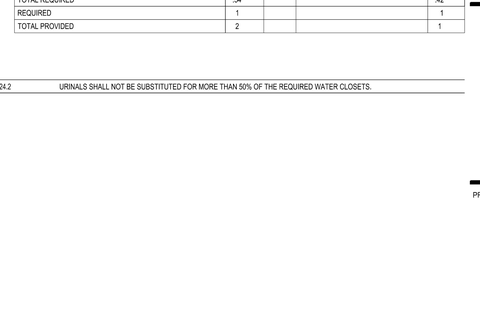


TENANT IMPROVEMENTS FOR:

SONNY'S

2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

PROJECT TEAM:

CLIENT:

SONNY'S The CarWash Factory

ARCHITECT OF RECORD:

FOUNDATION
ARCHITECTURE, LLC
(216) 973-1819

MEP ENGINEER:

pta engineering
275 Springside Dr., Suite 300
Akron, Ohio 44333
Phone: 330-666-3702
ptaengineering.com

DRAWING INDEX:

SHEET NO	DESCRIPTION	ISSUE DATE
GENERAL:		
G0.01	TITLE SHEET	8/15/25
G0.02	LIFE SAFETY PLAN	8/15/25
ARCHITECTURAL:		
A0.01	OVERALL DEMOLITION PLAN	8/15/25
A1.01	OVERALL FLOOR PLAN	8/15/25
A1.11	ENLARGED PLANS	8/15/25
A1.21	WALL TYPES AND DETAILS	8/15/25
A1.41	ROOM FINISH PLAN	8/15/25
A1.51	PARTIAL REFLECTED CEILING PLAN	8/15/25
A6.01	DOOR FRAME SCHEDULE	8/15/25
ELECTRICAL:		
E0.01	ELECTRICAL DEMOLITION PLAN	8/15/25
E1.01	LIGHTING PLAN	8/15/25
E1.02	RECEPTICAL PLAN	8/15/25
E1.03	EQUIPMENT WIRING PLAN	8/15/25
E1.04	SYSTEMS WIRING PLAN	8/15/25
E2.01	ELECTRICAL SCHEDULES	8/15/25
E3.01	ELECTRICAL SPECIFICATIONS	8/15/25

SHEET NO	DESCRIPTION	ISSUE DATE
PLUMBING:		
P0.01	GENERAL INFORMATION	8/15/25
P1.01	FIRST FLOOR PLUMBING DEMOLITION PLAN	8/15/25
P2.01	FIRST FLOOR PLUMBING PLAN	8/15/25
P3.01	FIRST FLOOR ENLARGED PLUMBING PLANS	8/15/25
P4.01	PLUMBING SCHEDULES AND DETAILS	8/15/25
P5.01	PLUMBING SPECIFICATIONS	8/15/25
MECHANICAL:		
M0.01	GENERAL INFORMATION	8/15/25
M1.01	FIRST FLOOR MECHANICAL DEMOLITION PLAN	8/15/25
M2.01	FIRST FLOOR MECHANICAL PLAN	8/15/25
M3.01	FIRST FLOOR ENLARGED MECHANICAL PLAN	8/15/25
M4.01	MECHANICAL SCHEDULES AND DETAILS	8/15/25
M5.01	MECHANICAL SPECIFICATIONS	8/15/25
M5.02	MECHANICAL SPECIFICATIONS	8/15/25

ABBREVIATION LEGEND

A/C	AIR CONDITIONING
ACM	ALUMINUM COMPOSITE MATERIAL
ACT	ACOUSTICAL CEILING TILE
ADJ	ADJACENT
AFF	ABOVE FINISH FLOOR
ALT	ALTERNATE
ALUM	ALUMINUM
ANOD	ANODIZED
APPROX	APPROXIMATE
ARCH	ARCHITECT(URAL)
AUTO	AUTOMATIC
BD	BOARD
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM
BOT OR B/	BOTTOM
BRG	BEARING
C/C	CENTER TO CENTER
CAB'T	CABINET
CB	CATCH BASIN
CL or ℄	CENTER LINE
CG	CORNER GUARD
CJ	CONTROL JOINT
CLG	CEILING
CLR	CLEAR
CNTR	COUNTER
CMU	CONCRETE MASONRY UNIT
CO	CASED OPENING/CLEAN OUT
COL	COLUMN
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
COORD	COORDINATE
CORR	CORRIDOR
CPT	CARPET
CT	CERAMIC TILE
CTR	CENTER
D	DEPTH
DBL	DOUBLE
DEG	DEGREES
DEMO	DEMOLITION
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DR	DOOR
DS	DOWN SPOUT
DET	DETAIL
DWG	DRAWING
EIFS	EXTERIOR INSULATED PANEL SYS.
EPDM	ETHYLENE PROPYLENE DIENE MONOMER (ROOF MEMBRANE)
EPS	EXPANDED POLYSTYRENE (FOAM)
EXP	EXPOSED
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
F/F	FACE TO FACE
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FIN	FINISH
FLR OR FL	FLOOR
FLUOR	FLUORESCENT
FPWH	FROST-PROOF WATER HYDRANT
FRP	FIBERGLASS REINFORCED PANELS
FRT	FIRE-RETARDANT TREATED
FRTWD	FIRE-RETARDANT TREATED WOOD
FT	FEET
FTG	FOOTING
FURR	FURRING
FVC	FIRE VALVE CABINET
FWC	FABRIC WALLCOVERING
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GL	GLASS
GYP BD	GYPSUM BOARD
H	HIGH
HB	HOSE BIBB
HC	HOLLOW CORE
HDWR	HARDWARE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HPDL	HIGH PRESSURE DECORATIVE LAMINATE
HP	HIGH POINT
HR	HOUR
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HVAC	HEATING, VENTILATION AIR CONDITIONING
HW	HOT WATER
ID	INSIDE DIMENSION
IN	INCH
INCL	INCLUDE(S)
INSUL	INSULATION
INT	INTERIOR
JAN	JANITOR
JST	JOIST
L	LENGTH (LONG)
LAM	LAMINATE(D)
LAV	LAVATORY
LB	POUND
LED	LIGHT EMITTING DIODE
LF	LINEAR FEET (FOOT)
LP	LOW POINT
LTD	LIMITED
LTG	LIGHTING
LVR	LOUVER
MAS'Y	MASONRY
MAT	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MEMB	MEMBRANE
MFR	MANUFACTURER
MH	MANHOLE
MID	MIDDLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTD	MOUNTED
MTL	METAL
MULL	MULLION
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OHD	OVERHEAD DOOR
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OVRD	OVERFLOW ROOF DRAIN
O/O	OUT TO OUT
OPG	OPENING
OPP	OPPOSITE
OPT	OPTIONAL
PC	PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PEMB	PRE-ENGINEERED METAL BLDG.
PL	PLATE
PLAS	PLASTIC
PLAM	PLASTIC LAMINATE
PLBG	PLUMBING
PLYWD	PLYWOOD
PNL	PANEL
PNT	PAINT
POL	POLISHED
POLYISO	POLYISOCYANURATE
PR	PAIR
PRD	PRIMARY ROOF DRAIN
PREFIN	PREFINISHED
PREFAB	PREFABRICATED
PROJ	PROJECTION
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT OR POCELAIN TILE
PTD	PAINTED
PTN	PARTITION
PTWD	PRESSURE TREATED WOOD
PVC	POLYVINYLCHLORIDE
PVMT	PAVEMENT
QRS	QUICK SERVE RESTAURANT
QT	QUARRY TILE
QTY	QUANTITY
R	RISER
RA	RETURN AIR
RAD	RADIUS
RD	ROOF DRAIN
REC	RECEPTACLE
REF	REFRIGERATOR
REG	REGISTER
REINF	REINFORCEMENT (REINFORCING)
REQD	REQUIRED
RES	RESILIENT
REV	REVISED (REVISION)
RM	ROOM
RO	ROUGH OPENING
RVS	REVERSE
SAC	SUSP. ACOUST. CEILING SYSTEM
SC	SOLID CORE
SCHED	SCHEDULE
SD	SMOKE DETECTOR
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SP	STAND PIPE
SPEC	SPECIFICATIONS
SPKR	SPEAKER
SPKLR	SPRINKLER
SQ	SQUARE
SQ IN	SQUARE INCH
SQ YD	SQUARE YARD
SS	STAINLESS STEEL/SLOP SINK
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUC	STRUCTURE (STRUCTURAL)
SUSP	SUSPENDED
SYS	SYSTEM(S)
T OR T/	TOP
TBD	TO BE DETERMINED
T&G	TONGUE AND GROOVE
TD	TRENCH DRAIN
TEL	TELEPHONE
TEMP	TEMPORARY
TEMP'D	TEMPERED
THK	THICK
TME	TO MATCH EXISTING
T/CONC	TOP OF CONCRETE (TOP OF CURB)
T/STEEL	TOP OF STEEL
T/DECK	TOP OF DECK
T/MASY	TOP OF MASONRY
T/JOIST	TOP OF JOIST
TPO	THERMOPLASTIC POLYOLEFIN (ROOF MEMBRANE)
TYP	TYPICAL
UC	UNDERCUT
UG	UNDERGROUND
UNFIN	UNFINISHED
UNLTD	UNLIMITED
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VEST	VESTIBULE
VCT	VINYL COMPOSITE TILE
VIF	VERIFY IN FIELD
VWC	VINYL WALLCOVERING
W	WIDTH
W/	WITH
W/O	WITHOUT
W/W	WALL TO WALL
WC	WATER CLOSET
WD	WOOD
WH	WATER HEATER
WIN	WINDOW
WT	WEIGHT
WWF	WELDED WIRE FABRIC
XPS	EXTRUDED POLYSTYRENE (FOAM)
YD	YARD

BUILDING CODE INFORMATION:

PROJECT CRITERIA:

OCCUPANCY CLASSIFICATION:	B_BUSINESS	2,423 S.F.
	H-3 HIGH HAZARD	17,165 S.F.
	S-1 MODERATE HAZARD STORAGE	4,914 S.F.
TENANT AREA (TOTAL):		24,502 S.F.
TYPE OF CONSTRUCTION:	IIB	
NUMBER OF STORIES:	1	
SPRINKLED:	YES (ESFR)	
FIRE ALARM:	YES	

PROJECT DESCRIPTION:

INTERIOR TENANT BUILD-OUT OF AN EXISTING BUILDING INCLUDING:
SOME NEW OFFICE SPACE . NEW WAREHOUSE AREA INCLUDING, RATED WALLS, AND PROPOSED RACKING LOCATIONS AND A LIQUID STORAGE ROOM.

GOVERNING CODES:

BUIILDING CODE: KANSAS CITY BUILDING CODE 2018 (2018 IBC)
MECHANICAL CODE: KANSAS CITY MECHANICAL CODE 2018
PLUMBING CODE: KANSAS CITY PLUMBING CODE 2018
ACCESSABILITY CODE: 2010 ADA STANDARDS
ELECTRICAL CODE: KANSAS CITY ELECTRICAL CODE 2017
ENERGY CODE: KANSAS CITY ENERGY CODE 2021

CHAPTER 3 USE AND OCCUPANCY CLASSIFICATION

304.1	BUSINESS GROUP B
307.5	HIGH-HAZARD GROUP H-3
311.2	MODERATE-HAZARD STORAGE GROUP S-1

CHAPTER 5 GENERAL BUILDING HEIGHTS AND AREAS

BUILDING DATA

STORIES = 1
GROSS AREA B = 2,423 SF
GROSS AREA H-3 = 17,165 SF
GROSS AREA S-1 = 4,914 SF
TOTAL GROSS AREA (TENANT) = 24,502 SF

TOTAL BUILDING AREA = 250,440 SF

507.1 THE AREA OF BUILDINGS OF THE OCCUPANCIES AND CONFIGURATIONS SPECIFIED IN SECTIONS 507.1 THROUGH 507.13 SHALL NOT BE LIMITED.

EXCEPTION: OTHER OCCUPANCIES SHALL BE PERMITTED IN UNLIMITED AREA BUILDINGS IN ACCORDANCE WITH THE PROVISIONS OF SECTION 508.2.

507.2 WHERE SECTION 507.2 THROUGH 507.13 REQUIRE BUILDINGS TO BE SURROUNDED AND ADJOINED BY PUBLIC WAYS AND YARDS THESE OPEN SPACES SHALL BE DETERMINED AS FOLLOWS:

1. YARDS SHALL BE MEASURED FROM BUILDING PERIMETER IN ALL DIRECTIONS TO THE CLOSEST INTERIOR LOT LINES OR TO THE EXTERIOR FACE OF AN OPPOSING BUILDING LOCATED ON THE SAME LOT AS APPLICABLE.
2. WHERE THE BUILDING FRONTS ON A PUBLIC WAY, THE ENTIRE WIDTH OF THE PUBLIC WAY SHALL BE USED.

507.4 SPRINKLERED, THE AREA OF B,E,F,M OR S BUILDING NO MORE THAN ONE STORY ABOVE GRADE PLANE OF ANY CONSTRUCTION TYPE, OR THE AREA OF A GROUP A-4 BUILDING NO MORE THAN ON STORY ABOVE GRADE OF OTHER THAN CONSTRUCTION TYPE V CONSTRUCTION, SHALL NOT BE LIMITED WHERE THE BUILDING IS PROVIDED WITH AN AUTOMATIC SPRINKLER SYSTEM THROUGHOUT IN ACCORDANCE WITH SECTION 903.3.1.1 AND IS SURROUNDED AND ADJOINED BY PUBLIC WAYS OR YARDS NOT LESS THAN 60 FEET IN WIDTH.

507.8 GROUP H-2, H-3 AND H-4 OCCUPANCIES SHALL BE PERMITTED IN UNLIMITED AREA BUILDINGS CONTAINING GROUP F OR S OCCUPANCIES IN ACCORDANCE WITH SECTIONS 507.4 AND 507.5 AND THE PROVISIONS OF SECTIONS 507.8.1 THROUGH 507.8.4.

507.8.1 THE AGGREGATE FLOOR AREA OF GROUP H OCCUPANCIES LOCATED IN AN UNLIMITED AREA BUILDING SHALL NOT EXCEED 10 PERCENT OF THE AREA OF THE BUILDING OR THE AREA LIMITATIONS FOR THE GROUP H OCCUPANCIES AS SPECIFIED IN SECTION 506 BASED ON THE PERIMETER OF EACH GROUP H FLOOR AREA THAT FRONTS ON A PUBLIC WAY OR OPEN SPACE.

EXISTING BUILDING IS 250,440 SF WHICH WOULD ALLOW AN H OCCUPANCY OF 25,044 SF.

TABULAR AREA OF 14,000 + 50% OPEN FRONTAGE INCREASE
ALLOWS (If=.25) = 17,500 sf

<u>THE H3 AREA HAS BEEN DESIGNED TO BE 17,165 SF. - PLAN COMPLIES</u>

507.8.2 EXCEPT AS PROVIDED FOR IN SECTION 507.8.1.1, GROUP H OCCUPANCIES SHALL BE LOCATED ON THE PERIMETER OF THE BUILDING. IN GROUP H-2 AND H-3 OCCUPANCIES, NOT LESS THAN 25 PERCENT OF THE PERIMETER OF SUCH OCCUPANCIES SHALL BE AN EXTERIOR WALL. - <u>PLAN COMPLIES</u>

507.8.3 GROUP H OCCUPANCIES SHALL BE SEPARATED FROM THE REMAINDER OF THE UNLIMITED AREA BUILDING AND FROM EACH OTHER IN ACCORDANCE WITH TABLE 508.4.

T508.4

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

OCCUPANCY	A, E		I-1^a, I-3, I-4		I-2		R^a		F-2, S-2^b, U		B^e, F-1, M, S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A, E	N	N	1	2	2	NP	1	2	N	1	1	2	NP	NP	3	4	2	3	2	NP
I-1^a, I-3, I-4	—	—	N	N	2	NP	1	NP	1	2	1	2	NP	NP	3	NP	2	NP	2	NP
I-2	—	—	—	—	N	N	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
R^a	—	—	—	—	—	—	N	N	1^c	2^c	1	2	NP	NP	3	NP	2	NP	2	NP
F-2, S-2^b, U	—	—	—	—	—	—	—	—	N	N	1	2	NP	NP	3	4	2	3	2	NP
B^e, F-1, M, S-1	—	—	—	—	—	—	—	—	—	—	N	N	NP	NP	2	3	1	2	1	NP
H-1	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	NP	NP	NP	NP	NP	NP
H-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	1	NP	1	NP
H-3, H-4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1^d	NP	1	NP
H-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP

FIRE CODE REQUIRES 2 HR RATING, THIS TABLE DOES NOT APPLY.

CHAPTER 6 TYPES OF CONSTRUCTION

T 601

BUILDING ELEMENT	TYPE 2 B
PRIMARY STRUCTURAL FRAME	0
BEARING WALLS EXTERIOR INTERIOR	 0 0
NONBEARING WALLS AND PARTITIONS EXTERIOR	SEE T 602
NONBEARING WALLS AND PARTITIONS INTERIOR	0
FLOOR CONSTRUCTION AND SECONDARY MEMBERS	0
ROOF CONSTRUCTION AND SECONDARY MEMBERS	0

CHAPTER 7 FIRE-RESISTANCE-RATED CONSTRUCTION

TABLE 716.1(2) OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE^b	FIRE-RATED GLAZING MARKING DOOR VISION PANEL$^{c, e}$	MINIMUM SIDELIGHT/ TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELIGHT/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4	3	See Note b	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3a	See Note b	D-H-W-180	Not Permitted	3	Not Permitted	W-180
	2	1½	100 sq. in.	≤100 sq. in. = D-H-90 >100 sq. in.=D-H-W-90	Not Permitted	2	Not Permitted	W-120
	1½	1½	100 sq. in.	≤100 sq. in. = D-H-90 >100 sq. in.= D-H-W-90	Not Permitted	1½	Not Permitted	W-90
Enclosures for shafts, interior exit stairways and interior exit ramps.	2	1½	100 sq. in.^{c}	≤100 sq. in. = D-H-90 > 100 sq. in.= D-H-T-W-90	Not Permitted	2	Not Permitted	W-120
Horizontal exits in fire walls^d	4	3	100 sq. in.	≤100 sq. in. = D-H-180 > 100 sq. in.= D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3^a	100 sq. in.	≤100 sq. in. = D-H-180 > 100 sq. in.= D-H-W-180	Not Permitted	3	Not Permitted	W-180
Fire barriers having a required fire-resistance rating of 1 hour: Enclosures for shafts, exit access stairways, exit access ramps, interior exit stairways and interior exit ramps; and exit passageway walls	1	1	100 sq. in.	≤100 sq. in. = D-H-60>100 sq. in.=D-H-T-W-60	Not Permitted	1	Not Permitted	W-60

CHAPTER 8 INTERIOR FINISHES

T 803.1.1

SPRINKLERED	EXIT ENCLOSURES AND PASSAGEWAYS	CORRIDORS AND EXIT ACCESS	ROOMS AND ENCLOSED SPACES
USE GROUP B	B	C	C
USE GROUP S	C	C	C
USE GROUP H	B	B	C

CLASS A:FLAME SPREAD 0-25; SMOKE-DEVELOPED 0-450
CLASS B:FLAME SPREAD 26-75; SMOKE-DEVELOPED 0-450
CLASS C:FLAME SPREAD 76-200; SMOKE-DEVELOPED 0-450

CHAPTER 9 FIRE PROTECTION SYSTEMS – FULLY SPRINKLERED

903 DRAWINGS, SPECIFICATIONS AND PRODUCT DATA FOR ALL COMPONENTS OF THE SPRINKLER SYSTEM AND FIRE ALARM SHALL BE PREPARED BY AN REGISTERED DESIGN PROFESSIONAL OR AN CERTIFIED SPRINKLER SYSTEM DESIGNER . THE SPRINKLER SYSTEM SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BEFORE ANY WORK ON THAT SYSTEM IS STARTED. THIS DEFERRED SUBMITTAL (UNDER SEPARATE PERMIT) SHALL CONTAIN THE SEAL AND SIGNATURE OF THE DESIGN PROFESSIONAL OR THE CERTIFICATION NUMBER AND SIGNATURE OF THE CERTIFIED SPRINKLER SYSTEM DESIGNER.

T 906.3(1) FIRE EXTINGUISHER FOR CLASS A FIRE HAZARDS

	LIGHT (LOW) HAZARD OCCUPANCY	ORDINARY (MODERATE) HAZARD OCCUPANCY	EXTRA (HIGH) HAZARD OCCUPANCY
MINIMUM-RATED SINGLE EXTINGUISHER	2-A	2-A	4-A
MAXIMUM FLOOR AREA PER UNIT OF A	3000 SF	1500 SF	1000 SF
MAXIMUM FLOOR AREA F OR EXTINGUISHER	11,250 SF	11,250 SF	11,250 SF
MAXIMUM DISTANCE OF TRAVEL TO EXTINGUISHER	75'	75'	75'

T 906.3(2) FIRE EXTINGUISHER FOR FLAMMABLE OR COMBUSTIBLE LIQUIDS WITH DEPTH LESS THAN OR EQUAL TO 0.25"

TYPE OF HAZARD	BASIC MINIMUM EXTINGUISHER RATING	MAX TRAVEL OF DISTANCE TO EXTINGUISHERS (FT)
LIGHT (LOW)	5-B 10-B	30 50
ORDINARY (MODERATE)	10-B 20-B	30 50
EXTRA (HIGH)	40-B 80-B	30 50

CHAPTER 10 MEANS OF EGRESS

T 1004.1.2

OCCUPANT LOAD	DESIGN	
BUSINESS AREA	2,423 / 150	= 16.1
WAREHOUSE - H3	17,165 / 500	= 34.3
WAREHOUSE - S1	4,914 / 500	= 9.8
TOTAL OCCUPANT LOAD		63 PEOPLE

T1014.3 COMMON PATH OF EGRESS TRAVEL

OCCUPANCY	MAXIMUM COMMON PATH OF TRAVEL DISTANCE (FEET) WITH SPRINKLER SYSTEM
B	100
H-3	25
S-1	100

T1016.2 EXIT ACCESS TRAVEL DISTANCE

	WITH SPRINKLER SYSTEM
A,E,F-1,M,R,S-1	250'
B	300'
H-3	150'

1016.2.2 BUILDINGS OR AREAS PROTECTED BY ESFR SPRINKLER SYSTEM ARE PERMITTED TO HAVE 400 FEET EXIT TRAVEL DISTANCE

1018.4 DEAD END CORRIDORS = 20 FT MAX

1018.4 EXCEPTION 2 DEAD END CORRIDORS, GROUP B AND S = 50 FT MAX W/ SPRINKLER SYSTEM

CHAPTER 29 PLUMBING

T 2902.1 OCCUPANT LOAD

MEN	OCCUPANTS	WC		URINALS	LAV	
		OCC / FIX	# FIX		OCC / FIX	# FIX
H3/S-1	22	1 PER 100	.22		1 PER 100	.22
B	8	1 PER 25 FOR THE 1ST 50 AND 1 PER 50 FOR THE REMAINDER EXCEEDING 50	.32		1 PER 40 FOR THE 1ST 40 AND 1 PER 80 FOR THE REMAINDER EXCEEDING 80	.20
TOTAL REQUIRED			.54	0		.42
REQUIRED			1	0		1
TOTAL PROVIDED			1	1		1
WOMEN	**OCCUPANTS**	**WC**			**LAV**	
		OCC / FIX	# FIX		OCC / FIX	# FIX
H3/S-1	24	1 PER 100	.22		1 PER 100	.22
B	11	1 PER 25 FOR THE 1ST 50 AND 1 PER 50 FOR THE REMAINDER EXCEEDING 50	.32		1 PER 40 FOR THE 1ST 40 AND 1 PER 80 FOR THE REMAINDER EXCEEDING 80	.20
TOTAL REQUIRED			.54			.42
REQUIRED			1			1
TOTAL PROVIDED			2			1

IPC 424.2 URINALS SHALL NOT BE SUBSTITUTED FOR MORE THAN 50% OF THE REQUIRED WATER CLOSETS.

GENERAL PROJECT NOTES

1. THE CONTRACT DOCUMENTS ARE PREPARED FOR THE CONTRACTOR TO BECOME FAMILIAR WITH THE SCOPE OF WORK AND PROPOSED DESIGN CONCEPT.
2. DO NOT SCALE THE CONTRACT DOCUMENTS. DIMENSIONS AS INDICATED SHALL GOVERN.
3. CONTRACTORS SHALL WARRANT THEIR RESPECTIVE CONSTRUCTION AND WORK TO BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS IF ALL LOCAL, STATE, AND FEDERAL LAWS, AUTHORITIES HAVING JURISDICTION, AND MANUFACTURER'S INSTALLATION AND WARRANTY REQUIREMENTS.
4. CONTRACTORS SHALL PROVIDE ALL REQUIRED LABOR AND MATERIALS TO ACHIEVE INDUSTRY STANDARD OF MEANS AND METHODS TO ACHIEVE THE DESIGN INTENT OF THE CONTRACT DOCUMENTS REGARDLESS WHETHER OR NOT DOCUMENTED HEREIN; CONSIDERATIONS FOR ADDITIONAL LABOR OR MATERIAL COSTS ON THE BASIS OF OMISSIONS SHALL NOT BE GRANTED.
5. INTERPRETATIONS, CLARIFICATIONS, CHANGES, DELETIONS, AND RELATED MODIFICATIONS TO THE CONTRACT DOCUMENTS SHALL BE SOLELY BY THE ARCHITECT EITHER BY ISSUANCE OF A CONSTRUCTION CHANGE DIRECTIVE OR ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS.
6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR(S) TO VERIFY ALL FIELD CONDITIONS PRIOR TO SUBMITTING PROJECT BIDS, ORDERING MATERIALS, GENERATING SHOP DRAWINGS AND SUBMITTALS, AND START OF WORK. THE ARCHITECT SHALL NOT BE HELD LIABLE FOR UN-VERIFIED FIELD CONDITIONS.
7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES, DIFFERENCES, OR ABNORMALITIES WITH THE FIELD CONDITIONS AGAINST THOSE AS DOCUMENTED IN THE CONSTRUCTION DOCUMENTS IN A TIMELY FASHION. THE CONTRACTOR SHALL BE HELD LIABLE FOR FAILURE TO REPORT ITEMS TO THE ARCHITECT AND RESPONSIBLE FOR CONSTRUCTION COSTS AND APPLICABLE FEES TO REMEDY CONFLICTS.
8. NO SUBSTITUTIONS, CHANGES, OR OMISSIONS TO THE CONTRACT DOCUMENTS ARE PERMITTED. CONTRACTOR MAY REQUEST SUBSTITUTIONS, CHANGES, AND/OR OMISSIONS IN WRITING TO THE ARCHITECT, ALLOW MIN 2 WEEKS FOR REVIEW/APPROVAL.
9. CLARIFICATIONS TO THE DOCUMENTS SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT FOR REVIEW AND RESPONSE.
10. THE CONTRACTOR IS RESPONSIBLE FOR THE REVIEW AND COORDINATION OF WORK AS ENTAILED WITHIN THE CONTRACT DOCUMENTS, INCLUDING THOSE OF THE ARCHITECT'S CONSULTANTS. COORDINATION OF RELATED TRADE WORK SHALL INCLUDE BUT NOT BE LIMITED TO: SEQUENCING, PHASING, FIELD COORDINATION, CUTS AND OPENINGS, INSPECTIONS, AND APPROVALS.
11. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL QUANTITIES PRIOR TO ORDERING MATERIALS. THE ARCHITECT SHALL NOT BE HELD LIABLE FOR QUANTITIES AS NOTED ON CONTRACT DOCUMENTS.

SHOP DRAWING / PRODUCT SUBMITTAL REQUIREMENTS

<u>SHOP DRAWING / PRODUCT SUBMITTAL REQUIREMENTS:</u>

1. ALLOW 2 WEEKS FOR SPECIFIED PRODUCT SUBMITTAL REVIEWS AND COMMENT.
   - 1.1. ALLOW AN ADDITIONAL 1 WEEK FOR REVIEW OF PRODUCT SUBSTITUTIONS TO ACCOMMODATE ANY THIRD PARTY REVIEW.
2. A PRODUCT SUBMITTAL FOR A DIFFERENT MANUFACTURER AND / OR IDENTIFICATION NUMBER THAN AS SPECIFIED WITHIN THE DOCUMENTS (THAT HAVE NOT BEEN PREVIOUSLY APPROVED, IN WRITING, BY THE ARCHITECT OF RECORD) SHALL BE CONSIDERED A PRODUCT SUBSTITUTION BY MAKING A REQUEST FOR SUBSTITUTION, THE CONTRACTOR:
   - 2.1. REPRESENTS THAT HE HAS PERSONALLY INVESTIGATED THE PROPOSED SUBSTITUTED PRODUCT AND HAS DETERMINED IT IS EQUAL OR SUPERIOR IN ALL RESPECTS TO THE SPECIFIED PRODUCT.
   - 2.2. CERTIFIES THAT THE COST DATA PRESENTED IS COMPLETE AND INCLUDES ALL RELATED COSTS UNDER THE CONTRACT.
   - 2.3. WAIVES ALL CLAIMS FOR ADDITIONAL COSTS OR SCHEDULE IMPACT RELATED TO THE SUBSTITUTION WHICH SUBSEQUENTLY BECOMES APPARENT.
   - 2.4. WILL COORDINATE THE INSTALLATION OF THE SUBSTITUTE, MAKING SURE CHANGES THAT MAY BE REQUIRED FOR THE WORK ARE COMPLETE IN ALL RESPECTS.
   - 2.5. REPRESENTS AND CERTIFIES THAT THE PROPOSED SUBSTITUTE COMPLIES WITH ALL APPLICABLE REGULATORY REQUIREMENTS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SECURING REGULATORY APPROVALS FOR SUBSTITUTIONS.
3. CONTRACTOR SHALL SUBMIT COMPARATIVE INFORMATION FOR ALL PRODUCT SUBSTITUTIONS INCLUDING:
   - 3.1. REASON FOR SUBSTITUTION (IE AVAILABILITY, COST SAVINGS, DELIVERY LEAD TIME, ETC.)
   - 3.2. COMPLETE TECHNICAL DATA OF ALL CHARACTERISTICS OF THE ORIGINALLY SPECIFIED ITEM, INCLUDING DRAWINGS, REFERENCE STANDARDS, PERFORMANCE SPECIFICATION, COST DATA, SAMPLES, AND TEST REPORTS OF THE PRODUCT PROPOSED FOR SUBSTITUTION. SUBMIT ADDITIONAL INFORMATION IF REQUESTED BY THE ARCHITECT / ENGINEER. ANNOTATE THE SPECIFIC SALIENT CHARACTERISTICS WHICH ARE BEING COMPARED TO THOSE OF THE ORIGINALLY SPECIFIED ITEM. THE MERE SUBMISSION OF CATALOG CUTS AND/OR OTHER DATA WITHOUT THE ANNOTATION IS NOT ACCEPTABLE. SEE THE FOLLOWING PARAGRAPH WHICH REQUIRES LINE BY LINE COMPARISON.
   - 3.3. DATA SIMILAR TO THAT SPECIFIED FOR THE ITEM FOR WHICH THE SUBSTITUTION IS PROPOSED. INCLUDE A LINE-BY-LINE COMPARISON OF CHARACTERISTICS BETWEEN SPECIFIED ITEM AND PROPOSED SUBSTITUTE DOCUMENTING EQUAL STATUS. HIGHLIGHT BY UNDERLINING OR OTHER MEANS, CHARACTERISTICS THAT ARE DIFFERENT FROM THOSE OF THE SPECIFIED ITEM. EQUIVALENCY WILL BE BASED ON SALIENT CHARACTERISTICS AS DETERMINED BY THE ARCHITECT / ENGINEER.
   - 3.4. EFFECT ON THE PROGRESS SCHEDULE.
   - 3.5. COMPLETE BREAKDOWN OF COSTS INDICATING THE COST AMOUNT TO BE EQUAL TO OR DEDUCTED FROM THE CONTRACT SUM IF THE PROPOSED SUBSTITUTION IS ACCEPTED.
   - 3.6. CERTIFICATION BY THE CONTRACTOR THAT THE PROPOSED SUBSTITUTION IS IN COMPLIANCE WITH THE CONTRACT DOCUMENTS AND APPLICABLE REGULATORY REQUIREMENTS.
   - 3.7. LIST OF OTHER WORK, IF ANY, WHICH MAY BE AFFECTED BY THE SUBSTITUTION.
   - 3.8. AVAILABILITY OF MAINTENANCE SERVICE AND SOURCE OF REPLACEMENT MATERIALS.
   - 3.9. SAMPLES, IF REQUESTED, OF BOTH THE ORIGINALLY SPECIFIED PRODUCT AND THE PROPOSED SUBSTITUTE PRODUCT.
   - 3.10. SAMPLE OF STANDARD FORM OF GUARANTEE OR WARRANTY OFFERED BY THE MANUFACTURER FOR THE SUBSTITUTE PRODUCT PROPOSED.
4. PHYSICAL SUBMITTALS (IE. PRINTED SHOP DRAWINGS, PRODUCT SAMPLES, ETC) SHALL INCLUDE AT LEAST ONE COPY / SAMPLE FOR ARCHITECT'S RECORD + ONE COPY / SAMPLE FOR CONSULTING ENGINEER'S RECORD (WHEN APPLICABLE) + ONE COPY / SAMPLE FOR CLIENT'S RECORD (VERIFY WITH GC PRIOR TO SUBMITTAL).
5. BASIS-OF-DESIGN PRODUCT SPECIFICATION: WHERE A SPECIFIC MANUFACTURER'S PRODUCT IS NAMED AND ACCOMPANIED BY THE WORDS "BASIS OF DESIGN," INCLUDING MAKE OR MODEL NUMBER OR OTHER DESIGNATION, TO ESTABLISH THE SIGNIFICANT QUALITIES RELATED TO TYPE, FUNCTION, DIMENSION, IN-SERVICE PERFORMANCE, PHYSICAL PROPERTIES, APPEARANCE, AND OTHER CHARACTERISTICS FOR PURPOSES OF EVALUATING COMPARABLE PRODUCTS OF OTHER NAMED MANUFACTURERS.

LOCATION MAP

DANIEL J. BARNEY
NUMBER A-2013009683
DANIEL J. BARNEY
LICENSE #A-2013009683
EXPIRATION DATE: 12/31/2025

SEAL

FOUNDATION
ARCHITECTURE, LLC
740 MARKS ROAD - SUITE A, VALLEY CITY, OHIO 44208

PROJECT:

TENANT IMPROVEMENTS FOR:
SONNY'S
2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

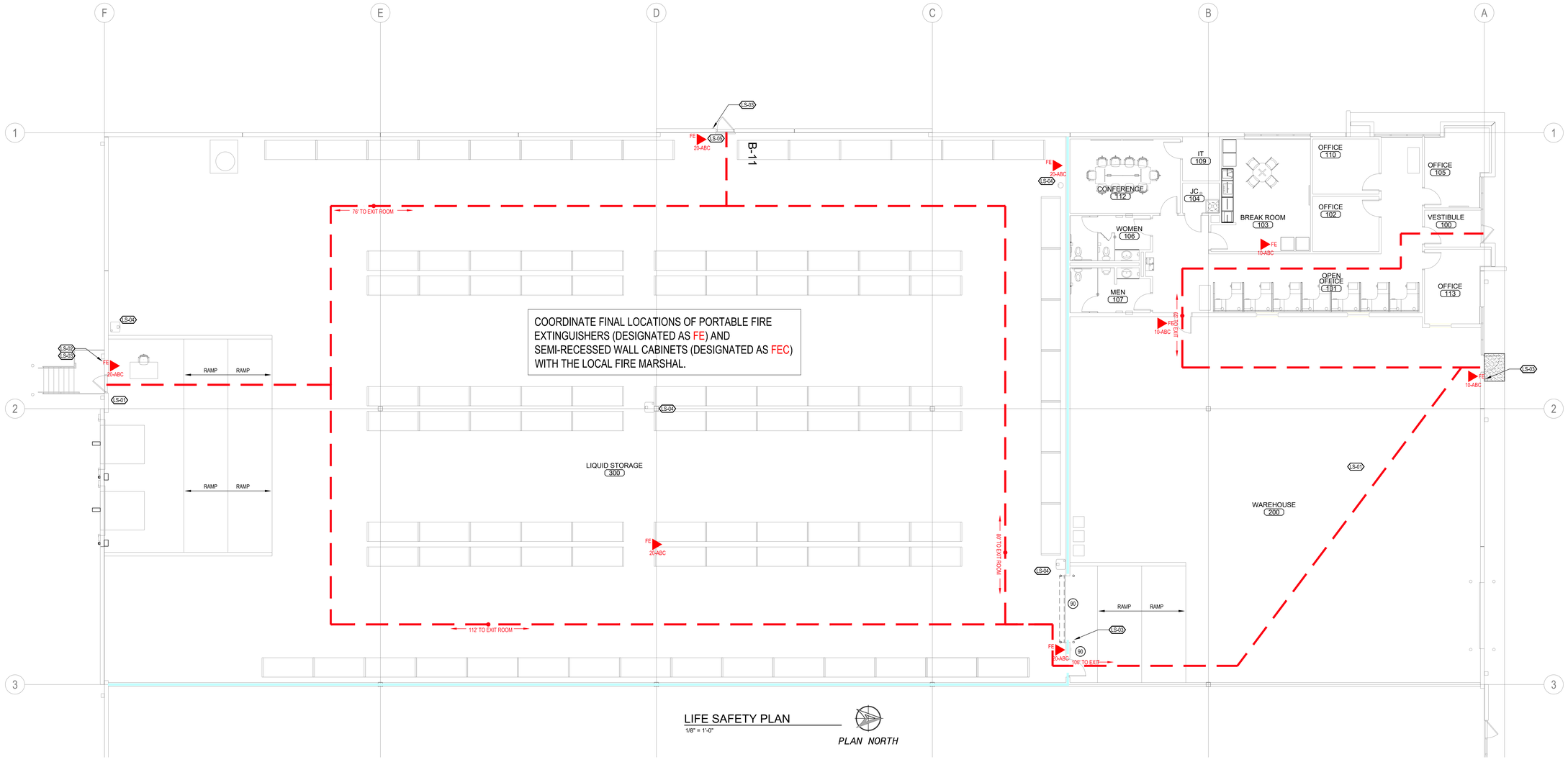
MARK:	ISSUE:	DATE:
	ISSUED	8/15/25

PROJECT #: 016-0402

DRAWN BY: RP
CHECKED BY: DB

DRAWING TITLE:
TITLE SHEET

SHEET #:
G0.01



LIFE SAFETY PLAN

1/8" = 1'-0"

PLAN NORTH

LIFE SAFETY PLAN GENERAL NOTES	LIFE SAFETY PLAN SYMBOL LEGEND		LIFE SAFETY PLAN KEY NOTES
1. PROVIDE PORTABLE FIRE EXTINGUISHERS PER LOCAL BUILDING CODES AND NFPA 10 STANDARDS. MAXIMUM TRAVEL DISTANCE TO FIRE EXTINGUISHER NOT TO EXCEED 75'. 50' IN LIQUID STORAGE ROOM.		2 HOUR FIRE-RATED WALL ASSEMBLY COORDINATE CONDITIONS WITH FLOOR PLAN AND WALL TYPES SHEETS	LS-01 EXISTING EXIT SIGNS TO REMAIN. EXISTING WAREHOUSE / MANUFACTURING AREA PATH OF TRAVEL LESS THAN 250' MAINTAINED THROUGHOUT. NEW WORK SHALL NOT AFFECT EXISTING TRAVEL DISTANCES.
2. COORDINATE FINAL LOCATIONS OF PORTABLE FIRE EXTINGUISHERS (DESIGNATED AS FE) AND SEMI-RECESSED WALL CABINETS (DESIGNATED AS FEC) WITH THE LOCAL FIRE MARSHAL.		EXISTING SWING DOOR AND FRAME TO REMAIN	LS-02 KNOX BOX
3. PORTABLE FIRE EXTINGUISHERS SHALL BE 10 LB. CLASS ABC.		NEW SWING DOOR AND FRAME	LS-03 NFPA 704 PLACARD TO BE PLACED AT DOOR
3a. PORTABLE FIRE EXTINGUISHERS SHALL IN LIQUID STORAGE ROOM TO BE BE 20 LB. CLASS ABC.	20	FIRE RATING FOR DOOR AND FRAME IN MINUTES	LS-04 EMERGENCY EYE WASH
4. FIRE EXTINGUISHER CABINETS SHALL COMPLY WITH APPLICABLE LOCAL, STATE AND ACCESSIBILITY CODES.	≤ 100'	PATH OF EGRESS WITH TRAVEL DISTANCE FROM FURTHEST POINT	LS-05 PROVIDE AND INSTALL NEW PIG, BUILD-A-BERM, SELF-RISING DRIVE-OVER BARRIER
5. FIRE EXTINGUISHER CABINETS SHALL BE FIRE RATED WHEN INSTALLED IN FIRE RATED WALLS (TYP.).	FE 10-ABC 20-ABC	PORTABLE FIRE EXTINGUISHER (WITH WALL MOUNTING BRACKET, UNLESS NOTED OTHERWISE). COORDINATE WITH LIFE SAFETY GENERAL NOTES / THIS SHEET	
6. FIRE EXTINGUISHER MOUNTING HEIGHTS SHALL COMPLY WITH ANSI A117.1 REQUIREMENTS.			

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STATE OF MISSOURI

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LEE'S SUMMIT, MISSOURI 64064

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DRAWN BY: RP CHECKED BY: DB

DRAWING TITLE:

LIFE SAFETY PLAN

SHEET #:

G0.02

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

PLAN NORTH

DEMOLITION KEY NOTES

DP-01 REMOVE EXIT DEVICE, SEE DOOR HARDWARE FOR REPLACEMENT

DP-02 SAWCUT FLOOR FOR NEW CONTAINMENT BUMP. COORDINATE DIMENSIONS WITH NEW WORK.

DP-03 REMOVE PORTION OF EXISTING STOREFRONT WINDOW SYSTEM TO INSTALL NEW EXIT DOOR.

DEMOLITION PLAN LEGEND

	EXISTING WALL TO REMAIN
	EXISTING WALL TO BE REMOVED
	EXISTING SWING DOOR AND FRAME TO REMAIN
	EXISTING SWING DOOR AND FRAME TO BE REMOVED
	SAWCUT AND REMOVE FLOOR SLAB
	REMOVE EXISTING CEILING

GENERAL DEMOLITION NOTES:

1. FIELD VERIFY EXISTING CONDITIONS/DIMENSIONS PRIOR TO START OF WORK.
2. PROVIDE DEMOLITION AS INDICATED ON DRAWINGS AND AS REQUIRED TO COMPLETE THE WORK SHOWN.
3. DEMOLITION DIMENSIONS ARE TO BE FIELD VERIFIED AND COORDINATED WITH FLOOR PLAN INFORMATION.
4. PROVIDE CUTTING AND PATCHING OF EXISTING WALLS, FLOORS AND CEILINGS AS REQUIRED TO ACCOMMODATE NEW LAYOUT. PATCH TO MATCH EXISTING ADJACENT WALLS, FLOORS AND CEILINGS FOR SMOOTH EVEN APPEARANCE, UNLESS OTHERWISE NOTED.
5. PROVIDE SHORING/BRACING AS REQUIRED AT AREAS OF DEMOLITION. STRUCTURE SHALL BE SELF-SUPPORTING AFTER DEMOLITION IS COMPLETE.
6. COORDINATE EXTENT AND DISPOSITION OF ALL /SALVAGEABLE ITEMS WITH OWNER.
7. COORDINATE ASPECTS OF DEMOLITION PLAN WITH NEW FLOOR, EQUIPMENT AND REFLECTED CEILING PLANS, AS WELL AS MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS.
8. REQUIRED MEANS OF EGRESS SHALL BE MAINTAINED DURING CONSTRUCTION AND RENOVATION TO THE BUILDING.
9. EXISTING FIRE DEPARTMENT VEHICLE ACCESS SHALL BE MAINTAINED DURING CONSTRUCTION.
10. FIRE RATED ASSEMBLIES DISRUPTED DURING CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL RATING OR BETTER.
11. ANY NEW PENETRATIONS TO A FIRE RATED ASSEMBLY SHALL BE CONSTRUCTED ACCORING TO AN UL ASSEMBLY MATCHING THE RATING OF THE ASSEMBLY BEING PENETRATED.

STATE OF MISSOURI
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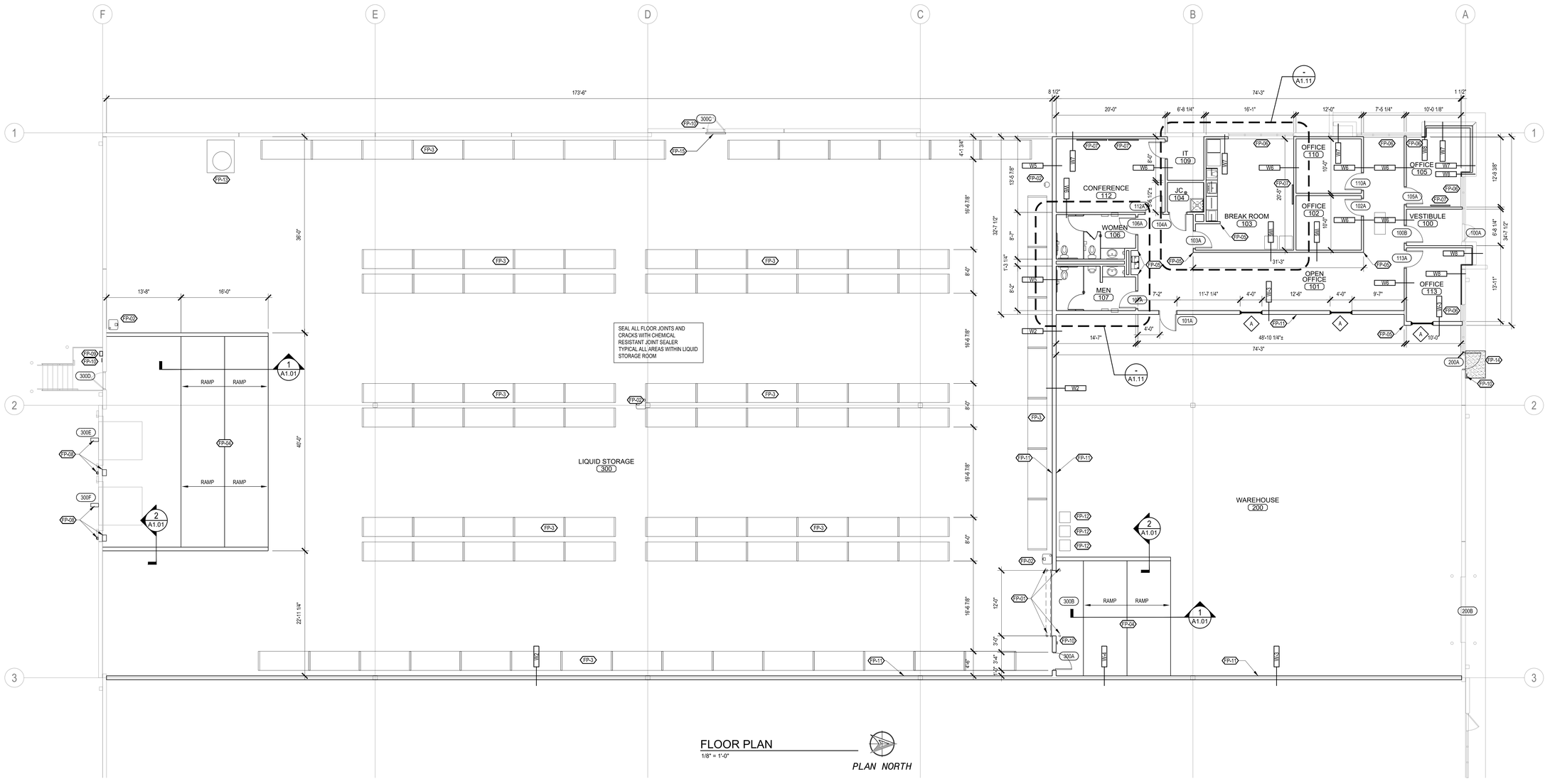
DRAWN BY: RP CHECKED BY: DB

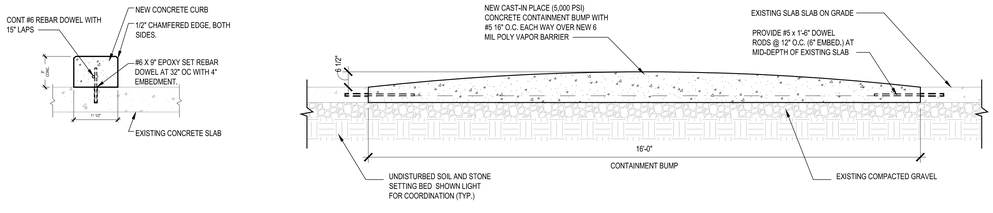
DRAWING TITLE:
OVERALL
DEMOLITION PLAN

SHEET #:
A0.01



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

PLAN NORTH



2 TYPICAL CONCRETE CURB
3/4" = 1'-0"

1 TYPICAL CONCRETE BUMP DETAIL FORK - TRUCKS
3/4" = 1'-0"

FLOOR PLAN KEY NOTES

- FP-01 4" DIA CONCRETE FILLED GUARD POST
- FP-02 NEW EMERGENCY EYE WASH STATION; REFER TO PLUMBING DRAWINGS
- FP-3 NEW STORAGE RACKING SYSTEM TO BE PROVIDED AND INSTALLED BY RACKING SUPPLIER; LAYOUT SHOWN FOR COORDINATION ONLY
- FP-04 NEW CAST-IN PLACE CONCRETE CONTAINMENT BUMP
- FP-05 4'-0" CORNER GUARD PROTECTION, MATCH WALL COLOR
- FP-06 PROVIDE SOLID SURFACE WINDOW SILL
- FP-07 TV BY OWNER
- FP-08 INSTALL NEW TRAILER RESTRAINT, SIGNAL LIGHT & CONTROL PANEL SIMILAR OR EQUAL TO STAR 4 VEHICLE RESTRAINT MFR'D BY KELLY.
- FP-09 INSTALL KNOX BOX
- FP-10 INSTALL NFPA 704 PLACARD TO BE PLACED AT DOOR
- FP-11 PAINT 2 ON WALLS
- FP-12 CHARGERS, SEE ELECTRICAL
- FP-13 SCALE/WRAPPER BY OWNER
- FP-14 NEW 4" REINFORCED CONCRETE WALK, EXTEND TO PAVEMENT
- FP-15 PROVIDE AND INSTALL NEW PIG, BUILD-A-BERM, SELF-RISING DRIVE-OVER BARRIER

FLOOR PLAN LEGEND

	USE FOR LARGE AREA INDICATIONS (IE, NEW CONCRETE SLAB)
	EXISTING WALL TO REMAIN
	NEW WALL - COORDINATE WITH WALL SECTIONS OR WALL TYPES
	EXISTING SWING DOOR AND FRAME TO REMAIN
	NEW SWING DOOR AND FRAME
101A	DOOR TAG: COORDINATE WITH DOOR SCHEDULE

FLOOR PLAN GENERAL NOTES

1. FIELD VERIFY EXISTING CONDITIONS/DIMENSIONS PRIOR TO START OF WORK.
2. REQUIRED MEANS OF EGRESS SHALL BE MAINTAINED DURING CONSTRUCTION AND RENOVATION TO THE BUILDING.
3. EXISTING FIRE DEPARTMENT VEHICLE ACCESS SHALL BE IDENTIFIED AND MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
4. REFER TO CIVIL DRAWINGS FOR SITE IMPROVEMENTS INCLUDING BUT NOT LIMITED TO: SIGNAGE, SIDEWALKS, CURBS, SITE SIGNAGE, IRRIGATION AND STORM WATER MANAGEMENT.
5. ALL DOOR OPENINGS ARE TO BE LOCATED 6" FROM INTERIOR CORNER OF WALL UNLESS NOTED OTHERWISE.
6. VERIFY ALL ROUGH OPENINGS FOR NEW DOORS AND WINDOWS WITH MANUFACTURER'S REQUIREMENTS.
7. COORDINATE LOCATIONS OF FIRE EXTINGUISHERS AND SEMI-RECESSED WALL CABINETSWITH LIFE SAFETY PLAN ON SHEET G0.02.
8. COORDINATE ALL FLOOR DRAIN LOCATIONS WITH THE PROJECT PLUMBING DRAWINGS.

STATE OF MISSOURI
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SONNY'S

2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

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DRAWN BY: RP | CHECKED BY: DB

DRAWING TITLE:
FLOOR PLAN

SHEET #:
A1.01

TOILET ROOM ACCESSORIES

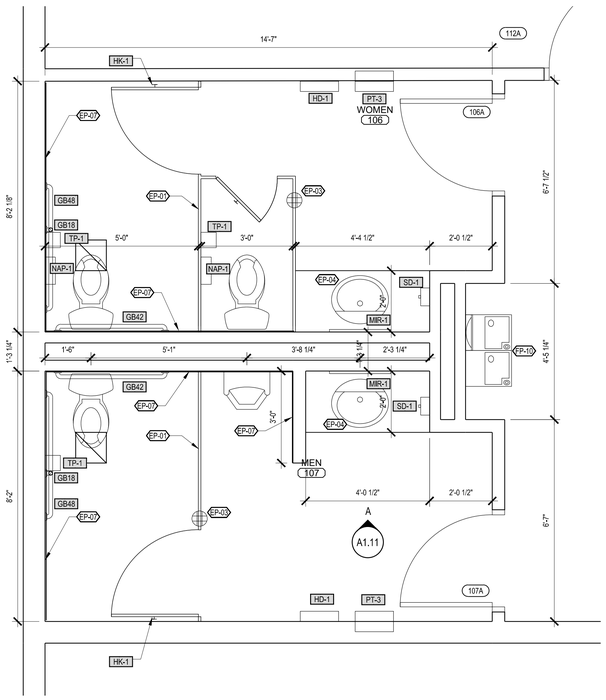
GB18	18" VERTICAL LONG X 1-1/2" DIA. GRAB BAR WITH PEENED SURFACE -BOBRICK: B-6806X18
GB42	42" LONG X 1-1/2" DIA. GRAB BAR WITH PEENED SURFACE -BOBRICK: B-6806X42
GB48	48" LONG X 1-1/2" DIA. GRAB BAR WITH PEENED SURFACE -BOBRICK: B-6806X48
HD-1	SURFACE MOUNTED HAND DRYER -XCELERATOR MODEL XL-SB
HK-1	CLOTHES HOOK WITH BUMPER -BOBRICK: B-212
MIR-1	24" WIDE X 36" HIGH STAINLESS STEEL FRAMED MIRROR. -BOBRICK: B-165-2436
MOP-1	MOP & BROOM HOLDER (24" LONG W/4 HOLDERS) -BOBRICK: B-223X24
NAP-1	SURFACE MOUNTED FEMININE NAPKIN DISPOSAL -BOBRICK: B-270
PT-3	RECESSED PAPER TOWEL DISPENSER/WASTE RECEPTACLE -BOBRICK: B-3944
SD-1	WALL MOUNTED SOAP DISPENSER -BOBRICK: B-4112
TP-1	SURFACE MOUNTED DUAL ROLL TOILET TISSUE DISPENSER -BOBRICK: B-3588

ACCESSORY NOTES

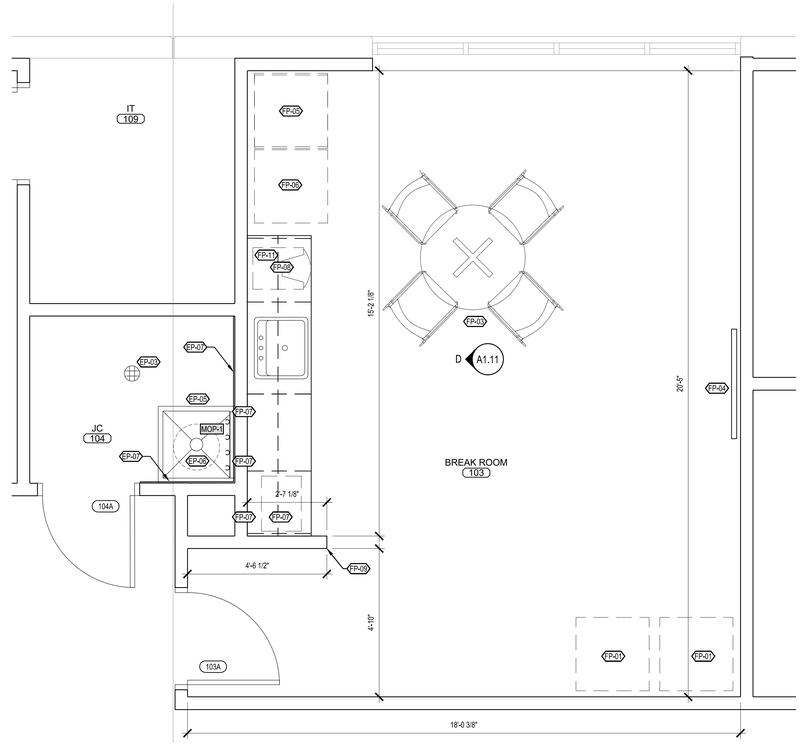
1. CONTRACTOR TO PROVIDE AND INSTALL FIRE-RETARDANT TREATED WOOD BLOCKING IN WALLS FOR THE ATTACHMENT OF ACCESSORIES AS REQUIRED.
2. ALL ACCESSORIES SHALL BE MOUNTED PER THE MANUFACTURER'S RECOMMENDATIONS AND PER ADA REQUIREMENTS.

FLOOR PLAN KEY NOTES

FP-01	VENDING MACHINES BY OWNER
FP-02	TRASH RECEPTICAL BY OWNER
FP-03	FURNITURE BY OWNER
FP-04	TV BY OWNER
FP-05	ICE BY OWNER
FP-06	REFRIGERATOR BY OWNER
FP-07	MICROWAVE BY OWNER
FP-08	COFFEE BY OWNER
FP-09	CORNER GUARD PROTECTION, MATCH WALL COLOR.
FP-10	HI/LO ELECTRIC WATER COOLER WITH BOTTLE FILLER
FP-11	UNDER CABINET REFRIGERATOR BY OWNER
FP-12	INSTALL 4' FRP PANEL
EP-01	1" THICK, FLOOR MOUNTED, WALL BRACED, BAKED ENAMEL TOILET PARTITION WITH COAT HOOK AND RUBBER STOP ON STALL SIDE OF DOOR
EP-03	FLOOR DRAIN, COORD WITH PLUMB DWGS.
EP-04	SOLID SURFACE COUNTER TYPE LAVATORY - SEE ELEVATION/SECTIONS A, B, AND C/THIS SHEET
EP-05	MOP SINK - COORD. WITH PLUMB. DWGS.
EP-06	WATER HEATER - COORD. WITH PLUMB. DWGS.
EP-07	4'-0" HIGH F.R.P. PANELING (WHERE INDICATED)

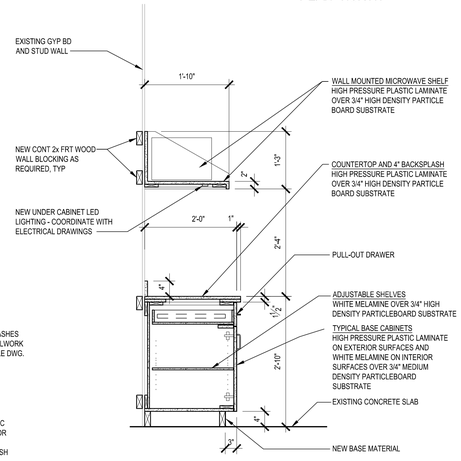


ENLARGED TOILET ROOM PLAN
1/2" = 1'-0"

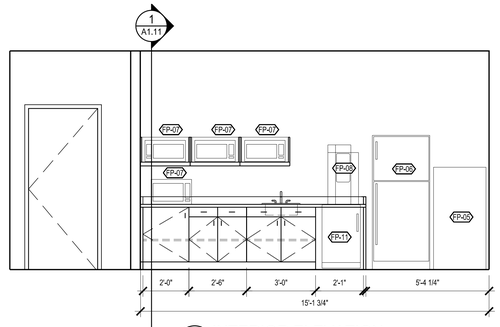


ENLARGED BREAK ROOM PLAN
1/2" = 1'-0"

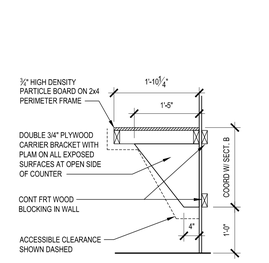
PLAN NORTH



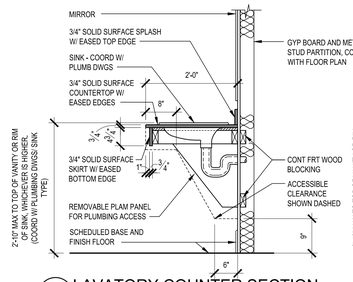
1 BASE CABINET SECTION
3/4" = 1'-0"



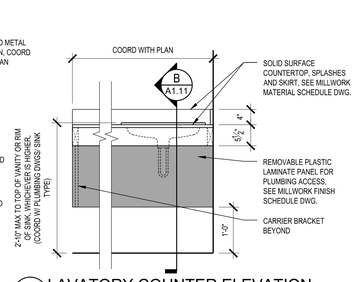
D INTERIOR ELEVATION
3/8" = 1'-0"
BREAK ROOM 103



C COUNTER SUPPORT DETAIL
3/4" = 1'-0"

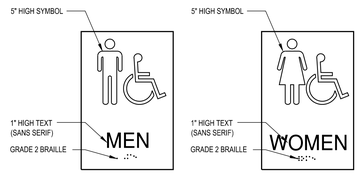


B LAVATORY COUNTER SECTION
3/4" = 1'-0"



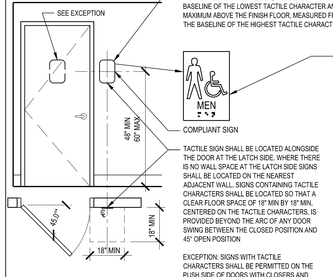
A LAVATORY COUNTER ELEVATION
3/4" = 1'-0"

TYPICAL TOILET ROOM ELEVATIONS AND PLAN DETAILS

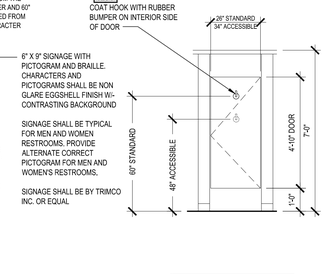


TOILET ROOM SIGNAGE

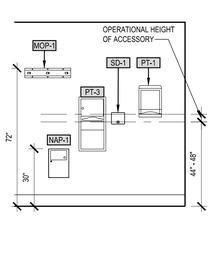
TYPICAL TOILET ROOM ELEVATIONS AND PLAN DETAILS



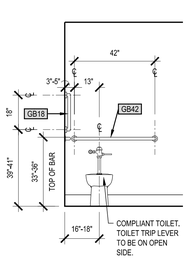
SIGNAGE CORRIDOR SIDE



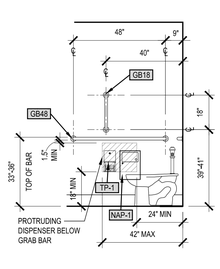
FLOOR MOUNTED, OVERHEAD BRACED TOILET PARTITION (FRONT)



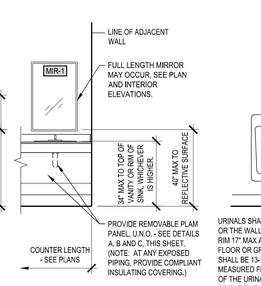
MISCELLANEOUS TOILET ROOM ACCESSORIES



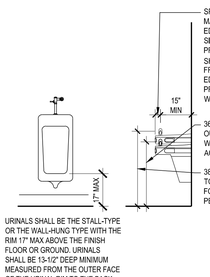
TOILET (FRONT)



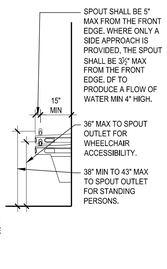
TOILET (SIDE)



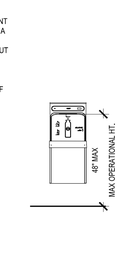
LAVATORY WITH COUNTER, AND MIRROR



URINAL (FRONT)



DRINKING FOUNTAIN



BOTTLE FILLING STATION

FLOOR PLAN LEGEND

	EXISTING WALL TO REMAIN
	NEW WALL - COORDINATE WITH WALL SECTIONS OR WALL TYPES
	EXISTING SWING DOOR AND FRAME TO REMAIN
	NEW SWING DOOR AND FRAME
101A	DOOR TAG: COORDINATE WITH DOOR SCHEDULE
A	WINDOW TAG: COORDINATE WITH WINDOW TYPES ON SHEET A6.01

STATE OF MISSOURI
DANIEL J. BARNEY
NUMBER A-2013009683
ARCHITECT
DANIEL J. BARNEY
LICENSE #A-2013009683
EXPIRATION DATE: 12/31/2025
SEAL

FOUNDATION
ARCHITECTURE, LLC
740 MARKS ROAD - SUITE A, VALLEY CITY, OHIO 44208

PROJECT:

TENANT IMPROVEMENTS FOR:

SONNY'S

2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
	ISSUED	8/15/25

PROJECT #: 016-0402

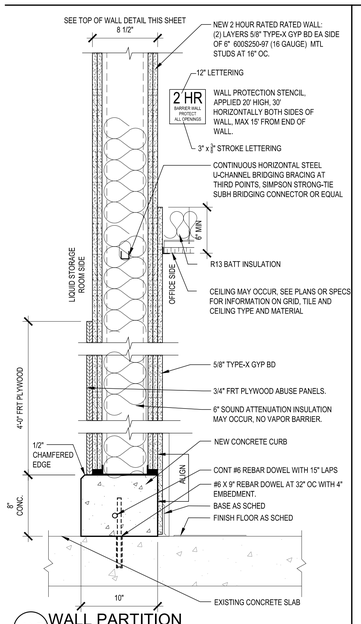
DRAWN BY: RP | CHECKED BY: DB

DRAWING TITLE:

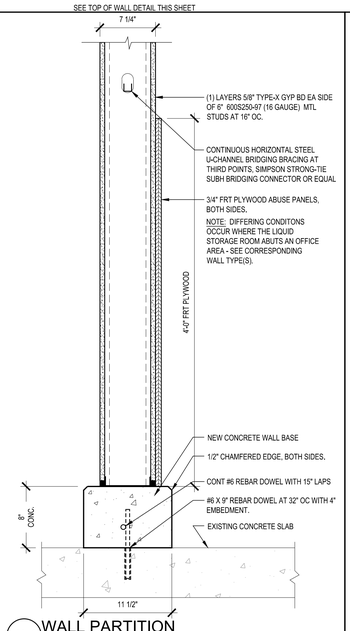
ENLARGED PLANS

SHEET #:

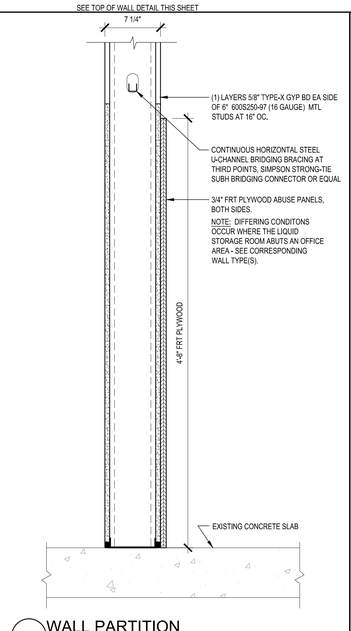
A1.11



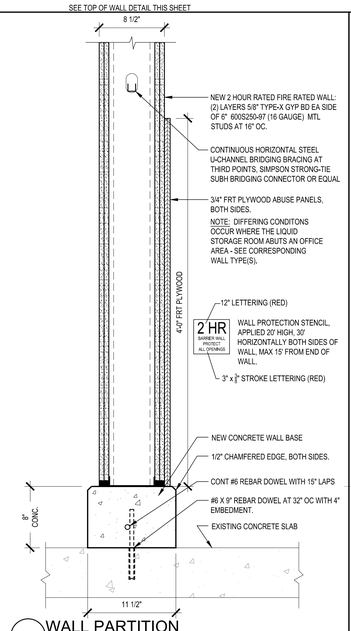
W-5 WALL PARTITION
1-1/2" = 1'-0" 2 HR NON-BEARING UL DES. NO. U419



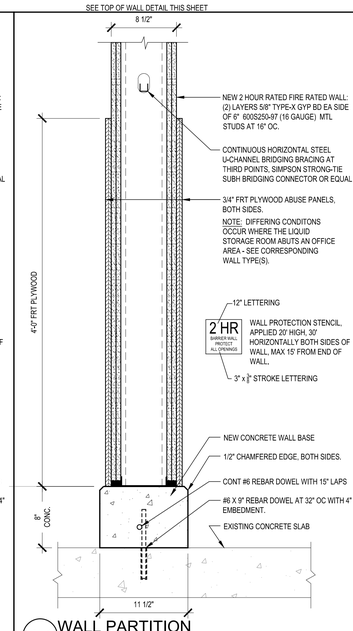
W-4 WALL PARTITION
1-1/2" = 1'-0" NON-RATED



W-3 WALL PARTITION
1-1/2" = 1'-0" NON-RATED

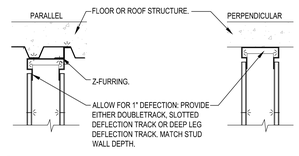


W-2 WALL PARTITION
1-1/2" = 1'-0" 2 HR NON-BEARING UL DES. NO. U419

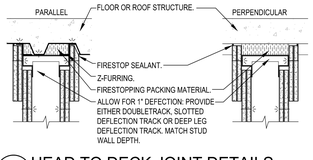


W-1 WALL PARTITION
1-1/2" = 1'-0" 2 HR NON-BEARING UL DES. NO. U419

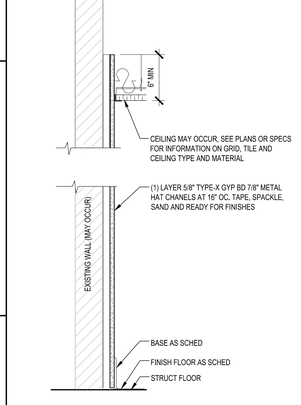
2 TYP GYP CONTROL JOINT DETAILS
1-1/2" = 1'-0"



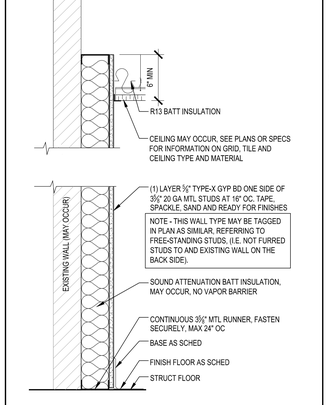
WT-2 HEAD TO DECK JOINT DETAILS
1-1/2"=1'-0" UNRATED



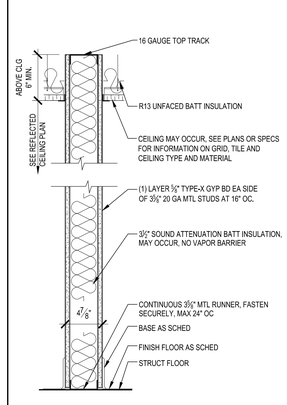
WT-1 HEAD TO DECK JOINT DETAILS
1-1/2"=1'-0" 2 HR REQUIRED UL HW-D-0060



W-8 WALL PARTITION
1-1/2" = 1'-0"



W-7 WALL PARTITION
1-1/2" = 1'-0"



W-6 WALL PARTITION
1-1/2" = 1'-0"

WALL TYPE GENERAL NOTES

1. BRACE ALL INTERIOR PARTITIONS ABOVE CEILING TO STRUCTURE ABOVE AS REQUIRED TO PREVENT WALLS FROM FLEXING.
2. ALL FULL HEIGHT METAL STUD FRAMING SHALL BE BRACED TO THE ROOF STRUCTURE AND SHALL NOT BE FASTENED IN ANY WAY TO THE ROOF PANELS OR DECK.
3. FRAMING CONTRACTORS SHALL PROVIDE SOLID BLOCKING CONCEALED IN WALLS AND ROUGH OPENINGS, AS REQUIRED, FOR MILLWORK SUPPORT, GRAB BARS, CLOSET SHELVING/RODS, TOILET ACCESSORIES, ETC.
4. CAULK PERIMETER OF ALL SOUND INSULATED WALLS WITH AN ACOUSTICAL SEALANT.
5. SEE FLOOR PLAN WALL TAG AND WALL COMPONENT NOTES FOR ADDITIONAL INFORMATION.

