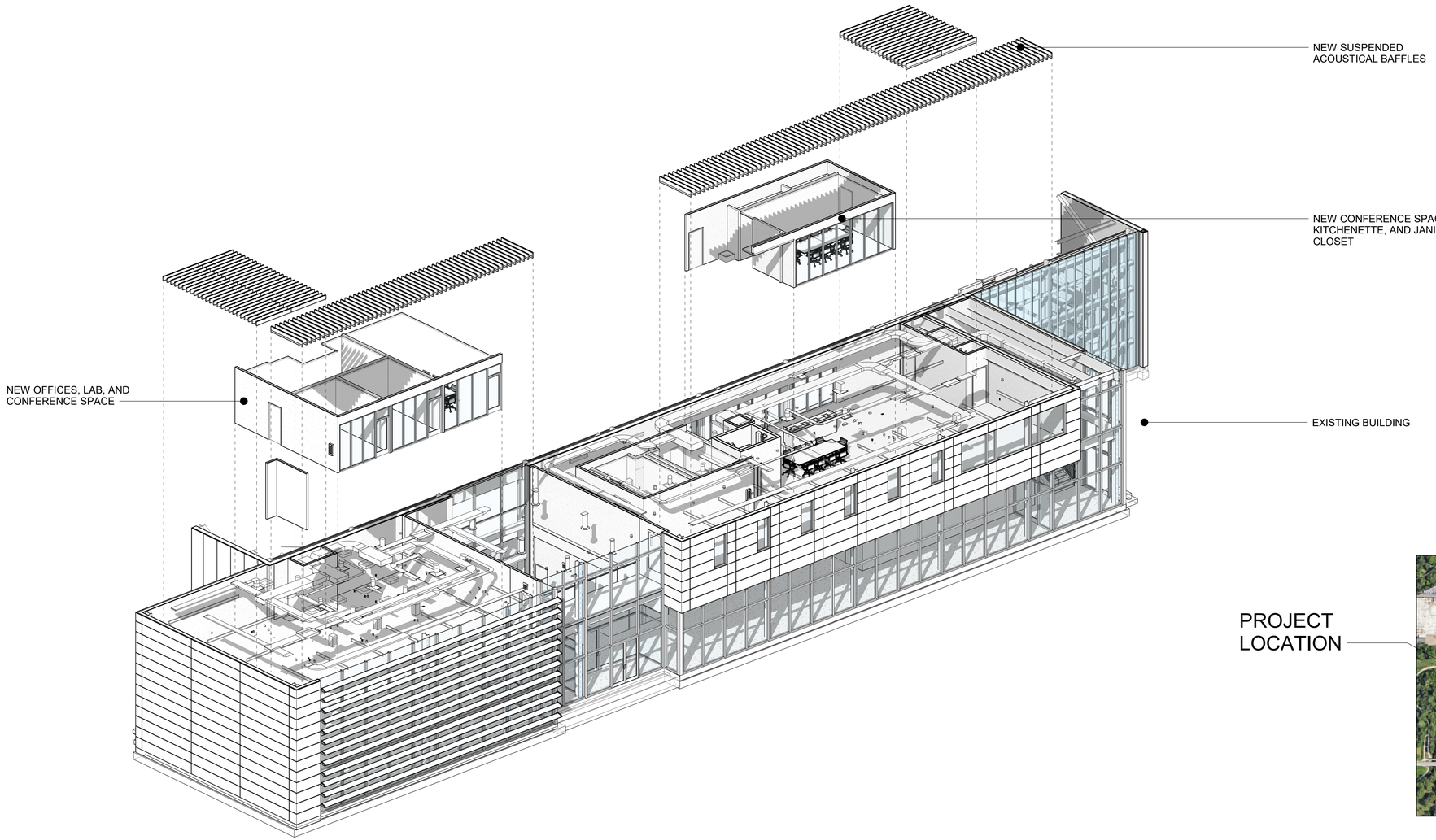
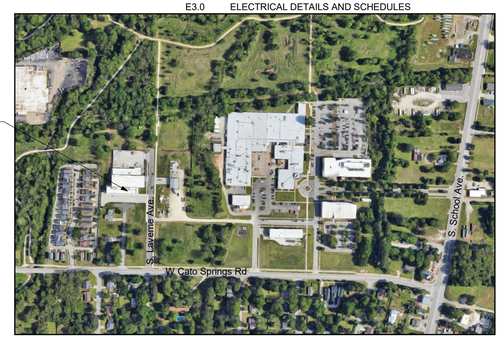
Civil Engineering Research and Education Center (CEREC)
University of Arkansas
Second Floor Fitout II

Arkansas Research and Technology Park
Fayetteville, Arkansas, 72701



SHEET INDEX - SECOND FLOOR FITOUT II

PROJECT LOCATION



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DEMX ARCHITECTURE

Architect's Seal:
REGISTERED ARCHITECT
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UNIVERSITY OF ARKANSAS

University of Arkansas
CEREC

DATE
2/23/2024

JOB NO.
ST14.014.00B

REVISIONS

G2.000
COVER SHEET

ABBREVIATIONS

∠	ANGLE
@	AT
℄	CENTER LINE
⊥	PERPENDICULAR
⌀	DIAMETER
A.B.	ANCHOR BOLT
A.C.M.U.	ARCHITECTURAL CEMENTIOUS MASONRY UNIT
A.D.	AREA DRAIN
A.F.F.	ABOVE FINISH FLOOR
A.H.U.	AIR HANDLING UNIT
A.P.	ACCESS PANEL
A/C	AIR CONDITIONER
ABV.	ABOVE
ACOUS.	ACOUSTICAL
ADJ.	ADJUSTABLE
AL.	ALUMINUM
ALT.	ALTERNATE
ANCH.	ANCHOR
APX.	APPROXIMATE
ARCH.	ARCHITECTURAL
AUTO	AUTOMATIC
B.M.	BENCH MARK
B.O.	BOTTOM OF OR BY OTHERS
BD.	BOARD
BLDG.	BUILDING
BLK	BLOCK
BOT.	BOTTOM
BR	BRICK
BRG.	BEARING
BS	BOTH SIDES
BSMT.	BASEMENT
BUR	BUILT UP ROOFING
C.B.	CHALKBOARD
C.I.	CAST IRON
C.I.P.C.	CAST IN PLACE CONCRETE
C.J.	CONTROL JOINT
C.M.U.	CONCRETE MASONRY UNIT
C.O.	CLEAN OUT
CAB.	CABINET
CL. OR CLR.	CLEAR
CLG.	CEILING
COL.	COLUMN
CONC.	CONCRETE
COND.	CONDITION
CONST.	CONSTRUCTION
CONT.	CONTINUOUS/CONTINUE
COR.	CORRIDOR
CTR.	COUNTER
CTSK.	COUNTERSUNK
CW	COLD WATER
D	DRAIN
D.F.	DRINKING FOUNTAIN
DBL.	DOUBLE
DIA.	DIAMETER
DIM.	DIMENSION
DIV.	DIVISION
DN.	DOWN
DP.	DEEP/DEPTH
DPR.	DISPENSER
DR.	DOOR
DS.	DOWNSPOUT
DTL.	DETAIL
DWG.	DRAWING
E.	EAST
E.B.	EXPANSION BOLT
E.F.	EACH FACE
E.J.	EXPANSION JOINT
E.P.	ELECTRICAL PANEL
E.P.S.	EXPANDED POLYSTYRENE
EA.	EACH
EL.	ELEVATION
ELEC.	ELECTRICAL
ELEV.	ELEVATOR
EMER.	EMERGENCY
ENC.	ENCLOSURE
EQ.	EQUAL
EQUIP.	EQUIPMENT
EST.	ESTIMATE
ETR.	EXISTING TO REMAIN
EXG.	EXISTING
EXP.	EXPANSION
EXT.	EXTERIOR
F.A.	FRESH AIR
F.B.	FACE BRICK
F.B.O.	FURNISHED BY OTHERS
F.D.	FLOOR DRAIN
F.E.C.	FIRE EXTINGUISHER CABINET
F.F.C.O.	FLUSH FLOOR CLEANOUT
F.F.E.	FINISHED FLOOR ELEVATION
F.F.L.	FINISHED FLOOR LINE
F.H.	FLAT HEAD
F.H.M.S.	FLAT HEAD MACHINE SCREW
F.H.W.S.	FLAT HEAD WOOD SCREW
F.L.	FLOW LINE
F.O.C.	FACE OF CONCRETE
F.O.F.	FACE OF FINISH
F.O.M.	FACE OF MASONRY
F.O.S.	FACE OF STUCCO
F.P.	FIREPROOF(ING)
F.R.	FIRE RATED
FAS.	FASTENER
FIN.	FINISH
FLUOR.	FLUORESCENT
FLR.	FLOOR(ING)
FND.	FOUNDATION
FT.	FEET OR FOOT
FTG.	FOOTING
FUR.	FURRING
FUT.	FUTURE
G.B.	GRAB BAR
G.C.	GENERAL CONTRACT(OR)
G.D.	GRADE/GRADING
G.F.	GROUND FACE
G.F.R.C	GLASS FIBER REINFORCED CONCRETE
G.I.	GALVANIZED IRON
G.R.G.	GLASS FIBER REINFORCED GYPSUM
GA.	GAUGE
GL.	GLASS
GV.	GALVANIZED
GYP.BD.	GYPSUM WALL BOARD
H.B.	HOSE BIBB
H.C.	HANDICAPPED
H.D.	HEAVY DUTY
H.M.	HOLLOW METAL
HBD.	HARDBOARD
HDW.	HARDWARE
HOR.	HORIZONTAL,HORIZONTALLY
HR.	HOUR
HT.	HEIGHT
HVAC	HEATING/VENTILATING/AIR CONDITIONING
HW	HOT WATER
HWD.	HARD WOOD
I.D.	INSIDE DIAMETER
INCL.	INCLUDE(D), (ING)
INSUL	INSULATE(D),(ION)
INT.	INTERIOR
INTM.	INTERMEDIATE
J.B.	JUNCTION BOX
J.F.	JOINT FILLER
JST.	JOIST
JT.	JOINT
KIT.	KITCHEN
K.O.	KNOCK OUT
L.	LENGTH
LAV.	LAVATORY
LAM.	LAMINATE
LH	LEFT HAND
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LMS.	LIMESTONE
LT.	LIGHT
LTL.	LINTEL
L.W.	LIGHT WEIGHT
L.W.C.	LIGHT WEIGHT CONCRETE
L.W.C.M.U.	LIGHT WEIGHT CONCRETE MASONRY UNIT
M.	METER(S)
M.B.	MACHINE BOLT OR MARKER BOARD
M.O.	MASONRY OPENING
M.R.D.	METAL ROOF DECK
MAS.	MASONRY
MAT.	MATERIAL(S)
MAX.	MAXIMUM
MECH.	MECHANICAL
MED.	MEDIUM
MEM./MMB.	MEMBRANE
MET.	METAL
MFR.	MANUFACTURE(R)
MH	MANHOLE
MIN.	MINIMUM
MIR.	MIRROR
MISC.	MISCELLANEOUS
MLD.	MOLDING, MOULDING
MOD.	MODULAR
MT.	MOUNT(ED), (ING)
MTFR	METAL FURRING
MTL.	METAL
MULL.	MULLION
N.	NORTH
N.I.C.	NOT IN CONTACT
N.R.	NOISE REDUCTION
N.R.C.	NOISE REDUCTION COEFFICIENT
N.T.S.	NOT TO SCALE
NO.	NUMBER
NOM.	NOMINAL
O.F.C.I.	OWNER-FURNISHED, CONTRACTOR-INSTALLED
P.BD.	PARTICLE BOARD
P.C.	PORTLAND CEMENT
P.LAM.	PLASTIC LAMINATE
P.S.F.	POUNDS PER SQUARE FOOT
P.S.I.	POUNDS PER SQUARE INCH
P.T.R.	PAPER TOILET RECEPTOR
PAR.	PARALLEL
PAV.	PAVING
PCC.	PRECAST CONCRETE
PED.	PEDESTRIAN
PERIM.	PERIMETER
PFB.	PREFABRICATE(D)
PK.	PARKING
PL.	PLATE OR PROPERTY LINE
PLAS.	PLASTER
PLBG.	PLUMBING
PNL.	PANEL
PNT.	PAINT(ED)
PR.	PAIR
PVMT.	PAVEMENT
PWD.	PLYWOOD
Q.T.	QUARRY TILE
QTY.	QUANTITY
R.	RADIUS OR RISER
R.A.	RETURN AIR
R.C.P.	REINFORCED CONCRETE PIPE
R.D.	ROOF DRAIN
R.H.	RIGHT HAND
R.O.	ROUGH OPENING
R.T.U.	ROOF TOP UNIT
RAD.	RADIUS
RBT.	RABBET
RECEP.	RECEPTACLE
REF.	REFER TO, REFERENCE
REFR.	REFRIGERATOR
REG.	REGISTER
REINF.	REINFORCE(D), (ING)
REM.	REMOVE
REQ.	REQUIRE(D)
RES.	RESILIENT
RET.	RETURN
REV.	REVISION(S), REVISE
RFG.	ROOFING
RFL.	REFLECT (ED), (IVE), (OR)
RM.	ROOM
RVRS.	REVERSE
S.	SOUTH
S.A.	SUPPLY AIR
S.C.	SOLID CORE
S.F.	SQUARE FOOT (FEET)
S.N.D.	SANITARY NAPKIN DISPENSER
S.N.R.	SANITARY NAPKIN RECEPTACLE
S.Y.	SQUARE YARD
SAN.	SANITARY
SCHED.	SCHEDULE
SECT.	SECTION
SHWR.	SHOWER
SHT.	SHEET
SHTH.	SHEATHING
SIM.	SIMILAR
SLNT.	SEALANT
SPC.	SPACE
SPCR.	SPACER
SPEC.	SPECIFICATION(S)
SPKR.	SPEAKER
SSK.	SERVICE SINK
ST. STL.	STAINLESS STEEL
STA.	STATION
STD.	STANDARD
STL.	STEEL
STOR.	STORAGE
STRUCT.	STRUCTURAL
SUSP.	SUSPEND(ED)
SYM.	SYMMETRICAL
SYS.	SYSTEM
T&G	TONGUE AND GROOVE
T.	TREAD
T.D.	TOWEL DISPENSER, TRENCH DRAIN
T.O.	TOP OF
T.O.C.	TOP OF CONCRETE
T.O.S.	TOP OF STEEL, TOP OF SLAB
T.P.D.	TOILET PAPER DISPENSER
TB.	TACKBOARD
TEL.	TELEPHONE
THK.	THICK(NESS)
TLT.	TOILET
TPTN.	TOILET PARTITION
T.O.W.	TOP OF WALL
TYP.	TYPICAL
TZ.	TERRAZZO
U.N.O.	UNLESS NOTED OTHERWISE
UNF.	UNFINISHED
UR.	URINAL
U.S.	URINAL SCREEN
V.B.	VAPOR BARRIER
V.C.T.	VINYL COMPOSITION TILE
V.I.F.	VERIFY IN FIELD
VERT.	VERTICAL
VEST.	VESTIBULE
W.	WEST OR WIDTH (WIDE)
W.C.	WATER CLOSET
W.G.	WIRE GLASS
W.O.	WHERE OCCURS
W.T.W.	WALL TO WALL
W.W.F.	WELDED WIRE FABRIC
W/	WITH
W/O	WITHOUT
WDO.	WINDOW
WPG.	WATERPROOFING
WS.	WATERSTOP
WSCT.	WAINSCOT
WT.	WEIGHT

MATERIAL LEGEND

- FACE BRICK (PLAN/SECTION)
- CAST STONE (ELEVATION)
- RIGID INSULATION
- SPRAY INSULATION
- CONCRETE MASONRY
- ASPHALT SHINGLES
- CONCRETE
- UNDISTURBED EARTH
- DISTURBED EARTH
- STEEL
- GYPSUM BOARD
- DRAINAGE FILL
- PLYWOOD
- BLANKET OR LOOSE FILL INSULATION
- DEMOLITION
- EXISTING
- NEW PARTITION

SYMBOL LIST

- ROOM NAME / 101 — ROOM NAME AND NUMBER
- 1 / A101 — BUILDING SECTION 1=SECTION NO. A101= SHEET NO.
- 1 / A101 — WALL SECTION 1=SECTION NO. A101= SHEET NO.
- 1 / A101 — ELEVATION 1=ELEVATION NO. A101= SHEET NO.
- 1 / A101 — DETAIL SECTION 1=DETAIL NO. A101= SHEET NO.
- 1 / A101 — DETAIL CALLOUT 1=DETAIL NO. A101= SHEET NO.
- XXa — PARTITION MARK (REF. PARTITION TYPES)
- A101 — DOOR TAG
- AA — WINDOW MARK
- NORTH ARROW
- 1'-0" A.F.F. — CEILING TAG W/ HEIGHT
- NAME / ELEVATION — LEVEL MARK
- B.5 — COLUMN GRID
- # — PLAN NOTE & DEMO NOTE
- 99 — REVISION
- M — TOILET ACCESSORY
- CJ — CONTROL JOINT
- 0 2' 4' 8' — GRAPHIC SCALE
- XX ## — LABORATORY CASEWORK TYPE REF. A800's
- XX — LABORATORY SERVICE REF. A800's
- # — LABORATORY EQUIPMENT REF. A800's

GENERAL NOTES

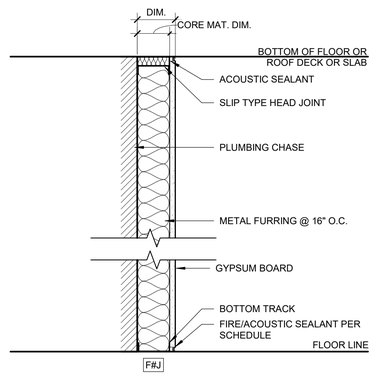
A. General Notes shall apply to all Work of this Project, including changes approved by the Owner during the course of the Work.

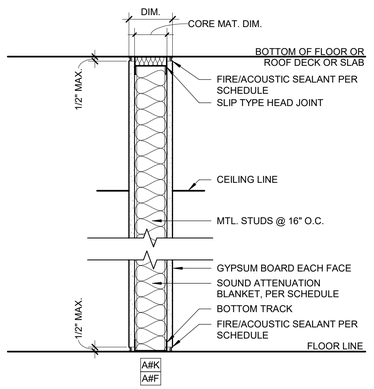
B. Drawings are intended to show end result of design. Minor modifications necessary to suit job conditions shall be included as part of the Work.

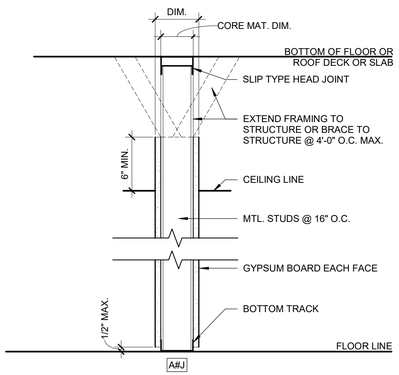
C. Architectural floor plan dimensions are to face of concrete, face of masonry, face of stud or Column Line, UNO. Masonry dimensions are nominal, UNO. "Clear" denotes minimum finish to finish dimension.

D. Do not scale drawings; dimensions shall govern.

PARTITION SCHEDULE - SECOND FLOOR FITOUT II								
TYPE	DIM.	CORE MAT. DIM.	GYP. BD	FIRE RATING	-< SOUND BATT.	U.L. NO.	STC	NOTES
A3F	4 7/8"	3 5/8"	5/8"					
A3J	4 7/8"	3 5/8"	5/8"					
A3K	4 7/8"	3 5/8"	5/8"					
F3K	4 1/4"	3 5/8"	5/8"					







PARTITION TYPES

1 1/2" = 1'-0"

A1

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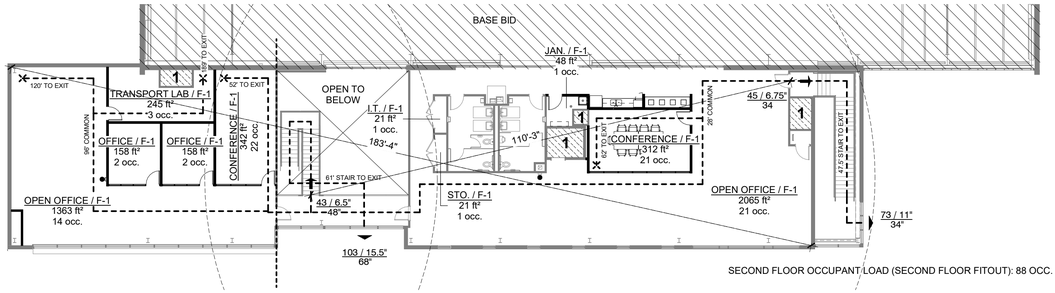
GENERAL NOTES, ABBREVIATIONS & PARTITION TYPES

CODE PLAN LEGEND

SYMBOL	DESCRIPTION	PROTECTIVE ELEMENTS
EXIT	EXIT - EXTERIOR	
EXIT	EXIT - INTERIOR (Assembly occ. over 50 and exits from floors.)	
	FIRE EXTINGUISHER	
	HOSE CABINET	
	HOSE CABINET WITH EXTINGUISHER	
	NON PROTECTED EXIT PATH	Per exception of fully sprinklered A, B, E, F, M, S, U occupancy.
P P	LIMITED PROTECTED EXIT PATH	Automatic Smoke Detection throughout Exit Path.
	PROTECTED EXIT PATH	1 hour Fire Barrier wall construction. 20-minute rated door assembly. Fire & Smoke Dampers.
1/2 1/2	PROTECTED EXIT PATH (sprinklered R occupancy)	.5 hour Fire Barrier wall construction. 20-minute rated door assembly. Fire & Smoke Dampers.
1 1	1 HOUR EXIT PASSAGEWAY	1-hour Fire Barrier wall construction. No openings other than required exit doors. 1-hour door assembly.
2 2	2 HOUR EXIT PASSAGEWAY	2-hour Fire Barrier wall construction. No openings other than required exit doors. 1 1/2-hour door assembly.
1 1	1 HOUR EXIT ENCLOSURE (vertical) (stairwell- 3 stories)	1-hour Fire Barrier wall construction. No openings other than required exit doors. 1-hour door assembly.
2 2	2 HOUR EXIT ENCLOSURE (vertical) (stairwell- 4 stories)	2-hour Fire Barrier wall construction. No openings other than required exit doors. 1 1/2-hour door assembly.
	1 HOUR FIRE BARRIER (Occupancy)	1 hour Fire Barrier wall construction. 3/4-hour rated door assembly. Fire Dampers.
	2 HOUR FIRE BARRIER (Occupancy)	2 hour Fire Barrier wall construction. 1 1/2 hour rated door assembly. Fire Dampers.
	3 HOUR FIRE BARRIER (Occupancy)	3 hour Fire Barrier wall construction. 3-hour rated door assembly. Fire Dampers.
	4 HOUR FIRE BARRIER (Occupancy)	4 hour Fire Barrier wall construction. 4-hour rated door assembly. Fire Dampers.
2	2 HOUR FIRE WALL (Building Separation)	2-hour Fire Wall construction per IBC 705. 1 1/2-hour door assembly. Fire dampers when ductwork is allowed to penetrate wall.
3 3	3 HOUR FIRE WALL (Building Separation)	3-hour Fire Wall construction per IBC 705. 3-hour door assembly. Fire dampers when ductwork is allowed to penetrate wall.
4 4	4 HOUR FIRE WALL (Building Separation)	4-hour Fire Wall construction per IBC 705. 4-hour door assembly. Fire dampers when ductwork is allowed to penetrate wall.
1 1	1 HOUR SHAFT (3 Stories or more)	1-hour Fire Barrier wall construction. 1-hour door assembly. Fire/Smoke Dampers.
2 2	2 HOUR EXIT ENCLOSURE (4 Stories or more)	2-hour Fire Barrier wall construction. 1 1/2-hour door assembly. Fire/Smoke Dampers.
	SPRINKLERED INCIDENTAL USE AREAS	Wall construction to resist the passage of smoke from floor to floor to F.R. floor/ceiling assembly. Self-or automatic closing doors with no air transfer grilles.
	FIRE PARTITIONS (dwelling/unit separation)(I-1 and R occupancies)	1 hour resistive rated walls. 3/4-hour rated door assembly. Fire Damper.
	SMOKE BARRIERS (I-2 and I-3 occupancies)	1 hour resistive rated walls. 20-minute rated door assembly. Smoke Damper.
6 / 9" 5.4	ACCUMULATED EXIT WIDTH AT REQUIRED EXIT (clear width)	Occupants / Required width Provided width
	PUBLIC FIRE HYDRANT (show distance from building)	
OFFICE / F-1 100 sf 2 occ.	ROOM DESIGNATION	Room type / Occupancy type Room Size Maximum Allowable occupants
40 80 40	SHOW ACCUMULATED OCCUPANT LOADS FOR COMPLEX EXIT PATHS	
	EXISTING BUILDING	
100'	COMMON PATH OF EGRESS TRAVEL / EXIT ACCESS TRAVEL DISTANCE	Common Path of Travel is included in Exit Access Travel Distance. Distance noted as "COMMON" or "TO EXIT", ref. plans.

OCCUPANCY SCHEDULE - SECOND FLOOR FITOUT				
ROOM NAME	AREA	Number	FLOOR AREA PER OCCUPANT	OCCUPANT LOAD
STORAGE	14 ft²	223		
I.T.	21 ft²	207	300 ft²	1
STO.	21 ft²	208	300 ft²	1
JAN.	48 ft²	204	300 ft²	1
OFFICE	158 ft²	212	100 ft²	2
OFFICE	158 ft²	213	100 ft²	2
TRANSPORT LAB	245 ft²	214	100 ft²	3
OPEN OFFICE	1363 ft²	210	100 ft²	14
OPEN OFFICE	2065 ft²	201	100 ft²	21
CONFERENCE	312 ft²	203	15 ft²	21
CONFERENCE	342 ft²	211	15 ft²	22
Grand total: 11				88



SECOND FLOOR OCCUPANT LOAD (SECOND FLOOR FITOUT): 88 OCC.

SECOND FLOOR CODE PLAN A2

1/16" = 1'-0"

0 8' 16' 32'

CODE ANALYSIS - SECOND FLOOR FITOUT

DESIGN CODES
- 2021 - Arkansas Fire Prevention Code (Based on 2021 IBC and IRC with amendments)
- 2014 - Arkansas State Energy Code (Based on 2009 IECC)
- 2020 - National Electric Code
- 2018 - Arkansas State Plumbing Code
- 2018 - Arkansas State Fuel Gas Code
- 2021 - Arkansas State Mechanical Code
- 2009 - State Code of Liquefied Petroleum Gas Containers and Equipment
- 2009 - Arkansas Rules and Regulations for Energy Efficient Standards for New Construction (Based on 2009 ICC w/ Arkansas Amendments)
- ASME A17.1-2007 Safety Code for Elevators
- 2017 - ANSI A117.1
- 2010 - ADA Standards for Accessible Design

USE & OCCUPANCY CLASSIFICATION
Factory Industrial, Moderate Hazard - F-1 (306.2)
Assembling, Fabrication, Finishing Operations

SPECIAL REQUIREMENTS
N/A

GENERAL BUILDING HEIGHTS & AREAS (Full Building)
Base Allowable Height & Areas (tbls. 504.3, 504.4 & 506.2)
Group F-1, Type II-B
Height: 55'
Stories: 2 stories
Area: 15,500 sf

Area Modifications:
Frontage Increase (Equation 5-2, 506.2.1)
0.75 = (784'/784'-0.25) (30'/30)
Automatic Sprinkler Increase (506.3)
200%
Area Modification (Equation 5-1, 506.1)
F-1 Allowable Area
58,125 = 15500+(15500x0.75)+(15500x2)

Actual Height & Areas
Base Bid: Group F-1, Type II-B
Height: 41'
Stories: 1 story
Area: 20,456 sf

Add Alternate: Group F-1, Type II-B
Height: 32'
Stories: 2 stories
Area: 5,787 sf (2nd floor finish out)

Levels	Permitted	Actual
First Flr.	58,125	28,005 (20,456+7,549)
Second Flr.	58,125	5,787
Total	116,250	35,554

BUILDING CONSTRUCTION TYPE
Construction Classification - II (602.2)
Fire-Resistance Rating - B (tbl. 601)

Fire-Resistance Rating Req's. for Bldg. Elements (tbl. 601)

Struct. Frame (w/ cols., girds., trusses)	0 hr.
Bearing Walls Ext.	0 hr.
Bearing Walls Int.	0 hr.
Nonbearing Walls Ext.	0 hr.
Nonbearing Walls Int.	0 hr.
Floor Constr. (w/ beams & joists)	0 hr.
Roof Constr. (w/ beams & joists)	0 hr.

* (tbl. 602)
** (note f, per tbl. 602)

AUTOMATIC SPRINKLER SYSTEMS
F-1: Required (903.2.4)

STANDPIPE SYSTEMS
Not Required (905.3.1)

FIRE EXTINGUISHERS (IFC tbl. 906.3(1))
Ordinary Hazard Occupancy
Minimum rated single extinguisher: 2-A
Max. floor area per unit of A: 1,500 sf
Max. floor area per extinguisher: 11,250 sf
Max. travel distance: 75'

MEANS OF EGRESS SIZING
Stairways (1005.3.1)
With sprinkler: 0.2"/occ.
Other egress components(doors) (1005.3.2)
With sprinkler: 0.15"/occ.

EXIT ACCESS
Common Path of Egress Travel (tbl. 1006.2.1)
F-1: 100'

EXIT AND EXIT ACCESS DOORWAYS
Spaces with One Exit (tbl. 1006.2.1)
F-1: 49 Max. occ.
Arrangement (1007.1.1)
With sprinkler: 1/3 diagonal

EXIT ACCESS TRAVEL DISTANCE
Exit Acces Travel Distance (tbl. 1017.2)
F-1: 250'

REQUIRED PLUMBING FIXTURES
88 Occupants = 44 Male & 44 Female

	Required	Provided
Water Closet	1:100	2 M 2 F
Lavatory	1:100	2 M 2 F
Drinking Fountain	1:400	1
Service Sink	1	1

0 8' 16' 32'

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CODE PLAN

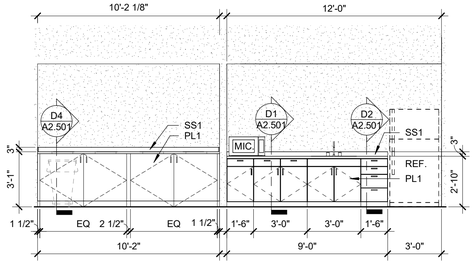
ROOM FINISH SCHEDULE - SECOND FLOOR FITOUT						
ROOM NO.	ROOM NAME	FLOOR FINISH	BASE FINISH	WALL FINISH / MATERIAL	CEILING FINISH	NOTES
201	OPEN OFFICE	SH	VB1	PT1/GYP	EX/SCB	1
202	CORRIDOR	SH	VB1	PT1/GYP	EX	
203	CONFERENCE	SH	VB1	PT1/GYP	APC1	
204	JAN.	SH	VB1	PT1/GYP	EX/SCB	
210	OPEN OFFICE	SH	VB1	PT1/GYP	EX/SCB	1
211	CONFERENCE	SH	VB1	PT1/GYP	APC1	
212	OFFICE	SH	VB1	PT1/GYP	APC1	
213	OFFICE	SH	VB1	PT1/GYP	APC1	
214	TRANSPORT LAB	SH	VB1	PT1/GYP	APC1	

FINISH LEGEND

APC1 - 2x2 ACOUSTICAL PANEL CEILING - ARMSTRONG -ULTIMA BEVELED TEGULAR
EX - EXPOSED STRUCTURE, NO FINISH
PL1 - PLASTIC LAMINATE - FOLKSTONE SCULPTED
PT1 - PAINT - SHERWIN WILLIAMS - FIRST STAR - SW 7646
VB1 - VINYL BASE - TARKETT 4" WALL BASE MEDIUM GRAY CG.
SCB - SUSPENDED CEILING BAFFLE - PINTA ACOUSTIC SONEX LINEAR BAFFLES - NATURAL GRAY
SH - SEALER / HARDENER
SS1 - SOLID SURFACE - CORIAN - DOVE
(--) - FINISH NOT REQUIRED

NOTES

1. ROLLER WINDOW SHADES AT SOUTH GLAZING.

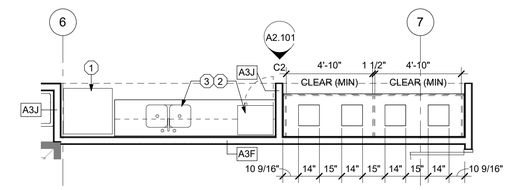


KITCHENETTE ELEVATION C2

1/4" = 1'-0"

0 2' 4' 8'

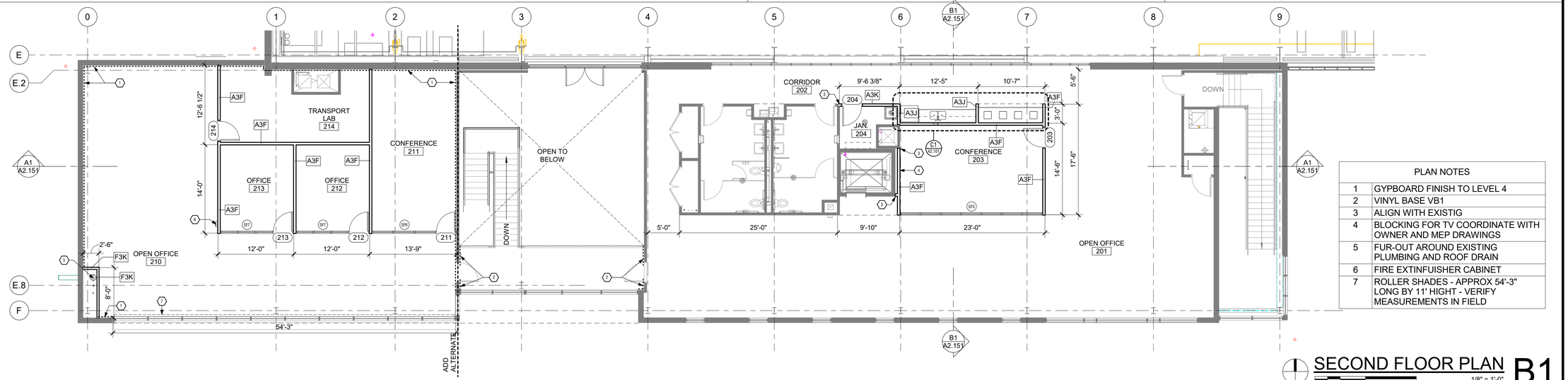
KITCHENETTE EQUIPMENT LEGEND		
#	DESCRIPTION	COMMENTS
1	TOP-FREEZER REFRIGERATOR	MODEL: WRT311FZDB, OR APPROVED EQ.
2	MICROWAVE	MODEL: WMC50522HB, OR APPROVED EQ.
3	UNDERMOUNT SINK & FAUCET	SEE PLUMBING DWGS.



ENLARGED KITCHENETTE PLAN C1

1/4" = 1'-0"

0 2' 4' 8'

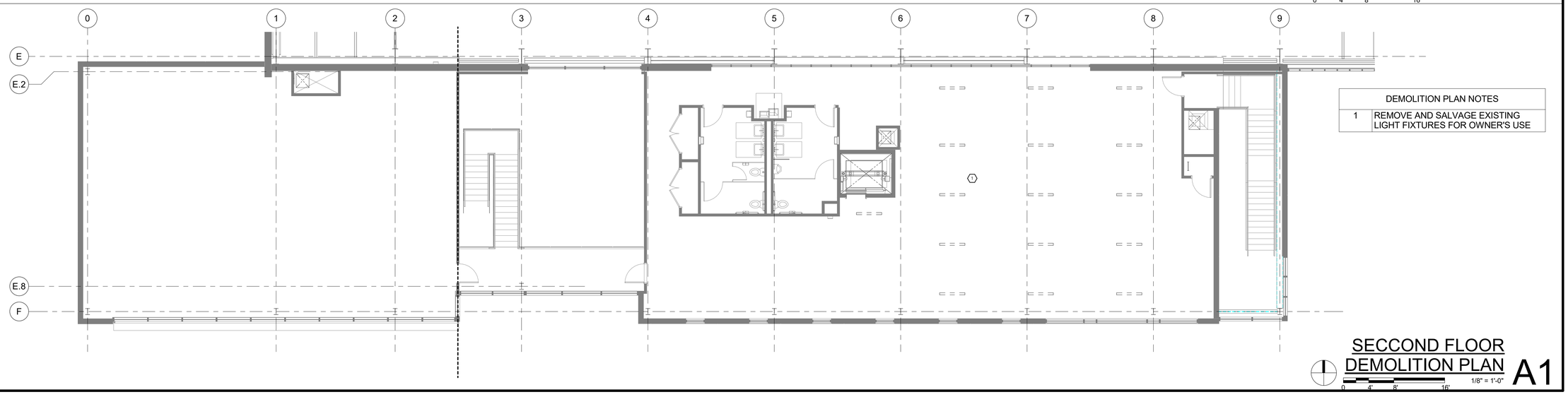


SECOND FLOOR PLAN B1

1/8" = 1'-0"

0 4' 8' 16'

PLAN NOTES	
1	GYPBOARD FINISH TO LEVEL 4
2	VINYL BASE VB1
3	ALIGN WITH EXISTIG
4	BLOCKING FOR TV COORDINATE WITH OWNER AND MEP DRAWINGS
5	FUR-OUT AROUND EXISTING PLUMBING AND ROOF DRAIN
6	FIRE EXTINFUISHER CABINET
7	ROLLER SHADES - APPROX 54'-3" LONG BY 11' HIGHT - VERIFY MEASUREMENTS IN FIELD



SECCOND FLOOR DEMOLITION PLAN A1

1/8" = 1'-0"

0 4' 8' 16'

DEMOLITION PLAN NOTES	
1	REMOVE AND SALVAGE EXISTING LIGHT FIXTURES FOR OWNER'S USE

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DEMX ARCHITECTURE

Architect's Seal:

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License Number: 9967
STATE OF ARKANSAS

UNIVERSITY OF ARKANSAS

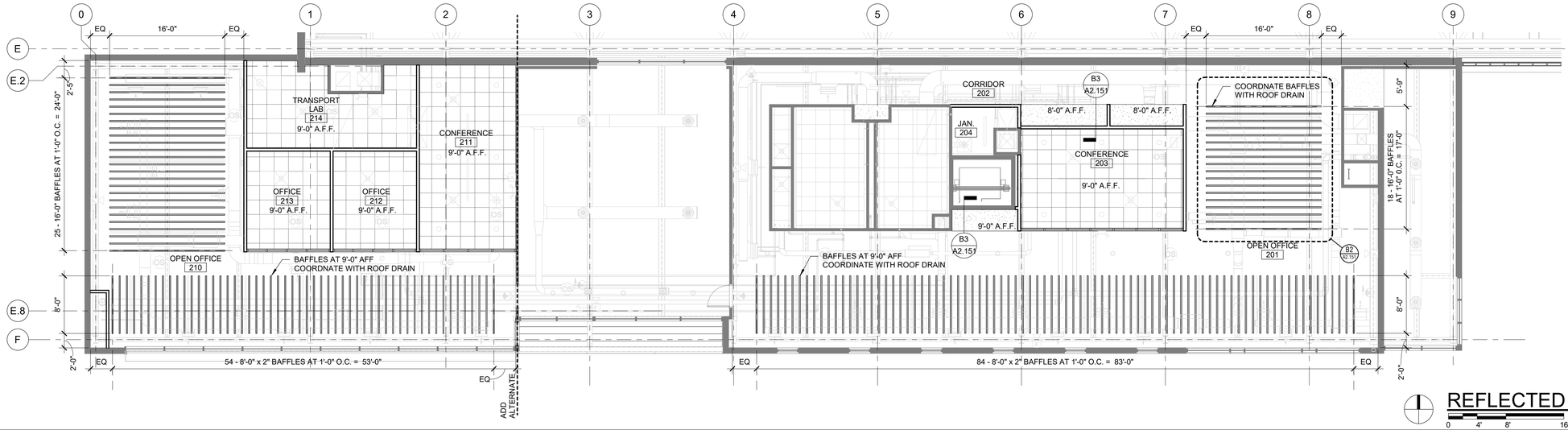
University of Arkansas
CEREC

DATE
2/23/2024

JOB NO.
ST14.014.00B

REVISIONS

A2.101
DEMOLITION PLAN & FLOOR PLAN



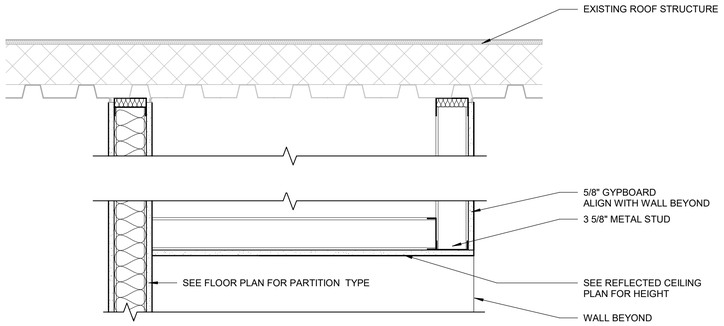
CEILING FINISH LEGEND

- APC1
- GYP./PT
- SUSP. CEILING BAFFLE
- LIGHT FIXTURE, REF. ELEC.
- DIFFUSER / GRILLE, REF. MECH.

