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SAFIRE

1475 SW MARKET ST
LEE'S SUMMIT, MO 64081

PERMIT

HIVE DESIGN COLLABORATIVE, INC.
601 E. 63rd St., Suite 440 Kansas City, MO 64110
816.581.6363

GENERAL PROJECT NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE GOVERNING LAWS AND CODES, AND IN ACCORDANCE WITH AUTHORITIES HAVING JURISDICTION.

2. GC TO VERIFY ALL DIMENSIONS AND NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION. CONTRACTOR ACKNOWLEDGES REVIEW OF CONDITIONS AND INTENT OF ALL CONSTRUCTION DOCUMENTS UPON SUBMITTING BID.

3. CALCULATE AND MEASURE REQUIRED DIMENSIONS. DO NOT SCALE DRAWINGS UNLESS OTHERWISE INDICATED. ALL DIMENSIONS TO BE TAKEN FROM DESIGNATED DATUM POINT. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER GRAPHIC REPRESENTATION. DETAIL DIMENSIONS TAKE PRECEDENCE OVER PLAN DIMENSIONS.

4. ALL ITEMS SUPPLIED BY THE OWNER AND INSTALLED BY THE CONTRACTOR WILL BE COORDINATED BY THE CONTRACTOR FROM DELIVERY TO INSTALLATION.

5. DIMENSIONS ON DRAWINGS ARE TO FACE OF FINISH AND CENTERLINE OF COLUMNS UNLESS OTHERWISE NOTED.

6. THE GENERAL CONTRACTOR (GC, HEREAFTER) UPON SIGNING THE OWNER/GC AGREEMENT, ACCEPTS THE CD (INCLUDING THESE DRAWINGS W/ THE INCLUDED NOTES & DESCRIPTIVE MATERIAL) & AGREES TO EXECUTE THE NECESSARY WORK IN MANNER DESCRIBED THEREIN.
   A) UPON EXAMINATION / FAMILIARIZATION OF CD & JOB SITE VISIT, ANY DISCREPANCIES, OMISSIONS, AMBIGUITIES AND/OR CONFLICTS NOTED, SHALL BE BROUGHT TO THE ATTENTION OF ARCHITECT IN WRITING, FOR CORRECTION.
   B) ANY ELEMENT, WHATSOEVER, REQUIRED BY BUILDING TO BE INCORPORATED IN CONSTRUCTION BUT NOT SPECIFIED IN CD SHALL BE BROUGHT TO ATTENTION OF ARCHITECT FOR REVIEW/ACTION.
   C) NO MODIFICATIONS / REVISIONS / CHANGES SHALL BE UNDERTAKEN UNLESS SPECIFICALLY SO INSTRUCTED AND APPROVED BY OWNER.
   D) DURING COURSE OF PROJECT, GENERAL CONTRACTOR SHALL MAKE EVERY EFFORT TO FULLY INFORM ALL CONCERNED PARTIES REGARDING DECISIONS/ACTIONS TAKEN WHICH, IN ANY WAY, MIGHT AFFECT ANY SAID CONSTRUCTION CONDITIONS.

7. ALL EXISTING HOLES/CRACKS IN SLAB AND THOSE RESULTING FROM THE CONSTRUCTION PROCESS SHALL BE FILLED/REPAIRED AND THE SURFACE PATCHED SMOOTH AND LEVEL WITH ADJACENT FLOOR SURFACE, IN A MANNER ACCEPTABLE TO OWNER AND ARCHITECT.

8. GC SHALL BE RESPONSIBLE FOR FIELD MEASURING OF EXISTING CONDITIONS PRIOR TO START OF WORK AND DURING CONSTRUCTION, AS NECESSARY, TO ASSURE CONSTRUCTION ADHERENCE TO DRAWINGS. BY ENTERING INTO A CONSTRUCTION CONTRACT FOR THIS WORK, GC SHALL INDICATE HIS FAMILIARITY WITH THE SITE/FIELD CONDITIONS.
   A) ALL "HOLD" DIMENSIONS SHALL BE MONITORED TO ASSURE CORRECTNESS.
   B) ANY DIMENSION REVISIONS/MODIFICATIONS ARE TO BE BROUGHT TO ATTENTION OF THE ARCHITECT FOR REVIEW/APPROVAL.

9. ALL VERTICAL DIMENSIONS SHALL BE TAKEN FROM "BENCH MARK" OR OTHER SIMILAR GUIDE ESTABLISHED PRIOR TO START OF CONSTRUCTION. HIGH POINTS, LOW POINTS, IRREGULARITIES IN FLOOR SLAB, PARTICULARLY, WHICH COULD IN ANY WAY AFFECT FABRICATION/INSTALLATION WORK OF OTHER TRADES OR VENDORS (I.E., CABINET CONTRACTORS), SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.
   A) VARIATIONS IN FLOOR LEVEL IN EXCESS OF 1/2" FOR EVERY 10'-0" IN EVERY DIRECTION WILL REQUIRE LEVELING OF SLAB BY GC LEVELING OF SLAB TO BE DONE AS REQUIRED READY TO RECEIVE FLOOR FINISHES, (I.E, VINYL TILE FLOORS, CARPETING, ETC). GC TO VERIFY SLAB CONDITION PRIOR TO BID SUBMISSION AND CONTACT LANDLORD.

10. GC, SUBCONTRACTORS, AND ALL VENDORS ARE TO VERIFY ALL CLEARANCES (CORRIDORS, STAIRS, ELEVATORS, ETC.) REQUIRED FOR DELIVERIES AND PASSAGE OF ALL JOB MATERIALS/EQUIPMENT.

11. ALL NECESSARY WOOD BLOCKING / GROUNDS, ETC., ARE TO BE SUPPLIED AS FIREPROOFED ELEMENTS. GC SHALL FULLY COORDINATE SETTING/PLACEMENT OF THESE ELEMENTS AS REQUIRED BY LOCAL CODE/BUILDING OR SURROUNDINGS.
   A) GROUND/BLOCKING MAY NOT BE WHOLLY SHOWN ON DRAWINGS AND GOOD CONSTRUCTION PRACTICE SHALL GOVERN/DETERMINE SAID USE WHERE A QUESTION ARISES.
   B) GC TO PAY PARTICULAR ATTENTION TO ALL LOCATIONS OF DRYWALL PARTITION CONSTRUCTION THAT ABUT OR RECEIVE MILLWORK OR CABINET WORK CONSTRUCTION. INTERNAL WOOD BLOCKING SHALL BE SUPPLIED FOR STURDY ANCHORAGE AT INTERSECTIONS OF WOOD/GLASS BORROWED LIGHT PARTITIONS AND ADJACENT DRYWALL CONSTRUCTION AS REQUIRED.

12. THE CONTRACTOR SHALL INSTALL DUST PROOF CURTAINS BETWEEN THE AREAS TO BE REMODELED AND THE AREAS TO REMAIN UNTIL ALL DUST PRODUCING WORK IS COMPLETED AND ALL DEBRIS IS CLEANED UP.

13. PROTECT THE AREAS OF THE BUILDING NOT BEING REMODELED FROM DAMAGE AT ALL TIMES.

14. KEEP ACCESS TO EMERGENCY EXITS AVAILABLE AT ALL TIMES.

15. CONTRACTOR SHALL REMOVE ALL DEBRIS FROM THE PROJECT SITE AND DISPOSE IN A LICENSED LANDFILL.

GENERAL NOTES

A.F.F.	Above Finish Floor
ACC.	Accessible
ACOUS.	Acoustical
ACT	Acoustical Ceiling Tile
ADJ	Adjacent, Adjustable
A/C	Air Conditioning
ALT	Alternate
ALUM	Aluminum
ANG	Angle
APPROX	Approximate
ARCH	Architect(ural)
AD	Area Drain
ASPH	Asphalt
BSMT	Basement
BM	Beam
BYND	Beyond
BITUM.	Bituminous
BLK	Block, Black
BLKG	Blocking
BD	Board
BOT	Bottom
B.O.	Bottom of
B.C.	Bottom of Curb
B.O.S.	Bottom of Steel
BLDG	Building
BO	By Others/Owner
CAB	Cabinet
CPT	Carpet
C.I.P.	Cast-In-Place
C.B.	Catch Basin
CLG.	Ceiling
CEM.	Cement
CTR	Center
CL	Center Line
C/C	Center to Center
CER.	Ceramic
CT	Ceramic Tile
C. OF O.	Certificate of Occupancy
C.	Channel
C.O.	Cleanout
CL., CLR	Clear
CLOS.	Closet
CW	Cold Water
COL.	Column
CONC	Concrete
CMU	Concrete Masonry Unit
CONF.	Conference
CONST.	Construction
C.M.	Construction Manager
CONT	Continuous
CONTR	Contractor
C.J.	Control Joint
CONV.	Convector
CG	Corner Guard
CORR.	Corridor
DK	Dark
DB	Decibel
DEG.	Degree
DEPT.	Department
D.O.B.	Dept. Of Building
D.E.P.	Dept. Of Environmental Protection
DTL.	Detail
DIA.	Diameter
DIFF.	Diffuser
DIM.	Dimension
DW	Dishwasher
DISP.	Dispenser
DR	Door
D.O.	Door Opening
DBL.	Double
DN	Down
DWG(S)	Drawing, Drawings
D.F.	Drinking Fountain
EA	Each
EW	Each Way
E	East
EPDM	Elastomeric Roof Membrane
ELEC.	Electric, Electrical
E.P.	Electrical Panelboard
EL.	Elevation
ELEV.	Elevator
EMER.	Emergency
ENCL.	Enclosure
EQ	Equal
EQ., EQUIP.	Equipment
EXIST., EX	Existing
ETR	Existing to Remain
EXP	Expansion
E.J.	Expansion Joint
EXT.	Exterior
EIFS	Exterior Insulation Finish System
FOC	Face of Concrete
FOF	Face of Finish
FOS	Face of Studs
FOW	Face of Wall
FV	Field Verify
FIN.	Finish
F.A.	Fire Alarm
F.E.	Fire Extinguisher
F.E.C.	Fire Extinguisher Cabinet
F.R.	Fire Rated, Fire Retardant
F.S.P.	Fire Stand Pipe
F.V.C.	Fire Valve Cabinet
F.P.	Fireproof
FPSC	Fireproof Self Closing
FIX, FIXT	Fixture
FLASH	Flashing
FL, FLR	Floor
F.D.	Floor Drain
FLUOR.	Fluorescent
FT, '	Foot, Feet
FTG.	Footing
FDN.	Foundation
F.A.I.	Fresh Air Intake
F.S.	Full Size
F.B.O.	Furnished by Others
FURR.	Furring
GALV.	Galvanize
G.	Gas
GA.	Gauge
GC	General Contractor
GL.	Glass
G.F.R.C.	Glass Fiber Reinforced Concrete
G.F.R.G.	Glass Fiber Reinforced Gypsum
GR.	Grade
GSF	Gross Square Feet
GND	Ground
GYP.	Gypsum
GYP. BD	Gypsum Wallboard
HDWR	Hardware
HDWD	Hardwood
HD	Head
HTR	Heater
HVAC	Heating, Venting, Air Conditioning
HT.	Height
HPC	High Performance Coating
H.P.	High Point
HWY	Highway
H.C.	Hollow Core
H.M.	Hollow Metal
HORIZ.	Horizontal
H.B.	Hose Bibb
HW	Hot Water
HR	Hour
IN, "	Inside
INC.	Include
I.D.	Inside Diameter
INSUL.	Insulation
INT.	Interior
JAN	Janitor
J.C.	Janitor's Closet
JT.	Joint
JST	Joist
KIT.	Kitchen
K.O.	Knock Out
LS	Life Safety
LAM.	Laminate, Laminated
LAV.	Lavatory
L.H.	Left Hand
L.	Length
LT	Light
L.W.	Lightweight
L.P.	Low Point
MH	Manhole
MFR, MANUF.	Manufacturer
M.O.	Masonry Opening
MATL	Material
MAX	Maximum
MECH.	Mechanical
MEP(FP)	Mechanical, Electrical, Plumbing, Fire Protection
M.E.R.	Mechanical Equipment Room
MDF	Medium Density Fireboard
MEMB.	Membrane
MTL	Metal
MEZZ.	Mezzanine
MIN.	Minimum
MIR	Mirror
MISC.	Miscellaneous
MTD.	Mounted
MTG.	Mounting
MULT.	Multiple
N.R.C.	Noise Reduction Coefficient
NOM.	Nominal
N	North
N.A., N/A	Not applicable
NIC	Not in Contact
N.I.C.	Not in Contract
NTS	Not to Scale
N.T.S.	Not to Scale
NO., NUM, #	Number
OFF.	Office
O.C.	On Center
OPNG.	Opening
OTS	Open To Structure
OPP.	Opposite
O.H.	Opposite Hand
O.D.	Outer Diameter (Dim.)
OFD	Over Flow Drain
O.A.	Overall
O.R.D.	Overflow Roof Drain
PT, PNT	Paint
PTD.	Painted
PR.	Pair
PNL	Panel, Panelboard
PERF.	Perforated
PERP	Perpendicular
PLAS	Plaster
P-LAM	Plastic Laminate
PL.	Plate
PLYWD.	Plywood
PT.	Point
PVC	Polyvinyl Chloride
PSF	Pounds per Sq. Foot
PC	Precast Concrete
PREFAB.	Prefabricated
PRT	Pressure Treated
PROJ	Project
PROP	Property
QTY	Quantity
Q.T.	Quarry Tile
R., RAD.	Radius
RE, REF.	Reference
REINF.	Reinforced
R.C.P.	Reinforced Concrete Pipe
R.A.	Relieving Angle
REQ.	Required
R.H.	Right Hand
R	Riser
RD.	Road
R.D.	Roof Drain
RM.	Room
R.O.	Rough Opening
RB	Rubber Base
SAB	Sound Attenuation Batt
SCHED.	Schedule
SEC.	Second
SECT.	Section
SHT.	Sheet
SIM.	Similar
S.C.	Solid Core
STC	Sound Transmission Coefficient
S	South
SPKR.	Speaker
SPEC.	Specification
S.F.P.	Spray on Fireproofing
SQ.	Square
S.F.	Square Feet
S.S.	Stainless Steel
ST	Stair
STD.	Standard
STA	Station
STL	Steel
STOR.	Storage
ST.	Street
STRUCT.	Structure, Structural
SUSP.	Suspended
SYM	Symmetrical
TEL.	Telephone
T.V.	Television
TEMP.	Temporary
THK	Thick, Thickness
T.&G.	Tongue and Groove
T.O.	Top Of
T.O.B.	Top Of Beam
T.O.C.	Top Of Curb
T.O.S.	Top Of Sidewalk
T.O.W.	Top Of Wall
T	Tread
TYP.	Typical
TW	Through Wall
UNFIN.	Unfinished
U.N.O.	Unless Noted Otherwise
VEND.	Vendor
V.I.F.	Verify in Field
VERT.	Vertical
VEST.	Vestibule
V.C.P.	Vetrified Clay Pipe
VCT	Vinyl Composition Tile
VWC	Vinyl Wallcovering
W	Water
W.C.	Water Closet
WR.	Water Resistant
WP.	Waterproofing
WT	Weight
WWF	Welded Wire Fabric
W	West
W.F	Wide flange
W	Width
WIN	Window
W, W/O	With, Without
WD.	Wood
YD	Yard

ABBREVIATIONS

DIVISION 01: GENERAL

- XX / AXXX — BUILDING SECTION / DETAIL SECTION CALLOUT
- XX / AXXX — DETAIL REFERENCE CALLOUT
- XX AXXX — BUILDING ELEVATION CALLOUT
- XX AXXX — INTERIOR ELEVATION CALLOUT
- XXXXX / XXXXX — LEVEL / ELEVATION DESIGNATION
- XXX — DOOR TAG
- XX-X,X — WALL ASSEMBLY TYPE TAG
- X — GLAZING ASSEMBLY TYPE TAG
- ROOM NAME / 000 / XX SF — ROOM TAG
- DX.XXX — DEMOLITION KEY NOTE TAG
- XX.XXX — GENERAL KEY NOTE TAG
- XX-XX — MATERIAL / ACCESSORY KEY NOTE TAG
- X — EQUIPMENT KEY NOTE TAG
- X — CENTER LINES OF COL. / BLDG. GRIDS
- 1 HR - FIRE RATED ASSEMBLY
- 2 HR - FIRE RATED ASSEMBLY
- 3 HR - FIRE RATED ASSEMBLY
- 4 HR - FIRE RATED ASSEMBLY
- SMOKE - FIRE RATED ASSEMBLY
- NEW WALL
- EXISTING WALL

DIVISION 03: CONCRETE

- CAST-IN-PLACE CONCRETE
- PRECAST CONCRETE
- PRECAST CONCRETE WALL
- PRECAST CONCRETE COLUMN
- CAST-IN-PLACE CONCRETE WALL & CAST-IN-PLACE COLUMN

DIVISION 04: MASONRY

- BRICK
- CONCRETE MASONRY UNIT
- CUT STONE
- CAST STONE
- BRICK PAVER
- LIMESTONE
- QUARRY TILE
- GROUT

DIVISION 05: METALS

- STEEL/ IRON (LARGE SCALE)
- ALUMINUM
- OTHER METALS (TBD PER PROJECT)

DIVISION 06: WOOD AND PLASTICS

- WOOD (DIMENSION) (THROUGH MEMBER)
- WOOD BLOCKING (DIMENSION) (INTERRUPTED MEMBER)
- PLYWOOD
- WOOD (FINISH)
- HARDBOARD
- PARTICLE BOARD
- SOLID SURFACE MATERIAL

DIVISION 07: THERMAL & MOISTURE PROTECTION

- RIGID INSULATION
- FIREPROOFING / FIRESTOPPING INSULATION
- BLANKET INSULATION
- LOOSE FILL INSULATION
- SEALANT W/ BACKER ROD
- MEMBRANE WATERPROOFING & DRAINAGE MAT COMPOSITE SYSTEM
- SPRAY-ON FIREPROOFING

DIVISION 08: DOORS & WINDOWS

- GLASS INSULATING
- GLASS ELEVATION
- PLASTIC GLAZING
- NEW DOUBLE DOOR
- NEW SINGLE DOOR
- NEW SWINGING DOOR
- NEW DOUBLE ACTING DOOR
- EXISTING DOUBLE DOORS
- EXISTING SINGLE DOOR

DIVISION 09: FINISHES

- LATH AND PLASTER
- GYPSUM BOARD
- CERAMIC TILE
- CEILING PANEL
- CARPET

SYMBOLS

WALL TYPE KEY:

WALL TYPE
- C = CONCRETE
- M = MASONRY
- S = METAL STUD
- W = WOOD STUD

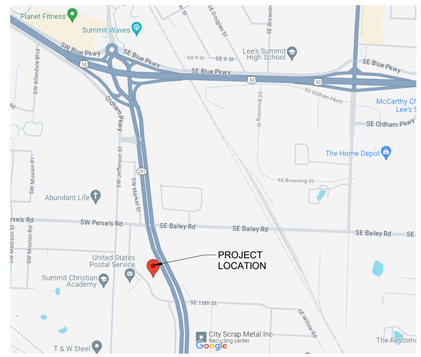
WALL SIZE
- 0 = 7/8" HAT CHANNEL *or* 3/4" WOOD FURRING STRIP
- 1 = 1 5/8" METAL STUD
- 2 = 2 1/2" METAL STUD *or* 1 1/2" WOOD STUD
- 3 = 3 5/8" METAL STUD
- 4 = 4" METAL STUD *or* 3 1/2" WOOD STUD *or* 3 5/8" CMU
- 6 = 6" METAL STUD *or* 5 1/2" WOOD STUD *or* 5 5/8" CMU
- 8 = 8" METAL STUD *or* 7 5/8" CMU
- 10 = 9 5/8" CMU
- 12 = 11 5/8" CMU

WALL FINISH
- A = GYP ONE SIDE
- AA = GYP BOTH SIDES
- F = TILE ON CEMENT BOARD
- K = SHAFTWALL

S3A-2 — WALL TAG

WALL MODIFIERS

WALLS CONSIDERED FULL HEIGHT TO STRUCT. UNLESS MODIFIED PER BELOW
- 1 = SOUND ATTENUATION BATTS FULL CAVITY WIDTH, APPLY ACOUS. SEALANT @ TOP & BASE OF WALL, EACH SIDE



LOCATION MAP

HIVE

SAFIRE

1475 SW MARKET ST
LEE'S SUMMIT, MO 64081

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seal/signature

STATE OF MISSOURI
LOGAN HAYES
NUMBER A-2015040635
ARCHITECT

05/30/24

project number 2024-023

date 05.30.2024

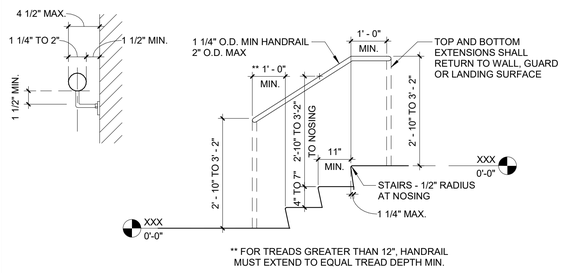
issued for PERMIT

rev date description

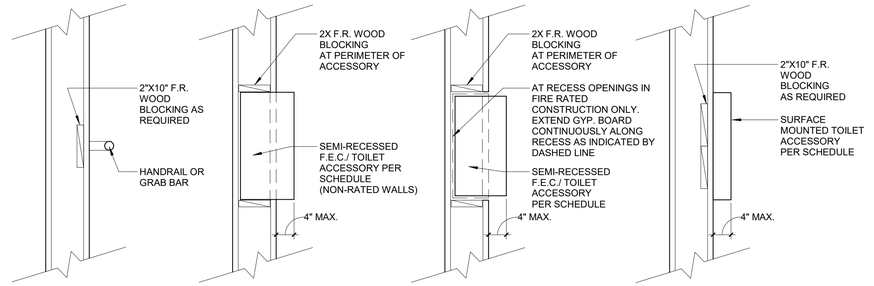
SYMBOLS AND ABBREVIATIONS

sheet number

G001



12 HANDRAIL CLEARANCES



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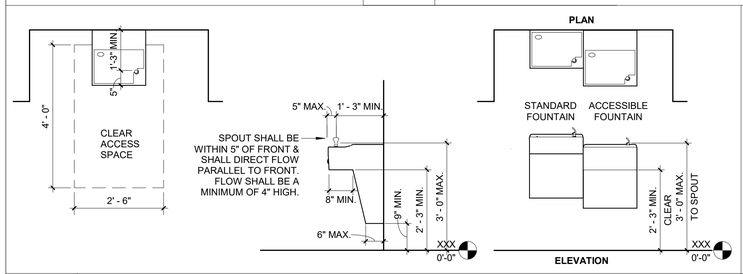
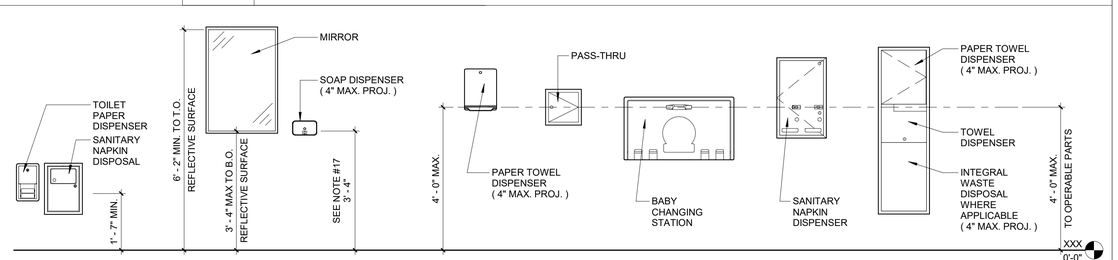
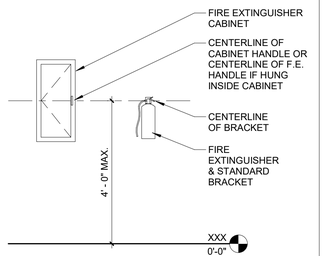


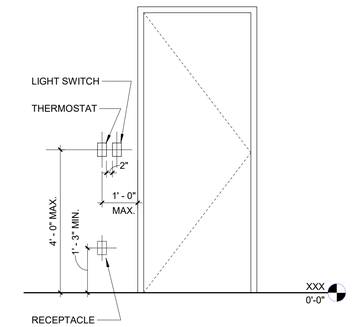
10 DRINKING FOUNTAIN



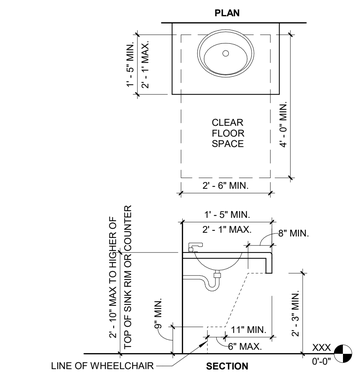
9 TOILET ACCESSORIES



8 FIRE EXTINGUISHER



7 SWITCH @ DOOR



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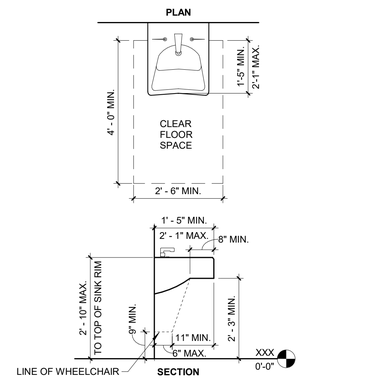

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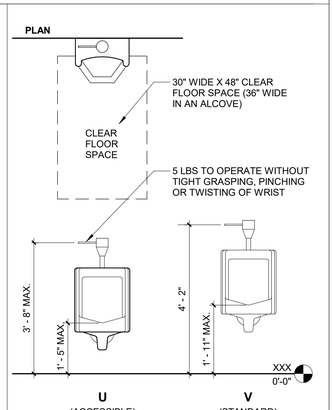
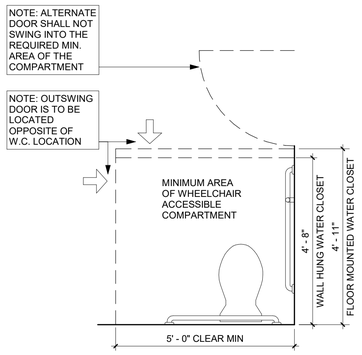
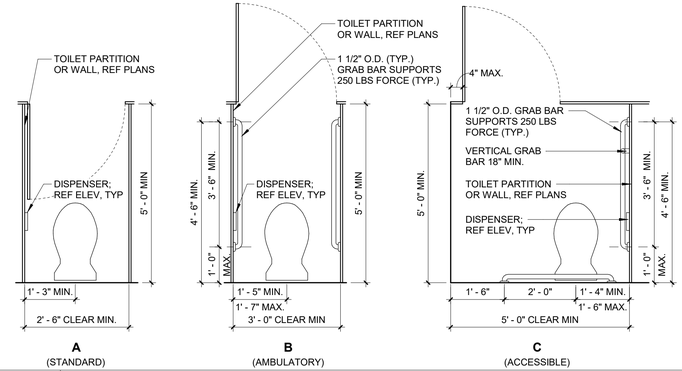


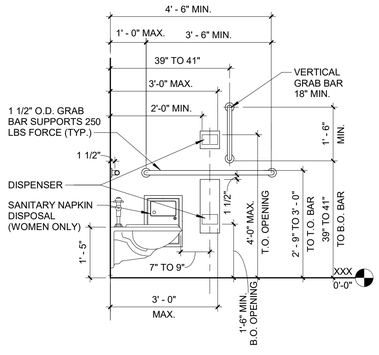
4 ACC. CLEAR FLOOR SPACE



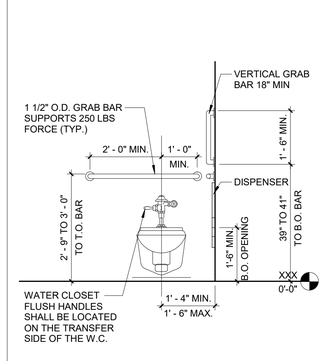
3 ACCESSIBLE TOILET STALL



2 WC SECTION



1 WC ELEVATION



GENERAL NOTES - ACCESSIBILITY GUIDELINES:

1. NOTE: ALL DIMENSIONS ARE MEASURED FROM FLOOR, UNLESS NOTED OR SHOWN OTHERWISE.
2. ACC. UNOBSTRUCTED REACH RANGES: ACC. FORWARD REACH = 48" MAX. & 15" MIN. ACC. SIDE REACH = 48" MAX. & 15" MIN.
3. ELEVATORS: STANDARD CALL BUTTONS: 35" TO 48" TO C.L. & PROTRUDE 1" MAX. ACC. CALL BUTTONS: 42" TO C.L. (TYP.) & 48" MAX. (3/4" SMALLEST DIM.). ACC. VISIBLE SIGNALS: 72" MIN. TO C.L. (2 1/2" SMALLEST DIM.). TACTILE SIGNAL ON HOISTWAY: 60" TO BASE OF CHARACTERS W/ TACTILE STAR & 2" HIGH CHARACTERS.
4. DOOR HARDWARE (TO CENTER OF HARDWARE): STANDARD MOUNTING HEIGHTS: PUSH PLATES = 42", PULL HANDLES = 42", KNOBS/ LEVERS = 40", PANIC EXIT = 42" CENTERLINE OF BAR, KICKPLATES: WIDTH = DOOR WIDTH MINUS 2", CENTER, HEIGHT = 16" FROM B.O. DOOR. THRESHOLDS: STANDARD = 1/2" MAX. AT EXT. SLIDING DOORS = 3/4" MAX., ACC. HARDWARE = 34" MIN. TO 48" MAX.
5. DRINKING FOUNTAINS & EWC'S (TO SPOUT): STANDARD = 38" MIN., 43" MAX. ACC. =36" MAX. (27" MIN. CLEAR KNEE SPACE)
6. COUNTERTOPS (TO SINK RIM/ COUNTERTOP): ACC. = 28" MIN. TO 34" MAX.
7. WATER CLOSETS (TO TOP OF SEAT): STANDARD = 14" TO 15". ACC. (TO TOP OF SEAT) = 17" TO 19". ACC. FLUSH CONTROLS = 44" MAX.
8. URINALS (TO RIM): STANDARD = 24" MAX. ACC. =17" MAX. ACC. FLUSH CONTROLS = 44" MAX.
9. LAVATORIES (TO SINK RIM/ COUNTERTOP): STANDARD = 36" MAX. ACC. = 34" MAX. (29" MIN. CLEAR KNEE SPACE)
10. MIRRORS (TO B.O. REFLECTIVE SURFACE): STANDARD = VARIES. ACC. = 40" MAX.
11. GRAB BARS - ACC. (TO TOP OF BAR): WATER CLOSETS = 33" MIN. TO 36" MAX. SHOWERS = 33" MIN. TO 36" MAX. (FROM B.O. SHOWER). BATHTUBS: TOP BAR = 33" MIN. TO 36" MAX. BOT. BAR = 9" ABOVE T.O. TUB
12. SHOWER HEADS (FROM FLOOR TO HEAD): STANDARD = 72" TO 84". ACC. = SPRAY UNIT W/ HOSE 60" LONG MIN. ACC. = FIXED SHOWER HEAD = 48" AFF.
13. SHOWER CONTROLS (TO CONTROL AREA): STANDARD = 48" MAX. (TO TOP). ACC. = 38" MIN. TO 48" MAX.
14. SHOWER ROD (FROM FLOOR TO C.L.): STANDARD = 78" MAX.
15. TOILET ROOM PARTITIONS: TOILETS = 12" TO BOT. & 70" TO TOP. URINALS = 18" TO BOT. & 60" TO TOP
16. TOILET PAPER DISPENSERS (TO C.L. OF OUTLET): STANDARD = 24". ACC. = 19" MIN. TO 24" MAX.
17. WALL MOUNTED SOAP DISPENSERS (TO C.L. OF PUSH BUTTON): STANDARD = 40". ACC. = VARIES. RE: OBSTRUCTED AND UNOBSTRUCTED REACH RANGES. ACC. SIDE REACH = 46" MAX. ABOVE SINK IN COUNTER
18. PAPER TOWEL DISPENSER/ WASTE RECEPTACLE (TO TOWEL SLOT): STANDARD = 40" MAX. ACC. FORWARD REACH = 48" MAX. & 15" MIN. ACC. SIDE REACH = 48" MAX. & 15" MIN.
19. WARM AIR HAND DRYER (TO PUSH SWITCH): STANDARD = 44" MAX. ACC. FORWARD REACH = 48" MAX. & 15" MIN. ACC. SIDE REACH = 48" MAX. & 15" MIN.
20. SANITARY NAPKIN DISPENSER (TO C.L. OF COIN SLOT): STANDARD = 40" MAX. ACC. FORWARD REACH = 48" MAX. & 15" MIN. ACC. SIDE REACH = 48" MAX. & 15" MIN.
21. SANITARY NAPKIN DISPOSAL (TO TOP OF UNIT): STANDARD = 28" MAX. ACC. = 19" MIN. TO 24" MAX. (TO OPNG.)
22. TOILET SEAT COVER DISPENSERS (TO OPNG.): STANDARD = 40" MAX. ACC. FORWARD REACH = 48" MAX. & 15" MIN. ACC. SIDE REACH = 48" MAX. & 15" MIN.
23. SHELVES: ACC. = 48" MAX.
24. COAT HOOKS: STANDARD = 68". ACC. = 48" MAX.
25. CHALKBOARDS, TACKBOARDS,& MARKERBOARDS: STANDARD = 32" TO 39" (TO B.O. BOARD OR CHALKTRAY). STANDARD = 80" (RECOMMENDED, TO T.O. BOARD)
26. THERMOSTATS & CONTROL DEVICES (TO TOP): ACC. FORWARD REACH = 48" MAX. ACC. SIDE REACH = 48" MAX.
27. LIGHT SWITCHES & CARD READERS (TO C.L.): LOCATE 6" FROM DOOR JAMB. ACC. = 48" MAX.
28. CONVENIENCE RECEPTACLES – ELECTRICAL/ TELEPHONE/ DATA (TO C.L.): STANDARD = 18". ACC. = 15" MIN.
29. EXIT LIGHTS - WALL MOUNTED: 2" MIN. BELOW CEILING. 2" MIN. ABOVE DOOR FRAME. EQUAL SPACE FROM CEILING TO TOP OF FRAME
30. FIRE EXTINGUISHERS (TO TOP, U.N.O.): GROSS WT. 40 LBS. OR LESS = 60" MAX. GROSS WT. MORE THAN 40 LBS. = 42" MAX. ACC. = 40" MAX. (B.O. CABINET)
31. FIRE ALARM PULL STATIONS (TO LEVER): STANDARD = 48" MAX. ACC. FORWARD REACH = 48" MAX. ACC. SIDE REACH = 48" MAX.
32. SMOKE AND/OR HEAT DETECTORS: STANDARD = CEILING HEIGHT
33. HORN/ SPEAKER/ VISUAL SIGNALS: STANDARD = 80" AFF. OR 6" BELOW CEILING - WHICHEVER IS LOWER.
34. ROOM SIGNAGE (TO C.L.): STANDARD = 60" HIGH AFF. & WITHIN 18" OF LATCH SIDE OF DOOR

PLUMBING FIXTURES AND ACCESSORIES SHOWN FOR REFERENCE ONLY

HIVE

SAFIRE

1475 SW MARKET ST
LEE'S SUMMIT, MO 64081

HIVE DESIGN COLLABORATIVE, INC.
601 E. 63rd St., Suite 440, Kansas City, MO 64110
816.581.6363

seal/signature

STATE OF MISSOURI
LOGAN HAYES KUMER
A-2015040635
ARCHITECT

05/30/24

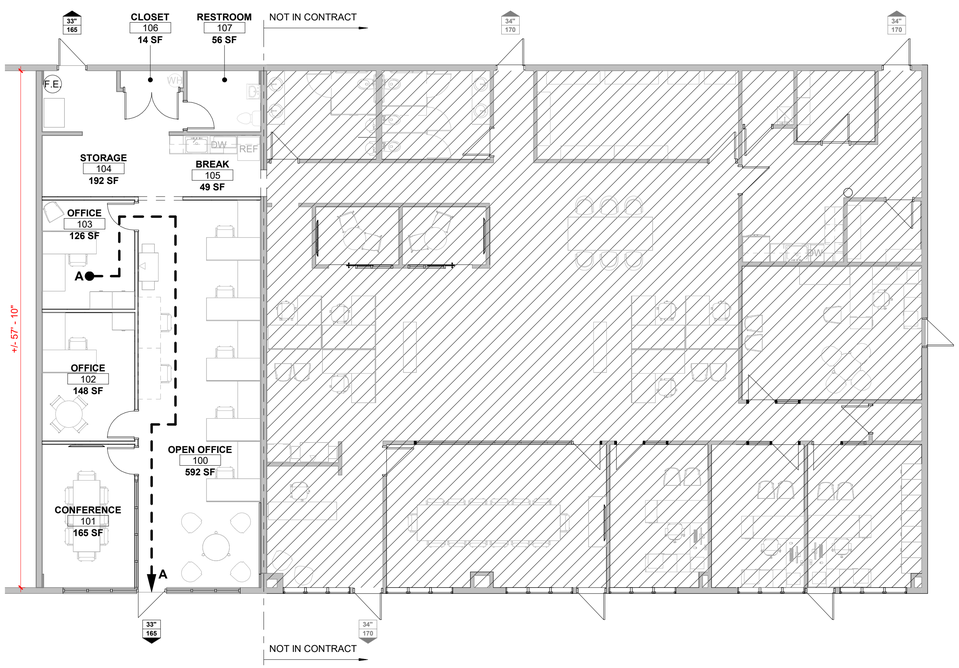
project number	2024-023
date	05.30.2024
issued for	PERMIT

rev	date	description

ACCESSIBILITY GUIDELINES

sheet number

G002



1 **CODE PLAN**

1/8" = 1'-0"

0' 2' 4' 8' 16'

CODE INFORMATION SUMMARY:

SUBJECT	DATA		REFERENCE
PROJECT DESCRIPTION	RENOVATION OF AN EXISTING OFFICE SPACE THAT WILL CONNECT WITH THE SPACE OF AN EXISTING TENANT		
JURISDICTION	CITY OF LEE'S SUMMIT		
APPLICABLE CODE	2018 INTERNATIONAL BUILDING CODE 2018 INTERNATIONAL PLUMBING CODE 2018 INTERNATIONAL MECHANICAL CODE 2018 INTERNATIONAL FUEL GAS CODE 2018 INTERNATIONAL FIRE CODE 2017 NATIONAL ELECTRIC CODE		
ADA STANDARDS	2010 ADA STANDARDS FOR ACCESSIBLE DESIGN		
OCCUPANCY CLASS	B (BUSINESS) OCC. IN A SEPARATED, MIXED-USE BUILDING		SECTION 303
CONSTRUCTION TYPE	V-B		SECTION 601
FIRE RESISTANCE	STRUCTURAL FRAME	0	SECTION 601
	BEARING WALLS, EXT.	0	
	NON BEARING WALLS	0	
	FLOOR CONSTRUCTION	0	
	ROOF CONSTRUCTION	0	
FIRE PROTECTION	AUTOMATIC SPRINKLER	NO	CHAPTER 9
	FIRE ALARM SYSTEM	EXISTING	
	FIRE EXTINGUISHER(S)	REQUIRED	
ALLOWABLE HEIGHT AND AREA	40' 9,000 SF (NS)		SECTIONS 504 & 506
FLOOR AREA (GROSS)	1,487 GSF		TABLE 1004.5
OCCUPANT LOAD	26		TABLE 1004.5
EXITS REQUIRED	1		SECTION 1006
EXITS PROVIDED	2		
EXIT ACCESS TRAVEL DISTANCE	200'		SECTION 1017

PLUMBING FIXTURE REQUIREMENT: 2018 IBC TABLE 2902.1

OCCUPANCY		WATER CLOSETS		LAVATORIES		DRINKING FOUNTAINS	SERVICE SINK
TOTAL	PER SEX	MALE	FEMALE	MALE	FEMALE		
ASSEMBLY		1 PER 125	1 PER 65	1 PER 200	1 PER 200	1 PER 500	1
16 OCC	8 EA	**.064**	**.123**	**.04**	**.04**	**.032**	
BUSINESS		1 PER 25*	1 PER 25*	1 PER 40*	1 PER 40*	1 PER 100	1
7 OCC	4 EA	**.16**	**.16**	**.1**	**.1**	**.07**	
STORAGE		1 PER 100	1 PER 100	1 PER 100	1 PER 100	1 PER 1000	1
2 OCC	1 EA	**.01**	**.01**	**.01**	**.01**	**.001**	
25 OCC		**.234**	**.293**	**.15**	**.15**	**.103**	**1**
PLUMBING FIXTURES		MALE	FEMALE	MALE	FEMALE		
REQUIRED		**1**	**1**	**1**	**1**	**1**	**1**
PROVIDED		**1***	**1***	**1***	**1***	**0****	**0*****

* SEPARATE FACILITIES NOT REQUIRED PER IBC 2902.2 EXCEPTION 4
** OWNER TO PROVIDE BOTTLED WATER AT ALL TIMES FOR EMPLOYEES & GUESTS
*** SERVICE SINK LOCATED IN CONNECTED SPACE THAT IS NOT IN CONTRACT

EGRESS (MAXIMUM TRAVEL DISTANCE)

TYPE	DISTANCE
Egress Path A	61' - 0"

CODE - OCCUPANCY CALCULATIONS

#	ROOM	AREA	OCCUPANCY	SPACE FUNCTION (1004.1.2)	LOAD FACTOR	NET / GROSS	OCCUPANT LOAD
LEVEL 1							
100	OPEN OFFICE	592 SF	BUSINESS	Business areas	150	gross	4
101	CONFERENCE	165 SF	ASSEMBLY	Assembly, without fixed, Unconcentrated (tables and chairs)	15	net	12
102	OFFICE	148 SF	BUSINESS	Business areas	150	gross	1
103	OFFICE	126 SF	BUSINESS	Business areas	150	gross	1
104	STORAGE	192 SF	STORAGE	Accessory storage areas, mechanical equipment rooms	300	gross	1
105	BREAK	49 SF	ASSEMBLY	Assembly, without fixed, Unconcentrated (tables and chairs)	15	net	4
106	CLOSET	14 SF	STORAGE	Accessory storage areas, mechanical equipment rooms	300	gross	1
107	RESTROOM	56 SF	BUSINESS	Business areas	150	gross	1
		1,342 SF					25

CODE PLAN LEGEND

ROOM OCCUPANT LOAD

OFFICE — ROOM NAME
101 — ROOM NUMBER
150 SF — SQUARE FEET OF ROOM

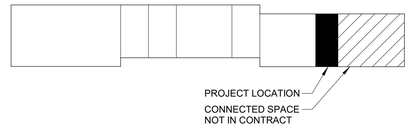
F.E. — FIRE EXTINGUISHER

EGRESS CAPACITY FACTORS

STAIRWAYS: 0.3" PER OCCUPANT SERVED*
DOORWAYS: 0.2" PER OCCUPANT SERVED*

33" — PROVIDED EXIT WIDTH IN DECIMAL INCHES
165 — PROVIDED EXIT WIDTH OCCUPANT CAPACITY

NOTE: FURNITURE AND EQUIPMENT SHOWN FOR REFERENCE ONLY.
* REF IBC SECTIONS 1005.3.1 & 1005.3.2 FOR CAPACITY FACTOR EXCEPTIONS.



