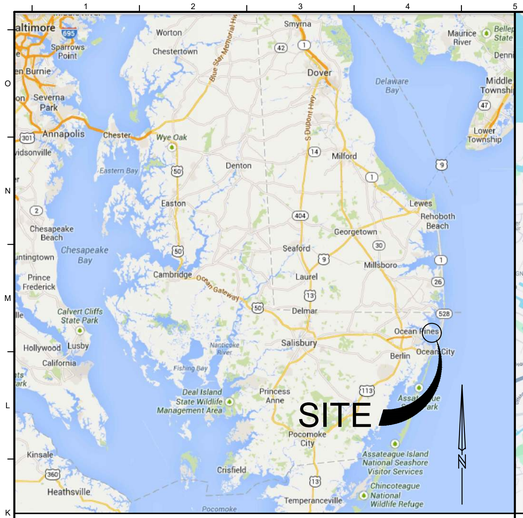
ISLE OF WIGHT FACILITY RENOVATION

WORCESTER COUNTY HEALTH DEPARTMENT
13070 ST. MARTIN'S NECK ROAD
BISHOPVILLE, MARYLAND 21813

AGENCY REVIEW / BID SET
JULY 29, 2025
DBF # 0085B055.A01



LOCATION MAP

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VICINITY MAP

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MATERIAL LEGEND

- NEW MASONRY WALL
- NEW STUD WALL
- NEW WOOD STUD WALL
- MASONRY IN ELEVATION
- ROOF SHINGLES IN ELEVATIONS
- CONCRETE IN PLAN OR DRYWALL IN SECTION
- CONCRETE
- EARTH
- POROUS FILL
- WOOD (FINISH) IN SECTION
- WOOD (ROUGH) IN SECTION
- BRICK
- CONCRETE MASONRY
- BATT INSULATION
- RIGID INSULATION
- PLYWOOD

GRAPHIC SYMBOL LEGEND

- EXISTING WALL AND DOOR TO BE REMOVED
- EXISTING WALL AND DOOR TO REMAIN
- CENTER LINE
- HIDDEN LINE
- DEMOLITION
- FENCE LINE
- PROPERTY LINE
- COLUMN LINE
- REVISION, WINDOW & ROOM SYMBOLS (1, A, 101)
- LINTEL NUMBER AND EQUIPMENT NUMBER (1001, 1001)
- POINT ELEV. EXIST., POINT ELEV. NEW (+47', +47')
- CONTOURS EXIST., NEW (NOTED HIGH SIDE) (47', 47')
- LEVEL LINE
- DETAIL SECTION OR EXTERIOR ELEV. (A1 / A-101)
- WALL SECTION CUT (A1 / A-101)
- NORTH ARROW

ARCHITECTURAL WORKING DRAWING ABREVIATIONS

SYMBOLS used as abbreviations

∠	angle
℄	centerline
d	penny
⊥	perpendicular
PL	plate
ø	round

ABBREVIATIONS

AB	anchor bolt
ABV	above
A/C	air conditioning
ACC	access
ACFL	access floor
ACT	acoustical tile
AD	area drain
ADD	addendum
ADH	adhesive
ADJ	adjacent
ADJT	adjustable
AFF	above finish floor
AGG	aggregate
AL	aluminum
ALT	alternate
ANC	anchor, anchorage
AND	anodized
ANG	angle
AP	access panel
APX	approximate
ARCH	architect (ural)
ASB	asbestos
ASPH	asphalt
AUTO	automatic
BBD	bulletin board
BD	board
BEL	below
BET	between
BIT	bituminous
BLDG	building
BKHD	bulkhead
BLK	block
BLKG	blocking
BM	beam
BOT	bottom
BP	back plaster (ed)
BPL	bearing plate
BRG	bearing
BRK	brick
BRZ	bronze
BS	both sides
BSMT	basement
BUR	built up roofing
BVL	beveled
BW	both ways
CAB	cabinet
CB	catch basin
CEM	cement
CER	ceramic
CF	cold-formed
CFL	counterflashing
CFT	cubic feet
CHAM	chamfer
CHBD	chalkboard
CHT	ceiling height
CIPC	cast-in-place-concrete
CIR	circle
CIRC	circumference
CJT	control joint
CK	caulking
CLL	contract limit line
CLG	ceiling
CLR	clear or clearance
CMT	ceramic mosaic tile
CMU	concrete masonry unit
COL	column
COMB	combination
CONC	concrete
CONST	construction
CONT	continuous or continue
CONTR	contract (or)
CORR	corrugated
CPR	copper
CPT	carpet
CR	cold-rolled
CRS	course (s)
CSMT	casement
CT	ceramic tile
CTER	counter
CTR	center
CTSK	countersunk screw
CYD	cubic yard
D	dryer
DA	double acting
DEM	demolish, demolition
DF	drinking fountain
DH	double hung
DIA	diameter
DIAG	diagonal
DL	dead load
DP	damp proofing
DPR	damper
DR	door
DRN	drain
DS	downspout
DT	drain tile
DTL	detail
DWR	drawer
DWG	drawing
EB	expansion bolt
EF	each face
EIFS	exterior insulated finish system
EJT	expansion joint
EL	elevation
ELEV	elevator
EMER	emergency
ENC	enclose
EP	electrical panelboard
EQ	equal
EQP	equipment
EST	estimate
EWC	electric water cooler
EXCA	excavate
EXG	existing
EXH	exhaust
EXP	exposed
EXT	exterior
FA	fire alarm
FAS	fasten, fastener
FB	face brick
FBD	fiberboard
FBO	furnished by others
FD	floor drain
FE	fire extinguisher
FEC	fire extinguisher cabinet
FF	factory finish
FFE	finished floor elevation
FFL	finished floor line
FGL	fiberglass
FIN	finish (ed)
FLCO	floor cleanout
FLG	flashing
FLPL	floor plate
FLR	floor (ing)
FLUR	flourescent
FN	fence
FND	foundation
FOC	face of concrete
FOF	face of finish
FOM	face of masonry
FOS	face of studs
FPL	fireplace
FR	frame (d) (ing)
FRP	fiberglass reinforced plastic
FTG	footing
FUR	furred (ing)
FUT	future
GA	gage, gauge
GB	grab bar
GC	general contract (or)
GD	grade, grading
GL	glass, glazing
GLB	glass block
GPDW	gypsum drywall
GT	grout
GALV	galvanized
GVL	gravel
HB	hose bib
HBD	hardboard
HC	hollow core
HD	heavy duty
HDPE	high-density polyethelene
HDW	hardware
HDR	header
HM	hollow metal
HOR	horizontal
HP	handicapped
HT	height
HTG	heating
HVAC	heating/ventilation/air conditioning
HWD	hardwood
HWH	hot water heater
ID	inside diameter
INCL	include (d) (ing)
INS	insulate (d) (ion)
INT	interior
INV	invert
JAN	janitor's closet
JST	joist
JT	joint
KIT	kitchen
KO	knockout
KPL	kickplate
L	length
LAD	ladder
LAM	laminate
LAV	lavatory
LB	lag bolt
LBL	label
LH	left hand
LL	live load
LT	light
LTL	lintel
LVR	louver
MAS	masonry
MAX	maximum
MBR	member
MC	medicine cabinet
MECH	mechanic (al)
MET	metal
MFD	metal floor decking
MFR	manufacture (er)
MH	manhole
MIN	minimum
MIR	mirror
MISC	miscellaneous
MLD	molding, moulding
MMB	membrane
MO	masonry opening
MOD	modular
MOV	movable
MR	moisture resistant
MRD	metal roof decking
MT	mount (ed) (ing)
MTFR	metal furring
MTHR	metal threshold
MTL	material (s)
MUL	mullion
MWK	millwork
NAT	natural
NIC	not in contract
NOM	nominal
NTS	not to scale
OA	overall
OBS	obscure
OC	on center (s)
OD	outside diameter
OH	overhead
OP	opaque
OPG	opening
OPH	opposite hand
OPP	opposite
OWJ	open-web joist
PAR	parallel
PB	panic bar
PBD	particle board
PCC	pre-cast concrete
PCF	pounds per cubic foot
PCPL	cement plaster (portland)
PERF	perforate
PERI	perimeter
PFB	prefabricated
PFN	prefinished
PG	plate glass
PK	parking
PL	property line
PLAM	plastic laminate
PLAS	plaster
PLF	pounds per lineal foot
PLT	plate
PNL	panel
PNT	paint (ed)
PRF	preformed
PRTR	pressure treated wood
PSF	pounds per square foot
PSI	pounds per square inch
PSL	parallel strand lumber
PT	point
PTD	paper towel dispenser
PTN	partition
PTR	paper towel receptor
PV	pave (d) (ing)
PVC	polyvinyl chloride
PVMT	pavement
PLYWD	plywood
QT	quarry tile
R	riser
RA	return air
RB	rubber base
RBT	rabbet, rebate
RCP	reflected ceiling plan
RD	roof drain
REINF	reinforce (d) (ing)
REF	reference
REFR	refrigerator
REG	register
REM	remove
REQ'D	required
RES	resilient
RET	return
REV	revision (s), revised
RFG	roofing
RFH	roof hatch
RFL	reflect (ed) (ive)
RH	right hand
RL	rail (ing)
RM	room
RO	rough opening
ROW	right of way
R.S.	reverse (side)
RTU	roof top unit
RWC	rain water collector
SC	solid core
SCH	schedule
SCN	screen
SD	storm drain
SEC	section
SG	sheet glass
SH	shelf, shelving
SHO	shore (d) (ing)
SHT	sheet
SHTH	sheathing
SIM	similar
SKL	skylight
SL	sleeve
SNT	sealant
SPC	spacer
SPEC (s)	specification
SPL	special
SPR	single-ply roof(ing)
SQ	square
STA	station
STD	static dissipative tile
STG	seating
STL	steel
STO	storage
STR	structural
SSK	service sink
SST	stainless steel
SUSP	suspended
SYM	symmetry (ical)
SYN	synthetic
SYS	system
T	tread
TB	towel bar
TEL	telephone
T&G	tongue and groove
TGL	tempered glass
THK	thick (ness)
THR	threshold
TKBD	tackboard
TKS	tackstrip
TOF	top of footing
TOL	tolerance
TOM	top of masonry
TOW	top of wall
TRTD	treated
TPTN	toilet partition
TPD	toilet paper dispenser
TSL	top of slab
TST	top of steel
TR	transom
TRANS	transverse
TV	television
TYP	typical
TZ	terrazzo
UC	undercut
UNF	unfinished
UNO	unless noted otherwise
UR	urinal
VAT	vinyl asbestos tile
VB	vapor barrier
VB	vinyl base
VCT	vinyl composition tile
VERT	vertical
VG	vertical grain
VIN	vinyl
VNR	veneer
VRM	vermiculite
VT	vinyl tile
VTR	vent thru roof
W	washing machine
W/	with
WB	wood base
WC	water closet
WCV	wallcovering
WD	wood
WG	wired glass
WH	wall hung
WHB	wheel bumper
WIN	window
WM	wire mesh
w/o	without
WP	waterproofing
WPT	working point
WS	waterstop
WSCT	wainscot
WTH	wide, width
WWF	welded wire fabric

LIST OF DRAWINGS

APPLICABLE CODES:

IBC / IEBC 2021
IECC 2021
NFPA 101 Life Safety Code 2018
NFPA 1 Fire Code 2018
2010 ADA Standards for Accessible Design

ALTERATION LEVEL 3: 30% Of Floor Plan

EXISTING FULL BUILDING INFORMATION:
Gross Area: First Floor = 5,292 SF,
Use Group: Group B

CONSTRUCTION TYPE: Type III-B

ALLOWABLE HEIGHT & AREAS:
Group B: Area Per Flr: 19,000 SF
Allowable Building Height: 3 Stories (55')

FIRE RESISTIVE RATINGS FOR BUILDING ELEMENTS:

Structural Frame:	0hr
Bearing Walls:	0hr
Non Bearing Walls	0hr
Floor/Roof Construction:	0hr
Corridors:	0hr

INTERIOR FINISHES:
Exit Passageways: B
Corridors, Rooms, Enclosed Spaces, Exit Access: C

FIRE PROTECTION SYSTEMS:
Fire Extinguishers: Required
Fire Alarm: Not Required
Sprinkler System: Not Required

OCCUPANCY LOAD:
First Floor Occupancy Load - 47
Office: 30
Assembly: 16
Storage: 1

EGRESS REQUIREMENTS:
Panic Hardware: Not Required
Exit Signs: Required
Emergency Lights: Required
Dead End: 20' Max
Exits: Tenant 1: Treasury Department - One Required - 2 Provided
Tenant 2: Health Department - Two Required - 2 Provided

ENERGY CODE REQUIREMENTS:
Fill exposed Existing Exterior Wall Cavities with minimum R-9.5 insulation.

Per IECC Table C402.4, Climate Zone 4 Except Marine (All Other), maximum

U-factor for Replacement windows	=	0.36 for fixed fenestrations
		0.45 for operable fenestrations.
SHGC for Replacement windows	=	0.36 for fixed fenestrations when PV < 0.2
Projection factor (PV)		0.33 for operable fenestrations when PV < 0.2
	=	0.43 for fixed fenestrations when 0.2 ≤ PV < 0.5
	=	0.40 for operable fenestrations when 0.2 ≤ PV < 0.5
	=	0.58 for fixed fenestrations when PV ≥ 0.5
	=	0.53 for operable fenestrations when PV ≥ 0.5

The above code review summary is not intended to be all-inclusive, but rather an overview of major code criteria.

GENERAL NOTES:

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1. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS AND DIMENSIONS BEFORE CONSTRUCTION. ANY VARIATIONS OR DISCREPANCIES SHALL BE BROUGHT TO THE ARCHITECT'S ATTENTION PRIOR TO CONSTRUCTION.
2. ANY CHANGE OR FIELD ALTERATION SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO CONSTRUCTION.
3. ANY ITEMS NOT SPECIFICALLY SHOWN ON THE DRAWINGS, BUT WHICH ARE REASONABLY INCIDENTAL TO AND NECESSARY FOR THE SATISFACTORY COMPLETION OF THE PROJECT IN ACCORDANCE WITH INDUSTRY STANDARDS, ARE INCLUDED WITHIN THE INTENT OF THESE DRAWINGS.
4. BUILDING CODE COMPLIANCE, CONSTRUCTION DETAILING, AND COORDINATION RESULTING FROM THE USE OF THESE DRAWINGS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
5. ALL EGRESS DOORS SHALL BE READILY OPERABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE OR EFFORT. NO BOLTS, HOOKS, OR SIMILAR DEVICES SHALL BE USED. INSTALLATION SHALL BE IN ACCORDANCE WITH IBC, LATEST EDITION.
6. CONTRACTOR IS RESPONSIBLE FOR ALL SHORING, BRACING, CONSTRUCTION MEANS AND METHODS RELATED TO DEMOLITION AND CONSTRUCTION.

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Dwn.By: CULLEN/EHC
Proj.No.: 0085B055.A01

TITLE SHEET

Dwg.No.: G-001

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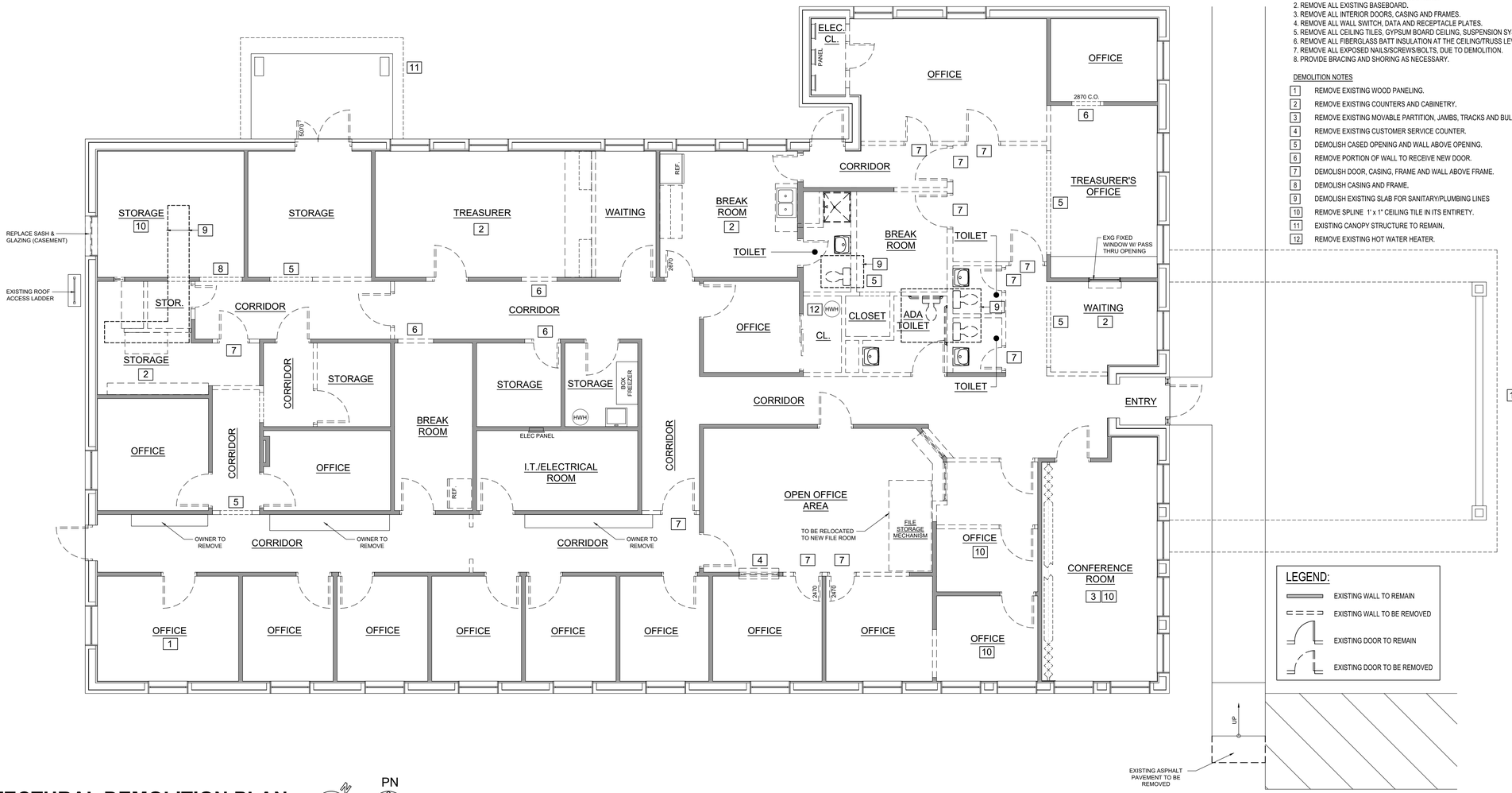
GENERAL DEMOLITION NOTES:
1. REMOVE ALL EXISTING FLOOR COVERINGS AND ADHESIVES. FLASH PATCH AS REQUIRED BY NEW FLOORING MANUFACTURERS INSTALLATION INSTRUCTIONS.
2. REMOVE ALL EXISTING BASEBOARD.
3. REMOVE ALL INTERIOR DOORS, CASING AND FRAMES.
4. REMOVE ALL WALL SWITCH, DATA AND RECEPTACLE PLATES.
5. REMOVE ALL CEILING TILES, GYPSUM BOARD CEILING, SUSPENSION SYSTEMS, AND WIRE.
6. REMOVE ALL FIBERGLASS BATT INSULATION AT THE CEILING/TRUSS LEVEL.
7. REMOVE ALL EXPOSED NAILS/SCREWS/BOLTS, DUE TO DEMOLITION.
8. PROVIDE BRACING AND SHORING AS NECESSARY.

DEMOLITION NOTES

1	REMOVE EXISTING WOOD PANELING.
2	REMOVE EXISTING COUNTERS AND CABINETRY.
3	REMOVE EXISTING MOVABLE PARTITION, JAMBS, TRACKS AND BULKHEAD.
4	REMOVE EXISTING CUSTOMER SERVICE COUNTER.
5	DEMOLISH CASED OPENING AND WALL ABOVE OPENING.
6	REMOVE PORTION OF WALL TO RECEIVE NEW DOOR.
7	DEMOLISH DOOR, CASING, FRAME AND WALL ABOVE FRAME.
8	DEMOLISH CASING AND FRAME.
9	DEMOLISH EXISTING SLAB FOR SANITARY/PLUMBING LINES
10	REMOVE SPLINE 1' x 1" CEILING TILE IN ITS ENTIRETY.
11	EXISTING CANOPY STRUCTURE TO REMAIN.
12	REMOVE EXISTING HOT WATER HEATER.



F1 ARCHITECTURAL DEMOLITION PLAN

3/16" = 1'-0"

PN

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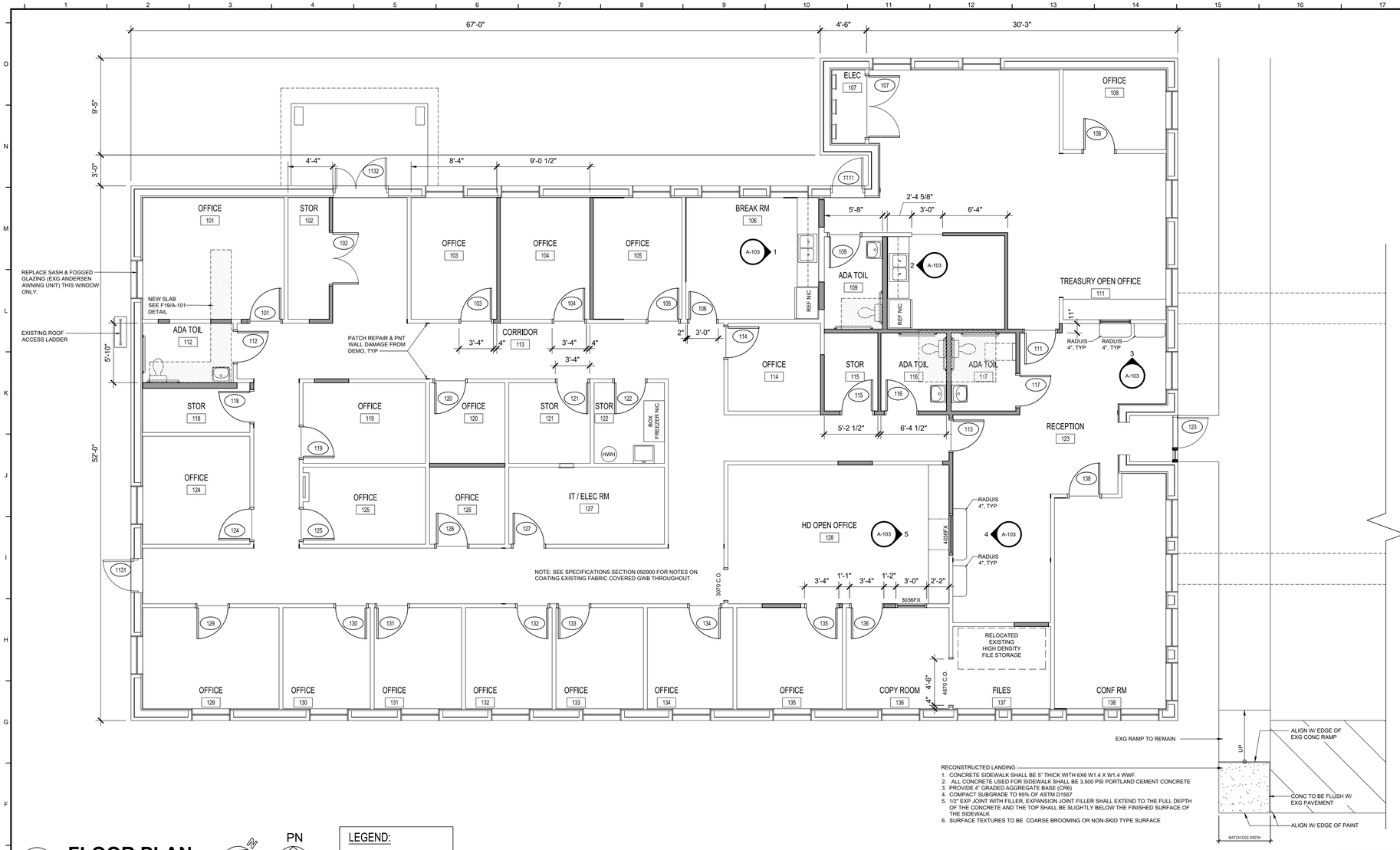
ARCHITECTURAL DEMOLITION PLAN

Dwg.No.:
AD-101

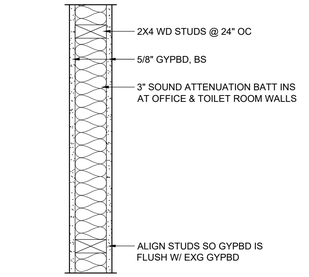


F1 FLOOR PLAN

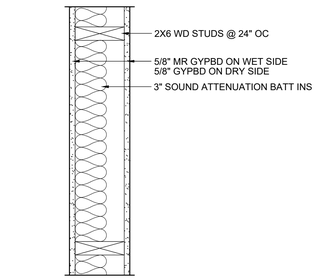
3/16" = 1'-0"

PN

LEGEND:
- NEW WALL
- EXISTING WALL



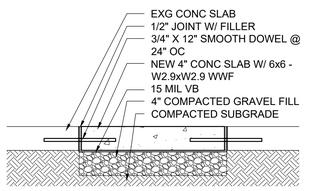
TYPICAL WALL



TYPICAL TOILET ROOM WET WALL

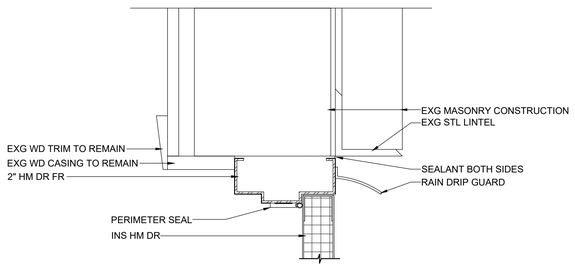
I19 WALL TYPES

1 1/2" = 1'-0"



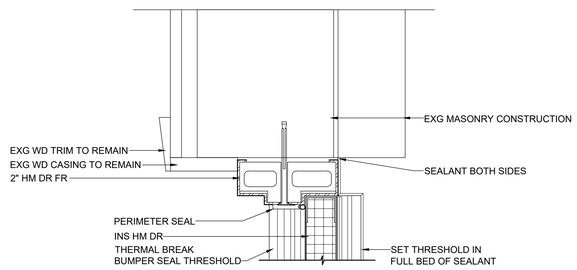
F19 CONC SLAB DETAIL

1" = 1'-0"



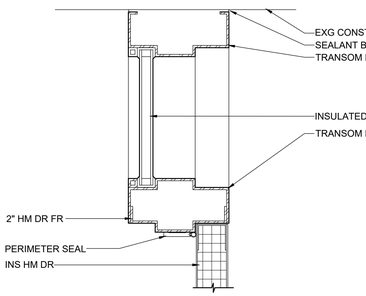
B1 HEAD FOR DRS 1111, 1131, 1132

3" = 1'-0"



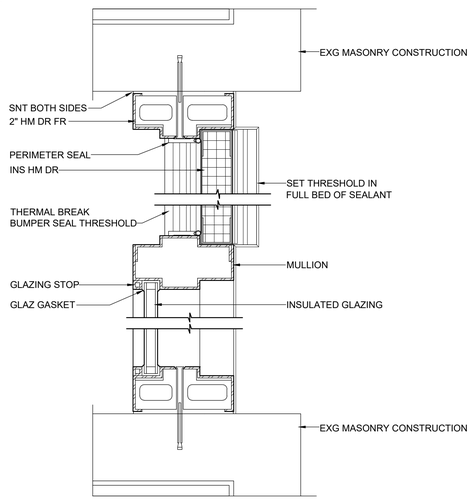
B6 JAMB FOR DRS 1111, 1131, 1132

3" = 1'-0"



B12 HEAD FOR DRS 123

3" = 1'-0"



B17 JAMB FOR DRS 123

3" = 1'-0"

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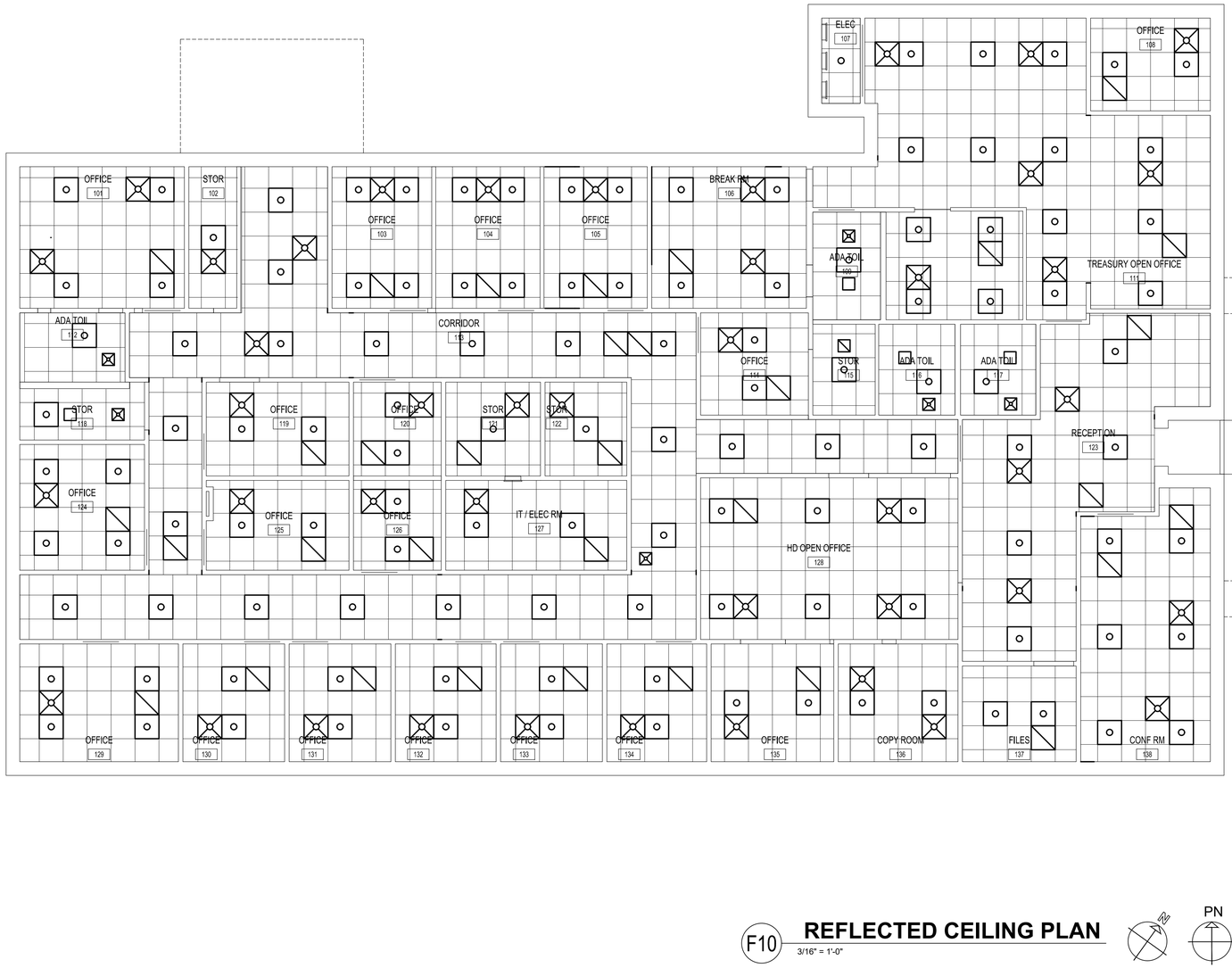
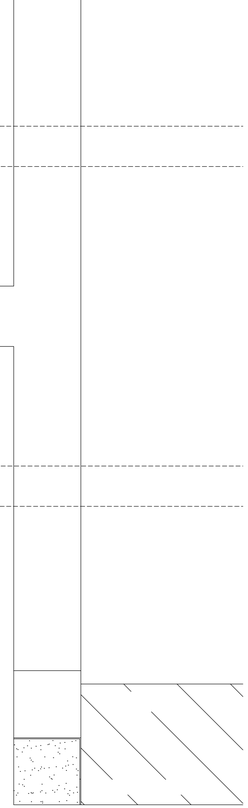
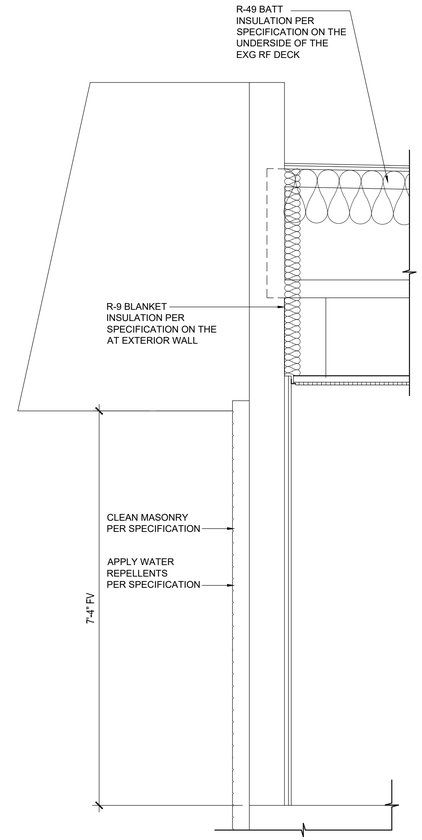
FLOOR PLAN

Dwg.No.: A-101







F10 REFLECTED CEILING PLAN

3/16" = 1'-0"

PN

F18 PARTIAL WALL SECTION

3/4" = 1'-0"

CEILING LEGEND

- ARMSTRONG 704A - 2'x2' ACOUSTICAL TILE & PRELUDE XL 15/16" SUSPENSION GRID
- 2'x2' LED LIGHT TROFFER
- SUPPLY DIFFUSER
- RETURN GRILLE

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REFLECTED CEILING PLAN

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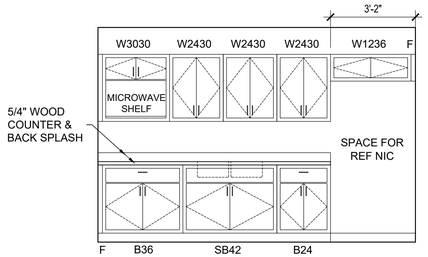

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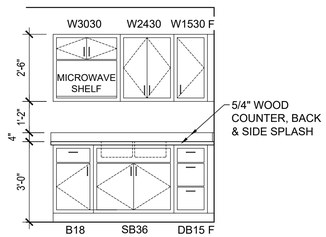

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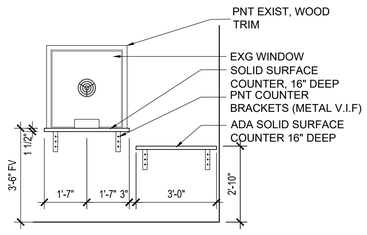

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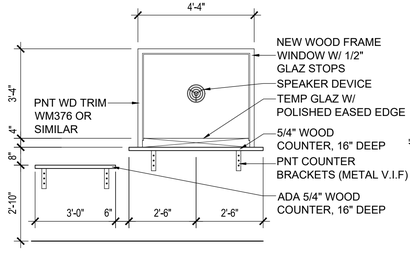

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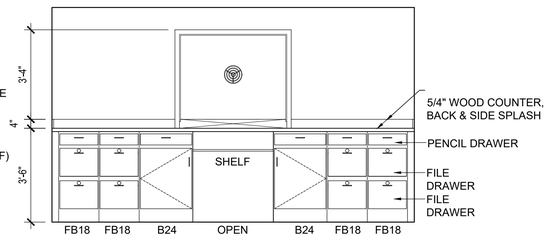

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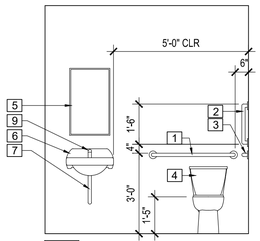
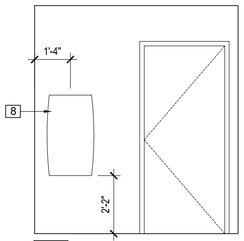


117 WEST



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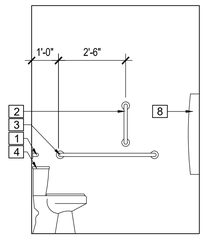

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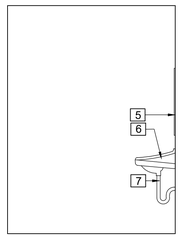
112 WEST (SIM NO 8)



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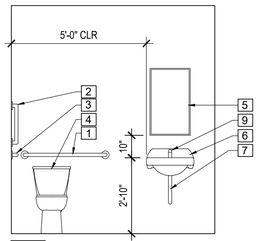

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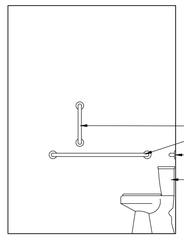

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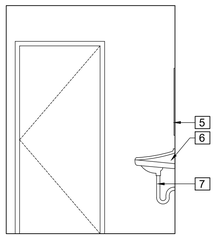

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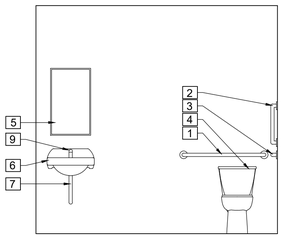
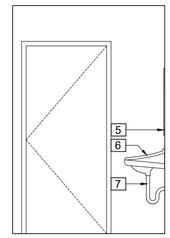


109 EAST
112 SOUTH



109 NORTH
112 EAST

I1 INTERIOR ELEVATIONS

3/8" = 1'-0"

GENERAL NOTES : WOOD TO BE PAINTED GRADE CLEAR PINE, CABINETS ARE WOOD FINISH, PROVIDE SHOP DRAWINGS AND SUBMITTALS FOR REVIEW AND SELECTION. PROVIDE PRE-FINISHED METAL BRACKETS FOR COUNTERS - VERIFY IN FIELD

ROOM FINISH SCHEDULE

NO.	Name	FLR	Base	Walls				Clg	HT	NOTES
				N	S	E	W			
101	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	8'-9"	
102	STOR	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
103	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
104	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
105	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
106	BREAK RM	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
107	ELEC	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
108	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
109	ADA TOIL	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
111	TREASURY OPEN OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
112	ADA TOIL	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
113	CORRIDOR	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
114	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
115	STOR	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
116	ADA TOIL	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
117	ADA TOIL	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
118	STOR	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
119	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
120	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
121	STOR	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
122	STOR	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
123	RECEPTION	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
124	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
125	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
126	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
127	IT / ELEC RM	LVT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
128	HD OPEN OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
129	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
130	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
131	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
132	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
133	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
134	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
135	OFFICE	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
136	COPY ROOM	CPT	VIN	GYP	GYP	GYP	GYP	ACT	7'-10"	
137	FILES	CPT	VIN	GYP	GYP	GYP	GYP	ACT	9'-0"	
138	CONF RM	CPT	VIN	GYP	GYP	GYP	GYP	ACT	9'-3"	

DOOR SCHEDULE

Door						Frame		Details			Remarks		
			Size										
Number	Type	Mat	W	H	TH	Type	Mat	Sill	Jamb	Head	Label	Hdw Set	Note
101	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
102	F	SCWD	5'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
103	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
104	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
105	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
106	HG	SCWD	2'-8"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
107	F	SCWD	6'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
108	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
109	F	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
111	F	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	NOTE 3
112	F	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
113	F	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	NOTE 3
1131	F	HM	3'-0"	6'-8"	1 3/4"	BF	HM	--	B6	B1	--	--	INS EXT DR, NOTE 1, NOTE 3, 5
1132	F	HM	5'-0"	6'-8"	1 3/4"	BF	HM	--	B6	B1	--	--	INS EXT DR, NOTE 1 & 2, 5
114	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
115	F	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
116	F	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
117	F	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
118	F	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
119	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
120	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
121	F	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
122	F	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
123	FG	HM	3'-0"	7'-0"	1 3/4"	BF	HM	--	B17	B12	--	--	INS EXT DR, NOTE 1, NOTE 3,4,5
124	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
125	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
126	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
127	F	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
129	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
130	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
131	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
132	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
133	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
134	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
135	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
136	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
138	HG	SCWD	3'-0"	6'-8"	1 3/4"	WAF	HM	--	--	--	--	--	
1111	F	HM	3'-0"	6'-8"	1 3/4"	BF	HM	--	B6	B1	--	--	INS EXT DR, NOTE 1, NOTE 3,5

NOTES:
1. B1, B6, B12 & B17 ARE SHOWN ON SHEET A101.
2. UNEQUAL LEAVES, 2'-0" AND 3'-0".
3. DOORS TO HAVE ELECTRONIC STRIKES.
4.DOOR#123 TO MATCH EXISTING WITH SIDE LITE AND TRANSOM IN C15.
5.CARD READER BY SECURITY VENDOR.

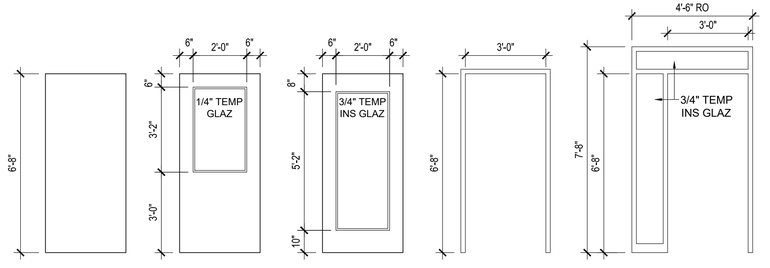
GENERAL NOTES:
1. SEE SPECIFICATIONS FOR HARDWARE SETS.
2. NO AUTOMATED OPERATOR FOR DOOR#123.
3.PAINT EXTERIOR SIDE OF DOORS# 111,1121,1132.

TOILET ELEVATION LEGEND

1 1-1/2" DIA, 36" PEENED GRAB BAR W/ SNAP FLANGES
2 1-1/2" DIA, 18" PEENED GRAB BAR W/ SNAP FLANGES
3 1-1/2" DIA, 42" PEENED GRAB BAR W/ SNAP FLANGES
4 TOT DRAKE ADA GRAVITY FED TOILET W/ OPEN FRONT ELONGATED SEAT
5 SS FRAMED MIRROR, 18"X30"
6 AS LUCERNE WALL HUNG LAVATORY W/ CONCEALED ARM CARRIER
7 LAVATORY GUARD FOR DRAIN & SUPPLY PIPES
8 BABY CHANGING STATION - WALL MOUNTED VERTICAL
9 SLOAN ETF600 LAVATORY FAUCET

GENERAL NOTES:

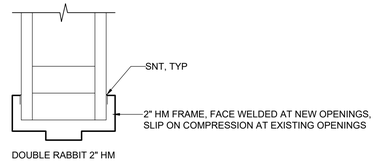
1. BATHROOM PAPER/SOAP DISPENSERS PROVIDED BY WCM FOR CONTRACTOR INSTALLATION.



F HG FG DOUBLE RABBIT 2" HM DOOR 123 DOUBLE RABBIT 2" HM

C15 **DOOR & FRAME ELEVATION**

3/8" = 1'-0"



DOUBLE RABBIT 2" HM

A15 **INTERIOR DOOR FRAMES DET**

3" = 1'-0"

DAVIS BOWEN & FRIEDEL, INC.
ARCHITECTS - ENGINEERS - SURVEYORS
EASTON, MARYLAND 410.770.4744
SALISBURY, MARYLAND 410.543.9091
MILFORD, DELAWARE 302.424.1444

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed Professional Architect in the laws of the State of Maryland, License No. 11115, Expiration Date: 09-08-2026.

ISLE OF WIGHT RENOVATION
WORCESTER CO HEALTH DEPARTMENT
13070 ST. MARTINS NECK ROAD; BISHOPVILLE, MD 21813

DATE	COMMENTS

Date: JULY 29, 2025
Scale: AS NOTED
Dwn.By: CULLEN/EHC
Proj.No.: 0085B055.A01

INTERIOR ELEVATIONS, FINISH & DOOR SCHEDULES, DR & FR ELEVATIONS

Dwg.No.: **A-103**

R:\0085\0085B055.A01 Isle of Wight\4-Cd\Drawings\A-Series_rev7-29-25.dwg Aug 15 , 2025 - 1:47pm CYLE

GENERAL MECHANICAL NOTES (ALL DRAWINGS):

1. MECHANICAL CONTRACTOR SHALL PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE HVAC SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND REQUIRED BY CODE.
2. THE CONTRACT DOCUMENT DRAWINGS ARE DIAGRAMMATIC ONLY, AND ARE INTENDED TO CONVEY THE SCOPE AND GENERAL ARRANGEMENT OF WORK.
3. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE VERIFIED BY THE CONTRACTOR BY FIELD INSPECTION PRIOR TO BIDDING. ANY INTERFERENCES TO INSTALLATION SHALL BE NOTED AND THE CONTRACTOR SHALL INCLUDE IN HIS BID PRICE THE COST TO AVOID OR RELOCATE ALL ITEMS, INCLUDING ITEMS OF OTHER TRADES, THAT INTERFERE. ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. ALL OFFSETS, RISES, TRANSITIONS AND DROPS IN DUCTS AND PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
4. VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. VERIFY AND PROVIDE DUCT TRANSITIONS OR PIPE ADAPTERS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DIMENSIONS BEFORE FABRICATION.
5. PROVIDE ACCESS IN WALLS & CEILINGS TO ACCESS ALL EQUIPMENT, VALVES, CONTROL DEVICES, VOLUME DAMPERS, AND FIRE/SMOKE DAMPERS.
6. FOLLOW MANUFACTURE'S RECOMMENDATIONS FOR INSTALLATION OF EQUIPMENT. ALSO REFER TO TYPICAL DETAILS FOR INSTALLATION OF EQUIPMENT.
7. ALL MATERIALS FURNISHED, AND ALL WORK PERFORMED BY THE MECHANICAL CONTRACTOR SHALL BE IN ACCORDANCE WITH ALL APPLICABLE CODES AND REGULATIONS, INCLUDING BUT NOT LIMITED TO THE LATEST APPLICABLE EDITIONS OF NFPA, IEEE, OSHA, SMACNA, INTERNATIONAL MECHANICAL CODE, INTERNATIONAL BUILDING CODE, AND ANY STATE, COUNTY, AND LOCAL CODES.
8. ALL EQUIPMENT, DUCTWORK, ETC., SHALL BE SUPPORTED SUFFICIENTLY AND ANY ADDITIONAL SUPPORT SHALL BE PROVIDED AS REQUIRED TO PROVIDE VIBRATION FREE AND SAFE INSTALLATION. ALL MISCELLANEOUS STEEL REQUIRED AND/OR AS SHOWN IN DETAILS FOR DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR. SUPPORT ALL DUCTWORK, PIPING AND EQUIPMENT MOUNTED ABOVE THE CEILING DIRECTLY FROM THE STRUCTURE. ALL ATTACHMENTS TO BEAMS, TRUSSES, OR JOIST SHALL BE MADE AT PANEL POINTS WITH BEAM CLAMPS MEETING MSS STANDARDS.
9. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH NEC AND ELECTRICAL SPECIFICATIONS FOR THIS PROJECT.

DUCTWORK GENERAL NOTES (ALL DRAWINGS):

1. ALL DUCTWORK INDICATED IS SCHEMATIC AND SHOW ONLY RELATIVE POSITIONS. PROVIDE OFFSETS, RISES, TRANSITIONS AND ELBOWS AS NEEDED TO INSTALL PROPERLY.
2. PROVIDE ACCESS DOORS IN DUCTWORK FOR OPERATION, ADJUSTMENT, AND MAINTENANCE OF ALL HVAC DEVICES, FANS, DAMPERS, (FIRE, SMOKE, BALANCING) COILS, AND TERMINAL EQUIPMENT.
3. LOCATIONS OF TERMINAL DEVICES, AIR OUTLETS AND INLETS ARE APPROXIMATE. LOCATE PER THE ARCHITECTURAL DRAWINGS AND TO AVOID OTHER TRADE'S WORK. COORDINATE LOCATIONS WITH OTHER TRADES. CONSULT ARCHITECT/ENGINEER FOR CLARIFICATION IF CONFLICTS OCCUR.
4. DUCT DIMENSIONS SHOWN ARE CLEAR INSIDE FACE-TO-FACE DIMENSIONS AND DO NOT INCLUDE DUCT LINER WHERE SPECIFIED. INCREASE DIMENSIONS OF LINED DUCTWORK TO PROVIDE FREE INSIDE AREA EQUAL DIMENSIONS SHOWN. REFER TO THE SPECIFICATIONS FOR LOCATION OF LINED DUCTWORK.
5. FINAL CONNECTIONS FROM HIGH VELOCITY MAIN DUCTS TO AIR TERMINAL UNITS SHALL BE MADE WITH FLEXIBLE DUCTWORK NOT EXCEEDING 3 FEET IN LENGTH. CONNECTIONS BETWEEN LOW VELOCITY DUCTWORK AND/OR TERMINAL UNITS TO AIR INLETS AND OUTLETS SHALL BE MADE WITH FLEXIBLE DUCTWORK NOT EXCEEDING 6 FEET IN LENGTH. LONGER DUCT RUN OUTS SHALL BE CONSTRUCTED OF HARD DUCT OF THE SAME MATERIAL SPECIFIED FOR THE SYSTEM SERVED AND INSULATED AS SPECIFIED FOR THAT SYSTEM. FLEXIBLE DUCTWORK SHALL BE OF THE PRESSURE CLASS AND FACTORY INSULATED AS SPECIFIED FOR THE SYSTEM WHERE INSTALLED.
6. FLEXIBLE DUCTWORK SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS WITHOUT ANY SAGS, SHARP TURNS OR KINKS. AT THE MINIMUM, THE FLEXIBLE DUCTWORK SHALL BE FASTENED TO THE HARD DUCT BY A NYLON STRAP SECURED BY SHEETMETAL SCREWS TO PREVENT SLIPPING OFF FROM COLLAR.
7. PROVIDE VOLUME DAMPERS AT EACH AIR OUTLET, AIR INLET AND TERMINAL DEVICE AND AT EACH BRANCH TAKE-OFF CONNECTION FROM THE MAIN.

MECHANICAL PIPING GENERAL NOTES (ALL DRAWINGS):

1. ALL PIPING SHOWN HAS BEEN DRAWN SCHEMATICALLY FOR CLARITY AND SHOW ONLY RELATIVE POSITIONS. PROVIDE OFFSETS AND ELBOWS AS NEEDED TO INSTALL PROPERLY AND TO AVOID INTERFERENCES.
2. ALL NEW OR REPLACED HYDRONIC PIPING SHALL BE INSTALLED SO THAT IT CAN BE COMPLETELY VENTED AT HIGH POINTS AND DRAINED AT LOW POINTS. PROVIDE AIR VENTS AT HIGH POINTS, TYPE PER SPECIFICATIONS. PROVIDE 1/2" BALL VALVES WITH HOSE END CONNECTIONS AND CAPS AT LOW POINT. ALL WATER MAINS SHALL BE INSTALLED LEVEL, UNLESS OTHERWISE NOTES.
3. PROVIDE SERVICE VALVES AT EACH BRANCH CONNECTION FROM MAINS AND AT EACH TERMINAL DEVICE OR EQUIPMENT CONNECTION.
4. CONTRACTOR SHALL PROVIDE NEW VALVES ON EXISTING PIPING WHERE THE PIPES ARE TO BE REMOVED SO THAT THE SYSTEM DOES NOT HAVE TO BE DRAINED WHILE REMOVING EXISTING UNITS, INSTALLING NEW UNITS AND MAKING CONNECTIONS TO NEW EQUIPMENT.

MECHANICAL DEMOLITION GENERAL NOTES (ALL DRAWINGS):

1. DEMOLITION DRAWINGS ARE BASED ON EXISTING PLANS AND FIELD INVESTIGATION PRIOR TO DEMOLITION. VISIT THE SITE PRIOR TO BID IN ORDER TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AND IN ORDER TO AVOID CONFLICTS.
2. ALL ITEMS SHOWN DASHED ON DEMOLITION PLANS ARE EXISTING AND SHALL BE REMOVED INCLUDING PIPING, DUCTWORK, HANGERS, FASTENERS, CONTROLS, AND ASSOCIATED APPURTENANCES UNLESS OTHERWISE NOTED.
3. ALL ITEMS SHOWN SOLID ON DEMOLITION PLANS ARE EXISTING TO REMAIN UNLESS OTHERWISE NOTED.
4. EXERCISE CARE IN REMOVAL OF DEMOLITION ITEMS. REPAIR, AT NO ADDITIONAL COST TO OWNER, ANY DAMAGE CAUSED TO EXISTING CONSTRUCTION AND/OR EQUIPMENT TO REMAIN.

MECHANICAL LEGEND

SYMBOL	ABRV.	DESCRIPTION
	EX	EXISTING EQUIPMENT OR DUCTWORK TO REMAIN
	RX	EXISTING EQUIPMENT OR DUCTWORK TO BE REMOVED
		NEW EQUIPMENT OR DUCTWORK
		LINED DUCTWORK
		SUPPLY DUCT UP
		SUPPLY DUCT DOWN
		RETURN DUCT UP
		RETURN DUCT DOWN
		EXHAUST DUCT UP
		EXHAUST DUCT DOWN
		ROUND DUCT ELBOW UP
		ROUND DUCT ELBOW DOWN
		ELBOW WITH TURNING VANES
R		DUCT OFFSET - RISE
D		DUCT OFFSET - DROP
		SQUARE / RECTANGULAR DUCT TRANSITION
		SQUARE/RECTANGULAR TO ROUND DUCT TRANSITION
	SD	SUPPLY DIFFUSER - MULTI-DIRECT.
		SUPPLY DIFFUSER - DIRECT. (HATCH DENOTES BLANK OFF)
	SG/EG	SIDEWALL SUPPLY or RETURN GRILLE - (R = REGISTER)
	LD	LINEAR DIFFUSER. SEE SCHEDULE FOR INFORMATION.
	RG/EG	RETURN GRILLE - (R = REGISTER)
	EG	EXHAUST GRILLE - (R = REGISTER)
		FLEXIBLE DUCT
	FLEX	FLEXIBLE DUCT CONNECTION (TO EQUIPMENT)
		SPIN TAP WITH VOLUME CONTROL DAMPER
AD	AD	DUCT ACCESS DOOR
	VD	VOLUME CONTROL DAMPER
AP		ACCESS PANEL
	FD	VERTICAL FIRE DAMPER (WALL)
	SD	VERTICAL SMOKE DAMPER (WALL)
	FD/SD	COMBINATION VERTICAL FIRE & SMOKE DAMPER
	HSD	HORIZONTAL SMOKE DAMPER (FLOOR)
	FD/SD	HORIZONTAL FIRE DAMPER (FLOOR)
	HFD/SD	COMBINATION HORIZONTAL FIRE & SMOKE DAMPER
	RD	CEILING RADIATION FIRE DAMPER
DD	DD	DUCT SMOKE DETECTOR
T		THERMOSTAT
H		HUMIDISTAT
TH		COMBINATION THERMOSTAT & HUMIDISTAT
SP		STATIC PRESSURE SENSOR
CO_2		CARBON DIOXIDE SENSOR
CO		CARBON MONOXIDE SENSOR
NO_2		NITROUS OXIDE SENSOR
S		TEMPERATURE SENSOR
S		STARTER
OS		OCCUPANCY SENSOR
R		REFRIGERANT DETECTOR
U	UC	UNDER CUT DOOR - 1"
L		LOUVERED DOOR

SYMBOL	ABRV.	DESCRIPTION
		CONNECTION POINT, NEW TO EXISTING
		DISCONNECTION POINT
1		DRAWING KEYNOTE
A		DEMOLITION DRAWING KEYNOTE
1		REVISION NUMBER
		REVISION CLOUD
		PIPE UP
		PIPE DOWN
		PIPE TEE DOWN
		TOP PIPE CONNECTION
		BALL VALVE OR SHUTOFF VALVE IN RISE
		PIPE CAP
		PIPE UNION
		FLANGED CONNECTION
		CONCENTRIC PIPE REDUCER
		ECCENTRIC PIPE REDUCER
		FLOW ARROW
		PIPE ANCHOR
		PIPE GUIDE
	BV	BALL VALVE
	BFV	BUTTERFLY VALVE
	PV	PLUG VALVE
	GV	GATE VALVE
	GBV	GLOBE VALVE
	PRV	PRESSURE REDUCING VALVE
	CV	CHECK VALVE
	BFP	BACKFLOW PREVENTER
		PRESSURE RELIEF VALVE
		AUTOMATIC FLOW CONTROL VALVE
		CALIBRATED BALANCING VALVE
		AUTOMATIC AIR VENT
		MANUAL AIR VENT
		P/T PLUG
		PRESSURE GAGE W/ SHUT-OFF
		THERMOMETER
		STRAINER (W/ BALL VALVE AND CAP)
		HOSE BIBB
		FLEXIBLE CONNECTOR
		2-WAY CONTROL VALVE
		3-WAY CONTROL VALVE
		TRIPLE DUTY VALVE WITH MEASURING CONNECTIONS
		INVERTED BUCKET STEAM TRAP
		FLOAT & THERMOSTATIC STEAM TRAP
	RA / EA	RETURN OR EXHAUST AIR
	SA / OA	SUPPLY OR OUTSIDE AIR
TYP #		EQUIPMENT UNIT DESIGNATION
TAG CFM		DIFFUSER, REGISTER & GRILLE UNIT DESIGNATION W/ CFM

SYMBOL	ABRV.	DESCRIPTION
— EX (X) —	EX	EXISTING PIPING TO REMAIN - (X) DESIGNATES SERVICE
— RX (X) —	RX	EXISTING PIPING TO BE REMOVED - (X) DESIGNATES SERVICE
— HWS —	HWS	HEATING WATER SUPPLY PIPING
— HWR —	HWR	HEATING WATER RETURN PIPING
— CWS —	CWS	CONDENSER WATER SUPPLY PIPING
— CWR —	CWR	CONDENSER WATER RETURN PIPING
— CHWS —	CHWS	CHILLED WATER SUPPLY PIPING
— CHWR —	CHWR	CHILLED WATER RETURN PIPING
— LPS —	LPS	LOW PRESSURE STEAM SUPPLY PIPING (0-15 PSIG)
— LPR —	LPR	LOW PRESSURE STEAM CONDENSATE RETURN
— MPS —	MPS	MEDIUM PRESSURE STEAM SUPPLY PIPING (16-60 PSIG)
— MPR —	MPR	MEDIUM PRESSURE STEAM CONDENSATE RETURN
— HPS —	HPS	HIGH PRESSURE STEAM SUPPLY PIPING (61 TO 200 PSIG)
— HPR —	HPR	HIGH PRESSURE STEAM CONDENSATE RETURN
— GWS —	GWS	GLYCOL WATER SUPPLY
— GWR —	GWR	GLYCOL WATER RETURN
— RL —	RL	REFRIGERANT LIQUID PIPING
— RS —	RS	REFRIGERANT SUCTION PIPING
— FOS —	FOS	FUEL OIL SUPPLY PIPING
— FOR —	FOR	FUEL OIL RETURN PIPING
— CW —	CW	CITY (DOMESTIC) WATER
— PC —	PC	PUMPED STEAM CONDENSATE
— D —	D	CONDENSATE DRAIN PIPING
— V —	V	VENT PIPING
— G —	G	NATURAL GAS PIPING

MECHANICAL ABBREVIATIONS

ABRV.	DESCRIPTION
HVAC	HEATING, VENTILATION AND AIR CONDITIONING
SA	SUPPLY AIR
RA	RETURN AIR
EA	EXHAUST AIR
OA	OUTSIDE AIR
TA	TRANSFER AIR
MA	MIXED AIR
MBH	1000 - BRITISH THERMAL UNITS
kW	1000-WATT (1 KW = 3,412 BTUH)
SENS.	SENSIBLE
LAT.	LATENT
E.A.T.	ENTERING AIR TEMPERATURE
L.A.T.	LEAVING AIR TEMPERATURE
E.W.T.	ENTERING WATER TEMPERATURE
L.W.T.	LEAVING WATER TEMPERATURE
DB/WB	DRY BULB / WET BULB
IN. W.G.	INCHES WATER GAUGE (AIR)
FT. W.G.	FEET WATER GAUGE (HYDRONIC)
E.S.P.	EXTERNAL STATIC PRESSURE
T.S.P.	TOTAL STATIC PRESSURE
TG	TRANSFER GRILLE
TR	TOP REGISTER
°F	FAHRENHEIT
R / R	REMOVE EXISTING ITEM & RELOCATE TO NEW LOCATION
EX	EXISTING
RL	RELOCATE EXISTING
UNO	UNLESS NOTED OTHERWISE
NTS	NOT TO SCALE
NIC	NOT IN CONTRACT
PH	PHASE
HZ	HERTZ
Ø	DIAMETER
AFF	ABOVE FINISHED FLOOR
ELEV.	ELEVATION FROM DATUM
FLA	FULL LOAD AMPS
MCA	MINIMUM CIRCUIT AMPACITY
MOCP	MAXIMUM OVERCURRENT PROTECTION

NOTES:

1. NOT ALL SYMBOLS AND ABBREVIATIONS ARE IN USE FOR THIS PROJECT.

STATE OF MARYLAND · TIMOTHY R. CHATTER... · No. 51406 · PROFESSIONAL ENGINEER

LICENSE NUMBER: 51406

EXPIRATION DATE: 08/10/2025

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

DAVIS BOWEN & FRIEDEL, INC.
ARCHITECTS · ENGINEERS · SURVEYORS
EASTON, MARYLAND 410.770.4744 · MILFORD, DELAWARE 302.424.1444 · SALISBURY, MARYLAND 410.543.9091

ISLE OF WIGHT RENOVATION
WORCESTER CO HEALTH DEPARTMENT
13070 ST. MARTINS NECK ROAD; BISHOPVILLE, MD 21813

DATE	COMMENTS
12/18/2024	100% Design Development
05/07/2025	90% Construction Documentation
07/16/2025	100% Construction Documentation
07/29/2025	Issued for Permit

Date:	July 29, 2025
Scale:	AS NOTED
Dwn.By:	ZCIO
Proj.No.:	0085B055.A01

MECHANICAL DATA SHEET

Allen + Shariff
MEP Engineering
Project Management
205 East Market Street
Salisbury, Maryland 21801
443.545.1300

Dwg.No.: M-001

ALLEN + SHARIFF JOB #: 2431096

MECHANICAL SPECIFICATIONS

MECHANICAL GENERAL CONDITIONS (230010)

A. GENERAL

1. CONFORM TO ALL GENERAL AND SPECIAL CONDITIONS OF CONTRACT AS SPECIFIED BY ARCHITECT AND/OR OWNER.

2. PRODUCTS AND INSTALLATION SHALL COMPLY WITH ALL APPLICABLE LAWS, CODES, GOVERNMENT REGULATIONS, UTILITY COMPANY REQUIREMENTS, ETC. OF ALL AUTHORITIES HAVING JURISDICTION. WORK SHALL COMPLY WITH THE FOLLOWING CODES, STANDARDS AND ORGANIZATIONS:
   - INTERNATIONAL BUILDING CODE
   - INTERNATIONAL MECHANICAL CODE
   - INTERNATIONAL PLUMBING CODE
   - INTERNATIONAL ENERGY CONSERVATION CODE
   - NATIONAL ELECTRIC CODE
   - NFPA
   - UNDERWRITERS LABORATORY (UL), IRI, FM
   - SMACNA "HVAC DUCT CONSTRUCTION STANDARDS" GUIDELINES, DETAILS, & MODEL SPECIFICATION
   - ASHRAE

3. WHERE CONFLICTS EXIST BETWEEN CODES, STANDARDS OR THIS SPECIFICATION THE HIGHER REQUIREMENT SHALL APPLY. DEVIATIONS FROM THE CONTRACT DOCUMENTS REQUIRED BY THE ABOVE AUTHORITIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. OBTAIN PERMITS AND PAY ALL FEES. ARRANGE FOR ALL REQUIRED INSPECTIONS AND APPROVALS. CONFIRM ALL UTILITY COMPANY REQUIREMENTS AND CONNECTION POINTS IN FIELD, PRIOR TO STARTING WORK.