REFLECTED CEILING PLAN C1

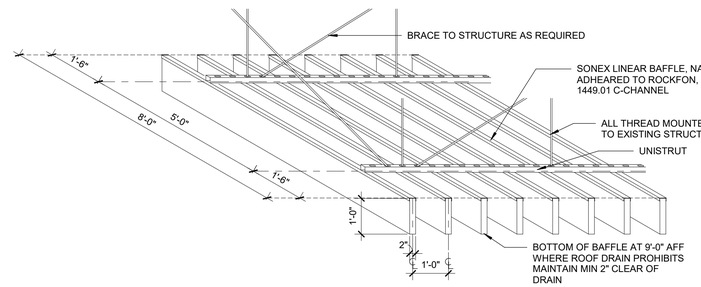
1/8" = 1'-0"

0 4' 8' 16'



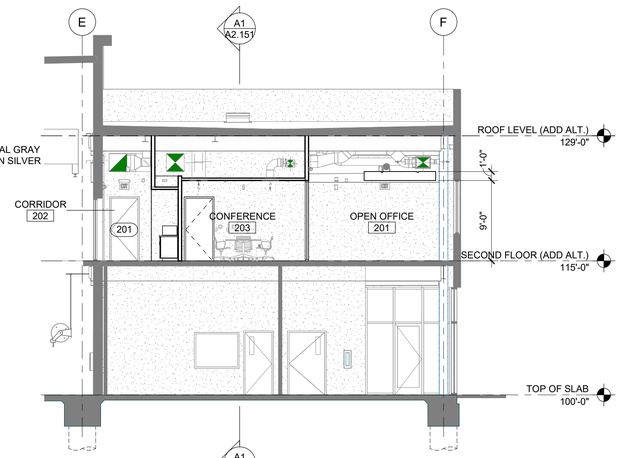
CEILING DETAIL B3

1 1/2" = 1'-0"



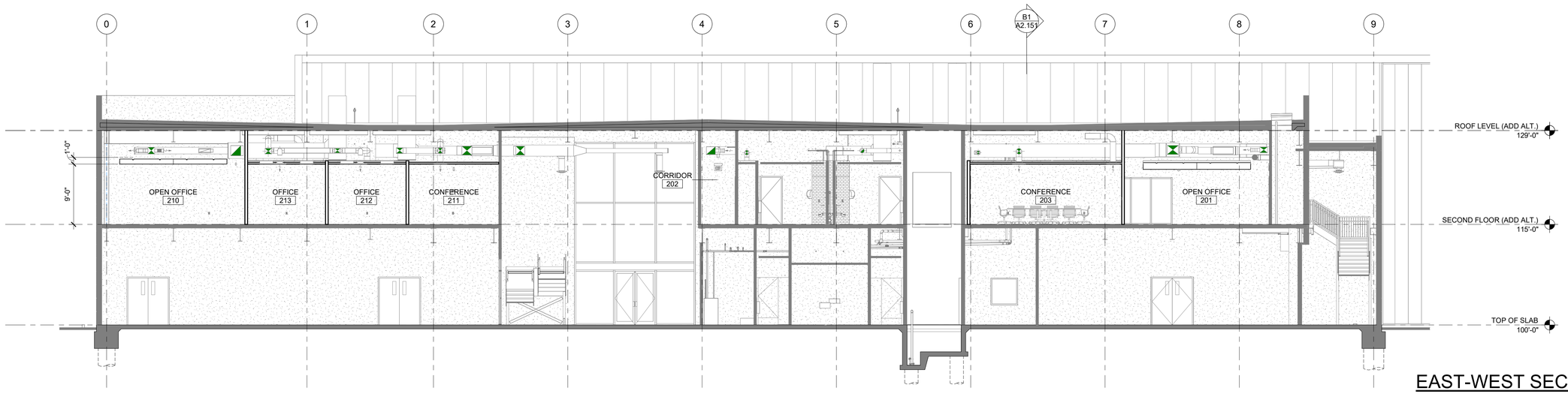
BAFFLE DETAIL B2

1/2" = 1'-0"



NORTH-SOUTH SECTION B1

1/8" = 1'-0"



EAST-WEST SECTION A1

1/8" = 1'-0"

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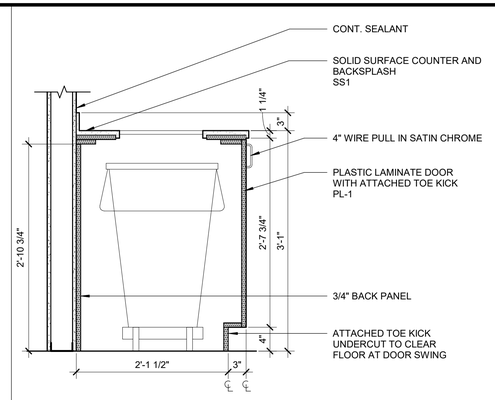
2/23/2024

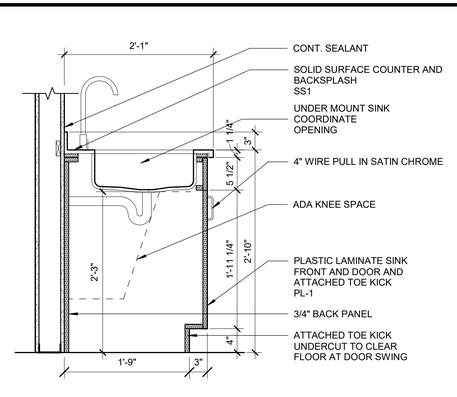
JOB NO.
ST14.014.00B

REVISIONS

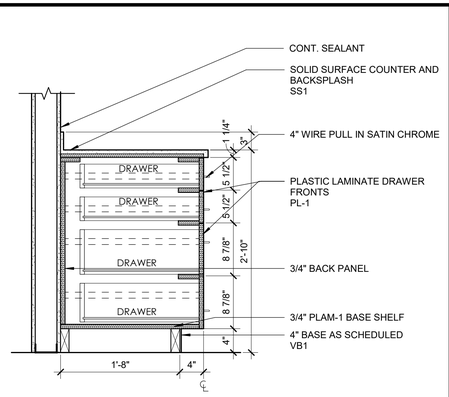
A2.151
REFLECTED CEILING PLAN AND BUILDING SECTIONS



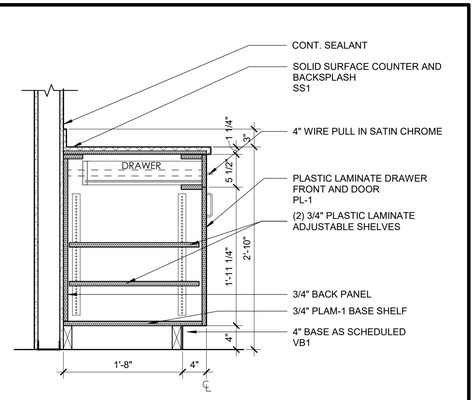
36" RECYCLING D4
1" = 1'-0"



34" ADA SINK CABINET D3
1" = 1'-0"



34" FOUR DRAWERS D2
1" = 1'-0"



34" BASE CABINET D1
1" = 1'-0"

DOOR & FRAME SCHEDULE - ADDITION II

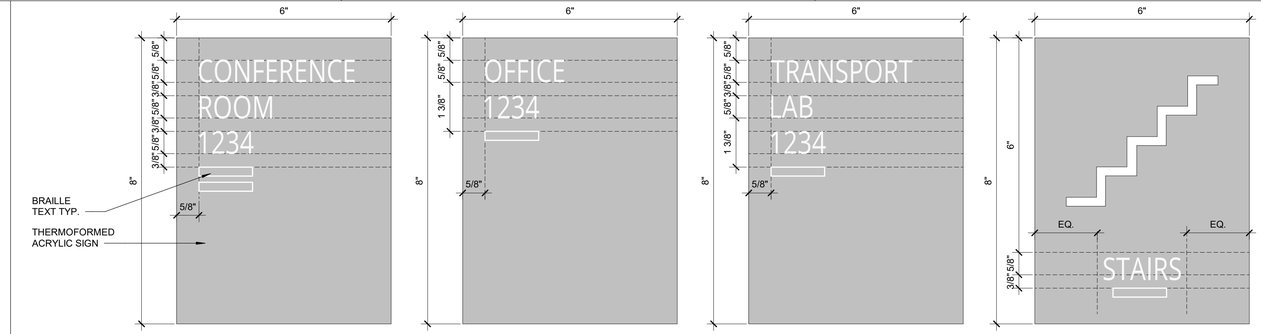
Mark	DOORS					FRAMES					FIRE RATING LABEL (MIN.)	NOTES
	OPENING SIZE								DETAILS			
	WIDTH	HGT.	TYPE	MAT	FIN	TYPE	MAT	FIN	JAMB	HEAD		
203	3'-0"	7'-0"	B	HM	PT	1	HM	PT	A, A3/A2.501	A, A3/A2.501	-	
204	3'-0"	7'-0"	A	HM	PT	1	HM	PT	A, A3/A2.501	A, A3/A2.501	-	
211	3'-0"	7'-0"	E	AL	FF		AL	FF	B, A3/A2.501	C, A3/A2.501	-	
212	3'-0"	7'-0"	E	AL	FF		AL	FF	B, A3/A2.501	C, A3/A2.501	-	
213	3'-0"	7'-0"	E	AL	FF		AL	FF	B, A3/A2.501	C, A3/A2.501	-	
214	3'-0"	7'-0"	B	HM	PT	1	HM	PT	A, A3/A2.501	A, A3/A2.501	-	

MATERIAL & FINISH LEGEND

AL - ALUMINUM
HM - HOLLOW METAL
STL - STEEL
PT - PAINT
FF - FACTORY FINISH

1

DOOR NOTES:
REFERENCE DOOR HARDWARE SPECIFICATION SHEET A2.606 FOR DOOR HARDWARE SETS.



INTERIOR SIGNAGE C1
6" = 1'-0"

FINISH LEGEND

APC1 - 2x2 ACOUSTICAL PANEL CEILING - ARMSTRONG -ULTIMA BEVELED TEGULAR
EX - EXPOSED STRUCTURE, NO FINISH
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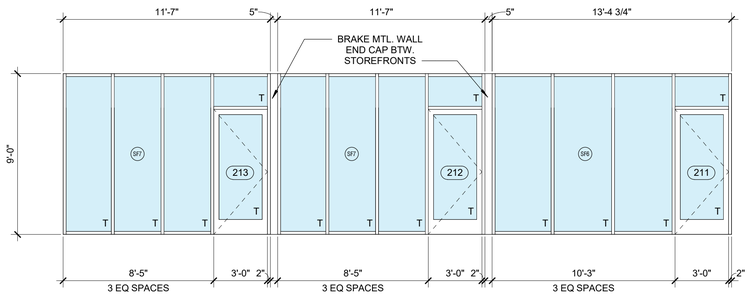
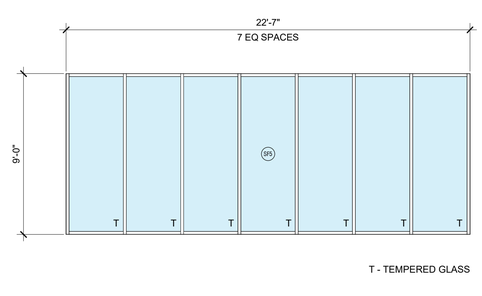
VB1 - VINYL BASE - TARKETT 4" WALL BASE MEDIUM GRAY CG.
SCB - SUSPENDED CEILING BAFFLE - PINTA ACOUSTIC SONEX LINEAR BAFFLES - NATURAL GRAY
SH - SEALER / HARDENER
SS1 - SOLID SURFACE - CORIAN - DOVE
(--) - FINISH NOT REQUIRED

NOTES

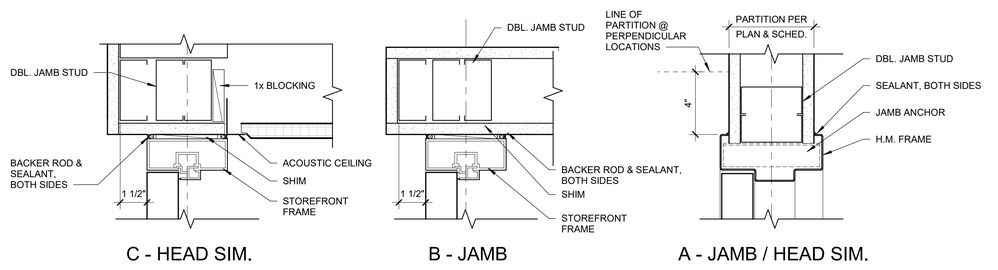
1. ROLLER WINDOW SHADES AT SOUTH GLAZING.



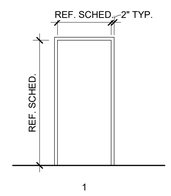
STOREFRONT ELEVATIONS SF6 & SF7 B2
1/4" = 1'-0"



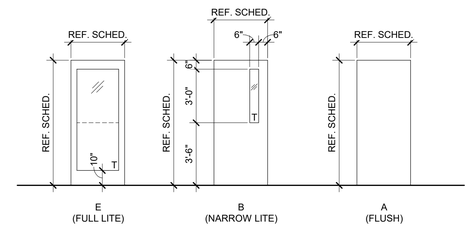
STOREFRONT ELEVATION SF5 B1
1/4" = 1'-0"



FRAME DETAILS A3
3" = 1'-0"



H.M. FRAME TYPES A2
1/4" = 1'-0"



DOOR TYPES A1
1/4" = 1'-0"

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DATE
2/23/2024

JOB NO.
STI4.014.00B

REVISIONS
04/29/2024

A2.501
DOOR SCHEDULE, DETAILS AND WINDOW ELEVATIONS

COLD FORMED METAL FRAMING- SECTION 05 40 00

PART 1 - GENERAL

1.3PERFORMANCE REQUIREMENTS
A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.
2. Interior Design Loads: Provide a minimum of 5 psf over the entire surface of the wall in spaces not exposed to exterior wind loads.
3. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
a. Exterior Non-Load-Bearing Metal Wall Panel Curtain-Wall Framing: Horizontal deflection of 1/360 of the wall height.
c. Soffit and Ceiling Joist Framing: Vertical deflection of 1/240 of the span.
4. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F (67 deg C).
5. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
a. Upward and downward movement of 3/4 inch.

1.4SUBMITTALS
A. Product Data: For each type of cold-formed metal framing product and accessory indicated.
C. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining Work.
1. For cold-formed metal framing indicated to comply with design loads, include structural analysis data and drawings signed and sealed by the qualified professional engineer responsible for their preparation.

1.5QUALITY ASSURANCE
A. Installer Qualifications: An experienced installer who has completed cold-formed metal framing similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
B. Engineering Responsibility: Engage a qualified professional engineer to prepare design calculations, Shop Drawings, and other structural data.

1.6DELIVERY, STORAGE, AND HANDLING
A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.

PART 2-PRODUCTS

2.1MANUFACTURERS
A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cold-formed metal framing that may be incorporated into the Work include, but are not limited to, the following:
1. Allied Studco.
2. AllSteel Products, Inc.
3. California Expanded Metal Products Company.
4. ClarkWestern Building Systems.
5. Consolidated Fabricators Corp.; Building Products Division.
6. Dale/Incor.
7. Dietrich Metal Framing; a Worthington Industries Company.
8. MarinoWare; a division of Ware Industries.
9. SCAFCO Corporation.
10.Steeler, Inc.
11.The Steel Network, Inc

2.2MATERIALS
A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.
B. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
1. Grade: As required by structural performance.
2. Coating: G90 (Z275).

2.3NON-LOAD-BEARING CURTAIN-WALL FRAMING
A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, complying with ASTM C 955, and as follows:
1. Minimum Uncoated-Steel Thickness: 0.0329 inch.
2. Flange Width: 1-5/8 inches.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, complying with ASTM C 955, and as follows:1. Minimum Uncoated-Steel Thickness: Matching steel studs.
1. Flange Width: 1-1/4 inches.
C. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads, and as follows:.
1. Minimum Uncoated-Steel Thickness: 0.0428 inch.
2. Flange Width: 2-1/2 inches.
D. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal and lateral loads, and as follows:
a. Minimum Uncoated-Steel Thickness: 0.0428 inch.
b. Flange Width: 2-1/2 inches.
2. Inner Track: Of web depth indicated, and as follows:
a. Minimum Uncoated-Steel Thickness: 0.0428 inch.
b. Flange Width: 4 inches.
E. Vertical Deflection Clips: Manufacturer's standard bypass or head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Dietrich Metal Framing; a Worthington Industries Company.
b. MarinoWare, a division of Ware Industries.
c. SCAFCO Corporation
d. The Steel Network, Inc.
F. Expansion, Control and Construction Joints: Provide steel studs on both sides of insulated metal wall panel joints and on both sides of expansion joints and other locations with wall surfaces are discontinuous.

2.4SOFFIT AND CEILING JOIST FRAMING
A. Steel Soffit and Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, unpunched, with stiffened flanges, complying with ASTM C 955, and as follows:
1. Minimum Uncoated-Steel Thickness: 0.0428 inch.
2. Flange Width: 1-5/8 inches, minimum.

2.5 FRAMING ACCESSORIES
A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. End clips.
5. Foundation clips.
6. Gusset plates.
7. Stud kickers, knee braces, and girts.
8. Joist hangers and end closures.
9. Hole reinforcing plates.
10.Backer plates.
F. Welding Electrodes: Comply with AWS standards.

2.8GYPSUM SHEATHING
A. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M.
1. Type and Thickness: 1/2 inch thick.
2. Size Options: 48 by 96 inches, 48 by 108 inches, or 48 by 120 inches.
3. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
a. "DensGlass Gold Sheathing" by Georgia-Pacific Corp.
b. "e2XP " by National Gypsum Company.
c. "Securock Glass-Mat Sheathing" by United States Gypsum Company.
d. "GreenGlass by Temple-Inland.

2.9SHEATHING ACCESSORIES
A. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing board to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.
1. For steel framing less than 0.0329 inch thick, attach sheathing to comply with ASTM C 1002.
2. For steel framing from 0.033 to 0.112 inch thick, attach sheathing to comply with ASTM C 954.

B. Glass-Fiber Sheathing Tape for Glass-Mat Gypsum Sheathing to be Painted or Plastered: Self-adhering glass-fiber tape, minimum 2 inches (50 mm) wide, 10 by 10 or 10 by 20 threads per inch (390 by 390 or 390 by 780 threads per meter), of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing board and with a history of successful in-service use.
1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
a. Perma-Tite Tape--PGM 207A; PermaGlas-Mesh, Inc.
b. Quik-Tape; Quik-Tape, Inc.

PART 3- EXECUTION

3.3 INSTALLATION, GENERAL
D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements in this Section.
J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 NON-LOAD-BEARING CUTAIN-WALL INSTALLATION
A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as follows:
1. Stud Spacing: 16 inches minimum.
C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
1. Install single deep-leg deflection tracks and anchor to building structure.
2. Install double deep-leg deflection tracks and anchor outer track to building structure.
3. Connect vertical deflection clips to bypassing or infill studs and anchor to primary building structure.
a. Install solid blocking at every other stud.
2. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.

3.6 GYPSUM SHEATHING INSTALLATION
A. General: Install gypsum sheathing to comply with GA-253 and manufacturer's written instructions.
B. Cut boards at penetrations, edges, and other obstructions of the work; fit tightly against abutting construction, except provide a 3/8-inch setback where non-load-bearing construction abuts structural elements.
C. Coordinate sheathing installation with flashing and joint sealant installation so these materials are installed in the sequence and manner that prevent exterior moisture from passing through completed exterior wall assembly
D. Apply fasteners so screw heads bear tightly against face of sheathing boards but do not cut into facing.
E. Do not bridge building expansion joints with sheathing; cut and space edges to match spacing of structural support elements.
F. Vertical Installation: Install 48-inch-wide gypsum sheathing boards vertically with vertical edges centered over flanges of steel studs. Abut ends and edges of each board with those of adjacent boards. Screw-attach boards at perimeter and within field of board to each steel stud at approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.
G. Fill joints or openings that exceed 1/8 inch in size with expanding urethane foam shaved flush with the sheathing surface.

3.7 FIELD QUALITY CONTROL
A. Testing: Owner will engage a qualified independent testing agency to perform field quality-control testing.
B. Field and shop welds will be subject to inspection and testing.
C. Testing agency will report test results promptly and in writing to Contractor and Architect.
D. Remove and replace Work that does not comply with specified requirements.
E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.

END OF SECTION 05 40 00

SECTION 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section Includes:
1. Wood and plywood blocking and nailers.
2. Plywood backing panels.
1.3 DEFINITIONS

A. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
Retain only those grading agencies referenced in this Section.
1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NHLA: National Hardwood Lumber Association.
3. NLGA: National Lumber Grades Authority.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS
A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL
A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.
B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS
A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
D. Application: Treat
1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches above the ground in crawl spaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
1. Treatment shall not promote corrosion of metal fasteners.
2. Exterior or Interior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
E. Application: Treat all miscellaneous carpentry unless otherwise indicated.

2.4 MISCELLANEOUS LUMBER
A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
1. Blocking.
2. Nailers.
3. Cants.
B. For items of dimension lumber size, provide Construction or No. 2 grade lumber of any species.
C. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
1. Mixed southern pine, No. 2 grade; SPIB.
2. Hem-fir or hem-fir (north), Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
3. Spruce-pine-fir (south) or spruce-pine-fir, Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
4. Eastern softwoods, No. 2 Common grade; NELMA.
5. Northern species, No. 2 Common grade; NLGA.
6. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA.
D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.5 PLYWOOD FOR BLOCKING AND NAILERS

A. Plywood: DOC PS 1, Exterior, AC, in thickness indicated.
B. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
C. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
D. Application: Treat all plywood used for blocking and nailers.

2.6 PLYWOOD BACKING PANELS
A. Equipment Backing Panels: DOC PS 1, Exterior, AC, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.7FASTENERS
A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
B. Nails, Brads, and Staples: ASTM F 1667.
C. Power-Driven Fasteners: NES NER-272.
D. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.
E. Lag Bolts: ASME B18.2.1.
F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

PART 3 - EXECUTION

3.1INSTALLATION, GENERAL
A. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels.
D. Do not splice structural members between supports unless otherwise indicated.
E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
F. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
G. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.
H. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
I. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 10 53

SECTION 079200 - JOINT SEALANTS

PART 2 - PRODUCTS

2.1MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

E. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2SILICONE JOINT SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:
a. BASF Building Systems; Omniseal 50.
b. Dow Corning Corporation; 756 SMS.
c. GE Advanced Materials - Silicones; SilPruf NB SCS9000.
d. May National Associates, Inc.; Bondaflex Sil 295.
e. Pecora Corporation; 864.
f. Polymeric Systems, Inc.; PSI-641.
g. Sika Corporation, Construction Products Division; SikaSil-C995.
h. Tremco Incorporated; Spectrem 2.

B. Single-Component, Nonsag, Traffic-Grade, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use T.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dow Corning Corporation; 790.
b. May National Associates, Inc.; Bondaflex Sil 728 NS.

C. Mildew-Resistant, Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

1. Products: Subject to compliance with requirements:

a. Pecora Corporation; 898.

D. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

a. BASF Building Systems; Omniplus.
b. Dow Corning Corporation; 786 Mildew Resistant.
c. GE Advanced Materials - Silicones; Sanitary SCS1700.
d. May National Associates, Inc.; Bondaflex Sil 100 WF.
e. Tremco Incorporated; Tremsil 200 Sanitary.

2.3LATEX JOINT SEALANTS

A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Products: Subject to compliance with requirements, provide one of the following:

a. BASF Building Systems; Sonolac.
b. Bostik, Inc.; Chem-Calk 600.
c. May National Associates, Inc.; Bondaflex Sil-A 700.
d. Pecora Corporation; AC-20+.
e. Schnee-Morehead, Inc.; SM 8200.
f. Tremco Incorporated; Tremflex 834.

2.4ACOUSTICAL JOINT SEALANTS

A. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
b. ATS Acoustics; QuietSeal Pro Acoustical Sealant.
c. Auralex; StopGap Acoustical Sealant.
d. Grabber Construction Products; Acoustical Sealant GSC.
e. Pecora Corporation; AC-20 FTR.
f. USG Corporation; SHEETROCK Acoustical Sealant.

2.5JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) Type B (bicellular material with a surface skin) or either of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.6MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

END OF SECTION 07 92 00

1

SEE SHEET A2.604 FOR REVISED SPEC. SECTION 081113

SECTION 08 1113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2SUMMARY
A. Section Includes:
1. Standard hollow metal doors and frames.

1.3SUBMITTALS
A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, temperature-rise ratings, and finishes.
B. Shop Drawings: Include the following:
1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.
9. Details of conduit and preparations for power, signal, and control systems.
C. Other Action Submittals:
1. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.

1.4QUALITY ASSURANCE
A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

1.5DELIVERY, STORAGE, AND HANDLING
A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
1. Provide additional protection to prevent damage to finish of factory-finished units.
B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

1.6PROJECT CONDITIONS
A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7COORDINATION
A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1MATERIALS
A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 or A60 metallic coating.
D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z coating designation; mill phosphatized.
1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

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04/29/2024

A2.601
ARCHITECTURAL SPECIFICATIONS

F. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow metal frames of type indicated.
G. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.
H. Glazing: Comply with requirements in Division 08 Section "Glazing."
I. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.2STANDARD HOLLOW METAL DOORS
A. General: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.
1. Design: Flush panel.
2. Core Construction: Manufacturer's standard kraft-paper honeycomb, polyurethane, polyisocyanurate, or vertical steel-stiffener core.
3. Vertical Edges for Single-Acting Doors: Beveled edge.
a. Beveled Edge: 1/8 inch in 2 inches.
4. Top and Bottom Edges: Closed with flush 0.042-inch- thick, end closures or channels of same material as face sheets.
5. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
B. Interior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
1. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 2 (Seamless).
C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
D. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

2.3STANDARD HOLLOW METAL FRAMES
A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
B. Interior Frames: Fabricated from cold-rolled steel sheet.
1. Fabricate frames with mitered or coped corners.
2. Fabricate frames as full profile welded unless otherwise indicated.
3. Frames for Level 3 Steel Doors: 0.059-inch (16 gauge) thick steel sheet.
C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

2.4FRAME ANCHORS
A. Jamb Anchors:
1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
2. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:
1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2.5STOPS AND MOLDINGS
A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch thick, fabricated from same material as door face sheet in which they are installed.
B. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch high unless otherwise indicated.

2.6ACCESSORIES
A. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

2.7FABRICATION
A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

2.8STEEL FINISHES
A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.

PART 3 - EXECUTION

3.1EXAMINATION
A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2PREPARATION
A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.
C. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3INSTALLATION
A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.
1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
a. At fire-protection-rated openings, install frames according to NFPA 80.
b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
c. Install frames with removable glazing stops located on secure side of opening.
d. Install door silencers in frames before grouting.
e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
f. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
g. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.
2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
4. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
5. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Standard Steel Doors:
a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
3. Smoke-Control Doors: Install doors according to NFPA 105.
D. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.
1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

END OF SECTION 081113

SEE SHEET A2.604 FOR REVISED SPEC SECTION 081113

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

1

PART 1 - GENERAL

1. RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1. SUMMARY

A. Section Includes: Kawneer Architectural Aluminum Storefront Systems, accessories, shims and anchors, and perimeter sealing of storefront units.

1. Types of Kawneer Aluminum Storefront Systems include:
a. Trifab® VG 451T Front-Glazed Storefront System – 2" x 4-1/2" nominal dimension;Thermal, Front-Glazed, Screw Spline Fabrication for areas without sunshade louvers
b. Trifab® CG 451T Center-Glazed Storefront System – 2" x 4-1/2" nominal dimenstion; Thermal, Center-Glazed, Screw Spline Fabrication for areas with sunshade louvers

B. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufactures Association (AAMA) – AAMA Glossary (AAMA AG).

1. PERFORMANCE REQUIREMENTS General Performance: Aluminum-framed storefront system shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:

A. Storefront System Performance Requirements:

1. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft2 (0.3 l/s · m2) at a static air pressure differential of 6.24 psf (300 Pa).
2. Water Resistance: The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 9 psf (383 Pa) as defined in AAMA 501.
3. Uniform Load: A static air design load of 40 psf (1915 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
4. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than:

1. SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum frame storefront system indicated.

B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.

C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.

D. Other Action Submittals:
1. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

1. QUALITY ASSURANCE

A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.

B. Manufacturer Qualifications: A manufacturer that has been providing framing products for a minimum of 25 years, capable of providing aluminum framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.

C. Source Limitations: Obtain aluminum framed storefront system through one source from a single manufacturer, as well as other framing systems involved in complete building framing package.
D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum framed storefront system and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements." Do not modify size and dimensional requirements.

1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

E. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

F. Structural-Sealant Joints: Design reviewed and approved by structural-sealant manufacturer.

1. PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of aluminum framed storefront openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

1. WARRANTY

A. Manufactures Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
1. Warranty Period: Ten (10) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

PART 2 - PRODUCTS

2.1MANUFACTURERS
A. Basis-of-Design Product:
1. Kawneer Company Inc. Trifab® 451T (thermal) Storefront System
2. 2" x 4-1/2" (50.8 mm x 114.3 mm) System Dimensions
3. Glass: Front-set at frames without sunshade louvers
4. Glass: Center-set at frames with sunshade louvers
B. Subject to compliance with requirements, provide a comparable product by the following:
1. Oldcastle
2. Wausau
C. Substitution Acceptance: No other products acceptable or open for substitution.

2.2MATERIALS

A. Aluminum Extrusions: Alloy and temper recommended by aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper
B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.

C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

E. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

F. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.

2.3STOREFRONT FRAMING SYSTEM

A. Thermal Barrier (Trifab® 451T):
1. Kawneer IsoLock® Thermal Break with a 1/4" (6.4 mm) separation consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections.
a. Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.

2.4GLAZING SYSTEMS

A. Glazing: As specified in Division 08 Section "Glazing."
B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.

2.5ENTRANCE DOOR SYSTEMS
A. Entrance Door Hardware: To Be Provided with door from Door Manufacturer

2.6ACCESSORY MATERIALS
A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 07 Section "Joint Sealants."
B. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30 mil (0.762 mm) thickness per coat.

2.7ALUMINUM FINISHES

A. Factory Finishing:
1. Kawneer Permanodic® AA-M12C22A41, AAMA 611, Architectural Class I Clear Anodic Coating (Color #14 Clear) (Optional).

PART 3 - EXECUTION

3.1INSTALLATION

A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing aluminum framed storefront system, accessories, and other components.

B. Install aluminum framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.

C. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.

D. Install aluminum framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within sliding door to the exterior.

E. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.2ADJUSTING, CLEANING, AND PROTECTION

A. Clean aluminum surfaces immediately after installing aluminum framed storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

B. Clean glass immediately after installation. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.

C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 08 44 13

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1SUMMARY
A. Intent: The intent of this Section is to provide finish hardware for the proper operation and control of all wood, hollow metal, and aluminum doors in the Project. Prior to bidding, notify the Architect of any doors that do not have hardware meeting this intention.
B. Section Includes: Provide all items of finish hardware required to adequately trim, hang, and operate all doors, as is hereinafter specified and listed in the Hardware Schedule.
1. The hardware supplier will be responsible to furnish correct hardware on labeled doors to satisfy State and Local Building Codes.
2. Should items of hardware, not definitely specified, be required for completion of work, furnish such items of type and quality suitable to the services required and comparable to the adjacent hardware.
3. Provide all necessary standard and special fasteners, screws, bolts, expansion shields or anchors to properly secure hardware to its intended door, frame, or other surface.
C. Related Sections include the following:
1. Division 08, Section Hollow Metal Frames
2. Division 08, Section Aluminum Framed Entrances and Storefronts
D. This Section includes, but is not necessarily limited to furnishing and installing complete, the following:
1. Finish hardware for proper operation, function, control and protection of all doors, as required.

1.2ACTION SUBMITTALS
A. General: Submit the following in accordance with Section 01 33 00.
B. Product Data: Provide a catalog cut sheet, clearly marked and identified, illustrating and describing each product included in the Hardware Schedule.
1. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Formulate catalog cut sheets into sets and include a set with each copy of the Hardware Schedule submitted.
C. Door Hardware Schedule: Prepared by or under the supervision of Architectural Hardware Consultant, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
3. Content: Include the following information:
a. Type, style, function, size, label, hand, and finish of each door hardware item.
b. Complete designations of every item required for each door or opening including name and manufacturer.
c. Fastenings and other pertinent information.
d. Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule. Use same scheduling sequence and format and use same door numbers and hardware set numbers as in the Contract Documents.
e. Explanation of abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for door hardware.
g. Door and frame sizes and materials.
h. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other Work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
D. Samples for Verification: If so requested by the Architect, provide a sample of any product or item requested, properly marked and tagged, for the opening for which it is intended.
E. Keying: Submit separate detailed schedule indicating keying for all locks. Keying schedule must be approved by the Owner prior to ordering any permanent cylinders.

1.3QUALITY ASSURANCE
A. Substitutions: Request for substitutions for alternative hardware items will not be accepted on this Project unless specifically indicated. If any specified product is listed as a "No Substitution" product, only that specified product shall be provided as indicated.
B. Installer Qualifications: An experienced installer who has completed door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
C. Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a qualified Architectural Hardware Consultant, available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
1. The hardware supplier shall be engaged regularly in the furnishing, delivery and servicing of contract builders' hardware and must be experienced and knowledgeable in all phases of estimating, detailing, scheduling, master keying, shipping and installation practices.
2. When electro-mechanical or electronic hardware is supplied, a qualified individual with a minimum five-(5) years of experience shall be available for assistance.
D. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
1. Provide hardware that complies with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," and ANSI A117.1.
E. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
2. Preliminary key system schematic diagram.
3. Requirements for key control system.
4. Address for delivery of keys.
5. Requirements and/or location of Key Cabinet.

1.4DELIVERY, STORAGE, AND HANDLING
A. Marking and Packaging: All items of hardware shall be delivered to the site in manufacturer's original cartons or boxes. Mark each box with hardware heading and door number according to approved hardware schedule.
B. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation: Provide a complete packing list showing items, door numbers and hardware headings with each shipment.
C. Store hardware in shipping cartons above ground and under cover to prevent damage. Provide secure lockup for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable -so that completion of the Work will not be delayed by hardware losses both before and after installation
D. Aluminum Door Hardware: Deliver hardware for aluminum doors as directed by the door supplier.

1.5COORDINATION
A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.6MAINTENANCE
A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
B. Maintenance Service: If there are any products listed hereinafter that normally require a maintenance or service contract, provide the Owner and Architect with details and costs of standard maintenance or service contract.

1.7WARRANTY
A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of operators and door hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
C. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.
D. Warranty Period for Manual Closers: 10 years from date of Substantial Completion.
E. Warranty Period for Exit Devices:
1. Mechanical: 5 years from date of Substantial Completion.
2. Electrical: [illegible] years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1MANUFACTURERS
A. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
1. Provide the materials or products indicated by trade names, manufacturer's name, or catalog number.
2. Provide manufacturer's standard products meeting the design intent of this Specification, free of imperfections affecting appearance or serviceability.
3. Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

2.2SPECIAL REQUIREMENTS
A. Hinges:
1. Provide non-removable pins for all exterior doors. Use non-rising pins for all other doors.
2. All doors at wet and high humidity areas, such as kitchens, shower rooms, mechanical rooms, etc. shall have a brass or bronze (non-ferrous) or stainless base metal hinge.
3. Provide three (3) hinges for doors up to 7'6" in height. Provide one (1) additional hinge per 30" of door height over 7'6".
B. Locksets:
1. All locksets ANSI A256.13 Series 1000, Grade 1 Operational and Grade 2 Security mortise, unless noted otherwise.
2. All doors leading into hazardous spaces, such as mechanical, electrical, and telecommunication rooms shall have a textured surface on the door lever.
3. Product (No Substitutions): Corbin Russwin ML2000, NSA Lever/Rose.
C. Closers:
1. Comply with manufacturer's recommendations for unit size based on door size, weather exposure and usage.
2. Provide parallel arms for all overhead closers, except as otherwise indicated.
3. All Closers UL Certified to be in compliance with UBC 7.2 and UL 10C.
4. Closers with Pressure Relief Values will not be acceptable.
5. Supplier to provide any brackets or plates required for proper Installation of door closers.
6. Product (No Substitutions): LCN 4040XP
D. Special Notes
1. All doors to have operable hardware
2. Provide stop that is required for the application. A wall stop is preferred. If an overhead stop or floor stop is a better application, it is to be provided.
3. Smoke seal and intumescent seal is to be provided as required on fire labeled openings.
4. Provide drop plates and any required mounting brackets for surface door closers at, but not limited to, aluminum doors in aluminum framing.
5. All doors leading into hazardous spaces, mechanical, electrical, and telecommunication rooms shall have a textured surface on the door lever.

2.3MATERIALS
1. Screws and Fasteners: Provide all screws and fasteners of the proper size and type to properly anchor or attach the item of hardware scheduled. Provide all fasteners with Phillips heads, unless security type screws (spanner-head or torx-head) are hereinafter specified.

2.4HARDWARE PRODUCTS

2.5FINISHES
A. Provide matching finishes for hardware units at each door to the greatest extent possible, unless otherwise indicated. In general, match items to the finish for the latch, lock or push pull unit for color and texture.
B. Hardware finishes as follows:
1. 626 - Satin Chrome-plated.
2. 630 – Satin Stainless Steel.
3. 689 – Aluminum Powder Coat.

PART 3 - EXECUTION

3.1EXAMINATION
A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2PREPARATION
A. Steel Doors and Frames: Comply with DHI A115 series.
1. Surface-Applied Door Hardware: Drill and tap doors and frames according to SDI 107 or ANSI A250.6, whichever is more stringent.

3.3INSTALLATION
A. Installation shall be by a qualified installer with a minimum five (5) years of experience in the installation of commercial grade hardware. Manufacturer's instructions shall dictate templating and installation.
B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
C. Prior to hardware installation, the General Contractor shall setup a meeting with the Hardware Supplier and the Hardware installer to ensure the installer has and understands the manufacturers installation requirements for all hardware items
D. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
E. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Architect prior to installation.
F. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

3.4FIELD QUALITY CONTROL
A. Perform final inspection with hardware installer and hardware supplier present to ensure correct installation and operation, and check for any damaged or defective items. Observe and inspect that all hardware has been installed to its correct destination in proper working order.
B. Independent Architectural Hardware Consultant: Owner reserves the right to engage a qualified independent Architectural Hardware Consultant to perform a separate independent inspection and to prepare an inspection report.

3.5ADJUSTING
A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended.
1. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust door closers immediately upon installation. Adjust in exact conformance with manufacturer's printed instructions. Advance backcheck to eliminate shock at dead stop. Set closer latching speed to assure unassisted positive latching.
a. Degree of swing of door for self-limiting closers shall be maximum available.
B. At completion of the installation and prior to Substantial Completion, make final adjustments to door closures and other items of hardware. Leave all hardware clean and fully operable. Should any item be found to be defective, it shall be repaired or replaced as directed.

SEE SHEET A2.604 FOR REVISED SPEC. SECTION 087100

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REVISIONS
04/29/2024

A2.602
ARCHITECTURAL SPECIFICATIONS

SEE SHEET A2.604 FOR REVISED SPEC. SECTION 087100

C. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust as follows:
1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.
2. Consult with and instruct Owner's personnel on recommended maintenance procedures.
3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.
4. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.6CLEANING AND PROTECTION
A. Clean adjacent surfaces soiled by door hardware installation.
B. Clean operating items as necessary to restore proper function and finish.
C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.7DEMONSTRATION
A. Instruct Owner's personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.
B. After hardware is installed and adjusted, the Supplier shall inspect the job with the Architect and the General contractor to determine if the hardware is functioning properly.

3.8HARDWARE SCHEDULE
A. The hardware sets listed below represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the close of the bidding process.
Final hardware to be determined.

END OF SECTION 087100

1

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section Includes:
1. Interior gypsum board.
2. Tile backing panels.

1.3 ACTION SUBMITTALS
A. Product Data: For each type of product.

1.4 DELIVERY, STORAGE AND HANDLING
A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS
A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL
A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD
A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Georgia-Pacific Gypsum LLC.: ToughRock® Mold-Guard™
2. National Gypsum Company: Gold Bond® XP® Gypsum Board
3. USG Corporation: Sheetrock® Brand Mold Tough® Gypsum Panels
B. Gypsum Wallboard: Type X: ASTM C 1396
Gypsum wallboard is also available in 1/4- and 3/8-inch (6.4- and 9.5-mm) thicknesses for limited applications.
1. Thickness: 5/8 inch.
2. Long Edges: Tapered.

2.4 TILE BACKING PANELS
A. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or 1325, with manufacturer's standard edges.
1. Products: Subject to compliance with requirements, provide one of the following:
a. James Hardie Building Products, Inc.; Hardiebacker.
b. National Gypsum Company, Permabase Cement Board.
c. USG Corporation; DUROCK Cement Board.
2. Thickness: 5/8 inch.
3. Mold Resistance: ASTM D 3273, score of 10.

2.5 TRIM ACCESSORIES
A. Interior Trim: ASTM C 1047.
1. Material: Vinyl complying with ASTM D-1784.
2. Shapes: Provide vinyl trim with perforated flanges for embedding in finishing compound. Provide in the following shapes or as shown:
a. Cornerbead.
b. LC-Bead: J-shaped; exposed long flange receives joint compound.
c. L-Bead: L-shaped; exposed long flange receives joint compound.
d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
e. Expansion (control) joint.

2.6 JOINT TREATMENT MATERIALS
A. General: Comply with ASTM C 475/C 475M.
B. Joint Tape:
1. Interior Gypsum Board: Paper.
2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
3. Tile Backing Panels: As recommended by panel manufacturer.
C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
a. Use setting-type compound for installing paper-faced metal trim accessories.
3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.
5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound or high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.
D. Joint Compound for Tile Backing Panels:
1. Cementitious Backer Units: As recommended by backer unit manufacturer.

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS, GENERAL
A. Comply with ASTM C 840.
B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
E. Form control and expansion joints with space between edges of adjoining gypsum panels.
F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.
G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.2 APPLYING INTERIOR GYPSUM BOARD
A. Install interior gypsum board in the following locations:
1. Wallboard Type: Vertical surfaces unless otherwise indicated.
B. Single-Layer Application:
1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.3 INSTALLING TRIM ACCESSORIES
A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
B. Interior Trim: Install in the following locations:
1. Cornerbead: Use at outside corners.
2. LC-Bead: Use at exposed panel edges.
3. L-Bead: Use where indicated.
4. U-Bead: Use at exposed panel edges where indicated.

3.4 FINISHING GYPSUM BOARD
A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Panels that are substrate for tile or applied finish panel surfaces.
3. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
a. Primer and its application to surfaces are specified in other Division 09 Sections.
4. Level 5: At all horizontal panel surfaces and panel surfaces scheduled to receive gloss or semigloss coatings.
a. Primer and its application to surfaces are specified in other Division 09 Sections.

3.5 PROTECTION
A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 29 00

SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY
A. This Section includes acoustical panels and exposed suspension systems for ceilings.
B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete at ceilings.

1.2 DEFINITIONS
A. AC: Articulation Class.
B. CAC: Ceiling Attenuation Class.
C. LR: Light Reflectance coefficient.
D. NRC: Noise Reduction Coefficient.

1.3 SUBMITTALS
A. Product Data: For each type of product indicated.
B. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
1. Ceiling suspension system members.
2. Method of attaching hangers to building structure.
3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
4. Minimum Drawing Scale: 1/8 inch = 1 foot (1:96).
C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
1. Acoustical Panel: Set of 6-inch- (150-mm-) square Samples of each type, color, pattern, and texture.
2. Exposed Suspension System Members, Moldings, and Trim: Set of 12-inch- (300-mm-) long Samples of each type, finish, and color.
D. Delegated-Design Submittal: For seismic restraints for ceiling systems.
1. Include design calculations for seismic restraints including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
2. Maintenance Data: For finishes to include in maintenance manuals. long Samples of each type, finish, and color.

1.4 QUALITY ASSURANCE
Retain first paragraph below if Contractor or manufacturer selects testing agency.
A. Acoustical Testing Agency Qualifications: An independent testing laboratory, or an NVLAP-accredited laboratory, with the experience and capability to conduct the testing indicated. NVLAP-accredited laboratories must document accreditation, based on a "Certificate of Accreditation" and a "Scope of Accreditation" listing the test methods specified.
B. Source Limitations:
1. Acoustical Ceiling Panel: Obtain each type through one source from a single manufacturer.
2. Suspension System: Obtain each type through one source from a single manufacturer.
3. Surface-Burning Characteristics: Provide acoustical panels with the following surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84:

1.5 DELIVERY, STORAGE, AND HANDLING
A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.6 PROJECT CONDITIONS
A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

1.7 COORDINATION
A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.8 EXTRA MATERIALS
A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Acoustical Ceiling Panels: Full-size panels equal to 2.0 percent of quantity installed.
2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of quantity installed.
3. Hold-Down Clips: Equal to 2.0 percent of quantity installed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design seismic restraints for ceiling systems.
B. Seismic Performance: Suspended ceilings shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.2 ACOUSTICAL PANELS, GENERAL
1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface per ASTM E 795.
B. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.
C. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.
D. Antimicrobial Fungicide Treatment: Provide acoustical panels with face and back surfaces coated with antimicrobial treatment consisting of manufacturer's standard formulation with fungicide added to inhibit growth of mold and mildew and showing no mold or mildew growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

2.3 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING
A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings:
1. Armstrong World Industries, Inc., Optima, white, 24" x 24", NRC .95.
B. Acoustical Field Panels:
1. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:
a. Type and Form: Type XX, other types; described as high-density, ceramic- and mineral-base panels with scrubbable finish, resistant to heat, moisture, and corrosive fumes.
b. Pattern: As indicated by manufacturer's designation.
2. Color: White.
3. LR: Not less than 0.90.
4. NRC: Not less than 0.95.
5. AC: Not less than 190.
6. Edge/Joint Detail: Square tegular with inferface with Prelude XL 15/16" Exposed Tee.
7. Thickness: 1 inch (25 mm).
8. Antimicrobial Treatment: Broad spectrum fungicide and bactericide based.

2.4 METAL SUSPENSION SYSTEMS, GENERAL
A. Recycled Content: Provide products made from steel sheet with average recycled content such that postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.
B. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.
C. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.
1. High-Humidity Finish: Comply with ASTM C 635 requirements for "Coating Classification for Severe Environment Performance".
D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
E. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.

2.5 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING
A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Armstrong World Industries, Inc.
2. USG Corporation
B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation, with prefinished 15/16-inch- (24-mm-) wide metal caps on flanges.
1. Structural Classification: Heavy-duty system.
2. End Condition of Cross Runners: Butt-edge type.
3. Face Design: Flat, flush.
4. Cap Material: Steel cold-rolled sheet.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION
A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION
A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic design requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
1. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
3. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
4. For reveal-edged panels on suspension system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension system surfaces and panel faces flush with bottom face of runners.

3.4 CLEANING
A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 13

SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1RELATED DOCUMENTS

1.2SUMMARY
A. Section Includes:
1. Resilient base.

1.3ACTION SUBMITTALS
A. Samples for Initial Selection: For each type of product indicated.

1.4MATERIALS MAINTENANCE SUBMITTALS
A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5DELIVERY, STORAGE, AND HANDLING
A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.6PROJECT CONDITIONS
A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following time periods:
1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.
B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1RESILIENT BASE
A. Resilient Base:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Armstrong World Industries, Inc.
b. Johnsonite.
c. Roppe Corporation, USA.
d. Mannington.
B. Resilient Base Standard: ASTM F 1861.
1. Material Requirement: Type TS (rubber, vulcanized thermoset).
2. Manufacturing Method: Group I (solid, homogeneous).
3. Style: Cove (base with toe).
C. Minimum Thickness: 0.125 inch.
D. Height:
1. 4 inches typ.
E. Lengths: Coils in manufacturer's standard length.
F. Outside Corners: Job formed.
G. Inside Corners: Job formed.
H. Finish: As selected by Architect from manufacturer's full range.

2.2INSTALLATION MATERIALS
A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1EXAMINATION
A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2PREPARATION
A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
C. Do not install resilient products until they are same temperature as the space where they are to be installed.
1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
D. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3RESILIENT BASE INSTALLATION
A. Comply with manufacturer's written instructions for installing resilient base.
B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
E. Do not stretch resilient base during installation.
F. Job-Formed Corners:
1. Inside Corners: Use straight pieces of maximum lengths possible.

