MARYLAND BUILDING NOTES:

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF THE 2021 INTERNATIONAL BUILDING CODE AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS

- 1. THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.
- 2. TESTS WILL BE CONDUCTED UNDER DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS. THE TESTS WILL SHOW COMPLIANCE WITH 2021 IBC REQUIREMENTS AS OUTLINED IN SECTION [IBC 1704].
- 3. THE LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS AND CONDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND REPORTS OF TESTS THAT THE SYSTEM COMPLIES WITH THE CONSTRUCTION DOCUMENTS AND APPLICABLE LAWS.
- 4. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
- A. STANDARDS OF HEATING 2021 IMC 309.1
- B. DUCT CONSTRUCTION AND INSTALLATION 2021 IMC 603
- C. AIR INTAKES, EXHAUSTS AND RELIEF 2021 IMC 401.5 D. AIR FILTERS - 2021 IMC - 605
- E. MANUAL AND AUTOMATIC FIRE AND SMOKE CONTROLS 2021 IMC 606
- F. GAS FIRED EQUIPMENT 2021 FUEL GAS CODE.
- 5. VENTILATION FOR ALL AREA SHALL COMPLY WITH 2021 IMC 401
- 6. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
- 7. A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY 2021 IMC - 403.3.
- 8. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
- 9. These plans are approved only for the work indicated on the application SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
- 10. SMOKE DETECTOR SHALL MEET UL268A.
- 11. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
- 12. A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY 2021 IMC - 403.3. HVAC SYSTEM SHALL BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS AS REQUIRED.
- 13. HVAC AND SERVICE WATER HEATING CONTROLS SHALL BE TASTED TO DOCUMENT THAT CONTROL DEVICES, COMPONENT, EQUIPMENT AND SYSTEM ARE CALIBRATED AND OPERATE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATION.
- 14. AIR BALANCING REPORT SHOULD BE PROVIDED IN ACCORDANCE WITH 2021 IMC 403.3.1.5.
- 15. MECHANICAL SYSTEM COMMISSIONING SHALL BE DONE AS PER SECTION C408.2. IF THE TOTAL MECHANICAL EQUIPMENT CONNECTED LOAD SERVING THE ALTERATION SPACE IS MORE THAN 480,000 BTU/H COOLING CAPACITY AND 600,000 BTU/H COMBINED SERVICE WATER HEATING AND SPACE HEATING.
- 16. DUCT AND PLENUM INSULATION SCHEDULE.
 - CONCEALED, RECTANGULAR, ROUND AND FLAT OVAL, SUPPLY-RETURN, OUTDOOR AND EXHAUST AIR DUCT AND AIR PLENUM INSULATION: FLEXIBLE FIBER BOARD OR POLYOLEFIN WITH MINIMUM THERMAL RESISTANCE AS FOLLOWS:
 - UNCONDITIONED SPACES WITHIN BUILDING: WITHIN BUILDING ENVELOPE ASSEMBLY: R-8 OUTSIDE OR BUILDING: R-8

THERMOSTATIC CONTROL NOTES:

- A. C403.2.4.1 THERMOSTATIC CONTROLS
 - THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, AT LEAST ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM.
- B. C403.2.4.1.2 DEADBAND
- WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CAPABLE OF PROVIDING A TEMPERATURE RANGE OR DEADBAND OF AT LEAST 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS CAPABLE OF BEING SHUT OFF OR REDUCED TO A MINIMUM...
- C. C403.2.4.1.3 SETPOINT OVERLAP RESTRICTION
- WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE PROVIDED WITH THE CAPABILITY TO PREVENT THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION C403.2.4.1.2.
- D. C403.2.4.2.1 THERMOSTATIC SETBACK CAPABILITIES
- THERMOSTATIC SETBACK CONTROLS SHALL HAVE THE CAPABILITY TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F
- C403.2.4.2.2 AUTOMATIC SETBACK AND SHUTDOWN
- AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR AT LEAST 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS: A MANUALLY OPERATED TIMER CAPABLE OF BEING ADJUSTED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR.
- C403.2.4.2.3 AUTOMATIC START CAPABILITIES
- AUTOMATIC START CONTROL SHALL BE PROVIDED FOR EACH HVAC SYSTEM. PROVIDED WITH SETBACK CONTROLS AND DIRECT DIGITAL CONTROL (DDC) SYSTEM. THE CONTROLS SHALL BE CAPABLE OF AUTOMATICALLY ADJUSTING THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY.

TESTING, ADJUSTING AND BALANCING FOR HVAC:

- 1.1 SUMMARY
- A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:
- 1. AIR SYSTEMS: CONSTANT-VOLUME

BE SUBMITTED FOR OWNER REVIEW.

- 1.2 QUALITY ASSURANCE
 - A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING, ADJUSTING AND BALANCING (TAB) SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AABC, NEBB OR TABB CERTIFIED.
- 1.3 EXECUTION
- A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR AND HYDRONIC SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL
- B. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR AND HYDRONIC SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- C. THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.
- D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.
- E. THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURI TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.

SEQUENCE OF OPERATION

- FOLLOWING SEQUENCES OF OPERATIONS
- 1. UNIT SHALL CONSIST OF SUPPLY AIR FAN, FILTERS, DX COOLING COIL, GAS-FIRED HEAT SECTION,
- PROVIDE AN OVERRIDE SWITCH TO OPERATE THE UNIT DURING UNOCCUPIED HOURS. THIS
- THE BEGINNING OF OCCUPANCY AND SHUT DOWN THE UNIT AT THE END OF OCCUPANCY NIT SHALL START EARLIER AS DETERMINED BY THE PROGRAM FOR EARLY WARM-UP OR COOL OWN. ON A SYSTEM STARTUP, THE RTU FAN SHALL START AND RUN CONTINUOUSLY AND THE RNAL FACTORY CONTROLS SHALL BE ENABLED. BASED ON THE SPACE TEMPERATURE
- 3.1. ECONOMIZER MODE: WHEN ENTHALPY OF OA IS BELOW 28 BTU/LB, ECONOMIZER MODE SHALL BE ENABLED. ECONOMIZER MODE SHALL LINEARLY MODULATE OUTDOOR AIR CFM
- 4. UNOCCUPIED MODE: THE RTU INTERNAL OA DAMPERS SHALL REMAINED CLOSED WHEN THE BUILDING IS NOT OCCUPIED. THE RTU SHALL STOP HEATING/COOLING AND THE FAN SHALL STOP. IF THE SPACE TEMPERATURE FALLS BELOW 60 DEGREE F (ADJUSTABLE), THE UNIT SHALL START AND HEAT UNTIL THE SPACE TEMPERATURE IS 64 DEGREE F (ADJUSTABLE) AND THEN SHUTDOWN. IF THE SPACE TEMPERATURE RISES ABOVE 85 DEGREE F (ADJUSTABLE), THE UNIT SHALL START AND COOL UNTIL THE SPACE TEMPERATURE IS 80 DEGREE F (ADJUSTABLE) AND THEN SHUTDOWN.

- 1. EXHAUST FAN SHALL RUN WHEN THE BUILDING IS OCCUPIED. EC TO WIRE THROUGH KITCHEN
- ANSUL SYSTEM ACTIVATION

MEC	HANICAL LEGEND		
X	SUPPLY DUCT UP	<u> </u>	PIPING DOWN
\boxtimes	SUPPLY DUCT DOWN	<u> </u>	PIPING UP
	RETURN DUCT UP		TURNING VANES
	RETURN DUCT DOWN	L	VOLUME DAMPER
•—	FIRE DAMPER	—с—	CONDENSATE DRAIN
-	COMB. FIRE/SMOKE DAMPER	M	MOTORIZED DAMPER
<u> </u>	BACKDRAFT DAMPER		BACKDRAFT DAMPER
$\langle S \rangle$	SMOKE DETECTOR	A	REMOTE ANNUNCIATOR
	SPIN-IN WITH VOLUME DAMPER	T _s	REMOTE TEMP. SENSOR
	45° RETURN DUCT TAP WITH VOL. DAMPER	T	THERMOSTAT
\boxtimes	DIFFUSER	>>>>>	FLEX DUCT
\boxtimes	DIFFUSER WITH FLEX CONNECTION		LINEAR DIFFUSER WITH FLEX CONNECTION
<u></u>	GRILLE/REGISTER	<u> </u>	ROUND DUCT UP
<u> </u>	SIDEWALL GRILLE/ REGISTER/ DIFFUSER		ROUND DUCT DOWN
•	CONNECT TO EXISTING		REDUCER
Р	PULL DOWN STATION	\bigoplus	EXTENT OF DEMOLITION

DEMOLITION

- .. PROVIDE STAND ALONE OR APPLICATION SPECIFIC CONTROLLERS AS REQUIRED TO PERFORM THE
- - AND A 7-DAY PROGRAMMABLE THERMOSTAT.
 - SWITCH SHALL BE PART OF THE PROGRAMMABLE THERMOSTAT. OVERRIDE SWITCH ALLOWS THE UNIT TO OPERATE FOR TWO HOURS (ADJUSTABLE).
 - . OCCUPIED MODE: BASED ON THE ROOFTOP UNIT'S HOURS OF OCCUPANCY, START THE UNIT AT TE: OUTSIDE AIR DAMPER WITHIN THE RTU SHALL OPEN AND THEN THE RTU SHALL START). THE SENSOR, THE UNIT SHALL CYCLE THE HEATING/COOLING TO MAINTAIN THE SPACE TEMPERATURE
 - FROM MINIMUM OA CFM TO 100% BASED ON ENTHALPY READINGS.

 - i. UPON DETECTION OF SMOKE BY UNIT SMOKE DETECTOR THE RTU SHALL SHUT DOWN AND AN ALARM SHALL BE SENT TO THE RESPECTIVE LOCAL REMOTE ANNUNCIATORS.
- C. KITCHEN HOOD EXHAUST FAN (EF-1) THE KITCHEN HOOD EXHAUST FAN SHALL BE ENABLED WHEN ANY COOKING APPLIANCE

LOCATED UNDER THE HOOD IS IN USE.

- UPON ACTIVATION OF ANSUL SYSTEM, SHUT DOWN RTU-1 AND RTU-2. PROVIDE RELAYS CONTACTS. INTERLOCKS. TRANSFORMERS AND ALL ASSOCIATED WIRING TO ACCOMPLISH SEQUENCE. MECHANICAL CONTRACTOR SHALL INTERLOCK RTU-1 AND RTU-2 TO ALSO SHUT

1EC	HANICAL LEGEND		
X	SUPPLY DUCT UP		PIPING DOWN
X	SUPPLY DUCT DOWN	<u> </u>	PIPING UP
	RETURN DUCT UP		TURNING VANES
	RETURN DUCT DOWN		VOLUME DAMPER
	FIRE DAMPER	—c—	CONDENSATE DRAIN
	COMB. FIRE/SMOKE DAMPER	M	MOTORIZED DAMPER
	BACKDRAFT DAMPER		BACKDRAFT DAMPER
	SMOKE DETECTOR	A	REMOTE ANNUNCIATOR
	SPIN-IN WITH VOLUME DAMPER	T _S	REMOTE TEMP. SENSOR
_	45° RETURN DUCT TAP WITH VOL. DAMPER	T	THERMOSTAT
\boxtimes	DIFFUSER	>>>>	FLEX DUCT
	DIFFUSER WITH FLEX CONNECTION		LINEAR DIFFUSER WITH FLEX CONNECTION
<u></u>	GRILLE/REGISTER	<u> </u>	ROUND DUCT UP
	SIDEWALL GRILLE/ REGISTER/ DIFFUSER		ROUND DUCT DOWN
•	CONNECT TO EXISTING		REDUCER
Р	PULL DOWN STATION	\bigoplus	EXTENT OF DEMOLITION

NOT TO SCALE DUTSIDE AIR DUTSIDE DIAMETER PRESSURE DROP PRESSURE REDUCING VALVE RETURN AIR RELIEF AIR UPPLY AIR SENSIBLE COOLING CAPACITY STATIC PRESSURE TEMPERATURE CONTROL PANEL OTAL STATIC PRESSURE TYPICAL UNLESS NOTED OTHERWISE

DRAWING INDEX								
I- 0	MECHANICAL GENERAL INFORMATION							
\-1	MECHANICAL FLOOR PLAN							
1-2	MECHANICAL ROOF PLAN							
1-3	MECHANICAL SCHEDULES							
\-4	HOOD DETAILS & INFORMATION							
-5	MECHANICAL SPECIFICATIONS							
1-6	MECHANICAL SPECIFICATIONS							

GENERAL NOTES:

TO ENGINEER FOR REVIEW.

MAXIMUM LENGTH OF 5'-0".

ABBREVIATIONS

EXISTING

(RELOCATE)

BUILDING

BOD BOTTOM OF DUCT

AUTOMATIC AIR VENT

AIR PRESSURE DROP

BACKDRAFT DAMPER

BACKFLOW PREVENTER

BOTTOM OF STRUCTURE

NTFRING AIR TEMPFRATURE

EXTERNAL STATIC PRESSURE

ENTERING WATER TEMPERATURE

BOTTOM OF BEAM

BOTTOM OF PIPE

CENTER LINE

CLEAN OUT

DRY BULB

DIAMETER

EXHAUST AIR

FICIENCY

THYLENE GLYCOL

DOWN

DB

ABOVE FINISHED FLOOR

BUILDING AUTOMATIC SYSTEM

FUTURE

AMB AMBIENT

A. ALL WORK TO BE PERFORMED TO MEET ALL STATE, CITY & LOCAL CODE REQUIREMENTS.

REFLECTED CEILING PLAN. ALSO COORDINATE MOUNTING HEIGHTS OF FIXTURES.

C. ALL WALL PATCHING TO BE BY THE GENERAL CONTRACTOR.

HVAC CONTRACTOR WILL CHANGE IT AT HIS OWN EXPENSE.

NECESSARY FOR A COMPLETE & OPERATIONAL SYSTEM.

REQUIREMENTS BEFORE ORDERING ANY EQUIPMENT.

PROVIDE TURNING VANES AT ALL 90° CHANGE IN DIRECTION.

b. all ductwork to be constructed of Galvanized metal according to smacmna

. HVAC CONTRACTOR IS TO COORDINATE WITH OTHER TRADES BEFORE INSTALLING DUCTWORK. IF THE

HVAC CONTRACTOR FAILS TO COORDINATE WITH OTHER TRADES AND THE WORK MUST BE ALTERED THE

ONCE THE SYSTEM IS COMPLETE AND ALL CEILING TILES ARE INSTALLED THE SYSTEM FILTER SHALL BE

CHANGED AND THE AIR SIDE SHALL BE BALANCED. SUBMIT ELECTRONIC COPY OF BALANCE REPORT

COORDINATE THE EXACT LOCATION OF ALL GRILLES, REGISTERS & DIFFUSER WITH ARCHITECTURAL

HVAC CONTRACTOR IS TO VISIT THE SITE PRIOR TO SUBMITTING A BID & INCLUDE IN THE BID ANY ITEMS

DRAWINGS ARE SCHEMATIC IN NATURE & HVAC CONTRACTOR IS TO INCLUDE ANY ITEMS REQUIRED FOR A COMPLETE & OPERATIONAL SYSTEM WHETHER SHOWN OR NOT SHOWN ON THE DRAWINGS.

HVAC CONTRACTOR TO COORDINATE WITH ELECTRICAL CONTRACTOR CONCERNING ELECTRICAL

FLEXIBLE DUCTS SHALL BE WIREMOLD TYPE WGC, 1-1/2" INSULATION & RATED AT 10" W.C WITH A

INS PER INCH

INNER DIAMETER

MANUFACTURER

NOT APPLICABLE

IORMALLY CLOSED

JORMALLY OPEN

GENERAL TRADES CONTRACTOR

EAVING WATER TEMPERATURE

VARIABLE FREQUENCY DRIVE

WET BULB

WATER GAUGE

WPD WATER PRESSURE DROP

EAVING AIR TEMPERATURE

HVAC CONTRACTOR TO FURNISH ALL PERMITS REQUIRED FOR HIS PORTION OF THE WORK.

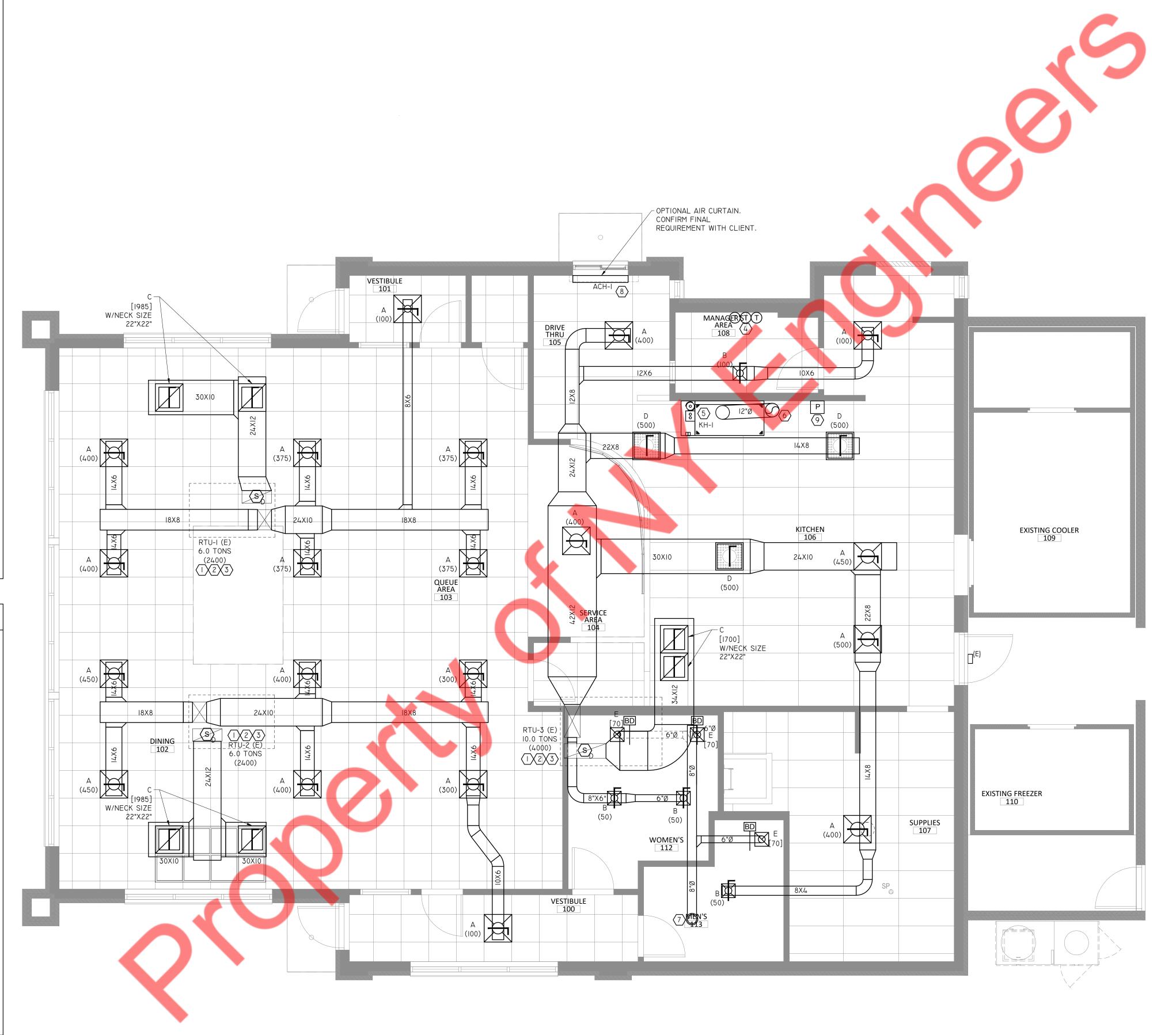
	Į:	SSUE
No.	DATE	DESCRIPTION
DWG	DATE:	09-18-2024
DRA	WN BY:	NYE
REVI	EWED BY:	
PRO	JECT No.:	
DWG	TITLE:	
I		

MECHANICAL GENERAL INFORMATION

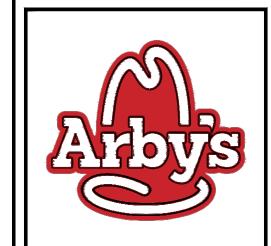
- A. COORDINATE ROOF PENETRATIONS WITH THE ROOFING CONTRACTOR (IF REQUIRED). PROVIDE AND PAY FOR ANY REQUIRED ROOFING BY ROOFING CONTRACTOR.
- B. REFER TO ARCHITECTURAL PLANS AND KITCHEN VENDOR DRAWINGS FOR DIMENSIONAL INFORMATION.
- c. A FINAL REPORT FOR THE TESTING AND ADJUSTING OF ALL NEW SYSTEMS SHALL BE COMPLETED PRIOR TO FINAL APPROVAL BY THE FIELD INSPECTOR. THIS REPORT SHALL BE SIGNED BY THE INDIVIDUAL RESPONSIBLE FOR PERFORMING THESE SERVICES.
- D. AN OPERATION & SYSTEMS MANUAL SHALL BE PROVIDED TO THE OWNER OR REPRESENTATIVE AND TO THE FIELD INSPECTOR AT THE TIME OF FINAL INSPECTION.
- E. AN AIR FILTER WITH A MINIMUM EFFICIENCY REPORTING VALUE (MERV) OF 8 OR HIGHER SHALL BE INSTALLED IN THE MECHANICAL SYSTEM FOR OUTSIDE AND RETURN AIR PRIOR TO OCCUPANCY.
- F. THE HVAC REFRIGERATION AND FIRE SUPPRESSION EQUIPMENT SHALL NOT CONTAIN CFC OR HALONS.
- G. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO THE BUILDING STRUCTURE OR BUILDING UTILITIES CAUSED AS RESULT OF THE CONTRACTOR'S WORK UNDER THIS CONTRACT. IT IS RECOMMENDED THAT MASONRY/CONCRETE FLOORS/WALLS BE X-RAYED PRIOR TO ANY PENETRATIONS.
- H. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING MECHANICAL EQUIPMENT THAT SERVING THIS AND NEARBY ADJACENT SPACES AND IS TO REMAIN. CONTRACTOR SHALL VERIFY THE PROPOSED LOCATIONS OF NEW MECHANICAL EQUIPMENT AND DETERMINE IF ANY CONFLICTS (CLEARANCES, ETC) EXIST BETWEEN EXISTING EQUIPMENT AND NEWLY INSTALLED EQUIPMENT CONTRACTOR SHALL NOTIFY THE ENGINEER IF EQUIPMENT EQUIPMENT CANNOT BE SUBSTANTIALLY INSTALLED AND LOCATED AS INDICATED BY THESE DRAWINGS.
- I. CONTRACTOR SHALL BALANCE EACH DEVICE WITH THE CFM SHOWN ON PLAN.
- J. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
- K. TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO G.C AND OWNER.
- L. NEW DUCTWORK IN CONCEALED AREAS MAY BE RECTANGULAR WITH EQUIVALENT CROSS SECTIONAL FLOW AREA.
- M. PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR FIRE RATINGS OF THE WALLS COORDINATE WITH ELECTRICAL ENGINEER FOR POWER REQUIREMENT FOR FSD.
- N. PROVIDE CHORD OPERATED DAMPERS IN INACCESSIBLE CEILING.
- o. PROVIDE WEATHER PROOF COATING FOR ALL EXTERIOR PIPING INSULATION.
- P. ALL EQUIPMENT SHALL MAINTAIN MINIMUM CLEARANCE FROM THE COMBUSTIBLE MATERIAL AS PER MANUFACTURE RECOMMENDATION.
- Q. PROVIDE 2 LAYERS OF 1.5" THICK FIRE WRAP TO KITCHEN EXHAUST DUCTS AS PER MANUFACTURERS RECOMMENDATIONS
- R. GREASE DUCTS SERVING TYPE I HOODS SHALL BE CONSTRUCTED OF STEEL HAVING A MINIMUM THICKNESS OF 0.0575 INCH (I.463 MM) (NO.16 GAUGE) OR STAINLESS STEEL NOT LESS THAN 0.0450 INCH(I.14 MM) (NO. 18 GAUGE) IN THICKNESS. OR IT SHALL BE UL 1978 LISTING IF FACTORY PROVIDED.

