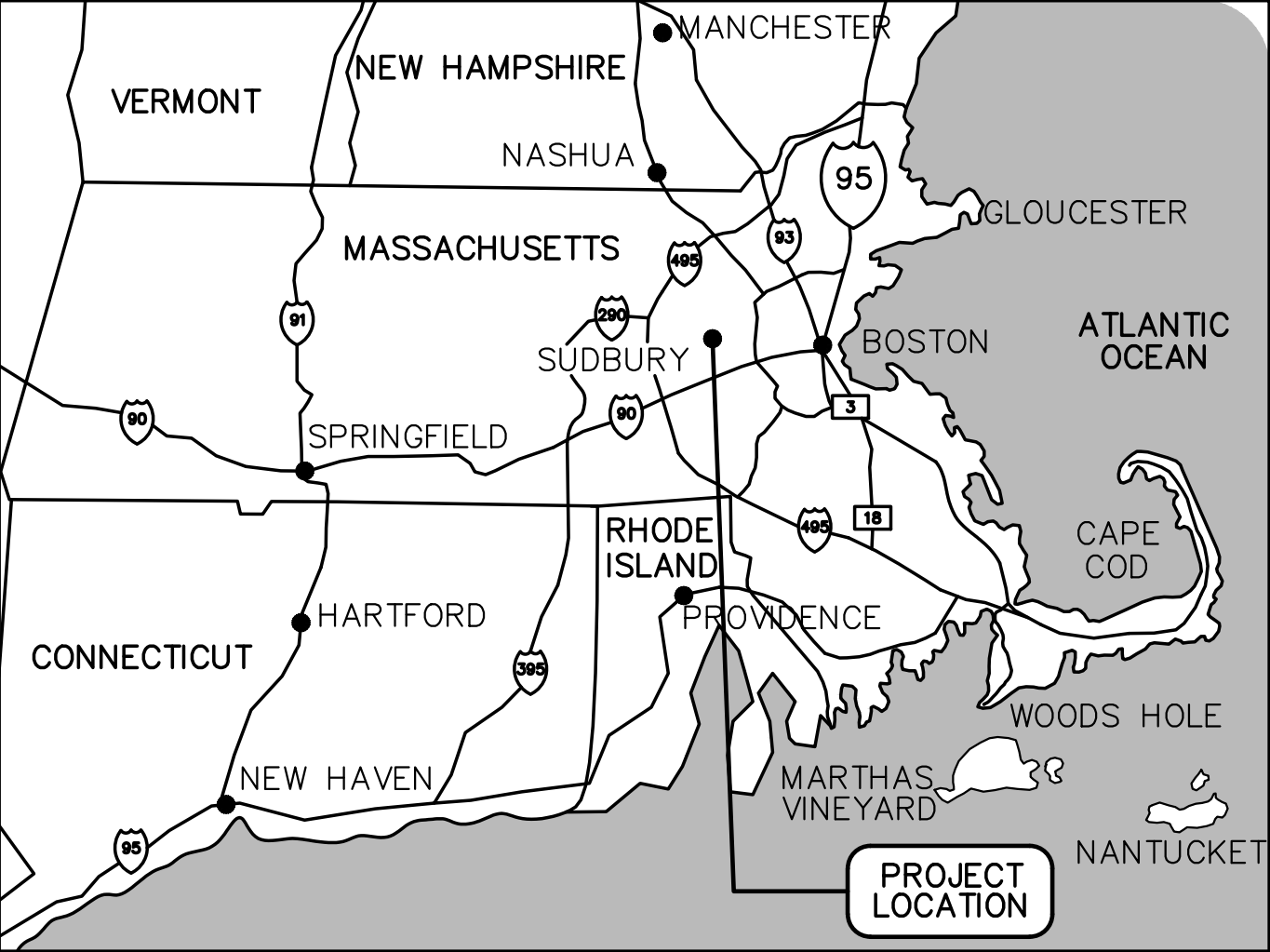


U.S. FISH AND WILDLIFE SERVICE

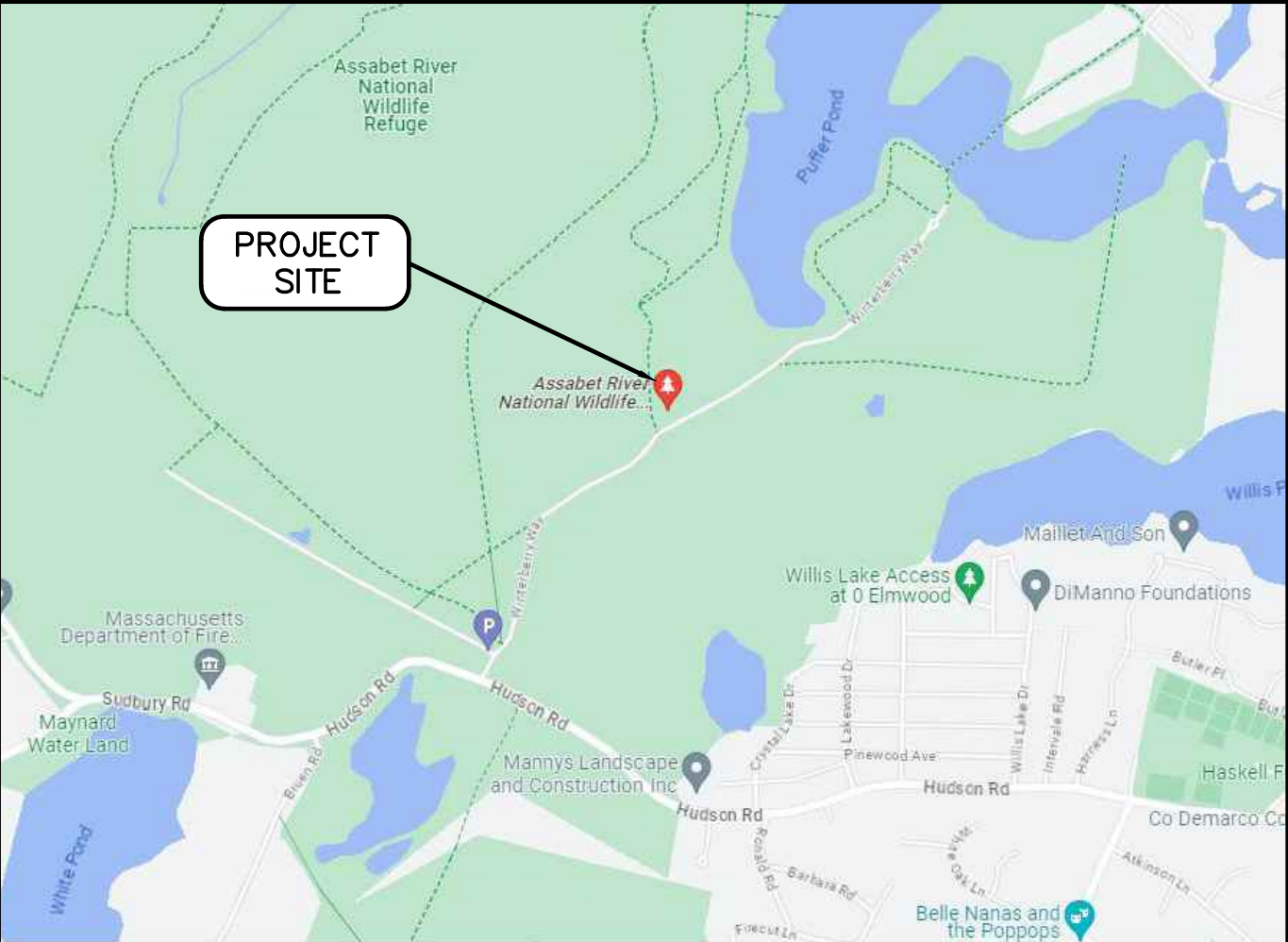
CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING

ASSABET RIVER NATIONAL WILDLIFE REFUGE
SUDBURY, MASSACHUSETTS
PROJECT NO. 5R-MA-1301-100.00
OAK POINT ASSOCIATES

ARCHITECTURE - ENGINEERING - PLANNING
231 MAIN STREET
BIDDEFORD, MAINE 04005



AREA MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE



No.		

OAK POINT ASSOCIATES ARCHITECTURE - ENGINEERING - PLANNING 73 COURT STREET PORTSMOUTH, NEW HAMPSHIRE 03801		
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UNITED STATES DEPARTMENT OF THE INTERIOR FISH AND WILDLIFE SERVICE DIVISION OF ENGINEERING		
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CERTIFIED:		ASSABET RIVER NATIONAL WILDLIFE REFUGE SUDBURY, MASSACHUSETTS CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING COVER SHEET			
10 CFR 435 COMPLIANCE					
SUBMITTED:					
REGIONAL ENGINEER					
REVIEWED:					
RECOMMENDED:					
ASST. REGIONAL DIRECTOR					
W.O. APPROVAL: DATE:		SURVEYED: WAD	DESIGNED: PNM	DRAWN: SXL	CHECKED: PNM
		DATE: MAY 29, 2025		DWG NO: 5R-MA-1301-100.00	
		SHEET 1 OF 50			



DISCIPLINE
SHEET NO **G-001**

ABBREVIATIONS

&	AND	MAX	MAXIMUM
Ⓢ	AT	MDF	MEDIUM DENSITY FIBER BOARD
±	PLUS/MINUS	MECH	MECHANICAL
%	PERCENT	MFR	MANUFACTURE
ACT	ACOUSTICAL CEILING TILE	MFRS	MANUFACTURE'S
ADA	AMERICAN WITH DISABILITY ACT	MIN	MINIMUM
ADJ	ADJACENT	MIR	MIRROR
AFF	ABOVE FINISH FLOOR	mm	MILLIMETER(S)
ALUM	ALUMINUM		
APPROX	APPROXIMATE	MTL	METAL
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIAL	N	NORTH
		NAT	NATURAL
BD	BOARD	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
BF	BARRIER FREE		
BL	BORROWED LITE	NIC	NOT IN CONTRACT
CJ	CONTROL JOINT	NO,#	NUMBER
Ⓢ	CENTERLINE	NTS	NOT TO SCALE
CLG	CEILING	OC	ON CENTER
CLR	CLEAR	OD	OUTSIDE DIAMETER
COL	COLUMN	OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
CONC	CONCRETE		
CORR	CORRIDOR	PLAM	PLASTIC LAMINATE
CPTT	CARPET TILE	PLYWD	PLYWOOD
CT	CERAMIC TILE	PNT	PAINT
DIA, ⌀	DIAMETER	PSF	POUNDS PER SQUARE FOOT
DN	DOWN	PSI	POUNDS PER SQUARE INCH
EA	EACH	PT	PRESSURE TREATED
ED	EXISTING DRAIN	RWB	RUBBER WALL BASE
EF	EXISTING FAN	RCP	REFLECTED CEILING PLAN
EFEC	EXISTING FIRE EXTINGUISHER CABINET	REINF	REINFORCED
EJ	EXPANSION JOINT	RM	ROOM
ELEC	ELECTRICAL	SCH	SCHEDULE
ELEV, EL	ELEVATION	SF	SQUARE FEET
EQ	EQUAL	SIM	SIMILAR
EV	EXISTING VENT	SQ	SQUARE
EXT	EXTERIOR	SS	STAINLESS STEEL
EXIST, EX	EXISTING	STL	STEEL
FDN	FOUNDATION	STRUCT	STRUCTURAL
FE	FIRE EXTINGUISHER	SY	SQUARE YARD
FEC	FIRE EXTINGUISHER CABINET	SYS	SYSTEM
FF	FINISH FLOOR	TYP	TYPICAL
FFE	FINISH FLOOR ELEVATION	UL	UNDERWRITERS LABORATORY
FRP	FIBER REINFORCED PLASTIC	VERT	VERTICAL
FT	FOOT	VIF	VERIFY IN FIELD
GA	GAGE	W/	WITH
GALV	GALVANIZED	WD	WOOD
GYP/P	GYP SUM BOARD/PAINTED		
HGT	HEIGHT		
HORIZ	HORIZONTAL		
HM	HOLLOW METAL		
HP	HIGH POINT		
IBC	INTERNATIONAL BUILDING CODE		
IN	INCH(ES)		
INSUL	INSULATION		
INV	INVERT		

GENERAL CONSTRUCTION NOTES

- CONFORM TO COMMONWEALTH, FEDERAL, NATIONAL, AND OTHER CODES AND ORDINANCES THAT APPLY TO THIS PROJECT.
- OBTAIN PERMITS THAT ARE REQUIRED FOR THE SATISFACTORY COMPLETION AND OCCUPANCY OF THE WORK AT NO ADDITIONAL COST TO THE GOVERNMENT. COMPLY WITH PERMIT APPROVAL CONDITIONS.
- COMPLETE WORK IN ACCORDANCE WITH INDUSTRY STANDARDS AND PERFORM WORK IN A WORKMANLIKE AND PROFESSIONAL MANNER.
- WHERE CONFLICTS EXIST WITHIN THE DOCUMENTS OR BETWEEN THE DOCUMENTS AND APPLICABLE CODES, ORDINANCES, OR INDUSTRY STANDARDS, THE MORE STRINGENT, AS DETERMINED BY THE GOVERNMENT, MUST BE PROVIDED AT NO ADDITIONAL COST.
- MAINTAIN BUILDING EGRESS PATHS DURING THE ENTIRE CONTRACT PERIOD. PROVIDE TEMPORARY PATHS TO MAINTAIN BUILDING EGRESS. COMPLY WITH NFPA 241, STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATIONS, AND DEMOLITION OPERATIONS.
- MAINTAIN THE CONSTRUCTION SITE IN A SECURE, NEAT, WATER TIGHT, CLEAN, AND SAFE CONDITION DURING THE ENTIRE CONTRACT PERIOD.
- PROVIDE ITEMS AND COMPONENTS SHOWN ON THE DRAWINGS UNLESS NOTED AS "EXISTING" (EXIST).
- WORK FROM GIVEN DIMENSIONS AND LARGE-SCALE DETAILS. DO NOT SCALE DRAWINGS.
- DIMENSIONING SYSTEM: UNLESS OTHERWISE NOTED, PLAN DIMENSIONS ARE TO/FROM FINISHED FACE OF EXISTING WALLS AND TO/FROM FACE OF FRAMING FOR NEW STUD-FRAMED WALLS. DIMENSIONS INDICATED AS "CLEAR" (CLR) MUST BE MAINTAINED AND ARE MEASURED FROM THE FACE OF FINISH. CENTERLINE DIMENSIONS ARE INDICATED BY CENTERLINE SYMBOL (Ⓢ).
- LOCATE DOOR OPENINGS THAT ARE NOT OTHERWISE DIMENSIONED 6 INCHES FROM ADJACENT WALL (FACE OF FRAMING TO ROUGH OPENING).
- VERIFY EXISTING CONDITIONS AND DIMENSIONS AND REPORT DISCREPANCIES IN WRITING TO THE GOVERNMENT. PROCEED WITH THE WORK AFTER THE DISCREPANCIES HAVE BEEN RESOLVED BY THE GOVERNMENT.
- DO NOT PENETRATE JOISTS, BEAMS, OR OTHER STRUCTURAL MEMBERS.
- PROVIDE SOLID BLOCKING BEHIND SURFACE-APPLIED ITEMS MOUNTED TO STUD WALLS, SUCH AS FIXTURES, TRIM, GRAB BARS, SHELVES, WOOD WALL BASE, BASE AND WALL CABINETS, MARKER BOARDS, TELEVISIONS, AND OTHER ACCESSORIES AND EQUIPMENT, INCLUDING GOVERNMENT-FURNISHED ITEMS.
- DISPOSE OF AND/OR RECYCLE CONSTRUCTION DEBRIS FROM THE PROJECT SITE AS REQUIRED BY THE COMMONWEALTH OF MASSACHUSETTS AND THE CONTRACT. OBTAIN REQUIRED DISPOSAL PERMITS AT NO ADDITIONAL COST TO THE GOVERNMENT.
- PROTECT EXISTING SYSTEMS AND SURFACES TO REMAIN. REPAIR OR REPLACE DAMAGE RESULTING FROM PROJECT OPERATIONS AT NO ADDITIONAL COST TO THE GOVERNMENT.

SHEET NO

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LIST OF DRAWINGS

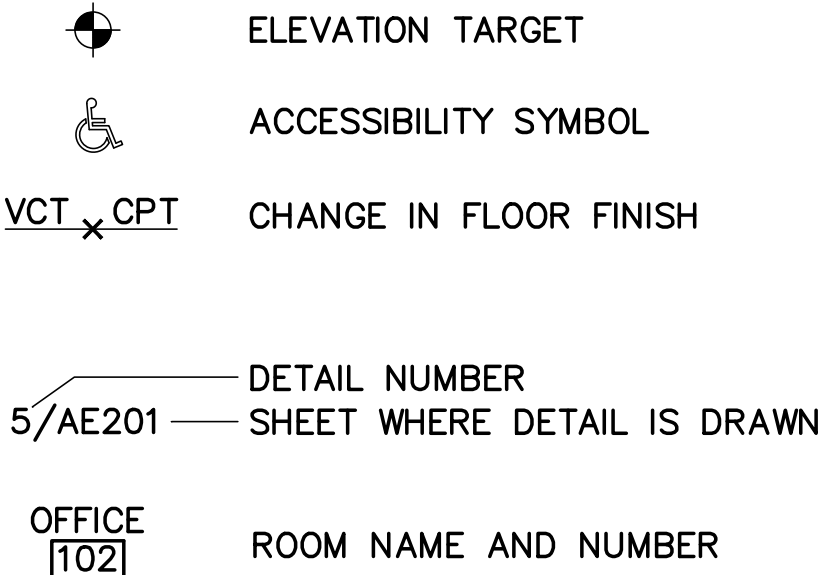
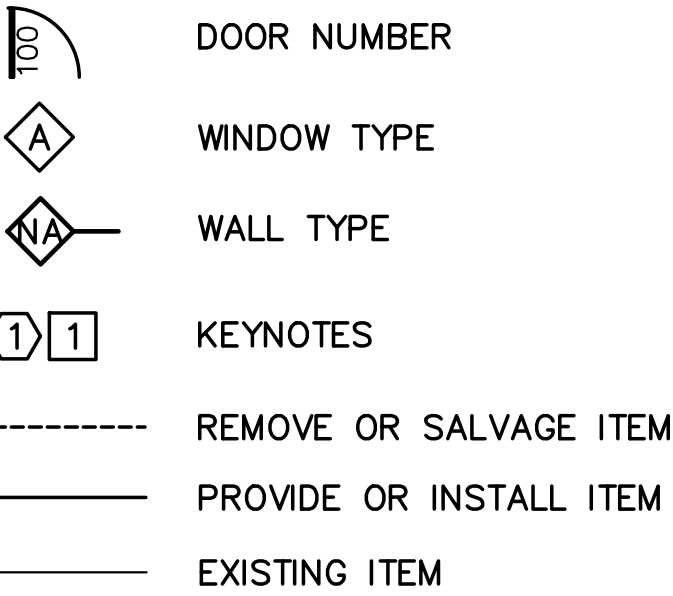
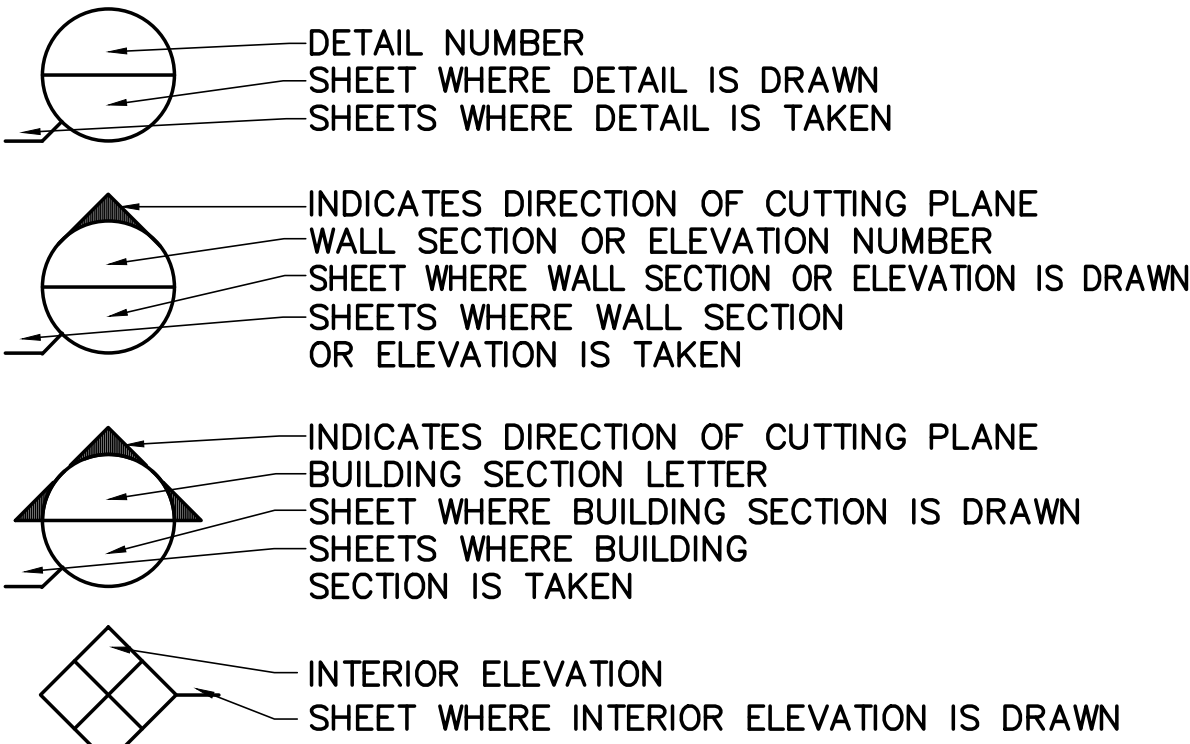
DRAWING

G-001
G-002
G-101
G-102
S-001
SF101
SF102
SF201
SF501
AD101
AD701
AE001
AE101
AE201
AE401
AE501
AE601
AE641
AE661
AE701
AE801
FD101
FX101
P-001
PD101
P-101
P-601
M-001
MD101
MD102
MH101
MP101
MR101
M-401
M-501
M-601
M-701
M-702
E-001
ED101
ED102
ED601
EP101
EP501
EP601
EL101
EL701
ET101
EY101
FA101

DRAWING TITLE

COVER SHEET
LIST OF DRAWINGS, GENERAL CONSTRUCTION NOTES, ABBREVIATIONS, AND LEGEND
LIFE SAFETY PLAN
CODE COMPLIANCE SUMMARY SHEET
STRUCTURAL NOTES, ABBREVIATIONS, AND DESIGN LOADS
SLAB AND FRAMING REPAIR PLAN
SHEAR WALL AND HEADER LAYOUT PLAN
SHEAR WALL ELEVATIONS
STRUCTURAL DETAILS
REMOVALS PLAN
REFLECTED CEILING REMOVALS PLAN
WALL TYPES
FLOOR PLAN
EXTERIOR ELEVATIONS
ENLARGED FLOOR PLAN AND INTERIOR ELEVATIONS
DETAILS
DOOR AND WINDOW SCHEDULES
ROOM FINISH SCHEDULE AND FLOOR PATTERN PLANS
SIGNAGE SCHEDULE AND DETAILS
REFLECTED CEILING PLAN
FURNITURE PLAN
FIRE SUPPRESSION LEGENDS, ABBREVIATIONS, GENERAL NOTES, AND REMOVALS PLAN
FIRE SUPPRESSION PLAN
PLUMBING LEGENDS, ABBREVIATIONS, AND GENERAL NOTES
PLUMBING REMOVALS PLANS
PLUMBING PLANS AND DETAILS
PLUMBING SCHEDULES AND ENLARGED PART PLANS
MECHANICAL LEGENDS, ABBREVIATIONS, AND GENERAL NOTES
MECHANICAL DUCTWORK REMOVALS PLAN
MECHANICAL PIPING REMOVALS PLANS AND ELEVATION
MECHANICAL DUCTWORK PLAN
MECHANICAL PIPING PLAN
MECHANICAL RADIANT PLAN AND SCHEDULE
ENLARGED MECHANICAL PART PLANS AND DETAILS
MECHANICAL DETAILS
MECHANICAL SCHEDULES
CONTROL DIAGRAMS 1
CONTROL DIAGRAMS 2
ELECTRICAL SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES
POWER AND TECHNOLOGY REMOVALS PLAN
LIGHTING, FIRE ALARM, AND SECURITY REMOVALS PLAN
EXISTING PANELBOARD SCHEDULES
POWER PLAN AND DETAILS
ONE-LINE DIAGRAM, ATTIC POWER, AND EXISTING ROOF PLAN
REVISED PANELBOARD SCHEDULES AND EQUIPMENT WIRING SCHEDULE
LIGHTING PLAN
LIGHTING FIXTURE SCHEDULE AND DETAILS
TECHNOLOGY PLAN
SECURITY PLAN
FIRE ALARM PLAN

LEGEND

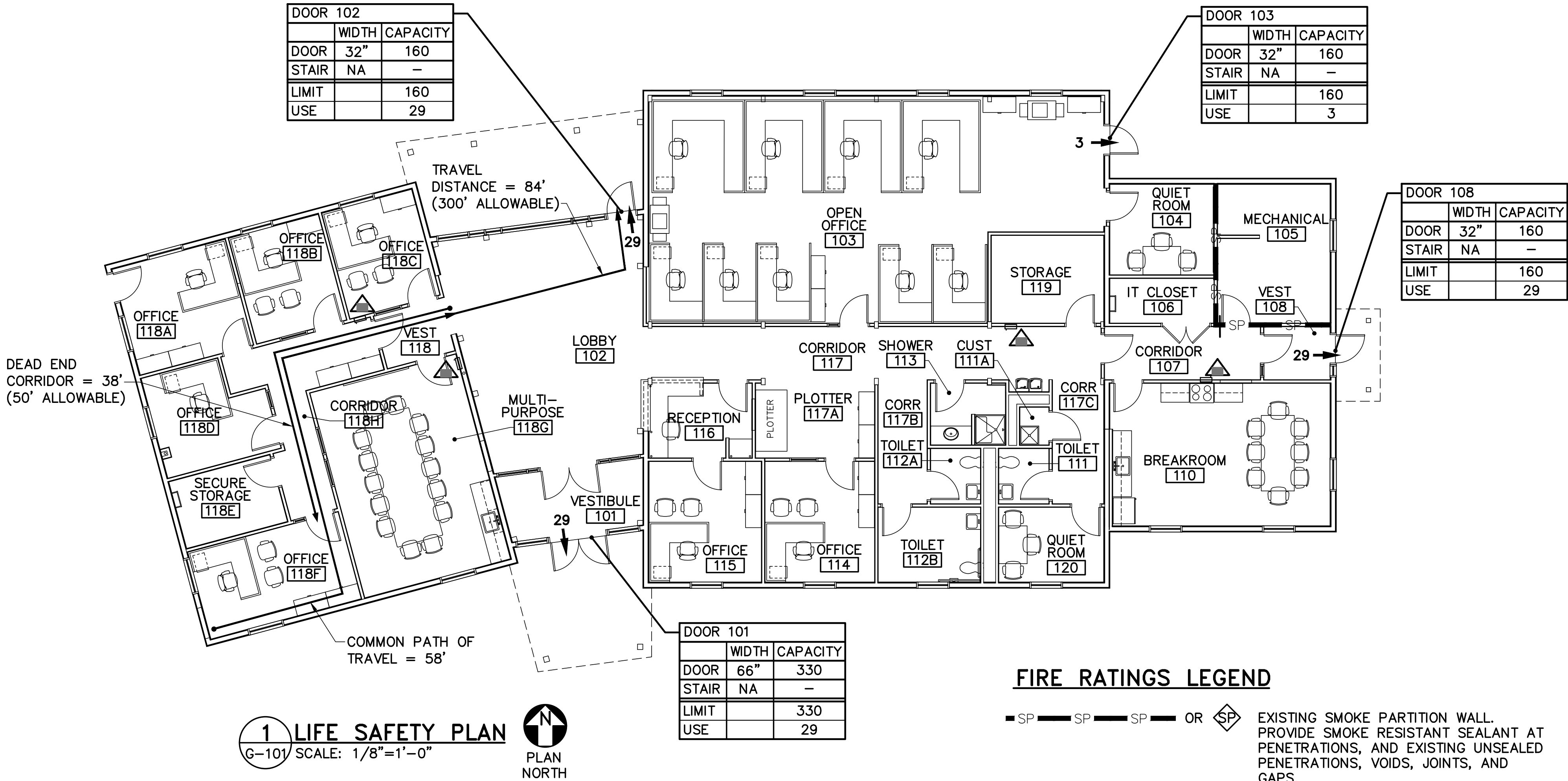


NO.	REVISIONS	DATE	BY
U.S. FISH AND WILDLIFE SERVICE			
CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING			
LIST OF DRAWINGS, GENERAL CONSTRUCTION NOTES, ABBREVIATIONS, AND LEGEND			
ASSABET RIVER NATIONAL WILDLIFE REFUGE			
SUDBURY, MASSACHUSETTS			
DISCIPLINE	DESIGNED: BML	DWG NO:	
SHEET NO	DRAWN: RMB	5R-MA-1301-100.00	

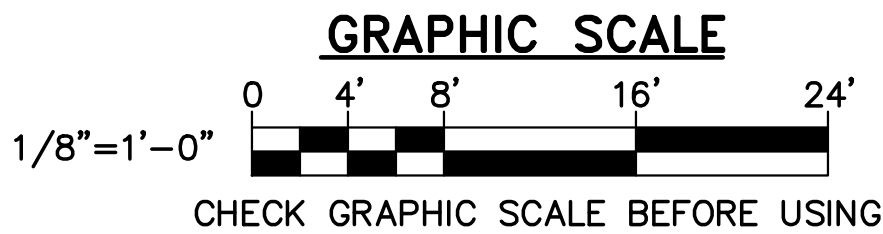
6-002

SHEET 2 OF 50

GENERAL BUILDING INFORMATION	
YEAR BUILT:	2008
BUILDING FOOTPRINT AREA:	5,879 Square Feet
TYPE OF CONSTRUCTION:	IBC VB, NFPA Type V(000)
CLASSIFICATION OF WORK:	IBC Alteration – Level 3, NFPA Modification
FIRE SUSPENSION SYSTEM:	Fully Sprinklered
FIRE ALARM SYSTEM:	Zoned System with Horn/Strobe Notification
GENERAL CODE INFORMATION	
APPLICABLE LIFE SAFETY/BUILDING CODES:	
2024 International Building Code (IBC)	
2024 International Existing Building Code (IEBC)	
2024 NFPA 1, Fire Code	
2023 NFPA 70, National Electrical Code	
2025 NFPA 72, National Fire Alarm and Signaling Code	
2024 NFPA 90A, Standard for the Installation of Air–Conditioning and Ventilating Systems	
2024 NFPA 101, Life Safety Code	
2024 NFPA 220, Standard on Types of Building Construction	
Code of Federal Regulations (CFR)	
Architectural Barriers Act (ABA)	



CALCULATED OCCUPANT LOAD					
ROOM/SPACE	ROOM NO.	USE	FLOOR AREA (SF)	OCCUPANT LOAD FACTOR (SF/PERSON)	LOAD (PEOPLE)
LOBBY	102	ASSEMBLY	462	30 NET	16
STORAGE	104	STORAGE	107	300 GROSS	1
MECHANICAL	105	UTILITY	175	300 GROSS	1
IT CLOSET	106	STORAGE	52	300 GROSS	1
BREAKROOM	110	ASSEMBLY	318	15 NET	22
SECURE STORAGE	118E	STORAGE	81	300 GROSS	1
MULTIPURPOSE	118G	ASSEMBLY	340	15 NET	23
REMAINING SPACES	–	BUSINESS	3,675	150 GROSS	25
TOTAL					90



								
	NO.	REVISIONS	DATE	BY				
	U.S. FISH AND WILDLIFE SERVICE		CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING					
LIFE SAFETY PLAN								
ASSABET RIVER NATIONAL WILDLIFE REFUGE SUDBURY, MASSACHUSETTS								
DISCIPLINE	DESIGNED: PNM	DWG NO:						
SHEET NO	DRAWN: RMB	5R-MA-1301-100.00						
G-101			SHEET	3 OF 50				

IBC BUILDING CODE SUMMARY			
BUILDING FEATURE	REQUIRED/ALLOWED	PROVIDED	REFERENCE
CLASSIFICATION OF WORK	NOT APPLICABLE	ALTERATION – LEVEL 3	IEBC, SECTION 604.1
OCCUPANCY CLASSIFICATION	NOT APPLICABLE	BUSINESS GROUP B	IBC, SECTIONS 303.1.2 AND 304.1
TYPE OF CONSTRUCTION	NOT APPLICABLE	TYPE V–B, COMBUSTIBLE, NON–RATED (NOT MODIFIED)	IBC, TABLE 601 AND SECTION 602.5
BUILDING HEIGHT	60 FEET ABOVE GRADE PLANE	31 FEET (NOT MODIFIED)	IBC, TABLE 504.3
BUILDING NUMBER OF STORIES	3 ABOVE GRADE PLANE	1 (NOT MODIFIED)	IBC, TABLE 504.4
BUILDING FOOTPRINT AREA	36,000 SQUARE FEET	5,320 SQUARE FEET (NOT MODIFIED)	IBC, TABLE 506.2
MULTISTORY BUILDING TOTAL AREA	NOT APPLICABLE, SINGLE STORY AREA	NOT APPLICABLE	–
EXTERIOR WALL FIRE–RESISTANCE RATING (FIRE SEPARATION DISTANCE = >30 FEET)	0	NOT APPLICABLE	IBC, TABLE 705.5
AREA OF EXTERIOR WALL OPENINGS (FIRE SEPARATION DISTANCE = >30 FEET)	NO LIMIT	NOT APPLICABLE	IBC, TABLE 705.9
INTERIOR RATINGS	OCCUPANCY SEPARATIONS: NO REQUIREMENTS	NOT APPLICABLE	IBC, SECTION 508.3.3
BUILDING STRUCTURAL ELEMENTS FIRE–RESISTANCE RATINGS	NOT REQUIRED	NO RATINGS PROVIDED	IBC, TABLE 601
SEISMIC DESIGN CATEGORY (DETERMINED BY STRUCTURAL ENGINEER)	NOT APPLICABLE	B, SEE SHEET S–001	NOT APPLICABLE
USE/OCCUPANT LOAD FACTORS	ASSEMBLY (LOBBY): 30 NET SF/ OCCUPANT [EXHIBIT] ASSEMBLY (OTHER): 15 NET SF/ OCCUPANT STORAGE: 300 GROSS SF/OCCUPANT MECHANICAL: 300 GROSS SF/OCCUPANT BUSINESS AREAS: 150 GROSS SF/ OCCUPANT	SEE CALCULATED OCCUPANT LOAD TABLE ON SHEET G–101	IBC, TABLE 1004.5
NUMBER OF EXITS	2	4	IBC, SECTION 1006.2.1
EXIT CAPACITY (CLEAR WIDTH)	DOORS: 0.2 INCHES/PERSON STAIRWAYS: N/A	SEE LIFE SAFETY PLAN ON SHEET G–101	IBC, SECTION 1005.3.2
MEANS OF EGRESS MINIMUM CLEAR WIDTH	CORRIDORS: 44 INCHES	CORRIDORS: 44 INCHES MINIMUM	IBC, TABLE 1020.3
MINIMUM DOOR CLEAR WIDTH	32 INCHES	32 INCHES	IBC, SECTION 1010.1.1
MINIMUM STAIR CLEAR WIDTH	NOT APPLICABLE	NONE PROVIDED	IBC, SECTION 1011.2
REMOTENESS OF EXITS	NO LESS THAN 1/3 THE MAXIMUM OVERALL DIAGONAL OF THE AREA SERVED: 1/3 OF 129 FEET = 43 FEET	79 FEET	IBC, SECTION 1007.1.1
TRAVEL DISTANCE	300 FEET MAXIMUM	84 FEET	IBC, TABLE 1017.2
COMMON PATH OF TRAVEL	100 FEET MAXIMUM	58 FEET	IBC, TABLE 1006.2.1
DEAD END CORRIDOR LENGTH	50 FEET MAXIMUM	38 FEET	IBC, SECTION 1020.5
ACCESSIBLE MEANS OF EGRESS	1	4	IBC, SECTION 1009.1
DISCHARGE FROM EXITS	DIRECTLY TO THE EXTERIOR AND THE PUBLIC WAY	DIRECTLY TO THE EXTERIOR AND THE PUBLIC WAY	IBC, SECTION 1022.2.2
INTERIOR FINISHES	MINIMUM OF CLASS C	MINIMUM OF CLASS C	IBC, TABLE 803.13
FIRE ALARM SYSTEM	NOT REQUIRED	PROVIDED	IBC, SECTION 907.2.2
AUTOMATIC SPRINKLER SYSTEM	NOT REQUIRED	PROVIDED	IBC, SECTION 903.2.2
PORTABLE FIRE EXTINGUISHERS	REQUIRED	4 PROVIDED	IBC, SECTION 906.1
EMERGENCY LIGHTING	REQUIRED	PROVIDED, SEE EL SHEETS	IBC, SECTION 1008.2
EXIT SIGNAGE	REQUIRED	PROVIDED	IBC, SECTION 1013.1

NFPA LIFE SAFETY CODE SUMMARY			
BUILDING FEATURE	REQUIRED/ALLOWED	PROVIDED	REFERENCE
CLASSIFICATION OF WORK	NOT APPLICABLE	MODIFICATION	NFPA 101, SECTION 43.2.2.1.3
OCCUPANCY CLASSIFICATION	NOT APPLICABLE	BUSINESS	NFPA 101, SECTION 6.1.11.1
TYPE OF CONSTRUCTION	NOT APPLICABLE	TYPE V (000) COMBUSTIBLE, NON–RATED (NOT MODIFIED)	NFPA 220, SECTION 4.6
USE/OCCUPANT LOAD FACTOR	ASSEMBLY (LOBBY): 30 NET SF/ OCCUPANT [NO NFPA EQUIVALENT – BASED ON IBC EXHIBIT OLF] ASSEMBLY (OTHER): 15 NET SF/ OCCUPANT STORAGE: 300 GROSS SF/OCCUPANT MECHANICAL: 300 GROSS SF/ OCCUPANT BUSINESS AREAS: 150 GROSS SF/ OCCUPANT	SEE CALCULATED OCCUPANT LOAD TABLE ON SHEET G–101	NFPA 101, TABLE 7.3.1.2
NUMBER OF EXITS	2	4	NFPA 101, SECTIONS 7.4.1.1 AND 39.2.4.1
EXIT CAPACITY (CLEAR WIDTH)	DOORS: 0.2 INCHES/PERSON STAIRS: N/A	SEE LIFE SAFETY PLAN ON SHEET G–101	NFPA 101, TABLE 7.3.3.1
MEANS OF EGRESS MINIMUM CLEAR WIDTH	28 INCHES 44 INCHES FOR CORRIDORS SERVING AN OCCUPANT LOAD OF 50 OR MORE	44 INCHES MINIMUM	NFPA 101, SECTIONS 7.3.4.1.2 AND 39.2.3.2
MINIMUM DOOR CLEAR WIDTH	28 INCHES	32 INCHES	NFPA 101, SECTION 7.2.1.2.3.2
MINIMUM STAIR CLEAR WIDTH	NOT APPLICABLE	NONE PROVIDED	NFPA 101, TABLE 7.2.2.1.1(b)
REMOTENESS OF EXITS	NO LESS THAN 1/3 THE MAXIMUM OVERALL DIAGONAL OF THE AREA SERVED: 1/3 OF 129 FEET = 43 FEET	79 FEET	NFPA 101, SECTION 7.5.1.3.3
TRAVEL DISTANCE	300 FEET MAXIMUM	84 FEET	NFPA 101, TABLE A.7.6
COMMON PATH OF TRAVEL	100 FEET MAXIMUM	58 FEET	NFPA 101, TABLE A.7.6
DEAD END CORRIDOR LENGTH	50 FEET MAXIMUM	38 FEET	NFPA 101, TABLE A.7.6
ACCESSIBLE MEANS OF EGRESS	2	4	NFPA 101, SECTION 7.5.4.1
DISCHARGE FROM EXITS	DIRECTLY TO THE EXTERIOR AND THE PUBLIC WAY	DIRECTLY TO THE EXTERIOR AND THE PUBLIC WAY	NFPA 101, SECTION 7.7.1
INTERIOR RATINGS	AREA OF INCREASED HAZARD: SMOKE PARTITIONS	SMOKE PARTITION AT MECHANICAL ROOM (NOT MODIFIED)	NFPA 101, SECTION 8.7.1.1(2)
INTERIOR WALL AND CEILING FINISHES	MINIMUM OF CLASS C	MINIMUM OF CLASS C	NFPA 101, TABLE A.10.2.2 WITH NOTE (6)
AUTOMATIC SPRINKLER SYSTEM	NOT REQUIRED	PROVIDED	NFPA 101, SECTION 39.3
PORTABLE FIRE EXTINGUISHERS	REQUIRED	4 PROVIDED	NFPA 101, SECTION 39.3.5
FIRE ALARM SYSTEM	NOT REQUIRED	PROVIDED	NFPA 101, SECTION 39.3.4.1
EMERGENCY LIGHTING	NOT REQUIRED	PROVIDED, SEE EL SHEETS	NFPA 101, SECTIONS 7.9.1.1 AND 39.2.9.1
EXIT SIGNAGE	REQUIRED	PROVIDED	NFPA 101, SECTIONS 7.10.1.2.1 AND 39.2.10



NO.	REVISIONS:	DATE:	BY:
U.S. FISH AND WILDLIFE SERVICECONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING			
CODE COMPLIANCE SUMMARY SHEET			
ASSABET RIVER NATIONAL WILDLIFE REFUGESUBBURY, MASSACHUSETTS			
DISCIPLINE SHEET NO. G-102		DESIGNED: PNM DRAWN: RMB	DWG NO: 5R-MA-1301-100.00 SHEET 4 OF 50

WOOD

- ## STRUCTURAL GLUED LAMINATED TIMBER

- COLUMNS:
GRADE = N2M14
IDENTIFICATION NUMBER = SP47.
F_b = 1,750 PSI
F_v = 260 PSI
F_t = 1,200 PSI
F_{c_{II}} = 1,150 PSI
E = 1,400,000 PSI

STRUCTURAL ABBREVIATIONS

BUILDING DESIGN LOADS

ROOF SNOW LOAD (ROOF LIVE LOAD) ASCE 7-22/IBC 2024

BALANCED ROOF SNOW LOAD (P_f) = 55 PSF
SNOW DRIFTING ON SMALL CANOPY ROOF (P_d) = 71 PSF

ROOF LIVE LOAD = 20 PSF
CONSTRUCTION LIVE LOAD = 20 PSF
CEILING LIVE LOAD = 20 PSF

WIND LOAD ASCE 7-22/IBC 2024

SEISMIC DESIGN DATA ASCE 7-22/IBC 2024

SHORT PERIOD SPECTRAL RESPONSE ACCELERATION (S_s) = 0.26
ONE SECOND SPECTRAL RESPONSE ACCELERATION (S_1) = 0.055
SEISMIC RISK CATEGORY = II
SEISMIC DESIGN CATEGORY = B
SEISMIC IMPORTANCE FACTOR = 1.0
SITE CLASS = D
TOTAL BASE SHEAR = 12 KIPS

BASIC STRUCTURAL SYSTEM

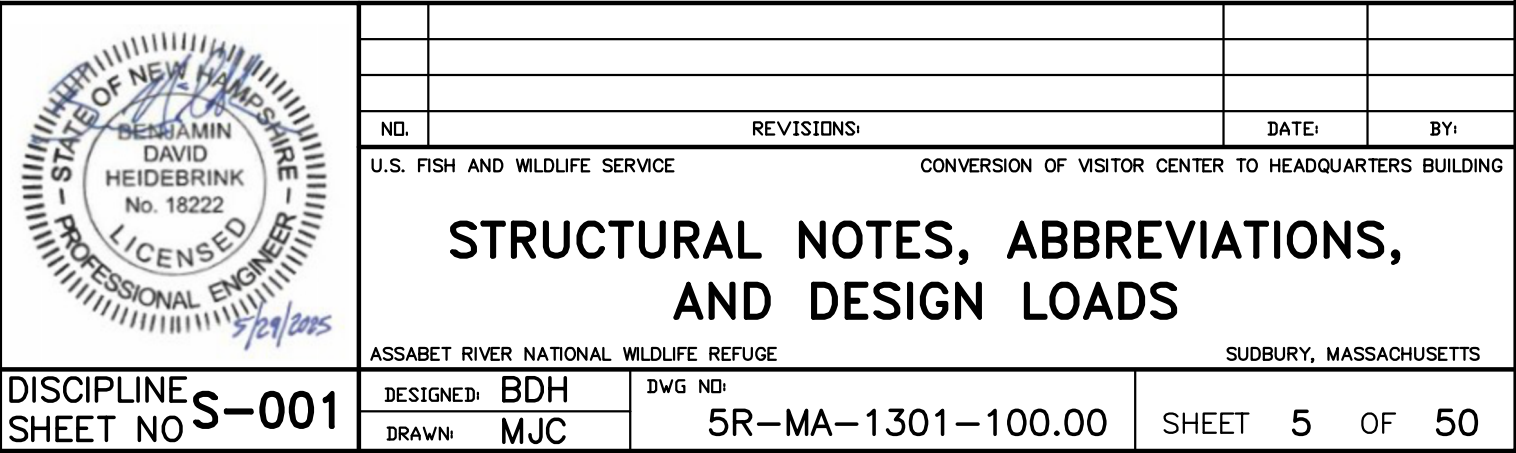
LIGHT FRAME WOOD SHEAR WALLS
RESPONSE MODIFICATION COEFFICIENT (R) = 6.50
DEFLECTION AMPLIFICATION FACTOR (Cd) = 4.00
SYSTEM OVER STRENGTH FACTOR (Ω_o) = 3.00

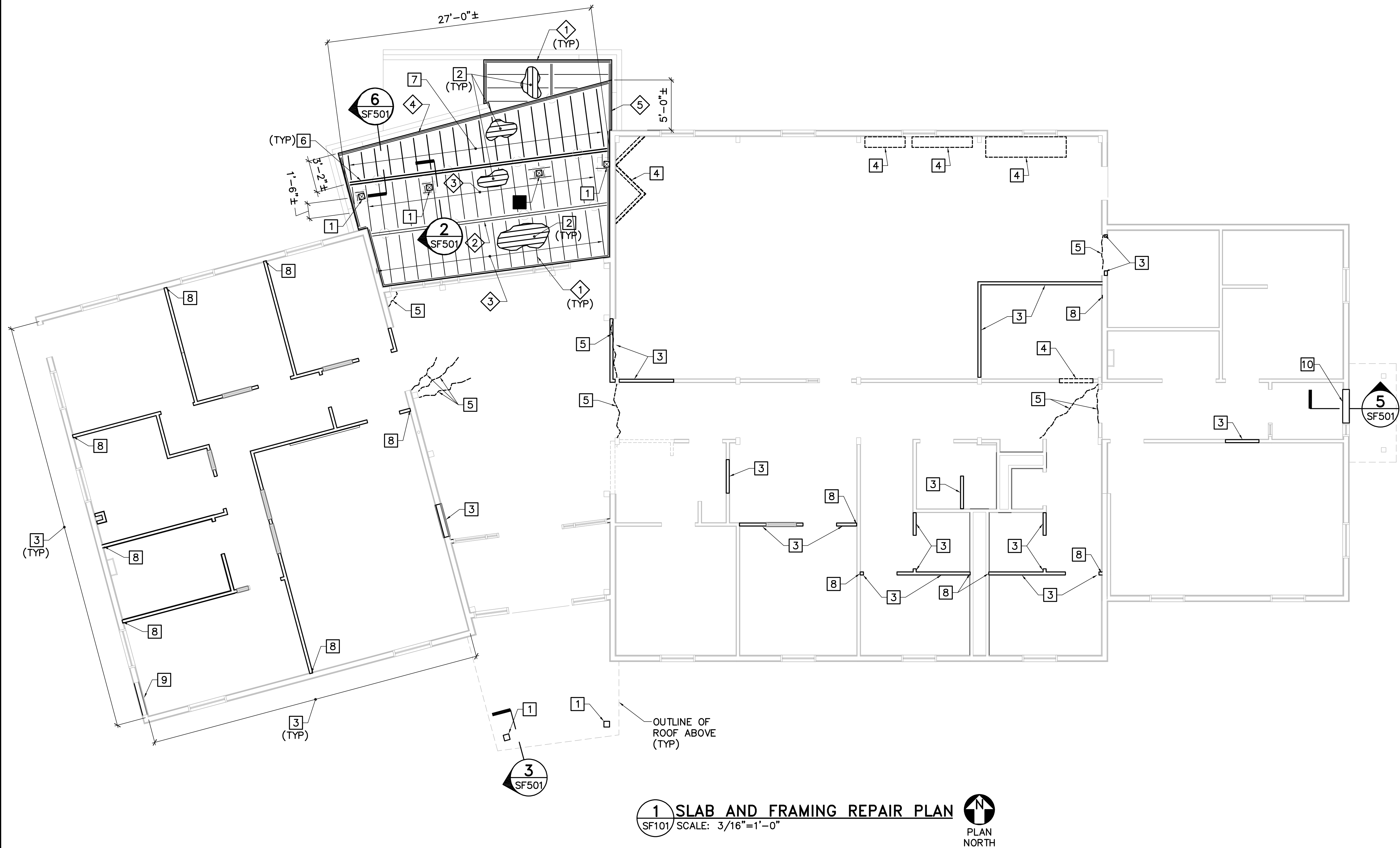
ANALYSIS PROCEDURE = EQUIVALENT LATERAL FORCE PROCEDURE

NOTE

EXISTING SEISMIC LOAD RESISTING SYSTEM CONSISTS OF THE FOLLOWING:

- A. VERTICAL ELEMENTS - LIGHT FRAME WOOD SHEAR WALLS.
- B. HORIZONTAL ELEMENTS - EXISTING WOOD SHEATHING ROOF DIAPHRAGM.
- C. COLLECTOR ELEMENTS - EXISTING CONTINUOUS WALL TOP PLATES





DRAWING NOTES

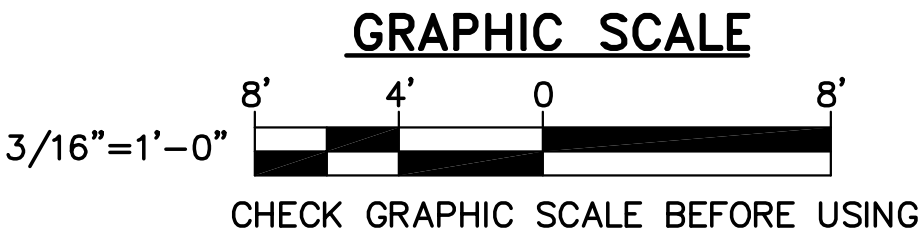
1. PATCH AND REPAIR 100 SQUARE FEET OF EXISTING SLAB AT DEMOLISHED ELEMENTS AND 60 LINEAR FEET OF SLAB CRACKS IN EXPOSED SLAB AREAS, AND WHERE (1) EXISTING SLAB PENETRATION IS ABANDONED. PATCH WITH AN APPROVED NON-SHRINK GROUT, MINIMUM 4,000 PSI, AND USE AN APPROVED BONDING AGENT. COMPLETELY CLEAN EXISTING CONCRETE PRIOR TO PATCHING.
2. NEW GLU-LAM COLUMNS MUST BE PRESERVATIVE TREATED WITH A NATURAL APPEARANCE.
3. REFER TO SHEET SF102 FOR ADDITIONAL FRAMING WORK.

EXISTING KEYNOTES (THIS SHEET ONLY)

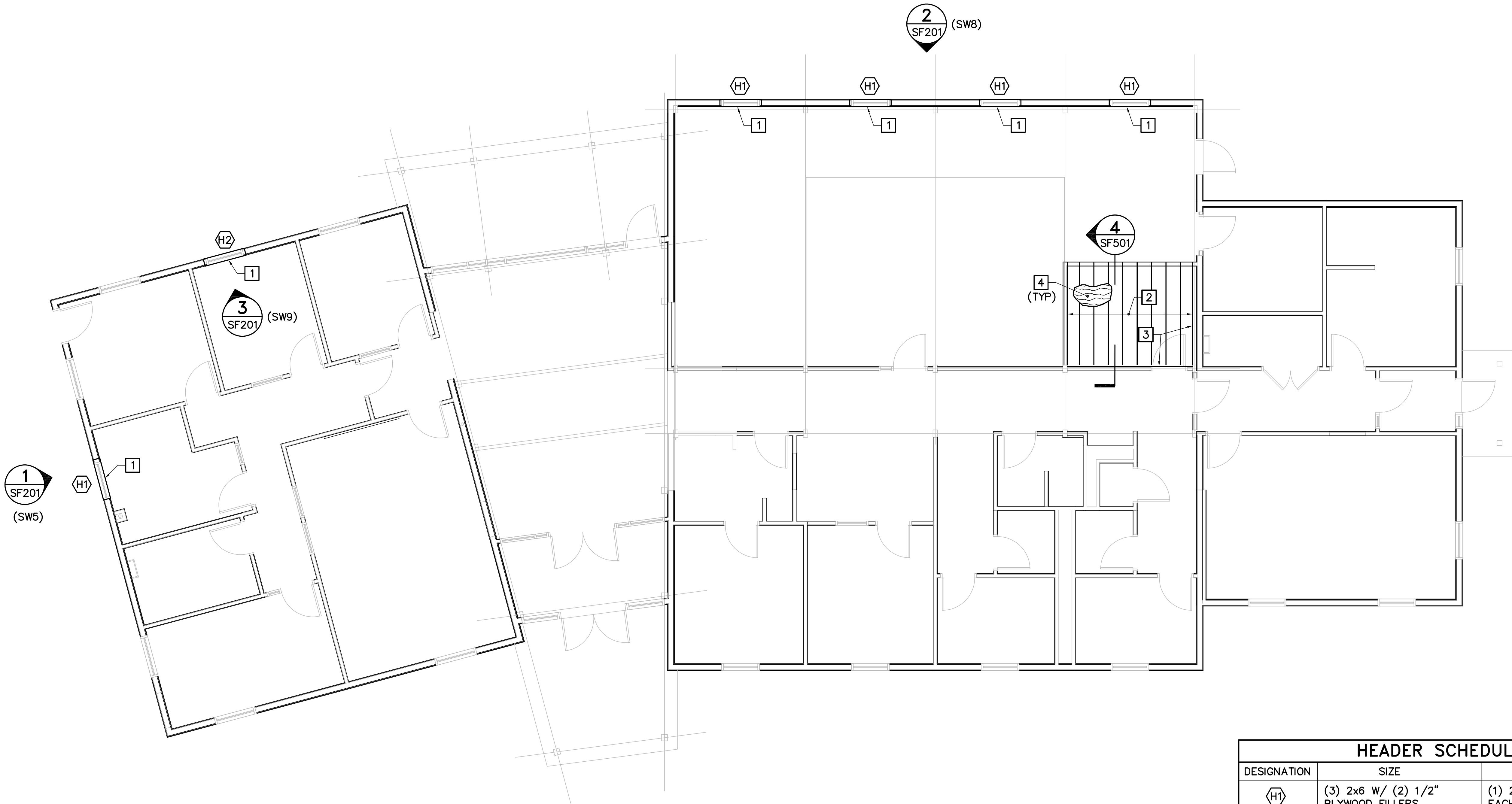
- 1 EXISTING WOOD FRAMED DECK.
- 2 EXISTING (2) PT 2x10 BEAM.
- 3 EXISTING 2x6 JOISTS AT 1'-4"± ON-CENTER.
- 4 EXISTING (2) PT 2x10 LEDGER.
- 5 EXISTING (2) PT 2x6 LEDGER.

KEYNOTES (THIS SHEET ONLY)

- 1 REMOVE EXISTING ROTTED GLU-LAM COLUMN. PROVIDE GLU-LAM COLUMN, MATCH EXISTING SIZE. FOR BIDDING PURPOSES, ASSUME 12'-0" COLUMN LENGTH.
- 2 REMOVE EXISTING 5/4"x6" COMPOSITE DECKING TO REPLACE ROTTED COLUMNS AND DECK FRAMING. PROVIDE REPLACEMENT 5/4"x6" COMPOSITE DECKING. REFER TO ARCHITECTURAL DRAWINGS.
- 3 PROVIDE PARTITIONS. COORDINATE WITH ARCHITECTURAL DRAWINGS. DO NOT DAMAGE RADIANT HEAT TUBING EMBEDDED IN SLAB. SEE DETAIL 1/SF501.
- 4 PATCH EXISTING SLAB WHERE DAMAGED BY THE REMOVAL OF PARTITIONS AND DISPLAY CASES ARE REMOVED AT EXPOSED SLAB AREAS. REPAIR CRACKS, HOLES, AND SPALLS. COORDINATE WITH ARCHITECTURAL DEMOLITION PLAN.
- 5 PATCH SLAB CRACKS. LOCATIONS SHOWN ARE APPROXIMATE.
- 6 REMOVE EXISTING PT (2) 2x10 BEAM. PROVIDE PT (2) 2x10 BEAM. JOINTS IN BEAM PLIES MUST ONLY OCCUR AT EXISTING SUPPORTS.
- 7 REMOVE EXISTING PT 2x6 AT 1'-4" ON-CENTER ALONG NORTH SIDE OF (2) 2x10 BEAM. PROVIDE PT 2x6 AT 1'-4" ON-CENTER.
- 8 PROVIDE 2x6 BLOCKING SPACED AT 2'-8" ON-CENTER MAXIMUM BETWEEN EXISTING WALL STUDS, FOR PARTITION END STUD ATTACHMENT.
- 9 INFILL EXISTING OPENING WITH 2x6 STUDS AT 1'-4" ON-CENTER. REFER TO SHEAR WALL ELEVATION 1/SF201.
- 10 INCREASE THE HEIGHT OF THE EXISTING LOUVER OPENING. COORDINATE WITH MECHANICAL DRAWINGS. SEE DETAIL 5/SF501.



 <i>Seal/Logo</i>						
	NO.	REVISIONS:			DATE:	BY:
	U.S. FISH AND WILDLIFE SERVICE			CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING		
	SLAB AND FRAMING REPAIR PLAN					
	ASSABET RIVER NATIONAL WILDLIFE REFUGE					
	SUDBURY, MASSACHUSETTS					
DISCIPLINE SHEET NO	DESIGNED: DRAWN:	BDH MJC	DWG NO: 5R-MA-1301-100.00		SHEET 6 OF 50	
SF101						



DRAWING NOTES

1. PROVIDED WALL FRAMING MUST BE CONTINUALLY BRACED BY FASTENING EXISTING WALL SHEATHING WITH 8d NAILS AT 12" ON-CENTER, EXCEPT WHERE TIGHTER SPACING IS REQUIRED AT SHEATHING PANEL EDGES.
2. EXISTING SHEAR WALL BLOCKING THAT IS CUT AS PART OF NEW OPENING CONSTRUCTION MUST BE REPLACED WITH UNCUT BLOCKING, SO ALL SHEATHING PANEL EDGES ARE BLOCKED.
3. SHEATHING EDGES CREATED BY NEW OPENINGS MUST BE FASTENED WITH REQUIRED EDGE NAILING SPECIFIED ON SHEET SF201.

KEYNOTES (THIS SHEET ONLY)

- 1 PROVIDE HEADER, SILL, AND JAMBS FOR WINDOW ROUGH OPENING. COORDINATE WITH ARCHITECTURAL DRAWINGS.
- 2 2x6 JOISTS AT 1'-4" ON-CENTER.
- 3 2x6 LEDGER FASTENED OVER EXISTING GYPSUM BOARD WITH (2) SIMPSON STRONG-TIE SDWH19600DB SCREWS INTO EACH EXISTING STUD AT 1'-4"± ON-CENTER.
- 4 5/8" APA RATED PLYWOOD SHEATHING.

HEADER SCHEDULE

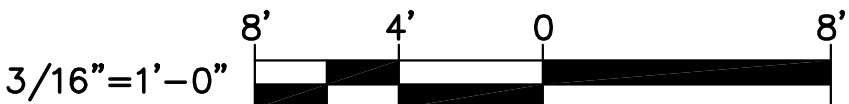
DESIGNATION	SIZE	REMARKS
H1	(3) 2x6 W/ (2) 1/2" PLYWOOD FILLERS	(1) 2x6 JACK STUD UNDER EACH END OF HEADER AND (2) 2x6 KING STUDS BESIDE EACH END OF HEADER
H2	(3) 2x8 W/ (2) 1/2" PLYWOOD FILLERS	

1 SHEAR WALL AND HEADER LAYOUT PLAN

SF102 SCALE: 3/16"=1'-0"



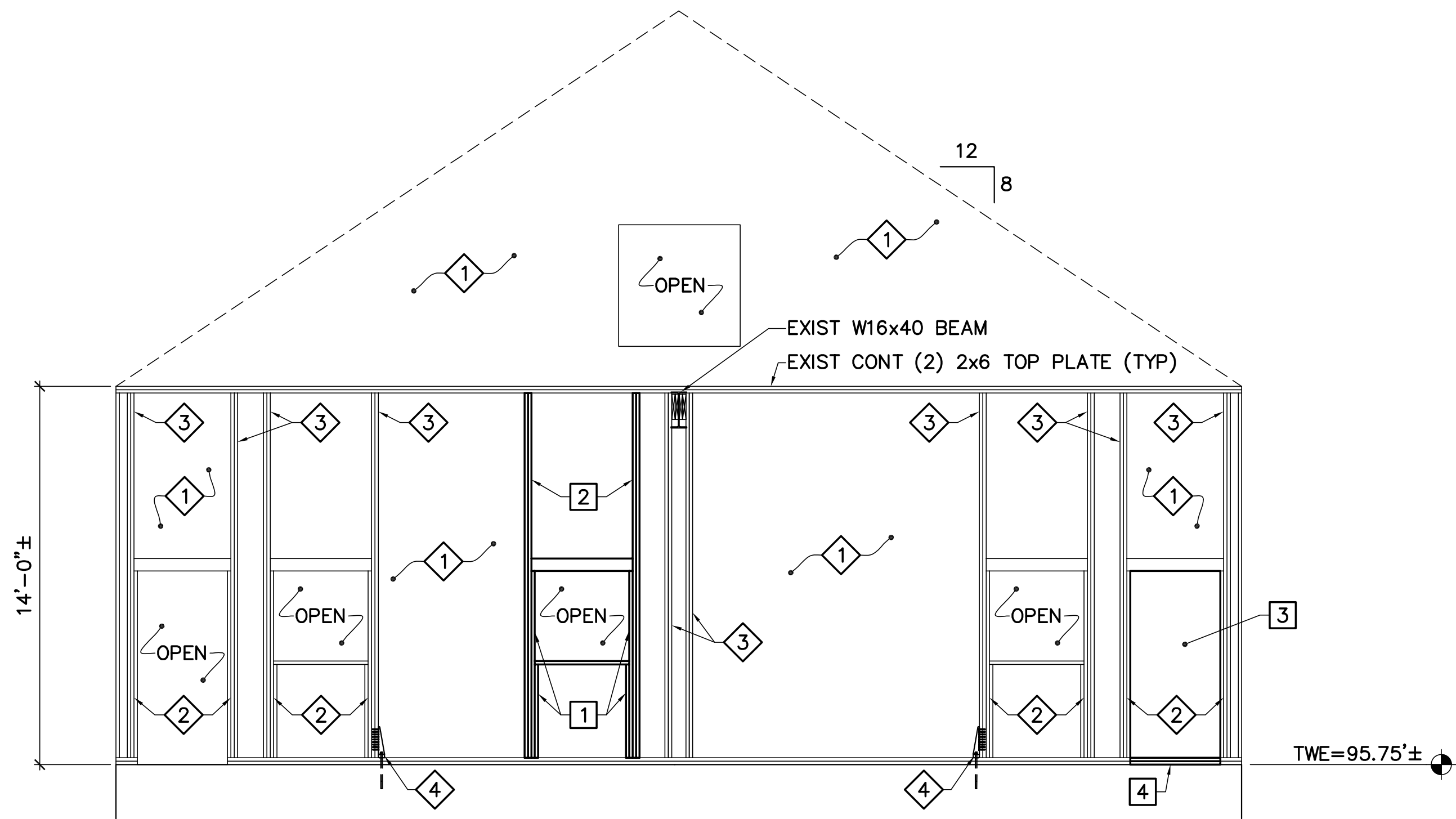
GRAPHIC SCALE



CHECK GRAPHIC SCALE BEFORE USING

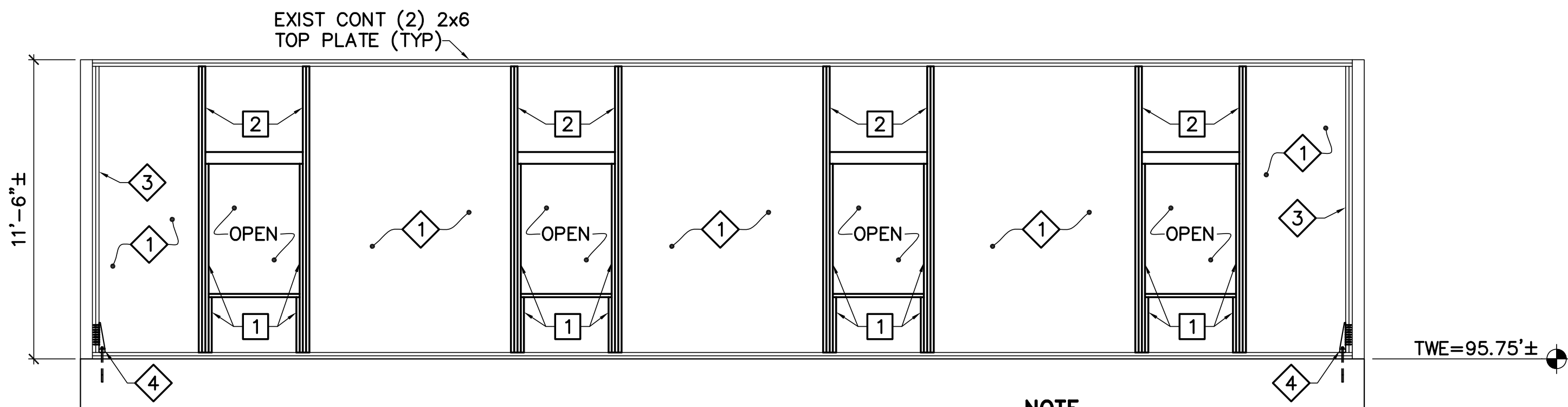


DISCIPLINE SHEET NO	SF102	DESIGNED: BDH DRAWN: MJC	DWG NO: 5R-MA-1301-100.00	SHEET 7 OF 50
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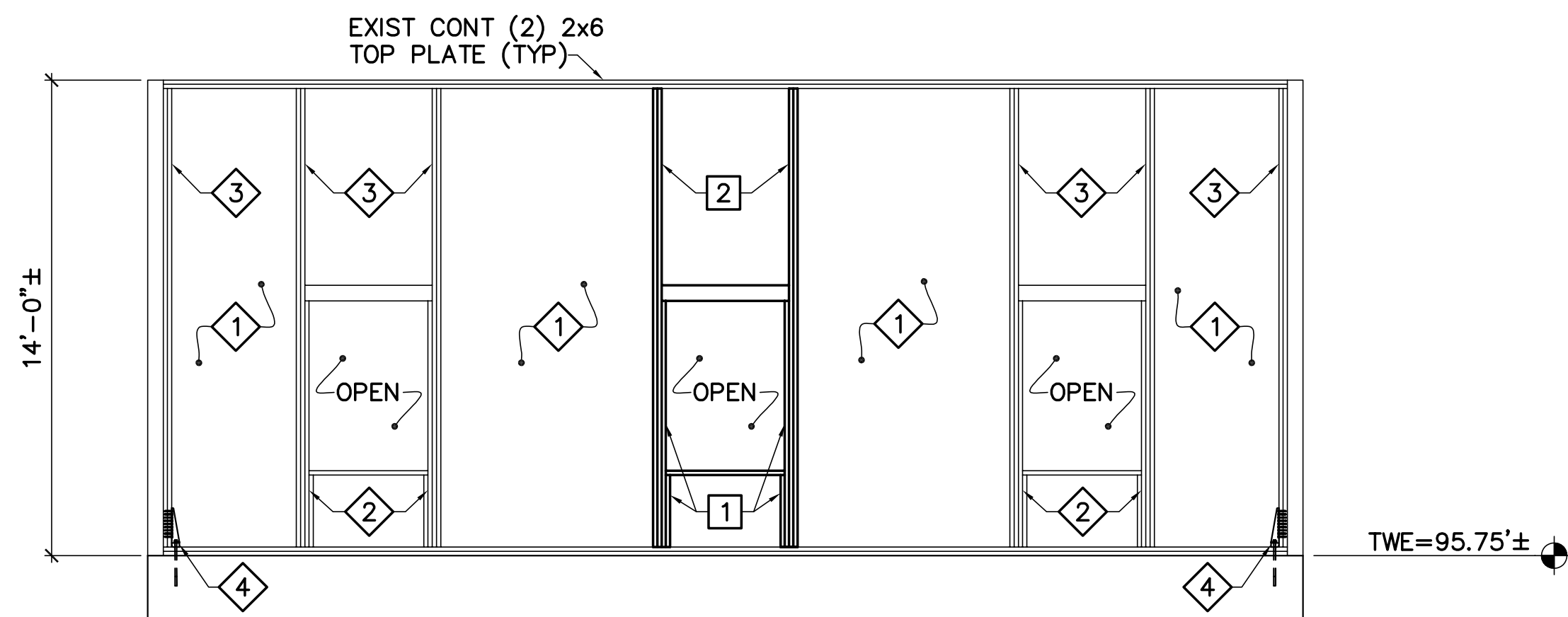
1 SHEAR WALL 5 ELEVATION (SW5)
SF201 SCALE: 1/4"=1'-0"
SF102

NOTE
SHEAR WALL 5 FRAMING
CONSISTS OF EXISTING 2x6
STUDS AT 1'-4"± ON-CENTER.



2 SHEAR WALL 8 ELEVATION (SW8)
SF201 SCALE: 1/4"=1'-0"
SF102

NOTE
SHEAR WALL 8 FRAMING
CONSISTS OF EXISTING 2x6
STUDS AT 2'-0"± ON-CENTER.



3 SHEAR WALL 9 ELEVATION (SW9)
SF201 SCALE: 1/4"=1'-0"
SF102

NOTE
SHEAR WALL 9 FRAMING CONSISTS
OF EXISTING 2x6 STUDS AT 1'-0"±
ON-CENTER.

DRAWING NOTES

- PROVIDE TEMPORARY SUPPORT OF FRAMING DURING CONSTRUCTION TO PREVENT FAILURE AND DAMAGE TO REMAINING STRUCTURE AND FINISHES.
- PROVIDE 2x6 BLOCKING AT WALL SHEATHING PANEL EDGES.
- REFER TO SHEET SF102 FOR LOCATION AND SIZES OF HEADERS AND JAMBS. PROVIDE (1) 2x6 AT EACH SILL.
- TYPICAL FRAMING CONNECTIONS:
 - STUD TO TOP OR BOTTOM WALL PLATE, OR HEADER: (4) 16d TOE-NAILS.
 - HEADER END TO JAMB: (6) 16d TOE-NAILS.
 - SILL END TO JAMB: (6) 16d TOE-NAILS.
 - BUILT-UP STUDS AND HEADERS: (2) 16d NAILS AT 1'-0" ON-CENTER PER PLY.

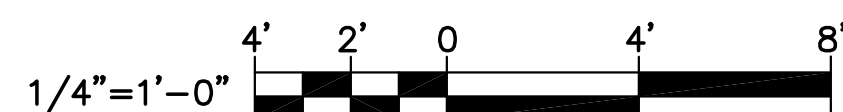
EXISTING KEYNOTES (THIS SHEET ONLY)

- EXISTING 1/2" APA RATED PLYWOOD SHEATHING WITH 8d NAILS AT 6" ON-CENTER AT PANEL EDGES AND 1'-0" ON-CENTER ELSEWHERE. SHEATHING LOCATED ON EXTERIOR WALL FACE. PROVIDE EQUIVALENT NAILING AT ALL NEW FRAMING OPENINGS.
- EXISTING 2x6 JACK STUD UNDER HEADER.
- EXISTING CONTINUOUS (2) 2x6 BUILT-UP POST.
- EXISTING SIMPSON STRONG-TIE PHD6-SDS3 HOLD-DOWN ANCHOR.