FOLLOW NORTH AMERICAN SPECIFICATION STANDARDS:
(1) RUNNER TRACK GA TO MATCH STUD.
(2) WALLS OVER 12'-0" HIGH TO BE LATERALLY BRACED, VERTICAL WITH 1½" 16 GA COLD-ROLLED CHANNELS CLIP ANCHORED TO METAL STUDS OR 9200 SPAZZER.
(3) DIFFERENT LEG WIDTHS MAY BE SUBSTITUTED TO REACH HIGHER HEIGHT LIMITS. GC TO SUBMIT SPECIFICATIONS FOR APPROVAL.
(A) BASED ON CLARKDIETRICH - PROSTUD SERIES INTERIOR NON-BEARING PARTITIONS WITH ONE LAYER OF GYP BD EACH SIDE (HT VARIES); USE GA AND TYPE AS SCHEDULED ABOVE, UNO ON DWGS, (L/240, 5-PSF).
(B) FLANGE SIZE = 1½"
(C) FLANGE SIZE = 1½"
(D) WEB STIFFENERS REQUIRED AT ENDS PER MANUFACTURER'S RECOMMENDATIONS.
(E) ADJUST PER MANUFACTURER'S SPECIFIC OR EQUIVALENT PRODUCT.
(F) STEEL STUD MANUFACTURER ASSOCIATION.

WALL COMPONENT NOTES

WXXXΔ — WALL TYPE TAG; ADDITIONAL WALL COMPONENT - SEE BELOW.

COMPONENT LETTER	COMPONENT NOTE/DESCRIPTION
A	INSULATION OCCURS FROM FLOOR SLAB TO MIN 6" ABOVE FINISHED CEILING.
B	INSULATION OCCURS FROM FLOOR SLAB TO DECK ABOVE.
C	MOLD/MOISTURE RESISTANT GYP BD ON WET WALL SIDE.

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TENANT IMPROVEMENTS FOR: SONNY'S

2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
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PROJECT #: 016-0402
DRAWN BY: RP | CHECKED BY: DB

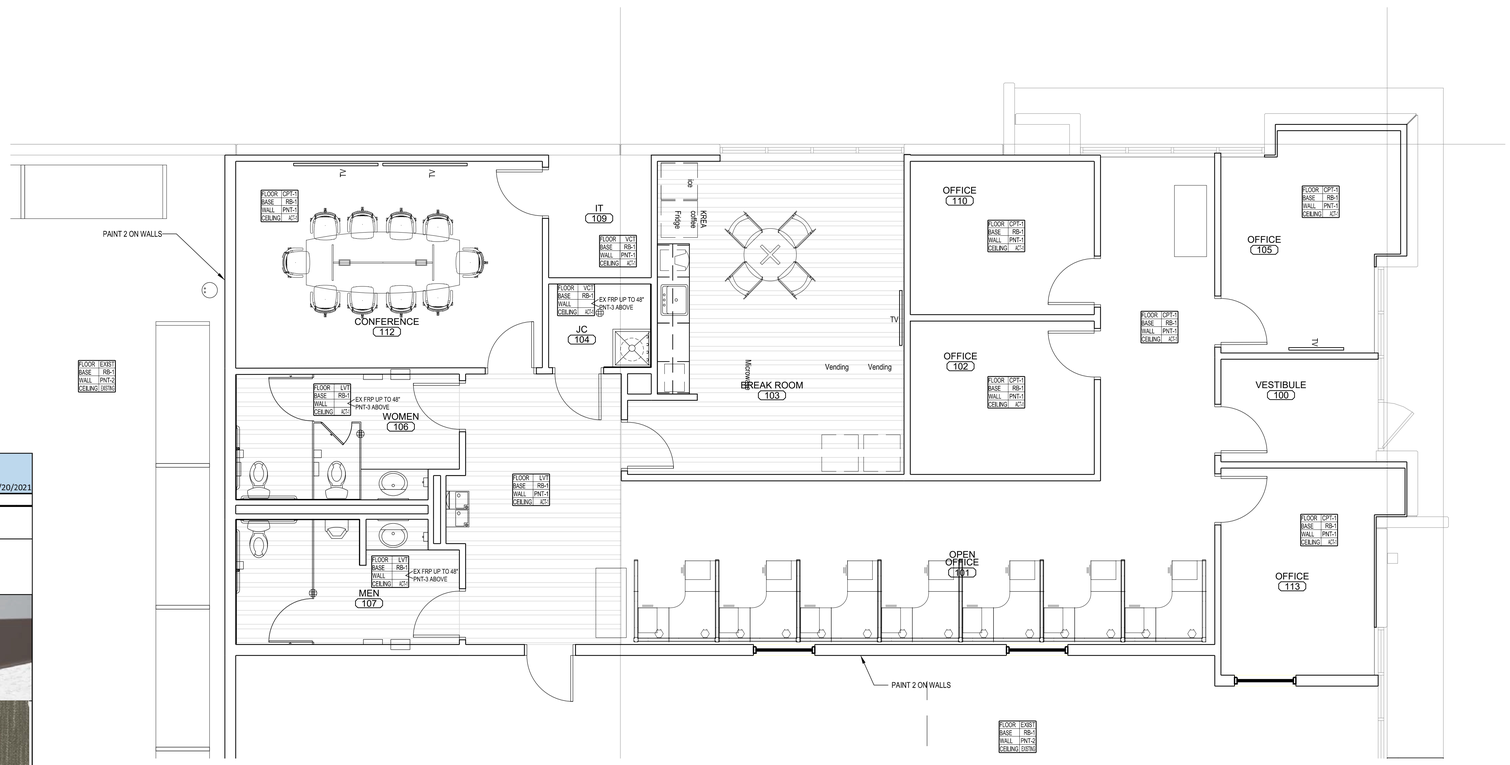
DRAWING TITLE:
WALL TYPES AND DETAILS

SHEET #:
A1.21

Sonny's Finish Schedule

9/20/2021

Description	TAG	Specification	Color	Sample
Sealed Concrete	SC-1	POLYURETHANE SEALER	CLEAR	
LUXURY VINYL PLANK	LVT-1	SHAW CONTRACT / TERRAIN II	000170 WILLOW	ImageenScreenshot 2025-01-27 122059 WILLOW.jpg
4" RUBBER BASE	**RB-1**	JOHNSONITE	283 TOAST	
Door trim paint	**PNT-4**	Sherwin Williams Promar200 Interior	Color match base	
CARPET TILE	**CPT-1**	SHAW CONTRACT, Carpet Tile 5T079	Area 78762	
Solid Core wood doors with PL	**Doors**	Solid core wood door with rotory cut White Berch veneer as manufactured by Marshfield or approved equal		
Cabinets	**Cabinets**	Prefinished cabinetry made with with rotory cut White Berch veneer as manufactured by Marshfield or approved equal. **Match Doors.** *Note for renovations to existing facilities, cabinetry shall be plastic laminate to match existing doors.*	Nutmeg 48-97 White Birch	
Toilet Room Solid Surface Countertop	**SS-1**	Wilsonart Solid Surface	Blustone 9075EA	
BreakRoom Laminate Counters	**PL-1**	Wilsonart Plastic Laminate	Bianco Romano 1872-38	
Entrancy Lobby - CERAMIC tile	**CT-1**	Crossville tile 12x24		
Entrancy Lobby - CERAMIC tile base	**CT-1**	Crossville tile 4" tile base	Color: Physics - Nucleus	
FIBERGLASS REINFORCED PANEL	**FRP-1**	Color to be selected by Architect		
WALL PAINT	**PNT-1**	Sherwin Williams Promar200 Interior	Color Match - DUNN-EDWARDS DE6213 FINE GRAIN	Fine Grain DE6213
CEILING PAINT & WAREHOUSE WALLS	**PNT-2**	Sherwin Williams Promar200 Interior	Flat White	
toilet room wall paint	**PNT-3**	Sherwin Williams Promar200 Interior	Colo9r Match - Durn Edwards Foggy Day DE6227	Foggy Day DE6226
Toilet room wall paint epoxy	PNT-3E	Sherwin Williams HP Pre-Catalyzed Waterborne Epoxy Semi-Gloss	Color Match - Dunn Edwards Foggy Day DE6227	
Vinyl Tile	**VCT-1**	Armstrong - Standard Excelon Imperial Texture	51911 Classic White	
Ceiling tile	**ACT-1**	Armstrong	Dune Second Look 9/16 grid 2722 White	



ROOM FINISH PLAN

1/4" = 1'-0"

NORTH

ROOM FINISH NOTES

1. PREP ALL WALLS TO RECEIVE SCHEDULED FINISH.
2. PREP ALL FLOORS TO RECEIVE SCHEDULED FINISH.
3. INSTALL METAL DIVIDER STRIPS AT ALL TRANSITIONS BETWEEN CERAMIC TILE, RUBBER AND CARPETING SURFACES UNLESS OTHERWISE NOTED.
4. MOVEMENT JOINTS SHALL BE PROVIDED IN ALL PORCELAIN TILE FLOORS. PROVIDE MOVEMENT JOINTS 20' TO 25' IN EACH DIRECTION WHERE PORCELAIN TILE FLOORS ARE EXPOSED TO DIRECT SUNLIGHT.
5. APPLY SELF LEVELING COMPOUND AND/OR TROWEL-ABLE LEVELING COMPOUND AS REQUIRED TO PROVIDE A SMOOTH, LEVEL FLOOR SURFACE TO RECEIVE NEW FLOOR FINISHES.
6. SUBSURFACE TOLERANCES: FOR TILES WITH ALL EDGES SHORTER THAN 15", MAXIMUM ALLOWABLE VARIATION IS 1/4" IN 10' FROM THE REQUIRED PLANE, WITH NO MORE THAN 1/16" VARIATION IN 12" WHEN MEASURED FROM THE HIGH POINTS IN THE SURFACE. FOR TILES WITH AT LEAST ON EDGE 15" IN LENGTH, MAXIMUM ALLOWABLE VARIATION IS 1/8" IN 10' FROM THE REQUIRED PLANE, WITH NO MORE THAN 1/16" VARIATION IN 24" WHEN MEASURED FROM THE HIGH POINTS IN THE SURFACE.
7. TILE FLOOR AND WALL FINISHES SHALL BE INSTALLED PER THE COUNCIL OF NORTH AMERICA, INC. (TCNA) CURRENT STANDARDS.
8. INSTALL CRACK ISOLATION MEMBRANE OVER ALL SAW CUTS IN CONCRETE FLOOR SLABS SCHEDULED TO RECEIVE NEW FLOOR TILE.
9. FINISHES NOT SPECIFIED SHALL BE SELECTED BY TENANT AND APPROVED BY ARCHITECT.
13. ALL MATERIALS AND FINISHES SHALL BE NEW UNLESS OTHERWISE NOTED.
14. PAINTING THROUGHOUT SHALL BE (1) COAT PRIMER, (2) COATS FINISH PAINT.
15. LATEX PAINT ON WALLS AND ALKYD SATIN ON METAL AND WOOD SURFACES.
16. ALL PRE-PRIMED H.M. DOORS AND FRAME SHALL RECEIVE (2) FINISH COATS OF PAINT.
17. INSTALL MOISTURE RESISTANT (MR) GYPSUM BOARD WHERE CERAMIC WALL TILE OCCURS AND ON ALL PLUMBING FIXTURE WALLS.
18. REFER TO OWNER APPROVED COLOR SCHEDULE FOR FINAL COLOR, STYLE AND MANUFACTURER SELECTIONS.
19. ALL GYPSUM BOARD, GLASS MAT AND FIBER REINFORCED GYPSUM PANEL SURFACES SHALL HAVE THE MINIMUM LEVEL OF FINISH (**LEVELS 0** THROUGH **5**) LISTED BELOW PRIOR TO THE APPLICATION OF ANY DECORATIVE FINISH (IE. PAINT, WALLCOVERING, ETC.) UNLESS SPECIFICALLY NOTED OTHERWISE. THE LEVEL OF FINISH SHALL BE IN COMPLIANCE WITH THE GYPSUM ASSOCIATIONS GA-214 "LEVELS OF FINISH FOR GYPSUM PANEL PRODUCTS".

    LEVEL 0 - TEMPORARY CONSTRUCTION OR WHENEVER A FINAL DECORATIVE FINISH HAS NOT BEEN DETERMINED.

    LEVEL 1 - SMOKE BARRIER APPLICATIONS AND PLENUM AREAS ABOVE CEILINGS AND IN NON-VISIBLE LOCATIONS.

    LEVEL 2 - SUBSTRATE FOR TILE AND AREAS (AS SPECIFIED BY ARCHITECT) WHERE SURFACE APPEARANCE IS NOT A CONCERN.

    LEVEL 3 - SUBSTRATE FOR APPLICATION OF CONTINUOUS HEAVY- OR MEDIUM-TEXTURE FINISHES (SPRAY OR HAND APPLIED) BEFORE FINAL PAINTING.

    LEVEL 4 - SUBSTRATE FOR FLAT PAINTS (0 TO 5 GLOSS UNITS AT A 60° ANGLE AND 0 TO 10 GLOSS UNITS AT AN 85° ANGLE), LIGHT TEXTURES AND NON-CONTINUOUS TEXTURES.

    LEVEL 5 - SUBSTRATE FOR NON-FLAT PAINTS (GREATER THAN 5 GLOSS UNITS AT A 60° ANGLE AND GREATER THAN 10 GLOSS UNITS AT AN 85° ANGLE) OR OTHER GLOSSY DECORATIVE FINISHES, DARK/DEEP TONE PAINTS, COMMERCIAL GRADE WALLCOVERINGS AND AT AREAS WITH CRITICAL LIGHTING CONDITIONS.
20. GC TO PROVIDE SHOP DRAWING/SUBMITTALS OF ALL SPECIFIED FINISHES FOR APPROVAL PRIOR TO ORDERING
21. NO SUBSTITUTIONS TO SPECIFIED MATERIALS AN/OR BRANDS OF MATERIALS WILL BE ACCEPTED UNLESS APPROVED BY THE ARCHITECT, IN WRITING, PRIOR TO CONSTRUCTION. ANY CONTRACTOR REQUESTING SUBSTITUTIONS SHALL SUBMIT SIX (6) COPIES OF DRAWINGS OR ELECTRONIC COPY, AND/OR PRODUCT LITERATURE ALONG WITH THE AMOUNT OF COST SAVINGS FOR THE ITEM IN QUESTION. THE CONTRACTOR MUST ALLOW THE ARCHITECT AT LEAST SEVEN BUSINESS DAYS TO DETERMINE THE SUITABILITY OF THE SUBSTITUTION.
22. COORDINATE WITH CODE INVESTIGATION FOR FLAME SPREAD AND SMOKE DEVELOPMENT RESTRICTIONS FOR ALL INTERIOR MATERIALS / FINISHES.
23. PER NFPA 101 LIFE SAFETY CODE
    CHAPTER 10 INTERIOR FINISHES, CONTENTS AND FURNISHINGS, PARAGRAPH 10.2.3 INTERIOR WALL OR CEILING FINISH TESTING AND CLASSIFICATION STATES "INTERIOR WALL OR CEILING FINISH THAT IS REQUIRED ELSEWHERE IN THE CODE TO BE CLASS A, B, OR C SHALL BE CLASSIFIED BASED ON TEST RESULTS FROM NFPA 255, ASTM E-84 OR UL723."
24. PAINTING OF GALVANIZED METAL SURFACES REQUIRES THE GALVANIZED METALS PROTECTIVE LAYER OF OIL / PASSIVATOR TO BE COMPLETELY REMOVED. REMOVAL OF THE OIL AND PASSIVATOR MUST BE TESTED BY CLEANING A SMALL AREA WITH A WATER-BASED OR SOLVENT-BASED CLEANER. ONCE THAT AREA IS DRY, TEST THE CLEAN AREA WITH A COPPER SULFATE SOLUTION. IF THE GALVANIZED SURFACE DOES NOT TURN BLACK, THE PASSIVATOR REMAINS ON THE SURFACE. THIS MUST BE REMOVED PER THE SSPC-SP7 / NACE PREPARATION PRECEDURE AND RE-TESTED PRIOR TO COATING THE SURFACE.

DANIEL J. BARNEY
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PROJECT:

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LEE'S SUMMIT, MISSOURI 64064

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DRAWN BY: RP | CHECKED BY: DB

DRAWING TITLE:
ROOM FINISH PLAN

SHEET #:
A1.41

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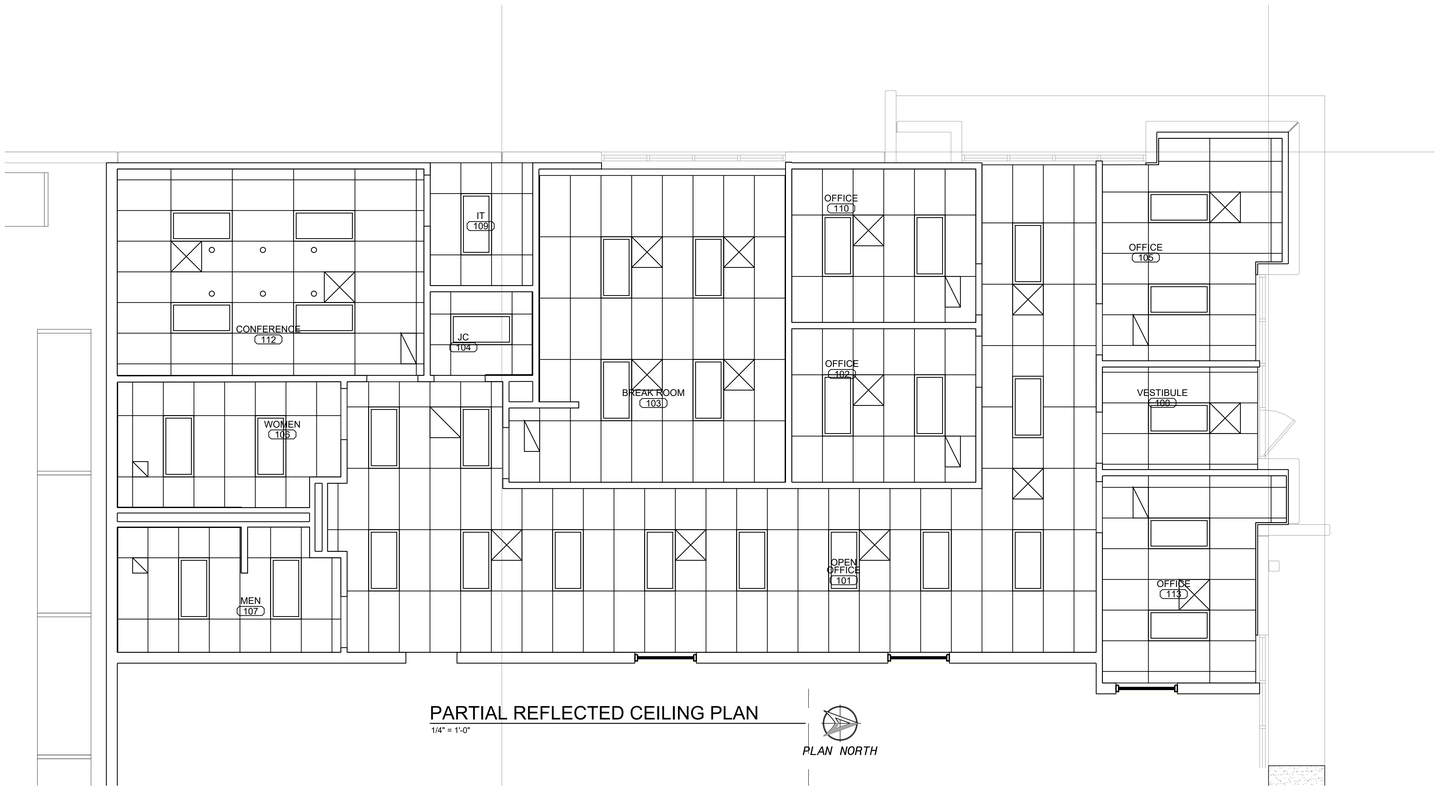

PARTIAL REFLECTED CEILING PLAN

1/4" = 1'-0"

PLAN NORTH

RCP GENERAL NOTES NOTES

1. COORDINATE LOCATIONS OF LIGHTS, GRILLS, DIFFUSERS, SPEAKERS, ETC WITH MECHANICAL AND ELECTRICAL DRAWINGS.
2. ALL AREAS SHALL BE FULLY SPRINKLERED.
3. GENERAL CONTRACTOR TO COORDINATE WITH FIRE PROTECTION SUBCONTRACTOR AND APPROVED FIRE PROTECTION SHOP DRAWINGS FOR QUANTITY AND LOCATIONS OF SPRINKLER HEADS.

CEILING PLAN LEGEND

	EXISTING 2 X 4 ACOUSTICAL CEILING TILE
	2 X 4 ACOUSTICAL CEILING TILE MATCH EXISTING
	2'x4' LAY-IN LIGHT FIXTURE
	RECESSED CAN LIGHT FIXTURE
	SUPPLY AIR DIFFUSER
	RETURN AIR GRILLE

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PARTIAL REFLECTED CEILING PLAN

SHEET #:

A1.51

DOOR HARDWARE

HARDWARE ITEM		MFR. - MODEL NO.	FINISH	REMARKS
HINGES	INTERIOR	MATCH EXISTING		STAINLESS STEEL WITH NON-RISING REMOVABLE PINS
	EXTERIOR			STAINLESS STEEL WITH NON-RISING REMOVABLE PINS
BORED LOCKSETS	STOREROOM		26D	
	CLASSROOM		26D	
	OFFICE		26D	LEVER TYPE - INTERCHANGEABLE CORES
	PRIVACY		26D	
	PASSAGE		26D	
	EXIT		26D	
MORTISED LOCKSET	LOCKSET		26D	
	CYLINDER		26D	
CLOSERS	STOREROOM			STANDARD ARM WITH HOLD OPEN
	STOREFRONT			STANDARD ARM
	HOTEL GUEST ROOM			STANDARD ARM
	HEAVY DUTY			
COORDINATOR				
DEADBOLT LOCK				
DEADBOLT LEVER				"LOCKED" OR "OPEN" INDICATOR
THUMBTURN CYLINDER				
PANIC HARDWARE	EXIT DEVICE			
PANIC TRIM	EXIT DEVICE		26D	
PANIC HARDWARE	UPGRADE			
STRIKE	DUST PROOF		26D	
LATCH PROTECTION PLATE			32D	
NIGHT LATCH	DOOR GUARD		26D	
ASTRAGAL	DUST PROOF			MATCH DOOR COLOR
PUSH/PULL	DUST PROOF		26D	
AUTO FLUSH BOLTS	WOOD DOORS	MATCH EXISTING	32D	
	METAL DOORS		32D	
MANUAL FLUSH BOLTS			26D	
PROTECTION (KICK) PLATE			32D	
PROTECTION (KICK) PLATE	UPGRADE		32D	
WALL BUMPER				
FLOOR STOPS				
CHAIN DOOR CHECK				
MECHANICAL KEY PAD				
SADDLE THRESHOLD				
GASKETING SET				
SWEEPS				
DRIP CAP				
PEEP HOLE	DOOR VIEWER		26D	

NGP = NATIONAL GUARD PRODUCT

HARDWARE FINISH SCHEDULE

BHMA FINISH CODE	US EQUIV.	FINISH DESCRIPTION	BASE MATERIAL
626	US 26D	SATIN CHROMIUM PLATED	BRASS/BRONZE
630	US 32D	SATIN STAINLESS STEEL	STAINLESS STEEL

DOOR HARDWARE SETS

SET NO 12 — SET ITEMS
(3) HINGES
(1) A DETEX BATTERY POWERED ALARMED EXIT DEVICE WITH 15 SECOND DELAY. HARDWARE TO HAVE KEYED ENTRY TRIM.
(1) SURFACE CLOSER
(1) BRUSH SWEEP
SILENCERS

PROVIDE KNOX BOX ON OUTSIDE WALL PER LOCAL FIRE DEPARTMENT STANDARDS.

SET NO 7 — SET ITEMS
(3) HINGES
(1) LEVER PASSAGE LATCHSET
(1) WALL BUMPER
(1) CLOSER
PAIR OF KICK PLATES
SILENCERS

SET NO 8 — SET ITEMS
(3) HINGES
(1) LEVER STOREROOM LOCKSET
(1) ELECTRIC STRIKE
(1) SURFACE CLOSER
(1) WALL BUMPER
SILENCERS
WIRING DIAGRAM BY DOOR SECURITY CONTRACTOR
(1) CARD READER BY DOOR SECURITY CONTRACTOR
(1) POWER SUPPLY

SET NO 9 — SET ITEMS
REPLACE EXISTING STRIKE WITH
(1) ELECTRIC STRIKE

WIRING DIAGRAM BY DOOR SECURITY CONTRACTOR
(1) CARD READER BY DOOR SECURITY CONTRACTOR
(1) POWER SUPPLY

ALL OTHER EXISTING HARDWARE TO BE REFURBISHED.

SET NO 10 — SET ITEMS
(3) HINGES
(1) LEVER OFFICE LOCKSET
(1) WALL BUMPER
SILENCERS

SET NO 11 — SET ITEMS
REPLACE EXISTING PANIC BAR WITH A DETEX BATTERY POWERED ALARMED EXIT DEVICE WITH 15 SECOND DELAY. HARDWARE TO HAVE KEYED ENTRY TRIM.

PROVIDE KNOX BOX ON OUTSIDE WALL PER LOCAL FIRE DEPARTMENT STANDARDS.

ALL OTHER EXISTING HARDWARE TO BE REFURBISHED.

SET NO 1 — SET ITEMS
(3) HINGES
(1) STORAGE LEVER LOCKSET
(1) CLOSER - STANDARD ARM
(1) WALL BUMPER
(2) 12" H. x FULL WIDTH ST. STL KICKPLATE
SILENCERS

SET NO 2 — SET ITEMS
ALL ITEMS SHALL BE AS PRODUCED BY OVERHEAD DOOR MFR. FOR EXTERIOR OR INTERIOR DOOR APPLICATIONS AND FURNISHED BY SUPPLIER.

SET NO 3 — SET ITEMS
(3) HINGES
(1) LEVER PASSAGE LOCKSET
(1) WALL BUMPER
SILENCERS

SET NO 4 — SET ITEMS
(3) HINGES
(1) PANIC EXIT DEVICE WITH PASSAGE LEVER TRIM
(1) 12" H. x FULL WIDTH ST. STL KICKPLATE
(2) WALL BUMPER (AT IN-SWINGING DOORS)
SILENCERS
WIRING DIAGRAM BY DOOR SECURITY CONTRACTOR
(1) CARD READER BY DOOR SECURITY CONTRACTOR
(1) POWER SUPPLY

SET NO 5 — SET ITEMS
(3) HINGES
(1) PANIC DEVICE WITH LEVER TRIM
(1) WALL BUMPER
(1) CLOSER
(1) KICK PLATE
SILENCERS

SET NO 6 — SET ITEMS
(3) HINGES
(1) PUSH/PULL PLATES
(1) CLOSER - STANDARD ARM
(1) WALL BUMPER
(2) 12" H. x FULL WIDTH ST. STL KICKPLATE
SILENCERS

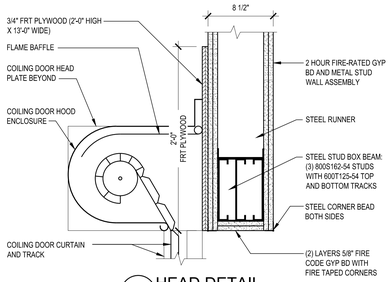
DOOR AND FRAME SCHEDULE

DOOR NO	TYPE	LOCATION	SIZE	MATERIAL	INSULATED	FINISH	FRAME TYPE	FRAME FINISH	FIRE RATING	HDWR SET NO	REMARKS (SEE DOOR SCHEDULE REMARKS BELOW THIS SCHEDULE)	DOOR NO
100A	EX	VESTIBULE TO EXTERIOR	3'-0" x 7'-0" x1 3/4"	EX	-	-	-	-	-	9		100A
100B	NL	OPEN OFFICE TO VESTIBULE	3'-0" x 7'-0" x1 3/4"	SC WOOD	-	STAIN	HM	PAINT	-	8		100B
101A	NL	WAREHOUSE TO OPEN OFFICE	3'-0" x 7'-0" x1 3/4"	SC WOOD	-	STAIN	HM	PAINT	-	5		101A
102A	F	OFFICE TO OPEN OFFICE	3'-0" x 7'-0" x1 3/4"	SC WOOD	-	STAIN	HM	PAINT	-	10		102A
103A	NL	BREAK ROOM TO OPEN OFFICE	3'-0" x 7'-0" x1 3/4"	SC WOOD	-	STAIN	HM	PAINT	-	7		103A
104A	F	JC TO OPEN OFFICE	3'-0" x 7'-0" x1 3/4"	SC WOOD	-	STAIN	HM	PAINT	-	1		104A
105A	F	OFFICE TO OPEN OFFICE	3'-0" x 7'-0" x1 3/4"	SC WOOD	-	STAIN	HM	PAINT	-	10		105A
106A	F	WOMEN TO OPEN OFFICE	3'-0" x 7'-0" x1 3/4"	SC WOOD	-	STAIN	HM	PAINT	-	6		106A
107A	F	MEN TO OPEN OFFICE	3'-0" x 7'-0" x1 3/4"	SC WOOD	-	STAIN	HM	PAINT	-	6		107A
110A	F	OFFICE TO OPEN OFFICE	3'-0" x 7'-0" x1 3/4"	SC WOOD	-	STAIN	HM	PAINT	-	10		110A
112A	F	CONFERENCE TO OPEN OFFICE	3'-0" x 7'-0" x1 3/4"	SC WOOD	-	STAIN	HM	PAINT	-	3		112A
113A	F	OFFICE TO OPEN OFFICE	3'-0" x 7'-0" x1 3/4"	SC WOOD	-	STAIN	HM	PAINT	-	10		113A
200A	F	WAREHOUSE TO EXTERIOR	3'-0" x 7'-0" x1 3/4"	HM	Y	PAINTED	HM	PAINT	-	12		200A
200B	EX	WAREHOUSE TO EXTERIOR	DRIVE-IN DOOR	EX	-	-	-	-	-	-		200B
300A	300A	LIQUID STORAGE TO WAREHOUSE	12'-0" x 14'-0" x1 3/4"	STEEL	-	-	STEEL	-	1,5 H	2		300A
300B	300B	LIQUID STORAGE TO WAREHOUSE	3'-0" x 7'-0" x1 3/4"	SC WOOD	-	PAINTED	HM	PAINT	1,5 H	4		300B
300C	EX	LIQUID STORAGE TO EXTERIOR	3'-0" x 7'-0" x1 3/4"	EX	-	-	-	-	-	11		300C
300D	EX	LIQUID STORAGE TO EXTERIOR	3'-0" x 7'-0" x1 3/4"	EX	-	-	-	-	-	-		300D
300E	EX	LIQUID STORAGE TO EXTERIOR	DOCK DOOR	EX	-	-	-	-	-	-		300E
300F	EX	LIQUID STORAGE TO EXTERIOR	DOCK DOOR	EX	-	-	-	-	-	-		300F

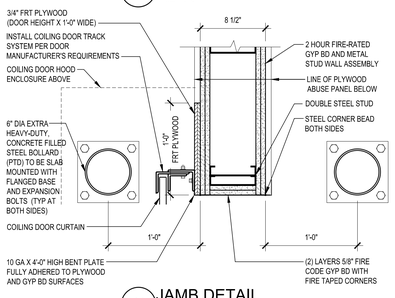
DOOR SCHEDULE REMARKS

1. NOTE NOT USED.
2. VERIFY WALL THICKNESS PRIOR TO ORDERING FRAME.

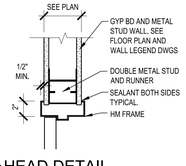
HEAD AND JAMB DETAILS



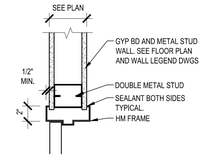
H1 HEAD DETAIL
1 1/2"=1'-0"



J1 JAMB DETAIL
1 1/2"=1'-0"



H2 HEAD DETAIL
1-1/2" = 1'-0"

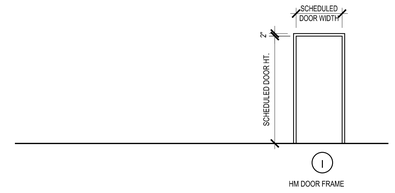


J2 JAMB DETAIL
1-1/2" = 1'-0"

DOOR/FRAME TYPE NOTES

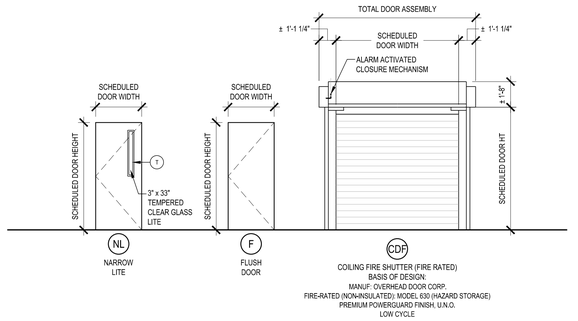
1. INTERIOR DOOR AND SIDELIGHT GLASS TO BE 1/4" TEMPERED SAFETY GLASS (UNO).
2. (T) INDICATES TEMPERED SAFETY GLASS.

FRAME TYPES



I HM DOOR FRAME

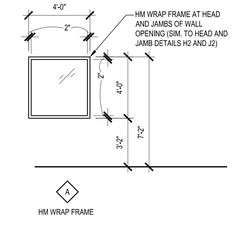
DOOR TYPES



WINDOW TYPE NOTES

1. INTERIOR WINDOW GLASS TO BE 1/4" CLEAR (UNO).
2. INTERIOR DOOR SIDELIGHT GLASS TO BE 1/4" TEMPERED SAFETY GLASS (UNO).
3. (T) INDICATES TEMPERED SAFETY GLASS.
4. PAINT HM WINDOW FRAMES TO MATCH ADJACENT WALL COLOR (UNO).
5. HM WINDOW FRAMES TO ABIDE BY APPLICABLE REQUIREMENTS LISTED IN THE GENERAL NOTES, THIS SHEET, FOR HM (DOOR) FRAMES.

WINDOW TYPES



GENERAL NOTES

1. EXTERIOR HM DR FRAMES SHALL BE:
   1.1. PRE-PRIMED
   1.2. MIN 14 GA STEEL (GALV)
   1.3. WELDED CONSTRUCTION
   1.4. PAINT PER FINISH NOTES
2. EXTERIOR HM DRS SHALL BE:
   2.1. PRE-PRIMED
   2.2. MIN 16 GA STEEL (GALV)
   2.3. INSULATED
   2.4. PAINT PER FINISH NOTES
3. INTERIOR HM DR FRAMES SHALL BE:
   3.1. MATCH EXISTING
4. INTERIOR WOOD DOORS ARE TO BE 5-PLY, SOLID PARTICLEBOARD CORE:
   5.1. MATCH EXISTING
9. ALL DOOR HARDWARE ITEMS SHALL BE AS SCHEDULED (OR ARCHITECT APPROVED EQUAL) UNLESS NOTED ON DOOR HARDWARE SCHEDULE:
10. DR HARDWARE SUPPLIER SHALL REVIEW ALL HARDWARE FUNCTIONS WITH BUILDING OWNER PRIOR TO SHOP DRAWING SUBMITTALS.
11. ALL NEW DOOR HARDWARE NOT SPECIFIED BUT INDICATED IN THE HARDWARE SCHEDULE SHALL BE SUBMITTED IN THE FORM OF SHOP DRAWINGS TO THE ARCHITECT FOR REVIEW AND APPROVAL.
12. ALL DOOR HARDWARE SHALL BE ACCESSIBLE COMPLIANT INCLUDING LOCKSETS AND LATCHSETS. LEVER HANDLES - SEE HARDWARE SCHEDULE OR ARCHITECT APPROVED EQUAL.
13. ALL LOUVER INFORMATION (IF REQUIRED, SIZE, STYLE, ETC) SHALL BE COORDINATED WITH MECHANICAL DRAWINGS.
14. ALL HOLLOW METAL FRAMED DOORS ARE TO RECEIVE DOOR SILENCERS.
15. ALL FIRE RATED DOORS AND FRAMES SHALL BEAR THE REQUIRED UL LABEL(S).
16. 1/4-INCH, CLEAR, TEMPERED GLASS:
    IMPACT TESTING. GLAZING SHALL BE TESTED IN ACCORDANCE CPSP 16 CFR 1201.
    9 SF OR LESS - CLASS I
    9 SF OR MORE - CLASS II
17. REFER TO ELECTRICAL DRAWINGS FOR ALL SECURITY/FIRE HARDWARE INCLUDING (BUT NOT LIMITED TO) PROXIMITY READERS, ELECTRIC STRIKES, BUZZERS, RELEASE BUTTONS, MAGNETIC LOCK, AUTOMATIC SELF CLOSING DEVICES, ETC.
18. ENSURE THAT ALL DOORS ARE PROPERLY UNDERCUT FOR EASE OF SWING. CUT TO BE NO GREATER THAT 1/4".
19. FRAMES TO RECEIVE BLOCKING WITHIN SURROUNDING PARTITIONS AS REQUIRED TO PROPERLY SUPPORT ALL SPECIFIED HARDWARE.
20. HARDWARE SUPPLIER TO COORDINATE FINAL DOOR HARDWARE AND ALL KEYING WITH OWNER REPRESENTATIVE.
    20.1 PROVIDE ALL KEYS IN INDIVIDUAL ENVELOPES, PROPERLY IDENTIFIED WITH DOOR NUMBERS, LOCATIONS AND KEY CODING.
21. PROVIDE CERTIFIED TEST REPORTS FOR DOOR HARDWARE AT DOORS IN FIRE SEPARATIONS AND EXIT DOORS SHOWING COMPLIANCE WITH SPECIFIED PERFORMANCE CHARACTERISTICS AND PHYSICAL PROPERTIES. PROVIDE NATIONALLY ACCREDITED PRODUCT CERTIFICATES SIGNED BY MANUFACTURER CERTIFYING MATERIALS COMPLY WITH SPECIFIED PERFORMANCE CHARACTERISTICS AND CRITERIA AND PHYSICAL REQUIREMENTS. CONDUCT PRE-INSTALLATION MEETING TO VERIFY PROJECT REQUIREMENTS, MANUFACTURER'S INSTALLATION INSTRUCTIONS AND MANUFACTURER'S WARRANTY REQUIREMENTS.
22. ALL LOCKSETS LISTED IN HARDWARE SCHEDULE ARE TO BE ANSI COMPLIANT LEVER FUNCTION WITH ANSI STANDARD STRIKES AND BOXES. FINISH(ES) SHALL BE VERIFIED BY ARCHITECT PRIOR TO PRODUCT PURCHASE.
23. USE ONLY FASTENERS PROVIDED BY MANUFACTURER. FAILURE TO COMPLY MAY VOID WARRANTIES AND APPLICABLE LICENSED LABELS. SUPPLY SCREWS, BOLTS, EXPANSION SHIELDS AND OTHER FASTENING DEVICES REQUIRE FOR SATISFACTORY INSTALLATION AND OPERATION OF HARDWARE. EXPOSED FASTENING DEVICES TO MATCH FINISH OF HARDWARE. WHERE PULL IS SCHEDULED ON ONE SIDE OF DOOR AND PUSH PLATE ON OTHER SIDE, SUPPLY FASTENING DEVICES, AND INSTALL SO PULL CAN BE SECURED THROUGH DOOR FROM REVERSE SIDE. INSTALL PUSH PLATE TO COVER FASTENERS. USE FASTENERS COMPATIBLE WITH MATERIAL THROUGH WHICH THEY PASS.
24. PROVIDE CYLINDERS FROM SAME MANUFACTURER AS LOCKSET, 6 PIN MORTISED UNIT, SUPPLY AND INSTALL ALL CYLINDERS, CORES AND KEYS FOR BUILDING BASED ON A GRAND MASTER KEY SYSTEM + 2 ON A SUBMASTER, TO BE COORDINATED WITH THE OWNER.
25. DOORS AND CABINET LOCKS TO BE GRAND MASTER KEYED. PREPARE DETAILED KEYING SCHEDULE IN CONJUNCTION WITH OWNER. PROVIDE (3) MASTERKEYS FOR EACH MK OR GMK GROUP. STAMP KEYING CODE NUMBERS ON KEYS AND CYLINDERS. PROVIDE CONSTRUCTION CORES. PROVIDE AND INSTALL ALL PERMANENT CORES, CYLINDERS AND KEYS. PROVIDE KEYS IN TRIPLICATE FOR EVERY LOCK IN THIS CONTRACT.
26. ADJUST DOOR HARDWARE, OPERATORS, CLOSURES AND CONTROLS FOR OPTIMUM, SMOOTH OPERATING CONDITION, SAFETY AND FOR WEATHER TIGHT CLOSURE. LUBRICATE HARDWARE, OPERATING EQUIPMENT AND OTHER MOVING PARTS. ADJUST DOOR HARDWARE TO PROVIDE TIGHT FIT AT CONTACT POINTS WITH FRAMES. PERFORM CLEANING AFTER INSTALLATION TO REMOVE CONSTRUCTION AND ACCUMULATED ENVIRONMENTAL DIRT. CLEAN HARDWARE WITH DAMP RAG AND APPROVED NON-ABRASIVE CLEANER, AND POLISH HARDWARE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMOVE PROTECTIVE MATERIAL FROM HARDWARE ITEMS WHERE PRESENT. UPON COMPLETION OF INSTALLATION, REMOVE SURPLUS MATERIALS, RUBBISH, TOOLS AND EQUIPMENT BARRIERS.
27. BRIEF MAINTENANCE STAFF REGARDING PROPER CARE, CLEANING, AND GENERAL MAINTENANCE OF PROJECT COMPLETE HARDWARE, DESCRIPTION, USE, HANDLING AND STORAGE OF KEYS, AND USE, APPLICATION AND STORAGE OF WRENCHES FOR DOOR CLOSERS, LOCKSETS AND FIRE EXIT HARDWARE. DEMONSTRATE OPERATION, OPERATING COMPONENTS, ADJUSTMENT FEATURES AND LUBRICATION REQUIREMENTS.

STATE OF MISSOURI
DANIEL J. BARNEY
NUMBER A-2013009683
ARCHITECT
DANIEL J. BARNEY
LICENSE #A-2013009683
EXPIRATION DATE: 12/31/2025
SEAL

FOUNDATION ARCHITECTURE, LLC
740 MARKS ROAD - SUITE A, VALLEY CITY, OHIO 44208

PROJECT:

TENANT IMPROVEMENTS FOR:
SONNY'S
2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
	ISSUED	8/15/25

PROJECT #: 016-0402
DRAWN BY: RP
CHECKED BY: DB

DRAWING TITLE:
DOOR/FRAME SCHEDULE

SHEET #:
A6.01

PROJECT NOTES

EXTERIOR WALL PENETRATION NOTES:

1. PENETRATE EXTERIOR BUILDING WALLS AS REQUIRED TO FACILITATE INSTALLATION OF ITEMS INDICATED.

COORDINATION NOTES:

1. CERTAIN AREAS OF THE BUILDING UTILIZE RETURN AIR CEILING PLENUMS. ALL MATERIALS INSTALLED WITHIN THE CEILING PLENUMS SHALL COMPLY WITH NFPA 90A REQUIREMENTS.
2. UNLESS DETAILED OTHERWISE, SYSTEMS SHALL BE ORGANIZED SUCH THAT DUCTWORK MAINS ARE THE HIGHEST LEVEL AND ARE TIGHT TO BUILDING STEEL. HVAC PIPING AND PLUMBING PIPING SHALL BE ROUTED BELOW THE DUCTWORK MAINS, AND FIRE PROTECTION PIPING SHALL BE BELOW ALL.
3. THE BOTTOM ELEVATION OF ALL SYSTEMS SHALL BE AT LEAST 6" ABOVE LAY-IN CELINGS OR 2" ABOVE LIGHTS TO FACILITATE CEILING TILE REMOVAL AND MAINTENANCE ACCESS.
4. SYSTEMS SHALL BE ARRANGED SUCH THAT THEY ARE NOT TOUCHING EACH OTHER OR ANY PART OF THE BUILDING STRUCTURE TO AVOID VIBRATION TRANSFERRENCE AND EXPANSION INTERFERENCE, AND TO FACILITATE SYSTEM INSULATION INSTALLATION (WHERE REQUIRED).

CEILING WORK NOTES:

1. REMOVE AND RE-INSTALL LAY-IN CEILINGS IN AREAS WHERE EXISTING CEILINGS ARE TO REMAIN AS REQUIRED TO COMPLETE THE INSTALLATION OF ITEMS SHOWN. SEE ARCHITECTURAL DRAWINGS FOR IDENTIFICATION OF AREAS WHERE EXISTING CEILINGS ARE TO REMAIN. REPLACE DAMAGED CEILING MATERIALS TO MATCH EXISTING CEILING.
2. CEILING TILES MAY BE LEFT OUT OF THE CEILING IN AREAS UNDER CONSTRUCTION ONLY IF STORED IN AREAS AS DIRECTED BY THE OWNER SO AS NOT TO HINDER THE DAILY OPERATIONS OF THE BUILDING'S OCCUPANTS.
3. REMOVE EXISTING DRYWALL OR PLASTER CEILINGS TO ACCOMMODATE INSTALLATION OF ITEMS INDICATED. PATCH AND PAINT DRYWALL OR PLASTER CEILINGS TO MATCH EXISTING ADJACENT UNDISTURBED SURFACES.
4. PROVIDE ESCUTCHEONS FOR ALL PIPING PENETRATIONS OF CEILINGS IN OCCUPIED AREAS.
5. FIRESTOP ALL PENETRATIONS OF RATED CEILINGS WITH THE APPROPRIATE FIRESTOPPING MATERIAL. REQUIRED MATERIALS ARE INDICATED IN THE SPECIFICATIONS

SLAB ON GRADE FLOOR PENETRATION NOTES:

1. CUT AND PATCH EXISTING FLOOR SLAB TO FACILITATE INSTALLATION OF UNDERFLOOR ITEMS INDICATED.
2. PATCH WITH MATERIALS SUITABLE FOR THE APPLICATION AND OF EQUAL STRENGTH AND THICKNESS AS ADJACENT UNDISTURBED SURFACES.
3. CUTTING AND PATCHING OF EXISTING FLOOR SLABS SHALL BE PROVIDED BY THE CONTRACTOR REQUIRING THE WORK. COORDINATE LOCATIONS AND AREAS OF SLAB REMOVAL WITH OTHERS TO FACILITATE INSTALLATION OF UNDERFLOOR ITEMS INDICATED.

ROOF PENETRATION NOTES:

1. CUT AND PATCH THE EXISTING ROOF AS REQUIRED TO FACILITATE INSTALLATION OF ROOF MOUNTED EQUIPMENT, SUPPORTS, AND PENETRATIONS INDICATED.
2. THE EXISTING ROOF IS UNDER WARRANTY. ALL ROOF WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO MAINTAIN THE VALIDITY OF THE CURRENT WARRANTY.
3. CUTTING AND PATCHING OF EXISTING ROOF SHALL BE PROVIDED BY THE CONTRACTOR REQUIRING THE WORK. COORDINATE LOCATIONS AND AREAS OF ROOFING SYSTEM REMOVAL WITH OTHERS TO FACILITATE INSTALLATION OF ROOF MOUNTED ITEMS INDICATED.
4. ROOF PENETRATIONS SHALL BE MADE IN ACCORDANCE WITH ARCHITECT/STRUCTURAL ENGINEER'S DESIGN REQUIREMENTS.
5. OBTAIN APPROVAL OF LOCATION AND PENETRATION METHOD PRIOR TO CREATING ROOF PENETRATIONS.

INTERIOR WALL PENETRATION NOTES:

1. PENETRATE INTERIOR BUILDING WALLS AS REQUIRED TO FACILITATE INSTALLATION OF ITEMS INDICATED.
2. PATCH AND PAINT EXISTING WALLS TO MATCH ADJACENT UNDISTURBED SURFACES.
3. FIRESTOP PENETRATIONS OF RATED WALLS WITH APPRORIATE SPECIFIED FIREPROOFING MATERIAL AND SEALING METHODS.
4. SOUND STOP FULL HEIGHT WALLS WITH APPROPRIATE MATERIALS AND METHODS AND AS INDICATED IN THE "PENETRATIONS" SECTION OF THE SPECIFICATIONS.
5. MAKE WALL PENETRATIONS LARGE ENOUGH TO ALLOW INSULATED PIPES AND/OR DUCTS TO PASS THROUGH WITHOUT INTERRUPTION OF INSULATION.
6. ALLOW A MINIMUM 3" CLEARANCE AROUND ALL SIDES BETWEEN DUCT SURFACE AND ANY WALL STUDS OR HEADERS TO AVOID TRANSFERRENCE OF VIBRATION TO STRUCTURE.

HVAC PIPE AND FITTING SCHEDULE

* WHERE MORE THAN ONE TYPE OF MATERIAL IS INDICATED AS AN OPTION, SELECTION IS INSTALLER'S CHOICE.

SERVICE	SIZE	PIPE MATERIAL	FITTINGS	JOINTS
REFRIGERANT PIPING	ALL SIZES	TYPE L HARD COPPER	WROUGHT COPPER	BRAZED

FIRESTOP SCHEDULE

NOTES:

1. FIRESTOP ASSEMBLY TYPE (REQUIRED FIRESTOPPING MATERIALS) SHALL BE DETERMINED BY THE WALL OR FLOOR/CEILING ASSEMBLY AND PENETRATION TYPE AND SHALL BE UL LISTED AND TESTED IN ACCORDANCE WITH ASTM E814. FIRE RATING OF THE ASSEMBLY SHALL BE EQUIVALENT TO THE WALL OR FLOOR/CEILING ASSEMBLY RATING.
2. ACCEPTABLE FIRE BARRIER PRODUCTS: HILTI "FS-ONE", NELSON "FLAMESEAL" OR APPROVED EQUAL AS MANUFACTURED BY 3M.
3. IF REQUESTED, THECONTRACTOR SHALL SHOW PROOF OF COMPLIANCE BY PROVIDING THE APPROPRIATE UL FIRESTOPPING SYSTEM NUMBER TO THE INSPECTION AUTHORITY HAVING JURISDICTION OR THE ARCHITECT/ENGINEER.

PENETRATION	RATING	U.L. SYSTEM
METAL DUCT WITHOUT FIRE DAMPER THROUGH GYPSUM BOARD	1 OR 2 HOUR	HILTI UL #WL7040 OR #WL7042 OR APPROVED EQUAL
METAL DUCT WITHOUT FIRE DAMPER THROUGH MASONRY/CONCRETE	1 OR 2 HOUR	HILTI UL #WJ7021 OR #WJ7022 OR APPROVED EQUAL
METAL DUCT WITHOUT FIRE DAMPER THROUGH MASONRY/CONCRETE	3 HOUR	HILTI UL #CAJ7046 OR APPROVED EQUAL
METAL PIPE THROUGH GYPSUM BOARD	1 OR 2 HOUR	HILTI UL #WL1054 OR APPROVED EQUAL
METAL PIPE THROUGH MASONRY/CONCRETE	2 HOUR	HILTI UL #CAJ1291 OR APPROVED EQUAL
METAL PIPE THROUGH MASONRY/CONCRETE	3 HOUR	HILTI UL #CAJ1155 OR #CAJ1226 OR APPROVED EQUAL
METAL PIPE THROUGH POURED CONCRETE FLOOR SLAB	3 HOUR	HILTI UL #FA1017 OR APPROVED EQUAL
INSULATED METAL PIPE THROUGH GYPSUM BOARD	1 OR 2 HOUR	HILTI UL #WL5029 OR APPROVED EQUAL
INSULATED METAL PIPE THROUGHMASONRY/CONCRETE	2 HOUR	HILTI UL #CAJ5091 OR APPROVED EQUAL
INSULATED METAL PIPE THROUGH MASONRY	4 HOUR	HILTI UL #WJ5028 OR APPROVED EQUAL
INSULATED METAL PIPE THROUGH POURED CONCRETE FLOOR SLAB	2 HOUR	HILTI UL #FA5017 OR APPROVED EQUAL
PLASTIC PIPE THROUGH GYPSUM BOARD	1 OR 2 HOUR	HILTI UL #WL2078 OR APPROVED EQUAL
PLASTIC PIPE THROUGH MASONRY/CONCRETE	2 HOUR	HILTI UL #CAJ2271 OR APPROVED EQUAL
PLASTIC PIPE THROUGH MASONRY/ CONCRETE	3 HOUR	HILTI UL #CAJ2109 OR #CAJ2110 OR APPROVED EQUAL
PLASTIC PIPE THROUGH POURED CONCRETE FLOOR SLAB	3 HOUR	HILTI UL #FA2054 OR APPROVED EQUAL

HVAC INSULATION SCHEDULE

INSULATION TYPE DESCRIPTIONS	
FD	FLEXIBLE DUCT WRAP INSULATION; MINIMUM THERMAL CONDUCTIVITY OF R = 7.4 WITH A DERATED VALVE OF R = 6.0 AT 70 DEG. F. MEAN TEMPERATURE WHEN COMPRESSED 25%. DENSITY = 0.75 POUNDS PER CUBIC FOOT.
EP	FLEXIBLE UNICELLULAR, PREFORMED ELASTOMERIC PIPE INSULATION; MAXIMUM THERMAL CONDUCTIVITY K = 0.28 AT 70 DEG. MEAN TEMPERATURE.
EF	FLEXIBLE, CLOSED-CELL, CFC-FREE, FACTORY INSTALLED MOLDED ELASTOMERIC PIPE INSULATION; THERMAL CONDUCTIVITY K = 0.30 AT 70 DEG. MEAN TEMPERATURE; WATER VAPOR TRANSMISSION = 0.08 PERM-INCH, UV-RESISTANT FOR OUTDOOR APPLICATIONS.
INSULATION FINISH DESCRIPTIONS	
FFV	FOIL FACED KRAFT PAPER VAPOR SEAL, FACTORY APPLIED

SERVICE	TYPE	THICKNESS	FINISH
COMBUSTION AND OUTSIDE AIR DUCTWORK	FD	3"	FFV
SUPPLY, MIXED AND RELIEF AIR DUCTWORK	FD	2"	FFV
SUPPLY, RETURN, MIXED AND RELIEF AIR DUCTWORK (IN NON-AIR CONDITIONED SPACE)	FD	3"	FFV
COOLING COIL CONDENSATE DRAIN PIPING (NOT IN AIR-HANDLING UNIT)	EP	1/2"	-
REFRIGERANT LINESET (MINI-SPLIT AND VRF SYSTEMS)	EF	1/2"	-

ABBREVIATIONS

LEGEND - MECHANICAL ABBREVIATION SCHEDULE1

ABBREVIATION	DESCRIPTION
AC	AIR CONDITIONING
ACC	AIR COOLED CONDENSER
ACD	AIR COMPRESSOR DRYER
ACU	AIR CURTAIN UNIT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFMS	AIRFLOW MEASURING STATION
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
APD	AIR PRESSURE DROP (INCHES OF WATER COLUMN)
APPROX	APPROXIMATELY
ARCH	ARCHITECT, ARCHITECTURAL
B	BOILER
BD	BACKDRAFT DAMPER
BFG	BELOW FINISHED GRADE
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTUH	BRITISH THERMAL UNIT PER HOUR
C	COMMON
CAV	CONSTANT AIR VOLUME
CC	COOLING COIL
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CO	CARBON MONOXIDE
CO	CLEANOUT
CO2	CARBON DIOXIDE
COMP	COMPRESSOR
CONV	CONVECTOR
COP	COEFFICIENT OF PERFORMANCE
CP	CONDENSATE PUMP
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
D	DEEP
DA	DEAREATOR
DACU	DUCTLESS AIR CONDITIONING UNIT
DB	DRY BULB
DCVA	DOUBLE CHECK VALVE ASSEMBLY
DD	DUAL DUCT TERMINAL BOX
DD	DUCT MOUNTED SMOKE DETECTOR
DDC	DIRECT DIGITAL CONTROL
DEG F	DEGREES FARENHEIT
DEMO	DEMOLITION
DIA	DIAMETER
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DTF	DOWN THROUGH FLOOR
DTR	DOWN THROUGH ROOF
DWG	DRAWING
DX	DIRECT EXPANSION
E	EAST
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE (DEG F)
EBB	ELECTRIC BASE BOARD
EC	ELECTRICAL CONTRACTOR
ECH	ELECTRICAL CABINET UNIT HEATER
ECU	ENVIRONMENTAL CONTROL UNIT
EDB	ENTERING DRY BULB
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EH	ELECTRIC HEATER
ERU	ENERGY RECOVERY UNIT
ERV	ENERGY RECOVERY VENTILATOR
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETC	ET CETERA
ETR	EXISTING TO REMAIN
EUH	ELECTRIC UNIT HEATER
EWB	ENTERING WET BULB
EWH	ELECTRIC WALL HEATER
EWT	ENTERING WATER TEMPERATURE (DEG F)
F	FURNACE
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FD	FLOOR DRAIN
FILT	FILTER
FLA	FULL LOAD AMPS
FP	FIRE PROTECTION
FPC	FIRE PROTECTION CONTRACTOR
FPM	FEET PER MINUTE
FPTB	FAN POWERED TERMINAL BOX
FSD	COMBINATION FIRE/SMOKE DAMPER
FT	FEET
FTK	FLASH TANK
FTR	FINNED TUBE RADIATION
GAL	GALLON
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
GV	GRAVITY VENTILATOR
H	HUMIDIFIER
HC	HEATING COIL
HD	HOOD
HEAD	FEET OF WATER COLUMN PRESSURE
HEPA	HIGH EFFIENCY PARTICULATE AIR
HOA	HAND-OFF-AUTOMATIC
HP	HEAT PUMP
HP	HORSEPOWER
HUM	HUMIDIFIER
HX	HEAT EXCHANGER
HZ	HERTZ (CYCLES PER SECOND)
IFB	INTEGRAL FACE AND BYPASS
IN	INCH
INV	INVERT ELEVATION

LEGEND - MECHANICAL ABBREVIATION SCHEDULE1

ABBREVIATION	DESCRIPTION
KW	KILOWATT
L	LENGTH
L	LOUVER
LAT	LEAVING AIR TEMPERATURE (DEG F)
LBS	POUNDS
LF	LINEAR FOOT
LRA	LOCKED ROTOR AMPS
LWT	LEAVING WATER TEMPERATURE (DEG F)
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAU	MAKE-UP AIR UNIT
MAX	MAXIMUM
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPS
MFR	MANUFACTURER
MFS	MINIMUM FUSE SIZE
MHP	MOTOR HORSEPOWER
MIN	MINIMUM
MOD	MOTOR OPERATED DAMPER
MOP	MAXIMUM OVERCURRENT PROTECTION
MZU	MULTIZONE UNIT
N	NORTH
NA, N/A	NOT APPLICABLE
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NO	NORMALLY OPEN
NO	NUMBER
NPT	NOMINAL PIPE THREAD
NTS	NOT TO SCALE
OA	OUTDOOR AIR
OAT	OUTDOOR AIR TEMPERATURE
P	PUMP
PBD	PARALLEL BLADE DAMPER
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP
PH	PHASE
PHC	PREHEAT COIL
PRV	HYDRONIC PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PTAC	PACKAGED TERMINAL AIR CONDITIONING UNIT
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RA	RETURN AIR
RCP	RADIANT CEILING PANEL
RD	ROOF DRAIN
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RLA	RUNNING LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
RTU	ROOFTOP UNIT
RV	RELIEF VALVE
S	SOUTH
SA	SOUND ATTENUATOR
SA	SUPPLY AIR
SD	SMOKE DAMPER
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SENS	SENSIBLE
SF	SQUARE FEET
SF	SUPPLY FAN
SMACNA	SHEET METAL AND AIRCONDITIONING CONTRACTORS NATIONAL ASSOCIATION
SPECS	SPECIFICATIONS
SPRS	STEAM PRESSURE REDUCING STATION
SPRV	STEAM PRESSURE REDUCING VALVE
SQ	SQUARE
SS	STAINLESS STEEL
SST	SATURATED SUCTION TEMPERATURE
T&P	TEMPERATURE AND PRESSURE
T-STAT	THERMOSTAT
TA	TRANSFER AIR
TB	TERMINAL BOX
TC	TEMPERATURE CONTROL
TCC	(TEMPERATURE) CONTROL CONTRACTOR
TCP	(TEMPERATURE) CONTROL PANEL
TEMP	TEMPERATURE (DEG F)
TOD	TOP OF DUCT
TOP	TOP OF PIPE
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES
UNO	UNLESS NOTED OTHERWISE
UTF	UP THROUGH FLOOR
UTR	UP THROUGH ROOF
UV	UNIT VENTILATOR
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VCT	VITREOUS CLAY TILE
VFD	VARIABLE FREQUENCY DRIVE
VFFB	VERTICAL INTEGRAL FACE AND BYPASS
VTR	VENT THROUGH ROOF
VVT	VARIABLE VOLUME AND TEMPERATURE
W	WATTS
W	WEST
W	WIDE
WB	WET BULB
WC	INCHES WATER COLUMN (PRESSURE)
WG	WATER GAUGE (PRESSURE)
WPD	WATER PRESSURE DROP (FEET OF WATER COLUMN)
WSA	WIRE SIZE AMPS

DRAWING LIST

DRAWING LIST - MECHANICAL

SHEET NUMBER	SHEET NAME
M0.01	GENERAL INFORMATION
M1.01	FIRST FLOOR MECHANICAL DEMOLITION PLAN
M2.01	FIRST FLOOR MECHANICAL PLAN
M3.01	FIRST FLOOR ENLARGED MECHANICAL PLANS
M4.01	MECHANICAL SCHEDULES AND DETAILS
M5.01	MECHANICAL SPECIFICATIONS
M5.02	MECHANICAL SPECIFICATIONS

REFERENCE SYMBOLS

REFERENCE SYMBOL LEGEND

SHEET NOTES

DRAWING INTERPRETATION NOTES:

1. EXISTING LINETYPE: THIN (LIGHT) SOLID LINES REPRESENT ITEMS THAT ARE EXISTING TO REMAIN OR ARE FURNISHED BY OTHERS.
2. DEMOLITION LINETYPE: THICK (DARK) DASHED LINES REPRESENT EXISTING ITEMS TO BE REMOVED.
3. NEW LINETYPE: THICK (DARK) SOLID LINES REPRESENT ITEMS THAT ARE NEW OR RELOCATED.
4. RELEVANT EXISTING CONDITIONS SHOWN ARE BASED ON RECORD DRAWINGS AND FIELD OBSERVATION(S). NOT ALL EXISTING ITEMS ARE SHOWN, OR COULD BE FIELD VERIFIED. ONCE AREAS OBSCURED FROM VIEW ARE EXPOSED, VERIFY THAT CONDITIONS ARE AS INDICATED ON THIS DRAWING. BEFORE PROCEEDING WITH WORK, NOTIFY THE ENGINEER IF CONDITIONS DIFFER FROM WHAT IS SHOWN.
5. EQUIPMENT SHOWN GRAY-SHADED OR TAGGED HAVE AN ASSOCIATED EQUIPMENT SCHEDULE. SEE SCHEDULE SHEET(S).
6. EQUIPMENT AND ITEMS TO BE RELOCATED ARE IDENTIFIED ON THE PLANS AND/OR EQUIPMENT SCHEDULE(S).

DUCT LINETYPE SCHEDULE

ABBREVIATION	DESCRIPTION	MATERIAL
CA	COMBUSTION AIR	GALVANIZED
EA	EXHAUST AIR	GALVANIZED
FLUE	FUEL-BURNING APPLIANCE FLUE VENT	TYPE B DOUBLE WALL
OA	OUTDOOR AIR	GALVANIZED
RA	RETURN AIR	GALVANIZED
SA	SUPPLY AIR	GALVANIZED
TA	TRANSFER AIR	GALVANIZED

STATE OF MISSOURI
PATRICK W. KLANAC NUMBER 29264
PROFESSIONAL ENGINEER
8-15-2025
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PROJECT:

TENANT IMPROVEMENTS FOR:
SONNY'S
2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK: ISSUE: DATE:
ISSUED 08/15/2025

PROJECT #: 016-0402

DRAWN BY: PTA, INC. CHECKED BY: JSC

DRAWING TITLE:
GENERAL INFORMATION

SHEET #:
M0.01

DRAWING INTERPRETATION NOTES:

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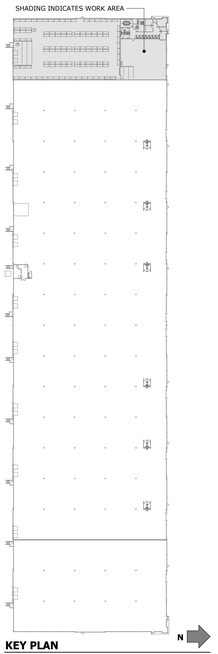
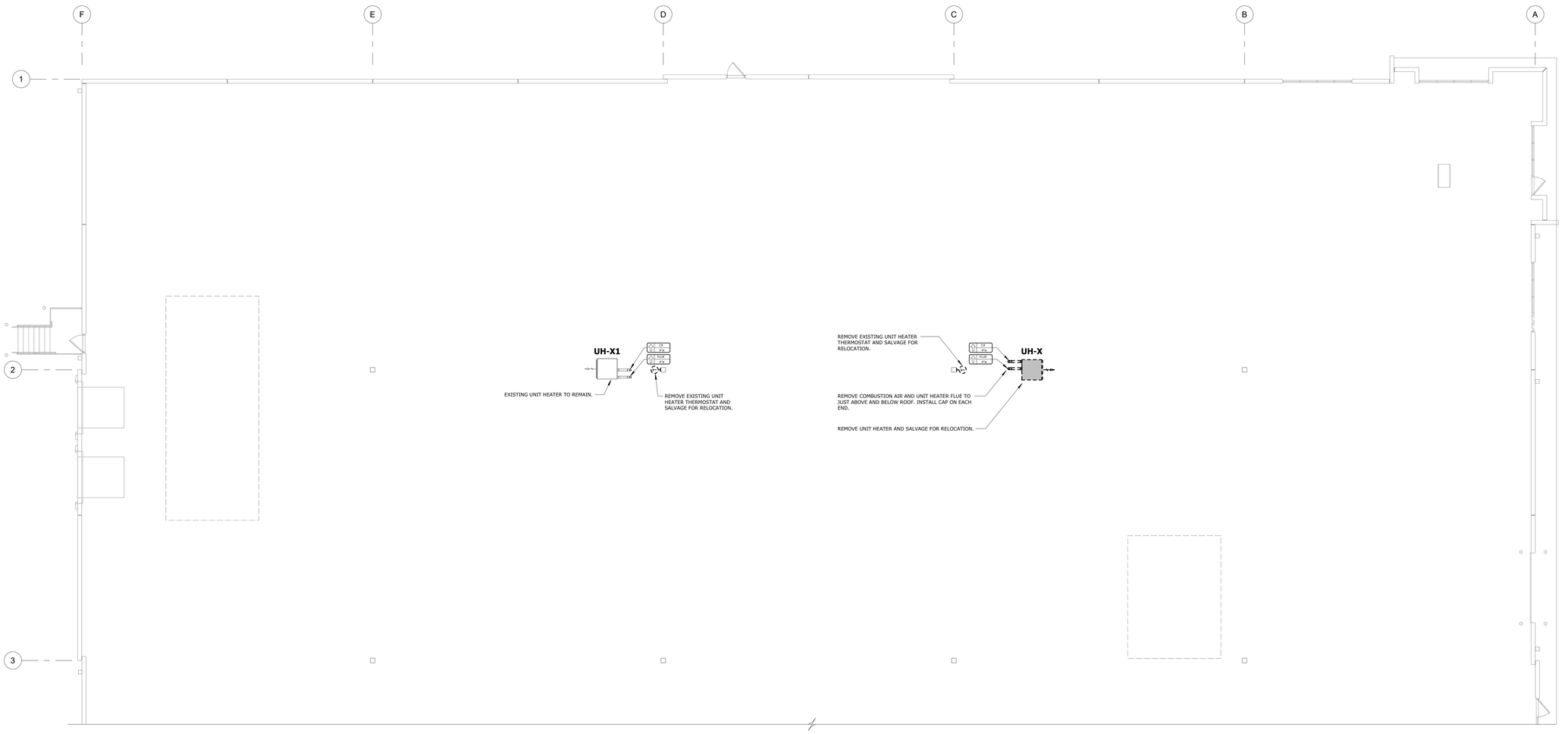
DUCTWORK DEMOLITION NOTES:

1. THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL UPON REMOVAL OF ALL SALVAGED ITEMS. OTHERWISE, REMOVE ALL DEMOLISHED ITEMS FROM THE SITE.
2. REMOVE ALL DUCTWORK, AS INDICATED BY THE DEMOLITION LINETYPE. REMOVE ALL ASSOCIATED ANCILLARY ITEMS, SUCH AS HANGERS, SUPPORTS, INSULATION, CONTROLS, ETC. - NOT UTILIZED FOR NEW WORK.
3. REMOVE DUCTWORK BACK TO TIE-IN POINTS WHERE INDICATED.
4. REMOVE DUCTWORK BACK TO CAPPED LOCATIONS WHERE INDICATED. INSULATE CAPPED DUCTS THE SAME AS NEW.



KEY PLAN
NO SCALE



FIRST FLOOR - DUCTWORK AND PIPING DEMOLITION PLAN

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

N

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LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402

DRAWN BY: PTA, INC. | CHECKED BY: JSC

DRAWING TITLE:
FIRST FLOOR
MECHANICAL
DEMOLITION PLAN

SHEET #:
M1.01

DRAWING INTERPRETATION NOTES:

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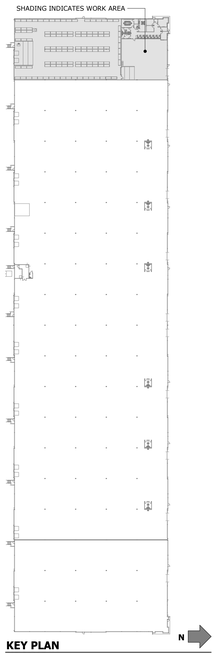
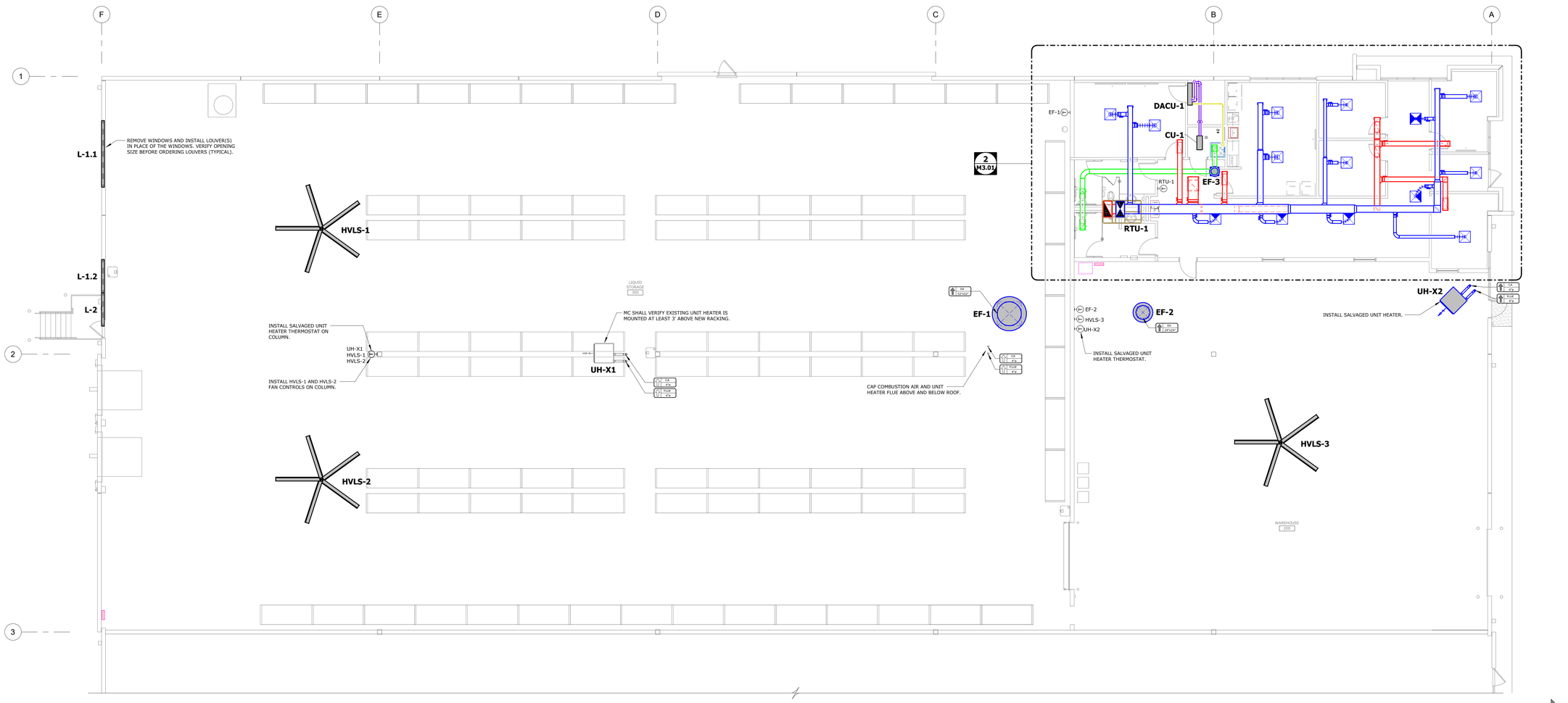
5. EQUIPMENT AND ITEMS TO BE RELOCATED ARE IDENTIFIED ON THE PLANS AND/OR EQUIPMENT SCHEDULE(S).