4. ALL SPECIFICATIONS AND DRAWINGS, I.E., ARCHITECTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL ARE COMPLIMENTARY AND MUST BE USED IN COMBINATION TO OBTAIN COMPLETE CONSTRUCTION INFORMATION. ANY INFORMATION CONFLICTS WITHIN THE SPECIFICATIONS AND DRAWINGS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION. DRAWINGS ARE DIAGRAMMATIC. CONFIRM ALL DIMENSIONS BY FIELD MEASUREMENT. THE EXACT LOCATIONS FOR APPARATUS, FIXTURES, EQUIPMENT AND PIPING WHICH IS NOT COVERED BY DRAWINGS, SHALL BE OBTAINED FROM THE ARCHITECT OR HIS REPRESENTATIVE IN THE FIELD, AND THE WORK SHALL BE LAID OUT ACCORDINGLY.

5. EACH CONTRACTOR SHALL PROVIDE FOR HIS OWN CLEAN-UP, REMOVAL AND LEGAL DISPOSAL OF ALL RUBBISH DAILY. CONTRACTOR SHALL PROTECT THEIR WORK AND EXISTING OR ADJACENT PROPERTY AGAINST WEATHER, TO MAINTAIN THEIR WORK, MATERIALS, APPARATUS AND FIXTURES FREE FROM INJURY OR DAMAGE. ANY WORK DAMAGED BY FAILURE TO PROVIDE PROTECTION REQUIRED, SHALL BE REMOVED AND REPLACED WITH NEW WORK AT THE CONTRACTOR'S EXPENSE.

6. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, SEQUENCES OF CONSTRUCTION AND THE SAFETY OF WORKMEN.

7. NO MEP, IT, FP SYSTEMS OR COMPONENTS SHALL BE INSTALLED OR ROUTED ABOVE ELECTRICAL PANELS AND EQUIPMENT OR THROUGH ELEVATOR ROOMS, FIRE PUMP ROOMS, OR STAIR TOWERS UNLESS SERVING THE MACHINE ROOM, FIRE PUMP ROOM OR STAIR TOWER.

8. THE CONTRACTOR SHALL COORDINATE AND OBTAIN A WRITTEN LISTING OF ELECTRICAL CHARACTERISTICS OF ALL MECHANICAL EQUIPMENT FROM ELECTRICAL CONTRACTOR PRIOR TO ORDERING OF EQUIPMENT. NO ADDITIONAL PAYMENT WILL BE MADE FOR LACK OF CONTRACTOR COORDINATION OF ELECTRICAL CHARACTERISTICS.

9. IN CASES OF DOUBT AS TO THE WORK INTENDED, OR IN THE EVENT OF NEED FOR EXPLANATION THEREOF, THE CONTRACTOR SHALL REQUEST SUPPLEMENTARY INSTRUCTIONS FROM THE ENGINEER. NO CHANGES ARE TO BE MADE TO THE WORK OF THIS CONTRACT WITHOUT PRIOR KNOWLEDGE AND APPROVAL OF THE ENGINEER. THE CONTRACTOR SHALL HOLD THE OWNER AND ITS CONSULTANTS HARMLESS AGAINST ALL CLAIMS AND JUDGMENTS ARISING OUT OF THE CONTRACTOR'S PERFORMANCE OF THE WORK OF THIS CONTRACT. THE CONTRACTOR SHALL NOT PROCEED WITH ANY WORK, WHICH HE EXPECTS ADDITIONAL COMPENSATION BEYOND THE CONTRACT AMOUNT, WITHOUT WRITTEN AUTHORIZATION FROM THE APPROPRIATE AUTHORITY. FAILURE TO OBTAIN SUCH AUTHORIZATION SHALL INVALIDATE ANY CLAIM FOR EXTRA COMPENSATION.

10. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO INSTALL THE HEATING, VENTILATION AND AIR CONDITIONING SYSTEM SO AS TO INSURE QUIET OPERATION. NO VIBRATION OR SOUND SHALL BE TRANSMITTED TO THE BUILDING, STRUCTURE OR OCCUPIED AREAS. THE DECISION OF THE ENGINEER AS TO THE QUIETNESS OF THE SYSTEM AND EQUIPMENT SHALL BE FINAL. IT SHALL BE THIS CONTRACTORS RESPONSIBILITY TO CORRECT OR REPLACE ANY NOISY SYSTEM OR EQUIPMENT AS REQUIRED.

11. OBTAIN PERMITS AND PAY ALL FEES. ARRANGE FOR ALL REQUIRED INSPECTIONS AND APPROVALS.

B. WORK IN EXISTING BUILDINGS

1. EXISTING BUILDING IS TO REMAIN OCCUPIED AND ACCESSIBLE AT ALL TIMES. PROTECT THE BUILDING PREMISES AND ALL OCCUPANTS ON THE PROJECT SITE. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGES CAUSED BY IMPROPER PROTECTION AND SHALL MAKE ALL NECESSARY REPLACEMENTS OR REPAIRS WITHOUT ANY ADDITIONAL COST. MAKE ALL ARRANGEMENTS, MAINTAIN AND PAY ALL COSTS FOR TEMPORARY WATER, PLUMBING, POWER, LIGHTING, AND HEATING OR VENTILATION AS REQUIRED TO PROPERLY CONDUCT THE WORK OF THIS CONTRACT AND MAINTAIN SERVICES. PROVIDE AND MAINTAIN FOR THE ENTIRE LENGTH OF THIS CONTRACT ALL EXITS, EXIT LIGHTING, FIRE PROTECTION DEVICES AND ALARMS TO CONFORM TO LOCAL BUILDING CODE REQUIREMENTS.

2. CONFORM WITH THE CURRENT EDITION OF THE SMACNA "IAQ GUIDELINES FOR OCCUPIED BUILDINGS UNDER CONSTRUCTION."

3. CONTRACTOR SHALL VERIFY ALL POINTS OF CONNECTION BEFORE COMMENCING WORK. CONTRACTOR SHALL COORDINATE WORK WITH EXISTING WORK AND OTHER TRADES. ALL UNUSED EQUIPMENT SERVING THIS AREA SHALL BE REMOVED AND RETURNED TO THE OWNER.

4. EXISTING EQUIPMENT TO REMAIN, BE REUSED, OR RELOCATED WITHIN OR SERVING THE SPACE, WHICH IS DAMAGED OR DOES NOT COMPLY WITH THE SPECIFICATIONS, SHALL BE RESTORED TO LIKE NEW CONDITION SUBJECT TO REVIEW BY THE ARCHITECT AND ENGINEER, OR SHALL BE REPLACED WITH NEW MATERIALS MEETING THE SPECIFICATION REQUIREMENTS.

5. SOME WORK SHOWN MAY REQUIRE PREMIUM TIME INCLUDING NOISE PRODUCING ACTIVITIES, ACCESS INTO ADJOINING SPACES & ACTIVITIES DISRUPTING MEP SERVICES. CONFIRM THE REQUIREMENTS FOR PREMIUM TIME OR SPECIAL PROCEDURES WITH THE OWNER/LANDLORD AND INCLUDE THE COST IN BID PROPOSAL. WORK RELATED TO THE EXISTING BUILDING SHALL BE COORDINATED TO MINIMIZE INTERFERENCE OR INTERRUPTION OF NORMAL BUILDING USE BY OWNER. REFER TO ARCHITECTURAL PLANS FOR ANY PHASING REQUIREMENTS. ARRANGE FOR AND OBTAIN OWNER'S PERMISSION FOR ANY SERVICE SHUTDOWNS.

6. THE CONTRACTOR, BY SUBMITTING HIS BID PROPOSAL AGREES TO ACCEPT ALL EXISTING SITE CONDITIONS NOT SPECIFICALLY EXCEPTED. ALL EXCEPTIONS SHALL BE PROVIDED IN WRITING TO THE ARCHITECT AND ENGINEER.

7. PERFORM ROUTINE SERVICE INSPECTION OF ALL EXISTING HVAC UNITS TO BE REUSED FOR THIS PROJECT. LUBRICATE BEARINGS, SERVICE CONTROL SYSTEMS, REPLACE FAN BELTS AND INSTALL NEW FILTERS IN EACH UNIT. FIELD VERIFY REFRIGERANT CHARGE AND NOTIFY OWNER IF THE CHARGE IS LESS THAN MANUFACTURER'S SPECIFICATIONS. SUBMIT SERVICE REPORT TO OWNER/TENANT INDICATING CONDITION OF UNIT AND REPORT ANY MAJOR COMPONENT FAILURES OR MALFUNCTIONS. REPORT SHALL INCLUDE COST TO SERVICE ALL ITEMS ABOVE AND BEYOND THE ITEMS LISTED ABOVE. COST SHALL INCLUDE PARTS AND LABOR. EQUIPMENT SHALL BE PLACED IN FULL OPERATION WITH CONTROLS CALIBRATED UPON COMPLETION OF PROJECT.

C. DEMOLITION

1. DISCONNECT, DISASSEMBLE, CAP, PLUG AND REMOVE ALL MEP ELEMENTS (PIPING, DUCTS, ELECTRICAL DEVICES, WIRING, CONDUIT, EQUIPMENT, HANGERS, SUPPORTS, ETC.) INDICATED ON THE DRAWINGS OR NOT OTHERWISE REQUIRED FOR COMPLETED PRODUCT. NO MEP ELEMENTS ARE TO BE ABANDONED IN PLACE UNLESS SPECIFICALLY NOTED. NOT ALL ITEMS TO BE REMOVED ARE INDICATED ON DRAWING.

2. ALL OPENINGS ON PIPING AND DUCTS THAT REMAIN SHALL BE CAPPED AND PROPERLY SECURED. WIRING SHALL BE DISCONNECTED AT CIRCUIT BREAKERS AND REMOVED AND BREAKERS MARKED "SPARE." REMOVE AND RECLAIM ANY REFRIGERANT IN EXISTING SYSTEMS PRIOR TO DEMOLITION OF ANY EQUIPMENT ACCORDING TO FEDERAL REQUIREMENT.

3. ANY EQUIPMENT DESIGNATED BY OWNER TO BE SALVAGED SHALL BE PROTECTED AND DELIVERED TO AN OWNER DESIGNATED AREA ON SITE.

4. ALL ASBESTOS REMOVAL (IF REQUIRED) WILL BE HANDLED BY THE OWNER AND IS NOT A PART OF THIS WORK. IF MATERIALS SUSPECTED OF CONTAINING HAZARDOUS MATERIALS ARE ENCOUNTERED, DO NOT DISTURB; NOTIFY ARCHITECT AND OWNER IMMEDIATELY.

D. BASIS OF DESIGN AND SUBSTITUTIONS

1. WHEREVER THE WORDS "APPROVED BY", "APPROVED EQUAL", "AS DIRECTED" OR SIMILAR PHRASES ARE USED IN THE FOLLOWING SPECIFICATIONS, THEY SHALL BE UNDERSTOOD TO REFER TO THE ENGINEER AS THE APPROVING AGENCY. THE NAME OR MAKE OF ANY EQUIPMENT OR MATERIALS NAMED IN THE SPECIFICATION (WHETHER OR NOT THE WORDS "OR APPROVED EQUAL" ARE USED) SHALL BE KNOWN AS THE "STANDARD".

2. SUBMIT SHOP DRAWINGS FOR MECHANICAL EQUIPMENT, FIRE PROTECTION SYSTEMS, DUCTWORK, AND PLUMBING FIXTURES AND EQUIPMENT WITH ADEQUATE DETAILS AND SCALES TO CLEARLY SHOW CONSTRUCTION. INDICATE THE OPERATING CHARACTERISTICS FOR EACH REQUIRED ITEM. CLEARLY IDENTIFY EACH ITEM ON THE SUBMITTAL AS TO MARK, LOCATION AND USE, USING SAME IDENTIFICATION AS PROVIDED ON DESIGN DRAWINGS. SHOP DRAWINGS TO BE SUBMITTED INCLUDE BUT NOT LIMITED TO:
   - SHEETMETAL
   - DIFFUSERS, GRILLES & REGISTERS
   - FIRE DAMPERS
   - VALVES & PIPING
   - ALL EQUIPMENT

3. DUCTWORK AND FIRE PROTECTION DRAWINGS SHALL BE FULLY DIMENSIONED BASED ON FIELD VERIFIED BUILDING CLEARANCES AND ARCHITECTURAL CEILING LAYOUTS, AND INDICATE STRUCTURAL, LIGHTING, DUCTWORK AND PIPING AT ALL CRITICAL LOCATIONS.

4. CONTRACTOR SHALL REVIEW AND INDICATE HIS APPROVAL OF EACH SHOP DRAWING PRIOR TO SUBMITTAL FOR REVIEW. DO NOT START WORK OR FABRICATION UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED BY THE ENGINEER AND RETURNED TO THE CONTRACTOR.

5. SUBMITTALS WILL BE REVIEWED ONLY FOR GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS AND NOT FOR DIMENSIONS OR QUANTITIES. THE SUBMITTAL REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PURCHASE OF ANY ITEM IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS OR ITS COMPLETE AND PROPER INSTALLATION.

6. WHERE SUBMITTALS VARY FROM THE CONTRACT REQUIREMENTS, THE CONTRACTOR SHALL CLEARLY INDICATE ON SUBMITTAL OR ACCOMPANYING DOCUMENTS THE NATURE AND REASON FOR VARIATIONS.

7. EACH MANUFACTURER OR HIS REPRESENTATIVE MUST CHECK THE APPLICATION OF HIS EQUIPMENT AND CERTIFY AT TIME OF SHOP DRAWING SUBMITTAL THAT EQUIPMENT HAS BEEN PROPERLY APPLIED AND CAN BE INSTALLED, SERVICED AND MAINTAINED WHERE INDICATED ON DRAWINGS. ADVISE ENGINEER IN WRITING WITH SUBMITTAL DRAWINGS OF ANY POTENTIAL PROBLEMS. THE MANUFACTURER SHALL BE RESPONSIBLE FOR ANY CHANGES THAT MIGHT BE NECESSARY BECAUSE OF PHYSICAL CHARACTERISTICS OF EQUIPMENT THAT HAVE NOT BEEN CALLED TO THE ENGINEER'S ATTENTION AT THE TIME OF SUBMITTAL.

E. CUTTING, PATCHING AND DRILLING

1. ALL CUTTING AND PATCHING OF THE BUILDING CONSTRUCTION REQUIRED FOR THIS WORK SHALL BE BY THIS CONTRACTOR UNLESS SHOWN ON ARCHITECTURAL DRAWINGS AND CONFIRMED AS TO SIZE AND LOCATION PRIOR TO NEW CONSTRUCTION. CUTTING SHALL BE IN A NEAT AND WORKMANLIKE MANNER. NEATLY SAW CUT ALL RECTANGULAR OPENINGS, SET SLEEVE THROUGH OPENING, AND FINISH PATCH OR PROVIDE TRIM FLANGE AROUND OPENING. CORE DRILL AND SLEEVE ALL ROUND OPENINGS. DO NOT CUT ANY STRUCTURAL COMPONENTS WITHOUT ARCHITECT'S APPROVAL.

2. PATCH AND FINISH TO MATCH ADJACENT AREAS THAT HAVE BEEN CUT, DAMAGED OR MODIFIED AS A RESULT OF THE INSTALLATION OF THE MECHANICAL OR ELECTRICAL EQUIPMENT. FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER.

3. ALL CONTRACTORS SHALL CONFIRM WITH OWNER, PRIOR TO BID, TIMES AVAILABLE FOR NOISE PRODUCING WORK SUCH AS CUTTING AND CORE DRILLING OF FLOORS, WALLS, ETC., AS WELL AS TIMES FOR WORK WHICH REQUIRE ACCESS INTO ADJOINING TENANT SPACES. INCLUDE ANY PREMIUM TIME IN BID

4. EXACT LOCATION OF ROOFTOP EQUIPMENT SHALL BE APPROVED BY OWNER'S STRUCTURAL ENGINEER.

5. INFORMATION REGARDING REQUIRED PIPE OPENINGS IN WALLS, FLOORS, CHASES, ETC., AND CONCRETE EQUIPMENT PADS OR FOUNDATIONS SHALL BE GIVEN TO THE GENERAL CONTRACTOR BY THIS CONTRACTOR PRIOR TO THE CONSTRUCTION PERIOD. IF THIS CONTRACTOR FAILS TO COMPLY WITH THIS REQUEST, OR IF INCORRECT INFORMATION IS GIVEN, THE NECESSARY CUTTING AND PATCHING WILL BE PERFORMED BY THE GENERAL CONTRACTOR, AT THIS CONTRACTOR'S EXPENSE.

F. FIRESTOPPING

1. ALL SERVICES THAT PASS THRU FIRE OR SMOKE RATED PARTITIONS, WALLS, FLOORS, SHALL BE FIRESTOPPED. FIRE STOPPING RATING SHALL MATCH PARTITION RATING. ALL FIRE STOPPING SYSTEM SHALL MEET THE REQUIREMENTS OF ASTM E 814,UL 1479, AND BE FACTORY MUTUAL APPROVED.

2. ALL FIRESTOPPING AND/OR SMOKE STOPPING MATERIAL AND INSTALLATION SHALL BE AS MANUFACTURED BY HILTI OR APPROVED EQUAL.

G. ACCESS DOORS & PANELS

1. ACCESS DOORS SHALL BE PROVIDED IN WALLS AND CEILINGS WHERE REQUIRED TO PERMIT PROPER ACCESS TO VALVES AND ANY OTHER SUCH DEVICES WHICH REQUIRE MAINTENANCE OR SERVICE. DOORS PLACED IN WALLS, PARTITIONS OR OTHER FIRE-RATED CONSTRUCTION SHALL HAVE A LABEL SIGNIFYING THAT THE DOOR HAS THE SAME FIRE RATING AS THE FIRE-RATED CONSTRUCTION.

2. THIS CONTRACTOR SHALL FURNISH ACCESS PANELS TO THE GENERAL CONTRACTOR FOR INSTALLATION.

3. ACCESS PANELS SHALL BE CONSTRUCTED OF 14 GAUGE STEEL, WITH 16 GAUGE STEEL FRAMES. DOORS SHALL FINISH FLUSH WITH THE SURROUNDING SURFACE. FRAMES SHALL HAVE 3 INCH WIDE EXPANDED METAL FOR PLASTERED SURFACES AND PLAIN FLANGED TYPE FRAME FOR TILE, MASONRY OR GYPSUM BOARD SURFACES. DOORS AND FRAMES SHALL BE FURNISHED PRIME COATED. DOORS INSTALLED IN CERAMIC TILE OR OTHER NON-PAINTED SURFACES SHALL BE STAINLESS STEEL. HINGES SHALL BE CONCEALED SPRING TYPE, TO ALLOW DOORS TO BE OPENED 175 DEGREES. LOCKS SHALL BE FLUSH SCREWDRIVER TYPE WITH STEEL CAMS. ACCESS PANELS SHALL BE 16 INCHES BY 16 INCHES OR LARGER AS MAY BE REQUIRED FOR PROPER ACCESS TO THE DEVICE BEING SERVED.

4. ACCESS PANELS ARE NOT REQUIRED IN COMPLETELY ACCESSIBLE LIFT OUT TILE CEILINGS. CONTRACTOR SHALL REVIEW THE ROOM FINISH SCHEDULE ON THE ARCHITECTURAL DRAWINGS IN ORDER TO VERIFY THE NEED FOR ACCESS PANEL

H. PAINTING

1. IN FINISHED SPACES, PAINTING OF ALL MECHANICAL EQUIPMENT, APPARATUS, AND PIPING SHALL BE DONE BY THE PAINTING TRADE UNDER THE GENERAL CONTRACTOR SPECIFICATION, EXCEPT WHERE SPECIFIED TO BE DONE BY THE MECHANICAL CONTRACTOR.

I. TEMPORARY HEAT

1. THE COSTS OF TEMPORARY HEAT, INCLUDING UTILITY COSTS, SHALL BE AT THE EXPENSE OF THE HEATING TRADE (MECHANICAL CONTRACTOR). THE HEATING TRADE SHALL PROVIDE THE MEANS OF TEMPORARY HEAT. EXISTING HEATING EQUIPMENT AND SYSTEMS MAY NOT BE USED DURING CONSTRUCTION AS THE SYSTEMS SERVE OTHER OCCUPIED SPACES WITHIN THE BUILDING.

2. THE PERMANENT MECHANICAL SYSTEM SHALL NOT BE USED UNDER ANY EXCEPTIONS TO PROVIDE TEMPORARY HEATING, VENTILATING, EXHAUST OR AIR CONDITIONING UNTIL THE BUILDING IS CLEAN, WITHOUT ANY DUST OR DEBRIS THAT CAN ENTER THE MECHANICAL SYSTEM AND IS READY FOR OCCUPANCY. COVERING THE RETURN/EXHAUST AIR INLETS WITH FILTER MEDIA IS NOT AN ACCEPTABLE ALTERNATIVE TO HAVING AN ENCLOSED, DUST-FREE ENVIRONMENT FOR THE SYSTEMS TO OPERATE IN. IN NO EVENT SHALL THE MECHANICAL CONTRACTOR'S ONE YEAR WARRANTY BE SHORTENED BY THE USE OF PERMANENT EQUIPMENT FOR TEMPORARY HEAT.

J. RECORD DRAWINGS

1. EACH CONTRACTOR OR SUBCONTRACTOR SHALL KEEP ONE (1) COMPLETE SET OF THE CONTRACT WORKING DRAWINGS ON THE JOB SITE ON WHICH HE SHALL REGULARLY RECORD ANY DEVIATIONS OR CHANGES FROM SUCH CONTRACT DRAWINGS MADE DURING CONSTRUCTION.

2. THESE DRAWINGS SHALL RECORD THE LOCATION OF ALL CONCEALED EQUIPMENT, PIPING, ELECTRIC SERVICE, SEWERS, WASTES, VENTS, DUCTS, CONDUIT AND OTHER PIPING, BY MEASURED DIMENSIONS TO EACH SUCH ITEM FROM READILY IDENTIFIABLE AND ACCESSIBLE WALLS OR CORNERS OF THE BUILDING. PLANS ALSO SHALL SHOW INVERT ELEVATION OF SEWERS AND TOP ELEVATION OF ALL OTHER BELOW-GRADE LINES.

3. RECORD DRAWINGS SHALL BE KEPT CLEAN AND UNDAMAGED AND SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN RECORDING DEVIATIONS FROM WORKING DRAWINGS AND EXACT LOCATIONS OF CONCEALED WORK.

4. AFTER THE PROJECT IS COMPLETED, THESE SETS OF DRAWINGS SHALL BE DELIVERED TO THE ARCHITECT IN GOOD CONDITION, AS A PERMANENT RECORD OF THE INSTALLATION AS ACTUALLY CONSTRUCTED.

5. OCEAN CITY REQUIRES STAMPED AS-BUILT DRAWINGS PRIOR TO ISSUING A CERTIFICATE OF OCCUPANCY. PER THE MD STATE ATTORNEY'S OFFICE "UNDER THE CODE OF ETHICS GOVERNING PROFESSIONAL ENGINEERS, A PROFESSIONAL ENGINEER MAY NOT SIGN OR SEAL DRAWINGS UNLESS HE OR SHE PERSONALLY PREPARED THEM OR APPROVED THEM." THE CODE OF ETHICS DEFINES THE TERM "APPROVED" AS " (1) HAVING TECHNICAL KNOWLEDGE AND RESPONSIBLE CONTROL OVER THE CONTENT OF TECHNICAL SUBMISSIONS DURING THEIR PREPARATION AND (2) PERFORMING SUBSTANTIVE REVIEW AND HAVING AUTHORITY TO MAKE REVISIONS WITH REGARD TO THE PREPARATION OF SUBMISSIONS..." THEREFORE ALL SUBSTANTIVE CHANGES IN THE DESIGN OR INSTALLATION OF MEP SYSTEMS SHALL BE DISCUSSED AND APPROVED BY OUR OFFICE PRIOR TO INSTALLATION. IF THE CONTRACTOR FAILS TO DO SO OUR OFFICE WILL NOT STAMP THE AS-BUILT DRAWINGS FOR THE CERTIFICATE OF OCCUPANCY.

K. WARRANTY

1. FULLY WARRANT ALL MATERIALS, EQUIPMENT AND WORKMANSHIP FOR ONE (1) YEAR FROM DATE OF ACCEPTANCE. EXTEND ALL MANUFACTURER'S WARRANTIES TO OWNER, INCLUDING ALL EXTENDED WARRANTIES ON HVAC EQUIPMENT.

2. REPAIR OR REPLACE WITHOUT CHARGE TO THE OWNER ALL ITEMS FOUND DEFECTIVE DURING THE WARRANTY PERIOD. IN THE CASE OF REPLACEMENT OR REPAIR DUE TO FAILURE WITHIN THE WARRANTY PERIOD, THE WARRANTY ON THAT PORTION OF THE WORK SHALL BE EXTENDED FOR A MINIMUM PERIOD OF ONE (1) YEAR FROM THE DATE OF SUCH REPLACEMENT OR REPAIR.

DUCTWORK (233113)

1. FABRICATE AND ERECT ALL DUCTWORK TO ASHRAE AND SMACNA STANDARDS FROM G90 GALVANIZED STEEL. COMPLY WITH NFPA BULLETIN 90A REQUIREMENTS.

2. ALL RECTANGULAR TRANSFER DUCTWORK SHALL HAVE 1" THICK ACOUSTICAL LINER. LINER SHALL BE FLEXIBLE AND CONSTRUCTED OF GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. THE SURFACE OF THE LINER SHALL HAVE AN ANTIMICROBIAL EROSION RESISTANCE COATING TESTED BY NRTL AND REGISTERED BY THE EPA FOR USE IN HVAC SYSTEMS. MINIMUM R-VALUE SHALL BE 4.2.

3. GENERAL EXHAUST DUCTWORK UNDER 45' IN LENGTH SHALL HAVE A SMACNA 1" STATIC PRESSURE RATING WITH SEAL CLASS B SEAM AND JOINTS. EXHAUST DUCTWORK OVER 45' IN LENGTH SHALL HAVE A SMACNA 2" STATIC PRESSURE RATING WITH SEAL CLASS A SEAM AND JOINTS.

4. ALL FLEXIBLE DUCTWORK SHALL BEAR THE UL 181 LABEL (CLASS 1 AIR DUCT) AND SHALL BE FACTORY INSULATED (1-1/2 ", 0.6 LB., FIBERGLASS) ATCO UPC #076 I OR EQUAL. FLEXIBLE DUCTWORK SHALL COMPLY W/ NFPA 90A, AND NFPA 90B. ALL FLEXIBLE DUCTWORK CONNECTED TO DIFFUSERS SHALL NOT BE LESS THAN THE NECK SIZE OF THE DIFFUSER. MINIMUM FLEXIBLE DUCT BEND RADIUS OF CURVATURE SHALL BE 3 DUCT DIAMETERS, MAXIMUM LENGTH SHALL BE 6'-0", NO MORE THAN THE EQUIVALENT OF TWO (2) 90 DEGREE BENDS WILL BE ACCEPTABLE. FLEXIBLE DUCTS SHALL BE INDEPENDENTLY SUPPORTED FROM THE STRUCTURE AND CONNECTED WITH PLASTIC DRAW BANDS TIGHTENED WITH MANUFACTURER'S TOOL. FLEXIBLE DUCTS ARE NOT PERMITTED IN ROOMS WITHOUT CEILINGS.

5. INCLUDE ALL ACOUSTIC, DOUBLE RADIUS AIRFOIL SHAPED PERFORATED ALUMINUM TURNING VANES, MANUAL DAMPERS, FLEXIBLE CONNECTORS, GRILLES AND DIFFUSERS, ACOUSTIC LINING, AND OTHER SHEET METAL ACCESSORIES FOR THE PROJECT. VOLUME DAMPERS TO BE OF OPPOSED BLADE TYPE CONSTRUCTED IN ACCORDANCE WITH "SMACNA" STANDARDS.

6. ALL BRANCH CONNECTION FITTINGS IN RECTANGULAR DUCTWORK SHALL BE 45 DEGREE TRANSITION TYPE, CONICAL FITTINGS OR SPIN-IN FITTINGS. BUTT FITTINGS ARE NOT ACCEPTABLE.

7. PROVIDE FIRE DAMPERS WITH ACCESS DOORS AT ALL FIRE RATED WALLS, PARTITIONS AND CEILINGS. DAMPERS SHALL HAVE RATING EQUIVALENT TO BARRIER. DAMPER SHALL BE THE DYNAMIC TYPE AND SHALL BE ABLE TO CLOSE AGAINST AN AIRSTREAM. DAMPERS SHALL MEET ALL NFPA AND IBC REQUIREMENTS.

8. PROVIDE SMOKE DAMPERS WITH ACCESS DOORS AT ALL SMOKE BARRIERS/PARTITIONS. UNIT SHALL INCORPORATE BLADE END SWITCHES (OPEN AND CLOSED), AND OUTSIDE THE DUCT MOUNTED UL LISTED MOTOR. PROVIDE MANUFACTURER'S STANDARD U.L. LISTED OPEN- CLOSE - RESET SWITCH AND POSITION PILOT LIGHTS IN UNIT MOUNTED ENCLOSURE. ENCLOSURE TO BE CAPABLE OF BEING REMOVED FOR REMOTE MOUNTING TO ENSURE VISIBILITY AFTER SYSTEM INSTALLATION.

9. PROVIDE COMBINATION FIRE/SMOKE DAMPERS AT ALL FIRE/SMOKE RATED SHAFT AND WALL LOCATIONS. EACH COMBINATION FIRE SMOKE DAMPER SHALL HAVE 16 GA. GALVANIZED BLADES STRENGTHENED WITH GROOVES MEETING REQUIREMENTS OF UL STANDARD 555 & 555S AND HAVE AN 1-1/2 HOUR RATING. BASIS OF DESIGN SHALL BE GREENHECK MODEL FSD 200 SERIES. DAMPERS SHALL BE EQUIPPED STANDARD WITH AN ELECTRIC HEAT-RESPONSIVE DEVICE THAT PERFORMS THE SAME FUNCTION AS A FUSIBLE LINK TO CLOSE DAMPER AT 350 °F. PROVIDE POSITION INDICATING SWITCHES TO MEET REQUIREMENTS OF SMOKE PURGE CONTROL AND/OR BUILDING MANAGEMENT SYSTEM CONTROLS. THE DAMPER OPERATION AND CONSTRUCTION SHALL MEET UL REQUIREMENTS.

10. PROVIDE CURBS FOR ALL ROOF OPENINGS FOR DUCTS, FLUES, PIPING AND EQUIPMENT. CURBS SHALL BE FURNISHED AS ACCESSORIES TO THE EQUIPMENT OR 8" HIGH PATE OR EQUAL EQUIPMENT SUPPORTS SPANNING STRUCTURE AND FLASHED INTO ROOFING. ALL CUTTING, FLASHING, AND PATCHING OF ROOF SHALL BE BY OWNER'S ROOFING CONTRACTOR AND PAID FOR BY MECHANICAL CONTRACTOR.

11. PROVIDE BIG FOOT H FRAME SETS SUPPORT SYSTEM OR SIMILAR FOR ALL ROOFTOP DUCTWORK. SPACING SHALL BE PER SMACNA GUIDELINES.

12. INSTALL OUTSIDE AIR AND EXHAUST/FLUE FOR WATER HEATER(S)/FURNACE(S) TO EXTERIOR WITH CODE APPROVED MATERIAL. COMPLY WITH ALL MANUFACTURER REQUIREMENTS. INSULATE VENTS THROUGH UNCONDITIONED SPACE(S) WITH 1/2"

STATE OF MARYLAND
TIMOTHY R. CHATTERTON
No. 51406
PROFESSIONAL ENGINEER

LICENSE NUMBER: 51406
EXPIRATION DATE: 08/10/2025
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

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DATE	COMMENTS
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05/07/2025	90% Construction Documentation
07/16/2025	100% Construction Documentation
07/29/2025	Issued for Permit

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Dwn.By:	ZCIO
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MECHANICAL SPECIFICATIONS

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FIBERGLASS INSULATION.

DUCTWORK EXTERNAL INSULATION & PIPE INSULATION (230713, 230719)

1. INSULATE DUCTWORK AS DESCRIBED IN DUCTWORK INSULATION SCHEDULE. FIBERGLASS DUCT WRAP SHALL BE FULLY SECURED TO DUCT. LAP AND TAPE SEAMS AND SECURE TIGHTLY TO THE DUCTS WITH WIRE OR STICK PINS.
2. DO NOT INSULATE:
   a. MAKE-UP AIR DUCTWORK OPERATING AT SURROUNDING AMBIENT CONDITIONS.
   b. RETURN AND EXHAUST AIR DUCTWORK LOCATED WITHIN THE BUILDING ENVELOPE (EXCEPT DUCTWORK WITHIN 10' OF BUILDING ENVELOPE PENETRATIONS).
   c. TRANSFER AIR DUCTWORK (ACOUSTICALLY LINE DUCT, CLEAR INSIDE DIMENSIONS SHOWN ON PLANS)
   d. EXPOSED SUPPLY DUCTWORK LOCATED IN CONDITIONED SPACE. (DOES NOT INCLUDE RETURN AIR PLENUM)
   e. PHENOLIC DUCTWORK
3. INTERNAL DUCT INSULATION -- DUCTWORK INDICATED TO HAVE INTERNAL INSULATION SHALL BE INTERNALLY COVERED WITH INSULATION SUITABLE TO MEET R-VALUES LISTED IN INSULATION SCHEDULE. INSULATION SHALL BE MANUFACTURED FROM A ROTARY PROCESS WITH A NON-WOVEN HYDROPHOBIC FACING. INSULATION SHALL HAVE FLAME/SMOKE RATING OF 25/50. INSULATION SHALL WITHSTAND DUCT VELOCITIES OF 4000 FPM MINIMUM. DUCT SIZES SHOWN ON DRAWINGS ARE CLEAR INTERNAL DIMENSIONS. WHERE LINER IS USED, INCREASE OUTSIDE DIMENSIONS OF DUCT TO MAINTAIN INTERNAL DIMENSIONS. INSTALL LINER PER SMACNA OR NAIMA STANDARDS. PROVIDE INTERNAL DUCT INSULATION 15' (MIN.) IN ALL SUPPLY AND RETURN AIR DUCTS FROM EQUIPMENT, DELIVERING TEMPERED AIR.
4. ALL INSULATION TO BE APPLIED IN FULL ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ALL INSULATION SHALL COMPLY WITH 25/50 FLAME AND SMOKE HAZARD RATINGS PER ASTM E-84, NFPA 255 AND UL 723.
5. PROVIDE REMOVABLE INSULATION SECTIONS TO COVER PARTS OF EQUIPMENT WHICH MUST BE OPENED PERIODICALLY FOR MAINTENANCE; INCLUDE METAL VESSEL COVERS, FASTENERS, FLANGES, CHILLED WATER PUMPS, FRAMES AND ACCESSORIES.
6. REPLACE DAMAGED INSULATION WHICH CANNOT BE REPAIRED SATISFACTORILY, INCLUDING UNITS WITH VAPOR BARRIER DAMAGE AND MOISTURE SATURATED UNITS.
7. CONDENSATE DRAIN PIPING IN RETURN AIR RATED PLENUMS SHALL BE TYPE L COPPER WITH 1/2" FIBERGLASS INSULATION (MIN. R-VALUE = 3). SCHEDULE 40 PVC WITHOUT INSULATION MAY BE USED IN ALL OTHER LOCATIONS.

EQUIPMENT (235000)

1. MAKE ALL FINAL EQUIPMENT CONNECTIONS AND PROVIDE THE NECESSARY ADAPTORS, FITTINGS, VALVES, DEVICES, ETC. FOR A COMPLETE AND OPERABLE SYSTEM. PROVIDE COMPLETE WITH BASES, ISOLATORS, SUPPORTS AND OTHER REQUIRED ACCESSORIES.
2. EQUIPMENT SHALL BE INSTALLED IN FULL ACCORDANCE WITH THE MANUFACTURER'S DATA AND INSTALLATION INSTRUCTIONS, INCLUDING CLEARANCES; LUBRICATE AND ADJUST AS REQUIRED. IT IS THIS CONTRACTOR'S RESPONSIBILITY TO CHECK AND CONFORM TO THESE REQUIREMENTS PRIOR TO STARTING WORK. FURNISH AND INSTALL CLEAN SET OF FILTERS PRIOR TO BALANCING.
3. THE CONTRACTOR SHALL COORDINATE ELECTRICAL CHARACTERISTICS OF ALL MECHANICAL EQUIPMENT PRIOR TO ORDERING OF EQUIPMENT. COORDINATE REQUIREMENT FOR PROVISION OF MOTOR STARTERS, DISCONNECTS, CONTACTORS, CONTROL WIRING, ETC. AS REQUIRED FOR PROPER FUNCTIONING SYSTEM WITH ELECTRICAL CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR LACK OF CONTRACTOR COORDINATION OF ELECTRICAL CHARACTERISTICS.
4. ALL EQUIPMENT SHALL BE MOUNTED ON VIBRATION ISOLATORS TO PREVENT THE TRANSMISSION OF VIBRATION AND MECHANICALLY TRANSMITTED SOUND TO THE BUILDING STRUCTURE.
5. ISOLATION EQUIPMENT SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER, AND SHALL BE DESIGNED SPECIFICALLY FOR THE APPLICATION REQUIRED. THIS INCLUDES, BUT IS NOT LIMITED TO, PIPING DUCTWORK, PUMPS, COMPRESSORS. VIBRATION ISOLATORS SHALL BE RATED FOR THE WEIGHT AND SPACING REQUIRED FOR THE EQUIPMENT REQUIRING ISOLATION.

CONTROLS (230910)

1. PROVIDE COMPLETE TEMPERATURE CONTROLS FOR ALL HVAC SYSTEMS. PROVIDE NEW CONTROL DEVICES INCLUDING DAMPER OPERATORS, TEMPERATURE SENSORS, STAGING RELAYS AND OTHER REQUIRED DEVICES TO PROVIDE A COMPLETE OPERATIONAL SYSTEM PER THE FOLLOWING OPERATING SEQUENCE. MOUNT ALL CONTROLS FURNISHED AS ACCESSORIES TO EQUIPMENT AND PROVIDE ALL CONTROL WIRING REQUIRED FOR PROPER OPERATION WHERE NOT SPECIFICALLY SHOWN ON ELECTRICAL PLANS. ALL WIRING SHALL BE IN CONDUIT OR PER N.E.C. AND LOCAL CODE REQUIREMENTS. STANDARD MOUNTING HEIGHT TO TOP OF THERMOSTAT IS 48" ABOVE FINISHED FLOOR OR AS INDICATED ON THE ARCHITECTURAL DRAWINGS. DO NOT INSTALL THERMOSTATS NEAR DIMMER SWITCHES. WIRING OF ALL MOTORIZED OPERATORS AND THERMOSTATS (REGARDLESS OF VOLTAGE) ARE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.
2. THE CONTRACTOR SHALL FURNISH AND INSTALL A COMPLETE, WEB-BASED, NATIVE BACNET-INTEGRATED BUILDING AUTOMATION SYSTEM (BAS) INCLUDING ALL NECESSARY HARDWARE, ALL OPERATING AND APPLICATIONS SOFTWARE NECESSARY TO PERFORM THE HVAC CONTROL SEQUENCES OF OPERATION AS CALLED FOR IN THIS SPECIFICATION OR AS SHOWN ON THE DRAWINGS. BAS CONTRACTOR SHALL FURNISH AND INSTALL ALL RELATED SOFTWARE AND HVAC-DDC CONTROLS AS SPECIFIED WITHIN THIS SPECIFICATION. IT SHALL BE THE RESPONSIBILITY OF THE BAS CONTRACTOR TO COORDINATE THIS WORK WITH THE GENERAL CONTRACTOR, MECHANICAL CONTRACTOR, AND THE ELECTRICAL CONTRACTOR AS IT RELATES TO THE INSTALLATION AND WIRING OF ALL RELATED HVAC SYSTEMS.
3. IT SHALL BE THE RESPONSIBILITY OF THE BAS CONTRACTOR TO PROVIDE ALL THE REQUIRED LABOR AND PROGRAMMING TO SEAMLESSLY INTEGRATE THE NEW BAS BACNET SYSTEM AND ITS DDC POINTS, GRAPHICS, ALARMS, ETC. INTO AN EXISTING BAS IF PRESENT.
4. THE CONTROLS CONTRACTOR SHALL WARRANT THE SYSTEM FOR 24 MONTHS AFTER SUBSTANTIAL COMPLETION. DURING THE WARRANTY PERIOD, THE BUILDING SYSTEM CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY REVISIONS TO THE SOFTWARE AS REQUIRED TO PROVIDE A COMPLETE AND WORKABLE SYSTEM CONSISTENT WITH THE LETTER AND INTENT OF THE SEQUENCE OF OPERATION SECTION OF THE SPECIFICATION.
5. THE FOLLOWING ARE THE APPROVED BAS MANUFACTURERS:
   PRITCHETT CONTROLS
   SIEMENS CONTROLS
   TRANE CONTROLS
   OR PRE-APPROVED EQUAL.
6. THE CONTROL SYSTEM SHALL BE PROGRAMMED WITH THE FOLLOWING SEQUENCES AND FEATURES:
   a. UNOCCUPIED HEAT: THE SYSTEM SHALL USE THE BASEBOARD HEAT AS THE PRIMARY SOURCE OF HEAT DURING UNOCCUPIED PERIODS. IF THE BASEBOARD IS NOT ABLE TO MAINTAIN TEMPERATURE, THEN THE VAV FAN WITH THE HEAT VALVE 100% OPEN SHALL CYCLE TO PROVIDE ADDITIONAL HEAT IN THE SPACES.
   b. MORNING WARM UP: BEFORE THE OCCUPIED PERIOD BEGINS, THE SYSTEM SHALL USE THE BASEBOARD HEAT TO BRING THE CONNECTED SPACES UP TO OCCUPIED TEMPERATURE. IF THE BASEBOARD CANNOT BRING THE SPACE UP TO SETPOINT WITHIN AN HOUR, THEN UTILIZE THE VAV BOXES TO ASSIST. THE VAV BOXES SHALL USE THEIR FANS AND HW COILS WITH THE PRIMARY AIR DAMPER CLOSED TO ADD HEAT NEEDED IN THE SPACES.
   c. SUPPLY FAN PRESSURE RESET: THE CONTROL SYSTEM SHALL MONITOR ALL DAMPER POSITIONS THAT ARE CONNECTED TO THE AHU SUPPLY FAN. THE SUPPLY AIR PRESSURE SETPOINT SHALL BE REDUCED IF NONE OF THE DAMPERS ARE OPEN 95% OR GREATER.
   d. SUPPLY TEMPERATURE RESET: THE CONTROL SYSTEM SHALL MONITOR ALL DAMPER POSITIONS THAT ARE CONNECTED TO A PARTICULAR UNIT'S SUPPLY FAN. THE SUPPLY AIR TEMPERATURE SHALL BE RESET HIGHER IF THE RETURN AIR RELATIVE HUMIDITY IS BELOW 40% AND NONE OF THE VAV DAMPER POSITIONS ARE OPEN 95% OR GREATER.
   e. ECONOMIZER: THE CONTROL SYSTEM SHALL MONITOR THE ECONOMIZER OPERATION AND THE RELEVANT SENSORS FOR THE AHU. THE AHU SHALL CONTROL THE DAMPER POSITION AS DESIGNED FROM THE FACTORY. THE CONTROL SYSTEM SHALL MONITOR THE DAMPER POSITION AND THE OTHER SENSORS THAT ARE INTEGRATED INTO ECONOMIZER OPERATION.

IDENTIFICATION (230593)

1. CONTRACTOR SHALL PROVIDE IDENTIFICATION LABELS, TAGS, ETC. AS INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN.THE IDENTIFICATION SHALL BE IN ACCORDANCE WITH ANSI STANDARD A13.1. PRESSURE SENSITIVE MARKERS SHALL BE MANUFACTURED BY THE BRADY CO., OR APPROVED EQUAL. MARKERS SHALL BE MANUFACTURER'S STANDARD PRODUCT. PRESSURE SENSITIVE PIPE MARKERS SHALL BE MANUFACTURED BY THE BRADY CO., OR APPROVED EQUAL. PIPE MARKERS SHALL BE MANUFACTURER'S STANDARD PRODUCT.

1.1. EQUIPMENT, THERMOSTATS AND CONTROL PANEL LABELS

1.1.1. MATERIAL AND THICKNESS: MULTI-LAYER, MULTI-COLOR, PLASTIC LABELS FOR MECHANICAL ENGRAVING, 1/16 INCH THICK, WITH PREDRILLED HOLES FOR ATTACHMENT HARDWARE.

1.1.2. MINIMUM LABEL SIZE: LENGTH AND WIDTH VARY FOR REQUIRED LABEL CONTENT, BUT NOT LESS THAN 2-1/2 BY 3/4 INCH.

1.1.3. MINIMUM LETTER SIZE: 1/4 INCH FOR NAME OF UNITS IF VIEWING DISTANCE IS LESS THAN 24 INCHES, 1/2 INCH FOR VIEWING DISTANCES OF UP TO 72 INCHES, AND PROPORTIONATELY LARGER LETTERING FOR GREATER VIEWING DISTANCES. INCLUDE SECONDARY LETTERING TWO-THIRDS TO THREE-FOURTHS THE SIZE OF PRINCIPAL LETTERING.

1.1.4. FASTENERS: STAINLESS STEEL RIVETS OR SELF-TAPPING SCREWS.

1.2. DUCT LABELS

1.2.1. MATERIAL AND THICKNESS: MULTI-LAYER, MULTI-COLOR, PLASTIC LABELS FOR MECHANICAL ENGRAVING, 1/16 INCH THICK, AND HAVING PREDRILLED HOLES FOR ATTACHMENT HARDWARE.

1.2.2. MAXIMUM TEMPERATURE: ABLE TO WITHSTAND TEMPERATURES UP TO 160 DEG F.

1.2.3. MINIMUM LABEL SIZE: LENGTH AND WIDTH VARY FOR REQUIRED LABEL CONTENT, BUT NOT LESS THAN 2-1/2 BY 3/4 INCH.

1.2.4. MINIMUM LETTER SIZE: 1/4 INCH FOR NAME OF UNITS IF VIEWING DISTANCE IS LESS THAN 24 INCHES, 1/2 INCH FOR VIEWING DISTANCES OF UP TO 72 INCHES, AND PROPORTIONATELY LARGER LETTERING FOR GREATER VIEWING DISTANCES. INCLUDE SECONDARY LETTERING TWO-THIRDS TO THREE-FOURTHS THE SIZE OF PRINCIPAL LETTERING.

1.2.5. FASTENERS: STAINLESS STEEL RIVETS OR SELF-TAPPING SCREWS.

1.2.6. ADHESIVE: CONTACT-TYPE PERMANENT ADHESIVE, COMPATIBLE WITH LABEL AND WITH SUBSTRATE.

1.2.7. DUCT LABEL CONTENTS: INCLUDE IDENTIFICATION OF DUCT SERVICE USING SAME DESIGNATIONS OR ABBREVIATIONS AS USED ON DRAWINGS. ALSO INCLUDE THE FOLLOWING:

1.2.7.1. DUCT SIZE.

1.2.7.2. FLOW-DIRECTION ARROWS: INCLUDE FLOW-DIRECTION ARROWS ON DISTRIBUTION DUCTS. ARROWS MAY BE EITHER INTEGRAL WITH LABEL OR MAY BE APPLIED SEPARATELY.

DISCONNECT SWITCHES (230514)

1. THIS CONTRACTOR SHALL FURNISH ALL SAFETY DISCONNECT SWITCHES (FUSED AND NON-FUSED) REQUIRED FOR EQUIPMENT FURNISHED UNDER THIS CONTRACT. IN ADDITION, THIS CONTRACTOR SHALL FURNISH A SAFETY DISCONNECT SWITCH FOR ALL MOTORS AND EQUIPMENT WHICH DO NOT HAVE COMBINATION STARTERS OR INTEGRAL DISCONNECTING MEANS. FUSIBLE DISCONNECT SWITCHES SHALL BE PROVIDED FOR ALL EQUIPMENT RATED FOR USE ONLY WITH FUSES (SUCH AS CONDENSING UNITS, COMPRESSORS, ETC.). SUCH SWITCHES SHALL BE ONE, TWO OR THREE POLE TYPE, WITH SOLID NEUTRAL FOR 4 WIRE SERVICE, AND SHALL HAVE THE PROPER CURRENT AND VOLTAGE RATING AS REQUIRED. INSTALLATION OF ALL DISCONNECT SWITCHES SHALL BE BY THE ELECTRICAL CONTRACTOR.
2. ALL SAFETY SWITCHES SHALL BE NEMA HEAVY DUTY TYPE AND SHALL CARRY THE UNDERWRITERS' LABORATORIES LABEL. FUSIBLE SWITCHES SHALL INCORPORATE CLASS "R" FUSE REJECTION FEATURE AND SHALL BE BRACED TO WITHSTAND 200,000 AMPERE RMS SYMMETRICAL FAULT CURRENT. SAFETY SWITCHES SHALL CONFORM TO FEDERAL SPECIFICATION W-S-865.
3. PROVIDE HEAVY-DUTY TYPE, SHEET ENCLOSED, SAFETY SWITCHES. THE TYPE, SIZE, AND RATING SHALL BE AS INDICATED ON THE DRAWINGS OR AS REQUIRED BY THE MOTOR OR EQUIPMENT SERVED. THE ENCLOSURE FOR DISCONNECT SWITCHES SHALL BE NEMA TYPE 1 FOR INDOOR USE, NEMA TYPE 4X FOR OUTDOOR USE AND NEMA TYPE 7 FOR EXPLOSION PROOF USE. DISCONNECTS SHALL BE MANUFACTURED BY ALLEN-BRADLEY, GENERAL ELECTRIC, CUTLER-HAMMER APPROVED EQUAL.
4. SWITCHES SHALL INCORPORATE QUICK-MAKE, QUICK-BREAK OPERATING HANDLES. THE MECHANISM SHALL BE AN INTEGRAL PART OF THE BOX, NOT THE COVER, AND SWITCHES SHALL HAVE A COVER INTERLOCK TO PREVENT UNAUTHORIZED OPENING OF THE SWITCH DOOR IN THE ON POSITION OR CLOSING OF THE SWITCH MECHANISM WITH THE DOOR OPEN. CURRENT CARRYING PARTS SHALL BE CONSTRUCTED OF HIGH-CONDUCTIVITY COPPER WITH SILVER-TUNGSTEN TYPE SWITCH CONTACT.
5. FUSE CLIPS SHALL BE POSITIVE PRESSURE TYPE REINFORCED FUSE CLIPS.
6. THE ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL AND CONNECT ALL POWER WIRING TO ALL MECHANICAL CONTRACTOR FURNISHED EQUIPMENT. THE MECHANICAL CONTRACTOR SHALL FURNISH, INSTALL AND CONNECT ALL CONTROL WIRING TO ALL FURNISHED EQUIPMENT, INCLUDING CONTROL DEVICES, STARTERS AND INTEGRAL DISCONNECT SWITCHES OF CONTRACTOR FURNISHED EQUIPMENT.

CHECK, TEST, START, ADJUST, BALANCE AND INSTRUCTIONS (230593)

1. AFTER INSTALLATION, CHECK ALL EQUIPMENT, AND PERFORM START UP IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
2. ALL PIPING SHALL BE TESTED AND FREE OF LEAKS.
3. CONCEALED OR INSULATED WORK SHALL REMAIN UNCOVERED UNTIL REQUIRED TESTS HAVE BEEN COMPLETED, BUT IF CONSTRUCTION SCHEDULE REQUIRES IT, ARRANGE FOR PRIOR TESTS ON PARTS OF SYSTEM AS APPROVED BY THE TENANT.
4. BALANCE ALL SYSTEMS, CALIBRATE CONTROLS, CHECK FOR PROPER OPERATION AND SEQUENCE UNDER ALL CONDITIONS AND MAKE ALL NECESSARY ADJUSTMENTS.
5. AFTER INSTALLATION AND EQUIPMENT IS PLACED IN OPERATION, HVAC CONTRACTOR IS RESPONSIBLE FOR BALANCING SYSTEMS. BALANCING SHALL BE PERFORMED BY AN INDEPENDENT AABC CERTIFIED CONTRACTOR.
6. ADJUST AND BALANCE THE AIR SYSTEMS BEFORE REFRIGERANT SYSTEMS. TESTING AND BALANCING SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT AABC NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE. GPM'S SHALL BE BALANCED WITHIN 10% OF DESIGN. AFTER ALL AIR SYSTEMS ARE INSTALLED, EACH SUPPLY AIR OUTLET SHALL BE AIR BALANCED TO WITHIN 10% OF THE CFM SHOWN WITH AIR PATTERNS SET AS INDICATED ON DRAWINGS (OR WITHIN 10 CFM WHEN BELOW 100 CFM). FAN RPMS AND ZONE DAMPERS SHALL BE ADJUSTED AND SHEAVES SHALL BE REPLACED AS REQUIRED TO ACHIEVE AIR BALANCE. ALL ZONES OR PORTIONS THEREOF SERVING OTHER SPACES AND WHICH MAY BE AFFECTED BY THE PROJECT SHALL BE TRAVERSED PRIOR TO CONSTRUCTION. THE FINAL AIR BALANCE SHALL RESTORE THESE AIR QUANTITIES. BEFORE AND AFTER AIR QUANTITIES SHALL BE LISTED IN THE AIR BALANCE REPORT
7. SHOULD THE AIR BALANCE REPORT INDICATE UNACCEPTABLE DUCT LEAKAGE, AS DETERMINED BY THE ENGINEER, THEN DUCT LEAKAGE TEST SHALL BE PERFORMED IN ACCORDANCE WITH AABC STANDARDS. DUCT SHALL BE RESEALED AND/OR REPAIRED AS REQUIRED TO MEET DESIGN REQUIREMENTS. ALL, OR PORTIONS OF THE SYSTEM SHALL BE REBALANCED AS REQUIRED UNTIL ALL SYSTEMS ARE WITHIN THE PERFORMANCE STANDARDS LISTED ABOVE.
8. CLEAN ALL MECHANICAL EQUIPMENT AND DUCTWORK OF ALL CONSTRUCTION DUST AT PROJECT COMPLETION. REPLACE ALL FILTERS PRIOR TO AIR BALANCING. PROVIDE ONE SPARE SET OF FILTERS FOR EACH PIECE OF EQUIPMENT TO THE OWNER.
9. START UP AND PLACE ALL SYSTEMS IN OPERATION AND TAG ALL SWITCHES AND CONTROLS WITH PERMANENT LABELS.
10. PROVIDE OWNER TRAINING AND DEMONSTRATION OF ALL MECHANICAL SYSTEMS AND EQUIPMENT. INSTRUCT OWNER ON PROPER OPERATION AND PREVENTATIVE MAINTENANCE OF SYSTEM. SUBMIT OPERATING AND MAINTENANCE MANUAL ON ALL EQUIPMENT AND SYSTEMS.

MISCELLANEOUS EQUIPMENT SPECIFICATIONS

PERFORATED FACE DIFFUSER - TITUS MODEL PSS OR APPROVED EQUAL. 24" X 24" FACE OR 12" X 12" (AS APPLICABLE OR AS SHOWN ON DRAWINGS), STEEL CONSTRUCTION, WHITE FINISH, FLUSH FACE, LAY IN BORDER, STAR PATTERN. PROVIDE SURFACE MOUNT BORDER FOR INSTALLATION IN DRYWALL CEILING. ROUND NECK. SEE SCHEDULE FOR NECK AND FLEX DUCT SIZE.

PERFORATED FACE CEILING RETURN AIR GRILLES - TITUS MODEL PAR OR APPROVED EQUAL. 24" X 24" FACE, STEEL CONSTRUCTION, WHITE FINISH, FLUSH FACE, LAY-IN BORDER (TYPICAL). PROVIDE SURFACE MOUNT BORDER FOR INSTALLATIONS IN DRYWALL CEILING. SEE SCHEDULE FOR REQUIRED NECK SIZE ON DUCTED APPLICATIONS.

RETURN / TRANSFER GRILLES - TITUS MODEL 350 FL OR APPROVED EQUAL. ALUMINUM CONSTRUCTION, BLADES SHALL HAVE 3/4" SPACING & 35° FIXED DEFLECTION. GRILLES SHALL BE FIELD PAINTABLE IN COLOR SELECTED BY ARCHITECT.

LOUVERED DOOR GRILLES - TITUS MODEL T-700L OR APPROVED EQUAL. STEEL CONSTRUCTION, SIGHT PROOF, 20 GAUGE STEEL BLADES, BLADES PARALLEL TO THE LONG DIMENSION. LOUVER SHALL HAVE A MINIMUM 2.0 SQUARE FOOT OF FREE AREA.

TORK TIME CLOCK INFO:
MODEL E101 OR APPROVED EQUAL. SET TO OWNERS OCCUPIED SCHEDULE.

CONDENSATE PUMP:
LITTLE GIANT, OR APPROVED EQUAL MODEL VCMA PRO SERIES, 120/1φ. 1.5 AMPS WITH STAINLESS STEEL MOTOR SHAFT, AUTO START/STOP, OVERFLOW DETECTION (WIRED TO SHUT DOWN UNIT UPON ACTIVATION), ANTI-SWEAT SLEEVE, CHECK VALVE, POWER CABLE AND 3 YEAR WARRANTY, OR APPROVED EQUAL.