3.4CLEANING AND PROTECTION
A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
B. Perform the following operations immediately after completing resilient product installation:
1. Remove adhesive and other blemishes from exposed surfaces.
C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
D. Cover resilient products until Substantial Completion.

END OF SECTION 09 65 13

SECTION 09 91 23 - INTERIOR PAINTING

PART 1 - GENERAL

1.8 PAINT, GENERAL
A. Material Compatibility:
1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
1.9METAL PRIMERS
A. Primer, Rust-Inhibitive, Water Based:
1. Benjamin Moore; Super Spec High Performance – Acrylic Metal Primer
2. Sherwin Williams; Pro Industrial – ProCryl Universal Primer
3. PPG; Pitt-Tech Plus Int/Ext DTM Industrial Primer 90-912
1.10 WATER-BASED PAINTS
A. Latex, Interior, Institutional Low Odor/VOC, Flat (Gloss Level 1):
1. Benjamin Moore; Eco Spec – Flat Interior Latex Enamel
2. Sherwin Williams; ProGreen 200 – Interior Latex Flat
3. PPG; Speedhide 6-70 – Interior Latex Flat
B. Latex, Interior, Institutional Low Odor/VOC, Eggshell (Gloss Level 2):
1. Benjamin Moore; Eco Spec – Eggshell Interior Latex Enamel
2. Sherwin Williams; ProGreen 200 – Interior Latex Eg-Shel
3. PPG: Speedhide 6-411 – Interior Latex Eg-Shel
C. Latex, Interior, Institutional Low Odor/VOC, Semi-Gloss (Gloss Level 5):
1. Benjamin Moore; Eco Spec – Interior Latex Semi-Gloss Enamel
2. Sherwin Williams; ProGreen 200 – Interior Latex Semi-Gloss
3. PPG; Pure Performance 9-500 – Interior Latex Semi-Gloss

PART 2 - EXECUTION

2.6INTERIOR PAINTING SCHEDULE
A. Steel Substrates, Hollow Metal Doors and Frames:
1. Institutional Alkyd-Based Semi-Gloss Enamel System:
a. Prime Coat: Rust-inhibitive primer (for non-primed surfaces).
b. Intermediate Coat: Alkyd-based enamel matching topcoat.
c. Topcoat: Alkyd-based enamel (semigloss).
B. Gypsum Board Substrates – Ceilings and Soffits:
1. Institutional Low-Odor/VOC Latex System:
a. Prime Coat: Interior latex primer/sealer.
b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
c. Topcoat: Institutional low-odor/VOC interior latex (flat).
C. Gypsum Board Substrates - Walls:
1. Institutional Low-Odor/VOC Latex System:
a. Prime Coat: Interior latex primer/sealer.
b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
c. Topcoat: Institutional low-odor/VOC interior latex (eggshell).

END OF SECTION 09 91 23

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DATE
2/23/2024

JOB NO.
ST14.014.00B

REVISIONS
04/29/2024

A2.603
ARCHITECTURAL SPECIFICATIONS

SECTION 10 14 23 - SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section Includes:
1. Building Plaque
2. Panel signs.
3. Room-identification signs.
B. Related Requirements:
1. Section 015000 "Temporary Facilities and Controls" for temporary Project identification signs and for temporary information and directional signs.
2. Section 015639 "Temporary Tree and Plant Protection" for temporary protection-zone signage.
3. Section 220553 "Identification for Plumbing Piping and Equipment" for labels, tags, and nameplates for plumbing systems and equipment.
4. Section 230553 "Identification for HVAC Piping and Equipment" for labels, tags, and nameplates for HVAC systems and equipment.
5. Section 260553 "Identification for Electrical Systems" for labels, tags, and nameplates for electrical equipment.

1.3 DEFINITIONS
A. Accessible: In accordance with the 2010 ADA Standards for Accessible Design.

1.4 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Shop Drawings: For panel signs.
1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.
C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.
1. Include representative Samples of available typestyles and graphic symbols.
D. Samples for Verification: For each type of sign assembly showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:
1. Panel Signs: Full-size Sample.
2. Room-Identification Signs: Full-size Sample.
3. Variable Component Materials: Full-size Sample of each base material, character (letter, number, and graphic element) in each exposed color and finish not included in Samples above.
4. Exposed Accessories: Full-size Sample of each accessory type.
E. Sign Schedule: Use same designations specified or indicated on Drawings or in a sign schedule.
F. LEED Submittal:
1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.
2. Product Data for Credit MR5: For products counted as regional materials, documentation indicating extraction and fabrication per LEED requirements.
a. Include statement indicating costs for each product having recycled content or contributing to regional materials.

1.5 CLOSEOUT SUBMITTALS
A. Maintenance Data: For signs to include in maintenance manuals.

1.6 QUALITY ASSURANCE
A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.7 WARRANTY
A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
a. Deterioration of finishes beyond normal weathering.
b. Deterioration of embedded graphic image.
c. Separation or delamination of sheet materials and components.
2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. Accessibility Standard: Comply with applicable provisions in the Texas Accessibility Standards and the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities for signs.

2.2 SIGNS
A. Panel Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
1. High impact Acrylic/PVC Thermoplastic Alloy, pressure molded using co-molding process.
a. Plaque Depth: 0.125 inch thick.
b. Tactile Graphics and Text: Provide tactile copy and Grade 2 Braille raised 1/32 inch minimum from plaque surface using manufacturer's co-molding process.
c. Color: As selected by Architect from manufacturer's full range of colors.

2. Sign-Panel Perimeter: Finish edges smooth.
a. Edge Condition: As indicated.
b. Corner Condition in Elevation: Rounded to radius indicated.
3. Mounting: Surface mounted to wall with two-face tape.
4. Text and Typeface: Accessible raised characters and Braille, Helvetica, and variable content as scheduled. Finish raised characters to contrast with background color, and finish Braille to match background color.
5. Flatness Tolerance: Sign panel shall remain flat or uniformly curved under installed conditions as indicated and within a tolerance of plus or minus 1/16 inch measured diagonally from corner to corner.
B. Room-Identification Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
1. High impact Acrylic/PVC Thermoplastic Alloy, pressure molded using co-molding process.
a. Plaque Depth: 0.125 inch thick.
b. Tactile Graphics and Text: Provide tactile copy and Grade 2 Braille raised 1/32-inch minimum from plaque surface using manufacturer's co-molding process.
c. Color: As selected by Architect from manufacturer's full range of colors.
d. Integral Window: Where indicated, provide lateral slot, separate changeable graphic insert plaque construction in compliance with indicated materials, thickness, finish, colors, designs, shapes, sizes, and details. Lens: Clear, .080 inch thick, matte first surface.
2. Sign-Panel Perimeter: Finish edges smooth.
a. Edge Condition: As indicated.
b. Corner Condition in Elevation: Rounded to radius indicated.
3. Mounting: Surface mounted to wall with two-face tape.
4. Text and Typeface: Accessible raised characters and Braille, Helvetica Medium (confirm compliance with 2010 ADA Standards for Accessible Design), variable content as scheduled. Finish raised characters to contrast with background color, and finish Braille to match background color.

2.3 PANEL-SIGN MATERIALS
A. Acrylic Sheet: ASTM D 4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).
B. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.4 ACCESSORIES
A. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick, with adhesive on both sides.
1. 80 percent coverage, minimum. Provide back panel for on-glazing installations.

2.5 FABRICATION
A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
B. Subsurface-Applied Graphics: Apply graphics to back face of clear face-sheet material to produce precisely formed image. Image shall be free of rough edges.
C. Signs with Changeable Message Capability: Fabricate signs to allow insertion of changeable messages as follows:
1. For slide-in changeable inserts, fabricate slot without burrs or constrictions that inhibit function. Furnish initial changeable insert. Furnish two blank inserts for each sign for Owner's use.

2.6 GENERAL FINISH REQUIREMENTS
A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.
B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION
A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Install signs so they do not protrude or obstruct according to the accessibility standard.
3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
B. Room-Identification Signs and Other Accessible Signage: Install in locations on walls as indicated, and according to accessibility standard.
C. Mounting Methods:
1. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place sign in position, and push to engage tape adhesive.

3.3 ADJUSTING AND CLEANING
A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
B. Remove temporary protective coverings and strippable films as signs are installed.
C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.
3.4 SCHEDULE. To be determined.

END OF SECTION 10 14 23

SECTION 12 24 13 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section Includes:
1. Manually operated roller shades with single rollers.
B. Related Requirements:
1. Division 06 Section "Miscellaneous Rough Carpentry" for wood blocking and grounds for mounting roller shades and accessories.

1.3 ACTION SUBMITTALS
A. Product Data: For each type of product.
1. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.
B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.
C. Samples for Initial Selection: For each type and color of shadeband material.
1. Include Samples of accessories involving color selection.
D. Roller-Shade Schedule: Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS
A. Product Certificates: For each type of shadeband material, signed by product manufacturer.

1.5 CLOSEOUT SUBMITTALS
A. Maintenance Data: For roller shades to include in maintenance manuals.

1.6 QUALITY ASSURANCE
A. Installer Qualifications: Fabricator of products.

1.7 DELIVERY, STORAGE, AND HANDLING
A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.8 FIELD CONDITIONS
A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. MechoShade Systems, Inc.
B. Source Limitations: Obtain roller shades from single source from single manufacturer.

2.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS
A. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
1. Bead Chains: Manufacturer's standard.
a. Loop Length: Full length of roller shade.
b. Limit Stops: Provide upper and lower ball stops.
c. Chain-Retainer Type: Clip, jamb mount.
B. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
1. Roller Drive-End Location: Right side of inside face of shade.
2. Direction of Shadeband Roll: Regular, from back of roller.
3. Shadeband-to-Roller Attachment: Manufacturer's standard method.
C. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
D. Shadebands:
1. Shadeband Material **[RS1]**: Light-filtering fabric.
2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
a. Type: Enclosed in sealed pocket of shadeband material.
b. Color and Finish: As selected by Architect from manufacturer's full range.
E. Installation Accessories:
1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
a. Shape: L-shaped.
b. Height: Manufacturer's standard height required to conceal roller and shadeband when shade is fully open, but not less than 4 inches (102 mm).
2. Endcap Covers: To cover exposed endcaps.

2.3 SHADEBAND MATERIALS
A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
B. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
1. Source: MechoShade Systems, Inc., ThermoVeil 2100 Series.
2. Type: Woven PVC-coated polyester.
3. Weave: Basketweave .
4. Thickness: 0.030 inches (0.762mm).
5. Roll Width: Manufacturer's standard.

2.4 ROLLER-SHADE FABRICATION
A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):
1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch (6 mm) per side or 1/2-inch (13-mm) total, plus or minus 1/8 inch (3.1 mm). Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch (6 mm), plus or minus 1/8 inch (3.1 mm).
2. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.
C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible except as follows:
1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4 , provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.
2. Railroaded Materials: Railroad material where material roll width is less than the required width of shadeband and where indicated. Provide battens and seams as required by railroaded material to produce shadebands with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of shadeband.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the Work.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER-SHADE INSTALLATION
A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions. Coordinate requirements for distance between roller shades and glass with glass type and placement of heating/cooling air supplies to avoid heat buildup and possible damage to glass. Generally, retain first option in "Opaque Shadebands" Subparagraph below. See "Product Characteristics" Article in the Evaluations.
1. Opaque Shadebands: Located so shadeband is not closer than 2 inches (51 mm) to interior face of glass. Allow clearances for window operation hardware.

3.3 ADJUSTING
A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION
A. Clean roller-shade surfaces after installation, according to manufacturer's written instructions.
B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION 12 24 13

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite and transom frames.
3. Louvers installed in hollow metal doors.
4. Light frames and glazing installed in hollow metal doors.

B. Related Sections:

1. Division 01 Section "General Conditions".
2. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
3. Division 08 Section "Flush Wood Doors".
4. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
5. Division 08 Section "Door Hardware".
6. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
9. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
10. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
11. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
12. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
13. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
14. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
15. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
16. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40" above sill) or UL 10C.

1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.

2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.

3. Smoke Control Door Assemblies: Comply with NFPA 105.

a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.

D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.

E. Storm Shelter Openings: Provide complete door systems for hurricane or tornado storm shelters, and other areas of refuge, complying and tested according to ICC 500 (2014/2020), ICC/NSSA Standard for the Design and Construction of Storm Shelters.

1. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

F. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.6 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Building Information Modeling (BIM) Support: Utilize designated BIM software tools and obtain training needed to successfully participate in the Project BIM processes. All technical disciplines are responsible for the product data integration and data reliability of their Work into the coordinated BIM applications.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:

1. CECO Door Products (C).
2. Curries Company (CU).
3. Steelcraft (S).

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.

B. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
1. Design: Flush panel.
2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.
a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
3. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
4. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
6. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

C. Manufacturers Basis of Design:

1. Curries Company (CU) - Polystyrene Core - 707 Series.

2.4 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
3. Manufacturers Basis of Design:
a. Curries Company (CU) - M Series.

C. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 LOUVERS

A. Metal Louvers: Unless otherwise indicated provide louvers to meet the following requirements.

1. Blade Type: Vision proof inverted V or inverted Y.
2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

B. Louvers for Fire Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire protection rating of 1-1/2 hours and less.

1. Manufacturers: Subject to compliance with requirements, provide louvers to meet rating indicated.
2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

2.7 LIGHT OPENINGS AND GLAZING

A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.

B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.

C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.

D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.8 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.9 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Doors:

1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

D. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

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DATE 2/23/2024

JOB NO. ST14.014.00B

REVISIONS 04/29/2024

A2.604
ARCHITECTURAL SPECIFICATIONS

3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
9. Jamb Anchors: Provide number and spacing of anchors as follows:

a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

1) Two anchors per jamb up to 60 inches high.
2) Three anchors per jamb from 60 to 90 inches high.
3) Four anchors per jamb from 90 to 120 inches high.
4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

1) Three anchors per jamb up to 60 inches high.
2) Four anchors per jamb from 60 to 90 inches high.
3) Five anchors per jamb from 90 to 96 inches high.
4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.

10.Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
11.Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.10 STEEL FINISHES

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.
C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.
E. Verify tolerances against manufacturers installations instructions for tornado and hurricane storm shelter openings.

3.3INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

3.5FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections "Closeout Procedures". Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

END OF SECTION 081113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Sliding doors.
3. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section "Hollow Metal Doors and Frames".
2. Division 08 Section "Flush Wood Doors".
3. Division 08 Section "Aluminum-Framed Entrances and Storefronts".

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.3SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:

a. Type, style, function, size, label, hand, and finish of each door hardware item.
b. Manufacturer of each item.
c. Fastenings and other pertinent information.
d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
e. Explanation of abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for door hardware.
g. Door and frame sizes and materials.
h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

D. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section "Hollow Metal Doors and Frames".
2. Division 08 Section "Flush Wood Doors".
3. Division 08 Section "Aluminum-Framed Entrances and Storefronts".

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.3SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:

a. Type, style, function, size, label, hand, and finish of each door hardware item.
b. Manufacturer of each item.
c. Fastenings and other pertinent information.
d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
e. Explanation of abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for door hardware.
g. Door and frame sizes and materials.
h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

D. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.5DELIVERY, STORAGE AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2BUTT HINGES

A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
1. Quantity: Provide the following hinge quantity:

a. Two Hinges: For doors with heights up to 60 inches.
b. Three Hinges: For doors with heights 61 to 90 inches.
c. Four Hinges: For doors with heights 91 to 120 inches.
d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Manufacturers:
a. Hager Companies (HA) - BB Series, 5-knuckle.
b. McKinney (MK) - TA/T4A Series, 5-knuckle.
c. dormakaba Best (ST) - F/FBB Series, 5-knuckle.

2.3DOOR OPERATING TRIM

A. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Pulls, where applicable, shall be provided with a 10" clearance from the finished floor on the push side to accommodate wheelchair accessibility.
5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
6. Manufacturers:

a. Burns Manufacturing (BU).
b. Ives (IV).
c. Rockwood (RO).

2.4CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Security Cylinders: ANSI/BHMA A156.5, Grade 1 Certified Products Directory (CPD) listed security cylinders and keys able to be used together under the same facility master or grandmaster key system.

1. New security key systems shall not be established with products that have an expired patent. Expired systems shall only be specified and supplied to support existing systems.
2. Manufacturers:

a. Corbin Russwin (RU) - Pyramid PS.
b. No Substitution.

C. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Field verify and key cylinders to match Owner's existing system.

D. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).

E. Construction Keying: Provide construction master keyed cylinders.

F. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.5MORTISE LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): Provide ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed mortise locksets. Listed manufacturers shall meet all functions and features as specified herein.
1. Manufacturers:

a. Corbin Russwin Hardware (RU) - ML2000 Series.
b. No Substitution.

2.6DEADLOCKS AND LATCHES

A. Narrow Case Deadlocks and Deadlatches: ANSI/BHMA 156.13 Series 1000 Grade 1 narrow case deadlocks and deadlatches for swinging or sliding door applications. All functions shall be manufactured in a single sized case formed from 12 gauge minimum, corrosion resistant steel (option for fully stainless steel case and components). Provide minimum 2 7/8" throw laminated stainless steel bolt. Bottom rail deadlocks to have 3/8" diameter bolts.

1. Manufacturers:

a. Adams Rite Manufacturing (AD) - MS1850S / MS1950 Series.

2.7LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.8DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.

1. Manufacturers:

a. LCN Closers (LC) - 4040XP Series.
b. Norton Rixson (NO) - 9500 Series.

2.9ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:

a. Stainless Steel: 300 grade, 050-inch thick.

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ARCHITECTURAL SPECIFICATIONS

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:

a. Burns Manufacturing (BU).
b. Rockwood (RO).

2.10 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

a. Burns Manufacturing (BU).
b. Ives (IV).
c. Rockwood (RO).

2.11 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NFPA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. National Guard Products (NG).
2. Pemko (PE).
3. Reese Enterprises, Inc. (RE).

2.12 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.13 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing and sizing all products.
3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

B. Manufacturer's Abbreviations:
1. MK - McKinney
2. AD - Adams Rite
3. RU - Corbin Russwin
4. RO - Rockwood
5. NO - Norton
6. PE - Pemko

Hardware Sets

Set: 1.0
Doors: 211
Description: ALD BTB PULLS CLOSER KICKDOWN STOP

3	Hinge, Full Mortise	TA2714 FT 4-1/2" x 4-1/2"	US26D	MK	087100
1	Pull, offset	RM3731-12 Mtg-Type 11XHD	US32D	RO	087100
1	Surface Closer	9500	689	NO	087100
1	Drop Plate	9586	689	NO	087100
1	Door Stop, kickdown	461	US26D	RO	087100
1	Gasketing	Gasketing by Frame Manufacturer			

Set: 2.0
Doors: 212, 213
Description: ALD SWING BOLT LOCK BTB PULLS CLOSER KICKDOWN STOP

3	Hinge, Full Mortise	TA2714 FT 4-1/2" x 4-1/2"	US26D	MK	087100
1	Mortise Deadlock	MS1850S	628	AD	087100
1	Cylinder, thumbturn	4066	130	AD	087100
1	Cylinder	CR1037-114 A03 (7P Pyramid match existing)	630	RU	087100
2	Pull, offset	RM3731-12 Mtg-Type 11XHD	US32D	RO	087100
1	Surface Closer	9500	689	NO	087100
1	Drop Plate	9586	689	NO	087100
1	Wall Stop	RM861	US32D	RO	087100
1	Door Stop, kickdown	461	US26D	RO	087100
1	Gasketing	Gasketing by Frame Manufacturer			

Set: 3.0
Doors: 203
Description: HMD PASSAGE LATCH NO CLOSER GASKET

3	Hinge, Full Mortise	TA2714 FT 4-1/2" x 4-1/2"	US26D	MK	087100
1	Passage Latch	ML2010 NSA	626	RU	087100
1	Wall Stop	RM861	US32D	RO	087100
1	Gasketing	S88D		PE	087100

Set: 4.0
Doors: 204
Description: HMD STOREROOM LOCK CLOSER GASKET

3	Hinge, Full Mortise	TA2714 FT 4-1/2" x 4-1/2"	US26D	MK	087100
1	Storeroom Lock	ML2057 NSA PCS (7 P IC Pyramid match existing)	626	RU	087100
1	Surface Closer	9500	689	NO	087100
1	Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO	087100
1	Wall Stop	RM861	US32D	RO	087100
1	Door Stop, kickdown	461	US26D	RO	087100
1	Gasketing	S88D		PE	087100

Set: 5.0
Doors: 214
Description: CLASSROOM LOCK CLOSER GASKET

3	Hinge, Full Mortise	TA2714 FT 4-1/2" x 4-1/2"	US26D	MK	087100
1	Classroom Lock	ML2055 NSA PCS (7 P IC Pyramid match existing)	626	RU	087100
1	Surface Closer	9500	689	NO	087100
1	Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO	087100
1	Wall Stop	RM861	US32D	RO	087100
1	Door Stop, kickdown	461	US26D	RO	087100
1	Gasketing	S88D		PE	087100

END OF SECTION 087100

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A2.606
ARCHITECTURAL SPECIFICATIONS

ABBREVIATIONS
(AS APPLICABLE)

(E)	EXISTING
3CS	THREE-COMPARTMENT SINK
A	AMP, AMPERE
A/E	ARCHITECT / ENGINEER
AAV	AIR ADMITTANCE VALVE
ABV	ABOVE
AC	AIR CONDITIONER, AIR CONDITIONING
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AFMD	AIR FLOW MEASURING DEVICE
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
ANSI	AMERICAN NAT'L STANDARDS INSTITUTE
AL	ALUMINUM
AP	ACCESS PANEL
ARCH	ARCHITECT, ARCHITECTURAL
ARI	AIR CONDITIONING & REFRIG INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, & AIR CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING & MATERIALS
ATC	AUTOMATIC TEMP CONTROLS
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
AWS	AMERICAN WELDING SOCIETY
AWWA	AMERICAN WATER WORKS ASSOCIATION
BAS	BUILDING AUTOMATION SYSTEM
BDD	BACKDRAFT DAMPER
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BT	BATHTUB
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
BV	BALANCING VALVE
BWV	BACKWATER VALVE
C	COMMON
CA	COMBUSTION AIR
CD	CEILING SUPPLY AIR DIFFUSER
CD	CONDENSATE DRAIN
CF	CEILING FAN
CF	CUBIC FEET
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON
CKT	CIRCUIT
CLG	CEILING
CO	CARBON MONOXIDE
CO	CLEANOUT
CO2	CARBON DIOXIDE
CONFIG	CONFIGURATION
COP	COEFFICIENT OF PERFORMANCE
CU	CONDENSING UNIT
CU	COPPER
CV	CIRCUIT VENT
CV	CONSTANT VOLUME
CWV	COMBINATION WASTE & VENT
DB	DRY-BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DEG	DEGREES
DF	DRINKING FOUNTAIN
DH	DUCT HEATER
DI	DEIONIZED WATER
DIA, ø	DIAMETER
DISC	DISCONNECT
DN	DOWN
DN	DOWNSPOUT NOZZLE
DOM	DOMESTIC
DP	DEW POINT
DPS	DIFFERENTIAL PRESSURE SENSOR
DWG	DRAWING
DX	DIRECT EXPANSION
EA	EACH
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EFF	EFFICIENCY
EG	EXHAUST GRILLE
ELEC	ELECTRICAL
EM	EMERGENCY LIGHTING
ENT	ENTERING
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
ETR	EXISTING TO REMAIN
EW	EYE WASH
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
F	FAHRENHEIT
FACP	FIRE ALARM CONTROL PANEL
FCO	FLOOR CLEANOUT
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FD	FIRE DAMPER
FDC	FIRE DEPARTMENT CONNECTION
FFE	FINISHED FLOOR ELEVATION
FLA	FULL LOAD AMPS
FM	FLOW METER
FP	FIRE PROTECTION
FPC	FIRE PROTECTION CONTRACTOR
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FPWH	FREEZE PROOF WALL HYDRANT
FS	FLOOR SINK
FS	FLOW SWITCH
FT	FEET
GA	GAUGE
GAL	GALLONS
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GFCI/GFI	GROUND FAULT CIRCUIT INTERRUPTER
GI	GREASE INTERCEPTOR
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GR	GRAINS
GR	GROUND
HB	HOSE BIBB
HD	HEAD
HD	HUB DRAIN
HOA	HAND / OFF / AUTOMATIC
HP	HEAT PUMP
HP	HORSEPOWER
HS	HAND SINK
HS	HAND SWITCH
HZ	HERTZ
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
I/O	INPUT / OUTPUT
IE	INVERT ELEVATION
IG	ISOLATED GROUND
IN	INCHES
IN WC	INCHES OF WATER COLUMN
IND	INDIRECT
IPLV	INTEGRATED PART LOAD VALUE
KEC	KITCHEN EQUIPMENT CONTRACTOR
KV	KILOVOLT
KVA	KILOVOLT-AMPS
KW	KILOWATT
KWH	KILOWATT HOUR
LAT	LEAVING AIR TEMPERATURE
LAV	LAVATORY
LB, #	POUNDS
LRA	LOCKED ROTOR AMPS
LTG	LIGHTING
LWT	LEAVING WATER TEMPERATURE
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBH	1000 BTUH
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM BRANCH CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MFR	MANUFACTURER
MHB	MIXING HOSE BIBB
MIN	MINIMUM
MLO	MAIN LUG ONLY
MM	MILLIMETER
MOCP	MAXIMUM OVERCURRENT PROTECTION
MS	MOP SINK
MUA	MAKE-UP AIR
MZ	MULTI-ZONE
N/A	NOT APPLICABLE
N.C.	NORMALLY CLOSED
NC	NOISE CRITERIA
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MFR'S ASSOCIATION
NFC	NOT FOR CONSTRUCTION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
N.O.	NORMALLY OPEN
NOM	NOMINAL
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OI	OIL INTERCEPTOR
OS&Y	OUTSIDE STEM AND YOKE
OSHA	OCCUPATIONAL SAFETY & HEALTH ADMIN.
PB	PUSH BUTTON
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP
PH	PHASE
PLBG	PLUMBING
PNLBD	PANELBOARD
PPM	PARTS PER MILLION
PRV	PRESSURE REGULATING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
PSIG	POUNDS PER SQUARE INCH - GAUGE
QTY	QUANTITY
RA	RETURN AIR
RAT	RETURN AIR TEMPERATURE
RAW	RETURN AIR WALL GRILLE
RC	REFRIGERATION CONTRACTOR
RCPTS	RECEPTACLES
RD	RADIATION DAMPER
RD	ROOF DRAIN
REBAL	REBALANCE
RECIRC	RECIRCULATE
REF	REFERENCE
REL	RELOCATED
REQ	REQUIRED
REV	REVISION, REVISE
RG	RETURN GRILLE
RH	RADIANT HEATER
RH	RELATIVE HUMIDITY
RLA	RUNNING LOAD AMPS
RO	REVERSE OSMOSIS
ROD	ROOF OVERFLOW DRAIN
RPM	REVOLUTIONS PER MINUTE
RPZ	REDUCED PRESSURE ZONE
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SAT	SUPPLY AIR TEMPERATURE
SAW	SUPPLY AIR WALL REGISTER
SC	SECURITY CAMERA
SC	SENSIBLE CAPACITY
SD	SMOKE DETECTOR
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SF	SQUARE FEET
SF	SUPPLY FAN
SH	SHOWER
SK	SINK
SM	SHEET METAL
SMACNA	SHEET METAL & A/C CONT NAT'L ASSOC.
SOV	SHUT-OFF VALVE
SP	STATIC PRESSURE
SPEC	SPECIFICATION
STD	STANDARD
SZ	SINGLE-ZONE
TAB	TESTING, ADJUSTING, BALANCE
TC	TOTAL CAPACITY
TD	TEMPERATURE DIFFERENCE
TD	TRENCH DRAIN
TDH	TOTAL DYNAMIC HEAD
TFD	TO FLOOR DRAIN
TG	TRANSFER GRILLE
THRU	THROUGH
TMV	THERMOSTATIC MIXING VALVE
TP	TOTAL PRESSURE
TP	TRAP PRIMER
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
U/F	UNDER FLOOR
U/G	UNDER GROUND
U/S	UNDER SLAB
UC	UNDERCUT DOOR
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC.
UR	URINAL
UNO	UNLESS NOTED OTHERWISE
V	VENT
V	VOLT
VA	VOLT-AMPERE
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VBF	VENT BELOW FLOOR
VBG	VENT BELOW GRADE
VFD	VARIABLE FREQUENCY DRIVE
VRF	VARIABLE REFRIGERANT FLOW
VTR	VENT THRU ROOF
W	WATTS
w/	WITH
w/o	WITHOUT
WB	WASHER BOX
WB	WET-BULB TEMPERATURE
WC	WATER CLOSET
WC	WATER COLUMN
WG	WATER GAUGE
WH	WATER HEATER
WP	WEATHER PROOF COVERPLATE
WR	WEATHER RESISTANT RECEPTACLE
WV	WET VENT
XFMR	TRANSFORMER

PLUMBING SYMBOLS
(AS APPLICABLE)

SYMBOL	DESCRIPTION
	DOMESTIC COLD WATER (CW)
	DOMESTIC HOT WATER (HW)
	DOMESTIC HOT WATER RETURN (HWR)
SW	SOFT WATER (SW)
PWS	PURE WATER SUPPLY (PWS)
PWR	PURE WATER RETURN (PWR)
G	NATURAL GAS (G) - LOW PRESSURE
G#	NATURAL GAS (G) - # PSI
LP	LIQUID PROPANE (LP) - LOW PRESSURE
LP#	LIQUID PROPANE (LP) - # PSI
A	COMPRESSED AIR (A)
SS	SANITARY SEWER (SS)
OW	OIL WASTE (OW)
GW	GREASE WASTE (GW)
ST	STORM DRAIN (ST)
CD	CONDENSATE (CD)
V	VENT (V)
	PIPE: RISE / FALL / TEE DOWN
	SHUT-OFF VALVE (SOV)
	BALANCING VALVE (BV)
	PRESSURE REDUCING VALVE (PRV)
	STRAINER w/ DRAIN VALVE
	CHECK VALVE
	REDUCED PRESSURE ZONE (RPZ)
	PRESSURE GAUGE W/ INSERTION WELL
	THERMOMETER W/ INSERTION WELL
	VACUUM RELIEF VALVE
	FLOOR CLEANOUT (FCO)
	FLOOR DRAIN (FD), ROUND / RECTANGULAR
	FLOOR SINK (FS), FULL / HALF GRATE
	GAS PRESSURE REGULATOR
	AUTOMATIC GAS VALVE
	STORM DRAIN DOWNSPOUT NOZZLE (DN)
	FREEZE PROOF WALL HYDRANT (FPWH)
	HOSE BIBB (HB)
	CLEANOUT - INLINE / WALL (CO / WCO)
	FLANGE
	UNION
	FLEXIBLE PIPE CONNECTOR
	CAPPED PIPE

ANNOTATION SYMBOLS
(AS APPLICABLE)

SYMBOL	DESCRIPTION
	PLAN NOTE (PER SHEET)
XXXX	KITCHEN EQUIPMENT REFERENCE NUMBER
	POINT OF CONNECTION TO EXISTING
	TERMINATION OF DEMOLITION
~	CONTINUATION
1 / M1	DETAIL NUMBER SHEET NUMBER
1 / M1	SECTION CUT DESIGNATION

APPLICABLE CODES

2021 ARKANSAS FIRE PREVENTION CODE, VOLUME I - FIRE
2021 ARKANSAS FIRE PREVENTION CODE, VOLUME II - BUILDING
2021 ARKANSAS MECHANICAL CODE (AMC)
2020 NFPA 70 - NATIONAL ELECTRICAL CODE (NEC)
2018 ARKANSAS PLUMBING CODE (APC)
2018 ARKANSAS FUEL GAS CODE (AFGC)
2009 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)

REMODEL NOTES
(AS APPLICABLE)

1. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW GENERAL NOTES, SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER OR TENANT, AS DEFINED IN BID DOCUMENTS, OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
2. EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
3. DURING INSTALLATION OF NEW WORK, AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN. REPAIR DAMAGE CAUSED DURING CONSTRUCTION AT NO EXTRA COST TO THE OWNER.
4. BUILDING OWNER RETAINS RIGHTS OF SALVAGE FOR EQUIPMENT AND FIXTURES TO BE REMOVED. COORDINATE WITH OWNER THE EQUIPMENT AND FIXTURES TO BE SALVAGED AND THE LOCATION FOR STORAGE. AVOID DAMAGE TO SALVAGED EQUIPMENT, FIXTURES, AND DEVICES DURING DEMOLITION WORK AND DURING TRANSPORT TO OWNER'S DESIGNATED STORAGE LOCATION.
5. REMOVE HANGERS AND SUPPORTS FOR PIPING AND/OR EQUIPMENT THAT ARE REMOVED AND THE EXISTING HANGERS AND SUPPORTS ARE NOT USED FOR THE NEW INSTALLATION.
6. INSTALL PERMANENT CAPS WHERE PIPING IS REMOVED AND WILL NOT BE USED FOR THE NEW INSTALLATION. WHERE PIPING IS REMOVED AND WILL BE USED FOR THE NEW INSTALLATION, INSTALL TEMPORARY CAPS TO PROTECT THE INTERIOR SURFACES UNTIL NEW PIPING IS INSTALLED.
7. WHERE EXISTING FIXTURES AND EQUIPMENT ARE REMOVED AND NOT REPLACED, CAP ALL PIPING WITHIN WALLS, FLOORS OR CEILINGS AS REQUIRED FOR CONCEALMENT.
8. REMOVE ALL EXISTING PIPING WHICH IS DEEMED INOPERABLE AS A RESULT OF THIS CONTRACT UNLESS SHOWN OR NOTED OTHERWISE.
9. CAP UNUSED UNDERSLAB WASTE PIPING MINIMUM 8" BELOW FINISHED FLOOR. IT IS NOT REQUIRED TO REMOVE UNDERSLAB WASTE PIPING BACK TO ACTIVE MAIN.
10. INSPECT EXISTING EQUIPMENT TO REMAIN TO VERIFY THAT EQUIPMENT IS OPERATING PROPERLY. NOTIFY TENANT OF DAMAGED AND/OR MALFUNCTIONING COMPONENTS.
11. VERIFY EXISTING LOCATION, INVERT, AND SLOPE OF UNDER SLAB PIPING PRIOR TO TRENCHING.
12. WHERE EXISTING PIPING TO REMAIN IS DISCOVERED BEHIND SURFACES BEING REMOVED, THE PLUMBING CONTRACTOR SHALL REROUTE AND RECONNECT PIPING AS REQUIRED.

ADA NOTES

THIS APPLIES TO HANDICAPPED ACCESSIBLE FIXTURES ONLY. REFER TO ARCHITECTURAL PLANS FOR PLUMBING FIXTURE ELEVATIONS.

FAUCETS CONTROLS: CONTROLS SHALL BE LEVER HANDLES OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE CONTROLS SHALL BE NO GREATER THAN 5 LBF.

SINKS: SINKS SHALL BE MOUNTED WITH THE RIM OR COUNTER SURFACE NO HIGHER 34" ABOVE THE FINISH FLOOR. PROVIDE A KNEE CLEARANCE OF AT LEAST 27" HIGH, 30" WIDE, AND 19" DEEP. SINKS SHALL BE A MAXIMUM OF 6 1/2" DEEP. ALL WATER AND DRAIN PIPING UNDER LAVATORIES SHALL BE INSULATED WITH A FOAM INSERT COVERED WITH A 1/8" VINYL OUTER SHELL. ANGLE STOPS SHALL HAVE A FLIP TOP ACCESS.

FIRE PROTECTION GENERAL NOTES

1. THIS BUILDING IS PROTECTED BY AN EXISTING SPRINKLER SYSTEM. THE FIRE PROTECTION CONTRACTOR SHALL BE RESPONSIBLE TO MODIFY ANY AND ALL PARTS OF THE EXISTING SYSTEM AS REQUIRED TO ACCOMMODATE NEW CONSTRUCTION, TO REPAIR ITEMS IN POOR CONDITION, OR TO CORRECT ANY CODE DEFICIENCY.
2. THE FIRE PROTECTION OF THIS BUILDING SHALL BE IN ACCORDANCE WITH STATE AND LOCAL CODES AND SHALL CONFORM TO NFPA 13 GENERAL REQUIREMENTS AND IN FULL COMPLIANCE WITH LOCAL FIRE MARSHAL. NOTES, DETAILS, AND SPECIFICATIONS CONTAINED IN THE PROJECT DOCUMENTS SHOW BASIC DESIGN INTENT ONLY. THE FIRE PROTECTION CONTRACTOR/ENGINEER IS RESPONSIBLE TO DESIGN, FABRICATE, AND INSTALL A COMPLETE, FULLY OPERATIONAL, CODE COMPLIANT SYSTEM IN AN ACCEPTABLE MANNER TO THE STATE HEALTH DEPARTMENT, LOCAL FIRE MARSHALL AND THE ARCHITECT/ENGINEER.
3. THE AUTOMATIC SPRINKLER SYSTEM SHALL BE DESIGNED, FABRICATED, INSTALLED, AND TESTED BY AN EXPERIENCED CONTRACTOR APPROVED BY THE ARCHITECT AND LICENSED BY THE STATE TO PERFORM SUCH WORK.
4. THE FIRE PROTECTION CONTRACTOR SHALL PAY FOR ALL PERMITS, LICENSES, FEES, DEPOSITS, AND CHARGES IN CONNECTION WITH THE WORK, EXCEPT AS NOTED HEREIN. CONTRACTOR SHALL SECURE ALL NECESSARY APPROVALS.
5. THE FIRE PROTECTION CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEFICIENCIES OR DEVIATIONS FROM THE REQUIREMENTS IN NFPA 13 AND/OR THE APPROVED PLANS.
6. THE CONTRACTOR SHALL PRODUCE SHOP DRAWINGS OF A NFPA 13 SYSTEM SHOWING COORDINATION WITH ALL STRUCTURAL AND HVAC COMPONENTS. SUBMIT SHOP DRAWINGS TO THE ARCHITECT AND THE OWNER'S INSURANCE COMPANY FOR APPROVAL. BEFORE BEING SENT TO THE ARCHITECT, ALL SHOP DRAWINGS MUST BEAR THE INSURANCE SERVICE OFFICES (ISO) STAMP OF ACCEPTANCE AND THE LOCAL FIRE MARSHALL'S STAMP OF APPROVAL.
7. SUBMIT COMPLETE DETAILS AND SECTIONS TO CLEARLY DEFINE AND CLARIFY THE DESIGN, INCLUDING A LIST OF MATERIALS DESCRIBING ALL PROPOSED MATERIALS WITH MANUFACTURER'S NAME AND CATALOG NUMBER.
8. THE CONTRACTOR SHALL PRODUCE HIS OWN HYDRAULICALLY DESIGNED SYSTEM FOR REVIEW AND APPROVAL BY THE LOCAL FIRE MARSHAL'S OFFICE AND ARCHITECT FOR USE ON THIS PROJECT.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CURRENT FIRE FLOW TEST.
10. UNDERWRITERS LABORATORIES (UL) AND/OR FACTORY MUTUAL RESEARCH CORPORATION (FMRC) APPROVED EQUIPMENT SHOULD BE UTILIZED WHERE APPLICABLE, AND THE DETAILS OF THE INSTALLATION SHOULD CONFORM TO FACTORY MUTUAL ENGINEERING ASSOCIATION (FMEA) GOOD PRACTICES.
11. ALL PIPES SHALL MEET OR EXCEED CORROSION RESISTANCE RATIO OF SCHEDULE 40 STEEL PIPE. FIELD COORDINATION IS REQUIRED ESPECIALLY WHEN CUTTING OR ADJUSTING PIPES FOR SPRINKLER INSTALLATION. ALL UNDERGROUND PIPING IS TO BE CHLORINATED PER THE REQUIREMENTS OF THE DEPARTMENT OF HEALTH. EXPOSED SPRINKLER PIPING SHALL BE PAINTED, COLOR SHALL BE SPECIFIED BY ARCHITECT.
12. RUN ALL PIPING PARALLEL OR PERPENDICULAR TO STRUCTURE IN ALL AREAS. SPRINKLER CONTRACTOR SHALL COORDINATE LOCATION OF HORIZONTAL SPRINKLER PIPING WITH OTHER TRADES TO MISS ALL LIGHT FIXTURES, DUCTS, MECHANICAL EQUIPMENT, AIR DIFFUSERS AND ALL OTHER ITEMS WHERE CEILING CLEARANCES ARE CLOSE.
13. PROVIDE SPRINKLER HEAD(S) FOR EACH ROOM/SPACE FOR COMPLETE PROTECTION IN COMPLIANCE WITH NFPA 13. CONTRACTOR SHALL COORDINATE COLOR OF SPRINKLER HEADS WITH OWNER/ARCHITECT.
14. UPON COMPLETION OF THE SPRINKLER SYSTEM INSTALLATION, TEST AND RE-TEST THE COMPLETE INSTALLATION. MAKE ALL CORRECTIONS AS NECESSARY TO SECURE ACCEPTANCE BY FIRE MARSHALL. FURNISH ALL TEST EQUIPMENT AND PERSONNEL REQUIRED.
15. AFTER THE FIRE SPRINKLER SYSTEM HAS BEEN COMPLETELY TESTED, INSPECTED AND APPROVED, SECURE A LETTER OF FINAL ACCEPTANCE FROM THE ADMINISTRATIVE AUTHORITY ADDRESSED TO THE SPRINKLER COMPANY RESPONSIBLE FOR THE INSTALLATION, PREPARED IN TRIPLICATE. DELIVER ALL THREE COPIES TO THE ARCHITECT.

