOLD AT LOCATION SHOWN. MODIFY SUPPLY DUCTWORK AS REQUIRED FOR INSTALLATION.
4. INSTALL THERMOSTAT IN LOCATION SHOWN. MODIFY/EXTEND/REPLACE EXISTING CONTROLS WIRING AS REQUIRED FOR COMPLETE INSTALLATION.
5. INSTALL HUMIDISTAT AT LOCATION SHOWN. MODIFY/EXTEND/REPLACE EXISTING WIRING REQUIRED FOR COMPLETE INSTALLATION.
6. INSTALL VARIABLE AIR VOLUME BOX AT LOCATION SHOWN. MODIFY DUCTWORK AS REQUIRED.



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FOURTH FLOOR PLAN - HVAC NEW





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DESIGNER	E. ERNVALL
DRAWN	E. ERNVALL
CHECKED	C. TRIERWEILER
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

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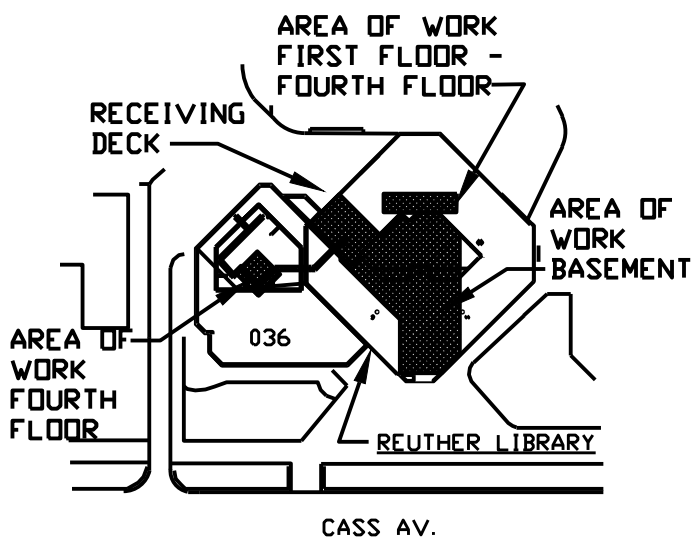
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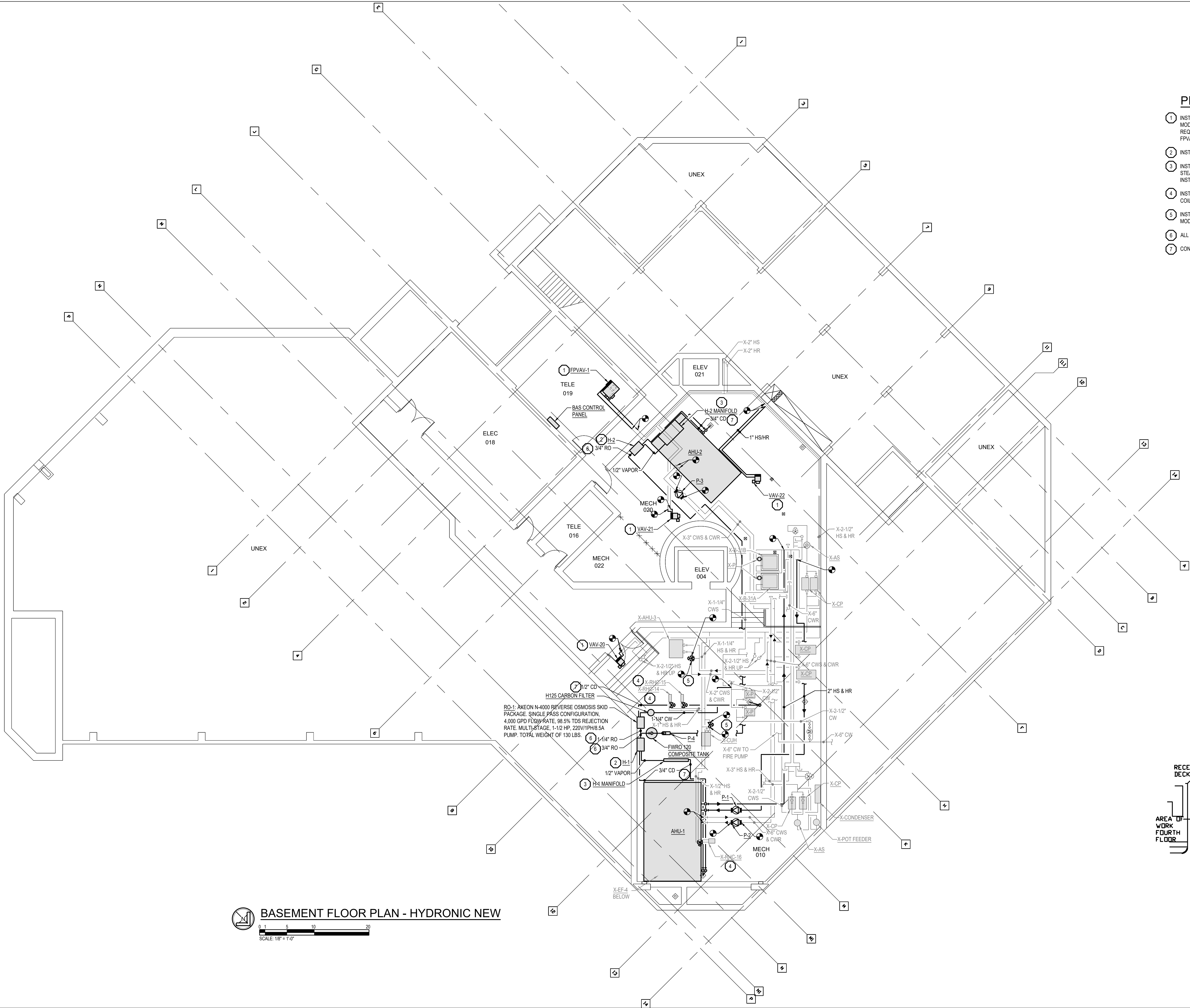
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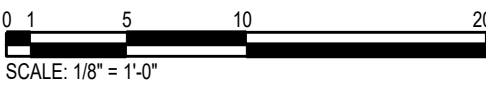
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1. INSTALL FPVAV/AV BOX AT LOCATION SHOWN. MODIFY HEATING SUPPLY AND RETURN PIPING AS REQUIRED. PROVIDE NEW CONTROL VALVE AT EACH FPVAV/AV PER DETAIL & SCHEDULE.
2. INSTALL HUMIDIFIER AT LOCATION SHOWN.
3. INSTALL HUMIDIFIER MANIFOLD AT LOCATION SHOWN. STEAM PIPING TO BE MODIFIED AS REQUIRED TO INSTALL NEW HUMIDIFIER.
4. INSTALL NEW CONTROL VALVE FOR EXISTING REHEAT COIL.
5. INSTALL CONTROL VALVE AT LOCATION SHOWN. MODIFY ASSOCIATED PIPING AS REQUIRED.
6. ALL RO WATER PIPING MUST BE STAINLESS STEEL.
7. CONDENSATE PIPING MUST BE PVC.



BASEMENT FLOOR PLAN - HYDRONIC NEW





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CHECKED	C. TRIERWEILER	
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PROJECT MGR	K. RUPP	

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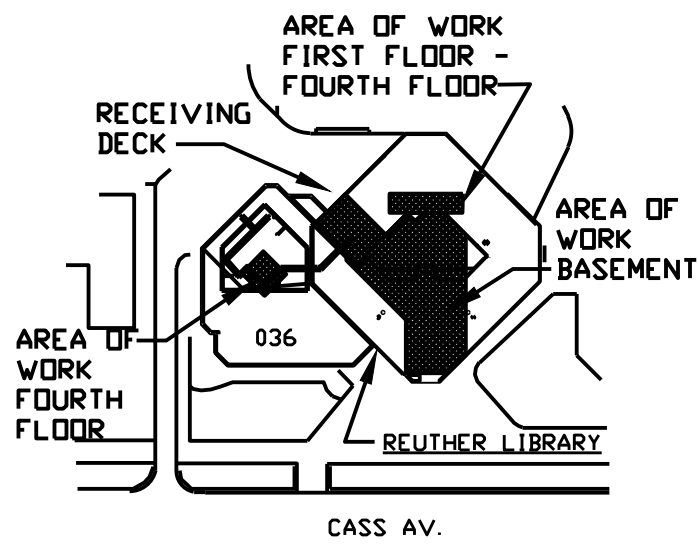
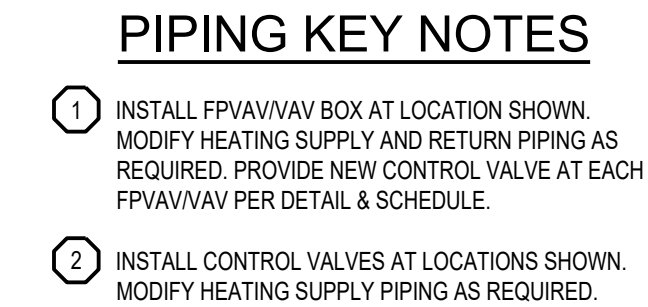
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	DOC REL 02 - 60% DD	08/10/23

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DRAWN	E. ERNVALL
CHECKED	C. TRIERWEILER
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

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WSU BLDG #: 036

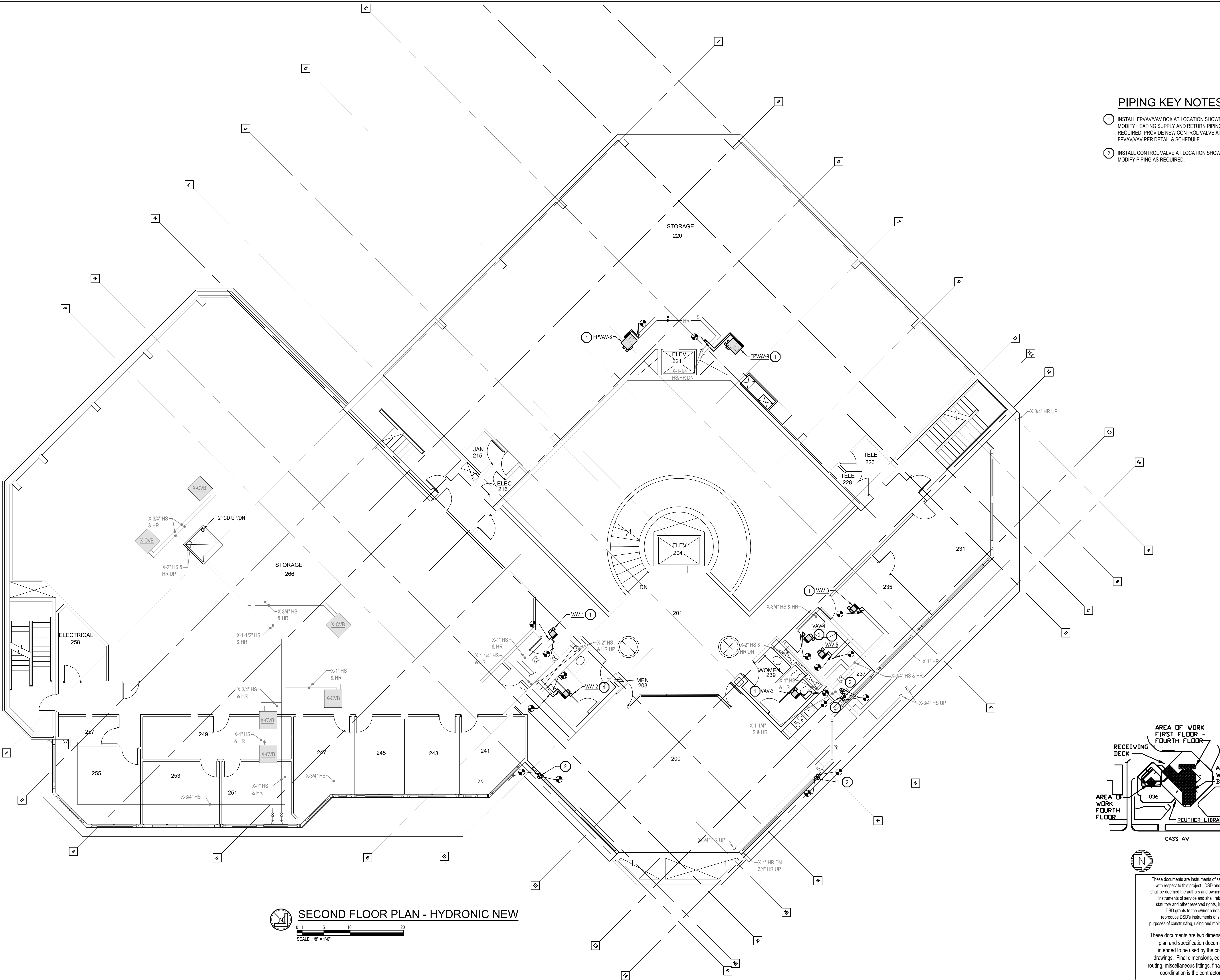
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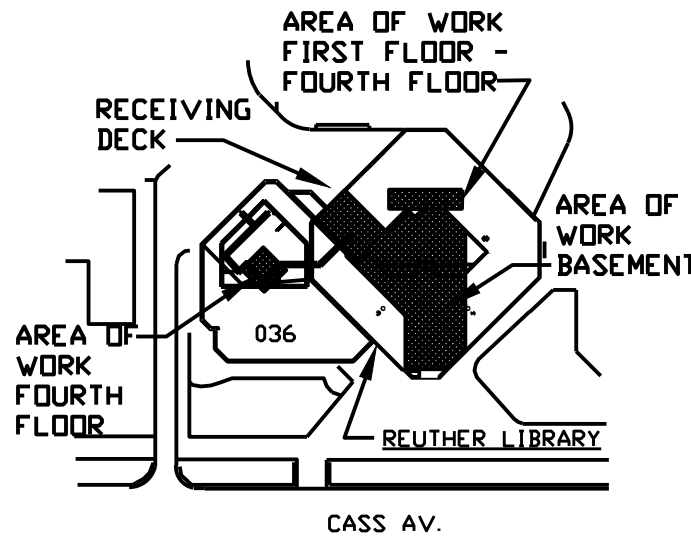
DSD FILE NAME
2164076-036-M-4.2

PIPING KEY NOTES

- 1 INSTALL FPVAV/VAV BOX AT LOCATION SHOWN.
MODIFY HEATING SUPPLY AND RETURN PIPING AS
REQUIRED. PROVIDE NEW CONTROL VALVE AT EACH
FPVAV/VAV PER DETAIL & SCHEDULE.
- 2 INSTALL CONTROL VALVE AT LOCATION SHOWN.
MODIFY PIPING AS REQUIRED.



SECOND FLOOR PLAN - HYDRONIC NEW
SCALE: 1/8" = 1'-0"



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routing, miscellaneous fittings, final installation and
coordination is the contractor's responsibility.

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CONSTRUCTION

	DOC REL 07 - IFB	07/02/24
A	DOC REL 06-ADDENDUM A	05/30/24
	DOC REL 05 - IFB	04/08/24
	DOC REL 04-95% REVIEW	03/13/24
	DOC REL 03 - 100% DD	02/08/24
	DOC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
DESIGNER	E. ERNVALL	
DRAWN	E. ERNVALL	
CHECKED	C. TRIERWEILER	
DEPT MGR	V. LALONDE	
PROJECT MGR	K. RUPP	

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THIRD FLOOR PLAN
HYDRONIC NEW

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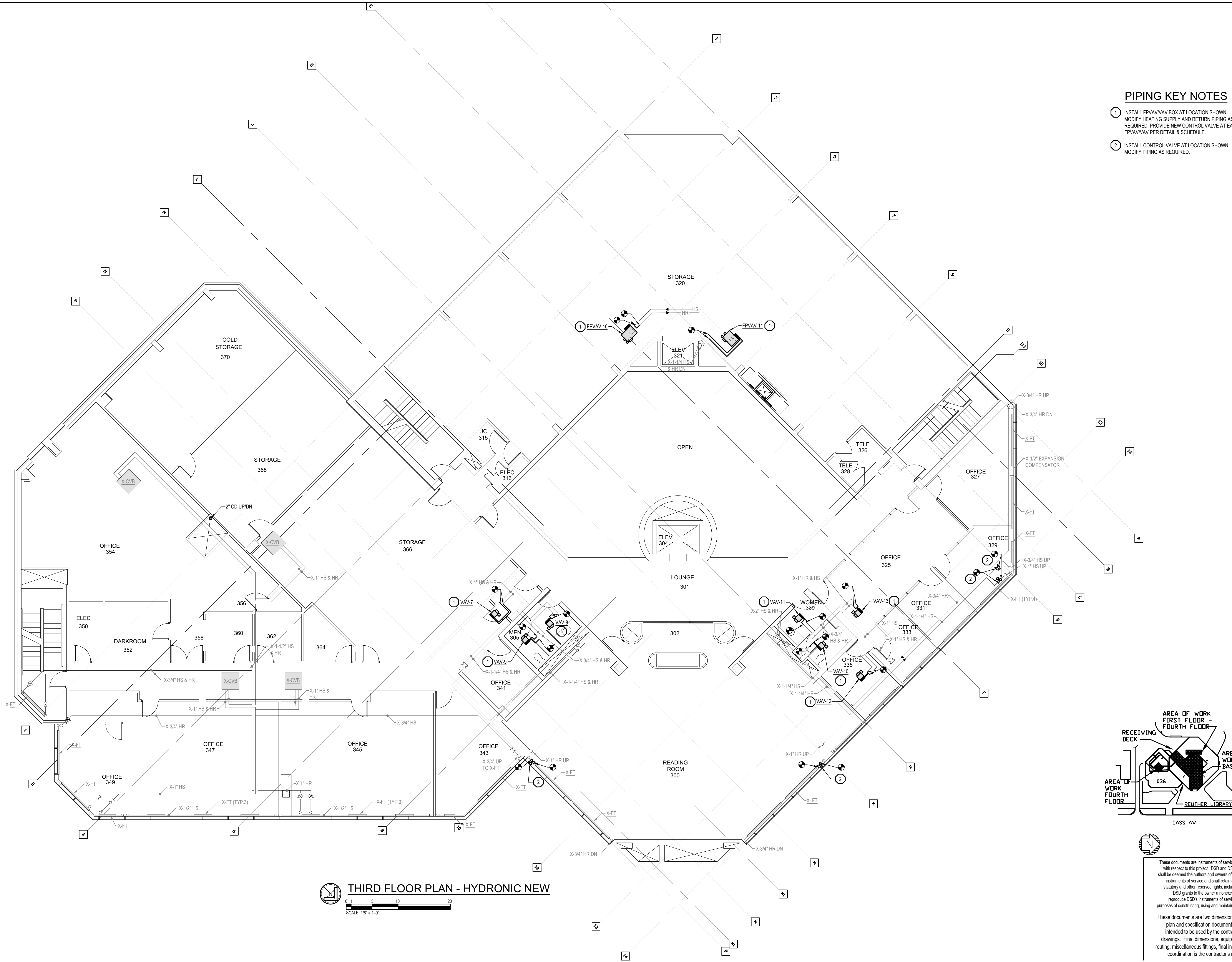
A/E PROJECT NO.
2164076

SHEET NO.
M-4.3

DSD FILE NAME
2164076-036-M-4.3

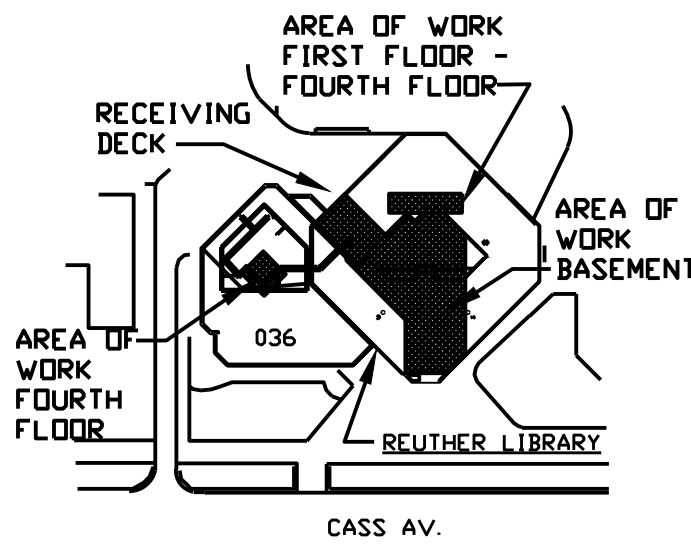
PIPING KEY NOTES

- 1 INSTALL FPVAV/VAV BOX AT LOCATION SHOWN.
MODIFY HEATING SUPPLY AND RETURN PIPING AS
REQUIRED. PROVIDE NEW CONTROL VALVE AT EACH
FPVAV/VAV PER DETAIL & SCHEDULE.
- 2 INSTALL CONTROL VALVE AT LOCATION SHOWN.
MODIFY PIPING AS REQUIRED.



THIRD FLOOR PLAN - HYDRONIC NEW

0 1 5 10 20
SCALE: 1/8" = 1'-0"



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CHECKED		C. TRIERWEILER
DEPT MGR		V. LALONDE
PROJECT MGR		K. RUPP

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DETROIT, MICHIGAN

FOURTH FLOOR PLAN
HYDRONIC NEW

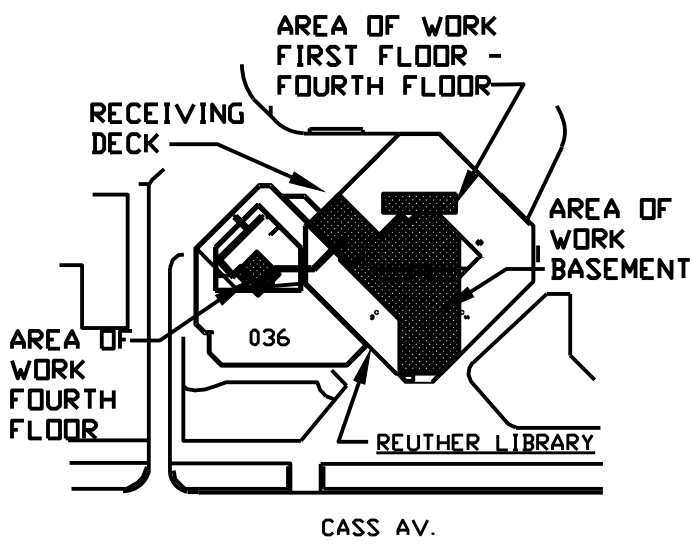
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WSU BLDG #: 036
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A/E PROJECT NO.
2164076

SHEET NO.

M-4.4

OSD FILE NAME
2164076-036-M-4.4



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1. INSTALL FPVAV/NAV BOX AT LOCATION SHOWN. MODIFY HEATING SUPPLY AND RETURN PIPING AS REQUIRED. PROVIDE NEW CONTROL VALVE AT EACH FPVAV/NAV PER DETAIL & SCHEDULE.
2. INSTALL NEW HUMIDIFIER AT LOCATION SHOWN.
3. INSTALL NEW HUMIDIFIER MANIFOLD AT LOCATION SHOWN. STEAM AND CONDENSATE PIPING TO BE INSTALLED PER MANUFACTURERS INSTALLATION INSTRUCTIONS.