LICENSE NUMBER: 51406
EXPIRATION DATE: 08/10/2025
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

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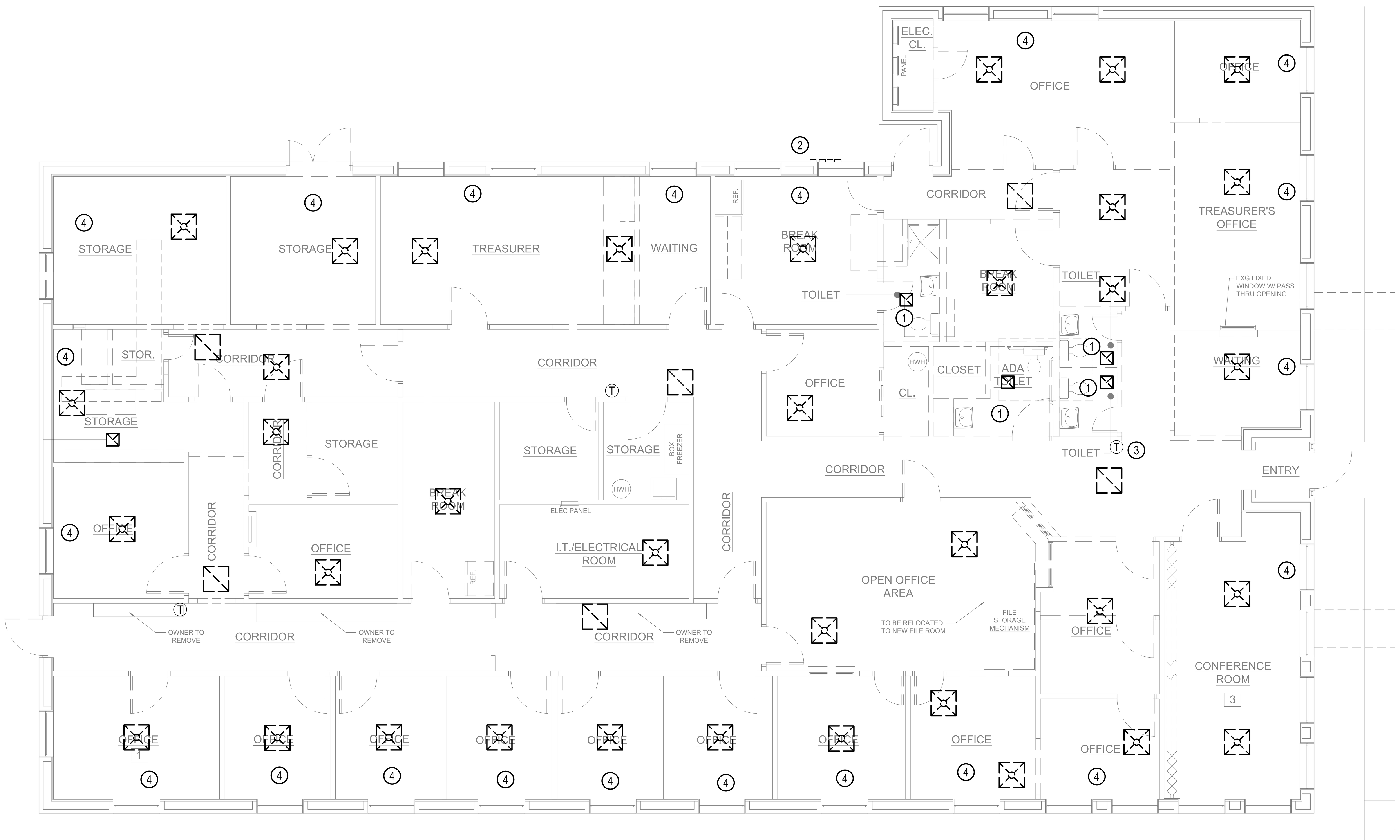
MECHANICAL SPECIFICATIONS

Allen + Shariff
MEP Engineering
Project Management

Dwg.No.: M-003

ALLEN + SHARIFF JOB #: 2431096



1 M-101 MECHANICAL DEMO PLAN

3/16" = 1'-0"

PRE-DEMOLITION AIR FLOW TESTING

1. TEST AND RECORD ALL AIR DEVICES WITHIN THE SCOPE OF WORK AREA, PRIOR TO DEMOLITION, TO CREATE A BASE-LINE AIR FLOW REQUIREMENT. SUBMIT RESULTS IN WRITING, TO THE ENGINEER, FOR EVALUATION AND USE IN FINAL TESTING AND BALANCING REQUIREMENTS.
2. ALL ZONE OR PORTIONS THEREOF SERVING OTHER SPACES AND WHICH MAY BE AFFECTED BY THE PROJECT SHALL BE TRAVERSED PRIOR TO CONSTRUCTION.

MECHANICAL GENERAL NOTES:

1. EXISTING CONDITIONS SHOWN ON THIS DRAWING HAVE BEEN OBTAINED FROM FIELD OBSERVATIONS, EXISTING DRAWINGS AND PHOTOS, AND MAY NOT INDICATE ALL ACTUAL EXISTING CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL EXISTING CONDITIONS PRIOR TO FABRICATION OR PERFORMANCE OF ANY WORK. SHOULD CONDITIONS BE DISCOVERED THAT PREVENT EXECUTION OF THE WORK AS INDICATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND ARCHITECT IN WRITING AND AWAIT DIRECTION BEFORE PROCEEDING WITH THE WORK.
2. PATCH ALL WALL, FLOOR, CEILING AND ROOF SURFACES SCHEDULED TO REMAIN, WHERE MEP ELEMENTS ARE BEING REMOVED, TO MATCH EXISTING CONDITIONS. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
3. MC SHALL VERIFY EXISTING CONDITIONS AND LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, AND STRUCTURE IN FIELD PRIOR TO BID. MC SHALL VERIFY EQUIPMENT IS IN GOOD WORKING ORDER AND THAT ANY COMPONENTS OF EQUIPMENT THAT REQUIRE REPLACEMENT ARE REPLACED PRIOR TO RE-INSTALLATION.
4. ALL EXISTING GRDs TO BE DEMOED AND REPLACED WITH NEW. EXISTING DUCT RUNNOUTS TO REAMAIN UNLESS NOTED OTHERWISE. EXTEND/MODIFY DUCTWORK AS NECCESSARY TO ACCOMODATE NEW LOCATIONS. SEE M-201 FOR MORE DETAILS.
5. ALL MECHANICAL EQUIPMENT, SENSORS AND DAMPERS LOCATED ABOVE HARD CEILINGS OR WITHIN WALLS SHALL BE PROVIDED WITH ACCESS PANELS SIZED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION REQUIREMENTS AND SUCH THAT THE FULL REMOVAL OF THE EQUIPMENT AND/OR DAMPER IS POSSIBLE. PROVIDE RATED ACCESS PANELS FOR ALL ACCESS PANELS LOCATED WITHIN RATED CEILINGS OR WALLS. ACCESS DOORS SHALL BE TAMPER AND VANDAL PROOF.

MECHANICAL KEY NOTES: (#)

1. DEMO EXISTING EXHAUST FAN AND ASSOCIATED POWER AND CONTROLS. EXISTING DUCTWORK TO REMAIN. SEE M-201 FOR MORE DETAILS.
2. EXISTING EXHAUST WALL CAPS. CONTRACTOR TO INSPECT TERMINATIONS, NOTIFY THE E.O.R OF ANY CONCERNS.
3. RELOCATE EXISTING THERMOSTAT. SEE NEW WORK PLANS FOR MORE INFORMATION.
4. REMOVE ALL EXISTING BASEBOARD HEAT, WIRING AND CONTROLS.

GRAPHIC SCALE 3/16" = 1'-0"

LICENSE NUMBER: 51406
EXPIRATION DATE: 08/10/2025
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

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ISLE OF WIGHT RENOVATION
WORCESTER CO HEALTH DEPARTMENT
13070 ST. MARTINS NECK ROAD; BISHOPVILLE, MD 21813

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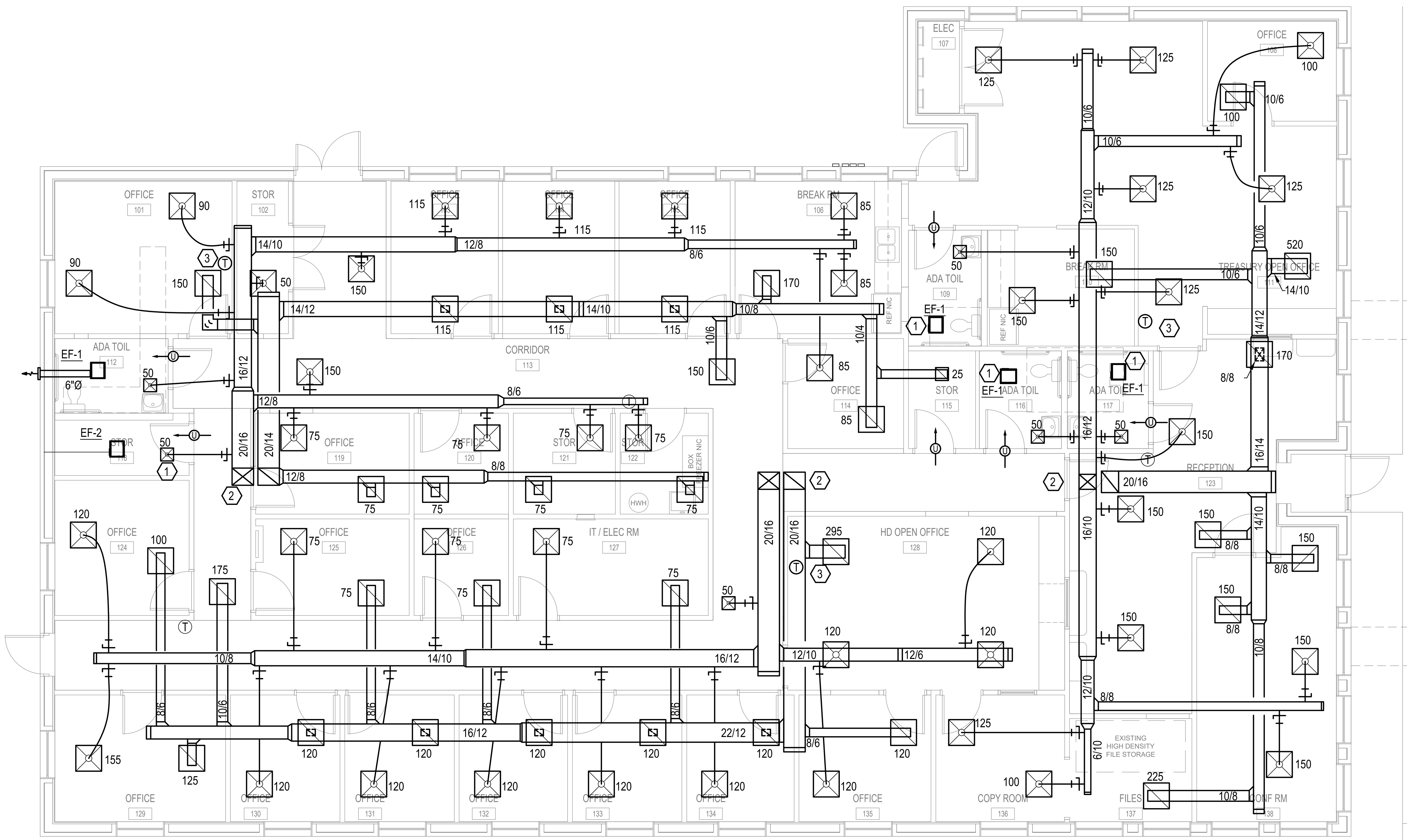
MECHANICAL DEMO PLAN

Allen + Shariff
MEP Engineering
Project Management

Dwg.No.: M-101

ALLEN + SHARIFF JOB #: 2431096



1 MECHANICAL FLOOR PLAN
M-201 3/16" = 1'-0"

MECHANICAL GENERAL NOTES:

1. EXISTING CONDITIONS SHOWN ON THIS DRAWING HAVE BEEN OBTAINED FROM FIELD OBSERVATIONS, EXISTING DRAWINGS AND PHOTOS, AND MAY NOT INDICATE ALL ACTUAL EXISTING CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL EXISTING CONDITIONS PRIOR TO FABRICATION OR PERFORMANCE OF ANY WORK. SHOULD CONDITIONS BE DISCOVERED THAT PREVENT EXECUTION OF THE WORK AS INDICATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND ARCHITECT IN WRITING AND AWAIT DIRECTION BEFORE PROCEEDING WITH THE WORK.
2. PATCH ALL WALL, FLOOR, CEILING AND ROOF SURFACES SCHEDULED TO REMAIN, WHERE MEP ELEMENTS ARE BEING REMOVED, TO MATCH EXISTING CONDITIONS. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
3. MC SHALL VERIFY EXISTING CONDITIONS AND LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, AND STRUCTURE IN FIELD PRIOR TO BID. MC SHALL VERIFY EQUIPMENT IS IN GOOD WORKING ORDER AND THAT ANY COMPONENTS OF EQUIPMENT THAT REQUIRE REPLACEMENT ARE REPLACED PRIOR TO RE-INSTALLATION.
4. ALL EXISTING GRDs TO BE DEMOED AND REPLACED WITH NEW. EXISITING DUCT RUNNOUTS TO REAMAIN UNLESS NOTED OTHERWISE. EXTEND/MODIFY DUCTWORK AS NECCESSARY TO ACCOMODATE NEW LOCATIONS. SEE M-201 FOR MORE DETAILS.
5. ALL MECHANICAL EQUIPMENT, SENSORS AND DAMPERS LOCATED ABOVE HARD CEILINGS OR WITHIN WALLS SHALL BE PROVIDED WITH ACCESS PANELS SIZED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION REQUIREMENTS AND SUCH THAT THE FULL REMOVAL OF THE EQUIPMENT AND/OR DAMPER IS POSSIBLE. PROVIDE RATED ACCESS PANELS FOR ALL ACCESS PANELS LOCATED WITHIN RATED CEILINGS OR WALLS. ACCESS DOORS SHALL BE TAMPER AND VANDAL PROOF.
6. ALL CONTROLS TO BE JOHNSON CONTROLS. MECHANICAL CONTRACTOR TO COORDINATE ALL CONTROLS WITH BUILDING OWNER'S CONTROLS CONTRACTOR.

MECHANICAL KEY NOTES:

1. CONNECT NEW EXHAUST FAN INTO EXISTING DUCTWORK. EXTEND/MODIFY DUCT AS NEEDED TO ACCOMODATE NEW FAN LOCATION. EXHAUST FAN TO BE CONTROLLED BY ROOM LIGHTING CONTROLS.
2. APPROXIMATE LOCATION OF RTU DUCT DROPS. EXACT LOCATION TO BE DETERMINED IN FIELD. RISE SA/RA AT UP TO RTU AND TRANSITION TO FULL SIZE OF OPENING IN RISE.
3. EXTEND/MODIFY RTU UNIT'S CONTROL WIRING TO LOCATION INDICATED.

GRAPHIC SCALE 3/16" = 1'-0"

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MEP Engineering
Project Management

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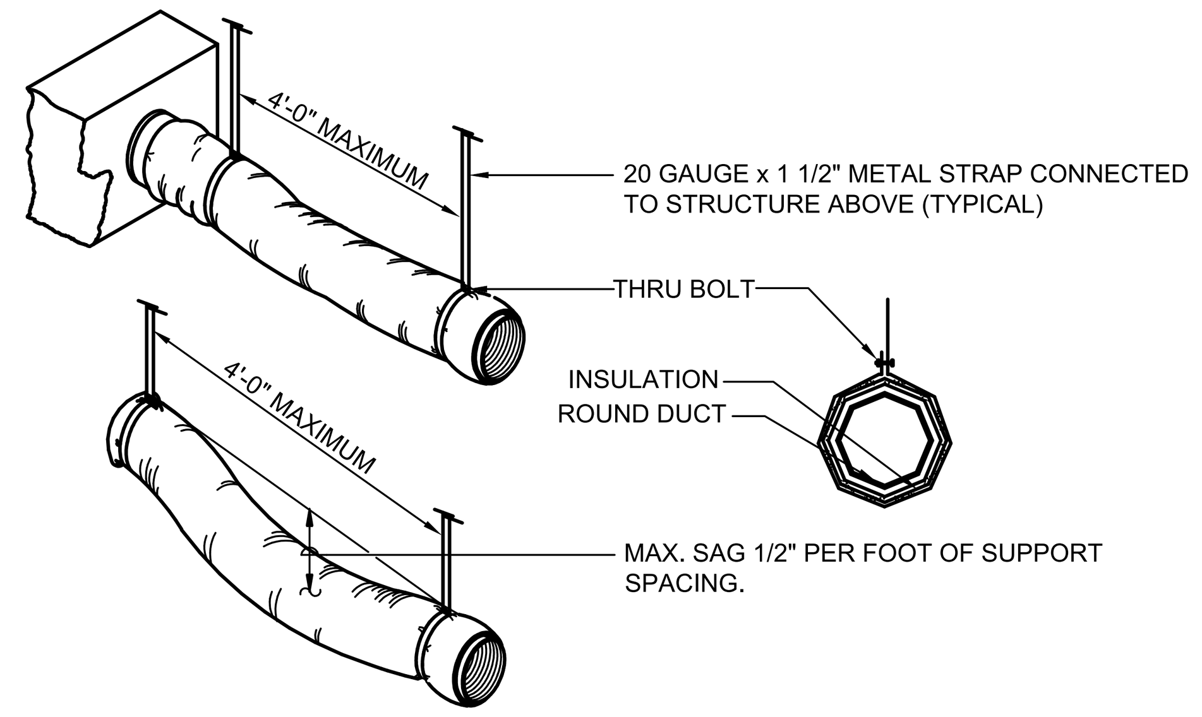
MECHANICAL FLOOR PLAN

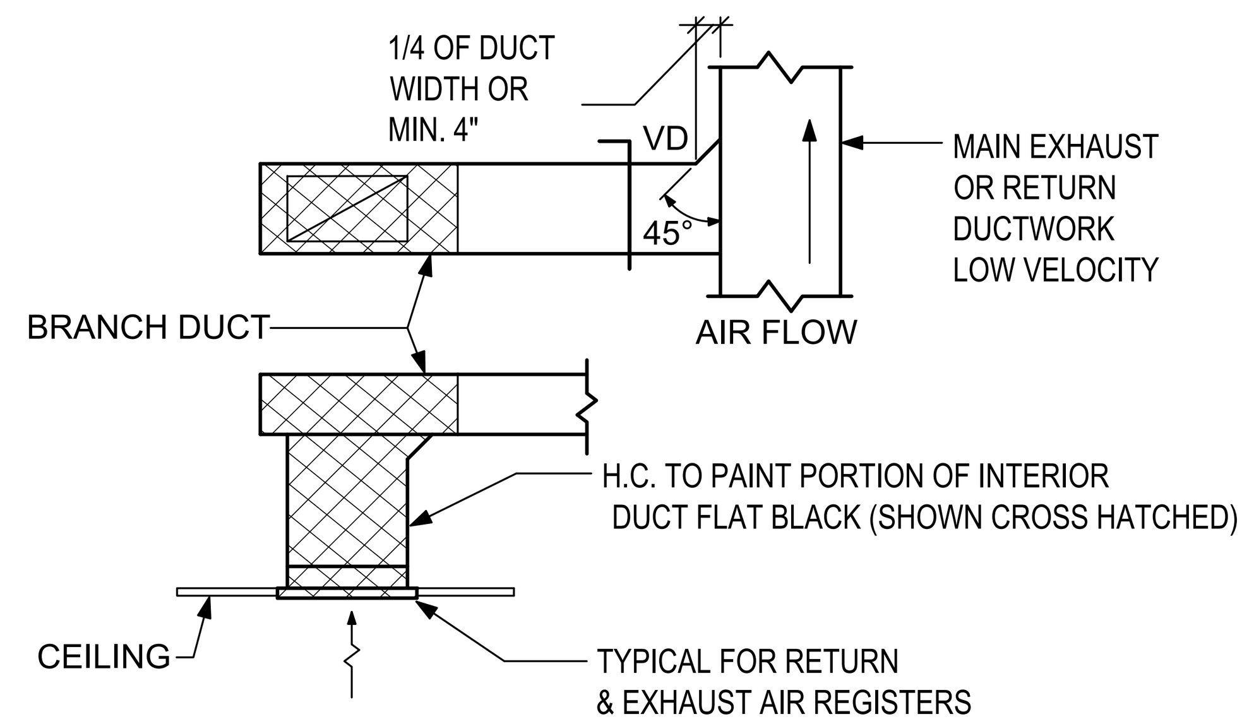
Dwg.No.: M-201

ALLEN + SHARIFF JOB #: 2431096



1 M-301 FLEXIBLE DUCT RUN-OUT SUPPORT DETAIL
NO SCALE

NOTES:
1. FLEXIBLE DUCT SHOULD EXTEND STRAIGHT FOR SEVERAL INCHES FROM RECTANGULAR DUCT CONNECTION BEFORE BENDING.
2. FLEXIBLE DUCT SHOULD NOT EXCEED 4'-0" IN LENGTH. USE RIGID ROUND DUCTWORK WHEN RUNOUTS EXCEED 4'-0".



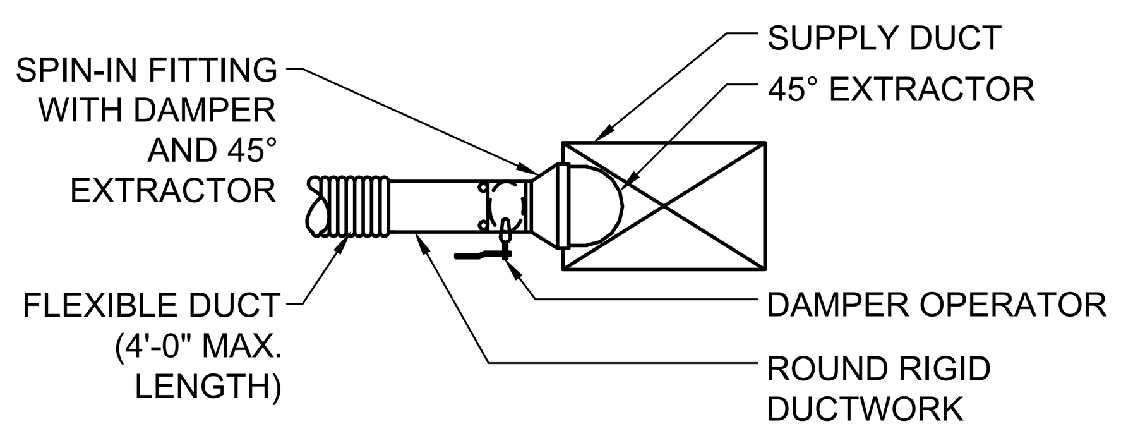
2 M-301 LOW VELOCITY BRANCH DUCT CONNECTION DETAIL
NOT TO SCALE

NOTE: AIRFLOW IN OPPOSITE DIRECTION IS SIMILAR.

EXHAUST FAN SCHEDULE

TAG	TYPE	CFM	SP IN W.C.	FAN RPM	WT. LB.S	MOTOR HP	MOTOR VOLTS / PH	BASIS OF DESIGN MFG.	BASIS OF DESIGN MODEL	REMARKS
EF-1	CEILING	75	.5	900	9	(18)	115/1	GREENHECK	SP-B90	1,2
EF-2	CEILING	75	.5	900	9	(18)	115/1	GREENHECK	SP-B90	1,3

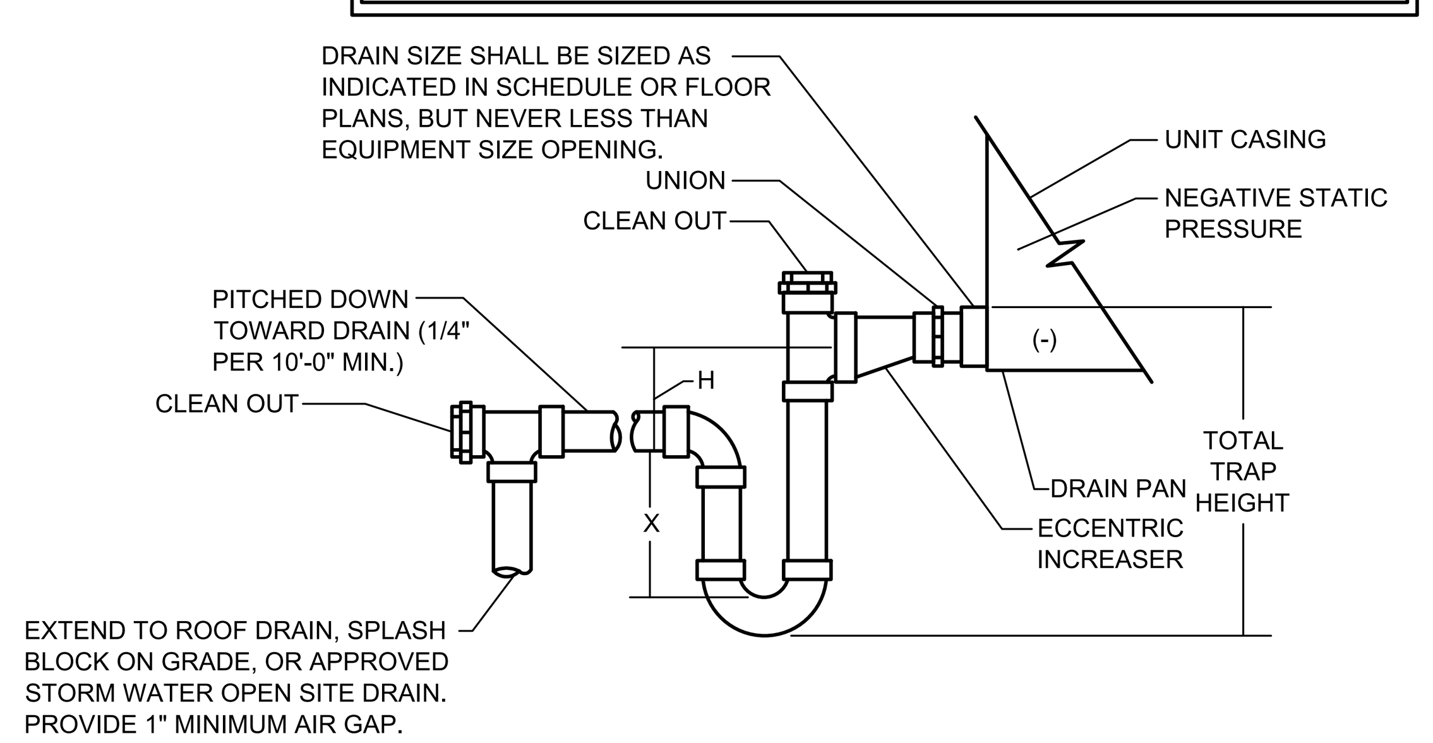
REMARKS:
1. PROVIDE DISCONNECT SWITCH AND SPEED CONTROLLER.
2. UNIT TO BE INTERLOCKED WITH BATHROOM OCCUPANCY SENSOR.
3. UNIT TO BE RUN OFF OF TIME-CLOCK. PROGRAM CLOCK TO RUN DURING HOURS OF OPERATION.



3 M-301 SPIN-IN FITTING DETAIL
NOT TO SCALE

NOTES:
1. USE SPIN-IN FITTING WHERE TAP SIZE IS 2" SMALLER THAN DUCT RAIL DIMENSION.
2. WHERE TAP SIZE IS 3" SMALLER THAN DUCT RAIL DIMENSION BELLMOUTH FITTING MAY BE USED.

TRAP SIZING
"H" MUST EQUAL 1 INCH PLUS CASING STATIC PRESSURE
"X" = 1/2 "H"
TOTAL TRAP HEIGHT = "X" + "H" + (1.5 X PIPE DIAMETER) + INSULATION THICKNESS



5 M-301 A/C CONDENSATE DRAIN TRAP ASSEMBLY DETAIL -
TYPICAL DRAW-THROUGH OR NEGATIVE PRESSURE
NOT TO SCALE

EXHAUST REGISTER SCHEDULE

CFM RANGE	DUCT / NECK SIZE
0 - 75	6 X 6
76 - 150	8 X 8
151 - 225	10 X 10
226 - 350	12 X 12
351 - 450	14 X 14
451 - 650	16 X 20
651 - 850	16 X 28
851 - 1025	22 X 22
1026-1850	24 X 24

NOTE: INSTALL AT SIZES ABOVE UNLESS NOTED OTHERWISE ON FLOOR PLANS.

24/24 PERFORATED FACE RETURN AIR GRILLE SCHEDULE

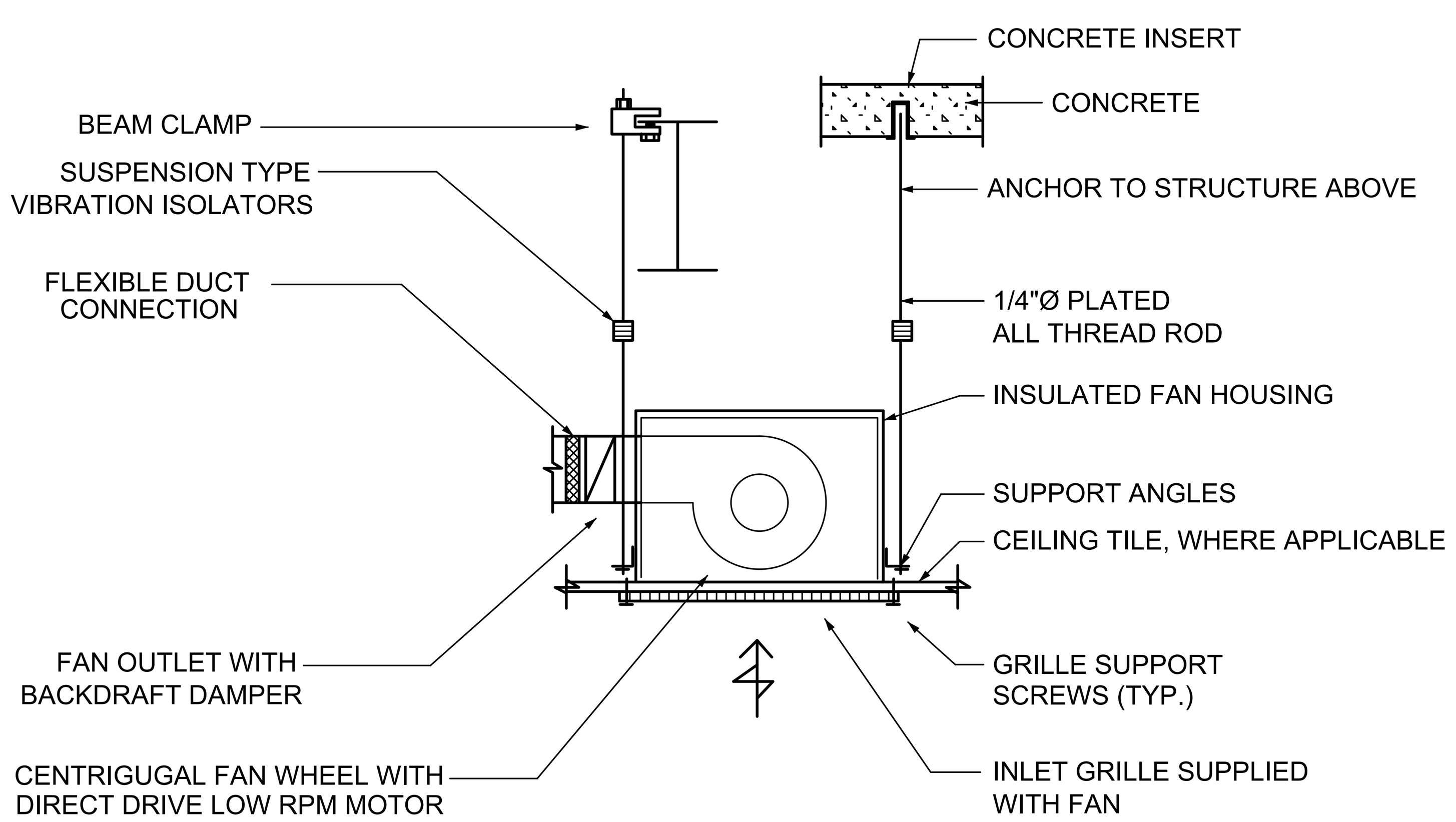
CFM RANGE	SQUARE NECK SIZE	ROUND NECK SIZE
0 - 125	6 X 6	6"Ø
126 - 240	8 X 8	8"Ø
241 - 375	10 X 10	10"Ø
376 - 510	12 X 12	12"Ø
511 - 725	14 X 14	16"Ø
726 - 850	18 X 18	N.A.
851 - 1190	22 X 22	N.A.

NOTE: ALL SIZES ABOVE ARE FOR DUCTED APPLICATIONS MODEL PAR NON-DUCTED UNITS SHALL BE MODEL PXP.

DIFFUSER NECK SIZE & RUNOUT LENGTH SCHEDULE

CFM RANGE	NECK SIZE	MAX LENGTH
0 - 50	4"Ø	4'-0"
51 - 125	6"Ø	4'-0"
126 - 230	8"Ø	5-0"
231 - 420	10"Ø	5'-0"
421 - 650	12"Ø	6'-0"
651 - 900	14"Ø	6'-0"

NOTE: DIAMETER OF DIFFUSER FLEXIBLE DUCT CONNECTOR IS EQUAL DIFFUSER NECK SIZE. SEE PLANS AND SPECIFICATIONS FOR FACE TYPE AND MODEL NUMBERS.



4 M-301 CEILING MOUNTED EXHAUST FAN
NOT TO SCALE

THERMAL INSULATION SCHEDULE

SYSTEM	SYSTEM- LOCATION	OPERATING TEMPERATURE	MATERIAL	SMACNA CLASS TYPE	THICKNESS IN.S	DENSITY LB/CU. FT.	INSTALLED "R" VALUE/ CONDUCTIVITY	JACKET	REMARKS
DUCT	SUPPLY AIR DUCT - INDOOR CONCEALED, ACCESSIBLE	40-120	MINERAL-FIBER	BLANKET	2.0"	0.75	5.0	FSK	1, 5
DUCT	SUPPLY AIR DUCT - INDOOR CONCEALED, INACCESSIBLE	40-120	MINERAL-FIBER	BOARD	1.5 "	2.25	6.5	FSK	2
DUCT	EXHAUST DUCT WITHIN 10 FEET OF EXTERIOR OPENING - INDOOR	40-120	MINERAL-FIBER	BOARD	1.0 "	2.25	4.3	FSK	

NOTES:
1. CONCEALED, ACCESSIBLE LOCATIONS - ABOVE LAY-IN OR ACCESSIBLE CEILINGS, ACCESSIBLE MECHANICAL SHAFTS.
2. CONCEALED, INACCESSIBLE LOCATIONS - ABOVE HARD CEILINGS, (DRY WALL, PLASTER), MECHANICAL SHAFTS, BEHIND WALLS.
3. FOR DUCTS LOCATED OUTDOORS PROVIDE WATERPROOF CONSTRUCTION WITH WATER & UV RESISTANT MASTIC ON ALL JOINTS. INTERNALLY LINE WITH ACOUSTICAL DUCT LINER. CROSS-BREAK TOP TO SHED WATER.
4. CONSTRUCT PER NFPA 96 STANDARDS FOR KITCHEN EXHAUST. WHERE LOCATED WITH 3" OF COMBUSTIBLE PROTECT COMBUSTIBLE MATERIALS, WRAP EXTERIOR WITH FIRE RESISTANT INSULATION.
5. DO NOT INSULATE:
   - MAKE-UP AIR DUCTWORK OPERATING AT SURROUNDING AMBIENT CONDITIONS
   - RETURN AND EXHAUST AIR DUCTWORK LOCATED INDOORS.
   - TRANSFER AIR DUCTWORK (ACOUSTICALLY LINE DUCT)
   - EXPOSED SUPPLY DUCTWORK LOCATED IN CONDITIONED SPACE. (DOES NOT INCLUDE RETURN AIR PLENUM)
6. COVER ALL EXPOSED PIPING LOCATED BELOW 7' 0" ABOVE FINISHED FLOOR WITH PVC JACKET.
7. MULTIPLE INSULATION METHODS MAY BE USED TO ACHIEVE THE TOTAL REQUIRED R-VALUE.

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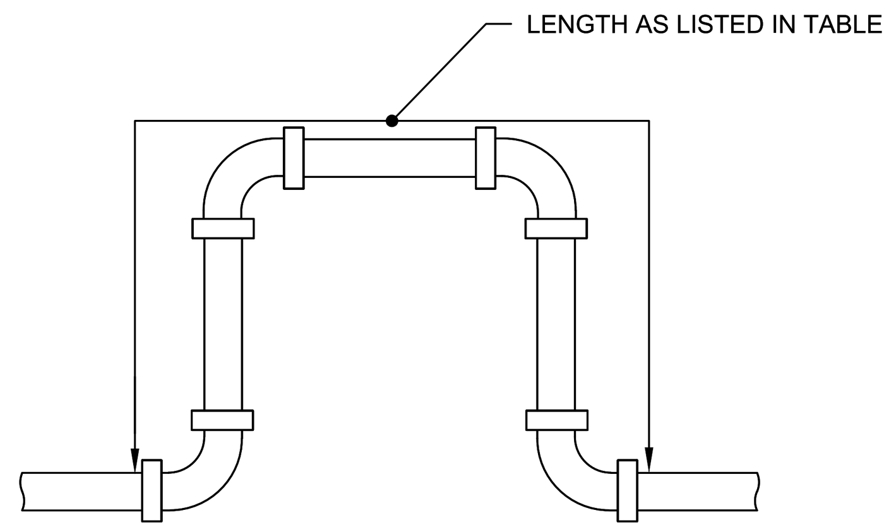
MECHANICAL DETAILS AND SCHEDULES

Allen + Shariff
MEP Engineering
Project Management
205 East Market Street
Salisbury, Maryland 21801
443.545.1300

Dwg.No.: M-301

ALLEN + SHARIFF JOB #: 2431096



DEVELOPED LENGTH OF EXPANSION LOOP TO ACCOMMODATE 1-1/2" MOVEMENT

NOMINAL PIPE DIA.	LENGTH PIPING IN FEET		
	STEEL PIPE	COPPER PIPE	SCH. 40 CPVC
1/2"	4.7'	5.3'	1.7'
3/4"	5.2'	6.2'	1.9'
1"	5.9'	7.1'	2.1'
1-1/4"	6.6'	7.8'	2.3'
1-1/2"	7.0'	8.5'	2.5'
2"	7.9'	9.7'	2.8'
2-1/2"	8.7'	10.8'	3.1'
3"	9.6'	11.8'	3.4'
4"	10.8'	13.5'	3.8'

NOTES:

1. EXPANSION LOOPS SHALL BE IN STALLED AT INTERVALS AS RECOMMENDED BY PIPE MANUFACTURER.
2. PRE-MANUFACTURED EXPANSION JOINTS MAY BE USED IN-LIEU OF EXPANSION LOOPS.
3. NOT ALL SIZES AND MATERIALS ARE USED ON PROJECT.

DIVISION OF MECHANICAL/ ELECTRICAL WORK

ITEM	MECH/ DIV 22 AND 23	ELEC/ DIV 26
AUTOMATIC TEMPERATURE CONTROLS	FURNISH, INSTALL & WIRE	POWER WIRE
CONTROL PANELS FOR MECHANICAL EQUIPMENT	FURNISH & INSTALL	POWER WIRE
LOW VOLTAGE CONTROL WIRING FOR MECH EQUIP.	FURNISH & INSTALL	
LINE VOLTAGE CONTROL WIRING FOR MECH. EQUIP.	FURNISH, INSTALL & WIRE	
MECHANICAL FLOW SWITCHES	FURNISH, INSTALL & WIRE	
THERMOSTATS/ SENSORS	FURNISH, INSTALL & WIRE	
P/E & E/P SWITCHES	FURNISH, INSTALL & WIRE	
DISCONNECT SWITCHES FOR MECHANICAL EQUIPMENT	FURNISH & INSTALL	POWER WIRE
MECHANICAL EQUIPMENT MONITORS	FURNISH & INSTALL	POWER WIRE
MANUAL STARTERS FOR MECHANICAL EQUIPMENT	FURNISH & INSTALL	POWER WIRE
MAGNETIC STARTERS FOR MECHANICAL EQUIPMENT	FURNISH	INSTALL & POWER WIRE
MOTOR CONTROL CENTERS	CONTROL WIRING	FURNISH, INSTALL & POWER WIRE
VARIABLE SPEED CONTROLLERS	FURNISH & INSTALL	POWER WIRE
MOTORIZED DAMPERS & VALVES	FURNISH, INSTALL & WIRE	
DUCT SMOKE DETECTORS	INSTALL	FURNISH & WIRE
HEAT TRACE CABLE FOR PIPING	FURNISH & INSTALL	POWER WIRE
OIL/ GAS EMERGENCY SHUT-OFF SWITCHES		FURNISH, INSTALL & POWER WIRE
SPRINKLER FLOW & TAMPER SWITCHES	BY SPRINKLER CONTRACTOR	WIRE

PIPE HANGER SPACING[C,D]

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (FEET)	MAXIMUM VERTICAL SPACING (FEET)
CAST-IRON PIPE	5[A]	10
CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE AND TUBING, 1 INCH AND SMALLER	3	10[B]
CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE AND TUBING, 1-1/4 INCH AND LARGER	4	10[B]
COPPER OR COPPER-ALLOY TUBING, 1-1/4 INCH AND SMALLER	6	10
COPPER OR COPPER-ALLOY TUBING, 1-1/2 INCH AND LARGER	10	10
CROSS-LINKED POLYETHYLENE (PEX) PIPE 1 INCH AND SMALLER	2.67 (32 INCHES)	10[B]
CROSS-LINKED POLYETHYLENE (PEX) PIPE 1-1/4 INCH AND LARGER	4	10[B]
CROSS-LINKED POLYETHYLENE/ALUMINUM/CROSS-LINKED POLYETHYLENE (PEX-AL-PEX) PIPE	2.67 (32 INCHES)	4
POLYVINYL CHLORIDE (PVC) PIPE	4	10[B]

REMARKS:

A. THE MAXIMUM HORIZONTAL SPACING OF CAST-IRON PIPE HANGERS SHALL BE INCREASED TO 10 FEET WHERE 10-FOOT LENGTHS OF PIPE ARE INSTALLED.

B. FOR SIZES 2 INCHES AND SMALLER, A GUIDE SHALL BE INSTALLED MIDWAY BETWEEN REQUIRED VERTICAL SUPPORTS. SUCH GUIDES SHALL PREVENT PIPE MOVEMENT IN A DIRECTION PERPENDICULAR TO THE AXIS OF THE PIPE.

C. THIS SCHEDULE IS BASED UPON 2018 INTERNATIONAL PLUMBING CODE TABLE 308.5. NOT ALL PIPE TYPES LISTED ARE USED IN PROJECT. PIPE MANUFACTURER'S SPACING RECOMMENDATIONS SHALL BE TAKEN INTO ACCOUNT WHEN INSTALLING HANGERS AND WHERE CONFLICTS BETWEEN THE CODE AND MANUFACTURER'S RECOMMENDATIONS OCCUR THE MOST STRINGENT SHALL BE APPLIED.

D. HANGERS/SUPPORTS SHALL BE PROVIDED IN ADDITIONAL AREAS NOT NOTED ABOVE. AREAS INCLUDE BUT NOT LIMITED TO THE FOLLOWING: EACH SIDE OF WALL/FLOOR PENETRATION, EACH SIDE OF JOINT, AT A CHANGE IN DIRECTION, AND EACH SIDE OF A VALVE.

PLUMBING GENERAL NOTES:

A. GENERAL

1. CONFORM TO GENERAL AND SPECIAL CONDITIONS OF CONTRACT.
2. SPECIFICATIONS ARE APPLICABLE TO CONTRACTORS AND/OR SUBCONTRACTORS.
3. THE ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING AND EQUIPMENT DRAWINGS AND SPECIFICATIONS ARE INCORPORATED INTO, AND BECOME A PART OF THIS DIVISION. THIS CONTRACTOR SHALL EXAMINE SUCH DRAWINGS AND SPECIFICATIONS AND BECOME THOROUGHLY FAMILIAR WITH THE PROVISIONS CONTAINED THEREIN. THE SUBMISSION OF THE BID SHALL INDICATE SUCH KNOWLEDGE.
4. VISIT SITE, CHECK FACILITIES AND CONDITIONS.
5. SYSTEMS SHALL BE COMPLETE AND PLACED IN OPERATION.
6. EACH CONTRACTOR SHALL PROVIDE FOR HIS OWN CLEAN-UP, REMOVAL AND LEGAL DISPOSAL OF RUBBISH DAILY. CONTRACTOR SHALL PROTECT THEIR WORK AND EXISTING OR ADJACENT PROPERTY AGAINST WEATHER, TO MAINTAIN THEIR WORK, MATERIALS, APPARATUS AND FIXTURES FREE FROM INJURY OR DAMAGE. ANY WORK DAMAGED BY FAILURE TO PROVIDE PROTECTION REQUIRED, SHALL BE REMOVED AND REPLACED WITH NEW WORK AT THE CONTRACTOR'S EXPENSE.
7. CONTRACTORS SHALL CONFIRM AND COMPLY WITH UTILITY COMPANY REQUIREMENTS, COORDINATE CONNECTION POINTS IN FIELD.
8. ARRANGE FOR AND OBTAIN OWNER'S AND INSURANCE REPRESENTATIVE'S PERMISSION FOR ANY SERVICE SHUTDOWNS.
9. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, SEQUENCES OF CONSTRUCTION AND THE SAFETY OF WORKMEN.
10. PIPING, CONTROLS, ETC., SHALL NOT BE INSTALLED, OR ROUTED ABOVE, ELECTRICAL PANELS AND EQUIPMENT OR THROUGH ELEVATOR MACHINE ROOMS.
11. THE CONTRACTOR SHALL COORDINATE AND PROVIDE A WRITTEN LISTING OF ELECTRICAL CHARACTERISTICS OF PLUMBING EQUIPMENT TO ELECTRICAL CONTRACTOR PRIOR TO ORDERING OF EQUIPMENT. ADDITIONAL COMPENSATION WILL NOT BE MADE FOR LACK OF CONTRACTOR COORDINATION OF EQUIPMENT'S ELECTRICAL CHARACTERISTICS.
12. DURING THE BUILDING CONSTRUCTION SOME EXISTING INSTALLATION MAY BE EXPOSED THAT WILL HAVE TO BE CHANGED, ALTERED, REROUTED AND/OR ABANDONED. ANY SUCH WORK WHICH COMES UNDER THE JURISDICTION OF THIS CONTRACTOR SHALL BE DONE BY THIS CONTRACTOR WITHOUT ADDITIONAL COST TO THE OWNER.
13. WORK RELATED TO THE EXISTING BUILDING SHALL BE COORDINATED TO MINIMIZE INTERFERENCE OR INTERRUPTION OF NORMAL BUILDING USE BY OWNER. REFER TO ARCHITECTURAL PLANS AND SPECIFICATIONS FOR PHASING REQUIREMENTS.
14. THE CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING CONDITIONS THAT MAY AFFECT THE BID. ADDITIONAL COMPENSATION WILL NOT BE PROVIDED FOR FAILURE TO REVIEW EXISTING CONDITIONS PRIOR TO BIDDING.

B. CODES, PERMITS, STANDARDS AND REGULATIONS

1. CONFORM TO APPLICABLE CODES (LOCAL, STATE, NATIONAL CODES, NFPA, OSHA, ETC.), GOVERNMENT REGULATIONS, UTILITY COMPANY REQUIREMENTS, AND APPLICABLE STANDARDS.
2. OBTAIN PERMITS AND PAY FEES. ARRANGE FOR REQUIRED TESTS, INSPECTIONS AND APPROVALS. PROVIDE COPIES OF INSPECTIONS, AND APPROVALS TO THE ARCHITECT-ENGINEER.

C. RELATED WORK SPECIFIED ELSEWHERE

1. OPENINGS AND CHASES, WHEN SHOWN ON ARCHITECTURAL DRAWINGS.
2. TEMPORARY WATER SERVICE, SANITARY FACILITIES, FIRE PROTECTION AND HEATING DURING CONSTRUCTION.
3. POURED-IN-PLACE CONCRETE.
4. FINISH PAINTING.
5. ELECTRIC POWER WIRING.

D. DRAWINGS

1. THE SYSTEMS SHOWN ON DRAWINGS ARE DIAGRAMMATIC. CONFIRM DIMENSIONS BY FIELD MEASUREMENT.
2. THE EXACT LOCATIONS FOR APPARATUS, FIXTURES, EQUIPMENT AND PIPING WHICH IS NOT COVERED BY DRAWINGS, SHALL BE OBTAINED FROM THE ARCHITECT OR HIS REPRESENTATIVE IN THE FIELD, AND THE WORK SHALL BE LAID OUT ACCORDINGLY.
3. DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT ONE ANOTHER. ANY MATERIALS OR LABOR CALLED FOR IN ONE BUT NOT THE OTHER SHALL BE PROVIDED.

E. DEMOLITION AND REMOVAL

1. DISCONNECT, DISASSEMBLE, CAP, PLUG AND REMOVE PIPING, DUCTS AND EQUIPMENT INDICATED ON THE DRAWINGS, AND AS REQUIRED FOR THE PROJECT.
2. ANY EQUIPMENT DESIGNATED BY OWNER TO BE SALVAGED SHALL BE PROTECTED AND DELIVERED TO THE OWNER'S ON SITE.
3. DEMOLITION SHALL BE DONE IN A MANNER NOT TO DAMAGE ADJACENT WORK AND NOT AFFECT THE OPERATION OF SYSTEMS TO REMAIN IN USE. ANY ITEM TO REMAIN THAT IS DAMAGED BY THE CONTRACTOR OR THAT REQUIRES DAMAGE DUE TO THE ABSOLUTE NECESSITY FOR DEMOLITION REQUIREMENTS SHALL BE REPLACED AND/OR REPAIRED AT HIS EXPENSE.
4. OPENINGS ON PIPING AND DUCTS THAT REMAIN SHALL BE CAPPED AND PROPERLY SECURED.
5. ASBESTOS REMOVAL WILL BE HANDLED BY THE OWNER AND IS NOT A PART OF THIS WORK.
6. EXAMINE AREAS AND CONDITIONS UNDER WHICH DEMOLITION WORK SHALL BE PERFORMED. CONTRACTOR SHALL COORDINATE WORK WITH OTHER TRADES PERFORMING DEMOLITION WORK.
7. REMOVE SUPPORTS, HANGERS, AND ACCESSORIES FROM EQUIPMENT AND MATERIAL INDICATED TO BE REMOVED.

F. BASE EQUIPMENT, MATERIALS AND SUBSTITUTIONS

1. EQUIPMENT AND MATERIALS SHALL BE NEW, FREE OF DEFECTS AND U.L. LABELED.
2. BASE BID MANUFACTURERS ARE INCLUDED IN SPECIFICATIONS OR LISTED IN SCHEDULE ON DRAWINGS. OTHER MANUFACTURERS ARE CONSIDERED A SUBSTITUTION.
3. THE NAME OR MAKE OF ANY ARTICLE, DEVICE, MATERIAL, FORM OF CONSTRUCTION, FIXTURE, ETC., STATED IN THIS SPECIFICATION, SHALL BE KNOWN AS A "STANDARD".

PLUMBING LEGEND

SYMBOL	ABRV.	DESCRIPTION	SYMBOL	ABRV.	DESCRIPTION
— EX (X) —	EX	EXISTING PIPING TO REMAIN - (X) DESIGNATES SERVICE			CONNECTION POINT, NEW TO EXISTING
— RX (X) —	RX	EXISTING PIPING TO BE REMOVED - (X) DESIGNATES SERVICE			DISCONNECTION POINT
		PIPING ROUTED BELOW GRADE / SLAB (LINE TYPE INDICATES SERVICE TYPE UNO)	1		DRAWING KEYNOTE
— SAN —	SAN	SANITARY PIPING	A		DEMOLITION DRAWING KEYNOTE
— GW —	GW	GREASE WASTE PIPING (TO GREASE INTERCEPTOR)	1		REVISION NUMBER
— OW —	OW	OIL WASTE PIPING			REVISION CLOUD
— ST —	ST	STORM PIPING (PRIMARY)			PIPE UP
— OST —	OST	SECONDARY / OVERFLOW DRAIN PIPING			PIPE DOWN
— V —	V	VENT PIPING			PIPE TEE DOWN
— CW —	CW	DOMESTIC COLD WATER PIPING			TOP PIPE CONNECTION
— HW —	HW	DOMESTIC HOT WATER PIPING			BALL VALVE OR SHUTOFF VALVE IN RISE
— HWR —	HWR	DOMESTIC HOT WATER RETURN PIPING			PIPE CAP
— DIS —	DIS	DEIONIZED WATER SUPPLY PIPING			PIPE UNION
— DIR —	DIR	DEIONIZED WATER RETURN PIPING			FLANGED CONNECTION
— TP —	TP	TRAP PRIMER PIPING			CONCENTRIC PIPE REDUCER
— G —	G	GAS PIPING (NATURAL OR PROPANE)			ECCENTRIC PIPE REDUCER
— FO —	FO	FUEL OIL PIPING			FLOW ARROW
— CD —	CD	CONDENSATE DRAIN PIPING			PIPE ANCHOR
— PD —	PD	PUMP DISCHARGE			PIPE GUIDE
— MV —	MV	MEDICAL VACUUM PIPING		BV	BALL VALVE
— MA —	MA	MEDICAL AIR PIPING		BFV	BUTTERFLY VALVE
— LV —	LV	LABORATORY VACUUM PIPING		PV	PLUG VALVE
— LA —	LA	LABORATORY AIR PIPING		GV	GATE VALVE
— PV —	PV	PROCESS AIR VACUUM PIPING		GBV	GLOBE VALVE
— PA —	PA	PROCESS AIR PIPING		PRV	PRESSURE REDUCING VALVE
— OXY —	OXY	OXYGEN PIPING		CV	CHECK VALVE
— HEX —	HEX	HELIX PIPING		BFP	BACK FLOW PREVENTER
— N —	N	NITROGEN PIPING			PRESSURE RELIEF VALVE
— CA —	CA	COMPRESSED AIR PIPING			AUTOMATIC FLOW CONTROL VALVE
— AV —	AV	ACID VENT PIPING			CALIBRATED BALANCING VALVE
— AW —	AW	ACID WASTE PIPING			AUTOMATIC AIR VENT
— CO2 —	CO2	CARBON DIOXIDE PIPING			MANUAL AIR VENT
— MAI —	MAI	MEDICAL AIR INTAKE PIPING			P/T PLUG
— MVD —	MVD	MEDICAL VACUUM DISCHARGE PIPING		PG	PRESSURE GAUGE W/ SHUT-OFF
— NO —	NO	NITROUS OXIDE PIPING			THERMOMETER
— WAGD —	WAGD	WASTE ANESTHETIC GAS DISCHARGE			STRAINER
X		MEDICAL GAS OUTLET (LETTER DESIGNATES GAS TYPE)		T&P	TEMPERATURE AND PRESSURE RELIEF VALVE
M		UTILITY METER		MV	MIXING VALVE
		HOT WATER RECIRC. PUMP			EXTERNAL WALL HYDRANT
X		DOMESTIC SHOCK ABSORBER/WATER HAMMER ARRESTER; TEXT DENOTES SIZE (PDI: A ~ F)		FCO	CLEAN OUT, FLOOR
		GAS SOLENOID VALVE		CO	CLEAN OUT, EXPOSED
		GAS COCK		FD	FLOOR DRAIN
		AQUASTAT		RD	ROOF DRAIN
		VACUUM RELIEF VALVE			PIPE TRAP
	VB	VACUUM BREAKER			FLOOR DRAIN WITH TRAP PRIMER
		HOSE BIBB			FLOOR SINK/RECEPTOR WITH HALF GRATE
		FLEXIBLE PIPE CONNECTION		OS&Y	OS&Y VALVE
I.E. XX.XX		INVERT ELEVATION B.F.F. (IN FEET)		TS	OS&Y VALVE WITH TAMPER SWITCH
XX		KITCHEN EQUIPMENT DESIGNATION; REFER TO KITCHEN EQUIPMENT DRAWINGS FOR DETAILS			

NOTES:
1. NOT ALL SYMBOLS AND ABBREVIATIONS ARE IN USE FOR THIS PROJECT.

STATE OF MARYLAND
TIMOTHY R. CHATTERTON
No. 51406
PROFESSIONAL ENGINEER

LICENSE NUMBER: 51406
EXPIRATION DATE: 08/10/2025

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

DAVIS BOWEN & FRIEDEL, INC.
ARCHITECTS · ENGINEERS · SURVEYORS
EASTON, MARYLAND 410.770.4744
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ISLE OF WIGHT RENOVATION

WORCESTER CO HEALTH DEPARTMENT

13070 ST. MARTINS NECK ROAD; BISHOPVILLE, MD 21813

DATE	COMMENTS
12/18/2024	100% Design Development
05/07/2025	90% Construction Documentation
07/16/2025	100% Construction Documentation
07/29/2025	Issued for Permit

Date: July 29, 2025
Scale: AS NOTED
Dwn.By: BWEA
Proj.No.: 0085B055.A01

PLUMBING DATA SHEET

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Dwg.No.: P-001

ALLEN + SHARIFF JOB #: 2431096

PLUMBING SPECIFICATIONS

PLUMBING GENERAL CONDITIONS (220100)

1. GENERAL

a. CONFORM TO ALL GENERAL AND SPECIAL CONDITIONS OF CONTRACT AS SPECIFIED BY ARCHITECT AND/OR OWNER.

b. PRODUCTS AND INSTALLATION SHALL COMPLY WITH ALL APPLICABLE LAWS, CODES, GOVERNMENT REGULATIONS, UTILITY COMPANY REQUIREMENTS, ETC. OF ALL AUTHORITIES HAVING JURISDICTION. WORK SHALL COMPLY WITH THE FOLLOWING CODES, STANDARDS AND ORGANIZATIONS:

INTERNATIONAL BUILDING CODE
INTERNATIONAL MECHANICAL CODE
INTERNATIONAL PLUMBING CODE
INTERNATIONAL ENERGY CONSERVATION CODE
NATIONAL ELECTRIC CODE
NFPA
UNDERWRITERS LABORATORY (UL), IRI, FM
COMAR 05.02.02 & ADAAG, 2010 ED.
SMACNA "HVAC DUCT CONSTRUCTION STANDARDS" GUIDELINES, DETAILS, & MODEL SPECIFICATION
ASHRAE

c. WHERE CONFLICTS EXIST BETWEEN CODES, STANDARDS OR THIS SPECIFICATION THE HIGHER REQUIREMENT SHALL APPLY. DEVIATIONS FROM THE CONTRACT DOCUMENTS REQUIRED BY THE ABOVE AUTHORITIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. OBTAIN PERMITS AND PAY ALL FEES. ARRANGE FOR ALL REQUIRED INSPECTIONS AND APPROVALS. CONFIRM ALL UTILITY COMPANY REQUIREMENTS AND CONNECTION POINTS IN FIELD, PRIOR TO STARTING WORK.

d. ALL SPECIFICATIONS AND DRAWINGS, I.E., ARCHITECTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL ARE COMPLIMENTARY AND MUST BE USED IN COMBINATION TO OBTAIN COMPLETE CONSTRUCTION INFORMATION. ANY INFORMATION CONFLICTS WITHIN THE SPECIFICATIONS AND DRAWINGS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION. DRAWINGS ARE DIAGRAMMATIC. CONFIRM ALL DIMENSIONS BY FIELD MEASUREMENT. THE EXACT LOCATIONS FOR APPARATUS, FIXTURES, EQUIPMENT AND PIPING WHICH IS NOT COVERED BY DRAWINGS, SHALL BE OBTAINED FROM THE ARCHITECT OR HIS REPRESENTATIVE IN THE FIELD, AND THE WORK SHALL BE LAID OUT ACCORDINGLY.

e. EACH CONTRACTOR SHALL PROVIDE FOR HIS OWN CLEAN-UP, REMOVAL AND LEGAL DISPOSAL OF ALL RUBBISH DAILY. CONTRACTOR SHALL PROTECT THEIR WORK AND EXISTING OR ADJACENT PROPERTY AGAINST WEATHER, TO MAINTAIN THEIR WORK, MATERIALS, APPARATUS AND FIXTURES FREE FROM INJURY OR DAMAGE. ANY WORK DAMAGED BY FAILURE TO PROVIDE PROTECTION REQUIRED, SHALL BE REMOVED AND REPLACED WITH NEW WORK AT THE CONTRACTOR'S EXPENSE.

f. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, SEQUENCES OF CONSTRUCTION AND THE SAFETY OF WORKERS.

g. NO MEP, IT, FP SYSTEMS OR COMPONENTS SHALL BE INSTALLED OR ROUTED ABOVE ELECTRICAL PANELS AND EQUIPMENT OR THROUGH ELEVATOR ROOMS, FIRE PUMP ROOMS, OR STAIR TOWERS UNLESS SERVING THE MACHINE ROOM, FIRE PUMP ROOM OR STAIR TOWER.

h. THE CONTRACTOR SHALL COORDINATE AND OBTAIN A WRITTEN LISTING OF ELECTRICAL CHARACTERISTICS OF ALL MECHANICAL EQUIPMENT FROM THE ELECTRICAL CONTRACTOR PRIOR TO THE ORDERING OF EQUIPMENT. NO ADDITIONAL PAYMENT WILL BE MADE FOR LACK OF CONTRACTOR COORDINATION OF ELECTRICAL CHARACTERISTICS.

i. IN CASES OF DOUBT AS TO THE WORK INTENDED, OR IN THE EVENT OF NEED FOR EXPLANATION THEREOF, THE CONTRACTOR SHALL REQUEST SUPPLEMENTARY INSTRUCTIONS FROM THE ENGINEER. NO CHANGES ARE TO BE MADE TO THE WORK OF THIS CONTRACT WITHOUT PRIOR KNOWLEDGE AND APPROVAL OF THE ENGINEER. THE CONTRACTOR SHALL HOLD THE OWNER AND ITS CONSULTANTS HARMLESS AGAINST ALL CLAIMS AND JUDGMENTS ARISING OUT OF THE CONTRACTOR'S PERFORMANCE OF THE WORK OF THIS CONTRACT. THE CONTRACTOR SHALL NOT PROCEED WITH ANY WORK, WHICH HE EXPECTS ADDITIONAL COMPENSATION BEYOND THE CONTRACT AMOUNT, WITHOUT WRITTEN AUTHORIZATION FROM THE APPROPRIATE AUTHORITY. FAILURE TO OBTAIN SUCH AUTHORIZATION SHALL INVALIDATE ANY CLAIM FOR EXTRA COMPENSATION.

j. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO INSTALL THE HEATING, VENTILATION AND AIR CONDITIONING SYSTEM SO AS TO INSURE QUIET OPERATION. NO VIBRATION OR SOUND SHALL BE TRANSMITTED TO THE BUILDING, STRUCTURE OR OCCUPIED AREAS. THE DECISION OF THE ENGINEER AS TO THE QUIETNESS OF THE SYSTEM AND EQUIPMENT SHALL BE FINAL. IT SHALL BE THIS CONTRACTORS' RESPONSIBILITY TO CORRECT OR REPLACE ANY NOISY SYSTEM OR EQUIPMENT AS REQUIRED.

k. OBTAIN PERMITS AND PAY ALL FEES. ARRANGE FOR ALL REQUIRED INSPECTIONS AND APPROVALS.