DUCTWORK NEW WORK NOTES:

1. BRANCH DUCTWORK RUNOUTS TO GRILLES/DIFFUSERS SHALL BE THE NECK SIZE OF THE GRILLE/DIFFUSER, UNLESS NOTED OTHERWISE.
2. DUCT SIZES NOTED REPRESENT THE ACTUAL SHEET METAL SIZE. WHERE INTERIOR DUCT LINING IS USED, DUCT SIZES HAVE ALREADY ACCOUNTED FOR THE LINING.
3. SEE SHEETMETAL FITTING DETAILS FOR FITTING CONSTRUCTION REQUIREMENTS. CONSULT ENGINEER IF UNCERTAIN WHICH TYPE OF FITTING IS REQUIRED IN A SPECIFIC LOCATION.
4. DO NOT INSTALL ANY DUCTWORK BENEATH OR ADJACENT TO ANY EQUIPMENT THAT WOULD HINDER MAINTENANCE ACCESS TO EQUIPMENT OR THE FUTURE REMOVAL OF EQUIPMENT.



KEY PLAN
NO SCALE



FIRST FLOOR - DUCTWORK AND PIPING PLAN

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

PATRICK W. KLANAC NUMBER 29264 PROFESSIONAL ENGINEER STATE OF MISSOURI
6-15-2025

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PROJECT:

TENANT IMPROVEMENT PLANS FOR:
SONNY'S
2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402

DRAWN BY: PTA, INC. | CHECKED BY: JSC

DRAWING TITLE:
FIRST FLOOR
MECHANICAL PLAN

SHEET #:
M2.01

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DRAWING INTERPRETATION NOTES:

1. EXISTING LINETYPE: THIN (LIGHT) SOLID LINES REPRESENT ITEMS THAT ARE EXISTING TO REMAIN OR ARE FURNISHED BY OTHERS.
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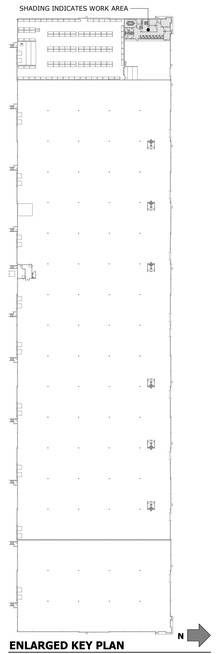
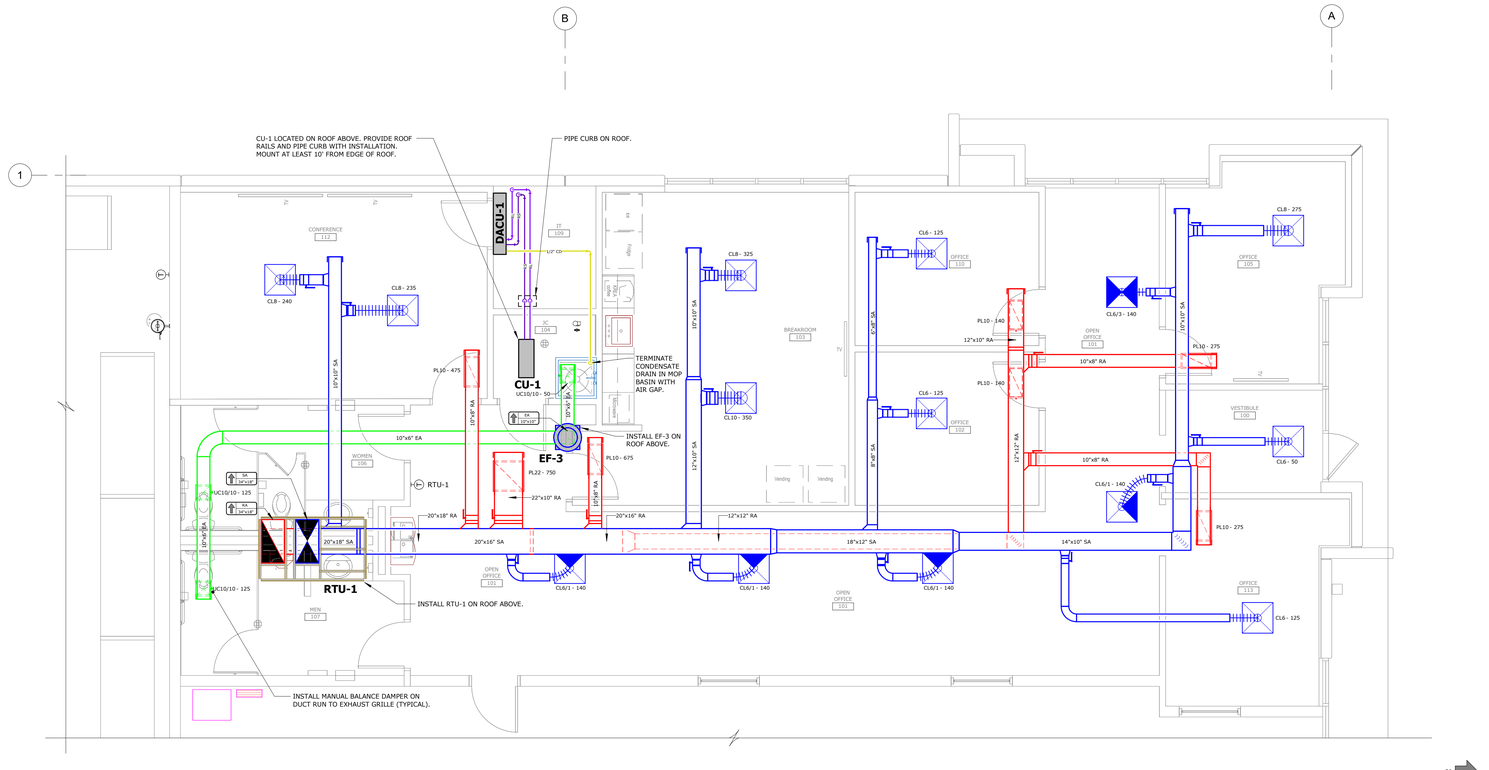
3. SEE SHEETMETAL FITTING DETAILS FOR FITTING CONSTRUCTION REQUIREMENTS. CONSULT ENGINEER IF UNCERTAIN WHICH TYPE OF FITTING IS REQUIRED IN A SPECIFIC LOCATION.
4. DO NOT INSTALL ANY DUCTWORK BENEATH OR ADJACENT TO ANY EQUIPMENT THAT WOULD HINDER MAINTENANCE ACCESS TO EQUIPMENT OR THE FUTURE REMOVAL OF EQUIPMENT.

REFRIGERANT SYSTEM NEW WORK NOTES:

1. CONSULT WITH EQUIPMENT MANUFACTURER FOR FINAL REQUIRED PIPE SIZES. ANY SIZES SHOWN ON THESE DOCUMENTS SHALL BE CONSIDERED APPROXIMATE, FOR PRICING PURPOSES ONLY.



ENLARGED KEY PLAN
NO SCALE



2 / M2.01 FIRST FLOOR - ENLARGED DUCTWORK AND PIPING PLAN
1/4" = 1'-0"

STATE OF MISSOURI
PATRICK W. KLANAC
NUMBER 29264
PROFESSIONAL ENGINEER
6-15-2025

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PROJECT:

TENANT IMPROVEMENTS FOR:
SONNY'S
2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402

DRAWN BY: PTA, INC. | CHECKED BY: JSC

DRAWING TITLE:
FIRST FLOOR
ENLARGED MECHANICAL
PLANS

SHEET #:
M3.01

23 22 10 - GRILLE AND DIFFUSER - CEILING DIFFUSER SCHEDULE

NOTES: APPLICABLE TO EACH MARK
1. COLOR SHALL BE WHITE UNLESS NOTED OTHERWISE.
2. ORIENT GRILLE BLADES PARALLEL TO LONG DIMENSION FOR CEILING APPLICATIONS, ORIENT PARALLEL WITH FLOOR FOR WALL MOUNTED APPLICATIONS.
3. SHEET METAL VISIBLE THROUGH THE GRILLE CORE SHALL BE PAINTED BLACK.
4. DIFFUSERS TAGGED 'EXS' AND 'EXR' ARE EXISTING FIXTURES. CLEAN TO LIKE NEW CONDITION. BALANCE AIRFLOW AS INDICATED.

OPTIONS/ACCESSORIES:
1. MANUFACTURER SHALL FURNISH SURFACE MOUNTED REGISTERS AND GRILLES WITH STANDARD FLAT 1-1/4" THICK BORDER.

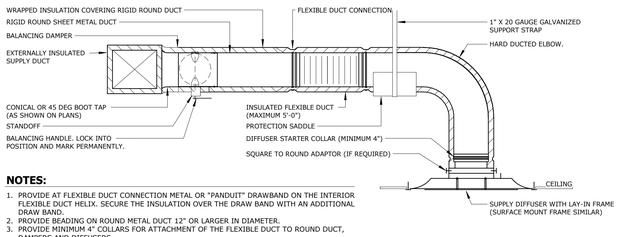
MARK	SERVICE	PRICE MODEL #	OVERALL SIZE	NECK SIZE	THROW TYPE	MOUNTING TYPE	MAX FLOW	MAX NC	OPTIONS/ACCESSORIES
CL6	SUPPLY	SPD	24"x24"	6" DIA	4 WAY	LAY-IN	210 CFM	25	
CL6/1	SUPPLY	SPD	24"x24"	6" DIA	3 WAY	LAY-IN	210 CFM	25	
CL6/3	SUPPLY	SPD	24"x24"	6" DIA	2 WAY	LAY-IN	210 CFM	25	
CL8	SUPPLY	SPD	24"x24"	8" DIA	4 WAY	LAY-IN	330 CFM	25	
CL10	SUPPLY	SPD	24"x24"	10" DIA	4 WAY	LAY-IN	470 CFM	25	
PL10	RETURN	80	24"x12"	22" x 10"	-	LAY-IN	960 CFM	25	
PL22	RETURN	80	24"x24"	22" x 22"	-	LAY-IN	2000 CFM	25	
UC10/10	EXHAUST	535/F/L	12"x12"	10"x10"		CEILING	310 CFM	25	

23 50 11 - DOWN-BLAST CENTRIFUGAL ROOF FANS

NOTES:
1. PROVIDE ROOF CURB BY MANUFACTURER.
2. PROVIDE WIRE MESH BIRD SCREEN BY MANUFACTURER.

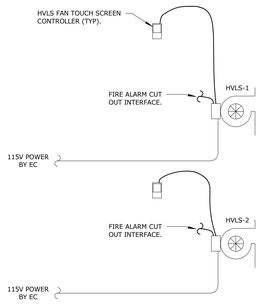
OPTIONS:
1. PROVIDE WITH EC MOTOR AND INTEGRAL SPEED CONTROLLER.
2. MC SHALL FURNISH A MOTOR OPERATED DAMPERS AND FIELD INSTALL. TCC SHALL FURNISH AND FIELD INSTALL DAMPER ACTUATOR.
3. MANUFACTURER SHALL FURNISH GRAVITY DAMPER AND MC SHALL FIELD INSTALL.
4. PROVIDE AUTO BELT TENSIONER BY MANUFACTURER.
5. PROVIDE DRIVE TYPE (BELT DRIVE OR DIRECT DRIVE WITH ECM MOTOR AND INTEGRAL SPEED CONTROLLER).
6. MANUFACTURER TO FURNISH FACTORY INSTALLED DISCONNECT SWITCH
7. EC TO FURNISH AND INSTALL MANUAL MOTOR STARTER AND REMOTE START/STOP RELAY.
8. EC TO FURNISH AND INSTALL COMBINATION STARTER/DISCONNECT
9. MANUFACTURER SHALL PROVIDE ROOF CURB RATED FOR SEISMIC APPLICATIONS.
10. INTERLOCK EXHAUST FAN WITH CORRESPONDING MOD.

MARK	MANUFACTURER	MODEL	SERVICE	FAN DATA CFM	FAN DATA ESP	FAN DATA FAN RPM	DRIVE TYPE	MOTOR RPM	ROOF CURB HEIGHT	ISOLATION DAMPER	ELECTRICAL DATA VOLTS/PHASE	HP	BHP	DISCONNECT BY	STARTER	OPTIONS/ACCESSORIES
EF-1	GREENHECK	GB-480-50	LIQUID STORAGE 300	17,000	0.25"	337	BELT	1725	1'-0"	GRAVITY	460/3	5	2.64	BY MFR	BY EC	3,5,6,9,10
EF-2	GREENHECK	G-240-VG	WAREHOUSE 200	5,000	0.5"	720	DIRECT	870	1'-0"	GRAVITY	460/3	2	0.98	BY MFR	BY EC	3,5,6,9,10
EF-3	GREENHECK	G-095-VG	BATHROOM EXHAUST	300	0.5"	1481	DIRECT	1725	1'-0"	GRAVITY	115/1	1/6	0.08	BY MFR	BY EC	3,5,6,9,10

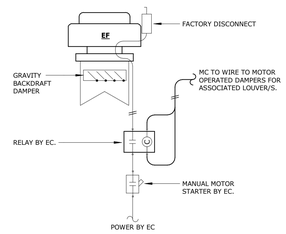


NOTES:
1. PROVIDE AT FLEXIBLE DUCT CONNECTION METAL OR "PANDUIT" DRAWBAND ON THE INTERIOR FLEXIBLE DUCT HELIX. SECURE THE INSULATION OVER THE DRAW BAND WITH AN ADDITIONAL DRAW BAND.
2. PROVIDE BEADING ON ROUND METAL DUCT 12" OR LARGER IN DIAMETER.
3. PROVIDE MINIMUM 4" COLLARS FOR ATTACHMENT OF THE FLEXIBLE DUCT TO ROUND DUCT, DAMPERS AND DIFFUSERS.
4. BAND RIGID ROUND DUCT INSULATION TO DUCT AND PROVIDE TAPE FOR INSULATION OVERLAP.

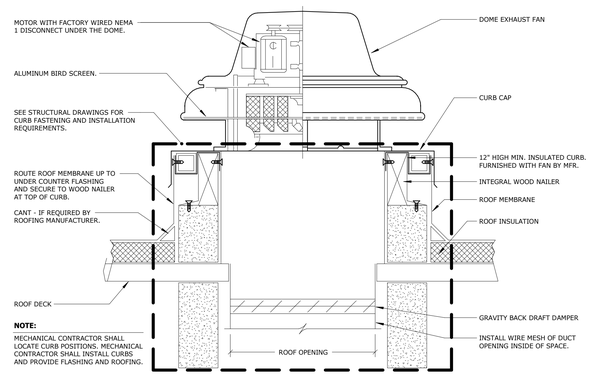
1 SUPPLY AIR DIFFUSER CONNECTION DETAIL
NO SCALE



2 HVLS FAN CONTROL
NO SCALE



3 CENTRIFUGAL ROOF EXHAUST FAN CONTROL DETAIL (EF-1 & 2)
NO SCALE



NOTE:
MECHANICAL CONTRACTOR SHALL LOCATE CURB POSITIONS. MECHANICAL CONTRACTOR SHALL INSTALL CURBS AND PROVIDE FLASHING AND ROOFING.

4 CENTRIFUGAL ROOF EXHAUST FAN INSTALLATION DETAIL - FLAT ROOF
NO SCALE

23 23 10 - LOUVER SCHEDULE

NOTES:
1. FURNISH WITH WIRE MESH ALUMINUM BIRD SCREEN.
2. VERIFY SIZING WITH FIELD CONDITIONS BEFORE ORDERING.

OPTIONS AND ACCESSORIES:
1. FURNISH WITH INTEGRAL MOTOR OPERATED DAMPERS (120V). MOD SHALL BE INTERLOCKED WITH CORRESPONDING EXHAUST FAN (SEE ASSOCIATED EQUIPMENT COLUMN). DAMPER SHALL BE OPEN WHEN FAN IS RUNNING.

MARK	MANUFACTURER	MODEL	FREE AREA RATIO	ASSOCIATED EQUIPMENT	SERVICE	OVERALL DIMENSIONS WIDTH	OVERALL DIMENSIONS HEIGHT	OVERALL DIMENSIONS DEPTH	PERFORMANCE CFM	PERFORMANCE FREE AREA VELOCITY	PERFORMANCE MAX APD (IN. W.G.)	MOUNTING HEIGHT	OPTIONS/ACCESSORIES
L-1.1	GREENHECK	EAC-601	0.46	EF-1	WAREHOUSE	144"	48"	6"	11,334	508	0.03	26' - 0"	1
L-1.2	GREENHECK	EAC-601	0.46	EF-1	WAREHOUSE	72"	48"	6"	5,666	518	0.03	26' - 0"	1
L-2	GREENHECK	EAC-601	0.46	EF-2	WAREHOUSE	72"	48"	6"	5,000	457	0.03	26' - 0"	1

HVLS FAN SCHEDULE

REMARKS:

MARK	MANUFACTURER	MODEL	TYPE	CFM	COVERAGE AREA (SF)	IMPELLER DIA (FT)	FAN RPM	ELECTRICAL DATA FLA	ELECTRICAL DATA VOLTS/PHASE	ELECTRICAL DATA DISCONNECT SWITCH
HVLS-1	GREENHECK	DS-3-16-70HV	HIGH VOLUME, LOW SPEED CEILING FAN	102,560	8,750	16	97	2.5	460/3	BY EC
HVLS-2	GREENHECK	DS-3-16-70HV	HIGH VOLUME, LOW SPEED CEILING FAN	102,560	8,750	16	97	2.5	460/3	BY EC
HVLS-3	GREENHECK	DS-3-18-70HV	HIGH VOLUME, LOW SPEED CEILING FAN	60,759	5,100	18	87	2.5	460/3	BY EC

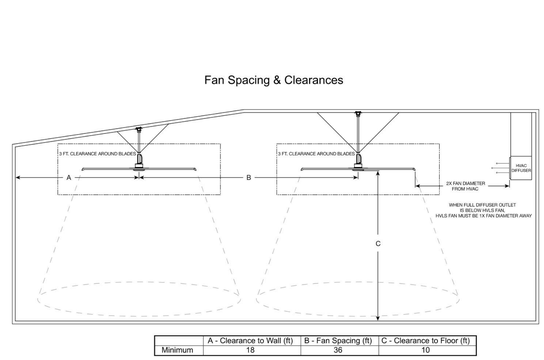
DUCTLESS AIR CONDITIONING UNIT SCHEDULE

NOTES:
1. PROVIDE WITH WIRED WALL MOUNTED THERMOSTAT.
2. PROVIDE WITH CONDENSATE PUMP.

MARK	MANUFACTURER	MODEL	TYPE	SERVICE	CFM	NOMINAL TONNAGE	TOTAL MBH	SENSIBLE HEAT FACTOR	ELECTRICAL DATA VOLTS/PHASE	ELECTRICAL DATA FLA	ELECTRICAL DATA MCA	ELECTRICAL DATA DISCONNECT	ASSOCIATED UNIT
DACU-1	TRANE	TPKA0A0121LA10A	HIGH WALL	IT ROOM	853	1	12,000	0.88	208-230/1	0.19	1	BY EC	CU-1

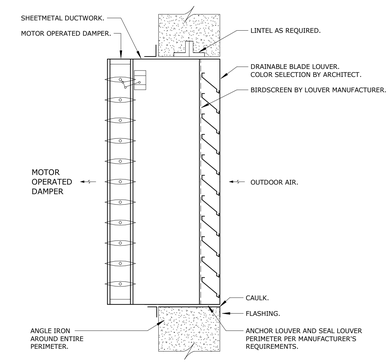
AIR COOLED CONDENSING UNITS (CU)

MARK	MANUFACTURER	MODEL	COOLING MBH	HEATING MBH	AMBIENT TEMPERATURE DESIGN	AMBIENT TEMPERATURE LOW	REFRIGERANT TYPE	EER2	ELECTRICAL DATA VOLTS/PHASE	ELECTRICAL DATA MCA	ELECTRICAL DATA MOCP	ELECTRICAL DATA DISCONNECT BY	ASSOCIATED UNIT	WEIGHT
CU-1	TRANE	TRUZA0121KA70NA	12,000	18,000	95°F DB/75°F WB	0 °F	R410A	13.3	208/230-1	11.0	28	BY EC	DACU-1	93 LBS

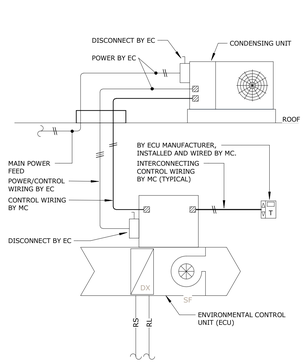


	A - Clearance to Wall (ft)	B - Fan Spacing (ft)	C - Clearance to Floor (ft)
Minimum	18	36	10

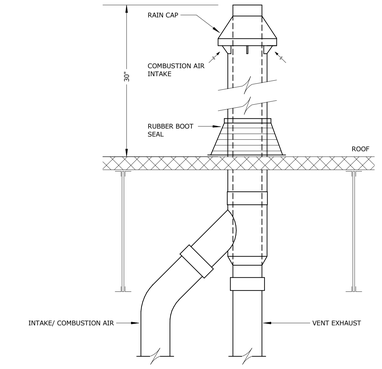
5 HVLS FAN INSTALLATION DETAIL
NO SCALE



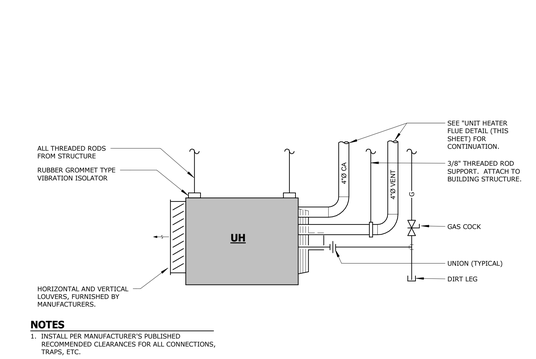
6 LOUVER INSTALLATION DETAIL
NO SCALE



7 DACU CONTROL DIAGRAM - STAND ALONE
NO SCALE

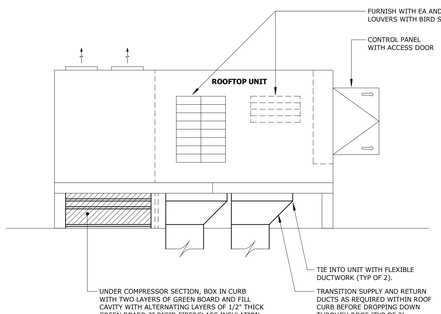


8 UNIT HEATER FLUE DETAIL
NO SCALE



NOTES
1. INSTALL PER MANUFACTURER'S PUBLISHED RECOMMENDED CLEARANCES FOR ALL CONNECTIONS, TRAPS, ETC.

9 GAS-FIRED UNIT HEATER DETAIL
NO SCALE



10 ROOFTOP UNIT INSTALLATION DETAIL
NO SCALE

Sonny's Direct Kansas City, Missouri Renovation

Missouri Mechanical Code Ventilation Requirement Calculations

OA% 12

Room Name	Classification	Area (ft^2)	# of Ppl	MMC Outdoor Air (OA) Requirements OA per person	OA per SF	Min. OA CFM	Min. OA Driven CFM	SELECTED MAX CFM
Office 105	Office Space	152	1	5	0.06	14	118	275
Vestibule	Main Entry Lobby	68	0	5	0.06	4	34	50
Office 113	Office Space	142	1	5	0.06	14	113	125
Open Office 101	Office Space	757	7	5	0.06	80	670	700
Office 110	Office Space	120	1	5	0.06	12	102	125
Office 102	Office Space	120	1	5	0.06	12	102	125
Breakroom 103	Multipurpose Assembly	344	4	5	0.06	41	339	675
Conference	Office Space	269	8	5	0.06	56	468	475

23 60 10 - PACKAGED RTU SCHEDULE (PART 1)

NOTES:
1. PROVIDE WITH THROUGH THE BASE ELECTRIC.
2. PROVIDE WITH NON-FUSED DISCONNECT.
3. PROVIDE WITH 2" MERV 8 FILTERS.

OPTIONS/ACCESSORIES:
1. PROVIDE WITH PROGRAMMABLE THERMOSTAT.
2. PROVIDE WITH POWERED GFCI, 120V15A, 2 PLUG, CONVENIENCE OUTLET WITH A SERVICE RECEPTABLE DISCONNECT.
3. PROVIDE WITH ECONOMIZER WITH BAROMETRIC RELIEF.
4. PROVIDE WITH MODULATING HOT GAS REHEAT.

MARK	MANUFACTURER	MODEL	GENERAL UNIT AIRFLOW SUPPLY	GENERAL UNIT AIRFLOW OA	GENERAL WEIGHT	SUPPLY FAN DATA ESP	SUPPLY FAN DATA TSP	SUPPLY FAN DATA FAN TYPE	SUPPLY FAN DATA FAN RPM	SUPPLY FAN DATA DRIVE	SUPPLY FAN DATA BHP	SUPPLY FAN DATA MHP	OPTIONS/ACCESSORIES
RTU-1	TRANE	YSK072A450L	2600	312	1480 LBS	0.750 IN WC	1.015 IN WC	BC PLENUM	1112	DIRECT	0.939	3	1,2,3,4

23 60 10 - PACKAGED RTU SCHEDULE (PART 2)

NOTES:
1.

OPTIONS/ACCESSORIES:
1.

MARK	DIRECT EXPANSION COOLING COIL DATA TOTAL MBH	SENSIBLE MBH	ENTERING AIR DRY BULB	ENTERING AIR WET BULB	LEAVING AIR DRY BULB	LEAVING AIR WET BULB	STAGES OF COOLING	QTY. OF REFRIGERANT CIRCUITS	REFRIGERANT TYPE	COMPRESSOR QUANTITY	COMPRESSOR TYPE	EFFICIENCY DATA EER	EFFICIENCY DATA IEER/SEER	GAS HEAT EAT	GAS HEAT LAT	GAS HEAT MAX INPUT (MBH)	GAS HEAT MAX OUTPUT (MBH)	FILTER EFFICIENCY	FILTER THICKNESS	ELECTRICAL DATA VOLTS/PHASE	ELECTRICAL DATA MCA	ELECTRICAL DATA MOCP
RTU-1	80.66	66.01	81.24 °F	66.43 °F	57.49 °F	56.41 °F	3	1	R-454B	2	SCROLL	11.0	14.6	52.32 °F	75.10 °F	80.0	64.80	MERV 8	2"	460/3	20	25

STATE OF MISSOURI
PATRICK W. KLANAC NUMBER 29264
PROFESSIONAL ENGINEER
6-15-2025
SEAL

FOUNDATION ARCHITECTURE, LLC
740 MARKS ROAD - SUITE A, VALLEY CITY, OHIO 44208

pta engineering
275 Springside Dr., Suite 300
Akron, Ohio 44333
Phone: 330-666-3702
ptaengineering.com

PROJECT:

TENANT IMPROVEMENTS FOR:
SONNY'S
2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402

DRAWN BY: PTA, INC. CHECKED BY: JSC

DRAWING TITLE:
MECHANICAL SCHEDULES AND DETAILS

SHEET #:
M4.01

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MECHANICAL SPECIFICATIONS

HVAC

23 00 10 DOCUMENT INTERPRETATION AND GENERAL REQUIREMENTS

A. IN GENERAL, HVAC WORK FOR THIS PROJECT SHALL CONSIST OF, BUT NOT LIMITED TO, NEW SUPPLY DIFFUSERS AND MINOR DUCTWORK REVISIONS AND INSTALLATION OF NEW EXHAUST FANS, LOUVERS, HIGH VOLUME, LOW SPEED FANS, AND A GAS-FIRED UNIT ROOFTOP UNIT.

B. FURNISH ALL LABOR, CONSTRUCTION EQUIPMENT AND MATERIALS NECESSARY FOR THE COMPLETE INSTALLATION OF THE HVAC SYSTEMS AS INDICATED. ALL WORK SHALL BE IN STRICT COMPLIANCE WITH ALL GOVERNING STATE AND LOCAL CODE REQUIREMENTS, IN FULL CONFORMITY WITH THE BEST CURRENT TRADE PRACTICES AND SUBJECT TO APPROVAL OF THE ARCHITECT/ENGINEER OR HIS REPRESENTATIVE.

C. ALL WORK DETAILS NOT COVERED IN THESE SPECIFICATIONS SHALL BE GOVERNED BY THE REQUIREMENTS OF THE LATEST EDITION OF THE MISSOURI MECHANICAL CODE AND NFPA-99.

D. INSTALLER SHALL BE LICENSED BY THE STATE OF MISSOURI AS A MECHANICAL CONTRACTOR.

E. WORK INCLUDED UNDER THIS DIVISION SHALL CONSIST OF FURNISHING ALL MATERIALS, SUPPLIES, EQUIPMENT, TOOLS, TRANSPORTATION, FACILITIES AND PERFORMING ALL LABOR AND SERVICES NECESSARY FOR THE COMPLETE INSTALLATION OF THE HVAC SYSTEMS SHOWN.

F. THIS CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE WORK TO BE DONE UNDER OTHER DIVISIONS OF THIS SPECIFICATION AND THEIR RELATED DRAWINGS AND SHALL SO COORDINATE AND SCHEDULE HIS WORK AS NOT TO CAUSE DELAYS OR INTERFERENCE WITH THE WORK OF OTHERS.

G. ALL ITEMS OF LABOR, MATERIAL AND EQUIPMENT NOT SPECIFICALLY MENTIONED HEREIN OR SHOWN ON PLANS, BUT INCIDENTAL TO, OR REQUIRED FOR THE COMPLETE INSTALLATION AND PROPER OPERATION OF THE WORK, SHALL BE FURNISHED AS IF CALLED FOR IN DETAIL BY THE SPECIFICATIONS OR DRAWINGS.

H. THE DESIGN DRAWINGS ARE DIAGRAMMATIC, INDICATING GENERAL ARRANGEMENT, AND LOCATIONS OF EQUIPMENT, DUCTWORK AND PIPING. VERIFY DIMENSIONS IN THE FIELD; ADJUST TO MANUFACTURER'S SHOP DRAWINGS. DO NOT SCALE DRAWINGS. PIPING, DUCTWORK, AND EQUIPMENT ARE TO BE INSTALLED ALONG THE GENERAL PLANS SHOWN ON THE DRAWINGS, BUT KEEPING IN MIND ACTUAL BUILDING CONDITIONS WHICH MUST BE CONFORMED WITHIN THE ACTUAL WORK.

I. DETERMINE SIZES AND LOCATIONS FOR CHASES AND OPENINGS NECESSARY FOR INSTALLATION OF THE WORK. COOPERATE WITH OTHER TRADES IN SETTING SLEEVES, INSERTS AND HANGERS.

J. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND SHALL CONFORM TO UNDERWRITERS' LABORATORIES STANDARDS, WHERE APPLICABLE. WHERE SPECIFICATIONS DESCRIBE, OR PLANS SHOW, MATERIALS OR EQUIPMENT OF HIGHER QUALITY THAN REQUIRED BY CODE AND LOCAL RULING, THE DRAWINGS AND SPECIFICATIONS SHALL GOVERN THE QUALITY OF THE MATERIAL OR EQUIPMENT.

K. COOPERATE WITH ALL TRADES IN PREPARING INTERFERENCE DRAWINGS FOR LOCATIONS WHERE THERE IS POSSIBLE CONFLICT BETWEEN TRADES. EXACT LOCATION OF PIPES, DUCTS, AND CONDUIT BASED ON FIELD MEASUREMENTS WITH FINAL ARRANGEMENT DETERMINED BY INTRA-TRADE AGREEMENTS SUBJECT TO ARCHITECT/ENGINEER'S APPROVAL.

L. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER BY FIRST-CLASS MECHANICS. THE CONTRACTOR SHALL PROVIDE ADEQUATE AND COMPETENT SUPERVISION OF THE JOB AS REQUIRED.

M. DUCTWORK, PIPING, AND EQUIPMENT SHALL BE ARRANGED SUBSTANTIALLY AS INDICATED. ANY CHANGES RESULTING IN A SAVINGS IN LABOR OR MATERIAL SHALL BE MADE ONLY IN ACCORDANCE WITH A CONTRACT CHANGE ORDER. DEVIATIONS SHALL BE MADE ONLY WHERE NECESSARY TO AVOID INTERFERENCES AND ONLY AFTER DRAWINGS SHOWING THE PROPOSED DEVIATIONS HAVE BEEN SUBMITTED TO AND APPROVED BY THE ARCHITECT/ENGINEER.

N. THE ARCHITECT AND ENGINEER RESERVE THE RIGHT TO MAKE REASONABLE CHANGES WITHOUT EXTRA COST TO THE OWNER.

O. COORDINATE ALL SYSTEM SHUT-DOWNS WITH THE OWNER.

P. GENERAL SCOPE OF WORK:

(1) THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL HEATING, VENTILATING, AND AIR CONDITIONING EQUIPMENT AS SHOWN ON THE DRAWINGS INCLUDING PIPING, DUCTWORK, INSULATION, AND CONTROLS.

(2) EACH CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOLITION WORK SHOWN ON THE DRAWINGS. DEMOLITION WORK SHALL INCLUDE REMOVAL, CUTTING AND PATCHING, SALVAGE, AND LEGAL DISPOSAL AS APPLICABLE TO THE PROJECT.

Q. VISIT TO THE SITE:

(1) EACH CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND BECOME FAMILIAR WITH ALL CONDITIONS AFFECTING THE WORK. THE SUBMISSION OF A PROPOSAL SHALL PRESUPPOSE KNOWLEDGE OF ALL SUCH CONDITIONS.

R. PROTECTION OF WORK AND PROPERTY:

(1) EACH CONTRACTOR SHALL BE RESPONSIBLE FOR SAFEGUARDING WORK, PROPERTY AND FACILITIES AGAINST DAMAGE, BOTH HIS OWN AS WELL AS OTHERS, WITH WHICH HE MAY COME INTO CONTACT IN THE PERFORMANCE OF HIS WORK.

(2) STORED MATERIALS SHALL BE PROTECTED AGAINST DAMAGE FROM WEATHER. PIPE OPENINGS SHALL BE CLOSED WITH CAPS OR PLUGS DURING INSTALLATION. ALL EQUIPMENT SHALL BE COVERED AND PROTECTED AGAINST INJURY. ANY MATERIALS OR EQUIPMENT DAMAGED AT ANY STAGE IN THE CONSTRUCTION SHALL BE REPLACED OR REPAIRED AND AT THE FINAL COMPLETION, ALL WORK SHALL BE IN A CLEAN, UNBLEMISHED CONDITION.

(3) EACH CONTRACTOR SHALL PROVIDE ALL NECESSARY PROTECTION FROM DIRT, FUMES, AND WATER DURING CONSTRUCTION. PROTECTION METHODS ARE SUBJECT TO APPROVAL BY THE ARCHITECT.

S. MATERIAL STORAGE:

(1) EACH CONTRACTOR SHALL MAKE PROVISIONS FOR THE DELIVERY AND SAFE STORAGE OF HIS MATERIALS AND EQUIPMENT IN COORDINATION WITH THE WORK OF OTHERS AND AS DIRECTED BY THE ARCHITECT AND OWNER. MATERIALS AND EQUIPMENT SHALL BE DELIVERED AT SUCH STAGES OF THE WORK AS WILL EXPEDITE THE WORK AS A WHOLE AND SHALL BE MARKED AND STORED IN SUCH A WAY AS TO BE EASILY CHECKED AND INSPECTED.

T. GUARANTEE

(1) THIS CONTRACTOR SHALL GUARANTEE FOR A PERIOD OF ONE YEAR THAT ALL WORK AND EQUIPMENT WILL REMAIN FREE FROM ALL DEFECTS IN WORKMANSHIP AND MATERIALS, AND THAT IT WILL COMPLY WITH ALL THE SPECIFIC REQUIREMENTS OF THE SPECIFICATIONS AND OTHER CONTRACT DOCUMENTS GOVERNING THE WORK.

(2) ALL WORK FOUND BY THE ARCHITECT/ENGINEER TO BE DEFECTIVE WILL BE REPLACED WITH NEW WORK MEETING ALL THE REQUIREMENTS OF THE CONTRACT. THIS CONTRACTOR WILL BEAR ALL COSTS OF SUPPLYING SUCH NEW WORK, AND INSTALLING AND FINISHING SAME, AND WILL ASSUME ALL COSTS FOR REPLACING OTHER WORK DAMAGED BY THE REMOVAL AND REPLACEMENT OF ANY OF THE WORK. THIS CONTRACTOR WILL BEAR ALL COSTS FOR FREIGHT, DRAYAGE AND DEMURRAGE, AND ALL LABOR IN CONNECTION THEREWITH.

U. SUBSTITUTIONS

(1) BIDDERS DESIRING TO MAKE A SUBSTITUTION FOR AN ALTERNATIVE EQUIPMENT MANUFACTURER, MATERIAL OR INSTALLATION METHOD NOT LISTED IN THE SPECIFICATIONS SHALL SUBMIT A WRITTEN REQUEST FOR A SUBSTITUTION TO THE ARCHITECT A MINIMUM OF FIVE WORKING DAYS PRIOR TO THE BID DUE DATE. THE SUBSTITUTION PROPOSAL SHALL INCLUDE THE FOLLOWING:

(2) PROPOSED SUBSTITUTION STATEMENT NAMING THE ALTERNATIVE MANUFACTURER, MATERIAL OR INSTALLATION METHOD.

(3) ALONG WITH EACH PROPOSAL, EACH EQUIPMENT SUPPLIER SHALL SUBMIT AN EQUIPMENT OR MATERIALS INFORMATION BINDER FOR REVIEW. EACH BINDER SHALL CONTAIN DETAILED EQUIPMENT INFORMATION, MATERIALS AND SPECIFICATIONS FOR EACH PIECE OF EQUIPMENT OR MATERIALS PROPOSED TO BE FURNISHED.

(4) ALONG WITH EACH PROPOSAL, THE CONTRACTOR SHALL PROVIDE MODIFIED DRAWINGS SHOWING THE INSTALLATION OF THE PROPOSED EQUIPMENT.

(5) ALONG WITH EACH PROPOSAL, EACH EQUIPMENT SUPPLIER SHALL SUBMIT A COMPLIANCE REVIEW RESPONSE TO THE AFFECTED CONTRACT DOCUMENT SPECIFICATIONS. THE REVIEW SHALL BE PARAGRAPH BY PARAGRAPH DESIGNATING IN THE FRONT OF EACH PARAGRAPH-SPECIFICATION COMPLIANCE WITH A "C", DEVIATION WITH A "D", OR EXCEPTION WITH AN "E". THE REASON FOR EACH PROPOSED DEVIATION AND EXCEPTION SHALL BE GIVEN ALONG WITH SUFFICIENT DETAIL TO CLEARLY EXPLAIN/SHOW ALL DEVIATIONS AND EXCEPTIONS. KEY DEVIATION OR EXCEPTION INFORMATION INCLUDES:

(A) THE EFFECT ON PERFORMANCE OVER THE ENTIRE RANGE OF EQUIPMENT OR SYSTEM OPERATION, INCLUDING THE EFFECT ON SYSTEM EFFICIENCIES.

(B) THE EFFECT ON THE WORK OF OTHER TRADES CAUSED BY THE PROPOSED SUBSTITUTION.

(6) ACCEPTANCE OR REJECTION OF THE PROPOSED SUBSTITUTIONS SHALL BE SUBJECT TO APPROVAL BY THE ARCHITECT, ENGINEER OR OWNER.

23 00 20 CODES, STANDARDS, AND REGULATORY REQUIREMENTS

A. INSTALL WORK IN FULL ACCORDANCE WITH RULES AND REGULATIONS OF STATE, COUNTY AND CITY AUTHORITIES HAVING JURISDICTION OVER PREMISES. THIS SHALL INCLUDE SAFETY REQUIREMENTS OF OSHA.

B. THIS CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND CERTIFICATES OF INSPECTION REQUIRED FOR THIS WORK.

C. DELIVER ALL CERTIFICATES AND OFFICIAL RECORDS OF APPROVAL, BY GOVERNING AGENCIES, TO THE ARCHITECT.

D. INSTALL WORK IN FULL ACCORDANCE WITH RULES AND REGULATIONS OF STATE, COUNTY AND CITY AUTHORITIES HAVING JURISDICTION OVER PREMISES. THIS SHALL INCLUDE SAFETY REQUIREMENTS OF THE STATE AND OSHA.

E. REFERENCE TO THE CODES AND STANDARDS LISTED SHALL CONSTITUTE THE MINIMUM ACCEPTABLE REQUIREMENTS. NOTHING IN THE SPECIFICATIONS SHALL BE CONSTRUED TO PERMIT DEVIATION FROM THE REQUIREMENTS OF THE GOVERNING CODE. WHERE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS EXCEED THOSE OF THE CODE LISTED, FOLLOW THE DRAWINGS AND SPECIFICATIONS.

F. ALL WIRING SHALL BE IN COMPLIANCE WITH THE CURRENT EDITION OF THE NATIONAL ELECTRIC CODE, APPLICABLE STATE CODE, APPLICABLE LOCAL (CITY) CODE, AND OSHA. IN CASES OF CONFLICT BETWEEN CODE AND SPECIFICATIONS, THE MORE RESTRICTIVE REQUIREMENTS SHALL GOVERN.

G. ALL EQUIPMENT, MATERIALS AND INSTALLATION METHODS SHALL COMPLY WITH THE FOLLOWING CODES, WHERE APPLICABLE:

(1) BUILDING OFFICIALS AND CODE ADMINISTRATORS INTERNATIONAL (BOCA)
(2) CODES AND STANDARDS ASSOCIATION (CSA)
(3) INTERNATIONAL BUILDING CODE (IBC)
(4) INTERNATIONAL MECHANICAL CODE (IMC)
(5) NATIONAL ELECTRIC CODE (NEC)
(6) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
(7) NATIONAL PRESSURE VESSEL CODE
(8) STANDARD BUILDING CODES (SBC)
(9) STANDARD MECHANICAL CODES (SMC)
(10)UNIFORM BUILDING CODES (UBC)
(11)UNIFORM MECHANICAL CODES (UMC)

H. ALL EQUIPMENT. MATERIALS AND, INSTALLATION METHODS SHALL COMPLY WITH THE FOLLOWING STANDARDS, WHERE APPLICABLE:

(1) AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
(2) AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
(3) AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
(4) AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)
(5) AMERICAN WATER WORKS ASSOCIATION (AWWA)
(6) AMERICAN WELDING SOCIETY (AWS)
(7) BUILDING OFFICIALS AND CODE ADMINISTRATORS INTERNATIONAL (BOCA)
(8) CAST IRON SOIL PIPE INSTITUTE (CISPI)
(9) CODES AND STANDARDS ASSOCIATION (CSA)
(10)FLUID SEALING ASSOCIATION (FSA)
(11)INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS (IAPMO)
(12)NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)
(13)NATIONAL PRESSURE VESSEL CODE
(14)NATIONAL SANITATION FOUNDATION (NSF)
(15)NATIONAL SCIENCE FOUNDATION (NSF)
(16)PLASTIC PIPE INSTITUTE (PPI)
(17)SHEETMETAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC. (SMACNA)
(18)UNDERWRITER'S LABORATORIES OF CANADA (ULC)
(19)UNDERWRITER'S LABORATORIES, INC. (UL)

I. EACH CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND INSPECTIONS REQUIRED FOR THE INSTALLATION OF THE WORK SHOWN. ALL PERMITS AND CERTIFICATES OF INSPECTION AND APPROVAL SIGNED BY THE CONTROLLING BUILDING DEPARTMENT OR AUTHORITY HAVING JURISDICTION SHALL BECOME PROPERTY OF THE OWNER. DELIVER ALL CERTIFICATES TO THE OWNER IN DUPLICATE.

J. ALL EQUIPMENT, MATERIALS AND INSTALLATION SHALL COMPLY WITH THE NATIONAL FIRE PROTECTION ASSOCIATION'S "NATIONAL FIRE CODES" AND "NATIONAL ELECTRICAL CODE". EQUIPMENT SHALL BEAR THE "UL" LABEL AS REQUIRED BY THESE CODES.

K. FOLLOWING COMPLETION OF THE WORK:

(1) FURNISH TO THE OWNER, DUPLICATE CERTIFICATES OF INSPECTION AND APPROVAL BY REGULATORY AGENCIES HAVING JURISDICTION.

(2) DEMONSTRATE TO THE OWNER'S SATISFACTION THE PROPER OPERATION OF EACH OF THE SYSTEMS COMPRISING THIS CONTRACT BEFORE FINAL PAYMENT.

(3) TEST PIPING FOR LEAKS; REPAIR LEAKS IN COPPER TUBING BY SWEATING OUT JOINTS, THOROUGHLY CLEANING BOTH TUBE AND FITTING, AND RESOLDERING OR REBRAZING; CORRECT LEAKS IN SCREWED JOINTS BY REPLACING THREAD OR FITTING OR BOTH.

(4) IMMEDIATELY CORRECT ANY WORK FOUND AT VARIANCE WITH THESE SPECIFICATIONS, THE NATIONAL, STATE, AND LOCAL CODES, AND REQUIREMENTS OF GOVERNING REGULATORY AGENCIES. COMPLETE ALL PUNCHLIST ITEMS OF THE ARCHITECT AND ENGINEER.

23 00 40 MECHANICAL DEMOLITION AND SALVAGE

A. DEMOLITION WORK - SERVICES

(1) ACTIVE SERVICES: WHEN ENCOUNTERED, SUPPORT ACTIVE MECHANICAL SERVICES AS NECESSARY. IF ACTIVE SERVICES REQUIRE RELOCATION (OTHER THAN THOSE INDICATED ON THE DRAWINGS), OBTAIN WRITTEN INSTRUCTIONS BEFORE PROCEEDING. DO NOT DISTURB ACTIVE SERVICES SCHEDULED TO REMAIN.

(2) INACTIVE OR ABANDONED SERVICES: WHEN ENCOUNTERED, REMOVE INACTIVE AND ABANDONED DUCTWORK AND PIPING FULL LENGTH. REMOVAL SHALL INCLUDE ALL HANGERS AND SUPPORTS. NOTIFY SERVICING UTILITY WHEN ENCOUNTERED OUTSIDE OF STRUCTURE.

(3) INTERRUPTION OF SERVICE: SEE "HVAC SYSTEM SHUT-DOWNS" SECTION FOR PROCEDURES AND REQUIREMENTS.

(4) TIE-INS: IN AREAS WHERE NEW CONSTRUCTION TIES INTO EXISTING FACILITIES OR IN REMODELED AREAS, DISMANTLE THE EXISTING MECHANICAL FACILITIES AS NECESSARY. RELOCATE ANY EXISTING SERVICES INTERFERING WITH CONSTRUCTION.

B. DEMOLITION WORK - GENERAL

(1) REMOVE OR RELOCATE THOSE MECHANICAL SERVICES SPECIFICALLY INDICATED ON THE DRAWINGS AND AS REQUIRED TO COMPLETE DEMOLITION WORK.

(2) REMOVE ALL EXISTING MECHANICAL EQUIPMENT, PIPING, DUCTWORK, DEVICES, CONTROLS AND WIRING IN REMODELED AREAS THAT INTERFERE WITH NEW CONSTRUCTION AND ARE NOT NECESSARY TO MAINTAIN SERVICES THAT ARE TO REMAIN.

(3) RELOCATE, OR EXTEND AS REQUIRED, MECHANICAL EQUIPMENT, PIPING, DUCTWORK, DEVICES AND WIRING THAT INTERFERES WITH NEW CONSTRUCTION AND IS ESSENTIAL TO MAINTAIN SERVICE TO EQUIPMENT AND DEVICES THAT ARE TO REMAIN.

(4) REMOVE OR RELOCATE THOSE MECHANICAL SERVICES SPECIFICALLY INDICATED ON THE DRAWINGS AND AS REQUIRED TO COMPLETE DEMOLITION WORK.

(5) ALL PIPING AND DUCTWORK AND WIRING TO BE REMOVED SHALL BE REMOVED FULL LENGTH BACK TO THE ACTIVE SOURCE.

(6) ALL HOLES OR DAMAGE CAUSED BY THE REMOVAL OF EXISTING WORK SHALL BE PROPERLY PATCHED. HOLES SHALL BE NEATLY PATCHED WITH SUITABLE MATERIALS TO MATCH EXISTING SURFACES.

C. SAFE DISPOSAL OF HAZARDOUS MATERIALS

(1) MECHANICAL CONTRACTOR SHALL SAFELY DISPOSE OF ALL HAZARDOUS MATERIALS ENCOUNTERED IN FULL COMPLIANCE WITH ALL FEDERAL, STATE, AND EPA REGULATIONS.

(2) MECHANICAL CONTRACTOR SHALL IDENTIFY INSTALLED FACILITIES REQUIRING REMOVAL OR MODIFICATION THAT ARE SUSPECTED TO CONTAIN ASBESTOS INSULATION. IF SUSPICIOUS INSULATION IS ENCOUNTERED, THE MECHANICAL CONTRACTOR WILL CEASE DEMOLITION OR MODIFICATIONS AND SHALL NOTIFY THE OWNER.

(3) THE MECHANICAL CONTRACTOR SHALL NOT BE RESPONSIBLE FOR REMOVAL OF ASBESTOS INSULATION.

(4) THE MECHANICAL CONTRACTOR SHALL WORK WITH THE OWNER'S ASBESTOS REMOVAL AND ABATEMENT CONTRACTOR TO PRIORITIZE ABATEMENT WORK AND DEVELOP A SCHEDULE FOR REMOVAL OF HAZARDOUS MATERIALS SO AS NOT TO AFFECT THE MECHANICAL CONTRACTUAL TIMEFRAME.

D. SALVAGE

(1) MECHANICAL EQUIPMENT, PIPING AND DEVICES THAT ARE TO BE REMOVED SHALL BE OFFERED TO THE OWNER FOR SALVAGE. EQUIPMENT, PIPING AND DEVICES SELECTED SHALL BE STORED ON THE SITE AT AREAS DESIGNATED BY THE OWNER.

(2) ALL ITEMS NOT SELECTED FOR SALVAGE BY THE OWNER SHALL BECOME THE PROPERTY OF THE MECHANICAL CONTRACTOR AND SHALL BE REMOVED FROM THE SITE BY THE MECHANICAL CONTRACTOR.

E. CLEAN-UP

(1) INSOFAR AS THIS CONTRACT IS CONCERNED, AT ALL TIMES KEEP PREMISES AND BUILDING IN NEAT AND ORDERLY CONDITION. FOLLOW EXPLICITLY ANY INSTRUCTIONS OF ARCHITECT IN REGARD TO STORING OF MATERIALS, PROTECTIVE MEASURES, AND CLEANING-UP OF DEBRIS.

(2) UPON COMPLETION OF THE WORK, THIS CONTRACTOR SHALL THOROUGHLY CLEAN ALL APPARATUS FURNISHED UNDER THIS CONTRACT, PACK ALL VALVES, AND THOROUGHLY CLEAN ALL PIPING, FIXTURES, AND EQUIPMENT, REMOVING ALL DIRT, GREASE, AND OIL.

(3) AIR HANDLING SYSTEMS SHALL NOT BE OPERATED WITHOUT FILTERS. UPON COMPLETION OF WORK, REPLACE ALL FILTERS.

23 01 20 SHOP DRAWINGS

A. THIS CONTRACTOR SHALL REVIEW, STAMP WITH HIS APPROVAL AND SUBMIT, WITH REASONABLE PROMPTNESS AND IN ORDERLY SEQUENCE SO AS TO CAUSE NO DELAY IN THE WORK OR IN THE WORK OF ANY OTHER CONTRACTOR, ALL SHOP DRAWINGS AND SAMPLES REQUIRED BY THE CONTRACT DOCUMENTS.

B. SUBMISSION OF SHOP DRAWINGS WITHOUT CONTRACTOR REVIEW, SIGNATURE, AND APPROVAL SHALL BE CAUSE FOR REJECTION. SUCH SUBMITTALS SHALL BE RETURNED WITHOUT REVIEW.

C. IF THE SUBMITTAL INCLUDES DEVIATIONS FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL CLEARLY NOTE THE DEVIATIONS "IN RED" ON THE SUBMITTAL.

D. INDICATE SPECIFIC OPTIONS OR ACCESSORIES ON SHOP DRAWINGS BY POINTING TO, CHECKING OFF, OR UNDERLINING. DO NOT USE HIGHLIGHTER.

E. DO NOT REPRODUCE CONTRACT DOCUMENTS OR COPY STANDARD INFORMATION AS THE BASIS OF SHOP DRAWINGS. STANDARD INFORMATION PREPARED WITHOUT SPECIFIC REFERENCE TO THE PROJECT IS NOT CONSIDERED SHOP DRAWINGS AND WILL BE CAUSE FOR REJECTION.

F. IN CHECKING SHOP DRAWINGS, THE ENGINEER AND ARCHITECT WILL MAKE EVERY EFFORT TO DETECT AND CORRECT ERRORS, OMISSIONS AND INACCURACIES IN SUCH DRAWINGS, BUT HIS FAILURE TO DETECT ERRORS, OMISSIONS AND INACCURACIES SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR THE PROPER AND COMPLETE INSTALLATION IN ACCORDANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS.

G. WHERE ONLY ONE MAKE OF EQUIPMENT IS NAMED, IT SHALL BE PROVIDED AS SPECIFIED.

H. VERBAL REQUESTS OF APPROVALS FOR ANY SUBSTITUTION WILL NOT BE BINDING ON THE ARCHITECT, ENGINEER, OR OWNER.

I. ALL SUBMITTALS SHALL BE IN ELECTRONIC FORMAT. ELECTRONIC SUBMITTALS SHALL CONFORM TO THIS SPECIFICATION.

(1) ELECTRONIC SUBMITTALS SHALL BE IN PORTABLE DOCUMENT FORMAT (.PDF).

(A) ELECTRONIC SUBMITTALS SHALL INCLUDE A TRANSMITTAL.

(B) ALL PORTIONS OF THE ELECTRONIC SUBMITTAL SHALL BE BOUND IN A SINGLE .PDF FILE.

(C) FILE SHALL BE NAMED TO MATCH SUBMITTAL NAME AS IT APPEARS IN THE SPECIFICATIONS. EXAMPLE: "GRILLES AND DIFFUSERS".

(D) SUBMITTALS SHALL SPECIFICALLY IDENTIFY ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS.

(2) ELECTRONIC SUBMITTALS SHALL INCLUDE A CONTRACTOR REVIEW STAMP THAT INDICATES REVIEW AND APPROVAL BY THE CONTRACTOR PRIOR TO SUBMISSION.

(3) ELECTRONIC SUBMITTALS SHALL BE TRANSMITTED VIA AN E-MAIL:

(A) PROVIDE ONLY ONE SUBMITTAL PER E-MAIL

(B) E-MAIL SUBJECT LINE SHALL CLEARLY INDICATE:

(4) PROJECT NAME

(5) THAT THE E-MAIL CONTAINS A SUBMITTAL

(6) CONTENTS OF SUBMITTAL

J. FAILURE TO CONFORM THE REQUIREMENTS ABOVE MAY RESULT IN REJECTION.

K. AT THE REVIEWER'S DISCRETION, THE REVIEWER HAS THE OPTION TO RETURN THE SUBMITTALS IN WHATEVER METHOD IS MOST CONVENIENT OR APPROPRIATE FOR THE PROJECT.

L. "BASIS OF DESIGN" EQUIPMENT

(1) WHERE MORE THAN ONE MANUFACTURER IS LISTED IN THE SPECIFICATIONS AS BEING ACCEPTABLE, IT SHALL BE UNDERSTOOD THAT THE "BASIS DESIGN" IS THE MANUFACTURER INCLUDED IN THE EQUIPMENT SCHEDULE OR NOTED WITH THE MODEL NUMBER LISTED. ALL OTHER LISTED MANUFACTURERS ARE CONSIDERED AS ACCEPTABLE ALTERNATIVES. IF INSTALLATION OF AN ACCEPTABLE ALTERNATIVE ALTERS THE DESIGN, ELECTRICAL OR SPACE REQUIREMENTS INDICATED ON THE DRAWINGS, THIS CONTRACTOR SHALL BEAR THE COSTS FOR THE REVISED DESIGN AND CONSTRUCTION INCLUDING COSTS OF ALL TRADES INVOLVED.

23 01 40 OPERATING AND MAINTENANCE MANUALS

A. THIS CONTRACTOR SHALL SUPPLY THE OWNER WITH THREE (3) COPIES OF OPERATION MANUALS CONTAINING THE FOLLOWING:

(1) PERFORMANCE DATA, RATINGS.
(2) MANUFACTURER'S DESCRIPTIVE LITERATURE.
(3) AUTOMATIC CONTROLS WITH DIAGRAMS AND WRITTEN DESCRIPTION OF OPERATION.
(4) MANUFACTURER'S MAINTENANCE AND SERVICE MANUALS.
(5) SPARE PARTS AND REPLACEMENT PARTS LIST FOR EACH PIECE OF EQUIPMENT.
(6) NAME OF SERVICE AGENCY AND INSTALLER.
(7) FINAL APPROVED SHOP DRAWINGS.
(8) STEP-BY-STEP PROCEDURES FOR START-UP AND SHUT-DOWN FOR EACH SYSTEM AND PIECE OF EQUIPMENT.
(9) WIRING DIAGRAMS.
(10)FINAL BALANCE REPORT.

23 01 50 RECORD DRAWINGS

A. AS WORK PROGRESSES, RECORD IN RED INK ON A SET OF "AS-BUILT" PRINTS ANY DEVIATIONS FROM DESIGN DRAWINGS. DELIVER TO THE OWNER BEFORE SUBMITTING REQUEST FOR FINAL PAYMENT. THE "AS-BUILT" PRINTS SHALL BE AN ACCURATE DEPICTION OF THE PROJECT AS COMPLETED.

23 02 10 OWNER AND OPERATING AND MAINTENANCE TRAINING

A. PROVIDE TO OWNER AFTER ALL EQUIPMENT IS IN OPERATION AND AT AN AGREEABLE TIME, INSTRUCTIONS FOR THE PURPOSE OF TRAINING OWNER'S PERSONNEL IN ALL PHASES OF OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS. SCHEDULE TRAINING WITH OWNER, PROVIDE AT LEAST SEVEN DAYS PRIOR NOTICE.

23 03 30 BALANCING:

A. THIS CONTRACTOR SHALL SECURE THE SERVICES OF AN INDEPENDENT CERTIFIED A.A.B.C. OR NEEB TESTING, ADJUSTING, AND BALANCING (TAB) COMPANY TO ACCOMPLISH BALANCING OF HYDRONIC AND AIR SYSTEMS. BALANCING COMPANY SHALL HAVE PROVEN CAPABILITY IN WORK OF THE TYPE AND SIZE AS PRESENTED BY THIS BUILDING. THE BALANCING AGENCY SHALL ADJUST AND BALANCE ALL SYSTEMS' COMPONENTS TO NO MORE THAN 10 PERCENT ABOVE OR 5 PERCENT BELOW DESIGN REQUIREMENTS. MARK EQUIPMENT SETTINGS, INCLUDING DAMPER AND VALVE POSITIONS AND SIMILAR CONTROLS AND DEVICES TO SHOW FINAL SETTINGS. MARK WITH PAINT OR OTHER SUITABLE PERMANENT IDENTIFICATION MATERIALS. SUBMIT AN ELECTRONIC COPY OF THE BALANCE REPORT AT PROJECT COMPLETION. INCLUDE ONE APPROVED SET IN EACH OPERATION AND MAINTENANCE MANUAL.

B. THE WORK OF THIS SECTION SHALL BE THE RESPONSIBILITY OF THE TESTING AND BALANCING CONTRACTOR WORKING AS AN INDEPENDENT SUB-CONTRACTOR TO THE MECHANICAL CONTRACTOR. THE MECHANICAL AND CONTROLS CONTRACTOR SHALL PROVIDE LABOR AND MATERIALS TO COORDINATE WITH THIS WORK.

(1) THE MECHANICAL CONTRACTOR SHALL MAKE ALL CHANGES IN SHEAVES, BELTS AND DAMPERS AS REQUIRED BY THE TESTING AND BALANCING CONTRACTOR.

(2) THE MECHANICAL CONTRACTOR SHALL ADD ALL BALANCING DAMPERS AS REQUIRED BY THE TESTING AND BALANCING CONTRACTOR.

(3) THE CONTROLS CONTRACTOR SHALL ADD VERIFY THAT ALL CONTROL COMPONENTS ARE FUNCTIONAL, CALIBRATED PROPERLY AND SET FOR DESIGN OPERATING CONDITIONS AND SHALL ASSIST THE TESTING AND BALANCING CONTRACTOR AS REQUIRED FOR A COMPLETE TESTING, ADJUSTING AND BALANCING OF THE HVAC SYSTEM.

(4) ALL VARIABLE PITCH SHEAVES SHALL BE REPLACED WITH CONSTANT PITCH SHEAVES AT THE TIME OF FINAL BALANCING BY THE MECHANICAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH AND INSTALL REPLACEMENT SHEAVES AND BELTS.

(5) THE BALANCING CONTRACTOR SHALL WORK WITH THE CONTROLS CONTRACTOR TO ESTABLISH DUCT STATIC PRESSURES AND HYDRONIC DIFFERENTIAL PRESSURES FOR HYDRONIC AND AIR MOVING EQUIPMENT. THESE SETPOINTS SHALL BE NOTED IN THE BALANCE REPORT AND EACH EQUIPMENT SENSOR LOCATION SHALL ALSO BE NOTED IN THE BALANCE REPORT.

(6) THE BALANCING CONTRACTOR SHALL WORK WITH THE VARIABLE FREQUENCY DRIVE (VFD) MANUFACTURER'S START-UP REPRESENTATIVE TO DETERMINE ALL RESONANT FREQUENCIES FOUND ON VFD-DRIVEN FANS AND PUMPS. THESE RESONANT FREQUENCIES SHALL BE NOTED IN THE BALANCE REPORTS AND SHALL BE PROGRAMMED BY THE VFD TECHNICIAN FOR CRITICAL AVOIDANCE FREQUENCIES.

(7) THE FOLLOWING DEVICES AND EQUIPMENT SHALL BE MEASURED AND DOCUMENTED IN THE BALANCE REPORT:

(A) AIR DISTRIBUTION (GRILLES, DIFFUSERS, REGISTERS)

(B) EXHAUST FANS

C. REQUIREMENT FOR SPECIFIC SYSTEM COMPONENTS

(1) DIFFUSERS, GRILLES, EXHAUST FANS, AND REGISTERS

(A) IDENTIFY EACH DIFFUSER, GRILLE AND REGISTER AS TO LOCATION AND AREA. TABULATE DESIGN VELOCITY AND CFM, AND TEST VELOCITY AND CFM AFTER ADJUSTMENT AND LIST SIZE, AND TYPE OF DIFFUSERS, GRILLES AND REGISTERS. ADJUST SUPPLY DIFFUSERS, GRILLES AND REGISTERS FOR PROPER AIR DISTRIBUTION PATTERN TO ELIMINATE DRAFTS.

23 05 10 ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT

A. MOTORS

(1) FOR EACH ITEM OF EQUIPMENT REQUIRING ELECTRIC DRIVE, PROVIDE AN INDUCTION MOTOR HAVING STARTING AND RUNNING CHARACTERISTICS CONSISTENT WITH THE TORQUE AND SPEED REQUIREMENTS OF THE DRIVEN EQUIPMENT. IN NO CASE SHALL POWER REQUIREMENTS OF THE DRIVEN EQUIPMENT EXCEED THE NOMINAL NAMEPLATE RATING OF THE FURNISHED MOTOR (DO NOT TAKE ADVANTAGE OF SERVICE FACTORS IN SELECTING MOTORS). FOR DESIGN, CONSTRUCTION AND PERFORMANCE CHARACTERISTICS, CONFORM TO APPLICABLE PROVISIONS OF LATEST NEMA AND IEEE STANDARDS FOR ROTATING ELECTRICAL EQUIPMENT.

(2) MOTORS SHALL BE DOE 2016 ENERGY EFFICIENT IN ACCORDANCE WITH NEMA MG 1-2021. THE MOTOR NAMEPLATE SHALL IDENTIFY "NEMA PREMIUM" AND MEET ENERGY EFFICIENCY REQUIREMENT FOR ALL VOLTAGES LISTED ON THE NAMEPLATE. REFER TO THE DRAWINGS FOR SYSTEM VOLTAGE, USE 200V RATED MOTORS USED FOR 208V SYSTEMS AND 460V RATED MOTORS USED FOR 480V SYSTEMS. 460V NAMEPLATED MOTORS SHALL NOT BE USED ON 208V SYSTEMS EVEN IF "USABLE AT 208V" IS LISTED ON THE DATASHEET.

(3) UNLESS OTHERWISE SPECIFIED, MOTORS ARE TO BE GENERAL-PURPOSE OPEN-DRIP PROOF TYPE, WITH CLASS B INSULATION, RATED FOR CONTINUOUS OPERATION IN 40°C AMBIENT TEMPERATURE. ALL MOTORS UTILIZED WITH VARIABLE FREQUENCY DRIVES SHALL BE "INVERTER READY" MOTOR WITH CLASS F INSULATION IN ACCORDANCE WITH NEMA MG1 PART 31.4.4.2. ALL MOTORS UTILIZED WITH VARIABLE FREQUENCY DRIVES SHALL BE PROVIDED WITH A SHAFT GROUND RING IN COMPLIANCE WITH NEMA MG1 31.4.4.3.

(A) UNLESS OTHERWISE SCHEDULED ON THE DRAWINGS, MOTORS 1/2 HP AND SMALLER SHALL BE SINGLE PHASE, CAPACITOR START TYPE, WITH BALL BEARINGS. SHADED-POLE TYPE WITH SLEEVE BEARINGS ARE ACCEPTABLE ONLY FOR MOTORS LESS THAN 1/16 HP.

(B) UNLESS OTHERWISE SCHEDULED ON THE DRAWINGS, MOTORS 3/4 HP AND LARGER SHALL BE THREE PHASE, SQUIRREL-CAGE TYPE WITH BALL BEARINGS.

(C) BALL BEARINGS SHALL BE REGREASABLE, EXCEPT WHERE MOTOR IS NORMALLY INACCESSIBLE FOR REGULAR MAINTENANCE, PERMANENTLY SEALED BALL BEARINGS SHALL BE PROVIDED.

(4) MOTORS SHALL HAVE A MINIMUM EFFICIENCY AS FOLLOWS IN ACCORDANCE WITH IEEE STANDARD 112, TEST METHOD B. IF HORSEPOWER IS NOT LISTED, MOTORS SHALL HAVE A HIGHER EFFICIENCY THAN "AVERAGE STANDARD INDUSTRY MOTORS" IN ACCORDANCE WITH IEEE STANDARD 112, TEST METHOD B.

(5) MOTORS SHALL BE FURNISHED WITH STAINLESS STEEL NAMEPLATE INDICATING MANUFACTURER, RATINGS, CHARACTERISTICS, CONSTRUCTION, EFFICIENCY AND SPECIAL FEATURES.

(6) ACCEPTABLE MOTOR MANUFACTURERS: A.O. SMITH, BALDOR (RELIANCE), EMERSON, GENERAL ELECTRIC, LEESON, LOUIS ALLIS, MARATHON ELECTRIC, TECO-WESTINGHOUSE.

B. MANUAL MOTOR STARTERS

(1) IN GENERAL, SINGLE PHASE MOTORS SHALL BE EQUIPPED WITH MANUAL MOTOR STARTERS. MANUAL MOTOR STARTERS SHALL BE PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS SPECIFIED IN DIVISION 26 UNLESS NOTED OTHERWISE ON THE DIVISION 23 DRAWINGS OR IN THE DIVISION 23 SPECIFICATIONS.

(2) ENCLOSURES IN DRY INDOOR LOCATIONS SHALL BE GENERAL PURPOSE NEMA TYPE 1, UNLESS NOTED OTHERWISE. ENCLOSURES IN WET INDOOR OR OUTDOOR LOCATIONS SHALL BE NEMA TYPE 4 (STAINLESS STEEL, UNLESS NOTED OTHERWISE).

(3) MANUAL MOTOR STARTER SHALL INCLUDE NEON PILOT LIGHT, "QUICK-MAKE, QUICK-BREAK" TRIP-FREE TOGGLE MECHANISM AND MELTING ALLOY THERMAL OVERLOAD RELAY SIZED TO PROTECT THE MOTOR.

C. COMBINATION MOTOR STARTERS

(1) IN GENERAL, THREE PHASE MOTORS SHALL BE EQUIPPED WITH COMBINATION MOTOR STARTERS. COMBINATION MOTOR STARTERS SHALL BE PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS SPECIFIED IN DIVISION 26 UNLESS NOTED OTHERWISE ON THE DIVISION 23 DRAWINGS OR IN THE DIVISION 23 SPECIFICATIONS.

(2) ENCLOSURES IN DRY INDOOR LOCATIONS SHALL BE GENERAL PURPOSE NEMA TYPE 1, UNLESS NOTED OTHERWISE. ENCLOSURES IN WET INDOOR OR OUTDOOR LOCATIONS SHALL BE NEMA TYPE 4 (STAINLESS STEEL, UNLESS NOTED OTHERWISE).

(3) SIZE OF STARTERS SHALL BE AS RECOMMENDED BY THE MOTOR OR DRIVEN EQUIPMENT MANUFACTURER.

(4) COMBINATION MOTOR STARTERS SHALL INCLUDE A DISCONNECT AS SPECIFIED IN THE FOLLOWING SECTION "2.5 DISCONNECT SWITCHES". STARTER SHALL BE FURNISHED WITH THE FOLLOWING DEVICES:

(A) "HAND-OFF-AUTO" SELECTOR SWITCH IN COVER.

(B) HEAVY DUTY PUSH-TO-TEST RED PILOT LIGHT TO ILLUMINATE WHEN MOTOR IS RUNNING.

(C) CONTROL POWER TRANSFORMER (COORDINATE SECONDARY VOLTAGE WITH REQUIRED CONTROL VOLTAGE). CONTROL TRANSFORMER PRIMARY SHALL BE CONNECTED TO THE LOAD SIDE OF THE INCOMING LINE DISCONNECT FUSES AND THE SECONDARY SHALL BE FUSED AND GROUNDED.

(D) THREE (3) BI-METAL TYPE THERMAL OVERLOAD ELEMENTS. THE STARTER SHALL BE INOPERATIVE IF ANY THERMAL ELEMENT IS REMOVED.

(E) MINIMUM OF TWO NO/NC FIELD CONVERTIBLE AUXILIARY CONTACTS. TWO NO AND TWO NC CONTACTS MAY BE FURNISHED IN LIEU OF CONVERTIBLE CONTACTS.

(F) ENGRAVED NAMEPLATE ON THE DOOR DESCRIBING THE EQUIPMENT CONTROLLED.

D. DISCONNECT SWITCHES

(1) DISCONNECT SWITCHES SHALL BE PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS SPECIFIED IN DIVISION 26 UNLESS NOTED OTHERWISE ON THE DIVISION 23 DRAWINGS OR IN THE DIVISION 23 SPECIFICATIONS.

(2) IN DRY INDOOR LOCATIONS, ENCLOSURES SHALL BE GENERAL PURPOSE NEMA TYPE 1, UNLESS NOTED OTHERWISE. IN WET INDOOR OR OUTDOOR LOCATIONS ENCLOSURES SHALL BE NEMA TYPE 4 (STAINLESS STEEL), UNLESS NOTED OTHERWISE.

(3) SIZE OF DISCONNECT SWITCHES SHALL BE AS RECOMMENDED BY THE MOTOR OR DRIVEN EQUIPMENT MANUFACTURER.

(4) DISCONNECT SWITCHES SHALL BE FUSIBLE TYPE, WITH CLASS R REJECTION FUSE CLIPS.

(A) THE DISCONNECT HANDLE SHALL ALWAYS BE IN CONTROL OF THE DISCONNECT DEVICE WITH THE DOOR OPEN OR CLOSED. THE DISCONNECT HANDLE SHALL BE CLEARLY MARKED AS TO WHETHER THE DISCONNECT DEVICE IS "ON" OR "OFF", AND SHALL INCLUDE A TWO-COLOR HANDLE GRIP, THE BLACK SIDE VISIBLE IN THE "OFF" POSITION INDICATING A SAFE CONDITION, AND THE RED SIDE VISIBLE IN THE "ON" POSITION INDICATING A DANGEROUS CONDITION.

(B) DISCONNECT HANDLE SHALL CONTAIN PROVISIONS FOR PADLOCKING IN THE "OFF" POSITION.