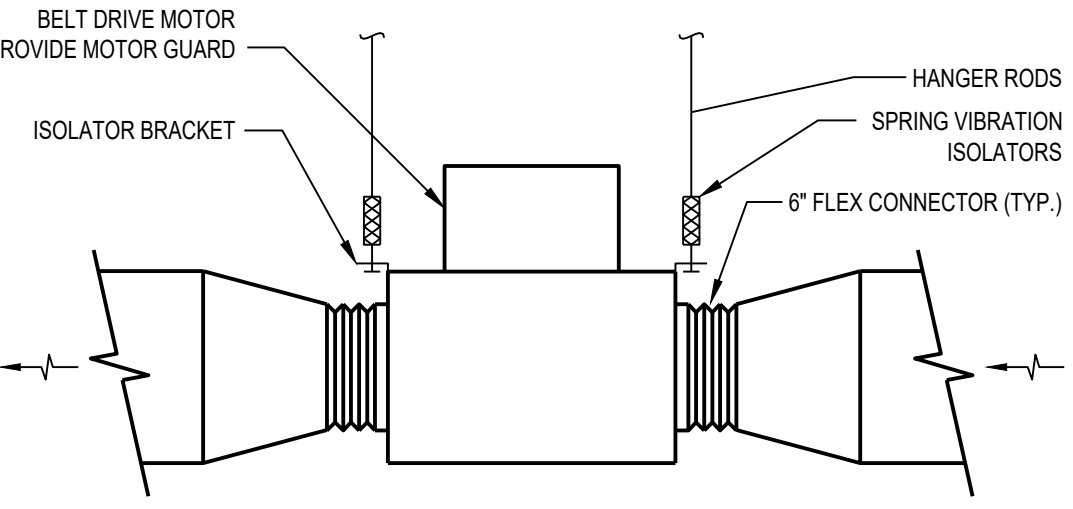


0 1 5 10 20
SCALE: 1/8" = 1'-0"

DESIGNER	E. ERNVALL
DRAWN	E. ERNVALL
CHECKED	C. TRIERWEILER
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

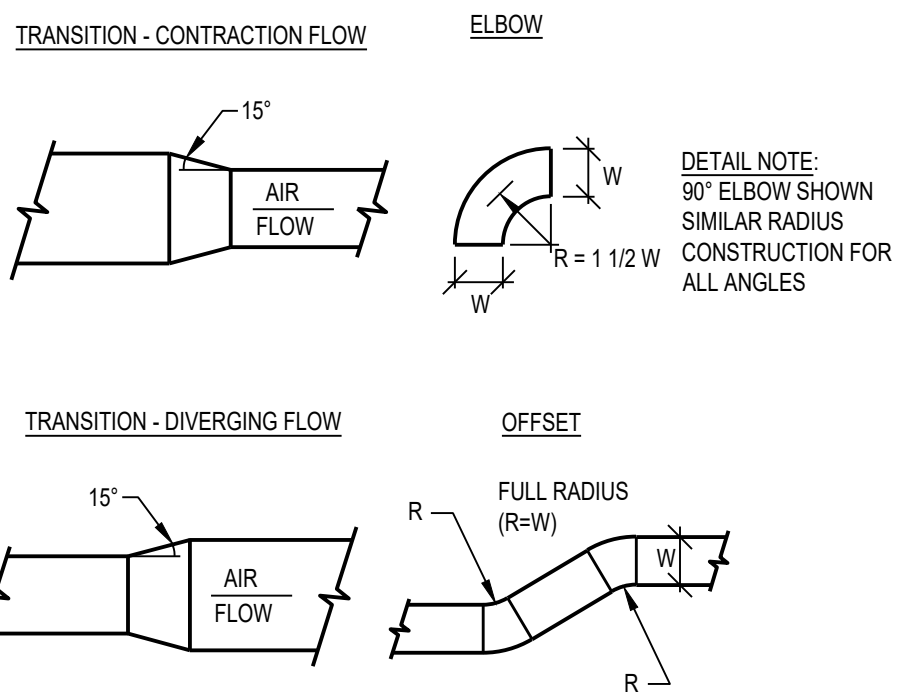
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OSD FILE NAME	2164076-036-M-5.1
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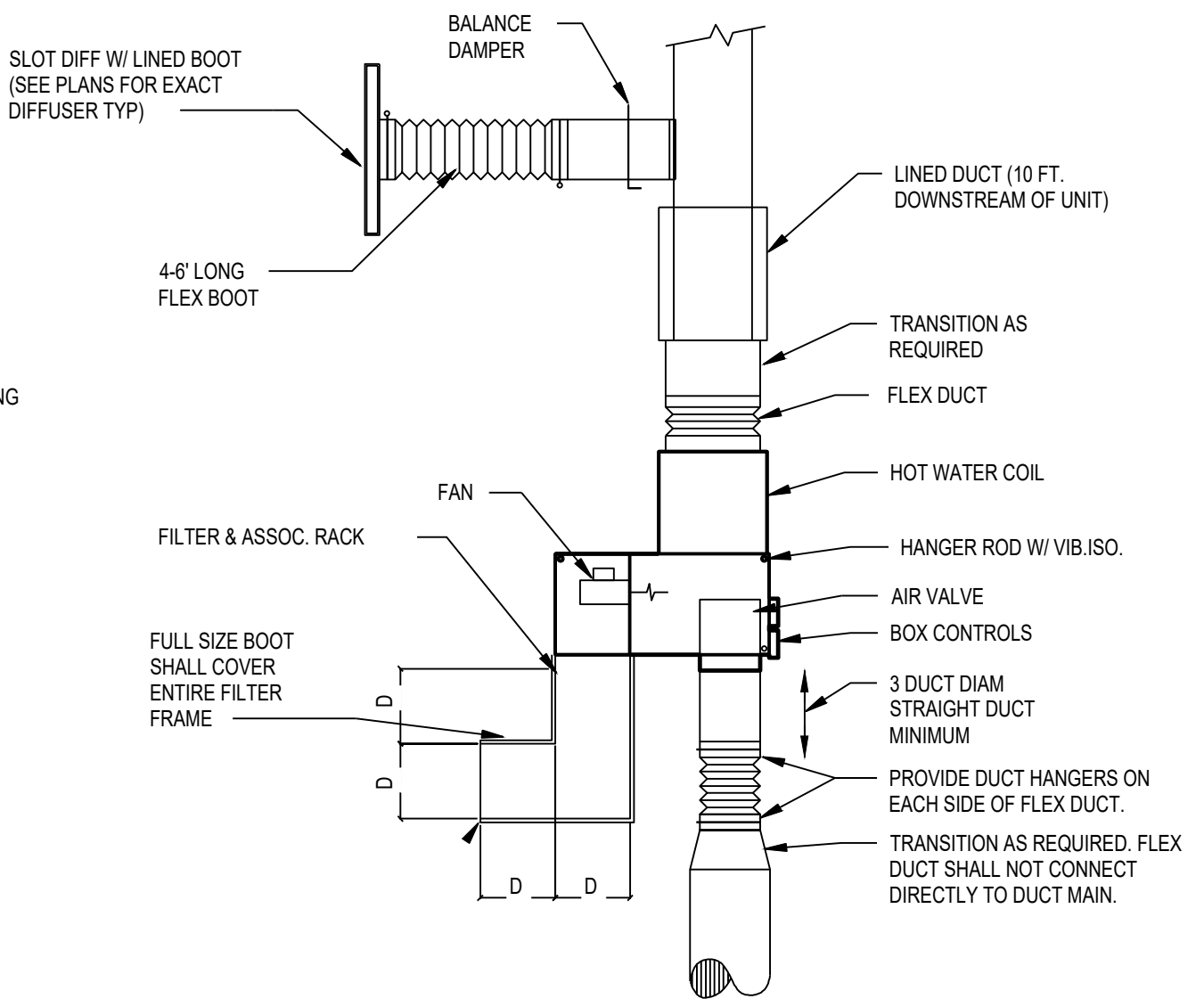


2 RETURN FAN DETAIL

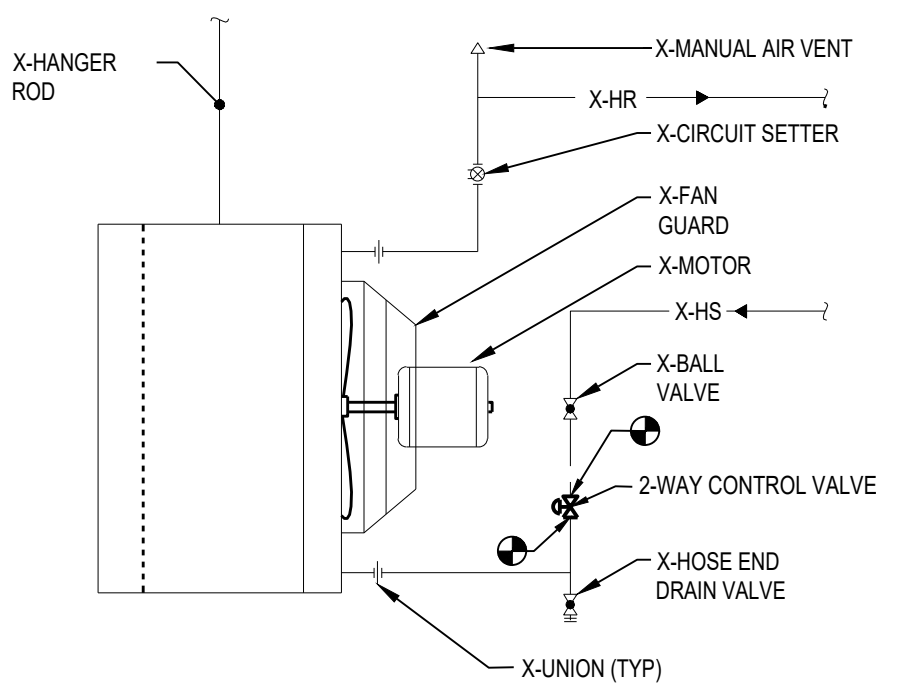
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5 OFFSETS, ELBOWS, & TRANSITIONS FOR RECTANGULAR DUCTWORK



7 PARALLEL FAN POWERED VAV BOX DETAIL
SCALE: NTS



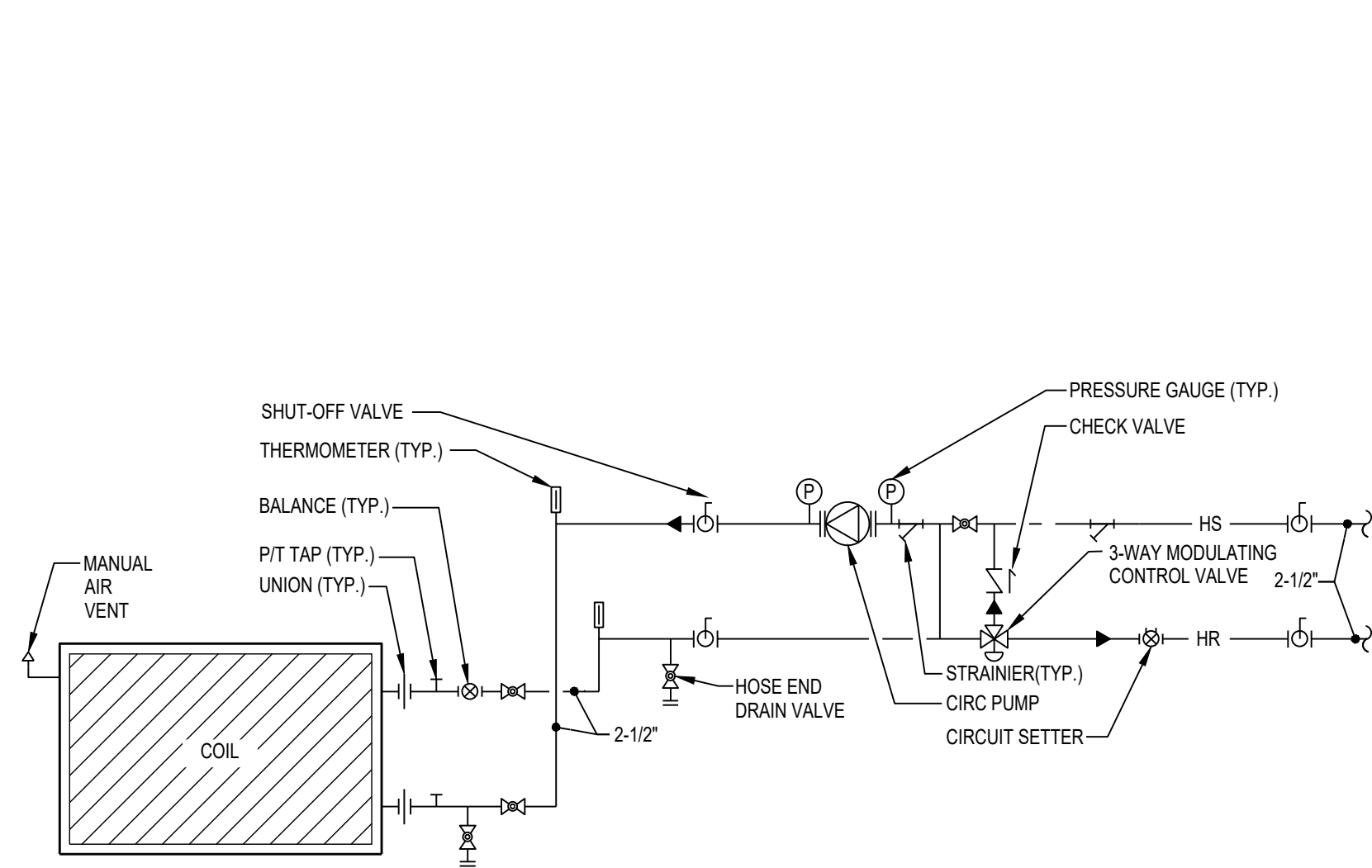
8 UNIT HEATER DETAIL
SCALE: N.T.S.

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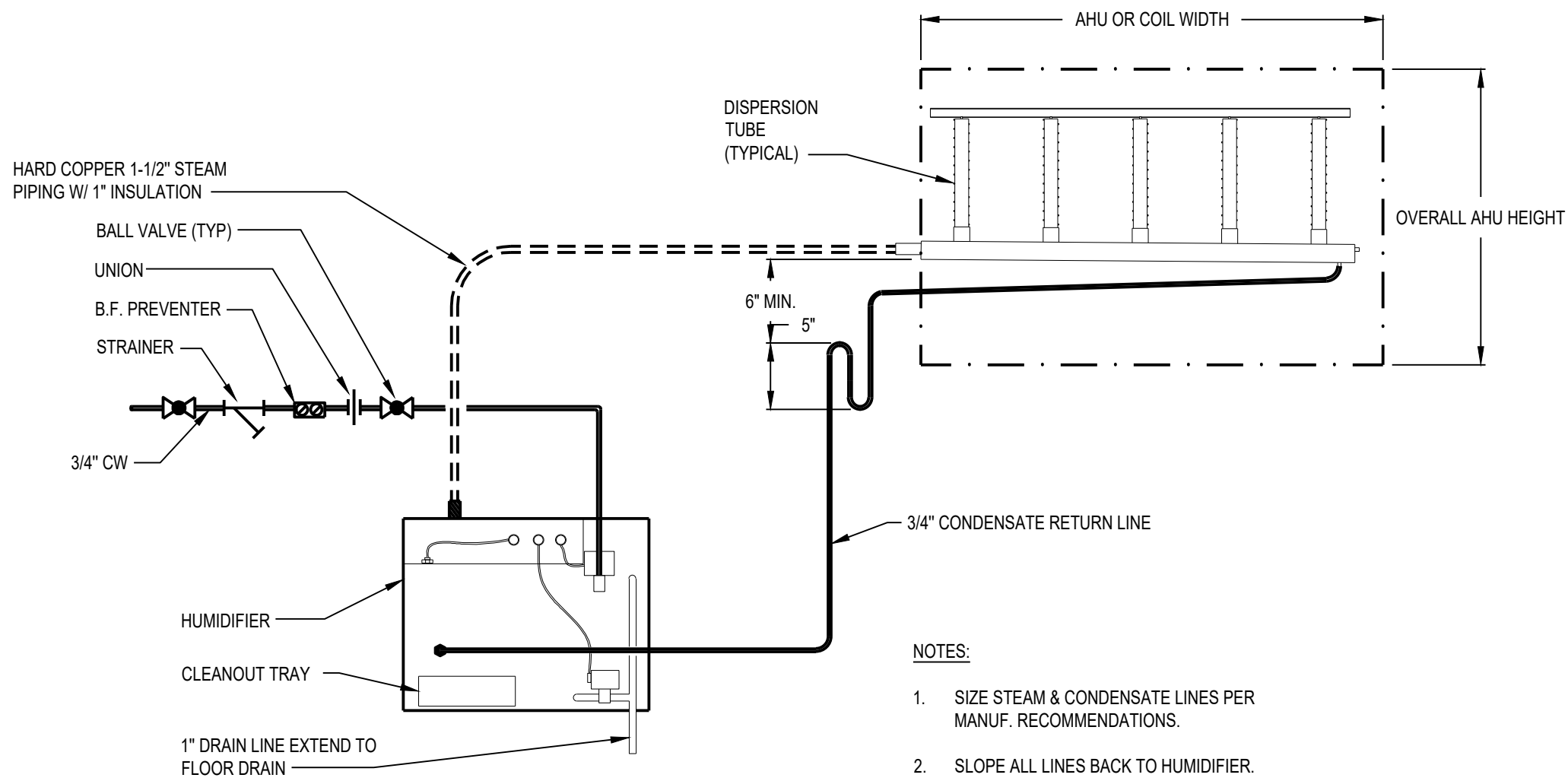
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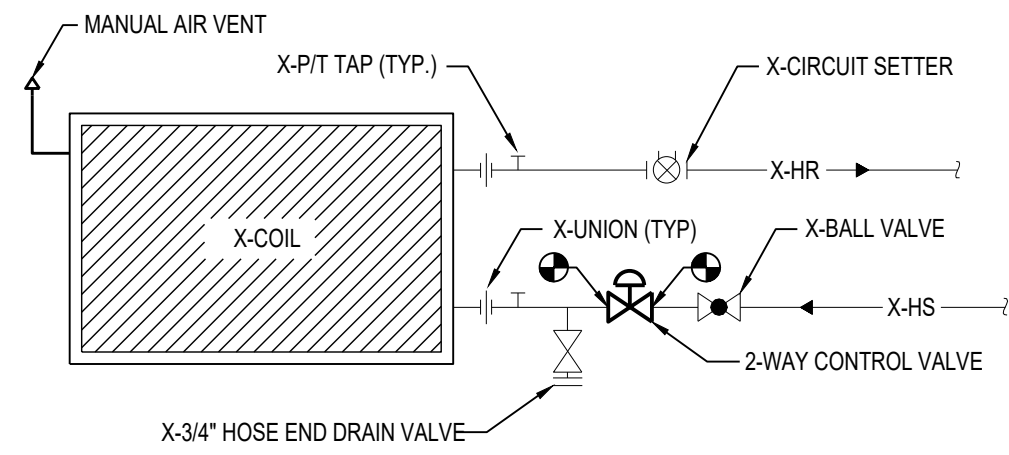
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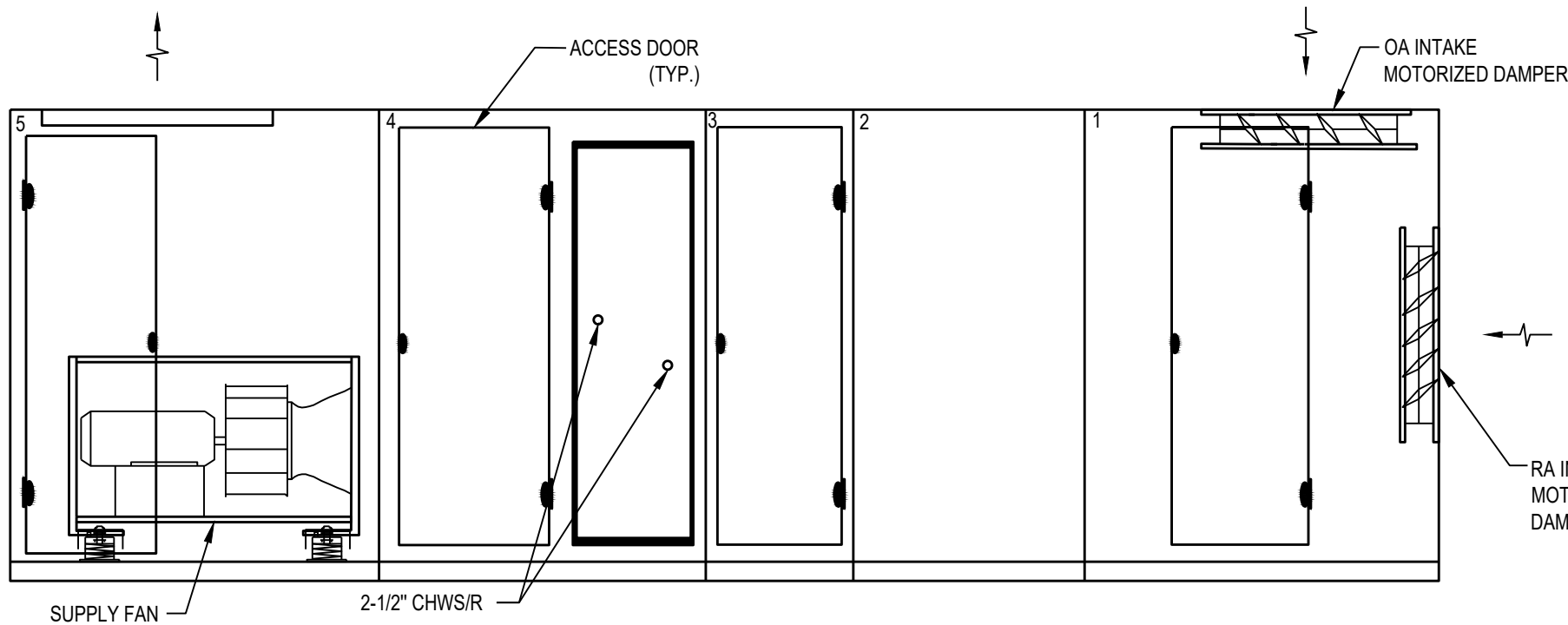
1 AHU-1 HEATING COIL DETAIL
SCALE: NTS