2. WORK IN EXISTING BUILDINGS (DIVISION 02)

a. THE EXISTING BUILDING IS TO REMAIN OCCUPIED AND ACCESSIBLE AT ALL TIMES. PROTECT THE BUILDING PREMISES AND ALL OCCUPANTS ON THE PROJECT SITE. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGES CAUSED BY IMPROPER PROTECTION AND SHALL MAKE ALL NECESSARY REPLACEMENTS OR REPAIRS WITHOUT ANY ADDITIONAL COST. MAKE ALL ARRANGEMENTS, MAINTAIN AND PAY ALL COSTS FOR TEMPORARY WATER, PLUMBING, POWER, LIGHTING, AND HEATING OR VENTILATION AS REQUIRED TO PROPERLY CONDUCT THE WORK OF THIS CONTRACT AND MAINTAIN SERVICES. PROVIDE AND MAINTAIN FOR THE ENTIRE LENGTH OF THIS CONTRACT ALL EXITS, EXIT LIGHTING, FIRE PROTECTION DEVICES AND ALARMS TO CONFORM TO LOCAL BUILDING CODE REQUIREMENTS.

b. CONFORM WITH THE CURRENT EDITION OF THE SMACNA "IAQ GUIDELINES FOR OCCUPIED BUILDINGS UNDER CONSTRUCTION."

c. CONTRACTOR SHALL VERIFY ALL POINTS OF CONNECTION BEFORE COMMENCING WORK. CONTRACTOR SHALL COORDINATE WORK WITH EXISTING WORK AND OTHER TRADES. ALL UNUSED EQUIPMENT SERVING THIS AREA SHALL BE REMOVED AND RETURNED TO THE OWNER.

d. EXISTING EQUIPMENT TO REMAIN, BE REUSED, OR RELOCATED WITHIN OR SERVING THE SPACE, WHICH IS DAMAGED OR DOES NOT COMPLY WITH THE SPECIFICATIONS, SHALL BE RESTORED TO LIKE NEW CONDITION SUBJECT TO REVIEW BY THE ARCHITECT AND ENGINEER, OR SHALL BE REPLACED WITH NEW MATERIALS MEETING THE SPECIFICATION REQUIREMENTS.

e. SOME WORK SHOWN MAY REQUIRE PREMIUM TIME INCLUDING NOISE PRODUCING ACTIVITIES, ACCESS INTO ADJOINING SPACES & ACTIVITIES DISRUPTING MEP SERVICES. CONFIRM THE REQUIREMENTS FOR PREMIUM TIME OR SPECIAL PROCEDURES WITH THE OWNER/LANDLORD AND INCLUDE THE COST IN BID PROPOSAL. WORK RELATED TO THE EXISTING BUILDING SHALL BE COORDINATED TO MINIMIZE INTERFERENCE OR INTERRUPTION OF NORMAL BUILDING USE BY OWNER. REFER TO ARCHITECTURAL PLANS FOR ANY PHASING REQUIREMENTS. ARRANGE FOR AND OBTAIN OWNER'S PERMISSION FOR ANY SERVICE SHUTDOWNS.

f. THE CONTRACTOR, BY SUBMITTING HIS BID PROPOSAL AGREES TO ACCEPT ALL EXISTING SITE CONDITIONS NOT SPECIFICALLY EXCEPTED. ALL EXCEPTIONS SHALL BE PROVIDED IN WRITING TO THE ARCHITECT AND ENGINEER.

g. PERFORM ROUTINE SERVICE INSPECTION OF ALL EXISTING PLUMBING EQUIPMENT TO BE REUSED FOR THIS PROJECT. LUBRICATE BEARINGS, SERVICE CONTROL SYSTEMS, REPLACE FAN BELTS AND INSTALL NEW FILTERS IN EACH UNIT. FIELD VERIFY REFRIGERANT CHARGE AND NOTIFY THE OWNER IF THE CHARGE IS LESS THAN THE MANUFACTURER'S SPECIFICATIONS. SUBMIT SERVICE REPORT TO OWNER/TENANT INDICATING CONDITION OF UNIT AND REPORT ANY MAJOR COMPONENT FAILURES OR MALFUNCTIONS. REPORT SHALL INCLUDE COST TO SERVICE ALL ITEMS ABOVE AND BEYOND THE ITEMS LISTED ABOVE. COST SHALL INCLUDE PARTS AND LABOR. EQUIPMENT SHALL BE PLACED IN FULL OPERATION WITH CONTROLS CALIBRATED UPON COMPLETION OF PROJECT.

3. DEMOLITION (024119)

a. DISCONNECT, DISASSEMBLE, CAP, PLUG AND REMOVE ALL MEP ELEMENTS (PIPING, DUCTS, ELECTRICAL DEVICES, WIRING, CONDUIT, EQUIPMENT, HANGERS, SUPPORTS, ETC.) INDICATED ON THE DRAWINGS OR NOT OTHERWISE REQUIRED FOR COMPLETED PRODUCT. NO MEP ELEMENTS ARE TO BE ABANDONED IN PLACE UNLESS SPECIFICALLY NOTED. NOT ALL ITEMS TO BE REMOVED ARE INDICATED ON DRAWING.

b. ALL OPENINGS ON PIPING AND DUCTS THAT REMAIN SHALL BE CAPPED AND PROPERLY SECURED. WIRING SHALL BE DISCONNECTED AT CIRCUIT BREAKERS AND REMOVED AND BREAKERS MARKED "SPARE." REMOVE AND RECLAIM ANY REFRIGERANT IN EXISTING SYSTEMS PRIOR TO DEMOLITION OF ANY EQUIPMENT ACCORDING TO FEDERAL REQUIREMENT.

c. ANY EQUIPMENT DESIGNATED BY OWNER TO BE SALVAGED SHALL BE PROTECTED AND DELIVERED TO AN OWNER DESIGNATED AREA ON SITE.

d. ALL ASBESTOS REMOVAL (IF REQUIRED) WILL BE HANDLED BY THE OWNER AND IS NOT A PART OF THIS WORK. IF MATERIALS SUSPECTED OF CONTAINING HAZARDOUS MATERIALS ARE ENCOUNTERED, DO NOT DISTURB; NOTIFY ARCHITECT AND OWNER IMMEDIATELY.

4. BASIS OF DESIGN AND SUBSTITUTIONS (012300)

a. WHEREVER THE WORDS "APPROVED BY", "APPROVED EQUAL", "AS DIRECTED" OR SIMILAR PHRASES ARE USED IN THE FOLLOWING SPECIFICATIONS, THEY SHALL BE UNDERSTOOD TO REFER TO THE OWNER AS THE APPROVING AGENCY. THE NAME OR MAKE OF ANY EQUIPMENT OR MATERIALS NAMED IN THE SPECIFICATION (WHETHER OR NOT THE WORDS "OR APPROVED EQUAL" ARE USED) SHALL BE KNOWN AS THE "STANDARD".

5. SUBMITTAL PROCEDURES (013300)

a. SUBMIT SHOP DRAWINGS FOR MECHANICAL EQUIPMENT, FIRE PROTECTION SYSTEMS, DUCTWORK, AND PLUMBING FIXTURES AND EQUIPMENT WITH ADEQUATE DETAILS AND SCALES TO CLEARLY SHOW CONSTRUCTION. INDICATE THE OPERATING CHARACTERISTICS FOR EACH REQUIRED ITEM. CLEARLY IDENTIFY EACH ITEM ON THE SUBMITTAL AS TO MARK, LOCATION AND USE, USING SAME IDENTIFICATION AS PROVIDED ON DESIGN DRAWINGS. SHOP DRAWINGS TO BE SUBMITTED INCLUDE BUT NOT LIMITED TO:

– FIXTURES
– VALVES & PIPING
– ALL EQUIPMENT

b. CONTRACTOR SHALL REVIEW AND INDICATE HIS APPROVAL OF EACH SHOP DRAWING PRIOR TO SUBMITTAL FOR REVIEW. DO NOT START WORK OR FABRICATION UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED BY THE ENGINEER AND RETURNED TO THE CONTRACTOR.

c. SUBMITTALS WILL BE REVIEWED ONLY FOR GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS AND NOT FOR DIMENSIONS OR QUANTITIES. THE SUBMITTAL REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PURCHASE OF ANY ITEM IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS OR ITS COMPLETE AND PROPER INSTALLATION.

d. WHERE SUBMITTALS VARY FROM THE CONTRACT REQUIREMENTS, THE CONTRACTOR SHALL CLEARLY INDICATE THE NATURE AND REASON FOR VARIATIONS ON SUBMITTAL OR ACCOMPANYING DOCUMENTS.

e. EACH MANUFACTURER OR HIS REPRESENTATIVE MUST CHECK THE APPLICATION OF HIS EQUIPMENT AND CERTIFY AT TIME OF SHOP DRAWING SUBMITTAL THAT EQUIPMENT HAS BEEN PROPERLY APPLIED AND CAN BE INSTALLED, SERVICED AND MAINTAINED WHERE INDICATED ON DRAWINGS. ADVISE ENGINEER IN WRITING WITH SUBMITTAL DRAWINGS OF ANY POTENTIAL PROBLEMS. THE MANUFACTURER SHALL BE RESPONSIBLE FOR ANY CHANGES THAT MIGHT BE NECESSARY BECAUSE OF PHYSICAL CHARACTERISTICS OF EQUIPMENT THAT HAVE NOT BEEN CALLED TO THE ENGINEER'S ATTENTION AT THE TIME OF SUBMITTAL.

6. CUTTING, PATCHING AND DRILLING (017329)

a. ALL CUTTING AND PATCHING OF THE BUILDING CONSTRUCTION REQUIRED FOR THIS WORK SHALL BE BY THIS CONTRACTOR UNLESS SHOWN ON ARCHITECTURAL DRAWINGS AND CONFIRMED AS TO SIZE AND LOCATION PRIOR TO NEW CONSTRUCTION. CUTTING SHALL BE IN A NEAT AND WORKMANLIKE MANNER. NEATLY SAW CUT ALL RECTANGULAR OPENINGS, SET SLEEVE THROUGH OPEN ING, AND FINISH PATCH OR PROVIDE TRIM FLANGE AROUND OPENING. CORE DRILL AND SLEEVE ALL ROUND OPENINGS. DO NOT CUT ANY STRUCTURAL COMPONENTS WITHOUT THE ARCHITECT'S APPROVAL.

b. PATCH AND FINISH TO MATCH ADJACENT AREAS THAT HAVE BEEN CUT, DAMAGED OR MODIFIED AS A RESULT OF THE INSTALLATION OF MECHANICAL OR ELECTRICAL EQUIPMENT. FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER.

c. ALL CONTRACTORS SHALL CONFIRM WITH OWNER, PRIOR TO BID, TIMES AVAILABLE FOR NOISE PRODUCING WORK SUCH AS CUTTING AND CORE DRILLING OF FLOORS, WALLS, ETC., AS WELL AS TIMES FOR WORK WHICH REQUIRE ACCESS INTO ADJOINING TENANT SPACES. INCLUDE ANY PREMIUM TIME IN BID.

d. THE EXACT LOCATION OF ROOFTOP EQUIPMENT SHALL BE APPROVED BY OWNER'S STRUCTURAL ENGINEER.

e. INFORMATION REGARDING REQUIRED PIPE OPENINGS IN WALLS, FLOORS, CHASES, ETC., AND CONCRETE EQUIPMENT PADS OR FOUNDATIONS SHALL BE GIVEN TO THE GENERAL CONTRACTOR BY THIS CONTRACTOR PRIOR TO THE CONSTRUCTION PERIOD. IF THIS CONTRACTOR FAILS TO COMPLY WITH THIS REQUEST, OR IF INCORRECT INFORMATION IS GIVEN, THE NECESSARY CUTTING AND PATCHING WILL BE PERFORMED BY THE GENERAL CONTRACTOR, AT THIS CONTRACTOR'S EXPENSE.

7. FIRESTOPPING (SAME AS 017329)

a. ALL SERVICES THAT PASS THRU FIRE OR SMOKE RATED PARTITIONS, WALLS, FLOORS, SHALL BE FIRESTOPPED. FIRE STOPPING RATING SHALL MATCH PARTITION RATING. ALL FIRE STOPPING SYSTEM SHALL MEET THE REQUIREMENTS OF ASTM E 814,UL 1479, AND BE FACTORY MUTUAL APPROVED.

b. ALL FIRESTOPPING AND/OR SMOKE STOPPING MATERIAL AND INSTALLATION SHALL BE AS MANUFACTURED BY HILTI OR APPROVED EQUAL.

8. ACCESS DOORS & PANELS (083113)

a. ACCESS DOORS SHALL BE PROVIDED IN WALLS AND CEILINGS WHERE REQUIRED TO PERMIT PROPER ACCESS TO VALVES AND ANY OTHER SUCH DEVICES WHICH REQUIRE MAINTENANCE OR SERVICE. DOORS PLACED IN WALLS, PARTITIONS OR OTHER FIRE-RATED CONSTRUCTION SHALL HAVE A LABEL SIGNIFYING THAT THE DOOR HAS THE SAME FIRE RATING AS THE FIRE-RATED CONSTRUCTION.

b. THIS CONTRACTOR SHALL FURNISH ACCESS PANELS TO THE GENERAL CONTRACTOR FOR INSTALLATION.

c. ACCESS PANELS SHALL BE CONSTRUCTED OF 14 GAUGE STEEL, WITH 16 GAUGE STEEL FRAMES. DOORS SHALL FINISH FLUSH WITH THE SURROUNDING SURFACE. F

d. FRAMES SHALL HAVE 3-INCH-WIDE EXPANDED METAL FOR PLASTERED SURFACES AND PLAIN FLANGED TYPE FRAME FOR TILE, MASONRY OR GYPSUM BOARD SURFACES. DOORS AND FRAMES SHALL BE FURNISHED PRIME COATED. DOORS INSTALLED IN CERAMIC TILE OR OTHER NON-PAINTED SURFACES SHALL BE STAINLESS STEEL. HINGES SHALL BE CONCEALED SPRING TYPE, TO ALLOW DOORS TO BE OPENED 175 DEGREES. LOCKS SHALL BE FLUSH SCREWDRIVER TYPE WITH STEEL CAMS. ACCESS PANELS SHALL BE 16 INCHES BY 16 INCHES OR LARGER AS MAY BE REQUIRED FOR PROPER ACCESS TO THE DEVICE BEING SERVED.

e. ACCESS PANELS ARE NOT REQUIRED IN COMPLETELY ACCESSIBLE LIFT-OUT-TILE CEILINGS. CONTRACTOR SHALL REVIEW THE ROOM FINISH SCHEDULE ON THE ARCHITECTURAL DRAWINGS IN ORDER TO VERIFY THE NEED FOR ACCESS PANEL

9. EXCAVATION AND BACKFILL (312000)

a. PERFORM EXCAVATION AND BACKFILL REQUIRED FOR INSTALLATION OF PIPING.

b. EXCAVATE TO DEPTH REQUIRED TO INSTALL PIPING AT THE REQUIRED LEVEL AND PITCH. PIPE SHALL BE INSTALLED ON SAND BEDDING TO GIVE UNIFORM BEARING ALONG LENGTH OF PIPE (SAND INSIDE BUILDING AND INTERLOCKING AGGREGATE OUTSIDE BUILDING).

c. BACKFILL WITH BEDDING MATERIAL TO A MINIMUM OF TWELVE (12) INCHES ABOVE TOP OF PIPES AND COMPACT. BALANCE OF BACKFILL IN GRASS AREAS SHALL BE CLEAN EARTH UP TO SIX (6) INCHES ABOVE SURROUNDING GRADES, UNDER FLOORS SAND, AND UNDER PAVING INTERLOCKING AGGREGATE. BACKFILL SHALL BE COMPACTED IN MAXIMUM SIX (6) INCH LAYERS.

d. OTHER EXCAVATIONS SHALL BE BACKFILLED WITH CLEAN EARTH, EXCLUDING RUBBISH AND BOULDERS AND THE DIRT SHALL BE PROPERLY COMPACTED.

e. PATCH FLOOR TO MATCH EXISTING.

10. PAINTING (099113 AND 099123)

a. IN FINISHED SPACES, PAINTING OF ALL MECHANICAL EQUIPMENT, APPARATUS, AND PIPING SHALL BE DONE BY THE PAINTING TRADE UNDER THE GENERAL CONTRACTOR SPECIFICATION, EXCEPT WHERE SPECIFIED TO BE DONE BY THE MECHANICAL CONTRACTOR.

11. RECORD DRAWINGS (017839)

a. EACH CONTRACTOR OR SUBCONTRACTOR SHALL KEEP ONE (1) COMPLETE SET OF THE CONTRACT WORKING DRAWINGS ON THE JOB SITE ON WHICH HE SHALL REGULARLY RECORD ANY DEVIATIONS OR CHANGES FROM SUCH CONTRACT DRAWINGS MADE DURING CONSTRUCTION.

b. THESE DRAWINGS SHALL RECORD THE LOCATION OF ALL CONCEALED EQUIPMENT, PIPING, ELECTRIC SERVICE, SEWERS, WASTES, VENTS, DUCTS, CONDUIT AND OTHER PIPING, BY MEASURED DIMENSIONS TO EACH SUCH ITEM FROM READILY IDENTIFIABLE AND ACCESSIBLE WALLS OR CORNERS OF THE BUILDING. PLANS ALSO SHALL SHOW INVERT ELEVATION OF SEWERS AND TOP ELEVATION OF ALL OTHER BELOW-GRADE LINES.

c. RECORD DRAWINGS SHALL BE KEPT CLEAN AND UNDAMAGED AND SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN RECORDING DEVIATIONS FROM WORKING DRAWINGS AND EXACT LOCATIONS OF CONCEALED WORK.

d. AFTER THE PROJECT IS COMPLETED, THESE SETS OF DRAWINGS SHALL BE DELIVERED TO THE ARCHITECT IN GOOD CONDITION, AS A PERMANENT RECORD OF THE INSTALLATION AS ACTUALLY CONSTRUCTED.

12. WARRANTY (017700)

a. FULLY WARRANT ALL MATERIALS, EQUIPMENT AND WORKMANSHIP FOR ONE (1) YEAR FROM DATE OF ACCEPTANCE. EXTEND ALL MANUFACTURER'S WARRANTIES TO THE OWNER, INCLUDING ALL EXTENDED WARRANTIES ON HVAC EQUIPMENT.

b. REPAIR OR REPLACE WITHOUT CHARGE TO THE OWNER ALL ITEMS FOUND DEFECTIVE DURING THE WARRANTY PERIOD. IN THE CASE OF REPLACEMENT OR REPAIR DUE TO FAILURE WITHIN THE WARRANTY PERIOD, THE WARRANTY ON THAT PORTION OF THE WORK SHALL BE EXTENDED FOR A MINIMUM PERIOD OF ONE (1) YEAR FROM THE DATE OF SUCH REPLACEMENT OR REPAIR.

13. PIPING SYSTEMS (220000)

a. CONNECTIONS BETWEEN DISSIMILAR PIPING MATERIALS SHALL BE MADE WITH SUITABLE DIELECTRIC INSULATING FITTINGS. ISOLATE COPPER PIPING FROM DISSIMILAR METALS, SUCH AS METAL STUDS AND VENT PIPING..

b. ALL PIPING SHALL RUN CONCEALED ABOVE CEILING OR IN WALL CHASE, UNLESS OTHERWISE NOTED. EXPOSED PIPING SHALL BE 3/4 INCH MINIMUM FROM ANY WALL SURFACE. EXCEPT WHERE OTHERWISE INDICATED ON THE DRAWINGS, PIPING IS SHOWN ON THE FLOOR WHERE IT ACTUALLY OCCURS IN THE BUILDING.

14. SANITARY (221316) AND STORM (221414) SEWERS

a. PROVIDE SANITARY AND STORM SEWERS, RAIN CONDUCTORS, STACKS, VENTS, FLOOR DRAINS, HUBS FOR DOWN SPOUTS AND CLEANOUTS FOR PROJECT AND EXTEND TO EXISTING BUILDING FACILITIES AS INDICATED ON THE DRAWINGS.

b. EXCEPT WHERE OTHERWISE INDICATED, HORIZONTAL SANITARY, SEWAGE AND WASTE PIPING SHALL SLOPE AT 1/4 INCH PER FOOT FOR PIPES 2 INCHES AND SMALLER, PIPES 3 INCHES AND LARGER SHALL SLOPE AT 1/8 INCH PER FOOT. ALL VERTICAL SANITARY SEWER AND STORM WATER PIPING, WHICH TURN 90º AFTER PASSING THROUGH A FLOOR, SHALL BE INSTALLED AS TIGHT AS POSSIBLE TO THE UNDERSIDE OF THE STRUCTURE.

c. CHANGES IN DIRECTION AND BRANCH CONNECTIONS SHALL BE MADE WITH CODE APPROVED DRAINAGE FITTINGS COMPATIBLE WITH THE PIPING SYSTEM MATERIAL. CLEAN-OUTS SHALL BE PROVIDED IN PIPING AT EACH CHANGE IN DIRECTION, IN ALL HORIZONTAL STRAIGHT RUNS MORE THAN 50 FEET LONG OR AS ALLOWED BY CODE, AND AT ALL OTHER LOCATIONS AS NOTED ON THE DRAWINGS. ALL CLEAN-OUTS SHALL BE THE SAME SIZE AS THE PIPE DIAMETER UP TO AND INCLUDING PIPE 4 INCHES IN DIAMETER. FOUR INCH CLEAN-OUTS SHALL BE USED FOR ALL PIPE LARGER THAN 4 INCHES, UNLESS NOTED OTHERWISE. ALL CLEAN-OUT LOCATIONS SHALL BE NO MORE THAN 5 FEET ABOVE THE BASE OF THE HORIZONTAL OFFSET AND BE APPROVED BY THE ARCHITECT. FOR CARPETED AREAS, PROVIDE A PERMANENT IDENTIFYING MARK IN THE CARPET DIRECTLY ABOVE THE CLEAN-OUT. THE CLEAN-OUT SHALL HAVE A SMOOTH POLISHED BRONZE FINISH WITH THE LETTERS "C.O." CAST IN THE COVER. FOR WALLS, PROVIDE AN ACCESS PANEL WITH CLEARANCE FOR RODDING. THE FLOOR CLEAN-OUTS SHALL BE ZURN MODEL ZN-1400-T OR APPROVED EQUAL WITH BRONZE PLUG, SQUARE NICKEL BRONZE FRAME AND COVER. THE WALL CLEAN-OUTS SHALL BE ZURN MODEL ZN-1443-BP OR APPROVED EQUAL WITH BRONZE PLUG AND 7 INCHES X 7 INCHES NICKEL BRONZE COVER. NO SANITARY, SOIL OR WASTE PIPE SHALL EXTEND GREATER THAN 2'-0" TO A DEAD-END.

d. PROVIDE ONE TRAP PRIMER VALVE FOR EACH FLOOR DRAIN WITHOUT A CONSTANT SOURCE OF WATER SUPPLY TO MAINTAIN TRAP SEAL. PRIMER VALVE SHALL BE LOCATED IN AN ACCESSIBLE AREA AND CONNECTED TO THE NEAREST 3/4 INCH COLD WATER LINE SERVING A FIXTURE. TRAP PRIMER VALVE SHALL CONFORM TO ASSE 1018 AND 1044. BARRIER TYPE TRAP SEAL PROTECTION DEVICES COMPLYING WITH ASSE 1072 MAY BE USED IN LIEU OF TRAP PRIMER VALVES AS ALLOWED BY LOCAL CODE AND AHJ. PROVIDE FLOAT TYPE BACKWATER VALVE (SIZED FOR ANTICIPATED FLOW RATE) IN ALL OPEN SITE DRAINS AND FLOOR RECEPTORS RECEIVING A/C UNIT CONDENSATE, AND/OR CLEAR WATER WASTE, SUCH AS SPRINKLER FLOW TESTING.

e. FIXTURES AND SANITARY DRAINS SHALL BE VENTED AS INDICATED ON DRAWINGS AND IN ACCORDANCE WITH CODE. VENTS ARE TO BE EXTENDED TO EXISTING BUILDING FACILITIES THROUGH ROOF AS INDICATED ON DRAWING AND FLASHED BY OWNER APPROVED ROOFING CONTRACTOR.

f. PVC PIPING:

– THIS PROJECT HAS A RETURN AIR PLENUM AND PVC SHALL NOT BE INSTALLED IN RETURN AIR PLENUMS, USE NO-HUB CAST IRON, DWV COPPER ASTM B306 PIPING, OR PRESS FIT STAINLESS STEEL.

– WHERE PVC PIPING IS USED, PROVIDE CODE APPROVED FIRE STOPPING MATERIAL AT FIRE RATED WALL PENETRATIONS.

g. INSIDE BUILDING BELOW GRADE SEWER AND VENT MATERIAL SHALL BE AS FOLLOWS:

– SERVICE WEIGHT - CAST IRON PIPE ASTM A-74-82 WITH ASTM C-564-70 NEOPRENE COMPRESSION JOINTS. CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.

– SOLID WALL PVC-DWV PLASTIC ASTM D-1785 WITH ASTM D-2665 DWV SOLVENT WELD SOCKET FITTINGS. FOAM CORE PVC SHALL NOT BE USED.

h. ABOVE GRADE RAIN CONDUCTORS, VENTS AND SANITARY -

– NO-HUB CAST IRON PIPE CISPI 1-301-78. CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.

– NO-HUB COUPLINGS:
- HEAVY-DUTY, 4 BAND, SHIELDED FOR 4" AND SMALLER.
- HEAVY-DUTY, 6 BAND, SHIELDED FOR 5" AND LARGER.

– SOLID WALL PVC-DWV PLASTIC ASTM D-1785 WITH ASTM D-2665 DWV SOLVENT WELD SOCKET FITTINGS. NOT FOR USE IN RETURN AIR PLENUM. FOAM CORE PVC SHALL NOT BE USED.

– DWV COPPER ASTM B306.

– FOR HIGH RISE TENANT SPACE: PIPING 2 INCH AND SMALLER SHALL BE DWV GRADE COPPER.

– STAINLESS STEEL

i. SITE STORM AND SANITARY SEWERS

– UP TO 15" - PVC PLASTIC ASTM D-3034 SDR 35 WITH ASTM D-3212 GASKET JOINTS.

– 18" AND OVER - REINFORCED CONCRETE PIPE (RCP) ASTM C 76-83 WITH ASTM C 443-79 RUBBER GASKET JOINTS.

15. DOMESTIC WATER PIPING (221116)

a. POTABLE WATER PIPING AND COMPONENTS SHALL COMPLY WITH NSF 14, NSF 372, AND NSF 61 ANNEX G. PLASTIC PIPING COMPONENTS SHALL BE MARKED WITH "NSF-PW." GASKETS, JOINTS, CONNECTORS, SPECIALTIES, AND PIPE SHALL BE MANUFACTURED AND PROVIDED BY THE SAME MANUFACTURER. ALL PIPING SHALL BE SUPPORTED DIRECTLY ON EACH SIDE OF A JOINT. ALL PIPING SUPPORTS AND RESTRAINTS SHALL BE IN STRICT ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS AND INSTALLATION GUIDELINES.

b. PROVIDE VALVES AND UNIONS WHERE NEEDED TO PERMIT DISCONNECTIONS OF EACH PIECE OF EQUIPMENT FOR REPAIRS. MAKE CONNECTIONS TO EQUIPMENT WITH SHUT-OFF VALVES ON SUPPLY AND BALANCE VALVES ON RETURNS. INSTALL UNIONS IN PIPES 2" AND SMALLER, ADJACENT TO EACH VALVE, AT FINAL CONNECTIONS EACH PIECE OF EQUIPMENT AND ELSEWHERE AS INDICATED. UNIONS ARE NOT REQUIRED ON FLANGED DEVICES.

c. LEVER TYPE HANDLE OPERATORS SHALL BE PROVIDED ON VALVES UP TO 4". GEAR OPERATORS SHALL BE PROVIDED ON VALVES OVER 4", AND ON VALVES REQUIRING CHAIN OPERATION. VALVES USED FOR BALANCING SHALL HAVE INFINITE POSITION LEVER OR GEAR OPERATORS WITH ADJUSTABLE, OPEN POSITION "MEMORY" STOP. PROVIDE 2" EXTENSION NECKS ON ALL VALVES INSTALLED IN INSULATED LINES.

d. DOMESTIC WATER PRESSURE REDUCING VALVE ASSEMBLIES SHALL BE SELECTED TO PROVIDE STABLE FLOW CONDITIONS WITHOUT CAVITATION OR VALVE CHATTER.

e. PROVIDE STOP VALVES AT ALL FIXTURE AND EQUIPMENT SUPPLIES. ALL EXPOSED FIXTURE CONNECTIONS SHALL BE CHROME PLATED, STAINLESS STEEL OR FITTED WITH CHROME PLATED SLEEVES. PROVIDE VACUUM BREAKERS WHERE REQUIRED BY CODE INCLUDE UNIONS, OR OTHER DISCONNECT MEANS, STOPS OR VALVES FOR ISOLATION OF FIXTURES AND EQUIPMENT. VALVES SHALL FULLY BE COMPATIBLE WITH PIPING FOR SERVICE INTENDED. AS MANUFACTURED BY APOLLO, NIBCO, CRANE, OR OTHER APPROVED MANUFACTURER. INCLUDE HOSE OR DRAIN VALVES AT LOW POINTS WHERE FIXTURES CANNOT BE USED FOR DRAINAGE.

f. WATER PIPING ABOVE GRADE SHALL BE:

– TYPE "L" HARD COPPER ASTM B 88-832 WITH WROUGHT COPPER FITTINGS ASTM B 16.22 1980 AND NON-LEAD OR ANTIMONY SOLDER JOINTS.

– TYPE "L" HARD COPPER ASTM B 88-832 WITH WROUGHT COPPER FITTINGS ASTM B 16.22 1980 AND PRESS-FIT JOINTS.

– PEX TUBING TYPE "A" (CROSS-LINKED POLYETHYLENE) MEETING SECTION 6.6 OF ASTM F876 AND USING "PROPEX" FITTINGS MEETING ASTM F1980, CSA B137.5, NSF/AMSI 14, & NSF/ANSI 61. PEX TUBING LAYOUT SHALL BE IN ACCORDANCE WITH UPONOR'S COMPLETE DESIGN ASSISTANCE MANUAL (CDAM) AND PROFESSIONAL PLUMBING INSTALLATION GUIDE BOOKLETS AND PEX MANUFACTURER'S INSTALLATION RECOMMENDATIONS.

– CPVC (CHLORINATED POLYVINYL CHLORIDE) - COPPER TUBE SIZE, (CTS.); ASTM D2846, ASTM F441, ASTM 442, CSA B137.6. FITTINGS SHALL COMPLY WITH ASTM D2846, ASTM F437, ASTM 438, ASTM F439, CSA B137.8, ASSE 1061.

– 2"Ø AND SMALLER, COPPER PIPE FITTINGS MAY BE PRESS-CONNECT CAST-BRONZE OR WROUGHT-COPPER FITTING WITH EPDM-RUBBER, O-RING SEAL IN EACH END. PRESS-CONNECT FITTINGS SHALL CONFORM TO ASME B16.51 STANDARD.

g. WATER PIPING BELOW GRADE SHALL BE TYPE "K" SOFT COPPER WITHOUT JOINTS.

h. ALL COLD WATER, HOT WATER, AND HOT WATER RETURN PIPING THAT IS PART OF A NEW SYSTEM OR AN ADDITION OF AN EXISTING SYSTEM SHALL BE THOROUGHLY CLEANED AND DISINFECTED AS PER AWWA C651 OR AWWA C652 GUIDELINES. THE DISINFECTION PROCESS SHALL BE PERFORMED AFTER ALL PIPES, COMPONENTS, VALVES, AND FIXTURES ARE INSTALLED AND THE REQUIRED LEAK/PRESSURE TESTS HAVE BEEN COMPLETED. THE SYSTEM SHALL BE FLUSHED WITH CLEAN, POTABLE WATER UNTIL THE SYSTEM IS COMPLETELY CLEAR OF ALL DIRT, SEDIMENT, AND DEBRIS. THE SYSTEM SHALL BE FILLED WITH A WATER/CHLORINE SOLUTION AS PER CODE AND SHALL BE VALVED OFF FROM THE MAIN WATER SUPPLY AND ALLOWED TO STAND FOR A MINIMUM OF 24 HOURS. AFTER THE REQUIRED STANDING TIME, THE SYSTEM SHALL BE FLUSHED WITH CLEAN POTABLE WATER UNTIL THE DISINFECTANT SOLUTION IS COMPLETELY PURGED FROM THE SYSTEM, FIXTURES, AND COMPONENTS. REPEAT DISINFECTION PROCEDURE AS NEEDED IF BACTERIOLOGICAL EXAMINATION INDICATES THAT CONTAMINATES ARE STILL PRESENT IN THE SYSTEM. CONTRACTOR SHALL PROVIDE THE FINAL STERILIZATION TESTING REPORT TO THE ENGINEER FOR REVIEW.

i. IF CONTRACTOR CHOOSES PRESS-CONNECT OPTION: AFTER PRESS-CONNECT FITTINGS HAVE BEEN INSTALLED A "TWO STEP TEST" SHALL BE FOLLOWED. PRESSURIZE THE SYSTEM WITH APPLICATION APPROPRIATE TEST MEDIUM, WATER BETWEEN 15 AND 85 PSI, OR AIR/DRY NITROGEN BETWEEN .5 AND 45 PSI. CHECK THE PRESSURE GAUGE FOR PRESSURE LOSS. IF THE SYSTEM DOES NOT HOLD PRESSURE, WALK THE SYSTEM AND CHECK FOR UN-PRESSED FITTINGS. SHOULD ANY UNPRESSED FITTINGS BE IDENTIFIED FOLLOWING TEST, ENSURE THE TUBE IS FULLY INSERTED INTO THE FITTING AND PROPERLY MARKED PRIOR TO PRESSING THE JOINT. AFTER APPROPRIATE REPAIRS HAVE BEEN MADE, RETEST THE SYSTEM PER LOCAL CODE AND SPECIFICATION REQUIREMENTS, NOT TO EXCEED 600 PSI WITH WATER OR, 200 PSI WHEN USING AIR.

j. DOMESTIC HOT AND COLD WATER PIPING UNDER CONCRETE FLOOR TO BE COVERED WITH SAND SO THAT PIPING WILL NOT BECOME EMBEDDED IN THE CONCRETE. PIPING UNDER CONCRETE FLOOR SHALL BE TYPE "K" SOFT COPPER OR PEX - TYPE A TUBING AND SHALL BE CONTINUOUS. SPLICES OR FITTINGS SHALL NOT BE PERMITTED.

k. EXTREME CAUTION MUST BE TAKEN SO THAT COPPER LINES AND INSULATION UNDER CONCRETE ARE NOT CRUSHED, CUT, SPLIT, RUPTURED OR DEFORMED DURING THE POURING OF THE FLOOR SLAB.

16. GAS PIPING (231123 - NATURAL; 231126 - PROPANE)

a. PROVIDE AN AGA APPROVED OR UL LISTED GAS VALVE, REGULATOR, AND A QUICK-DISCONNECT UNION AT EACH PIECE OF GAS FUELED EQUIPMENT AND AS INDICATED ON THE DRAWINGS. PROVIDE

STATE OF MARYLAND
TIMOTHY R. CHATTERTON
No. 51406
PROFESSIONAL ENGINEER

LICENSE NUMBER: 51406
EXPIRATION DATE: 08/10/2025

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

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DATE	COMMENTS
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ATMOSPHERIC VENTS FOR GAS REGULATORS IN ACCORDANCE WITH LOCAL CODE AND SUPPLIER'S REQUIREMENTS. VALVES SHALL BE INSTALLED AT AN ACCESSIBLE LOCATION. GAS VALVES 2 INCHES AND SMALLER SHALL BE AGA OR UL APPROVED. VALVES 2-1/2 INCHES AND LARGER SHALL BE CERTIFIED BY THE MANUFACTURER TO BE SUITABLE FOR GAS SERVICE AND SHALL BE MINIMUM 125 PSI RATED.

b. ALL EXPOSED METALLIC PIPE AND TUBING SHALL BE PROTECTED AGAINST CORROSION IN ACCORDANCE WITH NFPA 54, INTERNATIONAL FUEL GAS CODE, AND AUTHORITY HAVING JURISDICTION. PROTECTIVE COATINGS AND WRAPPINGS SHALL BE OF APPROVED TYPE AND COLOR FOR THE INTENDED APPLICATION. GAS PIPING ROUTED EXPOSED AND IN FINISHED AREAS SHALL BE PAINTED YELLOW IN COLOR.

c. ALL ABOVE GROUND, EXTERIOR PIPING SHALL BE MOUNTED NOT LESS THAN 3-1/2" ABOVE GRADE AND WHERE INSTALLED ON ROOF SURFACES. PIPING SHALL BE SUPPORTED AND LOCATED WHERE IT WILL BE PROTECTED FROM PHYSICAL DAMAGE. VERTICAL PIPING SHALL BE SUPPORTED BY GALVANIZED SPLIT RING, GALVANIZED UNISTRUT SYSTEM, OR GALVANIZED RISER CLAMPS. HORIZONTAL PIPING ON ROOF SHALL BE SUPPORTED BY A CLOSED-CELL POLYETHYLENE FOAM SUPPORT SYSTEM THAT IS UV AND WEATHER RESISTANT AND INCLUDE A GALVANIZED STRUT CHANNEL; BASIS OF DESIGN: FNW MODEL# FNW7701PP OR B-LINE DURABLOCK ROOFTOP PIPING SUPPORTS WITH COMPATIBLE UNISTRUT CLAMPS.

d. WELDING SHALL BE PERFORMED BY STATE CERTIFIED WELDERS. PROVIDE WELDING CERTIFICATIONS TO A/E.

e. GAS PIPING SHALL BE AS FOLLOWS:
- ABOVE-GRADE INSIDE OR OUTSIDE BUILDING, LOW PRESSURE - SCHEDULE 40 SEAMLESS BLACK STEEL PIPE, BEVELED ENDS.
  - 2" AND SMALLER - THREADED FITTINGS, WROUGHT IRON.
  - 2 1/2" AND LARGER - WELDED FITTINGS, BLACK STEEL.
- INSIDE BUILDING, REGULATED PRESSURE - SCHEDULE 40 BLACK STEEL WITH WELDED BLACK STEEL FITTINGS.
- BELOW GRADE, LOW AND MEDIUM PRESSURE GAS SERVICE - POLYETHYLENE PLASTIC ASTM D-2513 WITH STAB COUPLINGS OR FUSION WELD JOINTS.
- BELOW GRADE, HIGH PRESSURE SERVICE 60 PSI AND OVER - SCHEDULE 40 BLACK STEEL COATED AND WRAPPED WITH WELDED BLACK STEEL FITTINGS. INSTALL CATHODIC PROTECTION ANODE ON SERVICE LINE.

f. VALVES SHALL NOT BE LOCATED ABOVE ACCESSIBLE CEILING SPACES (SUBJECT TO THE APPROVAL OF THE AUTHORITY HAVING JURISDICTION), WHETHER OR NOT SUCH SPACES ARE USED AS A PLENUM.

17. COMPRESSED AIR SYSTEM (226000)

a. EXTEND COMPRESSED AIR PIPING FROM EXISTING MAIN, INCLUDING TAP TO MAIN, PRESSURE REGULATOR, AS INDICATED ON DRAWINGS AND CONNECT TO COMPRESSED AIR USING EQUIPMENT.

b. EXTEND COMPRESSED AIR PIPING FROM EXISTING AIR COMPRESSOR AND CONNECT TO COMPRESSED AIR USING EQUIPMENT.

c. PROVIDE A COMPRESSED AIR SYSTEM INCLUDING COMPRESSOR, REGULATORS, PIPING, HANGERS, TERMINATIONS AND CONNECTIONS TO EQUIPMENT USING COMPRESSED AIR.

d. COMPRESSED AIR CONNECTIONS AT EQUIPMENT SHALL INCLUDE PRESSURE REGULATOR AND FLEXIBLE PIPE CONNECTIONS.

e. COMPRESSED AIR PIPING SHALL BE AS FOLLOWS:
- ABOVE-GRADE INSIDE OR OUTSIDE BUILDING, LOW PRESSURE:
  - SCHEDULE 40 SEAMLESS BLACK STEEL PIPE, THREADED ENDS.
  - SCHEDULE 5 STEEL PIPE WITH PRESSURE SEAL FITTINGS.
  - COPPER TUBE TYPE K, TYPE L, TYPE M WITH WROUGHT COPPER FITTINGS.
  - BLUE ABS PIPE, WITH ABS MODIFIED RESIN, WITH SOCKET TYPE FITTINGS.

f. VALVES SHALL NOT BE LOCATED ABOVE ACCESSIBLE CEILING SPACES (SUBJECT TO THE APPROVAL OF THE AUTHORITY HAVING JURISDICTION), WHETHER OR NOT SUCH SPACES ARE USED AS A PLENUM.

18. FIXTURES AND EQUIPMENT (224000)

a. FURNISH FIXTURES AND EQUIPMENT INDICATED AND SCHEDULED ON DRAWINGS, COMPLETE WITH ACCESSORIES, CONTROLS AND INSTALLATION ITEMS REQUIRED.

b. INSTALL IN FULL ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND PLACE IN SATISFACTORY OPERATION.

c. FIXTURES AND EQUIPMENT SHALL BE AS INDICATED ON THE PLUMBING FIXTURE SCHEDULE.

19. CLEANOUTS (221319)

a. CLEANOUTS SHALL BE INSTALLED FLUSH WITH FINISHED FLOOR OR WALLS WITH PLATED COVERS.

b. CLEANOUTS SHALL BE AS SCHEDULED ON DRAWINGS.

20. INSULATION (220716 AND 220719)

a. REFER TO INSULATION SCHEDULE FOR INSULATION R-VALUE AND THICKNESS REQUIREMENTS.

b. CONDENSATE PIPING SHALL BE INSULATED WITH 1-INCH-THICK FIBERGLASS INSULATION WITH STANDARD VAPOR BARRIER JACKET OR WITH 1" THICK FLEXIBLE UNICELLULAR ("ARMAFLEX").

c. FIBERGLASS PIPE INSULATION SHALL BE PROVIDED WITH STANDARD VAPOR BARRIER JACKET AND HAVE A MAXIMUM CONDUCTIVITY OF 0.27 BTU PER "/HR-FT2-°F. ALL INSULATION SHALL BE APPLIED IN FULL ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

d. INSULATE FITTINGS, JOINTS, AND VALVES WITH INSULATION OF LIKE MATERIAL AND THICKNESS AS ADJOINING PIPE. PROVIDE REMOVABLE INSULATION SECTIONS TO COVER PARTS OF EQUIPMENT WHICH MUST BE OPENED PERIODICALLY FOR MAINTENANCE. FINISH WITH GLASS CLOTH OR PVC FITTING COVERS.

e. ALL PRODUCTS LOCATED WITHIN PLENUM AREAS, INCLUDING BUT NOT LIMITED TO INSULATION AND ADHESIVE SYSTEMS, SHALL HAVE A COMPOSITE FIRE HAZARD RATING NOT TO EXCEED 25 FLAME SPREAD AND 50 SMOKE DEVELOPED PER ASTM E-84, NFPA 255 AND UL 723.

f. INTERIOR ROOF DRAIN BODIES AND HORIZONTAL STORM DRAIN PIPING SHALL BE INSULATED WITH 1-INCH-THICK HEAVY-DUTY FIBERGLASS MATERIAL WITH ALL PURPOSE NONCOMBUSTIBLE VAPOR BARRIER JACKET. INSULATION SHALL HAVE A MAXIMUM THERMAL CONDUCTIVITY FACTOR (K) OF 0.27 BTU*IN/HR*FT2°F. ADHESIVE SYSTEMS THAT EMPLOY RELEASE PAPER WILL NOT BE ACCEPTABLE. ALL HORIZONTAL DRAINAGE PIPING AND TRAPS FROM AN OPEN SITE DRAINER RECEPTORS RECEIVING A/C UNIT CONDENSATE SHALL BE INSULATED.

g. ALL WASTE LINES FROM DRINKING WATER FOUNTAINS SHALL BE INSULATED WITH 1-INCH-THICK HEAVY-DUTY FIBERGLASS MATERIAL WITH ALL PURPOSE NONCOMBUSTIBLE VAPOR BARRIER JACKET. INSULATION SHALL HAVE A MAXIMUM THERMAL CONDUCTIVITY (K) OF 0.23 BTU*IN/HR*FT2*ºF AT 75ºF. ALL DRAINAGE PIPE SHALL BE SUPPORTED DIRECTLY ON EACH SIDE OF A JOINT.

h. EXISTING PVC PIPING IN PLENUM CEILINGS SHALL BE INSULATED TO MEET PLENUM RATINGS, WITH PRODUCT TYPICAL TO FYR-WRAP. INSTALL AS REQUIRED BY MANUFACTURER.

i. EXTREME CAUTION MUST BE TAKEN SO THAT COPPER LINES AND INSULATION UNDER CONCRETE ARE NOT CRUSHED, CUT, SPLIT, RUPTURED OR DEFORMED DURING THE POURING OF THE FLOOR SLAB.

21. HANGERS AND SUPPORTS (220529)

a. INSTALL PIPING SYSTEMS TO PERMIT FREE MOVEMENT FOR EXPANSION. SUPPORT ALL PIPING FROM STRUCTURE WITH UL LISTED HANGERS AND SUPPORTS SUITABLE FOR THE INTENDED INSTALLATION. DESIGN, SELECTION, SPACING, AND APPLICATION OF HANGERS AND SUPPORTS SHALL COMPLY WITH ANSI B31.1, MSS SP-69, AND PIPE MANUFACTURER'S RECOMMENDED SPACING REQUIREMENTS.

b. PROVIDE INSULATION HANGER WITH PROTECTIVE SHIELDS ON SYSTEMS REQUIRING A VAPOR BARRIER. HANGER SHALL BE PROVIDED AT EACH CHANGE OF DIRECTION. HANGERS AND SUPPORTS SHALL BE SPACED AT INTERVALS WHICH WILL PREVENT SAGGING AND REDUCE STRAIN ON VALVES AND SPECIALTIES; ALL PIPING SUPPORTS AND RESTRAINTS SHALL BE IN STRICT ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS AND INSTALLATION GUIDELINES. HANGERS SHALL ALLOW FOR EXPANSION AND CONTRACTION.

c. RISER CLAMPS SHALL BE INSTALLED ABOVE THE FLOOR AT EACH LEVEL. RISER CLAMPS MAY BE SUSPENDED BELOW FLOOR LEVEL, WITH HANGER RODS AND INSERTS, WHERE THE INSTALLATION OF ESCUTCHEON PLATES IS REQUIRED.

d. HANGER SPACING SHALL BE NO GREATER AND ROD SIZE SHALL BE NO SMALLER THAN THAT SHOWN IN THE ON THE HANGER SCHEDULE.

e. HANGERS FOR BLACK OR GALVANIZED STEEL PIPE SHALL BE MANUFACTURED BY MICHIGAN HANGER CO., MODEL NO. 100, OR APPROVED EQUAL.

f. HANGERS FOR CAST IRON PIPE SHALL BE MANUFACTURED BY MICHIGAN HANGER CO., MODEL NO. 400, OR APPROVED EQUAL.

g. HANGERS FOR COPPER TUBING SHALL BE MANUFACTURED BY MICHIGAN HANGER CO., MODEL NO. 102-A, OR APPROVED EQUAL.

h. TRAPEZE HANGERS OF A TYPE APPROVED BY THE ENGINEER. MAINTAIN PIPE INSULATION AT PIPE ANCHORS. PROVIDE INSULATION COUPLERS AS SPECIFIED ABOVE.

i. CONTRACTOR SHALL PROVIDE INSULATION HANGER WITH PROTECTIVE SHIELDS, SUCH AS MICHIGAN HANGER CO., MODEL NO. 103, OR APPROVED EQUAL. 5-INCH-LONG SECTION OF 1/2 INCH THICK CALCIUM SILICATE SECTIONAL PIPE INSULATION WITH FACTORY LONGITUDINAL LAP SHALL BE PROVIDED AT HANGER POINTS. BUTT JOINTS SHALL BE SEALED WITH INSULATING CEMENT.

j. STRAP HANGERS SHALL NOT BE PERMITTED.

k. CONTRACTOR SHALL PROVIDE RISER CLAMPS FOR VERTICAL PIPING AT EACH LEVEL. RISER CLAPS SHALL BE MICHIGAN HANGER CO., MODEL NO. 510 FOR STEEL PIPING AND MODEL NO. 511 FOR COPPER TUBING OR APPROVED EQUAL. USE "SHORT-END" RISER CLAMPS WHERE SPACE IS LIMITED.

l. IN CONCRETE, MICHIGAN HANGER CO., MODEL NO. 355 INSERTS, OR APPROVED EQUAL. INSERTS SHALL PERMIT ADJUSTMENT FROM 3/4 INCH THROUGH 1-1/4 INCH. IN METAL DECKS, CONTRACTOR SHALL PROVIDE REDHEAD SDI INSERTS, OR APPROVED EQUAL. POWDER PROPELLED INSERTS WILL BE PERMITTED IN NEW CONSTRUCTION WHERE TYPE AND LOCATION ARE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

m. CONTRACTOR SHALL PROVIDE SIDE BEAM CLAMPS FOR SUPPORTING PIPING FROM STRUCTURAL STEEL MEMBERS. BEAM CLAMPS SHALL BE MANUFACTURED BY MICHIGAN HANGER CO., MODEL 300 OR APPROVED EQUAL.

n. WHERE OTHER MEANS OF SUPPORT PIPING ARE REQUIRED OR DESIRED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE ENGINEER'S APPROVAL PRIOR TO INSTALLING THOSE SUPPORTS.

o. HANGER SHALL BE PROVIDED AT EACH CHANGE OF DIRECTION.

p. HANGERS AND SUPPORTS SHALL BE SPACED AT INTERVALS WHICH WILL PREVENT SAGGING AND REDUCE STRAIN ON VALVES AND SPECIALTIES. HANGERS SHALL ALLOW FOR EXPANSION AND CONTRACTION.

q. RISER CLAMPS SHALL BE INSTALLED ABOVE THE FLOOR AT EACH LEVEL. RISER CLAMPS MAY BE SUSPENDED BELOW FLOOR LEVEL, WITH HANGER RODS AND INSERTS, WHERE THE INSTALLATION OF ESCUTCHEON PLATES IS REQUIRED.

22. PIPE WALL SEALS (220500)

a. WALL PIPE SEALS WITH RUBBER LINKS SHALL BE THUNDERLINE LINK SEAL, OR APPROVED EQUAL. WALL PIPE SEALS WITH INORGANIC MATERIAL LINKS THE PENETRATIONS OF FIRE RATED WALLS SHALL BE THUNDERLINE PYRO-PAC, OR APPROVED EQUAL.

b. SEALS SHALL BE MODULAR MECHANICAL TYPE CONSISTING OF INTERLOCKING SYNTHETIC RUBBER OR INORGANIC MATERIAL LINKS SHAPED TO CONTINUOUSLY FILL THE ANNULAR SPACE BETWEEN THE PIPE AND WALL OPENING.

c. LINKS SHALL BE LOOSELY ASSEMBLED WITH BOLTS TO FORM A CONTINUOUS BELT AROUND THE PIPE. A PRESSURE PLATE SHALL BE PROVIDED UNDER THE BOLT HEAD AND NUT OF EACH LINK.

d. AFTER THE SEAL ASSEMBLY IS POSITIONED IN THE SLEEVE, THE TIGHTENING OF THE BOLTS SHALL CAUSE THE SEALING ELEMENTS TO EXPAND AND PROVIDE AN ABSOLUTELY WATER-TIGHT SEAL BETWEEN THE PIPE AND SLEEVE.

e. SEALS SHALL BE CONSTRUCTED TO PROVIDE ELECTRICAL INSULATION BETWEEN THE PIPE AND SLEEVE, THUS REDUCING THE CHANCES OF CATHODIC REACTION BETWEEN THESE TWO MEMBERS.

f. SLEEVES SHALL BE MANUFACTURED FROM HEAVY-WALL, WELDED OR SEAMLESS STEEL PIPE. A FULL CIRCLE CONTINUOUSLY WELDED WATER STOP PLATE SHALL BE PROVIDED TO ASSURE POSITIVE WATER SEALING OF THE SLEEVE. SLEEVES SHALL BE PROTECTED BY A COATING OF ENRICHED RED PRIMER.

23. VALVES (220523) AND SPECIALTIES (221119)

a. DOMESTIC WATER SHUT-OFF VALVES INSTALLED ON CPVC PIPING SHALL BE THREE PIECE BALL VALVE, FULL PORT, TRUE UNION TYPE, WITH PLASTIC BODY, BLOW-OUT PROOF STEM DESIGN AND O-RING STEM SEAL. PLASTIC PARTS SHALL BE CPVC. DOMESTIC WATER SHUT-OFF VALVES INSTALLED ON COPPER PIPING SHALL BE TWO PIECE BALL VALVE, FULL PORT, WITH BRASS BODY, STAINLESS STEEL BALL AND TRIM, BLOW-OUT PROOF STEM, AND REPLACEABLE "TEFLON OR TFE" SEATS AND SEALS. VALVES SHALL BE NIBCO OR EQUAL.

b. BALL VALVES 2-INCHES AND SMALLER SHALL BE 150 PSI SWP, 600 PSI WOG, BRONZE, 2-PIECE DESIGN, WITH PTFE TEFLON SEATS AND SEALS, AND BLOW-OUT PROOF STEMS MADE OF LEAD FREE BRONZE. VALVES SHALL HAVE THREADED ENDS FOR USE IN STEEL PIPING AND SOLDER OR PRESS-FIT ENDS FOR USE IN COPPER TUBING. BALL VALVES SHALL BE APOLLO 70LF-11/70LF-200-11, OR APPROVED EQUAL. PROVIDE THERMA-SEAL INSULATING TEE HANDLES FOR VALVES USED IN LINES WHICH ARE TO BE INSULATED.

c. BUTTERFLY VALVES SHALL BE LUG WAFER TYPE, SUITABLE FOR 150 PSI WOG AT TEMPERATURE RANGING FROM 25 DEGREES F THROUGH 230 DEGREES F.

d. BUTTERFLY VALVES SHALL HAVE FULLY REPLACEABLE SEATS MADE OF EPDM ELASTOMER. BUTTERFLY VALVES CLOSURE SHALL BE BUBBLE TIGHT.

e. BUTTERFLY VALVES SHALL HAVE CAST IRON OR SEMI-STEEL BODIES, ONE PIECE TYPE 416 STAINLESS STEEL STEMS, AND BRONZE DISCS. DISCS SHALL BE ANCHORED TO STEM WITH BRONZE DRIVE PINS. SEMI-STEEL DISCS WITH WELDED NICKEL EDGE MAY BE USED IN LIEU OF BRONZE DISCS.

f. PROVIDE 2 INCH EXTENSION NECKS ON VALVES INSTALLED IN INSULATED LINES.

g. LEVER TYPE HANDLE OPERATORS SHALL BE PROVIDED ON VALVES UP TO 4 INCHES IN SIZE. GEAR OPERATORS SHALL BE PROVIDED ON VALVES OVER 4 INCHES IN SIZE, AND ON VALVES REQUIRING CHAIN OPERATION. VALVES USED FOR BALANCING SHALL HAVE INFINITE POSITION LEVER OR GEAR OPERATORS WITH ADJUSTABLE, OPEN POSITION "MEMORY" STOP.

h. BUTTERFLY VALVES SHALL BE NIBCO LD-2000, ITT GRINNELL 8000 SERIES, OR APPROVED EQUAL.

i. GLOBE VALVES FOR COPPER PIPING UP TO AND INCLUDING 2-1/2 INCHES SHALL BE NIBCO NO. S-235 OR APPROVED EQUAL, CLASS 150, 300# WOG, BRONZE BODY, BRONZE RISING STEM, UNION BONNET, RENEWABLE SEAT AND SOLDERED ENDS. DOMESTIC WATER GLOBE VALVES FOR COPPER PIPING 3 INCHES AND 4 INCHES SHALL BE CRANE NO. 351 OR APPROVED EQUAL, CLASS 125, 200# WOG CAST IRON OS&Y VALVES WITH ANSI B16.1 FLANGED ENDS, YOKE BONNET, RENEWABLE SEAT AND BRONZE TRIM: STEMS, DISC FACES, SEAT FACES AND BUSHINGS CONSTRUCTED OF BRONZE. ALL OF THE ABOVE GLOBE VALVES SHALL BE USED FOR BALANCING OR THROTTLING VALVE APPLICATIONS.

j. CHECK VALVES (3 INCH AND SMALLER) SHALL BE 125# WITH REMOVABLE, REGRINDABLE DISCS AND THREADED OR SOLDER JOINT ENDS. CHECK VALVES TO BE INSTALLED IN HORIZONTAL LINES SHALL BE HAMMOND, MODEL IB940, OR APPROVED EQUAL, (SCREWED JOINTS) OR HAMMOND, MODEL IB941, OR APPROVED EQUAL (SOLDER JOINTS). CHECK VALVES TO BE INSTALLED IN VERTICAL PIPING SHALL BE HAMMOND, MODEL, IB939, OR APPROVED EQUAL. CONTRACTOR SHALL PROVIDE SWEAT-TO-THREAD ADAPTERS FOR SOLDER JOINT CONNECTIONS.

k. DOMESTIC WATER GATE VALVES FOR COPPER PIPING UP TO AND INCLUDING 2-1/2 INCHES SHALL BE NIBCO NO. S-111 OR APPROVED EQUAL, CLASS 125, 200 PSIG WOG, BRONZE BODY WITH SOLDERED ENDS, RISING STEM, SOLID WEDGE, AND SCREWED BONNET. DOMESTIC WATER GATE VALVES FOR COPPER PIPING 3 INCHES AND 4 INCHES SHALL BE CRANE NO. 465-1/2 OR APPROVED EQUAL, 200# WOG CAST IRON OS&Y VALVE WITH CLASS 125 ANSI B16.1 FLAT FACED FLANGED ENDS AND BRONZE TRIM: STEMS, DISC FACES, SEAT FACES, SEAT RINGS AND BONNET BUSHINGS CONSTRUCTED OF BRONZE. ALL OF THE ABOVE GATE VALVES SHALL BE USED FOR STOP OR ISOLATION VALVE APPLICATIONS. IN LIEU OF GATE VALVES FOR PIPING 2 INCHES AND SMALLER, NIBCO 585-70 BALL VALVES MAY BE USED.

l. GATE VALVES FOR UNDERGROUND WATER SERVICE SHALL BE UL LISTED AND FM APPROVED, 175#, WWP, WITH CAST IRON BODIES BRONZE MOUNTED, NON-RISING STEMS, SOLID WEDGE DISCS, AND INDICATOR POST FLANGES. VALVES SHALL BE STOCKHAM VALVE MODEL, G-635, WITH CONVENTIONAL PACKING AND MECHANICAL JOINT ENDS.

m. SHOCK ARRESTORS SHALL BE LOCATED DOWNSTREAM OF THE DOMESTIC WATER SERVICE VALVE, AT EACH SERVICE TO A GROUP OF FIXTURES, OR AS INDICATED ON THE DRAWINGS. SHOCK ARRESTORS SHALL BE AS MANUFACTURED BY PRECISION PLUMBING PRODUCTS OR APPROVED EQUAL AND CONFORM TO THE REQUIREMENTS OF THE PLUMBING AND DRAINAGE INSTITUTE. INSTALL SHOCK ABSORBERS AT EACH FIXTURE OR WHERE REQUIRED TO PREVENT WATER HAMMER IN ACCORDANCE WITH STANDARD PDI-WH 201.

n. PROVIDE STOP VALVES AT ALL FIXTURE AND EQUIPMENT SUPPLIES. ALL EXPOSED FIXTURE CONNECTIONS SHALL BE CHROME PLATED, STAINLESS STEEL OR FITTED WITH CHROME PLATED SLEEVES. PROVIDE VACUUM BREAKERS WHERE REQUIRED BY CODE INCLUDE UNIONS, OR OTHER DISCONNECT MEANS, STOPS OR VALVES FOR ISOLATION OF FIXTURES AND EQUIPMENT. VALVES SHALL FULLY BE COMPATIBLE WITH PIPING FOR SERVICE INTENDED. AS MANUFACTURED BY APOLLO, NIBCO, CRANE, OR OTHER APPROVED MANUFACTURER. INCLUDE HOSE OR DRAIN VALVES AT LOW POINTS WHERE FIXTURES CANNOT BE USED FOR DRAINAGE.

o. REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY SHALL BE WATTS NO# LF909-S SERIES OR APPROVED EQUAL. IF IT COMPLIES WITH THESE SPECIFICATIONS EQUIPMENT MANUFACTURED BY CLA-VAL COMPANY, FEBCO, HERSEY PRODUCTS, INC., OR WATTS REGULATION COMPANY WILL BE ACCEPTABLE. ASSEMBLY SHALL BE COMPLETE WITH STRAINER, DRAIN LINES, INLET AND OUTLET SHUT-OFF VALVES AND WATTS SERIES 'AG' AIR GAP. THE PRESSURE LOSS OVER THE ENTIRE ASSEMBLY SHALL NOT EXCEED 10 PSI AT THE DESIGN FLOW. THE SIZE OF THE ASSEMBLY SHALL NOT BE SMALLER THAN THE LINE SIZE IN WHICH IT IS INSTALLED. BACKFLOW PREVENTER ASSEMBLY SHALL BE INSTALLED IN AN ACCESSIBLE LOCATION. RELIEF OUTLET PIPE SHALL DISCHARGE TO NEAREST FLOOR DRAIN OR OTHER APPROVED LOCATION OF DISCHARGE. DO NOT INSTALL ABOVE FINISHED CEILINGS, UNLESS NOTED OR INDICATED OTHERWISE.

p. STRAINERS:
- Y-TYPE STRAINERS - BRONZE 3" AND SMALLER: STRAINER BODY TO BE ASTM B584 OR B62 BRONZE WITH THREADED OR SOLDER END CONNECTIONS AND .033 INCH PERFORATED TYPE 304 STAINLESS STEEL SCREEN OR 20 MESH TYPE 304 STAINLESS STEEL SCREEN ACCESSIBLE WITHOUT REMOVING THE STRAINER FROM THE LINE.
- Y-TYPE STRAINERS - IRON 3" AND SMALLER: STRAINER BODY TO BE CLASS 250 THREADED, TAPPED SCREW-IN BONNET WITH PLUG AND STAINLESS-STEEL SCREEN. BODY AND BONNET TO BE ASTM A126. SCREEN MUST BE ACCESSIBLE WITHOUT REMOVING THE STRAINER FROM THE LINE.
- Y-TYPE STRAINERS - IRON 2 1/2" AND LARGER: STRAINER BODY TO BE CLASS 125 FLANGED, TAPPED BOLTED BONNET WITH PLUG AND STAINLESS-STEEL SCREEN. BODY AND BONNET TO BE ASTM A126. SCREEN MUST BE ACCESSIBLE WITHOUT REMOVING THE STRAINER FROM THE LINE.

q. ACCEPTABLE MANUFACTURERS:
- NIBCO
- APOLLO
- WATTS

r. FLOOR CEILING AND WALL PLATES: FIT PIPE PASSING THROUGH WALLS, FLOORS OR CEILINGS IN FINISHED ROOMS WITH STEEL OR BRASS ESCUTCHEONS. WHERE SURFACE IS TO RECEIVE A PAINT FINISH ESCUTCHEONS SHALL BE PRIME PAINTED; OTHERWISE MAKE ESCUTCHEONS NICKEL OR CHROME PLATED. WHERE PIPING IS INSULATED, FIT ESCUTCHEONS OUTSIDE INSULATION.