KEY PLAN

SAFIRE
1475 SW MARKET ST.
LEE'S SUMMIT, MO 64081

HIVE DESIGN COLLABORATIVE, INC.
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STATE OF MISSOURI
LOGAN HAYES NUMBER A-2015040635
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05/30/24

project number 2024-023

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issued for PERMIT

rev	date	description

CODE FLOOR PLAN

sheet number

G201

SECTION 01 10 00 - SUMMARY
1. Project Name: Safire
2. Owner's Name: Bernell Rice - Property Owner
3. Architect's Name: HIVE Design Collaborative, Inc.
4. The Project consists:
5. Coordinate with Owner / Tenant on all items to be supplied and installed by Owner.
6. Coordinate with Owner / Tenant on occupancy requirements during the construction period.
7. Coordinate with Owner / Tenant to minimize conflict and to facilitate building operations.
8. Coordinate with Owner / Tenant on Utility Outages and Shutdowns.
9. Provide access to and from spaces as required by law and by Owner.
10. Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
11. Do not obstruct roadways, sidewalks, or other public ways without permit.

SECTION 01 20 00 - PRICE AND PAYMENT PROCEDURES
1. Coordinate requirements with Owner / Tenant on all pricing and payment procedures.

SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS
1. Coordinate requirements with Owner / Tenant for progress meetings, construction schedules, shop drawings and submittals.

SECTION 01 40 00 - QUALITY REQUIREMENTS
1. For products and workmanship specified by reference to a document or documents not included in these specifications, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
2. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
3. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
4. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.
5. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
6. Comply with manufacturers' instructions, including each step in sequence.
7. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
8. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
9. Have Work performed by persons qualified to produce required and specified quality.
10. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
11. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.
12. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
13. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
14. Adjust products to appropriate dimensions; position before securing products in place.
15. Replace Work or portions of the Work not conforming to specified requirements.
16. If, in the opinion of the Owner or Architect, it is not practical to remove and replace the Work, the Owner or Architect will direct an appropriate remedy or adjust payment.

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS
1. Coordinate requirements and restrictions with Owner / Tenant on all temporary utilities, facilities, barriers and enclosures as well as security, vehicle access, parking, waste removal and project signs.

SECTION 01 60 00 - PRODUCT REQUIREMENTS
1. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
2. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
3. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
4. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.
5. Provide new products unless specifically required or permitted by the Contract Documents.
6. Where all other criteria are met, Contractor shall give preference to products that are extracted, harvested, and/or manufactured closest to the location of the project, have longer documented life span under normal use, result in less construction waste, and are made of vegetable materials that are rapidly renewable.
7. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
8. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
9. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
10. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
11. Transport and handle products in accordance with manufacturer's instructions.
12. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
13. Arrange for the return of packing materials, such as wood pallets, where economically feasible.
14. Store and protect products in accordance with manufacturers' instructions.

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS
1. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
2. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
3. Examine and verify specific conditions described in individual specification sections.
4. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
5. Verify that utility services are available, of the correct characteristics, and in the correct locations.
6. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

PREPARATION
1. Clean substrate surfaces prior to applying next material or substance.
2. Seal cracks or openings of substrate prior to applying next material or substance.
3. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

GENERAL INSTALLATION REQUIREMENTS
1. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
2. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
3. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
4. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
5. Make neat transitions between different surfaces, maintaining texture and appearance.

ALTERATIONS
1. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
2. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
3. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
4. Clean existing systems and equipment.
5. Do not begin new construction in alterations areas before demolition is complete.

CUTTING AND PATCHING
1. Whenever possible, execute the work by methods that avoid cutting or patching.
2. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to specified condition.
3. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
4. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
5. Restore work with new products in accordance with requirements of Contract Documents.
6. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
7. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.
8. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit. Match color, texture, and appearance.
9. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

PROGRESS CLEANING
1. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
2. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
3. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
4. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

PROTECTION OF INSTALLED WORK
1. Protect installed work from damage by construction operations.
2. Provide special protection where specified in individual specification sections.
3. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
4. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
5. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
6. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
7. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

ADJUSTING
1. Adjust operating products and equipment to ensure smooth and unhindered operation.

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS (CONTINUED)
FINAL CLEANING AND CLOSEOUT PROCEDURES
1. Use cleaning materials that are nonhazardous.
2. Clean glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
3. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
4. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
5. Clean filters of operating equipment.
6. Remove waste, surplus materials, and trash/rubbish; dispose of in legal manner.
7. Coordinate with Owner / Tenant on project closeout procedures.

SECTION 01 78 00 - CLOSEOUT SUBMITTALS
PROJECT RECORD DOCUMENTS
1. Maintain on site one set of the following record documents; record actual revisions to the Work: Drawings. Addenda. Change Orders and other modifications to the Contract.
2. Ensure entries are complete and accurate, enabling future reference by Owner.
3. Store record documents separate from documents used for construction.
4. Record information concurrent with construction progress.
5. Record Drawings : Legibly mark each item to record actual construction including: Field changes of dimension and detail. Details not on original Contract drawings.

OPERATION AND MAINTENANCE DATA
1. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
2. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
3. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
4. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES
1. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

OPERATION AND MAINTENANCE MANUALS
1. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
2. Prepare data in the form of an instructional manual.

WARRANTIES AND BONDS
1. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
2. Verify that documents are in proper form, contain full information, and are notarized.
3. Co-execute submittals when required.
4. Retain warranties and bonds until time specified for submittal.

SECTION 02 41 19 - SELECTIVE STRUCTURE DEMOLITION
1. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
2. Obtain required permits.
3. Comply with applicable requirements of NFPA 241.
4. Provide, erect, and maintain temporary barriers and security devices.
5. Conduct operations to minimize effects on and interference with adjacent spaces, structures and occupants.
6. Do not close or obstruct roadways or sidewalks without permit.
7. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
8. Do not begin removal until receipt of notification to proceed from Owner.
9. Protect existing structures and other elements that are not to be removed.
10. Provide bracing and shoring.
11. Prevent movement or settlement of adjacent structures.
12. Stop work immediately if adjacent structures appear to be in danger.
13. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner.
14. Perform demolition in a manner that maximizes salvage and recycling of materials.
15. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only. Verify that construction and utility arrangements are as shown. Report discrepancies to Architect before disturbing existing installation.
16. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
17. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
18. Remove existing work as indicated and as required to accomplish new work.
19. Remove existing systems and equipment as indicated.
20. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
21. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
22. Verify that abandoned services serve only abandoned facilities before removal.
23. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.
24. Protect existing work to remain.
25. Prevent movement of structure; provide shoring and bracing if necessary.
26. Perform cutting to accomplish removals neatly and as specified for cutting new work.
27. Repair adjacent construction and finishes damaged during removal work.
28. Patch as specified for patching new work.
29. Remove debris, junk, and trash from site.
30. Leave site in clean condition, ready for subsequent work.

SECTION 06 10 00 - ROUGH CARPENTRY
1. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies. If no species is specified, provide any species graded by any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee and who provides grading service for the species and grade.
2. Dimension Lumber for Concealed Applications: Nominal sizes as indicated on Drawings, S4S. Moisture Content: S-dry or MC19.
3. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring: S4S, No. 2 or Standard Grade Lumber. Standard or No. 3 Boards.
4. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
5. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
6. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood. Treat rough lumber only items as indicated.
7. Fire Retardant Treatment: Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
8. Prevent exposure to precipitation during shipping, storage, or installation.
9. Provide lumber stamped with grade mark unless otherwise indicated.
10. Lumber fabricated from old growth timber is not permitted.
11. Select material sizes to minimize waste.
12. Reuse scrap to the greatest extent possible.
13. Provide temporary ventilation during and immediately after installation of treated wood sufficient to remove indoor air contaminants.
14. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
15. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
16. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
17. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs. Install adjacent boards without gaps.
18. Framing Member Tolerances: 1/4 inch from true position, maximum.
19. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

SECTION 06 20 00 - FINISH CARPENTRY
1. Softwood Lumber: As indicated on Drawings, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.
2. Hardwood Lumber: As indicated on Drawings, maximum moisture content of 6 percent ; with vertical grain, of quality suitable for transparent finish.
3. Softwood Plywood Not Exposed to View: Any face species, veneer core; PS 1 Grade A-B; glue type as recommended for application.
4. Softwood Plywood Exposed to View: Face species as indicated, plain sawn, medium density fiberboard core; glue type as recommended for application.
5. Hardwood Plywood: Face species as indicated, plain sawn, book matched, medium density fiberboard core; glue type as recommended for application.
6. Particleboard: ANSI A208.1; composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; sanded faces.
7. Hardboard: AHA A135.4; Pressed wood fiber with resin binder, Class 1 - Tempered, 1/4 inch thick, smooth one side (S1S).
8. Protect work from moisture damage.
9. Quality Grade: Unless otherwise indicated provide products of quality specified by AWII//AWMAC/WI Architectural Woodwork Standards for Premium Grade.
10. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by authority having jurisdiction.
11. Wood fabricated from old growth timber is not permitted.
12. Shop assemble work for delivery to site, permitting passage through building openings.
13. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

SECTION 06 20 00 - FINISH CARPENTRY (CONTINUED)
14. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
15. Install work in accordance with AWII/AWMAC/WI Architectural Woodwork Standards requirements for grade indicated.
16. Set and secure materials and components in place, plumb and level.
17. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
18. Maximum Variation from True Position: 1/16 inch.
19. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

SECTION 06 41 00 - ARCHITECTURAL WOOD CASEWORK
1. Quality Grade: Unless otherwise indicated provide products of quality specified by AWII//AWMAC/WI Architectural Woodwork Standards for Premium Grade.
2. Wood Veneer Faced Cabinets: Premium grade.
3. Plastic Laminate Faced Cabinets: Custom grade.
4. Protect units from moisture damage.
5. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.
6. Wood fabricated from old growth timber is not permitted.
7. Adhesive: Type recommended by fabricator to suit application.
8. Grommets: Standard plastic grommets for cut-outs, in color as indicated.
9. Hardware: BHMA A156.9, types as indicated for quality grade specified.
10. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch spacing adjustments.
11. Drawer and Door Pulls: "U" shaped wire pull, steel with chrome finish, 4 inch centers, unless otherwise indicated on Drawings.
12. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish, unless otherwise indicated on Drawings.
13. Catches: Magnetic.
14. Drawer Slides: Full extension, Static load capacity as required by drawer size, side mounted, steel with polished finish.
15. Hinges: European style concealed self-closing type, steel with polished finish, unless otherwise indicated on Drawings.
16. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
17. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
18. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

SECTION 07 84 00 - FIRESTOPPING
1. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation.
2. Firestopping: Any material meeting requirements
3. Fire Ratings: See Drawings for required systems and ratings.
4. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
5. Remove incompatible materials that could adversely affect bond.
6. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
7. Do not cover installed firestopping until inspected by authority having jurisdiction.
8. Install labeling required by code.
9. Clean adjacent surfaces of firestopping materials.
10. Protect adjacent surfaces from damage by material installation.

SECTION 07 90 05 - JOINT SEALERS
1. General Purpose Interior Sealant for interior wall and ceiling control joints, joints between door and window frames and wall surfaces, and other interior joints for which no other type or sealant is indicated: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
2. Bathtub/Tile Sealant for joints between plumbing fixtures and floor and wall surfaces and joints between kitchen and bath countertops and wall surfaces.: White silicone; ASTM C920, Uses I, M and A; single component, mildew resistant.
3. Acoustical Sealant bead between top stud runner and structure and between bottom stud track and floor: Permanently tacky non-hardening butyl sealant.
4. Interior Floor Joint Sealant for use at expansion joints in floors: Polyurethane, self-leveling; ASTM C920, Grade P, Class 25, Uses T, M and A; single component.
5. Sealants and Primers - General: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
6. Sealant colors to be selected by Architect from manufacturer's standard range.
7. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.
8. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
9. Perform installation in accordance with ASTM C1193.
10. Perform acoustical sealant application work in accordance with ASTM C919.
11. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.
12. Install bond breaker where joint backing is not used.
13. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
14. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
15. Tool joints concave.
16. Protect sealants until cured.

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES
1. Steel Door and Frame Manufacturers: Assa Abloy, Steelcraft or equal, unless otherwise indicated on Drawings.
2. Requirements for All Doors and Frames: Comply with ANSI/ICC A117.1, door top closures flush with top of faces and edges, beveled on both edges, smooth texture, factory primed for field finishing.
3. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
4. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
5. Galvanizing for Units in Wet Areas: All components hot-dipped zinc-iron alloy-coated (galvannealed), manufacturer's standard coating thickness.
6. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; where two requirements conflict, comply with the most stringent.
7. Exterior Steel Doors: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless. All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
8. Interior Steel Doors, Non-Fire-Rated: ANSI A250.8 Level 1, physical performance Level C, Model 2, seamless, 1-3/4 inches thick.
9. Interior Steel Doors, Fire-Rated: ANSI A250.8 Level 2, physical performance Level B, Model 2, seamless. Fire Rating as indicated on Door and Frame Schedule, tested in accordance with applicable code. Provide units listed and labeled by UL. Attach fire rating label to each fire rated unit.
10. Interior Steel Doors, Sound-Rated: ANSI A250.8 Level 2, physical performance Level B, Model 2, seamless. STC Rating of Entire Door, Frame, and Hardware Assembly as indicated on Drawings, calculated in accordance with ASTM E413, tested in accordance with ASTM E90 or ASTM E1408.
11. Interior Door Frames: Fully welded type complying with the requirements of grade specified for corresponding door.
12. Frames for Wood Doors: Fully welded type complying with frame requirements specified in ANSI A250.8 for Level 1, 18 gage
13. Frames for Sound-Rated Wood Doors: Fully welded type complying with frame requirements specified in ANSI A250.8 for Level 1, 16 gage
14. Exterior Door Frames: Face welded, seamless with joints filled. All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
15. Interior Door Frames, Fire-Rated: Fully welded type, fire rating same as door, labeled.
16. Frames for Interior Glazing or Borrowed Lights: Construction and face dimensions to match door frames, unless otherwise indicated on Drawings.
17. Removable Stops: Formed sheet steel, mitered corners.
18. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, nd 2 on head of pairs without center mullions.
19. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.
20. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.
21. Store in accordance with NAAMM HMMA 840.
22. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.
23. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.
24. In addition, install fire rated units in accordance with all applicable codes.
25. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.
26. Adjust for smooth and balanced door movement.
27. Adjust sound control doors so that seals are fully engaged when door is closed.Test sound control doors for force to close, latch, and unlatch in accordance with ASTM E1408; adjust as required to comply.

SECTION 08 14 16 - FLUSH WOOD DOORS
1. Wood Veneer Faced Door Manufacturers: Graham Wood Doors, Eggers Industries or equal, unless otherwise indicated on Drawings.
2. All Doors: Premium Grade Quality Level, in accordance with AWI/AWMAC/WI Architectural Woodwork Standards. 5-ply or 7-ply Wood Veneer Faced Doors, unless otherwise indicated on Drawings.
3. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction. Provide solid core doors at all locations.
4. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with jurisdiction having authority; UL or WH (ITS) labeled without any visible seals when door is open.
5. Sound Retardant Doors: Minimum STC as indicated on drawings, calculated in accordance with ASTM E413, tested in accordance with ASTM E1408.
6. Non-Rated Solid Core and 20 Minute Rated Doors: Particleboard core, Type PC, plies and faces as indicated on Drawings.
7. Fire Rated Doors: Mineral core, Type FD, plies and faces as indicated on Drawings; with core blocking as required to provide adequate anchorage of hardware without through-bolting.
8. Sound Retardant Doors: Equivalent to Type PC construction with core as required to achieve rating specified; plies and faces as indicated on Drawings.
9. Wood Veneer Facing for Transparent Finish: As indicated on Drawings.

SECTION 08 14 16 - FLUSH WOOD DOORS (CONTINUED)
10. Hardboard Facing for Opaque Finish: AHA A135.4, Class 1 - Tempered, S2S (smooth two sides) hardboard, composition face, 1/8 inch thick.
11. Package, deliver and store doors in accordance with specified quality standard.
12. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.
13. Provide manufacturer's warranty for the life of the installation.
14. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.
15. Fabricate doors in accordance with door quality standard specified.
16. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
17. Provide edge clearances in accordance with the quality standard specified.
18. Install doors in accordance with manufacturer's instructions and specified quality standard. Install fire-rated doors in accordance with NFPA 80 requirements.
19. Use machine tools to cut or drill for hardware.
20. Coordinate installation of doors with installation of frames and hardware.

SECTION 08 31 00 - ACCESS DOORS AND PANELS
1. Manufacturers: Acudor Products Inc, Milcor, or equal.
2. Door and Frame Units: Steel factory fabricated, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies units are to be installed in.
3. Verify that rough openings are correctly sized and located.
4. Install units in accordance with manufacturer's instructions.
5. Install frames plumb and level in openings. Secure rigidly in place.
6. Position units to provide convenient access to the concealed work requiring access.

SECTION 08 71 00 - DOOR HARDWARE
1. Coordinate the manufacture, fabrication, and installation of products onto which door hardware will be installed.
2. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
3. Convey Owner's keying requirements to manufacturers.
4. Provide all hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.
5. Provide all items of a single type of the same model by the same manufacturer.
6. Provide products that comply with the following:
   A. Applicable provisions of federal, state, and local codes.
   B. ANSI/CC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
   C. Applicable provisions of NFPA 101, Life Safety Code.
   D. Fire-Rated Doors: NFPA 80.
   E. All Hardware on Fire-Rated Doors: Listed and classified by UL as suitable for the purpose specified and indicated.
   F. Hardware for Smoke and Draft Control Doors: Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.
   G. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.
7. Electrically Operated and/or Controlled Hardware: Provide all power supplies, power transfer hinges, relays, and interfaces required for proper operation; provide wiring between hardware and control components and to building power connection.
8. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as instructed by the manufacturer.
9. Verify that electric power is available to power operated devices and of the correct characteristics.
10. Install hardware in accordance with manufacturer's instructions and applicable codes.
11. Use templates provided by hardware item manufacturer.
12. Do not install surface mounted items until finishes applied to substrate are complete.
13. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.
14. Mounting heights for hardware from finished floor to center line of hardware item:
   A. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames."
   B. For wood doors: Comply with DHI "Recommended Locations for Architectural Hardware for Wood Flush Doors."
15. Adjust work under provisions of Section 01 70 00.
16. Adjust hardware for smooth operation.
17. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

SECTION 08 80 00 - GLAZING
1. Single Vision Glazing: Fully tempered float glass, clear tint, ¼ inch thickness.
   A. Applications: All interior glazing unless otherwise indicated.
2. Fire-Rated Safety Glazing: Glass-ceramic safety glazing, ¼ inch thickness, fire rating as indicated on Drawings.
   A. Applications: Provide this type of glazing in the following locations:
3. Single Safety Glazing: Non-fire-rated, fully tempered float glass, clear tint, ¼ inch thickness.
   A. Applications: Provide this type of glazing in the following locations:
      a. Glazed lights in doors, except fire doors.
      b. Glazed sidelights to doors, except in fire-rated walls and partitions.
      c. Other locations required by applicable federal, state, and local codes and regulations.
      d. Other locations indicated on the drawings.
4. Float Glass: All glazing is to be float glass unless otherwise indicated.
   A. Annealed Type: ASTM C1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
   B. Heat-Strengthened and Fully Tempered Types: ASTM C1048.
5. Glass-Ceramic Safety Glazing: UL- or WH-listed as fire-protection-rated glazing and complying with 16 CFR 1201 test requirements for Category II without the use of a surface-applied film.
6. Silicone Sealant : Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; cured Shore A hardness of 15 to 25; color as selected.
7. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
8. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.
9. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; black color.
10. Glazing Clips: Manufacturer's standard type.
11. Verify that openings for glazing are correctly sized and within tolerance.
12. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.
13. Prime surfaces scheduled to receive sealant.
14. Install sealants in accordance with ASTM C1193 and FGMA Sealant Manual.
15. Install sealant in accordance with manufacturer's instructions.

INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)
1. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.
2. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
3. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
4. Place glazing tape on free perimeter of glazing in same manner described above.
5. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
6. Knife trim protruding tape.

INSTALLATION - INTERIOR WET METHOD (COMPOUND AND COMPOUND)
1. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch centers, kept 1/4 inch below sight line.
2. Locate and secure glazing pane using glazers' clips.
3. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

INSTALLATION - PLASTIC FILM
1. Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.
2. Place without air bubbles, creases or visible distortion.
3. Fit tight to glass perimeter with razor cut edge.

CLEANING AND PROTECTION
1. Remove glazing materials from finish surfaces.
2. Remove labels after Work is complete.
3. Clean glass and adjacent surfaces.
4. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

HIVE

SAFIRE
1475 SW MARKET ST
LEE'S SUMMIT, MO 64081

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seal/signature

STATE OF MISSOURI
LOGAN HAYES ULMER
A-2015040635
ARCHITECT

05/30/24

project number 2024-023

date 05.30.2024

issued for PERMIT

rev	date	description

SHEET SPECS

sheet number

G301

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

1. Provide completed assemblies complying with ASTM C840 and GA-216.
2. Interior Partitions Indicated as Sound-Rated: STC as indicated calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
3. Fire Rated Assemblies: Comply with applicable requirements of ICC IBC or GA-600 for the particular assembly. Provide construction equivalent to that listed for the particular assembly in the current UL Fire Resistance Directory.
4. Manufacturers - Metal Framing, Connectors, and Accessories: ClarkDietrich, Scafco, or equal.
5. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
6. Studs: "C" shaped with flat or formed webs .
7. Runners: U shaped, sized to match studs.
8. Ceiling Channels: C shaped.
9. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
10. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition. Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
    A. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
    B. Deflection and Firestop Track: Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
11. Manufacturers - Gypsum-Based Board: National Gypsum Company, USG Corporation or equal.
12. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
    A. Application: Use for vertical surfaces and ceilings, unless otherwise indicated. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
    B. Thickness:
        a. Vertical Surfaces: 5/8 inch.
        b. Ceilings: 1/2 inch.
        c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
13. Impact-Rated Wallboard: Tested to Level 3 soft-body and hard-body impact in accordance with ASTM C1629.
    A. Application: High-traffic areas indicated.
    B. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
    C. Type: Fire-resistance rated Type X, UL or WH listed.
    D. Thickness: 5/8 inch.
    E. Edges: Tapered.
14. Backing Board For Wet Areas:
    A. Application: Surfaces behind tile in wet areas including tub and shower surrounds and shower ceilings.
    B. Glass-Mat-Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178.
15. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
    A. Application: Vertical surfaces behind thinset tile, except in wet areas.
    B. Type: Regular and Type X, in locations indicated.
        a. Type X Thickness: 5/8 inch.
        b. Regular Board Thickness: 5/8 inch.
    C. Edges: Tapered.
16. Ceiling Board: Special sag-resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
    A. Application: Ceilings, unless otherwise indicated.
    B. Thickness: 1/2 inch.
    C. Edges: Tapered.
17. Acoustical Sound Dampening Wall and Ceiling Board: Two layers of heavy paper faced, high density gypsum board separated by a viscoelastic polymer layer and capable of achieving STC rating of 50 or more in typical stud wall assemblies as calculated in accordance with ASTM E413 and when tested in accordance with ASTM E90.
    A. Thickness: 1/2 inch.
    B. Long Edges: Tapered.
    C. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
18. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced.
    A. Thickness: __ inch.
19. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.
20. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
21. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
22. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type.
23. Screws for Attachment to Steel Members From 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.
24. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
25. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
26. Studs: Space studs as indicated. Extend partition framing to structure where indicated and to ceiling in other locations.
27. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
28. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
29. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
30. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
31. Acoustic Sealant: Install in accordance with manufacturer's instructions. Place one bead continuously on substrate before installation of perimeter framing members. Place continuous bead at perimeter of each layer of gypsum board. In non-fire-rated construction, seal around all penetrations by conduit, pipe, ducts, and rough-in boxes.
32. Board Installation: Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations. Install gypsum board parallel to framing, with ends and edges occurring over firm bearing.
33. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
34. Installation on Metal Framing: Use screws for attachment of all gypsum board .
35. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.
36. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board with sealant.
37. Control Joints: Place control joints not more than 30 feet apart on walls and ceilings over 50 feet long, unless otherwise indicated on Drawings:
38. Corner Beads: Install at external corners, using longest practical lengths.
39. Finish gypsum board in accordance with levels defined in ASTM C840.
40. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
41. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
42. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
43. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
44. Level 0: Temporary partitions and surfaces indicated to be finished in later stage of project.
45. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes. Feather coats of joint compound so that camber is maximum 1/32 inch.
46. Where Level 5 finish is indicated, spray apply high build drywall surface over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.
47. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

SECTION 09 30 00 - TILING

1. Standard Grout: Any type specified in ANSI A118.6 or A118.7.
2. Verify that surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
3. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.
4. Protect surrounding work from damage.
5. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
6. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.
7. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1 through A108.13, manufacturer's instructions, and The Tile Council of North America Handbook recommendations.
8. Lay tile to pattern indicated. Do not interrupt tile pattern through openings unless otherwise indicated.
9. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
10. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
11. Install ceramic accessories rigidly in prepared openings.
12. Install non-ceramic trim in accordance with manufacturer's instructions.
13. Install thresholds where indicated.
14. Sound tile after setting. Replace hollow sounding units.
15. Keep expansion joints free of adhesive or grout. Apply sealant to joints.
16. Allow tile to set for a minimum of 48 hours prior to grouting.
17. Grout tile joints. Use standard grout unless otherwise indicated.
18. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.
19. Over interior concrete substrates, install in accordance with The Tile Council of North America Handbook Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.
20. At tiled shower receptors install in accordance with The Tile Council of North America Handbook Method B415, mortar bed floor, and W244, thin-set over cementitious backer unit walls.
21. Over gypsum wallboard on wood or metal studs install in accordance with The Tile Council of North America Handbook Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.
22. Do not permit traffic over finished floor surface for 4 days after installation.

SECTION 09 51 00 - ACOUSTICAL CEILINGS

1. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.
2. Acoustical Units - General: ASTM E1264, Class A.
3. Units for Installation in Fire-Rated Suspension System: Listed and classified for the fire-resistive assembly the suspension system is a part of.
4. Suspension System Manufacturers: Same as for acoustical units indicated on Drawings.
5. Suspension Systems - General: ASTM C635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
6. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
7. Perimeter Moldings: Same material and finish as grid.
8. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.
9. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
10. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
11. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are penetrated, avoid visible displacement of face plane of adjacent members.
12. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
13. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
14. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
15. Do not eccentrically load system or induce rotation of runners.
16. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
17. Use longest practical lengths.
18. Overlap and rivet corners.
19. Install acoustical units in accordance with manufacturer's instructions.
20. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
21. Fit border trim neatly against abutting surfaces.
22. Install units after above-ceiling work is complete.
23. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
24. Cutting Acoustical Units: Make field cut edges of same profile as factory edges.
25. Lay acoustical insulation for a distance of 48 inches either side of acoustical partitions as indicated.
26. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
27. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

SECTION 09 65 00 - RESILIENT BASE

1. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
2. Install base on solid backing. Bond tightly to wall and floor surfaces.
3. Scribe and fit to door frames and other interruptions.

SECTION 09 68 00 - CARPETING

1. Store materials in area of installation for minimum period of 24 hours prior to installation.
2. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.
3. Ventilate installation area during installation and for 72 hours after installation.
4. Sub-Floor Filler: Type recommended by carpet manufacturer.
5. Adhesives - General: Compatible with materials being adhered; maximum VOC content of 50 g/L; CRI Green Label certified.
6. Seam Adhesive: Recommended by manufacturer.
7. Contact Adhesive: Recommended by carpet manufacturer; releasable type.
8. Verify that surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive carpet.
9. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesives to sub floor surfaces.
10. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH. Test in accordance with ASTM F710.
11. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
12. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
13. Starting installation constitutes acceptance of sub-floor conditions.
14. Install carpet in accordance with manufacturer's instructions and CRI Carpet Installation Standard.
15. Verify carpet match before cutting to ensure minimal variation between dye lots.
16. Lay out carpet and locate seams in accordance with shop drawings:
17. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
18. Do not locate seams perpendicular through door openings.
19. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
20. Locate changes of color or pattern between rooms under door centerline.
21. Provide monolithic color, pattern, and texture match within any one area.
22. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.
23. Trim carpet neatly at walls and around interruptions.
24. Remove excess adhesive from floor and wall surfaces without damage.
25. Clean and vacuum carpet surfaces.

SECTION 09 72 00 - WALL COVERINGS

1. Extra Materials: Deliver to Owner full-width rolls of wall covering equal to 5 percent of amount of each type installed, packaged with protective covering for storage.
2. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate.
3. Substrate Filler, Primer and Sealer: As recommended by adhesive and wall covering manufacturers; compatible with substrate.
4. Verify that substrate surfaces are prime painted and ready to receive work, and conform to requirements of the wall covering manufacturer.
5. Measure moisture content of surfaces using an electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.
6. Treat areas as necessary to ensure no pigment bleeding through wall covering.
7. Apply adhesive and wall covering in accordance with manufacturer's instructions.
8. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface. Butt edges tightly.
9. Install seams vertical and plumb. Horizontal seams are not acceptable.
10. Do not seam within 2 inches of internal corners or within 6 inches of external corners.
11. Where wall covering tucks into reveals, or metal wallboard or plaster stops, apply with contact adhesive within 6 inches of wall covering termination. Ensure full contact bond.
12. Remove excess adhesive at finished seams, perimeter edges, and adjacent surfaces using cleaning methods recommended by wall covering manufacturer.
13. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.

SECTION 09 90 00 - PAINTING AND COATING

1. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
2. Mechanical and Electrical: In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated on Drawings.
3. Do Not Paint or Finish the Following Items: Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished. Items indicated to receive other finishes. Items indicated to remain unfinished. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment. Floors, unless specifically so indicated. Ceramic and other tiles. Glass. Acoustical materials, unless specifically so indicated. Concealed pipes, ducts, and conduits.
4. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
5. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
6. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.
7. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
8. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
9. Provide lighting level of 80 ft candles measured mid-height at substrate surface.
10. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
11. Provide all paint and coating products from the same manufacturer to the greatest extent possible.
12. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
13. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
14. Supply each coating material in quantity required to complete entire project's work from a single production run.
15. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
16. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
17. Volatile Organic Compound (VOC) Content:
18. Provide coatings that comply with the most stringent requirements specified in the following: 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings. Architectural coatings VOC limits of State in which the project is located.
19. Colors: As indicated on Drawings. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.
20. Paint for Wood, Opaque: One coat of latex primer sealer. Two coats of latex enamel.
21. Paint for Wood, Transparent, Varnish, No Stain: One coat sealer.
22. Paint for Wood, Transparent, Varnish, Stain: Filler coat (for open grained wood only). One coat of stain. One coat sealer. One coat of varnish.
23. Paint for Concrete/Masonry, Opaque: One coat of block filler. Two coats of alkyd enamel.
24. Paint for Ferrous Metals, Unprimed: One coat of latex primer. Two coats of latex enamel.
25. Paint for Ferrous Metals, Primed: Touch-up with latex primer. Two coats of latex enamel.
26. Paint for Gypsum Board/Plaster: One coat of latex primer. Two coats of latex enamel.
27. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.
28. Patching Material: Latex filler.
29. Fastener Head Cover Material: Latex filler.
30. Clean surfaces thoroughly and correct defects prior to coating application.
31. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

SECTION 09 90 00 - PAINTING AND COATING (CONTINUED)

32. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
33. Seal surfaces that might cause bleed through or staining of topcoat.
34. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
35. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
36. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
37. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
38. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-PC 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).
39. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent. Apply treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.
40. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
41. Interior Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
42. Interior Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.
43. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.
44. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
45. Apply products in accordance with manufacturer's instructions.
46. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
47. Apply each coat to uniform appearance.
48. Sand wood and metal surfaces lightly between coats to achieve required finish.
49. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
50. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
51. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

SECTION 10 44 00 - FIRE PROTECTION SPECIALTIES

1. Fire Extinguishers, Fire Extinguisher Cabinets and Accessories: Ansul, Inc, Pyro-Chem, or equal.
2. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent. Provide extinguishers labeled by UL for the purpose specified and indicated.
3. Extinguisher Brackets: Formed steel, galvanized and enamel finished.
4. Install in accordance with manufacturer's instructions.
5. Install cabinets plumb and level in wall openings, 54 inches from finished floor to inside bottom of cabinet.
6. Secure rigidly in place.
7. Place extinguishers and accessories in cabinets and on wall brackets.

SECTION 11 31 00 - RESIDENTIAL APPLIANCES

1. Verify utility rough-ins are present and correctly located.
2. Install in accordance with manufacturer's instructions.
3. Anchor built-in equipment in place.
4. Adjust operating equipment to efficient operation.
5. Remove packing materials from equipment.
6. Wash and clean equipment.

SECTION 12 36 00 - COUNTERTOPS

1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
2. Quality Standard: Premium Grade, in accordance with AWI/AWMAC/WI Architectural Woodwork Standards.
3. Medium Density Fiberboard for Supporting Substrate: ANSI A208.2.
4. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
5. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
6. Join lengths of tops using best method recommended by manufacturer.
7. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
8. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
9. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings.
10. Do not begin installation until substrates have been properly prepared.
11. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.
12. Clean surfaces thoroughly prior to installation.
13. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
14. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
15. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.
16. Seal joint between back/end splashes and vertical surfaces.
17. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
18. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
19. Field Joints: 1/8 inch wide, maximum.
20. Clean countertops surfaces thoroughly.
21. Protect installed products until completion of project.
22. Touch-up, repair or replace damaged products before Substantial Completion.

SECTION 12 24 13 - ROLLER WINDOW SHADES

1. Provide product as indicated on drawings or approved equal by Architect.
2. Product shall have a manual operation.
3. Mounting: Inside mount and top mount.
4. Configuration: Single Solar Shadecloth
5. Solar Shadecloth: 3% Openness. Color as indicated on drawings.
6. Hardware Finish: To be selected by architect from manufacturer's full range.
7. Install window treatment in accordance with manufacturer's instructions.
8. Maximum Variation of Gap at Window Opening Perimeter: 1/4 inch.
9. Maximum Offset From Level: 1/8 inch.
10. Adjust window treatment for smooth operation.
11. Clean shade and valance surfaces just prior to occupancy.

HIVE

SAFIRE
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LEE'S SUMMIT, MO 64081

HIVE DESIGN COLLABORATIVE, INC.
601 E. 63rd St., Suite 440, Kansas City, MO 64110
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seal/signature

STATE OF MISSOURI
LOGAN HAYES WILMSER
A-2015040635
ARCHITECT

05/30/24

project number 2024-023

date 05.30.2024

issued for PERMIT

rev date description

SHEET SPECS

sheet number

G302

DOOR SCHEDULE

DOOR #	ROOM: NAME	WIDTH	HEIGHT	DOOR MATERIAL	DOOR TYPE	FRAME MATERIAL	FIRE RATING	HARDWARE	HEAD	JAMB	REMARKS
101	CONFERENCE	3' - 0"	7' - 0"	WD	C	HM	-	1	6 / A101	5 / A101	INCLUDE CLOSER PER TENANT REQUEST
102	OFFICE	3' - 0"	7' - 0"	WD	C	HM	-	2	6 / A101	5 / A101	
103	OFFICE	3' - 0"	7' - 0"	WD	C	HM	-	2	6 / A101	5 / A101	
105	CLOSET	6' - 0"	7' - 0"	WD	B	HM	-	3	6 / A101	5 / A101	
106	RESTROOM	3' - 0"	7' - 0"	WD	A	HM	-	4	6 / A101	5 / A101	

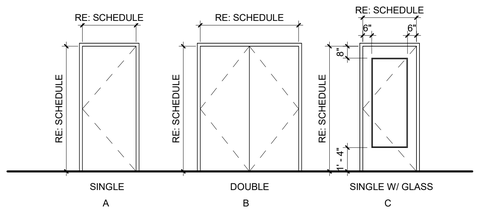
GENERAL NOTES - DOOR SCHEDULE:

1. HM REFERS TO HOLLOW METAL
2. AL REFERS TO ALUMINUM
3. WD REFERS TO WOOD
4. ALL INTERIOR ALUMINUM FRAMES ARE TO BE FINISHED TO MATCH ADJACENT EXTERIOR ALUMINUM WINDOW FRAME, UNO
5. REFER TO FINISH SCHEDULE FOR FINISH OF INTERIOR DOORS & FRAMES
6. ALL GLAZING IN CODE SPECIFIED "HAZARDOUS LOCATIONS" (i.e. DOORS, SIDE LITES, ETC.) SHALL COMPLY WITH THE SAFETY GLAZING REQUIREMENTS AS OUTLINED IN SECTIONS 2406 AND 2406.3 OF THE IBC
7. HARDWARE SET 1 - PASSAGE
8. HARDWARE SET 2 - OFFICE
9. HARDWARE SET 3 - STORAGE
10. HARDWARE SET 4 - PRIVACY

DOOR SCHEDULE

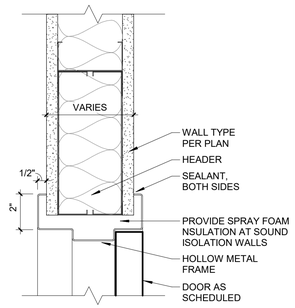
DOOR TYPES - INTERIOR

1/4" = 1'-0"



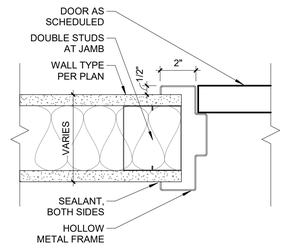
6 HEAD DETAIL

3" = 1'-0"



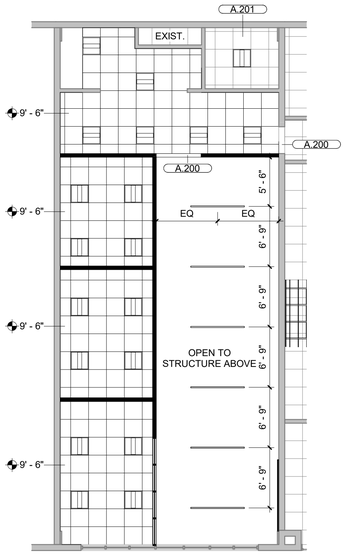
5 JAMB DETAIL

3" = 1'-0"



REFLECTED CEILING PLAN SYMBOLS:

- 9'-0" CEILING HEIGHT
- 2' x 2' ACOUSTIC CEILING TILE
- SUPPLY
- RETURN
- EXHAUST
- 2X2 LIGHT FIXTURE DIRECT / INDIRECT
- LINEAR PENDANT LIGHT FIXTURE DIRECT / INDIRECT

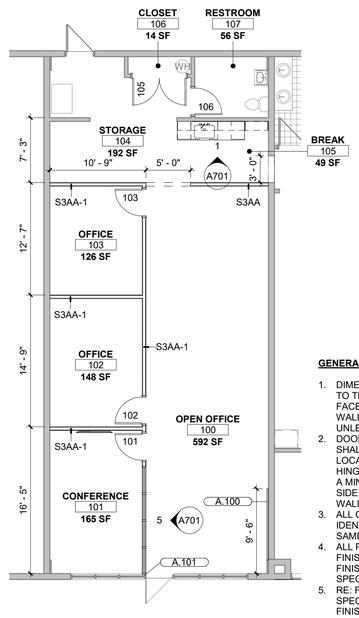


GENERAL NOTES- REFLECTED CEILING PLANS:

1. DIMENSIONS SHOWN ON THE REFLECTED CEILING PLANS ARE TO THE FACE OF GYP. BOARD (FOG), AND COLUMN GRID LINES, UNLESS NOTED OR SHOWN OTHERWISE.
2. ALL CEILING HEIGHTS AS SHOWN ON PLANS AND DETAILS ARE FROM SLAB OR TILE FLOOR (FINISHED FLOOR) TO FINISH CEILING.
3. RE: DETAILS FOR ADDITIONAL CONDITIONS AND CEILING HEIGHT INFORMATION
4. RE: FINISH LEGEND AND FINISH SCHEDULE FOR ROOM CEILING FINISHES.
5. CEILING TILES / GRID TO BE CENTERED IN THE ROOM, UNLESS NOTED OTHERWISE.
6. RECESSED LIGHTING, SPEAKERS, SMOKE DETECTORS, ETC. AND PENDANT LIGHT FIXTURES SHALL BE CENTERED IN CEILING TILE, UNLESS NOTED OTHERWISE.
7. RE: INTERIOR ELEVATIONS FOR LOCATION OF WALL MOUNTED LIGHT FIXTURES.
8. RE: ELECTRICAL SHEETS AND SPECIFICATIONS FOR DETAILED INFORMATION ON LIGHT FIXTURE SCHEDULE.
9. RE: MECHANICAL SHEETS AND SPECIFICATIONS FOR DETAILED INFORMATION ON DIFFUSERS.
10. COORDINATE ALL PENDANT MOUNTED LIGHT FIXTURES IN AREAS WITH EXPOSED STRUCTURE.
11. COORDINATE ALL CEILING MOUNTED EQUIPMENT WITH CASEWORK BELOW.
12. IF THERE IS A CONFLICT BETWEEN ANY ABOVE-CEILING MECHANICAL / ELECTRICAL / PLUMBING WORK & THE SCHEDULED OR SHOWN CEILING HEIGHT, CONTACT THE ARCHITECT IMMEDIATELY FOR CLARIFICATION.