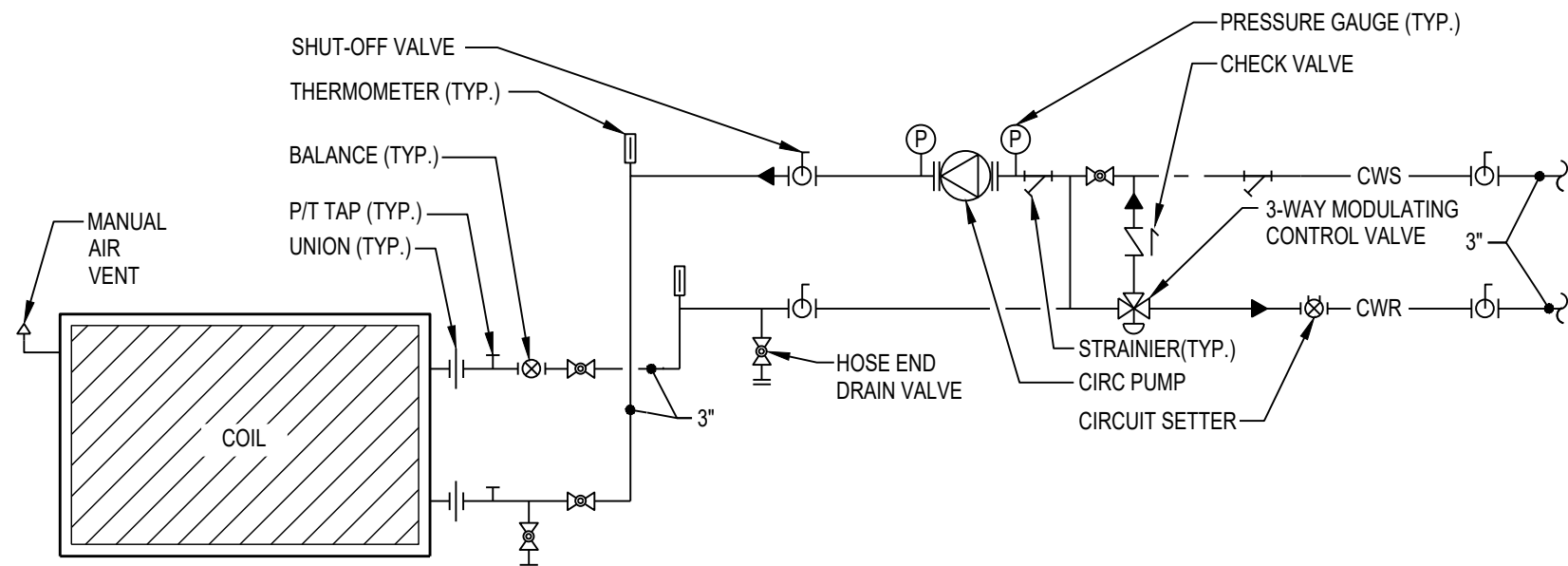
2 ELECTRIC HUMIDIFIER PIPING DIAGRAM
SCALE: NTS



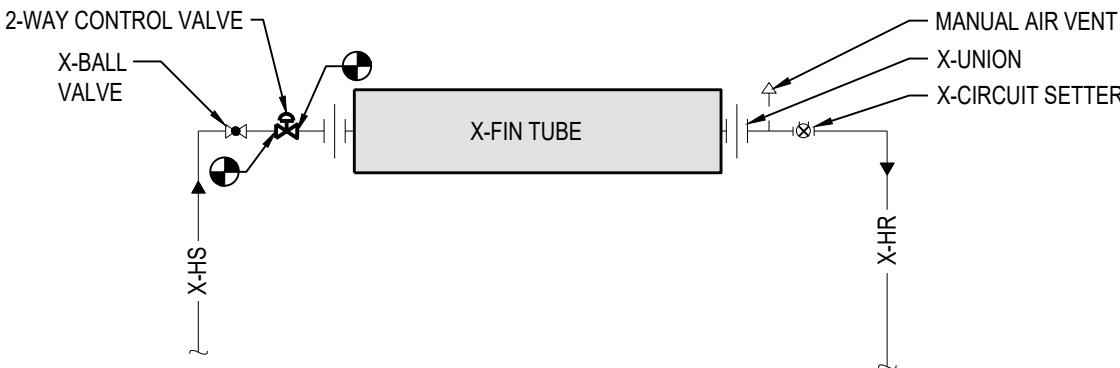
3 CABINET UNIT HEATER HYDRONIC PIPING
DIAGRAM
SCALE: NTS



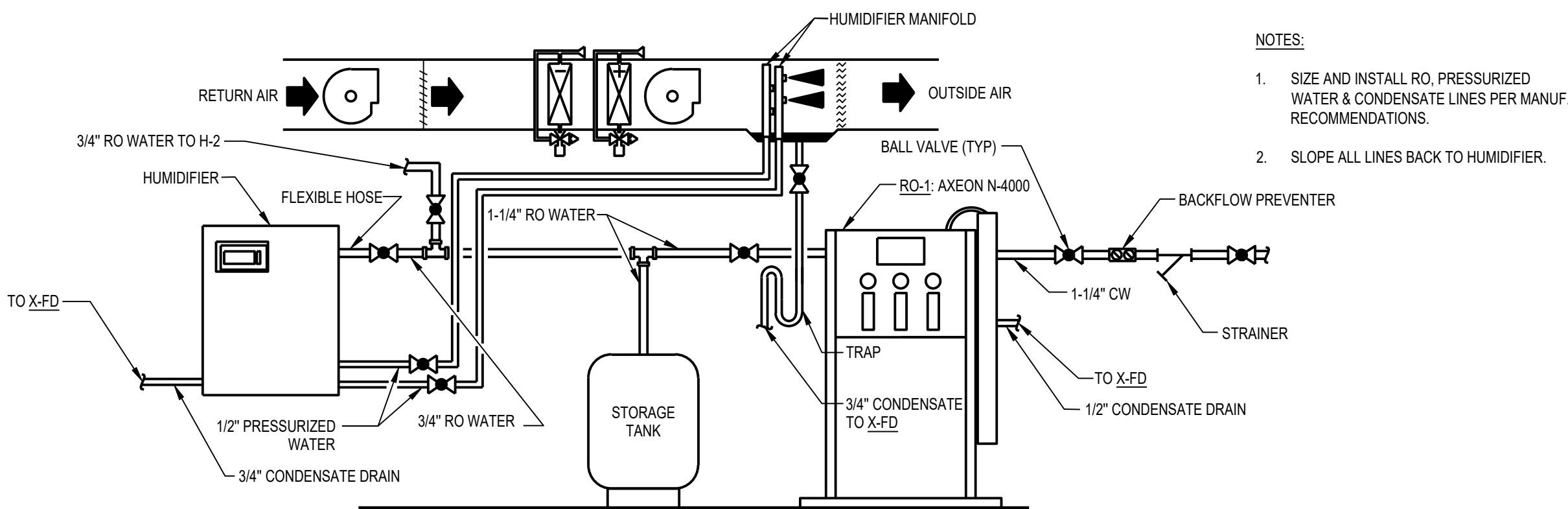
4 AHU-2 ELEVATION VIEW
SCALE: NTS



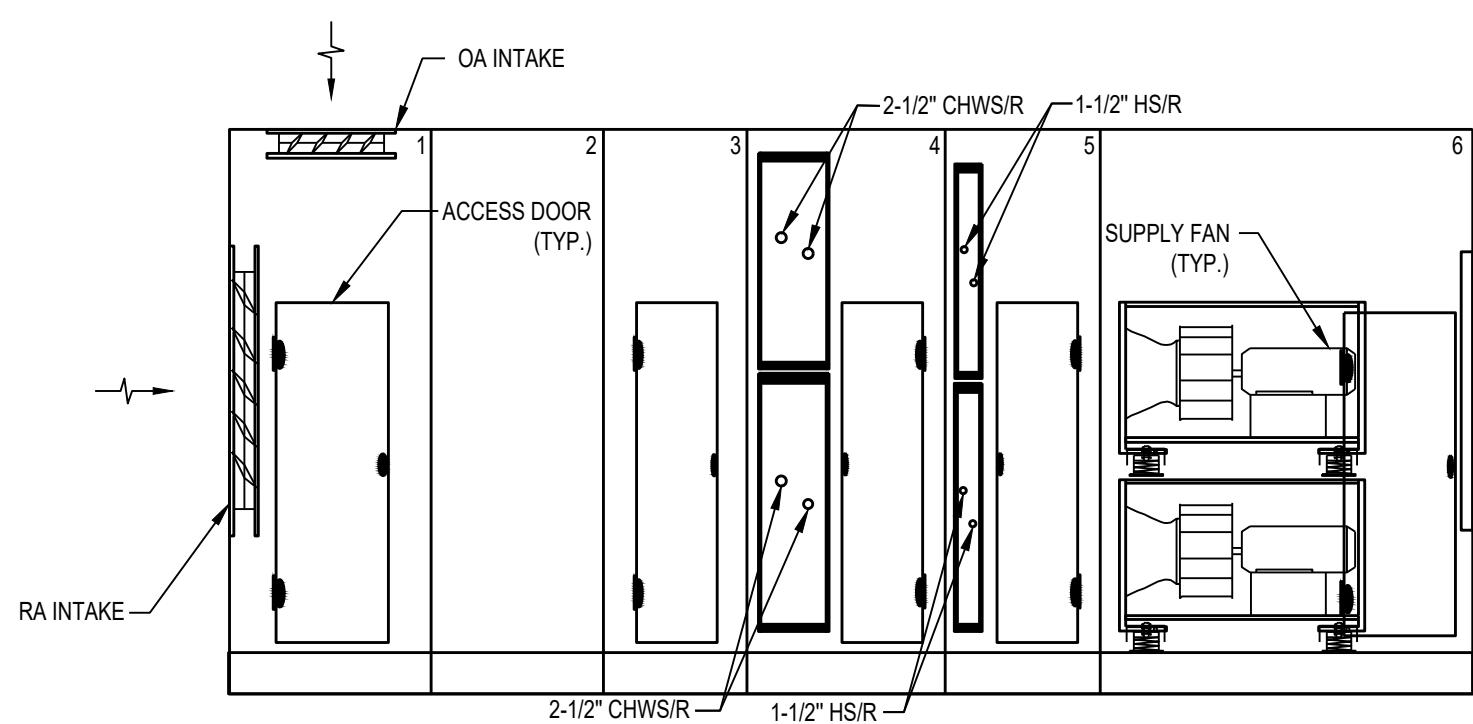
5 TYPICAL AHU COOLING COIL DETAIL
SCALE: NTS



6 FIN TUBE RADIATION DETAIL
SCALE: NTS



7 ADIBATIC HUMIDIFIER PIPING DIAGRAM
SCALE: NTS



8 AHU-1 ELEVATION VIEW
SCALE: NTS

- MODULES:
1. AIR MIXING SECTION
 2. ACCESS/TURNING SECTION
 3. ACCESS/TURNING SECTION
 4. COOLING COIL SECTION
 5. HEATING COIL SECTION
 6. FAN SECTION

	DDC REL 07 - IFB	07/02/24
A	DDC REL 06-ADDENDUM A	05/30/24
	DDC REL 05 - IFB	04/08/24
	DDC REL 04-95% REVIEW	03/13/24
	DDC REL 03 - 100% DD	02/08/24
	DDC REL 02 - 60% DD	08/10/23

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DESIGNER	E. ERNVALL	
DRAWN	E. ERNVALL	
CHECKED	C. TRIERWEILER	
DEPT MGR	V. LALONDE	
PROJECT MGR	K. RUPP	

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WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

A/E PROJECT NO.
2164076

SHEET NO.
M-5.2

DSD FILE NAME
2164076-036-M-5.2

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VAV BOX SCHEDULE												
TAG	MODEL	SERVES	CFM			HEATING COIL (°F)						COMMENTS
			MAXIMUM	HEATING	MINIMUM	EAT	LAT	MBH	EWT	DELTA T	GPM	
VAV-1	DESV	MEN 203	540	270	110	55	90	10.2	200	40	0.75	1,2,3,4,5
VAV-2	DESV	200	1550	775	310	55	90	29.3	200	40	1.5	1,2,3,4,5
VAV-3	DESV	200	1550	775	310	55	90	29.3	200	40	1.5	1,2,3,4,5
VAV-4	DESV	CORRIDOR 207	540	270	110	55	90	10.2	200	40	0.75	1,2,3,4,5
VAV-5	DESV	237	550	275	110	55	90	10.4	200	40	0.75	1,2,3,4,5
VAV-6	DESV	231	700	350	140	55	90	13.2	200	40	0.75	1,2,3,4,5
VAV-7	DESV	OFFICE 341	250	125	50	55	90	4.7	200	40	0.5	1,2,3,4,5
VAV-8	DESV	LOUNGE 301	500	250	100	55	90	9.5	200	40	0.5	1,2,3,4,5
VAV-9	DESV	READING ROOM 300	1350	675	270	55	90	25.5	200	40	1.25	1,2,3,4,5
VAV-10	DESV	READING ROOM 300	1350	675	270	55	90	25.5	200	40	1.25	1,2,3,4,5
VAV-11	DESV	OFFICE 325	800	400	160	55	90	15.1	200	40	0.75	1,2,3,4,5
VAV-12	DESV	OFFICE 335	1000	500	200	55	90	18.9	200	40	1	1,2,3,4,5
VAV-13	DESV	OFFICE 327	1000	500	200	55	90	18.9	200	40	1	1,2,3,4,5
VAV-14	DESV	MEN 403	550	275	110	55	90	10.4	200	40	0.75	1,2,3,4,5
VAV-15	DESV	OPEN 400	1360	680	272	55	90	25.7	200	40	1.25	1,2,3,4,5
VAV-16	DESV	OPEN 400	1360	680	272	55	90	25.7	200	40	1.25	1,2,3,4,5
VAV-17	DESV	402	2100	1050	420	55	90	39.7	200	40	2	1,2,3,4,5
VAV-18	DESV	CORRIDOR 416	550	275	110	55	90	10.4	200	40	0.75	1,2,3,4,5
VAV-19	DESV	402	1500	750	300	55	90	28.4	200	40	1.5	1,2,3,4,5
VAV-20	DESV	MECH 010	600	300	120	55	90	11.3	200	40	0.75	1,2,3,4,5
VAV-21	DESV	MECH 020	2900	1450	580	55	90	54.8	200	40	2.75	1,2,3,4,6
VAV-22	DESV	MECH 020	3625	1810	725	55	90	68.4	200	40	3.5	1,2,3,4,6
NOTES: 1. BASED ON TITUS 2. MAX. NC = 35 3. MAX AIR PRESSURE DROP = 0.3 IN-WC 4. MAX WATER PRESSURE DROP = 3 FT-HD 5. 2-WAY CONTROL VALVE 6. 3-WAY CONTROL VALVE												

RETURN FAN SCHEDULE													
TAG	MODEL	SERVICE/ LOCATION	CFM	TYPE	DRIVE	ESP (IN WC)	FAN RPM	SONES	ELECTRICAL				COMMENTS
									FAN HP	VOLTAGE	PHASE	DISC. BY	
RF-1	QEI-40	AHU-1	29,000	INLINE	BELT	2.5	879	15.5	20	480	3	EC	1,2
RF-2	QEI-30	AHU-2	16,000	INLINE	BELT	1.5	1,043	10.2	7 1/2	480	3	EC	1,2
NOTES: 1. BASED ON GREENHECK 2. PROVIDE WITH VFD. CONTROL TO TRACK ASSOCIATED SUPPLY FAN													
ABBREVIATIONS: EC - ELECTRICAL CONTRACTOR MC - MECHANICAL CONTRACTOR NR - NOT REQUIRED													

FPVAV BOX SCHEDULE																				
TAG	MANUFACTURER	MODEL	SERVES	AIRFLOW (CFM)				HEATING COIL						ELECTRICAL					COMMENTS	
				MAX CFM	HEATING AIRFLOW	MIN CFM	FAN (CFM)	EAT	LAT	MBH	DELTA T	GPM	EWT	HP	VOLTAGE	PHASE	DISC. BY	STARTER BY		
FPVAV-1	TITUS	DTQP	TELE 019	380	288	72	216	55	90	10.9	40	0.75	200	0.50	120	1	EC	EC	1,2,3,4,5	
FPVAV-2	TITUS	DTQP	112	330	264	66	198	55	90	10.0	40	0.75	200	0.50	120	1	EC	EC	1,2,3,4,5	
FPVAV-3	TITUS	DTQP	119	720	576	144	432	55	90	21.8	40	1.25	200	0.50	120	1	EC	EC	1,2,3,4,5	
FPVAV-4	TITUS	DTQP	119	250	200	50	150	55	90	7.6	40	0.75	200	0.50	120	1	EC	EC	1,2,3,4,5	
FPVAV-5	TITUS	DTQP	VAULT 120	500	400	100	300	55	90	15.1	40	0.75	200	0.50	120	1	EC	EC	1,2,3,4,5	
FPVAV-6	TITUS	DTQP	123	120	96	24	72	55	90	3.6	40	0.75	200	0.50	120	1	EC	EC	1,2,3,4,5	
FPVAV-7	TITUS	DTQP	STORAGE 124	1380	1104	276	828	55	90	41.7	40	2.25	200	0.50	120	1	EC	EC	1,2,3,4,5	
FPVAV-8	TITUS	DTQP	STORAGE 220	1600	1280	320	960	55	90	48.4	40	2.50	200	0.50	120	1	EC	EC	1,2,3,4,5	
FPVAV-9	TITUS	DTQP	STORAGE 220	1600	1280	320	960	55	90	48.4	40	2.50	200	0.50	120	1	EC	EC	1,2,3,4,5	
FPVAV-10	TITUS	DTQP	STORAGE 320	1600	1280	320	960	55	90	48.4	40	2.50	200	0.50	120	1	EC	EC	1,2,3,4,5	
FPVAV-11	TITUS	DTQP	STORAGE 320	1600	1280	320	960	55	90	48.4	40	2.50	200	0.50	120	1	EC	EC	1,2,3,4,5	
FPVAV-12	TITUS	DTQP	STORAGE 420	3000	2400	600	1800	55	90	90.7	40	4.50	200	1.00	120	1	EC	EC	1,2,3,4,6	
FPVAV-13	TITUS	DTQP	STORAGE 420	3000	2400	600	1800	55	90	90.7	40	4.50	200	1.00	120	1	EC	EC	1,2,3,4,6	
NOTES: 1. BASED ON TITUS 2. MAX NC = 35 3. MAX AIR PRESSURE DROP = 0.3 IN-WC 4. MAX WATER PRESSURE DROP = 3 FT-HD																				
				5. 2-WAY CONTROL VALVE				ABBREVIATIONS: EC - ELECTRICAL CONTRACTOR												
				6. 3-WAY CONTROL VALVE																

AIR HANDLING UNIT SCHEDULE																																		
TAG	MODEL	AIR CAPACITY			SUPPLY FAN MOTOR			HOT WATER HEATING COIL								CHILLED WATER COOLING COIL								ELECTRICAL					COMMENTS					
		TOTAL CFM	O.A. CFM	QTY.	E.S.P.	HP/FAN	VFD	EAT °F	LAT °F	MBH	EWT °F	LWT °F	GPM	MAX. P.D.	FACE VELOCITY	APD (IN-WC)	EAT °F DB WB	LAT °F DB WB	TOTAL	SENS	EWT °F	LWT °F	GPM	MAX. P.D.	FACE VELOCITY	APD (IN-WC)	VOLTAGE	PHASE		FLA	STARTER	DISCONNECT		
AHU-1	PSCA	35,500	6,390	4	2.70	15	MFR	40	82.32	815	200	160	41	1.35	290	0.025	81	64	54.6	53.3	1,119	1,029	45	52	319	15.04	565	0.685	480	3	18.1	N/A	MFR	1,2,3,4,5,6,7,8,9,10,11,12,13,15
AHU-2	CSAA	16,000	800	2	2.43	7.5	MFR	-	-	-	-	-	-	-	-	-	80	67	57.8	56.5	532	393	45	52	152	6.04	558	0.619	480	3	9.8	N/A	MFR	1,2,3,4,6,7,8,9,10,11,12,14,15
NOTES:																																		
1. BASED ON TRANE					5. THREE-WAY CONTROL VALVE AT HEATING COIL					9. FREEZESTAT					13. AIR HANDLING UNIT TO CONSIST OF THE FOLLOWING MODULES:					14. AIR HANDLING UNIT TO CONSIST OF THE FOLLOWING MODULES:					ABBREVIATIONS:									
2. UC800 CONTROLS PACKAGE, FIELD PROGRAMMABLE					6. THREE-WAY CONTROL VALVE AT COOLING COIL					10. FAN STATUS CONTROL					AIR MIXING SECTION, HEATING COIL SECTION, COOLING COIL					AIR MIXING SECTION, COOLING COIL					MFR - MANUFACTURER									
3. DIRECT DRIVE PLENUM FAN WITH VFD					7. COOLING BASED ON 80°F DB / 67°F WB					11. STAINLESS STEEL DRAIN PAN					SECTION, SUPPLY FAN SECTION					SECTION, SUPPLY FAN SECTION														
4. CONNECT TO BAS					8. DIRTY FILTER SWITCH					12. 6" BASE RAIL										15. 2" DYNAMIC AIR CLEANER, MERV-13														

FLUID PUMP SCHEDULE																			
TAG	SERVES	LOCATION	SERIES	MODEL	TYPE	FLUID			PUMP				MOTOR						COMMENTS
						TYPE	% CONC.	TEMP. °F	GPM	HEAD (FT)	IMP. DIA.	% EFF	RPM	HP	VOLT	PHASE	DISC BY	STARTER BY	
P-1	AHU-1 HC	BASEMENT	ecodrc XL	20-140	CIRCULATOR	WATER	100	200	41	10	-	54.4	2330	0.5	230	1	EC	EC	1
P-2	AHU-1 CC	BASEMENT	e-80	5x5x9.5B	IN-LINE	WATER	100	48	319	20	7.875	73.7	1200	3	230	1	EC	EC	1
P-3	AHU-2 CC	BASEMENT	ecodrc XL	40-275	IN-LINE	WATER	100	48	152	15	-	62.1	2283	2	230	1	EC	EC	1
P-4	H-2	BASEMENT	CM	CM 1-7 A-S-I-E-AQOE B-A-A-N	END-SUCTION	WATER	100	68	9	208	-	68	3480	1.48	120	1	EC	EC	2
NOTES:																			
1. BASED ON: BELL GOSSETT			ABBREVIATIONS																
2. BASED ON: GRUNDFOSS			EC - ELECTRICAL CONTRACTOR																
			ETHL - ETHL - ETHELENE GLYCOL																
			PROP. - PROPYLENE GLYCOL																
			NR - NOT REQUIRED																

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SEQUENCE OF OPERATION: AHU-2

SUPPLY FAN CONTROL:

THE VARIABLE SPEED SUPPLY FANS (SFX-C) WILL BE STARTED BASED ON OCCUPANCY SCHEDULE (OCC-SCHEDULE). WHEN THE ANALOG FAN STATUS (SFA-R) INDICATES SUFFICIENT FANS HAVE STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. THE SUPPLY FANS (SFX-O) WILL MODULATE IN UNISON TO MAINTAIN THE DISCHARGE STATIC PRESSURE (DA-SP) AT SETPOINT (DAP-SP). UPON A LOSS OF AIRFLOW (SFA-R) OF ENOUGH FANS TO DROP BELOW THE MINIMUM REQUIRED (MINIMUM RUNNING DEVICES), THE FANS WILL STOP UNTIL THE UNIT IS MANUALLY RESET (SYS-RESET).

RETURN FAN CONTROL:

AFTER THE SUPPLY FAN HAS BEEN STARTED, THE VARIABLE SPEED RETURN FAN WILL BE STARTED. THE RETURN FAN (RF-O) WILL MODULATE TO MAINTAIN THE BUILDING STATIC PRESSURE AT SETPOINT (BLDG-SP). EXHAUST AIR DAMPERS (EAD-O) WILL BE ENABLED WHEN BOTH THEIR SUPPLY AND RETURN FANS ARE PROVEN ON, AND THE RETURN FANS ARE CONTROLLING TO BUILDING PRESSURE. THEY WILL BE CLOSED OTHERWISE. EXHAUST DAMPERS WILL BE MODULATED OPEN TO MAINTAIN BUILDING STATIC PRESSURE SETPOINT. ONCE FULLY OPEN, THE BUILDING PRESSURE CONTROL LOOP WILL RESET THE RETURN FAN DISCHARGE STATIC SETPOINT (EFF-RF-DSP) FROM (RF-DSP-MIN) TO (RF-DSP-MAX) TO MAINTAIN BUILDING STATIC PRESSURE SETPOINT. UPON A LOSS OF RETURN AIRFLOW (RF-S), THE SYSTEM WILL STOP UNTIL THE UNIT IS MANUALLY RESET (SYS-RESET).

ECONOMIZER CONTROL:

WHEN THE ENTHALPY OF THE OUTDOOR AIR IS LESS THAN THE RETURN AIR (ECON-AVAILABLE), THE ECONOMIZER WILL ACT AS THE INITIAL STAGE OF COOLING, WORKING IN SEQUENCE WITH THE COOLING COIL. THE RETURN AIR CO2 SENSOR (RA-Q) WILL BE USED TO RESET THE DAMPER MINIMUM POSITION.

MINIMUM OA CONTROL:

THE FRESH AIR INTAKE OF THE UNIT WILL BE LIMITED TO PREVENT THE MIXED AIR TEMPERATURE (MA-T) FROM FALLING BELOW THE LOW LIMIT SETPOINT (OALT-SP).

TEMPERATURE CONTROL:

THE OUTDOOR AIR TEMPERATURE (OA-T) WILL RESET THE ZONE TEMPERATURE TARGET, WHICH WILL RESET THE DISCHARGE AIR TEMPERATURE SETPOINT (DAT-SP). THE TEMPERATURE SETPOINT (XX-SP) WILL ADDITIONALLY BE SHIFTED BASED ON OUTDOOR AIR TEMPERATURE TO COMPENSATE FOR EXTREME OUTDOOR AIR TEMPERATURES (OA-T).

OCCUPIED MODE:

THE OCCUPANCY MODE WILL BE CONTROLLED VIA A NETWORK INPUT (OCC-SCHEDULE). THE OCCUPANCY MODE CAN ALSO BE OVERRIDDEN BY A NETWORK INPUT (OCC-OVERRIDE).

FREEZE PROTECTION GENERAL:

THIS SEQUENCE CONSISTS OF THREE STAGES USED TO PREVENT THE COILS FROM FREEZING WHEN THE DISCHARGE AIR TEMPERATURE (DA-T) FALLS TOO LOW. THE FIRST STAGE SENDS HEATING HOT-WATER PLANT REQUESTS, SETS THE ECONOMIZER DAMPER(S) TO THE MINIMUM POSITION, AND MODULATES ANY APPLICABLE HEATING COILS (SEE INDIVIDUAL COIL SECTIONS FOR DETAILS) TO MAINTAIN A STAGE ONE LOW TEMPERATURE SETPOINT (STG1-LT-SP). THE SECOND STAGE FULLY CLOSSES ANY ASSOCIATED OUTDOOR AIR DAMPERS FOR ONE HOUR AND SETS A LEVEL 3 ALARM (L3MINVENT-INTR). THE THIRD STAGE SHUTS DOWN THE SUPPLY FAN (SF-C) AND ANY RETURN/RELIEF FAN, CLOSES THE ECONOMIZER DAMPER(S), FULLY OPENS ANY APPLICABLE COOLING COIL, AND SENDS TWO HEATING HOT-WATER REQUESTS. THE THIRD STAGE ALSO MODULATES APPLICABLE HEATING COILS (SEE INDIVIDUAL COIL SECTIONS FOR DETAILS) AND SENDS A LEVEL 2 ALARM (L2-LOW-TEMP).

