ELECTRICAL SYMBOL LEGEND

LINE WEIGHT & LINE TYPE DESIGNATIONS

SYMBOL	DESCRIPTION	REMARKS
	EXISTING (UNLESS OTHERWISE INDICATED)	
	PROVIDE AS NEW (UNLESS OTHERWISE INDICATED)	

BASIC DRAWING

SYMBOL	DESCRIPTION	REMARKS
(#)	KEYED DRAWING NOTE	
	REMOVALS	
	CIRCUIT	

ONE-LINE/RISER

SYMBOL	DESCRIPTION	REMARKS
	CIRCUIT BREAKER	
	FUSE	
	DISCONNECT SWITCH (NON-FUSED)	
	DISCONNECT SWITCH (FUSED)	
	TRANSFER SWITCH	
	TRANSFORMER	
	PANELBOARD	
M	METER (SELF CONTAINED)	
CT M	METER (WITH CURRENT TRANSFORMERS)	
#	MOTOR (NUMBER INDICATES HORSEPOWER)	
G	GENERATOR	
	GROUND CONNECTION	
	CONTINUATION	

POWER - DISTRIBUTION

SYMBOL	DESCRIPTION	REMARKS
	PANELBOARD (FLUSH-MOUNTED)	
	PANELBOARD (SURFACE-MOUNTED)	
T	TRANSFORMER	
	DISCONNECT SWITCH (NON-FUSED)	
	DISCONNECT SWITCH (FUSED)	
	COMBINATION MAGNETIC MOTOR STARTER/DISCONNECT	
VFD	VARIABLE FREQUENCY DRIVE (VFD)	
M	MOTOR	
	HARD-WIRED EQUIPMENT CONNECTION	
G	GENERATOR	
	GROUND ROD	

POWER - BRANCH DEVICES

SYMBOL	DESCRIPTION	REMARKS
	SIMPLEX RECEPTACLE	MOUNT AT 18" AFF, UNO
	DUPLEX RECEPTACLE	MOUNT AT 18" AFF, UNO
	DUPLEX RECEPTACLE	MOUNT ABOVE COUNTER, UNO MOUNT HORIZONTAL FOR ADA
C	DUPLEX CONTROLLED RECEPTACLE	MOUNT AT 18" AFF, UNO
	TWO DUPLEX RECEPTACLES MOUNTED IN COMMON BOX	MOUNT AT 18" AFF, UNO
	SPECIAL PURPOSE RECEPTACLE, SUBSCRIPT INDICATES TYPE	MOUNT AT 18" AFF, UNO
J J	JUNCTION BOX OR OUTLET BOX	
	RECEPTACLE(S) IN RECESSED FLOOR BOX	
	CEILING MOUNTED RECEPTACLE(S)	

TELEPHONE/DATA/COMMUNICATION

SCOPE OF WORK SHALL BE RACEWAY ONLY. FOR EACH WALL DEVICE LOCATION, PROVIDE RECESSED WALL-BOX AND 1" CONDUIT STUB WITH PULL STRING TO ACCESSIBLE ABOVE CEILING SPACE. FOR EACH CEILING DEVICE LOCATION, PROVIDE RECESSED CEILING BOX AND 1" CONDUIT TO NEAREST ACCESSIBLE ABOVE-CEILING SPACE. DEVICES, CABLING, EQUIPMENT, ETC. PROVIDED BY OTHERS.

SYMBOL	DESCRIPTION	REMARKS
#D ▽	DATA OUTLET. #D SUBSCRIPT INDICATE NUMBER OF DATA AND TELEPHONE JACKS. IF NO SUBSCRIPTS ARE GIVEN, PROVIDE BLANK COVERPLATE.	MOUNT AT 18" AFF, UNO
#V ▼	TELEPHONE OUTLET. #V SUBSCRIPT INDICATE NUMBER OF DATA AND TELEPHONE JACKS. IF NO SUBSCRIPTS ARE GIVEN, PROVIDE BLANK COVERPLATE.	MOUNT AT 18" AFF, UNO
#D#V ▼	TELEPHONE/DATA OUTLET. #D #V SUBSCRIPT INDICATE NUMBER OF DATA AND TELEPHONE JACKS. IF NO SUBSCRIPTS ARE GIVEN, PROVIDE BLANK COVERPLATE.	MOUNT AT 18" AFF, UNO
W	WIRELESS ACCESS POINT	
DR	DATA RACK (REFER TO RISER, AND/OR SPECIFICATIONS FOR TYPE)	
TV	CABLE TELEVISION OUTLET	MOUNT AT 18" AFF, UNO
	PUSHBUTTON (SUBSCRIPT INDICATES TYPE) EPO - EMERGENCY POWER OFF DB - DOOR BELL HC - DOOR OPENER	MOUNT AT 46" AFF, UNO
AD	AUDIBLE/VISUAL DOORBELL CHIME	MOUNTING HEIGHT PER ADA

LIGHTING (LETTER INDICATES TYPE, REFER TO LIGHT FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION)

SYMBOL	DESCRIPTION	REMARKS
	LIGHT FIXTURE	WALL MOUNTED
	EMERGENCY LIGHT FIXTURE	WALL MOUNTED
	LIGHT FIXTURE	CEILING MOUNTED
	EMERGENCY LIGHT FIXTURE	CEILING MOUNTED
	LIGHT FIXTURE	CEILING MOUNTED
	EMERGENCY LIGHT FIXTURE	CEILING MOUNTED
	LIGHT FIXTURE	WALL MOUNTED
	EMERGENCY LIGHT FIXTURE	WALL MOUNTED
	STRIP LIGHT FIXTURE	CEILING MOUNTED
	EXIT LIGHT (HATCHING/ARROW INDICATES FACE/DIRECTION)	CEILING MOUNTED
	EXIT LIGHT (HATCHING/ARROW INDICATES FACE/DIRECTION)	WALL MOUNTED
	EMERGENCY BATTERY PACK LIGHT FIXTURE	WALL MOUNTED
S	SINGLE POLE SWITCH; T- 208V, 1 PHASE DISC. SWITCH.	MOUNT AT 48" AFF, UNO
S_3	SINGLE POLE SWITCH (3-WAY)	MOUNT AT 48" AFF, UNO
S_4	SINGLE POLE SWITCH (4-WAY)	MOUNT AT 48" AFF, UNO
S_D	SINGLE POLE SWITCH (DIMMER)	MOUNT AT 48" AFF, UNO
OS	OCCUPANCY SENSOR/WALL SWITCH (SUBSCRIPT INDICATES TYPE)	MOUNT AT 48" AFF, UNO
OS	OCCUPANCY SENSOR (SUBSCRIPT INDICATES TYPE)	CEILING MOUNTED
PC	PHOTOCELL	
TC	TIME CLOCK	
	SITE LIGHT FIXTURE	POLE MOUNTED

FIRE ALARM

SYMBOL	DESCRIPTION	REMARKS
FACP	FIRE ALARM CONTROL PANEL	
FAAP	FIRE ALARM REMOTE ANNUNCIATOR	
S	SMOKE DETECTOR	
S_S	SMOKE DETECTOR WITH SOUNDER BASE	
S_V	SMOKE DETECTOR WITH VISUAL BASE	
H	HEAT DETECTOR	
D	DUCT SMOKE DETECTOR	
F	MANUAL PULL STATION	
F	STROBE NOTIFICATION DEVICE	
F	COMBINATION HORN/STROBE NOTIFICATION DEVICE	
F	HORN NOTIFICATION DEVICE	
DH	DOOR HOLD-OPEN DEVICE	
FS	WATER FLOW DETECTION SWITCH	
TS	TAMPER SWITCH	
CM	CONTROL MODULE	
MM	MONITOR MODULE	
SD	SMOKE DAMPER	
PS	PRESSURE SWITCH	
C	CARBON MONOXIDE DETECTOR	
NAC	NOTIFICATION APPLIANCE CIRCUIT EXTENDER PANEL	
KNO	KNOX BOX	

BRANCH CIRCUIT NOTES

1. CIRCUIT NUMBERS ARE FOR REFERENCE ONLY AND INDICATE THE DEVICES REQUIRED TO BE CONNECTED TO DESIGNATED CIRCUITS.
2. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING AND PROVIDING THE ACTUAL NUMBER OF CONDUCTORS REQUIRED FOR ALL BRANCH CIRCUIT WIRING TO SERVE THE INTENDED FUNCTION.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY BALANCING LOADS ON ALL THREE PHASES.
4. ALL BRANCH CIRCUITS SHALL HAVE SEPARATE GROUND WIRE.
5. ALL BRANCH CIRCUITS SHALL HAVE SEPARATE NEUTRAL WIRE.
6. ALL BRANCH CIRCUITS SHALL BE SIZED PER OVERCURRENT PROTECTION RATING AND NEC REQUIREMENTS (INCLUDING NEC CONDUCTOR AMPACITY TABLES, ARTICLE 334.80, AND 338.10(B)(4)).
7. PROVIDE ARC-FAULT CIRCUIT PROTECTION PER NEC ARTICLE 210.12.

GENERAL NOTES

1. THE GENERAL NOTES APPLY TO ALL DRAWINGS UNDER THIS CONTRACT. REFER TO INDIVIDUAL DRAWINGS FOR ADDITIONAL NOTES.
2. ALL ELECTRICAL WORK SHOWN SHALL BE PROVIDED AS NEW UNLESS OTHERWISE NOTED.
3. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. FOLLOW DRAWING IN LAYING OUT WORK AND CHECK DRAWINGS OF OTHER TRADES TO VERIFY SPACE CONDITIONS. MAINTAIN HEADROOM AND SPACE CONDITIONS. BRANCH CIRCUIT NUMBERS ARE FOR REFERENCE ONLY. CONTRACTOR SHALL DETERMINE THE CIRCUIT NUMBERS AND PROVIDE A SCHEDULE IN PANEL IDENTIFYING BRANCH CIRCUITS.
4. JUNCTION AND PULL BOXES SHALL GENERALLY BE LOCATED FOR FLUSH MOUNTING IN FINISHED SPACES. WHERE NECESSARY, CONDUITS SHALL BE REROUTED OR OTHER ARRANGEMENTS MADE FOR CONCEALMENT. PULL BOXES SHALL BE PROVIDED AS INDICATED AND WHEREVER NECESSARY TO FACILITATE PULLING OF WIRE AND COORDINATE LOCATIONS WITH OTHER TRADES. COVERS OF JUNCTION AND PULL BOXES SHALL BE ACCESSIBLE. FOR EMPTY RACEWAY RUNS, PULL BOXES SHALL BE PROVIDED EVERY 100 FEET AND AS INDICATED OR NECESSARY.
5. BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. WALL AND SWITCH OUTLETS SHALL BE ERECTED IN ADVANCE OF FURRING AND FIREPROOFING. BOXES SHALL BE SECURED TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRONS.
6. IN EXISTING BUILDINGS, ALL REQUIRED ACCESS DOORS SHALL BE FURNISHED AND INSTALLED UNDER THE ELECTRICAL SECTION. ALL ACCESS DOOR LOCATIONS SHALL BE FIELD COORDINATED WITH THE OWNER.
7. NO ELECTRICAL RACEWAYS OR CONDUCTORS SHALL BE INSTALLED WITHIN 3 INCHES OF STEAM OR HOT WATER PIPES, OR APPLIANCES, EXCEPT FOR CROSSING WHERE RACEWAYS SHALL BE AT LEAST 1 INCH FROM PIPE COVER.
8. SUFFICIENTLY LONG WIRE SLACK SHALL BE LEFT IN RUNS TO ALLOW FOR MAKING PROPER FINAL CONNECTIONS. ALL EMPTY CONDUITS SHALL BE PROVIDED WITH #12 AWG STEEL DRAG WIRES.
9. REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATION OF ALL HVAC EQUIPMENT. (AC UNITS, FANS, VAV BOXES, ETC).
10. REFER TO PLUMBING DRAWINGS FOR EXACT LOCATION OF ALL PLUMBING EQUIPMENT.
11. ALL WIRING SHALL BE ROUTED IN AN ORGANIZED AND NEAT MANNER.
12. SUBMIT DIMENSIONED LAYOUTS OF ALL ELECTRIC EQUIPMENT WITH EQUIPMENT SUBMITTALS.
13. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL RACEWAYS RUNS WITH EXISTING CONDITIONS AND INCLUDE ALL PULLBOXES, OFFSETS, CUTTING, PATCHING, PAINTING TO MATCH EXISTING, SUPPORTS, ETC. AS REQUIRED.
14. THE ROUTING AND LOCATION OF CONDUIT RUNS ARE GENERALLY NOT DIMENSIONAL ON THE DRAWINGS BUT SHALL BE DETERMINED IN THE FIELD TO SUIT THE LOCATIONS OF EQUIPMENT, TO CONFORM TO STRUCTURAL AND ARCHITECTURAL FEATURES AND TO AVOID INTERFERENCES.
15. ALL CUTTING AND RESTORATION OF SLAB AND FLOOR SHALL BE IN ACCORDANCE WITH STRUCTURAL ENGINEER'S REQUIREMENTS AND AS APPROVED BY ENGINEER.
16. ELECTRICAL CONTRACTOR SHALL VERIFY ALL PENETRATIONS, POKE THRUS, AND EXISTING CONDUIT LOCATIONS PRIOR TO MODIFICATION.
17. ALL SIGHT EXPOSED ELECTRICAL DEVICES SHALL BE LOCATED AS PER ARCHITECT'S DRAWINGS AND/OR DIRECTION.
18. WHERE CONDUIT OR JUNCTION BOXES ARE RUN IN SLAB, THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING, PATCHING, AND RESTORATION OF SLAB AND FLOOR.
19. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL LIGHT FIXTURES, REMOTE BALLASTS AND ASSOCIATED WIRING, SUPPORTS, HARDWARE, AND ACCESSORIES AS REQUIRED.
20. SYMBOLS AND LEGENDS SHOWN ON THIS DRAWING ARE FOR ELECTRICAL DRAWINGS ONLY. SEE ARCHITECTURAL DRAWINGS AND TRADE DRAWINGS FOR RESPECTIVE SYMBOLS AND LEGENDS.
21. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL SLAB CUTS, FOUNDATION WALL PENETRATIONS, WALL OPENINGS, CORE DRILLING, ROOF PENETRATIONS, ETC. AND PATCHING AS REQUIRED TO PROVIDE ALL ELECTRICAL WORK. FOR FOUNDATION WALL PENETRATIONS PROVIDE 4"X4"X3/8" WELDED STEEL ANGLE BY THE CONTRACTOR AND APPROVED BY THE STRUCTURAL ENGINEER AND PROVIDE WATER PROOFING . ALL ROOF, TUNNEL AND FOUNDATION PENETRATIONS SHALL BE WATER PROOFED. COORDINATE WORK SO AS TO MAINTAIN ANY AND ALL WARRANTIES FOR ROOF SYSTEMS, FOUNDATIONS, ETC.
22. ALL TELEPHONE/DATA RACEWAYS SHALL BE PROVIDED WITH INSULATED END BUSHINGS.
23. SEPARATE RACEWAYS SHALL BE PROVIDED FOR CONDUCTORS OF NORMAL AND EMERGENCY CIRCUITS.
24. HORIZONTAL OR CROSS RUNS IN PARTITIONS OR WALLS ARE NOT PERMITTED.
25. THE ELECTRICAL CONTRACTOR SHALL NOT INSTALL MORE THAN THE NUMBER OF CIRCUITS SHOWN IN ANY HOMERUN CIRCUIT.
26. CONTRACTOR TO PROVIDE FIRE PROOFING AT ALL PENETRATIONS OF RATED PARTITIONS, FLOORS, AND WHERE THE EXISTING FIRE PROOFING WAS REMOVED TO EXPOSE EXISTING STEEL FOR NEW HANGER INSTALLATION. REFER TO SPECIFICATION SECTION FIRE PROOFING.
27. LOCATIONS INDICATED FOR LOCAL WALL SWITCHES ARE SUBJECT TO MODIFICATIONS. AT OR NEAR DOORS, INSTALL SWITCH ON SIDE OPPOSITE HINGE (VERIFY FINAL DOOR HINGE LOCATION IN FIELD PRIOR TO SWITCH OUTLET INSTALLATION).
28. EXACT LOCATION OF LIGHTING FIXTURES SHALL BE IN ACCORDANCE WITH ARCHITECTURAL REFLECTED CEILING PLAN OR AS DIRECTED BY THE ARCHITECT.
29. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CEILING WORK WITH CEILING CONTRACTOR AND DETERMINE CEILING TYPE PRIOR TO THE PURCHASING AND INSTALLATION OF LIGHTING FIXTURES, SPEAKERS, SMOKE DETECTORS, EXIT LIGHTS, OR ANY OTHER CEILING MOUNTED ELECTRICAL ELEMENTS. THE ELECTRICAL CONTRACTOR SHALL ALSO COORDINATE ALL ELECTRICAL WORK WITH LOCATION OF DIFFUSERS AND SPRINKLERS AND OTHER MECHANICAL WORK.
30. EXACT LOCATION AND MOUNTING OF LIGHTING FIXTURES IN MECHANICAL AREAS SHALL BE COORDINATED WITH THE MECHANICAL TRADES TO AVOID CONFLICT WITH PIPING, DUCTS AND EQUIPMENT. IN GENERAL, THE FINAL LOCATION OF LIGHTING FIXTURES SHALL BE GOVERNED BY THE NEED OF TASK LIGHTING IN THE VICINITY OF PANEL BOARDS, MOTOR CONTROLS, CONTROL AND INSTRUMENT PANELS AND GAUGES.
31. LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS SHALL BE VERIFIED WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIMS, PANELING, SUSPENDED CEILINGS AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT ANY ADDITIONAL EXPENSE TO THE OWNER.
32. ALL RACEWAYS, WIRING, AND ASSOCIATED ELECTRICAL EQUIPMENT SHALL BE ROUTED CONCEALED EXCEPT IN UNFINISHED AREAS.
33. ALL EQUIPMENT, MATERIALS, ETC. SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL. REFER TO SPECIFICATIONS FOR ADDITIONAL ACTION SUBMITTAL AND SHOP DRAWING REQUIREMENTS.
34. PRIOR TO CONSTRUCTION, COORDINATE WITH LOCAL AHJ THE UL CONDITIONAL LISTING REQUIREMENTS FOR ALL JUNCTIONS BOXES UTILIZED IN RATED WALLS AND CEILINGS.
35. WHERE CONFLICTS EXIST BETWEEN THE INFORMATION INCLUDED IN THESE DRAWINGS OR BETWEEN INFORMATION PROVIDED IN THESE DRAWINGS AND THE PROJECT SPECIFICATIONS OR WITHIN THE PROJECT SPECIFICATIONS, THE MORE STRINGENT AND/OR HIGHEST COST REQUIREMENTS SHALL APPLY. SHOULD THE CONTRACTOR REQUIRE FURTHER CLARIFICATION, AN RFI SHALL BE SUBMITTED FOR CLARIFICATION. WHERE CONFLICTS DO EXIST, THE PROJECT ENGINEER OF RECORD SHALL HAVE THE SOLE DISCRETION AND RIGHT TO PROVIDE INTERPRETATION OF INTENT OF THE CONTRACT DOCUMENTS AS REQUIRED AND THIS INTERPRETATION SHALL SERVE TO DIRECT THE CONTRACTOR IN ACCORDANCE WITH THE IMPLIED INTENT OF THE CONSTRUCTION DOCUMENTS WITHOUT ADDITIONAL COST TO THE PROJECT.
36. ALL VALUE ENGINEERING OR DEVIATIONS FROM THE CONTRACT DOCUMENTS SHALL BE SUBMITTED IN WRITING TO THE DESIGN TEAM FOR APPROVAL. ANY COST INCURRED AS A RESULT OF ANY DEVIATIONS FROM THE BASIS OF DESIGN INDICATED IN THE CONTRACT DOCUMENTS (E.G. ELECTRICAL MODIFICATIONS TO ACCOMMODATE ALTERNATE EQUIPMENT SELECTIONS, DESIGN RELATED EXPENSES FOR REQUIRED DRAWING MODIFICATIONS, ETC)SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NO INCREASE IN CONTRACT COST WILL BE GRANTED UNLESS BORNE BY AND APPROVED IN WRITING BY THE OWNER CONTRACT DOCUMENTS ARE DEFINED TO INCLUDE ALL DISCIPLINES AND DIVISIONS OF THE CONTRACT.

ABBREVIATIONS

A	AMPERE(S)	KAIC	1000 AMPERE INTERRUPTING CAPACITY
AC	ALTERNATING CURRENT		
ADA	AMERICANS WITH DISABILITIES ACT	KCMIL	1000 CIRCULAR MIL(S)
AFCI	ARC-FAULT CIRCUIT INTERRUPTER	KVA	KILOVOLT AMPERE(S)
AFF	ABOVE FINISHED FLOOR	KW	KILOWATT(S)
AFG	ABOVE FINISHED GRADE	LTG	LIGHTING
AHJ	AUTHORITY HAVING JURISDICTION	MC	MECHANICAL CONTRACTOR
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	MCA	MINIMUM CIRCUIT AMPACITY
		MCB	MAIN CIRCUIT BREAKER
ATS	AUTOMATIC TRANSFER SWITCH	MIC	MICROWAVE
AWG	AMERICAN WIRE GUAGE	MISC	MISCELLANEOUS
BLDG	BUILDING	MIN	MINIMUM
C	CONDUIT	MFR	MANUFACTURER
CB/CKT BKR	CIRCUIT BREAKER	MH	MOUNTING HEIGHT
CL	CLOSET	MTD	MOUNTED
CLG	CEILING	N	NEUTRAL
CKT	CIRCUIT	NC	NORMALLY CLOSED
CO	CONDUIT ONLY	NEC	NATIONAL ELECTRIC CODE
CONC	CONCRETE	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
COND	CONDUCTOR		
CONST	CONSTRUCTION	NL	NIGHT LIGHT
CONT	CONTRACT	NO	NORMALLY OPEN
CP	CONTROL PANEL	NTS	NOT TO SCALE
CT	CURRENT TRANSFORMER	P	POLE
CU	COPPER	PB	PULL BOX
DED	DEDICATED	PC	PLUMBING CONTRACTOR
DISC	DISCONNECT	PH/Ø	PHASE
DISH	DISHWASHER	PL	PLUG LOAD
DISP	DISPOSAL	PNL	PANEL
DIV	DIVISION	PRI	PRIMARY
DT	DUAL TECHNOLOGY (IR/US)	PWR	POWER
DWG	DRAWING	QTY	QUANTITY
EA	EACH	REC/RECEPT	RECEPTACLE
EC	ELECTRICAL CONTRACTOR	REF	REFRIGERATOR
ELEC	ELECTRIC	SEC	SECONDARY
EM/EMER	EMERGENCY	SPEC	SPECIFICATION
EX/EXIST	EXISTING	SW	SWITCH
F	FUSE	TEL	TELEPHONE
FA	FIRE ALARM	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
FBO	FURNISHED BY OTHERS		
FDR	FEEDER	TYP	TYPICAL
FL	FLOOR	UG	UNDERGROUND
FLA	FULL LOAD AMPS	UL	UNDERWRITER'S LABORATORIES
FLUOR	FLUORESCENT	UNO	UNLESS NOTED OTHERWISE
FT	FEET	UON	UNLESS OTHERWISE NOTED
G/GND	GROUND	UPS	UNINTERRUPTIBLE POWER SUPPLY
GC	GENERAL CONTRACTOR	US	ULTRASONIC
GFI	GROUND FAULT INTERRUPTER	UV	ULTRAVIOLET
HC	HUNG CEILING	V	VOLT(S)
HOA	HAND-OFF-AUTO SELECTOR SWITCH	VA	VOLTAMPERE(S)
HP	HORSEPOWER	VFD	VARIABLE FREQUENCY DRIVE
IR	INFRARED	W	WATT(S)
JB	JUNCTION BOX	WP	WEATHERPROOF

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PROJECT

7-ELEVEN 42655
CST

1360 NC 24-87, CAMERON NC 28326

DWG. TITLE

GENERAL NOTES, LEGEND, AND ABBREVIATIONS

ISSUE/REVISIONS		
0	06/06/25	ISSUE FOR BID AND PERMIT
DATE		DESCRIPTION

SEAL

6/06/25

NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO JR

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SCALE: 1/4" = 1'-0"	PROJECT No: JAL#25-008
DATE: 6/06/25	FILE NAME:

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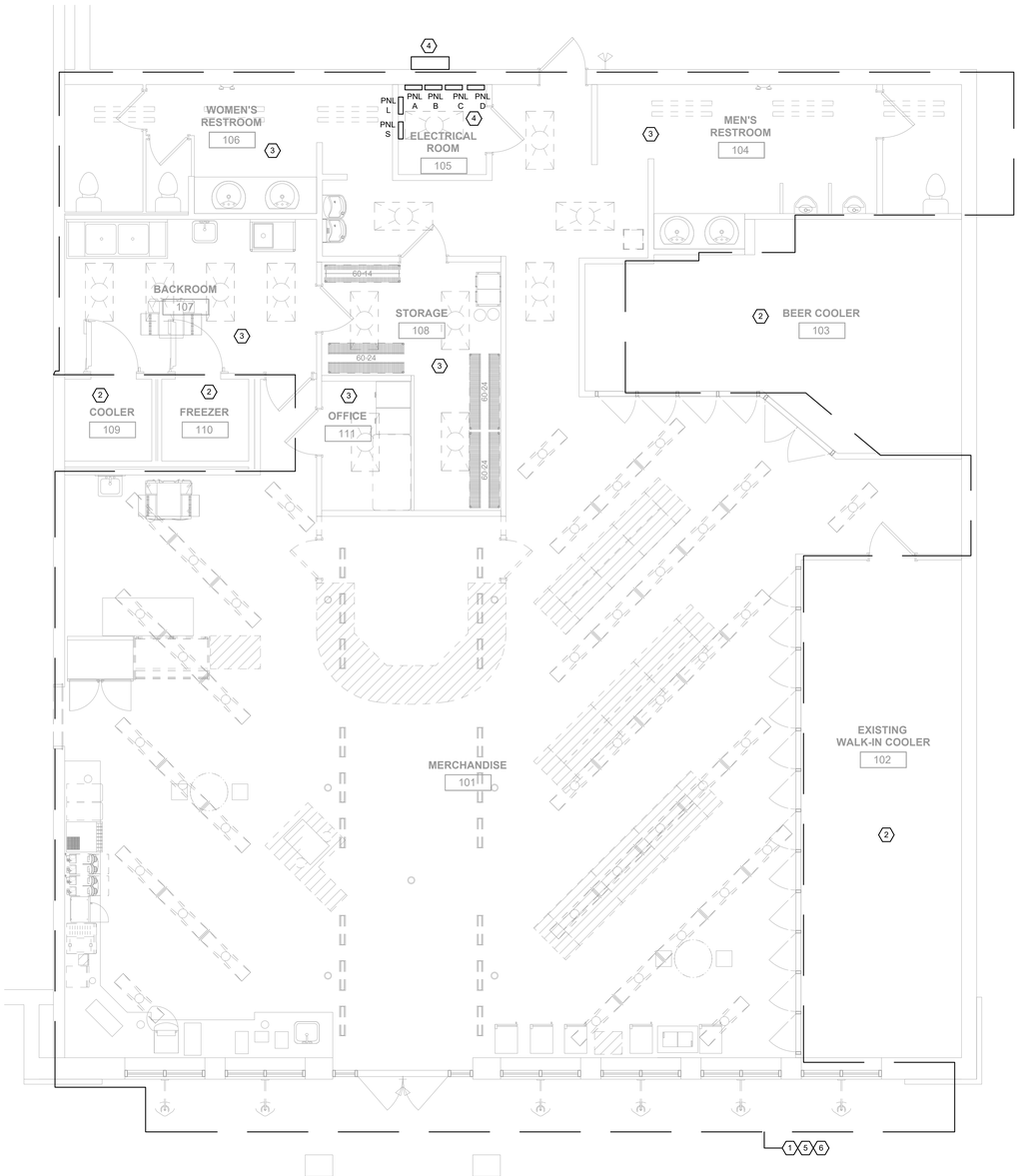

1 ELECTRICAL DEMOLITION PLAN
Scale: 1/4"=1'

DEMO KEYED NOTES

1. ALL DEVICES IN THE DEMOLISHED WALLS AND REMOVED EQUIPMENT DEVICES/CONNECTIONS SHALL BE DISCONNECTED AND REMOVED BACK TO SOURCE, UNLESS OTHERWISE NOTED. ALL DEVICES ON WALLS NOT TO BE DEMOLISHED SHALL BE REUSED WHEN POSSIBLE. 'EX' DENOTES EXISTING TO REMAIN.
2. ALL EXISTING COOLER AND FREEZER EQUIPMENT ARE TO REMAIN, INCLUDING ROOF MOUNTED EQUIPMENT.
3. ELECTRICAL DEVICES IN ROOM ARE EXISTING TO REMAIN.
4. EXISTING ELECTRICAL PANELS TO REMAIN. REFER TO ONE-LINE FOR MORE INFORMATION.
5. CONTRACTOR SHALL PROTECT ALL EXISTING SLAB RUN CONDUITS, EXISTING CEILING DROPS AND BRANCH CIRCUITS ARE PROTECTED DURING DEMOLITION FOR REUSE IS POSSIBLE.
6. EXISTING LIGHTING FIXTURES SHALL BE DISCONNECTED AND REMOVED. SAFE-OFF BRANCH CIRCUITS, SWITCH LEGS AND CONTROLS FOR REUSE, WHERE REQUIRED.

NOTES:

1. REFER TO DWG. E0.1 FOR SYMBOL LIST, NOTES AND ABBREVIATIONS.
2. 'EX' DENOTES EXISTING TO REMAIN. 'ED' DENOTES EXISTING TO BE REMOVED.
3. EXISTING RTU HVAC SYSTEMS ARE TO REMAIN. EXISTING FEEDERS AND CIRCUIT BREAKERS SHALL REMAIN.

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ELECTRICAL DEMOLITION FLOOR PLAN

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NO.	DATE	DESCRIPTION

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NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO, JR

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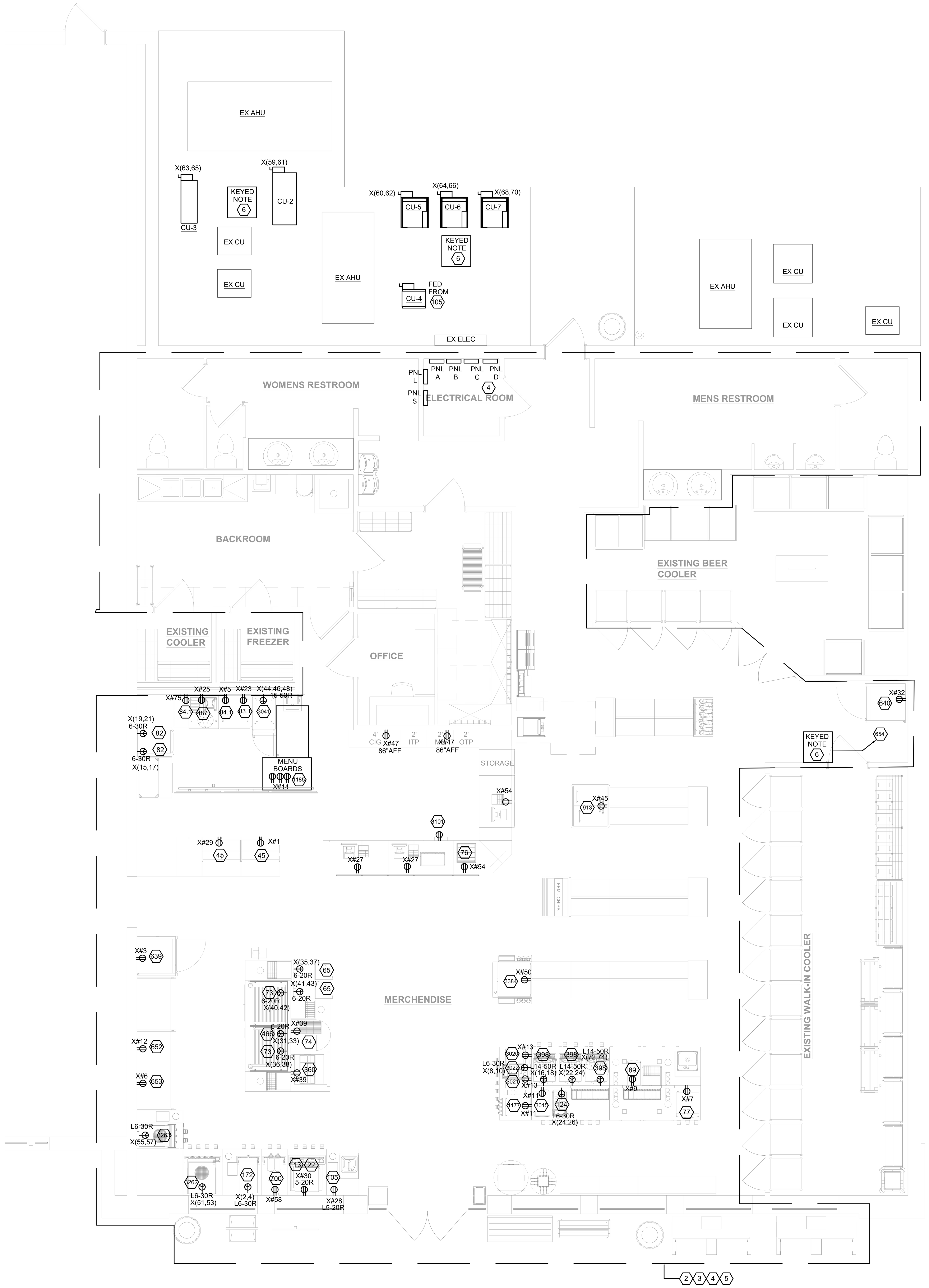

1 ELECTRICAL FLOOR PLAN
Scale: 1/4"=1'

KEYED NOTES

1. EXISTING ELECTRICAL PANELS TO REMAIN. REFER TO ONE-LINE FOR MORE INFORMATION.
2. NEW DEVICES AND EQUIPMENT SHALL BE CONNECTED TO EXISTING BRANCH CIRCUITS CREATED DEMOLITION IN THE EXISTING ELECTRICAL PANELS. CIRCUIT NUMBERS IN PANEL 'X' ARE FOR REFERENCE ONLY AND SHALL BE COORDINATED IN THE FIELD.
3. CONTRACTOR SHALL PROTECT ALL EXISTING SLAB RUN CONDUITS. EXISTING CEILING DROPS AND BRANCH CIRCUITS ARE PROTECTED DURING DEMOLITION FOR REUSE IS POSSIBLE.
4. COORDINATE FINAL EQUIPMENT LOCATIONS IN FIELD.
5. CONTRACTOR SHALL REUSE EXISTING RECEPTACLES AND BRANCH CIRCUITS WERE POSSIBLE, INCLUDING THE BACK OF HOUSE SPACES.
6. REMOTE CONDENSER LOCATED ON GRADE. COORDINATE WITH MECHANICAL CONTRACTOR.

GENERAL NOTES

THE INTENT OF THE PROJECT IS AN ALTERATION TO REPLACE EXISTING LIGHTING FIXTURES, EQUIPMENT AND DEVICES IN A LIMITED AREA OF THE BUILDING AND TO REUSE EXISTING BRANCH CIRCUITS IN THE AREA WHERE POSSIBLE.

NO ADDITIONAL LIGHTING OR DEVICE ELECTRICAL LOAD IS EXPECTED BE ADDED TO THE EXISTING BRANCH CIRCUITS.

LIGHTING FIXTURES ARE TO BE SELECTED BY OWNER/ARCHITECT.

NOTES:

1. REFER TO DWG. E0.1 FOR SYMBOL LIST, NOTES AND ABBREVIATIONS.
2. NEW DEVICES AND EQUIPMENT SHALL BE CONNECTED TO EXISTING BRANCH CIRCUITS CREATED DEMOLITION IN THE EXISTING ELECTRICAL PANELS. CIRCUIT NUMBERS IN PANEL 'X' ARE FOR REFERENCE ONLY AND SHALL BE COORDINATED IN THE FIELD.
3. REFER TO E1.2 AND E1.3 FOR ONE LINE DIAGRAM AND SCHEDULES.
4. EXISTING HVAC SYSTEMS ARE TO REMAIN. EXISTING FEEDERS AND CIRCUIT BREAKERS SHALL REMAIN.
5. CONTRACTOR SHALL REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION AND MOUNTED OF DEVICES.
6. CONTRACTOR SHALL CONFIRM REQUIRED CONNECTIONS AND DEVICES FOR ALL EQUIPMENT PRIOR TO INSTALLATION.
7. CONTRACTOR SHALL CONFIRM QUANTITIES AND EXACT LOCATIONS FOR ALL EQUIPMENT PRIOR TO INSTALLATION.
8. CONTRACTOR SHALL PROTECT ALL EXISTING SLAB RUN CONDUITS, EXISTING CEILING DROPS AND BRANCH CIRCUITS ARE PROTECTED DURING DEMOLITION FOR REUSE IS POSSIBLE.
9. ALL RECEPTACLES SHALL BE GFI PROTECTED WHERE REQUIRED BY NEC 210.
10. ALL EQUIPMENT CONNECTIONS AND EQUIPMENT RECEPTACLES SHALL BE GFI PROTECTED WHERE REQUIRED.