KEYED NOTES:

- I. APPROXIMATE LOCATION OF EXISTING DUCTWORKS DROP FOR RTU-I(E), RTU-2(E) & RTU-3(E). CONTRACTOR TO VERIFY THE EXACT SIZE AND LOCATION IN FIELD.
- 2. EXTEND FULL SIZE SUPPLY & RETURN DUCTWORK FROM AC UNITS TO SPACE. EXTEND AS SHOWN. ACOUSTICALLY LINE THE FIRST 10'-0" OF BOTH SUPPLY AND RETURN MAIN DUCTS.
- 3. PROVIDE REMOTE TEMP SENSOR MOUNTED IN RETURN DUCT AND WIRE BACK TO T-STAT.
- 4. RELOCATE AND REUSE EXISTING THERMOSTAT, IF EXISTING THERMOSTAT IS NOT IN CONDITION TO REUSE THEN INSTALL NEW THERMOSTAT WITH LOCKABLE VENTED BOX TO BE MOUNTED AT 48" CENTER LINE A.F.F. COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
- 5. EXHAUST FOR FRYER. HOOD IS REQUIRED AT THE KITCHEN AND. RUN SHEET METAL DUCT FROM CONNECTION ON HOOD TO RESPECTIVE EXHAUST FAN. OFFSET AND TRANSITION AT CONNECTIONS AS NEEDED. VERIFY DIMENSIONS PRIOR TO FABRICATION OR INSTALLATION. USE FACTORY-MANUFACTURED PIPE AND FITTINGS ONLY. VERIFY LOCATION ON SITE WITH MOST RECENT KITCHEN PLANS
- 6. DIA 12" GREASE DUCT EXHAUST TERMINATION: TERMINATE GREASE DUCT EXHAUST AIR DUCT UP THRU ROOF IN ACCORDANCE WITH LOCAL CODE. TERMINATE OUTLET A MINIMUM 10 FT. FROM PROPERTY LINES AND OPERABLE OPENINGS INTO THE BUILDING AND 10 FT.AWAY FROM MECHANICAL AIR INTAKES.
- 7. DIA 8" TOILET EXHAUST DUCT TERMINATION: TERMINATE TOILET EXHAUST AIR DUCT UP THRU ROOF IN ACCORDANCE WITH LOCAL CODE. TERMINATE OUTLET A MINIMUM IO FT. FROM PROPERTY LINES AND OPERABLE OPENINGS INTO THE BUILDING AND IO FT.AWAY FROM MECHANICAL AIR INTAKES.
- 8. OPTIONAL AIR CURTAIN. COORDINATE FINAL REQUIREMENT WITH ARCHITECT/ OWNER. INSTALL AS PER MANUFACTURER RECOMMENDATION.
- 9. FIRE SUPPRESSION PULL STATION: PROVIDE AND INSTALL ANSUL R-102 PULL STATION FOR MANUAL ACTIVATION OF HOOD FIRE SUPPRESSION SYSTEM. LOCATE IN READILY ACCESSIBLE LOCATION IN PATH OF



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



		ISSUE
No.	DATE	DESCRIPTION
DWG	DATE:	09-18-2024
DRAV	WN BY:	NYE
REVI	EWED BY:	
PRO	JECT No.:	
DWG	TITLE:	

SHEET No.

MECHANICAL

FLOOR PLAN

M-I

KEYED NOTES:

- I. EXISTING RTU-I(E), RTU-2(E) & RTU-3(E) WITH ALL ITS ACCESSORIES TO REMAIN AND TO BE REUSED. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION ON SITE.
- 2. CONTRACTOR TO CLEAN REPAIR AND REUSED EXISTING CONDENSATE DRAIN LINE. CONTRACTOR TO REPAIR AND REPLACE WITH SIMILAR MATERIAL IF FOUND DAMAGE.
- 3. RUN SHEET METAL DUCT FROM CONNECTION ON HOOD TO RESPECTIVE EXHAUST FAN. OFFSET AND TRANSITION AT CONNECTIONS AS NEEDED. VERIFY DIMENSIONS PRIOR TO FABRICATION OR INSTALLATION. USE FACTORY-MANUFACTURED PIPE AND FITTINGS ONLY. VERIFY LOCATION ON SITE WITH MOST RECENT KITCHEN PLANS.
- 4. PROVIDE EXHAUST FAN IN LOCATION AS SHOW PLANS. CONNECT 12" EXHAUST DUCT FROM EXHAUST HOOD UP TO EF-I ON ROOF. COORDINATE EXHAUST ROUTING WITH STRUCTURAL TRUSS LAYOUT. MAINTAIN MINIMUM 10' DISTANCE FROM MECHANICAL AIR INTAKE.
- 5. COORDINATE FINAL LOCATION OF EQUIPMENT WITH STRUCTURAL DRAWINGS.
- 6. PROVIDE EXHAUST FAN IN LOCATION AS SHOWN ON PLANS. CONNECT 8" EXHAUST DUCT FROM RESTROOM GRILLE UP TO EF-2 ON ROOF. COORDINATE EXHAUST ROUTING WITH STRUCTURAL TRUSS LAYOUT. MAINTAIN MINIMUM 10' DISTANCE FROM MECHANICAL AIR INTAKE.

GENERAL NOTES:

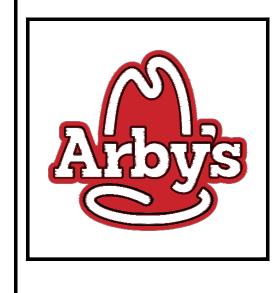
RTU-I (E) 6.0 TONS WT.: S.A.E.

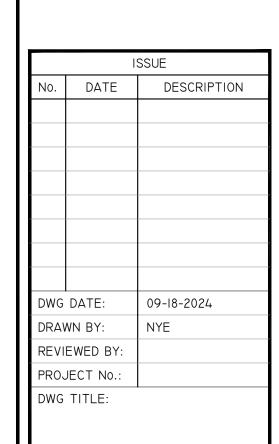
> RTU-2 (E) 6.0 TONS WT.: s.a.e.

- A. COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL ENGINEERS. PROVIDE NEW OPENING IF REQUIRED AND CLOSE USED OPENINGS.
- B. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL
 BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR
 DRAWINGS AND SITE BEFORE FABRICATION OF DUCTWORK, PIPING
- C. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS
 FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO
- INSTALLATION.
 D. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND
- SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.

 E. TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO G.C AND
- OWNER.

 F. COORDINATE ALL EQUIPMENT WITH STRUCTURAL.
- G. MAINTAIN ALL CODE AND MANUFACTURERS RECOMMENDED CLEARANCE AROUND ALL ROOF EQUIPMENT.





MECHANICAL ROOF PLAN

CUEET N

M-2

MECHANICAL ROOF PLAN

RTU-3 (E) 10.0 TONS WT : \$.A.E.

ROOF TOP UNIT SCHEDULE NOMINAL TOTAL OUTSIDE EXTERNAL STATIC INPUT OUTPUT TOTAL SENSIBLE AMBIENT ENTERING UNITID MANUFACTURER **EFFICIENCY** SERVED STAGES | VOLTS | PHASE | MCA(A) | MOCP(A) | CFM | AIR CFM | PRESSURE(IN. W.G.) MBH | MBH | MBH | DB (°F) | DB / WB(°F) | RTU-1 (E) STANDARD 48FCEM07A2A5 (V.I.F) S.A.E S.A.E 95 80/67 | S.A.E | 208 (V.I.F) | 3 (V.I.F) | 28 (V.I.F) | 45 (V.I.F) | S.A.E | S.A.E | S.A.E | S.A.E S.A.E | S.A.E | S.A.E | S.A.E | 95 | 80/67 | S.A.E | 208 (V.I.F) | 37 (V.I.F) | 50 (V.I.F) | S.A.E | S.A.E | S.A.E RTU-2 (E) S.A.E STANDARD 48TCEM07A2A5 (V.I.F) SEE PLAN 2400 S.A.E | S.A.E | S.A.E | S.A.E | 95 | 80/67 | S.A.E | 208 (V.I.F) | 3 (V.I.F) | 53 (V.I.F) | 60 (V.I.F) | S.A.E | S.A.E | S.A.E | S.A.E | S.A.E 4000 RTU-3 (E) S.A.E STANDARD 48TCED12A2A5 (V.I.F) SEE PLAN

NOTES / ACCESSORIES -

1 EXISTING RTUS WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.

2 S.A.E.: SAME AS EXISTING, V.I.F.: VERIFY IN FIELD

3 CONTRACTOR TO FIELD VERIFY ALL RTUS ARE WORKING AT THEIR 100% RATED CAPACITY. INFORM TO DESIGN ENGINEER IF ANY DISCREPANCIES ARE FOUND IN PERFORMANCE PRIOR TO CONSTRUCTION.

4 CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF UNIT ON SITE.

5 IF REQUIRED, PROVIDE NEW THERMOSTAT AND TEMPRETURE SENSOR COMPATIBLE WITH EXISTING RTU. CO-ORDINATE FINAL LOCATION OF T-SENSOR WITH ARCHITECT/OWNER.

6 CONTRACTOR TO BALANCE OUTSIDE AIR & RETURN AIR DAMPER ON EXISTING RTU TO MATCH VALUES MENTIONED IN ABOVE TABLES. 7 REPLACE FILTERS, IF REQUIRED.

8 CONTRACTOR SHALL VERIFY EXACT ELECTRICAL CONNECTIONS, WIRE SIZES, BREAKER, DISCONNECT ETC. PRIOR TO ORDERING AND BID.

			GRILLES, REGISTERS, A	AND DIFFUSER	RS SCHEDULE			
BASED ON METAL-AIRE/GRAINGER U.N.O.								
TAG	FUNCTION	MODEL	FACE SIZE	FRAME TYPE	MATERIAL	FINISH	BALANCE DAMPER	MAX N.C.
Α	SUPPLY	EP5700/STR-C	24" x 24"	LAY-IN	POLYMER	WHITE	-	25
В	SUPPLY	EP5700/STR-C	12" x 12"	LAY-IN	POLYMER	WHITE	-	25
С	RETURN	EPRHF/SSTR-ERFG-W-FR	24" x 24"	LAY-IN	POLYMER	BEIGE	-	25
D	SUPPLY	EP5750/STR-PERF	24" x 24"	LAY-IN	POLYMER	WHITE	-	25
ROUND NECK SIZES SCHEDULE: SQUARE NECK SIZE SCHEDULE:								
					Up To 100 Cfm - 6" [NΑ	6"X6" : 0 - 115 CFM	
					101 To 225 Cfm - 8"	DIA	8"X8" : 116 - 220 CFM	
					226 To 350 Cfm - 10	" DIA	10"X10" : 221 - 350 CFM	
					351 To 600 Cfm - 12	" DIA	12"X12" : 351 - 520 CFM	
					601 To 900 Cfm - 14	" DIA	14"X14" : 521 - 730 CFM	
							16"X16" : 731 - 840 CFM	
							18"X18" : 840 - 1035 CFM	
							20"X20" : 1036 - 1285 CFM	<u></u>
							22"X22" : 1286 - 1570 CFM	<u></u>

THIS EQUIPMENT HAS BEEN SELECTED AND APPROVED BY CAPTIVEARE. ALL INFORMATION PERTINENT TO THESE UNITS SHALL BE THE SOLE RESPONSIBILITY OF CAPTIVEAIRE. BASED ON CAPTIVEA											
UNIT DATA						LIGHTS MISC.					
TAG	MODEL	HOOD LENGTH	MAX. COOKING TEMP.	TOTAL EXHAUST CFM	RISER (DIA)	S.P. (IN" W.G.)	QTY.	TYPE	FIRE SUPP. SYSTEM	HANGING WEIGHT (LBS.)	COMMENTS
KH-1	3044-BD-2	5'-0"	450°F	1200	12"	-0.45	1	INCAND.	YES	280	

	FAN SCHEDULE															
LINITID	MANUFACTURER	ADEA CEDVED	MODEL	CEM	TVDE	DRIVE	VE FAN DDA4	E.S.P.		МС	OTOR		CEDVICE	INTERLOCKED WITH	WEICHT (LDC)	NOTES / ACCESSORIES
UNIT ID	IVIANUFACTURER	AREA SERVED	MODEL	CFM	TYPE	DRIVE	FAN RPM	(IN. W.G.)	FLA (A)	HP	VOLTS	PHASE	SERVICE	INTERLOCKED WITH	WEIGHT (LBS)	NOTES / ACCESSORIES
EF-1 (N)	CAPTIVE-AIRE	KH-1 HOOD EXHAUST	DU50HFA	1200	ROOF MOUNTED UP BLAST	DIRECT	1320	0.75	8.4	1/4	115	1	FRYER	KH-1	100	1,2
EF-2 (N)	GREENHECK	RESTROOM	G-095-D	210	ROOF MOUNTED DOWN BLAST	DIRECT	1550	0.7	-	1/8	115	1	TOILET	RTU-3 (E)	70	1,2

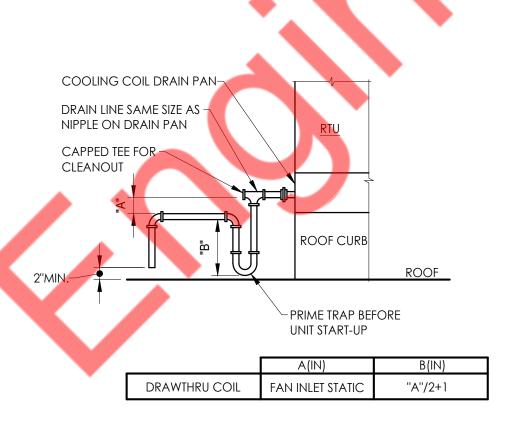
NOTES: 1. FACTORY PROVIDED DISCONNECT SWITCH 2. REUSE THE EXISTING ROOF CURB AND MODIFY IT IF REQUIRED.

						VENTILA	TION CALCULATION	NC						
ROOM NAME	AREA (SQ.FT.)	NUMBER OF PEOPLE/1000sq.ft	NUMBER OF PEOPLE	NUMBER	FINAL PEOPLE	MIN OUTSIDE A	AIR AS PER IMC 2021	REQ. OA	Provided OA After	Provided OA (CFM)	EXHAUST AIRFLOW RATI	NO OF FIXTURES	TOTAL EXHAUST	PROVIDED
ROOM NAME	AREA (SQ.FT.)	AS PER IMC 2021	AS PER IMC 2021	OF CHAIR	NO.	CFM/PEOPLE	CFM/SQ.FT	(CFM)	Effectiveness 0.8	Provided OA (CFIVI)	(CFM/SQ.FT OR /FIXT.)	INO OF FIXTURES	CFM	EXHAUST (CFM)
RTU-1 (E)														
DINING	680	70	48	26	26	7.5	0.18	317	320		0	0	0	0
VESTIBULE 01	41	0	0	0	0	0	0.06	2	5	415	0	0	0	0
ROOM 01	20	5	1	0	0	5	0.06	1	5		0	0	0	0
	741			26	26			321	330	415			0	0
RTU-2 (E)														
DINING	680	70	48	26	26	7.5	0.18	317	320	415	0	0	0	0
VESTIBULE 02	101	0	0	0	0	0	0.06	6	10	415	0	0	0	0
	781			26	26			323	330	415			0	0
RTU-3 (E)									- L					
SERVICE AREA	113	20	3	3	3	7.5	0.12	36	40		0	0	0	0
HALLWAY	36	0	0	0	0	0	0.06	2	5		0	0	0	0
KITCHEN	689	20	14	14	14	7.5	0.12	188	190		0.7	0	482.3	1200
SUPPLIES/EQUIP	248	0	0	0	0	0	0.12	30	30	700	0.7	0	0	0
MANAGERS AREA	60	5	1	1	1	5	0.06	9	10		0	0	0	0
WOMENS	122	0	0	0	0	0	0	0	0		70	2	140	140
MENS	86	0	0	0	0	0	0	0	0		70	1	70	70
	1146			18	18			264.26	275	700			482.3	1410

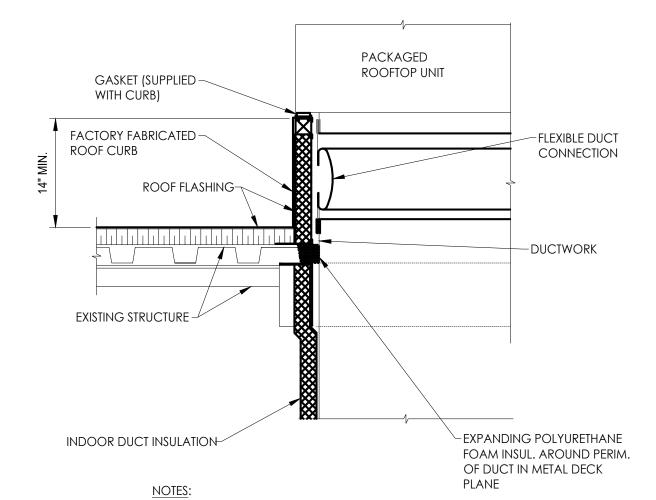
	AIR BALANCE							
UNIT	AREA SERVED	SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	RETURN AIR (CFM)	EXHAUST AIR(C	FM)		
RTU-1 (E)	SEE PLAN	2400	415	1985	0			
RTU-2 (E)	SEE PLAN	2400	415	1985	0			
RTU-3 (E)	SEE PLAN	4000	700	3300	0			
EF-1 (N)	SEE PLAN	0	0	0	1200			
EF-2 (N)	SEE PLAN	0	0	0	210			
TOTAL:		8800	1530	7270	1410			
BUIL	DING PRESSUR	E:	120	POS	SITIVE			

1. CONTRACTOR TO ADJUST MOTORIZED DAMPER ON FRESH AIR TAP TO PROVIDE OUTSIDE AIR AS MENTIONED IN ABOVE TABLE.

	AIR CURTAIN SCHEDULE							
MANUFACTURER UNIT ID MODEL LENGTH (IN.) CFM QUANTITY ELECTRIC HEAT (KW) V/PH/HZ AMPS (A)								
MARS ACH-1 LPV248-1UA-OB 48 1200 1 - 115/1/60 2.4								
NOTES / ACCESSORIE	ES:							
1. COORDINATE WIT	H ARCHITEC	T/OWNER FOR FINA	AL REQUIRE	MENT.				
2. PROVIDE MANUFACTURER RECOMMENDED ACCESSORIES.								
3. COORDINATE WIT	H ELECTRICA	AL CONTRACTOR FO	R POWER R	EQUIREMEN	IT.			



1 RTU CONDENSATE DRAIN DETAIL



GENERAL EXHAUST FAN DETAIL

1. IN-FILL BETWEEN EQUIPMENT CURB AND DUCTWORK, ALL SIDES WITH BATT. INSULATION (TYP.).

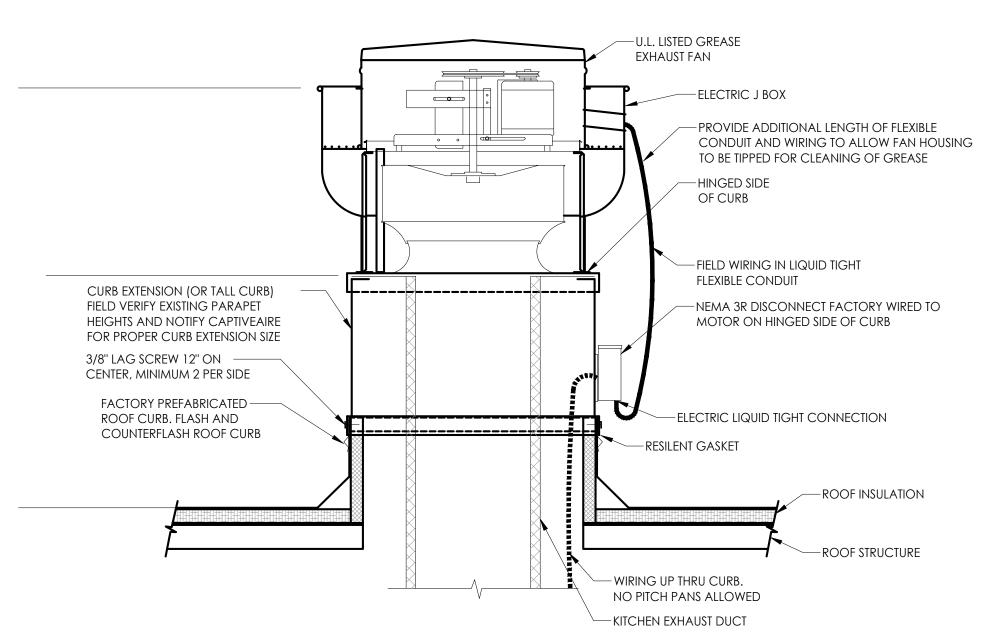
BACKDRAFT DAMPER IN -

SHEET METAL SLEEVE

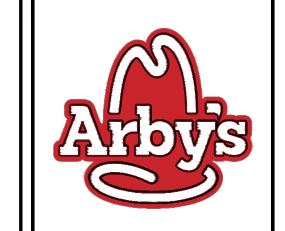
ROOF INSULATION -

HROUGH ROOF





- 1. INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA 96 REQUIREMENTS. 2. CUT AND PATCH EXISTING ROOFING AS REQUIRED FOR NEW CURB INSTALLATION.
- 3. CURB SHALL BE TAPERED TYPE AND MATCH THE PITCH OF THE ROOF. 4. CONTRACTOR TO PROVIDE TREATED WOOD BLOCKINGS AND SHIM FLAT ROOF CURB TILL LEVEL FOR ALL EXHAUST FANS
- AND TO ACHIEVE ROOF CURB HEIGHTS, PROVIDE ROOF CURB EXTENSION IF REQUIRED. GREASE EXHAUST FAN DETAIL