KEYNOTES (THIS SHEET ONLY)

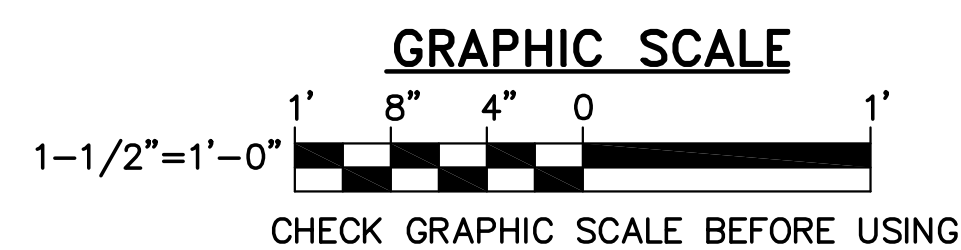
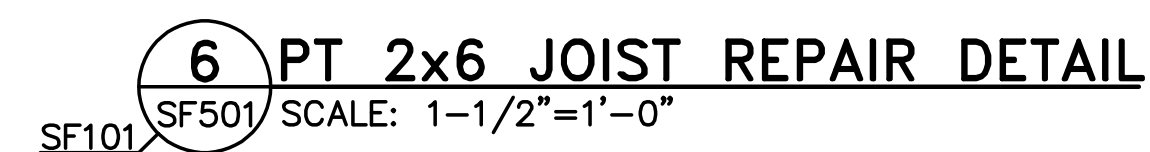
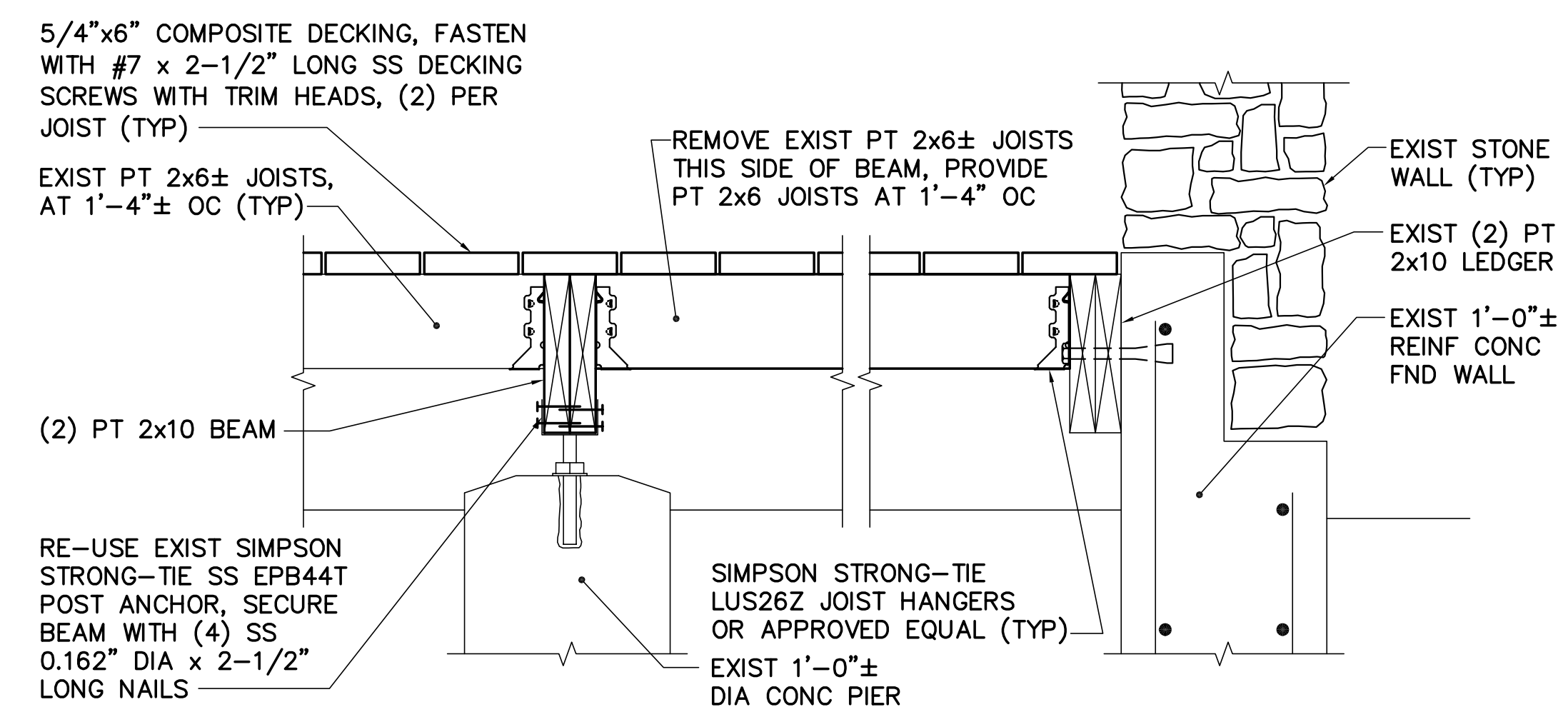
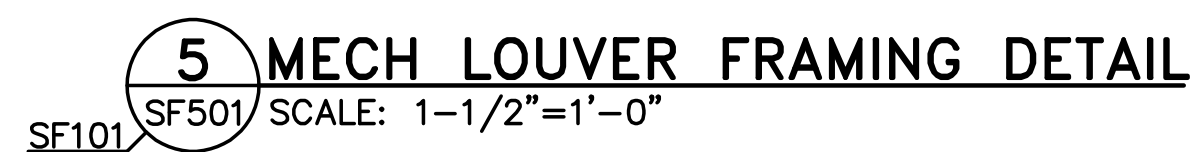
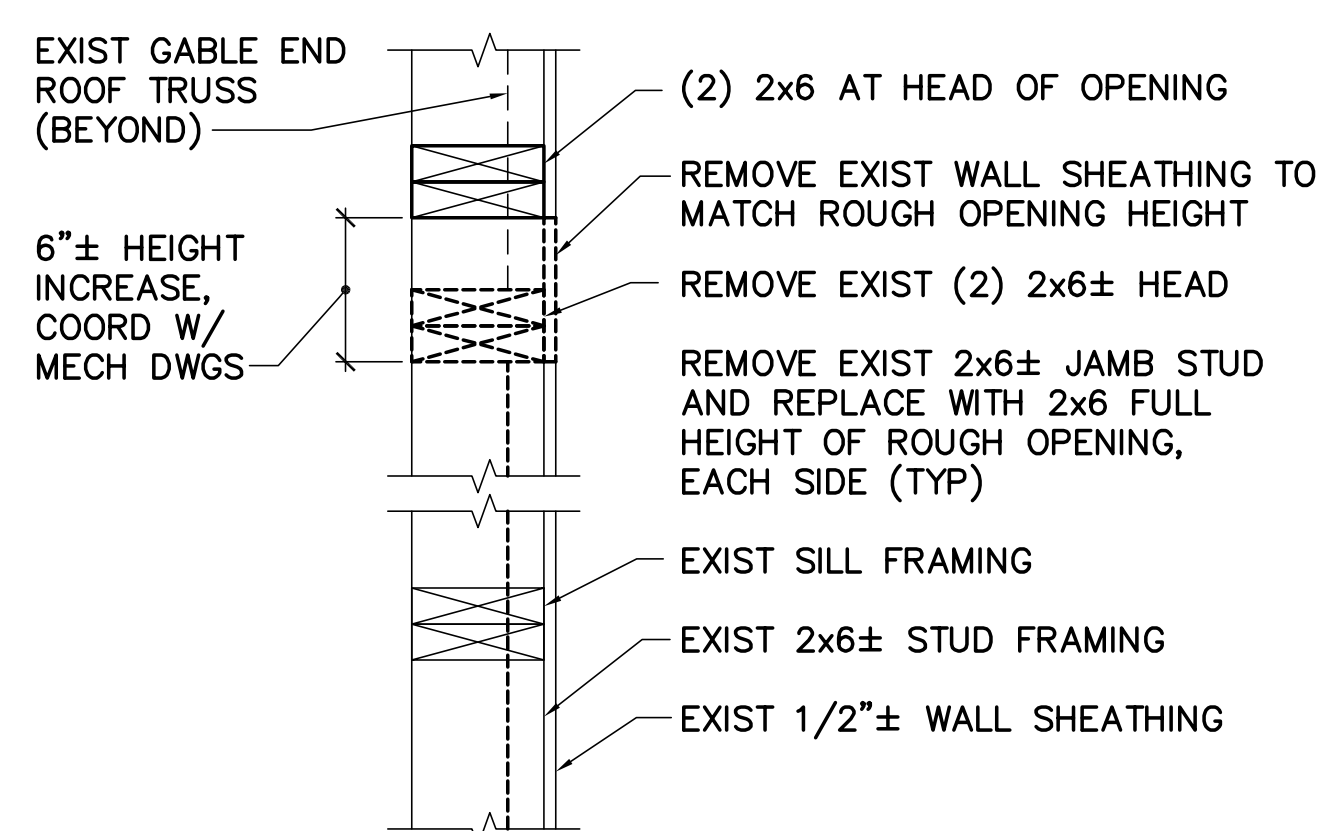
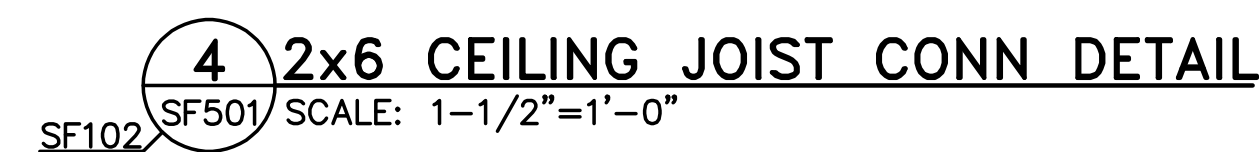
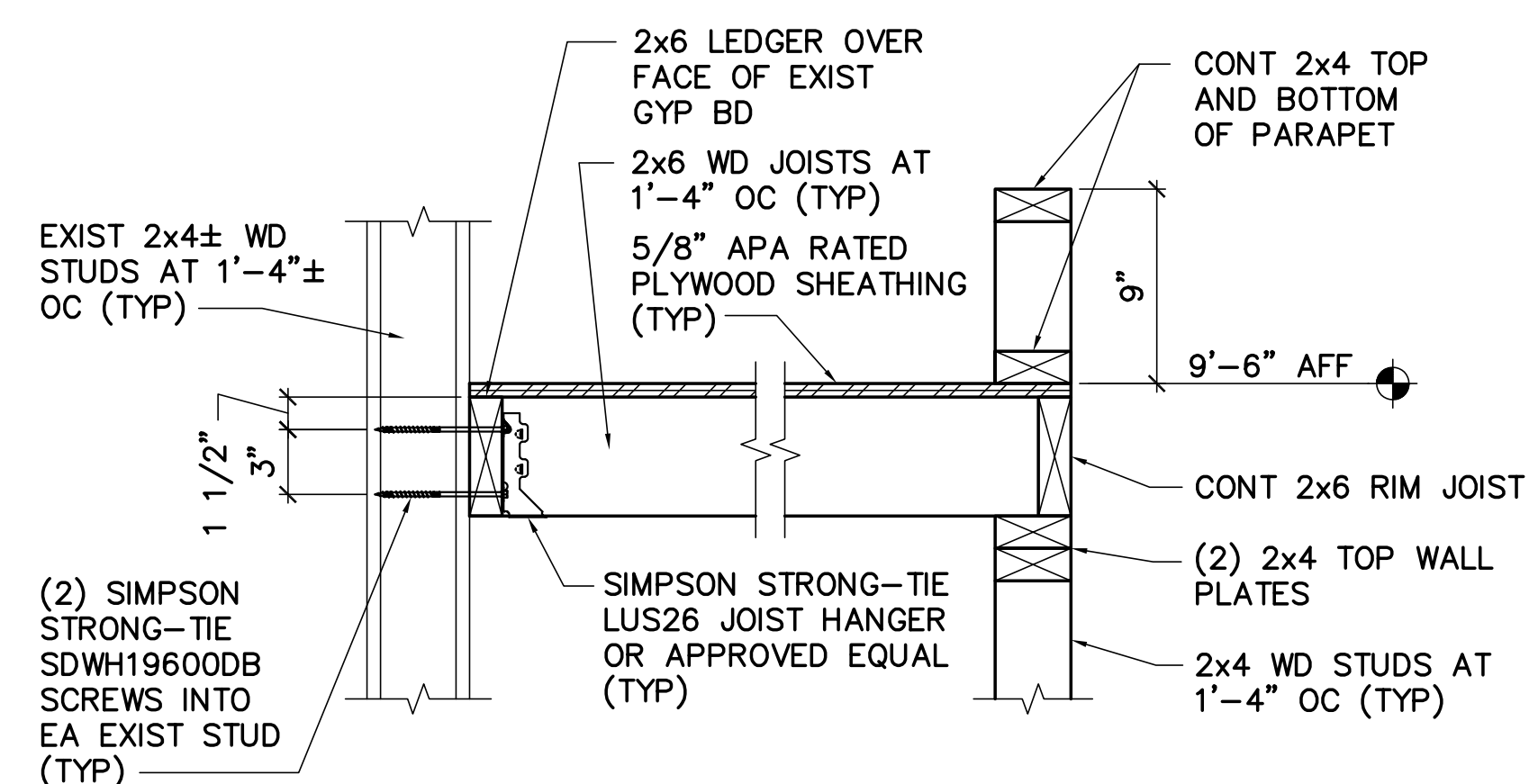
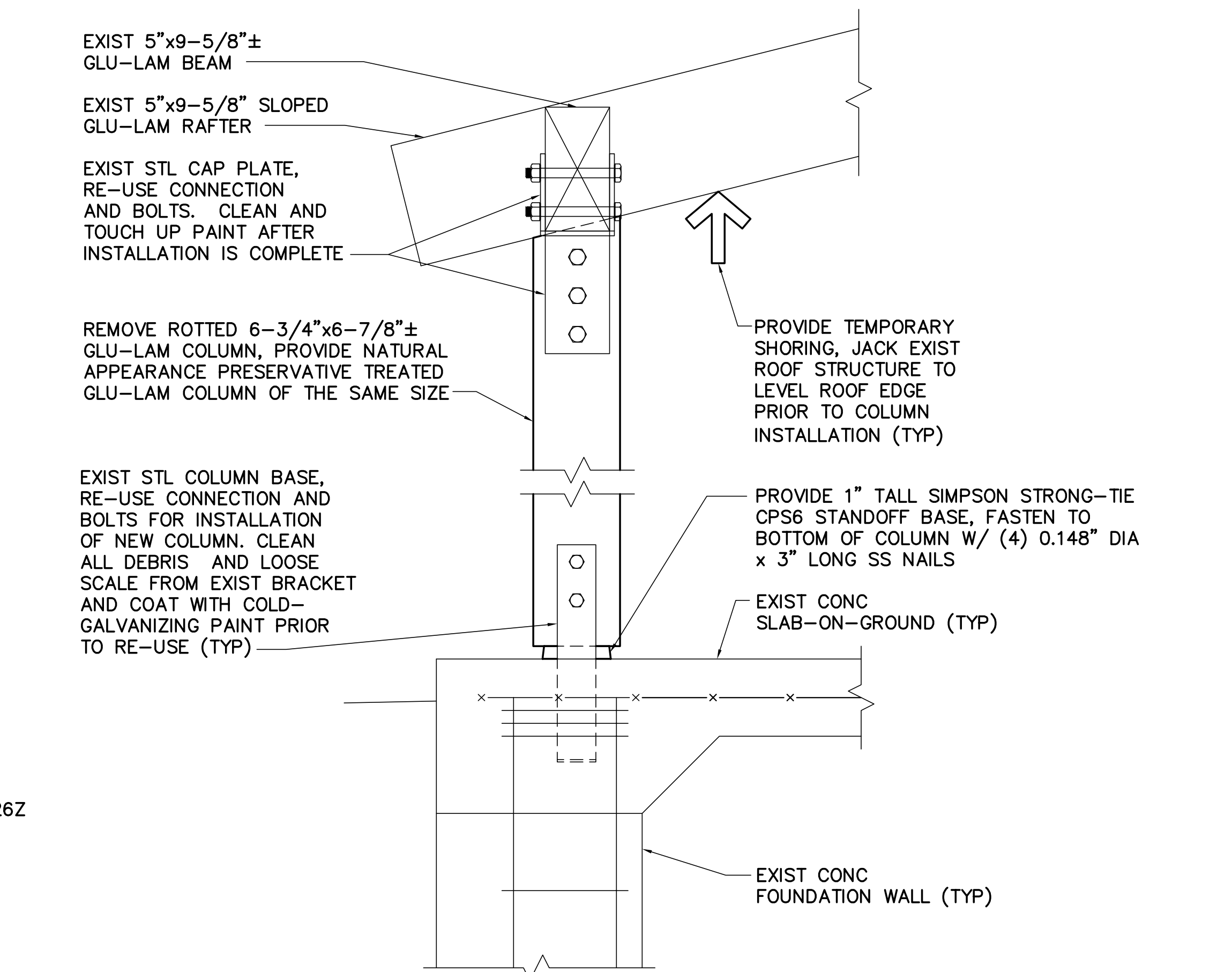
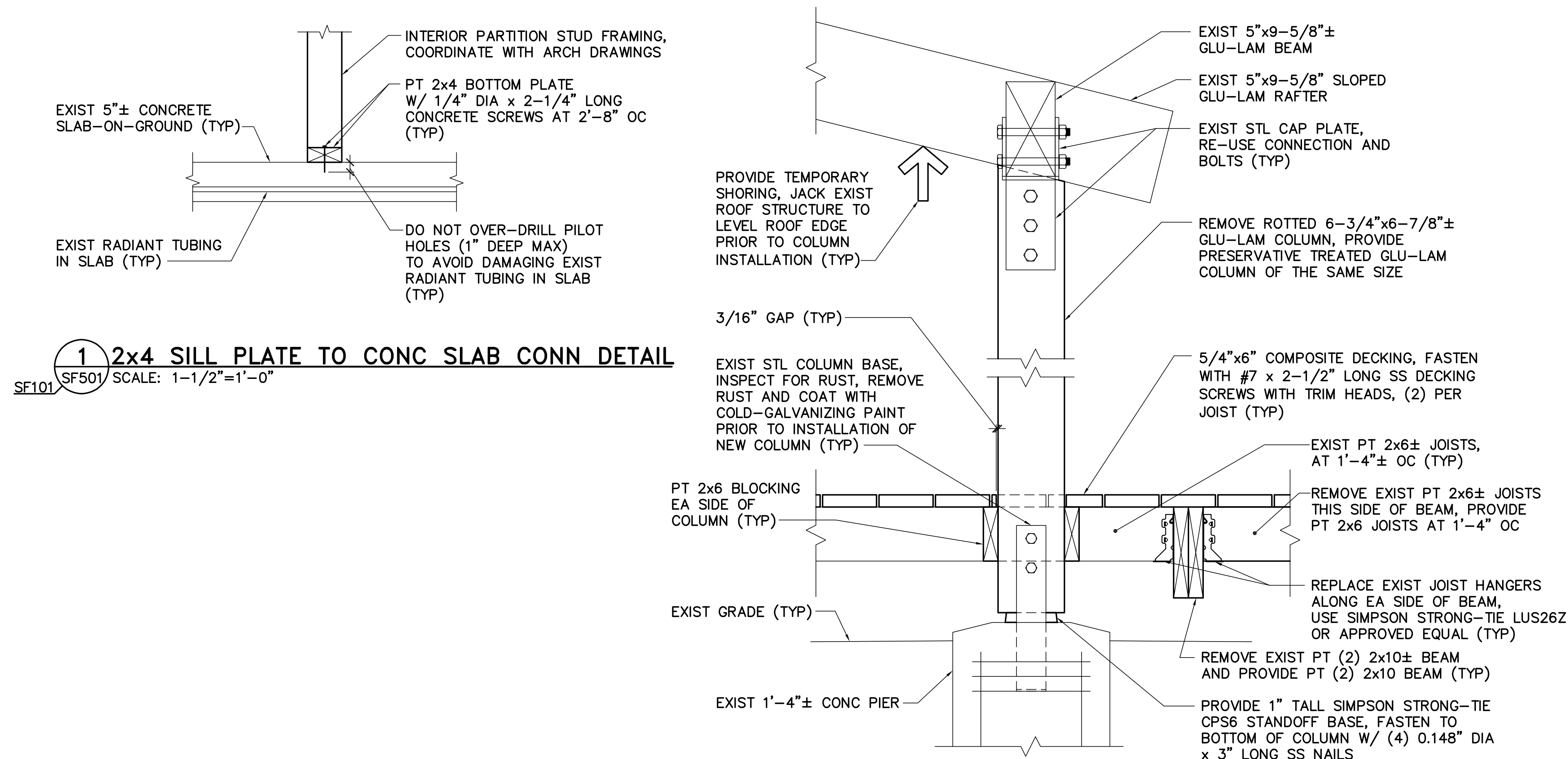
- 2x6 JACK STUD UNDER HEADER AND SILL.
- CONTINUOUS (2) 2x6 BUILT-UP POST.
- PROVIDE 2x6 AT 1'-4" ON-CENTER STUD INFILL FRAMING AND 1/2" APA RATED PLYWOOD WALL SHEATHING (ON EXTERIOR STUD FACE). FASTEN SHEATHING WITH 8d NAILS AT 6" ON-CENTER ALONG PANEL EDGES AND 1'-0" ON-CENTER ELSEWHERE. PROVIDE 2x6 BLOCKING AT ALL PANEL EDGES.
- CONTINUOUS 2x6 PT WOOD SILL PLATE ANCHORED TO EXISTING FOUNDATION WITH (2) 1/2" DIAMETER x 4" LONG SIMPSON STRONG-TIE TITEN HD SCREW ANCHORS. CONTINUOUS 2x6 WOOD BOTTOM PLATE FASTENED OVER SILL PLATE WITH (2) 16d NAILS AT 1'-4" ON-CENTER.

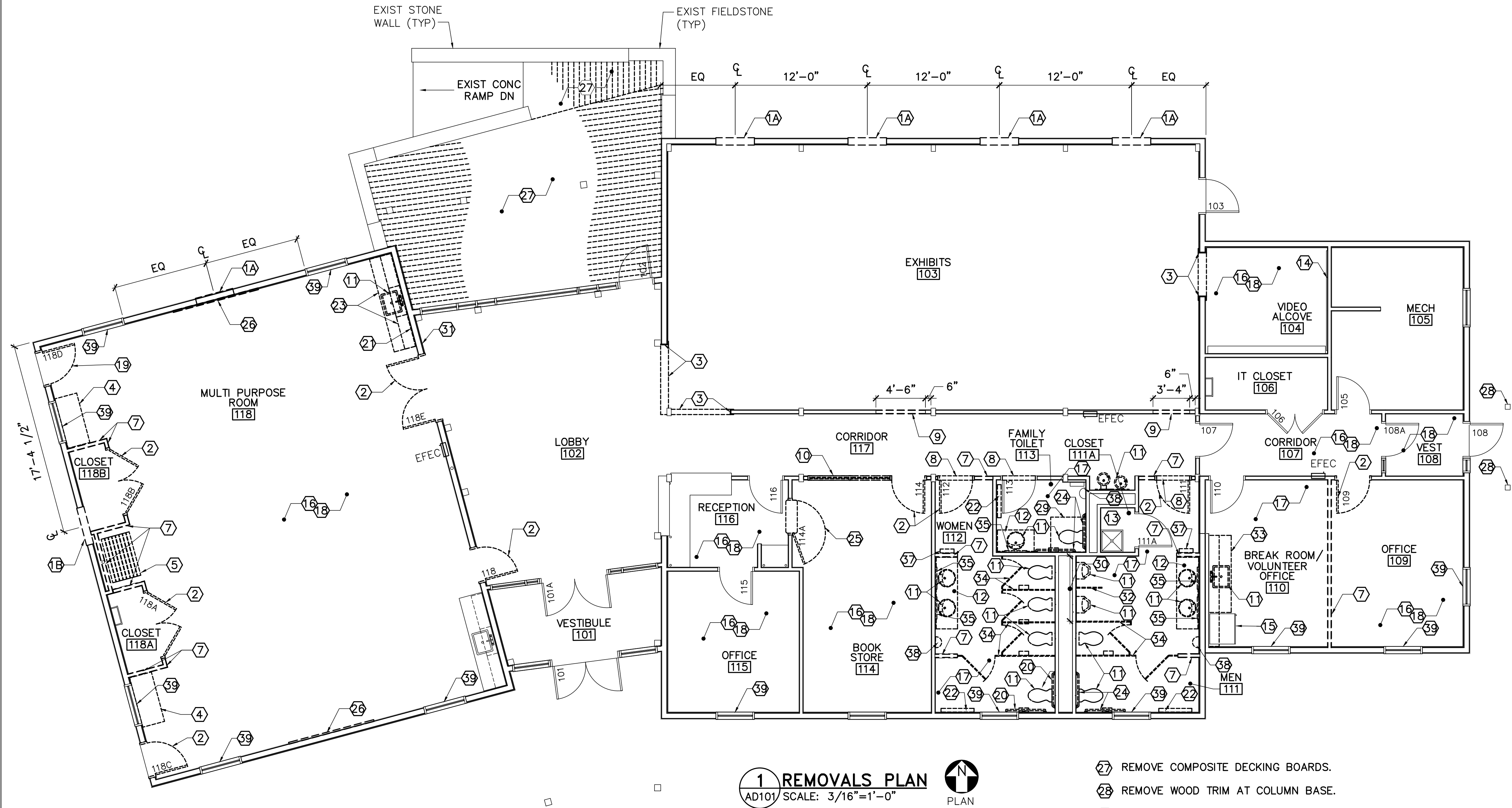
GRAPHIC SCALE



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	NO.		REVISIONS		DATE		BY	
	U.S. FISH AND WILDLIFE SERVICE		CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING					
	SHEAR WALL ELEVATIONS							
	ASSABET RIVER NATIONAL WILDLIFE REFUGE SUDBURY, MASSACHUSETTS							
DISCIPLINE SHEET NO. SF201		DESIGNED: BDH DRAWN: MJC		DWG NO. 5R-MA-1301-100.00		SHEET 8 OF 50		





1. REMOVALS PLAN AD101 SCALE: 3/16"=1'-0"



- 27 REMOVE COMPOSITE DECKING BOARDS.
- 28 REMOVE WOOD TRIM AT COLUMN BASE.
- 29 REMOVE PORTION OF CONCRETE FLOOR SLAB. COORDINATE EXTENTS AND IN-SLAB RADIANT HEATING LOCATIONS WITH PLUMBING SHEETS.
- 30 REMOVE CERAMIC WALL TILE AND PORTION OF GYPSUM BOARD WALL TO ACCOMMODATE PLUMBING FOR WATER CLOSET. COORDINATE WITH PLUMBING SHEETS.
- 31 REMOVE "MULTI PURPOSE" ROOM SIGN AND SALVAGE FOR REINSTALLATION AT DOOR 118G.
- 32 REMOVE URINAL PARTITION.
- 33 REMOVE COUNTERTOP. REMOVE AND SALVAGE FOR REINSTALLATION BASE CABINETS. WALL CABINETS TO REMAIN.
- 34 REMOVE TOILET PARTITION INCLUDING DOOR, HARDWARE, AND PARTITION MOUNTED ACCESSORIES. SALVAGE THREE (3) TOILET TISSUE DISPENSERS FOR REINSTALLATION.
- 35 REMOVE WALL-MOUNTED MIRROR. SALVAGE FOUR (4) FOR REINSTALLATION.
- 36 NOT USED.
- 37 REMOVE RECESSED WASTE RECEPTACLE.
- 38 REMOVE ELECTRIC HAND DRYER AND HAND DRYER WALL GUARD. SALVAGE HAND DRYER FOR REINSTALLATION.
- 39 SCRAPE, SAND, AND PREP WOOD WINDOW SILL AND TRIM FOR PAINT.

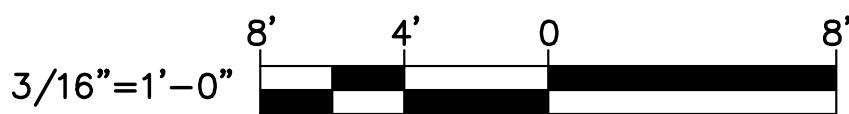
GENERAL NOTES

- UNLESS NOTED OTHERWISE, EXHIBITS, DISPLAY CASES, AND WALL-MOUNTED INFORMATION BOARDS WILL BE REMOVED BY THE GOVERNMENT PRIOR TO CONSTRUCTION.
- SEE SHEET AE201 FOR EXTERIOR ELEVATION REMOVALS.
- PATCH AND PREPARE FOR REPAINTING EXISTING-TO-REMAIN WALLS AT WALL-MOUNTED ITEM REMOVAL LOCATIONS. INCLUDING AT LOCATIONS OF ITEMS REMOVED BY GOVERNMENT.

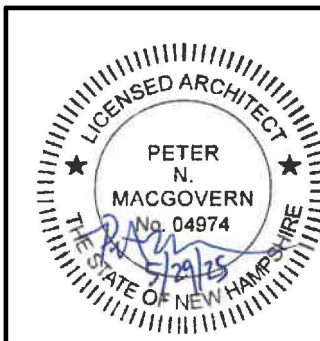
REMOVALS KEYNOTES (THIS SHEET ONLY)

- 1 REMOVE PORTION OF EXTERIOR WALL SYSTEM, INCLUDING INTERIOR GYPSUM BOARD THE FULL HEIGHT OF THE WALL, TO CREATE ROUGH OPENING FOR WINDOW. SILL HEIGHT TO MATCH EXISTING ADJACENT WINDOWS. COORDINATE EXTENTS OF REMOVALS WITH STRUCTURAL SHEETS. WINDOW MANUFACTURER'S INSTALLATION REQUIREMENTS, AND TO COMPLETE WINDOW AND FLASHING INSTALLATION. WINDOW SIZES ARE AS FOLLOWS:
 - A: 5'-0" HIGH x 3'-6" WIDE
 - B: 3'-6" HIGH x 3'-6" WIDE
- 2 REMOVE DOOR, FRAME, HARDWARE, AND WOOD TRIM.
- 3 REMOVE WOOD TRIM AT CASIED OPENING INCLUDING AT HEAD.
- 4 REMOVE BASE CABINETS AND COUNTERTOP.
- 5 REMOVE FOLDING PANEL PARTITION. STEEL SUPPORT COLUMNS AND BEAM TO REMAIN.
- 6 NOT USED.
- 7 REMOVE WOOD STUD AND GYPSUM BOARD PARTITION.
- 8 REMOVE MARBLE THRESHOLD AND ADHESIVE.
- 9 REMOVE PORTION OF WOOD STUD AND GYPSUM BOARD WALL FOR DOOR (AND SIDELIGHT) ROUGH OPENING. COORDINATE WITH DOOR SCHEDULE.
- 10 REMOVE WOOD-FRAMED WINDOW SYSTEM.
- 11 REMOVE PLUMBING FIXTURE, SEE PLUMBING SHEETS. COORDINATE WITH PLUMBING SHEETS FOR FIXTURES INDICATED FOR REINSTALLATION.
- 12 REMOVE COUNTERTOP AND OAK BASE SUPPORT. SALVAGE ONE (1) SOAP DISPENSER FOR REINSTALLATION IN SHOWER ROOM 113.
- 13 EXISTING 3"x3" MOSAIC TILE FLOORING TO REMAIN IN CUSTODIAL CLOSET.
- 14 PROTECT MURAL.
- 15 TEMPORARILY RELOCATE REFRIGERATOR DURING FLOORING WORK.
- 16 REMOVE CARPET TILE AND ADHESIVE.
- 17 REMOVE CERAMIC FLOOR TILE, CERAMIC WALL BASE, AND MORTAR.
- 18 REMOVE RUBBER WALL BASE AND ADHESIVE.
- 19 REMOVE DOOR AND HARDWARE.
- 20 REMOVE AND SALVAGE FOR REINSTALLATION GRAB BARS TO ACCOMMODATE REMOVAL AND INSTALLATION OF CERAMIC WALL TILE.
- 21 REMOVE AND SALVAGE FOR REINSTALLATION METAL ACCESS PANEL FROM BACK OF WALL CABINET.
- 22 REMOVE WALL-MOUNTED DIAPER CHANGING STATION.
- 23 REMOVE BASE AND WALL CABINETS AND COUNTERTOP.
- 24 REMOVE WALL-MOUNTED GRAB BARS.
- 25 REMOVE DUTCH DOOR, FRAME, AND HARDWARE.
- 26 REMOVE AND SALVAGE PROJECTION SCREEN, TURN OVER TO GOVERNMENT.

GRAPHIC SCALE



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DISCIPLINE SHEET NO. AD101		REVISIONS		DATE	BY
DESIGNED: PNM		DRAWN: RMB		5R-MA-1301-100.00	

REMOVALS PLAN

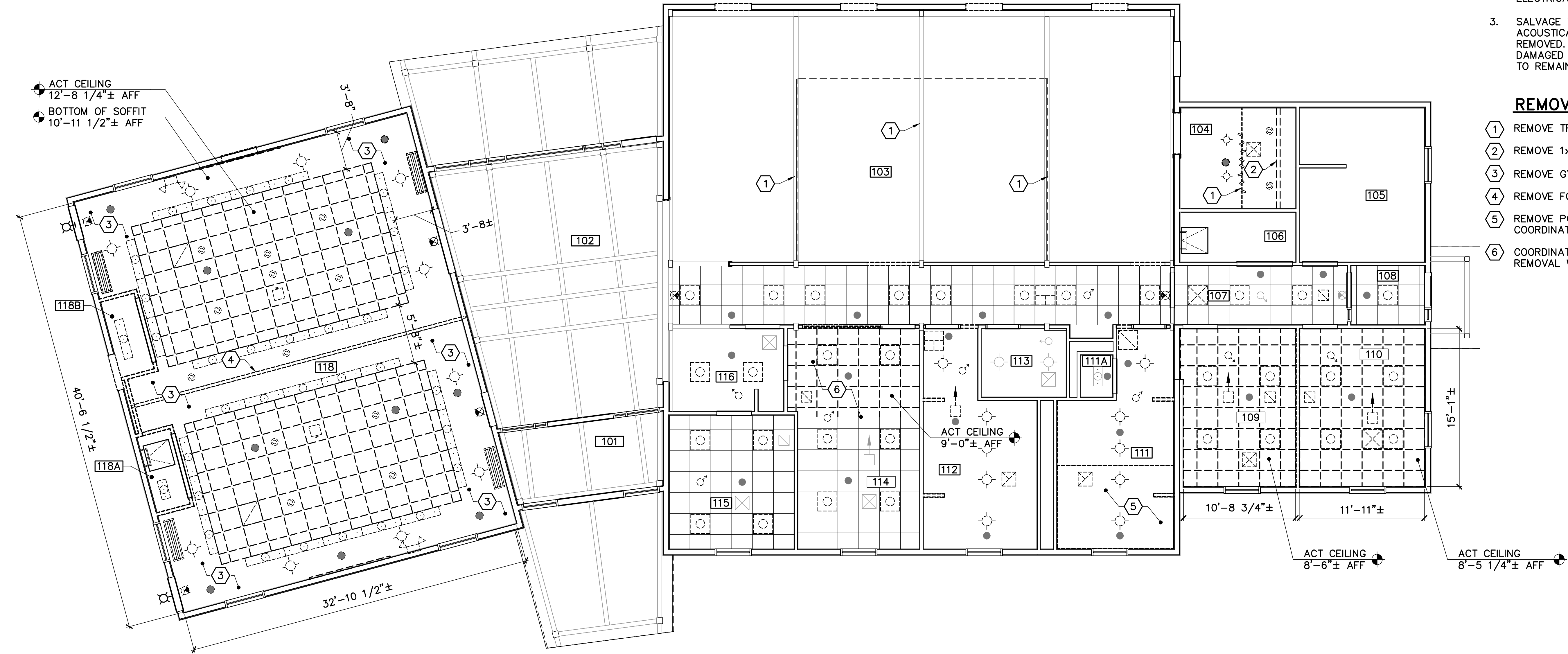
ASSABET RIVER NATIONAL WILDLIFE REFUGE SUDBURY, MASSACHUSETTS

GENERAL NOTES

- MECHANICAL, FIRE PROTECTION, AND ELECTRICAL ITEMS SHOWN FOR COORDINATION PURPOSES ONLY. SEE MECHANICAL, FIRE PROTECTION, AND ELECTRICAL SHEETS FOR MORE INFORMATION.
- COORDINATE CEILING REMOVALS REQUIRED FOR MECHANICAL, FIRE PROTECTION, AND ELECTRICAL WORK WITH MECHANICAL, FIRE PROTECTION, AND ELECTRICAL SHEETS.
- SALVAGE TWENTY (20) EXISTING WHOLE ACOUSTICAL CEILING TILES INDICATED TO BE REMOVED. USE SALVAGED TILES TO REPLACE DAMAGED TILES IN EXISTING ACOUSTICAL CEILINGS TO REMAIN.

REMOVALS KEYNOTES (THIS SHEET ONLY)

- REMOVE TRACK LIGHTING.
- REMOVE 1x WOOD VALANCE WITH LED LIGHTING.
- REMOVE GYPSUM BOARD CEILING/SOFFIT SYSTEM.
- REMOVE FOLDING PARTITION TRACK.
- REMOVE PORTION OF GYPSUM BOARD CEILING. COORDINATE EXTENTS WITH FLOOR PLAN.
- COORDINATE EXTENT OF ACOUSTICAL CEILING TILE REMOVAL WITH FLOOR PLAN.



1 REFLECTED CEILING REMOVALS PLAN
AD701 SCALE: 3/16"=1'-0"



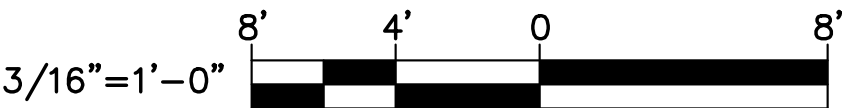
EXISTING LEGEND:

- | | | | |
|---|-------------------------------|---|--|
| ⊙ | EXIST SURFACE MOUNTED FIXTURE | ⌵ | EXIST ACCESS HATCH |
| ⊗ | EXIST EXIT SIGN | ■ | EXIST 2'-0" x 2'-0" ACOUSTICAL CEILING TILE SYSTEM |
| ⚡ | EXIST EMERGENCY LIGHT | | |
| ⊙ | EXIST OCCUPANCY SENSOR | | |
| □ | EXIST MOTION DETECTOR | | |
| ⊙ | EXIST RECESSED LIGHT FIXTURE | | |
| ⊠ | EXIST SUPPLY DIFFUSER | | |
| ⊠ | EXIST RETURN DIFFUSER | | |
| ⊠ | EXIST EXHAUST GRILLE | | |
| ⊠ | EXIST TRANSFER GRILLE | | |
| ● | EXIST SPRINKLER HEAD | | |

REMOVALS LEGEND:

- | | | | |
|---|----------------------------------|---|---|
| ⊙ | REMOVE RECESSED CAN FIXTURE | ⌵ | REMOVE FLUORESCENT FIXTURE |
| ⊗ | REMOVE WALL SCONCE | ⌵ | REMOVE FLUORESCENT FIXTURE |
| ⚡ | REMOVE TRACK LIGHTING | ⌵ | REMOVE FLUORESCENT FIXTURE |
| ⊠ | REMOVE CEILING MOUNTED PROJECTOR | ⌵ | REMOVE LINEAR SUPPLY DIFFUSER |
| ⊙ | REMOVE SURFACE MOUNTED FIXTURE | ■ | REMOVE 2'-0" x 2'-0" ACOUSTICAL CEILING TILE SYSTEM |
| ⊗ | REMOVE EXIT SIGN | ⊠ | REMOVE SUPPLY DIFFUSER |
| ⚡ | REMOVE EMERGENCY LIGHT | ⊠ | REMOVE RETURN DIFFUSER |
| ● | REMOVE SPRINKLER HEAD | | |
| ⊙ | REMOVE OCCUPANCY SENSOR | | |

GRAPHIC SCALE



CHECK GRAPHIC SCALE BEFORE USING



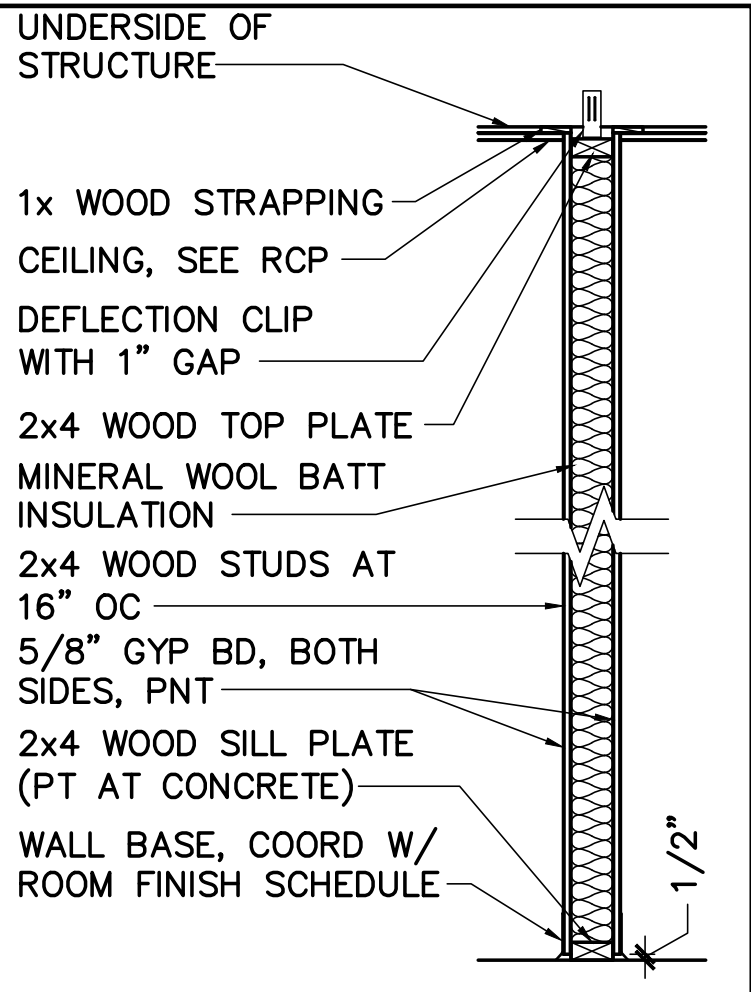
DISCIPLINE SHEET NO	AD701
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WALL TYPE GENERAL NOTES

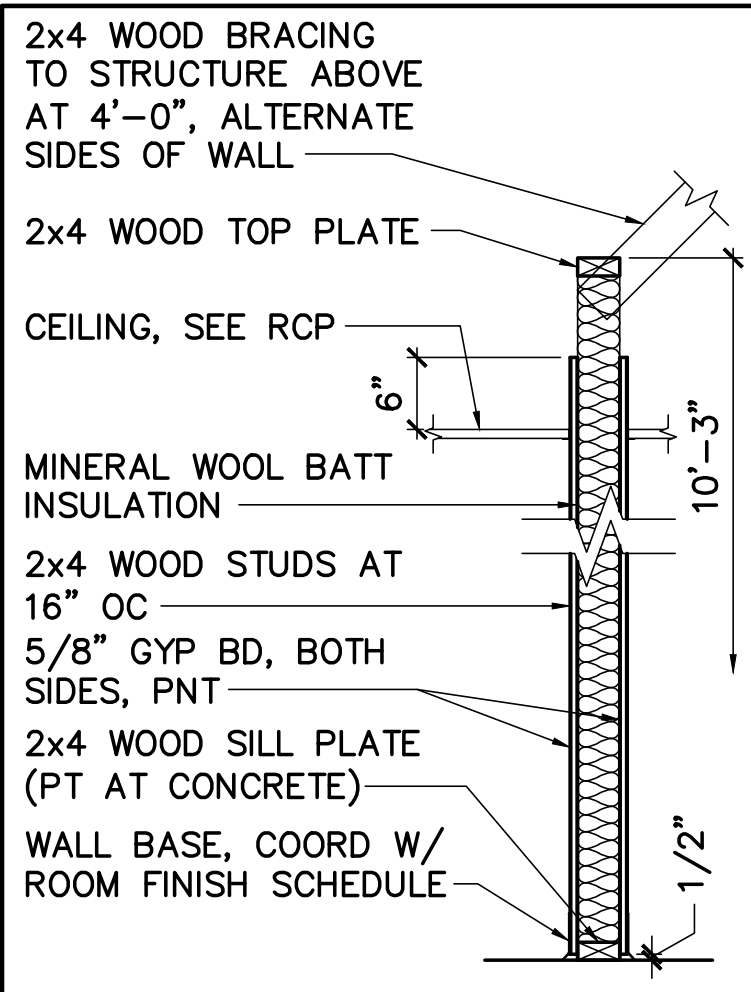
- SEE ROOM FINISH SCHEDULE ON AE641 FOR WALL AND BASE FINISHES.
- SEE REFLECTED CEILING PLANS FOR CEILING HEIGHTS.
- FASTEN PARTITION SILL PLATES TO FLOOR SO AS TO NOT PUNCTURE RADIANT TUBING. SEE DETAIL 1/SF501.

SECURE WALL (TYPE NC) NOTES

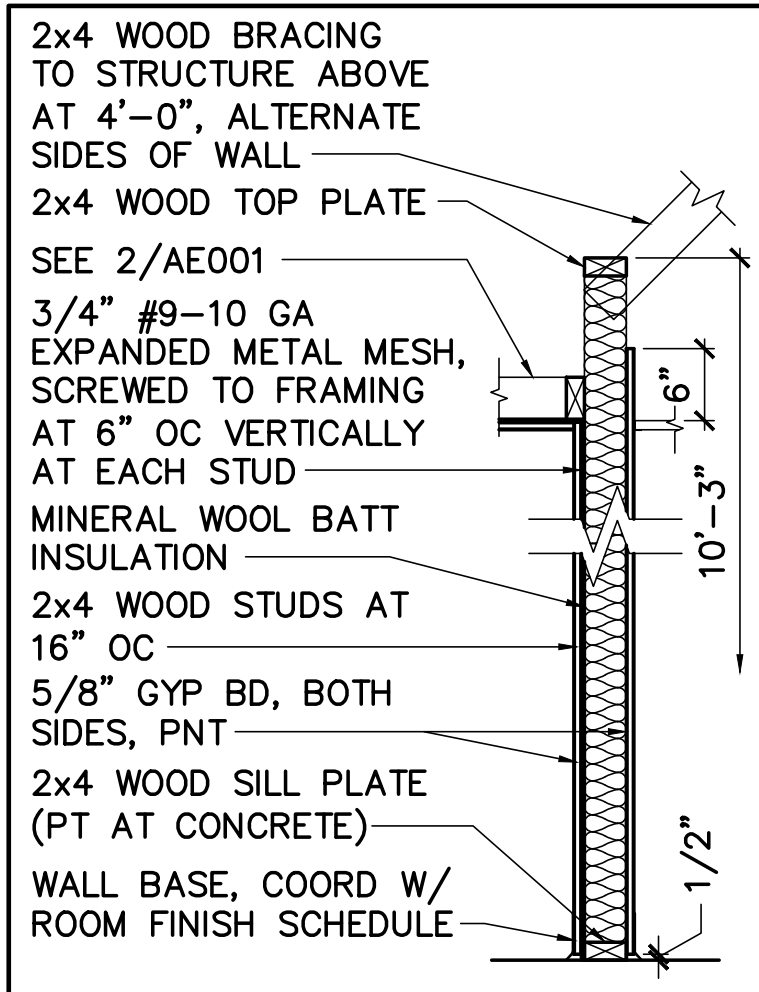
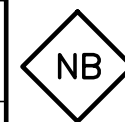
- PROVIDE EXPANDED METAL MESH ON SECURE STORAGE 118E SIDE OF WALL.
- PROVIDE CARBON STEEL SECURITY MESH, ASTM A589/569M, ASTM F1267, TYPE II, CLASS 1, STANDARD, FLATTENED STYLE 3/4" #9-10GA, 171 LBS/100SF. DESIGN SIZE: SWD=0.913", LWD=2.10" WITH OVERALL THICKNESS OF 0.120" AND A MAXIMUM OPEN AREA OF 71%.
- FILL SCREW HEADS SECURING EXPANDED METAL MESH WITH EPOXY AFTER INSTALLATION.
- SEAL DUCT PENETRATIONS.
- NOTIFY THE GOVERNMENT OF ANY DUCT OPENINGS LARGER THAN 96 SQUARE INCHES (UNLESS ONE DIMENSION IS LESS THAN 6"). SUCH DUCT OPENINGS MUST BE PROTECTED WITH 1/2" MANBARS SPACED AND WELDED AT 6" OC. AND A 12"x12" ACCESS PANEL MUST BE PROVIDED IN THE BOTTOM OF THE DUCT AND IN THE CEILING ON THE SECURE SIDE.



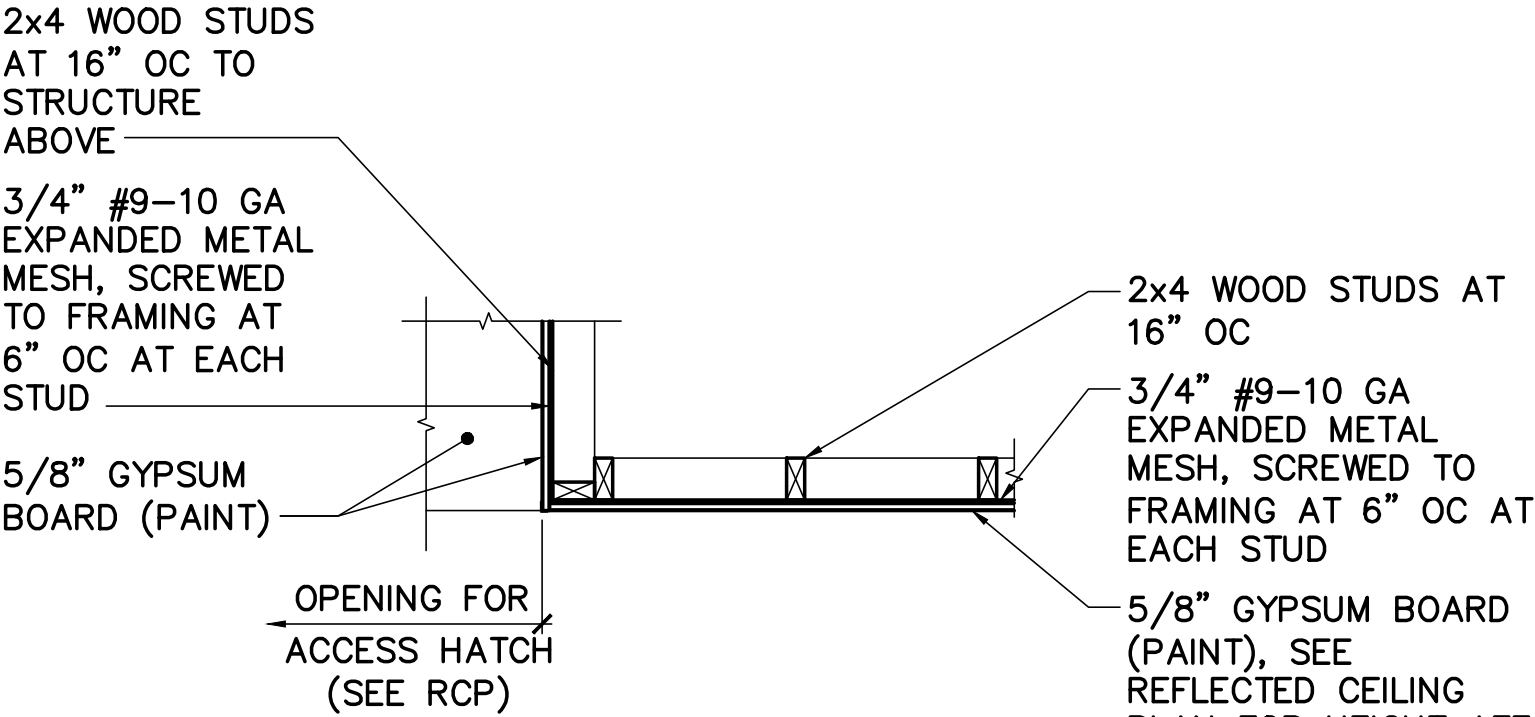
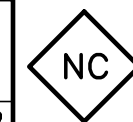
2x4 NON-LOAD BEARING PARTITION
STC:45 (MIN) WIDTH=4-3/4"
NON-FIRE RATED



2x4 NON-LOAD BEARING PARTITION
STC:45 (MIN) WIDTH=4-3/4"
NON-FIRE RATED

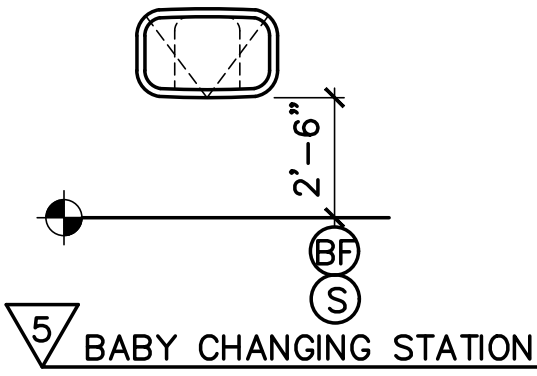
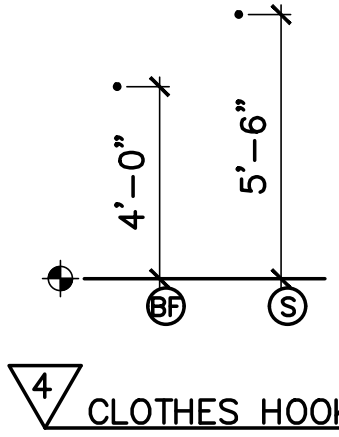
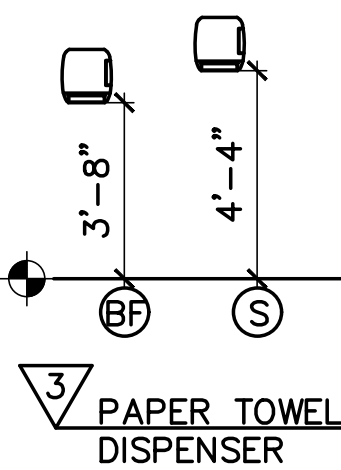
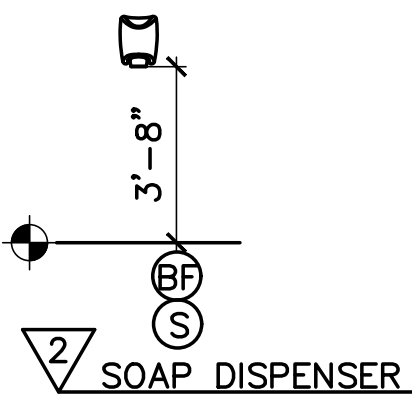
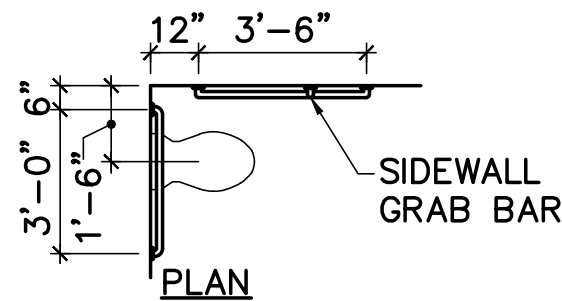


2x4 NON-LOAD BEARING SECURE PARTITION
STC:45 (MIN) WIDTH=4-3/4"
NON-FIRE RATED



2 SECURE CEILING DETAIL
AE001 SCALE: NOT TO SCALE

1 WALL TYPES
AE001 SCALE: NOT TO SCALE

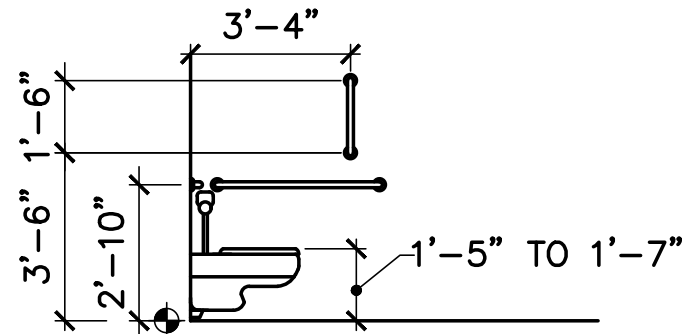


LEGEND

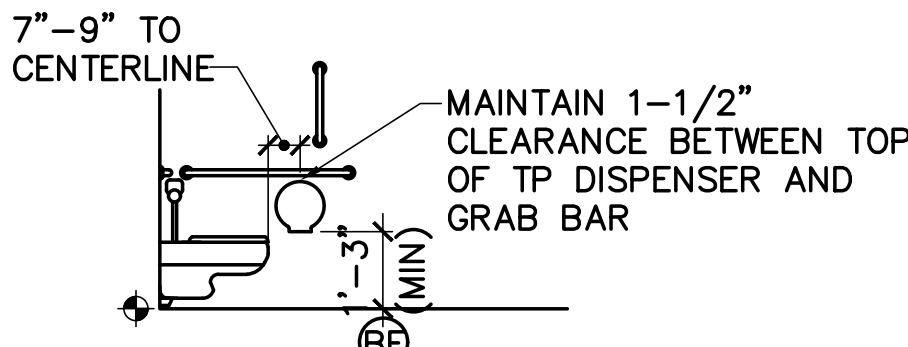
- BF BARRIER FREE MOUNTING HEIGHT
- S STANDARD MOUNTING HEIGHT
- FINISH FLOOR LINE

NOTES

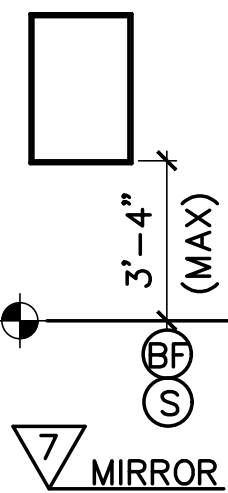
- MOUNT FIXTURES AND ACCESSORIES AT STANDARD MOUNTING HEIGHTS EXCEPT IN SPACES INDICATED WITH A & SYMBOL. IN ROOMS INDICATED WITH A & SYMBOL MOUNT FIXTURES AND ACCESSORIES AT BARRIER FREE MOUNTING HEIGHT.
- REFER TO DRAWINGS AND SPECIFICATIONS FOR TYPES OF FIXTURES THAT MAY APPLY TO THIS PROJECT.



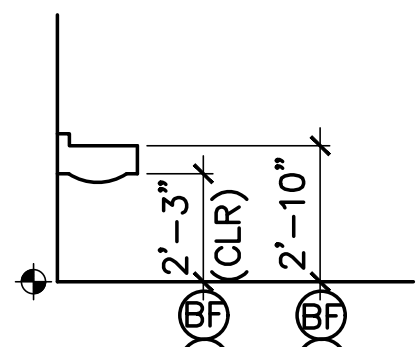
1 WATER CLOSET/GRAB BARS



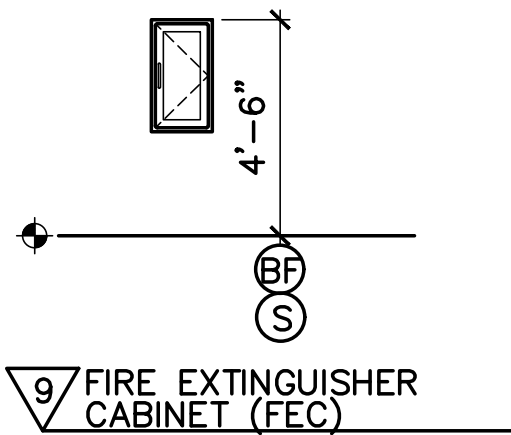
6 TOILET PAPER DISPENSERS



7 MIRROR



8 WALL-HUNG LAVATORY



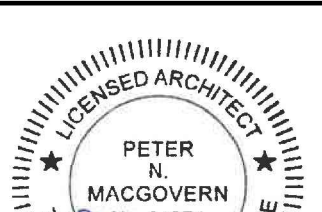
9 FIRE EXTINGUISHER CABINET (FEC)

4 STANDARD MOUNTING HEIGHTS
AE001 NOT TO SCALE

GRAPHIC SCALE



CHECK GRAPHIC SCALE BEFORE USING

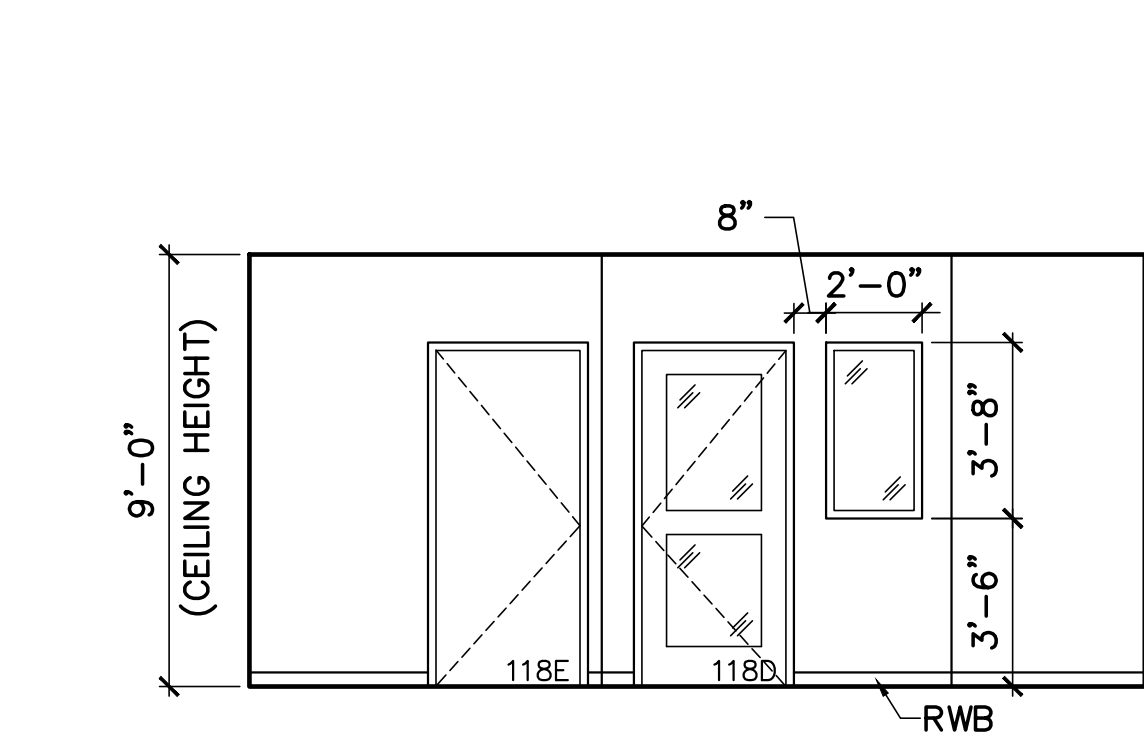
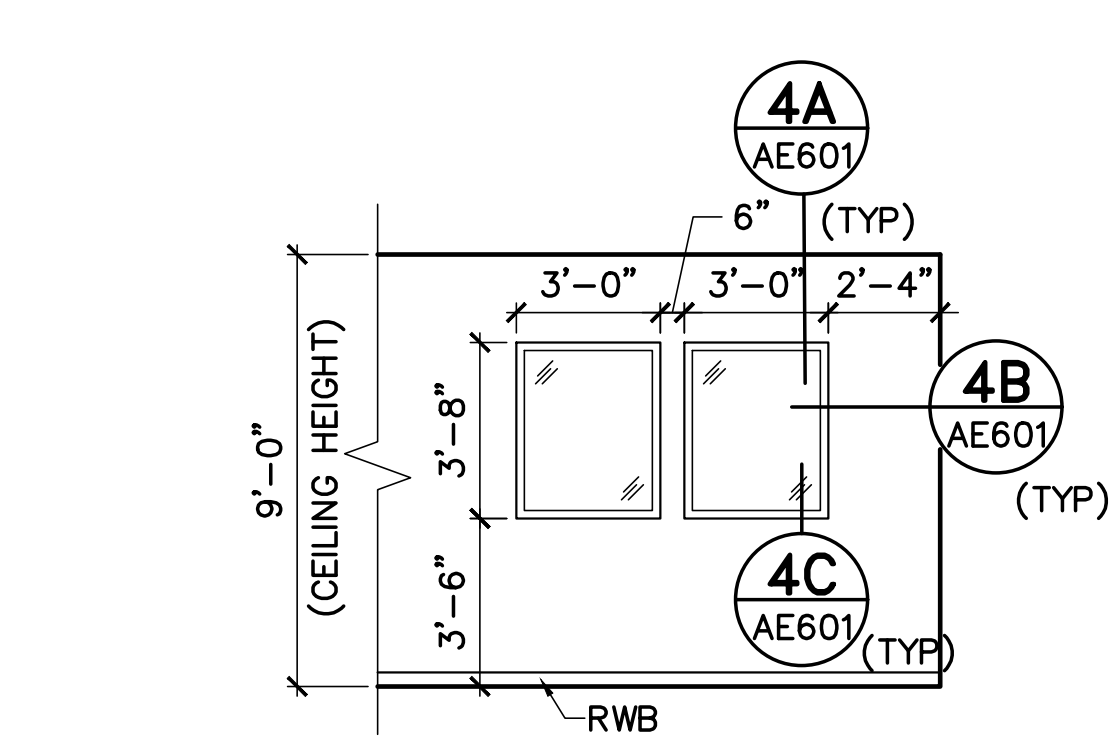
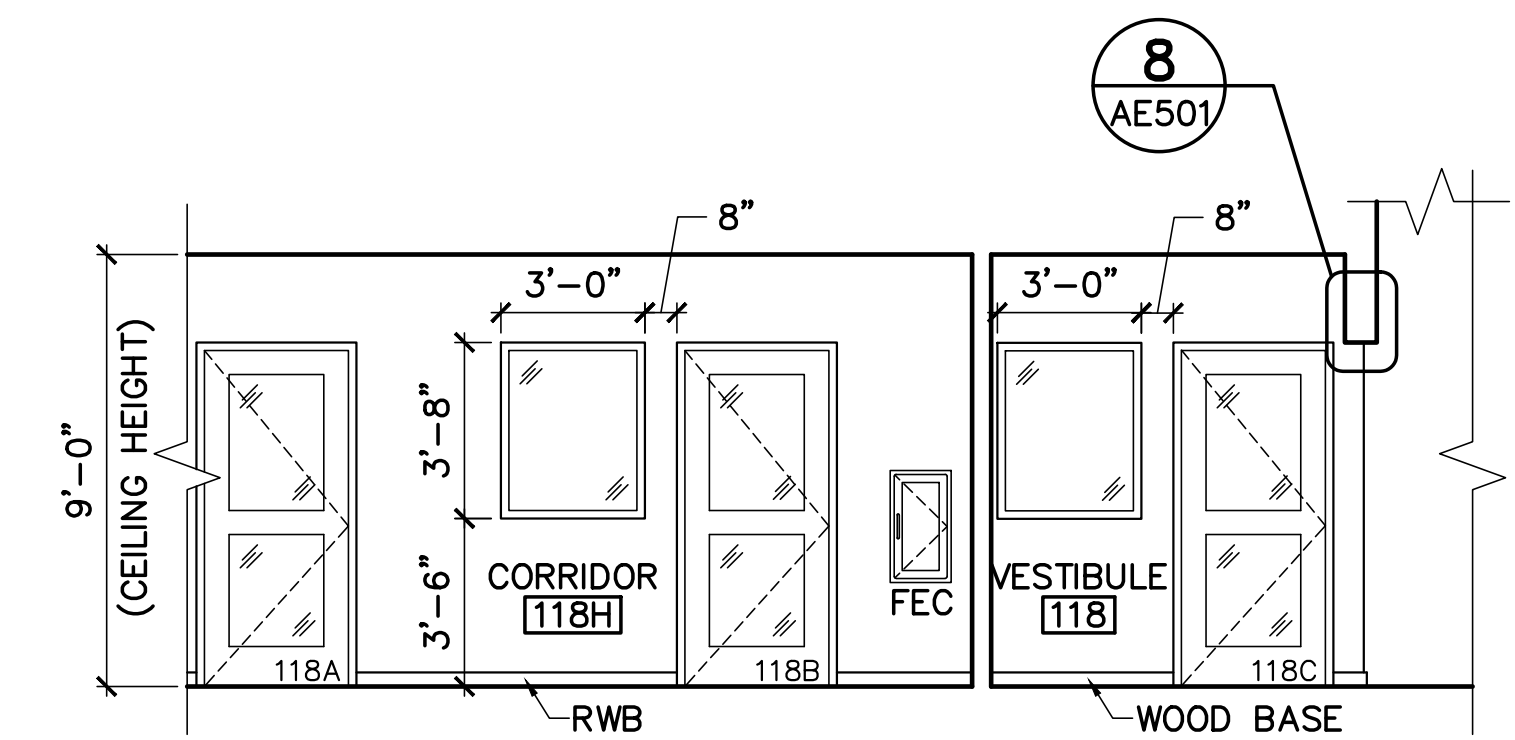
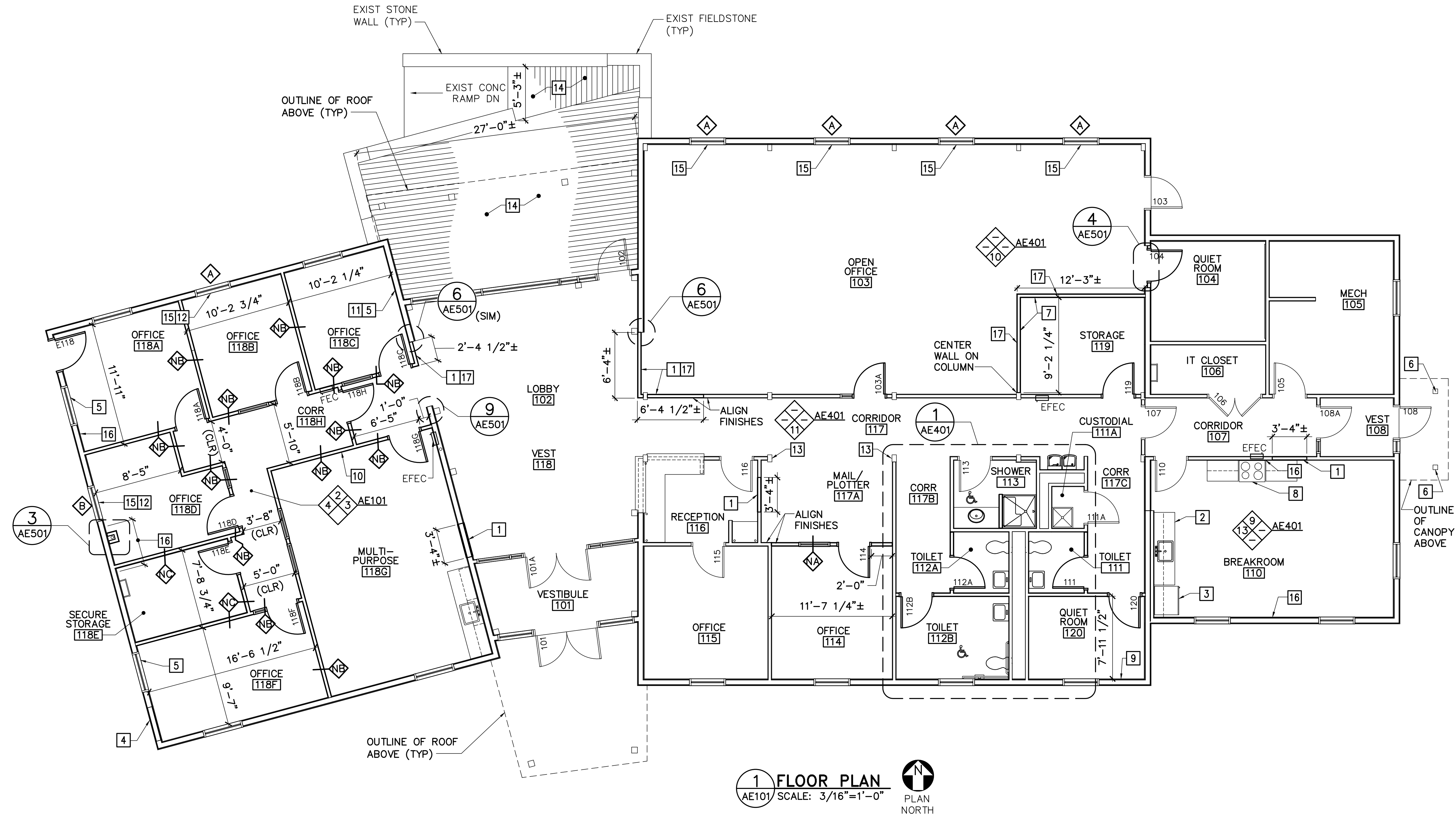
															
NO.				REVISIONS				DATE				BY			
U.S. FISH AND WILDLIFE SERVICE								CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING							
WALL TYPES															
ASSABET RIVER NATIONAL WILDLIFE REFUGE															
SUDBURY, MASSACHUSETTS															
DISCIPLINE SHEET NO AE001				DESIGNED: PNM		DWG NO.		5R-MA-1301-100.00				SHEET 12 OF 50			
				DRAWN: RMB											

GENERAL NOTES

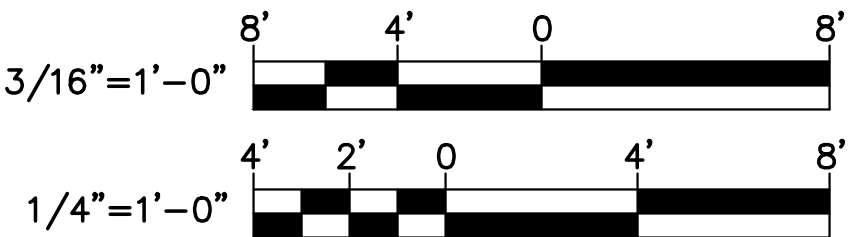
- SEE SHEET AE001 FOR WALL TYPES.
- FASTEN PARTITION SILL PLATES SO AS TO NOT PUNCTURE RADIANT FLOOR TUBING. SEE DETAIL 1/SF501.
- PATCH WALLS AT ELECTRICAL DEVICE REMOVALS LOCATIONS. COORDINATE WITH ELECTRICAL SHEETS.
- SEE SHEET AE601 FOR DOOR AND WINDOW SCHEDULES.
- SEE SHEET AE641 FOR ROOM FINISH SCHEDULE.
- ALIGN FINISHED FACES OF WALL INFILLS WITH ADJACENT WALLS UNLESS NOTED OTHERWISE.
- SEE SHEET AE001 FOR STANDARD MOUNTING HEIGHT.
- PATCH AND PREPARE FOR REPAINTING EXISTING WALLS AT WALL-MOUNTED ITEM REMOVAL LOCATIONS.

KEYNOTES (THIS SHEET ONLY)

- 2x4 WOOD STUDS WITH MINERAL WOOL BATT INSULATION AND (1) LAYER 5/8" GYPSUM BOARD EACH SIDE WALL INFILL.
- REINSTALL SALVAGED BASE CABINETS IN FORMER LOCATION. PROVIDE SOLID SURFACING COUNTERTOP. SEE PLUMBING SHEETS FOR SINK AND FAUCET.
- REINSTALL REFRIGERATOR.
- 2x6 WOOD STUD EXTERIOR WALL INFILL TO MATCH EXISTING. SEE DETAIL 5/AE501.
- PATCH AND PREPARE WALL FOR REPAINTING AT CABINET REMOVAL LOCATION.
- PROVIDE WOOD COLUMN BASE TRIM, SEE DETAIL 2/AE501.
- 2x4 WOOD STUDS AT 1'-4" OC WITH MINERAL WOOL BATT INSULATION AND (1) LAYER 5/8" GYPSUM BOARD EACH SIDE TO A HEIGHT OF 10'-3" ABOVE FINISHED FLOOR. SEE STRUCTURAL SHEETS. PROVIDE 1x4 WOOD TRIM AT TOP OF WALL ON ROOM 103 SIDE.
- INSTALL GOVERNMENT FURNISHED RANGE.
- PATCH AND PREPARE WALL FOR REPAINTING AT BABY CHANGING STATION REMOVAL LOCATION.
- PROVIDE BLOCKING IN WALL FOR WALL MOUNTED TELEVISION AND AUDIO VISUAL EQUIPMENT.
- REINSTALL SALVAGED ACCESS PANEL FLUSH WITH GYPSUM BOARD.
- PROVIDE WINDOW ROLLER SHADE TO MATCH EXISTING ADJACENT. BASIS OF DESIGN PRODUCT, DRAPER'S MANUAL FLEX SHADE, 3% OPENNESS FACTOR, COLOR WHITE.
- PATCH WOOD COLUMN AND BASE AT WALL REMOVAL LOCATION. FINISH TO MATCH EXISTING ADJACENT.
- 5/4"x6" COMPOSITE DECKING BOARDS.
- PROVIDE 1x HORIZONTAL WOOD FURRING AND ONE LAYER 5/8" GYPSUM BOARD FOR THE FULL HEIGHT OF THE WALL AT REMOVALS LOCATIONS.
- PATCH AND PREPARE WALL FOR REPAINTING AT PARTITION REMOVAL LOCATION.
- PROVIDE WOOD BASE MATCHING EXISTING ADJACENT AT NEW WALL LOCATIONS, SEE 3/AE641.



GRAPHIC SCALES



CHECK GRAPHIC SCALES BEFORE USING



NO.	REVISIONS			DATE	BY
U.S. FISH AND WILDLIFE SERVICE				CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING	
FLOOR PLAN					
ASSABET RIVER NATIONAL WILDLIFE REFUGE				SUDBURY, MASSACHUSETTS	
DESIGNED:	PNM	DWG NO:		5R-MA-1301-100.00	
DRAWN:	RMB			SHEET 13 OF 50	



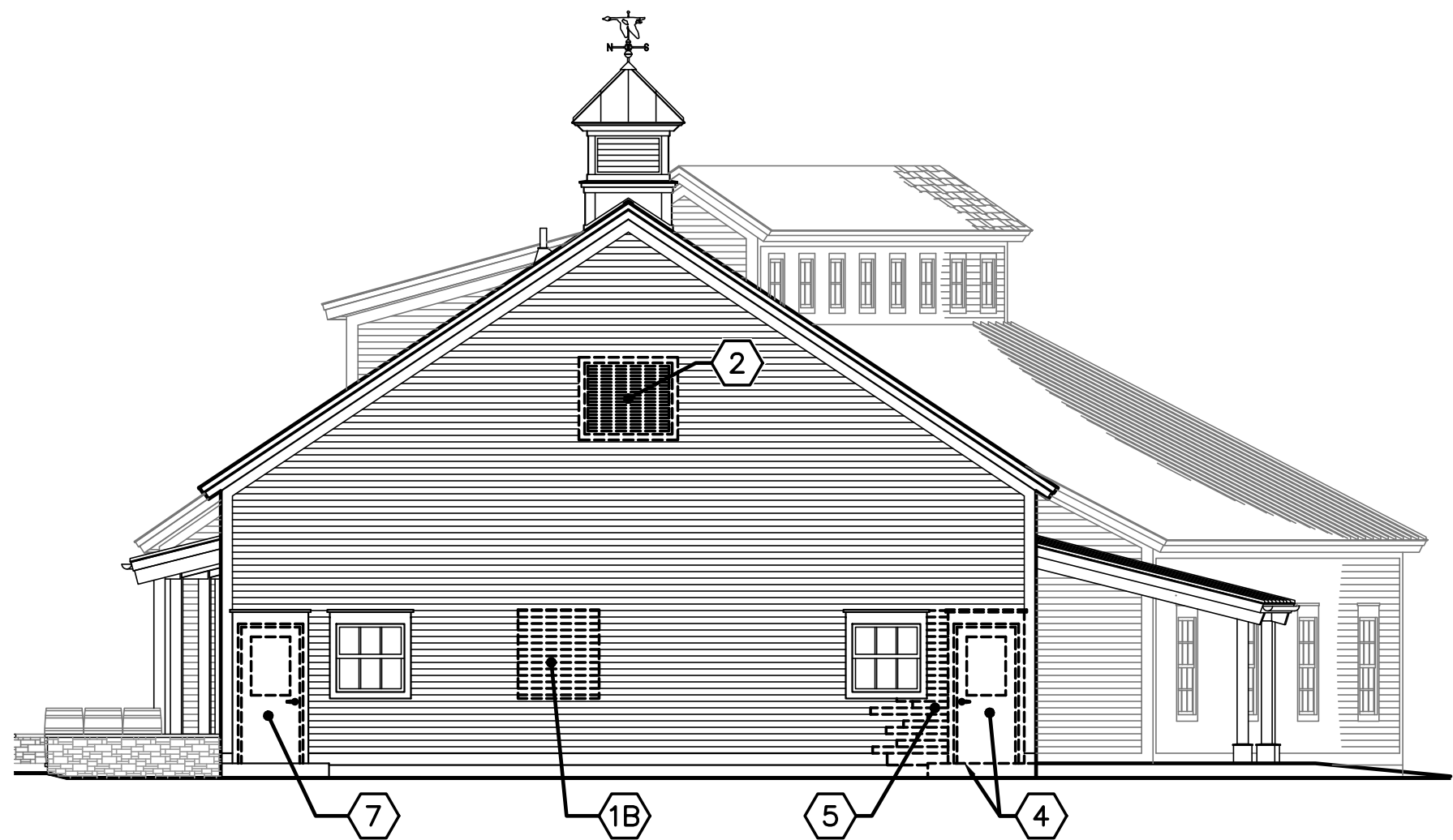
1 NORTH ELEVATION REMOVALS
AE201 SCALE: 1/8"=1'-0"



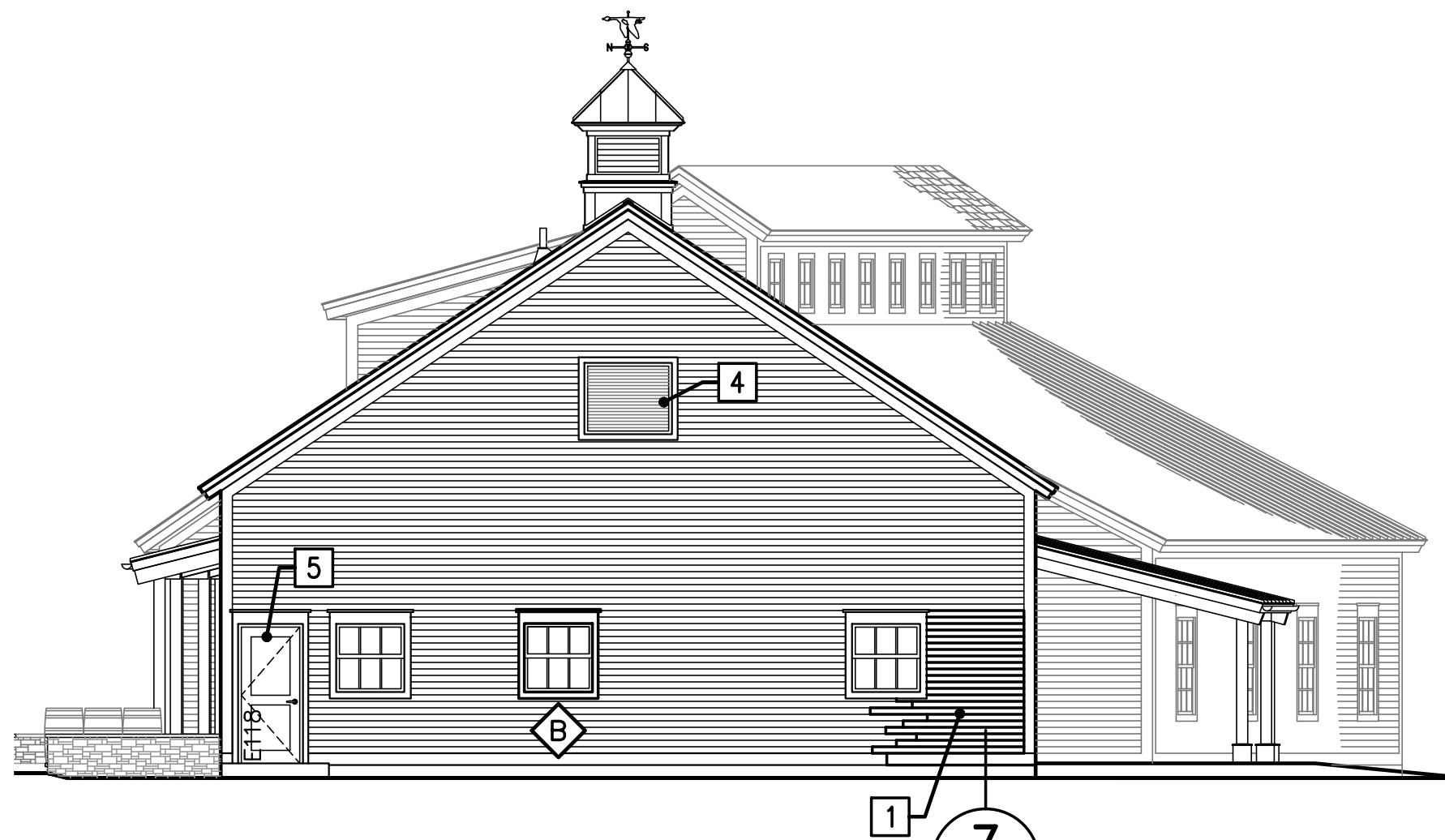
2 NORTH ELEVATION
AE201 SCALE: 1/8"=1'-0"

GENERAL NOTE

1. SEE SHEET AE601 FOR DOOR AND WINDOW TYPES.



3 WEST ELEVATION REMOVALS
AE201 SCALE: 1/8"=1'-0"



4 WEST ELEVATION
AE201 SCALE: 1/8"=1'-0"

REMOVALS KEYNOTES (THIS SHEET ONLY)

- 1 REMOVE PORTION OF EXTERIOR WALL SYSTEM INCLUDING INTERIOR GYPSUM BOARD THE FULL HEIGHT OF THE WALL TO CREATE ROUGH OPENING FOR WINDOW. SILL HEIGHT TO MATCH EXISTING ADJACENT WINDOWS. COORDINATE EXTENTS OF REMOVALS WITH STRUCTURAL SHEETS. WINDOW MANUFACTURER'S REQUIREMENTS, AND TO COMPLETE WINDOW AND FLASHING INSTALLATION AS FOLLOWS:
A: 5'-0" HIGH x 3'-6" WIDE
B: 3'-6" HIGH x 3'-6" WIDE
- 2 REMOVE AND SALVAGE FOR REINSTALLATION WOOD TRIM AND METAL LOUVER TO ACCOMMODATE MECHANICAL SCOPE. SEE MECHANICAL SHEETS.
- 3 REMOVE WOOD TRIM AND WOOD BLOCKING AT COLUMN BASE.
- 4 REMOVE DOOR, FRAME, HARDWARE, WOOD TRIM, AND CONCRETE STOOP.
- 5 REMOVE FIBER CEMENT SIDING AND SKIRT TRIM BOARD TO NEAREST BUTT JOINT.
- 6 REMOVE LOUVER AND WOOD TRIM. REMOVE PORTION OF EXTERIOR WALL SYSTEM TO CREATE OPENING FOR LARGER LOUVER. COORDINATE EXTENTS WITH MECHANICAL SHEETS.
- 7 REMOVE DOOR AND HARDWARE.