REFRIGERATION REMOTE CONDENSING UNIT SCHEDULE

TAG	QTY	ORACLE	MFR	MODEL	SUPPLIER	SUPPLIER PART NUMBER	SERVICE	ELECTRICAL V/PH	ELECTRICAL MCA	ELECTRICAL MOCP	WEIGHT (LBS)	FURNISH BY	INSTALL BY
CU-2	1	03309785	FBD	FBD-DRC	FBD PARTNERSHIP LP	-	DUAL CIRCUIT SLURPEE	208/2	2.2	15	143	TURNKEY	GC
CU-3	1	03309784	FBD	FBD-SRC	FBD PARTNERSHIP LP	-	FROZEN LEMONADE	208/2	1.8	15	105	TURNKEY	GC
CU-4	1	03164149	HOSHIZAKI	URC-5F	HOSHIZAKI	-	ICE MAKER	120/1	--	--	60	TURNKEY	GC
CU-5	1	TBD	BOHN	TBD	HEATCRAFT	-	1-DOOR MERCHANDISER	208/2	20	20	169	TURNKEY	GC
CU-6	1	00130388	BOHN	BZT010M6BF	HEATCRAFT	-	4' DISPLAY CASE	208-230/1	38	40	209	TURNKEY	GC
CU-7	1	TBD	BOHN	TBD	HEATCRAFT	-	6' DISPLAY CASE	208-230/1	38	40	209	TURNKEY	GC

NOTES:
1. CONTRACTOR TO VERIFY ALL EQUIPMENT WITH LATEST 7-11 STANDARDS AND 7-11 EQUIPMENT REPRESENTATIVES AND MECHANICAL CONTRACTOR
2. FIELD COORDINATE LOCATIONS OF CONDENSERS WITH MECHANICAL CONTRACTOR.

BRIAN D. LAUG, AIA NCARB
ARCHITECT

16925 OLD SAWMILL ROAD
WOODBINE, MD 21797
443-250-6557

CONSULTANT:
Joseph A. Loiero, Jr.
NC PE License #042310
2007 Twin Lakes Dr,
Jarrettsville, MD, 21084
410-776-5868

PROJECT:

7-ELEVEN 42655 CST

1360 NC 24-87, CAMERON NC 28326

DWG. TITLE:

ELECTRICAL FLOOR PLAN

ISSUE/REVISIONS:

	DATE	DESCRIPTION
0	06/06/25	ISSUE FOR BID AND PERMIT

SEAL:

6/06/25

DocuSigned by: 38E7250D67A54BA...

NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO, JR

DRAWN BY:	CHECKED BY:
JAL	JAL
SCALE: 1/4" = 1'-0"	PROJECT No. JAL#25-008
DATE: 6/06/25	FILE NAME.

SHEET NO:

E1.1

PANELBOARD EXIST. A SCHEDULE

VOLTAGE: 208Y/120V
PHASE: 3Φ WIRE: 4W
AIC RATING: EXISTING
BUS RATING: 225A
MAIN BREAKER: 200A MCB
NEUTRAL SIZE: 100%
LOCATION: ON PLAN
MOUNTING: SURFACE
ISO. GROUND: N SPD: N

NOTE	TYPE	LOAD	DESCRIPTION	BRANCH C/B	BRANCH P	CIRCUIT #	CIRCUIT Φ	CIRCUIT #	BRANCH C/B	BRANCH P	DESCRIPTION	LOAD	TYPE	NOTE
	L	200	EXISTING DRINK COOLER LTG	20	1	1	A	2	30	3	EXISTING SURGE PROTECTOR			
	R	200	EXISTING COOLER EVAP	20	1	3	B	4	.	-				
			EXISTING SPARE	20	1	5	C	6	.	-				
	R	400	EXISTING DRINK COOLER HEAT	20	1	7	A	8	20	1	EXISTING SPARE			
	R	1000	EXISTING MENS WATER HEATER	20	1	9	B	10	20	1	EXISTING SPARE			
	L	300	EXISTING EXIT SIGNS	20	1	11	C	12	20	1	EXISTING NEON	540	L	
	L	200	EXISTING REST ROOM LTG	20	1	13	A	14	20	1	EXISTING TMS POWER	200	R	
	R	300	EXISTING HEAT TAPE RECEPT	20	1	15	B	16	20	1	EXISTING LOAD	400	R	
	R	180	EXISTING BEER COOLER RECEPT	20	1	17	C	18	50	3	EXISTING QUIZNOS TOASTER	360	R	
	L	200	EXISTING BEER COOLER LTG	20	1	19	A	20	.	-	OVEN	4800	R	
	R	300	EXISTING BEER COOL DR HEAT	20	1	21	B	22	.	-		4800	R	
	R	600	EXISTING AIR MACHINE	20	1	23	C	24						
						25	A	26						
						27	B	28						
						29	C	30						
						31	A	32						
						33	B	34						
						35	C	36						
						37	A	38						
						39	B	40						
						41	C	42						

	TYPE	CONNECTED LOAD (VA)	NEC DEMAND FACTOR	NEC DEMAND LOAD (VA)
R	RECEPTACLES ≤ 10KVA	10000	1.00	10000
	RECEPTACLES > 10KVA	7980	0.50	3990
L	LIGHTING	1200	1.25	1500
M	LARGEST MOTOR	-	1.25	-
	REMAINING MOTORS	-	1.00	-
H	HEATING (RESISTIVE)	-	1.25	-
E	EQUIPMENT	-	1.00	-
K	KITCHEN EQUIPMENT	-	1.00	-
	TOTAL	19180		15490

PHASE A LOAD =	6000	VA
PHASE B LOAD =	7000	VA
PHASE C LOAD =	6180	VA

NEC DEMAND LOAD =	43	A
SPARE CAPACITY =	157	A
TOTAL AVAILABLE =	200	A

NOTES: 1 NEW REQUIRED BRANCH CIRCUITS SHALL BE INSTALLED IN SPACES CREATED DURING DEMOLITION.

PANELBOARD EXIST. B SCHEDULE

VOLTAGE: 208Y/120V
PHASE: 3Φ WIRE: 4W
AIC RATING: EXISTING
BUS RATING: 225A
MAIN BREAKER: 200A MCB
NEUTRAL SIZE: 100%
LOCATION: ON PLAN
MOUNTING: SURFACE
ISO. GROUND: N SPD: N

NOTE	TYPE	LOAD	DESCRIPTION	BRANCH C/B	BRANCH P	CIRCUIT #	CIRCUIT Φ	CIRCUIT #	BRANCH C/B	BRANCH P	DESCRIPTION	LOAD	TYPE	NOTE
	R	1600	EXISTING COFFEE RECEPT	20	2	1	A	2	80	3	EXISTING HVAC #1	5700	E	
	R	1600		.	-	3	B	4	.	-		5700	E	
	R	1500	EXISTING DRINK RECEPT	20	2	5	C	6	.	-		5700	E	
	R	1500		.	-	7	A	8	20	1	EXISTING HALLWAY RECEPT	180	R	
	R	400	EXISTING DRINK RECEPT	20	1	9	B	10	20	1	EXISTING DSL RECEPT	200	R	
	R	400	EXISTING DRINK RECEPT	20	1	11	C	12	20	1	EXISTING DSL RECEPT	540	R	
	R	360	EXISTING LEFT FRONT GFI	20	1	13	A	14	20	1	EXISTING RECEPTACLE	180	R	
	R	600	EXISTING ATM RECEPTACLE	20	1	15	B	16	20	1	EXISTING FLOOR BOX RECEPT.	400	R	
	R	180	EXISTING LEFT FRONT GFI	20	1	17	C	18	20	1	EXISTING FLOOR BOX RECEPT.	360	R	
	R	180	EXISTING LEFT FT WALL REC	20	1	19	A	20	20	2	EXISTING QUIZNOS COOLER	1500	R	
	R	180	EXISTING COUNTER PLUG	20	1	21	B	22	.	-	CONDENSER	1500	R	
	R	180	EXISTING COUNTER PLUG	20	1	23	C	24	30	2	EXISTING QUIZNOS FREEZER	1800	R	
	R	360	EXISTING GONDOLA RECEPT	20	1	25	A	26	.	-	CONDENSER	1800	R	
	R	360	EXISTING GONDOLA RECEPT	20	1	27	B	28	20	1	EXISTING CASH COUNTER	400	R	
	R	360	EXISTING GONDOLA RECEPT	20	1	29	C	30	20	1	EXISTING LOTTERY	300	R	
	R	360	EXISTING GONDOLA RECEPT	20	1	31	A	32	20	1	EXISTING COUNTER REC	400	R	
	R	180	EXISTING SAFE	20	1	33	B	34	20	1	EXISTING COUNTER REC	400	R	
	R	400	EXISTING CASH COUNTER	20	1	35	C	36						
						37	A	38						
						39	B	40						
						41	C	42						

	TYPE	CONNECTED LOAD (VA)	NEC DEMAND FACTOR	NEC DEMAND LOAD (VA)
R	RECEPTACLES ≤ 10KVA	10000	1.00	10000
	RECEPTACLES > 10KVA	10360	0.50	5180
L	LIGHTING	-	1.25	-
M	LARGEST MOTOR	-	1.25	-
	REMAINING MOTORS	-	1.00	-
H	HEATING (RESISTIVE)	-	1.25	-
E	EQUIPMENT	17100	1.00	17100
K	KITCHEN EQUIPMENT	-	1.00	-
	TOTAL	37460		32280

PHASE A LOAD =	14120	VA
PHASE B LOAD =	11920	VA
PHASE C LOAD =	11420	VA

NEC DEMAND LOAD =	90	A
SPARE CAPACITY =	110	A
TOTAL AVAILABLE =	200	A

NOTES: 1 NEW REQUIRED BRANCH CIRCUITS SHALL BE INSTALLED IN SPACES CREATED DURING DEMOLITION.

PANELBOARD EXIST. C SCHEDULE

VOLTAGE: 208Y/120V
PHASE: 3Φ WIRE: 4W
AIC RATING: EXISTING
BUS RATING: 225A
MAIN BREAKER: 200A MCB
NEUTRAL SIZE: 100%
LOCATION: ON PLAN
MOUNTING: SURFACE
ISO. GROUND: N SPD: N

NOTE	TYPE	LOAD	DESCRIPTION	BRANCH C/B	BRANCH P	CIRCUIT #	CIRCUIT Φ	CIRCUIT #	BRANCH C/B	BRANCH P	DESCRIPTION	LOAD	TYPE	NOTE
	E	8600	EXISTING HVAC #2	90	3	1	A	2	50	2	EXISTING INSTAHOT	4100	E	
	E	8600		-	-	3	B	4	-	-		4100	E	
	E	8600		-	-	5	C	6	20	1	EXISTING EXHAUST FAN	300	E	
	L	200	EXISTING WALK IN COOLER LTG	20	1	7	A	8	20	1	EXISTING DRINK RECEPT	400	R	
	R	200	EXISTING WALK IN COOL EVAP	20	1	9	B	10	20	1	EXISTING GENERAL RECEPT	360	R	
	R	300	EXISTING WALK IN COOL HEAT	20	1	11	C	12	20	1	EXISTING DRINK RECEPT	540	R	
	R	300	EXISTING WALK IN COOL FRAME	20	1	13	A	14	20	1	EXISTING ICE MACHINE	600	R	
	R	180	EXISTING CASH REGIST. RECEP	20	1	15	B	16	20	1	EXISTING GENERAL RECEPT	400	R	
	R	180	EXISTING COUNTER RECEPT	20	1	17	C	18	20	1	EXISTING HALLWAY RECEPT	360	R	
	R	180	EXISTING CASH REGIST. RECEP	20	1	19	A	20						
	R	180	EXISTING COUNTER RECEPT	20	1	21	B	22	20	1	EXISTING QUIZNOS COUNTER	360	R	
	R	400	EXISTING HOT BOX GFI	20	1	23	C	24	20	1	EXISTING QUIZNOS COUNTER	360	R	
						25	A	26	20	1	EXISTING QUIZNOS CASH	360	R	
						27	B	28	20	1	EXISTING QUIZNOS COUNTER	360	R	
						29	C	30						
						31	A	32	20	2	EXISTING SANDWICH BOX	1600	R	
						33	B	34	-	-		1600	R	
						35	C	36						
						37	A	38						
						39	B	40						
						41	C	42						

	TYPE	CONNECTED LOAD (VA)	NEC DEMAND FACTOR	NEC DEMAND LOAD (VA)
R	RECEPTACLES ≤ 10KVA	9040	1.00	9040
	RECEPTACLES > 10KVA	-	0.50	-
L	LIGHTING	200	1.25	250
M	LARGEST MOTOR	-	1.25	-
	REMAINING MOTORS	-	1.00	-
H	HEATING (RESISTIVE)	-	1.25	-
E	EQUIPMENT	34300	1.00	34300
K	KITCHEN EQUIPMENT	-	1.00	-
	TOTAL	43540		43590

PHASE A LOAD =	16340	VA
PHASE B LOAD =	16300	VA
PHASE C LOAD =	10900	VA

NEC DEMAND LOAD =	121	A
SPARE CAPACITY =	79	A
TOTAL AVAILABLE =	200	A

NOTES: 1 NEW REQUIRED BRANCH CIRCUITS SHALL BE INSTALLED IN SPACES CREATED DURING DEMOLITION.

PANELBOARD EXIST. D SCHEDULE

VOLTAGE: 208Y/120V
PHASE: 3Φ WIRE: 4W
AIC RATING: EXISTING
BUS RATING: 225A
MAIN BREAKER: 200A MCB
NEUTRAL SIZE: 100%
LOCATION: ON PLAN
MOUNTING: SURFACE
ISO. GROUND: N SPD: N

NOTE	TYPE	LOAD	DESCRIPTION	BRANCH C/B	BRANCH P	CIRCUIT #	CIRCUIT Φ	CIRCUIT #	BRANCH C/B	BRANCH P	DESCRIPTION	LOAD	TYPE	NOTE
	E	2800	EXISTING BEER CAVE CONDEN.	30	3	1	A	2	30	3	EXISTING DRINK CONDEN.	2800	E	
	E	2800		-	-	3	B	4	-	-		2800	E	
	E	2800		-	-	5	C	6	-	-		2800	E	
	L	300	EXISTING PANEL ROOM LTG	20	1	7	A	8	20	1	EXISTING STOR/OFFICE LTG	300	L	
	R	360	EXISTING REST./OUTSIDE GFI	20	1	9	B	10	20	1	EXISTING STOR/OFFICE REC	400	R	
	R	200	EXISTING WATER FOUNTAIN GFI	20	1	11	C	12	20	1	EXISTING WOMENS WH	540	R	
	R	800	EXISTING WATER HEATER	20	1	13	A	14	20	1	EXISTING WH	600	R	
	R	400	EXISTING DRINK COUNTER REC	20	1	15	B	16	20	1	EXISTING QUIZNOS REC	400	R	
	R	400	EXISTING DRINK COUNTER REC	20	1	17	C	18	20	1	EXISTING QUIZNOS REC	360	R	
	R	400	EXISTING DRINK COUNTER REC	20	1	19	A	20	20	1	EXISTING QUIZNOS REC	400	R	
	R	400	EXISTING DRINK COUNTER REC	20	1	21	B	22	20	1	EXISTING QUIZNOS REC	400	R	
	R	400	EXISTING DRINK COUNTER REC	20	1	23	C	24	30	2	EXISTING INSTAHOT	1600	E	
	R	400	EXISTING DRINK COUNTER REC	20	1	25	A	26	-	-		1600	E	
	R	400	EXISTING DRINK COUNTER REC	20	1	27	B	28	30	3	EXISTING REACH IN BEER	2800	E	
	R	400	EXISTING FLY FAN	20	1	29	C	30	-	-	COOLER CONDENSER	2800	E	
	E	1600	EXISTING COFFEE MACHINE	30	2	31	A	32	-	-		2800	E	
	E	1600		-	-	33	B	34						
						35	C	36						
						37	A	38						
						39	B	40						
						41	C	42						

	TYPE	CONNECTED LOAD (VA)	NEC DEMAND FACTOR	NEC DEMAND LOAD (VA)
R	RECEPTACLES ≤ 10KVA	7760	1.00	7760
	RECEPTACLES > 10KVA	-	0.50	-
L	LIGHTING	600	1.25	750
M	LARGEST MOTOR	-	1.25	-
	REMAINING MOTORS	-	1.00	-
H	HEATING (RESISTIVE)	-	1.25	-
E	EQUIPMENT	31600	1.00	31600
K	KITCHEN EQUIPMENT	-	1.00	-
	TOTAL	39960		40110

PHASE A LOAD =	14800	VA
PHASE B LOAD =	12760	VA
PHASE C LOAD =	12400	VA

NEC DEMAND LOAD =	111	A
SPARE CAPACITY =	89	A
TOTAL AVAILABLE =	200	A

NOTES: 1 NEW REQUIRED BRANCH CIRCUITS SHALL BE INSTALLED IN SPACES CREATED DURING DEMOLITION.

PANELBOARD EXIST. L SCHEDULE

VOLTAGE: 208Y/120V
PHASE: 3Φ WIRE: 4W
AIC RATING: EXISTING
BUS RATING: 225A
MAIN BREAKER: 200A MCB
NEUTRAL SIZE: 100%
LOCATION: ON PLAN
MOUNTING: SURFACE
ISO. GROUND: N SPD: N

NOTE	TYPE	LOAD	DESCRIPTION	BRANCH C/B	BRANCH P	CIRCUIT #	CIRCUIT Φ	CIRCUIT #	BRANCH C/B	BRANCH P	DESCRIPTION	LOAD	TYPE	NOTE
	R	9500	EXISTING GAS PANEL	100	3	1	A	2	20	1	EXISTING STORE LTG	400	L	
	R	9500		-	-	3	B	4	20	1	EXISTING STORE LTG	400	L	
	R	9500		-	-	5	C	6	20	1	EXISTING RECESSED & TRACK	400	L	
	L	400	EXISTING STORE LTG	20	1	7	A	8	20	2	EXISTING CANOPY LTG	1200	L	
	L	200	EXISTING BUILDING SIGN	20	1	9	B	10	-	-		1200	L	
	L	400	EXISTING STORE LTG	20	1	11	C	12	20	2	EXISTING CANOPY LTG	540	L	
	L	1200	EXISTING CANOPY SIGN	20	2	13	A	14	-	-		1200	L	
	L	1200		-	-	15	B	16	20	1	EXISTING WALL PACK	400	L	
	L	1200	EXISTING CANOPY SIGN	20	2	17	C	18	20	1	EXISTING AWNING LTG	360	R	
	L	1200		-	-	19	A	20	30	3	EXISTING SURGE PROTECTOR			
	L	200	EXISTING LIGHTING CONTACTOR	20	1	21	B	22	-	-				
	L	1200	EXISTING AREA LIGHTS	20	2	23	C	24	-	-				
	L	1200		-	-	25	A	26	20	2	EXISTING AREA LIGHTS	1200	L	
	L	1200	EXISTING AREA LIGHTS	20	2	27	B	28	-	-		1200	L	
	L	1200		-	-	29	C	30	20	1	EXISTING FLAG POLE	400	L	
	L	400	EXISTING ROAD SIGN	20	1	31	A	32	20	1	EXISTING ROAD SIGN LTG	400	L	
						33	B	34						
						35	C	36						
						37	A	38						
						39	B	40						
						41	C	42						

	TYPE	CONNECTED LOAD (VA)	NEC DEMAND FACTOR	NEC DEMAND LOAD (VA)
R	RECEPTACLES ≤ 10KVA	10000	1.00	10000
	RECEPTACLES > 10KVA	18500	0.50	9250
L	LIGHTING	21200	1.25	26500
M	LARGEST MOTOR	-	1.25	-
	REMAINING MOTORS	-	1.00	-
H	HEATING (RESISTIVE)	-	1.25	-
E	EQUIPMENT	-	1.00	-
K	KITCHEN EQUIPMENT	-	1.00	-
	TOTAL	49700		45750

PHASE A LOAD =	18300	VA
PHASE B LOAD =	15500	VA
PHASE C LOAD =	15900	VA

NEC DEMAND LOAD =	127	A
SPARE CAPACITY =	73	A
TOTAL AVAILABLE =	200	A

NOTES: 1 NEW REQUIRED BRANCH CIRCUITS SHALL BE INSTALLED IN SPACES CREATED DURING DEMOLITION.

PANELBOARD X SCHEDULE

VOLTAGE: 208Y/120V
PHASE: 3Φ WIRE: 4W
AIC RATING:
BUS RATING:
MAIN BREAKER
NEUTRAL SIZE: 100%
LOCATION:
MOUNTING:
ISO. GROUND: N TVSS: N

NOTE	TYPE	LOAD	DESCRIPTION	BRANCH C/B	BRANCH P	CIRCUIT #	CIRCUIT Φ	CIRCUIT #	BRANCH C/B	BRANCH P	DESCRIPTION	LOAD	TYPE	NOTE
	R	1100	DISPLAY (45)	20	1	1	A	2	20	2	FROZEN BEVERAGE (172)	1440	E	
	R	800	DISPLAY CASE (339)	20	1	3	B	4	-	-		1400	E	
	E	800	REF (84.1)	20	1	5	C	6	20	1	DISPLAY CASE (653)		E	
	E	1800	CAPPUCCINO (77)	20	1	7	A	8	30	2	COFFEE MAKER (3022)	2250	E	
	E	480	REFRIGERATED LIQUID (89)	20	1	9	B	10	-	-		2250	E	
	E	700	COUNT. BEV (1177),ICE (3015)	20	1	11	C	12	20	1	DISPLAY CASE (652)	200	E	
	E	800	MILK (3020) FLAVOR (3021)	20	1	13	A	14	20	1	MENU BOARDS (1185)	1080	R	
	E	1750	COUNTER OVEN (82)	40	2	15	B	16	40	2	BUNN COFFEE (398)	3000	E	
	E	1750		-	-	17	C	18	-	-		3000	E	
	E	1750	COUNTER OVEN (82)	40	2	19	A	20	40	2	BUNN COFFEE (398)	3000	E	
	E	1750		-	-	21	B	22	-	-		3000	E	
	E	800	FRZER (83.1)	20	1	23	C	24	20	2	BEAN TO CUP (ITEM 124)	500	E	
	R	400	PRINTER (487)	20	1	25	A	26	-	-		500	E	
	R	600	SALES RECEPTACLES	20	1	27	B	28	20	1	ICEMAKER (105)	1836	E	
	E	1100	DISPLAY (45)	20	1	29	C	30	20	1	DRINK DISP (113), WATER (22)	1100	E	
	E	100	BUN WARMER (466)	20	2	31	A	32	20	1	DISPLAY (640)	800	E	
	E	100		-	-	33	B	34	20	1			E	
	R	850	MICROWAVE (65)	20	2	35	C	36	20	2	ROLLER GRILL (73)	1205	E	
	R	850		-	-	37	A	38	-	-		1205	E	
	R	800	CHEESE (74), CONDIMENT (360)	20	1	39	B	40	20	2	ROLLER GRILL (73)	1205	E	
	R	850	MICROWAVE (65)	20	2	41	C	42	-	-		1205	E	
	R	850		-	-	43	A	44	40	3	MULTICOOK (3041)	1000	E	
	E	800	NOVELTY FREEZER (913)	20	1	45	B	46	-	-		1000	E	
	R	720	GENERAL RECEPTACLES	20	1	47	C	48	-	-		1000	E	
				20	1	49	A	50	20	1	BAKERY CASE (3384)	500	E	
	E	1000	SLURPEE (3262)	30	2	51	B	52	20	1				
	E	1000		-	-	53	C	54	20	1	SALES RECEPTACLES	360	R	
	E	1000	SLURPEE (3263)	30	2	55	A	56	20	1	ATM	1000	R	
	E	1000		-	-	57	B	58	20	1	SWEETENER (700)	600	R	
	E	1000	REMOTE CONDENSER (CU-2)	15	2	59	C	60	20	2	REMOTE CONDENSER (CU-5)	1000	E	
	E	1000		-	-	61	A	62	-	-		1000	E	
	E	187	REMOTE CONDENSER (CU-3)	15	2	63	B	64	40	2	REMOTE CONDENSER (CU-6)	3952	E	
	E	1000		-	-	65	C	66	-	-		1000	E	
		1000				67	A	68	40	2	REMOTE CONDENSER (CU-7)	1000	E	
						69	B	70	-	-		3952	E	
		1000				71	C	72	40	2	BUNN COFFEE (398)		E	
		1000				73	A	74	-	-			E	
	E	800	FRZER (83.1)	20	1	75	B	76						
						77	C	78						

	TYPE	CONNECTED LOAD (VA)	NEC DEMAND FACTOR	NEC DEMAND LOAD (VA)
R	RECEPTACLES ≤ 10KVA	6530	1.00	6530
	RECEPTACLES > 10KVA	-	0.50	-
L	LIGHTING	-	1.25	-
M	LARGEST MOTOR	-	1.25	-
	REMAINING MOTORS	-	1.00	-
H	HEATING (RESISTIVE)	-	1.25	-
E	EQUIPMENT	42776	1.00	42776
K	KITCHEN EQUIPMENT	-	1.00	-
	TOTAL	49306		49306

PHASE A LOAD =	17075	VA
PHASE B LOAD =	18971	VA
PHASE C LOAD =	14060	VA

NEC DEMAND LOAD	137	A
SPARE CAPACITY =	-137	A
TOTAL AVAILABLE =		A

NOTES: 1 PANEL IS FOR REFERENCE ONLY. ALL BRANCH CIRCUITS SHOWN SHALL BE CONNECTED TO EXISTING SPARES CREATEED IN THE EXISTING PANELBOARDS DURING DEMOLITION.

BRIAN D. LAUG, AIA NCARB
ARCHITECT

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7-ELEVEN 42655
CST
1360 NC 24-87, CAMERON NC 28326

DRG. TITLE
ELECTRICAL PANEL SCHEDULES

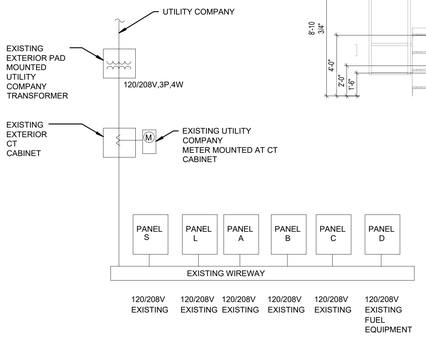
ISSUE/REVISIONS

	DATE	DESCRIPTION
0	06/06/25	ISSUE FOR BID AND PERMIT

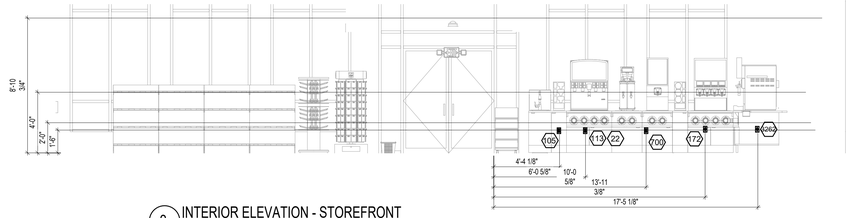
SEAL
6/06/25
Docusigned by:
38E7250D67A549A...
NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO JR

DRAWN BY: JAL	CHECKED BY: JAL
SCALE: 1/4" = 1'-0"	PROJECT No: JAL#25-008
DATE: 6/06/25	FILE NAME:

SHEET NO.
E1.2



1 PARTIAL EXISTING ELECTRICAL SINGLE LINE DIAGRAM
N.T.S.



2 INTERIOR ELEVATION - STOREFRONT
3/8" = 1'-0"

COMcheck Software Version COMcheckWeb

Interior Lighting Compliance Certificate

Project Information

Energy Code: 2018 IECC
Project Title: 25-008 7-11 Cameron, NC
Project Type: Alteration

Construction Site:
1360 NC 24-87
CAMERON 28326

Owner/Agent:

Designer/Contractor:

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts
1-Retail	4028	1.06	4270
		Total Allowed Watts =	4270

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Fixture Watt.	E (C X D)
Retail (4028 sq.ft.)				
LED RECESSED 2'X4': A3: Other:	1	3	36	108
LED RECESSED 1'X4': A4: Other:	1	40	32	1280
LED SURFACE 1'X4: DS4: Other:	1	6	32	192
			Total Proposed Watts =	1580

Interior Lighting PASSES

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2018 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title | Signature | Date

Project Title: 25-008 7-11 Cameron, NC
Data filename:
Report date: 05/31/25
Page 1 of 5

BRIAN D. LAUG, AIA NCARB
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CONSULTANT

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PROJECT:

7-ELEVEN 42655
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DWG. TITLE:

ELECTRICAL ONE-LINE AND DETAILS

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SEAL:

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NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO JR

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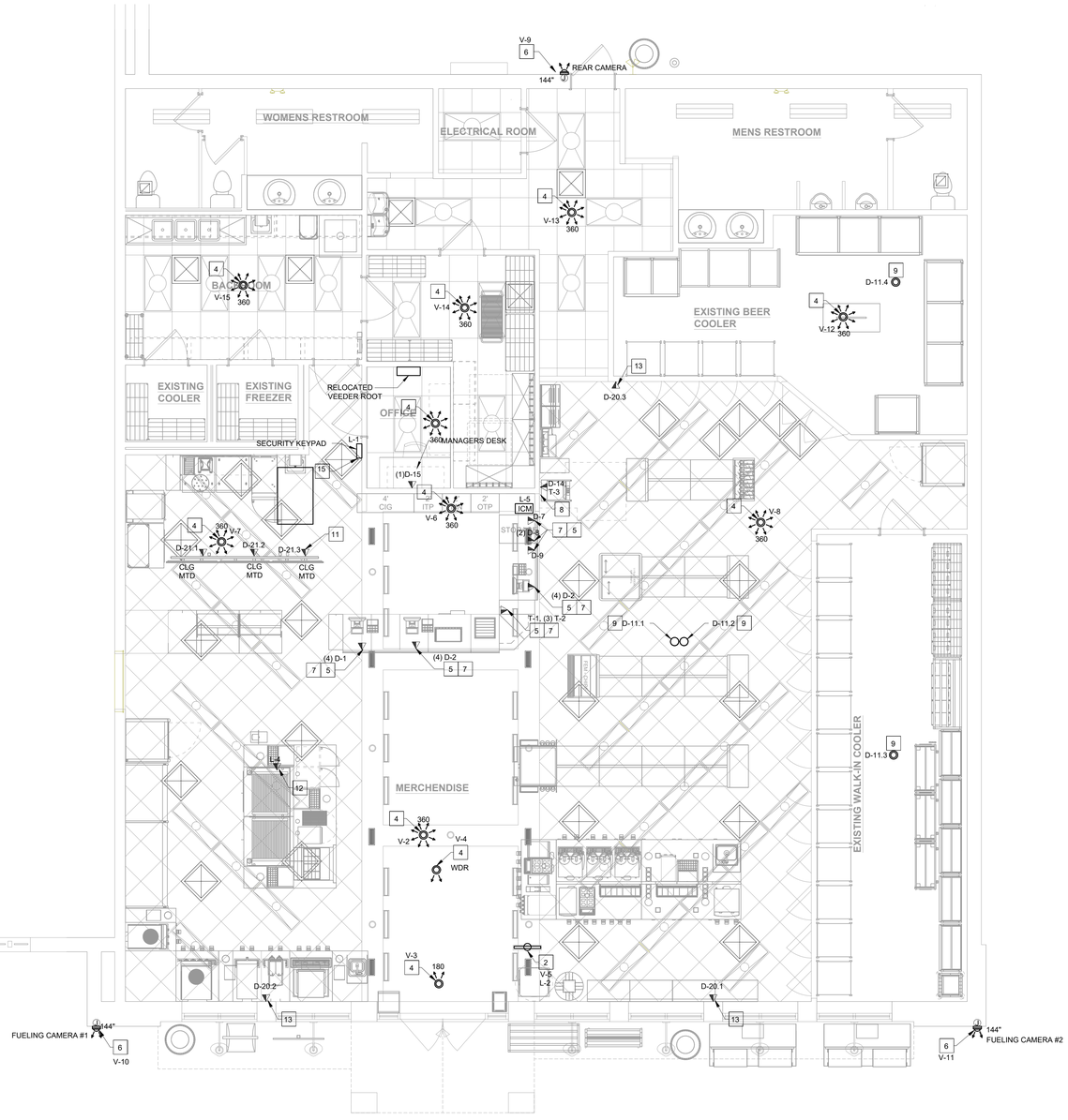
E1.3



1 LOW VOLTAGE FLOOR PLAN
Scale: 1/4"=1'

KEYNOTES	
1	ROUTE DATA CABLE TO EMS ENCLOSURE (REF. LOW VOLTAGE WIRING TABLE). ENCLOSURE AND EMS CONTROLS BY EMS VENDOR.
2	ROUTE DATA CABLE(S) TO PVM LOCATION SHOWN (REF. LOW VOLTAGE WIRING TABLE). EXACT PLACEMENT OF PVM TO BE DETERMINED BY SECURITY CONTRACTOR AT TIME OF INSTALL.
3	TELECOM DEMARC WITH (1) #6 CU. GROUND PER TELE. CO. REQUIREMENTS. REF 1/E1.5.
4	ROUTE DATA CABLE(S) TO CAMERA LOCATION SHOWN (REF. LOW VOLTAGE WIRING TABLE). EXACT PLACEMENT OF CAMERA TO BE DETERMINED BY SECURITY CONTRACTOR AT TIME OF INSTALL.
5	ROUTE DATA CABLES UNDERSLAB TO DATA / COM OUTLET (REF. E1.2).
6	ROUTE DATA CABLE(S) TO EXTERIOR CAMERA LOCATION SHOWN (REF. LOW VOLTAGE WIRING TABLE). GC TO COORDINATE EXACT CAMERA LOCATIONS WITH ANDREW MORRIS AT OWL SERVICES (ANDREW.MORRIS@OWLSERVICES.COM)
7	SURFACE MOUNT DATA OUTLETS IN CABINETRY BELOW COUNTER.
8	INSTALL 1-GANG BOX, FLUSH IN WALL WITH 1/2" CONDUIT STUBBED UP TO ACCESSIBLE CEILING SPACE FOR ATM. FLUSH MOUNT DATA / COM OUTLET AND PROVIDE / INSTALL FACEPLATE.
9	ROUTE DATA CABLE TO ACCESS POINT LOCATION SHOWN (REF. LOW VOLTAGE WIRING TABLE). TERMINATE IN BOX WITH CAT6 FEMALE RJ45 JACK. LEAVE 10' EXCESS COILED AT JACK LOCATION.
10	PULL DATA WIRING TO LOW VOLTAGE SECTION OF FLOOR BOX AND INSTALL DATA/COM JACK. REF LOW VOLTAGE TABLE.
11	ROUTE DATA CABLE(S) TO DIGITAL MENU BOARD (DMB) LOCATION SHOWN (REF. LOW VOLTAGE WIRING TABLE). COORDINATE EXACT LOCATION WITH ARCHITECTURAL RCP.
12	ROUTE CABLE TO AVA SENSOR (REF. LOW VOLTAGE WIRING TABLE) AND TERMINATE ON REAR OF DEVICE.
13	ROUTE DATA CABLE TO QSIC MUSIC SPEAKER LOCATION (REF. LOW VOLTAGE WIRING TABLE). INSTALL FEMALE RJ45 JACK, FLUSH IN WALL. COORDINATE EXACT SPEAKER MOUNTING HEIGHT WITH ARCHITECTURAL DRAWINGS. INSTALL SPEAKER TO CONCEAL JACK. MINIMIZE AND NEATLY ARRANGE EXCESS CABLE.
14	INSTALL (2) 1-1/2" CONDUITS FOR EMS AND LOW VOLTAGE CABLES. SUPPORT CONDUITS FROM TOP FLANGE OF BAR JOIST AND ROUTE WITHIN WEBBING. STUB CONDUITS INTO ACCESSIBLE CEILING SPACE. CAP ENDS WITH NYLON BUSHING.
15	INSTALL 1-GANG BOX, FLUSH IN WALL, CENTERED AT 45" AFF WITH 1/2" CONDUIT STUBBED UP TO ACCESSIBLE CEILING SPACE FOR ALARM KEYPAD.

LOW VOLTAGE NOTES

A. LOW-VOLTAGE WIRING, TERMINATIONS AND FACEPLATES PROVIDED AND INSTALLED BY LOW-VOLTAGE CONTRACTOR.

B. WHERE REQUIRED, RACEWAYS (CONDUIT, BOXES, FITTINGS, ETC.) PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR.

C. ALL CONDUIT INSTALLED AS STUB-UPS TO ACCESSIBLE CEILING SPACE, SLEEVES, ETC., SHALL BE EMT. FLEXIBLE CONDUIT SHALL NOT BE USED.