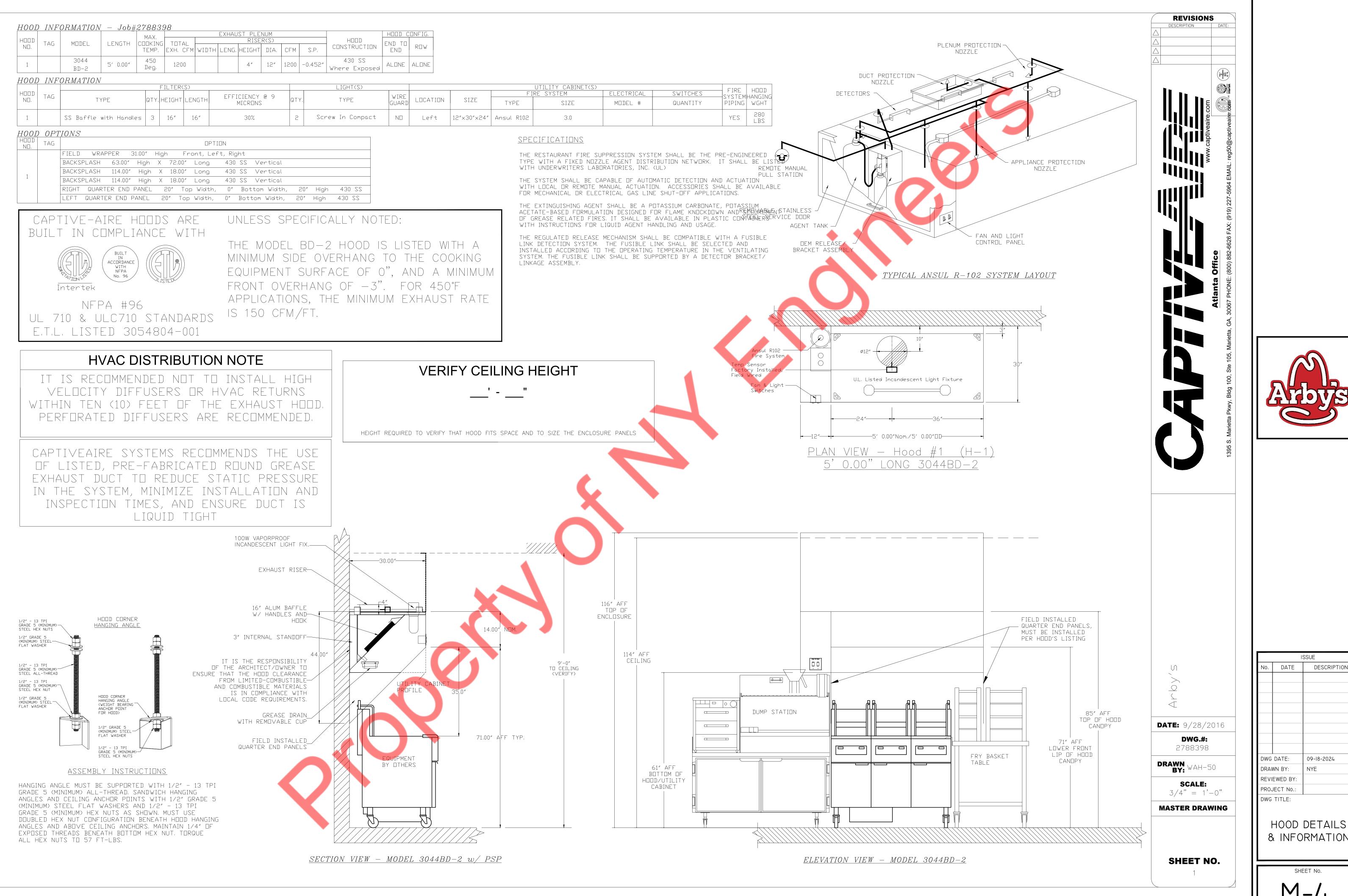
-FACTORY PROVIDED

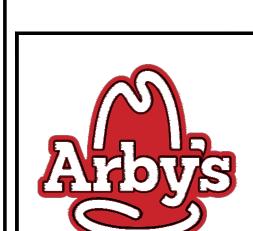
ROOF CURB

	1:	SSUE
No.	DATE	DESCRIPTION
DWG	DATE:	09-18-2024
DRAV	WN BY:	NYE
REVI	EWED BY:	
PRO	JECT No.:	
DWG	TITLE:	

MECHANICAL

SCHEDULE





ISSUE DATE DESCRIPTION DWG DATE: 09-18-2024 DRAWN BY: REVIEWED BY: PROJECT No.: DWG TITLE:

& INFORMATION

SPECIFICATIONS - DIVISION 23 - HVAC

GENERAL MECHANICAL REQUIREMENTS:

HVAC SUBCONTRACTOR SHALL PROVIDE AT BID TIME A BID TO PROVIDE PREVENTATIVE MAINTENANCE SERVICES FOR ONE YEAR.

FURNISH TO THE OWNER ALL OPERATING & MAINTENANCE MANUALS, RECORD DRAWINGS, TEST & BALANCE REPORT. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER REPRESENTATIVES FOR EMPLOYEE TRAINING REQUIREMENTS FOR ALL EQUIPMENT.

MECHANICAL CONTRACTOR SHALL SUBMIT COMPLIANCE CHECKLIST TO BUILDING OFFICIAL UPON SUBSTANTIAL COMPLETION OF PROJECT.

PROVIDE EQUIPMENT INDICATED ON THE DRAWINGS, AND AS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM.

FURNISH MEANS TO SUPPLY AND DELIVER TO PROJECT SITE, READY FOR INSTALLATION.

INSTALL MEANS TO PLACE IN POSITION AND MAKE CONNECTIONS FOR SERVICE OR USE

PROVIDE MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE.

PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF THE COMPLETED PROJECT. PROVIDE A SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE, AT THE OWNER'S OPTION. CONTRACTOR SHALL INCLUDE ONE YEAR WARRANTY ON OWNER FURNISHED EQUIPMENT. CONTRACTOR SHALL INCLUDE COSTS FOR RECEIVING, HANDLING, STORAGE, AND HOISTING OF OWNER FURNISHED EQUIPMENT.

PROVIDE OPERATION MANUALS, MAINTENANCE MANUALS AND SCHEMATICS FOR ALL MECHANICAL EQUIPMENT INSTALLED.

COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE.

DUCT DIMENSIONS: UNLESS OTHERWISE NOTED, DUCT DIMENSIONS ON THE DRAWINGS ARE INSIDE CLEAR DIMENSIONS.

TEMPERATURE CONTROLS:

PROVIDE PROGRAMMABLE THERMOSTATS WITH REMOTE TEMPERATURE SENSORS AND REMOTE HUMIDISTATS COMPATIBLE WITH ROOFTOP UNIT. CONTROL WIRING SHALL BE INSTALLED IN CONDUIT. THERMOSTAT SHALL MEET SETPOINT ADJUSTMENT FOR UNOCCUPIED MODE: HEATING DOWN TO 55 DEGREES AND COOLING UP TO 85 DEGREES. PROVIDE INTERLOCK CONTROL WIRING BETWEEN HOOD EXHAUST FANS AND ROOFTOP UNITS.

END OF SECTION

SECTION 230700 - HVAC INSULATION

PART 1 - PRODUCTS

1.1 PERFORMANCE REQUIREMENTS

A. SURFACE-BURNING CHARACTERISTICS:

WITH ASTM C 1136, TYPE I.

ADHESIVE; COMPLYING WITH ASTM C 1136.

1. INDOOR INSULATION AND RELATED MATERIALS: TO BE FACTORY LABELED DESIGNATING MAXIMUM FLAME-SPREAD INDEX OF 25 OR LESS, AND SMOKE-DEVELOPED INDEX OF 50 OR LESS ACCORDING TO ASTM E 84.

1.2 INSULATION MATERIALS

- A. FLEXIBLE ELASTOMERIC: CLOSED-CELL, SPONGE- OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534, TYPE I FOR TUBULAR MATERIALS AND TYPE II FOR SHEET MATERIALS.
- B. MINERAL-FIBER BLANKET INSULATION: COMPLY WITH ASTM C 553, TYPE II AND ASTM C 1290, TYPE I.
- 1. FSK JACKET: ALUMINUM-FOIL, FIBERGLASS-REINFORCED SCRIM WITH KRAFT-PAPER BACKING; COMPLYING
- WITH ASTM C 1136, TYPE II. 2. FSK TAPE: FOIL-FACE, VAPOR-RETARDER TAPE MATCHING FACTORY-APPLIED JACKET WITH ACRYLIC
- C. MINERAL-FIBER, PIPE AND TANK INSULATION: COMPLYING WITH ASTM C 1393, TYPE II OR TYPE IIIA 1.2 DUCTS CATEGORY 2, OR WITH PROPERTIES SIMILAR TO ASTM C 612, TYPE IB; AND HAVING FACTORY-APPLIED ASJ
- JACKET. NOMINAL DENSITY IS 2.5 LB/CU. FT. OR MORE. THERMAL CONDUCTIVITY (K-VALUE) AT 100 DEG F IS 0.29 BTU X IN./H X SQ. FT. X DEG F OR LESS.
- 2. ASJ TAPE: WHITE VAPOR-RETARDER TAPE MATCHING FACTORY-APPLIED JACKET WITH ACRYLIC ADHESIVE, COMPLYING WITH ASTM C 1136.
- D. FLEXIBLE ELASTOMERIC ADHESIVE: COMPLY WITH MIL-A-24179A, TYPE II, CLASS I.
- E. MINERAL-FIBER ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2, GRADE A.
- F. VAPOR-BARRIER MASTIC: WATER BASED; SUITABLE FOR INDOOR AND OUTDOOR USE ON BELOW AMBIENT SERVICES; COMPLY WITH MIL-PRF-19565C, TYPE II.

2.1 INSULATION INSTALLATION

- A. COMPLY WITH REQUIREMENTS OF THE MIDWEST INSULATION CONTRACTORS ASSOCIATION'S "NATIONAL COMMERCIAL & INDUSTRIAL INSULATION STANDARDS" FOR INSULATION INSTALLATION ON PIPES AND FQUIPMENT
- B. INSULATION INSTALLATION AT INTERIOR WALL AND PARTITION PENETRATIONS (THAT ARE NOT FIRE RATED): INSTALL INSULATION CONTINUOUSLY THROUGH WALLS AND PARTITIONS.
- C. INSULATION INSTALLATION AT FIRE-RATED WALL, PARTITION, AND FLOOR PENETRATIONS: INSTALL INSULATION CONTINUOUSLY THROUGH PENETRATIONS. SEAL PENETRATIONS. COMPLY WITH REQUIREMENTS IN SECTION 078400.

D. FLEXIBLE ELASTOMERIC INSULATION INSTALLATION:

- 1. SEAL LONGITUDINAL SEAMS AND END JOINTS WITH ADHESIVE TO ELIMINATE OPENINGS IN INSULATION THAT ALLOW PASSAGE OF AIR TO SURFACE BEING INSULATED.
- 2. INSULATION INSTALLATION ON PIPE FITTINGS AND ELBOWS: INSTALL MITERED SECTIONS OF PIPE INSULATION. SECURE INSULATION MATERIALS AND SEAL SEAMS WITH ADHESIVE TO ELIMINATE OPENINGS IN INSULATION THAT ALLOW PASSAGE OF AIR TO SURFACE BEING INSULATED.

E. MINERAL-FIBER INSULATION INSTALLATION:

- 1. INSULATION INSTALLATION ON STRAIGHT PIPES AND TUBES: WHERE VAPOR BARRIERS ARE INDICATED, SEAL LONGITUDINAL SEAMS, END JOINTS, AND PROTRUSIONS WITH VAPOR-BARRIER MASTIC AND JOINT
- 2. FOR INSULATION WITH FACTORY-APPLIED JACKETS ON ABOVE AMBIENT SURFACES, SECURE LAPS WITH OUTWARD CLINCHED STAPLES AT 6 INCHES O.C.
- 3. FOR INSULATION WITH FACTORY-APPLIED JACKETS ON BELOW AMBIENT SURFACES, DO NOT STAPLE LONGITUDINAL TABS BUT SECURE TABS WITH ADDITIONAL ADHESIVE AS RECOMMENDED BY INSULATION MATERIAL MANUFACTURER AND SEAL WITH VAPOR-BARRIER MASTIC AND FLASHING SEALANT.
- 4. BLANKET INSULATION INSTALLATION ON DUCTS AND PLENUMS: SECURE WITH ADHESIVE AND INSULATION
- 5. FOR DUCTS AND PLENUMS WITH SURFACE TEMPERATURES BELOW AMBIENT, INSTALL A CONTINUOL UNBROKEN VAPOR BARRIER.
- F. PLENUMS AND DUCTS REQUIRING INSULATION:
- CONCEALED SUPPLY AIR.
- 2. CONCEALED AND EXPOSED OUTDOOR AIR.
- 3. CONCEALED AND EXPOSED RETURN AIR LOCATED IN NONCONDITIONED SPACE.

2.2 DUCT AND PLENUM INSULATION SCHEDULE

RETAIN "ONE OF" OPTION IN PARAGRAPHS IN THIS ARTICLE TO ALLOW CONTRACTOR TO SELECT PIPING MATERIALS FROM THOSE RETAINED.

- A. CONCEALED DUCT INSULATION SHALL BE 1-1/2" THICK MINERAL-FIBER BLANKET WITH A 1.5-LB/CU. FT. NOMINAL
- 2.3 HVAC PIPING INSULATION SCHEDULE
- A. CONDENSATE PIPING: INSULATION SHALL BE 1" THICK FLEXIBLE ELASTOMERIC
- B. REFRIGERANT PIPING: INSULATION SHALL BE 1" THICK FLEXIBLE ELASTOMERIC

END OF SECTION 230700

SECTION 232300 - REFRIGERANT PIPING

PART 1 - PRODUCTS

- 1.1 TUBES AND FITTINGS
- A. COPPER TUBE: ASTM B 88, TYPE K OR TYPE L, ANNEALED OR DRAWN-TEMPER TUBING AND WROUGHT-COPPER FITTINGS WITH BRAZED OR SOLDERED JOINTS.
- B. WROUGHT-COPPER FITTINGS AND UNIONS: ASME B16.22.
- C. SOLDER FILLER METALS: ASTM B 32. USE 95-5 TIN ANTIMONY OR ALLOY HB SOLDER TO JOIN COPPER SOCKET FITTINGS ON COPPER PIPE.
- D. BRAZING FILLER METALS: AWS A5.8.
- VALVES AND SPECIALTIES
- AS REQUIRED BY THE KITCHEN EQUIPMENT MANUFACTURER.

2.1 INSTALLATION

- A. INSTALL REFRIGERANT PIPING AND CHARGE WITH REFRIGERANT ACCORDING TO ASHRAE 15.
- B. INSTALL REFRIGERANT PIPING AS REQUIRED BY THE KITCHEN EQUIPMENT MANUFACTURER.

END OF SECTION 232300

SECTION 233100 - HVAC DUCTS AND CASINGS

PART 1 - PRODUCTS

- 1.1 PERFORMANCE REQUIREMENTS
- A. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE."
- B. STRUCTURAL PERFORMANCE: DUCT HANGERS AND SUPPORTS SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS DESCRIBED IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE".
- C. COMPLY WITH NFPA 96 FOR DUCTS CONNECTED TO COMMERCIAL KITCHEN HOODS.

- A. GALVANIZED-STEEL SHEET: ASTM A 653/A 653M, AND A 924 WITH G90 HOT-DIP GALVANIZED COATING. 1. GALVANIZED COATING DESIGNATION: G90.
- 1. ASJ: WHITE, KRAFT-PAPER, FIBERGLASS-REINFORCED SCRIM WITH ALUMINUM-FOIL BACKING; COMPLYING B. TYPE 1 KITCHEN EXHAUST DUCTWORK

1. FIELD FABRICATED RECTANGULAR KITCHEN GREASE DUCT:

- a. MINIMUM 16 GAUGE CARBON STEEL WHERE CONCEALED, AND OF MINIMUM 16 GAUGE STAINLESS STEEL WHERE EXPOSED. JOINTS AND SEAMS SHALL BE CONTINUOUSLY WELDED LIQUID TIGHT ON THE EXTERNAL SIDE OF THE DUCT SYSTEM.
- b. PROVIDE GREASE RESERVOIR AS REQUIRED BY THE REQUIREMENTS OF IMC 506.3.7.1 AND PROVIDE DUCT CLEANOUT(S) AS REQUIRED BY THE REQUIREMENTS OF IMC 506.8.3.
- C. COMPOSITE GREASE DUCT ENCLOSURE ASSEMBLIES: PROVIDE FLEXIBLE BLANKET-TYPE INSULATION COMPOSED OF FIBER BLANKET ENCAPSULATED IN AN ALUMINUM FOIL SCRIM, PROVIDING A NONCOMBUSTIBLE WRAP TO PROVIDE A VAPOR AND DUST BARRIER. DUCT WRAP SYSTEM SHALL HAVE FLAME SPREAD INDEX OF NOT MORE THAN 5 AND SMOKE DEVELOPED INDEX NOT EXCEEDING 5, WHEN TESTED PER ASTM E-84 METHOD. INSULATION AND JACKET SHALL BE RATED FOR OPERATING TEMPERATURES UP TO 2000°F. DUCT WRAP SYSTEM MUST COMPLY WITH ALL FIVE FIRE TESTS OF STANDARD ASTM E2336, GREASE DUCT ENCLOSURE SYSTEM, AND THE DUCT FIRESTOP SYSTEM SHALL BE ASTM E814 CLASSIFIED. FABRICATE DUCT WRAP ENCLOSURE WITH (2) LAYERS OF DUCT WRAP TO PROVIDE 2-HOUR FIRE RATING. PROVIDE COMPOSITE GREASE DUCT FIRE PROTECTION INSULATION FROM ONE OF THE FOLLOWING: THERMAL CERAMICS FIREMASTER FASTWRAP XL, UNIFRAX FYREWRAP 2.0 MAX.
- C. JOINT AND SEAM TAPE, AND SEALANT: COMPLY WITH UL 181A. PROVIDE POLYMERIC RUBBER TYPE SEALANT FOR USE ON BOTH INTERIOR LOCATED DUCTWORK AND DUCTWORK EXPOSED TO OUTDOOR CONDITIONS. SEALER SHALL HAVE HIGH BONDING STRENGTH FOR SURE, FIRST TIME SEALING OF JOINTS IN LOW, MEDIUM, AND HIGH PRESSURE DUCT SYSTEMS. SEALER SHALL BE HIGH IN SOLID CONTENT. PROVIDE A TWO PART TAPE SEALING SYSTEM, CONSISTING OF WOVEN FIBER TAPE IMPREGNATED WITH A GYPSUM MINERAL COMPOUND, AND A MODIFIED ACRYLIC/SILICONE ACTIVATOR THAT REACTS EXOTHERMICALLY WITH THE TAPE. TWO PART TAPE SEALING SYSTEM MUST BE RATED FOR BOTH INDOOR AND OUTDOOR APPLICATION. TAPE SHALL NOT CONTAIN ASBESTOS.
- D. METAL DUCT FABRICATION: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE."

1.3 ACCESSORIES

- A. VOLUME DAMPERS AND CONTROL DAMPERS: SINGLE-BLADE AND MULTIPLE OPPOSED-BLADE DAMPERS, STANDARD LEAKAGE RATING, AND SUITABLE FOR HORIZONTAL OR VERTICAL APPLICATIONS; FACTORY FABRICATED AND COMPLETE WITH REQUIRED HARDWARE AND ACCESSORIES.
- 1. ROUND VOLUME DAMPERS: PROVIDE MINIMUM 20 GAUGE GALVANIZED STEEL FRAME AND BLADES, MINIMUM 3/8" SQUARE STEEL AXLE, MOLDED SYNTHETIC BEARINGS, WITH LOCKING POSITION REGULATOR. REGULATOR SHALL BE POSITIONED WITH SHEET METAL BRACKET BEYOND DUCT COVERING. WHERE POSITIONING REGULATOR IS NOT ACCESSIBLE, PROVIDE COUPLING AND EXTENSION ROD WITH REGULATOR FOR CEILING OR WALL INSTALLATION, AS REQUIRED.
- CTANGULAR VOLUME DAMPERS: PROVIDE MINIMUM 16 GAUGE GALVANIZED STEEL CHANNEL FRAME, 16 uge galvanized steel blades, minimum ½" hexagonal axle, bolded synthetic bearings, with 3/8" S<mark>QUARE</mark> PLATED STEEL CONTROL SHAFT. LINKAGES SHALL BE CONCEALED IN THE FRAME. OPERATING SHAFT SHALL EXTEND BEYOND FRAME AND DUCT TO A LOCKING QUADRANT WITH ADJUSTABLE LEVER. MAXIMUM BLADE WIDTH SHALL NOT EXCEED 6".
- B. FLEXIBLE DUCT CONNECTORS: FLAME-RETARDED OR NONCOMBUSTIBLE FABRICS, COATINGS, AND ADHESIVES COMPLYING WITH UL 181, CLASS 1. CONNECTOR TO BE 30 OUNCE, NEOPRENE COATED, FIBERGLASS FABRIC.
- FLEXIBLE DUCTS: FACTORY ASSEMBLED, UL 181, CLASS 1, WITH 1-1/2-INCH THICK (R-5 MIN.), 1 PCF FIBERGLASS INSULATION AND REINFORCED OUTER PROTECTIVE COVER/VAPOR BARRIER. FLEXIBLE DUCT SHALL MEET NFPA 90A WITH FLAME SPREAD UNDER 25, SMOKE DEVELOPED UNDER 50, AND SHALL BE RATED FOR MINIMUM 2-INCH WG PRESSURE AND 0 TO 250°F TEMPERATURE. PROVIDE SCREW-OPERATED METAL ADJUSTABLE CLAMPING DEVICES. USE TWIST-LOCK CONICAL TAP COLLARS AT CONNECTIONS INTO SHEET METAL DUCTWORK. MAXIMUM EXTENDED LENGTH OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FEET.
- D. TURNING VANES: PROVIDE FABRICATED TURNING VANES AND VANE RUNNERS, CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS". PROVIDE TURNING VANES CONSTRUCTED OF CURVED BLADES, SUPPORTED WITH BARS PERPENDICULAR TO BLADES, AND SET INTO SIDE STRIPS SUITABLE FOR MOUNTING IN DUCTWORK. FOLLOW SMACNA GUIDELINES FOR SPACING SUPPORT, AND CONSTRUCTION. ALL BLADES SHALL BE DOUBLE THICKNESS AIRFOIL TYPE.
- E. BIRD SCREENS AND FRAMES: PROVIDE BIRD SCREENS THAT CONFORM TO ASTM E 2016, NO. 2 MESH, ALUMINUM OR STAINLESS STEEL. PROVIDE "MEDIUM-LIGHT" RATED ALUMINUM SCREENS. PROVIDE "LIGHT" RATES STAINLESS STEEL
- F. DUCT-MOUNTED ACCESS DOORS: FABRICATE ACCESS PANELS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE"; FIGURES 2-10, "DUCT ACCESS DOORS AND PANELS," AND 2-11, "ACCESS PANELS - ROUND DUCT."