COOLING COIL:

THE COOLING COIL (CLG-O) WILL MODULATE TO MAINTAIN THE TEMPERATURE SETPOINT. ON A CALL FOR COOLING OR A DROP IN THE OUTDOOR AIR TEMPERATURE (OA-T) BELOW THE LOW OUTDOOR AIR TEMPERATURE SETPOINT (OALT-SP), THE COIL PUMP (CP-C) WILL BE STARTED. UPON A LOSS OF COOLING COIL PUMP STATUS (CP-S), THE PUMP WILL ATTEMPT TO AUTOMATICALLY RESTART UNTIL POSITIVE STATUS IS RECEIVED. ON A CALL FOR COOLING OR A DROP IN THE OUTDOOR AIR TEMPERATURE (OA-T) BELOW THE LOW OUTDOOR AIR TEMPERATURE SETPOINT (OALT-SP), THE LEAD COIL PUMP (CPX-C) WILL BE STARTED. WHEN THE UNIT IS SHUTDOWN, THE COOLING COIL WILL BE COMMANDED TO A PRESET POSITION SHOULD THE OUTDOOR AIR TEMPERATURE (OA-T) FALL BELOW THE LOW OUTDOOR AIR TEMPERATURE SETPOINT (OALT-SP). WHEN THE CONDENSATE FLOAT SWITCH IS IN "ALARM" (COND-A), THE COOLING CONTROL SEQUENCE WILL BE DISABLED. THEN THE FAN(S) WILL BE DISABLED VIA A HARD WIRED SHUTDOWN CIRCUIT. DURING STAGE 3 FREEZE PROTECTION THE COIL WILL MODULATE TO A FULLY OPEN POSITION AND ENERGIZE THE CHILLED WATER PUMP (CP-C).

HUMIDIFICATION:

THE HUMIDIFIER WILL BE ENABLED (HUM-C) AND MODULATE (HUM-O) TO MAINTAIN THE ZONE RELATIVE HUMIDITY SETPOINT (HUM-SP) AS SENSED BY THE ZONE RELATIVE HUMIDITY SENSOR (ZN-H). THE HUMIDITY HIGH LIMIT WILL OVERRIDE THE OUTPUT IF NECESSARY TO PREVENT THE DISCHARGE AIR HUMIDITY FROM EXCEEDING DISCHARGE HUMIDITY HIGH LIMIT SETPOINT.

DEHUMIDIFICATION:

ON A RISE IN THE RETURN AIR HUMIDITY (RA-H), THE COOLING COIL OUTPUT WILL BE OVERRIDDEN TO MAINTAIN THE RETURN AIR HUMIDITY BELOW THE RETURN AIR DEHUMIDIFICATION SETPOINT (DEHUM-SP). THE REHEAT CONTROL WILL MAINTAIN THE TEMPERATURE AT SETPOINT. SEE HUMIDIFIER SEQUENCE ON SHEET M-7.4.

UNIT PROTECTION:

- DISCHARGE AIR HIGH DUCT PRESSURE ALARM (DAPHI-A) -WHEN IN "ALARM", THE CONTROL SEQUENCE WILL STOP RUNNING AND THE FAN(S) WILL BE DISABLED VIA A HARD WIRED SHUTDOWN CIRCUIT.
- RETURN AIR HIGH DUCT PRESSURE (RAPHI-A) -WHEN IN "ALARM", THE CONTROL SEQUENCE WILL STOP RUNNING AND THE FAN(S) WILL BE DISABLED VIA A HARD WIRED SHUTDOWN CIRCUIT.
- DISCHARGE AIR SMOKE DETECTOR (DA-SD) -DISABLES THE FAN(S) VIA A HARD WIRED SHUTDOWN CIRCUIT.
- RETURN AIR SMOKE DETECTOR (RA-SD) -DISABLES THE FAN(S) VIA A HARD WIRED SHUTDOWN CIRCUIT.

ADDITIONAL POINTS MONITORED BY THE FMS:

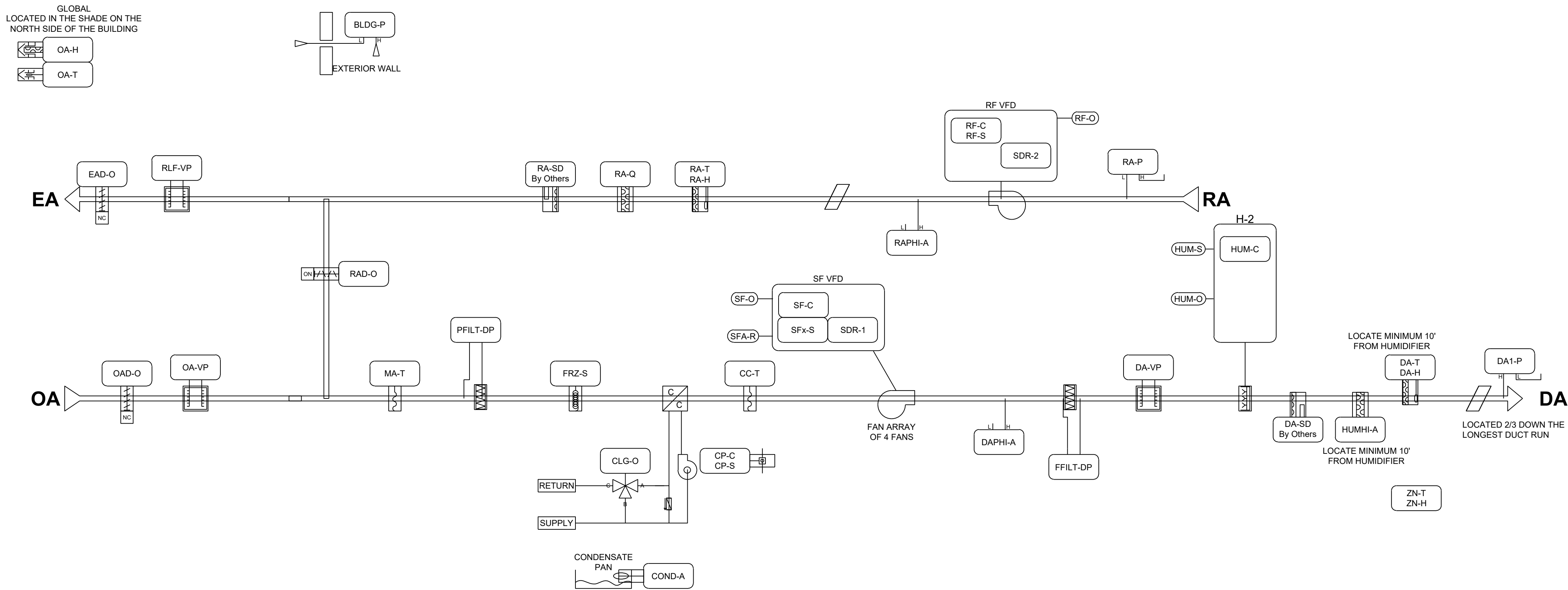
- OUTDOOR AIR TEMPERATURE (OA-T)
- OUTDOOR AIR HUMIDITY (OA-H)-OUTDOOR AIR VELOCITY PRESSURE (OA-VP)
- COOLING COIL DISCHARGE TEMPERATURE (CC-T)-DISCHARGE AIR VELOCITY PRESSURE (DA-VP)
- RELIEF AIR VELOCITY PRESSURE (RLF-VP)
- PREFILTER DIFF PRESSURE (PFILT-DP)
- FINAL FILTER DIFFERENTIAL PRESSURE (FFILT-DP)
- HIGH HUMIDITY LIMIT (HUMHI-A)-HUMIDIFIER STATUS (HUM-S)



GENERAL CONTROLS NOTES

- ALL LOW-VOLTAGE WIRING MUST COMPLY WITH REQUIREMENTS OF THE WAYNE STATE UNIVERSITY STANDARDS FOR COMMUNICATIONS INFRASTRUCTURE. CONTRACTOR SHALL REQUEST A COPY OF THE STANDARD FROM THE OWNER.
- ALL NEWLY INSULATED CONTROLLERS SHALL COMMUNICATE TO THE BAS SYSTEM VIA BACnet/IP CONNECTION.

POINTS LIST: AHU-2				
NAME	DESCRIPTION	SIGNAL	POINTTYPE	DATATYPE
BLDG-P	BUILDING STATIC PRESSURE	0-10VDC	INPUT	ANALOG
COND-A	CONDENSATE ALARM	DRY CONTACT MAINTAINED	INPUT	BINARY
CLG-O	COOLING OUTPUT	0-10VDC	OUTPUT	ANALOG
CC-T	COOLING COIL DISCHARGE TEMPERATURE	NICKEL 1K RTD	INPUT	ANALOG
CP-C	COOLING PUMP COMMAND	24VAC MAINTAINED	OUTPUT	BINARY
CP-S	COOLING PUMP STATUS	DRY CONTACT MAINTAINED	INPUT	BINARY
DA-H	DISCHARGE AIR HUMIDITY	0-10VDC	INPUT	ANALOG
DA-T	DISCHARGE AIR TEMPERATURE	NICKEL 1K RTD	INPUT	ANALOG
DAPHI-A	DISCHARGE AIR HIGH DUCT PRESSURE	DRY CONTACT MAINTAINED	INPUT	BINARY
DA1-P	DISCHARGE AIR STATIC PRESSURE 1	0-10VDC	INPUT	ANALOG
DA-VP	DISCHARGE AIR VELOCITY PRESSURE	0-10VDC	INPUT	ANALOG
EAD-O	EXHAUST AIR DAMPER OUTPUT	0-10VDC	OUTPUT	ANALOG
FFILT-DP	FINAL FILTER DIFFERENTIAL PRESSURE	0-10VDC	INPUT	ANALOG
FRZ-S	FREEZE STATUS	DRY CONTACT MAINTAINED	INPUT	BINARY
HUMHI-A	HUMIDITY HIGH LIMIT	DRY CONTACT MAINTAINED	INPUT	BINARY
HUM-O	HUMIDIFIER OUTPUT	0-10VDC	OUTPUT	ANALOG
HUM-S	HUMIDIFIER STATUS	DRY CONTACT MAINTAINED	INPUT	BINARY
HUM-C	HUMIDIFIER COMMAND	24VAC MAINTAINED	OUTPUT	BINARY
MA-T	MIXED AIR TEMPERATURE	NICKEL 1K RTD	INPUT	ANALOG
OA-H	OUTDOOR AIR HUMIDITY	0-10VDC	INPUT	ANALOG
OA-T	OUTDOOR AIR TEMPERATURE	NICKEL 1K RTD	INPUT	ANALOG
OAD-O	OUTDOOR AIR DAMPER OUTPUT	0-10VDC	OUTPUT	ANALOG
OA-VP	OUTDOOR AIR VELOCITY PRESSURE	0-10VDC	INPUT	ANALOG
PFILT-DP	PREFILTER DIFFERENTIAL PRESSURE	0-10VDC	INPUT	ANALOG
RLF-VP	RELIEF AIR VELOCITY PRESSURE	0-10VDC	INPUT	ANALOG
RA-H	RETURN AIR HUMIDITY	0-10VDC	INPUT	ANALOG
RA-Q	RETURN AIR QUALITY	0-10VDC	INPUT	ANALOG
RA-T	RETURN AIR TEMPERATURE	NICKEL 1K RTD	INPUT	ANALOG
RAD-O	RETURN AIR DAMPER OUTPUT	0-10VDC	OUTPUT	ANALOG
RAPHI-A	RETURN AIR HIGH DUCT PRESSURE	DRY CONTACT MAINTAINED	INPUT	BINARY
RA-P	RETURN AIR STATIC PRESSURE	0-10VDC	INPUT	ANALOG
RF-O	RETURN FAN OUTPUT	0-10VDC	OUTPUT	ANALOG
RF-C	RETURN FAN COMMAND	24VAC MAINTAINED	OUTPUT	BINARY
RF-S	RETURN FAN STATUS	DRY CONTACT MAINTAINED	INPUT	BINARY
SFA-R	SUPPLY FAN ARRAY STATUS RESISTANCE	RESISTIVE	INPUT	ANALOG
SF-O	SUPPLY FAN OUTPUT	0-10VDC	OUTPUT	ANALOG
SF-C	SUPPLY FAN COMMAND	24VAC MAINTAINED	OUTPUT	BINARY
ZN-H	ZONE HUMIDITY	SAB	INPUT	ANALOG
OCC-MODE	OCCUPANCY STATUS DISPLAY	SAB	OUTPUT	MULTISTATE
ZN-T	ZONE TEMPERATURE	SAB	INPUT	ANALOG



REGISTRATION SEAL

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	DDC REL 07 - IFB	07/02/24
A	DDC REL 06-ADDENDUM A	05/30/24
	DDC REL 05 - IFB	04/08/24
	DDC REL 04-95% REVIEW	03/13/24
	DDC REL 03 - 100% DD	02/08/24
	DDC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
DESIGNER	E. ERNVALL	
DRAWN	E. ERNVALL	
CHECKED	C. TRIERWEILER	
DEPT MGR	V. LALONDE	
PROJECT MGR	K. RUPP	

TITLE: WSU REUTHER
LIBRARY MEP

REUTHER LIBRARY
5401 CASS AVENUE
DETROIT, MICHIGAN

MECHANICAL CONTROLS
HUMIDIFIERS

WSU PROJECT #: 036-350464
WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

A/E PROJECT NO.

2164076

SHEET NO.

M-7.4

DSD FILE NAME

2164076-036-M-7.4

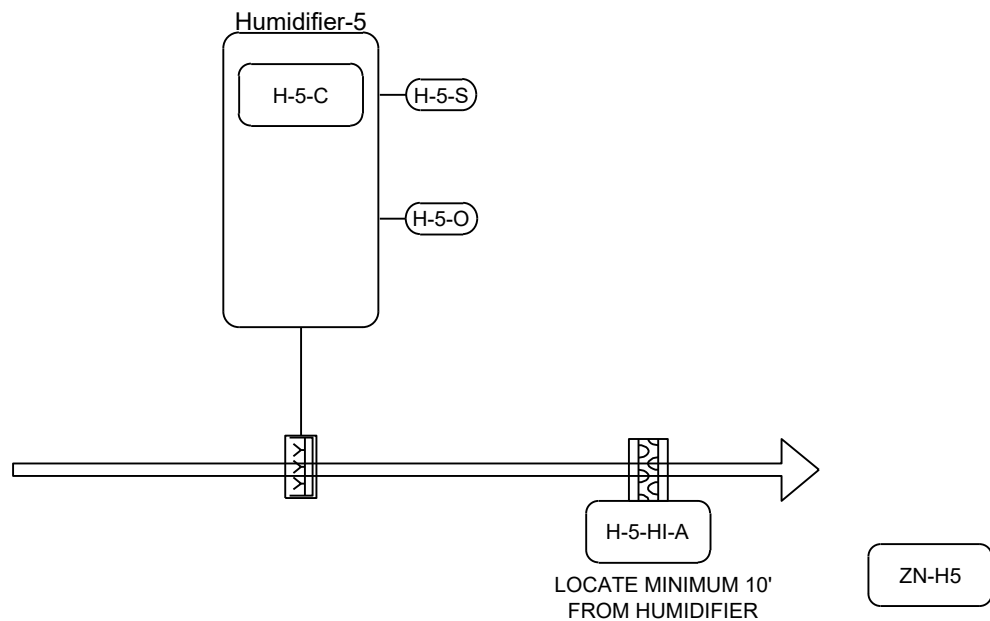
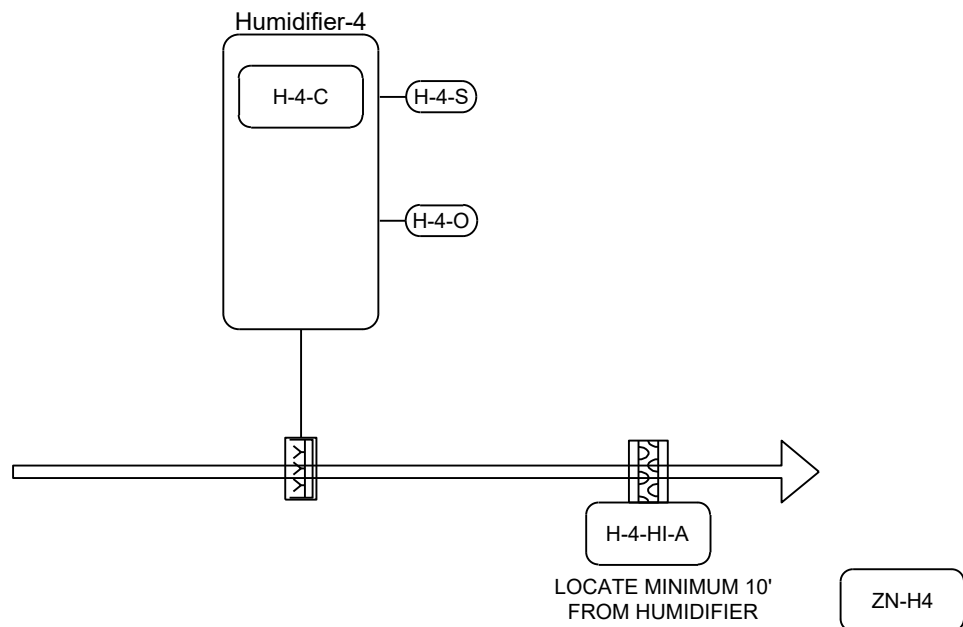
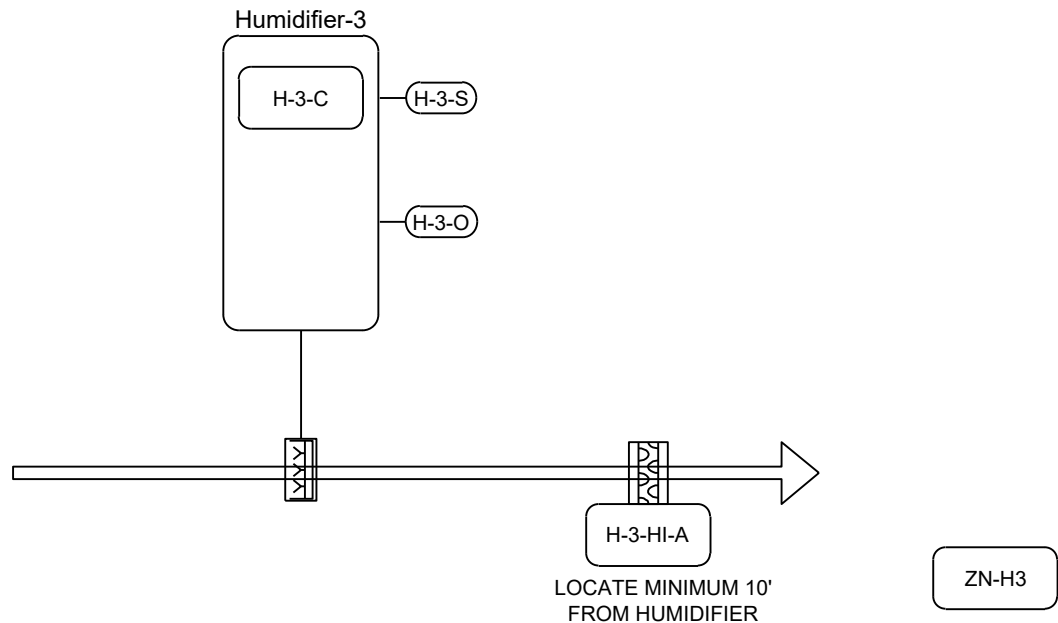
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GENERAL CONTROLS NOTES

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- ALL NEWLY INSULATED CONTROLLERS SHALL COMMUNICATE TO THE BAS SYSTEM VIA BACnet/IP CONNECTION.



POINTS LIST: H-3 - H-5				
NAME	DESCRIPTION	SIGNAL	POINTTYPE	DATATYPE
H-3-HI-A	H-3 HIGH LIMIT	DRY CONTACT MAINTAINED	INPUT	BINARY
H-3-O	H-3 OUTPUT	0-10VDC	OUTPUT	ANALOG
H-3-S	H-3 STATUS	DRY CONTACT MAINTAINED	INPUT	BINARY
H-3-C	H-3 COMMAND	24VAC MAINTAINED	OUTPUT	BINARY
ZN-H3	ZONE HUMIDITY H-3	SAB	INPUT	ANALOG
H-4-HI-A	H-4 HIGH LIMIT	DRY CONTACT MAINTAINED	INPUT	BINARY
H-4-O	H-4 OUTPUT	0-10VDC	OUTPUT	ANALOG
H-4-S	H-4 STATUS	DRY CONTACT MAINTAINED	INPUT	BINARY
H-4-C	H-4 COMMAND	24VAC MAINTAINED	OUTPUT	BINARY
ZN-H4	ZONE HUMIDITY H-4	SAB	INPUT	ANALOG
H-5-HI-A	H-5 HIGH LIMIT	DRY CONTACT MAINTAINED	INPUT	BINARY
H-5-O	H-5 OUTPUT	0-10VDC	OUTPUT	ANALOG
H-5-S	H-5 STATUS	DRY CONTACT MAINTAINED	INPUT	BINARY
H-5-C	H-5 COMMAND	24VAC MAINTAINED	OUTPUT	BINARY
ZN-H5	ZONE HUMIDITY H-5	SAB	INPUT	ANALOG

SEQUENCE OF OPERATION: H-3 - H-5

HUMIDIFICATION:

THE HUMIDIFIER WILL BE ENABLED (H-X-C) AND MODULATE (H-X-O) TO MAINTAIN THE ZONE RELATIVE HUMIDITY SETPOINT AS SENSED BY THE ZONE RELATIVE HUMIDITY SENSOR (ZN-HX). THE HUMIDITY HIGH LIMIT WILL OVERRIDE THE OUTPUT IF NECESSARY TO PREVENT THE DISCHARGE AIR HUMIDITY FROM EXCEEDING DISCHARGE HUMIDITY HIGH LIMIT SETPOINT.

ADDITIONAL POINTS MONITORED BY THE FMS:

- HUMIDIFIER STATUS (H-X-S)

1 H-3 - H-5 CONTROL DIAGRAM

SEQUENCE OF OPERATION: VAV-1, VAV-14, VAV-20 - VAV-22

OCCUPIED MODE:

WHEN THE ZONE TEMPERATURE (ZN-T) IS BETWEEN THE OCCUPIED HEATING (EFFHTG-SP) AND COOLING (EFFCLG-SP) SETPOINTS (INSIDE OF THE BIAS), THE PRIMARY AIR DAMPER (DPR-O) WILL BE AT THE MINIMUM CFM (SA-F) AND THERE WILL BE NO MECHANICAL HEATING. ON A RISE IN ZONE TEMPERATURE (ZN-T) ABOVE THE COOLING SETPOINT (EFFCLG-SP), THE PRIMARY AIR DAMPER (DPR-O) WILL INCREASE THE CFM (SA-F) AND THERE WILL BE NO MECHANICAL HEATING. ON A DROP IN ZONE TEMPERATURE (ZN-T) BELOW THE HEATING SETPOINT (EFFHTG-SP), THE REHEAT COIL WILL BE USED TO MAINTAIN THE ZONE TEMPERATURE (ZN-T) AND THE DAMPER (DPR-O) IS CONTROLLED TO PROVIDE A MINIMUM CFM (SA-F).

UNOCCUPIED MODE:

WHEN IN THIS MODE, WHILE THE ZONE TEMPERATURE (ZN-T) IS BETWEEN THE UNOCCUPIED HEATING (EFFHTG-SP) AND COOLING (EFFCLG-SP) SETPOINTS (INSIDE OF THE BIAS), THE PRIMARY AIR DAMPER (DPR-O) WILL BE AT THE MINIMUM CFM (SA-F) AND THERE WILL BE NO MECHANICAL HEATING. ON A RISE IN ZONE TEMPERATURE (ZN-T) ABOVE THE UNOCCUPIED COOLING SETPOINT (EFFCLG-SP), THE PRIMARY AIR DAMPER (DPR-O) WILL INCREASE THE CFM (SA-F) (IF AVAILABLE) AND THERE WILL BE NO MECHANICAL HEATING. ON A DROP IN ZONE TEMPERATURE (ZN-T) BELOW THE UNOCCUPIED HEATING SETPOINT (EFFHTG-SP), THE REHEAT COIL WILL BE USED TO MAINTAIN THE ZONE TEMPERATURE (ZN-T) AND THE PRIMARY AIR DAMPER (DPR-O) WILL BE AT THE MINIMUM CFM (SA-F).