24. EQUIPMENT (220500)

a. MAKE ALL FINAL EQUIPMENT AND FIXTURE CONNECTIONS AND PROVIDE THE NECESSARY ADAPTORS, FITTINGS, VALVES, DEVICES, ETC. FOR A COMPLETE AND OPERABLE SYSTEM. PROVIDE COMPLETE WITH BASES, ISOLATORS, SUPPORTS AND OTHER REQUIRED ACCESSORIES. PROVIDE VALVES AND UNIONS WHERE NEEDED TO PERMIT DISCONNECTIONS OF EACH PIECE OF EQUIPMENT FOR REPAIRS. PLUMBING CONNECTIONS SHOWN ARE NOMINAL. VERIFY EXACT CONNECTION SIZE WITH EACH PIECE OF EQUIPMENT SUPPLIED.

b. EQUIPMENT SHALL BE INSTALLED IN FULL ACCORDANCE WITH THE MANUFACTURER'S DATA AND INSTALLATION INSTRUCTIONS, INCLUDING CLEARANCES, LUBRICATE AND ADJUST AS REQUIRED. IT IS THIS CONTRACTOR'S RESPONSIBILITY TO CHECK AND CONFORM TO THESE REQUIREMENTS PRIOR TO STARTING WORK. FURNISH AND INSTALL CLEAN SET OF FILTERS PRIOR TO BALANCING.

c. THE CONTRACTOR SHALL COORDINATE THE ELECTRICAL CHARACTERISTICS OF ALL MECHANICAL EQUIPMENT PRIOR TO ORDERING OF EQUIPMENT. COORDINATE REQUIREMENT FOR PROVISION OF MOTOR STARTERS, DISCONNECTS, CONTACTORS, CONTROL WIRING, ETC. AS REQUIRED FOR A PROPER FUNCTIONING SYSTEM WITH ELECTRICAL CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR LACK OF CONTRACTOR COORDINATION OF ELECTRICAL CHARACTERISTICS.

d. ALL FLOOR MOUNTED EQUIPMENT SHALL BE INSTALLED ON CONCRETE HOUSEKEEPING PADS. MINIMUM PAD THICKNESS SHALL BE NOMINAL 4". PAD SHALL EXTEND BEYOND THE EQUIPMENT A MINIMUM OF 4" ON EACH SIDE. CONCRETE PADS SHALL BE PROVIDED BY THIS CONTRACTOR. IT SHALL BE THE RESPONSIBILITY OF THE THIS CONTRACTOR TO COORDINATE THE SIZE AND LOCATION OF THE CONCRETE HOUSEKEEPING PADS WITH THE GENERAL CONTRACTOR.

e. ALL EQUIPMENT SHALL BE MOUNTED ON VIBRATION ISOLATORS TO PREVENT THE TRANSMISSION OF VIBRATION AND MECHANICALLY TRANSMITTED SOUND TO THE BUILDING STRUCTURE.

f. ISOLATION EQUIPMENT SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER AND SHALL BE DESIGNED SPECIFICALLY FOR THE APPLICATION REQUIRED. THIS INCLUDES, BUT IS NOT LIMITED TO, PIPING DUCTWORK, PUMPS, COMPRESSORS. VIBRATION ISOLATORS SHALL BE RATED FOR THE WEIGHT AND SPACING REQUIRED FOR THE EQUIPMENT REQUIRING ISOLATION.

g. ALL CONDENSATE DRAINS SHALL BE TRAPPED PER DETAIL ON MECHANICAL DRAWINGS. PROVIDE CLEANOUT(S). PROVIDE AUXILIARY DRAIN PANS AT ALL EQUIPMENT WHERE DAMAGE TO ANY BUILDING COMPONENT COULD OCCUR AS A RESULT OF OVERFLOW OR STOPPAGE OF THE PRIMARY SYSTEM. WATER LEVEL DETECTION SHALL BE PROVIDED IN AUXILIARY PAN TO PROVIDE SHUT DOWN OF EQUIPMENT.

h. PROVIDE CURBS FOR ALL ROOF OPENINGS FOR DUCTS, FLUES, PIPING AND EQUIPMENT. CURBS SHALL BE FURNISHED AS ACCESSORIES TO THE EQUIPMENT OR 8" HIGH PATE OR EQUAL EQUIPMENT SUPPORTS SPANNING STRUCTURE AND FLASHED INTO ROOFING. ALL CUTTING, FLASHING, AND PATCHING OF THE ROOF SHALL BE BY OWNER'S ROOFING CONTRACTOR AND PAID FOR BY PLUMBING CONTRACTOR.

i. SEAL JOINTS BETWEEN PLUMBING FIXTURES AND THE SURFACE TO WHICH THEY ARE MOUNTED USING SANITARY-TYPE, ONE-PART, MILDEW RESISTANT SILICONE SEALANT. MATCH SEALANT COLOR TO FIXTURE COLOR.

25. IDENTIFICATION (220553)

a. CONTRACTOR SHALL PROVIDE IDENTIFICATION LABELS, TAGS, ETC. AS INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN. THE IDENTIFICATION SHALL BE IN ACCORDANCE WITH ANSI STANDARD A13.1. PRESSURE SENSITIVE MARKERS SHALL BE MANUFACTURED BY THE BRADY CO., OR APPROVED EQUAL. MARKERS SHALL BE MANUFACTURER'S STANDARD PRODUCT. PRESSURE SENSITIVE PIPE MARKERS SHALL BE MANUFACTURED BY THE BRADY CO., OR APPROVED EQUAL. PIPE MARKERS SHALL BE MANUFACTURER'S STANDARD PRODUCT.

b. PIPE LABEL LOCATIONS: LOCATE PIPE LABELS WHERE PIPING IS EXPOSED OR ABOVE ACCESSIBLE CEILINGS IN FINISHED SPACES; MACHINE ROOMS; ACCESSIBLE MAINTENANCE SPACES SUCH AS SHAFTS, TUNNELS, AND PLENUMS; AND EXTERIOR EXPOSED LOCATIONS AS FOLLOWS:
- NEAR EACH VALVE AND CONTROL DEVICE.
- NEAR EACH BRANCH CONNECTION, EXCLUDING SHORT TAKEOFFS FOR FIXTURES AND TERMINAL UNITS. WHERE FLOW PATTERN IS NOT OBVIOUS, MARK EACH PIPE AT BRANCH.
- NEAR PENETRATIONS AND ON BOTH SIDES OF THROUGH WALLS, FLOORS, CEILINGS, AND INACCESSIBLE ENCLOSURES.
- AT ACCESS DOORS, MANHOLES, AND SIMILAR ACCESS POINTS THAT PERMIT VIEW OF CONCEALED PIPING.
- NEAR MAJOR EQUIPMENT ITEMS AND OTHER POINTS OF ORIGINATION AND TERMINATION.
- SPACED AT MAXIMUM INTERVALS OF 50 FEET (15 m) ALONG EACH RUN. REDUCE INTERVALS TO 25 FEET (7.6 m) IN AREAS OF CONGESTED PIPING AND EQUIPMENT.

c. PROVIDE VALVE TAGS AND VALVE CHART PER ASME A13.1 SCHEME FOR THE IDENTIFICATION OF PIPING SYSTEMS.

26. CHECK, TEST, START, ADJUST, BALANCE AND INSTRUCTIONS (220593)

z. AFTER THE INSTALLATION, CHECK ALL EQUIPMENT, AND PERFORM START UP IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

aa. PERFORM A HYDROSTATIC PRESSURE TEST ON ALL PIPING, AT THE PIPING SYSTEM WORKING PRESSURE, FOR A MINIMUM PERIOD OF 24-HOURS. REPAIR ANY LEAKS AND RETEST TO DEMONSTRATE TIGHTNESS. STOP-LEAK COMPOUNDS WILL NOT BE ALLOWED. ALL PIPING FOR PRESSURIZED WATER SYSTEMS SHALL HAVE A MINIMUM PRESSURE RATING OF 150 PSI.

ab. CONCEALED OR INSULATED WORK SHALL REMAIN UNCOVERED UNTIL REQUIRED TESTS HAVE BEEN COMPLETED, BUT IF THE CONSTRUCTION SCHEDULE REQUIRES IT, ARRANGE FOR PRIOR TESTS ON PARTS OF SYSTEM AS APPROVED BY THE TENANT.

ac. START UP AND PLACE ALL SYSTEMS IN OPERATION AND TAG ALL VALVES, SWITCHES AND CONTROLS WITH PERMANENT LABELS.

ad. PROVIDE OWNER TRAINING AND DEMONSTRATION OF ALL PLUMBING SYSTEMS AND EQUIPMENT. INSTRUCT OWNER ON PROPER OPERATION AND PREVENTATIVE MAINTENANCE OF SYSTEM. SUBMIT OPERATING AND MAINTENANCE MANUAL ON ALL EQUIPMENT AND SYSTEMS.

STATE OF MARYLAND · TIMOTHY R. CHATTER · No. 51406 · PROFESSIONAL ENGINEER

LICENSE NUMBER: 51406
EXPIRATION DATE: 08/10/2025
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

DAVIS BOWEN & FRIEDEL, INC.
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SALISBURY, MARYLAND 410.543.9091

ISLE OF WIGHT RENOVATION
WORCESTER CO HEALTH DEPARTMENT
13070 ST. MARTINS NECK ROAD; BISHOPVILLE, MD 21813

DATE	COMMENTS
12/18/2024	100% Design Development
05/07/2025	90% Construction Documentation
07/16/2025	100% Construction Documentation
07/29/2025	Issued for Permit

Date: July 29, 2025
Scale: AS NOTED
Dwn.By: BWEA
Proj.No.: 0085B055.A01

PLUMBING SPECIFICATIONS

Allen + Shariff
MEP Engineering
Project Management
205 East Market Street
Salisbury, Maryland 21801
443.545.1300

Dwg.No.: P-003

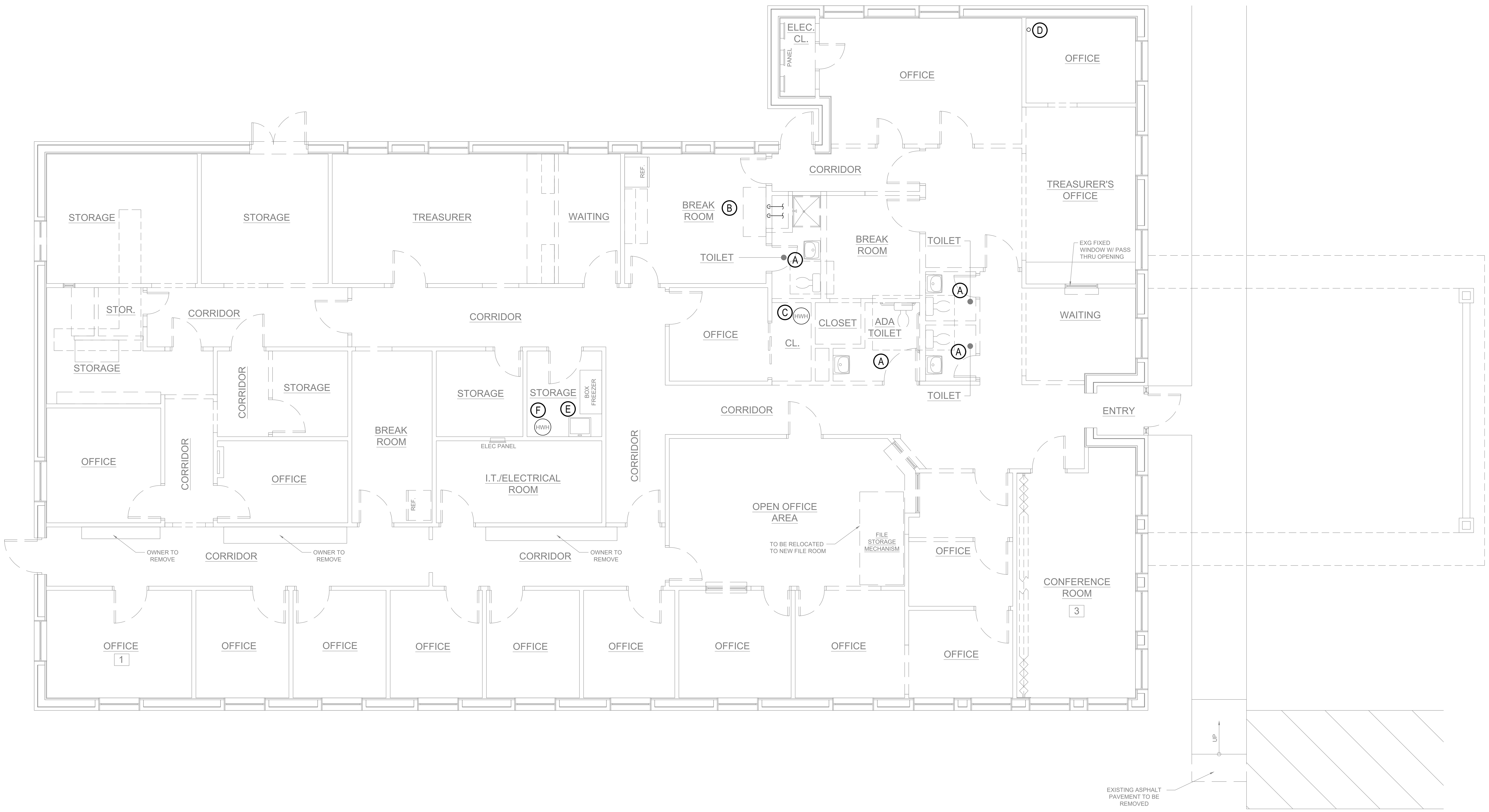
ALLEN + SHARIFF JOB #: 2431096

DISCIPLINE GENERAL NOTES:

1. EXISTING CONDITIONS SHOWN ON THIS DRAWING HAVE BEEN OBTAINED FROM EXISTING FIELD OBSERVATIONS AND PHOTOS, AND MAY NOT INDICATE ALL ACTUAL EXISTING CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL EXISTING CONDITIONS PRIOR TO FABRICATION OR PERFORMANCE OF ANY WORK. SHOULD CONDITIONS BE DISCOVERED THAT PREVENT EXECUTION OF THE WORK AS INDICATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND ARCHITECT IN WRITING AND AWAIT DIRECTION BEFORE PROCEEDING WITH THE WORK.

DISCIPLINE KEY NOTES: (X)

A. EXISTING RESTROOM FIXTURES TO BE REMOVED. EXISTING PLUMBING SERVICES TO BE DEMOLISHED BACK TO POINT ABOVE CEILING OR BELOW FLOOR AND CAPPED. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF CAP.
B. EXISTING SINK TO BE REPLACED. EXISTING CONNECTIONS TO REMAIN FOR CONNECTION OF NEW FIXTURE.
C. EXISTING WATER HEATER TO BE REMOVED. CONTRACTOR TO REMOVE EXISTING HW/CW CONNECTIONS AND CAPP ABOVE CEILING.
D. EXISTING TO REMAIN INCOMING COLD WATER SERVICE. EXISTING WATER HEATER TO BE REMOVED. CONTRACTOR TO MODIFY EXISTING HW/CW CONNECTIONS TO ACCOMODATE NEW WATER HEATER INSTALLTION.
E. EXISTING SERVICE SINK TO BE REMOVED. EXISTING PLUMBING SERVICES TO BE PREPPED FOR CONNECTION OF NEW SERVICE SINK.
F. EXISTING WATER HEATER TO REMAIN.



(1) P-101 **PLUMBING DEMO PLAN**
3/16" = 1'-0"

GRAPHIC SCALE 3/16" = 1'-0" (1' 0 4' 8' 12' 16') N

LICENSE NUMBER: 51406
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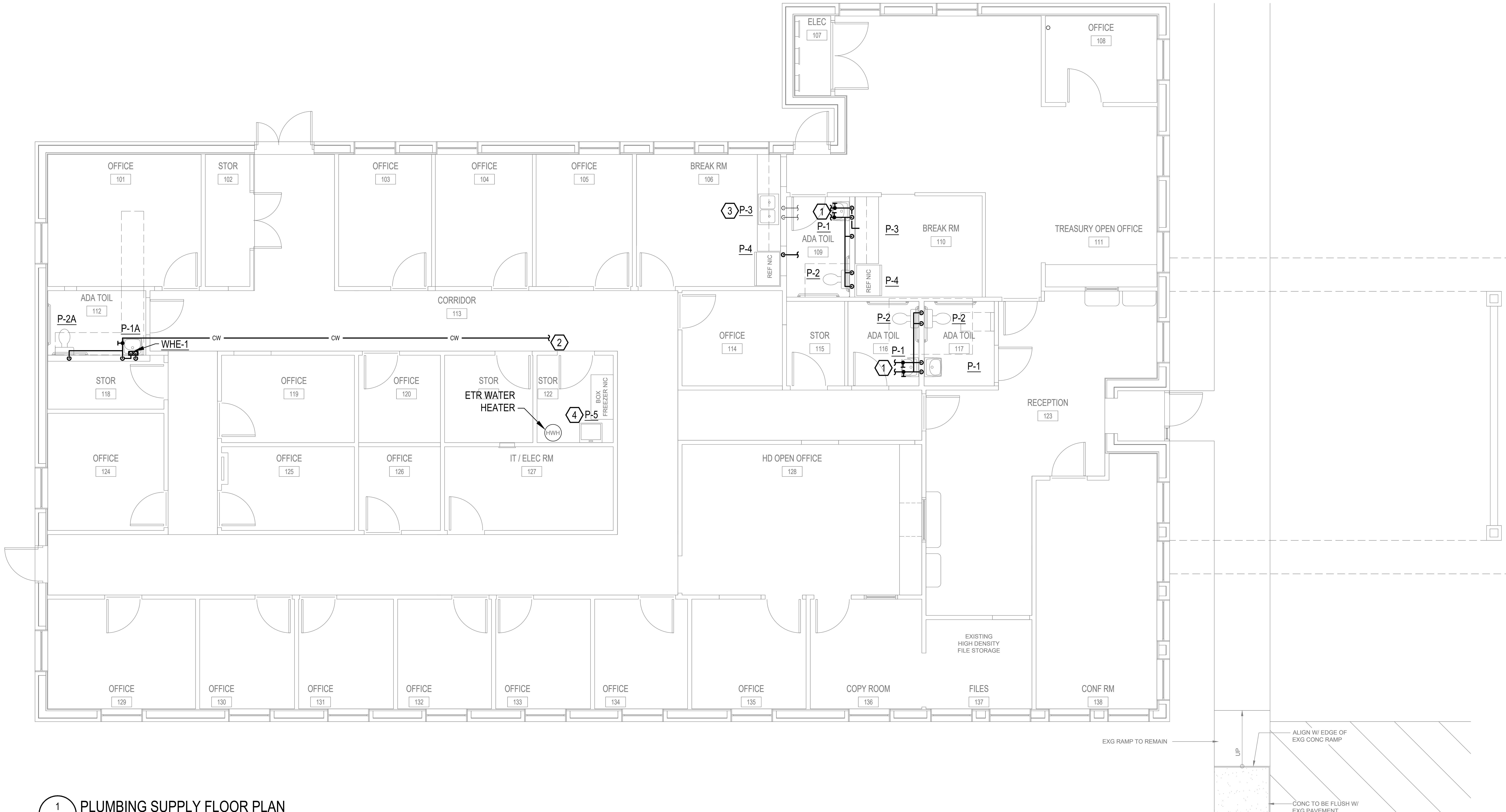
PLUMBING DEMO PLAN

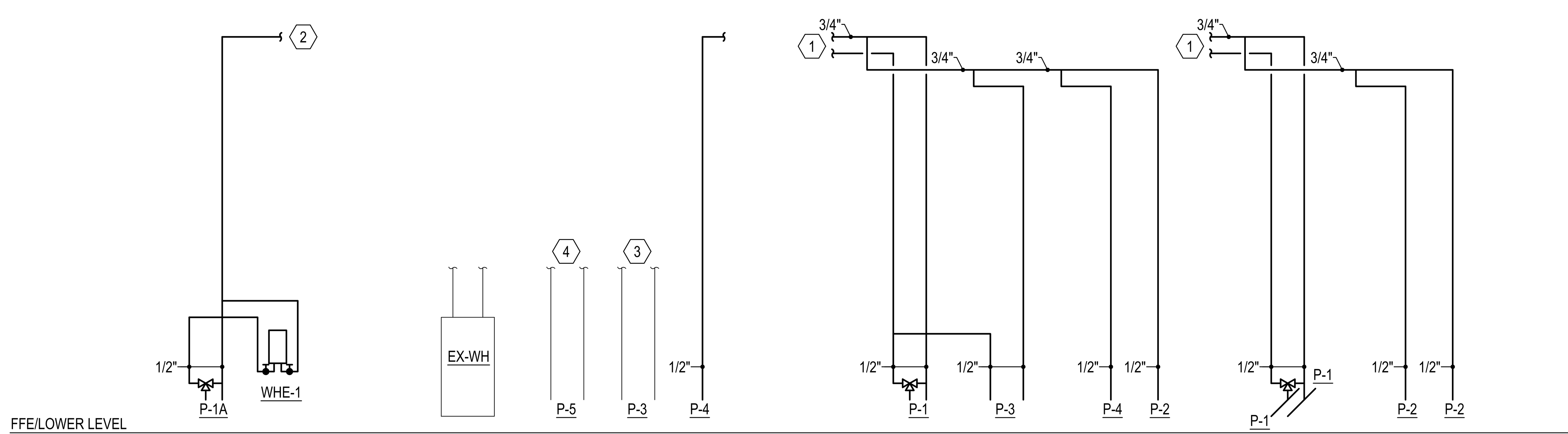
Allen + Shariff
MEP Engineering
Project Management

Dwg.No.: P-101

ALLEN + SHARIFF JOB #: 2431096



1 / P-201 PLUMBING SUPPLY FLOOR PLAN
3/16" = 1'-0"



2 / P-201 DOMESTIC WATER RISER DIAGRAM
NONE
WSFU: 28.0
REFER TO PLUMBING FIXTURE SCHEDULE FOR CONNECTION SIZES.

SUPPLY GENERAL NOTES:

1. EXISTING CONDITIONS SHOWN ON THIS DRAWING HAVE BEEN OBTAINED FROM FIELD OBSERVATIONS AND PHOTOS, AND MAY NOT INDICATE ALL ACTUAL EXISTING CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL EXISTING CONDITIONS PRIOR TO FABRICATION OR PERFORMANCE OF ANY WORK. SHOULD CONDITIONS BE DISCOVERED THAT PREVENT EXECUTION OF THE WORK AS INDICATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND ARCHITECT IN WRITING AND AWAIT DIRECTION BEFORE PROCEEDING WITH THE WORK.

SUPPLY KEY NOTES:

1. 3/4" HW/CW TO CONNECT TO EXISTING DOMESTIC WATER SYSTEM IN THIS AREA. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND FINAL CONNECTION.
2. 1/2"CW TO CONNECT TO EXISTING DOMESTIC WATER SYSTEM IN THIS AREA. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND FINAL CONNECTION.
3. CONNECT P-4 TO EXISTING CONNECTIONS. CONTRACTOR TO PROVIDE NEW SUPPLIES, STOPS, AND RISERS. PROVIDE NEW SUPPLY RISERS, ISOLATION VALVES, P-TRAPS, WAX RING, ETC. WITH NEW FIXTURE ROUGH-IN. NEW FIXTURES SHALL BE CAULKED/SEALED TO ADJOINING SURFACES
4. CONNECT P-5 TO EXISTING CONNECTIONS. CONTRACTOR TO PROVIDE NEW SUPPLIES, STOPS, AND RISERS. PROVIDE NEW SUPPLY RISERS, ISOLATION VALVES, P-TRAPS, ETC. WITH NEW FIXTURE ROUGH-IN. NEW FIXTURES SHALL BE CAULKED/SEALED TO ADJOINING SURFACES.

STATE OF MARYLAND TIMOTHY R. CHATTER No. 51406 PROFESSIONAL ENGINEER
LICENSE NUMBER: 51406
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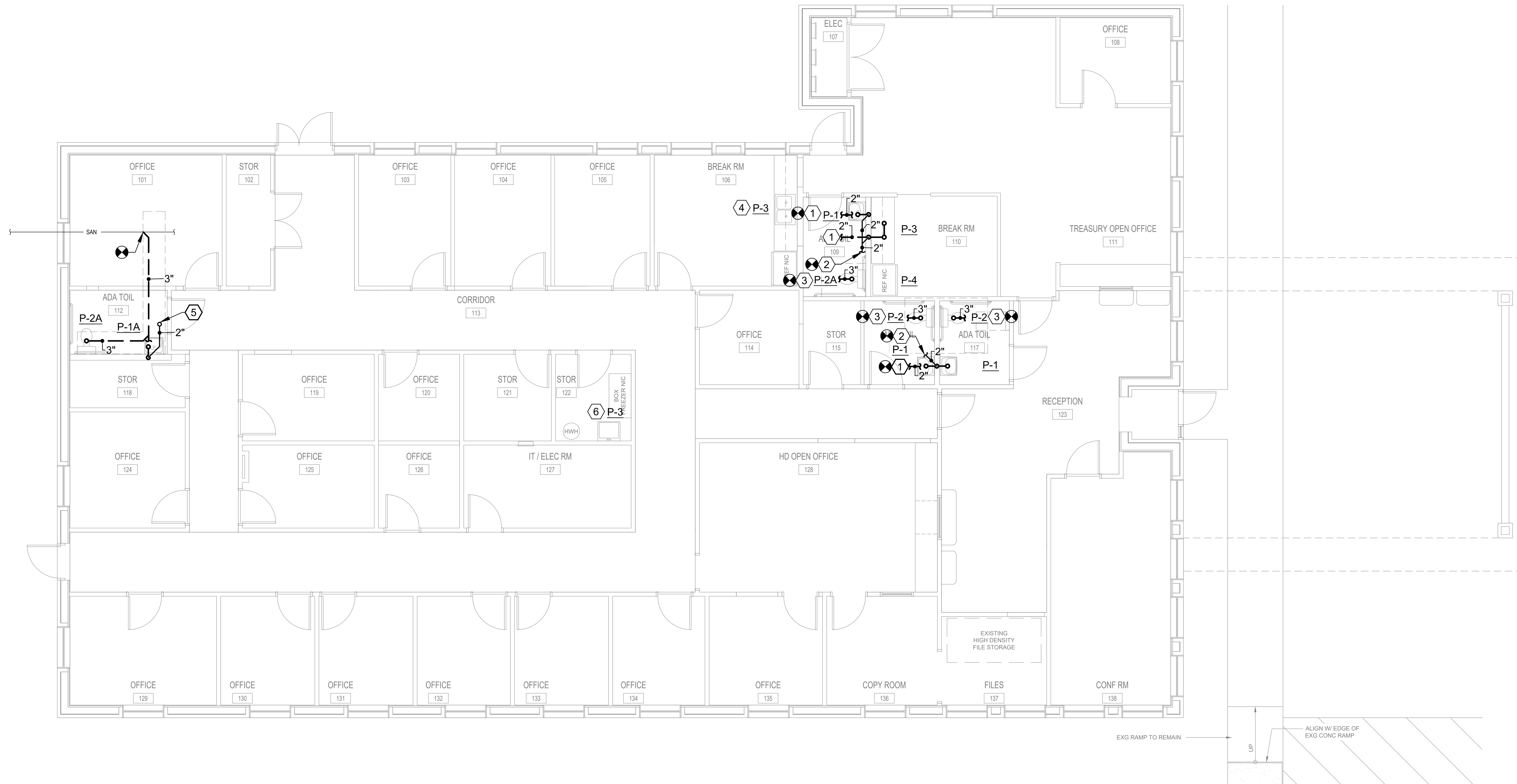
PLUMBING SUPPLY PLAN

GRAPHIC SCALE 3/16" = 1'-0"

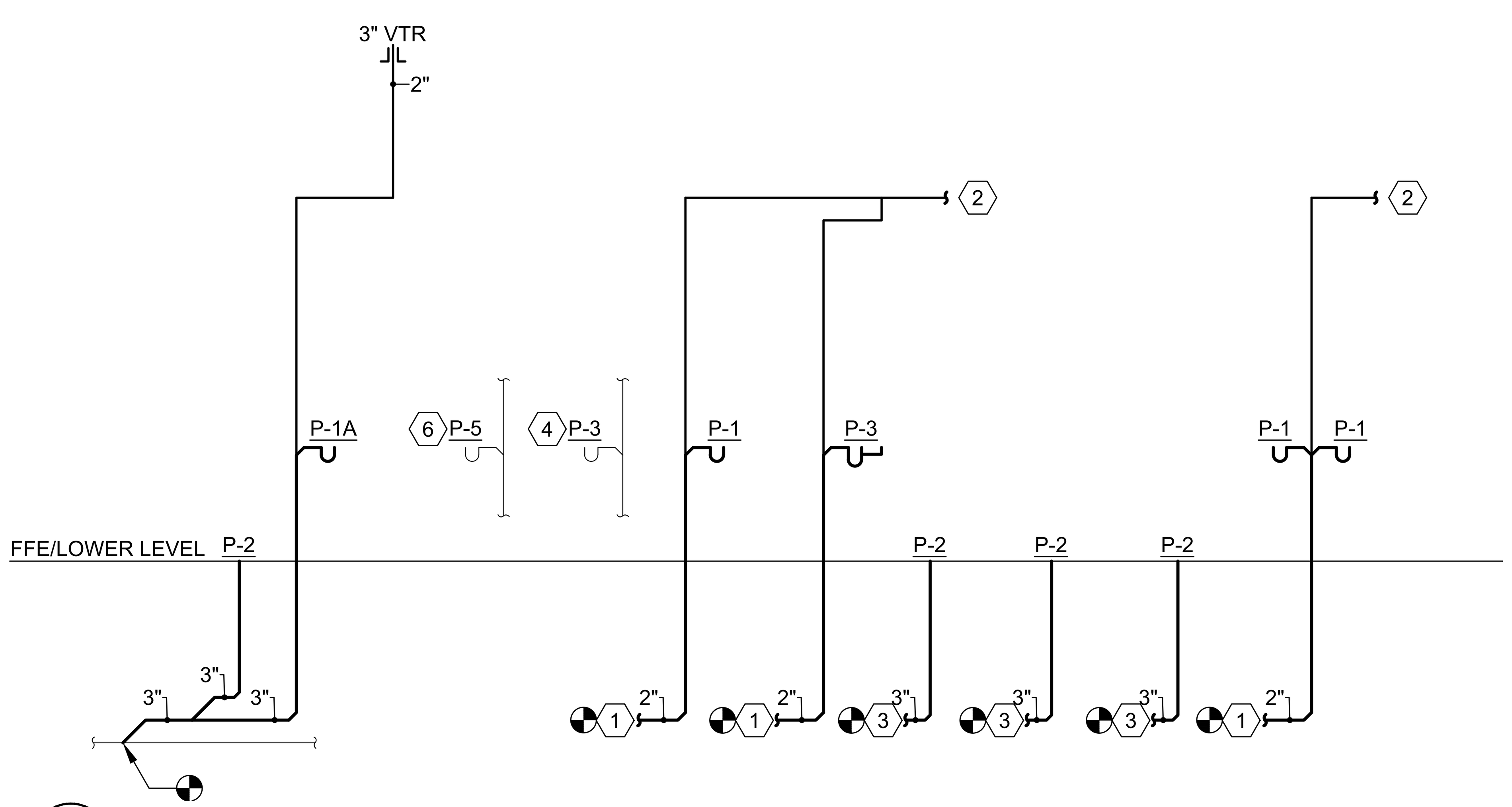
Allen + Shariff
MEP Engineering
Project Management

Dwg.No.: P-201

ALLEN + SHARIFF JOB #: 2431096



1 / P-301 **Plumbing Drainage Floor Plan**
3/16" = 1'-0"



2 / P-201 **DRAINAGE RISER DIAGRAM**
NONE
DFU: 22.0
REFER TO PLUMBING FIXTURE SCHEDULE FOR CONNECTION SIZES.

DRAINAGE GENERAL NOTES:

1. EXISTING CONDITIONS SHOWN ON THIS DRAWING HAVE BEEN OBTAINED FROM FIELD OBSERVATIONS AND PHOTOS, AND MAY NOT INDICATE ALL ACTUAL EXISTING CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL EXISTING CONDITIONS PRIOR TO FABRICATION OR PERFORMANCE OF ANY WORK. SHOULD CONDITIONS BE DISCOVERED THAT PREVENT EXECUTION OF THE WORK AS INDICATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND ARCHITECT IN WRITING AND AWAIT DIRECTION BEFORE PROCEEDING WITH THE WORK.

DRAINAGE KEY NOTES:

1. CONNECT 2" SAN. TO EXISTING SANITARY SYSTEM IN THIS AREA. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND FINAL CONNECTION.
2. CONNECT 2" V. TO EXISTING VENT SYSTEM IN THIS AREA. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND FINAL CONNECTION.
3. CONNECT 3" SAN. TO EXISTING SANITARY SYSTEM IN THIS AREA. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND FINAL CONNECTION.
4. CONNECT P-4 TO EXISTING CONNECTIONS. CONTRACTOR TO PROVIDE NEW SUPPLIES, STOPS, AND RISERS. PROVIDE NEW SUPPLY RISERS, ISOLATION VALVES, P-TRAPS, WAX RING, ETC. WITH NEW FIXTURE ROUGH-IN. NEW FIXTURES SHALL BE CAULKED/SEALED TO ADJOINING SURFACES
5. 2" V. UP TO 3" VTR.
6. CONNECT P-5 TO EXISTING CONNECTIONS. CONTRACTOR TO PROVIDE NEW SUPPLIES, STOPS, AND RISERS. PROVIDE NEW SUPPLY RISERS, ISOLATION VALVES, P-TRAPS, WAX RING, ETC. WITH NEW FIXTURE ROUGH-IN. NEW FIXTURES SHALL BE CAULKED/SEALED TO ADJOINING SURFACES

STATE OF MARYLAND · TIMOTHY R. CHATTERTON · No. 51406 · PROFESSIONAL ENGINEER

LICENSE NUMBER: 51406

EXPIRATION DATE: 08/10/2025

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WORCESTER CO HEALTH DEPARTMENT
13070 ST. MARTINS NECK ROAD; BISHOPVILLE, MD 21813

DATE	COMMENTS
12/18/2024	100% Design Development
05/07/2025	90% Construction Documentation
07/16/2025	100% Construction Documentation
07/29/2025	Issued for Permit

Date:	July 29, 2025
Scale:	3/16" = 1'-0"
Dwn.By:	BWEA
Proj.No.:	0085B055.A01

PLUMBING DRAINAGE PLAN

Allen + Shariff
MEP Engineering
Project Management

GRAPHIC SCALE 3/16" = 1'-0"

Dwg.No.: P-301

ALLEN + SHARIFF JOB #: 2431096

DOMESTIC WATER PIPING INSULATION SCHEDULE

SYSTEM OR SERVICE	FLUID TEMPERATURE RANGE (DEG F)	INSULATION TYPE	INSULATION THICKNESS (INCHES)			
			PIPE SIZE (INCHES)			
			1/2" TO <1-1/2"	1-1/2" TO <4"	4" TO <8"	≥8"
DOMESTIC HOT WATER AND HOT WATER CIRCULATION	105 TO 140	MINERAL FIBER	1"	1-1/2"	1-1/2"	1-1/2"
DOMESTIC COLD WATER	40 TO 60	MINERAL FIBER	1/2"	1"	1"	1-1/2"

NOTES:

1. NOT ALL PIPE SIZES LISTED ARE USED ON PROJECT.
2. SIZES LISTED ARE BASED UPON 2021 IECC TABLE C403.11.3.
3. ALL PIPING INSULATION SHALL HAVE A MAXIMUM THERMAL CONDUCTIVITY FACTOR (K) OF 0.27 BTU*IN/HR*FT2°F.
4. OTHER INSULATION MATERIAL THAT MEETS OR EXCEEDS THE PERFORMANCE CHARACTERISTICS OF THE LISTED MATERIAL MAY BE USED. CONTRACTOR SHALL PROVIDE INSULATION PERFORMANCE CUT SHEET PRIOR TO INSTALLATION.

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PLUMBING FIXTURE SCHEDULE (BASIS OF DESIGN)

DESIGNATION	FIXTURE TYPE	C.W.	H.W.	WASTE	MANUFACTURER	MODEL NO.	TRIM	DRAIN	TRAP	SUPPLY	ACCESSORIES	REMARKS
P-1	LAVATORY	1/2"	1/2"	1-1/4"	KOHLER	K-1728	KOHLER / CORALAIS K-1524-4RA	GRID DRAIN W/ OVERFLOW	CHROME PLATE W/ CLEAN OUT PLUG	MCGUIRE SSLAV SUPPLY RISERS W/ KEY OPERATED VALVES	TMV-1	1, 2, 3, 4
P-1A	LAVATORY - ADA	1/2"	1/2"	1-1/4"	KOHLER	K-1728	KOHLER / CORALAIS K-1524-4RA	GRID DRAIN W/ OVERFLOW	CHROME PLATE W/ CLEAN OUT PLUG	MCGUIRE SSLAV SUPPLY RISERS W/ KEY OPERATED VALVES	TMV-1	1, 2, 3, 4
P-2	WATER CLOSET - TANK TYPE;	1/2"	-	3"	KOHLER	KINGSTON K-25077-RA	-	-	INTEGRAL	BRASSCRAFT B-3**DL SUPPLY W/ WHEEL HANDLE STOP	BEMIS / 1955SSTFR SEAT	1,2,4
P-2A	WATER CLOSET - TANK TYPE; ADA	1/2"	-	3"	KOHLER	KINGSTON K-25077-RA	-	-	INTEGRAL	BRASSCRAFT B-3**DL SUPPLY W/ WHEEL HANDLE STOP	BEMIS / 1955SSTFR SEAT	1,2,4
P-3	KITCHEN SINK - SINGLE BOWL UNDERMOUNT	1/2"	1/2"	1-1/2"	ELKAY	ECTSRAD25226T BG - COORDINATE MOUNTING WITH ARCHITECT	MOEN / 7864	GRID DRAIN W/ CRUMB CUP STOPPER	CHROME PLATED W/ CLEAN OUT PLUG	BRASSCRAFT B1-**A SUPPLIES W/ 1/4 TURN VALVE	-	1,3,4
P-4	REFRIGERATOR OUTLET BOX	1/2"	-	-	WATER TITE	AB9200HA	1/4 VALVES W/ SHOCK ARRESTORS	-	-	-	-	1,4
P-5	SERVICE SINK	1/2"	1/2"	1-1/2"	FIAT	FL-1	A-1	GRID DRAIN	SAME SIZE AS OUTLET	-	-	1, 4

REMARKS

1. PROVIDE ALL REQUIRED COMPONENTS FOR COMPLETE FIXTURE ROUGH-IN, I.E., SUPPLIES, STOPS, TRAPS, CARRIERS, GRID DRAINS, TAILPIECES, ETC. NOT ALL REQUIRED COMPONENTS ARE SPECIFIED ABOVE. CARRIERS FOR LAVATORIES AND WATER CLOSETS SHALL COMPLY WITH ANSI STANDARD A112.6.1M AND PLUMBING DRAIN INSTITUTE (PDI) ARTICLE "MINIMUM SPACE REQUIREMENTS FOR ENCLOSED PLUMBING FIXTURE SUPPORTS."
2. FIXTURES SHALL BE ADA COMPLIANT. PROVIDED WITH ADA COMPLIANT ACCESSORIES. MOUNT ADA COMPLIANT. SEE ARCHITECTURAL PLANS FOR ELEVATIONS.
3. ROUTE 1/2" HW FROM SINK SUPPLY TO SERVE DISHWASHER.
4. REFER TO RISER DIAGRAM FOR VENT PIPE SIZES AND CONNECTIONS.
5. ROUTE DISHWASHER DRAIN AS HIGH AS POSSIBLE IN CABINETRY AND CONNECT TO BARBED FITTING ON SINK TAILPIECE.

MIXING VALVE SCHEDULE (BASIS OF DESIGN)

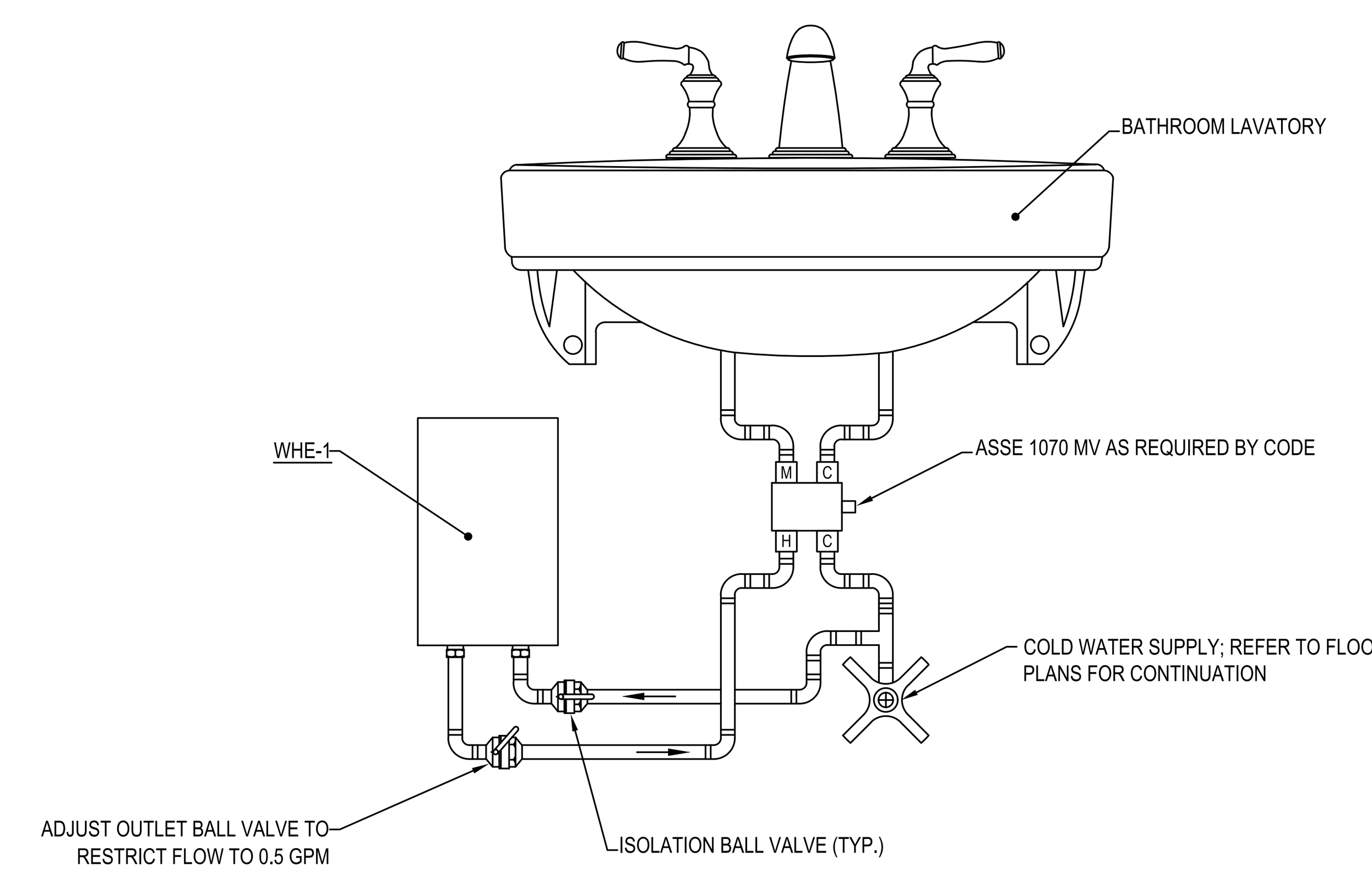
DESIGNATION	DESCRIPTION	LOCATION	MANUFACTURER / MODEL#	OPTIONS	LOAD RANGE
TMV-1	POINT OF USE MIXING VALVE CONFORMING TO ASSE 1070 STANDARD	MOUNTED UNDER EACH LAVATORY	WATTS / LFMMV	INTEGRAL STRAINERS AND CHECKS ON INLET PIPING	0.5 GPM AT 0.8 PSI LOSS SET TEMP: 105°- 110°

ELECTRIC WATER HEATER SCHEDULE (BASIS OF DESIGN)

DESIGNATION	DESCRIPTION	MANUFACTURER / MODEL#	LOCATION	STORAGE VOLUME	GPH RECOVERY AT 100 DEG. F RISE	ELEMENT WATTAGE	VOLTAGE	REMARKS
WHE-1	ON DEMAND ELECTRIC WATER HEATER	EEMAX / SPEX4208T	UNDER LAVATORY SERVING BATHROOM	NA	0.5 GPM AT 56°F RISE	4.1 KW	208V/1Ø	1

REMARKS:

1. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR FURTHER INSTALLATION REQUIREMENTS.



1 / P-401 ELECTRIC INSTANTANEOUS WATER HEATER DETIAL

NOT TO SCALE

NOTES:

1. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR FURTHER INSTALLATION REQUIREMENTS.

STATE OF MARYLAND · TIMOTHY CHATTERTON · No. 51406 · PROFESSIONAL ENGINEER

LICENSE NUMBER: 51406

EXPIRATION DATE: 08/10/2025

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

DAVIS BOWEN & FRIEDEL, INC.
ARCHITECTS · ENGINEERS · SURVEYORS
EASTON, MARYLAND 410.770.4744
MILFORD, DELAWARE 302.424.1444
SALISBURY, MARYLAND 410.543.9091

ISLE OF WIGHT RENOVATION

WORCESTER CO HEALTH DEPARTMENT

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PLUMBING DETAILS

Allen + Shariff
MEP Engineering
Project Management
205 East Market Street
Salisbury, Maryland 21801
443.545.1300

Dwg.No.: P-401

ALLEN + SHARIFF JOB #: 2431096

ELECTRICAL ABBREVIATIONS

A	AMPERE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CURRENT
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIO/VISUAL
BFG	BELOW FINISHED GRADE
C	CONDUIT
CATV	CABLE ANTENNA TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CFL	COMPACT FLUORESCENT
cd	CANDELA RATING FOR FIRE ALARM DEVICE
CKT	CIRCUIT
D	DEMO OF EXISTING FIXTURE, DEVICE OR EQUIPMENT
E	EXISTING TO REMAIN FIXTURE, DEVICE OR EQUIPMENT
EBU	EMERGENCT BATTERY UNIT
EC	EMPTY CONDUIT
EC	ELECTRICAL CONTRACTOR
ECB	ENCLOSED CIRCUIT BREAKER
EF	EXHAUST FAN
ERU	ENERGY RECOVERY UNIT
EQUIP	EQUIPMENT
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EXIST	EXISTING
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPS
FPC	FIRE PROTECTION CONTRACTOR
FPVAV	FAN POWERED VARIABLE AIR VOLUME
GC	GENERAL CONTRACTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
HD	HEAT DETECTOR
HP	HORSE POWER/HEAT PUMP
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
IG	ISOLATED GROUND
JB	JUNCTION BOX
KVA	KILO-VOLT AMPERE
KW	KILO-WATT
LC	LIGHTING CONTACTOR
LTG	LIGHTING
MAU	MAKE UP AIR UNIT
MCA	MINIMUM CIRUIT AMPS
MC	MECHANICAL CONTRACTOR
MC	METAL CLAD
MCB	MAIN CIRCUIT BREAKER
MFR	MANUFACTURER
MLO	MAIN LUGS ONLY
MTD	MOUNTED
NEC	NATIONAL ELECTRICAL CODE
NF	NON-FUSED
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NTS	NOT TO SCALE
OC	OCCUPANCY SENSOR
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
P	POLE
PC	PLUMBING CONTRACTOR
PCP	PUMP CONTROL PANEL
PF	POWER FACTOR
PL	PROPERTY LINE
PNL	PANEL
PNLBD	PANELBOARD
Ø	PHASE
PRI	PRIMARY
R	EXISTING FIXTURE, DEVICE OR EQUIP. TO BE RELOCATED
RECP	RECEPTACLE
RTU	ROOF TOP UNIT
SD	SMOKE DETECTOR
SE	SERVICE ENTRANCE
SEC	SECONDARY

POWER

E	DUPLEX RECEPTACLE, 20A, 120V, 18"AFF, UON.
	DUPLEX RECEPTACLE, GROUND FAULT INTERRUPTING TYPE, 20A, 120V, 18"AFF, UON.
	DUPLEX RECEPTACLE, 20A, 120V, 40"AFF OR 4" ABOVE COUNTER TOP OR IN CASEWORK (AS APPLICABLE), OR IN CASEWORK, AS APPLICABLE, UON.
	DUPLEX RECEPTACLE, GROUND FAULT INTERRUPTING TYPE, 20A, 120V, 40" AFF TO 4" ABOVE COUNTER TOP OR IN CASEWORK (AS APPLICABLE), OR IN CASEWORK, AS APPLICABLE, UON.
	QUADRUPLEX RECEPTACLES IN COMMON BOX, 20A, 120V, 18"AFF, UON.
WP	DUPLEX RECEPTACLE, GROUND FAULT INTERRUPTING TYPE, 20A, 120V, WITH COOPER MODEL WIU-1D (OR EQUAL) "WHILE-IN-USE" WEATHERPROOF COVER, 18"AFG UON.
EWC	ELECTRIC WATER COOLER CONNECTION, PROVIDE 20A, 120V GROUND FAULT INTERRUPTING TYPE DUPLEX RECEPTACLE. COORDINATE WITH EWC MANUFACTURER'S ROUGH-IN REQUIREMENTS. RECEPTACLE SHALL BE ACCESSIBLE THROUGH REMOVAL OF EWC COVER.
	FLOORBOX WITH DUPLEX RECEPTACLE. COORDINATE EXACT LOCATION IN FIELD WITH IN-FLOOR DISTRIBUTION SYSTEM.
	FLOORBOX WITH DUPLEX RECEPTACLE AND TELE/DATA. COORDINATE EXACT LOCATION IN FIELD WITH IN-FLOOR DISTRIBUTION SYSTEM.
	SURFACE METAL RACEWAY WITH 20A, 120V SINGLE RECEPTACLES MOUNTED AT 12" ON CENTER. MOUNT 1" ABOVE COUNTERTOP BACKSPLASH.
	SPECIAL RECEPTACLE. NEMA CONFIGURATION AS NOTED. MOUNT 18"AFF UON.
J	JUNCTION BOX - ABOVE CEILINGS OR FLUSH IN WALLS.
MGB	MAIN GROUND BAR
GB	GROUND BAR
	DISCONNECT SWITCH - SIZE AS INDICATED ON PLANS 30/2/20/3R — NEMA RATING (IF OTHER THAN 1) FUSE SIZE (AMPS), N.F. INDICATES NON-FUSED No. OF POLES SIZE (AMPS)
M	HORSEPOWER RATED MOTOR SWITCH
	MOTOR CONNECTION.
M	EMON DMON METER. REFER TO POWER PLAN FOR ADDITIONAL INFORMATION.
	ELECTRICAL METER. MOUNT 54" AFF (MINIMUM).
	ELECTRICAL PANELBOARD
	ELECTRICAL CIRCUIT RUN IN CONDUIT AND CIRCUIT HOMERUN TO PANELBOARD (PANEL AND CIRCUIT DESIGNATION AS INDICATED). AS A MINIMUM CONDITION, EACH SINGLE PHASE CIRCUIT SHALL HAVE 1 #12 PHASE CONDUCTOR, 1 #12 NEUTRAL CONDUCTOR, AND 1 #12 GROUNDING CONDUCTOR IN 3/4" CONDUIT. PROVIDE ADDITIONAL PHASE CONDUCTORS AS REQUIRED FOR "MULTIPLE PHASED" ELECTRICAL LOADS. PROVIDE ADDITIONAL "SWITCH LEG" CONDUCTORS TO PROVIDE THE LIGHT FIXTURE CONTROL INDICATED. MULTIPLE SINGLE PHASE CONDUCTORS SHALL BE GROUPED TOGETHER IN A COMMON CONDUIT IN ACCORDANCE WITH THE NEC AND AT THE CONTRACTOR'S DISCRETION. NEUTRAL AND GROUNDING CONDUCTORS SHALL BE SHARED AS ALLOWED BY THE NEC. CONDUIT LARGER THAN 3/4" AND CONDUCTORS LARGER THAN #12 SHALL BE AS INDICATED.
XX-#	TYPICAL ARCHITECTURAL, MECHANICAL OR PLUMBING EQUIPMENT DESIGNATION, "XX" SUBSCRIPT INDICATES THE TYPE OF EQUIPMENT AND "#" SUBSCRIPT INDICATES RESPECTIVE MANUFACTUER AND MODEL TYPE AS INDICATED BY ARCHITECTURAL, MECHANICAL OR PLUMBING SCHEDULES. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL EQUIPMENT VOLTAGES WITH MECHANICAL AND PLUMBING CONTRACTORS AND/OR OWNER'S/ARCHITECT'S PROVIDED EQUIPMENT PRIOR TO EQUIPMENT ORDER.

	TELE/DATA BOX, 4"X4"X2 1/4"D BOX WITH SINGLE GANG PLASTER RING 18"AFF, UON, WITH 1"C WITH PULL STRING STUBBED ABOVE ACCESSIBLE CEILING AND TERMINATED WITH PLASTIC BUSHING.
	TELE/DATA BOX, 4"X4"X2 1/4"D BOX WITH SINGLE GANG PLASTER RING 40"AFF OR 4" ABOVE COUNTER TOP OR BACKSPLASH (WHICHEVER IS HIGHER) OR IN CASEWORK AS APPLICABLE, UON, WITH 1"C WITH PULL STRING STUBBED ABOVE ACCESSIBLE CEILING AND TERMINATED WITH PLASTIC BUSHING.
	TELEPHONE PLYWOOD BACKBOARD 3/4"x8'x4', FIRE RETARDANT. BOTTOM AT 0'-4" AFF.
TV	CABLE TELEVISION OUTLET WITH DUPLEX RECEPTACLE, PROVIDE DUPLEX RECEPTACLE AND ADDITIONAL 4"X4"X2 1/4"D BOX WITH SINGLE GANG PLASTER RING, WITH 1"C WITH PULL STRING STUBBED ABOVE ACCESSIBLE CEILING AND TERMINATED WITH BUSHING. MOUNT 18"AFF UON.

ELECTRICAL ABBREVIATIONS (CONTINUED)

TBB	TELEPHONE BACKBOARD
TR	TAMPER RESISTANT
TRT	TRIPLE TUBE FLUORESCENT LAMP
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSER
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLTS
VAC	VOLTS ALTERNATING CURRENT
VAV	VARIABLE AIR VOLUME
VDC	VOLTS DIRECT CURRENT
VFD	VARIABLE REQUENCY DRIVE
VS	VACANCY SENSOR
W	WATTS/WIRE
WG	WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER

LIGHTING

	LIGHTING FIXTURE.
	LIGHTING FIXTURE ON EMERGENCY CIRCUIT. SUBSCRIPT "NL" WHERE USED, INDICATES NIGHT LIGHT CONNECTED AHEAD OF LIGHTING CONTROLS. TYPICAL ALL FIXTURE TYPES.
	DOWNLIGHT FIXTURE.
	PENDANT LIGHTING FIXTURE.
	WALL WASH LIGHTING FIXTURE. SHADED AREA INDICATES LIGHT THROW DIRECTION.
	DOWNLIGHT FIXTURE ON EMERGENCY CIRCUIT. SUBSCRIPT "NL" WHERE USED, INDICATES NIGHT LIGHT CONNECTED AHEAD OF LIGHTING CONTROLS.
	WALL MOUNTED LIGHTING FIXTURE.
	WALL MOUNTED LIGHTING FIXTURE ON EMERGENCY CIRCUIT. SUBSCRIPT "NL" WHERE USED, INDICATES NIGHT LIGHT CONNECTED AHEAD OF LIGHTING CONTROLS.
	TRACK LIGHTING FIXTURE. INDICATES AN INDIVIDUAL FIXTURE ON THE TRACK.
	EMERGENCY LIGHTING REMOTE UNIT.
	EMERGENCY BATTERY LIGHTING UNIT, CONNECT AHEAD OF LOCAL SWITCH.
	EXIT LIGHTING FIXTURE WITH DIRECTIONAL ARROWS AS INDICATED ON DRAWINGS. CONNECT TO DEDICATED EMERGENCY BRANCH CIRCUIT. SHADED AREA DENOTES LIGHTED FACE.
$a	DUAL SWITCH (SINGLE POLE OR AS INDICATED BY SUBSCRIPT), 20A, 120/277V, 44"AFF, UON. CONNECT EACH TO SEPARATELY CONTROL INBOARD AND OUTBOARD LAMPS OF EACH FIXTURE INDICATED. CONTROL INBOARD AND OUTBOARD LAMPS CONSISTENTLY. SUBSCRIPT "a" INDICATES ASSOCIATED FIXTURES TO BE CONTROLLED.
$a	SINGLE POLE SWITCH, 20A, 120/277V, 44"AFF UON. SUBSCRIPT "a" INDICATES ASSOCIATED FIXTURES TO BE CONTROLLED.
$4a	FOUR-WAY SWITCH, 20A, 120/277V, 44"AFF UON. SUBSCRIPT "a" INDICATES ASSOCIATED FIXTURES TO BE CONTROLLED.
$3a	THREE-WAY SWITCH, 20A, 120/277V, 44"AFF UON. SUBSCRIPT "a" INDICATES ASSOCIATED FIXTURES TO BE CONTROLLED.
$Da	DIMMER SWITCH, 44" AFF UON. SUBSCRIPT "a", WHERE USED, INDICATES ASSOCIATED FIXTURES TO BE CONTROLLED.
$OC	WALL SWITCH OCCUPANCY SENSOR, 44" AFF UON.
$VS	WALL SWITCH VACANCY SENSOR, 44" AFF UON.
OC	OCCUPANCY SENSOR. SUBSCRIPT "a", WHERE USED, INDICATES ASSOCIATED FIXTURES TO BE CONTROLLED.
VS	VACANCY SENSOR. SUBSCRIPT "a", WHERE USED, INDICATES ASSOCIATED FIXTURES TO BE CONTROLLED.
PC	PHOTOCELL FOR EXTERIOR LIGHTING CONTROL. MOUNT ON ROOF OF BUILDING AND AIM NORTH.
DS	DAYLIGHT SENSOR.