PART 2 - EXECUTION

2.1 INSTALLATION

- A. INSTALL DUCTWORK, ACCESSORIES, AND SUPPORTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" UNLESS OTHERWISE INDICATED.
- B. SEAL DUCTS TO THE FOLLOWING SEAL CLASSES ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE": 1-INCH WG, SEAL CLASS A.
- C. CONCEAL DUCTS FROM VIEW IN FINISHED AND OCCUPIED SPACES.
- D. AVOID PASSING THROUGH OR ABOVE ELECTRICAL EQUIPMENT SPACES AND ENCLOSURES.
- E. CLEAN DUCT SYSTEMS BEFORE TESTING, ADJUSTING, AND BALANCING.
- 2.2 TESTING, ADJUSTING, AND BALANCING
- A. BALANCE AIRFLOW WITHIN DISTRIBUTION SYSTEMS, INCLUDING SUBMAINS, BRANCHES, AND TERMINALS TO INDICATED QUANTITIES PER SPECIFICATIONS.

END OF SECTION 233100

SECTION 233423 - HVAC EXHAUST FANS

PART 1 - PRODUCTS

- 1.1 PERFORMANCE REQUIREMENTS
- A. PRODUCTS SHALL BE LICENSED TO USE THE AMCA-CERTIFIED RATINGS SEAL.
- B. EXHAUST FANS SHALL COMPLY WITH UL 705, TYPE 1 FANS SHALL ALSO COMPLY WITH UL 762.
- C. TYPE 1 FANS TO BE DESIGNED FOR HIGH HEAT OPERATION AT 300°F.
- D. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A

QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.

- 1.2 CENTRIFUGAL VENTILATORS
- A. HOUSING: REMOVABLE, SPUN-ALUMINUM, DOME TOP AND OUTLET BAFFLE; SQUARE, ONE-PIECE, ALUMINUM BASE WITH VENTURI INLET CONE.
- 1. UPBLAST UNITS: ALUMINUM DISCHARGE BAFFLE TO DIRECT DISCHARGE AIR UPWARD, WITH RAIN AND SNOW DRAINS.
- B. FAN WHEELS: ALUMINUM HUB AND WHEEL WITH BACKWARD-INCLINED BLADES
- C. BELT-DRIVEN DRIVE ASSEMBLY: RESILIENTLY MOUNTED TO HOUSING.
- 1. FAN SHAFT: TURNED, GROUND, AND POLISHED STEEL; KEYED TO WHEEL HUB.
- 2. SHAFT BEARINGS: PERMANENTLY LUBRICATED, PERMANENTLY SEALED, SELF-ALIGNING BALL BEARINGS.
- 3. PULLEYS: CAST-IRON, ADJUSTABLE-PITCH MOTOR PULLEY.

4. FAN AND MOTOR ISOLATED FROM EXHAUST AIRSTREAM. D. ACCESSORIES:

- DISCONNECT SWITCH: NON-FUSIBLE TYPE, WITH THERMAL-OVERLOAD PROTECTION, FACTORY WIRED THROUGH AN INTERNAL ALUMINUM CONDUIT.
- BIRD SCREENS: REMOVABLE, 1/2-INCH MESH, ALUMINUM OR BRASS WIRE.
- 3. DAMPERS: COUNTERBALANCED, PARALLEL-BLADE, BACKDRAFT DAMPERS MOUNTED IN CURB BASE; FACTORY SET TO CLOSE WHEN FAN STOPS.
- MOTORIZED DAMPERS: PARALLEL-BLADE DAMPERS MOUNTED IN CURB BASE WITH ELECTRIC ACTUATOR; WIRED TO CLOSE WHEN FAN STOPS.
- 5. GREASE BOX FOR TYPE 1 EXHAUST FANS.
- 6. G2 GREASE GUARD FOR TYPE 1 EXHAUST FANS.
- ROOF CURBS: 20 GAUGE GALVANIZED STEEL; MITERED AND WELDED CORNERS; 1-1/2-INCH THICK, RIGID, FIBERGLASS INSULATION ADHERED TO INSIDE WALLS; AND 1-1/2-INCH WOOD NAILER. SIZE AS REQUIRED TO SUIT ROOF OPENING AND FAN BASE.
- 1. CONFIGURATION: SELF-FLASHING WITHOUT A CANT STRIP, WITH MOUNTING FLANGE.
- 2. OVERALL HEIGHT: 12 INCHES FOR GENERAL EXHAUST FANS; 20 INCHES FOR KITCHEN EXHAUST FANS.
- 3. PITCH MOUNTING: MANUFACTURE CURB FOR ROOF SLOPE.

4. MOUNTING PEDESTAL: GALVANIZED STEEL WITH REMOVABLE ACCESS PANEL

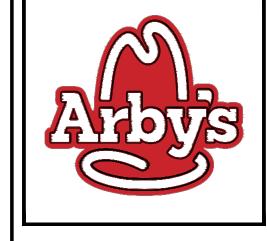
- 5. TYPE 1 ROOF CURBS TO BE VENTED TYPE.
- 6. TYPE 1 AND TYPE 2 ROOF CURBS TO BE HINGED TYPE
- F. CAPACITIES AND CHARACTERISTICS: SEE SCHEDULE.

- A. COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, ENCLOSURE TYPE, AND
- EFFICIENCY REQUIREMENTS FOR MOTORS. 1. MOTOR SIZES: MINIMUM SIZE AS INDICATED. IF NOT INDICATED, LARGE ENOUGH SO DRIVEN LOAD WILL NOT REQUIRE MOTOR TO OPERATE IN SERVICE FACTOR RANGE ABOVE 1.0.
- B. ENCLOSURE TYPE: TOTALLY ENCLOSED, FAN COOLED.

PART 2 - EXECUTION 2.1 INSTALLATION

- A. INSTALL UNITS WITH CLEARANCES FOR SERVICE AND MAINTENANCE.
- B. ROOF-MOUNTED UNITS: INSTALL ROOF CURB ON ROOF STRUCTURE, ACCORDING TO ARI GUIDELINE B. INSTALL AND SECURE ROOF-MOUNTED FANS ON CURBS, AND COORDINATE ROOF PENETRATIONS AND FLASHING WITH ROOF CONSTRUCTION.

END OF SECTION 233423



DATE DESCRIPTION DWG DATE: 09-18-2024 DRAWN BY: REVIEWED BY: PROJECT No .: DWG TITLE:

ISSUE

MECHANICAL

SPECIFICATIONS - DIVISION 23 - HVAC SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES PART 1 - GENERAL 1.1 SECTION REQUIREMENTS A. SUBMITTALS: 1. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED, INCLUDING COLOR CHARTS FOR FACTORY FINISHES PART 2 - PRODUCTS 2.1 DIFFUSERS, REGISTERS, AND GRILLES: A. REFER TO SCHEDULES FOR FINISH TYPE, COLOR, MATERIAL, AND MOUNTING PART 3 - EXECUTION 3.1 INSTALLATION A. INSTALL DIFFUSERS, REGISTERS, AND GRILLES LEVEL AND PLUMB B. CEILING-MOUNTED OUTLETS AND INLETS: DRAWINGS INDICATE GENERAL ARRANGEMENT OF DUCTS, FITTINGS, ANDVERIFY AVAILABILITY OF HIGH-ALTITUDE FEATURE WITH MANUFACTURERS. LAY-IN CEILING PANELS, LOCATE UNITS IN THE CENTER OF PANEL UNLESS OTHERWISE INDICATED. WHERE ARCHITECTURAL FEATURES OR OTHER ITEMS CONFLICT WITH INSTALLATION, NOTIFY ARCHITECT FOR A B. HEAT-EXCHANGER AND DRAIN PAN: STAINLESS STEEL DETERMINATION OF FINAL LOCATION. C. AFTER INSTALLATION, ADJUST DIFFUSERS, REGISTERS, AND GRILLES TO AIR PATTERNS INDICATED, OR AS DIRECTED, D. SAFETY CONTROLS: BEFORE STARTING AIR BALANCING. END OF SECTION 233713 SECTION 237413 - PACKAGED ROOFTOP UNITS 1.1 SUMMARY A. THIS SECTION INCLUDES PACKAGED, ROOFTOP UNITS WITH THE FOLLOWING COMPONENTS AND ACCESSORIES: DIRECT-EXPANSION COOLING. 2. GAS FURNACE. 3. ECONOMIZER OUTDOOR-AND RETURN-AIR DAMPER SECTION 4. INTEGRAL, SPACE TEMPERATURE CONTROLS. ROOF CURBS. 1.2 SECTION REQUIREMENTS A. SUBMITTALS: 1. PRODUCT DATA: INCLUDE MANUFACTURER'S TECHNICAL DATA FOR EACH RTU, INCLUDING RATED CAPACITIES, DIMENSIONS, REQUIRED CLEARANCES, CHARACTERISTICS, FURNISHED SPECIALTIES, AND ACCESSORIES. PART 2 - PRODUCTS A. GENERAL FABRICATION REQUIREMENTS FOR CASINGS: FORMED AND REINFORCED INSULATED PANELS, FABRICATED TO ALLOW REMOVAL FOR ACCESS TO INTERNAL PARTS AND COMPONENTS, WITH JOINTS BETWEEN SECTIONS B. EXTERIOR CASING MATERIAL: GALVANIZED STEEL WITH FACTORY-PAINTED FINISH, WITH PITCHED ROOF PANELS AND CASING THICKNESS: 16 GAUGE THICK C. CASING INSULATION AND ADHESIVE: COMPLY WITH NFPA 90A MATERIALS: ASTM C 1071, TYPE I 2. THICKNESS: 1/2 INCH AIR SIDE. 4. LINER ADHESIVE: COMPLY WITH ASTM C 916, TYPE I.

KNOCKOUTS WITH GROMMET SEALS FOR ELECTRICAL AND PIPING CONNECTIONS AND LIFTING LUGS 3. LINER MATERIALS SHALL HAVE AIR-STREAM SURFACE INSULATED WITH A MINIMUM 1/2-IN. THICK, MINIMUM 1/2 LB DENSITY, FLEXIBLE FIBERGLASS INSULATION BONDED WITH A PHENOLIC BINDER, NEOPRENE COATED ON THE

D. UNIT SHALL HAVE A THRU-THE-BASE GAS AND ELECTRICAL CONNECTIONS. 2.2 FANS OPTION A OR B:

A. DIRECT-DRIVEN SUPPLY-AIR FANS: DOUBLE WIDTH, BACKWARD INCLINED, CENTRIFUGAL; WITH PERMANENTLY LUBRICATED, MOTOR RESILIENTLY MOUNTED IN THE FAN INLET. ALUMINUM OR PAINTED-STEEL WHEELS, AND GALVANIZED- OR PAINTED-STEEL FAN SCROLLS. B. BELT-DRIVEN SUPPLY-AIR FANS: DOUBLE WIDTH, FORWARD CURVED, CENTRIFUGAL; WITH PERMANENTLY

LUBRICATED, SINGLE-SPEED MOTOR INSTALLED ON AN ADJUSTABLE FAN BASE RESILIENTLY MOUNTED IN THE CASING. ALUMINUM OR PAINTED-STEEL WHEELS, AND GALVANIZED- OR PAINTED-STEEL FAN SCROLLS. C. CONDENSER-COIL FAN: DIRECT DRIVE, PROPELLER, MOUNTED ON SHAFT OF PERMANENTLY LUBRICATED MOTOR

WITH THERMAL OVERLOAD PROTECTION. D. POWER EXHAUST: FORWARD CURVED, SHAFT MOUNTED ON PERMANENTLY LUBRICATED MOTOR.

2.3 COILS

A. SUPPLY-AIR REFRIGERANT COIL: 1. ALUMINUM-PLATE FIN AND SEAMLESS INTERNALLY GROOVED COPPER TUBE IN STEEL CASING WITH EQUALIZING-TYPE VERTICAL DISTRIBUTOR.

2. POLYMER STRIP SHALL PREVENT ALL COPPER COIL FROM CONTACTING STEEL COIL FRAME OR CONDENSATE

3. CATHODIC EPOXY COATING.

4. CONDENSATE DRAIN PAN: GALVANIZED STEEL WITH CORROSION-RESISTANT COATING FORMED WITH PITCH AND DRAIN CONNECTIONS. B. OUTDOOR-AIR REFRIGERANT COIL:

1. ALUMINUM-PLATE FIN AND SEAMLESS INTERNALLY GROOVED COPPER TUBE IN STEEL CASING WITH EQUALIZING-TYPE VERTICAL DISTRIBUTOR.

2. POLYMER STRIP SHALL PREVENT ALL COPPER COIL FROM CONTACTING STEEL COIL FRAME OR CONDENSATE 3. CATHODIC EPOXY COATING.

C. HOT-GAS REHEAT REFRIGERANT COIL (OPTIONAL): 1. ALUMINUM-PLATE FIN AND SEAMLESS INTERNALLY GROOVED COPPER TUBE IN STEEL CASING WITH EQUALIZING-TYPE VERTICAL DISTRIBUTOR. 2. POLYMER STRIP SHALL PREVENT ALL COPPER COIL FROM CONTACTING STEEL COIL FRAME OR CONDENSATE

3. CATHODIC EPOXY COATING.

2.4 REFRIGERANT CIRCUIT COMPONENTS A. NUMBER OF REFRIGERANT CIRCUITS: TWO

B. COMPRESSOR: HERMETIC, SCROLL, MOUNTED ON VIBRATION ISOLATORS; WITH INTERNAL OVERCURRENT AND HIGH-TEMPERATURE PROTECTION, INTERNAL PRESSURE RELIEF AND CRANKCASE HEATER.

C. REFRIGERATION SPECIALTIES: 1. REFRIGERANT: R-410A

2. EXPANSION VALVE WITH REPLACEABLE THERMOSTATIC ELEMENT.

3. REFRIGERANT FILTER/DRYER. 4. MANUAL-RESET HIGH-PRESSURE SAFETY SWITCH.

5. AUTOMATIC-RESET LOW-PRESSURE SAFETY SWITCH.

TRANSFORMER IF REQUIRED. B. LOW-AMBIENT KIT STAGED DOWN TO 0°F.

6. MINIMUM OFF-TIME RELAY. 7. AUTOMATIC-RESET COMPRESSOR MOTOR THERMAL OVERLOAD. 8. BRASS SERVICE VALVES INSTALLED IN COMPRESSOR SUCTION AND LIQUID LINES.

9. LOW-AMBIENT KIT HIGH-PRESSURE SENSOR. 10. HOT-GAS REHEAT SOLENOID VALVE WITH A REPLACEABLE MAGNETIC COIL. 2.5 AIR FILTRATION

A. PROVIDE 2" THROW-AWAY FIBERGLASS FILTERS. 2.6 GAS FURNACE A. BURNERS: IN-SHOT TYPE CONSTRUCTED OF ALUMINUM-COATED STEEL

 FUEL: NATURAL GAS. 2. IGNITION: DIRECT SPARK IGNITION (DSI).

ACCESSORIES. MAKE FINAL LOCATIONS WHERE INDICATED, AS MUCH AS PRACTICAL. FOR UNITS INSTALLED IN

3. HIGH-ALTITUDE KIT: FOR PROJECT ELEVATIONS MORE THAN 2,000 FEET ABOVE SEA LEVEL.

1. GAS CONTROL VALVE: TWO STAGE.

SOLENOID VALVE, PILOT FILTER, PRESSURE REGULATOR, PILOT SHUTOFF, AND MANUAL SHUTOFF. 2.7 DAMPERS A. OUTDOOR AND RETURN AIR MIXING DAMPERS: PARALLEL OR OPPOSED-BLADE GALVANIZED-STEEL DAMPERS MECHANICALLY FASTENED TO CADMIUM PLATED FOR GALVANIZED-STEEL OPERATING ROD IN REINFORCED3.1 EXAMINATION CABINET. CONNECT OPERATING RODS WITH COMMON LINKAGE AND INTERCONNECT LINKAGES SO DAMPERS

1. DAMPER MOTOR: MODULATING WITH ADJUSTABLE MINIMUM POSITION 2. RELIEF AIR DAMPER: GRAVITY ACTUATED, WITH BIRD SCREEN AND HOOD 2.8 ELECTRICAL POWER CONNECTION

A. PROVIDE FOR SINGLE CONNECTION OF POWER TO UNIT WITH UNIT-MOUNTED DISCONNECT SWITCH ACCESSIBLE FROM OUTSIDE UNIT AND CONTROL-CIRCUIT TRANSFORMER WITH BUILT-IN OVERCURRENT PROTECTION. 2.9 CONTROLS

A. BASIC UNIT CONTROLS: CONTROL-VOLTAGE TRANSFORMER.

2. WALL-MOUNTED THERMOSTAT OR SENSOR WITH THE FOLLOWING FEATURES: a. HEAT-COOL-OFF SWITCH b. FAN ON-AUTO SWITCH.

c. FAN-SPEED SWITCH. d. AUTOMATIC CHANGEOVER e. ADJUSTABLE DEADBAND. f. EXPOSED SET POINT. g. EXPOSED INDICATION. h. DEGREE F INDICATION.

C. INDUCED DRAFT COMBUSTION BLOWER.

i. UNOCCUPIED-PERIOD-OVERRIDE PUSH BUTTON. j. DATA ENTRY AND ACCESS PORT TO INPUT TEMPERATURE AND HUMIDITY SET POINTS, OCCUPIED AND B. CONTRACTOR TO ENSURE THAT ALL THERMOSTATS AND SENSORS ARE COMPATIBLE WITH THE RTU CONTROLS. UNOCCUPIED PERIODS, AND OUTPUT ROOM TEMPERATURE AND HUMIDITY, SUPPLY-AIR TEMPERATURE 3.5 FIELD QUALITY CONTROL OPERATING MODE, AND STATUS.

3. WALL-MOUNTED HUMIDISTAT OR SENSOR WITH THE FOLLOWING FEATURES: a. EXPOSED SET POINT. b. EXPOSED INDICATION.

REMOTE WALL-MOUNTED ANNUNCIATOR PANEL WITH KEYED ACCESS FOR EACH UNIT: a. LIGHTS TO INDICATE POWER ON, UNIT ALARM OR FAILURE, SMOKE DETECTION. B. DDC CONTROLLER:

1. CONTROLLER SHALL HAVE VOLATILE-MEMORY BACKUP. 2. SAFETY CONTROL OPERATION: a. SMOKE DETECTORS: STOP FAN AND CLOSE OUTDOOR-AIR DAMPER IF SMOKE IS DETECTED. PROVIDE ADDITIONAL CONTACTS FOR ALARM INTERFACE TO FIRE ALARM CONTROL PANEL.

b. FIRE ALARM CONTROL PANEL INTERFACE WHERE APPLICABLE. C. LOW-DISCHARGE TEMPERATURE: STOP FAN AND CLOSE OUTDOOR-AIR DAMPER IF SUPPLY AIR TEMPERATURI IS LESS THAN 40°F. RETAIN FIRST SUBPARAGRAPH BELOW FOR AIR-TO-AIR HEAT-PUMP FEATURE.

3. UNIT SHALL BE CAPABLE OF DIRECT COMMUNICATION WITH GENERIC OPEN PROTOCOL SUCH AS BACNET A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO PERFORM STARTUP SERVICE. MS/TP, LONTALK, OR MODUS. THIS WILL ALLOW THE UNIT TO INTEGRATE WITH A FACILITY ENERGY MANAGEMENT B

4. SCHEDULED OPERATION: OCCUPIED AND UNOCCUPIED PERIODS ON SEVEN-DAY CLOCK WITH A MINIMUM OF

FOUR PROGRAMMABLE PERIODS PER DAY. 5. UNOCCUPIED PERIOD:

a. HEATING SETBACK: 10°F. b. COOLING SETBACK: SYSTEM OFF. c. OVERRIDE OPERATION: TWO HOURS. 6. SUPPLY FAN OPERATION:

a. OCCUPIED PERIODS: RUN FAN CONTINUOUSL b. UNOCCUPIED PERIODS: CYCLE FAN TO MAINTAIN SETBACK TEMPERATURE. 7. REFRIGERANT CIRCUIT OPERATION:

a. OCCUPIED PERIODS: CYCLE OR STAGE COMPRESSORS, AND OPERATE HOT-GAS BYPASS TO MATCH COMPRESSOR OUTPUT TO COOLING LOAD TO MAINTAIN ROOM TEMPERATURE AND HUMIDITY. CYCLE CONDENSER FANS TO MAINTAIN MAXIMUM HOT-GAS PRESSURE. OPERATE LOW-AMBIENT CONTROL KIT TO MAINTAIN MINIMUM HOT-GAS PRESSURE. b. UNOCCUPIED PERIODS: CYCLE COMPRESSORS AND CONDENSER FANS FOR HEATING TO MAINTAIN

SETBACK TEMPERATUR 8. HOT-GAS REHEAT-COIL OPERATION (OPTIONAL): a. OCCUPIED PERIODS: HUMIDISTAT OPENS HOT-GAS VALVE TO PROVIDE HOT-GAS REHEAT, AND CYCLES

b. UNOCCUPIED PERIODS: REHEAT NOT REQUIRED. 9. GAS FURNACE OPERATION

b. UNOCCUPIED PERIODS: CLOSE OUTDOOR-AIR DAMPER AND OPEN RETURN-AIR DAMPER.

a. OCCUPIED PERIODS: STAGE BURNER TO MAINTAIN ROOM TEMPERATURE. **b. UNOCCUPIED PERIODS: CYCLE BURNER TO MAINTAIN SETBACK TEMPERATURE.** FIXED MINIMUM OUTDOOR-AIR DAMPER OPERATION: a. OCCUPIED PERIODS: OPEN TO 25 PERCENT.

b. UNOCCUPIED PERIODS: CLOSE THE OUTDOOR-AIR DAMPER. . ECONOMIZER OUTDOOR-AIR DAMPER OPERATION: a. OCCUPIED PERIODS: OPEN TO 25 PERCENT FIXED MINIMUM INTAKE, AND MAXIMUM 100 PERCENT OF THE FAN CAPACITY TO COMPLY WITH ASHRAE CYCLE II. CONTROLLER SHALL PERMIT AIR-SIDE ECONOMIZER OPERATION WHEN OUTDOOR AIR IS LESS THAN 60 ° F. USE MIXED-AIR TEMPERATURE AND SELECT BETWEEN OUTDOOR-AIR AND RETURN-AIR ENTHALPY TO ADJUST MIXING DAMPERS DURING ECONOMIZER CYCLE OPERATION, LOCK OUT COOLING.

2.10 ACCESSORIES A. DUPLEX, 115-V, GROUND-FAULT-INTERRUPTER OUTLET WITH 15-A OVERCURRENT PROTECTION. INCLUDE

C. FILTER DIFFERENTIAL PRESSURE SWITCH WITH SENSOR TUBING ON EITHER SIDE OF FILTER. SET FOR FINAL FILTER PRESSURE LOSS. D. HAIL GUARDS OF GALVANIZED STEEL, PAINTED TO MATCH CASING

E. DUCT MOUNTED SMOKE DETECTOR IN RETURN AIR STREAM CAPABLE OF SHUTTING DOWN THE UNIT IN THE PRESENCE A. OCCUPANCY ADJUSTMENTS: WHEN REQUESTED WITHIN 12 MONTHS OF DATE OF SUBSTANTIAL COMPLETION, OF SMOKE DETECTION. 2.11 ROOF CURBS

A. MATERIALS: GALVANIZED STEEL WITH CORROSION-PROTECTION COATING, WATERTIGHT GASKETS, AND FACTORY-INSTALLED WOOD NAILER; COMPLYING WITH NRCA STANDARDS.