DISCHARGE AIR TEMP SENSOR:

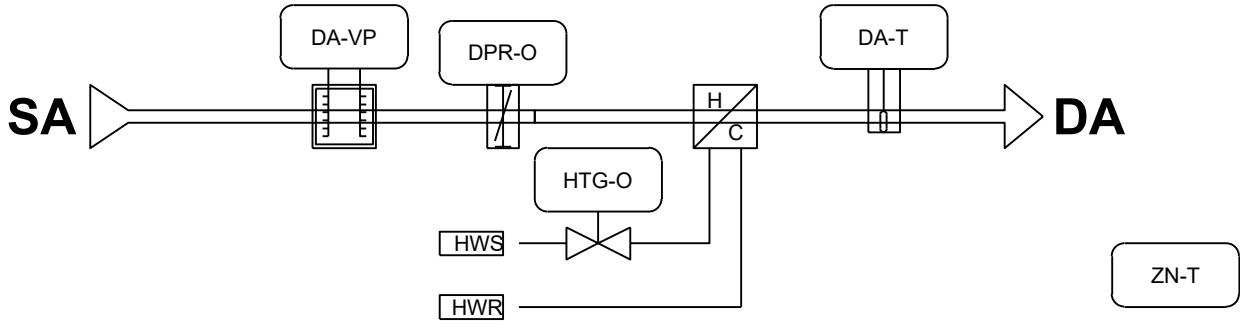
A DISCHARGE AIR TEMP (DA-T) SENSOR IS PROVIDED ON EACH BOX FOR MONITORING PURPOSES.

UNIT ENABLE:

A NETWORK UNIT ENABLE (UNITEN-MODE) SIGNAL WILL CONTROL THE MODE OF THE BOX. ADD "LOCAL REHEAT CONTROL" FROM TRANE 500.

NETWORK WARMUP-COOLDOWN:

WARM-UP AND COOLDOWN MODES WILL BE ACTIVATED BY A NETWORK COMMAND (WC-C). WHEN THE ZONE TEMPERATURE (ZN-T) IS BELOW THE EFFECTIVE HEATING SETPOINT (EFFHTG-SP), THE BOX DAMPER WILL BE MODULATED TO ALLOW WARM AIR FLOW, THEN REHEAT COIL TO MAINTAIN THE ZONE TEMPERATURE (ZN-T). WHEN THE BOX EFFECTIVE HEATING SETPOINT IS SATISFIED THE FLOW WILL REMAIN AT THE WARM-UP MINIMUM POSITION UNTIL THE WARM COMMAND HAS BEEN REMOVED.



1 VAV-1, VAV-14, VAV-20 - VAV-22 CONTROL DIAGRAM

SEQUENCE OF OPERATION: VAV-2 - VAV-13 & VAV-15 - VAV-19

OCCUPIED MODE:

WHEN THE ZONE TEMPERATURE (ZN-T) IS BETWEEN THE OCCUPIED HEATING (EFFHTG-SP) AND COOLING (EFFCLG-SP) SETPOINTS (INSIDE OF THE BIAS), THE PRIMARY AIR DAMPER (DPR-O) WILL BE AT THE MINIMUM CFM (SA-F) AND THERE WILL BE NO MECHANICAL HEATING. ON A RISE IN ZONE TEMPERATURE (ZN-T) ABOVE THE COOLING SETPOINT (EFFCLG-SP), THE PRIMARY AIR DAMPER (DPR-O) WILL INCREASE THE CFM (SA-F) AND THERE WILL BE NO MECHANICAL HEATING. ON A DROP IN ZONE TEMPERATURE (ZN-T) BELOW THE HEATING SETPOINT (EFFHTG-SP), THE SUPPLEMENTARY HEAT COIL WILL BE FULLY UTILIZED BEFORE THE REHEAT COIL IS ENABLED AND THE DAMPER (DPR-O) IS CONTROLLED TO PROVIDE A MINIMUM CFM (SA-F).

UNOCCUPIED MODE:

WHEN IN THIS MODE, WHILE THE ZONE TEMPERATURE (ZN-T) IS BETWEEN THE UNOCCUPIED HEATING (EFFHTG-SP) AND COOLING (EFFCLG-SP) SETPOINTS (INSIDE OF THE BIAS), THE PRIMARY AIR DAMPER (DPR-O) WILL BE AT THE MINIMUM CFM (SA-F) AND THERE WILL BE NO MECHANICAL HEATING. ON A RISE IN ZONE TEMPERATURE (ZN-T) ABOVE THE UNOCCUPIED COOLING SETPOINT (EFFCLG-SP), THE PRIMARY AIR DAMPER (DPR-O) WILL INCREASE THE CFM (SA-F) (IF AVAILABLE) AND THERE WILL BE NO MECHANICAL HEATING. ON A DROP IN ZONE TEMPERATURE (ZN-T) BELOW THE UNOCCUPIED HEATING SETPOINT (EFFHTG-SP), THE REHEAT COIL WILL BE FULLY UTILIZED BEFORE THE SUPPLEMENTARY HEAT IS ENABLED AND THE PRIMARY AIR DAMPER (DPR-O) WILL BE AT THE MINIMUM CFM (SA-F).

DISCHARGE AIR TEMP SENSOR:

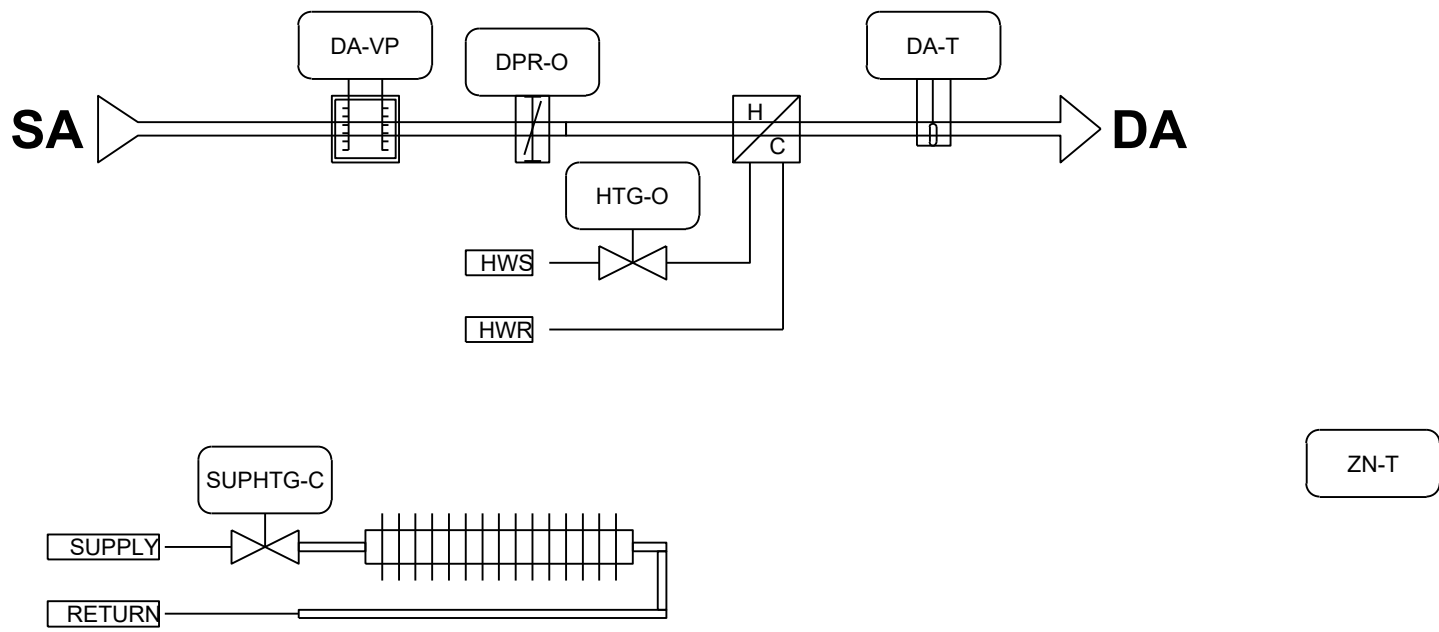
A DISCHARGE AIR TEMP (DA-T) SENSOR IS PROVIDED ON EACH BOX FOR MONITORING PURPOSES.

UNIT ENABLE:

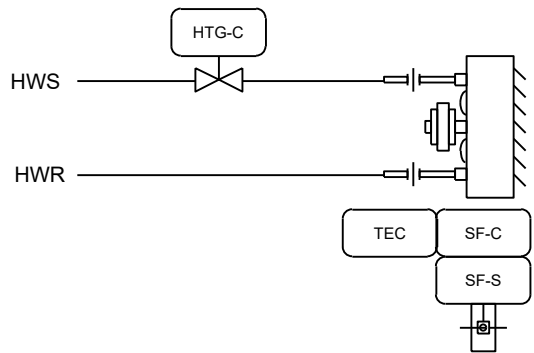
A NETWORK UNIT ENABLE (UNITEN-MODE) SIGNAL WILL CONTROL THE MODE OF THE BOX.

NETWORK WARMUP-COOLDOWN:

WARM-UP AND COOLDOWN MODES WILL BE ACTIVATED BY A NETWORK COMMAND (WC-C). WHEN THE ZONE TEMPERATURE (ZN-T) IS BELOW THE EFFECTIVE HEATING SETPOINT (EFFHTG-SP), THE BOX DAMPER WILL BE MODULATED TO ALLOW WARM AIR FLOW, THEN REHEAT COIL, THEN SUPPLEMENTAL HEATING COIL TO MAINTAIN THE ZONE TEMPERATURE (ZN-T). WHEN THE BOX EFFECTIVE HEATING SETPOINT IS SATISFIED THE FLOW WILL REMAIN AT THE WARM-UP MINIMUM POSITION UNTIL THE WARM COMMAND HAS BEEN REMOVED.



2 VAV-2 - VAV-13 & VAV-15 - VAV-19 CONTROL DIAGRAM



SEQUENCE OF OPERATION: X-CUH-1 - X-CUH-3 & X-UH-1

SUPPLY FAN CONTROL:

THIS FAN IS SINGLE SPEED THAT WILL RUN CONTINUOUSLY WHEN HEATING.

TEMPERATURE CONTROL:

THE UNIT WILL CONTROL TO MAINTAIN THE ZONE TEMPERATURE SET POINT AS SENSED BY THE ZONE TEMPERATURE SENSOR.

OCCUPIED MODE:

THE OCCUPANCY MODE WILL BE CONTROLLED VIA A NETWORK INPUT.

UNOCCUPIED MODE:

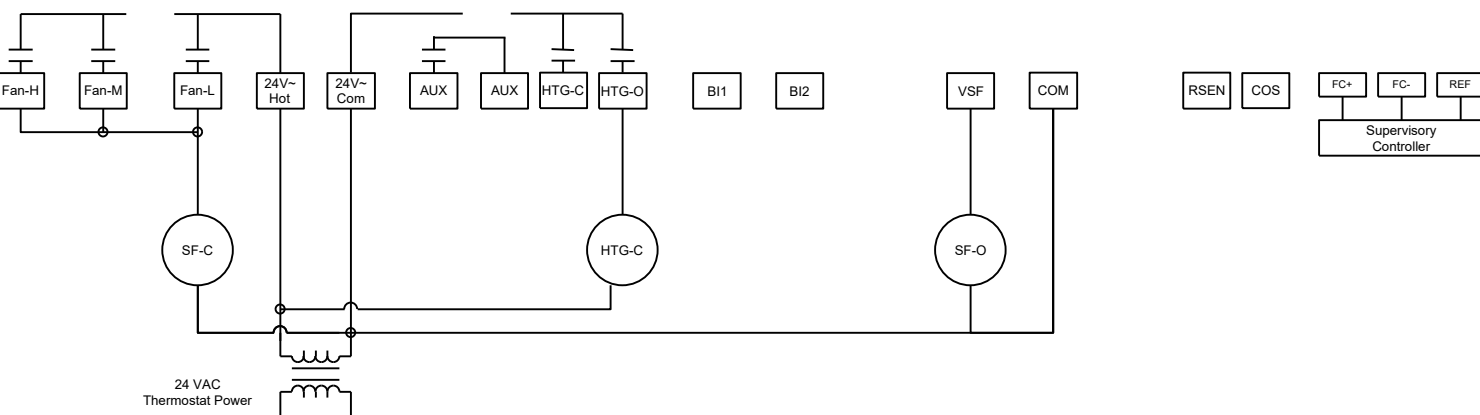
THE ZONE TEMPERATURE SET POINT WILL BE SETBACK IN UNOCCUPIED MODE.

HEATING COIL:

THE HEATING COIL WILL CYCLE OPEN AND CLOSED TO MAINTAIN THE TEMPERATURE SET POINT.

ADDITIONAL POINTS MONITORED BY THE FMS:

- SUPPLY FAN STATUS (SF-S)



3 X-CUH-1 - X-CUH-3 & X-UH-1 CONTROL DIAGRAM



GENERAL CONTROLS NOTES

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POINTS LIST: VAV-1, VAV-14, VAV-20 - VAV-22				
NAME	DESCRIPTION	SIGNAL	POINTTYPE	DATATYPE
HTG-O	HEATING OUTPUT	0-10VDC	OUTPUT	ANALOG
DA-T	DISCHARGE AIR TEMPERATURE	NICKEL 1K RTD	INPUT	ANALOG
DPR-O	SUPPLY AIR DAMPER OUTPUT	INTEGRATED	OUTPUT	POSITIONADJUST
DA-VP	DISCHARGE AIR VELOCITY PRESSURE	INTEGRATED DIGITAL VELOCITY PRESSURE	INPUT	ANALOG
OCC-MODE	OCCUPANCY STATUS DISPLAY	SAB	OUTPUT	MULTISTATE
ZN-T	ZONE TEMPERATURE	SAB	INPUT	ANALOG
WC-ADJ	WARMER/COOLER ADJUST	SAB	INPUT	ANALOG

POINTS LIST: VAV-2 - VAV-13, VAV-15 - VAV-19				
NAME	DESCRIPTION	SIGNAL	POINTTYPE	DATATYPE
HTG-O	HEATING OUTPUT	0-10VDC	OUTPUT	ANALOG
DA-T	DISCHARGE AIR TEMPERATURE	NICKEL 1K RTD	INPUT	ANALOG
SUPHTG-C	SUPPLEMENTAL HEATING COMMAND	24VAC MAINTAINED	OUTPUT	BINARY
DPR-O	SUPPLY AIR DAMPER OUTPUT	INTEGRATED	OUTPUT	POSITIONADJUST
DA-VP	DISCHARGE AIR VELOCITY PRESSURE	INTEGRATED DIGITAL VELOCITY PRESSURE	INPUT	ANALOG
OCC-MODE	OCCUPANCY STATUS DISPLAY	SAB	OUTPUT	MULTISTATE
ZN-T	ZONE TEMPERATURE	SAB	INPUT	ANALOG
WC-ADJ	WARMER/COOLER ADJUST	SAB	INPUT	ANALOG

POINTS LIST: X-CUH-1 - X-CUH-3 & X-UH-1				
NAME	DESCRIPTION	SIGNAL	POINTTYPE	DATATYPE
HTG-C	HEATING OUTPUT	24VAC MAINTAINED	OUTPUT	BINARY
SF-C	SUPPLY FAN COMMAND	24VAC MAINTAINED	OUTPUT	BINARY
SF-S	SUPPLY FAN STATUS	DRY CONTACT MAINTAINED	INPUT	BINARY
ZN-T	ZONE TEMPERATURE	SAB	INPUT	ANALOG

WAYNE STATE UNIVERSITY

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Design Services
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Detroit MI 48202

GHAFARI

17101 MICHIGAN AVENUE
DEARBORN, MI 48126-2736 USA
TEL +1.313.441.3000
www.ghafari.com

REGISTRATION SEAL

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	DDC REL 07 - IFB	07/02/24
A	DDC REL 06-ADDENDUM A	05/30/24
	DDC REL 05 - IFB	04/08/24
	DDC REL 04-95% REVIEW	03/13/24
	DDC REL 03 - 100% DD	02/08/24
	DDC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
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DESIGNER	E. ERNVALL
DRAWN	E. ERNVALL
CHECKED	C. TRIERWEILER
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

TITLE: WSU REUTHER LIBRARY MEP

REUTHER LIBRARY
5401 CASS AVENUE
DETROIT, MICHIGAN

MECHANICAL CONTROLS

WSU PROJECT #: 036-350464
WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

A/E PROJECT NO.
2164076

SHEET NO.
M-7.5

DSD FILE NAME
2164076-036-M-7.5

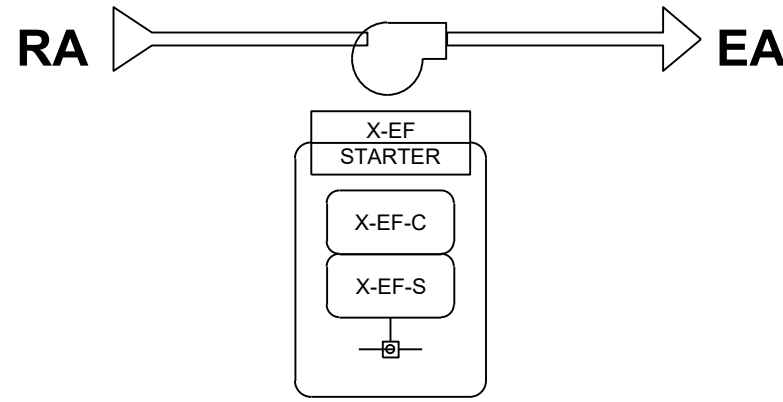
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SEQUENCE OF OPERATION: X-EF

ADDITIONAL POINTS MONITORED/CONTROLLED BY THE FMS:

- X-EF STATUS (X-EF-S)
- X-EF COMMAND (X-EF-C)



1 X-EF CONTROL DIAGRAM

POINTS LIST: X-EF				
NAME	DESCRIPTION	SIGNAL	POINTTYPE	DATATYPE
X-EF-C	X-EF COMMAND	24VAC MAINTAINED	OUTPUT	BINARY
X-EF-S	X-EF STATUS	DRY CONTACT MAINTAINED	INPUT	BINARY

GENERAL CONTROLS NOTES

- ALL LOW-VOLTAGE WIRING MUST COMPLY WITH REQUIREMENTS OF THE WAYNE STATE UNIVERSITY STANDARDS FOR COMMUNICATIONS INFRASTRUCTURE. CONTRACTOR SHALL REQUEST A COPY OF THE STANDARD FROM THE OWNER.
- ALL NEWLY INSULATED CONTROLLERS SHALL COMMUNICATE TO THE BAS SYSTEM VIA BACnet/IP CONNECTION.

SEQUENCE OF OPERATION: X-FT

TEMPERATURE CONTROL:

THE UNIT WILL CONTROL TO MAINTAIN THE ZONE TEMPERATURE SET POINT AS SENSED BY THE ZONE TEMPERATURE SENSOR.

OCCUPIED MODE:

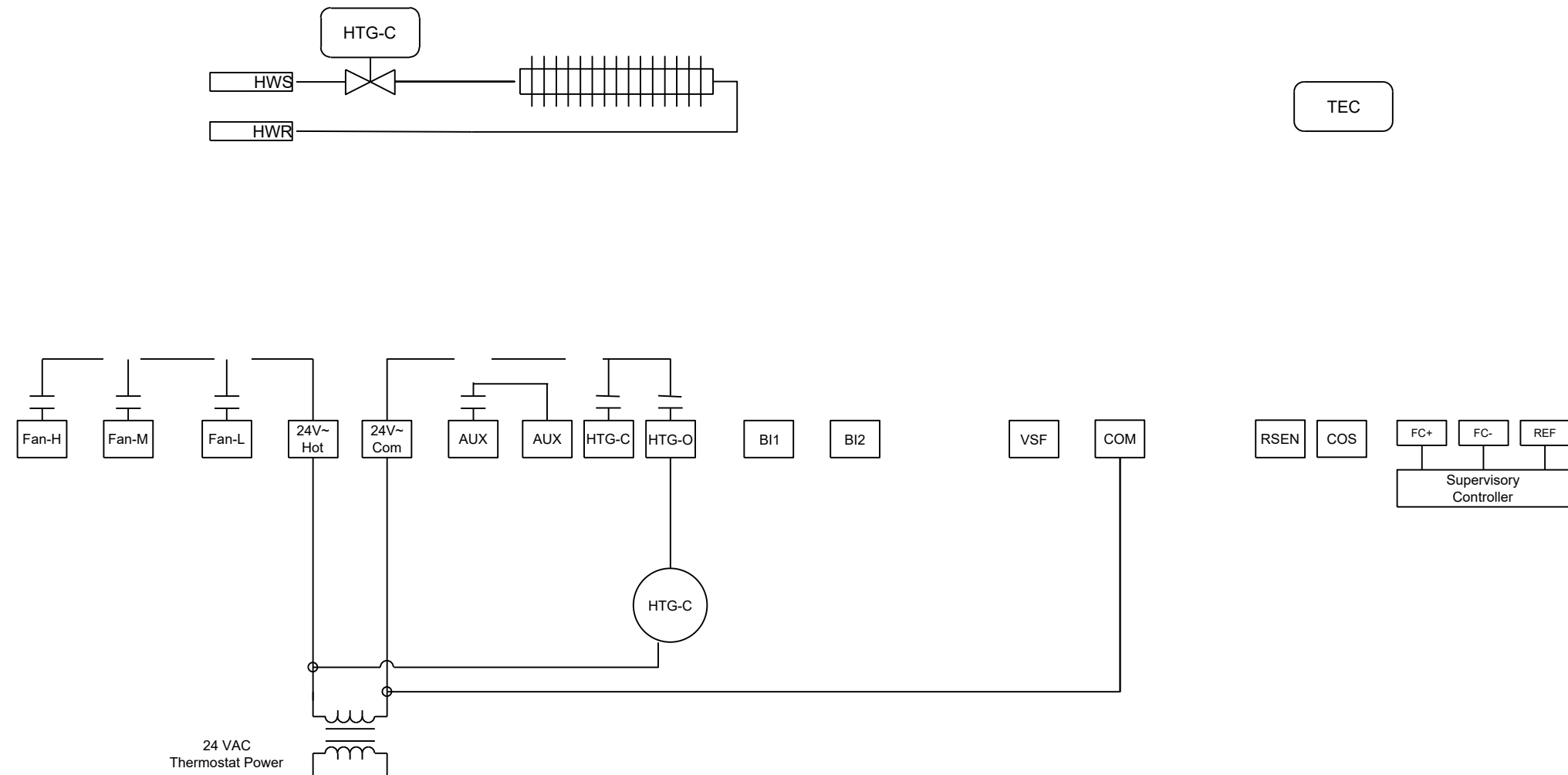
THE OCCUPANCY MODE WILL BE CONTROLLED VIA A NETWORK INPUT.

UNOCCUPIED MODE:

THE ZONE TEMPERATURE SET POINT WILL BE SETBACK IN UNOCCUPIED MODE.

HEATING COIL:

THE HEATING COIL WILL CYCLE OPEN AND CLOSED TO MAINTAIN THE TEMPERATURE SET POINT.



2 X-FT CONTROL DIAGRAM

POINTS LIST: X-FT				
NAME	DESCRIPTION	SIGNAL	POINTTYPE	DATATYPE
HTG-C	HEATING OUTPUT	24VAC MAINTAINED	OUTPUT	BINARY
ZN-T	ZONE TEMPERATURE	SAB	INPUT	ANALOG

SEQUENCE OF OPERATION: X-CUH-1 - X-CUH-3 & X-UH-1

TEMPERATURE CONTROL:

THE UNIT WILL CONTROL TO MAINTAIN THE ZONE TEMPERATURE SETPOINT.