LIGHTING FIXTURE KEY

A LP-B-3a	1. LETTER "A" DENOTES FIXTURE TYPE. REFER TO LIGHTING FIXTURE SCHEDULE. 2. SUBSCRIPT "LP-B" INDICATES NAME OF PANELBOARD FROM WHICH FIXTURE IS FED. ASSOCIATED NUMBER "3" INDICATES CIRCUIT NUMBER IN PANELBOARD FROM WHICH FIXTURE IS FED. ASSOCIATED LETTER "a", WHERE USED, INDICATES LIGHTING FIXTURE CONTROL DEVICE DESIGNATION.

FIRE ALARM

FACP	FIRE ALARM CONTROL PANEL, SURFACE MOUNTED, TOP 5'-9" AFF.
F	FIRE ALARM MANUAL PULL STATION, 44"AFF TO ACTUATING ARM, UON.
SD	ADDRESSABLE FIRE ALARM SYSTEM PHOTO-ELECTRIC SMOKE DETECTOR, CEILING MOUNTED.
DD	DUCT MOUNTED ADDRESSABLE FIRE ALARM SYSTEM PHOTO-ELECTRIC SMOKE DETECTOR.
HD	ADDRESSABLE FIRE ALARM SYSTEM HEAT DETECTOR, FIXED TEMPERATURE/RATE OF RISE TYPE. CEILING MOUNTED.
IM	FIRE ALARM SYSTEM ADDRESSABLE INPUT MONITOR MODULE.
MM	FIRE ALARM SYSTEM MONITOR MODULE.
CM	FIRE ALARM SYSTEM CONTROL MODULE.
RT	FIRE ALARM SYSTEM ADDRESSABLE REMOTE TEST SWITCH.
## cd 30	FIRE ALARM VISUAL (STROBE) APPLIANCE, MOUNT 80"AFF, OR 6" BELOW FINISHED CEILING, WHICHEVER IS LOWER, UON. "## cd" SUBSCRIPT INDICATES MINIMUM CANDELA RATING, WHERE GREATER THAN 15.
## cd	FIRE ALARM SYSTEM VISUAL (STROBE) APPLIANCE, WALL MOUNTED AT 80" AFF TO BOTTOM OF LENS, OR 6" BELOW FINISHED CEILING, WHICHEVER IS LOWER, UON. "## cd" SUBSCRIPT INDICATES MINIMUM CANDELA RATING, WHERE GREATER THAN 15.
## cd AV	FIRE ALARM AUDIO/VISUAL (HORN/STROBE) APPLIANCE, 80"AFF, OR 6" BELOW FINISHED CEILING, WHICHEVER IS LOWER, UON. "## cd" SUBSCRIPT INDICATES MINIMUM CANDELA RATING, WHERE GREATER THAN 15.
## cd AV	FIRE ALARM SYSTEM HORN/STROBE, WALL MOUNTED AT 80" AFF TO BOTTOM OF LENS, OR 6" BELOW FINISHED CEILING, WHICHEVER IS LOWER, UON. "## cd" SUBSCRIPT INDICATES MINIMUM CANDELA RATING, WHERE GREATER THAN 15.
TS	SPRINKLER SYSTEM SUPERVISORY VALVE TAMPER SWITCH CONNECTION.
FS	SPRINKLER SYSTEM SUPERVISORY FLOW SWITCH CONNECTION.
PS	SPRINKLER SYSTEM PRESSURE SWITCH CONNECTION.
DH	FIRE ALARM MAGNETIC DOOR HOLDER CONNECTION POWERED THROUGH FIRE ALARM SYSTEM. COORDINATE MOUNTING HEIGHT WITH ASSOCIATED DOOR MOUNTED DEVICE.
B	SPRINKLER SYSTEM BELL ALARM APPLIANCE, WEATHERPROOF. MOUNT 80" AFG.
PIV	POST INDICATOR VALVE CONNECTION, COORDINATE EXACT LOCATION WITH SITE DRAWINGS.
MFSD	SMOKE DAMPER CONNECTION, 120V.
	FIREMAN TELEPHONE OUTLET, 46"AFF, UON.

DIVISION OF MECHANICAL/ ELECTRICAL WORK

ITEM	MECH/ DIV 22 AND 23	ELEC/ DIV 26
AUTOMATIC TEMPERATURE CONTROLS	FURNISH, INSTALL & WIRE	POWER WIRE
CONTROL PANELS FOR MECHANICAL EQUIPMENT	FURNISH & INSTALL	POWER WIRE
LOW VOLTAGE CONTROL WIRING FOR MECH EQUIP.	FURNISH & INSTALL	
LINE VOLTAGE CONTROL WIRING FOR MECH. EQUIP.	FURNISH, INSTALL & WIRE	
MECHANICAL FLOW SWITCHES	FURNISH, INSTALL & WIRE	
THERMOSTATS/ SENSORS	FURNISH, INSTALL & WIRE	
P/E & E/P SWITCHES	FURNISH, INSTALL & WIRE	
DISCONNECT SWITCHES FOR MECHANICAL EQUIPMENT	FURNISH & INSTALL	POWER WIRE
MECHANICAL EQUIPMENT MONITORS	FURNISH & INSTALL	POWER WIRE
MANUAL STARTERS FOR MECHANICAL EQUIPMENT	FURNISH & INSTALL	POWER WIRE
MAGNETIC STARTERS FOR MECHANICAL EQUIPMENT	FURNISH	INSTALL & POWER WIRE
MOTOR CONTROL CENTERS	CONTROL WIRING	FURNISH, INSTALL, & POWER WIRE
VARIABLE SPEED CONTROLLERS	FURNISH & INSTALL	POWER WIRE
MOTORIZED DAMPERS & VALVES	FURNISH, INSTALL & WIRE	
DUCT SMOKE DETECTORS	INSTALL	FURNISH & WIRE
HEAT TRACE CABLE FOR PIPING	FURNISH & INSTALL	POWER WIRE
OIL/ GAS EMERGENCY SHUT-OFF SWITCHES		FURNISH, INSTALL, & POWER WIRE
SPRINKLER FLOW & TAMPER SWITCHES	BY SPRINKLER CONTRACTOR	WIRE

GENERAL

1	KEYNOTE.
	LIMIT OF DEMOLITION WORK.
	POINT OF CONNECTION, NEW TO EXISTING.

DETAIL OR SECTION NOTATION:
ENUMERATION: A = DETAIL, 1 = SECTION

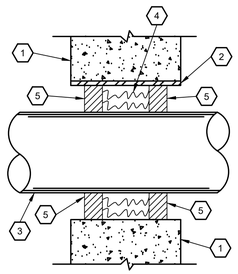
X — ENUMERATION NUMBER OR LETTER
XX — SHEET WHERE DETAIL OR SECTION IS SHOWN

LINEWEIGHTS

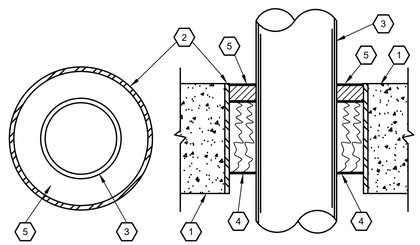
	NEW
E	EXISTING
R D	REMOVE EXISTING

DEMOLITION WORK NOTES:

1. FIXTURES AND DEVICES INDICATED BY 'E' AND A THIN LINE WEIGHT ARE EXISTING TO REMAIN. CONTRACTOR TO PROTECT ITEMS DURING DEMOLITION AND CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR REPLACEMENT OF ITEMS IN KIND IF THEY DAMAGE.
2. FIXTURES AND DEVICES INDICATED BY 'R' ARE EXISTING TO BE RELOCATED. CONTRACTOR SHALL DISCONNECT, REMOVE, CLEAN, STORE, AND RELAMP EXISTING FIXTURES. REFER TO NEW WORK DRAWINGS FOR NEW LOCATIONS OF FIXTURES WITH LABEL 'NR'. ALSO COORDINATE WITH ARCHITECTURAL PLANS FOR EXISTING FIXTURES AND DEVICES TO BE RELOCATED. CONTRACTOR IS RESPONSIBLE FOR REPLACEMENT OF ITEMS IN KIND IF THEY DAMAGE.
3. FIXTURES AND DEVICES INDICATED BY 'D' AND THICK AND/OR THICK DASHED LINE WEIGHTS SHALLE BE DEMOLISHED.



WALL ASSEMBLY



FLOOR ASSEMBLY

1 / E001 FIRE STOP DETAIL
N.T.S.

KEYED NOTES:

1. FLOOR OR WALL ASSEMBLY MINIMUM 5" THICK NORMAL WEIGHT CONCRETE FLOOR OR WALL OR MINIMUM 7-5/8" THICK MASONRY WALL HAVING A MINIMUM 2 HOUR FIRE RESISTIVE RATING WITH A NOMINAL 6" DIAMETER OPENING.

2. STEEL PIPE SLEEVE (OPTIONAL) NOMINAL 6" DIAMETER SCHEDULE 40 OR HEAVIER STEEL PIPE SLEEVE. (2 TRADE SIZES LARGER THAN CONDUIT).

3. STEEL OR EMT CONDUIT NOMINAL 4" DIAMETER CENTERED THROUGH THE OPENING.

4. FORMING MATERIAL MINERAL WOOL, MINIMUM DENSITY OF 4.4 PCF FIRMLY PACKED WITHIN THE OPENING TO A NOMINAL THICKNESS OF 3" FOR FLOORS. FOR WALLS, THE MINERAL WOOL SHALL BE CENTERED IN THE OPENING.

5. FILL, VOID OR CAVITY MATERIAL* - FILL MATERIAL THAT IS TROWELED INTO THE OPENING TO A MINIMUM THICKNESS OF 1/2" IN ACCORDANCE WITH THE ACCOMPANYING INSTALLATION INSTRUCTIONS. IN WALLS, THE FILL MATERIAL SHALL BE INSTALLED ON BOTH SURFACES OF THE OPENING.

* BEARING THE "UL" CLASSIFICATION MARKING

STATE OF MARYLAND — CHRISTOPHER CHATTIN — No. 51406 — PROFESSIONAL ENGINEER
LICENSE NUMBER: 51406
EXPIRATION DATE: 08/10/2025
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

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DATE	COMMENTS
12/18/2024	100% Design Development
05/07/2025	90% Construction Documentation
07/16/2025	100% Construction Documentation
07/29/2025	Issued for Permit

Date: July 29, 2025
Scale: AS NOTED
Dwn.By: PDIX
Proj.No.: 0085B055.A01

ELECTRICAL DATA SHEET

Dwg.No.: E-001

Allen + Shariff
MEP Engineering
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205 East Market Street
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ELECTRICAL SPECIFICATIONS

ELECTRICAL GENERAL CONDITIONS (260000)

CODES AND STANDARDS - THE LATEST EFFECTIVE PUBLICATIONS OF ALL APPLICABLE STANDARDS, CODES, ETC., AS ADOPTED BY THE AUTHORITY HAVING JURISDICTION, STATE AND LOCAL GOVERNMENTS, AS THEY APPLY, FORM PART OF THESE SPECIFICATIONS AS IF WERE WRITTEN FULLY HEREIN AND CONSTITUTE MINIMUM REQUIREMENTS. THE FOLLOWING WILL BE REFERRED TO THROUGHOUT IN ABBREVIATED FORMS.

NATIONAL ELECTRICAL CODE, (NFPA 70) (NEC).
INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE).
NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA).
AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) / COMAR IN MARYLAND.
APPLICABLE STATE AND LOCAL CODES.
APPLICABLE STANDARDS OF UNDERWRITER'S LABORATORIES, INC. (UL).
APPLICABLE STANDARDS OF NATIONAL FIRE PROTECTION ASSOCIATION (NFPA).
THE INTERNATIONAL BUILDING CODE (IBC).
THE INTERNATIONAL FIRE CODE (IFC)
THE AMERICANS WITH DISABILITIES ACT (ADA).
INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA).
THE INTERNATIONAL ENERGY CONSERVATION CODE (IECC).
ASHRAE 90.1
INTERNATIONAL GREEN CONSTRUCTION CODE IN BALTIMORE AND DISTRICT OF COLUMBIA

A. SCOPE OF WORK - PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, APPURTENANCES AND SERVICES TO PROVIDE A COMPLETE ELECTRICAL INSTALLATION AS SHOWN ON THE DRAWINGS AND AS DESCRIBED IN THESE SPECIFICATIONS.
B. SITE VISIT - THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING HIS BID TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AND DETERMINE THE EXTENT OF WORK. LACK OF KNOWLEDGE OF EXISTING CONDITIONS WILL NOT BE CONSIDERED A BASIS FOR CHANGE ORDERS. PRIOR TO ORDERING EQUIPMENT, CONTRACTOR SHALL VERIFY THAT EQUIPMENT TO BE PROVIDED UNDER THIS CONTRACT IS ACCEPTABLE AND CAN FIT INTO BUILDING AND ROOM. EXPENSE INCURRED BY THE CONTRACTOR, WHICH IN THE ENGINEER'S OPINION COULD HAVE BEEN AVOIDED BY THIS STEP, SHALL NOT BE A BASIS FOR CHANGE ORDERS.
C. DRAWINGS AND SPECIFICATIONS - THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT, CHARACTER AND ARRANGEMENT OF EQUIPMENT, FIXTURES AND CONDUIT AND WIRING SYSTEMS. IT IS THE INTENTION OF THESE SPECIFICATIONS AND DRAWINGS TO FULLY COVER ALL WORK AND MATERIALS FOR A COMPLETE, FIRST-CLASS ELECTRICAL INSTALLATION, AND ANY DEVICES SUCH AS PULL BOXES, STARTERS, AND DISCONNECT SWITCHES, USUALLY EMPLOYED IN THIS CLASS OF WORK THOUGH NOT SPECIFICALLY MENTIONED OR SHOWN ON THE DRAWINGS OR IN THIS SPECIFICATION, BUT WHICH MAY BE NECESSARY FOR THE SATISFACTORY COMPLETION OF THE WORK, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR AS A PART OF HIS TOTAL WORK UNDER THIS DIVISION. CONSULT THE SPECIFICATIONS AND DRAWINGS OF ALL OTHER TRADES AND PERFORM ALL ELECTRICAL WORK REQUIRED THEREIN. COOPERATE WITH ALL OTHER CONTRACTORS OR SUBCONTRACTORS TO FURNISH COMPLETE WORKABLE SYSTEMS.
D. ALL ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
E. MANUFACTURING STANDARDS - MATERIAL SHALL BE NEW AND APPROVED AND LABELED BY UL WHEREVER STANDARDS HAVE BEEN ESTABLISHED BY THAT AGENCY. DEFECTIVE EQUIPMENT OR EQUIPMENT DAMAGED IN THE COURSE OF INSTALLATION OR TEST SHALL BE REPLACED OR REPAIRED IN A MANNER MEETING THE APPROVAL OF THE OWNER. ALL ITEMS OF THE SAME TYPE AND RATING SHALL BE IDENTICAL.
F. TRADE NAMES - UNLESS SPECIFICALLY IDENTIFIED OTHERWISE, MANUFACTURERS' NAMES AND CATALOG NUMBERS INDICATED HEREIN AND ON THE DRAWINGS ARE NOT INTENDED TO BE PROPRIETARY DESIGNATIONS. THEY ARE TO INDICATE GENERAL TYPE AND QUALITY OF MATERIALS AND EQUIPMENT REQUIRED. EQUIPMENT AND MATERIAL BY OTHER MANUFACTURERS WHICH IN THE OPINION OF THE ENGINEER ARE OF EQUAL QUALITY AND WHICH WILL PRODUCE THE SAME RESULTS WILL BE CONSIDERED ACCEPTABLE.
G. "FURNISH" SHALL MEAN TO PURCHASE, DELIVER TO JOB SITE, AND UNLOAD FROM TRUCK AT JOB SITE. "INSTALL" SHALL MEAN TO MOUNT IN PLACE, MAKE ALL NECESSARY CONNECTIONS AS SPECIFIED ON PLANS, AND ON SHOP DRAWINGS. "PROVIDE" SHALL MEAN TO FURNISH AND INSTALL.
H. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL EQUIPMENT VOLTAGES WITH MECHANICAL CONTRACTORS AND/OR OWNER'S/ARCHITECT'S PROVIDED EQUIPMENT PRIOR TO EQUIPMENT ORDER.
I. MOTORS SHALL BE PROVIDED WITH DISCONNECTING MEANS EVEN WHERE NOT INDICATED ON DRAWINGS.
J. CONTROL, INTERLOCK AND INTERNAL EQUIPMENT - WIRING, REGARDLESS OF VOLTAGE, SHALL BE PROVIDED BY OTHERS UNLESS SPECIFICALLY SHOWN HERE.
K. LABELING OF EQUIPMENT - ALL PANELBOARDS, CABINETS, SAFETY SWITCHES, MOTOR DISCONNECT SWITCHES, AND MOTOR CONTROLLERS SHALL BE IDENTIFIED BY MACHINE ENGRAVED LAMINATED PLASTIC DESIGNATION PLATES PERMANENTLY ATTACHED THERETO WITH SELF-TAPPING SCREWS OR RIVETS. ALL COMPONENT PARTS OF EACH ITEM OF EQUIPMENT OR DEVICE SHALL BEAR THE MANUFACTURER'S NAMEPLATE, GIVING NAME OF MANUFACTURER, DESCRIPTION, SIZE TYPE, SERIAL AND MODEL NUMBER AND ELECTRICAL CHARACTERISTICS IN ORDER TO FACILITATE MAINTENANCE OR REPLACEMENT. PROVIDE UPDATED PANEL DIRECTORIES FOR ALL NEW AND MODIFIED EXISTING PANELS TO INDICATE CORRECT CIRCUITING DESIGNATIONS.
L. GROUNDING - THE ENTIRE ELECTRICAL SYSTEM, INCLUDING EQUIPMENT FRAMES, CONDUIT, SWITCHES, CONTROLLERS, WIREWAYS, AND ALL OTHER SUCH EQUIPMENT SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED IN ACCORDANCE WITH THE NEC. GROUNDING OF EACH TRANSFORMER SECONDARY SHALL BE PROVIDED AND EACH SHALL BE CONSIDERED AS A SEPARATE SERVICE GROUND. PROVIDE A SEPARATE GROUND CONDUCTOR IN ALL BRANCH CIRCUIT CONDUITS SIZED IN ACCORDANCE WITH THE NEC.
M. THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL ANGLE IRON, CHANNEL IRON, RODS, SUPPORTS, HANGERS, CONCRETE OR PLYWOOD REQUIRED TO INSTALL, MOUNT AND SUPPORT ANY ELECTRICAL EQUIPMENT OR DEVICE CALLED FOR ON THE PLANS.
N. SUPPORTING MATERIAL SHALL BE COMPLETE WITH HANGERS, CONNECTORS, BOLTS, CLAMPS AND NECESSARY ACCESSORIES TO MAKE A COMPLETE INSTALLATION. SUPPORTING MATERIAL SHALL BE GALVANIZED, PAINTED OR OTHERWISE SUITABLY FINISHED.
O. ALL SURFACE-MOUNTED EQUIPMENT ON BLOCK WALLS SHALL BE MOUNTED ON 3/4" PLYWOOD BACKBOARD. ALL FLOOR-MOUNTED EQUIPMENT SHALL BE INSTALLED ON A 4" HIGH CONCRETE HOUSEKEEPING PAD.
P. ALL ELECTRICAL WORK SHALL BE INSTALLED TO MAINTAIN ALL CLEARANCES AS DEFINED IN ARTICLE NEC 110.26 AND ITS SUBSEQUENT SUBSECTIONS. NO DUCT, CONDUIT, PIPE, ETC. NOT DIRECTLY ASSOCIATED WITH THAT PIECE OF ELECTRICAL EQUIPMENT SHALL BE LOCATED IN THE CLEARANCE SPACE AS DEFINED BY THE NEC. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF OTHER TRADES TO MAINTAIN THESE CLEARANCES.
Q. SCHEDULE OF WORK - THE SCHEDULE OF THE ELECTRICAL WORK SHALL BE ARRANGED TO SUIT THE PROGRESS OF WORK BY THE OTHER TRADES AND SHALL IN NO WAY RETARD PROGRESS OF CONSTRUCTION OF THE PROJECT.
R. DURING CONSTRUCTION - KEEP AN ACCURATE RECORD OF ALL DEVIATIONS BETWEEN THE WORK AS SHOWN ON THE CONTRACT DRAWINGS AND THAT WHICH IS ACTUALLY INSTALLED ON A SET OF PRINTS OF THE ELECTRICAL DRAWINGS, AND NOTE CHANGES THEREON WITH RED MARKS, IN A NEAT AND ACCURATE MANNER. WHEN ALL REVISIONS HAVE BEEN SHOWN ON THESE PRINTS TO INDICATE THE WORK AS FINALLY INSTALLED, THE PRINTS SHALL BE DELIVERED TO THE ENGINEER, BEFORE FINAL PAYMENT.
S. PERMITS, INSPECTION AND TESTS - THE RIGHT IS RESERVED TO INSPECT AND TEST ANY PORTION OF THE INSTALLATION/EQUIPMENT DURING THE PROGRESS OF ITS ERECTION. THIS CONTRACTOR SHALL TEST ALL WIRING FOR CONTINUITY AND GROUNDS BEFORE CONNECTING ANY FIXTURES OR DEVICES. THIS CONTRACTOR SHALL TEST THE ENTIRE SYSTEM WHEN THE WORK IS FINALLY COMPLETED TO ENSURE THAT ALL PORTIONS ARE FREE FROM SHORT CIRCUITS AND GROUNDS.
T. SECURE AND PAY - FOR ALL REQUIRED PERMITS AND INSPECTIONS. INSPECTION CERTIFICATES FROM LOCAL AUTHORITIES HAVING JURISDICTION SHALL BE DELIVERED TO THE OWNER BEFORE FINAL PAYMENT.
U. TEMPORARY ELECTRICAL SERVICE - TEMPORARY ELECTRICAL SERVICE AT 120/240V, 1-PHASE AND OR 120/208V, 3-PHASE WITH GROUND FAULT INTERRUPTER WITH SOLIDLY GROUNDED NEUTRAL SHALL BE PROVIDED. AMPERAGE AND VOLTAGE SHALL BE COORDINATED WITH SITE AND PROJECT SPECIFIC REQUIREMENTS. PROVIDE ALL NECESSARY TEMPORARY LIGHTING AND RECEPTACLES. GENERAL CONTRACTOR WILL PAY ALL CHARGES, WHICH MAY BE MADE BY THE POWER COMPANY FOR TEMPORARY SERVICE.
V. SUBMITTALS - SUBMIT SHOP DRAWINGS, PRODUCT DATA WITHIN THIRTY (30) DAYS OF AWARD OF CONTRACT AND IN ACCORDANCE WITH THE GENERAL CONDITIONS AND SUPPLEMENTARY CONDITIONS. SUBMITTALS ARE REQUIRED FOR ALL SAFETY SWITCHES, ENCLOSED CIRCUIT BREAKERS, PANELBOARDS, TRANSIENT VOLTAGE SURGE SUPPRESSORS, SURGE PROTECTIVE DEVICE (SPD), TRANSFORMERS, LIGHTING FIXTURES, FIRE ALARM SYSTEM, AND SPECIALTY DEVICES PROVIDED UNDER THIS SPECIFICATION. REVIEW OF SUBMITTALS BY THE ENGINEER AND ANY ASSOCIATED ACTION TAKEN BY THE ENGINEER DOES NOT RELIEVE THE CONTRACTOR OF ANY REQUIREMENTS SET FORTH BY THE CONTRACT DOCUMENTS. PROVIDE PRODUCT DATA FOR EACH TYPE OF PRODUCT UNDER EACH SPECIFICATION CATEGORY.
W. OBTAIN APPROVED SHOP DRAWINGS - SHOWING WIRING DIAGRAMS, CONNECTION DIAGRAMS, ROUGH-IN AND HOOKUP DETAILS, FROM ALL CONTRACTORS FOR ALL EQUIPMENT AND COMPLY THEREWITH.
X. STORAGE AND MATERIALS - SPACE WILL BE ASSIGNED TO THE CONTRACTOR BY THE OWNER FOR THE STORAGE OF MATERIAL. THIS CONTRACTOR WILL BE RESPONSIBLE FOR THE PROTECTION AND SAFEKEEPING OF MATERIALS, TOOLS, AND EQUIPMENT. ALL MATERIALS AND EQUIPMENT SHALL BE KEPT IN ITS ASSIGNED PLACE UNTIL THE TIME OF ITS INSTALLATION. EXCESS MATERIALS, DIRT AND REFUSE SHALL BE PROMPTLY REMOVED FROM THE WORK SITE.
Y. COORDINATION - COOPERATE AND COORDINATE EFFORTS WITH ALL CONTRACTORS ON THE PROJECT. THIS IS ESPECIALLY IMPORTANT IN DETERMINING EXACT LOCATIONS OF ALL SWITCHES, RECEPTACLES AND LIGHTING FIXTURES. ARRANGE LIGHTING FIXTURES IN ACCORDANCE WITH THE ARCHITECTURAL REFLECTED CEILING PLANS UNLESS OTHERWISE INDICATED. COORDINATE LIGHTING FIXTURE LOCATIONS WITH GRILLES, DIFFUSERS, ACCESS PANELS, ETC. VERIFY CEILING AND WALL CONSTRUCTION AND MATERIAL PRIOR TO ORDERING LIGHTING FIXTURES OR OTHER DEVICES TO ENSURE PROPER FIXTURE OR DEVICE IS FURNISHED TO MATCH CONSTRUCTION. THIS VERIFICATION MUST BE EXECUTED REGARDLESS OF INFORMATION PLACED ON THE DRAWINGS. ANY COST INCURRED WHICH IN THE OPINION OF THE OWNER, COULD HAVE BEEN AVOIDED BY THIS STEP SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
Z. WORK UNDER THIS DIVISION - SHALL PROCEED IN ADVANCE OF THE WORK OF OTHERS WHENEVER POSSIBLE, ELIMINATING ALL CUTTING AND PATCHING. WHEN SUCH PROCEDURE IS IMPOSSIBLE, CUTTING AND PATCHING SHALL BE PROVIDED IN AN APPROVED MANNER. CUTTING SHALL NOT ENDANGER STRUCTURAL INTEGRITY IN ANY WAY. PATCHING SHALL EXACTLY MATCH CONTIGUOUS WORK. ACTUAL WORK OF CUTTING AND PATCHING OF EXISTING SURFACES SHALL BE PERFORMED BY THE SUBCONTRACTOR WHO ORIGINALLY PREPARED THESE SURFACES, E.G., CUTTING AND PATCHING OF MASONRY WALL WILL BE PERFORMED BY THE MASONRY SUBCONTRACTOR. COSTS OF SUCH CUTTING AND PATCHING SHALL BE BORNE BY THE ELECTRICAL SUBCONTRACTOR. CUTTING SHALL BE CAREFULLY DONE AND DAMAGE TO BUILDING, PIPING, WIRING OR EQUIPMENT AS A RESULT OF CUTTING SHALL BE REPAIRED BY SKILLED MECHANICS OF TRADE INVOLVED. PROVIDE ALL CUTTING, PATCHING, PAINTING AND REFINISHING REQUIRED FOR INSTALLATION OF THE ELECTRICAL WORK.
AA. GUARANTEE OF WORK - CONTRACTOR GUARANTEES BY HIS ACCEPTANCE OF THE CONTRACT THAT ALL WORK INSTALLED IS FREE FROM ANY AND ALL DEFECTS IN WORKMANSHIP AND/OR MATERIALS, AND THAT THE APPARATUS WILL DEVELOP CAPACITIES AND CHARACTERISTICS SPECIFIED, AND THAT IF, DURING THE PERIOD OF ONE YEAR OR AS OTHERWISE SPECIFIED, FROM DATE OF CERTIFICATE OF COMPLETION AND ACCEPTANCE OF THE WORK ANY SUCH DEFECTS IN WORKMANSHIP, MATERIAL OR PERFORMANCE APPEAR, HE WILL, WITHOUT COST TO THE OWNER, REMEDY SUCH DEFECTS WITHIN A REASONABLE TIME TO BE SPECIFIED IN NOTICE. IN DEFAULT THEREOF, THE OWNER MAY HAVE SUCH WORK DONE AND CHARGE COST TO CONTRACTOR. EQUIPMENT GUARANTEES FROM DATE OF "START-UP" WILL NOT BE RECOGNIZED.

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (260519)

A. COPPER BUILDING WIRE: FLEXIBLE, INSULATED AND UNINSULATED, DRAWN COPPER CURRENT-CARRYING CONDUCTOR WITH AN OVERALL INSULATION LAYER OR JACKET, OR BOTH, RATED 600 V OR LESS.
   1. CONDUCTOR INSULATION: TYPE THHN AND TYPE THWN-2- COMPLY WITH UL 83. TYPE XHHW-2- COMPLY WITH UL 44.
B. METAL-CLAD CABLE, TYPE MC: A FACTORY ASSEMBLY OF ONE OR MORE CURRENT-CARRYING INSULATED CONDUCTORS IN AN OVERALL METALLIC SHEATH. COMPLY WITH UL 1569.
   1. GROUND CONDUCTOR SHALL BE INSULATED. CONDUCTOR INSULATION TYPE THHN/THWN-2 SHALL COMPLY WITH UL 83. CONDUCTOR INSULATION TYPE XHHW-2 SHALL COMPLY WITH UL 44.
   2. ARMOR SHALL BE STEEL OR ALUMINUM, INTERLOCKED. JACKET SHALL BE PVC APPLIED OVER ARMOR.
C. CONNECTORS AND SPLICES: FACTORY-FABRICATED CONNECTORS, SPLICES, AND LUGS OF SIZE, AMPACITY RATING, MATERIAL, TYPE, AND CLASS FOR APPLICATION AND SERVICE INDICATED.
   1. FOR STEEL AND ALUMINUM JACKETED CABLES, ZINC DIE-CAST WITH SET SCREWS, DESIGNED TO CONNECT CONDUCTORS SPECIFIED IN THIS SECTION.
   2. LUGS: ONE PIECE, SEAMLESS, DESIGNED TO TERMINATE CONDUCTORS SPECIFIED IN THIS SECTION. MATERIAL SHALL BE COPPER. TYPE SHALL BE ONE OR TWO HOLE WITH STANDARD OR LONG BARRELS. TERMINATIONS SHALL BE COMPRESSION.
D. FEEDERS: COPPER UNLESS OTHERWISE INDICATED ON THE RISER DIAGRAM. CONDUCTORS SHALL BE SOLID OR STRANDED FOR NO. 10 AWG AND SMALLER; STRANDED FOR NO. 8 AWG AND LARGER.
E. BRANCH CIRCUITS: COPPER UNLESS OTHERWISE INDICATED ON THE RISER DIAGRAM AND SCHEDULES. SOLID OR STRANDED FOR NO. 10 AWG AND SMALLER; STRANDED FOR NO. 8 AWG AND LARGER. WIRE SMALLER THAN NO. 12 AWG SHALL NOT BE USED FOR LIGHTING AND POWER CIRCUITS.
F. POWER-LIMITED FIRE ALARM AND CONTROL: SOLID FOR NO. 12 AWG AND SMALLER.
G. APPLICATIONS AND WIRING METHODS: SERVICE ENTRANCE- TYPE THHN-THWN OR XHHW-2, SINGLE CONDUCTORS IN RACEWAY. FEEDERS AND BRANCH CIRCUITING- TYPE THHN-THWN, SINGLE CONDUCTORS IN RACEWAY. METAL-CLAD CABLE, TYPE MC, SHALL BE PERMISSIBLE WHERE INSTALLED AS BRANCH CIRCUITING CONCEALED IN ACCESSIBLE CEILINGS, WALLS, AND PARTITIONS, OR WHERE INSTALLED BELOW RAISED FLOORING.
H. CONCEAL CABLES IN FINISHED WALLS, CEILINGS, AND FLOORS UNLESS OTHERWISE INDICATED. INSTALL EXPOSED CABLES PARALLEL AND PERPENDICULAR TO SURFACES OF EXPOSED STRUCTURAL MEMBERS, AND FOLLOW SURFACE CONTOURS WHERE POSSIBLE.
I. METAL CLAD CABLING SHALL BE SECURED EVERY SIX FEET AND WITHIN 12 INCHES OF EVERY BOX OR TERMINATION AS REQUIRED BY CODE. INSTALLATION OF METAL CLAD CABLING SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER AND FOLLOW OR BE PERPENDICULAR TO BUILDING LINES.
J. EACH DESIGNED CIRCUIT HOMERUN SHALL HAVE ITS OWN INDIVIDUAL GROUND CONDUCTOR. CONDUIT SHALL NOT BE USED A GROUND CONDUCTOR.
K. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. USE TORQUE VALUES SPECIFIED IN UL 486A-486B WHERE NOT PUBLISHED.
L. MAKE SPLICES, TERMINATIONS, AND TAPS THAT ARE COMPATIBLE WITH CONDUCTOR MATERIAL AND THAT POSSESS EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATINGS THAN UNSPLICED CONDUCTORS.
M. INSTALL CONDUCTORS AT EACH OUTLET, WITH AT LEAST 6 INCHES OF SLACK.
N. ALL EXTERIOR WIRING CONNECTIONS, AND THOSE MADE AT OR BELOW GRADE SHALL BE WATERPROOF WITH UL LISTED WATERPROOF CONNECTORS.
O. COPPER CONDUCTORS #10 AWG AND SMALLER SHALL BE TERMINATED AND SPLICED WITH WIRE NUT CONNECTORS. THE NYLON SELF_INSULATED TYPE SHALL BE USED TO ISOLATE THE TERMINATION FROM OTHER METAL PARTS AND EQUIPMENT. PUSH-ON WIRE CONNECTORS, OTHER THAN FOR LUMINAIRE DISCONNECTS, ARE NOT PERMITTED.
P. COPPER CONDUCTORS #8 AWG AND LARGER SHALL BE TERMINATED, SPLICED, AND TAPPED WITH COLOR_KEYED COMPRESSION CONNECTORS. THE MANUFACTURERS RECOMMENDED TOOLS AND DIES SHALL BE USED.
Q. COPPER CABLE LUG CONNECTIONS #8 AND LARGER TO COPPER BUS BAR MAINS AND BRANCHES SHALL USE COPPER SOLDERLESS CONNECTORS HAVING EITHER 2_BOLT CAST COPPER CLAMPS OR COMPRESSION CONNECTORS, WITH MANUFACTURER'S RECOMMENDED HEXAGONAL DIES AND HYDRAULIC COMPRESSION TOOLS.
R. PLENUM RATED CABLE OR WIRING IN METAL CONDUIT SHALL BE UTILIZED IN ALL PLENUM RATED SPACES.

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS (260526)

A. COMPLY WITH UL 467 FOR GROUNDING AND BONDING MATERIALS AND EQUIPMENT.
B. INSULATED CONDUCTORS: COPPER OR TINNED-COPPER WIRE OR CABLE INSULATED FOR 600 V.
C. GROUNDING BUS: PREDRILLED RECTANGULAR BARS OF ANNEALED COPPER, 1/4 BY 4 INCHES IN CROSS SECTION, WITH 9/32-INCH HOLES SPACED 1-1/8 INCHES APART. STAND-OFF INSULATORS FOR MOUNTING SHALL COMPLY WITH UL 891 FOR USE IN SWITCHBOARDS, 600 V AND SHALL BE LEXAN OR PVC, IMPULSE TESTED AT 5000 V. MINIMUM SIZE SHALL BE 24" IN LENGTH.
D. GROUND RODS SHALL BE COPPER-CLAD STEEL; 3/4 INCH BY 10 FEET. GROUND PLATES SHALL BE 1/4 INCH THICK, HOT-DIP GALVANIZED.
E. INSTALL SOLID CONDUCTOR FOR NO. 8 AWG AND SMALLER, AND STRANDED CONDUCTORS FOR NO. 6 AWG AND LARGER UNLESS OTHERWISE INDICATED.
F. UNDERGROUND GROUNDING CONDUCTORS: INSTALL BARE COPPER CONDUCTOR, NO. 3/0 AWG MINIMUM. BURY AT LEAST 24 INCHES BELOW GRADE.
G. ISOLATED GROUNDING CONDUCTORS: GREEN-COLORED INSULATION WITH CONTINUOUS YELLOW STRIPE. ON FEEDERS WITH ISOLATED GROUND, IDENTIFY GROUNDING CONDUCTOR WHERE VISIBLE TO NORMAL INSPECTION, WITH ALTERNATING BANDS OF GREEN AND YELLOW TAPE, WITH AT LEAST THREE BANDS OF GREEN AND TWO BANDS OF YELLOW.
H. CONDUCTOR TERMINATIONS AND CONNECTIONS: PIPE AND EQUIPMENT GROUNDING CONDUCTOR TERMINATIONS- BOLTED CONNECTORS. UNDERGROUND CONNECTIONS- WELDED CONNECTORS EXCEPT AT TEST WELLS AND AS OTHERWISE INDICATED. CONNECTIONS TO GROUND RODS AT TEST WELLS- BOLTED CONNECTORS. CONNECTIONS TO STRUCTURAL STEEL- WELDED CONNECTORS.
I. GROUNDING AT THE SERVICE: EQUIPMENT GROUNDING CONDUCTORS AND GROUNDING ELECTRODE CONDUCTORS SHALL BE CONNECTED TO THE GROUND BUS. INSTALL A MAIN BONDING JUMPER BETWEEN THE NEUTRAL AND GROUND BUSES.
J. INSTALL INSULATED EQUIPMENT GROUNDING CONDUCTORS WITH ALL FEEDERS AND BRANCH CIRCUITS.
K. INSTALL INSULATED EQUIPMENT GROUNDING CONDUCTORS WITH THE FOLLOWING ITEMS, IN ADDITION TO THOSE REQUIRED BY NFPA 70: FEEDERS AND BRANCH CIRCUITS, LIGHTING CIRCUITS, RECEPTACLE CIRCUITS, SINGLE-PHASE MOTOR AND APPLIANCE BRANCH CIRCUITS, THREE-PHASE MOTOR AND APPLIANCE BRANCH CIRCUITS, FLEXIBLE RACEWAY RUNS, METAL-CLAD CABLE RUNS, COMPUTER AND RACK-MOUNTED ELECTRONIC EQUIPMENT CIRCUITS. INSTALL INSULATED EQUIPMENT GROUNDING CONDUCTOR IN BRANCH-CIRCUIT RUNS FROM POWER PANELS AND POWER-DISTRIBUTION UNITS.
L. WHERE UNGROUNDED CONDUCTORS ARE INCREASED IN SIZE FROM THE MINIMUM SIZE THAT HAS SUFFICIENT AMPACITY FOR THE INTENDED INSTALLATION, THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE INCREASED PER NEC 250.122(B).
M. ROUTE GROUNDING CONDUCTORS ALONG SHORTEST AND STRAIGHTEST PATHS POSSIBLE UNLESS OTHERWISE INDICATED OR REQUIRED BY CODE. AVOID OBSTRUCTING ACCESS OR PLACING CONDUCTORS WHERE THEY MAY BE SUBJECTED TO STRAIN, IMPACT, OR DAMAGE.
N. DRIVE GROUND RODS UNTIL TOPS ARE 6 INCHES BELOW FINISHED FLOOR OR FINAL GRADE UNLESS OTHERWISE INDICATED. INTERCONNECT GROUND RODS WITH GROUNDING ELECTRODE CONDUCTOR BELOW GRADE AND AS OTHERWISE INDICATED. MAKE CONNECTIONS WITHOUT EXPOSING STEEL OR DAMAGING COATING IF ANY. FOR GROUNDING ELECTRODE SYSTEM, INSTALL AT LEAST THREE RODS SPACED AT LEAST ONE-ROD LENGTH FROM EACH OTHER AND LOCATED AT LEAST THE SAME DISTANCE FROM OTHER GROUNDING ELECTRODES, AND CONNECT TO THE SERVICE GROUNDING ELECTRODE CONDUCTOR. SYSTEM SHALL MEET REQUIREMENTS OF NEC 250.52 AND 250.53.
O. TEST WELLS: GROUND ROD DRIVEN THROUGH DRILLED HOLE IN BOTTOM OF HANDHOLE. HANDHOLES SHALL BE AT LEAST 12 INCHES DEEP, WITH COVER.INSTALL AT LEAST ONE TEST WELL FOR EACH SERVICE UNLESS OTHERWISE INDICATED. INSTALL AT THE GROUND ROD ELECTRICALLY CLOSEST TO SERVICE ENTRANCE. SET TOP OF TEST WELL FLUSH WITH FINISHED GRADE OR FLOOR.
P. BONDING STRAPS AND JUMPERS: INSTALL IN LOCATIONS ACCESSIBLE FOR INSPECTION AND MAINTENANCE EXCEPT WHERE ROUTED THROUGH SHORT LENGTHS OF CONDUIT. BOND STRAPS DIRECTLY TO BASIC STRUCTURE, TAKING CARE NOT TO PENETRATE ANY ADJACENT PARTS.
Q. BONDING TO EQUIPMENT MOUNTED ON VIBRATION ISOLATION HANGERS AND SUPPORTS: INSTALL BONDING SO VIBRATION IS NOT TRANSMITTED TO RIGIDLY MOUNTED EQUIPMENT.
R. USE EXOTHERMIC-WELDED CONNECTORS FOR ALL BELOW GRADE CONNECTIONS AND OUTDOOR LOCATIONS; IF A DISCONNECT-TYPE CONNECTION IS REQUIRED, USE A BOLTED CLAMP.
S. METAL WATER SERVICE PIPE: INSTALL INSULATED COPPER GROUNDING CONDUCTORS, IN PVC CONDUIT OR METAL CONDUIT WHERE GROUND WIRE IS TIED TO CONDUIT, FROM BUILDING'S MAIN SERVICE EQUIPMENT, OR GROUNDING BUS, TO MAIN METAL WATER SERVICE ENTRANCES TO BUILDING. CONNECT GROUNDING CONDUCTORS TO MAIN METAL WATER SERVICE PIPES; USE A BOLTED CLAMP CONNECTOR OR BOLT A LUG-TYPE CONNECTOR TO A PIPE FLANGE BY USING ONE OF THE LUG BOLTS OF THE FLANGE. WHERE A DIELECTRIC MAIN WATER FITTING IS INSTALLED, CONNECT GROUNDING CONDUCTOR ON STREET SIDE OF FITTING. BOND METAL GROUNDING CONDUCTOR CONDUIT OR SLEEVE TO CONDUCTOR AT EACH END.
T. WATER METER PIPING: USE BRAIDED-TYPE BONDING JUMPERS TO ELECTRICALLY BYPASS WATER METERS. CONNECT TO PIPE WITH A BOLTED CONNECTOR.
U. BOND EACH ABOVEGROUND PORTION OF GAS PIPING SYSTEM DOWNSTREAM FROM EQUIPMENT SHUTOFF VALVE.
V. BONDING INTERIOR METAL DUCTS: BOND METAL AIR DUCTS TO EQUIPMENT GROUNDING CONDUCTORS OF ASSOCIATED FANS, BLOWERS, ELECTRIC HEATERS, AND AIR CLEANERS. INSTALL TINNED BONDING JUMPER TO BOND ACROSS FLEXIBLE DUCT CONNECTIONS TO ACHIEVE CONTINUITY.
W. GROUNDING FOR STEEL BUILDING STRUCTURE: INSTALL A DRIVEN GROUND ROD AT BASE OF EACH CORNER COLUMN AND AT INTERMEDIATE EXTERIOR COLUMNS AT DISTANCES NOT MORE THAN 60 FEET APART.
X. MAKE CONNECTIONS SO POSSIBILITY OF GALVANIC ACTION OR ELECTROLYSIS IS MINIMIZED. SELECT CONNECTORS, CONNECTION HARDWARE, CONDUCTORS, AND CONNECTION METHODS SO METALS IN DIRECT CONTACT ARE GALVANICALLY COMPATIBLE.

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS (260533)

A. METAL CONDUIT:
   1. GRC: COMPLY WITH ANSI C80.1.
   2. IMC: COMPLY WITH ANSI C80.6.
   3. PVC-COATED STEEL CONDUIT: PVC-COATED RIGID STEEL CONDUIT IMC. COMPLY WITH NEMA RN 1.
   4. EMT: COMPLY WITH ANSI C80.3.
   5. FMC: COMPLY WITH UL 1; ZINC-COATED STEEL OR ALUMINUM.
   6. LFMC: FLEXIBLE STEEL CONDUIT WITH PVC JACKET AND COMPLYING WITH UL 360.
B. METAL FITTINGS:
   1. COMPLY WITH NEMA FB 1 AND UL 514B.
   2. CONDUIT FITTINGS FOR HAZARDOUS (CLASSIFIED) LOCATIONS: COMPLY WITH UL 1203 AND NFPA 70.
   3. FITTINGS FOR EMT: MATERIAL- STEEL OR DIE CAST. TYPE- COMPRESSION.
   4. EXPANSION FITTINGS: PVC OR STEEL TO MATCH CONDUIT TYPE, COMPLYING WITH UL 651, RATED FOR ENVIRONMENTAL CONDITIONS WHERE INSTALLED, AND INCLUDING FLEXIBLE EXTERNAL BONDING JUMPER.
   5. COATING FOR FITTINGS FOR PVC-COATED CONDUIT: MINIMUM THICKNESS OF 0.040 INCH, WITH OVERLAPPING SLEEVES PROTECTING THREADED JOINTS.
C. NONMETALLIC CONDUIT (EXTERIOR):
   1. ENT: COMPLY WITH NEMA TC 13.
   2. RNC: TYPE EPC-80-PVC, COMPLYING WITH NEMA TC 2 AND UL 651 UNLESS OTHERWISE INDICATED.
   3. LFNC: COMPLY WITH UL 1660.
D. NONMETALLIC FITTINGS (EXTERIOR):
   1. FITTINGS FOR ENT AND RNC: COMPLY WITH NEMA TC 3; MATCH TO CONDUIT OR TUBING TYPE AND MATERIAL.
   2. FITTINGS FOR LFNC: COMPLY WITH UL 514B.
E. METAL WIREWAYS AND AUXILIARY GUTTERS:
   1. SHEET METAL, COMPLYING WITH UL 870 AND NEMA 250, TYPE 1, TYPE 3R, OR TYPE 4 UNLESS OTHERWISE INDICATED, AND SIZED ACCORDING TO NFPA 70. METAL WIREWAYS INSTALLED OUTDOORS SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
   2. FITTINGS AND ACCESSORIES: INCLUDE COVERS, COUPLINGS, OFFSETS, ELBOWS, EXPANSION JOINTS, ADAPTERS, HOLD-DOWN STRAPS, END CAPS, AND OTHER FITTINGS TO MATCH AND MATE WITH WIREWAYS AS REQUIRED FOR COMPLETE SYSTEM.
   3. WIREWAY COVERS: HINGED TYPE SCREW-COVER TYPE FLANGED-AND-GASKETED TYPE UNLESS OTHERWISE INDICATED.
   4. FINISH: MANUFACTURER'S STANDARD ENAMEL FINISH.
F. SURFACE METAL RACEWAYS: GALVANIZED STEEL WITH SNAP-ON COVERS COMPLYING WITH UL 5. MANUFACTURER'S STANDARD ENAMEL FINISH IN COLOR SELECTED BY ARCHITECT. INSTALL SURFACE RACEWAYS ONLY WHERE INDICATED ON DRAWINGS.
G. BOXES, ENCLOSURES, AND CABINETS INSTALLED IN WET LOCATIONS SHALL BE LISTED FOR USE IN WET LOCATIONS. BOXES FOR CEILING FANS SHALL MEET NEC 314.27(C).
H. METAL FLOOR BOXES SHALL BE CAST METAL OR SHEET METAL, RECTANGULAR AND FULLY ADJUSTABLE.
I. LUMINAIRE OUTLET BOXES SHALL BE NONADJUSTABLE, DESIGNED FOR ATTACHMENT OF LUMINAIRES, MARKED FOR MAXIMUM WEIGHT.
J. CAST-METAL ACCESS, PULL, AND JUNCTION BOXES SHALL BE CAST ALUMINUM OR GALVANIZED, CAST IRON WITH GASKETED COVER. PULL BOXES SHALL BE SIZED PER 314.28.
K. BOX EXTENSIONS USED TO ACCOMMODATE NEW BUILDING FINISHES SHALL BE OF SAME MATERIAL AS RECESSED BOX.
L. DEVICE BOX DIMENSIONS: 4 INCHES SQUARE BY 2-1/8 INCHES DEEP OR 4 INCHES BY 2-1/8 INCHES BY 2-1/8 INCHES DEEP. GANGABLE BOXES ARE PROHIBITED.
M. CABINETS: NEMA 250, TYPE 1 [TYPE 3R] [TYPE 12] GALVANIZED-STEEL BOX WITH REMOVABLE INTERIOR PANEL AND REMOVABLE FRONT, FINISHED INSIDE AND OUT WITH MANUFACTURER'S STANDARD ENAMEL. HINGED DOOR IN FRONT COVER WITH FLUSH LATCH AND CONCEALED HINGE. KEY LATCH TO MATCH PANELBOARDS. METAL BARRIERS TO SEPARATE WIRING OF DIFFERENT SYSTEMS AND VOLTAGE. ACCESSORY FEET WHERE REQUIRED FOR FREESTANDING EQUIPMENT.
N. PROVIDE SUPPORT FOR ALL BOXES AND CONDUIT PER NEC TABLE 300.19.
O. APPLY RACEWAY PRODUCTS AS SPECIFIED BELOW UNLESS OTHERWISE INDICATED:
   1. OUTDOORS
      a. EXPOSED CONDUIT: GRC, IMC, RNC, TYPE EPC-80-PVC
      b. CONCEALED CONDUIT, ABOVEGROUND: GRC, IMC AND EMT.
      c. UNDERGROUND CONDUIT: RNC, TYPE EPC-80-PVC, DIRECT BURIED AND CONCRETE ENCASED WHERE UNDER DRIVES AND PARKING AREAS.
      d. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): LFMC AND LFNC.
      e. BOXES AND ENCLOSURES, ABOVEGROUND: NEMA 250, TYPE 3R AND TYPE 4 OR 4X.
   2. INDOORS
      a. EXPOSED, NOT SUBJECT TO PHYSICAL DAMAGE: EMT.
      b. EXPOSED, NOT SUBJECT TO SEVERE PHYSICAL DAMAGE: EMT.
      c. EXPOSED AND SUBJECT TO SEVERE PHYSICAL DAMAGE: GRC. RACEWAY LOCATIONS INCLUDE THE FOLLOWING: LOADING DOCK, CORRIDORS USED FOR TRAFFIC OF MECHANIZED CARTS, FORKLIFTS, AND PALLET-HANDLING UNITS, MECHANICAL ROOMS.
      d. CONCEALED IN CEILINGS AND INTERIOR WALLS AND PARTITIONS: EMT
      e. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): FMC, EXCEPT USE LFMC IN DAMP OR WET LOCATIONS.
      f. DAMP OR WET LOCATIONS: GRC.
   3. BOXES AND ENCLOSURES: NEMA 250, TYPE 1, EXCEPT USE NEMA 250, TYPE 4 STAINLESS STEEL IN INSTITUTIONAL AND COMMERCIAL KITCHENS AND DAMP OR WET LOCATIONS.
P. RACEWAY FITTINGS SHALL BE COMPATIBLE WITH RACEWAYS AND SUITABLE FOR USE AND LOCATION. MINIMUM RACEWAY SIZE SHALL BE 3/4-INCH TRADE SIZE. USE THREADED RIGID STEEL CONDUIT FITTINGS FOR RIGID AND INTERMEDIATE STEEL CONDUIT. USE ONLY FITTINGS LISTED FOR USE WITH PVC EXTERNALLY COATED RIGID STEEL CONDUITS. PATCH AND SEAL ALL JOINTS, NICKS, AND SCRAPES IN PVC COATING AFTER INSTALLING CONDUITS AND FITTINGS. USE SEALANT RECOMMENDED BY FITTING MANUFACTURER AND APPLY IN THICKNESS AND NUMBER OF COATS RECOMMENDED BY MANUFACTURER. USE SETSCREW, STEEL FITTINGS FOR USE WITH EMT. USE ONLY FITTINGS LISTED FOR USE WITH FLEXIBLE CONDUIT.
Q. KEEP RACEWAYS AT LEAST 6 INCHES AWAY FROM PARALLEL RUNS OF FLUES AND STEAM OR HOT-WATER PIPES. INSTALL HORIZONTAL RACEWAY RUNS ABOVE WATER AND STEAM PIPING.
R. INSTALL NO MORE THAN THE EQUIVALENT OF THREE 90-DEGREE BENDS IN ANY CONDUIT RUN EXCEPT FOR CONTROL WIRING CONDUITS, FOR WHICH FEWER BENDS ARE ALLOWED. SUPPORT WITHIN 12 INCHES OF CHANGES IN DIRECTION.
S. CONCEAL CONDUIT AND EMT WITHIN FINISHED WALLS, CEILINGS, AND FLOORS UNLESS OTHERWISE INDICATED. INSTALL CONDUITS PARALLEL OR PERPENDICULAR TO BUILDING LINES. ARRANGE STUB-UPS SO CURVED PORTIONS OF BENDS ARE NOT VISIBLE ABOVE FINISHED SLAB.
T. SUPPORT CONDUIT WITHIN 12 INCHES OF ENCLOSURES TO WHICH ATTACHED. ALL JUNCTION BOXES SHALL REMAIN ACCESSIBLE PER NEC REQUIREMENTS.
U. RACEWAYS EMBEDDED IN SLABS: ARRANGE RACEWAYS TO KEEP A MINIMUM OF 3 INCHES OF CONCRETE COVER IN ALL DIRECTIONS. DO NOT EMBED THREADLESS FITTINGS IN CONCRETE UNLESS SPECIFICALLY APPROVED BY ARCHITECT FOR EACH SPECIFIC LOCATIONS. DO NOT INSTALL ALUMINUM CONDUITS, BOXES, OR FITTINGS IN CONTACT WITH CONCRETE OR EARTH.
V. STUB-UPS TO ABOVE RECESSED CEILINGS: USE EMT, IMC, OR RMC FOR RACEWAYS.USE A CONDUIT BUSHING OR INSULATED FITTING TO TERMINATE STUB-UPS NOT TERMINATED IN HUBS OR IN AN ENCLOSURE.
W. THREADED CONDUIT JOINTS, EXPOSED TO WET, DAMP, CORROSIVE, OR OUTDOOR CONDITIONS: APPLY LISTED COMPOUND TO THREADS OF RACEWAY AND FITTINGS BEFORE MAKING UP JOINTS. FOLLOW COMPOUND MANUFACTURER'S WRITTEN INSTRUCTIONS.
X. COAT FIELD-CUT THREADS ON PVC-COATED RACEWAY WITH A CORROSION-PREVENTING CONDUCTIVE COMPOUND PRIOR TO ASSEMBLY.
Y. RACEWAY TERMINATIONS AT LOCATIONS SUBJECT TO MOISTURE OR VIBRATION: USE INSULATING BUSHINGS TO PROTECT CONDUCTORS INCLUDING CONDUCTORS SMALLER THAN NO. 4 AWG.
Z. TERMINATE THREADED CONDUITS INTO THREADED HUBS OR WITH LOCKNUTS ON INSIDE AND OUTSIDE OF BOXES OR CABINETS. INSTALL BUSHINGS ON CONDUITS UP TO 1-1/4-INCH TRADE SIZE AND INSULATED THROAT METAL BUSHINGS ON 1-1/2-INCH TRADE SIZE AND LARGER CONDUITS TERMINATED WITH LOCKNUTS. INSTALL INSULATED THROAT METAL GROUNDING BUSHINGS ON SERVICE CONDUITS.
AA. INSTALL PULL WIRES IN EMPTY RACEWAYS.
BB. FLEXIBLE CONDUIT CONNECTIONS: COMPLY WITH NEMA RV 3. USE A MAXIMUM OF 72 INCHES OF FLEXIBLE CONDUIT FOR EQUIPMENT SUBJECT TO VIBRATION, NOISE TRANSMISSION, OR MOVEMENT; AND FOR TRANSFORMERS AND MOTORS. USE LFMC IN DAMP OR WET LOCATIONS SUBJECT TO SEVERE PHYSICAL DAMAGE. LFNC MAY BE UTILIZED WHERE NOT SUBJECT TO PHYSICAL DAMAGE.
CC. MOUNT BOXES AT HEIGHTS INDICATED ON DRAWINGS. IF MOUNTING HEIGHTS OF BOXES ARE NOT INDIVIDUALLY INDICATED, GIVE PRIORITY TO ADA REQUIREMENTS. INSTALL BOXES WITH HEIGHT MEASURED TO CENTER OF BOX UNLESS OTHERWISE INDICATED.
DD. RECESSED BOXES IN MASONRY WALLS: SAW-CUT OPENING FOR BOX IN CENTER OF CELL OF MASONRY BLOCK, AND INSTALL BOX FLUSH WITH SURFACE OF WALL. PREPARE BLOCK SURFACES TO PROVIDE A FLAT SURFACE FOR A RAINTIGHT CONNECTION BETWEEN BOX AND COVER PLATE OR SUPPORTED EQUIPMENT AND BOX.
EE. HORIZONTALLY SEPARATE BOXES MOUNTED ON OPPOSITE SIDES OF WALLS SO THEY ARE NOT IN THE SAME VERTICAL CHANNEL. LOCATE BOXES SO THAT COVER OR PLATE WILL NOT SPAN DIFFERENT BUILDING FINISHES.
FF. SUPPORT BOXES OF THREE GANGS OR MORE FROM MORE THAN ONE SIDE BY SPANNING TWO FRAMING MEMBERS OR MOUNTING ON BRACKETS SPECIFICALLY DESIGNED FOR THE PURPOSE. FASTEN JUNCTION AND PULL BOXES TO OR SUPPORT FROM BUILDING STRUCTURE. DO NOT SUPPORT BOXES BY CONDUITS.