PLUMBING GENERAL NOTES
(AS APPLICABLE)

1. NOTES APPLY TO ALL PLUMBING SHEETS.
2. EACH CONTRACTOR IS RESPONSIBLE FOR HAVING THOROUGH KNOWLEDGE OF ALL DRAWINGS AND SPECIFICATIONS AS THEY RELATE TO THIS WORK. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED DUE TO LACK OF THIS KNOWLEDGE.
3. ALL WORK SHALL BE PERFORMED BY LICENSED CONTRACTORS AS REQUIRED BY LOCAL AND STATE CODES.
4. PROVIDE ALL MATERIALS FOR A COMPLETE INSTALLATION IN ALL RESPECTS READY FOR INTENDED USE AND IN STRICT ACCORDANCE WITH STATE AND LOCAL CODES AND MANUFACTURER'S RECOMMENDATIONS. PLANS AND SPECIFICATIONS GOVERN WHERE THEY EXCEED CODE MINIMUM REQUIREMENTS.
5. ALL PLUMBING EQUIPMENT SHOWN ON THE PLUMBING PLANS SHALL BE PROVIDED BY THE PLUMBING CONTRACTOR UNLESS NOTED OTHERWISE. UNLESS NOTED OTHERWISE, THE INDICATION AND/OR DESCRIPTION OF ANY ITEM, IN THE DRAWINGS OR SPECIFICATIONS CARRIES WITH IT THE INSTRUCTION TO FURNISH AND INSTALL THE ITEM. ALL EQUIPMENT AND MATERIALS PROVIDED BY THE CONTRACTOR WILL BE NEW; THERE WILL BE NO ALLOWANCE FOR REUSED MATERIAL UNLESS EXPLICITLY INDICATED OTHERWISE BY THE ENGINEER OR OWNER.
6. OBTAIN AND PAY FOR ALL PERMITS REQUIRED BY THIS WORK. PROVIDE TO THE ARCHITECT OR OWNER'S CONSTRUCTION MANAGER A COPY OF INSPECTION REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS.
7. DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENTS OR GEOMETRICAL RELATIONSHIPS OF EQUIPMENT AND SERVICES. THEY ARE NOT INTENDED TO SPECIFY OR SHOW EVERY OFFSET, SEQUENCE, DEVICE, OPTION, FITTING, OR COMPONENT. DO NOT SCALE FLOOR PLANS FOR EXACT LOCATION OF PIPE ROUTING. EQUIPMENT SCHEDULES SHALL TAKE PRECEDENCE OVER CONFLICTING DRAWING INFORMATION. DRAWINGS SPECIFIC TO THIS DISCIPLINE DO NOT LIMIT THE RESPONSIBILITY OF WORK REQUIRED BY CONTRACT DOCUMENTS. REFER TO ARCHITECTURAL, STRUCTURAL, ELECTRICAL, AND OTHER DRAWINGS FOR COMPLETE INFORMATION. NOTIFY THE ARCHITECT OR OWNER'S CONSTRUCTION MANAGER OF ANY CONFLICTS OR DISCREPANCIES.
8. INFORMATION AND COMPONENTS SHOWN ON DIAGRAMS OR DETAILS, BUT NOT SHOWN ON PLANS, AND VICE VERSA, SHALL BE PROVIDED AS IF EXPRESSLY REQUIRED BY BOTH.
9. PROVIDE A CONSTRUCTION RECORD SET OF "AS-BUILT" DOCUMENTS TO THE ARCHITECT OR OWNER'S CONSTRUCTION MANAGER REFLECTING ANY VARIANCES OF INSTALLED EQUIPMENT OR PIPING LOCATIONS CONTRARY TO THE CONSTRUCTION DOCUMENTS.
10. COORDINATE THE INSTALLATION OF THE PLUMBING SYSTEMS WITH OTHER TRADES TO ENSURE A NEAT AND ORDERLY INSTALLATION. INSTALL PIPING AS TIGHT TO STRUCTURE AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATE INSTALLATION OF PIPING TO AVOID CONFLICTS WITH ELECTRICAL PANELS, LIGHTING FIXTURES, ETC. ANY MODIFICATIONS REQUIRED DUE TO LACK OF COORDINATION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO EXTRA COST TO THE OWNER.
11. THE CONTRACTOR SHALL DO ALL CUTTING OF WALLS, FLOORS, AND CEILINGS AS REQUIRED FOR INSTALLATION OF PLUMBING WORK. ALL CUTTING SHALL BE HELD TO A MINIMUM. NO STRUCTURAL MEMBERS MAY BE CUT OR MODIFIED WITHOUT THE WRITTEN PERMISSION OF THE STRUCTURAL ENGINEER.
12. THESE DRAWINGS REFLECT SYSTEMS DESIGNED AROUND SPECIFIC REFERENCE PRODUCTS (BASIS OF DESIGN), THE SELECTION OF WHICH INFLUENCED THE DESIGNS OF OTHER TRADES. IF SUBSTITUTE MANUFACTURERS, SIZES, MODELS, ETC. ARE SUBMITTED, IT IS THE RESPONSIBILITY OF THE PLUMBING CONTRACTOR TO COORDINATE ALL DIFFERENCES WITH OTHER TRADES. ALL COSTS OF ALL TRADES ASSOCIATED WITH THE SUBSTITUTION SHALL BE INCLUDED.
13. NEW PLUMBING EQUIPMENT AND PIPING ARE SHOWN AT APPROXIMATE LOCATIONS. FIELD MEASURE FINAL PIPING LOCATIONS PRIOR TO FABRICATION AND MAKE ADJUSTMENTS AS REQUIRED TO FIT THE PIPING WITHIN THE AVAILABLE SPACE. VERIFY THAT FINAL EQUIPMENT LOCATIONS MEET MANUFACTURER'S RECOMMENDATIONS REGARDING SERVICE CLEARANCE AND PROPER AIRFLOW CLEARANCE AROUND EQUIPMENT.
14. COORDINATE PIPE ROUTING AWAY FROM ELECTRICAL PANELS. IF PIPE ROUTING OVER ELECTRICAL PANELS IS UNAVOIDABLE, PROVIDE DRIP CATCH PANS UNDER THE ENTIRE LENGTH OF PIPE WHERE INSTALLED ABOVE ELECTRICAL EQUIPMENT. PANS SHALL BE MANUFACTURED, FIELD, OR SHOP FABRICATED OUT OF GALVANIZED SHEET METAL COMPLYING WITH ASTM A653/A653M. END CAP AND SEAMS SHALL BE WELDED OR SOLDERED AND SHALL BE TESTED TO BE LEAK PROOF. PANS SHALL BE CONSTRUCTED SO THAT THEY ARE LARGER THAN THE DRAIN LINE SERVING.
15. SEAL PENETRATIONS THROUGH THE BUILDING COMPONENTS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. FIREPROOF PENETRATIONS THROUGH FIRE RATED COMPONENTS IN ACCORDANCE WITH U.L. REQUIREMENTS. REFER TO ARCHITECTURAL PLANS FOR WALL AND FLOOR TYPES.
16. PROVIDE SLEEVE FOR ALL WATER PIPE FLOOR PENETRATIONS. MAKE SLEEVE LARGE ENOUGH FOR INSULATION. SEAL WITH MASTIC AND ENSURE OF NO WATER PENETRATIONS.
17. COORDINATE PIPING INSTALLATION WITH STRUCTURAL GRADE BEAMS, FOOTINGS, COLUMN PIERS, ETC. SLEEVE PIPING THROUGH GRADE BEAMS, FOOTINGS, ETC. WHERE REQUIRED AND AS NOTED ON PLANS.
18. SANITARY SEWER PIPING SHOWN IS BASED ON 1/4" PER FOOT FALL FOR ALL PIPE SMALLER THAN 3" DIAMETER AND 1/8" PER FOOT FALL FOR PIPE 3" DIAMETER AND LARGER, UNLESS NOTED OTHERWISE.
19. ALL SEWER PIPING BELOW SLAB TO BE 2" DIAMETER MINIMUM.
20. PROVIDE ACCESS PANELS TO ALL CONCEALED VALVES, WATER HAMMER ARRESTORS, AND OTHER DEVICES BEHIND HARD SURFACES. LOCATE ITEMS ABOVE LAY-IN CEILINGS AND CLOSE TOGETHER WHERE POSSIBLE TO AVOID UNNECESSARY ADDITIONAL ACCESS PANELS. COORDINATE ALL ACCESS PANELS WITH ARCHITECT.
21. ALL FLOOR DRAINS SHALL HAVE MINIMUM 4" DEEP SEAL TRAPS.
22. PROVIDE TRAP GUARDS OR TRAP SEAL PRIMERS AND 1/2" COPPER TUBING CONNECTION TO ALL FLOOR DRAINS AS SHOWN OR AS REQUIRED BY AHJ. CONTRACTOR SHALL VERIFY REQUIREMENTS. PROVIDE SHUT-OFF VALVE UPSTREAM OF TRAP PRIMER VALVE. LOCATE TRAP PRIMER VALVES IN ACCESSIBLE LOCATION OR PROVIDE ACCESS PANEL. DO NOT LOCATE TRAP PRIMER VALVES OR PIPING IN PUBLIC ACCESSIBLE AREAS.
23. LOCATION OF FLOOR DRAINS IN MECHANICAL ROOMS SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT FOR PLACEMENT. DO NOT LOCATE DRAINS UNDER THE FOOTPRINT OF THE MECHANICAL EQUIPMENT.
24. WATER PIPING SHALL BE SLOPED FOR DRAINAGE WITH DRAIN VALVES INSTALLED AT LOW POINTS.
25. PROVIDE INSULATION ON ALL WATER PIPING ABOVE FLOOR.
26. VALVES SHALL BE LINE SIZE UNLESS NOTED OTHERWISE. ALL WATER SHUT-OFF VALVES SHALL BE "BALL LOCK" TYPE. PROVIDE SHUT-OFF VALVES AT EACH TERMINATION POINT OF ASSOCIATED EQUIPMENT.
27. PROVIDE WATER HAMMER ARRESTORS AS REQUIRED BY MANUFACTURER, GOOD PRACTICE, AHJ AND/OR CODE, OR MINIMUM OF ONE ARRESTOR FOR EACH FIXTURE OR BANK OF FIXTURES. WATER HAMMER ARRESTORS SHALL BE THE SAME SIZE AS PIPE INSTALLED ON, MINIMUM. AIR CHAMBERS SHALL NOT BE USED.
28. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND MOUNTING HEIGHTS OF PLUMBING FIXTURES.
29. PROVIDE COMPLETE FIXTURES AND INCLUDE SUPPLIES, STOPS, VALVES, FAUCETS, DRAINS, TRAPS, TAILPIECES, ESCUTCHEONS, ETC. EXPOSED COPPER OR BRASS MATERIALS SHALL BE CHROME PLATED.
30. ALL EXPOSED OR ACCESSIBLE P-TRAPS SHALL BE CHROME PLATED AND PROVIDED WITH BOTTOM CLEANOUT PLUGS.
31. PROVIDE INSULATION AT ALL EXPOSED HOT WATER & DRAIN PIPING FOR HANDICAP FIXTURES PER ANSI A117.1 AND ADA REQUIREMENTS.
32. CLEAN FAUCET AERATORS AND PIPE STRAINERS PRIOR TO TURNING BUILDING OVER TO THE OWNER.

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Engineer's Seal:
STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER JASON PATRICK MOWREY No. 14988
2/23/2024

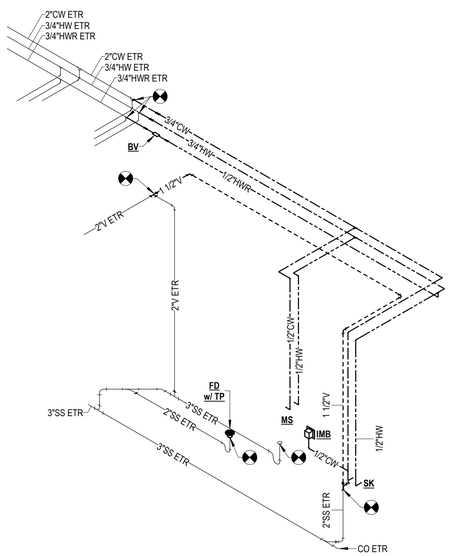
Firm's Seal:
CERTIFICATE OF AUTHORIZATION PRIGM ENGINEERING, PLLC No. 3588 ARKANSAS

UNIVERSITY OF ARKANSAS

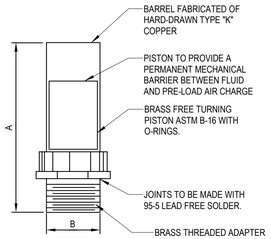
University of Arkansas - CEREC

DATE 2/23/2024
JOB NO. 23108
REVISIONS

P0.0
PLUMBING NOTES AND LEGENDS



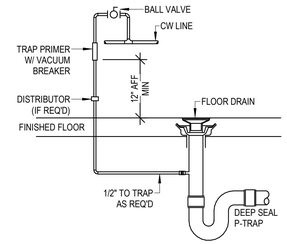
3 PLUMBING ISOMETRIC



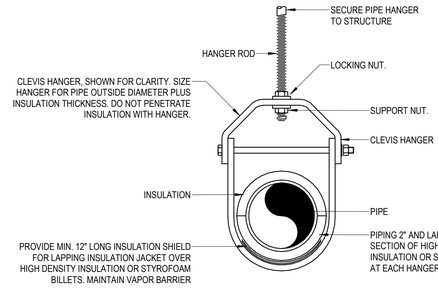
PPP SIZE	P.D.I. SYMBOL	FIXTURE UNIT RATINGS	A SIZE	B SIZE
1/2"	A	1 - 11	5"	1/2"
3/4"	B	12 - 32	5"	3/4"
1"	C	33 - 60	7"	1"
1-1/4"	D	61 - 113	7"	1-1/4"
1-1/2"	E	114 - 154	9"	1-1/2"
2"	F	155 - 330	9"	2"

LOCATE ARRESTORS IN AN ACCESSIBLE LOCATION. PROVIDE ARRESTORS AS INDICATED PER SCHEDULE. ARRESTORS SHALL BE SAME SIZE AS PIPE INSTALLED ON, MINIMUM.

6 WATER HAMMER ARRESTOR
SCALE: NTS



5 TRAP PRIMER DETAIL
SCALE: NTS



REFER TO SPECIFICATIONS FOR INSULATION TYPES, INSULATION THICKNESSES, HANGER TYPES, HANGER ROD CONNECTIONS TO STRUCTURE, AND HANGER SPACING.

4 INSULATED PIPE HANGER
SCALE: NTS

SPECIALTY PLUMBING FIXTURE SCHEDULE

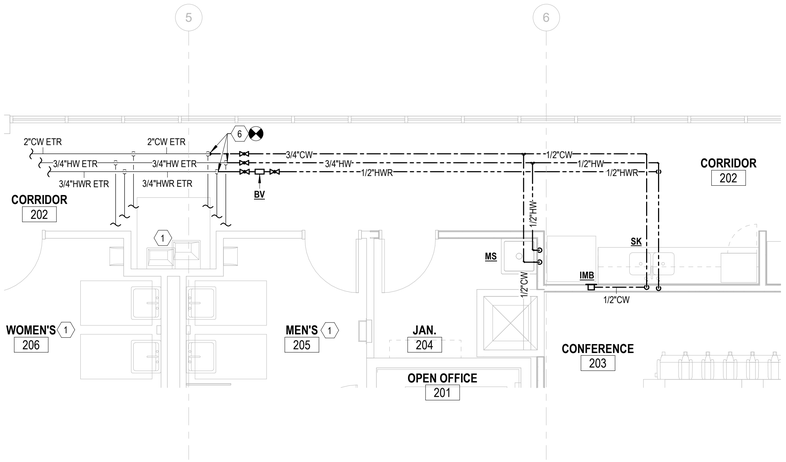
MARK	FIXTURE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	DESCRIPTION
---	VALVES	WATTS	LFB6000	FULL PORT BRASS BALL VALVE WITH PLASTIC JACKETED LEVER TYPE HANDLE, LEAD FREE.
BV	THERMOSTATIC BALANCING VALVE	THERM-OMEGA-TECH	CIRCUIT SOLVER (CSU)	SELF-ACTUATING THERMOSTATIC RECIRCULATION VALVE WITH INTEGRATED UNION BODY. SIZE SAME AS PIPE SERVED.
FD	FLOOR DRAIN (ROUND)	ZURN	ZN415B	6" ROUND "TYPE B" POLISHED NICKEL BRONZE, LIGHT-DUTY STRAINER. DURA-COATED CAST IRON BODY WITH BOTTOM OUTLET, COMBINATION INVERTIBLE MEMBRANE CLAMP AND ADJUSTABLE COLLAR WITH SEEPAGE SLOTS.
IMB	ICE MAKER BOX	GUY GRAY	MIB1AB	METAL POWDER COATED, WHITE, LOW LEAD, 1/4 TURN VALVE, 1/2" SWEAT CONNECTION.
TP	TRAP PRIMER	WATTS	LFTP300 (-DR)	BRASS PRIMER VALVE WITH REMOVABLE OPERATING PARTS, LEAD FREE, INTEGRAL VACUUM BREAKER, AND GASKETED ACCESS COVER. PROVIDE DISTRIBUTION UNIT WHERE REQUIRED TO SERVE MULTIPLE TRAPS.
WHA	WATER HAMMER ARRESTOR	ZURN	1260XL	LEAD-FREE, CONFORM TO PDI WH-201, ANSI A112.26.1M, ASSE 1010. SIZE PER MANUFACTURER'S RECOMMENDATION.

PLUMBING FIXTURE SCHEDULE

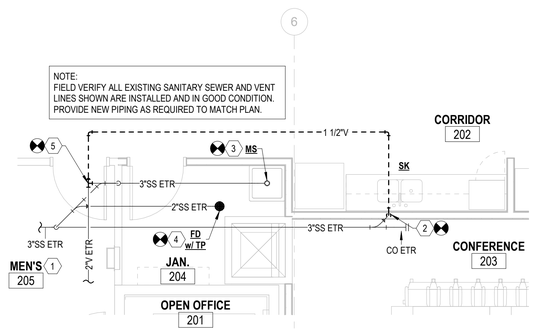
MARK	FIXTURE	BRANCH SIZES (MIN.) CW	HW	WASTE	VENT	ELECTRICAL	DESCRIPTION
MS	MOP SINK	1/2"	1/2"	3"	2"	---	FIAT, MODEL MSB2424, MOLDED STONE MOP SERVICE BASIN, 24" x 24" x 10", PROVIDE NO. 830AA FAUCET WITH INTEGRAL VACUUM BREAKER, NO. 832-AA HOSE AND BRACKET, NO. 1453BB FLOOR STRAINER AND NO. 899-CC MOP HANGER. LOCATE MOP HANGER BRACKET NEAR MOP SINK. COORDINATE FINAL LOCATION WITH OWNER.
SK	SINK - DOUBLE BOWL (ADA)	1/2"	1/2"	2"	1-1/2"	---	ADA COMPLIANT SINK: ELKAY, MODEL LRAD291855, DROP-IN, 18 GAUGE 304 STAINLESS STEEL, 29" x 18" x 5-1/2", EQUAL DOUBLE BOWL. FAUCET: AMERICAN STANDARD, MODEL 4932.300 "EDGEWATER", PULL-DOWN KITCHEN FAUCET, SINGLE-HOLE (LESS ESCUTCHEON PLATE), HIGH ARC, 1.5 GPM, 4 FUNCTION SPRAY, POLISHED CHROME.

GENERAL NOTES (ALL FIXTURES AS APPLICABLE):

1. FIXTURE AND HARDWARE PROVIDED AND INSTALLED BY PLUMBING CONTRACTOR, UNLESS NOTED OTHERWISE.
2. ADA SINKS: PROVIDE INSULATION KIT (TRUEBRO E-Z SERIES "LAVGUARD") WHERE PIPING IS EXPOSED.



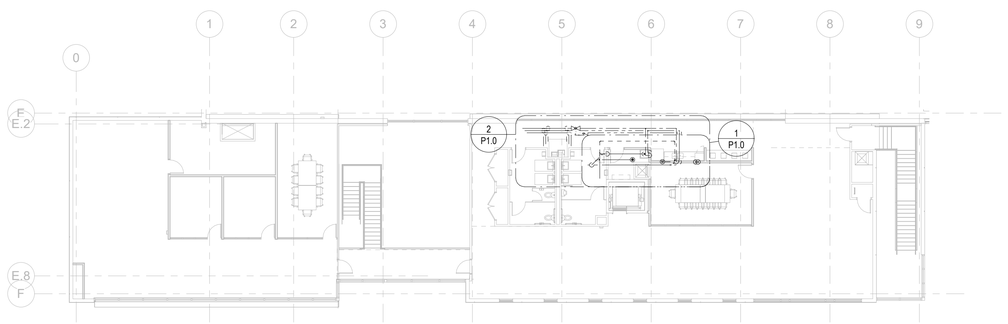
2 ENLARGED SUPPLY PLAN
1/4" = 1'-0"



1 ENLARGED DWV PLAN
1/4" = 1'-0"

PLAN NOTES:

1. EXISTING PLUMBING FIXTURES TO REMAIN.
2. CONNECT SINK TO EXISTING SANITARY SEWER STUB UP.
3. CONNECT NEW JANITOR SINK TO EXISTING SANITARY SEWER STUB UP.
4. CONNECT NEW FLOOR DRAIN TO EXISTING SANITARY SEWER LINE.
5. CONNECT NEW VENT LINE TO EXISTING VENT LINE.
6. CONNECT NEW COLD, HOT, AND HOT WATER RETURN LINES TO EXISTING LINES.



0 OVERALL PLAN
1/16" = 1'-0"

N

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P1.0
PLUMBING SCHEDULES, DETAILS, AND PLANS

PART 1: GENERAL

1.1 GENERAL REQUIREMENTS:

A. REQUIREMENTS UNDER DIVISION ONE AND THE GENERAL AND SUPPLEMENTARY CONDITIONS OF THESE SPECIFICATIONS SHALL BE A PART OF THIS SECTION. THE CONTRACTOR SHALL BECOME THOROUGHLY ACQUAINTED WITH ITS CONTENTS AS TO REQUIREMENTS THAT AFFECT THIS DIVISION OR SECTION. THE WORK REQUIRED UNDER THIS SECTION INCLUDES MATERIAL, EQUIPMENT, APPLIANCES, TRANSPORTATION, SERVICES, AND LABOR REQUIRED TO COMPLETE THE ENTIRE SYSTEM AS REQUIRED BY THE DRAWINGS AND SPECIFICATIONS.

B. DRAWINGS ARE DIAGRAMMATIC; THEREFORE, ALL OFFSETS, FITTINGS, VALVES, AND ACCESSORIES ARE NOT INDICATED. COORDINATE WORK AROUND BUILDING DETAILS AND OTHER TRADES.

C. THE SPECIFICATIONS AND DRAWINGS FOR THE PROJECTS ARE COMPLEMENTARY, AND PORTIONS OF THE WORK DESCRIBED IN ONE, SHALL BE PROVIDED AS IF DESCRIBED IN BOTH. IN THE EVENT OF DISCREPANCIES, NOTIFY THE ENGINEER AND/OR OWNER AND REQUEST CLARIFICATION PRIOR TO PROCEEDING WITH THE WORK INVOLVED.

1.2 INSPECTION OF SITE:

A. PRIOR TO SUBMITTING BID, VISIT THE SITE OF THE PROPOSED WORK AND BECOME FULLY INFORMED AS TO THE CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. FAILURE TO DO SO WILL NOT BE CONSIDERED SUFFICIENT JUSTIFICATION TO REQUEST OR OBTAIN EXTRA COMPENSATION OVER AND ABOVE THE CONTRACT PRICE.

1.3 MATERIAL AND WORKMANSHIP:

A. PROVIDE NEW MATERIAL, EQUIPMENT, AND APPARATUS UNDER THIS CONTRACT UNLESS OTHERWISE STATED HEREIN, OF BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE, AND FREE FROM ANY DEFECTS. MODEL NUMBERS LISTED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS ARE NOT NECESSARILY INTENDED TO DESIGNATE THE REQUIRED TRIM, WRITTEN DESCRIPTIONS OF THE TRIM GOVERN MODEL NUMBERS.

B. WORK PERFORMED UNDER THIS CONTRACT SHALL PROVIDE A NEAT AND "WORKMANLIKE" APPEARANCE WHEN COMPLETED, TO THE SATISFACTION OF THE ARCHITECT AND ENGINEER. WORKMANSHIP SHALL BE THE FINEST POSSIBLE BY EXPERIENCED MECHANICS. INSTALLATIONS SHALL COMPLY WITH APPLICABLE CODES AND LAWS.

C. THE COMPLETE INSTALLATION SHALL FUNCTION AS DESIGNED AND INTENDED WITH RESPECT TO EFFICIENCY, CAPACITY, NOISE LEVEL, ETC. ABNORMAL NOISE CAUSED BY RATTLING EQUIPMENT, PIPING, AND SQUEAKS IN ROTATING COMPONENTS WILL NOT BE ACCEPTABLE. IN GENERAL, MATERIALS AND EQUIPMENT SHALL BE OF COMMERCIAL SPECIFICATION GRADE IN QUALITY. LIGHT DUTY AND RESIDENTIAL TYPE EQUIPMENT WILL NOT BE ACCEPTED.

D. REMOVE FROM THE PREMISES WASTE MATERIAL PRESENT AS A RESULT OF WORK, INCLUDING CARTONS, CRATING, PAPER, STICKERS, AND/OR EXCAVATION MATERIAL NOT USED IN BACKFILLING, ETC. CLEAN EQUIPMENT INSTALLED UNDER THIS CONTRACT TO PRESENT A NEAT AND CLEAN INSTALLATION AT THE TERMINATION OF THE WORK.

E. REPAIR OR REPLACE PUBLIC AND PRIVATE PROPERTY DAMAGED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT TO THE SATISFACTION OF AUTHORITIES AND REGULATIONS HAVING JURISDICTION.

1.4 COORDINATION:

A. COORDINATE WORK WITH THAT OF OTHER TRADES SO THAT THE VARIOUS COMPONENTS OF THE SYSTEMS WILL BE INSTALLED AT THE PROPER TIME, WILL FIT THE AVAILABLE SPACE, AND WILL ALLOW PROPER SERVICE ACCESS TO THOSE ITEMS REQUIRING MAINTENANCE. COMPONENTS WHICH ARE INSTALLED WITHOUT REGARD TO THE ABOVE SHALL BE RELOCATED AT NO ADDITIONAL COST TO THE OWNER.

B. UNLESS OTHERWISE INDICATED, THE GENERAL CONTRACTOR WILL PROVIDE CHASES AND OPENINGS IN BUILDING CONSTRUCTION REQUIRED FOR INSTALLATION OF THE SYSTEMS SPECIFIED HEREIN. THE CONTRACTOR SHALL FURNISH THE GENERAL CONTRACTOR WITH INFORMATION WHERE CHASES AND OPENINGS ARE REQUIRED, KEEP INFORMED AS TO THE WORK OF OTHER TRADES ENGAGED IN THE CONSTRUCTION OF THE PROJECT, AND EXECUTE WORK IN A MANNER AS TO NOT INTERFERE WITH OR DELAY THE WORK OF OTHER TRADES.

C. FIGURED DIMENSIONS SHALL BE TAKEN IN PREFERENCE TO SCALE DIMENSIONS. CONTRACTOR SHALL TAKE HIS OWN MEASUREMENTS AT THE BUILDING, AS VARIATIONS MAY OCCUR. CONTRACTOR WILL BE HELD RESPONSIBLE FOR ERRORS THAT COULD HAVE BEEN AVOIDED BY PROPER CHECKING AND INSPECTION.

D. PROVIDE MATERIALS WITH TRIM THAT WILL PROPERLY FIT THE TYPES OF CEILING, WALL, OR FLOOR FINISHES ACTUALLY INSTALLED. MODEL NUMBERS LISTED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS ARE NOT INTENDED TO DESIGNATE THE REQUIRED TRIM.

1.5 ORDINANCES AND CODES:

A. WORK PERFORMED UNDER THIS CONTRACT SHALL, AT A MINIMUM, BE IN CONFORMANCE WITH APPLICABLE NATIONAL, STATE, AND LOCAL CODES HAVING JURISDICTION. EQUIPMENT FURNISHED AND ASSOCIATED INSTALLATION WORK PERFORMED UNDER THIS CONTRACT SHALL BE IN STRICT COMPLIANCE WITH CURRENT APPLICABLE CODES ADOPTED BY THE LOCAL AHJ INCLUDING ANY AMENDMENTS AND STANDARDS AS SET FORTH BY THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), UNDERWRITERS LABORATORIES (UL), OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME), AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS (ASHRAE), AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), AMERICAN SOCIETY OF TESTING MATERIALS (ASTM), AND OTHER NATIONAL STANDARDS AND CODES WHERE APPLICABLE. WHERE THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THEIR REFERENCED CODES, STANDARDS, ETC., THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE.

B. PROCURE AND PAY FOR PERMITS AND LICENSES REQUIRED FOR THE ACCOMPLISHMENT OF THE WORK HEREIN DESCRIBED. WHERE REQUIRED, OBTAIN, PAY FOR, AND FURNISH CERTIFICATES OF INSPECTION TO THE OWNER. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR VIOLATIONS OF THE LAW.

1.6 PROTECTION OF EQUIPMENT AND MATERIALS:

A. STORE AND PROTECT FROM DAMAGE EQUIPMENT AND MATERIALS DELIVERED TO JOB SITE. SHELTER FROM THE ELEMENTS BY STORING IN DRY, HEATED SPACES OR COVER WITH WATERPROOF, TEAR-RESISTANT, HEAVY TARP OR POLYETHYLENE PLASTIC AS REQUIRED TO PROTECT FROM PLASTER, DIRT, PAINT, WATER, PHYSICAL DAMAGE, OR THEFT. EQUIPMENT AND MATERIAL THAT HAS BEEN DAMAGED BY CONSTRUCTION ACTIVITIES WILL BE REJECTED, AND CONTRACTOR IS OBLIGATED TO FURNISH NEW EQUIPMENT AND MATERIAL OF A LIKE KIND AS APPROVED BY OWNER.

B. KEEP PREMISES CLEAN FROM FOREIGN MATERIAL CREATED DURING WORK PERFORMED UNDER THIS CONTRACT. PIPING, EQUIPMENT, ETC., SHALL HAVE A NEAT AND CLEAN APPEARANCE AT THE TERMINATION OF THE WORK.

C. PLUG OR CAP OPEN ENDS OF PIPING SYSTEMS WHILE STORED OR INSTALLED DURING CONSTRUCTION WHEN NOT IN USE THE PREVENT THE ENTRANCE OF DEBRIS INTO THE SYSTEMS.

1.7 SUBSTITUTIONS:

A. THE BASE BID SHALL INCLUDE ONLY THE PRODUCTS FROM MANUFACTURERS SPECIFICALLY NAMED IN THE DRAWINGS AND SPECIFICATIONS. NO SUBSTITUTION WILL BE CONSIDERED PRIOR TO RECEIPT OF BIDS UNLESS WRITTEN REQUEST FOR APPROVAL TO BID HAS BEEN RECEIVED BY THE ENGINEER AT LEAST TEN CALENDAR DAYS PRIOR TO THE DATE FOR RECEIPT OF BIDS. EACH SUCH REQUEST SHALL INCLUDE THE NAME OF THE MATERIAL OR EQUIPMENT FOR WHICH IT IS TO BE SUBSTITUTED AND A COMPLETE DESCRIPTION OF THE PROPOSED SUBSTITUTE INCLUDING DRAWINGS, CUT SHEETS, PERFORMANCE AND TEST DATA AND OTHER INFORMATION NECESSARY FOR AN EVALUATION. A STATEMENT SETTING FORTH CHANGES IN OTHER MATERIALS, EQUIPMENT OR OTHER WORK THAT INCORPORATION OF THE SUBSTITUTE WOULD REQUIRE SHALL BE INCLUDED. THE BURDEN OF PROOF OF THE MERIT OF THE PROPOSED SUBSTITUTE IS UPON THE PROPOSER. THE ENGINEER'S DECISION OF APPROVAL OR DISAPPROVAL TO BID OF A PROPOSED SUBSTITUTION SHALL BE FINAL.

B. THE TERMS "APPROVED", "APPROVED EQUAL", AND "EQUAL" REFER TO APPROVAL BY THE ENGINEER AS AN ACCEPTABLE ALTERNATE BID. NO SUBSTITUTIONS WILL BE CONSIDERED THAT ARE NOT BID AS AN ALTERNATE. NO MATERIAL SUBSTITUTIONS SHALL BE CONSIDERED FOR APPROVAL PRIOR TO AWARD OF CONTRACT.

C. COORDINATE AND VERIFY WITH OTHER TRADES WHETHER OR NOT THE SUBSTITUTED EQUIPMENT CAN BE INSTALLED AS SHOWN ON THE CONSTRUCTION DRAWINGS WITHOUT MODIFICATION TO ASSOCIATED SYSTEMS OR ARCHITECTURAL OR ENGINEERING DESIGN. INCLUDE ADDITIONAL COSTS FOR ARCHITECTURAL AND ENGINEERING DESIGN FEES IN BID IF DRAWING MODIFICATIONS ARE REQUIRED BECAUSE OF SUBSTITUTED EQUIPMENT.

1.8 SHOP DRAWINGS AND SUBMITTALS:

A. SUBMIT MANUFACTURER'S CATALOG SHEETS AND/OR SHOP DRAWINGS COVERING ALL PHASES OF WORK INCLUDED IN THIS CONTRACT. SUBMITTALS SHALL BE ARRANGED IN SETS AND BOUND IN FOLDERS OR IN BOOKMARKED PDF FORMAT. SUBMITTALS ARE REQUIRED EVEN THOUGH EQUIPMENT BEING FURNISHED IS EXACTLY AS SPECIFIED. FINAL DECISION AS TO WHETHER OR NOT A SPECIFIC PIECE OF EQUIPMENT MEETS SPECIFICATIONS SHALL REST WITH ARCHITECT.

1.9 OPERATION AND MAINTENANCE INSTRUCTIONS:

A. COLLECT AND COMPILE A COMPLETE BROCHURE OF FIXTURES, MATERIALS, AND EQUIPMENT FURNISHED AND INSTALLED ON THIS PROJECT. INCLUDE OPERATIONAL AND MAINTENANCE INSTRUCTIONS, MANUFACTURER'S CATALOG SHEETS, WIRING DIAGRAMS, PARTS LISTS, APPROVED SHOP DRAWINGS, AND DESCRIPTIVE LITERATURE FURNISHED BY THE MANUFACTURER. INCLUDE AN INSIDE COVER SHEET THAT LISTS THE PROJECT NAME, DATE, OWNER, ARCHITECT, ENGINEER, GENERAL CONTRACTOR, SUBCONTRACTOR, AND AN INDEX OF CONTENTS.

B. SUBMIT COPIES OF LITERATURE BOUND IN APPROVED BINDERS (OR IN BOOKMARKED PDF FORMAT) TO THE ARCHITECT AND OWNER AT THE TERMINATION OF THE WORK. PAPER CLIPS, STAPLES, RUBBER BANDS, AND MAILING ENVELOPES ARE NOT CONSIDERED APPROVERS. FINAL APPROVAL OF MECHANICAL SYSTEMS WILL BE WITHHELD UNTIL THIS EQUIPMENT BROCHURE IS DEEMED COMPLETE BY THE ARCHITECT, ENGINEER, AND OWNER.

1.10 WARRANTIES:

A. WARRANT EACH SYSTEM AND EACH ELEMENT THEREOF AGAINST ALL DEFECTS DUE TO FAULTY WORKMANSHIP, DESIGN, OR MATERIAL FOR A PERIOD OF 12 MONTHS FROM DATE OF SUBSTANTIAL COMPLETION, UNLESS SPECIFIC ITEMS ARE NOTED TO CARRY A LONGER WARRANTY IN THE CONSTRUCTION DOCUMENTS OR MANUFACTURER'S STANDARD WARRANTY EXCEEDS 12 MONTHS. TIME PERIOD FOR CORRECTION OF DEFECTIVE MOTORS SHALL BE FIVE YEARS FROM THE DATE OF SUBSTANTIAL COMPLETION. REMEDY ALL DEFECTS, OCCURRING WITHIN THE WARRANTY PERIOD(S), AS STATED IN THE GENERAL CONDITIONS AND DIVISION 1.

B. WARRANTIES SHALL INCLUDE LABOR AND MATERIAL. MAKE REPAIRS OR REPLACEMENTS WITHOUT ANY ADDITIONAL COSTS TO THE OWNER.

C. PERFORM THE REMEDIAL WORK PROMPTLY, UPON WRITTEN NOTICE FROM THE ENGINEER OR OWNER.

D. AT THE TIME OF SUBSTANTIAL COMPLETION, DELIVER TO THE OWNER ALL WARRANTIES, IN WRITING AND PROPERLY EXECUTED, INCLUDING TERM LIMITS FOR WARRANTIES EXTENDING BEYOND THE ONE YEAR PERIOD, EACH WARRANTY INSTRUMENT BEING ADDRESSED TO THE OWNER AND STATING THE COMMENCEMENT DATE AND TERM.

1.11 CUTTING AND PATCHING:

A. PERFORM CUTTING OF WALLS, FLOORS, CEILINGS, ETC. AS REQUIRED TO INSTALL WORK UNDER THIS SECTION. OBTAIN PERMISSION FROM THE ARCHITECT PRIOR TO CUTTING. DO NO CUT OR DISTURB STRUCTURAL MEMBERS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT. CUT HOLES AS SMALL AS POSSIBLE. GENERAL CONTRACTOR SHALL PATCH WALLS, FLOORS, ETC. AS REQUIRED BY WORK UNDER THIS SECTION. PATCHING SHALL MATCH THE ORIGINAL MATERIAL AND CONSTRUCTION. REPAIR AND REFINISH AREAS DISTURBED BY WORK TO THE CONDITION OF ADJOINING SURFACES IN A MANNER SATISFACTORY TO THE ARCHITECT.

1.12 ROUGH-IN:

A. COORDINATE WITHOUT DELAY ROUGHING-IN WITH GENERAL CONSTRUCTION. CONCEAL PIPING AND CONDUIT ROUGH-IN EXCEPT IN UNFINISHED AREAS WHERE OTHERWISE SHOWN.

1.13 STRUCTURAL STEEL:

A. STRUCTURAL STEEL USED FOR PIPE SUPPORTS, EQUIPMENT SUPPORTS, ETC., SHALL BE NEW, CLEAN, AND CONFORM TO ASTM DESIGNATION A-36.

B. SUPPORT PLUMBING EQUIPMENT AND PIPING FROM THE BUILDING STRUCTURE. DO NOT SUPPORT PLUMBING SYSTEMS FROM CEILINGS, OTHER MECHANICAL, PLUMBING, OR ELECTRICAL COMPONENTS, AND OTHER NON-STRUCTURAL ELEMENTS.

1.14 ACCESS DOORS:

A. PROVIDE ACCESS DOORS IN CEILINGS AND WALLS WHERE INDICATED OR REQUIRED FOR ACCESS TO CONCEALED VALVES AND EQUIPMENT INSTALLED UNDER THIS SECTION. PROVIDE CONCEALED HINGES, SCREWDRIVER-TYPE LOCK, ANCHOR STRAPS; MANUFACTURED BY MILCOR, ZURN, TITUS, OR EQUAL. OBTAIN ARCHITECT'S APPROVAL OF TYPE, SIZE, LOCATION, AND COLOR BEFORE ORDERING.

1.15 PENETRATIONS:

A. SEAL FLOOR PENETRATIONS WATER TIGHT WITH APPROPRIATE NON-SHRINK, NON-HARDENING COMMERCIAL CONSTRUCTION SEALANT. SEAL ROOF PENETRATIONS WITH FOUR POUND PER SQUARE FOOT LEAD FLASHING. PROVIDE A SLEEVE, AND SEAL NON-FIRE-RATED FLOOR AND WALL PENETRATIONS WITH FIBERGLASS PACKING AND SILICONE CAULK (FOR ACOUSTICAL INSULATION).

B. COORDINATE FIRE RATING REQUIREMENTS AND LOCATIONS WITH THE ARCHITECT. SEAL PENETRATIONS OF FIRE-RATED ASSEMBLIES WITH LISTED FIRE BARRIER CAULK (PROVIDE THICKNESS AND METHOD AS REQUIRED AND RECOMMENDED BY MANUFACTURER) TO MAINTAIN THE FIRE RESISTANCE RATING OF FIRE-RATED ASSEMBLIES.

PART 2: PRODUCTS

2.1 PIPING:

A. DOMESTIC WATER PIPING:

1. ABOVE AND BELOW GRADE COLD WATER AND HOT WATER PIPING SHALL BE THE FOLLOWING.

a. ABOVE GRADE: TYPE "L" HARD DRAWN SEAMLESS COPPER TUBING CONFORMING TO ASTM B88. FITTINGS SHALL BE CAST COPPER ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET, METAL-TO-METAL SEATING SURFACE CONFORMING TO ASTM B16.18 JOINING MATERIAL JOINING MATERIAL SHALL BE ASTM B813 WATER-FLUSHABLE, LEAD-FREE FLUX WITH ASTM B32 SN95 ALLOY LEAD-FREE SOLDER.

b. AT CONTRACTOR'S OPTION, COLD WATER AND HOT WATER PIPING SHALL BE PRESS JOINT PIPING MANUFACTURE RED BY VIEGA "PRO-PRESS" OR APPROVED EQUAL. FITTINGS SHALL BE PROVIDED BY SAME MANUFACTURER AS PIPING.

2. AT CONTRACTOR'S OPTION, ABOVE AND BELOW GRADE COLD WATER AND HOT WATER PIPING SHALL BE PEX TUBING CONFORMING TO ASTM F877 CROSS-LINKED POLYETHYLENE TUBING, ASTM F876 CROSS-LINKED POLYETHYLENE TUBE, AND COMPLY WITH NSF STANDARD 14 AND 61. PEX TUBING SHALL BE WATTS WATERPEX CROSS-LINKED POLYETHYLENE OR APPROVED EQUAL. ALL PEX TUBING BELOW GRADE SHALL BE SLEEVED WITH PVC PIPE.

a. FITTINGS SHALL BE MECHANICAL CRIMP FITTINGS IN COMPLIANCE WITH ASTM F1807. PEX FITTINGS SHALL BE BRASS CRIMPRING FITTINGS USING EITHER COPPER CRIMPRING, STAINLESS STEEL CINCHCLAMP, OR APPROVED EQUAL, INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. MANUFACTURER FOR THE FITTINGS SHALL MATCH THE PIPING SYSTEM.

b. PIPE SIZES SHOWN ON PLANS ARE FOR COPPER. IF PEX IS USED, ADJUST SIZES PER TABLE BELOW.

EQUIVALENT NOMINAL PIPE SIZES						
PLAN SIZE (COPPER)	1/2"	3/4"	1"	1-1/4"	1-1/2"	> 1-1/2"
PEX	1/2"	1"	1-1/4"	1-1/2"	2"	N/A

B. SOIL, WASTE, AND VENT PIPING:

1. ABOVE GRADE SOIL, WASTE, AND VENT PIPING SHALL BE HUBLESS CAST-IRON PIPING AND FITTINGS CONFORMING TO CISPI 301 OR ASTM A888 WITH HEAVY-DUTY, HUBLESS PIPING FITTINGS AND COUPLINGS CONFORMING WITH ASTM C1540. PROVIDE WITH STAINLESS STEEL SHIELD WITH MINIMUM OF FOUR STAINLESS STEEL BANDS AND TIGHTENING DEVICES MEETING ASTM C1540 AND LABELD AS "HEAVY DUTY" BY THE MANUFACTURER, AND ASTM C564 RUBBER SLEEVE WITH INTEGRAL CENTER PIPE STOP. INSTALL CAST-IRON SOIL PIPING ACCORDING TO CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK" CHAPTER IV, "INSTALLATION OF CAST IRON SOIL PIPE AND FITTINGS".

2. AT CONTRACTOR'S OPTION, ABOVE AND BELOW GRADE SOIL, WASTE, AND VENT PIPING SHALL BE POLYVINYL CHLORIDE (PVC) PIPING, SCHEDULE 40 DWV PIPE CONFORMING TO ASTM D2665. CELLULAR (FOAM) CORE PVC NOT ALLOWED. INSTALL PER ASTM D2665 AND ASTM D2321. PVC PLASTIC PIPING SHALL NOT ALLOWED IN RETURN AIR PLENUM SPACES OR WHERE WATER TEMPERATURES EXCEED 140 DEGREE F.

a. FITTINGS SHALL BE PVC SOCKET-TYPE DWV PIPE FITTINGS; ASTM D2665 MADE TO ASTM D3311 DRAIN, WASTE, AND VENT PATTERNS.

3. AT CONTRACTOR'S OPTION, ABOVE GRADE SOIL, WASTE, AND VENT PIPING SHALL BE DWV COPPER DRAINAGE TUBING CONFORMING TO ASTM B306.

a. FITTINGS SHALL BE WROUGHT COPPER FITTINGS CONFORMING TO ASTM 16.29.

4. FURNISH ELLS, TEES, REDUCING TEES, WYES, COUPLINGS, INCREASERS, CROSSES, TRANSITIONS, AND END CAPS OF SAME TYPE AND CLASS OF MATERIAL AS CONDUIT, OR OF MATERIAL HAVING EQUAL OR SUPERIOR PHYSICAL AND CHEMICAL PROPERTIES AS ACCEPTABLE TO THE OWNER AND ENGINEER.

2.2 PIPING INSULATION:

A. DOMESTIC COLD WATER PIPING (WITHIN BUILDING):

1. COPPER PIPING: ONE-PIECE FIBERGLASS COVERING WITH A CONTINUOUS VAPOR BARRIER MANUFACTURED BY CERTAINTEED, OWENS-CORNING, ARMSTRONG, OR APPROVED EQUAL.

a. PIPING LESS THAN 1-1/2": 1/2" THICK.

b. PIPING 1-1/2" AND LARGER: 1" THICK.

2. PEX TUBING: NO INSULATION REQUIRED.

B. DOMESTIC HOT WATER PIPING AND HOT WATER RECIRCULATION PIPING:

1. COPPER PIPING AND PEX TUBING: ONE-PIECE FIBERGLASS COVERING WITH CONTINUOUS VAPOR BARRIER MANUFACTURED BY CERTAINTEED, OWENS-CORNING, ARMSTRONG, OR APPROVED EQUAL.

a. FLUID TEMPERATURE 140°F OR LESS:

i. PIPING LESS THAN 1-1/2": 1" THICK.
ii. PIPING 1-1/2" AND LARGER: 1-1/2" THICK.

C. FOR PIPING AT HANGERS, PROVIDE 8" LONG SECTIONS OF HIGH DENSITY, HIGH TEMPERATURE CALCIUM SILICATE MANUFACTURED BY JOHNS-MANVILLE, FIBERGLASS MANUFACTURED BY KNAUF, OR 8" LONG STYROFOAM BILLETS MANUFACTURED BY DOW. INSULATION SHALL BE CONTINUOUS ALONG THE PIPE SURFACE, EXCEPT AT VALVES, UNIONS, AND WHERE PIPING IS EXPOSED AT FIXTURES.

D. FOR HOT WATER AND COLD WATER PIPING EXPOSED, CONCEALED IN WALLS, AND/OR INSTALLED INSIDE MASONRY UNITS OF WALLS, COVER FITTINGS WITH ZESTON, KNAUF, OR APPROVED EQUAL ONE-PIECE PVC PREMOLDED INSULATING COVERS. FITTING COVERS, JACKETS, AND ADHESIVES SHALL NOT EXCEED FLAME SPREAD RATING OF 25 AND SMOKE DEVELOPMENT RATING OF 50 PER ASTM E84. AT ALL ELBOWS AND TEES, FILL VOIDS BETWEEN COVERS AND PIPING WITH FIBERGLASS INSULATION AND TAPE JOINTS. INSTALL PIPE INSULATION IN COMPLIANCE WITH MANUFACTURER'S RECOMMENDATIONS. WHERE PREMOLDED INSULATING FITTINGS ARE NOT APPROVED BY LOCAL AUTHORITIES, MITER INSULATION AT FITTINGS.

E. FOR HANDICAP FIXTURE HOT AND COLD WATER PIPING, TRAPS, DRAINS, AND STOPS, PROVIDE MANUFACTURED FIBERGLASS INSULATION COVERED WITH PVC PLASTIC JACKET MANUFACTURED BY TRUEBRO OR APPROVED EQUAL.