3 REFLECTED CEILING PLAN

1/8" = 1'-0"



GENERAL NOTES - FLOOR PLANS:

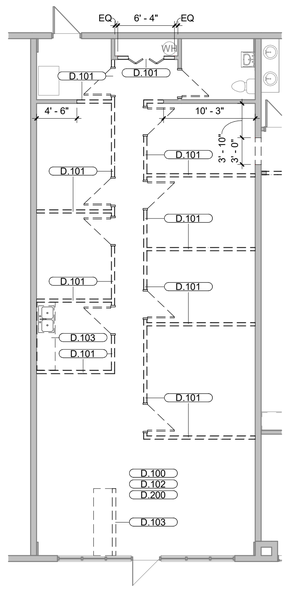
1. DIMENSIONS SHOWN ON THE FLOOR PLAN ARE TO THE FACE OF GYP. BOARD / WALL (FOG), FACE OF MASONRY (FOM), FACE OF CONCRETE WALLS (FOC), AND COLUMN GRID LINES, UNLESS NOTED OR SHOWN OTHERWISE.
2. DOOR OPENINGS NOT LOCATED BY DIMENSION SHALL BE CENTERED IN WALL SHOWN OR LOCATED 4 INCHES FROM FINISH WALL TO HINGE SIDE OF THE DOOR, ALWAYS ALLOWING A MINIMUM OF 18" FROM THE PULL SIDE (STRIKE SIDE) OF THE DOOR TO THE INTERSECTING WALL, OR OTHER PROTRUDING OBJECTS.
3. ALL CLOSETS AND ALCOVES WITHOUT A SPACE IDENTIFICATION NUMBER SHALL HAVE THE SAME FINISHES AS THE ADJOINING SPACES.
4. ALL PUBLIC SPACES: THE WALLS WILL BE FINISHED WITH 5/8" GYP. BD. TO A LEVEL 4 FINISH AND PAINTED, UNLESS NOTED OR SPECIFIED OTHERWISE.
5. RE: FINISH LEGEND, FINISH SCHEDULE AND SPECIFICATIONS FOR DOOR AND DOOR FRAME FINISHES.
6. ALL GLAZING IN CODE SPECIFIED "HAZARDOUS LOCATIONS" (i.e. DOORS, SIDE LITES, ETC.) SHALL COMPLY WITH THE SAFETY GLAZING REQUIREMENTS AS OUTLINED IN SECTIONS 2406 AND 2406.3 OF THE IBC.

2 FLOOR PLAN

1/8" = 1'-0"

DEMO PLAN WALL KEY:

- EXISTING WALL
- DEMOLITION WALL



GENERAL NOTES - DEMOLITION PLANS:

1. RE: SHEET G001 FOR ADDITIONAL GENERAL NOTES THAT ARE APPLICABLE.
2. CONTRACTOR TO VISIT PROJECT SITE AND BUILDING, PRIOR TO BID.
3. BUILDING AND SITE TO REMAIN SECURE DURING DEMOLITION AND CONSTRUCTION.
4. PROTECT ALL ITEMS TO REMAIN (WALLS, PLUMBING FIXTURES, PIPING, HVAC UNITS, COLUMNS, ETC).
5. CONTRACTOR TO PROTECT EXISTING FINISHES ADJACENT TO DEMOLITION WORK.
6. CONTRACTOR TO PATCH AND REPAIR ALL WORK, ESPECIALLY WORK ADJACENT TO EXISTING AREAS, AS REQUIRED.
7. CONTRACTOR TO REPAIR ANY AREAS DAMAGED DURING DEMOLITION.
8. CONTRACTOR TO REPAIR ANY PUNCTURES OR TEARS TO THE VAPOR BARRIER AT THE EXTERIOR WALLS.
9. CONTRACTOR TO COORDINATE DEMOLITION OPENINGS WITH NEW PLANS AND ELEVATIONS.
10. REMOVE EXISTING GYP BOARD OR PLASTER AS NECESSARY, TO PROVIDE NEW BLOCKING IN EXISTING WALLS FOR NEW CASEWORK AND EQUIPMENT.
11. REMOVE ALL CEILING ELEMENTS IN CONSTRUCTION AREA INDICATED.
12. LIGHT FIXTURES / CONTROLS ARE SHOWN FOR GENERAL SCOPE ONLY AND DO NOT RELIEVE THE CONTRACTOR OF ANY OBLIGATION TO REMOVE ALL ELEMENTS IN THE CEILING GRID. REFERENCE MEP DRAWINGS FOR EXTENTS ABOVE CEILING GRID. ALL CEILING FIXTURES, DIFFUSERS, SPEAKERS, SMOKE ALARMS, EXIT SIGNS, STROBES, CEILING TILES, CEILING GRID, BULKHEADS, AND SOFFIT ELEMENTS TO BE REMOVED.

1 DEMOLITION PLAN

1/8" = 1'-0"

KEYNOTE LEGEND	
A.100	FURR OUT WALL TO CONTINUE EXISTING FURRING TO DIMENSION SHOWN FOR WALL GRAPHIC, GRAPHIC BY OWNER
A.101	ALIGN FACE OF WALL & NEW WINDOW MULLION WITH DOOR-SIDE FACE OF EXISTING STOREFRONT MULLION IN ORDER TO NOT IMPEDE ON EXIT WIDTH
A.200	WALL OPENING HEIGHT TO MATCH DOOR HEIGHT
A.201	NEW CEILING TILES & LIGHT FIXTURE IN EXISTING GRID
D.100	REMOVE FLOORING THROUGHOUT SPACE, PREP EXPOSED CONCRETE TO BE SEALED
D.101	DEMO EXISTING NON-BEARING WALL AS SHOWN, NOTIFY ARCHITECT OF ANY DISCREPANCIES
D.102	DEMO ALL EXISTING INTERIOR DOORS & ASSOCIATED HARDWARE
D.103	REMOVE CASEWORK IN ITS ENTIRETY, CAP EXISTING PLUMBING LINES IN WALL, PROVIDE ACCESS PANEL
D.200	REMOVE CEILING THROUGHOUT, EXCEPT WATER HEATER CLOSET & RESTROOM CEILING GRID TO REMAIN

WALL TYPE KEY:

WALL TYPE
- C = CONCRETE
- M = MASONRY
- S = METAL STUD
- W = WOOD STUD

WALL SIZE
- 0 = 7/8" HAT CHANNEL *or* 3/4" WOOD FURRING STRIP
- 1 = 1 5/8" METAL STUD
- 2 = 2 1/2" METAL STUD *or* 1 1/2" WOOD STUD
- 3 = 3 5/8" METAL STUD
- 4 = 4" METAL STUD *or* 3 1/2" WOOD STUD *or* 3 5/8" CMU
- 6 = 6" METAL STUD *or* 5 1/2" WOOD STUD *or* 5 5/8" CMU
- 8 = 8" METAL STUD *or* 7 5/8" CMU
- 10 = 9 5/8" CMU
- 12 = 11 5/8" CMU

WALL FINISH
- A = GYP ONE SIDE
- AA = GYP BOTH SIDES
- F = TILE ON CEMENT BOARD
- K = SHAFTWALL

S3A-2 — WALL TAG

WALL MODIFIERS

WALLS CONSIDERED FULL HEIGHT TO STRUCT. UNLESS MODIFIED PER BELOW
- 1 = SOUND ATTENUATION BATTS FULL CAVITY WIDTH, APPLY ACOUS. SEALANT @ TOP & BASE OF WALL, EACH SIDE

0' 2' 4' 8' 16'

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STATE OF MISSOURI
LOGAN HAYES
NUMBER A-2015040635
ARCHITECT

05/30/24

project number	2024-023
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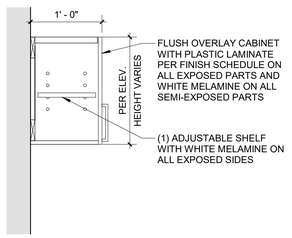
FLOOR PLAN

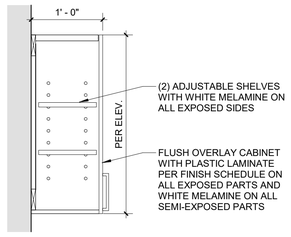
sheet number

A101



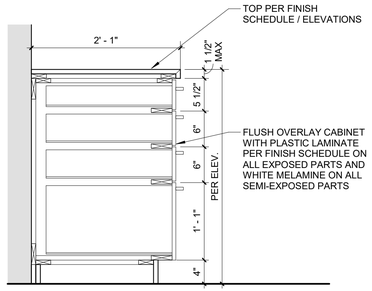
8 **MILL. SECTION**

1" = 1'-0"



7 **MILL. SECTION**

1" = 1'-0"

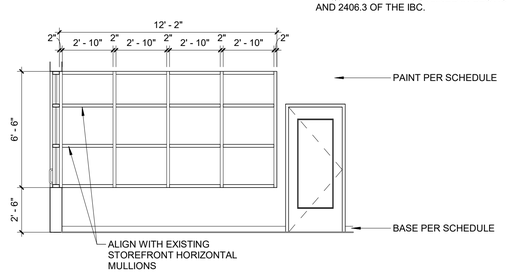


6 **MILL. SECTION**

1" = 1'-0"

GENERAL NOTES - WINDOW TYPES / GLASS TYPES:

1. ALL DIMENSIONS ARE TO ROUGH OPENING AND TO TOP OR BOTTOM OF MULLION, UNLESS NOTED OR SHOWN OTHERWISE.
2. ALL OPENINGS ARE TO BE FIELD VERIFIED, AND NOTED AS SUCH ON SHOP DRAWINGS, PRIOR TO ARCHITECT'S REVIEW.
3. ALL GLAZING IN CODE SPECIFIED "HAZARDOUS LOCATIONS" (i.e. DOORS, SIDE LITES, ETC.) SHALL COMPLY WITH THE SAFETY GLAZING REQUIREMENTS AS OUTLINED IN SECTIONS 2406 AND 2406.3 OF THE IBC.

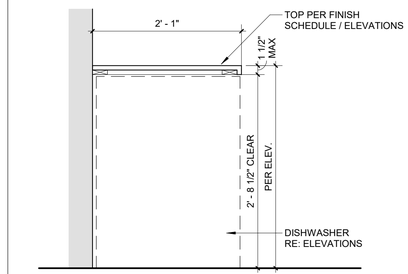


5 **CONFERENCE ELEVATION**

1/4" = 1'-0"

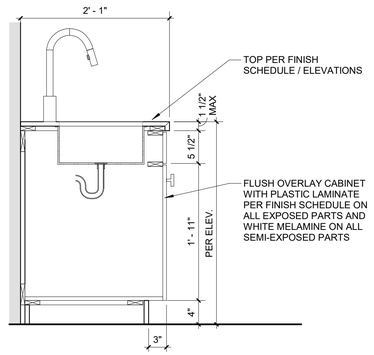
GENERAL NOTES - INTERIOR ELEVATIONS & MILLWORK / CASEWORK ELEVATIONS:

1. RE: FINISH LEGEND AND FINISH SCHEDULE FOR SPECIFIC FINISH INFORMATION AND LOCATIONS.
2. WALL FINISHES SHOWN ARE FOR CLARIFICATION ONLY. RE: FINISH SCHEDULE FOR ADDITIONAL ROOM FINISHES.
3. PROVIDE GYPSUM BOARD CONTROL JOINTS AT DOOR HEADERS WHERE GYPSUM BOARD EXCEEDS 30 FEET (TYP.), UNLESS SHOWN OTHERWISE. JOINTS TO BE LINED UP WITH BOTH SIDES OF DOOR FRAMES FOR DOORS 4'-0" AND OVER AND ALL DOORS THAT ARE LEAD LINED.
4. ALIGN ALL WALL TILE JOINTS WITH FLOOR TILE JOINTS, UNLESS NOTED OR SHOWN OTHERWISE.
5. TRANSITION ALL WALL AND BASE FINISHES, AND/ OR COLOR CHANGES AT INSIDE CORNERS, UNLESS NOTED OTHERWISE. CONSULT ARCHITECT FOR CLARIFICATION, IF NECESSARY.
6. CONTINUE WALL FINISH AS SCHEDULED BEHIND ALL FURNITURE AND EQUIPMENT, INCLUDING UNDER OPEN COUNTERS.
7. CONTINUE WALL BASE AT ALL WALLS, FURRED OUT COLUMNS & COLUMN COVERS, AND AT ALL CASEWORK TOE KICKS, SIDE PANELS, AND UNDER OPEN COUNTERS, UNLESS NOTED OTHERWISE.
8. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO MILLWORK/ CASEWORK FABRICATION & INSTALLATION.
9. ALL MILLWORK/CASEWORK CONSTRUCTION SHALL MEET AWI PREMIUM STANDARDS, UNLESS NOTED OR SPECIFIED OTHERWISE.
10. CONTRACTOR SHALL PROVIDE & INSTALL GROMMETS AT 48" O.C. MAX. AT ALL WORK STATIONS WITH OPEN KNEE SPACE. COORDINATE LOCATIONS DIRECTLY WITH ELECTRICAL/DATA DRAWINGS FOR OUTLET LOCATIONS. COLOR TO BE SELECTED BY ARCHITECT.
11. CONTRACTOR SHALL PROVIDE COUNTERTOP BRACKETS AT OPEN KNEE SPACES WIDER THAN 42" (TYP.). CENTER IN OPEN AREA AND PAINT TO MATCH WALL COLOR, UNLESS NOTED OR SHOWN OTHERWISE.
12. ALL EXPOSED CASEWORK/MILLWORK SURFACES SHALL BE FINISHED TO MATCH ADJACENT SURFACES, UNLESS NOTED OTHERWISE.
13. ALL FILLER PANELS SHALL BE FINISHES TO MATCH ADJACENT SURFACES AND SCRIBED TO FIT ADJACENT WALL, UNLESS NOTED OTHERWISE.
14. ALL GLAZING IN CODE SPECIFIED "HAZARDOUS LOCATIONS" (i.e. DOORS, SIDE LITES, ETC.) SHALL COMPLY WITH THE SAFETY GLAZING REQUIREMENTS AS OUTLINED IN SECTIONS 2406 AND 2406.3 OF THE IBC.
15. RE: EQUIPMENT DRAWINGS & SPECS. FOR EQUIPMENT ITEMS SHOWN DASHED, PROVIDED BY EQUIP. CONSULTANT AND/ OR SUPPLIED BY OWNER. COORDINATE WITH OTHER TRADES AS NECESSARY.
16. MECH. & ELEC. SYMBOLS AND OUTLETS ARE SHOWN FOR REFERENCE ONLY. COORDINATE LOCATIONS WITH MEP DRAWINGS. CONSULT ARCHITECT FOR CLARIFICATION, IF NECESSARY.



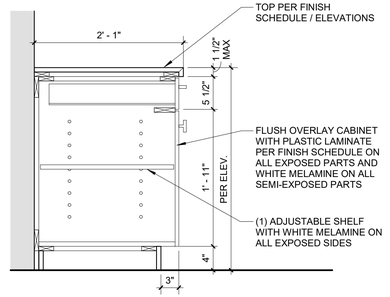
4 **MILL. SECTION**

1" = 1'-0"



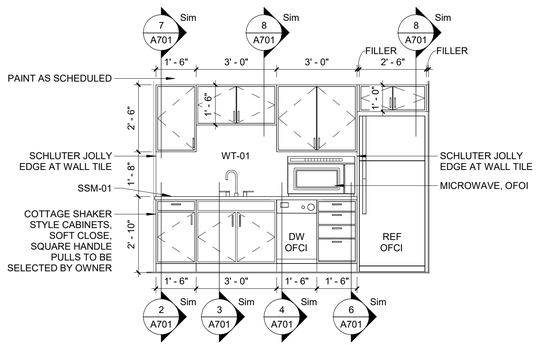
3 **MILL. SECTION**

1" = 1'-0"



2 **MILL. SECTION**

1" = 1'-0"



1 **BREAK ELEVATION**

3/8" = 1'-0"

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INTERIOR ELEVATIONS AND DETAILS

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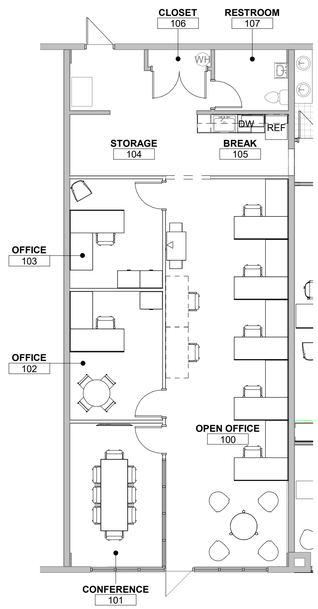
FINISH LEGEND

CODE	MATERIAL	MANUFACTURER	STYLE, COLOR, SIZE	NOTES
FLOOR				
CPT-01	CARPET			NOT USED
SC-01	SEALED CONCRETE	--	MATCH EXISTING	
BASE				
RWB-01	RUBBER WALL BASE	TARKETT	COVE, 63 BURNT UMBER, 4"H	COILS ONLY
WALLS				
PNT-01	PAINT	SHERWIN WILLIAMS	FROSTY WHITE 6196, EGGSHELL, CONFIRM WITH TENANT	FIELD COLOR
PNT-02	PAINT	SHERWIN WILLIAMS	COLOR BY TENANT	ACCENT COLOR
PNT-03	PAINT	SHERWIN WILLIAMS	COLOR TO MATCH RWB-01 WALL BASE, SEMI-GLOSS	DOOR & FRAME COLOR
WT-01	WALL TILE	--	SUBWAY TILE TO MATCH ADJACENT BREAK WALL TILE	MATCH EXISTING
CEILING				
ACT-01	ACOUSTICAL CEILING TILE			MATCH TENANT'S EXISTING STOCK
ETR	EXISTING TO REMAIN	--	--	
CASEWORK				
CSW-01	PRE-MANUFACTURED CASEWORK	RTA CABINET STORE	RADNOR SLAB, DARK GREY	OR EQUAL PRODUCT BY OTHERS
SSM-01	SOLID SURFACE MATERIAL	LX HAUSYS	HI MACS, ARTIC WHITE S006	
MISCELLANEOUS				
WTR-01	WINDOW TREATMENT	DRAPER	SHEERWEAVE, 3% OPACITY, V22 CHARCOAL/GREY, CONFIRM WITH TENANT	FASCIA COLOR TO MATCH EXTERIOR WINDOW FRAME

ROOM FINISH SCHEDULE

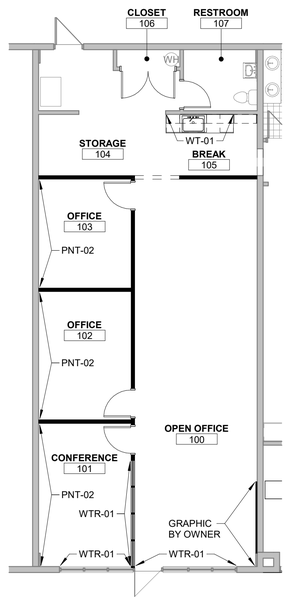
RM. NO.	ROOM NAME	FLOORS		WALL FINISH				CEILING FINISH	CASEWORK			NOTES
		FLOOR	WALL BASE	NORTH WALL	EAST WALL	SOUTH WALL	WEST WALL		COUNTER TOP	BASE CABINET	UPPER CABINET	
100	OPEN OFFICE	SC-01	RWB-01	PNT-01	PNT-01	PNT-01	PNT-01	OTS, PNT-01				
101	CONFERENCE	SC-01	RWB-01	PNT-01	PNT-01	PNT-02	PNT-01	ACT-01				
102	OFFICE	SC-01	RWB-01	PNT-01	PNT-01	PNT-02	PNT-01	ACT-01				
103	OFFICE	SC-01	RWB-01	PNT-01	PNT-01	PNT-02	PNT-01	ACT-01				
104	STORAGE	SC-01	RWB-01	PNT-01	PNT-01	PNT-01	PNT-01	ACT-01				
105	BREAK	SC-01	RWB-01	PNT-01	PNT-01	PNT-01	PNT-01	ACT-01	SSM-01	CSW-01	CSW-01	
106	CLOSET	SC-01	RWB-01	PNT-01	PNT-01	PNT-01	PNT-01	ETR				
107	RESTROOM	SC-01	RWB-01	PNT-01	PNT-01	PNT-01	PNT-01	ACT-01				



NOTE: FURNITURE LAYOUT FOR REFERENCE ONLY

2 FFE PLAN

1/8" = 1'-0"



1 FINISH PLAN

1/8" = 1'-0"

KEYNOTE LEGEND

GENERAL NOTES - INTERIOR FINISHES:

1. WHERE MULTIPLE FINISHES ARE LISTED IN ONE AREA OR ROOM ON THE FINISH SCHEDULE, REFER TO FINISH PLANS FOR CLARIFICATION.
2. ALL FINISHES SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURERS LATEST WRITTEN SPECIFICATIONS AND INITIAL MAINTENANCE INSTRUCTIONS.
3. NEW DRYWALL SURFACES SHALL RECEIVE (1) COAT OF PRIMER AND (2) FINISH COATS.
4. INSTALLATION OF NEW FINISHES BY THE CONTRACTOR SHALL INDICATE ACCEPTANCE OF WALL AND FLOOR PREPARATION, AND FULL RESPONSIBILITY FOR COMPLETED WORK.
5. CONTRACTOR SHALL SUBMIT TO TENANT. FOR REVIEW AND APPROVAL, SAMPLES OR DRAW DOWNS OF FINISHES AND MATERIALS SPECIFIED IN "FINISH SCHEDULE".
6. EXISTING SUB FLOOR SHALL BE FLASH-PATCHED AT ALL AREAS WHERE FLOOR IS NOT LEVEL OR TRUE.
7. GENERAL CONTRACTOR SHALL VERIFY WITH TENANT THE PLACEMENT OF ALL ATTIC STOCK OF NEW FINISH MATERIALS, I.E.: CARPET, VINYL COMPOSITION TILE, VINYL BASE, ETC. FOR TENANT STORAGE.
8. INSTALL METAL TRANSITION STRIP WHERE WALL TILE MEETS PAINTED GYP. BD. WALL IN ALL VERTICAL AND/ OR HORIZONTAL CONDITIONS, UNLESS NOTED OTHERWISE.
9. HOLLOW METAL FRAMES SHALL RECEIVE PNT-03 PAINT WITH SEMI-GLOSS FINISH.

0' 2' 4' 8' 16'

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FINISH PLAN

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MECHANICAL ABBREVIATIONS

(ALPHABETICAL BY ABBREVIATION)

ABBREVIATION	LONG FORM
ABV	ABOVE
AC OR ACU	AIR-CONDITIONING UNIT
AHAP	AS HIGH AS POSSIBLE
AHU	AIR-HANDLING UNIT
AUTO	AUTOMATIC
BLW	BELOW
C	CHILLER
CD	CONDENSATE
CF	CABINET FAN
CFM	CUBIC FEET PER MINUTE
CH	CABINET HEATER
CHP	CHILLED WATER PUMP
CLNG OR CLG	CEILING
CONC	CONCRETE
CP OR CWP	CONDENSER WATER PUMP
CS	CONDENSER WATER SUPPLY
CR	CONDENSER WATER RETURN
CRAC OR CACU	COMPUTER ROOM AIR-CONDITIONING UNIT
CREF	CHILLER ROOM EXHAUST FAN
CRU	CONDENSATE (STEAM) RETURN UNIT
CT	COOLING TOWER CELL
CTU	CONDENSATE (STEAM) TRANSFER UNIT
CU	CONDENSING UNIT
DV	CONSTANT VOLUME TERMINAL BOX
DEF	DISHWASER EXHAUST FAN
DMPR	DAMPER
DN	DOWN
EA	EACH
EBH	ELECTRIC BASEBOARD HEATER
EDH	ELECTRIC DUCT-MOUNTED HEATER
EF	EXHAUST FAN
EG	EXHAUST GRILLE
ER	EXHAUST REGISTER
EUH	ELECTRIC UNIT HEATER
EXH	EXHAUST
FD	FIRE DAMPER
FCU	FAN-COIL UNIT
FF	FINAL FILTER
FFCH	FORCED-FLOW CABINET HEATER
FFU	FAN FILTER UNIT
FP	FAN POWERED TERMINAL BOX
GPM	GALLONS PER MINUTE
HC	HEATING COIL
HUM	HUMIDIFIER
HWP OR HP	HEATING WATER PUMP
HX	HEAT EXCHANGER
KEF	KITCHEN (GREASE HOOD) EXHAUST FAN
KW	KILOWATTS
LD	LINEAR SUPPLY DIFFUSER
MOT	MOTORIZED
MTD	MOUNTED
MUAF	MAKE-UP AIR FAN
MUAHU	MAKE-UP AIR-HANDLING UNIT
OA	OUTSIDE AIR
OAF	OUTSIDE AIR FAN
OPG OR OPNG	OPENING

NOT ALL ABBREVIATIONS ON THIS LIST ARE NECESSARILY USED ON THIS PROJECT

MECHANICAL ABBREVIATIONS CONT.

(ALPHABETICAL BY ABBREVIATION)

ABBREVIATION	LONG FORM
PF	PRE-FILTER
PLNM	PLENUM
RA	RETURN AIR
RAF	RETURN AIR FAN
RAG OR RG	RETURN AIR GRILLE
RAR OR RR	RETURN AIR REGISTER
RAS	RETURN AIR SILENCER
RE:	IN REFERENCE TO
RTU	ROOFTOP UNIT
SA	SUPPLY AIR
SAF OR SF	SUPPLY AIR FAN
SAG OR SG	SUPPLY AIR GRILLE
SAR OR SR	SUPPLY AIR REGISTER
SAS	SUPPLY AIR SILENCER
SCHP	SECONDARY CHILLED WATER PUMP
SD	SMOKE DAMPER OR DETECTOR
SPCHP	SPECIAL PROCESS CHILLED WATER PUMP
TA	THROW AWAY (FILTER TYPE)
TDEF	TRUCK DOCK EXHAUST FAN
TEF	TOILET EXHAUST FAN
TRANS	TRANSITION OR TRANSFER
TYP	TYPICAL
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
VF	VENTILATION FAN
VFD	VARIABLE FREQUENCY DRIVE
V V	VARIABLE VOLUME TERMINAL BOX
W/	WITH
XFMR OR TFMR	TRANSFORMER
XT OR EX	EXPANSION TANK

NOT ALL ABBREVIATIONS ON THIS LIST ARE NECESSARILY USED ON THIS PROJECT

MECHANICAL GENERAL NOTES

1. PRIOR TO SUBMITTING BID, VISIT THE SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW GENERAL NOTES, SPECIFICATIONS AND ALL OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS WHICH MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
2. COORDINATE THE INSTALLATION OF MECHANICAL SYSTEMS WITH OTHER TRADES TO ENSURE A NEAT AND ORDERLY INSTALLATION. DUCTWORK AND PIPING SHALL BE ROUTED TO AVOID CONFLICTS WITH ELECTRICAL PANELS, LIGHTING FIXTURES, ETC.
3. TAKE NECESSARY PRECAUTIONS TO AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN FOR NEW INSTALLATION DURING WORK. REPAIR ANY DAMAGE CAUSED DURING CONSTRUCTION AT NO COST TO THE OWNER.
4. ALL MECHANICAL EQUIPMENT SHOWN ON THE MECHANICAL PLANS SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS OTHERWISE NOTED.
5. NEW MECHANICAL EQUIPMENT, DUCTWORK AND PIPING IS SHOWN AT APPROXIMATE LOCATIONS. FIELD MEASURE FINAL DUCTWORK AND PIPING LOCATIONS PRIOR TO FABRICATION AND SHALL MAKE ADJUSTMENTS AS REQUIRED TO FIT THE DUCTWORK AND PIPING WITHIN THE AVAILABLE SPACE. FIELD VERIFY FINAL LOCATIONS TO INSTALL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS REGARDING SERVICE CLEARANCE AND PROPER AIRFLOW CLEARANCE AROUND EQUIPMENT.
6. REFER TO ARCHITECTURAL DRAWINGS FOR ALL RELATED CONSTRUCTION DETAILS AS APPLICABLE TO THE HVAC SYSTEM. CHASE AND PENETRATIONS INTENDED FOR DUCTWORK AND PIPING SHALL BE VERIFIED WITH ARCHITECTURAL DRAWINGS PRIOR TO INSTALLATION.
7. COORDINATE LOCATION OF ROOF PENETRATIONS WITH THE EXISTING CONDITIONS AND ARCHITECTURAL DRAWINGS.
8. SEAL ALL PENETRATIONS THROUGH THE BUILDING COMPONENTS IN ACCORDANCE WITH THE CONSTRUCTION SPECIFICATIONS. FIREPROOF ALL PENETRATIONS THROUGH FIRE RATED COMPONENTS IN ACCORDANCE WITH U.L. REQUIREMENTS.
9. 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.
10. LOCATION OF CEILING DIFFUSERS, REGISTERS, AND GRILLES SHALL BE ADJUSTED AS REQUIRED TO ACCOMMODATE FINAL CEILING AND LIGHTING LOCATIONS.
11. DUCTWORK CROSSING FIRE RATED WALL OR OTHER FIRE RATED ASSEMBLIES SHALL BE MINIMUM 26 GAUGE SHEET METAL.
12. PROVIDE FIRE AND/OR FIRE/SMOKE DAMPERS IN DUCTWORK AT CEILINGS AND WALLS AS REQUIRED BY BUILDING CODE AUTHORITY HAVING JURISDICTION. FIRE AND FIRE/SMOKE DAMPERS SHALL CONFORM TO NFPA AS APPLICABLE.
13. PROVIDE WALL AND/OR DUCT ACCESS PANELS OR DOORS FOR ACCESS TO ALL FIRE AND/OR FIRE/SMOKE DAMPERS. ACCESS PANEL OR DOOR SHALL BE MINIMUM SIZE OF 6"x6" AND SHALL BE INSTALLED WITH 12" OF DAMPER. PROVIDE A REMOVABLE DUCT SECTION WHERE DUCT SIZE IS TOO SMALL FOR A 6"x6" ACCESS DOOR.
14. THERMOSTATS AND HUMIDISTATS SHALL BE LOCATED AND SET BY MECHANICAL CONTRACTOR AND WIRED IN CONDUIT BY ELECTRICAL CONTRACTOR. VERIFY EXACT LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION. MOUNTING HEIGHTS SHALL BE 48" AFF TO MEET ADA REQUIREMENTS UNLESS OTHERWISE NOTED ON PLANS.
15. COORDINATE THE LOCATION AND ELEVATION OF WALL-MOUNTED DEVICES WITH ANY WALL MOUNTED ITEMS INDICATED ON THE ARCHITECTURAL DRAWINGS. CONTRACTOR WILL NOT BE REIMBURSED FOR RELOCATION OF ANY WALL-MOUNTED DEVICES CAUSED BY A LACK OF COORDINATION.
16. ALL BRANCH DUCT CONNECTIONS AND TAKE-OFFS TO INDIVIDUAL DIFFUSERS, REGISTERS, AND GRILLES SHALL HAVE A PREFABRICATED 45 DEGREE, HIGH EFFICIENCY, RECTANGULAR/ROUND BRANCH DUCT TAKEOFF FITTING WITH MANUAL BALANCING DAMPER AND LOCKING QUADRANT.
17. BRANCH DUCTWORK TO AIR OUTLETS SHALL BE SAME SIZE AS OUTLET NECK SIZE UNLESS OTHERWISE NOTED.
18. RIGID DUCTWORK INSULATION: PROVIDE R-6 MINIMUM INSULATION WRAP ON ALL CONCEALED DUCTWORK. PROVIDE R-6 MINIMUM INTERNAL DUCT LINER ON ALL EXPOSED DUCTWORK. DUCT SIZES ON MECHANICAL PLANS INDICATE CLEAR INSIDE DIMENSIONS, SHEET METAL SIZES SHALL INCREASE ACCORDINGLY. PROVIDE R-12 MINIMUM INSULATION ON ALL DUCTWORK INSTALLED IN UNCONDITIONED SPACES. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
19. FLEXIBLE DUCT WORK SHALL BE THERMAFLEX TYPE MKE, FLEXMASTER TYPE 8M, OR APPROVED EQUAL, SHALL BE LISTED UNDER 181 AS CLASS 1 AIR DUCT AND SHALL BE PROVIDED WITH INTEGRAL R-6 MINIMUM FIBERGLASS INSULATION. FLEXIBLE DUCTWORK SHALL NOT EXCEED 5'-0" IN LENGTH AND SHALL BE INSTALLED AND SUPPORT TO AVOID SHARP BENDS AND SAGGING.
20. WALL MOUNTED DIFFUSERS AND GRILLES SHALL BE PROVIDED WITH SUITABLE MOUNTING FRAME TO MATCH WALL CONSTRUCTION. COORDINATE WITH ARCHITECTURAL DRAWINGS.

DUCTWORK LEGEND

(REFER TO SPECIFICATIONS SECTIONS 15815 AND 15820 FOR ADDITIONAL INFORMATION)

SINGLE LINE	DESCRIPTION	DOUBLE LINE
	ROUND ELBOW DOWN	
	ROUND ELBOW UP	
	OFFSET TO CHANGE ELEVATION (AT 30° WHEN POSSIBLE. ARROW SLOPES DN, U.N.O.)	
	ROUND RADIUS ELBOW	
	90° STRAIGHT TEE	
	90° CONICAL TEE	
	45° LATERAL TAP	
	45° LATERAL CONICAL TEE	
	SIZE OR SHAPE TRANSITION	
	ROUND FLEXIBLE DUCT	
	RECTANGULAR ELBOW DOWN	
	RECTANGULAR ELBOW UP	
	OFFSET TO CHANGE ELEVATION (AT 30° WHERE POSSIBLE. ARROW SLOPES DN., U.N.O.)	
	RECTANGULAR RADIUS ELBOW	
	RECTANGULAR ELBOW WITH TURNING VANES	
	SPLIT BRANCH TAKE-OFF WITH SQUARE ELBOW & SPLITTER DAMPER	
	SPLIT BRANCH TAKE-OFF WITH RADIUS ELBOW & SPLITTER DAMPER	
	SPLIT BRANCH TAKE-OFF TEE WITH STATIONARY SPLITTER DAMPER	
	BRANCH TAKE-OFF WITH 45° LEAD IN TAP	
	INSULATED/LINED DUCTWORK (U.N.O.)	
	SQUARE FACED CEILING DIFFUSER 4-WAY DIRECTIONAL THROW (U.N.O.)	
	ROUND FACED CEILING DIFFUSER	
OR	CEILING RETURN OR EXHAUST AIR GRILLE OR REGISTER	
	SIDEALL SUPPLY GRILLE OR REGISTER	
	SUPPLY DUCT RISER	
	RETURN, EXHAUST OR OUTSIDE AIR DUCT RISER	
	MANUAL BALANCING DAMPER	
	AUTOMATIC (MOTOR-OPERATED) DAMPER	
	FIRE DAMPER	
	GRAVITY BACKDRAFT DAMPER	
	COMBINATION FIRE AND SMOKE DAMPER WITH SMOKE DETECTOR	
	SMOKE DAMPER (AUTOMATIC) WITH SMOKE DETECTOR	
S	DUCT MOUNTED SMOKE DETECTOR	S OR S

NOT ALL SYMBOLS ON THIS LIST ARE NECESSARILY USED ON THIS PROJECT

STANDARD MECHANICAL SYMBOLS

VALVES, FITTINGS, & DEVICES

SYMBOL	DESCRIPTION
	GATE VALVE
	BALL VALVE
	GLOBE VALVE
	BUTTERFLY VALVE
	PLUG VALVE
	ANGLE VALVE
	CHECK VALVE
	AUTOMATIC CONTROL VALVE (STRAIGHT THROUGH)
	AUTOMATIC CONTROL VALVE (3-WAY)
	AUTOMATIC CONTROL VALVE (ANGLE)
	AUTOMATIC CONTROL VALVE (STRAIGHT THROUGH)
	SOLENOID VALVE
	PRESSURE REDUCING VALVE
	PRESSURE RELIEF VALVE
	GAUGE COCK
	PRESSURE GAUGE WITH GAUGE COCK
	THERMOMETER
	THERMOMETER WELL
	TEST PLUG
F	FLOW METER
T	TEMPERATURE SENSOR
P	PRESSURE SENSOR
DP	DIFFERENTIAL PRESSURE SWITCH
T	IMMERSION THERMOSTAT
	MANUAL AIR VENT
	AUTOMATIC AIR VENT
FS	FLOW SWITCH
	ORIFICE
	PIPE SLEEVE THRU WALL OR FLOOR
	EXPANSION JOINT
	FLEXIBLE PIPE JOINT
	PIPE GUIDE
	ANCHOR
	STRAINER (Y-TYPE)
	STRAINER (BASKET TYPE)
	UNION
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
T	THERMOSTAT
H	HUMIDISTAT
FSC	FAN SPEED CONTROLLER

PIPING

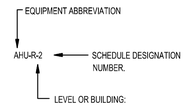
CS	CONDENSER WATER SUPPLY
CR	CONDENSER WATER RETURN
D	CONDENSATE DRAIN

NOT ALL SYMBOLS ON THIS LIST ARE NECESSARILY USED ON THIS PROJECT

OTHER SYMBOLS

SYMBOL	DESCRIPTION
	INDICATES CONNECTION TO EXISTING DUCT OR PIPE

GENERAL EQUIPMENT DESIGNATION KEY:



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seal/signature

STATE OF MISSOURI
RYAN BREWER
NUMBER PE-2020010759
PROFESSIONAL ENGINEER

05/30/2024

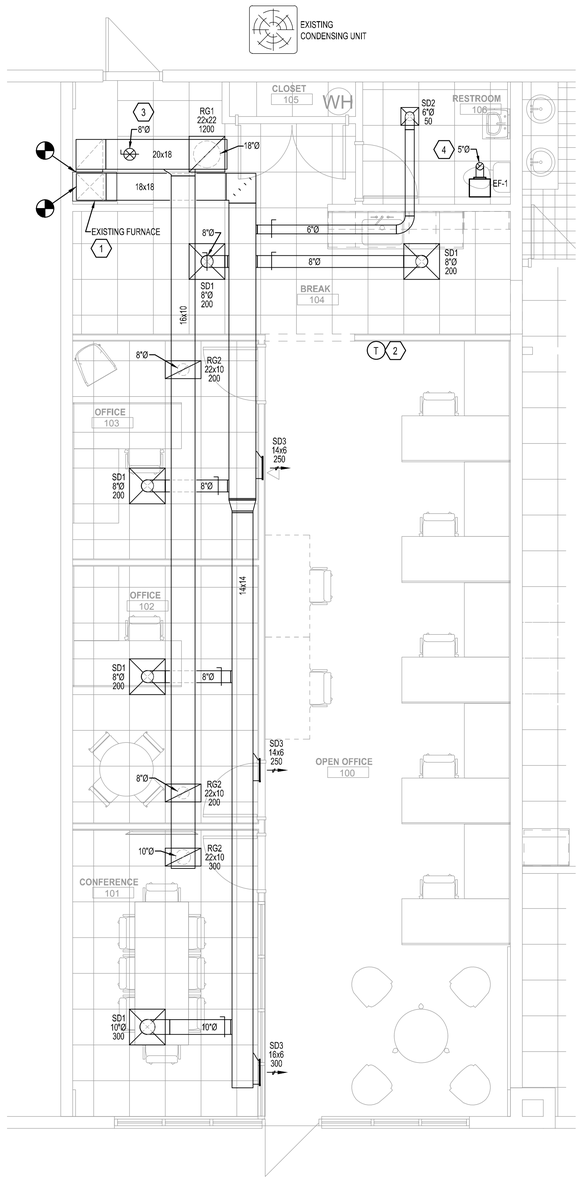
project number	2024-023
date	05.30.2024
issued for	PERMIT

rev	date	description

MECHANICAL NOTES, SYMBOLS, & ABBREVIATIONS

sheet number

M101



1 MECHANICAL FLOOR PLAN

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

GENERAL NOTES

(NOT ALL NOTES APPLY)

1. REFERENCE SHEET M101 FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS.
2. CONTRACTOR, AT THEIR DISCRETION, MAY REUSE EXISTING DUCTWORK IF IT IS IN PROPER WORKING CONDITION AND MEETS THE DESIGN INTENT OF THE DRAWINGS.