KEYNOTES (THIS SHEET ONLY)

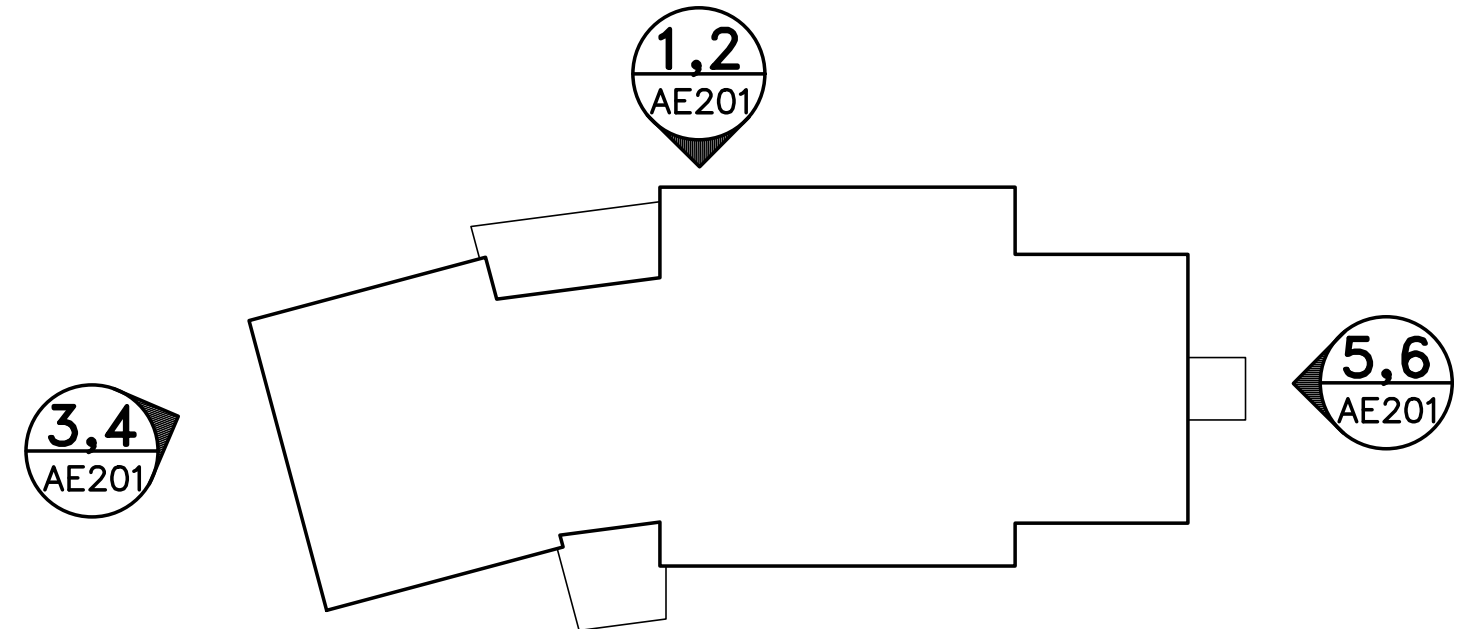
- 1 PROVIDE 2x6 WOOD STUD EXTERIOR WALL SYSTEM AND FIBER CEMENT SKIRT TRIM BOARD TO MATCH EXISTING, SEE DETAIL 5/AE501. PAINT SIDING AND TRIM TO MATCH EXISTING.
- 2 PROVIDE WOOD COLUMN BASE TRIM, SEE DETAIL 2/AE501.
- 3 PROVIDE METAL LOUVER (PAINT) AND WOOD TRIM (PAINT). COORDINATE SIZE WITH MECHANICAL SHEETS. PROVIDE METAL FLASHING ABOVE HEAD TRIM.
- 4 REINSTALL SALVAGED METAL LOUVER AND WOOD TRIM (PAINT) UPON COMPLETION OF MECHANICAL SCOPE. SEE MECHANICAL SHEETS.
- 5 PROVIDE DOOR AND HARDWARE IN EXISTING OPENING.



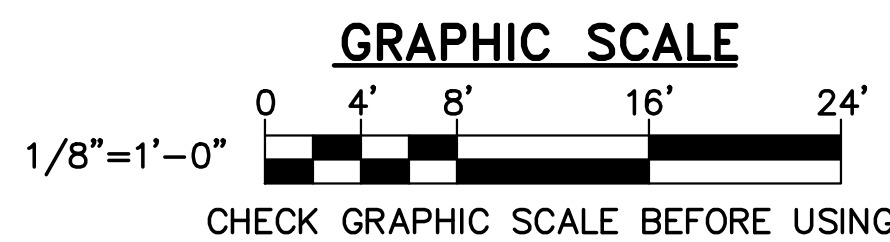
5 EAST ELEVATION REMOVALS
AE201 SCALE: 1/8"=1'-0"



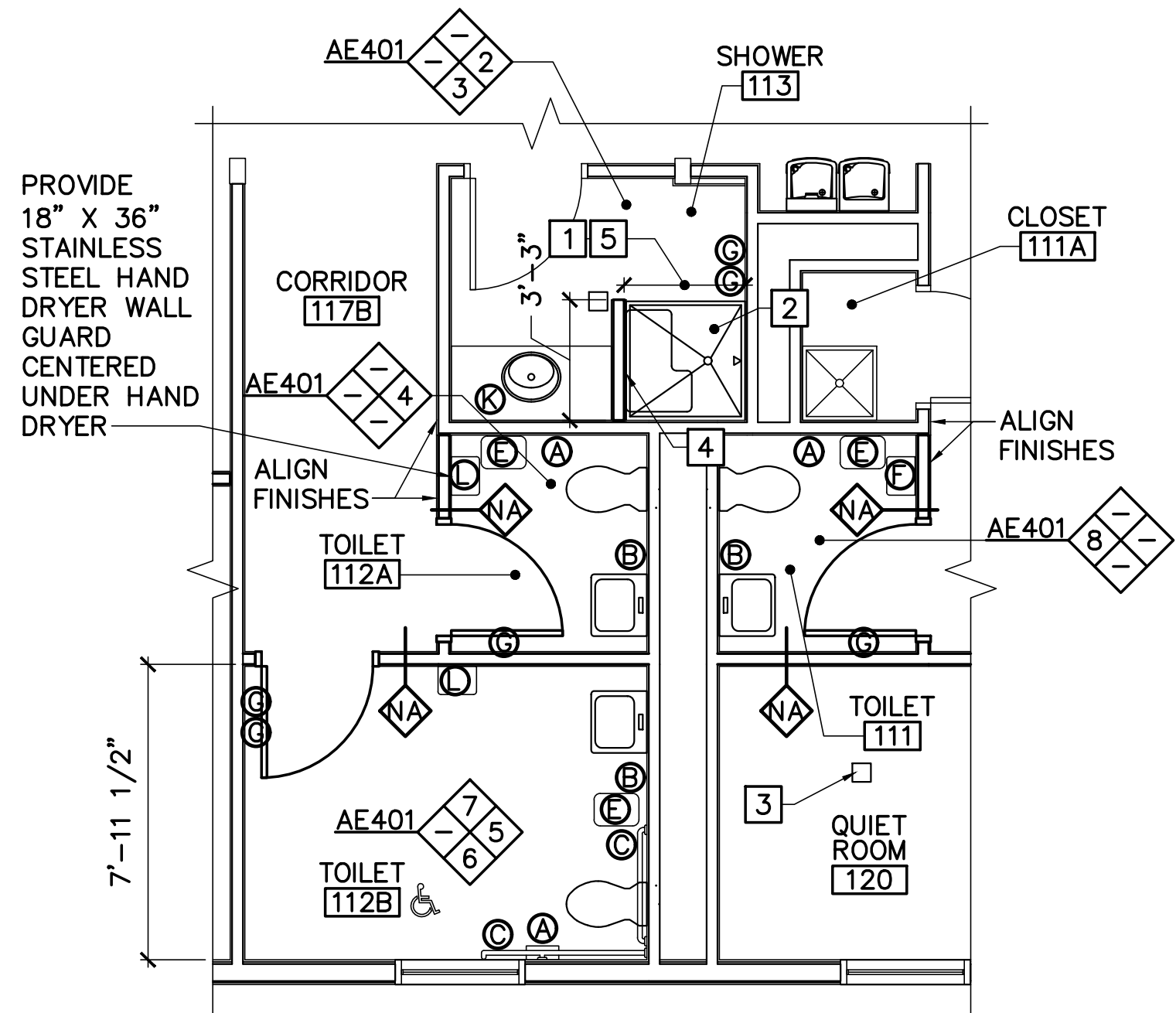
6 EAST ELEVATION
AE201 SCALE: 1/8"=1'-0"



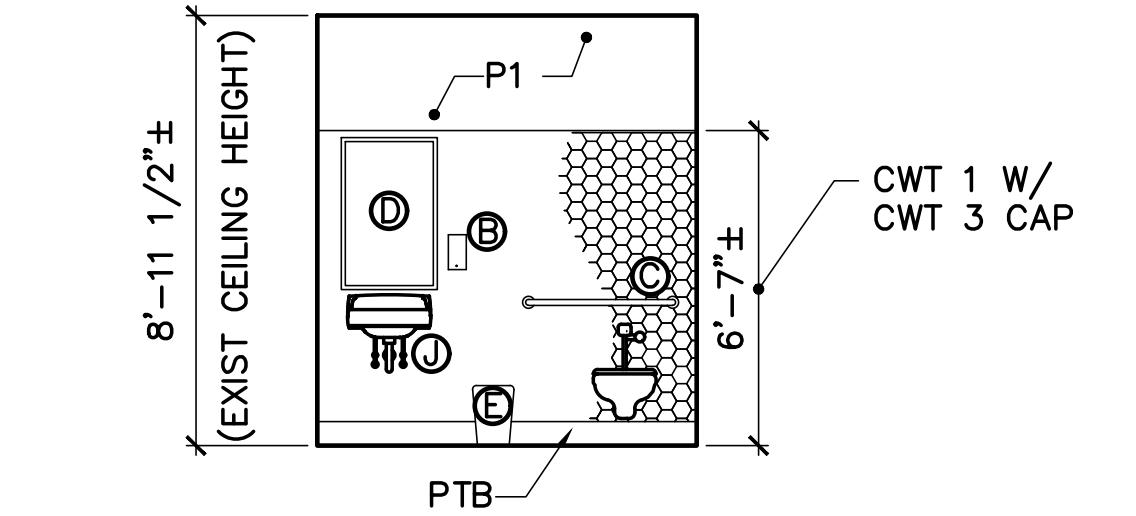
KEY PLAN
NOT TO SCALE



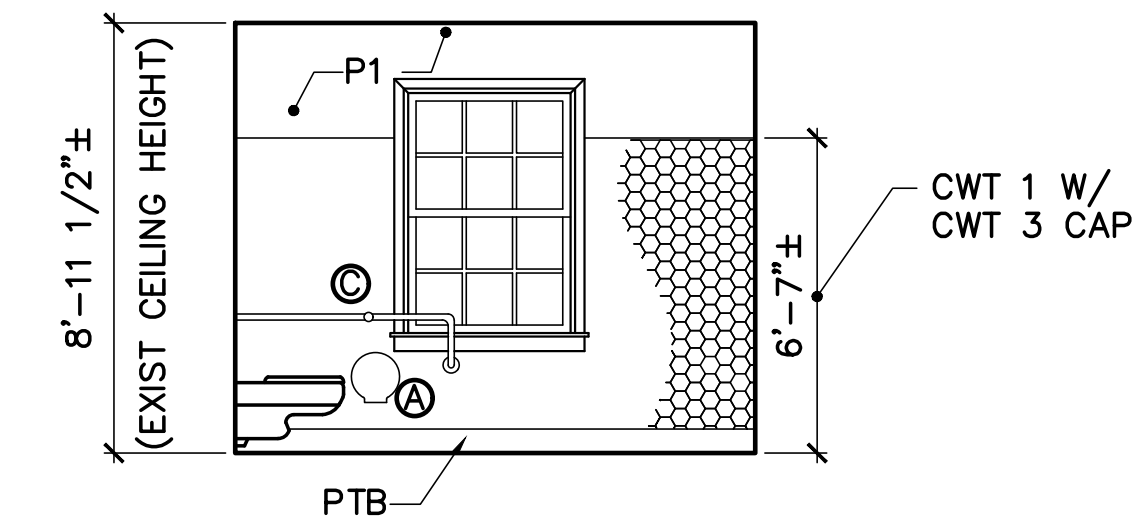
						
	NO.		REVISIONS		DATE	
					BY	
U.S. FISH AND WILDLIFE SERVICE						CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING
EXTERIOR ELEVATIONS						
ASSABET RIVER NATIONAL WILDLIFE REFUGE						SUDBURY, MASSACHUSETTS
DISCIPLINE		DESIGNED:	DWG. NO.			
SHEET NO. AE201		PNM	5R-MA-1301-100.00	SHEET 14 OF 50		
		DRAWN: RMB				



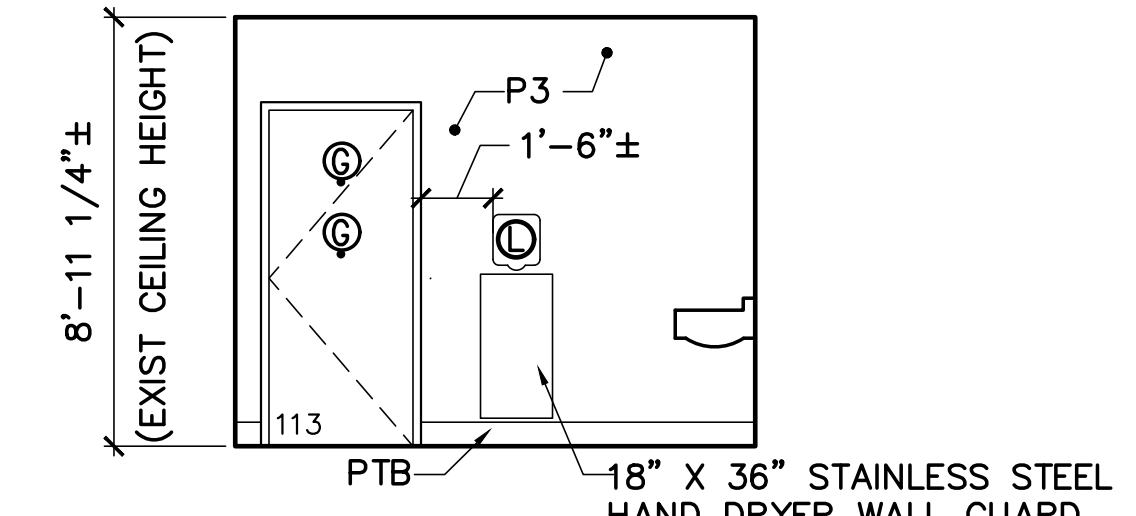
1 ENLARGED PARTIAL FLOOR PLAN
AE101/AE401 SCALE: 1/4"=1'-0"



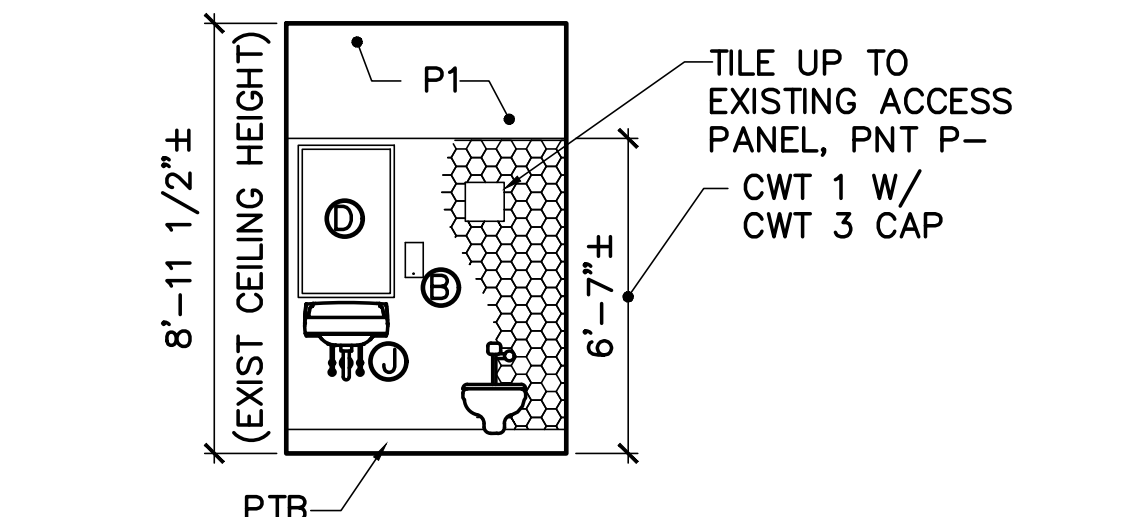
5 TOILET 112B ELEVATION
AE401 SCALE: 1/4"=1'-0"



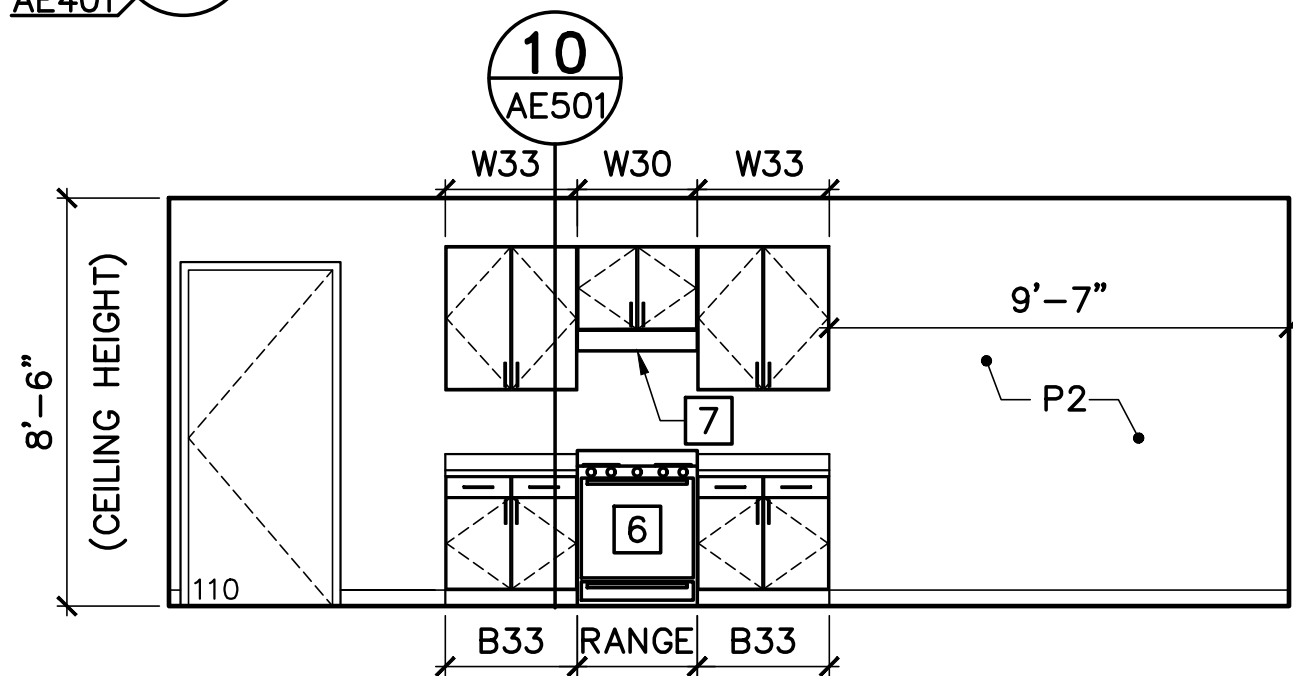
6 TOILET 112B ELEVATION
AE401 SCALE: 1/4"=1'-0"



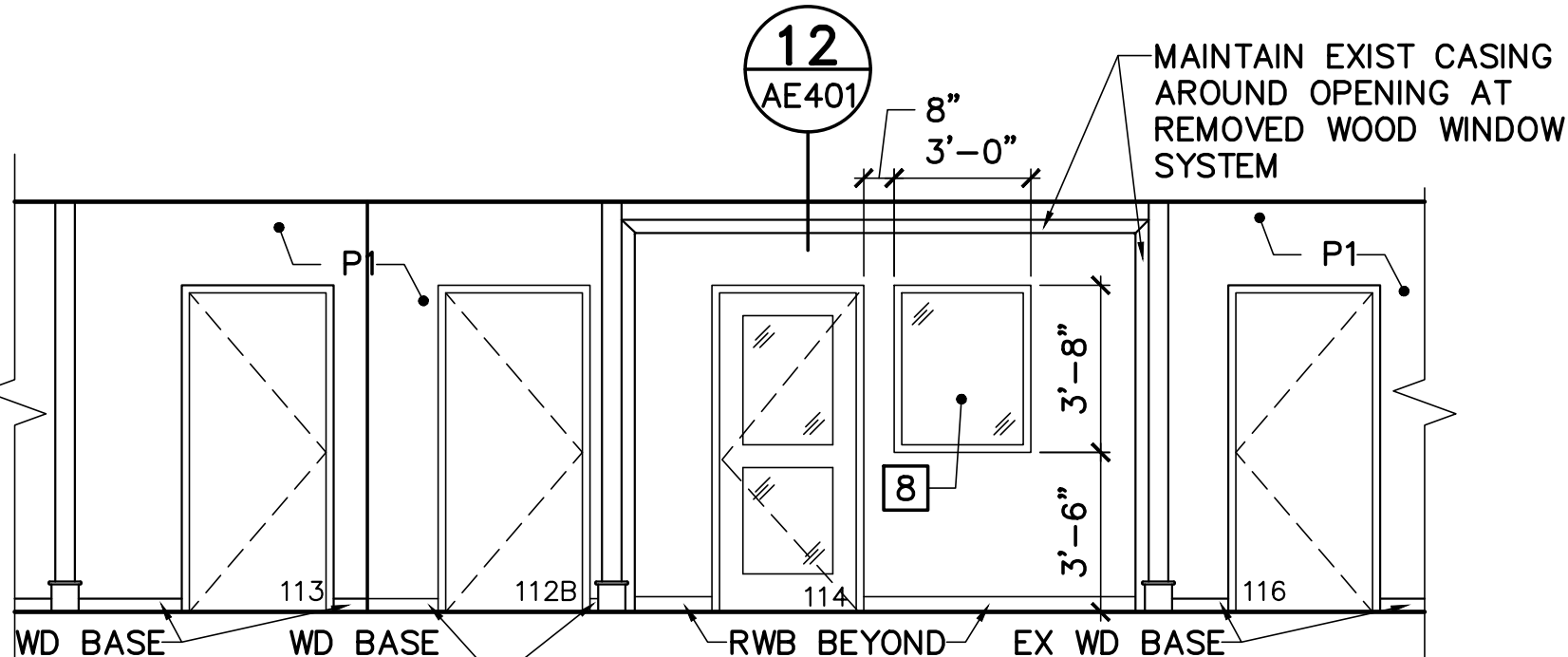
7 TOILET 112B ELEVATION
AE401 SCALE: 1/4"=1'-0"



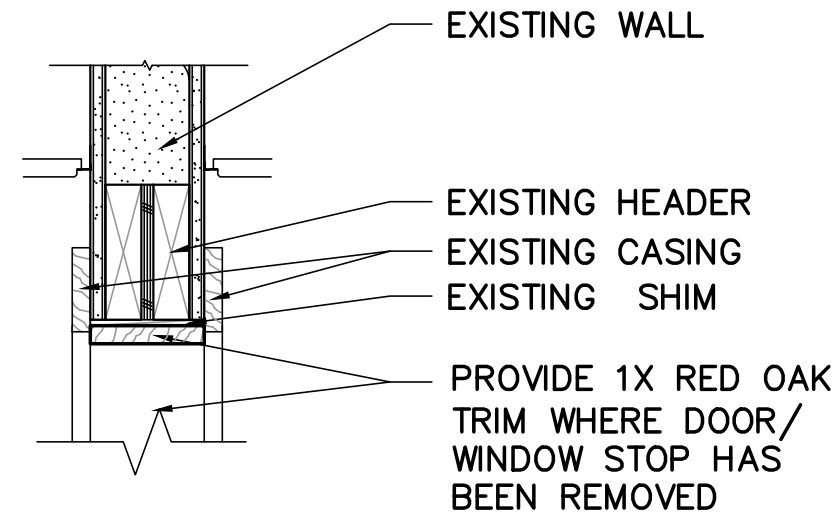
8 TOILET 111 ELEVATION
AE401 SCALE: 1/4"=1'-0"



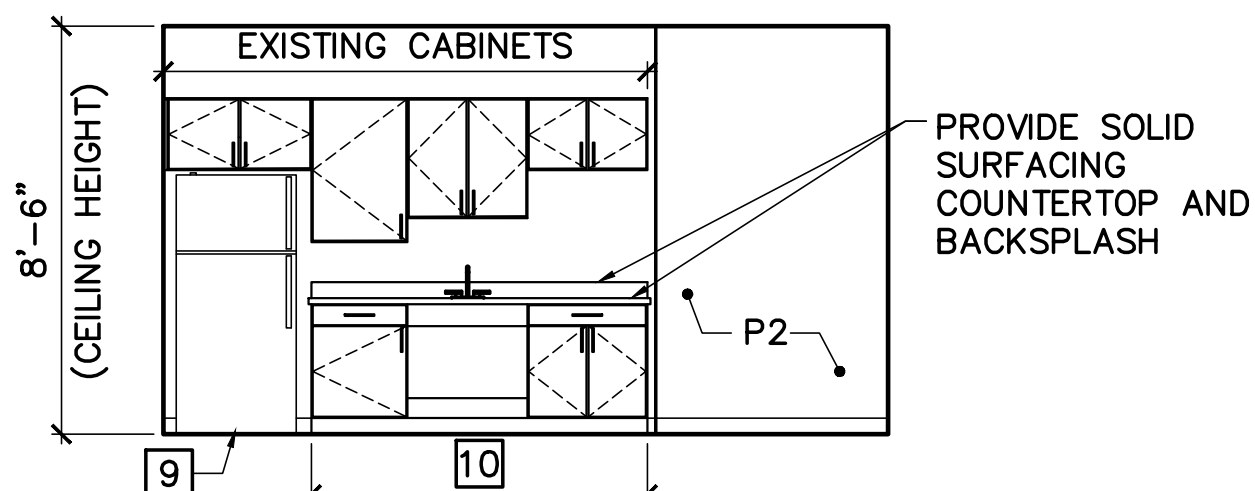
10 OPEN OFFICE 103 ELEVATION
AE101/AE401 SCALE: 1/4"=1'-0"



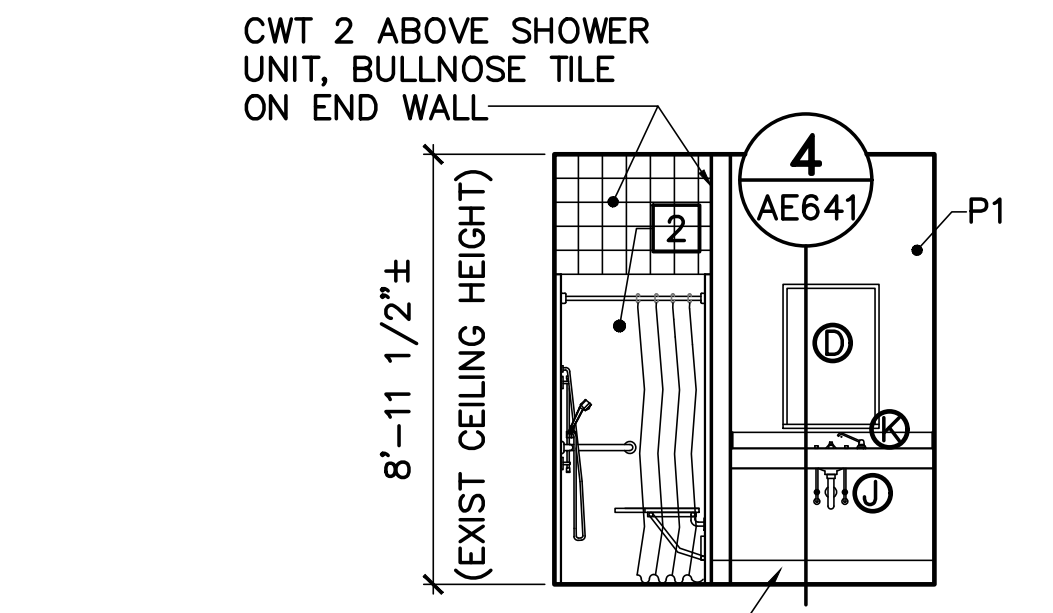
11 CORRIDOR 117 ELEVATION
AE101/AE401 SCALE: 1/4"=1'-0"



12 HEADER DETAIL
AE401 SCALE: 1-1/2"=1'-0"

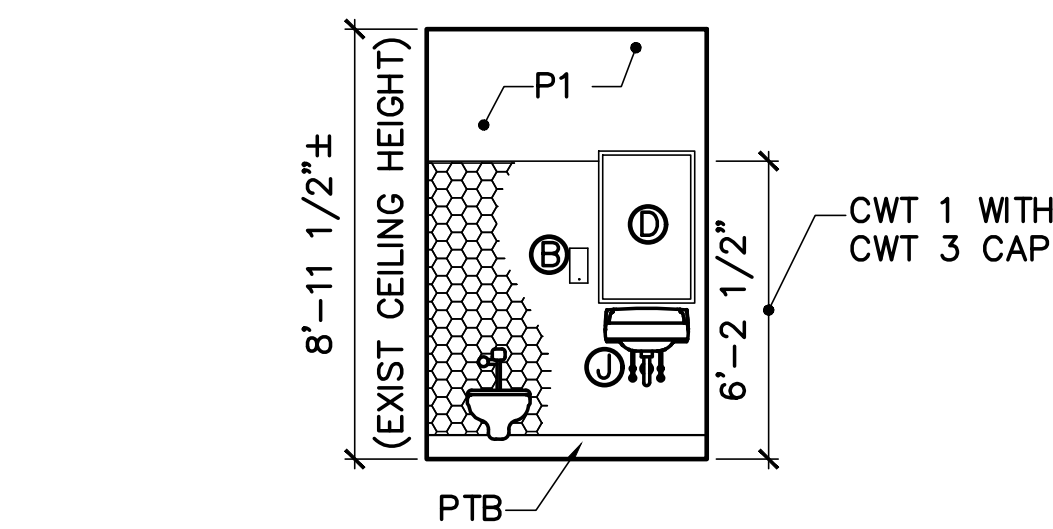


13 BREAKROOM 110 ELEVATION
AE101/AE401 SCALE: 1/4"=1'-0"



2 SHOWER 113 ELEVATION
AE401 SCALE: 1/4"=1'-0"

3 SHOWER 113 ELEVATION
AE401 SCALE: 1/4"=1'-0"



4 TOILET 112A ELEVATION
AE401 SCALE: 1/4"=1'-0"

GENERAL NOTES

- SEE SHEET AE001 FOR WALL TYPES.
- SEE SHEET AE601 FOR DOOR TYPES.

KEYNOTES (THIS SHEET ONLY)

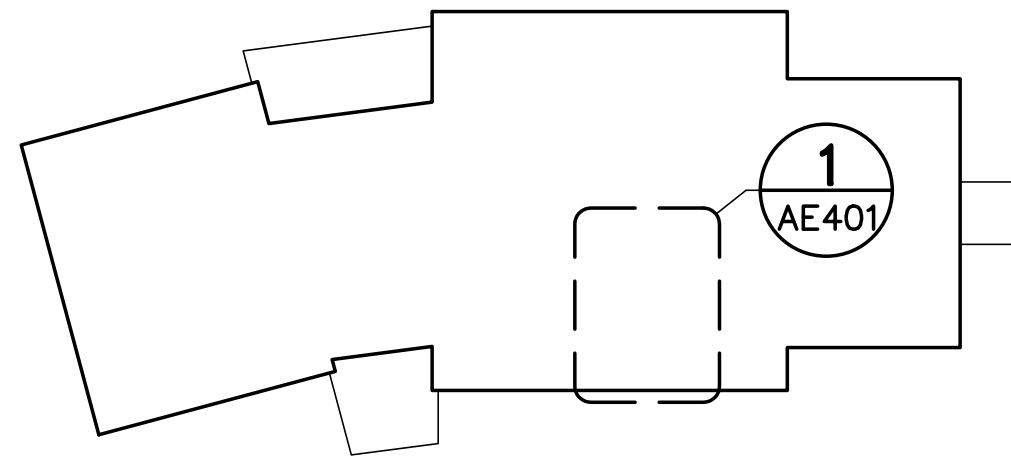
- COORDINATE WALL LOCATION WITH SHOWER UNIT MANUFACTURER'S REQUIREMENTS.
- ADA COMPLIANT ACCESSIBLE FIBERGLASS SHOWER UNIT WITH GRAB BARS, FOLDING SEAT, AND SHOWER ROD AND CURTAIN.
- LEVEL CONCRETE AROUND CAPPED FLOOR DRAIN. PROVIDE SELF-LEVELER APPROVED BY CARPET TILE ADHESIVE MANUFACTURER TO PRODUCE A UNIFORM AND SMOOTH SUBSTRATE.
- 2X4 WOOD STUD PARTITION TO EXISTING CEILING WITH 5/8" GYPSUM BOARD EACH SIDE.
- PROVIDE CONCRETE FLOOR INFILL AT REMOVAL LOCATION. SEE STRUCTURAL SHEETS.
- INSTALL GOVERNMENT FURNISHED RANGE.
- EXHAUST HOOD. SEE MECHANICAL DRAWINGS.
- INTERIOR WINDOW. SEE 4/AE601.
- REINSTALL REFRIGERATOR.
- REINSTALL SALVAGED BASE CABINETS.

TOILET ROOM ACCESSORY SCHEDULE

LTR	ITEM	NOTES	BASIS OF DESIGN PRODUCT
A	TOILET TISSUE DISPENSER	REINSTALL EXISTING	EXISTING
B	SOAP DISPENSER	WALL MOUNTED	BOBRICK'S B-2111
C	GRAB BAR	REINSTALL EXISTING	EXISTING
D	24" x 36" MIRROR	REINSTALL EXISTING	EXISTING
E	WASTE RECEPTACLE	FREE STANDING	RUBBERMAID 28 QUART
F	PAPER TOWEL DISPENSER	WALL MOUNTED	BOBRICK'S B-72860
G	COAT HOOK	-	BOBRICK'S B-9542
H	NOT USED	-	-
I	UNDER LAV GUARD	-	-
J	SOAP DISPENSER	REINSTALL SOAP DISPENSER FROM WOMEN 112	EXISTING
K	ELECTRIC HAND DRYER	REINSTALL EXISTING	EXISTING

NOTES:

- SEE SHEET AE001 FOR MOUNTING HEIGHTS.
- BASIS OF DESIGN PRODUCTS ARE LISTED FOR AESTHETIC COORDINATION PURPOSES ONLY. PRODUCTS FROM OTHER MANUFACTURERS MAY BE PROVIDED IF THE PRODUCTS APPROXIMATE THOSE INDICATED, CONFORM TO THE SPECIFICATIONS, AND ARE APPROVED BY THE CONTRACTING OFFICER.

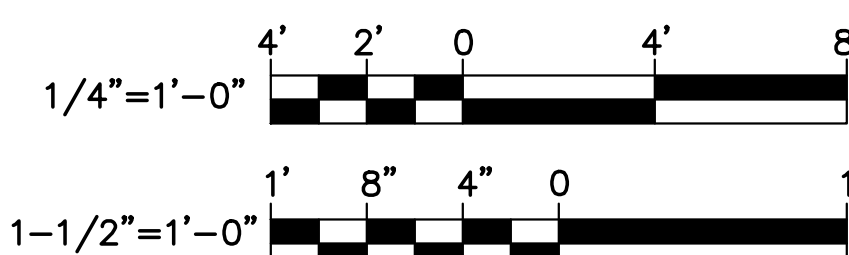


KEY PLAN

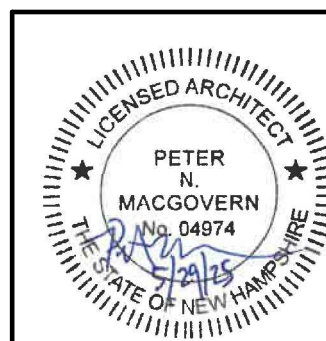
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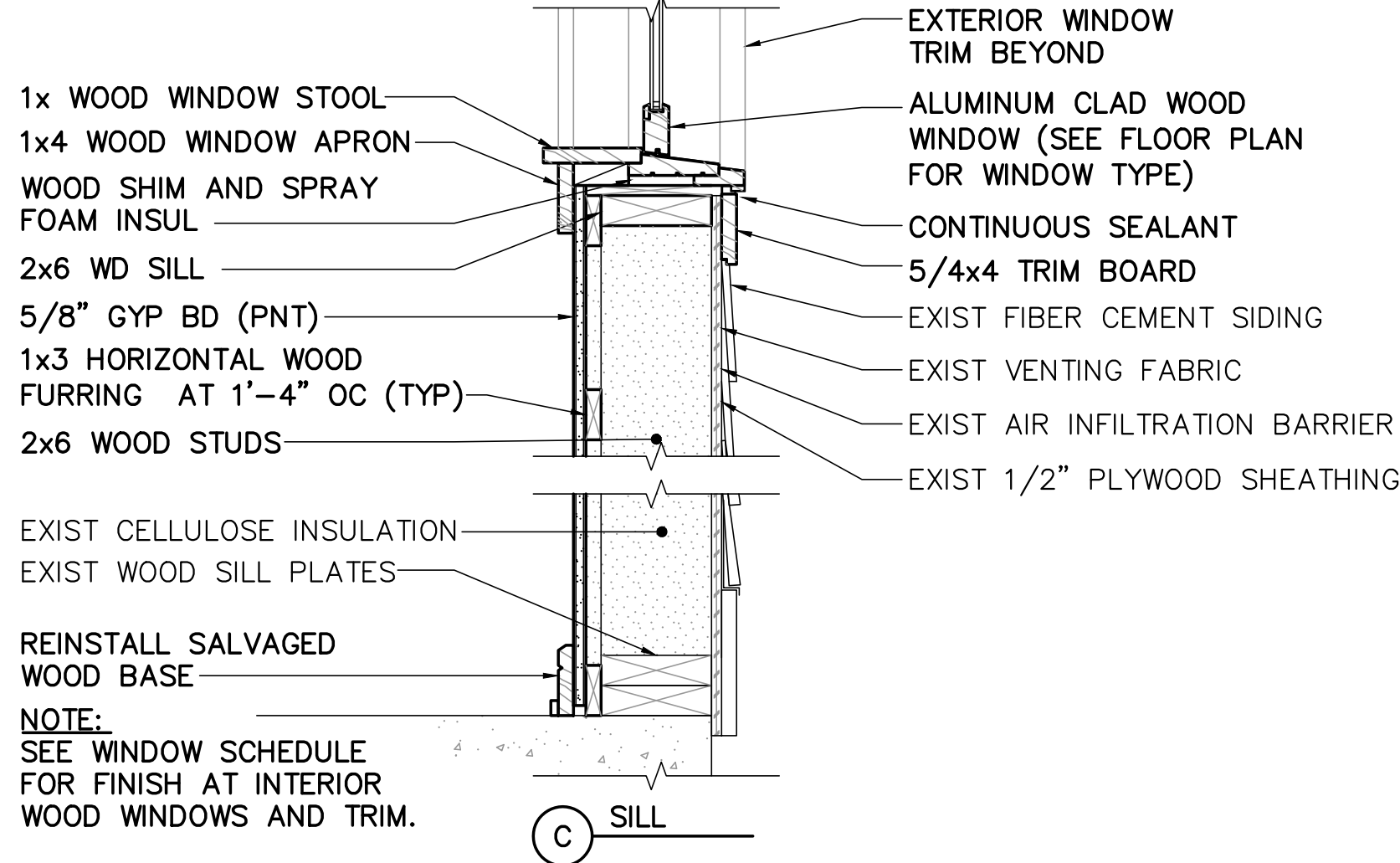
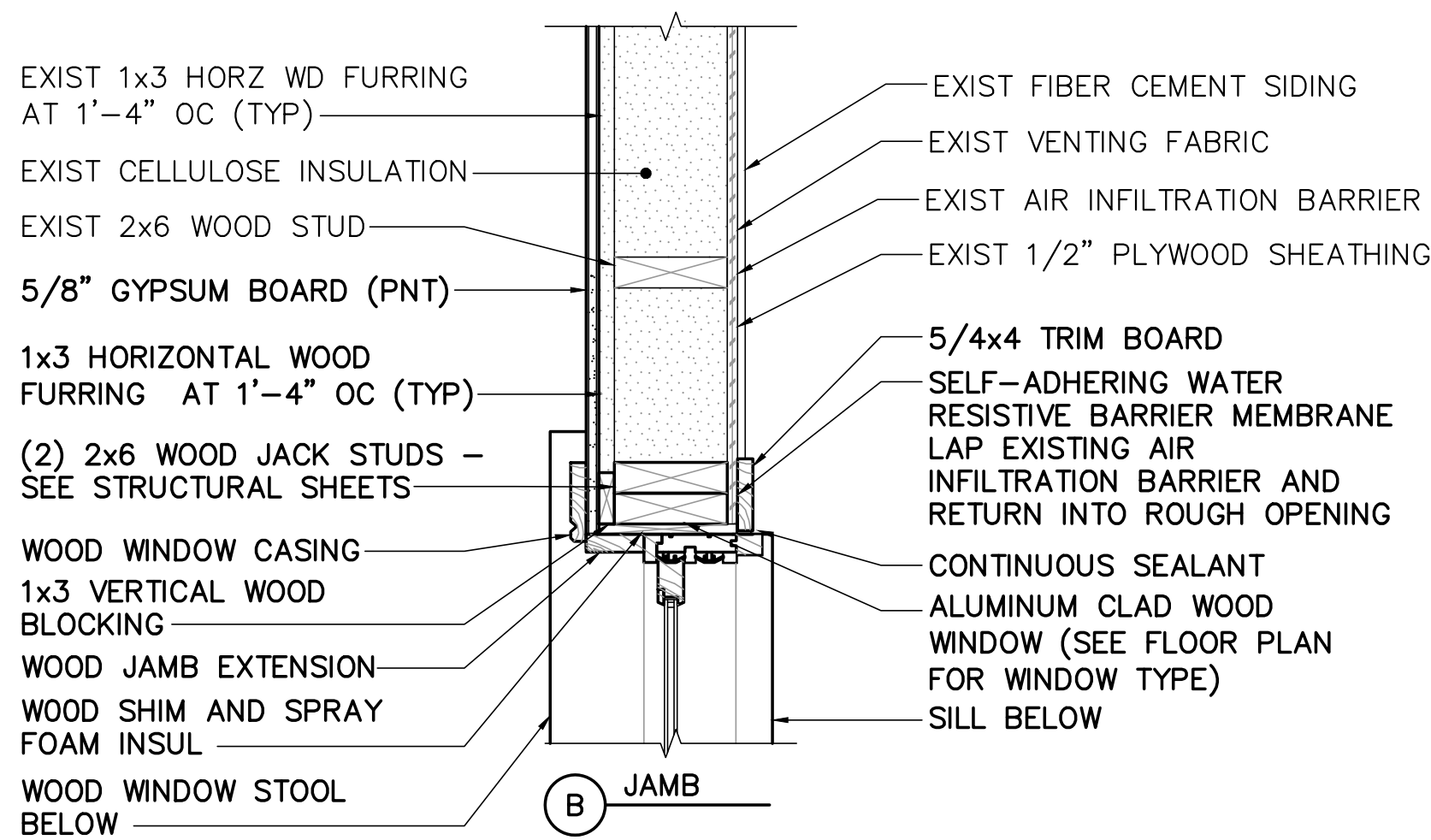
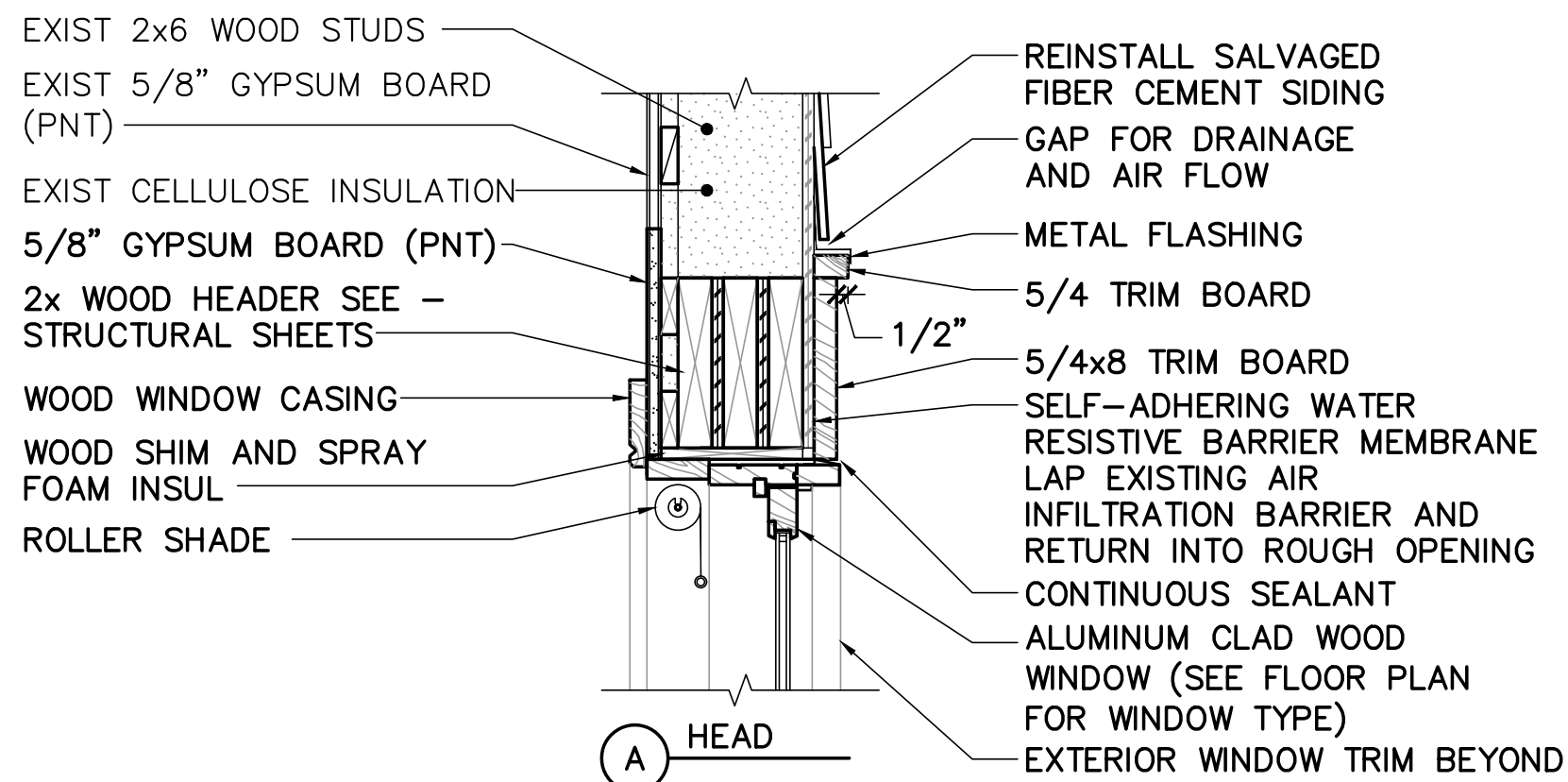


GRAPHIC SCALES



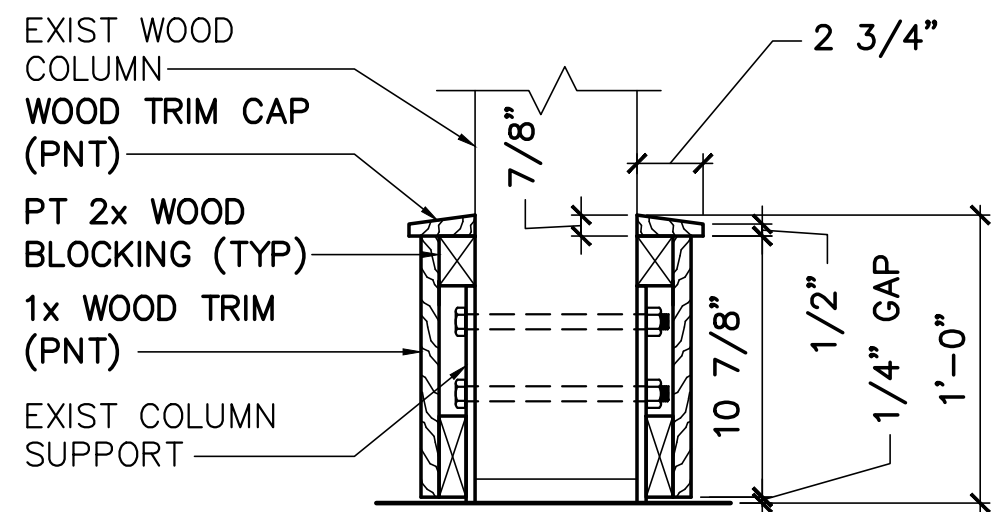
CHECK GRAPHIC SCALES BEFORE USING





1 EXTERIOR WINDOW DETAILS

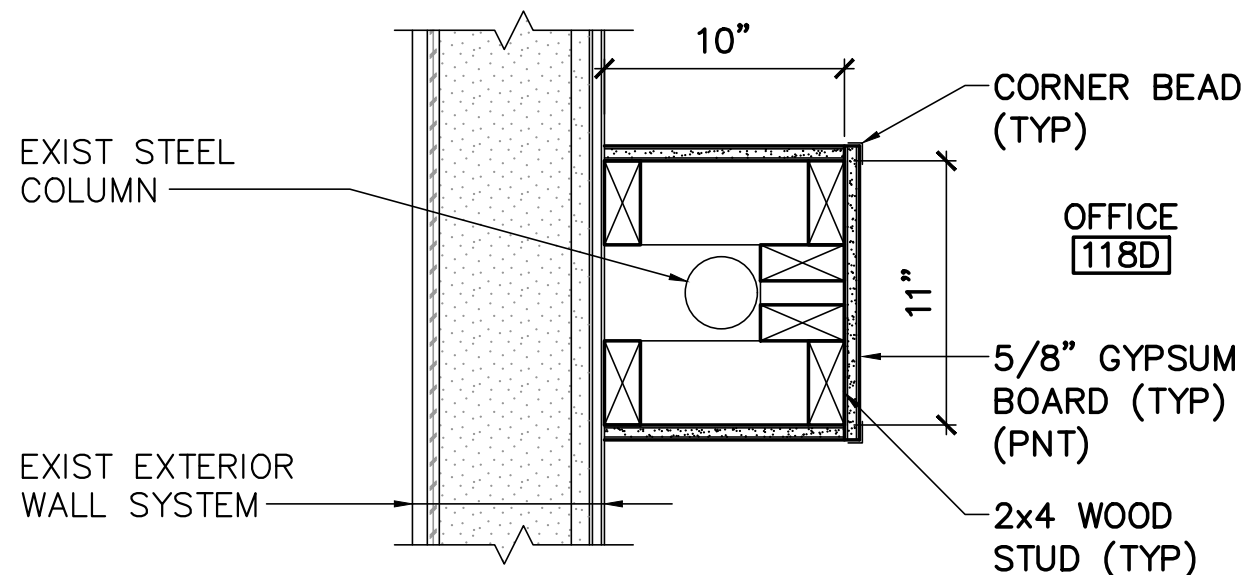
AE501 SCALE: 1-1/2"=1'-0"



NOTE: PROVIDE TRIM ON ALL FOUR SIDES OF COLUMN

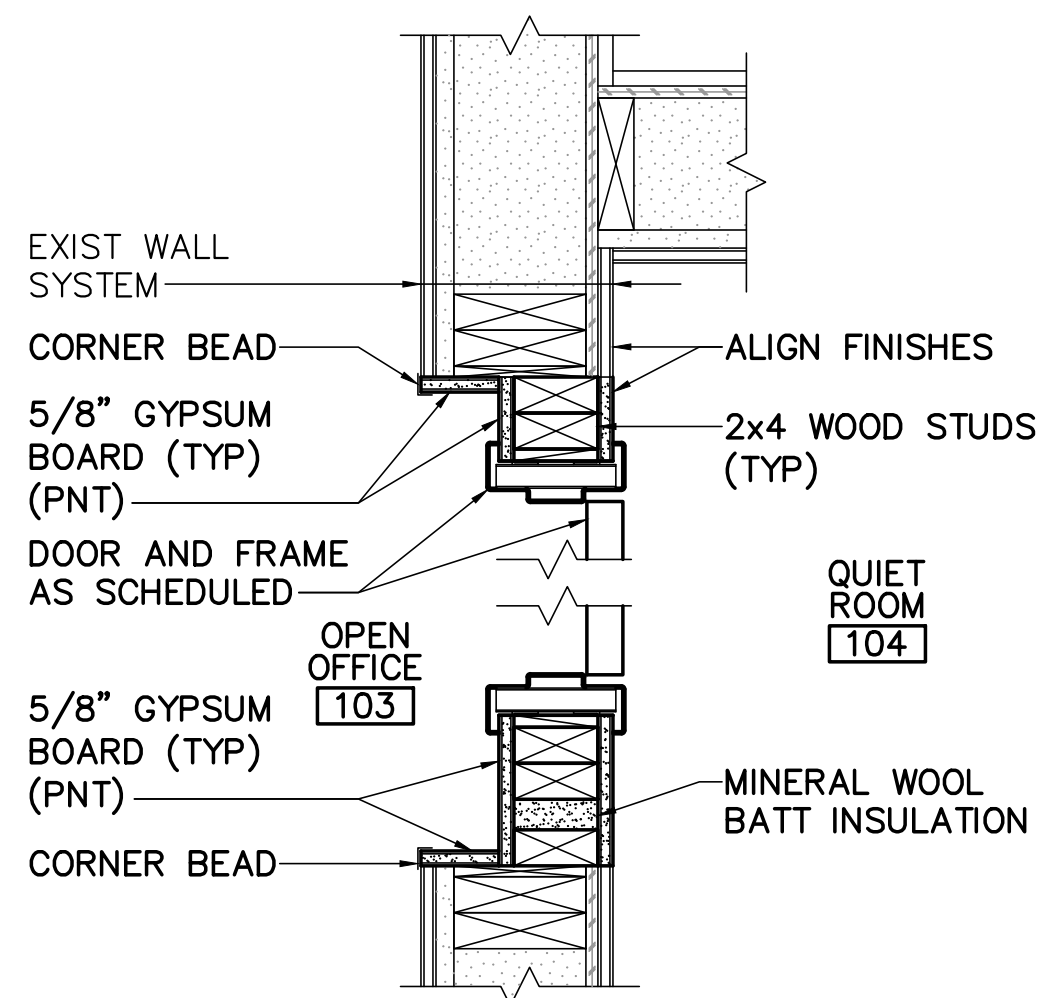
2 EXTERIOR COLUMN BASE DETAIL

AE501 SCALE: 1-1/2"=1'-0"



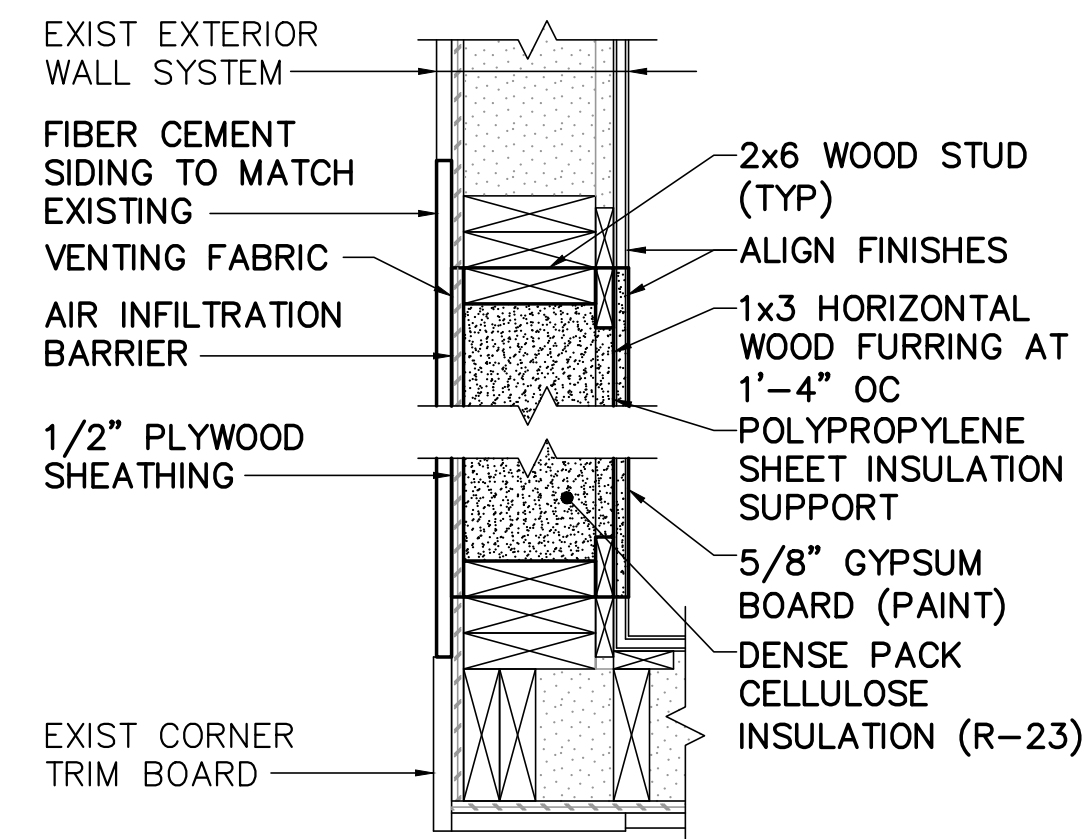
3 PLAN DETAIL

AE501 SCALE: 1-1/2"=1'-0"



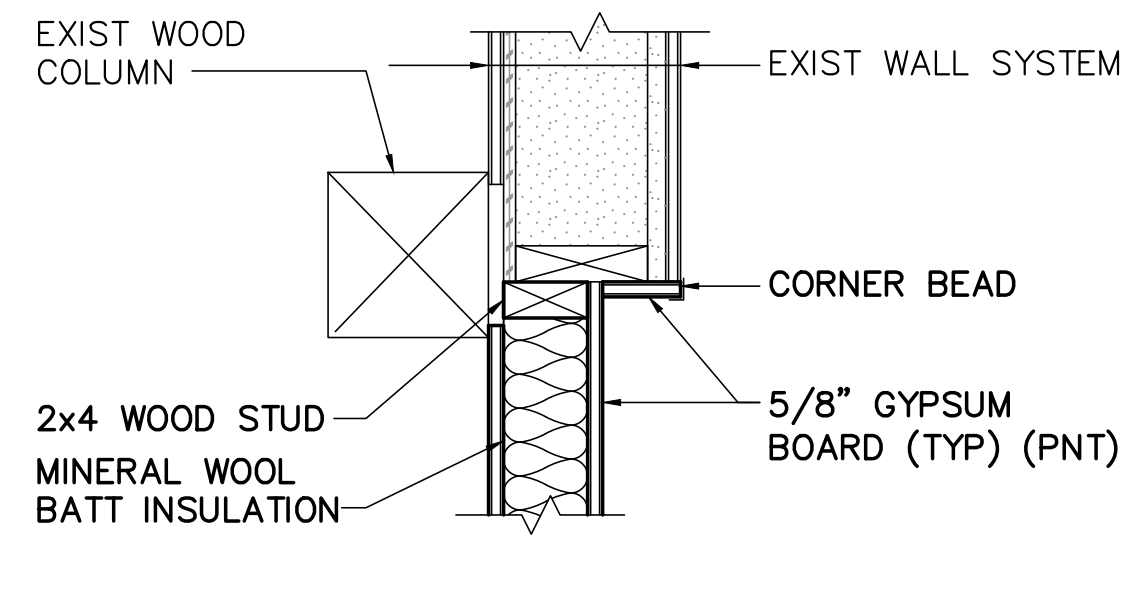
4 INTERIOR WALL INFILL DETAIL

AE501 SCALE: 1-1/2"=1'-0"



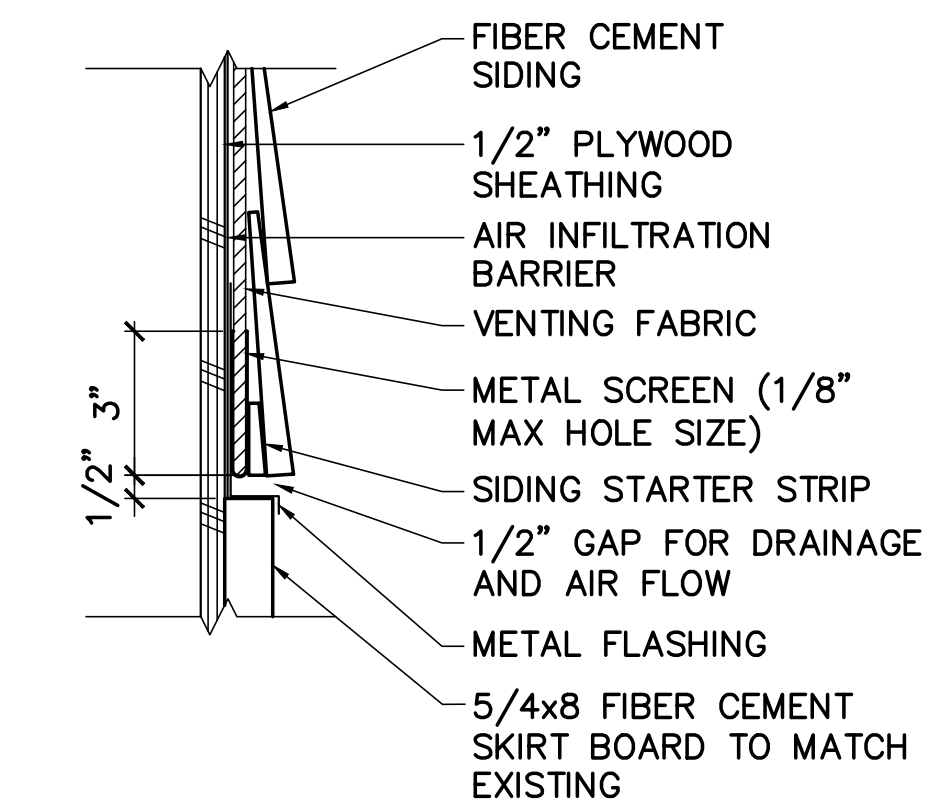
5 EXTERIOR WALL INFILL DETAIL

AE501 SCALE: 1-1/2"=1'-0"



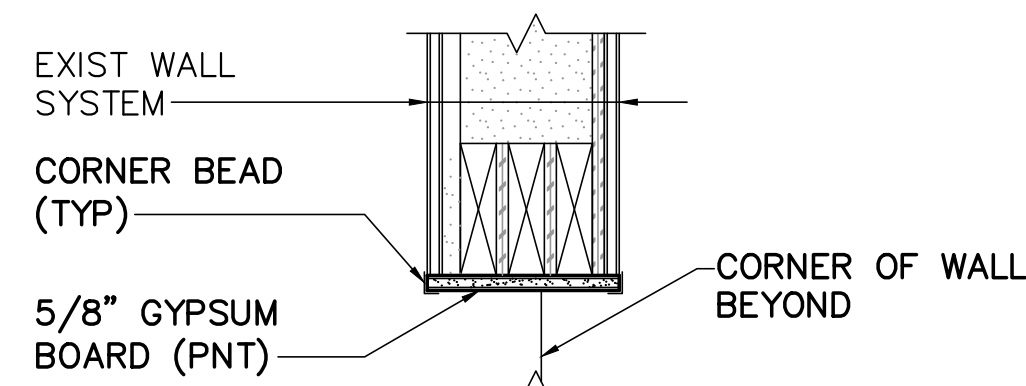
6 INTERIOR WALL INFILL DETAIL

AE501 SCALE: 1-1/2"=1'-0"



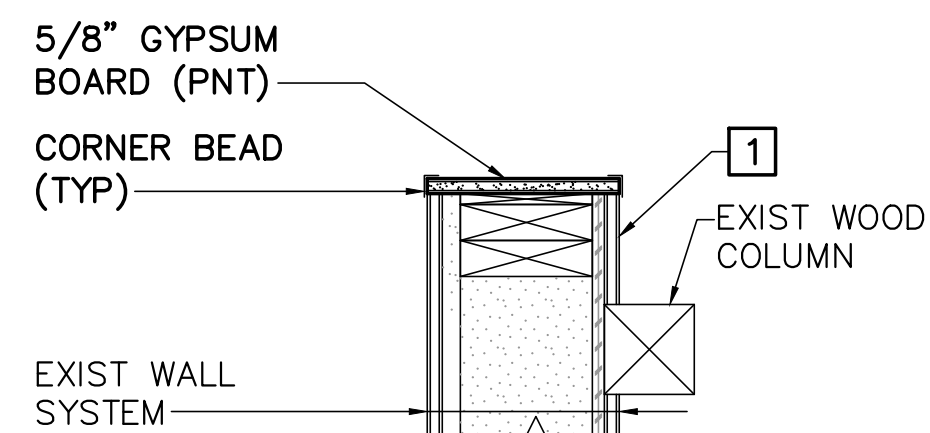
7 EXTERIOR SIDING DETAIL

AE501 NOT TO SCALE



8 SOFFIT DETAIL

AE501 SCALE: 1-1/2"=1'-0"



9 WALL DETAIL

AE501 SCALE: 1-1/2"=1'-0"

GRAPHIC SCALE



CHECK GRAPHIC SCALE BEFORE USING

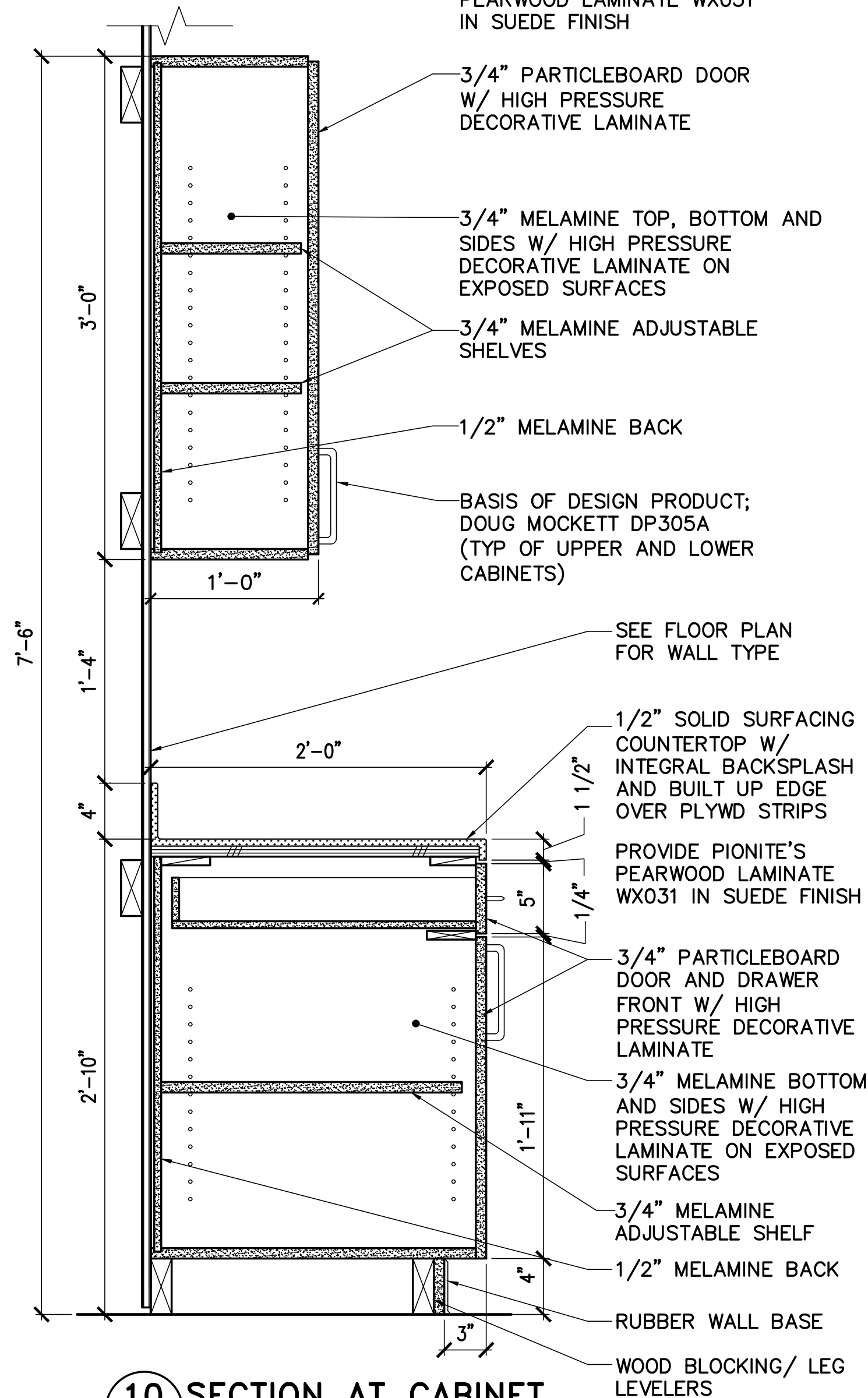
GENERAL NOTE

- EXTERIOR TRIM BOARDS: PROVIDE FIBER CEMENT TRIM BOARDS.

KEYNOTE (THIS SHEET ONLY)

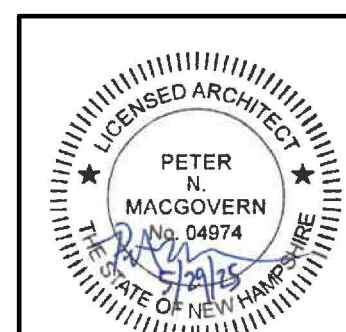
- REMOVE EXISTING WOOD WALL BASE FROM OPENING TO EXISTING WALL COLUMN. PROVIDE WOOD WALL BASE (SEE DETAIL 3/AE641) FROM THE EXISTING WOOD COLUMN TO THE OPENING (WRAP OPENING).

PROVIDE PIONITE'S PEARWOOD LAMINATE WX031 IN SUEDE FINISH



10 SECTION AT CABINET

AE501 SCALE: 1-1/2"=1'-0"



DISCIPLINE
SHEET NO AE501

NO.	REVISIONS	DATE	BY
1	CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING		
DETAILS			
ASSABET RIVER NATIONAL WILDLIFE REFUGE			
DESIGNED: PNM	DWG NO: 5R-MA-1301-100.00	SUBURRY, MASSACHUSETTS	
DRAWN: RMB		SHEET 16 OF 50	

ROOM FINISH SCHEDULE

NO.	DESCRIPTION	FLOOR	BASE	WALLS				CEILING	NOTES
				NORTH	EAST	SOUTH	WEST		
101	VESTIBULE	EXIST WALK OFF	EX WD	P2	P2	P2	P2	EXIST	—
102	LOBBY	EXIST CONC	EX WD	P2	P2	P2	P2	EXIST	D
103	OPEN OFFICE	CPTT 4	EX WD	P4	P4	P4	P4	EXIST	D
104	QUIET ROOM	CPTT 4	RWB	P1	—	P3	P1	EX GYP BD/P5	A
105	MECHANICAL	EXIST CONC	EX RWB	EXIST	EXIST	EXIST	EXIST	EXIST	—
106	IT CLOSET	EXIST CONC	EX RWB	EXIST	EXIST	EXIST	EXIST	EXIST	—
107	CORRIDOR	CPTT 4	RWB	P1	P1	P1	P1	EXIST	—
108	VESTIBULE	EXIST WALK OFF	RWB	P1	P1	P1	P1	EXIST	—
110	BREAK ROOM	SVT	RWB	P2	P2	P2	P2	ACT	—
111	TOILET	PFT	PTB	P3	P3	CWT1&3/P1	CWT1&3/P1	EX GYP BD/P5	B,C
111A	CUSTODIAL	EXIST	EX	EXIST	EXIST	EXIST	EXIST	EXIST	—
112A	TOILET	PFT	PTB	P3	CWT1&3/P1	CWT1&3/P1	P3	EX GYP BD/P5	B,C
112B	TOILET	PFT	PTB	P3	CWT1&3/P1	CWT1&3/P1	P3	EX GYP BD/P5	B,C
113	SHOWER	PFT	PTB	P2	CWT2	CWT2/P1	P2	EX GYP BD/P5	B,C
114	OFFICE	CPTT 4	RWB	P1	P1	P1	P1	EXIST	G
115	OFFICE	CPTT 4	RWB	P1	P1	P1	P1	EXIST	—
116	RECEPTION	CPTT 4	RWB	P1	P1	P1	P1	EX GYP BD/P5	—
117	CORRIDOR	EXIST CONC	EX WD	P1	P1	P1	P1	EXIST	—
117A	MAIL/PLOTTER	CPTT 4	RWB	P2	P2	P2	P2	ACT	—
117B	CORRIDOR	PFT	WD	—	P3	P3	P3	ACT	D
117C	CORRIDOR	PFT	RWB	P1	P1	P1	P1	ACT	—
118	VESTIBULE	CPTT 4	WD	P1	P1	P1	P1	ACT	—
118A	OFFICE	CPTT 4	RWB	P1	P1	P1	P1	ACT	—
118B	OFFICE	CPTT 4	RWB	P1	P1	P1	P1	ACT	G
118C	OFFICE	CPTT 4	RWB	P1	P1	P1	P1	ACT	G
118D	OFFICE	CPTT 4	RWB	P1	P1	P1	P1	ACT	G
118E	SECURE STORAGE	CPTT 4	RWB	P1	P1	P1	P1	GYP BD/P5	F
118F	OFFICE	CPTT 4	RWB	P1	P1	P1	P1	ACT	—
118G	MULTI-PURPOSE	CPTT 1-3	RWB	P1	P3	P1	P3	GYP BD/P5	E,G
118H	CORRIDOR	CPTT 4	RWB	P1	P1	P1	P1	ACT	H
119	STORAGE	EXIST CONC	RWB	P1	P1	P1	P1	ACT	—
120	QUIET ROOM	CPTT 3	RWB	P1	P1	P3	P3	ACT	—

COLOR KEY/MANUFACTURER GUIDE

MATERIAL	MANUFACTURER MODEL/TYPE	COLOR & FINISH
WALLS		
P1	SHERWIN WILLIAMS	NATURAL CHOICE SW 7011
P2	SHERWIN WILLIAMS	DECOROUS AMBER SW 0007
P3	SHERWIN WILLIAMS	OAK MOSS SW 6180
P4	SHERWIN WILLIAMS	INVITING IVORY SW 6372
FLOORS		
CPTT 1	INTERFACE OPEN AIR 403	NICKEL
CPTT 2	INTERFACE OPEN AIR 403 TRANSITION	NICKEL/MOSS
CPTT 3	INTERFACE OPEN AIR 403 ACCENT	MOSS
CPTT 4	INTERFACE JUMBO ROCK	NATURAL
CWT 1	MARAZZI RHYME AND REASON 4"x5" HEX	BONE RR16
CWT 2	MARAZZI RHYME AND REASON 6"x6"	BONE RR16
CWT 3	MARAZZI RHYME AND REASON JOLLY 1/2"	BONE RR16
PFT	DALTILE CALGARY 12"x24	LEGACY CG40
SVT	TARKETT IQ EMINENT 24"x24"	21030 816 GREY CG
BASE		
PTB	DALTILE CALGARY 6"x12" COVE BASE	LEGACY CG40
RWB	JOHNSONITE 4" RUBBER WALL BASE	CHARCOAL #20
WD	RED OAK	NATURAL
CEILINGS		
ACT	ARMSTRONG'S CIRrus HIGH NRC, 24"x24"	WHITE
GYP BD P5	SHERWIN WILLIAMS	HIGH REFLECTIVE WHITE SW 7757
MISCELLANEOUS		
SOLID SURFACE COUNTERTOPS	FORMICA	BLANCO TERRAZZO
PLASTIC LAMINATE CABINETS	PIONITE	PEARWOOD WX031-S SUEDE
METAL DOORS/FRAMES	SHERWIN WILLIAMS	MATCH ADJACENT WALL COLOR
WINDOWS (INDICATED TO BE PAINTED)	SHERWIN WILLIAMS	HIGH REFLECTIVE WHITE SW7757
INTERIOR WINDOWS BLINDS	BALI 1" ALUMINUM MINI BLINDS	TO BE SELECTED

ROOM FINISH SCHEDULE NOTES

- A. EXIST MURAL ON EAST WALL TO REMAIN. DO NOT PAINT.
- B. SEE 1/AE641 FOR PORCELAIN FLOOR TILE (PFT) PATTERN.
- C. SEE ELEVATIONS ON SHEET AE401 FOR CERAMIC WALL TILE (CWT) LOCATIONS.
- D. PROVIDE INFILL WOOD BASE TO MATCH EXISTING, SEE 3/AE641 FOR PROFILE.
- E. SEE 2/AE641 FOR CARPET TILE PATTERN.
- F. PROVIDE SECURE GYPSUM BOARD CEILING, SEE 2/AE001.
- G. PROVIDE HORIZONTAL BLINDS AT INTERIOR WINDOW(S).
- H. PROVIDE MINERAL WOOL BATT INSULATION BETWEEN CEILING JOIST.