1. CURB INSULATION AND ADHESIVE: COMPLY WITH NFPA 90A OR NFPA 90B. a. MATERIALS: ASTM C 1071, TYPE I OR II. b. THICKNESS: 1-1/2 INCHES.

2. APPLICATION: FACTORY APPLIED WITH ADHESIVE AND MECHANICAL FASTENERS TO THE INTERNAL SURFACE OF CURB. a. LINER ADHESIVE: COMPLY WITH ASTM C 916, TYPE I. b. MECHANICAL FASTENERS: GALVANIZED STEEL, SUITABLE FOR ADHESIVE ATTACHMENT, MECHANICAL

ATTACHMENT, OR WELDING ATTACHMENT TO DUCT WITHOUT DAMAGING LINER WHEN APPLIED AS RECOMMENDED BY MANUFACTURER AND WITHOUT CAUSING LEAKAGE IN CABINET. c. Liner materials shall have air-stream surface insulated with a minimum 1/2-in. Thick, minimum 1/2 LB DENSITY, FLEXIBLE FIBERGLASS INSULATION BONDED WITH A PHENOLIC BINDER, NEOPRENE CO ON THE AIR SIDE. d. LINER ADHESIVE: COMPLY WITH ASTM C 916, TYPE I

2. GAS TRAIN: SINGLE-BODY, REGULATED, REDUNDANT, 24-V AC GAS VALVE ASSEMBLY CONTAINING PILOT B. CURB HEIGHT: 14 INCHES TYPICAL. PROVIDE 24 INCH CURB IN AREAS WITH EXPECTED HEAVY SNOWFALL

PART 3 - EXECUTION

EXAMINE SUBSTRATES, AREAS, AND CONDITIONS, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING PERFORMANCE OF RTUS.

B. EXAMINE ROUGHING-IN FOR RTUS TO VERIFY ACTUAL LOCATIONS OF PIPING AND DUCT CONNECTIONS BEFORE EQUIPMENT INSTALLATION.

C. EXAMINE ROOFS FOR SUITABLE CONDITIONS WHERE RTUS WILL BE INSTALLED D. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED. 3.2 INSTALLATION

A. ROOF CURB: INSTALL ON ROOF STRUCTURE, LEVEL AND SECURE. INSTALL RTUS ON CURBS AND COORDINATE ROOF PENETRATIONS AND FLASHING WITH ROOF CONSTRUCTION. RTUS TO UPPER CURB RAIL, AND SECURE CURB BASE TO ROOF FRAMING OR CONCRETE BASE WITH ANCHOR BOLTS

A. . THE FOLLOWING ARE SPECIFIC CONNECTION REQUIREMENTS 1. INSTALL DUCTS TO TERMINATION AT TOP OF ROOF CURB.

3.3 CONNECTIONS

2. REMOVE ROOF DECKING ONLY AS REQUIRED FOR PASSAGE OF DUCTS. DO NOT CUT OUT DECKING UNDER ENTIRE ROOF CURB.

3.4 COORDINATION A. CONTRACTOR TO COORDINATE WITH KITCHEN EQUIPMENT SUPPLIER TO ENSURE THAT THE RTUS ARE COORDINATED WITH THE KITCHEN EQUIPMENT, PARTICULARLY THE EXHAUST HOODS AND THE MAKE-UP AIR UNIT, TO PROPERLY

PRESSURIZE THE BUILDING/SPACE.

A. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT, TEST, AND ADJUST COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS. REPORT

B. PERFORM TESTS AND INSPECTIONS AND PREPARE TEST REPORTS. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS, AND TO ASSIST IN

TESTING. REPORT RESULTS IN WRITING. C. TESTS AND INSPECTIONS:

1. AFTER INSTALLING RTUS AND AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, TEST UNITS FOR COMPLIANCE WITH REQUIREMENTS. 2. OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER

MOTOR ROTATION AND UNIT OPERATION. 3. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.

d. DEFROST CONTROL FOR CONDENSER COIL: PRESSURE DIFFERENTIAL SWITCH TO INITIATE DEFROST SEQUENCE. D. REMOVE AND REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED ABOVE. 3.6 STARTUP SERVICE

COMPLETE INSTALLATION AND STARTUP CHECKS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AND

1. INSPECT FOR VISIBLE DAMAGE TO UNIT CASING, FURNACE COMBUSTION CHAMBER, COMPRESSOR, COILS, AND FANS. 2. VERIFY THAT LABELS ARE CLEARLY VISIBLE, CLEARANCES HAVE BEEN PROVIDED FOR SERVICING, CONTROLS ARE CONNECTED AND OPERABLE, AND FILTERS ARE INSTALLED.

3. CLEAN CONDENSER COIL AND FURNACE AND INSPECT FOR CONSTRUCTION DEBRIS. 4. REMOVE PACKING FROM VIBRATION ISOLATORS.

5. VERIFY LUBRICATION ON FAN AND MOTOR BEARINGS. 6. INSPECT FAN-WHEEL ROTATION FOR MOVEMENT IN CORRECT DIRECTION WITHOUT VIBRATION AND BINDING.

PEAK EFFICIENCY.

7. ADJUST FAN BELTS TO PROPER ALIGNMENT AND TENSION. 8. START UNIT ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

a. INSPECT AND RECORD PERFORMANCE OF INTERLOCKS AND PROTECTIVE DEVICES; VERIFY SEQUENCES. 10. OPERATE UNIT FOR AN INITIAL PERIOD AS RECOMMENDED OR REQUIRED BY MANUFACTURER. 11. PERFORM THE FOLLOWING OPERATIONS FOR BOTH MINIMUM AND MAXIMUM FIRING. ADJUST BURNER FOR

a. MEASURE GAS PRESSURE ON MANIFOLD. b. INSPECT OPERATION OF POWER VENTS. C. MEASURE SUPPLY-AIR TEMPERATURE AND VOLUME WHEN BURNER IS AT MAXIMUM FIRING RATE AND WHEN

BURNER IS OFF. CALCULATE USEFUL HEAT TO SUPPLY AIR. 20. ADJUST AND INSPECT HIGH-TEMPERATURE LIMITS.

21. INSPECT OUTDOOR-AIR DAMPERS FOR PROPER STROKE AND INTERLOCK WITH RETURN-AIR DAMPERS. 22. INSPECT CONTROLS FOR CORRECT SEQUENCING OF HEATING, MIXING DAMPERS, REFRIGERATION, AND

NORMAL AND EMERGENCY SHUTDOWN. 23. SIMULATE MAXIMUM COOLING DEMAND AND INSPECT THE FOLLOWING:

a. COMPRESSOR REFRIGERANT SUCTION AND HOT-GAS PRESSURES. b. SHORT CIRCUITING OF AIR THROUGH CONDENSER COIL OR FROM CONDENSER FANS TO OUTDOOR-AIR INTAKE.

27. VERIFY OPERATION OF REMOTE PANEL INCLUDING PILOT-LIGHT OPERATION AND FAILURE MODES. INSPECT THE FOLLOWING: a. HIGH-TEMPERATURE LIMIT ON GAS-FIRED HEAT EXCHANGER.

b. LOW-TEMPERATURE SAFETY OPERATION. C. FILTER HIGH-PRESSURE DIFFERENTIAL ALARM. d. ECONOMIZER TO MINIMUM OUTDOOR-AIR CHANGEOVER. e. RELIEF-AIR FAN OPERATION. f. SMOKE ALARMS.

28. AFTER STARTUP AND PERFORMANCE TESTING AND PRIOR TO SUBSTANTIAL COMPLETION, REPLACE EXISTING FILTERS WITH NEW FILTERS. 3.7 CLEANING AND ADJUSTING

provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to TWO VISITS TO SITE DURING OTHER-THAN-NORMAL OCCUPANCY HOURS FOR THIS PURPOSE. B. AFTER COMPLETING SYSTEM INSTALLATION AND TESTING, ADJUSTING, AND BALANCING RTU AND AIR-DISTRIBUTION

SYSTEMS, CLEAN FILTER HOUSINGS AND INSTALL NEW FILTERS.

ISSUE DATE DESCRIPTION DWG DATE: 09-18-2024 DRAWN BY: REVIEWED BY: PROJECT No.: DWG TITLE:

MECHANICAL

ELECT	RICAL LEGEND
DETAIL	DESCRIPTION
\ominus	SIMPLEX RECEPTACLE
\oplus	DUPLEX RECEPTACLE
•	DUPLEX RECEPTACLE ABOVE COUNTER
GFI	DUPLEX RECEPTACLE - GFCI
⊕ GFI	DUPLEX RECEPTACLE - GFCI, ABOVE COUNTER
	SPLIT RECEPTACLE
WP/GFI	DUPLEX RECEPTACLE - WITH WEATHERPROOF COVER & GFCI
\rightarrow	DOUBLE DUPLEX RECEPTACLE
	DUPLEX RECEPTACLE IN CEILING
IG	DUPLEX RECEPTACLE - 20A, 125V, WITH ISOLATED GROUND
A-1	BRANCH CIRCUIT HOME-RUN WITH CIRCUIT NUMBER
0	FLOOR MOUNTED DUPLEX RECEPTACLE
	SPECIAL RECEPTACLE (SEE PLANS FOR TYPE)
(J)	JUNCTION BOX
99	MOTOR (SINGLE PHASE & THREE PHASE)
TC	TIME CLOCK
V	VOLUME CONTROL
Р	PULL BOX - SIZE & TYPE AS REQUIRED
	TELEPHONE / DATA OUTLET
TV	TV CABLE OUTLET
	DISCONNECT - NON FUSED
Zh	DISCONNECT - FUSED
M	UTILITY METER
	ELECTRICAL PANEL

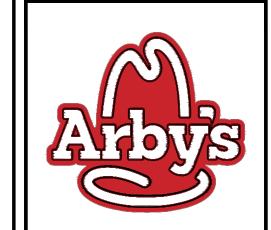
LIGH	TING LEGEND
TAG	DESCRIPTION
	INTERIOR RECESSED DOWNLIGHT
0	INTERIOR RECESSED DOWNLIGHT
	INTERIOR RECESSED DOWNLIGHT
+	PENDANT
0	PENDANT
\bigcirc	PENDANT
	TRACK LIGHT
<u> </u>	VANITY LIGHT
- ộ -I	WALL SCONCE
0	2X4 LAY-IN TROFFER
0	2X4 NIGHT LIGHT
	2X4 EMERGENCY LIGHT
4	EXIT/EMERGENCY LIGHT W/ BATTERY PACK AND DUAL HEADS
P	EXIT/EMERGENCY LIGHT WITH BATTERY PACK
_ 🌣	EXIT LIGHT (SURFACE MOUNTED)
*	EXIT LIGHT (CEILING MOUNTED)
<u></u>	REMOTE EMERGENCY HEADS
₩	EMERGENCY BATTERY PACK AND DUAL HEADS
Ş ^D	DIMMER SWITCH EQUAL TO LUTRON NOVA SERIES T
\$	TOGGLE SWITCH SINGLE POLE SWITCH WITH COVER PLATE
\$ ²	TOGGLE SWITCH 2 POLE SWITCH WITH COVER PLATE
\$ ³	TOGGLE SWITCH 3 WAY SWITCH WITH COVER PLATE
ŞK	TOGGLE SWITCH KEY OPERATED SWITCH WITH COVER PLATE
PC	PHOTOCELL
Ś	WALL MOUNTED OCCUPANCY SENSOR
	CEILING MOUNTED OCCUPANCY SENSOR SENSORSWITCH MODEL #CMR 9 2P

- A. ALL WORK TO COMPLY TO ALL STATE, LOCAL, NEC, & NFPA CODES.
- B. ELECTRICAL CONTRACTOR TO VISIT THE SITE PRIOR TO SUBMITTING A BID & INCLUDE IN THEIR BID ANY ITEM ANY ITEMS NECESSARY FOR A COMPLETE & OPERATIONAL SYSTEM.
- C. DRAWINGS ARE SCHEMATIC IN NATURE. ELECTRICAL CONTRACTOR IS TO ADD ANY ITEMS THAT ARE REQUIRED FOR A COMPLETE & OPERATIONAL SYSTEM IN THEIR PROPOSAL.
- D. ELECTRICAL CONTRACTOR IS TO COORDINATE THEIR INSTALLATION WITH THE OTHER TRADES. IF A CONFLICT OCCURS AND IT IS DUE TO THE ELECTRICAL CONTRACTOR'S LACK OF COORDINATION, ALL WORK INVOLVED IN RESOLVING THE CONFLICT WILL BE AT THE EXPENSE OF THE ELECTRICAL CONTRACTOR.
- E. ELECTRICAL CONTRACTOR SHALL PAY ALL FEES AND PERMITS.

ΑB	BREVIATIONS		
(A)	EXISTING TO BE ABANDONED	INCD	INCANDESCENT
(D)	EXISTING TO BE DEMOLISHED	KVA	KILOVOLT AMPERE
(E)	EXISTING TO REMAIN	KW	KILOWATT
(F)	FUTURE	LTG	LIGHTING OR LIGHT
(R)	EXISTING TO BE RELOCATED	LRA	LOCKED ROTOR AMPS
A	AMPERE	МСА	MAXIMUM CURRENT AMPACITY
AC	ALTERNATING CURRENT OR AIR CONDITIONER	МСВ	MAIN CIRCUIT BREAKER
AFF	ABOVE FINISHED FLOOR	мсс	MOTOR CONTROL CENTER
AFG	ABOVE FINISHED GRADE	MDP	MAIN DISTRIBUTION PANEL
AIC	AMPS INTERRUPTING CAPACITY	MLO	MAIN LUGS ONLY
ANNC	ANNUNCIATOR	МОСР	MAXIMUM OVERCURRENT PROTECTION
AWG	AMERICAN WIRE GAUGE	MSB	MAIN SWITCHBOARD
BPS	BOLTED PRESSURE SWITCH	МН	METAL HALIDE
С	CONDUIT	MTS	MANUAL TRANSFER SWITCH
СВ	CIRCUIT BREAKER	NAC	NOTIFICATION APPLIANCE CIRCUIT
CCTV	CLOSED CIRCUIT TELEVISION	NC	NORMALLY CLOSED
CKT	CIRCUIT	NO	NORMALLY OPEN
СМ	CONSTRUCTION MANAGER	NF	NON-FUSED
DC	DIRECT CURRENT	OCC	OCCUPANCY
DP	DISTRIBUTION PANELBOARD	PA	PUBLIC ADDRESS
DTT	DOUBLE TWIN TUBE	РВ	PULL BOX OR PUSH BUTTON
EB	ELECTRONIC BALLAST	PVC	POLYVINYL CHLORIDE (PLASTIC PIPE)
EC	ELECTRICAL CONTRACTOR	PWR	POWER
EM	EMERGENCY	RECPT	RECEPTACLE
EMT	ELECTRICAL METAL TUBING	STP	SHIELDED, TWISTED PAIR
EWC	ELECTRIC WATER COOLER	TC	TIME CLOCK
FA	FIRE ALARM	TRT	TRIPLE TUBE
FLA	full load amps	TYP	TYPICAL
G	GROUND	UNO	unless noted otherwi <mark>se</mark>
GC	GENERAL TRADES CONTRACTOR	UTP	UNSHIELDED, TWISTED PAIR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	٧	VOLT
GEN	GENERATOR	W	WATT
HOA	HAND-OFF-AUTOMATIC	WAP	WIRELESS ACCESS POINT
HP	HORSEPOWER	WH	WATTHOUR
HPC	HIGH PRESSURE CONTACT SWITCH	WP	WEATHERPROOF, NEMA 3R UNO
HZ	HERTZ	XFMR	transformer
IG	ISOLATED GROUND	Z	IMPEDANCE
IMC	INTERMEDIATE METAL CONDUIT	Φ	PHASE

DR.	AWING INDEX					
E-0	ELECTRICAL LEGEND AND GENERAL INFORMATION					
E-1 LIGHTING PLAN						
E-2	POWER PLAN					
E-3 POS SYSTEM PLAN						
E-4 ROOF POWER PLAN						
E-5	ELECTRICAL RISER DIAGRAM AND DETAILS					
E-6	PANEL SCHEDULE AND EQUIPMENT SCHEDULE					
E-7	ELECTRICAL SPECIFICATIONS					

E-8 ELECTRICAL SPECIFICATIONS



	13	SSUE
No.	DATE	DESCRIPTION
-		
DWG	DATE:	09-18-2024
DRAV	WN BY:	NYE
REVI	EWED BY:	
PRO	JECT No.:	
DWG	TITLE:	
	FLFC	TRICAL
	LEGE	ND AND
	GEN	IERAL
l		· — · · · —

SHEET No.

INFORMATION

F-(

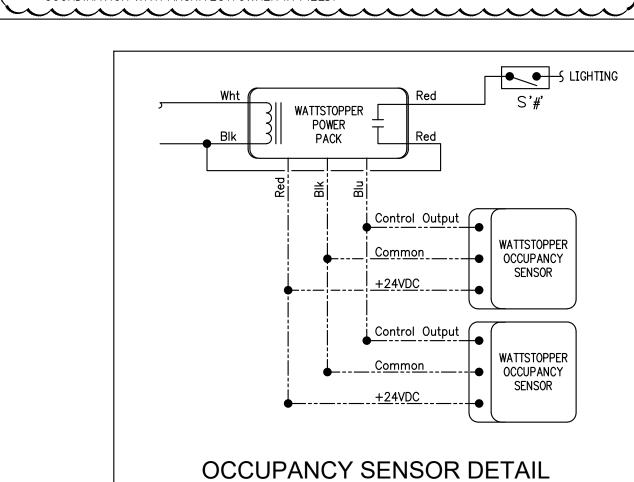
	LIGHT FIXTURE SCHEDULE												
TYEP	EQUIPMENT DESCRIPTION MANUFACTURER		MODULE	MOUNTING	LAMP	DRIVER	COMMENTS	VOLTS	WATTS	QAUNTITY			
A1	PENDANT	KICHLER	EVERLY 42046-OZ-1 (OLD BRONZE)	SUSPENDED	SATCO \$9578	N/A	SEE NOTE 1	120	4.5	3			
A2	PENDANT	KICHLER	MISSOULA 78200-LT-1 (BRONZE)	SUSPENDED	SATCO \$9578	N/A	SEE NOTE 1	120	4.5	3			
C1	LED DOWNLIGHT	CREE	CR6T-825-27K-12-E25/RC6-GU24 E26 ADAPTER	RECESSED	LED ENGINE	LED DRIVER	WHITE TRIM RING	120	11	70			
F2	2X4 LED TROFFER	CREE	C-TR-B-FP24-50L-40K-WH-2	RECESSED	LED ENGINE	LED DRIVER	-	120	50	24			
W2	EXTERIOR UP/DOWN SCONCE	SATCO	NUVO62/1143R1	WALL	3000K CCT LED	LED DRIVER	-	120	20	16			
W3	EXTERIOR WALL SCONCE	WESTGATE	LWA-12-CS-WH	W ALL	LED ENGINE	LED DRIVER	-	120	12	2			
EX1	COMBINATION EMERGENCY EXIT SIGN	EXITRONIX	VLEDC-51-WH	UNIVERSAL	WITH UNIT WITH UNIT	N/A	PENDANT MOUNTED AT 10-0" AFF	120	14	6			
EM1	EMERGENCY BATTERY PACK WITH DUAL HEADS	EXITRONIX	LED-90	WALL	W/UNIT	N/A	-	120	14	7			

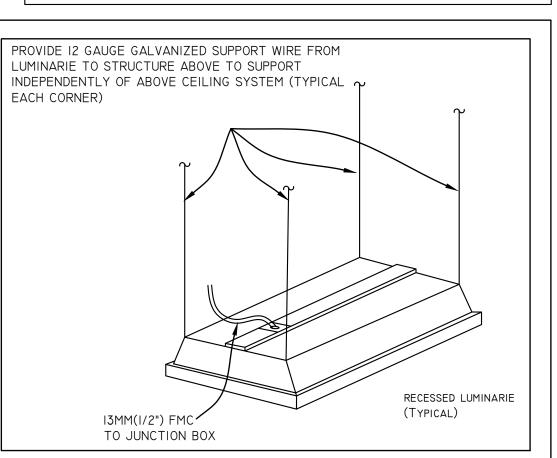
- A. REFER TO REFLECTED CEILING PLAN FOR COORDINATION OF CEILING GRID, DIFFUSERS AND LIGHTING.
- B. ALL NIGHT LIGHTING, EXIT AND EGRESS EMERGENCY LIGHTING SHALL BE CONNECTED TO LOCAL LIGHTING CIRCUIT AHEAD OF SWITCH LEG.
- CONTRACTOR PROVIDE ALL MATERIALS TO PROVIDE A COMPLETE INSTALLATION IN ACCORDANCE WITH THE CURRENT EDITION OF THE NEC AND ALL STATE AND LOCAL CODES.
- D. REFER TO DECOR PLANS FOR COORDINATION OF ALL DECORATIVE PENDANT AND SCONCE LIGHTING, INCLUDING MOUNTING HEIGHTS AND SUSPENSION HEIGHTS & SPECIFICATIONS.