KEYED NOTES:

1. EXISTING FURNACE AND ASSOCIATED CONDENING UNIT TO REMAIN. CLEAN AND REFURBISH TO LIKE-NEW CONDITION. BALANCE SUPPLY AIR OF FURNACE TO 1950 CFM AND OUTSIDE AIR TO 200 CFM.
2. RELOCATE EXISTING THERMOSTAT. VERIFY FINAL LOCATION OF THERMOSTAT WITH OWNER. MOUNT TOP OF THERMOSTAT AT MAXIMUM 48" AFF PER ADA REQUIREMENTS.
3. IF NOT ALREADY EXISTING, ROUTE OUTSIDE AIR DUCT UP THROUGH ROOF AND TERMINATE WITH ROOF HOOD.
4. ROUTE EXHAUST AIR DUCT UP THROUGH ROOF AND TERMINATE WITH ROOF CAP. MAINTAIN MINIMUM 10'-0" CLEARANCE FROM ALL MECHANICAL AIR INTAKES.

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MECHANICAL FLOOR PLAN

sheet number

M201

EXHAUST FAN SCHEDULE

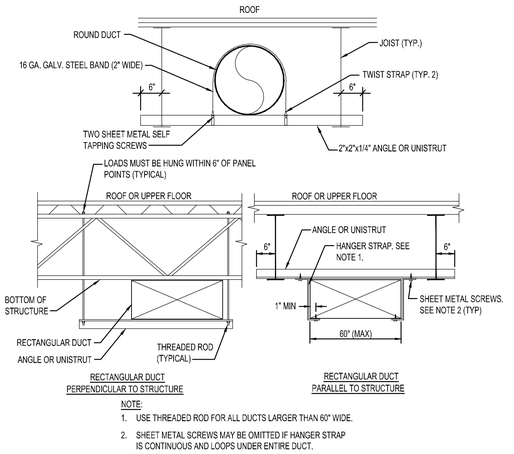
MARK	MANUFACTURER	MODEL	MOUNTING	VOLUME (CFM)	ESP (IN)	FAN RPM	DRIVE (BELT/DIRECT)	MOTOR WATTS	ELECTRICAL VOLTS/PH	WEIGHT (LBS)	NOTE
EF-1,2	GREENHECK	SP-B70	CEILING	70	0.25	660	DIRECT	15	120/1	15	1,2

NOTES:
1 PROVIDE WITH BACK DRAFT DAMPER, SPEED CONTROLLER FOR BALANCING, AND DISCONNECT SWITCH. COORDINATE GRILLE FINISH WITH OWNER.
2 FAN SHALL BE INTERLOCKED WITH RESTROOM LIGHTS.

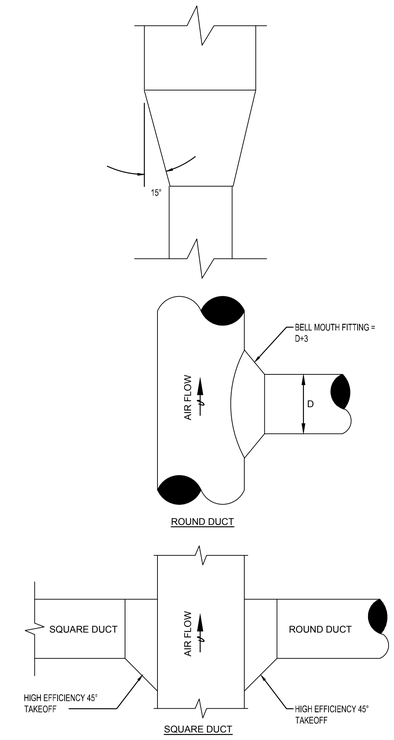
GRILLE, REGISTER, AND DIFFUSER SCHEDULE

MARK	MANUFACTURER	MODEL	FACE TYPE	MOUNTING LOCATION	FACE SIZE (IN)	NOTES
SD1	PRICE	SCD	SQUARE CONE	CEILING	24"x24"	1,2,3,4,5,6
SD2	PRICE	SCD	SQUARE CONE	CEILING	12"x12"	1,3,4,5,6
SD3	PRICE	520D	LOUVERED	DUCT	NECK + 2"	1,3,4,5,6
RG1	PRICE	80	EGGCRATE	CEILING	24"x24"	1,3,4,6
RG2	PRICE	80	EGGCRATE	CEILING	24"x12"	1,3,4,6

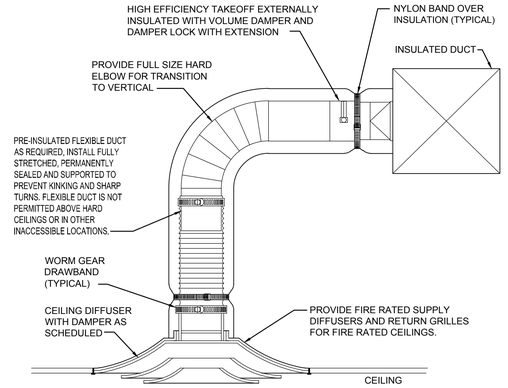
NOTES:
1 NECK SIZE SHOWN ON DRAWINGS.
2 4-WAY THROW PATTERN, UNLESS SHOWN OTHERWISE ON DRAWINGS.
3 BAKED ENAMEL FINISH TO MATCH CEILING/WALL COLOR, COORDINATE WITH ARCHITECTURAL PLANS.
4 PROVIDE NECK FOR DUCT CONNECTION.
5 BRANCH DUCT SIZE SHALL BE SAME AS NECK SIZE UNLESS OTHERWISE SHOWN ON DRAWINGS.
6 FRAME TYPE TO MATCH CONSTRUCTION OF MOUNTING LOCATION, COORDINATE WITH ARCHITECTURAL PLANS.



3 DUCT HANGERS AND SUPPORTS
NOT TO SCALE



2 DUCT TAKEOFFS AND FITTINGS
NOT TO SCALE



1 LAY-IN CEILING DIFFUSER
NOT TO SCALE

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STATE OF MISSOURI
RYAN BREWER
NUMBER PE-2020010759
PROFESSIONAL ENGINEER
Ryan Brewer

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MECHANICAL SCHEDULES & DETAILS

sheet number

M301

15000 - BASIC MECHANICAL REQUIREMENTS

DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND ALL OTHER SPECIFICATION SECTIONS, APPLY TO THIS AND THE OTHER SECTIONS OF DIVISION 15.

READ THE SPECIFICATIONS AND REVIEW DRAWINGS FOR ALL DIVISIONS OF WORK AND COORDINATE AND THE WORK OF SUBCONTRACTORS WITH ALL DIVISIONS OF WORK. PROVIDE SUBCONTRACTORS WITH A COMPLETE SET OF BID DOCUMENTS.

SCHEDULE THE COMPLETION AND INSPECTION OF WORK AND THE WORK OF SUBCONTRACTORS WORK TO COMPLY WITH THE SCHEDULE AND THE PROJECT COMPLETION DATE.

VISIT THE SITE PRIOR TO SUBMITTAL OF BID TO DETERMINE CONDITIONS AFFECTING THE WORK. ANY ITEMS WHICH ARE NOT COVERED IN THE BID DOCUMENTS OR ANY PROPOSED SUBSTITUTIONS SHALL BE LISTED SEPARATELY AND QUALIFIED IN THE BID. SUBMITTAL OF BID SHALL SERVE AS EVIDENCE OF KNOWLEDGE OF EXISTING CONDITIONS AND ANY MODIFICATIONS WHICH ARE REQUIRED TO MEET THE INTENT OF THE DRAWINGS AND SPECIFICATIONS. FAILURE TO VISIT THE SITE DOES NOT RELIEVE RESPONSIBILITY IN PERFORMANCE OF WORK.

READ ALL RELEVANT DOCUMENTS, BECOME FAMILIAR WITH THE JOB, SCOPE OF WORK, TYPE OF GENERAL CONSTRUCTION, AND THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS. ALSO UNDERSTAND THE PURPOSE FOR WHICH THESE DOCUMENTS HAVE BEEN PREPARED AND BECOME COGNIZANT OF ALL THE DETAILS INVOLVED. COORDINATE WORK WITH THAT OF OTHERS.

DEFINITIONS:

FURNISH - PURCHASE AND DELIVER TO PROJECT SITE COMPLETE WITH EVERY NECESSARY APPURTENANCE AND SUPPORT.
INSTALL - UNLOAD AT THE DELIVERY POINT AT THE SITE AND PERFORM EVERY OPERATION NECESSARY TO ESTABLISH SECURE MOUNTING AND CORRECT OPERATION AT THE PROPER LOCATION IN THE PROJECT.
PROVIDE - FURNISH AND INSTALL

GENERAL REQUIREMENTS

PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION, INCIDENTALS AND DETAILS NECESSARY TO PROVIDE A COMPLETE MECHANICAL SYSTEM AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS, AND AS REQUIRED BY JOB CONDITIONS. ALL WORK NOT SPECIFICALLY NOTED AS BEING BY THE OTHERS SHALL BE PROVIDED. CLOSELY COORDINATE THE ENTIRE INSTALLATION WITH THE ARCHITECT-ENGINEER, AS REQUIRED.

THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER AND ANY MATERIAL OR LABOR CALLED FOR IN ONE SHALL BE FURNISHED AND INSTALLED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN BOTH. 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 SIMILAR CHARACTER, SHALL BE FURNISHED AND INSTALLED AS PART OF CONTRACT.

WHERE THE DRAWINGS OR SPECIFICATIONS CALL FOR ITEMS WHICH EXCEED CODES OR THE OWNERS CRITERIA, PROVIDE THE SYSTEM WITH THE MORE STRINGENT REQUIREMENTS AS DESIGNED AND DESCRIBED ON THESE DRAWINGS, UNLESS SPECIFICALLY NOTED OTHERWISE.

ALL MECHANICAL WORK SHALL BE INSTALLED SO AS TO BE READILY ACCESSIBLE FOR OPERATING, SERVICING, MAINTAINING, AND REPAIRING. THIS CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUFFICIENT SERVICE ACCESS TO ALL EQUIPMENT.

ALL WORK SHALL BE PERFORMED IN A NEAT PROFESSIONAL MANNER USING GOOD ENGINEERING PRACTICES.

UNLESS SPECIFICALLY NOTED OTHERWISE, MATERIALS, PRODUCTS, AND EQUIPMENT, INCLUDING ALL COMPONENTS THEREOF, SHALL BE NEW, UNDERWRITERS LABORATORIES LISTED AND LABELED AND SIZED IN CONFORMITY WITH REQUIREMENTS OF STATE AND LOCAL CODES, WHICHEVER IS MORE STRINGENT.

CODES

ALL WORK SHALL CONFORM TO THE OWNER'S CRITERIA, THE STATE'S, COUNTY'S, CITY'S AND LOCAL CODES AND ORDINANCES, SAFETY AND HEALTH CODES, NFPA CODES, ENERGY CODES AND ALL OTHER APPLICABLE CODES AND REQUIREMENTS. INQUIRE INTO AND COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, AND REGULATIONS. INCLUDE ANY CHANGES REQUIRED BY CODES IN THE BID AND IF THESE CHANGES ARE NOT INCLUDED IN THE BID, THEY MUST BE QUALIFIED AS A SEPARATE LINE ITEM IN THE BID. AFTER CONTRACT IS ISSUED, NO ADDITIONAL COST DUE TO CODE ISSUES SHALL BE REIMBURSED BY THE OWNER.

LICENSES, PERMITS, COMMISSIONING, INSPECTIONS & FEES

OBTAIN AND PAY FOR ALL LICENSES, PERMITS, COMMISSIONING, INSPECTIONS, AND FEES REQUIRED OR RELATED TO THIS WORK.

PROVIDE TO THE OWNER-ARCHITECT A COMMISSIONING PLAN, PRELIMINARY COMMISSIONING REPORT, FINAL COMMISSIONING REPORT, AND CERTIFICATES OF INSPECTION AND FINAL INSPECTION APPROVAL AT COMPLETION OF PROJECT.

TRADE NAMES, MANUFACTURERS AND SHOP DRAWINGS

WHERE TRADE NAMES AND MANUFACTURERS ARE USED ON THE DRAWINGS OR IN THE SPECIFICATIONS, THE EXACT EQUIPMENT SHALL BE USED AS A MINIMUM FOR THE BASE BID. MANUFACTURERS CONSIDERED AS AN EQUAL OR BETTER IN ALL ASPECTS TO THAT SPECIFIED WILL BE SUBJECT TO APPROVAL IN WRITING BY ARCHITECT-ENGINEER PRIOR TO BID THROUGH SHOP DRAWING SUBMITTAL PROCESS, FOR ACCEPTANCE PRIOR TO INSTALLATION. ANY CHANGES TO ELECTRICAL SERVICE, STRUCTURAL FRAMING, ETC. OR ANY OTHER MODIFICATION THAT IS REQUIRED BY THE USE OF ALTERNATE EQUIPMENT SHALL BE COORDINATED WITH OTHER TRADES AND SHALL INCLUDE ALL COSTS IN BID FOR THE REQUIRED CHANGES. THE USE THE USE OF ANY UNAUTHORIZED EQUIPMENT SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT NO EXPENSE TO THE OWNER.

GUARANTEE

GUARANTEE ALL MATERIALS AND WORK PROVIDED UNDER THIS CONTRACT AND MAKE GOOD, REPAIR OR REPLACE AT NO EXPENSE TO THE OWNER, ANY DEFECTIVE WORK, MATERIAL, OR EQUIPMENT WHICH MAY BE DISCOVERED WITHIN A PERIOD OF TWELVE (12) MONTHS FROM THE DATE OF ACCEPTANCE (IN WRITING) OF THE INSTALLATION. EXTENDED WARRANTIES ARE AS SPECIFIED WITH INDIVIDUAL EQUIPMENT.

QUALITY ASSURANCE

INDUSTRY STANDARDS AND CODES: UNLESS MODIFIED BY THESE SPECIFICATIONS, THE DESIGN, MANUFACTURER, TESTING AND METHOD OF INSTALLING ALL MATERIALS, APPARATUS AND EQUIPMENT SHALL CONFORM TO THE FOLLOWING:

1. ARI CODE FOR REFRIGERATION APPARATUS
2. ANSI B9.1 SAFETY CODE FOR MECHANICAL REFRIGERATION
3. STANDARDS OF NATIONAL FIRE PROTECTION ASSOCIATION
4. SMACNA
5. ASHRAE

RECORD DRAWINGS

MAINTAIN ONE COPY OF DRAWINGS ON THE JOB SITE TO RECORD DEVIATIONS FROM CONTRACT DRAWINGS, SUCH AS: LOCATION OF CONCEALED PIPING VALVES AND DUCTS, REVISIONS, ADDENDUMS, AND CHANGE ORDERS, AND SIGNIFICANT DEVIATIONS MADE NECESSARY BY FIELD CONDITIONS, APPROVED EQUIPMENT SUBSTITUTIONS, AND CONTRACTOR'S COORDINATION WITH OTHER TRADES.

AT COMPLETION OF THE PROJECT AND BEFORE FINAL APPROVAL, MAKE ANY FINAL CORRECTIONS TO DRAWINGS AND CERTIFY THE ACCURACY OF EACH PRINT BY SIGNATURE THEREON. A SET OF REPRODUCIBLE DRAWINGS ALONG WITH ONE SET OF BLULINES OF THE MOST RECENT SET OF DRAWINGS WITH TEMPERATURE CONTROL DRAWINGS INCLUDED SHALL BE DELIVERED TO THE ARCHITECT UPON COMPLETION OF THE WORK AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.

DISCREPANCIES IN DOCUMENTS

DRAWINGS (PLANS, SPECIFICATIONS, AND DETAILS) ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION AND INTENT OF THE MECHANICAL SYSTEMS. WHERE DRAWINGS, EXISTING SITE CONDITIONS, SPECIFICATIONS OR OTHER TRADES CONFLICT OR ARE UNCLEAR, ADVISE THE ARCHITECT-ENGINEER IN WRITING, OF VARIATIONS TO CONTRACT DOCUMENTS PRIOR TO SUBMISSION OF BID. OTHERWISE, ARCHITECT-ENGINEER'S INTERPRETATION OF CONTRACT DOCUMENTS OR CONDITIONS SHALL BE FINAL WITH NO ADDITIONAL COMPENSATION PERMITTED.

PHASING REQUIREMENTS

INCLUDE IN BID ALL NECESSARY SERVICE REQUIRED TO KEEP THE OPERATING PHASE OF THE PROJECT'S HVAC, PLUMBING AND SPRINKLER SERVICE IN OPERATION. IF APPLICABLE, SCHEDULE IN WRITING WITH ARCHITECT ONE WEEK PRIOR TO ANY SHUT DOWN OF THE HVAC, PLUMBING OR FIRE PROTECTION SYSTEMS.

DEMOLITION

COORDINATE THE DEMOLITION OF EXISTING WORK AND THE DEMOLITION PROVIDED BY OTHER. COORDINATE ANY EXISTING EQUIPMENT REQUIRED TO BE LEFT INTACT.

VERIFY SCOPE OF AND THE REMOVAL OF ALL EXISTING FIRE PROTECTION, PLUMBING FIXTURES, PIPING, HVAC UNITS, REFRIGERANT RECAPTURE, EXHAUST FANS, ETC. AND ASSOCIATED ROOF CURBS NOT TO BE REUSED ON THIS PROJECT, UNLESS SPECIFICALLY NOTED OTHERWISE. VERIFY ALL PRESUMED ABANDONED EQUIPMENT, PIPES, DUCTWORK, AND EQUIPMENT PRIOR TO REMOVAL. ROOF CURBS SHALL BE REMOVED AND THE ROOF PATCHED. ALL EXTRANEOUS ITEMS IN THE SPACE OR ON THE ROOF NOT APPLICABLE TO THE NEW WORK MUST BE REMOVED AND ROOF/WALL/FLOOR PATCHED/REPAIRED TO MATCH EXISTING STRUCTURE. EXISTING ABANDONED PIPES, DUCTS, OR EQUIPMENT IN THE FLOOR, EMBEDDED IN CONCRETE, OR OTHERWISE INACCESSIBLE ARE TO BE CUT OFF AND SEALED BELOW OR WITHIN FLOOR OR WALL LEVEL WHEN THEY ARE NOT TO BE REUSED IN THIS PROJECT. ABANDONED PIPING AND/OR DUCTWORK MUST BE REMOVED TO POINT OF ORIGIN. CONFIRM THE EXTENT OF DEMOLITION PRIOR TO BID AND INCLUDE IN BID PROPOSAL.

CUTTING AND PATCHING

PERFORM ALL CUTTING AND PATCHING AS REQUIRED FOR THE INSTALLATION OF THE WORK UNDER THIS SPECIFICATION. NO CUTTING OF THE STRUCTURE SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER OR ARCHITECT.

PATCHING SHALL BE OF THE SAME WORKMANSHIP, MATERIAL AND FINISH AND SHALL MATCH ACCURATELY ALL SURROUNDING CONSTRUCTION IN A MANNER SATISFACTORY TO THE ARCHITECT.

EXISTING UTILITIES, ETC. THAT ARE DAMAGED DURING THE CONSTRUCTION PERIOD, WHETHER OR NOT DUE TO NEGLIGENCE SHALL BE REPAIRED OR REPLACED AND LEFT IN A CONDITION SUITABLE TO THE ARCHITECT.

SLEEVES

PROVIDE SLEEVES TO PROTECT EQUIPMENT OR FACILITIES IN THE INSTALLATION. EACH SLEEVE SHALL EXTEND THROUGH ITS RESPECTIVE FLOOR, WALL OR PARTITION AND SHALL BE CUT FLUSH WITH EACH SURFACE EXCEPT SLEEVES THAT PENETRATE THE FLOOR, WHICH SHALL EXTEND 2" ABOVE THE FLOOR. COORDINATE THROUGH THE ARCHITECT ANY CORE DRILLING OR CUTTING OF OPENINGS IN MASONRY FLOORS OR WALLS.

ALL SLEEVES AND OPENINGS THROUGH FIRE RATED WALLS AND/OR FLOORS SHALL BE FIRE SEALED WITH CALCIUM SILICATE, SILICONE "RTV" FOAM, "3M" FIRE RATED SEALANTS OR EQUAL, SO AS TO RETAIN THEIR FIRE RATING.

SLEEVES IN BEARING AND MASONRY WALLS, FLOORS, AND PARTITIONS SHALL BE STANDARD WEIGHT STEEL PIPE FINISHED WITH SMOOTH EDGES. FOR OTHER THAN MASONRY PARTITIONS, THROUGH SUSPENDED CEILINGS, OR FOR CONCEALED VERTICAL PIPING, SLEEVES SHALL BE NO. 22 U.S.G. GALVANIZED STEEL MINIMUM.

HANGERS

HANGERS SHALL INCLUDE ALL MISCELLANEOUS STEEL SUCH AS ANGLE IRON, BANDS, C-CLAMPS WITH RETAINING CLIPS, CHANNELS, HANGER RODS, ETC., NECESSARY FOR THE INSTALLATION OF WORK.

HANGERS SHALL BE FASTENED TO BUILDING STEEL, CONCRETE, OR MASONRY, BUT NOT TO PIPING. HANGING FROM METAL DECK IS NOT PERMITTED. HANGERS MUST BE ATTACHED TO UPPER CHORD OF BAR JOIST, WHERE INTERFERENCES OCCUR, AND IN ORDER TO SUPPORT DUCTWORK OR PIPING, INSTALL TRAPEZE TYPE HANGERS OR SUPPORTS WHICH SHALL BE LOCATED WHERE THEY DO NOT INTERFERE WITH ACCESS TO FIRE DAMPERS, VALVES, AND OTHER EQUIPMENT. HANGER TYPES AND INSTALLATION METHODS ARE ALSO SUBJECT TO LANDLORD CRITERIA.

HANGERS FOR ALL INSULATED PIPING SHALL BE SIZED AND INSTALLED FOR THE OUTER DIAMETER OF INSULATION. INSTALL 6" LONG SPLIT CIRCLE GALVANIZED SADDLE BETWEEN THE HANGER AND THE PIPE INSULATION.

HANGERS AND PIPING OF DISSIMILAR METALS SHALL BE DI-ELECTRICALLY SEPARATED.

PROVIDE SWAY AND SEISMIC BRACING WHERE REQUIRED BY CODE.

JOB CONDITIONS
PROTECT MATERIALS, APPARATUS AND EQUIPMENT FROM DAMAGE, MOISTURE, DIRT, DEBRIS AND WORK OF OTHER TRADES.

OPERATION MANUALS AND INSTRUCTIONS

PROVIDE OPERATING AND MAINTENANCE INSTRUCTIONS AT THE COMPLETION OF THE PROJECT. SUBMIT THREE HARD BOUND COPIES TO ARCHITECT.

SCHEDULE A MEETING WITH THE OWNER'S REPRESENTATIVE AT THE SITE TO PROVIDE DETAILED INFORMATION ON THE OPERATING AND MAINTENANCE OF EQUIPMENT.

SUBMITTALS
SUBMIT WITHIN THIRTY (30) DAYS AFTER THE DATE OF NOTICE TO PROCEED AND BEFORE PURCHASING ANY MATERIALS OR EQUIPMENT, SUBMIT TO THE ARCHITECT FOR REVIEW, A COMPLETE LIST, IN SIX (6) COPIES, OF ALL MATERIALS INCORPORATED IN THE WORK. THIS LISTING SHALL BE ARRANGED BY THE ORDER OF OCCURRENCE IN THE SPECIFICATIONS, FOLLOWED BY THE ITEMS ON THE DRAWING NOT SPECIFICALLY INCLUDED IN THE SPECIFICATIONS.

AFTER THE LIST HAS BEEN PROCESSED BY THE ARCHITECT, SUBMIT COMPLETE SHOP DRAWINGS AND PRODUCT DATA OF ALL EQUIPMENT. THESE SUBMITTALS SHALL BE SUBMITTED WITHIN THIRTY (30) DAYS AFTER THE PROCESSING DATE OF THE ORIGINAL SUBMITTAL LIST. SUBMISSIONS SHALL BE MADE EARLY ENOUGH IN PROJECT TO ALLOW FOR (10) WORKING DAYS FOR REVIEW BY ARCHITECT-ENGINEER WITHOUT CAUSING DELAYS OR CONFLICTS IN THE PROJECT'S PROGRESS.

ALL SUBMITTALS SHALL BE COMPLETE AND SHALL BE IN THREE-RING, LOOSE -LEAF BINDERS, NO CONSIDERATION WILL BE GIVEN TO PARTIAL SUBMITTALS. UNLESS NOTED OTHERWISE BY ARCHITECT. EACH ITEM SHALL HAVE A COVER PAGE STATING PROJECT, SPECIFICATION AND PARAGRAPH REFERENCE NUMBER, OR DRAWING REFERENCE NUMBER, AND SCHEDULED EQUIPMENT IDENTIFICATION NUMBER, IF APPLICABLE.

THE REVIEW OF SUBMITTALS DOES NOT RELIEVE RESPONSIBILITY OF SHOP DRAWING ERRORS IN DETAILS, SIZES, QUANTITIES, WIRING DIAGRAM ARRANGEMENTS AND DIMENSIONS WHICH DEVIATE FROM THE SPECIFICATIONS, CONTRACT DRAWINGS AND/OR JOB CONDITIONS AS THEY EXIST.

IF APPARATUS OR MATERIALS ARE SUBSTITUTED FOR THOSE SPECIFIED UNDER THIS SECTION, AND SUCH SUBSTITUTIONS NECESSITATE CHANGES IN OR ADDITIONAL CONNECTIONS, PIPING SUPPORTS OR CONSTRUCTIONS, SAME SHALL BE PROVIDE AT NO ADDITIONAL COST TO THE OWNER. ASSUME COST AND ENTIRE RESPONSIBILITY THEREOF. ARCHITECTS PERMISSION TO MAKE SUCH SUBSTITUTION SHALL NOT RELIEVE FULL RESPONSIBILITY FOR WORK.

TEST AND BALANCE REPORT: SUBMIT AT FINAL INSPECTION OPERATION AND MAINTENANCE MANUALS: SUBMIT COPIES IN COMPLIANCE WITH SECTION, OPERATION AND MAINTENANCE MANUALS.

15400 - HEATING VENTILATION AND & AIR CONDITIONING

PRODUCTS:
ALL MATERIALS AND EQUIPMENT SHALL BE NEW. SYSTEMS SHALL FUNCTION CORRECTLY AS A WHOLE, AND IN ALL ITS PARTS, UP TO THE SPECIFIED CAPACITY. SYSTEMS OR DEVICES FAILING TO MEET PERFORMANCE REQUIREMENTS SHALL BE REPLACED, ALTERED OR REPAIRED AS REQUIRED TO BRING PERFORMANCE UP TO SPECIFIED REQUIREMENTS. WORK DAMAGED OR MARRED BY SUCH REPLACEMENTS, ALTERATIONS, OR REPAIRS SHALL BE RESTORED TO PRIOR CONDITIONS, AT NO ADDITIONAL COST TO THE OWNER. WHERE MULTIPLE ITEMS OF EQUIPMENT OR MATERIALS ARE REQUIRED, THEY SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER. BEFORE ORDERING EQUIPMENT, THE PHYSICAL DIMENSIONS SHALL BE CHECKED TO VERIFY FIT IN SPACES ALLOTTED ON THE DRAWINGS. INSERTS, PIPE SLEEVES, AND SUPPORTS OF AIR CONDITIONING EQUIPMENT SHALL BE PROVIDED AS SPECIFIED. WHERE SUCH ITEMS ARE TO BE SET OR EMBEDDED IN CONCRETE, MASONRY OR SIMILAR WORK, THE ITEMS SHALL BE FURNISHED AT THE PROPER TIME FOR SETTING OR EMBEDMENT SO AS TO CAUSE NO DELAY. DUCTWORK AND EQUIPMENT ASSEMBLIES SHOWN ON THE DRAWINGS ARE DIAGRAMMATIC. ADDITIONAL DUCTWORK AND APPURTENANCES REQUIRED FOR PROPER OPERATION OF EQUIPMENT SHALL BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST.

MANUFACTURER'S NAMES AND CATALOG NUMBERS
SPECIFIC REFERENCES HAVE BEEN MADE TO ONE OR MORE MANUFACTURER'S NAMES AND MODEL OR CATALOG NUMBERS. THIS DOES NOT INDICATE THAT THE MATERIAL AND EQUIPMENT SPECIFIED IS NECESSARILY AN "OFF THE SHELF" ITEM; REQUIREMENTS FOR SPECIFIC FINISHES, MATERIALS OR OTHER MODIFICATIONS MAY INTRODUCE VARIANCES FROM MANUFACTURER'S STANDARDS. ASCERTAIN THAT SUCH MODIFICATIONS ARE FULLY CONSIDERED.

DIAGRAMS, NAMEPLATES AND LABELS
EACH MAJOR COMPONENT OF EQUIPMENT SHALL HAVE THE MANUFACTURER'S NAME, ADDRESS AND CATALOG NUMBER ON A PLATE SECURELY AFFIXED IN A CONSPICUOUS PLACE. THE NAMEPLATE OF A DISTRIBUTING AGENT WILL NOT BE ACCEPTED. ALL PIECES OF EQUIPMENT, VALVES, STARTERS, DISCONNECTS, AND ALL PNEUMATIC AND ELECTRIC CONTROL INSTRUMENTS AND APPARATUS SHALL BE IDENTIFIED WITH 1/16" THICK BLACK LAMINATED PLASTIC NAMEPLATES, WITH 3/16" HIGH WHITE LAMINATED LETTERS. SIMILAR AND LIKE EQUIPMENT SHALL BE DESIGNATED WITH NUMERICAL SUFFIX (EXAMPLE: THERMOSTAT, T-1). THE NAMEPLATE IDENTIFICATIONS SHALL COINCIDE WITH ITEMS APPEARING ON DIAGRAMS. PROVIDE A LABEL FOR THE MECHANICAL SYSTEM STATING: (NAME, ADDRESS AND PHONE NUMBER OF CONTRACTOR). LETTERS SHALL BE 1/4" HIGH AND LOCATED IN A CONSPICUOUS PLACE NEAR THE HVAC EQUIPMENT.

EXECUTION

INSTALLATION AND WORKMANSHIP
THE WORK SHALL BE PERFORMED BY QUALIFIED MECHANICS. ALL MATERIALS, APPARATUS AND EQUIPMENT SHALL BE INSTALLED IN NEAT, WORKMANLIKE MANNER. MATERIALS, DEVICES OR EQUIPMENT WHICH, IN THE OPINION OF THE ARCHITECT-ENGINEER, IS IMPROPERLY INSTALLED SHALL BE REMOVED AND REINSTALLED IN AN APPROVED MANNER AT NO ADDITIONAL COST TO THE OWNER. THE WORK SHALL BE COORDINATED WITH THE WORK OF OTHER TRADES. WHERE THE WORK IS DEPENDENT UPON WORK OF OTHER TRADES OR WORK ALREADY IN PLACE, SUCH OTHER WORK AND WORK IN PLACE SHALL BE EXAMINED AND SHALL BE IN PROPER CONDITION AND STATE OF COMPLETION BEFORE CONTINUING THE INSTALLATION. THE INSTALLATION OF WORK SHALL, IN GENERAL, BE AS HIGH AS POSSIBLE AND LOCATED IN ACCORDANCE WITH THE DRAWINGS. DUCTWORK INDICATED SHALL BE FOLLOWED AS ACCURATELY AS POSSIBLE. ANY NECESSARY DEVIATIONS SHALL BE CALLED TO THE ATTENTION OF THE ARCHITECT-ENGINEER. PROVIDE DRAWINGS SHOWING PROPOSED CHANGES. APPROVAL IS REQUIRED BEFORE CHANGES SHALL TAKE EFFECT.

CUTTING AND PATCHING
LAYOUT OPENINGS FOR CUTTING BY OTHER TRADES AS REQUIRED. CUTTING OF STEEL, CONCRETE OR ANY OTHER STRUCTURAL PART MUST BE APPROVED IN WRITING BY ARCHITECT-ENGINEER PRIOR TO CUTTING.

WATERPROOFING
DO NOT CUT OR PENETRATE WATERPROOFED SURFACES, OR WATERPROOFING MEMBRANES. WITHOUT FIRST MAKING ARRANGEMENTS FOR REPAIR BY A METHOD APPROVED BY ARCHITECT-ENGINEER.

PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AND DUNNAGE STEEL AS REQUIRED.

ELECTRICAL WORK
POWER WIRING FROM PANELS TO MOTOR CONTROLLERS AND FROM CONTROLLERS TO MOTORS IS SPECIFIED IN DIVISION 16. MOTOR STARTERS NOT SPECIFIED TO BE FURNISHED WITH THE MOTORS FROM THE FACTORY ARE SPECIFIED IN DIVISION 16. SUBMIT WIRING DIAGRAMS FOR APPROVAL AND FURNISH APPROVED DIAGRAMS TO THE ELECTRICAL CONTRACTOR FOR COORDINATION. ELECTRICAL CONTROL WIRING FOR CONNECTION OF TEMPERATURE CONTROLLERS, PUSH BUTTONS, INTERLOCKS IN MOTOR CONTROLLERS, AND LIKE ITEMS IS SPECIFIED IN THE CONTROL SECTION(S) IN THIS DIVISION. FURNISH ALL EQUIPMENT WITH COMPLETE INTERNAL CONTROL WIRING. ELECTRICAL WORK SPECIFIED IN THIS DIVISION SHALL CONFORM TO APPLICABLE PROVISIONS OF DIVISION 16. ALL CONTROL WIRING SHALL BE IN CONDUIT. PROVIDE MOTORS CONFORMING TO CHARACTERISTICS SHOWN ON ELECTRICAL DRAWINGS.

ACCESS DOORS (ACCESS PANELS)
PROVIDE ACCESS REQUIRED FOR MAINTENANCE, ADJUSTMENT, REMOVAL AND REPAIR OF VALVES, CONTROLS, DAMPERS, EQUIPMENT AND LIKE ITEMS. PROVIDE ACCESS DOORS (ACCESS PANELS) CONFORMING TO REQUIREMENTS OF DIVISION 8 SPECIFICATIONS. PANELS SHALL BE LOCATED TO MAKE ALL ITEMS EASILY ACCESSIBLE.

CLEAN UP
REFER TO GENERAL CONDITIONS FOR CLEAN-UP. CLEAN ALL MATERIALS AND EQUIPMENT OF DIRT, DUST, PAINT, SPOTS AND STAINS, SOIL MARKS AND OTHER FOREIGN MATTER.

FINAL INSPECTION
GIVE NOTICE TO THE ARCHITECT-ENGINEER THAT THE WORK IS READY FOR FINAL INSPECTION.

1. SUBMIT TEST AND BALANCE REPORT AND COMPLETE REQUIREMENTS AS NOTED.
2. SUBMIT LETTER FROM CONTROL MANUFACTURER CERTIFYING THAT CONTROLS HAVE BEEN CHECKED FOR OPERATION AND CALIBRATION, AND THAT THE SYSTEM IS OPERATING AS INTENDED.

FURNISH NECESSARY MECHANICS TO OPERATE SYSTEM, MAKE NECESSARY ADJUSTMENTS AND ASSIST WITH FINAL INSPECTION.

INSTRUCTION OF OWNER'S OPERATING PERSONNEL
INCLUDE THE COST OF THE SERVICES OF QUALIFIED INSTRUCTOR(S) TO INSTRUCT THE OWNER'S OPERATING PERSONNEL IN THE OPERATION, ADJUSTMENT, CARE AND MAINTENANCE OF ALL HVAC EQUIPMENT AND SYSTEMS. INSTRUCTION SHALL BE PERFORMED AT A TIME APPROVED BY THE OWNER AND AFTER ALL HVAC EQUIPMENT AND SYSTEMS ARE INSTALLED, COMPLETE, ADJUSTED AND OPERATING TO SPECIFIED REQUIREMENTS. NOTIFY THE ARCHITECT-ENGINEER WHEN INSTRUCTIONS WILL BE GIVEN. QUALIFICATIONS OF INSTRUCTORS SHALL BE SUBJECT TO APPROVAL OF THE OWNER AND EQUIPMENT MANUFACTURER. ADDITIONAL REQUIREMENTS CONCERNING OPERATION AND MAINTENANCE OF MECHANICAL EQUIPMENT AND SYSTEMS MAY BE SPECIFIED IN OTHER SECTIONS. TWO COPIES OF ACKNOWLEDGMENT OF ALL REQUIRED INSTRUCTIONS TO OWNER'S OPERATING PERSONNEL, SIGNED BY THE OWNER OR HIS AUTHORIZED REPRESENTATIVE, SHALL BE SUBMITTED TO THE ARCHITECT-ENGINEER PRIOR TO SUBMITTING APPLICATION FOR FINAL PAYMENT. AN ADDITIONAL COPY OF THIS ACKNOWLEDGMENT IS REQUIRED IN EACH COPY OF OPERATION AND MAINTENANCE MANUALS REQUIRED IN THE SECTION, OPERATION AND MAINTENANCE MANUALS.

OPERATION AND MAINTENANCE MANUALS

FURNISH THREE COPIES OF COMPLETE OPERATION AND MAINTENANCE MANUALS TO THE ARCHITECT-ENGINEER, FOR APPROVAL AND FOR THE OWNER, ON ALL EQUIPMENT AND SYSTEMS. THE MANUALS SHALL BE BOUND IN HARD-BACK, THREE RING LOOSE-LEAF BINDERS. MANUALS SHALL CONTAIN A TITLE SHEET WITH JOB NAME, AND THE NAMES, ADDRESSES AND PHONE NUMBERS OF THE CONTRACTOR, SUBCONTRACTOR, CONTROL SUBCONTRACTOR, RELATED CONTRACTORS AND MATERIAL AND EQUIPMENT SUPPLIERS.

A COPY OF ACKNOWLEDGMENT OF INSTRUCTION TO THE OWNER'S OPERATING PERSONNEL IN THE OPERATION OF ALL MECHANICAL EQUIPMENT AND SYSTEMS, SIGNED BY THE OWNER OR HIS AUTHORIZED REPRESENTATIVE. TYPEWRITTEN OPERATING INSTRUCTIONS FOR THE OWNER'S PERSONNEL DESCRIBING HOW TO STOP AND START EACH PIECE OF EQUIPMENT; HOW TO SET THE TEMPERATURE CONTROL SYSTEM FOR NORMAL OPERATION AND NORMAL RESTARTING PROCEDURES, CAUTION AND WARNING NOTICES. APPROVED SHOP DRAWINGS, PRODUCT DATA AND PARTS AND MAINTENANCE BOOKLET FOR EACH ITEM OF MATERIAL AND EQUIPMENT FURNISHED UNDER DIVISION 15000. RECORD DRAWINGS OF ALL SYSTEMS INCLUDING ELECTRICAL AND CONTROL DIAGRAMS. TEST AND BALANCE REPORT. COPIES OF CERTIFICATES OF INSPECTION. GUARANTEES, INCLUDING EXTENDED GUARANTEES.

DELIVER THE MANUALS TO THE OWNER PRIOR TO SUBMITTING APPLICATION FOR FINAL PAYMENT.

HVAC/HYDRONIC PIPING

CONDENSATE DRAIN
PROVIDE CONDENSATE DRAINS FOR ALL AIR CONDITIONING UNITS AND PIPE AS DENOTED ON DRAWINGS. CONDENSATE DRAIN PIPING SHALL BE INSTALLED WITH TRAP AT THE COIL CONNECTION AND SHALL HAVE A MINIMUM SEAL DEPTH EQUAL TO THE RESPECTIVE AIR HANDLING UNIT FAN STATIC PRESSURE. DEPTH SHALL BE A MINIMUM OF 2".

HVAC INSULATION

LOW PRESSURE DUCTWORK INSULATION
EXTERNAL INSULATION SHALL BE R-6 MINIMUM SCHULLER TYPE SMALLLITE, FSK SPIN-GLAS OR APPROVED EQUAL WITH AN EMBOSSED ALUMINUM FOIL FACING. INTERNAL INSULATION SHALL BE R-6 MINIMUM LINER WITH A COATED AIR SIDE SURFACE TO PREVENT EROSION. APPLY ADHESIVES AND FASTENERS PER SMACNA AND THE MANUFACTURER. ALL TRANSVERSE EDGES TO BE COATED WITH ADHESIVE. ALL CONCEALED DUCTWORK SHALL HAVE EXTERNAL INSULATION. UNCONCEALED DUCTWORK SHALL BE INTERNALLY LINED. DUCTWORK INSTALLED IN UNCONDITIONED SPACES SHALL BE R-12 MINIMUM SCHULLER TYPE SMALLLITE, FSK SPIN-GLAS OR APPROVED EQUAL WITH AN EMBOSSED ALUMINUM FOIL FACING.

ALL AIR SUPPLY DIFFUSERS BACKS AND NECKS, SHALL BE INSULATED WITH R-6 MINIMUM MANVILLE R-SERIES SMALLITE, OR APPROVED EQUAL FIBERGLASS BLANKET INSULATION.

ADHESIVES, MASTIC, SEALANTS
ADHESIVE SHALL BE FOSTER'S 85-20. STUDWELD PINS SHALL BE SEALED WITH FOSTER'S 30-36 ADHESIVE. ALL JOINTS, SEAMS AND BREAKS IN THE VAPOR BARRIER SHALL BE SEALED WITH FOSTER'S 35-00, REINFORCED WITH 4 INCH WIDE GLASS FABRIC.

TERMINAL HEAT TRANSFER UNITS

DESCRIPTION
INSTALL AIR CONDITIONING UNITS OF THE CAPACITIES INDICATED, COMPLETE WITH GAS-FIRED HEATING SYSTEM, WHERE INDICATED ON THE DRAWINGS. UNIT SHALL BE CONSTRUCTED IN ACCORDANCE WITH APPLICABLE ASME AND ANSI CODES AND SHALL BE LISTED BY UNDERWRITER'S LABORATORIES. UNIT SHALL BE RATED IN ACCORDANCE WITH THE LATEST ARI STANDARD 21. WHERE SPECIFIED OPERATING CONDITIONS ARE OTHER THAN ARI STANDARD CONDITIONS, CAPACITIES SHALL BE INTERPOLATED FROM ARI CONDITIONS.