OCCUPIED MODE:

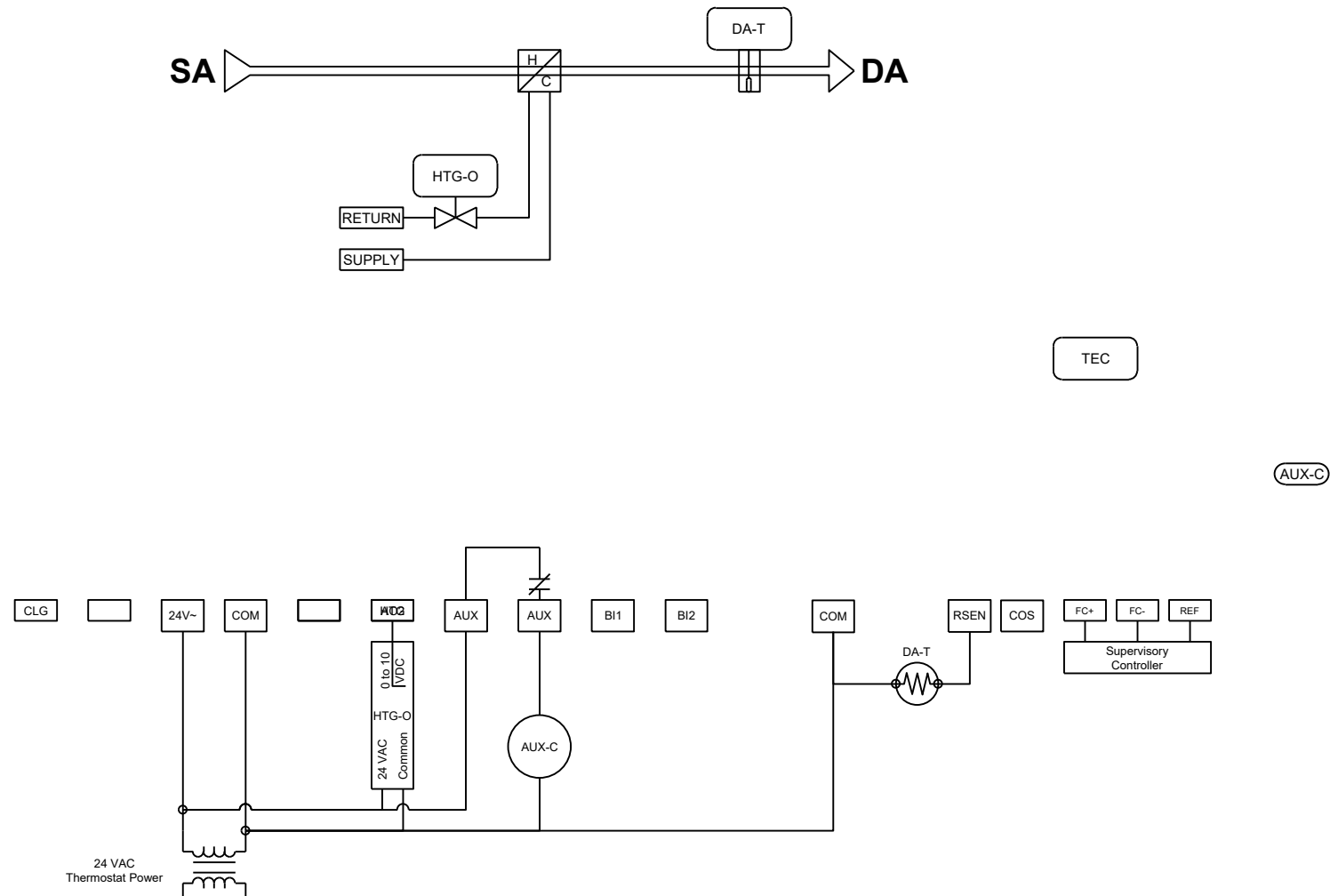
THE OCCUPANCY MODE WILL BE CONTROLLED VIA A NETWORK INPUT.

HEATING COIL:

THE HEATING COIL WILL MODULATE OPEN AND CLOSE IN SEQUENCE TO MAINTAIN THE TEMPERATURE SETPOINT.

ADDITIONAL POINTS MONITORED BY THE FMS:

- DISCHARGE AIR TEMPERATURE (DA-T)



3 X-RHC-14 - X-RHC-16 CONTROL DIAGRAM

POINTS LIST: X-RHC-14 - X-RHC-16				
NAME	DESCRIPTION	SIGNAL	POINTTYPE	DATATYPE
DA-T	DISCHARGE AIR TEMPERATURE	NICKEL 1K RTD	INPUT	ANALOG
HTG-O	HEATING OUTPUT	0-10VDC	OUTPUT	ANALOG
ZN-T	ZONE TEMPERATURE	SAB	INPUT	ANALOG

WAYNE STATE
UNIVERSITY

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5454 Cass Ave.
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DDC REL 04-95% REVIEW	03/13/24
DDC REL 03 - 100% DD	02/08/24
DDC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
DESIGNER	E. ERNVALL	
DRAWN	E. ERNVALL	
CHECKED	C. TRIERWEILER	
DEPT MGR	V. LALONDE	
PROJECT MGR	K. RUPP	

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MECHANICAL CONTROLS
X-EF, X-FT, X-RHC

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WSU BLDG #: 036

A/E PROJECT NO.

2164076

SHEET NO.

M-7.6

DSD FILE NAME

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	DDC REL 03 - 100% DD	02/08/24
	DDC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
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DESIGNER	B. THELEN
DRAWN	B. THELEN
CHECKED	J. SOVIS
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

TITLE: WSU REUTHER LIBRARY MEP

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ELECTRICAL
SYMBOLS, ABBREVIATIONS,
NOTES, AND SCHEDULES

SCALE: N.T.S.

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WSU BLDG #: 036

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DSD FILE NAME
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ELECTRICAL SYMBOLS LEGEND

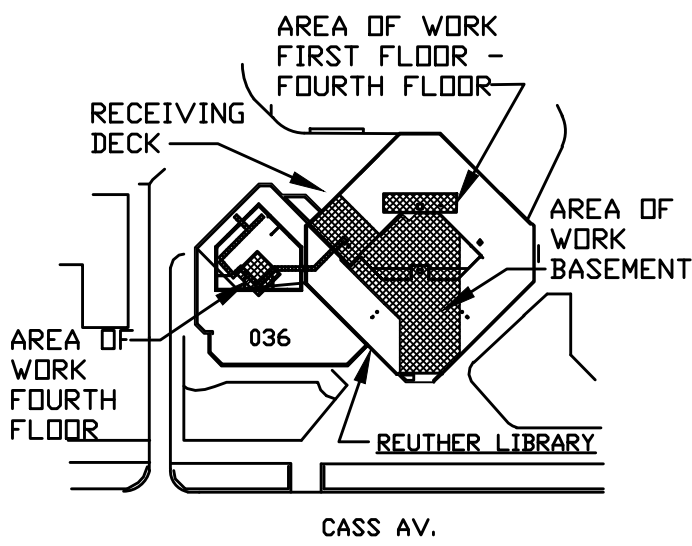
OUTLETS	FIXTURES	SERVICE and EQUIPMENT
⌀ SINGLE RECEPTACLE (120 VOLT)	⌀ LIGHT FIXTURE	VSS TRANSIENT VOLTAGE SURGE SUPPRESSION
⌀ DUPLEX RECEPTACLE	⌀ STRIP FIXTURE	VFD VARIABLE FREQUENCY DRIVE
⌀ EMERGENCY RECEPTACLE	⌀ EMERGENCY LIGHT FIXTURE	T TRANSFORMER
⌀ DOUBLE DUPLEX RECEPTACLE	⌀ IN-GRADE LIGHT FIXTURE	DISCONNECT SWITCH
⌀ F FLUSH FLOOR BOX	⌀ SPOTLIGHT (number of heads shown)	⊠ MAGNETIC STARTER
⌀ S SURFACE FLOOR BOX	⌀ EXIT SIGN (face & direction as shown)	COMB. STARTER
⌀ SPECIAL EQUIPMENT RECEPTACLE	⌀ WALL MOUNT LIGHT FIXTURE	PANELBOARD, SURFACE MOUNTED
⌀ TELEPHONE OUTLET	⌀ CEILING LIGHT FIXTURE	PANELBOARD, FLUSH MOUNTED
▽ DATA OUTLET	⌀ TRACK & FIXTURE	WEATHERHEAD
▽ TELEPHONE / DATA OUTLET	⌀ STREET TYPE POLE FIXTURE	UTILITY METER, AS REQUIRED
■ PP POWER POLE	⌀ POLE MOUNTED LIGHT FIXTURE	DIGITAL EQUIPMENT METER, AS REQUIRED
⌀ JUNCTION BOX	⌀ EXTERIOR WALL MOUNT LIGHT FIXTURE	CT CURRENT TRANSFORMERS
⌀ WALL JUNCTION BOX	⌀ WALLPACK LIGHT FIXTURE	G GENERATOR, KW SHOWN
⌀ PULL (JUNCTION) BOX	⌀ SPECIAL PURPOSE LIGHT FIXTURE	⌀ TELEPHONE TERMINAL BOARD
⌀ UNDERFLOOR JUNCTION BOX	⌀ HIGH BAY LIGHT FIXTURE	⌀ GROUND CONNECTION PER N.E.C.
⌀ CEILING MOUNTED WIFI	⌀ EMERGENCY EGRESS LIGHT FIXTURE (number of heads shown)	W WIREWAY
	⌀ DOCK LIGHT FIXTURE	TS TRANSFER SWITCH
SWITCHES	CIRCUITRY and RACEWAYS	ENCLOSED CIRCUIT BREAKER
\$ SINGLE-POLE SWITCH	— CONDUIT INSTALLED (by E.C.)	CAPACITOR
3\$ THREE-WAY SWITCH	— — CONDUIT INSTALLED (by others)	CONTROL
4\$ FOUR-WAY SWITCH	⌀ CONDUIT STUB UP	⊕ THERMOSTAT
S SWITCH WITH PILOT LIGHT	⌀ CONDUIT STUB DOWN	⊕ HUMIDISTAT
⌀ THERMAL OVERLOAD SWITCH	➔ HOME RUN (with circuit numbers)	⊕ PC PHOTOCELL (voltage as required)
⌀ MANUAL MOTOR SWITCH	— END OF CONDUIT RUN	⊕ TIME CLOCK (24 hour U.O.N.)
⌀ KEY SWITCH	— END OF CONDUIT RUN, CAP AND STAKE	⊕ PUSHBUTTON STATION (number of buttons indicated)
⌀ TIME SWITCH	— "CONDUIT RUN CONTINUES" INDICATION	⊕ CONTROL TRANSFORMER
⌀ DIMMER SWITCH	— FLEXIBLE PIGTAILS/CONNECTIONS	⊕ LIGHTING CONTACTOR
MECHANICAL	— WM WIREMOLD AS SPECIFIED	⊕ IRRIGATION CONTROLLER (120 volt xxVA connection by x/C)
⌀ SINGLE PHASE MOTOR	— PM PLUGMOLD AS SPECIFIED	⊕ WALL MOUNT DUAL TECHNOLOGY SENSOR
⌀ THREE PHASE MOTOR	— BD BUS DUCT	⊕ OCCUPANCY SENSOR / PHOTOCELL
⌀ RESISTANCE HEATER, KW SHOWN	— UFD UNDERFLOOR DUCT	⊕ ULTRASONIC SENSOR - 360° - 2 CIRCUIT
⌀ PIPE TRACE HEATER		⊕ DUAL TECHNOLOGY SENSOR - 360° - 1000 SQ FT
⌀ ELECTRIC UNIT HEATER		⊕ DUAL TECHNOLOGY SENSOR - 360° - 500 SQ FT
⌀ ELECTRIC WATER HEATER		⊕ SWITCH STYLE OCCUPANCY SENSOR
NURSE CALL	SOUND and SIGNAL	⊕ POWER PACK
NCC NURSE CALL CONTROLLER	S SPEAKER	⊕ DIGITAL TIME SWITCH
M MASTER STATION	S WALL MOUNTED SPEAKER	FIRE ALARM
P EMERGENCY PULL STATION	S WALL MOUNTED SPEAKER / CLOCK COMBO	⊕ SMOKE DETECTOR
E EMERGENCY PUSH STATION	S SINGLE FACE CLOCK	⊕ HEAT DETECTOR
CB CODE BLUE STATION	S DUAL FACE CLOCK	⊕ DUCT SMOKE DETECTOR
A PENDENT INTERFACE	V VIDEO INPUT	⊕ DUCT SMOKE DETECTOR
I BED / LIGHT INTERFACE	AU AUDIO / VIDEO INPUT	⊕ HORN
B1 SINGLE BED STATION	B BELL	⊕ HORN & LIGHT
B2 DUAL BED STATION	V VOLUME CONTROL	⊕ SPEAKER
DOME LIGHT	B BUZZER	⊕ SPEAKER & LIGHT
SRS STAFF REGISTER STATION	⊕ CHIME	⊕ PULL STATION
S STAFF STATION	⊕ TELEVISION OUTLET	⊕ FIRE ALARM CONTROL PANEL
S DUTY STATION	⊕ MICROPHONE OUTLET	ANNUNCIATOR PANEL
DESIGNATIONS	⊕ INTERCOM OUTLET	
⊕ DEMOLITION NOTE	C CAMERA	
⊕ PLAN NOTE	DC DOOR CONTACT	
⊕ ADDENDUM NOTE	M MOTION DETECTOR	
	B BEAM DETECTOR	
	KP KEY PAD	
	SCP SECURITY SYSTEM CONTROL PANEL	
	CCTV CCTV CONTROL PANEL	
	CR CARD READER	
	SS STUDENT STATION	
	AS ADMINISTRATION STATION	
	TS TEACHER STATION	
	GB GLASS BREAK	

GENERAL ELECTRICAL NOTES

- ALL WALL AND FLOOR PENETRATIONS ARE TO BE SEALED TO MAINTAIN ORIGINAL RATING.
- ALL CONDUITS TO BE FIELD ROUTED ALONG EXISTING PIPING AND STRUCTURAL STEEL.
- THE DIVISION 26 CONTRACTORS SHALL VISIT THE PROJECT AND DETERMINE THE EXACT EXTENT OF THE DEMOLITION WORK REQUIRED BEFORE BIDDING THE PROJECT.
- REMOVE ALL EXISTING OBSOLETE EXPOSED CONDUIT, WIRE AND UNUSED EQUIPMENT WHERE WORK IS BEING DONE EXCEPT ITEMS NOTED OTHERWISE.
- WHERE BUILDING SURFACES ARE DAMAGED BY THE REMOVAL OF OLD WORK, SURFACES SHALL BE PATCHED TO MATCH ADJACENT.
- EXISTING WORK WHICH IS PRESENTLY CONCEALED AND WHICH WILL REMAIN CONCEALED AND DOES NOT INTERFERE WITH ANY NEW WORK OF ANY TRADE NEED NOT BE REMOVED. HOWEVER, ALL CONDUIT SHALL BE CAPPED BELOW FINISH SURFACE AND THEN PATCHED TO MATCH, OR AS NOTED.
- EXISTING OPENINGS, WHICH ARE TO BE REUSED, SHALL BE MODIFIED OR ENLARGED TO SUIT THE NEW SYSTEMS AS REQUIRED. PROVIDE ALL REQUIRED CUTTING AND PATCHING.
- IF ASBESTOS IS PRESENT, IT WILL BE REMOVED OR RENDERED HARMLESS UNDER SEPARATE CONTRACT BY THE OWNER.
- THE DIVISION 26 CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING THE EXISTING WALLS TO MATCH THE ADJACENT SURFACES BEHIND ALL SURFACE MOUNTED EQUIPMENT.
- CONTRACTOR SHALL FIELD VERIFY ALL EQUIPMENT VOLTAGES AND LOADS PRIOR TO INSTALLING SERVICE TO EQUIPMENT.
- DRAWINGS ARE BASED ON EXISTING RECORD DOCUMENT AND CASUAL FIELD OBSERVATION. REPORT ANY DISCREPANCIES TO ENGINEER FOR CLARIFICATION.

ABBREVIATIONS LEGEND

A AC ACU- AFF AHJ AUTHORITY HAVING JURISDICTION AHU- AIR HANDLING UNIT AIC AMPS INTERRUPTING CAPACITY AS ABOVE SHELF ATS AUTOMATIC TRANSFER SWITCH	AMPS ABOVE COUNTER AIR CONDITIONING UNIT ABOVE FINISHED FLOOR DISCONNECT SWITCH MAGNETIC STARTER COMB. STARTER PANELBOARD, SURFACE MOUNTED PANELBOARD, FLUSH MOUNTED WEATHERHEAD UTILITY METER, AS REQUIRED DIGITAL EQUIPMENT METER, AS REQUIRED CURRENT TRANSFORMERS GENERATOR, KW SHOWN TELEPHONE TERMINAL BOARD GROUND CONNECTION PER N.E.C. WIREWAY TRANSFER SWITCH ENCLOSED CIRCUIT BREAKER CAPACITOR	GC GENERAL CONTRACTOR GFI GROUND FAULT INTERRUPTER GND GROUND H- HUMIDIFIER HOA HIGH INTENSITY DISCHARGE HP HAND-OFF-AUTO SELECTOR SWITCH HR HORSEPOWER HVAC HOUR HEATING/VENTILATING/AIR CONDITIONING IG ISOLATED GROUND IMC INTERMEDIATE METAL CONDUIT JB JUNCTION BOX LC LIGHT CONTROL LT LIGHT LTG LIGHTING LT FLEX LIQUID TIGHT FLEXIBLE METAL CONDUIT MAX MAXIMUM MC MECHANICAL CONTRACTOR MCC MOTOR CONTROL CENTER MIN MINIMUM MLO MAIN LUG ONLY MT MOUNTED MTG MOUNTING MUAU MAKE-UP AIR UNIT NC NORMALLY CLOSED NIC NOT IN CONTRACT NL NIGHT LIGHT NO NORMALLY OPEN NTS NOT TO SCALE	P POLE P- PUMP PB PULL BOX PNL PANEL PRV POWER ROOF VENTILATOR PVC POLY VINYL CHLORIDE PWR POWER RECEPT RGC RIGID GALVANIZED STEEL CONDUIT RTU- ROOF TOP UNIT SF- SUPPLY FAN SPEC SPECIFICATIONS SW SWITCH SWBD SWITCHBOARD TCC TEMPERATURE CONTROL CONTRACTOR TR TAMPER PROOF RECEPTACLE TS TAMPER PROOF SWITCH TYP TYPICAL UF UNDER FLOOR UH- UNIT HEATER UL UNDERWRITERS' LABORATORIES, INC. UNO UNLESS NOTED OTHERWISE V VOLTS VL VERIFY LOCATION WITH OWNER W WATTS W/ WITH W/O WITHOUT WP WEATHER PROOF XFMR TRANSFORMER
BB- ELECTRIC BASEBOARD EC ELECTRICAL CONTRACTOR EF- EXHAUST FAN EM EMERGENCY EMT ELECTRICAL METALLIC TUBING EWC ELECTRIC WATER COOLER EXIST (E) EXISTING FLA FULL LOAD AMPS FLEX FLEXIBLE CONDUIT FLR FLOOR FLUOR FLUORESCENT FSES FOOD SERVICE EQUIP. SUPPLIER F/S FIRE/SMOKE FU FURNACE	BOILER BELOW COUNTER BUILDING CHILLER CONDUIT CKT CIRCUIT CKT BKR CIRCUIT BREAKER CT- COOLING TOWER CU- CONDENSING UNIT CUH- CABINET UNIT HEATER DFU- DUCT FURNACE DISC DISCONNECT DWG DRAWING DWH- DOMESTIC WATER HEATER EBB- ELECTRIC BASEBOARD EC ELECTRICAL CONTRACTOR EF- EXHAUST FAN EM EMERGENCY EMT ELECTRICAL METALLIC TUBING EWC ELECTRIC WATER COOLER EXIST (E) EXISTING FLA FULL LOAD AMPS FLEX FLEXIBLE CONDUIT FLR FLOOR FLUOR FLUORESCENT FSES FOOD SERVICE EQUIP. SUPPLIER F/S FIRE/SMOKE FU FURNACE	GENERAL CONTRACTOR GROUND FAULT INTERRUPTER GROUND HUMIDIFIER HIGH INTENSITY DISCHARGE HAND-OFF-AUTO SELECTOR SWITCH HORSEPOWER HOUR HEATING/VENTILATING/AIR CONDITIONING ISOLATED GROUND INTERMEDIATE METAL CONDUIT JUNCTION BOX LIGHT CONTROL LIGHT LIGHTING LIQUID TIGHT FLEXIBLE METAL CONDUIT MAXIMUM MECHANICAL CONTRACTOR MOTOR CONTROL CENTER MINIMUM MAIN LUG ONLY MOUNT MOUNTED MOUNTING MAKE-UP AIR UNIT NORMALLY CLOSED NOT IN CONTRACT NIGHT LIGHT NORMALLY OPEN NOT TO SCALE	POLE PUMP PULL BOX PANEL POWER ROOF VENTILATOR POLY VINYL CHLORIDE POWER RECEPTACLE RIGID GALVANIZED STEEL CONDUIT ROOF TOP UNIT SUPPLY FAN SPECIFICATIONS SWITCH SWITCHBOARD TEMPERATURE CONTROL CONTRACTOR TAMPER PROOF RECEPTACLE TAMPER PROOF SWITCH TYPICAL UNDER FLOOR UNIT HEATER UNDERWRITERS' LABORATORIES, INC. UNLESS NOTED OTHERWISE VOLTS VERIFY LOCATION WITH OWNER WATTS WITH WITHOUT WEATHER PROOF TRANSFORMER



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	DOC REL 03 - 100% DD	02/08/24
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DRAWN	B. THELEN
CHECKED	J. SOVIS
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

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ELECTRICAL
BASEMENT
FLOOR PLAN
DEMOLITION

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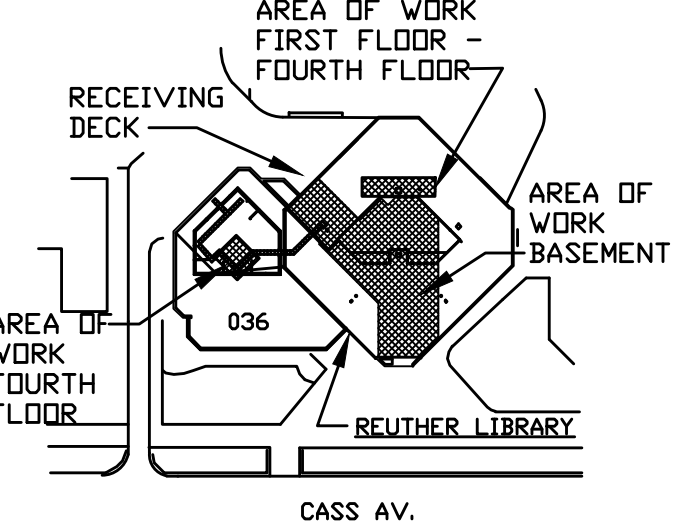
SHEET NO.

E-1.0

OSD FILE NAME

2164076-036-E-1.0

- 1 NO WORK DONE IN THIS AREA, UNLESS NOTED OTHERWISE.
- 2 EXISTING DEVICE TO REMAIN.
- 3 EXISTING EQUIPMENT TO REMAIN.
- 4 DISCONNECT & REMOVE EXISTING DEVICE. REMOVE ASSOCIATED CONDUIT & WIRE.
- 5 DISCONNECT & REMOVE EXISTING EQUIPMENT. REMOVE ASSOCIATED CONDUIT & WIRE.
- 6 DISCONNECT & REMOVE EXISTING EQUIPMENT. ASSOCIATED CONDUIT & WIRE TO REMAIN FOR NEW EQUIPMENT.