2.3 PLUMBING FIXTURES, SPECIALTIES AND EQUIPMENT:

A. FIXTURES: KOHLER, AMERICAN STANDARD, ELJER, OR APPROVED EQUAL.

B. FLOOR DRAINS AND CLEAN OUTS: WADE, ZURN, OR APPROVED EQUAL.

C. STAINLESS STEEL SINKS: JUST, ELKAY, OR APPROVED EQUAL.

D. SUPPLIES, STOPS, TRAPS: EBC, MCGUIRE, CHICAGO FAUCET, OR APPROVED EQUAL.

E. PROVIDE ALL NECESSARY SUPPORT, TRIM AND ACCESSORIES REQUIRED.

F. ALL EXPOSED FINISHED METAL PARTS SHALL BE CHROMIUM-PLATED, UNLESS OTHERWISE SCHEDULED.

G. ALL FIXTURES SHALL BE PROVIDED WITH SUPPLIES STOPS AND ESCUTCHEON PLATES.

H. TRAPS SHALL BE 17 GA. MINIMUM, WITH CLEANOUT.

PART 3: INSTALLATION

3.1 GENERAL:

A. CLEAN PIPE THOROUGHLY PRIOR TO INSTALLATION. REAM ENDS OF PIPE TO REMOVE BURRS.

B. CUT PIPE ACCURATELY TO MEASUREMENTS TAKEN ON THE JOB.

C. INSTALL WITH ADEQUATE CLEARANCE FOR INSTALLATION OF COVERINGS WHERE REQUIRED.

D. PIPE SHALL NOT BE SPRUNG OR BENT.

E. NEATLY ALIGN PIPE, CONNECT IT SECURELY, AND SUPPORT IT FROM THE BUILDING STRUCTURE WITH HANGERS AS SPECIFIED BELOW.

F. PROVIDE CHROME-PLATED ESCUTCHEONS ON PIPES PASSING THROUGH CEILINGS, FLOORS, OR WALLS OF FINISHED SPACES.

G. RUN PIPES FREELY THROUGH FLOOR AND WALL PENETRATIONS USING PIPE SLEEVES. DO NOT GROUT IN PLACE UNLESS REQUIRED FOR STRUCTURAL FIRE INTEGRITY.

H. INSTALL PIPE CONCEALED IN FINISHED SPACES WHEREVER POSSIBLE.

I. USE A DIELECTRIC UNION WHERE FERROUS AND COPPER PIPE CONNECT. DIELECTRIC UNION SHALL HAVE A ZINC STEEL BODY, A THREADED NYLON INSERT, AND INSULATION PRESSURE GASKET. NO FERROUS METAL-TO-COPPER CONNECTION MADE WITHOUT INSULATING UNIONS WILL BE ALLOWED.

3.2 HANGERS & SUPPORTS:

A. PIPE HANGERS SHALL BE AS DESCRIBED IN THE SPECIFICATIONS BY B-LINE OR EQUAL BY ANVIL, MICHIGAN, TRUSCON, OR UNISTRUT.

B. CONNECT HANGERS TO THE STRUCTURE WITH SIDE BEAM CONNECTORS AND ALL THREAD HANGER RODS.

C. PROVIDE ENGINEERED SUPPORT STRUTS BETWEEN JOISTS AND OTHER STRUCTURAL MEMBERS AS REQUIRED TO PROVIDE A RIGID HANGING.

3.3 DOMESTIC WATER:

A. ARRANGE COLD, HOT, AND HOT WATER RECIRCULATION PIPING TO DRAIN AT THE LOWEST POINT IN EACH SYSTEM.

B. INSTALL AT LEAST ONE PIPE UNION ADJACENT TO ALL SHUT-OFF VALVES, AT CONNECTION POINT OF EACH PIECE OF EQUIPMENT, AND ELSEWHERE IN THE SYSTEM WHERE REQUIRED TO ALLOW PROPER MAINTENANCE. PROVIDE UNIONS OF THE GROUND JOINT TYPE.

C. MAKE ALLOWANCE FOR EXPANSION AND CONTRACTION WHERE REQUIRED BY THE INSTALLATION.

D. WHERE WATER PIPING OCCURS IN EXTERIOR WALLS, HOLD PIPE AS CLOSE AS POSSIBLE TO THE INTERIOR FACE OF THE WALL AND INSTALL INSULATION BATT OR OTHER INSULATION (MINIMUM R-8) BETWEEN PIPING AND THE EXTERIOR WALL FACE.

3.4 TESTING AND INSPECTION:

A. UPON COMPLETION OF EACH PHASE OF THE INSTALLATION, TEST EACH SYSTEM IN CONFORMANCE WITH LOCAL CODE REQUIREMENTS AND AS NOTED BELOW.

B. FURNISH LABOR AND EQUIPMENT REQUIRED TO TEST PLUMBING WORK INSTALLED UNDER THIS CONTRACT, AND ASSUME ALL COSTS INVOLVED IN MAKING THE TESTS, AND REPAIRING AND/OR REPLACING DAMAGE RESULTING THEREFROM.

C. NOTIFY THE ARCHITECT AND AUTHORITY HAVING JURISDICTION, THREE (3) WORKING DAYS PRIOR TO MAKING PLUMBING SYSTEM TESTS.

D. LEAVE CONCEALED WORK UNCOVERED UNTIL THE REQUIRED TESTS HAVE BEEN COMPLETED AND APPROVED, BUT IF NECESSARY DUE TO CONSTRUCTION PROCEDURE, TESTS ON PORTIONS OF THE WORK MAY BE MADE, AND WHEN SATISFACTORY, THE WORK MAY BE CONCEALED. TEST PIPING BEFORE INSULATION IS INSTALLED, AND BEFORE BACKFILL.

E. PIPES, JOINTS, FLANGES, VALVE STEMS, ETC., SHALL BE LEAK TIGHT.

F. REPAIR OR REPLACE SYSTEM DEFECTS WITH NEW MATERIALS. CAULKING OF DEFECTIVE JOINTS, CRACK OR HOLES WILL NOT BE PERMITTED. REPEAT TESTS AFTER DEFECTS HAVE BEEN ELIMINATED.

G. MAKE TESTS IN THE PRESENCE OF THE ADMINISTRATIVE AUTHORITY AND/OR THE OWNER'S AUTHORIZED REPRESENTATIVE.

H. WORK SHALL BE INSPECTED FOR COMPLIANCE WITH CODES, ORDINANCES, REGULATIONS, AND ADHERENCE TO CONTRACT DOCUMENTS. PLUMBING CONTRACTOR SHALL SUPPLY OWNER WITH SIGNED FORMS OR PROOF OF ACCEPTANCE BY THE LOCAL AUTHORITY BEFORE CONTINUING FROM ONE STAGE TO ANOTHER.

I. FINAL APPROVAL SHALL BE OBTAINED BEFORE FINAL PAYMENT IS MADE ON THE CONTRACT.

3.5 REMODEL WORK:

A. REMOVE ALL UNUSED EQUIPMENT, PIPING, AND ASSOCIATED SUPPORTS. CAP PIPING AT MAINS AND SEAL WATER TIGHT.

B. PROVIDE ITEMS OF PLUMBING SYSTEMS MODIFICATION REQUIRED BECAUSE OF BUILDING REMODELING, AS NOTED ON THE DRAWINGS OR NECESSARY FOR PROPER OPERATION. MATCH EXISTING MATERIALS AND CONSTRUCTION TECHNIQUES WHEN MODIFYING EXISTING SYSTEMS UNLESS SPECIFIED OTHERWISE. COORDINATE ADDITIONAL REQUIREMENTS WITH GENERAL CONTRACTOR AND ARCHITECT.

C. SEAL WATER TIGHT EXISTING PIPING REQUIRED TO BE ABANDONED IN PLACE OR NOT IN USE AT THE TERMINATION OF THE WORK.

D. CAP AND SEAL WEATHERTIGHT EXISTING ROOF OPENINGS TO BE ABANDONED IN PLACE AS A RESULT OF EQUIPMENT REMOVAL.

E. CLEAN AND REFURBISH EXISTING PLUMBING EQUIPMENT INTENDED FOR REUSE AS REQUIRED FOR PROPER OPERATION.

F. COMPLY WITH THE SCHEDULE OF OPERATIONS AS OUTLINED IN THE ARCHITECTURAL PORTIONS OF THIS SPECIFICATION. ACCOMPLISH WORK REQUIRING INTERRUPTION OF BUILDING OPERATION AT A TIME WHEN THE BUILDING IS NOT IN OPERATION, AND ONLY WITH WRITTEN APPROVAL OF BUILDING OWNER AND/OR TENANT. COORDINATE INTERRUPTION OF BUILDING OPERATION WITH THE OWNER AND/OR TENANT A MINIMUM OF SEVEN DAYS IN ADVANCE OF WORK.

3.6 GUARANTEE:

A. THE WORK TO BE PERFORMED UNDER THIS CONTRACT SHALL INCLUDE THE FURNISHING, INSTALLATION, AND CONNECTION OF PLUMBING SYSTEMS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS.

B. BY SIGNING THE CONTRACT, THE PLUMBING CONTRACTOR ACKNOWLEDGES THAT HE HAS ACQUAINTED HIMSELF WITH THE SITE AND THE EXISTING CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED, AND THE DRAWINGS AND SPECIFICATIONS PERTAINING THERETO, AND HE INDICATES THAT HE WILL COMPLY WITH THE REQUIREMENTS AND INTENT OF PERTINENT DOCUMENTS IN THE PERFORMANCE OF THE WORK.

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Engineer's Seal:
STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 14988 JASON PATRICK MOWREY
2/23/2024

Firm's Seal:
CERTIFICATE OF AUTHORIZATION PRIGM ENGINEERING, PLLC No. 3588 ARKANSAS

UNIVERSITY OF ARKANSAS

University of Arkansas - CEREC

DATE 2/23/2024
JOB NO. 23108
REVISIONS

P2.0
PLUMBING SPECIFICATIONS

ABBREVIATIONS

(AS APPLICABLE)

(E)	EXISTING
3CS	THREE-COMPARTMENT SINK
A	AMP, AMPERE
A/E	ARCHITECT / ENGINEER
AAV	AIR ADMITTANCE VALVE
ABV	ABOVE
AC	AIR CONDITIONER, AIR CONDITIONING
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AFMD	AIR FLOW MEASURING DEVICE
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
ANSI	AMERICAN NAT'L STANDARDS INSTITUTE
AL	ALUMINUM
AP	ACCESS PANEL
ARCH	ARCHITECT, ARCHITECTURAL
ARI	AIR CONDITIONING & REFRIG INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, & AIR CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING & MATERIALS
ATC	AUTOMATIC TEMP CONTROLS
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
AWS	AMERICAN WELDING SOCIETY
AWWA	AMERICAN WATER WORKS ASSOCIATION
BAS	BUILDING AUTOMATION SYSTEM
BDD	BACKDRAFT DAMPER
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BT	BATHTUB
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
BV	BALANCING VALVE
BWV	BACKWATER VALVE
C	COMMON
CA	COMBUSTION AIR
CD	CEILING SUPPLY AIR DIFFUSER
CD	CONDENSATE DRAIN
CF	CEILING FAN
CF	CUBIC FEET
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON
CKT	CIRCUIT
CLG	CEILING
CO	CARBON MONOXIDE
CO	CLEANOUT
CO2	CARBON DIOXIDE
CONFIG	CONFIGURATION
COP	COEFFICIENT OF PERFORMANCE
CU	CONDENSING UNIT
CU	COPPER
CV	CIRCUIT VENT
CV	CONSTANT VOLUME
CWV	COMBINATION WASTE & VENT
DB	DRY-BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DEG	DEGREES
DF	DRINKING FOUNTAIN
DH	DUCT HEATER
DI	DEIONIZED WATER
DIA, ø	DIAMETER
DISC	DISCONNECT
DN	DOWN
DN	DOWNSPOUT NOZZLE
DOM	DOMESTIC
DP	DEW POINT
DPS	DIFFERENTIAL PRESSURE SENSOR
DWG	DRAWING
DX	DIRECT EXPANSION
EA	EACH
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EFF	EFFICIENCY
EG	EXHAUST GRILLE
ELEC	ELECTRICAL
EM	EMERGENCY LIGHTING
ENT	ENTERING
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
ETR	EXISTING TO REMAIN
EW	EYE WASH
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
F	FAHRENHEIT
FACP	FIRE ALARM CONTROL PANEL
FCO	FLOOR CLEANOUT
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FD	FIRE DAMPER
FDC	FIRE DEPARTMENT CONNECTION
FFE	FINISHED FLOOR ELEVATION
FLA	FULL LOAD AMPS
FM	FLOW METER
FP	FIRE PROTECTION
FPC	FIRE PROTECTION CONTRACTOR
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FPWH	FREEZE PROOF WALL HYDRANT
FS	FLOOR SINK
FS	FLOW SWITCH
FT	FEET
GA	GAUGE
GAL	GALLONS
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GFCI/GFI	GROUND FAULT CIRCUIT INTERRUPTER
GI	GREASE INTERCEPTOR
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GR	GRAINS
GR	GROUND
HB	HOSE BIBB
HD	HEAD
HD	HUB DRAIN
HOA	HAND / OFF / AUTOMATIC
HP	HEAT PUMP
HP	HORSEPOWER
HS	HAND SINK
HS	HAND SWITCH
HZ	HERTZ
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
I/O	INPUT / OUTPUT
IE	INVERT ELEVATION
IG	ISOLATED GROUND
IN	INCHES
IN WC	INCHES OF WATER COLUMN
IND	INDIRECT
IPLV	INTEGRATED PART LOAD VALUE
KEC	KITCHEN EQUIPMENT CONTRACTOR
KV	KILOVOLT
KVA	KILOVOLT-AMPS
KW	KILOWATT
KWH	KILOWATT HOUR
LAT	LEAVING AIR TEMPERATURE
LAV	LAVATORY
LB, #	POUNDS
LRA	LOCKED ROTOR AMPS
LTG	LIGHTING
LWT	LEAVING WATER TEMPERATURE
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBH	1000 BTUH
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM BRANCH CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MFR	MANUFACTURER
MHB	MIXING HOSE BIBB
MIN	MINIMUM
MLO	MAIN LUG ONLY
MM	MILLIMETER
MOCP	MAXIMUM OVERCURRENT PROTECTION
MS	MOP SINK
MUA	MAKE-UP AIR
MZ	MULTI-ZONE
N/A	NOT APPLICABLE
N.C.	NORMALLY CLOSED
NC	NOISE CRITERIA
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MFR'S ASSOCIATION
NFC	NOT FOR CONSTRUCTION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
N.O.	NORMALLY OPEN
NOM	NOMINAL
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OI	OIL INTERCEPTOR
OS&Y	OUTSIDE STEM AND YOKE
OSHA	OCCUPATIONAL SAFETY & HEALTH ADMIN.
PB	PUSH BUTTON
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP
PH	PHASE
PLBG	PLUMBING
PNLBD	PANELBOARD
PPM	PARTS PER MILLION
PRV	PRESSURE REGULATING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
PSIG	POUNDS PER SQUARE INCH - GAUGE
QTY	QUANTITY
RA	RETURN AIR
RAT	RETURN AIR TEMPERATURE
RAW	RETURN AIR WALL GRILLE
RC	REFRIGERATION CONTRACTOR
RCPTS	RECEPTACLES
RD	RADIATION DAMPER
RD	ROOF DRAIN
REBAL	REBALANCE
RECIRC	RECIRCULATE
REF	REFERENCE
REL	RELOCATED
REQ	REQUIRED
REV	REVISION, REVISE
RG	RETURN GRILLE
RH	RADIANT HEATER
RH	RELATIVE HUMIDITY
RLA	RUNNING LOAD AMPS
RO	REVERSE OSMOSIS
ROD	ROOF OVERFLOW DRAIN
RPM	REVOLUTIONS PER MINUTE
RPZ	REDUCED PRESSURE ZONE
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SAT	SUPPLY AIR TEMPERATURE
SAW	SUPPLY AIR WALL REGISTER
SC	SECURITY CAMERA
SC	SENSIBLE CAPACITY
SD	SMOKE DETECTOR
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SF	SQUARE FEET
SF	SUPPLY FAN
SH	SHOWER
SK	SINK
SM	SHEET METAL
SMACNA	SHEET METAL & A/C CONT NAT'L ASSOC.
SOV	SHUT-OFF VALVE
SP	STATIC PRESSURE
SPEC	SPECIFICATION
STD	STANDARD
SZ	SINGLE-ZONE
TAB	TESTING, ADJUSTING, BALANCE
TC	TOTAL CAPACITY
TD	TEMPERATURE DIFFERENCE
TD	TRENCH DRAIN
TDH	TOTAL DYNAMIC HEAD
TFD	TO FLOOR DRAIN
TG	TRANSFER GRILLE
THRU	THROUGH
TMV	THERMOSTATIC MIXING VALVE
TP	TOTAL PRESSURE
TP	TRAP PRIMER
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
U/F	UNDER FLOOR
U/G	UNDER GROUND
U/S	UNDER SLAB
UC	UNDERCUT DOOR
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC.
UR	URINAL
UNO	UNLESS NOTED OTHERWISE
V	VENT
V	VOLT
VA	VOLT-AMPERE
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VBF	VENT BELOW FLOOR
VBG	VENT BELOW GRADE
VFD	VARIABLE FREQUENCY DRIVE
VRF	VARIABLE REFRIGERANT FLOW
VTR	VENT THRU ROOF
W	WATTS
w/	WITH
w/o	WITHOUT
WB	WASHER BOX
WB	WET-BULB TEMPERATURE
WC	WATER CLOSET
WC	WATER COLUMN
WG	WATER GAUGE
WH	WATER HEATER
WP	WEATHER PROOF COVERPLATE
WR	WEATHER RESISTANT RECEPTACLE
WV	WET VENT
XFMR	TRANSFORMER

DUCTWORK SYMBOLS

(AS APPLICABLE)

SYMBOL	DESCRIPTION
12"ø	12"ø DIAMETER ROUND DUCT (INSIDE CLEAR DIMENSIONS)
18"x12"	RECTANGULAR DUCT 18" WIDE BY 12" DEEP (INSIDE CLEAR DIMENSIONS)
18"/12"ø	FLAT OVAL DUCT 18" WIDE BY 12" DEEP (INSIDE CLEAR DIMENSIONS)
	MEDIUM / HIGH PRESSURE DUCTWORK (REFER TO SPECIFICATIONS)
	SPIRAL DUCTWORK (REFER TO SPECIFICATIONS)
	SUPPLY DUCT IN SECTION
	RETURN DUCT IN SECTION
	EXHAUST DUCT IN SECTION
	ELBOW WITH TURNING VANES (GREATER THAN 45° ANGLE ONLY)
	SUPPLY AIR DIFFUSER
	RETURN AIR GRILLE
	EXHAUST AIR GRILLE
	VOLUME/BALANCE DAMPER
M	MOTORIZED DAMPER
	FIRE DAMPER (FD)
	SMOKE DAMPER (SD)
	COMBINATION FIRE/SMOKE DAMPER (FSD)
A | 3 10"x10" 500	DEVICE MARK | THROW PATTERN (IF SHOWN) NECK SIZE OR LENGTH OF LINEAR DIFFUSER CFM
T	THERMOSTAT
S	TEMPERATURE SENSOR
C	CO2 SENSOR
H	HUMIDISTAT
D	SMOKE DETECTOR
SP	STATIC PRESSURE SENSOR
PS	PULL STATION

ANNOTATION SYMBOLS

(AS APPLICABLE)

SYMBOL	DESCRIPTION
	PLAN NOTE (PER SHEET)
XXXX	KITCHEN EQUIPMENT REFERENCE NUMBER
	POINT OF CONNECTION TO EXISTING
	TERMINATION OF DEMOLITION
~	CONTINUATION
1 M1	DETAIL NUMBER SHEET NUMBER
1 M1	SECTION CUT DESIGNATION

REMODEL NOTES

(AS APPLICABLE)

1. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW GENERAL NOTES, SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER OR TENANT, AS DEFINED IN BID DOCUMENTS, OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
2. EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
3. DURING INSTALLATION OF NEW WORK, AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN. REPAIR DAMAGE CAUSED DURING CONSTRUCTION AT NO EXTRA COST TO THE OWNER.
4. BUILDING OWNER RETAINS RIGHTS OF SALVAGE FOR EQUIPMENT AND FIXTURES TO BE REMOVED. COORDINATE WITH OWNER THE EQUIPMENT AND FIXTURES TO BE SALVAGED AND THE LOCATION FOR STORAGE. AVOID DAMAGE TO SALVAGED EQUIPMENT, FIXTURES, AND DEVICES DURING DEMOLITION WORK AND DURING TRANSPORT TO OWNER'S DESIGNATED STORAGE LOCATION.
5. REMOVE HANGERS AND SUPPORTS WHERE DUCTWORK, PIPING AND/OR EQUIPMENT ARE REMOVED AND THE EXISTING HANGERS AND SUPPORTS ARE NOT USED FOR THE NEW INSTALLATION.
6. INSTALL PERMANENT CAPS WHERE DUCTWORK AND PIPING IS REMOVED AND THE EXISTING TAPS ARE NOT USED FOR THE NEW INSTALLATION. WHERE DUCTWORK AND PIPING ARE REMOVED AND THE EXISTING TAPS WILL BE USED FOR THE NEW INSTALLATION, INSTALL TEMPORARY CAPS TO PROTECT THE INTERIOR SURFACES UNTIL NEW DUCTWORK AND PIPING ARE INSTALLED.
7. INSPECT EXISTING EQUIPMENT TO REMAIN TO VERIFY THAT EQUIPMENT IS OPERATING PROPERLY. NOTIFY TENANT OF DAMAGED AND/OR MALFUNCTIONING COMPONENTS.

APPLICABLE CODES

2021 ARKANSAS FIRE PREVENTION CODE, VOLUME I - FIRE
2021 ARKANSAS FIRE PREVENTION CODE, VOLUME II - BUILDING
2021 ARKANSAS MECHANICAL CODE (AMC)
2020 NFPA 70 - NATIONAL ELECTRICAL CODE (NEC)
2018 ARKANSAS PLUMBING CODE (APC)
2018 ARKANSAS FUEL GAS CODE (AFGC)
2009 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)

DESIGN CONDITIONS

WEATHER STATION (2021 ASHRAE HANDBOOK):

DRAKE FIELD, AR, USA (WMO: 723445)
ELEVATION: 1251 FT.

OUTDOOR DESIGN CONDITIONS:

COOLING (0.4%):	95.2°F DB / 74.4°F WB
DEHUMIDIFICATION (0.4%):	75.3°F DP / 83.3°F DB
ENTHALPY (0.4%):	42.7 BTU/LB / 88.5°F DB
HEATING (99.6%):	10.4°F DB
HUMIDIFICATION (99.6%):	1.0°F DP / 14.3°F DB

INDOOR DESIGN CONDITIONS:
(UNLESS SPECIFIED BY ROOM ELSEWHERE)

SUMMER:	72°F DB / 50% RH
WINTER:	70°F DB

MECHANICAL GENERAL NOTES

(AS APPLICABLE)

1. NOTES APPLY TO ALL MECHANICAL SHEETS.
2. EACH CONTRACTOR IS RESPONSIBLE FOR HAVING THOROUGH KNOWLEDGE OF ALL DRAWINGS AND SPECIFICATIONS AS THEY RELATE TO THIS WORK. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED DUE TO LACK OF THIS KNOWLEDGE.
3. PROVIDE ALL MATERIALS FOR A COMPLETE INSTALLATION IN ALL RESPECTS READY FOR INTENDED USE AND IN STRICT ACCORDANCE WITH STATE AND LOCAL CODES AND MANUFACTURER'S RECOMMENDATIONS. PLANS AND SPECIFICATIONS GOVERN WHERE THEY EXCEED CODE MINIMUM REQUIREMENTS.
4. ALL MECHANICAL EQUIPMENT SHOWN ON THE MECHANICAL PLANS SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS NOTED OTHERWISE. UNLESS NOTED OTHERWISE, THE INDICATION AND/OR DESCRIPTION OF ANY ITEM, IN THE DRAWINGS OR SPECIFICATIONS CARRIES WITH IT THE INSTRUCTION TO FURNISH AND INSTALL THE ITEM. ALL EQUIPMENT AND MATERIALS PROVIDED BY THE CONTRACTOR WILL BE NEW; THERE WILL BE NO ALLOWANCE FOR REUSED MATERIAL UNLESS EXPLICITLY INDICATED OTHERWISE BY THE ENGINEER OR OWNER.
5. OBTAIN AND PAY FOR ALL PERMITS REQUIRED BY THIS WORK. PROVIDE TO THE ARCHITECT OR OWNER'S CONSTRUCTION MANAGER A COPY OF INSPECTION REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS.
6. DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENTS OR GEOMETRICAL RELATIONSHIPS OF EQUIPMENT AND SERVICES. THEY ARE NOT INTENDED TO SPECIFY OR SHOW EVERY OFFSET, SEQUENCE, DEVICE, OPTION, FITTING, OR COMPONENT. DO NOT SCALE FLOOR PLANS FOR EXACT LOCATION OF DUCT OR PIPE ROUTING. NOTIFY THE ARCHITECT OR OWNER'S CONSTRUCTION MANAGER OF ANY CONFLICTS OR DISCREPANCIES.
7. INFORMATION AND COMPONENTS SHOWN ON DIAGRAMS OR DETAILS, BUT NOT SHOWN ON PLANS, AND VICE VERSA, SHALL BE PROVIDED AS IF EXPRESSLY REQUIRED BY BOTH.
8. PROVIDE A CONSTRUCTION RECORD SET OF "AS-BUILT" DOCUMENTS TO THE ARCHITECT OR OWNER'S CONSTRUCTION MANAGER REFLECTING ANY VARIANCES OF INSTALLED EQUIPMENT, DUCT, OR PIPING LOCATIONS CONTRARY TO THE CONSTRUCTION DOCUMENTS.
9. COORDINATE THE INSTALLATION OF THE MECHANICAL SYSTEMS WITH OTHER TRADES TO ENSURE A NEAT AND ORDERLY INSTALLATION. INSTALL DUCTWORK AND PIPING AS TIGHT TO STRUCTURE AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATE INSTALLATION OF DUCTWORK AND PIPING TO AVOID CONFLICTS WITH ELECTRICAL PANELS, LIGHTING FIXTURES, ETC. ANY MODIFICATIONS REQUIRED DUE TO LACK OF COORDINATION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO EXTRA COST TO THE OWNER.
10. THESE DRAWINGS REFLECT SYSTEMS DESIGNED AROUND SPECIFIC REFERENCE PRODUCTS (BASIS OF DESIGN), THE SELECTION OF WHICH INFLUENCED THE DESIGNS OF OTHER TRADES. IF SUBSTITUTE MANUFACTURERS, SIZES, MODELS, ETC. ARE SUBMITTED, IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO COORDINATE ALL DIFFERENCES WITH OTHER TRADES. ALL COSTS OF ALL TRADES ASSOCIATED WITH THE SUBSTITUTION SHALL BE INCLUDED.
11. MECHANICAL CONTRACTOR (MC) SHALL COORDINATE AND VERIFY THE FOLLOWING WITH THE ELECTRICAL CONTRACTOR (EC) PRIOR TO BID:

    A. DISCONNECTS:
    - WHERE NOT FURNISHED WITH EQUIPMENT: FURNISHED BY EC, INSTALLED BY EC.
    - WHERE FURNISHED WITH EQUIPMENT: FURNISHED BY MC, INSTALLED BY EC.

12. NEW MECHANICAL EQUIPMENT AND DUCTWORK ARE SHOWN AT APPROXIMATE LOCATIONS. FIELD MEASURE FINAL DUCTWORK AND PIPING LOCATIONS PRIOR TO FABRICATION AND MAKE ADJUSTMENTS AS REQUIRED TO FIT THE DUCTWORK AND PIPING WITHIN THE AVAILABLE SPACE. VERIFY THAT FINAL EQUIPMENT LOCATIONS MEET MANUFACTURER'S RECOMMENDATIONS REGARDING SERVICE CLEARANCE AND PROPER AIRFLOW CLEARANCE AROUND EQUIPMENT.
13. COORDINATE DUCTWORK ROUTING AWAY FROM ELECTRICAL PANELS. DO NOT INSTALL DUCTWORK OR PIPING OVER ELECTRICAL PANELS.
14. SEAL PENETRATIONS THROUGH THE BUILDING COMPONENTS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. FIREPROOF PENETRATIONS THROUGH FIRE RATED COMPONENTS IN ACCORDANCE WITH U.L. REQUIREMENTS. REFER TO ARCHITECTURAL PLANS FOR WALL AND FLOOR TYPES.
15. DUCTWORK IDENTIFICATION AND INSTALLATION SHALL ADHERE TO GOVERNING CODES.
16. INSTALL DUCTWORK PARALLEL TO BUILDING COLUMN LINES UNLESS OTHERWISE SHOWN OR NOTED. ALL DUCTS SHALL BE MOUNTED HIGH AS POSSIBLE AGAINST BOTTOM OF STRUCTURE EXCEPT AS REQUIRED TO AVOID CONFLICTS WITH INTERSECTING DUCTS. DIAGONALLY OFFSET DUCTS IMMEDIATELY BEFORE AND AFTER PASSING UNDER INTERSECTING DUCTS OR LARGE STRUCTURAL MEMBERS TO MAINTAIN DUCT TIGHT TO STRUCTURE.
17. NO OTHER TRADES, I.E., ELECTRICAL, CEILING, PLUMBING, ETC., SHALL BE SUSPENDED, HUNG, OR SUPPORTED FROM DUCTWORK OR PIPING.
18. COORDINATE LOCATION OF EQUIPMENT SUPPORTS WITH LOCATION OF EQUIPMENT ACCESS PANELS/DOORS TO ENABLE SERVICE OF EQUIPMENT.
19. COORDINATE THE EXACT MOUNTING SIZE AND FRAME TYPE OF DIFFUSERS, REGISTERS AND GRILLES WITH THE SUPPLIER TO MEET THE CEILING, WALL AND DUCT INSTALLATION REQUIREMENTS.
20. SPRINKLER HEAD AND LIGHTING FIXTURE LOCATIONS TAKE PRECEDENCE OVER DIFFUSER LOCATIONS. ADJUST LOCATION OF CEILING DIFFUSERS, REGISTERS AND GRILLES AS REQUIRED TO ACCOMMODATE FINAL CEILING GRID AND LIGHTING LOCATIONS.
21. ALL CEILING DIFFUSERS ARE 4-WAY PATTERN UNLESS NOTED OTHERWISE.
22. LOCATE AND SET THERMOSTATS AT LOCATIONS SHOWN ON PLANS. VERIFY EXACT LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION. INSTALL WIRING IN CONDUIT PROVIDED BY ELECTRICAL CONTRACTOR. ANY THERMOSTAT THAT IS REQUIRED TO BE MOUNTED ON AN EXTERIOR WALL SHALL BE MOUNTED ON AN INSULATED PAD.
23. PROVIDE A MANUAL BALANCING DAMPER IN EACH BRANCH DUCT TAKEOFF FROM MAIN SUPPLY, RETURN, OUTDOOR AND EXHAUST AIR DUCTS. LOCATE DAMPERS A MINIMUM 4'-0" AWAY FROM DIFFUSERS. PROVIDE REMOTE BALANCING DAMPER (POTTORFF MODEL RD-10 OR EQUAL) OR CABLE OPERATED DAMPER (POTTORFF MODEL RCS OR EQUAL) WHERE INSTALLED IN AN INACCESSIBLE LOCATION.
24. PROVIDE A PREFABRICATED 45 DEGREE, HIGH EFFICIENCY, RECTANGULAR/ROUND BRANCH DUCT TAKEOFF FITTING WITH MANUAL BALANCING DAMPER AND LOCKING QUADRANT FOR BRANCH DUCT CONNECTIONS AND TAKE-OFFS TO INDIVIDUAL DIFFUSERS, REGISTERS AND GRILLES. TYPICAL BRANCH DUCT FITTING DETAIL IS APPLICABLE THROUGHOUT.
25. BRANCH DUCTWORK TO AIR OUTLETS SHALL BE SAME SIZE AS OUTLET NECK SIZE UNLESS NOTED OTHERWISE.
26. DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS AND ARE REPRESENTATIVE OF THE INSIDE EQUIVALENT FREE AREA REQUIRED TO MAINTAIN THE AIR FLOW SPECIFIED. IF DUCT LINING IS REQUIRED, INCREASE DUCT SIZE TO MAINTAIN ORIGINAL INSIDE DIMENSIONS. IF DUCT SIZES NEED TO BE ALTERED FOR SPACE REQUIREMENTS, ENSURE THE ORIGINAL INSIDE DUCT EQUIVALENT FREE AREA IS MAINTAINED.
27. CONTRACTOR'S OPTION TO SUBSTITUTE ROUND DUCT OF EQUAL FREE AREA FOR RECTANGULAR DUCT AND VICE VERSA. DIMENSIONS OF RECTANGULAR DUCT MAY BE ADJUSTED AS NECESSARY TO INSTALL DUCT IN AVAILABLE SPACE AS LONG AS FREE AREA IS MAINTAINED.
28. RIGID DUCTWORK INSULATION: PROVIDE 3/4 LB DENSITY, 2" R-6 THICK, INSULATION WRAP ON RIGID ROUND AND RECTANGULAR, CONCEALED SUPPLY, RETURN , AND OUTSIDE AIR DUCTS.
29. PROVIDE THERMAFLEX TYPE G-KM, M-KE, FLEXMASTER TYPE 8, OR APPROVED EQUAL FLEXIBLE DUCTWORK. FLEXIBLE DUCTWORK SHALL BE LISTED UNDER UL 181 AS CLASS 1 AIR DUCT AND BE PROVIDED WITH INTEGRAL R-6, 3/4 LB DENSITY FIBERGLASS INSULATION. FLEXIBLE DUCTWORK SHALL NOT EXCEED 3'-0" IN LENGTH AND SHALL BE INSTALLED AND SUPPORTED TO AVOID SHARP BENDS AND SAGGING.
30. FOR ALL EXPOSED DUCTWORK, PROVIDE DUCTWORK INSULATION TYPE AND COLOR (WHITE) TO MATCH EXISTING.
31. PROVIDE A COMPLETE TEST AND BALANCE FOR HVAC SYSTEM. AIR BALANCE SHALL BE WITHIN 5% OF SCHEDULED AIRFLOWS.

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REVISIONS

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MECHANICAL NOTES AND LEGENDS

SINGLE DUCT SUPPLY AIR TERMINAL UNIT WITH ELECTRIC REHEAT SCHEDULE

MARK	MANUFACTURER / MODEL	INLET SIZE (IN.)	COOLING			INLET STATIC AIR PRESSURE (IN. W.G.)	OUTLET STATIC AIR PRESSURE (IN. W.G.)	HEATING						ELECTRICAL			NOTES
			OCCUPIED / UNOCCUPIED MAXIMUM AIRFLOW (CFM)	OCCUPIED MINIMUM AIRFLOW (CFM)	UNOCCUPIED MINIMUM AIRFLOW (CFM)			OCCUPIED / UNOCCUPIED MAXIMUM AIRFLOW (CFM)	OCCUPIED MINIMUM AIRFLOW (CFM)	UNOCCUPIED MINIMUM AIRFLOW (CFM)	CAPACITY (KW)	EAT (DEG. F.)	LAT (DEG. F.)	VOLTS / PHASE / HZ	MCA	MOCP	
AT-20	TRANE VCEF	16	2,200	700	0	1.00	0.25	1,700	700	0	25.0	55.0	96.1	480 / 3 / 60	--	--	C
AT-201A	TRANE VCEF	10	1,300	420	0	1.00	0.25	800	420	0	11.0	55.0	98.3	480 / 3 / 60	16.54	20.0	
AT-201B	TRANE VCEF	12	1,900	630	0	1.00	0.25	1,200	630	0	15.0	55.0	96.2	480 / 3 / 60	22.55	25.0	
AT-203	TRANE VCEF	8	600	210	0	1.00	0.25	450	210	0	6.0	55.0	97.0	480 / 3 / 60	9.02	15.0	B
AT-211	TRANE VCEF	8	600	210	0	1.00	0.25	450	210	0	6.0	55.0	97.0	480 / 3 / 60	9.02	15.0	B
AT-212	TRANE VCEF	5	250	125	0	1.00	0.25	175	125	0	2.5	55.0	100.0	480 / 3 / 60	3.76	15.0	
AT-214	TRANE VCEF	6	500	175	0	1.00	0.25	300	175	0	4.0	55.0	97.0	480 / 3 / 60	6.01	15.0	
AT-IT	TRANE VCEF	5	200	70	0	1.00	0.25	--	--	--	--	--	--	--	--	--	A

GENERAL NOTES (ALL DEVICES AS APPLICABLE):

1. PROVIDE WITH INTEGRAL DISCONNECT SWITCH.
2. PROVIDE WITH SCR CONTROLS FOR ELECTRIC HEATING.
3. PROVIDE WITH HANGER BRACKETS.
4. PROVIDE WITH 1" FIBRE FREE FOAM LINER.
5. PROVIDE WITH THERMOSTAT - OCCUPANT ADJUSTABLE ROOM TEMP SENSOR WITH DIGITAL DISPLAY, SETPOINT ADJUST, AND OVERRIDE PUSHBUTTON.

NOTES:

A. COOLING ONLY.
B. PROVIDE WITH CO2 SENSOR FOR DEMAND CONTROL VENTILATION.
C. EXISTING SUPPLY AIR TERMINAL BOX. UPDATE PROGRAMMING FOR NEW SCHEDULED AIRFLOWS. FOR REFERENCE ONLY.

AIR DEVICE SCHEDULE

MARK	SERVICE	BASIS OF DESIGN		DESCRIPTION	MODULE SIZE	NECK SIZE	NOTES
		MFR	MODEL				
A	SUPPLY	TITUS	TDC-AA	ALUMINUM LOUVERED FACE DIFFUSER, ROUND NECK	24" x 24"	REF. PLAN	A
B	SUPPLY	TITUS	300FL	ALUMINUM DOUBLE DEFLECTION GRILLE, 3/4" BLADE SPACING, BLADES PARALLEL TO LONG DIMENSION	---	REF. PLAN	A
1	RETURN	TITUS	50F	ALUMINUM EGGCRATE GRILLE, ROUND NECK	24" x 24"	REF. PLAN	
2	RETURN	TITUS	50F	ALUMINUM EGGCRATE GRILLE, RECTANGULAR NECK	24" x 24"	REF. PLAN	
3	RETURN	TITUS	350FL	ALUMINUM GRILLE, 3/4" BLADE SPACING, 35 DEGREE DEFLECTION, BLADES PARALLEL TO LONG DIMENSION	---	REF. PLAN	

GENERAL NOTES (ALL DEVICES AS APPLICABLE):

1. ALL SUPPLY DIFFUSERS ARE 4-WAY/ALL-WAY THROW UNLESS NOTED OTHERWISE.
2. DIFFUSER NECK SHALL BE SAME AS BRANCH DUCT SIZE UNLESS SHOWN OTHERWISE. REFER TO PLANS.
3. PROVIDE BORDER/FRAME COMPATIBLE WITH MOUNTING SURFACE TYPE. REFER TO ARCHITECTURAL DRAWINGS.
4. FINISH SHALL BE SELECTED FROM MANUFACTURER'S STANDARD OPTIONS OR READY FOR PAINT. COLOR TO BE SELECTED BY ARCHITECT.
5. PROVIDE DAMPER AT TAKEOFF TO EACH DEVICE AND WHERE OTHERWISE SHOWN ON PLANS.
6. PROVIDE NECK FOR DUCT CONNECTION AS REQUIRED. PROVIDE MANUFACTURER'S SQUARE TO ROUND ADAPTOR (SRG) WHERE APPLICABLE.
7. DIFFUSERS SHALL BE FULL FACE.
8. MAX NOISE CRITERIA 25, UNLESS NOTED OTHERWISE.

NOTES (APPLICABLE ONLY WHERE NOTED):

A. PROVIDE WITH OPPOSED BLADE DAMPER IN NECK, ADJUSTABLE FROM FACE.

SMACNA DUCT CLASSIFICATION SCHEDULE

DESCRIPTION	PRESSURE CLASS	SEAL CLASS	LEAKAGE CLASS
BETWEEN AHU & TERMINAL UNIT			
SUPPLY AIR - RECTANGULAR	+4"	**	**
SUPPLY AIR - ROUND	+4"	**	**
SUPPLY AIR - FLEXIBLE	+4"	---	---
BETWEEN TERMINAL UNIT & DIFFUSER			
SUPPLY AIR - RECTANGULAR	+2"	**	**
SUPPLY AIR - ROUND	+2"	**	**
SUPPLY AIR - FLEXIBLE	+2"	---	---
GENERAL RETURN - UPSTREAM OF FAN			
RECTANGULAR	-1"	**	**
ROUND	-2"	**	**
FLEXIBLE	-1"	---	---

** REFER TO MINIMUM DUCT SEAL AND LEAKAGE CLASSIFICATION SCHEDULES.

MINIMUM DUCT SEAL CLASSIFICATION SCHEDULE

PRESSURE CLASS	SUPPLY			RETURN			EXHAUST		
	OUTDOORS	UNCONDITIONED SPACES	CONDITIONED SPACES	OUTDOORS	UNCONDITIONED SPACES	CONDITIONED SPACES	OUTDOORS	UNCONDITIONED SPACES	CONDITIONED SPACES
+/- 1", 2"	A	C	C	A	B	C	C	C	C
+/- 4"	A	A	A	A	A	B	C	A	A

NOTE: THIS SCHEDULE STATES MINIMUM STANDARD REQUIREMENTS. MEET SPECIFIC REQUIRMENTS WHERE SPECIFIED ON SMACNA DUCT CLASSIFICATION SCHEDULE.

MINIMUM DUCT LEAKAGE CLASSIFICATION SCHEDULE

SEAL CLASS	APPLICABLE SEALING	LEAKAGE CLASS	
		RECTANGULAR DUCT	ROUND DUCT
C	TRAVERSE JOINTS ONLY	24	12
B	TRAVERSE JOINTS AND SEAMS	12	6
A	JOINTS, SEAMS, AND ALL WALL PENETRATIONS	6	3

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MECHANICAL SCHEDULES

PART 1: GENERAL

1.1 GENERAL REQUIREMENTS:

A. REQUIREMENTS UNDER DIVISION ONE AND THE GENERAL AND SUPPLEMENTARY CONDITIONS OF THESE SPECIFICATIONS SHALL BE A PART OF THIS SECTION. THE CONTRACTOR SHALL BECOME THOROUGHLY ACQUAINTED WITH ITS CONTENTS AS TO REQUIREMENTS THAT AFFECT THIS DIVISION OR SECTION. THE WORK REQUIRED UNDER THIS SECTION INCLUDES MATERIAL, EQUIPMENT, APPLIANCES, TRANSPORTATION, SERVICES, AND LABOR REQUIRED TO COMPLETE THE ENTIRE SYSTEM AS REQUIRED BY THE DRAWINGS AND SPECIFICATIONS.

B. DRAWINGS ARE DIAGRAMMATIC; THEREFORE, ALL OFFSETS, FITTINGS, VALVES, AND ACCESSORIES ARE NOT INDICATED. COORDINATE WORK AROUND BUILDING DETAILS AND OTHER TRADES.

C. THE SPECIFICATIONS AND DRAWINGS FOR THE PROJECTS ARE COMPLEMENTARY, AND PORTIONS OF THE WORK DESCRIBED IN ONE, SHALL BE PROVIDED AS IF DESCRIBED IN BOTH. IN THE EVENT OF DISCREPANCIES, NOTIFY THE ENGINEER AND/OR OWNER AND REQUEST CLARIFICATION PRIOR TO PROCEEDING WITH THE WORK INVOLVED.

1.2 INSPECTION OF SITE:

A. PRIOR TO SUBMITTING BID, VISIT THE SITE OF THE PROPOSED WORK AND BECOME FULLY INFORMED AS TO THE CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. FAILURE TO DO SO WILL NOT BE CONSIDERED SUFFICIENT JUSTIFICATION TO REQUEST OR OBTAIN EXTRA COMPENSATION OVER AND ABOVE THE CONTRACT PRICE.

1.3 MATERIAL AND WORKMANSHIP:

A. PROVIDE NEW MATERIAL, EQUIPMENT, AND APPARATUS UNDER THIS CONTRACT UNLESS OTHERWISE STATED HEREIN, OF BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE, AND FREE FROM ANY DEFECTS. MODEL NUMBERS LISTED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS ARE NOT NECESSARILY INTENDED TO DESIGNATE THE REQUIRED TRIM, WRITTEN DESCRIPTIONS OF THE TRIM GOVERN MODEL NUMBERS.

B. WORK PERFORMED UNDER THIS CONTRACT SHALL PROVIDE A NEAT AND "WORKMANLIKE" APPEARANCE WHEN COMPLETED, TO THE SATISFACTION OF THE ARCHITECT AND ENGINEER. WORKMANSHIP SHALL BE THE FINEST POSSIBLE BY EXPERIENCED MECHANICS. INSTALLATIONS SHALL COMPLY WITH APPLICABLE CODES AND LAWS.