E. MOUNT EXIT LIGHTS IN DINING ROOM ON BULKHEAD ABOVE DOOR.

LIGHTING PLAN KEYED NOTES (#)

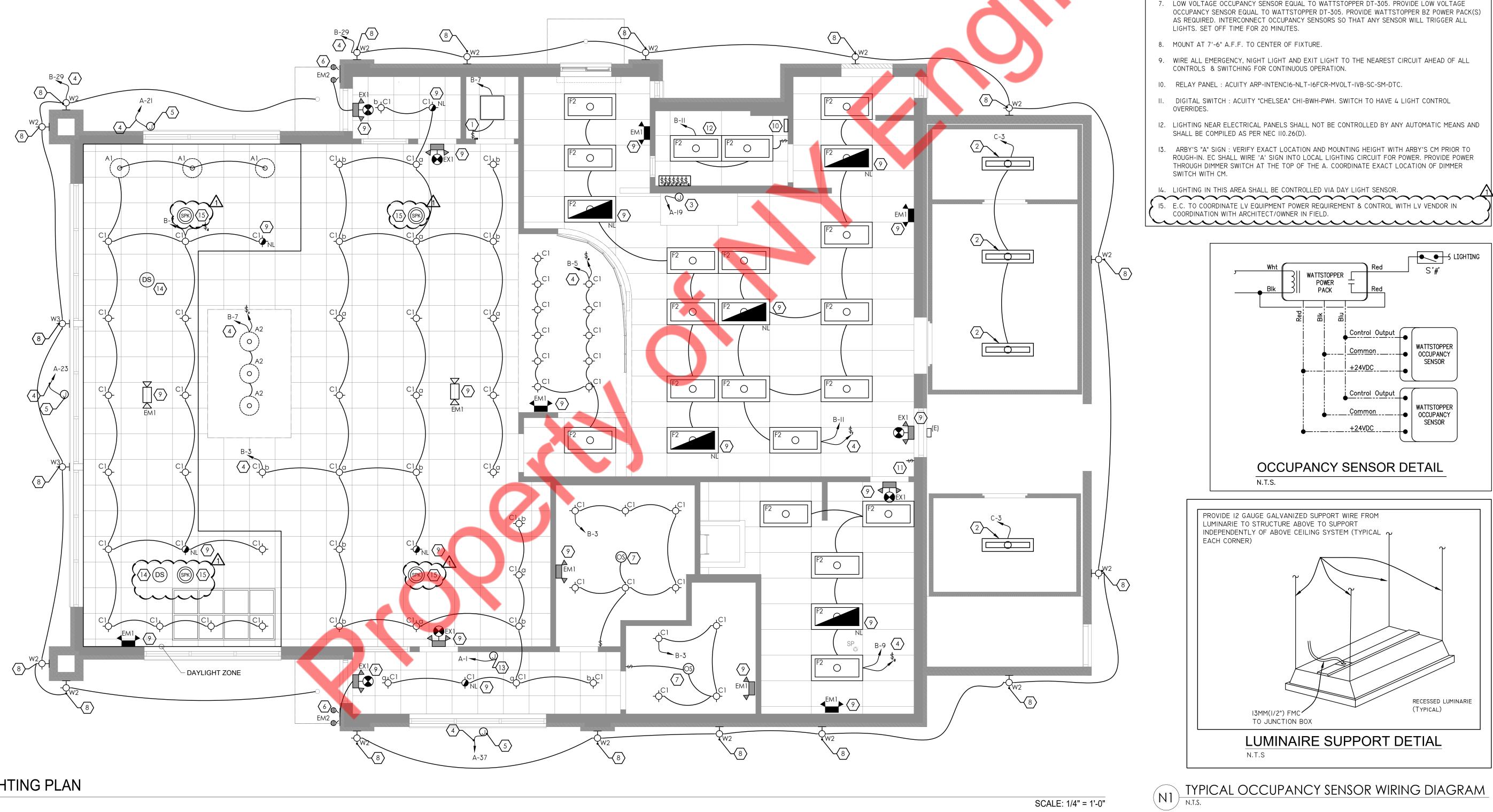
- ALL MOUNTED OCCUPANCY SENSOR EQUAL TO WATTSTOPPER WS-250.SET OFF TIME TO 20 MINUTES FOR RESTROOM & OFFICE APPLICATIONS, SET DIP SWITCH TO AUTOMATIC ON.
- THE EXISTING FREEZER/COOLER LIGHTING FIXTURE, LIGHTING CONTROL & ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY THE OPERABLE CONDITION OF EXISTING LIGHT FIXTURE, LIGHTING CONTROL & E.C. TO RECONNECT EXISTING CIRCUIT TO NEW BREAKER AS SHOWN REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- VAPOR PROOF LIGHT FIXTURES FURNISHED BY EXHAUST HOOD MANUFACTURER. EC SHALL INSTALL LIGHT FIXTURES PER MANUFACTURER'S RECOMMENDATION AND WIRE THRU EXHAUST HOOD CONTROLLER. SEE POWER PLAN. MAKE FINAL CONNECTION.
- 4. THRU RELAY PANEL. SEE DETAIL AND SCHEDULE SHEET E-5.
- 5. EXTERIOR SIGN: PROVIDE WP JB AT 19'-0". DO NOT COMBINE OR SHARE NEUTRALS WITH OTHER CIRCUITS. IF SIGN IS NOT EQUIPPED WITH INTEGRAL DISCONNECT, PROVIDE WP DISC SW. COORDINATE WITH SIGN VENDOR. MOUNT JB INSIDE BUILDING IN TRUSS SPACE.
- 6. MOUNT AT 9'-2" AFF TO CENTERLINE OF FIXTURE.
- 7. LOW VOLTAGE OCCUPANCY SENSOR EQUAL TO WATTSTOPPER DT-305. PROVIDE LOW VOLTAGE OCCUPANCY SENSOR EQUAL TO WATTSTOPPER DT-305. PROVIDE WATTSTOPPER BZ POWER PACK(S) AS REQUIRED. INTERCONNECT OCCUPANCY SENSORS SO THAT ANY SENSOR WILL TRIGGER ALL LIGHTS. SET OFF TIME FOR 20 MINUTES.
- 8. MOUNT AT 7'-6" A.F.F. TO CENTER OF FIXTURE.
- 9. WIRE ALL EMERGENCY, NIGHT LIGHT AND EXIT LIGHT TO THE NEAREST CIRCUIT AHEAD OF ALL CONTROLS & SWITCHING FOR CONTINUOUS OPERATION.
- IO. RELAY PANEL: ACUITY ARP-INTENCI6-NLT-I6FCR-MVOLT-IVB-SC-SM-DTC.
- II. DIGITAL SWITCH: ACUITY "CHELSEA" CHI-BWH-PWH. SWITCH TO HAVE 4 LIGHT CONTROL OVERRIDES.
- 12. LIGHTING NEAR ELECTRICAL PANELS SHALL NOT BE CONTROLLED BY ANY AUTOMATIC MEANS AND SHALL BE COMPILED AS PER NEC 110.26(D).
- 13. ARBY'S "A" SIGN: VERIFY EXACT LOCATION AND MOUNTING HEIGHT WITH ARBY'S CM PRIOR TO ROUGH-IN. EC SHALL WIRE 'A' SIGN INTO LOCAL LIGHTING CIRCUIT FOR POWER. PROVIDE POWER THROUGH DIMMER SWITCH AT THE TOP OF THE A. COORDINATE EXACT LOCATION OF DIMMER SWITCH WITH CM.
- 14. LIGHTING IN THIS AREA SHALL BE CONTROLLED VIA DAY LIGHT SENSOR. IS. E.C. TO COORDINATE LV EQUIPMENT POWER REQUIREMENT & CONTROL WITH LV VENDOR IN COORDINATION WITH ARCHITECT/OWNER IN FIELD.





LUMINAIRE SUPPORT DETIAL

DATE DESCRIPTION 1 | 10/31/2024 | PERMIT COMMENTS DWG DATE: 09-18-2024 DRAWN BY: REVIEWED BY: PROJECT No.: DWG TITLE: LIGHTING PLAN



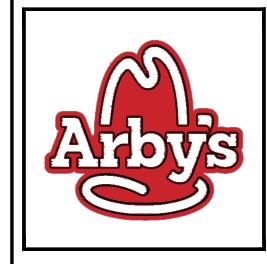
LIGHTING PLAN

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

GENERAL NOTES: A. VERIFY POWER AND ROUGH-IN REQUIREMENTS WITH KITCHEN EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN. B. MAKE ALL CONNECTIONS AND PROVIDE ALL DEVICES TO PLACE EQUIPMENT IN OPERATION. EC TO INSTALL SITE MENU BOARD AND SPEAKER POST. EC TO PROVIDE POWER TO SMOKE DETECTORS. (5) JB FOR POS SYSTEM— REFER TO THE APPROPRIATE DRAWINGS FOR THE EXACT LOCATION OF EQUIPMENT INSTALLED UNDER OTHER DIVISIONS OF THE DOCUMENTS WHICH REQUIRE ELECTRICAL SERVICE. —DUPLEX FOR MUSIC SYSTEM PULL BOX AND STRING FOR -FUTURE SECURITY SYSTEM EC SHALL COORDINATE WITH OWNER FOR CABLES TO BE PULLED FOR CASH REGISTER AND MONITOR SYSTEM. EC SHALL INSTALL OWNER PROVIDED CABLES AS REQUIRED TO MAKE A COMPLETE AND WORKING PULL BOX AND STRING FOR POS & RJ45 ETHERNET (13) TWO RJ11 PHONE JACKS -REFER TO SHEET E-4 FOR ROOF ELECTRIC PLAN. ALL SINGLE PHASE 50A OR LESS, RATED 150V TO GROUND OR LESS, AND ALL THREE PHASE RECEPTACLES CO2 MONITOR **ELEVATION** THAT ARE 100A OR LESS, RATED 150V TO GROUND OR LESS SHALL HAVE GFCI PROTECTION. POS SYSTEM INSTALLER SHALL INSTALL CAT 6 CABLING FROM POS JB'S TO PUNCH PANEL IN MANAGERS \sim PUNCH PANEL JB $\langle 34 \rangle$ OFFICE. INSTALL COVER PLATES AND LABELING AT BOTH ENDS OF ALL CABLE RUNS. COORDINATE WITH DINING AREA: DUPLEX RECEPTACLES SHALL BE BROWN WITH STAINLESS STEEL COVER PLATES. MANAGER'S DESK ELEVATION $_{-}$ JB FOR DT TIMER SYSTEM \langle 21angleTCHEN AREA: DUPLEX RECEPTACLES SHALL BE WHITE WITH WHITE COVER PLATES. -QUAD FOR DT TIMER SYSTEM POWER (22) -QUAD FOR MICROPHONE SPEAKER POWER (10) JB FOR DT LOOP DETECTORS EC SHALL PROVIDE (I) I" CONDUIT FOR POWER FOR DRIVE-THRU LOOP DETECTOR. VERIFY EXACT LOCATION WITH GC. MAKE FINAL CONNECTIONS.— - EC SHALL PROVIDE (2) I" CONDUITS, (I) I" CONDUIT FOR POWER & (I) CONDUIT FOR DATA FOR DRIVE-THRU MENUBOARD. VERIFY EXACT LOCATION WITH GC. MAKE FINAL CONNECTIONS. EC SHALL PROVIDE (2) I" CONDUITS, (I) I" CONDUIT FOR POWER & (I) I' CONDUIT FOR DATA FOR DRIVE-THRU SPEAKER CANOPY. VERIFY EXACT LOCATION WITH GC. MAKE FINAL CONNECTION $^{\sim}$ JB FOR POS BUMP BAR \langle 17 angle-SITE LIGHTING CONDUITS STUBBED IN<mark>TO</mark> SPACE BY GC. EC SHA COORDINATE WIRING REQUIREMENTS AND MAKE FINAL CONNECTIONS. EC SHALL WIRE SITE LIGHTING THRU LIGHTING RELAY PANEL FOR CONTROLS. \sim JB FOR AUTO OPENER \langle 6 angleSEE SHEET E-5. EX. CT CABINET DRIVE THRU ELEVATION

POWER PLAN KEYED NOTES NOTES:

- I. BELL TRANSFORMER ABOVE CEILING (EDWARDS #99B)
- 2. BELL: EDWARDS #17-4. PROVIDE ALL WIRING REQUIRED TO MAKE THE COMPLETE BELL SYSTEM. INSTALL BELL SYSTEM PER MANUFACTURER'S RECOMMENDATIONS.
- 3. <u>TELEPHONE TERMINAL BOARD:</u> 2'-0" X 2'-0" X 3/4" FIRE RETARDANT PLYWOOD BACKBOARD ABOVE PUNCH PANEL. MOUNT AS HIGH AS POSSIBLE ON WALL. COORDINATE WITH GC PRIOR TO ROUGH-IN. PROVIDE A #6 GROUND
- 4. EXISTING WALK-IN COOLER / FREEZER & ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL FIELD VERIFY THE OPERABLE CONDITION IN FIELD. REPLACE IF FOUND IN OPERABLE. BASE BID ACCORDINGLY.
- 5. POS: PROVIDE JB & DUPLEX RECEPTACLE. COORDINATE WITH POS INSTALLER PRIOR TO ROUGH IN. SHEET E-5 FOR FURTHER INFORMATION.
- 6. PROVIDE JB UNDER DRIVE-THRU WINDOW FOR AUTO OPENER.
- E.C. SHALL COORDINATE EXACT LOCATION, DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.
- 8. PROVIDE CONNECTION TO FOOD PRODUCTION COUNTER PANEL (PROVIDED BY FOOD PRODUCTION COUNTER MANUFACTURER). COORDINATE CONNECTION WITH FOOD PRODUCTION COUNTER WITH MANUFACTURER PRIOR TO ROUGH-IN. MAKE CONNECTION PER MANUFACTURER'S RECOMMENDATIONS. SEE ONE-LINE RISER DIAGRAM ON SHEET E-5. ROUTE CONDUIT AND FEEDERS ABOVE CEILING TO PRODUCTION COUNTER THEN DOWN TO PRODUCTION COUNTER THROUGH POWER CHASE. COORDINATE EXACT LOCATION OF POWER CHASE IN FIELD. MAKE FINAL CONNECTION. REFER TO ONE-LINE DIAGRAM FOR CONTINUATION.
- GAS SOLENOID VALVE: PROVIDE JB ABOVE CEILING (COORDINATE EXACT LOCATION WITH HOOD SUPPLIER PRIOR TO ROUGH IN). INTERLOCK SOLENOID VALVE TO HOOD SUPPRESSION SYSTEM/MASTER CONTROL PANEL AS NORMALLY OPEN SO THAT GAS APPLIANCES WILL NOT OPERATE WITHOUT HOOD EXHAUST IN USE.
- PROVIDE DRIVE THRU LOOP DETECTORS AT THE MENU BOARD CANOPY AND OUTSIDE THE DRIVE THRU WINDOW. PROVIDE A I" EMPTY CONDUIT WITH PULLSTRING FOR DRIVE THRU WINDOW LOOP THROUGH THE CURB, FOUNDATION AND FLOOR SLAB, AND UP THE DRIVE-THRU WINDOW WALL TO ABOVE THE CEILING. CONDUIT SHALL NOT BE EXPOSED TO THE EXTERIOR. COORDINATE WITH ARBY'S CM PRIOR TO ROUGH IN.
- II. FUTURE WIFI: PROVIDE DUPLEX RECEPTACLE AND JB WITH PULL STRING AND (I) "8P8C" CONNECTOR ABOVE CEILING. SECURE TO LOBBY SIDE OF TRUSS.
- 2. HOOD MASTER CONTROL PANEL (FURNISHED BY HOOD SUPPLIER/INSTALLED BY E.C). AUTOMATICALLY ACTIVATE EXHAUST FAN WHEN COOKING OPERATIONS OCCUR. REFER TO FP OPTION SENSOR INSTALLATION DETAIL BY KEC FOR ADDITIONAL INFORMATION. PROVIDE CONTROL WIRING REQUIRED FOR CONNECTION OF SENSOR TO CONTROL PANEL. EXTEND WIRING FROM CONTACTS AND CONNECT DEVICES UNDER HOOD TO CONTACTORS FOR SHUNT TRIP. REFER TO HOOD CONTROL WIRING SCHEMATIC BY KEC FOR ADDITIONAL INFORMATION.
- I3. PROVIDE JB AND (2) 3/4" EMPTY CONDUITS WITH PULLSTRING TO ABOVE ACCESSIBLE CEILING FOR (2) "RJII" PHONE JACKS (BY OTHERS).
- 14. START/STOP SWITCH WITH PILOT LIGHT (PROVIDED WITH HOOD) FOR HOOD EXHAUST FAN AND LIGHTING. MAKE FINAL CONNECTIONS AS REQUIRED.
- 15. ROUTE POS CABLES INSIDE CASEWORK. COORDINATE WITH ARBY'S CM BEFORE INSTALLATION.
- 16. ROUTE CIRCUIT FOR HOOD EXHAUST FAN EF-I(N) THROUGH HOOD MASTER CONTROL PANEL FOR CONTROL. SEE ROOF POWER PLAN, SHEET E-4 FOR COORDINATION.
- 7. POS BUMP BAR: PROVIDE EMPTY 3/4" CONDUIT WITH PULL STRING FROM JB TO ABOVE CEILING. COORDINATE MOUNTING HEIGHT WITH ARBY'S CM PRIOR TO ROUGH IN.
- 18. EC SHALL RUN CONDUIT FOR POWER IN WALL TO CEILING SPACE AND BACK TO PANEL.
- 19. PROVIDE FINAL CONNECTION TO HEAT TRACE FURNISHED BY OTHERS.
- 20. THRU RELAY PANEL/TIMER.
- 21. DRIVE-THRU TIMER SYSTEM: PROVIDE JB AND 3/4" EMPTY CONDUIT WITH PULLSTRING TO ABOVE ACCESSIBLE CEILING. SEE MANUFACTURER'S INSTRUCTIONS FOR DRIVE-THRU TIMER SYSTEM.
- 22. DRIVE-THRU TIMER SYSTEM POWER: LOCATE ABOVE DRIVE-THRU WINDOW. SEE MANUFACTURER'S INSTRUCTIONS FOR DRIVE-THRU TIMER SYSTEM. SEE SHEET A-5 FOR ELEVATION.
- 23. PROVIDE OUTLET FOR IRRIGATION. COORDINATE EXACT LOCATION OF OUTLET WITH IRRIGATION VENDOR.
- 24. PROVIDE JB FOR FUTURE SECURITY MONITOR.
- 25. BAG-IN-BOX: LOCATE 6" BELOW CEILING.
- 26. ANSUL PULL STATION: PROVIDE A 4" OCTAGON JB AT 44" A.F.F. LOCATE AT A MINIMUM OF 10'-0", NOT TO EXCEED 25'-0", FROM THE HOOD ON THE EXIT PATH. REFER TO DETAIL ON SHEET E-5.
- 27. BELL PUSH BUTTON: "EDWARDS #B-52" MOUNT AT 44" A.F.F.
- 28. EXISTING WATER HEATER SHALL REMAIN. E.C. SHALL FIELD VERIFY THE OPERABLE CONDITION AND RECONNECT TO NEW CIRCUIT BREAKER AS SHOWN. REPLACE IF FOUND IN OPERABLE. BASE BID ACCORDINGLY.
- 29. PROVIDE ELECTRICAL OUTLETS IN WALL RECESS FOR MENU BOARD. REFER TO ARCHITECTURAL DRAWINGS (SHEET A-4 FOR MORE INFORMATION.)
- 30. PROVIDE EMPTY 2" CONDUIT WITH PULLSTRING FROM 4X4 JB IN CABINETRY TO NEAREST FULL HEIGHT WALL.
 PROVIDE CONDUIT TO ABOVE ACCESSIBLE CEILING FOR POS SYSTEM CABLES. SEE SCHEMATIC SHEET E-3. DO
 NOT PENETRATE SHEAR WALL.
- 31. PROVIDE WALL MOUNTED DUPLEX RECEPTACLE AND EMPTY JB FOR WALL MOUNTED MONITOR. COORDINATE EXACT LOCATION IN THE FIELD WITH ARBY'S CM PRIOR TO ROUGH-IN. POS INSTALLER SHALL PROVIDE MONITOR PRACKET
- 32. PROVIDE NEMA 6-20R RECEPTACLE.
- 33. PROVIDE JB FOR PHONE/DATA PUNCH PANEL LOCATED BELOW TTB.
- 34. EC SHALL PROVIDE COPPER USB CHARGER/TAMPER RESISTANT DUPLEX RECEPTACLE (#TR7740W ON TILE, #TR7740BK ON WOOD) MOUNT HORIZONTAL AT HEIGHT SHOWN WITH STAINLESS STEEL COVERPLATE.
- 35. ALL DEVICES LOCATED IN THIS AREA SHALL BE WIRED FROM PRODUCTION COUNTER PANEL.
- 36. RECEPTACLE FOR SODA EQUIPMENT. WIRE INTO SODA DISPENSER CIRCUIT AND MAKE FINAL CONNECTIONS.
- 37. CARBONATOR FIELD VERIFY EXACT LOCATION PRIOR TO ROUGH IN.
- 38. INFRARED FAUCET SENSOR. COORDINATE WITH PLUMBING CONTRACTOR AND MAKE FINAL CONNECTIONS.
- 39. AUTOMATIC VALVE SENSOR (ABOVE CEILING.) COORDINATE WITH PLUMBING CONTRACTOR AND MAKE FINAL CONNECTIONS.
- 40. SHOW WINDOW RECEPTACLE: INSTALL AT NO MORE THAN 18" ABOVE WINDOW. PROVIDE CEILING BOX HANGER AND COVERPLATE TO MATCH CEILING TILE. INSTALL CONDUIT ABOVE CEILING AND ROUTE CIRCUIT THROUGH TIMECLOCK CONTROLLED CONTACTOR. REFER TO DETAIL ON SHEET E-5.
- II. HOT WATER HEATER CONTROL PANEL: PROVIDE EMPTY 3/4" CONDUIT WITH PULLSTRING TO ABOVE ACCESSIBLE CEILING.
- 42. TELEVISION: PROVIDE QUAD RECEPTACLE AND QUAD GANG JB AND MOUNT AT 9'-0" A.F.F. PULL 3/4" EMPTY CONDUIT WITH PULLSTRING FROM JB TO ABOVE ACCESSIBLE CEILING AND STUB.
- 43. CO2 MONITORING SYSTEM. EC SHALL PROVIDE JB FOR REMOTE SENSOR AT 18" A.F.F. LOCATED AT CO2 TANKS. EC SHALL PROVIDE JB WITH 3/4" EMPTY CONDUIT WITH PULLSTRING TO ABOVE ACCESSIBLE CEILING FOR MONITORING CABLING. PROVIDE BACKBOX AT MANAGERS DESK FOR MONITORING DISPLAY. ALL SYSTEM CONTROL WIRING PROVIDED BY CO2 SYSTEMS INSTALLER. COORDINATE EXACT LOCATIONS OF DEVICES WITH CO2 SYSTEMS INSTALLER PRIOR TO ROUGH-IN. SEE SHEET E-0 FOR DETAIL.
- 4. EC SHALL PROVIDE JB ABOVE CEILING FOR ANSUL SYSTEM AUDIO / VISUAL DEVICE. COORDINATE FINAL LOCATION WITH FIRE MARSHALL AND ANSUL INSTALLER.
- 45. DISHWASHER: PROVIDE JB AT 24".
- 46. MOUNT JUNCTION BOX AT 66" A.F.F.