ROOM FINISH ABBREVIATIONS

FLOOR FINISHES:
CONC = CONCRETE
CPTT = CARPET TILE
PFT = PORCELAIN FLOOR TILE
SVT = SOLID VINYL TILE

WALL BASE FINISHES:
PTB = PORCELAIN TILE BASE
RWB = RUBBER WALL BASE
WD = WOOD BASE

WALL FINISHES:
CWT = CERAMIC WALL TILE
PNT = PAINT

CEILING FINISHES:
ACT = ACOUSTICAL CEILING TILE
GYP-P_ = GYPSUM BOARD, PAINTED

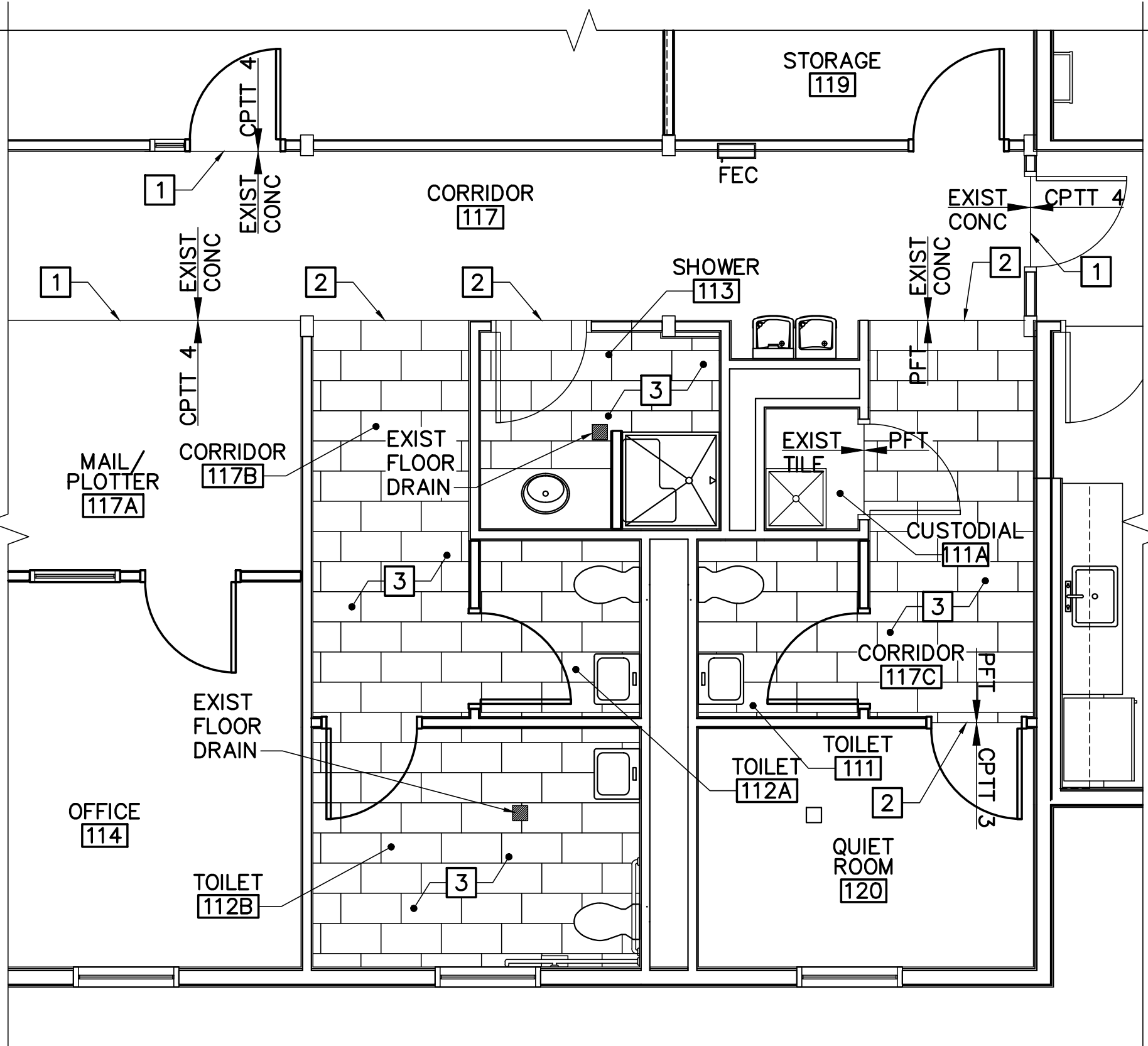
MISC:
EXIS, EX = EXISTING TO REMAIN

GENERAL NOTE

1. BASIS OF DESIGN PRODUCTS ARE LISTED FOR AESTHETIC COORDINATION PURPOSES ONLY. PRODUCTS FROM OTHER MANUFACTURERS MAY BE PROVIDED IF THE PRODUCTS APPROXIMATE THOSE INDICATED, CONFORM TO THE SPECIFICATIONS, AND ARE APPROVED BY THE CONTRACTING OFFICER.

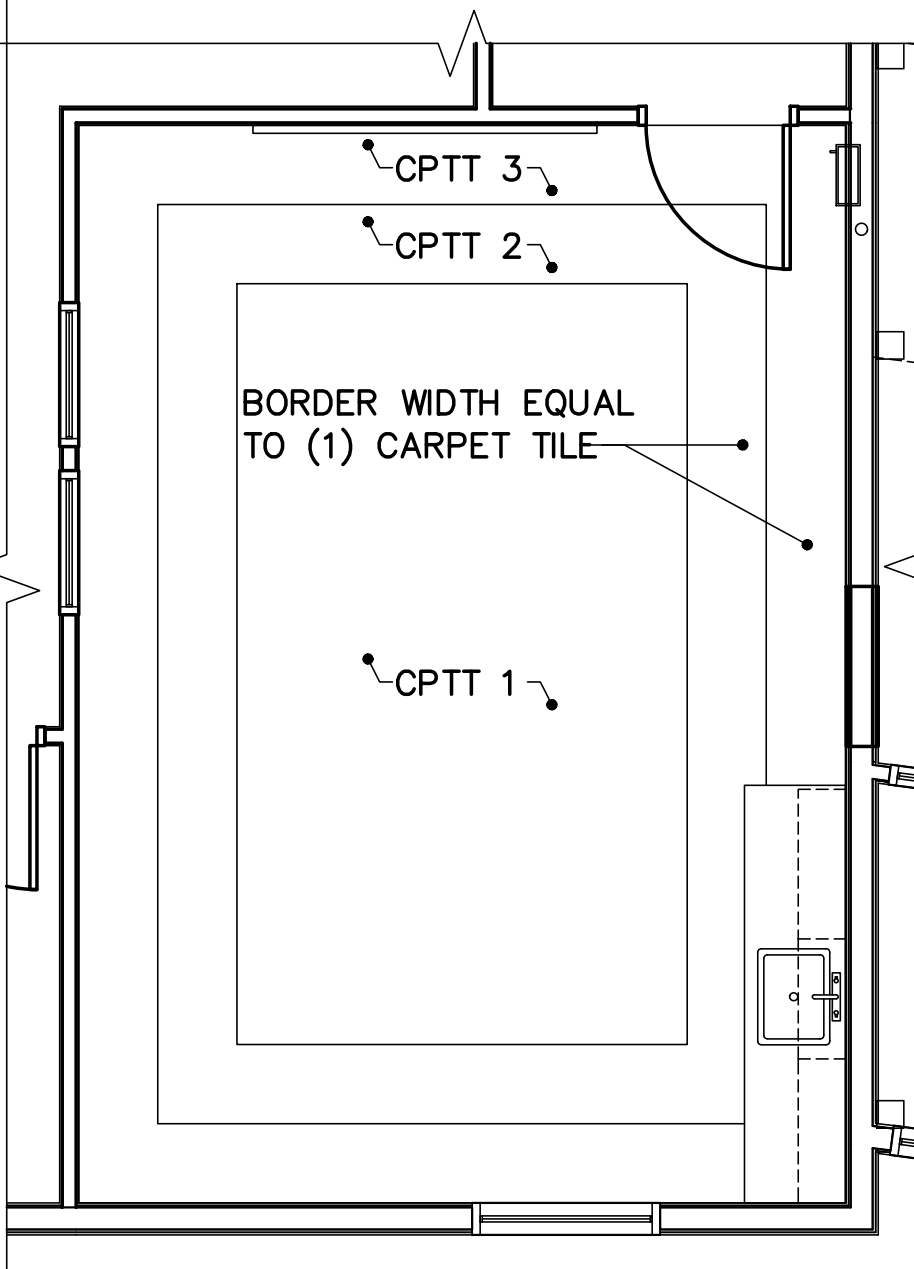
KEYNOTES (THIS SHEET ONLY)

- 1 TRANSITION STRIP: BASIS OF DESIGN = SLT-XX-L BY TARKETT, COLOR TO BE SELECTED.
- 2 TRANSITION STRIP: BASIS OF DESIGN = RENO-U BY SCHLUTER IN STAINLESS STEEL.
- 3 PFT IN RUNNING BOND PATTERN. ENSURE OVERLAP OF JOINTS DOES NOT EXCEED 1/3 OF THE TILE TO AVOID LIPPAGE. CENTER FULL TILE ON DOOR ENTRANCE WHEN DOOR IS PARALLEL WITH TILE.



1 PARTIAL FLOOR PATTERN PLAN

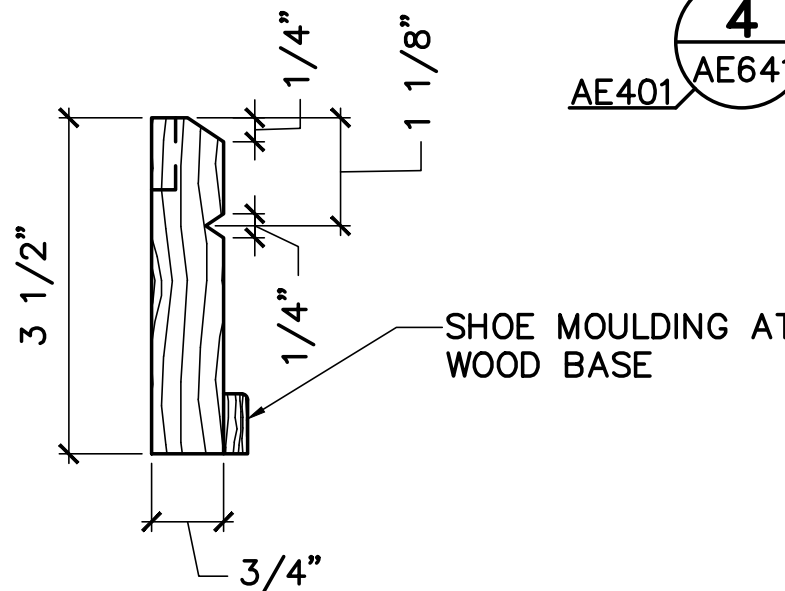
AE641 SCALE: 1/4"=1'-0"



MULTI-PURPOSE 118G

2 CARPET TILE PATTERN PLAN

AE641 SCALE: 1/4"=1'-0"

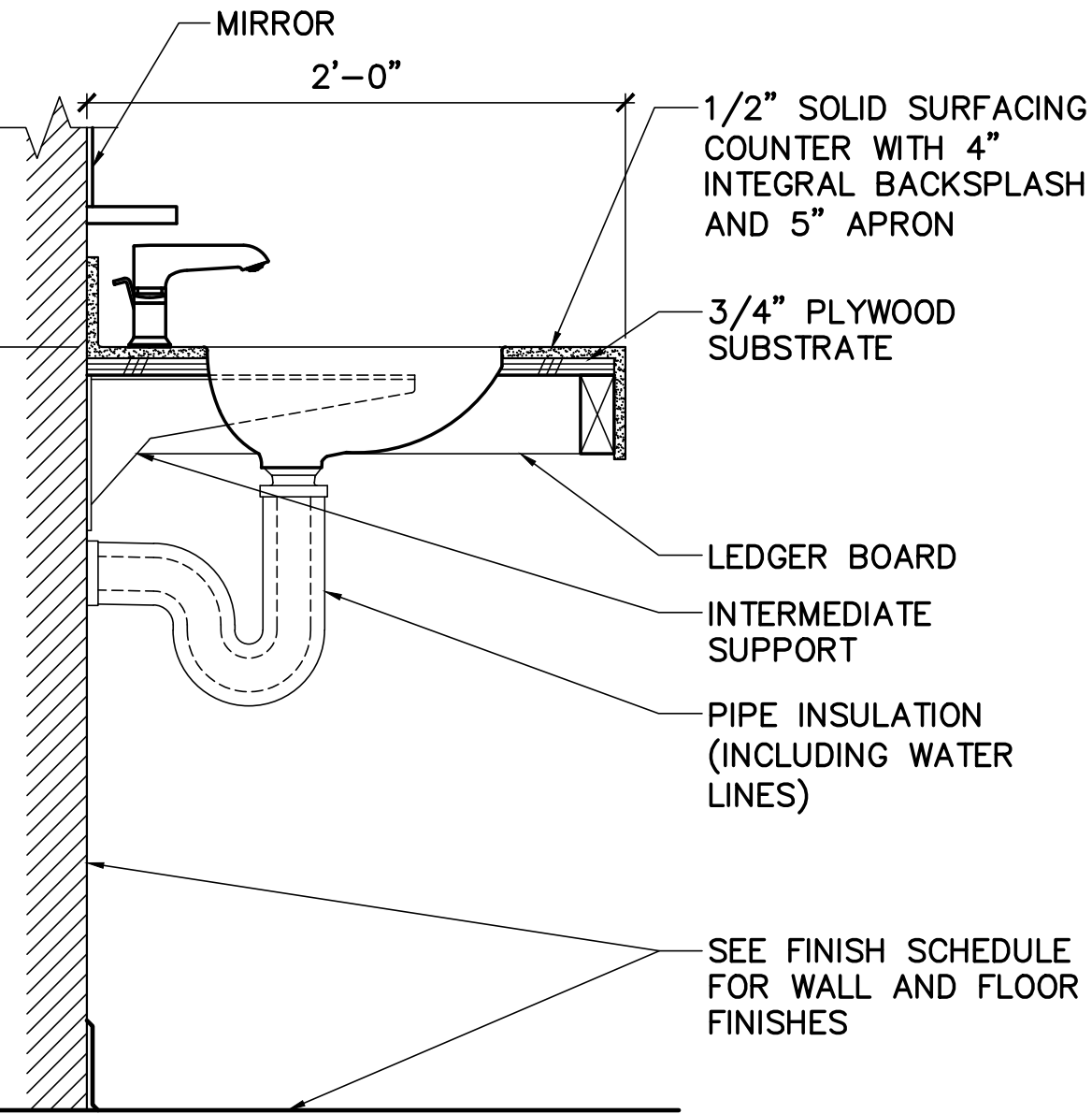


NOTE: CLEAR FINISH UNLESS NOTED OTHERWISE.

WINDOW CASING

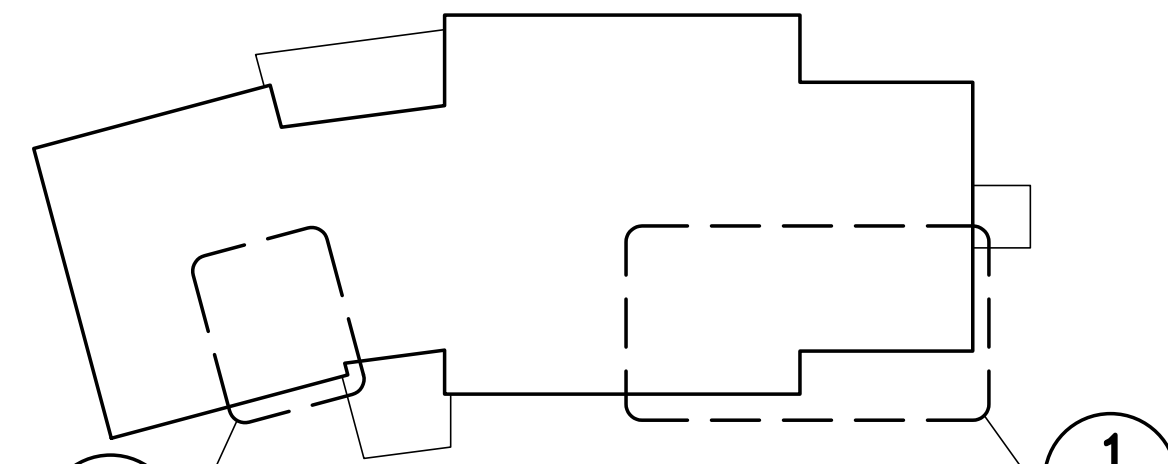
AND WALL BASE DETAIL

AE641 SCALE: 6"=1'-0"



4 COUNTERTOP DETAIL

AE401 SCALE: 1-1/2"=1'-0"



KEY PLAN

NOT TO SCALE



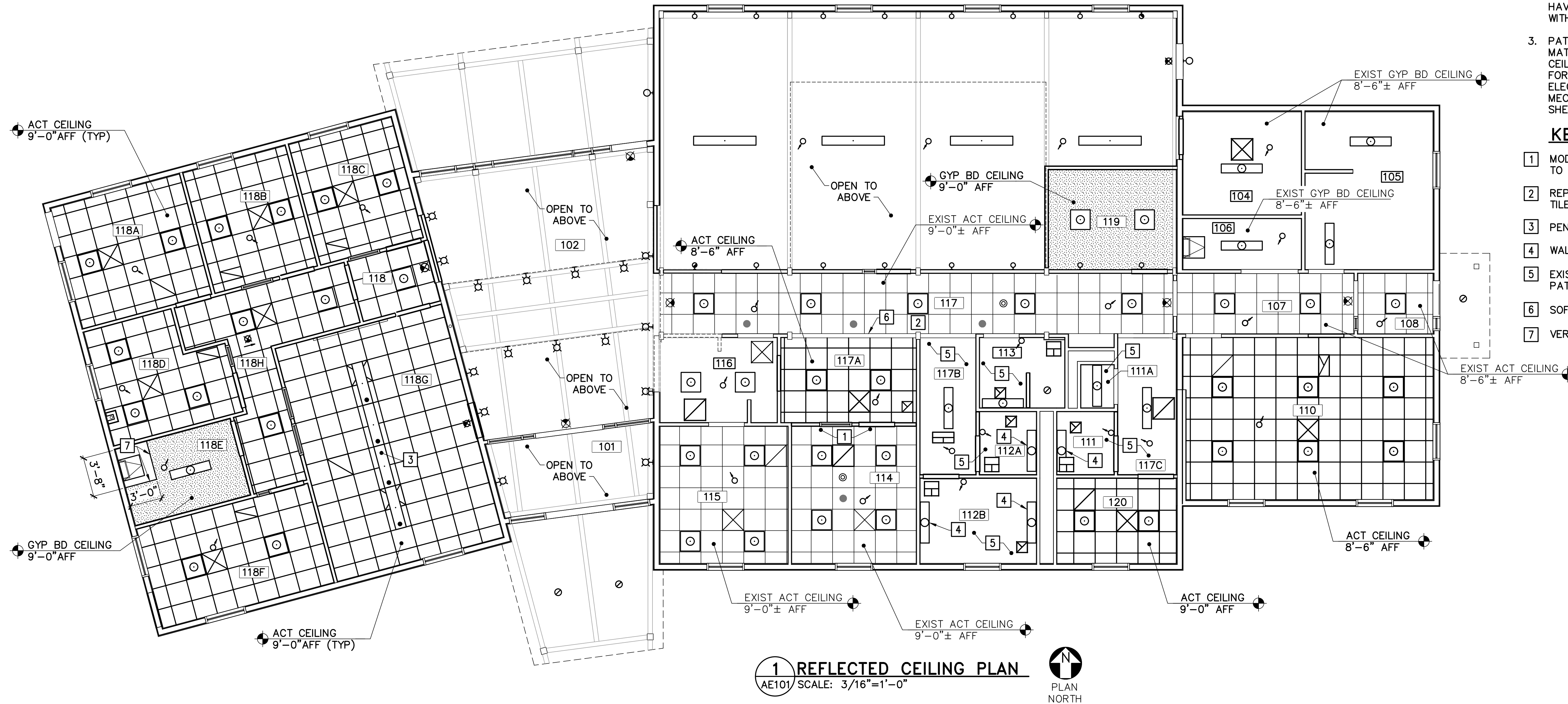
DISCIPLINE SHEET NO		AE641	
DESIGNED: PNM		DWG NO: 5R-MA-1301-100.00	
DRAWN: RMB		SHEET 18 OF 50	

GENERAL NOTES

1. MECHANICAL AND ELECTRICAL ITEMS SHOWN FOR COORDINATION PURPOSES ONLY. SEE MECHANICAL AND ELECTRICAL SHEETS FOR INSTALLATION INFORMATION.
2. PATCH EXISTING GYPSUM BOARD CEILINGS TO MATCH EXISTING ADJACENT WHERE LIGHT FIXTURES AND MECHANICAL DIFFUSERS/GRILLES HAVE BEEN REMOVED. COORDINATE LOCATIONS WITH MECHANICAL AND ELECTRICAL SHEETS.
3. PATCH EXISTING GYPSUM BOARD CEILINGS TO MATCH EXISTING AND REPLACE ACOUSTICAL CEILING TILES AT REMOVAL LOCATIONS REQUIRED FOR MECHANICAL, FIRE PROTECTION, AND ELECTRICAL WORK. COORDINATE WITH MECHANICAL, FIRE PROTECTION, AND ELECTRICAL SHEETS.

KEYNOTES (THIS SHEET ONLY)

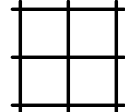
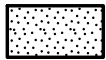
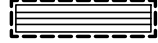
- 1 MODIFY CEILING GRID AND TILES WHERE REMOVED TO INSTALL WALL.
- 2 REPLACE STAINED CEILING TILE WITH SALVAGED TILE.
- 3 PENDANT FIXTURES.
- 4 WALL MOUNTED FIXTURE.
- 5 EXISTING GYPSUM BOARD CEILING AT 9'-0"± AFF. PATCH AT TOILET PARTITION REMOVAL LOCATIONS.
- 6 SOFFIT, SEE DETAIL 12/AE401.
- 7 VERTICAL CHASE WALL, SEE DETAIL 2/AE001.



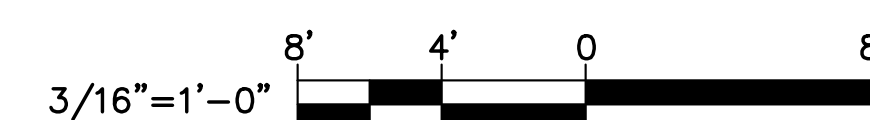
EXIST LEGEND:

- | | |
|---|---|
|  | SURFACE MOUNTED FIXTURE |
|  | EXIT LIGHT |
|  | EMERGENCY LIGHT |
|  | SPRINKLER HEAD |
|  | OCCUPANCY SENSOR |
|  | SUPPLY DIFFUSER |
|  | RETURN DIFFUSER |
|  | ACCESS HATCH |
|  | 2'-0" x 2'-0" ACOUSTICAL CEILING
TILE SYSTEM |

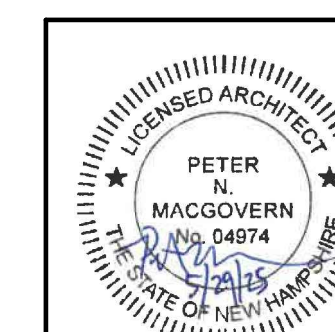
LEGEND:

- | | | | |
|---|-------------------------|---|---|
|  | RECESSED CAN FIXTURE |  | LED LIGHT FIXTURE |
|  | WALL SCONCE |  | LED LIGHT FIXTURE |
|  | SURFACE MOUNTED FIXTURE |  | LED LIGHT FIXTURE |
|  | EXIT SIGN |  | EXIT LIGHT |
|  | EMERGENCY LIGHT |  | 2'-0" x 2'-0" ACOUSTICAL CEILING
TILE SYSTEM |
|  | SPRINKLER HEAD |  | GYPSUM BOARD CEILING |
|  | OCCUPANCY SENSOR | | |
|  | LINEAR SUPPLY DIFFUSER | | |
|  | SUPPLY DIFFUSER | | |
|  | RETURN DIFFUSER | | |

GRAPHIC SCALE



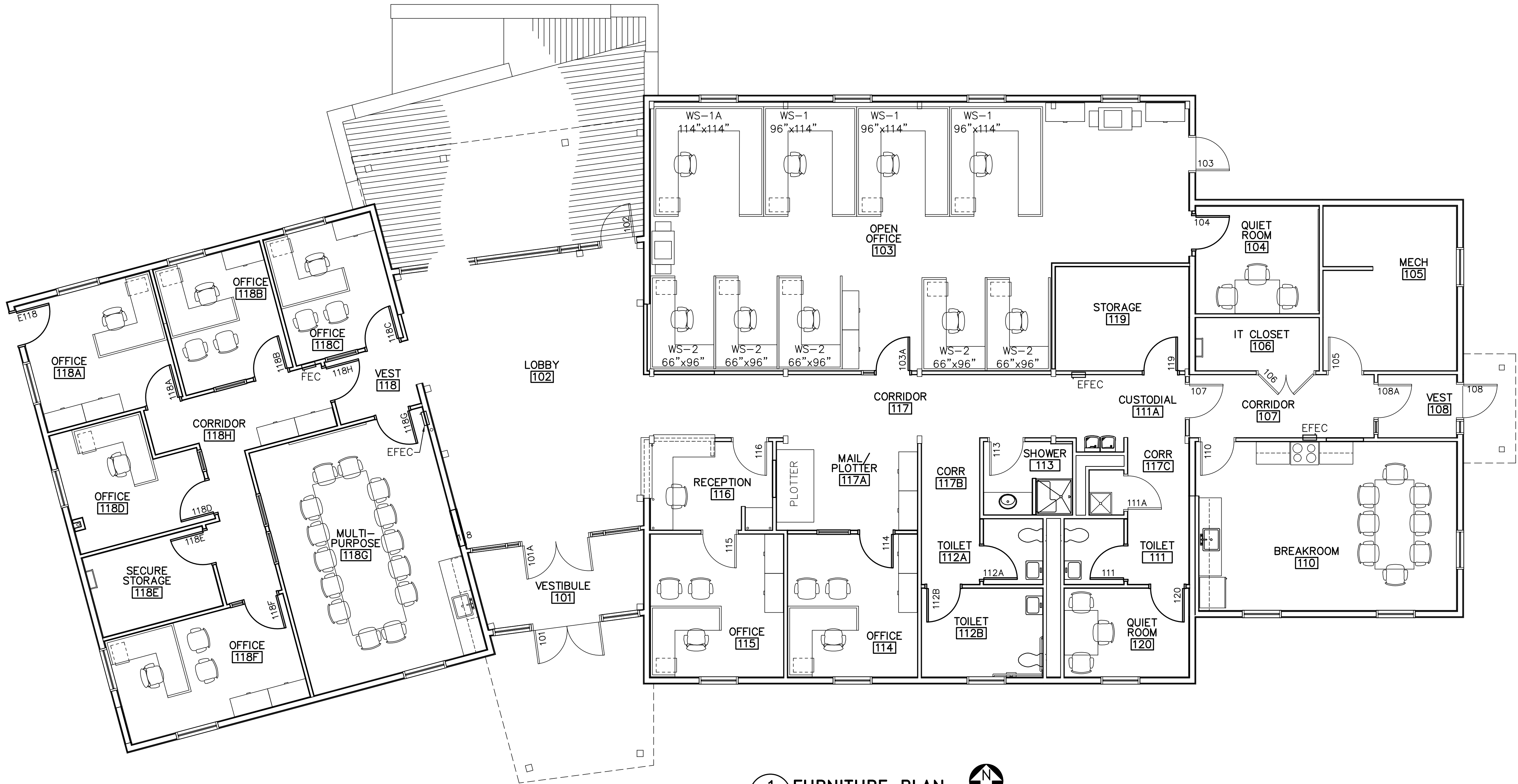
CHECK GRAPHIC SCALE BEFORE USING



NO.	REVISIONS			DATE	BY
U.S. FISH AND WILDLIFE SERVICE			CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING		
REFLECTED CEILING PLAN					
ASSABET RIVER NATIONAL WILDLIFE REFUGE			SUDBURY, MASSACHUSETTS		
DESIGNED: PNM DRAWN: RMR	DWG NO: 5R-MA-1301-100.00	SHEET 20 OF 50			

GENERAL NOTE

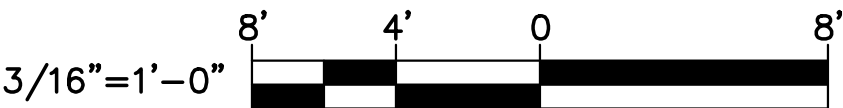
1. FURNITURE IS SHOWN FOR COORDINATION PURPOSES ONLY. FURNISHING AND INSTALLATION OF FURNITURE IS THE RESPONSIBILITY OF THE GOVERNMENT.



1 FURNITURE PLAN
AE801 SCALE: 3/16"=1'-0"



GRAPHIC SCALE

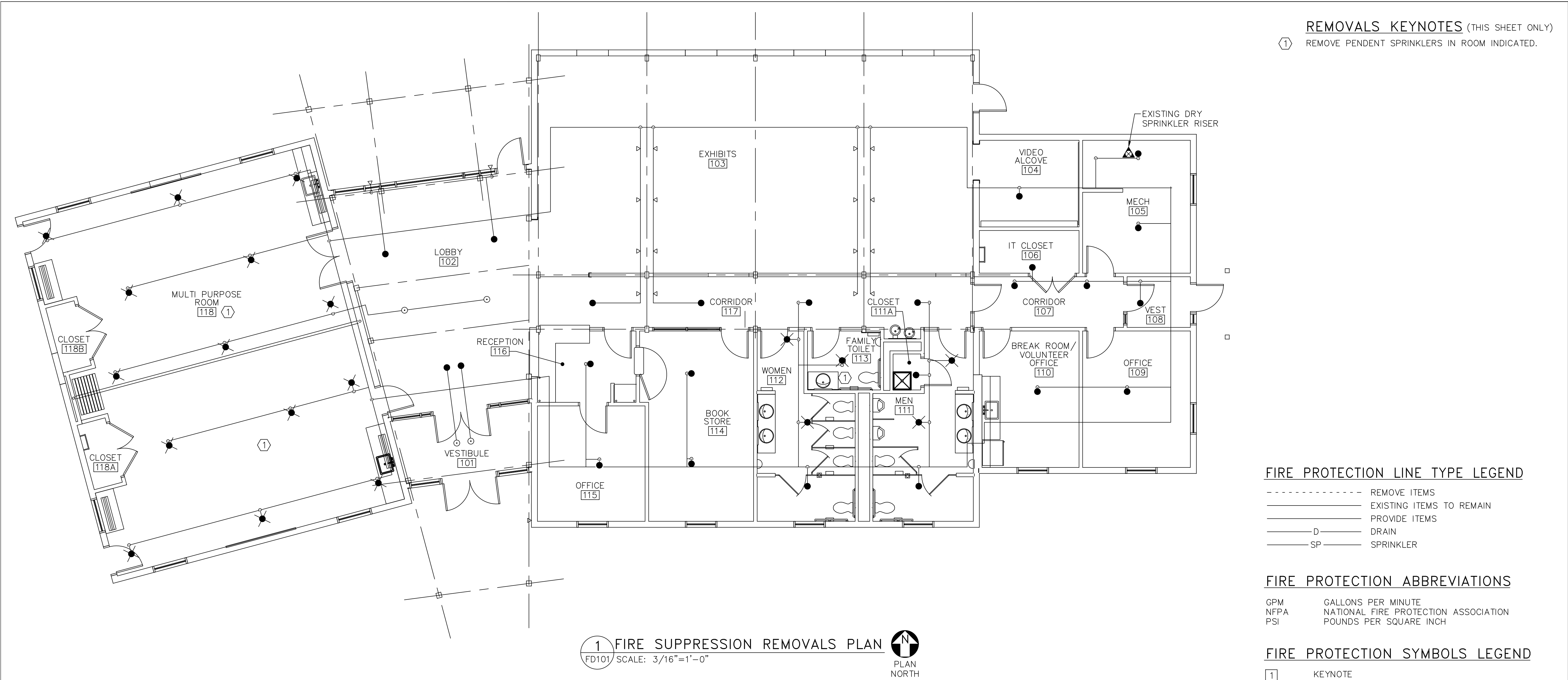


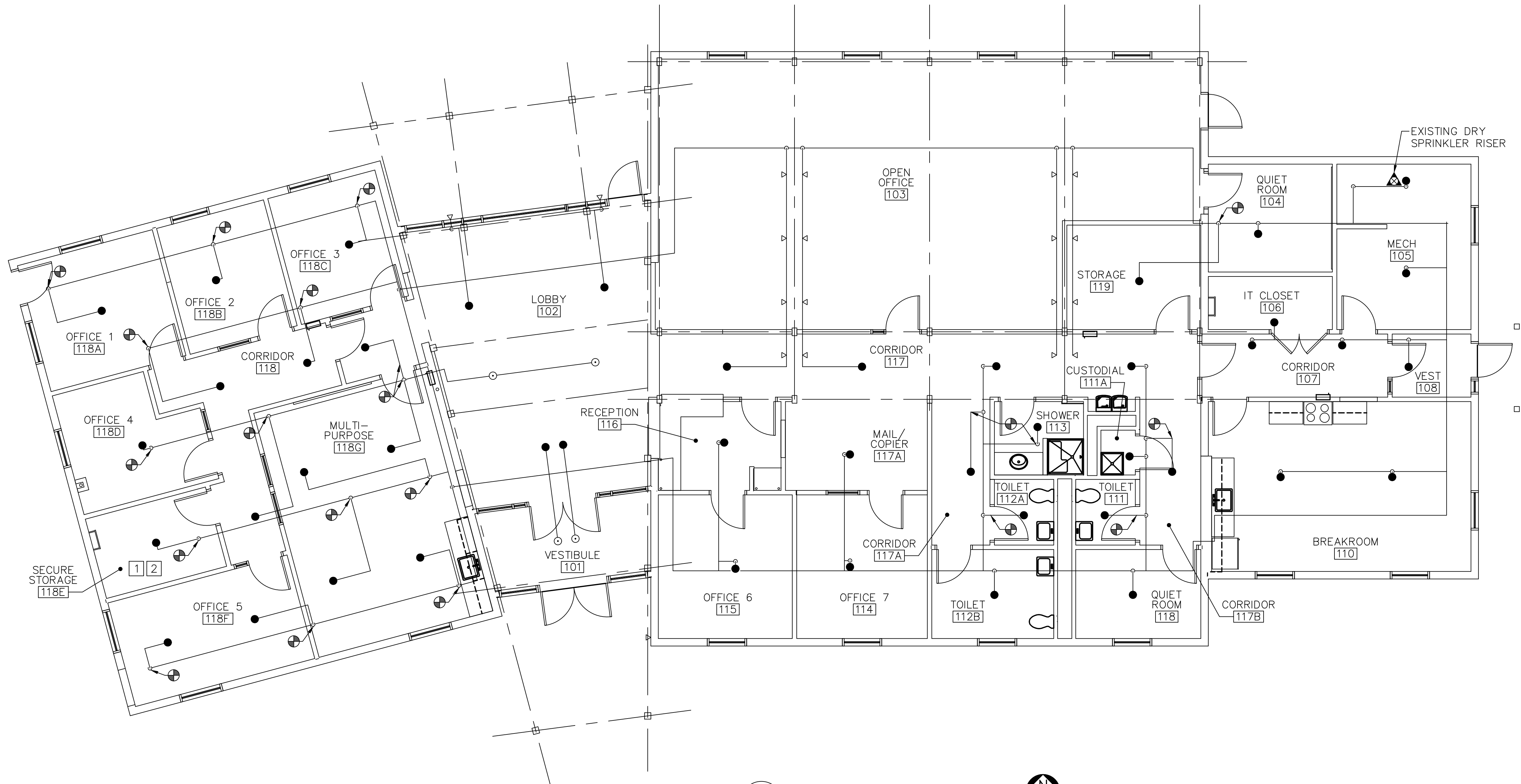
CHECK GRAPHIC SCALE BEFORE USING



DISCIPLINE SHEET NO	AE801
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NO.	REVISIONS	DATE	BY
U.S. FISH AND WILDLIFE SERVICE	CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING		
FURNITURE PLAN			
ASSABET RIVER NATIONAL WILDLIFE REFUGE SUDBURY, MASSACHUSETTS			
DESIGNED: PNM	DWG NO:		
DRAWN: RMB	5R-MA-1301-100.00	SHEET 21 OF 50	





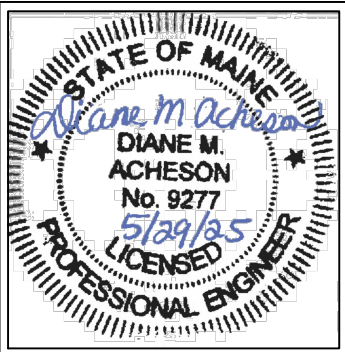
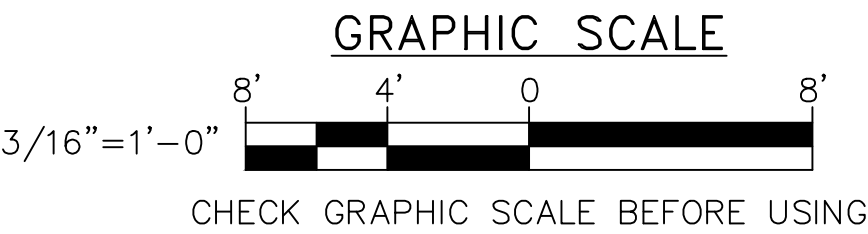
GENERAL NOTES

1. REFER TO SHEET FD101 FOR FIRE SUPPRESSION LEGENDS, ABBREVIATIONS AND GENERAL NOTES.
2. PROVIDE LIGHT HAZARD SPRINKLER COVERAGE THROUGHOUT UNLESS OTHERWISE NOTED.
3. SPRINKLERS IN ATTIC ARE NOT SHOWN.

KEYNOTES (THIS SHEET ONLY)

- 1 PROVIDE SPRINKLER(S) WITH WIRE GUARD(S) IN ROOM INDICATED.
- 2 PROVIDE ORDINARY HAZARD GROUP 1 SPRINKLER COVERAGE IN ROOM INDICATED.

1 FIRE SUPPRESSION PLAN
FX101 SCALE: 3/16"=1'-0"



DISCIPLINE
SHEET NO FX101

NO.		REVISIONS		DATE	BY
U.S. FISH AND WILDLIFE SERVICE			CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING		
FIRE SUPPRESSION PLAN					
ASSABET RIVER NATIONAL WILDLIFE REFUGE			SUDBURY, MASSACHUSETTS		
DESIGNED: DMA	DWG NO.		5R-MA-1301-100.00		
DRAWN: SRW					
			SHEET 23 OF 50		

PLUMBING ABBREVIATIONS

©	AT	MAX	MAXIMUM
ADA	AMERICANS WITH DISABILITIES ACT	MIN	MINIMUM
AFF	ABOVE FINISHED FLOOR ACCESS	MR	MOP RECEPTOR
BFP	BACKFLOW PREVENTER	NFWH	NON-FREEZE WALL HYDRANT
BHP	BRAKE HORSEPOWER	NO	NUMBER, NORMALLY OPEN
CIRC	CIRCULATING	PEX	CROSS-LINKED POLYETHYLENE
CO	CLEANOUT	PRV	PRESSURE REDUCING VALVE
CW	COLD WATER	PSI	POUNDS PER SQUARE INCH
ø,DIA	DIAMETER	PSIG	POUNDS PER SQUARE INCH GAGE
DHW	DOMESTIC HOT WATER	RM	ROOM
DHWR	DOMESTIC HOT WATER RETURN	RP	RECIRCULATING PUMP
DN	DOWN	RPM	REVOLUTIONS PER MINUTE
E	EXISTING	RPZ	REDUCED PRESSURE ZONE
EFF	EFFICIENCY	S	SINK, SANITARY
EWC	ELECTRIC WATER COOLER	SAN	SANITARY
EWB	ELECTRIC WATER HEATER	SH	SHOWER
EXT	EXPANSION TANK	TEMP	TEMPERATURE
°F	DEGREES FAHRENHEIT	TMV	TEMPERATURE MIXING VALVE
FCO	FLOOR CLEANOUT	TP	TRAP PRIMER ASSEMBLY OR LINE
FD	FLOOR DRAIN	TYP	TYPICAL
GAL	GALLON	U	URINAL
GPM	GALLONS PER MINUTE	V	VENT
GVV	GATE VALVE IN VERTICAL HOSE	VTR	VENT TO ROOF
HB	BIBB	W	WASTE
HP	HORSEPOWER	W&T	WASTE AND TRAP
HW	HOT WATER	WC	WATER COLUMN, WATER CLOSET
HWR	HOT WATER RETURN	WCO	WALL CLEANOUT
IECC	INTERNATIONAL ENERGY CONSERVATION CODE	W/	WITH
IN	INCHES	WHA	WATER HAMMER ARRESTOR
IPC	INTERNATIONAL PLUMBING CODE		
L	LAVATORY		

PLUMBING LINE TYPE LEGEND

—————	PROVIDE ITEMS
—————	EXISTING ITEMS
- - - - -	REMOVAL ITEMS
————— W —————	WASTE PIPE
————— SAN —————	SANITARY SEWER ABOVE FLOOR
—— — SAN —— —	SANITARY SEWER BELOW FLOOR OR GRADE
- - - - -	VENT
————— TP —————	TRAP PRIMER LINE
— — — — —	DOMESTIC COLD WATER
————— — — — — —	DOMESTIC HOT WATER
————— — — — — —	DOMESTIC HOT WATER RETURN

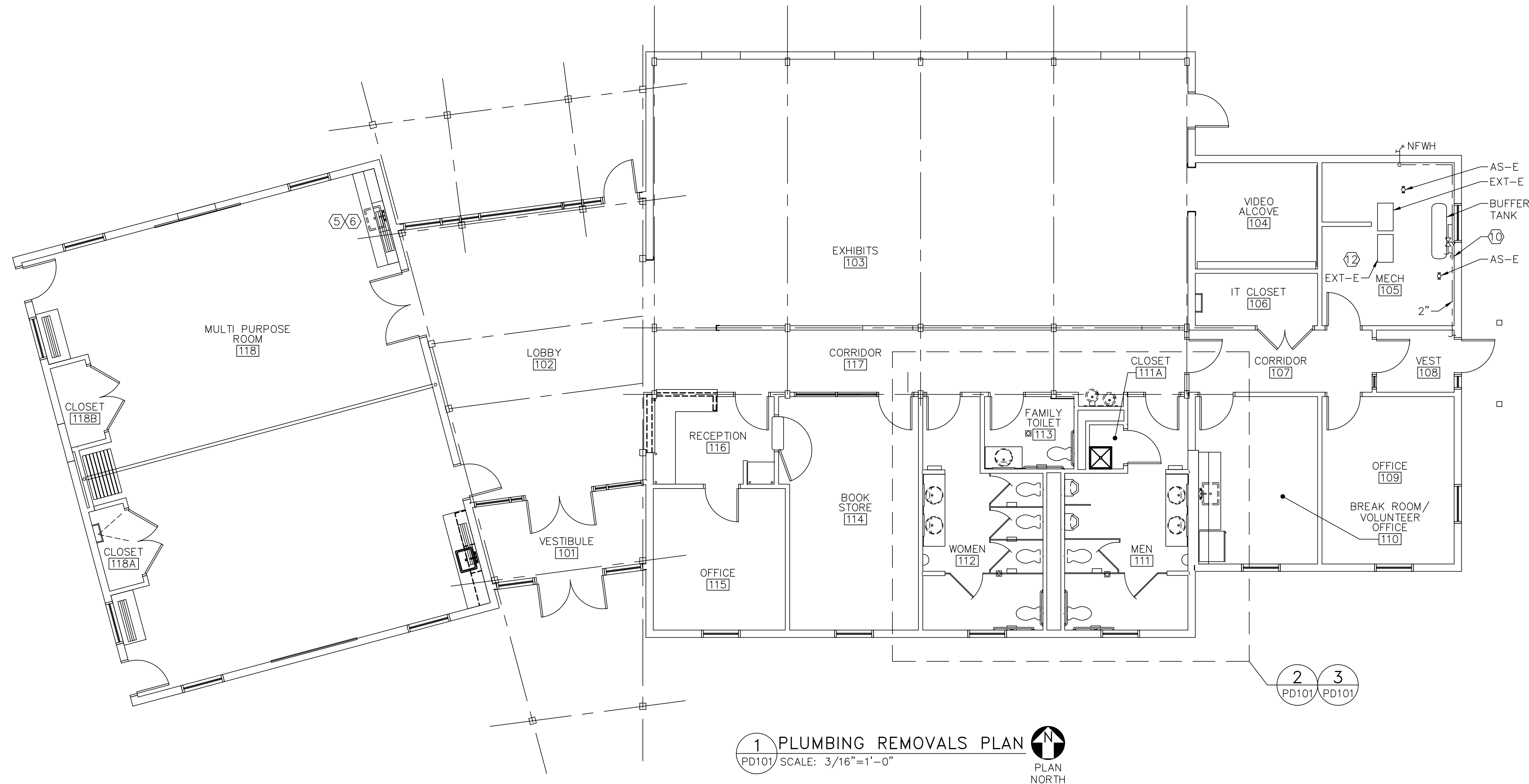
PLUMBING SYMBOLS LEGEND

ANNOTATION		PIPING & VALVES (CONT)	
	SYMBOL PER ABBREVIATION LIST		DIRECTION OF FLOW
	EQUIPMENT SEQUENCE NUMBER		FLANGES
	KEYNOTE		P-TRAP
	CONNECT TO EXISTING		PIPE PITCH DOWN
	GALLONS PER MINUTE		PRESSURE RELIEF VALVE
FIXTURES			PRESSURE REDUCING/REGULATING VALVE
	WALL HUNG WATER CLOSET WITH FLUSH VALVE		CAP
	WALL HUNG URINAL WITH FLUSH VALVE	EQUIPMENT & SPECIALTIES	
	COUNTERTOP LAVATORY		FLOOR DRAIN
	KITCHEN SINK		THERMOMETER
	MOP RECEPTOR		WATER HAMMER ARRESTOR
	DUAL HEIGHT ELECTRIC WATER COOLER, WALL MOUNTED		REDUCED PRESSURE ZONE BACKFLOW PREVENTOR
PIPING & VALVES			AIR GAP FITTING
	PIPE TRANSITION		PUMP
	ELBOW DOWN		AIR VENT, AUTOMATIC
	PIPE TEE UP OR UP AND DOWN		AIR VENT, MANUAL
	ELBOW UP OR UP AND DOWN		HOSE BIBB OR HYDRANT
	PIPE TEE DOWN		THERMOSTATIC MIXING VALVE
	STRAINER		VACUUM RELIEF VALVE
	BALL VALVE		WATER METER
	WALL CLEANOUT		
	FLOOR CLEANOUT		
	PRESSURE GAUGE AND COCK		
	UNION		
	CHECK VALVE, SWING		
	CLEANOUT		
	BALANCING VALVE		

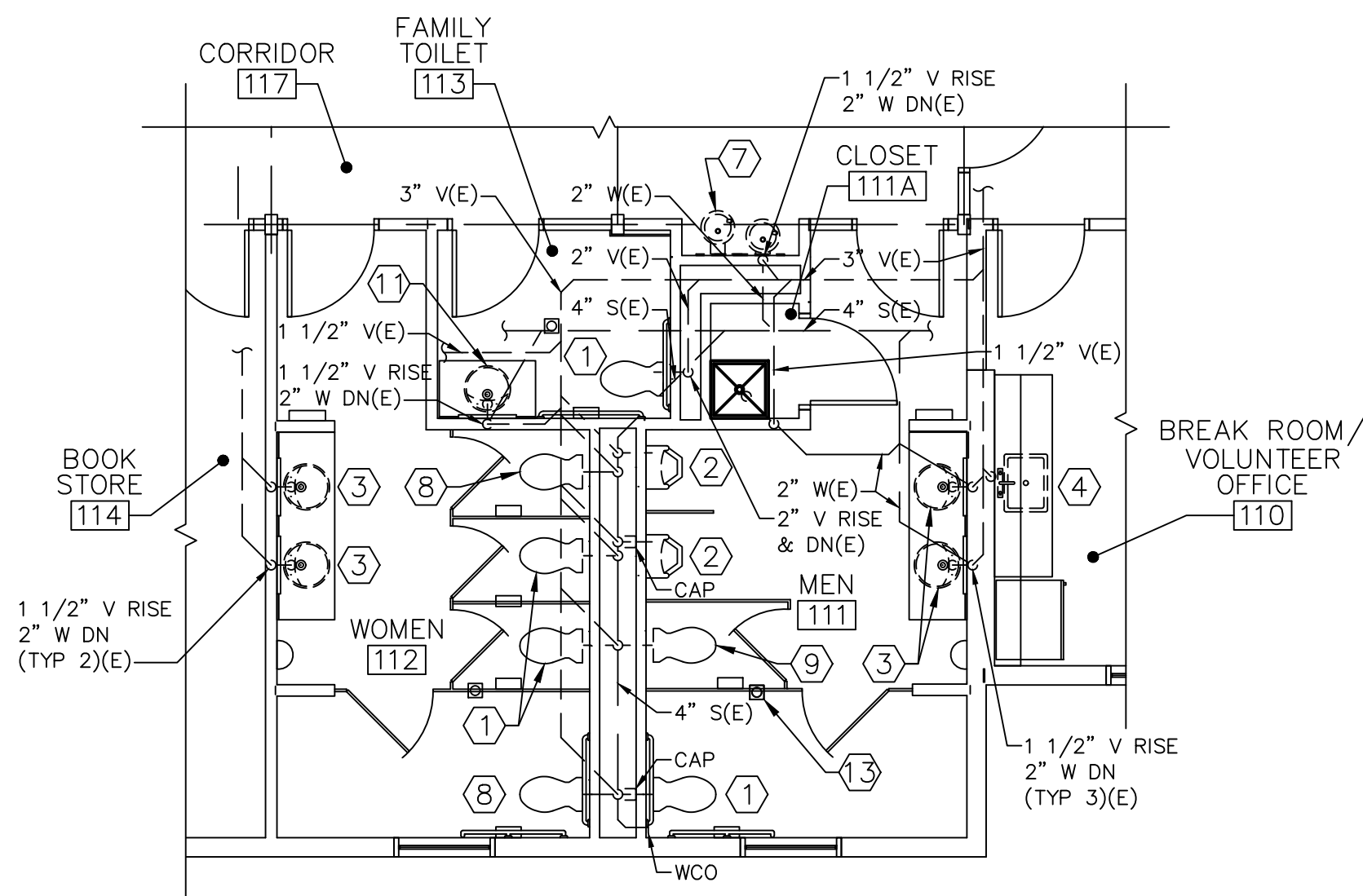
GENERAL PLUMBING SYSTEM NOTES

- PLUMBING MUST BE DONE IN ACCORDANCE WITH THE MASSACHUSETTS PLUMBING CODE 248 CMR:10.00:UNIFORM STATE PLUMBING CODE, INTERNATIONAL PLUMBING CODE (IPC) – CURRENT EDITION, AND THE INTERNATIONAL ENERGY AND CONSERVATION CODE (IECC) – CURRENT EDITION.
- INSTALL SANITARY DRAINAGE WITH A PITCH OF 1/4 INCH PER FOOT FOR BUILDING SANITARY PIPING 3 INCHES AND SMALLER AND A PITCH OF 1/8 INCH PER FOOT FOR BUILDING SANITARY PIPING 4 INCHES AND LARGER.
- FOR PIPE SIZES NOT SHOWN ON PLANS REFER TO APPROPRIATE PART PLANS.
- PIPING IS SHOWN DIAGRAMMATICALLY, EXACT LOCATION MUST BE DETERMINED IN THE FIELD.
- PIPING MUST BE INSTALLED CONCEALED ABOVE CEILINGS, IN WALLS AND IN CHASES, UNLESS OTHERWISE NOTED. PIPING MUST BE INSTALLED PARALLEL TO BUILDING LINES.
- PROVIDE DRAINS AT DOMESTIC WATER PIPING LOW POINTS AND PITCH PIPING TO LOW POINTS DRAINS.
- PIPING MUST BE SUPPORTED FROM THE TRUSS TOP OR BOTTOM CHORD. CONNECTIONS TO THE TRUSS WEB MEMBERS ARE UNACCEPTABLE. SUPPORTS MUST BE ATTACHED TO THE SIDE OF THE TRUSS TOP OR BOTTOM CHORD AT THE MID-DEPTH OF THE MEMBER. NO STRUCTURAL MEMBERS SHALL BE CUT.
- PROVIDE ACCESSIBLE CLEANOUTS AT THE BASE OF STACKS, AT HORIZONTAL CHANGES OF DIRECTION GREATER THAN 45° AND WHERE SHOWN ON DRAWINGS.
- PIPING DROPS TO FIXTURES MUST BE ANCHORED SOLID TO WALL WITH STEEL SUPPORT BRACKET WITH ADJUSTABLE CLIP.
- PROVIDE STEEL PIPE SLEEVES AT SLAB PENETRATIONS BOTH ON GRADE AND AT PARTITION PENETRATIONS. OPENINGS MUST BE SEALED SMOKE AND WATER TIGHT. REFER TO PIPE PENETRATIONS DETAILS ON PLUMBING DETAIL SHEETS.
- HOSE END VALVES MUST BE PROVIDED WITH HOSE END VACUUM BREAKERS.
- COORDINATE LOCATION OF PIPING WITH WORK OF OTHER TRADES. PERFORM CUTTING WORK ASSOCIATED WITH PLUMBING SYSTEMS.
- MATERIALS ON THIS PROJECT MUST MEET THE BUY AMERICA ACT.

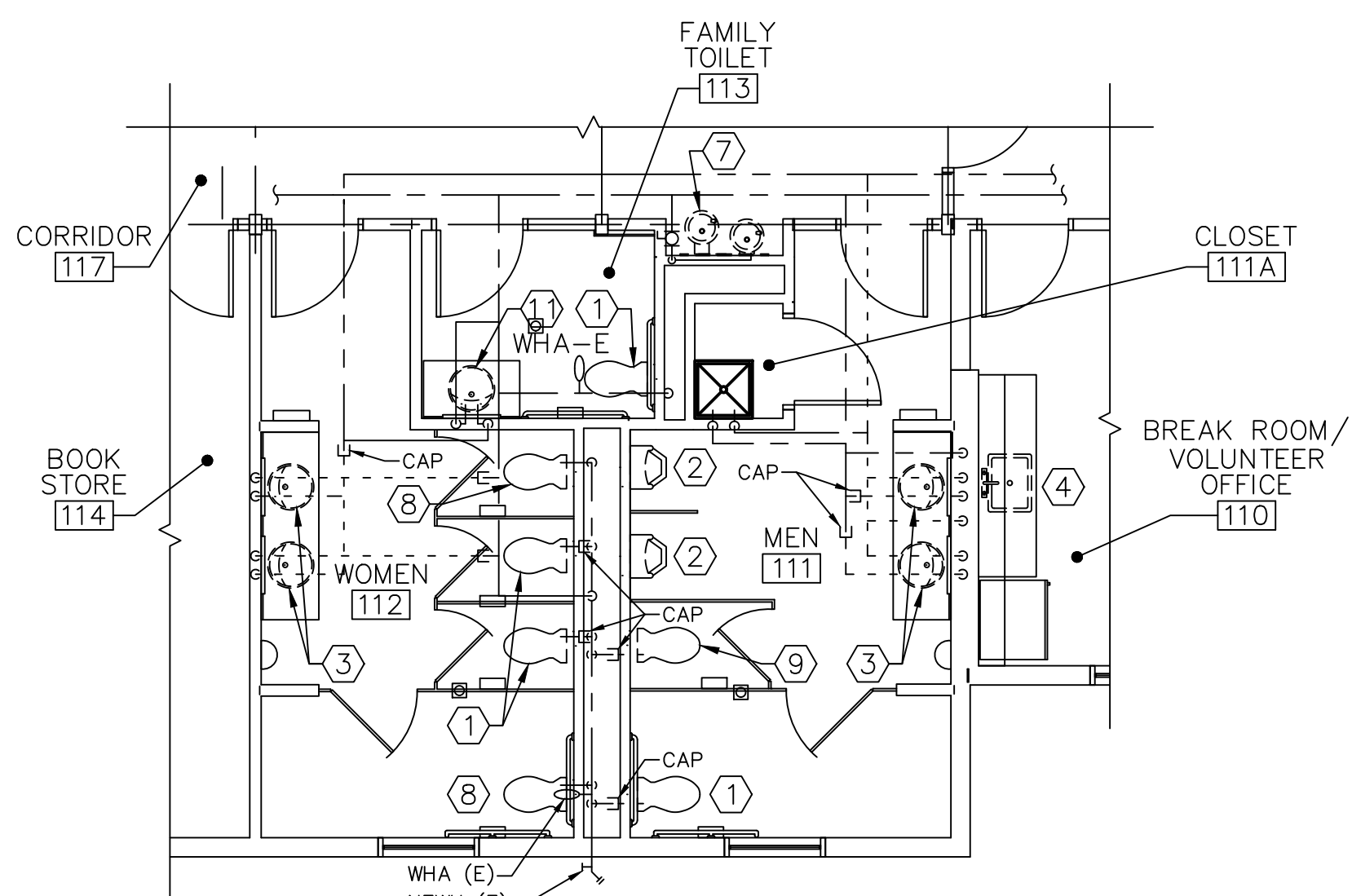
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	U.S. FISH AND WILDLIFE SERVICE CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING			
PLUMBING LEGENDS, ABBREVIATIONS, AND GENERAL NOTES				
ASSABET RIVER NATIONAL WILDLIFE REFUGE SUDBURY, MASSACHUSETTS				
DISCIPLINE SHEET NO	DESIGNED: DMA DRAWN: SRW		DWG NO: 5R-MA-1301-100.00	SHEET 24 OF 50



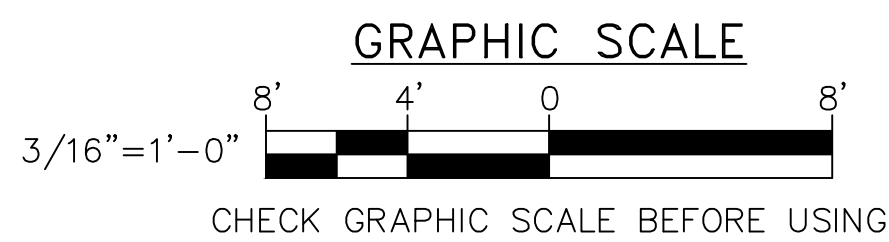
1 PLUMBING REMOVALS PLAN
PD101 SCALE: 3/16"=1'-0"



2 SANITARY AND VENT PLUMBING REMOVALS PART PLAN
PD101 SCALE: 3/16"=1'-0"



3 DOMESTIC WATER SUPPLY PLUMBING REMOVALS PART PLAN
PD101 SCALE: 3/16"=1'-0"

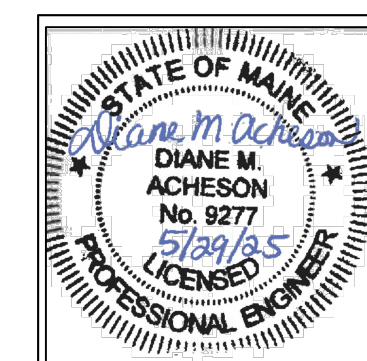


GENERAL NOTES

- REFER TO P-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.
- IN WALL WATER AND SANITARY PIPING SHOWN IS NOT VISIBLE AND ROUTING IS ASSUMED.

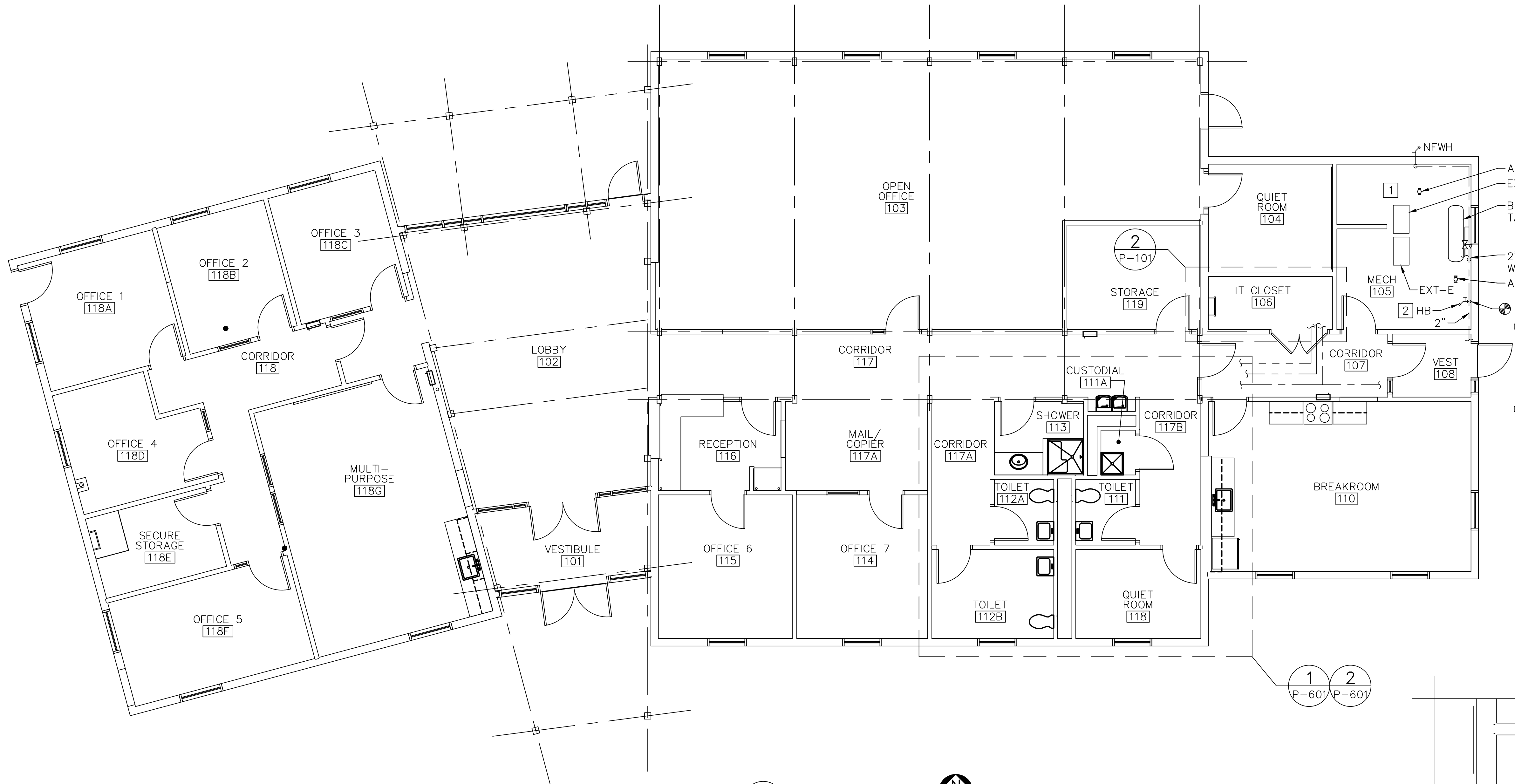
REMOVALS KEYNOTES (THIS SHEET ONLY)

- REMOVE EXISTING WALL MOUNTED WATER CLOSET, CARRIER, FLUSH VALVE AND ASSOCIATED PIPING. CAP PIPING BEHIND FINISHED WALL.
- REMOVE EXISTING WALL MOUNT URINAL AND CARRIER.
- REMOVE EXISTING COUNTER MOUNTED LAVATORY, FAUCET, AND ASSOCIATED PIPING. CAP DOMESTIC WATER PIPING ABOVE FINISHED CEILING. CAP WASTE AND VENT PIPING BEHIND FINISHED WALL.
- REMOVE EXISTING SINK AND FAUCET. TEMPORARILY CAP PIPING.
- REMOVE EXISTING SINK, FAUCET AND ASSOCIATED PIPING. CAP PIPING BEHIND FINISHED WALL.
- REMOVE EXISTING 2.5 GALLON ELECTRIC WATER HEATER AND ASSOCIATED PIPING IN CABINETRY. SALVAGE ELECTRIC WATER HEATER AND TURN OVER TO GOVERNMENT.
- REMOVE EXISTING ELECTRIC WATER COOLER. TEMPORARILY CAP SANITARY AND DOMESTIC WATER PIPING.
- REMOVE WATER CLOSET AND FLUSH VALVE. SALVAGE AND STORE WATER CLOSET AND FLUSH VALVE FOR REINSTALLATION. TEMPORARILY CAP SANITARY AND DOMESTIC WATER PIPING.
- REMOVE WATER CLOSET, FLUSH VALVE, CARRIER, AND ASSOCIATED PIPING. SALVAGE AND STORE WATER CLOSET AND FLUSH VALVE FOR REINSTALLATION. CAP PIPING BEHIND FINISHED WALL.
- 2" CW DN TO DOMESTIC WATER ENTRANCE (METER, BACKFLOW PREVENTER AND PRESSURE REDUCING VALVE).
- REMOVE EXISTING COUNTER MOUNTED LAVATORY AND FAUCET. TEMPORARILY CAP PIPING.
- REMOVE PIPE INSULATION ON ALL EXISTING TO REMAIN PIPING IN THIS ROOM.
- REMOVE FLOOR DRAIN AND CAP PIPING.



DISCIPLINE PD101
SHEET NO

NO.	REVISIONS		DATE	BY
U.S. FISH AND WILDLIFE SERVICE			CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING	
PLUMBING REMOVALS PLANS				
ASSABET RIVER NATIONAL WILDLIFE REFUGE			SUDBURY, MASSACHUSETTS	
DESIGNED: DMA	DWG NO:		5R-MA-1301-100.00	
DRAWN: SRW				
			SHEET 25 OF 50	



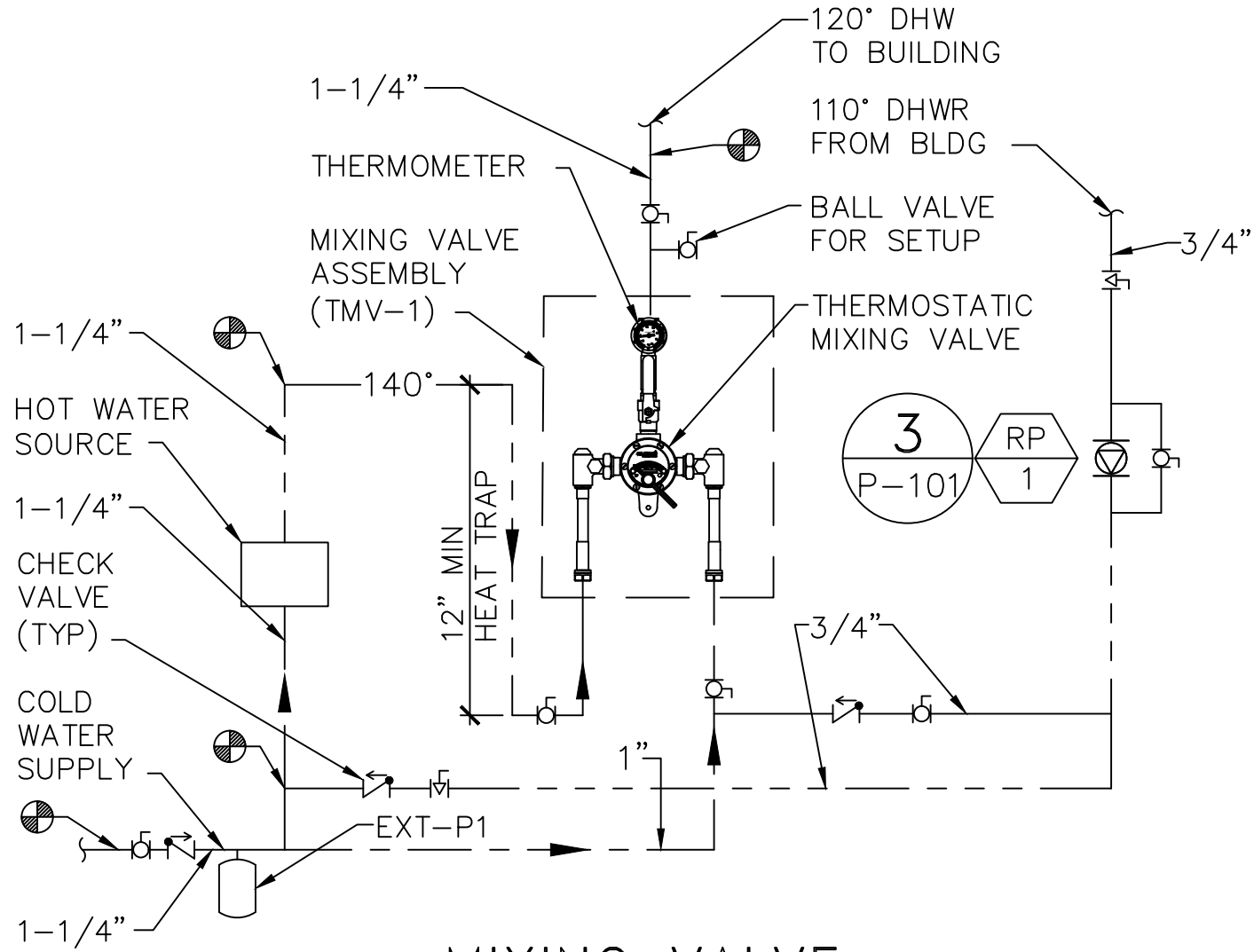
GENERAL NOTES

- 1. REFER TO P-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.
- 2. REPLACE ANY INSULATION DAMAGED DURING CONSTRUCTION.

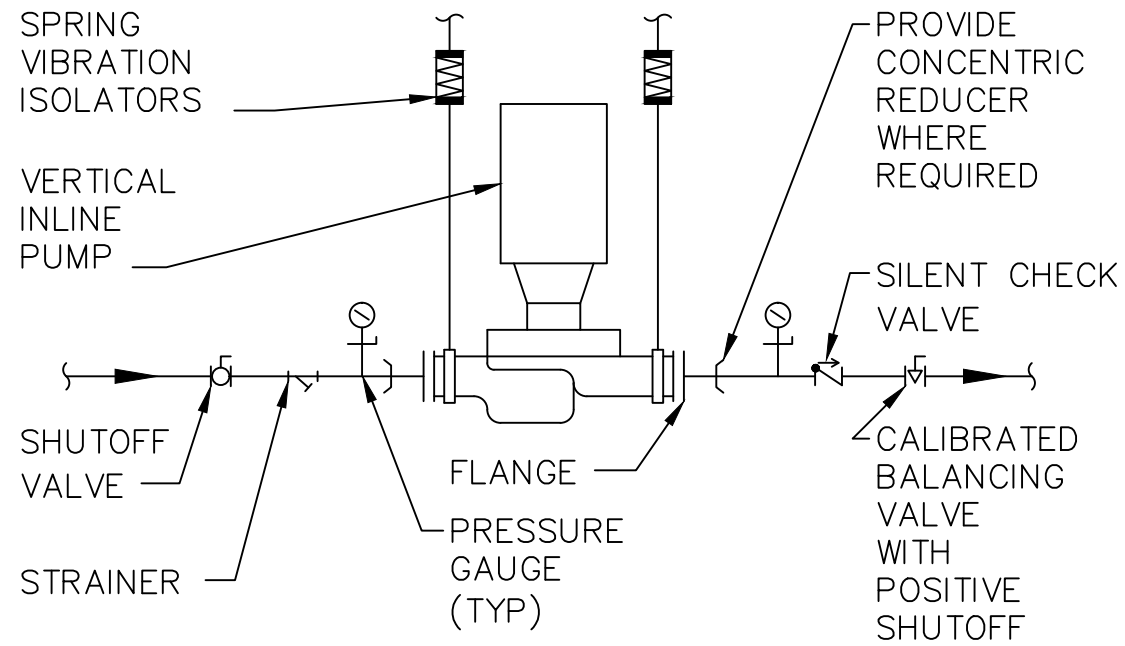
KEYNOTE (THIS SHEET ONLY)

- 1 RE-INSULATE ALL EXISTING TO REMAIN PIPING IN THIS ROOM.
- 2 PROVIDE 1/2" HOSE BIBB WITH INTEGRAL VACUUM BREAKER. PROVIDE HOSE TO REACH GLYCOL TANK FILL. REFER TO DETAIL 11/M-501. PROVIDE BALL VALVE ON PIPE DROP.

1 PLUMBING PLAN
P-101 SCALE: 3/16"=1'-0"
PLAN NORTH

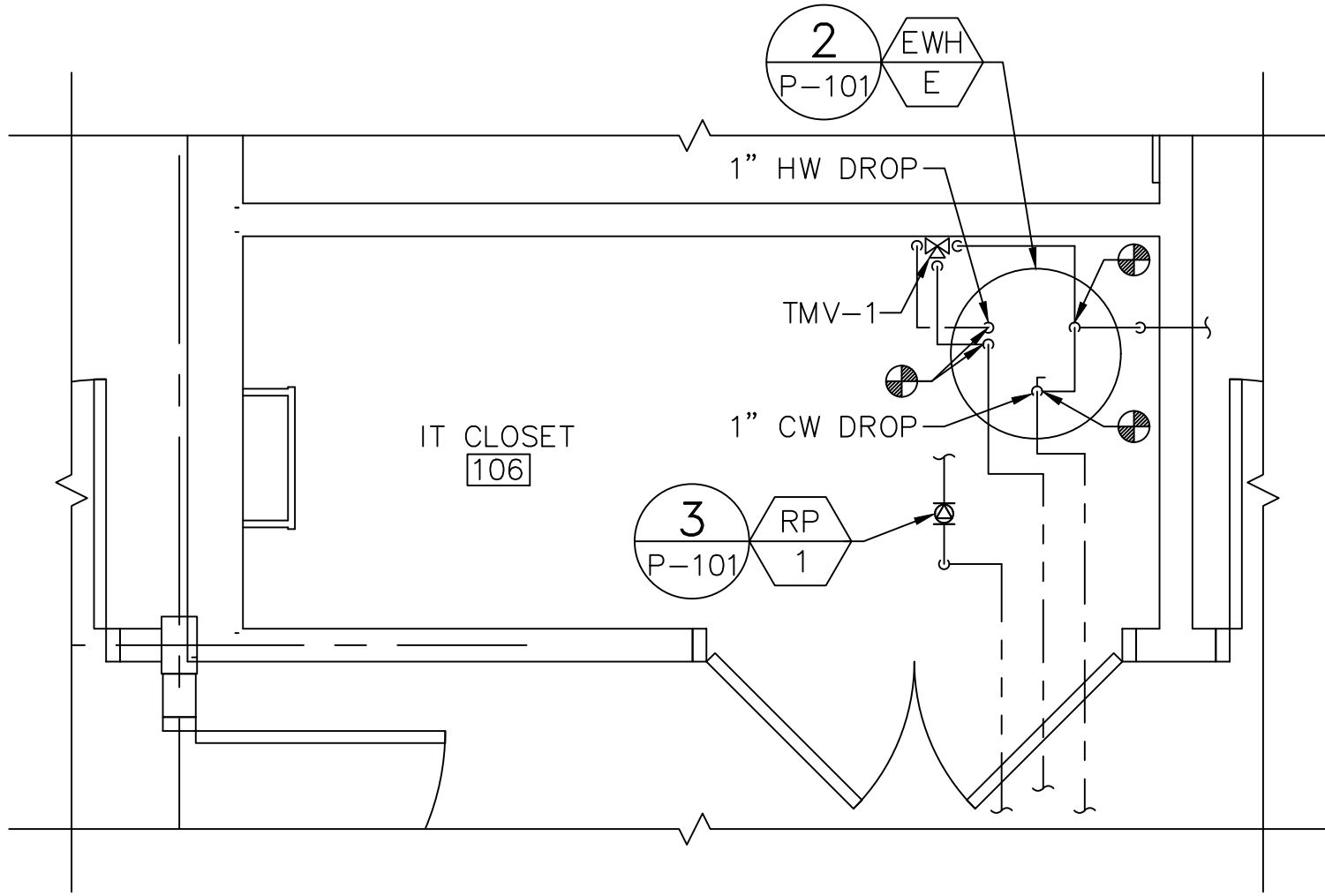


2 MIXING VALVE PIPING SCHEMATIC
P-101 NOT TO SCALE

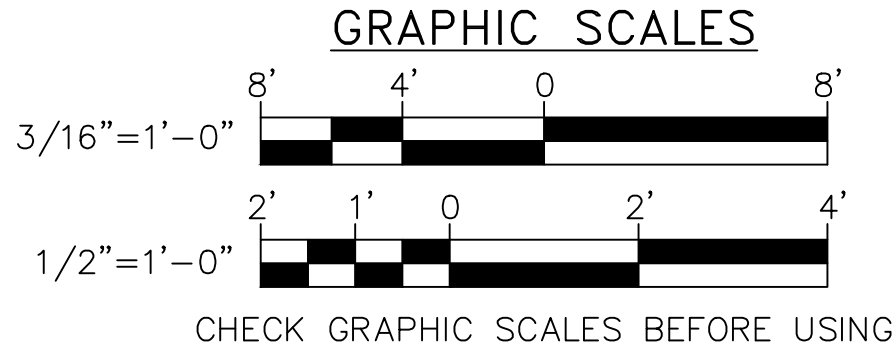


- NOTES
- 1. VALVES SHALL BE SAME SIZE AS PIPE.
 - 2. PROVIDE SPRING VIBRATION ISOLATORS FOR PUMP.