C. THE COMPLETE INSTALLATION SHALL FUNCTION AS DESIGNED AND INTENDED WITH RESPECT TO EFFICIENCY, CAPACITY, NOISE LEVEL, ETC. ABNORMAL NOISE CAUSED BY RATTLING EQUIPMENT, PIPING, DUCTS, AIR DEVICES, AND SQUEAKS IN ROTATING COMPONENTS WILL NOT BE ACCEPTABLE. IN GENERAL, MATERIALS AND EQUIPMENT SHALL BE OF COMMERCIAL SPECIFICATION GRADE IN QUALITY, LIGHT DUTY AND RESIDENTIAL TYPE EQUIPMENT WILL NOT BE ACCEPTED.

D. REMOVE FROM THE PREMISES WASTE MATERIAL PRESENT AS A RESULT OF WORK, INCLUDING CARTONS, CRATING, PAPER, STICKERS, AND/OR EXCAVATION MATERIAL NOT USED IN BACKFILLING, ETC. CLEAN EQUIPMENT INSTALLED UNDER THIS CONTRACT TO PRESENT A NEAT AND CLEAN INSTALLATION AT THE TERMINATION OF THE WORK.

E. REPAIR OR REPLACE PUBLIC AND PRIVATE PROPERTY DAMAGED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT TO THE SATISFACTION OF AUTHORITIES AND REGULATIONS HAVING JURISDICTION.

1.4 COORDINATION:

A. COORDINATE WORK WITH THAT OF OTHER TRADES SO THAT THE VARIOUS COMPONENTS OF THE SYSTEMS WILL BE INSTALLED AT THE PROPER TIME, WILL FIT THE AVAILABLE SPACE, AND WILL ALLOW PROPER SERVICE ACCESS TO THOSE ITEMS REQUIRING MAINTENANCE. COMPONENTS WHICH ARE INSTALLED WITHOUT REGARD TO THE ABOVE SHALL BE RELOCATED AT NO ADDITIONAL COST TO THE OWNER.

B. UNLESS OTHERWISE INDICATED, THE GENERAL CONTRACTOR WILL PROVIDE CHASES AND OPENINGS IN BUILDING CONSTRUCTION REQUIRED FOR INSTALLATION OF THE SYSTEMS SPECIFIED HEREIN. THE CONTRACTOR SHALL FURNISH THE GENERAL CONTRACTOR WITH INFORMATION WHERE CHASES AND OPENINGS ARE REQUIRED, KEEP INFORMED AS TO THE WORK OF OTHER TRADES ENGAGED IN THE CONSTRUCTION OF THE PROJECT, AND EXECUTE WORK IN A MANNER AS TO NOT INTERFERE WITH OR DELAY THE WORK OF OTHER TRADES.

C. FIGURED DIMENSIONS SHALL BE TAKEN IN PREFERENCE TO SCALE DIMENSIONS. CONTRACTOR SHALL TAKE HIS OWN MEASUREMENTS AT THE BUILDING, AS VARIATIONS MAY OCCUR. CONTRACTOR WILL BE HELD RESPONSIBLE FOR ERRORS THAT COULD HAVE BEEN AVOIDED BY PROPER CHECKING AND INSPECTION.

D. PROVIDE MATERIALS WITH TRIM THAT WILL PROPERLY FIT THE TYPES OF CEILING, WALL, OR FLOOR FINISHES ACTUALLY INSTALLED. MODEL NUMBERS LISTED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS ARE NOT INTENDED TO DESIGNATE THE REQUIRED TRIM.

E. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR DUCTWORK AND PIPING LAYOUTS TO THE CONSTRUCTION MANAGER FOR OWNER APPROVAL PRIOR TO INSTALLATION.

1.5 ORDINANCES AND CODES:

A. WORK PERFORMED UNDER THIS CONTRACT SHALL, AT A MINIMUM, BE IN CONFORMANCE WITH APPLICABLE NATIONAL, STATE, AND LOCAL CODES HAVING JURISDICTION. EQUIPMENT FURNISHED AND ASSOCIATED INSTALLATION WORK PERFORMED UNDER THIS CONTRACT SHALL BE IN STRICT COMPLIANCE WITH CURRENT APPLICABLE CODES ADOPTED BY THE LOCAL AHJ INCLUDING ANY AMENDMENTS AND STANDARDS AS SET FORTH BY THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), UNDERWRITERS LABORATORIES (UL), OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME), AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS (ASHRAE), AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), AMERICAN SOCIETY OF TESTING MATERIALS (ASTM), AND OTHER NATIONAL STANDARDS AND CODES WHERE APPLICABLE. WHERE THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THEIR REFERENCED CODES, STANDARDS, ETC., THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE.

B. PROCURE AND PAY FOR PERMITS AND LICENSES REQUIRED FOR THE ACCOMPLISHMENT OF THE WORK HEREIN DESCRIBED. WHERE REQUIRED, OBTAIN, PAY FOR, AND FURNISH CERTIFICATES OF INSPECTION TO THE OWNER. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR VIOLATIONS OF THE LAW.

1.6 PROTECTION OF EQUIPMENT AND MATERIALS:

A. STORE AND PROTECT FROM DAMAGE EQUIPMENT AND MATERIALS DELIVERED TO JOB SITE. SHELTER FROM THE ELEMENTS BY STORING IN DRY, HEATED SPACES OR COVER WITH WATERPROOF, TEAR-RESISTANT, HEAVY TARP OR POLYETHYLENE PLASTIC AS REQUIRED TO PROTECT FROM PLASTER, DIRT, PAINT, WATER, PHYSICAL DAMAGE, OR THEFT. EQUIPMENT AND MATERIAL THAT HAS BEEN DAMAGED BY CONSTRUCTION ACTIVITIES WILL BE REJECTED, AND CONTRACTOR IS OBLIGATED TO FURNISH NEW EQUIPMENT AND MATERIAL OF A LIKE KIND AS APPROVED BY OWNER.

B. KEEP PREMISES CLEAN FROM FOREIGN MATERIAL CREATED DURING WORK PERFORMED UNDER THIS CONTRACT. DUCTWORK, PIPING, EQUIPMENT, ETC., SHALL HAVE A NEAT AND CLEAN APPEARANCE AT THE TERMINATION OF THE WORK.

C. PLUG OR CAP OPEN ENDS OF DUCTWORK AND PIPING SYSTEMS WHILE STORED OR INSTALLED DURING CONSTRUCTION WHEN NOT IN USE THE PREVENT THE ENTRANCE OF DEBRIS INTO THE SYSTEMS.

1.7 SUBSTITUTIONS:

A. THE BASE BID SHALL INCLUDE ONLY THE PRODUCTS FROM MANUFACTURERS SPECIFICALLY NAMED IN THE DRAWINGS AND SPECIFICATIONS. NO SUBSTITUTION WILL BE CONSIDERED PRIOR TO RECEIPT OF BIDS UNLESS WRITTEN REQUEST FOR APPROVAL TO BID HAS BEEN RECEIVED BY THE ENGINEER AT LEAST TEN CALENDAR DAYS PRIOR TO THE DATE FOR RECEIPT OF BIDS. EACH SUCH REQUEST SHALL INCLUDE THE NAME OF THE MATERIAL OR EQUIPMENT FOR WHICH IT IS TO BE SUBSTITUTED AND A COMPLETE DESCRIPTION OF THE PROPOSED SUBSTITUTE INCLUDING DRAWINGS, CUT SHEETS, PERFORMANCE AND TEST DATA AND OTHER INFORMATION NECESSARY FOR AN EVALUATION. A STATEMENT SETTING FORTH CHANGES IN OTHER MATERIALS, EQUIPMENT OR OTHER WORK THAT INCORPORATION OF THE SUBSTITUTE WOULD REQUIRE SHALL BE INCLUDED. THE BURDEN OF PROOF OF THE MERIT OF THE PROPOSED SUBSTITUTE IS UPON THE PROPOSER. THE ENGINEER'S DECISION OF APPROVAL OR DISAPPROVAL TO BID OF A PROPOSED SUBSTITUTION SHALL BE FINAL.

B. THE TERMS "APPROVED", "APPROVED EQUAL", AND "EQUAL" REFER TO APPROVAL BY THE ENGINEER AS AN ACCEPTABLE ALTERNATE BID. NO SUBSTITUTIONS WILL BE CONSIDERED THAT ARE NOT BID AS AN ALTERNATE. NO MATERIAL SUBSTITUTIONS SHALL BE CONSIDERED FOR APPROVAL PRIOR TO AWARD OF CONTRACT.

C. COORDINATE AND VERIFY WITH OTHER TRADES WHETHER OR NOT THE SUBSTITUTED EQUIPMENT CAN BE INSTALLED AS SHOWN ON THE CONSTRUCTION DRAWINGS WITHOUT MODIFICATION TO ASSOCIATED SYSTEMS OR ARCHITECTURAL OR ENGINEERING DESIGN. INCLUDE ADDITIONAL COSTS FOR ARCHITECTURAL AND ENGINEERING DESIGN FEES IN BID IF DRAWING MODIFICATIONS ARE REQUIRED BECAUSE OF SUBSTITUTED EQUIPMENT.

1.8 SHOP DRAWINGS AND SUBMITTALS:

A. SUBMIT MANUFACTURER'S CATALOG SHEETS AND/OR SHOP DRAWINGS COVERING ALL PHASES OF WORK INCLUDED IN THIS CONTRACT. SUBMITTALS SHALL BE ARRANGED IN SETS AND BOUND IN FOLDERS OR IN BOOKMARKED PDF FORMAT. SUBMITTALS ARE REQUIRED EVEN THOUGH EQUIPMENT BEING FURNISHED IS EXACTLY AS SPECIFIED. FINAL DECISION AS TO WHETHER OR NOT A SPECIFIC PIECE OF EQUIPMENT MEETS SPECIFICATIONS SHALL REST WITH ARCHITECT.

1.9 OPERATION AND MAINTENANCE INSTRUCTIONS:

A. COLLECT AND COMPILE A COMPLETE MAINTENANCE MANUALS AND BROCHURE OF FIXTURES, MATERIALS, AND EQUIPMENT FURNISHED AND INSTALLED ON THIS PROJECT. INCLUDE OPERATIONAL AND MAINTENANCE INSTRUCTIONS, MANUFACTURER'S CATALOG SHEETS, WIRING DIAGRAMS, PARTS LISTS, APPROVED SHOP DRAWINGS, PERFORMANCE CURVES, ENGINEERING DATA AND TESTS, WARRANTIES, AND DESCRIPTIVE LITERATURE FURNISHED BY THE MANUFACTURER. INCLUDE AN INSIDE COVER SHEET THAT LISTS THE PROJECT NAME, DATE, OWNER, ARCHITECT, ENGINEER, GENERAL CONTRACTOR, SUBCONTRACTOR, AND AN INDEX OF CONTENTS.

B. SUBMIT COPIES OF LITERATURE BOUND IN APPROVED BINDERS (OR IN BOOKMARKED PDF FORMAT) TO THE ARCHITECT AND OWNER AT THE TERMINATION OF THE WORK. PAPER CLIPS, STAPLES, RUBBER BANDS, AND MAILING ENVELOPES ARE NOT CONSIDERED APPROVED BINDERS. FINAL APPROVAL OF MECHANICAL SYSTEMS WILL BE WITHHELD UNTIL THIS EQUIPMENT BROCHURE IS DEEMED COMPLETE BY THE ARCHITECT, ENGINEER, AND OWNER.

1.10 WARRANTIES:

A. WARRANT EACH SYSTEM AND EACH ELEMENT THEREOF AGAINST ALL DEFECTS DUE TO FAULTY WORKMANSHIP, DESIGN, OR MATERIAL FOR A PERIOD OF 12 MONTHS FROM DATE OF SUBSTANTIAL COMPLETION, UNLESS SPECIFIC ITEMS ARE NOTED TO CARRY A LONGER WARRANTY IN THE CONSTRUCTION DOCUMENTS OR MANUFACTURER'S STANDARD WARRANTY EXCEEDS 12 MONTHS. TIME PERIOD FOR CORRECTION OF DEFECTIVE MOTORS AND COMPRESSORS SHALL BE FIVE YEARS FROM THE DATE OF SUBSTANTIAL COMPLETION. REMEDY ALL DEFECTS, OCCURRING WITHIN THE WARRANTY PERIOD(S), AS STATED IN THE GENERAL CONDITIONS AND DIVISION 1.

B. WARRANTIES SHALL INCLUDE LABOR AND MATERIAL. MAKE REPAIRS OR REPLACEMENTS WITHOUT ANY ADDITIONAL COSTS TO THE OWNER.

C. PERFORM THE REMEDIAL WORK PROMPTLY, UPON WRITTEN NOTICE FROM THE ENGINEER OR OWNER.

D. AT THE TIME OF SUBSTANTIAL COMPLETION, DELIVER TO THE OWNER ALL WARRANTIES, IN WRITING AND PROPERLY EXECUTED, INCLUDING TERM LIMITS FOR WARRANTIES EXTENDING BEYOND THE ONE YEAR PERIOD, EACH WARRANTY INSTRUMENT BEING ADDRESSED TO THE OWNER AND STATING THE COMMENCEMENT DATE AND TERM.

1.11 CUTTING AND PATCHING:

A. PERFORM CUTTING OF WALLS, FLOORS, CEILINGS, ETC. AS REQUIRED TO INSTALL WORK UNDER THIS SECTION. OBTAIN PERMISSION FROM THE ARCHITECT PRIOR TO CUTTING. DO NO CUT OR DISTURB STRUCTURAL MEMBERS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT. CUT HOLES AS SMALL AS POSSIBLE. GENERAL CONTRACTOR SHALL PATCH WALLS, FLOORS, ETC. AS REQUIRED BY WORK UNDER THIS SECTION. PATCHING SHALL MATCH THE ORIGINAL MATERIAL AND CONSTRUCTION. REPAIR AND REFINISH AREAS DISTURBED BY WORK TO THE CONDITION OF ADJOINING SURFACES IN A MANNER SATISFACTORY TO THE ARCHITECT.

1.12 ROUGH-IN:

A. COORDINATE WITHOUT DELAY ROUGHING-IN WITH GENERAL CONSTRUCTION. CONCEAL PIPING AND CONDUIT ROUGH-IN EXCEPT IN UNFINISHED AREAS WHERE OTHERWISE SHOWN.

1.13 STRUCTURAL STEEL:

A. STRUCTURAL STEEL USED FOR DUCT AND PIPE SUPPORTS, EQUIPMENT SUPPORTS, ETC., SHALL BE NEW, CLEAN, AND CONFORM TO ASTM DESIGNATION A-36.

B. SUPPORT MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING FROM THE BUILDING STRUCTURE. DO NOT SUPPORT MECHANICAL SYSTEMS FROM CEILINGS, OTHER MECHANICAL, PLUMBING, OR ELECTRICAL COMPONENTS, AND OTHER NON-STRUCTURAL ELEMENTS.

1.14 ACCESS DOORS:

A. PROVIDE ACCESS DOORS IN CEILINGS AND WALLS WHERE INDICATED OR REQUIRED FOR ACCESS TO CONCEALED VALVES, DAMPERS, CONTROLS, AND EQUIPMENT INSTALLED UNDER THIS SECTION. PROVIDE CONCEALED HINGES, SCREWDRIVER-TYPE LOCK, ANCHOR STRAPS; MANUFACTURED BY MILCOR, KARP, ZURN, TITUS, OR EQUAL. OBTAIN ARCHITECT'S APPROVAL OF TYPE, SIZE, LOCATION, AND COLOR BEFORE ORDERING.

1.15 PENETRATIONS:

A. SEAL FLOOR, EXTERIOR WALL, AND ROOF PENETRATIONS WATER AND WEATHER TIGHT WITH APPROPRIATE NON-SHRINK, NON-HARDENING COMMERCIAL CONSTRUCTION SEALANT. SEAL ROOF PENETRATIONS WITH FOUR POUND PER SQUARE FOOT LEAD FLASHING. PROVIDE A SLEEVE, AND SEAL NON-FIRE-RATED FLOOR AND WALL PENETRATIONS WITH FIBERGLASS PACKING AND SILICONE CAULK (FOR ACOUSTICAL INSULATION).

1.16 ELECTRICAL:

A. FURNISH AND INSTALL ALL ELECTRICAL INTERLOCK AND CONTROL WIRING FOR PROPER OPERATION AND CONTROL OF ALL MECHANICAL EQUIPMENT. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE AND INSTALL ALL WIRING 120V AND GREATER.

B. SUPERVISE AND COORDINATE ALL ELECTRICAL WORK IN CONNECTION WITH MECHANICAL SYSTEMS.

C. FURNISH ALL MOTOR CONTROLLERS OR CONTACTORS FOR PROPER OPERATION OF ALL MOTORS.

D. WHERE A FACTORY DISCONNECT IS UNABLE TO BE PROVIDED WITH MECHANICAL EQUIPMENT, THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE AND FIELD INSTALL DISCONNECTS.

PART 2: PRODUCTS

2.1 AIR DISTRIBUTION DUCTWORK:

A. CONTRACTOR SHALL PROVIDE ANY DUCTWORK NECESSARY FOR A COMPLETE INSTALLATION OF HVAC SYSTEMS (INCLUDING EXHAUST SYSTEMS); ALL DUCTWORK IDENTIFICATION AND INSTALLATION TO ADHERE TO ASHRAE AND SMACNA STANDARDS AND ALL GOVERNING CODES.

B. DUCTWORK SHALL BE A MINIMUM 26 GAUGE GALVANIZED STEEL SHEET METAL DUCTWORK.

C. CONCEALED AND EXPOSED DUCT RUNS SHALL BE CONSTRUCTED OF METAL PIPE WITH EXTERNAL SLEEVE INSULATION.

D. FLEX DUCT SHALL BE OWENS-CORNING FOIL-BACK HIGH-QUALITY UL APPROVED OR EQUAL, 3'-0" MAXIMUM LENGTH. PLASTIC WRAPPED FLEX DUCT IS NOT ACCEPTABLE. FLEX DUCT MUST BE PROPERLY SUPPORTED WITH ONE INCH STRAPS AND CUT TO PROPER LENGTH TO PREVENT SAGGING.

1. DUCTWORK CONNECTIONS TO AIR DEVICES MUST BE MADE WITH HARDPIPE ELBOWS, COVERED WITH SLEEVE INSULATION. FLEX DUCT MUST NOT BE UTILIZED FOR A 90 DEGREE CONNECTION TO AN AIR DEVICE.

E. PROVIDE ALL DUCTWORK SYSTEMS WITH HARDCAST SEAL. DUCT LEAKAGE NOT TO EXCEED 5%.

F. VOLUME/BALANCING DAMPERS SHALL BE PROVIDED IN ALL BRANCH DUCT TAKE-OFFS FROM THE MAIN TRUNKS, UNLESS NOTED OTHERWISE ON PLANS. LOCATE DAMPERS A MINIMUM OF 4'-0" AWAY FROM AIR DEVICES.

G. PROVIDE RADIUS ELBOWS FOR CHANGES OF DIRECTION IN RECTANGULAR DUCTWORK, NOT RESTRICTED TO 90° ELBOWS. CENTERLINE RADIUS SHALL BE EQUAL TO ONE AND A HALF (1.5) DUCT WIDTHS. SQUARE THROAT ELBOWS MAY NOT BE USED.

1. WHERE AIR VELOCITY IS BELOW 1,000 FEET PER MINUTE, A CENTERLINE RADIUS OF ONE HALF (0.5) DUCT WIDTHS MAY BE USED.

2. PROVIDE MITERED ELBOWS IN RECTANGULAR DUCTWORK WHERE REQUIRED DUE TO SPACE CONSTRAINTS. MITERED ELBOWS GREATER THAN 45 DEGREES SHALL HAVE SINGLE THICKNESS TURNING VANES OF SAME GAUGE AS DUCTWORK.

2.2 DUCTWORK INSULATION:

A. SUPPLY AND RETURN AIR DUCTWORK INSIDE THE BUILDING SHALL BE EXTERNALLY WRAPPED WITH 2" THICK GLASS FIBER DUCT WRAP WITH VAPOR BARRIER AND A MINIMUM R-VALUE OF 6. PROVIDE SAME INSULATION FOR THE TOP SURFACE OF CEILING DIFFUSERS.

B. DUCTWORK INSULATION FOR EXPOSED DUCTWORK SHALL MATCH EXISTING TYPE AND COLOR (WHITE).

2.3 AIR DEVICES:

A. PROVIDE AIR DEVICES AS SCHEDULED ON THE DRAWINGS. MAINTAIN NOISE LEVEL OF NC-28 OR LESS. ALL AIR TERMINAL DEVICES SHALL BE INSTALLED AS SHOWN ON THE PLANS IN ORDER TO HANDLE THE DESIGNED AIR FLOW CAPACITIES WITH A MINIMUM AMOUNT OF NOISE AND STATIC PRESSURE DROP. PROVIDE AIR DEVICES WITH WHITE ENAMEL FINISH UNLESS NOTED OTHERWISE.

2.4 MECHANICAL IDENTIFICATION:

A. EQUIPMENT: 1/8" THICK ENGRAVED MELAMINE PLASTIC LAMINATE (BLACK WITH WHITE LETTERS) PUNCHED FOR MECHANICAL FASTENING.

1. FASTENERS: SELF-TAPPING STAINLESS STEEL SCREWS, EXCEPT CONTACT-TYPE PERMANENT ADHESIVE WHERE SCREWS CANNOT OR SHOULD NOT PENETRATE THE SUBSTRATE.

2.5 AIR TERMINAL UNITS:

A. MANUFACTURERS: TRANE, TITUS, PRICE, TUTTLE & BAILEY, OR APPROVED EQUAL.

B. GENERAL: FACTORY BUILT, PRESSURE INDEPENDENT UNITS, FACTORY SET, FOR DUCT APPLICATIONS THAT MATCH OR EXCEED PERFORMANCE CHARACTERISTICS AS SCHEDULED. CLEARLY SHOW ON EACH UNIT THE MANUFACTURER'S MODEL NUMBER AND FACTORY SET AIR VOLUME(S) AND UNIT TAG CORRESPONDING TO THE CONTRACT DRAWINGS. COORDINATE FLOW CONTROLLER SEQUENCE AND DAMPER OPERATION DETAILS WITH THE DRAWINGS.

2.6 CONTROLS:

A. ALL CONTROLS SHALL BE PROVIDED BY HARRISON ENERGY PARTNERS (HEP) IN ACCORDANCE WITH THE IDIQ CONTRACT WITH THE OWNER.

B. PROVIDE ALL TEMPERATURE CONTROLS, VALVES, DAMPERS, ETC. REQUIRED FOR COMPLETE AND OPERATING MECHANICAL SYSTEM.

C. ALL CONTROLS SHALL BE DDC TYPE AND PROVIDED BY THE ATC CONTRACTOR.

D. FURNISH COMPLETE WIRING DIAGRAMS SHOWING ALL INTERLOCK WIRING IN ADDITION TO TEMPERATURE CONTROL WIRING DIAGRAMS. WIRING IS TO BE COLOR-CODED AND INSTALLED IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE (NEC).

E. COORDINATE LOCATIONS FOR THERMOSTATS AND SENSORS FOR ROUGH-IN.

F. PROVIDE ALL TEMPERATURE CONTROLS IN ACCORDANCE WITH RECOMMENDATIONS OF THE EQUIPMENT MANUFACTURER.

2.7 FINAL TESTING, ADJUSTING, AND BALANCING:

A. EMPLOY THE SERVICES OF AN INDEPENDENT TESTING, ADJUSTING, AND BALANCING AGENCY CERTIFIED BY NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB) OR CERTIFIED BY ASSOCIATED AIR BALANCE COUNCIL (AABC) TO BE THE SINGLE SOURCE OF RESPONSIBILITY TO TEST, ADJUST, AND BALANCE THE BUILDING MECHANICAL SYSTEMS, TO PRODUCE THE DESIGN OBJECTIVES. SERVICES SHALL INCLUDE CHECKING INSTALLATIONS FOR CONFORMITY TO DESIGN, MEASUREMENT AND ESTABLISHMENT OF THE FLUID QUANTITIES OF THE MECHANICAL SYSTEMS AS REQUIRED TO MEET DESIGN SPECIFICATIONS, AND RECORDING AND REPORTING THE RESULTS.

B. CODES AND STANDARDS:

1. NEBB: "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS".

2. AABC: "NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE".

3. ASHRAE: ASHRAE HANDBOOK, 1984 SYSTEMS VOLUME, CHAPTER 37, TESTING, ADJUSTING, AND BALANCING.

C. TEST, ADJUST, AND BALANCE THE FOLLOWING MECHANICAL SYSTEMS COMPLETE:

1. SUPPLY AIR SYSTEMS, RETURN AIR SYSTEMS, OUTSIDE AIR SYSTEMS, AND VERIFY TEMPERATURE CONTROL SYSTEM OPERATION.

D. SUBMIT CERTIFIED TESTING, ADJUSTING, AND BALANCING REPORTS BEARING THE SEAL AND SIGNATURE OF THE TAB ENGINEER. THE REPORTS SHALL BE CERTIFIED PROOF THAT THE SYSTEMS HAVE BEEN TESTED, ADJUSTED, AND BALANCED IN ACCORDANCE WITH THE REFERENCED STANDARDS; ARE AN ACCURATE REPRESENTATION OF HOW THE SYSTEMS HAVE BEEN INSTALLED; ARE A TRUE REPRESENTATION OF HOW THE SYSTEMS ARE OPERATING AT THE COMPLETION OF THE TESTING; ADJUSTING, AND BALANCING PROCEDURE; AND ARE AN ACCURATE RECORD OF ALL FINAL QUANTITIES MEASURED, TO ESTABLISH NORMAL OPERATING VALUES OF THE SYSTEMS. REPORT FORMS SHALL BE THOSE STANDARD FORMS PREPARED BY THE REFERENCED STANDARD FOR EACH RESPECTIVE ITEM AND SYSTEM TO BE TESTED, ADJUSTED, AND BALANCED.

2.8 ELECTRICAL WIRING:

A. ALL PROVISIONS FOR LOW VOLTAGE WIRING SHALL BE PERFORMED BY THE CONTRACTOR UNLESS CODES OR LABOR SITUATIONS DO NOT PERMIT. IF THE CONTRACTOR CANNOT PERFORM LOW VOLTAGE WIRING, THE CONTRACTOR SHALL INFORM THE GENERAL CONTRACTOR, AS PART OF THE HVAC BID DOCUMENT, TO HAVE THE ELECTRICAL SUBCONTRACTOR INCLUDE THIS WORK IN THEIR BID.

B. ALL ELECTRICAL POWER WIRING TO INCLUDE FINAL CONNECTIONS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR'S ELECTRICAL SUBCONTRACTOR.

PART 3: EXECUTION

3.1 GENERAL:

A. VERIFY LOCAL SITE CONDITIONS.

B. INSTALL EQUIPMENT AND SYSTEMS IN ACCORDANCE WITH LOCAL AND STATE CODES, LAWS, ORDINANCES, RULES AND REGULATIONS, INDUSTRY STANDARDS AND PRACTICES AND IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.

C. INSTALL EQUIPMENT AND SYSTEMS PLUMB, RIGID AND TRUE TO LINE.

D. COORDINATE INSTALLATION WITH BUILDING COMPONENTS AND WITH ALL TRADES.

E. COORDINATE DUCTWORK AND PIPE ROUTING AWAY FROM ELECTRICAL PANELS. DO NOT INSTALL DUCTWORK OR PIPING OVER ELECTRICAL PANELS.

F. REMOVE AND REPLACE DEFECTIVE WORK.

G. CLEAN MATERIALS, SYSTEMS AND EQUIPMENT THOROUGHLY PRIOR TO START UP, OPERATIONAL TESTS, AND TEST AND BALANCE WORK.

H. REPAIR MARRED AND DAMAGED FACTORY PAINTED FINISHES WITH MATERIALS TO MATCH ORIGINAL FACTORY FINISH.

I. START UP FOR SYSTEMS AND COMPONENTS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. INSTALL A CLEAN SET OF FILTERS PRIOR TO START UP AND BALANCING.

J. INSTRUCT OWNER REGARDING LOCATION OF EQUIPMENT AND AREAS SERVED, INCLUDING LOCATION OF CRITICAL SHUT-OFF VALVES.

K. DEMONSTRATE TO OWNER SYSTEM'S OPERATION AND CONTROL.

L. ENSURE ALL OUTSIDE AIR INTAKES ARE AT A MINIMUM OF 10'-0" AWAY FROM ALL EXHAUST FAN DISCHARGE LOCATIONS AND PLUMBING VENT LOCATIONS.

3.2 REMODEL WORK:

A. REMOVE ALL UNUSED EQUIPMENT, DUCTWORK, PIPING AND ASSOCIATED SUPPORTS. CAP DUCTWORK AND PIPING AT MAINS AND SEAL AIR AND WATER TIGHT.

B. PROVIDE ITEMS OF HVAC SYSTEMS MODIFICATION REQUIRED BECAUSE OF BUILDING REMODELING, AS NOTED ON THE DRAWINGS OR NECESSARY FOR PROPER OPERATION. MATCH EXISTING MATERIALS AND CONSTRUCTION TECHNIQUES WHEN MODIFYING EXISTING SYSTEMS UNLESS SPECIFIED OTHERWISE. COORDINATE ADDITIONAL REQUIREMENTS WITH GENERAL CONTRACTOR AND ARCHITECT.

C. CLEAN AND REBALANCE EXISTING DUCTWORK, DIFFUSERS, REGISTERS, AND GRILLES INTENDED FOR REUSE AS REQUIRED OR AS INDICATED ON DRAWINGS.

D. CLEAN AND REFURBISH EXISTING HVAC EQUIPMENT INTENDED FOR REUSE AS REQUIRED FOR PROPER OPERATION INCLUDING REPLACEMENT OF FILTERS, BELTS, MOTORS, REMOTE CONTROLS, AND SAFETY INTERLOCKS.

E. COMPLY WITH THE SCHEDULE OF OPERATIONS AS OUTLINED IN THE ARCHITECTURAL PORTIONS OF THIS SPECIFICATION. BUILDING SHALL BE IN CONTINUOUS OPERATION. ACCOMPLISH WORK REQUIRING INTERRUPTION OF BUILDING OPERATION AT A TIME WHEN THE BUILDING IS NOT IN OPERATION, AND ONLY WITH WRITTEN APPROVAL OF BUILDING OWNER. COORDINATE INTERRUPTION OF BUILDING OPERATION WITH THE OWNER A MINIMUM OF SEVEN DAYS IN ADVANCE OF WORK.

3.3 GUARANTEE

A. THE WORK TO BE PERFORMED UNDER THIS CONTRACT SHALL INCLUDE THE FURNISHING, INSTALLATION, AND CONNECTION OF MECHANICAL SYSTEMS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS.

B. BY SIGNING THE CONTRACT, THE MECHANICAL CONTRACTOR ACKNOWLEDGES THAT HE HAS ACQUAINTED HIMSELF WITH THE SITE AND THE EXISTING CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED, AND THE DRAWINGS AND SPECIFICATIONS PERTAINING THERETO, AND HE INDICATES THAT HE WILL COMPLY WITH THE REQUIREMENTS AND INTENT OF PERTINENT DOCUMENTS IN THE PERFORMANCE OF THE WORK.

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Engineer's Seal:

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 14988
JASON PATRICK POWER

2/23/2024

Firm's Seal:

CERTIFICATE OF AUTHORIZATION
PRIGM ENGINEERING, PLLC
No. 3588
ARKANSAS

UNIVERSITY OF ARKANSAS

University of Arkansas - CEREC

DATE
2/23/2024

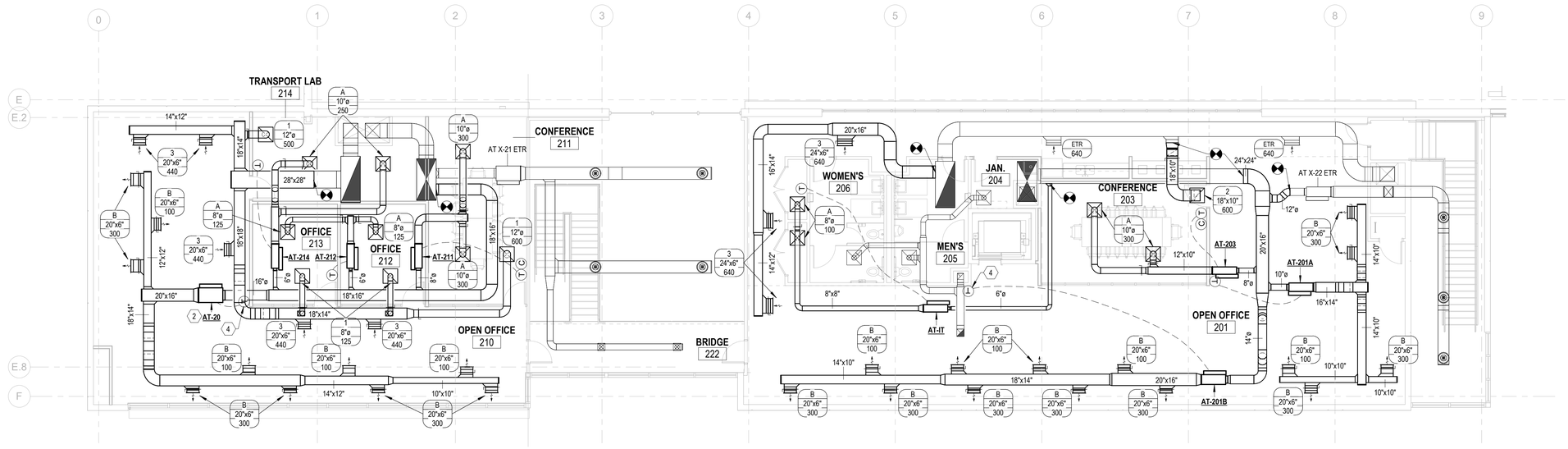
JOB NO.
23108

REVISIONS

M0.3
MECHANICAL SPECIFICATIONS

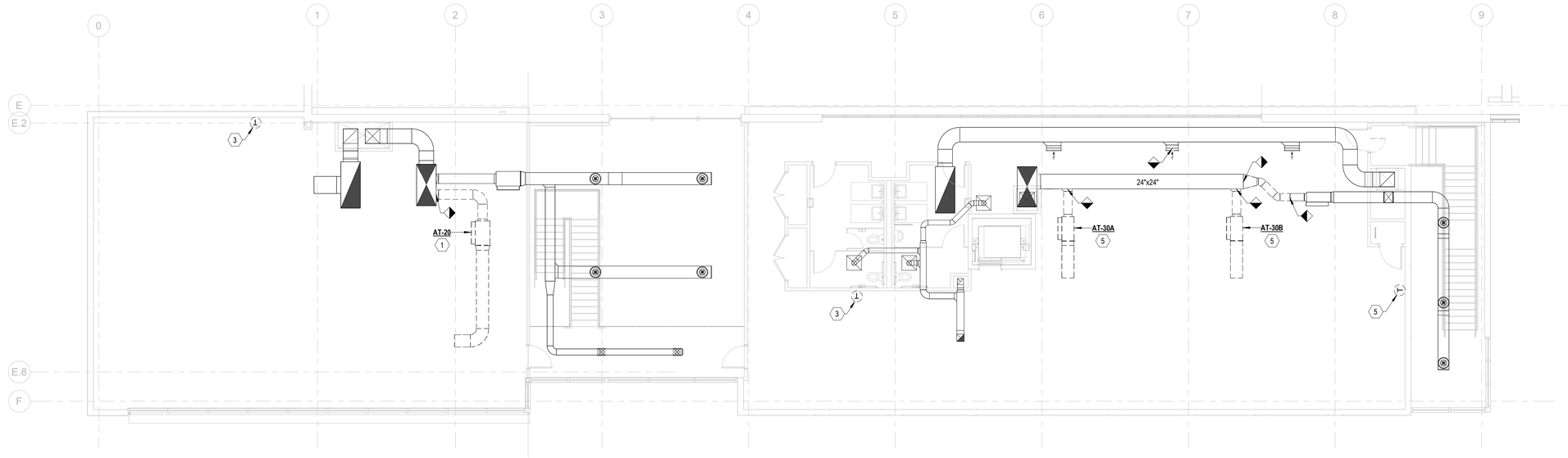
PLAN NOTES:

1. REMOVE EXISTING SUPPLY AIR TERMINAL AND DUCTWORK UNIT. RELOCATE SUPPLY AIR TERMINAL UNIT AS SHOWN.
2. RELOCATED SUPPLY AIR TERMINAL UNIT.
3. REMOVE EXISTING THERMOSTAT AND RELOCATE AS SHOWN.
4. RELOCATED THERMOSTAT.
5. EXISTING SUPPLY AIR TERMINAL UNIT, ASSOCIATED DUCTWORK, AND THERMOSTAT TO BE DEMOLISHED. RETURN SUPPLY AIR TERMINAL UNIT TO OWNER.



2 MECHANICAL LEVEL 2 - NEW

1/8" = 1'-0"



1 MECHANICAL LEVEL 2 - DEMO

1/8" = 1'-0"

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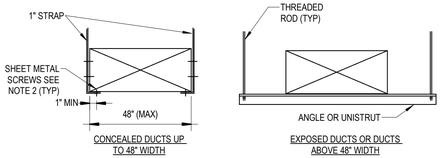
MECHANICAL PLAN - LEVEL 2



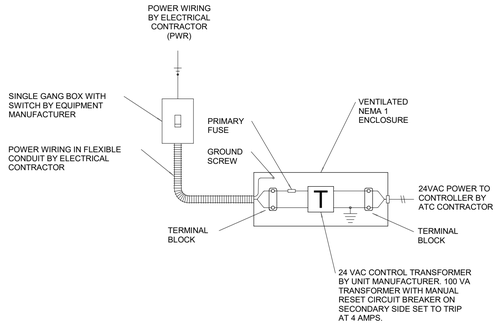
NOTES:

1. USE THREADED ROD FOR ALL DUCTS LARGER THAN 48" DIAMETER WIDE.

2. SHEET METAL SCREWS MAY BE OMITTED IF HANGER STRAP IS CONTINUOUS AND LOOPS UNDER ENTIRE DUCT.

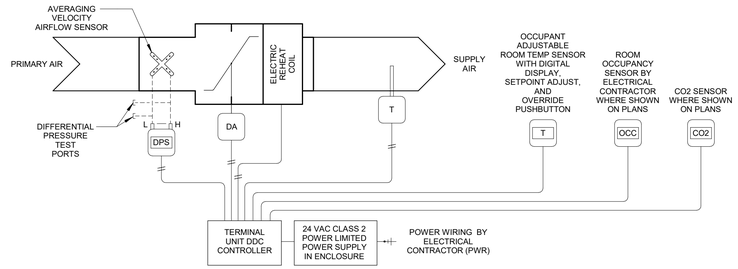
9 RECTANGULAR DUCT SUPPORT

SCALE: NTS



8 SUPPLY AIR TERMINAL UNIT POWER SUPPLY DETAIL

SCALE: NTS



VAV SUPPLY AIR TERMINAL UNIT WITH ELECTRIC REHEAT SEQUENCE OF OPERATION:

THE SUPPLY TERMINAL UNIT CONTROLLER SHALL SEND THE CONTROLLER OCCUPIED, AND UNOCCUPIED COMMANDS. THE CONTROLLER MAY ALSO SEND A HEAT/COOL MODE, PRIORITY SHUTDOWN COMMANDS, SPACE TEMPERATURE AND/OR SPACE TEMPERATURE SETPOINT.

OCCUPIED:

NORMAL OPERATING MODE FOR OCCUPIED SPACES OR DAYTIME OPERATION. WHEN THE UNIT IS IN THE OCCUPIED MODE THE VAV SHALL MAINTAIN THE SPACE TEMPERATURE AT THE ACTIVE OCCUPIED HEATING OR COOLING SETPOINT. APPLICABLE VENTILATION AND AIRFLOW SETPOINTS SHALL BE ENFORCED. THE OCCUPIED MODE SHALL BE THE DEFAULT MODE OF THE VAV.

UNOCCUPIED:

NORMAL OPERATING MODE FOR UNOCCUPIED SPACES OR NIGHTTIME OPERATION. WHEN THE UNIT IS IN UNOCCUPIED MODE THE VAV CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE AT THE STORED UNOCCUPIED HEATING OR COOLING SETPOINT REGARDLESS OF THE PRESENCE OF A HARDWIRED OR COMMUNICATED SETPOINT. WHEN THE SPACE TEMPERATURE EXCEEDS THE ACTIVE UNOCCUPIED SETPOINT THE VAV SHALL MODULATE FULLY CLOSED.

OCCUPIED BYPASS:

MODE USED TO TEMPORARILY PLACE THE UNIT INTO THE OCCUPIED OPERATION. TENANTS SHALL BE ABLE TO OVERRIDE THE UNOCCUPIED MODE FROM THE SPACE SENSOR. THE OVERRIDE SHALL LAST FOR A MAXIMUM OF 4 HOURS (ADJ.). THE TENANTS SHALL BE ABLE TO CANCEL THE OVERRIDE FROM THE SPACE SENSOR AT ANY TIME. DURING THE OVERRIDE THE UNIT SHALL OPERATE IN OCCUPIED MODE.

HEAT/COOL MODE:

THE HEAT/COOL MODE SHALL BE SET BY A COMMUNICATED VALUE OR AUTOMATICALLY BY THE VAV. IN STANDALONE OR AUTO MODE THE VAV SHALL COMPARE THE PRIMARY AIR TEMPERATURE WITH THE CONFIGURED AUTO CHANGEOVER SETPOINT TO DETERMINE IF THE AIR IS "HOT" OR "COLD". HEATING MODE IMPLIES THE PRIMARY AIR TEMPERATURE IS HOT. COOLING MODE IMPLIES THE PRIMARY AIR TEMPERATURE IS COLD."

HEAT/COOL SETPOINT:

THE SPACE TEMPERATURE SETPOINT SHALL BE DETERMINED EITHER BY A LOCAL (E.G., THUMBWHEEL) SETPOINT, THE VAV DEFAULT SETPOINT OR A COMMUNICATED VALUE. THE VAV SHALL USE THE LOCALLY STORED DEFAULT SETPOINTS WHEN NEITHER A LOCAL SETPOINT NOR COMMUNICATED SETPOINT IS PRESENT. IF BOTH A LOCAL SETPOINT AND COMMUNICATED SETPOINT EXIST, THE VAV SHALL USE THE COMMUNICATED VALUE.

COOLING MODE:

WHEN THE UNIT IS IN COOLING MODE, THE VAV CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE AT THE ACTIVE COOLING SETPOINT BY MODULATING THE AIRFLOW BETWEEN THE ACTIVE COOLING MINIMUM AIRFLOW SETPOINT TO THE MAXIMUM COOLING AIRFLOW SETPOINT. THE VAV SHALL USE THE MEASURED SPACE TEMPERATURE AND THE ACTIVE COOLING SETPOINT TO DETERMINE THE REQUESTED COOLING CAPACITY OF THE UNIT. THE OUTPUTS WILL BE CONTROLLED BASED ON THE UNIT CONFIGURATION AND THE REQUESTED COOLING CAPACITY. WHEN IN THE OCCUPIED MODE, THE CONTROLLER SHALL USE THE MEASURED SPACE TEMPERATURE AND THE ACTIVE COOLING SETPOINT TO DETERMINE THE REQUESTED COOLING CAPACITY OF THE UNIT. THE OUTPUTS SHALL BE CONTROLLED BASED ON THE UNIT CONFIGURATION AND THE REQUESTED COOLING CAPACITY.

HEATING MODE:

WHEN THE UNIT IS IN HEATING MODE, THE VAV CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE AT THE ACTIVE HEATING SETPOINT BY MODULATING THE AIRFLOW BETWEEN THE ACTIVE HEATING MINIMUM AIRFLOW SETPOINT TO THE MAXIMUM HEATING AIRFLOW SETPOINT. THE VAV CONTROLLER SHALL USE THE MEASURED SPACE TEMPERATURE AND THE ACTIVE HEATING SETPOINT TO DETERMINE THE REQUESTED HEATING CAPACITY OF THE UNIT. THE OUTPUTS WILL BE CONTROLLED BASED ON THE UNIT CONFIGURATION AND THE REQUESTED HEATING CAPACITY.