(C) IF REQUIRED, THE DISCONNECT SWITCH SHALL BE FURNISHED WITH ONE AUXILIARY SPDT CONTACT FOR USE BY THE CONTROLS CONTRACTOR TO DE-ENERGIZE REMOTELY POWERED INTERLOCK WIRING WHEN THE DISCONNECT IS IN THE "OFF" POSITION.

(5) DISCONNECT SWITCHES SHALL BE FURNISHED WITH A GROUND LUG.

23 07 10 CUTTING, PATCHING, AND FIRESTOPPING

A. ALL CUTTING AND PATCHING REQUIRED FOR THE INSTALLATION OF THE WORK SHOWN SHALL BE DONE BY EACH INDIVIDUAL CONTRACTOR.

B. HOLES THROUGH FLOORS, MASONRY WALLS, CONCRETE WALLS, OR FIRE WALLS SHALL BE SEALED WITH THE APPROPRIATE INTUMESCENT CAULK, PUTTY, STRIP OR SHEET TYPE FIRE BARRIER PRODUCT.

C. FIRESTOP ASSEMBLY TYPE (REQUIRED FIRESTOPPING MATERIALS) SHALL BE DETERMINED BY THE WALL OR FLOOR/CEILING ASSEMBLY AND PENETRATION TYPE AND SHALL BE UL LISTED AND TESTED IN ACCORDANCE WITH ASTM E814. FIRE RATING OF THE ASSEMBLY SHALL BE EQUIVALENT TO THE WALL OR FLOOR/CEILING ASSEMBLY RATING.

(1) REFER TO FIRESTOP SPECIFICATION FOR ADDITIONAL DETAILS.

(2) ACTUAL PROJECT CONDITIONS MAY REQUIRE A UL SYSTEM NOT SPECIFICALLY DESCRIBED ABOVE. FIRE BARRIER PRODUCTS MANUFACTURER SHALL PROVIDE A UL SYSTEM TO MEET ACTUAL PROJECT CONDITIONS.

(3) ACCEPTABLE FIRE BARRIER PRODUCT MANUFACTURERS: 3M; FIRE PROTECTION PRODUCTS DIVISION, FIRETRAK CORP, HILTI, INC., SPECIFIED TECHNOLOGIES INC., THERMAFIBER SAFING.

D. EACH CONTRACTOR SHALL BE RESPONSIBLE TO TOUCH UP AND REPAIR ANY DAMAGED FACTORY FINISHES ON EQUIPMENT AND MATERIALS FURNISHED. COMPLETE ADDITIONAL PAINTING AS INDICATED ON THE DRAWINGS. OTHER PAINTING WILL COMPLY WITH THE PAINTING DIVISION OF THE SPECIFICATIONS.

23 07 11 ROOF EQUIPMENT SUPPORT RAILS

A. ROOF EQUIPMENT, PIPING AND DUCT SUPPORTS

(1) FABRICATE ROOF CURBS AND ROOF SUPPORT CURBS FROM ZINC-COATED STEEL, ASTM A 146, GRADE C, DESIGNATION G90 HOT-DIP COATING, MILL PHOSPHATIZED. CLEAN AND PAINT WITH RUST-INHIBITIVE METAL PRIMER PAINT OF TYPE RECOMMENDED BY MANUFACTURER, 2.0 MILS DRY FILM THICKNESS.

(2) REINFORCE CONTINUOUS RUNS OF OVER 3'-0" LENGTH, BY INSERTING WELDED STIFFENERS OF HEAVY GAUGE WITH FLANGES AS REQUIRED TO PROVIDE SUFFICIENT RIGIDITY AND STRENGTH TO WITHSTAND MAXIMUM LATERAL FORCES IN ADDITION TO SUPERIMPOSED VERTICAL LOADS.

(3) FABRICATE CURBS OF MINIMUM 18 GAUGE GALVANIZED METAL AND TO A MINIMUM HEIGHT ABOVE ROOF SURFACE OF 12".

(4) PROVIDE PRESSURE TREATED WOOD NAILER, NOT LESS THAN 1-5/8" THICK AND OF WIDTH INDICATED, BUT NOT LESS THAN WIDTH OF SUPPORT WALL ASSEMBLY. ANCHOR NAILER SECURELY TO TOP OF METAL FRAME UNIT. WOOD SHALL BE PRESSURE TREATED WITH WATER-BORNE PRESERVATIVES FOR "ABOVE GROUND" USE, COMPLYING WITH AWPB LP-2.

(5) INSULATE CURB'S INSIDE STRUCTURAL SUPPORT WALL WITH RIGID GLASS FIBER INSULATING BOARD OF APPROXIMATELY 3 LB. DENSITY AND 1½" MINIMUM THICKNESS, EXCEPT AS OTHERWISE INDICATED.

B. ACCEPTABLE MANUFACTURERS

(1) SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PREFABRICATED ROOF CURBS MANUFACTURED BY ONE OF THE FOLLOWING:

(A) CUSTOM CURB, INC.
(B) PATE CO.
(C) ROOF PRODUCTS & SYSTEMS CORP.
(D) THYCURB DIV.; THYBAR CORP.

23 08 10 VIBRATION ISOLATION

A. BASE-MOUNTED EQUIPMENT

(1) SUPPORT BASE-MOUNTED EQUIPMENT ON ONE OF THE FOLLOWING, AS IDENTIFIED ON THE DRAWINGS:

(A) INERTIA BASES
(B) SPRING ISOLATORS
(C) NEOPRENE ISOLATORS

B. SUSPENDED EQUIPMENT

(1) CEILING SUSPENDED FANS SHALL BE SUSPENDED BY THREADED RODS FROM THE OVERHEAD STRUCTURE WITH TWO INCH DEFLECTION SPRING TYPE VIBRATION ISOLATORS AT THE MOUNTING BRACKET.

(2) MOUNTING BRACKET WITH VIBRATION ISOLATORS SHALL BE FURNISHED BY THE EQUIPMENT MANUFACTURER.

C. PIPING AND DUCTWORK SUPPORTS

(1) SHALL BE SUPPORTED INDEPENDENTLY OF THE EQUIPMENT AND SHALL BE ISOLATED AS FOLLOWS:

(A) SUSPENDED PIPING ENTERING OR LEAVING BASE MOUNTED PUMPS SHALL BE SUPPORTED FOR THE FIRST THREE HANGERS/SUPPORTS FROM THE EXISTING PIPING SUPPORT STRUCTURE. THE RESILIENT HANGERS SHALL CONTAIN STEEL SPRINGS AND PRE-COMPRESSED MOLDED FIBERGLASS INSERTS, DESIGNED FOR STATIC DEFLECTIONS BETWEEN 1" AND 1-3/4" UNDER OPERATING CONDITIONS.

(B) ALL FLOOR SUPPORTED PIPING AND PIPE HANGERS IN THE MECHANICAL EQUIPMENT ROOMS SHALL BE MOUNTED ON STEEL SPRING VIBRATION ISOLATORS IN COMBINATION WITH PRE-COMPRESSED MOLDED FIBERGLASS NOISE ISOLATORS, DESIGNED FOR MINIMUM STATIC DEFLECTIONS OF 1".

D. FLEXIBLE CONNECTIONS

(1) FANS SHALL BE SUPPORTED INDEPENDENTLY OF CASINGS AND DUCTWORK WITH FLEXIBLE CANVASS CONNECTIONS. FLEXIBLE CANVAS DUCT SHALL COMPLY WITH NFPA 90A. FLEXIBLE CONNECTOR SHALL BE FACTORY FABRICATED WITH FABRIC STRIP ATTACHED TO 2 STRIPS OF 2-3/4 INCH-WIDE, 0.028-INCH-THICK, GALVANIZED-STEEL SHEET.

(A) FLEXIBLE CONNECTOR FABRIC SHALL CONSIST OF GLASS FABRIC, DOUBLE COATED WITH NEOPRENE. FABRICS, COATINGS, AND ADHESIVE SHALL COMPLY WITH UL 181, CLASS 1.

I. FAVRIC MINIMUM WEIGHT: 26OZ./SQ.YD.

II. FABRIC TENSILE STRENGTH: 480 IBF/INCH IN THE WARP AND 360 IBF/INCH IN THE FILLING.

III. FABRIC SERVICE TEMPERATURE: MINUS 40 TO PLUS 200°F.

E. ACCEPTABLE MANUFACTURERS

(1) SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ISOLATORS AS MANUFACTURED BY ONE OF THE FOLLOWING:

(A) AMBER BOOTH
(B) CONSOLIDATED KINETICS CORP.
(C) FLEX-HOSE CO.
(D) KEFLEX
(E) MASON INDUSTRIES, INC.
(F) METRAFLEX
(G) TWIN CITY HOSE, INC.
(H) VIBRO ACOUSTICS

23 10 10 PIPING SYSTEMS - GENERAL:

A. PROVIDE PIPING MATERIALS AND FACTORY-FABRICATED PIPING PRODUCTS OF SIZES, TYPES, PRESSURE RATINGS, TEMPERATURE RATINGS AND CAPACITIES AS DETERMINED BY INSTALLER TO COMPLY WITH INSTALLATION REQUIREMENTS. PROVIDE SIZES AND TYPES MATCHING PIPING CONNECTIONS; PROVIDE FITTINGS OF MATERIALS, WHICH MATCH PIPE MATERIALS USED IN FIRE PROTECTION SYSTEMS. WHERE MORE THAN ONE TYPE OF MATERIALS OR PRODUCTS ARE INDICATED, SELECTION IS INSTALLER'S OPTION.

B. GENERAL - ALL HVAC PIPING AND FITTINGS SHALL BE CONSTRUCTED OF MATERIALS AS SPECIFIED IN THE HVAC PIPE AND FITTING SCHEDULE.

C. FACTORY FORMED FITTINGS SHALL BE UTILIZED FOR ALL CHANGES IN DIRECTION, CHANGES IN SIZE AND ALL BRANCH CONNECTIONS.

D. ALL PIPING SHALL BE INSTALLED PARALLEL WITH, OR AT RIGHT ANGLES TO, THE BUILDING WALLS. DIAGONAL RUNS ARE NOT PERMITTED UNLESS EXPRESSLY INDICATED ON THE DRAWINGS. ALL VERTICAL RISERS SHALL BE INSTALLED PLUMB AND STRAIGHT.

E. ALL HYDRONIC PIPING SHALL BE INSTALLED WITH A PITCH IN THE DIRECTION OF FLOW OF NOT LESS THAN ONE INCH IN FORTY FEET, EXCEPT AS OTHERWISE SHOWN.

F. LONG RADIUS ELBOWS SHALL BE UTILIZED FOR ALL HYDRONIC PIPING SYSTEMS.

G. REAM ENDS OF PIPES AND TUBES AND REMOVE BURRS AND REMOVE SCALE, SLAG, DIRT AND DEBRIS FROM BOTH INSIDE AND OUTSIDE OF PIPING AND FITTINGS BEFORE ASSEMBLY.

H. BEFORE ANY PIPING IS INSTALLED, IT SHALL BE UP-ENDED AND POUNDED TO REMOVE ANY FOREIGN MATTER PRESENT, AND SHALL BE SWABBED, IF NECESSARY, FOR THOROUGH CLEANING.

I. HYDRONIC CONNECTIONS BETWEEN COPPER PIPING AND SCREWED FERROUS EQUIPMENT CONNECTIONS OR SCREWED FERROUS PIPING SYSTEMS SHALL BE MADE USING DIELECTRIC NIPPLES. DIELECTRIC UNIONS ARE NOT ALLOWED. BRASS VALVES FOR DIELECTRIC SEPARATION ARE NOT ALLOWED.

J. THREADED JOINTS SHALL CONFORM TO AMERICAN TAPER PIPE THREAD ASA-B2.1-1960. ALL BURRS SHALL BE REMOVED, PIPE ENDS SHALL BE REAMED OR FILED TO SIZE OF BORE AND ALL CHIPS REMOVED.

K. COPPER WATER PIPING JOINTS SHALL BE MADE WITH THE SCHEDULED FITTINGS. SURFACES TO BE SOLDERED SHALL BE CLEANED BRIGHT, PROPERLY FLUXED AND MADE WITH SOLDER OF NOT LESS THAN 95-5. 50-50 AND ALL OTHER LEAD BEARING SOLDERS ARE PROHIBITED.

L. DURING SOLDERING AND WELDING PROCEDURES, THIS CONTRACTOR SHALL PROTECT THE BUILDING'S WALLS, FLOORS, AND CEILING AND ALL STRUCTURES AND FINISHES FROM DAMAGE. ALL DAMAGE ENCOUNTERED FROM SOLDERING AND WELDING PROCEDURES WILL BE CORRECTED THROUGH THE EXPENSE OF THIS CONTRACTOR.

M. THE PLUMBING CONTRACTOR SHALL PAINT ALL BLACK STEEL NATURAL GAS PIPING EXPOSED TO THE OUTDOORS. PIPE SHALL BE PRIMED AND PAINTED WITH TWO COATS OF WEATHER RESISTANT PAINT OF A COLOR AS SELECTED BY THE ARCHITECT.

23 11 10 PIPING INSULATION:

A. EACH CONTRACTOR SHALL FURNISH AND INSTALL ALL INSULATION NECESSARY TO THE PROJECT AND IN ACCORDANCE WITH THE FOLLOWING SCHEDULE. ALL INSULATION AND ACCESSORIES USED SHALL HAVE A COMPOSITE (INSULATION, JACKET AND ADHESIVE) FIRE AND SMOKE HAZARD RATING AS TESTED UNDER PROCEDURE ASTM E-84, NFPA 255 AND UL 723, NOT EXCEEDING A FLAME SPREAD 25 AND SMOKE DEVELOPED 50. INSULATION SHALL BE RATED FOR INSTALLATION IN PLENUM CEILINGS.

B. MATERIALS:

(1) ALL INSULATION WORK SHALL BE INSTALLED WHERE INDICATED IN THE INSULATION SCHEDULE AND SHALL BE OF THE THICKNESS AND MATERIALS CONFORMING WITH THE INSULATION SCHEDULE.

C. ACCEPTABLE MANUFACTURERS FOR FIBERGLASS INSULATION PRODUCTS:OWENS CORNING, KNAUF, CERTAIN TEED, OR JOHNS MANVILLE.

D. ACCEPTABLE MANUFACTURERS FOR CLOSED-CELL ELASTOMERIC AND POLYMERIC INSULATION PRODUCTS: AEROCEL, ARMACELL, HALSTEAD, NOMACO, OR RUBATEX.

A. OUTDOOR PIPING

(1) IN ADDITION TO THE INSULATION AND NORMAL FINISH, ALL OUTDOOR PIPING SHALL BE COVERED WITH A PRE-FABRICATED UV-RESISTANT PVC JACKET.

(2) PRE-FABRICATED SELF-ADHERING, SHEET-TYPE WATERPROOFING MEMBRANE.

(A) THE MEMBRANE SHALL BE UV-RESISTANT, EXCEED A 25/50 FLAME/SMOKE RATING, AND BE DESIGNED SPECIFICALLY FOR EXTERIOR USE. THE ENTIRE ASSEMBLY SHALL BE WEATHERPROOF (WATER IMPERMEABLE) AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

(B) ACCEPTABLE WATERPROOFING MEMBRANE PRODUCTS: FLEXCLAD 400 MANUFACTURED BY MFM BUILDING PRODUCTS CORP., VENTRUECLAD 1577 CW MANUFACTURED BY VENTURE TAPE CORP.

(3) UV-RESISTANT PVC JACKET

(A) PVC JACKET SHALL BE HIGH-IMPACT-RESISTANT, UV-RESISTANT PVC COMPLYING WITH ASTM D 1784, CLASS 16354-C.

(4) ALUMINUM JACKET

(A) JACKET SHALL BE 0.016" THICK SHEET ALUMINUM.

23 12 10 PIPING IDENTIFICATION

A. LABEL ALL PIPING SYSTEMS WITH PIPE MARKERS INSTALLED ADJACENT TO VALVES, WHERE PIPES PASS THROUGH WALLS OR FLOORS, NEAR ALL BRANCHES AND CHANGES OF DIRECTION, AT 20 FEET INTERVALS ON STRAIGHT RUNS OF PIPE, AND AT ACCESS DOOR LOCATIONS. ALL PIPE MARKERS SHALL CONFORM TO ANSI A13.1 "SCHEME FOR THE IDENTIFICATION OF PIPING SYSTEMS".

23 12 20 PIPE HANGERS, SUPPORTS AND INSTALLATION:

A. PIPING SHALL BE CUT ACCURATELY TO MEASUREMENT AT THE SITE AND WORKED INTO PLACE WITHOUT SPRINGING OR FORCING. SUFFICIENT OFFSETS, PIPE LOOPS, OF EXPANSION JOINTS BETWEEN ANCHOR POINTS SHALL BE PROVIDED AS NEEDED, WHETHER OR NOT SHOWN, TO LIMIT STRESSES AND CONTROL MOVEMENT OF PIPING SUBJECT TO THERMAL EXPANSION.

B. PIPE TO BE THREADED SHALL BE CUT SQUARE AND FULL THREADED WITH CLEAN-CUT TAPERING THREADS AND SHALL BE REAMED AFTER THREADING. ALL THREADED CONNECTIONS SHALL BE MADE WITH PIPE COMPOUND APPLIED TO THE WALL THREADS ONLY.

C. THE EDGES OF THE PIPE TO BE WELDED SHALL BE MACHINE BEVELED WHEREVER POSSIBLE. BEFORE WELDING, THE SURFACES SHALL BE THOROUGHLY CLEANED. THE PIPING SHALL BE CAREFULLY ALIGNED. NO METAL SHALL PROJECT WITHIN THE PIPE. MITERED JOINTS ARE PROHIBITED, ONLY FACTORY FORMED FITTINGS SHALL BE USED. FLANGES SHALL BE WELDING NECK TYPE. MITERING OF THE PIPE TO FORM ELBOWS OR NOTCHING OF PIPE TO FORM TEES SHALL NOT BE PERMITTED.

D. UNIONS OR FLANGES SHALL BE INSTALLED IN ALL CONNECTIONS TO EQUIPMENT, CONTROL VALVES, ETC. AS NECESSARY TO PERMIT REMOVAL OF EQUIPMENT AND SPECIALTIES FOR SERVICING, REPAIRING, OR CLEANING. IT SHALL BE POSSIBLE TO REMOVE ANY PIECE OF EQUIPMENT BE REMOVING ONLY ONE OR TWO SECTIONS OF PIPING.

E. VALVES SHALL BE IN SUITABLE LOCATIONS AT EACH PIECE OF EQUIPMENT OR SECTION OF PIPING AS INDICATED OR REQUIRED FOR PROPER AND SAFE OPERATION OF EQUIPMENT AND TO FACILITATE MAINTENANCE AND/OR REMOVAL OF ALL EQUIPMENT. ON HORIZONTAL PIPE RUNS, INSTALL ALL VALVE STEMS VERTICALLY WHERE POSSIBLE. IN NO CASE SHALL THE STEMS BE TURNED MORE THAN 90° FROM THE VERTICAL POSITION.

F. TAPS (HALF COUPLINGS OR TEES) SHALL BE PROVIDED AS NECESSARY TO PERMIT THE INSTALLATION OF TEMPERATURE CONTROL SENSORS, THERMOMETERS, PRESSURE GAUGES, AIR VENTS, ETC.

G. CONNECTIONS BETWEEN COPPER PIPING AND SCREWED FERROUS PIPING OR EQUIPMENT CONNECTIONS SHALL BE AS FOLLOWS:

(1) FOR PIPE AND STATIONARY NON-ROTATING, NON VIBRATING EQUIPMENT CONNECTIONS - 4" LONG DIELECTRIC NIPPLES.

(2) FOR ROTATING OR VIBRATING EQUIPMENT CONNECTIONS - CAST BRASS ADAPTER AND BRONZE FLANGES WITH DIELECTRIC SEPARATION OF FLANGES AND BOLTS.

H. CONNECTION BETWEEN COPPER PIPING AND FLANGED FERROUS PIPING OR EQUIPMENT CONNECTIONS SHALL BE MADE USING BRONZE COMPANION FLANGE WITH DIELECTRIC SEPARATION OF FLANGES AND BOLTS.

I. BRASS OR BRONZE VALVES IN FERROUS PIPING REQUIRE DIELECTRIC SEPARATION.

J. ANY PIPING RESTING ON OR COMING IN CONTACT WITH BUILDING STRUCTURE SHALL BE INSULATED AT THAT POINT TO PREVENT THE TELEGRAPHING OF SOUND.

K. PIPING SYSTEMS SHALL BE SUPPORTED AT INTERVALS AS REQUIRED BY CODE. RISER CLAMPS, CLEVIS HANGERS, SWIVEL LOOP HANGERS, OR TRAPEZE HANGERS MAY BE USED. ALL HANGERS, BRACKETS, CLAMPS, ETC., SHALL BE OF STANDARD WEIGHT STEEL. PERFORATED STRAP HANGERS SHALL NOT BE USED IN ANY WORK. CLAMPS AND HANGERS IN DIRECT CONTACT WITH THE PIPE SHALL MATCH THE MATERIAL OF THE PIPE. HANGERS FOR INSULATED PIPING SYSTEMS SHALL NOT BE IN DIRECT CONTACT WITH THE PIPE. HANGERS FOR INSULATED PIPING SYSTEMS SHALL BE OVERSIZED TO ACCOMMODATE THE INSULATION AND SHALL INCLUDE AN INSULATION PROTECTION SHIELD WITH CALCIUM SILICATE OR WOOD BLOCK INSERT. INSULATION VAPOR BARRIER SHALL BE CONTINUOUS AT EACH HANGER.

L. PROVIDE MACHINE CUT STEEL PIPE SLEEVES 1" LARGER THAN OUTSIDE DIAMETER OF PIPE. WHERE FLOORS OR WALLS ARE CORE DRILLED, STEEL SLEEVES ARE NOT REQUIRED. EXTEND SLEEVES 4" HIGHER THAN FLOOR IN MECHANICAL ROOMS AND ALL ROOMS CONTAINING FLOOR DRAINS. SEAL OPENINGS TO MAINTAIN THE INTEGRITY OF THE FIRE RATING.

M. PROVIDE ALL INSERTS, FASTENERS AND SUPPORTS TO PROPERLY SUPPORT AND RETAIN PIPING; TO CONTROL EXPANSION, CONTRACTION, ANCHORAGE, DRAINAGE, AND PREVENT SWAY AND VIBRATION. PIPING SHALL BE SO SUPPORTED AS NOT TO PLACE A STRAIN ON VALVES, FIXTURES OR EQUIPMENT.

N. THE DRAWINGS INDICATE THE GENERAL LOCATION AND ARRANGEMENT OF THE PIPING SYSTEMS. SO FAR AS PRACTICAL, INSTALL PIPING AS INDICATED, MAKING FINAL CONNECTIONS TO ALL EQUIPMENT AND FIXTURES. INSTALL PIPING AS DIRECT AS POSSIBLE AVOIDING UNNECESSARY OFFSETS. HOWEVER, IF OFFSETS ARE REQUIRED IN ORDER TO OBTAIN MAXIMUM HEADROOM OR TO AVOID CONFLICT WITH OTHER WORK, THEY SHALL BE MADE AS REQUIRED OR AS REQUESTED BY THE ARCHITECT/ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER. THE ARCHITECT/ENGINEER RESERVES THE RIGHT TO MAKE MINOR CHANGES IN THE LOCATION OF PIPING AND EQUIPMENT DURING THE ROUGHING-IN, WITHOUT ADDITIONAL COST TO THE OWNER. ALL CHANGES PROPOSED BY OTHERS SHALL BE APPROVED BY THE ARCHITECT/ENGINEER.

O. INSTALL PIPING FREE OF SAGS OR BENDS.

P. ALL HYDRONIC PIPING SYSTEMS MUST BE INSTALLED SO THEY CAN BE COMPLETELY DRAINED. PROVIDE TEE FITTING WITH BALL VALVE WITH CAPPED HOSE THREAD FITTING AT ALL LOW POINTS, TRAPPED SECTIONS, BASES OF RISERS, AND ON EQUIPMENT SIDE OF SHUT OFF VALVES TO PERMIT DRAINING. ALL DRAIN VALVES SHALL BE ACCESSIBLE.

Q. INSTALL BALL VALVE AIR VENTS AT ALL HIGH POINTS IN THE PIPING SYSTEMS NEEDED FOR COMPLETE AIR ELIMINATION FROM THE SYSTEM. INSTALL AIR VENTS ON THE HIGH SIDE OF ALL EQUIPMENT CONNECTIONS. ALL AIR VENTS SHALL BE ACCESSIBLE. PROVIDE 3/8" SOFT COPPER TUBING ON OUTLET OF AIR VENT VALVES TURNED 180 DEGREES DOWNWARD TO DISCHARGE CLEAR OF PIPE AND INSULATION.

R. PROVIDE ALL STOPS, SUPPLIES, TRAPS, ESCUTCHEONS, CARRIERS, ETC. REQUIRED FOR A COMPLETE INSTALLATION.

S. WHERE HYDRONIC LINES ARE REDUCED IN SIZE, ECCENTRIC REDUCING FITTINGS SHALL BE USED TO ALIGN TOP OF MAINS AND PREVENT AIR POCKETS.

T. BRANCH HEATING WATER CONNECTIONS FROM MAINS TO RISERS, RADIATION OR EQUIPMENT BELOW MAINS SHALL BE TAKEN FROM THE BOTTOM OF THE MAIN AND PROVIDED WITH AT LEAST THREE ELBOWS FOR EXPANSION. SUPPLY RUN-OUTS SHALL PITCH DOWN AWAY FROM MAIN 1 INCH IN 5'-0". RETURN RUN-OUTS SHALL PITCH UP TO MAIN 1 INCH IN 5'-0".

U. BRANCH HEATING WATER CONNECTIONS FROM MAINS TO RISERS, RADIATION OR EQUIPMENT ABOVE MAINS SHALL BE TAKEN FROM THE TOP OF MAIN AND PROVIDED WITH AT LEAST THREE ELBOWS FOR EXPANSION. SUPPLY RUN-OUTS SHALL PITCH UP AWAY FROM MAIN 1 INCH IN 5'-0". RETURN RUN-OUTS SHALL PITCH DOWN TO MAIN 1 INCH IN 5'-0".

V. PROVIDE A SHUT-OFF VALVE IN THE SUPPLY TO EACH HEATING COIL, FINNED TUBE RADIATOR OR UNIT HEATER AND A BALANCING VALVE IN THE RETURN LINE. PROVIDE AN ADDITIONAL SHUT-OFF VALVE IN THE RETURN LINE.

W. UL AND FM COMPLIANCE; HANGERS, SUPPORTS AND COMPONENTS SHALL BE LISTED AND LABELED BY UL AND FM WHERE USED FOR FIRE PROTECTION PIPING SYSTEMS. SUPPORT FIRE PROTECTION SYSTEMS PIPING INDEPENDENTLY FROM OTHER PIPING SYSTEMS.

23 12 21 PIPE GUIDES AND PIPE ANCHORS

A. ALIGNMENT GUIDES

(1) DESCRIPTION: ALIGNMENT GUIDES SHALL BE CONSTRUCTED OF STEEL, FACTORY FABRICATED, WITH BOLTED TWO-SECTION OUTER CYLINDER AND BASE FOR ALIGNMENT OF PIPING AND TWO-SECTION GUIDING SPIDER FOR BOLTING TO PIPE.

(2) ACCEPTABLE MANUFACTURERS: ADSCO MANUFACTURING, LLC.; ADVANCED THERMAL SYSTEMS, INC.; FLEX-HOSE CO., INC.; FLEXICRAFT INDUSTRIES; FLEX-WELD, INC.; HYSPAN PRECISION PRODUCTS, INC.; METRAFLEX, INC.; PIPING TECHNOLOGY & PRODUCTS, INC.; SENIOR FLEXONICS, INC.; PATHWAY DIVISION.

B. MATERIALS FOR ANCHORS

(1) STEEL SHAPES AND PLATES: ASTM A 36/A 36M.

(2) BOLTS AND NUTS: ASME B18.10 OR ASTM A 183, STEEL, HEX HEAD.

(3) WASHERS: ASTM F 844, STEEL, PLAIN, FLAT WASHERS.

(4) MECHANICAL FASTENERS: INSERT-WEDGE-TYPE STUD WITH EXPANSION PLUG ANCHOR FOR USE IN HARDENED PORTLAND CEMENT CONCRETE, AND TENSION AND SHEAR CAPACITIES APPROPRIATE FOR APPLICATION.

(A) STUD: THREADED, ZINC-COATED CARBON STEEL.

(B) EXPANSION PLUG: ZINC-COATED STEEL.

(C) WASHER AND NUT: ZINC-COATED STEEL.

C. EXPANSION-JOINT INSTALLATION

(1) INSTALL EXPANSION JOINTS OF SIZES MATCHING SIZE OF PIPING IN WHICH THEY ARE INSTALLED. INSTALL EXPANSION JOINTS AND ALIGNMENT GUIDES TO ALLOW EXPANSION AND TO AVOID END-LOADING AND TORSIONAL STRESS.

D. PIPE BEND AND LOOP INSTALLATION

(1) INSTALL PIPE BENDS AND LOOPS COLD-SPRUNG IN TENSION OR COMPRESSION AS REQUIRED TO PARTLY ABSORB TENSION OR COMPRESSION PRODUCED DURING ANTICIPATED CHANGE IN TEMPERATURE.

(2) ATTACH PIPE BENDS AND LOOPS TO ANCHORS. ATTACH BY WELDING. COMPLY WITH ASME B31.9 AND ASME BOILER AND PRESSURE VESSEL CODE: SECTION IX, "WELDING AND BRAZING QUALIFICATIONS."

E. ALIGNMENT-GUIDE INSTALLATION

(1) INSTALL GUIDES ON PIPING ADJOINING PIPE EXPANSION FITTINGS AND LOOPS. ATTACH GUIDES TO PIPE AND SECURE TO BUILDING STRUCTURE.

F. ANCHOR INSTALLATION

(1) INSTALL ANCHORS AT LOCATIONS TO PREVENT STRESSES FROM EXCEEDING THOSE PERMITTED BY ASME B31.9 AND TO PREVENT TRANSFER OF LOADING AND STRESSES TO CONNECTED EQUIPMENT.

(2) FABRICATE AND INSTALL STEEL ANCHORS BY WELDING STEEL SHAPES, PLATES, AND BARS TO PIPING AND TO STRUCTURE. COMPLY WITH ASME B31.9 AND AWS D1.1.

(3) INSTALL PIPE ANCHORS ACCORDING TO EXPANSION-JOINT MANUFACTURER'S WRITTEN INSTRUCTIONS IF EXPANSION JOINTS ARE INDICATED.

23 13 40 REFRIGERATION PIPING, VALVES AND SPECIALTIES

A. PIPING AND FITTINGS

(1) REFRIGERANT PIPING SHALL BE TYPE "ACR" HARD DRAWN SEAMLESS COPPER TUBE WITH WROUGHT COPPER BRAZED JOINT FITTINGS. BRAZING FILLER METAL SHALL CONFORM TO AWS STANDARD A5.8 - FILLER METALS FOR BRAZING.

B. VALVES

(1) SHUT-OFF VALVES: ANGLE PATTERN OR STRAIGHT THROUGH DESIGN, CAST BRONZE BODY WITH CAST BRONZE OR FORGED BRASS WING CAP AND BOLTED BONNECT, REPLACEABLE RESILIENT SEAT DISC, PLATED STEEL STEM, SOLDER ENDS, CAPABLE OF BEING REPACKED UNDER PRESSURE, 450 PSIG WORKING PRESSURE, 275 °F OPERATING TEMPERATURE.

(2) SOLENOID VALVES: TWO-WAY STRAIGHT THROUGH DESIGN, FORGED BRASS, TEFLON VALVE SEAT, SOLDER ENDS, 400 PSIG WORKING PRESSURE, 250 °F OPERATING TEMPERATURE. FURNISH COMPLETE WITH NEMA 1 SOLENOID ENCLOSURE WITH ½ INCH CONDUIT ADAPTER, 24 VOLT, 60 HZ NORMALLY CLOSED HOLDING COIL AND MANUAL OPERATOR TO OPEN VALVE.

(3) THERMOSTATIC EXPANSION VALVE: THERMOSTATIC ADJUSTABLE MODULATING TYPE, COMPLETE WITH SENSING BULB, DISTRIBUTOR WITH SIDE CONNECTION FOR HOT GAS BYPASS LINE AND EXTERNAL EQUALIZER LINE, SOLDER ENDS. SIZE AS REQUIRED FOR SPECIFIC REQUIREMENTS AND FACTORY SET FOR PROPER EVAPORATOR SUPERHEAT REQUIREMENTS.

C. SPECIALTIES

(1) FILTER-DRIER: STEEL SHELL, STEEL FLANGE RING, STEEL SPRING, DUCTILE IRON COVER PLATE WITH STEEL CAPSCREWS, WROUGHT COPPER SOLDER ENDS, 500 PSIG OPERATING PRESSURE. FURNISH COMPLETE WITH REPLACEABLE FILTER-DRIER CORE KIT, INCLUDING GASKETS AND STANDARD CAPACITY DESICCANT SIEVES TO PROVIDE MICRONIC FILTRATION.

(2) SIGHT GLASS: FORGED BRASS BODY, REPLACEABLE POLISHED OPTICAL VIEWING WINDOW, SOLDER ENDS, 500 PSIG OPERATING PRESSURE, AND 200 °F OPERATING TEMPERATURE.

(3) FLEXIBLE CONNECTORS: SEAMLESS TIN BRONZE OR STAINLESS STEEL CORE, HIGH TENSILE BRONZE BRAID COVERING WITH SYNTHETIC COVERING, FACTORY PRESSURE TESTED, MINIMUM 7 INCH LENGTH, SOLDER ENDS, 500 PSIG OPERATING PRESSURE.

D. REFRIGERANT

(1) REFRIGERANT R-134 (AIR HANDLING UNITS) AND R-410 (DUCTLESS A/C UNITS) IN ACCORDANCE WITH ASHRAE STANDARD 15.

E. GENERAL INSTALLATION REQUIREMENTS

(1) PIPING AND SPECIALTIES SHALL BE SIZED TO PREVENT EXCESSIVE PRESSURE DROP AND ALLOW COMPRESSORS AND EVAPORATORS TO OPERATE TOGETHER WITH BALANCE POINTS AT OR ABOVE THE SPECIFIED CAPACITIES.

(2) PIPING AND SPECIALTIES SHALL BE ARRANGED TO RETURN OIL AT ALL LOADS AND PREVENT LIQUID FROM "SLUGGING" THE COMPRESSOR OR SIPHONING TO THE EVAPORATOR. PROVIDE DOUBLE SUCTION RISERS AND TRAPS AS REQUIRED.

(3) PITCH HORIZONTAL REFRIGERANT PIPING 1/2 INCH PER 10 FEET IN DIRECTION OF FLOW.

(4) PROVIDE SEPARATE REFRIGERANT CIRCUITS FOR MULTIPLE COMPRESSOR APPLICATIONS.

(5) ALL REFRIGERANT PIPING SHALL BE ASSEMBLED WITH BRAZED JOINTS. CONTINUOUSLY PURGE JOINTS WHILE BEING BRAZED WITH OIL-FREE DRY NITROGEN TO PREVENT THE FORMATION OF SCALE WITHIN THE TUBING.

(6) INSTALL STRAINERS IMMEDIATELY AHEAD OF EACH THERMOSTATIC EXPANSION VALVE, SOLENOID VALVE AND AS REQUIRED TO PROTECT REFRIGERATION PIPING SYSTEM COMPONENTS.

(7) INSTALL UNIONS TO ALLOW REMOVAL OF THERMOSTATIC EXPANSION VALVES AND SOLENOID VALVES AND AT CONNECTIONS TO COMPRESSORS AND EVAPORATORS.

(8) INSTALL FLEXIBLE CONNECTORS AT THE INLET AND DISCHARGE CONNECTIONS OF COMPRESSORS.

(9) INSTALL PRESSURE REGULATING AND RELIEVING VALVES AS REQUIRED BY ASHRAE STANDARD 15 AND THE SAFETY CODE FOR MECHANICAL REFRIGERATION (ANSI B9.1).

(10)REFRIGERANT SYSTEM PIPING LAYOUT AND SIZING SHALL BE APPROVED BY THE EQUIPMENT MANUFACTURER.

F. TESTING AND CHARGING

(1) TEST REFRIGERANT PIPING WITH OIL-FREE PUMPED DRY NITROGEN. TWENTY FOUR HOUR STANDING TIME MINIMUM. TEST LOW SIDE OF THE SYSTEM TO 150 PSI AND HIGH SIDE TO 300 PSI. TESTS SHALL CONFORM TO "PRESSURE PIPING CODE" 4101:8-3 AND ANSI STANDARD B31.5 "REFRIGERANT PIPING".

(2) EVACUATE AND CHARGE SYSTEM WITH REFRIGERANT AS REQUIRED TO PLACE EQUIPMENT IN OPERATION. PROVIDE FULL OPERATING CHARGE.

23 20 10 SHEET METAL WORK:

A. FURNISH AND INSTALL DUCTWORK, HANGERS, DAMPERS, GRILLES, REGISTERS, DIFFUSERS AND RELATED SHEET METAL ACCESSORIES AS SHOWN ON THE DRAWINGS AND AS INDICATED IN THESE SPECIFICATIONS.

B. ALL SHEET METAL SHALL BE FABRICATED IN ACCORDANCE WITH REQUIREMENTS OF THE SMACNA PRESSURE CLASSIFICATION INDICATED IN THE DRAWINGS. DUCT SHALL BE FABRICATED OF NO. 1 PRIME GALVANIZED SHEET METAL. EVIDENCE OF ANY SEPARATION OF GALVANIZED SURFACE FROM THE STEEL AT ANY POINT OF THE DUCTWORK SHALL BE CONSIDERED SUFFICIENT CAUSE TO REJECT THIS MATERIAL AND WORK.

C. SEALING MATERIALS SHALL BE SUITABLE FOR USE WITH AIR DISTRIBUTION DUCTWORK. ACCEPTABLE MANUFACTURERS ARE MONOCO INDUSTRIES, 3M, PR UNITED SHEET METAL.

D. PROVIDE ALL DUCTWORK AS INDICATED ON THE DRAWINGS, MAKING ALL NECESSARY OFFSETS (WHETHER OR NOT SPECIFICALLY INDICATED) AS REQUIRED TO MEET THE VARIOUS BUILDING CONDITIONS. DUCTWORK INSTALLATION SHALL NOT CONFLICT WITH EQUIPMENT OR PIPING.

E. ALL CHANGES IN CROSS SECTION SHALL BE MADE WITHOUT REDUCING THE DESIGN AREA OF THE DUCT.

F. NO PIPE OR OTHER OBSTRUCTIONS SHALL PASS THROUGH AIR DUCTS.

G. CAP ALL OPEN ENDS OF DUCTWORK DURING CONSTRUCTION TO PREVENT ENTRANCE OF DUST, DEBRIS, ETC.

H. INSTALL DUCTWORK RUN ABOVE CEILING SO AS TO MAINTAIN DESIGN CEILING HEIGHTS. EXPOSED DUCTWORK SHALL BE INSTALLED TO PROVIDE MAXIMUM HEADROOM.

I. DUCTWORK SHALL NOT BE HUNG FROM EQUIPMENT, PIPING, CONDUIT, OR OTHER DUCTWORK.

J. ALL DUCTWORK JOINTS AND SEAMS SHALL BE AIR-TIGHT. POORLY MADE JOINTS, SPLITS, VISIBLE HOLES AT CORNERS, ETC. SHALL BE REWORKED AND REPAIRED WHERE EXCESSIVE PULSATING OF DUCTWORK IS FOUND, ADDITIONAL STIFFENERS SHALL BE ADDED. ANY CRACKING IN THE SEALANT THAT IS APPARENT UPON INSPECTION SHALL BE SUFFICIENT TO WARRANT REJECTION.

K. IF THE INTERIOR OF SHEET METAL IS EXPOSED TO VIEW THROUGH AIR DISTRIBUTION DEVICES IN FINISHED AREAS OF THE BUILDING, IT SHALL BE COATED WITH PRIMER AND A FLAT BLACK FINISH COAT.

L. ALL DUCTWORK SHALL BE SUPPORTED PER SMACNA REQUIREMENTS.

M. RECTANGULAR DUCTWORK FITTINGS:

(1) BRANCH CONNECTIONS SHALL BE 45 DEGREES ENTRY. STRAIGHT TAPS ARE NOT PERMITTED.

(2) CHANGES IN DIRECTION, OF ALL RECTANGULAR DUCTWORK, SHALL BE MADE WITH FULL RADIUS ELBOWS WITH RADIUS EQUAL TO 1-1/2 TIMES THE HORIZONTAL WIDTH OF THE DUCT, OR WITH SQUARE ELBOWS WITH TURNING VANES. TURNING VANES SHALL BE CONSTRUCTED OF THE SAME MATERIAL AS THE SURROUNDING DUCTWORK AND TWO (2) GAUGE NUMBERS HEAVIER.

N. ROUND DUCTWORK FITTINGS:

(1) FABRICATE ROUND DUCTS OF SMACNA 2" W.G. PRESSURE CLASSIFICATION WITH SPIRAL SEAM, GROOVED SEAM OR SNAPLOCK SEAM CONSTRUCTION. FABRICATE ROUND DUCTS OF 6" W.G. PRESSURE CLASSIFICATION WITH SPIRAL LOCK-SEAM CONSTRUCTION OR FUSION-WELDED BUTT SEAM FOR LONGITUDINAL SEAM DUCT. COMPLY WITH THE LATEST EDITION OF SMACNA "HVAC DUCT CONSTRUCTION STANDARDS", FOR GALVANIZED STEEL GAUGES. NINETY DEGREE ROUND DUCT BRANCHES AND FORTY-FIVE DEGREE LATERALS SHALL BE MADE WITH CONICAL LATERALS AND NINETY DEGREE CONICAL TEES SHALL BE FABRICATED TO CONFORM TO SMACNA "HVAC DUCT CONSTRUCTION STANDARDS," AND FIGURE 3-5 AND WITH METAL THICKNESSES SPECIFIED FOR LONGITUDINAL SEAM STRAIGHT DUCT. ALL DIVERGING-FLOW ROUND DUCT FITTINGS SHALL BE FABRICATED WITH A REDUCED ENTRANCE TO BRANCH TAPS WITH NO EXCESS MATERIAL PROJECTING FROM THE BODY INTO BRANCH TAP ENTRANCE. FABRICATE ROUND DUCT IN STAMPED OR FIVE-GORED SEGMENTED ELBOWS 1.5 TIMES THE ELBOW DIAMETER. SEGMENTED ELBOWS SHALL NOT EXCEED 20 DEGREE CHANGE OF DIRECTION PER SECTION.

O. DUCTWORK PRESSURE CLASSIFICATION

(1) ALL SHEET METAL SHALL BE FABRICATED OF THICKNESS NOT LESS THAN REQUIRED BY SMACNA FOR THE PRESSURE CLASSIFICATION INDICATED, OR WHERE NOT INDICATED AS REQUIRED FOR SMACNA 2' W.G. PRESSURE CLASSIFICATION.

(2) ALL SUPPLY AIR DUCTWORK INSTALLED UPSTREAM OF VAV TERMINAL BOXES AND FAN POWERED TERMINAL BOXES SHALL BE CONSTRUCTED PER SMACNA STANDARDS FOR MINIMUM 6 INCH WATER GAUGE DUCT PRESSURE CLASSIFICATION.

P. DUCTWORK JOINT AND SEAM SEALANT SHALL BE ONE PART, NON-SAG SOLVENT-RELEASE-CURING POLYMERIZED BUTYL SEALANT COMPLYING WITH FS TT-S-001657, TYPE I; FORMULATED WITH A MINIMUM OF 70 PERCENT SOLIDS OR APPROVED EQUAL AS MANUFACTURED BY MONOCO INDUSTRIES, SPECSEAL, 3M, OR UNITED SHEET METAL. SEAL ALL TRANSVERSE JOINTS AND LONGITUDINAL SEAMS OF SUPPLY AIR DUCTWORK. SEAL AND PRESSURE TEST EXTERNALLY INSULATED DUCTS PRIOR TO INSULATION INSTALLATION WITH TWO COATS OF SEALANT.

Q. INSTALLATION OF DUCTWORK, HARDWARE AND ACCESSORIES:

(1) INSTALL BALANCING VOLUME DAMPERS AS INDICATED ON DRAWINGS; AS CLOSE TO THE MAIN DUCT AS POSSIBLE AND AS FAR FROM DIFFUSERS, REGISTERS OR GRILLES AS POSSIBLE. INSTALL BALANCING DAMPERS AT AN ACCESSIBLE LOCATION.

(2) INSTALL DUCTWORK ACCESSORIES IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTION, WITH APPLICABLE PORTIONS OF DETAILS OF CONSTRUCTION AS SHOWN IN SMACNA STANDARDS, AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PRODUCTS SERVE INTENDED FUNCTION. COORDINATE WITH OTHER WORK, INCLUDING CEILING AND DUCTWORK, AS NECESSARY TO INTERFACE INSTALLATION OF DUCTWORK ACCESSORIES PROPERLY WITH OTHER WORK. INSTALL REGULATORS ON ALL BALANCING (VOLUME) DAMPERS.

(3) DUCT-MOUNTED SMOKE DETECTORS:

(A) DUCT-MOUNTED SMOKE DETECTORS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR AND MOUNTED IN THE DUCT BY THE HVAC CONTRACTOR.

(B) ELECTRICAL CONTRACTOR SHALL COORDINATE THE MOUNTING LOCATION OF THE SMOKE DETECTOR WITH THE HVAC CONTRACTOR. EXACT LOCATION SHALL BE DETERMINED BY THE HVAC CONTRACTOR. LOCATION SHALL BE IN ACCORDANCE WITH NFPA 72 AND THE SMOKE DETECTOR MANUFACTURER'S REQUIREMENTS. SMOKE DETECTOR LOCATION MUST BE ACCESSIBLE FOR SERVICE AND MAINTENANCE.

(C) IF THE DETERMINED SMOKE DETECTOR LOCATION REQUIRES ADDITIONAL MOUNTING PROVISION TO PERMIT PROPER INSTALLATION, THE PROVISIONS SHALL BE PROVIDED AND INSTALLED BY THE HVAC CONTRACTOR. MINIMUM DUCT SIZES FOR INSTALLATION OF DUCT SMOKE DETECTOR ARE TYPICALLY 18" FOR ROUND AND 8" SQUARE FOR RECTANGULAR. PROVIDE TRANSITIONS TO SECTIONS THAT MEET THESE MINIMUM REQUIREMENTS. VERIFY REQUIREMENTS WITH ACTUAL DUCT DETECTOR BEING FURNISHED BY DIVISION 26.

PATRICK W.
KLANAC
NUMBER
29264
8-15-2025

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PROJECT:

TENANT IMPROVEMENTS FOR:
SONNY'S
2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402

DRAWN BY: PTA, INC. | CHECKED BY: JSC

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DRAWING TITLE:
MECHANICAL
SPECIFICATIONS

SHEET #:
M5.01

MECHANICAL SPECIFICATIONS (CONTINUED)

23 20 20 FLEXIBLE DUCTWORK

R. THE LAST 36" HORIZONTAL OR VERTICAL CONNECTION TO EACH DIFFUSER MAY BE MADE OF 4" PRESSURE CLASS FLEXIBLE DUCT WITH EXTERIOR FIBERGLASS INSULATION.

S. ACCEPTABLE MANUFACTURERS: ATCO - TYPE UPC 070, CLEVAFLEX - TYPE KQ, OR FLEXMASTER - TYPE 1B.

23 21 10 DUCTWORK INSULATION

T. EACH CONTRACTOR SHALL FURNISH AND INSTALL ALL INSULATION NECESSARY TO THE PROJECT AND IN ACCORDANCE WITH THE FOLLOWING SCHEDULE. ALL INSULATION AND ACCESSORIES USED SHALL HAVE A COMPOSITE (INSULATION, JACKET AND ADHESIVE) FIRE AND SMOKE HAZARD RATING AS TESTED UNDER PROCEDURE ASTM E-84, NFPA 255 AND UL 723, NOT EXCEEDING A FLAME SPREAD 25 AND SMOKE DEVELOPED 50. INSULATION SHALL BE RATED FOR INSTALLATION IN PLENUM CEILINGS.

U. MATERIALS:

(1) ALL INSULATION WORK SHALL BE INSTALLED WHERE INDICATED IN THE INSULATION SCHEDULE AND SHALL BE OF THE THICKNESS AND MATERIALS CONFORMING WITH THE INSULATION SCHEDULE.

V. ACCEPTABLE MANUFACTURERS FOR FIBERGLASS INSULATION PRODUCTS: OWENS CORNING, KNAUF, CERTAIN TEED, OR JOHNS MANVILLE.

W. ACCEPTABLE MANUFACTURERS FOR CLOSED-CELL ELASTOMERIC AND POLYMERIC INSULATION PRODUCTS: AEROCEL, ARMACELL, HALSTEAD, NOMACO, OR RUBATEX.

X. IN ADDITION TO THE INSULATION AND NORMAL FINISH, ALL OUTDOOR PIPING SHALL BE COVERED WITH A PRE-FABRICATED SELF-ADHERING, SHEET-TYPE WATERPROOFING MEMBRANE. THE MEMBRANE SHALL BE UV-RESISTANT, EXCEED A 25/50 FLAME/SMOKE RATING, AND BE DESIGNED SPECIFICALLY FOR EXTERIOR USE. THE ENTIRE ASSEMBLY SHALL BE WEATHERPROOF (WATER IMPERMEABLE) AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

(1) ACCEPTABLE WATERPROOFING MEMBRANE PRODUCTS: FLEXCLAD 400 MANUFACTURED BY MFM BUILDING PRODUCTS CORP., VENTRUECLAD 1577 CW MANUFACTURED BY VENTURE TAPE CORP.

23 22 10 GRILLES AND DIFFUSERS

A. INSTALL DIFFUSERS, REGISTERS AND GRILLES IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PRODUCTS SERVE INTENDED FUNCTIONS. COORDINATE WITH OTHER WORK, INCLUDING DUCTWORK AND DUCT ACCESSORIES, AS NECESSARY TO INTERFACE INSTALLATION WITH OTHER WORK. LOCATE CEILING AIR DIFFUSERS, REGISTERS AND GRILLES AS INDICATED ON GENERAL CONSTRUCTION "REFLECTED CEILING PLANS." UNLESS OTHERWISE INDICATED, LOCATE UNITS IN CENTER OF ACOUSTICAL CEILING MODULES.

B. ALL GRILLES, REGISTERS AND DIFFUSERS SHALL BE OF THE SIZES, TYPE, ETC., AS SHOWN ON THE PLAN AND SCHEDULES.

C. ACCEPTABLE MANUFACTURERS: KRUEGER, PRICE OR TITUS.

23 22 30 MANUAL BALANCE DAMPERS

D. FURNISH AND INSTALL ALL MANUAL BALANCING DAMPERS AS SHOWN ON THE DRAWINGS OR REQUIRED TO PROPERLY DISTRIBUTE THE AIR. BALANCING DAMPERS IN ROUND DUCTWORK SHALL BE OF SINGLE BLADE TYPE CONSTRUCTION, MINIMUM 18 GAUGE GALVANIZED STEEL OR DUCT GAUGE, WHICHEVER IS HEAVIER. PIVOT ROD SHAFT SHALL BE CONTINUOUS ON ALL SINGLE BLADE BALANCING DAMPERS. PROVIDE BALANCING DAMPERS IN RECTANGULAR DUCTWORK OF MULTI-BLADE (OPPOSED BLADE) TYPE CONSTRUCTION. ALL BALANCING DAMPERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS."

E. ALL MANUAL BALANCING DAMPERS SHALL BE CONTROLLED BY VENTLOK 620/635 OR YOUNG 403 REGULATORS FOR UNINSULATED OR INTERNALLY LINED DUCTS OR BY VENTLOK 628/638 OR YOUNG 443 REGULATORS FOR EXTERNALLY WRAPPED DUCTS.

F. ACCEPTABLE MANUFACTURERS FOR MULTIBLADE TYPE BALANCING DAMPERS: AIR GUIDE, ARROW UNITED, RELIABLE DAMPER, YOUNG REGULATOR, AIR BALANCE, OR GREENHECK.

23 23 10 LOUVERS

A. PROVIDE LOUVERS WITH FRAME AND SILL STYLES THAT ARE COMPATIBLE WITH ADJACENT SUBSTRATE. LOUVERS SHALL BE SPECIFICALLY MANUFACTURED TO FIT INTO CONSTRUCTION OPENINGS IN THE ADJACENT SUBSTRATE WITH ACCURATE FIT AND ADEQUATE SUPPORT FOR A WEATHERPROOF INSTALLATION. CONSTRUCT LOUVERS OF EXTRUDED ALUMINUM ALLOY FRAME AND BLADES WITH ALL WELDED CONSTRUCTION. LOUVERS SHALL BE PROVIDED WITH A KYNAR FINISH. COLOR OF LOUVERS WILL BE SELECTED BY THE ARCHITECT. SUBMIT MANUFACTURERS STANDARD COLOR CHARTS FOR SELECTION. PROVIDE LOUVERS WITH ALUMINUM BIRD SCREENS.

B. ACCEPTABLE MANUFACTURERS: RUSKIN, AMERICAN WARMING AND VENTILATING, OR GREENHECK.

23 30 10 EQUIPMENT IDENTIFICATION

A. PROVIDE CLEAR STICKER ON CEILING T-BAR TO INDICATE ACCESS LOCATION FOR EACH FAN POWERED BOX AND VAV TERMINAL BOX.

B. THE CONTRACTOR SHALL FURNISH AND INSTALL A SYSTEM OF NAMEPLATES OR STENCILS DESIGNED TO IDENTIFY EACH PIECE OF EQUIPMENT.

(1) NAMEPLATE LETTERS AND NUMBERS SHALL MATCH EQUIPMENT DESIGNATION AS INDICATED ON THE DRAWINGS.

(2) NAMEPLATES SHALL BE LAMINATED PHENOLIC WITH BLACK SURFACE AND WHITE CORE. USE 1/16" THICK MATERIAL FOR PLATES UP TO 2" BY 4". FOR LARGER SIZES USE 1/8" THICK. LETTERS AND NUMBERS SHALL BE A MINIMUM OF 1/2" HIGH.

(3) FASTEN NAMEPLATES TO ALL EQUIPMENT BY THE USE OF STAINLESS STEEL SHEET METAL SCREWS.

23 50 11 CENTRIFUGAL ROOF FANS:

A. PROVIDE DIRECT CENTRIFUGAL FANS, AS SCHEDULED, CONSISTING OF HOUSING, WHEEL, FAN SHAFT, BEARINGS, ECM, MOTOR AND DISCONNECT SWITCH, DRIVE ASSEMBLY, CURB BASE, AND ACCESSORIES.

B. HOUSING: REMOVABLE, SPUN-ALUMINUM, DOME TOP, AND OUTLET BAFFLE SQUARE, ONE-PIECE, ALUMINUM BASE WITH VENTURI INLET CONE.

C. FAN WHEELS: ALUMINUM HUB AND WHEEL WITH BACKWARD-INCLINED BLADES.

D. ACCESSORIES:

(1) DISCONNECT SWITCH: NONFUSIBLE TYPE, WITH THERMAL-OVERLOAD PROTECTION MOUNTED INSIDE FAN HOUSING, FACTORY WIRED THROUGH AN INTERNAL ALUMINUM CONDUIT.

(2) BIRD SCREENS: REMOVABLE, 1/2-INCH MESH, ALUMINUM OR BRASS WIRE.

(3) DAMPERS: COUNTERBALANCED, PARALLEL-BLADE, BACKDRAFT DAMPERS MOUNTED IN CURB BASE; FACTORY SET TO CLOSE WHEN FAN STOPS.

E. ROOF CURBS: SHALL BE FURNISHED BY THE FAN MANUFACTURER AND SHALL BE GALVANIZED STEEL; MITERED AND WELDED CORNERS; 1-1/2-INCH- THICK, RIGID, FIBERGLASS INSULATION ADHERED TO INSIDE WALLS; AND 1-1/2-INCH WOOD NAILER. SIZE AS REQUIRED TO SUIT ROOF OPENING AND FAN BASE.

(1) CONFIGURATION: SELF-FLASHING WITHOUT A CANT STRIP, WITH MOUNTING FLANGE

(2) OVERALL HEIGHT: 14 INCHES

(3) METAL LINER: GALVANIZED STEEL.

F. ACCEPTABLE MANUFACTURERS: CARNES COMPANY HVAC, GREENHECK, LOREN COOK COMPANY, NEW YORK BLOWER COMPANY, PENN VENTILATION, TWIN CITY FAN COMPANY.

23 60 10 PACKAGED ROOFTOP AIR CONDITIONING UNITS

G. GENERAL DESCRIPTION

(1) PACKAGED ROOFTOP UNITS SHALL INCLUDE COMPRESSOR(S), EVAPORATOR COIL(S), FILTERS, SUPPLY FANS, DAMPERS, AIR-COOLED CONDENSER COILS, CONDENSER FANS, ELECTRIC PRE-HEATERS, EXHAUST FANS, AND ENERGY RECOVERY WHEELS.

(2) UNITS SHALL BE FACTORY ASSEMBLED AND TESTED INCLUDING LEAK TESTING OF THE COILS, PRESSURE TESTING OF THE REFRIGERATION CIRCUIT, AND RUN TESTING OF THE COMPLETED UNIT. RUN TEST REPORT SHALL BE SUPPLIED WITH EACH UNIT IN THE CONTROLS COMPARTMENT'S LITERATURE POCKET.

(3) UNITS SHALL HAVE DECALS AND TAGS TO INDICATE LIFTING AND RIGGING, SERVICE AREAS AND CAUTION AREAS FOR SAFETY AND TO ASSIST SERVICE PERSONNEL.

(4) UNIT COMPONENTS SHALL BE LABELED, INCLUDING PIPE STUB OUTS, REFRIGERATION SYSTEM COMPONENTS AND ELECTRICAL AND CONTROLS COMPONENTS.

(5) ESTIMATED SOUND POWER LEVELS (DB) SHALL BE SHOWN ON THE UNIT RATINGS SHEET.

(6) INSTALLATION, OPERATION AND MAINTENANCE MANUAL SHALL BE SUPPLIED WITHIN EACH UNIT.

(7) LAMINATED COLOR-CODED WIRING DIAGRAM SHALL MATCH FACTORY INSTALLED WIRING AND SHALL BE AFFIXED TO THE INTERIOR OF THE CONTROL COMPARTMENT'S ACCESS DOOR.

(8) UNIT NAMEPLATE SHALL BE PROVIDED IN TWO LOCATIONS ON THE UNIT, AFFIXED TO THE EXTERIOR OF THE UNIT AND AFFIXED TO THE INTERIOR OF THE CONTROL COMPARTMENT'S ACCESS DOOR.

H. CONSTRUCTION

(1) ALL CABINET WALLS, ACCESS DOORS, AND ROOF SHALL BE FABRICATED OF DOUBLE WALL, IMPACT RESISTANT, RIGID POLYURETHANE FOAM PANELS.

(2) UNIT INSULATION SHALL HAVE A MINIMUM THERMAL RESISTANCE R-VALUE OF 13. FOAM INSULATION SHALL HAVE A MINIMUM DENSITY OF 2 POUNDS/CUBIC FOOT AND SHALL BE TESTED IN ACCORDANCE WITH ASTM D-1929 FOR A MINIMUM FLASH IGNITION TEMPERATURE OF 610°F.

(3) UNIT CONSTRUCTION SHALL BE DOUBLE WALL WITH G90 GALVANIZED STEEL ON BOTH SIDES AND A THERMAL BREAK. DOUBLE WALL CONSTRUCTION WITH A THERMAL BREAK PREVENTS MOISTURE ACCUMULATION ON THE INSULATION, PROVIDES A CLEANABLE INTERIOR, PREVENTS HEAT TRANSFER THROUGH THE PANEL, AND PREVENTS EXTERIOR CONDENSATION ON THE PANEL.

(4) UNITS SHALL BE DESIGNED TO REDUCE AIR LEAKAGE AND INFILTRATION THROUGH THE CABINET. CABINET LEAKAGE SHALL NOT EXCEED 1% OF TOTAL AIRFLOW WHEN TESTED AT 3 TIMES THE MINIMUM EXTERNAL STATIC PRESSURE PROVIDED IN AHRI STANDARD 340/360. PANEL DEFLECTION SHALL NOT EXCEED L/240 RATIO AT 125% OF DESIGN STATIC PRESSURE, AT A MAXIMUM 8 INCHES OF POSITIVE OR NEGATIVE STATIC PRESSURE, TO REDUCE AIR LEAKAGE. DEFLECTION SHALL BE MEASURED AT THE MIDPOINT OF THE PANEL HEIGHT AND WIDTH. CONTINUOUS SEALING SHALL BE INCLUDED BETWEEN PANELS AND BETWEEN ACCESS DOORS AND OPENINGS TO REDUCE AIR LEAKAGE. REFRIGERANT PIPING AND ELECTRICAL CONDUIT THROUGH CABINET PANELS SHALL INCLUDE SEALING TO REDUCE AIR LEAKAGE.

(5) ROOF OF THE UNITS SHALL BE SLOPED TO PROVIDE COMPLETE DRAINAGE. CABINET SHALL HAVE RAIN BREAK OVERHANGS ABOVE ACCESS DOORS.

(6) ACCESS TO FILTERS, DAMPERS, COOLING COILS, EXHAUST FANS, RETURN FANS, ENERGY RECOVERY WHEELS, COMPRESSORS, AND ELECTRICAL AND CONTROLS COMPONENTS SHALL BE THROUGH HINGED ACCESS DOORS WITH QUARTER TURN, ZINC CAST, LOCKABLE HANDLES. FULL LENGTH STAINLESS STEEL PIANO HINGES SHALL BE INCLUDED ON THE DOORS.

(7) EXTERIOR PAINT FINISH SHALL BE CAPABLE OF WITHSTANDING AT LEAST 2,500 HOURS, WITH NO VISIBLE CORROSIVE EFFECTS, WHEN TESTED IN A SALT SPRAY AND FOG ATMOSPHERE IN ACCORDANCE WITH ASTM B 117-95 TEST PROCEDURE.

(8) UNITS WITH COOLING COILS SHALL INCLUDE DOUBLE SLOPED 304 STAINLESS STEEL DRAIN PANS.

(9) UNITS SHALL BE PROVIDED FOR DOWNFLOW ARRANGEMENT WITH BASE DISCHARGE AND RETURN AIR OPENINGS. ALL OPENINGS THROUGH THE BASE PAN OF THE UNIT SHALL HAVE UPTURNED FLANGES OF AT LEAST 1/2 INCH IN HEIGHT AROUND THE OPENING.

(10)UNITS SHALL INCLUDE LIFTING LUGS TO AID IN RIGGING.

I. ELECTRICAL

(1) UNITS SHALL BE PROVIDED WITH STANDARD POWER BLOCK FOR CONNECTING POWER TO THE UNIT. A SINGLE POWER FEED SHALL BE PROVIDED FOR EACH UNITS SUPPLY FAN, RETURN/EXHAUST FAN, ENERGY RECOVERY WHEEL, CONTROLS AND REFRIGERATION COMPONENTS, INCLUDING COMPRESSORS AND CONDENSER FANS. UNITS SHALL BE PROVIDED WITH A FACTORY INSTALLED AND FACTORY WIRED, NON-FUSED DISCONNECT SWITCH FOR ALL OF THIS EQUIPMENT.

(2) UNITS SHALL BE PROVIDED WITH A SEPARATE POWER FEED FOR THE ELECTRIC PRE-HEAT COILS.

J. SUPPLY FANS

(1) UNITS SHALL INCLUDE DIRECT DRIVE, UNHOUSED, BACKWARD CURVED, PLENUM SUPPLY FANS.

(2) BLOWERS AND MOTORS SHALL BE DYNAMICALLY BALANCED AND MOUNTED ON RUBBER ISOLATORS.

(3) MOTORS SHALL BE PREMIUM EFFICIENCY ODP WITH BALL BEARINGS RATED FOR 200,000 HOURS SERVICE WITH EXTERNAL LUBRICATION POINTS.

(4) UNITS SCHEDULED TO BE VARIABLE AIRFLOW SHALL BE PROVIDED WITH VARIABLE FREQUENCY DRIVES TO SERVE SUPPLY FANS. VARIABLE FREQUENCY DRIVES (VFD) SHALL BE FACTORY WIRED AND MOUNTED IN THE UNIT. FAN MOTORS SHALL BE PREMIUM EFFICIENCY, COMPATIBLE WITH THE VFD'S.

K. POWERED EXHAUST FANS

(1) POWERED EXHAUST FANS AND DAMPERS SHALL BE SIZED FOR 100% RELIEF.

(2) FANS AND MOTORS SHALL BE DYNAMICALLY BALANCED.

(3) MOTORS SHALL BE PREMIUM EFFICIENCY ODP WITH BALL BEARINGS RATED FOR 200,000 HOURS SERVICE WITH EXTERNAL LUBRICATION POINTS.

(4) ACCESS TO EXHAUST FANS SHALL BE THROUGH DOUBLE WALL, HINGED ACCESS DOORS WITH QUARTER TURN HANDLES.

(5) POWERED EXHAUST FANS SHALL BE PROVIDED WITH VARIABLE FREQUENCY DRIVES. VARIABLE FREQUENCY DRIVES SHALL BE FACTORY WIRED AND MOUNTED IN THE UNIT. FAN MOTORS SHALL BE PREMIUM EFFICIENCY.

L. COOLING COILS

(1) EVAPORATOR COILS

(A) COILS SHALL BE DESIGNED FOR USE WITH R-410A REFRIGERANT AND CONSTRUCTED OF COPPER TUBES WITH ALUMINUM FINS MECHANICALLY BONDED TO THE TUBES AND GALVANIZED STEEL END CASINGS. FIN DESIGN SHALL BE SINE WAVE RIPPLED. FIN SPACING SHALL NOT EXCEED 10 FINS PER INCH.

(B) COILS FOR UNITS WITH TWO REFRIGERANT CIRCUITS SHALL HAVE INTERLACED CIRCUITRY.

(C) COILS SHALL BE HELIUM LEAK TESTED.

(D) COILS SHALL BE FURNISHED WITH FACTORY INSTALLED THERMOSTATIC EXPANSION VALVES.

M. REFRIGERATION SYSTEM

(1) UNITS SHALL BE FACTORY CHARGED WITH SCHEDULED REFRIGERANT.

(2) COMPRESSORS SHALL BE SCROLL TYPE WITH THERMAL OVERLOAD PROTECTION, INDEPENDENTLY CIRCUITED, AND CARRY A 5 YEAR NON-PRORATED WARRANTY.

(3) COMPRESSORS SHALL BE MOUNTED IN AN ISOLATED SERVICE COMPARTMENT WHICH CAN BE ACCESSED WITHOUT AFFECTING UNIT OPERATION. LOCKABLE HINGED COMPRESSOR ACCESS DOORS SHALL BE FABRICATED OF DOUBLE WALL, RIGID POLYURETHANE FOAM INSULATED PANELS TO PREVENT THE TRANSMISSION OF NOISE OUTSIDE THE CABINET.

(4) COMPRESSORS SHALL BE ISOLATED FROM THE BASE PAN WITH THE COMPRESSOR MANUFACTURER'S RECOMMENDED RUBBER VIBRATION ISOLATORS, TO REDUCE ANY TRANSMISSION OF NOISE FROM THE COMPRESSORS INTO THE BUILDING AREA.

(5) EACH REFRIGERATION CIRCUIT SHALL BE EQUIPPED WITH THERMOSTATIC EXPANSION VALVE TYPE REFRIGERANT FLOW CONTROL.

(6) EACH REFRIGERATION CIRCUIT SHALL BE EQUIPPED WITH AUTOMATIC RESET LOW PRESSURE AND MANUAL RESET HIGH PRESSURE REFRIGERANT SAFETY CONTROLS, SCHRADER TYPE SERVICE FITTINGS ON BOTH THE HIGH PRESSURE AND LOW PRESSURE SIDES, AND FACTORY INSTALLED LIQUID LINE FILTER DRIERS. EACH REFRIGERATION CIRCUIT SHALL BE EQUIPPED WITH A LIQUID LINE SIGHT GLASS.

(A) EACH REFRIGERATION CIRCUIT SHALL BE PROVIDED WITH AN ADJUSTABLE TEMPERATURE SENSOR FREEZE STAT WHICH SHUTS DOWN THE COOLING CIRCUITS WHEN THE EVAPORATOR COIL TUBING FALLS BELOW THE SETPOINT.

(B) EACH REFRIGERATION CIRCUIT SHALL BE EQUIPPED WITH SUCTION AND DISCHARGE COMPRESSOR ISOLATION VALVES.

(C) EACH CAPACITY STAGE SHALL BE EQUIPPED WITH A 5 MINUTE OFF, DELAY TIMER TO PREVENT COMPRESSOR SHORT CYCLING.

(D) EACH CAPACITY STAGE SHALL BE EQUIPPED WITH AN ADJUSTABLE, 20 SECOND DELAY TIMER TO PREVENT MULTIPLE CAPACITY STAGES FROM STARTING ALL AT ONCE.

(E) UNITS SHALL INCLUDE A VARIABLE CAPACITY SCROLL COMPRESSOR(S) ON THE LEAD REFRIGERATION CIRCUIT(S) WHICH SHALL BE CAPABLE OF MODULATION FROM 10-100% OF ITS CAPACITY.

N. CONDENSERS

(1) AIR-COOLED CONDENSER FANS SHALL BE VERTICAL DISCHARGE, AXIAL FLOW, AND DIRECT DRIVE FANS.

(2) COILS SHALL BE DESIGNED FOR USE WITH R-410A REFRIGERANT AND CONSTRUCTED OF COPPER TUBES WITH ALUMINUM FINS MECHANICALLY BONDED TO THE TUBES AND ALUMINUM END CASINGS. FIN DESIGN SHALL BE SINE WAVE RIPPLED.

(3) COILS SHALL BE DESIGNED FOR A MINIMUM OF 10F OF REFRIGERANT SUB-COOLING.

(4) COILS SHALL BE HELIUM LEAK TESTED.

(5) CONDENSER FANS SHALL HAVE HIGH EFFICIENCY, ELECTRICALLY COMMUTATED MOTORS DRIVEN BY VARIABLE FREQUENCY DRIVES WHICH ARE CONTROLLED BASED ON HEAD PRESSURE AND ALLOW MATCHING CONDENSER AIRFLOW WITH COOLING CAPACITY REQUIREMENTS.

O. FILTERS

(1) UNITS SHALL INCLUDE 2 INCH THICK, PLEATED PANEL FILTERS WITH AN ASHRAE EFFICIENCY OF 30% AND MERV RATING OF 7, UPSTREAM OF THE ENERGY RECOVERY WHEEL IN THE RETURN AIRSTREAM AND UPSTREAM OF ELECTRIC HEATING COILS AS INDICATED.

P. OUTSIDE AIR/ECONOMIZER

(1) UNITS SHALL INCLUDE 0-100% ECONOMIZER CONSISTING OF A MOTOR OPERATED OUTSIDE AIR DAMPER AND RETURN AIR DAMPER ASSEMBLY CONSTRUCTED OF EXTRUDED ALUMINUM, HOLLOW CORE, AIRFOIL BLADES WITH RUBBER EDGE SEALS AND ALUMINUM END SEALS. DAMPER BLADES SHALL BE GEAR DRIVEN AND DESIGNED TO HAVE NO MORE THAN 15 CFM OF LEAKAGE PER SQ. FT. OF DAMPER AREA WHEN SUBJECTED TO 2 INCHES W.G. AIR PRESSURE DIFFERENTIAL ACROSS THE DAMPER. DAMPER ASSEMBLY SHALL BE CONTROLLED BY SPRING RETURN SENSIBLE TEMPERATURE ACTIVATED FULLY MODULATING ACTUATOR. UNIT SHALL INCLUDE OUTSIDE AIR OPENING BIRD SCREEN, OUTSIDE AIR HOOD WITH RAIN LIP AND BAROMETRIC RELIEF DAMPERS OR POWERED EXHAUST FAN.

(2) WHERE INDICATED IN THE CONTROL SEQUENCES, THE ECONOMIZER SHALL BE FURNISHED WITH RETURN AIR CO_2 OVERRIDE.