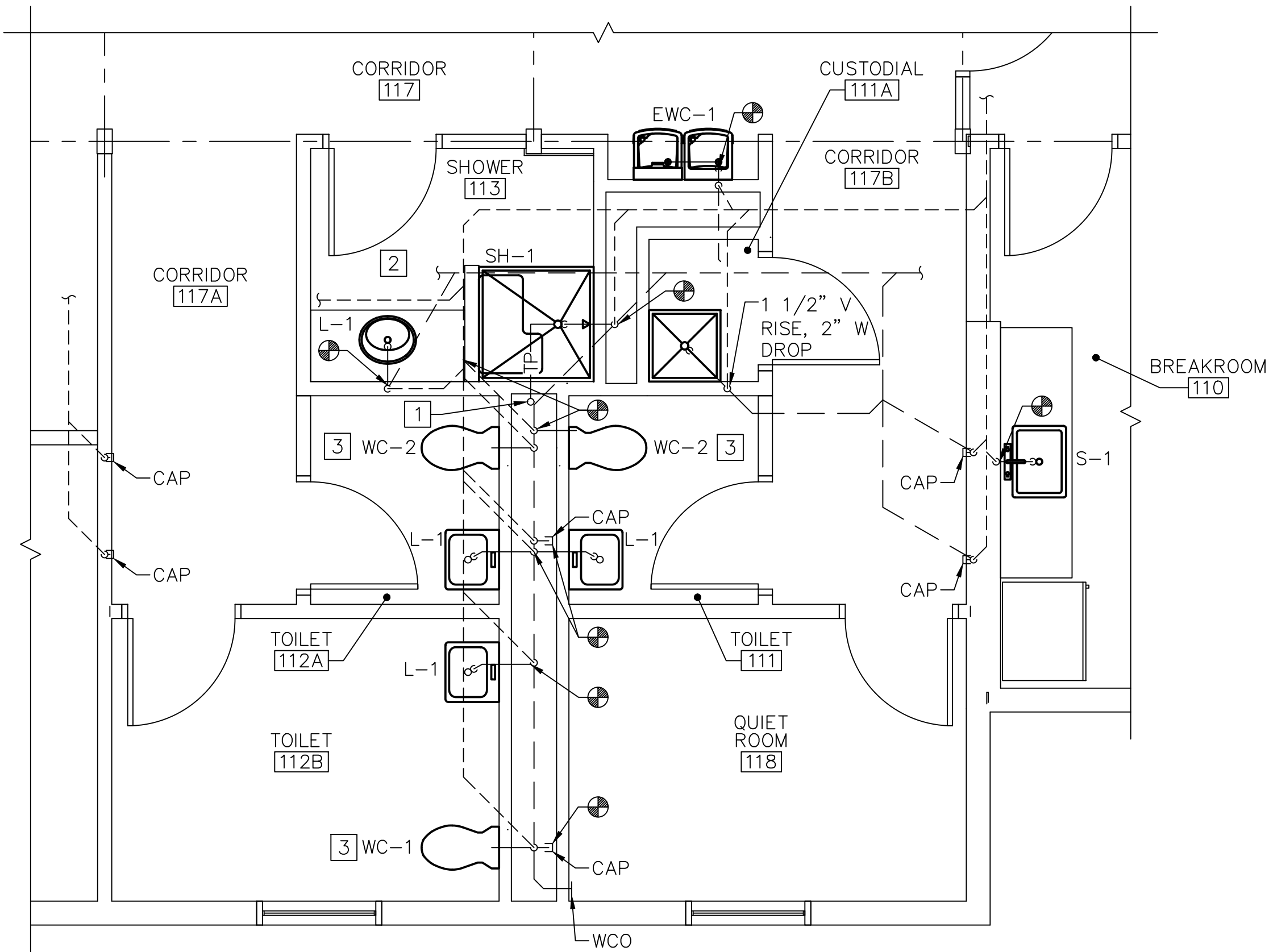
3 INLINE PUMP PIPING DETAIL
P-101 NOT TO SCALE



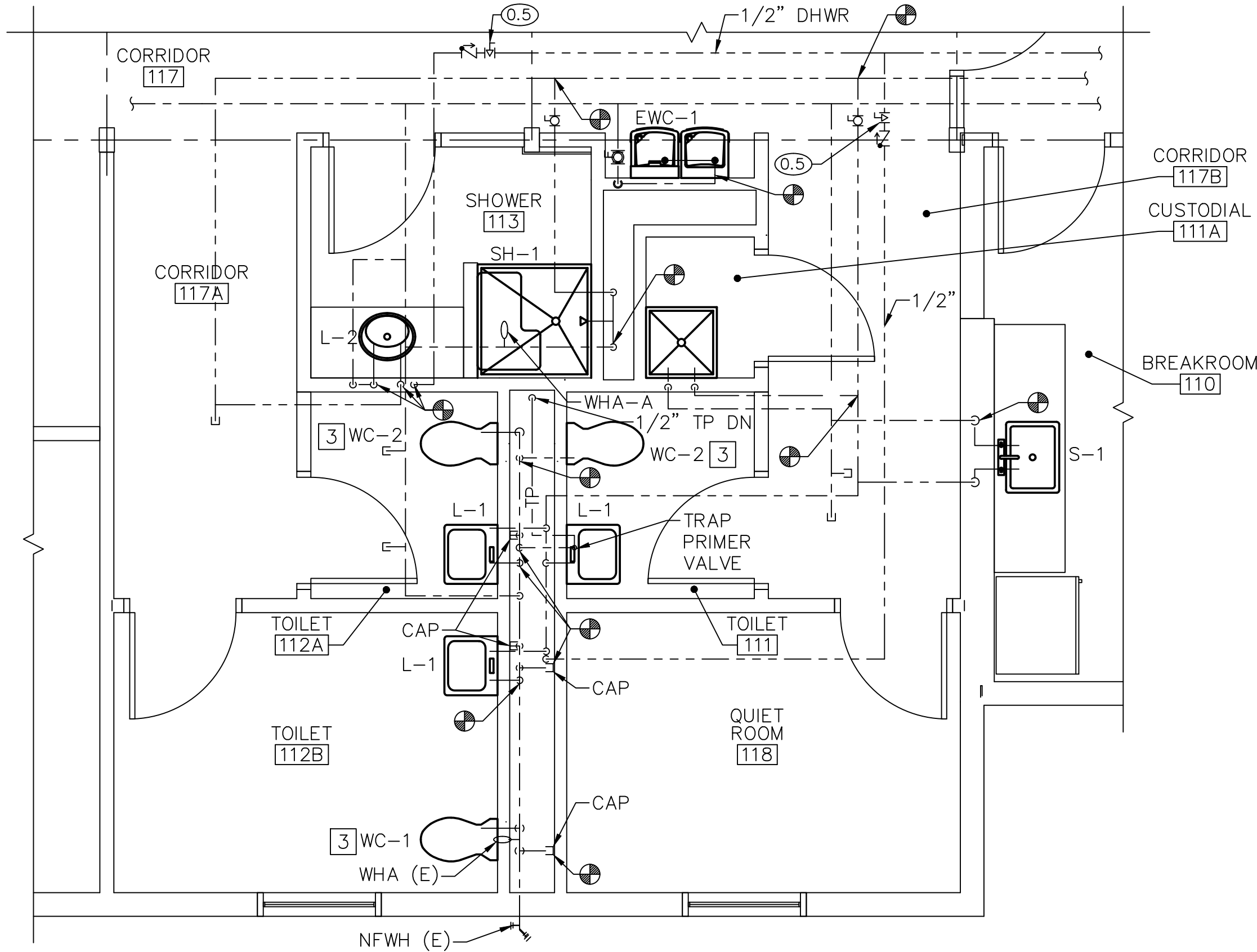
2 IT CLOSET PLUMBING PART PLAN
P-101 SCALE: 1/2"=1'-0"
PLAN NORTH



				
	REVISIONS		DATE	BY
	U.S. FISH AND WILDLIFE SERVICE		CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING	
	PLUMBING PLANS AND DETAILS			
	ASSABET RIVER NATIONAL WILDLIFE REFUGE		SUDBURY, MASSACHUSETTS	
DISCIPLINE SHEET NO	DESIGNED: DMA	DWG NO:	SHEET 26 OF 50	
	DRAWN: SRW	5R-MA-1301-100.00		



TOILET ROOM AREA
SANITARY AND VENT PART PLAN
1
P-601
SCALE: 1/4"=1'-0"
PLAN NORTH



TOILET ROOM AREA
DOMESTIC WATER SUPPLY PART PLAN
2
P-601
SCALE: 1/4"=1'-0"
PLAN NORTH

GENERAL NOTES

- REFER TO P-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.
- NOTE ON BASIS OF DESIGN: PRODUCTS OF OTHER MANUFACTURERS ARE ACCEPTABLE IF THEY MEET THE OPERATIONAL REQUIREMENTS INDICATED. ANY ADJUSTMENTS TO DUCTING, PIPING, WIRING OR CONFIGURATION DUE TO THE SELECTION OF A MANUFACTURER OTHER THAN THAT LISTED AS THE BASIS OF DESIGN WILL BE ACCOMPLISHED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE GOVERNMENT.

KEYNOTES (THIS SHEET ONLY)

- 1/2" TP UP.
- EXISTING RADIANT TUBING IN FLOOR SLAB. DO NOT CUT TUBING. REFER TO EXISTING RADIANT PLAN ON MR101. CONTRACTOR SHALL CONFIRM TUBING LOCATION BEFORE SAWCUTTING FLOOR SLAB.
- RE-INSTALL SALVAGED WATER CLOSET AND FLUSH VALVE.

PLUMBING FIXTURE ROUGH-IN SCHEDULE

UNIT NO	DESCRIPTION	WASTE	VENT	HW	CW	REMARKS
WC-1	WATER CLOSET	4"	2"	-	1"	EXISTING WALL MOUNTED, MANUAL FLUSH VALVE, ADULT ADA HEIGHT
WC-2	WATER CLOSET	4"	2"	-	1"	EXISTING WALL MOUNTED, MANUAL FLUSH VALVE, ADULT STANDARD HEIGHT
L-1	LAVATORY	1-1/2"	1-1/2"	1/2"	1/2"	WALL MOUNTED, SENSOR FAUCET
L-2	LAVATORY	1-1/2"	1-1/2"	1/2"	1/2"	INTEGRAL WITH COUNTERTOP, SENSOR FAUCET
S-1	SINK	2"	1-1/2"	1/2"	1/2"	STAINLESS STEEL, SINGLE BOWL, UNDERMOUNT, ADA
SH-1	SHOWER	2"	1-1/2"	1/2"	1/2"	ONE-PIECE FIBERGLASS SHOWER ENCLOSURE, ADA, SHOWER DRAIN & VALVE, TRAP PRIMER CONNECTION
EWC-1	ELECTRIC WATER COOLER	1-1/2"	1-1/2"	-	1/2"	ADA DUAL HEIGHT WITH CHILLER UNIT, FILTER AND INTEGRAL BOTTLE FILLER

- NOTES:
- REFER TO SHEET AE001 FOR FIXTURE INSTALLATION HEIGHTS.
 - PROVIDE TRAP PRIMER CONNECTION TO FLOOR DRAINS, WHERE INDICATED ON PLANS AND SCHEDULES.
 - WHERE VENT CONNECTIONS TO FIXTURES ARE CALLED OUT ON PLANS TO BE LARGER THAN SCHEDULED ROUGH-IN, PROVIDE LARGER SIZE REQUIRED FOR LONG HORIZONTAL VENT LENGTH FOR COMBINATION WASTE AND VENT PIPING.

MIXING VALVE SCHEDULE

UNIT NO	SERVICES	INLET	OUTLET	TEMP F°	BASIS OF DESIGN	MIN FLOW	MAX FLOW	PRESSURE DROP
TMV-1	EWB-E	3/4"	3/4"	120	LEONARD XL-186-32A-LF	1.0	14.0	10

- NOTES: 1. PROVIDE WITH INTEGRAL CHECK VALVES.

EXPANSION TANK SCHEDULE

UNIT NO	LOCATION	SERVES	ACCEPTANCE VOLUME	DIMENSIONS	BASIS OF DESIGN	NOTES
EXT-P1	IT CLOSET 106	DOMESTIC WATER	5 GAL	24 3/4" x 14ø	TACO PAX30-150P	POTABLE WATER

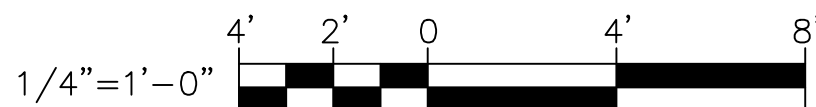
- NOTES:

PUMP SCHEDULE

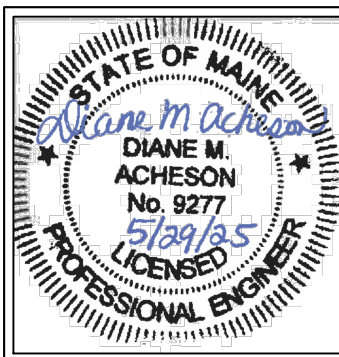
UNIT NO	SERVES	TYPE	LOCATION	GPM	TOTAL HEAD	MOTOR DATA			SUCTION/ DISCHARGE (IN)	BASIS OF DESIGN	NOTES
						HP	RPM	VOLTS/PHASE			
RP-1	DHW RECIRC	CIRC	IT CLOSET 106	1.0	8.0	1/40	3250	115/1	3/4 / 3/4	TACO 006-ST4-2PNP	1,2

- NOTES:
- PROVIDE PUMP WITH STAINLESS STEEL CONSTRUCTION.
 - PROVIDE PLUG AND PLAY PUMP WITH INTEGRAL DIGITAL TIMER AND INTEGRAL ANALOG AQUASTAT, SET PUMP CONTROLS TO MAINTAIN 115°F HOT WATER RETURN TEMPERATURE.

GRAPHIC SCALE



CHECK GRAPHIC SCALE BEFORE USING



DISCIPLINE
SHEET NO P-601

U.S. FISH AND WILDLIFE SERVICE		CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING	
DESIGNED: DMA		DWG NO: 5R-MA-1301-100.00	
DRAWN: SRW		SHEET 27 OF 50	

PLUMBING SCHEDULES AND ENLARGED PART PLANS

MECHANICAL ABBREVIATIONS

A	AMPERE, AIR	FLR	FLOOR
AHU	AIR HANDLING UNIT	FWS	FISH AND WILDLIFE SERVICE
APD	AIR PRESSURE DROP	FT	FOOT, FEET
AS	AIR SEPARATOR, AIRSCOOP, AIRFLOW SWITCH	G	GAS
BDD	BACKDRAFT DAMPER	GAL	GALLONS
BHP	BRAKE HORSEPOWER	GPM	GALLONS PER MINUTE
BT	BUFFER TANK	GR	GEOTHERMAL RETURN
BVIV	BALL VALVE IN VERTICAL	GS	GEOTHERMAL SUPPLY
CD	CONDENSATE DRAIN	GUI	GRAPHIC USER INTERFACE
CFM	CUBIC FEET PER MINUTE	H	HUMIDIFIER, HUMIDISTAT, HEIGHT
CO	CLEANOUT, COMPANY	H2O	WATER
CO2	CARBON DIOXIDE	HCR	HOT/CHILLED WATER RETURN
COP	COEFFICIENT OF PERFORMANCE	HCS	HOT/CHILLED WATER SUPPLY
CS	CURRENT SENSOR	HD	HEAD
CW	COLD WATER	HP	HORSEPOWER, HEAT PUMP
D	DEPTH, DAMPER	HTG	HEATING
DB	DRY BULB	HVAC	HEATING, VENTING AND AIR CONDITIONING (UNIT)
DDC	DIRECT DIGITAL CONTROL	IN	INCHES
DEG	DEGREES	L	LOUVER, LENGTH
Ø,DIA	DIAMETER	LAT	LEAVING AIR TEMPERATURE
DN	DOWN	LF	LINEAR FEET
E	EXISTING, EXHAUST	LWT	LEAVING WATER TEMPERATURE
EA	EXHAUST AIR, EACH	M	MOTOR, METER
EAT	ENTERING AIR TEMPERATURE	MAX	MAXIMUM
EER	ENERGY EFFICIENCY RATIO	MBH, MBTUH	1000 BTU PER HOUR
EF	EXHAUST FAN	MCA	MINIMUM CIRCUIT AMPERES
EFF	EFFICIENCY	MECH	MECHANICAL
EQUIP	EQUIPMENT	MFR	MANUFACTURER
ERU	ENERGY RECOVERY UNIT	MIN	MINIMUM
ERV	ENERGY RECOVERY VENTILATOR	N/A	NOT APPLICABLE
ESP	EXTERNAL STATIC PRESSURE	NC	NOISE CRITERIA, NORMALLY CLOSED
EWI	ENTERING WATER TEMPERATURE	NO	NUMBER, NORMALLY OPEN
EXT	EXPANSION TANK	NTS	NOT TO SCALE
°F	DEGREES FAHRENHEIT	OA	OUTSIDE AIR
FC	FLEX CONNECTOR	OAT	OUTSIDE AIR TEMPERATURE
FD	FLOOR DRAIN, FIRE DAMPER	OBD	OPPOSED BLADE DAMPER
FF	FINISH FLOOR	P	PUMP, PITCH OR PRESSURE
		PD	PRESSURE DIFFERENCE
		PH	PHASE
		PSI	POUNDS PER SQUARE INCH

GENERAL MECHANICAL SYSTEM NOTES

1.

MECHANICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE (IMC), 2021 EDITION, AND THE INTERNATIONAL ENERGY AND CONSERVATION CODE (IECC), 2021 EDITION.
2.

PIPING IS SHOWN DIAGRAMMATICALLY, EXACT LOCATIONS SHALL BE DETERMINED IN THE FIELD.
3.

PIPING SHALL BE INSTALLED CONCEALED ABOVE CEILINGS, IN WALLS AND IN CHASES, UNLESS OTHERWISE NOTED. PIPING SHALL BE INSTALLED PARALLEL TO BUILDING LINES AND PITCHED TO LOW POINTS.
4.

COORDINATE LOCATION OF PIPING WITH OTHER TRADES. PERFORM CUTTING WORK ASSOCIATED WITH MECHANICAL SYSTEMS.
5.

PIPING MUST BE SUPPORTED FROM THE TRUSS TOP OR BOTTOM CHORD. CONNECTIONS TO THE TRUSS WEB MEMBERS ARE UNACCEPTABLE. SUPPORTS MUST BE ATTACHED TO THE SIDE OF THE TRUSS TOP OR BOTTOM CHORD AT THE MID-DEPTH OF THE MEMBER AS NOTED ON FRAMING PLANS. BUILDING STRUCTURE. NO STRUCTURAL MEMBERS SHALL BE CUT. PROVIDE INTERIM GALVANIZED STEEL SLOTTED CHANNELS SPANNING STRUCTURAL ELEMENTS WHERE REQUIRED TO SUPPORT PIPING, DUCTS, AND EQUIPMENT BETWEEN STRUCTURAL MEMBERS.
6.

PIPING THRU PARTITIONS SHALL HAVE STEEL PIPE SLEEVES. OPENINGS SHALL BE SEALED SMOKE AND WATER TIGHT.
7.

AFTER CONSTRUCTION AND PRIOR TO OCCUPANCY, CONDUCT A MINIMUM 72-HOUR FLUSH-OUT WITH MAXIMUM OUTDOOR AIR CONSISTENT WITH ACHIEVING RELATIVE HUMIDITY NO GREATER THAN 60% WHILE MAINTAINING AN INTERNAL TEMPERATURE OF AT LEAST 60°F. FOLLOW RECOMMENDED APPROACH OF THE SHEET METAL AND AIR CONDITIONING CONTRACTOR’S NATIONAL ASSOCIATION INDOOR AIR QUALITY GUIDELINES FOR OCCUPIED BUILDING UNDER CONSTRUCTION, 2007. AFTER OCCUPANCY, CONTINUE FLUSH-OUT AS NECESSARY TO MINIMIZE EXPOSURE TO CONTAMINANTS FROM NEW BUILDING MATERIALS.
8.

CLEAN EXISTING HVAC AIR DISTRIBUTION DUCTS, PLENUMS AND SYSTEM COMPONENTS TO REMAIN.
9.

MATERIALS ON THIS PROJECT MUST MEET THE BUY AMERICA ACT.
10.

THE MECHANICAL AND CONTROLS CONTRACTOR SHALL TEST ALL EQUIPMENT AND IS RESPONSIBLE FOR PROVIDING A COMPLETE AND FUNCTIONAL HVAC SYSTEM.
11.

PRESSURE TEST GEOTHERMAL LOOPS AND HYDRONIC LOOPS AT THE START OF THE PROJECT, PRIOR TO ANY REMOVAL WORK. REPORT FINDINGS TO FWS.

MECHANICAL SYMBOLS LEGEND

SYMBOL	ANNOTATION
	SYMBOL PER ABBREVIATION LIST
	EQUIPMENT SEQUENCE NUMBER
	AIR INLET OR OUTLET WITH CFM
	GPM SETTING FOR BALANCING VALVE
	KEYNOTE
	DIRECTION OF AIR FLOW
	DUCTWORK
	RETURN GRILLE/REGISTER
	SUPPLY DIFFUSER/REGISTER/GRILLE
	EXHAUST GRILLE/REGISTER
	TRANSFER GRILLE
	SIDEWALL REGISTER/GRILLE
	ACCESS DOOR ON BOTTOM OF DUCT
	DUCT
	FLEXIBLE CONNECTION
	RECTANGULAR TO ROUND FITTING
	MANUAL BALANCING DAMPER IN DUCT
	RETURN DUCT
	EXHAUST DUCT
	SUPPLY DUCT
	SQUARE ELBOW WITH TURNING VANES
	FLEXIBLE DUCT
	FIRE DAMPER
	BACKDRAFT DAMPER
	MOTORIZED DAMPER, PARALLEL BLADE
	MOTORIZED DAMPER, OPPOSED BLADE
	HOT WATER HEATING COIL
	DIRECT EXPANSION COOLING COIL

MECHANICAL LINE TYPE LEGEND

	PROVIDE ITEMS
	EXISTING ITEMS
	REMOVAL ITEMS
	HOT/CHILLED WATER SUPPLY
	HOT/CHILLED WATER RETURN
	GEOTHERMAL SUPPLY
	GEOTHERMAL RETURN
	RADIANT HEATING SUPPLY
	RADIANT HEATING RETURN
	CONDENSATE DRAIN
	CONTROL WIRING

SYMBOL	EQUIPMENT
	CENTRIFUGAL FAN
	PUMP
	PIPING
	ELBOW DOWN
	PIPE TEE UP OR UP AND DOWN
	ELBOW UP OR UP AND DOWN
	PIPE TEE DOWN
	STRAINER
	BALL VALVE
	GATE VALVE
	PRESSURE GAGE
	CHECK VALVE
	CALIBRATED BALANCING VALVE WITH POSITIVE SHUTOFF
	PIPE PITCH DOWN
	PRESSURE RELIEF VALVE
	2-WAY ELECTRIC AUTOMATIC CONTROL VALVE
	PRESSURE REDUCING VALVE
	CAP
	UNION
	CONCENTRIC PIPE REDUCER/INCREASER
	THERMOMETER
	AIR VENT, AUTOMATIC
	MANUAL FLOAT VENT
	VACUUM BREAKER
	FLEXIBLE CONNECTOR
	AIR SEPARATOR
	CLEANOUT
	HOSE BIBB WITH CAP & CHAIN
	CONTROL DEVICE IN WELL

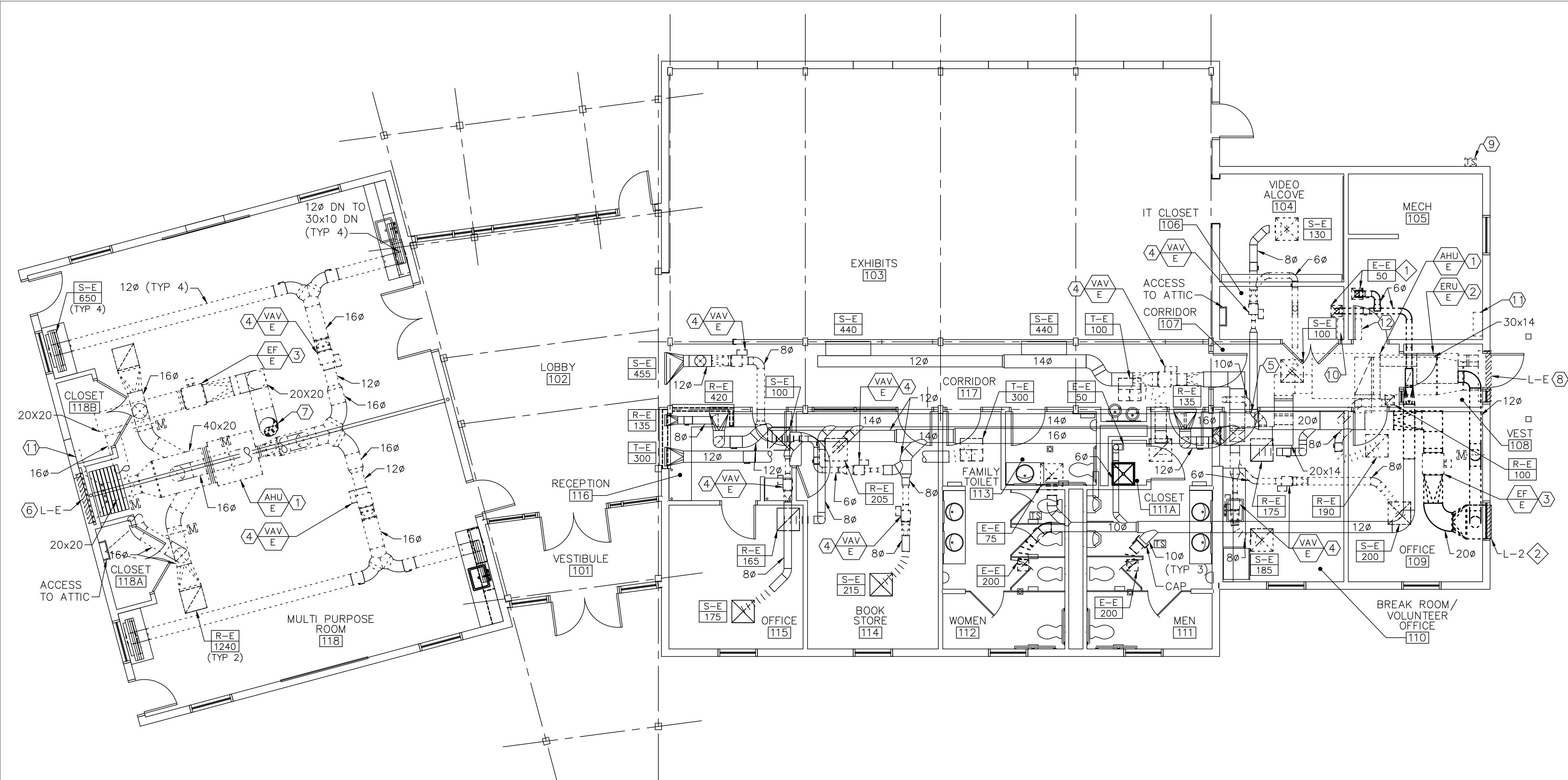
SYMBOL	CONTROLS AND METERING
	WALL MOUNTED TEMPERATURE SENSOR (REFER TO CONTROL DIAGRAMS FOR VARYING SPECIFIC REQUIREMENTS)
	TEMPERATURE SENSOR WITH SUNSHADE
	WALL MOUNTED THERMOSTAT WITH INTEGRAL CONTACTORS, USER-ADJUSTABLE
	AVERAGING DUCT MOUNTED TEMPERATURE SENSOR
	PROBE TYPE DUCT MOUNTED TEMPERATURE SENSOR
	LOW TEMPERATURE THERMOSTAT (FREEZESTAT)
	FLUID TEMPERATURE SENSOR IN WELL
	FLUID TPRESSURE SENSOR IN WELL
	PRESSURE SWITCH
	OCCUPANCY SENSOR
	VARIABLE FREQUENCY DRIVE
	CARBON DIOXIDE SENSOR
	START/STOP CONTROLLER
	CURRENT SENSOR
	MANUAL SWITCH
	MOTORIZED DAMPER ACTUATOR
	DIFFERENTIAL PRESSURE SWITCH
	STATIC PRESSURE SENSOR
	RELATIVE HUMIDITY SENSOR
	OUTSIDE AIR TEMPERATURE SENSOR

DISCIPLINE

SHEET NO

M-001

U.S. FISH AND WILDLIFE SERVICE		CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING	
MECHANICAL LEGENDS, ABBREVIATIONS, AND GENERAL NOTES			
ASSABET RIVER NATIONAL WILDLIFE REFUGE			
SUDBURY, MASSACHUSETTS			
DESIGNED: DMA	DWG NO	5R-MA-1301-100.00	
DRAWN: SRW	SHEET 28		OF 50



1 MECHANICAL DUCTWORK REMOVALS PLAN
MD101 SCALE: 3/16"=1'-0"
PLAN NORTH

GENERAL NOTE

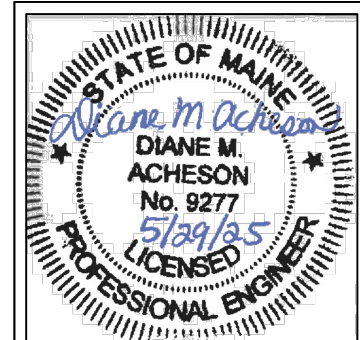
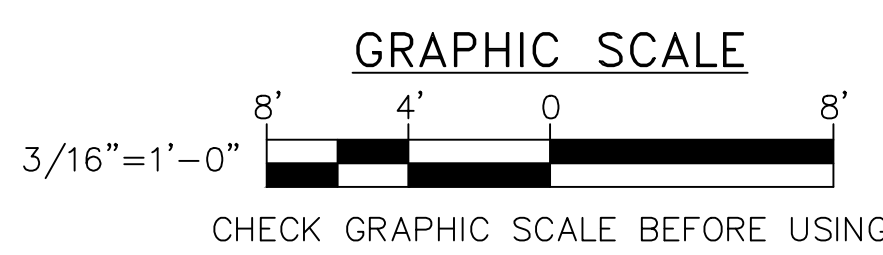
1. REFER TO M-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.

REMOVALS KEYNOTES (THIS SHEET ONLY)

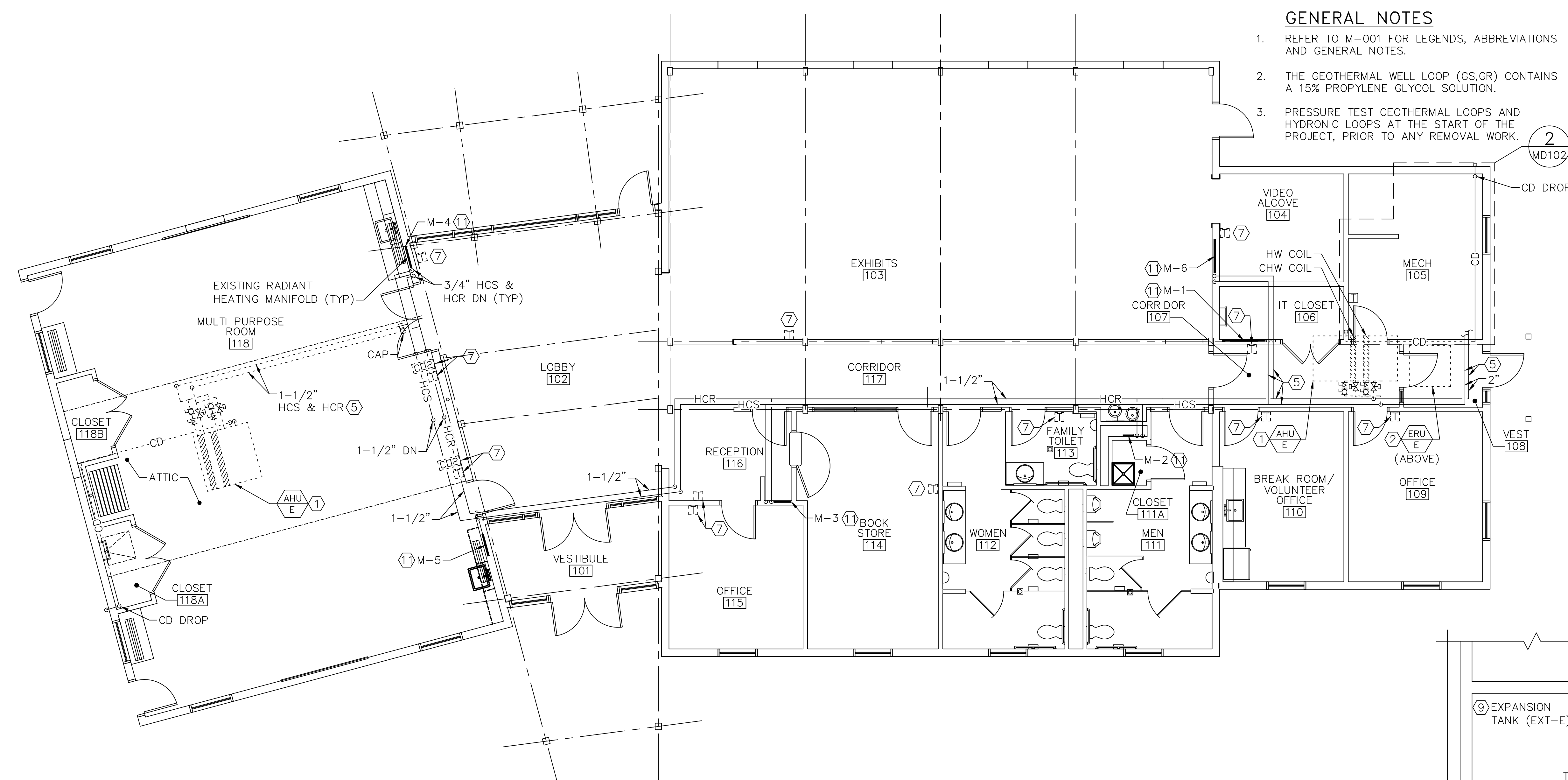
- 1 REMOVE EXISTING AHU AND EQUIPMENT SUPPORTS. EXISTING AHU IS HUNG IN ATTIC SPACE.
- 2 REMOVE EXISTING ERU AND EQUIPMENT SUPPORTS. EXISTING ERU IS HUNG IN ATTIC SPACE.
- 3 REMOVE EXISTING EXHAUST FAN AND EQUIPMENT SUPPORTS. EXISTING EXHAUST FAN IS HUNG IN ATTIC SPACE.
- 4 REMOVE EXISTING VAV BOX AND EQUIPMENT SUPPORTS. EXISTING VAV BOX IS HUNG IN ATTIC SPACE.
- 5 CAP DUCTWORK.
- 6 REMOVE EXISTING LOUVER. SALVAGE AND STORE FOR REINSTALLATION. LOUVER OPENING WILL BE USED FOR EQUIPMENT REMOVAL IN ATTIC.
- 7 REMOVE 20" EXHAUST DUCT IN ATTIC SPACE. 20" UP TO CUPOLA SHALL REMAIN.
- 8 REMOVE EXISTING LOUVER.
- 9 REMOVE EXISTING OUTSIDE AIR TEMPERATURE SENSOR.
- 10 REMOVE EXISTING JACE.
- 11 REMOVE EXISTING DDC CONTROL PANEL IN ATTIC.
- 12 REMOVE EXISTING DDC CONTROL PANEL.

EXISTING KEYNOTES (THIS SHEET ONLY)

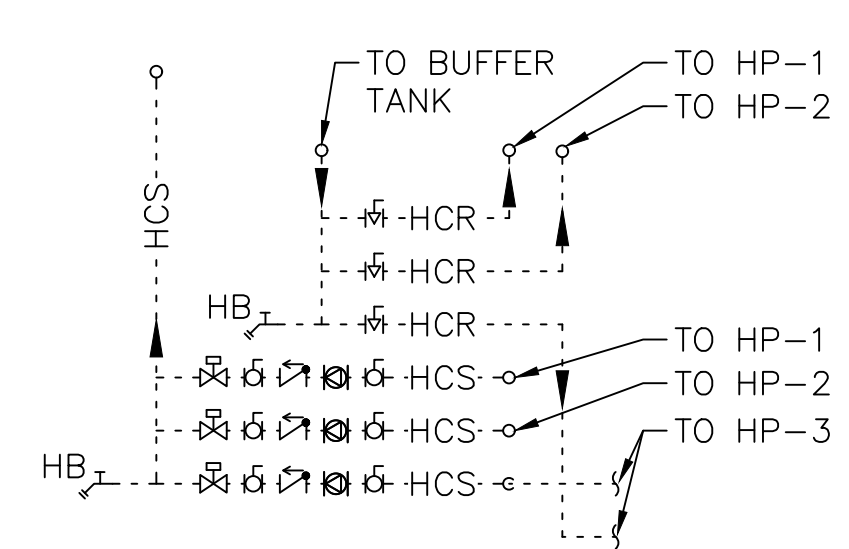
- 1 EXISTING GRILLE TO REMAIN.
- 2 EXISTING LOUVER TO REMAIN.



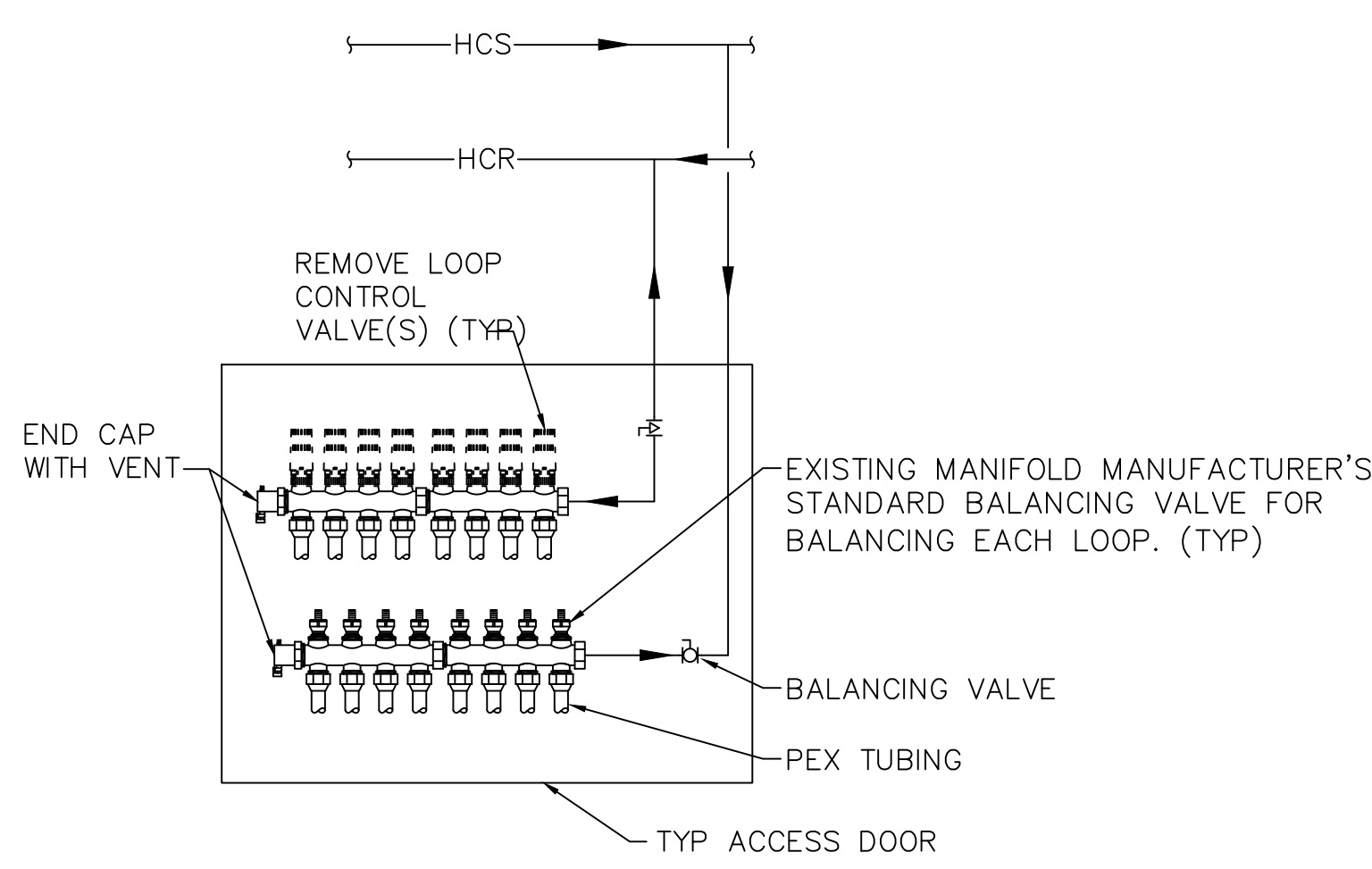
U.S. FISH AND WILDLIFE SERVICE		CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING	
MECHANICAL DUCTWORK REMOVALS PLAN			
ASSABET RIVER NATIONAL WILDLIFE REFUGE		SUDBURY, MASSACHUSETTS	
DESIGNED: DMA	DWG NO:	5R-MA-1301-100.00	SHEET 29 OF 50
DRAWN: SRW			



1 MECHANICAL PIPING REMOVALS PLAN
MD102 SCALE: 3/16"=1'-0"
PLAN NORTH



3 PIPING ELEVATION
MD102 NOT TO SCALE



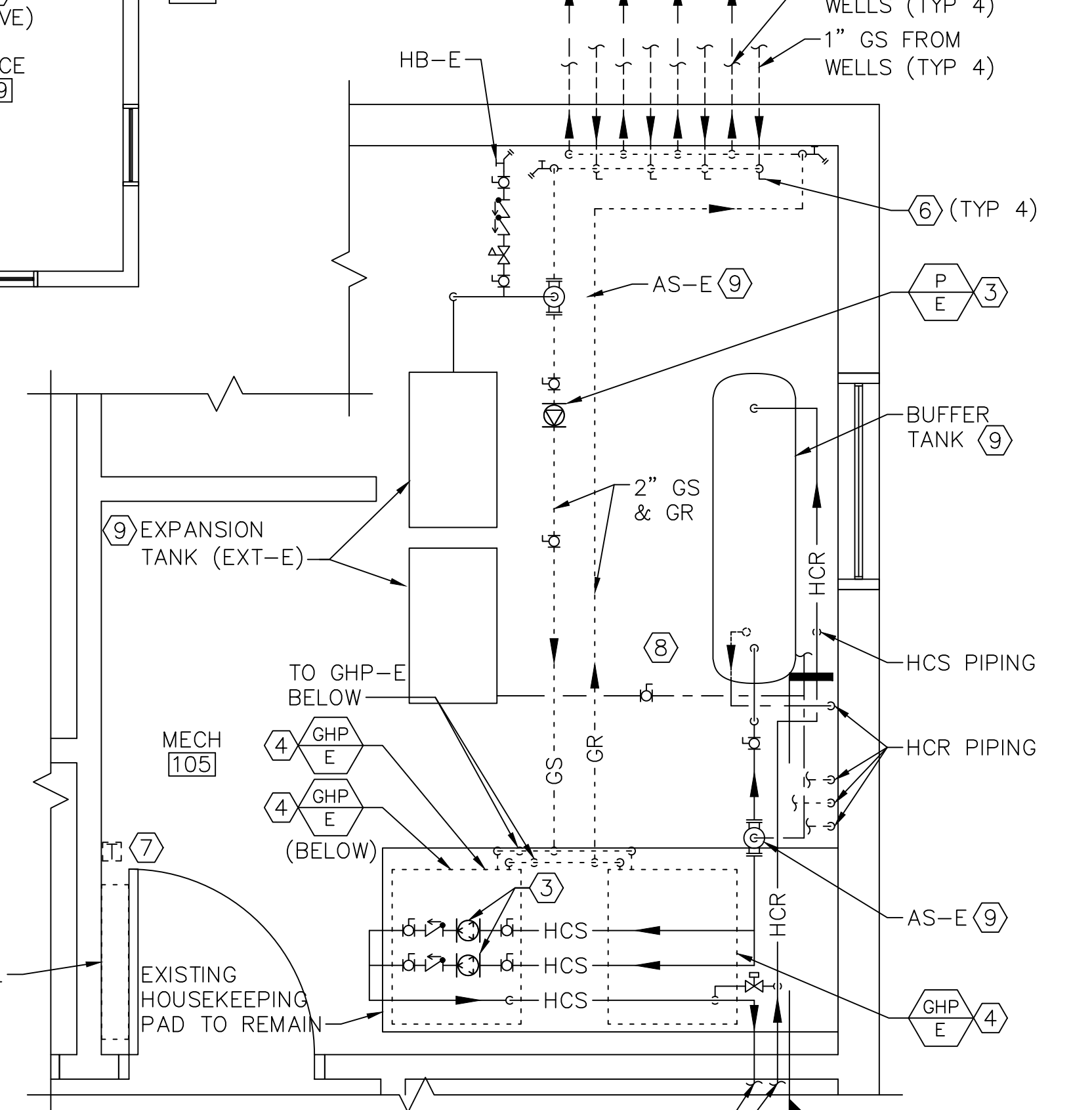
4 TYPICAL RADIANT HEAT MANIFOLD
MD102 NOT TO SCALE

GENERAL NOTES

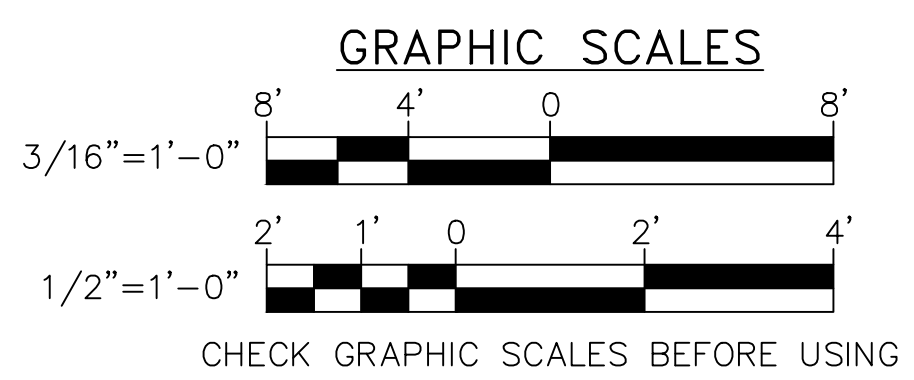
1. REFER TO M-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.
2. THE GEOTHERMAL WELL LOOP (GS,GR) CONTAINS A 15% PROPYLENE GLYCOL SOLUTION.
3. PRESSURE TEST GEOTHERMAL LOOPS AND HYDRONIC LOOPS AT THE START OF THE PROJECT, PRIOR TO ANY REMOVAL WORK.

REMOVALS KEYNOTES (THIS SHEET ONLY)

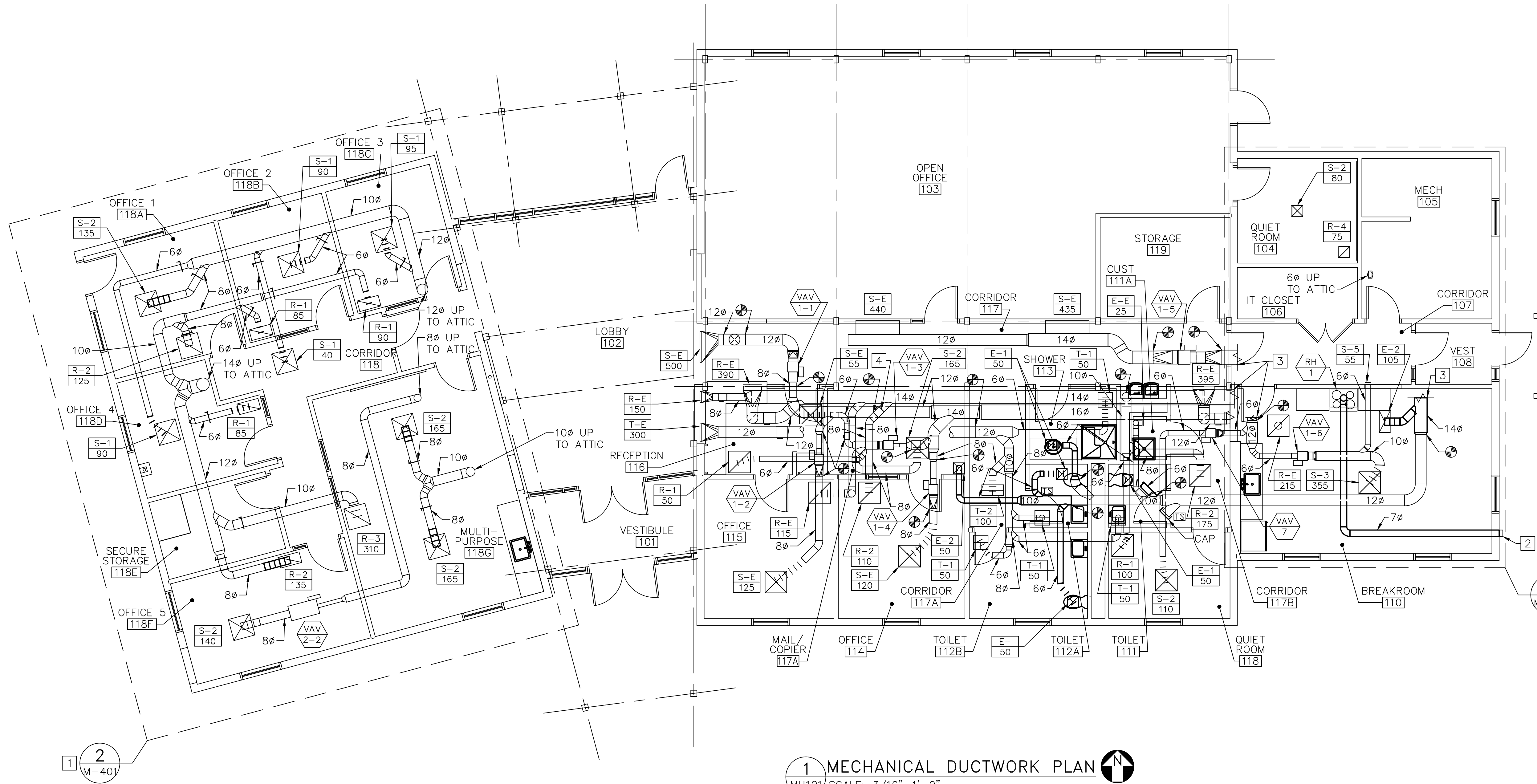
- 1 REMOVE EXISTING AHU AND EQUIPMENT SUPPORTS.
- 2 REMOVE EXISTING ERU AND EQUIPMENT SUPPORTS.
- 3 REMOVE EXISTING INLINE PUMP AND EQUIPMENT SUPPORTS.
- 4 REMOVE EXISTING WATER TO WATER HEAT PUMP, EQUIPMENT STAND AND SUPPORTS. HEAT PUMP REFRIGERANT IS R-22 & R410A. HVAC EQUIPMENT DISPOSAL SHALL BE DONE IN ACCORDANCE WITH THE CLEAN AIR ACT AND LOCAL STATE AND FEDERAL REGULATIONS. REFRIGERANT MUST BE REMOVED PRIOR TO DISPOSING OF UNITS. THE USED REFRIGERANT SHALL BE RECALLED BY EPA APPROVED, SPECIALIZED EQUIPMENT REFRIGERANT MECHANIC.
- 5 PIPING BELOW ATTIC FLOOR.
- 6 REMOVE BALL VALVES.
- 7 REMOVE SENSOR AND ASSOCIATED WIRING AND ACCESSORIES.
- 8 REMOVE PIPE INSULATION ON ALL EXISTING TO REMAIN PIPING IN THIS ROOM.
- 9 INSPECT TANK/EQUIPMENT. NOTIFY GOVERNMENT OF ANY ISSUES OR DEFECTS.
- 10 REMOVE EXISTING DDC CONTROL PANEL.
- 11 REMOVE RADIANT HEAT LOOP CONTROL VALVES. REFER TO 4/MD102.



2 MECHANICAL ROOM
PIPING REMOVALS PART PLAN
MD102 SCALE: 1/2"=1'-0"
PLAN NORTH



	U.S. FISH AND WILDLIFE SERVICE		CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING	DATE:	BY:
	ASSABET RIVER NATIONAL WILDLIFE REFUGE		SUDBURY, MASSACHUSETTS		
	DESIGNED: DMA	DWG NO:	5R-MA-1301-100.00	SHEET 30 OF 50	
	DRAWN: SRW				



GENERAL NOTES

1. REFER TO M-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.
2. CLEAN ALL EXISTING TO REMAIN DUCTWORK.
3. INSTALL EQUIPMENT TO ALLOW EQUIPMENT MAINTENANCE ACCESS AS REQUIRED BY MANUFACTURER'S WRITTEN INSTRUCTIONS. PROVIDE MINIMUM 12" MAINTENANCE CLEARANCE AT VALVES AND OTHER ACCESS LOCATIONS.
4. DUCTWORK AND PIPING PENETRATIONS THROUGH WALLS SHALL BE SEALED SMOKE TIGHT.
5. REPLACE DUCT INSULATION DAMAGED DURING CONSTRUCTION.

KEYNOTES (THIS SHEET ONLY)

- 1 FOR ATTIC SPACE ABOVE.
- 2 HOODED WALL VENT WITH SPRING LOADED DAMPER. MOUNT BOTTOM OF VENT AT HEIGHT TO MATCH BOTTOM OF EXHAUST LOUVER.
- 3 CONTINUED ON 3/M-401.
- 4 REPAIR DAMAGED DUCT INSULATION.

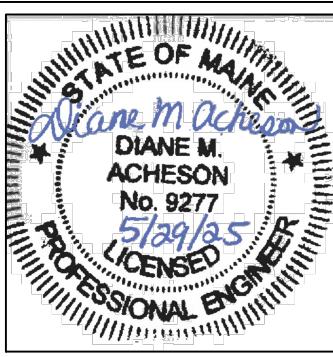
1 MECHANICAL DUCTWORK PLAN
MH101 SCALE: 3/16"=1'-0"



GRAPHIC SCALE

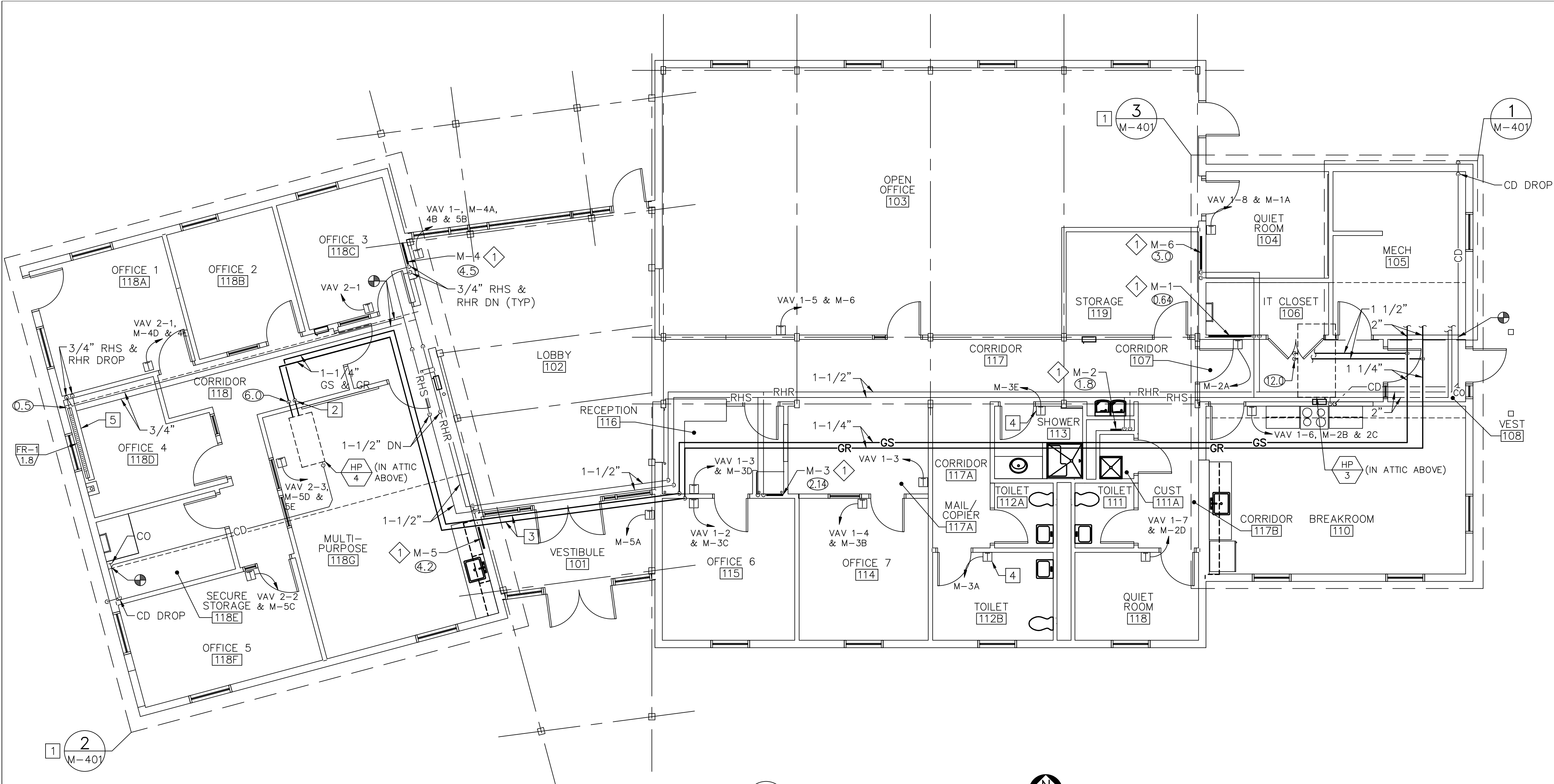


CHECK GRAPHIC SCALE BEFORE USING



DISCIPLINE
SHEET NO MH101

REVISIONS:		DATE:	BY:
NO.	U.S. FISH AND WILDLIFE SERVICE	CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING	
MECHANICAL DUCTWORK PLAN			
ASSABET RIVER NATIONAL WILDLIFE REFUGE SUDBURY, MASSACHUSETTS			
DESIGNED: DMA	DWG NO:	5R-MA-1301-100.00	SHEET 31 OF 50
DRAWN: SRW			



GENERAL NOTES

1. REFER TO M-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.
2. INSTALL EQUIPMENT TO ALLOW MAINTENANCE ACCESS AS REQUIRED BY EQUIPMENT MANUFACTURER'S WRITTEN INSTRUCTIONS. PROVIDE MINIMUM 12" MAINTENANCE CLEARANCE AT VALVES AND OTHER ACCESS LOCATIONS.
3. DUCTWORK AND PIPING PENETRATIONS THROUGH WALLS SHALL BE SEALED SMOKE TIGHT.
4. REPLACE PIPE INSULATION DAMAGED DURING CONSTRUCTION.

KEYNOTES (THIS SHEET ONLY)

- 1 FOR THE ATTIC SPACE ABOVE.
- 2 DROP BELOW ATTIC FLOOR.
- 3 EXPOSED PIPING. RUN PIPING ABOVE WINDOWS. PROVIDE PVC PAINTABLE JACKET OVER PIPE INSULATION.
- 4 CONTROLS RADIANT LOOP ONLY.
- 5 PIPING SHOWN OFFSET FOR CLARITY.

EXISTING KEYNOTE (THIS SHEET ONLY)

- 1 EXISTING RADIANT HEATING MANIFOLD.

1 MECHANICAL PIPING PLAN
MP101 SCALE: 3/16"=1'-0"

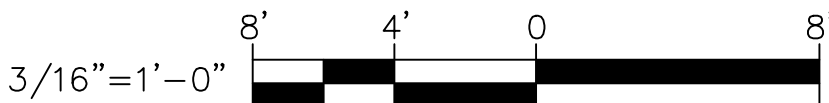


CONTROL VALVE SCHEDULE

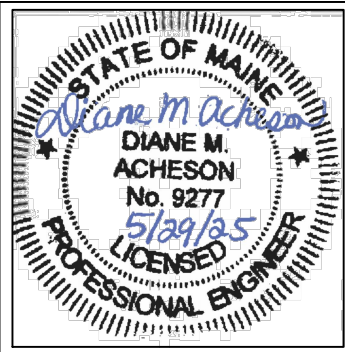
NO	EQUIPMENT SERVED	LOCATION	SERVICE	TYPE	ACTION	WATER VALVES		FAIL POSITION	NOTES
						GPM	SIZING		
1	HP-1	MECH 105	GEO THERMAL	3-WAY	2-POSITION	15	3 PSIG WPD MAX	OPEN	1
1	HP-2	MECH 105	GEO THERMAL	3-WAY	2-POSITION	15	3 PSIG WPD MAX	OPEN	1
1	HP-3	EAST ATTIC	GEO THERMAL	3-WAY	2-POSITION	12	3 PSIG WPD MAX	OPEN	1
1	HP-4	WEST ATTIC	GEO THERMAL	3-WAY	2-POSITION	6	3 PSIG WPD MAX	OPEN	1
1	RADIANT BYPASS	MECH 105	RADIANT WATER	2-WAY	MODULATING	-	5 PSIG WPD MAX	OPEN	
27	RADIANT MANIFOLD	VARIOUS	RADIANT WATER	2-WAY	2-POSITION	NOTE 2	NOTE	CLOSED	

NOTES: 1. VALVE PERFORMANCE TO BE BASED ON 15% PROPYLENE GLYCOL. 2. REFER TO RADIANT FLOOR HEATING SCHEDULE.

GRAPHIC SCALE

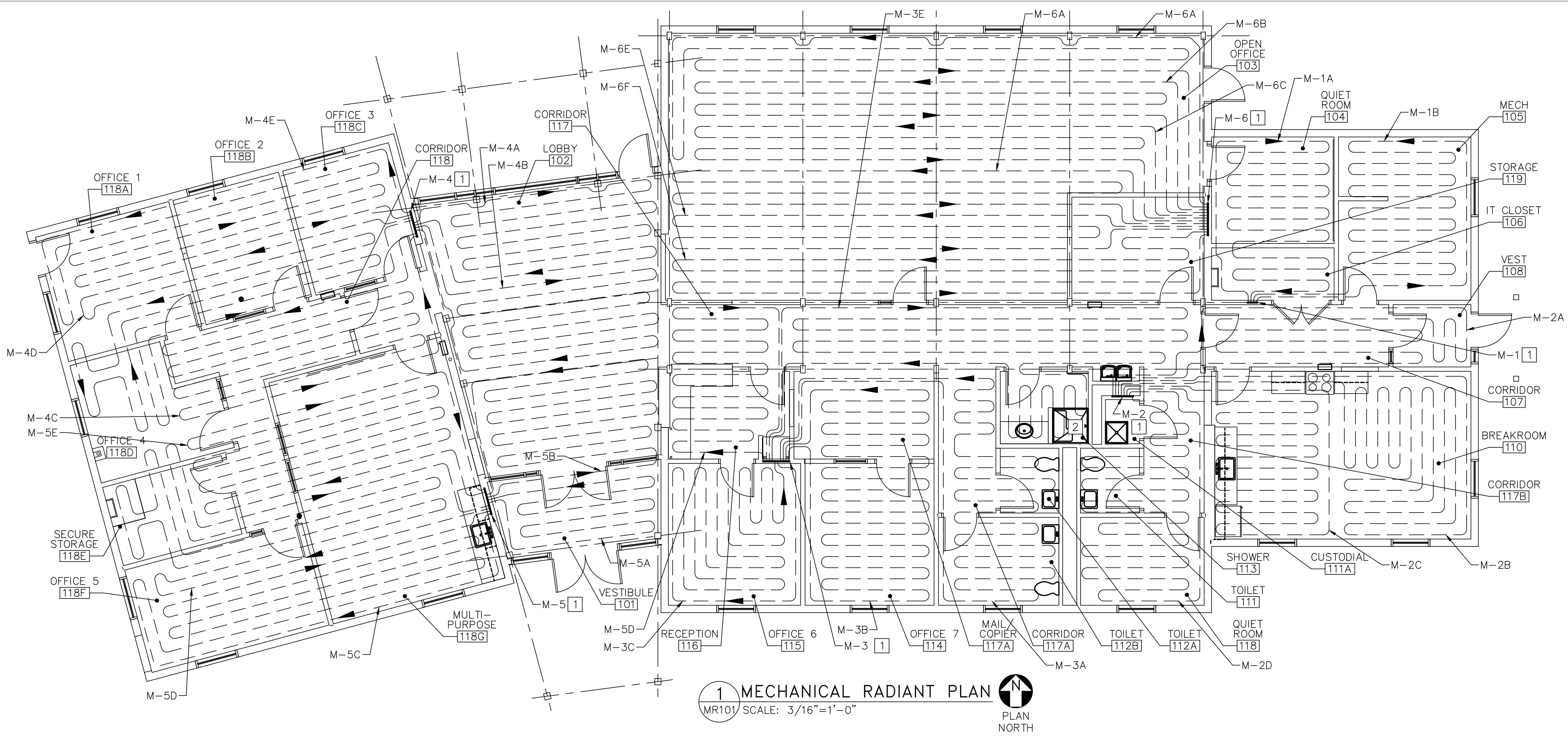


CHECK GRAPHIC SCALE BEFORE USING



DISCIPLINE
SHEET NO MP101

NO.	REVISIONS:			DATE:	BY:
U.S. FISH AND WILDLIFE SERVICE			CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING		
MECHANICAL PIPING PLAN					
ASSABET RIVER NATIONAL WILDLIFE REFUGE			SUDBURY, MASSACHUSETTS		
DESIGNED: DMA		DWG NO:	5R-MA-1301-100.00		SHEET 32 OF 50
DRAWN: SRW					



GENERAL NOTES

- REFER TO M-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.
- THE RADIANT HEATING SYSTEM IS AN EXISTING SYSTEM AND SHOWN FOR INFORMATION ONLY.

KEYNOTES (THIS SHEET ONLY)

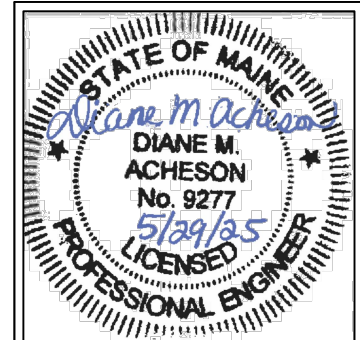
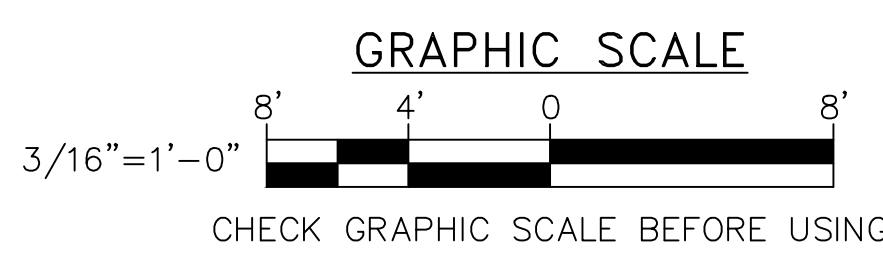
- REPLACE LOOP CONTROL VALVES AND REBALANCE RADIANT HEATING SYSTEM.
- DO NOT DAMAGE EXISTING RADIANT TUBING IN FLOOR SLAB DURING INSTALLATION OF SHOWER.

1 MECHANICAL RADIANT PLAN
MR101 SCALE: 3/16"=1'-0" PLAN NORTH

RADIANT FLOOR HEATING SCHEDULE – (EXISTING SYSTEM)

MANIFOLD ASSEMBLY	ROOM NAME	TOTAL RADIANT LOAD MBH	NUMBER OF LOOPS	FLOW PER CIRCUIT, GPM	ROOM GROSS AREA SQ-FT	MANIFOLD TOTAL FLOW GPM	TUBE SPACING IN
M-1	104 QUIET ROOM	1.1	1	0.22	107	0.64	12
	106 IT				52		
	105 MECHANICAL	2.1	1	0.42	173		12
M-2	107 CORRIDOR	2.5	1	0.5	92	1.8	12
	108 VESTIBULE				39		
	110 BREAKROOM	3.9	2	0.4	349		12
	111 MEN	2.5	1	0.5	193		12
M-3	112 WOMEN	2.5	1	0.5	187	2.14	12
	114 OFFICE				148		
	117A PLOTTER	3.0	1	0.6	99		12
	115 OFFICE	1.8	1	0.36	152		12
	116 RECEPTION	1.2	1	0.24	85		12
	117 CORRIDOR / 113 SHOWER	2.2	1	0.44	228		12
	102 LOBBY	6.0	2	0.6	328		12
M-4	118 CORRIDOR	5.6	1	1.1	185	4.5	12
	118A OFFICE				144		
	118B OFFICE				114		
	118C OFFICE				114		
	118D OFFICE				118		
		11.3	2	1.1			12
M-5	101 VESTIBULE	1.5	1	0.3	104	4.2	12
	102 LOBBY	3.0	1	0.6	164		12
	118E SECURE STORAGE				81		
	118F OFFICE				157		
	118G MULTI-PURPOSE	16.9	3	1.1	359		12
M-6	103 OPEN OFFICE	13.9	6	0.5	1158	3.0	12

NOTES: A. MANIFOLD-MOUNTED CIRCUIT FLOW BALANCING VALVES ARE USED TO DISTRIBUTE TOTAL MANIFOLD FLOW EQUALLY THROUGH EACH CIRCUIT.
B. EACH MANIFOLD ASSEMBLY CONSISTS OF A SUPPLY AND RETURN MANIFOLD, RADIANT FLOOR TUBING, AND ACCESSORIES.
C. RADIANT HEATING PERFORMANCE BASED ON 120°F EWT, 110°F LWT, AND 1/2" PEX CIRCUIT PIPING, UNLESS NOTED OTHERWISE.
D. MAXIMUM SLAB SURFACE TEMPERATURE SHALL NOT EXCEED 85°F.



NO.	REVISIONS	DATE	BY
U.S. FISH AND WILDLIFE SERVICE CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING			
MECHANICAL RADIANT PLAN AND SCHEDULE			
ASSABET RIVER NATIONAL WILDLIFE REFUGE SUDBURY, MASSACHUSETTS			
DESIGNED: DMA	BWG NO:	5R-MA-1301-100.00	SHEET 33 OF 50
DRAWN: SRW			

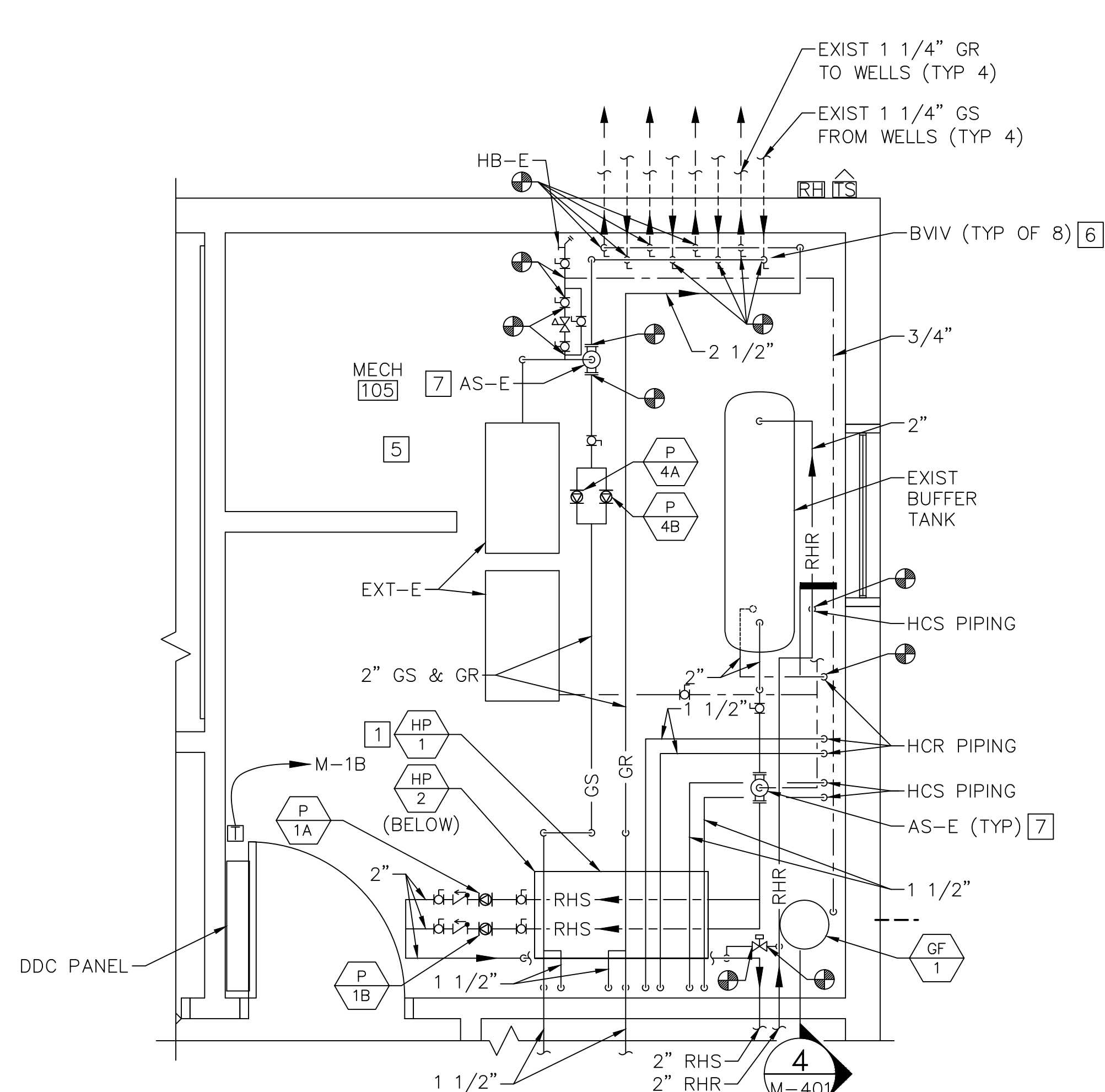
DISCIPLINE MR101
SHEET NO

GENERAL NOTE

1. REFER TO M--001 FOR LEGENDS, ABBREVIATIONS AND GENERAL NOTES.
2. INSTALL EQUIPMENT TO ALLOW MAINTENANCE ACCESS AS REQUIRED BY EQUIPMENT MANUFACTURER'S WRITTEN INSTRUCTIONS. PROVIDE MINIMUM 12" MAINTENANCE CLEARANCE AT VALVES AND OTHER ACCESS LOCATIONS.
3. DUCTWORK AND PIPING PENETRATIONS THROUGH WALLS SHALL BE SEALED SMOKE TIGHT.
4. REPLACE INSULATION DAMAGED DURING CONSTRUCTION.
5. SUPPORT HVAC EQUIPMENT IN ATTIC SPACE FROM STRUCTURE.

KEYNOTES (THIS SHEET ONLY)

- 1 PROVIDE EQUIPMENT STAND FOR HEAT PUMP.
- 2 REINSTALL EXISTING LOUVER.
- 3 14Ø DROP TO OA DUCT WITH RA DAMPER.
- 4 14Ø UP TO 20Ø
- 5 RE-INSULATE ALL EXISTING PIPING IN THIS ROOM.
- 6 INSTALL BALL VALVE ON VERTICAL SUPPLY AND RETURN GEOTHERMAL LOOP PIPING (TYP OF 8). INSTALL BALANCING VALVE ON RETURN GEOTHERMAL LOOP PIPING AND BALANCE EACH LOOP TO 12 GPM (TYP OF 4).
- 7 RE-INSTALL SALVAGED AIR SEPARATOR.
- 8 DUCTWORK SHALL RUN BELOW LOUVER.
- 9 INSTALL DUCTWORK BETWEEN STRUCTURAL JOISTS TO ALLOW ACCESS TO EQUIPMENT.
- 10 PROVIDE ROUNDED ELBOW.
- 11 INSTALL DUCTWORK RIGHT BELOW STRUCTURE TO ALLOW ACCESS TO EQUIPMENT.