MANUFACTURER
UNITS SHALL BE TRANE, LENNOX, AAON OR APPROVED EQUAL.

EXHAUST FANS

INLINE EXHAUST FAN
INSTALL DIRECT DRIVE CENTRIFUGAL INLINE EXHAUST FAN BY GREENHECK OR APPROVED EQUAL WITH GALVANIZED STEEL HOUSING, BACKWARD INCLINED ALUMINUM WHEEL, ACCESS PANELS, INTEGRAL DUCT CONNECTION FLANGES, BALL BEARING MOTORS, AND CORROSION RESISTANT FAS

GENERAL PLUMBING NOTES

1. ALL WORK SHALL BE IN CONFORMANCE WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION.
2. PROVIDE TO OWNER A COPY OF ALL REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS AND ALL PLUMBING SYSTEMS EQUIPMENT MANUALS INCLUDING WARRANTIES.
3. COORDINATE THE COMPLETE INSTALLATION OF SYSTEMS TO AVOID CONFLICT WITH OTHER TRADES.
4. COORDINATE ALL ABOVE SLAB AND UNDER SLAB SANITARY, AND WATER PIPING SYSTEMS TO AVOID CONFLICT WITH ALL OTHER TRADES SYSTEMS, AND COLUMN FOOTINGS. ALL SOIL AND WASTE PIPING SHALL BE GRADED TO A UNIFORM SLOPE OF NOT LESS THAN 1/8" PER FOOT FOR PIPING 4" OR LARGER, AND NOT LESS THAN 1/4" PER FOOT FOR PIPING 3" OR SMALLER.
5. COORDINATE ALL FLOOR DRAINS, CLEANOUTS, AND FLOOR MOUNTED FIXTURES WITH FINISHED FLOOR SLAB ELEVATION TO ENSURE THEY ARE INSTALLED PLUM AND FLUSH WITHOUT CRACKS, RISE IN THE SLAB, OR VOIDS AROUND GRATES OR TOPS. ALL CLEANOUTS SHALL BE INSTALLED ALONG MAINS AT 50'-0" DISTANCE MAXIMUM. ALL FLOOR AND WALL CLEANOUTS SHALL BE ACCESSIBLE FOR MAINTENANCE AND NOT INSTALLED BENEATH EQUIPMENT. ANY DRAIN GRATES THAT ARE DAMAGED AS A RESULT OF OTHER CONSTRUCTION PRIOR TO RELEASE OF THE BUILDING TO THE OWNER SHALL BE REPLACED WITH LIKE GRATE AT NO EXPENSE OF THE OWNER.
6. ALL EXPOSED PIPES PENETRATING FINISHED WALLS SHALL BE EQUIPPED WITH WALL ESCUTCHEONS.
7. PROVIDE TRAP AND SEAL PRIMERS ON ALL FLOOR DRAINS IF REQUIRED BY CODE OR OWNER.
8. PLUMBING VENTS THROUGH THE ROOF ARE LOCATED AT A MINIMUM OF 5'-0" FROM BUILDING PARAPETS AND 10'-0" FROM FRESH AIR INTAKES AND AS REQUIRED TO MEET LOCAL CODES.
9. ALL SHUT-OFF OR BALANCING VALVES TO PLUMBING ROUTED IN PIPE CHASES SHALL BE ACCESSIBLE FROM CEILING AREA OR ACCESS DOORS PROVIDED IN WALL.
10. PROVIDE FINAL CONNECTIONS FOR ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. PROVIDE ALL REQUIRED SHUT-OFFS, BACKFLOW PREVENTERS, PRESSURE REGULATORS, AND CONDENSATE DRAINS AS REQUIRED BY LOCAL CODES FOR COMPLETE EQUIPMENT INSTALLATION. CONSULT EQUIPMENT SUPPLIER OR OWNER FOR ADDITIONAL FINAL CONNECTION REQUIREMENTS NOT SHOWN ON THESE DRAWINGS.
11. CONTRACTOR TO FULLY INVESTIGATE ALL EXISTING PIPING TO REMAIN TO INSURE EXISTING PIPING IS IN GOOD REPAIR. IF ANY EXISTING PIPING IS FOUND TO BE DAMAGED REPLACE WITH LIKE.
12. ALL WATER SERVICE INSTALLATIONS INCLUDING BACKFLOW DEVICES ARE SUBJECT TO FIELD VERIFICATION AND APPROVAL BY THE WATER DEPARTMENT INSPECTOR.

PLUMBING ABBREVIATIONS

AD	AREA DRAIN, ACCESS DOOR	IE	INVERT ELEVATION
AFC	ABOVE FINISH CEILING	LP	LIQUIFIED PETROLEUM
AFG	ABOVE FINISH GRADE	MBH	1000 BTU PER HOUR
AHU	AIR HANDLING UNIT	N/A	NOT APPLICABLE
BFP	BACKFLOW PREVENTER	ORD	OVERFLOW ROOF DRAIN
BOP	BOTTOM OF PIPE	OST	STORM OVERFLOW
BOS	BOTTOM OF STRUCTURE	PD	PUMP DISCHARGE
CD	CONDENSATE	PIV	POST INDICATOR VALVE
CO	CLEANOUT	PRV	PRESSURE REDUCING VALVE
CW	DOMESTIC COLD WATER	REV	REVISION
DD	DECK DRAIN	RPM	REVOLUTIONS PER MINUTE
DN	DOWN	RTU	ROOF TOP UNIT
ETR	EXISTING TO REMAIN	SAN	SANITARY
EWC	ELECTRIC WATER COOLER	SCW	SOFT DOMESTIC COLD WATER
FCO	FLOOR CLEANOUT	SHW	SOFT DOMESTIC HOT WATER
FFA	FROM FLOOR ABOVE	SDHWR	SOFT RECIRC. HOT WATER
FP	FIRE PROTECTION	ST	STORM
FS	FLOOR SINK	TFA	TO FLOOR ABOVE
G	GAS (NATURAL)	TFB	TO FLOOR BELOW
GCO	GRADE CLEANOUT	TW	TEMPERED WATER
GPM	GALLONS PER MINUTE	UH	UNIT HEATER
HB	HOSE BIBB	V	VENT PIPE
HW	DOMESTIC HOT WATER	VTR	VENT THROUGH ROOF
HWR	HOT WATER RETURN	WCO	WALL CLEANOUT
HWS	HOT WATER SUPPLY	WH	WALL HYDRANT

PLUMBING SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	GATE VALVE		FLOOR DRAIN / AREA DRAIN
	CHECK VALVE		FLOOR SINK
	PRESSURE		HOT WATER RECIRCULATION PUMP
	SOLENOID VALVE	VTR	PLUMBING VEVT THRU ROOF
	GLOBE VALVE (STRAIGHT PATTERN)		POINT OF CONNECTION (CONNECT NEW TO EXISTING)
	BUTTERFLY VALVE	306A	KITCHEN EQUIPMENT DESIGNATION
	BALL VALVE	XXX	PLUMBING EQUIPMENT DESIGNATION
	GAS COCK	X / X	PLUMBING RISER OR DETAIL DESIGNATION
	PLUG VALVE	S	SANITARY SEWER PIPING
FCO	FLOOR CLEAN OUT	ST	STORM SEWER PIPING
WCO	WALL CLEAN OUT	V	VENT PIPING
CO	CLEAN OUT	CW	COLD WATER PIPING
	HOSE BIBB	HW	HOT WATER PIPING
	FREEZE PROOF WALL HYDRANT	HWR	HOT WATER RECIRCULATING PIPING
	ELBOW DOWN	FW	FILTERED WATER PIPING
	ELBOW UP	G	GAS PIPING
	TEE UP	CD	CONDENSATE PIPING
	TEE DOWN		
	STRAINER		
	UNION		
	CAP		

PLUMBING FIXTURE SCHEDULE

TAG	MANUFACTURER	MODEL	DRAIN	VENT	COLD WATER	HOT WATER	ELECTRICAL REQUIREMENTS	DESCRIPTION
IMB	SIOUX CHIEF	696	---	---	1/2"	---	---	ICE MAKER BOX WITH SHUTOFF AND MINI ARRESTOR.
SNK	ELKAY	ELGAD3322PD	2"	2"	1/2"	1/2"	110V, SINGLE PHASE 1/3HP	DOUBLE BOWL DROP-IN SINK WHITE. FAUCET: PEERLESS P188103LF-SD PROVIDE WITH ASSE 1070 THERMOSTATIC MIXING VALVE AND INSINKERATOR BADGER 1 GARBAGE DISPOSER.

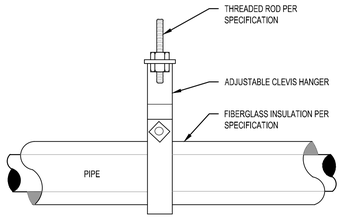
NOTES:
1. MODELS IN SCHEDULE ARE A BASIS OF DESIGN CONFIRM FINAL FIXTURE MODELS WITH OWNER PRIOR TO PURCHASING.
2. ALL LAVATORIES/SINKS SHALL BE PROVIDED WITH ANTI-SCALD ASSE 1070 COMPLIANT VALVE.
3. PROVIDE LOOSE KEY STOPS AND FLEXIBLE RISERS.
4. ON LAVATORY INSULATE EXPOSED TAILPIECE, P-TRAP, AND WATER RISERS WITH TRU-BRO INSULATION KIT.
5. PROVIDE FLUSH VALVE HANDLE ON WIDE SIDE OF ROOM.

PLUMBING FIXTURE MINIMUM CONNECTION SCHEDULE

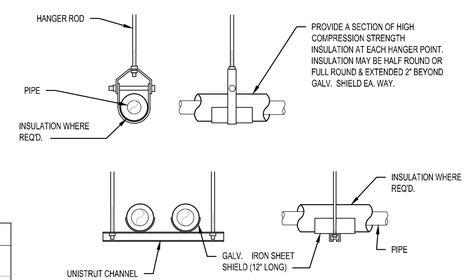
DESIGNATION	FIXTURE	C.W.	H.W.	DRAIN	VENT
WC	WATER CLOSET	1"	-	4"	2"
UR	URINAL	3/4"	-	2"	2"
LAV.	LAVATORY	1/2"	1/2"	2"	2"
EWC/DF	ELECTRIC WATER COOLER/DRINKING FOUNTAIN	1/2"	-	2"	2"
MB/SS	MOP BASIN/SERVICE SINK	1/2"	1/2"	3"	2"
SH/BT	SHOWER/BATHTUB	1/2"	1/2"	2"	2"
SK	SINK	1/2"	1/2"	2"	2"

GENERAL NOTES:

1. PITCH ALL DRAINAGE PIPING 3" AND LARGER AT 1/8" PER FOOT MINIMUM UNLESS OTHERWISE NOTED. PITCH ALL DRAINAGE PIPING 2-1/2" AND SMALLER AT 1/4" PER FOOT.
2. ALL UNDERGROUND DRAINAGE PIPING SHALL BE A MINIMUM OF 2" IN SIZE.
3. PROVIDE TRAP PRIMER UNITS FOR ALL FLOOR DRAINS.
4. VERIFY/COORDINATE LOCATIONS OF ALL FIXTURES, DRAIN, ETC. WITH ARCHITECT PRIOR TO ROUGH-IN.



WATER PIPING (COPPER TYPE "L")				
PIPE SIZE	WEIGHT / FT. WITH WATER (IN LBS.)	MAX SPACING	LOAD / HGR	ROD SIZE
1/2"	.38	6'	2.28	3/8"
3/4"	.66	6'	3.96	3/8"
1"	1.04	6'	6.24	3/8"
1-1/4"	1.43	6'	8.58	3/8"
1-1/2"	1.92	6'	19.2	3/8"
2"	3.09	10'	30.8	3/8"
2-1/2"	4.52	10'	45.2	3/8"



NOTES:

1. ATTACH SUPPORTS FOR ALL PIPING SUSPENDED FROM THE STEEL STRUCTURE TO THE TOP CORD OF JOISTS OR BEAMS.
2. PROVIDE COPPER OR PLASTIC COATED HANGERS FOR NON-INSULATED COPPER PIPE.

1 PIPE HANGING DETAIL

SCALE: NTS

HIVE

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STATE OF MISSOURI
RYAN BREWER
NUMBER PE-2020010759
PROFESSIONAL ENGINEER

05/30/2024

project number 2024-023

date 05.30.2024

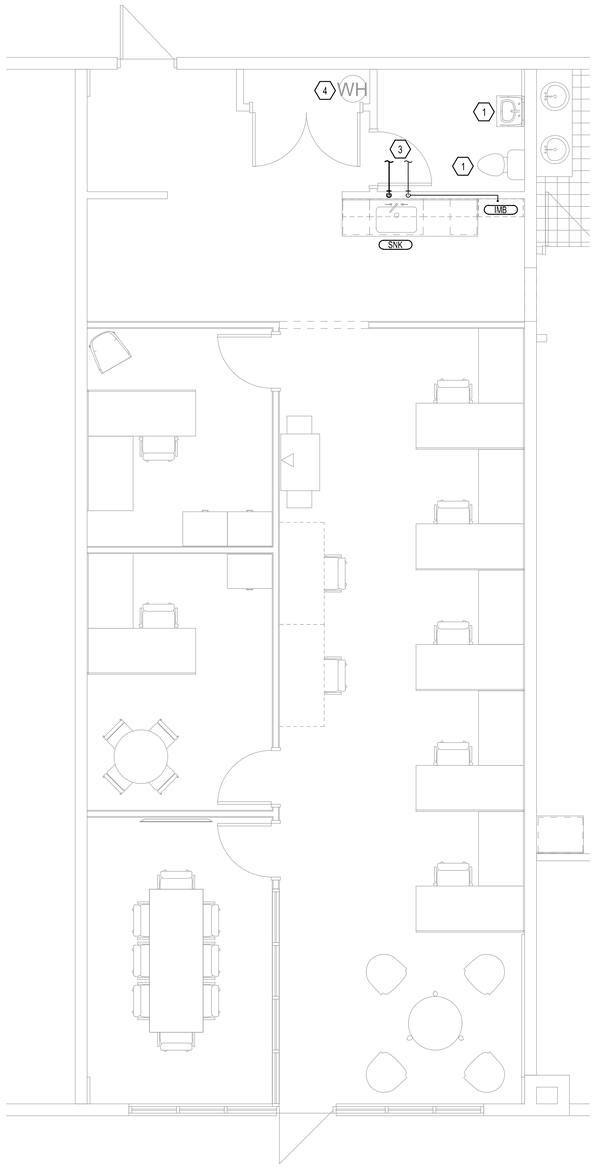
issued for PERMIT

rev	date	description

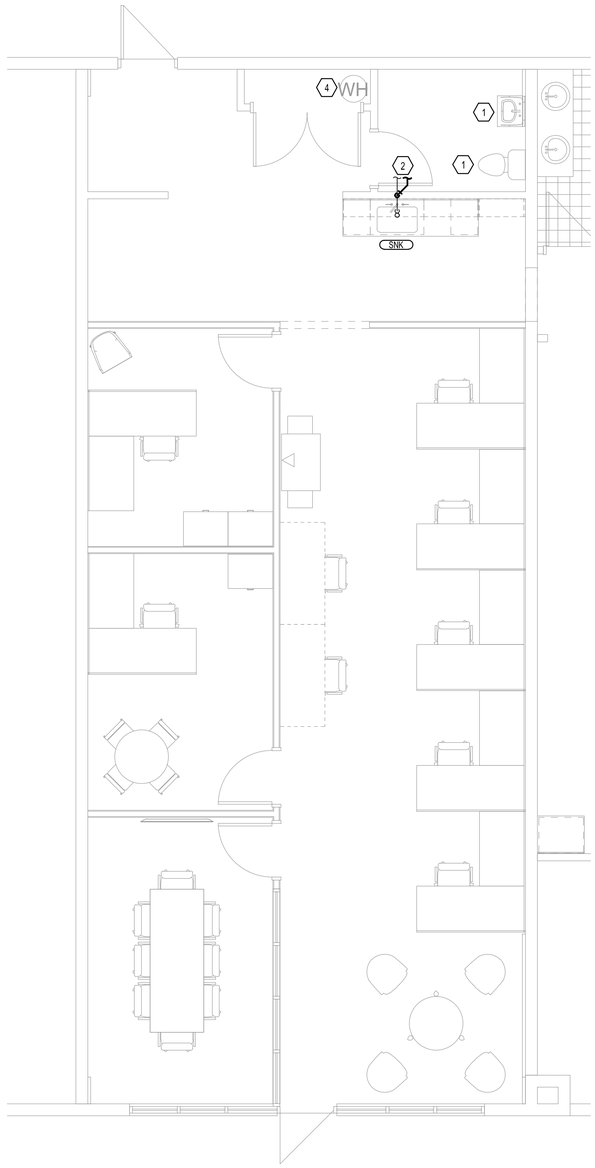
PLUMBING NOTES, SYMBOLS, & ABBREVIATIONS

sheet number

P101



2 **PLUMBING WATER PLAN**
SCALE: 1/4" = 1'-0"



1 **PLUMBING WASTE AND VENT PLAN**
SCALE: 1/4" = 1'-0"

GENERAL NOTES
(NOT ALL NOTES APPLY)

1. REFERENCE SHEET P101 FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS.

KEYED NOTES:

1. EXISTING PLUMBING FIXTURE TO REMAIN.
2. CONNECT 2"S AND 1-1/2"V PIPING INTO EXISTING WASTE AND VENT PIPING IN THIS AREA. FIELD VERIFY EXACT CONNECTION POINTS, LINE SIZES, MATERIALS, AND AVAILABLE INVERT.
3. CONNECT NEW 1/2"CW AND 1/2"HW PIPING INTO EXISTING COLD AND HOT WATER PIPING IN THIS AREA. FIELD VERIFY EXACT CONNECTION POINTS, LINE SIZES, AND MATERIAL.
4. EXISTING ELECTRIC WATER HEATER TO REMAIN. INSPECT EXISTING WATER HEATER AND ENSURE IN GOOD WORKING ORDER. IF EXISTING WATER HEATER IS FOUND TO NOT BE IN GOOD REPAIR REPLACE WITH LIKE.

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PLUMBING PLAN

sheet number

P201

15400 - PLUMBING WORK

DESCRIPTION
ALL PLUMBING AND ASSOCIATED WORK IN DIVISION 15 IS GOVERNED BY THIS SECTION. PROVIDE LABOR AND MATERIALS NECESSARY TO PROVIDE THE WORK AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN. REFER TO OTHER DIVISIONS FOR CONTINUATION OF EXTERIOR AND ALLIED WORK.

QUALITY ASSURANCE
OBTAIN AND PAY FOR ALL PERMITS, INSPECTIONS AND CONNECTION FEES REQUIRED BY GOVERNING BODIES IN CONNECTION WITH THE WORK. DELIVER CERTIFICATES OF INSPECTION TO THE OWNER'S REPRESENTATIVE. ALL WORK SHALL COMPLY WITH GOVERNING CODES, ORDINANCES, AND REGULATIONS OF CITY, COUNTY AND STATE.

SUBMITTALS
SHOP DRAWINGS: SUBMIT MATERIALS, PRODUCTS, EQUIPMENT AND SYSTEMS AS SPECIFIED UNDER EACH PLUMBING SECTION IN THIS DIVISION IN ACCORDANCE WITH THE GENERAL CONDITIONS. SHOW PIPE SIZES, LOCATION, SLOPES OF HORIZONTAL RUNS, FITTINGS, VALVES, METERS, GAGES AND CONNECTIONS.

PRODUCT DATA: SUBMIT ON MATERIALS, FIXTURES, AND EQUIPMENT UNLESS OTHERWISE SPECIFIED OR ACKNOWLEDGED IN WRITING.

SAMPLES: SUBMIT WHEN SPECIFIED OR REQUESTED.

RECORD DOCUMENTS
REFER TO GENERAL CONDITIONS FOR REQUIREMENTS CONCERNING RECORD DOCUMENTS. ADDITIONAL REQUIREMENTS MAY BE SPECIFIED IN DIVISION 1. UNLESS SEPIAS OF THE DRAWINGS ARE TO BE FURNISHED BY THE ARCHITECT-ENGINEER FOR PREPARATION OF RECORD DRAWINGS, FURNISH OWNER'S REPRESENTATIVE WITH TWO SETS OF ACCURATELY MARKED COPIES OF THE DRAWINGS, INSTEAD OF ONE SET AS REQUIRED BY THE GENERAL CONDITIONS, INDICATING ALL CHANGES FROM ORIGINAL DRAWINGS AS INSTALLED.

PRODUCT HANDLING
PIPE, FIXTURES AND ACCESSORIES SHALL BE PROTECTED FROM DAMAGE IN SHIPMENT, HANDLING, STORAGE AND INSTALLATION: FROM MOISTURE, DIRT AND DEBRIS. PIPE, CLEANOUT AND FLOOR DRAIN OPENINGS SHALL BE TEMPORARILY PLUGGED WITH TEST PLUGS UNTIL FINAL CONNECTIONS ARE MADE.

GUARANTEE AND SERVICE
REFER TO GENERAL CONDITIONS FOR GUARANTEE. WHERE EXTENDED GUARANTEES ARE CALLED FOR, FURNISH THREE COPIES TO BE INSERTED INTO OPERATION AND MAINTENANCE MANUALS.

GENERAL
PLUMBING SYSTEMS SHALL BE PROVIDED COMPLETE. SHOULD A SYSTEM, OR ANY PART THEREOF FAIL TO MEET PERFORMANCE REQUIREMENTS, NECESSARY REPLACEMENTS, ALTERATIONS OR REPAIRS, AS REQUIRED BY THE OWNER'S REPRESENTATIVE, SHALL BE MADE TO BRING PERFORMANCE UP TO SPECIFIED REQUIREMENTS AND ALL BUILDING CONSTRUCTION AND FINISHES DAMAGED OR MARRED BY SUCH REPLACEMENTS, ALTERATIONS OR REPAIRS SHALL BE RESTORED TO PRIOR CONDITION, AT NO ADDITIONAL COST TO THE OWNER.

WHERE MULTIPLE ITEMS OF EQUIPMENT OR MATERIALS ARE REQUIRED THEY SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER.

INSERTS, PIPE SLEEVES, HANGERS, SUPPORTS, FIXTURES, TRIM DRAINS AND ANCHORAGE OF PLUMBING SHALL BE PROVIDED AS SPECIFIED HEREIN, WHERE SUCH ITEMS ARE TO BE SET OR EMBEDDED IN CONCRETE, MASONRY OR SIMILAR WORK, THE ITEMS SHALL BE FURNISHED AND LAYOUT MADE AT THE PROPER TIME FOR THE SETTING OR EMBEDMENT THEREOF SO AS TO CAUSE NO DELAY IN THE WORK.

MANUFACTURER'S NAMES AND CATALOG NUMBERS
SPECIFIED REFERENCES HAVE BEEN MADE TO ONE OR MORE MANUFACTURER'S NAMES AND MODEL OR CATALOG NUMBERS. THIS DOES NOT NECESSARILY INDICATE THAT THE MATERIAL AND EQUIPMENT SPECIFIED IS AN "OFF THE SHELF" ITEM. REQUIREMENTS FOR SPECIFIC FINISHES, MATERIAL OR OTHER MODIFICATIONS MAY INTRODUCE VARIANCES FROM MANUFACTURERS' STANDARDS. MODIFICATIONS SHALL BE FULLY CONSIDERED.

CHARTS AND TAGS
IN AREAS HAVING VALVES, PROVIDE SINGLE LINE DIAGRAMS FRAMED UNDER GLASS AND MOUNTED ON EQUIPMENT ROOM WALL. THE DIAGRAMS SHALL GIVE NAME, NUMBER DESIGNATION AND LOCATION OF VALVE.

VALVES SHALL BE IDENTIFIED WITH 1/16 INCH THICK WHITE LAMINATED PLASTIC NAMEPLATES WITH 3/16 INCH HIGH BLACK LAMINATED LETTERS. THE NAMEPLATE IDENTIFICATION SHALL COINCIDE WITH ITEMS APPEARING ON DIAGRAMS. ATTACH NAMEPLATES TO VALVES WITH NON-CORROSIVE CHAIN OR WIRE.

ACCESS DOORS
PROVIDE ACCESS DOORS AS INDICATED AND SPECIFIED IN DRAWINGS

INSTALLATION AND WORKMANSHIP
THE WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ANY MATERIAL, APPARATUS OR EQUIPMENT WHICH, IN THE OPINION OF THE OWNER'S REPRESENTATIVE, IS IMPROPERLY INSTALLED SHALL BE REMOVED AND REINSTALLED IN AN APPROVED MANNER AT NO ADDITIONAL COST TO THE OWNER.

THE LOCATION OF PLUMBING PIPING SHALL BE COORDINATED TO ENSURE THAT IT CLEARS OPENINGS AND STRUCTURAL MEMBERS; THAT PIPING INDICATED AS CONCEALED CAN BE PROPERLY CONCEALED IN WALLS OR PARTITIONS AND THAT IT DOES NOT INTERFERE WITH LIGHTS, DUCTWORK OR EQUIPMENT HAVING FIXED LOCATIONS. MAKE NECESSARY HORIZONTAL OR VERTICAL OFFSETS WITH PIPE FITTINGS TO INSTALL THE SYSTEM IN THE AVAILABLE SPACE. CONCEAL OR INSTALL TIGHT TO STRUCTURE (IF EXPOSED) UNLESS OTHERWISE NOTED.

PIPING SHALL BE EXPOSED IN FINISHED AREAS ONLY WHERE INDICATED OR WITH THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

WHERE DRAIN OR WATER CONNECTIONS NECESSARY TO THE OPERATION OF FIXTURES OR EQUIPMENT ARE NOT SPECIFICALLY SHOWN ON DIAGRAMS, EXTEND NECESSARY BRANCHES TO THE CLOSEST INDICATED BRANCH OR MAIN, AT NO ADDITIONAL COST TO THE OWNER.

EACH FIXTURE, EQUIPMENT DRAIN OR FLOOR DRAIN SHALL BE SEPARATELY TRAPPED UNLESS OTHERWISE INDICATED OR SPECIFIED.

PLUMBING PIPING AND EQUIPMENT SHALL NOT BE FIELD PAINTED, OR PRIMED BEYOND THE DEGREE OF APPLICATION FROM THE FACTORY SOURCE, OR EXCEPT AS REQUIRED BY APPLICABLE CODES AND AUTHORITIES HAVING JURISDICATION.

WATERPROOFING
DO NOT CUT OR PENETRATE WATERPROOFED SURFACES OR WATERPROOFING MEMBRANES WITHOUT FIRST MAKING ARRANGEMENTS FOR REPAIR BY A METHOD APPROVED BY THE OWNER'S REPRESENTATIVE.

ACCESS DOORS
INSTALL AS REQUIRED FOR MAINTENANCE, ADJUSTMENT, REMOVAL AND REPAIR OF VALVES, EQUIPMENT AND LIKE ITEMS. DOORS SHALL BE CONVENIENTLY LOCATED AND OF SUFFICIENT SIZE.

PIPING PROVISIONS FOR FIXTURES AND EQUIPMENT SPECIFIED IN OTHER SECTIONS OR FURNISHED BY THE OWNER
ROUGH IN LOCATIONS SHALL BE DETERMINED FOR SERVICES. PROVIDE ALL NECESSARY PLUMBING SERVICES, ACCESSIBLE VALVES ON PLUMBING BRANCHES AND MAKE ALL FINAL CONNECTIONS.

PLUMBING OPERATION AND MAINTENANCE MANUALS

DESCRIPTION
FURNISH TWO COPIES OF COMPLETE OPERATION AND MAINTENANCE MANUALS TO THE OWNER'S REPRESENTATIVE, FOR APPROVAL AND FOR THE OWNER, ON PLUMBING EQUIPMENT AND SPECIALTIES. THE MANUAL SHALL BE BOUND IN HARD-BACK, THREE-RING LOOSE-LEAF BINDERS.

MANUAL CONTENTS
TITLE SHEET WITH JOB NAME, AND THE NAMES, ADDRESSES AND PHONE NUMBERS OF THE CONTRACTOR, SUBCONTRACTOR, CONTROL SUBCONTRACTOR, RELATED CONTRACTOR AND MATERIAL AND EQUIPMENT SUPPLIERS.

INDEX OF CONTENTS
TYPEWRITTEN OPERATING INSTRUCTIONS FOR THE OWNER'S PERSONNEL DESCRIBING HOW TO OPERATE EACH PIECE OF EQUIPMENT, AND CAUTION AND WARNING NOTICES.

APPROVED SHOP DRAWINGS, PRODUCT DATA AND PARTS AND MAINTENANCE BOOKLET FOR EACH ITEM OF PLUMBING, EQUIPMENT SPECIFIED IN DIVISION 15.

COPIES OF CERTIFICATES OF INSPECTION, WHERE INSPECTION IS REQUIRED. GUARANTEES, INCLUDING EXTENDED GUARANTEES.

DELIVERY
DELIVER THE MANUALS TO THE OWNER'S REPRESENTATIVE PRIOR TO SUBMITTING APPLICATION FOR FINAL PAYMENT.

PLUMBING PIPING

DESCRIPTION
FURNISH AND INSTALL PLUMBING PIPING WHERE SHOWN ON DRAWINGS AND AS SPECIFIED.

PIPING MATERIALS
OPTIONS
1. CAST IRON HUBLESS SANITARY PIPE AND FITTINGS: CISPI STD. 301.
2. CAST IRON SOIL PIPE AND FITTINGS, SERVICE WEIGHT: ASTM A 74.
3. CAST IRON SOIL PIPE AND FITTINGS, EXTRA HEAVY WEIGHT: ASTM A 74.
4. STEEL PIPE: ASTM A 53.
5. MALLEABLE IRON FITTINGS, 150 LB.: ASTM A 197.
6. PIPE THREADS: ANSI B2.1.
7. NIPPLES, PIPE (THREADED): FED SPEC. WW-N-351.
8. COPPER WATER TUBE: ASTM B 88.
9. WROUGHT COPPER AND BRONZE SOLDER-JOINT PRESSURE FITTINGS: ANSI B16.29.
10. WROUGHT COPPER AND WROUGHT COPPER ALLOY SOLDER-JOINT DRAINAGE FITTINGS: ANSI BL6.29.
11. CAULKING LEAD: FED. SPEC. QQ-C-40 (2).
12. SHEET LEAD: FED. SPEC. QQ-L-201.
13. SHEET COPPER: ASTM B 152.
14. NO-HUB STAINLESS STEEL COUPLING AND GASKETS: CISPI STD. S-301.
15. WHERE ACCEPTABLE BY LOCAL AUTHORITY HAVING JURISDICTION SOLID WALL ABS PIPING MAY BE USED FOR WASTE PIPING.
15.A. PVC/ABS PIPING CANNOT BE USED IN RETURN AIR PLENUM APPLICATION.

JOINTS AND CONNECTIONS
OPTIONS
1. CAST IRON, HUB AND SPIGOT: PACKED WITH OAKUM AND FINISHED WITH LEAD NOT LESS THAN 1 INCH DEEP, WELL CAULKED.
2. CAST IRON, NO-HUB: NEOPRENE GASKET AND CORRUGATED 304 STAINLESS STEEL SHIELD IN CONJUNCTION WITH 4 STAINLESS STEEL CLAMPS FOR 4" AND SMALLER, 6 CLAMPS FOR 5" AND LARGER.
3. BETWEEN LEAD AND BRASS: FERRULES OR SOLDERING NIPPLES WITH WIPED JOINTS 3/8" THICK AND 3/4" EACH SIDE OF JOINTS.
4. SCREWED JOINTS: AMERICAN NATIONAL STANDARD WITH PIPE FREE FROM CUTTING AND BURRS, THREE THREADS EXPOSED MAXIMUM.
5. SOLDERED JOINTS: 95-5 TIN-ANTIMONY SOLDER. SLIP JOINTS: USE FOR PLUMBING TRAP SEALS ON INLET SIDE ONLY.
6. BETWEEN COPPER AND FERROUS MATERIALS: INSULATING DIELECTRIC UNION.
7. FLANGED JOINTS: FURNISH WITH COMPANION FLANGE AND CLOTH INSERTED RUBBER GASKET.
8. FLANGED BOLTS: ASTM A 354, MINIMUM GRADE BD, ALLOY STEEL WITH HEX NUTS IN COMPLIANCE WITH ANSI B18.22 AND STANDARD ROLLED STEEL WASHERS.
9. ASSEMBLY FOR HUBLESS PIPING: AS RECOMMENDED BY THE MANUFACTURER.
10. CHANGES IN PIPE SIZE SHALL BE MADE WITH REDUCERS, INCREASERS OR REDUCING FITTINGS, BUSHINGS WILL NOT BE PERMITTED.

INSTALLATION
BEFORE INSTALLING PIPE IN ANY PART OF THE SYSTEM, THE PIPE SHALL BE CLEANED INSIDE AND MADE FREE OF OIL, DIRT, AND FOREIGN MATTER, PROPERLY ALIGN AND INSTALL IN NEAT ARRANGEMENT, TRUE TO THE LINES OF THE BUILDING. PITCH LINE AT A CONSTANT SLOPE FOR PROPER DRAINAGE.

EXCEPT AS NOTED OTHERWISE ON DRAWINGS, PIPING SHALL BE HELD AS HIGH AS POSSIBLE, BETWEEN STRUCTURES AND THROUGH JOIST WEBBING. WITH DUE REGARD TO CONFLICTS WITH OTHER SYSTEMS AND THEIR REQUIREMENTS FOR SPACE.

PIPING, INCLUDING NO-HUB PIPING, SHALL BE INSTALLED STRAIGHT AND TRUE TO VERTICAL AND HORIZONTAL LINES. DEFLECTION SHALL NOT EXCEED ONE DEGREE, WHEN NECESSARY TO ACHIEVE THIS ALIGNMENT PROVIDE ADDITIONAL HANGERS OR BRACING.

APPLY LUBRICANT TO SCREW JOINT MALE THREADS.

METAL TO BE SOLDERED SHALL BE CLEANED AND FLUXED AS SUITABLE FOR THE SOLDER USED.

NOTCHING OF COPPER TUBING OR PLASTIC PIPING FOR CONNECTIONS WILL NOT BE PERMITTED.

PLUMBING SPECIALITES

PIPE SLEEVES
SCHEDULE 40 BLACK STEEL, GALVANIZED 26 GAGE STEEL, PROVIDE FOR ALL PIPES THROUGH WALLS AND FLOORS.

ESCUTCHEONS
PROVIDE FOR ALL PIPING THROUGH WALLS, FLOORS AND CEILING WERE PIPING IS EXPOSED TO VIEW IN FINISHED AREA. ESCUTCHEONS SHALL BE CHROMIUM PLATED, TWO PIECE, HINGED WITH SET SCREW.

UNIONS
PROVIDE GROUND JOINT BRASS UNIONS OR FLANGES ON EACH PIPING CONNECTION TO EQUIPMENT.

PROVIDE DIELECTRIC UNIONS BETWEEN COPPER AND STEEL PIPING CONNECTION TO EQUIPMENT.

VACUUM BREAKERS
SHALL CONFORM TO THE REQUIREMENTS OF THE REFERENCED PLUMBING CODE AND SHALL BE PROVIDED FOR HOSE BIBBS, FLUSHOMETERS AND ANY FIXTURE OR EQUIPMENT WATER SUPPLY HAVING A THREADED OUTLET.

FLASHING
VENT FLASHING SHALL COMPLY WITH ROOFING MANUFACTURER'S WRITTEN SPECIFICATIONS

CLEANOUTS
CLEANOUTS ON NO-HUB PIPE SHALL BE STANDARD NO-HUB FITTINGS.
CLEANOUTS ON CAST IRON HUB AND SPIGOT PIPING, SHALL BE CADMIUM PLATED.
APPROVED MANUFACTURERS: ZURN, JOSAM OR JONESPEC.

TRAP PRIMERS
PROVIDE WHERE INDICATED ON DRAWINGS. PRECISION PRODUCTS WITH DISTRIBUTION UNIT OR APPROVED EQUAL.

PIPE SLEEVES
1. EXTEND SLEEVE 1/4 INCH BEYOND FINISHED SURFACE.
2. SET SLEEVE BEFORE POURING CONCRETE.
3. PROVIDE CLEARANCE BETWEEN SLEEVE AND PIPE OR BETWEEN SLEEVE AND INSULATION TO ALLOW FOR PIPE MOVEMENT DUE TO EXPANSION AND CONTRACTION.
4. INSULATION SHALL PASS CONTINUOUS THROUGH THE SLEEVE.
5. CAULK BETWEEN SLEEVE AND PIPE OR SLEEVE AND INSULATION. PREFABRICATED, PRE-INSULATED, "PIPE SHIELDS" WILL BE ACCEPTABLE FOR PIPES PASSING THROUGH FLOORS. EXTERIOR WALLS, FIRE WALLS AND FIRE RESISTIVE WALLS AND PARTIITONS.
6. ESCUTCHEONS: FIT AROUND INSULATION WHERE PRESENT. PROVIDE DEEP ESCUTCHEON PLATES WHERE PIPE SLEEVES EXTEND ABOVE FLOORS.
7. WATER HAMMER ARRESTERS: INSTALL WHERE SHOWN ON DRAWINGS.
8. CLEANOUTS: INSTALL WHERE SHOWN ON DRAWINGS AND AT BASE OF ALL RISERS. PROVIDE ADDITIONAL CLEANOUTS WHERE REQUIRED BY LOCAL CODES AND FOR CONVENIENCE OF TESTING AND ERECTION AT CONTRACTOR'S OPTION.
9. FRAMES AND COVERS SHALL BE FLUSH WITH ADJOINING ARCHITECTURAL FINISH.

PLUMBING VALVES

DESCRIPTION
INSTALL IN ACCESSIBLE LOCATION.
VALVES SHALL NOT BE INSTALLED WITH THE STEMS BELOW THE HORIZONTAL POSITION.

VALVES, GATE, 125# UNION BONNET, RISING STEM
3 INCH AND SMALLER:
1. SCREWED: ITT GRINNELL #3080 OR APPROVED EQUAL.
2. SOLDER JOINT: ITT GRINNELL #3080 SJ OR APPROVED EQUAL.

VALVES, BALL (MAY BE USED IN LIEU OF GATE VALVES UP TO 2"): 2" AND SMALLER NIBCO #T580; TWO PIECE BRONZE BODY, WITH SCREEWED ENDS, CHROME PLATED BRONZE BALL WITH CONVENTIONAL PORT, 400 PSI, BLOW OUT PROOF STEM.

VALVES, GLOBE 150# TEFLON DISC, UNION BONNET
3 INCH OR SMALLER:
1. SCREWED: ITT GRINELL #3240 OR APPROVED EQUAL.
2. SOLDER JOINT: ITT GRINELL #3240 SJ OR APPROVED EQUAL.

VALVES, CHECK 125# REMOVABLE REGRINDABLE DISC A. 3 INCH AND SMALLER, HORIZONTAL:
1. SCREWED: ITT GRINELL #3300 OR APPROVED EQUAL.
2. SOLDER JOINT: ITT GRINELL #3300 SJ OR APPROVED EQUAL.

3 INCH AND SMALLER, VERTICAL:
1. FOR SCREWED AND SOLDER JOINT INSTALLATION. SAME AS SECTION A OR APPROVED EQUAL, PROVIDE ADAPTERS FOR SOLDER JOINT CONNECTION. 2.05 HOSE BIBBS A. SEE FIXTURE SCHEDULE ON DRAWINGS. B. PLUG COCKS, 125# BRONZE COCKS. TWO (2) INCH AND SMALLER SHALL BE CRANE NO. 250 OR APPROVED EQUAL.

INSTALLATION
INSTALL VALVES WHERE SHOWN ON DRAWINGS.

PLUMBING HANGERS AND SUPPORTS

DESCRIPTION
PROVIDE HANGERS FOR ALL PIPING NOT INDICATED BELOW GRADE. USE HANGERS CAPABLE OF ADJUSTMENT.

HANGERS AND SUPPORTS
HANGERS FOR BLACK OR GALVANIZED STEEL PIPE SHALL BE GRINNELL, MODEL NO. 65 OR APPROVED EQUAL.

HANGERS FOR CAST IRON PIPE SHALL BE GRINNELL, MODEL NO. 260 OR APPROVED EQUAL.

HANGERS FOR COPPER TUBING SHALL BE GRINNELL, MODEL NO. 97 C OR APPROVED EQUAL.

TRAPEZE HANGERS OF A TYPE APPROVED BY THE OWNER'S REPRESENTATIVE MAY BE USED WHERE PIPES ARE DESIGNED TO RUN PARALLEL AT THE SAME ELEVATION.

PROVIDE ISOLATION HANGER WITH PROTECTIVE SHIELD, GRINNELL, MODEL NO. 300 103 OR APPROVED EQUAL, FOR ALL INSULATED PIPING, AT HANGER POINTS, PROVIDE 6 INCH LONG SECTION OF 1/2 INCH THICK CALCIUM SILICATE SECTIONAL PIPE INSULATION WITH FACTORY LONGITUDINAL LAP, SEAL BUTT JOINTS WITH INSULATING CEMENT.

STRAP HANGERS: NOT PERMITTED.

RISER CLAMPS: PROVIDE RISER CLAMPS FOR VERTICAL PIPING AT EACH LEVEL, GRINNELL MODEL NO. 261

INSERTS: IN CONCRETE, GRINNELL MODEL NO. 285 OR APPROVED EQUAL, HAVING ADJUSTMENT FROM 3/4 INCH THROUGH 1-1/4 INCH. IN METAL DECKS READHEAD SD1 OR APPROVED EQUAL. POWDER PROPELLED PERMITTED IN NEW CONSTRUCTION WHERE TYPE AND LOCATION ARE APPROVED PRIOR TO INSTALLATION. IN EXISTING CONSTRUCTION, START SLUGIN NO. 6800 SERIES OR APPROVED EQUAL.