Q. CONTROLS

(1) EACH ROOFTOP AIR CONDITIONING UNIT SHALL BE PROVIDED WITH FACTORY INSTALLED AND TESTED CONTROLS. EACH UNIT'S CONTROLLER SHALL BE MICROPROCESSOR-BASED AND SHALL BE CAPABLE OF CONTROLLING ALL FEATURES AND OPTIONS OF THE UNITS AS SHOWN ON THE DRAWINGS AND INDICATED IN THE SEQUENCES OF OPERATION. CONTROLLERS SHALL BE INTERFACED WITH THE BUILDING AUTOMATION SYSTEM AS INDICATED BUT SHALL BE ALSO CAPABLE OF STAND ALONE OPERATION WITH UNIT CONFIGURATION, SETPOINT ADJUSTMENT, SENSOR STATUS VIEWING, UNIT ALARM VIEWING, AND OCCUPANCY SCHEDULING AVAILABLE WITHOUT DEPENDENCE ON A BUILDING MANAGEMENT SYSTEM. CONTROLLERS SHALL HAVE AN ONBOARD CLOCK AND CALENDAR FUNCTIONS THAT ALLOW FOR OCCUPANCY SCHEDULING. CONTROLLERS SHALL INCLUDE NON-VOLATILE MEMORY TO RETAIN ALL PROGRAMMED VALUES, WITHOUT THE USE OF AN EXTERNAL BATTERY, IN THE EVENT OF A POWER FAILURE.

(2) VARIABLE AIR VOLUME CONTROLS

(A) UNITS SHALL BE EQUIPPED WITH DIGITAL SCROLL COMPRESSOR(S) ON THE LEAD REFRIGERATION CIRCUITS TO PROTECT AGAINST EVAPORATOR FROSTING AT LOW SUCTION PRESSURES AND TO PREVENT EXCESSIVE COMPRESSOR CYCLING.

(B) OUTSIDE AND RETURN AIR TEMPERATURE SENSORS SHALL BE FACTORY MOUNTED AND WIRED (OUTSIDE ARE TEMPERATURE SENSORS MUST BE FIELD INSTALLED ON UNITS WITH ELECTRIC PREHEAT COILS). SUPPLY AIR TEMPERATURE SENSOR AND SUPPLY AIR DUCT STATIC PRESSURE SENSOR SHALL BE FURNISHED WITH THE UNIT FOR FIELD INSTALLATION.

(C) CONTROL OF SUPPLY AIR FLOW WITH DUCT STATIC PRESSURE CONTROL, SHALL BE VIA THE UNIT CONTROLLER, THE FACTORY INSTALLED VARIABLE FREQUENCY DRIVE, AND REMOTE SUPPLY AIR DUCT STATIC PRESSURE SENSOR.

(3) CONSTANT VOLUME CONTROLS

(A) OUTSIDE AIR TEMPERATURE SENSOR SHALL BE FACTORY MOUNTED AND WIRED. SUPPLY AIR TEMPERATURE SENSOR AND SPACE TEMPERATURE SENSOR WITH TEMPERATURE SETPOINT RESET AND UNOCCUPIED OVERRIDE SHALL BE FURNISHED WITH THE UNIT FOR FIELD INSTALLATION.

R. CURBS

(1) CURBS SHALL TO BE FULLY GASKETED BETWEEN THE CURB TOP AND UNIT BOTTOM WITH THE CURB PROVIDING FULL PERIMETER SUPPORT, CROSS STRUCTURE SUPPORT AND AIR SEAL FOR THE UNIT. CURB GASKET SHALL BE FURNISHED WITHIN THE CONTROL COMPARTMENT OF THE ROOFTOP UNIT TO BE MOUNTED ON THE CURB IMMEDIATELY BEFORE MOUNTING OF THE ROOFTOP UNIT.

(2) CURB SHALL HAVE MINIMUM 1" DEFLECTION SPRING ISOLATION.

S. ACCEPTABLE MANUFACTURERS: AAON, MAMMOTH, SEASONS 4, TEMPTROL, TRANE, DAIKIN

23 81 10 DUCTLESS, SPLIT SYSTEM AIR CONDITIONERS

A. THE DUCTLESS, SPLIT SYSTEM AIR CONDITIONERS CONTROL SYSTEM SHALL BE DESIGNED TO MAINTAIN TEMPERATURE CONDITIONS WITHIN THE ROOM. THE DUCTLESS, SPLIT SYSTEM AIR CONDITIONERS SYSTEM SHALL BE SPLIT REFRIGERATION SYSTEM WITH THE COMPRESSOR LOCATED IN A REMOTE CONDENSING UNIT.

B. THE EVAPORATOR SECTIONS SHALL BE SPECIFICALLY DESIGNED FOR WALL-MOUNTED INSTALLATION. CONDENSING UNITS SHALL BE DESIGNED FOR OUTDOOR INSTALLATION.

C. THE INDOOR, WALL-MOUNTED UNIT SHALL BE FACTORY ASSEMBLED, WIRE AND TESTED. THE UNIT CABINET SHALL BE FORMED FROM HIGH STRENGTH MOLDED PLASTIC WITH SMOOTH FINISH, FLAT FRONT PANEL DESIGN WITH ACCESS FOR FILTER. THE UNIT SHALL CONTAIN ALL FACTORY WIRING AND INTERNAL PIPING, CONTROL CIRCUIT BOARD AND FAN MOTOR. THE UNIT, IN CONJUNCTION WITH THE WIRED, WALL MOUNTED CONTROLLER SHALL HAVE A SELF-DIAGNOSTIC FUNCTION, 3-MINUTE TIME DELAY MECHANISM, AN AUTO RESTART FUNCTION, AND A TEST RUN SWITCH.

D. THE INDOOR UNIT FAN SHALL BE DOUBLE INLET, FORWARD CURVE, AND DIRECT DRIVE WITH A SINGLE MOTOR. THE FANS SHALL BE STATICALLY AND DYNAMICALLY BALANCED AND RUN ON A MOTOR WITH PERMANENTLY LUBRICATED BEARINGS. THE INDOOR FAN SHALL CONSIST OF THREE (3) SPEEDS: LOW, MID, HI, AND AUTO. THE FAN SHALL HAVE A SELECTABLE AUTO FAN SETTING THAT WILL ADJUST THE FAN SPEED ON THE DIFFERENCE BETWEEN CONTROLLER SET-POINT AND SPACE TEMPERATURE.

E. FILTER: RETURN AIR SHALL BE FILTERED BY MEANS OF AN EASILY REMOVABLE WASHABLE FILTER.

F. THE EVAPORATOR COIL SHALL BE NONFERROUS CONSTRUCTION WITH PRE-COATED ALUMINUM FINS ON COPPER TUBING. A CONDENSATE PAN AND DRAIN SHALL BE PROVIDED UNDER THE COIL.

G. THE ELECTRIC POWER OF THE UNIT SHALL BE 208 VOLTS OR 230 VOLTS, 1 PHASE, 60 HERTZ AS SCHEDULED. THE POWER TO THE INDOOR UNIT SHALL BE SUPPLIED FROM THE OUTDOOR UNIT.

H. THE INDOOR UNIT SHALL BE CONNECTED TO A WALL MOUNTED AND WIRED CONTROLLER TO PERFORM INPUT FUNCTIONS NECESSARY TO OPERATE THE SYSTEM. THE WIRED CONTROLLER SHALL HAVE A LARGE MULTI-LANGUAGE DOT LIQUID CRYSTAL DISPLAY AND CONSIST OF AN ON/OFF BUTTON, INCREASE/DECREASE SET TEMPERATURE BUTTONS, A HEAT/COOL/AUTO MODE SELECTOR, A TIMER MENU BUTTON, A TIMER ON/OFF BUTTON, SET TIME BUTTONS, A FAN SPEED SELECTOR, A VENTILATION BUTTON, A TEST RUN BUTTON, AND A CHECK MODE BUTTON. THE CONTROLLER SHALL HAVE A BUILT-IN TEMPERATURE SENSOR. TEMPERATURE SHALL BE DISPLAYED IN DEGREES FAHRENHEIT.

I. OUTDOOR AIR-COOLED CONDENSING UNITS SHALL BE FACTORY-ASSEMBLED AND TESTED, AIR-COOLED, HORIZONTAL DISCHARGE TYPE, CONSISTING OF COMPRESSOR, CONDENSER COIL, FAN, MOTOR, REFRIGERANT RESERVOIR AND OPERATING CONTROLS. CASING SHALL BE ZINC COATED STEEL FINISHED WITH BAKED ENAMEL, COMPLETE WITH REMOVABLE PANELS FOR ACCESS TO CONTROLS AND MOUNTING HOLES IN BASE. COMPRESSOR SHALL BE HERMETICALLY SEALED, WITH BUILT-IN OVERLOADS AND VIBRATION ISOLATION.

J. THE CONDENSING UNIT COMPRESSOR SHALL BE A DC TWIN-ROTOR ROTARY COMPRESSOR WITH VARIABLE SPEED INVERTER DRIVE TECHNOLOGY. THE COMPRESSOR SHALL BE DRIVEN BY THE INVERTER CIRCUIT TO CONTROL COMPRESSOR SPEED. THE COMPRESSOR SPEED SHALL DYNAMICALLY VARY TO MATCH THE ROOM LOAD FOR SIGNIFICANTLY INCREASING THE EFFICIENCY OF THE SYSTEM WHICH SHALL RESULT IN SIGNIFICANT ENERGY SAVINGS. TO PREVENT LIQUID FROM ACCUMULATING IN THE COMPRESSOR DURING THE OFF CYCLE, A MINIMAL AMOUNT OF CURRENT SHALL BE AUTOMATICALLY, INTERMITTENTLY APPLIED TO THE COMPRESSOR MOTOR WINDINGS TO MAINTAIN SUFFICIENT HEAT TO VAPORIZE ANY REFRIGERANT. NO CRANKCASE HEATER IS TO BE USED. THE OUTDOOR CONDENSING UNIT SHALL HAVE AN ACCUMULATOR AND HIGH PRESSURE SAFETY SWITCH. THE COMPRESSOR SHALL BE MOUNTED TO AVOID THE TRANSMISSION OF VIBRATION.

K. THE L-SHAPED CONDENSER COIL SHALL BE OF COPPER TUBING WITH FLAT ALUMINUM FINS. THE COIL SHALL BE PROTECTED WITH AN INTEGRAL METAL GUARD. REFRIGERANT FLOW FROM THE CONDENSER SHALL BE CONTROLLED BY MEANS OF AN ELECTRONIC LINEAR EXPANSION VALVE (LEV) METERING DEVICE. THE LEV SHALL BE CONTROLLED BY A MICROPROCESSOR CONTROLLED STEP MOTOR.

L. AN ALUMINUM CONDENSING UNIT PROPELLER FAN SHALL BE DIRECT-DRIVEN WITH PERMANENTLY LUBRICATED OR BALL BEARING FAN MOTOR HAVING THERMAL OVERLOAD PROTECTION. FURNISH UNIT WITH WIND BAFFLE ACCESSORY FOR LOW AMBIENT COOLING DOWN TO 0°F OUTDOOR AIR TEMPERATURE. REFRIGERANT CHARGE: R-410A.

M. THE OUTDOOR UNIT SHALL BE COMPATIBLE WITH THE INDOOR UNIT AND SHALL BE OF THE SAME CAPACITY AND SAME MANUFACTURER AS THE INDOOR UNIT. THE OUTDOOR UNIT SHALL BE EQUIPPED WITH A CONTROL BOARD THAT INTERFACES WITH THE INDOOR UNIT TO PERFORM ALL NECESSARY OPERATIONS FUNCTIONS.

N. THE CONTROL SYSTEM SHALL CONSIST OF TWO MICROPROCESSORS, ONE ON EACH INDOOR AND OUTDOOR UNIT, INTERCONNECTED BY A SINGLE, NON-POLAR TWO-CABLE. THE SYSTEM SHALL HAVE SELF-DIAGNOSTICS ABILITY AND SHALL BE CAPABLE OF AUTOMATIC RESTART WHEN POWER IS RESTORED AFTER POWER INTERRUPTION. THE INDOOR UNIT SHALL BE CONNECTED TO A WALL-MOUNTED WIRED CONTROLLER VIA 12VDC MONITORING SET TEMPERATURE, ROOM TEMPERATURE, AND COMPRESSOR OPERATION CONDITIONS. THE CONTROL SIGNAL BETWEEN THE INDOOR AND OUTDOOR UNITS SHALL BE 24VDC.

O. ACCEPTABLE MANUFACTURERS: ENVIROMASTER INTL. (EMI), FRIEDRICH, MITSUBISHI, SANYO, CARRIER.

23 93 30 CONTROL DAMPERS

A. CONTROL DAMPERS SHALL BE LOW LEAKAGE PARALLEL BLADE TYPE. CONSTRUCT BLADES OF 16 GAUGE GALVANIZED STEEL OR AIR-FOIL SHAPED EXTRUDED 12-GAUGE (0.0181") ALUMINUM. PROVIDE HEAVY-DUTY MOLDED SELF-LUBRICATING OILITE OR SYNTHETIC BEARINGS WITH 1/2" DIAMETER STEEL AXLES SPACED ON MAXIMUM 6" CENTERS. CONSTRUCT FRAME OF MINIMUM 16 GAUGE GALVANIZED STEEL CHANNEL OR 0.125" THICK 6063-T5 EXTRUDED ALUMINUM HAT-SHAPED FRAME WITH STAINLESS STEEL FASTENERS. DAMPERS SHALL HAVE LEAKAGE OF LESS THAN ½% OR 20 SCFM/SQ. FT. WHEN CLOSING AGAINST 4" WATER COLUMN STATIC PRESSURE AND WHEN SIZED FOR 2000 FPM VELOCITY. CONTROL DAMPERS SHALL HAVE PLASTIC EDGE SEALS WITH A TEMPERATURE RANGE TO 150 °F AND STAINLESS STEEL COMPRESSION TYPE JAMB SEALS.

B. ACCEPTABLE MANUFACTURERS: AIR BALANCE, AMERICAN WARMING & VENTILATING, ARROW, GREENHECK, HONEYWELL, JOHNSON CONTROLS OR RUSKIN.

PATRICK W. KLANAC
NUMBER
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8-15-2025

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PROJECT:

TENANT IMPROVEMENTS FOR:
SONNY'S
2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402

DRAWN BY: PTA, INC. CHECKED BY: JSC

DRAWING TITLE:
MECHANICAL SPECIFICATIONS

SHEET #:
M5.02

EQUIPMENT/DEVICES

EQUIPMENT/DEVICES SYMBOL LEGEND

SYMBOL	DESCRIPTION	
AD	AREAWAY DRAIN	22 41 10
	CONTROL VALVE (TWO-POSITION)	
	DOUBLE CHECK BACKFLOW PREVENTER	22 14 20
ERD	EMERGENCY (OVERFLOW) ROOF DRAIN	22 41 10
HB	FAUCET OR HOSE BIBB	22 42 10
	MIXING VALVE	22 13 11
	PRESSURE GAUGE WITH SHUT-OFF VALVE	22 12 30
	REDUCED PRESSURE BACKFLOW PREVENTER WITH FUNNEL AND DRAIN	22 14 10
RD	ROOF DRAIN	22 41 20
FD	SAINTARY FLOOR DRAIN	22 41 10
	THERMOMETER	22 12 30
	TRAP PRIMER VALVE	22 41 10
	WATER HAMMER ARRESTOR	22 12 50
	WATER UTILITY METER	22 19 20
	WATER SUB-METER	22 19 10

NOTE: ALL SYMBOLS MAY NOT BE USED IN THIS SET.

ABBREVIATIONS

PLUMBING ABBREVIATION SCHEDULE1

ABBREVIATION	DESCRIPTION
AD	AREA DRAIN
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
AP	ACCESS PANEL
APPROX	APPROXIMATELY
ARCH	ARCHITECT, ARCHITECTURAL
BFG	BELOW FINISHED GRADE
BHP	BRAKE HORSEPOWER
BOP	BOTTOM OF PIPE
BT	BATHTUB
BTUH	BRITISH THERMAL UNIT PER HOUR
CFH	CUBIC FEET PER HOUR
CI	CAST IRON
CS	CLINIC SINK
D	DEEP
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY
DCVA	DOUBLE CHECK VALVE ASSEMBLY
DEG F	DEGREES FARENHEIT
DEMO	DEMOLITION
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DN	DOWN
DS	DOWNSPOUT
DTF	DOWN THROUGH FLOOR
DTR	DOWN THROUGH ROOF
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DWS	DOMESTIC WATER SOFTENER
E	EAST
EA	EACH
EC	ELECTRICAL CONTRACTOR
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE (DEG F)
FD	FLOOR DRAIN
FFE	FINISHED FLOOR ELEVATION
FP	FIRE PROTECTION
FPC	FIRE PROTECTION CONTRACTOR
FT	FEET
GAL	GALLON
GC	GENERAL CONTRACTOR
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GPR	GAS PRESSURE REGULATOR
GV	GAS VENT
H	HIGH
HB	HOSE BIBB
HEAD	FEET OF WATER COLUMN PRESSURE
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HZ	HERTZ (CYCLES PER SECOND)
IN	INCH
INV	INVERT ELEVATION
KW	KILOWATT
L	LENGTH
LAV	LAVATORY
LT	LAUNDRY TUB

NOTE: ALL ABBREVIATIONS MAY NOT BE USED IN THIS SET.

PLUMBING ABBREVIATION SCHEDULE1

ABBREVIATION	DESCRIPTION
LWT	LEAVING WATER TEMPERATURE (DEG F)
MAX	MAXIMUM
MB	MOP BASIN
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
MC	MECHANICAL CONTRACTOR
MFR	MANUFACTURER
MHP	MOTOR HORSEPOWER
MIN	MINIMUM
MV	MIXING VALVE
MVP	MEDICAL VACUUM PUMP
N	NORTH
NA, N/A	NOT APPLICABLE
NEC	NATIONAL ELECTRIC CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NO	NORMALLY OPEN
NO	NUMBER
NPT	NOMINAL PIPE THREAD
NTS	NOT TO SCALE
P	PUMP
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP
PH	PHASE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RD	ROOF DRAIN
RPBP	REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER
RPM	REVOLUTIONS PER MINUTE
S	SOUTH
S	SINK
SF	SQUARE FEET
SH	SHOWER
SPECS	SPECIFICATIONS
SQ	SQUARE
SS	STAINLESS STEEL
T&P	TEMPERATURE AND PRESSURE
TCC	(TEMPERATURE) CONTROL CONTRACTOR
TEMP	TEMPERATURE (DEG F)
TOP	TOP OF PIPE
TP	TRAP PRIMER VALVE
TYP	TYPICAL
U	URINAL
UL	UNDERWRITERS LABORATORIES
UNO	UNLESS NOTED OTHERWISE
UTF	UP THROUGH FLOOR
UTR	UP THROUGH ROOF
V	VOLTS
VB	VACUUM BREAKER
VCT	VITREOUS CLAY TILE
VP	VACUUM PUMP
VTR	VENT THROUGH ROOF
W	WATTS
W	WEST
W	WIDE
WB	WALL BOX
WC	WATER CLOSET
WHA	WATER HAMMER ARRESTOR
ZV	ZONE VALVE BOX

LINETYPES

LEGEND - PIPE LINETYPE SCHEDULE

ABBREVIATION	DESCRIPTION
CW	DOMESTIC COLD WATER
HW	110º DOMESTIC HOT WATER
SAN	SANITARY SEWER
SANB	SANITARY SEWER (BELOW FLOOR OR GRADE)
V	SANITARY VENT

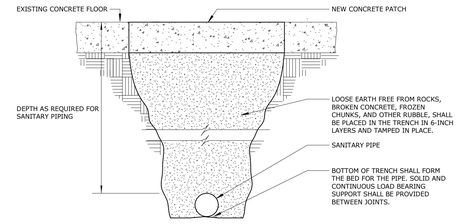
NOTE: ALL LINETYPES MAY NOT BE USED IN THIS SET.

REFERENCE SYMBOL LEGEND

X / XXXX — VIEW NUMBER ON SHEET / SHEET REFERENCE	DETAIL CALLOUT
X / XXXX — VIEW NUMBER ON SHEET / SHEET REFERENCE	SECTION AND ELEVATION CALLOUT
X / XXXX — VIEW NUMBER ON SHEET / SHEET REFERENCE	ENLARGED PLAN CALLOUT
X / XXXX — VIEW NUMBER ON SHEET / SHEET REFERENCE	CONTINUATION CALLOUT

SANITARY SEWER MINIMUM PIPE SLOPES

PIPE SIZE	SLOPE (PER FOOT)
2-1/2" OR LESS	1/4" (2%)
3" TO 6"	1/8" (1%)



7 **22 04 30 - UNDERFLOOR SANITARY TRENCH DETAIL**
NO SCALE

DRAWING LIST

DRAWING LIST - PLUMBING

SHEET NUMBER	SHEET NAME
P0.01	GENERAL INFORMATION
P1.01	FIRST FLOOR PLUMBING DEMOLITION PLAN
P2.01	FIRST FLOOR PLUMBING PLAN
P3.01	FIRST FLOOR ENLARGED PLUMBING PLANS
P4.01	PLUMBING SCHEDULES AND DETAILS
P5.01	PLUMBING SPECIFICATIONS

PIPING

PIPING SYMBOL LEGEND

SYMBOL	DESCRIPTION
	PIPE DOWN THROUGH FLOOR/ROOF
	EXISTING TO REMAIN PIPE DOWN THROUGH FLOOR/ROOF
	REMOVE PIPE DOWN THROUGH FLOOR/ROOF
	PIPE UP THROUGH FLOOR/ROOF
	EXISTING TO REMAIN PIPE UP THROUGH FLOOR/ROOF
	REMOVE PIPE UP THROUGH FLOOR/ROOF

NOTE: ALL SYMBOLS MAY NOT BE USED IN THIS SET.

PIPE FITTINGS SYMBOL LEGEND

SYMBOL	DESCRIPTION
	CAP
CO	CLEANOUT
FWFCO	CLEANOUT (FLUSH WITH FLOOR)
	EXPANSION JOINT
	ORIFICE FLOW METER FITTING
	MANUAL AIR VENT
	MANUAL DRAIN VALVE WITH HOSE CONNECTION
	PIPE ANCHOR
	PIPE GUIDE
	REDUCER
	TIE-IN POINT
	90º PIPE RISE OR DROP
	90º PIPE CONNECTION OUT OF BOTTTOM
	90º PIPE CONNECTION OUT OF TOP
SANITARY / STANDARD	90º PIPE CONNECTION OUT OF SIDE
	PIPING RISER DOWN
	PIPING RISER UP

NOTE: ALL SYMBOLS MAY NOT BE USED IN THIS SET.

PLUMBING PIPE ACCESSORIES LEGEND

SYMBOL	DESCRIPTION
	AUTO BALANCE VALVE
	MANUAL BALANCE VALVE
	BALL VALVE
	BUTTERFLY VALVE
	CHECK VALVE
	FLEXIBLE CONNECTION - WOVEN METAL
	GAS COCK
	GATE VALVE
	STRAINER
BLOWDOWN	STRAINER WITH BLOWDOWN VALVE
	PLUG VALVE
	PRESSURE REDUCING VALVE (PRV)

NOTE: ALL SYMBOLS MAY NOT BE USED IN THIS SET.

PATRICK W. KLANAC NUMBER 29264 — STATE OF MISSOURI — PROFESSIONAL ENGINEER — 6-15-2025

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PROJECT:

TENANT IMPROVEMENTS FOR:
SONNY'S
2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402

DRAWN BY: PTA, INC. | CHECKED BY: JSC

DRAWING TITLE:
GENERAL INFORMATION

SHEET #:
P0.01

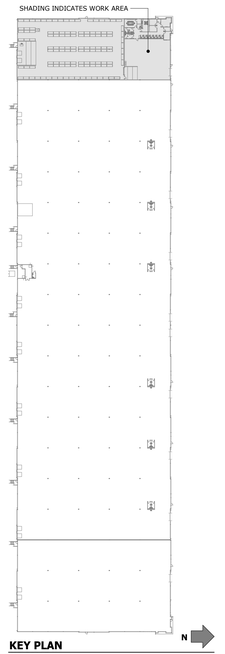
8/18/2025 2:21:30 PM C:\Users\mmuscil\Documents\138-25-25 MFP R25_mmusciSQ834.rvt

DRAWING INTERPRETATION NOTES:

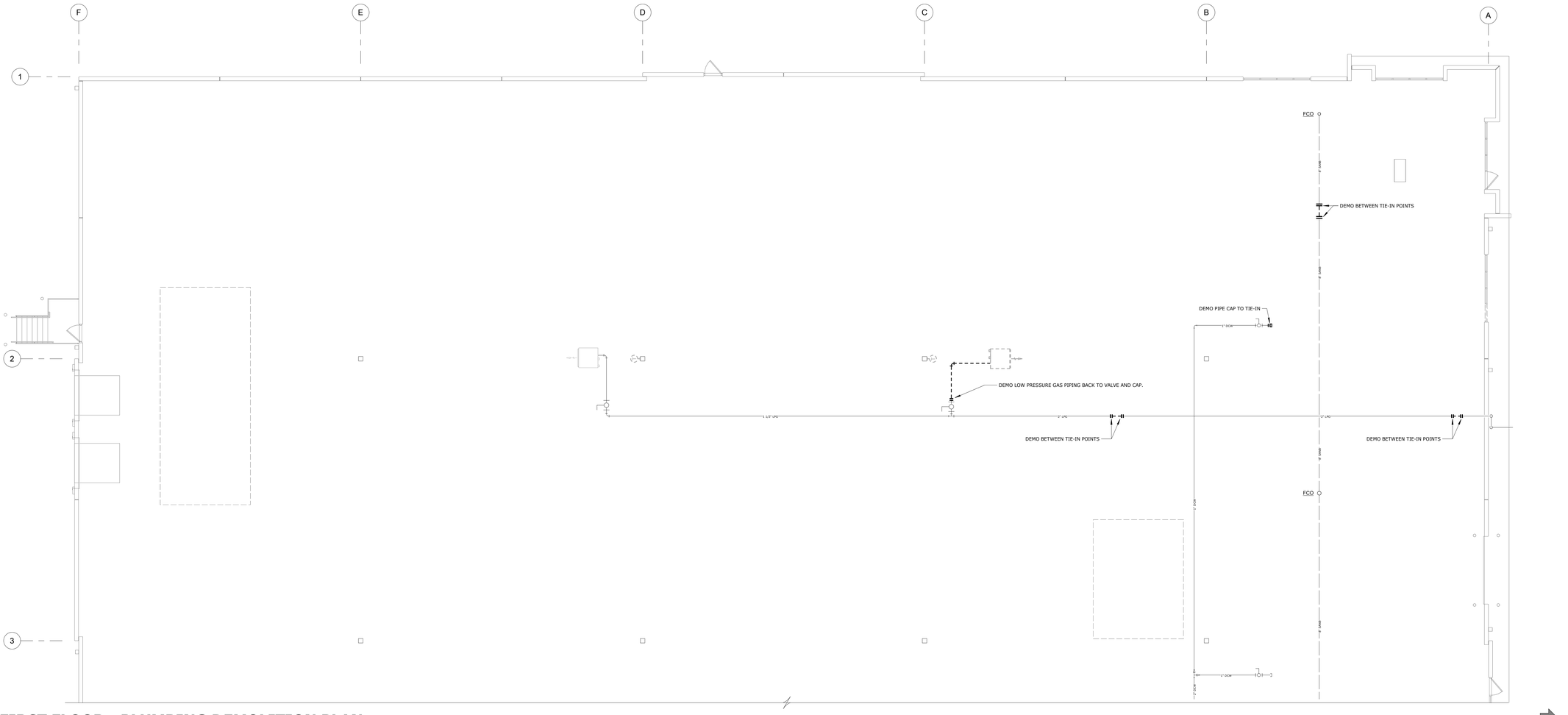
1. EXISTING LINETYPE: THIN (LIGHT) SOLID LINES REPRESENT ITEMS THAT ARE EXISTING TO REMAIN OR ARE FURNISHED BY OTHERS.
2. DEMOLITION LINETYPE: THICK (DARK) DASHED LINES REPRESENT EXISTING ITEMS TO BE REMOVED.
3. RELEVANT EXISTING CONDITIONS SHOWN ARE BASED ON RECORD DRAWINGS AND FIELD OBSERVATION(S). NOT ALL EXISTING ITEMS ARE SHOWN, OR COULD BE FIELD VERIFIED. ONCE AREAS OBSCURED FROM VIEW ARE EXPOSED, VERIFY THAT CONDITIONS ARE AS INDICATED ON THIS DRAWING. BEFORE PROCEEDING WITH WORK, NOTIFY THE ENGINEER IF CONDITIONS DIFFER FROM WHAT IS SHOWN.

PLUMBING PIPING DEMOLITION NOTES:

1. THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL UPON REMOVAL OF ALL SALVAGED ITEMS. OTHERWISE, REMOVE ALL DEMOLISHED ITEMS FROM THE SITE.
2. REMOVE ALL PIPING, AS INDICATED BY THE DEMOLITION LINETYPE. REMOVE ALL ASSOCIATED ANCILLARY ITEMS, SUCH AS PIPE HANGERS, SUPPORTS, INSULATION, VALVES, CONTROLS, ETC. - NOT UTILIZED FOR NEW WORK.
3. REMOVE PIPING BACK TO TIE-IN POINTS WHERE INDICATED.
4. REMOVE PIPING BACK TO CAPPED LOCATIONS WHERE INDICATED. INSULATE CAPPED PIPES SAME AS NEW. DEAD LEGS SHALL NOT BE PERMITTED.



KEY PLAN
NO SCALE



FIRST FLOOR - PLUMBING DEMOLITION PLAN

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

N

STATE OF MISSOURI
PATRICK W. KLANAC
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PROFESSIONAL ENGINEER
6-15-2025

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LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
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PROJECT #: 016-0402

DRAWN BY: PTA, INC. | CHECKED BY: JSC

DRAWING TITLE:
FIRST FLOOR PLUMBING DEMOLITION PLAN

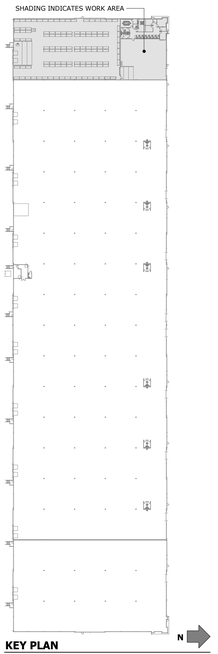
SHEET #:
P1.01

PLUMBING PIPING NEW WORK NOTES:

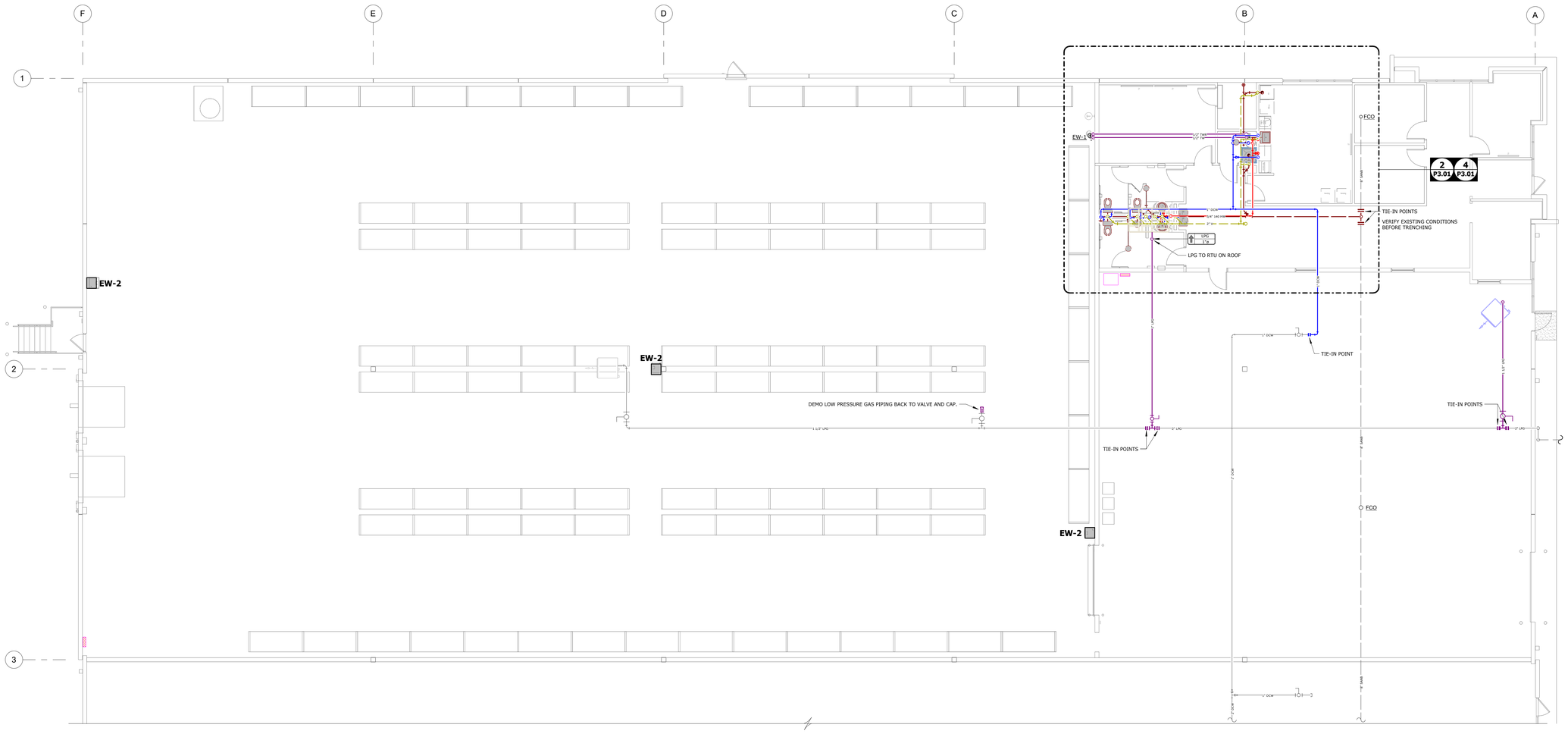
1. SHUT-OFF VALVES SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS. COORDINATE THE LOCATION OF ACCESS DOORS IN CEILINGS OR WALLS WITH THE GENERAL CONTRACTOR IF A VALVE IS REQUIRED TO BE LOCATED ABOVE AN INACCESSIBLE CEILING OR IN A WALL OR CHASE.
2. DO NOT INSTALL ANY PIPING BENEATH OR ADJACENT TO ANY EQUIPMENT THAT WOULD HINDER MAINTENANCE ACCESS TO EQUIPMENT OR THE FUTURE REMOVAL OF EQUIPMENT.
3. WHERE TYING INTO EXISTING SANITARY LINES, SNAKE SANITARY LINE CLEAR THROUGH TO EXISTING ACTIVE MAIN.
4. FOR SANITARY AND VENT SIZES NOT SHOWN, REFER TO SANITARY ISOMETRIC. FOR RUNOUT/CONNECTION SIZES REFER TO FIXTURE AND EQUIPMENT SCHEDULES.
5. FOR DOMESTIC WATER RUNOUT/CONNECTION SIZES REFER TO FIXTURE AND EQUIPMENT SCHEDULES.
6. FOR NATURAL GAS RUNOUT/CONNECTION SIZES REFER TO FIXTURE AND EQUIPMENT SCHEDULES.
7. MEDICAL GAS RUNOUT/CONNECTION SIZES UNLESS NOTED OTHERWISE SHALL BE:
   MA, O2, NO, N, CO2- 1/2"
   MV, WAGD - 3/4"

DRAWING INTERPRETATION NOTES:

1. EXISTING LINETYPE: THIN (LIGHT) SOLID LINES REPRESENT ITEMS THAT ARE EXISTING TO REMAIN OR ARE FURNISHED BY OTHERS.
2. NEW LINETYPE: THICK (DARK) SOLID LINES REPRESENT ITEMS THAT ARE NEW OR RELOCATED.
3. RELEVANT EXISTING CONDITIONS SHOWN ARE BASED ON RECORD DRAWINGS AND FIELD OBSERVATION(S). NOT ALL EXISTING ITEMS ARE SHOWN, OR COULD BE FIELD VERIFIED. ONCE AREAS OBSCURED FROM VIEW ARE EXPOSED, VERIFY THAT CONDITIONS ARE AS INDICATED ON THIS DRAWING. BEFORE PROCEEDING WITH WORK, NOTIFY THE ENGINEER IF CONDITIONS DIFFER FROM WHAT IS SHOWN.
4. EQUIPMENT SHOWN GRAY-SHADED OR TAGGED HAVE AN ASSOCIATED EQUIPMENT SCHEDULE. SEE SCHEDULE SHEET(S).



KEY PLAN
NO SCALE



FIRST FLOOR - PLUMBING PLAN
SCALE: 1/8" = 1'-0"

N

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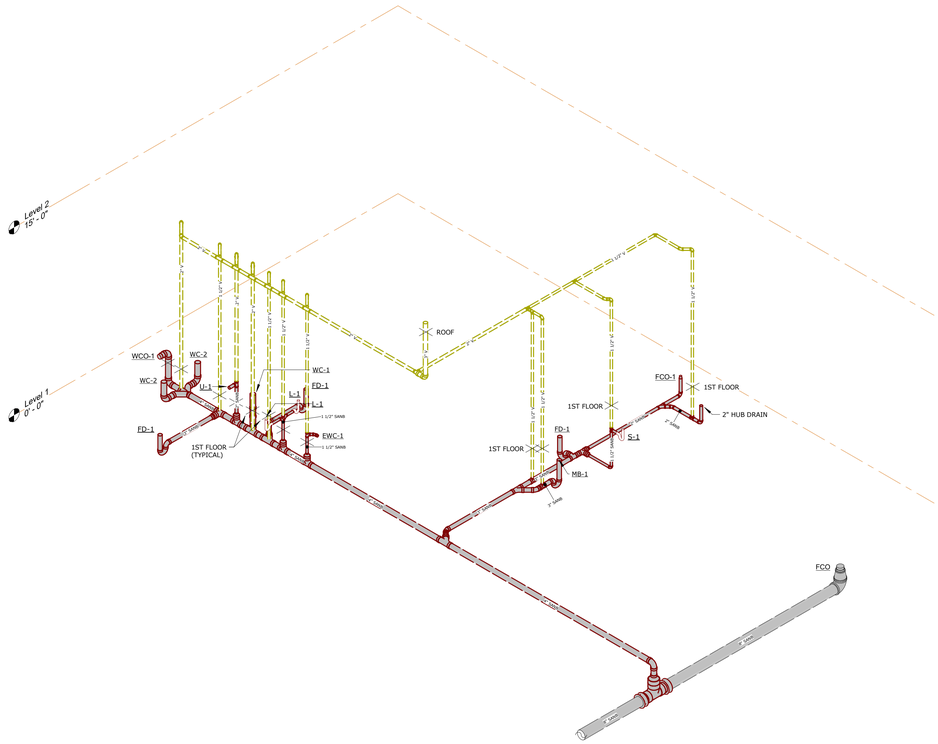
DRAWN BY: PTA, INC. | CHECKED BY: JSC

DRAWING TITLE:
FIRST FLOOR PLUMBING PLAN

SHEET #:
P2.01



PLUMBING SANITARY ISOMETRIC

NO SCALE

DRAWING INTERPRETATION NOTES:

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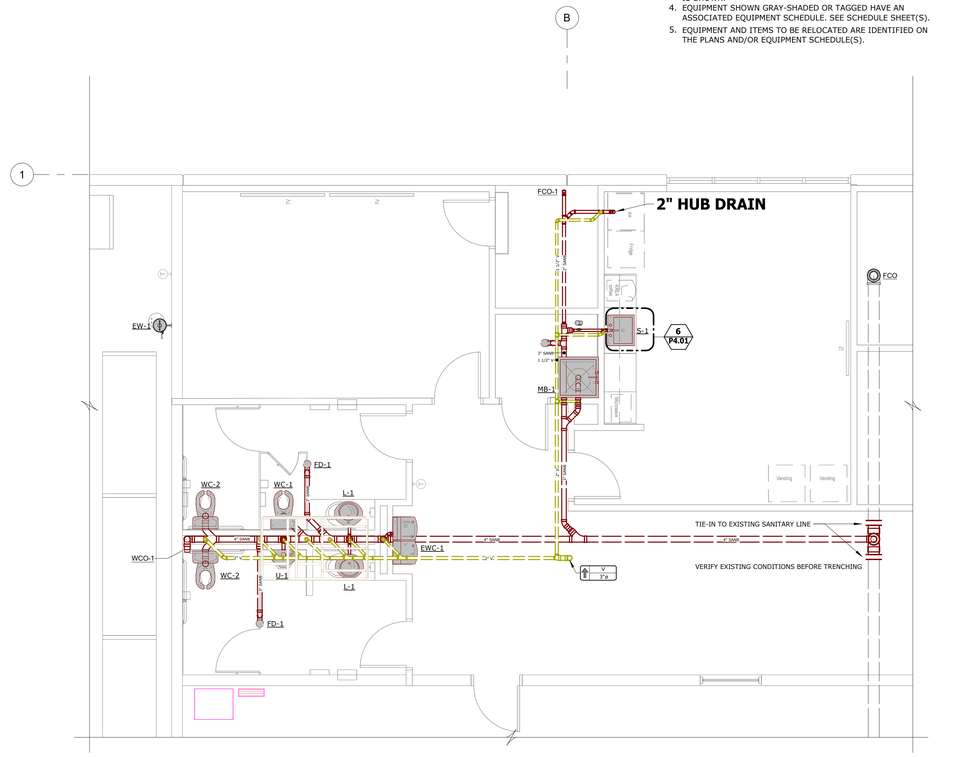
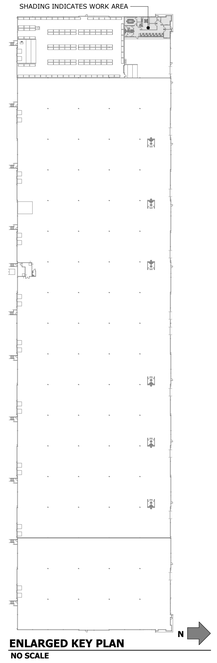
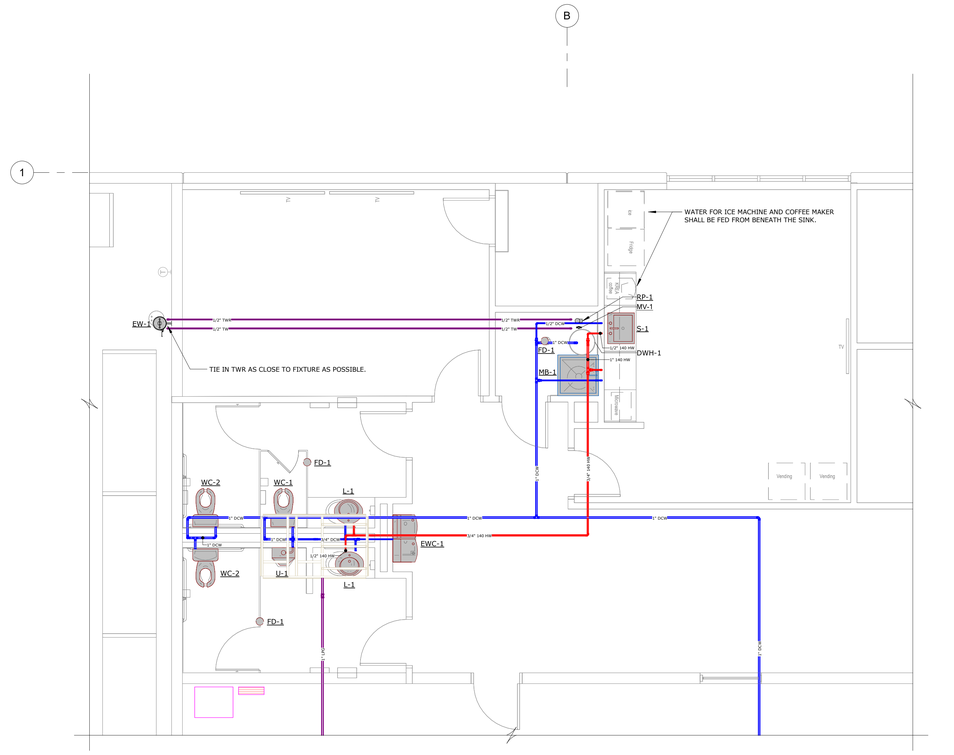
2. DEMOLITION LINETYPE: THICK (DARK) DASHED LINES REPRESENT EXISTING ITEMS TO BE REMOVED.
3. RELEVANT EXISTING CONDITIONS SHOWN ARE BASED ON RECORD DRAWINGS AND FIELD OBSERVATION(S). NOT ALL EXISTING ITEMS ARE SHOWN, OR COULD BE FIELD VERIFIED. ONCE AREAS OBSCURED FROM VIEW ARE EXPOSED, VERIFY THAT CONDITIONS ARE AS INDICATED ON THIS DRAWING. BEFORE PROCEEDING WITH WORK, NOTIFY THE ENGINEER IF CONDITIONS DIFFER FROM WHAT IS SHOWN.
4. EQUIPMENT SHOWN GRAY-SHADED OR TAGGED HAVE AN ASSOCIATED EQUIPMENT SCHEDULE. SEE SCHEDULE SHEET(S).
5. EQUIPMENT AND ITEMS TO BE RELOCATED ARE IDENTIFIED ON THE PLANS AND/OR EQUIPMENT SCHEDULE(S).



4 P2.01 FIRST FLOOR - ENLARGED SANITARY AND VENT PLAN
1/4" = 1'-0"



ENLARGED KEY PLAN
NO SCALE



2 P2.01 FIRST FLOOR - ENLARGED PLUMBING PLAN
1/4" = 1'-0"

STATE OF MISSOURI
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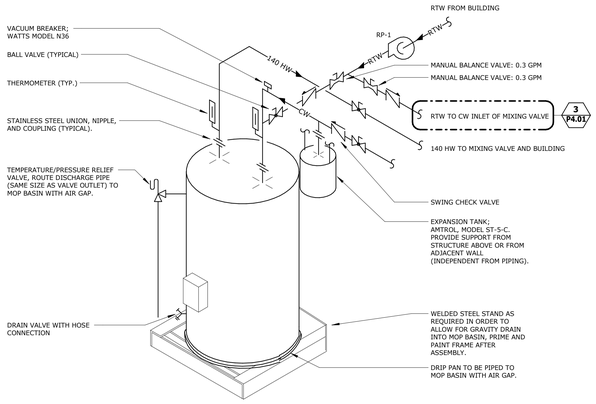
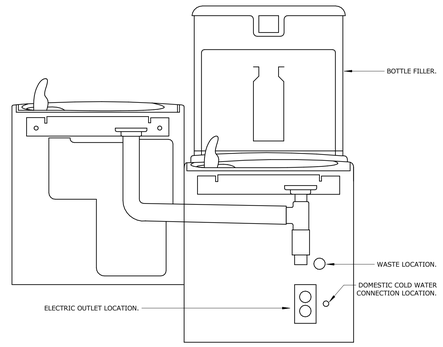
DRAWN BY: PTA, INC. CHECKED BY: JSC

DRAWING TITLE:
FIRST FLOOR
ENLARGED PLUMBING
PLANS

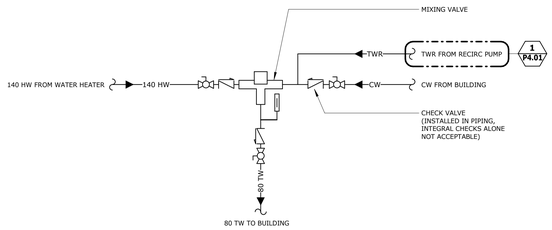
SHEET #:
P3.01



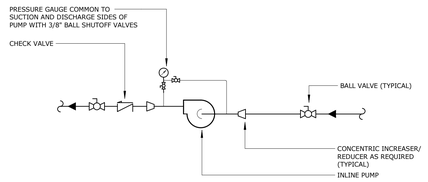
1 **22 21 20 - ELECTRIC DOMESTIC WATER HEATER PIPING DETAIL**
NO SCALE



2 **ELECTRIC WATER COOLER INSTALLATION DETAIL**
NO SCALE



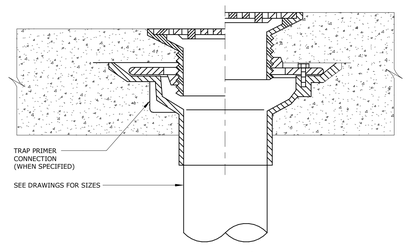
3 **22 13 11 - MASTER MIXING VALVE DETAIL**
NO SCALE



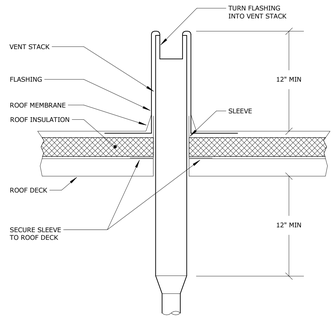
4 **22 24 20 - RECIRCULATOR PUMP PIPING DETAIL (WITHOUT AQUASTAT)**
NO SCALE

5 **22 12 60 - FLUSH WITH WALL CLEANOUT**
NO SCALE

6 **22 40 20 - ANCILLARY EQUIPMENT PIPING DETAIL**
NO SCALE

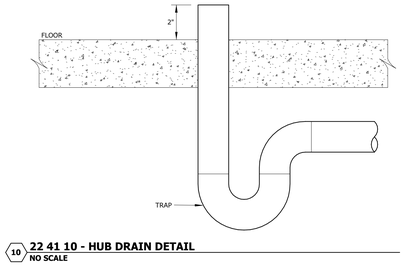


7 **22 41 11 - FLOOR DRAIN (ROUND STRAINER) DETAIL**
NO SCALE

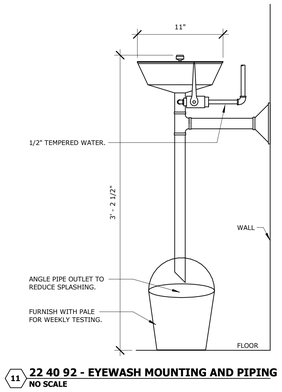


8 **22 07 10 - VENT THROUGH ROOF INSTALLATION DETAIL (FLAT ROOF)**
NO SCALE

9 **22 12 41 - GAS CONNECTION DETAIL**
NO SCALE



10 **22 41 10 - HUB DRAIN DETAIL**
NO SCALE



11 **22 40 92 - EYEWASH MOUNTING AND PIPING**
NO SCALE

22 40 12 - WALL HUNG URINAL

NOTE:
*COORDINATE FLUSH VALVE HANDING WITH ARCHITECT.

MARK	FIXTURE		FIXTURE SUPPORT		FLUSH				CONNECTIONS			ADA COMPLIANT	RIM HEIGHT	ACCESSORIES
	MANUFACTURER	MODEL	MANUFACTURER	MODEL	VALVE MANUFACTURER	MODEL	OPERATION	RATE	CW	SAN	VENT			
U-1	AMERICAN STANDARD	WASHBROOK 6590.001	J.R. SMITH	FIG 0637	AMERICAN STANDARD	6062.101.002	HANDS-FREE (HARD-WIRED)	1.0 GPF	1"	2"	2"	No	24"	FURNISH WITH HARD-WIRED POWER KIT

22 40 11 - WALL-MOUNTED WATER CLOSET (FLUSH TANK) SCHEDULE

NOTE:
*COORDINATE FLUSH TANK HANDING WITH ARCHITECT.

MARK	FIXTURE		FLUSH TANK				SEAT			CONNECTIONS			ADA COMPLIANT	RIM HEIGHT	ACCESSORIES
	MANUFACTURER	MODEL	MANUFACTURER	MODEL	OPERATION	RATE	MANUFACTURER	MODEL	COLOR	CW	SAN	VENT			
WC-1	AMERICAN STANDARD	2462.016	AMERICAN STANDARD	4142.016	MANUAL	1.6 GPF	AMERICAN STANDARD	5257A.65C	WHITE	1"	4"	2"	No	15"	
WC-2	AMERICAN STANDARD	2467.016	AMERICAN STANDARD	4142.016	MANUAL	1.6 GPF	AMERICAN STANDARD	5257A.65C	WHITE	1"	4"	2"	Yes	16.5"	

22 40 50 - ELECTRIC WATER COOLER

NOTE:
*INSTALL ELKAY EZWSR BOTTLE FILLER ON LOWER EWC.

MARK	MANUFACTURER	MODEL	TYPE	QUANTITY OF OUTLETS	ORIFICE HEIGHT		PERFORMANCE				CONNECTIONS			ELECTRICAL		
					LEFT	RIGHT	CAPACITY	EWT	LWT	DESIGN AMBIENT	CW	SAN	V	VOLTS/PHASE	FLA	POWER SUPPLY
EWC-1	ELKAY	EZSTL8WSLK	WALL MOUNT	3	42"	36"	8.0 GPH	52 °F	50 °F	9 °F	1/2"	1-1/2"	1-1/2"	115/1	6	3 WIRE GROUNDING TYPE SERVICE CORD

22 40 32 - MOP BASIN

MARK	FIXTURE				FAUCET				CONNECTIONS				ACCESSORIES
	TYPE	MANUFACTURER	MODEL	STRAINER	MANUFACTURER	FAUCET	HANDLES	OUTLET	HW	CW	SAN	VENT	
MB-1	MOP BASIN - TERRAZZO	FIAT	63M (32x32x12)	INTEGRAL MOLDED	CHICAGO FAUCETS	897-CCP	2-3/8" LEVER	3/4" HODE THREAD CONNECTION	1/2"	1/2"	3"	1 1/2"	WALL GAURD: MSG, HOSE BRACKET: 832AA

22 13 11 - MIXING VALVE SCHEDULE

MARK	MANUFACTURER	MODEL	CONNECTIONS			WATER FLOW				SETPOINT	REMARKS
			140 HW	CW	80 TW	MIN	MAX	DESIGN	PRESSURE DROP @ DESIGN FLOW		
MV-1	LEONARD	TA-300-LF	1/2"	1/2"	1/2"	0.3 GPM	12.0 GPM	3.2 GPM	22.50 psi	80 °F	PROVIDE WITH INTEGRAL DIAL THERMOMETER

22 40 14 - COUNTER MOUNTED LAVATORY SCHEDULE

NOTE:
*COORDINATE SINK SIZE WITH CASEWORK FOR PROPER FITMENT PRIOR TO ORDERING.

MARK	FIXTURE			FAUCET			CONNECTIONS				ACCESSORIES
	TYPE	MANUFACTURER	MODEL	MANUFACTURER	FAUCET	HANDLES	OUTLET	HW	CW	SAN	VENT	
L-1	COUNTER MOUNTED	AMERICAN STANDARD	RELIANT 0475247	SLOAN	SF-2100-4-PLG-BDM-CP-05GPM-MLM-IR-FCT	HANDS-FREE	0.5 GPM	1/2"	1/2"	1-1/2"	1-1/2"	THERMOSTATIC MIXING VALVE: LEONARD VALVE LF-170

22 40 20 - STAINLESS STEEL SINK SCHEDULE

NOTE:
*COORDINATE SINK SIZE WITH CASEWORK FOR PROPER FITMENT PRIOR TO ORDERING.
*FURNISH WITH THERMOSTATIC MIXING VALVE: LEONARD VALVE, MODEL 170-LF

MARK	FIXTURE				FAUCET				CONNECTIONS			
	TYPE	MANUFACTURER	MODEL	STRAINER	MANUFACTURER	FAUCET	HANDLES	OUTLET	HW	CW	SAN	VENT
S-1	SINGLE BOWL STAINLESS STEEL SINK	ELKAY	ELUHAD211555	LK99	GROHE	CONCETTO	SINGLE HANDLE	1.75 GPM	1/2"	1/2"	1 1/2"	1 1/2"

22 21 20 - ELECTRIC WATER HEATER

MARK	MANUFACTURER	MODEL	SERVICE	TYPE	INPUT (KW)	STORAGE CAPACITY (GALLONS)	GPH	EWT	LWT	VOLTS/PHASE	FLA	DISCONNECT
DWH-1	A.O. SMITH	DEN-30	DOMESTIC HOT WATER	ELECTRIC	10	37	41	52 °F	140 °F	480/3	12.1	BY EC

22 24 20 - RECIRCULATOR PUMP SCHEDULE

NOTE:
1. HARDWIRED POWER

MARK	MANUFACTURER	MODEL	SERVICE	TYPE	THREADDED CONNECTION	GPM	HEAD PRESSURE (FT)	HP	RPM	VOLTS/PHASE
RP-1	TACO	003-B4	DOMESTIC HOT WATER RECIRC	IN-LINE	3/4"	0.5	1.5	1/40	3250	115/1

22 41 11 - FLOOR DRAIN SCHEDULE

MARK	MANUFACTURER	MODEL	STRAINER SIZE	CONNECTION SIZE		TRAP SEAL
				WASTE	CW	
FD-1	JAY R. SMITH	2005-NB	06 DIA	3"	-	QUAD SEAL 2692

22 40 92 - EYEWASH SCHEDULE (EW)

MARK	MANUFACTURER	MODEL	FINISH	MOUNTING LOCATION
EW-1	GUARDIAN	G1814P	ORANGE ABS PLASTIC	WALL MOUNT
EW-2	GUARDIAN	G1540	GREEN POLYETHYLENE	WALL MOUNT

22 12 60 - CLEANOUT SCHEDULE

MARK	MANUFACTURER	MODEL	CONNECTION SIZE	REMARKS
FCO-1	SMITH	4031	MATCH PIPE SIZE	
WCO-1	SMITH	4422C	MATCH PIPE SIZE	

PLUMBING PIPE AND FITTING SCHEDULE

* WHERE MORE THAN ONE TYPE OF MATERIAL IS INDICATED AS AN OPTION, SELECTION IS INSTALLER'S CHOICE.

SERVICE	SIZE	PIPE MATERIAL	FITTINGS	JOINTS
DOMESTIC WATER - ABOVE GROUND	4" AND SMALLER	TYPE L HARD COPPER	WROUGHT COPPER	SOLDERED
NATURAL GAS - ABOVE GROUND	2" AND SMALLER	SCHEDULE 40 BLACK STEEL	MALLEABLE IRON	THREADED
NATURAL GAS - ABOVE GROUND	2" AND LARGER	SCHEDULE 40 BLACK STEEL	FACTORY FORMED	WELDED

PLUMBING INSULATION SCHEDULE

INSULATION TYPE DESCRIPTIONS	
FP	PREFORMED ONE-PIECE FIBERGLASS PIPE INSULATION WITH ALL-SERVICE JACKET; MAXIMUM THERMAL CONDUCTIVITY K=0.23 AT 75 DEG. F MEAN TEMPERATURE.
ER	FLEXIBLE, CLOSED-CELL, ELASTOMERIC ROLL INSULATION; MAXIMUM THERMAL CONDUCTIVITY K = 0.28 AT 70 DEG. MEAN TEMPERATURE.
EP	FLEXIBLE UNICELLULAR, PREFORMED ELASTOMERIC PIPE INSULATION; MAXIMUM THERMAL CONDUCTIVITY K = 0.28 AT 70 DEG. MEAN TEMPERATURE.
INSULATION FINISH DESCRIPTIONS	
AJ	0.016" THICK SHEET ALUMINUM JACKET WITH MOLDED UV RESISTANT PVC FITTING COVERS
ASJ	ALL SERVICE JACKET WITH SELF-SEAL LAP

SERVICE	TYPE	THICKNESS	FINISH
DOMESTIC HOT, RECIRCULATING HOT, AND COLD WATER PIPING	FP	1"	ASJ
FLOOR DRAINS, TRAPS OF FLOOR DRAINS, AND HORIZONTAL SANITARY PIPING RECEIVING COOLING COIL CONDENSATE DRAINAGE OR ICE MACHINE DRAINAGE	EP	1/2"	-

STATE OF MISSOURI
PATRICK W. KLANAC
NUMBER 29264
6-15-2025
PROFESSIONAL ENGINEER
SEAL

FOUNDATION ARCHITECTURE, LLC
740 MARKS ROAD - SUITE A, VALLEY CITY, OHIO 44208

pta engineering
275 Springside Dr., Suite 300
Akron, Ohio 44333
Phone: 330-666-3702
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PROJECT:

TENANT IMPROVEMENTS FOR:
SONNY'S
2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402
DRAWN BY: PTA, INC. CHECKED BY: JSC

DRAWING TITLE:
PLUMBING SCHEDULES AND DETAILS

SHEET #:
P4.01

PLUMBING SPECIFICATIONS

PART 1 - PLUMBING

PART 2 - 22 00 10 DOCUMENT INTERPRETATION AND GENERAL REQUIREMENTS

A. FURNISH ALL LABOR, CONSTRUCTION EQUIPMENT AND MATERIALS NECESSARY FOR THE COMPLETE INSTALLATION OF THE PLUMBING SYSTEMS AS INDICATED. ALL WORK SHALL BE IN STRICT COMPLIANCE WITH ALL GOVERNING STATE AND LOCAL CODE REQUIREMENTS, IN FULL CONFORMITY WITH THE BEST CURRENT TRADE PRACTICES AND SUBJECT TO APPROVAL OF THE ARCHITECT/ENGINEER OR HIS REPRESENTATIVE.

B. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOLITION WORK SHOWN ON THE DRAWINGS. DEMOLITION WORK SHALL INCLUDE REMOVAL, CUTTING AND PATCHING, SALVAGE, AND LEGAL DISPOSAL AS APPLICABLE TO THE PROJECT.

C. ALL WORK DETAILS NOT COVERED IN THESE SPECIFICATIONS SHALL BE GOVERNED BY THE REQUIREMENTS OF THE LATEST EDITION OF THE MISSOURI PLUMBING CODE.

D. WORK INCLUDED UNDER THIS DIVISION SHALL CONSIST OF FURNISHING ALL MATERIALS, SUPPLIES, EQUIPMENT, TOOLS, TRANSPORTATION, FACILITIES AND PERFORMING ALL LABOR AND SERVICES NECESSARY FOR THE COMPLETE INSTALLATION OF THE PLUMBING SYSTEMS SHOWN.

E. THIS CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE WORK TO BE DONE UNDER OTHER DIVISIONS OF THIS SPECIFICATION AND THEIR RELATED DRAWINGS AND SHALL SO COORDINATE AND SCHEDULE HIS WORK AS NOT TO CAUSE DELAYS OR INTERFERENCE WITH THE WORK OF OTHERS. SUCH COORDINATION AND SCHEDULING SHALL ACCOMPLISH THE INSTALLATION PLUMBING SYSTEMS AND PIPING WITH A MINIMUM OF CUTTING THROUGH MASONRY AND OTHER ADJUSTMENTS.

F. ALL ITEMS OF LABOR, MATERIAL AND EQUIPMENT NOT SPECIFICALLY MENTIONED HEREIN OR SHOWN ON PLANS, BUT INCIDENTAL TO, OR REQUIRED FOR THE COMPLETE INSTALLATION AND PROPER OPERATION OF THE WORK, SHALL BE FURNISHED AS IF CALLED FOR IN DETAIL BY THE SPECIFICATIONS OR DRAWINGS.

G. THE DESIGN DRAWINGS ARE DIAGRAMMATIC, INDICATING GENERAL ARRANGEMENT, AND LOCATIONS OF EQUIPMENT AND PIPING. VERIFY DIMENSIONS IN THE FIELD; ADJUST TO MANUFACTURER'S SHOP DRAWINGS. DO NOT SCALE DRAWINGS. PIPING, AND EQUIPMENT ARE TO BE INSTALLED ALONG THE GENERAL PLANS SHOWN ON THE DRAWINGS, BUT KEEPING IN MIND ACTUAL BUILDING CONDITIONS WHICH MUST BE CONFORMED WITHIN THE ACTUAL WORK.

H. DETERMINE SIZES AND LOCATIONS FOR CHASES AND OPENINGS NECESSARY FOR INSTALLATION OF THE WORK. COOPERATE WITH OTHER TRADES IN SETTING SLEEVES, INSERTS AND HANGERS.

I. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND SHALL CONFORM TO UNDERWRITERS' LABORATORIES STANDARDS, WHERE APPLICABLE. WHERE SPECIFICATIONS DESCRIBE, OR PLANS SHOW, MATERIALS OR EQUIPMENT OF HIGHER QUALITY THAN REQUIRED BY CODE AND LOCAL RULING, THE DRAWINGS AND SPECIFICATIONS SHALL GOVERN THE QUALITY OF THE MATERIAL OR EQUIPMENT.

J. COOPERATE WITH ALL TRADES IN PREPARING INTERFERENCE DRAWINGS FOR LOCATIONS WHERE THERE IS POSSIBLE CONFLICT BETWEEN TRADES. EXACT LOCATION OF PIPES, DUCTS, AND CONDUIT BASED ON FIELD MEASUREMENTS WITH FINAL ARRANGEMENT DETERMINED BY INTRA-TRADE AGREEMENTS SUBJECT TO ARCHITECT/ENGINEER'S APPROVAL.

K. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER BY FIRST-CLASS MECHANICS. THE CONTRACTOR SHALL PROVIDE ADEQUATE AND COMPETENT SUPERVISION OF THE JOB AS REQUIRED.

L. PIPING, AND EQUIPMENT SHALL BE ARRANGED SUBSTANTIALLY AS INDICATED. ANY CHANGES RESULTING IN A SAVINGS IN LABOR OR MATERIAL SHALL BE MADE ONLY IN ACCORDANCE WITH A CONTRACT CHANGE ORDER. DEVIATIONS SHALL BE MADE ONLY WHERE NECESSARY TO AVOID INTERFERENCES AND ONLY AFTER DRAWINGS SHOWING THE PROPOSED DEVIATIONS HAVE BEEN SUBMITTED TO AND APPROVED BY THE ARCHITECT/ENGINEER.

M. THE ARCHITECT AND ENGINEER RESERVE THE RIGHT TO MAKE REASONABLE CHANGES WITHOUT EXTRA COST TO THE OWNER.

N. COORDINATE ALL SYSTEM SHUT-DOWNS WITH THE OWNER.

O. GUARANTEE

(1) THIS CONTRACTOR SHALL GUARANTEE FOR A PERIOD OF ONE YEAR THAT ALL WORK AND EQUIPMENT WILL REMAIN FREE FROM ALL DEFECTS IN WORKMANSHIP AND MATERIALS, AND THAT IT WILL COMPLY WITH ALL THE SPECIFIC REQUIREMENTS OF THE SPECIFICATIONS AND OTHER CONTRACT DOCUMENTS GOVERNING THE WORK.

(2) ALL WORK FOUND BY THE ARCHITECT/ENGINEER TO BE DEFECTIVE WILL BE REPLACED WITH NEW WORK MEETING ALL THE REQUIREMENTS OF THE CONTRACT. THIS CONTRACTOR WILL BEAR ALL COSTS OF SUPPLYING SUCH NEW WORK, AND INSTALLING AND FINISHING SAME, AND WILL ASSUME ALL COSTS FOR REPLACING OTHER WORK DAMAGED BY THE REMOVAL AND REPLACEMENT OF ANY OF THE WORK. THIS CONTRACTOR WILL BEAR ALL COSTS FOR FREIGHT, DRAYAGE AND DEMURRAGE, AND ALL LABOR IN CONNECTION THEREWITH.

P. SUBSTITUTIONS

(1) BIDDERS DESIRING TO MAKE A SUBSTITUTION FOR AN ALTERNATIVE EQUIPMENT MANUFACTURER, MATERIAL OR INSTALLATION METHOD NOT LISTED IN THE SPECIFICATIONS SHALL SUBMIT A WRITTEN REQUEST FOR A SUBSTITUTION TO THE ARCHITECT A MINIMUM OF FIVE WORKING DAYS PRIOR TO THE BID DUE DATE. THE SUBSTITUTION PROPOSAL SHALL INCLUDE THE FOLLOWING:

(2) PROPOSED SUBSTITUTION STATEMENT NAMING THE ALTERNATIVE MANUFACTURER, MATERIAL OR INSTALLATION METHOD.

(3) ALONG WITH EACH PROPOSAL, EACH EQUIPMENT SUPPLIER SHALL SUBMIT AN EQUIPMENT OR MATERIALS INFORMATION BINDER FOR REVIEW. EACH BINDER SHALL CONTAIN DETAILED EQUIPMENT INFORMATION, MATERIALS AND SPECIFICATIONS FOR EACH PIECE OF EQUIPMENT OR MATERIALS PROPOSED TO BE FURNISHED.

(4) ALONG WITH EACH PROPOSAL, THE CONTRACTOR SHALL PROVIDE MODIFIED DRAWINGS SHOWING THE INSTALLATION OF THE PROPOSED EQUIPMENT.

(5) ALONG WITH EACH PROPOSAL, EACH EQUIPMENT SUPPLIER SHALL SUBMIT A COMPLIANCE REVIEW RESPONSE TO THE AFFECTED CONTRACT DOCUMENT SPECIFICATIONS. THE REVIEW SHALL BE PARAGRAPH BY PARAGRAPH DESIGNATING IN THE FRONT OF EACH PARAGRAPH-SPECIFICATION COMPLIANCE WITH A "C", DEVIATION WITH A "D", OR EXCEPTION WITH AN "E". THE REASON FOR EACH PROPOSED DEVIATION AND EXCEPTION SHALL BE GIVEN ALONG WITH SUFFICIENT DETAIL TO CLEARLY EXPLAIN/SHOW ALL DEVIATIONS AND EXCEPTIONS. KEY DEVIATION OR EXCEPTION INFORMATION INCLUDES:

(A) THE EFFECT ON PERFORMANCE OVER THE ENTIRE RANGE OF EQUIPMENT OR SYSTEM OPERATION, INCLUDING THE EFFECT ON SYSTEM EFFICIENCIES.

(B) THE EFFECT ON THE WORK OF OTHER TRADES CAUSED BY THE PROPOSED SUBSTITUTION.

(6) ACCEPTANCE OR REJECTION OF THE PROPOSED SUBSTITUTIONS SHALL BE SUBJECT TO APPROVAL BY THE ARCHITECT, ENGINEER OR OWNER.

PART 3 - 22 00 20 CODES AND STANDARDS

A. ALL PLUMBING SYSTEMS SHALL COMPLY WITH THE MISSOURI PLUMBING CODE AND ALL REQUIREMENTS OF THE LOCAL AUTHORITIES HAVING JURISDICTION.

B. PLUMBING SYSTEMS SHALL COMPLY WITH ASPE, ASSE AND AWWA REQUIREMENTS.

C. ALL GAS PIPING, DOMESTIC WATER PIPING, STORM, AND SANITARY SEWERS SHALL BE INSTALLED, INSPECTED, AND TESTED AS REQUIRED BY THE LOCAL PLUMBING CODE AND THE LOCAL AUTHORITY HAVING JURISDICTION AND THE LOCAL UTILITY. PERFORM ALL TESTS BEFORE PIPING IS CONCEALED OR INSULATED.

D. INSTALL WORK IN FULL ACCORDANCE WITH RULES AND REGULATIONS OF STATE, COUNTY AND CITY AUTHORITIES HAVING JURISDICTION OVER PREMISES. THIS SHALL INCLUDE SAFETY REQUIREMENTS OF THE STATE AND OSHA.

E. REFERENCE TO THE CODES AND STANDARDS LISTED SHALL CONSTITUTE THE MINIMUM ACCEPTABLE REQUIREMENTS. NOTHING IN THE SPECIFICATIONS SHALL BE CONSTRUED TO PERMIT DEVIATION FROM THE REQUIREMENTS OF THE GOVERNING CODE. WHERE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS EXCEED THOSE OF THE CODE LISTED, FOLLOW THE DRAWINGS AND SPECIFICATIONS.

F. ALL WIRING SHALL BE IN COMPLIANCE WITH THE CURRENT EDITION OF THE NATIONAL ELECTRIC CODE, APPLICABLE STATE CODE, APPLICABLE LOCAL (CITY) CODE, AND OSHA. IN CASES OF CONFLICT BETWEEN CODE AND SPECIFICATIONS, THE MORE RESTRICTIVE REQUIREMENTS SHALL GOVERN.

G. ALL EQUIPMENT, MATERIALS AND INSTALLATION METHODS SHALL COMPLY WITH THE FOLLOWING CODES, WHERE APPLICABLE:

(1) BUILDING OFFICIALS AND CODE ADMINISTRATORS INTERNATIONAL (BOCA)
(2) CODES AND STANDARDS ASSOCIATION (CSA)
(3) INTERNATIONAL BUILDING CODE (IBC)
(4) INTERNATIONAL MECHANICAL CODE (IMC)
(5) NATIONAL ELECTRIC CODE (NEC)
(6) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
(7) NATIONAL PRESSURE VESSEL CODE
(8) STANDARD BUILDING CODES (SBC)
(9) STANDARD MECHANICAL CODES (SMC)
(10)UNIFORM BUILDING CODES (UBC)
(11)UNIFORM MECHANICAL CODES (UMC)

H. ALL EQUIPMENT. MATERIALS AND, INSTALLATION METHODS SHALL COMPLY WITH THE FOLLOWING STANDARDS, WHERE APPLICABLE:

(1) AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
(2) AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
(3) AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
(4) AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)
(5) AMERICAN WATER WORKS ASSOCIATION (AWWA)
(6) AMERICAN WELDING SOCIETY (AWS)
(7) BUILDING OFFICIALS AND CODE ADMINISTRATORS INTERNATIONAL (BOCA)
(8) CAST IRON SOIL PIPE INSTITUTE (CISPI)
(9) CODES AND STANDARDS ASSOCIATION (CSA)
(10)FLUID SEALING ASSOCIATION (FSA)
(11)INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS (IAPMO)
(12)NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)
(13)NATIONAL PRESSURE VESSEL CODE
(14)NATIONAL SANITATION FOUNDATION (NSF)
(15)NATIONAL SCIENCE FOUNDATION (NSF)
(16)PLASTIC PIPE INSTITUTE (PPI)
(17)SHEETMETAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC. (SMACNA)
(18)UNDERWRITER'S LABORATORIES OF CANADA (ULC)
(19)UNDERWRITER'S LABORATORIES, INC. (UL)

I. EACH CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND INSPECTIONS REQUIRED FOR THE INSTALLATION OF THE WORK SHOWN. ALL PERMITS AND CERTIFICATES OF INSPECTION AND APPROVAL SIGNED BY THE CONTROLLING BUILDING DEPARTMENT OR AUTHORITY HAVING JURISDICTION SHALL BECOME PROPERTY OF THE OWNER. DELIVER ALL CERTIFICATES TO THE OWNER IN DUPLICATE.