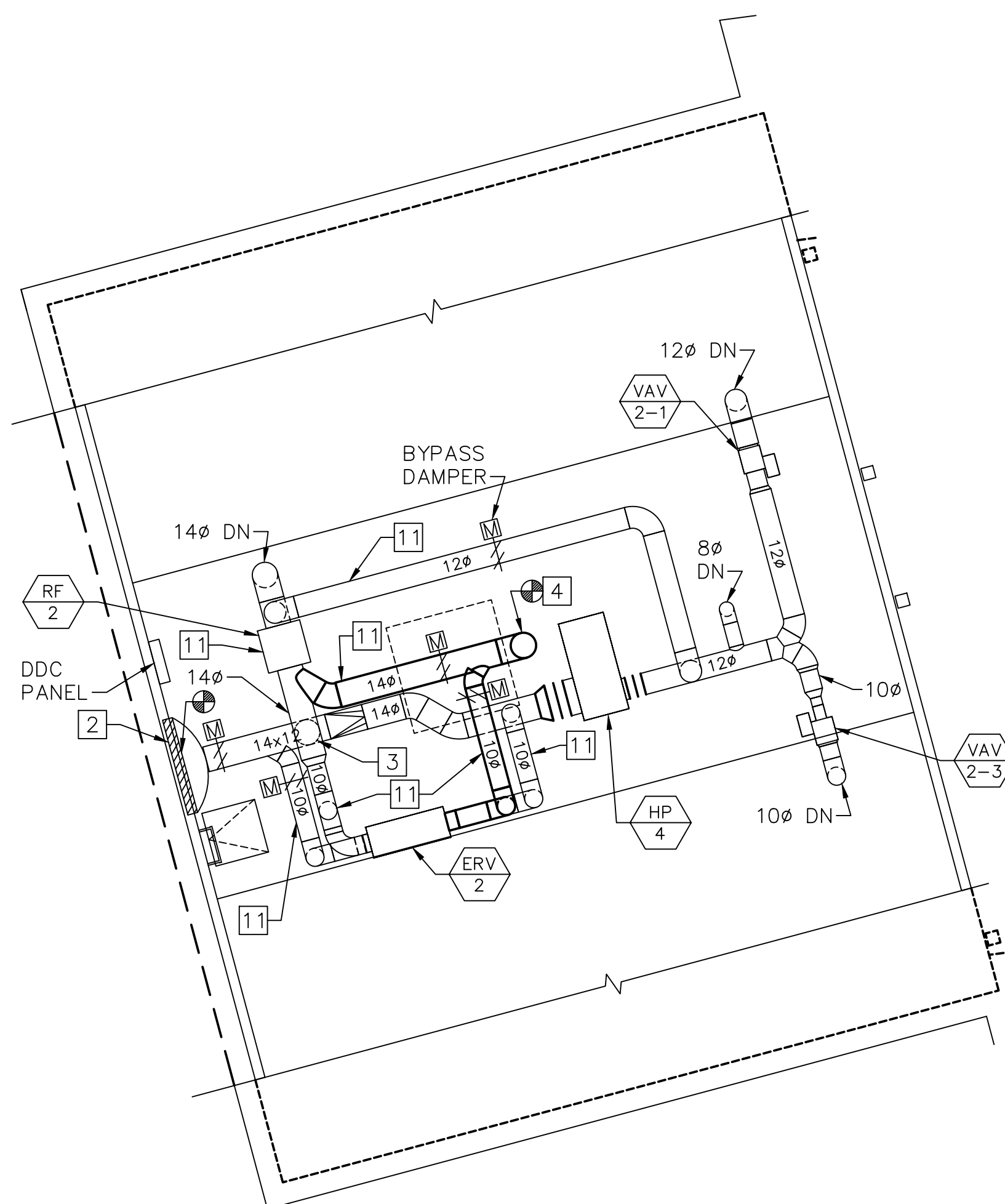
MECHANICAL ROOM PART PLAN

1
M-401

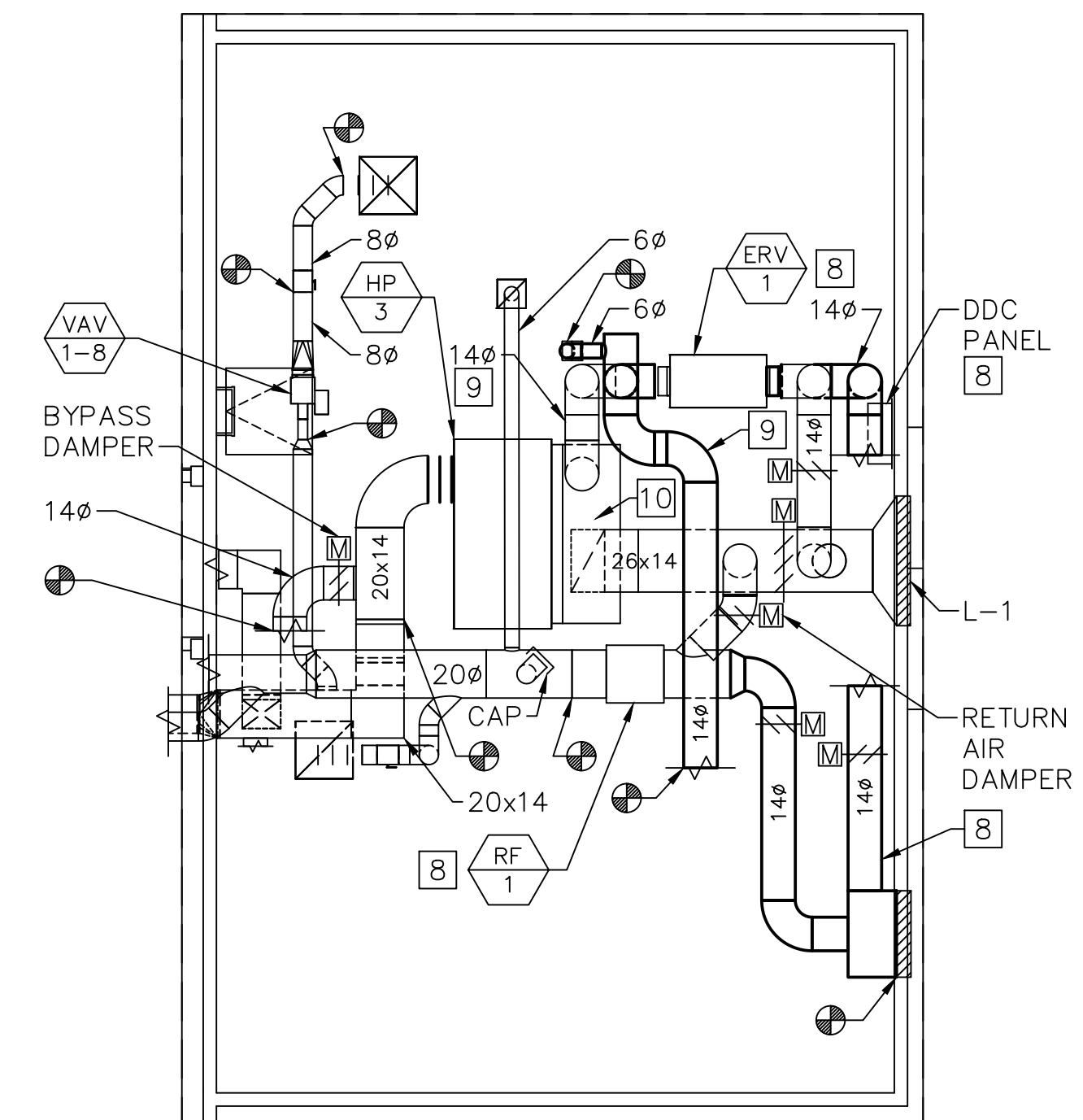
SCALE: 1/2"=1'-0"

MH101, MP101

PLAN NORTH

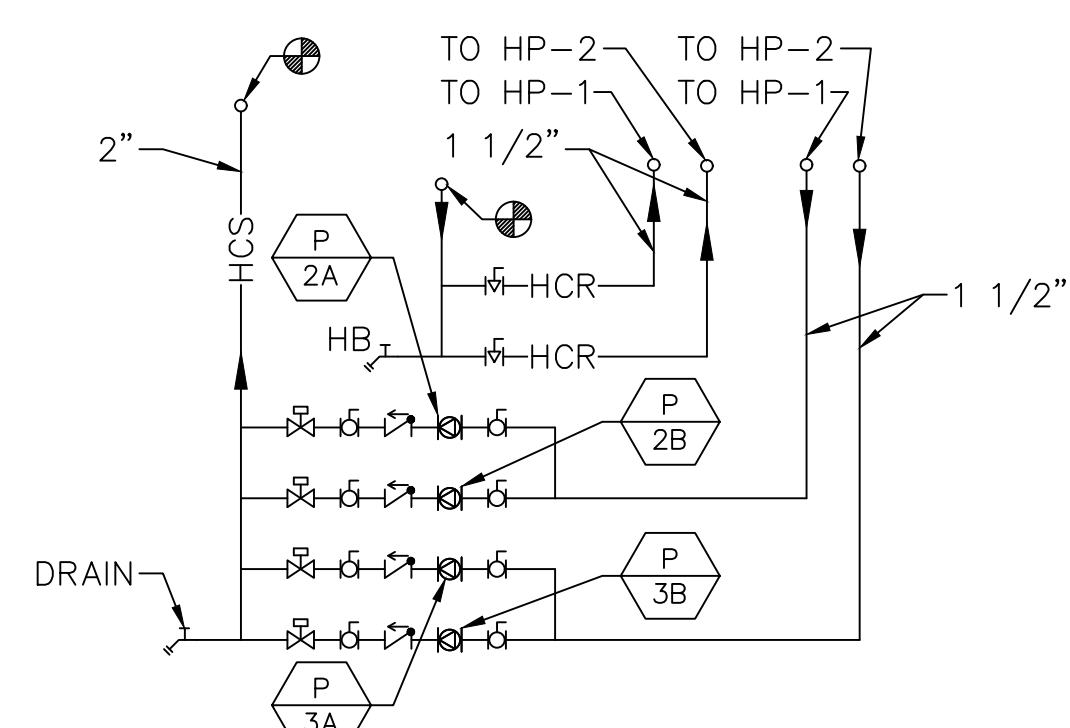


2 WEST ATTIC PLAN
M-401 SCALE: 3/16"=1'-0"
MH101



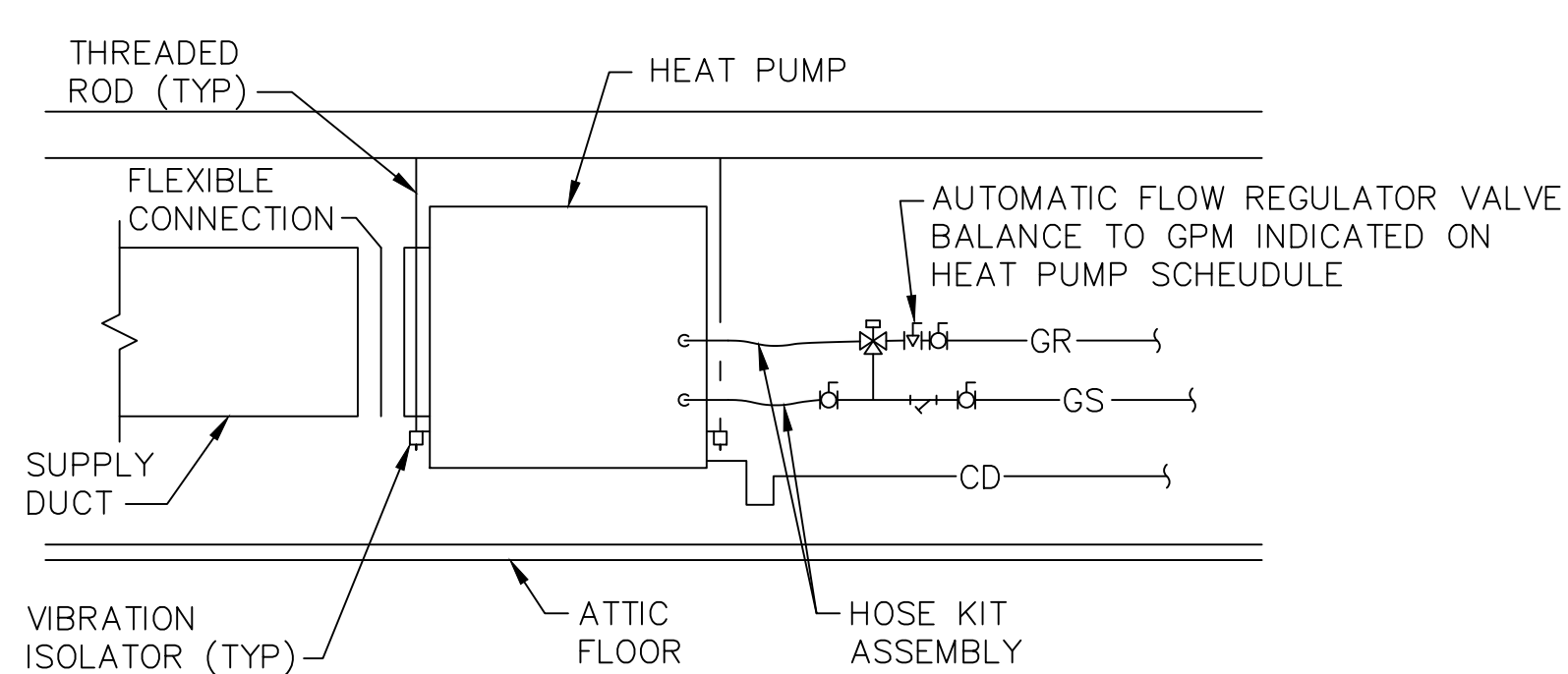
3 EAST ATTIC PLAN
MH101 M-401 SCALE: 3/16"=1'-0"

PLAN NORTH

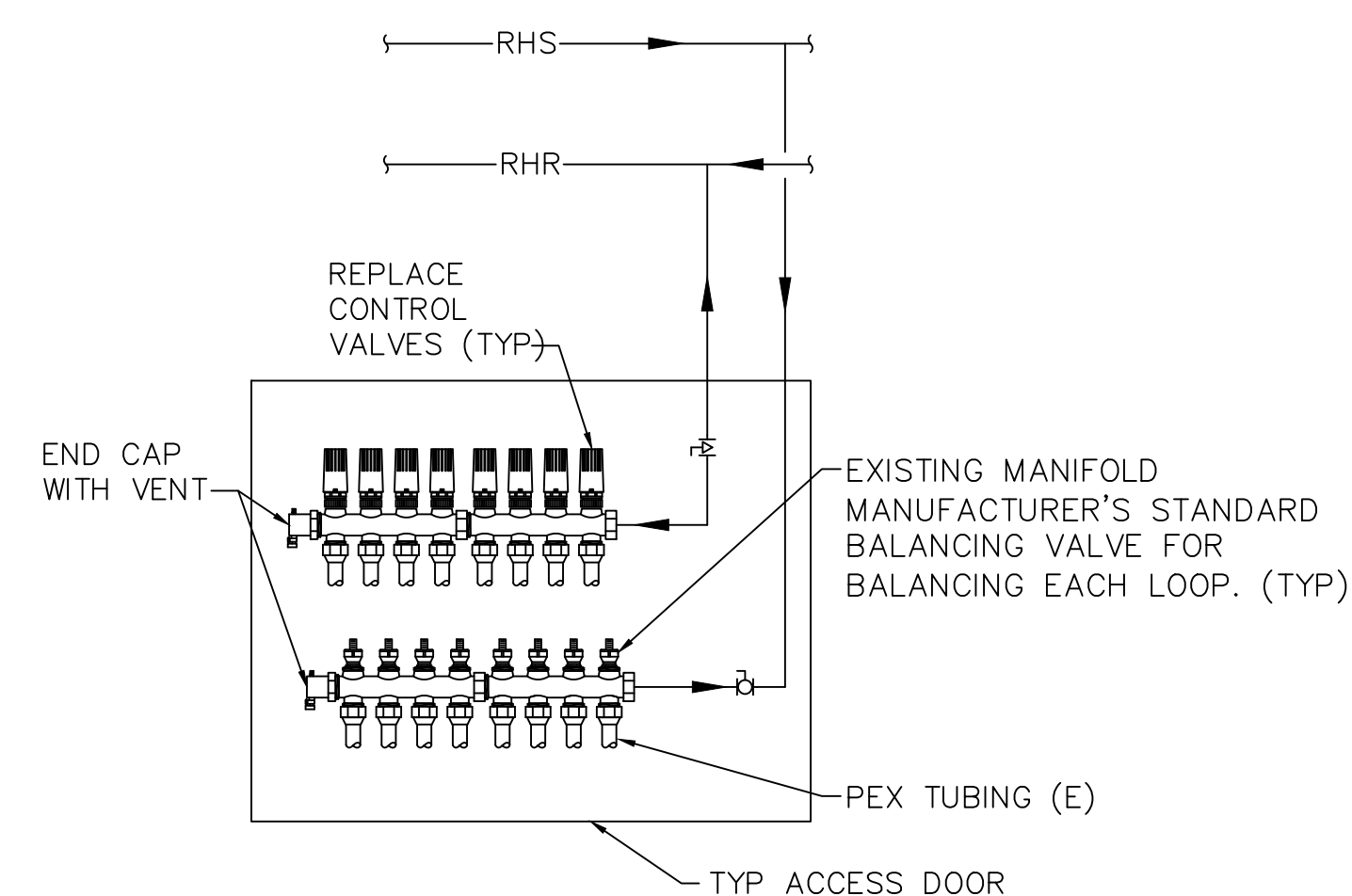


4 PIPING ELEVATION

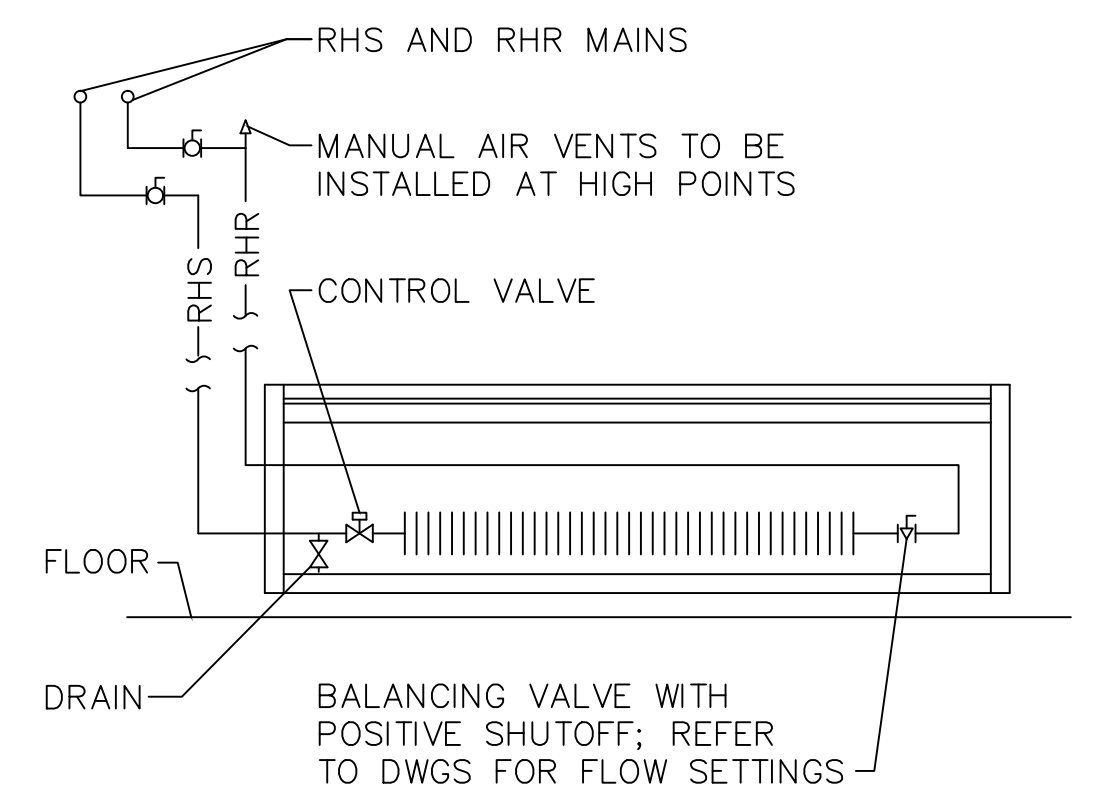
M-401 SCALE: NOT TO SCALE



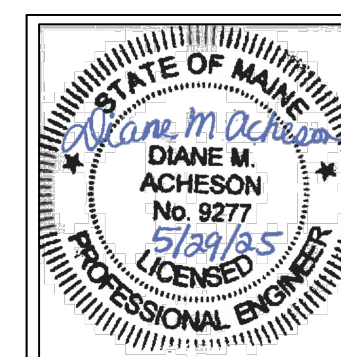
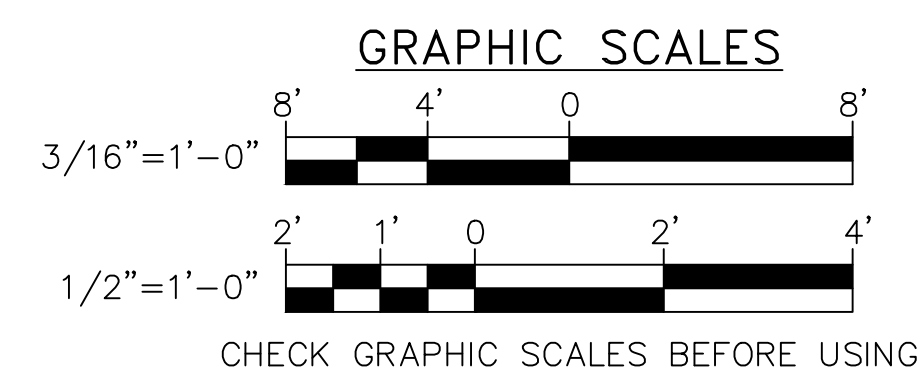
5 HEAT PUMP PIPING DETAIL
M-401 NOT TO SCALE



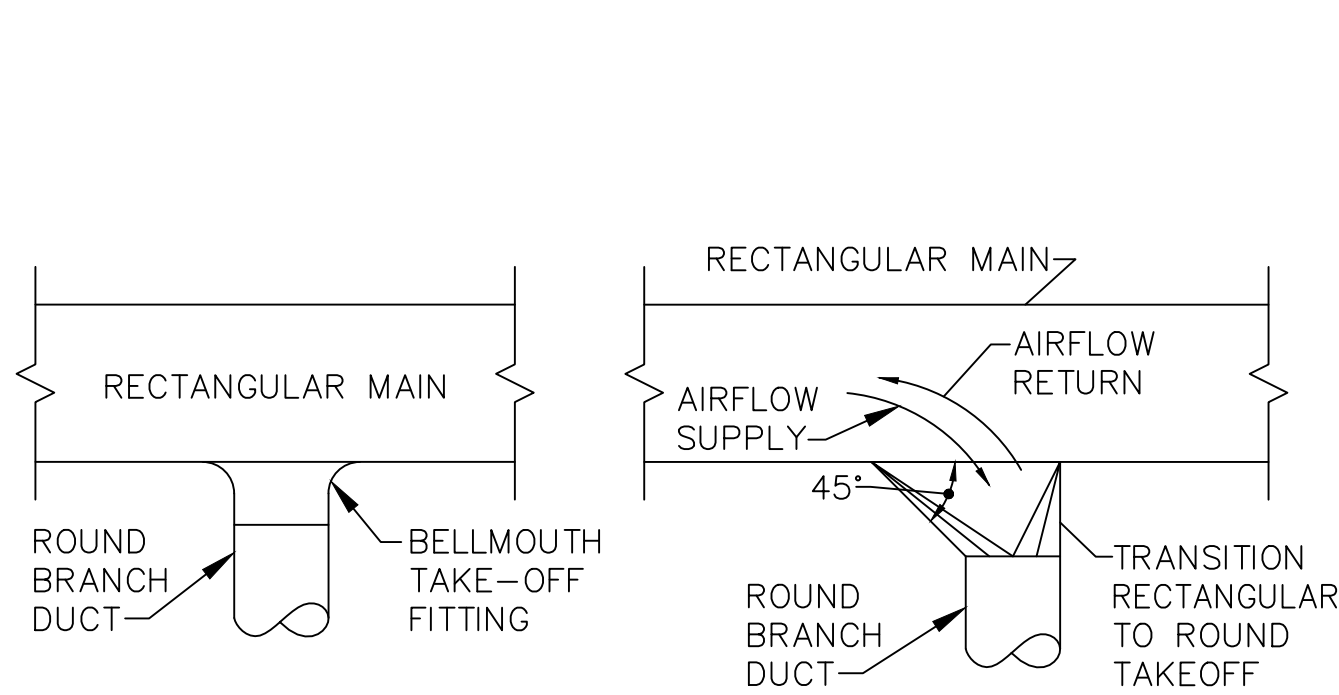
6 TYPICAL RADIANT HEAT MANIFOLD
M-401 NOT TO SCALE



7 FINTUBE RADIATION DETAIL
(SINGLE ROW - DOWN FEED)
M-401 NOT TO SCALE

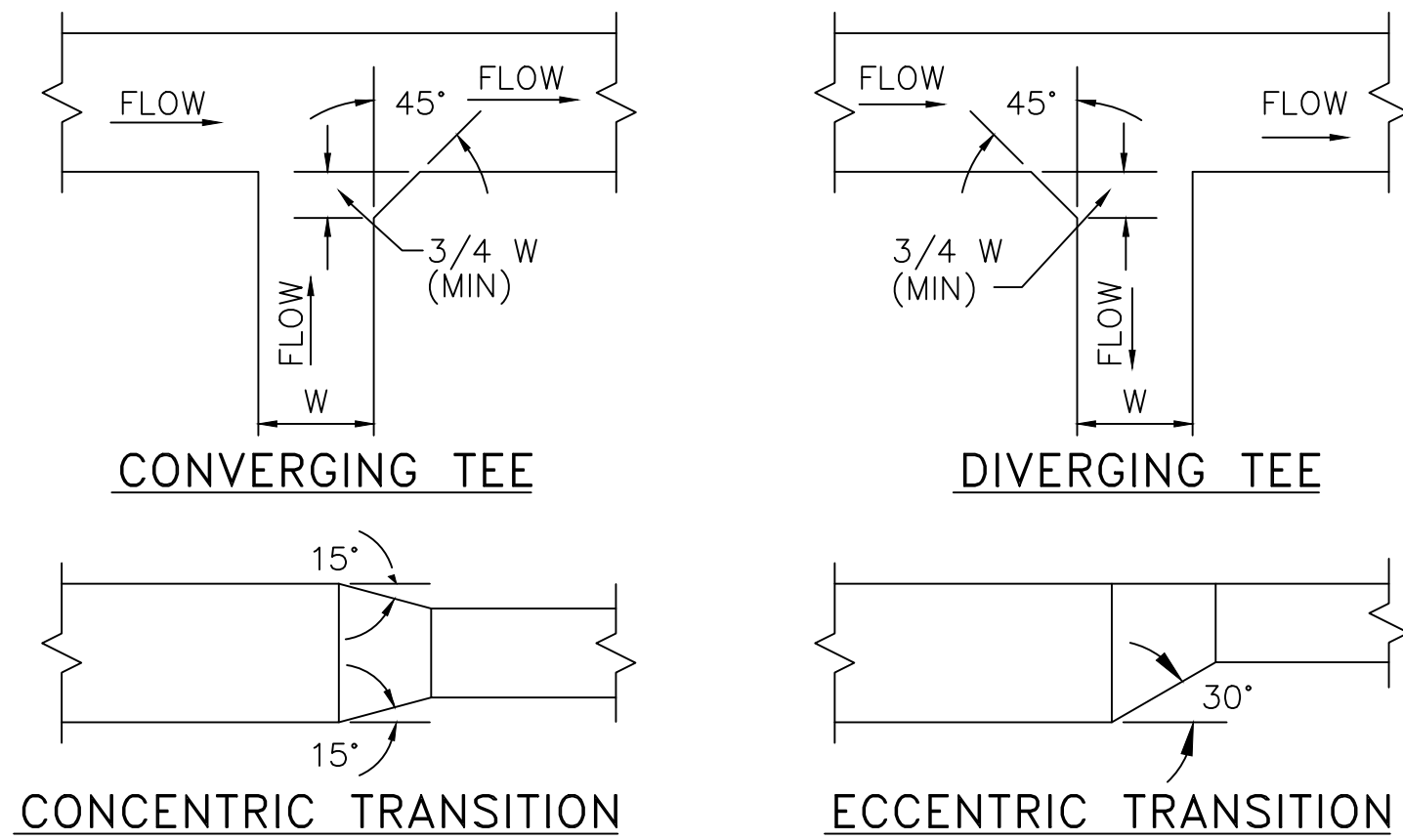


				
NO. _____ REVISIONS: _____ DATE: _____ BY: _____		U.S. FISH AND WILDLIFE SERVICE CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING		
ENLARGED MECHANICAL PART PLANS AND DETAILS				
ASSABET RIVER NATIONAL WILDLIFE REFUGE		SUDBURY, MASSACHUSETTS		
DISCIPLINE SHEET NO. M-401	DESIGNED: DMA DRAWN: SRW	DWG. NO. 5R-MA-1301-100.00	SHEET 34 OF 50	

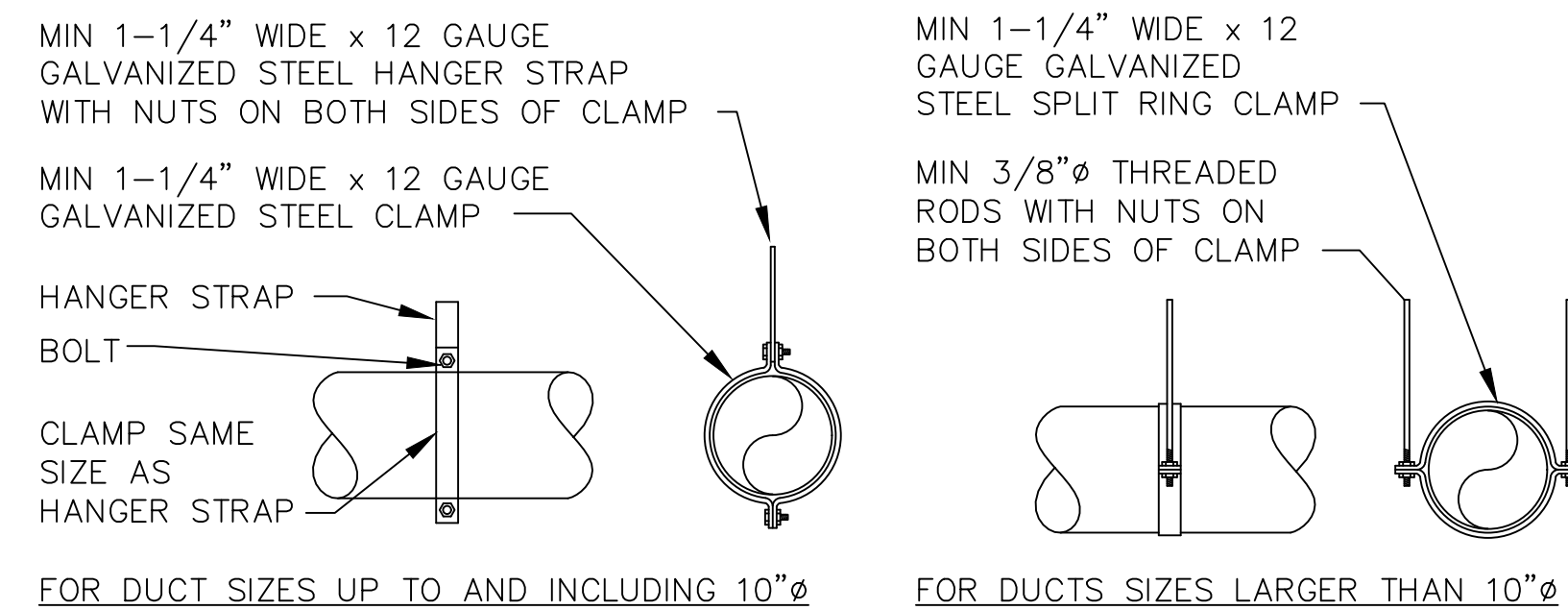


NOTE
1. SPIN-IN TYPE STRAIGHT TAKE-OFF FITTINGS SHALL NOT BE PERMITTED.

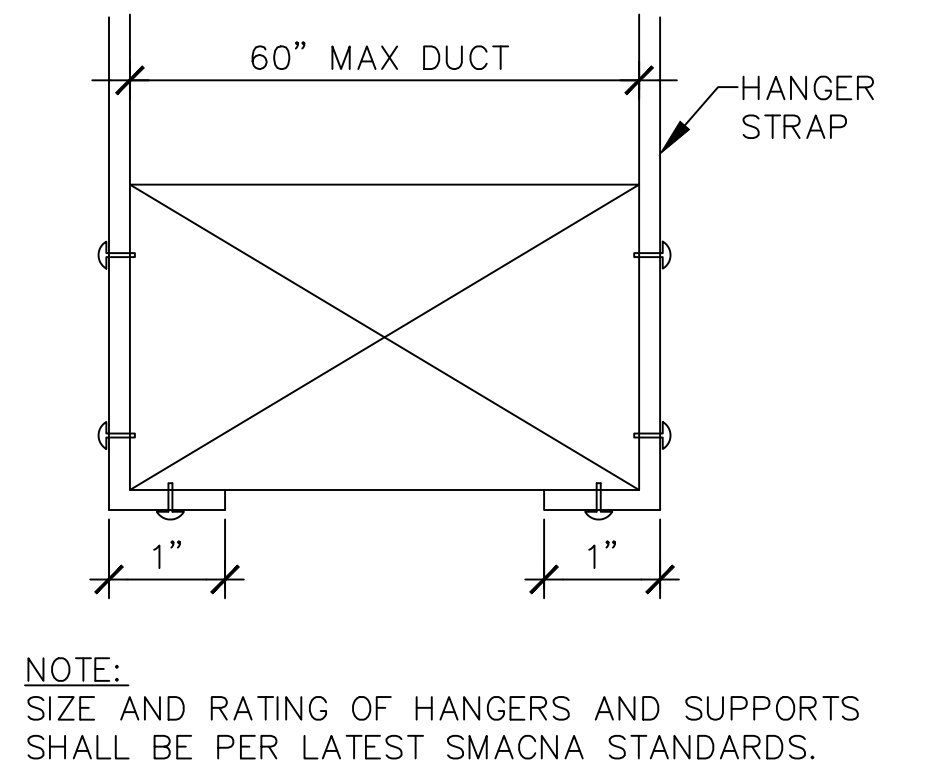
1 TYPICAL ROUND BRANCH DUCT CONNECTIONS TO RECTANGULAR MAIN
M-501 NOT TO SCALE



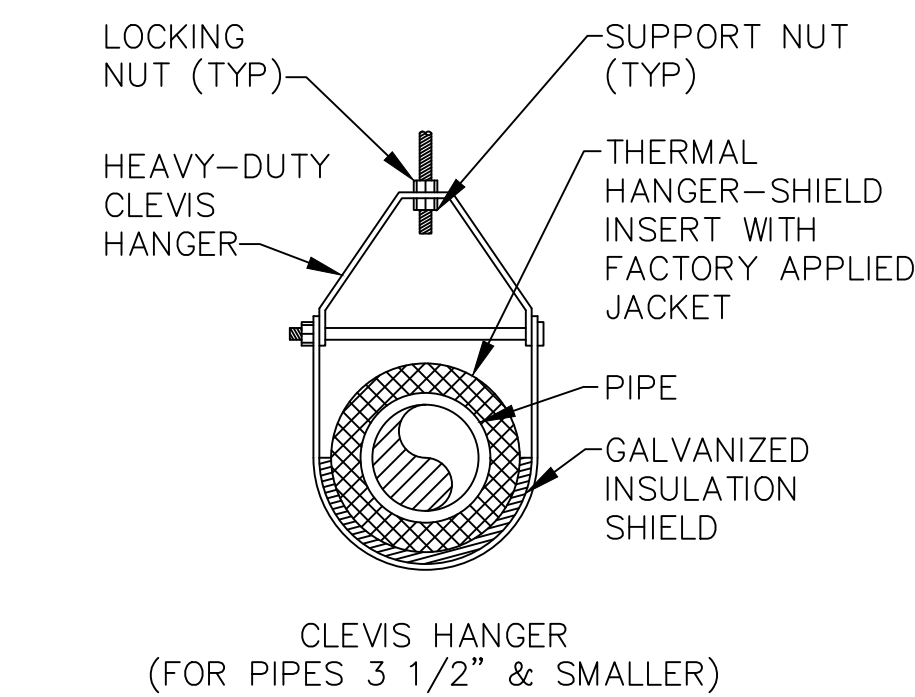
2 RECTANGULAR DUCT TRANSITIONS DETAIL
M-501 NOT TO SCALE



3 ROUND DUCT HANGER DETAIL
M-501 NOT TO SCALE

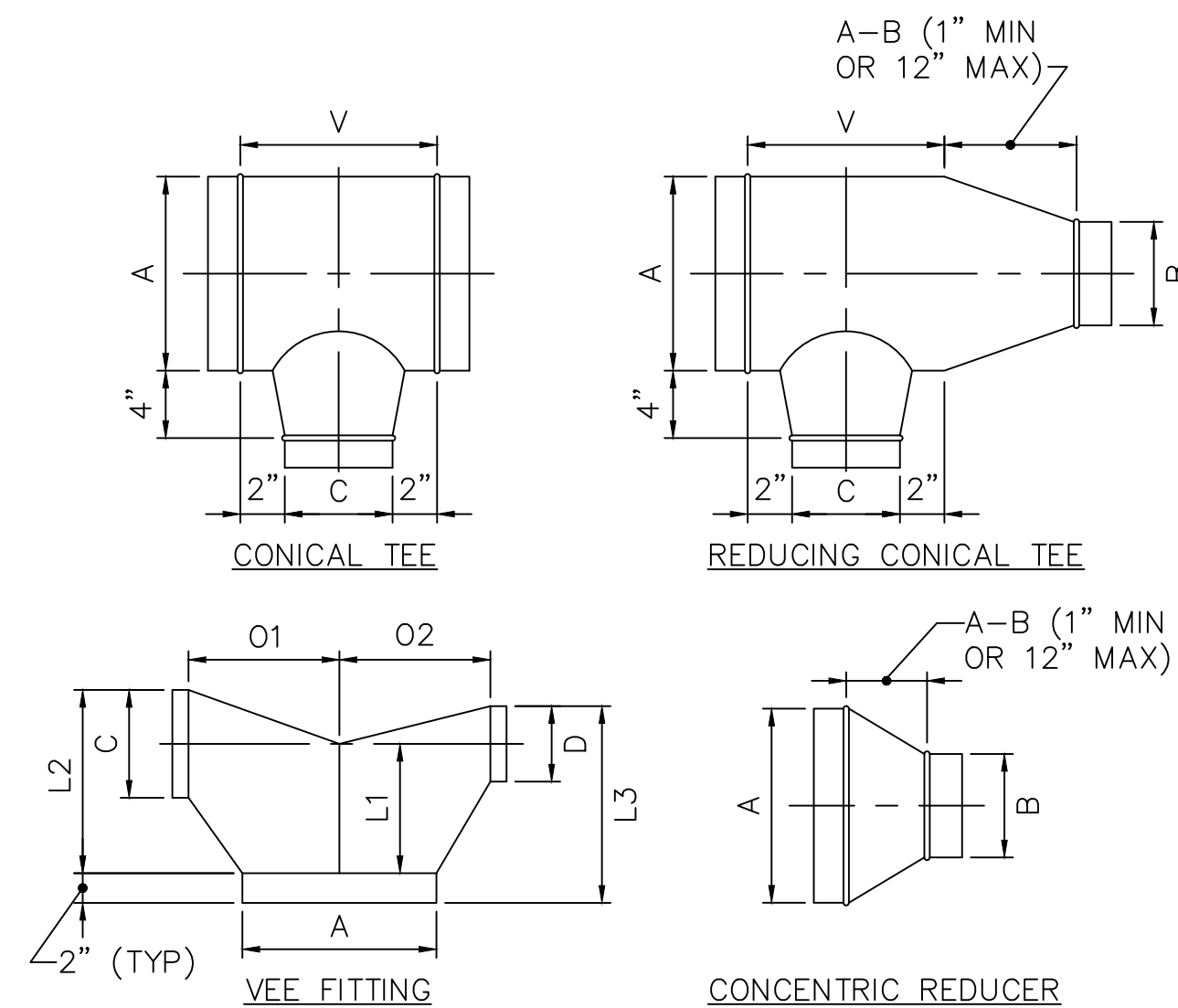


4 DUCT SUPPORT ATTACHMENTS DETAIL
M-501 NOT TO SCALE

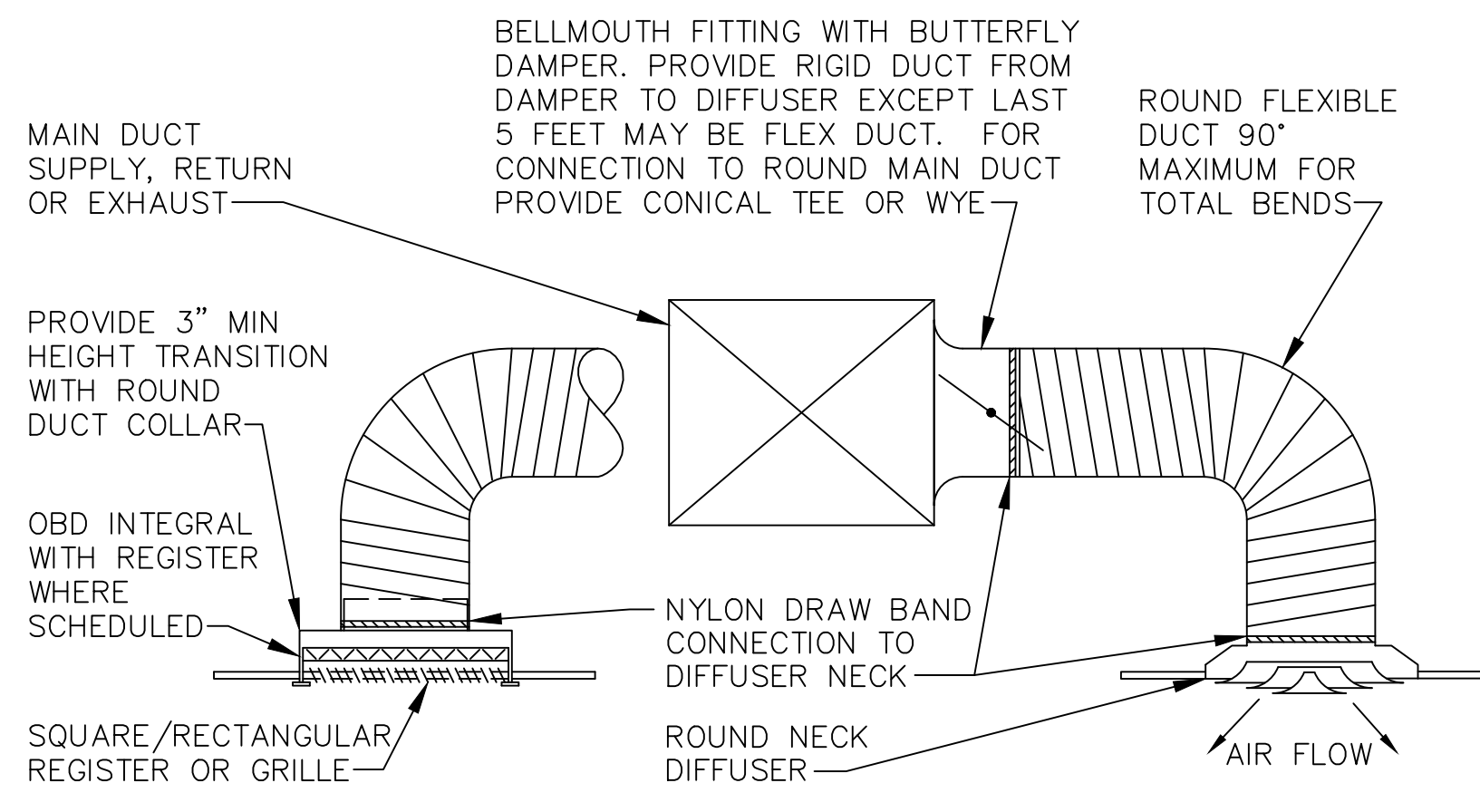


NOTES:
1. PROVIDE THERMAL HANGER SHIELD INSERT WITH SAME THICKNESS AS PIPE INSULATION.
2. FOR BELOW AMBIENT SERVICES, EXTEND THERMAL HANGER SHIELD INSERT A MINIMUM OF 1-1/2\"/>

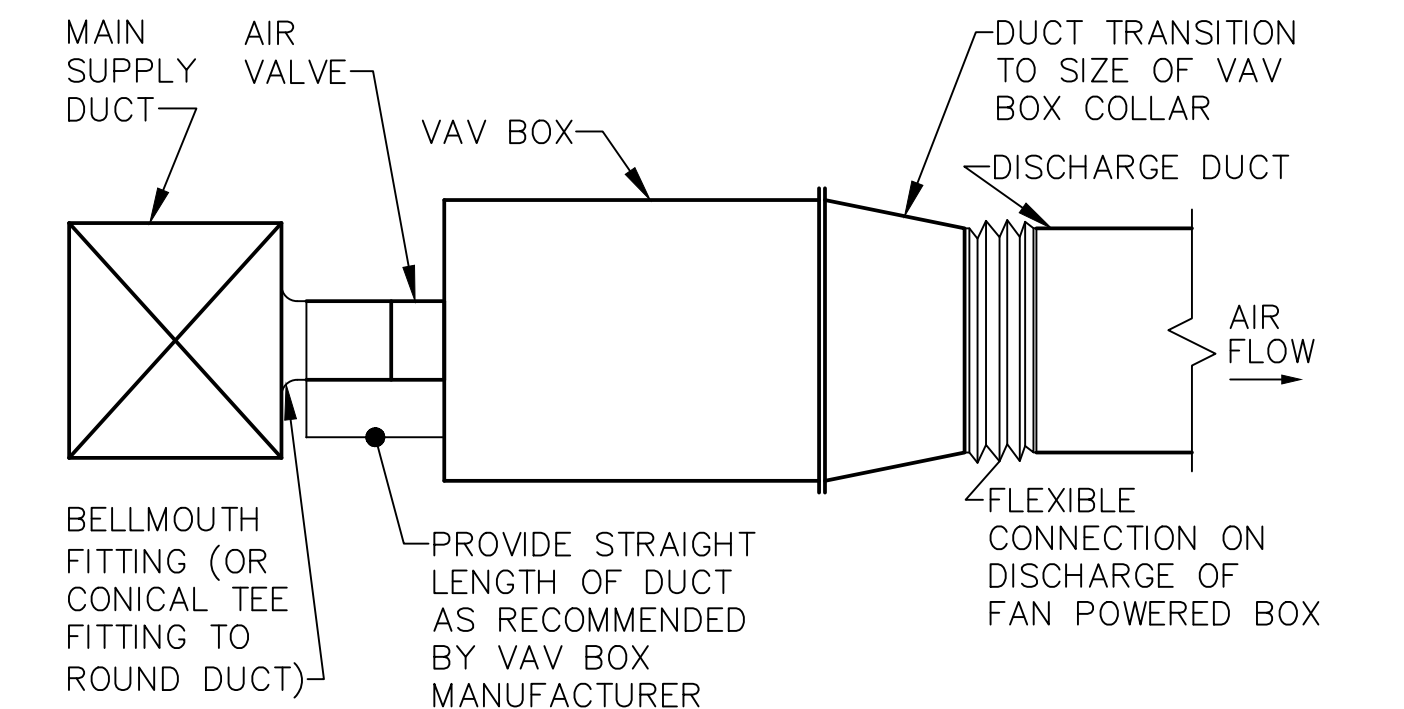
5 INSULATED PIPE HANGER ATTACHMENT DETAILS
M-501 NOT TO SCALE



6 TYPICAL ROUND DUCT FITTINGS DETAIL
M-501 NOT TO SCALE

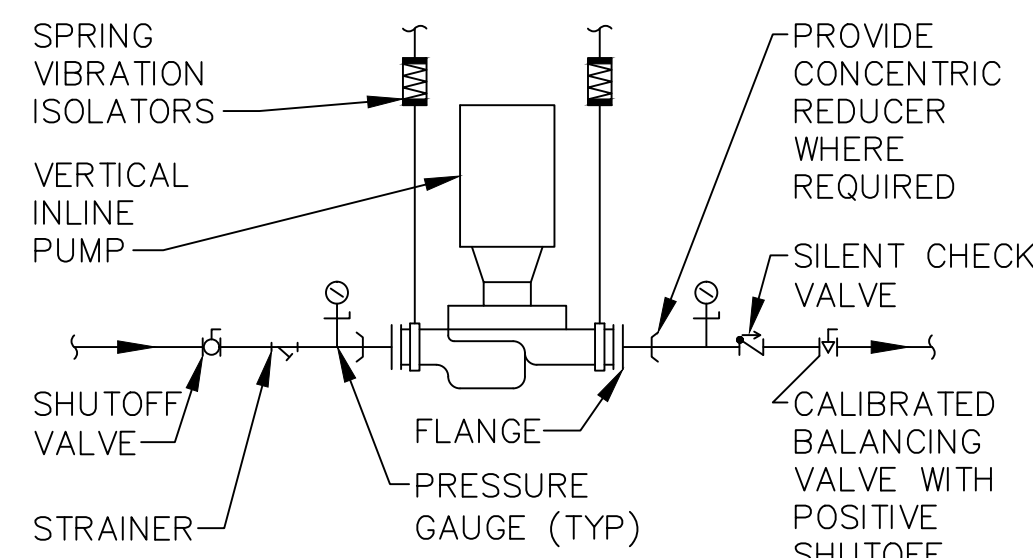


7 DIFFUSER AND REGISTER RUNOUT DETAIL
M-501 NOT TO SCALE



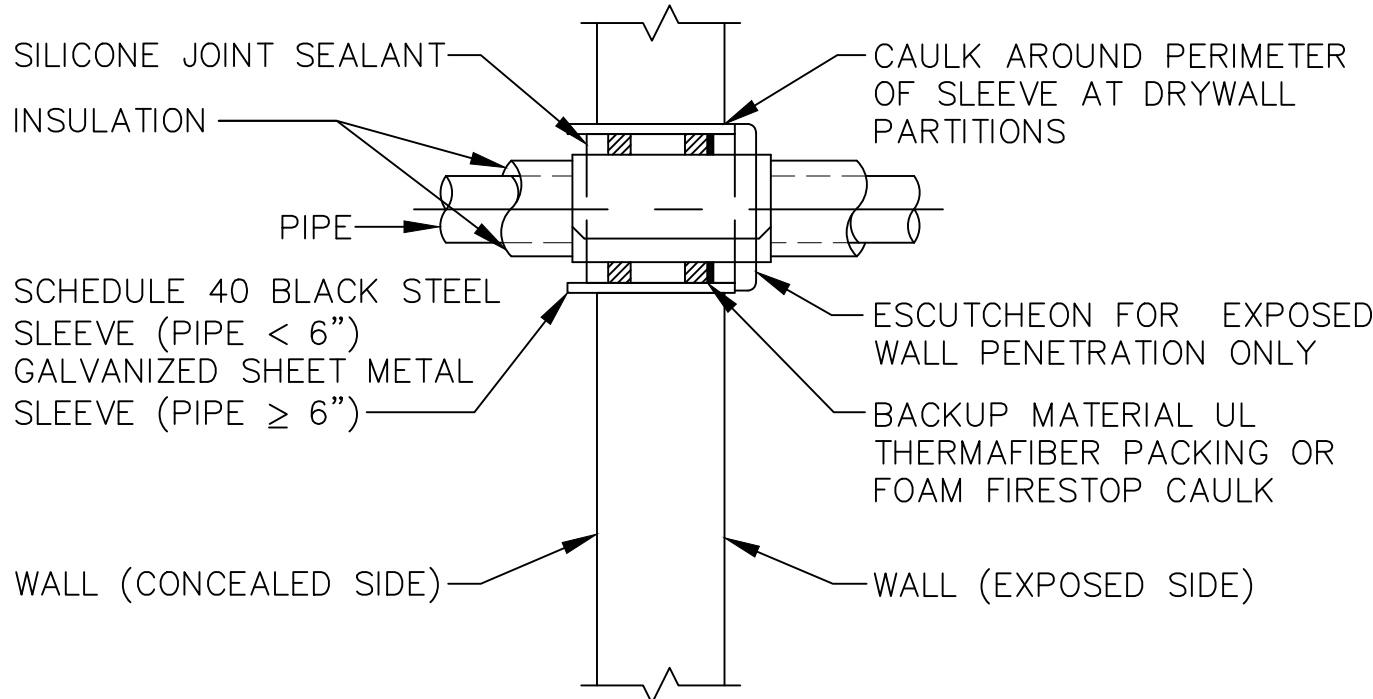
NOTES
1. PIPING BRANCH RUNOUTS MUST BE 3/4\"/>

8 TYPICAL VAV BOX INSTALLATION DIAGRAM
M-501 NOT TO SCALE

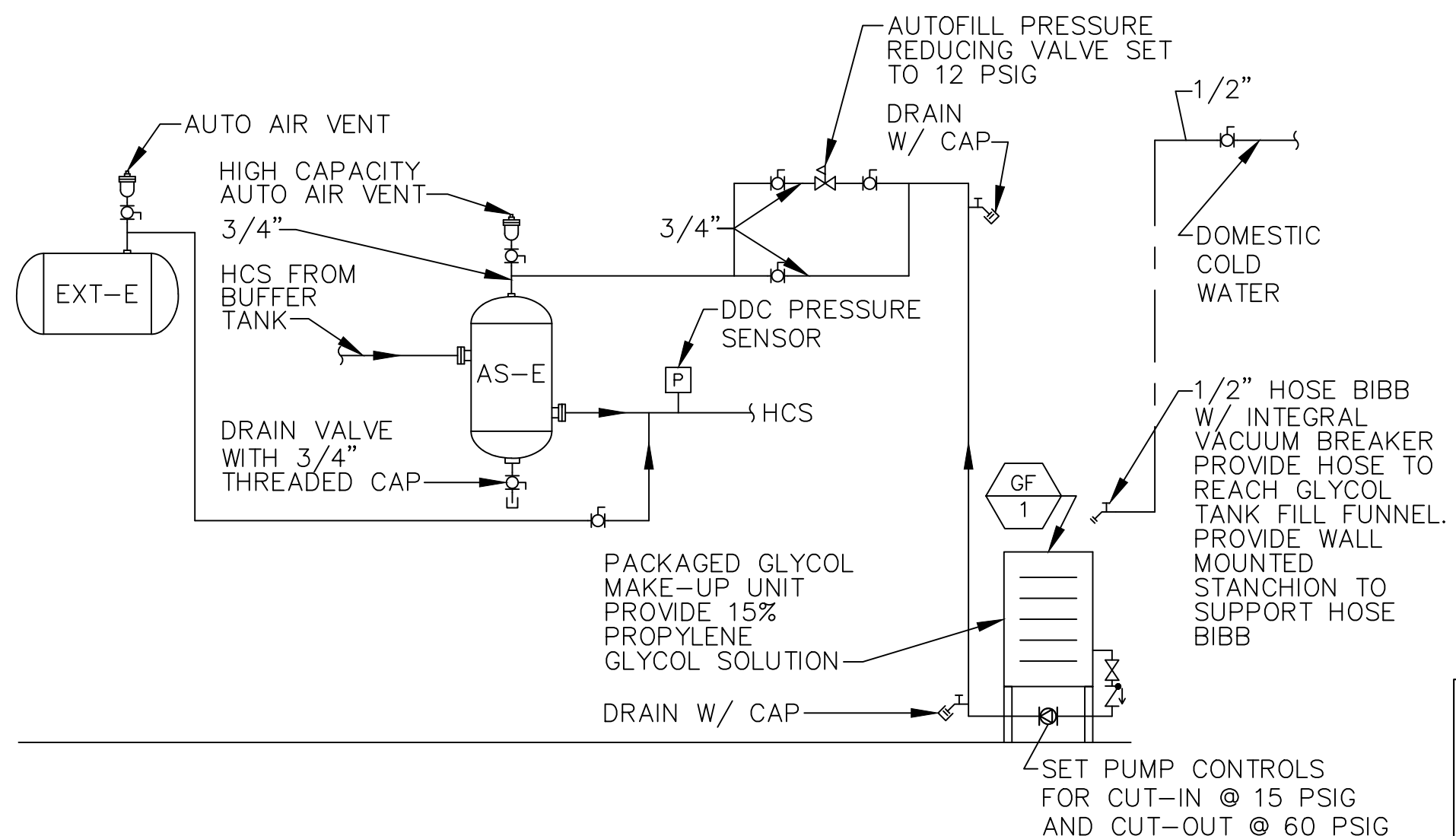


NOTES
1. VALVES SHALL BE SAME SIZE AS PIPE.
2. PROVIDE SPRING VIBRATION ISOLATORS FOR PUMP.

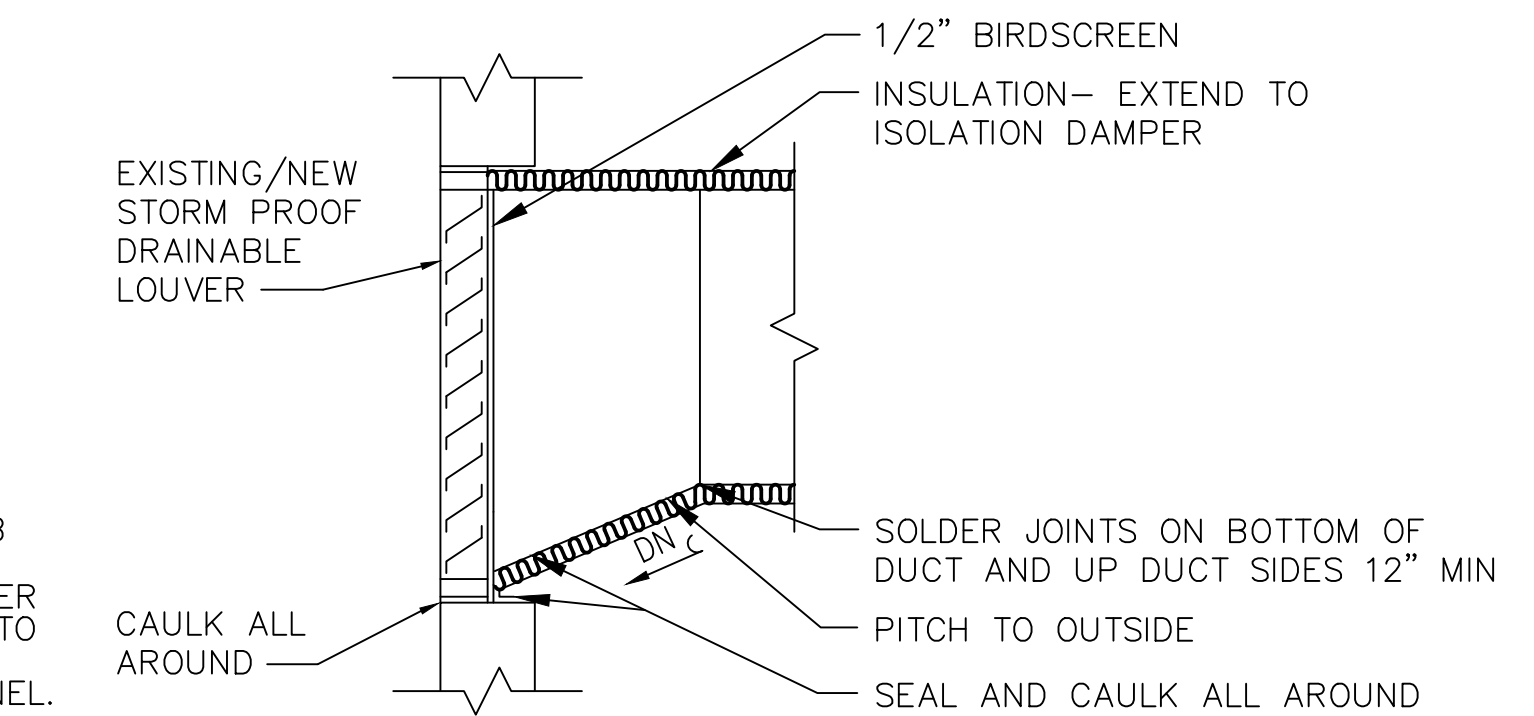
9 INLINE PUMP PIPING DETAIL
M-501 NOT TO SCALE



10 PIPE SLEEVE THRU WALL
M-501 NOT TO SCALE



11 GLYCOL COOLING AIR CONTROL PIPING DIAGRAM
M-501 NOT TO SCALE



12 LOUVER CONNECTION DETAIL
M-501 NOT TO SCALE

				
	NO.	REVISIONS:	DATE:	BY:
	U.S. FISH AND WILDLIFE SERVICE		CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING	
MECHANICAL DETAILS				
ASSABET RIVER NATIONAL WILDLIFE REFUGE		SUDBURY, MASSACHUSETTS		
DISCIPLINE SHEET NO. M-501	DESIGNED: DMA	DWG NO: 5R-MA-1301-100.00	SHEET 35 OF 50	
	DRAWN: KLG			

GEOHERMAL WATER TO WATER HEAT PUMP SCHEDULE																
UNIT NO	TYPE	LOCATION	HEATING						WPD IN FT		ELECTRICAL				BASIS OF DESIGN	NOTES
			SOURCE 10° DROP		10 DEG RISE LOAD		HEATING CAPACITY MBTUH	HEAT OF ABSORPTION MBTUH	HTG COP	SOURCE	LOAD	VOLTS/ PHASE	MCA	MAX FUSE AMP		
			GPM	EWT	GPM	EWT										
HP-1	WATER-TO-WATER	MECH 105	15	40	15	110	49.4	32.8	4.3	10.9	10.4	230/1	29.6	50	TRANE EXWK0602	1,2,3
HP-2	WATER-TO-WATER	MECH 105	15	40	15	110	49.4	32.8	4.3	10.9	10.4	230/1	29.6	50	TRANE EXWK0602	1,2,3
NOTES: 1. GROUND-LOOP SOURCE SIDE OF HEAT PUMP SYSTEM SHALL CONTAIN 15% PROPYLENE GLYCOL. 2. PROVIDE R-454B REFRIGERANT. 3. HEAT PUMP USED FOR HEATING ONLY.																

WATER TO AIR HEAT PUMP SCHEDULE																		
UNIT NO	SERVES	GPM	WATER P.D. FT WC	CFM	ESP IN H ₂ O	HEATING				COOLING				ELECTRICAL			MANUFACTURER AND MODEL	NOTES
						EWT °F	EAT °F	HEATING CAPACITY MBH	HTG COP	EWT °F	EAT DB/WB °F	COOLING CAPACITY MBH	EER	VOLTS/ PHASE	MAX FUSE A	MCA		
HP-3	OFFICES-EAST	12.0	6.1	2315	0.77	40	57.6	33.0	4.5	75	78.4/63.7	77.3	14.8	230/1	60	44.1	TRANE GEHK0722	1,2,3,4,5
HP-4	OFFICES-WEST	6.0	4.8	915	0.65	40	60	23.6	6.0	75	78.8/63.8	33.9	17.5	230/1	35	21.0	TRANE DXHK036A	1,2,3,4,5
NOTES: 1. WATER FLOWS BASED ON 10°F DROP FOR HEATING AND 10°F RISE FOR COOLING. 4. 2-STAGE COMPRESSOR.																		
2. PROVIDE HOT GAS REHEAT. 5. GROUND-LOOP SOURCE SIDE OF HEAT PUMP SYSTEM SHALL CONTAIN																		
3. PROVIDE UNIT WITH R-454B REFRIGERANT. 15% PROPYLENE GLYCOL.																		

ENERGY RECOVERY UNIT SCHEDULE																	
UNIT NO	SERVES	SUPPLY			EXHAUST			COOLING			HEATING			ELECTRICAL DATA		BASIS OF DESIGN	NOTES
		CFM	ESP IN WC	FAN W	CFM	ESP IN WC	FAN W	SUPPLY		EXHAUST	SUPPLY		EXHAUST				
								EAT DB/WB °F	LAT DB/WB °F		EAT °F	LAT °F		EAT@ RH °F@%			
															VOLTS/ PHASE		
ERV-1	HP-3	665	0.5	480	430	0.5	480	91.0/73.0	81.9/68.7	75.0/50	7.0	41.7	68.0 @ 30%	120/1	14.6	RENEWAIRE HE101NV	1
ERV-2	HP-4	300	0.5	357	205	0.5	357	91.0/73.0	81.2/68.0	75.0/50	7.0	45.8	70.0 @ 30%	120/1	12.2	RENEWAIRE HE07INH	1
NOTES: 1. PROVIDE LOW LEAKAGE, MOTORIZED DAMPERS FOR OUTSIDE AIR AND EXHAUST.																	

DIFFUSER / REGISTER SCHEDULE								
UNIT NO	FACE SIZE IN	NECK SIZE IN	MAX PRESSURE DROP IN WC	MAX NOISE CRITERIA	CFM RANGE	TYPE	BASIS OF DESIGN	NOTES
S-1	24x24	6ø	0.10	25	0-100	LAY-IN SQUARE SUPPLY DIFFUSER	PRICE SCDA	1,2,3
S-2	24x24	8ø	0.10	25	101-250	LAY-IN SQUARE SUPPLY DIFFUSER	PRICE SCDA	1,2,3
S-3	24x24	10ø	0.10	25	251-410	LAY-IN SQUARE SUPPLY DIFFUSER	PRICE SCDA	1,2,3
S-4	12x12	6ø	0.10	25	0-100	SURFACE MOUNT SUPPLY DIFFUSER	PRICE SCDA	2,3,4
S-5	8x4	8x4	0.10	25	0-55	LOUVERED SUPPLY GRILLE	PRICE 520	2,3,4,7,8,9
R-1	24x12	6ø	0.10	25	0-100	PERFORATED FACE RETURN GRILLE	PRICE PDDR	1,2,3
R-2	24x24	8ø	0.10	25	101-250	PERFORATED FACE RETURN GRILLE	PRICE PDDR	1,2,3
R-3	24x24	10ø	0.10	25	251-410	PERFORATED FACE RETURN GRILLE	PRICE PDDR	1,2,3
R-4	12x12	6ø	0.10	25	0-100	PERFORATED FACE RETURN GRILLE	PRICE PDDR	2,3,4
E-1	12x12	6ø	0.10	25	50	PERFORATED FACE EXHAUST GRILLE	PRICE PDDR	2,3,4,5
E-2	8x6	8x6	0.10	25	0-150	EXHAUST REGISTER	PRICE 630D	3,4,5,6,7,8
T-1	12x12	6ø	0.10	25	50	PERFORATED FACE TRANSFER GRILLE	PRICE PDDR	2,3,4,5
T-2	24x12	6ø	0.10	25	0-100	PERFORATED FACE TRANSFER GRILLE	PRICE PDDR	1,2,3
NOTES:								
1. FOR INSTALLATION IN T-BAR CEILING.			6. ALUMINUM CONSTRUCTION.					
2. STEEL CONSTRUCTION.			7. 3/4" BLADE SPACING, 45-DEG DEFLECTION.					
3. PROVIDE TRANSITION FROM DUCTWORK TO DIFFUSER/GRILLE.			8. BLADES PARALLEL TO LONG DIMENSION.					
4. SURFACE MOUNTED.			9. DOUBLE DEFLECTION.					
5. PROVIDE WITH INTEGRAL OPPOSED BLADE DAMPER.								

FAN SCHEDULE												
UNIT NO	SERVES	CFM	ESP IN WC	DRIVE TYPE	FAN TYPE	FAN RPM	SONES	HP	VOLTS/ PHASE	BASIS OF DESIGN		ACCESSORIES
RF-1	HP-3	1775	0.85	BELT	INLINE	1329	13.5	3/4	115/1	GREENHECK BSQ-140		A,B
RF-2	HP-4	825	0.5	BELT	INLINE	1377	9.9	1/4	115/1	GREENHECK BSQ-100		A,B
ACCESSORIES: A. MFR FAN MOUNTED DISCONNECT SWITCH. B. SPRING VIBRATION ISOLATORS. C. VARI-GREEN EC MOTOR.												

RANGE HOOD SCHEDULE							
UNIT NO	SERVES	CFM	SP IN WC	VOLTS/ PHASE	MANUFACTURER AND MODEL	ACCESSORIES	NOTES
RH-1	RANGE	190	0.11	115/1	BROAN MTR1303SS	A	1
NOTES: 1. PROVIDE DAMPER WHICH IS SELF-CLOSING WHEN FAN IS NOT IN OPERATION. ACCESSORIES: A. HOODED WALL CAP WITH BIRD SCREEN.							

PUMP SCHEDULE												
UNIT NO	SERVES	TYPE	GPM	TOTAL HEAD	PUMP EFF(%)	MOTOR DATA				SUCTION/ DISCHARGE (IN)	BASIS OF DESIGN	NOTES
						BHP	HP	RPM	VOLTS/PHASE			
P-1A	HYDRONIC HEATING	INLINE	16.8	34	37	0.38	0.5	1760	120/1	1.5/1.5	TACO KS1915	
P-1B	HYDRONIC HEATING	INLINE	16.8	34	37	0.38	0.5	1760	120/1	1.5/1.5	TACO KS1915	
P-2A	HP-1	INLINE	15	23.2	—	—	0.12	3250	120/1	1.5/1.5	TACO IL0013	1
P-2B	HP-1	INLINE	15	23.2	—	—	0.12	3250	120/1	1.5/1.5	TACO IL0013	1
P-3A	HP-2	INLINE	15	23.2	—	—	0.12	3250	120/1	1.5/1.5	TACO IL0013	2
P-3B	HP-2	INLINE	15	23.2	—	—	0.12	3250	120/1	1.5/1.5	TACO IL0013	2
P-4A	WELLS	INLINE	48	79.1	50	2.24	3	1760	240/1	1.5/1.5	TACO KS1509	3
P-4B	WELLS	INLINE	48	79.1	50	2.24	3	1760	240/1	1.5/1.5	TACO KS1509	3
NOTES: 1. INTERLOCK WITH HP-1. 2. INTERLOCK WITH HP-2. 3. 15% PROPYLENE GLYCOL.												

LOUVER SCHEDULE									
UNIT NO	SERVES	TYPE	CFM	DIMENSIONS			MIN FREE AREA SQUARE FT	BASIS OF DESIGN	NOTES
				LENGTH	HEIGHT	DEPTH			
L-1	HP-3/ERV-1	FIXED	2425	54	30	4	6.0	RUSKIN ELF375DX	1,2,3,4
NOTES: 1. PROVIDE FINISH IN COLOR TO MATCH EXISTING LOUVERS. 2. PROVIDE WITH BIRDSCREEN. 3. LOUVER SHALL BE DRAINABLE. 4. LOUVER IS SIZED TO ALLOW EQUIPMENT TO ENTER INTO BUILDING THROUGH LOUVER OPENING.									

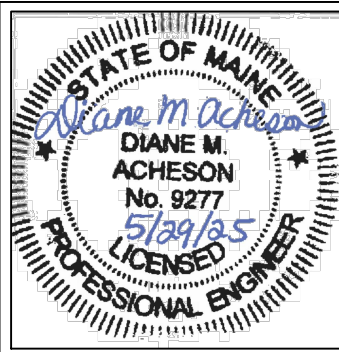
FINTUBE RADIATION SCHEDULE										
UNIT NO	ELEMENT				ENCLOSURE		CAPACITY BTUH/LF	AVERAGE WATER TEMP	BASIS OF DESIGN	NOTES
	TUBE SIZE	ROWS	FINS PER FOOT	SIZE (IN)	MOUNTING HEIGHT (IN)	ENCLOSURE HEIGHT (IN)				
FR-1	3/4"	1	32	3-5/8"x4-1/4"	18	14	350	115°F	STERLING JVB-S	1
NOTES: 1. PROVIDE FINISH IN STANDARD COLOR SELECTED BY ARCHITECT.										

GLYCOL FEEDER									
UNIT NO	LOCATION	SERVES	TANK (GAL)	GPM	PRESSURE RANGE	VOLTS/ PHASE	HP	BASIS OF DESIGN	NOTES
GF-1	MECH 105	GLYCOL WATER	30	1.5	10-60 PSI	115/1	1/3	CHEM WORLD GF-3A1A	1,2
NOTES: 1. PACKAGED AUTOMATIC GLYCOL SOLUTION MAKE-UP. 2. PROVIDE WITH BACNET BMS INTEGRATION.									

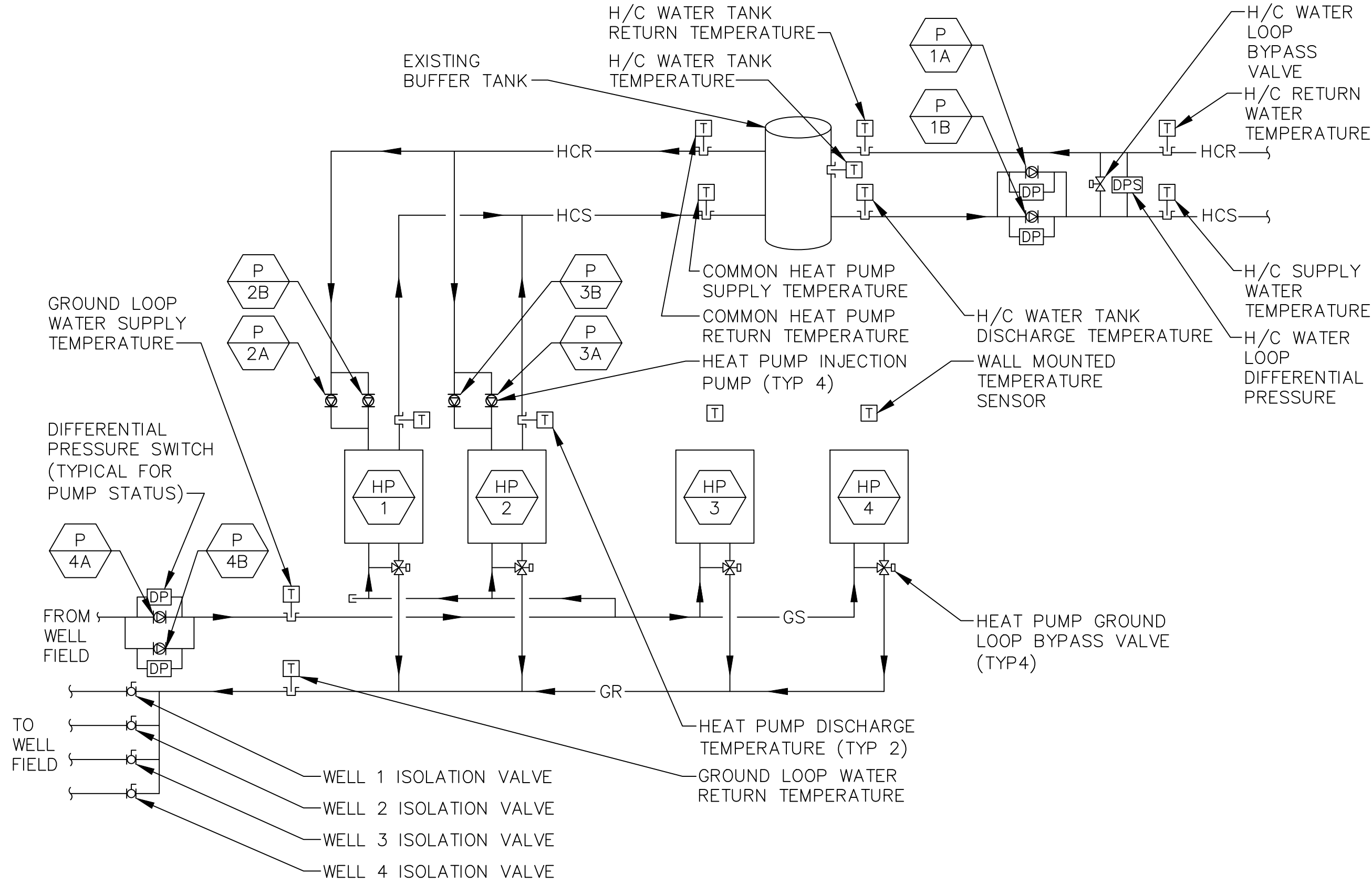
VAV TERMINAL UNITS SCHEDULE						
UNIT NO	SERVES	PRIMARY CFM		INLET SIZE IN	APD @ MAX AIRFLOW IN WC	NOTES
		MAX	MIN			
VAV 1-1	LOBBY 102	500	225	8ø	0.10	2
VAV 1-2	OFFICE 115	125	40	4ø	0.10	2
VAV 1-3	RECEPTION 116, MAIL/COPIER 117A	220	110	5ø	0.10	2
VAV 1-4	OFFICE 114	120	40	4ø	0.10	2
VAV 1-5	OPEN OFFICE 103	875	265	10ø	0.10	2
VAV 1-6	BREAKROOM 110	410	170	8ø	0.10	2
VAV 1-7	QUIET ROOM 118	110	35	4ø	0.10	2
VAV 1-8	QUIET ROOM 104	80	40	4ø	0.10	2
VAV 2-1	OFFICE 118A/B/C/D	445	140	8ø	0.10	2
VAV 2-2	OFFICE 118F	140	45	4ø	0.10	2
VAV 2-3	MULTI-PURPOSE 118G	330	115	6ø	0.10	1,2
NOTES: 1. PROVIDE CO2 CONTROL. REFER TO CONTROL DIAGRAM. 2. ZONE HEATING BY RADIANT SLAB HEAT. REFER TO CONTROL DIAGRAM.						
GENERAL NOTES: A. SELECTION BASED ON TRANE TERMINAL UNITS; OUTLET AND INLET SIZES SHOWN ON PLANS ARE BASED ON THIS MFR. VARIATIONS IN INLET AND OUTLET SIZES WHICH PROVIDE COMPARABLE PERFORMANCE ARE ACCEPTABLE. B. UNLESS NOTED OTHERWISE, VAV TERMINALS PROVIDED SHALL HAVE A MAXIMUM NOISE CRITERIA OF 30. C. INSTALL TERMINAL UNITS IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.						

GENERAL NOTE

- NOTE ON BASIS OF DESIGN
PRODUCTS OF OTHER MANUFACTURERS ARE ACCEPTABLE IF THEY MEET THE OPERATIONAL REQUIREMENTS INDICATED. ANY ADJUSTMENTS TO DUCTING, PIPING, WIRING OR CONFIGURATION DUE TO THE SELECTION OF A MANUFACTURER OTHER THAN THAT LISTED AS THE BASIS OF DESIGN WILL BE ACCOMPLISHED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE GOVERNMENT.



DISCIPLINE	M-601	DESIGNED: DMA	DWG NO:	5R-MA-1301-100.00	SHEET 36 OF 50
SHEET NO		DRAWN: SRW			



SEQUENCE OF OPERATION – GEOTHERMAL HEAT PUMP SYSTEM

WELL PUMPS P-4A & 4B:

P-4A, P-4B SHALL BE OPERATED BY A LEAD/LAG CONTROL. WHENEVER THE LEAD PUMP SIGNALS AN ALARM, THE LAG PUMP SHALL START AUTOMATICALLY. THE LEAD PUMP THAT IS IN ALARM SHALL BE STOPPED AND AN ALARM SHALL BE ANNUNCIATED. THE LEAD PUMP SHALL OPERATE CONTINUOUSLY WHENEVER THERE IS A CALL FOR HEATING OR COOLING FROM A HEAT PUMP.

WATER-TO-WATER HEAT PUMPS HP-1 & HP-2:

HP-1 & HP-2 SHALL OPERATE IN THE HEATING MODE AND SHALL BE ENABLED WHENEVER THE OUTSIDE AIR TEMPERATURE FALLS BELOW 60°F (ADJUSTABLE) AND SHALL REMAIN OFF OTHERWISE.

THE HEAT PUMPS SHALL CYCLE ONE STAGE AT A TIME TO MAINTAIN THE BUFFER TANK TEMPERATURE. DURING THE HEATING MODE THE BUFFER TANK TEMPERATURE SHALL BE RESET BASED ON OUTSIDE AIR TEMPERATURE ACCORDING TO THE FOLLOWING USER ADJUSTABLE SCHEDULE:

OUTSIDE AIR TEMP	BUFFER TANK TEMP
20 DEG F	120 DEG F
70 DEG F	70 DEG F

HP-1 AND HP-2 SHALL OPERATE IN A LEAD/LAG ARRANGEMENT. EACH HEAT PUMP SHALL RUN FOR A MINIMUM OF 10 MINUTES AFTER IT IS STARTED. THERE SHALL BE A DELAY OF 5 MINUTES AFTER THE START OF EACH HEAT PUMP BEFORE THE START OF THE NEXT HEAT PUMP. THE LEAD HEAT PUMP SHALL CHANGE WEEKLY IN ORDER TO PROVIDE EQUAL WEAR. WHEN HP-1 IS THE LEAD, HP-2 SHALL BE THE 2ND LAG PUMP. WHEN A HEAT PUMP IS ACTIVATED ITS ASSOCIATED ISOLATION VALVES SHALL BE OPEN AND INJECTION PUMP SHALL BE ON, OTHERWISE THE VALVES SHALL BE CLOSED AND THE PUMP SHALL BE OFF.

DURING THE HEATING MODE, IF THE BUFFER TANK TEMPERATURE FALLS 3 DEG F BELOW SET POINT THE LEAD HEAT PUMP SHALL START. IF THE TEMPERATURE FALLS ANOTHER DEGREE, THE LAG HEAT PUMPS SHALL START. EACH HEAT PUMP SHALL STOP WHEN THE TEMPERATURE RISES 3 DEG F ABOVE THE TEMPERATURE THAT STARTED THE HEAT PUMP, SO THE LEAD HEAT PUMP SHALL STOP AT SETPOINT.

WATER-TO AIR HEAT PUMPS HP-3 & HP-4:
REFER TO SEQUENCE 1/M-702.