REHEAT CONTROL:

REHEAT WILL ONLY BE ALLOWED WHEN THE PRIMARY AIR TEMPERATURE IS 5.0 DEG. F BELOW THE CONFIGURED REHEAT ENABLE SETPOINT OF 70.0 DEG. F (ADJ.). THE REHEAT SHALL BE ENABLED WHEN THE SPACE TEMPERATURE DROPS BELOW THE ACTIVE HEATING SETPOINT AND THE MINIMUM AIRFLOW REQUIREMENTS ARE MET. DURING REHEAT THE VAV SHALL OPERATE AT ITS MINIMUM HEATING AIRFLOW SETPOINT AND ENERGIZE THE HEAT AS FOLLOWS:

ELECTRIC SILICON CONTROLLED RECTIFIER REHEAT (SCR):

IF THE SPACE TEMPERATURE IS AT THE HEATING SETPOINT, THE ELECTRIC HEATER SHALL MODULATE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE AT THE ACTIVE HEATING SETPOINT WHILE THE VAV OPERATES AT ITS MINIMUM HEATING AIRFLOW SETPOINT. IF THE DISCHARGE AIR TEMPERATURE REACHES THE DESIGN HEATING DISCHARGE AIR TEMPERATURE SETPOINT (ADJ.), THE VAV SHALL MODULATE AIRFLOW BETWEEN THE MINIMUM HEATING AIRFLOW SETPOINT AND THE MAXIMUM HEATING AIRFLOW SETPOINT AS REQUIRED TO MAINTAIN SPACE TEMPERATURE AT THE ACTIVE HEATING SETPOINT, WHILE THE ELECTRIC HEATER MODULATES TO MAINTAIN DISCHARGE AIR TEMPERATURE AT THE DESIGN HEATING DISCHARGE AIR TEMPERATURE SETPOINT. IF THE AIRFLOW REACHES THE MAXIMUM HEATING AIRFLOW SETPOINT, THE VAV SHALL MODULATE THE ELECTRIC HEATER AS REQUIRED TO MAINTAIN SPACE TEMPERATURE AT THE ACTIVE HEATING SETPOINT, WHILE THE VAV OPERATES AT ITS MAXIMUM HEATING AIRFLOW SETPOINT

DEMAND CONTROL VENTILATION:

WHEN THE UNIT IS IN UNOCCUPIED MODE, THE VENTILATION AIRFLOW SETPOINT WILL BE ZERO. WHEN THE UNIT IS IN OCCUPIED MODE, THE VENTILATION AIRFLOW SETPOINT SHALL BE EQUAL THE DESIGN OUTDOOR AIRFLOW AND RESET BASED ON OCCUPANCY AND CO2.

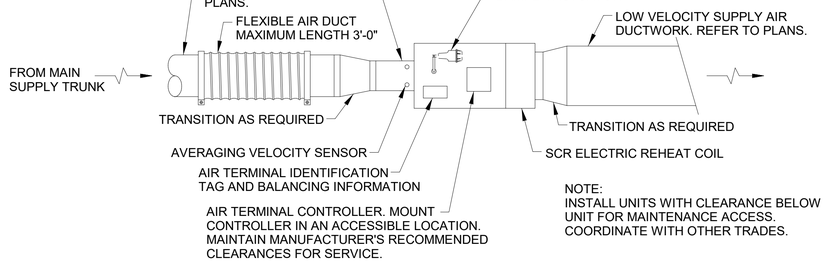
CO2 SENSOR: WHEN THE UNIT IS IN OCCUPIED MODE, WHEN THE CO2 CONCENTRATION IN THE SPACE INCREASES ABOVE 1,000 PPM, THE SUPPLY AIR TERMINAL UNIT DAMPER SHALL GRADUALLY OPEN TO ALLOW MORE SUPPLY AIR INTO THE SPACE, THUS INCREASING THE OUTSIDE AIR TO THE SPACE, WHILE STILL MAINTAINING THE SPACE TEMPERATURE SETPOINT.

SPACE SENSOR FAILURE:

IF THERE IS A FAULT WITH THE OPERATION OF THE ZONE SENSOR AN ALARM SHALL BE ANNUNCIATED. SPACE SENSOR FAILURE SHALL CAUSE THE VAV TO DRIVE THE DAMPER TO MINIMUM AIR FLOW IF THE VAV IS IN THE OCCUPIED MODE, OR DRIVE IT CLOSED IF THE VAV IS IN THE UNOCCUPIED MODE.

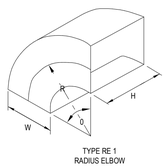
5 SUPPLY AIR TERMINAL UNIT CONTROL DIAGRAM

SCALE: NTS



6 SUPPLY AIR TERMINAL UNIT DETAIL

SCALE: NTS



TYPE RE 1
RADIUS ELBOW

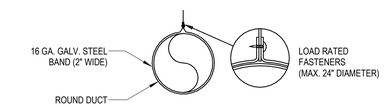
CENTERLINE R = 3W/2 UNLESS OTHERWISE SPECIFIED - NOT RESTRICTED TO 90° ELBOWS.

WHERE AIR VELOCITY IS BELOW 1,000 FPM, R = W/2 MAY BE USED.

SQUARE THROAT ELBOWS MAY NOT BE USED.

7 SMACNA RADIUS ELBOW TYPE RE1 DETAIL

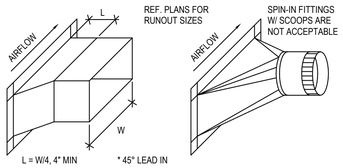
SCALE: NTS



NOTE:
1. FOR DUCTS LARGER THAN 36" DIAMETER, USE TWO HANGER RODS, WIRES OR STRAPS TO SUPPORT DUCT FROM EACH SIDE.

4 ROUND DUCT SUPPORT

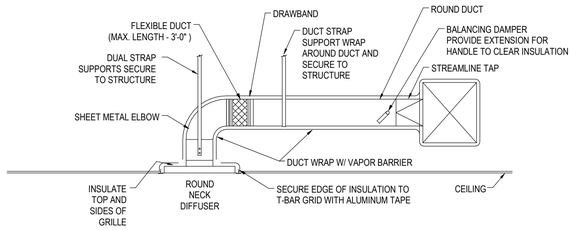
SCALE: NTS



3 BRANCH DUCT FITTING

SCALE: NTS

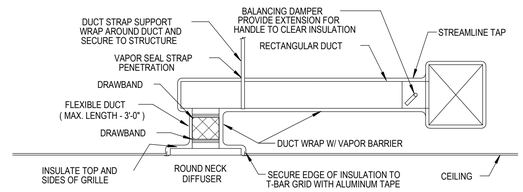
NOTE: FLEXIBLE DUCT CONNECTIONS SHALL BE INSTALLED TO ADC STANDARDS AND SEALED TO UL STANDARDS PER AMC 603 AND 604.2.1. AS A MINIMUM, THE CONTRACTOR SHALL SECURE THE FLEXIBLE DUCT TO ENDS OF METAL DUCT WITH DRAWBANDS, AND WRAP 3" WIDE ALUMINUM TAPE EQUAL TO HARDCAST "FOIL GRIP" AROUND DRAWBAND AND EXPOSED END OF FLEXIBLE DUCT INSULATION.



2 ROUND DUCT DIFFUSER CONNECTION

SCALE: NTS

NOTE:
FLEXIBLE DUCT CONNECTIONS SHALL BE INSTALLED TO ADC STANDARDS AND SEALED TO UL STANDARDS PER AMC 603 AND 604.2.1. AS A MINIMUM, THE CONTRACTOR SHALL SECURE THE FLEXIBLE DUCT TO GRILLE AND METAL DUCT WITH DRAWBANDS, AND WRAP 3" WIDE ALUMINUM TAPE EQUAL TO HARDCAST "FOIL GRIP" AROUND DRAWBAND AND EXPOSED END OF FLEXIBLE DUCT INSULATION.



1 RECTANGULAR DUCT GRILLE CONNECTION

SCALE: NTS

PRIGM ENGINEERING
479.877.3188
310 W. Dickson St., Suite 210
Fayetteville, AR 72701
www.prigm.com

Engineer's Seal:

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
JASON PATRICK MOWRE
No. 14988

2/23/2024

Firm's Seal:

CERTIFICATE OF AUTHORIZATION
PRIGM ENGINEERING, PLLC
No. 3588
ARKANSAS

UNIVERSITY OF ARKANSAS

University of Arkansas - CEREC

DATE 2/23/2024

JOB NO. 23108

REVISIONS

M2.0

MECHANICAL DETAILS & CONTROLS

I. GENERAL PROVISIONS

A. GENERAL CONDITIONS, CODES & STANDARDS

1. GENERAL CONDITIONS OF THE CONTRACT FOUND IN THE ARCHITECTURAL DRAWINGS, GENERAL AND SPECIAL CONDITIONS OF THE AMERICAN INSTITUTE OF ARCHITECTS (AIA) AND ANY OF THE OWNER'S GENERAL REQUIREMENTS SHALL APPLY UNLESS NOTED OTHERWISE.
2. REFER TO THE GENERAL CONDITIONS ON THE ARCHITECTURAL DOCUMENTS AND THE GENERAL AND SPECIAL CONDITIONS OF THE AIA FOR ADDITIONAL REQUIREMENTS REGARDING; SAFETY, COORDINATION & COOPERATION, WORKMANSHIP, PROTECTION, CUTTING AND PATCHING, DAMAGE TO OTHER WORK, PRELIMINARY OPERATIONS, STORAGE, ADJUSTMENTS, CLEANING, ETC.
3. ALL WORK SHALL BE IN CONFORMANCE WITH ALL LOCALLY ENFORCED, FEDERAL, STATE, AND LOCAL CODES AND ORDINANCES INCLUDING ANY SPECIAL OWNER REQUIREMENTS IN ADDITION TO THOSE SPECIFIED. NFPA 70 (NEC), OSHA, AND UL SHALL BE THE MINIMUM STANDARD OF CODE COMPLIANCE. THE NEC VERSION THAT IS FOLLOWED BY THE LOCAL JURISDICTION SHALL BE THE MINIMUM REQUIREMENTS OF THE WORK.
4. CONTRACTOR SHALL PAY FOR AND OBTAIN ALL NECESSARY LICENSES, PERMITS AND INSPECTIONS REQUIRED TO PROCEED WITH THE WORK. THIS SHALL INCLUDE ALL REQUIRED COORDINATION WITH THE LOCAL UTILITY COMPANIES AND THEIR ASSOCIATED FEES OR COSTS.
5. THE ELECTRICAL DRAWINGS ARE GRAPHIC REPRESENTATIONS OF THE WORK THAT IS CONTRACTED. THESE DRAWINGS ARE TO BE USED AS A GUIDE FOR LAYING OUT WORK AND TO VERIFY EQUIPMENT SPECIFICATIONS, LOCATIONS, AND COMPLIANCE. EQUIPMENT INSTALLED PER MANUFACTURER'S RECOMMENDATIONS SHALL ENSURE A COMPLETE, COORDINATE AND PROPERLY OPERATING SYSTEM. DETERMINE EXACT LOCATIONS BY JOB MEASUREMENTS, BY CHECKING WITH OTHER TRADES, AND BY REVIEWING ALL CONTRACT DOCUMENTS. ERRORS THAT ARE CAUSED BY IMPROPER CHECKING AND INSPECTION SHALL BE CORRECTED AT NO ADDITIONAL COST TO OWNER.
6. A PRE-BID SITE VISIT SHALL BE PERFORMED TO BECOME AWARE OF THE SITE AND BUILDING CONDITIONS THAT THE WORK IS TO BE DONE.

B. SCOPE OF WORK

1. THIS CONTRACT SHALL INCLUDE THE FURNISHING, INSTALLING, CONNECTING, AND OPERATION OF ALL EQUIPMENT WHICH IS A PART OF THE ELECTRICAL SYSTEMS AS SHOWN ON THE DRAWINGS AND AS REQUIRED BY SIMILAR INSTALLATIONS. ANY MATERIAL OR LABOR WHICH IS NEITHER SHOWN ON THE DRAWINGS NOR CALLED FOR IN THE SPECIFICATIONS, BUT WHICH IS OBVIOUSLY NECESSARY TO COMPLETE THE WORK AND WHICH IS USUALLY INCLUDED IN WORK OF A SIMILAR CHARACTER SHALL BE FURNISHED AND INSTALLED UNDER THIS CONTRACT AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS REQUIRED TO PROVIDE THE OWNER A COMPLETE, CODE APPROVED AND OPERATIONAL ELECTRICAL SYSTEM.
2. CAREFULLY READ SPECIFICATION FOR ALL PARTS OF THE WORK SO AS TO BECOME FAMILIAR WITH ALL TRADES' WORK SCOPE. CONSULT WITH OTHER TRADES TO INSURE PROPER LOCATIONS AND AVOID INTERFERENCES. ANY CONFLICT SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER BEFORE WORK IS COMMENCED.
3. CONTRACTORS SHALL BE HELD TO HAVE EXAMINED THE PREMISES AND SITE SO AS TO COMPARE THEM WITH THE DRAWINGS AND SPECIFICATIONS, NOTE THE EXISTING CONDITIONS AND OTHER WORK THAT WILL BE REQUIRED, AND THE NATURE OF THE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED. NO ALLOWANCE SHALL BE MADE TO THE CONTRACTOR BY REASON OF THIS FAILURE TO HAVE MADE SUCH EXAMINATION OR OF ANY ERROR ON HIS PART.
4. ALL EXISTING UTILITY AND ELECTRICAL SERVICES SHALL BE FIELD VERIFIED. CORRECTIONS TO THE DESIGN AND INSTALLATION SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER.
5. PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF ELECTRICAL WORK. ALL CORE DRILLING OR CUTTING OF FIRE RATED FLOORS, SHAFTS, AND WALLS SHALL BE FIRESTOPPED PRIOR TO FINISH PATCHING. ALL PENETRATIONS SHALL BE FIRE SEALED TO MATCH THE FIRE RATING OF THE FLOORS, SHAFTS, AND WALLS PENETRATED. ACCEPTABLE MANUFACTURERS OF FIRESTOPPING ARE: HILTI, 3M CORP, RECTORSEAL, AND SPECIFY TECHNOLOGY. PROVIDE THE PROPER FIRE-STOPPING APPLICATION BASED ON MANUFACTURER'S INTENDED USE.
6. TEMPORARY ELECTRICAL SERVICE, LIGHTING, AND RELATED WIRING SHALL BE PROVIDED TO OSHA REQUIREMENTS FOR THE USE OF ALL TRADES DURING CONSTRUCTION.
7. TEMPERATURE AND INTERLOCK CONTROL COMPONENTS AND ALL RELATED WIRING AND CONDUIT SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
8. THIS CONTRACT SHALL ALSO INCLUDE ALL LABOR, MATERIALS AND MISCELLANEOUS EXPENSES REQUIRED FOR ALL REQUIRED ELECTRICAL DEMOLITION OF THE EXISTING AREAS BEING RENOVATED.
   a. THE DEMOLITION SHALL CONSIST OF THE COMPLETE REMOVAL (PROPERLY DISPOSED OFF SITE UNLESS OTHERWISE NOTED) OF ALL ELECTRICAL EQUIPMENT, WIRING, CONDUIT, MATERIALS, ETC. NOT REQUIRED IN THE FINAL DESIGN AND INSTALLATION OF THE ELECTRICAL SYSTEMS FOR THE NEW RENOVATED AREAS.
   b. ALL UNDERGROUND SERVICES NOT BEING REUSED SHALL BE CAPPED BELOW THE FLOOR, WIRING REMOVED, AND FLOOR PENETRATIONS REPAIRED TO MATCH ADJACENT SURFACES.
   c. ALL ABOVE GROUND CIRCUITS SHALL BE REMOVED BACK TO THE SOURCE UNLESS INDICATED OTHERWISE.
   d. COORDINATE ALL DEMOLITION WITH THE ARCHITECTURAL DOCUMENTS, THE ARCHITECT, AND THE OWNER'S GENERAL REQUIREMENTS.
9. ALL WORK INCLUDING, BUT NOT LIMITED TO PARTS, MATERIAL, EQUIPMENT AND LABOR SHALL BE GUARANTEED FOR ONE YEAR AFTER ACCEPTANCE BY THE ENGINEER AND OWNER. WHERE AN EQUIPMENT MANUFACTURER HAS A WARRANTY THAT EXCEEDS ONE YEAR, THAT WARRANTY PERIOD SHALL APPLY TO THIS PROJECT.

C. DOCUMENTS

1. THE DRAWINGS ARE DIAGRAMMATIC; ALL WORK SHALL BE PERFORMED AS INDICATED ON THE DRAWINGS UNLESS EXISTING CONDITIONS OR COORDINATION ISSUES REQUIRE CHANGES. THESE CHANGES SHALL BE MADE WITH NO ADDITIONAL COST TO THE OWNER.
2. ANY INCIDENTAL ITEMS OR LABOR, ETC. NOT INCLUDED IN THE SPECIFICATIONS OR THE DRAWINGS BUT REASONABLY IMPLIED AS NECESSARY FOR THE COMPLETE INSTALLATION OF ALL APPARATUS SHALL BE INCLUDING IN BID.
3. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER AND ANY MATERIAL OR LABOR CALLED FOR IN ONE SHALL BE FURNISHED EVEN THOUGH NOT MENTIONED IN BOTH.
4. IF ERRORS ARE FOUND IN THE DRAWINGS OR SPECIFICATIONS OR DISCREPANCIES OCCUR BETWEEN THE SAME, OR BETWEEN THE FIGURES ON THE DRAWINGS, AND THE SCALE OF SAME OR BETWEEN THE LARGER AND SMALLER DRAWINGS, OR IN THE DESCRIPTIVE MATTER ON THE DRAWINGS SHALL BE REFERRED TO THE OWNER FOR REVIEW AND FINAL DECISION PRIOR TO THE BID DUE DATE.
5. THE BIDDING OF THIS WORK WILL CONTEMPLATE THE USE OF EQUIPMENT AND MATERIALS EXACTLY AS SPECIFIED HEREIN. WHERE MORE THAN ONE MANUFACTURER IS MENTIONED ANY ONE MAY BE UTILIZED. SUBSTITUTE MANUFACTURERS MAY BE OFFERED ONLY AS AN ALTERNATE TO THE SPECIFIED EQUIPMENT AND MATERIAL AND MUST BE SUBMITTED AS SPECIFIED IN THE ARCHITECTURAL DOCUMENTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM THE ALTERNATE IS A SATISFACTORY EQUAL PRIOR TO THE SUBMISSION FOR APPROVAL TO THE ENGINEER. THE ARCHITECT OR ENGINEER HAS THE RIGHT TO APPROVE OR DISAPPROVE ANY SUBSTITUTION AND THE DECISION IS FINAL.
6. MISCELLANEOUS ITEMS NECESSARY TO COMPLETE THE SYSTEMS CAN BE OF ANY RECOGNIZED MANUFACTURER, PROVIDED THESE ITEMS MEET MINIMUM STANDARDS AS SET IN THESE SPECIFICATIONS, ARE FROM A MANUFACTURER WITH A MINIMUM OF 5 YEAR EXISTENCE, AND IT IS UL LISTED.. REFER TO EACH SECTION FOR ANY SPECIFIC REQUIREMENTS.

D. COORDINATION

1. CONTRACTOR SHALL LOCATE, IDENTIFY AND PROTECT ANY EXISTING SERVICES WHICH ARE REQUIRED TO BE MAINTAINED OPERATIONAL AND SHALL EXERCISE EXTRA CAUTION IN THE PERFORMANCE OF ALL WORK TO AVOID DISTURBING SUCH FACILITIES. ALL COSTS FOR REPAIR OF DAMAGES TO SUCH SERVICES SHALL BE PAID BY THE CONTRACTOR CAUSING THE DAMAGE.
2. EACH CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ALL DAMAGE TO OTHER WORK CAUSED BY HIS WORK OR THROUGH THE NEGLECT OF HIS, OR HIS SUB-TRADE'S PERSONNEL. ALL PATCHING, REPAIRING, REPLACEMENT AND PAINTING, ETC. SHALL BE DONE AS DIRECTED BY THE OWNER BY THE CRAFTSMEN OF THE TRADES INVOLVED. THE COSTS OF SUCH WORK SHALL BE PAID BY THE CONTRACTOR CAUSING THE DAMAGE.
3. IT IS ESSENTIAL THAT ALL WORK AT THE PROJECT BE DONE AT SUCH TIME AND IN SUCH MANNER AS NOT TO INTERFERE WITH THE OPERATIONS OF THE SPACE, ADJACENT SPACES, OR FACILITY. A WORK SCHEDULE SHALL BE ARRANGED WITH THE OWNER, INCLUDING PREMIUM TIME WORK TO FACILITATE WORK WITH A MINIMUM OF INTERFERENCE TO THE OWNER'S OPERATIONS.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE ALL REQUIREMENTS WITH OTHER TRADES, SUCH AS CONCEALED CONDUIT SPACES, PENETRATIONS, DIMENSION OF EQUIPMENT, ETC. TO ENSURE AN ACCURATE AND SUCCESSFUL INSTALLATION. PROVIDE TRIM FOR EQUIPMENT/MATERIALS THAT REQUIRE IT TO PROPERLY FIT THE TYPES OF CEILING, WALL, OR FLOOR FINISHES ACTUALLY INSTALLED. ALL FINAL TRIM SELECTIONS SHALL BE COORDINATED WITH ARCHITECTURAL DRAWINGS.
5. CONTRACTOR SHALL VERIFY EQUIPMENT FITS IN SPACES SHOWN PRIOR TO ROUGH-IN AND INSTALLATION.

E. METHODS

1. EXCAVATIONS SHALL BE MADE IN OPEN TRENCHES. FLOORS SHALL BE SAW CUT. CONDUIT SHALL BE LAID ON AN APPROPRIATELY GRADED 6" BED OF CLEAN AND DRY SAND. ENGINEERED FILL SHALL BE USED TO BACKFILL TO 6" ABOVE THE CONDUIT. BACKFILL THE REMAINDER OF THE TRENCH UTILIZING THE EXCAVATED MATERIAL IF APPROVED BY THE ARCHITECT OR THE OWNER. IF THE EXCAVATED MATERIALS ARE NOT ACCEPTABLE, ENGINEERED FILL ACCEPTABLE TO THE ARCHITECT SHALL BE UTILIZED TO BACKFILL THE REMAINDER OF THE TRENCH. BACKFILL SHALL BE ACCOMPLISHED IN 9" LIFTS WITH ALL LIFTS COMPACTED TO 95% PROCTOR. PATCH FLOOR TO MATCH EXISTING.
2. EQUIPMENT, CONDUIT, ETC. SHALL NOT BE SUPPORTED FROM ANY CEILINGS, OTHER PIPING, OTHER CONDUIT OR DUCTWORK, ROOF DECK, OR JOIST BRIDGING. ITEMS SHALL BE SUPPORTED FROM ACCEPTABLE STRUCTURAL BUILDING COMPONENTS AS DETERMINED BY THE ARCHITECT AND STRUCTURAL ENGINEER.
3. ALL ROOF PENETRATIONS, FLASHINGS AND COUNTER FLASHINGS SHALL BE PERFORMED BY THE OWNER'S ROOFING CONTRACTOR AT THE REQUESTING CONTRACTORS COST. PENETRATIONS SHALL BE MADE WITHIN MECHANICAL EQUIPMENT CURBS WHEN POSSIBLE.
4. ALL EQUIPMENT AND MATERIALS SHALL BE SAFELY STORED AND PROTECTED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION, UNTIL INSTALLATION. PLUG OR CAP OPEN ENDS OF CONDUIT WHILE STORED TO PREVENT DIRT AND DEBRIS FROM ENTERING.

F. SUBMITTALS

1. SHOP DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT OF ALL EQUIPMENT AND ACCESSORIES PROVIDED FOR THE PROJECT WHETHER SPECIFIED HERE-IN OR ON THE DRAWINGS. REVIEW OF THE SHOP DRAWINGS SHALL BE FOR GENERAL DESIGN CONCEPT AND ADHERENCE WITH THE SPECIFICATIONS. QUANTITY OF SHOP DRAWINGS SUBMITTED SHALL BE AS SPECIFIED BY THE ARCHITECT. SHOP DRAWINGS SHALL BE PREPARED BY THE CONTRACTOR SHOWING LOCATIONS AND MEASUREMENTS FROM COLUMNS OF ALL CONCEALED AND EXPOSED PIPING, DUCTWORK, CONDUIT, EQUIPMENT, ACCESSORIES, ETC., AND SUBMITTED PRIOR TO INSTALLATION. THE OWNER MAY MAKE REPRODUCIBLE COPIES OF THEIR DRAWINGS AVAILABLE FOR USE IN PREPARATION OF SHOP DRAWINGS, HOWEVER THE OWNER SHALL NOT BE HELD RESPONSIBLI FOR NOT CONFIRMING ALL INFORMATION ON THE DRAWINGS PRIOR TO FABRICATION AND/OR INSTALLATION.
2. AT A MINIMUM, SUBMITTALS SHALL BE PROVIDED FOR ALL LIGHT FIXTURES, LIGHTING CONTROLS, AND ALL ELECTRICAL DISTRIBUTION EQUIPMENT SUCH AS PANELBOARDS/SWITCHBOARDS, DISCONNECTS, TRANSFORMERS, ETC. SHOP DRAWINGS SHALL BE SUBMITTED FOR LOW VOLTAGE SYSTEMS SUCH AS FIRE ALARM, LIGHTNING PROTECTION, ETC. SUBMITTALS AND SHOP DRAWINGS SHALL NOT CONTAIN THE ENGINEER'S NAME ON DOCUMENTS.
3. PROJECT RECORD DOCUMENTS - MAINTAIN AT THE JOBSITE ONE COPY OF ALL CONTRACT DOCUMENTS CLEARLY MARKED AS "PROJECT RECORD COPY". THESE RAWINGS ARE TO BE MAINTAINED IN GOOD CONDITION, UPDATED DAILY FOR CHANGES ENCOUNTERED AND AVAILABLE AT ALL TIMES FOR INSPECTION BY THE OWNER. DO NOT USE FOR FIELD CONSTRUCTION! PROJECT RECORD DOCUMENTS ARE TO BE KEPT CURRENT WITH EXACT DIMENSIONS OF ALL WORK, EQUIPMENT, DISTRIBUTION CONDUIT, CIRCUITS, ETC. MARK ALL INFORMATION IN RED LINES AND NOTES SO AS TO BE EASILY IDENTIFIED FROM THE BASE DRAWING. UPON COMPLETION OF THE WORK, ONE SET OF THESE DOCUMENTS SHALL BE TURNED OVER TO THE OWNER AS ONE QUALIFICATION FOR FINAL PAYMENT.
4. THREE COMPLETE SETS OF AS-BUILT DOCUMENTATION SHALL BE PROVIDED. IT SHALL INCLUDE, BUT NOT BE LIMITED TO ACCURATE PLAN DRAWINGS, WIRING DIAGRAMS AND OPERATION AND MAINTENANCE MANUALS.

G. WARRANTIES

1. WARRANTIES SHALL BE PROVIDED FOR EQUIPMENT BASED ON ARCHITECT'S REQUIREMENTS STATED IN THEIR SPECIFICATIONS.

II. PRODUCTS

A. CONDUIT

1. CONDUIT SHALL BE HEAVY WALL RIGID GALVANIZED STEEL WHERE EXPOSED AND SUBJECT TO DAMAGE, 8'-0" AFF AND BELOW, AND IN WET LOCATIONS WHERE INDICATED ON THE DRAWINGS. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC AND SHALL BE CONCRETE ENCASED (3" MINIMUM) WHERE INDICATED ON THE DRAWINGS. A TRANSITION SHALL BE MADE TO HEAVY WALL RIGID GALVANIZED STEEL BEFORE PVC CONDUITS PENETRATE THE FLOOR SLAB. INTERIOR CONDUITS SHALL BE ELECTRICAL METALLIC TUBING (EMT). METAL CLAD (MC) CABLE MAY BE USED IF APPROVED BY THE OWNER, AND INSTALLED IN LOCATIONS PERMITTED BY CODE.
2. FLEXIBLE METAL CONDUIT SHALL BE USED FROM OUTLET BOX TO INDIVIDUAL RECESSED LIGHT FIXTURES, AND FOR FINAL CONNECTIONS TO MOTORS AND OTHER DEVICES SUBJECT TO VIBRATION. LIQUID-TIGHT FLEXIBLE METAL CONDUIT SHALL BE USED IN WET LOCATIONS.
3. COORDINATE SLEEVE PENETRATIONS AND FIRESTOPPING APPLICATION WITH THE APPROPRIATE DISCIPLINE PRIOR TO INSTALLATION.
4. SUPPORT SYSTEMS SHALL BE STEEL SLOTTED CHANNEL. 12-GAUGE, 1-5/8 INCH X 1-5/8 INCH. ACCEPTABLE MANUFACTURERS: HILTI, POWER-STRUT, THOMAS & BETTS CORP, UNISTRUT, COOPER B-LINE, ERICO INTERNATIONAL CORP. FINISHES SHALL BE MADE PER ARCHITECTURAL REQUIREMENTS.
5. CONDUIT SHALL BE INSTALLED CONCEALED ABOVE SUSPENDED CEILINGS OR IN WALLS OR FLOORS WHEREVER POSSIBLE, UNLESS NOTED OTHERWISE.
6. INSTALL CONDUIT PARALLEL AND PERPENDICULAR TO BUILDING LINES. A MAXIMUM OF (4ea) 90 DEGREE BENDS WILL BE ALLOWED BETWEEN CONNECTIONS. SECURE AND FASTEN CONDUIT IN APPROVED METHOD TO BUILDING STRUCTURAL COMPONENTS. DO NOT CONNECT TO SUSPENDED CEILING SYSTEMS.
7. LOW VOLTAGE CABLING SHALL BE INSTALLED IN EMT WHEN INSTALLED VERTICALLY WITHIN WALLS. STUB CONDUIT UP ABOVE WALL AND PROVIDE BUSHING ON END TO PROTECT WIRE WHILE PULLING.
8. USE BUSHINGS, LOCKNUTS, AND COMPRESSION TYPE FITTINGS FOR FINAL CONNECTIONS OF CONDUIT TO EQUIPMENT.

B. CONDUIT FITTINGS AND BOXES

1. INTERIOR OUTLET BOXES SHALL BE STANDARD GALVANIZED SHEET STEEL TYPE, NOT LESS THAN 14 GAUGE IN THICKNESS, WITH KNOCKOUT OPENINGS, EXTENSIONS, PLASTER RINGS AND COVER PLATES TO ACCOMMODATE THE DEVICES INSTALLED. COVER PLATES SHALL BE SMOOTH PLASTIC TO MATCH DEVICE COLOR. USE STEEL PLATES WITH ROUNDED CORNERS FOR SURFACE BOXES. OUTDOOR (WET LOCATION) OUTLET BOXES SHALL BE CAST ALUMINUM TYPE WITH DEVICE COVERS TO SUIT.
2. OUTLET BOXES SHALL NOT BE LESS THAN 4 INCHES SQUARE, 1-1/2 INCHES DEEP.
3. COUPLINGS AND CONNECTORS FOR EMT SHALL BE DIE CAST ZINC OR STEEL. BUSHING SHALL BE GROUNDING TYPE WITH INSULATING PLASTIC INSERT.

C. WIRE AND CABLE

1. CONDUCTORS FOR POWER AND LIGHTING SHALL BE NEW 600-VOLT, 90°C, TYPE XHHW OR THHN/THWN-2 INSULATION, MINIMUM SIZE #12-AWG. EXCEPT FOR CONTROL WIRING WHICH MAY BE #14-AWG. OTHER SIZES SHALL BE AS NOTED ON THE DRAWINGS. CONDUCTORS SHALL BE COPPER, UNLESS OTHERWISE APPROVED BY THE OWNER. CONDUCTORS #10 AWG AND SMALLER TO BE SOLID COPPER.
2. BRANCH CIRCUIT RUNS EXCEEDING 100 FEET IN TOTAL LENGTH FROM THE PANELBOARD TO THE LAST DEVICE, SHALL BE #10-AWG CONDUCTORS UNLESS OTHERWISE NOTED.
3. COMPRESSION TYPE LUGS AND CONNECTORS SHALL BE USED FOR ALL TERMINATIONS AND SPLICES.
4. ALL LOW VOLTAGE COMMUNICATIONS, FIRE ALARM, DATA, SECURITY, TELEPHONE AND ALL OTHER MISCELLANEOUS LOW VOLTAGE WIRING INSTALLED IN CEILING SHALL BE PLENUM RATED. USE CAT6 CABLE FOR ETHERNET COMMUNICATIONS. WIRING TYPE SHALL BE DETERMINED BY USING SUGGESTED TYPE FROM MANUFACTURER OF THE RESPECTIVE EQUIPMENT.
5. IF NO WIRE SIZE IS SHOWN ON PLANS THEN USE THE ASSOCIATED SIZE AS REQUIRED BY NEC.
6. ALL WIRING TO BE INSTALLED IN APPROVED RACEWAY AND ENCLOSURES.
7. USE INSULATION COLOR SCHEMES AS SUGGESTED IN NEC.
8. AN INSULATED GREEN CONDUCTOR SHALL BE PROVIDED IN EACH RACEWAY FOR GROUND WIRE.

D. WIRING DEVICES

1. DUPLEX RECEPTACLES SHALL BE SPECIFICATION GRADE, GROUNDING TYPE, NEMA 5-20R, RATED FOR 20 AMPS, 125 VOLTS, WITH PROVISIONS FOR BACK AND SIDE WIRING.
2. GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLES SHALL BE PROVIDED WHERE INDICATED. THESE CIRCUITS SHALL HAVE DEDICATED NEUTRAL WIRE. EACH RECEPTACLE THAT REQUIRES GFI PROTECTION SHALL HAVE ITS OWN INTEGRAL GFI, AND NOT BE RELIANT ON AN UPSTREAM GFI RECEPTACLE. A GFI CIRCUIT BREAKER IS ACCEPTABLE.
3. SWITCHES SHALL BE TOGGLE OPERATED, QUIET TYPE, RATED FOR 20 AMPS, 120/277 VOLTS, WITH PROVISIONS FOR BACK AND SIDE WIRING. THREE WAY AND FOUR WAY SWITCHES SHALL BE PROVIDED WHERE INDICATED.
4. DIMMERS SHALL BE LUTRON "NOVA T-STAR" SERIES, OF A RATING, VOLTAGE AND WATTAGE SUITABLE FOR LOAD SERVED, OR APPROVED EQUAL.
5. COLORS OF DEVICES SHALL BE SELECTED BY ARCHITECT.
6. WIRING DEVICES SHALL BE SPECIFICATION GRADE, AS MANUFACTURED BY HUBBELL, PASS & SEYMOUR, ARROW HART, LEVITON AND GENERAL ELECTRIC.
7. LOCATIONS SHOWN ON PLANS ARE APPROXIMATE. DEVICES GROUPED TOGETHER SHALL HAVE SIMILAR FINISH AND BE MOUNTED AT SAME HEIGHT FOR UNIFORMITY.

E. LIGHTING AND RECEPTACLE PANELBOARDS

1. CIRCUIT BREAKERS SHALL BE BOLT ON TYPE: WITH MOLDED PLASTIC CASE; 1, 2, OR 3 POLE AS INDICATED; QUICK-MAKE, QUICK-BREAK; AND THERMAL-MAGNETIC TRIP DEVICE.
2. ALL CIRCUIT BREAKERS FEEDING HVAC EQUIPMENT SHALL BE HACR RATED, UNLESS OTHERWISE NOTED.
3. MULTI-WIRE BRANCH CIRCUITS SHALL BE PROVIDED WITH A MEANS TO SIMULTANEOUSLY DISCONNECT ALL CIRCUITS THAT SHARE A NEUTRAL.
4. NEW CIRCUIT BREAKERS INSTALLED IN EXISTING PANELBOARDS SHALL MATCH EXISTING AIC RATINGS, MANUFACTURER, AND TYPE OF EXISTING CIRCUIT BREAKERS.

F. SAFETY SWITCHES AND MOTOR STARTERS

1. SAFETY SWITCHES SHALL BE FUSIBLE OR NON-FUSIBLE AS INDICATED ON THE DRAWINGS. SWITCHES SHALL BE QUICK-MAKE, QUICK-BREAK, HEAVY DUTY VISIBLE BLADE TYPE. ENCLOSURES SHALL BE NEMA 1 TYPE UNLESS OTHERWISE INDICATED ON THE DRAWINGS, NEMA 3R IN WET LOCATIONS. FUSES SHALL BE DUAL ELEMENT - TIME DELAY TYPE.
2. MAGNETIC MOTOR STARTERS SHALL BE COMBINATION TYPE WITH THERMAL OVERLOAD, INTEGRAL FUSED SAFETY SWITCH, H-O-A SELECTOR SWITCH, CONTROL TRANSFORMER, RUNNING PILOT LIGHT, NEMA TYPE 1 ENCLOSURE, AND (2) NORMALLY OPEN AND (2) NORMALLY CLOSED AUXILIARY CONTACTS.
3. ALL MOTORS OVER 1/8 HP SHALL BE PROVIDED WITH THERMAL OVERLOAD PROTECTION. OVERLOAD PROTECTION SHALL BE PROVIDED INTEGRAL WITH THE MOTOR WINDINGS AND/OR MOTOR CONTROLLER (PROVIDED BY OTHERS) UNLESS OTHERWISE INDICATED ON DRAWINGS.
4. SWITCHES AND STARTERS TO BE MANUFACTURED BY SQUARE D, EATON, SIEMENS, OR GENERAL ELECTRIC.
5. DO NOT DOUBLE LUG EQUIPMENT UNLESS SPECIFICALLY DESIGNED FOR IT.

G. LUMINAIRES AND LAMPS

1. ALL LUMINAIRES SHALL BE SPECIFIED ON THE LUMINAIRE SCHEDULE. FIXTURES SHALL BE LED TYPE UNLESS NOTED OTHERWISE.
2. EMERGENCY LIGHTING AS INDICATED, SHALL PROVIDE A MINIMUM OF ONE FOOTCANDLE ALONG THE PATH OF EGRESS. EMERGENCY FIXTURE SUPPLIER SHALL PROVIDE FOOTCANDLE PRINTOUT TO VERIFY EMERGENCY LIGHT LEVELS.

III. EXECUTION

A. GENERAL MISCELLANEOUS

1. ALL CONDUIT RUN IN FINISHED AREAS SHALL BE CONCEALED. CONDUIT SMALLER THAN 3/4" SHALL NOT BE USED FOR ANY CIRCUIT HOMERUNS.
2. RACEWAYS EXPOSED TO DIFFERENT TEMPERATURES SHALL BE FILLED WITH AN APPROVED MATERIAL IN ACCORDANCE WITH ARTICLE 300.7 OF THE NATIONAL ELECTRICAL CODE.
3. HANGERS, SUPPORTS, OR FASTENINGS SHALL BE PROVIDED AT EACH ELBOW, AT THE ENDS OF STRAIGHT RUNS TERMINATING AT BOXES OR CABINETS, AND AT INTERMEDIATE POINTS AS REQUIRED BY CODE. CONDUITS OR BOXES SHALL NOT BE SUPPORTED BY CEILING SUPPORT WIRES OR OTHER CEILING SUPPORTING HARDWARE.

4. FIXTURE SUPPORTS SHALL BE IN ACCORDANCE WITH ARTICLE 410-30 OF THE NATIONAL ELECTRICAL CODE, OR ANY LOCAL CODES WHICH MY APPLY.
5. PROVIDE PERMANENT NAMEPLATES WITH DESIGNATIONS FOR PANELBOARDS, FEEDER DEVICES, DISTRIBUTION EQUIPMENT AND STARTERS. NAMEPLATES TO BE ENGRAVED, CONTRASTING COLOR, LAMINATED PLASTIC INDICATING THE NAME OF THE EQUIPMENT, LOAD, OR CIRCUIT AS SHOWN ON THE DRAWINGS. IT SHALL BE ADHERED WITH FIELD-APPLIED EPOXY ADHESIVE, COMPATIBLE WITH THE EQUIPMENT FINISH.
6. PROVIDE TYPEWRITTEN DIRECTORY CARDS WITH BRANCH CIRCUIT IDENTIFICATION FOR BRANCH CIRCUIT PANELBOARDS. PANELBOARDS, FEEDER DEVICES, DISTRIBUTION EQUIPMENT AND STARTERS SHALL BE FIELD MARKED TO WARN QUALIFIED PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS IN ACCORDANCE WITH NEC 110.16.
7. INSTALL HANDLE GUARDS ON ALL BREAKERS FOR NIGHT LIGHTING, EMERGENCY AND SIMILAR CIRCUITS.
8. THE ELECTRICAL CONTRACTOR SHALL BALANCE PANELBOARD LOADING TO WITHIN 10% ON EACH PHASE BASED ON INSTALLED CONDITIONS. LOAD BALANCING CIRCUIT CHANGES SHALL BE PERFORMED OUTSIDE THE NORMAL OCCUPANCY WORKING SCHEDULE AND AT A TIME DIRECTED BY LANDLORD.
9. ALL FLUSH MOUNTED PANELBOARDS SHALL HAVE (3) 3/4" EMPTY CONDUITS INSTALLED TO ABOVE ACCESSIBLE CEILING FOR FUTURE USE.
10. THE FINAL LOCATIONS OF ALL EQUIPMENT, OUTLETS, ETC. SHALL BE SUBJECT TO REASONABLE CHANGES IN LOCATION UP TO THE TIME OF ROUGHING-IN, AT NO ADDITIONAL COST TO THE OWNER.
11. AT ALL TIMES KEEP PREMISES AND BUILDING IN A NEAT AND ORDERLY CONDITION, FOLLOWING OWNER'S INSTRUCTION IN REGARD TO STORING OF MATERIALS, PROTECTIVE MEASURES AND DISPOSING OF DEBRIS.
12. RACEWAYS BELOW DRIVEWAYS, PARKING LOTS, AND ANY RACEWAYS INSTALLED BELOW GRADE SHALL BE SCHEDULE 80 PVC AND INSTALLED A MINIMUM OF 24" BELOW FINISHED GRADE PER NEC 300-5.
13. A CONCRETE BASE SHALL BE PROVIDED FOR ALL FLOOR MOUNTED ELECTRICAL EQUIPMENT AND WHERE SPECIFIED IN DRAWINGS. THE BASE SHALL HAVE CHAMFERED EDGES AND IT SHALL BE A MINIMUM OF 2 INCHES GREATER THAN THE FOOTPRINT OF THE EQUIPMENT THAT IT IS SUPPORTING. THE HEIGHT OF THE BASE SHALL BE A MINIMUM OF 4 INCHES.
14. PRIOR TO START-UP, ALL SCREWS, BOLTS, TERMINATIONS, CONNECTIONS, ETC SHALL BE CHECK FOR PROPER TIGHTNESS AND ANY MOVING PARTS ARE TO BE LUBRICATED PROPERLY. ALL EQUIPMENT SHALL BE TESTED FOR PROPER OPERATION. ADJUSTMENTS AND ALIGNMENTS SHALL BE MADE AS NECESSARY.

B. GROUNDING

1. GROUND ALL CONDUITS, CABINETS, MOTORS, PANELS, AND OTHER EXPOSED NON-CURRENT CARRYING PARTS OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH NEC ARTICLE 250.
2. BOND METAL WATER PIPING AND OTHER METAL PIPING (INCLUDING GAS PIPING) AND EXPOSED STRUCTURAL METAL IN ACCORDANCE WITH NEC ARTICLE 250.
3. GROUNDING OF THE ELECTRICAL SYSTEM SHALL BE BY MEANS OF AN INSULATED GROUNDING CONDUCTOR INSTALLED WITH ALL FEEDERS AND BRANCH CIRCUIT CONDUCTORS IN ALL CONDUITS.
4. CONNECTIONS/TERMINATIONS FOR GROUNDING SHALL BE IN ACCORDANCE WITH NEC.