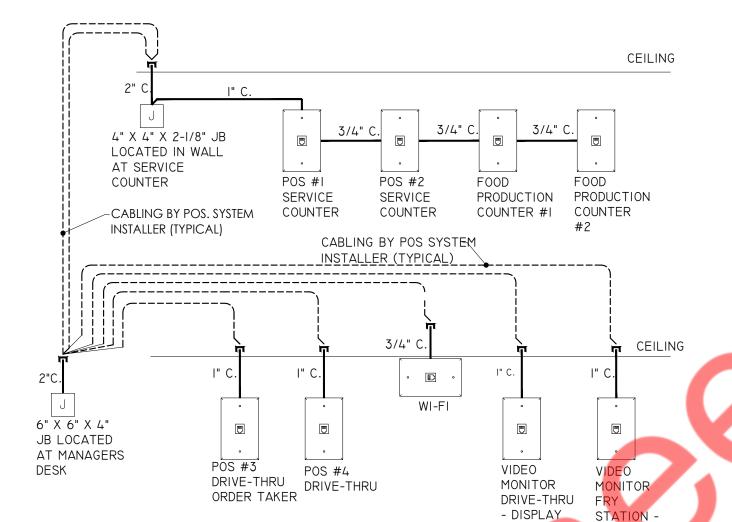


I									
I		[:	SSUE						
I	No.	DATE	DESCRIPTION						
I	1	10/31/2024	PERMIT COMMENTS						
I									
ı									
I									
I									
I									
I									
I									
I	DWG	DATE:	09-18-2024						
I	DRA	WN BY:	NYE						
I	REVI	EWED BY:							
I	PRO	JECT No.:							
ı	DWG	TITLE:							

POWER PLAN

CHEET NO

E-2



P.O.S. SYSTEM CONDUIT/CABLING SCHEMATIC

VIDEO MONITOR

DRIVE-THRU-3

POS#2 SERVICE COUNTER

PRODUCTION COUNTER#2

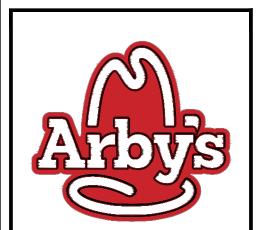
CABLING BY POS SYSTEM INSTALLER (TYPICAL) POS#4 DRIVE-THRU

3 FRY STATION-

PRODUCTION
— COUNTER#4

KEYED NOTES: (#)

- I. PROVIDE I" CONDUIT FROM WALL JUNCTION BOX.
- 2. PROVIDE JUNCTION BOX AND 2" CONDUIT FOR POS SYSTEM. COORDINATE WITH POS INSTALLER PRIOR TO ROUGH IN. SEE SCHEMATIC THIS SHEET.
- 3. PROVIDE JUNCTION BOX AND I" CONDUIT FOR POS SYSTEM. COORDINATE WITH POS INSTALLER PRIOR TO ROUGH-IN. SEE CONDUIT/CABLING SCHEMATIC THIS SHEET FOR MORE INFORMATION.
- 4. PROVIDE JUNCTION BOX WITH PULL STRING AND (I) "8P8C" CONNECTOR ABOVE CEILING. SECURE TO LOBBY SIDE OF TRUSS ABOVE DECOR WALL FOR FUTURE WIFI. COORDINATE EXACT LOCATION WITH GENERAL CONTRACTOR.
- PROVIDE JUNCTION BOX AND (2) 3/4" EMPTY CONDUITS WITH PULLSTRING TO ABOVE ACCESSIBLE CEILING FOR (2) "RJII" PHONE JACKS (BY OTHERS).
- 6. PROVIDE EMPTY 2" CONDUIT WITH PULLSTRING FROM 6"X6"X4" JUNCTION BOX TO ABOVE ACCESSIBLE CEILING FOR POS SYSTEM CABLES.
- PROVIDE JUNCTION BOX FOR PHONE/DATA PUNCH PANEL LOCATED BELOW TTB.
- 8. PROVIDE 3/4" CONDUIT RUN IN HALF WALL.
- 9. PROVIDE CONDUIT ABOVE CEILING BACK TO MANAGERS DESK.



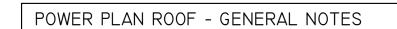
ISSUE										
No.	DATE	DESCRIPTION								
DWG	DATE:	09-18-2024								
DRAV	WN BY:	NYE								
REVI	EWED BY:									
PRO	JECT No.:									
DWG	TITLE:									
$\mid r \mid r \mid r$	TV2 2	EM PLAN								

POS SYTEM PLAN

SHEET No.

POS SYSTEM PLAN

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



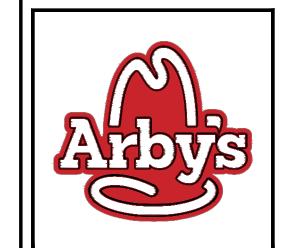
- I. COORDINATE EXACT LOCATION OF HVAC EQUIPMENTS ON ROOF WITH MECHANICAL CONTRACTOR.
- 2. ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER FOR FINAL SELECTION PRIOR TO ROUGH-IN. E.C. COORDINATE LOCATION OF DISCONNECT SWITCH WITH MANUFACTURER AND MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.

POWER PLAN ROOF - KEYED WORK NOTES (#)

- I. EXISTING CIRCUIT AND DISCONNECTING MEANS FOR EXISTING ALL RTU'S SHALL REMAIN. E.C. SHALL VERIFY OPERABLE CONDITION OF EXISTING DISCONNECT INCLUDING WIRE/CONDUIT/BREAKER IN FIELD, REPLACE WITH NEW IF FOUND INOPERABLE. INFORM ENGINEER ON RECORD FOR ANY DISCREPANCY PRIOR TO BID. BASE BID ACCORDINGLY.
- 2. THE EXHAUST FAN EF-I (N) AND EF-2 (N) SHALL BE INTERLOCKED WITH THE KH-I HOOD EXAHUST AND RESTROOM LIGHTS RESPECTIVELY . E.C. TO COORDINATE WITH MECHANICAL DRAWINGS AND PROVIDE NECESSARY WIRING AND CONTROL AS REQUIRED ON FIELD.
- 3. DRIVE-THRU BEVERAGE STATION ICE MAKER CONDENSING UNIT: 2.4 KW, 208V-IPH. PROVIDE (2) #12, #12G IN 3/4" CONDUIT FROM 20A/2P BREAKER THROUGH 30A/2P NON-FUSED NEMA 3R DISC SWITCH TO UNIT. MAKE FINAL CONNECTION.

A:20,22

30A/2P/NF/ 3 ICE 3R/WP MAKER CONDENSER UNIT



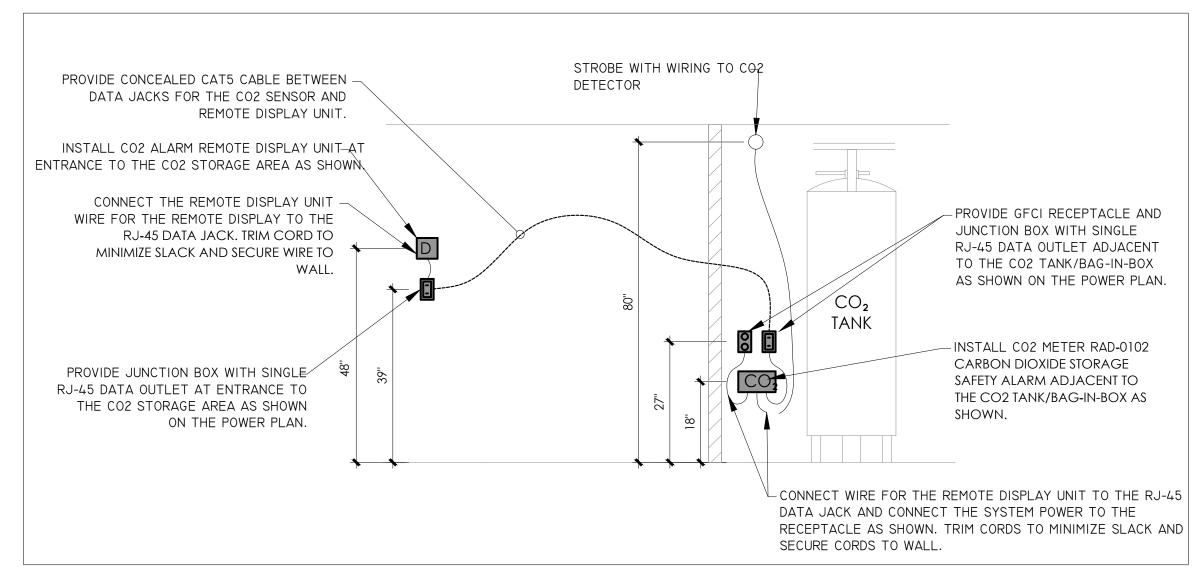
		SSUE
No.	DATE	DESCRIPTION
DWG	DATE:	09-18-2024
DRAW	'N BY:	NYE
REVIE	EWED BY:	
PROJI	ECT No.:	
DWG	TITLE:	

SUEET No.

E-4

ROOF POWER PLAN

SCALE: 14" = 1"-9"



A9 CO2 DETECTOR DETAIL

∠208V, 30A, 2P CONTACTOR FOR ELECTRICAL EQUIPMENT UNDER HOOD — H → A-18 120V, 20A, 4P CONTACTOR FOR ELECTRICAL EQUIPMENT UNDER HOOD ── SPARE HOOD CONTROL PANEL (BY OTHERS) TO EF-IA/B ANSUL FIRE EXTINGUISHING CABINET CONTROL TO MAU-I CONTROL NEUTRAL 2-POLE SW. & PILOT LIGHT NOTES: I. ELECTRICAL CONTRACTOR SHALL PROVIDE CONTACTORS AND ALL INTERLOCK WIRING. COORDINATE EXACT TERMINATION REQUIREMENTS WITHIN HOOD CONTROL PANEL AND ANSUL CABINET WITH HOOD MANUFACTURER.

CO2 ALARM OPTIONS X CO2 DETECTOR X CO2 REMOTE DISPLAY UNIT REMOTE STROBE RELAY

N.T.S

SHUNT TRIP WIRING DIAGRAM

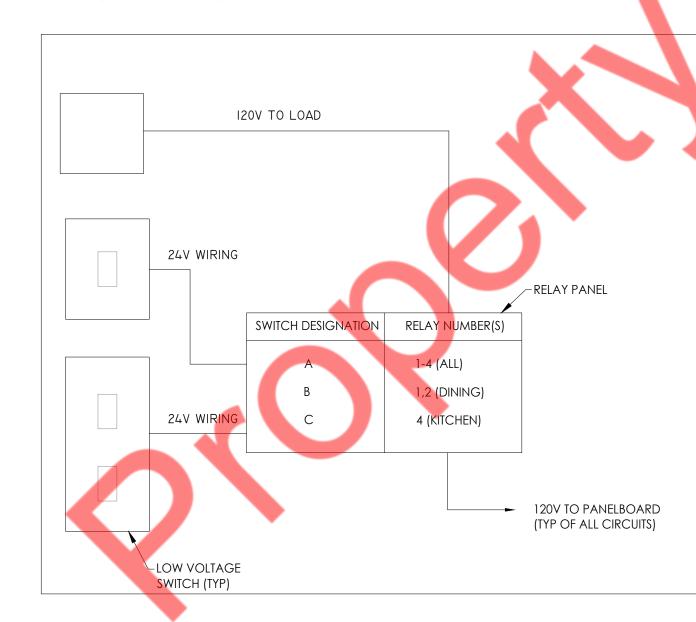
LIGHTING CONTROL PANEL SCHEDULE CIRCUIT NUMBER | AREA CONTROLLED | CONTROL | VOLTS RELAY LVS/TC DINING LIGHTING 120 B-3 LVS/TC DINING LIGHTING 120 LVS/TC 120 B-5 SERVICE LIGHTING KITCHEN LIGHTING LVS/TC B-II 120 B-29 EXTERIOR LIGHTING TC/PC 120 TC/PC 120 A-21 SIGNAGE TC 120 A-21 SIGNAGE TC 120 B-30 SHOW WINDOW TC 120 B-34 SHOW WINDOW B-36 SHOW WINDOW TC 120 SITE LIGHTING TC/PC 120 C-31 SITE LIGHTING TC/PC 120 C-33 SPARE SPARE SPARE

SPARE

LIGHTING CONTROL WIRING DIAGRAM

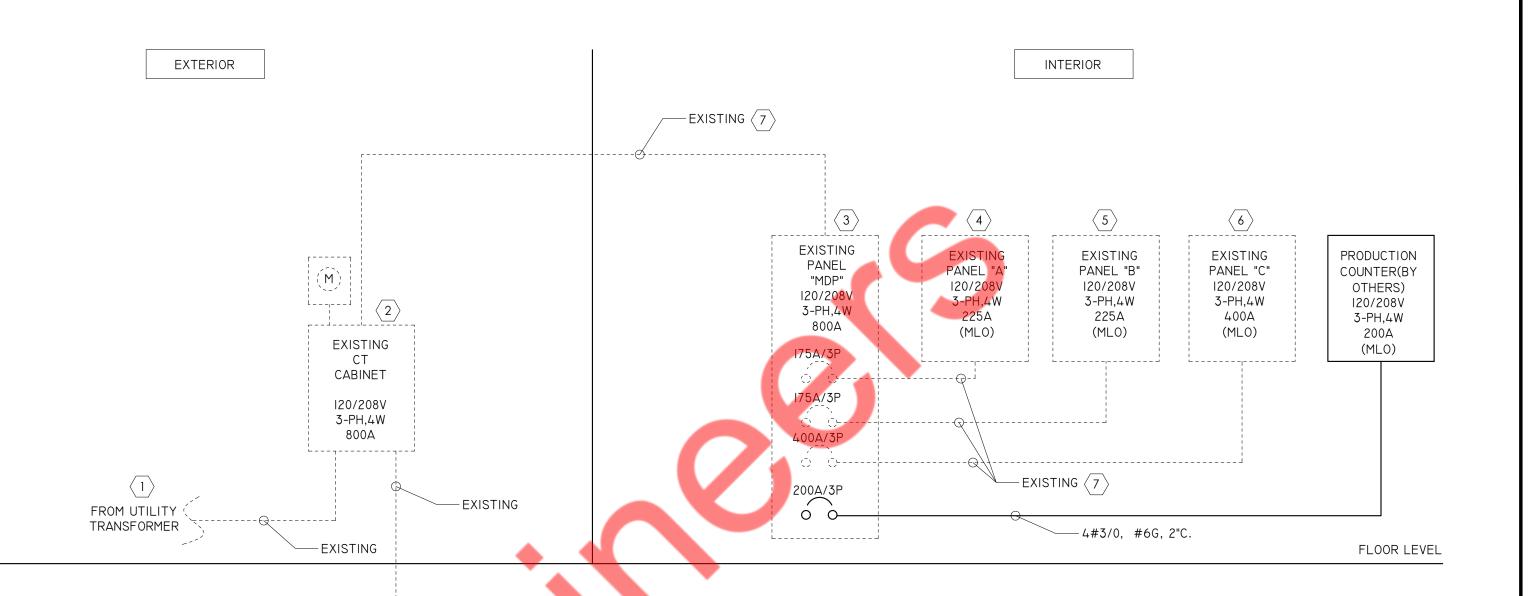
LIGHTING CONTROL WIRING DIAGRAM

N.T.S



TC = TIME CLOCK
PC = PHOTOCELL
LVS = LOW VOLTAGE SWITCH

N.T.S



RISER DIAGRAM GENERAL NOTES

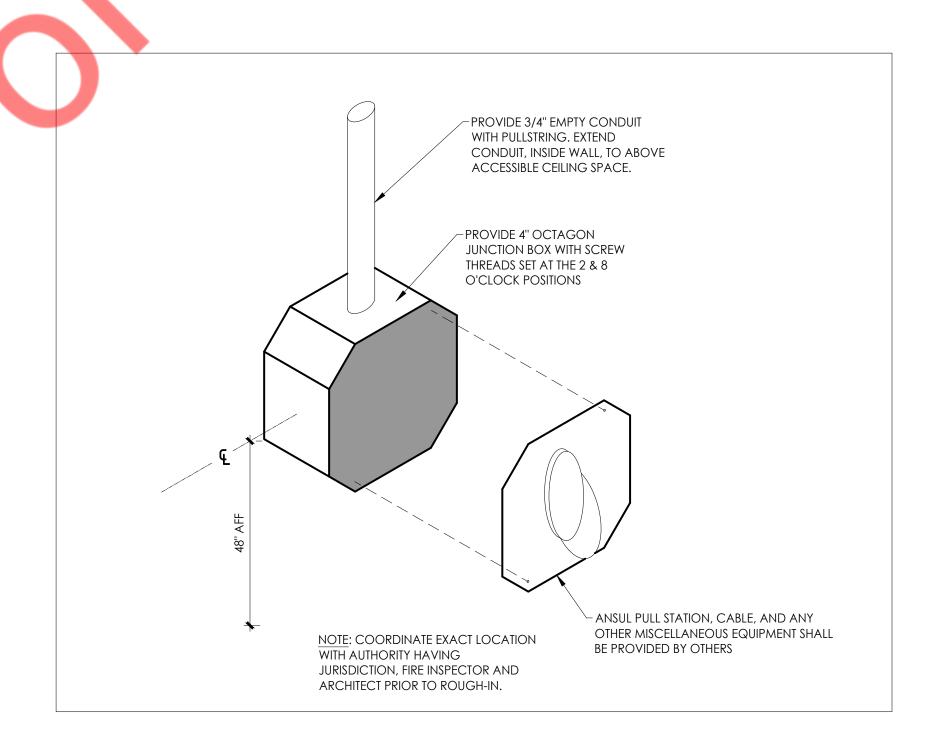
- I. RISER DIAGRAM IS FOR REFERENCE PURPOSES ONLY. E.C. SHALL VERIFY EXACT POWER DISTRIBUTION IN FIELD AND INFORM ENGINEER ON RECORD FOR ANY DISCREPANCY.
- 2. E.C. SHALL VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION IN FILED COORDINATION WITH OWNER/ARCHITECT.
- 3. ELECTRICAL CONTRACTOR TO COORDINATE FAULT CURRENT (ISC RATING WITH UTILITY COMPANY AND AHJ PRIOR TO BID.

ELECTRICAL RISER DIAGRAM

RISER DIAGRAM KEYED NOTES (#)

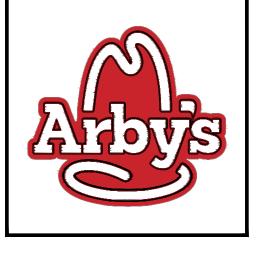
- I. EXISTING 800A, 120/208V, 3-PHASE, 4-WIRE ELECTRICAL SERVICE FROM THE UTILITY SHALL REMAIN. E.C. SHALL VERIFY AND COORDINATE EXACT RATING AND LOCATION WITH UTILITY COMPANY/OWNER IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.
- 2. EXISTING 800A, I20/208V, 3-PHASE, 4-WIRE CT CABINET AND ELECTRICAL METER SHALL REMAIN. E.C. SHALL VERIFY EXACT RATING AND LOCATION IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.
- 3. EXISTING 800A (MLO), I20/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "MDP" SHALL REMAIN. E.C. SHALL VERIFY EXACT RATING, LOCATION AND THE OPERABLE CONDITION OF EXISTING ELECTRICAL PANEL "MDP" IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.
- 4. EXISTING 225A (MLO), I20/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "A" SHALL REMAIN. E.C. SHALL VERIFY EXACT RATING, LOCATION AND THE OPERABLE CONDITION OF EXISTING ELECTRICAL PANEL "A" IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.
- 5. EXISTING 225A (MLO), I20/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "B" SHALL REMAIN. E.C. SHALL VERIFY EXACT RATING, LOCATION AND THE OPERABLE CONDITION OF EXISTING ELECTRICAL PANEL "B" IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.
- 6. EXISTING 400A (MLO), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "C" SHALL REMAIN. E.C. SHALL VERIFY EXACT RATING, LOCATION AND THE OPERABLE CONDITION OF EXISTING ELECTRICAL PANEL "C" IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.
- 7. EXISTING ELECTRICAL FEEDER SHALL REMAIN. E.C. SHALL VERIFY THE RATING, CONDUIT SIZE AND OPERABLE CONDITION OF EXISTING ELECTRICAL FEEDER IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.

N.T.S





N.T.S



	[:	SSUE
No.	DATE	DESCRIPTION
DWG	DATE:	09-18-2024
DRAV	WN BY:	NYE
REVI	EWED BY:	
PRO	JECT No.:	
DWG	TITLE:	
FΙ	FCTRI	CAL RISER

ELECTRICAL RISER DIAGRAM AND DETAILS

SHEET No.

E-5

PANEL:	MDP (E	XISTING)												MOUNTING: RECESSED					
120/208	VOLTS,		3	PHASE,			4	WIRE						PANEL LOCATION: OFFICE					
MAIN CB:	NA		MLO:	800A		BUS:	EXISTNG	MIN,						FED FROM: EX. ELE. SERVIC	E				
NOTE:	TRIP				LOAD	LOAD	MINIMUM BRANCH	DEC	PHASE (K	\/A\	MINIMUM BRANCH	LOAD	LOAD		TRIP				
CKT NO.	AMPS	[ESCRIPTION C	F LOAD	TYPE	(KVA)	CIRCUIT	A	B B	C C	CIRCUIT	(KVA) TYPE		DESCRIPTION OF LOAD	AMPS	CKT NO			
					0	10.04		16.41				6.36	Н						
1	3P-175 EX. PANEL B			0	10.04	EXISTNG		16.41		EXISTNG	6.36	Н	EX. RTU-3	3P-60	1				
				0	10.04	/ 1\			16.41	6	6.36	Н							
					0 (13.22)	13.22					•						
2	3P-400	EX. PANEL C			0	13.22) EXISTNG		13.22							2			
				0 \	13.22	<u> </u>			13.22										
					E	19.21		23.66				4.44	Н						
3	3P-200	PRODUCTION	I COUNTER(BY	OTHERS)	E	19.21	4#3/0, #6G, 2"C.		23.66		EXISTNG	4.44	Н	EX. RTU-2	3P-50	3			
					E	19.21				23.66		4.44	Н						
					0	9.22		12.59				3.36	Н		3P-45				
4	4 3P-175 EX. PA	EX. PANEL A	EX. PANEL A	. PANEL A	EL A	VEL A	C. PANEL A		0	9.22		12.59		EXISTNG	3.36	Н	EX. RTU-1		4
					0	9.22			~~		/1\	3.36	Н						
						TOTAL	CONNECTED LOAD (KVA		65.88	65.88									