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 **ELECTRICAL - BASEMENT FLOOR PLAN - DEMOLITION**

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



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	DOC REL 02 - 60% DD	08/10/23
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DRAWN	B. THELEN
CHECKED	J. SOVIS
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

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ELECTRICAL
FIRST
FLOOR PLAN
DEMOLITION

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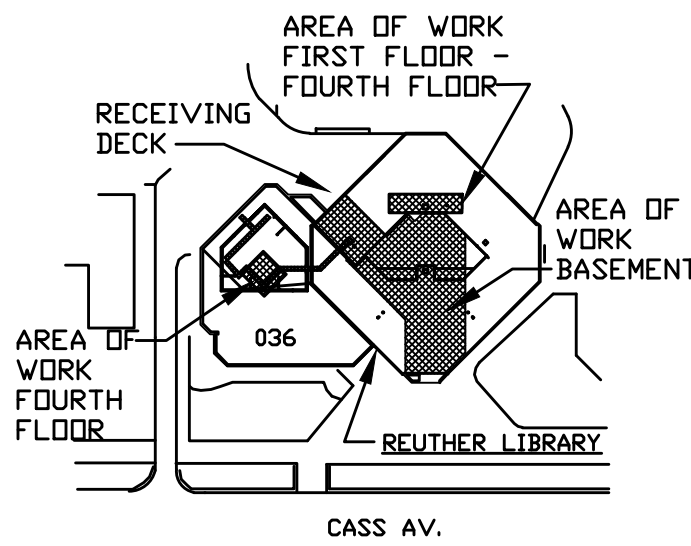
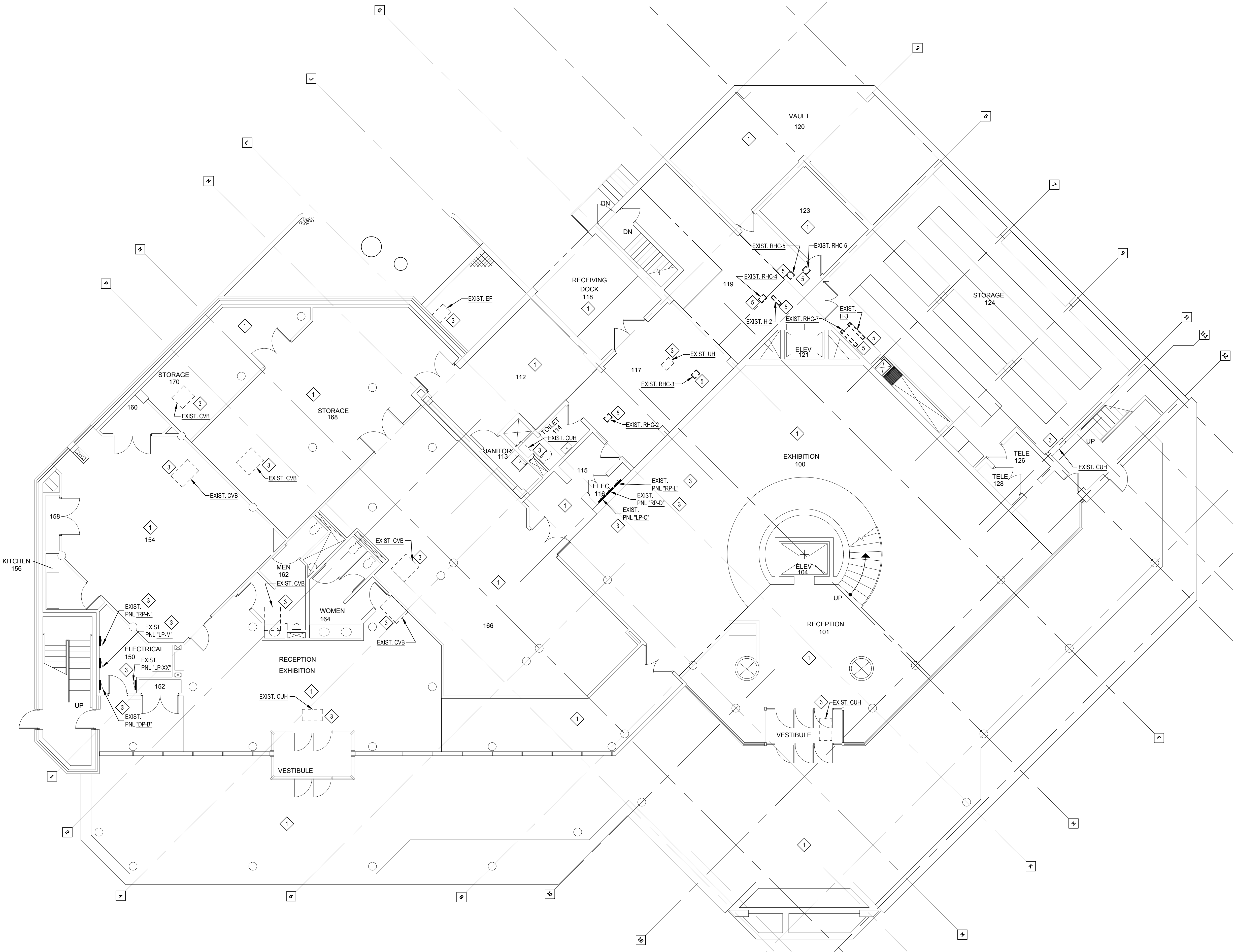
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SHEET NO. E-1.1

OSD FILE NAME	2164076-036-E-1.1
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- 1 NO WORK DONE IN THIS AREA, UNLESS NOTED OTHERWISE.
- 2 EXISTING DEVICE TO REMAIN.
- 3 EXISTING EQUIPMENT TO REMAIN.
- 4 DISCONNECT & REMOVE EXISTING DEVICE. REMOVE ASSOCIATED CONDUIT & WIRE.
- 5 DISCONNECT & REMOVE EXISTING EQUIPMENT. REMOVE ASSOCIATED CONDUIT & WIRE.



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 **ELECTRICAL - FIRST FLOOR PLAN - DEMOLITION**

0 1 5 10 20

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

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DRAWN	B. THELEN
CHECKED	J. SOVIS
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

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ELECTRICAL
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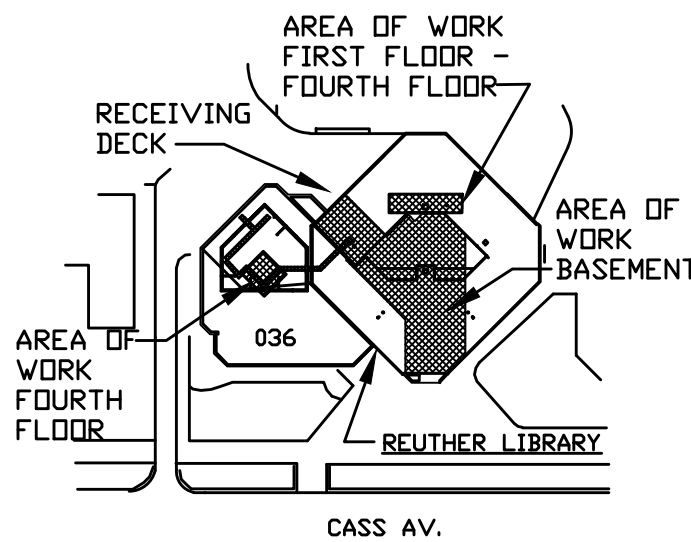
A/E PROJECT NO.
2164076

SHEET NO.
E-1.2

DSD FILE NAME
2164076-036-E-1.2

DEMOLITION NOTES

- NO WORK DONE IN THIS AREA, UNLESS NOTED OTHERWISE.
- EXISTING DEVICE TO REMAIN.
- EXISTING EQUIPMENT TO REMAIN.
- DISCONNECT & REMOVE EXISTING DEVICE. REMOVE ASSOCIATED CONDUIT & WIRE.
- DISCONNECT & REMOVE EXISTING EQUIPMENT. REMOVE ASSOCIATED CONDUIT & WIRE.



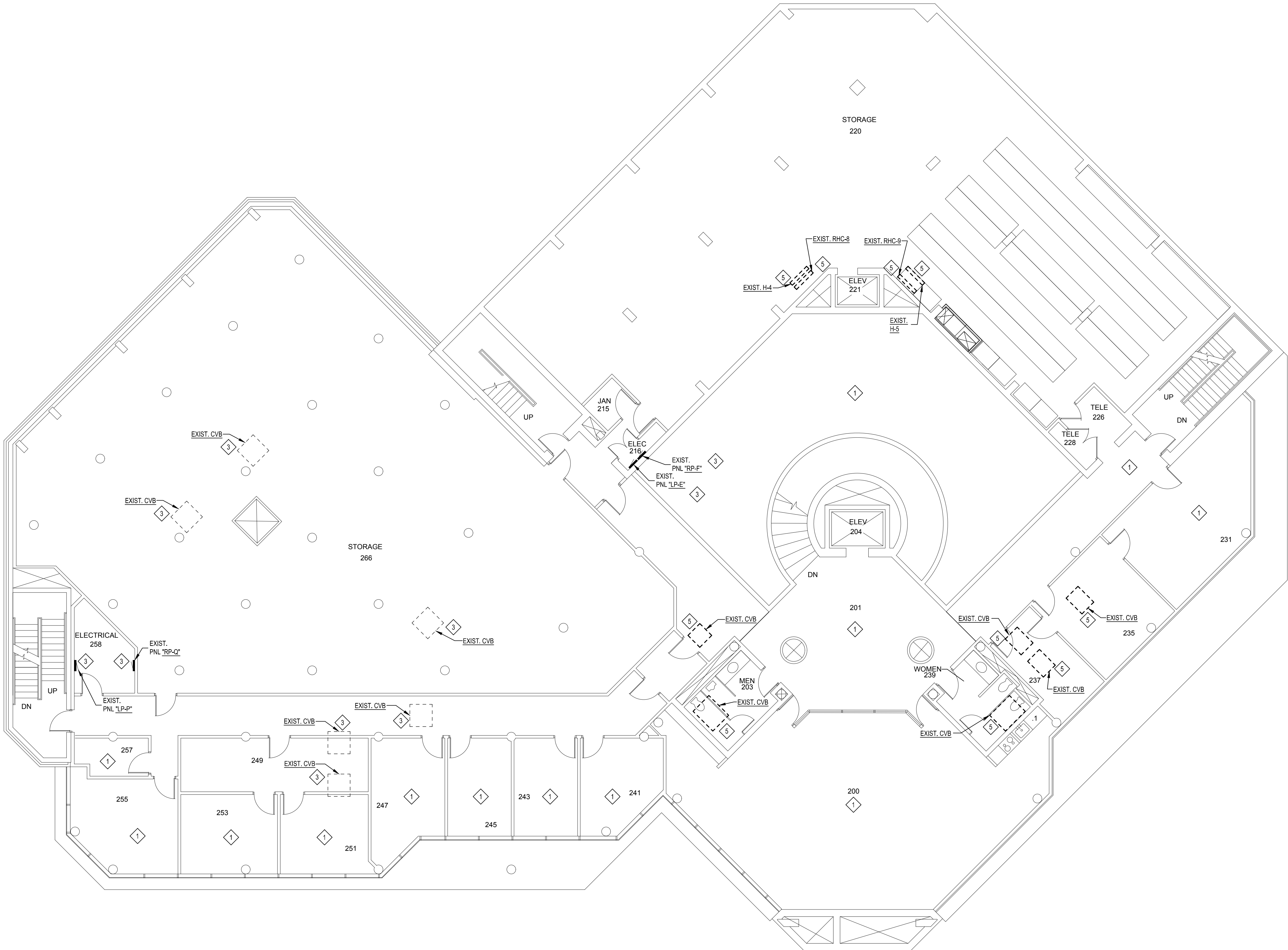
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ELECTRICAL - SECOND FLOOR PLAN - DEMOLITION

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



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	DDC REL 03 - 100% DD	02/08/24
	DDC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
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DESIGNER	B. THELEN
DRAWN	B. THELEN
CHECKED	J. SOVIS
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

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ELECTRICAL
THIRD
FLOOR PLAN
DEMOLITION

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WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

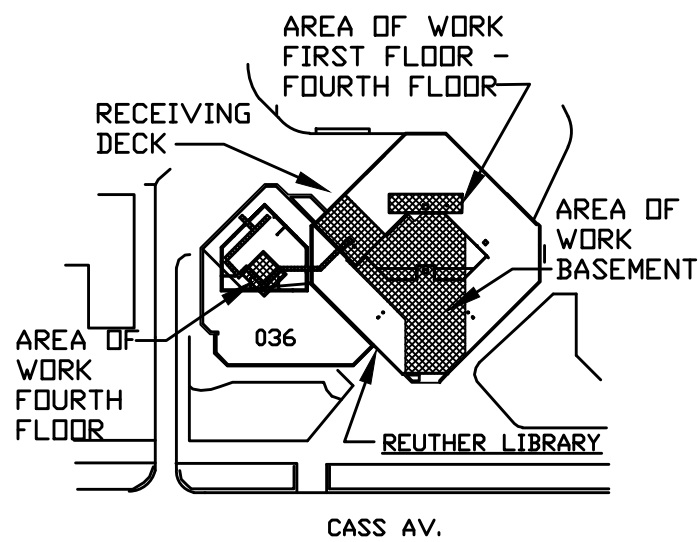
A/E PROJECT NO.
2164076

SHEET NO.
E-1.3

DSD FILE NAME
2164076-036-E-1.3

DEMOLITION NOTES

- NO WORK DONE IN THIS AREA, UNLESS NOTED OTHERWISE.
- EXISTING DEVICE TO REMAIN.
- EXISTING EQUIPMENT TO REMAIN.
- DISCONNECT & REMOVE EXISTING DEVICE. REMOVE ASSOCIATED CONDUIT & WIRE.
- DISCONNECT & REMOVE EXISTING EQUIPMENT. REMOVE ASSOCIATED CONDUIT & WIRE.



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ELECTRICAL - THIRD FLOOR PLAN - DEMOLITION

0 1 5 10 20
SCALE: 1/8" = 1'-0"

REGISTRATION SEAL

NOT FOR
CONSTRUCTION

	DDC REL 07 - IFB	07/02/24
A	DDC REL 06-ADDENDUM A	05/30/24
	DDC REL 05 - IFB	04/08/24
	DDC REL 04-95% REVIEW	03/13/24
	DDC REL 03 - 100% DD	02/08/24
	DDC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
DESIGNER	B. THELEN	
DRAWN	B. THELEN	
CHECKED	J. SOVIS	
DEPT MGR	V. LALONDE	
PROJECT MGR	K. RUPP	

TITLE: WSU REUTHER
LIBRARY MEP

REUTHER LIBRARY
5401 CASS AVENUE
DETROIT, MICHIGAN

ELECTRICAL
FOURTH
FLOOR PLAN
DEMOLITION

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

WSU PROJECT #: 036-350464
WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

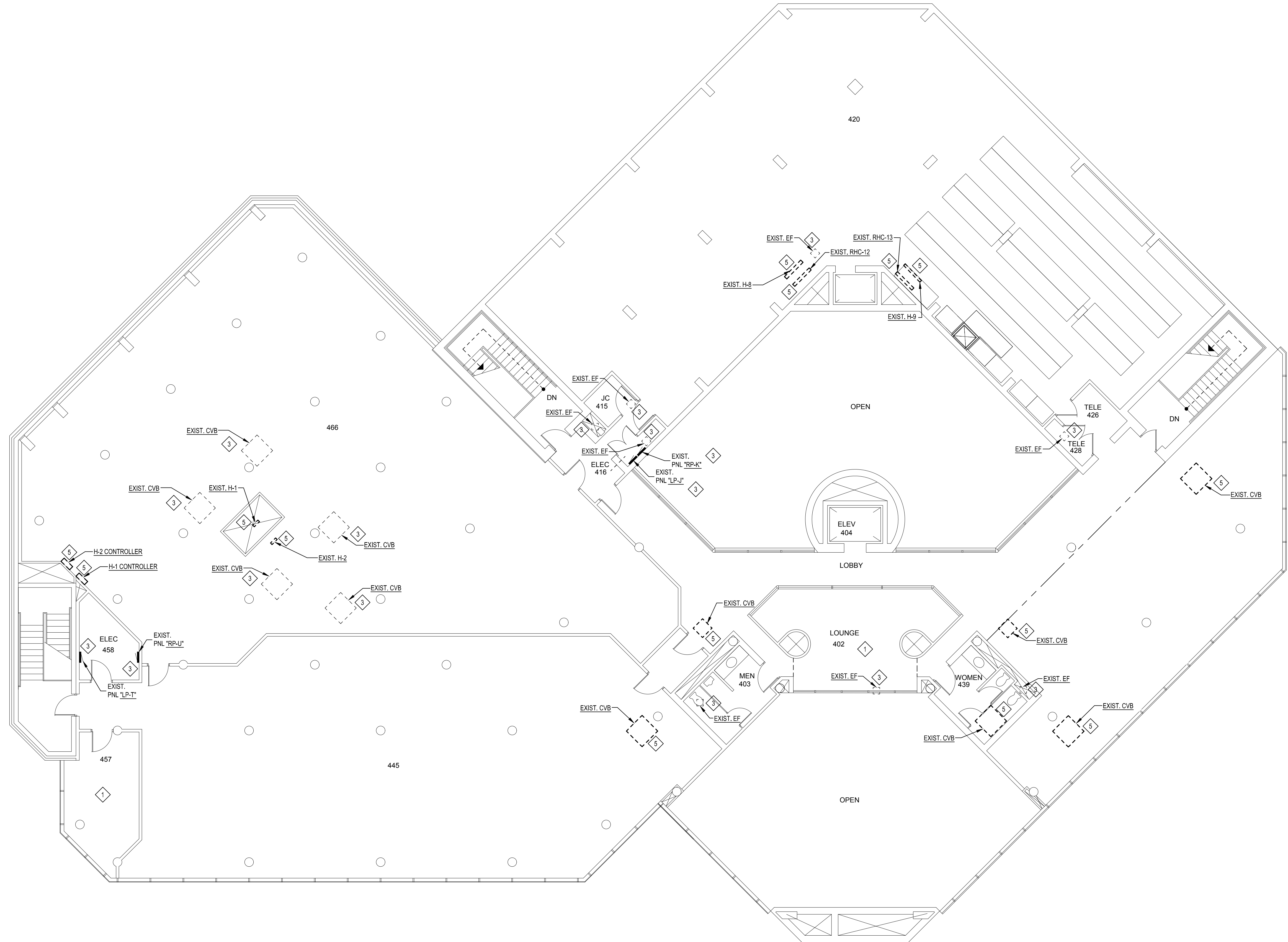
A/E PROJECT NO.
2164076

SHEET NO.
E-1.4

DSD FILE NAME
2164076-036-E-1.4

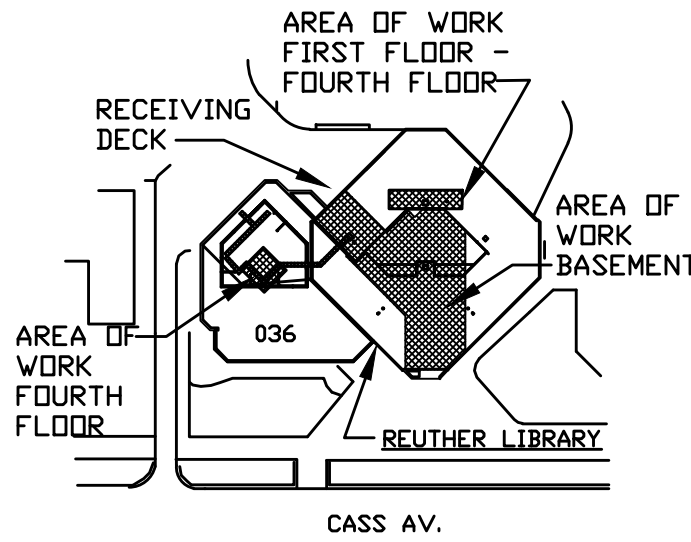
DEMOLITION NOTES

- 1 NO WORK DONE IN THIS AREA, UNLESS NOTED OTHERWISE.
- 2 EXISTING DEVICE TO REMAIN.
- 3 EXISTING EQUIPMENT TO REMAIN.
- 4 DISCONNECT & REMOVE EXISTING DEVICE. REMOVE ASSOCIATED CONDUIT & WIRE.
- 5 DISCONNECT & REMOVE EXISTING EQUIPMENT. REMOVE ASSOCIATED CONDUIT & WIRE.



ELECTRICAL - FOURTH FLOOR PLAN - DEMOLITION

0 1 5 10 20
SCALE: 1/8" = 1'-0"



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REGISTRATION SEAL

NOT FOR
CONSTRUCTION

	DDC REL 07 - IFB	07/02/24
A	DDC REL 06-ADDENDUM A	05/30/24
	DDC REL 05 - IFB	04/08/24
	DDC REL 04-95% REVIEW	03/13/24
	DDC REL 03 - 100% DD	02/08/24
	DDC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
------	-------	------

DESIGNER	B. THELEN
DRAWN	B. THELEN
CHECKED	J. SOVIS
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

TITLE: WSU REUTHER
LIBRARY MEP

REUTHER LIBRARY
5401 CASS AVENUE
DETROIT, MICHIGAN

ELECTRICAL
BASEMENT
FLOOR PLAN
NEW

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

WSU PROJECT #: 036-350464
WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

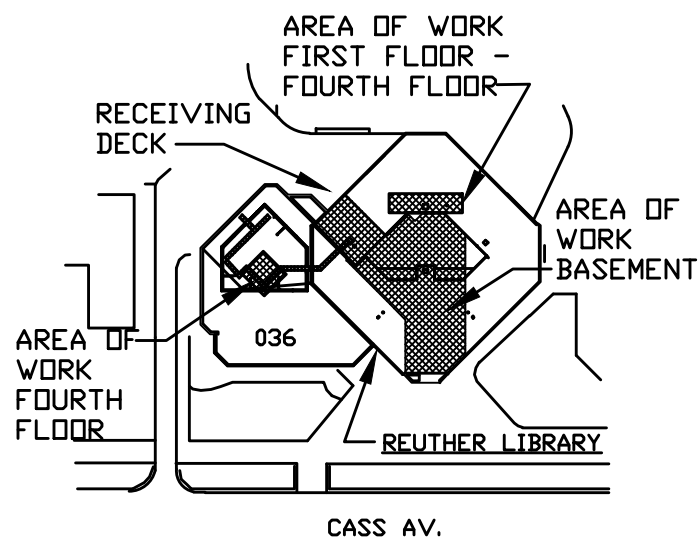
A/E PROJECT NO.
2164076

SHEET NO.
E-2.0

DSD FILE NAME
2164076-036-E-2.0

ELECTRICAL KEY NOTES

- NO WORK IN THIS AREA, UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL CIRCUIT TO NEAREST AVAILABLE 20A CIRCUIT.
- CONTRACTOR SHALL REPLACE EXISTING 60A FUSES IN MCC WITH NEW 30A FUSES. NEW FUSES SHALL MATCH EXISTING TYPE.
- CONTRACTOR SHALL REPLACE EXISTING 20A FUSES IN MCC WITH NEW 35A FUSES. NEW FUSES SHALL MATCH EXISTING TYPE.
- CONTRACTOR SHALL REPLACE EXISTING 125A FUSES IN MCC WITH NEW 70A FUSES. NEW FUSES SHALL MATCH EXISTING TYPE.
- CONTRACTOR SHALL REUSE EXISTING CIRCUIT FOR NEW EQUIPMENT.
- CONTRACTOR SHALL PROVIDE AND INSTALL NEW 20KVA MINI POWER ZONE WITH 480V INPUT AND 120/240V OUTPUT. MINI POWER ZONE SHALL BE SQUARE D, OR APPROVED EQUAL. COORDINATE LOCATION IN FIELD. CONTRACTOR SHALL PROVIDE AND INSTALL NEW 50A-2P BREAKER IN EXISTING PANEL "LP-A" TO FEED NEW POWER ZONE.
- CONTRACTOR SHALL INSTALL NEW DATA DEVICE FOR MECHANICAL UNIT. DATA SHALL TERMINATE TO NEAREST IT CLOSET. CONTRACTOR SHALL ADHERE TO ALL WSU STANDARDS FOR COMMUNICATIONS NETWORKS (PT 1.02)



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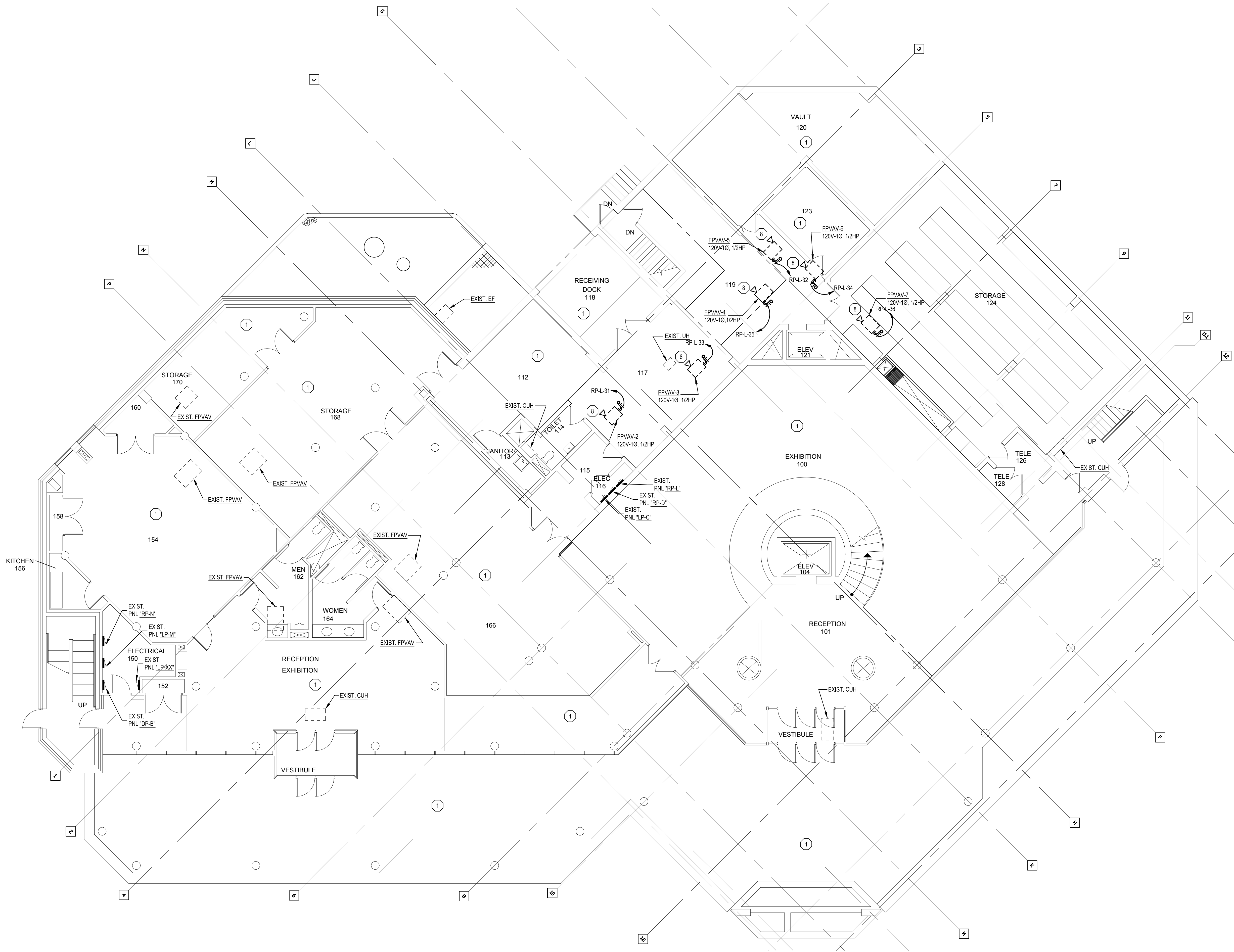
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ELECTRICAL - BASEMENT FLOOR PLAN - NEW

0 1 5 10 20
SCALE: 1/8" = 1'-0"





ELECTRICAL KEY NOTES

- 1 NO WORK IN THIS AREA, UNLESS NOTED OTHERWISE.
- 2 NOT USED.
- 3 NOT USED.
- 4 NOT USED.
- 5 NOT USED.
- 6 NOT USED.
- 7 NOT USED.
- 8 CONTRACTOR SHALL INSTALL NEW DATA DEVICE FOR MECHANICAL UNIT. DATA SHALL TERMINATE TO NEAREST I.T. CLOSET.