SIDE BEAM CLAMPS: PROVIDE WHEN SUPPORTING FROM STRUCTURAL STEEL MEMBERS, GRINNELL, MODEL 225 OR APPROVED EQUAL.

OTHER SUPPORTS: OBTAIN OWNER'S REPRENTATIVE APPROVAL FOR OTHER METHODS OF SUPPORT.

SPACING OF HANGERS
PROVIDE HANGER AT EACH CHANGE OF DIRECTION.

SPACE HANGERS AND SUPPORTS TO PREVENT SAGGING AND REDUCE STRAIN ON VALVES AND SPECIALTIES WITH SPACING NO GREATER AND ROD NO SMALLER THAN SHOWN ON THE FOLLOWING TABLE. HANGERS SHALL ALLOW FOR EXPANSION AND CONTRACTION.

FERROUS PIPING AND COPPER TUBING:

DIAMETER OF PIPE	MAXIMUM SPACING	ROD SIZE
1/2" THROUGH 1-1/2"	6 FT.	3/8"
2" THROUGH 3"	10 FT.	1/2"
4" THROUGH 5"	12 FT.	5/8"
6" AND LARGER	16 FT.	3/4" D.

CAST IRON PIPING:

DIAMETER OF PIPE	MAXIMUM SPACING	ROD SIZE	
2" AND 3"	EACH JOINT	3/8"	
4" AND 5"	EACH JOINT	1/2"	
6" AND 8"	EACH JOINT	3/4"	
10" THROUGH 15"	EACH JOINT	3/4"	(TWO HANGERS)

RISER CLAMPS
INSTALL AT EACH LEVEL BELOW THE FLOOR. SUSPEND FROM TWO HANGER RODS AND INSERTS WHERE THE INSTALLATION OF ESCUTCHEON PLATES IS REQUIRED.

TESTING OF PLUMBING PIPING

DESCRIPTION
CONDUCT ALL TESTS AFTER PIPING IS INSTALLED AND BEFORE PIPING IS CONCEALED OR COVERED.

PROVIDE ALL NECESSARY TEMPORARY PIPING CLOSURES.

PROVIDE ALL TESTING EQUIPMENT, MATERIALS AND SUPPLIES.

SYSTEMS SHALL REMAIN UNDER TEST FOR SUFFICIENT LENGTH OF TIME TO PROVE TIGHTNESS THEREOF AND FOR ADEQUATE OBSERVATION BY THE ARCHITECT-ENGINEER.

MATERIALS OTHER THAN THOSE SPECIFIED FOR JOINING WILL NOT BE PERMITTED IN THE PIPING SYSTEMS FOR THE PURPOSE OF STOPPING LEAKS.

ALL LEAKS DISCLOSED BY THE TESTING PROCEDURES SHALL BE REPAIRED AND TESTING REPEATED UNTIL THE SYSTEM IS PROVEN TIGHT.

TESTING REQUIREMENTS ARE MINIMUM AND ARE NOT INTENDED TO BE LIMITING WHERE ADDITIONAL TESTING METHODS ARE REQUIRED BY THE AUTHORITY HAVING JURISDICTION.

SUBMITTALS
STERILIZATION: PROVIDE A DATED LETTER TO THE ARCHITECT-ENGINEER'S REPRESENTATIVE STATING THAT PIPING SYSTEM HAS BEEN STERILIZED AND FLUSHED AS SPECIFIED.

PIPING TEST
DOMESTIC HOT AND COLD WATER PIPING SHALL BE FILLED, THEN TESTED TO A HYDROSTATIC PRESSURE OF 150 PSIG, MAINTAIN TEST PRESSURE FOR A MINIMUM OF ONE HOUR.

SANITARY PIPING, PREVIOUS TO CONNECTION OF FIXTURES, SHALL BE FILLED WITH WATER TO THE TOP OF THE SYSTEM AND PROVEN TIGHT, WHEN TESTING THE SYSTEM BY SECTIONS THE MINIMUM HEIGHT OF THE WATER COLUMN SHALL BE 10 FEET. EXAMINE ALL JOINTS FOR LEAKS.

NEW FIRE STANDPIPE SYSTEM SHALL BE TESTED TO A HYDROSTATIC PRESSURE OF 200 PSIG. MAINTAIN TEST PRESSURE FOR A MINIMUM OF TWO HOURS.

GAS PIPING SHALL BE TESTED WITH NITROGEN TO 50 PSIG. PRESSURE SHALL BE MEASURED WITH A MANOMETER. MAINTAIN TEST PRESSURE FOR A MINIMUM OF 30 MINUTES.

STERILIZATION
AFTER TESTS ARE COMPLETED ALL WATER SUPPLY SYSTEMS SHALL BE FILLED WITH A SOLUTION CONTAINING 100 PPM OF AVAILABLE CHLORINE AND ALLOWED TO STAND FOR A PERIOD TO TWO HOURS BEFORE BEING FLUSHED WITH CLEAN WATER.

PLUMBING, FIXTURES, TRIM AND DRAINS

MANUFACTURER
MANUFACTURER SHALL BE AS SCHEDULED OR BY APPROVED EQUAL.

PIPING
PIPING TO SERVE FIXTURES AND EQUIPMENT AND EXPOSED TO VIEW IN FINISHED AREAS SHALL BE BRASS, CHROMIUM PLATED.

SUPPORTS
PROVIDE ALL BRACKETS, PLATES, ANCHORS AND FASTENING DEVICES REQUIRED FOR ANCHORING THE FIXTURES RIGIDLY IN PLACE. RISERS TO SHOWER HEADS SHALL BE ANCHORED TO THE WALL CONSTRUCTION TO PREVENT MOVEMENT.

FIXTURES
PROVIDE PLUMBING FIXTURES AS SCHEDULED ON DRAWINGS, AMERICAN STANDARD, KOHLER, ELJER OR APPROVED EQUAL.

PLUMBING DRAINS
FURNISH WITH SEEPAGE FLANGE WHERE INSTALLED WITH PANS OR FLASHING. FURNISH CLAMPING RING.

ALL DRAINS SHALL BE OF THE SAME MANUFACTURER.

FURNISH FLOOR DRAINS WITH PRIMER CONNECTIONS WHERE INDICATED ON THE DRAWINGS. IN LIEU OF CAST-IN PRIMER CONNECTIONS ON THE DRAIN BODY, A TEE BETWEEN THE DRAIN BODY AND THE TRAP, TO RECEIVE THE PRIMER DISCHARGE WILL BE ACCEPTABLE.

PROVIDE FLOOR DRAINS WITH 4 INCH DEEP SEAL TRAPS.

PROVIDE ALL DRAINS AS SCHEDULED ON DRAWINGS OR APPROVED EQUAL.

INSTALLATION
DRAIN SHALL BE INSTALLED WHERE SHOWN ON THE DRAWINGS; ACCESSIBLE AND LOCATED TO SUIT EQUIPMENT APPROVED FOR INSTALLATION. WHERE FLUSH VALVES ARE SPECIFIED WITH FIXTURES, THE SUPPLY TO THE VALVE IN EACH ROOM SHALL BE AT THE SAME HEIGHT FOR THE TYPE OF FIXTURE AND THE VALVE SHALL BE SET IN PLACE SO THAT THE CENTER LINE OF THE VALVE DISCHARGE IS DIRECTLY ABOVE THE CENTER LINE OF FIXTURE STUD. BENDING OF NIPPLE BETWEEN THE VALVE AND THE STUD TO ACHIEVE CONNECTION WILL NOT BE PERMITTED.

CHROME PLATED PIPING REQUIRING THE USE OF WRENCH SHALL BE PROTECTED FROM DAMAGE.

BOLT WATER CLOSET CARRIER TO FLOOR.

GAS PIPING

PIPING
SHALL COMPLY WITH THE REQUIREMENTS OF NFPA NO. 54 AND THE LOCAL GAS COMPANY.

PIPE SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH MALLEABLE FITTINGS

INSTALLATION
PIPING SHALL COMPLY WITH THE REQUIREMENTS OF NFPA NO. 54 AND THE LOCAL GAS COMPANY.

INSTALL GAS SHUT-OFF AND GAS MANIFOLDS AS INDICATED OR REQUIRED.

DOMESTIC HOT AND COLD WATER

DESCRIPTION
THE WORK INCLUDES FURNISHING AND INSTALLING HOT AND COLD WATER PIPING AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.

PIPING
HOT AND COLD WATER PIPING SHALL BE COPPER WATER TUBE HARD TEMPER, TYPE "L" WITH WROUGHT SOLDER FITTINGS ABOVE FLOOR AND SOFT TEMPER TYPE "K" WITH WROUGHT SOLDER FITTINGS BELOW GRADE.

GATE VALVES
SPECIFIED IN SECTION, PLUMBING VALVES .

INSTALLATION
NOTCHING OF PIPE FOR CONNECTION NOT PERMITTED.

WHERE POSSIBILITY OF BACKFLOW FROM THE DRAIN TO THE SUPPLY FITTING EXISTS, INSTALL VACUUM BREAKERS.

NOT MORE THAN ONE LAVATORY, SINK, OR SIMILAR FIXTURE SHALL BE SUPPLIED BY A 1/2 INCH BRANCH. LINEAR DIMENSIONS NOT TO EXCEED 5 FEET.

MAKE CONNECTION TO EQUIPMENT AND FIXTURES INDICATED ON THE DRAWINGS OR SPECIFIED HEREIN.

HOT WATER BRANCH CONNECTIONS TO DISTRIBUTION MAINS SHALL BE TOP TAKE-OFF, SWING JOINT TYPE.

ALL PIPING INSTALLED BELOW GROUND SHALL RECEIVE TWO COATS OF KOPPERS NO. 50 OR APPROVED EQUAL.

PLUMBING INSULATION

DESCRIPTION
INSULATION SHALL NOT BE INSTALLED UNTIL TESTING PROCEDURES HAVE BEEN COMPLIED WITH AND ALL SURFACES HAVE BEEN CLEANED AND FREE OF DIRT, GREASE AND COMPLETELY DRIED.

MATERIALS SHALL COMPLY WITH UL 723, FLAME SPREAD RATING, HOT SURFACE TEST PERFORMANCE, AND SMOKE DEVELOPED RATING.

SUBMITTALS
SAMPLES AND MANUFACTURER'S PRODUCT DATA: SUBMIT SAMPLES OF INSULATION AND ADHESIVE AND PRODUCT DATA LISTING RECOMMENDATIONS FOR USE AND COMPLIANCE WITH NFPA 90.

INSULATION
INSULATION FOR HOT AND COLD WATER PIPING, SHALL BE SECTIONAL GLASS FIBER AS MANUFACTURED BY OWENS CORNING FIBERGLASS TYPE ASJ/SSLII OR APPROVED EQUAL, WITH FACTORY APPLIED, ALL PURPOSE, FIRE RETARDANT JACKET.

INSULATION FOR EXPOSED HOT AND COLD WATER PIPING SHALL BE SECTIONAL GLASS FIBER AS MANUFACTURED BY OWENS CORNING FIBERGLASS TYPE ASJ/SSLII OR APPROVED EQUAL, WITH FACTORY APPLIED, .016 EMBOSSED ALUMINUM JACKET.

ADHESIVE SHALL BE BENJAMIN FOSTER 30-36, OR APPROVED EQUAL, WHITE INSULATION LAGGING ADHESIVE.

VAPOR BARRIER MASTIC SHALL BE BENJAMIN FOSTER NO. 82-07, WHITE, OR APPROVED EQUAL.

INSTALLATION
HOT AND COLD WATER PIPING: SHALL BE INSULATED WITH 1/2 INCH THICK GLASS FIBER INSULATION HAVING A FACTORY APPLIED, ALL PURPOSE, FIRE RETARDANT JACKET WITH A MINIMUM R-4.0 PER INCH. CONCEALED AND EXPOSED PIPING SHALL HAVE THE INSULATION APPLIED WITH SIDE AND END JOINTS BUTTED TIGHTLY. SEAL JACKET LEGS AND BUTT JOINT STRIPS WITH ADHESIVE.

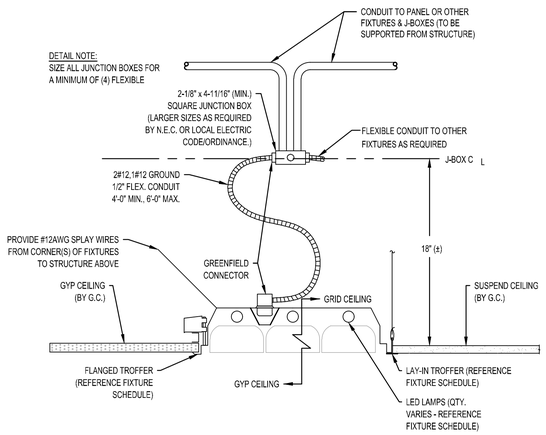
INSULATE FITTINGS FOR PIPING UP TO 3 INCHES IPS WITH MOLDED GLASS FIBER. INSULATE FITTINGS FOR PIPING LARGER THAN 3 INCHES WITH MOLDED FITTINGS OR SEGMENTED SECTIONS, WIRED IN PLACE TO THE SAME THICKNESS AS ADJACENT INSULATION. EXPOSED INSULATED PIPING AND FITTINGS SHALL BE JACKETED WITH 6 OUNCE CANVAS PIPING INCLUDING THE FITTING CHANGE FROM HORIZONTAL TO VERTICAL. CONCEALED AND EXPOSED PIPING SHALL HAVE THE INSULATION APPLIED WITH SIDE AND END JOINTS BUTTED TIGHTLY. SEAL OFF ENDS OF INSULATION WITH VAPOR BARRIER MASTIC AT EACH FITTING AND AT 21 FOOT INTERVALS ON CONTINUOUS RUNS.

INSTALL THE FACTORY APPLIED FIRE RETARDANT JACKET VAPOR BARRIER SO THAT IT WILL LAP SMOOTHLY AND SECURELY AT THE LONGITUDINAL LAP AND ADHERE IT WITH VAPOR BARRIER MASTIC. ADHERE 3 INCH WIDE BUTT STRIPS X SMOOTHLY OVER ALL END JOINTS WITH THE VAPOR BARRIER MASTIC TO ASSURE A CONTINUOUS VAPOR BARRIER - NO STAPLES ALLOWED. INSULATE DRAIN BODIES AND FITTINGS WITH METERED SEGMENTS OF PIPE INSULATION, OVERSIZED PIPE INSULATION OR MOLDED FITTINGS. COAT WITH TWO, 1/8 INCH COATS OF VAPOR BARRIER MASTIC REINFORCED WITH GLASS FABRIC EXTENDING 2 INCHES ONTO ADJACENT PIPES. EXPOSED INSULATED PIPING AND FITTINGS SHALL BE JACKETED WITH 8 OUNCE CANVAS. TERMINATE INSULATION NEATLY AT CLEANOUTS ON STORM AND COLD DRAIN PIPING. DO NOT COVER CLEANOUTS.

DOMESTIC WATER HEATING

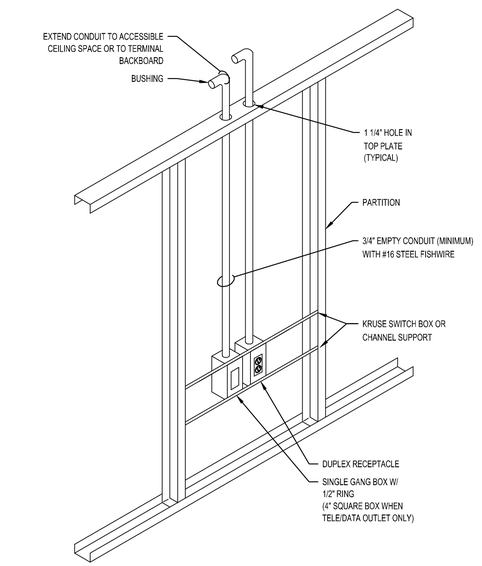
DESCRIPTION
PROVIDE DOMESTIC WATER HEATING EQUIPMENT WHERE SHOWN ON DRAWINGS AND SPECIFIED.

DISCHARGE PIPE
RELIEF VALVE D



1 TYPICAL RECESSED FIXTURE DETAIL

SCALE: NOT TO SCALE



2 OUTLET IN HOLLOW PARTITION

SCALE: NOT TO SCALE

ELECTRICAL ABBREVIATIONS

AC	ALTERNATING CURRENT
AHU	AIR HANDLING UNIT
A. OR AMPS.	AMPERES
AFC	ABOVE FINISH COUNTER
AFCI	ARC FAULT CIRCUIT INTERRUPTER
AFF	ABOVE FINISHED FLOOR
AIC	AMPERES INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
BTC	BRANCH TO CONNECTION POINT AND CONNECT EQUIPMENT
C	CONDUIT ("E.C." IS EMPTY CONDUIT)
CF	CEILING FAN
CM	COFFEE MAKER
CT	COOKTOP
D	DEDICATED CIRCUIT
DCO	DUPLEX CONVIENCE OUTLET
DP	DISPOSAL
DW	DISHWASHER
DY	DRYER
EMT	ELETRICAL METALLIC TUBING
EF	EXHAUST FAN
EWC	ELECTRIC WATER COOLER (WATER-COOLED DRINKING FOUNTAIN)
EX	EXISTING
FCU	FAN COIL UNIT
GFI/GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFIP	GROUND FAULT INTERRUPTER PROTECTED
GRD	GROUND
H	HORIZONTAL MOUNT (RECEPTACLE)
HD	VENTILATION HOOD
HP	HORSEPOWER
HT	HEAT TRACE POWER (PROVIDE W/ 20A/1P GFI BREAKER)
HVAC	HEATING, VENTILATING, & AIR CONDITIONING
HZ	HERTZ
IG	ISOLATED GROUND (DUPLEX RECEPTS. - NEMA 5-20RIG)
KCM	THOUSAND CIRCULAR MILLS
KVA	KILOVOLT-AMPERES (1000 VOLT-AMPERES)
KW	KILOWATTS (1000 WATTS)
MLO	MAIN LUGS ONLY
MCB	MAIN CIRCUIT BREAKER
MW	MICROWAVE (COORD MTG HT W/ ARCHITECT)
NIC	NOT IN CONTRACT
NEC	NATIONAL ELECTRICAL CODE
NF	NOT FUSED
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
PNL	PANEL
PH OR Ø	PHASE
P	POLE
PVC	POLYVINYL CHLORIDE
RF	REFRIGERATOR
RG	RANGE
SPD	SURGE PROTECTIVE DEVICE
T	TAMPERPROOF RECEPTACLE
TTB	TELEPHONE TERMINAL BOARD
TV	TELEVISION RECEPTACLE
UC	UNDERCOUNTER REFRIGERATOR (OR ICE MACHINE)
UL	UNDERWRITERS LABORATORIES
U.N.O.	UNLESS NOTED OTHERWISE
V	VOLTS
VA	VOLT-AMPERES
VD	VENDING MACHINE (24"AFF)
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS
WA	WASHER
WD	WARMING DRAWER
WO	WALL OVEN
WP	WEATHERPROOF
WP/WR	WEATHERPROOF/WEATHER RESISTANT
W/UNIT	DISCONNECT IS SUPPLIED WITH THE UNIT

GENERAL ELECTRICAL NOTES

1. COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, REQUIREMENTS OF THE AHJ AND ALL LOCAL & STATE CODES.
2. DO NOT SCALE FROM THESE DRAWINGS.
3. REFER TO ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF ALL LIGHTING FIXTURES AND ELECTRICAL DEVICES.
4. ALL EMPTY CONDUITS SHALL BE PROVIDED WITH PULL STRINGS AND BUSHINGS.
5. ALL JUNCTION BOXES SHALL HAVE A COVER.
6. COORDINATE EACH LIGHT FIXTURE INSTALLATION(S) W/ ACTUAL CEILING TO BE FURNISHED.
7. ALL BRANCH CIRCUITS WITHOUT A CONDUCTOR & CONDUIT INDICATED SHALL BE ROUTED TO A 20A-1P BREAKER W/ 2#12,1#12EG,3/4"C.
8. ALL BRANCH CIRCUIT CONDUCTORS SHALL NOT BE SMALLER THAN #12 AWG AND ALL CONDUIT SHALL NOT BE SMALLER THAN 3/4"C. UNLESS SPECIFICALLY NOTED OTHERWISE.
9. ALL CIRCUITS (LIGHTING AND POWER) SHALL BE PROVIDED WITH DEDICATED NEUTRALS UNLESS NOTED OTHERWISE. WHERE NEUTRALS ARE INDICATED TO BE SHARED, MULTIWIRE BRANCH CIRCUITS SHALL BE PROVIDED WITH 2P OR 3P BREAKERS AS REQUIRED PER NEC210.4.
10. ALL CIRCUITS (LIGHTING AND POWER) SHALL BE PROVIDED WITH AN INSULATED EQUIPMENT GROUND CONDUCTOR SIZED IN ACCORDANCE WITH THE NEC. THE RACEWAY SHALL NOT BE USED AN EQUIPMENT GROUND.
11. ALL FIXTURES SHALL BE SUPPORTED FROM EACH CORNER (INDEPENDENT OF THE SUSPENDED CEILING) WITH 12 GAUGE WIRE CONNECTED TO STRUCTURAL SYSTEM OF BUILDING. THE INSTALLATION SHALL MEET OR EXCEED THE SEISMIC REQUIREMENTS OF LOCAL AND NATIONAL CODES.
12. ELECTRICAL DEVICE MOUNTING HEIGHTS, UNO:

PANELBOARDS	78" AFF TO TOP OF PANEL
SWITCHES	48" AFF TO TOP OF JUNCTION BOX
RECEPTACLES	18" AFF TO CENTER OF RECEPTACLE
TELE/DATA OUTLETS	18" AFF TO CENTER OF RECEPTACLE
APARTMENT LOADCENTERS	PER ANSI A117.1 REQUIREMENTS (VERIFY WITH LOCAL INSPECTOR)

13. ELECTRICAL EQUIPMENT (PANELBOARDS, TRANSFORMERS, DISTRIBUTION EQUIPMENT, ETC.) IS SHOWN TO SCALE ON THE FLOOR PLANS.
14. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING EQUIPMENT THAT WILL FIT WITHIN THE SPACES SHOWN ON THE PLANS AND COMPLYING WITH ALL CODE REQUIRED CLEARANCES.
15. ELECTRICAL CONTRACTOR TO LABEL ALL DEVICES (RECEPTACLES, SWITCHES, PANELBOARDS, DISCONNECTS, ETC.) WITH CIRCUIT NUMBER AND PANELBOARD DESIGNATION. RECEPTACLES, SWITCHES, AND SIMILAR DEVICES TO HAVE PRE-PRINTED, SELF ADHESIVE LABEL.
16. PANELBOARDS, DISCONNECT SWITCHES, AND SIMILAR DEVICES TO HAVE ENGRAVED, SELF-ADHESIVE, LAMINATED ACRYLIC LABEL (BLACK W/ WHITE LETTERING).
17. PROVIDE TYPE-WRITTEN PANELBOARD SCHEDULES FOR ALL ELECTRICAL PANELBOARDS.

ELECTRICAL SYMBOLS

LIGHTING FIXTURES/DEVICES

SYMBOL	DESCRIPTION	MOUNTING
A	DOWNLIGHT (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	CEILING
A	DIRECTIONAL DOWNLIGHT (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	CEILING
A	WALL MOUNTED LIGHT FIXTURE (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	WALL
A	LINEAR LIGHT FIXTURE (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	CEILING OR SUSPENDED
A	2X4 LIGHT FIXTURE (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	CEILING
A	2X2 LIGHT FIXTURE (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	CEILING
	HATCHING ON FIXTURE INDICATES FIXTURE TO HAVE EMERGENCY BACK-UP	
X3	TWO HEAD EMERGENCY LIGHT FIXTURE (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	WALL OR CEILING
X1 X1	EMERGENCY EXIT SIGN. PROVIDE ARROW(S) AS INDICATED. SHADING INDICATES FACE (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	WALL OR CEILING
S	SINGLE POLE SWITCH 20A (120/277V)	WALL - 48" AFF
S_3	THREE WAY SWITCH 20A (120/277V)	WALL - 48" AFF
S_4	FOUR WAY SWITCH 20A (120/277V)	WALL - 48" AFF
	WALL BOX DIMMER SWITCH	WALL - 48" AFF
X X	CEILING OR WALL MOUNTED OCCUPANCY SENSOR (LETTER INDICATES SENSOR TYPE) REFER TO LIGHTING CONTROLS SCHEDULE	WALL OR CEILING
LCS X	LOW-VOLTAGE CONTROL STATION (LETTER INDICATES CONTROL STATION TYPE) REFER TO LIGHTING CONTROLS SCHEDULE	WALL - 48" AFF
PC X	PHOTOCELL SENSOR (LETTER INDICATES SENSOR TYPE) REFER TO LIGHTING CONTROLS SCHEDULE	FIELD VERIFY
PP	POWERPACK (LETTER INDICATES POWERPACK TYPE) REFER TO LIGHTING CONTROLS SCHEDULE	ACCESSIBLE CEILING

COMMUNICATION/LOW-VOLTAGE DEVICES

SYMBOL	DESCRIPTION	MOUNTING
CR	CARD READER (VERIFY EXACT REQUIREMENTS)	
	DATA, TELEPHONE, OR COMBO TELE/DATA OUTLET PROVIDE PULLSTRING IN CONDUIT TO ACCESSIBLE CEILING	WALL - 18" AFF
	DATA, TELEPHONE, OR COMBO TELE/DATA OUTLET PROVIDE PULLSTRING IN CONDUIT TO ACCESSIBLE CEILING	FLOOR OR CEILING
TV	TELEVISION OUTLET	WALL OR CEILING
	SPEAKER OUTLET	FIELD VERIFY
'TTB'	TELEPHONE TERMINAL BOARD	WALL
	SECURITY CAMERA OUTLET	FIELD VERIFY
	PUSH BUTTON	

POWER EQUIPMENT/DEVICES

SYMBOL	DESCRIPTION	MOUNTING
	SWITCHBOARD OR DISTRIBUTION PANEL REFER TO PANEL SCHEDULES	
	DRY-TYPE TRANSFORMER REFER TO PLANS FOR KVA RATING	
	120/208V, 3Ø, 4W PANELBOARD REFER TO PANEL SCHEDULES	
	277/480V, 3Ø, 4W PANELBOARD REFER TO PANEL SCHEDULES	
J	JUNCTION BOX	WALL OR CEILING
30/20/3	FUSED SAFETY SWITCH (E.G. 30/20/3 INDICATES A 30A, 3-POLE SWITCH WITH 20A FUSES)	
30/NF/3	NON-FUSED SAFETY SWITCH (E.G. 30/NF/3 INDICATES A 30A, 3-POLE SWITCH WITHOUT FUSES)	
M	MOTOR RATED SWITCH	
	MOTOR	
	NEMA 5-20R SIMPLEX RECEPTACLE	WALL - 18" AFF
	NEMA 5-20R DUPLEX RECEPTACLE	WALL - 18" AFF
	NEMA 5-20R DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER	1
	NEMA 5-20R QUAD-PLEX RECEPTACLE	WALL - 18" AFF
	NEMA 5-20R SPLIT RECEPTACLE. TOP OUTLET WIRED HOT. BOTTOM OUTLET SWITCHED.	WALL - 18" AFF
	SPECIAL PURPOSE RECEPTACLE REFER TO PLANS FOR NEMA CONFIGURATION	WALL - 18" AFF OR CEILING
USB	NEMA 5-20R - DUPLEX RECEPTACLE WITH USB PORTS SIMILAR TO HUBBELL #USB20AC5W	WALL - 18" AFF
	NEMA 5-20R DUPLEX RECEPTACLE MOUNTED ON CEILING	CEILING - FLUSH
FB	HUBBELL CFB4 SERIES FLOOR BOX (OR EQUAL) WITH (2) DUPLEX RECEPTACLES AND DATA/COMMUNICATION CONNECTION CAPABILITY	FLOOR - FLUSH
FBX	HUBBELL B24 SERIES FLOOR BOX (OR EQUAL) WITH (1) DUPLEX RECEPTACLE AND DATA/COMMUNICATION CONNECTION CAPABILITY	FLOOR - FLUSH
FBL	HUBBELL B24 SERIES FLOOR BOX (OR EQUAL) FOR POWER AND DATA CONNECTIONS TO PRE-WIRED FURNITURE VERIFY EXACT CONNECTION WITH FURNITURE VENDOR	FLOOR - FLUSH
PCL	HUBBELL S1PT SERIES 4" POKE-THRU (OR EQUAL) WITH (2) DUPLEX RECEPTACLES AND DATA/COMMUNICATION CONNECTION CAPABILITY	FLOOR - FLUSH
PCL	HUBBELL S1PTFF SERIES 4" POKE-THRU (OR EQUAL) FOR POWER AND DATA CONNECTIONS TO PRE-WIRED FURNITURE VERIFY EXACT CONNECTION WITH FURNITURE VENDOR	FLOOR - FLUSH
PCL	HUBBELL S1R6 SERIES 6" POKE-THRU (OR EQUAL) WITH (2) DUPLEX RECEPTACLES AND DATA/COMMUNICATION AND A/V CONNECTION CAPABILITY	FLOOR - FLUSH
	CONDUIT IN OR UNDER FLOOR/GRADE	
	CONDUCTOR HOME RUN - (H) HOT, (I) NUETRAL, (E) EQUIPMENT GROUND, & ( ) ISOLATED GROUND	
	EQUIPMENT CONNECTION	
	CONDUIT IN CEILING OR WALL	

NOTE: NOT ALL SYMBOLS MAY BE USED.

1 IF MOUNTED ABOVE A COUNTER, DEVICE TO BE WALL MOUNTED 6" ABOVE FINISHED COUNTER OR 44" TO TOP OF JUNCTION BOX (WHICHEVER IS LOWER). IF NOT MOUNTED ABOVE A COUNTER, DEVICE TO BE WALL MOUNTED AT 48" AFF TO TOP OF JUNCTION BOX AS REQUIRED TO MEET ADA REQUIREMENTS. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS/ELEVATIONS.

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STATE OF MISSOURI
RYAN BREWER
NUMBER PE-2020010759
PROFESSIONAL ENGINEER
05/30/2024

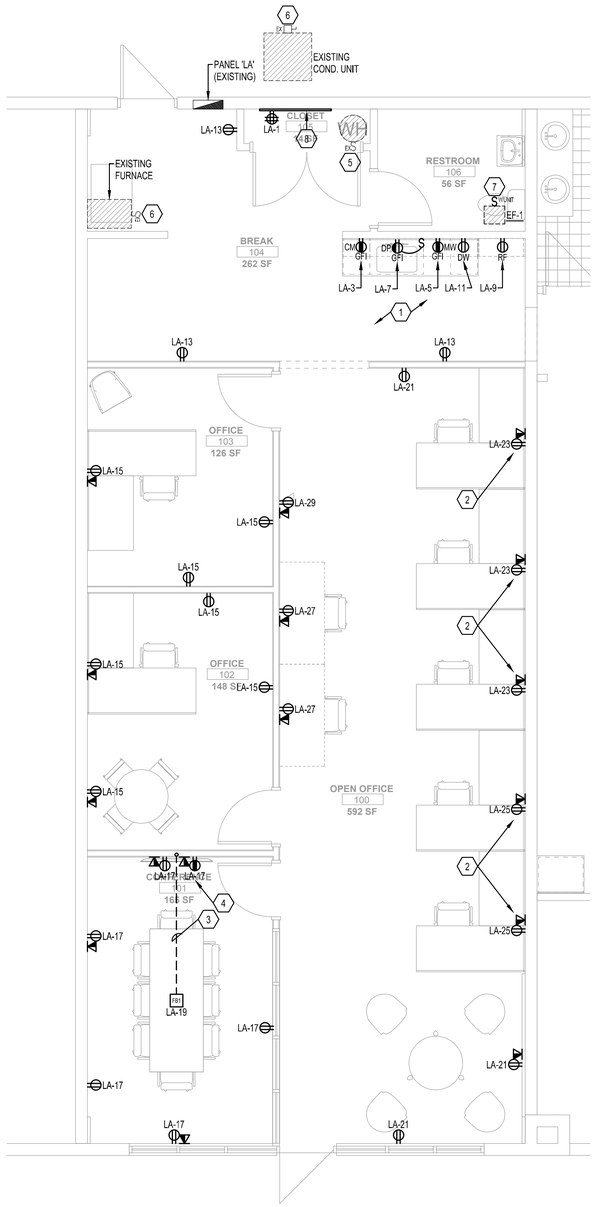
project number	2024-023
date	05.30.2024
issued for	PERMIT

rev date description

ELECT. NOTES, SYMBOLS & ABBREVIATIONS

sheet number

E101



1 ELECTRICAL POWER PLAN

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

GENERAL NOTES

(NOT ALL NOTES APPLY)

1. REFERENCE SHEET E101 FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS.
2. COORDINATE MOUNTING HEIGHTS AND LOCATIONS FOR ALL DEVICES WITH ARCHITECT AND/OR INTERIOR ELEVATIONS PRIOR TO ROUGH-IN.
3. CIRCUIT NUMBERS ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS.
4. WHERE POSSIBLE, RE-USE SPARE CIRCUITS RESULTING FROM DEMOLITION PRIOR TO PULLING NEW CIRCUITS FROM PANELBOARD.
5. EXISTING CONDITIONS INDICATED IN THESE DOCUMENTS ARE BASED ON A CURSORY SITE REVIEW AND DO NOT REPRESENT A COMPLETE "AS-BUILT" SET OF DOCUMENTS. IT IS THE CONTRACTORS RESPONSIBILITY TO FULLY INVESTIGATE ALL EXISTING CONDITIONS AND NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES TO THESE DOCUMENTS OR THE DESIGN INTENT.
6. DEVICES LABELED 'EX' ARE EXISTING TO REMAIN UNLESS NOTED OTHERWISE.

KEYED NOTES:

1. FIELD VERIFY EXACT CONNECTION REQUIREMENTS OF ALL BREAK ROOM APPLIANCES WITH OWNER PRIOR TO ROUGH-IN.
2. POWER AND DATA FOR OPEN OFFICE FURNITURE. FIELD VERIFY EXACT CONNECTION REQUIREMENTS WITH FURNITURE SUPPLIER PRIOR TO ROUGH-IN.
3. PROVIDE (1) 3/4" CONDUIT FOR POWER AND (1) 1-1/4" CONDUIT FOR DATA FROM POKE-THRU TO NEAREST WALL AND UP INTO ACCESSIBLE CEILING. PATCH AND REPAIR CONCRETE AS REQUIRED.
4. POWER AND DATA FOR WALL MOUNTED TV. FIELD VERIFY EXACT LOCATION PRIOR TO ROUGH-IN.
5. EXISTING WATER HEATER TO REMAIN.
6. EXISTING HVAC EQUIPMENT TO REMAIN.
7. CONNECT EXHAUST FAN TO LIGHTING SWITCHLEG IN THIS AREA. DESIGN INTENT IS FOR FAN TO ENERGIZE 'ON'/'OFF' WITH THE LIGHT FIXTURES IN THIS AREA.
8. PROVIDE 4'X8'X3/4" SHEET OF FIRE RESISTANT PLYWOOD FOR TELE/DATA TERMINAL BOARD AND IT EQUIPMENT.

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STATE OF MISSOURI
RYAN BREWER
NUMBER PE-2020010759
PROFESSIONAL ENGINEER

05/30/2024

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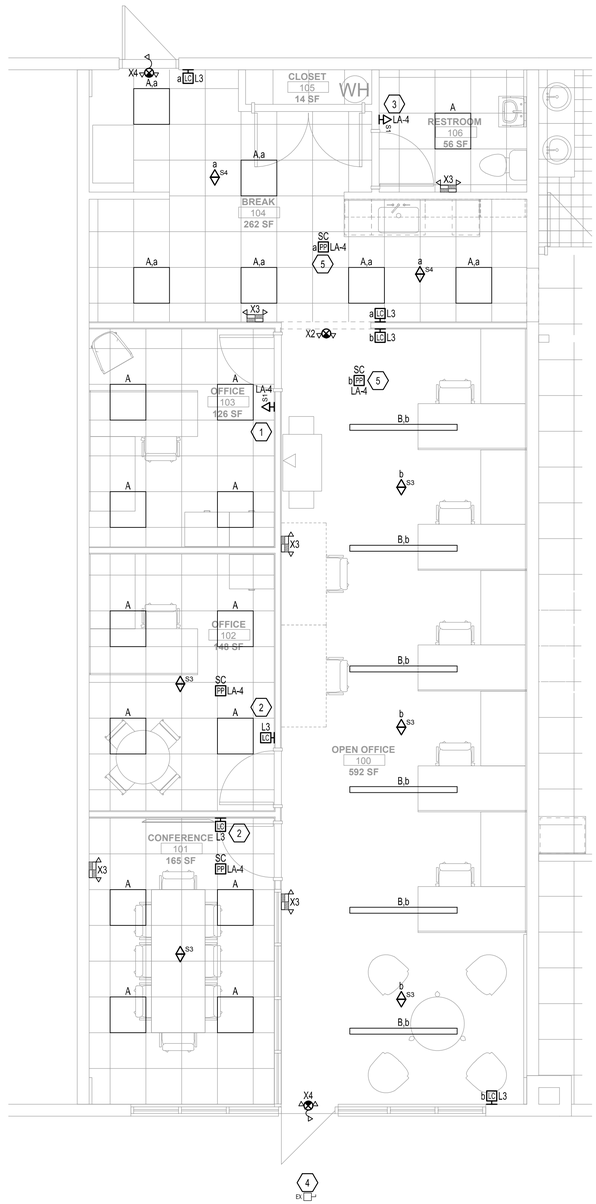
ELECTRICAL POWER PLAN

sheet number

E201



1 **ELECTRICAL LIGHTING PLAN**

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

GENERAL NOTES

(NOT ALL NOTES APPLY)

1. REFERENCE SHEET E101 FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS.
2. COORDINATE MOUNTING HEIGHTS AND LOCATIONS FOR ALL DEVICES WITH ARCHITECT AND/OR INTERIOR ELEVATIONS PRIOR TO ROUGH-IN.
3. CIRCUIT NUMBERS ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS.
4. WHERE POSSIBLE, RE-USE SPARE CIRCUITS RESULTING FROM DEMOLITION PRIOR TO PULLING NEW CIRCUITS FROM PANELBOARD.
5. EXISTING CONDITIONS INDICATED IN THESE DOCUMENTS ARE BASED ON A CURSORY SITE REVIEW AND DO NOT REPRESENT A COMPLETE "AS-BUILT" SET OF DOCUMENTS. IT IS THE CONTRACTORS RESPONSIBILITY TO FULLY INVESTIGATE ALL EXISTING CONDITIONS AND NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES TO THESE DOCUMENTS OR THE DESIGN INTENT.
6. CIRCUIT ALL EXIT SIGNS TO NEAREST EMERGENCY LIGHTING CIRCUIT (OR NEAREST LIGHTING CIRCUIT IF NO GENERATOR).
7. VERIFY ALL EXISTING BRANCH CIRCUITING. CONTRACTOR SHALL WIRE FIXTURES IN ACCORDANCE WITH SWITCHING INDICATED. CONNECTED LOAD ON 277V-20A CIRCUITS SHALL NOT EXCEED 4000W, 120V-20A CIRCUITS SHALL NOT EXCEED 1800W.

KEYED NOTES:

1. CONTROL INTENT FOR THIS AREA IS FOR LIGHTS TO BE MANUAL 'ON', AUTO 'OFF' VIA OCCUPANCY SENSOR SWITCH.
2. CONTROL INTENT FOR THIS AREA IS FOR LIGHTS TO BE MANUAL 'ON', AUTO 'OFF' VIA OCCUPANCY SENSOR WITH MANUAL OVERRIDE AVAILABLE AT THE LOW-VOLTAGE CONTROL STATION.
3. CONTROL INTENT FOR THIS AREA IS FOR LIGHTS TO BE AUTO 'ON', AUTO 'OFF' VIA OCCUPANCY SENSOR SWITCH.
4. EXISTING SIGNAGE CIRCUIT AND CONTROLS TO REMAIN. FIELD VERIFY THE EXISTING SIGNAGE CIRCUIT HAS A NEMA 3R, LOCKABLE DISCONNECT SWITCH THAT CAN BE RE-USED FOR A NEW SIGN AS REQUIRED. IF NECESSARY, PROVIDE A LOCKABLE DISCONNECT SWITCH FOR ANY NEW SIGNAGE. FIELD VERIFY EXACT REQUIREMENTS WITH OWNER/SIGNAGE PROVIDER.
5. CONTROL INTENT FOR THIS AREA IS FOR LIGHTS TO BE AUTO 'ON', AUTO 'OFF' VIA OCCUPANCY SENSOR WITH MANUAL OVERRIDE AVAILABLE AT THE LOW-VOLTAGE CONTROL STATION.