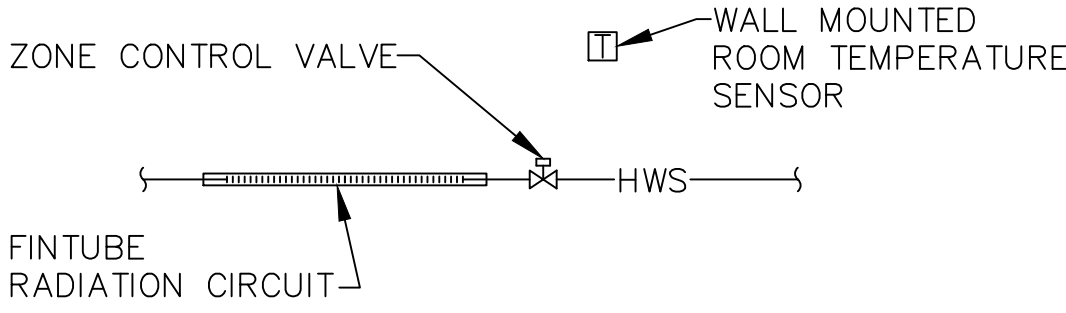
HEATING WATER PUMPS P-1A & P-1B:

THE PUMPS SHALL OPERATE IN A LEAD/LAG ARRANGEMENT. THE LEAD PUMP SHALL RUN IF ANY ZONE CALLS FOR HEATING. IF THE PUMP DIFFERENTIAL PRESSURE SWITCH DETECTS A FAILURE OF THE LEAD PUMP, THE LAG PUMP SHALL START AUTOMATICALLY AND AN ALARM SHALL BE GENERATED. THE LEAD PUMP SHALL CHANGE WEEKLY IN ORDER TO PROVIDE EQUAL WEAR. THE H/C WATER LOOP BYPASS VALVE SHALL MODULATE TO MAINTAIN THE H/C LOOP DIFFERENTIAL PRESSURE AT 20 PSI (ADJUSTABLE).

HYDRONIC PLANT SYSTEMS POINTS LIST									
SYSTEM POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG
HP-1 STAGE 1 ENABLE	x			x					x
HP-2 STAGE 1 ENABLE	x			x					x
HP-3 ENABLE	x			x					x
HP-4 ENABLE	x			x					x
HP-1 DISCHARGE TEMPERATURE	x	x							x
HP-2 DISCHARGE TEMPERATURE	x	x							x
HP-1 GROUND LOOP BYPASS VALVE	x			x					x
HP-1 REVERSING VALVE	x			x					x
HP-1 INJECTION PUMP P-2A START/STOP	x			x					x
HP-1 INJECTION PUMP P-2A STATUS (CURRENT SENSOR)	x		x	x					x
HP-1 INJECTION PUMP P-2B START/STOP	x			x					x
HP-1 INJECTION PUMP P-2B STATUS (CURRENT SENSOR)	x		x	x					x
HP-2 GROUND LOOP BYPASS VALVE	x			x					x
HP-2 REVERSING VALVE	x			x					x
HP-2 INJECTION PUMP P-3A START/STOP	x			x					x
HP-2 INJECTION PUMP P-3A STATUS (CURRENT SENSOR)	x		x	x					x
HP-2 INJECTION PUMP P-3B START/STOP	x			x					x
HP-2 INJECTION PUMP P-3B STATUS (CURRENT SENSOR)	x		x	x					x
HP-3 GROUND LOOP BYPASS VALVE	x			x					x
HP-3 REVERSING VALVE	x			x					x
HP-4 GROUND LOOP BYPASS VALVE	x			x					x
HP-4 REVERSING VALVE	x			x					x
COMMON HP SUPPLY TEMPERATURE	x	x							x
COMMON HP RETURN TEMPERATURE	x	x							x
H/C TANK DISCHARGE TEMPERATURE	x	x			x				x
H/C TANK RETURN TEMPERATURE	x	x							x
H/C TANK TEMPERATURE	x	x							x
GROUND LOOP WATER SUPPLY TEMPERATURE	x	x			x				x
GROUND LOOP WATER RETURN TEMPERATURE	x	x							x
GROUND LOOP PUMP (P-4A) START/STOP	x			x					x
GROUND LOOP PUMP (P-4A) STATUS (CURRENT SENSOR)	x		x	x					x
GROUND LOOP PUMP (P-4B) START/STOP	x			x					x
GROUND LOOP PUMP (P-4B) STATUS (CURRENT SENSOR)	x		x	x					x
HEATING WATER PUMP (P-1A) START/STOP	x			x					x
HEATING WATER PUMP (P-1A) STATUS (CURRENT SENSOR)	x		x	x					x
HEATING WATER PUMP (P-1B) START/STOP	x			x					x
HEATING WATER PUMP (P-1B) STATUS (CURRENT SENSOR)	x		x	x					x
HEATING WATER DIFFERENTIAL PRESSURE	x	x			x				x
HEATING WATER DIFFERENTIAL PRESSURE SET POINT	x					x			x
HEATING WATER BYPASS VALVE	x	x							x
HEATING WATER SUPPLY TEMPERATURE	x	x			x	x			x
HEATING WATER RETURN TEMPERATURE	x	x							x
BUILDING WINTER MODE	x						x		x
BUILDING SUMMER MODE	x						x		x
BUILDING SHOULDER MODE	x						x		x
RADIANT WATER FLOW	x	x							x
NOTES: 1. GENERATE ALARM IF HEATING WATER SUPPLY IS NOT ±10°F OF SET POINT. 2. GENERATE ALARM IF TEMPERATURE IS NOT WITHIN LIMITS. 3. GENERATE ALARM IF PUMP FAILS TO SHOW PROOF OF FLOW. 4. GENERATE ALARM IF PRESSURE IS NOT WITHIN ±5 % OF SET POINT.									

GENERAL NOTES

- EACH HEAT PUMP SHALL HAVE A DEDICATED DDC CONTROLLER, WHICH SHALL MONITOR AND CONTROL HEAT PUMP STAGING, INJECTION PUMPING AND ISOLATION VALVE OPERATION, TEMPERATURE AND ALARM MONITORING AND REVERSING VALVE OPERATION.
- CONTROLS CONTRACTOR SHALL INSPECT AND SIMULATE CONDITIONS TO VALIDATE CONTROL OF HVAC SYSTEMS AND CORRECT ANY DEFICIENCIES.



SEQUENCE OF OPERATION

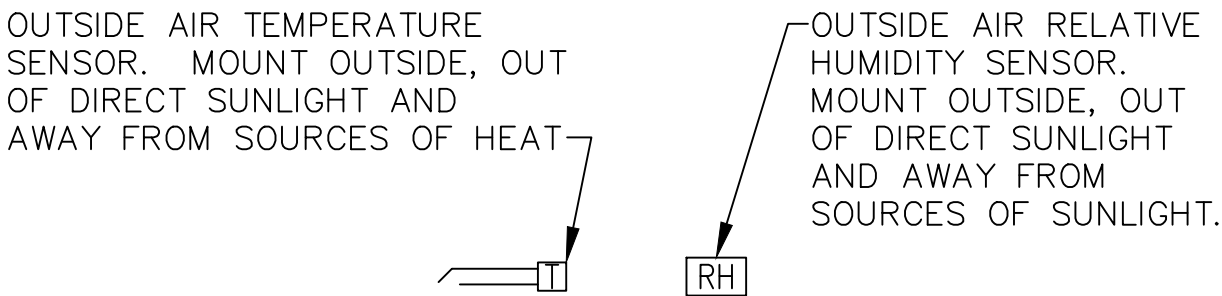
DURING OCCUPIED TIMES THE FINITUBE RADIATION CONTROL VALVE SHALL CYCLE TO MAINTAIN THE ROOM SETPOINT, 70°F (ADJUSTABLE). DURING UNOCCUPIED TIMES THE FINITUBE RADIATION CONTROL VALVE SHALL CYCLE TO MAINTAIN THE NIGHT SET-BACK, 62°F (ADJUSTABLE). WHEN THERE IS A CALL FOR HEAT FROM THE TEMPERATURE SENSOR THE ASSOCIATED ZONE VALVE IN THE MECHANICAL ROOM SHALL OPEN.

TYPICAL POINTS LIST									
SYSTEM POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG
ZONE TEMPERATURE	x	x				x		x	1
HEATING SET POINT	x						x	x	2
ZONE CONTROL VALVE	x		x					x	
NIGHT HEATING SET-BACK	x						x	x	2
NOTES: 1. GENERATE ALARM AT GUI IF ROOM TEMPERATURE IS LOWER THAN 3°F BELOW THE HEATING SET POINT. 2. VARIABLE ADJUSTMENT AT GUI.									

TYPICAL FINITUBE

2 RADIATION CONTROL DIAGRAM

NOT TO SCALE



GLOBAL BUILDING POINTS LIST									
SYSTEM POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG
OUTSIDE AIR TEMPERATURE	x	x						x	
OUTSIDE AIR RELATIVE HUMIDITY	x	x						x	
NOTES:									

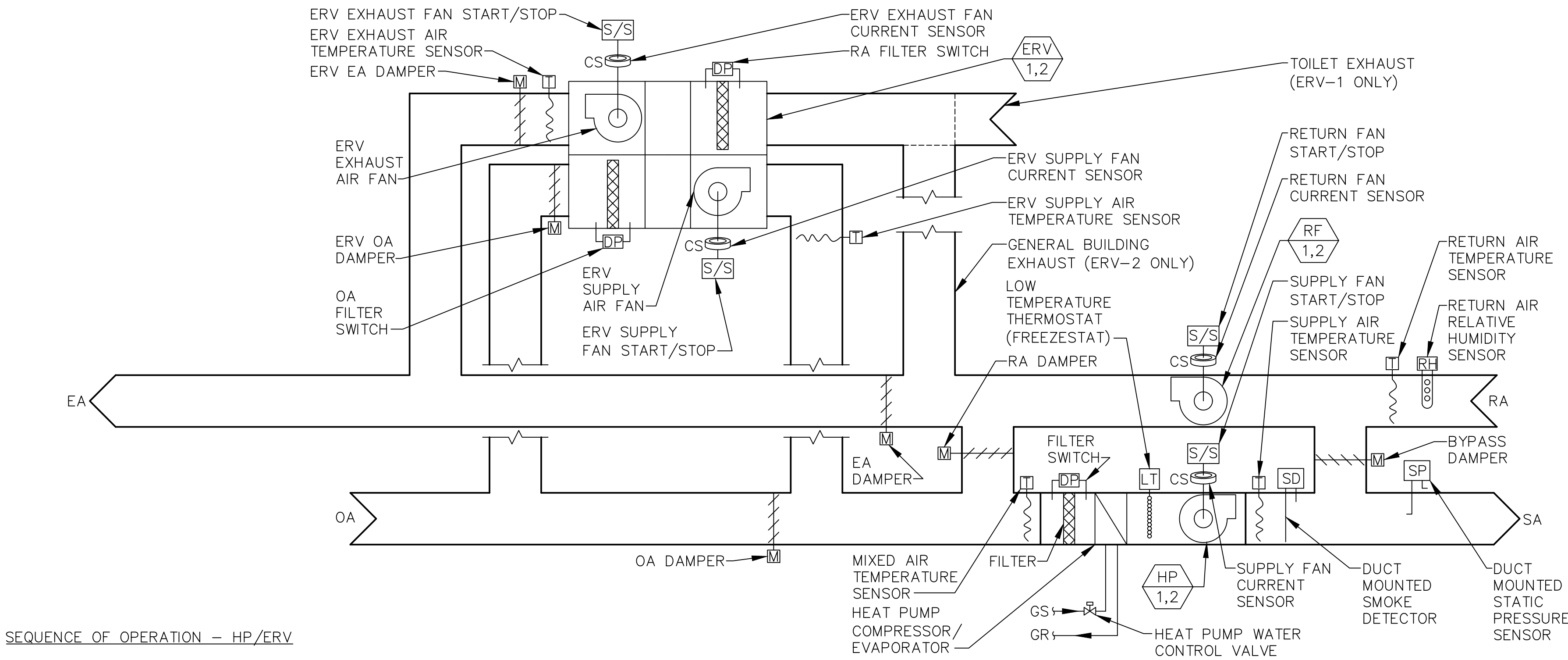
3 BUILDING GLOBAL POINTS CONTROL DIAGRAM

NOT TO SCALE

	NO.		REVISIONS:		DATE:		BY:	
	U.S. FISH AND WILDLIFE SERVICE							CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING
	ASSABET RIVER NATIONAL WILDLIFE REFUGE							SUDBURY, MASSACHUSETTS
	DISCIPLINE SHEET NO	DESIGNED: DMA DRAWN: KLG		DWG NO 5R-MA-1301-100.00		SHEET 37 OF 50		

1 HYDRONIC PLANT SYSTEMS CONTROL DIAGRAM

NOT TO SCALE



SEQUENCE OF OPERATION – HP/ERV

OCCUPIED / UNOCCUPIED MODES: THE OCCUPIED AND UNOCCUPIED MODES SHALL BE DETERMINED BY USER ADJUSTABLE 7 DAY / 24 HOUR SCHEDULES ACCESSIBLE TO THE BUILDING OPERATOR THROUGH THE GUI.

HEATING / COOLING MODE: THE HEATING MODE SHALL BE ENABLED WHEN THE ROOM TEMPERATURE FALLS BELOW THE HEATING SETPOINT, 68 DEGF (ADJUSTABLE). THE COOLING MODE SHALL BE ENABLED WHEN THE ROOM TEMPERATURE RISES ABOVE THE COOLING SETPOINT, 76 DEG F (ADJUSTABLE). IN ORDER TO PREVENT SHORT CYCLING, THE BUILDING OPERATOR SHALL NOT BE ALLOWED TO ADJUST THE COOLING SETPOINT LOWER THAN 2 DEG F ABOVE THE HEATING SETPOINT.

ECONOMIZER COOLING: ECONOMIZER COOLING SHALL BE ENABLED WHENEVER THE OUTSIDE AIR ENTHALPY IS 10% LOWER THAN THE RETURN AIR ENTHALPY.

OCCUPIED MODE: DURING THE OCCUPIED MODE THE HP SUPPLY FAN AND ASSOCIATED RETURN FAN AND ERV SUPPLY AND EXHAUST FAN SHALL RUN CONTINUOUSLY.

DURING COOLING MODE WHEN ECONOMIZER COOLING IS ENABLED, ERV–2 SUPPLY AND EXHAUST AIR FANS SHALL REMAIN OFF AND THE ERV OUTSIDE AND EXHAUST DAMPERS SHALL REMAIN CLOSED. ERV–1 SUPPLY FAN SHALL REMAIN OFF AND THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED. ERV–1 EXHAUST FAN SHALL OPERATE TO EXHAUST THE TOILET ROOMS AND THE EXHAUST AIR DAMPER SHALL REMAIN OPEN. THE HP MIXING DAMPERS (OUTSIDE, EXHAUST AND RETURN AIR DAMPERS) SHALL MODULATE TO MAINTAIN THE COOLING SETPOINT. SUPPLY AIR TEMP SHALL NOT BE LOWER THAN 55 DEG F. THE HP COMPRESSOR SHALL REMAIN OFF AND HEAT PUMP WATER CONTROL VALVE SHALL REMAIN CLOSED.

DURING COOLING MODE WHEN ECONOMIZER COOLING IS DISABLED, THE HP OUTSIDE AND EXHAUST DAMPERS SHALL REMAIN CLOSED, THE HP RETURN AND THE ERV OUTSIDE AND EXHAUST DAMPERS SHALL REMAIN OPEN, THE HP SUPPLY AND RETURN FANS AND ERV SUPPLY AND EXHAUST FANS SHALL RUN CONTINUOUSLY, AND THE HEAT PUMP WATER CONTROL VALVE SHALL REMAIN OPEN. THE HP REVERSING VALVE SHALL SET THE HP IN THE COOLING MODE AND THE HP COMPRESSOR SHALL CYCLE (WITH A 5 MINUTE MINIMUM RUN TIME) TO MAINTAIN THE COOLING SETPOINT.

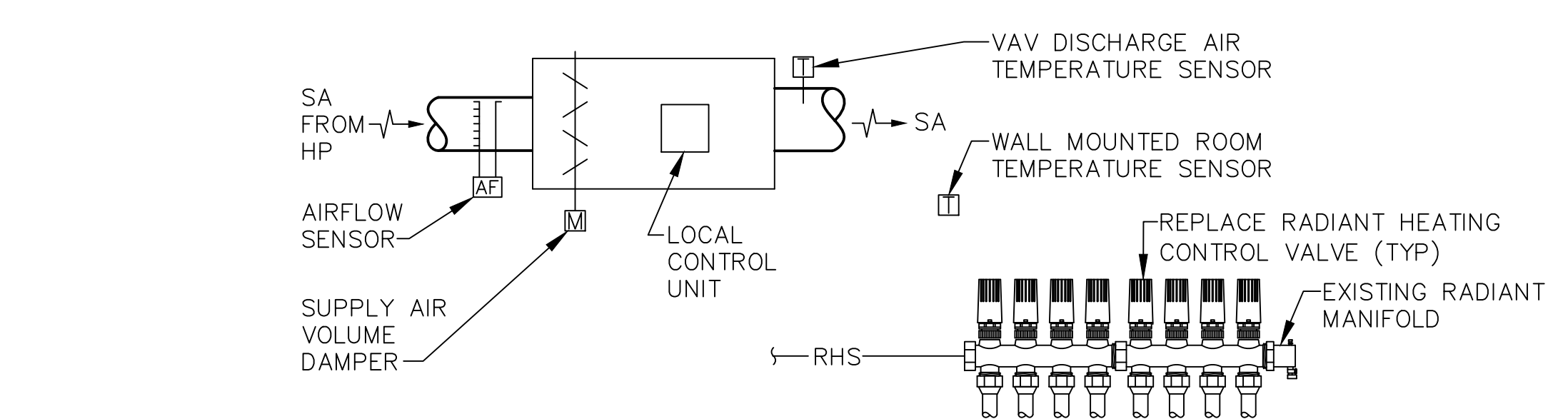
WHEN THE HEATING MODE IS ENABLED, THE HP OUTSIDE AND EXHAUST DAMPERS SHALL REMAIN CLOSED, THE HP RETURN AND THE ERV OUTSIDE AND EXHAUST DAMPERS SHALL REMAIN OPEN, THE HP SUPPLY AND RETURN FANS AND ERV SUPPLY AND EXHAUST FANS SHALL RUN CONTINUOUSLY, AND THE HEAT PUMP WATER CONTROL VALVE SHALL REMAIN OPEN. THE HP REVERSING VALVE SHALL SET THE HP IN THE HEATING MODE AND THE HP COMPRESSOR SHALL CYCLE (WITH A 5 MINUTE MINIMUM RUN TIME) TO MAINTAIN THE HEATING SETPOINT.

UNOCCUPIED MODE: DURING THE UNOCCUPIED MODE, THE HP SUPPLY AND RETURN FANS AND ERV SUPPLY AND EXHAUST AIR FANS SHALL REMAIN OFF AND THE ERV OUTSIDE AND EXHAUST DAMPERS SHALL REMAIN CLOSED. THE HP OUTSIDE AND EXHAUST DAMPERS SHALL REMAIN CLOSED AND THE RETURN AIR DAMPER SHALL REMAIN OPEN.

SAFETIES AND ALARMS:

- A DUCT MOUNTED SMOKE DETECTOR SHALL STOP THE HP & ERV SUPPLY, RETURN, AND EXHAUST FANS, CLOSED THE OUTSIDE AND EXHAUST AIR DAMPERS AND GENERATE AN ALARM ON THE GUI IF SMOKE IS DETECTED IN A DUCT.
- AN ALARM SHALL BE GENERATED ON THE GUI IF THE SUPPLY AIR TEMPERATURE IS NOT WITHIN ± 5 DEG F OF SETPOINT.
- AN ALARM SHALL BE GENERATED ON THE GUI IF THE ERV EXHAUST AIR TEMPERATURE FALLS BELOW 15 DEG F.
- AN ALARM SHALL BE GENERATED ON THE GUI IF A SUPPLY, RETURN OR EXHAUST AIR FAN FAILS TO SHOW PROOF OF OPERATION.
- A MAINTENANCE ALARM SHALL BE GENERATED ON THE GUI IF ONE OF THE FILTER PRESSURE DROPS EXCEEDS 0.70 IN H2O.
- AN ALARM SHALL BE GENERATED IF THE FREEZESTAT INDICATES A LOW TEMPERATURE CONDITION.

HP/ERV POINTS LIST									
SYSTEM POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG
SUPPLY FAN START/STOP	x			x	x			x	1
SUPPLY FAN CURRENT	x		x					x	
SUPPLY AIR TEMPERATURE	x	x				x	x	x	2
HEAT PUMP WATER CONTROL VALVE	x			x				x	
FILTER SWITCH	x		x	x		x		x	4
RETURN AIR TEMPERATURE	x	x						x	
RETURN AIR RELATIVE HUMIDITY	x	x						x	
OUTSIDE AIR DAMPER	x	x						x	
RETURN AIR DAMPER	x	x						x	
EXHAUST AIR DAMPER	x	x						x	
ERV SUPPLY FAN START/STOP	x				x	x		x	1
ERV SUPPLY FAN CURRENT	x		x					x	
ERV EXHAUST FAN START/STOP	x				x	x		x	1
ERV EXHAUST FAN CURRENT	x			x				x	
ERV SUPPLY AIR TEMPERATURE	x	x				x	x	x	
ERV EXHAUST AIR TEMPERATURE	x	x				x	x	x	5
ERV OUTSIDE AIR DAMPER	x				x			x	
ERV EXHAUST AIR DAMPER	x				x			x	
RETURN AIR FILTER SWITCH	x		x		x			x	4
OUTSIDE AIR FILTER SWITCH	x		x		x			x	4
BYPASS DAMPER	x	x						x	6
SUPPLY DUCT MOUNTED STATIC PRESSURE SENSOR	x	x					x	x	
RETURN FAN START/STOP	x				x	x		x	1
RETURN FAN CURRENT	x		x					x	
LOW TEMPERATURE FREEZESTAT	x		x			x		x	3
SUPPLY AIR SMOKE DETECTOR	x		x			x		x	7
NOTES: 1. GENERATE ALARM IF MOTOR FAILS TO SHOW PROOF OF OPERATION. 2. GENERATE ALARM IF TEMPERATURE IS NOT $\pm 5^{\circ}\text{F}$ OF SETPOINT. 3. GENERATE ALARM IF FREEZESTAT INDICATES A LOW TEMPERATURE CONDITION. 4. GENERATE MAINTENANCE ALARM IF FILTER SWITCH PRESSURE DROP EXCEEDS 0.70 IN H2O. 5. GENERATE ALARM IF TEMPERATURE FALLS BELOW 15°F. 6. GENERATE MAINTENANCE ALARM WHEN PRESSURE DROP EXCEEDS 0.70 IN H2O. 7. GENERATE ALARM IF SMOKE DETECTOR INDICATES AN ALARM CONDITION.									



SEQUENCE OF OPERATION

OCCUPIED MODE: THE VAV BOX SHALL MODULATE THE SUPPLY AIR VOLUME DAMPER TO MAINTAIN THE SUPPLY AIRFLOW SETPOINT. THE ZONE TEMPERATURE SENSOR SHALL RESET THE SUPPLY AIRFLOW SETPOINT. AS THE ZONE TEMPERATURE RISES ABOVE THE ZONE COOLING SETPOINT (78° F ADJUSTABLE) THE SUPPLY AIRFLOW SETPOINT SHALL INCREASE. THE SUPPLY AIRFLOW SETPOINT SHALL DECREASE AS THE ZONE TEMPERATURE APPROACHES THE COOLING SETPOINT. AS THE ZONE TEMPERATURE FALLS BELOW THE ZONE HEATING SETPOINT (68° F ADJUSTABLE) THE AIRFLOW SETPOINT SHALL BE AT MINIMUM AND THE RADIANT HEATING ZONE VALVES SHALL CYCLE TO MAINTAIN THE HEATING SETPOINT. THE VAV BOX SHALL REMAIN IN THE OCCUPIED MODE FOR A MINIMUM OF 1 HOUR (ADJUSTABLE) AFTER THE OCCUPIED MODE IS STARTED.

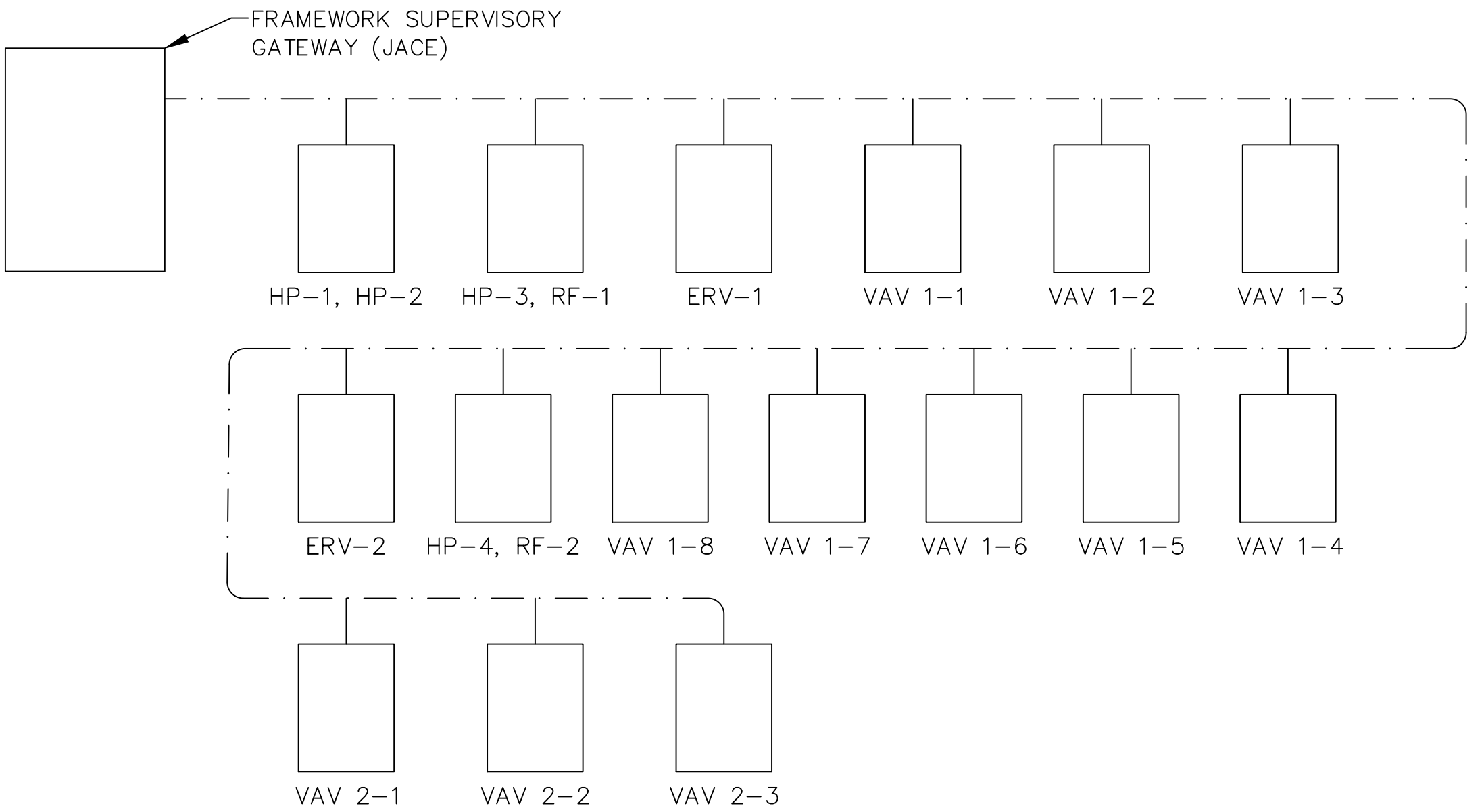
UNOCCUPIED MODE: IF THE UNOCCUPIED OVERRIDE BUTTON IS PRESSED THE VAV BOX SHALL ENTER THE OCCUPIED MODE FOR 2 HOURS (ADJUSTABLE), OTHERWISE THE VAV BOX DAMPER SHALL REMAIN CLOSED.

NIGHT SETBACK MODE: THE RADIANT HEATING VALVE SHALL CYCLE TO MAINTAIN NIGHT HEATING SETBACK, (65° F ADJUSTABLE).

TYPICAL VAV BOX POINTS LIST									
SYSTEM POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG
ZONE TEMPERATURE	x	x					x	x	1
HEATING SET POINT	x						x	x	
COOLING SET POINT	x						x	x	
AIR FLOW (CFM)	x	x				x		x	2
DAMPER POSITION	x	x						x	
RADIANT HEATING CONTROL VALVE	x			x				x	
NIGHT HEATING SET-BACK	x						x	x	
NIGHT COOLING SET-BACK	x						x	x	
NOTES: 1. GENERATE ALARM IF ROOM TEMPERATURE IS GREATER THAN 3°F ABOVE THE COOLING SETPOINT OR LOWER THAN 3°F BELOW THE HEATING SETPOINT. 2. GENERATE ALARM IF AIRFLOW IS NOT BETWEEN MINIMUM AND THE MAXIMUM AIRFLOW SETTINGS. 3. TIE EXISTING RADIANT HEATING CONTROL VALVES TO NEW CONTROLLERS.									

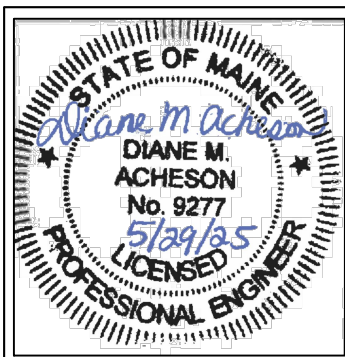
2 TYPICAL VAV BOX CONTROL DIAGRAM

M-702 NOT TO SCALE



3 DIRECT DIGITAL CONTROL ARCHITECTURE

M-702 NOT TO SCALE



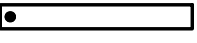
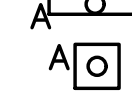
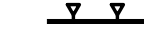
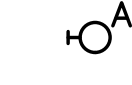
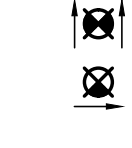
DISCIPLINE
SHEET NO

ND.	REVISIONS:	DATE:	BY:
U.S. FISH AND WILDLIFE SERVICE	CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING		
CONTROL DIAGRAMS 2			
ASSABET RIVER NATIONAL WILDLIFE REFUGE	SUDBURY, MASSACHUSETTS		
DESIGNED: DMA	DWG NO:	5R-MA-1301-100.00	SHEET 38 OF 50
DRAWN: KLG			

ELECTRICAL SYMBOLS

LIGHTING

NOTE: UPPER CASE SUBSCRIPTS INDICATE FIXTURE TYPE. REFER TO LIGHTING FIXTURE SCHEDULE. LOWER CASE SUBSCRIPTS INDICATE FIXTURE CONTROL

S _{ab}	120/277V, 20A LIGHT SWITCH, SPECIFICATION GRADE
S ₃	120/277V, 20A 3–WAY LIGHT SWITCH, SPECIFICATION GRADE
S _p	120/277V, 20A LIGHT SWITCH WITH PILOT LIGHT. SPECIFICATION GRADE
S _D	120/277V, DIMMER SWITCH
	PENDANT LIGHT FIXTURE
	LIGHT FIXTURES
	LIGHT FIXTURES WITH EMERGENCY BACKUP
	TRACK LIGHTING
	EMERGENCY LIGHT, BATTERY POWERED TWO LAMPS
	EMERGENCY LIGHT, REMOTE HEAD ONE LAMP
	WALL MOUNTED FIXTURE SUBSCRIPT INDICATES FIXTURE TYPE
	RECESSED DOWNLIGHT
	DUAL TECHNOLOGY OCCUPANCY SENSOR V = VACANCY SENSOR W = WALL TYPE OCCUPANCY SENSOR
	ILLUMINATED EXIT SIGN, LED TYPE SINGLE FACE OR DOUBLE FACE, ARROW INDICATES DIRECTION OF FLOW FOR THE FACE
	TIME CLOCK
	EXTERIOR PHOTOCELL
	INTERIOR PHOTOCELL

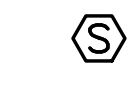
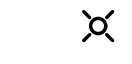
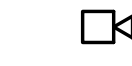
TELEPHONE, DATA AND VIDEO

	TELEPHONE JACK OUTLET W = WALL TYPE
	EXISTING CATEGORY 5 DATA JACK (REMOVE)
	CABLE TV JACK
	CATEGORY 6A DATA JACKS # INDICATES QUANTITY OF JACKS, DEFAULT = 2 JACKS, 2 BLANKS C = CEILING
	FLOOR MOUNTED DATA JACKS
	WIRELESS ACCESS POINT – CEILING MOUNT DATA JACK ONLY. ACCESS POINT PROVIDED BY OWNER. V = GOVERNMENT NETWORK P = PUBLIC NETWORK
	EXISTING FLOOR CATEGORY 5 DATA JACK (REMOVE)

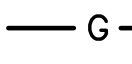
RECEPTACLES

	DUPLEX RECEPTACLE, 120V, 20A, SPECIFICATION GRADE, NEMA 5–20 R "C" INDICATES CEILING MOUNTED
	DUPLEX RECEPTACLE, 120V, 20A SPECIFICATION GRADE, NEMA 5–20 R SUBSCRIPT "G" INDICATES GROUND FAULT CIRCUIT INTERRUPTER, WP INDICATES WEATHERPROOF GROUND FAULT CIRCUIT INTERRUPTER. SUBSCRIPT "A" INDICATES SPLIT CIRCUIT RECEPTACLE WITH ONE AUTO CONTROLLED RECEPTACLE AND ONE NON–CONTROLLED RECEPTACLE.
	DOUBLE DUPLEX RECEPTACLE SUBSCRIPT "A" INDICATES SPLIT CIRCUIT RECEPTACLE WITH ONE AUTO CONTROLLED RECEPTACLE AND ONE NON–CONTROLLED RECEPTACLE.
	DUPLEX RECEPTACLES, 240V, 30A SPECIFICATION GRADE, NEMA 6–30R
	FLOOR OUTLET

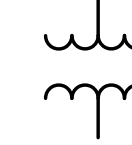
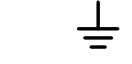
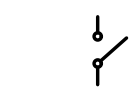
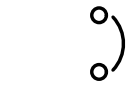
FIRE ALARM

	FIRE ALARM CONTROL PANEL
	HEAT DETECTOR BLANK = RATE OF RISE F = FIXED TEMPERATURE
	SMOKE DETECTOR BLANK = PHOTOELECTRIC D = DUCT DETECTOR
	STROBE
	HORN WITH STROBE
	HORN
	MANUAL PULL STATION
	REMOTE INDICATOR
	TAMPER SWITCH
	FLOW SWITCH

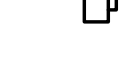
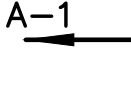
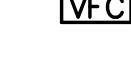
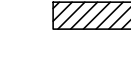
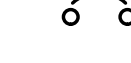
GROUNDING

	GROUND WIRE, BARE
	GROUND ROD, COPPER CLAD.

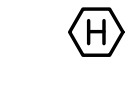
SINGLE LINE DIAGRAM

	TRANSFORMER
	METER
	GROUND CONNECTION
	DISCONNECT SWITCH
	CIRCUIT BREAKER, MANUALLY OPERATED
	THERMAL CUTOUT SWITCH

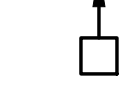
GENERAL

	MOTOR
	TRANSFORMER
	NON–FUSED DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	JUNCTION BOX "F" INDICATES FLOOR BOX
	BRANCH CIRCUIT HOMERUN, A–1 INDICATES PANEL DESIGNATION AND CIRCUIT NUMBER
	PUSHBUTTON
	PUSHBUTTON STATION
	VARIABLE FREQUENCY CONTROLLER
	PANELBOARD
	EXISTING PANELBOARD
	AUTOMATIC TRANSFER SWITCH
	CIRCUIT BREAKER
	SURGE PROTECTION DEVICE

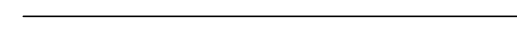
SOUND SYSTEMS

	SPEAKER
	HORN TYPE SPEAKER
	VOLUME CONTROL SWITCH

SECURITY

	SECURITY SYSTEM PANEL
	KEY PAD
	MOTION DETECTOR
	SECURITY SYSTEM HORN WITH STROBE
	GLASS BREAK SENSOR

LINE TYPE LEGEND

	REMOVE EXISTING ITEMS
	EXIST ITEMS TO REMAIN
	PROVIDE ITEMS

ELECTRICAL GENERAL NOTES

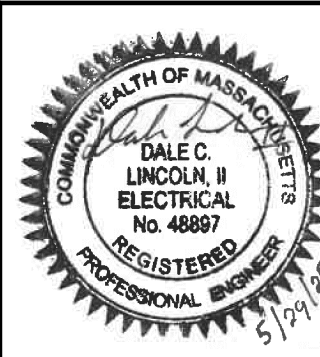
- ELECTRICAL INSTALLATION MUST COMPLY WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC), NFPA, AND STATE AND LOCAL CODES.
- WORK MUST BE COORDINATED WITH ARCHITECTURAL, CIVIL, STRUCTURAL, AND MECHANICAL TRADES.
- ELECTRICAL EQUIPMENT AND WIRING MUST BE NEW AND UL LISTED UNLESS OTHERWISE NOTED.
- LIGHT FIXTURES AND OTHER CEILING MOUNTED ELECTRICAL EQUIPMENT MUST BE COORDINATED WITH ARCHITECTURAL, STRUCTURAL, AND MECHANICAL WORK TO AVOID INTERFERENCE.
- A SEPARATE GREEN GROUNDING CONDUCTOR SHALL BE PROVIDED FOR EACH INDIVIDUAL CIRCUIT. METAL CONDUIT MUST BE GROUNDED BUT MUST NOT BE USED AS THE EQUIPMENT GROUNDING CONDUCTOR.
- VERIFY EXISTING CONDITIONS AND DIMENSIONS AND REPORT DISCREPANCIES TO THE OWNER'S REPRESENTATIVE. THE CONTRACTOR MUST PROCEED WITH THE WORK ONLY AFTER THE DISCREPANCIES HAVE BEEN RESOLVED BY THE OWNER'S REPRESENTATIVE.
- CONDUCTORS MUST BE MINIMUM #12 AWG UNLESS NOTED OTHERWISE.
- CONDUIT MUST BE MINIMUM 3/4" UNLESS OTHERWISE NOTED.
- FIRE ALARM STROBES MUST BE RATED 15/75 CANDELA UNLESS NOTED OTHERWISE.
- UNLESS OTHERWISE INDICATED, WIRE AND CONDUIT SIZE FOR EACH 15A 1P, 15A 2P, 20A 1P AND 20A 2P BRANCH CIRCUIT MUST BE 2 #12 + #12G, IN 3/4"C.
- UNLESS OTHERWISE INDICATED, WIRE AND CONDUIT SIZE FOR EACH 15A 3P AND 20A 3P BRANCH CIRCUIT MUST BE 3 #12 + #12G, IN 3/4"C.
- A SEPARATE NEUTRAL CONDUCTOR MUST BE PROVIDED FOR EACH INDIVIDUAL 120V CIRCUIT.
- COORDINATE WITH MECHANICAL TRADE TO ENSURE DUCTWORK AND PIPING ARE NOT INSTALLED ABOVE PANELBOARDS.
- SEAL CONDUIT INTERIOR AT PENETRATIONS THROUGH BUILDING ENVELOPE TO PREVENT PASSAGE OF AIR AND MOISTURE. PROVIDE SEALANT PRODUCT INTENDED FOR SUCH USE. PROVIDE AT CONDUITS PENETRATING EXTERIOR WALLS, BELOW SLABS AND EXTENDING THROUGH ROOF. BASIS OF DESIGN: AMERICAN POLYWATER FST.

MOUNTING HEIGHT SCHEDULE

- RECEPTACLES AND TELECOMMUNICATIONS OUTLETS 18" UNLESS NOTED OTHERWISE.
- RECEPTACLES AND TELECOMMUNICATIONS OUTLETS AT COUNTERS: 6" ABOVE COUNTER TOP/BACKSPLASH.
- SWITCHES 48".
- MANUAL PULL STATIONS: 48"
- FIRE ALARM STROBES: 80"–96"
- RECEPTACLES IN BATHROOMS: 48" ADJACENT TO SINK, HAND DRYER, ETC. 48"

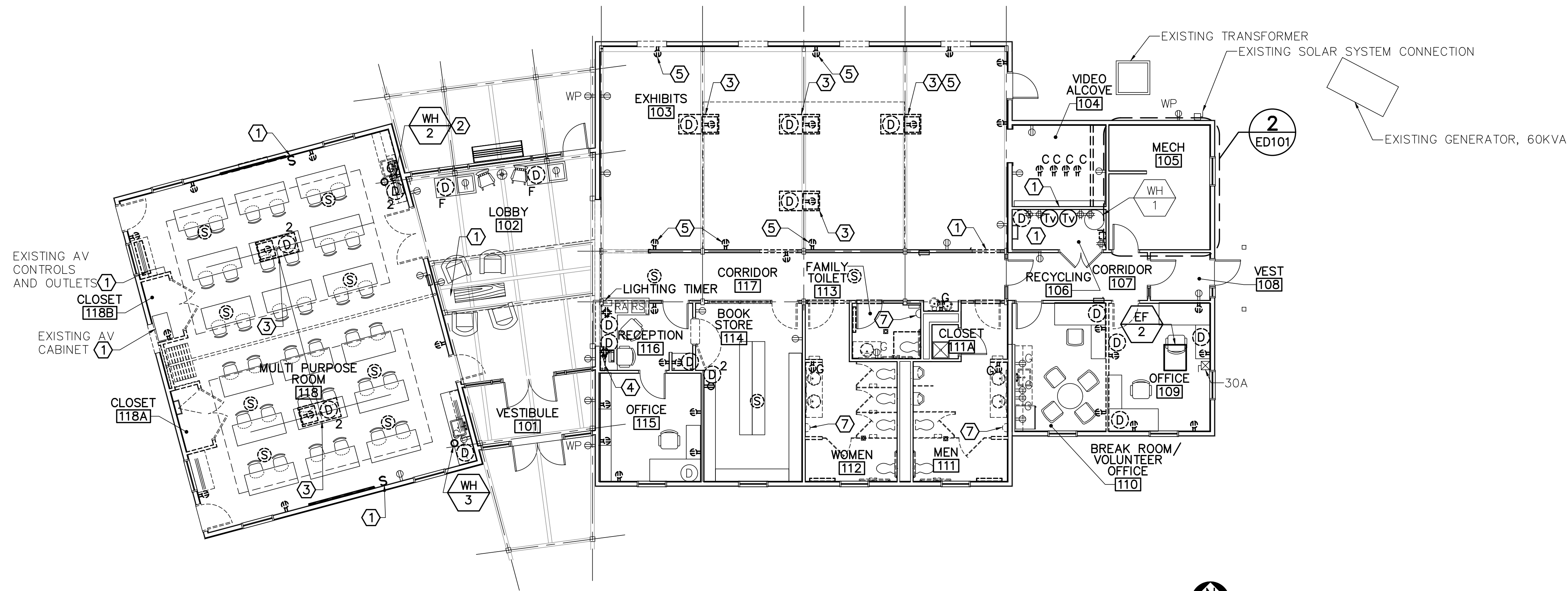
ELECTRICAL ABBREVIATIONS

A, AMP	AMPERE
A3P	AMPERES, 3–POLE
AC	ALTERNATING CURRENT
AFF	ABOVE FINISHED FLOOR
AIC	AMPERE INTERRUPTING CAPACITY
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
BKR	BREAKER
C	CONDUCTOR, CONDUIT
CAT	CATALOG, CATEGORY
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CU	COPPER
DDC	DIRECT DIGITAL CONTROL
DWG	DRAWING
EMT	ELECTRICAL METALLIC TUBING
FACP	FIRE ALARM CONTROL PANEL
G	GROUND; GROUND FAULT CIRCUIT INTERRUPTER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
H	HEATING LOAD TYPE FOR PANEL SCHEDULE
HO	HIGH OUTPUT
HP	HORSEPOWER
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
IBC	INTERNATIONAL BUILDING CODE
KCMIL	KILO–CIRCULAR MILS
KVA	KILO–VOLT–AMPERE
KW	KILO–WATT
L	LIGHTING LOAD TYPE FOR PANEL SCHEDULE
LC	LIGHTING CONTROL PANEL
LED	LIGHT EMITTING DIODE
LTG	LIGHTING
M	MOTOR LOAD TYPE FOR PANEL SCHEDULE
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MH	METAL HALIDE
MIN	MINIMUM
MLO	MAIN LUG ONLY
MTS	MANUAL TRANSFER SWITCH
N	NEUTRAL
N/A	NOT APPLICABLE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NO, #	NUMBER
OCC	OCCUPANCY
ø	PHASE
P	POLE
P/O	PART OF
PV	PHOTOVOLTAIC
R	RECEPTACLE LOAD TYPE FOR PANEL SCHEDULE
REC	RECEPTACLE
RGS	RIGID GALVANIZED STEEL
RM	ROOM
RMC	RIGID METAL CONDUIT
SPDT	SINGLE POLE, DOUBLE THROW
SQ	SQUARE
SW	SWITCH
THHN	HEAT RESISTANT THERMOPLASTIC WIRE WITH NYLON JACKET
THWN	MOISTURE & HEAT RESISTANT THERMOPLASTIC WIRE WITH NYLON JACKET
TMGB	TELECOM MAIN GROUND BUSBAR
TV	TELEVISION
TYP	TYPICAL
UE	UNDERGROUND ELECTRIC
UL	UNDERWRITERS LABORATORIES
V	VOLT
VA	VOLT AMPERE
VFC	VARIABLE FREQUENCY CONTROLLER
W	WATT, WIRE
W/	WITH
WP	WEATHERPROOF



DALE C.
LINCOLN II
ELECTRICAL
No. 48887
REGISTERED
PROFESSIONAL ENGINEER

NO.	REVISIONS	DATE	BY
U.S. FISH AND WILDLIFE SERVICE CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING			
ASSABET RIVER NATIONAL WILDLIFE REFUGE SUDBURY, MASSACHUSETTS			
DISCIPLINE SHEET NO E–001		DESIGNED: DCL DRAWN: BPD	DWG NO: 5R–MA–1301–100.00
		SHEET 39 OF 50	



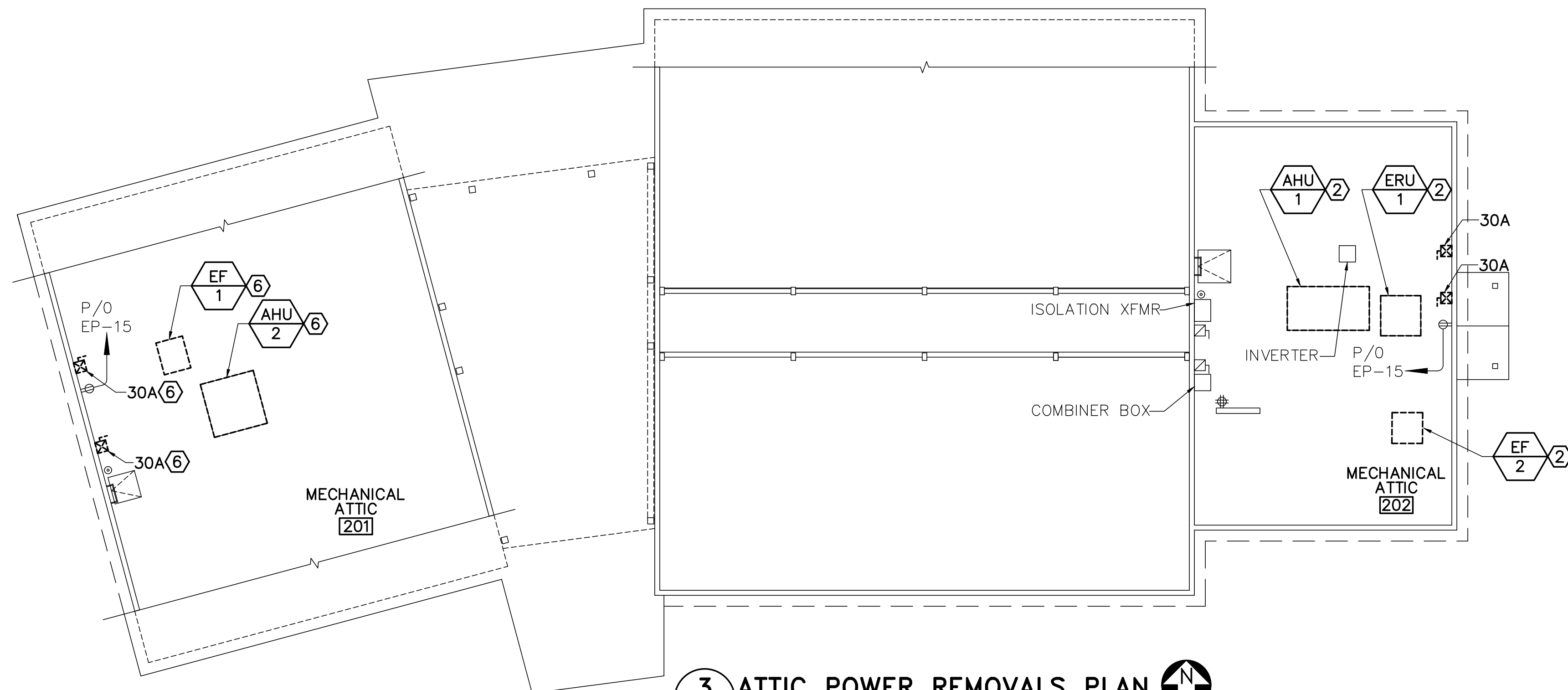
1 FIRST FLOOR POWER AND TECHNOLOGY REMOVALS PLAN
ED101 SCALE: 1/8"=1'-0" PLAN NORTH

GENERAL REMOVALS NOTES

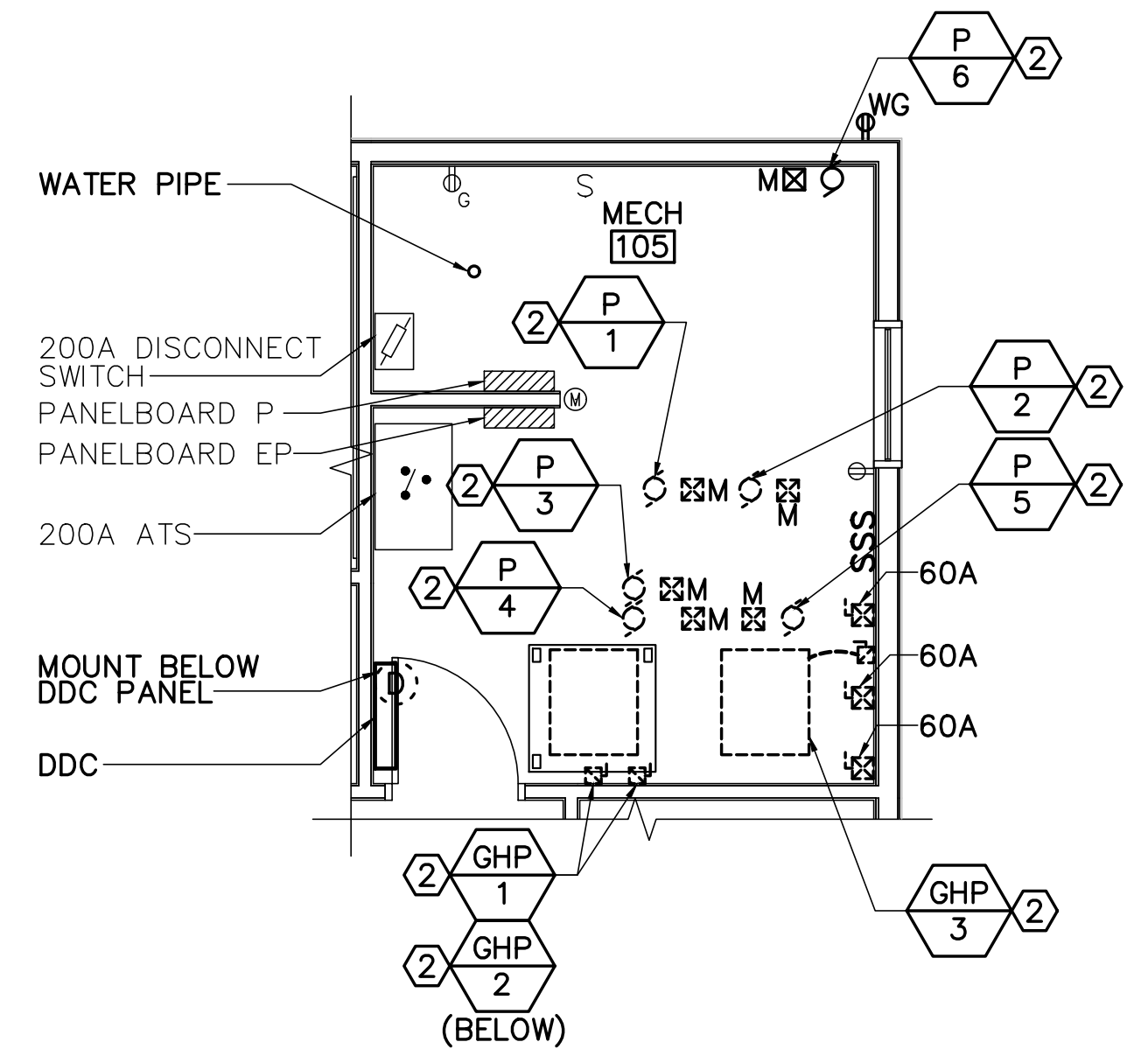
- DISCONNECT EXISTING WIRING AND CONDUIT ASSOCIATED WITH EXISTING VAV BOXES. REFER TO SHEET MD101 FOR VAV LOCATIONS AND SHEET ED601 FOR PANELBOARD SCHEDULES.
- UNLESS OTHERWISE INDICATED, REMOVE EXISTING ITEMS WITH ASSOCIATED WIRING AND CONDUIT BACK TO THE SOURCE. EXISTING CONDUIT AND BOXES IN FLOORS AND EXISTING-TO-REMAIN WALLS MUST REMAIN.

REMOVALS KEYNOTES

- EXISTING AV CABINET, CONTROLS, AND OUTLETS WITH ASSOCIATED CABLES AND CONDUIT REMOVED BY OWNER.
- REMOVE EXISTING DISCONNECT SWITCH, STARTER, WIRING, AND CONDUIT BACK TO SOURCE PANELBOARD IN MECH ROOM 105. REFER TO EXISTING PANELBOARD SCHEDULES ON SHEET ED601.
- REMOVE EXISTING DEVICES AND ASSOCIATED WIRING AND CABLING. EXISTING FLOOR BOX AND EMBEDDED CONDUIT MUST REMAIN. PROVIDE COVER.
- EXISTING FOUR (4) WINDOW CONTROLLERS MUST REMAIN.
- REMOVE RECEPTACLE AND ASSOCIATED WIRING. PROVIDE COVER PLATE.
- REMOVE EXISTING DISCONNECT SWITCH, STARTER, AND WIRING BACK TO SOURCE PANELBOARD. EXISTING 3/4" CONDUIT HOMERUN TO SOURCE PANELBOARD IN MECH ROOM 105 MUST REMAIN AND BE UTILIZED FOR CIRCUITS SHOWN ON 1/EP501.
- DISCONNECT POWER TO EXISTING HAND DRYERS. EXTEND CIRCUIT TO LOCATION SHOWN ON EP101.

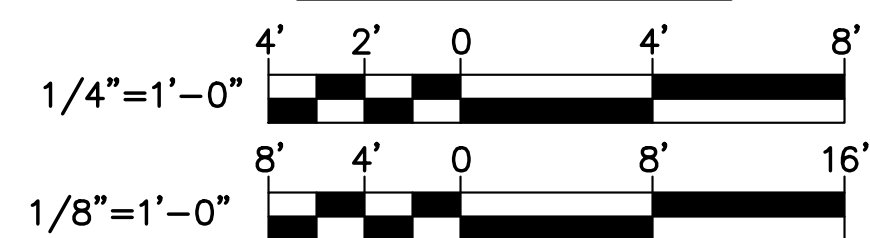


3 ATTIC POWER REMOVALS PLAN
ED101 SCALE: 1/8"=1'-0" PLAN NORTH

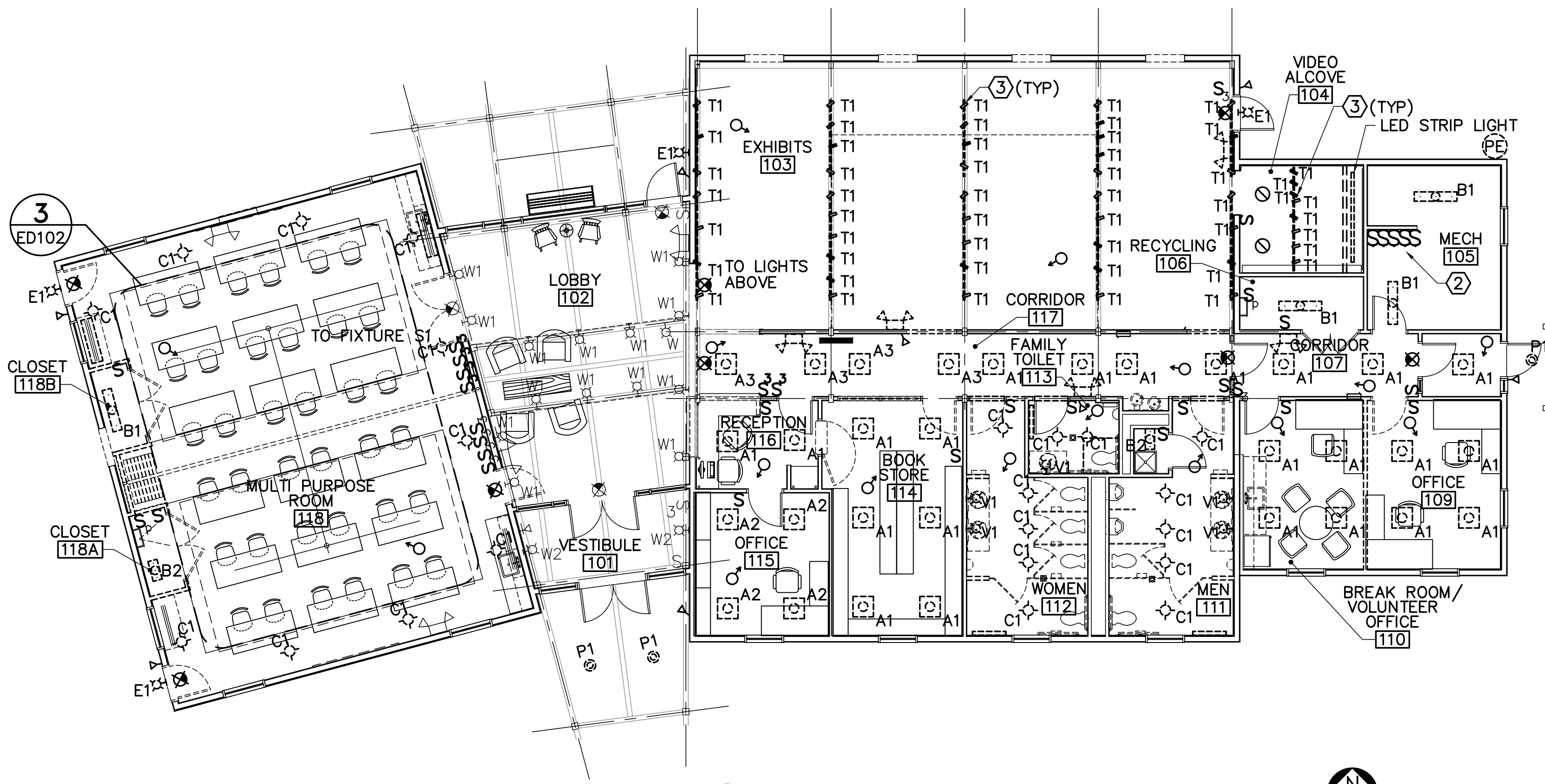


2 MECHANICAL RM POWER AND EXISTING CONDITIONS PLAN
ED101 SCALE: 1/4"=1'-0" PLAN NORTH

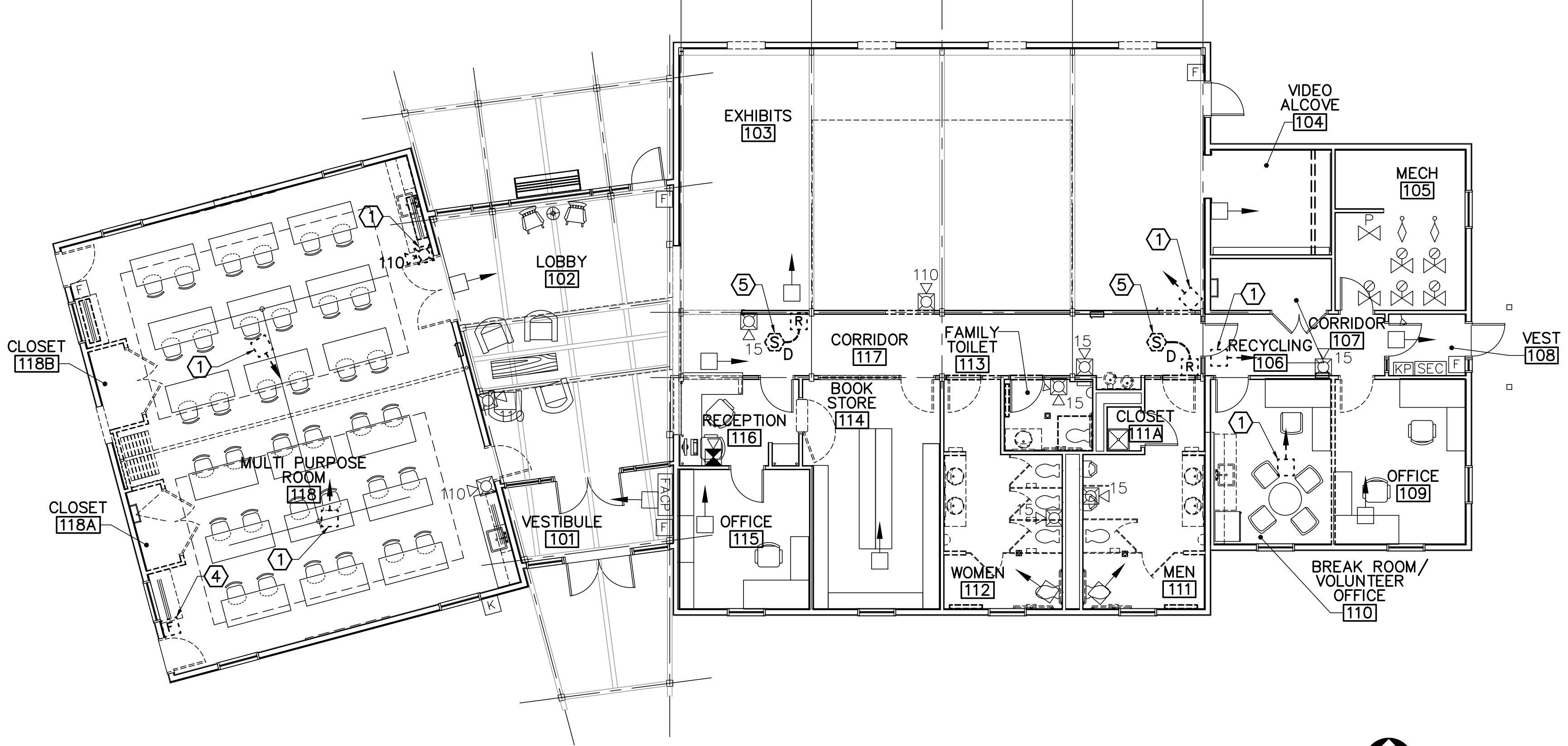
GRAPHIC SCALES



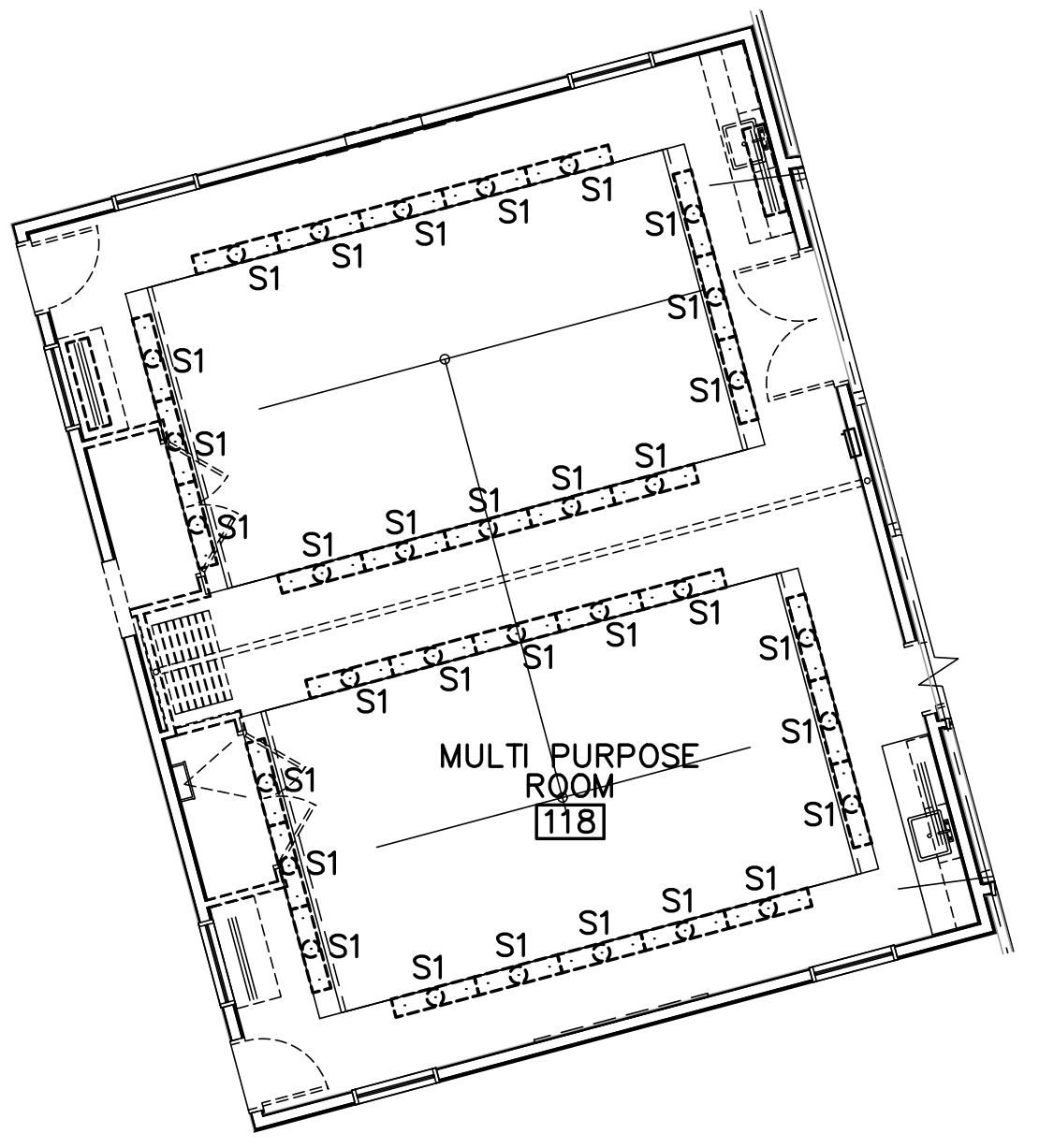
	NO.		REVISIONS:		DATE:		BY:	
	U.S. FISH AND WILDLIFE SERVICE CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING							
	POWER AND TECHNOLOGY REMOVALS PLAN							
	ASSABET RIVER NATIONAL WILDLIFE REFUGE SUDBURY, MASSACHUSETTS							
DISCIPLINE SHEET NO. ED101		DESIGNED: DCL DRAWN: BPD		DWG NO.: 5R-MA-1301-100.00		SHEET 40 OF 50		



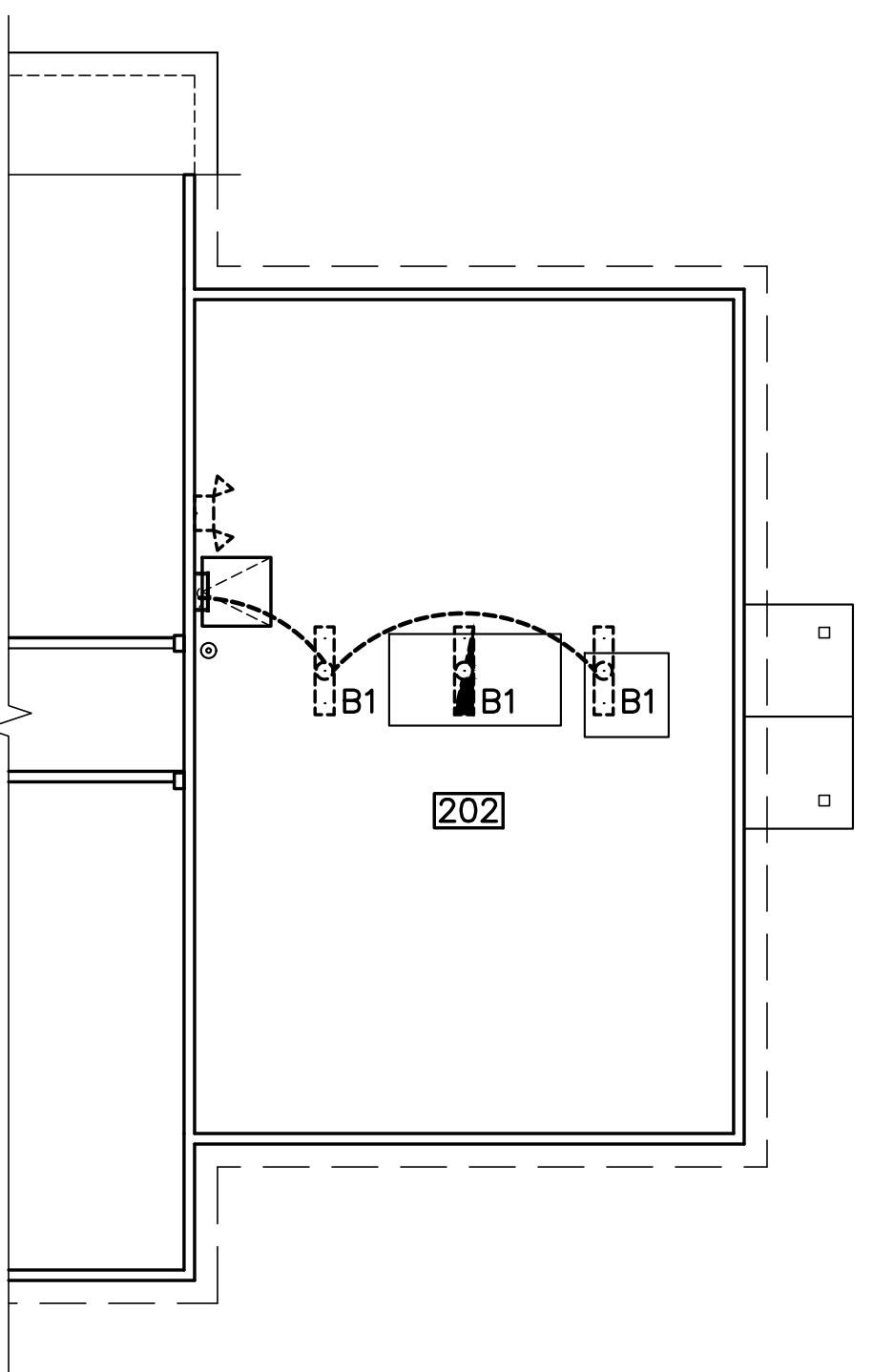
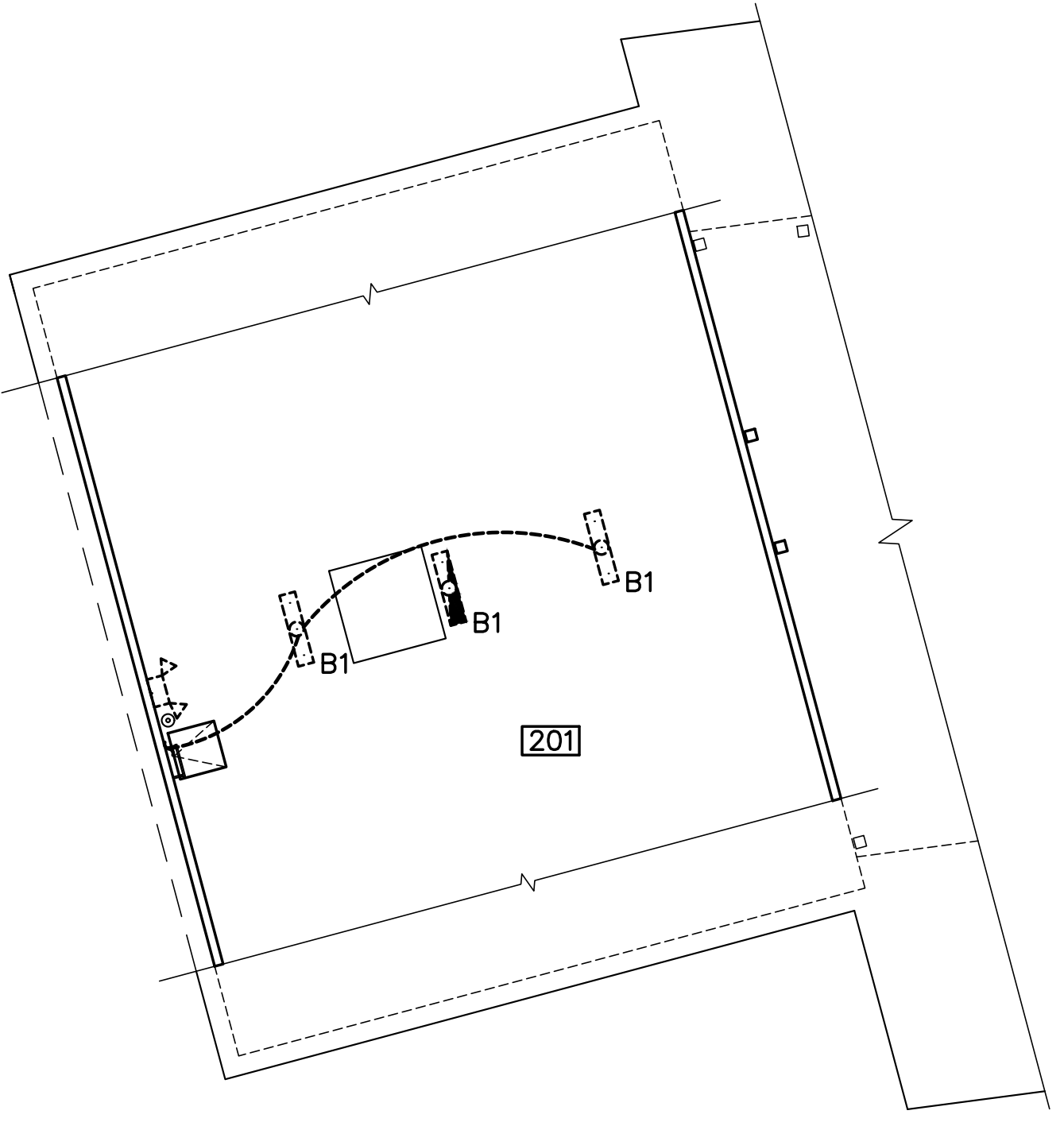
1 FIRST FLOOR LIGHTING REMOVALS PLAN
ED102 SCALE: 1/8"=1'-0"



2 FIRST FLOOR FIRE ALARM AND SECURITY REMOVALS PLAN
ED102 SCALE: 1/8"=1'-0"



3 RM 118 LIGHTING REMOVALS PLAN
ED102 SCALE: 1/8"=1'-0"



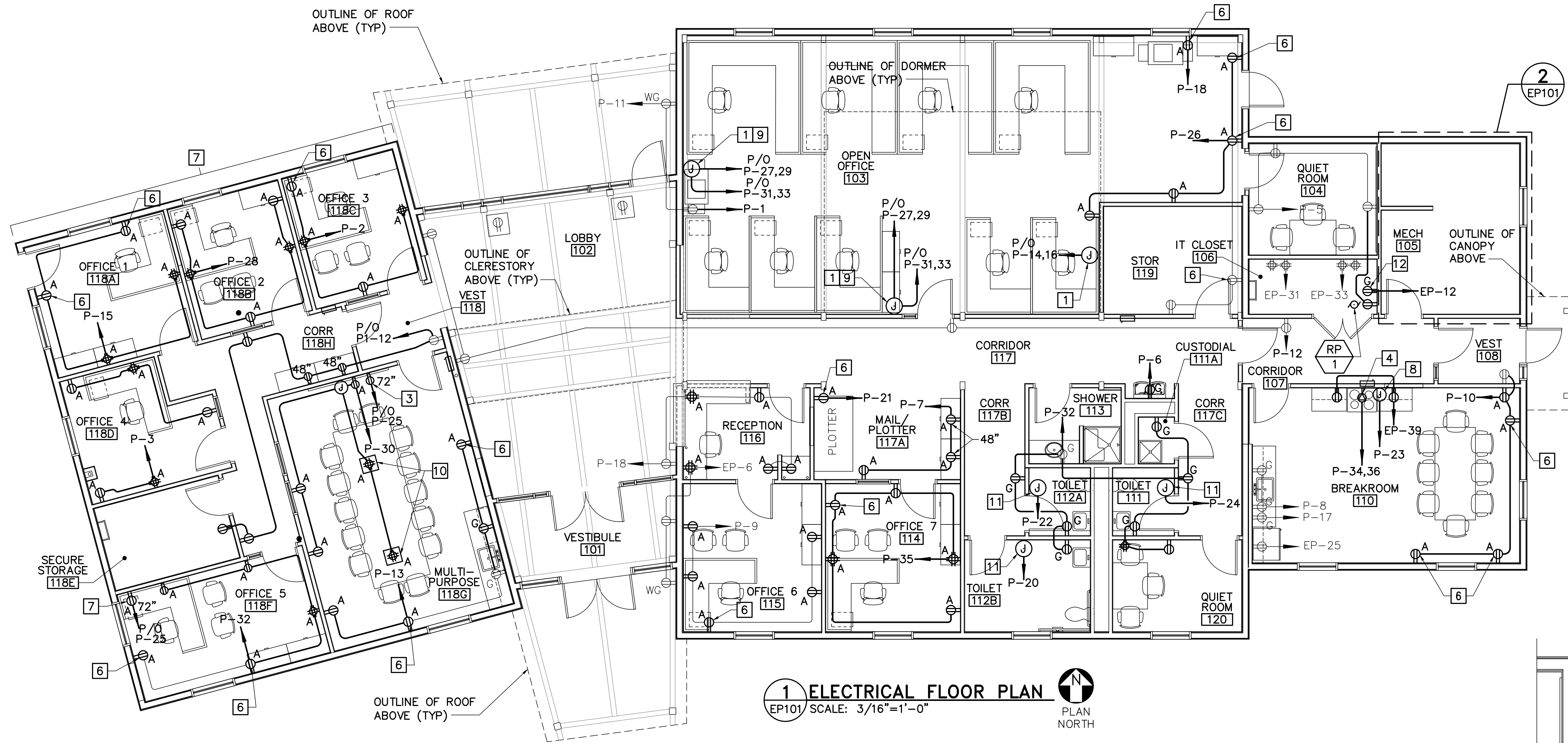
4 ATTIC LIGHTING REMOVALS PLANS
ED102 SCALE: 1/8"=1'-0"