J. ALL EQUIPMENT, MATERIALS AND INSTALLATION SHALL COMPLY WITH THE NATIONAL FIRE PROTECTION ASSOCIATION'S "NATIONAL FIRE CODES" AND "NATIONAL ELECTRICAL CODE". EQUIPMENT SHALL BEAR THE "UL" LABEL AS REQUIRED BY THESE CODES.

K. FOLLOWING COMPLETION OF THE WORK:

(1) FURNISH TO THE OWNER, DUPLICATE CERTIFICATES OF INSPECTION AND APPROVAL BY REGULATORY AGENCIES HAVING JURISDICTION.

(2) DEMONSTRATE TO THE OWNER'S SATISFACTION THE PROPER OPERATION OF EACH OF THE SYSTEMS COMPRISING THIS CONTRACT BEFORE FINAL PAYMENT.

(3) TEST PIPING FOR LEAKS; REPAIR LEAKS IN COPPER TUBING BY SWEATING OUT JOINTS, THOROUGHLY CLEANING BOTH TUBE AND FITTING, AND RESOLDERING OR REBRAZING; CORRECT LEAKS IN SCREWED JOINTS BY REPLACING THREAD OR FITTING OR BOTH.

(4) IMMEDIATELY CORRECT ANY WORK FOUND AT VARIANCE WITH THESE SPECIFICATIONS, THE NATIONAL, STATE, AND LOCAL CODES, AND REQUIREMENTS OF GOVERNING REGULATORY AGENCIES. COMPLETE ALL PUNCHLIST ITEMS OF THE ARCHITECT AND ENGINEER.

PART 4 - 22 00 40 PLUMBING DEMOLITION AND SALVAGE

A. DEMOLITION WORK - SERVICES

(1) ACTIVE SERVICES: WHEN ENCOUNTERED, SUPPORT ACTIVE PLUMBING SERVICES AS NECESSARY. IF ACTIVE SERVICES REQUIRE RELOCATION (OTHER THAN THOSE INDICATED ON THE DRAWINGS), OBTAIN WRITTEN INSTRUCTIONS BEFORE PROCEEDING. DO NOT DISTURB ACTIVE SERVICES SCHEDULED TO REMAIN.

(2) INACTIVE OR ABANDONED SERVICES: WHEN ENCOUNTERED, REMOVE INACTIVE AND ABANDONED PIPING FULL LENGTH. REMOVAL SHALL INCLUDE ALL HANGERS AND SUPPORTS. NOTIFY SERVICING UTILITY WHEN ENCOUNTERED OUTSIDE OF STRUCTURE. "DEAD LEGS" SHALL NOT BE LEFT IN ANY PIPING SYSTEM.

(3) INTERRUPTION OF SERVICE: SEE "PLUMBING SYSTEMS SHUT-DOWNS" SECTION IN THESE SPECIFICATIONS FOR PROCEDURES AND REQUIREMENTS.

B. DEMOLITION WORK - GENERAL

(1) REMOVE ALL EXISTING FIXTURES, PIPING, CONTROLS, WIRING AND EQUIPMENT AS INDICATED ON THE DRAWINGS OR THOSE THAT ARE NOT NECESSARY TO MAINTAIN SERVICE TO EQUIPMENT AND DEVICES THAT ARE TO REMAIN.

(2) RELOCATE OR EXTEND AS REQUIRED, PIPING THAT INTERFERES WITH DEMOLITION AND IS ESSENTIAL TO MAINTAIN SERVICE TO EQUIPMENT AND FIXTURES THAT ARE TO REMAIN.

(3) REMOVE OR RELOCATE ALL EQUIPMENT AND FIXTURES SPECIFICALLY INDICATED ON THE DRAWINGS AND AS REQUIRED TO COMPLETE DEMOLITION WORK.

(4) IN THOSE CASES WHERE EQUIPMENT AND FIXTURES ARE REMOVED, THE ASSOCIATED PIPING THAT WILL NO LONGER BE ACTIVE SHALL BE REMOVED. ALL PIPING TO BE REMOVED SHALL BE REMOVED FULL LENGTH BACK TO THE SOURCE OR AN ACTIVE LINE OR PORTION OF THE SYSTEM.

(5) ALL HOLES OR DAMAGE CAUSED BY THE REMOVAL OF EXISTING EQUIPMENT, FIXTURES, AND PIPING SHALL BE PROPERLY PATCHED. HOLES SHALL BE NEATLY PATCHED WITH SUITABLE MATERIALS TO MATCH EXISTING SURFACES.

(6) PIPING THAT IS INDICATED TO BE REMOVED AND PENETRATES THE GROUND FLOOR SLAB SHALL BE REMOVED TO WITHIN SIX (6) INCHES OF THE TOP OF FLOOR SLAB, AND CAPPED.

(7) PIPING THAT IS INDICATED TO BE REMOVED AND PENETRATES THE BASEMENT EXTERIOR WALL AND CONTINUES OUTSIDE THE BUILDING BELOW GRADE SHALL BE CUT WITHIN SIX (6) INCHES OF THE INSIDE SURFACE OF THE EXTERIOR WALL AND CAPPED.

C. SAFE DISPOSAL OF HAZARDOUS MATERIALS

(1) CONTRACTOR SHALL SAFELY DISPOSE OF ALL HAZARDOUS MATERIALS ENCOUNTERED IN FULL COMPLIANCE WITH ALL FEDERAL AND STATE EPA REGULATIONS.

(2) CONTRACTOR SHALL IDENTIFY INSTALLED FACILITIES REQUIRING REMOVAL OR MODIFICATION THAT ARE SUSPECTED TO CONTAIN ASBESTOS INSULATION. IF SUSPICIOUS INSULATION IS ENCOUNTERED, THE CONTRACTOR WILL CEASE DEMOLITION OR MODIFICATIONS AND SHALL NOTIFY THE OWNER.

(3) THE CONTRACTOR SHALL NOT BE RESPONSIBLE FOR REMOVAL OF ASBESTOS INSULATION.

(4) THE CONTRACTOR SHALL WORK WITH THE OWNER'S ASBESTOS REMOVAL AND ABATEMENT CONTRACTOR TO PRIORITIZE ABATEMENT WORK AND DEVELOP A SCHEDULE FOR REMOVAL OF HAZARDOUS MATERIALS SO AS NOT TO AFFECT THE MECHANICAL CONTRACTUAL TIMEFRAME.

D. SALVAGE

(1) PLUMBING FIXTURES, EQUIPMENT, PIPING AND DEVICES THAT ARE TO BE REMOVED SHALL BE OFFERED TO THE OWNER FOR SALVAGE. FIXTURES, EQUIPMENT, PIPING AND DEVICES SELECTED SHALL BE STORED ON THE SITE AT AREAS DESIGNATED BY THE OWNER.

(2) ALL ITEMS NOT SELECTED FOR SALVAGE BY THE OWNER SHALL BECOME THE PROPERTY OF THE PLUMBING CONTRACTOR AND SHALL BE REMOVED FROM THE SITE BY THE PLUMBING CONTRACTOR.

PART 5 - 22 00 50 PLUMBING SYSTEM SHUTDOWNS

A. SYSTEM SHUT-DOWNS

(1) THE CONTRACTOR SHALL WORK WITH THE OWNER TO SCHEDULE AND PLAN REQUIRED SYSTEM SHUTDOWNS. THE CONTRACTOR SHALL IDENTIFY ALL NECESSARY SHUTDOWNS AND SHALL IDENTIFY THE APPROXIMATE DATE(S) SHUTDOWNS WILL BE REQUIRED AT THE OUTSET OF THE PROJECT.

(2) THE OWNER SHALL RESERVE THE RIGHT TO DICTATE FINAL TIME AND DATE OF ALL SHUTDOWNS. THE CONTRACTOR SHALL PERFORM ALL SHUTDOWNS AT THE TIME AND DATE AS DIRECTED BY THE OWNER, EVEN IF THEY ARE REQUIRED TO BE PERFORMED ON WEEKENDS OR AFTER NORMAL BUSINESS HOURS.

(3) THE CONTRACTOR SHALL WORK WITH THE OWNER'S PERSONNEL TO IDENTIFY ISOLATION VALVES IN THE EXISTING SYSTEMS REQUIRING SHUT-DOWN TO PROPERLY ISOLATE ACTIVE PORTIONS OF THE SYSTEM FROM THE TARGETED INACTIVE PORTION OF THE SYSTEM. SHOULD ISOLATION VALVES NOT BE PRESENT, OR NOT BE FUNCTIONAL, THE OWNER SHALL BE NOTIFIED OF THE DEFICIENCY. IN ANY CASE, THE SHUT-DOWN SHALL STILL BE REQUIRED AND DEFICIENCIES OF THE EXISTING SYSTEM SHALL BE PLANNED AROUND.

B. DAMAGE AND EMERGENCY REPAIRS

(1) ASSUME RESPONSIBILITY FOR ANY DAMAGE CAUSED BY LEAKS IN THE PIPING SYSTEM BEING REWORKED UNDER THIS CONTRACT. REPAIR ALL DAMAGE WITHOUT EXTRA COST TO OWNER. RESTORE BUILDING, PIPING, INSULATION ETC. TO THEIR ORIGINAL CONDITION.

(2) OWNER RESERVES THE RIGHT TO MAKE EMERGENCY REPAIRS AS REQUIRED TO KEEP EQUIPMENT IN OPERATION, WITHOUT VOIDING CONTRACTOR'S GUARANTEE OR RELIEVING HIM OF RESPONSIBILITY DURING WARRANTY PERIOD.

PART 6 - 22 01 20 SHOP DRAWINGS

A. THIS CONTRACTOR SHALL REVIEW, STAMP WITH HIS APPROVAL AND SUBMIT, WITH REASONABLE PROMPTNESS AND IN ORDERLY SEQUENCE SO AS TO CAUSE NO DELAY IN THE WORK OR IN THE WORK OF ANY OTHER CONTRACTOR, ALL SHOP DRAWINGS AND SAMPLES REQUIRED BY THE CONTRACT DOCUMENTS.

B. SUBMISSION OF SHOP DRAWINGS WITHOUT CONTRACTOR REVIEW, SIGNATURE, AND APPROVAL SHALL BE CAUSE FOR REJECTION. SUCH SUBMITTALS SHALL BE RETURNED WITHOUT REVIEW.

C. IF THE SUBMITTAL INCLUDES DEVIATIONS FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL CLEARLY NOTE THE DEVIATIONS "IN RED" ON THE SUBMITTAL.

D. INDICATE SPECIFIC OPTIONS OR ACCESSORIES ON SHOP DRAWINGS BY POINTING TO, CHECKING OFF, OR UNDERLINING. DO NOT USE HIGHLIGHTER.

E. DO NOT REPRODUCE CONTRACT DOCUMENTS OR COPY STANDARD INFORMATION AS THE BASIS OF SHOP DRAWINGS. STANDARD INFORMATION PREPARED WITHOUT SPECIFIC REFERENCE TO THE PROJECT IS NOT CONSIDERED SHOP DRAWINGS AND WILL BE CAUSE FOR REJECTION.

F. IN CHECKING SHOP DRAWINGS, THE ENGINEER AND ARCHITECT WILL MAKE EVERY EFFORT TO DETECT AND CORRECT ERRORS, OMISSIONS AND INACCURACIES IN SUCH DRAWINGS, BUT HIS FAILURE TO DETECT ERRORS, OMISSIONS AND INACCURACIES SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR THE PROPER AND COMPLETE INSTALLATION IN ACCORDANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS.

G. WHERE ONLY ONE MAKE OF EQUIPMENT IS NAMED, IT SHALL BE PROVIDED AS SPECIFIED.

H. VERBAL REQUESTS OF APPROVALS FOR ANY SUBSTITUTION WILL NOT BE BINDING ON THE ARCHITECT, ENGINEER, OR OWNER.

I. ALL SUBMITTALS SHALL BE IN ELECTRONIC FORMAT. ELECTRONIC SUBMITTALS SHALL CONFORM TO THIS SPECIFICATION.

(1) ELECTRONIC SUBMITTALS SHALL BE IN PORTABLE DOCUMENT FORMAT (.PDF).

(A) ELECTRONIC SUBMITTALS SHALL INCLUDE A TRANSMITTAL.

(B) ALL PORTIONS OF THE ELECTRONIC SUBMITTAL SHALL BE BOUND IN A SINGLE .PDF FILE.

(C) FILE SHALL BE NAMED TO MATCH SUBMITTAL NAME AS IT APPEARS IN THE SPECIFICATIONS. EXAMPLE: "PLUMBING FIXTURES".

(D) SUBMITTALS SHALL SPECIFICALLY IDENTIFY ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS.

(2) ELECTRONIC SUBMITTALS SHALL INCLUDE A CONTRACTOR REVIEW STAMP THAT INDICATES REVIEW AND APPROVAL BY THE CONTRACTOR PRIOR TO SUBMISSION.

(3) ELECTRONIC SUBMITTALS SHALL BE TRANSMITTED VIA AN E-MAIL:

(A) PROVIDE ONLY ONE SUBMITTAL PER E-MAIL

(B) E-MAIL SUBJECT LINE SHALL CLEARLY INDICATE:

(4) PROJECT NAME

(5) THAT THE E-MAIL CONTAINS A SUBMITTAL

(6) CONTENTS OF SUBMITTAL

J. FAILURE TO CONFORM THE REQUIREMENTS ABOVE MAY RESULT IN REJECTION.

K. AT THE REVIEWER'S DISCRETION, THE REVIEWER HAS THE OPTION TO RETURN THE SUBMITTALS IN WHATEVER METHOD IS MOST CONVENIENT OR APPROPRIATE FOR THE PROJECT.

22 01 40 PLUMBING OPERATIONS AND MAINTENANCE MANUAL

A. OPERATING AND MAINTENANCE MANUALS

(1) THIS CONTRACTOR SHALL SUPPLY THE OWNER WITH THREE (3) COPIES OF OPERATION MANUALS CONTAINING THE FOLLOWING:

(A) PERFORMANCE DATA, RATINGS.
(B) MANUFACTURER'S DESCRIPTIVE LITERATURE.
(C) AUTOMATIC CONTROLS WITH DIAGRAMS AND WRITTEN DESCRIPTION OF OPERATION.
(D) MANUFACTURER'S MAINTENANCE AND SERVICE MANUALS.
(E) SPARE PARTS AND REPLACEMENT PARTS LIST FOR EACH PIECE OF EQUIPMENT.
(F) NAME OF SERVICE AGENCY AND INSTALLER.
(G) FINAL APPROVED SHOP DRAWINGS.
(H) STEP-BY-STEP PROCEDURES FOR START-UP AND SHUT-DOWN FOR EACH SYSTEM AND PIECE OF EQUIPMENT.
(I) WIRING DIAGRAMS.
(J) FINAL BALANCE REPORT.

22 01 50 RECORD DRAWINGS

A. AS-BUILT DRAWINGS

(1) AS WORK PROGRESSES, RECORD IN RED INK ON A SET OF "AS-BUILT" PRINTS ANY DEVIATIONS FROM DESIGN DRAWINGS. DELIVER TO THE OWNER BEFORE SUBMITTING REQUEST FOR FINAL PAYMENT. THE "AS-BUILT" PRINTS SHALL BE AN ACCURATE DEPICTION OF THE PROJECT AS COMPLETED.

PART 7 - 22 02 10 OWNER OPERATING AND MAINTENANCE TRAINING

A. PROVIDE TO OWNER AFTER ALL EQUIPMENT IS IN OPERATION AND AT AN AGREEABLE TIME, INSTRUCTIONS FOR THE PURPOSE OF TRAINING OWNER'S PERSONNEL IN ALL PHASES OF OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS. SCHEDULE TRAINING WITH OWNER, PROVIDE AT LEAST SEVEN DAYS PRIOR NOTICE.

PART 8 - 22 03 10 PIPING SYSTEM FLUSHING AND TESTING

A. ALL DOMESTIC WATER SYSTEMS SHALL BE PRESSURE TESTED WITH POTABLE WATER TO 125 PSI. TEST DURATION SHALL BE 6 HOURS.

B. CHLORINATE ALL DOMESTIC WATER SYSTEMS AS FOLLOWS. FIRST FLUSH SYSTEM WITH CLEAN POTABLE WATER UNTIL DIRTY WATER DOES NOT APPEAR AT OUTLETS. THEN FILL WITH A WATER/CHLORINE SOLUTION (50PPM CHLORINE) AND ALLOW TO STAND FOR 24 HOURS. FOLLOWING STANDING TIME, FLUSH THE SYSTEM WITH CLEAN POTABLE WATER UNTIL CHLORINE IS PURGED FROM THE SYSTEM. REPEAT CHLORINATION, IF NECESSARY, UNTIL NO BACTERIOLOGICAL CONTAMINATION IS PRESENT IN THE SYSTEM. PROCEDURE SHALL CONFORM TO AWWA C651 AND BE ACCEPTED BY THE LOCAL HEALTH DEPARTMENT.

C. ALL STORM AND SANITARY SEWERS SHALL BE INSPECTED AND TESTED AS REQUIRED BY THE INTERNATIONAL PLUMBING CODE AND THE LOCAL AUTHORITY.

D. ALL GAS PIPING SYSTEMS SHALL BE INSPECTED AND PRESSURE TESTED. TESTING PROCEDURE SHALL CONFORM TO THE LOCAL GAS UTILITY REQUIREMENTS AND THE LATEST "INTERNATIONAL FUEL GAS CODE". TEST PRESSURE SHALL BE 1-1/2 TIMES THE PROPOSED MAXIMUM WORKING PRESSURE, BUT NOT LESS THAN 3 PSI, IRRESPECTIVE OF DESIGN PRESSURE. TEST MEDIUM SHALL BE AIR OR AN INERT GAS (OXYGEN SHALL NEVER BE USED). TEST DURATION SHALL BE 24 HOURS. PRIOR TO TESTING, THE INTERIOR OF THE PIPE SHALL BE CLEARED OF ALL FOREIGN MATERIAL. ALL TESTING SHALL BE DONE WITH DUE REGARD FOR THE SAFETY OF EMPLOYEES AND THE PUBLIC. AFTER A SUCCESSFUL PRESSURE TEST AND BEFORE THE SYSTEM IS PLACED IN OPERATION THE PIPING SYSTEM SHALL BE PURGED IN ACCORDANCE WITH NFPA 54 "NATIONAL FUEL GAS CODE". THE POINT OF DISCHARGE SHALL NOT BE LEFT UNATTENDED DURING PURGING. AFTER THE PIPING HAS BEEN PLACED IN OPERATION, ALL EQUIPMENT SHALL BE PURGED AND THEN PLACED IN OPERATION, AS NECESSARY.

E. COPIES OF ALL CERTIFICATES OF INSPECTIONS SHALL BE INCLUDED IN THE OPERATING AND MAINTENANCE MANUAL. A COPY OF A CERTIFICATE THAT THE DOMESTIC WATER SYSTEM CHLORINATION HAS BEEN COMPLETED AND ACCEPTED BY THE LOCAL HEALTH DEPARTMENT SHALL BE INCLUDED IN THE OPERATING AND MAINTENANCE MANUAL.

PART 9 - 22 04 30 EXCAVATION TRENCHING, AND BACKFILL

A. EACH RESPECTIVE CONTRACTOR IS RESPONSIBLE TO FURNISH MATERIALS, TOOLS, LABOR, AND SUPERVISION NECESSARY TO PROVIDE ALL EXCAVATING, TRENCHING, AND BACKFILLING REQUIRED FOR THE INSTALLATION OF BELOW GROUND FIRE, GAS, WATER, STORM AND SANITARY PIPING IN COMPLIANCE WITH THE REQUIREMENTS OF THE GOVERNING AUTHORITIES. DO NOT EXCAVATE UNTIL WORK IS READY TO PROCEED WITHOUT DELAY.

B. EXACT ROUTING OF TRENCHING SHALL BE DETERMINED BY THE CONTRACTOR PERFORMING THE WORK AND APPROVED, IN ADVANCE, BY THE GENERAL CONTRACTOR.

C. MAINTAIN SIDES AND SLOPES OF EXCAVATIONS IN A SAFE CONDITION UNTIL COMPLETION OF BACKFILLING. FOR DEEP EXCAVATIONS PROVIDE ALL REQUIRED SHORING AND BRACING.

D. DO NOT ALLOW WATER TO ACCUMULATE IN EXCAVATIONS. IF NECESSARY, PROVIDE AND MAINTAIN DEWATERING SYSTEM EQUIPMENT TO CONVEY WATER AWAY FROM EXCAVATIONS. LAY NO PIPE IN WATER.

E. EXCAVATE TO REQUIRED DEPTH AND EXACT SLOPE WITH ONLY SUFFICIENT DIRT REMOVED AT JOINT LOCATIONS TO PROVIDE WORKING SPACE. ANY EXCAVATIONS DUG BELOW THE REQUIRED DEPTH SHALL BE FILLED TO PROPER DEPTH WITH SAND AND THOROUGHLY TAMPED.

F. WHERE ROCK IS ENCOUNTERED, EXCAVATE 6 INCHES BELOW REQUIRED DEPTH AND BACKFILL WITH A LAYER OF CRUSHED STONE OR GRAVEL. DO NOT SET PIPING DIRECTLY ON SOLID ROCK WITHOUT STONE OR GRAVEL CUSHION.

G. AFTER PIPING IS INSTALLED, EXCAVATION SHALL BE KEPT OPEN UNTIL PIPING HAS BEEN INSPECTED, TESTED AND ACCEPTED.

H. BACKFILL WITH AN INITIAL 12 INCH LAYER OF SAND OVER THE PIPE. THE REMAINDER OF THE BACKFILL SHALL BE BANKRUN GRAVEL. INSTALL BACKFILL IN 6 INCH TAMPED LAYERS.

I. CONTROL TRENCH SOIL COMPACTION DURING CONSTRUCTION. COMPACT TYPE TOP 12" OF SUBGRADE AND EACH LAYER OF BACKFILL FOR FILL MATERIAL AT 95% DENSITY FOR COHESION LESS SOILS AND 90% DENSITY FOR COHESIVE SOIL MATERIAL. TEST TO BE PERFORMED BY AN INDEPENDENT TESTING SERVICE, WITH COMPLIANCE REPORT SUBMITTED TO ARCHITECT.

PART 10 - 22 10 10 COMMON PIPING REQUIREMENTS

A. PROVIDE PIPING MATERIALS AND FACTORY-FABRICATED PIPING PRODUCTS OF SIZES, TYPES, PRESSURE RATINGS, TEMPERATURE RATINGS AND CAPACITIES AS DETERMINED BY INSTALLER TO COMPLY WITH INSTALLATION REQUIREMENTS. PROVIDE SIZES AND TYPES MATCHING PIPING CONNECTIONS; PROVIDE FITTINGS OF MATERIALS, WHICH MATCH PIPE MATERIALS USED IN PLUMBING SYSTEMS. WHERE MORE THAN ONE TYPE OF MATERIALS OR PRODUCTS ARE INDICATED, SELECTION IS INSTALLER'S OPTION.

B. GENERAL - ALL PLUMBING PIPING AND FITTINGS SHALL BE CONSTRUCTED OF MATERIALS AS SPECIFIED IN THE PLUMBING PIPE AND FITTING SCHEDULE.

C. WATER OUTLETS: AT LOCATIONS WHERE WATER IS SUPPLIED (BY MANUAL, AUTOMATIC OR REMOTE CONTROL), PROVIDE COMMERCIAL QUALITY FAUCETS, VALVES OR DISPENSING DEVICES OF TYPE AND SIZE INDICATED AND AS REQUIRED TO OPERATE AS INDICATED. INCLUDE MANUAL SHUT-OFF VALVES AND CONNECTING PIPES TO PERMIT OUTLET SERVICING WITHOUT SHUT-DOWN OF WATER SUPPLY PIPING SYSTEMS.

D. VACUUM BREAKERS: PROVIDE WITH FLUSH VALVES WHERE REQUIRED BY GOVERNING REGULATIONS, INCLUDING LOCATIONS WHERE WATER OUTLETS ARE EQUIPPED FOR HOSE ATTACHMENT.

E. P-TRAPS: INCLUDE REMOVABLE P-TRAPS (WITH CLEAN-OUT PLUG) WHERE DRAINS ARE INDICATED FOR DIRECT CONNECTION TO DRAINAGE SYSTEM.

F. FIXTURE BOLT CAPS: PROVIDE MANUFACTURER'S STANDARD EXPOSED FIXTURE BOLT CAPS FINISHED TO MATCH FIXTURE FINISH.

G. ESCUTCHEONS: WHERE FIXTURE SUPPLIES AND DRAINS PENETRATE WALLS IN EXPOSED LOCATIONS AND BENEATH COUNTERS OR CABINETS PROVIDE CHROME-PLATED SHEET STEEL ESCUTCHEONS WITH FRICTION SLIPS.

H. AERATORS: PROVIDE AERATORS OF TYPES APPROVED BY HEALTH DEPARTMENT HAVING JURISDICTION.

I. UNIONS 2" AND SMALLER SHALL BE CAST BRASS, SOLDER ENDS WITH MACHINED AND LAPPED SEATS SUITABLE FOR 125 PSI WORKING PRESSURES. 2-1/2" AND LARGER SHALL HAVE FLANGED CONNECTIONS.

J. COMPLY WITH ADDITIONAL FIXTURE REQUIREMENTS CONTAINED IN THE PLUMBING FIXTURE SCHEDULE ON DRAWINGS.

PART 11 - 22 10 40 NATURAL GAS PIPING

A. PROVIDE A SHUT-OFF VALVE, UNION AND TEE WITH FULL SIZED DIRT LEG (SEDIMENT TRAP) AT ALL NATURAL GAS EQUIPMENT CONNECTIONS.

B. PORTION OF GAS PIPING SYSTEMS INSTALLED IN CONCEALED LOCATIONS (I.E., INSIDE STUD WALLS) OR WITHIN RETURN AIR CEILING PLENUMS, SHALL NOT CONTAIN UNIONS OR SHUT-OFF VALVES.

C. ELBOWS, TEES AND COUPLINGS ARE PERMITTED.

D. NATURAL GAS PIPING SHALL NOT BE USED AS A GROUNDING ELECTRODE.

E. BUSHINGS AND CAST IRON FITTINGS SHALL NOT BE UTILIZED IN NATURAL GAS PIPING.

F. GALVANIZED PIPE OR FITTINGS SHALL NOT BE UTILIZED FOR NATURAL GAS PIPING.

G. EXTEND GAS VENT PIPING THROUGH AN EXTERIOR WALL, ELBOW DOWNWARD, INCREASE OPEN PIPE DISCHARGE TWO PIPE SIZES LARGER THAN VENT SIZE, AND COVER OPEN DISCHARGE PIPE WITH A STAINLESS STEEL INSECT SCREEN.

H. ALL BLACK STEEL NATURAL GAS PIPE AND FITTINGS EXPOSED TO THE OUTDOORS SHALL BE PAINTED WITH PRIMER, AND THEN TWO COATS OF RUST INHIBITED PAINT-COLOR AS SELECTED BY THE OWNER OR ARCHITECT.

PART 12 - 22 11 10 PIPING INSULATION

A. GENERAL - ALL PLUMBING INSULATION SHALL BE CONSTRUCTED OF MATERIALS AS SPECIFIED IN THE PLUMBING INSULATION SCHEDULE.

B. EACH CONTRACTOR SHALL FURNISH AND INSTALL ALL INSULATION NECESSARY TO THE PROJECT AND IN ACCORDANCE WITH THE FOLLOWING SCHEDULE. ALL INSULATION AND ACCESSORIES USED SHALL HAVE A COMPOSITE (INSULATION, JACKET AND ADHESIVE) FIRE AND SMOKE HAZARD RATING AS TESTED UNDER PROCEDURE ASTM E-84, NFPA 255 AND UL 723, NOT EXCEEDING A FLAME SPREAD 25 AND SMOKE DEVELOPED 50. INSULATION SHALL BE RATED FOR INSTALLATION IN PLENUM CEILINGS.

C. PROVIDE ALL INSULATION MATERIALS (INSULATION, JACKETS, FITTING COVERS, ADHESIVES, CEMENTS, MASTICS, SEALERS AND FINISHES) WITH A FLAME-SPREAD INDEX OF 25 OR LESS AND SMOKE DEVELOPED INDEX OF 50 OR LESS, AS TESTED UNDER PROCEDURE ASTM E-84 (NFPA 255).

D. MATERIALS:

(1) ALL INSULATION WORK SHALL BE INSTALLED WHERE INDICATED IN THE INSULATION SCHEDULE AND SHALL BE OF THE THICKNESS AND MATERIALS CONFORMING WITH THE INSULATION SCHEDULE.

E. PROVIDE FIBERGLASS INSULATION PRODUCTS AS MANUFACTURED BY OWENS CORNING, KNAUF, CERTAIN TEED, OR JOHNS MANVILLE.

F. PROVIDE CLOSED-CELL ELASTOMERIC AND POLYMERIC INSULATION PRODUCTS AS MANUFACTURED BY AEROCEL, ARMACELL, HALSTEAD, NOMACO, OR RUBATEX.

G. IN ADDITION TO THE INSULATION AND NORMAL FINISH, ALL OUTDOOR PIPING SHALL BE COVERED WITH A PRE-FABRICATED UV-RESISTANT PVC JACKET.

H. PVC JACKETS

(1) PVC JACKET SHALL BE HIGH-IMPACT-RESISTANT, UV-RESISTANT PVC COMPLYING WITH ASTM D 1784, CLASS 16354-C.

(2) PROVIDE PVC JACKET ON ALL EXPOSED PIPING REQUIRED TO RECEIVE INSULATION (PIPING BELOW FINISHED CEILING; NOT CONCEALED ABOVE CEILINGS OR WITHIN WALLS).

I. ADA INSULATION KITS

(1) ACCEPTABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS; PROVIDE INSULATION KITS AS MANUFACTURED BY ONE OF THE FOLLOWING:

(A) MCGUIRE MANUFACTURING COMPANY, INC. "PROWRAP"
(B) TRUEBRO "HANDI LAV-GUARD"
(C) PLUMBEREX "PRO-2000" SERIES

(2) MATERIALS

(A) INSULATION KITS SHALL BE A MINIMUM OF 1/8" THICK MOLDED CLOSED CELL VINYL CONSTRUCTION WITH PVC SATIN WHITE COVER. INSULATION MATERIAL SHALL BE ANTI-MICROBIAL/ANTI FUGAL. PROVIDE KIT WITH REMOVABLE VALVE ACCESS CAPS.

(B) UNITS SHALL BE BARRIER-FREE, AND SHALL BE INSTALLED PER ADA REQUIREMENTS AND SHALL COMPLY WITH ICC/ANSI A 117.1.

PART 13 - 22 12 20 PIPE HANGERS AND SUPPORTS:

A. PIPING SHALL BE CUT ACCURATELY TO MEASUREMENT AT THE SITE AND WORKED INTO PLACE WITHOUT SPRINGING OR FORCING. SUFFICIENT OFFSETS, PIPE LOOPS, OF EXPANSION JOINTS BETWEEN ANCHOR POINTS SHALL BE PROVIDED AS NEEDED, WHETHER OR NOT SHOWN, TO LIMIT STRESSES AND CONTROL MOVEMENT OF PIPING SUBJECT TO THERMAL EXPANSION.

B. PIPE TO BE THREADED SHALL BE CUT SQUARE AND FULL THREADED WITH CLEAN-CUT TAPERING THREADS AND SHALL BE REAMED AFTER THREADING. ALL THREADED CONNECTIONS SHALL BE MADE WITH PIPE COMPOUND APPLIED TO THE WALL THREADS ONLY.

C. THE EDGES OF THE PIPE TO BE WELDED SHALL BE MACHINE BEVELED WHEREVER POSSIBLE. BEFORE WELDING, THE SURFACES SHALL BE THOROUGHLY CLEANED. THE PIPING SHALL BE CAREFULLY ALIGNED. NO METAL SHALL PROJECT WITHIN THE PIPE. MITERED JOINTS ARE PROHIBITED, ONLY FACTORY FORMED FITTINGS SHALL BE USED. FLANGES SHALL BE WELDING NECK TYPE. MITERING OF THE PIPE TO FORM ELBOWS OR NOTCHING OF PIPE TO FORM TEES SHALL NOT BE PERMITTED.

D. UNIONS OR FLANGES SHALL BE INSTALLED IN ALL CONNECTIONS TO EQUIPMENT, CONTROL VALVES, ETC. AS NECESSARY TO PERMIT REMOVAL OF EQUIPMENT AND SPECIALTIES FOR SERVICING, REPAIRING, OR CLEANING. IT SHALL BE POSSIBLE TO REMOVE ANY PIECE OF EQUIPMENT BE REMOVING ONLY ONE OR TWO SECTIONS OF PIPING.

E. VALVES SHALL BE IN SUITABLE LOCATIONS AT EACH PIECE OF EQUIPMENT OR SECTION OF PIPING AS INDICATED OR REQUIRED FOR PROPER AND SAFE OPERATION OF EQUIPMENT AND TO FACILITATE MAINTENANCE AND/OR REMOVAL OF ALL EQUIPMENT. ON HORIZONTAL PIPE RUNS, INSTALL ALL VALVE STEAMS VERTICALLY WHERE POSSIBLE. IN NO CASE SHALL THE STEMS BE TURNED MORE THAN 90° FROM THE VERTICAL POSITION.

F. TAPS (HALF COUPLINGS OR TEES) SHALL BE PROVIDED AS NECESSARY TO PERMIT THE INSTALLATION OF TEMPERATURE CONTROL SENSORS, THERMOMETERS, PRESSURE GAUGES, AIR VENTS, ETC.

G. CONNECTIONS BETWEEN COPPER PIPING AND SCREWED FERROUS PIPING OR EQUIPMENT CONNECTIONS SHALL BE AS FOLLOWS:

(1) FOR PIPE AND STATIONARY NON-ROTATING, NON VIBRATING EQUIPMENT CONNECTIONS - 4" LONG DIELECTRIC NIPPLES.

(2) FOR ROTATING OR VIBRATING EQUIPMENT CONNECTIONS - CAST BRASS ADAPTER AND BRONZE FLANGES WITH DIELECTRIC SEPARATION OF FLANGES AND BOLTS.

H. CONNECTION BETWEEN COPPER PIPING AND FLANGED FERROUS PIPING OR EQUIPMENT CONNECTIONS SHALL BE MADE USING BRONZE COMPANION FLANGE WITH DIELECTRIC SEPARATION OF FLANGES AND BOLTS.

I. BRASS OR BRONZE VALVES IN FERROUS PIPING REQUIRE DIELECTRIC SEPARATION.

J. ANY PIPING RESTING ON OR COMING IN CONTACT WITH BUILDING STRUCTURE SHALL BE INSULATED AT THAT POINT TO PREVENT THE TELEGRAPHING OF SOUND.

K. PIPING SYSTEMS SHALL BE SUPPORTED AT INTERVALS AS REQUIRED BY CODE. RISER CLAMPS, CLEVIS HANGERS, SWIVEL LOOP HANGERS, OR TRAPEZE HANGERS MAY BE USED. ALL HANGERS, BRACKETS, CLAMPS, ETC., SHALL BE OF STANDARD WEIGHT STEEL. PERFORATED STRAP HANGERS SHALL NOT BE USED IN ANY WORK. CLAMPS AND HANGERS IN DIRECT CONTACT WITH THE PIPE SHALL MATCH THE MATERIAL OF THE PIPE. HANGERS FOR INSULATED PIPING SYSTEMS SHALL NOT BE IN DIRECT CONTACT WITH THE PIPE. HANGERS FOR INSULATED PIPING SYSTEMS SHALL BE OVERSIZED TO ACCOMMODATE THE INSULATION AND SHALL INCLUDE AN INSULATION PROTECTION SHIELD WITH CALCIUM SILICATE OR WOOD BLOCK INSERT. INSULATION VAPOR BARRIER SHALL BE CONTINUOUS AT EACH HANGER.

L. PROVIDE MACHINE CUT STEEL PIPE SLEEVES 1" LARGER THAN OUTSIDE DIAMETER OF PIPE. WHERE FLOORS OR WALLS ARE CORE DRILLED, STEEL SLEEVES ARE NOT REQUIRED. EXTEND SLEEVES 4" HIGHER THAN FLOOR IN MECHANICAL ROOMS AND ALL ROOMS CONTAINING FLOOR DRAINS. SEAL OPENINGS TO MAINTAIN THE INTEGRITY OF THE FIRE RATING.

M. PROVIDE ALL INSERTS, FASTENERS AND SUPPORTS TO PROPERLY SUPPORT AND RETAIN PIPING; TO CONTROL EXPANSION, CONTRACTION, ANCHORAGE, DRAINAGE, AND PREVENT SWAY AND VIBRATION. PIPING SHALL BE SO SUPPORTED AS NOT TO PLACE A STRAIN ON VALVES, FIXTURES OR EQUIPMENT.

N. THE DRAWINGS INDICATE THE GENERAL LOCATION AND ARRANGEMENT OF THE PIPING SYSTEMS. SO FAR AS PRACTICAL, INSTALL PIPING AS INDICATED, MAKING FINAL CONNECTIONS TO ALL EQUIPMENT AND FIXTURES. INSTALL PIPING AS DIRECT AS POSSIBLE AVOIDING UNNECESSARY OFFSETS. HOWEVER, IF OFFSETS ARE REQUIRED IN ORDER TO OBTAIN MAXIMUM HEADROOM OR TO AVOID CONFLICT WITH OTHER WORK, THEY SHALL BE MADE AS REQUIRED OR AS REQUESTED BY THE ARCHITECT/ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER. THE ARCHITECT/ENGINEER RESERVES THE RIGHT TO MAKE MINOR CHANGES IN THE LOCATION OF PIPING AND EQUIPMENT DURING THE ROUGHING-IN, WITHOUT ADDITIONAL COST TO THE OWNER. ALL CHANGES PROPOSED BY OTHERS SHALL BE APPROVED BY THE ARCHITECT/ENGINEER.

O. INSTALL PIPING FREE OF SAGS OR BENDS.

P. ALL HYDRONIC PIPING SYSTEMS MUST BE INSTALLED SO THEY CAN BE COMPLETELY DRAINED. PROVIDE TEE FITTING WITH BALL VALVE WITH CAPPED HOSE THREAD FITTING AT ALL LOW POINTS, TRAPPED SECTIONS, BASES OF RISERS, AND ON EQUIPMENT SIDE OF SHUT OFF VALVES TO PERMIT DRAINING. ALL DRAIN VALVES SHALL BE ACCESSIBLE.

Q. INSTALL BALL VALVE AIR VENTS AT ALL HIGH POINTS IN THE PIPING SYSTEMS NEEDED FOR COMPLETE AIR ELIMINATION FROM THE SYSTEM. INSTALL AIR VENTS ON THE HIGH SIDE OF ALL EQUIPMENT CONNECTIONS. ALL AIR VENTS SHALL BE ACCESSIBLE. PROVIDE 3/8" SOFT COPPER TUBING ON OUTLET OF AIR VENT VALVES TURNED 180 DEGREES DOWNWARD TO DISCHARGE CLEAR OF PIPE AND INSULATION.

R. PROVIDE ALL STOPS, SUPPLIES, TRAPS, ESCUTCHEONS, CARRIERS, ETC. REQUIRED FOR A COMPLETE INSTALLATION.

S. TERMINATE PLUMBING VENT PIPES AT LEAST 12 INCHES ABOVE ROOF.

T. WHERE HYDRONIC LINES ARE REDUCED IN SIZE, ECCENTRIC REDUCING FITTINGS SHALL BE USED TO ALIGN TOP OF MAINS AND PREVENT AIR POCKETS.

U. UL AND FM COMPLIANCE; HANGERS, SUPPORTS AND COMPONENTS SHALL BE LISTED AND LABELED BY UL AND FM WHERE USED FOR FIRE PROTECTION PIPING SYSTEMS. SUPPORT FIRE PROTECTION SYSTEMS PIPING INDEPENDENTLY FROM OTHER PIPING SYSTEMS.

PART 14 - 22 12 60 CLEANOUTS

A. ALL CLEAN-OUTS IN SUSPENDED CAST IRON SEWERS SHALL BE CAST IRON NO-HUB WITH CAST BRONZE PLUG.

B. ALL FLOOR CLEAN-OUTS SHALL BE CAPABLE OF ADJUSTMENT TO MATCH FINISH SURFACE.

C. ACCEPTABLE MANUFACTURERS: ZURN INDUSTRIES INC., JAY R. SMITH, WADE, JOSAM.

PART 15 - 22 13 10 DOMESTIC WATER VALVES

A. BALL VALVES, 3" AND SMALLER, SHALL BE 600# WOG, 150# SWP, TWO-PIECE, FULL PORT CAST BRONZE OR FORGED BRASS BODY, CHROME PLATED BRASS BALL, REPLACEABLE "TEFLON" OR "TFE" SEATS AND SEALS, BLOWOUT-PROOF STEM, VINYL-COVERED STEEL HANDLE AND HAVE THREADED ENDS.

(1) ACCEPTABLE MANUFACTURERS: HAMMOND, MILWAUKEE, STOCKHAM, NIBCO, APOLLO OR WATTS.

B. HORIZONTAL SWING CHECK VALVES 2" AND SMALLER SHALL HAVE BRONZE BODY, BRONZE DISC, HORIZONTAL SWING TYPE WITH THREADED ENDS, 300 PSI CWP.

(1) ACCEPTABLE MANUFACTURERS: CRANE, HAMMOND, JENKINS, MILWAUKEE, NIBCO, OR STOCKHAM.

PART 16 - 22 13 11 DOMESTIC WATER MIXING VALVES

A. INDIVIDUAL-FIXTURE TYPE:

(1) PROVIDE BELOW DECK THERMOSTATIC WATER MIXING VALVE FOR USE WITH A SINGLE ELECTRONIC FAUCET.

(2) THERMOSTATIC WATER MIXING VALVE SHALL HAVE THE FOLLOWING FEATURES:

(A) DESIGNED FOR UNDER-THE-LAVATORY APPLICATIONS WHERE THE OUTLET TEMPERATURE OF HOT WATER MUST BE CONTROLLED FOR SAFE, ECONOMIC USE.

(B) INSTALLS IN PLACE OF THE TEE FITTING SUPPLIED WITH THE FAUCET PRIOR TO THE SOLENOID VALVE.

(C) DESIGNED TO QUICKLY SENSE AND COMPENSATE FOR TEMPERATURE FLUCTUATIONS INDUCED BY WATER TEMPERATURE AND PRESSURE CHANGES IN THE SUPPLY LINE.

(D) WATER TEMPERATURE ADJUSTMENT STEM WITH LOCK NUT TO PREVENT TAMPERING.

(E) EQUIPPED WITH INTEGRAL CHECK VALVES AT INLETS.

(F) STANDARDS: COMPLIES WITH PERFORMANCE STANDARDS ASSE 1070 AND CSA B125 FOR THERMOSTATICALLY CONTROLLED WATER TEMPERING VALVE.

(G) PRESSURE RATING: 125 PSIG MINIMUM.

(H) BODY: BRONZE BODY WITH CORROSION-RESISTANT INTERIOR COMPONENTS.

(I) TEMPERATURE CONTROL: ADJUSTABLE - 80-120°F RANGE.

(J) INLETS AND OUTLET: THREADED OR 3/8" COMPRESSION CONNECTIONS.

(K) FINISH: ROUGH OR CHROME-PLATED BRONZE.

(L) TEMPERED-WATER SETTING: 120 DEG F.

(M) TEMPERED-WATER DESIGN FLOW RATE: 4.0 GPM.

(N) MINIMUM FLOW: 0.5 GPM.

(3) ACCEPTABLE MANUFACTURERS (INDIVIDUAL-FIXTURE): APOLLO VALVES; ARMSTRONG INTERNATIONAL, INC.; CONBRACO INDUSTRIES, INC.; LAWLER MANUFACTURING COMPANY, INC.; LEONARD VALVE COMPANY; MOEN; POWERS (A WATTS INDUSTRIES CO.); SLOAN; WATTS INDUSTRIES, INC. (WATER PRODUCTS DIV.); ZURN PLUMBING PRODUCTS GROUP (WILKINS DIV.).

B. PRIMARY THERMOSTATIC MIXING VALVES (FOR MULTIPLE FIXTURES)

(1) THERMOSTATIC WATER MIXING VALVE SHALL HAVE THE FOLLOWING FEATURES:

(A) STANDARD: ASSE 1016, 1017, 1069, AND 1070.

(B) PRESSURE RATING: 125 PSIG.

(C) TYPE: [EXPOSED-MOUNTING] [CABINET-TYPE], THERMOSTATICALLY CONTROLLED WATER MIXING VALVE.

(D) MATERIAL: BRONZE BODY WITH CORROSION-RESISTANT INTERIOR COMPONENTS.

(E) CONNECTIONS: THREADED [UNION] INLET AND OUTLET.

(F) ACCESSORIES: MANUAL TEMPERATURE CONTROL, CHECK STOPS ON HOT- AND COLD-WATER SUPPLIES, AND ADJUSTABLE, TEMPERATURE-CONTROL HANDLE.

(G) VALVE PRESSURE RATING: 125 PSIG MINIMUM.

(H) TEMPERED-WATER SETTING: 120 DEG F

(I) TEMPERED-WATER DESIGN FLOW RATE: ___ GPM

(J) SELECTED VALVE FLOW RATE AT 5-PSIG PRESSURE DROP: ___ GPM

(K) VALVE FINISH: [CHROME PLATED] [POLISHED, CHROME PLATED] [ROUGH BRONZE].

(L) PIPING FINISH: [CHROME PLATED] [COPPER].

(M) CABINET: FACTORY-FABRICATED, STAINLESS STEEL, FOR [RECESSED] [SURFACE] MOUNTING AND WITH HINGED, STAINLESS-STEEL DOOR.

(2) ACCEPTABLE MANUFACTURERS: LAWLER MFG; LEONARD VALVE CO.; POWERS PROCESS CONTROLS; SYMMONS INDUSTRIES, INC.

C. MASTER THERMOSTATIC WATER MIXING VALVE ASSEMBLIES

(1) MASTER THERMOSTATIC WATER MIXING VALVE SHALL HAVE THE FOLLOWING FEATURES:

(A) DESCRIPTION: PROVIDE FACTORY-FABRICATED, [CABINET-TYPE] [EXPOSED-MOUNTING], THERMOSTATICALLY CONTROLLED, WATER-MIXING-VALVE ASSEMBLIES IN [TWO] [THREE]-VALVE PARALLEL ARRANGEMENT. THERMOSTATIC WATER MIXING VALVES SHALL INCLUDE COPPER ENCAPSULATED PARAFFIN-BASED THERMOSTAT, LOCKING TEMPERATURE REGULATOR HANDLE, INTEGRAL HOT AND COLD SUPPLY CHECKSTOPS, INTEGRAL WALL SUPPORT, AND INTERNAL PARTS OF BRASS, BRONZE, AND STAINLESS STEEL CONSTRUCTION. FINISH SHALL BE ROUGH BRONZE.

(B) THERMOSTATIC MIXING VALVES SHALL COMPLY WITH ASSE 1017. INCLUDE CHECK STOPS ON HOT- AND COLD-WATER INLETS AND SHUTOFF VALVE ON OUTLET.

(C) WATER REGULATOR(S) SHALL COMPLY WITH ASSE 1003. INCLUDE PRESSURE GAGE ON INLET AND OUTLET.

(D) COMPONENT PRESSURE RATING SHALL BE 125 PSIG MINIMUM.

(E) CABINET: FACTORY-FABRICATED, STAINLESS STEEL, FOR [RECESSED] [SURFACE] MOUNTING AND WITH HINGED, STAINLESS-STEEL DOOR.

(F) TEMPERED-WATER SETTING: 120 DEG F

(G) UNIT TEMPERED-WATER DESIGN FLOW RATE: GPM

(H) UNIT MINIMUM TEMPERED-WATER DESIGN FLOW RATE: 5 GPM

(I) MIXING VALVES SHALL NOT BE DEPENDENT UPON A CIRCULATING PUMP TO ACHIEVE MINIMUM FLOW PERFORMANCE.

(J) MIXING VALVES SHALL BE ASSE LISTED AND 3RD PARTY CERTIFIED AS LEAD FREE.

(2) ACCEPTABLE MANUFACTURERS: LAWLER MANUFACTURING CO.; LEONARD VALVE CO.; POWERS (A WATTS INDUSTRIES CO.); SYMMONS INDUSTRIES, INC.

PART 17 - 22 13 20 NATURAL GAS VALVES

D. NATURAL GAS SHUT-OFF VALVES 2" AND SMALLER SHALL BE FORGED BRASS OR BRONZE BODY, FULL PORT BALL VALVES WITH LEVER HANDLE, PTFE SEATS, CHROME PLATED BRASS BALL AND THREADED ENDS, 600 PSI CWP, WITH 5 PSIG PRESSURE LIMIT. PROVIDE ALL VALVES WITH A REMOVABLE WRENCH TO MATCH OPERATOR SQUARE HEAD SIZE. WRENCHES SHALL BE LOCKED IN PLACE WITH A SET SCREW.

(1) ACCEPTABLE MANUFACTURERS: APOLLO, MILWAUKEE OR NIBCO.

E. NATURAL GAS VALVES 2-1/2" AND LARGER SHALL BE 175# WOG, CAST IRON, FLANGED BODY PATTERN. VALVES SHALL BE UL LISTED FOR GAS SERVICE. VALVES SHALL BE KEY PORT VALVES SERIES 425 WITH "RS-49" PLUG, SEALS AND LEVER HANDLE. PROVIDE ALL VALVES WITH A REMOVABLE WRENCH TO MATCH OPERATOR SQUARE HEAD SIZE. WRENCHES SHALL BE LOCKED IN PLACE WITH A SET SCREW.

(1) ACCEPTABLE MANUFACTURERS: DEZURIK, KEYSTONE, OR RESUN.

PART 18 - 22 13 21 NATURAL GAS PRESSURE REGULATORS

A. ALL NATURAL GAS SYSTEMS SHALL COMPLY WITH THE LATEST "INTERNATIONAL FUEL GAS CODE" AND LOCAL UTILITY REQUIREMENTS. GAS REGULATORS SHALL BE ANSI Z21.18 CERTIFIED.

B. OPERATION

(1) REGULATORS SHALL BE CAPABLE OF REGULATING GAS LINE PRESSURE FROM INLET VALUE TO OUTLET VALUE AS SCHEDULED ON DRAWINGS.

(2) REGULATORS SHALL, AT A MINIMUM, BE CAPABLE OF PASSING THE SCHEDULED REQUIRED CAPACITY OF GAS AT THE SCHEDULED MAXIMUM PRESSURE DROP.

(3) REGULATORS SHALL BE PROTECTED FROM OVER-PRESSURIZATION WITH AN INTEGRAL PRESSURE RELIEF MECHANISM.

(4) REGULATORS SHALL BE CAPABLE OF MULTI-POISE MOUNTING.

(5) REGULATORS SHALL PROVIDE POSITIVE DEAD-END LOCK UP.

C. CONSTRUCTION

(1) REGULATOR BODY SHALL BE CONSTRUCTED OF HIGH TENSILE STRENGTH CAST IRON.

(2) ORIFICE SHALL BE CONSTRUCTED OF BRASS.

(3) REGULATOR SEAT SHALL BE CONSTRUCTED OF BUNA-N OR SILICONE (FOR TEMPERATURES BELOW -20 °F).

(4) DIAPHRAGM SHALL BE CONSTRUCTED OF BUNA-N AND NYLON.

(5) HOUSING SHALL BE DIE CAST ALUMINUM.

D. CONNECTIONS

(1) FURNISH WITH FLANGED INLET AND DISCHARGE PIPE CONNECTIONS, OF SIZES AS INDICATED ON DRAWINGS.

(2) IF NOT INDICATED, PROVIDE BOTH INLET AND DISCHARGE SIZES SHALL BE EQUAL TO THE DOWNSTREAM PIPE SIZE.

E. INSTALLATION

(1) WHERE REGULATORS ARE INSTALLED INDOORS, PIPE REGULATOR EXCESS PRESSURE VENTED DIRECTLY TO THE OUTDOORS WITH A DEDICATED PIPE. PIPE SHALL BE FULL DISCHARGE CONNECTION SIZE. PIPE SHALL NOT BE COMBINED INSIDE THE BUILDING WITH ANY OTHER VENT PIPING.

(2) ALL SPECIALTIES INSTALLED OUTDOORS SHALL BE PAINTED WITH PRIMER, AND THEN TWO COATS OF RUST INHIBITED PAINT-COLOR AS SELECTED BY THE ARCHITECT.

(3) ALL REGULATORS SHALL BE SEPARATELY VENTED FULL SIZE TO THE EXTERIOR, WITH A TURNDOWN ELBOW AND INSECT SCREEN. VENT OUTLET SHALL NOT TERMINATE WITHIN 20 FEET OF A COMBUSTION OR FRESH AIR INTAKE.

F. ACCEPTABLE MANUFACTURERS: ACTARIS, ITRON, MAXITROL, SCHUMBERGER, SPRAGUE, NORGAS.

PART 19 - 22 14 20 DUAL CHECK BACKFLOW PREVENTERS

A. DUAL CHECK VALVES: COST BRONZE BODY WITH PLASTIC CHECK MODULES, INJECTION MOLDED WITH ACETYL RESIN AND PPO, WITH SILICONE DISC AND BUNA 'N' SEALS, STAINLESS STEEL SPRING. CHECK MODULES SHALL BE REPLACEABLE.

PART 20 - 22 15 11 HYDRONIC MANUAL BALANCING VALVES

A. MANUAL BALANCING VALVES 2" AND SMALLER SHALL HAVE BRONZE BODY WITH COMBINATION VENTURI AND BALL VALVE WITH LEVER HANDLE, MEMORY STOP, TWO P/T PORTS, INLET UNION CONNECTION AND THREADED ENDS, PSI AT 250°F.

B. ACCEPTABLE MANUFACTURERS: BELL & GOSSETT, FLOW DESIGN INC., GRISWOLD, OR NEXUS.

PART 21 - 22 17 30 STRAINERS

A. STRAINERS SHALL BE Y-TYPE, BRONZE BODY, THREADED ENDS, BRASS PLUG, STAINLESS STEEL SCREEN WITH # 20 MESH, 200 WOG AT 150°F.

PART 22 - 22 20 10 EQUIPMENT AND PIPING IDENTIFICATION

A. LABEL ALL PIPING SYSTEMS WITH PIPE MARKERS INSTALLED ADJACENT TO VALVES, WHERE PIPES PASS THROUGH WALLS OR FLOORS, NEAR ALL BRANCHES AND CHANGES OF DIRECTION, AT 20 FEET INTERVALS ON STRAIGHT RUNS OF PIPE, AND AT ACCESS DOOR LOCATIONS. ALL PIPE MARKERS SHALL CONFORM TO ANSI A13.1 "SCHEME FOR THE IDENTIFICATION OF PIPING SYSTEMS".

B. PROVIDE CLEAR STICKER ON CEILING T-BAR TO INDICATE ACCESS LOCATION FOR EACH FAN POWERED BOX AND VAV TERMINAL BOX.

C. THE CONTRACTOR SHALL FURNISH AND INSTALL A SYSTEM OF NAMEPLATES OR STENCILS DESIGNED TO IDENTIFY EACH PIECE OF EQUIPMENT.

(1) NAMEPLATE LETTERS AND NUMBERS SHALL MATCH EQUIPMENT DESIGNATION AS INDICATED ON THE DRAWINGS.

(2) NAMEPLATES SHALL BE LAMINATED PHENOLIC WITH BLACK SURFACE AND WHITE CORE. USE 1/16" THICK MATERIAL FOR PLATES UP TO 2" BY 4". FOR LARGER SIZES USE 1/8" THICK. LETTERS AND NUMBERS SHALL BE A MINIMUM OF 1/2" HIGH.

(3) FASTEN NAMEPLATES TO ALL EQUIPMENT BY THE USE OF STAINLESS STEEL SHEET METAL SCREWS.

PART 23 - 22 21 20 STORAGE-TYPE ELECTRIC HOT WATER HEATERS

D. GENERAL: PROVIDE AUTOMATIC, COMMERCIAL, ELECTRIC WATER HEATER WITH VERTICAL, ASME LABELED, 150 PSIG RATED STORAGE TANK, INTEGRAL CONTROLS, DRAIN VALVE AND AGA/ASME TEMPERATURE AND PRESSURE RELIEF VALVE.

E. TANK: GLASS-LINED STEEL WITH ANODE RODS AND DRAIN VALVE.

F. HEATING ELEMENTS: SCREW-IN OR FLANGED BOLT-IN IMMERSION TYPE, IN MULTIPLE OF 3 ELEMENTS.

G. CONTROLS: ADJUSTABLE IMMERSION THERMOSTAT.

H. SAFETY CONTROLS: AUTOMATIC, HIGH-TEMPERATURE-LIMIT CUTOFF AND LOW WATER CUTOFF.

I. TEMPERATURE AND PRESSURE RELIEF VALVE: ASME RATED AND LABELED.

J. ELECTRICAL CHARACTERISTICS: AS SCHEDULED ON DRAWINGS. ELECTRICAL CONTRACTOR TO PROVIDE DISCONNECT.

K. WARRANTY: PROVIDE A 3-YEAR LIMITED WARRANTY.

L. ACCEPTABLE MANUFACTURERS: RHEEM WATER HEATER DIV., CITY INVESTING CO.; RUUD WATER HEATER DIV., CITY INVESTING CO.; SMITH CORP. (A.O.). CONSUMER PRODUCTS DIV.; STATE INDUSTRIES, INC.; BRADFORD WHITE

PART 24 - 22 24 20 RECIRCULATION PUMPS

A. DOMESTIC HOT WATER CIRCULATORS SHALL BE IN-LINE TYPE, BRONZE BODY AND FLANGES WITH DYNAMICALLY AND ONE-PIECE HYDRAULICALLY BALANCED BRONZE IMPELLER, SUITABLE FOR USE IN DOMESTIC WATER SYSTEMS.

B. THE CIRCULATOR SHALL HAVE A SELF-LUBRICATING, MAINTENANCE FREE DESIGN WITH A FIELD-SERVICEABLE AND REPLACEABLE CARTRIDGE. THE CARTRIDGE SHALL CONTAIN ALL THE MOVING PARTS AND NO MECHANICAL SEAL SHALL BE REQUIRED.

C. MOTOR SHALL BE RESILIENT MOUNTED, OPEN-DRIP PROOF ENCLOSURE TYPE. SINGLE PHASE MOTORS SHALL BE FURNISHED WITH BUILT-IN OVERLOAD PROTECTION.

D. ACCEPTABLE MANUFACTURERS: BELL + GOSSETT, PACO, TACO, GRUNDFOS.

PART 25 - 22 40 00 PLUMBING FIXTURES

A. PROVIDE FACTORY-FABRICATED PLUMBING FIXTURES OF TYPE, STYLE AND MATERIAL INDICATED. FOR EACH TYPE FIXTURE, PROVIDE FIXTURE MANUFACTURER'S STANDARD TRIM, CARRIER, SEATS AND VALVES AS SHOWN BY THEIR PUBLISHED PRODUCT INFORMATION AND INDICATED IN THE PLUMBING FIXTURES SCHEDULE, EITHER AS DESIGNED AND CONSTRUCTED OR AS RECOMMENDED BY MANUFACTURER AND AS REQUIRED FOR COMPLETE INSTALLATION. WHERE MORE THAN ONE TYPE IS INDICATED, SELECTION IS INSTALLER'S OPTION, BUT ALL FIXTURES OF SAME TYPE MUST BE FURNISHED BY SINGLE MANUFACTURER. WHERE TYPE IS NOT OTHERWISE INDICATED, PROVIDE FIXTURES COMPLYING WITH GOVERNING REGULATIONS.

B. PROVIDE VACUUM BREAKERS AS PART OF THE FIXTURE TRIM WHEREVER THERE IS A POSSIBILITY OF BACK SIPHONING.

C. PROVIDE FIXTURES CONSTRUCTED OF VITREOUS CHINA WITH ALL VISIBLE SURFACES GLAZED. FURNISH ENAMELED CAST IRON FIXTURES CONSTRUCTED WITH NON-STAINING, ACID RESISTANT, PORCELAIN ENAMELED COAT THOROUGHLY FUSED ON THE SURFACES. FURNISH STAINLESS STEEL SINKS WITH SATIN FINISH, UNLESS NOTED OTHERWISE.

D. PROVIDE ALL STOPS, SUPPLIES, TRAPS, AND ESCUTCHEONS NECESSARY FOR A COMPLETE INSTALLATION. ALL COMPONENTS SHALL BE CHROME PLATED BRASS.

E. STOPS SHALL BE STRAIGHT OR ANGLE TYPE AS REQUIRED BY THE INSTALLATION, WITH LOOSE KEY, METAL STEM AND WASHER CUP WITH SET SCREW WASHER RETAINER.

F. SUPPLIES SHALL BE FLEXIBLE CHROME PLATED COPPER.

G. TRAPS SHALL BE 17 GAUGE CHROME PLATED BRASS WITH CLEAN-OUT PLUG. FURNISH WITH SLIP NUTS, WALL BEND AND ESCUTCHEON.

H. PROVIDE CARRIERS AND SUPPORTS AS REQUIRED FOR PROPER FIXTURE INSTALLATION. TYPE SHALL PERMIT FIELD ADJUSTMENT TO FIT VARIATIONS IN CONSTRUCTION. UNLESS NOTED OTHERWISE, SUPPORT ALL WALL MOUNTED PLUMBING FIXTURES ON CONCEALED CHAIR CARRIERS WITH FOOT SUPPORT.

I. PROVIDE FAUCET AERATORS AND OUTLETS OF TYPES APPROVED BY THE LOCAL HEALTH DEPARTMENT.

J. INSULATE ALL EXPOSED WATER SUPPLIES AND TRAPS WHERE FIXTURES ARE INDICATED TO COMPLY WITH THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT. INSULATION KITS SHALL BE 3/16" THICK MOLDED CLOSED CELL VINYL CONSTRUCTION WITH PVC SATIN WHITE COVER.

K. PROVIDE ALL DRAINS INSTALLED IN WATERPROOF SLABS WITH FLASHING RING, WITH 30 INCH BY 30 INCH, 6 POUND LEAD FLASHING PROPERLY FASTENED TO THE FLASHING RING. PROVIDE ALL FLOOR DRAINS WITH "P" TRAPS WITH TRAP PRIMER CONNECTION. FURNISH ALL TRAPS 3 INCH DIAMETER OR LESS, INSTALLED ABOVE GRADE, WITH CLEAN-OUT PLUGS.

L. ROOF DRAIN OUTLET CONNECTION SHALL BE THREADED OR NO-HUB TYPE. CAULKING OR GASKET TYPE OUTLETS ARE NOT ACCEPTABLE.

22 40 10 VITREOUS CHINA FIXTURES

M. VITREOUS CHINA PLUMBING FIXTURES (I.E., WATER CLOSETS, URINALS AND LAVATORIES) AND CARRIERS:

(1) ACCEPTABLE MANUFACTURERS:

(A) AMERICAN STANDARD (U.S. PLUMBING PRODUCTS), CRANE PLUMBING/FIAT PRODUCTS, SLOAN, ELJER PLUMBINGWARE DIV. (A HOUSEHOLD INTERNATIONAL CO.), KOHLER COMPANY.

N. PLUMBING TRIM:

(1) ACCEPTABLE MANUFACTURERS:

(A) AMERICAN STANDARD, CHICAGO FAUCET COMPANY, CRANE PLUMBING/FIAT PRODUCTS, ELJER PLUMBINGWARE DIV. (A HOUSEHOLD INTERNATIONAL CO.), KOHLER COMPANY, ROYAL BRASS MANUFACTURING COMPANY, SLOAN, SPEAKMAN COMPANY.

O. FIXTURE SEATS:

(1) ACCEPTABLE MANUFACTURERS:

(A) BEMIS MANUFACTURING COMPANY, BENEKE CORPORATION, CHURCH SEAT COMPANY, KOHLER COMPANY, SLOAN, OLSONITE CORPORATION (OLSONITE SEATS).

22 40 31 MOP BASINS

A. ACCEPTABLE MANUFACTURERS: STERN WILLIAMS, MUSTEE.

22 40 20 STAINLESS STEEL SINKS

A. ACCEPTABLE MANUFACTURERS: ELKAY MANUFACTURING COMPANY, JUST MANUFACTURING COMPANY

PART 26 - 22 40 50 ELECTRIC WATER COOLERS

B. PROVIDE ELECTRIC BI-LEVEL WATER COOLERS AS INDICATED AND SCHEDULED ON THE DRAWINGS. ALL WATER COOLERS SHALL BE CONSTRUCTED WITH HEAVY-GAUGE GALVANIZED STEEL FRAME AND STAINLESS STEEL TOP. UNITS SHALL INCLUDE FRONT AND SIDE PUSH PADS TO ACTIVATE THE FLOW WATER. BASIN SHALL BE DESIGNED TO ELIMINATE SPLASHING AND STANDING WATER. CABINET FINISH SHALL BE POWDER-COATED PAINT OR BAKED ENAMEL OF COLOR AS SELECTED BY ARCHITECT. BUBBLE GUARDS SHALL BE CONSTRUCTED OF PLASTIC AND OPERATE BETWEEN 20 AND 80 PSIG. ALL MATERIALS OF CONSTRUCTION ON CONTACT WITH DOMESTIC WATER SHALL BE LEAD-FREE AND SHALL UTILIZE REFRIGERANT 134A. WATER COOLERS SHALL COMPLY WITH ANSI A117.1 AND SHALL BE LISTED BY UNDERWRITER'S LABORATORIES AND SHALL BE CERTIFIED TO NSF/ANSI STANDARD 61, ANNEX G (AB1953). WATER COOLER COMPRESSORS SHALL BE WARRANTED FOR FIVE (5) YEARS.

C. WHERE INDICATED, UNITS SHALL BE BARRIER-FREE, AND SHALL BE INSTALLED PER ADA REQUIREMENTS.

D. ACCEPTABLE MANUFACTURERS: ELKAY, HALSEY, OASIS

22 40 92 EMERGENCY EYEWASH STATIONS

A. ACCEPTABLE MANUFACTURERS: KEWAUNEE, GUARDIAN EQUIPMENT, SPEAKMAN

B. COMPONENTS:

A. SPRAY HEAD ASSEMBLY:

1. 1.6-GPM FLOW CONTROL ORIFICES MOUNTED ON A CHROME PLATED BRASS EYEWASH ASSEMBLY.

2. TWO SPRAY HEADS. EACH HEAD SHALL HAVE A "FLIP TOP" DUST COVER, INTERNAL FLOW CONTROL AND FILTER TO REMOVE IMPURITIES FROM THE WATER FLOW.

B. BOWL:

1. 11-3/4" DIAMETER ABS PLASTIC.

C. ANSI-COMPLIANT IDENTIFICATION SIGN.

D. 1/2" IPS CHROME PLATED BRASS STAY-OPEN BALL VALVE. VALVE SHALL BE US-MADE WITH CHROME PLATED BRASS BALL AND TEFLON SEALS.

E. HEAVY DUTY CAST ALUMINUM WALL BRACKET WITH CORROSION RESISTANT POWDER COATED FINISH.

F. OPTIONS:

1. WATER TEMPERING VALVE:

a. FURNISH WITH THERMOSTATIC MIXING VALVE PRECISELY BLENDS HOT AND COLD WATER TO DELIVER WARM (TEPID) WATER AS PROVIDED BY ANSI Z358.1 - 2014.

b. THERMOSTATIC MIXING VALVE (FACTORY SET TO 85 DEGREES) FOR SINGLE EMERGENCY EYE WASH. UNIT SHALL INCLUDE A BUILT-IN COLD WATER BY-PASS, ROUGH BRONZE FINISH, SOLID BIMETAL THERMOSTAT, LOCKING TEMPERATURE REGULATOR WITH LIMIT STOP FACTORY SET FOR 90 DEGREES, INTEGRAL CHECK STOPS, AND DIAL THERMOMETER.

c. PERFORMANCE: UNIT SHALL HAVE A FLOW RANGE OF 0.5-GPM TO 5-GPM WITH A MAXIMUM PRESSURE LOSS OF 20-PSI AND COME WITH A FULL 1-YEAR WARRANTY.

d. QUALITY ASSURANCE: UNIT SHALL BE CERTIFIED TO ASSE 1071. UNIT SHALL BE CERTIFIED TO MEET LOW LEAD REQUIREMENTS OF WETTED SURFACE AREA CONTAINING LESS THAN 0.25% LEAD BY WEIGHT.

2. PROVIDE CHROME PLATED BRASS TAILPIECE AND TRAP WITH 1-1/2" WASTER CONNECTION.

PART 27 - 22 41 10 DRAINS AND TRAP PRIMERS

A. TRAP PRIMER VALVES SHALL HAVE CORROSION RESISTANT BRASS BODY, 1/2" THREADED INLET AND OUTLET, WITH BACKFLOW PREVENTER SEAL AND VACUUM BREAKER PORT. UNIT TO CONTAIN NO SPRINGS OR DIAPHRAGMS. "O" RING SEALS TESTED FOR RELIABILITY AT A TEMPERATURE RANGE OF -40° TO 450°F. DESIGNED TO AUTOMATICALLY ACTIVATE WHEN THE DOMESTIC WATER SYSTEM PRESSURE DROPS AS LITTLE AS 5 PSI. PROVIDE WITH DISTRIBUTION UNIT AND SUPPLY TUBE FOR MULTIPLE (MAXIMUM OF 4) FLOOR DRAIN INSTALLATION.

(1) ACCEPTABLE MANUFACTURERS: JOSAM, JAY R. SMITH, PRECISION PLUMBING PRODUCTS, WADE, OR ZURN.

B. FLOOR DRAINS AND ROOF DRAINS:

(1) ACCEPTABLE MANUFACTURERS: JOSAM, JAY R. SMITH COMPANY, TYLER PIPE (SUB. OF TYLER CORPORATION/WADE), ZURN INDUSTRIES INC.