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STATE OF MISSOURI
RYAN BREWER
NUMBER PE-2020010759
PROFESSIONAL ENGINEER

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ELECTRICAL LIGHTING PLAN

sheet number

E301

PANEL LA (EXISTING)

VOLTAGE/PHASE: **208Y/120V, 3PH, 4W**
BUS AMPERAGE: **200A**
MAIN TYPE: **MLO**

AFC VALUE: **EXISTING**
AIC RATING: **EXISTING**
MOUNTING: **RECESSED (NEMA 1)**

GROUNDS: **EG (PER T250.122)**
ISOLATED GROUND BUS: **NO**
SERVICE ENTRANCE RATED: **NO**

ALL LOADS IN VA

LTG	RCPT	MOTOR	HEAT	COOL	MISC	KITCHEN	ELEV	DESCRIPTION	AMP	P	WIRE	CKT #	PHASE A	CKT #	WIRE	P	AMP	DESCRIPTION	LTG	RCPT	MOTOR	HEAT	COOL	MISC	KITCHEN	ELEV	
	360				1500			TELEDATA BRD QUAD	20	1	12	1	A	2	EX	1	20	WATER HEATER						1500			
					1200			COFFEE MAKER	20	1	12	3	B	4	12	1	20	INTERIOR LTG	973								IX
					1200			MICROWAVE	20	1	12	5	C	6	EX	1	20	SIGNA GETMECLOCK	1200								
		1184						DISPOSAL	20	1	12	7	A	8				SPACE ONLY									
GF					1000			REFRIGERATOR	20	1	12	9	B	10				SPACE ONLY									
GF					1000			DISHWASHER	20	1	12	11	C	12				SPACE ONLY									
	540							BREAK AREA RCPTS	20	1	12	13	A	14				SPACE ONLY									
	1080							OFFICE 102/103 RCPTS	20	1	12	15	B	16	EX	1	20	FURNACE (EXISTING)			1200						IX
	1080							CONF 101 WALL RCPTS	20	1	12	17	C	18				SPACE ONLY									
	360							CONF 101 FLOORBOX	20	1	12	19	A	20				SPACE ONLY									
	540							OP-OFFICE CONF RCPTS	20	1	12	21	B	22				SPACE ONLY									
	540							OP-OFFICE DESK RCPTS	20	1	12	23	C	24				SPACE ONLY									
	360							OP-OFFICE DESK RCPTS	20	1	12	25	A	26									2078				
	360							OP-OFFICE DESK RCPTS	20	1	12	27	B	28	EX	3	40	CONDENSING UNIT (EXISTING)					2078				IX
					1800			COPY MACHINE	20	1	12	29	C	30									2078				
0	5400	1184	0	0	6500	0	0	**TOTALS**										**TOTALS**	2173	0	1200	0	6233	1500	0	0	

NEC CODE REFERENCES

* 100% OF 1ST 10 KVA, 50% OF REMAINING
** 125% OF LARGEST MOTOR + 100% SUM OF REMAINING MOTORS
*** ELEVATOR DEMAND FACTOR BASED ON NEC T620.14.

PANEL ABBREVIATIONS

GF - GROUND FAULT BREAKER
DT - SHUNT TRIP BREAKER
AF - ARC FAULT BREAKER
GFAF - COMBO ARC/GROUND FAULT BREAKER
IG - PROVIDE ISOLATED GROUND
EM - PROVIDE EMERGENCY LOCKING TAB
FA - FIRE ALARM, PROVIDE RED LOCKING TAB
LOK - PROVIDE PADLOCKABLE BREAKER
OL - REFER TO DWELING DIAGRAM FOR WIRE SIZE
RP - CIRCUIT CONTROLLED VIA RELAY PANEL

PANEL NOTES

PHASE LOAD SUMMARY

TOTAL	PHASE	LTG	RCPT	MOTOR	HEAT	COOL	MISC	KITCHEN	ELEV
6361	A	0	1620	1184	0	2078	1500	0	0
8911	B	973	2160	1200	0	2078	2500	0	0
8998	C	1200	1620	0	0	2078	4000	0	0

PANEL LOAD SUMMARY

24190	CONNECTED VA	2173	5400	2384	0	6233	8000	0	0
---	DEMAND FACTORS	1.25	--	--	1.00	1.00	1.00	1.00	1.00
24733	DEMAND VA	2716	5400	2384	0	6233	8000	0	0
0	SHOWN WINDOW DEMAND								
0	TRACK LTG DEMAND								
0%	SPARE								
24733	DEMAND VA + SPARE								
68.7	TOTAL DESIGN AMPS								

LIGHTING CONTROLS SCHEDULE

FIXTURE TAG	MANUFACTURER	MODEL #	SETTINGS	DESCRIPTION	NOTES
SC	ACUITY BRANDS: nLIGHT	nPP16 SERIES	REFER TO PLANS FOR CONTROL INTENT	ON/OFF ROOM SWITCH CONTROLLER LINE VOLTAGE - SINGLE RELAY	1,2,4
L3	ACUITY BRANDS: nLIGHT	nPODM	-	ON/OFF LOW VOLTAGE SWITCH WITH 1-CHANNEL CONTROL	1,6
S1	SENSOR SWITCH	WSX SERIES	REFER TO PLANS FOR CONTROL INTENT	WALL MOUNT OCCUPANCY SENSOR LINE VOLTAGE - SINGLE RELAY	1
S3	ACUITY BRANDS: nLIGHT	nCM-9 SERIES	-	CEILING MOUNT OCCUPANCY SENSOR - SMALL MOTION LOW VOLTAGE	3
S4	ACUITY BRANDS: nLIGHT	nCM-10 SERIES	-	CEILING MOUNT OCCUPANCY SENSOR - LARGE MOTION LOW VOLTAGE	3
WIRE	-	-	-	CAT5, CAT5e, OR CAT 6. STANDARD OR SOLID. TERMINATED AS RJ45 TIA/EIA-568B	

NOTES:

1. COORDINATE ALL MODEL NUMBERS WITH MANUFACTURER PRIOR TO ORDERING. PROVIDE DEVICES TO MEET CONTROL INTENT INDICATED ON THE DRAWINGS.
2. PROVIDE 6'-0" OF EXCESS CONTROL WIRING, COILED AND TIED, BETWEEN CEILING MOUNTED OCCUPANCY SENSOR AND CORRESPONDING LOAD CONTROLLER.
3. MODIFY LOCATIONS OF CEILING MOUNTED OCCUPANCY SENSORS AS REQUIRED SO THAT NO OCCUPACNY SENSORS IS WITHIN 4'-0" OF AN HVAC SUPPLY DIFFUSER.
4. LOCATE DEVICE ABOVE CEILING OR AT STRUCTURE IN ACCESSIBLE LOCATION. LOCATIONS SHOWN ON DRAWINGS ARE SCHEMATIC. ADD ACCESS PANEL WITHIN CEILING IF NECESSARY. COORDINATE ACCESS PANEL LOCATION AND SPECIFICATION DIRECTLY WITH ARCHITECT.
5. LOCATION SHOWN ON PLAN FOR REFERENCE ONLY. CONTRACTOR MAY RELOCATE BRIDGE PORTS FOR A MORE ECONOMICAL LAYOUT IF DESIRED.
6. PROVIDE DEVICES WITH DEFAULT MANUFACTURE MARKINGS ON BUTTONS.
7. ROUTE RECEPTACLE CIRCUIT INDICATED ON PLAN AS "CONTROLLED RECEPTACLES" THROUGH PLUG LOAD CONTROLLER FOR AUTOMATIC ON/OFF CONTROL VIA OCCUPANCY SENSOR. ONE CONTROLLED CIRCUIT PER PLUG CONTROLLER.
8. DEVICE TO BE INSTALLED IN SINGLE GANG BOX. COORDINATE TIME-OF-DAY SCHEDULES WITH OWNER FOR ZONES TO BE ON TIME-OF-DAY CONTROL.
9. PENDANT MOUNT DEVICE TO 1/2" KNOCKOUT ON JUNCTION BOX AS REQUIRED.

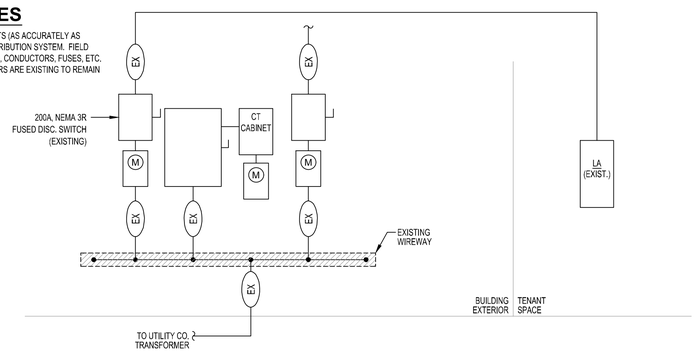
LIGHTING FIXTURE SCHEDULE

FIXT. TYPE	DESCRIPTION & MANUFACTURER OPTIONS	LAMPS NO.	LAMPS TYPE	FIXT. VOLT	TOTAL WATTS	FINISH	REMARKS/MOUNTING	NOTES
A	2' x 2' Field Selectable LED Troffer	1	LED	UNV	31W	Standard	Recessed (Lay-In)	
	M# LITHONIA #STAKS 2X2 AL03 SWW7							
B	Pendant Mounted 6' Linear LED Strip Fixture	1	LED	UNV	42W	Coord. w/ Architect	Mount Fixtures as Close to 10' AFF as Possible. Field Coordinate Exact Locations to Avoid Obstructions.	
	M# BETA CALCO #BLFP1P-SL07-LPF080-CR80-CTA40-DD3-V1-DA01							
X2	Combination LED Exit Sign and Emergency Light Fixture, Universal Mount, Emergency Battery Pack. Provide Arrows as Indicated.	1	LED	UNV	2W		Wall/Ceiling/Pendant	1
	M# EVENLITE #TCXCOM-R-U-W DUAL LITE #EVC-U-R-W							
X3	LED Emergency Light w/ (2) 2-Watt Adjustable LED Heads and Emergency Battery Backup	2	LED	UNV	5W	White	Surface (Wall/Ceiling)	1
	M# EVENLITE #TCL-4-W DUAL LITE #EV4D-02L							
X4	Combination LED Exit Sign and Emergency Light Fixture w/ Exterior Rated Remote Emergency Heads, Universal Mount, Emergency Battery Pack. Provide Arrows as Indicated.	1	LED	UNV	5W		Wall/Ceiling/Pendant	1
	M# EVENLITE #TCXCOM-R-U-W-PRWLED2MV DUAL LITE #EVC-U-R-W-D4 WITH EVO-D-X							

NOTES:
1. Circuit Emergency Battery Packs and Exit Signs to Local Lighting Circuit Ahead of Any Means of Control for Proper Operation.

GENERAL NOTES

1. THIS RISER DIAGRAM REPRESENTS (AS ACCURATELY AS POSSIBLE) THE ELECTRICAL DISTRIBUTION SYSTEM. FIELD VERIFY ALL SIZES OF EQUIPMENT, CONDUCTORS, FUSES, ETC. ALL EQUIPMENT AND CONDUCTORS ARE EXISTING TO REMAIN UNLESS NOTED OTHERWISE.



1 ELECTRICAL RISER DIAGRAM

SCALE: NO SCALE

FEEDER SCHEDULE

THHN/THWN COPPER CONDUCTORS W/ EG CONDUCTOR
XHHW ALUMINUM CONDUCTORS W/ EG CONDUCTOR

CONDUCTORS & GROUND				AMPS
CODE	SETS	CONDUCTORS	RACEWAY	
EX	-	EXISTING CONDUCTORS TO REMAIN	EXISTING	-

NOTES:
1. ALL CONDUCTORS AMPACITY BASED ON THE NEC TABLE 310-16 FOR CONDUCTORS W/ 75°C INSULATION.
2. ALL RACEWAY SIZES (EMT/RMC/PVC 40) BASED ON THE NEC TABLE 4(CHAPTER 9), 40% FILL COLUMN.
3. ELECTRICAL CONTRACTOR TO VERIFY ALL EQUIPMENT CONDUCTOR TERMINATION TEMPERATURE RATINGS (IE. 60°C OR 75°C), ADJUST CONDUCTOR AMPACITY AND CONDUIT SIZES ACCORDINGLY.
4. VERIFY MAXIMUM NO. OF SETS OF SERVICE ENTRANCE CONDUCTORS ALLOWED W/ UTILITY CO.
5. EQUIPMENT GROUNDING CONDUCTORS BASED ON T250.122. GROUND TO BE ADJUSTED PER T250.66 FOR SEPARATELY DERIVED SYSTEMS.
6. ALUMINUM FEEDERS NOT TO BE USED ON TRANSFORMER SECONDARY CONDUCTORS.

VOLTAGE DROP CHART

BRANCH CIRCUIT VOLTAGE DROP WIRING SCHEDULE FOR 1Ø CIRCUITS

BRANCH CIRCUIT RATING (AMPS)	WIRE SIZE (AWG)	MAXIMUM LENGTH OF BRANCH CIRCUIT (FEET) 120V	208V	240V	277V	480V
20A	#12	50	90	110	125	200
	#10	80	150	175	200	350
	#8	140	230	280	320	550
	#6	215	375	430	500	870
30A	#10	50	100	110	130	225
	#8	80	160	180	210	360
	#6	135	250	280	325	560
	#4	220	400	450	525	910

NOTES:
1. PROVIDE BRANCH CIRCUIT CONDUCTORS AS INDICATED IN THE TABLE ABOVE FOR ALL LIGHTING AND RECEPTACLE BRANCH CIRCUITS. WHERE BRANCH CIRCUITS SERVE DEDICATED EQUIPMENT, THE CONTRACTOR MAY PERFORM VOLTAGE DROP CALCULATIONS BASED ON ACTUAL EQUIPMENT CONNECTED LOAD AND PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO A MAXIMUM OF 3%.
2. CONDUCTOR SIZES ARE BASED ON SOLID COPPER CONDUCTORS FOR WIRES SMALLER THAN #6 AND STRANDED COPPER CONDUCTORS FOR WIRES #6 AND LARGER, IN A SINGLE METAL CONDUIT.
3. LIMITS FOR CONDUCTOR LENGTH SHOWN ARE BASED ON A MAXIMUM OF 3% VOLTAGE DROP TO COMPLY WITH THE NEC FOR CIRCUITS LOADED UP TO 80% OF THE BRANCH BREAKER RATING. FIELD VERIFY EXACT BRANCH CIRCUIT LENGTHS AND PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO 3%.

UNLESS NOTED OTHERWISE, WIRE SIZES CALLED OUT IN PANEL SCHEDULES DO NOT ACCOUNT FOR VOLTAGE DROP. CONTRACTOR SHALL INCREASE WIRE SIZES AS REQUIRED UTILIZING VOLTAGE DROP TABLE PROVIDED.

AFTER DEMOLITION, VERIFY THE QUANTITY OF AVAILABLE CIRCUITS IN THE EXISTING PANELBOARDS. IF THE QUANTITY OF AVAILABLE CIRCUITS IS NOT ENOUGH TO COMPLETE THE NEW SCOPE OF WORK, NOTIFY ENGINEER. WHERE NECESSARY, PROVIDE NEW BREAKERS AS REQUIRED.

GENERAL NOTES

(NOT ALL NOTES APPLY)

1. REFERENCE SHEET E101 FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS.
2. COORDINATE MOUNTING HEIGHTS AND LOCATIONS FOR ALL DEVICES WITH ARCHITECT AND/OR INTERIOR ELEVATIONS PRIOR TO ROUGH-IN.
3. FIELD VERIFY ALL ELECTRICAL WORK WITH OWNER/ARCHITECT PRIOR TO START OF PROJECT.

KEYED NOTES:

1. FIELD VERIFY EXISTING FEEDER IS (4)#3/0, (1)#6G IN 2" CONDUIT(MINIMUM). NOTIFY ENGINEER IF FEEDER DOES NOT MEET THIS MINIMUM REQUIREMENT.

HIVE

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seal/signature

STATE OF MISSOURI
RYAN BREWER
NUMBER PE-2020010759
PROFESSIONAL ENGINEER
05/30/2024

project number 2024-023

date 05.30.2024

issued for PERMIT

rev	date	description

ELECT. RISER DIAGRAM & SCHEDULES

sheet number

E401

16000 - ELECTRICAL

GENERAL

DESCRIPTION
DIVISION 16 OF THE SPECIFICATIONS COVERS ALL ELECTRICAL WORK FOR THE PROJECT. WORK SHALL INCLUDE LABOR, MATERIAL AND ACCESSORIES NECESSARY TO ACCOMPLISH THE WORK AS SPECIFIED AND SHOWN ON THE DRAWINGS, INCLUDING CONNECTION AND CHECKOUTS OF EQUIPMENT FURNISHED BY OTHERS (OTHER TRADES, THE OWNER AND OTHER CONTRACTORS), AND TO ALL EQUIPMENT ITEMS AND AS INDICATED ON DRAWINGS OR AS REQUIRED.

THE ARCHITECTURAL SPECIFICATIONS AND DRAWINGS INCLUDING THE GENERAL - CONDITIONS, INCLUDING ALL SUPPLEMENTS ISSUED THERETO, INSTRUCTIONS TO BIDDERS, AND OTHERS PERTINENT DOCUMENTS ISSUED BY THE ARCHITECT ARE A PART OF THESE SPECIFICATIONS AND ELECTRICAL DRAWINGS. THIS TRADE SHALL CONSULT THEM FOR INSTRUCTIONS WHICH APPLY. DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF THE ELECTRICAL LAYOUT AND WORK INCLUDED. ELECTRICIAN SHALL FOLLOW DRAWINGS IN LAYOUT THE ELECTRICAL WORK AND CONSULT THE DRAWINGS AND LAYOUTS OF OTHER TRADES TO VERIFY LOCATION AND SPACES IN WHICH WORK WILL BE INSTALLED.

CODES, PERMITS, INSPECTION AND COMMISSIONING
INSTALLATION SHALL COMPLY WITH ALL LAWS APPLYING TO ELECTRICAL WORK IN EFFECT, INCLUDING THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (N.E.C.), THE NATIONAL ELECTRICAL SAFETY CODE, ALL LOCAL GOVERNING CODES AND ORDINANCES. WITH THE REGULATIONS OF THE SERVING ELECTRICAL UTILITY COMPANY. PROVIDE ALL REQUIRED PERMITS AND INCLUDE THE COST OF SAME IN THE COST OF THE PROJECT. OBTAIN AND PAY FOR (WITHOUT ADDITIONAL EXPENSE TO THE OWNER) ALL REQUIRED INSPECTIONS AND REVIEWS. PROVIDE FOR AND PAY ALL EXPENSES (WITHOUT ADDITIONAL EXPENSE TO THE OWNER) ASSOCIATED WITH LIGHTING AND LIGHTING CONTROLS COMMISSIONING. ALL COMMISSIONING DOCUMENTATION SHALL BE CERTIFIED AND GIVEN TO OWNER AND DESIGN PROFESSIONAL.

QUALITY ASSURANCE
THE FOLLOWING INDUSTRY STANDARDS AS APPLICABLE TO ELECTRICAL WORK SHALL APPLY TO THE WORK OF THIS DIVISION EXCEPT THAT, WHERE THE REQUIREMENTS OF THESE SPECIFICATIONS ARE MORE THAN THE LISTED STANDARD, THESE SPECIFICATIONS SHALL TAKE PRECEDENCE:

UL - UNDERWRITERS' LABORATORIES
NEMA - NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION
NECA - NATIONAL ELECTRICAL CONTRACTOR'S ASSOCIATION
ANSI - AMERICAN NATIONAL STANDARDS INSTITUTE
ASTM - AMERICAN SOCIETY OF TESTING MATERIALS.

ALL MATERIALS SHALL BE NEW, UL LISTED AND LABELED WHERE LABELED MATERIALS ARE AVAILABLE, UNDAMAGED AND FREE OF DEFECTS AT TIME OF INSTALLATION. MATERIALS OR EQUIPMENT DAMAGED IN SHIPMENT OR OTHERWISE DAMAGED PRIOR TO OR DURING INSTALLATION SHALL NOT BE REPAIRED AT THE JOB SITE, BUT SHALL BE REPLACED WITH NEW MATERIALS. WHEN THE MANUFACTURER'S NAME APPEARS IN THESE SPECIFICATIONS AND DRAWINGS, IT SHALL BE CONSTRUED THAT THE MANUFACTURER HAS TO MEET THE FULL REQUIREMENTS OF THE SPECIFICATIONS AND DRAWINGS.

SUBMITTALS
SUBMIT SHOP DRAWINGS AND PRODUCT DATA FOR EQUIPMENT TO THE ARCHITECT FOR ENGINEER'S REVIEW ELECTRONICALLY OR HARD COPIES. INCLUDE SUFFICIENT INFORMATION TO INDICATE COMPLETE COMPLIANCE WITH SPECIFICATIONS. PROVIDE SUBMITTALS AS EARLY AS REQUIRED TO SUPPORT THE PROJECT SCHEDULE. ALLOW ONE WEEK FOR ENGINEER REVIEW TIME. THE ENGINEER'S SUBMITTAL REVIEWS WILL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN DIMENSIONS, DETAILS, SIZE OF MEMBERS, OR QUANTITIES; OR FOR OMITTING COMPONENTS OR FITTINGS; OR FOR NOT COORDINATING ITEMS WITH ACTUAL BUILDING CONDITIONS AND/OR OTHER TRADES.

OWNER RECORDS
ACCUMULATE DURING THE PROGRESS OF THE JOB, THE FOLLOWING DATA IN DUPLICATE, AND PREPARE IN A NEAT BROCHURE OR PACKET FOLDER TO BE TURNED OVER TO THE OWNER AT SUBSTANTIAL COMPLETION: RECORD DRAWINGS PER ABOVE.

ALL WARRANTIES, GUARANTEES, AND MANUFACTURER'S DIRECTION ON EQUIPMENT & MATERIAL FURNISHED.

COMPLETE PLAIN ENGLISH STEP-BY-STEP OPERATING INSTRUCTIONS FOR THE ELECTRICAL SYSTEM. ONE COPY OF THESE INSTRUCTIONS SHALL BE FRAMED AND POSTED AS DIRECTED ON THE PREMISES.

CERTIFIED LIGHTING AND LIGHTING CONTROLS COMMISSIONING AS REQUIRED BY CURRENTLY ADOPTED ENERGY CODE REQUIREMENTS.

MANUFACTURERS' NAMES AND CATALOG NUMBERS
IN SOME INSTANCES, SPECIFIC REFERENCES HAVE BEEN MADE TO ONE OR MORE MANUFACTURER'S NAME AND MODEL OR CATALOG NUMBERS. USE OF NAMES AND CATALOG NUMBERS DOES NOT INDICATE THAT THE EQUIPMENT SPECIFIED IN NECESSARILY AN "OFF THE SHELF" ITEM. VARIANCES MAY BE DUE TO REQUIREMENT OF DESIRED FINISH, MATERIAL OR OTHER MODIFICATION.

IN THE CASE OF PANELBOARDS, SAFETY SWITCHES AND OTHER EQUIPMENT REQUIRING WIRE AND CABLE TERMINATIONS, ASCERTAIN THAT LUG SIZES AND WIRING GUTTERS OR WIRING SPACE ALLOWED IS PROPER FOR THE WIRES AND CABLES CONTAINED THEREIN.

WHEN APPROVAL IS GIVEN FOR THE USE OF EQUIPMENT DIFFERING FROM THAT SHOWN ON DRAWINGS IN REGARD TO FOUNDATIONS, SPACE FOR PIPING, DUCTWORK, WIRING, INSULATION, ETC. CHANGES REQUIRED TO ACCOMPLISH SUCH DIFFERENCES SHALL BE ACCOMPLISHED AT NO COST TO THE OWNER.

PROTECTION OF EQUIPMENT
ELECTRICAL EQUIPMENT SHALL BE PROTECTED FROM THE WEATHER, IN PARTICULAR, DRIPPING OR SPLASHING WATER, AT ALL TIMES DURING SHIPMENT, STORAGE AND CONSTRUCTION. MANUFACTURER'S RECOMMENDATIONS WITH REGARD TO STORAGE, PROTECTION, AND HANDLING SHALL BE FOLLOWED.

SHOULD ANY APPARATUS BE SUBJECTED TO POSSIBLE INJURY DUE TO WATER, IT SHALL BE THOROUGHLY DRIED AND PUT THROUGH A DIELECTRIC TEST, AT THE EXPENSE OF THE CONTRACTOR, TO ASCERTAIN THE SUITABILITY OF THE APPARATUS OR IT SHALL BE REPLACED WITHOUT ADDITIONAL COST TO THE OWNER.

DAMAGED OR DEFECTIVE EQUIPMENT: INSPECT ALL ELECTRICAL EQUIPMENT AND MATERIALS PRIOR TO INSTALLATION. INSTALLATION OR PLACEMENT INTO SERVICE OF DAMAGED MATERIALS WITHOUT THE PRIOR WRITTEN CONSENT OF THE OWNER IS PROHIBITED. REPLACE OR REPAIR TO NEW CONDITION, AS CERTIFIED BY THE MANUFACTURER, AND TEST DAMAGED EQUIPMENT IN COMPLIANCE WITH INDUSTRY STANDARDS AT NO ADDITIONAL COST TO THE OWNER. EQUIPMENT REQUIRED FOR THE TESTING SHALL BE PROVIDED BY THE CONTRACTOR.

WORKING CLEARANCE
THE SIZE OF ELECTRICAL EQUIPMENT SHOWN ON THE DRAWINGS IS BASED ON DIMENSIONS OF A PARTICULAR MANUFACTURER, (GENERALLY THE FIRST NAMED), WHILE OTHER MANUFACTURERS MAY BE ACCEPTABLE, IT IS THE RESPONSIBILITY OF THE TRADE TO DETERMINE IF THE EQUIPMENT PROPOSED WILL FIT IN THE ALLOCATED SPACE.

INSTALL ALL EQUIPMENT IN A MANNER TO PERMIT ACCESS TO ALL SURFACES. MAINTAIN PROPER CLEARANCE TO MEET ALL SAFETY AND OPERATING CODES, PARTICULARLY N.E.C. INCLUDE ALL REQUIREMENTS DICTATED BY OPERATION, CONTROL, ADJUSTMENT, MAINTENANCE AND POSSIBLE REPLACEMENT OF EQUIPMENT IN DETERMINING CLEARANCE.

SHOULD THERE BE APPARENT VIOLATIONS OF N.E.C. CLEARANCE, NOTIFY THE ARCHITECT-ENGINEER BEFORE PROCEEDING WITH CONNECTION OR PLACEMENT OF EQUIPMENT.

COORDINATION
INSTALLATION STUDIES ARE REQUIRED TO COORDINATE THE ELECTRICAL WORK WITH THE WORK OF OTHER TRADES. PREPARE COORDINATION DRAWINGS AT ACCURATE SCALE WHERE SEVERAL ELEMENTS OF ELECTRICAL OR COMBINED MECHANICAL/STRUCTURAL/ELECTRICAL WORK MUST BE SEQUENCED AND POSITIONED WITH PRECISION IN ORDER TO FIT INTO THE AVAILABLE SPACE.

SHOW THE ACTUAL PHYSICAL DIMENSIONS REQUIRED FOR PROPER INTEGRATION OF EQUIPMENT WITH BUILDING SYSTEMS.

PROVIDE APPROVED SHOP DRAWINGS TO ALL REQUIRED DISCIPLINES AND VERIFY FINAL ELECTRICAL CHARACTERISTICS BEFORE ROUGHING POWER FEEDS TO ANY EQUIPMENT. WHEN ELECTRICAL DATA ON APPROVED SHOP DRAWINGS DIFFERS FROM CONTEMPLATED DESIGN, MAKE NECESSARY ADJUSTMENTS TO THE WIRING, DISCONNECTS, AND BRANCH-CIRCUIT PROTECTION FOR THE EQUIPMENT ACTUALLY INSTALLED AT NO ADDITIONAL COST TO THE OWNER.

DAMAGE FROM INTERFERENCE CAUSED BY INADEQUATE COORDINATION SHALL BE RECTIFIED AT NO ADDITIONAL COST TO THE OWNER.

WORKMANSHIP
ALL WORK SHALL BE EXECUTED IN A WORKMANLIKE MANNER AND SHALL PRESENT A NEAT MECHANICAL APPEARANCE WHEN COMPLETED.

ANY MATERIAL ITEMS OR WORK NOT SHOWN ON THE DRAWINGS, BUT MENTIONED IN THESE SPECIFICATIONS OR VISA-VERSA, OR ANY ACCESSORIES NECESSARY TO MAKE THE WORK COMPLETE IN ALL RESPECTS AND READY FOR OPERATION SHALL BE PROVIDED WITHOUT ADDITIONAL COST TO THE OWNER.

THIS TRADE SHALL DO OR HAVE DONE BY COMPETENT TRADESMEN ALL CUTTING AND PATCHING NECESSARY FOR THE INSTALLATION OF THIS WORK. NO CUTTING IN CONSTRUCTIVE PARTS OF THE BUILDING LIKELY TO IMPAIR ITS STRENGTH SHALL BE DONE WITHOUT THE ARCHITECT-ENGINEER'S WRITTEN APPROVAL.

EXCAVATION AND BACKFILL
EXCAVATION, TRENCHING AND BACKFILLING ARE SPECIFIED IN SECTION EXCAVATION TRENCHING AND BACKFILLING FOR UTILITIES. CONDUIT IS TO BE INSTALLED AS SPECIFIED FOR PIPELINES. CONDUIT INSTALLED BENEATH FLOOR SLAB SHALL BE A MINIMUM OF 6" BELOW SLAB. BACKFILL OVER CONDUIT SHALL BE COMPACTED AS FOR SLAB BEDDING MATERIAL. REFER TO STRUCTURAL DRAWINGS FOR DETAILS OF CONDUIT (PIPE) PENETRATION OF EXTERIOR FOOTINGS. COMPLETE INSTALLATION SHALL CONFORM TO N.E.C.

PENETRATIONS
COORDINATE SLEEVE SELECTION AND APPLICATION WITH SELECTION AND APPLICATION OF FIRE-STOPPING SPECIFIED IN ARCHITECTURAL SPECIFICATIONS.

ROOFS: COORDINATE ALL ROOF PENETRATIONS WITH ENGINEER, OWNER, AND AS APPLICABLE, THE ROOFING CONTRACTOR PROVIDING A ROOF WARRANTY. KEEP ALL RACEWAY PENETRATIONS WITHIN MECHANICAL EQUIPMENT CURBS WHEREVER POSSIBLE. COORDINATE WITH DIVISION 15. FLASH AND COUNTERFLASH ALL OPENINGS THROUGH ROOF, AND/OR PROVIDE PRE-FABRICATED MOLDED SEALS COMPATIBLE WITH THE ROOF CONSTRUCTION INSTALLED, OR AS REQUIRED BY THE ENGINEER, OWNER, OR ROOFING CONTRACTOR. ALL ROOF PENETRATIONS SHALL BE LEAKTIGHT AT THE TERMINATINO OF THE WORK AND SHALL NOT VOID ANY NEW OR EXISTING ROOF WARRANTIES.

WALLS AND FLOORS - SLEEVES FOR RACEWAYS AND CABLES:
STEEL PIPE SLEEVES: ASTM A 53/A 53M, TYPE E, GRADE B, SCHEDULE 40, GALVANIZED STEEL, PLAIN ENDS AND DRIP RINGS.

CAST IRON PIPE SLEEVES: CAST OR FABRICATED "WALL PIPE", EQUIVALIENT TO DUCTILE-IRON PRESSURE PIPE, WITH PLAIN ENDS AND INTEGRAL SATERSTOP, UNLESS OTHERWISE INDICATED.

FIRESTOPPING: FIRE RESISTANT THROUGH PENETRAION SEALANTS - TWO PART, FOAMED-IN-PLACE, SILICONE SEALANT FORMULATED FOR USE IN THROUGH-PENETRAION FIRE-STOPPING AROUND CABLES, RACEWAYS, AND CABLE TRAY PENETRAIONS THROUGH FIRE-RATED WALLS AND FLOORS. SEALANTS AND ACCESSORIES SHALL HAVE FIRE-RESISTANCE RATINGS INDICATED, AS ESTABLISHED BY TESTING IDENTICAL ASSEMBLIES IN ACCORDANCE WITH ASTM E 814, BY UNDERWRITER'S LABORATORIES, INC., OR OTHER NRTL ACCEPTABLE TO AHJ.
ACCEPTABLE MANUFACTURERS - HILTI, INC., 3M CORP, RECTORSEAL, SPECIFY TECHNOLOGY INC., UNITED STATES GYPSUM COMPANY.

ELECTRICAL SERVICE
SERVICE SHALL BE AS SHOWN ON DRAWINGS.

PROVIDE SECONDARY SERVICE INTO THE BUILDING WITH CONDUIT AND WIRING AS SHOWN ON THE PLANS, INCLUDING, BUT NOT LIMITED TO, UNDERGROUND RACEWAYS AND CABLES AND SECONDARY CONNECTIONS TO UTILITY TRANSFORMERS AS REQUIRED BY SERVING ELECTRICAL UTILITY COMPANY. COORDINATE ALL REQUIREMENTS WITH UTILITY COMPANY PRIOR TO BID.

PROVIDE ALL REQUIRED GROUNDING FOR A COMPLETE SERVICE ENTRANCE GROUNDING SYSTEM, PERMANENTLY AND EFFECTIVELY GROUND AND BOND THE ELECTRICAL INSTALLATION IN A THOROUGH AND EFFICIENT MANNER, AND IN CONFORMANCE (AT A MINIMUM) WITH N.E.C. OR THESE DOCUMENTS, WHERE THEY EXCEED CODE REQUIREMENTS. USE BARE OR INSULATED CONDUCTORS, AS SPECIFIED HEREIN, AND OTHER MATERIALS INDICATED ON THE DRAWINGS.

PROVIDE ALL NECESSARY ENCLOSURES REQUIRED BY THE OWNER FOR THE UTILITY COMPANY METERING. REFER TO DRAWINGS FOR MINIMUM REQUIREMENTS. COORDINATE WITH UTILITY COMPANY PRIOR TO BID FOR ALL REQUIREMENTS.

PRODUCTS

GENERAL
ALL EQUIPMENT OF A PARTICULAR KIND, SUCH AS WIRING DEVICES AND PANELBOARDS AND ALL LIGHTING FIXTURES OF THE SAME TYPE, SHALL BE THE PRODUCT OF THE SAME MANUFACTURER.

PROVIDE ACCESS PANELS FOR ALL EQUIPMENT AND DEVICES REQUIRING SUCH PANELS. SIZE AS REQUIRED FOR PROPER ACCESS AND MAINTENANCE, MINIMUM ACCEPTABLE IS 12 IN BY 12 IN CLEAR OPENING WHERE HAND ACCESS ONLY IS REQUIRED.

PROVIDE LABELS FOR EACH MOTOR CONTROLLER, SAFETY SWITCH, RELAY, PANELBOARD, CONTACTOR, TIMER, CONTROL DEVICE, METER AND CIRCUIT BREAKER. LABELS SHALL BE LAMINATED, PHENOLIC STRIPS 1/16" THICK, AND ENGRAVED TO SHOW BLACK LETTERS ON A WHITE BACKGROUND NOT LESS THAN 1/4" HIGH. SIZE STRIPS TO PROPERLY FIT MANUFACTURER'S BRACKETS AND BE LEGIBLE. WHERE MANUFACTURER'S BRACKETS ARE NOT PROVIDED, MOUNT LABELS WITH PROPER SCREWS, OR AN APPROVED ADHESIVE.

RACEWAYS
CONDUIT, RIGID STEEL; GALVANIZED OR SHERADIZED AND MANUFACTURED IN ACCORDANCE WITH ANSI STANDARD C80.L. FITTINGS SHALL BE PIPE THREADED, MALLEABLE IRON. CONNECTORS SHALL BE INSULATED THROAT TYPE.

CONDUIT, PVC: POLYVINYLCHLORIDE SCHEDULE 40 PIPE SPECIFICALLY MANUFACTURED AND LABELED (UL STANDARD 651) FOR USE AS ELECTRICAL CONDUIT. FITTINGS SHALL BE EITHER SOCKET WELDED TYPE OR PIPE THREADED WITH INSULATED THROAT.

CONDUIT, FLEXIBLE METALLIC: GALVANIZED, INTERLOCKED SPIRALLY WOUND STEEL STRIP WITH GALVANIZED OR SHERADIZED FITTINGS. LISTED PER UL-L. FITTINGS SHALL BE OF THE SQUEEZE TYPE WITH INSULATED THROATS.

CONDUIT, LIQUIDTIGHT FLEXIBLE METALLIC: GALVANIZED, INTERLOCKED SPIRALLY WOUND STEEL STRIP WITH OVERALL JACKET OF LIQUID TIGHT PVC, UL LISTED. FITTINGS SHALL BE STEEL OR MALLEABLE IRON INSULATED THROAT, WATERTIGHT.

ELECTRIC METALLIC TUBING: GALVANIZED OR SHERADIZED AND MANUFACTURED IN ACCORDANCE WITH ANSI STANDARD C80.3. FITTINGS 1/2 INCH THROUGH 2 INCH TRADE SIZE SHALL BE COMPRESSION TYPE, MANUFACTURED FROM MALLEABLE IRON OR STEEL, AND RAIN AND/OR CONCRETE-TIGHT AS REQUIRED BY INSTALLATION. POT METAL OR DIE CAST TYPE FITTINGS ARE PROHIBITED. CONNECTORS SHALL BE INSULATED THROAT TYPE.

CONDUCTORS AND CABLES
GENERAL: SERVICE LATERALS AND PANELBOARD FEEDERS SHALL BE OF ANNEALED (SOFT) COPPER COMPLYING WITH ICEA S-95-658/NEMA WC70; SOLID CONDUCTOR FOR NO. 10 AWG AND SMALLER; CONCENTRIC, COMPRESSED STRANDED FOR NO. 8 AWG AND LARGER. ALL FEEDER CONDUCTORS NO 8 AWG AND LARGER; STRANDED, TYPE THWN-2 OR XHHW-2 INSULATION.

ALL BRANCH CIRCUITS SHALL BE ANNEALED (SOFT) COPPER COMPLYING WITH ICEA S-95-658/NEMA WC70; SOLID CONDUCTOR FOR NO. 10AWG AND SMALLER; CONCENTRIC, COMPRESSED STRANDED FOR NO. 8 AWG AND LARGER. ALL BRANCH CIRCUIT CONDUCTORS NO 8 AWG AND LARGER; STRANDED, TYPE THWN-2 OR XHHW-2 INSULATION. ALL CONDUCTORS, NO 10 AWG AND SMALLER, USED FOR POWER AND LIGHTNG CIRCUITS; SOLID COPPER, TYPE THWN-2 INSULATION (WET OR DAMP LOCATIONS, OR IN CONDUIT BELOW GRADE OR SLAB), TYPE THHN INSULATION (DRY LOCATIONS ONLY ABOVE GRADE), OR DUAL RATED TYPE THHN/THWN-2. ALL BRANCH CIRCUIT WIRING SHALL NOT BE SMALLER THAN NO 12 AWG. IF NO CONDUCTOR SIZE IS INDICATED ON THE DRAWINGS FOR A BRANCH CIRCUIT, PROVIDE CONDUCTORS AND CONDUIT SIZED PER NFPA 70 AND BASED ON THE INDICATED BRANCH CIRCUIT OVERCURRENT PROTECTIVE DEVICE RATING AND NUMBER OF POLES. WHERE NO CIRCUIT SIZE (CONDUCTORS AND OVERCURRENT PROTECTIVE DEVICE) IS INDICATED ON THE DRAWINGS FOR A BRANCH CIRCUIT, PROVIDE THREE NO 12 AWG CONDUCTORS IN 3/4" RACEWAY, AND A 20A SINGLE POLE CIRCUIT BREAKER.

CONDUCTOR INSULATION TYPES; 90-DEGREE C-RATED, TYPE THHN/THWN-2 OR XHHW-2 COMPLYING WITH ICEA S-95-658/NEMA WC70.

COLORS FOR 208/120V CONDUCTORS
PHASE A: BLACK
PHASE B: RED
PHASE C: BLUE
NEUTRAL: WHITE
EQUIPMENT GROUND: GREEN
ISOLATED GROUND: GREEN WITH YELLOW STRIPE

COLORS FOR 480/277V CONDUCTORS
PHASE A: BROWN
PHASE B: ORANGE
PHASE C: YELLOW
NEUTRAL: WHITE
EQUIPMENT GROUND: GREEN

UNLESS NOTED OTHERWISE, SPECIAL PURPOSE CONDUCTORS AND CABLES, SUCH AS LOW VOLTAGE CONTROL AND SHIELDED INSTRUMENT WIRING, SHALL BE AS RECOMMENDED BY THE SYSTEM EQUIPMENT MANUFACTURER.

CONTROL WIRING; STRANDED COPPER CONDUCTORS, 600V INSULATION, OF THE PROPER TYPE, SIZE AND NUMBER AS REQUIRED TO ACCOMPLISH SPECIFIED FUNCTION. MINIMUM SIZE; NO. 14 AWG UNLESS NOTED OTHERWISE.

MC TYPE CABLE CAN BE USED IF ACCEPTED BY LOCAL AUTHORITY AND GOVERNING CODES FOR WHIPS FROM JUNCTION BOX TO LIGHT FIXTURES ONLY. TYPE MC CABLE; 600V, UNJACKETED; ANSI E119 AND E814, UL STANDARDS 44 OR 83 (AS APPLICABLE), AND 1569, NFPA 70 ARTICLE 330; ALUMINUM OR GALVANIZED STEEL INTERLOCKED ARMOR; THHN- OR XHHW-INSULATED CONDUCTORS; COLOR CODE; ICEA METHOD 1, WITH GREEN INSULATED GROUDING CONDUCTOR.

PROVIDE A DEDICATED EQUIPMENT-GROUNDING CONDUCTOR, OR BONDING JUMPER, AS APPLICABLE, IN ALL BRANCH CIRCUITS AND FEEDERS, SIZED IN ACCORDANCE WITH NFPA 70, UNLESS INDICATED AS LARGER ON THE DRAWINGS.

PROVIDE A DEDICATED NEUTRAL (WHERE REQUIRED) AND DEDICATED GROUNDING CONDUCTOR FOR EACH BRANCH CIRCUIT.

VOLTAGE DROP IN BRANCH CIRCUITS SHALL NOT EXCEED 2%.