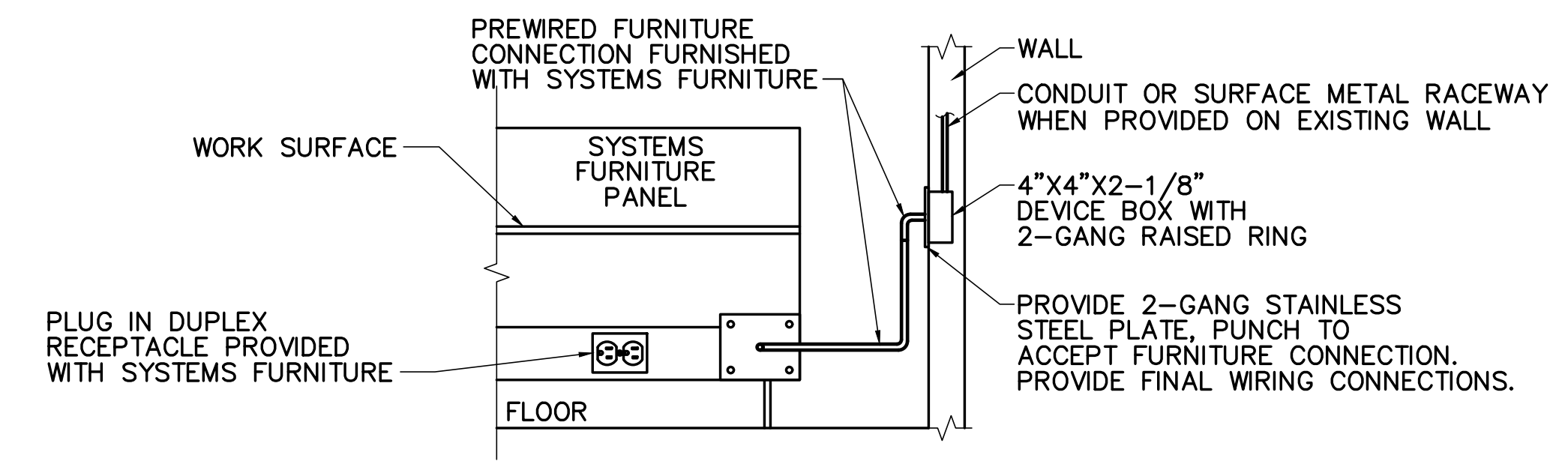
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EATON CUTLER HAMMER POW-R-LINE C															EXISTING PANELBOARD SCHEDULE P														
CKT NO	AMPS PER PHASE		DESCRIPTION	LOAD TYPE	CKT TRIP	BKR POLE	CKT TRIP	BKR POLE	LOAD TYPE	DESCRIPTION	AMPS PER PHASE		CKT NO																
	A	B									A	B																	
1	6		REC – FLOOR 103, REVENUE METER <2>	–	20	1	40	1	–	WH-2 NORTH <1>	25		2																
3		4	REC – FLOOR 118 <2>	–	20	1	40	1	–	WH-3 SOUTH		25	4																
5	6		REC – 104, 106	–	20	1	20	1	–	REC – 111, 113, H2O COOLER <1>	6		6																
7		6	REC – 112, 114	–	20	1	20	1	–	REC – 110		8	8																
9	10		REC – 115	–	20	1	20	1	–	REC – 108, 109	12		10																
11		12	REC – 103, NORTH	–	20	1	20	1	–	REC – 102, 106, 107, 117		12	12																
13	10		REC – 118	–	20	1	20	2	–	TRACK LTG D 103	.		14																
15		10	REC – 118	–	20	1	↓	↓	↓	TRACK LTG B 103		12	16																
17	.		REC – MICROWAVE	–	20	1	20	1	–	RECEPTACLES 102, 106	.		18																
19		.	SITE LIGHTING	–	20	1	20	1	–	HAND DRYER – RM 112		.	20																
21	13.8		EF-1 <1>	–	20	1	20	1	–	HAND DRYER – RM 113	.		22																
23		7.2	EF-2 <1>	–	20	1	20	1	–	HAND DRYER – RM 111		.	24																
25	.		TRACK LIGHTING "A"	–	20	1	20	1	–	REC – 103 SOUTH	12		26																
27		.	TRACK LIGHTING "C" "E"	–	20	2	20	1	–	SPARE		.	28																
29	.		↓	↓	↓	↓	20	1	–	LTG – RM 101, 102	.		30																
31		.	LTG – RM 109, 110 <1>	–	20	1	20	1	–	PROJECTOR SCREENS		5	32																
33	.		LTG – RM 114, 115, 116 <1>	–	20	1	20	1	–	STAGE RECEPTACLES <1>	.		34																
35		.	SPARE	–	20	1	20	1	–	STAGE RECEPTACLES <1>		.	36																
37	.		GENERATOR	–	20	1	20	1	–	GENERATOR	.		38																
39		.	INVERTER	–	50	2	20	1	–	GENERATOR		.	40																
41	.		↓	↓	↓	↓	20	1	–	GENERATOR	.		42																
			TOTAL/PHASE	VOLTS: 120/240, SINGLE PHASE, 3 WIRE										DESIGNATION: –															
			CODE AMPS	MCB: ☐										LOCATION: .															
			TOTAL = CODE	MLO: ☐										MOUNTING: .															
			AMPS X 1.25	FAULT AMPS: 65,000 (MCB)																									

EATON PRL1A POW-R-LINE C				EXISTING PANELBOARD SCHEDULE EP											
CKT NO	AMPS PER PHASE		DESCRIPTION	LOAD TYPE	CKT TRIP	BKR POLE	CKT TRIP	BKR POLE	LOAD TYPE	DESCRIPTION	AMPS PER PHASE		CKT NO		
	A	B									A	B			
1	8		AHU-1 <1>	M	20	2	40	2	-	GHP-1, P-3 <1>	39		2		
3		8	↓	↓	↓	↓	↓	↓	↓	↓		39	4		
5	8		ERU-1 <1>	M	20	2	20	2	-	PUMP P-1 <1>	.		6		
7		8	↓	↓	↓	↓	↓	↓	↓	↓		.	8		
9	8		AHU-2 <1>	M	20	2	20	2	-	PUMP P-2 <1>	.		10		
11		8	↓	↓	↓	↓	↓	↓	↓	↓		.	12		
13	4		REC - 105, 116, OUTSIDE 101	R	20	1	20	1	M	VAV-1, 3 & 4	.		14		
15		8	REC - 201, 202, DDC WEST	R	20	1	20	1	M	VAV-5, 6, 7 & 8		.	16		
17	39		GHP-3 <1>	M	40	2	20	1	M	VAV-2, 9 & 10	.		18		
19		39	↓	↓	↓	↓	40	2	-	GHP-2 <1>		.	20		
21	19		WH-1	M	30	2	↓	↓	↓	↓	.		22		
23		19	↓	↓	↓	↓	20	1	M	HVAC CONTROL PANEL (DDC)		.	24		
25	.		REFRIGERATOR <3>	-	20	1	20	1	-	FAUCET - RM 111, 112, 113	.		26		
27		.	LTG - 104, 105, 106, 107, 117	-	20	1	20	1	-	RM T11 GFCI		.	28		
29	.		SECURITY CONTROL PANEL	-	20	1	20	1	-	LTG - 116 SOUTH (FRONT)	.		30		
31		.	DATA CLOSET RECS "A"	-	20	1	20	1	-	LTG - 111, 111A, 112, 113		.	32		
33	.		DATA CLOSET RECS "B"	-	20	1	20	1	-	LTG - 201, 202	.		34		
35		.	LTG - 118 NORTH MULTIMEDIA RM (REAR)	-	20	1	20	1	-	AIR COMPRESSOR		.	36		
37	.		WINDOW SENSOR	-	20	1	20	1	-	FIRE ALARM PANEL	.		38		
39		.	PUMP 3, 4, 5 <1>	-	20	1	20	2	-	PUMP P-6 <1>		.	40		
41	.		LTG - TIMER FEED	-	20	1	↓	↓	↓	↓	.		42		
			TOTAL/PHASE	VOLTS: 120/240, SINGLE PHASE, 3 WIRE											DESIGNATION: -
			CODE AMPS	MCB: ☒											LOCATION: .
			TOTAL = CODE	MLO: ☐											MOUNTING: .
			AMPS X 1.25	FAULT AMPS: 65,000 (MCB)											



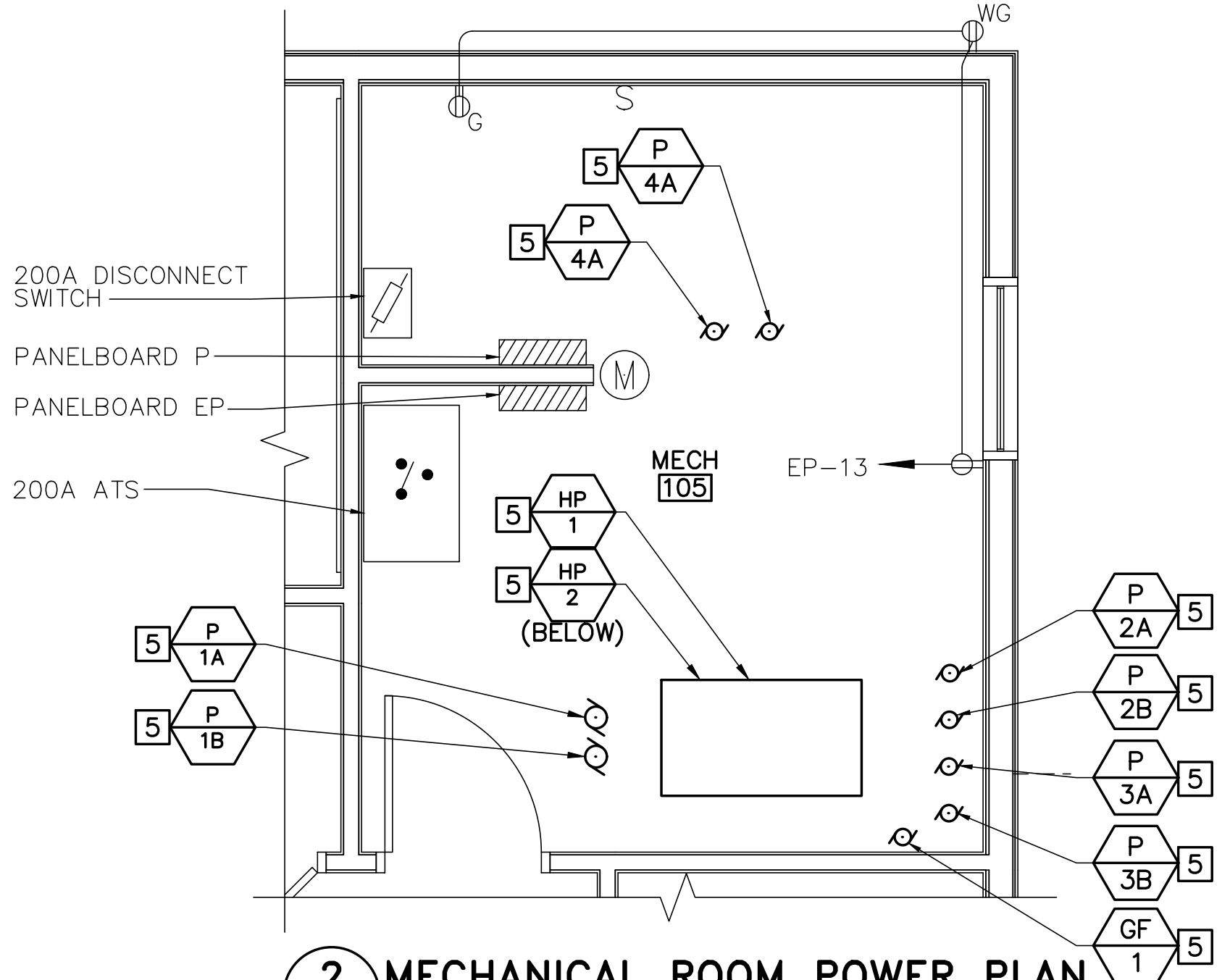
1 ELECTRICAL FLOOR PLAN
EP101 SCALE: 3/16"=1'-0"
PLAN NORTH



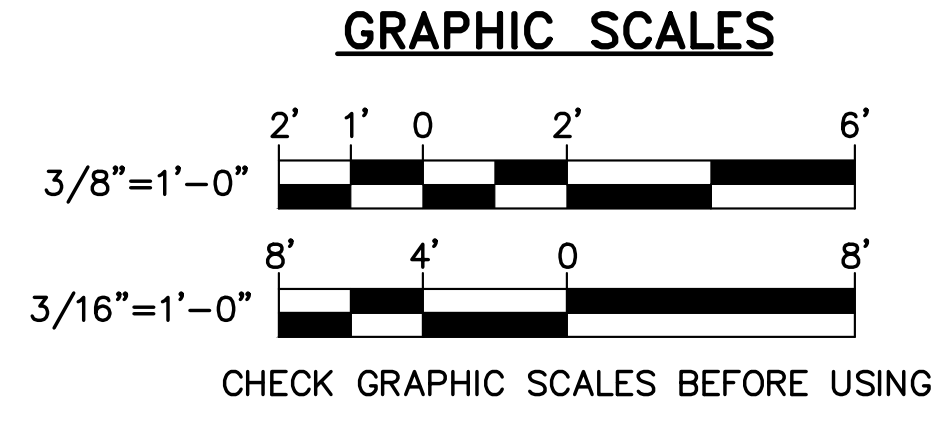
3 SYSTEMS FURNITURE POWER CONNECTION DETAILS
EP101 NOT TO SCALE

- DETAIL NOTES:**
1. REFER TO EP PLAN SHEETS FOR SYSTEMS FURNITURE CIRCUITRY.
 2. PROVIDE 4#12 CIRCUIT CONDUCTORS, 2#10 OVERSIZED NEUTRAL CONDUCTORS AND 2#12 GROUND CONDUCTORS FOR 8-WIRE 4 CIRCUIT (2+2) SERVICE TO 8-WIRE SYSTEMS FURNITURE.
 3. PROVIDE WIRING IN COMPLIANCE WITH NEC 2024 605.5 AND 605.8.
 4. COORDINATE WITH THE CONTRACTING OFFICER FOR FINAL SYSTEMS FURNITURE WIRING CONFIGURATION PRIOR TO ROUGH IN. A SINGLE CIRCUIT SHALL NOT SERVE MORE THAN 2 WORK STATIONS.
 5. OBTAIN CONTRACTING OFFICERS APPROVAL FOR SURFACE MOUNTED CONDUIT LOCATION AND ROUTING PRIOR TO INSTALLATION.

- GENERAL NOTES**
1. REFER TO E-001 FOR ELECTRICAL SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
 2. VERIFY EXISTING (TO REMAIN) CIRCUITS IN THE FIELD.
 3. AUTO CONTROLLED RECEPTACLES OF SPLIT CIRCUIT TYPE A RECEPTACLES MUST BE CONTROLLED BY LOCAL OCCUPANCY SENSORS. REFER TO SHEET EL101 FOR LOCATION OF OCCUPANCY SENSORS.
 4. CONNECT VAV BOXES TO EXISTING VAV CIRCUIT WIRING. REFER TO DRAWINGS MH101 AND M-401 FOR LOCATIONS OF VAV BOXES.
- KEYNOTES (THIS SHEET ONLY)**
- 1 SYSTEMS FURNITURE CONNECTION. REFER TO 3/EP101.
 - 2 PROVIDE IDENTIFIED HANDLE TIE.
 - 3 FOR TV.
 - 4 PROVIDE OUTLET FOR KITCHEN STOVE. COORDINATE WITH MANUFACTURER INSTRUCTIONS FOR OUTLET TYPE PRIOR TO INSTALLATION.
 - 5 PROVIDE POWER, WIRING, CONDUIT, AND DISCONNECT SWITCH AND STARTER FOR MECHANICAL AND PLUMBING EQUIPMENT. REFER TO MECHANICAL AND PLUMBING SHEETS FOR LOCATIONS. REFER TO SHEET EP601 FOR MECHANICAL AND PLUMBING EQUIPMENT WIRING SCHEDULE.
 - 6 PROVIDE RECEPTACLE IN EXISTING BOX. REUSE EXISTING CONDUIT.
 - 7 UTILIZE EXISTING RACEWAYS IN EXISTING TO REMAIN WALLS AND FLOORS FOR BRANCH CIRCUIT WIRING HOMERUNS THROUGH LOBBY 102 AND VESTIBULE 101.
 - 8 PROVIDE 120V CIRCUIT FOR RANGE HOOD.
 - 9 PROVIDE SURFACE METAL RACEWAY ON EXISTING WALL. PAINT BLACK.
 - 10 PROVIDE SURFACE MOUNTED DUAL SERVICE POWER/DATA OUTLET WITH UNDER CARPET WIREWAY. BASIS OF DESIGN: FLEX SYSTEM CONNECTRAC UNDER-CARPET TILE WIREWAY.
 - 11 FOR HAND DRYERS.
 - 12 FOR RP-1.



2 MECHANICAL ROOM POWER PLAN
EP101 SCALE: 3/8"=1'-0"

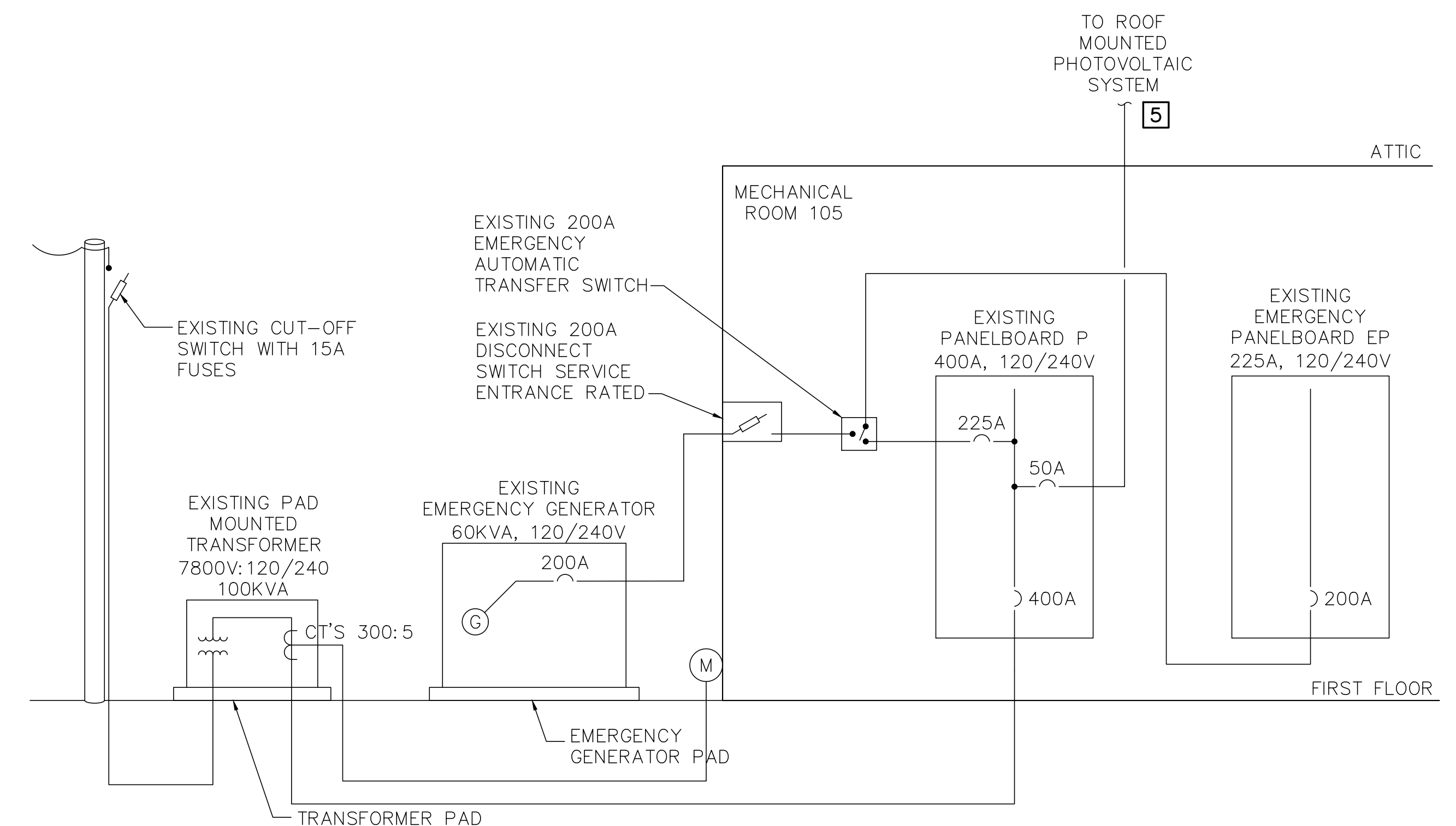
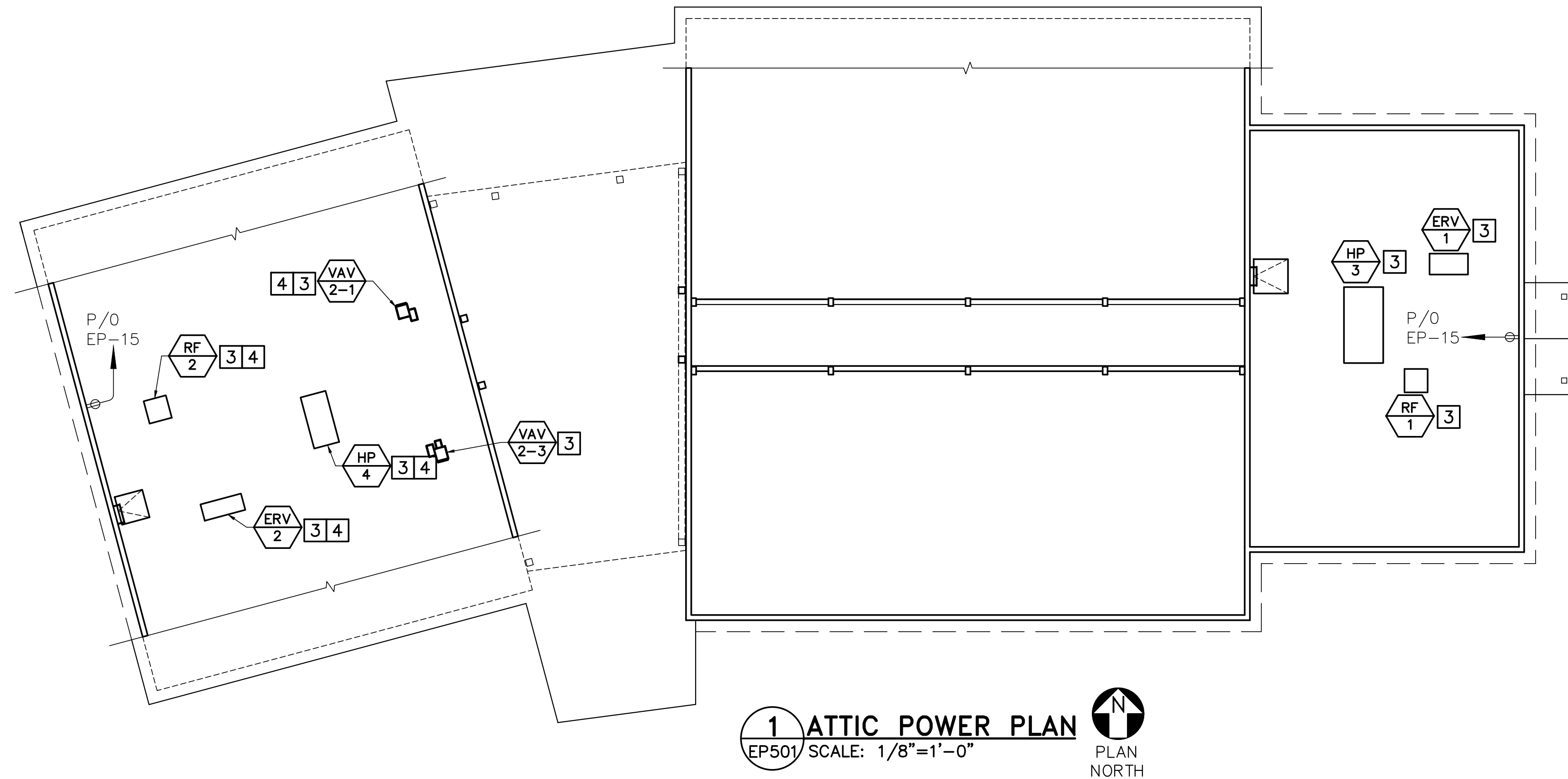


	DESIGNED: DCL		DWG NO: 5R-MA-1301-100.00		SHEET 43 OF 50	
	DRAWN: BPD					
	DISCIPLINE: ELECTRICAL		SHEET NO: EP101			
	ASSAYT RIVER NATIONAL WILDLIFE REFUGE		SUDBURY, MASSACHUSETTS			

POWER PLAN AND DETAILS

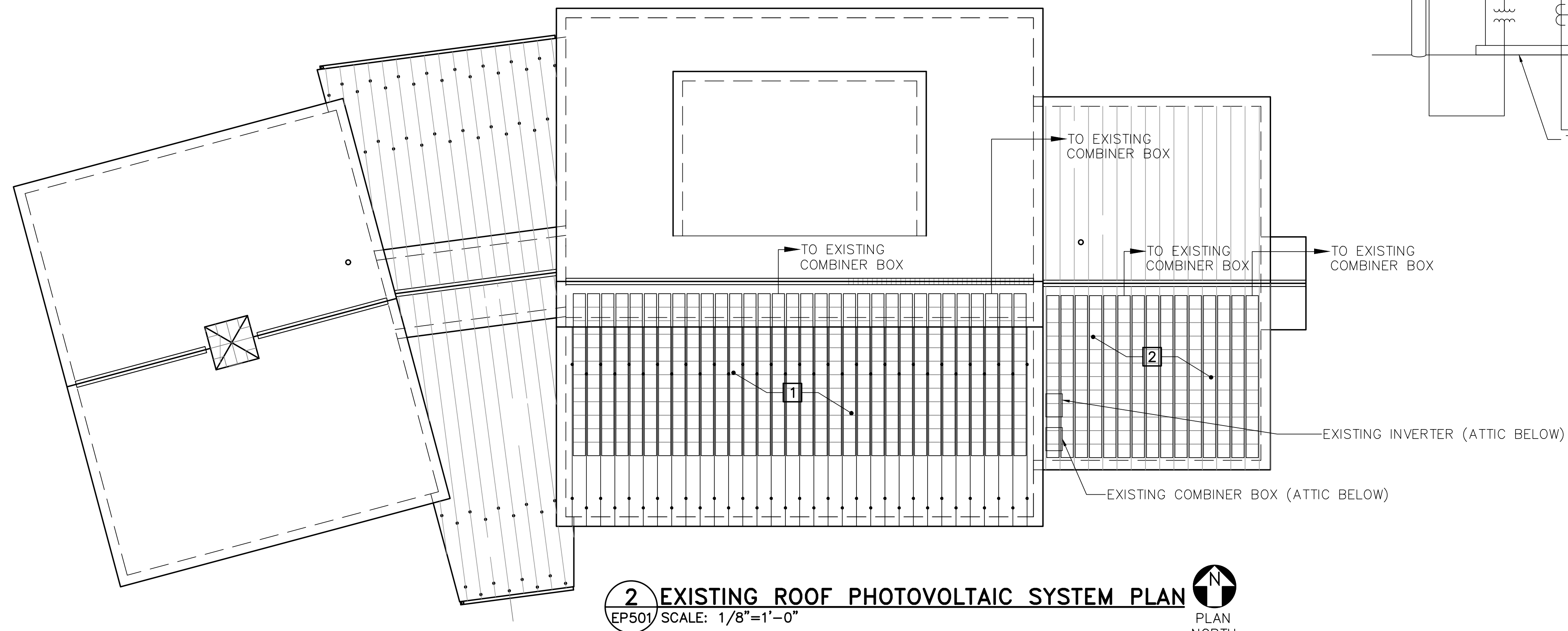
DRAWING KEYNOTES

- 1 EXISTING PHOTOVOLTAIC LAMINATE (720.75 SQ FT).
- 2 EXISTING PHOTOVOLTAIC LAMINATE (350 SQ FT).
- 3 PROVIDE POWER, WIRING, CONDUIT, AND DISCONNECT SWITCH FOR MECHANICAL AND PLUMBING EQUIPMENT. REFER TO MECHANICAL AND PLUMBING SHEETS FOR LOCATIONS. REFER TO SHEET EP601 FOR MECHANICAL AND PLUMBING EQUIPMENT WIRING SCHEDULE.
- 4 UTILIZE EXISTING CONDUIT HOMERUNS TO EXISTING MECH ROOM 105.
- 5 EXISTING PHOTOVOLTAIC SYSTEM MUST REMAIN OPERATIONAL.



3 EXISTING ONE-LINE DIAGRAM

EP501 NOT TO SCALE



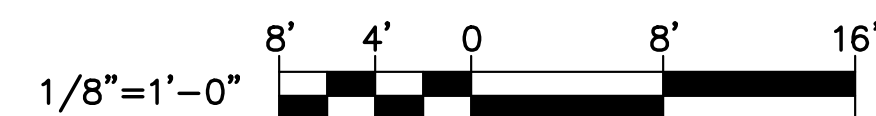
2 EXISTING ROOF PHOTOVOLTAIC SYSTEM PLAN

EP501 SCALE: 1/8"=1'-0"

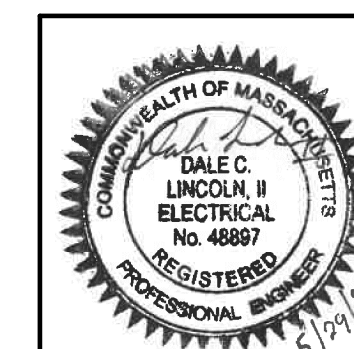


PLAN
NORTH

GRAPHIC SCALE



CHECK GRAPHIC SCALE BEFORE USING



U.S. FISH AND WILDLIFE SERVICE CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING

ONE-LINE DIAGRAM, ATTIC POWER, AND EXISTING ROOF PLAN

ASSABET RIVER NATIONAL WILDLIFE REFUGE
SUBBURY, MASSACHUSETTS

DESIGNED: DCL
 DRAWN: BPD

DWG NO:
5R-MA-1301-100.00

SHEET **44** OF **50**

EATON CUTLER HAMMER POW-R-LINE C										REVISED PANELBOARD SCHEDULE P (EXISTING PANELBOARD)3									
CKT NO	AMPS PER PHASE		DESCRIPTION	LOAD TYPE	CKT TRIP	BKR POLE	CKT TRIP	BKR POLE	LOAD TYPE	DESCRIPTION	AMPS PER PHASE		CKT NO						
	A	B									A	B							
1	12		REC – COPIER 103 WEST	–	20	1	20	1	–	REC – OFFICE 118C	2		2						
3			REC – OFFICE 118D	–	20	1	40	1	–	WH–3 SOUTH		25	4						
5	6		REC – 104	–	20	1	20	1	–	REC – WATER COOLER	1	5	6						
7			REC – RM 117A	–	20	1	20	1	–	REC – 110		8	8						
9	10		REC – 115	–	20	1	20	1	–	REC – RMS 108, 110			10						
11			REC – FLOOR AND WALL 118G	–	20	1	20	1	–	REC – 118, 118E		9	12						
13			REC – RMS 118G	–	20	1	20	2	–	REC – SYSTEM FURN 103			14						
15			REC – RMS 118A	–	20	1	↓	↓	↓	↓			16						
17			REC – MICROWAVE	–	20	1	20	1	–	REC – COPIER 103 EAST		12	18						
19			SITE LIGHTING	–	20	1	20	1	–	HAND DRYER – RM 112B			20						
21	12		REC – PLOTTER 117A	–	20	1	20	1	–	HAND DRYER – RM 112A			22						
23			REC – RANGE HOOD 110	–	20	1	20	1	–	HAND DRYER – RM 111			24						
25	10		REC – TV'S 118F, 118G	–	20	1	20	1	–	REC – 103		6	26						
27			REC – SYSTEM FURN 103	R	20	2	20	1	–	REC – RMS 118B			28						
29			↓	↓	↓	↓	20	1	–	REC – MULTI-PURPOSE 118G		9.5	30						
31			REC – SYSTEM FURN 103	2	–	20	2	20	1	–	REC – TOILET ROOMS, QUIET ROOM 120		13.5	32					
33			↓	↓	↓	↓	30	2	–	REC – OVEN RM 110	2	24	34						
35			REC – RM 114	–	20	1	↓	↓	↓	↓		24	36						
37			GENERATOR		20	1	20	1	–	GENERATOR			38						
39			INVERTER	–	50	2	20	1	–	GENERATOR			40						
41			↓	↓	↓	↓	20	1	–	GENERATOR			42						
			TOTAL/PHASE	VOLTS: 120/240, SINGLE PHASE, 3 WIRE						DESIGNATION: –									
			CODE AMPS	MCB: ☐						LOCATION: .									
			TOTAL = CODE AMPS X 1.25	MLO: ☐						MOUNTING: .									
				MCB AMPS: 400A BUS AMPS: 400A															
				FAULT AMPS: 65,000 (MCB)															

EATON PRL1A POW-R-LINE C										REVISED PANELBOARD SCHEDULE EP (EXISTING PANELBOARD)3									
CKT NO	AMPS PER PHASE		DESCRIPTION	LOAD TYPE	CKT TRIP	BKR POLE	CKT TRIP	BKR POLE	LOAD TYPE	DESCRIPTION	AMPS PER PHASE		CKT NO						
	A	B									A	B							
1	17		HP-4	M	35	2	60	2	-	HP-3	35		2						
3		17										35	4						
5	11		ERV-1	M	20	1	20	1	-	PUMP P-1A, 1B	9.8		6						
7		11	ERV-2	M	20	1	15	1	-	PUMP P-2A, 2B		4	8						
9	13.8		RF-1	M	35	1	15	1	-	PUMP P-3A, 3B	4		10						
11		5.8	RF-2	M	15	1	15	1	-	RP-1		1.5	12						
13	4		REC - 105, 116, OUTSIDE	R	20	1	20	1	M	VAV BOXES	.		14						
15		8	REC - 201, 202, OBC WEST	R	20	1	20	1	M	VAV BOXES, GF-1	.		16						
17	24		HP-2	M	50	2	20	1	M	VAV BOXES	.		18						
19		24					50	2	-	HP-1		24	20						
21	19		WH-1	M	30	2					24		22						
23		19					20	1	M	HVAC CONTROL PANEL (DDC)	.		24						
25	.		REFRIGERATOR	-	20	1	20	1	-	FAUCET - RM 111, 112, 113	.		26						
27		.	LTG - RMS 103-117A, 202	-	20	1	20	1	-	RM T11 GFCI	.		28						
29	.		SECURITY CONTROL PANEL	-	20	1	20	1	-	LTG - RMS 118-118G, 201	.		30						
31		.	DATA CLOSET RECS "A"	-	20	1	20	1	-	REC - 118D	.		32						
33	.		DATA CLOSET RECS "B"	-	20	1	20	1	-	REC - 118B	.		34						
35		.	REC - RMS 118C	-	20	1	20	1	-	AIR COMPRESSOR	.		36						
37	.		WINDOW SENSOR	-	20	1	20	1	-	FIRE ALARM PANEL	.		38						
39		12	REC - COUNTER 110	-	20	1	40	2	-	PUMP P-4A, 4B		17	40						
41	.		LTG - TIMER FEED	-	20	1					17		42						
			TOTAL/PHASE	VOLTS: 120/240, SINGLE PHASE, 3 WIRE							DESIGNATION: -								
			CODE AMPS	MCB: ☒							LOCATION: .								
			TOTAL = CODE AMPS X 1.25	MLO: ☐							MOUNTING: .								
				MCB AMPS: 225 BUS AMPS: 225															
				FAULT AMPS: 65,000 (MCB)															

MECHANICAL AND PLUMBING EQUIPMENT WIRING SCHEDULE

EQUIPMENT	SHEET #	EQUIPMENT LOCATION	VOLTS	PHASE	HP	FLA	CIRCUIT #	FEEDER	DISCONNECT	FUSE	NEMA STARTER SIZE	NEMA ENCLOSURE
HP–1	EP101	MECH 105	240	1	–	27	EP–20,22	2#6 + #10G, 1"C	60A, 2P	50A	4	1
HP–2	EP101	MECH 105	240	1	–	27	EP–17,19	2#6 + #10G, 1"C	60A, 2P	50A	4	1
HP–3	EP501	EAST ATTIC	240	1	–	35	EP–2,4	2#6 + #10G, 1"C	60A, 2P	60A	4	1
HP–4	EP501	WEST ATTIC	240	1	–	19	EP–1,3	2#8 + #10G, 1"C	60A, 2P	35A	4	1
ERV–1	EP501	EAST ATTIC	120	1	–	11.7	EP–5	2#12 + #12G, 3/4"C	30A, 1P	20A	4	1
ERV–2	EP501	WEST ATTIC	120	1	–	9.8	EP–7	2#12 + #12G, 3/4"C	30A, 1P	20A	4	1
P–1A	EP101	MECH 105	120	1	0.5	9.8	EP–6	2#12 + #12G, 3/4"C	30A, 1P	20A	0	1
P–1B	EP101	MECH 105	120	1	0.5	9.8	EP–6	2#12 + #12G, 3/4"C	30A, 1P	20A	0	1
P–2A	EP101	MECH 105	120	1	0.12	4	EP–8	2#12 + #12G, 3/4"C	30A, 1P	15A	00	1
P–2B	EP101	MECH 105	120	1	0.12	4	EP–8	2#12 + #12G, 3/4"C	30A, 1P	15A	00	1
P–3A	EP101	MECH 105	120	1	0.12	4	EP–10	2#12 + #12G, 3/4"C	30A, 1P	15A	00	1
P–3B	EP101	MECH 105	120	1	0.12	4	EP–10	2#12 + #12G, 3/4"C	30A, 1P	15A	00	1
P–4A	EP101	MECH 105	240	1	3	17	EP–40,42	2#8 + #10G, 3/4"C	30A, 2P	30A	2	1
P–4B	EP101	MECH 105	240	1	3	17	EP–40,42	2#8 + #10G, 3/4"C	30A, 2P	30A	2	1
RF–1	EP501	EAST ATTIC	120	1	3/4	13.8	EP–11	2#8 + 1#10G, 3/4"C	30A, 1P	25A	4	1
RF–2	EP501	WEST ATTIC	120	1	1/4	5.8	EP–9	2#12 + 1#12G, 3/4"C	30A, 1P	15A	4	1
RP–1	EP101	IT CLOSET 106	120	1	1/40	1.5	EP–12	2#12 + 1#12G, 3/4"C	30A, 1P	15A	N/A	1
GF–1	EP101	MECH 105	120	1	1/3	7.2	EP–16	2#12 + 1#12G, 3/4"C	30A, 1P	15A	0	1

DRAWING KEYNOTE

- 1 PROVIDE GFCI BREAKER.
- 2 PROVIDE CIRCUIT BREAKER.
- 3 PROVIDE UPDATED CIRCUIT DIRECTORY.
- 4 STARTER PROVIDED WITH EQUIPMENT.
- 5 CONNECT VAV BOXES TO EXISTING VAV CIRCUIT WIRING. REFER TO DRAWINGS MH101 AND M–401 FOR LOCATIONS OF VAV BOXES.



DISCIPLINE
SHEET NO

EP601

DESIGNED: DCL		DWG NO:		SHEET 45 OF 50	
DRAWN: RSW		5R–MA–1301–100.00			

U.S. FISH AND WILDLIFE SERVICE

CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING

ASSABET RIVER NATIONAL WILDLIFE REFUGE

SUDBURY, MASSACHUSETTS

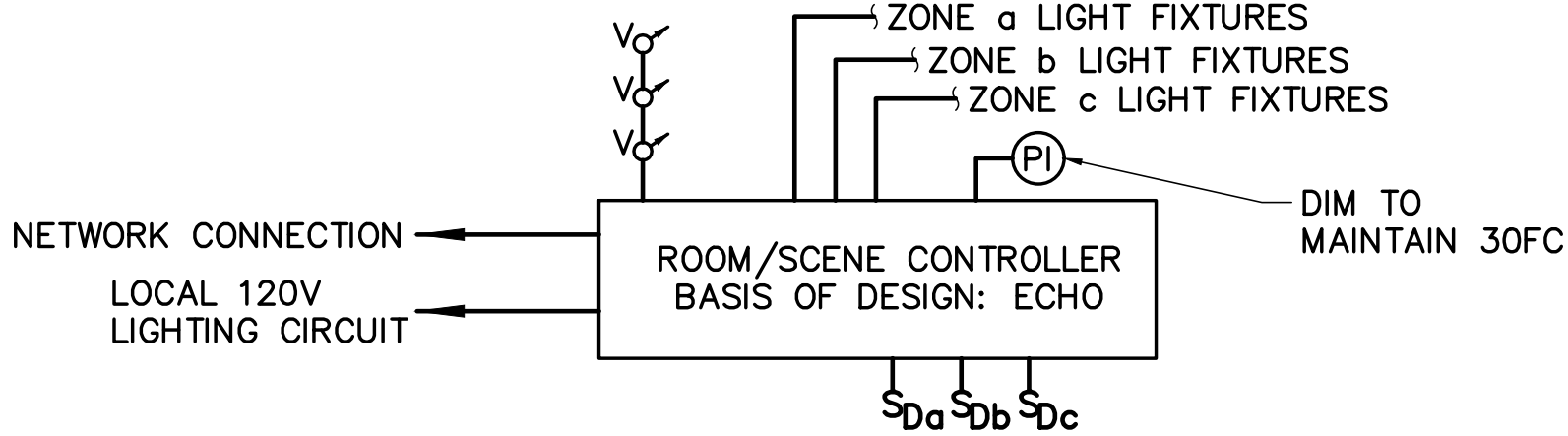
REVISED PANELBOARD SCHEDULES AND
EQUIPMENT WIRING SCHEDULE

LIGHTING FIXTURE SCHEDULE									
BASIS OF DESIGN NOTE: FIXTURE MANUFACTURER AND CATALOG NUMBER ARE LISTED TO ESTABLISH QUALITY, PERFORMANCE AND AESTHETICS									
TYPE	DESCRIPTION	SOURCE	LUMENS	VOLTS	W/VA	MOUNTING	NOTES	MANUFACTURER	CATALOG NUMBER
A1	2X2 LED TROFFER	LED	2675	120	19	RECESSED	1,3	COLUMBIA	LCAT22-S-35-L026-G-EDU-BAA-(ELL14)
A2	2X2 LED TROFFER	LED	3178	120	22	RECESSED	1,3	COLUMBIA	LCAT22-S-35-L033-G-EDU-BAA-(ELL14)
A3	2X2 LED TROFFER	LED	3826	120	28	RECESSED	1,3	COLUMBIA	LCAT22-S-35-L036-G-EDU-BAA-(ELL14)
B1	WALL MOUNTED 4' LINEAR	LED	2572	120	28.3	WALL MOUNT	2,3	FINELITE	S17LED-WM-ACF-PF-4FT-B-835-120-FC-1%-(LGD18W)
B2	WALL MOUNTED 2' LINEAR	LED	1701	120	9.2	WALL MOUNT	2,3	FINELITE	S17LED-WM-ACF-PF-2FT-B-835-120-FC-1%-(LGD18W)
C1	1X4 SURFACE, LOW LUMEN OUTPUT	LED	2519	120	19.4	SURFACE/CHAIN	3	COLUMBIA	RLW-4FT-35-XW-FAW-EDU-(ELL14)
C2	1X4 SURFACE, HIGH LUMEN OUTPUT	LED	5679	120	47.8	SURFACE/CHAIN	3	COLUMBIA	RLW-4FT-35-HL-FAW-EDU-(ELL14)
C3	1X2 SURFACE, MEDIUM LUMEN OUTPUT	LED	2566	120	22.7	SURFACE/CHAIN	3	COLUMBIA	RLW-2FT-35-LW-FAW-EDU-(ELL14)
D	WALL MOUNT, EXTERIOR	LED	747	120	10	WALL MOUNT	2,3	LUMINARE LED	AEL-12-MIN1-2DRV-10W-35K-MVOLT-(EMB310)
E	DOWNLIGHT, 6" CYLINDER	LED	746	120	7.8	DOWNLIGHT	4,7	PRESCOLITE	LTR-6RD-RFH-SL06L-DM1-BAA-LTR-6RD-T-SL-35K-8-MDS-BAA
F	INDIRECT/DIRECT PENDANT	LED	3971	120	33.9	PENDANT/AIRCRAFT CABLE	5,6	FINELITE	S12-LEID-DCO-8FT-3E-B-V-835-FTO-120V-FC-1%-SC-FA-FA-(LGD18W)
G1	INDIRECT/DIRECT PENDANT, BLACK FINISH	LED	4106	120	36.5	PENDANT/AIRCRAFT CABLE	3,5,6	FINELITE	HP-4-P-ID-4FT-B-B-835-WSO-F-120-FC-1%-(LGD18W)
G2	INDIRECT/DIRECT PENDANT, BLACK FINISH	LED	5890	120	54.9	PENDANT/AIRCRAFT CABLE	3,5,6	FINELITE	HP-4-P-ID-6FT-B-V-835-WSO-F-120-FC-1%-(LGD18W)
H	WALL MOUNT, 4" SQUARE	LED	2580	120	27.8	WALL MOUNT	3	PRESCOLITE	LTC-4SQD-S-25L-35K-8-WD-DM1-BAA-(EM)
J	LED CANOPY, SURFACE MOUNT	LED	3856	120	26.6	SURFACE/CANOPY	3	LITHONIA	VCVLLED-V4-P1-40K-80-T5M-MVOLT-(E10WH)
W1	WALL WASH – LOBBY	LED	–	120	12	WALL	–	EXISTING	EXISTING
W2	WALL WASH – VESTIBULE & HALLWAY	LED	–	120	6	WALL	–	EXISTING	EXISTING
ⓧ	EXIT SIGN – ARCHITECTURAL	LED	–	120	3.3	CEILING/WALL	1	LITHONIA LTG	EDG-2-R-RMR-EL-BAA

LIGHTING FIXTURE SCHEDULE NOTES:

1. COORDINATE MOUNTING TYPE (GRID(SAT), FLANGE (GYPSUM), OR SURFACE/SUSPENDED (NO CEILING) WITH CEILING/WALL/FLOOR TYPE.
2. VERIFY FINAL FIXTURE COLOR/FINISH WITH ARCHITECT FROM MANUFACTURERS SUBMITTALS.
3. PROVIDE INTEGRAL EMERGENCY BACKUP WHERE INDICATED ON PLANS.
4. PROVIDE REMOTE MOUNTED EMERGENCY BALLAST INVERTER TO OPERATE FIXTURE. BASIS OF DESIGN: DUAL-LITE LITEGEAR 250W. SIZE FOR CONNECTED LOAD.
5. COORDINATE FIXTURE HEIGHT WITH ARCHITECTURAL TRADE TO CONFIRM STEM/CABLE LENGTH PRIOR TO ORDERING.
6. PROVIDE LENGTH SHOWN ON DRAWINGS.
7. PROVIDE WET LOCATION RATED FIXTURE.

EXISTING LIGHTING FIXTURE SCHEDULE (DEMOLITION SHEETS)								
TYPE	DESCRIPTION	#	LAMP (S)	VOLTS	W	MOUNTING	NOTES	CATALOG NUMBER
A1	2x2 RECESSED INDIRECT FLUORESCENT	1	TT5	120	40	RECESSED	–	LEDALITE 97-22-D1-B-1-40
A2	2x2 RECESSED INDIRECT FLUORESCENT	1	TT5	120	55	RECESSED	–	LEDALITE 97-22-D1-B-1-55
A3	2x2 RECESSED INDIRECT FLUORESCENT	1	TT5	120	40	RECESSED	3	LEDALITE 97-22-D1-B-1-40
B1	1x4 INDUSTRIAL FLUORESCENT	2	T8	120	32	PENDANT	–	COLUMBIA WC4-232-EB8-120
B2	1x2 INDUSTRIAL FLUORESCENT	2	T8	120	32	PENDANT	–	COLUMBIA WC2-217-EB8-120
C1	RECESSED CANS	1	26TT	120	30	RECESSED	2	PRESCOLITE CFT832HEB
E1	WALL MOUNTED, EXTERIOR	1	50MH	120	50	WALL	4,5	KIM WF32H/50MH120/WH-P
E2	SITE LIGHTING	1	100MH	120	100	POLE	4	KIM 1A/RA173/100MH120/A-30
	POLE						–	KIM HSAS12-534188 A/HF1
	ARM						–	KIM 1A/HA02
E3	FLAG POLE LIGHT	1	MR16	120	50	POLE	4	FLAGPOLE BEACON ORN FPB-8-359-D-110V
E4	BOLLARD	1	PMH	120	100	BOLLARD	4	KIM BNB/100PMH/BBC
F1	EMERGENCY LIGHT	2	MR16	12	12	WALL	–	COOPER CC8
F2	SINGLE REMOTE HEAD	1	HALOGEN	12	8	WALL	–	COOPER 12T8WHRD
F3	SINGLE REMOTE HEAD – EXTERIOR	1	HALOGEN	12	8	WALL	–	COOPER 12T8WWH
P1	PORCH LIGHT	1	CF	120	36	SURFACE	4,5	PRESCOLITE CFSCB818EB BL
S1	RECESSED INDIRECT FLUORESCENT	2	T8	120	53	RECESSED	–	ALERA PIC 2T8-EB8 120-4
T1	TRACK LIGHTING	1	PAR38	120	250	TRACK	6	LITELAB L-125-5A-MB
V1	BATHROOM VANITY LIGHT	1	G9	120	100	WALL	–	HUBBARDTON FORGE 20-7841-05-H107
W1	WALL WASH – LOBBY	12	LED	120	12	WALL	–	PRESCOLITE LD4FUDWBL
W2	WALL WASH – VESTIBULE & HALLWAY	6	LED	120	6	WALL	–	PRESCOLITE LD4FDWBL
ⓧ	EXIT SIGN – SINGLE FACE	–	LED	120	3.9	UNIVERSAL	–	COOPER EU-S-60-R
NOTES: 1. NOT USED 2. FIXTURES IN BATHROOM LISTED FOR WET LOCATIONS 3. TRIM FOR DRYWALL CEILING 4. LIGHT ON ASTRONOMICAL TIMER 5. COLD BALLAST FIXTURE 6. TRACK WITH 2 CIRCUITS								

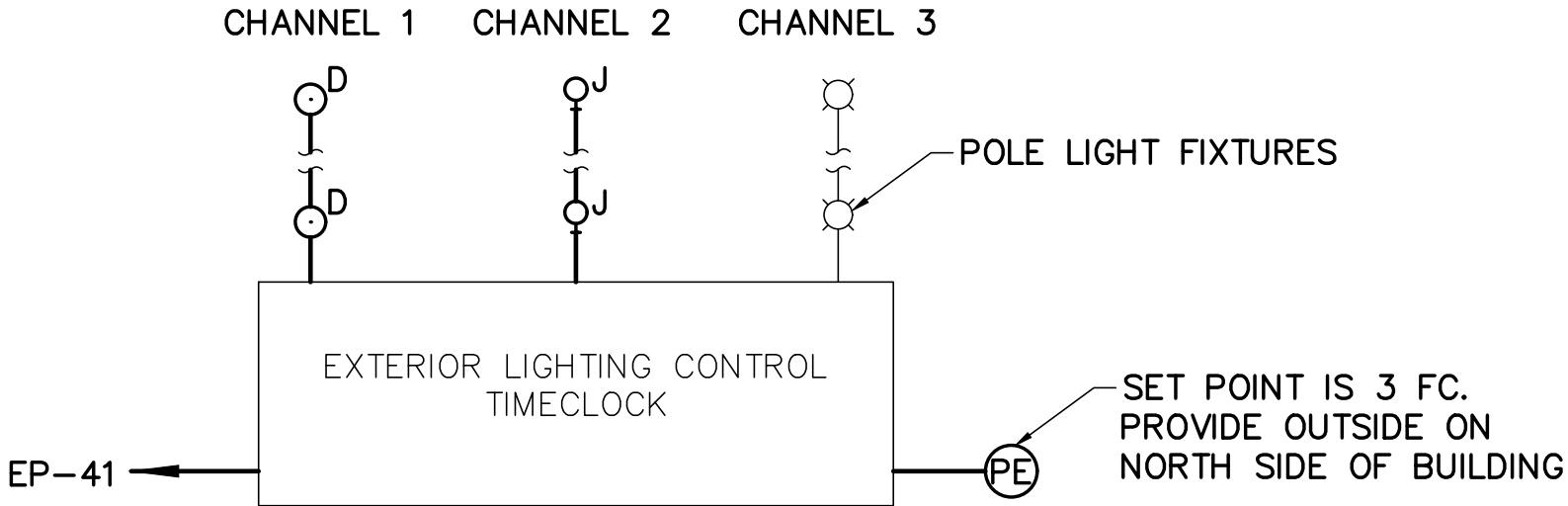


3 OPEN OFFICE 103 LIGHTING CONTROL DIAGRAM

EL701/ NOT TO SCALE

OPEN OFFICE LIGHTING CONTROL DIAGRAM NOTES:

1. WIRING, COMPONENTS, AND INSTALLATION REQUIREMENTS WILL VARY DEPENDING ON SYSTEM.
2. INSTALLATION OF PHOTOCELLS, OCCUPANCY SENSORS, WIRING, ETC. MUST BE PER MANUFACTURERS RECOMMENDATIONS.
3. CONTROL WIRING MUST BE PER MANUFACTURERS RECOMMENDATIONS.
4. OCCUPANCY SENSORS PROVIDE AUTO ON/OFF (FIELD SELECTABLE FOR MANUAL ON/AUTO OFF) WITH 20 MIN TIME DELAY DURING AFTER HOUR SERVICE
5. LOSS OF POWER MUST TURN ALL RELAYS ON.
6. DIAGRAM INDICATES CONTROL DEVICES AND WIRING ONLY. REFER TO LIGHTING DRAWINGS FOR BRANCH CIRCUITS.
7. PROVIDE ADDITIONAL DEVICES FOR FULL COVERAGE OF SPACE AS DIAGRAMS INDICATE DESIGN INTENT.
8. EACH SWITCH STATION MUST BE ABLE TO TURN ON/OFF EACH LIGHTING ZONE, RAISE/LOWER EACH LIGHTING ZONE AND AUTOMATICALLY CONTROL THE LIGHTING ZONES FOR DAYLIGHT HARVESTING. THE NUMBER OF PUSHBUTTONS NEEDED WILL VARY FOR DIFFERENT MANUFACTURERS. SWITCH STATIONS MUST HAVE ENGRAVED, LABELED DIRECTORIES ASSIGNED TO PUSHBUTTONS INDICATING CONTROL ZONES (FOR EXAMPLE: "CENTER", "NORTH WALL", "SOUTH WALL").

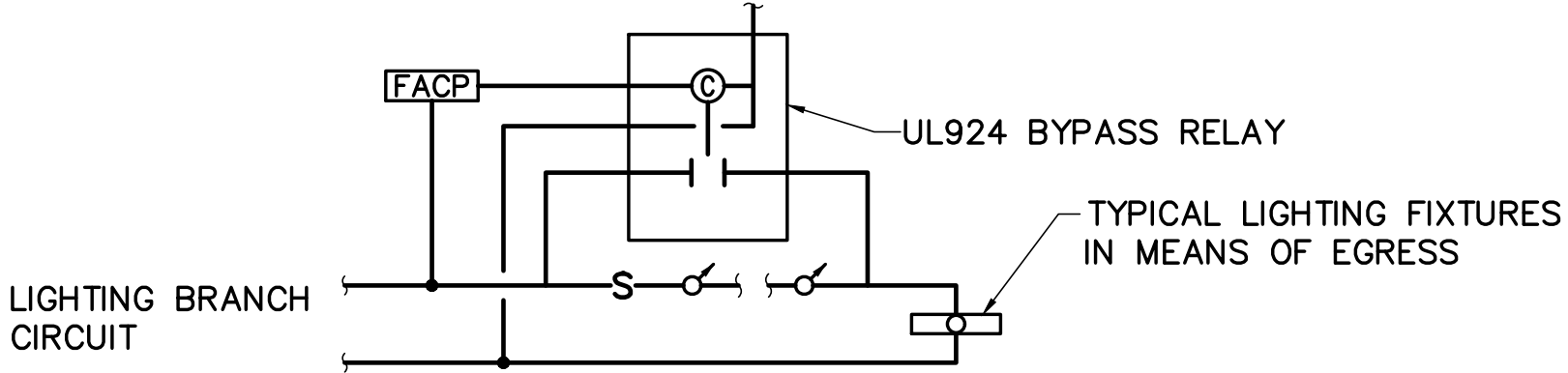


1 EXTERIOR LIGHTING CONTROL DIAGRAM

EL701/ SCALE: NOT TO SCALE

EXTERIOR LIGHTING CONTROL DIAGRAM NOTES:

1. EXISTING TIMECLOCK IS AN INTERMATIC ASTRONOMIC TIME SWITCH SYSTEM.
2. WIRING, COMPONENTS AND INSTALLATION REQUIREMENTS WILL VARY DEPENDING ON SYSTEM.
3. CONTROL WIRING SHALL BE PER MANUFACTURERS RECOMMENDATION.
4. LOSS OF POWER SHALL TURN ALL RELAYS ON.
5. DIAGRAM INDICATES CONTROL DEVICES. REFER TO LIGHTING DRAWINGS FOR BRANCH CIRCUITS.
6. TIME SCHEDULES SHALL BE COORDINATED WITH OWNER AT STARTUP.
7. NOT ALL PARTS ARE SHOWN IN CONTROL DIAGRAM. PROVIDE COMPONENTS FOR A COMPLETE WORKING SYSTEM.
8. LIGHTING CONTROLS SHALL BE UL924 LISTED.
9. INSTALLATION OF PHOTOCELLS, SWITCHES AND WIRING SHALL BE PER MANUFACTURERS RECOMMENDATIONS.
10. PROVIDE CONTROLLER EQUIPPED TO ACCEPT QUANTITY OF 120V INPUT CIRCUITS REQUIRED.



2 LIGHTING BYPASS CONTROL DIAGRAM

EL701/ NOT TO SCALE

LIGHTING BYPASS CONTROL DIAGRAM NOTES:

1. PROVIDE 120V AC BYPASS RELAY WITH MINIMUM 20 AMP, 120V RATED NORMALLY OPEN AND NORMALLY CLOSED CONTACTS. NORMALLY CLOSED BYPASS RELAY CONTACTS SHALL BE HELD OPEN BY 120 VOLT POWER. NORMALLY CLOSED CONTACT SHALL CLOSE WHEN FIRE ALARM IS IN ALARM AND BYPASS THE SWITCHES, CONTROLS AND OCCUPANCY SENSORS.
2. BYPASS RELAY SHALL BE UL LISTED FOR EMERGENCY LIGHTING CONTROL USE.
3. PROVIDE 1 RELAY PER SEPARATELY CONTROLLED LIGHTING GROUP.
4. LABEL BYPASS RELAY WITH CIRCUIT NUMBER AND F.A. CONTROL MODULE ADDRESS.
5. COORDINATE WORK WITH FIRE ALARM INSTALLER.
6. SINGLE POLE SWITCH AND LINE VOLTAGE MOTION SENSORS SHOWN. DETAIL ALSO APPLIES WHERE S3 AND S4 SWITCHES OR LOW VOLTAGE CONTROLS ARE SHOWN.
7. PROVIDE FOR PATH OF EGRESS AREAS, TO INCLUDE CORRIDORS, EXITS, AISLES SERVING MULTIPLE WORKSTATIONS, AND TOILET ROOMS.
8. REFER TO FA101 FOR FIRE ALARM CONTROL PANEL LOCATION.



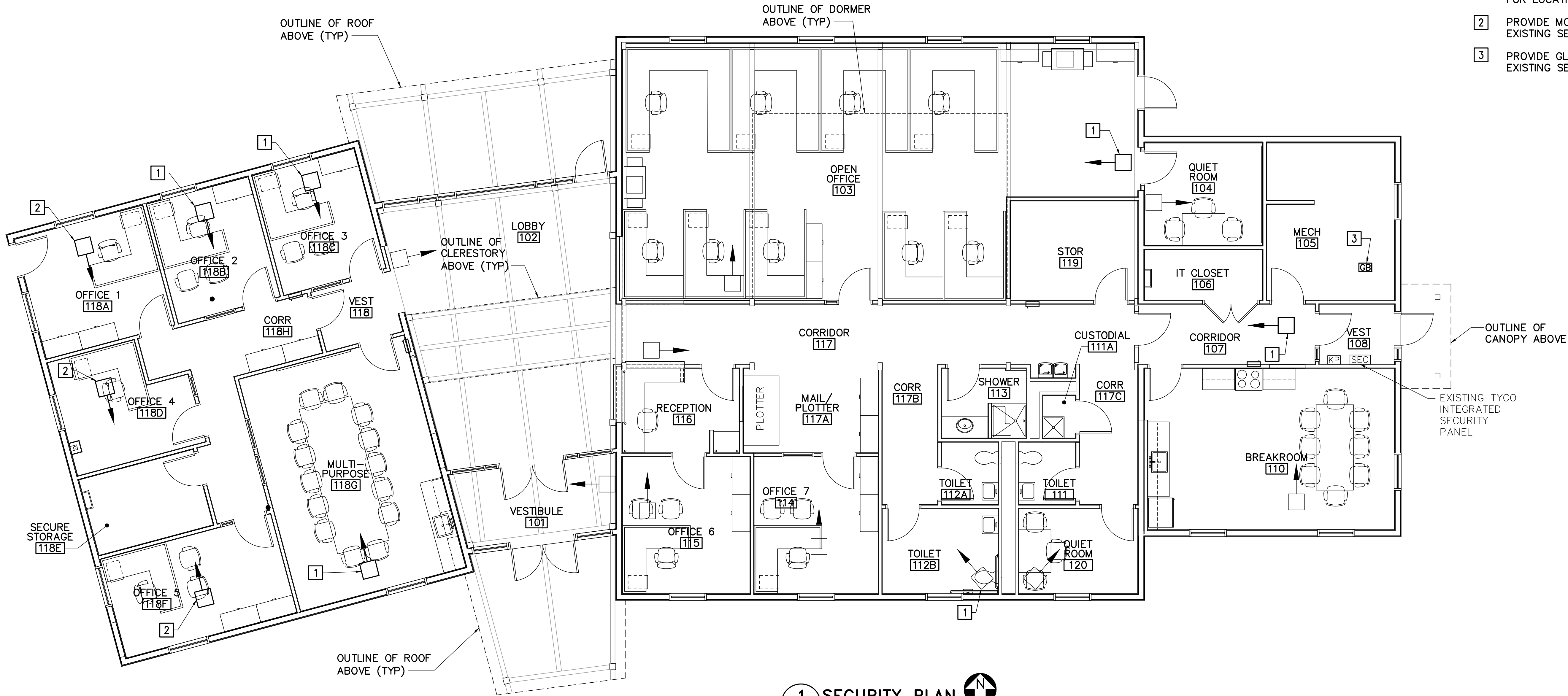
DISCIPLINE	EL701	DESIGNED: DCL	DWG NO: 5R-MA-1301-100.00	SHEET 47 OF 50
SHEET NO		DRAWN: BPD		

GENERAL NOTES

1. PROVIDE WIRING, CABLES, CONDUIT, EQUIPMENT AND ACCESSORIES FOR A COMPLETE AND OPERATIONAL SYSTEM.

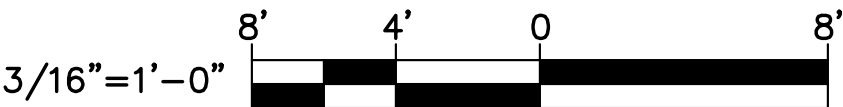
KEYNOTES (THIS SHEET ONLY)

1. INSTALL SALVAGED DEVICE. REFER TO 2/ED102 FOR LOCATION OF EXISTING DEVICE.
2. PROVIDE MOTION DETECTOR. CONNECT TO EXISTING SECURITY SYSTEM.
3. PROVIDE GLASS BREAK SENSOR. CONNECT TO EXISTING SECURITY SYSTEM.

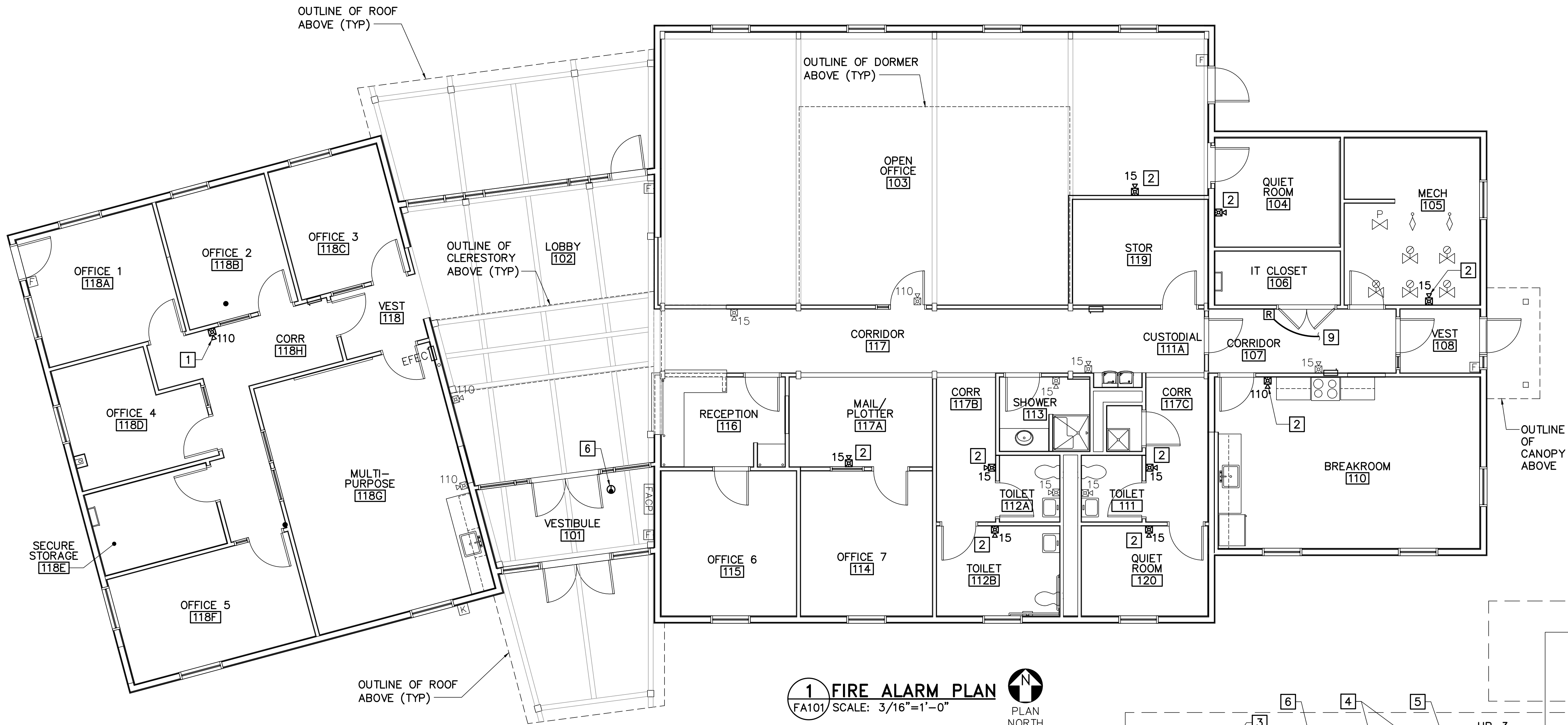


1 SECURITY PLAN
EY101 SCALE: 3/16"=1'-0" PLAN NORTH

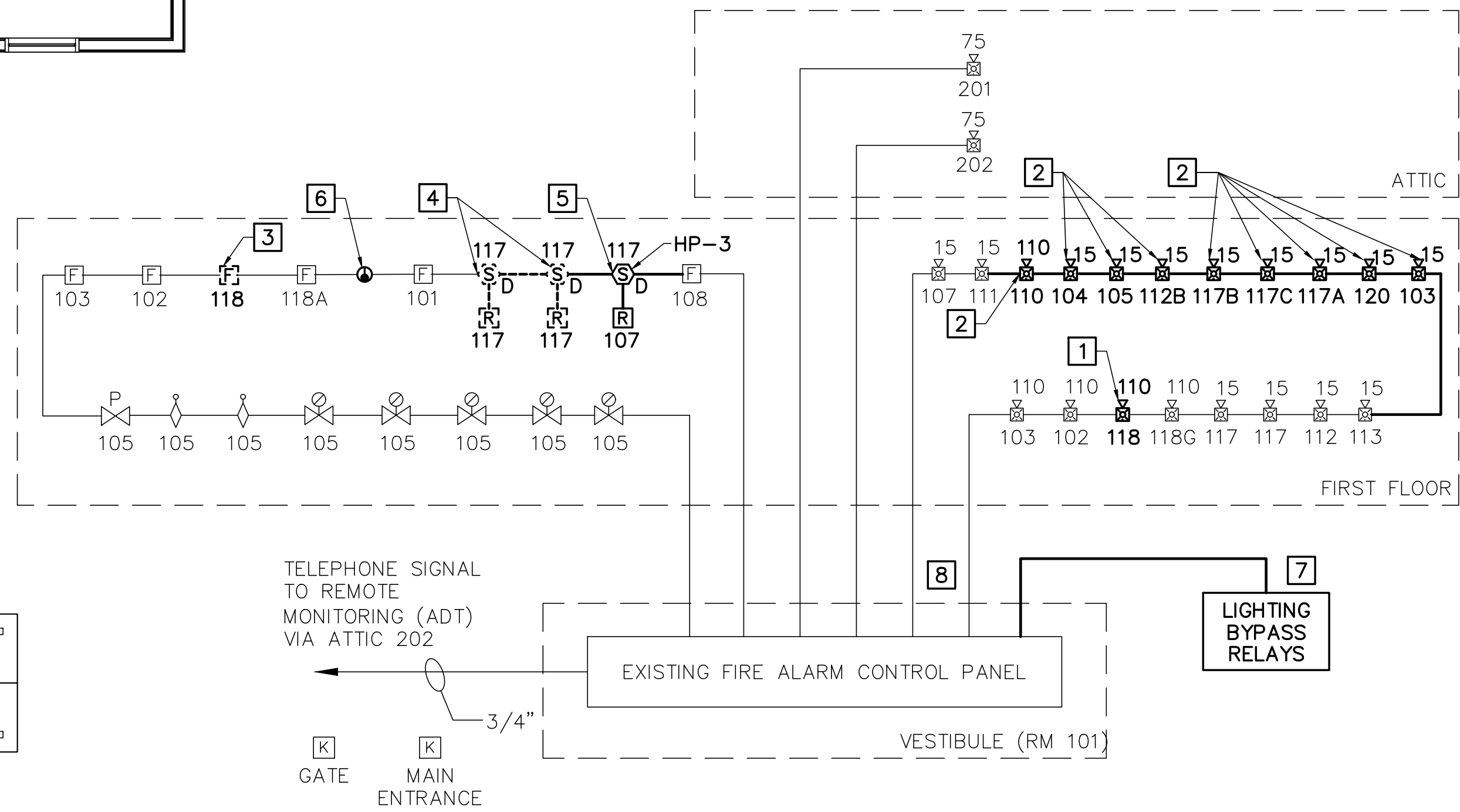
GRAPHIC SCALE



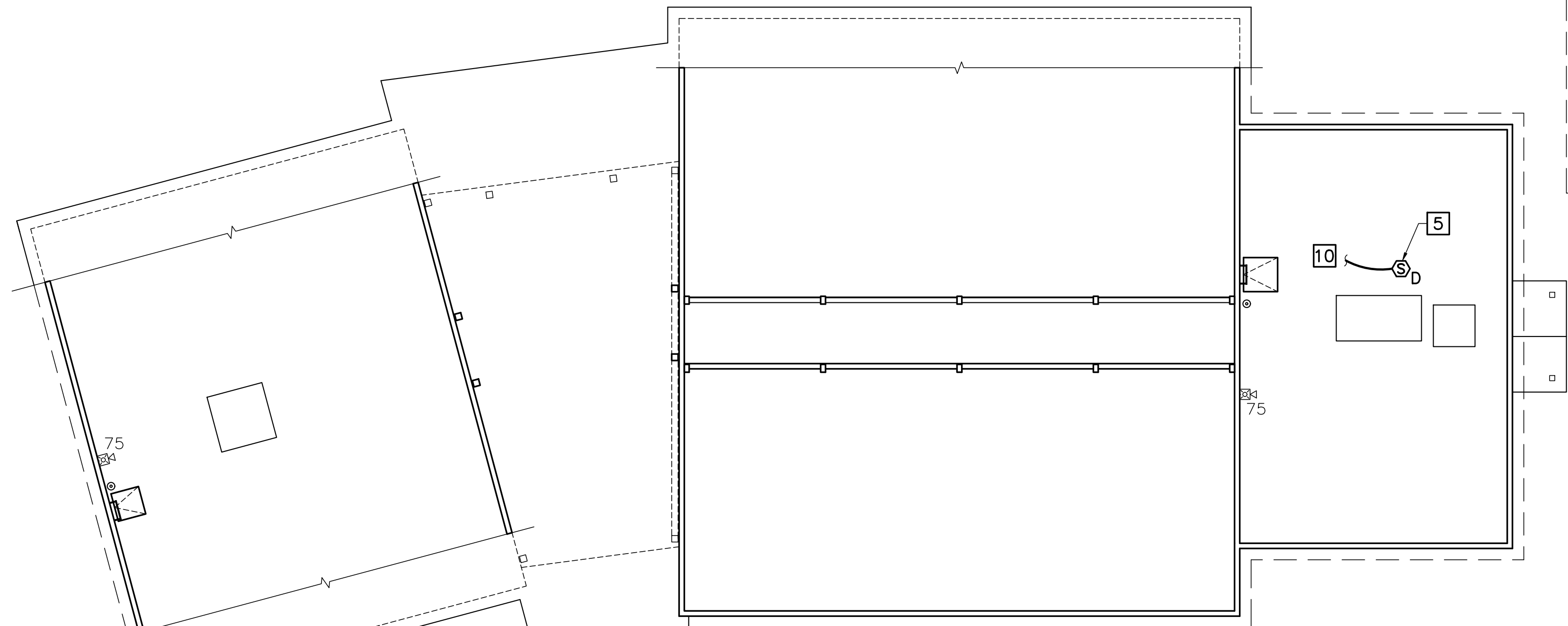
	NO.		REVISIONS:	DATE:	BY:
	U.S. FISH AND WILDLIFE SERVICE		CONVERSION OF VISITOR CENTER TO HEADQUARTERS BUILDING		
	SECURITY PLAN				
	ASSABET RIVER NATIONAL WILDLIFE REFUGE SUDBURY, MASSACHUSETTS				
DISCIPLINE SHEET NO EY101	DESIGNED: DCL DRAWN: BPD	DWG NO: 5R-MA-1301-100.00	SHEET 49 OF 50		



1 FIRE ALARM PLAN
FA101 SCALE: 3/16"=1'-0"



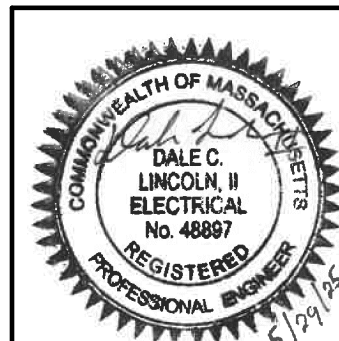
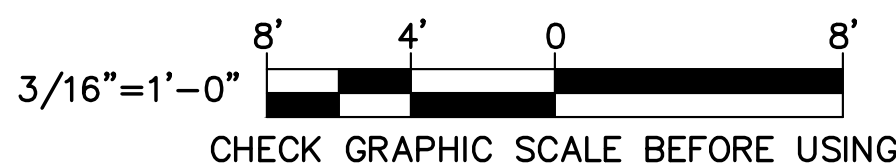
2 FIRE ALARM RISER DIAGRAM
FA101 NOT TO SCALE



2 ATTIC FIRE ALARM PLAN
FA101 SCALE: 1/8"=1'-0"



GRAPHIC SCALE



DISCIPLINE
SHEET NO FA101

REVISIONS		DATE	BY
NO.	REVISIONS	DATE	BY
1	DESIGNED: DCL		
2	DRAWN: BPD		
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FIRE ALARM PLAN			
ASSABET RIVER NATIONAL WILDLIFE REFUGE			
SUDBURY, MASSACHUSETTS			
DESIGNED: DCL		DWG NO: 5R-MA-1301-100.00	
DRAWN: BPD		SHEET 50 OF 50	

KEYNOTES (THIS SHEET ONLY)

- 1 INSTALL SALVAGED APPLIANCE.
- 2 PROVIDE NOTIFICATION APPLIANCE. CONNECT TO EXISTING FIRE ALARM SYSTEM.
- 3 REMOVE EXISTING PULL STATION. MAINTAIN CONTINUITY OF EXISTING CIRCUIT.
- 4 REMOVE EXISTING DUCT SMOKE DETECTOR AND REMOTE INDICATOR. MAINTAIN CONTINUITY OF EXISTING INITIATING CIRCUIT.
- 5 PROVIDE DUCT SMOKE DETECTOR. CONNECT TO EXISTING INITIATING CIRCUIT.
- 6 PROVIDE HEAT DETECTOR. CONNECT TO EXISTING INITIATING CIRCUIT.
- 7 REFER TO 2/EL701.
- 8 PROVIDE POWER EXTENDER PANEL FOR ADDITIONAL NOTIFICATION APPLIANCES.
- 9 UP TO DUCT SMOKE DETECTOR IN ATTIC.
- 10 DOWN TO REMOTE INDICATOR IN CORRIDOR 107.

KEYNOTES (THIS SHEET ONLY)

1. PROVIDE EQUIPMENT, ACCESSORIES, WIRING, AND CONDUIT FOR A COMPLETE AND OPERATIONAL SYSTEM.