LIGHTING CONTROL DEVICES (260923)

A. PROVIDE PRODUCTS SPECIFICALLY INDICATED ON DRAWINGS WHERE PRODUCT DATA IS PROVIDED. WHERE SPECIFIC PRODUCT IS NOT INDICATED ON DRAWINGS, FOLLOW SPECIFICATIONS WITHIN THIS SECTION.
B. COORDINATE LAYOUT AND INSTALLATION OF CEILING-MOUNTED DEVICES WITH OTHER CONSTRUCTION THAT PENETRATES CEILINGS OR IS SUPPORTED BY THEM, INCLUDING LIGHT FIXTURES, HVAC EQUIPMENT, SMOKE DETECTORS, FIRE-SUPPRESSION SYSTEM, AND PARTITION ASSEMBLIES.
C. LOW VOLTAGE DIGITAL TIME SWITCH: THE DIGITAL TIME SWITCH SHALL BE PROGRAMMABLE TO TURN LOADS OFF AFTER A PRESET TIME. SHALL BE A FIVE WIRE, COMPLETELY SELF-CONTAINED CONTROL SYSTEM THAT REPLACES A STANDARD TOGGLE SWITCH. SWITCHING MECHANISM SHALL BE A 30V, 1A AIR GAP RELAY. SHALL OPERATE AT EITHER 24 VAC OR 24 VDC, 60 HZ. SHALL HAVE NO MINIMUM LOAD REQUIREMENT. SHALL BE 6-BUTTON WITH 30 MINUTE/1HOUR/2HOUR/4 HOUR/8 HOUR/12 HOUR OPTIONS, WITH EACH OPTION ENGRAVED ON THE BUTTONS TO REFLECT THOSE TIMES. SHALL GIVE VISUAL WARNING AT 5 MINUTES UNTIL LIGHTS TURN OFF, AND AUDIBLE/VISUAL WARNING AT 1 MINUTE BEFORE THE LIGHTS TURN OFF. SHALL HAVE THE OPTION FOR A BEEP WARNING THAT SHALL SOUND EVERY FIVE SECONDS ONCE THE TIME SWITCH COUNTDOWN REACHES ONE MINUTE. SHALL HAVE MANUAL FEATURE FOR TIMER RESET WHERE PRESSING THE ON/OFF SWITCH FOR MORE THAN 2 SECONDS RESETS THE TIMER TO THE PROGRAMMED TIME-OUT PERIOD. SHALL BE CAPABLE OF OPERATING AS AN ON/OFF SWITCH. CAN OPERATE WITH POWER PACKS IN ORDER TO CONTROL ADDITIONAL LOADS.
D. ELECTRONIC TIME SWITCHES: DIGITAL, PROGRAMMABLE, AND WITH ALPHANUMERIC DISPLAY; COMPLYING WITH UL 917. SHALL POSSESS EIGHT CHANNELS WITH EACH CHANNEL BEING INDIVIDUALLY PROGRAMMABLE WITH 40 ON-OFF OPERATIONS PER WEEK AND AN ANNUAL HOLIDAY SCHEDULE THAT OVERRIDES THE WEEKLY OPERATION ON HOLIDAYS. CIRCUITRY SHALL ALLOW CONNECTION OF A PHOTOELECTRIC RELAY AS SUBSTITUTE FOR ON-OFF FUNCTION OF A PROGRAM. AUTOMATIC DAYLIGHT SAVINGS TIME CHANGEOVER SHALL BE PROVIDED. BATTERY BACKUP SHALL NOT BE LESS THAN SEVEN DAYS RESERVE, TO MAINTAIN SCHEDULES AND TIME CLOCK.
E. OUTDOOR PHOTOELECTRIC SWITCHES: SOLID STATE, WITH DPST DRY CONTACTS RATED FOR 1800-VA TUNGSTEN OR 1000-VA INDUCTIVE, TO OPERATE CONNECTED RELAY, CONTACTOR COILS, OR MICROPROCESSOR INPUT; COMPLYING WITH UL 773A. SHALL BE ADJUSTABLE IN 15 DEGREE INCREMENTS. SPECIFIC PRODUCT AS INDICATED ON DRAWINGS.
F. DAYLIGHTING SENSORS: SOLID-STATE, LIGHT-LEVEL SENSOR UNIT, WITH SEPARATE RELAY UNIT, TO DETECT CHANGES IN LIGHTING LEVELS THAT ARE PERCEIVED BY THE EYE. COMPATIBLE WITH LIGHTING SYSTEM AS SPECIFIED.
G. INDOOR OCCUPANCY AND VACANCY SENSORS: WALL- OR CEILING-MOUNTING, SOLID-STATE UNITS WITH A SEPARATE RELAY UNIT. SENSORS SHALL BE ABLE TO OPERATE IN OCCUPANCY OR VACANCY MODE VIA DIP SWITCH.
   1. OCCUPANCY SENSOR OPERATION: UNLESS OTHERWISE INDICATED, TURN LIGHTS ON WHEN COVERAGE AREA IS OCCUPIED, AND TURN THEM OFF WHEN UNOCCUPIED; WITH A TIME DELAY FOR TURNING LIGHTS OFF, ADJUSTABLE OVER A MINIMUM RANGE OF 1 TO 30 MINUTES.
   2. VACANCY SENSOR OPERATION: UNLESS OTHERWISE INDICATED, LIGHTS ARE MANUALLY TURNED ON AND SENSOR TURNS LIGHTS OFF WHEN THE ROOM IS UNOCCUPIED; WITH A TIME DELAY FOR TURNING LIGHTS OFF, ADJUSTABLE OVER A MINIMUM RANGE OF 1 TO 30 MINUTES.
   3. SENSOR SHALL BE SUITABLE FOR MOUNTING IN ANY POSITION ON A STANDARD OUTLET BOX.
   4. INDICATOR: LED, TO SHOW WHEN MOTION IS BEING DETECTED DURING TESTING AND NORMAL OPERATION OF THE SENSOR.
   5. BYPASS SWITCH: OVERRIDE THE ON FUNCTION IN CASE OF SENSOR FAILURE.
   6. PIR TYPE: CEILING MOUNTING; DETECT OCCUPANCY BY SENSING A COMBINATION OF HEAT AND MOVEMENT IN AREA OF COVERAGE.
      a. DETECTOR SENSITIVITY: DETECT OCCURRENCES OF 6-INCH- (150-MM-) MINIMUM MOVEMENT OF ANY PORTION OF A HUMAN BODY THAT PRESENTS A TARGET OF NOT LESS THAN 36 SQ. IN. (232 SQ. CM).
      b. DETECTION COVERAGE (ROOM): DETECT OCCUPANCY ANYWHERE IN A CIRCULAR AREA OF 1000 SQ. FT. (93 SQ. M) WHEN MOUNTED ON A 96-INCH- (2440-MM-) HIGH CEILING.
      c. DETECTION COVERAGE (CORRIDOR): DETECT OCCUPANCY WITHIN 90 FEET (27.4 M) WHEN MOUNTED ON A 10-FOOT- (3-M-) HIGH CEILING.
   7. ULTRASONIC TYPE: CEILING MOUNTING; DETECT OCCUPANCY BY SENSING A CHANGE IN PATTERN OF REFLECTED ULTRASONIC ENERGY IN AREA OF COVERAGE.
      a. DETECTOR SENSITIVITY: DETECT A PERSON OF AVERAGE SIZE AND WEIGHT MOVING NOT LESS THAN 12 INCHES (305 MM) IN EITHER A HORIZONTAL OR A VERTICAL MANNER AT AN APPROXIMATE SPEED OF 12 INCHES/S (305 MM/S).
      b. DETECTION COVERAGE (SMALL ROOM): DETECT OCCUPANCY ANYWHERE WITHIN A CIRCULAR AREA OF 600 SQ. FT. (56 SQ. M) WHEN MOUNTED ON A 96-INCH- (2440-MM-) HIGH CEILING.
      c. DETECTION COVERAGE (STANDARD ROOM): DETECT OCCUPANCY ANYWHERE WITHIN A CIRCULAR AREA OF 1000 SQ. FT. (93 SQ. M) WHEN MOUNTED ON A 96-INCH- (2440-MM-) HIGH CEILING.
      d. DETECTION COVERAGE (LARGE ROOM): DETECT OCCUPANCY ANYWHERE WITHIN A CIRCULAR AREA OF 2000 SQ. FT. (186 SQ. M) WHEN MOUNTED ON A 96-INCH- (2440-MM-) HIGH CEILING.
      e. DETECTION COVERAGE (CORRIDOR): DETECT OCCUPANCY ANYWHERE WITHIN 90 FEET (27.4 M) WHEN MOUNTED ON A 10-FOOT- (3-M-) HIGH CEILING IN A CORRIDOR NOT WIDER THAN 14 FEET (4.3 M).
   8. DUAL-TECHNOLOGY TYPE: CEILING MOUNTING; DETECT OCCUPANCY BY USING A COMBINATION OF PIR AND ULTRASONIC DETECTION METHODS IN AREA OF COVERAGE. PARTICULAR TECHNOLOGY OR COMBINATION OF TECHNOLOGIES THAT CONTROLS ON-OFF FUNCTIONS SHALL BE SELECTABLE IN THE FIELD BY OPERATING CONTROLS ON UNIT.
      a. SENSITIVITY ADJUSTMENT: SEPARATE FOR EACH SENSING TECHNOLOGY.
      b. DETECTOR SENSITIVITY: DETECT OCCURRENCES OF 6-INCH- (150-MM-) MINIMUM MOVEMENT OF ANY PORTION OF A HUMAN BODY THAT PRESENTS A TARGET OF NOT LESS THAN 36 SQ. IN. (232 SQ. CM), AND DETECT A PERSON OF AVERAGE SIZE AND WEIGHT MOVING NOT LESS THAN 12 INCHES (305 MM) IN EITHER A HORIZONTAL OR A VERTICAL MANNER AT AN APPROXIMATE SPEED OF 12 INCHES/S (305 MM/S).
      c. DETECTION COVERAGE (STANDARD ROOM): DETECT OCCUPANCY ANYWHERE WITHIN A CIRCULAR AREA OF 1000 SQ. FT. (93 SQ. M) WHEN MOUNTED ON A 96-INCH- (2440-MM-) HIGH CEILING.
H. EMERGENCY TRANSFER DEVICE: THE EMERGENCY TRANSFER DEVICE SHALL PROVIDE ALL REQUIRED FUNCTIONALITY TO ALLOW ANY STANDARD LIGHTING CONTROL DEVICE TO CONTROL EMERGENCY LIGHTING IN CONJUNCTION WITH NORMAL LIGHTING IN ANY AREA WITHIN A BUILDING.
   1. THE EMERGENCY LIGHTING CONTROL UNIT SHALL ALLOW CONTROL OF EMERGENCY LIGHTING FIXTURES IN TANDEM WITH NORMAL LIGHTING IN AN AREA WHILE ENSURING THAT EMERGENCY LIGHTING WILL TURN ON IMMEDIATELY TO FULL BRIGHTNESS UPON LOSS OF NORMAL POWER SUPPLYING THE CONTROL DEVICE. EMERGENCY LIGHTING OPERATION SHALL BE INDEPENDENT FOR EACH CONTROLLED AREA AND SHALL NOT REQUIRE A GENERALIZED POWER FAILURE FOR PROPER OPERATION.
   2. THE UNIT SHALL AUTOMATICALLY SWITCH EMERGENCY LIGHTING ON AND OFF AS NORMAL LIGHTING IS SWITCHED. WHEN NORMAL POWER IS NOT AVAILABLE, THE UNIT SHALL FORCE AND HOLD EMERGENCY LIGHTING ON REGARDLESS OF THE STATE OF ANY EXTERNAL CONTROL DEVICE UNTIL NORMAL POWER IS RESTORED.
   3. THE UNIT SHALL BE UL924 AND CUL LISTED AND LABELED FOR CONNECTION TO BOTH NORMAL AND NORMAL/EMERGENCY LIGHTING POWER SOURCES.
I. SENSOR INSTALLATION
   1. INSTALL AND AIM SENSORS IN LOCATIONS TO ACHIEVE NOT LESS THAN 90 PERCENT COVERAGE OF AREAS INDICATED. DO NOT EXCEED COVERAGE LIMITS SPECIFIED IN MANUFACTURER'S WRITTEN INSTRUCTIONS.
   2. SENSOR LOCATIONS SHOWN ON THE DRAWINGS ARE TO DENOTE ROOMS THAT SHALL HAVE SENSOR CONTROL. PROVIDE SENSORS IN LOCATIONS AND QUANTITY AS REQUIRED BY THE MANUFACTURER FOR PROPER COVERAGE AND OPERATION OF SPACE. SENSORS SHALL BE LOCATED A MINIMUM OF 6' FROM HVAC SUPPLY DIFFUSERS.
   3. PROVIDE ALL RELATED PARTS AND ACCESSORIES FOR A COMPLETE AND OPERATIONAL SYSTEM.
   4. CEILING MOUNTED OCCUPANCY SENSORS AND DAYLIGHT SENSORS SHALL BE INSTALLED CENTERED IN CEILING TILES.
   5. UNLESS NOTED OTHERWISE WALL MOUNTED SWITCHES SHALL BE INSTALLED ON THE LATCH SIDE OF THE DOOR.
   6. INSTALL DAYLIGHTING SENSORS AS INDICATED TO CONTROL LAMPS AS DETAILED ON CONTRACT DOCUMENTS. LOCATE IN CEILING TO NOT INTERFERE OPERATION BY OTHER OBJECTS AND AS REQUIRED BY MANUFACTURER TO DETECT NATURAL LIGHT LEVELS. SET SENSITIVITY LEVELS FOR CONTROL AS RECOMMENDED BY MANUFACTURER.
J. ALL OCCUPANCY SENSORS AND DAYLIGHT SENSORS SHALL BE COMMISSIONED. DUAL TECHNOLOGY SENSORS SHALL BE SET TO “TURN ON” WHEN BOTH TECHNOLOGIES SENSE MOTION AND MAINTAIN “ON” WITH EITHER TECHNOLOGY. SET SENSOR TO MID-RANGE SENSITIVITY WITH A 15 MINUTE DELAY TIME TO OFF. SET LIGHT LEVEL FUNCTION FOR DAYLIGHT SENSORS BETWEEN 11AM AND 1PM DURING A DAY OF MODERATE CLOUD COVER WHERE ILLUMINATION AT THE DESK IS AT LEAST 40 FOOTCANDLES WITH THE LUMINAIRES OFF.
K. OCCUPANCY ADJUSTMENTS: WHEN REQUESTED WITHIN 12 MONTHS OF DATE OF SUBSTANTIAL COMPLETION, PROVIDE ON-SITE ASSISTANCE IN ADJUSTING SENSORS TO SUIT OCCUPIED CONDITIONS. PROVIDE UP TO TWO VISITS TO PROJECT DURING OTHER-THAN-NORMAL OCCUPANCY HOURS FOR THIS PURPOSE.
L. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN LIGHTING CONTROL DEVICES. REFER TO DIVISION 01 SECTION 017900 “DEMONSTRATION AND

STATE OF MARYLAND
TIMOTHY R. CHATTERTON
No. 51406
PROFESSIONAL ENGINEER
LICENSE NUMBER: 51406
EXPIRATION DATE: 08/10/2025
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

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DATE	COMMENTS
12/18/2024	100% Design Development
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07/16/2025	100% Construction Documentation
07/29/2025	Issued for Permit

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ELECTRICAL SPECIFICATIONS

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TRAINING."

LOW-VOLTAGE DISTRIBUTION TRANSFORMERS (262200)

A. TRANSFORMERS SHALL BE FACTORY-ASSEMBLED AND -TESTED, AIR-COOLED UNITS FOR 60-HZ SERVICE.
B. TRANSFORMERS RATED 15 KVA AND LARGER: COMPLY WITH 10 CFR 431 (DOE 2016) EFFICIENCY LEVELS. MARKED AS COMPLIANT WITH DOE 2016 EFFICIENCY LEVELS BY AN NRTL.
C. DISTRIBUTION TRANSFORMERS SHALL BE LISTED AND LABELED AS COMPLYING WITH UL 1561.
   1. CORES SHALL BE ELECTRICAL GRADE, NON-AGING SILICON STEEL WITH HIGH PERMEABILITY AND LOW HYSTERESIS LOSSES.
      a. ONE LEG PER PHASE.
      b. CORE VOLUME SHALL ALLOW EFFICIENT TRANSFORMER OPERATION AT 10 PERCENT ABOVE THE NOMINAL TAP VOLTAGE.
      c. GROUNDED TO ENCLOSURE.
   2. COILS SHALL BE CONTINUOUS WINDINGS WITHOUT SPLICES EXCEPT FOR TAPS. MATERIAL SHALL BE COPPER/ALUMINUM WITH BRAZED OR PRESSURE TYPE INTERNAL CONNECTIONS.
   3. TRANSFORMERS SMALLER THAN 30 KVA SHALL HAVE CORE AND COILS COMPLETELY RESIN ENCAPSULATED.
   4. ENCLOSURES SHALL BE VENTILATED NEMA 250, TYPE 2 TYPE 3R: CORE AND COIL SHALL BE ENCAPSULATED WITHIN RESIN COMPOUND USING A VACUUM-PRESSURE IMPREGNATION PROCESS TO SEAL OUT MOISTURE AND AIR. KVA RATINGS SHALL BE BASED ON CONVECTION COOLING ONLY AND NOT RELYING ON AUXILIARY FANS. WIRING COMPARTMENT SHALL BE SIZED FOR CONDUIT ENTRY AND WIRING INSTALLATION. FINISH SHALL BE GRAY, ANSI 49 OR GRAY ANSI 61 WEATHER-RESISTANT ENAMEL.
   5. TAPS FOR TRANSFORMERS 3 KVA AND SMALLER- NONE; 7.5 TO 24 KVA- ONE 5 PERCENT TAP ABOVE AND ONE 5 PERCENT TAP BELOW NORMAL FULL CAPACITY; 25 KVA AND LARGER- TWO 2.5 PERCENT TAPS ABOVE AND FOUR 2.5 PERCENT TAPS BELOW NORMAL FULL CAPACITY.
   6. INSULATION CLASS: 220 DEG C, UL-COMPONENT-RECOGNIZED INSULATION SYSTEM WITH A MAXIMUM OF 150 DEG C RISE ABOVE 40 DEG C AMBIENT TEMPERATURE.
   7. PROVIDE GROUND-BAR KIT OR A GROUND BAR INSTALLED ON THE INSIDE OF THE TRANSFORMER ENCLOSURE.
   8. EACH WINDING SHALL HAVE AN INDEPENDENT, SINGLE, FULL-WIDTH COPPER ELECTROSTATIC SHIELD ARRANGED TO MINIMIZE INTERWINDING CAPACITANCE. ARRANGE COIL LEADS AND TERMINAL STRIPS TO MINIMIZE CAPACITIVE COUPLING BETWEEN INPUT AND OUTPUT TERMINALS. INCLUDE SPECIAL TERMINAL FOR GROUNDING THE SHIELD.
   9. WHERE REQUIRED PROVIDE WALL BRACKETS FABRICATED FROM DESIGN DRAWINGS SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER.
   10. SOUND LEVEL REQUIREMENTS SHALL BE A MINIMUM OF 3 DB BELOW REQUIREMENTS OF NEMA ST-20.
   11. K-FACTOR RATED TRANSFORMERS, WHERE INDICATED, SHALL COMPLY WITH UL 1561 REQUIREMENTS FOR NONSINUSOIDAL LOAD CURRENT-HANDLING CAPABILITY TO THE DEGREE DEFINED BY DESIGNATED K-FACTOR. UNIT SHALL NOT OVERHEAT WHEN CARRYING FULL-LOAD CURRENT WITH HARMONIC DISTORTION CORRESPONDING TO DESIGNATED K-FACTOR, WITHOUT EXCEEDING THE INDICATED INSULATION CLASS IN A 40 DEG C MAXIMUM AMBIENT AND A 24-HOUR AVERAGE AMBIENT OF 30 DEG C. INDICATE VALUE OF K-FACTOR ON TRANSFORMER NAMEPLATE. UNIT SHALL COMPLY WITH REQUIREMENTS OF DOE 2016 EFFICIENCY LEVELS WHEN TESTED ACCORDING TO NEMA TP 2 WITH A K-FACTOR EQUAL TO ONE. NEUTRAL RATED 200 PERCENT OF FULL LOAD CURRENT FOR K-RATED TRANSFORMERS
D. VERIFY THAT FIELD MEASUREMENTS ARE AS NEEDED TO MAINTAIN WORKING CLEARANCES REQUIRED BY NFPA 70 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.
E. ENCLOSURES SHALL BE RATED FOR THE ENVIRONMENT IN WHICH THEY ARE LOCATED. COVERS FOR NEMA 250, TYPE 4X ENCLOSURES SHALL NOT CAUSE ACCESSIBILITY PROBLEMS.
F. INSTALL WALL-MOUNTED TRANSFORMERS LEVEL AND PLUMB WITH WALL BRACKETS FABRICATED FROM DESIGN DRAWINGS SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER. COORDINATE INSTALLATION OF WALL-MOUNTED AND STRUCTURE-HANGING SUPPORTS WITH ACTUAL TRANSFORMER PROVIDED. BRACE WALL-MOUNTED TRANSFORMERS AS SPECIFIED IN SECTION 260548.16 "SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS."
G. INSTALL TRANSFORMERS LEVEL AND PLUMB ON A CONCRETE BASE WITH VIBRATION-DAMPENING SUPPORTS. LOCATE TRANSFORMERS AWAY FROM CORNERS AND NOT PARALLEL TO ADJACENT WALL SURFACE.
H. CONSTRUCT CONCRETE BASES AND ANCHOR FLOOR-MOUNTED TRANSFORMERS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS, AND SEISMIC CODES APPLICABLE TO PROJECT. COORDINATE SIZE AND LOCATION OF CONCRETE BASES WITH ACTUAL TRANSFORMER PROVIDED. CAST ANCHOR-BOLT INSERTS INTO BASES. CONCRETE, REINFORCEMENT, AND FORMWORK REQUIREMENTS ARE SPECIFIED WITH CONCRETE.
I. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A-486B.
J. VACUUM DIRT AND DEBRIS; DO NOT USE COMPRESSED AIR TO ASSIST IN CLEANING.

PANELBOARDS (262416)

A. FURNISH EXTRA MATERIALS THAT MATCH PRODUCTS INSTALLED AND THAT ARE PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED WITH LABELS DESCRIBING CONTENTS.
   1. KEYS: TWO SPARES FOR EACH TYPE OF PANELBOARD CABINET LOCK.
   2. CIRCUIT BREAKERS INCLUDING GFCI AND GFEP TYPES: TWO SPARES FOR EACH PANELBOARD.
B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING: EATON, SIEMENS, SQUARE D, OR GE.
C. PANELBOARDS SHALL POSSESS FLUSH AND SURFACE-MOUNTED, DEAD-FRONT CABINET ENCLOSURES. PANELS SHALL BE RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION. INDOOR DRY AND CLEAN LOCATIONS: NEMA 250, TYPE 1. OUTDOOR LOCATIONS: NEMA 250, TYPE 3R. KITCHEN WASH-DOWN AREAS: NEMA 250, TYPE 4X, STAINLESS STEEL. OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4. INDOOR LOCATIONS SUBJECT TO DUST, FALLING DIRT, AND DRIPPING NONCORROSIVE LIQUIDS: NEMA 250, TYPE 5 OR TYPE 12.
D. BRANCH OVERCURRENT PROTECTIVE DEVICES SHALL BE BOLT-ON CIRCUIT BREAKERS, REPLACEABLE WITHOUT DISTURBING ADJACENT UNITS.
E. PANELS SHALL HAVE A MAXIMUM HEIGHT OF 84 INCHES. FRONT SHALL BE SECURED TO BOX WITH CONCEALED TRIM CLAMPS. FOR SURFACE-MOUNTED FRONTS, MATCH BOX DIMENSIONS; FOR FLUSH-MOUNTED FRONTS, OVERLAP BOX. TRIMS SHALL COVER ALL LIVE PARTS AND SHALL HAVE NO EXPOSED HARDWARE. ENTIRE FRONT TRIM SHALL BE HINGED TO BOX AND WITH STANDARD DOOR WITHIN HINGED TRIM COVER. SKIRTS FOR SURFACE-MOUNTED PANELBOARDS SHALL BE SAME GAGE AND FINISH AS PANELBOARD FRONT WITH FLANGES FOR ATTACHMENT TO PANELBOARD, WALL, AND CEILING OR FLOOR.
F. INCOMING MAINS SHALL BE CONVERTIBLE BETWEEN TOP AND BOTTOM. MAIN LUG INTERIORS UP TO 400 AMPERES SHALL BE FIELD CONVERTIBLE TO MAIN BREAKER.
G. PHASE, NEUTRAL, AND GROUND BUSES:
   1. MATERIAL: HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY. PLATING SHALL RUN ENTIRE LENGTH OF BUS. BUS SHALL BE FULLY RATED THE ENTIRE LENGTH.
   2. INTERIORS SHALL BE FACTORY ASSEMBLED INTO A UNIT. REPLACING SWITCHING AND PROTECTIVE DEVICES SHALL NOT DISTURB ADJACENT UNITS OR REQUIRE REMOVING THE MAIN BUS CONNECTORS.
   3. EQUIPMENT GROUND BUS: ADEQUATE FOR FEEDER AND BRANCH-CIRCUIT EQUIPMENT GROUNDING CONDUCTORS; BONDED TO BOX.
H. CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL AND SIZES.
   1. MATERIAL: HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY.
   2. TERMINATIONS SHALL ALLOW USE OF 75 DEG C RATED CONDUCTORS WITHOUT DERATING.
   3. SIZE: LUGS SUITABLE FOR INDICATED CONDUCTOR SIZES, WITH ADDITIONAL GUTTER SPACE, IF REQUIRED, FOR LARGER CONDUCTORS.
   4. MAIN AND NEUTRAL LUGS: MECHANICAL TYPE, WITH A LUG ON THE NEUTRAL BAR FOR EACH POLE IN THE PANELBOARD.
   5. GROUND LUGS AND BUS-CONFIGURED TERMINATORS: MECHANICAL TYPE, WITH A LUG ON THE BAR FOR EACH POLE IN THE PANELBOARD.
   6. FEED-THROUGH LUGS: MECHANICAL TYPE, SUITABLE FOR USE WITH CONDUCTOR MATERIAL. LOCATE AT OPPOSITE END OF BUS FROM INCOMING LUGS OR MAIN DEVICE.
   7. SUBFEED (DOUBLE) LUGS: MECHANICAL TYPE SUITABLE FOR USE WITH CONDUCTOR MATERIAL. LOCATE AT SAME END OF BUS AS INCOMING LUGS OR MAIN DEVICE.
   8. GUTTER-TAP LUGS: MECHANICAL TYPE SUITABLE FOR USE WITH CONDUCTOR MATERIAL AND WITH MATCHING INSULATING COVERS. LOCATE AT SAME END OF BUS AS INCOMING LUGS OR MAIN DEVICE.
I. PANELBOARDS SHALL HAVE MOUNTING BRACKETS, BUS CONNECTIONS, FILLER PLATES, AND NECESSARY APPURTENANCES REQUIRED FOR FUTURE INSTALLATION OF DEVICES.
J. PANELBOARD SHORT-CIRCUIT CURRENT RATING: FULLY RATED TO INTERRUPT SYMMETRICAL SHORT-CIRCUIT CURRENT AVAILABLE AT TERMINALS. ASSEMBLY LISTED BY AN NRTL FOR 100 PERCENT INTERRUPTING CAPACITY.
K. SURGE SUPPRESSION: FACTORY INSTALLED AS AN INTEGRAL PART OF INDICATED PANELBOARDS, COMPLYING WITH UL 1449 SPD TYPE 1 AT SERVICE AND TYPE 2 FOR ADDITIONAL ELECTRICAL INSTALLATIONS. ALL INSTALLATIONS SHALL COMPLY WITH NEC 285 REQUIREMENTS.
   1. PEAK SURGE CURRENT RATING: THE MINIMUM SINGLE-PULSE SURGE CURRENT WITHSTAND RATING PER PHASE SHALL NOT BE LESS THAN 100 KA. THE PEAK SURGE CURRENT RATING SHALL BE THE ARITHMETIC SUM OF THE RATINGS OF THE INDIVIDUAL MOVS IN A GIVEN MODE.
   2. PROTECTION MODES AND UL 1449 VPR FOR GROUNDED WYE CIRCUITS WITH 480Y/277 V OR 208Y/120 V, THREE-PHASE, FOUR-WIRE CIRCUITS SHALL NOT EXCEED THE FOLLOWING:
      a. LINE TO NEUTRAL, LINE TO GROUND, NEUTRAL TO GROUND: 1200 V FOR 480Y/277 V, 700 V FOR 208Y/120 V.
      b. LINE TO LINE: 2000 V FOR 480Y/277 V, 1200 V FOR 208Y/120 V.
   3. PROTECTION MODES AND UL 1449 VPR FOR 240/120-V, SINGLE-PHASE, THREE-WIRE CIRCUITS SHALL NOT EXCEED THE FOLLOWING:
      a. LINE TO NEUTRAL, LINE TO GROUND, NEUTRAL TO GROUND: 700 V.
      b. LINE TO LINE: 1200 V.

   4. SCCR: EQUAL TO THE SCCR OF THE PANELBOARD IN WHICH INSTALLED
L. POWER PANELBOARDS, AS SPECIFIED IN THIS ARTICLE, FALL UNDER REQUIREMENTS OF "DISTRIBUTION PANELBOARDS" IN NEMA PB 1.
   1. PANELBOARDS: NEMA PB 1, DISTRIBUTION TYPE.
   2. DOORS: SECURED WITH VAULT-TYPE LATCH WITH TUMBLER LOCK; KEYED ALIKE.
M. LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS, AS SPECIFIED IN THIS ARTICLE, COMPLY WITH REQUIREMENTS OF "LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS" IN NEMA PB 1. PANELS KNOWN AS LOADCENTERS ARE NOT ACCEPTABLE
N. IDENTIFICATION: PANELBOARD LABEL SHALL POSSESS MANUFACTURER'S NAME AND TRADEMARK, VOLTAGE, AMPERAGE, NUMBER OF PHASES, AND NUMBER OF POLES SHALL BE LOCATED ON THE INTERIOR OF THE PANELBOARD DOOR. BREAKER LABEL FACEPLATE SHALL LIST CURRENT RATING, UL AND IEC CERTIFICATION STANDARDS, AND AIC RATING. CIRCUIT DIRECTORY CARD SHALL BE PROVIDED INSIDE PANELBOARD DOOR, MOUNTED IN METAL FRAME WITH TRANSPARENT PROTECTIVE COVER. CIRCUIT DIRECTORY SHALL IDENTIFY SPECIFIC PURPOSE WITH DETAIL SUFFICIENT TO DISTINGUISH IT FROM ALL OTHER CIRCUITS.
O. COORDINATE LAYOUT AND INSTALLATION OF PANELBOARDS AND COMPONENTS WITH OTHER CONSTRUCTION THAT PENETRATES WALLS OR IS SUPPORTED BY THEM, INCLUDING ELECTRICAL AND OTHER TYPES OF EQUIPMENT, RACEWAYS, PIPING, ENCUMBRANCES TO WORKSPACE CLEARANCE REQUIREMENTS, AND ADJACENT SURFACES. MAINTAIN REQUIRED WORKSPACE CLEARANCES AND REQUIRED CLEARANCES FOR EQUIPMENT ACCESS DOORS AND PANELS. MOUNT TOP OF TRIM 90 INCHES ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED.

WIRING DEVICES (262726)

A. OBTAIN EACH TYPE OF WIRING DEVICE AND ASSOCIATED WALL PLATE FROM SINGLE SOURCE FROM SINGLE MANUFACTURER. ACCEPTABLE MANUFACTURERS ARE EATON, HUBBELL, PASS & SEYMOUR, AND LEVITON, UNLESS OTHERWISE NOTED.
B. CONNECTORS SHALL COMPLY WITH UL 2459 AND SHALL BE MADE WITH STRANDED BUILDING WIRE.
C. DEVICES FOR OWNER-FURNISHED EQUIPMENT SHALL MATCH PLUG CONFIGURATIONS OR EQUIPMENT REQUIREMENTS.
D. STRAIGHT-BLADE RECEPTACLES
   1. DUPLEX CONVENIENCE RECEPTACLES: 125 V, 20 A; COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION 5-20R, UL 498, AND FS W-C-596.
   2. ISOLATED-GROUND, DUPLEX CONVENIENCE RECEPTACLES: 125 V, 20 A; COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION 5-20R, UL 498, AND FS W-C-596. STRAIGHT BLADE; EQUIPMENT GROUNDING CONTACTS SHALL BE CONNECTED ONLY TO THE GREEN GROUNDING SCREW TERMINAL OF THE DEVICE AND WITH INHERENT ELECTRICAL ISOLATION FROM MOUNTING STRAP. ISOLATION SHALL BE INTEGRAL TO RECEPTACLE CONSTRUCTION AND NOT DEPENDENT ON REMOVABLE PARTS.
E. USB CHARGER DEVICES
   1. TAMPER-RESISTANT, USB CHARGER RECEPTACLES: 12 V DC, 2.0 A, USB DUAL TYPE A; COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION 5-20R, UL 498, UL 1310, AND FS W-C-596. SINGLE-PIECE, RIVETLESS, NICKEL-PLATED, ALL-BRASS GROUNDING SYSTEM. NICKEL-PLATED, BRASS MOUNTING STRAP.
F. GFCI RECEPTACLES
   1. DUPLEX RECEPTACLE, 125 V, 20 A, STRAIGHT BLADE, NON-FEED-THROUGH TYPE.COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION 5-20R, UL 498, UL 943 CLASS A, AND FS W-C-596.
   2. INCLUDE INDICATOR LIGHT THAT SHOWS WHEN THE GFCI HAS MALFUNCTIONED AND NO LONGER PROVIDES PROPER GFCI PROTECTION.
G. TWIST-LOCKING RECEPTACLES
   1. TWIST-LOCK, SINGLE CONVENIENCE RECEPTACLES: 125 V, 20 A; COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION L5-20R, AND UL 498.
H. SPECIALTY AND CONTROLLED RECEPTACLES
   1. REFER TO DRAWING FOR NEMA CONFIGURATION OF ALL SPECIALTY RECEPTACLES.
   2. CONTROLLED RECEPTACLES SHALL BE SPLIT CONTROLLED (UNLESS OTHERWISE NOTED ON DRAWINGS.) ALL MARKINGS FOR CONTROL SHALL MEET NEC 406.3 AND BE UL498B LISTED. RATING SHALL BE 20A UNLESS OTHERWISE NOTED ON DRAWINGS.
I. PENDANT CORD-CONNECTOR DEVICES
   1. MATCHING, LOCKING-TYPE PLUG AND RECEPTACLE BODY CONNECTOR. NEMA WD 6 CONFIGURATIONS L5-20P AND L5-20R, HEAVY-DUTY GRADE, AND FS W-C-596. BODY: NYLON, WITH SCREW-OPEN, CABLE-GRIPPING JAWS AND PROVISION FOR ATTACHING EXTERNAL CABLE GRIP. EXTERNAL CABLE GRIP: WOVEN WIRE-MESH TYPE MADE OF HIGH-STRENGTH, GALVANIZED-STEEL WIRE STRAND, MATCHED TO CABLE DIAMETER, AND WITH ATTACHMENT PROVISION DESIGNED FOR CORRESPONDING CONNECTOR.
J. CORD AND PLUG SETS: MATCH VOLTAGE AND CURRENT RATINGS AND NUMBER OF CONDUCTORS TO REQUIREMENTS OF EQUIPMENT BEING CONNECTED. CORD: RUBBER-INSULATED, STRANDED-COPPER CONDUCTORS, WITH TYPE SOW-A JACKET; WITH GREEN-INSULATED GROUNDING CONDUCTOR AND AMPACITY OF AT LEAST 130 PERCENT OF THE EQUIPMENT RATING. PLUG: NYLON BODY AND INTEGRAL CABLE-CLAMPING JAWS. MATCH CORD AND RECEPTACLE TYPE FOR CONNECTION.
K. TOGGLE SWITCHES SHALL COMPLY WITH NEMA WD 1, UL 20, AND FS W-S-896, OPERATING AT 120/277 V, 20 A:
   1. PILOT-LIGHT SWITCHES: SINGLE POLE, WITH LED-LIGHTED HANDLE, ILLUMINATED WHEN SWITCH IS OFF OPERATING AT 120/277 V, 20 A.
   2. KEY-OPERATED SWITCHES: SINGLE POLE, WITH FACTORY-SUPPLIED KEY IN LIEU OF SWITCH HANDLE OPERATING AT 120/277 V, 20 A.
L. WALL SWITCH SENSOR LIGHT SWITCH, DUAL TECHNOLOGY SHALL BE SWITCHBOX-MOUNTED, COMBINATION LIGHTING-CONTROL SENSOR AND CONVENTIONAL SWITCH LIGHTING-CONTROL UNIT USING DUAL TECHNOLOGY. ADJUSTABLE TIME DELAY OF 20 MINUTES. ABLE TO BE LOCKED TO AUTOMATIC-ON OR MANUAL-ON MODE. COMPLY WITH NEMA WD 1, UL 20, AND FS W-S-896.
M. WALL-BOX DIMMERS SHALL BE MODULAR, FULL-WAVE, SOLID-STATE DIMMER SWITCH WITH INTEGRAL, QUIET ON-OFF SWITCHES, WITH AUDIBLE FREQUENCY AND EMI/RFI SUPPRESSION FILTERS. CONTINUOUSLY ADJUSTABLE SLIDER WITH SINGLE-POLE OR THREE-WAY SWITCHING. COMPLY WITH UL 1472.
N. WALL PLATES
   1. SINGLE AND COMBINATION TYPES SHALL MATCH CORRESPONDING WIRING DEVICES.
   2. PLATE-SECURING SCREWS: METAL WITH HEAD COLOR TO MATCH PLATE FINISH.
   3. MATERIAL FOR FINISHED SPACES: SMOOTH, HIGH-IMPACT THERMOPLASTIC.
   4. MATERIAL FOR UNFINISHED SPACES: SMOOTH, HIGH-IMPACT THERMOPLASTIC.
   5. MATERIAL FOR DAMP LOCATIONS: THERMOPLASTIC WITH SPRING-LOADED LIFT COVER, AND LISTED AND LABELED FOR USE IN WET AND DAMP LOCATIONS.
   6. WET-LOCATION, WEATHERPROOF COVER PLATES: NEMA 250, COMPLYING WITH TYPE 3R, WEATHER-RESISTANT THERMOPLASTIC WITH LOCKABLE COVER.
O. FLOOR SERVICE FITTINGS TYPE: MODULAR, DUAL-SERVICE UNITS SUITABLE FOR WIRING METHOD USED. TYPE AS INDICATED ON DRAWINGS. BARRIER SEPARATES POWER FROM VOICE AND DATA COMMUNICATION CABLING. SERVICE PLATE AS INDICATED BY ARCHITECT WITH SATIN FINISH. POWER RECEPTACLE SHALL BE NEMA WD 6 CONFIGURATION 5-20R, GRAY FINISH, UNLESS OTHERWISE INDICATED. DATA COMMUNICATION OUTLET SHALL BE AS DIRECTED BY THE OWNER.
P. POKE-THROUGH ASSEMBLIES: FACTORY-FABRICATED AND -WIRED ASSEMBLY OF BELOW-FLOOR JUNCTION BOX WITH MULTICHANNELED, THROUGH-FLOOR RACEWAY/FIRESTOP UNIT AND DETACHABLE MATCHING FLOOR SERVICE-OUTLET ASSEMBLY. COMPLY WITH UL 514 SCRUB WATER EXCLUSION REQUIREMENTS. SERVICE-OUTLET ASSEMBLY SHALL BE TYPE AS INDICATED ON DRAWINGS. SIZE TO BE SELECTED TO FIT NOMINAL CORED HOLES IN FLOOR AND MATCHED TO FLOOR THICKNESS. UNIT IS LISTED AND LABELED FOR FIRE RATING OF FLOOR-CEILING ASSEMBLY. CLOSURE PLUG: ARRANGED TO CLOSE UNUSED CORED OPENINGS AND REESTABLISH FIRE RATING OF FLOOR.
Q. WIRING DEVICES CONNECTED TO NORMAL POWER SYSTEM SHALL BE COLORED AS SELECTED BY ARCHITECT UNLESS OTHERWISE INDICATED OR REQUIRED BY NFPA 70 OR DEVICE LISTING. WIRING DEVICES CONNECTED TO EMERGENCY POWER SYSTEM SHALL BE RED. ISOLATED-GROUND RECEPTACLES SHALL BE AS SPECIFIED ABOVE, WITH ORANGE TRIANGLE ON FACE. WALL PLATE COLOR SHALL MATCH DEVICE COLOR.
R. INSTALLATION OF DEVICES SHALL COMPLY WITH NECA 1, INCLUDING MOUNTING HEIGHTS LISTED IN THAT STANDARD, UNLESS OTHERWISE INDICATED.
S. PROTECT INSTALLED DEVICES AND THEIR BOXES. DO NOT PLACE WALL FINISH MATERIALS OVER DEVICE BOXES AND DO NOT CUT HOLES FOR BOXES WITH ROUTERS THAT ARE GUIDED BY RIDING AGAINST OUTSIDE OF BOXES. KEEP OUTLET BOXES FREE OF PLASTER, DRYWALL JOINT COMPOUND, MORTAR, CEMENT, CONCRETE, DUST, PAINT, AND OTHER MATERIAL THAT MAY CONTAMINATE THE RACEWAY SYSTEM, CONDUCTORS, AND CABLES. INSTALL WIRING DEVICES AFTER ALL WALL PREPARATION, INCLUDING PAINTING, IS COMPLETE.
T. INSTALL DEVICE BOXES IN BRICK OR BLOCK WALLS SO THAT THE COVER PLATE DOES NOT CROSS A JOINT UNLESS THE JOINT IS TROWELED FLUSH WITH THE FACE OF THE WALL.
U. DO NOT STRIP INSULATION FROM CONDUCTORS UNTIL RIGHT BEFORE THEY ARE SPLICED OR TERMINATED ON DEVICES. STRIP INSULATION EVENLY AROUND THE CONDUCTOR USING TOOLS DESIGNED FOR THE PURPOSE. AVOID SCORING OR NICKING OF SOLID WIRE OR CUTTING STRANDS FROM STRANDED WIRE.
V. CUT BACK AND PIGTAIL OR REPLACE ALL DAMAGED EXISTING CONDUCTORS.STRAIGHTEN CONDUCTORS THAT REMAIN AND REMOVE CORROSION AND FOREIGN MATTER. PIGTAILING EXISTING CONDUCTORS IS PERMITTED, PROVIDED THE OUTLET BOX IS LARGE ENOUGH.
W. REPLACE DEVICES THAT HAVE BEEN IN TEMPORARY USE DURING CONSTRUCTION AND THAT WERE INSTALLED BEFORE BUILDING FINISHING OPERATIONS WERE COMPLETE.
X. CONNECT DEVICES TO BRANCH CIRCUITS USING PIGTAILS THAT ARE NOT LESS THAN 6 INCHES (152 MM) IN LENGTH.
Y. WHEN THERE IS A CHOICE, USE SIDE WIRING WITH BINDING-HEAD SCREW TERMINALS. WRAP SOLID CONDUCTOR TIGHTLY CLOCKWISE, TWO-THIRDS TO THREE-FOURTHS OF THE WAY AROUND TERMINAL SCREW. TIGHTEN UNUSED TERMINAL SCREWS ON THE DEVICE.
Z. WHEN MOUNTING INTO METAL BOXES, REMOVE THE FIBER OR PLASTIC WASHERS USED TO HOLD DEVICE-MOUNTING SCREWS IN YOKES, ALLOWING METAL-TO-METAL CONTACT.
AA. INSTALL GROUND PIN OF VERTICALLY MOUNTED RECEPTACLES UP, AND ON HORIZONTALLY MOUNTED RECEPTACLES TO THE RIGHT.
BB. ALL RECEPTACLES AND LIGHT SWITCHES IN PLENUM SPACES OR ROOMS SHALL BE IN A METAL ENCLOSURE PER NEC 300.22 (C)(3).
CC. DO NOT USE OVERSIZED OR EXTRA-DEEP PLATES. REPAIR WALL FINISHES AND REMOUNT OUTLET BOXES WHEN STANDARD DEVICE PLATES DO NOT FIT FLUSH OR DO NOT COVER ROUGH WALL OPENING.
DD. ARRANGEMENT OF DEVICES: UNLESS OTHERWISE INDICATED, MOUNT FLUSH, WITH LONG DIMENSION VERTICAL AND WITH GROUNDING TERMINAL OF RECEPTACLES ON TOP. GROUP ADJACENT SWITCHES UNDER SINGLE, MULTIGANG WALL PLATES.
EE. ADJUST LOCATIONS OF FLOOR SERVICE OUTLETS AND SERVICE POLES TO SUIT ARRANGEMENT OF PARTITIONS AND FURNISHINGS.
FF. IDENTIFY EACH RECEPTACLE WITH PANELBOARD IDENTIFICATION AND CIRCUIT NUMBER. USE HOT, STAMPED, OR ENGRAVED MACHINE PRINTING WITH BLACK-FILLED LETTERING ON FACE OF PLATE, AND DURABLE WIRE MARKERS OR TAGS INSIDE OUTLET BOXES.

FUSES (262813)

A. FURNISH EXTRA MATERIALS THAT MATCH PRODUCTS INSTALLED AND THAT ARE PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED WITH LABELS DESCRIBING CONTENTS.
   1. FUSES: EQUAL TO 10 PERCENT OF QUANTITY INSTALLED FOR EACH SIZE AND TYPE, BUT NO FEWER THAN THREE OF EACH SIZE AND TYPE.
B. SOURCE LIMITATIONS: OBTAIN FUSES, FOR USE WITHIN A SPECIFIC PRODUCT OR CIRCUIT, FROM SINGLE SOURCE FROM SINGLE MANUFACTURER.
C. CARTRIDGE FUSES: NEMA FU 1, CURRENT-LIMITING, NONRENEWABLE CARTRIDGE FUSES WITH VOLTAGE RATINGS CONSISTENT WITH CIRCUIT VOLTAGES. COMPLY WITH NEMA FU 1 FOR CARTRIDGE FUSES.
   1. COORDINATE FUSE RATINGS WITH UTILIZATION EQUIPMENT NAMEPLATE LIMITATIONS OF MAXIMUM FUSE SIZE AND WITH SYSTEM SHORT-CIRCUIT CURRENT LEVELS.
D. SPARE-FUSE CABINET: WALL-MOUNTED STEEL UNIT WITH FULL-LENGTH, RECESSED PIANO-HINGED DOOR AND KEY-CODED CAM LOCK AND PULL. SIZE CABINET FOR ADEQUATE STORAGE OF SPARE FUSES SPECIFIED WITH 15 PERCENT SPARE CAPACITY MINIMUM. GRAY, BAKED ENAMEL FINISH. IDENTIFICATION: "SPARE FUSES" IN 1-1/2-INCH- (38-MM-) HIGH LETTERS ON EXTERIOR OF DOOR. FUSE PULLERS: FOR EACH SIZE OF FUSE, WHERE APPLICABLE AND AVAILABLE, FROM FUSE MANUFACTURER.
E. CARTRIDGE FUSE APPLICATIONS:
   1. SERVICE ENTRANCE: CLASS L, FAST ACTING
   2. FEEDERS: CLASS RK1, FAST ACTING
   3. MOTOR BRANCH CIRCUITS: CLASS RK1, TIME DELAY.
   4. LARGE MOTOR BRANCH (601-4000 A): CLASS L, TIME DELAY.
   5. OTHER BRANCH CIRCUITS: CLASS RK1, TIME DELAY
   6. ELEVATOR POWER MODULES: CLASS J
F. INSTALL FUSES IN FUSIBLE DEVICES. ARRANGE FUSES SO RATING INFORMATION IS READABLE WITHOUT REMOVING FUSE.
G. INSTALL SPARE-FUSE CABINET(S) IN LOCATION SHOWN ON THE DRAWINGS OR AS INDICATED IN THE FIELD BY OWNER.

ENCLOSED SWITCHES AND CIRCUIT BREAKERS (262816)

A. FURNISH EXTRA MATERIALS THAT MATCH PRODUCTS INSTALLED AND THAT ARE PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED WITH LABELS DESCRIBING CONTENTS.
   1. FUSES: EQUAL TO 10 PERCENT OF QUANTITY INSTALLED FOR EACH SIZE AND TYPE, BUT NO FEWER THAN THREE OF EACH SIZE AND TYPE.
B. OBTAIN ENCLOSED SWITCHES AND CIRCUIT BREAKERS, OVERCURRENT PROTECTIVE DEVICES, COMPONENTS, AND ACCESSORIES, WITHIN SAME PRODUCT CATEGORY, FROM SINGLE MANUFACTURER. ACCEPTABLE MANUFACTURERS ARE EATON, SIEMENS, SQUARE D, AND GE.
C. FUSIBLE SWITCH, 800 A AND SMALLER: NEMA KS 1, TYPE HD, WITH CLIPS OR BOLT PADS TO ACCOMMODATE SPECIFIED FUSES, LOCKABLE HANDLE WITH CAPABILITY TO ACCEPT TWO PADLOCKS, AND INTERLOCKED WITH COVER IN CLOSED POSITION. ALL SERVICE-RATED SWITCHES SHALL BE LABELED FOR USE AS SERVICE ENTRANCE. PROVIDE THE FOLLOWING ACCESSORIES.
   1. EQUIPMENT GROUND KIT: INTERNALLY MOUNTED AND LABELED FOR COPPER AND ALUMINUM GROUND CONDUCTORS.
   2. NEUTRAL KIT: INTERNALLY MOUNTED; INSULATED, CAPABLE OF BEING GROUNDED, AND BONDED; AND LABELED FOR COPPER AND ALUMINUM NEUTRAL CONDUCTORS.
   3. AUXILIARY CONTACT KIT: AUXILIARY SET OF CONTACTS ARRANGED TO OPEN BEFORE SWITCH BLADES OPEN. PROVIDE WHEN USED AS REMOTE DISCONNECT FOR VARIABLE FREQUENCY MOTOR CONTROLLER CIRCUITS.
D. NONFUSIBLE SWITCH, 800 A AND SMALLER: NEMA KS 1, TYPE HD, LOCKABLE HANDLE WITH CAPABILITY TO ACCEPT TWO PADLOCKS, AND INTERLOCKED WITH COVER IN CLOSED POSITION. ALL SERVICE-RATED SWITCHES SHALL BE LABELED FOR USE AS SERVICE ENTRANCE. PROVIDE THE FOLLOWING ACCESSORIES.
   1. EQUIPMENT GROUND KIT: INTERNALLY MOUNTED AND LABELED FOR COPPER AND ALUMINUM GROUND CONDUCTORS.
   2. NEUTRAL KIT: INTERNALLY MOUNTED; INSULATED, CAPABLE OF BEING GROUNDED, AND BONDED; AND LABELED FOR COPPER AND ALUMINUM NEUTRAL CONDUCTORS.
   3. AUXILIARY CONTACT KIT: AUXILIARY SET OF CONTACTS ARRANGED TO OPEN BEFORE SWITCH BLADES OPEN. PROVIDE WHEN USED AS REMOTE DISCONNECT FOR VARIABLE FREQUENCY MOTOR CONTROLLER CIRCUITS.
E. MOLDED-CASE CIRCUIT BREAKER: NEMA AB 1, WITH INTERRUPTING CAPACITY TO MEET AVAILABLE FAULT CURRENTS.
   1. THERMAL-MAGNETIC CIRCUIT BREAKERS: INVERSE TIME-CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT-BREAKER FRAME SIZES 250 A AND LARGER.
   2. ADJUSTABLE INSTANTANEOUS-TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT-MOUNTED, FIELD-ADJUSTABLE TRIP SETTING.
   3. ELECTRONIC TRIP-UNIT CIRCUIT BREAKERS: RMS SENSING; FIELD-REPLACEABLE RATING PLUG; WITH THE FOLLOWING FIELD-ADJUSTABLE SETTINGS: INSTANTANEOUS TRIP, LONG- AND SHORT-TIME PICKUP LEVELS, LONG- AND SHORT-TIME TIME ADJUSTMENTS, GROUND-FAULT PICKUP LEVEL, TIME DELAY, AND I2T RESPONSE.
   4. STANDARD FRAME SIZES, TRIP RATINGS, AND NUMBER OF POLES
   5. LUGS: MECHANICAL STYLE SUITABLE FOR NUMBER, SIZE, TRIP RATINGS, AND CONDUCTOR MATERIAL.
   6. APPLICATION LISTING: HACR FOR HEATING, AIR-CONDITIONING, AND REFRIGERATING EQUIPMENT.
   7. GROUND-FAULT PROTECTION: INTEGRALLY MOUNTED RELAY AND TRIP UNIT WITH ADJUSTABLE PICKUP AND TIME-DELAY SETTINGS, PUSH-TO-TEST FEATURE, AND GROUND-FAULT INDICATOR.
   8. SHUNT TRIP: 120-V TRIP COIL ENERGIZED FROM SEPARATE CIRCUIT, SET TO TRIP AT 55 PERCENT OF RATED VOLTAGE.
   9. UNDERVOLTAGE TRIP: SET TO OPERATE AT 35 TO 75 PERCENT OF RATED VOLTAGE WITHOUT INTENTIONAL OR WITH FIELD-ADJUSTABLE 0.1- TO 0.6-SECOND TIME DELAY.
   10. AUXILIARY SWITCH: ONE SPDT SWITCH OR TWO SPDT SWITCHES WITH "A" AND "B" CONTACTS; "A" CONTACTS MIMIC CIRCUIT-BREAKER CONTACTS, "B" CONTACTS OPERATE IN REVERSE OF CIRCUIT-BREAKER CONTACTS.
F. ENCLOSURES SHALL BE NEMA AB 1 AND NEMA KS 1 TO MEET ENVIRONMENTAL CONDITIONS OF INSTALLED LOCATION. INDOOR LOCATIONS: NEMA 250, TYPE 1. OUTDOOR LOCATIONS: NEMA 250, TYPE 3R. OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4.
   1. CONDUIT ENTRY: NEMA 250 TYPES 4, 4X, AND 12 ENCLOSURES SHALL CONTAIN NO KNOCKOUTS. NEMA 250 TYPES 7 AND 9 ENCLOSURES SHALL BE PROVIDED WITH THREADED CONDUIT OPENINGS IN BOTH ENDWALLS.
   2. ENCLOSURES DESIGNATED AS NEMA 250 TYPE 4, 4X STAINLESS STEEL, 12, OR 12K SHALL HAVE A DUAL COVER INTERLOCK MECHANISM TO PREVENT UNINTENTIONAL OPENING OF THE ENCLOSURE COVER WHEN THE CIRCUIT BREAKER IS ON AND TO PREVENT TURNING THE CIRCUIT BREAKER ON WHEN THE ENCLOSURE COVER IS OPEN.
   3. ALL ENCLOSURES SHALL INCLUDE A BONDED EQUIPMENT BUS.
G. COORDINATE LAYOUT AND INSTALLATION OF SWITCHES, CIRCUIT BREAKERS, AND COMPONENTS WITH EQUIPMENT SERVED AND ADJACENT SURFACES. INSTALL INDIVIDUAL WALL-MOUNTED SWITCHES AND CIRCUIT BREAKERS WITH TOPS AT UNIFORM HEIGHT UNLESS OTHERWISE INDICATED. INSTALL FUSES IN FUSIBLE DEVICES. COMPLY WITH NFPA 70 AND NECA 1.

LED LIGHTING (265100)

A. PROVIDE LUMINAIRES FROM A SINGLE MANUFACTURER FOR EACH LUMINAIRE TYPE. EACH LUMINAIRE TYPE SHALL BE BINNED WITHIN A THREE-STEP MACADAM ELLIPSE TO ENSURE COLOR CONSISTENCY AMONG LUMINAIRES.
B. DELIVERY, STORAGE, AND HANDLING: PROTECT FINISHES OF EXPOSED SURFACES BY APPLYING A STRIPPABLE, TEMPORARY PROTECTIVE COVERING BEFORE SHIPPING.
C. WARRANTY: MANUFACTURER AND INSTALLER AGREE TO REPAIR OR REPLACE COMPONENTS OF LUMINAIRES THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD. WARRANTY PERIOD: FIVE YEAR(S) FROM DATE OF SUBSTANTIAL COMPLETION.
D. CRI,CCT, AND VOLTAGE AS INDICATED IN LIGHTING FIXTURE SCHEDULE.
E. RATED LAMP LIFE OF 50,000 HOURS TO L70.
F. LAMPS DIMMABLE FROM 100 PERCENT TO 0 PERCENT OF MAXIMUM LIGHT OUTPUT AS INDICATED ON THE FIXTURE SCHEDULE. WHERE DIMMING DRIVERS ARE UTILIZED, THEY SHALL BE COMPATIBLE WITH LIGHTING CONTROLS DESIGNATED FOR OPERATION OF THOSE FIXTURES.
G. LAMPS, BOTH INTEGRAL TO THE FIXTURE AND SCREW-IN TYPE, SHALL POSSESS A MINIMUM 75% EFFICACY TO MEET ENERGY CODES. LAMPS WITH EFFICACY LESS THAN 75% ARE NOT ACCEPTABLE AND SHALL NOT BE UTILIZED.
H. LUMINAIRE SUPPORT SHALL FOLLOW THE FOLLOWING METHODS:
   1. SINGLE-STEM HANGERS: 1/2-INCH (13-MM) STEEL TUBING WITH SWIVEL BALL FITTINGS AND CEILING CANOPY. FINISH SAME AS LUMINAIRE.
   2. WIRES: ASTM A 641/A 641 M, CLASS 3, SOFT TEMPER, ZINC-COATED STEEL, 12 GAGE (2.68 MM)
   3. ROD HANGERS: 3/16-INCH (5-MM) MINIMUM DIAMETER, CADMIUM-PLATED, THREADED STEEL ROD.
   4. HOOK HANGERS: INTEGRATED ASSEMBLY MATCHED TO LUMINAIRE, LINE VOLTAGE, AND EQUIPMENT WITH THREADED ATTACHMENT, CORD, AND LOCKING-TYPE PLUG.
I. INTERNAL TYPE EMERGENCY POWER UNIT: SELF-CONTAINED,
   1. MODULAR, BATTERY-INVERTER UNIT, FACTORY MOUNTED
   2. WITHIN LUMINAIRE BODY. OPERATE ALL FIXTURE LAMP(S) CONTINUOUSLY AT AN OUTPUT OF FULL LUMEN OUTPUT OF FIXTURE UPON LOSS OF NORMAL POWER. CONNECT UNSWITCHED CIRCUIT TO BATTERY-INVERTER UNIT AND SWITCHED CIRCUIT TO LUMINAIRE BALLAST.
   3. OPERATION: RELAY AUTOMATICALLY TURNS LAMP ON WHEN POWER-SUPPLY CIRCUIT VOLTAGE DROPS TO 80 PERCENT OF NOMINAL VOLTAGE OR BELOW. LAMP AUTOMATICALLY DISCONNECTS FROM BATTERY WHEN VOLTAGE APPROACHES DEEP-DISCHARGE LEVEL. WHEN NORMAL VOLTAGE IS RESTORED, RELAY DISCONNECTS LAMPS FROM BATTERY, AND BATTERY IS AUTOMATICALLY RECHARGED AND FLOATED ON CHARGER.
   4. TEST PUSH-BUTTON AND INDICATOR LIGHT: VISIBLE AND ACCESSIBLE WITHOUT OPENING LUMINAIRE OR ENTERING CEILING SPACE.
   5. PUSH BUTTON: PUSH-TO-TEST TYPE, IN UNIT HOUSING, SIMULATES LOSS OF NORMAL POWER AND DEMONSTRATES UNIT OPERABILITY.
   6. INDICATOR LIGHT: LED INDICATES NORMAL POWER ON. NORMAL GLOW INDICATES TRICKLE CHARGE; BRIGHT GLOW INDICATES CHARGING AT END OF DISCHARGE CYCLE.
   7. BATTERY: SEALED, MAINTENANCE-FREE, NICKEL-CADMIUM TYPE.
   8. CHARGER: FULLY AUTOMATIC, SOLID-STATE, CONSTANT-CURRENT TYPE WITH SEALED POWER TRANSFER RELAY.
   9. INTEGRAL SELF-TEST: FACTORY-INSTALLED ELECTRONIC DEVICE AUTOMATICALLY INITIATES CODE-REQUIRED TEST OF UNIT EMERGENCY OPERATION AT REQUIRED INTERVALS. TEST FAILURE IS ANNUNCIATED BY AN INTEGRAL AUDIBLE ALARM AND A FLASHING RED LED.
J. INSTALL LUMINAIRES LEVEL, PLUMB, AND SQUARE WITH CEILINGS AND WALLS UNLESS OTHERWISE INDICATED. INSTALL LAMPS IN EACH LUMINAIRE.
K. ALL SUPPORTS SHALL BE SIZED AND RATED FOR LUMINAIRE WEIGHT, AND SHALL BE ABLE TO MAINTAIN LUMINAIRE POSITION AFTER CLEANING AND RELAMPING.
L. PROVIDE SUPPORT FOR LUMINAIRE WITHOUT CAUSING DEFLECTION OF CEILING OR WALL. LUMINAIRE MOUNTING DEVICES SHALL BE CAPABLE OF SUPPORTING A HORIZONTAL FORCE OF 100 PERCENT OF LUMINAIRE WEIGHT AND VERTICAL FORCE OF 400 PERCENT OF LUMINAIRE WEIGHT.
M. FLUSH-MOUNTED LUMINAIRE SUPPORT:
   1. SECURED TO OUTLET BOX.
   2. ATTACHED TO CEILING STRUCTURAL MEMBERS AT FOUR POINTS EQUALLY SPACED AROUND CIRCUMFERENCE OF LUMINAIRE.
   3. TRIM RING FLUSH WITH FINISHED SURFACE.
N. WALL-MOUNTED LUMINAIRE SUPPORT:
   1. ATTACHED TO STRUCTURAL MEMBERS IN WALLS.
   2. DO NOT ATTACH LUMINAIRES DIRECTLY TO GYPSUM BOARD.
O. CEILING-MOUNTED LUMINAIRE SUPPORT:
   1. CEILING MOUNT WITH FOUR-POINT PENDANT MOUNT WITH 5/32-INCH- (4-MM-) DIAMETER AIRCRAFT CABLE SUPPORTS ADJUSTABLE TO 120 INCHES (6 M) IN LENGTH.
   2. CEILING MOUNT WITH HOOK MOUNT.
P. SUSPENDED LUMINAIRE SUPPORT: DO NOT USE CEILING GRID AS SUPPORT FOR PENDANT LUMINAIRES. CONNECT SUPPORT WIRES OR RODS TO BUILDING STRUCTURE.
   1. PENDANTS AND RODS: WHERE LONGER THAN 48 INCHES (1200 MM), BRACE TO LIMIT SWINGING.
   2. STEM-MOUNTED, SINGLE-UNIT LUMINAIRES: SUSPEND WITH TWIN-STEM HANGERS. SUPPORT WITH APPROVED OUTLET BOX AND ACCESSORIES THAT HOLD STEM AND PROVIDE DAMPING OF LUMINAIRE OSCILLATIONS. SUPPORT OUTLET BOX VERTICALLY TO BUILDING STRUCTURE USING APPROVED DEVICES.
   3. CONTINUOUS ROWS OF LUMINAIRES: USE TUBING OR STEM FOR WIRING AT ONE POINT AND WIRE SUPPORT FOR SUSPENSION FOR EACH UNIT LENGTH OF LUMINAIRE CHASSIS, INCLUDING ONE AT EACH END.
Q. CEILING-GRID-MOUNTED LUMINAIRES SHALL BE SECURED TO ANY REQUIRED OUTLET BOX. SECURE LUMINAIRE TO THE LUMINAIRE OPENING USING APPROVED FASTENERS IN A MINIMUM OF FOUR LOCATIONS, SPACED NEAR CORNERS OF LUMINAIRE. USE APPROVED DEVICES AND SUPPORT COMPONENTS TO CONNECT LUMINAIRE TO CEILING GRID AND BUILDING STRUCTURE IN A MINIMUM OF FOUR LOCATIONS, SPACED NEAR CORNERS OF LUMINAIRE.
R. OCCUPANCY ADJUSTMENTS: WHEN REQUESTED WITHIN 12 MONTHS OF DATE OF SUBSTANTIAL COMPLETION, PROVIDE ON-SITE ASSISTANCE IN ADJUSTING THE DIRECTION OF AIM OF LUMINAIRES TO SUIT OCCUPIED CONDITIONS. MAKE UP TO TWO VISITS TO PROJECT DURING OTHER-THAN-NORMAL HOURS FOR THIS PURPOSE. SOME OF THIS WORK MAY BE REQUIRED DURING HOURS OF DARKNESS. ADJUST THE AIM OF LUMINAIRES IN THE PRESENCE OF THE ARCHITECT.
S. BOLLARD LUMINAIRE INSTALLATION: ALIGN UNITS FOR OPTIMUM DIRECTIONAL ALIGNMENT OF LIGHT DISTRIBUTION. INSTALL ON CONCRETE BASE WITH TOP 4 INCHES (100 MM) ABOVE FINISHED GRADE OR SURFACE AT LUMINAIRE LOCATION. CAST CONDUIT INTO BASE, AND SHAPE BASE TO MATCH SHAPE OF BOLLARD BASE. FINISH BY TROWELING AND RUBBING SMOOTH.
T. INSTALLATION OF INDIVIDUAL GROUND-MOUNTED LUMINAIRES: AIM AS INDICATED ON DRAWINGS.
U. PROVIDE METAL HOUSING WITH GLASS LENS TO MEET UL2043 (SMOKE/FIRE SPREAD: 50/25 OR LESS) IN PLENUM SPACES.