D. ALL CONDUIT PROVIDED AS STUB-UPS TO ACCESSIBLE CEILING SPACE, SLEEVES, ETC., SHALL HAVE NYLON BUSHINGS INSTALLED FOR PROTECTION OF WIRING INSTALLED IN THEM.

E. CONDUIT AND WIRING IN AREAS WHERE EXPOSED SHALL BE ROUTED AT 90 DEGREE ANGLES PERPENDICULAR OR PARALLEL TO JOISTS.

F. EXPOSED CONDUIT SHALL BE PAINTED TO MATCH ARCHITECTURAL FINISHES.

G. ALL LOW-VOLTAGE WIRING INSTALLED WITHIN RETURN AIR PLENUMS OR AS REQUIRED BY APPLICABLE CODES, AHJ, ETC. SHALL BE PLENUM-RATED.

H. LOW VOLTAGE WIRING IN EXPOSED CEILING AREAS SHALL BE INSTALLED IN RACEWAY (LEGRAND 400 SERIES) AND/OR ROUTED IN SUCH A WAY TO CONCEAL FROM VIEW FROM THE FLOOR BELOW. COORDINATE CABLE AND/OR RACEWAY COLOR WITH FINISH PLAN OR PAINT-TO-MATCH AFTER INSTALLATION.

I. CONDUITS EXPOSED TO WIDELY DIFFERENT TEMPERATURES, SUCH AS COOLERS AND FREEZERS, SHALL BE SEALED TO PREVENT CIRCULATION OF AIR / MOISTURE.

J. ALL CABLING SHALL BE CAT6 WIRED TO TIA/EIA 568B EXCEPT FOR POS REGISTERS WHICH SHALL BE WIRED TO TIA/EIA 568A.

K. CAT-6 KEYSTONE JACKS WIRED TIA/EIA-568B SHALL BE WHITE IN COLOR. CAT-6 KEYSTONE JACKS WIRED TIA/EIA-568A SHALL BE BLUE IN COLOR.

SYMBOL LEGEND	
J	JUNCTION BOX FOR VIEW MONITOR
V	DATA OUTLET
	ACCESS POINT
	SECURITY CAMERA
S	SPEAKER

KEY:
360 - 360 DEGREE CAMERA
180 - 180 DEGREE CAMERA
PVM - PERSONAL VIDEO MONITOR
WDR - WIDE DYNAMIC RANGE

LOW VOLTAGE PACKAGE SCHEDULE

Oracle Number	MANUFACTURER	MODEL	DESCRIPTION	FURNISH BY	INSTALL BY
01111031	QSIC	SMALL STORE PACKAGE	QSIC 2.0 C-STORE MUSIC PLATFORM (In Store Audio System: includes 3 speakers, brackets, media control, AVA, cabling, hardware/mounts & switch)	OWNER	LVC
03144271	Tyco Integrated Security Llc.	711-GKIT-IP	DT QUEUE CAMERA, 1 Set of 14Cameras	OWNER	SECURITY SYSTEM INSTALLER

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PROJECT:

7-ELEVEN 42655
CST

1360 NC 24-87, CAMERON NC 28326

DWG. TITLE:

LOW VOLTAGE FLOOR PLAN

ISSUE / REVISIONS:

	DATE:	DESCRIPTION:
0	06/06/25	ISSUE FOR BID AND PERMIT

SEAL:

6/06/25

NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO JR

DocuSigned by: 38E7250DE7A54BA...

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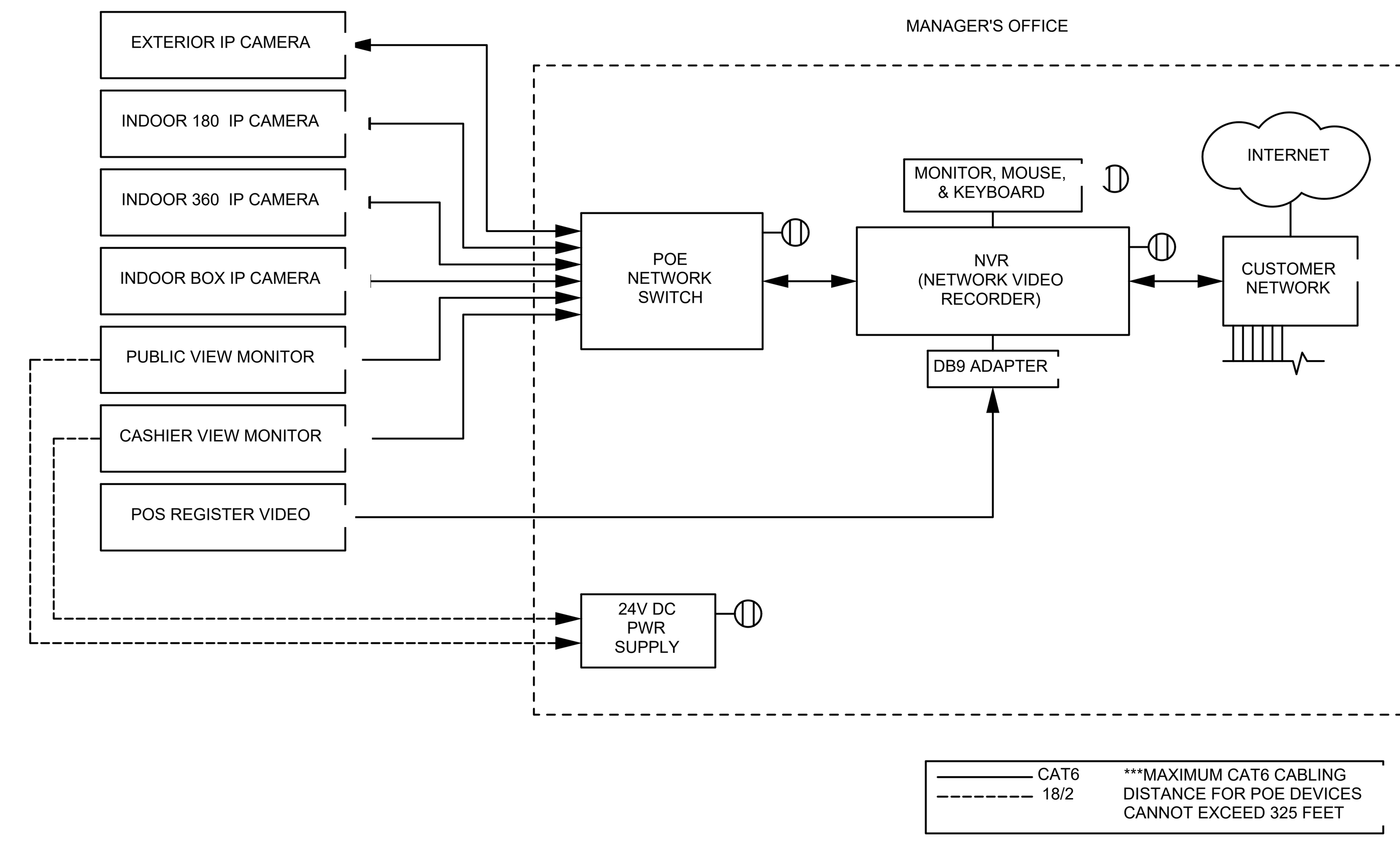
E1.4

LOW VOLTAGE WIRING TABLE						
FROM	**TO**	**DESCRIPTION**	**ID**	**CABLE**	**QTY**	**NOTE**
PHONE BOARD	SALES COUNTER	VOICE	T1	CAT6	1	
	SALES COUNTER	FAX	T2	CAT6	3	
	SALES (ATM)	ATM	T3	CAT6	1	
ISP DESK	SALES COUNTER	POS 1	D1	CAT6	4	2
	SALES COUNTER	POS 2	D2	CAT6	4	2
	SALES COUNTER	POS 3	D3	CAT6	4	2
	SALES COUNTER	SAFE	D7	CAT6	1	
	SALES COUNTER	MONEY ORDER	D8	CAT6	2	
	SALES COUNTER	LOTTO	D9	CAT6	1	
	ELECTRICAL	EMS	D10	CAT6	1	
	SALES	AP-11A	D11.1	CAT6	1	
	SALES	AP-11B	D11.2	CAT6	1	
	VAULT COOLER	AP-11C	D11.3	CAT6	1	
	BEER CAVE	AP-11D	D11.4	CAT6	1	
	ELECTRICAL	FUELING	D12	CAT6	4	1
	TELECOM	RIS / BROADBAND	D13	CAT6	4	
	SALES (ATM)	ATM	D14	CAT6	1	
	MANAGER	DVR	D15	CAT6	1	
	SALES	QSIC SPEAKER	D20.1	CAT6	1	
	SALES	QSIC SPEAKER	D20.2	CAT6	1	
	SALES	QSIC SPEAKER	D20.3	CAT6	1	
	SALES COUNTER	DMB SALES	D21.1	CAT6	1	
	SALES COUNTER	DMB SALES	D21.2	CAT6	1	
	SALES COUNTER	DMB SALES	D21.3	CAT6	1	
	SALES	AUTO VOLUME ADJUSTMENT (QSIC)	L4	24/3 SHLD	1	3
MANAGER OFFICE	SALES COUNTER	SALES COUNTER 360 CAMERA	V1	CAT6	1	
	SALES	SALES 360 CAMERA	V2	CAT6	1	
	SALES	FRONT 180 CAMERA	V3	CAT6	1	
	SALES	FRONT WDR BOX CAMERA	V4	CAT6	1	
	SALES	FRONT PUBLIC VIEW MONITOR	V5	CAT6	1	
	SALES	SALES 360 CAMERA	V6	CAT6	1	
	SALES	SALES 360 CAMERA	V7	CAT6	1	
	SALES	SALES 360 CAMERA	V8	CAT6	1	
	EXTERIOR	EXTERIOR CAMERA (FACING REAR DOOR)	V9	CAT6	1	
	EXTERIOR	EXTERIOR CAMERA (FACING AUTO CANOPY)	V10	CAT6	1	
	EXTERIOR	EXTERIOR CAMERA (FACING AUTO CANOPY)	V11	CAT6	1	
	BEER CAVE	SALES 360 CAMERA	V12	CAT6	1	
	SALES	SALES 360 CAMERA	V13	CAT6	1	
	MANAGER	MANAGER 360 CAMERA	V14	CAT6	1	
	FOOD PREP	FOOD PREP 360 CAMERA	V15	CAT6	1	
	MANAGER	KEYPAD OUTSIDE MANAGERS OFFICE	L1	22/4	1	
	SALES	FRONT PVM POWER	L2	18/2	1	
ELECTRIC ROOM	SALES COUNTER	INTERCOM WIRING	L5		1	1

NOTES:
(CONTRACTOR TO VERIFY ALL EXISTING LOW VOLTAGE EQUIPMENT AND FIELD COORDINATE QUANTITIES AND LOCATIONS OF EQUIPMENT PRIOR TO ORDERING

1. EC TO PROVIDE AND INSTALL CONDUIT AND PULL STRING. WIRING AND TERMINATIONS PROVIDED BY FUELING CONTRACTOR.
2. ALL CABLING SHALL BE CAT6 WIRED TO TIA/EIA 568B EXCEPT FOR POS REGISTERS WHICH SHALL BE WIRED TO TIA/EIA 568A.
3. BELDEN 8406 OR EQUIVALENT.
4. INSTALL ONLY WHEN REQUIRED.

1 LOW VOLTAGE TABLE
N.T.S.



2 STANDARD 7-ELEVEN IP CCTV TOPOLOGY
N.T.S.

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PROJECT

7-ELEVEN 42655 CST

1360 NC 24-87, CAMERON NC 28326

DWG. TITLE:

LOW VOLTAGE DETAILS

ISSUE REVISIONS

0	06/06/25	ISSUE FOR BID AND PERMIT
NO.	DATE	DESCRIPTION

SEAL
6/06/25
NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO, JR.
DocuSigned by:

DRAWN BY: JAL	CHECKED BY: JAL
SCALE: 1/4" = 1'-0"	PROJECT No. JAL#25-008
DATE: 6/06/25	FILE NAME:

SHEET NO.

E1.5

1 LIGHTING PLAN

Scale: 1/4"=1'

LIGHT FIXTURE SCHEDULE

LIGHT FIXTURE NAME	QTY	MANUFACTURER	CATALOG NUMBER	VOLTAGE	VA PER FIXTURE	LAMP TYPE	MOUNTING	LISTING	FIXTURE DESCRIPTION	SUPPLIER	FURNISH BY	INSTALL BY
A2/A3	0/10	CREE	FLX22/24-40L-940-CRV-10V10-UNV	120.0 V	33 VA	LED	RECESSED	DLC	LED 2' X 2'/2'X4' RECESSED TROFFER	GRAYBAR	GC	GC
A2E/A3E	0/3	CREE	FLX22/24-40L-940-CRV-10V10-UNV-EB	120.0 V	36 VA	LED	RECESSED	DLC	LED 2' X 2' RECESSED TROFFER WITH EMERGENCY BATTERY	GRAYBAR	GC	GC
A4	34	TBD	TBD	120.0 V	-VA	LED	RECESSED	DLC	LED 1'X4' RECESSED TROFFER	GRAYBAR	GC	GC
A4E	6	TBD	TBD	120.0 V	-VA	LED	RECESSED	DLC	LED 1' X 2' RECESSED TROFFER WITH EMERGENCY BATTERY	GRAYBAR	GC	GC
DS4	6	CREE	CR-B-LE-40L-940-UNV-10V1 & SMK-LE & SMK-EC	120.0 V	32 VA	LED	SURFACE	DLC	LED 1x4 SURFACE MOUNTED 4000K	GRAYBAR	GC	GC
R1	2	COOPER	APWR2BK	3.6 V	N / A	LED	UNIVERSAL	UL 924	REMOTE HEAD, BLACK	GRAYBAR	GC	GC
X1		SIGNIFY/CHLORIDE	VERWEM	120.0 V	10 VA	LED	UNIVERSAL	UL 924	LED EXIT (RED) LETTERS, EMERGENCY BATTERY BACK-UP LOW TEMP	GRAYBAR	GC	GC
X2	3	COOPER	APXH7R2	120.0 V	2 VA	LED	UNIVERSAL	UL 924	LED EXIT (RED) LETTERS, EMERGENCY BATTERY BACK-UP, REMOTE CAPABLE	GRAYBAR	GC	GC

KEYED NOTES

1. ALL NEW LIGHTING FIXTURES, EM LIGHTING AND EXIT SIGNS IN THIS AREA SHALL BE CONNECT TO EXISTING BRANCH CIRCUITS/SWITCH LEGS MADE SAFE-OFF DURING DEMOLITION. ALL LIGHTING CONTROLS SHALL BE REUSED , WHERE REQUIRED.
2. NEW LIGHTING FIXTURES ARE TO BE INSTALLED IN THIS AREA AND CONNECTED TO LOCAL EXISTING LIGHTING BRANCH CIRCUITS/SWITCH LEGS. EXISTING LIGHTING CONTROLS ARE TO REMAIN, WHERE REQUIRED.
3. EXISTING ELECTRICAL PANELS TO REMAIN. REFER TO ONE-LINE FOR MORE INFORMATION.
4. EMERGENCY LIGHT FIXTURE. CONNECT TO EXISTING LIGHTING CIRCUIT IN AREA AHEAD OF ALL SWITCHES. COORDINATE SELECTION WITH ARCHITECT.
5. LIGHTING FIXTURES, CONTROLS AND LIGHTING BRANCH CIRCUITS IN THIS AREA ARE EXISTING TO REMAIN.

GENERAL NOTES

THE INTENT OF THE PROJECT IS AN ALTERATION TO REPLACE EXISTING LIGHTING FIXTURES, EQUIPMENT AND DEVICES IN A LIMITED AREA OF THE BUILDING AND TO REUSE EXISTING BRANCH CIRCUITS IN THE AREA WHERE POSSIBLE.

NO ADDITIONAL LIGHTING OR DEVICE ELECTRICAL LOAD IS EXPECTED BE ADDED TO THE EXISTING BRANCH CIRCUITS.

LIGHTING FIXTURES ARE TO BE SELECTED BY OWNER/ARCHITECT.

NOTES:

1. REFER TO DWG. E0.1 FOR SYMBOL LIST, NOTES AND ABBREVIATIONS.
2. LIGHTING FIXTURE SELECTIONS SHALL BE COORDINATED WITH THE ARCHITECT.

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PROJECT

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DRG. TITLE:

LIGHTING PLAN

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SEAL

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E2.0

SECTION 16000 – BASIC ELECTRICAL

1. THE WORK COVERED BY DIVISION 16 CONSISTS OF FURNISHING ALL LABOR, EQUIPMENT, SUPPLIES, AND MATERIALS (EXCEPT AS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS) REQUIRED TO PERFORM ALL OPERATIONS NECESSARY FOR THE INSTALLATION OF COMPLETE ELECTRICAL SYSTEMS. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS.

2. COORDINATE ALL WORK WITH OTHER TRADES AND EXISTING CONDITIONS TO PREVENT CONFLICTS CAUSING UNNECESSARY EXPENSE OR DELAYS IN THE INSTALLATION OF WORK. WHEN CONFLICTS ARISE, REMOVE AND RELOCATE ITEMS CAUSING SUCH CONFLICTS AT NO ADDITIONAL COST TO THE OWNER. REFER TO OTHER DISCIPLINE'S DRAWINGS, RELEVANT EQUIPMENT DRAWINGS, AND SHOP DRAWINGS TO DETERMINE AVAILABLE CLEARANCES AND POSSIBLE OBSTRUCTIONS. MAKE ANY NECESSARY OFFSETS OR TRANSITIONS AS REQUIRED TO CLEAR STRUCTURAL MEMBERS, EXISTING EQUIPMENT, ETC. TO FACILITATE INSTALLATION OF THE WORK IN THE MANNER INDICATED.

3. ALL WORK SHALL COMPLY WITH THE LOCALLY ADOPTED ELECTRICAL CODE AND ALL APPLICABLE LAWS, CODES, RECOMMENDATIONS, REGULATIONS, AND INTERIM AMENDMENTS, OF THE GOVERNMENTAL BODIES HAVING JURISDICTION INCLUDING ADA COMPLIANCE. ALL ELECTRICAL WORK SHALL BE PERFORMED IN COMPLIANCE WITH ALL APPLICABLE GOVERNING SAFETY REGULATIONS, INCLUDING OSHA REGULATIONS. ALL SAFETY LIGHTS, GUARDS AND SIGNS REQUIRED FOR THE PERFORMANCE OF THE ELECTRICAL WORK SHALL BE PROVIDED BY AND OPERATED BY THE ELECTRICAL CONTRACTOR.

4. THE INTENT OF THE DRAWINGS IS TO INDICATE THE GENERAL EXTENT OF WORK REQUIRED FOR THE PROJECT. THE DRAWINGS FOR ELECTRICAL WORK ARE DIAGRAMMATIC, SHOWING THE LOCATION, TYPE, DEVICES AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENTS. PROVIDE ALL FIXTURES, DEVICES, ACCESSORIES, OFFSETS, AND MATERIALS NECESSARY TO FACILITATE THE SYSTEM'S FUNCTIONING AS INDICATED BY THE DESIGN AND THE EQUIPMENT FURNISHED BY OTHERS.

5. ELECTRICAL DESIGN FOR THIS INSTALLATION IS BASED ON FIELD INSPECTIONS AND PREVIOUS DESIGN DRAWINGS FOR THE EXISTING BUILDING. ELECTRICAL CONTRACTOR IS TO FIELD VERIFY EXISTING CONDITIONS PRIOR TO BIDDING. ALLOWANCES ARE TO BE INCLUDED FOR UNFORESEEN EXISTING CONDITIONS THAT MAY EFFECT THE CONTRACTOR'S SCOPE OF WORK. MINOR DEVIATIONS REQUIRED FOR ACCOMPLISHING THE INTENT OF THIS DESIGN IS TO BE INCLUDED IN THIS ALLOWANCE.

6. ELECTRICAL CONTRACTOR TO FIELD VERIFY ALL EXISTING UTILITIES. ANY ITEM DAMAGED BY THIS CONTRACTOR IS TO BE REPAIRED IMMEDIATELY AND AT NO COST TO THE OWNER.

7. ROOF PENETRATIONS SHALL COMPLY WITH "SMACNA" AND "NRCA" STANDARDS, AND WITH THE REQUIREMENTS OF THE EXISTING ROOFING WARRANTY, IF APPLICABLE. DO NOT PERFORM ROOFING PENETRATIONS IN A MANNER WHICH WOULD VOID OR OTHERWISE LIMIT THE EXISTING ROOFING WARRANTY.

8. ALL EQUIPMENT AND COMPONENTS FURNISHED AND/OR INSTALLED SHALL BE LISTED AND LABELED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL).

9. TEMPORARY ELECTRICAL SERVICE:

   A. PROVIDE TEMPORARY ELECTRICAL SERVICE FOR POWER AND LIGHTING DURING CONSTRUCTION. MAINTAIN DURING CONSTRUCTION AND REMOVE SERVICE AFTER CONSTRUCTION IS COMPLETED. THE TEMPORARY SYSTEM SHALL CONSIST OF AN ELECTRICAL SERVICE, DISTRIBUTION SYSTEM, LOAD-CENTER PANEL, GROUNDING, 15 AMP AND/OR 20 AMP BRANCH CIRCUITS, GROUNDED TYPE RECEPTACLES AND LIGHTING FIXTURES.

   B. PROVIDE AND INSTALL SUFFICIENT NUMBER OF TEMPORARY LIGHT FIXTURES FOR A SAFE INSTALLATION FOR ALL TRADES THROUGHOUT THE BUILDING. ALL LAMPS FOR GENERAL ILLUMINATION SHALL BE PROTECTED FROM ACCIDENTAL CONTACT OR BREAKAGE BY SUITABLE FIXTURE OR LAMPHOLDER WITH A GUARD. (NO EXCEPTIONS.)

10. WARRANTIES:

   A. CONTRACTOR SHALL WARRANT ALL WORK PERFORMED AND MATERIAL & LABOR PROVIDED UNDER THE CONTRACT AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP FOR ONE YEAR FROM SUBSTANTIAL COMPLETION. PROVIDE ALL SERVICES AS REQUIRED TO IMMEDIATELY REPAIR OR REPLACE, AT NO ADDITIONAL COST, ANY DEFECTIVE PART OF THE INSTALLATION RESULTING FROM THE SUPPLY OF FAULTY WORKMANSHIP OR MATERIAL. LACK OF MAINTENANCE, ACCIDENTS, OR CARELESSNESS ON THE PART OF THE OWNER SHALL NOT BE INCLUDED IN THIS WARRANTY.

   B. ALL LAMPS ARE TO BE WARRANTED ACCORDING TO LAMP MANUFACTURER, WHICH IS ALSO BASED ON AVERAGE LIFE DATA FOR EACH SPECIFIC TYPE OF LAMP. PROVIDE LABOR TO REPLACE ALL DEFECTIVE LAMPS THAT ARE WITHIN LAMP MANUFACTURER'S WARRANTY PERIOD.

   C. ALL EQUIPMENT, APPARATUS AND APPLIANCES WHICH ARE SPECIFIED AND/OR COME WITH WARRANTIES LONGER THAN ONE YEAR SHALL BE REGISTERED WITH THE MANUFACTURER IN THE OWNER'S NAME.

11. EXCAVATION:

   A. PROVIDE ALL EXCAVATION AND BACKFILL AS NECESSARY TO INSTALL THE CONDUIT SYSTEMS AS SHOWN ON THE DRAWINGS.

   B. CARE SHALL BE TAKEN IN EXCAVATING THAT WALLS AND FOOTINGS AND ADJACENT LOAD BEARING SOILS ARE NOT DISTURBED IN ANY WAY. WHERE RACEWAYS MUST CROSS UNDER A WALL FOOTING, THE EXCAVATION SHALL BE KEPT AT A MINIMUM.

   C. CONDUIT SHALL BE SUPPORTED DIRECTLY ON UNDISTURBED SOIL, DO NOT EXCAVATE BEYOND INDICATED DEPTH. IF EXISTING SOIL IS UNSUITABLE (SOFT SPOT OR ROCK), EXCAVATE TO SOLID SUBGRADE, OR 6" FOR ROCK, BELOW BOTTOM OF WORK AND PROVIDE SUB-BASE MATERIAL AS REQUIRED.

   D. IMMEDIATELY AFTER INSTALLATION, THE TRENCH SHALL BE CAREFULLY BACKFILLED WITH EARTH FREE FROM CLODS, BRICK, ETC. TO A DEPTH ONE-HALF THE RACEWAY DIAMETER AND THEN FIRMLY TAMPED IN SUCH A MANNER AS NOT TO DISTURB ALIGNMENT OR JOINTS OF THE CONDUIT. THEREAFTER THE BACKFILL SHALL BE TAMPED EVERY VERTICAL FOOT.

12. CUTTING AND PATCHING:

   A. NO STRUCTURAL MEMBERS SHALL BE CUT, DRILLED, OR PENETRATED WITHOUT PRIOR APPROVAL FROM THE ARCHITECT.

   B. PROVIDE CUTTING, PATCHING, AND PATCH PAINTING IN EXISTING STRUCTURES, AS REQUIRED FOR THE INSTALLATION OF WORK OF THIS SECTION. EXTENT OF CUTTING SHALL BE MINIMIZED. USE CORE DRILLS, POWER SAWS, AND OTHER MACHINES WHICH WILL PROVIDE NEAT, MINIMUM OPENINGS. REFER TO STRUCTURAL DRAWINGS FOR LINTELS AND SUPPORTS TO BE FURNISHED BY OTHERS FOR THE ELECTRICAL WORK. ALL OTHER LINTELS AND SUPPORTS REQUIRED FOR THE ELECTRICAL WORK SHALL BE FURNISHED BY DIVISION 16. PATCHING SHALL MATCH AND EQUAL ADJACENT MATERIALS AND SURFACES AND SHALL BE PERFORMED BY CRAFTSMAN SKILLED IN THE RESPECTIVE CRAFT REQUIRED. PATCHED FINISHES SHALL BE APPROVED BY THE ARCHITECT.

   C. ALL PUBLIC AND PRIVATE PROPERTY DAMAGED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT SHALL BE REPAIRED AND REPLACED BY THIS CONTRACTOR, TO THE SATISFACTION OF THE AUTHORITIES HAVING REGULATORY JURISDICTION AND BUILDING OWNER.

SECTION 16060 – GROUNDING

1. EXTENT OF ELECTRICAL GROUNDING AND BONDING WORK IS INDICATED BY DRAWINGS AND AS SPECIFIED HEREIN. GROUNDING AND BONDING WORK IS DEFINED TO ENCOMPASS SYSTEMS, CIRCUITS, AND EQUIPMENT.

2. EXCEPT AS OTHERWISE INDICATED, PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEMS INDICATED WITH ASSEMBLY OF MATERIALS, INCLUDING, BUT NOT LIMITED TO, CABLES/WIRES, CONNECTORS, SOLDERLESS LUG TERMINALS, GROUNDING ELECTRODES AND PLATE ELECTRODES, BONDING JUMPER BRAID, AND ADDITIONAL ACCESSORIES NEEDED FOR A COMPLETE INSTALLATION. WHERE MORE THAN ONE TYPE COMPONENT PRODUCT MEETS INDICATED REQUIREMENTS, SELECTION IS INSTALLER'S OPTION. WHERE MATERIALS OR COMPONENTS ARE NOT INDICATED, PROVIDE PRODUCTS WHICH COMPLY WITH BUILDING CODES, UL, AND IEEE REQUIREMENTS AND WITH ESTABLISHED INDUSTRY STANDARDS FOR THOSE APPLICATIONS INDICATED.

3. INSTALL ELECTRICAL GROUNDING AND BONDING SYSTEMS AS INDICATED, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPLICABLE PORTIONS OF THE BUILDING CODES, NECA'S "STANDARD OF INSTALLATION", AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PRODUCTS COMPLY WITH REQUIREMENTS.

4. RACEWAY SYSTEMS SHALL NOT BE USED AS GROUNDING METHOD. ALL BRANCH AND FEEDER CONDUITS TO HAVE A GROUNDING CONDUCTOR INSTALLED WITH PHASE AND NEUTRAL CONDUCTORS. SIZE OF GROUND CONDUCTOR TO BE IN ACCORDANCE WITH THE ADOPTED ELECTRICAL CODE. TERMINATE FEEDER AND BRANCH CIRCUIT INSULATED EQUIPMENT GROUNDING CONDUCTORS WITH GROUNDING LUG, BUS, OR BUSHING.

5. INSTALLATION OF ELECTRICAL GROUNDING AND BONDING SYSTEMS:

   A. GROUNDING ELECTRODE CONDUCTORS, WHERE NOT INSTALLED AS PART OF A BRANCH CIRCUIT OR FEEDER, SHALL BE INSTALLED IN PVC CONDUIT, TO PROTECT THE WIRING FROM PHYSICAL DAMAGE.

   B. CONNECT GROUNDING ELECTRODE CONDUCTORS TO METAL COLD WATER PIPE AND ALL OTHER TYPES OF METAL PIPING WITHIN THE BUILDING USING A SUITABLY SIZED GROUND CLAMP. PROVIDE CONNECTIONS TO FLANGED PIPING TO STREET SIDE OF FLANGE. PROVIDE BONDING AS DESCRIBED IN ADOPTED ELECTRICAL CODE INCLUDING BONDING JUMPER AROUND WATER METER.

   C. CONNECT TOGETHER SYSTEM NEUTRAL, SERVICE EQUIPMENT ENCLOSURES, EXPOSED NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT, METAL RACEWAY SYSTEMS, GROUNDING CONDUCTOR IN RACEWAYS AND CABLES, RECEPTACLE GROUND CONNECTORS, AND PLUMBING SYSTEMS.

   D. THE UTILITY COMPANY METER SOCKET SHALL BE GROUNDED TO A 1/2" X 10' COPPER CLAD STEEL GROUND ROD WITH COPPER WIRE INSTALLED IN P.V.C. CONDUIT. THE GROUND ROD SHALL BE DRIVEN INTO THE EARTH WITH THE TOP 1'-0" BELOW GRADE, AS NEAR AS POSSIBLE TO THE LOCATION OF THE METER SOCKET WITH THE TOP 1'-0" BELOW FINISHED GRADE.

SECTION 16075 – IDENTIFICATION

1. ENGRAVED, PLASTIC-LAMINATED LABELS, SIGNS, AND INSTRUCTION PLATES: ENGRAVING STOCK MELAMINE PLASTIC LAMINATE, 1/16-INCH MINIMUM THICK FOR SIGNS UP TO 20 SQUARE INCHES, OR 8 INCHES IN LENGTH; 1/8-INCH THICK FOR LARGER SIZES. ENGRAVED LEGEND IN WHITE LETTERS ON BLACK FACE AND PUNCHED FOR MECHANICAL FASTENERS.

2. CABLE TIES: FUNGUS-INERT, SELF-EXTINGUISHING, ONE-PIECE, SELF-LOCKING NYLON CABLE TIES, 0.18-INCH MINIMUM WIDTH, 50-LB MINIMUM TENSILE STRENGTH, AND SUITABLE FOR A TEMPERATURE RANGE FROM MINUS 50 F TO 350 F. PROVIDE TIES IN SPECIFIED COLORS WHEN USED FOR COLOR-CODING.

3. SELF ADHESIVE, COMMERCIALLY AVAILABLE ARC FLASH HAZARD LABELS. LABELS TO CONFORM TO THE ADOPTED ELECTRICAL CODE AND A.N.S.I. Z535.4.

4. CONDUCTOR COLOR CODING: PROVIDE COLOR CODING FOR SECONDARY SERVICE, FEEDER, AND BRANCH CIRCUIT CONDUCTORS THROUGHOUT THE PROJECT SECONDARY ELECTRICAL SYSTEM PER WIRES AND CABLING SECTION.

5. APPLY EQUIPMENT IDENTIFICATION LABELS OF ENGRAVED PLASTIC- LAMINATE ON EACH MAJOR UNIT OF ELECTRICAL EQUIPMENT IN BUILDING, INCLUDING CENTRAL OR MASTER UNIT OF EACH ELECTRICAL SYSTEM. THIS INCLUDES COMMUNICATION/SIGNAL/ALARM SYSTEMS, UNLESS UNIT IS SPECIFIED WITH ITS OWN SELF-EXPLANATORY IDENTIFICATION. EXCEPT AS OTHERWISE INDICATED, PROVIDE SINGLE LINE OF TEXT, WITH 1/4-INCH-HIGH LETTERING ON 1-INCH-HIGH LABEL (1-1/2-INCH-HIGH WHERE TWO LINES ARE REQUIRED), WHITE LETTERING IN BLACK FIELD. TEXT SHALL MATCH TERMINOLOGY AND NUMBERING OF THE CONTRACT DOCUMENTS AND SHOP DRAWINGS. APPLY LABELS FOR EACH UNIT OF THE FOLLOWING CATEGORIES OF ELECTRICAL EQUIPMENT.

   A. PANELBOARDS, ELECTRICAL CABINETS, AND ENCLOSURES
   B. ELECTRICAL SWITCHGEAR AND SWITCHBOARDS
   C. MOTOR STARTERS AND/OR VFDs FURNISHED BY THIS CONTRACTOR
   D. DISCONNECT SWITCHES
   E. CONTACTORS

SECTION 16075 – IDENTIFICATION

1. ENGRAVED, PLASTIC-LAMINATED LABELS, SIGNS, AND INSTRUCTION PLATES: ENGRAVING STOCK MELAMINE PLASTIC LAMINATE, 1/16-INCH MINIMUM THICK FOR SIGNS UP TO 20 SQUARE INCHES, OR 8 INCHES IN LENGTH; 1/8-INCH THICK FOR LARGER SIZES. ENGRAVED LEGEND IN WHITE LETTERS ON BLACK FACE AND PUNCHED FOR MECHANICAL FASTENERS.

2. CABLE TIES: FUNGUS-INERT, SELF-EXTINGUISHING, ONE-PIECE, SELF-LOCKING NYLON CABLE TIES, 0.18-INCH MINIMUM WIDTH, 50-LB MINIMUM TENSILE STRENGTH, AND SUITABLE FOR A TEMPERATURE RANGE FROM MINUS 50 F TO 350 F. PROVIDE TIES IN SPECIFIED COLORS WHEN USED FOR COLOR-CODING.

3. SELF ADHESIVE, COMMERCIALLY AVAILABLE ARC FLASH HAZARD LABELS. LABELS TO CONFORM TO THE ADOPTED ELECTRICAL CODE AND A.N.S.I. Z535.4.

4. CONDUCTOR COLOR CODING: PROVIDE COLOR CODING FOR SECONDARY SERVICE, FEEDER, AND BRANCH CIRCUIT CONDUCTORS THROUGHOUT THE PROJECT SECONDARY ELECTRICAL SYSTEM PER WIRES AND CABLING SECTION.

5. APPLY EQUIPMENT IDENTIFICATION LABELS OF ENGRAVED PLASTIC- LAMINATE ON EACH MAJOR UNIT OF ELECTRICAL EQUIPMENT IN BUILDING, INCLUDING CENTRAL OR MASTER UNIT OF EACH ELECTRICAL SYSTEM. THIS INCLUDES COMMUNICATION/SIGNAL/ALARM SYSTEMS, UNLESS UNIT IS SPECIFIED WITH ITS OWN SELF-EXPLANATORY IDENTIFICATION. EXCEPT AS OTHERWISE INDICATED, PROVIDE SINGLE LINE OF TEXT, WITH 1/4-INCH-HIGH LETTERING ON 1-INCH-HIGH LABEL (1-1/2-INCH-HIGH WHERE TWO LINES ARE REQUIRED), WHITE LETTERING IN BLACK FIELD. TEXT SHALL MATCH TERMINOLOGY AND NUMBERING OF THE CONTRACT DOCUMENTS AND SHOP DRAWINGS. APPLY LABELS FOR EACH UNIT OF THE FOLLOWING CATEGORIES OF ELECTRICAL EQUIPMENT.

   A. PANELBOARDS, ELECTRICAL CABINETS, AND ENCLOSURES
   B. ELECTRICAL SWITCHGEAR AND SWITCHBOARDS
   C. MOTOR STARTERS AND/OR VFDs FURNISHED BY THIS CONTRACTOR
   D. DISCONNECT SWITCHES
   E. CONTACTORS

SECTION 16120 – WIRES AND CABLES

1. CONDUCTORS: PROVIDE SOLID CONDUCTORS FOR POWER AND LIGHTING CIRCUITS NO. 10 AWG AND SMALLER. PROVIDE STRANDED CONDUCTORS FOR SIZES NO. 8 AWG AND LARGER.

2. CONDUCTOR MATERIAL: COPPER FOR ALL WIRES AND CABLES.

3. INSULATION: PROVIDE THHN/THWN INSULATION FOR ALL CONDUCTORS NO. 14 AWG THRU NO. 10 AWG. FOR ALL OTHER SIZES PROVIDE THHN/THWN OR XHHW INSULATION AS APPROPRIATE FOR THE LOCATION WHERE INSTALLED.