PATRICK W. KLANAC
NUMBER
29264
Patrick W Klanac
8-15-2025

SEAL

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PROJECT:

TENANT IMPROVEMENTS FOR:
SONNY'S
2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

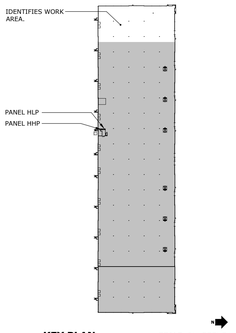
MARK:	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402

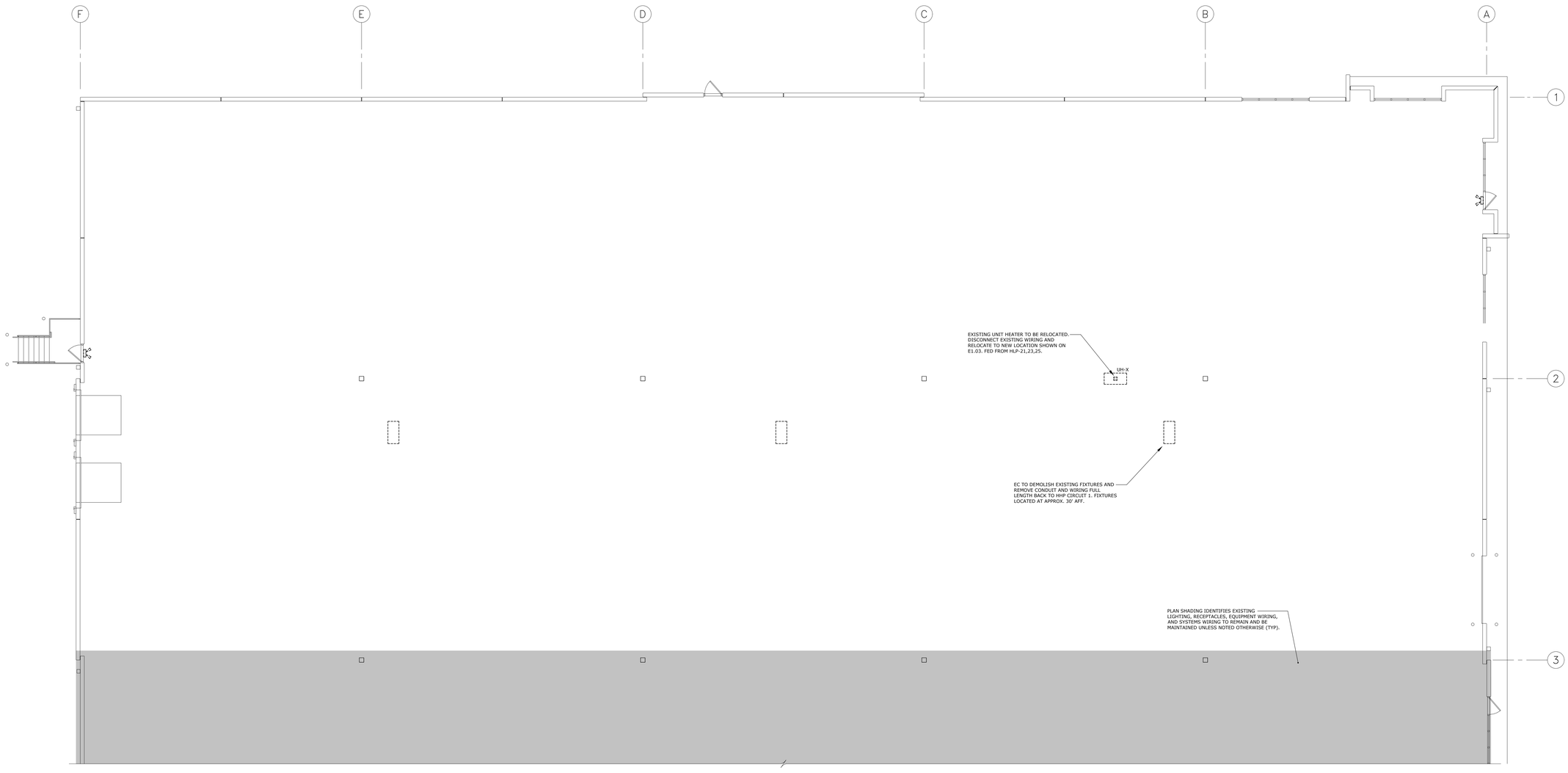
DRAWN BY: PTA, INC.
CHECKED BY: JSC

DRAWING TITLE:
PLUMBING
SPECIFICATIONS

SHEET #:
P5.01



KEY PLAN SCALE: 1"=200'-0"



ELECTRICAL DEMOLITION PLAN

STATE OF MISSOURI
JONATHAN J. JENNINGS
NUMBER PE-2023000149
PROFESSIONAL ENGINEER
08-15-25
SEAL

FOUNDATION
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740 MARKS ROAD - SUITE A, VALLEY CITY, OHIO 44280

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275 Springside Dr., Suite 300
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MARK:	ISSUE:	DATE:
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PROJECT #: 016-0402

DRAWN BY: PTA INC | CHECKED BY: J.J.J.

DRAWING TITLE:

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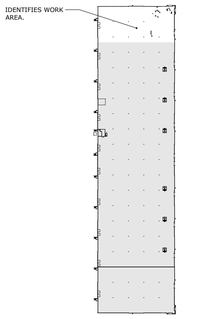
SHEET #:

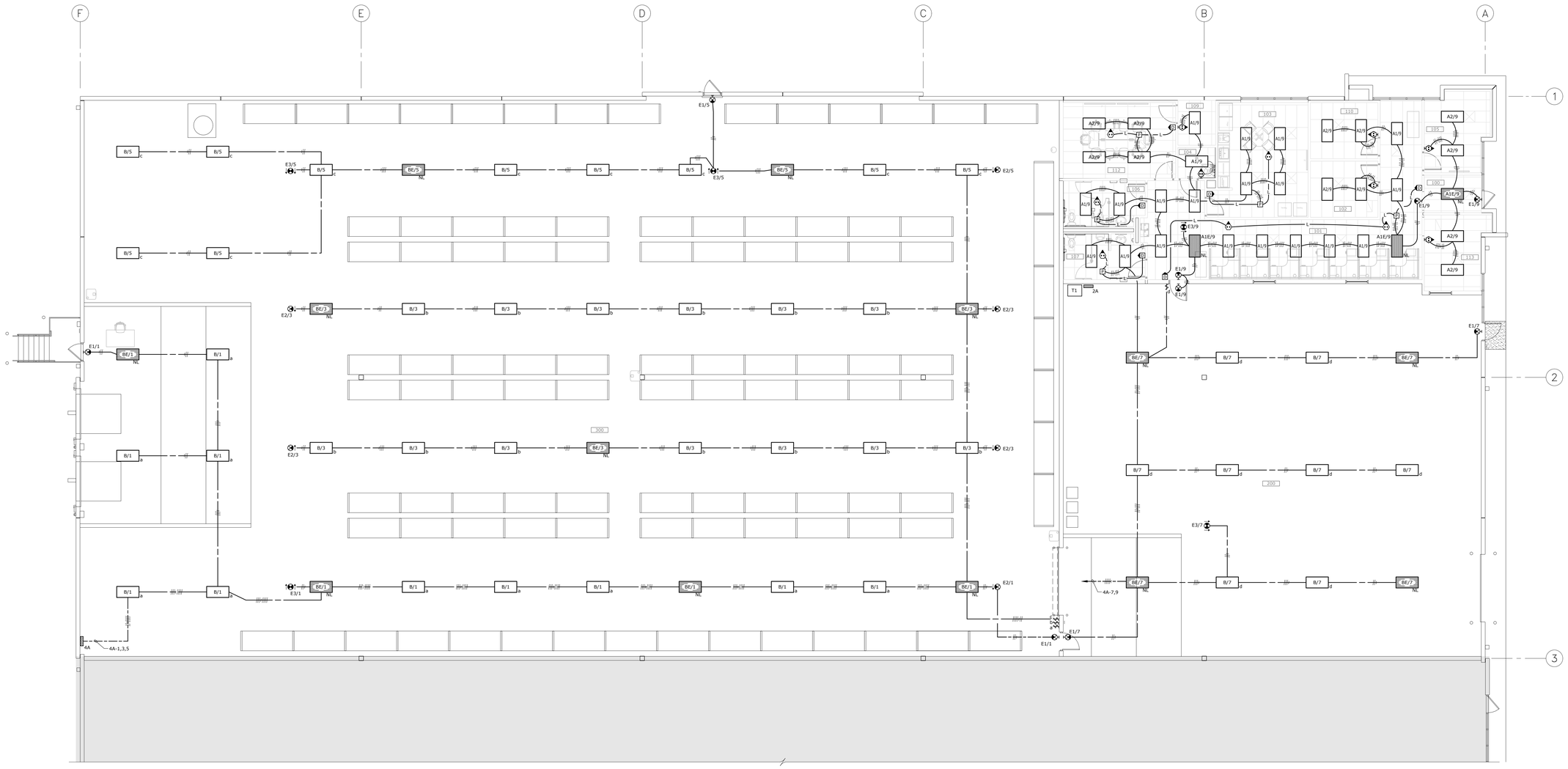
E0.01



KEY PLAN SCALE: 1"=200'-0"

NOTES:

1. BRANCH CIRCUIT CONDUCTOR SIZES SHALL MINIMALLY BE #12 AWG. WHERE THE LENGTH OF A HOMERUN, FROM PANEL TO FIRST DEVICE, EXCEEDS 75 FEET FOR A 120 VOLT CIRCUIT OR 175 FEET FOR A 277 VOLT CIRCUIT, THE MINIMUM CONDUCTOR SIZE SHALL BE #10 AWG.
2. DEVICES INSTALLED IN FIRE RATED WALLS SHALL BE INSTALLED IN ACCORDANCE WITH IBC ARTICLE 714.4.2. COORDINATE WALL TYPES WITH THE ARCHITECTURAL DRAWINGS.
3. PLAN SHADING IDENTIFIES EXISTING LIGHTING, RECEPTACLES, EQUIPMENT WIRING, AND SYSTEMS WIRING TO REMAIN AND BE MAINTAINED UNLESS NOTED OTHERWISE (TYP).



EQUIPMENT WIRING PLAN

0' 4' 8' 16'

JONATHAN J. JENNINGS NUMBER PE-2023000149 PROFESSIONAL ENGINEER STATE OF MISSOURI 08-15-25

SEAL

FOUNDATION ARCHITECTURE, LLC
740 MARKS ROAD - SUITE A, VALLEY CITY, OHIO 44208

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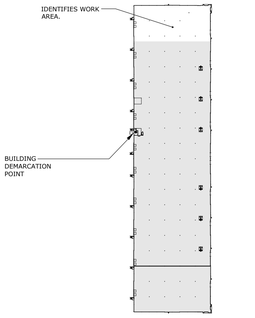
PROJECT #: 016-0402

DRAWN BY: PTA INC | CHECKED BY: J.J.J

DRAWING TITLE:
LIGHTING PLAN

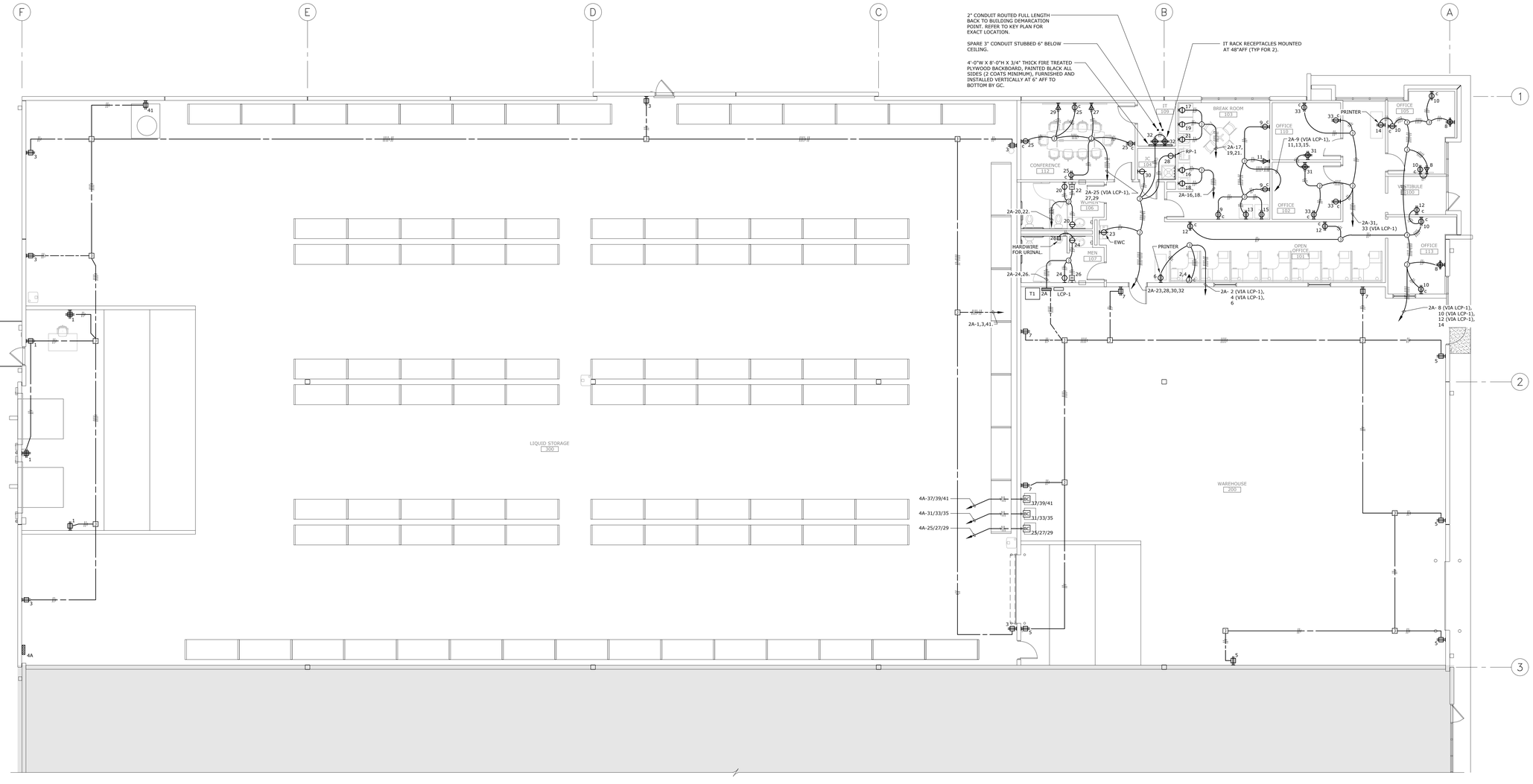
SHEET #:
E1.01



KEY PLAN SCALE: 1"=200'-0"

NOTES:

1. BRANCH CIRCUIT CONDUCTOR SIZES SHALL MINIMALLY BE #12 AWG. WHERE THE LENGTH OF A HOMERUN, FROM PANEL TO FIRST DEVICE, EXCEEDS 75 FEET FOR A 120 VOLT CIRCUIT OR 175 FEET FOR A 277 VOLT CIRCUIT, THE MINIMUM CONDUCTOR SIZE SHALL BE #10 AWG.
2. DEVICES INSTALLED IN FIRE RATED WALLS SHALL BE INSTALLED IN ACCORDANCE WITH IBC ARTICLE 714.4.2. COORDINATE WALL TYPES WITH THE ARCHITECTURAL DRAWINGS.
3. PLAN SHADING IDENTIFIES EXISTING LIGHTING, RECEPTACLES, EQUIPMENT WIRING, AND SYSTEMS WIRING TO REMAIN AND BE MAINTAINED UNLESS NOTED OTHERWISE (TYP).



RECEPTACLE WIRING PLAN

STATE OF MISSOURI
JONATHAN J. JENNINGS
NUMBER PE-2023000149
PROFESSIONAL ENGINEER
08-15-25

SEAL

FOUNDATION
ARCHITECTURE, LLC
740 MARKS ROAD - SUITE A, VALLEY CITY, OHIO 44208

pta engineering
275 Springside Dr., Suite 300
Akron, Ohio 44333
Phone: 330-666-3702
ptaengineering.com

PROJECT:

TENANT IMPROVEMENT FOR:

SONNY'S

2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

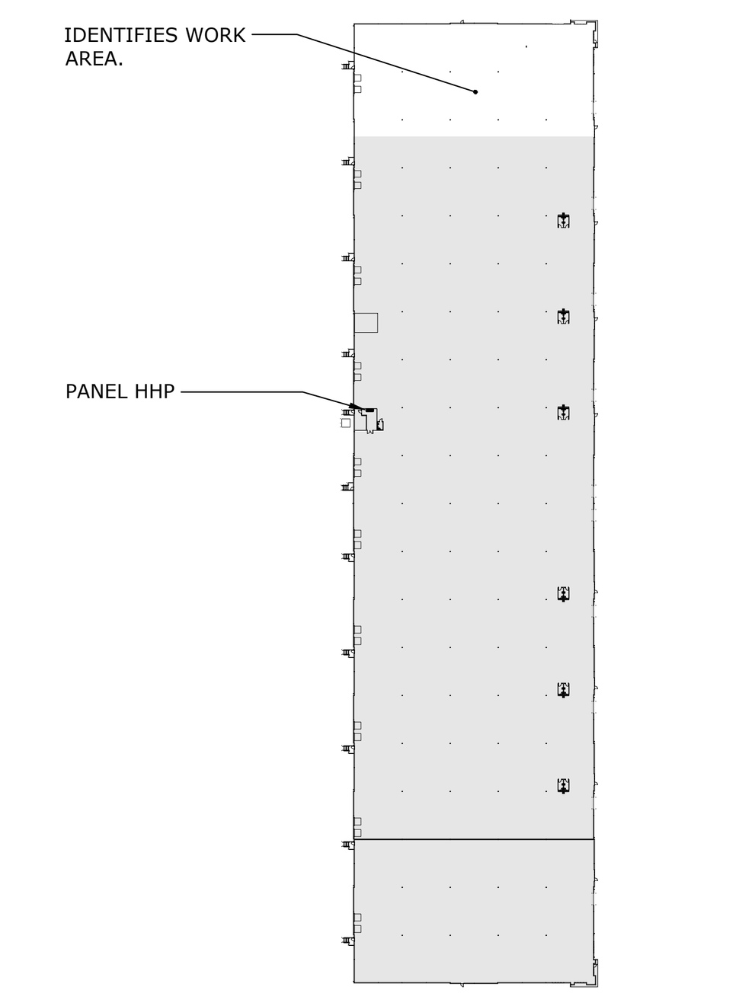
MARK:	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402

DRAWN BY: PTA INC | CHECKED BY: J.J.J.

DRAWING TITLE:
RECEPTACLE PLAN

SHEET #:
E1.02

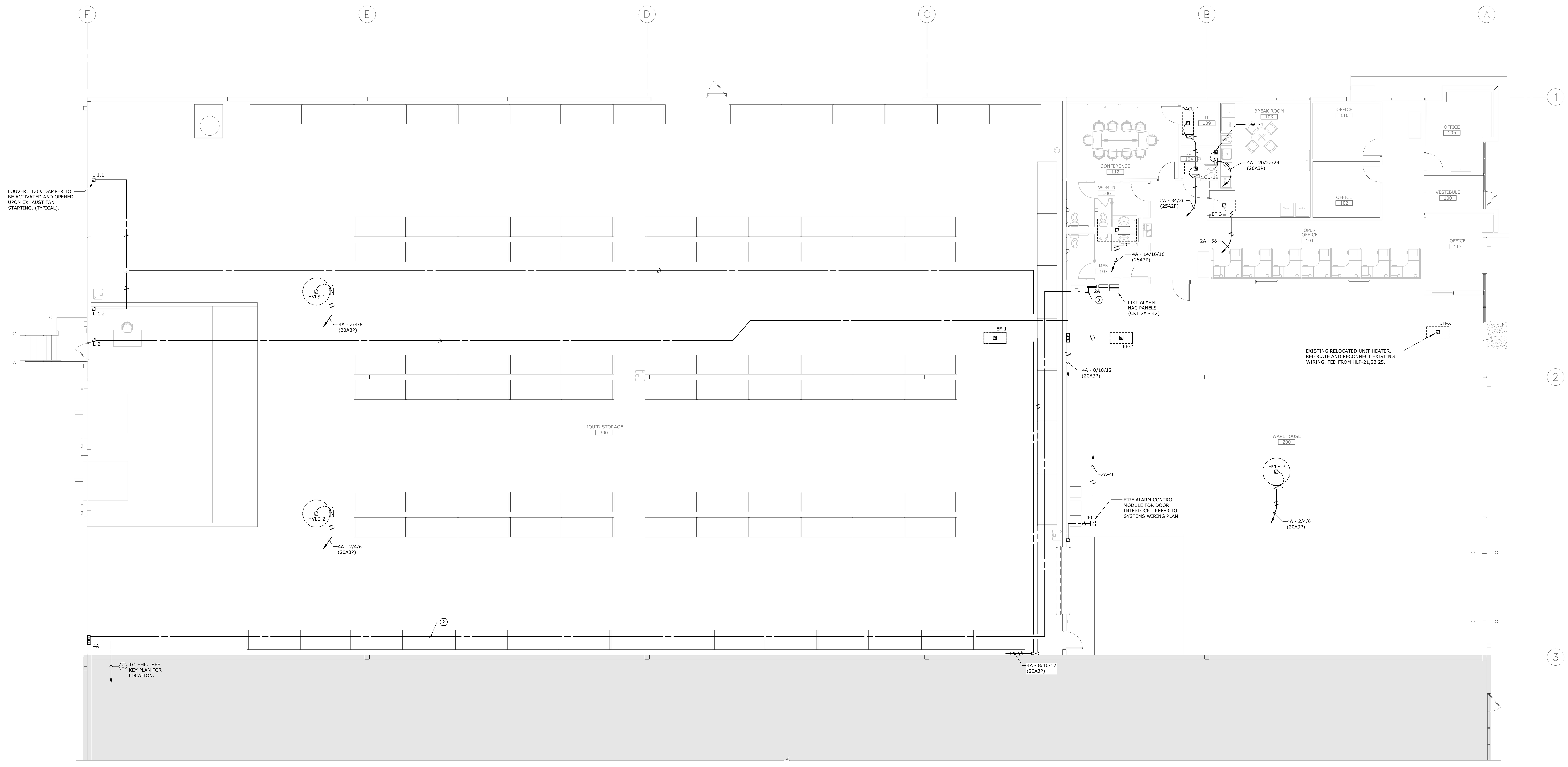


KEY PLAN SCALE: 1"=200'-0"

MECHANICAL EQUIPMENT SCHEDULE			
ITEM	DESCRIPTION	LOAD	REMARKS
CU-1	CONDENSING UNIT	208V, 1Ø, 11 MCA, 28A MOCP	DISCONNECT BY EC, FEEDS DACU-1
DACU-1	DUCTLESS AIR CONDITIONING UNIT	208V, 1Ø, 0.2 FLA	DISCONNECT BY EC, FED FROM CU-1
EF-1	EXHAUST FAN	480V, 3Ø, 5 HP	DISCONNECT BY MFR, STARTER BY EC
EF-2	EXHAUST FAN	480V, 3Ø, 2 HP	DISCONNECT BY MFR, STARTER BY EC
EF-3	EXHAUST FAN	120V, 1Ø, 1/6 HP	DISCONNECT BY MFR, STARTER BY EC
RTU-1	ROOF TOP UNIT	480V, 3Ø, 20 MCA, 25A MOCP	DISCONNECT BY MFR
L-1.1	LOUVER	120V, 1Ø, 2 FLA	
L-1.2	LOUVER	120V, 1Ø, 2 FLA	
L-2	LOUVER	120V, 1Ø, 2 FLA	
HVLS-1	HVLS FAN	480V, 3Ø, 2.5 FLA	DISCONNECT BY EC
HVLS-2	HVLS FAN	480V, 3Ø, 2.5 FLA	DISCONNECT BY EC
HVLS-3	HVLS FAN	480V, 3Ø, 2.5 FLA	DISCONNECT BY EC
DWH-1	ELECTRIC WATER HEATER	480V, 3Ø, 7.2 FLA	DISCONNECT BY EC

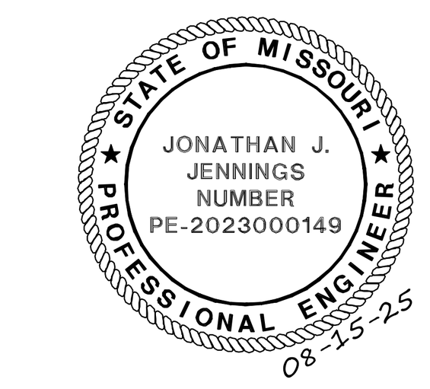
NOTES:

1. BRANCH CIRCUIT CONDUCTOR SIZES SHALL MINIMALLY BE #12 AWG. WHERE THE LENGTH OF A HOMERUN, FROM PANEL TO FIRST DEVICE, EXCEEDS 75 FEET FOR A 120 VOLT CIRCUIT OR 175 FEET FOR A 277 VOLT CIRCUIT, THE MINIMUM CONDUCTOR SIZE SHALL BE #10 AWG.
2. DEVICES INSTALLED IN FIRE RATED WALLS SHALL BE INSTALLED IN ACCORDANCE WITH IBC ARTICLE 714.4.2. COORDINATE WALL TYPES WITH THE ARCHITECTURAL DRAWINGS.
3. PLAN SHADING IDENTIFIES EXISTING LIGHTING, RECEPTACLES, EQUIPMENT WIRING, AND SYSTEMS WIRING TO REMAIN AND BE MAINTAINED UNLESS NOTED OTHERWISE (TYP).
4. " XX " IDENTIFIES FEEDER. REFER TO DISTRIBUTION DIAGRAM.



EQUIPMENT WIRING PLAN

0' 4' 8' 16'



SEAL

FOUNDATION ARCHITECTURE, LLC

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PROJECT:

TENANT IMPROVEMENTS FOR:

SONNY'S

2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402

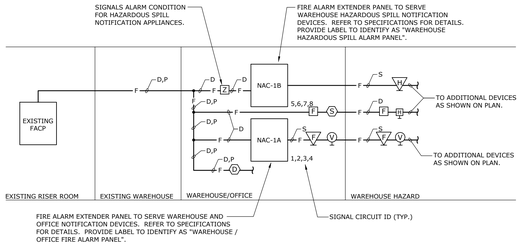
DRAWN BY: PTA INC | CHECKED BY: J.J.J.

DRAWING TITLE:

EQUIPMENT WIRING PLAN

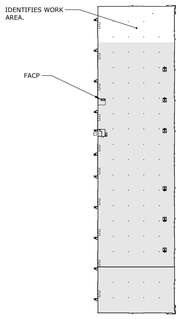
SHEET #:

E1.03



FIRE ALARM RISER DIAGRAM

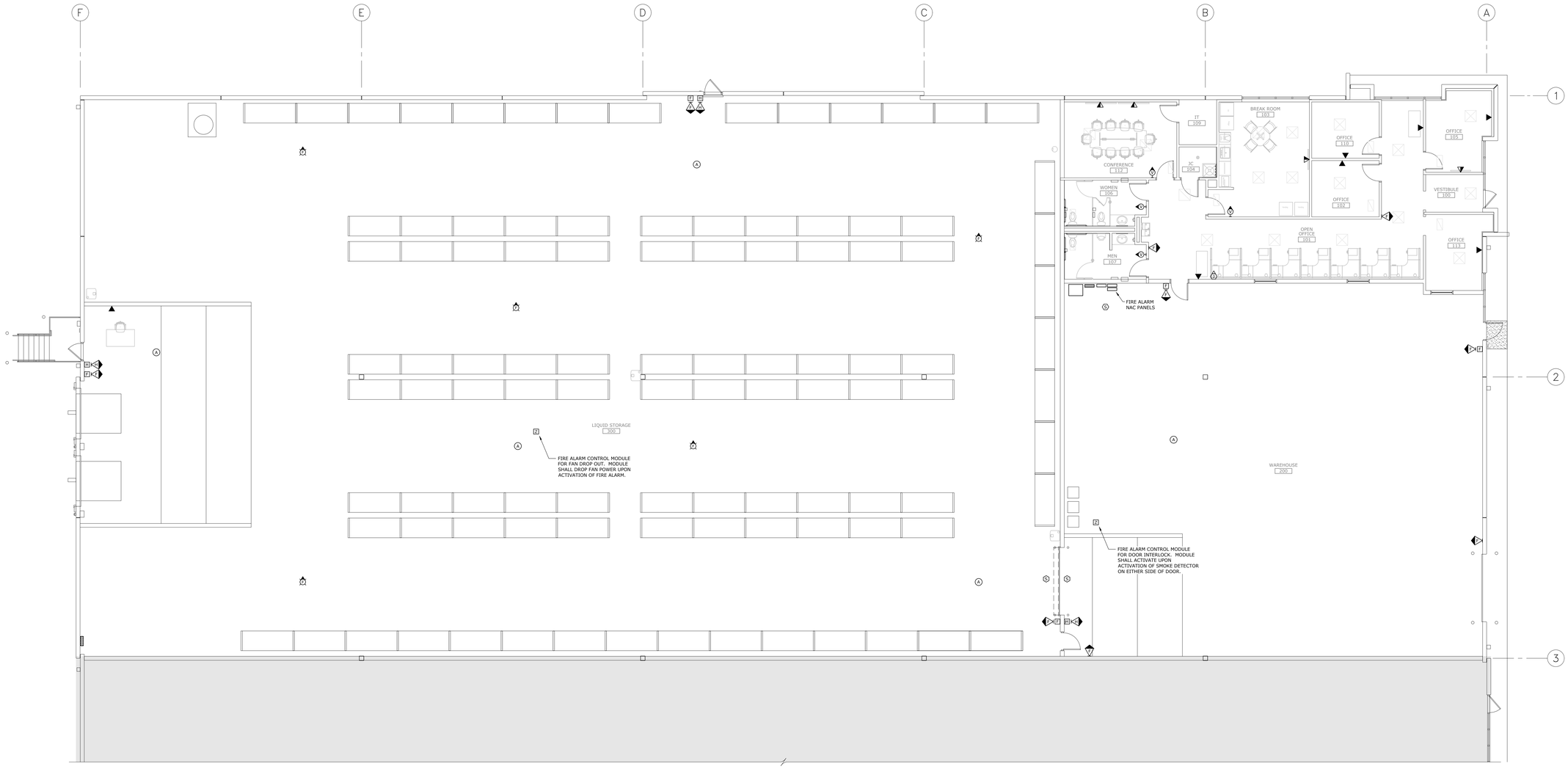
NO SCALE



KEY PLAN **SCALE: 1"=200'-0"**

NOTES:

1. REFER TO SYMBOLS AND SPECIFICATIONS FOR EQUIPMENT DESCRIPTION.
2. EC SHALL VERIFY EXISTING FIRE ALARM SYSTEM IN FIELD. VERIFY DEVICE PART NUMBERS AND CABLE TYPE WITH FIRE ALARM MANUFACTURER PRIOR TO ORDERING.
3. DEVICES INSTALLED IN FIRE RATED WALLS SHALL BE INSTALLED IN ACCORDANCE WITH IBC ARTICLE 714.4.2. COORDINATE WALL TYPES WITH THE ARCHITECTURAL DRAWINGS.
4. FIRE ALARM SYSTEM PLAN IS A DEFERRED SUBMITTAL. FIRE ALARM VENDOR SHALL HAVE SUBMITTAL DRAWINGS THAT INCLUDE LOAD CALCS AND POINT TO POINT CABLING APPROVED BY BUILDING DEPARTMENT PRIOR TO INSTALLATION.
5. REFER TO DRAWING E2.01 FOR ELECTRICAL FIXTURE & SYMBOLS SCHEDULES.
6. UNLESS NOTED OTHERWISE, PLAN SHADING THIS DRAWING IDENTIFIES AREAS IN WHICH SUSPENDED GRID CEILINGS, LIGHT FIXTURES, WALLS, WALL MOUNTED DEVICES, AND CARPETING/TILING SHALL REMAIN AND BE MAINTAINED.
7. ELECTRICAL CLASSIFICATION AND FIRE CODE REQUIREMENTS FOR THE WAREHOUSE/STORAGE AREAS ARE BASED ON THE "FIRE PROTECTION AND LIFE SAFETY ANALYSIS REPORT" PROVIDED BY ARCHITECT/OWNER'S FIRE PROTECTION PROFESSIONAL ENGINEERING CONSULTANT.



SYSTEMS WIRING PLAN

N

0' 4' 8' 16'

STATE OF MISSOURI
JONATHAN J. JENNINGS
NUMBER PE-2023000149
PROFESSIONAL ENGINEER
08-15-25

SEAL

FOUNDATION ARCHITECTURE, LLC
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TENANT IMPROVEMENTS FOR:
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LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402

DRAWN BY: PTA INC | CHECKED BY: J.J.J.

DRAWING TITLE:
SYSTEMS WIRING PLAN

SHEET #:
E1.04

SYMBOL SCHEDULE:

SURFACE MOUNTED HIGHBAY LED FIXTURE WITH PLUG IN RECEPTACLE TO BE REMOVED. REMOVE ALONG WITH ASSOCIATED WIRING AND CONDUIT.

EMERGENCY EGRESS LIGHTING. REMOVE ALONG WITH ALL ASSOCIATED WIRING AND CONDUIT.

24" X 48" RECESSED CEILING MOUNTED FIXTURE. REFER TO FIXTURE SCHEDULE FOR DESCRIPTION.

NL 24" X 48" 277V RECESSED CEILING MOUNTED FIXTURE WITH INTEGRAL EMERGENCY EGRESS BALLAST. "NL" SUBSCRIPT, WHERE SHOWN, INDICATES FIXTURE TO BE UNSWITCHED FOR 24-HOUR USE AS A NIGHT LIGHT. REFER TO FIXTURE SCHEDULE FOR DESCRIPTION.

CEILING MOUNTED EXIT SIGN. ARROWS, WHERE SHOWN, IDENTIFY DIRECTION OF EGRESS WHERE INDICATED ON PLANS. REFER TO FIXTURE SCHEDULE FOR DESCRIPTION.

FLUSH WALL OR EDGE WALL MOUNTED EXIT SIGN. ARROWS, WHERE SHOWN, IDENTIFY DIRECTION OF EGRESS WHERE INDICATED ON PLANS. REFER TO FIXTURE SCHEDULE FOR DESCRIPTION.

20 AMP, 120V, SINGLE POLE TOGGLE SWITCH BY EC. MOUNT FLUSH IN WALL AT 48" AFF. INSTALL LAMINATED LABEL (CLEAR WITH BLACK LETTERS) ON COVERPLATE TO IDENTIFY BRANCH PANEL AND CIRCUIT NUMBER. HUBBELL # HBL1221.

P 16 AMP POWER/RELAY PACK WITH 0-10V DIMMING FOR CONTROL OF LIGHTING ZONE(S), AND NETWORKING CAPABILITIES. SUBSCRIPT ADJACENT INDICATES ASSOCIATED ZONE(S) TO BE CONTROLLED. MOUNT TO JBOX ABOVE ACCESSIBLE CEILING. INSTALL LAMINATED LABEL (CLEAR WITH BLACK LETTERS) IDENTIFYING BRANCH PANEL, CIRCUIT NUMBER, AND THE FIXTURES CONTROLLED BY EACH RELAY. NLIGHT #NPP16-D OR APPROVED EQUAL.

LOW-VOLTAGE, SINGLE-CHANNEL, 3-BUTTON ON/OFF AND RAISE/LOWER DIMMING WALL STATION WITH WHITE FINISH. FLUSH MOUNT IN A RECESSED SINGLE GANG OUTLET BOX AT 48" AFF. STUB A 1"C FROM BOX TO CEILING PLENUM FOR CABLE INSTALLATION. NLIGHT #NPODM-DX OR APPROVED EQUAL. SUBSCRIPT "2", WHERE SHOWN, INDICATES 2-CHANNEL.

LOW-VOLTAGE CEILING MOUNTED DUAL TECHNOLOGY "PIR/MICROPHONICS" OCCUPANCY SENSOR WITH EXTENDED RANGE (2000 SQ-FT), 360-DEGREE SENSOR, NETWORKING PORT, AND WHITE FINISH. MOUNT OVER FLUSH OCTAGONAL OUTLET BOX IN CEILING. ADJUST TIME DELAY TO 30 MINUTES, AND SET SENSOR TO MANUAL-ON MODE (VACANCY SENSING). NLIGHT #NCM-PDT-10 OR APPROVED EQUAL. WHERE NOTED, SUBSCRIPTS IDENTIFY SWITCH ZONES.

0-10V WHITE DUAL TECHNOLOGY (PIR/ULTRASONIC) OCCUPANCY SENSOR DIMMING WALL SWITCH WITH WHITE COVERPLATE. MOUNT FLUSH IN WALL AT 48" AFF. SET TIME DELAY TO 30 MINUTES. SET SENSOR TO MANUAL-ON MODE (VACANCY SENSING). SENSOR SWITCH #WSX-PDT-D SERIES OR APPROVED EQUAL.

20 AMP, 120V, WHITE COLORED, SPECIFICATION GRADE SNAP CONNECT DUPLEX GROUNDING RECEPTACLE WITH #12 AWG STRANDED PLUGTAIL CONNECTOR AND WHITE COVERPLATE. (HUBBELL # SNAP5362/SNAP6R2). MOUNT FLUSH IN WALL AT 18" AFF, UNLESS NOTED OTHERWISE. INSTALL SELF LAMINATING LABEL (CLEAR W/ BLACK LETTERS) ON COVERPLATE TO IDENTIFY BRANCH PANEL AND CIRCUIT NUMBER. WHERE SHOWN, "c" INDICATES CONTROLLED RECEPTACLE WITH PERMANENTLY MARKED FACE (HUBBELL #BR202C2).

SIMILAR TO " " EXCEPT QUAD RECEPTACLE.

SIMILAR TO " " EXCEPT INSTALLED SURFACE MOUNTED IN CONJUNCTION WITH EXPOSED CONDUIT.

SIMILAR TO " " EXCEPT QUAD RECEPTACLE.

SIMILAR TO " " EXCEPT MOUNTED AT APPROXIMATELY 72" AFF. COORDINATE EXACT LOCATION WITH TV/WALL BRACKET.

20 AMP, 120V, WHITE COLORED, DUPLEX RECEPTACLE WITH INTEGRAL GFCI AND WHITE COVERPLATE. (HUBBELL # GFRST20). MOUNT FLUSH IN WALL AT 18" AFF, UNLESS NOTED OTHERWISE. INSTALL SELF LAMINATING LABEL (CLEAR W/ BLACK LETTERS) ON COVERPLATE TO IDENTIFY BRANCH PANEL AND CIRCUIT NUMBER.

SIMILAR TO " " EXCEPT MOUNTED ABOVE COUNTER OR AT 44" AFF WHERE NO COUNTER IS INSTALLED. COORDINATE EXACT HEIGHT WITH ARCHITECT.

WALL END PANEL FURNITURE FEED ASSEMBLY CONSISTING OF A VERTICAL DROP CONCEALED IN STUD WALL, A SINGLE GANG JUNCTION BOX MOUNTED FLUSH IN WALL AT 18" AFF WITH PLASTER RING, AND A BLANK STEEL COVERPLATE WITH ½" FLEXIBLE METALLIC MODULAR FURNITURE WHIP BY FURNITURE VENDOR TO FURNITURE MOUNTED RECEPTACLES.

TOW MOTOR BATTERY CHARGING UNIT FURNISHED BY OWNER. E.C. SHALL INSTALL 8'-0" LONG #10 AWG / 4C STO FLEXIBLE CORD AND NEMA L830 PLUG (480V, 3 WIRE WITH GROUND). INSTALL LAMINATED LABEL (CLEAR W/ BLACK LETTERS) ON COVERPLATE TO IDENTIFY BRANCH PANEL AND CIRCUIT NUMBER.

JUNCTION BOX WITH BLANK SCREW COVER CONCEALED ABOVE ACCESSIBLE CEILING. SIZE AS REQUIRED BY NEC.

JUNCTION BOX INSTALLED IN CONJUNCTION WITH EXPOSED CONDUIT. MOUNT SECURELY. SIZE AS REQUIRED BY NEC.

120V, 1500W ELECTRIC HAND DRYER FURNISHED BY GENERAL TRADES, SET OVER A RECESSED WALL MOUNTED OUTLET BOX AND WIRED BY EC. REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION.

SURFACE MOUNTED 208/120V PANEL. REFER TO DISTRIBUTION DIAGRAM AND PANELBOARD SCHEDULE FOR DESCRIPTION.

SURFACE MOUNTED 480/277V PANEL. REFER TO DISTRIBUTION DIAGRAM AND PANELBOARD SCHEDULE FOR DESCRIPTION.

2-PORT VOICE/DATA OUTLET WITH TWO CATEGORY JACK (TWO DATA). INSTALL IN A TWO-GANG OUTLET BOX WITH SINGLE GANG PLASTER RING SURFACE MOUNT WALL AT HEIGHT INDICATED ON ARCHITECTURAL DRAWINGS WITH 3/4" CONDUIT (WITH INSULATING BUSHING EACH END) FROM BOX TO ACCESSIBLE CEILING PLENUM.

SIMILAR TO " " EXCEPT AT 72" AFF BEHIND MONITOR DISPLAY.

CEILING MOUNTED WIRELESS ACCESS POINT. DEVICES SHALL BE FURNISHED BY OWNER AND INSTALLED BY LOW VOLTAGE CONTRACTOR.

FIRE ALARM SYSTEM AUDIO/VISUAL NOTIFICATION DEVICE. REFER TO SPECIFICATIONS FOR DESCRIPTION. SURFACE MOUNT OVER 4" X 1-1/2" DEEP TWO-GANG BOX ON WALL AT 80" AFF TO BOTTOM.

CEILING MOUNTED FIRE ALARM SYSTEM SPEAKER/STROBE NOTIFICATION DEVICE. MOUNT OVER FLUSH OCTAGON BOX TIGHT TO LAY-IN TEE BAR GRID CEILING. SUBSCRIPT INDICATES SIGNAL CIRCUIT. REFER TO SPECIFICATIONS FOR DESCRIPTION.

FIRE ALARM SYSTEM VISUAL ONLY NOTIFICATION DEVICE. REFER TO SPECIFICATIONS FOR DESCRIPTION. SURFACE MOUNT OVER 4" X 1-1/2" DEEP TWO-GANG BOX ON WALL AT 80" AFF TO BOTTOM.

H FIRE ALARM SYSTEM HAZARDOUS SPILL PUSH STATION AND ADDRESSABLE MONITOR MODULE. REFER TO SPECIFICATIONS FOR DESCRIPTION. ELECTRICAL CONTRACTOR SHALL MOUNT MONITOR MODULE IN BACKBOX AND INTERCONNECT WITH (2) #14 THWN CONDUCTORS. PROVIDE SELF-LAMINATING LABEL ON MODULE INDICATING DEVICE ADDRESS. SURFACE MOUNT OVER 4" X 1-1/2" DEEP TWO-GANG BOX ON WALL AT 80" AFF TO BOTTOM.

EMERGENCY HAZARDOUS MATERIAL SPILL AUDIO/VISUAL NOTIFICATION DEVICE. REFER TO SPECIFICATIONS FOR DESCRIPTION. SURFACE MOUNT OVER 4" X 1-1/2" DEEP TWO-GANG BOX ON WALL AT 80" AFF TO BOTTOM.

Z FIRE ALARM SYSTEM ADDRESSABLE CONTROL MODULE. REFER TO SPECIFICATIONS FOR DESCRIPTION.

S FIRE ALARM SYSTEM SMOKE DETECTOR. REFER TO SPECIFICATIONS FOR DESCRIPTION. MOUNT TIGHT TO UNDERSIDE OF FINISHED CEILING OVER RECESSED 4" OCTAGONAL BOX. PROVIDE SELF LAMINATING LABEL TO IDENTIFY DEVICE ADDRESS.

CONDUIT INSTALLED CONCEALED ABOVE CEILINGS AND IN WALLS BY THE EC. HASH MARKS INDICATE QUANTITY OF # 12 AWG CONDUCTORS UNLESS OTHERWISE NOTED ON PLANS. SHORT HASH MARK INDICATES GREEN INSULATED EQUIPMENT GROUND CONDUCTOR THAT IS SIZED IN ACCORDANCE WITH NEC TABLE 250-122.

#– – CONDUIT INSTALLED EXPOSED AT ROOF STRUCTURE AND ON WALLS.

HEAVY DUTY FUSED DISCONNECT FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. NEMA TYPE 1 INDOORS, NEMA TYPE 3R OUTDOORS AND IN WET LOCATIONS. AMPERAGE AND NUMBER OF POLES AS INDICATED ON THE DRAWINGS. ALL SWITCHES TO CONTAIN GROUND LUG. FURNISH AND INSTALL ENGRAVED NAMEPLATE ON FRONT TRIM TO IDENTIFY LOAD SERVED.

COMBINATION MAGNETIC MOTOR STARTER / FUSED DISCONNECT SWITCH WITH AUXILIARY SPDT CONTACT, (3) DUAL ELEMENT CURRENT LIMITING FUSES, FVNR STARTER WITH (2) NO/NC CONVERTIBLE AUXILIARY CONTACTS, 120V CONTROL POWER TRANSFORMER (WITH FUSED PRIMARY AND GROUNDED SECONDARY), HAND-OFF-AUTO SELECTOR SWITCH, RED PUSH-TO-TEST MOTOR RUN INDICATING LAMP, AND NEMA 1 SURFACE ENCLOSURE. STARTER AND FUSE SIZE AS INDICATED ON DRAWINGS. THE EC SHALL SIZE OVERLOAD ELEMENTS PER THE MOTOR NAMEPLATE FULL LOAD AMPERAGE AS COORDINATED WITH MECHANICAL SHOP DRAWINGS. ALLEN BRADLEY BULLETIN 512. INSTALL ENGRAVED NAMEPLATE ON FRONT TRIM TO IDENTIFY LOAD.

TERMINAL CONNECTION ON EQUIPMENT FURNISHED AND SET BY OTHERS. LINE CONNECTIONS BY THE ELECTRICAL CONTRACTOR.

LIGHTING FIXTURE SCHEDULE:

TYPE A1: 24" X 48" X 2"D LED FLAT PANEL FIXTURE WITH 4800 LUMEN OUTPUT, 37W, 4000K COLOR TEMPERATURE, 80CRI, 120-277V UNV DRIVER, 0-10V DIMMING AND SATIN WHITE LENS. METALUX #24GR SERIES OR APPROVED EQUAL.

TYPE A1E: SIMILAR TO TYPE A1 EXCEPT WITH EMERGENCY BATTERY BACKUP.

TYPE A2: SIMILAR TO TYPE A1 EXCEPT 5600 LUMEN OUTPUT AND 45W.

TYPE B: 21" X 24" X 3"D LED HIGH BAY FIXTURE WITH 30000 LUMEN OUTPUT, 226W, 4000K COLOR TEMPERATURE, 80 CRI, 120-277V UNV DRIVER, 0-10V DIMMING, INTEGRAL OCCUPANCY SENSOR, MEDIUM DISTRIBUTION, AND A FROSTED LENS. SUSPENDED FROM CEILING BELOW STRUCTURAL CEILING JOISTS AT APPROX. 30'-0" AFF. METALUX #OHB SERIES OR APPROVED EQUAL.

TYPE BE: SIMILAR TO TYPE B EXCEPT WITH EMERGENCY BATTERY BACKUP.

TYPE E1: WALL MOUNTED SINGLE FACED EXIT SIGN WITH 277V INPUT, GREEN LETTERING, NICKEL CADMIUM BATTERY, SELF DIAGNOSTICS, AND WHITE HOUSING. LITHONIA #LQM SERIES OR APPROVED EQUAL.

TYPE E2: SINGLE FACED EXIT SIGN MOUNTED ON CEILING OR SUSPENDED FROM CEILING AT 15'-0'' AFF ON THREADED ROD IN STORAGE AREA. ARROWS, WHERE SHOWN, IDENTIFY DIRECTION OF EGRESS WHERE INDICATED ON PLANS. LITHONIA #LQM SERIES OR APPROVED EQUAL.

TYPE E3: SIMILAR TO TYPE E2 EXCEPT DUAL FACED.

PANEL: 2A — 225A, 208/120V, 3-PHASE, 4-WIRE — (NEW)

LOCATION: WAREHOUSE 200 — REMARK: 225A3P MAIN BREAKER (TOP)

CKT	BKR	LOAD LTG (VA)	LOAD REC (VA)	LOAD MISC (VA)	DESCRIPTION	PHASE	CKT	BKR	LOAD LTG (VA)	LOAD REC (VA)	LOAD MISC (VA)	DESCRIPTION
1	20A1P		1080		RECIVING - RECEPT	A	2	20A1P		1440		OPEN OFFICE - RECEPT
3	20A1P		1080		LIQUID STORAGE - RECEPT	B	4	20A1P		1080		OPEN OFFICE - RECEPT
5	20A1P		900		WAREHOUSE - RECEPT	C	6	20A1P			1000	PRINTER
7	20A1P		720		WAREHOUSE - RECEPT	A	8	20A1P		900		OFFICE 105 & OFFICE 113 - RECEPT
9	20A1P		540		BREAKROOM - RECEPT	B	10	20A1P		900		OFFICE 105 - RECEPT
11	20A1P		180		BREAKROOM TV	C	12	20A1P		720		OPEN OFFICE & VESTIBULE - RECEPT
13	20A1P			1200	VENDING MACHINE #1	A	14	20A1P			1000	PRINTER
15	20A1P			1200	VENDING MACHINE #2	B	16	20A1P		180		KITCHEN - RECEPT
17	20A1P			800	ICE MACHINE	C	18	20A1P			1440	MICROWAVE
19	20A1P			800	FRIDGE	A	20	20A1P		360		WOMEN - RECEPT
21	20A1P			1200	COFFEE MACHINE	B	22	20A1P		1200		WOMEN - HEATER
23	20A1P			1000	WATER FOUNTAIN	C	24	20A1P		360		MEN - RECEPT
25	20A1P		720		CONFERENCE - RECEPT	A	26	20A1P		1200		MEN - HEATER
27	20A1P		180		CONFERENCE TV #1	B	28	20A1P		180		JO - RECEPT
29	20A1P		180		CONFERENCE TV #2	C	30	20A1P			180	RP-1
31	20A1P		720		OFFICE 102 & OFFICE 110 - RECEPT	A	32	20A1P			1200	IT CABINET
33	20A1P		720		OFFICE 102 & OFFICE 110 - RECEPT	B	34					
35	20A1P		180		LIQUID STORAGE - RECEPT	C	36	25A2P			1840	CU-1
37	20A1P				SPARE	A	38	20A1P			530	EF-3
39	20A1P				SPARE	B	40	§20A1P			100	DOOR INTERLOCK CONTROL MODULE
41	20A1P				SPARE	C	42	§20A1P			500	FA NAC PANELS
43	20A1P				SPARE	A	44	20A1P				SPARE
45	20A1P				SPARE	B	46	20A1P				SPARE
47	20A1P				SPARE	C	48	20A1P				SPARE
49	20A1P				SPARE	A	50	20A1P				SPARE
51	20A1P				SPARE	B	52	20A1P				SPARE
53	20A1P				SPARE	C	54	20A1P				SPARE
Sub-Total		0	7200	6200					0	7320	7790	

Total Load: 28510 VA, 79.23 AMPS

AIC RATING: 10K
MOUNTING: SURFACE
§ = INSTALL BREAKER LOCKING DEVICE TO KEEP BREAKER IN THE "ON" POSITION

PANEL: 4A — 400A, 480/277V, 3-PHASE, 4-WIRE — (NEW)

LOCATION: WAREHOUSE 300 — REMARK: 400A3P MAIN BREAKER (TOP)

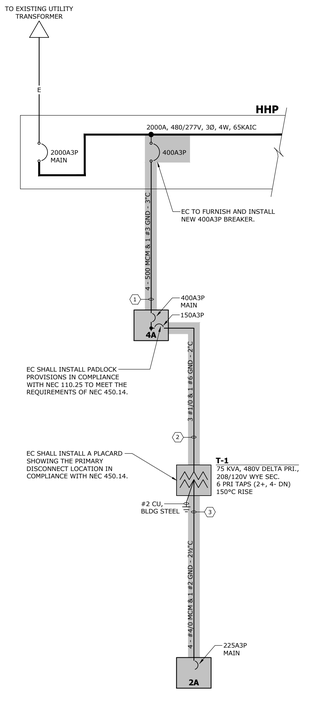
CKT	BKR	LOAD LTG (VA)	LOAD REC (VA)	LOAD MISC (VA)	DESCRIPTION	PHASE	CKT	BKR	LOAD LTG (VA)	LOAD REC (VA)	LOAD MISC (VA)	DESCRIPTION
1	20A1P	3170			WAREHOUSE LIGHTING - EAST	A	2					
3	20A1P	3170			WAREHOUSE LIGHTING - CENTER	B	4	20A3P			6300	HVLS-1, HVLS-2, & HVLS-3 FANS
5	20A1P	3170			WAREHOUSE LIGHTING - WEST	C	6					
7	20A1P	2720			WAREHOUSE LIGHTING - NORTH	A	8					
9	20A1P	1400			OFFICE LIGHTING	B	10	20A3P			9140	EF-1 & EF-2
11	20A1P				SPARE	C	12					
13	20A1P				SPARE	A	14					
15	20A1P				SPARE	B	16	25A3P			13300	RTU-1
17	20A1P				SPARE	C	18					
19	20A1P				SPARE	A	20					
21	20A1P				SPARE	B	22	20A3P			10000	DWH-1
23	20A1P				SPARE	C	24					
25						A	26	20A1P				SPARE
27	30A3P			16650	BATTERY CHARGER #1	B	28	20A1P				SPARE
29						C	30	20A1P				SPARE
31						A	32	20A1P				SPARE
33	30A3P			16650	BATTERY CHARGER #2	B	34	20A1P				SPARE
35						C	36	20A1P				SPARE
37						A	38					
39	30A3P			16650	BATTERY CHARGER #3	B	40	150A3P			28510	PANEL 2A
41						C	42					
Sub-Total		13630	0	49950					0	0	67250	

Total Load: 130830 VA, 157.55 AMPS

AIC RATING: 14K
MOUNTING: SURFACE

NOTES:

1. " (XX) " IDENTIFIES FEEDER LOCATED ON FEEDER & EQUIPMENT PLANS.
2. EQUIPMENT, DEVICES, AND CABLING SHOWN SOLID SHALL REMAIN AND BE MAINTAINED.
3. EQUIPMENT, DEVICES, AND CABLING SHOWN SHADED IDENTIFY SCOPE ITEMS.



DISTRIBUTION DIAGRAM — NO SCALE

JONATHAN J. JENNINGS NUMBER PE-2023000149 PROFESSIONAL ENGINEER STATE OF MISSOURI 08-15-25

SEAL

FOUNDATION ARCHITECTURE LLC
740 MARKS ROAD - SUITE A, VALLEY CITY, OHIO 44208

pta engineering
275 Springside Dr., Suite 300
Akron, Ohio 44333
Phone: 330-666-3702
ptaengineering.com

PROJECT:

TENANT IMPROVEMENTS FOR:
SONNY'S
2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402
DRAWN BY: PTA INC | CHECKED BY: J.J.J.

DRAWING TITLE:
ELECTRICAL SCHEDULES

SHEET #:
E2.01

ELECTRICAL SPECIFICATIONS

1. GENERAL PROVISIONS

A. THIS CONTRACTOR SHALL PROVIDE ALL LABOR, EQUIPMENT, SUPPLIES, SERVICES, AND SHALL PERFORM ALL OPERATIONS INCLUDING SETTING OF SLEEVES, CUTTING, CHANNELING, AND CHASING NECESSARY FOR THE COMPLETE INSTALLATION OF THE ELECTRICAL WORK ON THIS PROJECT, COMPLETE IN STRICT ACCORDANCE WITH THIS SPECIFICATION AND APPLICABLE DRAWINGS, AND READY FOR USE. THIS WORK INCLUDES ALL ELECTRICAL WORK FROM THE POINT OF SERVICE CONNECTION OR CONNECTIONS TO AND INCLUDING OUTLETS, WIRING DEVICES, LIGHTING FIXTURES, MOTOR TERMINALS, ETC.

(1) THE ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL, AND REMOVE TEMPORARY LIGHTING AND POWER SERVICES AS REQUIRED FOR THE COMPLETION OF THE PROJECT.

B. THIS CONTRACTOR IS INSTRUCTED TO READ CAREFULLY THE SPECIFICATIONS FOR ALL PARTS OF THE WORK, ESPECIALLY THE MECHANICAL TRADES OF THIS CONTRACT AND INCLUDE COSTS FOR WIRING ALL THEIR EQUIPMENT UNLESS SPECIFICALLY EXCEPTED HEREIN.

C. ALL ITEMS OF LABOR, MATERIAL AND EQUIPMENT NOT SPECIFICALLY MENTIONED HEREIN OR SHOWN ON PLANS, BUT INCIDENTAL TO, OR REQUIRED FOR THE COMPLETE INSTALLATION AND PROPER OPERATION OF THE WORK, SHALL BE FURNISHED AS IF CALLED FOR IN DETAIL BY THE SPECIFICATIONS OR DRAWINGS.

2. PERMITS, CODES, INSPECTIONS, AND TESTS

A. THE ELECTRICAL CONTRACTOR (EC) SHALL SECURE AND PAY FOR ALL PERMITS AND INSPECTIONS REQUIRED FOR THE PROSECUTION OF ELECTRICAL WORK. ALL PERMITS AND CERTIFICATES OF INSPECTION AND APPROVAL SIGNED BY THE CONTROLLING BUILDING DEPARTMENT SHALL BECOME PROPERTY OF THE OWNER.

B. ALL WIRING SHALL BE IN COMPLIANCE WITH THE CURRENT EDITION OF THE NATIONAL ELECTRIC CODE, APPLICABLE STATE AND CITY REGULATIONS, AND OSHA. IN CASES OF CONFLICT BETWEEN CODE AND SPECIFICATIONS, THE MORE RESTRICTIVE REQUIREMENTS SHALL GOVERN.

C. FOLLOWING COMPLETION OF THE ELECTRICAL WORK, FURNISH TO THE OWNER, IN DUPLICATE, CERTIFICATES OF INSPECTION AND APPROVAL BY REGULATORY AGENCIES HAVING JURISDICTION.

(1) ARRANGE FOR INSPECTION CERTIFICATION PRIOR TO SUBMITTING FINAL REQUEST FOR PAYMENT. PAY ALL FEES IN CONNECTION WITH SUCH INSPECTIONS.

(2) IMMEDIATELY CORRECT ANY WORK FOUND AT VARIANCE WITH THESE SPECIFICATIONS, THE NATIONAL ELECTRICAL CODE, OR REQUIREMENTS OF GOVERNING REGULATORY AGENCIES.

(3) DEMONSTRATE, BY TEST, THAT ALL WORK COMPLIES WITH THE STATED STANDARDS. TESTS WILL INCLUDE: OPERATION OF LIGHTS AND EQUIPMENT, CONTINUITY OF CONDUIT SYSTEM, GROUNDING RESISTANCES AND INSULATION RESISTANCES ON NOT MORE THAN 10 REPRESENTATIVE CIRCUITS AND ANY OTHER CIRCUITS JUSTIFYING SUCH TESTING, AND ANY OTHER TESTING IDENTIFIED IN THIS SPECIFICATION. LABOR AND EQUIPMENT FOR PERFORMING TESTS SHALL BE SUPPLIED AS PART OF THE WORK UNDER THIS DIVISION.

3. VISIT TO THE SITE

A. THE CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND BECOME FAMILIAR WITH ALL CONDITIONS AFFECTING THE WORK. THE SUBMISSION OF A PROPOSAL SHALL PRESUPPOSE KNOWLEDGE OF ALL SUCH CONDITIONS.

4. PROTECTION

A. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY PROTECTION FROM DIRT AND WATER DURING CONSTRUCTION NECESSITATED BY ELECTRICAL WORK. PROTECTION METHODS ARE SUBJECT TO APPROVAL BY THE CONSTRUCTION MANAGER AND/OR THE ARCHITECT.

5. EQUIPMENT AND EQUIPMENT IDENTIFICATION

A. ALL EQUIPMENT AND DEVICES SHALL BE NEW AND SHALL CONFORM TO NEMA AND UNDERWRITERS' LABORATORIES STANDARDS. WHERE SPECIFICATIONS DESCRIBE, OR PLANS SHOW, MATERIALS OR EQUIPMENT OF HIGHER QUALITY THAN REQUIRED BY CODE AND LOCAL RULING, THE DRAWINGS AND SPECIFICATIONS SHALL GOVERN THE QUALITY OF THE MATERIAL OR EQUIPMENT.

B. THE CONTRACTOR SHALL SUBMIT PROOF, IF REQUESTED BY THE OWNER, THAT THE MATERIALS, APPLIANCES, EQUIPMENT OR DEVICES THAT ARE FURNISHED AND INSTALLED UNDER THIS CONTRACT MEET THE REQUIREMENTS OF THE UNDERWRITERS' LABORATORIES, INC., AS REGARDING FIRE AND CASUALTY HAZARDS. THE LABEL OF OR LISTING BY THE UNDERWRITERS' LABORATORIES, INC. WILL BE ACCEPTED AS CONFORMING WITH THIS REQUIREMENT. IN LIEU OF THE LABEL OR LISTING, THE CONTRACTOR MAY SUBMIT INDEPENDENT PROOF SATISFACTORY TO THE ENGINEER THAT THE MATERIALS, APPLIANCES OR DEVICES CONFORM TO THE UNDERWRITERS' LABORATORIES, INC. PUBLISHED STANDARDS AND TESTING METHODS. UNDERWRITERS' LABORATORIES, INC. AND ITS PUBLICATIONS WILL BE REFERRED TO HEREINAFTER BY THE ABBREVIATION UL, WITH OR WITHOUT ADDITIONAL IDENTIFYING SYMBOLS.

C. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A SYSTEM OF NAMEPLATES DESIGNED TO IDENTIFY EACH PIECE OF ELECTRICAL EQUIPMENT, INCLUDING BUT NOT LIMITED TO, SWITCHBOARDS, DISTRIBUTION PANELBOARDS, CIRCUIT BREAKERS AND FUSED SWITCHES WITHIN SWITCHBOARDS AND DISTRIBUTION PANELBOARDS, BRANCH CIRCUIT PANELBOARDS, MOTOR CONTROL CENTERS, CONTROL PANELS, TRANSFORMERS, CIRCUIT BREAKERS, DISCONNECT SWITCHES, MOTOR STARTERS, COMBINATION MOTOR STARTERS, VARIABLE FREQUENCY DRIVES, AND CONTACTORS. NAMEPLATES SHALL ALSO BE PROVIDED BY THE ELECTRICAL CONTRACTOR FOR MECHANICAL EQUIPMENT UNLESS THE EQUIPMENT IS LOCATED ADJACENT TO A NAMEPLATED LOCAL DISCONNECT AND THE EQUIPMENT DESIGNATION IS READILY APPARENT.

(1) NAMEPLATES SHALL BE ENGRAVED MICARTA BLACK WITH WHITE LETTERS FOR NORMAL POWER SOURCE AND RED WITH WHITE LETTERS FOR EMERGENCY POWER SOURCE, UNLESS NOTED OTHERWISE ON THE DRAWINGS. NAMEPLATES SHALL BE ADHERED TO A CLEAN FLAT SURFACE OR MECHANICALLY FASTENED TO THE EQUIPMENT. SELF LAMINATING OR HAND WRITTEN LABELS ARE NOT ACCEPTABLE.

(2) SWITCHBOARD, DISTRIBUTION PANELBOARD, BRANCH CIRCUIT PANELBOARD, AND MOTOR CONTROL CENTER NAMEPLATES SHALL IDENTIFY PANEL DESIGNATION, VOLTAGE, AND DESIGNATION OF UPSTREAM SOURCE:

(A) LINE 1: "PANEL 1-2A"

(B) LINE 2: "208/120V, 3Ø, 4-WIRE"

(C) LINE 3: "FED FROM SWITCHBOARD SDP-2A"

D. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL IDENTIFYING LABELS, WHERE NECESSARY OR AS DIRECTED BY THE OWNER, FOR ALL PUSHBUTTONS, SELECTOR SWITCHES, KEY SWITCHES, TOGGLE SWITCHES, MANUAL MOTOR STARTERS, RECEPTACLES, SPECIAL OUTLETS, ETC.

(1) LABELS SHALL BE SELF LAMINATING WHITE WITH BLACK LETTERS, UNLESS NOTED OTHERWISE ON THE DRAWINGS, AND SHALL BE ADHERED TO A CLEAN FLAT SURFACE.

6. GUARANTEE

A. THE ELECTRICAL CONTRACTOR SHALL GUARANTEE FOR A PERIOD OF ONE YEAR (FROM THE DATE OF OWNER ACCEPTANCE) THAT ALL WORK AND EQUIPMENT WILL REMAIN FREE FROM ALL DEFECTS IN WORKMANSHIP AND MATERIALS, AND THAT IT WILL COMPLY WITH ALL THE SPECIFIC REQUIREMENTS OF THE SPECIFICATIONS AND OTHER CONTRACT DOCUMENTS GOVERNING THE WORK.

B. ALL WORK FOUND BY THE ENGINEER TO BE DEFECTIVE WILL BE REPLACED WITH NEW WORK MEETING ALL THE REQUIREMENTS OF THE CONTRACT. THE ELECTRICAL CONTRACTOR WILL BEAR ALL COSTS OF SUPPLYING SUCH NEW WORK, AND INSTALLING AND FINISHING SAME, AND WILL ASSUME ALL COSTS FOR REPLACING OTHER WORK DAMAGED BY THE REMOVAL AND REPLACEMENT OF ANY OF THE WORK. THE ELECTRICAL CONTRACTOR WILL BEAR ALL COSTS FOR FREIGHT, DRAYAGE AND DEMURRAGE, AND ALL LABOR IN CONNECTION THEREWITH.

7. CUTTING, PATCHING, FIRESTOPPING, CLEANING, AND PAINTING

A. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING ALL HOLES REQUIRED FOR INSTALLATION OF ELECTRICAL WORK. HOLES SHALL BE CUT IN A NEAT MANNER SATISFACTORY TO THE ENGINEER.

B. THE LOCATION OF ALL CONDUIT AND BOXES SHALL BE PREDETERMINED BY THIS CONTRACTOR WHO SHALL BE RESPONSIBLE FOR THE INSTALLATION OF SAME IN WALLS AND CEILINGS.

C. ALL HOLES OR DAMAGE CAUSED BY THE REMOVAL OF EXISTING WORK OR THE INSTALLATION OF NEW WORK SHALL BE PROPERLY PATCHED BY THIS CONTRACTOR. HOLES SHALL BE NEATLY PATCHED WITH SUITABLE MATERIAL TO MATCH EXISTING SURFACES. HOLES THROUGH FLOORS OR FIRE WALLS SHALL BE SEALED WITH THE APPROPRIATE INTUMESCENT CAULK, PUTTY, STRIP, BLOCK, SPONGE, OR SHEET TYPE FIRE BARRIER PRODUCT; HILTI "FS-ONE", NELSON "FLAMESEAL", SPECIFIED TECHNOLOGIES INC. "SPEC SEAL", INTERNATIONAL PROTECTIVE COATINGS "FLAMESAFE", CSD SEALING SYSTEMS, OR APPROVED EQUAL AS MANUFACTURED BY 3M.

D. FIRESTOPPING MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH ALL U.L. SYSTEM REQUIREMENTS FOR THE TYPE OF PENETRATION AND FIRESTOPPING SYSTEM USED. FIRESTOPPING MATERIALS SHALL BE HILTI INC. OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE LISTING FOR THE FURNISHED MANUFACTURER AND PENETRATING COMPONENT.

(1) "F" RATING - 1 OR 2 HOURS

(A) METAL PIPE THROUGH GYPSUM BOARD - HILTI #W-L-1054

(B) METAL PIPE THROUGH WOOD FLOOR/CEILING ASSEMBLY - HILTI #F-C-1059

(C) PLASTIC PIPE THROUGH GYPSUM WALL ASSEMBLY - HILTI #W-L-2251

(D) PLASTIC PIPE THROUGH WOOD FLOOR/CEILING ASSEMBLY - HILTI #F-C-2127

(E) CABLE THROUGH GYPSUM BOARD - HILTI #W-L-3065

(F) CABLE/CABLE BUNDLE THROUGH WOOD FLOOR/CEILING ASSEMBLY - HILTI #F-C-3012

(G) CABLE TRAY THROUGH GYPSUM BOARD - HILTI #W-L-4011, #W-L-4019

(H) CABLE TRAY THROUGH GYPSUM WALL ASSEMBLY - HILTI #W-L-4011

(2) "F" RATING - 3 HOURS

(A) METAL PIPE THROUGH MASONRY/CONCRETE FLOOR OR WALL - HILTI #C-AJ-1155, #C-AJ-1226

(B) METAL PIPE THROUGH POURED CONCRETE FLOOR SLABS - HILTI #F-A-1017

(C) PLASTIC PIPE THROUGH MASONRY/CONCRETE FLOOR OR WALL - HILTI #C-AJ-2109

(D) CABLE THROUGH MASONRY/CONCRETE FLOOR OR WALLS - HILTI #C-AJ-3095

(E) CABLE THROUGH POURED CONCRETE FLOOR SLABS - HILTI #F-A-3007

(F) CABLE TRAY THROUGH MASONRY/CONCRETE FLOOR OR WALL - HILTI #C-AJ-4035

(G) MULTIPLE CABLE TRAYS THROUGH MASONRY/CONCRETE FLOOR OR WALL - HILTI #C-AJ- 4017

E. SWAB INTERIORS OF CONDUITS CLEAN AND DRY BEFORE PULLING WIRE. CLEAN INTERIORS OF BOXES AND CABINETS BEFORE INSTALLING TRIMS AND COVERS.

F. ALL PAINTING REQUIRED BY ELECTRICAL DEMOLITION OR BY THE INSTALLATION OF NEW ELECTRICAL CONDUIT AND EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

G. ALL RACEWAYS, JUNCTION BOXES, OUTLET BOXES, RACEWAY SUPPORTS, ETC. INSTALLED EXPOSED ON THE SURFACE OF EXISTING PAINTED SURFACES SHALL BE PAINTED (2 COATS MINIMUM) BY THE ELECTRICAL CONTRACTOR TO MATCH EXISTING SURFACES.

(1) RACEWAYS INSTALLED ON UNPAINTED MASONRY SHALL NOT BE PAINTED.

(2) IVORY COLORED WIREMOLD RACEWAYS AND WIREMOLD OUTLET BOXES SURFACE MOUNTED ON IVORY OR WHITE PAINTED SURFACES SHALL NOT BE PAINTED.

(3) SUBMIT PAINT CHIPS TO THE ARCHITECT FOR APPROVAL PRIOR TO THE PURCHASE OF ANY PAINT.

H. ELECTRICAL CONTRACTOR SHALL PATCH AND FINISH SAND ALL EXISTING SURFACES MARRED BY THE REMOVAL OF EXISTING CONDUITS, CABLE, AND EQUIPMENT. WHERE PATCHES ARE EXPOSED ON EXISTING PAINTED SURFACES, THEY SHALL BE PAINTED (2 COATS MINIMUM) BY THE ELECTRICAL CONTRACTOR TO MATCH EXISTING SURFACES.

I. TOUCH UP AND REPAIR ANY DAMAGED FACTORY FINISHES ON EQUIPMENT AND MATERIALS FURNISHED. REMOVE ANY RUST SPOTS, PRIME WITH RUST INHIBITIVE PAINT ANY METAL SURFACES OF ELECTRICAL DEVICES NOT PROVIDED WITH RUST INHIBITIVE COATINGS, THEN APPLY PAINT (2 COATS MINIMUM) TO MATCH FACTORY FINISH.

8. COORDINATION AND CONDUCT OF WORK

A. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC, INDICATING GENERAL ARRANGEMENT, APPROXIMATE SIZES, GENERAL LOCATIONS OF EQUIPMENT AND OUTLETS. VERIFY DIMENSIONS IN FIELD; ADJUST TO MANUFACTURER'S SHOP DRAWINGS. DO NOT SCALE DRAWINGS.

B. ARCHITECTURAL AND STRUCTURAL DRAWINGS SUPERSEDE ELECTRICAL DRAWINGS. DETERMINE THAT WORK OF THIS DIVISION CAN BE ACCOMMODATED WITHIN SPACES PROVIDED. NOTIFY ARCHITECT OF ANY INTERFERENCES BEFORE STARTING INSTALLATION.

C. DETERMINE SIZES, LOCATIONS FOR CHASES, AND OPENINGS NECESSARY FOR INSTALLATION OF ELECTRICAL WORK. COOPERATE WITH OTHER TRADES IN SETTING SLEEVES, INSERTS, AND HANGERS.

D. COORDINATE THIS WORK WITH ALL TRADES. ARRANGE OPERATIONS SO AS NOT TO DELAY INSTALLATION OR COMPLETION OF ANY PARTS OF INTERRELATED WORK SO THAT CONSTRUCTION MAY PROCEED ON SCHEDULE. ARRANGE WORK AND SCHEDULE CONTINUOUS WORK SHIFTS TO PROVIDE MINIMUM POSSIBLE OUTAGE OF ELECTRIC SERVICE.

E. COOPERATE WITH MECHANICAL TRADES IN PREPARING INTERFERENCE DRAWINGS FOR POINTS WHERE THERE IS POSSIBLE CONFLICT BETWEEN TRADES. EXACT LOCATION OF PIPES, DUCTS, AND CONDUITS BASED ON FIELD MEASUREMENTS WITH FINAL ARRANGEMENT DETERMINED BY INTRA-TRADE AGREEMENTS ARE SUBJECT TO APPROVAL BY THE ARCHITECT.

F. DRAWINGS OTHER THAN ELECTRICAL DRAWINGS AND OTHER SECTIONS OF THIS SPECIFICATION MAY SHOW OR SPECIFY ELECTRICALLY OPERATED EQUIPMENT, WIRING DIAGRAMS, ETC. THE CONTRACTOR SHALL EXAMINE ALL SUCH DRAWINGS AND SPECIFICATION SECTIONS TO BECOME FAMILIAR WITH THE CHARACTERISTICS OF AND REQUIRED CONNECTIONS FOR ALL EQUIPMENT FOR WHICH WIRING IS TO BE PROVIDED.

G. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER BY FIRST-CLASS MECHANICS. THE CONTRACTOR SHALL PROVIDE ADEQUATE AND COMPETENT SUPERVISION THROUGHOUT CONSTRUCTION.

H. CONDUITS, WIRING, AND EQUIPMENT SHALL BE ARRANGED SUBSTANTIALLY AS INDICATED. ANY CHANGE RESULTING IN A SAVINGS IN LABOR OR MATERIAL SHALL BE MADE ONLY IN ACCORDANCE WITH A CONTRACT CHANGE ORDER. DEVIATIONS SHALL BE MADE ONLY WHERE NECESSARY TO AVOID INTERFERENCES AND ONLY AFTER DRAWINGS SHOWING THE PROPOSED DEVIATIONS HAVE BEEN SUBMITTED TO AND APPROVED BY THE ARCHITECT.