GFCI CIRCUITS: DO NOT USE MULTI-CONDUCTOR CIRCUITS, WITH A SHARED NEUTRAL FOR ANY GFCI CIRCUIT BREAKER OR RECEPTACLE CIRCUIT. BRANCH CIRCUITS FED FROM GFCI CIRCUIT BREAKERS, LIMIT THE ONE-WAY CONDUCTOR LENGTH TO 100 FEET BETWEEN THE PANELBOARD AND THE MOST REMOTE RECEPTACLE OR LOAD ON THE GFCI CIRCUIT.

BOXES
OUTLET BOXES: GALVANIZED PRESSED STEEL WITH GALVANIZED STEEL EXTENSION RINGS OR PLASTER RINGS OR TILE RINGS TO PROVIDE EXPOSED SURFACE FLUSH WITH WALL OR CEILING FINISH. PROVIDE ALL CEILING OUTLET BOXES WITH "NO-BOLT" OR THROUGH AND LOCKNUTTED TYPE FIXTURE STUDS.

JUNCTION AND PULL BOXES: FABRICATE IN ACCORDANCE WITH NEMA AND N.E.C. STANDARDS AND REQUIREMENTS INSOFAR AS MATERIAL, GAUGES, DIMENSIONS, AND FABRICATION METHODS. BOXES SHALL BEAR THE UL LABEL. WHERE BOXES ARE NOT SIZED ON THE DRAWINGS, THEY SHALL BE SIZED IN ACCORDANCE WITH N.E.C. REQUIREMENTS. FINISH IN STANDARD GRAY ENAMEL, WITH SIDES AND BACK SPOT-WELDED IN POSITION AND THE REMOVABLE SCREW COVER MOUNTED WITH BRASS MACHINE SCREWS.

WIRING DEVICES
SWITCHES: HEAVY DUTY AC, RATED 20 AMPERES, 120/277 VOLTS, SINGLE-POLE, DOUBLE-POLE, THREE-POLE, OR FOUR-WAY AS NOTED ON DRAWINGS OR AS REQUIRED FOR THE SWITCHING ARRANGEMENTS IN EACH SPACE. HUBBELL #HBL122** OR EQUAL. COORDINATE SWITCH COLORS WITH COVERPLATES AS DESCRIBED BELOW UNDER "PLATES".

SWITCHES, SPECIAL PURPOSE: KEY OPERATED, HEAVY-DUTY AC, RATED 20 AMPERES, 120/277 VOLTS, SINGLE OR MULTI-POLE AS NOTED OR AS REQUIRED. HUBBELL #HBL122** OR EQUAL.

RECEPTACLES: THREE WIRE GROUNDING TYPE, 120 VOLT RATED, SPECIFICATION GRADE 20 AMPERES DUPLEX UNLESS NOTED OTHERWISE ON DRAWINGS. HUBBELL #5362 OR EQUAL. COORDINATE RECEPTACLE COLOR WITH COVERPLATE AS DESCRIBED BELOW UNDER "PLATES". SINGLE RECEPTACLE, 20 AMPERE, 120 VOLT, SPECIFICATION GRADE. HUBBELL #5361 OR EQUAL.

DUST AND MOISTURE RESISTANT, MELAMINE BODY, GRAY NYLON FACE BACKED BY FABRIC REINFORCED NEOPRENE GASKET SLIT TO PROVIDE WIPING ACTION ON CAP BLADES. PASS & SEYMOUR #6307 OR APPROVED EQUAL. GROUND FAULT CIRCUIT INTERRUPTER, NYLON FACE CLASS A, NEMA 5-20R, SPECIFICATION GRADE. HUBBELL #GF-5362* OR EQUAL.

CORROSION RESISTANT, SIMILAR AND APPROVED EQUAL TO STANDARD RECEPTACLE, EXCEPT FABRICATED FROM YELLOW MELAMINE PLASTIC WITH YELLOW NYLON FACE AND EXPOSED METAL PARTS FINISHED TO RESIST CORROSION. (NEMA 5-15R = HUBBELL #52CM61).

ISOLATED GROUND, DUPLEX OR SIMPLEX THREE WIRE GROUNDING TYPE, SPECIFICATION GRADE, ORANGE FACE. GROUND CONTACT FULLY ISOLATED FROM STRAP AND EQUIPPED WITH SCREW TERMINAL. HUBBELL #IG-5362* OR EQUAL.

RECEPTACLES, SPECIAL PURPOSE: SPECIAL PURPOSE OUTLETS SHALL BE AS SCHEDULED ON DRAWINGS.

PLATES: PROVIDE PLATES FOR ALL OUTLET BOXES. PLATES SHALL BE OF SUITABLE CONFIGURATION FOR THE NUMBER AND TYPE OF DEVICES SERVED, SHALL BE ONE PIECE, SHALL OVERLAP OUTLET BOX EDGE AND ROOM SURFACES, AND SHALL BE SMOOTH FINISH NYLON TYPE OF SAME MANUFACTURER AS THE WIRING DEVICES. VERIFY DESIRED MATERIALS AND COLORS WITH ARCHITECT PRIOR TO INSTALLATION.

STANDARD INTERIOR: IVORY FINISHED ON LIGHT COLORED WALLS - COORDINATE ALL COLORS WITH ARCHITECT

INTERIOR DAMP LOCATIONS: STAINLESS STEEL.

EXTERIOR LOCATIONS: FOR UNATTENDED WET LOCATIONS, PROVIDE IN-USE NEMA 3R, UL LABELED PLATES MOLDED FROM A CLEAR HIGH IMPACT ULTRAVIOLET STABILIZED POLYCARBONATE MATERIAL FOR EASY VERIFICATION THAT CORDS ARE PLUGGED IN AND THAT THE GFCI IS FUNCTIONING. COVER PLATES SHALL BE BY THE SAME MANUFACTURER AS THE WIRING DEVICES; COMPLYING WITH NFPA 70 406.8 (A) OR (B) REQUIREMENTS FOR ATTENDED OR UNATTENDED USE AS APPLICABLE.

ACCEPTABLE MANUFACTURERS: HUBBELL, PASS & SEYMOUR, LEVITON AND COOPER.

CABINETS AND ENCLOSURES
FURNISH AND INSTALL FLUSH CABINETS AND ENCLOSURES AS SHOWN ON THE PLANS AND AS HEREIN SPECIFIED. UNIT SHALL BE PROVIDED WITH DEAD FRONT SUB PANEL, RECESSED AS REQUIRED, TO HOUSE CONTROLS. DOOR SHALL BE PROVIDED WITH CONCEALED HINGES AND FLUSH KEY OPERATED LOCK. DOOR AND TRIM SHALL BE PRIME PAINTED FOR FIELD PAINTING TO MATCH WALL FINISHES. PROVIDE KNOCK-OUTS, LOUVERS AND IDENTIFICATION ENGRAVING AS REQUIRED TO MEET FIELD CONDITIONS. EXACT BACKBOX SIZE TO BE COORDINATED WITH EQUIPMENT SUPPLIER.

CIRCUIT DISCONNECTS
SAFETY SWITCHES: SAFETY SWITCHES SHALL CONSIST OF A BOX, FRONT COVER, AND CIRCUIT PROTECTOR DEVICE ALL MANUFACTURED AND ASSEMBLED IN ACCORDANCE WITH NEMA STANDARDS

THE BOX SHALL BE FABRICATED FROM CODE GAUGE GALVANIZED SHEET STEEL IN ACCORDANCE WITH U.L. LISTING AND LABEL. THE CIRCUIT PROTECTOR DEVICE SHALL BE HEAVY DUTY, QUICK-MAKE, QUICK-BREAK FUSED OR UNFUSED SWITCH RATED FOR MOTOR CIRCUITS AND/OR SERVICE ENTRANCE DUTY, IF REQUIRED. UNITS SHALL BE FURNISHED FOR SURFACE OR FLUSH MOUNTING WITH EITHER GENERAL PURPOSE OR RAINTIGHT ENCLOSURES. AS REQUIRED. FUSED UNITS SHALL BE FURNISHED COMPLETE WITH PROPER FUSES.

PANELBOARDS
SHALL CONSIST OF BOX, INTERIOR, FRONT, AND CIRCUIT PROTECTIVE DEVICES. THE ASSEMBLY SHALL BE U.L. LABELED AND BE LISTED FOR SERVICE. THE ASSEMBLY SHALL BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH NEMA STANDARD PB-1. THE LATEST UL STANDARD (UL-50) AND SHALL HAVE A TURNED EDGE AROUND THE FRONT FOR RIGIDITY AND FOR CLAMPING ON FRONT. PROVIDE STANDARD KNOCKOUTS ON REMOVABLE BOX ENDS. FABRICATE FROM SHEET STEEL AND FINISH WITH BAKED ON GRAY ENAMEL OVER RUST INHIBITOR, EACH FRONT SHALL HAVE A DOOR MOUNTED ON SEMI-CONCEALED HINGES WITH A CYLINDER LOCK, INDEX CARD CIRCUIT DIRECTORY MOUNTED BEHIND CLEAR PLASTIC AND HELD IN A METAL FRAME, AND CONCEALED TRIM CLAMPS FOR MOUNTING TO THE BOX. ALL LOCKS SHALL BE MASTER KEYED AND ALL PANEL DIRECTORIES SHALL BE TYPEWRITTEN.

ALL INTERIORS SHALL BE COMPLETELY FACTORY ASSEMBLED. THE DESIGN OF THE INTERIOR SHALL PERMIT REPLACEMENT OF INDIVIDUAL BRANCH BREAKERS WITHOUT DISTURBING ADJACENT UNITS AND WITHOUT MACHINE DRILLING OR TAPPING. BUS BARS FOR PANELS RATED 600 AMPERES OR MORE SHALL BE TIN PLATED 98% CONDUCTIVITY COPPER OR TIN FINISH ALUMINUM (57% CONDUCTIVITY) OF RECTANGULAR CROSS-SECTION. BUS BARS FOR PANELS RATED LESS THAN 600 AMPERES SHALL BE TIN PLATED 98% CONDUCTIVITY COPPER OF RECTANGULAR CROSS-SECTION. BUS BAR CONNECTIONS TO BRANCH CIRCUIT BREAKERS SHALL BE THE PHASE SEQUENCE TYPE AND ACCEPT BOLT-ON TYPE BREAKERS ONLY. PANELBOARD BUS STRUCTURE AND MAIN BREAKER OR MAIN LUGS SHALL BE RATED AS SCHEDULED ON DRAWING. SUCH RATINGS SHALL BE ESTABLISHED BASED ON HEAT RISE TESTS IN ACCORDANCE WITH UL STANDARDS. GROUP INCOMING CABLE LUGS AT ONE END FOR SEPARATION FROM LOAD SIDE CABLES. EQUIPMENT NEUTRAL BUSSING WITH A LUG FOR EACH BRANCH BREAKER POSITION. INTERIOR SHALL MOUNT TO BOX WITHOUT TOOLS.

BREAKERS SHALL BE QUICK-MAKE, QUICK-BREAK, BOLT-ON THERMAL-MAGNETIC MOLDED CASE CIRCUIT BREAKERS ONE, TWO OR THREE POLE WITH INTEGRAL CROSSBAR FOR MULTI-POLE UNITS, EQUIPPED WITH AN OVERCENTER, TRIP-FREE, TOGGLE-TYPE OPERATING ACTION AND POSITIVE HANDLE INDICATION OF BREAKER STATUS. CIRCUIT BREAKERS SHALL BE UL LISTED IN ACCORDANCE WITH UL STANDARDS.

EACH PANELBOARD, AS A COMPLETE UNIT, SHALL HAVE A SHORT CIRCUIT RATING EQUAL TO OR GREATER THAN THE INTEGRATED EQUIPMENT RATING SHOWN ON DRAWINGS. THE RATING SHALL BE ESTABLISHED BY TESTING WITH THE OVERCURRENT DEVICES MOUNTED IN THE PANELBOARD. THE SHORT CIRCUIT TESTS ON THE OVERCURRENT DEVICES ON THE STRUCTURE SHALL BE MADE SIMULTANEOUSLY BY CONNECTING THE FAULT TO EACH OVERCUR

WIRING OF MECHANICAL EQUIPMENT
PROVIDE ALL RACEWAYS AND POWER WIRING FOR ALL DIVISION 15 EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS, INCLUDING, BUT NOT LIMITED TO, PUMPS, WATER HEATERS, AND HVAC EQUIPMENT, AND ALL LINE-VOLTAGE CONTROL AND INTERLOCK WIRING NOT PROVIDED UNDER DIVISION 15. CONNECT PER MANUFACTURER'S WIRING DIAGRAMS. COORDINATE WITH DIVISION 15 FOR DISCONNECTS FURNISHED WITH EQUIPMENT, AND PROVIDE ALL DISCONNECT SWITCHES AS REQUIRED. AFTER INSTALLING WIRING, VERIFY THAT EACH MOTOR LOAD HAS THE CORRECT PHASE ROTATION.

VERIFY THE ACTUAL "MAXIMUM OVERCURRENT PROTECTION" DEVICE RATINGS AND "MINIMUM CIRCUIT AMPACITY" CONDUCTOR SIZING FOR MECHANICAL EQUIPMENT FROM THE EQUIPMENT NAMEPLATE. BASE ELECTRICAL INSTALLATIONS ON ACTUAL REQUIRED AMPERAGES, WHICH MAY VARY SOMEWHAT FROM THE CONDUCTOR AND EQUIPMENT SIZES SHOWN ON THE DRAWINGS; HOWEVER, IN NO CASE, REDUCE THE SIZE OF CONDUCTORS INDICATED ON THE DRAWINGS WITHOUT AUTHORIZATION FROM THE ENGINEER. PROVIDE PROPERLY SIZED ELECTRICAL WIRING AND EQUIPMENT WITHOUT EXTRA COST TO THE OWNER. NOTIFY THE ENGINEER OF ALL CHANGES REQUIRED IN THE ELECTRICAL INSTALLATION DUE TO EQUIPMENT VARIANCES SO THAT THE EFFECTS ON FEEDERS, BRANCH CIRCUITS, PANELBOARDS, FUSES AND CIRCUIT BREAKERS CAN BE CHECKED PRIOR TO PURCHASING AND INSTALLATION. BE RESPONSIBLE FOR COORDINATING WITH DIVISION 15 TO VERIFY THE ACTUAL AMPACITIES AND CORRECT SIZES OF ALL CONDUCTORS AND OVERCURRENT PROTECTIVE DEVICES FOR ALL EQUIPMENT, AND CORRECT OVERLOAD HEATERS FOR ALL MOTORS, WHEN STARTERS ARE PROVIDED UNDER DIVISION 16.

PROVIDE ALL RACEWAYS, POWER WIRING, AND LINE-VOLTAGE CONTROL AND INTERLOCK WIRING NOT PROVIDED UNDER DIVISION 15, FOR ALL THERMOSTATS, TEMPERATURE CONTROL DEVICES, AND CONTROLS, INCLUDING, BUT NOT LIMITED TO, NIGHT-STATS, WATER HEATER INTERLOCKS, TIME SWITCHES AND OVERRIDE TIMERS. SEE MECHANICAL DRAWINGS FOR LOCATIONS AND TEMPERATURE CONTROL DIAGRAMS. LOW-VOLTAGE CONDUCTORS FOR THERMOSTATS AND TEMPERATURE CONTROL SYSTEMS MAY BE RUN EXPOSED ABOVE FINISHED ACCESSIBLE CEILINGS, IF APPROVED AND LISTED FOR THIS PURPOSE, BUT SHALL BE INSTALLED IN CONDUIT WITHIN WALLS AND WHERE EXPOSED IN THE WORK AREAS.

EXECUTION

METHOD OF PROCEDURE
ERECT EQUIPMENT PARTS AT SUCH TIME AND IN SUCH MANNER AS TO MINIMIZE INTERFERENCES AND DELAYS IN THE EXECUTION OF THE WORK CARE SHALL BE USED IN THE ERECTION AND INSTALLATION OF ALL EQUIPMENT AND MATERIALS TO AVOID MARRING SURFACES OF THE WORK. DAMAGES SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.

EQUIPMENT REQUIRING ELECTRICAL SERVICE SHALL NOT BE ENERGIZED OR PLACED IN SERVICE UNTIL ALL INTERESTED PARTIES HAVE BEEN DULY NOTIFIED AND ARE PRESENT OR HAVE WAIVED THEIR RIGHT TO BE PRESENT. WHERE EQUIPMENT TO BE PLACED IN SERVICE INVOLVES SERVICE OR CONNECTION FROM ANOTHER CONTRACTOR OR THE OWNER, NOTIFY THE OWNER IN WRITING WHEN THE EQUIPMENT WILL BE READY. THE OWNER SHALL BE NOTIFIED AS FAR IN ADVANCE AS POSSIBLE, OF THE DATE THE VARIOUS ITEMS OF EQUIPMENT WILL BE COMPLETE.

THE WORK OF THIS TRADE INCLUDES ROUGH-IN FOR AND FINAL CONNECTION AND REQUIRED TO ALL MISCELLANEOUS EQUIPMENT FURNISHED BY OTHERS, OR UNDER OTHER DIVISIONS OF THE WORK. THIS SHALL INCLUDE POWER AND CONTROL WIRING. WIRING DEVICES AND COVER-PLATES FOR BUILT-IN EQUIPMENT ARE INCLUDED IN THE WORK OF THIS DIVISION. SAFETY DISCONNECTS AND OTHER MISCELLANEOUS PROTECTIVE DEVICES REQUIRED BY N.E.C. ARE INCLUDED IN THE WORK OF THIS DIVISION. DO ALL ROUGHING-IN AND FINAL CONNECTIONS FROM APPROVED SHOP DRAWINGS ONLY.

COMPLIANCE WITH THE DRAWING AND ANY NOTES THEREON IS REQUIRED. PROVIDE OPENINGS THROUGH WALLS, PARTITIONS, FLOORS, AND ROOFS AS REQUIRED FOR ELECTRICAL WORK.

PROVIDE SLEEVES FOR ELECTRICAL WORK PASSING THROUGH WALLS, PARTITIONS, ROOFS, AND FLOORS. SLEEVES SHALL EXTEND THROUGH FLOORS, WALLS AND PARTITIONS AND SHALL BE CUT FLUSH WITH EACH SURFACE UNLESS OTHERWISE SPECIFIED. FIRE WALL AND/OR FLOOR INTEGRITY SHALL BE RESTORED AFTER PENETRATION. SLEEVES IN CONCRETE AND MASONRY WALLS, CONCRETE FLOORS AND ROOFS, SHALL BE FABRICATED FROM STANDARD GALVANIZED STEEL PIPE WITH ENDS FINISHED SMOOTH, BURR FREE, WITHOUT SHARP EDGES. SLEEVES IN WALLS, ROOFS, AND FLOORS OF OTHER CONSTRUCTION AND THROUGH SUSPENDED CEILINGS SHALL BE FABRICATED FROM 22 U.S. GAUGE GALVANIZED STEEL. FLOOR SLEEVES SHALL EXTEND THREE INCHES ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED. SPACE BETWEEN FLOOR SLEEVES AND PASSING CONDUIT SHALL BE FILLED WITH DUCT SEAL PACKING AND CAULKED WITH WATERPROOF COMPOUND AS APPROVED. WHERE CONDUITS PASS THROUGH WATERPROOFED FLOORS OR WALLS, SLEEVES SHALL BE FABRICATED SUCH THAT WATERPROOFING CAN BE FLASHED ONTO AND AROUND THE SLEEVE.

RACEWAYS
ALL POWER AND LIGHTING CIRCUITS SHALL BE RUN IN METALLIC RACEWAYS EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE. THESE RACEWAYS SHALL BE RUN CONCEALED IN ALL FINISHED AREAS, AND WHERE RUN EXPOSED SHALL BE SQUARE TO THE BUILDING AND HELD TIGHT TO THE BUILDING CONSTRUCTION. LOW VOLTAGE, TELEPHONE, INTERCOM, MUSIC, ALARM AND SECURITY WIRING RUN ABOVE ACCESSIBLE CEILINGS SHALL BE RUN USING INSULATED, PLENUM RATED CABLE. PROVIDE LOW VOLTAGE CABLE IN CONDUIT IF REQUIRED BY LOCAL AHJ. VERIFY ALL REQUIREMENTS PRIOR TO INSTALLATION. METALLIC CONDUIT FOR THESE SYSTEMS SHALL BE PROVIDED ONLY WHERE RUN INSIDE WALLS. THE DRAWINGS INDICATE THE REQUIRED SIZE OF ALL RACEWAYS (EXCEPT AS HEREINAFTER SPECIFIED), THE POINTS OF TERMINATION AND THE SUGGESTED ROUTING. HOWEVER, THE INSTALLER IS RESPONSIBLE FOR PROPER COORDINATION WITH BUILDING STRUCTURE AND THE WORK OF OTHER TRADES. FURNISH ALL REQUIRED BENDS, ELBOWS, FITTINGS, JUNCTION AND PULL BOXES, WHETHER OR NOT SPECIFICALLY SHOWN ON DRAWINGS, THAT MAY BE REQUIRED TO SATISFY CODES AND THE STANDARDS OF GOOD PRACTICE. WHERE CONDUITS FOR BOTH BRANCH AND FEEDER CIRCUITS ARE RUN CONCEALED, THEY MAY BE RUN OUT OF SQUARE TO THE BUILDING PROVIDING THE SHORTEST POSSIBLE RUN IS UTILIZED. RACEWAY SIZES ARE BASED ON THE USE OF COPPER CONDUCTORS AND N.E.C. FILL.

CONDUIT SHALL BE CONSTRUED AS ELECTRICAL RACEWAYS AND SHALL CONFORM TO THE FOLLOWING: CONCEALED IN SUSPENDED CEILINGS AND INTERIOR PARTITIONS - EMT WITH SET SCREW TYPE FITTINGS. UNDERGROUND OR BELOW INTERIOR SLABS - GRS. (NOTE: PVC CONDUIT IS PERMITTED OUTSIDE FOR PARKING AREA LIGHTING, SIGNS, ETC. ELBOWS SHALL BE GRS). EXPOSED ON BUILDING EXTERIOR - GRS.

CONDUIT BENDS SHALL BE MADE TO THE LARGEST POSSIBLE RADIUS FOR EASE IN PULLING CONDUCTORS AND TO PROVIDE A NEATLY INSTALLED APPEARANCE. EQUIPMENT AND CONDITIONS PERMITTING, POWER CONDUIT BENDS SHALL CONFORM TO THE FOLLOWING: 1-1/2 IN. - 18 IN. RADIUS; 2 IN. - 24 IN. RADIUS; 2-1/2 IN. - 24 IN. RADIUS; 3 IN. - 36 IN. RADIUS.

GRS CONDUIT SHALL BE CUT WITH POWER OR HACKSAW AND CLEANLY REAMED TO REMOVE ALL "BURRS" AND ALL FIELD CUT THREADS SHALL BE PAINTED WITH WHITE LEAD BEFORE COUPLINGS ARE APPLIED.

EMPTY CONDUIT SYSTEMS INSTALLED FOR COMMUNICATION SYSTEMS, PUBLIC TELEPHONES, OWNER ITEMS AND OTHER SYSTEMS AS INDICATED ON DRAWINGS SHALL BE INSTALLED COMPLETE WITH NYLON PULL WIRES PROPERLY TAGGED AT BOTH ENDS FOR IDENTIFICATION.

WHERE BUILDING VENTILATION CONDITIONS ARE SUCH THAT AIR MAY FLOW CONTINUOUSLY IN CONDUITS, CAUSING CONDENSATION AND THE COLLECTION OF MOISTURE, THE CONDUITS SHALL BE SEALED AT EACH END WITH A PLIABLE X DUCT SEALING COMPOUND. ALSO SEAL ALL CONDUITS ENTERING AND LEAVING REFRIGERATED EQUIPMENT AND PROVIDE EXPANSION JOINTS PER N.E.C.

ALL CONNECTIONS TO MOTORS, SOLENOID VALVES, PRESSURE SWITCHES, LIMIT SWITCHES, AND SIMILAR APPARATUS SHALL BE FLEXIBLE CONDUIT WHERE PERMITTED. WHERE EQUIPMENT IS INSTALLED OUTDOORS OR EXPOSED TO MOISTURE, USE LIQUIDTIGHT FLEXIBLE CONDUIT WITH WATERTIGHT FITTINGS.

EQUIPMENT LEVELING, HANGERS AND SUPPORTS
SET EACH PIECE INSTALLED UNDER THIS DIVISION TRUE AND LEVEL. ADEQUATELY SUPPORT ALL RACEWAYS FROM THE STRUCTURE USING SCREW CLAMPS TO SECURE TO SAME. ARRANGE SUPPORTS TO PREVENT MOISTURE COLLECTION AND ALLOW ENTRANCE TO BOXES WITHOUT BENDS. INSTALL MULTIPLE CONDUITS USING CHANNEL TRAPEZE SUPPORTS TIGHT TO STRUCTURE ABOVE. USE APPROVED SPACERS TO INSULATE FROM CONTACT WITH BUILDING. SIZE CLAMPS, INSERTS, CHANNELS AND ALL OTHER MEMBERS TO SUPPORT A LOAD EQUAL TO 200% OF THE COMBINED WEIGHT OF ALL SUPPORTED MATERIAL PLUS THE WEIGHT OF A MAN.

WHERE SEVERAL RACEWAYS ARE SUPPORTED ON A COMMON TRAPEZE HANGER, SUPPORTS SHALL BE SPACED TO ACCOMMODATE THE SMALLEST SIZE RACEWAY INVOLVED. SPACE HANGERS AS FOLLOWS:
RIGID CONDUIT: 1/2 AND 3/4 IN. SIZE; 6'-0" ON CENTERS; 1 AND 1-1/4 IN. SIZE; 9'-0" ON CENTERS
ELECTRIC METALLIC TUBING:
1/2 AND 3/4 IN. SIZE; 5'-0" ON CENTERS; 1 AND 1-1/4 IN SIZE; 6'-0" ON CENTERS.

SECURELY ATTACH HANGERS AND SUPPORTS TO CONSTRUCTION BY METHODS RECOMMENDED IN THE "NECA STANDARDS OF INSTALLATION" MANUAL COORDINATION WITH MECHANICAL TRADES: THE INTENT OF THE ABOVE CEILING SUPPORTS IS TO COMBINE AS MANY PIPES, CONDUITS, ETC., AS IS POSSIBLE WITHIN SAFE STRUCTURAL LIMITS, ON EACH HORIZONTAL SECTION OF A TRAPEZE HANGER. PRIOR TO SELECTING THE HORIZONTAL MEMBER, ALL TRADES, MECHANICAL AND ELECTRICAL, SHALL COORDINATE ACTUAL NUMBER OF PIPES, CONDUITS, ETC., SUCH THAT FINAL SELECTION RESULTS IN A NEATLY GROUPED, DISCIPLINED AND ACCESSIBLE INSTALLATION.

WIRING INSTALLATION
EXCEPT FOR SUCH ITEMS AS ARE NORMALLY WIRED AT THEIR POINT OF MANUFACTURE AND SO DELIVERED - AND UNLESS SPECIFICALLY NOTED TO THE CONTRARY HEREIN - THE ELECTRICAL TRADE SHALL DO ALL ELECTRICAL WIRING OF EVERY CHARACTER. IT IS THE INTENT OF THESE SPECIFICATIONS AND DRAWINGS THAT ALL SYSTEMS AND EQUIPMENT SHALL BE PROVIDED WITH ALL NECESSARY UTILITY CONNECTIONS, COMPLETED TO ALLOW SAFE AND PROPER OPERATION OF SAID SYSTEMS. WHEN IT IS NECESSARY FOR TRADES PERFORMING WORK COVERED BY THIS DIVISION TO MAKE FINAL CONNECTIONS TO ITEMS OF EQUIPMENT BEING FURNISHED BY OTHERS, OR BY OTHER TRADES UNDER OTHER DIVISIONS, ALL SUCH WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THIS DIVISION AND ALL MATERIALS USED SHALL BE AS SPECIFIED HEREIN.

MINIMUM WIRE SIZE FOR BRANCH CIRCUITS SHALL BE #12 AWG, EXCEPT THAT HOMERUNS LONGER THAN 100 FT. LENGTH FROM THE PANEL TO THE CIRCUIT'S ELECTRICAL LOAD CENTER SHALL BE #10 AWG MINIMUM. WHERE RUNS EXCEED 150', CONTRACTOR MUST ENSURE WIRE SIZE BEING UTILIZED DOES NOT CREATE A VOLTAGE DROP GREATER THAN 3%. REQUEST PROPER WIRE SIZE PRIOR TO INSTALLATION IF A 3% VOLTAGE DROP MAY OCCUR FOR ANY BRANCH CIRCUIT. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS ARE ENCLOSED IN THE SAME RACEWAY, CONDUCTORS ARE TO BE DERATED PER N.E.C. AND WIRE SIZE INCREASED AS REQUIRED. WHERE THE INCREASED CONDUCTOR SIZE REQUIRES, INCREASE THE RACEWAY SIZE AS WELL. FOR CONTROL WIRING, USE #14 AWG MINIMUM. FOR FIXTURE WIRING, AS PERMITTED BY N.E.C., USE #18 AWG MINIMUM. FOR SIGNAL AND COMMUNICATIONS SYSTEMS USE WIRE SIZE AS SPECIFICALLY REQUIRED BY THE SYSTEM SUPPLIER.

MAKE CONNECTIONS TO TERMINALS USING PRESSURE TYPE CONNECTORS. SOLDERED JOINTS ARE PROHIBITED. ALL JOINTS IN CONDUCTORS SHALL BE MADE AT AN ACCESSIBLE LOCATION WITHIN A BOX BY TWISTING THE BARE CONDUCTOR ENDS TOGETHER AND APPLYING A WIRE CONNECTOR IN ALL SIZES UP TO THE MAXIMUM CAPACITY OF THE CONNECTOR. JOINTS SHALL BE TAPED WITH AN APPROVED ELECTRICAL TAPE. SPLICES FOR CONDUCTORS LARGER THAN #10 AWG SHALL BE MADE WITH AN APPROVED COMPRESSION (SQUEEZE) CONNECTOR INSULATED WITH NOT LESS THAN TWO LAYERS OF ELECTRICAL FILL TAPE TO 1.5 TIMES THE THICKNESS OF INSULATION, FOLLOWED BY TWO (MINIMUM) LAYERS OF HALF-LAPPED ELECTRICAL TAPE FOR MECHANICAL PROTECTION. LOCATE ALL SPLICES IN BOXES OR FITTINGS OF PROPER SIZE PER N.E.C.

IDENTIFY ALL WIRES AND CABLES WITH BRADY ADHESIVE WIRE MARKERS AT EACH BOX, PANEL, AND OUTLET. IDENTIFICATION SHALL, AS A MINIMUM, INDICATE THE PANEL AND CIRCUIT SUPPLYING THE OUTLET. AT THE PANEL END, THE LOAD SERVED AND ITS LOCATION SHALL BE INDICATED. PROVIDE A MINIMUM OF 6 IN. SLACK WIRE AT EACH OUTLET FOR MAKING CONNECTION TO THE DEVICE OR TO PROVIDE FOR A FUTURE DEVICE IN THE BOX.

BOXES
EACH BOX SHALL BE OF PROPER SIZE TO ACCOMMODATE THE DEVICE AND FUNCTION FOR WHICH IT IS SHOWN. BOXES FOR WALL DEVICES SHALL BE FURNISHED COMPLETE WITH PLASTER RING OR TILE RING ACCORDING TO WALL CONSTRUCTION WHERE REQUIRED. BOXES FOR INSTALLATION IN MASONRY WALLS SHALL BE SPECIAL SQUARE CORNER MASONRY TYPE. BOXES FOR MOUNTING OF LIGHTING FIXTURES SHALL BE FOUR INCH OCTAGON, EQUIPPED WITH 3/8 IN. "NO-BOLT" FIXTURE STUD. BOXES FOR FLOOR OUTLETS SHALL BE CONCRETE PROOF STEEL BOXES WITH ADJUSTABLE TOPS AND DEVICES AS HEREINAFTER NOTED OR SHOWN. ALL BOXES SHALL BE FURNISHED COMPLETE WITH PROPER COVER AND/OR DEVICE PLATE AND DEVICE. UNLESS OTHERWISE NOTED, PLACE OUTLET BOXES AT THE FOLLOWING HEIGHTS (BOX CENTER TO FINISH FLOOR): WALL SWITCHES 46" AND CONVENIENCE OUTLETS 18" UNLESS NOTED OTHERWISE ON DRAWINGS.

TELEPHONE, ALARM, AND SIGNAL SYSTEM OUTLET BOXES SHALL BE STANDARD OUTLET BOX TYPE WHERE ONLY ONE CONDUIT ENTERS SAME, UNLESS OTHERWISE SPECIFIED OR INDICATED ON DRAWINGS, WHERE TWO OR MORE CONDUITS ENTER, BOX SHALL BE 4-11/16 IN. SQUARE MINIMUM WITH SUITABLE ADAPTER RING.

LOCATE ALL OUTLETS AS INDICATED ON DRAWINGS, HOWEVER, AT INSTALLATION INSPECT ARCHITECTURAL DRAWINGS AND LOCATE LOCAL SWITCHES ON THE STRIKE SIDE OF THE DOOR.

SYSTEM GROUNDING
EQUIPMENT, RACEWAY SYSTEMS, WIRING SYSTEM NEUTRALS, RECEPTACLES AND POWER OUTLETS, MOTORS AND MOTORIZED EQUIPMENT, SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C. ARTICLE 250.

GROUND RECEPTACLES AND POWER OUTLETS TO THE CONDUIT SYSTEM WITH A GREEN GROUNDING CONDUCTOR SIZE IN ACCORDANCE WITH N.E.C. AND CONNECTED BETWEEN THE DEVICE GROUNDING SCREW AND THE OUTLET BOX. CONNECTION TO THE BOX MAY BE A "G" CLIP OR BY A 10/24 SCREW THREADED INTO A HOLE IN THE BACK OF THE BOX AND USED FOR NO OTHER PURPOSE. EQUIPMENT CONNECTED TO THE ELECTRICAL SYSTEM SHALL BE GROUNDED WITHIN INSULATED GREEN GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH N.E.C. AND INSTALLED WITHIN THE RACEWAY. CONDUCTOR SHALL BE CONTINUOUS BETWEEN A GROUNDING SCREW IN THE EQUIPMENT JUNCTION BOX AND A GROUND ATTACHMENT IN THE NEAREST OUTLET BOX IN THE RIGID METALLIC CONDUIT SYSTEM. THIS REQUIREMENT INCLUDES ALL FLEXIBLE CONDUIT.

GENERALLY FOR TELEPHONE AND SUPPLEMENTAL COMMUNICATION SYSTEMS NO 6 AWG CONDUCTOR TO EACH PROTECTOR CABINET, OTHER CABINET, OR DEVICE INSTALLATION SHALL BE CONSIDERED SUFFICIENT, FROM THE SERVICE GROUND (UNLESS INDICATED OTHERWISE).

GROUNDING MATERIAL:
GROUND-RODS - 1/2" DIA., 10' LONG, COPPERWELD
GROUND CONDUCTOR - SIZE AS PER N.E.C. REQUIREMENTS, SOFT DRAWN OR SOFT ANNEALED, COPPER WIRE.
JOINTS AND CONNECTIONS - MOLDED FUSION WELDING PROCESS USING PROPER MOLD AND THE NUMBER, SIZE AND TYPE CARTRIDGE FOR THE JOINT OR CONNECTION. WATERPIPE CONNECTION, SILICON BRONZE APPROVED MECHANICAL CONNECTOR DESIGNED FOR THE PIPE AND CABLE TO BE BONDED.

PANELBOARD INSTALLATION:
MOUNT PANELBOARDS WITH CENTERLINE AT 5 FT.-6IN. ABOVE FINISH FLOOR, EXCEPT THAT THE HIGHEST BREAKER HANDLE SHALL BE BELOW 6 FT.-5 IN. ABOVE FINISH FLOOR. ARRANGE BREAKERS SO THAT THE BREAKER RATING IS VISIBLE WITH THE PANEL FRONT IN PLACE.

PANEL DIRECTORIES, AS A MINIMUM, SHALL BE TYPEWRITTEN AND INDICATE BREAKER POSITION NUMBER AND EQUIPMENT SERVED. THE PANEL IDENTIFICATION SHALL BE LOCATED ON THE PANEL TRIM AND SHALL CONSIST OF A BLACK LAMINATED PHENOLIC LABEL, SCREW MOUNTED, WITH THE PANEL IDENTIFICATION MATCHING PANEL IDENTIFICATION ON DRAWINGS. LABEL ALL CONDUCTORS WITH ADHESIVE WRAP LABELS WITHIN 2 IN. OF THE CONDUCTOR TERMINATION PRIOR TO INSTALLATION OF TRIM.

LIGHTING FIXTURE INSTALLATION
PROVIDE A LIGHTING FIXTURE FOR EACH AND EVERY OUTLET IN ACCORDANCE WITH TYPE DESIGNATION AND FIXTURE SCHEDULE ON THE DRAWINGS. VERIFY THE ARCHITECTURAL FINISHES AND CEILING CONSTRUCTION AND - REGARDLESS OF THE CATALOG NUMBER PREFIXES AND SUFFIXES SHOWN - PROVIDE FIXTURES WITH THE PROPER TRIM, FRAMES, SUPPORTS, AND HANGER AND OTHER MISCELLANEOUS APPURTENANCES TO PROPERLY COORDINATE WITH SAID FINISHES. REINFORCE CEILING CONSTRUCTION AS REQUIRED TO PROPERLY SUPPORT THE WEIGHT OF FIXTURES INSTALLED THEREON.

IMMEDIATELY PRIOR TO FINAL INSPECTION: THOROUGHLY CLEAN ALL FIXTURES INSIDE AND OUT, INCLUDING PLASTICS AND GLASSWARE. ADJUST TRIM TO FIT ADJACENT SURFACES. REPLACE BROKEN OR DAMAGED PARTS. INSTALL NEW LAMPS. ELECTRICALLY AND MECHANICALLY TEST THE SYSTEM FOR PROPER OPERATION.

THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPROVAL FROM LOCAL CODE AUTHORITIES AND MAKING ANY REVISIONS DIRECTED BY THEM ON EMERGENCY AND EXIT LIGHTING.

CLEANING
THOROUGHLY CLEAN ALL FIXTURES, SWITCHES, OTHER DEVICES, PANELBOARDS, AND EQUIPMENT PROVIDED OR CONNECTED IN THIS CONTRACT. ALL SURFACES SHALL BE PROPERLY POLISHED AND SHALL BE FREE OF PAINT AND ALL OTHER DIRT OR DEBRIS. TOUCHUP OR COMPLETELY REFINISH ALL EQUIPMENT FURNISHED WITH FACTORY FINISHES THAT IS DAMAGED DURING DELIVERY OR CONSTRUCTION. PROPERLY PROTECT THE FRONTS OF ALL PANELBOARDS, SWITCHBOARDS AND SIMILAR EQUIPMENT TO PREVENT MARRING AND OTHER DEFACING.

AT ALL TIMES, KEEP THE PREMISES FREE FROM ACCUMULATIONS OF WASTE MATERIALS OR RUBBISH CAUSED BY THE WORK OF THE TRADESMEN DOING ELECTRICAL WORK. AT COMPLETION OF THE WORK, REMOVE ALL RUBBISH, TOOLS, EQUIPMENT, AND SURPLUS MATERIALS. BROOM CLEAN ALL ASSIGNED SPACES PRIOR TO LEAVING THE PREMISES.

TESTING AND LOAD BALANCING

TEST ALL CIRCUITS TO ASSURE THEM TO BE FREE OF GROUNDS AND SHORTS. LIGHT AND TEST EACH LAMP. PROVE AND TEST THE AVAILABLE VOLTAGE ON THE LOAD SIDE OF EACH DISCONNECT. VERIFY PROPER OPERATION OF THE DISCONNECT. VERIFY THE PHASE SEQUENCE, VOLTAGE, AND ROTATION AT EACH MOTOR IN THE PRESENCE OF THE INSTALLER. RUN EACH MOTOR WITH ITS CONTROL AS NEARLY AS POSSIBLE UNDER OPERATING CONDITIONS FOR A SUFFICIENT LENGTH OVER TIME TO DEMONSTRATE CORRECT ALIGNMENT, WIRING CAPACITY, SPEED, AND OVERALL SATISFACTORY OPERATION. CHECK THAT THE PROPER OVERLOAD HEATERS HAVE BEEN INSTALLED BY READING THE MOTOR NAMEPLATE. ADJUST THE SIZE OF THE OVERLOAD HEATER AS REQUIRED TO MATCH THE MOTOR NAMEPLATE. OPERATE ALL MAIN AND FEEDER SWITCHES AND BREAKERS.

THE VARIOUS BRANCH CIRCUITS SERVED FROM THE LIGHTING PANELBOARDS VARY IN LOADING. CAREFULLY BALANCE THE ACTUAL OPERATING LOAD ON EACH PANELBOARD WHEN ALL LOAD IS TURNED ON AND THE SYSTEM IS OPERATING AT 100% DEMAND, THE UNBALANCE SHALL NOT EXCEED 10%. DURING FINAL INSPECTION, FURNISH THE TEST INSTRUMENTS AND QUALIFIED PERSONNEL TO PERFORM COMPLETE TESTING. COSTS OF ALL TESTING, INCLUDING THE INCIDENT COSTS FOR RETESTING OCCASIONED BY DEFECTS AND FAILURES OF THE EQUIPMENT TO MEET THE SPECIFICATIONS, SHALL BE BORNE BY THE CONTRACTOR.

FURNISH AT THE COMPLETION OF THE PROJECT A FINAL INSPECTION CERTIFICATE FROM THE LOCAL INSPECTING AUTHORITY.

END OF SECTION 16000

HIVE

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STATE OF MISSOURI
RYAN BREWER
NUMBER PE-2020010759
PROFESSIONAL ENGINEER
05/30/2024

project number 2024-023
date 05.30.2024
issued for PERMIT

rev date description

ELECTRICAL SPECIFICATIONS

sheet number
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