4. ALUMINUM CONDUCTORS ARE NOT APPROVED OR ACCEPTABLE.

5. ALUMINUM CONDUCTORS:

   A. AT THE CONTRACTOR'S OPTION, ALUMINUM CONDUCTORS WILL BE ALLOWED FOR COPPER SIZES RATED FOR 100 AMPERES AND LARGER BUT, SIZE MUST BE INCREASED TO EQUAL OR EXCEED THE COPPER AMPACITY IN ACCORDANCE WITH ADOPTED ELECTRICAL CODE. RACEWAY AND PULL BOXES MUST BE INCREASED TO CONFORM TO ADOPTED ELECTRICAL CODE. ALL ALUMINUM CONDUCTORS MUST BE MADE BASED ON COMPACT STRANDED, AA-8000 SERIES ALUMINUM ALLOY MATERIAL EQUAL TO "STABILOY" ALCAN CABLE.

   B. IF ALUMINUM CABLE IS TO BE INSTALLED ON THIS PROJECT, CONTRACTOR IS TO NOTIFY ENGINEER IN WRITING, AT TIME OF SUBMITTAL DRAWINGS. CONTRACTOR IS TO LIST ALL FEEDERS THAT WILL BE CHANGED TO ALUMINUM, AND INDICATE THE REVISED ALUMINUM CONDUCTOR SIZE.

   C. CONNECTORS AND TERMINATIONS INSTALLED WITH ALUMINUM-ALLOY CONDUCTORS SHALL BE COMPRESSION TYPE ONLY, AND ONLY THOSE LISTED BY UNDERWRITER'S LABORATORIES STRANDED 486-B AND MARKED "AL7CU" FOR 75C RATED CIRCUITS.

   D. IF THE CONTRACTOR DECIDES TO EXERCISE THE OPTION OF ALUMINUM CONDUCTORS FOR CONNECTIONS TO EQUIPMENT PROVIDED AND/OR INSTALLED BY OTHER TRADES, THEN THIS CONTRACTOR SHALL REIMBURSE THE EQUIPMENT SUPPLIER FOR ANY COST ASSOCIATED WITH THE MODIFICATIONS REQUIRED TO THAT EQUIPMENT.

   E. ENDS OF ALL CONDUCTORS ARE TO BE BRUSHED CLEAN AND PRIOR TO FINAL CONNECTION, EXPOSED PORTION OF CONDUCTOR TO BE COVERED WITH ALUMINUM OXIDE INHIBITOR. CONDUCTOR TERMINATION MADE WITH SET-SCREW TERMINAL LUGS ARE TO BE TORQUED, USING A TORQUE WRENCH, IN ACCORDANCE WITH LUG MANUFACTURER SPECIFICATIONS OR ACCORDING TO UL STANDARD 486B. AT THE COMPLETION OF THE PROJECT CONTRACTOR IS TO CHECK TORQUE VALUES ON ALL ALUMINUM TERMINATIONS. CONTRACTOR IS TO SUBMIT IN WRITING, AT TIME OF RECORD DRAWINGS, A COMPLETE LIST OF APPLIED TORQUE VALUES FOR ALL ALUMINUM TERMINATIONS.

6. VARIABLE FREQUENCY DRIVE CABLES: WHERE A VFD IS INSTALLED, PROVIDE A VFD CABLING SYSTEM FROM THE VFD TO THE CONTROLLED EQUIPMENT MANUFACTURED MEETING THE FOLLOWING SPECIFICATIONS:
   6.1. ASTM B3 AND B8
   6.2. UL 44, UL 1277
   6.3. COLOR CODE PER ICEA S-58-679 METHOD 4
   6.4. IEEE 1202/FT4 FLAME TEST
   6.5. CONDUCTORS SHALL BE CLASS B STRANDED, UNCOATED ANNEALED COPPER; EACH CONDUCTOR SHALL BE INSULATED WITH BLACK POLYETHYLENE. A 5 MIL UNCOATED COPPER TAPE SHIELD, HELICALLY WRAPPED OVER THE TWISTED ASSEMBLY WITH A 50% OVERLAP AND IN CONTACT WITH THE GROUND WIRE. WITH A FLAME RETARDANT PVC JACKET OUTER JACKET.

1. INSTALLATION OF WIRES AND CABLES:

   A. ALL BRANCH CIRCUIT WIRES, FEEDER CABLES, ETC., SHALL BE CONTINUOUS FROM OUTLET TO OUTLET. NO JOINTS SHALL BE MADE EXCEPT IN OUTLET, JUNCTION OR PULL BOXES, PANELBOARD AND SWITCHBOARD GUTTERS. FOR THE SPLICING OF EXISTING FEEDER CONDUCTORS, COMPRESSION TYPE BUTT SPLICES WITH COLD SHRINK INSULATION KITS ARE TO BE USED.

   B. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES. WHERE MANUFACTURER'S TORQUE REQUIREMENTS ARE NOT INDICATED, TIGHTEN CONNECTORS AND TERMINALS TO COMPLY WITH TIGHTENING TORQUE'S SPECIFIED IN UL 486A AND UL 486B.

   C. TERMINALS ON SWITCHES AND CONVENIENCE OUTLETS SHALL NOT BE USED TO "FEED THROUGH" TO THE NEXT SWITCH OR OUTLET. WHERE MORE THAN ONE GROUND, COMMON NEUTRAL, OR COMMON PHASE CONDUCTOR ENTERS A BOX, ALL LIKE CONDUCTORS SHALL BE IN GOOD ELECTRICAL CONTACT WITH EACH OTHER AND THE ARRANGEMENT SHALL BE SUCH, THAT THE DISCONNECTING OR REMOVAL OF A DEVICE FED FROM THE BOX, WILL NOT INTERFERE WITH OR INTERRUPT SERVICE TO THE REMAINDER OF THE BRANCH CIRCUIT WIRING.

208Y/120 VOLTS NORMAL	PHASE
BLACK	A
RED	B
BLUE	C
WHITE	NEUTRAL
GREEN	GROUND
GREEN W/ YELLOW STRIP	ISOLATED GROUND

SECTION 16130 – RACEWAYS

1. THIS SECTION INCLUDES RACEWAYS FOR ELECTRICAL WIRING. TYPES OF RACEWAYS IN THIS SECTION INCLUDE THE FOLLOWING:

   A. ELECTRICAL METALLIC TUBING (EMT)
   B. INTERMEDIATE METAL CONDUIT (IMC)
   C. FLEXIBLE METAL CONDUIT
   D. LIQUID-TIGHT FLEXIBLE CONDUIT
   E. RIGID METAL CONDUIT
   F. RIGID NONMETALLIC CONDUIT (PVC)
   G. SURFACE RACEWAYS
   H. WIREWAY
   I. METAL CLAD (MC) AND ALUMINUM CLAD (AC) CABLE

2. WIREWAYS:

   A. ELECTRICAL WIREWAYS SHALL BE OF TYPES, SIZES, AND NUMBER OF CHANNELS AS INDICATED. FITTINGS AND ACCESSORIES INCLUDING BUT NOT LIMITED TO COUPLINGS, OFFSETS, ELBOWS, EXPANSION JOINTS, ADAPTERS, HOLD-DOWN STRAPS, AND END CAPS SHALL MATCH AND MATE WITH WIREWAY AS REQUIRED FOR A COMPLETE SYSTEM. WHERE FEATURES ARE NOT INDICATED, SELECT TO FULFILL WIRING REQUIREMENTS AND COMPLY WITH APPLICABLE PROVISIONS OF ADOPTED ELECTRICAL CODE.

4. SURFACE RACEWAYS:

   A. SIZES AND CHANNELS AS INDICATED, MINIMUM SIZE TO BE EQUAL TO WIREMOLD #500 SERIES. PROVIDE FITTINGS THAT MATCH AND MATE WITH RACEWAY. CONSTRUCT OF GALVANIZED STEEL WITH SNAP-ON COVERS, WITH 1/8-INCH MOUNTING SCREW KNOCKOUTS IN BASE APPROXIMATELY 8 INCHES ON-CENTER. FINISH WITH MANUFACTURER'S STANDARD PRIME COATING SUITABLE FOR PAINTING. PROVIDE RACEWAYS OF TYPE SUITABLE FOR EACH APPLICATION REQUIRED.

5. WIRING METHOD:

   A. OUTDOORS: USE THE FOLLOWING WIRING METHODS:
      A.1. EXPOSED: INTERMEDIATE METAL CONDUIT.
      A.2. CONCEALED: INTERMEDIATE METAL CONDUIT.
      A.3. UNDERGROUND, RIGID NONMETAL CONDUIT.
      A.4. CONNECTION TO VIBRATING EQUIPMENT: INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC OR ELECTRIC SOLENOID OR MOTOR-DRIVEN EQUIPMENT: LIQUID-TIGHT FLEXIBLE METAL CONDUIT.
      A.5. INDOORS OR OUTDOORS: CONNECTION TO VIBRATING EQUIPMENT AND HYDRAULIC, PNEUMATIC, OR ELECTRIC SOLENOID OR MOTOR-DRIVEN EQUIPMENT IN MOIST OR HUMID LOCATION OR CORROSIVE ATMOSPHERE, OR WHERE SUBJECT TO WATER SPRAY OR DRIPPING OIL, GREASE, OR WATER: LIQUID-TIGHT FLEXIBLE METAL CONDUIT.

   B. INDOORS: USE THE FOLLOWING WIRING METHODS:
      B.1. CONNECTION TO VIBRATING EQUIPMENT: INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC OR ELECTRIC SOLENOID OR MOTOR-OPERATED EQUIPMENT: FLEXIBLE METAL CONDUIT.
      B.2. EXPOSED: ELECTRICAL METALLIC TUBING CONDUIT.
      B.3. CONCEALED: ELECTRICAL METALLIC TUBING.
      B.4. CONCEALED, IN CONCRETE EMBEDDED, STRUCTURAL INTERIOR WALLS, OR ROOF DECK PENETRATIONS: INTERMEDIATE METAL OR RIGID METAL CONDUIT.
      B.5. UNDER CONCRETE FLOOR (SLAB ON GRADE): INTERMEDIATE METAL OR RIGID METAL CONDUIT.

   C. P.V.C. CONDUIT CAN BE INSTALLED BELOW FLOOR SLAB INDOORS, ONLY IF RIGID STEEL ELBOWS ARE USED WHEN PASSING THRU FLOOR SLAB. MINIMUM SIZE P.V.C. CONDUIT THAT CAN BE INSTALLED IS 3/4" UNLESS NOTED OTHERWISE. ALL P.V.C. CONDUIT JOINTS ARE TO BE GLUED AND SEALED TO PREVENT MOISTURE FROM ENTERING RACEWAY SYSTEM. CONDUITS FOUND TO CONTAIN MOISTURE WILL BE REPAIRED OR REPLACED AS REQUIRED PRIOR TO INSTALLATION OF CONDUCTORS.

   D. METAL CLAD (MC) AND ALUMINUM CLAD (AC) CABLE
      D.1. MC AND AC CABLE MAY BE USED IN LIEU OF E.M.T. CONDUIT IF ACCEPTABLE TO LOCAL AUTHORITIES AND INSTALLED PER ELECTRICAL CODE REGARDING SUPPORT, GROUNDING AND CABLE TERMINATIONS. ALL MC AND AC CABLE NOT INSTALLED PER THE ADOPTED CODE SHALL BE REMOVED, REINSTALLED AND CORRECTED AT CONTRACTOR'S EXPENSE WITH NO EXTENSION IN THE CONSTRUCTION SCHEDULE.
      D.2. MC AND AC CABLE MUST BE SUPPORTED AND SECURED BY STAPLES, CABLE TIES, STRAPS, HANGERS, OR SIMILAR FITTINGS, DESIGNED AND INSTALLED SO AS NOT TO DAMAGE THE CABLE.
      D.3. MC AND AC CABLE, WITH FOUR OR LESS CONDUCTORS SIZED NO LARGER THAN 10 AWG, MUST BE SECURED WITHIN 12 IN. OF EVERY OUTLET BOX, JUNCTION BOX, CABINET, OR FITTING AND AT INTERVALS NOT EXCEEDING 6 FT.
      D.4. MC AND AC CABLE MUST BE SUPPORTED AT INTERVALS NOT EXCEEDING 6 FT. CABLES INSTALLED HORIZONTALLY THROUGH WOODEN OR METAL FRAMING MEMBERS ARE CONSIDERED SECURED AND SUPPORTED WHERE SUCH SUPPORT DOESN'T EXCEED 6 FT INTERVALS.
      D.5. MAY NOT BE USED IN EXTERIOR APPLICATIONS

6. CONDUIT SHALL BE INSTALLED AS A COMPLETE SYSTEM, CONTINUOUS FROM OUTLET TO OUTLET, CABINET OR FITTING, AND BE SO MECHANICALLY AND ELECTRICALLY CONNECTED THAT ADEQUATE ELECTRICAL CONTINUITY FROM ONE CONDUIT TO ANOTHER IS SECURED. THE ENTIRE SYSTEMS SHALL BE SECURELY FASTENED IN PLACE WITHIN 3' OF EACH OUTLET OR JUNCTION BOX, CABINET OR FITTING, AND AT INTERVALS NOT EXCEEDING 10', EXCEPT AS OTHERWISE SPECIFIED OR SHOWN. SINGLE CONDUITS FOR FEEDERS SHALL BE HUNG WITH GRINNEL, CRANE, OR EQUAL, MALLEABLE SPLIT RING HANGERS WITH ROD SUSPENSION SPACED NOT OVER 10' APART FROM CONSTRUCTION ABOVE. GROUPS OF HORIZONTAL FEEDER AND BRANCH CIRCUIT CONDUITS SHALL BE CLAMPED TO UNISTRUT, OR EQUAL, STEEL CHANNELS AND SUSPENDED FROM RODS SUPPORTED FROM STRUCTURE, SPACED NOT OVER 10' APART FROM CONSTRUCTION ABOVE. WHERE POSSIBLE CONDUITS MAY BE CLAMPED DIRECTLY TO THE STEEL JOISTS.

7. USE RACEWAY FITTINGS THAT ARE OF TYPES COMPATIBLE WITH THE ASSOCIATED RACEWAY AND SUITABLE FOR THE USE AND LOCATION. FOR INTERMEDIATE METAL CONDUIT, USE THREADED RIGID STEEL CONDUIT FITTINGS. FOR EMT CONDUITS: FITTINGS ARE TO BE COMPRESSION OR SET SCREW TYPE.

8. INSTALL PULL WIRES IN EMPTY RACEWAYS. USE NO. 14 AWG ZINC-COATED STEEL OR MONOFILAMENT PLASTIC LINE HAVING NOT LESS THAN 200-LB TENSILE STRENGTH. LEAVE NOT LESS THAN 12 INCHES OF SLACK AT EACH END OF THE PULL WIRE.

9. TELEPHONE AND SIGNAL SYSTEM RACEWAYS 2-INCH TRADE SIZE AND SMALLER: IN ADDITION TO THE ABOVE REQUIREMENTS, INSTALL RACEWAYS IN MAXIMUM LENGTHS OF 150 FEET AND WITH A MAXIMUM OF TWO, 90 BENDS OR EQUIVALENT. INSTALL PULL OR JUNCTION BOXES WHERE NECESSARY TO COMPLY WITH THESE REQUIREMENTS.

10. ALL CONDUITS ABOVE LAY-IN CEILING SYSTEM SHALL NOT BE SUPPORTED FROM CEILING SUSPENSION WIRES.

11. PROVIDE 36" MINIMUM RADIUS RIGID STEEL CONDUIT ELBOWS FOR PRIMARY SERVICE CONDUITS UNDER THE TRANSFORMER PAD.

12. CONDUITS CAPPED OUTSIDE OF BUILDING FOR FUTURE ADDITION SHALL BE A MINIMUM OF 1'-6" BELOW FINISH GRADE, CAPPED AND PAINTED WITH BITUMINOUS PAINT, WHICH SHALL BE THOROUGHLY DRY, BEFORE BACKFILL IS INSTALLED.

13. METAL CLAD (MC) AND ALUMINUM CLAD (AC) CABLES:

   A. ALL HOMERUNS TO PANELBOARDS SHALL REMAIN IN E.M.T. CONDUIT.
   B. MC AND AC CABLES SHALL NOT BE USED IN EXPOSED AREAS.
   C. ALL FITTINGS SHALL BE LISTED FOR USE WITH MC AND AC CABLE USED.
   D. CONDUCTORS IN MC AND AC CABLE SHALL COMPLY WITH SECTION "WIRES & CABLES".

SECTION 16135 – CABINETS, BOXES AND FITTINGS

1. THIS SECTION INCLUDES CABINETS, BOXES, AND FITTINGS FOR ELECTRICAL INSTALLATIONS AND CERTAIN TYPES OF ELECTRICAL FITTINGS NOT COVERED IN OTHER SECTIONS

2. METAL OUTLET, DEVICE, AND SMALL WIRING BOXES:

   A. GENERAL: CONFORM TO UL 514A, "METALLIC OUTLET BOXES, ELECTRICAL," AND UL 514B, "FITTINGS FOR CONDUIT AND OUTLET BOXES." BOXES SHALL BE OF TYPE, SHAPE, SIZE, AND DEPTH TO SUIT EACH LOCATION AND APPLICATION.

   B. STEEL BOXES: CONFORM TO NEMA OS 1, "SHEET STEEL OUTLET BOXES, DEVICE BOXES, COVERS, AND BOX SUPPORTS." BOXES SHALL BE SHEET STEEL WITH STAMPED KNOCKOUTS, THREADED SCREW HOLES AND ACCESSORIES SUITABLE FOR EACH LOCATION INCLUDING MOUNTING BRACKETS AND STRAPS, CABLE CLAMPS, EXTERIOR RINGS AND FIXTURE STUDS.

   C. CAST-IRON FLOOR BOXES: FULLY ADJUSTABLE, WATERPROOF, WITH THREADED RACEWAY ENTRANCES, RECTANGULAR BOX OPENING, ADJUSTING RINGS, GASKETS, BRASS FLOOR PLATES, AND POLYCARBONATE CARPET FLANGE. WHERE INDICATED, PROVIDE MULTI-SECTION BOXES WITH INDIVIDUAL HINGED SECTION COVERS AND PROVIDE FOR A DUPLEX RECEPTACLE UNDER ONE OR MORE OF THE COVERS.

3. PULL AND JUNCTION BOXES:

   A. COMPLY WITH UL 50, "ELECTRICAL CABINETS AND BOXES", FOR BOXES OVER 100 CUBIC INCHES VOLUME. BOXES SHALL HAVE SCREWED OR BOLTED ON COVERS OF MATERIAL SAME AS BOXES AND SHALL BE OF SIZE AND SHAPE TO SUIT APPLICATION.

   B. STEEL BOXES: SHEET STEEL WITH WELDED SEAMS. WHERE NECESSARY TO PROVIDE A RIGID ASSEMBLY, CONSTRUCT WITH INTERNAL STRUCTURAL STEEL BRACING.

   C. HOT-DIPPED GALVANIZED STEEL BOXES: SHEET STEEL WITH WELDED SEAMS. WHERE NECESSARY TO PROVIDE A RIGID ASSEMBLY, CONSTRUCT WITH INTERNAL STRUCTURAL STEEL BRACING. HOT-DIP GALVANIZED AFTER FABRICATION.

4. CABINETS:

   A. COMPLY WITH UL 50, "ELECTRICAL CABINETS AND BOXES." SHEET STEEL, NEMA 1 CLASS EXCEPT AS OTHERWISE INDICATED. CABINET SHALL CONSIST OF A BOX AND A FRONT CONSISTING OF A ONE-PIECE FRAME AND A HINGED DOOR. ARRANGE DOOR TO CLOSE AGAINST A RABBET PLACED ALL AROUND THE INSIDE EDGE OF THE FRAME, WITH A UNIFORMLY CLOSE FIT BETWEEN DOOR AND FRAME. PROVIDE CONCEALED FASTENERS, NOT OVER 24-INCHES APART, TO HOLD FRONTS TO CABINET BOXES AND PROVIDE FOR ADJUSTMENT. PROVIDE FLUSH OR CONCEALED DOOR HINGES NOT OVER 24-INCHES APART AND NOT OVER 6-INCHES FROM TOP AND BOTTOM OF DOOR. FOR FLUSH CABINETS, MAKE THE FRONT APPROXIMATELY 3/4 INCH LARGER THAN THE BOX ALL AROUND. FOR SURFACE MOUNTED CABINETS MAKE FRONT SAME HEIGHT AND WIDTH AS BOX.

   B. DOORS: DOUBLE DOORS FOR CABINETS WIDER THAN 24-INCHES. TELEPHONE CABINETS WIDER THAN 48-INCHES MAY HAVE SLIDING OR REMOVABLE DOORS.

   C. LOCKS: COMBINATION SPRING CATCH AND KEY LOCK, WITH ALL LOCKS FOR CABINETS OF THE SAME SYSTEM KEYED ALIKE. LOCKS MAY BE OMITTED ON SIGNAL, POWER, AND LIGHTING CABINETS LOCATED WITHIN WIRE CLOSETS AND MECHANICAL-ELECTRICAL ROOMS. LOCKS SHALL BE OF A TYPE TO PERMIT DOORS TO LATCH CLOSED WITHOUT LOCKING.

5. STEEL ENCLOSURES WITH HINGED DOORS:

   A. COMPLY WITH UL 50, "CABINETS AND ENCLOSURES" AND NEMA ICS 6, "ENCLOSURES FOR INDUSTRIAL CONTROLS AND SYSTEMS." SHEET STEEL, 16 GAGE MINIMUM, WITH CONTINUOUS WELDED SEAMS. NEMA CLASS AS INDICATED ARRANGED FOR SURFACE MOUNTING.

   B. DOORS: HINGED DIRECTLY TO CABINET AND REMOVABLE, WITH APPROXIMATELY 3/4-INCH FLANGE AROUND ALL EDGES, SHAPED TO COVER EDGE OF BOX. PROVIDE HANDLE OPERATED, KEY LOCKING LATCH. INDIVIDUAL DOOR WIDTH SHALL BE NO GREATER THAN 24-INCHES. PROVIDE MULTIPLE DOORS WHERE REQUIRED.

   C. ENCLOSURE: WHERE DOOR GASKETING IS REQUIRED, PROVIDE NEOPRENE GASKET ATTACHED WITH OIL-RESISTANT ADHESIVE, AND HELD IN PLACE WITH STEEL RETAINING STRIPS. FOR ALL ENCLOSURES OF CLASS HIGHER THAN NEMA 1, USE HUBBED RACEWAY ENTRANCES.

6. WEATHERPROOF PULL AND SPLICE BOXES:

   A. BOXES TO BE NEMA 12 AND 13 RATED, ALL STEEL CONSTRUCTION CONFORMING TO J.I.C. STANDARD EGP-1-1997. EXTERNAL MOUNTING FEET FOR SURFACE MOUNTING. OIL-RESISTANT GASKET ATTACHED TO INSIDE OF DOOR COVER. CONTINUOUS HINGE AND EXTERNAL SCREW CLAMP FOR QUICK OPENING AND CLOSING.

7. FIRESTOP FOR RECESSED WALL BOXES:

   A. INSTALLATIONS OF MULTIPLE BOXES (LESS THAN 24" APART) WITH MAXIMUM 4-11/16" BY 4-11/16" FLUSH DEVICE UL LISTED METAL OUTLET BOXES IN FIRE RATED GYPSUM WALL BOARD WALL ASSEMBLIES FRAMED WITH MINIMUM 3-1/2" WIDE WOOD OR STEEL STUDS AND CONSTRUCTED AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE FIRE RESISTANCE DIRECTORY. 3M #MPP-4S MOLDABLE PUTTY PADS ARE TO BE INSTALLED ON THE EXTERIOR SURFACES OF THE FLUSH DEVICE BOX IN 1 AND 2 HOUR FIRE RATED WALLS AND PARTITIONS.

8. FLOOR BOXES IN SLABS ON GRADE AND WET LOCATIONS TO BE NEMA TYPE 4, CAST-IRON BOXES WITH THREADED HUBS. FLOOR BOXES LOCATED IN SLABS ABOVE GRADE CAN BE STAMPED STEEL. PLASTIC FLOOR BOXES ARE NOT APPROVED.

   A. INSTALL IN CONCRETE FLOOR SLABS SO THEY ARE COMPLETELY ENVELOPED IN CONCRETE EXCEPT FOR THE TOP. WHERE NORMAL SLAB THICKNESS WILL NOT ENVELOP BOX AS SPECIFIED ABOVE, PROVIDE INCREASED THICKNESS OF THE SLAB. PROVIDE EACH COMPARTMENT OF EACH FLOOR BOX WITH GROUNDING TERMINAL CONSISTING OF A WASHER-IN-HEAD MACHINE SCREW, NOT SMALLER THAN NO. 10-32, SCREWED INTO A TAPPED HOLE IN THE BOX. ADJUST COVERS OF FLOOR BOXES FLUSH WITH FINISHED FLOOR.

9. PULL AND SPLICE BOXES LOCATED OUTDOORS OR WHERE INDICATED ON DRAWINGS ARE TO BE WEATHERPROOF TYPE J.I.C. BOXES. CONDUIT TERMINATIONS ARE TO BE ACCOMPLISHED BY USING MEYER HUBS.

10. ELECTRICALLY GROUND METALLIC CABINETS, BOXES, AND ENCLOSURES. WHERE WIRING TO ITEM INCLUDES A GROUNDING CONDUCTOR, PROVIDE A GROUNDING TERMINAL IN THE INTERIOR OF THE CABINET, BOX OR ENCLOSURE.

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DWG. TITLE:

ELECTRICAL
SPECIFICATIONS

ISSUE/REVISIONS:

	DATE	DESCRIPTION
0	06/06/25	ISSUE FOR BID AND PERMIT

SEAL:

6/06/25

SEAL 042310
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DRAWN BY: JAL
CHECKED BY: JAL
SCALE: 1/4" = 1'-0"
PROJECT No. JAL#25-008
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SECTION 16140 – WIRING DEVICES

1. THIS SECTION INCLUDES THE FOLLOWING:

   A. RECEPTACLES
   B. LIGHTING AND EQUIPMENT SWITCHES
   C. WALL PLATES
   D. FLOOR SERVICE OUTLETS
   E. OCCUPANCY SENSORS
   F. MANUAL DIMMERS

2. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

   A. WIRING DEVICES & ACCESSORIES:
      A.1. COPPER WIRING DEVICES
      A.2. CROUSE–HINDS CO.
      A.3. HUBBELL INC.
      A.4. LEVITON
      A.5. PASS AND SEYMOUR INC.

   B. FLOOR BOXES:
      B.1. AMERICAN ELECTRIC, STEEL CITY
      B.2. WALKER / WIREMOLD COMPANY
      B.3. RACO, INC., HUBBELL INC.
      B.4. RACEWAY COMPONENTS, INC.

   C. DIMMERS:
      C.1. HUBBELL INC.
      C.5. LEVITON LIGHTING CONTROLS
      C.6. LUTRON LIGHTING

   D. OCCUPANCY SENSOR LIGHTING CONTROL:
      D.1. HUBBELL INC.
      D.2. LEVITON MANUFACTURING INC.
      D.3. WATT STOPPER INC.
      D.4. SENSOR SWITCH
      D.5. GREENGATE

3. WIRING DEVICES:
   A. PROVIDE WIRING DEVICES, IN TYPES, CHARACTERISTICS, GRADES, COLORS, AND ELECTRICAL RATINGS FOR APPLICATIONS INDICATED WHICH ARE UL LISTED AND WHICH COMPLY WITH NEMA WD 1 AND OTHER APPLICABLE UL AND NEMA STANDARDS. ALL DEVICES TO BE SPECIFICATION GRADE (HEAVY DUTY U.L. GRADE), WITH GREEN HEXAGONAL EQUIPMENT GROUND SCREW, METAL PLASTER EARS AND SIDE TERMINAL SCREWS FOR BACK AND SIDE WIRING.

   B. ALL WIRING DEVICES ARE TO BE PROVIDED BY THE SAME MANUFACTURER UNLESS NOTED OTHERWISE.

   C. ALL WIRING DEVICES AND COVERPLATES SHALL BE:
      C.1. WHITE.
      C.2. WHITE – WHERE INSTALLED IN WHITE CEILINGS.
      C.3. BLACK – WHERE INSTALLED IN DARK CEILINGS.
      C.4. ORANGE – WHERE SUPPLYING A UPS CIRCUIT. (DEVICE ONLY, COVERPLATE SHALL BE AS ABOVE).

   D. RECEPTACLES:
      D.1. DUPLEX RECEPTACLE, 15 AMP, 125 VOLT, 2–POLE, 3–WIRE, GROUNDING TYPE WITH NEMA CONFIGURATION 5–15R, MEETS FEDERAL SPEC. WC–596–F. LEVITON #5252.

      D.2. SINGLE RECEPTACLE, 20 AMP, 125 VOLT, 2–POLE, 3–WIRE, GROUNDING TYPE WITH NEMA CONFIGURATION 5–20R, MEETS FEDERAL SPEC. WC–596–F. LEVITON #5351.

      D.3. DUPLEX RECEPTACLE, 20 AMP, 125 VOLT, 2–POLE, 3–WIRE, GROUNDING TYPE WITH NEMA CONFIGURATION 5–20R, MEETS FEDERAL SPEC. WC–596–F. LEVITON #5352.

      D.4. GROUND FAULT INTERRUPTER RECEPTACLE, 20 AMP, 125 VOLT, 2–POLE, 3–WIRE, GROUNDING TYPE WITH NEMA CONFIGURATION 5–20R. UL943 APPROVED, SELF–TESTING, SOLID STATE GROUND FAULT SENSING LEVEL WITH 5 MILLIAMPERES GROUND FAULT TRIP LEVEL. LED INDICATOR LIGHT WITH TEST/RESET BUTTONS THAT MATCH THE COLOR OF THE FACE. LEVITON #G5362–WT*.

      D.5. USB RECEPTACLE, 20A, 125V, 2–POLE, 3–WIRE, GROUNDING TYPE WITH NEMA CONFIGURATION 5–20R, (2) VERTICAL USB PORTS WITH 3.6A CHARGING CAPACITY (MINIMUM), MEETS FEDERAL SPEC. WC–596–F. LEVITON #T5832
      D.5.1. WHERE SHOWN AS A QUAD RECEPTACLE ON PLANS, PROVIDE (2) USB RECEPTACLES AS SPECIFIED ABOVE.

      D.6. WEATHERPROOF RECEPTACLE SHALL BE A GROUND–FAULT INTERRUPTER WITH THOMAS & BETTS #CKSUV DIE–CAST ALUMINUM 'SMALL' COVER PLATE. LOCATE BOX VERTICAL IN WALL. PLATE TO BE LISTED AND LABELED 'SUITABLE FOR WET LOCATIONS WHILE IN USE.

      D.7. ISOLATED GROUND DUPLEX RECEPTACLE, 20 AMP, 125 VOLT, 2–POLE, 3–WIRE, FACE WITH ORANGE TRIANGLE, GROUND SCREW ISOLATED FROM MOUNTING YOKE, NEMA CONFIGURATION 5–20RIG. LEVITON #5362–IG.

      D.8. CONTROLLED DUPLEX RECEPTACLE, 20 AMP, 125 VOLT, 2–POLE, 3–WIRE, GROUNDING TYPE WITH NEMA CONFIGURATION 5–20R, PERMANENTLY LABELED WITH CONTROLLED SYMBOL, MEETS FEDERAL SPEC. WC–596–F. LEVITON #5362–2.
      D.8.1. WHERE SHOWN AS A QUAD RECEPTACLE ON PLANS, PROVIDE (1) CONTROLLED RECEPTACLE AND (1) DUPLEX RECEPTACLE AS SPECIFIED ABOVE.

      D.9. HEAVY DUTY RECEPTACLES SHALL BE OF THE SAME MANUFACTURER AS THE CONVENIENCE OUTLETS AND HAVE THE RATINGS AND CHARACTERISTICS (VOLTAGE, AMPS, POLES, WIRES) AS SHOWN ON DRAWINGS.

   E. SWITCHES:
      E.1. TOGGLE TYPE SWITCH, 20 AMP, 120/277 VOLT AC SINGLE–POLE, QUITE TYPE, WITH MOUNTING YOKE INSULATED FROM MECHANISM, EQUIPPED WITH PLASTER EARS, SIDE–WIRED SCREW TERMINALS, MEETS FEDERAL SPEC WS–896. LEVITON #1121–2.
      E.1.1. DOUBLE–POLE, 3–WAY, AND 4–WAY SWITCHES SHALL BE OF THE SAME MAKE AS FOR SINGLE–POLE.

      E.2. KEY TYPE SWITCH, 20 AMP, 120/277 VOLT AC SINGLE–POLE, WITH MOUNTING YOKE INSULATED FROM MECHANISM, EQUIPPED WITH PLASTER EARS, SIDE–WIRED SCREW TERMINALS, POLISHED METAL TOP AND PROVIDE WITH ONE STEEL KEY. LEVITON #1121–2L.
      E.2.1. DOUBLE–POLE, 3–WAY, AND 4–WAY SWITCHES SHALL BE OF THE SAME MAKE AS FOR SINGLE–POLE.

      E.3. WHEN A LIGHTED HANDLE IS INDICATED WITH SWITCHING DEVICE, PROVIDE SWITCH DEVICE WITH 1/25 WATT NEON PILOT INTEGRAL WITH TOGGLE HANDLE, RATED 120/277 VOLT. GLOWS WHEN SWITCH IS "OFF". PASS & SEYMOUR #20AC1–CSL.

      E.4. WHEN A PILOT LIGHT IS INDICATED WITH SWITCHING DEVICE, PROVIDE SWITCH DEVICE WITH 1/25 WATT NEON PILOT INTEGRAL WITH TOGGLE HANDLE, RATED 120/277 VOLT. GLOWS WHEN SWITCH IS "ON". PASS & SEYMOUR #20AC1–RPL.

   F. FLOOR RECEPTACLES:
      F.1. TYPE 'A': HUBBELL #B–2436, RECTANGULAR SINGLE–GANG, WATERTIGHT BOX WITH ONE S–3825 DUPLEX FLAP COVER. BOX COVER PLATE SHALL BE BRASS. COVER TO BE PROVIDED WITH BRASS CARPET FLANGE FOR FLUSH INSTALLATION IN LINOLEUM, WOOD OR CARPET FLOORS. EACH FLOOR OUTLET SHALL BE COMPLETE WITH ONE 20 AMP, 125 VOLT DUPLEX BROWN RECEPTACLE AS SPECIFIED UNDER "RECEPTACLES".

      F.2. TYPE 'B': HUBBELL #B–4233, RECTANGULAR DOUBLE–GANG, FULLY ADJUSTABLE, WATERTIGHT BOX WITH ONE S–3825 DUPLEX FLAP COVER COMPLETE WITH ONE 20 AMP, 125 VOLT DUPLEX BROWN RECEPTACLE AS SPECIFIED UNDER "RECEPTACLES". ALSO PROVIDE ONE #S–2625 COVER PLATE WITH ONE #S–3067 SPLIT NOZZLE FOR PROTECTION OF TELEPHONE/COMPUTER CABLES. BOX COVER PLATES SHALL BE BRASS. COVER TO BE PROVIDED WITH BRASS CARPET FLANGE FOR FLUSH INSTALLATION IN LINOLEUM, WOOD OR CARPET FLOORS.

      F.3. TYPE 'C': HUBBELL #B–2436, RECTANGULAR SINGLE–GANG BOX, BRASS PLATE #S2425 WITH 3/4 PLUG OPENING FOR CONNECTION OF FLEXIBLE CONDUIT FROM EQUIPMENT. COVER TO BE PROVIDED WITH BRASS CARPET FLANGE FOR FLUSH INSTALLATION IN LINOLEUM, WOOD OR CARPET FLOORS.

   G. WALL PLATES: SINGLE AND COMBINATION, OF TYPES, SIZES, AND WITH GANGING AND CUTOUTS AS INDICATED. PROVIDE PLATES WHICH MATE WITH WIRING DEVICES TO WHICH ATTACHED. PROVIDE METAL SCREWS FOR SECURING PLATES TO DEVICES WITH SCREW HEADS TO MATCH FINISH OF PLATES. PROVIDE WALL PLATES WITH ENGRAVED LEGEND WHERE INDICATED. CONFORM TO REQUIREMENTS

SECTION 16140 – WIRING DEVICES

OF SECTION "ELECTRICAL IDENTIFICATION."

   H. OCCUPANCY SENSOR LIGHTING CONTROL:
      H.1. WALL MOUNTED OCCUPANCY SENSOR TO BE PASSIVE INFRARED COVERING 1200 (OR 900) SQUARE FEET, RATED FOR 120/277 VOLT, 1500 WATTS MAXIMUM LOAD OF INCANDESCENT OR FLUORESCENT LIGHT. SENSOR TO HAVE 180° FIELD OF VIEW, OFF/AUTO/ON SLIDE SWITCH, ADJUSTABLE TIME–OUT FROM 1 TO 20 MINUTES, AND LED MOVEMENT INDICATOR PILOT. SENSOR TO BE MOUNTED IN A SINGLE–GANG WALL BOX AT SAME ELEVATION AS STANDARD WALL SWITCHES.
      H.1.1. WATT STOPPER #PW–100 SINGLE REALY (OR #PW–200 DUAL RELAY).