I. CONSTRUCTION MANAGER AND ARCHITECT RESERVE THE RIGHT TO MAKE REASONABLE CHANGES IN INDICATED LOCATIONS WITHOUT ADDITIONAL COST TO THE OWNER.

9. REMOVAL AND REARRANGEMENT OF EXISTING WIRING AND ELECTRICAL EQUIPMENT

A. REMOVE ALL EXISTING WIRING AND ELECTRICAL DEVICES THAT INTERFERE WITH NEW CONSTRUCTION AND ARE NOT NECESSARY TO MAINTAIN SERVICE TO LOADS THAT ARE TO REMAIN.

B. RELOCATE, AND/OR EXTEND AS REQUIRED, WIRING THAT INTERFERES WITH NEW CONSTRUCTION AND IS ESSENTIAL TO MAINTAIN SERVICE TO LOADS THAT ARE TO REMAIN.

C. REMOVE AND/OR RELOCATE THOSE DEVICES SPECIFICALLY INDICATED ON THE DRAWINGS.

D. IN THOSE CASES WHERE DEVICES ARE REMOVED, THE ASSOCIATED WIRING THAT WILL NO LONGER BE ACTIVE SHALL BE REMOVED FULL LENGTH BACK TO THE SOURCE OR FIRST ACTIVE JUNCTION POINT.

E. PROVIDE NEW UPDATED TYPED CIRCUIT DIRECTORIES FOR ALL PANELS EFFECTED BY DEMOLITION WORK.

F. CONDUITS TO BE ABANDONED THAT PENETRATE ON GRADE FLOOR SLABS SHALL BE CUT FLUSH WITH SLAB, FILED TO REMOVE ALL BURRS, AND GROUTED TO MATCH SLAB.

G. ELECTRICAL CONTRACTOR SHALL SAFELY DISPOSE OF ALL FLUORESCENT AND HID BALLASTS AND LAMPS IN FULL COMPLIANCE WITH ALL FEDERAL AND STATE EPA REGULATIONS. ELECTRICAL CONTRACTOR SHALL, UNDER THE BASE BID PROPOSAL, PACKAGE, AND DISPOSE OR RECYCLE ALL LAMPS AND BALLASTS REMOVED UNDER THE DEMOLITION PORTION OF THIS CONTRACT.

(1) DISPOSAL SHALL BE DONE AT AN EPA APPROVED HAZARDOUS WASTE FACILITY.

(2) RECYCLING SHALL BE DONE BY AN EPA APPROVED RECYCLE FACILITY.

(3) ELECTRICAL CONTRACTOR SHALL PROVIDE BOTH OWNER AND ARCHITECT WITH COPIES OF ALL LAMP AND BALLAST DISPOSAL/RECYCLE DOCUMENTATION IN ACCORDANCE WITH U.S. EPA AND STATE EPA REGULATIONS.

H. ALL ELECTRICAL MATERIAL AND DEVICES THAT ARE REMOVED SHALL BE STORED ON THE SITE FOR SALVAGE BY THE OWNER. ALL ITEMS NOT SELECTED FOR SALVAGE SHALL BECOME THE PROPERTY OF THE ELECTRICAL CONTRACTOR AND SHALL BE REMOVED BY HIM FROM THE SITE.

10. SUBMITTALS

A. THIS CONTRACTOR SHALL PREPARE OR OBTAIN FROM THE MANUFACTURERS SHOP DRAWINGS OF THE ITEMS LISTED BELOW AND AFTER REVIEW AND STAMPING SHALL SUBMIT ELECTRONICALLY FOR REVIEW.

B. ELECTRONIC SUBMITTALS SHALL BE IN PDF FORMAT. SUBMITTALS SHALL INCLUDE A TRANSMITTAL, INCLUDE A CONTRACTOR REVIEW STAMP THAT INDICATES APPROVAL BY THE CONTRACTOR, SHALL CLEARLY INDICATE EACH ITEM TO BE REVIEWED WITH SPECIFIC NOTES IDENTIFYING ANY DEVIATION FROM THE CONTRACT DOCUMENTS, AND BE BOUND INTO A SINGLE DOCUMENT NAMED TO MATCH CONTENTS.

C. THESE DRAWINGS SHALL BE COMPLETE IN EVERY RESPECT, SHOWING PERTINENT DETAILS OF SIZE, CAPACITIES, ACCESSORIES, TYPE AND THICKNESS OF MATERIALS, WEIGHT, MAINTENANCE, FEATURES, ETC. ALL LIGHTING FIXTURES SHALL BE SUBMITTED AT ONE TIME.

(1) LIGHTING FIXTURES

(2) WIRING DEVICES

(3) PANELBOARDS

(4) TRANSFORMERS

(5) DISCONNECT SWITCHES

(6) FLOOR BOXES

(7) OCCUPANCY SENSORS & LIGHTING CONTROLS

(8) FIRE ALARM SYSTEM

11. OPERATION AND MAINTENANCE MANUALS

A. ELECTRICAL CONTRACTOR SHALL FURNISH TO THE OWNER OPERATION/MAINTENANCE MANUALS AS DESCRIBED IN THE DIVISION 1 SPECIFICATIONS.

B. MANUALS SHALL MEET OR EXCEED ALL DIVISION 1 SPECIFICATION REQUIREMENTS AND SHALL MINIMALLY INCLUDE THREE (3) INDIVIDUALLY BOUND AND INDEXED (THUMB TABBED) MANUALS. EACH MANUAL SHALL PROVIDE OPERATING INSTRUCTIONS, MAINTENANCE MANUALS, SPARE PARTS LISTING, COPIES OF WARRANTIES, WIRING DIAGRAMS, INSPECTION PROCEDURES AND SHOP DRAWINGS ON ALL EQUIPMENT AND SYSTEMS.

C. UNLESS OTHERWISE DIRECTED BY THE DIVISION 1 SPECIFICATION EACH MANUAL SHALL BE BOUND IN A HEAVY-DUTY, 3 INCH, THREE-RING VINYL COVERED BINDER WITH POCKET FOLDERS FOR DRAWINGS AND FOLDED SHEET INFORMATION. EACH BINDER SHALL BE IDENTIFIED ON BOTH THE FRONT AND THE SPINE.

12. AS-BUILT DRAWINGS

A. AS WORK PROGRESSES, RECORD ON A SET OF RED-LINED "AS-BUILT" PRINTS ANY DEVIATIONS FROM DESIGN DRAWINGS. DELIVER TO THE OWNER AND ENGINEER IN ELECTRONIC FORMAT AUTOCAD (DWG) OR ADOBE ACROBAT (PDF) BEFORE SUBMITTING THE REQUEST FOR FINAL PAYMENT.

13. BRANCH CIRCUIT PANELBOARDS

A. BRANCH CIRCUIT PANELBOARDS SHALL BE DEAD FRONT TYPE AND SURFACE OR FLUSH MOUNTED AS SPECIFIED ON THE DRAWINGS. THE FRAMEWORK IS TO BE OF CODE GAUGE STEEL, RIGIDLY WELDED AND BOLTED TOGETHER TO SUPPORT ALL COVER PLATES, BUSSING, AND COMPONENT DEVICES DURING SHIPMENT AND INSTALLATION.

(1) FRONT TRIM SHALL CONSIST OF A SCREW REMOVABLE NON-VENTILATED HINGED COVER WITH HINGED DOOR, CONCEALED DOOR HINGES, FLUSH RECTANGULAR DOOR LOCK, ADHESIVE PANELBOARD DIRECTORY SLEEVE, AND TWO (2) STANDARD MANUFACTURERS KEYS.

(2) FRONT TRIM SHALL BE FLUSH WITH PANELBOARD TUB FOR SURFACE MOUNTED PANELBOARDS AND EXTEND 1/8" BEYOND PANELBOARD TUB, ON ALL SIDES, FOR FLUSH MOUNTED PANELBOARDS.

(3) EXTERIOR AND INTERIOR METAL SURFACES OF THE PANELBOARD SHALL BE FINISHED WITH BAKED ENAMEL OVER AN IRON PHOSPHATE PRE-TREATMENT. THE ENAMEL FINISH SHALL BE LIGHT GRAY ANSI #61 OR DARK GRAY ANSI #49.

B. BRANCH CIRCUIT PANELBOARDS SHALL BE ARRANGED FOR 480/277 VOLT, THREE-PHASE, FOUR-WIRE OR 208/120 VOLT, THREE-PHASE, FOUR-WIRE AS SHOWN ON THE DRAWINGS.

C. PANELBOARDS SHALL BE SEQUENCED BUSSED, I.E., CIRCUITS 1 AND 2 TO PHASE "A", 3 AND 4 TO PHASE "B", 5 AND 6 TO PHASE "C", ETC., TO CONFORM TO THE BRANCH CIRCUIT NUMBERING SYSTEM SHOWN ON THE PLANS.

D. PHASE AND NEUTRAL BUSSES SHALL BE TIN OR SILVER PLATED ALUMINUM OR COPPER, OF THE CURRENT RATINGS INDICATED ON THE DRAWINGS, AND SIZED FOR 65°C TEMPERATURE RISE ABOVE 40°C AMBIENT.

E. EACH PANELBOARD SHALL CONTAIN A COPPER EQUIPMENT GROUND BUS, BOLTED TO THE INSIDE OF THE ENCLOSURE, TO ACCEPT ALL OUTGOING EQUIPMENT GROUND CONDUCTORS.

F. MAIN BUSSES, GROUND BUS, AND THRU FEED BUS SHALL HAVE LUGS TO ACCOMMODATE INCOMING FEEDERS AND GROUNDS AS SHOWN ON THE DRAWINGS.

G. CIRCUIT BREAKERS SHALL BE OF THE SWITCH RATED BOLT-ON TYPE WITH QUANTITY, SIZE, AND MINIMUM INTERRUPTING CAPACITY AS NOTED ON DRAWINGS.

(1) ARRANGE CIRCUIT BREAKERS PER THE PANELBOARD SCHEDULES ON THE DRAWINGS.

(2) MAIN BREAKERS, WHERE SPECIFIED, SHALL BE LOCATED AT THE TOP OR BOTTOM OF THE PANEL. BACK-FED BRANCH MOUNTED BREAKERS SHALL NOT BE USED AS MAIN BREAKERS.

(3) SINGLE-POLE BREAKERS SHALL BE FACTORY MOUNTED AT THE TOP OF THE PANELBOARD ASSEMBLY, UNLESS NOTED OTHERWISE.

(4) TWO-POLE AND THREE-POLE BREAKERS SHALL BE FACTORY MOUNTED AT THE BOTTOM OF THE PANELBOARD ASSEMBLY, BELOW ALL SINGLE-POLE BREAKERS, PROVISIONS, AND SPACES, UNLESS NOTED OTHERWISE.

H. PANELBOARDS SHALL BE IDENTIFIED WITH AN ENGRAVED NAMEPLATE INSTALLED ON THE FRONT TRIM. REFER TO EQUIPMENT AND EQUIPMENT IDENTIFICATION SPECIFICATION SECTION FOR REQUIREMENTS.

I. PANELBOARD CIRCUITS SHALL BE NUMBERED SEQUENTIALLY WITH ADHESIVE FACTORY LABELS. WHERE PANELBOARDS ARE TWO OR MORE SECTIONS, THE NUMBERING SEQUENCE SHALL BE CONTINUOUS, I.E. SECTION 1 NUMBERED 1 THRU 42, SECTION 2 NUMBERED 43 THRU 84, ETC.

J. FURNISH AND INSTALL AN ARC FLASH WARNING LABEL IN A CLEARLY VISIBLE LOCATION INSIDE THE HINGED PANEL COVER OF EACH BRANCH CIRCUIT PANELBOARD TO COMPLY WITH NEC 110.16. LABELS SHALL BE BRADY IDENTIFICATION SOLUTIONS (1-800-537-8791), CAT. NO. 94913, 3.5" X 5", OR EQUIVALENT.

K. WIREWAYS SHALL NOT BE INSTALLED ABOVE BRANCH CIRCUIT PANELBOARDS. (RACEWAYS SHALL TERMINATE DIRECTLY INTO PANELBOARD TUB).

L. 208/120V (480/277V) BRANCH PANELBOARDS SHALL BE ABB/GE "AQ/(AE/AD)" SERIES, EATON "POW-R-LINE 1A/(2A)", SIEMENS "P1/(P2)" SERIES, OR SQUARE D TYPE "NQ/(NF)".

(1) ABB / GENERAL ELECTRIC HINGED FRONT TRIMS SHALL BE "FRONT HINGED TO BOX SERIES".

(2) EATON HINGED FRONT TRIMS SHALL BE "DOOR IN DOOR LTDD SERIES".
EZ-TRIM IS ACCEPTABLE ONLY FOR SURFACE MOUNTED PANELS.

(3) SIEMENS HINGED FRONT TRIMS SHALL BE "HINGED TO BOX SERIES".

(4) SQUARE D HINGED FRONT TRIMS SHALL BE "HINGED FRONT NCHR SERIES".

M. SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL.

14. DRY TYPE TRANSFORMERS

A. DRY TYPE TRANSFORMERS SHALL HAVE KVA AND VOLTAGE RATINGS PER THE DRAWINGS, 150 DEGREE CELSIUS TEMPERATURE RISE, SIX (6) 2-1/2% PRIMARY TAPS (2 ABOVE, 4 BELOW RATED NOMINAL), AND A NEMA 1 INDOOR VENTILATED ENCLOSURE.

B. WHERE ENCAPSULATED TRANSFORMERS ARE SPECIFIED ON THE DRAWINGS, THEY SHALL HAVE 115 DEGREE CELSIUS TEMPERATURE RISE, FOUR (4) 2-1/2% PRIMARY TAPS (2 ABOVE, 2 BELOW RATED NOMINAL), AND A NEMA 3R OUTDOOR NON-VENTILATED ENCLOSURE.

C. TRANSFORMERS MUST COMPLY WITH "DOE 2016" EFFICIENCY LEVELS OF THE UNITED STATES DEPARTMENT OF ENERGY CONSERVATION STANDARDS. ENCAPSULATED TRANSFORMERS ARE EXEMPT.

D. TRANSFORMERS MANUFACTURERS SHALL BE: ABB/GE, ACME ELECTRIC, EATON, FEDERAL PACIFIC, POWERSMITHS - E-SAVER 33L, SIEMENS, OR SQUARE D.

E. CONNECTIONS TO TRANSFORMERS SHALL UTILIZE A SHORT LENGTH OF FLEXIBLE METAL CONDUIT.

15. RACEWAYS

A. FURNISH AND INSTALL CONDUIT, SUPPORTS, BOXES, WIRE, AND NECESSARY FITTINGS AND ACCESSORIES AS REQUIRED TO MAKE A COMPLETE INSTALLATION OF THE WIRING SYSTEM INDICATED ON THE DRAWINGS.

B. ALL WIRING SHALL BE INSTALLED IN CONDUIT, FLEXIBLE METALLIC CONDUIT, OR LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT AS INDICATED ON PLANS.

(1) CONDUITS INSTALLED INDOORS SHALL BE ELECTRICAL METALLIC TUBING GALVANIZED INSIDE AND OUT WITH A CLEAR TOP COAT TO RESIST ABRASION AND AN INTERIOR ORGANIC COATING TO PROVIDE LUBRICATION.

(2) CONDUITS INSTALLED EXPOSED OUTDOORS SHALL BE GALVANIZED RIGID TYPE UNLESS NOTED OTHERWISE. EXPANSION JOINTS SHALL BE INCORPORATED AS NEEDED FOR LONG RUNS.

CONDUITS SHALL BE OF THE SIZE INDICATED OR REQUIRED BY THE NATIONAL ELECTRIC CODE FOR THE NUMBER AND SIZE CONDUCTORS INVOLVED. JOINTS SHALL BE CUT SQUARE, REAMED SMOOTH AND PULLED UP TIGHT. CONDUITS SHALL NOT BE SMALLER THAN 3/4", UNLESS NOTED OTHERWISE.

(3) EMT CONDUIT FITTINGS SHALL BE SET SCREW TYPE GALVANIZED STEEL, CONCRETE TIGHT. DIE CAST TYPE INDENTOR FITTINGS ARE NOT ACCEPTABLE.

C. REFER TO THE CONDUCTORS SECTION OF THIS SPECIFICATION FOR LIMITED USE OF MC CABLE.

D. RACEWAYS FROM VARIABLE FREQUENCY DRIVES SHALL CONTAIN "VFD RATED" MULTI-CONDUCTOR SHIELDED CABLE AND, WHERE NOT SUBJECT TO PHYSICAL DAMAGE, UP TO 6-FEET OF VFD CABLE MAYBE ROUTED EXPOSED TO ALLOW CABLE TERMINATION AT MOTORS.

(1) THREADED INSULATED BUSHINGS SHALL BE USED TO TERMINATE VFD RACEWAYS.

(2) INSULATED, NON-ARMORED, WEATHERPROOF, TRAY CABLE TYPE CABLE GLANDS SHALL BE USED TO TRANSITION EXPOSED VFD CABLE TO RACEWAY AND FOR TERMINATING VFD CABLE AT MOTORS.

E. RACEWAYS IN GENERAL SHALL BE INSTALLED CONCEALED ABOVE FINISHED CEILINGS, IN WALLS, IN ACCESSIBLE FLOOR PLENUMS, AND EXPOSED ELSEWHERE AS SHOWN ON PLANS.

(1) PVC CONDUIT AND LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT SHALL NOT BE USED IN ENVIRONMENTAL AIR PLENUMS.

(2) CONDUITS INSTALLED ON EXTERIORS OF BUILDINGS OR OTHER STRUCTURES SHALL BE ARRANGED TO DRAIN (NOT TRAP WATER), AND SHALL BE RAIN-TIGHT IN WET LOCATIONS.

(3) WHERE CONDUITS ARE ROUTED THROUGH AREAS OF DIFFERING TEMPERATURES OR AIR PRESSURES (AIR HANDLERS, EXTERIOR WALLS, ETC.), THE PENETRATION AROUND THE CONDUIT SHALL BE ADEQUATELY SEALED. THE INTERIOR OF THESE CONDUITS SHALL BE SEALED AT THE FIRST BOX OR FITTING ADJACENT TO THE PENETRATION TO PREVENT AIR MIGRATION BETWEEN THE SPACES.

F. ALL EXPOSED CONDUITS SHALL BE RUN IN A NEAT MANNER, PARALLEL WITH OR AT RIGHT ANGLES TO BUILDING LINES. EXPOSED CONDUITS SHALL BE ADEQUATELY SUPPORTED WITH BEAM CLAMPS, ONE HOLE STRAPS, ETC.

(1) WHERE ENCOUNTERED, STEEL FIREPROOFING SHALL BE REPAIRED BY THE ELECTRICAL CONTRACTOR WHERE SUPPORTS ARE INSTALLED ON EXISTING STEEL STRUCTURES.

G. ALL ELECTRICAL SYSTEMS, RACEWAYS, JUNCTION BOXES, CABLES, AND ALL FLEXIBLE WIRING SYSTEMS SHALL BE SUPPORTED INDEPENDENT OF THE SUSPENDED TEE-BAR CEILING SYSTEM AND INDEPENDENT OF HANGER WIRES ASSOCIATED WITH THE CEILING SYSTEM, IN FULL COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL CODES.

H. RACEWAYS THAT ARE INSTALLED EXPOSED TO DIRECT SUNLIGHT ON ROOFTOPS SHALL HAVE 60°F ADDED TO THE OUTDOOR AMBIENT TEMPERATURE USED TO CALCULATE THE CONDUCTOR DERATING FACTOR IN COMPLIANCE WITH NEC ARTICLE 310.15(B).

16. CONDUCTORS

A. FEEDER AND BRANCH CIRCUIT CONDUCTORS SHALL BE STRANDED COPPER WITH NOT LESS THAN 98% CONDUCTIVITY AND 600 VOLT TYPE THWN OR XHHW INSULATION. CONDUCTORS SHALL BE #12 AWG UNLESS INDICATED OTHERWISE ON PLANS.

(1) WHERE THE DRAWINGS ALLOW USE OF ALUMINUM CONDUCTORS THEY SHALL BE AA-8000 SERIES ALLOY COMPACT STRANDED TYPE. TERMINATIONS SHALL BE MADE USING NOALOX ANTI-OXIDANT COMPOUND.

B. TYPE THHN OR XHHW (90°C) INSULATED STRANDED COPPER CONDUCTORS SHALL BE USED WHERE BRANCH CIRCUIT CONDUCTORS ARE ROUTED THRU FLUORESCENT FIXTURE CHANNELS.

C. UNLESS SPECIFICALLY NOTED OTHERWISE ON THE ELECTRICAL BID DOCUMENTS, THE ELECTRICAL CONTRACTOR SHALL NOT INSTALL TYPE AC ARMORED CABLE, TYPE FC FLAT CABLE, TYPE FCC FLAT CONDUCTOR CABLE, TYPES NM / NMC / NMS NONMETALLIC SHEATHED CABLE, TYPES SE / USE SERVICE CABLE OR TYPE UF UNDERGROUND FEED CABLE. REFER BELOW FOR LIMITED USE OF MC CABLE.

D. FEEDER CONDUCTORS SHALL BE ROUTED CONTINUOUS FROM ORIGIN TO DESTINATION, WITHOUT SPLICING, UNLESS SPECIFICALLY NOTED OTHERWISE ON PLANS. FEEDER CONDUCTORS SHALL BE PULLED WITH THE USE OF AN APPROVED PULLING COMPOUND OR POWDER.

E. "VFD RATED" MULTI-CONDUCTOR SHIELDED CABLES SHALL BE TERMINATED ACCORDING TO THE MANUFACTURERS RECOMMENDATIONS. BRAIDED SHIELDS SHALL BE ROUTED UNBROKEN WHERE SERVICE DISCONNECTS ARE LOCATED BETWEEN THE VFD AND MOTOR. PHASE AND GROUND CONDUCTORS SHALL BE PULLED THROUGH BRAIDED SHIELDS AT EACH END AND TERMINATED TOGETHER WITH THE GROUND CONDUCTORS.

F. METAL CLAD CABLE (NEC TYPE MC):

(1) METAL CLAD CABLE (MC CABLE) MAY ONLY BE USED WHERE PERMITTED BY THE NEC, LOCAL CODES AND THE FOLLOWING LIMITATIONS.

(A) FOR BRANCH CIRCUIT WIRING FISHED INTO EXISTING WALLS OR INACCESSIBLE CEILINGS AND IN CASEWORK. (MC CABLE SHALL NOT BE INSTALLED ABOVE CEILINGS IN LENGTHS GREATER THAN 8 FEET.)

(B) FOR LIGHTING, RECEPTACLE AND EQUIPMENT BRANCH CIRCUIT WIRING WITH-IN A ROOM, WHERE CONCEALED IN WALLS AND ABOVE FINISHED CEILINGS. ALL ASSOCIATED "HOME RUN" WIRING SHALL BE INSTALLED IN CONDUIT.

(C) MC CABLE SHALL NOT BE INSTALLED EXPOSED ON WALLS.

(D) MC CABLE IS NOT PERMITTED FOR FEEDER CIRCUITS.

(E) MC CABLE IS NOT PERMITTED FOR EMERGENCY POWER CIRCUITS, EXCEPT WHERE FISHED INTO EXISTING WALLS OR INACCESSIBLE CEILINGS.

(F) UNGROUNDED CONDUCTORS SHALL BE IDENTIFIED PER NEC 210.5.C.

(2) MC CABLE SHALL BE UL LISTED FOR ITS USE. WHERE MC CABLE IS INSTALLED IN HEALTHCARE FACILITIES (AS DEFINED BY THE NEC), THE CABLE ASSEMBLY SHALL BE LISTED FOR USE IN PATIENT CARE AREAS (HCF).

G. FURNISH AND INSTALL CODE GAUGE SCREW COVER PULL BOXES AND TYPE LB CONDUIT FITTINGS WHERE SHOWN ON PLANS AND AS REQUIRED FOR THE SATISFACTORY INSTALLATION OF ALL FEEDER CONDUCTORS.

H. SPLICES IN BRANCH CIRCUIT WIRES SHALL BE MADE ONLY IN READILY ACCESSIBLE JUNCTION BOXES.

(1) IN-LINE SPLICES AND TAPS FOR CONDUCTORS #8 AWG OR SMALLER SHALL BE 600V RATED WITH "LIVE SPRING" AND INSULATED RIGID NYLON WING TYPE BODY, 3M "RANGER", BUCHANAN "B-CAP", OR EQUAL.

(2) IN-LINE CONNECTORS FOR 600V COPPER CONDUCTORS #6 AWG THRU #3 AWG SHALL BE ILSCO TYPE "CT" CIRCUMFERENTIAL COMPRESSION SLEEVES OR EQUAL BY T & B OR BUCHANAN.

(3) IN-LINE CONNECTORS FOR 600V COPPER CONDUCTORS #2 AWG OR LARGER SHALL BE EXTRA LONG BARREL ILSCO TYPE "CTL" COMPRESSION SLEEVES (OR EQUAL BY T & B OR BUCHANAN) WITH 3M BRAND "PST" SILICONE COLD SHRINK INSULATORS.

I. CIRCUIT CONDUCTORS SHALL BE CONNECTED AT PANELBOARDS AS INDICATED ON THE DRAWINGS. PANELBOARD LOADS SHALL BE CHECKED AT COMPLETION OF THE JOB AND WHERE UNBALANCE EXCEEDS 5% (PLUS OR MINUS) ADJUSTMENTS SHALL BE MADE.

J. ALL MULTI-WIRE BRANCH CIRCUITS THAT FEED MORE THAN ONE DEVICE OR EQUIPMENT MOUNTED ON, OR WIRED FROM, A COMMON YOKE, SHALL BE POWERED FROM A BRANCH CIRCUIT OVERCURRENT DEVICE THAT SIMULTANEOUSLY DISCONNECTS ALL UNGROUNDED SUPPLY CONDUCTORS IN FULL COMPLIANCE WITH NEC ARTICLE 210.4.

K. EACH FEEDER AND BRANCH CIRCUIT ASSOCIATED WITH A TWO-POLE OR THREE-POLE PROTECTIVE DEVICE SHALL BE PROVIDED WITH A SEPARATE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR. THE REQUIRED EQUIPMENT GROUNDING CONDUCTOR SHALL BE SIZED AS SHOWN ON THE DRAWINGS, SHALL NOT BE SMALLER THAN SHOWN IN NEC TABLE 250.122, AND SHALL BE INSTALLED IN A COMMON CONDUIT WITH THE RELATED PHASE AND/OR NEUTRAL CONDUCTORS. IN THE CASE OF PARALLEL FEEDERS, EACH RACEWAY SHALL HAVE A FULL SIZE GREEN INSULATED EQUIPMENT GROUND CONDUCTOR.

L. BRANCH CIRCUIT CONDUCTORS SHALL BE COLOR CODED. CONDUCTOR INSULATION SHALL BE FACTORY COLORED IN SIZES UP THROUGH #8 AWG. COLORS SHALL BE ASSIGNED TO EACH CONDUCTOR AS DESCRIBED BELOW AND CARRIED THROUGHOUT ALL MAIN AND BRANCH CIRCUIT DISTRIBUTION.

	208/120 VOLT	480/277 VOLT
(1) PHASE "A" CONDUCTOR	BLACK	BROWN
(2) PHASE "B" CONDUCTOR	RED	ORANGE
(3) PHASE "C" CONDUCTOR	BLUE	YELLOW
(4) NEUTRAL CONDUCTOR	WHITE	GRAY
(5) GROUNDING CONDUCTOR	GREEN	GREEN
(6) ISOLATED GROUNDING CONDUCTOR	GREEN WITH YELLOW STRIPE	

M. IN GENERAL, 120V AND 277V SINGLE PHASE CIRCUITS SHALL BE PROVIDED WITH DEDICATED NEUTRALS AND CONNECTED TO SINGLE POLE BREAKERS.

N. CIRCUITS INSTALLED FOR MODULAR TYPE FURNITURE SHALL BE CONNECTED TO A SINGLE-POLE BREAKER WITH A DEDICATED NEUTRAL, WITHOUT EXCEPTION.

O. WHERE MORE THAN ONE NOMINAL VOLTAGE SYSTEM IS PRESENT WITHIN A PREMISES, THE IDENTIFICATION USED FOR EACH PHASE, NEUTRAL, AND GROUND CONDUCTORS SHALL BE PERMANENTLY POSTED AT EACH DISTRIBUTION PANEL AND AT EACH BRANCH PANEL.

P. CONTROL WIRING SHALL BE COLOR CODED SUCH THAT RED IS USED EXCLUSIVELY FOR ALL 120 VOLT CONDUCTORS AND WHITE FOR ALL NEUTRAL CONDUCTORS. ALL CONTROL WIRING TO BE IDENTIFIED AT BOTH ENDS WITH PERMANENT WIRE MARKERS.

17. OUTLET BOXES

A. CONCEALED OUTLET BOXES FOR LIGHTING FIXTURES IN SUSPENDED CEILING AREAS SHALL BE 4" OCTAGON BY 1-1/2" DEEP. WHERE NUMBER OF WIRES REQUIRES A LARGER BOX, USE 4-11/16" OR 4" SQUARE BY 2-1/8" DEEP. BOXES SHALL BE PROVIDED WITH ROUND OPENING PLASTER COVERS TO FINISH FLUSH WITH CEILING. PROVIDE 3/8" FIXTURE STUDS.

B. OUTLET BOXES LOCATED ABOVE ACCESSIBLE CEILINGS FOR LIGHTING FIXTURES SHALL BE PROVIDED WITH BLANK COVERS. WIRING SHALL BE EXTENDED TO FIXTURES IN FLEXIBLE METAL CONDUIT WITH GROUND WIRE.

C. OUTLET BOXES FOR WIRING DEVICES SHALL BE 4" SQUARE BY 1-1/2" DEEP. WHERE NUMBER OF WIRES REQUIRES A LARGER BOX, USE 4" SQUARE BY 2-1/8" DEEP. PROVIDE ONE OR TWO GANG ADAPTERS AS REQUIRED, TO FINISH FLUSH WITH WALL. WHERE THREE OR MORE DEVICES ARE SET AT ONE POINT, USE GANG TYPE BOXES.

D. JUNCTION BOXES SHALL BE BONDED TO THE EQUIPMENT GROUND CONDUCTORS CONTAINED WITHIN, WHENEVER SAID CONDUCTORS ARE "SPLICED" OR "TERMINATED" WITHIN THE BOX, IN FULL COMPLIANCE WITH NEC ARTICLE 250.148.

E. ALL BOXES SHALL BE RIGIDLY SUPPORTED FROM THE BUILDING STRUCTURE INDEPENDENT OF THE CONDUIT SYSTEM.

F. ELECTRICAL CONTRACTOR SHALL PROVIDE PRE-PAINTED RED, SPRAY PAINTED RED, OR RED COLORED STICK-ON LABELS FOR ALL FIRE ALARM SYSTEM JUNCTION BOXES AND COVERS.

18. WIRING DEVICES AND COVERPLATES

A. WIRING DEVICES SHALL BE FURNISHED AS DESCRIBED IN THE SYMBOL SCHEDULE AND INSTALLED AT LOCATIONS SHOWN ON THE DRAWINGS. WIRING DEVICES TO BE COOPER "INDUSTRIAL SPEC GRADE", HUBBELL "HBL" SERIES, LEVITON "LEV-SPEC", OR PASS & SEYMOUR "INDUSTRIAL SPEC GRADE".

(1) DEVICES SHALL HAVE ONE-PIECE BRASS MOUNTING STRAP.

(2) DEVICES SHALL BE "IVORY" IN COLOR UNLESS INDICATED OTHERWISE ON PLANS.

B. COVERPLATES FOR FLUSH MOUNTED AND SURFACE MOUNTED DEVICES IN WIREMOLD BOXES SHALL BE 0.04" THICK BRUSHED FINISH, STAINLESS STEEL. WHERE TWO OR MORE DEVICES ARE SET AT ONE POINT, THEY SHALL BE COVERED WITH A COMMON PLATE.

C. COVERPLATES FOR DEVICES SHALL BE SMOOTH IVORY COLORED NYLON NON-BREAKABLE TYPE. WHERE TWO OR MORE DEVICES ARE SET AT ONE POINT, THEY SHALL BE COVERED WITH A COMMON PLATE.

D. WHERE DECORATIVE SCREW-LESS COVERPLATE SWITCHES OR DIMMERS ARE LOCATED ADJACENT TO STANDARD TOGGLE SWITCHES THEY SHALL BE INSTALLED IN SEPARATE BOXES.

E. COVERPLATES FOR SURFACE MOUNTED DEVICES IN CAST FS BOXES SHALL BE HEAVY-GAUGE GALVANIZED STAMPED SHEET STEEL, CROUSE HINDS TYPE "DS" OR APPLETON TYPE "FSK".

19. LIGHTING

A. FURNISH AND INSTALL LIGHTING FIXTURES AND LAMPS AS INDICATED IN THE FIXTURE SCHEDULE ON THE DRAWINGS. LAMPS SHALL BE BY GENERAL ELECTRIC, OSRAM/SYLVANIA, OR PHILLIPS LIGHTING.

B. FURNISH AND INSTALL ALL REQUIRED HANGING ACCESSORIES AND FITTINGS TO ENSURE PROPER INSTALLATION AND CONFORMANCE WITH THE CODE.

(1) ALL FIXTURE SUPPORTS SHALL BE CAPABLE OF SUPPORTING THE FIXTURE PLUS 100% ADDITIONAL WEIGHT.

(2) THE ELECTRICAL CONTRACTOR SHALL TAKE SPECIAL NOTE OF THE VARIOUS TYPES OF CEILING CONSTRUCTION USED THROUGHOUT THE BUILDING SO THAT PROPER MOUNTING ARRANGEMENTS ARE MADE FOR LIGHTING FIXTURES.

(3) SURFACE TYPE FIXTURES WHICH MOUNT ON GRID CEILINGS SHALL BE SUPPORTED FROM METAL SUPPORTING MEMBERS (FURNISHED BY THE ELECTRICAL CONTRACTOR) LOCATED ABOVE GRID CEILING.

C. FIXTURE FRAMES SHALL BE GROUNDED TO THE CONDUIT SYSTEM EITHER THROUGH THE HANGING DEVICE OR BY MEANS OF A #14 GREEN JUMPER.

D. GENERAL:

(1) LUMINAIRE MANUFACTURER SHALL HAVE A MINIMUM OF FIVE (5) YEARS EXPERIENCE IN THE MANUFACTURE AND DESIGN OF LED PRODUCTS AND SYSTEMS AND NO LESS THAN ONE HUNDRED (100) NORTH AMERICAN INSTALLATIONS.

(2) UNLESS OTHERWISE SPECIFIED, ALL LED LUMINAIRES AND POWER/DATA SUPPLIES SHALL BE PROVIDED BY A SINGLE MANUFACTURER TO ENSURE COMPATIBILITY.

(3) ALL COMPONENTS, PERIPHERAL DEVICES AND CONTROL SOFTWARE ARE TO BE PROVIDED BY AND SHALL BE THE RESPONSIBILITY OF A SINGLE ENTITY. ALL COMPONENTS SHALL PERFORM SUCCESSFULLY AS A COMPLETE SYSTEM AND SHALL OPERATE AS DESCRIBED ON THE DRAWINGS.

(4) INCLUDE ALL COMPONENTS NECESSARY FOR A COMPLETE INSTALLATION. PROVIDE ALL POWER SUPPLIES, SYNCHRONIZERS, DATA CABLES, AND DATA TERMINATORS FOR A COMPLETE WORKING SYSTEM.

(5) ALL LED SOURCES USED IN THE LED LUMINAIRE SHALL BE OF PROVEN QUALITY FROM ESTABLISHED AND REPUTABLE LED MANUFACTURERS AND SHALL HAVE BEEN FABRICATED AFTER 2007.

E. LIGHTING/RECEPTACLE CONTROL PANEL SHALL HAVE QUANTITY OF PROGRAMMABLE RELAYS AS IDENTIFIED ON DRAWINGS. NEMA-1 SURFACE MOUNTED ENCLOSURE AND DIGITAL TIME CLOCK. NLIGHT #ARP OR APPROVED EQUAL.

F. WARRANTY:

(1) SYSTEM SHALL CARRY A FULL WARRANTY FOR FIVE (5) YEARS. MANUFACTURER SHALL BE RESPONSIBLE FOR COST OF SHIPPING AND LABOR TO REPLACE ANY COMPONENT OF THE SYSTEM THAT FAILS WITHIN 2 YEARS OF INSTALLATION.

G. PRODUCTS AND COMPONENTS - PERFORMANCE

(1) LED LUMINAIRES AND COMPONENTS SHALL BE UL LISTED OR UL CLASSIFIED.

(2) ALL LED COMPONENTS SHALL BE RESTRICTION OF HAZARDOUS SUBSTANCE DIRECTIVE (ROHS) COMPLIANT.

(3) WHITE LEDS SHALL HAVE A RATED SOURCE LIFE OF 50,000 HOURS UNDER NORMAL OPERATING CONDITIONS. RGB LEDS SHALL HAVE A RATED SOURCE LIFE OF 100,000 HOURS. LED “RATED SOURCE LIFE” IS DEFINED AS THE TIME WHEN A MINIMUM OF 70% OF INITIAL LUMEN OUTPUT REMAINS.

(4) LUMINAIRE ASSEMBLY SHALL INCLUDE A METHOD OF DISSIPATING HEAT SO AS TO NOT DEGRADE LIFE OF SOURCE, ELECTRONIC EQUIPMENT, OR LENSES. LED LUMINAIRE HOUSING SHALL BE DESIGNED TO TRANSFER HEAT FROM THE LED BOARD TO THE OUTSIDE ENVIRONMENT. LUMINAIRE HOUSING SHALL HAVE NO NEGATIVE IMPACT ON LIFE OF COMPONENTS.

(5) LEDS SHALL BE ADEQUATELY PROTECTED FROM MOISTURE OR DUST IN INTERIOR APPLICATIONS.

(6) ALL HARDWIRED CONNECTIONS TO LED LUMINAIRES SHALL BE REVERSE POLARITY PROTECTED AND PROVIDE HIGH VOLTAGE PROTECTION IN THE EVENT CONNECTIONS ARE REVERSED OR SHORTED DURING THE INSTALLATION PROCESS.

(7) THE LED LUMINAIRE SHALL BE OPERATED AT CONSTANT AND CAREFULLY REGULATED CURRENT LEVELS. LEDS SHALL NOT BE OVERDRIVEN BEYOND THEIR SPECIFIED NOMINAL VOLTAGE AND CURRENT.

20. LIGHTING CONTROLS

A. THE CONTRACTOR SHALL REVIEW THE PROPOSED LIGHTING CONTROLS WITH THE MANUFACTURERS TECHNICIAN AND PROCURE FACTORY ONE-LINES. INCLUDE FACTORY ONE-LINES IN LIGHTING CONTROL SHOP DRAWING SUBMITTALS.

B. THE CONTRACTOR SHALL ENGAGE THE SERVICES OF THE MANUFACTURERS FIELD SERVICE TECHNICIAN TO PERFORM ALL PROGRAMMING, STARTUP, CALIBRATION, AND CERTIFICATION OF THE LIGHTING CONTROL SYSTEM.

C. ALL SYSTEM PROGRAMMING SHALL BE REVIEWED AND APPROVED BY THE OWNER IN ADVANCE. AN OWNER'S REPRESENTATIVE SHALL BE PRESENT THROUGHOUT THE PROGRAMMING AND STARTUP PROCEDURES.

D. THE CONTRACTOR SHALL PROVIDE LABOR TO PROGRAM EACH OCCUPANCY SENSOR AND DAYLIGHT SENSOR AS NECESSARY FOR INTERFACE WITH THE SYSTEM.

E. WHERE ROOMS ARE DIVIDED WITH OPERABLE PARTITIONS, THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A SYSTEM WITH AN OPTICAL PARTITION SWITCH TO ALLOW INDIVIDUAL ROOM CONTROLS WHEN THE PARTITION IS CLOSED AND COMMON ROOM CONTROLS WHEN THE PARTITION IS OPEN.

21. MECHANICAL EQUIPMENT WIRING

A. FURNISH AND INSTALL POWER WIRING TO ALL HEATING, VENTILATING, AND AIR CONDITIONING EQUIPMENT. CHECK HEATING AND VENTILATING DRAWINGS TO BE FAMILIAR WITH ALL POWER REQUIREMENTS AND ELECTRICAL ROUGH-IN LOCATIONS.

B. ALL TEMPERATURE CONTROL WIRING SHALL BE FURNISHED AND INSTALLED BY MECHANICAL TRADES UNDER SEPARATE CONTRACT UNLESS OTHERWISE SHOWN ON THE ELECTRICAL PLANS.

C. MOTOR STARTERS SHALL BE FURNISHED INTERNAL TO THE HVAC EQUIPMENT EXCEPT WHERE OTHERWISE NOTED ON THE ELECTRICAL DRAWINGS.

D. ALL MOTORS SHALL BE GROUNDED IN ACCORDANCE WITH NATIONAL ELECTRIC CODE REQUIREMENTS. DISCONNECT MEANS SHALL BE SUPPLIED AS REQUIRED TO SATISFY THE CODE REQUIREMENTS.

E. CONNECTIONS TO MOTORS SHALL BE MADE WITH A SHORT LENGTH (24" MINIMUM) OF LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT.

22. LOAD BALANCE AND ADJUSTMENT

A. THIS CONTRACTOR SHALL PROVIDE PERSONNEL AND EQUIPMENT TO CHECK LOADS AND ADJUST AS REQUIRED TO ENSURE THAT CONNECTED LOADS ARE BALANCED AS NEARLY AS POSSIBLE BETWEEN PHASES ON ALL FEEDERS.

B. SPECIAL CARE SHALL BE TAKEN DURING LOAD BALANCE TO ASSURE THAT REVERSE ROTATION OF MOTORS IS NOT CAUSED.

23. GROUNDING

A. FURNISH AND INSTALL GROUND CONDUCTORS AS INDICATED ON THE DRAWINGS. CONDUCTORS SHALL BE INSULATED COPPER, TYPE THWN, IDENTIFIED GREEN, AND SIZED AS SHOWN ON THE DRAWINGS.

B. METALLIC CONDUIT SYSTEM SHALL BE ELECTRICALLY CONTINUOUS THROUGHOUT.

C. EACH FEEDER AND BRANCH CIRCUIT ASSOCIATED WITH A TWO-POLE OR THREE-POLE PROTECTIVE DEVICE SHALL BE PROVIDED WITH A SEPARATE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR. THE REQUIRED EQUIPMENT GROUNDING CONDUCTOR SHALL BE SIZED AS SHOWN ON THE DRAWINGS, SHALL NOT BE SMALLER THAN SHOWN IN NEC TABLE 250.122, AND SHALL BE INSTALLED IN A COMMON CONDUIT WITH THE RELATED PHASE AND/OR NEUTRAL CONDUCTORS. IN THE CASE OF PARALLEL FEEDERS, EACH RACEWAY SHALL HAVE A FULL SIZE GREEN INSULATED EQUIPMENT GROUND CONDUCTOR.

24. LOW VOLTAGE AND COMMUNICATIONS RACEWAY PROVISIONS

A. FURNISH AND INSTALL A SYSTEM OF RACEWAYS AND OUTLETS FOR THE INSTALLATION OF VOICE/DATA CABLING AND SIMILAR LOW VOLTAGE SYSTEMS.

B. CONDUITS SHALL BE SIZED AS SHOWN ON THE DRAWINGS AND SHALL CONFORM TO "RACEWAYS" SPECIFICATION.

C. OUTLETS SHALL BE AS DESCRIBED IN THE SYMBOL SCHEDULE ON THE DRAWINGS.

D. RACEWAYS SHALL UTILIZE LONG SWEEP 90° BENDS AT ALL LOCATIONS WHERE ELBOWS ARE REQUIRED (2 FOOT MINIMUM RADIUS ON ALL BENDS).

E. ALL RACEWAYS SHALL BE TERMINATED WITH INSULATING BUSHINGS. ALL RACEWAYS LEFT WITHOUT CABLING SHALL CONTAIN NYLON PULL WIRE.

F. WIRING SHALL BE INSTALLED BY OTHERS.

25. DISCONNECT SWITCHES

A. FURNISH AND INSTALL HEAVY DUTY DISCONNECT SWITCHES AT THE LOCATIONS SHOWN ON THE DRAWINGS.

B. ENCLOSURES SHALL BE NEMA TYPE 1 IN DRY LOCATIONS, AND NEMA TYPE 3R (RAIN-TIGHT) IN DAMP LOCATIONS, WET LOCATIONS, OR WHERE EXPOSED TO WEATHER.

C. CURRENT RATINGS, NUMBER OF POLES, AND ASSOCIATED VOLTAGE SHALL BE AS INDICATED ON THE DRAWINGS.

D. EACH ENCLOSURE SHALL CONTAIN A FACTORY GROUND LUG TO ACCEPT INCOMING AND OUTGOING GROUND CONDUCTORS.

E. SWITCHES SHALL BE ARRANGED FOR CLASS J FUSES OR CONTAIN CLASS R REJECTION CLIPS TO ACCEPT ONLY CURRENT-LIMITING FUSES WHERE FUSED DISCONNECTS ARE SPECIFIED.

F. FURNISH AND INSTALL AN ENGRAVED NAMEPLATE ON FRONT TRIM OF EACH DISCONNECT SWITCH TO IDENTIFY LOAD SERVED. REFER TO EQUIPMENT AND EQUIPMENT IDENTIFICATION SPECIFICATION SECTION FOR REQUIREMENTS.

G. DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE BY EATON, ABB/GE, SIEMENS, OR SQUARE D.

26. FUSES

A. FUSES SHALL NOT BE INSTALLED UNTIL EQUIPMENT IS READY TO BE ENERGIZED. ALL FUSES SHALL BE OF THE SAME MANUFACTURER TO ASSURE COORDINATION.

B. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A COMPLETE SET OF FUSES FOR ALL FUSIBLE EQUIPMENT ON THE JOB. UNLESS OTHERWISE NOTED, ALL FUSES SHALL BE UL LISTED, CURRENT-LIMITING AND HAVE AN INTERRUPTING RATING OF 200,000 RMS AMPERES SYMMETRICAL.

C. ALL FUSES RATED 600 AMPERES OR LESS SHALL BE TIME-DELAY CURRENT-LIMITING UL CLASS J, UNLESS OTHERWISE NOTED. THEY SHALL BE:

(1) BUSSMANN LOW PEAK; LPJ

(2) LITTLEFUSE POWER PRO; JTD

(3) MERSEN AMP-TRAP 2000; AJT

D. INSTALL PROPER SIZE AND PROPER TYPE FUSES IN ALL FUSIBLE EQUIPMENT.

27. EMERGENCY POWER SYSTEM

A. A LABEL READING "CONTAINS EMERGENCY CIRCUITS" SHALL BE INSTALLED ON ALL BOXES AND ENCLOSURES THAT CONTAIN EMERGENCY POWERED CIRCUITS TO COMPLY WITH NEC 700-10.

(1) LABELS SHALL BE INSTALLED ON FRONT COVERS OF ALL PULLBOXES, JUNCTION BOXES AND CONTROL ENCLOSURES.

(2) LABELS SHALL BE INSTALLED ON INTERIOR TRIM OF ALL BRANCH CIRCUIT PANELBOARDS.

28. FIRE ALARM SYSTEM

A. THE ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL, AND PLACE IN OPERATING CONDITION AN ELECTRICALLY-OPERATED, SUPERVISED, AUTOMATED FIRE DETECTION ALARM SYSTEM AS DESCRIBED IN THESE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS. EQUIPMENT PROVIDED UNDER THIS SPECIFICATION SHALL INCLUDE ALL DEVICES REQUIRED TO PROVIDE A COMPLETELY OPERABLE SYSTEM.

B. THE SYSTEM FURNISHED UNDER THIS SPECIFICATION SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF THE FOLLOWING STANDARDS AND CODES:

(1) NFPA 70, NATIONAL ELECTRICAL CODE

(2) NFPA 72, NATIONAL FIRE ALARM CODE

(3) STATE CODES

(4) LOCAL CODES

(5) SYSTEM SHALL BE UL LISTED

C. THE EQUIPMENT SHALL BE AS MANUFACTURED BY SIMPLEX GRINNELL, NOTIFIER, EDWARDS EST, OR SIEMENS.

D. THE EQUIPMENT MANUFACTURER SHALL HAVE A LOCAL BRANCH OFFICE STAFFED WITH TRAINED, FULL-TIME EMPLOYEES WHO ARE CAPABLE OF PERFORMING TESTING, INSPECTION, REPAIR, AND MAINTENANCE SERVICE FOR THE FIRE DETECTION SYSTEM.

E. ALL COMPONENTS, PARTS AND ASSEMBLIES SUPPLIED BY THE MANUFACTURER SHALL BE GUARANTEED AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF 12 MONTHS. WARRANTY SERVICE SHALL BE PROVIDED BY A TRAINED SPECIALIST OF THE EQUIPMENT MANUFACTURER. THE SPECIALIST SHALL BE BASED IN A FULLY STAFFED BRANCH OFFICE LOCATED WITHIN A REASONABLE DISTANCE FROM THE JOB SITE.

F. PRIOR TO INSTALLATION OF ANY EQUIPMENT OR RACEWAYS, SUBMIT SHOP DRAWINGS FOR APPROVAL. DRAWINGS SHALL INCLUDE:

(1) EQUIPMENT BROCHURE WITH SPECIFICATION SHEETS INCLUDING CUSTOM LABELING DESIGNATION.

(2) DEVICE WIRING DIAGRAMS WITH REQUIRED COLOR CODING NOTED.

(3) FLOOR PLANS WITH WIRING, DEVICE ADDRESSES AND SYMBOL SCHEDULE.

(4) RISER DIAGRAMS WITH WIRE FILL NOTED.

(5) BATTERY CALCULATIONS (PER NFPA 72) AND A LISTING OF SPARE CAPACITY ON EACH POWER SUPPLY IN THE SYSTEM UNDER NORMAL AND ALARM CONDITIONS.

(6) COMPLETE DESCRIPTION OF SYSTEM OPERATION.

(7) LISTING OF ALL MATERIALS FURNISHED WITH THE SYSTEM.

(8) FIRE ALARM EQUIPMENT SUPPLIER SHALL SUBMIT APPROVED SHOP DRAWINGS TO BUILDING DEPARTMENT FOR PLAN REVIEW AND PERMITTING.

G. PROVIDE ON-SITE TRAINING FOR MINIMUM OF FOUR (4) PERSONS ON SYSTEM OPERATION AND SYSTEM RESET. THIS TRAINING SHALL INCLUDE A MINIMUM OF FOUR (4) HOURS DEDICATED INSTRUCTOR TIME.

(1) EQUIPMENT SUPPLIER SHALL BE RESPONSIBLE FOR THE INITIAL PROGRAMMING REQUIRED TO MAKE THE SYSTEM PERFORM AS OUTLINED UNDER SYSTEM OPERATION OF THIS SPECIFICATION.

(2) CUSTOM LABEL MESSAGES FOR THE INDIVIDUAL ZONES SHALL BE DEFINED BY THE OWNER AN SHALL BE PROGRAMMED BY THE SUPPLIER. THE OWNER RESERVES THE RIGHT TO REQUEST MINOR CHANGES IN THE OPERATION WITHOUT INCURRING ADDITIONAL EXPENSE.

(3) COMPLETE DOCUMENTATION OF THE SYSTEM PROGRAMMING SHALL BE FURNISHED TO THE OWNER PRIOR TO FINAL ACCEPTANCE.

H. SYSTEM OPERATION

(1) UPON ACTUATION OF ANY ALARM INITIATION DEVICE (MANUAL STATION, CEILING OR DUCT SMOKE DETECTOR, WATERFLOW SWITCH, OR FIRE SUPPRESSION PANEL), THE FOLLOWING DESCRIBED EVENTS SHALL OCCUR:

(A) DISPLAY THE ALARM CONDITION AND SOUND THE AUDIBLE TONE AT THE CONTROL PANEL.

(B) DISPLAY THE ALARM CONDITION AND SOUND THE AUDIBLE TONE AT ALL ANNUNCIATORS.

(C) ALERT THE OWNER SELECTED CENTRAL STATION OR LOCAL FIRE DEPARTMENT SERVICE UTILIZING HARDWARE IN THE CONTROL PANEL.

(D) AUDIO/VISUAL DEVICES SHALL ACTIVATE SOUND AND SYNCHRONIZED FLASH OF STROBES. SOUND MAY BE SILENCED WHILE THE VISUAL INDICATOR SHALL REMAIN FLASHING UNTIL THE SYSTEM IS RESET.

(E) THE AIR HANDLING UNIT SHALL BE SHUT DOWN (DUCT DETECTOR ALARM ONLY).

(2) UPON ACTIVATION OF THE ELEVATOR EQUIPMENT ROOM SMOKE DETECTOR, ELEVATOR LOBBY SMOKE DETECTOR, OR ELEVATOR SHAFT SMOKE DETECTOR, THE FIRE ALARM SYSTEM SHALL SEND THE ASSOCIATED ELEVATOR TO THE MAIN EGRESS LEVEL. IN THE EVENT THAT THE ELEVATOR LOBBY SMOKE DETECTOR ON THE MAIN EGRESS LEVEL IS ACTIVATED, THE ELEVATOR SHALL BE SENT TO AN ALTERNATE FLOOR AS DESIGNATED BY THE OWNER.

(3) UPON ACTIVATION OF THE ELEVATOR EQUIPMENT ROOM HEAT DETECTORS THE ELEVATOR SHUNT TRIP MECHANISM SHALL BE ACTIVATED AND SHUNT TRIP ALL ELEVATOR EQUIPMENT.

(4) UPON ACTUATION OF VALVE SUPERVISORY SWITCH THE FOLLOWING DESCRIBED EVENTS SHALL OCCUR:

(A) ILLUMINATE THE APPROPRIATE ZONE LED TO INDICATE THE TROUBLE CONDITION ON THE CPU.

(B) THE CPU SHALL SOUND AND DISPLAY THE TROUBLE CONDITION.

(5) THE AUDIO DEVICES SHALL BE SILENCED BY THE ALARM SILENCE SWITCH. THE VISUAL DEVICE SHALL CONTINUE TO STROBE UNTIL THE SYSTEM IS RESET.

(6) THE FIRE ALARM SYSTEM SHALL ALLOW FOR LOADING AND EDITING SPECIAL INSTRUCTIONS AND OPERATING SEQUENCES AS REQUIRED. THE SYSTEM SHALL BE CAPABLE OF ON-SITE PROGRAMMING TO ACCOMMODATE SYSTEMS EXPANSION AND FACILITATE CHANGES IN OPERATION. ALL SOFTWARE OPERATIONS SHALL BE STORED IN A NON-VOLATILE PROGRAMMABLE MEMORY WITHIN THE FIRE ALARM CONTROL PANEL. LOSS OF PRIMARY AND SECONDARY POWER SHALL NOT ERASE THE INSTRUCTIONS STORED IN MEMORY. FULL FLEXIBILITY FOR SELECTIVE INPUT/OUTPUT CONTROL FUNCTIONS BASED ON ANDING, ORING, NOTING, TIMING AND SPECIAL CODED OPERATIONS SHALL ALSO BE INCORPORATED IN THE RESIDENT SOFTWARE PROGRAMMING OF THE SYSTEM.

(7) THE SYSTEM SHALL HAVE THE CAPABILITY OF RECALLING ALARMS AND TROUBLE CONDITIONS IN CHRONOLOGICAL ORDER FOR THE PURPOSE OF RECREATING AN EVENT HISTORY.

(8) WHEN THE SYSTEM IS OPERATING ON BATTERY POWER, A TROUBLE CONDITION SHALL BE GENERATED AFTER POWER OUTAGE EXCEEDS 15 SECONDS. WHEN AC POWER IS RESTORED, THE SYSTEM SHALL REVERT TO THE 120 VAC, 60 HZ SUPPLY WITHOUT ANY MANUAL RESTART PROCEDURES.

(9) THE SYSTEM SHALL DETECT FAULTS IN THE WIRING AND POWER LOSS. UPON DETECTION OF THESE CONDITIONS, A LOCAL ALARM AND INDICATION LIGHT SHALL OPERATE AT THE FIRE ALARM PANEL AND ALSO AT THE REMOTE ANNUNCIATOR.

(10) THE SYSTEM SHALL CONTAIN INDEPENDENTLY SUPERVISED INITIATION CIRCUITS AND INDIVIDUALLY ADDRESSABLE DEVICES. THE ALARM ACTIVATION OF ANY INITIATING CIRCUIT SHALL NOT PREVENT THE SUBSEQUENT ALARM OPERATION OF ANY OTHER INITIATION CIRCUIT.

(11) AUXILIARY MANUAL CONTROLS SHALL BE SUPERVISED SO THAT AN "OFF NORMAL" POSITION OF ANY SWITCH SHALL CAUSE A SYSTEM TROUBLE.

(12) EACH INDEPENDENTLY SUPERVISED CIRCUIT SHALL INCLUDE A DISCRETE LCD READOUT TO INDICATE DISARRANGEMENT CONDITION PER CIRCUIT.

(13) THE SYSTEM BATTERIES SHALL BE SUPERVISED SO THAT A LOW BATTERY CONDITION OR DISCONNECTION OF THE BATTERY SHALL BE AUDIBLY AND VISUALLY INDICATED AT THE CONTROL PANEL AND THE REMOTE ANNUNCIATOR.

(14) ALL SYSTEM CONTROL AND MONITOR MODULES SHALL BE ELECTRICALLY SUPERVISED FOR MODULE PLACEMENT. SHOULD A MODULE BECOME DISCONNECTED THE SYSTEM TROUBLE INDICATOR SHALL ILLUMINATE AND THE AUDIBLE TROUBLE SIGNAL MUST SOUND.

(15) THE SYSTEM SHALL HAVE PROVISIONS FOR DISABLING AND ENABLING ALL CIRCUITS INDIVIDUALLY FOR MAINTENANCE OR TESTING PURPOSES.

(16) SYSTEM RESET

(A) THE "SYSTEM RESET" BUTTON SHALL BE USED TO RETURN THE SYSTEM TO ITS NORMAL STATE AFTER AN ALARM CONDITION HAS BEEN REMEDIED. PRINTED MESSAGES SHALL PROVIDE OPERATOR ASSURANCE OF THE SEQUENTIAL STEPS (I.E.: "IN PROGRESS", "RESET COMPLETED", AND "SYSTEM NORMAL") AS THEY OCCUR, SHOULD ALL ALARM CONDITIONS BE CLEARED.

(B) SHOULD AN ALARM CONDITION CONTINUE TO EXIST, THE SYSTEM WILL REMAIN IN AN ABNORMAL STATE. SYSTEM CONTROL RELAYS SHALL NOT RESET. THE PANEL PRIORITY ALARM LED SHALL REMAIN ON. THESE POINTS WILL NOT REQUIRE ACKNOWLEDGMENT IF THEY WERE PREVIOUSLY ACKNOWLEDGED.

I. ADDRESSABLE SMOKE DETECTORS SHALL HAVE AN ANALOG ADDRESSABLE BASE WITH LED INDICATOR AND PHOTOELECTRIC HEAD. SIMPLEX #4098 SERIES, NOTIFIER #FSP-851/B210LP, EST #SIGA-PS, SIEMENS #FDO SERIES.

J. AUDIO/VISUAL DEVICES SHALL BE 24VDC HORN, AND XENON STROBE WITH CLEAR LENS AND RED "FIRE" LETTERING, 2-WIRE DEVICE, AND SURFACE MOUNTING WHERE REQUIRED. SIMPLEX #4906 SERIES, NOTIFIER #P2W/P2WH, EST #GENESIS SERIES, SIEMENS #ZH-MC-R. PROVIDE SURFACE BACK BOX AND MOUNTING PLATE PER MANUFACTURER WHERE REQUIRED.

K. VISUAL ONLY DEVICES SHALL BE 24VDC XENON STROBE WITH CLEAR LENS AND RED "FIRE" LETTERING, 2-WIRE DEVICE, AND SURFACE MOUNTING WHERE REQUIRED. SIMPLEX #4906 SERIES, NOTIFIER #SW, EST #GENESIS SERIES, SIEMENS #ZR-MC-R. PROVIDE SURFACE BACK BOX AND MOUNTING PLATE PER MANUFACTURER WHERE REQUIRED.

L. ADDRESSABLE CONTROL MODULES SHALL CONTAIN TWO FORM C CONTACTS, RATED AT 2 AMPS, 120 VOLT. SIMPLEX #4090-9002, NOTIFIER #FRM-1, EST #SIGA-CR SERIES, SIEMENS #HTRI-R.

M. INSTALLATION

(1) THE CONTRACTOR IS RESPONSIBLE FOR ASSURING THAT CONDUIT SIZE AND WIRE QUANTITY, SIZE, AND TYPE IS SUITABLE FOR THE EQUIPMENT SUPPLIED. EQUIPMENT INSTALLATION AND WIRING SHALL BE AS DESCRIBED ABOVE, AS SHOWN ON THE DRAWINGS, AND IN ACCORDANCE WITH DETAILED INFORMATION FURNISHED BY THE EQUIPMENT MANUFACTURER. THE MANUFACTURER SHALL MAINTAIN A FULL-TIME SERVICE ORGANIZATION AND SHALL SUPERVISE FINAL CONNECTIONS OF THE WIRING AT THE CONTROL EQUIPMENT.

(2) JUNCTION BOXES SHALL BE PRE-PAINTED RED, SPRAY PAINTED RED, OR IDENTIFIED WITH RED COLORED STICK-ON LABELS.

(3) WIRING SHALL BE COLOR-CODED THROUGHOUT AND TEST FREE AND CLEAR OF OPENS, GROUNDS, AND CROSSES BETWEEN CONDUCTORS. COLOR CODING SHALL BE AS DIRECTED BY THE FIRE ALARM SUPPLIER.

(4) FIRE ALARM DEVICES SHALL BE LABELED WITH ASSOCIATED ADDRESSABLE ADDRESS. MONITOR AND CONTROL RELAYS SHALL ALSO HAVE A DESCRIPTION OF ASSOCIATED FUNCTION.

N. TESTING

(1) WIRING SHALL BE CHECKED AND TESTED BY THE CONTRACTOR IN ACCORDANCE WITH INSTRUCTIONS PROVIDED BY THE MANUFACTURER TO INSURE THAT THE SYSTEM IS FREE OF GROUNDS, SHORTS, OPENS, AND THAT THE INSULATION RESISTANCE BETWEEN CURRENT CARRYING CONDUCTORS IS 10 MEGAOHMS OR GREATER.

(2) UPON COMPLETION, THE CONTRACTOR SHALL CONDUCT A TOTAL SYSTEM TEST FOR THE OWNER. AT MINIMUM, THIS TEST SHALL INCLUDE:

(A) OPERATING ALL INITIATING DEVICES

(B) VERIFYING LINE SUPERVISION OF EACH INITIATING CIRCUIT

(C) VERIFYING ALL CONTROL PANEL FUNCTIONS

(D) VERIFYING COMPLETE SYSTEM OPERATION

(3) A FACTORY-TRAINED TECHNICIAN SHALL PERFORM ALL NECESSARY TESTS AND ADJUSTMENTS, AND SHALL THEN FILE A LETTER OF CERTIFICATION WITH THE OWNER INDICATING THAT THE SYSTEM FUNCTIONS AND CONFORMS TO PRESCRIBED STANDARDS.

(4) AS-BUILT DRAWINGS SHALL INCLUDE

(A) ADDRESSABLE DEVICE ADDRESSES.

(B) OPERATIONAL SYSTEM MATRIX IDENTIFYING EXISTING INITIATION, NOTIFICATION, ALARM, TROUBLE, HVAC SHUTDOWN, SMOKE EVACUATION, ELEVATOR CAPTURE, AND CENTRAL STATION OUTPUT PROGRAMMING.

29. ACCEPTANCE TESTING

A. IT IS THE PURPOSE OF THESE SPECIFICATIONS TO ASSURE THAT ALL TESTED ELECTRICAL EQUIPMENT, BOTH CONTRACTOR AND OWNER SUPPLIED, IS OPERATIONAL AND WITHIN INDUSTRY AND MANUFACTURERS TOLERANCES AND IS INSTALLED IN ACCORDANCE WITH DESIGN SPECIFICATIONS.

B. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXECUTION, COORDINATION, AND SUPERVISION OF ALL TESTING WORK REQUIRED BY THESE SPECIFICATIONS AND THE AUTHORITIES HAVING JURISDICTION.

C. TESTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING AGENCY AS A SUB-CONTRACTOR TO THE ELECTRICAL CONTRACTOR.

(1) THE ELECTRICAL CONTRACTOR SHALL COORDINATE AND SCHEDULE ALL WORK TO BE PERFORMED BY THE TESTING SUB-CONTRACTOR.

(2) THE ELECTRICAL CONTRACTOR SHALL SUPPLY TO THE TESTING ORGANIZATION COMPLETE SETS OF APPROVED SHOP DRAWINGS, COORDINATION STUDY, SETTINGS OF ALL ADJUSTABLE DEVICES, AND OTHER INFORMATION NECESSARY FOR AN ACCURATE INSPECTION AND EVALUATION OF THE SYSTEM PRIOR TO THE PERFORMANCE OF ANY TESTS.

D. CODES AND STANDARDS

(1) INTERNATIONAL ELECTRICAL TESTING ASSOCIATION - ACCEPTANCE TESTING SPECIFICATIONS FOR ELECTRICAL POWER DISTRIBUTION EQUIPMENT AND SYSTEMS, LATEST REVISION.

(2) ALL INSPECTIONS AND TESTS SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS INCLUDING NEC, ANSI, IEEE, NFPA, NEMA, AND OSHA.

(3) EQUIPMENT CALIBRATION PROGRAM SHALL CONFORM WITH THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST).

(4) ALL TESTS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL ELECTRICAL TESTING ASSOCIATION'S (NETA) ACCEPTANCE TESTING SPECIFICATION FOR ELECTRICAL POWER DISTRIBUTION EQUIPMENT AND SYSTEMS.

E. QUALIFICATIONS

(1) THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A QUALIFIED INDEPENDENT TESTING ORGANIZATION TO PROVIDE FINAL INSPECTION, TESTING, CALIBRATION, AND ADJUSTING ON THE ELECTRICAL DISTRIBUTION SYSTEM AS DEFINED IN THIS SPECIFICATION.

(2) THE INDEPENDENT TESTING ORGANIZATION SHALL HAVE BEEN ENGAGED IN FULL PRACTICE FOR A MINIMUM OF FIVE YEARS. THE ORGANIZATION SHALL BE CORPORATELY AND FINANCIALLY INDEPENDENT OF THE SUPPLIER, PRODUCER, OR INSTALLER OF THE EQUIPMENT TO BE TESTED.

(3) ELECTRICAL TESTING SHALL BE PERFORMED BY ELECTRICAL TESTING SERVICES (440-327-0078), GREAT LAKES TESTING (440-951-5890), HIGH VOLTAGE MAINTENANCE CORPORATION (440-951-8326), ELECTRIC POWER SYSTEMS (330-460-3706), INDEPENDENT TESTING AND MAINTENANCE (330-753-1422), OR OTHER TESTING AGENCY APPROVED BY THE ENGINEER.

F. SUBMITTALS

(1) THE ELECTRICAL CONTRACTOR AND TESTING SUB-CONTRACTOR SHALL SUBMIT FOR APPROVAL AN ACCEPTANCE TEST PROCEDURE FOR EACH ITEM OF ELECTRICAL DISTRIBUTION EQUIPMENT TO BE TESTED ON THIS PROJECT. TEST PROCEDURES SHALL INCLUDE THE PROPOSED SYSTEM FUNCTION TEST. NO TESTING SHALL BE PERFORMED UNTIL THE TEST PROCEDURES HAVE BEEN APPROVED BY THE ELECTRICAL ENGINEER.

(2) WHERE COORDINATION STUDY SETTINGS ARE IMPLEMENTED, PICTURES SHALL BE SUBMITTED TO THE ELECTRICAL ENGINEER FOR VERIFICATION. PHOTOS SHALL CLEARLY IDENTIFY THE DEVICE, LOCATION, AND AS-LEFT SETTINGS. FOR DEVICES THAT CONTAIN COMPLICATED PROGRAMMABLE LOGIC, A SETTINGS FILE SHALL BE SUBMITTED IN THE DEFAULT FORMAT TOGETHER WITH AN EXPORT OF THE ASSOCIATED SETTINGS IN ADOBE ACROBAT (PDF) FORMAT.

G. VISUAL INSPECTION

(1) AN ON-SITE VISUAL INSPECTION OF THE INSTALLED EQUIPMENT SHALL BE PERFORMED BY THE TESTING SUB-CONTRACTOR TO VERIFY THAT THE DISTRIBUTION EQUIPMENT INSTALLED AND TO BE TESTED IS THE EQUIPMENT DENOTED ON THE APPROVED SHOP DRAWINGS. THE INSPECTION SHALL CHECK THE EQUIPMENT DESIGNATIONS, DEVICE CHARACTERISTICS, SPECIAL INSTALLATION REQUIREMENTS, APPLICABLE CODES, AND STANDARDS.

(2) AFTER COMPLETION OF THE VISUAL INSPECTION, A LETTER SHALL BE FILED TO THE ARCHITECT STATING ANY DISCREPANCIES THAT WERE FOUND.

H. ACCEPTANCE TESTING GUIDELINES

(1) SWITCHBOARDS: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.1 OF NETA ATS.

(2) DRY-TYPE TRANSFORMERS, 600 VOLTS AND BELOW: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.2.1.1 OF NETA ATS.

(3) SWITCHES:

(A) MEDIUM VOLTAGE AIR SWITCHES: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.5.1.2 OF NETA ATS.

(5) CIRCUIT BREAKERS

(A) LOW VOLTAGE, INSULATED CASE/MOLDED CASE BREAKERS, 100 AMP TRIP AND LARGER: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.6.1.1 OF NETA ATS.

(B) LOW VOLTAGE, POWER OPERATED BREAKERS: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.6.1.2 OF NETA ATS.

(C) MEDIUM VOLTAGE, AIR BREAKERS: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.6.1.3 OF NETA ATS.

(D) MEDIUM VOLTAGE, VACUUM BREAKERS: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.6.3 OF NETA ATS.

(E) MEDIUM VOLTAGE, SF6 INSULATED BREAKERS: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.6.4 OF NETA ATS.

(6) PROTECTIVE RELAYS: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.9 OF NETA ATS.

(7) INSTRUMENT TRANSFORMERS: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.10 OF NETA ATS.

(8) METERING: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.11 OF NETA ATS.

(9) MOTOR CONTROL EQUIPMENT, LOW VOLTAGE: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.16.1.1 AND 7.16.2.1 OF NETA ATS

(10) SYSTEM FUNCTION TESTS: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 8 OF NETA ATS.

(11) CABLES:

(A) LOW VOLTAGE FEEDERS #2 AND LARGER, 600 VOLTS AND BELOW: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.3.2 OF NETA ATS.

(B) MEDIUM/HIGH VOLTAGE CABLES: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.3.3 OF NETA ATS.

(12) GROUNDING SYSTEMS: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.13 OF NETA ATS.

(13) GROUND FAULT PROTECTION SYSTEMS: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.14 OF NETA ATS.

(14) MOTORS 10 HP AND LARGER: PERFORM ALL TESTS, INCLUDING ALL OPTIONAL TESTS, LISTED IN SECTION 7.15.1.1 OF NETA ATS.

I. DOCUMENTATION

(1) THREE BOUND COPIES OF THE CERTIFIED TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER AT THE COMPLETION OF THE PROJECT.

(2) THE FINAL REPORT SHALL BE SIGNED AND SHALL INCLUDE THE FOLLOWING INFORMATION:

(A) SUMMARY OF THE PROJECT

(B) DESCRIPTION OF EQUIPMENT TESTED

(C) VISUAL INSPECTION REPORT

(D) DESCRIPTION OF TESTS

(E) TEST RESULTS

(F) CONCLUSIONS AND RECOMMENDATIONS

(G) APPENDIX INCLUDING APPROPRIATE TEST FORMS

(H) IDENTIFICATION OF TEST EQUIPMENT USED

STATE OF MISSOURI
JONATHAN J. JENNINGS
NUMBER
PE-2023000149
PROFESSIONAL ENGINEER
08-15-25

SEAL

FOUNDATION
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PROJECT:

TENANT IMPROVEMENTS FOR:
SONNY'S
2201 NE TOWN CENTRE BOULEVARD
LEE'S SUMMIT, MISSOURI 64064

MARK:	ISSUE:	DATE:
	ISSUED	08/15/2025

PROJECT #: 016-0402

DRAWN BY: PTA INC
CHECKED BY: J.J.J.

DRAWING TITLE:

ELECTRICAL SPECIFICATIONS

SHEET #:

E3.01