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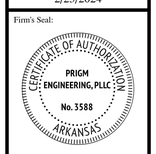

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ELECTRICAL SPECIFICATIONS

ELECTRICAL SYMBOLS LEGEND

(SYMBOLS APPLY ONLY WHEN USED ON DRAWINGS)

SYMBOL	DESCRIPTION
	RECESSED CAN LIGHT FIXTURE
	FLUORESCENT OR LED FIXTURE
	TRACK LIGHTING
	EXIT FIXTURE (WALL MOUNTED/CEILING MOUNTED)
S	SWITCH, SINGLE POLE
S_3	SWITCH, 3-WAY
S_D	SWITCH, DIMMER, TO BE COMPATIBLE WITH LIGHT TYPE AND LOAD
S_T	SINGLE POLE TIMER SWITCH (PARAGON MODEL #ET1100F)
S_{3T}	3-WAY TIMER SWITCH (PARAGON MODEL #ET1100F/3-WAY)
S_M	SWITCH, MANUAL MOTOR
S_{OS}	SWITCH, OCCUPANCY SENSOR, WALL MOUNT
$S_{OS,D}$	SWITCH, OCCUPANCY SENSOR AND DIMMER COMBO, WALL MOUNT
	RECEPTACLE, DUPLEX
	RECEPTACLE, DUPLEX, ISOLATED GROUND
	RECEPTACLE, DUPLEX, GFI
OS	OCCUPANCY SENSOR, CEILING MOUNT
PP	POWER PACK FOR LIGHTING CONTROLS
	RECEPTACLE, DUPLEX, CEILING MOUNTED (FIELD VERIFY EXACT LOCATION) INSTALL FLUSH IN CEILING IN AREAS WITH FINISHED CEILINGS
	RECEPTACLE, DUPLEX FLUSH FLOOR
	RECEPTACLE, DUPLEX ISOLATED GROUND FLUSH FLOOR
	RECEPTACLE, SPECIAL FLUSH FLOOR
	RECEPTACLE, DOUBLE DUPLEX
	RECEPTACLE, SIMPLEX TWIST LOCK, L5-15R, UNO
	RECEPTACLE, DUPLEX TWIST LOCK, L5-15R, UNO
	RECEPTACLE, SPECIAL
	RECEPTACLE, SIMPLEX
	DATA OUTLET, CAT 6 OR PER SPECS
	TELEPHONE OUTLET
	TELEVISION OUTLET, CONFIRM CABLE TYPE PRIOR TO INSTALLATION
	DATA OUTLET & PHONE OUTLET, CAT 6 OR PER SPECS
J	JUNCTION BOX
J	JUNCTION BOX (FLUSH FLOOR MOUNTED)
JB J PB	GENERIC JUNCTION BOX OR PULL BOX AS APPLICABLE. SEE DRAWINGS FOR MORE SPECIFIC APPLICATION INFORMATION
	EQUIPMENT CONNECTION POINT (PROVIDED WITH EQUIPMENT)
	NON-FUSED DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
LA-1	HOME-RUN (WITH CIRCUIT NUMBER(S) WHERE APPLICABLE) CIRCUIT NUMBERS ARE ALSO SHOWN WITHOUT HOMERUN
	CIRCUIT, CONCEALED IN SLAB FLOOR
	CABLING/RACEWAY - CEILING OR WALL - SEE SPECS. FOR APPL CONDUIT/RACEWAY REQ'TS. (FULLY CONCEALED IN FINISHED AREAS, CONCEALED TO OVERHEAD STRUCTURE IN UNFIN. AREAS)
	CONDUIT SLEEVE
	FLUSH MOUNTED PANELBOARD
	SURFACE MOUNTED PANELBOARD
	MOTOR
	TELEPOWER POLE (TUBE-STEEL CHASE FURNISHED BY OWNER, INSTALLED BY E.C.) SEE POWER PLANS FOR FURTHER INFORMATION
	PUSH BUTTON
	BUZZER
	INDICATES GROUNDING BY E.C. PER N.E.C. ARTICLE 250 MINIMUM
TV/DTV	TV BOX: PROVIDE POWER, CAT 6 AND COAX RECEPTACLES.

ABBREVIATIONS

AC	ABOVE COUNTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AL	ALUMINUM
BAS	BUILDING AUTOMATION SYSTEM
BFF	BELOW FINISHED FLOOR
CU	COPPER
DDC	DIRECT DIGITAL CONTROL
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EM	EMERGENCY LIGHTING
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
GC	GENERAL CONTRACTOR
GFCI/GFI	GROUND FAULT CIRCUIT INTERRUPTER
GR	GROUND
IG	ISOLATED GROUND
HD	HAND DRYER
LTG	LIGHTING
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MFR	MANUFACTURER
MIN	MINIMUM
MLO	MAIN LUG ONLY
NL	NIGHT LIGHT
PC	PLUMBING CONTRACTOR
PNLBD	PANELBOARD
RC	REFRIGERATION CONTRACTOR
RCPTS	RECEPTACLES
REF	REFERENCE
RH	RADIANT HEATER
RTU	ROOF TOP UNIT
SC	SECURITY CAMERA
TYP	TYPICAL
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
WH	WATER HEATER
WP	WEATHER PROOF COVERPLATE
WR	WEATHER RESISTANT RECEPTACLE
XFMR	TRANSFORMER

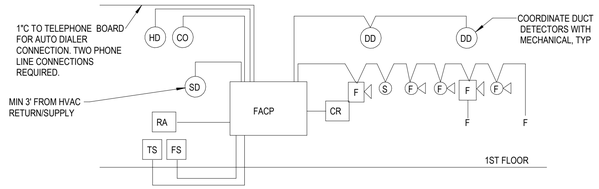
FIRE ALARM SYMBOLS LEGEND

(SYMBOLS APPLY ONLY WHEN USED ON DRAWINGS)

SYMBOL	DESCRIPTION
F	FIRE ALARM MANUAL STATION. PROVIDE PROTECTION DEVICE.
F	ADA COMPLIANT FIRE ALARM SPEAKER WITH STROBE LIGHT, UNLESS NOTED OTHERWISE.
SD	CEILING MOUNTED SMOKE DETECTOR
SC	CEILING MOUNTED SMOKE DETECTOR/CARBON MONOXIDE COMBINATION UNIT
DD	DUCT MOUNTED SMOKE DETECTOR. FURNISHED AND CONNECTED BY ELECTRICAL CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR. CUTTING OF DUCT, INSTALLATION OF DETECTOR, AND DETERMINATION OF SAMPLING TUBE LENGTH SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY. PROVIDE REMOTE INDICATING LIGHT WITH EACH DETECTOR.
HD	CEILING MOUNTED HEAT DETECTOR
FS	SPRINKLER SYSTEM FLOW SWITCH
TS	SPRINKLER SYSTEM TAMPER SWITCH
SD	SMOKE DAMPER. FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR, CONNECTED TO FIRE ALARM SYSTEM BY ELECTRICAL CONTRACTOR.
DH	MAGNETIC DOOR HOLDER, PROVIDED BY GENERAL CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR. PROVIDE A SMOKE DETECTOR WITHIN 5 FT OF BOTH SIDES OF DOORS TO LOCALLY ACTIVATE DOOR UPON SMOKE SIGNAL.
RA	FIRE ALARM REMOTE GRAPHIC ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL WITH LOCAL SMOKE DETECTOR.
CO	CARBON MONOXIDE DETECTOR
S	ADA COMPLIANT FIRE ALARM STROBE LIGHT, UNLESS NOTED OTHERWISE.

GENERAL POWER/LIGHTING NOTES

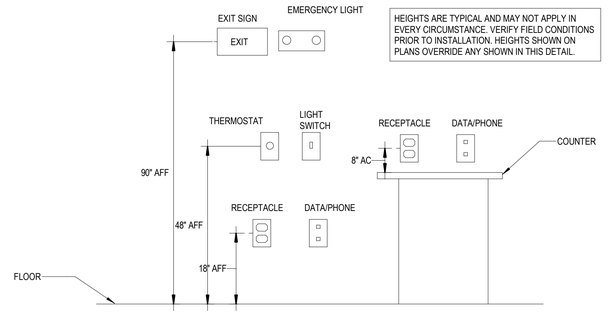
A	PROVIDE SEALS AT RACEWAY PENETRATIONS AS FOLLOWS: A. FIRE RATED WALLS: SEAL PER SPECIFICATIONS FOR FIRE STOPPING. B. NEUTRALIZATION AREA: SEAL PER MECHANICAL DETAILS. C. EXTERIOR: REFER TO ARCHITECTURAL DOCUMENTS FOR SEALING REQUIREMENTS AT ALL EXTERIOR MOUNTED DEVICES, FIXTURES, ENCLOSURES, AND RACEWAY PENETRATIONS.
B	PROVIDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR (SIZE PER NEC) IN ALL CONDUIT AND RACEWAYS. CONDUIT SHALL BE SIZED PER NEC BASED ON THWN 600 VOLT COPPER SINGLE CONDUCTORS, PLUS THE EQUIPMENT GROUNDING CONDUCTOR.
C	WIRING DEVICES: DEVICE MOUNTING HEIGHTS ARE FROM FINISHED FLOOR TO CENTER OF OUTLET BOX UNLESS NOTED OTHERWISE ON PLANS. COORDINATE THE STANDARD MOUNTING HEIGHTS WITH MASONRY: A. SWITCHES +48" B. RECEPTACLES +18" C. VOICE/DATA +18" OR AS NOTED ON PLANS
D	WIRING SHALL INCLUDE FINAL CONNECTION TO ALL EQUIPMENT IN CONFORMANCE WITH EQUIPMENT SUPPLIER WIRING DIAGRAMS.
E	CONTRACTOR IS RESPONSIBLE FOR PROVIDING COMPLETE PANELBOARD IDENTIFICATIONS SCHEDULES.
F	BRANCH CIRCUIT CONDUCTORS SHALL BE MINIMUM #12 AWG UNLESS NOTED OTHERWISE IN SCHEDULES. WHERE 20A BRANCH CIRCUITS HAVE #8 AND LARGER WIRE SPECIFIED, #10 AWG WIRE SHALL BE USED FOR FINAL CONNECTION (15-FT MAXIMUM).
G	WHERE BRANCH CIRCUITS ARE GROUPED, SIZE CONDUIT AND DERATE CURRENT CARRYING CONDUCTORS PER NEC.
H	PROVIDE HANDLE TIES ON ALL MULTIWIRE BRANCH CIRCUITS TO MEET NEC REQUIREMENTS.
I	ALL EMERGENCY AND EXIT SIGN CIRCUITRY SHALL BE UNSWITCHED.
J	PROVIDE 4'X4', 3/4" FIRE RATED PLYWOOD BACKBOARD WHERE SHOWN ON PLANS OR AS REQUIRED FOR DATA/PHONE, CATV, OR ALARMS. COORDINATE FINAL LOCATION WITH THE RESPECTIVE CONTRACTOR.
K	PROVIDE SURGE PROTECTIVE DEVICE FOR ANY OWNER PROVIDED EQUIPMENT, SUCH AS ACCESS CONTROL SYSTEMS, COMMUNICATIONS SYSTEMS, DATA SYSTEMS, AND SECURITY SYSTEMS.
L	GROUP SWITCHES ADJACENT TO EACH OTHER IN MULTI-GANG BOX. MOUNT SWITCHES AT SAME HEIGHT AS EACH OTHER AND OTHER DEVICES NEARBY FOR A CLEAN LOOK.
M	DIMMER SWITCHES SHALL BE COMPATIBLE WITH LOAD IT'S SERVING. 0-10V LIGHT FIXTURES SHALL BE DIMMED WITH 0-10V DIMMER WITH CONTROL WIRING.
N	ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT FOR ANY MECHANICAL CONTROL CABLING BETWEEN UNITS, CONTROLLERS, THERMOSTATS, ETC. COORDINATE FINAL LOCATIONS WITH MECHANICAL CONTRACTOR.
O	LOW VOLTAGE CABLING IN WALLS OR WHEN EXPOSED SHALL ALWAYS BE ROUTED IN CONDUIT. HORIZONTAL CABLING THAT IS CONCEALED SHALL BE PER OWNER, AHJ, OR ENGINEER REQUIREMENTS.



NOTES:
1. FACP SHALL HAVE A MINIMUM 24 HR BATTERY BACKUP.
2. FACP SHALL BE CONNECTED TO A UL APPROVED CENTRAL STATION.
3. FACP SHALL BE FULLY ANALOG ADDRESSABLE.
4. ZONE PER NFPA 72 AND MANUFACTURER'S RECOMMENDATIONS WITH NO SINGLE ZONE EXCEEDING 15,000 SQUARE FEET PER FLOOR.
5. FIRE ALARM ENGINEER TO PROVIDE DEFERRED SUBMITTAL CONTAINING EXACT QUANTITY AND DEVICE LOCATIONS. FIRE ALARM DEVICES ON THIS SET OF PLANS IS FOR REFERENCE ONLY.
6. PROVIDE MULTI-TEMPORAL SOUNDING CAPABILITY AT ALL AUDIO DEVICES FOR EMERGENCY NOTIFICATION.
7. THE FIRE ALARM SYSTEM MANUFACTURER SHALL PROVIDE NOTIFICATION APPLIANCE CIRCUIT (NAC) POWER EXTENDERS AS REQUIRED.
8. COORDINATE LOCATIONS OF ALL SPRINKLER SYSTEM DEVICES, I.E. FLOW/TAMPER/PRESSURE SWITCHES, BELLS, ETC. WITH THE SPRINKLER CONTRACTOR.
9. THE EVACUATION TONE IS REQUIRED TO BE THREE BEAT TEMPORAL PATTERN.
10. ALL STROBES WITHIN THE SAME AREA SHALL BE SYNCHRONIZED.
11. THE CIRCUIT FEEDING THE FIRE ALARM PANEL IS DEDICATED FOR THE FIRE ALARM ONLY. FACP BREAKER SHALL BE MARKED IN RED.
12. FOR ALL DEVICES, PROVIDE 3/4" CONDUIT BACK TO FACP. NO PLENUM RATED CABLE SHALL BE ALLOWED UNLESS ALLOWED BY FIRE MARSHAL.
13. CONTRACTOR SHALL INCLUDE IN THE BID CONTRACT FOR AN ADDITIONAL (5) ANNUNCIATION DEVICES, (2) PULL STATIONS, (2) SMOKE DETECTORS, (2) HEAT DETECTORS, AND RELOCATION OF (2) PULL STATIONS. THESE DISTANCES SHALL BE PRICED BASED ON 100 FT (EACH) FROM THE FACP. DEVICES SHALL NOT BE PURCHASED OR INSTALLED UNTIL DIRECTED BY OWNER OR ENGINEER.
14. FIRE ALARM INSTALLER SHALL BE NICET CERTIFIED.

REVISE FOR EXISTING SYSTEM

2 TYPICAL FIRE ALARM RISER
NTS



1 TYPICAL MOUNTING HEIGHTS
NTS

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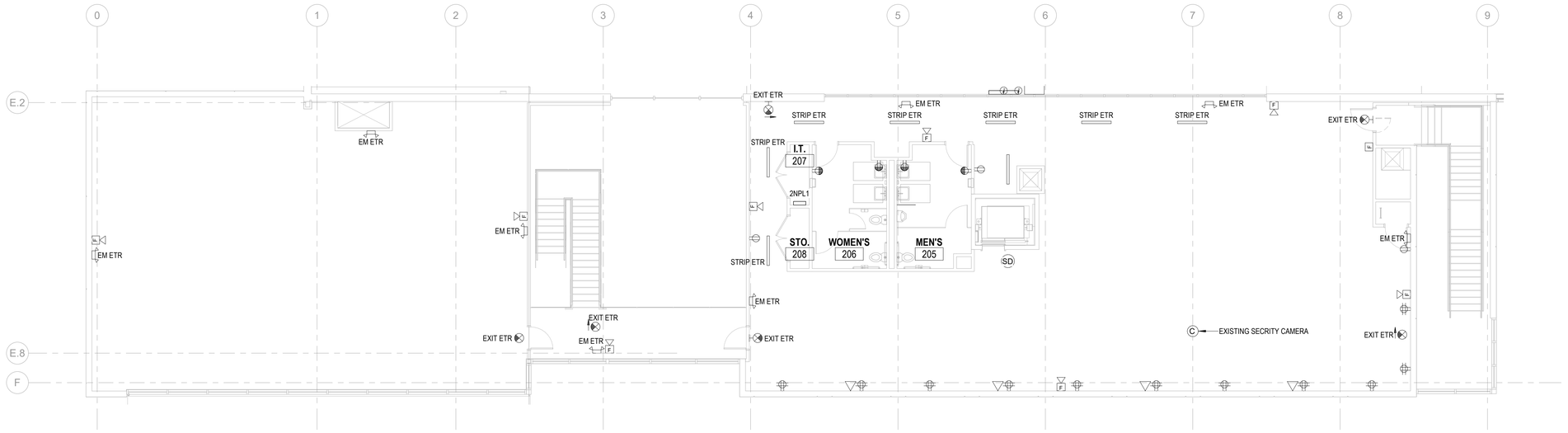
ELECTRICAL & LIGHTING NOTES AND SYMBOLS

DEMOLITION / EXISTING PLAN NOTES:

1. EXISTING STRIP LIGHTING NOT SHOWN AS EXISTING TO REMAIN SHALL BE REMOVED AND RETURNED TO OWNER
2. MAINTAIN EXISTING CIRCUITING AND CONTROLS FOR STRIP LIGHTING THAT IS EXISTING TO REMAIN
3. LIGHTING AND CONTROLS IN ROOMS 205, 206, 207 AND 208 ARE EXISTING TO REMAIN
4. EXISTING POWER, DATA, AND FIRE ALARM DEVICES SHALL REMAIN

GENERAL ELECTRICAL DEMOLITION/EXISITNG NOTES

1	PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE FACILITY AND RELATED SITE. REVIEW THE GENERAL NOTES AND ALL OTHER TRADE DRAWINGS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE NOTED IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER OR OWNER, AS SPECIFIED, OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMITTING BID.
2	ANY EXISTING CONDITIONS REFLECTED WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT AS-BUILT CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS AND COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.
3	PROVIDE ALL DEMOLITION OF EXISTING ELECTRICAL SYSTEMS AND NEW ELECTRICAL SYSTEM MODIFICATIONS REQUIRED BECAUSE OF BUILDING REMODELING, AS NOTED ON THE DRAWINGS, OR NECESSARY FOR PROPER OPERATION AND NEW CONSTRUCTION. REMOVE ALL ABANDONED CABLES AND WIRING ABOVE ACCESSIBLE CEILINGS AND VENTILATION SHAFTS.
4	COORDINATE INTERUPTION OF ALL BUILDING SERVICES INCLUDING BUT NOT LIMITED TO BRANCH CIRCUITS, DATA, TELEPHONE, ETC WITH BUILDING OWNER PRIOR TO INTERUPTION. PROVIDE LABOR AND MATERIALS AS REQUIRED TO REDUCE INTERUPTIONS IN ORDER TO MAINTAIN EXISTING OPERATION.
5	DO NOT DAMAGE THE FINISH OF EXISTING WALLS AND CEILINGS THAT ARE TO REMAIN WHEN REMOVING OR REPLACING LIGHT FIXTURES AND OTHER ELECTRICAL DEVICES. REPAIR ANY DAMAGE CAUSED DURING WORK AT NO EXTRA COST TO THE OWNER.
6	RELOCATE ALL EXISTING ELECTRICAL, FIRE ALARM, AND OTHER LOW-VOLTAGE SYSTEMS REQUIRED TO BE IN OPERATION AT SUBSTANTIAL COMPLETION OF THE CONTRACT, IF REQUIRED, AS A RESULT OF WORK INCLUDED UNDER THIS CONTRACT, EVEN IF NOT SPECIFICALLY INDICATED IN THE DRAWINGS OR SPECIFICATIONS.
7	SEAL ALL PENETRATIONS THROUGH FLOORS, WALLS, CEILINGS, AND ROOF WHERE ELECTRICAL COMPONENTS ARE REMOVED AND WHERE THE EXISTING PENETRATION IS NOT USED FOR THE NEW INSTALLATION. REPAIR DAMAGED SURFACES TO MATCH ADJACENT AREAS OR AS DIRECTED BY THE OWNER.
8	UNLESS NOTED OTHERWISE, ABANDONED CONDUIT ASSEMBLIES SERVING DEMOLISHED DEVICES SHALL BE REMOVED BACK TO NEAREST JUNCTION BOX OUTSIDE OF AREA OF DEMOLITION AND LABLED AS REQUIRED FOR FUTURE USE. ASSOCIATED WIRING SHALL BE REMOVED BACK TO SERVING PANELBOARD, UPDATE PANELBOARD CIRCUIT DIRECTORY AS REQUIRED TO INDICATE RELATED CIRCUIT(S) AS "SPARE".
9	ALL CIRCUIT BREAKERS SERVING BRANCH CIRCUITS TO BE REMOVED SHALL REMAIN IN RESPECTIVE PANELBOARD FOR FUTURE USE UNLESS NOTED OTHERWISE.



1 DEMOLITION / EXISTING ELECTRICAL PLAN

1/8" = 1'-0"

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ELECTRICAL DEMOLITION / EXISTING PLAN

FIRE ALARM DEVICES:

FIRE ALARM DEVICES ARE SHOWN FOR REFERENCE ONLY. THE FINAL FIRE ALARM DESIGN AND PERMITTING SHALL BE DONE BY FIRE ALARM CONTRACTOR. NEW DEVICES SHALL BE COMPATIBLE WITH AND CONNECT TO THE EXISTING FIRE ALARM SYSTEM.

MECHANICAL AND PLUMBING GENERAL COORDINATION NOTES:

1. PROVIDE 1" CONDUITS WITH PULL STRINGS AND JUNCTION BOXES AS REQUIRED FROM HVAC UNITS TO CORRESPONDING INDOOR UNITS AND/OR THERMOSTATS
2. COORDINATE CONNECTIONS TO MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR

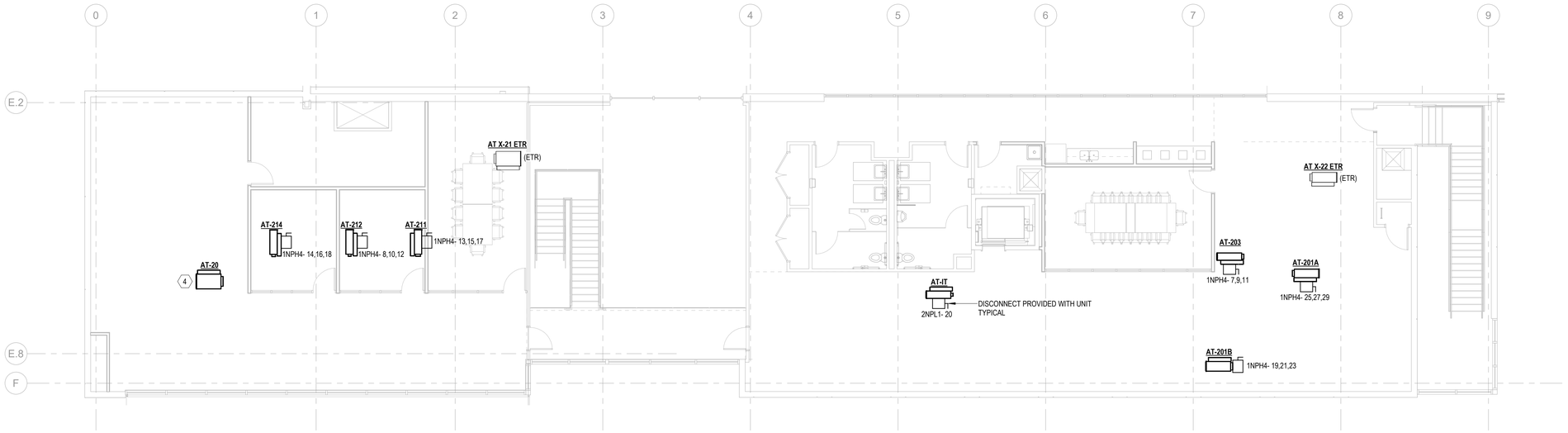
KEYNOTES:

1 PROVIDE (1) DUPLEX RECEPTACLE AT STANDARD HEIGHT DIRECTLY BELOW TV BOX

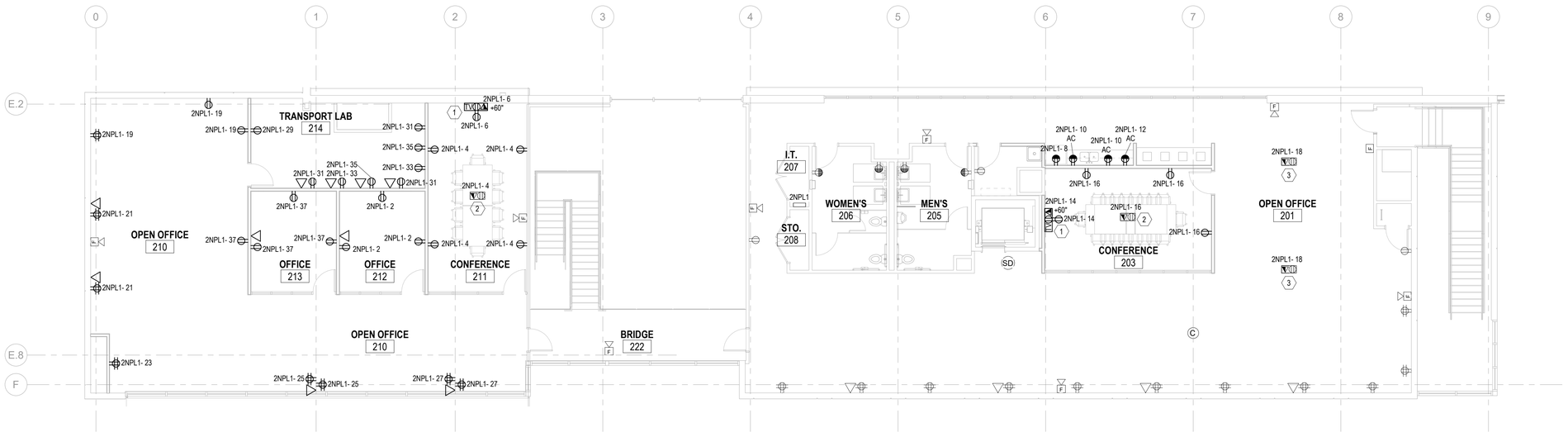
2 POKE-THRU FLOOR BOX WITH A/V, DATA, AND POWER CONNECTIONS. LEGRAND WIREMOLD 6AT SERIES OR EQUAL. PROVIDE (2) 1" CONDUITS FROM FLOOR BOX TO TV WALL, AND UP WALL TO TV FOR A/V AND DATA CONNECTIONS.

3 POKE-THRU FLOOR BOX WITH DATA AND POWER CONNECTIONS. LEGRAND WIREMOLD 6AT SERIES OR EQUAL. PROVIDE (1) 3/4" CONDUIT FROM FLOOR BOX TO NEAREST WALL, AND UP WALL TO ACCESSIBLE CEILING SPACE.

4 EXISTING AND RELOCATED HVAC UNIT. EXTEND EXISTING CIRCUIT AS REQUIRED.



2 MECHANICAL POWER PLAN
1/8" = 1'-0"



1 POWER PLAN
1/8" = 1'-0"

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POWER PLANS

LIGHTING FIXTURE SCHEDULE

FIXTURE TYPE	DESCRIPTION	MANUFACTURER	MODEL	LOAD	VOLTAGE	COLOR TEMPERATURE	LAMP TYPE	LUMENS	MOUNTING TYPE
A1	2FT X 2FT TROFFER	METALUX	22RLN-LD5-25-UNV-L840-CD1-U	21 VA	UNV	4000K	LED 0-10V DIMMING	2500	RECESSED
D1	4IN DOWNLIGHT	HALO COMMERCIAL	HC415D010-HM40525840-41MDH	15 VA	UNV	4000K	LED 0-10V DIMMING	1500	RECESSED
E1	EMERGENCY LIGHT	SURELITES	APEL	2 VA	UNV	N/A	LED	N/A	SURFACE
L1	8FT LINEAR PENDANT	STARTEK	BEAM-8-750-SD-40K-80-PS-ACX10-U-1C	48 VA	UNV	4000K	LED 0-10V DIMMING	6000	PENDANT
L2	16FT LINEAR PENDANT	STARTEK	BEAM-16-500-SD-40K-80-PS-ACX10-U-1C	60 VA	UNV	4000K	LED 0-10V DIMMING	8000	PENDANT
L3	12FT LINEAR PENDANT	STARTEK	BEAMDI-12-350-350-SD-CL-40K-80-PS-ACX10-U-1C	65 VA	UNV	4000K	LED 0-10V DIMMING	8400	PENDANT
P1	CYLINDER PENDANT	HALO COMMERCIAL	HCC4S15D010-SL-HCAC120XX-HM40525840-41MDH	15 VA	UNV	4000K	LED 0-10V DIMMING	1500	PENDANT

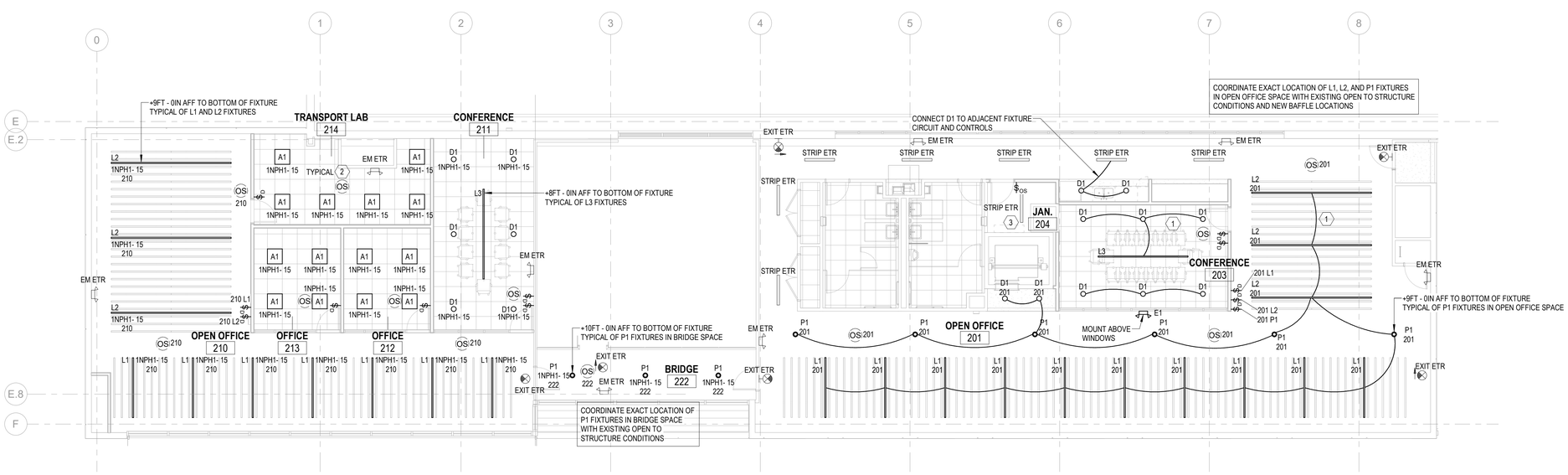
ALL LIGHT FIXTURES ARE BASIS OF DESIGN. APPROVAL FROM OWNER REQUIRED PRIOR TO PURCHASING ANY LIGHT FIXTURE. IF ALTERNATE LIGHT FIXTURES ARE CHOSEN, THEY SHALL BE APPROVED BY ENGINEER AS WELL AS OWNER TO BE CONFIRMED AS AN ACCEPTABLE EQUAL. DISTANCES BETWEEN EMERGENCY LIGHTS MAY NEED TO BE REVISED IF DIFFERENT FIXTURE IS SELECTED THAN SHOWN. FOLLOW MANUFACTURER SPACING RECOMMENDATIONS FOR EMERGENCY FIXTURES. FINAL FINISH SELECTIONS TO BE APPROVED BY ARCHITECT.

KEYNOTES:

1 CONNECT TO EXISTING LIGHTING CIRCUIT IN THIS AREA AND CONTROL NEW LIGHT FIXTURES AS SHOWN

2 PROVIDE OCCUPANCY SENSOR WITH BAS/HVAC RELAY FOR CONNECTION TO HVAC UNITS. COOPER GREENGATE OAC-DT-2000-R. COORDINATE CONNECTION TO HVAC UNITS WITH MECHANICAL CONTROLS CONTRACTOR.

3 RELOCATE ONE EXISTING STRIP FIXTURE TO ROOM. CONNECT TO EXISTING LIGHTING CIRCUIT IN THE AREA AND CONTROL AS SHOWN.



1 LIGHTING PLAN
1/8" = 1'-0"

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REGISTERED PROFESSIONAL ENGINEER
No. 14710
DANIEL E. MILES

2/23/2024

Firm's Seal:

CERTIFICATE OF AUTHORIZATION
PRIGM ENGINEERING, PLLC
No. 3588
ARKANSAS

UNIVERSITY OF ARKANSAS

University of Arkansas - CEREC

DATE 2/23/2024

JOB NO. 23108

REVISIONS

E2.0
LIGHTING PLAN

PANELBOARD: 2NPL1 — EXISTING

LOCATION:
SUPPLY FROM: T2NPL1
MOUNTING: SURFACE
ENCLOSURE: NEMA 1

VOLTS: 208/120V-3PH,4W
PHASES: 3
WIRES: 4

A.I.C. RATING: EXISTING
MAINS TYPE: M.C.B.
MAINS RATING: 225 A

NOTES:

CKT	Circuit Description	Trip	Poles	Wire	A (kVA)		B (kVA)		C (kVA)		Wire	Poles	Trip	Circuit Description	CKT
1	RECEPTACLES WOMENS...	20	1		0.36	0.54					12	1	20	RECEPTS OFFICE 212 (14)	2
3	RECEPTACLES MENS RESTROOM (E)	20	1				0.36	0.72			12	1	20	RECEPTS CONFERENCE 211 (14)	4
5	RECEPTACLE JANITOR CLOSET	20	1						0.18	0.36	12	1	20	RECEPTS CONFERENCE 211 (14)	6
7	MOD FURN OPEN OFFICE 201 (E)	20	1		0.18	0.18					12	1	20	REFRIGERATOR (14)	8
9	MOD FURN OPEN OFFICE 201 (E)	20	1				0.36	0.36			12	1	20	RECEPTS COUNTERTOP (14)	10
11	MOD FURN OPEN OFFICE 201 (E)	20	1						0.36	0.18	12	1	20	RECEPTS COUNTERTOP (14)	12
13	MOD FURN OPEN OFFICE 201 (E)	20	1		0.36	0.36					12	1	20	RECEPTS CONFERENCE 203 (14)	14
15	MOD FURN OPEN OFFICE 201 (E)	20	1				0.36	0.54			12	1	20	RECEPTS CONFERENCE 203 (14)	16
17	REC OPEN OFF 201 EAST WALL (E)	20	1						0.36	0.00	12	1	20	FLOOR BOXES OPEN OFFICE 201...	18
19	RECEPTS OPEN OFFICE 210 (14)	20	1	12	0.54	0.50					12	1	20	AT-IT (14)	20
21	RECEPTS OPEN OFFICE 210 (14)	20	1	12			0.36								22
23	RECEPTS OPEN OFFICE 210 (14)	20	1	12					0.18						24
25	RECEPTS OPEN OFFICE 210 (14)	20	1	12	0.36	0.00					--	1	20	SPARE (E)	26
27	RECEPTS OPEN OFFICE 210 (14)	20	1	12			0.36	0.00			--	1	20	SPARE (E)	28
29	RECEPTS TRANSPORT LAB 214 (14)	20	1	12					0.18	0.00	--	1	20	SPARE (E)	30
31	RECEPTS TRANSPORT LAB 214 (14)	20	1	12	0.54	0.00					--	1	20	SPARE (E)	32
33	RECEPTS TRANSPORT LAB 214 (14)	20	1	12			0.36	0.00			--	1	20	SPARE (E)	34
35	RECEPTS TRANSPORT LAB 214 (14)	20	1	12					0.36	0.00	--	1	20	SPARE (E)	36
37	RECEPTS OFFICE 213 (14)	20	1	12	0.72	0.00					--	1	20	SPARE (E)	38
39	SPACE	--	1	--			--	--			--	1	--	SPACE	40
41	SPACE	--	1	--					--	--	--	1	--	SPACE	42
				Total Load:	4640 VA		3780 VA		2160 VA						
				Total Amps:	41 A		34 A		18 A						

Load Classification	Connected Load	Demand Factor	Demanded Load	Panel Totals	
HVAC	500 VA	100.00%	500 VA		
Other	0 VA	0.00%	0 VA	**Total Conn. Load:**	10580 VA
RECEPTS	10080 VA	99.60%	10040 VA	**Total Feeder Load:**	10540 VA
				Total Connected Current:	29 A
				Total Feeder Current:	29 A

PANELBOARD: 1NPH4 — EXISTING

LOCATION:
SUPPLY FROM:
MOUNTING: SURFACE
ENCLOSURE: NEMA 1

VOLTS: 480/277V-3PH,4W
PHASES: 3
WIRES: 4

A.I.C. RATING: EXISTING
MAINS TYPE: M.C.B.
MAINS RATING: 400 A

NOTES:

CKT	Circuit Description	Trip	Poles	Wire	A (kVA)		B (kVA)		C (kVA)		Wire	Poles	Trip	Circuit Description	CKT
1	100 RAH-01 (E)	125	3		27.99	27.99						3	125	101 RAH-02 (E)	2
3	--	--	--	--			27.99	27.99			--	--	--	--	4
5	--	--	--	--					27.99	27.99	--	--	--	--	6
7	AT-203 (N)	15	3	12	2.50	1.04					12	3	15	AT-212 (N)	8
9	--	--	--	--			2.50	1.04			--	--	--	--	10
11	--	--	--	--					2.50	1.04	--	--	--	--	12
13	AT-211 (N)	15	3	12	2.50	1.67					12	3	15	AT-214 (N)	14
15	--	--	--	--			2.50	1.67			--	--	--	--	16
17	--	--	--	--					2.50	1.67	--	--	--	--	18
19	AT-201B (N)	25	3	10	6.25	--					--	1	--	SPACE	20
21	--	--	--	--			6.25	--			--	1	--	SPACE	22
23	--	--	--	--					6.25	--	--	1	--	SPACE	24
25	AT-201A (14)	20	3	12	4.58	0.00					--	3	20	SPARE (E)	26
27	--	--	--	--			4.58	0.00			--	--	--	--	28
29	--	--	--	--					4.58	0.00	--	--	--	--	30
31	SPARE (E)	20	3	--	0.00	0.00					--	3	20	SPARE (E)	32
33	--	--	--	--			0.00	0.00			--	--	--	--	34
35	--	--	--	--					0.00	0.00	--	--	--	--	36
37	2NPL1	150	3		4.64	--					--	1	--	SPACE	38
39	--	--	--	--			3.78	--			--	1	--	SPACE	40
41	--	--	--	--					2.16	--	--	1	--	SPACE	42
				Total Load:	79162 VA		78302 VA		76682 VA						
				Total Amps:	287 A		284 A		277 A						

Load Classification	Connected Load	Demand Factor	Demanded Load	Panel Totals	
HVAC	224065 VA	100.00%	224065 VA		
Other	0 VA	0.00%	0 VA	**Total Conn. Load:**	234145 VA
RECEPTS	10080 VA	99.60%	10040 VA	**Total Feeder Load:**	234105 VA
				Total Connected Current:	282 A
				Total Feeder Current:	282 A

PANELBOARD: 1NPH1 — EXISTING

LOCATION:
SUPPLY FROM:
MOUNTING: SURFACE
ENCLOSURE: NEMA 1

VOLTS: 480/277V-3PH,4W
PHASES: 3
WIRES: 4

A.I.C. RATING: EXISTING
MAINS TYPE: M.C.B.
MAINS RATING: 150 A

NOTES:

CKT	Circuit Description	Trip	Poles	Wire	A (kVA)		B (kVA)		C (kVA)		Wire	Poles	Trip	Circuit Description	CKT
1	LTG 101 WEST R1 (E)	20	1	--	0.00	0.00					--	1	20	LTG 101 WEST R2 (E)	2
3	LTG 101 EAST R3 (E)	20	1	--			0.00	0.00			--	1	20	LTG 101 EAST R4 (E)	4
5	LTG BONEYARD RD (E)	20	1	--					0.00	0.00	--	1	20	LTG PEDESTRIAN R6 (E)	6
7	LTG EXTERIOR GLDG R7 (E)	20	1	--	0.00	0.00					--	1	20	LTG 104-105 (E)	8
9	LTG 106-111	20	1	--			0.00	0.00			--	1	20	LTG 112-115 (E)	10
11	LTG 101-EMERG (E)	20	1	--					0.00	0.00	--	1	20	LTG 104-115 EMERG (E)	12
13	LTG 101-115 EXIT (E)	20	1	--	0.00	0.00					--	1	20	LTG 101 PANEL LIGHTING	14
15	LIGHTING 210,211,212,213,214,222 (N)	20	1	12			1.01	--			--	1	--	SPACE	16
17	SPACE	--	1	--					--	--	--	1	--	SPACE	18
19	SPACE	--	1	--	--	--					--	1	--	SPACE	20
21	SPACE	--	1	--			--	--			--	1	--	SPACE	22
23	SPACE	--	1	--					--	--	--	1	--	SPACE	24
25	SPACE	--	1	--	--	--					--	1	--	SPACE	26
27	SPACE	--	1	--			--	--			--	1	--	SPACE	28
29	SPACE	--	1	--					--	--	--	1	--	SPACE	30
31	SPACE	--	1	--	--	--					--	1	--	SPACE	32
33	SPACE	--	1	--			--	0.00			--	1	20	UNIDENTIFIED EXISTING LOAD (E)	34
35	UNIDENTIFIED EXISTING LOAD (E)	20	1	--					0.00	0.00	--	1	20	UNIDENTIFIED EXISTING LOAD (E)	36
37	UNIDENTIFIED EXISTING LOAD (E)	20	1	--	0.00	0.00					--	1	20	UNIDENTIFIED EXISTING LOAD (E)	38
39	UNIDENTIFIED EXISTING LOAD (E)	20	1	--			0.00	0.00			--	1	20	UNIDENTIFIED EXISTING LOAD (E)	40
41	UNIDENTIFIED EXISTING LOAD (E)	20	1	--					0.00	0.00	--	1	20	UNIDENTIFIED EXISTING LOAD (E)	42
				Total Load:	0 VA		1010 VA		0 VA						
				Total Amps:	0 A		4 A		0 A						

Load Classification	Connected Load	Demand Factor	Demanded Load	Panel Totals	
LIGHTS	1010 VA	125.00%	1263 VA		
				Total Conn. Load:	1010 VA
				Total Feeder Load:	1263 VA
				Total Connected Current:	1 A
				Total Feeder Current:	2 A

GROUND WIRE SIZING CHART

BRKR AMPS		WIRE SIZE				
15-20	PHASE	12	10	8	6	4
	GROUND	12	10	8	6	4
25-30	PHASE	10	8	6	4	3
	GROUND	10	8	6	4	3
35-50	PHASE	8	6	4	3	2
	GROUND	10	8	4	4	4
60	PHASE	6	4	3	2	1
	GROUND	10	6	6	4	4
70	PHASE	6	4	3	2	1
	GROUND	8	4	4	3	2
80-90	PHASE	4	3	2	1	1/0
	GROUND	8	6	4	4	3
100	PHASE	3	2	1	1/0	2/0
	GROUND	8	6	4	4	3
PER NEC 250.122(B)						

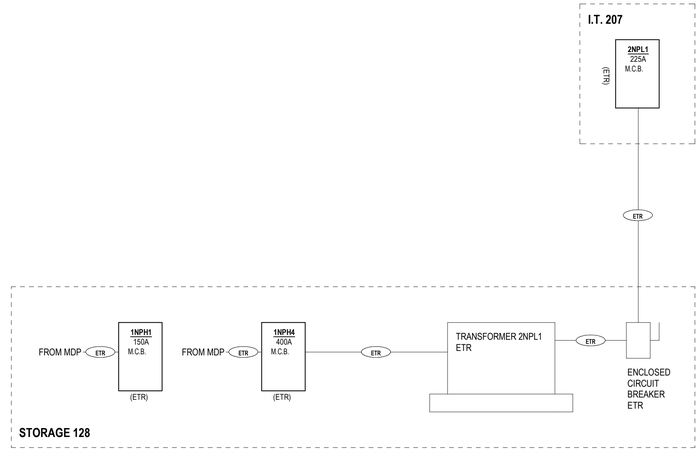
CONDUIT SIZED BASED ON CONDUCTOR PROPERTIES LISTED IN THE CURRENT NEC EDITION, CHAPTER, 9, TABLES 5 AND 5A, AND CONDUIT AREAS LISTED CHAPTER 9, TABLE 4 FOR EMT WITH 40% FILL. OTHER CONDITIONS MAY REQUIRE A LARGER CONDUIT, SUCH AS UNDERGROUND PVC, SIZED FOR NEC.

COORDINATE LUG SIZE, TYPE, AND AMOUNT WITH EQUIPMENT MANUFACTURER PRIOR TO FEEDER INSTALLATION.

PANELBOARD NOTES (#)

NOTE IS IN CIRCUIT DESCRIPTION IN PARENTHESIS

(E)	EXISTING TO REMAIN
(N)	NEW CIRCUIT BREAKER
1.	TERMINATE GROUND ON ISOLATED GROUND BUS.
2.	INSTALL LOCKING DEVICE FURNISHED WITH PANELBOARD (LOCK-OFF FOR MAINTENANCE).
3.	INSTALL LOCKING DEVICE FURNISHED WITH PANELBOARD (LOCK-ON FOR CRITICAL LOAD).
4.	GFI BREAKER FOR PERSONNEL PROTECTION (5 mA).
5.	GFI BREAKER FOR EQUIPMENT PROTECTION (30 mA).
6.	CONDUCTOR SIZE SHOWN IN PANEL SCHEDULE HAS BEEN INCREASED FOR VOLTAGE DROP. EQUIPMENT PROPORTIONALLY PER NEC. REFERENCE GROUND WIRE SIZING CHART.
7.	REFER TO ONE-LINE DIAGRAM FOR AVAILABLE FAULT CURRENT FOR INTERRUPT RATINGS.
8.	REFER TO ONE-LINE DIAGRAM FOR WIRE SIZES.
9.	FACTORY WIRED TO LOAD.
10.	THRU CONTACTOR FOR TIMED CONTROL.
11.	LOAD IS EXISTING TO REMAIN.
12	SHUNT TRIP BREAKER
13	EXISTING LOAD IS RELOCATED TO NEW PANEL
14	EXISTING CIRCUIT BREAKER UTILIZED FOR NEW LOAD



1 PARTIAL ELECTRICAL ONE-LINE DIAGRAM
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