      H.2. CEILING MOUNTED OCCUPANCY SENSOR TO BE DUAL TECHNOLOGY WITH ULTRASONIC & PASSIVE INFRARED TYPE SENSORS. SENSORS TO HAVE TWO–WAY OR ONE–WAY DISTRIBUTION DEPENDING ON MOUNTING LOCATION CAPABLE OF ADJUSTING THE SENSITIVITY AND LENGTH OF OPERATION BASED ON PAST ACTIVITY LEVEL OF THE AREA'S OCCUPANTS. CUSTOM PERFORMANCE CONTROLS TO BE LOCATED BEHIND THE SENSOR LENS FOR FIELD MODIFICATION OF SENSOR DESIGN. UNIT TO BE MOUNTED TO RECESSED JUNCTION BOX.
      H.2.1. WATT STOPPER #DT–355, 800W @ 120V (1200W @ 277V)

   I. MANUAL DIMMERS:
      I.1. PROVIDE AND INSTALL AC DIMMER CONTROLS FOR LIGHTING FIXTURES; WATTAGE AS INDICATED BELOW. 120 VOLT, 60 HERTZ, WITH PRESET SLIDE CONTROLS AND PUSHBUTTON FOR ON/OFF CONTROLS, SINGLE–POLE.:
      I.1.1. ID1 = 1000 WATTS, LEVITON #IPI10–1LX (120/277V INCANDESCENT)
      I.1.2. D1 = 1200/1500 VA, LEVITON #IP710–LFZ (120/277V LED)
      I.1.3. LD2 = 400 VA, LEVITON #IPE04–1LX (ELECTRONIC LOW VOLTAGE)
      I.1.4. LD3 = 1000 VA, LEVITON #IPM10–1LX (MAGNETIC LOW VOLTAGE)
      I.1.5. FD1 = 1200/1500 VA, LEVITON #IP710–DLX (120/277V FLUORESCENT 0–10V)
      I.1.6. FD2 = 1000 VA, LEVITON #IPX10–10 (120V FLUORESCENT LINE VOLTAGE)
      I.1.7. FD3 = 1200 VA, LEVITON #IPX12–70 (277V FLUORESCENT LINE VOLTAGE)

4. INSTALLATION OF WIRING DEVICES AND ACCESSORIES:

   A. GROUPS OF SWITCHES OR SWITCH AND OUTLET COMBINATIONS SHALL BE MOUNTED UNDER ONE COVER PLATE. COVER PLATES SHALL FIT THE DEVICES SECURELY AND SHALL COVER THE WALL OPENING COMPLETELY TO PROVIDE A NEAT AND FINISHED APPEARANCE FLUSH WITH SURROUNDING SURFACES.

   B. TERMINALS ON ALL WIRING DEVICES SHALL NOT BE USED TO FEED–THROUGH TO THE NEXT DEVICES.

   C. INSTALL WALL–MOUNTED RECEPTACLES WITH GROUND SLOT UP.

   D. RECEPTACLE MOUNTED ABOVE COUNTER–TOP TO BE INSTALLED HORIZONTAL, WITH LONG DIMENSION PARALLEL TO FLOOR AND COUNTER–TOP.

SECTION 16180 – FUSES

1. MANUFACTURER: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS OF ONE OF THE FOLLOWING (FOR EACH TYPE AND RATING OF OVERCURRENT PROTECTIVE DEVICE):

   A. BUSSMANN DIV; MCGRAW_EDISON CO.
   B. FERRAZ SHAWMUT, INC.
   C. LITTELFUSE, INC.

2. EXCEPT AS OTHERWISE INDICATED, PROVIDE FUSES OF TYPES, SIZES, RATINGS, AND AVERAGE TIME/CURRENT AND PEAK LET–THROUGH CURRENT CHARACTERISTICS INDICATED, WHICH COMPLY WITH MANUFACTURER'S STANDARD DESIGN, MATERIALS, AND CONSTRUCTION IN ACCORDANCE WITH PUBLISHED PRODUCT INFORMATION, AND WITH INDUSTRY STANDARDS AND CONFIGURATIONS. ALL FUSES TO BE FOR USE WITH FUSE REJECTION CLIPS.

3. ALL FUSES FOR THIS PROJECT SHALL BE OF THE SAME MANUFACTURER TO INSURE SELECTIVE COORDINATION.

4. EXCEPT WHERE NOTED OTHERWISE, THREE (3) SPARE FUSES OF EACH SIZE INSTALLED SHALL BE PROVIDED TO THE OWNER.

5. INSTALL FUSES WITH MANUFACTURER'S NAMETAG FACING OUTWARD.

6. SERVICE ENTRANCE AND FEEDER CIRCUITS 601 AMPERES AND LARGER, FUSES SHALL BE BOLT–ON U.L. LISTED CLASS L, CURRENT–LIMITING WITH 200,000 AMPERES R.M.S. SYMMETRICAL INTERRUPTING RATING.

7. FEEDER CIRCUITS, EXCEPT MOTOR CIRCUITS, 600 AMPERES AND SMALLER SHALL BE PLUG–IN CARTRIDGE U.L. CLASS RK–1, CURRENT–LIMITING WITH 200,000 AMPERES R.M.S. SYMMETRICAL INTERRUPTING RATING.

8. MOTOR, TRANSFORMERS, AND INDUCTIVE TYPE CIRCUITS 600 AMPERES AND SMALLER SHALL BE PLUG–IN CARTRIDGE U.L. CLASS RK–5 DUAL–ELEMENT WITH TIME DELAY. THEY SHALL ALSO HAVE CURRENT–LIMITING LINKS AND 200,000 AMPERES INTERRUPTING RATING. FUSE REDUCERS SHALL BE USED WHERE SWITCH FUSE CLIPS ARE SPACED LARGER THAN FUSE SIZE SHOWN ON DRAWING.

9. PLUG FUSES FOR INDIVIDUAL MOTOR PROTECTION SHALL BE BUSSMANN FUSTAT, DUAL–ELEMENT, 10,000 AMPERES R.M.S. SYMMETRICAL INTERRUPTING RATING, TYPE "S" WITH FUSTAT ADAPTER SIZED FOR PLUG–FUSE INSTALLED. SIZE OF FUSE TO BE ACCORDING TO SPECIFICATIONS FOR "DISCONNECT SWITCHES".

SECTION 16190 – SUPPORTING DEVICES

1. THIS SECTION INCLUDES SECURE SUPPORT FROM THE BUILDING STRUCTURE FOR ELECTRICAL ITEMS BY MEANS OF HANGERS, SUPPORTS, ANCHORS, SLEEVES, INSERTS, SEALS, AND ASSOCIATED FASTENINGS.

2. COATING: SUPPORTS, SUPPORT HARDWARE, AND FASTENERS SHALL BE PROTECTED WITH ZINC COATING OR WITH TREATMENT OF EQUIVALENT CORROSION RESISTANCE USING APPROVED ALTERNATIVE TREATMENT, FINISH, OR INHERENT MATERIAL CHARACTERISTIC. PRODUCTS FOR USE OUTDOORS SHALL BE HOT–DIP GALVANIZED.

3. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

4. SUPPORT INDIVIDUAL HORIZONTAL RACEWAYS BY SEPARATE PIPE HANGERS. SPRING STEEL FASTENERS MAY BE USED IN LIEU OF HANGERS ONLY FOR 3/4–INCH AND SMALLER RACEWAYS SERVING LIGHTING AND RECEPTACLE BRANCH CIRCUITS ABOVE SUSPENDED CEILINGS ONLY. FOR HANGER RODS WITH SPRING STEEL FASTENERS, USE 1/4–INCH–DIAMETER OR LARGER THREADED STEEL. USE SPRING STEEL FASTENERS THAT ARE SPECIFICALLY DESIGNED FOR SUPPORTING SINGLE CONDUITS OR TUBING. CONDUITS ABOVE LAY–IN CEILING SYSTEM SHALL NOT BE SUPPORTED FROM CEILING SUSPENSION WIRES.

5. INSTALL INDIVIDUAL AND MULTIPLE (TRAPEZE) RACEWAY HANGERS AND RISER CLAMPS AS NECESSARY TO SUPPORT RACEWAYS. PROVIDE U–BOLTS, CLAMPS, ATTACHMENTS AND OTHER HARDWARE NECESSARY FOR HANGER ASSEMBLY AND FOR SECURING HANGER RODS AND CONDUITS.

6. SUPPORT PARALLEL RUNS OF HORIZONTAL RACEWAYS TOGETHER ON TRAPEZE–TYPE HANGERS

7. DO NOT CUT HOLES IN REINFORCED CONCRETE BEAMS OR CUT REINFORCING BARS IN CONCRETE WITH OUT WRITTEN APPROVAL OF STRUCTURAL ENGINEER.

8. UNLESS OTHERWISE INDICATED, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE BUILDING STRUCTURE, INCLUDING BUT NOT LIMITED TO CONDUITS, RACEWAYS, CABLES, CABLE TRAYS, BUSWAYS, CABINETS, PANELBOARDS, TRANSFORMERS, BOXES, DISCONNECT SWITCHES, AND CONTROL COMPONENTS.

SECTION 16410 – DISCONNECTS, CONTACTORS

1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

   A. GENERAL ELECTRIC CO.
   B. SQUARE D COMPANY.
   C. EATON CORPORATION
   D. SIEMENS, I.T.E.
   E. ALLEN–BRADLEY CO.
   F. FURNAS CO.

2. TEMPERATURE RATINGS: ALL CONDUCTOR TERMINALS AND EQUIPMENT ENCLOSURES TO BE U.L. LISTED FOR USE WITH MINIMUM 75C RATED CONDUCTORS.

3. DISCONNECT SWITCHES:

   A. PROVIDE CIRCUIT AND MOTOR DISCONNECT SWITCHES OF TYPES, SIZES AND ELECTRICAL CHARACTERISTICS INDICATED ON DRAWING. FUSIBLE OR NON–FUSED TYPE, RATED 250 OR 600 VOLTS, 60 HZ, 2– OR 3–POLES, SOLID NEUTRAL; AND INCORPORATING QUICK–MAKE, QUICK–BREAK TYPE SWITCHES; CONSTRUCT SO THAT SWITCH BLADES ARE VISIBLE IN OFF POSITION WITH DOOR OPEN. SWITCH SHALL HAVE A DUAL COVER INTERLOCK TO PREVENT UNAUTHORIZED OPENING OF THE SWITCH DOOR WHEN HANDLE IS IN THE "ON" POSITION, AND TO PREVENT CLOSING OF THE SWITCH MECHANISM WITH THE DOOR OPEN. EQUIP WITH OPERATING HANDLE WHICH IS INTEGRAL PART OF ENCLOSURE BASE AND WHOSE POSITION IS EASILY RECOGNIZABLE, AND IS PADLOCKABLE IN OFF POSITION; CONSTRUCT CURRENT CARRYING PARTS OF HIGH–CONDUCTIVITY COPPER, WITH SILVER–TUNGSTEN TYPE SWITCH CONTACTS, AND POSITIVE PRESSURE TYPE REINFORCED FUSE CLIPS. PROVIDE SWITCH IN NEMA 1 OR NEMA TYPE 3R ENCLOSURE AS INDICATED OR REQUIRED. INSTALL ENGRAVED PLASTIC PLATE AS TO WHAT EACH SWITCH CONTROLS.

   B. EQUIPMENT REQUIRING A DISCONNECTING MEANS, RATED FOR 120 OR 208 VOLT SINGLE PHASE, UP TO 30 AMPERES MAY BE PROVIDED WITH A SNAP–SWITCH TYPE TOGGLE DEVICE AT THE EQUIPMENT. THE DEVICE IS TO HAVE AN AMPERE AND VOLTAGE RATING EQUAL TO OR GREATER THAN THE BRANCH CIRCUIT FEEDING THE EQUIPMENT. IF EQUIPMENT IS MOTOR RELATED, THEN THE SWITCH MUST BE HORSEPOWER RATED. REFER TO SECTION 16140 FOR MINIMUM SPECIFICATIONS FOR TOGGLE SWITCHES. SWITCHES LOCATED OUTDOORS OR IN COOLER/FREEZER APPLICATIONS ARE TO BE MOUNTED IN A DIE–CAST ALUMINUM DEVICE BOX WITH GASKETED WEATHERPROOF COVER PLATE.

4. RELAYS AND CONTACTORS:

   A. GENERAL POWER PURPOSE RELAYS, FOR CONTROL OF MISCELLANEOUS MOTORS, TO BE PROVIDED AND INSTALLED WITH NUMBER OF POLES AND COIL VOLTAGE AS SHOWN ON DRAWINGS. RELAY TO BE HORSEPOWER RATED FOR THE MOTOR LOAD TO WHICH IT CONTROLS. RELAY TO BE MOUNTED IN A NEMA TYPE 1 ENCLOSURE.

   B. LIGHTING CONTACTORS TO BE PROVIDED AND INSTALLED WITH THE NUMBER OF POLES, COIL VOLTAGE, AND LOAD CONTACT RATINGS AS SHOWN ON DRAWINGS. CONTACTORS TO BE PROVIDED WITH SILVER ALLOY DOUBLE BREAK CONTACTS RATED FOR TUNGSTEN AND BALLAST LIGHTING LOADS. CONTACTS TO BE CONVERTIBLE WITH NORMALLY OPEN AND NORMALLY CLOSED INDICATORS. RELAY TO BE MOUNTED IN A NEMA TYPE 1 ENCLOSURE.

6. INSTALLATION OF DISCONNECTS AND STARTERS:

   A. SURFACE MOUNT ON WALLS OR COLUMNS APPROXIMATELY 5'–0" TO CENTERLINE ABOVE THE FLOOR WHERE POSSIBLE.

   B. DISCONNECT SWITCHES MOUNTED ON ROOFTOP AIR CONDITIONING UNITS TO BE CAULKED BETWEEN SWITCH AND UNIT TO PROVIDE WEATHERPROOF SEAL. ELECTRICAL CONTRACTOR TO VERIFY EXACT MOUNTING LOCATION ON UNIT SO AS NOT TO COVER UP ANY REMOVABLE PANELS.

   C. WHEN RELAYS OR CONTACTORS ARE INDICATED TO BE LOCATED ABOVE THE CEILING, THE EQUIPMENT IS TO BE READILY ACCESSIBLE AND SOUND INSULATED FROM THE MOUNTING SUPPORTS.

SECTION 16470 – PANELBOARDS

1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PANELBOARD PRODUCTS OF ONE OF THE FOLLOWING (FOR EACH TYPE AND RATING OF PANELBOARD AND ENCLOSURE):

   A. GENERAL ELECTRIC COMPANY
   B. SQUARE D COMPANY
   C. EATON CORPORATION
   D. SIEMEN'S, I.T.E.

2. POWER DISTRIBUTION PANELS: PROVIDE DEAD–FRONT SAFETY–TYPE DISTRIBUTION PANELBOARDS RATED 208/120, 3–PHASE, 4–WIRE. SHORT CIRCUIT RATING OF PANEL AND DEVICES TO BE 22,000 RMS MINIMUM UNLESS NOTED OTHERWISE ON THE DRAWINGS. PANELBOARDS SWITCHING AND PROTECTIVE DEVICES IN SOLDERLESS PRESSURE–TYPE LINE SIDE CONNECTORS APPROVED FOR COPPER CONDUCTORS.

3. 120/208 VOLT LIGHTING AND APPLIANCE PANELBOARDS: PROVIDE DEAD–FRONT SAFETY TYPE LIGHTING AND APPLIANCE PANELBOARDS AS INDICATED, WITH SWITCHING AND PROTECTIVE DEVICES IN QUANTITIES, RATINGS, TYPES AND ARRANGEMENTS SHOWN, WITH ANTI–TURN SOLDERLESS PRESSURE TYPE LUG CONNECTORS. APPROVED FOR USE WITH COPPER CONDUCTORS; CONSTRUCT UNIT FOR CONNECTING FEEDERS TO PANEL; EQUIP WITH COPPER, COPPER PLATED OR ALUMINUM BUS BARS, FULL–SIZED NEUTRAL BAR, WITH BOLT–IN TYPE HEAVY–DUTY, QUICK–MAKE, QUICK–BREAK, SINGLE–POLE CIRCUIT–BREAKERS, WITH TOGGLE HANDLES THAT INDICATE WHEN TRIPPED. PROVIDE SUITABLE LUGS ON NEUTRAL BUS FOR EACH OUTGOING FEEDER REQUIRED; AND PROVIDE BARE UNINSULATED GROUNDING BARS SUITABLE FOR BOLTING TO ENCLOSURES. SELECT ENCLOSURES FABRICATED BY SAME MANUFACTURER AS PANELBOARDS, WHICH MATE AND MATCH PROPERLY WITH PANELBOARDS. MINIMUM INTERRUPTING CAPACITY OF MANUFACTURED PANELBOARDS TO BE 10,000 A.I.C, UNLESS NOTED OTHERWISE ON THE DRAWINGS.

4. MOLDED–CASE CIRCUIT BREAKERS: PROVIDE FACTORY ASSEMBLED, MOLDED CASE CIRCUIT BREAKERS OF FRAME SIZE INDICATED. PROVIDE BREAKERS WITH PERMANENT THERMAL AND INSTANTANEOUS MAGNETIC TRIPS IN EACH POLE AND AMPERE RATING AS INDICATED. CONSTRUCT WITH OVER CENTER, TRIP–FREE, TOGGLE TYPE OPERATING MECHANISMS WITH QUICK–MAKE, QUICK–BREAK ACTION AND POSITIVE HANDLE INDICATION. CONSTRUCT BREAKERS FOR MOUNTING AND OPERATING IN ANY PHYSICAL POSITION AND OPERATING IN AN AMBIENT TEMPERATURE OF 40C. PROVIDE BREAKERS WITH MECHANICAL SCREW TYPE REMOVABLE CONNECTOR LUGS, AL/CU RATED. ALL BREAKERS TO BE BOLT–IN TYPE CONSTRUCTION. ALL BREAKERS TO BE UL489 LISTED.

   A. ALL SINGLE POLE BREAKERS TO BE RATED FOR "SWITCHING DUTY" (SWD) AND FOR OPERATION ON FLUORESCENT LIGHTING SOURCES.

   B. ALL CIRCUIT BREAKERS PROTECTING HIGH INTENSITY DISCHARGE (HID) LIGHTING TO BE RATED AND LABELED 'HID' FOR OPERATION ON H.I.D. LIGHTING SOURCES

   C. CIRCUIT BREAKERS USED ON HEATING, AIR CONDITIONING, OR REFRIGERATION EQUIPMENT SHALL BE TYPE 'HACR' AND U.L. LISTED FOR SUCH USE.

5. PANELBOARD MANUFACTURER TO PROVIDE A COMPLETE "ARC FLASH STUDY". ALL SUBMITTALS WILL BE REJECTED UNLESS THIS STUDY IS PROVIDED AT THE TIME OF SHOP DRAWING REVIEW.

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PROJECT

7-ELEVEN 42655 CST

1360 NC 24-87, CAMERON NC 28326

DRG. TITLE:

ELECTRICAL SPECIFICATIONS

ISSUE REVISIONS

NO.	DATE	DESCRIPTION
0	06/06/25	ISSUE FOR HID AND PERMIT

SEAL

6/06/25

NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO, JR

DocuSigned by: 38E7250DE7A54BA...

DRAWN BY:	CHECKED BY:
JAL	JAL
SCALE: 1/4" = 1'–0"	PROJECT NO: JAL#25–008
DATE: 6/06/25	FILE NAME:

SHEET NO:

E3.1

ABBREVIATIONS

AAV	AUTOMATIC AIR VENT
ABV	ABOVE
AC	AIR CURTAIN
ACU	AIR CONDITIONING UNIT
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
@	AT
AFMS	AIR FLOW MEASURING STATION
AS	AIR SEPARATOR
ATG	ADC TRANSFER GRILL
AV	AUTOMATIC AIR VENT
B	BOILER
BAS	BUILDING AUTOMATION SYSTEM
BC	BRANCH CONTROLLER
BDD	BACKDRAFT DAMPER (GRAVITY)
BDR	BASEBOARD RADIATOR
BEL	BELOW
BFP	BACKFLOW PREVENTION DEVICE
BHP	BRAKE HORESPOWER
BLDG	BUILDING
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTUH	BRITISH THERMAL UNITS PER HOUR
CA	COMPRESSED AIR
CC	COOLING COIL
CD	CEILING DIFFUSER /CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CLG	CEILING
℄	CENTER LINE
COND	CONDENSATE
COP	COEFFICIENT OF PERFOMANCE
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CV	CONSTANT VOLUME / CONTROL VALVE
CW	DOMESTIC COLD WATER
CR	CONDENSER WATER RETURN
CS	CONDENSER WATER SUPPLY
DB	DRY BULB TEMPATURE
DC	DRY COOLER
°F	DEGREE FAHRENHEIT
DH	DEHUMIDIFIER
DN	DOWN
DOAS	DEDICATED OUTDOOR AIR SYSTEM
DP	DIFFERENTIAL PRESSURE
DX	DX COOLING COIL
EA	EXHAUST AIR
EA.	EACH
EAT	ENTERING AIR TEMPERATURE
EER	ENERGY EFFICIENT RATIO
EF	EXHAUST FAN
EFF	EFFICIENCY
EG	EXHAUST GRILLE (LESS DAMPER)
EL	ELEVATION
ER	EXHAUST REGISTER
ERV	ENERGY RECOVERY VENTILATOR
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
EWH	ELECTRIC WALL HEATER
EWT	ENTERING WATER TEMPERATURE
EX	EXISTING
EXT	EXTERNAL
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FL	FLOOR
FLEX	FLEXIBLE
FO	FLAT OVAL
FPM	FEET PER MINUTE
FPMB	FAN POWERED MIXING BOX
FSD	FIRE SMOKE DAMPER
FT	FEET
FT²	SQUARE FEET
FTR	FINNED TUBE RADIATOR
GAL	GALLON
GC	GENERAL CONTRACTOR
GIH	GRAVITY INTAKE HOOD
GPM	GALLONS PER MINUTE
GR	GLYCOL RETURN
GRH	GAS RADIANT HEATER
GS	GLYCOL SUPPLY
GUH	GAS UNIT HEATER
GV	GRAVITY VENTILATOR
H	HUMIDIFIER
HC	HEATING COIL
HCWR	DUAL TEMPERATURE RETURN
HCWS	DUAL TEMPERATURE SUPPLY
HGRH	HOT GAS REHEAT
HP	HEAT PUMP / HORSEPOWER
HPR	HIGH PRESSURE STEAM RETURN
HPS	HIGH PRESSURE STEAM SUPPLY
HR	HOUR
HRC	HEAT RECOVERY COIL
HRV	HEAT RECOVERY VENTILATOR
HW	HOT WATER
HWR	HW RECIRC/HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
HX	HEAT EXCHANGER
HZ	HERTZ
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
IN W.C.	INCHES WATER COLUMN
ISP	INTERNAL STATIC PRESSURE
IRH	INFRARED RADIANT TUBE HEATER
KEF	KITCHEN EXHAUST FAN
KH	KITCHEN EXHAUST HOOD
KW	KILOWATT
L	LOUVER
LAT	LEAVING AIR TEMPERATURE
LB	POUNDS
LBS/HR	POUNDS PER HOUR
LF	LINEAR FOOT
LG	LENGTH
LPR	LOW PRESSURE STEAM RETURN
LPS	LOW PRESSURE STEAM SUPPLY
LWT	LEAVING WATER TEMPATURE
MAT	MIXED AIR TEMPERATURE
MAU	MAKEUP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	THOUSANDS OF BTU PER HOUR
MCA	MINIMUM CURRENT AMPACITY
MIN	MINIMUM
M.O.D.	MOTOR OPERATED DAMPER
MOCP	MAXIMUM OVERCURRENT PROTECTION
NC	NOISE CRITERIA
N.C.	NORMALLY CLOSED
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTDOOR AIR
OBD	OPPOSED BLADE DAMPER
OED	OPEN END DUCT
P	PUMP
PBD	PARALLEL BLADE DAMPER
PD	PRESSURE DROP
PDH	POOL ROOM DEHUMIDIFIER
PH	PHASE
PPM	PARTS PER MILLION
PRV	PRESSURE RELIEF VALVE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
RA	RETURN AIR
RF	RETURN AIR FAN / RELIEF AIR
RG	RETURN GRILLE (LESS DAMPER)
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RLA	RUNNING LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
RLFA	RELIEF AIR
RM.	ROOM
RR	RETURN REGISTER (WITH DAMPER)
RTU	ROOFTOP AIR HANDLING UNIT
RX	REMOVE EXISTING
SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SD	SUPPLY DIFFUSER/SMOKE DAMPER
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SF	SQUARE FOOT
SPEC.	PROJECT SPECIFICATIONS
SPF	STAIR PRESSURIZATION FAN
SG	SUPPLY GRILLE
SR	SUPPLY REGISTER
STRUCT.	STRUCTURAL
TEMP	TEMPERATURE
TF	TRANSFER FAN
TOD	TOP OF DUCT
TOP	TOP OF PIPE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
UV	UNIT VENTILATOR
V	VOLT
VAC	VOLTS ALTERNATING CURRENT
VAV	VARIABLE AIR VOLUME TERMINAL
VD	VOLUME DAMPER
VEH	VEHICLE EXHAUST
VFD	VARIABLE FREQUENCY DRIVE
VP	VELOCITY PRESSURE
VRF	VARIABLE REFRIGERANT FLOW
W	WATTS
W/	WITH
W/O	WITHOUT
WB	WET BULB
WG	WATER GAUGE
WSHP	WATER SOURCE HEAT PUMP

GENERAL NOTES

GENERAL MECHANICAL REQUIREMENTS

1. Materials, equipment, and systems shall meet all pertinent requirements of the Underwriters Laboratory (UL), the American Society for Testing Materials (ASTM), American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE), Sheet Metal and Air Conditioning Contractors National Association (SMACNA), American Gas Association (AGA), National Fire Protection Association (NFPA)and other nationally recognized agencies as well as the latest adopted edition of state and local code procedures, methods, and requirements, including the most stringent of health and safety standards as required and as interpreted by the authority having jurisdiction. Applicable codes and standards include, but are not limited to the following: "international plumbing, building, energy, mechanical, and fuel gas codes" applicable local and municipal codes and ordinances.
2. Bidders shall be licensed contractors in accordance with local and state laws.
3. Bidders shall thoroughly acquaint themselves with the conditions under which the work is to be performed. They shall examine all services, equipment, surfaces, etc., which this work is in any way dependent upon, and bring any discrepancies determined or omissions found in the drawings to the owner's attention before submitting bid. Verify all dimensions by field measurements.
4. The systems shown on the drawings shall be provided to serve all fixtures, equipment, and areas within the Contract Limit Lines as set forth by the Architectural solution for the project. The bidding and contract requirements, general requirements, and general provisions shall apply to this section. Systems shall include all equipment, appurtenances, safety devices, and controls necessary for the intended service.
5. All permits and fees required for this work shall be secured and paid for by the mechanical contractor and included in bid price.
6. Anything drawn or specified on these plans shall not be construed to conflict with any local, municipal or state law, regulation or ordinance which governs the installation of any mechanical or related work. Where any portion of the systems is not installed as in accordance with applicable laws, ordinances, regulations and codes, this contractor shall make all changes required by the enforcing authorities in a manner approved by the owner and without additional cost to the owner. Where plan requirements are more stringent than code, the installation shall be in accordance with the plans.
7. Where job conditions require changes from the contract documents that do not change the scope of installation or nature of work required, the contractor shall make such changes without additional cost to the owner. No other changes may be made without written permission of the owner.
8. All equipment shall be new and unused, UON, and shall bear the label of an approved agency. All equipment shall be installed in strict conformance to manufacturer's instructions, except where these specifications require a higher quality installation than recommended by manufacturer. All mechanical equipment shall be provided with installation instructions, which shall be made available at the job site.
9. All installed systems, devices and related items shall be tested in place on site. Replace any and all contractor-supplied defective devices, items or systems at contractor's own expense before completion of the project. Report any problems with existing to remain (ETR) items to owner for resolution.
10. Contractor shall guarantee all work for which materials are furnished, fabricated or field erected, all factory assembled equipment for which no specific manufacturer's guarantee is furnished, and all work in connection with installing manufacturer's guaranteed equipment. This contractor's guarantee shall exist for a period of one (1) year from the date of final owner acceptance of the work and shall apply to defects in material and to defective workmanship of any kind.
11. Contractor shall replace at contractor's own expense any contractor-supplied materials, equipment, and related items that fail or are found to be defective within the guarantee period.
12. Arrange for chases, slots, and openings in other building components to allow for mechanical installations. Coordinate the installation of required supporting devices and sleeves to be set in poured in place concrete and other structural components, as they are constructed. Coordinate the cutting and patching of building components to accommodate installation of mechanical equipment and materials.
13. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing-in the building.
14. Coordinate mechanical equipment and materials installation with other building components. Coordinate the installation of mechanical materials and equipment above ceilings with suspension system, light fixtures, and other installations.
15. Equipment locations, roof & wall openings are approximate: verify size and coordinate with G.C., equipment supplier, and owner. Provide steel framing around roof opening(s) where required and around wall opening(s) where required.
16. Do not endanger or damage installed Work through procedures and processes of cutting and patching. Arrange for repairs required to restore other work, because of damage caused as a result of mechanical installations.
17. Where mounting heights are not detailed or dimensioned, install mechanical services and overhead equipment to provide the maximum headroom possible.
18. Install mechanical equipment to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
19. For all air systems: adjust fans, supply register dampers, and duct volume dampers as needed to balance all systems to match listed airflows (+/- 10%), and provide a written summary report. Replace fan drive if required to achieve design airflows. Air balance shall be performed by an independent AABC or NEBB certified firm. Summary report shall include design, preliminary and final airflow data, and shall include a list of deficiencies.
20. For all water systems: adjust ball valves, balance valves, pumps, etc, as needed to balance all piping to match GPM and pressure and temperature ranges shown, and provide a written summary report. Water system balance shall be performed by an independent AABC or NEBB certified firm. Summary report shall include design, preliminary and final flow data, and shall include a list of deficiencies.
21. The entire installation, including the gauges of ductwork, shall be in strict compliance with SMACNA standards, except where these specifications require a stricter installation standard. System is 1" pressure class, UON. All ducts shall be sealed to meet SMACNA Class A requirements, and shall be supported at intervals not exceeding 10'. Sealant shall be UL-181A or 181B certified.
22. All 90 degree turns in supply and return ductwork shall be mitered elbows with single wall turning vanes at 2" spacing extended in the direction of airflow, or smooth radius elbows with a radius-to-width ratio of 1.0 or greater. Mitered elbows without turning vanes, square-throat radiused-heel elbows, and radiused-throat square-heel elbows are NOT acceptable. All duct transitions shall be smooth (30 degree taper maximum), not abrupt.
23. All supply and return and outside air ducts inside the building thermal envelope shall be insulated with 1.5"fiberglass duct insulation. All supply and return ductwork outside the building thermal envelope shall be insulated with 3" fiberglass duct insulation (minimum R-8 "installed"value). Insulation shall be fiberglass wrap with scrim-reinforced foil backing. Seal all joints and punctures to preserve vapor barrier.
24. Duct smoke detectors and accessories shall be UL tested and listed. Equipment and installation shall meet all pertinent requirements of the mechanical code and NFPA 72. Duct smoke detectors located more than 10 ft above the finished floor, or located such that the detector's alarm indicator is not visible to responding personnel, shall be provided with remote alarm indicators. Each remote indicator shall be clearly labeled as to function and air handling unit served, with an acrylic engraved nameplate.
25. All curtain-type fire dampers shall be UL 555 listed and dynamic rated, except that static rated fire dampers shall be permitted where the air handling system is automatically shut down in the event of fire. Provide and install duct access panel with acrylic engraved nameplate for each fire damper.
26. All diffusers and grilles shall be factory finished white, unless otherwise noted.
27. All mechanical equipment shall have vibration isolators, as well as flexible duct connectors. Flexible connectors shall be UL 181 tested and labeled, and shall not exceed 14" in length. Mechanical fasteners and sealants shall be used to connect ducts to mechanical equipment.
28. All duct coverings, linings, tape and vibration isolation connectors shall have a maximum flame spread rating of 25, and a maximum smoke generation rating of 50.
29. All duct dimensions listed on plans are inside clear dimensions. Where internally lined ductwork is specified, adjust sheet metal dimensions to accommodate liner.
30. Flexible ducts shall not exceed 6' in length, nor shall they be installed where they must be flattened. Flexible ducts shall be UL 181 tested and labeled, and must be fastened per SMACNA standards. If job conditions do not permit proper installation of flexible duct, rectangular galvanized steel duct with equal free area shall be used instead. Flexible ducts shall not be used where exposed, or where concealed above drywall or plaster ceilings.
31. Provide volume dampers at each branch off of a trunk duct to a supply diffuser.
32. Ductwork is shown in schematic form. All required duct risers and drops to allow general routing depicted may not be shown. Provide offsets as required to meet space requirements and to avoid interference with other trades and field conditions. Exact location of the ductwork may vary according to the coordinated space requirements. Each trade shall be totally responsible for coordination with other trades. Notify engineer of conditions representing significant changes to the designed routing
33. Coordinate size, quantity, and location of all openings required for duct and pipe penetrations through walls, floors, and roofs, with contractor responsible for rough framing. Coordinate location of air intakes with exhaust and plumbing vents so that intakes are a minimum of 10 feet from exhaust openings or plumbing vents
34. Install ducts in longest length possible and fewest possible joints. Install fabricated fittings for changes in directions, changes in size and shape, and connections
35. Install ducts, unless otherwise indicated, vertically and horizontally, parallel and perpendicular to building lines; avoid diagonal runs unless specifically indicated on drawings
36. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated
37. All mechanical equipment with the exception of air handling units, supported from floor structure shall be mounted on 4" thick concrete housekeeping pads unless noted otherwise. air-handling units shall be mounted on 6" thick concrete housekeeping pads to accommodate proper trapping of the condensate drain.
38. Air filters shall be replaced in all air handling equipment employing such prior to final completion and owner occupancy
39. Basis of design mechanical equipment is as scheduled on the drawings. Contractor assumes responsibility for coordinating physical space requirements of equivalent capacity mechanical equipment deemed acceptable by the engineer
40. Mechanical equipment factory finish damaged during the course of construction shall be restored to original condition prior to final acceptance
41. Coordinate mechanical ceiling devices such as diffusers and registers with light fixtures, speakers, sprinkler heads, etc.
42. Electrical equipment spaces: Route ductwork to avoid passing through transformer vaults and electrical equipment spaces and enclosures. Avoid routing ductwork directly above electrical equipment unless specifically indicated on the mechanical drawings
43. Non-Fire-Rated Partition Penetrations: where ducts pass through interior partitions and are exposed to view in mechanical rooms, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same metal thickness as duct. overlap opening on four sides by at least 1-1/2 inches unless indicated otherwise
44. Fire-Rated Partition Penetrations: where ducts pass through interior partitions, install appropriately rated fire damper. Fire damper installation must strictly adhere to manufacturer's written instructions
45. All air handlers, condensers, control devices and other mechanical apparatus shall be clearly marked for easy identification and owner Use black plastic or bakelite name plate engraved with white letters 1/4" high. Punched tape is not acceptable.
46. Mechanical contractor shall furnish record set of drawings with any deviations marked in red ink, within 90 days of system acceptance.
47. Mechanical contractor shall furnish manuals for all new equipment within 90 days of system acceptance, including, at a minimum: equipment input and output capacity and required maintenance actions, O&M manuals, controls maintenance and calibration information (including wiring diagrams and controls set points), and a complete written narrative of how each system is intended to operate. Systems shall be tested to ensure that controls are calibrated, adjusted, and in proper working condition.
48. All submittals shall be sent in pdf format, hard copies will not be reviewed. Submittals shall be highlighted or redlined to indicate equipment ID from schedules, model number, performance data, electrical data, dimensions, weights, options and accessories, and shall be emailed to the Architect.
49. Ductwork systems in areas with drywall ceilings/bulkheads shall be balanced prior to closing of the ceiling. All air devices mounted in drywall ceiling to have trim panels. Where access to manual balancing dampers will not be easily accessible, provide cable controlled damper at neck of diffuser or at duct main takeoff. Metropolitan air technology "roto-twist" model RT-150 or equal.