DIGITAL ADDRESSABLE FIRE ALARM SYSTEM (283111)

A. GENERAL CONDITIONS
   1. PROVIDE ADDRESSABLE DIGITAL FIRE ALARM SYSTEM INSTALLED AS SHOWN ON DRAWINGS AND DESCRIBED HEREIN. THE OPERATION SHALL BE SUCH THAT ACTUATION OF ANY MANUAL FIRE ALARM STATION OR ANY OTHER INITIATION DEVICE SHALL CAUSE AUDIBLE/VISIBLE SIGNAL DEVICES THROUGHOUT THE BUILDING TO OPERATE, SHALL CAUSE THE MAIN ANNUNCIATOR TO DISPLAY THE "ADDRESS"/"ZONE" OF THE INITIATING DEVICE UNTIL THE DEVICE IS RESTORED TO ITS NORMAL POSITION AND THE CONTROL PANEL IS RESET AND SHALL CAUSE AN ALARM SIGNAL TO BE TRANSMITTED TO A CENTRAL STATION. ALL INITIATING DEVICES SHALL BE FULLY COMPATIBLE WITH EXISTING SYSTEMS AND SHALL BE PER MANUFACTURER'S RECOMMENDATIONS. ALL COMPONENTS SHALL BE ADDRESSABLE OR BE PROVIDED WITH ADDRESSABLE ZONE INTERFACE MODULES.
   2. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
      a. NOTIFIER; A HONEYWELL COMPANY.
      b. SIEMENS BUILDING TECHNOLOGIES, INC.; FIRE SAFETY DIVISION.
      c. SIMPLEX GRINNELL LP; A TYCO INTERNATIONAL COMPANY.
      d. EDWARDS
   3. SYSTEM DESCRIPTION: NONCODED, UL-CERTIFIED ADDRESSABLE SYSTEM, WITH MULTIPLEXED SIGNAL TRANSMISSION AND HORN/STROBE EVACUATION. AUTOMATIC SENSITIVITY CONTROL OF CERTAIN SMOKE DETECTORS. ALL COMPONENTS PROVIDED SHALL BE LISTED FOR USE WITH THE SELECTED SYSTEM. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
   4. SUBMITTALS: SUBMITTALS SHALL BE APPROVED BY AUTHORITIES HAVING JURISDICTION PRIOR TO SUBMITTING THEM TO ARCHITECT.
      a. SHOP DRAWINGS SHALL BE PREPARED BY PERSONS TRAINED AND CERTIFIED BY MANUFACTURER IN FIRE-ALARM SYSTEM DESIGN WITH NICET-CERTIFIED FIRE-ALARM TECHNICIAN, LEVEL III MINIMUM. LICENSED OR CERTIFIED BY AUTHORITIES HAVING JURISDICTION.
      b. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.
      c. SHOP DRAWINGS: FOR FIRE-ALARM SYSTEM. INCLUDE PLANS, ELEVATIONS, SECTIONS, DETAILS, AND ATTACHMENTS TO OTHER WORK. INCLUDE THE FOLLOWING:
   1. VOLTAGE DROP CALCULATIONS FOR NOTIFICATION APPLIANCE CIRCUITS.
   2. BATTERY-SIZE CALCULATIONS.
   3. PERFORMANCE PARAMETERS AND INSTALLATION DETAILS FOR EACH DETECTOR, VERIFYING THAT EACH DETECTOR IS LISTED FOR COMPLETE RANGE OF AIR VELOCITY, TEMPERATURE, AND HUMIDITY POSSIBLE WHEN AIR-HANDLING SYSTEM IS OPERATING.
   4. AUDIO/ALARM SIGNALING-SERVICE EQUIPMENT RACK OR CONSOLE LAYOUT, GROUNDING SCHEMATIC, AMPLIFIER POWER CALCULATION, AND SINGLE-LINE CONNECTION DIAGRAM.
   5. FLOOR PLANS TO INDICATE FINAL OUTLET LOCATIONS SHOWING ADDRESS OF EACH ADDRESSABLE DEVICE. SHOW SIZE AND ROUTE OF CABLE AND CONDUITS.
   5. QUALITY ASSURANCE: PERSONNEL SHALL BE TRAINED AND CERTIFIED BY MANUFACTURER FOR INSTALLATION OF UNITS REQUIRED FOR THIS PROJECT. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: OBTAIN CERTIFICATION ACCORDING TO NFPA 72 BY A UL-LISTED ALARM COMPANY.
   6. EXTRA MATERIALS: FURNISH EXTRA MATERIALS THAT MATCH PRODUCTS INSTALLED AND THAT ARE PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED WITH LABELS DESCRIBING CONTENTS.
      a. LAMPS FOR REMOTE INDICATING LAMP UNITS: QUANTITY EQUAL TO 10 PERCENT OF AMOUNT INSTALLED.
      b. LAMPS FOR STROBE UNITS: QUANTITY EQUAL TO 10 PERCENT OF AMOUNT INSTALLED.
      c. SMOKE DETECTORS, FIRE DETECTORS: QUANTITY EQUAL TO 10 PERCENT OF AMOUNT OF EACH TYPE INSTALLED, BUT NO FEWER THAN 1 UNIT OF EACH TYPE.
      d. DETECTOR BASES: QUANTITY EQUAL TO 2 PERCENT OF AMOUNT OF EACH TYPE INSTALLED, BUT NO FEWER THAN 1 UNIT OF EACH TYPE.
      e. KEYS AND TOOLS: ONE EXTRA SET FOR ACCESS TO LOCKED AND TAMPERPROOFED COMPONENTS.
      f. AUDIBLE AND VISUAL NOTIFICATION APPLIANCES: ONE OF EACH TYPE INSTALLED.
      g. FUSES: TWO OF EACH TYPE INSTALLED IN THE SYSTEM.
   7. SEQUENCING AND SCHEDULING
      a. EXISTING FIRE-ALARM EQUIPMENT: MAINTAIN EXISTING EQUIPMENT FULLY OPERATIONAL UNTIL NEW EQUIPMENT HAS BEEN TESTED AND ACCEPTED. AS NEW EQUIPMENT IS INSTALLED, LABEL IT "NOT IN SERVICE" UNTIL IT IS ACCEPTED.

STATE OF MARYLAND · TIMOTHY R. CHATTER · No. 51406 · PROFESSIONAL ENGINEER

LICENSE NUMBER: 51406
EXPIRATION DATE: 08/10/2025
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

DAVIS BOWEN & FRIEDEL, INC.
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ISLE OF WIGHT RENOVATION
WORCESTER CO HEALTH DEPARTMENT
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DATE	COMMENTS
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Date: July 29, 2025
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ELECTRICAL SPECIFICATIONS

Allen + Shariff
MEP Engineering
Project Management
205 East Market Street
Salisbury, Maryland 21801
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Dwg.No.: E-003

ALLEN + SHARIFF JOB #: 2431096

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REMOVE LABELS FROM NEW EQUIPMENT WHEN PUT INTO SERVICE, AND LABEL EXISTING FIRE-ALARM EQUIPMENT "NOT IN SERVICE" UNTIL REMOVED FROM THE BUILDING.

b. EQUIPMENT REMOVAL: AFTER ACCEPTANCE OF NEW FIRE-ALARM SYSTEM, REMOVE EXISTING DISCONNECTED FIRE-ALARM EQUIPMENT AND WIRING.

8. WARRANTY: MANUFACTURER AGREES TO REPAIR OR REPLACE FIRE-ALARM SYSTEM EQUIPMENT AND COMPONENTS THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD. ALL EQUIPMENT AND COMPONENTS NOT COVERED IN THE MAINTENANCE SERVICE AGREEMENT FOR FIVE YEARS FROM DATE OF SUBSTANTIAL COMPLETION.

B. FIRE-ALARM CONTROL UNIT

1. GENERAL REQUIREMENTS FOR FIRE-ALARM CONTROL UNIT:

a. FIELD-PROGRAMMABLE, MICROPROCESSOR-BASED, MODULAR, POWER-LIMITED DESIGN WITH ELECTRONIC MODULES, COMPLYING WITH UL 864 AND LISTED AND LABELED BY AN NRTL.

1. PROVIDE COMMUNICATION BETWEEN THE FACP AND REMOTE CIRCUIT INTERFACE PANELS, ANNUNCIATORS, AND DISPLAYS.
2. THE FACP SHALL BE LISTED FOR CONNECTION TO A CENTRAL-STATION SIGNALING SYSTEM SERVICE.
3. PROVIDE NONVOLATILE MEMORY FOR SYSTEM DATABASE, LOGIC, AND OPERATING SYSTEM AND EVENT HISTORY. THE SYSTEM SHALL REQUIRE NO MANUAL INPUT TO INITIALIZE IN THE EVENT OF A COMPLETE POWER DOWN CONDITION. THE FACP SHALL PROVIDE A MINIMUM 500-EVENT HISTORY LOG.

b. ADDRESSABLE INITIATION DEVICES THAT COMMUNICATE DEVICE IDENTITY AND STATUS.

1. SMOKE SENSORS SHALL ADDITIONALLY COMMUNICATE SENSITIVITY SETTING AND ALLOW FOR ADJUSTMENT OF SENSITIVITY AT FIRE-ALARM CONTROL UNIT.
2. TEMPERATURE SENSORS SHALL ADDITIONALLY TEST FOR AND COMMUNICATE THE SENSITIVITY RANGE OF THE DEVICE.

c. ADDRESSABLE CONTROL CIRCUITS FOR OPERATION OF MECHANICAL EQUIPMENT.

2. ALPHANUMERIC DISPLAY AND SYSTEM CONTROLS: ARRANGED FOR INTERFACE BETWEEN HUMAN OPERATOR AT FIRE-ALARM CONTROL UNIT AND ADDRESSABLE SYSTEM COMPONENTS INCLUDING ANNUNCIATION AND SUPERVISION. DISPLAY ALARM, SUPERVISORY, AND COMPONENT STATUS MESSAGES AND THE PROGRAMMING AND CONTROL MENU.
3. INITIATING-DEVICE, NOTIFICATION-APPLIANCE, AND SIGNALING-LINE CIRCUITS: PATHWAY CLASS DESIGNATIONS: NFPA 72, CLASS B.
4. PRIMARY POWER: 24-V DC OBTAINED FROM 120-V AC SERVICE AND A POWER-SUPPLY MODULE. INITIATING DEVICES, NOTIFICATION APPLIANCES, SIGNALING LINES, TROUBLE SIGNALS, SUPERVISORY AND DIGITAL ALARM COMMUNICATOR TRANSMITTERS SHALL BE POWERED BY 24-V DC SOURCE. ALARM CURRENT DRAW OF ENTIRE FIRE-ALARM SYSTEM SHALL NOT EXCEED 80 PERCENT OF THE POWER-SUPPLY MODULE RATING.
5. SECONDARY POWER: 24-V DC SUPPLY SYSTEM WITH BATTERIES, AUTOMATIC BATTERY CHARGER, AND AUTOMATIC TRANSFER SWITCH. BATTERIES: SEALED LEAD CALCIUM.

C. MANUAL FIRE-ALARM BOXES

1. PROVIDE NON-CODED DOUBLE ACTION MANUAL STATIONS WHERE SHOWN ON THE DRAWINGS, TO BE FLUSH OR SURFACE MOUNTED AS REQUIRED. PULL STATION ACTIVATION SHALL PROVIDE ALARM INPUT TO THE SYSTEM AND ALARM OUTPUT FROM THE SYSTEM WITHIN FOUR (4) SECONDS. THE MANUAL STATION SHALL BE EQUIPPED WITH TERMINAL STRIP AND PRESSURE STYLE SCREW TERMINALS FOR THE CONNECTION OF FIELD WIRING. HOUSINGS SHALL BE MADE OF THERMOPLASTIC MATERIAL WITH RAISED FIRE ALARM LETTERING AND BE COLORED RED. STATIONS THAT REQUIRE THE BREAKING OF GLASS WILL NOT BE ACCEPTABLE. SURFACE MOUNTED STATIONS WHERE INDICATED ON THE DRAWINGS SHALL BE MOUNTED USING A MANUFACTURER'S PRESCRIBED MATCHING RED ENAMEL OUTLET BOX.

D. SYSTEM SMOKE DETECTORS

1. PROVIDE PHOTOELECTRIC TYPE. DETECTORS SHALL BE LISTED FOR USE AS OPEN AREA PROTECTIVE COVERAGE AND SHALL BE INSENSITIVE TO AIR VELOCITY CHANGES. THE SMOKE DETECTOR SHALL CONTAIN A MULTI-COLORED LED INDICATOR THAT WILL FLASH GREEN TO INDICATE THAT THE DETECTOR IS OPERATIONAL AND FLASH RED WHEN THE DETECTOR IS IN ALARM. THE DETECTOR SHALL BE CONTINUALLY SELF-TESTING AND SHALL BE DESIGNED TO ELIMINATE CALIBRATION ERRORS ASSOCIATED WITH FIELD CLEANING OF THE CHAMBER. DETECTOR SHALL TWIST LOCK INTO A BASE ASSEMBLY WITH SCREW CLAMP TERMINALS. DETECTOR ACTIVATION SHALL PROVIDE ALARM INPUT TO THE SYSTEM AND ALARM OUTPUT FROM THE SYSTEM WITHIN FOUR (4) SECONDS. THE DETECTOR SHALL SUPPORT THE USE OF A RELAY OR LED REMOTE INDICATOR. DETECTOR SPACING AND LOCATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, THE REQUIREMENTS OF NFPA 72, AND AS INDICATED. NO DETECTOR SHALL BE LOCATED CLOSER THAN 12 INCHES TO ANY PART OF ANY LIGHTING FIXTURE NOR SHALL ANY DETECTOR BE MOUNTED CLOSER THAT 36 INCHES TO ANY AHU AIR DIFFUSER.

E. HEAT DETECTORS

1. HEAT DETECTOR (SYSTEM) - THERMAL DETECTORS SHALL BE RATED AT 135 DEGREES FAHRENHEIT FIXED TEMPERATURE AND 15 DEGREES PER MINUTE RATE OF RISE OR GREATER. DETECTORS SHALL BE CONSTRUCTED TO COMPENSATE FOR THE THERMAL LAG INHERENT IN CONVENTIONAL TYPE DETECTORS DUE TO THE THERMAL MASS, AND ALARM AT THE SET POINT OF 135 DEGREES FAHRENHEIT. THE DETECTORS FURNISHED SHALL HAVE A LISTED SPACING FOR COVERAGE UP TO 2,500 SQUARE FEET AND SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS OF NFPA 72 FOR OPEN AREA COVERAGE.

F. NOTIFICATION APPLIANCES

1. NOTIFICATION APPLIANCES - THE HORN, STROBE OR HORN/STROBE APPLIANCE AS INDICATED ON THE DRAWINGS SHALL BE A SYNCHRONIZED TEMPORAL HORN WITH A SYNCHRONIZED STROBE LIGHT WITH MULTIPLE CANDELA TAPS TO MEET THE INTENDED APPLICATION. THE STROBE LIGHT TAPS SHALL BE ADJUSTABLE FOR 15, 30, 75, AND 110 CANDELA. THE STROBE SHALL FLASH AT A RATE BETWEEN 1/3 AND 3 FLASHES/SECOND. CEILING MOUNTED APPLIANCES SHALL BE RATED FOR THAT APPLICATION.

G. REMOTE ANNUNCIATOR

1. PROVIDE ANNUNCIATOR WITH FUNCTIONS TO MATCH THOSE OF FIRE-ALARM CONTROL UNIT FOR ALARM, SUPERVISORY, AND TROUBLE INDICATIONS. MANUAL SWITCHING FUNCTIONS SHALL MATCH THOSE OF FIRE-ALARM CONTROL UNIT, INCLUDING ACKNOWLEDGING, SILENCING, RESETTING, AND TESTING. MOUNTING SHALL BE FLUSH CABINET, NEMA 250, TYPE 1. ALPHANUMERIC DISPLAY AND LED INDICATING LIGHTS SHALL MATCH THOSE OF FIRE ALARM CONTROL UNIT. PROVIDE CONTROLS TO ACKNOWLEDGE, SILENCE, RESET, AND TEST FUNCTIONS FOR ALARM, SUPERVISORY, AND TROUBLE SIGNALS.

H. ADDRESSABLE INTERFACE DEVICE

1. PROVIDE ADDRESSABLE INTERFACE DEVICES WITH THE FOLLOWING FUNCTIONS:

a. INCLUDE ADDRESS-SETTING MEANS ON THE MODULE.
b. STORE AN INTERNAL IDENTIFYING CODE FOR CONTROL PANEL USE TO IDENTIFY THE MODULE TYPE.
c. LISTED FOR CONTROLLING HVAC FAN MOTOR CONTROLLERS.

2. MONITOR MODULE: MICROELECTRONIC MODULE PROVIDING A SYSTEM ADDRESS FOR ALARM-INITIATING DEVICES FOR WIRED APPLICATIONS WITH NORMALLY OPEN CONTACTS.
3. INTEGRAL RELAY: CAPABLE OF PROVIDING A DIRECT SIGNAL TO ELEVATOR CONTROLLER TO INITIATE ELEVATOR RECALL OR TO CIRCUIT-BREAKER SHUNT TRIP FOR POWER SHUTDOWN. ALLOW THE CONTROL PANEL TO SWITCH THE RELAY CONTACTS ON COMMAND. HAVE A MINIMUM OF TWO NORMALLY OPEN AND TWO NORMALLY CLOSED CONTACTS AVAILABLE FOR FIELD WIRING.
4. CONTROL MODULE: OPERATE NOTIFICATION DEVICES. OPERATE SOLENOIDS FOR USE IN SPRINKLER SERVICE.

I. DIGITAL ALARM COMMUNICATOR TRANSMITTER

1. PROVIDE DIGITAL ALARM COMMUNICATOR TRANSMITTER ACCEPTABLE TO THE REMOTE CENTRAL STATION AND COMPLYING WITH UL 632.
2. FUNCTIONAL PERFORMANCE: UNIT SHALL RECEIVE AN ALARM, SUPERVISORY, OR TROUBLE SIGNAL FROM FIRE-ALARM CONTROL UNIT AND AUTOMATICALLY CAPTURE TWO TELEPHONE LINE(S) AND DIAL A PRESET NUMBER FOR A REMOTE CENTRAL STATION. WHEN CONTACT IS MADE WITH CENTRAL STATION(S), SIGNALS SHALL BE TRANSMITTED. IF SERVICE ON EITHER LINE IS INTERRUPTED FOR LONGER THAN 45 SECONDS, TRANSMITTER SHALL INITIATE A LOCAL TROUBLE SIGNAL AND TRANSMIT THE SIGNAL INDICATING LOSS OF TELEPHONE LINE TO THE REMOTE ALARM RECEIVING STATION OVER THE REMAINING LINE. TRANSMITTER SHALL AUTOMATICALLY REPORT TELEPHONE SERVICE RESTORATION TO THE CENTRAL STATION. IF SERVICE IS LOST ON BOTH TELEPHONE LINES, TRANSMITTER SHALL INITIATE THE LOCAL TROUBLE SIGNAL.
3. LOCAL FUNCTIONS AND DISPLAY AT THE DIGITAL ALARM COMMUNICATOR TRANSMITTER SHALL INCLUDE THE FOLLOWING:
   a. VERIFICATION THAT BOTH TELEPHONE LINES ARE AVAILABLE.
   b. PROGRAMMING DEVICE.
   c. LED DISPLAY.
   d. MANUAL TEST REPORT FUNCTION AND MANUAL TRANSMISSION CLEAR INDICATION.
   e. COMMUNICATIONS FAILURE WITH THE CENTRAL STATION OR FIRE-ALARM CONTROL UNIT.
4. SECONDARY POWER: INTEGRAL RECHARGEABLE BATTERY AND AUTOMATIC CHARGER.
5. SELF-TEST: CONDUCTED AUTOMATICALLY EVERY 24 HOURS WITH REPORT TRANSMITTED TO CENTRAL STATION.

J. PATHWAYS

1. PATHWAYS SHALL BE INSTALLED IN EMT. FIRE ALARM MC CABLE IS SUITABLE ONLY WHERE NOT EXPOSED.
2. FIRE ALARM BOXES SHALL BE PAINTED RED ENAMEL.
3. WIRING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE AND NFPA 72, AND ALL OTHER APPLICABLE STATE AND LOCAL CODES. THE CONTRACTOR SHALL PROVIDE, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, ALL WIRING, CONDUIT, AND OUTLET BOXES REQUIRED FOR THE ERECTION OF THE COMPLETE SYSTEM AS DESCRIBED HEREIN AND AS SHOWN ON THE DRAWINGS. COLOR-CODED WIRES SHALL BE USED.

K. CONNECTIONS

1. FOR FIRE-PROTECTION SYSTEMS RELATED TO DOORS IN FIRE-RATED WALLS AND PARTITIONS AND TO DOORS IN SMOKE PARTITIONS, COMPLY WITH REQUIREMENTS IN SECTION 087100 "DOOR HARDWARE." CONNECT HARDWARE AND DEVICES TO FIRE-ALARM SYSTEM. VERIFY THAT HARDWARE AND DEVICES ARE LISTED FOR USE WITH INSTALLED FIRE-ALARM SYSTEM BEFORE MAKING CONNECTIONS.
2. MAKE ADDRESSABLE CONNECTIONS WITH A SUPERVISED INTERFACE DEVICE TO THE FOLLOWING DEVICES AND SYSTEMS. INSTALL THE INTERFACE DEVICE LESS THAN 36 INCHES FROM THE DEVICE CONTROLLED. MAKE AN ADDRESSABLE CONFIRMATION CONNECTION WHEN SUCH FEEDBACK IS AVAILABLE AT THE DEVICE OR SYSTEM BEING CONTROLLED.
   a. SMOKE DAMPERS IN AIR DUCTS OF DESIGNATED HVAC DUCT SYSTEMS.
   b. MAGNETICALLY HELD-OPEN DOORS.
   c. ELECTRONICALLY LOCKED DOORS AND ACCESS GATES.
   d. ALARM-INITIATING CONNECTION TO ELEVATOR RECALL SYSTEM AND COMPONENTS.
   e. ALARM-INITIATING CONNECTION TO ACTIVATE EMERGENCY LIGHTING CONTROL.
   f. ALARM-INITIATING CONNECTION TO ACTIVATE EMERGENCY SHUTOFFS FOR GAS AND FUEL SUPPLIES.
   g. SUPERVISORY CONNECTIONS AT VALVE SUPERVISORY SWITCHES.
   h. SUPERVISORY CONNECTIONS AT LOW-AIR-PRESSURE SWITCH OF EACH DRY-PIPE SPRINKLER SYSTEM.
   i. SUPERVISORY CONNECTIONS AT ELEVATOR SHUNT-TRIP BREAKER.
   j. SUPERVISORY CONNECTIONS AT FIRE-EXTINGUISHER LOCATIONS.
3. GROUND FIRE-ALARM CONTROL UNIT AND ASSOCIATED CIRCUITS; COMPLY WITH IEEE 1100. INSTALL A GROUND WIRE FROM MAIN SERVICE GROUND TO FIRE-ALARM CONTROL UNIT.

L. EQUIPMENT INSTALLATION

1. COMPLY WITH NFPA 72, NFPA 101, AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION FOR INSTALLATION AND TESTING OF FIRE-ALARM EQUIPMENT. INSTALL ALL ELECTRICAL WIRING TO COMPLY WITH REQUIREMENTS IN NFPA 70 INCLUDING, BUT NOT LIMITED TO, ARTICLE 760, "FIRE ALARM SYSTEMS."
2. CONNECTING TO EXISTING EQUIPMENT: VERIFY THAT EXISTING FIRE-ALARM SYSTEM IS OPERATIONAL BEFORE MAKING CHANGES OR CONNECTIONS.
3. INSTALL WALL-MOUNTED EQUIPMENT, WITH TOPS OF CABINETS NOT MORE THAN 78 INCHES ABOVE THE FINISHED FLOOR.
4. MANUAL FIRE-ALARM BOXES:
   a. INSTALL MANUAL FIRE-ALARM BOX IN THE NORMAL PATH OF EGRESS WITHIN 60 INCHES OF THE EXIT DOORWAY.
   b. MOUNT MANUAL FIRE-ALARM BOX ON A BACKGROUND OF A CONTRASTING COLOR.
   c. THE OPERABLE PART OF MANUAL FIRE-ALARM BOX SHALL BE BETWEEN 42 INCHES AND 48 INCHES ABOVE FLOOR LEVEL. ALL DEVICES SHALL BE MOUNTED AT THE SAME HEIGHT UNLESS OTHERWISE INDICATED.
5. SMOKE- OR HEAT-DETECTOR SPACING: COMPLY WITH NFPA 72.
6. DUCT SMOKE DETECTORS: COMPLY WITH NFPA 72 AND NFPA 90A. INSTALL SAMPLING TUBES SO THEY EXTEND THE FULL WIDTH OF DUCT. TUBES MORE THAN 36 INCHES LONG SHALL BE SUPPORTED AT BOTH ENDS. REFER TO MECHANICAL DRAWINGS FOR INSTALLATION LOCATION. LOCATE A MINIMUM OF 3' FROM ANY DIFFUSER.
7. SINGLE-STATION SMOKE DETECTORS: WHERE MORE THAN ONE SMOKE ALARM IS INSTALLED WITHIN A DWELLING OR SUITE, THEY SHALL BE CONNECTED SO THAT THE OPERATION OF ANY SMOKE ALARM CAUSES THE ALARM IN ALL SMOKE ALARMS TO SOUND. LOCATE A MINIMUM OF 3' FROM ANY DIFFUSER.
8. REMOTE STATUS AND ALARM INDICATORS: INSTALL IN A VISIBLE LOCATION NEAR EACH SMOKE DETECTOR, SPRINKLER WATER-FLOW SWITCH, AND VALVE-TAMPER SWITCH THAT IS NOT READILY VISIBLE FROM NORMAL VIEWING POSITION.
9. AUDIBLE ALARM-INDICATING DEVICES: INSTALL NOT LESS THAN 6 INCHES BELOW THE CEILING. INSTALL BELLS AND HORNS ON FLUSH-MOUNTED BACK BOXES WITH THE DEVICE-OPERATING MECHANISM CONCEALED BEHIND A GRILLE. INSTALL ALL DEVICES AT THE SAME HEIGHT UNLESS OTHERWISE INDICATED.
10. VISIBLE ALARM-INDICATING DEVICES: INSTALL ADJACENT TO EACH ALARM BELL OR ALARM HORN AND AT LEAST 6 INCHES BELOW THE CEILING. INSTALL ALL DEVICES AT THE SAME HEIGHT UNLESS OTHERWISE INDICATED.
11. DEVICE LOCATION-INDICATING LIGHTS: LOCATE IN PUBLIC SPACE NEAR THE DEVICE THEY MONITOR.
12. THE COMPLETED FIRE ALARM SYSTEM SHALL BE FULLY TESTED IN ACCORDANCE WITH NFPA 72, AND LOCAL FIRE DEPARTMENT REQUIREMENTS, BY THE INSTALLER, AND IN THE PRESENCE OF THE OWNERS REPRESENTATIVE AND THE LOCAL FIRE MARSHALL. UPON COMPLETION OF A SUCCESSFUL TEST, THE INSTALLER SHALL SO CERTIFY IN WRITING TO THE OWNER AND GENERAL CONTRACTOR. TEST CONDUCTORS FOR SHORT CIRCUITS USING AN INSULATION-TESTING DEVICE, INDICATING AND INITIATING CIRCUITS FOR PROPER SIGNAL TRANSMISSION UNDER OPEN CIRCUIT CONDITIONS, INDICATING AND INITIATING CIRCUITS FOR PROPER ALARM OPERATION AND RESPONSE AND ANNUNCIATION AT THE MAIN FIRE ALARM CONTROL PANEL, AND NEW SYSTEMS FOR SPECIFIED FUNCTIONS ACCORDING TO THIS SPECIFICATION
13. REACCEPTANCE TESTING: PERFORM REACCEPTANCE TESTING TO VERIFY THE PROPER OPERATION OF ADDED OR REPLACED DEVICES AND APPLIANCES.
14. FIRE-ALARM SYSTEM WILL BE CONSIDERED DEFECTIVE IF IT DOES NOT PASS TESTS AND INSPECTIONS.
15. TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN FIRE-ALARM SYSTEM.

STATE OF MARYLAND
CHRISTOPHER CHATTIN
No. 51406
PROFESSIONAL ENGINEER

LICENSE NUMBER: 51406
EXPIRATION DATE: 08/10/2025
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

DAVIS BOWEN & FRIEDEL, INC.
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ISLE OF WIGHT RENOVATION
WORCESTER CO HEALTH DEPARTMENT
13070 ST. MARTINS NECK ROAD; BISHOPVILLE, MD 21813

DATE	COMMENTS
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07/29/2025	Issued for Permit

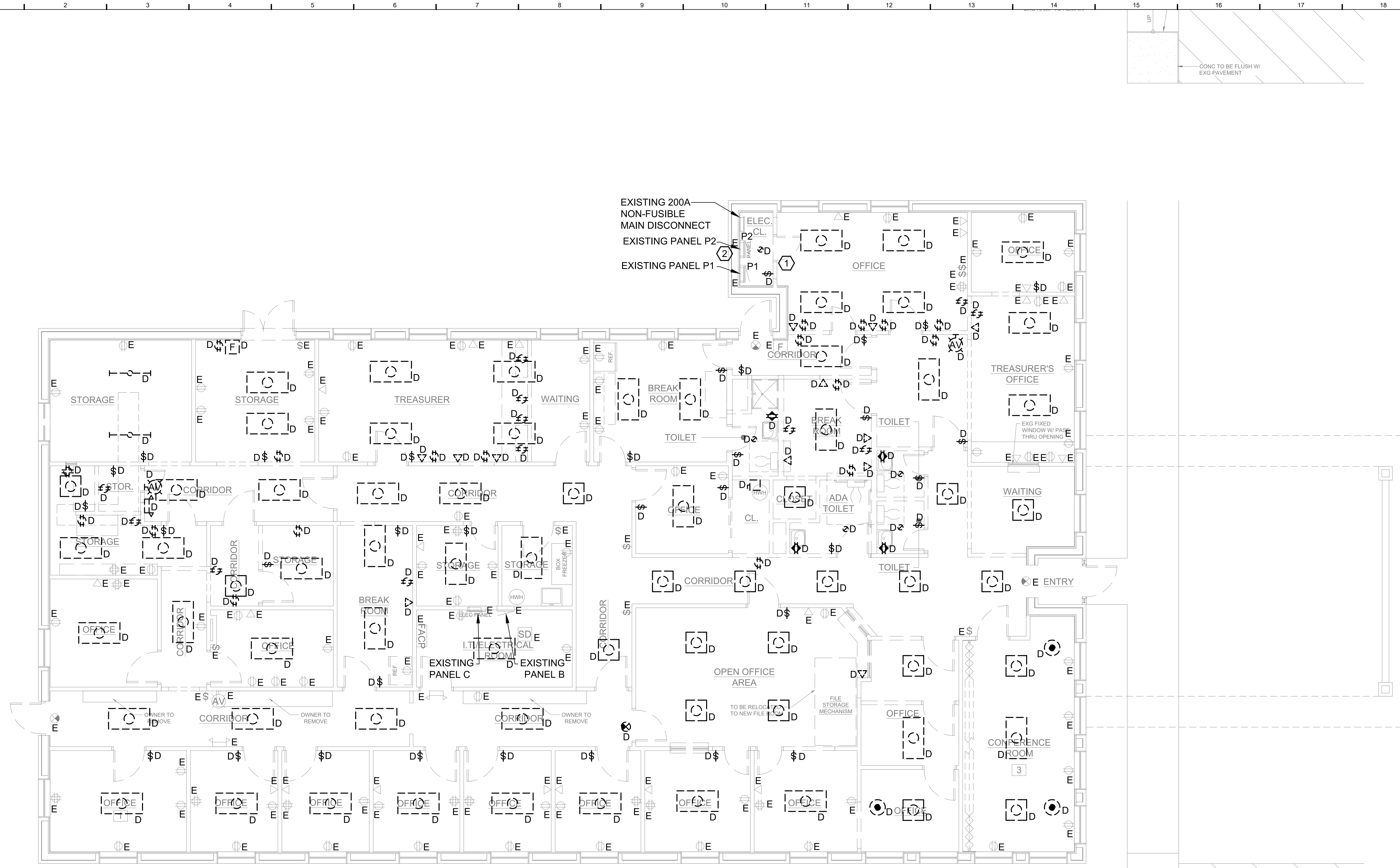
Date: July 29, 2025
Scale: AS NOTED
Dwn.By: PDIX
Proj.No.: 0085B055.A01

ELECTRICAL SPECIFICATIONS

Dwg.No.: E-004

Allen + Shariff
MEP Engineering
Project Management
205 East Market Street
Salisbury, Maryland 21801
443.543.1365

ALLEN + SHARIFF JOB #: 2431096



1 E-101 ELECTRICAL DEMO PLAN
3/16" = 1'-0"

ELECTRICAL GENERAL NOTES:

1. EXISTING CONDITIONS CAPTURED THROUGH SITE WALK AND OWNER PROVIDED AS-BUILT NOTES, AND MAY NOT BE AN ACCURATE DEPICTION OF ALL EXISTING CONDITIONS. DETERMINE EXISTING CONDITIONS PRIOR TO DEMOLITION WORK, AND INCLUDE ALL SCOPE WHETHER SHOWN OR NOT. DEVICES LOCATED OUTSIDE OF THE SOW TENANT SPACE ARE NOT SHOWN.
2. FIXTURES AND DEVICES INDICATED BY 'E' AND A THIN LINE WEIGHT ARE EXISTING TO REMAIN. CONTRACTOR TO PROTECT ITEMS DURING DEMOLITION AND CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR REPLACEMENT OF ITEMS IN KIND IF THEY DAMAGE.
3. FIXTURES AND DEVICES INDICATED BY 'R' ARE EXISTING TO BE RELOCATED. CONTRACTOR SHALL DISCONNECT, REMOVE, CLEAN, STORE, AND RELAMP EXISTING FIXTURES. REFER TO NEW WORK DRAWINGS FOR NEW LOCATIONS OF FIXTURES WITH LABEL 'NR'. ALSO COORDINATE WITH ARCHITECTURAL PLANS FOR EXISTING FIXTURES AND DEVICES TO BE RELOCATED. CONTRACTOR IS RESPONSIBLE FOR REPLACEMENT OF ITEMS IN KIND IF THEY DAMAGE.
4. FIXTURES AND DEVICES INDICATED BY 'D' AND THICK AND/OR THICK DASHED LINE WEIGHTS SHALLE BE DEMOLISHED.
5. CIRCUITING TO REMAIN: WHERE AFFECTED BY NEW WORK, EXISTING CIRCUITING TO REMAIN SHALL BE REROUTED OR RECONNECTED AS REQUIRED, IN ORDER TO MAINTAIN CONTINUITY OF CIRCUIT.
6. REUSE OF EXISTING CIRCUITRY: EXISTING CIRCUITS SHALL BE REUSED WHERE CONVENIENT TO SERVE THE NEW LAYOUT. PROVIDE CIRCUIT MODIFICATIONS INDICATED OR REQUIRED TO MAINTAIN CONTINUITY OF EXISTING CIRCUITS THAT REMAIN.
7. REMOVE ALL EXISTING DEVICES AND COVERS FOR REPLACE UNDER NEW WORK SCOPE.
8. REMOVE EXISTING POWER SERVING ALL EXISTING BASEBOARD HEATERS BACK TO SOURCE. SEE MECHANICAL DRAWINGS FOR LOCATIONS OF BASEBOARD HEATERS.
9. PROVIDE TEMPORARY POWER FOR STRING LIGHTING IN ALL AREAS OF CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR TURNING OFF POWER AT THE END OF EACH WORK DAY.

ELECTRICAL KEY NOTES:

1. PROVIDE DOUBLE DOOR TO MEET CLEARANCE REQUIREMENTS FOR EXISTING PANELS.
2. EXISTING 400A 208Y/120V 3Ø/4W NQO-424-4M SQUARE D PANEL.

GRAPHIC SCALE 3/16" = 1'-0"

Allen + Shariff
MEP Engineering
Project Management

LICENSE NUMBER: 51406
EXPIRATION DATE: 08/10/2025
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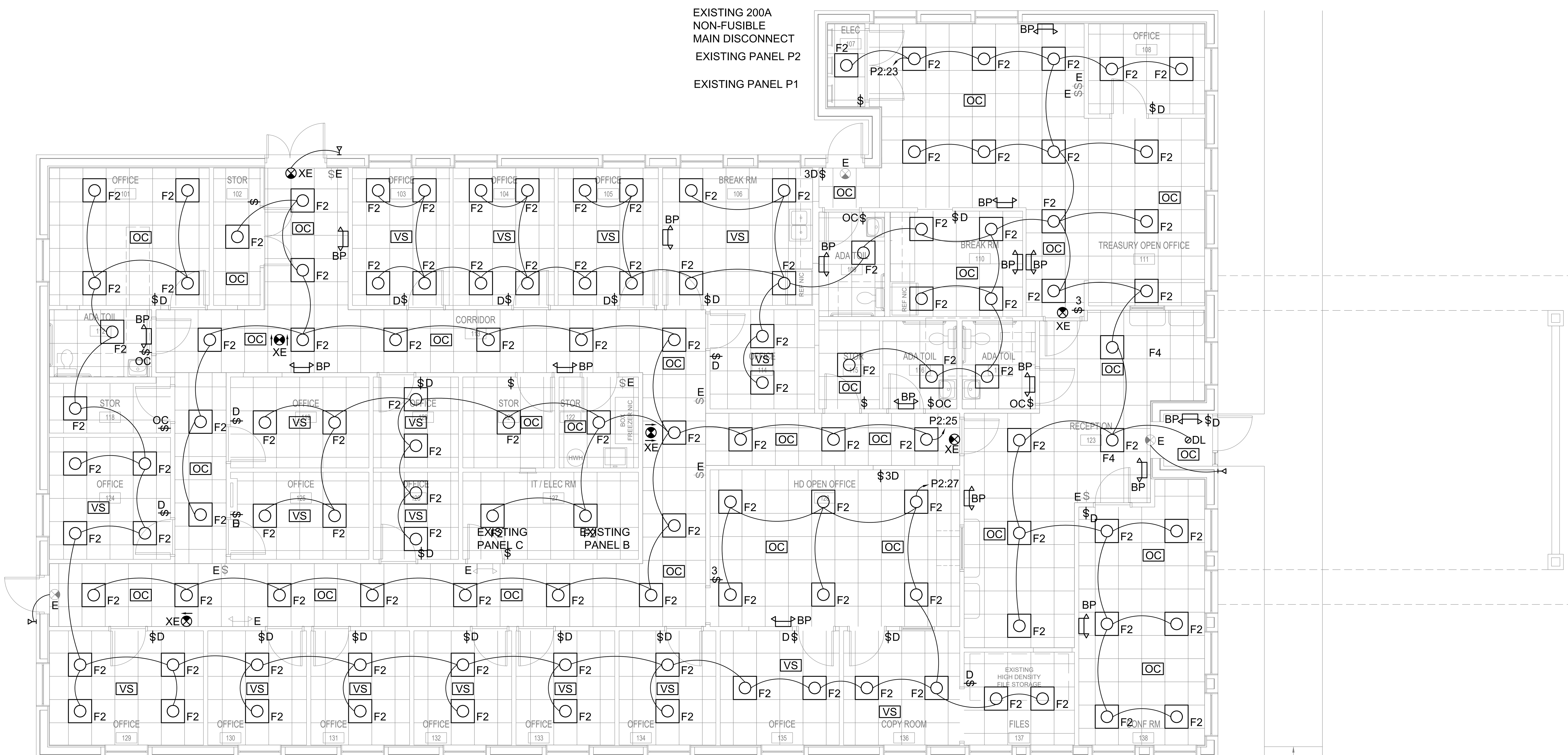
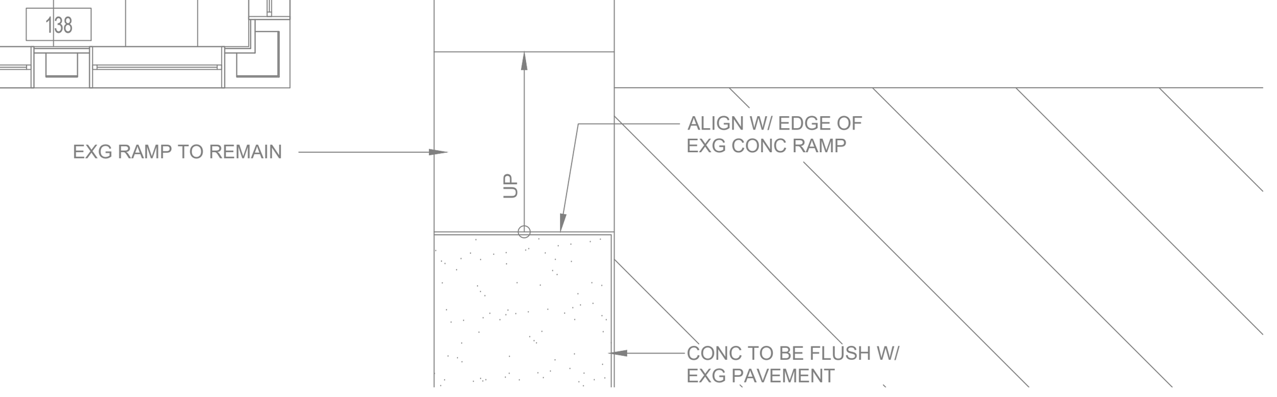
ELECTRICAL DEMO PLAN

Dwg.No.: E-101

ALLEN + SHARIFF JOB #: 2431096





1 E-201 ELECTRICAL LIGHTING PLAN

3/16" = 1'-0"

ELECTRICAL GENERAL NOTES:

1. FIXTURES AND DEVICES INDICATED BY 'E' AND A THIN LINE WEIGHT ARE EXISTING TO REMAIN. CONTRACTOR TO PROTECT ITEMS DURING DEMOLITION AND CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR REPLACEMENT OF ITEMS IN KIND IF THEY DAMAGE.
2. FIRE STOP ALL FIRE RATED FLOORS,CEILINGS, AND WALLS AS REQUIRED BY CODE. PENETRATIONS INTO OR THROUGH FIRE RESISTANCE RATED WALLS SHALL COMPLY WITH IBC CHAPTER 7.
3. PROVIDE EXPANSION FITTINGS AS REQUIRED AT ALL EXPANSION JOINTS. COORDINATE WITH ARCHITECTURAL PLANS.
4. WHERE EXPOSED, BRANCH CIRCUITS SHALL BE RUN IN EMT CONDUIT ROUTED PARALLEL AND PERPENDICULAR TO BUILDING STRUCTURE. WHERE CONCEALED WITHIN WALLS OR ABOVE CEILING, MC CABLE IS PERMISSIBLE.
5. WHERE WIRE SIZE IS NOT INDICATED, #12 AWG MINIMUM SHALL BE USED FOR CIRCUITS LESS THAN 100 FEET IN LENGTH, #10 AWG SHALL BE USED FOR CIRCUITS FROM 100 TO 150 FEET IN LENGTH, AND #8 AWG SHALL BE USED FOR CIRCUITS FROM 150 TO 250 FEET IN LENGTH. CIRCUIT LENGTHS GREATER THAN 250 FEET SHALL BE WIRED USING #6 MINIMUM, SUBJECT TO FIELD VERIFICATION. ALL EXACT CONDUIT FOOTINGS, LENGTHS, AND WIRE SIZES SHALL BE FIELD DETERMINED BY THE E.C. PER ALL APPLICABLE CODES BASED ON ACTUAL CONDUIT AND WIRE ROUTING. THE INFORMATION ABOVE SHALL BE USED FOR PRICING PURPOSES ONLY.
6. EC SHALL NOT HAVE MORE THAN THREE CURRENT CARRYING CONDUCTORS IN A CONDUIT WITHOUT DERATING AMPACITIES PER THE NEC.
7. VERIFY EXACT LOCATIONS OF ALL DEVICES WITH ARCHITECTURAL PLANS PRIOR TO ROUGH-IN.
8. WHERE DEVICES ARE DIMENSIONED ON ARCHITECTURAL DRAWINGS, INSTALL DEVICES PER THOSE DIMENSIONS. WHERE DEVICE LOCATIONS ARE NOT DIMENSIONED ON ARCHITECTURAL DRAWINGS, INSTALL IN ACCORDANCE WITH DEFAULT LOCATIONS IN ELECTRICAL SPECIFICATIONS.
9. REPLACE ALL EXISTING DEVICES, SWITCHES, AND COVER PLATES WITH NEW DEVICES AND COVER PLATES.

GRAPHIC SCALE 3/16" = 1'-0"

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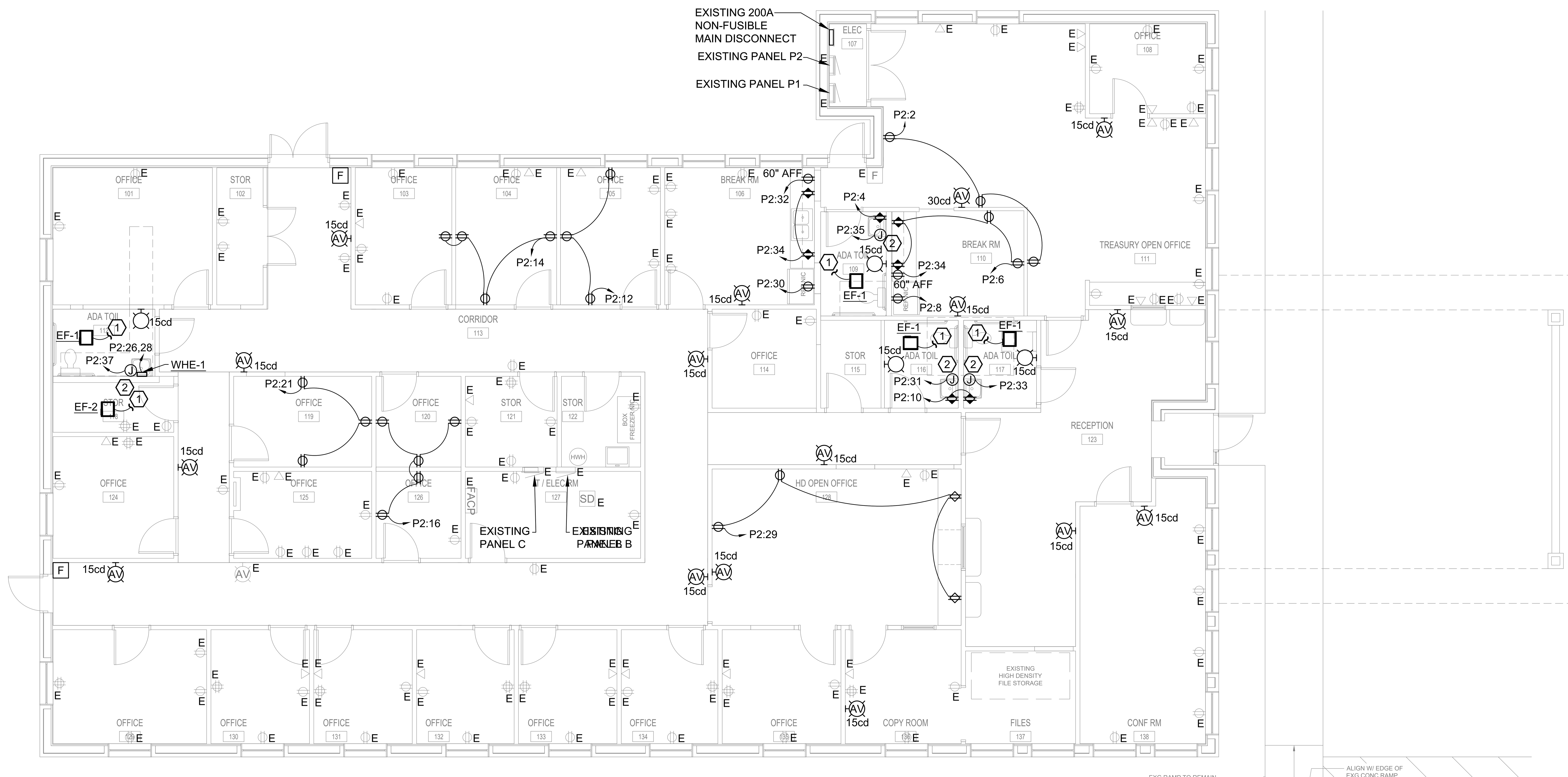
ELECTRICAL LIGHTING PLAN

Allen + Shariff
MEP Engineering
Project Management
205 East Market Street
Salisbury, Maryland 21801
443.545.1300

Dwg.No.: E-201

ALLEN + SHARIFF JOB #: 2431096



1 ELECTRICAL POWER PLAN

E-301 3/16" = 1'-0"

ELECTRICAL GENERAL NOTES:

1. FIXTURES AND DEVICES INDICATED BY 'E' AND A THIN LINE WEIGHT ARE EXISTING TO REMAIN. CONTRACTOR TO PROTECT ITEMS DURING DEMOLITION AND CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR REPLACEMENT OF ITEMS IN KIND IF THEY DAMAGE.
2. FIRE STOP ALL FIRE RATED FLOORS,CEILINGS, AND WALLS AS REQUIRED BY CODE. PENETRATIONS INTO OR THROUGH FIRE RESISTANCE RATED WALLS SHALL COMPLY WITH IBC CHAPTER 7.
3. PROVIDE EXPANSION FITTINGS AS REQUIRED AT ALL EXPANSION JOINTS. COORDINATE WITH ARCHITECTURAL PLANS.
4. WHERE EXPOSED, BRANCH CIRCUITS SHALL BE RUN IN EMT CONDUIT ROUTED PARALLEL AND PERPENDICULAR TO BUILDING STRUCTURE. WHERE CONCEALED WITHIN WALLS OR ABOVE CEILING, MC CABLE IS PERMISSIBLE.
5. WHERE WIRE SIZE IS NOT INDICATED, #12 AWG MINIMUM SHALL BE USED FOR CIRCUITS LESS THAN 100 FEET IN LENGTH, #10 AWG SHALL BE USED FOR CIRCUITS FROM 100 TO 150 FEET IN LENGTH, AND #8 AWG SHALL BE USED FOR CIRCUITS FROM 150 TO 250 FEET IN LENGTH. CIRCUIT LENGTHS GREATER THAN 250 FEET SHALL BE WIRED USING #6 MINIMUM, SUBJECT TO FIELD VERIFICATION. ALL EXACT CONDUIT FOOTINGS, LENGTHS, AND WIRE SIZES SHALL BE FIELD DETERMINED BY THE E.C. PER ALL APPLICABLE CODES BASED ON ACTUAL CONDUIT AND WIRE ROUTING. THE INFORMATION ABOVE SHALL BE USED FOR PRICING PURPOSES ONLY.
6. EC SHALL NOT HAVE MORE THAN THREE CURRENT CARRYING CONDUCTORS IN A CONDUIT WITHOUT DERATING AMPACITIES PER THE NEC.
7. VERIFY EXACT LOCATIONS OF ALL DEVICES WITH ARCHITECTURAL PLANS PRIOR TO ROUGH-IN.
8. WHERE DEVICES ARE DIMENSIONED ON ARCHITECTURAL DRAWINGS, INSTALL DEVICES PER THOSE DIMENSIONS. WHERE DEVICE LOCATIONS ARE NOT DIMENSIONED ON ARCHITECTURAL DRAWINGS, INSTALL IN ACCORDANCE WITH DEFAULT LOCATIONS IN ELECTRICAL SPECIFICATIONS.
9. REPLACE ALL EXISTING DEVICES, SWITCHES, AND COVER PLATES WITH NEW DEVICES, SWITCHES, AND COVER PLATES.

ELECTRICAL KEY NOTES:

1. CONNECT EXHAUST FAN TO LOCAL SWITCHED LIGHTING CIRCUIT.
2. PROVIDE 120V POWER CONNECTION FOR BATHROOM FAUCET.

1' 0 4' 8' 12' 16'

GRAPHIC SCALE 3/16" = 1'-0"

N

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ELECTRICAL POWER PLAN

Allen + Shariff
MEP Engineering
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205 East Market Street
Salisbury, Maryland 21801
443.545.1300

Dwg.No.: E-301

ALLEN + SHARIFF JOB #: 2431096

LIGHTING FIXTURE SCHEDULE

TYPE	FIXTURE DESCRIPTION	MANUFACTURER	MODEL	DRIVER/ BALLAST	INPUT WATTS	VOLTS	MOUNTING	NOTES
DL	6" LED DOWNLIGHT	LITHONIA	LDN6 35/15 L06 AR MVOLT GZ10	0-10V	17.5	120-277	RECESSED	
F2	2X2 LED FLAT PANEL	LITHONIA	EPANL 2X2 3400LM 80CRI 35K MIN10 ZT MVOLT	0-10V	30	120-277	RECESSED	
BP	EMERGENCY BATTERY LIGHT	LITHONIA	ELM2L M12	N/A	1.09	120-277	SURFACE	
XE	EMERGENCY EXIT SIGN	LITHONIA	LHQM WITH REMOTE HEADS	N/A	4.3	120-277	SURFACE	

NOTES:
1. ARCHITECT SHALL SPECIFY / VERIFY ALL FINISH SELECTIONS.
2. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL MOUNTING ACCESSORIES.
4. LIGHTING FIXTURE SUBSTITUTIONS THAT ARE CONSIDERED EQUAL TO THE SPECIFIED PRODUCTS MAY BE SUBMITTED AND WILL BE REVIEWED BY ARCHITECT AND ELECTRICAL ENGINEER. ACCEPTANCE WILL BE EVALUATED BASED ON AESTHETICS, PERFORMANCE, AND QUALITY. DO NOT PROVIDE VALUE ENGINEERING OPTIONS UNLESS SPECIFICALLY DIRECTED BY THE OWNER, ARCHITECT, OR ENGINEER.
5. THE STANDARD DRIVER OPTION FOR MOST FIXTURES IS 0-10V DIM. THE CONTRACTOR IS ONLY REQUIRED TO PROVIDE 0-10V WIRING WHERE DIMMING CONTROLS ARE SHOWN ON THE LIGHTING PLAN.
6. FIXTURES WITH HALF FILLED OR FILLED CENTERS SHALL BE PROVIDED WITH A 1100 LUMEN MIN EMERGENCY BATTERY BACKUP.

Existing Branch Panel: P2

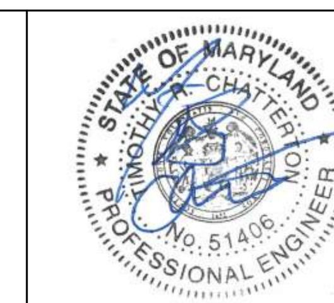
Location: ELEC 107
Supply From: EXISTING
Mounting: SURFACE
Enclosure: TYPE 1

Volts: 208/120V
Phases: 3
Wires: 4

A.I.C. Rating: 22 KAIC
Mains Type: MCB
Mains Rating: 400
MCB Rating: 400

CKT	Circuit Description	Notes	Wire Size	Trip	Pole	LOAD (VA)						Pole	Trip	Wire Size	Notes	Circuit Description	CKT
						A		B		C							
1	PANEL A		EXISTING	60	3	-	540					1	20	2#12,1#12G,3/4"C	2	REC OPEN OFFICE 111	2
3								-	180			1	20	2#12,1#12G,3/4"C	2	REC ADA TOIL 109	4
5										-	720	1	20	2#12,1#12G,3/4"C	2	REC BREAK RM 110	6
7	PANEL C		EXISTING	100	3	-	500					1	20	2#12,1#12G,3/4"C	2,3	REFRIGERATOR 110	8
9								-	360			1	20	2#12,1#12G,3/4"C	2	REC ADA TOIL 116,117	10
11										-	540	1	20	2#12,1#12G,3/4"C	2	REC OFFICE 105	12
13	EXISTING LOAD		EXISTING	100	2	-	720					1	20	2#12,1#12G,3/4"C	2	REC OFFICE 104	14
15								-	900			1	20	2#12,1#12G,3/4"C	2	REC OFFICE 120,126	16
17	PUMP HOUSE		EXISTING	30	2					-	-	2	20	EXISTING		EXISTING LOAD	18
19						-	-										20
21	REC OFFICE 119	2	2#12,1#12G,3/4"C	20	1			540	-			1	20	EXISTING		EXISTING LOAD	22
23	LTG	2	2#12,1#12G,3/4"C	20	1					1495	-	1	20	EXISTING		EXISTING LOAD	24
25	LTG	2	2#12,1#12G,3/4"C	20	1	1020	2080					2	25	2#10,1#10G,3/4"C	2	WHE-1	26
27	LTG	2	2#12,1#12G,3/4"C	20	1			1080	2080								28
29	REC HD OPEN OFFICE 128	2	2#12,1#12G,3/4"C	20	1					720	500	1	20	2#12,1#12G,3/4"C	2,3	REFRIGERATOR 106	30
31	FAUCET 116	2	2#12,1#12G,3/4"C	20	1	180	500					1	20	2#12,1#12G,3/4"C	2,3	REC MICROWAVE 106	32
33	FAUCET 117	2	2#12,1#12G,3/4"C	20	1			180	360			1	20	2#12,1#12G,3/4"C	2	REC BREAK RM 106	34
35	FAUCET 109	2	2#12,1#12G,3/4"C	20	1					180	500	1	20	2#12,1#12G,3/4"C	2,3	REC MICROWAVE 110	36
37	FAUCET 112	2	2#12,1#12G,3/4"C	20	1	180	-					-	-	-	-	SPACE	38
39	SPACE	-	-	-	-			-	-			-	-	-	-	SPACE	40
41	SPACE	-	-	-	-					-	-	-	-	-	-	SPACE	42
					Total Load:	5720		5680		4655							
					Amps:			44.6									

NOTES:
1. UNLESS OTHERWISE NOTED, ALL BRANCH CIRCUIT BREAKERS ARE EXISTING TO REMAIN.
2. (WHERE NOTED) PROVIDE NEW CIRCUIT BREAKER; SIZED AS SHOWN. MATCH MANUFACTURER, MODEL, AND AIC RATING OF EXISTING CIRCUIT BREAKERS.
3. PROVIDE GFCI BREAKER.



LICENSE NUMBER: 51406
EXPIRATION DATE: 08/10/2025
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

DAVIS BOWEN & FRIEDEL, INC.
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SALISBURY, MARYLAND 410.543.9091

ISLE OF WIGHT RENOVATION
WORCESTER CO HEALTH DEPARTMENT
13070 ST. MARTINS NECK ROAD; BISHOPVILLE, MD 21813

DATE	COMMENTS
12/18/2024	100% Design Development
05/07/2025	90% Construction Documentation
07/16/2025	100% Construction Documentation
07/29/2025	Issued for Permit

Date: July 29, 2025
Scale: AS NOTED
Dwn.By: PDIX
Proj.No.: 0085B055.A01

ELECTRICAL SCHEDULES

Allen + Shariff
MEP Engineering
Project Management

Dwg.No.: E-401

ALLEN + SHARIFF JOB #: 2431096