WAYNE STATE UNIVERSITY

Facilities Planning & Management
Design Services
5454 Cass Ave.
Detroit MI 48202

GHAFARI

17101 MICHIGAN AVENUE
DEARBORN, MI 48126-2736 USA
TEL +1.313.441.3000
www.ghafari.com

REGISTRATION SEAL

NOT FOR CONSTRUCTION

	DDC REL 07 - IFB	07/02/24
A	DDC REL 06-ADDENDUM A	05/30/24
	DDC REL 05 - IFB	04/08/24
	DDC REL 04-95% REVIEW	03/13/24
	DDC REL 03 - 100% DD	02/08/24
	DDC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
------	-------	------

DESIGNER	B. THELEN
DRAWN	B. THELEN
CHECKED	J. SOVIS
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

TITLE: WSU REUTHER LIBRARY MEP

REUTHER LIBRARY
5401 CASS AVENUE
DETROIT, MICHIGAN

ELECTRICAL
FIRST
FLOOR PLAN
NEW

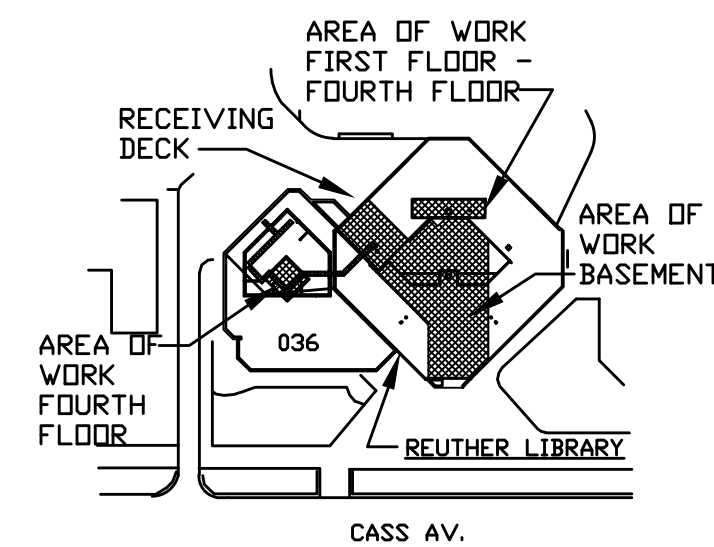
SCALE: 1/8" = 1'-0"

WSU PROJECT #: 036-350464
WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

A/E PROJECT NO.
2164076

SHEET NO.
E-2.1

DSD FILE NAME
2164076-036-E-2.1



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ELECTRICAL - FIRST FLOOR PLAN - NEW

0 1 5 10 20
SCALE: 1/8" = 1'-0"

REGISTRATION SEAL

NOT FOR
CONSTRUCTION

	DDC REL 07 - IFB	07/02/24
A	DDC REL 06-ADDENDUM A	05/30/24
	DDC REL 05 - IFB	04/08/24
	DDC REL 04-95% REVIEW	03/13/24
	DDC REL 03 - 100% DD	02/08/24
	DDC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
------	-------	------

DESIGNER	B. THELEN
DRAWN	B. THELEN
CHECKED	J. SOVIS
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

TITLE: WSU REUTHER
LIBRARY MEP

REUTHER LIBRARY
5401 CASS AVENUE
DETROIT, MICHIGAN

ELECTRICAL
SECOND
FLOOR PLAN
NEW

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

WSU PROJECT #: 036-350464
WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

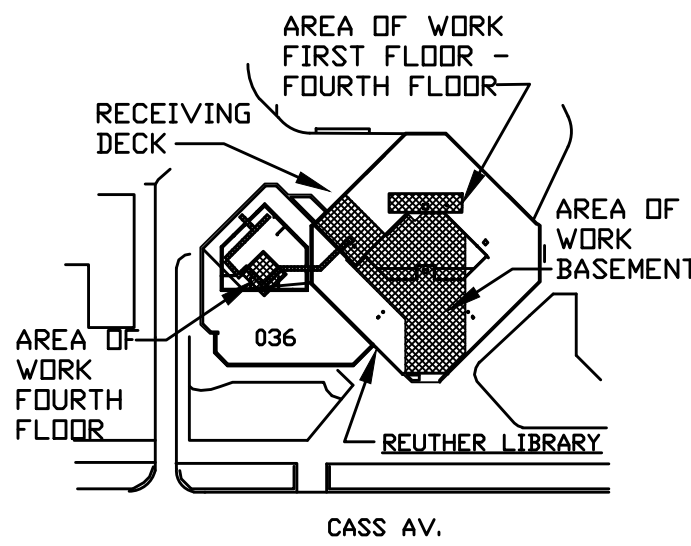
A/E PROJECT NO.
2164076

SHEET NO.
E-2.2

DSD FILE NAME
2164076-036-E-2.2

ELECTRICAL KEY NOTES

- 1 NO WORK IN THIS AREA, UNLESS NOTED OTHERWISE.
- 2 NOT USED.
- 3 NOT USED.
- 4 NOT USED.
- 5 NOT USED.
- 6 NOT USED.
- 7 NOT USED.
- 8 CONTRACTOR SHALL INSTALL NEW DATA DEVICE FOR MECHANICAL UNIT. DATA SHALL TERMINATE TO NEAREST I.T. CLOSET.



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ELECTRICAL - SECOND FLOOR PLAN - NEW

0 1 5 10 20
SCALE: 1/8" = 1'-0"

REGISTRATION SEAL

NOT FOR
CONSTRUCTION

	DDC REL 07 - IFB	07/02/24
A	DDC REL 06-ADDENDUM A	05/30/24
	DDC REL 05 - IFB	04/08/24
	DDC REL 04-95% REVIEW	03/13/24
	DDC REL 03 - 100% DD	02/08/24
	DDC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
------	-------	------

DESIGNER	B. THELEN
DRAWN	B. THELEN
CHECKED	J. SOVIS
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

TITLE: WSU REUTHER
LIBRARY MEP

REUTHER LIBRARY
5401 CASS AVENUE
DETROIT, MICHIGAN

ELECTRICAL
THIRD
FLOOR PLAN
NEW

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

WSU PROJECT #: 036-350464
WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

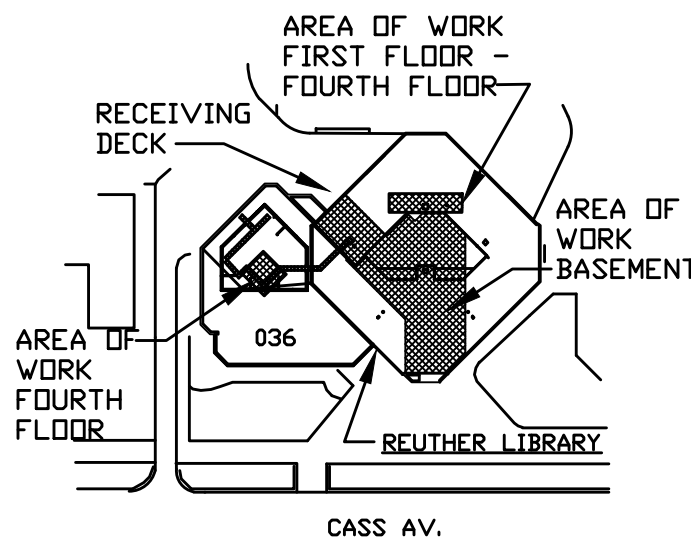
A/E PROJECT NO.
2164076

SHEET NO.
E-2.3

DSD FILE NAME
2164076-036-E-2.3

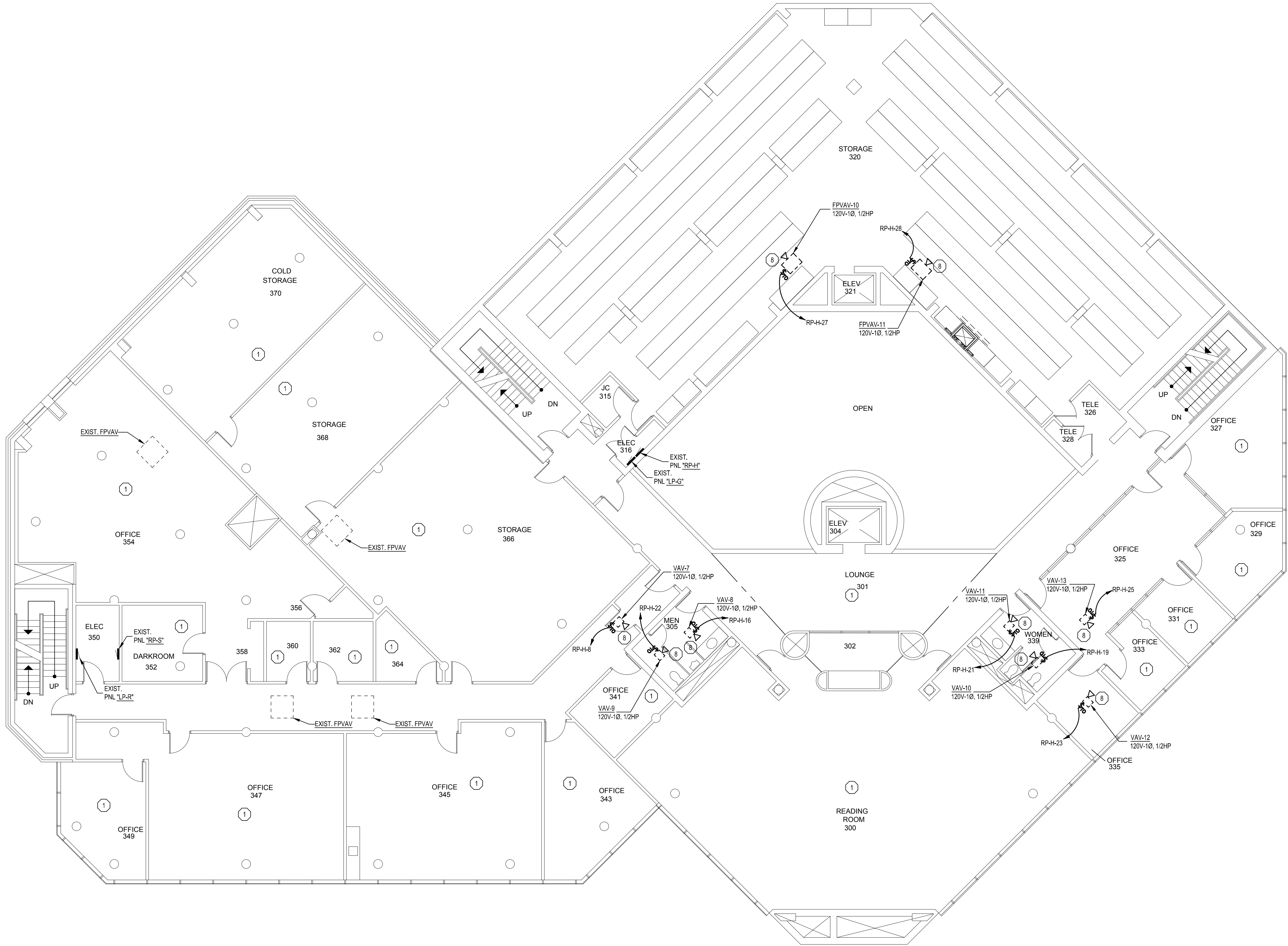
ELECTRICAL KEY NOTES

- 1 NO WORK IN THIS AREA, UNLESS NOTED OTHERWISE.
- 2 NOT USED.
- 3 NOT USED.
- 4 NOT USED.
- 5 NOT USED.
- 6 NOT USED.
- 7 NOT USED.
- 8 CONTRACTOR SHALL INSTALL NEW DATA DEVICE FOR MECHANICAL UNIT. DATA SHALL TERMINATE TO NEAREST I.T. CLOSET.



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ELECTRICAL - THIRD FLOOR PLAN - NEW

0 1 5 10 20
SCALE: 1/8" = 1'-0"

REGISTRATION SEAL

NOT FOR
CONSTRUCTION

	DDC REL 07 - IFB	07/02/24
A	DDC REL 06-ADDENDUM A	05/30/24
	DDC REL 05 - IFB	04/08/24
	DDC REL 04-95% REVIEW	03/13/24
	DDC REL 03 - 100% DD	02/08/24
	DDC REL 02 - 60% DD	08/10/23

MARK	ISSUE	DATE
------	-------	------

DESIGNER	B. THELEN
DRAWN	B. THELEN
CHECKED	J. SOVIS
DEPT MGR	V. LALONDE
PROJECT MGR	K. RUPP

TITLE: WSU REUTHER
LIBRARY MEP

REUTHER LIBRARY
5401 CASS AVENUE
DETROIT, MICHIGAN

ELECTRICAL
FOURTH
FLOOR PLAN
NEW

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

WSU PROJECT #: 036-350464
WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

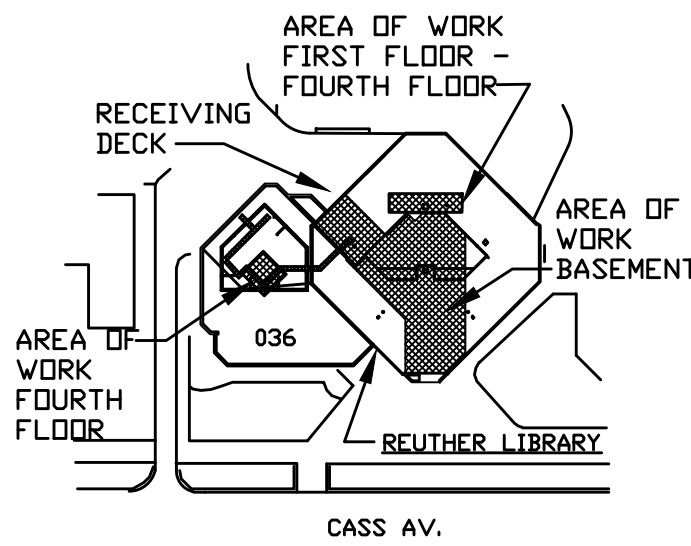
A/E PROJECT NO.
2164076

SHEET NO.
E-2.4

DSD FILE NAME
2164076-036-E-2.4

ELECTRICAL KEY NOTES

- 1 NO WORK IN THIS AREA, UNLESS NOTED OTHERWISE.
- 2 NOT USED.
- 3 NOT USED.
- 4 NOT USED.
- 5 NOT USED.
- 6 NOT USED.
- 7 NOT USED.
- 8 CONTRACTOR SHALL INSTALL NEW DATA DEVICE FOR MECHANICAL UNIT. DATA SHALL TERMINATE TO NEAREST I.T. CLOSET.



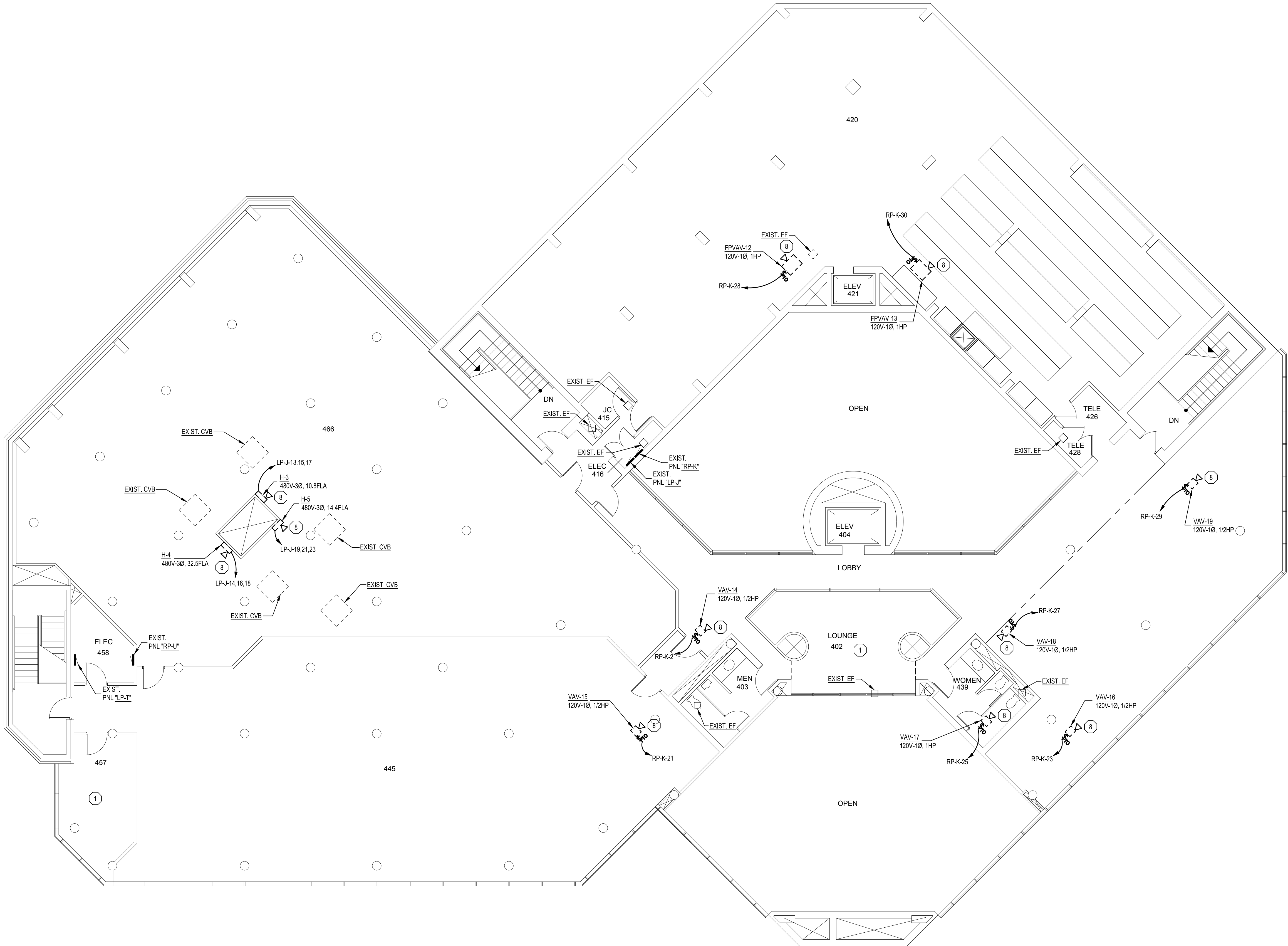
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ELECTRICAL - FOURTH FLOOR PLAN - NEW

0 1 5 10 20
SCALE: 1/8" = 1'-0"



	DOC REL 07 - IFB	07/02/24
A	DOC REL 06-ADDENDUM A	05/30/24
	DOC REL 05 - IFB	04/08/24
	DOC REL 04-95% REVIEW	03/13/24
	DOC REL 03 - 100% DD	02/08/24
	DOC REL 02 - 60% DD	08/10/23

TITLE: WSU REUTHER
LIBRARY MEP

ELECTRICAL PANEL SCHEDULES

WSU PROJECT #: 036-350464
WSU BLDG NAME: REUTHER LIBRARY
WSU BLDG #: 036

2164076

E-6.1

2164076-036-E-6.1



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NEW PANEL "MPZ"

LOCATION: MECHANICAL RM 010
SUPPLY FROM: PANEL "LP-A"

MOUNTING: SURFACE
ENCLOSURE: NEMA 1

A.I.C. RATING: 18 kA
NOTES:

VOLTS: 240 /120 PHASE: 1 WIRE: 3 AMPS: 70 MAIN: MCB

BRKR		DESCRIPTION	CIRCUIT		PHASE LOADS			CIRCUIT		DESCRIPTION	BRKR	
A	P		VA		A		C	VA			A	P
20	2	P-1	588	1	972			2	384	H-1	20	2
-	-	-	588	3			972	4	384	-	-	-
25	2	P-2	2040	5	3060			6	1020	RO-1	20	2
-	-	-	2040	7			3060	8	1020	-	-	-
20	2	P-3	1440	9	1680			10	240	H-2	20	2
-	-	-	1440	11			1680	12	240	-	-	-
30	1	P-4	2400	13	2400			14		SPARE	20	1
20	1	SPARE		15			0	16		SPARE	20	1
20	1	SPARE		17			0	18		SPARE	20	1
CONNECTED					8112		5712	TOTAL CONNECTED LOAD				
TOTAL CONNECTED					13824			13824 VOLT-AMPS				
								57.60 AMPS				

LOAD CALCULATIONS

LOAD TYPE	CONNECTED VA	DEMAND VA	N.E.C. SECTION
MECHANICAL LIGHTING	13824	13824	215.2(A)(1)
RECEPTACLE	0	0	215.2(A)(1)
KITCHEN EQUIPMENT	0	0	TABLE 220.44
OTHER	0	0	TABLE 220.56
TOTAL VA	13824	13824	
TOTAL AMPERAGE	57.60	57.60	