MECHANICAL SYMBOLS LIST

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
20x12	RECTANGULAR DUCT		4WAY BLOW SUPPLY AIR DIFFUSER
10"ø	ROUND DUCT		NON-4WAY DIFFUSER AIR PATTERN
12x8ø	FLAT OVAL DUCT		LINEAR SUPPLY AIR DIFFUSER
VD	VOLUME DAMPER		ROUND SUPPLY AIR DIFFUSER
FD AD	FIRE DAMPER W/ACCESS DOOR		RETURN AIR GRILLE
SD AD	SMOKE DAMPER W/ ACCESS DOOR		EXHAUST AIR REGISTER
SP	STATIC PRESSURE SENSOR		CEILING EXHAUST FAN
MOD	MOTOR OPERATED DAMPER		DIRECTION OF AIR FLOW
	FLEXIBLE CONNECTION		CONNECT TO EXISTING
	SOUND LINED DUCTWORK		DEMOLISH TO THIS LOCATION
	CAPPED DUCTWORK	T	THERMOSTAT
	CAPPED DUCTWORK	T_R	REVERSE ACTING THERMOSTAT
	DUCTWORK TRANSITIONS	H	HUMIDISTAT
	ROUND TO RECTANGULAR TRANS	S	SENSOR
	DUCTWORK TRANSITION	SD	SMOKE DETECTOR
	RISE AND DROP IN DUCTWORK	P	PRESSURE SENSOR
	RISE AND DROP IN DUCTWORK	GD	GAS DETECTOR SENSOR
	TURNING VANES	$	ON/OFF SWITCH
	RADIUS ELBOW	^{VS}	VARIABLE SPEED SWITCH
	SUPPLY DUCT DOWN	CFM	CUBIC FEET PER MINUTE (CFM)
	SUPPLY DUCT UP	ø	DIAMETER
	RETURN DUCT DOWN	⬮	FLAT OVAL
	RETURN DUCT UP	1	DRAWING NOTE
	EXHAUST DUCT DOWN	1	REVISION SYMBOL
	EXHAUST DUCT UP	1"	1" UNDERCUT DOOR
	AIR TITE FITTING W/INTEGRAL VOLUME DAMPER	DL	DOOR LOUVER
	TOP AIR TITE FITTING CONNECTION	1	EQUIPMENT IDENTIFIER
	DOUBLE LINE FLEXIBLE DUCT		
	SINGLE LINE FLEXIBLE DUCT		

NOTE:

- ALL SYMBOLS ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL NOTE THAT NOT ALL SYMBOLS MAY BE USED, AS WELL AS NOT ALL SYMBOLS USED MAY BE LISTED. REFER TO PROJECT SPECIFIC NOTES FOR ADDITIONAL INFORMATION.

DRAWING CONVENTIONS

- NEW WORK – HEAVY AND SOLID LINES
- EXISTING TO REMAIN – LIGHT AND SOLID LINES
- REMOVE EXISTING – HEAVY AND DASHED LINES

NOTICE TO CONTRACTORS

ALL CONTRACTORS PRIOR TO BID SUBMISSION PROCESS SHALL VISIT PROPOSED WORK SITE AND FIELD VERIFY ALL EXISTING CONDITIONS. ANY CONDITIONS THAT DIFFER FROM THAT SHOWN ON THESE PLANS SHALL BE REPORTED TO ARCHITECT/ENGINEER SO THAT NEW AND REVISED BID DRAWINGS OR INFORMATION MAY BE ISSUED. MODIFICATIONS TO SCOPE OF WORK WHICH RESULT FROM CONTRACTORS NEGLECT TO VISIT THE SITE PRIOR TO SUBMITTING BID, SHALL BE THE CONTRACTORS SOLE RESPONSIBILITY.

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PROJECT

7-ELEVEN 42655 CST

1360 NC 24-87, CAMERON NC 28326

DRG. TITLE:

GENERAL NOTES LEGEND AND ABBREVIATIONS

ISSUE/REVISIONS:

	DATE	DESCRIPTION
0	06/06/25	ISSUE FOR BID AND PERMIT

SEAL

6/06/25

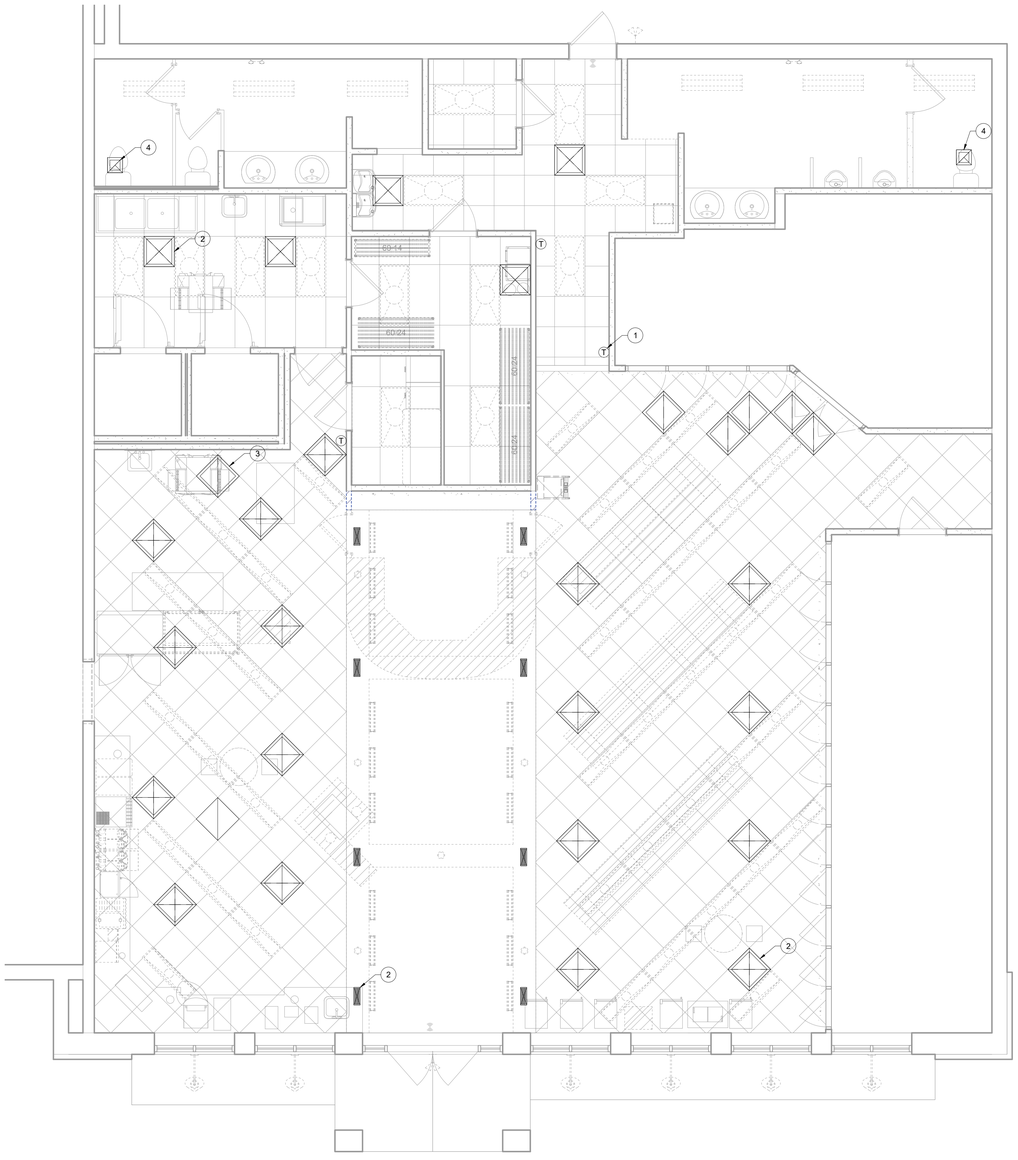
NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO, JR

Docusigned by: 38E72500674548A...

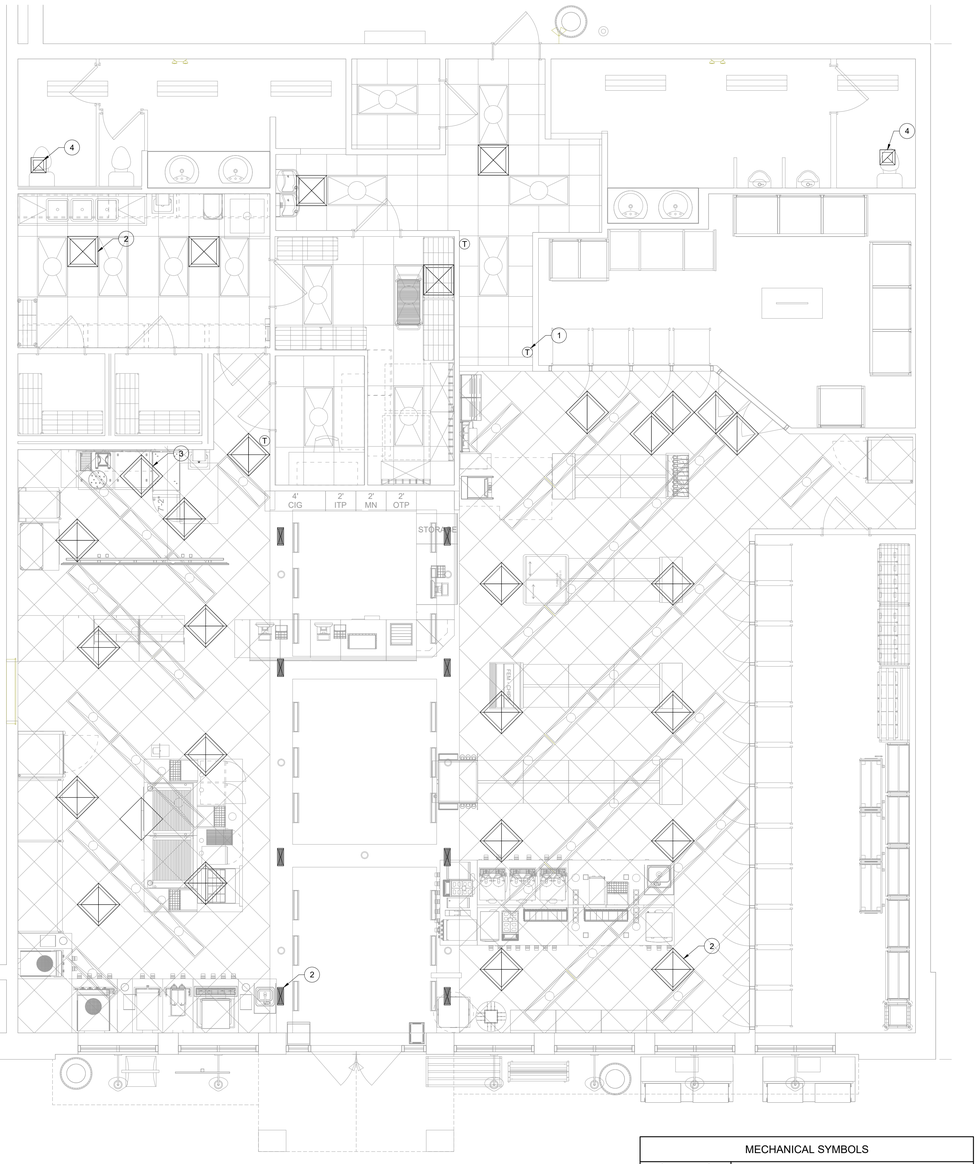
DRAWN BY: JAL	CHECKED BY: JAL
SCALE: 1/4" = 1'-0"	PROJECT No: JAL#25-008
DATE: 6/06/25	FILE NAME:

SHEET NO:

M0.1



1 HVAC DEMOLITION PLAN
Scale: 1/4"=1'



2 HVAC NEW WORK PLAN
Scale: 1/4"=1'

HVAC Drawing Notes: (1) (2) (#)

1. EXISTING THERMOSTAT TO REMAIN. (TYPICAL)
2. EXISTING SA DIFFUSER TO REMAIN.
2. EXISTING SA DIFFUSER TO REMAIN.
3. RESTROOMS ARE OUTSIDE SCOPE OF WORK. EXISTING EXHAUST FANS TO REMAIN.

HVAC NOTES

A. NOTES APPLY TO ALL MECHANICAL SHEETS.

B. EACH CONTRACTOR IS RESPONSIBLE FOR HAVING THOROUGH KNOWLEDGE OF ALL DRAWINGS AND SPECIFICATIONS AS THEY RELATE TO THIS WORK. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED DUE TO LACK OF THIS KNOWLEDGE.

C. PROVIDE ALL MATERIALS FOR A COMPLETE INSTALLATION IN ALL RESPECTS READY FOR INTENDED USE AND IN STRICT ACCORDANCE WITH STATE AND LOCAL CODES AND MANUFACTURER'S RECOMMENDATIONS.

D. SPRINKLER HEAD AND LIGHTING FIXTURE LOCATIONS TAKE PRECEDENCE OVER DIFFUSER LOCATIONS. COORDINATE WITH ELECTRICAL CONTRACTOR AND FIRE PROTECTION CONTRACTOR.

E. DUCTWORK IDENTIFICATION AND INSTALLATION TO ADHERE TO GOVERNING CODES.

F. TYPICAL BRANCH DUCT FITTING DETAIL IS APPLICABLE THROUGHOUT. FLEXIBLE DUCTWORK IS ONLY PERMITTED FOR FINAL CONNECTION - MAX LENGTH OF 6'-0".

G. FURNISH AND INSTALL VOLUME/BALANCE DAMPERS AT ALL BRANCH DUCTS TO DIFFUSERS. LOCATE DAMPERS A MINIMUM 4'-0" AWAY FROM DIFFUSERS. PROVIDE ACCESS AS REQUIRED.

H. ALL CEILING DIFFUSERS ARE 4-WAY PATTERN UNLESS SHOWN OTHERWISE.

MECHANICAL SYMBOLS

18"x12"	RECTANGULAR DUCT 18" WIDE BY 12" DEEP (INSIDE CLEAR DIMENSIONS)
12"	12" DIAMETER ROUND DUCT (INSIDE CLEAR DIMENSIONS)
	SUPPLY DUCT IN SECTION
	RETURN OR EXHAUST DUCT IN SECTION
	ELBOW WITH TURNING VANES
	TEE WITH TURNING VANES
	ROUND (OR OVAL) ELBOW
	SUPPLY AIR DIFFUSER WITH ROUND SUPPLY DUCT
	RETURN OR EXHAUST AIR DIFFUSER WITH ROUND DUCT
CD / 400 CFM	DIFFUSER OR GRILLE TYPE & CFM
(S)(H)(C)	SPACE/HUMIDITY/CO2 COMBO SENSOR
(S)(H)	TEMPERATURE/HUMIDITY COMBO SENSOR
(D)	SMOKE DETECTOR
(R)	SMOKE DETECTOR TEST/RESET STATION
(A)	HORN & STROBE ANNUNCIATOR
(P)	PRESSURE TRANSDUCER
	BALANCE DAMPER

LAY-IN CEILING NOTE: SUPPLY AIR DEVICES SHALL BE INDICATED AS 3-WAY AIR DEVICES WHEN LOCATED WITHIN A 10'-0" RADIUS OF THE OPEN AIR SANDWICH CASE

BRIAN D. LAUG, AIA NCARB
ARCHITECT

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CONSULTANT

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410-776-5868

PROJECT

7-ELEVEN 42655 CST

1360 NC 24-87, CAMERON NC 28326

DRG. TITLE

MECHANICAL PLANS

ISSUE/REVISIONS

#	DATE	DESCRIPTION
0	06/06/25	ISSUE FOR BID AND PERMIT

SEAL

6/06/25

NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO JR

DocuSigned by: 38E7250D67A54BA...

DRAWN BY:	CHECKED BY:
JAL	JAL
SCALE: 1/4" = 1'-0"	PROJECT No. JAL#25-008
DATE: 6/06/25	FILE NAME:

SHEET NO

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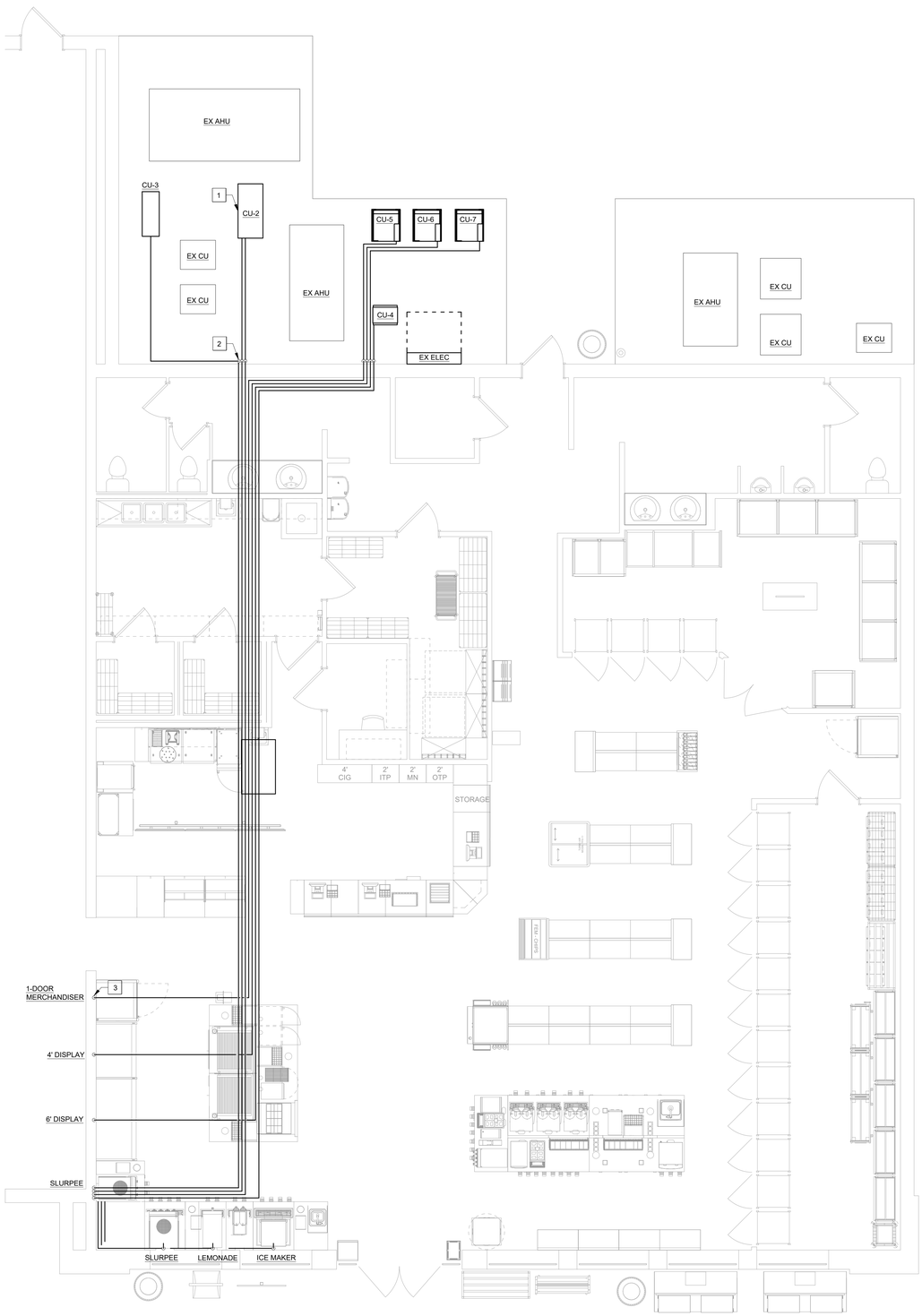

2 MECHANICAL FLOOR PLAN
Scale: 1/4"=1'

Mechanical Drawing Notes: 1 2

1. CONDENSING UNIT TO BE INSTALLED AND CONNECTED COMPLETE TO THE ASSOCIATED PIECE OF STORE EQUIPMENT. THIS INCLUDES ALL POWER, CONTROL WIRING, AND REFRIGERATION LINES. COORDINATE INSTALLATION WITH MANUFACTURER'S INSTALLATION REQUIREMENTS. LOCATE UNITS TO MINIMIZE REFRIGERANT RUNS AND MAINTAIN MAINTENANCE AND CODE REQUIRED CLEARANCES AND MAINTENANCE CLEARANCES OF EXISTING EQUIPMENT. (TYPICAL)
2. REFRIGERANT PIPE SET THRU WALL TO GRADE MOUNTED CONDENSER. INSTALL, SIZE AND TRAP PER MANUFACTURERS INSTRUCTIONS. (TYPICAL)
3. REFRIGERANT PIPE DOWN WITHIN WALL TO EQUIPMENT. INSTALL, SIZE AND TRAP PER MANUFACTURERS INSTRUCTIONS. (TYPICAL)

MECHANICAL MANUFACTURER CONTACT INFORMATION

MANUFACTURER	CONTACT	PHONE	EMAIL
HEATCRAFT WORLDWIDE REFRIGERATION / BOHN	RYAN KELLY	678-472-9885	RYAN.KELLY@HEATCRAFTRPD.COM

REFRIGERATION REMOTE CONDENSING UNIT SCHEDULE

TAG	QTY	ORACLE	MFR	MODEL	SUPPLIER	SUPPLIER PART NUMBER	SERVICE	ELECTRICAL V/PH	ELECTRICAL MCA	ELECTRICAL MOCP	WEIGHT (LBS)	FURNISH BY	INSTALL BY
CU-2	1	03309785	FBD	FBD-DRC	FBD PARTNERSHIP LP	-	DUAL CIRCUIT SLURPEE	208/2	2.2	15	143	TURNKEY	GC
CU-3	1	03309784	FBD	FBD-SRC	FBD PARTNERSHIP LP	-	FROZEN LEMONADE	208/2	1.8	15	105	TURNKEY	GC
CU-4	1	03164149	HOSHIZAKI	URC-5F	HOSHIZAKI	-	ICE MAKER	120/1	--	--	60	TURNKEY	GC
CU-5	1	TBD	BOHN	TBD	HEATCRAFT	-	1-DOOR MERCHANDISER	208/2	20	20	169	TURNKEY	GC
CU-6	1	00130388	BOHN	BZT010M6BF	HEATCRAFT	-	4' DISPLAY CASE	208-230/1	38	40	209	TURNKEY	GC
CU-7	1	TBD	BOHN	TBD	HEATCRAFT	-	6' DISPLAY CASE	208-230/1	38	40	209	TURNKEY	GC

NOTES:
1. **CONTRACTOR TO VERIFY ALL EQUIPMENT SELECTIONS WITH LATEST 7-11 STANDARDS AND 7-11 EQUIPMENT REPRESENTTIVES PRIOR TO ORDERING. NOT ALL EQUIPMENT SELECTIONS WERE PROVIDED. VERIFY SCHEDULE INFORMATION**
2. **FIELD COORDINATE LOCATIONS OF CONDENSERS TO MINIMIZE REFRIGERANT RUNS, SIZE , TRAP AND INSTALL PER MANUFACTURERS RECOMMENDATIONS. CONTRACTOR TO CONSULT FACTORY FOR ALL LONG LINE SET SIZING AND FIELD COORDINATE INSTALLATION.**

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PROJECT:

7-ELEVEN 42655
CST

1360 NC 24-87, CAMERON NC 28326

DRG. TITLE:

MECHANICAL ROOF PLAN

ISSUE REVISIONS

NO.	DATE:	DESCRIPTION:
0	06/06/25	ISSUE FOR BID AND PERMIT

SEAL:

6/06/25

NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO, JR

DocuSigned by: 3EE7250D87A54BA...

DRAWN BY:	CHECKED BY:
JAL	JAL
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DATE: 6/06/25	FILE NAME:

SHEET NO:

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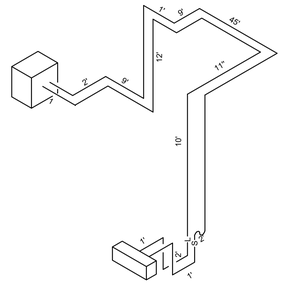
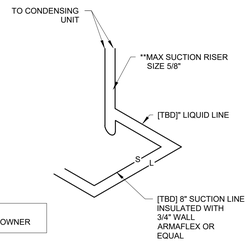




EQUIPMENT CUTSHEET NOT PROVIDED. CONTRACTOR TO SIZE REFRIGERATION PIPING IN FIELD ACCORDING TO UNITS SELECTED BY OWNER

REFRIGERATED CASE LIQUID AND SUCTION REFRIGERANT LINE LENGTHS

DESIGN NOTES:
- LINE SIZING TABLE 8 FROM THE MANUAL SHOWS [TBD] BTUH REQUIRES A [TBD]" SUCTION FOR UP TO ???' OF EQUIVALENT LINE LENGTH.
- HORIZONTAL SUCTION LINES SHALL SLOPE AWAY FROM THE EVAPORATOR TOWARD THE COMPRESSOR AT THE RATE OF 1" PER 10' FOR SUFFICIENT OIL RETURN.

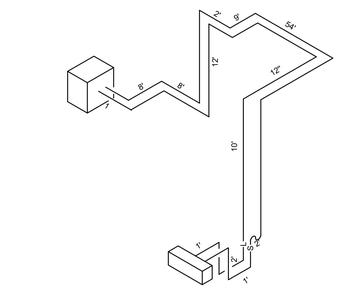
REFRIGERATED CASE LIQUID AND SUCTION REFRIGERANT LINE SIZES

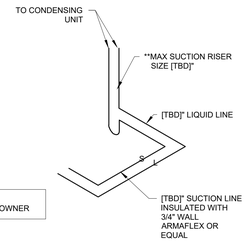
LINE SIZING - [TBD] BTUH @ +20°F:
- (5) [TBD]" ELBOWS: EQUIVALENT LINE LENGTH = [TBD]'
- PIPING LENGTH = 104'/106'
- TOTAL DEVELOPED LENGTH = [TBD'/TBD]'
- SUCTION LINE SIZE = [TBD]"
- LIQUID LINE SIZE = [TBD]"

PIPING DIAGRAM FOR THE R448A MEDIUM (TBD)
TEMPERATURE (+20°F SST) COOLER REFRIGERATION SYSTEM

REFER TO REFRIGERATION INSTALLATION MANUAL FOR LONGER LINE RUNS.
HTTPS://WWW.HEATCRAFTRPD.COM/PDF/I&O/H-IM-CU.PDF

2 1-DOOR MERCHANDISER
NO SCALE





EQUIPMENT CUTSHEET NOT PROVIDED. CONTRACTOR TO SIZE REFRIGERATION PIPING IN FIELD ACCORDING TO UNITS SELECTED BY OWNER

REFRIGERATED CASE LIQUID AND SUCTION REFRIGERANT LINE LENGTHS

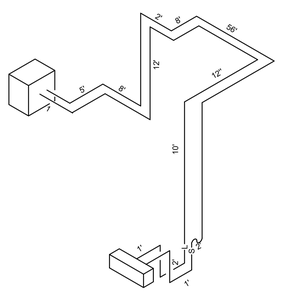
DESIGN NOTES:
- LINE SIZING TABLE 6 FROM THE MANUAL SHOWS [TBD] BTUH REQUIRES A [TBD]" SUCTION FOR UP TO [TBD]' OF EQUIVALENT LINE LENGTH.
- HORIZONTAL SUCTION LINES SHALL SLOPE AWAY FROM THE EVAPORATOR TOWARD THE COMPRESSOR AT THE RATE OF 1" PER 10' FOR SUFFICIENT OIL RETURN.

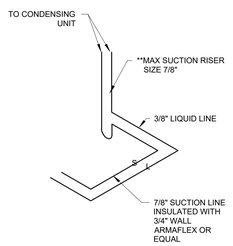
LINE SIZING - [TBD] BTUH @ +20°F:
- (11) 7/8" ELBOWS: EQUIVALENT LINE LENGTH = 22'
- PIPING LENGTH =120'/122'
- TOTAL DEVELOPED LENGTH = 142'/144'
- SUCTION LINE SIZE = [TBD]"
- LIQUID LINE SIZE = [TBD]"

PIPING DIAGRAM FOR THE R404A MEDIUM
TEMPERATURE (+20°F SST) COOLER REFRIGERATION SYSTEM

REFER TO REFRIGERATION INSTALLATION MANUAL FOR LONGER LINE RUNS.
HTTPS://WWW.HEATCRAFTRPD.COM/PDF/I&O/H-IM-CU.PDF

1a 72" CASE MERCHANDISER
NO SCALE





REFRIGERATED CASE LIQUID AND SUCTION REFRIGERANT LINE LENGTHS

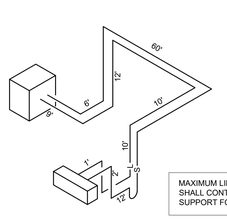
DESIGN NOTES:
- LINE SIZING TABLE 6 FROM THE MANUAL SHOWS 12,000 BTUH REQUIRES A 7/8" SUCTION FOR UP TO 150' OF EQUIVALENT LINE LENGTH.
- HORIZONTAL SUCTION LINES SHALL SLOPE AWAY FROM THE EVAPORATOR TOWARD THE COMPRESSOR AT THE RATE OF 1" PER 10' FOR SUFFICIENT OIL RETURN.

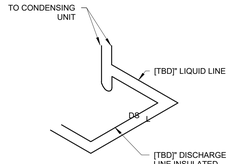
LINE SIZING - 11,260 BTUH @ +20°F:
- (11) 7/8" ELBOWS: EQUIVALENT LINE LENGTH = 22'
- PIPING LENGTH =117'/119'
- TOTAL DEVELOPED LENGTH = 139'/141"
- SUCTION LINE SIZE = 7/8"
- LIQUID LINE SIZE = 3/8"

PIPING DIAGRAM FOR THE R404A MEDIUM
TEMPERATURE (+20°F SST) COOLER REFRIGERATION SYSTEM

REFER TO REFRIGERATION INSTALLATION MANUAL FOR LONGER LINE RUNS.
HTTPS://WWW.HEATCRAFTRPD.COM/PDF/I&O/H-IM-CU.PDF

1b 48" CASE MERCHANDISER
NO SCALE





MAXIMUM LINE LENGTH EXCEEDS 100'. CONTRACTOR SHALL CONTACT MANUFACTURERS TECHNICAL SUPPORT FOR SIZING/INSTALLATION INSTRUCTIONS.

FROZEN LEMONADE MACHINE LIQUID AND DISCHARGE REFRIGERANT LINE LENGTHS

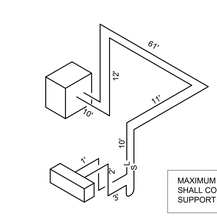
DESIGN NOTES:
- PRE-CHARGED R404A REFRIGERATION LINESETS ARE PROVIDED BY THE VENDOR, IN 50' or 100' SECTIONS, WITH 5/8"DS & 3/8"L
- PIPING LENGTH = 123'/125'
- COMPRESSOR LOCATED IN FBD UNIT
- CONTRACTOR TO LOCATE UNIT TO REDUCE LINE LENGTH AS MUCH AS POSSIBLE AND MAINTAIN SERVICE CLEARANCES

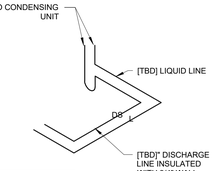
ENLARGED INTERIOR FROZEN LEMONADE MACHINE LIQUID AND DISCHARGE REFRIGERANT LINE SIZES AND CONNECTIONS

INSTALLATION NOTES:
- MAXIMUM LINE LENGTH EXCEEDS 100' SO CONTRACTOR SHALL CONTACT MANUFACTURERS TECHNICAL SUPPORT FOR SIZING/INSTALLATION INSTRUCTIONS.
- LINE SETS SHALL BE MEASURED AND CUT TO FIT TOTAL DEVELOPED LENGTH AS TO NOT HAVE ANY REMAINING COIL OF TUBING ON-SITE

REFER TO FBD INSTALLATION MANUAL.
HTTPS://DOWNLOADS.FBDFROZEN.COM/DOWNLOADS/DOWNLOAD/272

5 FROZEN LEMONADE
NO SCALE





MAXIMUM LINE LENGTH EXCEEDS 100'. CONTRACTOR SHALL CONTACT MANUFACTURERS TECHNICAL SUPPORT FOR SIZING/INSTALLATION INSTRUCTIONS.

SLURPEE MACHINE (EACH) LIQUID AND DISCHARGE REFRIGERANT LINE LENGTHS

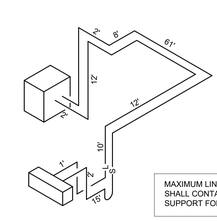
DESIGN NOTES:
- PRE-CHARGED R404A REFRIGERATION LINESETS ARE PROVIDED BY THE VENDOR, IN 50' or 100' SECTIONS, WITH 5/8"DS & 3/8"L
- PIPING LENGTH = 110'/112'
- COMPRESSOR LOCATED IN FBD UNIT
- CONTRACTOR TO LOCATE UNIT TO REDUCE LINE LENGTH AS MUCH AS POSSIBLE AND MAINTAIN SERVICE CLEARANCES

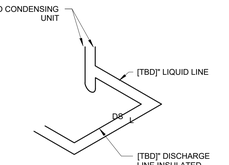
ENLARGED INTERIOR SLURPEE MACHINE (EACH) LIQUID AND DISCHARGE REFRIGERANT LINE SIZES AND CONNECTIONS

INSTALLATION NOTES:
- MAXIMUM LINE LENGTH EXCEEDS 100' SO CONTRACTOR SHALL CONTACT MANUFACTURERS TECHNICAL SUPPORT FOR SIZING/INSTALLATION INSTRUCTIONS.
- LINE SETS SHALL BE MEASURED AND CUT TO FIT TOTAL DEVELOPED LENGTH AS TO NOT HAVE ANY REMAINING COIL OF TUBING ON-SITE

REFER TO FBD INSTALLATION MANUAL.
HTTPS://DOWNLOADS.FBDFROZEN.COM/DOWNLOADS/DOWNLOAD/272

4 SLURPEE MACHINE (EACH)
NO SCALE





MAXIMUM LINE LENGTH EXCEEDS 100'. CONTRACTOR SHALL CONTACT MANUFACTURERS TECHNICAL SUPPORT FOR SIZING/INSTALLATION INSTRUCTIONS.

ICE MAKER LIQUID AND DISCHARGE REFRIGERANT LINE LENGTHS

DESIGN NOTES:
- PRE-CHARGED R404A REFRIGERATION LINESETS ARE PROVIDED BY THE VENDOR, IN 35' SECTIONS, WITH 3/8"DS & 1/4"L
- PIPING LENGTH = 125'/127'
- COMPRESSOR LOCATED IN ICE MAKER
- CONTRACTOR TO LOCATE UNIT TO REDUCE LINE LENGTH AS MUCH AS POSSIBLE AND MAINTAIN SERVICE CLEARANCES

ENLARGED INTERIOR ICE MAKER LIQUID AND DISCHARGE REFRIGERANT LINE SIZES AND CONNECTIONS

INSTALLATION NOTES:
- MAXIMUM LINE LENGTH SHALL NOT EXCEED 66'
- MAXIMUM RISE IS 33'
- LINE SETS SHALL BE MEASURED AND CUT TO FIT TOTAL DEVELOPED LENGTH AS TO NOT HAVE ANY REMAINING COIL OF TUBING ON-SITE
- CONTRACTOR TO USE MANUFACTURERS LONG LINE SET FOR LENGTHS GREATER THAN 66' AND LESS THAN 100'

REFER TO REFRIGERATION INSTALLATION MANUAL.
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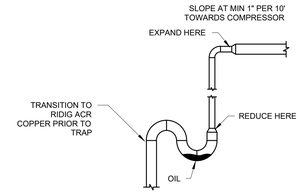
3 FD-1002MRJ-C ICE MAKER
NO SCALE



**SUCTION LINE RISER REDUCTION PER HEATCRAFT INSTALLATION MANUAL

6 PIPE REDUCTION DETAIL
NO SCALE

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PROJECT

7-ELEVEN 42655 CST

1360 NC 24-87, CAMERON NC 28326

DRG. TITLE:

REFRIGERATION PIPING RISER DETAILS

ISSUE / REVISIONS		
0	06/06/25	ISSUE FOR BID AND PERMIT
DATE		DESCRIPTION

SEAL

6/06/25

NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO JR

DocuSigned by: 38E7250DE7A54BA...

DRAWN BY:	CHECKED BY:
JAL	JAL
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1/4" = 1'-0"	JAL#25-008
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6/06/25	

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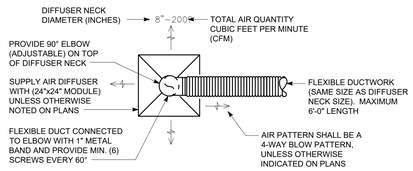
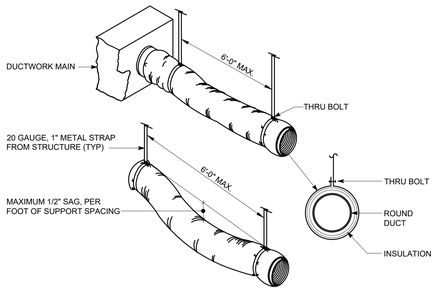


SUPPLY AIR DIFFUSER KEY

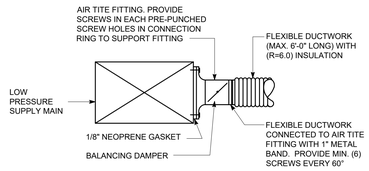
NO SCALE



FLEXIBLE DUCT RUN-OUT SUPPORT DETAIL

NO SCALE

NOTES:
1) FLEXIBLE DUCT SHOULD EXTEND STRAIGHT FOR SEVERAL INCHES FROM RECTANGULAR DUCT CONNECTION BEFORE BENDING.
2) USE RIGID DUCTWORK WHEN FLEXIBLE DUCT LENGTH EXCEEDS 6'-0" LENGTH.



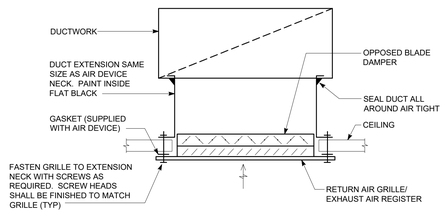
AIR-TITE SIZE CHART

DUCTSIZE	CONNECTION RING	DUCTSIZE	CONNECTION RING
5"	8"	9"	12"
6"	9"	10"	13"
7"	10"	11"	15"
8"	11"	12"	17"

NOTE:
WHERE CONNECTION RING SIZE IS LARGER THAN SUPPLY DUCT, THEN CONNECTION RING SHALL BE CRIMPED OVER DUCT AND CONNECTED, SCREWED & SEALED ON TOP AND BOTTOM OF SUPPLY DUCT.

AIR-TITE SPIN-IN FITTING DETAIL

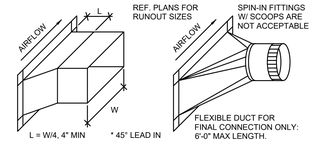
NO SCALE



RETURN AIR GRILLE/EXHAUST REGISTER MOUNTING DETAIL

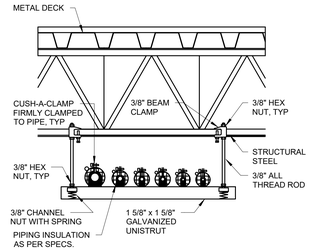
NO SCALE

NOTES:
1) ALL EXHAUST REGISTERS LOCATED IN WET AREAS SHALL BE ALUMINUM.
2) ALL EXHAUST AIR DUCTWORK CONVEYING MOISTURE SHALL BE ALL ALUMINUM.



1 BRANCH DUCT DETAIL

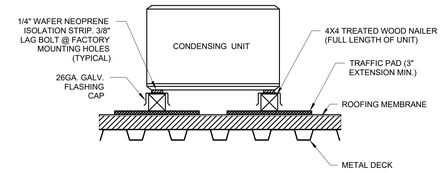
1/4" = 1'-0"



2 REFRIGERANT LINE SUPPORT DETAIL

1/4" = 1'-0"

COORDINATE ALL REFRIGERANT PIPING AND EQUIPMENT INSTALLATION WITH EQUIPMENT VENDER. SIZE TRAP AND INSTALL PER MANUFACTURERS RECOMMENDATIONS

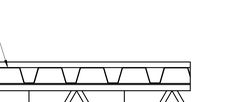


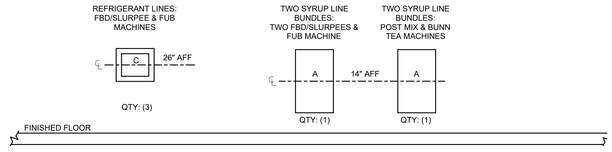
NOTE:
MECHANICAL CONTRACTOR SHALL LEVEL EQUIPMENT CURB PRIOR TO MOUNTING UNIT.

3 CONDENSING UNIT DETAIL

1/4" = 1'-0"

LEGEND	
A	SYRUP LINE BUNDLE WALL CHASE EVERBILT - 12"WX17.75"L STAINLESS STEEL RECESSED WALL CHASE/DRYER VENT BOX - MODEL MDRBHD; FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR. https://www.homedepot.com/p/Everbilt-12-in-W-x-17-75-in-L-Metal-Recessed-Dryer-Vent-Box-MDRBHD/313386890
B	REFRIGERANT LINE WALL CHASE OATEY - CENTRO II 3/4" PVC WALL CHASE/WASHING MACHINE OUTLET BOX, MODEL 38120; FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR. https://www.homedepot.com/p/Oatey-3-1-2-in-Center-Drain-Washing-Machine-Outlet-Box-38120/205124558
C	REFRIGERANT LINE WALL CHASE OATEY - QUADTRO " HIPS WALL CHASE/WASHING MACHINE OUTLET BOX, MODEL 38550; FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR. https://www.oatey.com/products/oatey-quadtro-single-lever-washing-machine-outlet-boxes-848912322?upc=038753385501





4 SYRUP & REFRIGERANT LINE WALL CHASE MOUNTING HEIGHTS

1/4" = 1'-0"

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PROJECT

7-ELEVEN 42655 CST

1360 NC 24-87, CAMERON NC 28326

DRG. TITLE:

MECHANICAL DETAILS

ISSUE/ REVISIONS

	DATE	DESCRIPTION
0	06/06/25	ISSUE FOR BID AND PERMIT

SEAL:

6/06/25

DocuSigned by: 38E7250D67A54BA...

NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO JR

DRAWN BY:	CHECKED BY:
JAL	JAL
SCALE:	PROJECT No:
1/4" = 1'-0"	JAL#25-008
DATE:	FILE NAME:
6/06/25	

SHEET NO:

M2.0

ABBREVIATIONS

A	COMPRESSED AIR	HZ	HERTZ
AAV	AUTOMATIC ADMITTANCE VALVE	ICE	ICE MAKER
ABV	ABOVE	ID	INDIRECT DRAIN
ACU	AIR CONDITIONING UNIT	IE	INVERT ELEVATION
AD	AREA DRAIN	IN W.C.	INCHES WATER COLUMN
AE	ANESTHESIA EXHAUST	KW	KILOWATT
AFF	ABOVE FINISHED FLOOR	LAV	LAVATORY
AHU	AIR HANDLING UNIT	LBS	POUNDS
AS	AIR SEPARATOR	LBS/HR	POUNDS PER HOUR
AV	AUTOMATIC AIR VENT	LG	LENGTH
AW	ACID WASTE	LPR	LOW PRESSURE STEAM RETURN
@	AT	LPS	LOW PRESSURE STEAM SUPPLY
B	BOILER	LWT	LEAVING WATER TEMPATURE
BAS	BUILDING AUTOMATION SYSTEM	MAU	MAKEUP AIR UNIT
BFP	BACKFLOW PREVENTION DEVICE	MAV	MANUAL AIR VENT
BHP	BRAKE HORESPOWER	MAX	MAXIMUM
BLDG	BUILDING	MBH	THOUSANDS OF BTU PER HOUR
BOP	BOTTOM OF *PIPE*	MC	MECHANICAL CONTRACTOR
BO	BOILER BLOW OFF	MCA	MINIMUM CURRENT AMPACITY
BTUH	BRITISH THERMAL UNITS PER HOUR	MIN	MINIMUM
CD	CEILING DIFFUSER /CONDENSATE DRAIN	MOCP	MAXIMUM OVERCURRENT PROTECTION
CH	CHILLER	MPR	MEDIUM PRESSURE RETURN
CHR	CHILLED WATER RETURN	MPS	MEDIUM PRESSURE STEAM
CHS	CHILLED WATER SUPPLY	N	NITROGEN
CLG	CEILING	N.C.	NORMALLY CLOSED
COND	CONDENSATE	NIC	NOT IN CONTRACT
COP	COEFFICIENT OF PERFOMANCE	NO	NITROUS OXIDE
CT	COOLING TOWER	N.O.	NORMALLY OPEN
CU	CONDENSING UNIT	NTS	NOT TO SCALE
CV	CONTROL VALVE	O	OXYGEN
CW	DOMESTIC COLD WATER	OFD	OVERFLOW ROOF DRAIN
D	DRAIN	P	PUMP
DC	DRY COOLER	P-1	PLUMBING FIXTURE IDENTIFIER
°F	DEGREE FAHRENHEIT	PBD	PARALLEL BLADE DAMPER
DH	DEHUMIDIFIER	PC	PLUMBING CONTRACTOR
DI	DEIONIZED WATER	PD	PRESSURE DROP
DN	DOWN	PH	PHASE
DOAS	DEDICATED OUTDOOR AIR SYSTEM	PPM	PARTS PER MILLION
DS	DOWNSPOUT NOZZLE	PRV	PRESSURE RELIEF VALVE
DTR	DUAL TEMPERATURE RETURN	PS	PRESSURE SWITCH
DTS	DUAL TEMPERATURE SUPPLY	PSI	POUNDS PER SQUARE INCH
DW	DISHWASHER	PSIA	POUNDS PER SQUARE INCH ABSOLUTE
EA	EACH	PSIG	POUNDS PER SQUARE INCH GAUGE
EC	ELECTRICAL CONTRACTOR	PTAC	PACKAGED TERMINAL AIR CONDITIONER
EFF	EFFICIENCY	RD	ROOF DRAIN
EL	ELEVATION	RLA	RUNNING LOAD AMPS
ER	EXHAUST REGISTER	RL	RAIN LEADER
ET	EXPANSION TANK	RM.	ROOM
EWC	ELECTRIC WATER COOLER	RO	REVERSE OSMOSIS SUPPLY
EWH	ELECTRIC WATER HEATER	RPM	REVOLUTIONS PER MINUTE
EWT	ENTERING WATER TEMPERATURE	RR	REVERSE OSMOSIS RETURN
EX	EXISTING	RTU	ROOFTOP AIR HANDLING UNIT
EXT	EXTERNAL	RX	REMOVE EXISTING
FCO	FLOOR CLEANOUT	SF	SQUARE FOOT
FCU	FAN COIL UNIT	SH	SHOWER
FD	FLOOR DRAIN	SPEC.	PROJECT SPECIFICATIONS
FDC	FIRE DEPARTMENT CONNECTION	SS	STAINLESS STEEL
FDV	FIRE DEPARTMENT VALVE	STRUCT.	STRUCTURAL
FL	FLOOR	SW	STORM WATER
FLA	FULL LOAD AMPS	TEMP	TEMPERATURE
FOR	FUEL OIL RETURN	TMV	THERMOSTATIC MIXING VALVE
FOS	FUEL OIL SUPPLY	TOP	TOP OF PIPE
FOV	FUEL OIL VENT	TP	TRAP PRIMER
FPM	FEET PER MINUTE	TWH	TANKLESS WATER HEATER
FS	FLOOR SINK	TYP	TYPICAL
FSD	FIRE SMOKE DAMPER	UH	UNIT HEATER
FT	FEET	UON	UNLESS OTHERWISE NOTED
FT^2	SQUARE FEET	UR	URINAL
FTR	FINNED TUBE RADIATOR	V	VOLT / VACUUM
FW	FEED WATER PUMPED DISCHARGE	VAC	VOLTS ALTERNATING CURRENT
GAL	GALLON	VB	VACUUM BREAKER
GC	GENERAL CONTRACTOR	VP	VELOCITY PRESSURE
GPM	GALLONS PER MINUTE	VRF	VARIABLE REFRIGERANT FLOW
GR	GLYCOL RETURN	VTR	VENT THRU ROOF
GRH	GAS RADIANT HEATER	W	WATTS
GS	GLYCOL SUPPLY	W/	WITH
GUH	GAS UNIT HEATER	W/O	WITHOUT
GV	GRAVITY VENTILATOR	WC	WATER CLOSET
GW	GREASE WASTE	WCO	WALL CLEANOUT
GWH	GAS WATER HEATER	WF	WATER FILTER
H	HUMIDIFIER	WG	WATER GAUGE
HB	HOSE BIBB	WH	WALL HYDRANT
HC	HEATING COIL	WS	WATER SOFTENER
HCWR	DUAL TEMPERATURE RETURN	WSHP	WATER SOURCE HEAT PUMP
HCWS	DUAL TEMPERATURE SUPPLY		
HD	HUB DRAIN		
HP	HEAT PUMP / HORSEPOWER		
HPR	HIGH PRESSURE STEAM RETURN		
HPS	HIGH PRESSURE STEAM SUPPLY		
HR	HOUR		
HW	HOT WATER		
HWR	HW RECIRC/HEATING WATER RETURN		
HWS	HEATING WATER SUPPLY		
HX	HEAT EXCHANGER		

GENERAL NOTES

GENERAL PLUMBING REQUIREMENTS

1. Materials, equipment, and systems shall meet all pertinent requirements of the Underwriters Laboratory (UL), the American Society for Testing Materials (ASTM), American Water Works Association (AWWA), American Gas Association (AGA), National Fire Protection Association (NFPA), and other nationally recognized agencies as well as the latest adopted edition of state and local code procedures, methods, and requirements, including the most stringent of health and safety standards as required and as interpreted by the authority having jurisdiction. Applicable codes and standards include, but are not limited to the following: "international plumbing, building, energy, mechanical, and fuel gas codes" applicable local and municipal codes and ordinances.
2. Bidders shall be licensed contractors in accordance with local and state laws.
3. Bidders shall thoroughly acquaint themselves with the conditions under which the work is to be performed. They shall examine all services, equipment, surfaces, etc., which this work is in any way dependent upon, and bring any discrepancies determined or omissions found in the drawings to the owner's attention before submitting bid.
4. All installed systems, devices and related items shall be tested in place on site. Replace any and all contractor supplied defective devices, items or systems at contractor's own expense before completion of the project.
5. Contractor shall guarantee all work for which materials are furnished, fabricated or field erected, all factory assembled equipment for which no specific manufacturer's guarantee is furnished, and all work in connection with installing manufacturer's guaranteed equipment. This contractor's guarantee shall exist for a period of one (1) year from the date of final owner acceptance of the work and shall apply to defects in material and to defective workmanship of any kind.
6. The systems shown on the drawings shall be provided to serve all fixtures, equipment, and areas within the Contract Limit Lines as set forth by the Architectural solution for the project. Systems shall include all equipment, appurtenances, safety devices, and controls necessary for the intended service.
7. All permits and fees required for the work shall be secured and paid for by the plumbing contractor and included in bid price.
8. Anything drawn or specified on these plans shall not be construed to conflict with any local, municipal or state law, regulation or ordinance which governs the installation of any plumbing or related work. Where any portion of the systems are not installed as in accordance with applicable laws, ordinances, regulations and codes, this contractor shall make all changes required by the enforcing authorities in a manner approved by the owner and without additional cost to the owner.
9. Where job conditions require changes from the contract documents that do not change the scope of installation or nature of work required, the contractor shall make such changes without additional cost to the owner. No other changes may be made without written permission of the owner.
10. All equipment and fixtures shall be new and unused and installed in strict conformance to manufacturer's recommendations. Provide fixtures complete with all trim, stops, hangers, carriers, supports, etc. including provision for the handicapped, if required. Where fixtures are accessible to the handicapped, fixtures must comply with all federal ADA regulations.
11. Arrange for chases, slots, and openings in other building components to allow for plumbing installations. Coordinate the cutting and patching of building components to accommodate installation of plumbing equipment and materials.
12. Do not endanger or damage installed Work through procedures and processes of cutting and patching. Provide repairs required to restore other work, because of damage caused as a result of plumbing installations.
13. Coordinate the installation of required supporting devices and sleeves to be set in poured in place concrete and other structural components, as they are constructed. Plumbing contractor shall be responsible for assuring all hangers and supports are anchored or attached to building elements adequate for intended plumbing system or equipment. Plumbing contractor to provide and install nail plates where piping passes through stud(s) within 2" of nailing surface to protect pipe from nails or drywall screws.
14. Sequence, coordinate, and integrate installations of plumbing materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing-in the building.
15. Where mounting heights are not detailed or dimensioned, install plumbing services and overhead equipment to provide the maximum headroom possible.
16. Install plumbing equipment to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
17. Coordinate the installation of plumbing materials and equipment above ceilings with suspension system, light fixtures, ductwork, conduit, and other installations. Coordinate plumbing equipment and materials installation with other building components.
18. All pipes shall be of the size given on the drawings. All piping shall be run true to line. Pipes may be moved, if necessary for installation, provided that the nature of the system is not changed. All pipes shall be concealed: located above ceiling, below floor or in walls, except where connection is made to fixture.
19. Coordinate connection of plumbing systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service and coordinate all locations, sizes and invert elevations with civil engineer.
20. Plumbing service rough-in shall be based on information, drawings, equipment cuts, etc. prepared by the equipment supplier. Final plumbing connections shall be made from rough-in to equipment after equipment is set in place.
21. Actual locations and mounting methods for fixtures and penetrations are subject to Architect's approval. All piping is shown schematically for clarity - coordinate with structure, ducts, lights, utilities, etc. Verify all dimensions by field measurements.
22. The hot and cold water supply line branches for all lavatories and sinks shall have Josam or Zurn water hammer arresters installed on the high point at the end of each branch line.
23. All above-ground water supply piping shall be Type L rigid copper. All below grade water supply piping shall be Type K soft copper with at least 50' between joints. All joints shall be soldered with "lead-free" solder (e.g., 95-5).
24. Flush and sterilize water system after connections are made in accordance with local regulations.
25. All sanitary waste piping below slab shall be cast-iron or solid-wall PVC. All grease waste piping shall be cast iron. Other DWV piping may be solid-wall PVC or cast-iron or galvanized steel, except that PVC may NOT be used in demising walls and may NOT be used in return plenum ceilings.
26. All condensate drain piping and indirect drains shall be DWV seamless copper tubing with soldered drainage fittings or schedule 40 plastic pipe with solvent sealed plastic fittings, except that PVC may NOT be used in demising walls and may NOT be used in return plenum ceilings.
27. All floor penetrations and all exterior penetrations shall be completely waterproofed, firesafed, and sealed. All pipe penetrations of fire rated assemblies shall be sleeved and sealed as required to maintain the rating of the assembly. Sleeves shall be used for all masonry penetrations. Proper sealing of penetrations as described here is the sole responsibility of the plumbing contractor.
28. All domestic water piping, vent piping and gas piping shall run above ceiling, UON. All sanitary piping shall be run under the floor, UON.
29. Existing piping shown on drawings is based on original drawings, and location, mounting heights and points of connection must be verified in field. All items that are indicated in bold print shall be considered new or relocated, unless otherwise noted.
30. In general, do not abandon old piping - remove and dispose of properly, unless inaccessible or under slab, or unless noted otherwise.
31. All water piping inside the building thermal envelope shall be insulated with Owens Corning SSL II with ASJ Max Fiberglas pipe insulation as follows: Cold water, 1/2" thick insulation; hot water supply and recirculation piping 1.25" dia and smaller, 1" thick insulation; hot water supply and recirculation piping 1.5" dia and larger, 1.5" thick insulation.
32. No hot and cold water supply piping shall be run in outside walls, crawl space, attic, or other unheated spaces.
33. All sanitary sewer traps and grease waste piping that is located in unheated areas shall be heat traced and insulated with 1" fiberglass minimum to prevent freezing. All heat tracing shall be controlled with a sensor on the coldest portion of the piping and set to turn on if pipe temperature drops below 45F.
34. Provide and install LavGuard by Truebro, Inc. ADA compliant, vinyl coated with standard white finish, foam insulation on all exposed plumbing waste and supply connectors underneath all lavatories, not just the one labeled with an H-. If there are any instant water heaters, transformers for hands-free devices, or any other sharp or abrasive objects under lavatory, provide and install full lavatory shield (LavShield by Truebro, Inc. or equal), maintaining ADA required clearances under all lavatories.
35. All horizontal branches and vents 3" in diameter and over shall be sloped at 1/8" per foot minimum, unless otherwise noted. All horizontal branches and vents under 3" in diameter shall be sloped at 1/4" per foot minimum, unless otherwise noted (UON).
36. Fabricate, install, inspect, test and purge natural gas systems in accordance with the latest IFGC 2018, and with local gas company. Gas pipe shall be schedule 40 black steel, UON.
37. Contractor to install, size and trap refrigerant piping per the manufacturer's recommendations.
38. All existing H.V.A.C. and piping/plumbing information shown was obtained from field surveys or original previous tenant design drawings. Contractor must verify this information prior to any work being performed.
39. Any cutting or patching of the roof to be done by the owner's roofing contractor so not to void any original warranties.
40. The general contractor shall coordinate all exterior plumbing inverts with actual site conditions, proposed installation and with civil drawings prior to construction, to ensure that all connection points leaving the building can be met..
41. All access panels required in hard ceilings and walls shall be furnished and installed by the contractor. Panels shall be wind-lock model stealth or approved equal with appropriate size.
42. All service valves, unions, gas cocks, etc., shall be manufactured by Nibco or equal.
43. All domestic water piping shall be insulated with 1" pre-molded fiberglass insulation with an all service jacket. Fittings shall be insulated with fiberglass and covered with PVC jackets.
44. All sanitary piping located above food storage racks, above food preparation areas or above food serving areas shall be copper pipe with soldered copper drainage and waste fittings.
45. All refrigerant piping shall be wrapped with 1" Armaflex insulation.
46. All sanitary piping shall be sloped at minimum 1/8" per foot. All sanitary piping 2" and smaller and located below first floor slab/grade shall be sloped at 1/4" per foot.
47. All indirect piping that is equal or greater then 4'-0" long shall be provided with trap at equipment connection.
48. Plumbing contractor is responsible for all services within building and to 5'-0" outside building foundation wall unless noted otherwise on plans. See site utility plans for related work by others.
49. Maintain a minimum clearance of 3'-0" in front of electrical panels and 1'-0" either side when installing plumbing systems in the same area. Pipe systems, equipment, etc. shall not be routed directly over panels or switch gear and where above may be as close as 12 inches from perimeter. Refer to adopted electrical codes where in doubt.
50. All cleanouts, valves, air chambers, etc. are to be accessible. Extend piping and provide access panels where necessary. Plumbing contractor will be required to demonstrate accessibility if it is questionable. Access panel sizes, locations, and final color shall be coordinated with the architect as well as all other trades to avoid any conflicts. Access panels required for this purpose are to be provided by plumbing contractor for installation by general contractor.
51. All plumbing system valves shall be installed in a location and orientation that will permit intended use.
52. Provide stops and/or isolation valves to each individual fixture or piece of equipment to allow for individual servicing unless noted otherwise on plans.
53. Indirect drain piping from fixtures, specialties, and equipment shall be routed to floor drain or other approved receptacles and terminated with an air gap 2 times the diameter of the drain piping but not less than a 1 inch gap. Support piping so drain piping cannot be deflected from drain source.
54. Wherever possible, horizontal soil or waste pipe shall come off top or at 45 degree vertically from center of pipe before offsetting horizontally to riser.
55. All vent terminations shall be coordinated with building structure, openings, air intakes, and other roof mounted equipment. Adjust vent through roof locations to comply with applicable code.
56. Plumbing contractor shall install air chambers on vertical drop to individual sinks with spray feature and piping to all shower valves. Install piston-type water hammer arrestors on horizontal piping prior to drop to all individual flush valve fixtures. Piston- or diaphragm-type water hammer arrestors may be utilized for water headers serving a group of fixtures within the same chase and shall be located upstream the last fixture served on the header. Locate arrestors in accessible location, or provide access panel. Size arrestors per manufacturer's recommendation for related fixture load.
57. Minimize developed length of branch runouts from circulated domestic hot water mains to fixtures and/or mixing valves whenever possible.
58. Plumbing contractor to install and test equipment per manufacturer's written instructions and recommendations to assure proper operation.
59. Insulate all above floor traps receiving chilled water or condensate with 1/2" thick elastomeric material.
60. Insulate all horizontal storm piping and exposed roof drain sumps (where applicable). See plumbing insulation specification for clarification.
61. The general contractor shall be responsible for removal and disposal of all construction debris and refuse from the job site.
62. All submittals must be sent in pdf format, highlighted or redlined
63. Upon completion of the work, the general contractor shall prepare a punch list first and notify architect to review and verify punch-list for corrections.
64. Plumbing contractor shall furnish record set of drawings with any deviations marked in red ink, within 90 days of system acceptance.

NOTICE TO CONTRACTORS

ALL CONTRACTORS PRIOR TO BID SUBMISSION PROCESS SHALL VISIT PROPOSED WORK SITE AND FIELD VERIFY ALL EXISTING CONDITIONS. ANY CONDITIONS THAT DIFFER FROM THAT SHOWN ON THESE PLANS SHALL BE REPORTED TO ARCHITECT/ENGINEER SO THAT NEW AND REVISED BID DRAWINGS OR INFORMATION MAY BE ISSUED. MODIFICATIONS TO SCOPE OF WORK WHICH RESULT FROM CONTRACTORS NEGLECT TO VISIT THE SITE PRIOR TO SUBMITTING BID, SHALL BE THE CONTRACTORS SOLE RESPONSIBILITY.

DRAWING CONVENTIONS

- NEW WORK - HEAVY AND SOLID LINES
- EXISTING TO REMAIN - LIGHT AND SOLID LINES
- REMOVE EXISTING - HEAVY AND DASHED LINES

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GENERAL NOTES

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SEAL:

6/06/25

NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO JR

DocuSigned by: 38E7250D67A48A...

DRAWN BY: JAL	CHECKED BY: JAL
SCALE: 1/4" = 1'-0"	PROJECT No: JAL#25-008
DATE: 6/06/25	FILE NAME:

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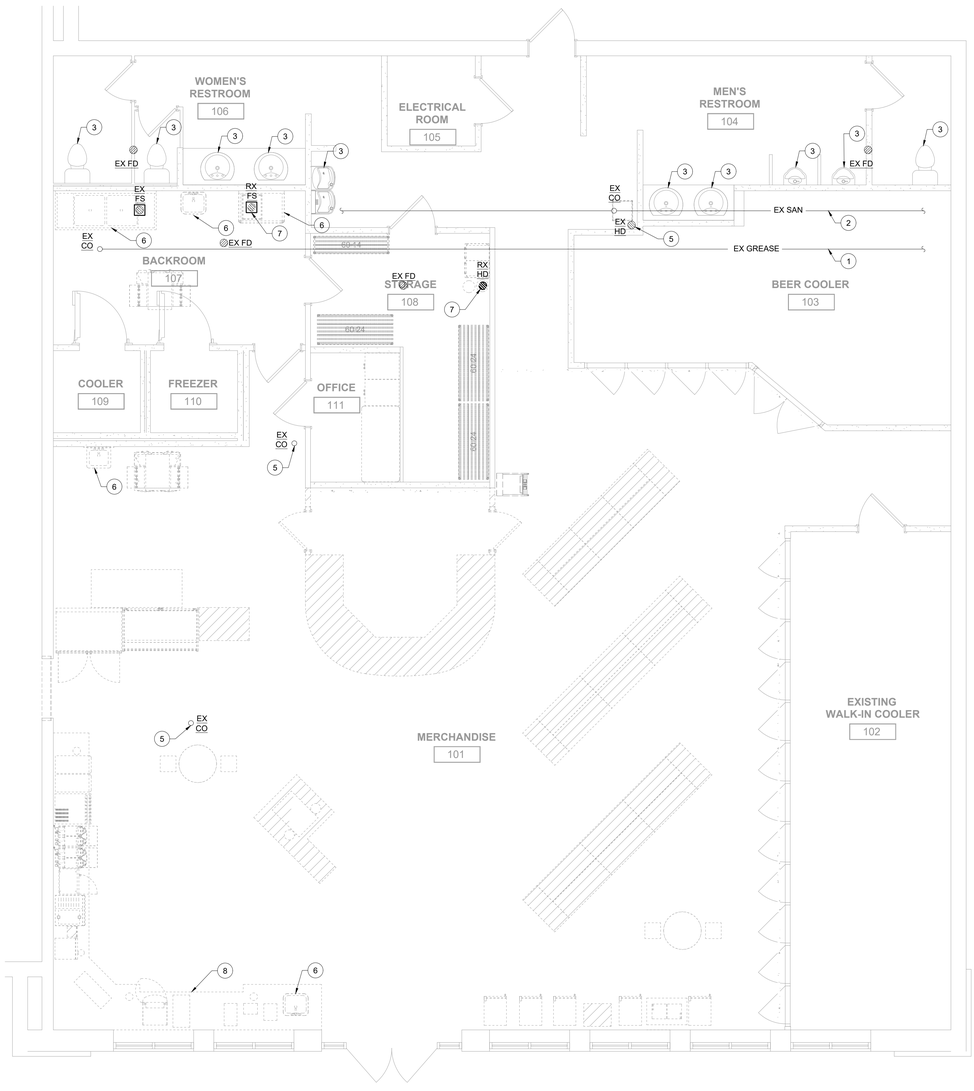
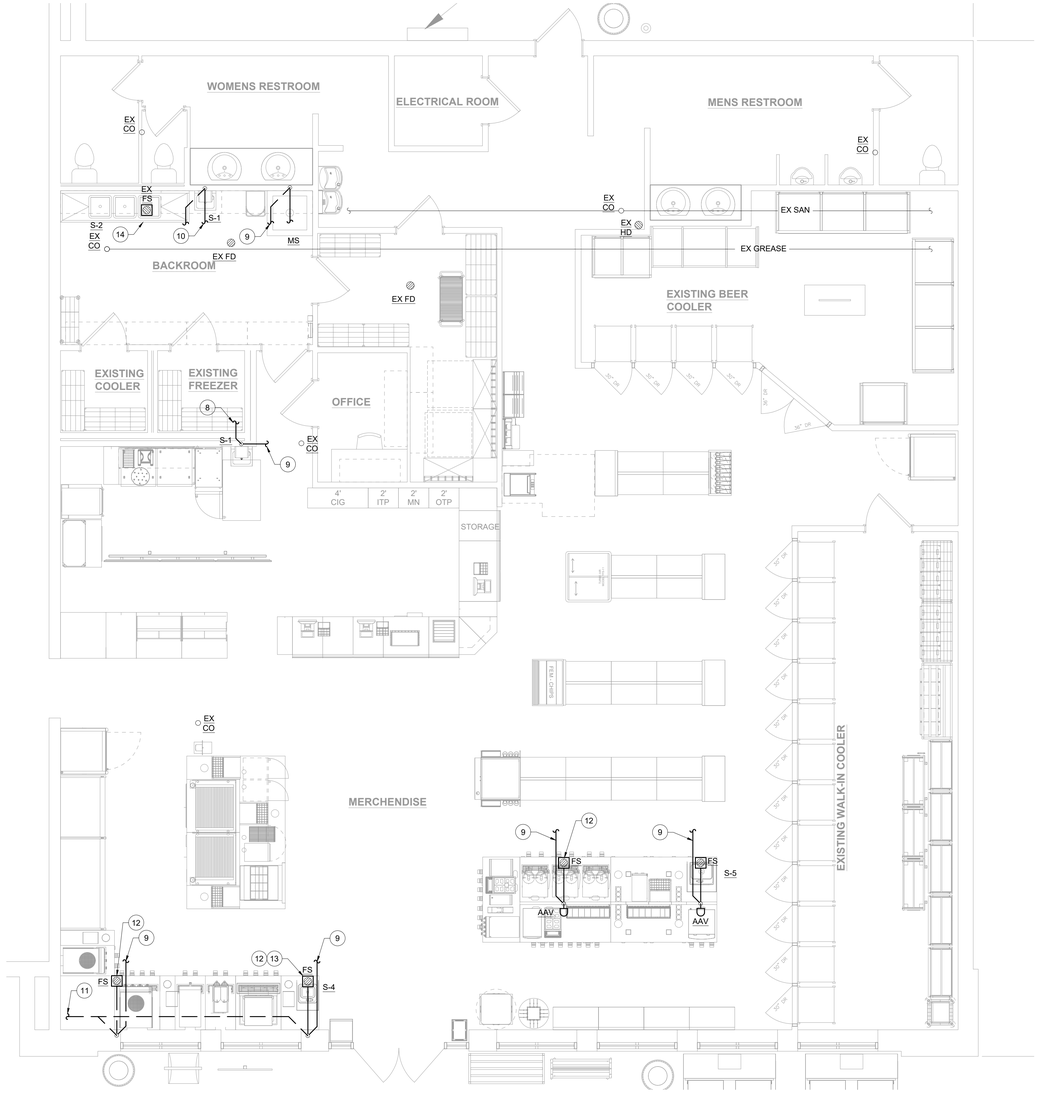


1 DRAIN PLAN - DEMOLITION

Scale: 1/4"=1'



2 DRAIN PLAN - NEW WORK

Scale: 1/4"=1'

PLUMBING NOTES	
A.	NOTES APPLY TO ALL PLUMBING SHEETS.
B.	EACH CONTRACTOR IS RESPONSIBLE FOR HAVING THOROUGH KNOWLEDGE OF ALL DRAWINGS AND SPECIFICATIONS AS THEY RELATE TO THIS WORK. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED DUE TO LACK OF THIS KNOWLEDGE.
C.	PROVIDE ALL MATERIALS FOR A COMPLETE INSTALLATION IN ALL RESPECTS READY FOR INTENDED USE AND IN STRICT ACCORDANCE WITH STATE AND LOCAL CODES AND MANUFACTURER'S RECOMMENDATIONS.
D.	COORDINATE SEWER AND WATER CONNECTIONS WITH CIVIL AND AHJ. PROVIDE PRESSURE REDUCING VALVE AND BACKFLOW PREVENTER AS SHOWN OR REQUIRED BY AHJ. VERIFY INVERT AND SLOPE OF INCOMING SANITARY SEWER BEFORE TRENCHING.
E.	REFER TO RISER DIAGRAMS AND PLUMBING FIXTURE SCHEDULE FOR ALL PIPING AND PIPE SIZES NOT SHOWN ON PLAN.
F.	SANITARY AND STORM SEWER PIPING SHOWN IS BASED ON 1/4" PER FOOT FALL FOR ALL PIPE. NOTIFY 7-11 CM IF THE SLOPE CANNOT BE ACHIVED.
G.	ALL SEWER PIPING BELOW SLAB TO BE 2" DIAMETER MINIMUM.
H.	PROVIDE ACCESS DOORS TO ALL CONCEALED VALVES AND CLEAN-OUTS; AND NOT ABOVE AN ACCESSIBLE CEILING.
I.	PROVIDE TRAP SEAL PRIMERS AND 1/2" COPPER TUBING CONNECTION TO ALL FLOOR DRAINS AS SHOWN OR AS REQUIRED BY AHJ. CONTRACTOR SHALL VERIFY REQUIREMENTS.
J.	INSTALL VTR'S, EXHAUST FANS, AND FLUES A MINIMUM 5'-0" FROM PARAPET OR OUTSIDE WALL AND 10'-0" MINIMUM FROM EQUIPMENT WITH OUTSIDE AIR INTAKE.
K.	INSTALL WATER PIPE ON INSIDE OF EXTERIOR WALL INSULATION TO PREVENT FREEZING.
L.	WHEN DEEP FROST LOCATIONS ARE ENCOUNTERED, ROUTE SANITARY LINES UNDER BUILDING AS MUCH AS POSSIBLE.
M.	PROVIDE PVC SLEEVE FOR ALL COLD/HOT WATER FLOOR PIPE PENETRATIONS. MAKE SLEEVE LARGE ENOUGH FOR INSULATION. SEAL WITH GRAY MASTIC AND ENSURE OF NO WATER PENETRATIONS.
N.	PROVIDE AND INSTALL WATTS 8A VACUUM BREAKER ON ANY THREADED EXTERIOR OR INTERIOR FAUCETS.
O.	ALL WATER SHUT-OFF VALVES SHALL BE "BALL LOCK" TYPE. PROVIDE SHUT-OFF VALVES AT EACH TERMINATION POINT OF ASSOCIATED EQUIPMENT.
P.	PROVIDE SEISMIC BRACING BASED ON APPROPRIATE SEISMIC ZONE REQUIREMENTS PER LOCAL AND NATIONAL CODES. CONTRACTOR'S RESPONSIBILITY INCLUDES STRUCTURAL ENGINEER'S CERTIFICATION ON DETAILS SUBMITTED FOR PERMITTING.

PLUMBING SYMBOLS			
SS	SANITARY SEWER		TEE - TURNED DOWN
GW	GREASE WASTE		TEE - TURNED UP
GI	GREASE INTERCEPTOR		BALL VALVE
	DOMESTIC COLD WATER		BACKFLOW PREVENTER
	DOMESTIC HOT WATER	FD	FLOOR DRAIN
	DOMESTIC HOT WATER RETURN	FS	FLOOR SINK
FW	FILTERED WATER	FCO	FLOOR CLEANOUT
G	NATURAL GAS	YCO	YARD CLEANOUT
CD	CONDENSATE DRAIN	FPWH	
	PLUMBING VENT	HB	HOSE BIBB
	UNION	WCO	WALL CLEANOUT
	ELBOW - TURNED DOWN		GAS PRESSURE REGULATOR
	ELBOW - TURNED UP		GAS COCK

Drawing Notes: (1) (2) (#)

1. APPROXIMATE LOCATION OF EXISTING GREASE PIPING TO EXISTING OUTSIDE UNDERGROUND GREASE INTERCEPTOR TO REMAIN. CONTRACTOR TO VERIFY EXACT SIZE AND LOCATION OF GREASE INTERCEPTOR AND PIPING PRIOR TO WORK BEING PERFORMED.
2. APPROXIMATE LOCATION OF EXISTING SANITARY PIPING. CONTRACTOR TO VERIFY EXACT SIZE AND LOCATION PRIOR TO WORK BEING PERFORMED.
3. EXISTING PLUMBING FIXTURE TO REMAIN.
4. EXISTING CLEANOUT TO REMAIN. (TYPICAL)
5. EXISTING HUB DRAIN TO REMAIN. (TYPICAL)
6. REMOVE EXISTING PLUMBING FIXTURE AND ALL ASSOCIATED PIPING BACK TO MAINS AND CAP. (TYPICAL)
7. REMOVE EXISTING FLOOR SINK/HUBDRAIN AND REWORK AS SHOWN IN NEW WORK PLAN.
8. REMOVE EXISTING PLUMBING IN CASEWORK AS REQUIRED TO ACCOMMODATE NEW WORK
9. NEW SAN PIPING UNDER SLAB. EXTEND TO NEAREST SAN MAIN. CONTRACTOR TO FIELD LOCATE EXISTING MAIN. (TYPICAL)
10. NEW GREASE WASTE PIPING UNDER SLAB. EXTEND TO NEAREST GREASE MAIN. CONTRACTOR TO FIELD LOCATE EXISTING MAIN. (TYPICAL)
11. NEW VENT PIPING ABOVE CEILING EXTEND TO NEAREST VENT MAIN. CONTRACTOR TO FIELD LOCATE EXISTING MAIN. (TYPICAL)
12. PLUMBING CONTRACTOR TO PROVIDE FULL SIZE DRAINS FROM BEVERAGE EQUIPMENT TO FS WITH AIR GAP (TYP) (TYPICAL)
13. ROUTE FULL SIZE DRAIN FROM DUMP SINK (S4) TO FS WITH AN APPROVED AIR GAP
14. ROUTE FULL SIZE SCH 80 PVC DRAINS FROM 3 COMPARTMENT SINK (S2) TO FS WITH AN APPROVED AIR GAP. SEE DETAIL 3/P2.0 FOR MORE INFORMATION.

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PROJECT:

7-ELEVEN 42655
CST

1360 NC 24-87, CAMERON NC 28326

DWG. TITLE:

DRAIN PIPING PLAN

ISSUE REVISIONS

NO.	DATE:	DESCRIPTION:
0	06/06/25	ISSUE FOR BID AND PERMIT

SEAL:

6/06/25

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042310 JOSEPH A. LOIERO, JR

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DATE: 6/06/25	FILE NAME:

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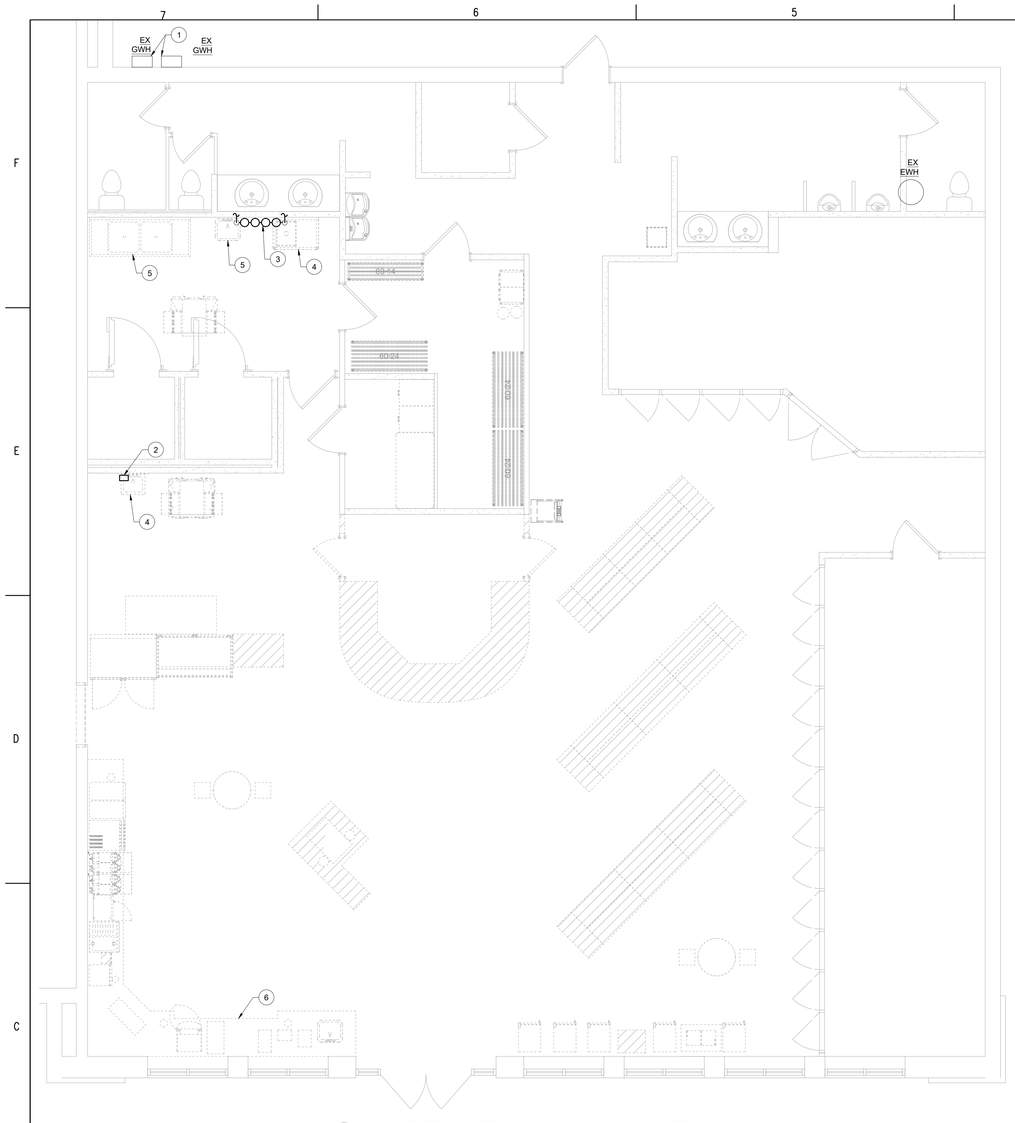
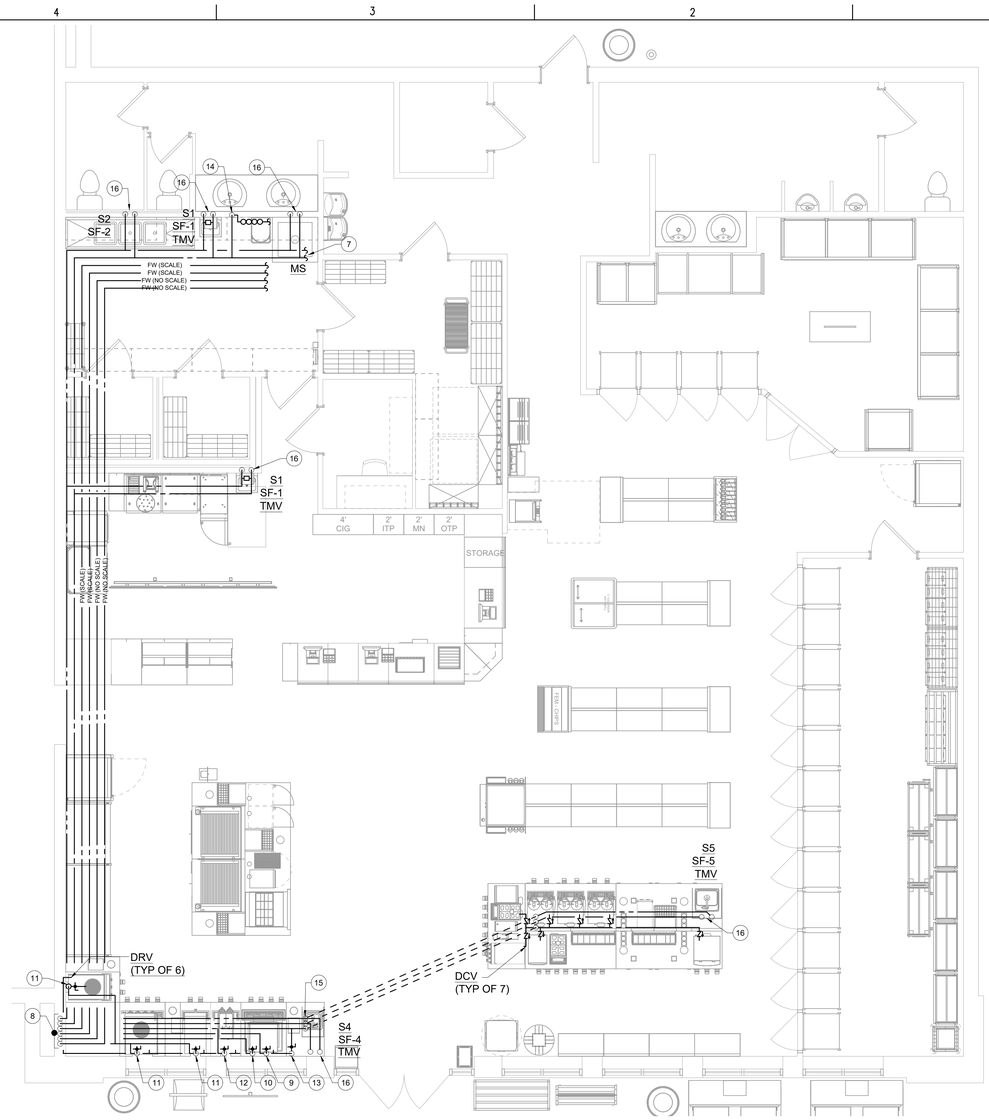


1 DOMESTIC WATER PIPING PLAN - DEMOLITION
Scale: 1/4"=1'



2 DOMESTIC WATER PIPING PLAN - NEW WORK
Scale: 1/4"=1'

PLUMBING NOTES	
A.	NOTES APPLY TO ALL PLUMBING SHEETS.
B.	EACH CONTRACTOR IS RESPONSIBLE FOR HAVING THOROUGH KNOWLEDGE OF ALL DRAWINGS AND SPECIFICATIONS AS THEY RELATE TO THIS WORK. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED DUE TO LACK OF THIS KNOWLEDGE.
C.	PROVIDE ALL MATERIALS FOR A COMPLETE INSTALLATION IN ALL RESPECTS READY FOR INTENDED USE AND IN STRICT ACCORDANCE WITH STATE AND LOCAL CODES AND MANUFACTURER'S RECOMMENDATIONS.
D.	COORDINATE SEWER AND WATER CONNECTIONS WITH CIVIL AND AHJ. PROVIDE PRESSURE REDUCING VALVE AND BACKFLOW PREVENTER AS SHOWN OR REQUIRED BY AHJ. VERIFY INVERT AND SLOPE OF INCOMING SANITARY SEWER BEFORE TRENCHING.
E.	REFER TO RISER DIAGRAMS AND PLUMBING FIXTURE SCHEDULE FOR ALL PIPING AND PIPE SIZES NOT SHOWN ON PLAN.
F.	SANITARY AND STORM SEWER PIPING SHOWN IS BASED ON 1/4" PER FOOT FALL FOR ALL PIPE. NOTIFY 7-11 CM IF THE SLOPE CANNOT BE ACHIVED.
G.	ALL SEWER PIPING BELOW SLAB TO BE 2" DIAMETER MINIMUM.
H.	PROVIDE ACCESS DOORS TO ALL CONCEALED VALVES AND CLEAN-OUTS; AND NOT ABOVE AN ACCESSIBLE CEILING.
I.	PROVIDE TRAP SEAL PRIMERS AND 1/2" COPPER TUBING CONNECTION TO ALL FLOOR DRAINS AS SHOWN OR AS REQUIRED BY AHJ. CONTRACTOR SHALL VERIFY REQUIREMENTS.
J.	INSTALL VTR'S, EXHAUST FANS, AND FLUES A MINIMUM 5'-0" FROM PARAPET OR OUTSIDE WALL AND 10'-0" MINIMUM FROM EQUIPMENT WITH OUTSIDE AIR INTAKE.
K.	INSTALL WATER PIPE ON INSIDE OF EXTERIOR WALL INSULATION TO PREVENT FREEZING.
L.	WHEN DEEP FROST LOCATIONS ARE ENCOUNTERED, ROUTE SANITARY LINES UNDER BUILDING AS MUCH AS POSSIBLE.
M.	PROVIDE PVC SLEEVE FOR ALL COLD/HOT WATER FLOOR PIPE PENETRATIONS. MAKE SLEEVE LARGE ENOUGH FOR INSULATION. SEAL WITH GRAY MASTIC AND ENSURE OF NO WATER PENETRATIONS.
N.	PROVIDE AND INSTALL WATTS 8A VACUUM BREAKER ON ANY THREADED EXTERIOR OR INTERIOR FAUCETS.
O.	ALL WATER SHUT-OFF VALVES SHALL BE "BALL LOCK" TYPE. PROVIDE SHUT-OFF VALVES AT EACH TERMINATION POINT OF ASSOCIATED EQUIPMENT.
P.	PROVIDE SEISMIC BRACING BASED ON APPROPRIATE SEISMIC ZONE REQUIREMENTS PER LOCAL AND NATIONAL CODES. CONTRACTOR'S RESPONSIBILITY INCLUDES STRUCTURAL ENGINEER'S CERTIFICATION ON DETAILS SUBMITTED FOR PERMITTING.

PLUMBING SYMBOLS			
SS	SANITARY SEWER		TEE - TURNED DOWN
GW	GREASE WASTE		TEE - TURNED UP
GI	GREASE INTERCEPTOR		BALL VALVE
	DOMESTIC COLD WATER		BACKFLOW PREVENTER
	DOMESTIC HOT WATER	FD	FLOOR DRAIN
	DOMESTIC HOT WATER RETURN	FS	FLOOR SINK
FW	FILTERED WATER	FCO	FLOOR CLEANOUT
G	NATURAL GAS	YCO	YARD CLEANOUT
CD	CONDENSATE DRAIN	FPWH	
	PLUMBING VENT	HB	HOSE BIBB
	UNION	WCO	WALL CLEANOUT
	ELBOW - TURNED DOWN		GAS PRESSURE REGULATOR
	ELBOW - TURNED UP		GAS COCK

Drawing Notes: 1 2

1. EXISTING 199MBH INSTANTANEOUS WATER HEATERS TO REMAIN. CONTRACTOR TO VERIFY IN WORKING ORDER. REPLACE IF NECESSARY.
2. REMOVE EXISTING POINT OF USE WATER HEATER.
3. REMOVE AND REPLACE EXISTING WATER FILTRATION SYSTEM.
4. REMOVE EXISTING PLUMBING FIXTURE AND ASSOCIATED PIPING BACK TO MAIN.
5. REMOVE EXISTING PLUMBING FIXTURE AND PREP EXISTING PIPING FOR NEW FIXTURE.
6. REMOVE ALL BEVERAGE BAR PLUMBING BACK TO MAINS AND REWORK AS SHOWN IN NEW WORK.
7. EXTEND TO EXISTING DOMESTIC WATER MAINS. CONTRACTOR TO FIELD LOCATE AND VERIFY SIZES OF MAINS PRIOR TO WORK BEING PERFORMED.
8. ROUTE PIPING DOWN INSIDE WALL INTO CASEWORK AND EXTEND TO SYSTEMS AS SHOWN IN PLAN AND RISER DIAGRAM.
9. ROUTE 1/2" FW TO ICE MAKER WITH SHUT OFF VALVE AND DCV (ASSE 1022)
10. ROUTE 1/2" FW TO POST MIX WITH SHUT OFF VALVE AND DCV (ASSE 1022)
11. ROUTE 3/4" FW TO SLURPEES/LEMONADE WITH SHUT OFF VALVE AND DCV (ASSE 1022)
12. ROUTE 3/4" FW TO ICED TEA BREWER WITH SHUT OFF VALVE AND DCV (ASSE 1022)
13. 1/2" CW ROUTED DOWN WALL INTO CASEWORK FOR AUTO-FLUSH SYSTEM, SEE DRV ON SPECIALTY PLUMBING FIXTURE SCHEDULE FOR MORE INFORMATION, INCLUDE WITH DCV (ASSE 1022) PRIOR TO CONNECTION. INSTALL PER MANUFACTURER REQUIREMENTS.
14. NEW 3/4" CW TO NEW FILTER SYSTEM. REFER TO DETAIL 1/P2.0.
15. 1/2" CW, 1/2" HW, 3/4" FW ROUTED DOWN TO UNDER SLAB AND EXTENDED TO COFFEE BAR.
16. 1/2" CW AND 1/2" HW ROUTED TO NEW PLUMBING FIXTURE.

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DOMESTIC WATER PIPING PLAN

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NORTH CAROLINA PROFESSIONAL SEAL 042310 ENGINEER JOSEPH A. LOIERO JR

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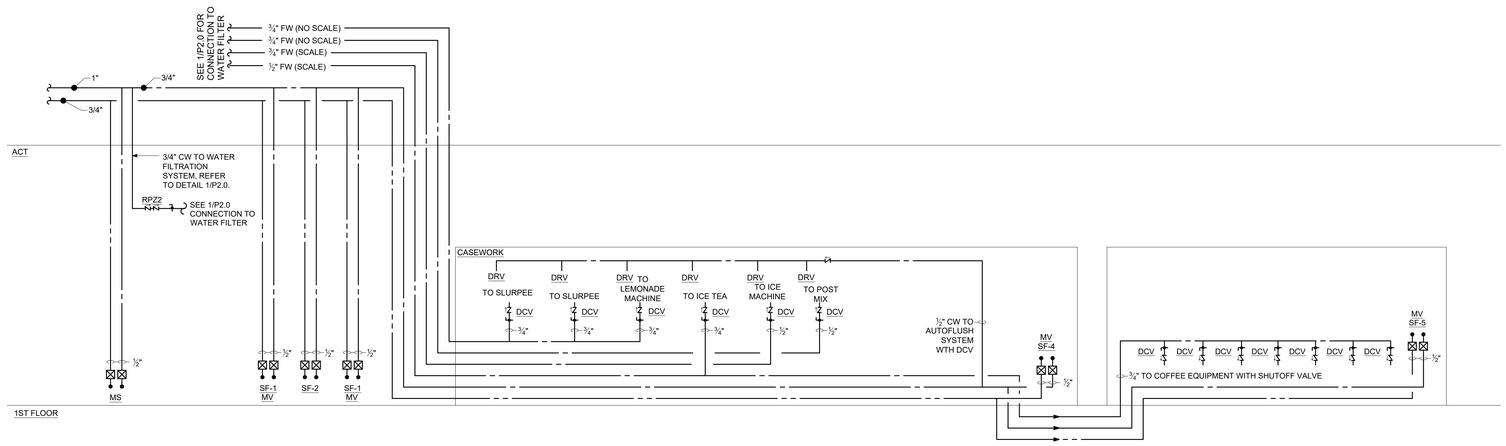
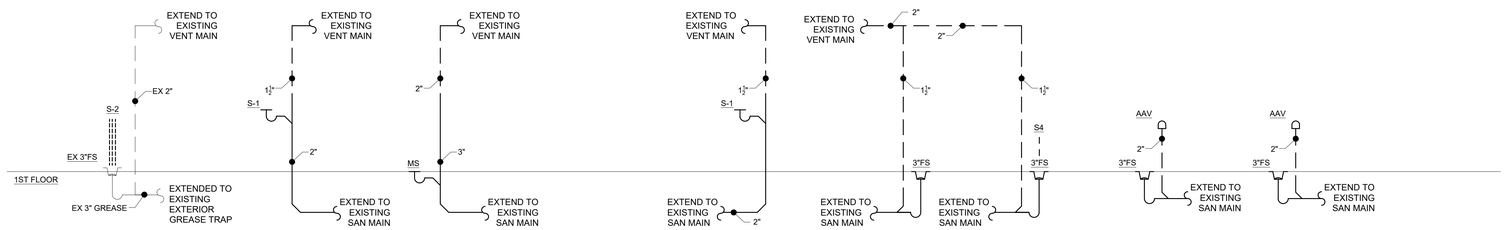


DOMESTIC WATER RISER DIAGRAM

NO SCALE

NOTES:
1) EACH OF THE HAND SINKS SHALL BE PROVIDED WITH UNDERSINK THERMOSTATIC MIXING VALVE SET AT 105°F



SANITARY/GREASE RISER DIAGRAM

NO SCALE

NOTES:
1) ALL VENTING PIPING FROM HORIZONTAL BRANCH SHALL BE FROM TOP OF BRANCH AT A MINIMUM 45 DEGREE ANGLE AND SLOPED UPWARD. NO FLAT VENTING IS ALLOWED. REFER TO PLUMBING CODE SECTION 905.4.
2) VERTICAL DISTANCE BETWEEN FIXTURE OUTLET AND TRAP SHALL NOT EXCEED 24". REFER TO PLUMBING CODE SECTION 1002.1.

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PLUMBING RISERS

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PLUMBING FIXTURE SCHEDULE (NOT ALL DEVICES ARE USED ON THIS PROJECT)												
								CONNECTION				
TAG	FIXTURE	ORACLE	MANUFACTURER	MODEL	FURNISH BY	INSTALL BY	SUPPLIER	CW	HW	WASTE	VENT	DESCRIPTION
DCV	DUAL CHECK VALVE	-	WATTS	SD-3	GC	GC	--	SEE PLAN	--	--	--	LEAD FREE STAINLESS STEEL BODY WITHS TRAINER AND VENT DISCHARGE PORT. (ASSE 1022)
DRV	DRAIN VALVE	-	GRANZGOW	E2B15-00V	GC	GC	--	1/4"	--	--	--	ELECTRONIC DRAIN VALVE, TIMER SET TO 15 SECONDS ON, 15 MINUTES OFF.
FCO	FLOOR CLEANOUT	-	SIOUX CHIEF	851	GC	GC	--	--	--	NOTE A	--	PVC BODY, ROUND HEAVY-DUTY CAST IRON TOP. POLYPROPYLENE OR ABS PLUG, ADJUSTABLE TO FINISH SURFACE.
FD	FLOOR DRAIN	-	SIOUX CHIEF	832-36PNQ	GC	GC	--	--	--	3"	1-1/2"	3" LIGHT DUTY DRAIN WITH 7" SQUARE TOP, PVC BODY WITH NICKEL BRONZE RING AND STRAINER.
FS	FLOOR SINK	-	SIOUX CHIEF	861	GC	GC	--	--	--	3"	1-1/2"	WHITE PVC 12"X12" FLOOR SINK WITH 2/4" HEAVY-DUTY PVC HALF GRATE, SEDIMENT BUCKET.
GT	GREASE TRAP	-	SCHIER (GREAT BASIN)	GB-50	GC	GC	--	--	--	3"	--	SEAMLESS MOLDED POLYETHYLENE TANK, 50 GPM FLOW RATE, 439.5 LB GREASE CAPACITY, 65 GALLON LIQUID CAPACITY, W/ BUILT-IN FLOW CONTROL, INTEGRAL AIR RELIEF/ANTI SYPHON, FIELD ADJUSTABLE RISER SYSTEM, 4" PLAIN INLET/OUTLET, WATER/GAS TIGHT SEAL COVER WITH MIN 16,000 LB LOAD CAPACITY, CERTIFIED TO ASME A112.14.3 AND CSA B481.1.
MS	MOP SINK	-	FIAT	MSB-2424	GC	GC	--	1/2"	1/2"	3"	1-1/2"	FIXTURE AND HARDWARE PROVIDED AND INSTALLED BY PLUMBING CONTRACTOR. NO .830AA FAUCET WITH INTEGRAL VACUUM BREAKER, NO. 832-AA HOSE AND BRACKET NO. 1453BB FLOOR STRAINER AND NO. 899-CC MOP HANGER.
RPZ	REDUCED PRESSURE BACKFLOW PREVENTER	-	WATTS	LF909QTS	GC	GC	--	2"	--	--	--	LEAD FREE BRONZE BODY WITH SHUT-OFF VALVES, Y STRAINER, AND TEST COCKS. (ASSE 1013)
S1	HAND SINK	03291395	JOHN BOOS	PBHS-W0140-SSLR	TURNKEY	GC	--	1/2"	1/2"	1-1/2"	1-1/2"	FIXTURE AND HARDWARE OWNER FURNISHED, INSTLALLED BY PLUMBING CONTRACTOR. ADA COMPLIANT, CUSTOM WALL MOUNT 10" FRONT TO BACK X 14" W X 6" D HAND SINK (PRODUCTION LINE). PROVIDED WITH BRASS FAUCET (REF SF-1 THIS SCHEDULE) & P-TRAP, INSTALL TRUEBRO LAV GUARD 2 PROTECTIVE PIPE COVERS ON EXPOSED HOT WATER AND DRAIN LINES, STOP VALVES, AND TEMPERATURE-ACTIVATING MIXING VALVE SET TO 105°F.
S2	3-COMP SINK	03119411	TURBO AIR	TSA-3-D1-711	TURNKEY	GC	--	1/2"	1/2"	2"(3)	--	BOWL SIZE 12"x19"x12", FIXTURE AND HARDWARE OWNER FURNISHED, INSTALLED BY PLUMBING CONTRACTOR, PROVIDED WITH FAUCET (REF SF-2 THIS SCHEDULE), P-TRAP AND STOP VALVES.
S4	DUMP SINK	-	DAYTON	K1115152	TURNKEY	GC	ROYSTON	1/2"	1/2"	1-1/2"	1-1/2"	FIXTURE AND HARDWARE PROVIDED FURNISHED, INSTALLED BY PLUMBING CONTRACTOR. STAINLESS STEEL FIXTURE, DECK MOUNTED BRASS FAUCET (REF SF-4 THIS SCHEDULE) WITH AERATOR & P-TRAP, PROVIDED WITH STOP VALVES, FLEXIBLE SUPPLY RISERS, TUEBRO LAV GUARD 2 PROTECTIVE PIPE COVERS.
S5	DUMP SINK	-	ELKAY	PSR19181	TURNKEY	GC	ROYSTON	1/2"	1/2"	1-1/2"	1-1/2"	FIXTURE AND HARDWARE PROVIDED FURNISHED, INSTALLED BY PLUMBING CONTRACTOR. STAINLESS STEEL FIXTURE, DECK MOUNTED BRASS FAUCET (REF SF-5 THIS SCHEDULE) WITH AERATOR & P-TRAP, PROVIDED WITH STOP VALVES, FLEXIBLE SUPPLY RISERS, TUEBRO LAV GUARD 2 PROTECTIVE
SF-1	SINK FAUCET	03136254	T&S BRASS AND BRONZE WORKS, INC.	B-1146	TURNKEY	GC	--	1/2"	1/2"	--	--	4" WALL MOUNT WORKBOARD FAUCET, QUARTER-TURN ETERNA CARTRIDGES WITH SPRING CHECKS, LEVER HANDLES, 5 3/4" SWIVEL GOOSENECK, 2.2 GPM AERATOR.
SF-2	SINK FAUCET	03164018	TURNKEY RESOURCES	MPY8WLN-08CR	TURNKEY	GC	--	1/2"	1/2"	--	--	8" WALL MOUNT MIXING FAUCET, QUARTER-TURN CERAMA CARTRIDGES WITH CHECK VALVES, LEVER HANDLES, ADD-ON FAUCET WITH 8" SQING NOZZLE, COMPACT SPRING, 24" FLEXIBLE STAINLESS STEEL HOSE, 0.65 GPM LOW FLOW SPRAY VALVE, 6" WALL BRACKET
SF-4	SINK FAUCET	-	MOEN	5995	TURNKEY	GC	ROYSTON	1/2"	1/2"	--	--	FIXTURE AND HARDWARE OWNER FURNISHED, INSTALLED BY PLUMBING CONTRACTOR. ADA COMPLAINT, 1.5 GPM FLOW RATE STAINLESS STEEL FAUCET.
TMV	THERMOSTATIC MIXING VALVE	-	WATTS	LFUSG-B-M1	GC	GC	--	1/2"	1/2"	--	--	+/- 3°F UP TO 120°F WITH BUILT-IN CHECK VALVES, BRASS BODY, AND COPPER THERMOSTAT.
WF-3	FILTER CARTRIDGE	07883005	ECOLAB	92213690	TURNKEY	GC	--	--	--	--	--	TO20S SCALE FILTER CARTRIDGE
WF-4	FILTER CARTRIDGE	07883001	ECOLAB	92213686	TURNKEY	GC	--	--	--	--	--	TO14 FILTER CARTRIDGE
WF-8	WATER FILTER MANIFOLD	04300903	ECOLAB	9320-2357			ECO-LAB, INC.	1"	--	--	--	SPLIT TRIPLE HEAD MANIFOLD

NOTES:
A. CLEANOUT (FCO, YCO) SHALL BE SAME SIZE AS PIPE BEING SERVED.

MANUFACTURER CONTACT INFORMATION			
MANUFACTURER	CONTACT	PHONE	EMAIL
ECOLAB, INC	JENNIFER GREENE	612-366-3636	JENNIFER.GREENE@ECOLAB.COM
FERGUSON ENTERPRISES, LLC	JASON WADDLES	757-234-8204	NA.PORJECTS@FERGUSON.COM
SCHIER PRODUCTS	SEAN MOLEN	8165063203	SEAN.MOLEN@SHIERPRODUCTS.COM

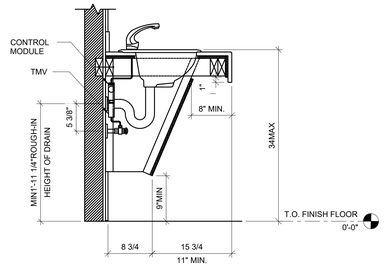
RECIRCULATING PUMP SCHEDULE (IF REQUIRED)							
TAG	QTY	MANUFACTURER	MODEL	HEAD LOSS (FT)	ELECTRICAL	NOTES	FURNISH BY	INSTALL BY
P-1	1	BELL & GOSSETT	NBF-9U/LW	11 @ 5 GPM	120/1	A-D	GC	GC

NOTES:
A LEAD FREE CONSTRUCTION.
B. PROVIDE WITH FLEXIBLE PLUG-IN CORD.
C. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
D. PROVIDE WITH FLOW AND TEMPERATURE SWITCH PER 2018 IECC C404.7, REF 2/P2.0.

WATER ROUGH-IN HEIGHTS (NOT ALL USED ON EVERY PROJECT)			
TAG	SERVICE	SIZE	HEIGHT (AFF)
WC	COLD WATER	1"	28"
LAV	HOT & COLD WATER	1/2"	22"
MS	HOT & COLD WATER	1/2"	36"
S1	HOT & COLD WATER	1/2"	18"
S2	HOT & COLD WATER	1/2"	24"
S3	HOT & COLD WATER	1/2"	18"
HB	COLD WATER	1/2"	24"
UR	COLD WATER	3/4"	46-3/4"

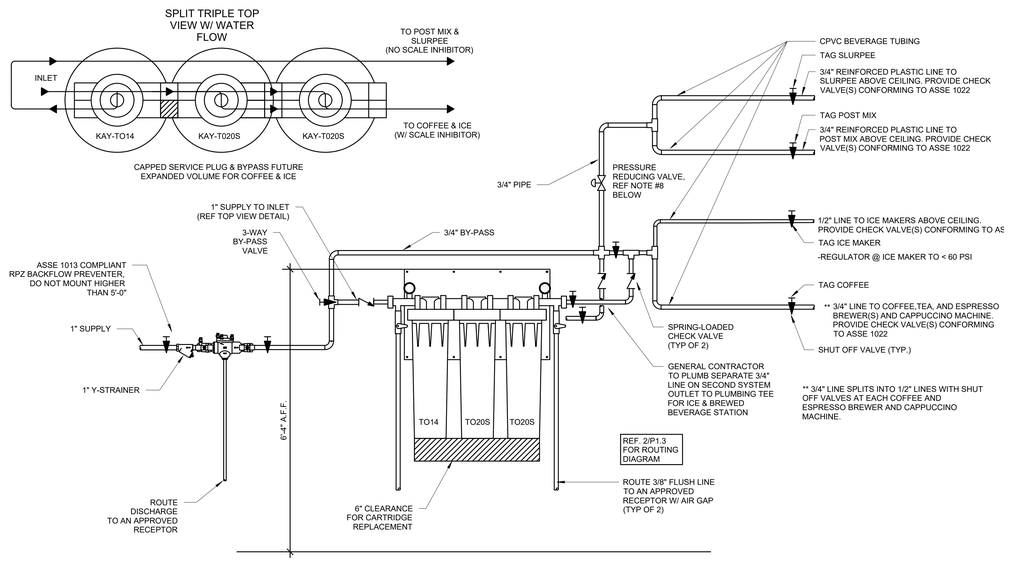
NOTES:
A FIELD VERIFY ROUGH-IN REQUIREMENTS PER MANUFACTURER'S RECOMMENDATIONS.

BACKFLOW PREVENTION SCHEDULE (NOT ALL USED ON EVERY PROJECT)	
EQUIPMENT	BACKFLOW PREVENTION
HOSE BIBB	INTEGRAL VACUUM BREAKER
MOP SINK	INTEGRAL VACUUM BREAKER
3-COMPARTMENT SINK	AIR GAP
HAND SINK	AIR GAP
DUMP SINK	AIR GAP
ICE MAKER	DCV (ASSE 1022)
CARBONATED BEVERAGE DISPENSER	DCV (ASSE 1022)
SLURPEE/FROZEN LEMONADE MACHINE	DCV (ASSE 1022)
COFFEE/BEVERAGE DISPENSERS	DCV (ASSE 1022)
FOUNTAIN DRAINS	DCV (ASSE 1022)
REFRIGERATION CONDENSATE LINES	AIR GAP
TROUGH FOUNTAIN DRAINS	DRV



4 LAVATORY SHROUD
1" = 1'-0"

NOTE: CLEAR PEX OR TUBING IS NOT ALLOWED



FILTER SYSTEM REQUIREMENTS:

1. WATER SUPPLY MUST BE 1" INCH.
2. WATER SHUT-OFF VALVE SHALL BE "BALL LOCK" TYPE POSITIVE ON-OFF.
3. DRAIN MUST BE PROVIDED TO PERMIT FLUSHING OF NEW FILTERS.
4. KAY HIGH CAPACITY KAY-TO14 FILTER WILL BE REPLACED AS REQUIRED BASED ON GALLONAGE.
5. WATER FOR ICE MAKERS, COFFEE MAKERS, AND CAPPUCCINO MACHINES SHALL BE ROUTED THROUGH THE ECOLAB (2)KAY-TO20S FILTER.
6. WATER FOR FSD AND FCB EQUIPMENT SHOULD NOT BE ROUTED THROUGH THE KAY-TO20S FILTERS (WILL REDUCE CARBONATION).
7. KAY-TO14 AND/OR TO20S FILTERS MAY BE CHANGED INDIVIDUALLY AND/OR ADDITIONALLY AS NEEDED. KAT-TO14 PROVIDES UP TO 75,000 GALLONS. (2) KAY-TO20S FILTERS WILL PROVIDE UP TO 200,000 GALLONS OF SCALE CONTROL.
8. HONEYWELL PRESSURE REDUCING VALVE MODEL DSO5C1030 (SET AT 65 PSI) INSTALLED BEFORE FIRST TEE TO BEVERAGE EQUIPMENT.
9. ECOLAB RECOMMENDS MINIMUM INLET PRESSURE TO BE 45 PSI AND WILL REPORT BACK / CALL OUT ANY UNITS WITH INLET FLOW BELOW 45 PSI FOR REVIEW. IN THIS CIRCUMSTANCE, GRUNFOS MQ3-35 BOOSTER PUMP ASSEMBLY IS RECOMMENDED.
10. KAY HSD 20 PREFILTER - ONLY REQUIRED IN EXTREME WATER CONDITION AREAS AND WILL REQUIRE EXTRA SINGLE MANIFOLD IN FRONT OF STANDARD SYSTEM.

COFFEE RELATED EQUIPMENT ON 3/4" FILTER LINE:

REQUIREMENTS FOR COFFEE RELATED EQUIPMENT:
3/4" FILTERED WATER LINE TO COFFEE RELATED EQUIPMENT IS IN THE FOLLOWING ORDER OF CONNECTION:

1. BUNN ICED TEA BREWERS (2)
2. CURTIS CAPPUCCINO
3. BUNN NITRO
4. BUNN COFFEE BREWERS (2)
5. FOLLETT ICE MAKER
6. FRANKE BEAN TO CUP (2)

ECOLAB KAY-TO14S (SCALE CONTROL FILTER) WILL SUPPORT COFFEE FILTRATION APPLICATION.

ECOLAB HIGH CAPACITY FILTERS WILL BE REPLACED AS REQUIRED BASED ON GALLONAGE.

ECOLAB RECOMMENDS A SEPARATE KAY-TO14S (SCALE CONTROL FILTER) INSTEAD OF THE SS-IMF SCALE STICKS FOR UNITS REQUIRING 15,000 GALLONS OR MORE OF SCALE CONTROL OR WHERE THE RAW WATER HARDNESS EXCEEDS 10 GPG HARDNESS TO PROTECT EQUIPMENT FROM EXCESS WATER HARDNESS SCALE BUILD-UP.

ECOLAB HIGH CAPACITY TO14 FILTERS TO PROVIDE 0.5 MICRON AND 75,000 GALLONS AT 5 GPM AND TO20S FILTERS TO PROVIDE 0.5 MICRON AND 100,000 GALLONS AT 10 GPM.

1 ECOLAB WATER PURIFICATION SYSTEM
1/4" = 1'-0"

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