PANEL:	A (EXIS	TNG)										MOUNTING: RECESSED		
120/208	VOLTS,	3 PHASE,			4	WIRE						PANEL LOCATION: OFFICE		
MAIN CB:	NA	MLO: 225A		BUS:	225A	MIN,						FED FROM: EX. MDP		
NOTE:	1			Į.										
CKT NO.	TRIP	DESCRIPTION OF LOAD	LOAD	LOAD	MINIMUM BRANCH	PEF	R PHASE (K	VA)	MINIMUM BRANCH	LOAD	LOAD	DESCRIPTION OF LOAD	TRIP	CKT NO.
CKI NO.	AMPS	DESCRIPTION OF LOAD	TYPE	(KVA)	CIRCUIT	Α	В	С	CIRCUIT	(KVA)	TYPE	DESCRIPTION OF LOAD	AMPS	CKI NO.
_ 1	20	ARBY'S SIGN	L	1.00	2#12, #12G, 3/4"C	1.36			2#12, #12G, 3/4"C	0.36	0	RESTROOM AUTO SENSORS	20	2
2 > 3	20	8-HEAD DRINK DISPENSER	E	1.10	2#12, #12G, 3/4"C		2.18		2#12, #12G, 3/4"C	1.08	R	39-DRIVE THRU ORDER SYSTEM	20	4
5	20	27-WATER HEATER CONTROLS	0	0.50	2#12, #12G, 3/4"C			2.30	2#12, #12G, 3/4"C	1.80	Е	92- ICE MAKER	20	6 (2
2\7	20	16-COOK AND HOLD CABINET	E	0.80	2#12, #12G, 3/4"C	0.90			2#12, #12G, 3/4"C	0.10	Е	75- DRIVE THRU WINDOW OPENER	20	_ 。 _
2 7 9 2 11	20	13-LEMONADE MACHINE	E	0.48	2#12, #12G, 3/4"C		1.28		2#12, #12G, 3/4"C	0.80	Е	16-COOK AND HOLD CABINET	20	10 (
$^{2})_{11}$	20	80-UPRIGHT FREEZER	E	0.70	2#12, #12G, 3/4"C			2.40	2#12, #12G, 3/4"C	1.70	Е	49-COFFEE MAKER	20	12 2
2) $^{13}_{15}$	20	16-COOK AND HOLD CABINET	E	0.80	2#12, #12G, 3/4"C	1.16			2#12, #12G, 3/4"C	0.36	R	MENUBOARD	20	
	20	16-COOK AND HOLD CABINET	E	0.80	2#12, #12G, 3/4"C		0.98		2#12, #12G, 3/4"C	0.18	Е	126-CO2 MONITORING SYSTEM	20	16 (2
2 >17	20	HOOD CONTROLS/GAS SOLENOID	E	1.20	2#12, #12G, 3/4"C			2.40	2#12, #12G, 3/4"C	1.20	E	43-THREE BANK FRYER	20	18 \
19	20	HOOD LIGHTING	L	0.20	2#12, #12G, 3/4"C	1.86			2#12, #12G, 3/4"C	1.66	Н	 - 92A- ICE MACHINE CONDENSER UNIT	2P-20	20
21	20	EXTERIOR SIGN	L	1.20	2#12, #12G, 3/4"C		2.86		2112, 1120, 374 0	1.66	Н	32A TEE WACTIINE CONDENSER ONT	21 20	22
23	20	EXTERIOR SIGN	L	1.20	2#12, #12G, 3/4"C			1.70	2#12, #12G, 3/4"C	0.50	0	HEAT TRACE	20	24
25	20	IRRIGATION	0	0.36	2#12, #12G, 3/4"C	0.96			2#12, #12G, 3/4"C	0.60	0	LOOP DETECTORS	20	26
27	20	DRIVE THRU TIMER SYSTEM	R	0.18	2#12, #12G, 3/4"C		0.98		2#12, #12G, 3/4"C	0.80	0	DRIVE THRU MENUBOARD	20	28
29	20	63-MUSIC SYSTEM	E	0.18	2#12, #12G, 3/4"C			0.48	2#12, #12G, 3/4"C	0.30	0	DRIVE THRU SPRAKER CANOPY	20	30
31	20	EQ-SATELLITE RECIEVER	E	0.18	2#12, #12G, 3/4"C	0.98			2#12, #12G, 3/4"C	0.80	E	84-BAG IN BOX	20	32 2
33	20	DINING-TV	R	0.36	2#12, #12G, 3/4"C		1.56		2#12, #12G, 3/4"C	1.20	E	96- GREASE STORAGE	20	34 🔀
35	20	EQ-POS/MONITOR(FRY DUMP)	R	1.08	2#12, #12G, 3/4"C			1.48	2#12, #12G, 3/4"C	0.40	E	44-CABONATOR	20	36 2
37	20	EXTERIOR SIGN	L	1.20	2#12, #12G, 3/4"C	1.70			2#12, #12G, 3/4"C	0.50	Н	EX. WALK IN COOLER EAVPORATOR	20	38
39	20	SPARE					1.00		2#10, #10G, 3/4"C	1.00	Н	 - EX. WALK IN FREEZER EAVPORATOR	2P-30	40
41	20	SPARE						1.00	2π10, π100, 3/4 C	1.00	Н	LA. WALKIN THELZER EAVI ONATOR	21-30	42
				TOTAL (CONNECTED LOAD (KVA)	8.92	10.84	11.76						

PANEL:	B (EXISI	TNG)										MOUNTING: RECESSED		
120/208	VOLTS,	3 PHASE,			4	WIRE						PANEL LOCATION: OFFICE		
MAIN CB:	NA	MLO: 225A		BUS:	225A	MIN,						FED FROM: EX. MDP		
NOTE:	TRIP	DESCRIPTION OF LOAD	LOAD	LOAD	MINIMUM BRANCH	PER	PHASE (K	VA)	MINIMUM BRANCH	LOAD	LOAD	DESCRIPTION OF LOAD	TRIP	CKT NO.
CKI IVO.	AMPS	DESCRIPTION OF LOAD	TYPE	(KVA)	CIRCUIT	Α	В	С	CIRCUIT	(KVA)	TYPE	DESCRIPTION OF EOAD	AMPS	CRI IVO.
1	20	POS/MONITOR(DRIVE THRU)	R	1.08	2#12, #12G, 3/4"C	1.26			2#12, #12G, 3/4"C	0.18	0	MICROPHONE SPEAKER	20	2
3	20	LTG-DINING, VESTIBULE & RESTROOM	L	0.53	2#12, #12G, 3/4"C		1.43		2#12, #12G, 3/4"C	0.90	R	RECEPTACLE-MANAGER'S DESK	20	4
5	20	LTG- SERVICE AREA	L	0.20	2#12, #12G, 3/4"C			1.28	2#12, #12G, 3/4"C	1.08	R	EQ-POS-FRONT COUNTER	20	6
7		LTG- DAYLIGHT ZONE & DINING AREA	L	0.30	2#12, #12G, 3/4"C	0.30								8
9		LTG-SUPPLIES ROOM	L	0.35	2#12, #12G, 3/4"C		0.35					SPARE	3P-20	10
11	20	LTG-KITCHEN AREA AND OFFICE	L	1.30	2#12, #12G, 3/4"C			1.30						12
13						0.00								14
15	3P-25	SPARE					0.00					SPARE	3P-30	16
17								0.00				_		18
19						0.18			2#12, #12G, 3/4"C	0.18	E	15-SAFE	20	20 (2
21	3P-25	SPARE					0.36		2#12, #12G, 3/4"C	0.36	R	TELEPHONE TERMINAL BOARD	20	22
23								0.36	2#12, #12G, 3/4"C	0.36	R	DINING RECEPTACLE	20	24
25	2P-30	12-SHAKE MACHINE	E	2.18	2#10, #10G, 3/4"C	2.36			2#12, #12G, 3/4"C	0.18	R	RECEPTACLE-/WIFI	20	26
27			E	2.18	21/10, 1/100, 5/ 1 0		3.26		2#12, #12G, 3/4"C	1.08	R	EQ-POS-DRIVE THRU	20	28
29	20	LTG-EXTERIOR	L	1.30	2#12, #12G, 3/4"C			2.90	2#12, #12G, 3/4"C	1.60	R	SHOW WINDOW RECEPTACLE	20	30
31			Н	1.92		2.62			2#12, #12G, 3/4"C	0.70	E	44-CABONATOR	20	32 2
33	3P-20	EX. WALK IN FREEZER	Н	1.92	EXISTING		3.52		2#12, #12G, 3/4"C	1.60	R	SHOW WINDOW RECEPTACLE	20	34
35			Н	1.92				3.72	2#12, #12G, 3/4"C	1.80	R	SHOW WINDOW RECEPTACLE	20	36
37			Н	1.92		1.92								38
39	3P-20	EX. WALK IN COOLER	Н	1.92	EXISTING		1.92					SPARE	3P-20	40
41			Н	1.92				1.92						42
				TOTAL (CONNECTED LOAD (KVA)	8.65	10.85	11.48						

PANEL SCHEDULE GENERAL NOTES

- I. ALL CIRCUITING SHOWN IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY CIRCUITING OF THE EXISTING DEVICES IN FIELD AND INFORM ENGINEER FOR ANY DISCREPANCIES.
- 2. ELECTRICAL CONTRACTOR TO VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE.
- 3. ELECTRICAL CONTRACTOR SHALL VERIFY EXACT CIRCUIT NUMBER & BREAKER SIZE OF EXISTING DEVICES IN FIELD.
- 4. E.C. SHALL PROVIDE NEW CIRCUIT BREAKERS IN PLACE OF EXISTING CIRCUIT BREAKERS WHEREVER NECESSARY TO BE IN LINE WITH THE PANEL SCHEDULE. BASE BID ACCORDINGLY.
- 5. E.C. SHALL VERIFY THE EXISTING EQUIPMENT LOAD & RATINGS IN FIELD AND ACCORDINGLY CONSIDER THE ELECTRICAL LOAD IN PANEL BOARD SCHEDULE.
- 6. E.C. TO UPDATE THE PANEL BOARD SCHEDULE AS PER EXISTING SITE CONDITION & NEW EQUIPMENT REQUIREMENTS
- 7. EXISTING EQUIPMENTS AND ITS EXISTING ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY THE CIRCUIT NUMBER, BREAKER SIZE AND OPERABLE CONDITION OF EXISTING ELECTRICAL CONNECTION IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- 8. ALL EXISTING HVAC EQUIPMENTS AND ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY THE CIRCUIT NUMBER & OPERABLE CONDITION OF EXISTING ELECTRICAL CONNECTION IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- 9. E.C. TO ENSURE THAT DEMAND LOAD AMPERES ON PANEL A SHALL NOT BE MORE THAN 225A.
- IO. E.C. TO ENSURE THAT DEMAND LOAD AMPERES ON PANEL E SHALL NOT BE MORE THAN IOOA.
- II. ALL EXISTING ELECTRICAL EQUIPMENT & ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY THE OPERABLE CONDITION OF ALL EXISTING ELECTRICAL EQUIPMENT & ITS ELECTRICAL CONNECTIONS AND ITS CIRCUIT BREAKER IN FIELD. EXTEND THE EXISTING FEEDER AS REQUIRED. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.

			KITCHEN EQUI					
ITEM	QUANTITY	EQUIPMENT DESCRIPTION	VOLTAGE	PHASE	AMPS	KW	POWER CONNECTION	
1	4~~	POS/CASH REGISTER	120	1	10	1.2	NEMA 5-15R	<u>~</u>
2	1	12 HEAD DRINK DISPENSER	120	1	5.2	0.624	NEMA 5-15R	
8		8-HEAD DRINK DISPENSER	10		9.3	1.1	NEMA 6-20P	
12	1	SHAKE MACHINE	208	1	21	4.4	NEMA 6-20P	
13	1	LEMONADE MACHINE	120	1	4.00	0.4	NEMA 5-15R	
15	1	SAFE	120	1	1.00	0.1	NEMA 5-15R	
16	4	COOK AND HOLD	120	1	6.50	0.8	NEMA 5-15R	
17	2	DIGITAL COUNTERTOP ELECTRIC CONVECTION OVEN	208	1	14.00	3.3	NEMA 6-15P	
22	1	WAREWASHER	208	1	30	6.24	DIRECT	
32	1	WALK-IN FREEZER CONDENSER UNIT	208	3	30.00	5.4	DIRECT	
33	1	WALK-IN COOLER CONDENSER UNIT	208	3	20.00	2.7	DIRECT	
39	1	DRIVE-THRU ORDER SYSTEM	120	1	3.30	0.4	DIRECT	
41	1	FRY DUMP	208	1	14.75	3.1	NEMA 6-20P	
43	1	GAS FRYER	120	1	10.00	1.2	NEMA 5-15R	
44	1	CARBONATOR	120	1	6.00	0.7		
45	1	MENU BOARD	120	1	-	-	NEMA 5-20R	
46	1	PRODUCTION COUNTER	208	3	160	45	DIRECT	
49	1	COFFEE MAKER	120	1	14.00	1.7	NEMA 5-20R	
63	1	MUSIC SYSTEM (MNGR'S DESK)	120	1	5.00	0.6	NEMA 5-15R	
75	1	AUTOMATIC DRIVE THRU WINDOW	120	1	0.80	0.1	NEMA 5-15R	
80	1	REACH-IN FREEZER	120	1	0.60	0.7	NEMA 5-15R	
92	2	ICE MAKER	208	1	10.70	2.2	NEMA 5-15R	
92A	2	REMOTE CONDENSER	208	1	11.60	2.4	DIRECT	
96	1	GREASE STORAGE TANK	120	1	1.10	0.1	DIRECT	-
126	1	CO2 MONITORING SYSTEM	120	1	1.00	0.1	NEMA 5-15R	



EQUIPMENT SCHEDULE

NTS

PANEL:	C (EXIST	ring)	>									MOUNTING: RECESSED		
20/208	VOLTS,	3 PHASE,			4	WIRE						PANEL LOCATION: OFFICE		
MAIN CB:	NA	MLO: 400A		BUS:	400A	MIN,						FED FROM: EX. MDP		
CKT NO.	TRIP	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER	R PHASE (K	VA)	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO
_1	20	92- ICE MAKER	E	1.80	2#12, #12G, 3/4"C	2.08	_	_	2#12, #12G, 3/4"C	0.28	Н	ACH-1	20	2
3		EX. WALK IN COOLER/FREEZER LIGHTING	L	0.20	2#12, #12G, 3/4"C		1.86			1.66	Н			
5	20	ROOF TOP RECEPTACLE	R	0.36	2#12, #12G, 3/4"C			2.02	2#12, #12G, 3/4"C	1.66	Н	92A- ICE MACHINE CONDENSER UNIT	2P-20	41
7					, , ,	0.00								8
9	3P-30	SPARE					0.00					SPARE	3P-60	10
11		•						0.00						12
13						0.00								14
15	3P-60	SPARE					0.00					SPARE	3P-50	16
17								0.00						18
19	20	EF-1 (N)	M	1.01	2#12, #12G, 3/4"C	1.01			^					20
~21~	20	EF2(N)	V	2,09	2#12, #12G, 3/4"E	~~	0.60	~~	$\sqrt{1}$			SPARE	3P-60	22
23	20	2-12 HEAD DRINK DISPENSER	E	0.60	2#12, #12G, 3/4"C			0.60)					24
25	20	SPARE	<u> </u>			8.00				8.00	0			26
27	2P-20	17-CONVECTION OVEN		1.65	2#12, #12G, 3/4"C		9.65		3#4, #8G, 1"C	8.00	0	EX. WATER HEATER	3P-80	28
29	21 20		E	1.65				9.65		8.00	0			30
31	20	SITE LIGHTS	L	1.00	2#12, #12G, 3/4"C	1.00								32
33	20	SITE LIGHTS	L	1.00	2#12, #12G, 3/4"C		1.00					SPARE	3P-80	34
35	2P-20	41-FRY DUMP	E	1.55	2#12, #12G, 3/4"C			1.55						36
37	25-20	TI-TITI DOIVIE	E	1.55	2#12,#120,3/4 C	1.55								38
39	2P-20	17-CONVECTION OVEN	E	1.65	2#12, #12G, 3/4"C		1.65					SPARE	3P-30	40
41	ZF-ZU	17-CONVECTION OVEN	E	1.65	2π12, #120, 3/4 C		~~	1.65	<u>/1\</u>					42
				TOTAL (CONNECTED LOAD (KVA)	13.63	14.25	15.47	•					

PANEL SCHEDULE KEYED NOTES (#)

ELECTRICAL PANEL SCHEDULE ABBREVIATIONS

L = LIGHTING R = RECEPTACLE

H = HVAC

M = MOTOR E = EQUIPMENT

O = OTHER

E.C. SHALL PROVIDE NEW BREAKERS IN PLACE OF EXISTING BREAKERS AS SHOWN. INFROM ENGINEER IF FOUND ANY DISCREPANCY. BASE BID ACCORDINGLY.
 PROVIDE GFCI RATED BREAKERS.



	1:	SSUE
No.	DATE	DESCRIPTION
1	10/31/2024	PERMIT COMMENTS
DWG	DATE:	09-18-2024
DRAV	WN BY:	NYE
REVI	EWED BY:	
PRO	JECT No.:	
DWG	TITLE:	
		SCHEDULE
I ^A	IND EG	KOII I'ILIN I

SHEET NO

E-6

SCHEDULE

PANEL SCHEDULE

NTS

SPECIFICATIONS -ELECTRICAL

SECTION 26 05 33 - RACEWAYS FOR ELECTRICAL SYSTEMS (CONTINUED)

PART 2 - PRODUCTS

2.1 ELECTRICAL METALLIC TUBING (EMT)

- PROVIDE GALVANIZED OR ZINC COATED STEEL EMT COMPLIANT WITH FS WW-C-563, ANSI C80.3 AND UL
- PROVIDE EMT FOR ABOVE-GRADE CONDUIT, EXCEPT WHERE INDICATED OTHERWISE HEREIN, UNDER OTHER DIVISION 26 SECTIONS, OR ON DRAWINGS.

2.2 STEEL RIGID METAL CONDUIT (RMC)

- A. PROVIDE RIGID STEEL, HEAVY WALL, FULL WEIGHT, ZINC-COATED, THREADED TYPE (GALVANIZED AFTER CUTTING/THREADING) CONDUIT CONFORMING TO ANSI C80.1 AND UL 6. PROVIDE ZINC COATING FUSED TO INSIDE AND OUTSIDE WALLS OF CONDUIT.
- B. PROVIDE GALVANIZED OR ZINC COATED STEEL THREADED FITTINGS
- C. PROVIDE FOR THE FOLLOWING APPLICATIONS
 - I. CONDUIT INSTALLED EMBEDDED IN CONCRETE, OR MASONRY.
 - 2. CONDUITS (GROUNDED) THAT TURN UP FROM BELOW GRADE OR BELOW SLAB, EXCLUDING THE 90 DEGREE FITTINGS THAT CONNECT TO HORIZONTAL CONDUITS BELOW GRADE OR SLAB.
 - 3. OTHER APPLICATIONS AS INDICATED IN PROJECT MANUAL OR ON DRAWINGS, AS REQUIRED BY NEC, OR AS OTHERWISE REQUIRED FOR SPECIAL PHYSICAL PROTECTION (I.E. NEARBY VEHICULAR/EQUIPMENT TRAFFIC, SITE MAINTENANCE EQUIPMENT, ETC.).

2.3 PVC COATED STEEL RIGID METAL CONDUIT (PVC/RMC)

- PROVIDE RIGID STEEL, HEAVY WALL, FULL WEIGHT, THREADED TYPE (GALVANIZED AFTER CUTTING/THREADING INSIDE AND OUT) PVC COATED CONDUIT CONFORMING TO UL 6 STANDARD FOR SAFETY, RIGID METAL CONDUIT, AND UL514B STANDARD FOR SAFETY, FITTINGS FOR CONDUIT AND OUTLET BOXES
- THE PVC COATED GALVANIZED RIGID CONDUIT MUST BE ETL VERIFIED TO THE INTERTEK ETL SEMKO HIGH TEMPERATURE H20 PVC COATING ADHESION TEST PROCEDURE FOR 200 HOURS. THE PVC COATED GALVANIZED RIGID CONDUIT MUST BEAR THE ETL VERIFIED PVC-001 LABEL TO SIGNIFY COMPLIANCE TO THE ADHESION PERFORMANCE STANDARD.
- C. PROVIDE FOR APPLICATIONS SPECIFICALLY DESIGNATED ON DRAWINGS.

2.4 FLEXIBLE METAL CONDUIT

- PROVIDE FLEXIBLE METAL CONDUIT COMPLIANT WITH FS WW-C-566 AND UL I, AND FORMED FROM CONTINUOUS LENGTH OF SPIRALLY WOUND, INTERLOCKED ZINC-COATED OR GALVANIZED (INSIDE & OUTSIDE) STRIP STEEL. PROVIDE CONDUIT FITTINGS FOR USE WITH FLEXIBLE STEEL CONDUIT OF THREADLESS HINGED CLAMP TYPE, WITH INSULATED THROATS. PROVIDE STRAIGHT TERMINAL CONNECTORS CONSISTING OF ONE PIECE BODY, FEMALE END WITH CLAMP AND DEEP SLOTTED MACHINE SCREW FOR SECURING CONDUIT, AND MALE THREADED END WITH LOCKNUT. DO NOT USE 45 DEGREE OR 90 DEGREE TERMINAL ANGLE CONNECTORS FOR FLEXIBLE OR WATER-TIGHT FLEXIBLE METAL CONDUIT IN LOCATIONS THAT WILL NOT BE FULLY ACCESSIBLE AFTER COMPLETION OF CONSTRUCTION. PROVIDE FULL SIZE GREEN INSULATED GROUND WIRE FOR ALL APPLICATIONS, REGARDLESS OF LENGTH. PROVIDE FLEXIBLE METAL CONDUIT FOR THE FOLLOWING CONDITIONS AS APPLICABLE.
 - I. PROVIDE FOR FINAL 72 INCHES FROM OUTLET/JUNCTION BOXES TO RECESSED LUMINAIRES THAT ARE LOCATED IN ACCESSIBLE CEILING SYSTEMS. OPTIONALLY, TYPE AC/MC CABLE MAY BE USED FOR "FIXTURE WHIPS" (REFER TO SECTION 26 05 19).
 - 2. PROVIDE FOR FINAL 24-72 INCHES OF CONNECTION TO INDOOR EQUIPMENT THAT IS SUBJECT TO END OF SECTION MOVEMENT OR VIBRATION. LEAVE SUFFICIENT SLACK IN FLEXIBLE CONDUIT TO PERMIT MOVEMENT FROM VIBRATION WITHOUT ADVERSELY AFFECTING CONDUITS AND CONNECTIONS.

PART 3 - EXECUTION

- A. GENERAL
 - I. PROVIDE CONDUIT, TUBING AND FITTINGS OF TYPES, GRADES, SIZES AND WEIGHTS (WALL THICKNESSES) FOR APPLICATIONS AS NEEDED TO RENDER ELECTRICAL WORK FULLY
 - 2. PROPERLY SUPPORT AND ANCHOR RACEWAYS FOR THEIR ENTIRE LENGTH USING STRUCTURAL MATERIALS. DO NOT SPAN ANY SPACE UNSUPPORTED.

END OF SECTION

SECTION 26 05 34 - BOXES AND FITTINGS FOR ELECTRICAL SYSTEMS

PART I - PRODUCTS

I.I INDOOR BOXES

- A. PROVIDE MINIMUM SIZE OF 4 INCHES SQUARE BY I-I/2 INCHES DEEP FOR OUTLET BOXES AND JUNCTION BOXES. PROVIDE OUTLET BOX ACCESSORIES AS REQUIRED FOR EACH INSTALLATION, INCLUDING BOX SUPPORTS, MOUNTING EARS AND BRACKETS, WALLBOARD HANGERS, BOX EXTENSION RINGS, FIXTURE STUDS, CABLE CLAMPS, AND METAL STRAPS FOR SUPPORTING OUTLET BOXES, WHICH ARE COMPATIBLE WITH OUTLET BOXES BEING USED TO FULFILL INSTALLATION REQUIREMENTS FOR INDIVIDUAL WIRING SITUATIONS. PROVIDE WITH STAINLESS STEEL NUTS, BOLTS, SCREWS AND WASHERS.
- 1.2 DAMP AND WET LOCATION OUTLET BOXES AND COVERS
 - PROVIDE CORROSION-RESISTANT WEATHERTIGHT/RAINTIGHT OUTLET WIRING BOXES, OF TYPES, SHAPES AND SIZES, INCLUDING DEPTH OF BOXES, WITH THREADED CONDUIT HOLES FOR FASTENING ELECTRICAL CONDUIT, SUITABLY CONFIGURED FOR EACH APPLICATION, INCLUDING FACE PLATE GASKETS AND CORROSION-RESISTANT PLUGS AND FASTENERS. PROVIDE WEATHERTIGHT OUTLETS FOR INTERIOR AND EXTERIOR LOCATIONS EXPOSED TO WEATHER OR MOISTURE, I.E. IN DAMP OR WET LOCATIONS.
 - PROVIDE MINIMAL PROFILE ASSEMBLIES THAT ARE RATED NEMA 3R WHILE IN USE AND THAT EMPLOY RECESSED BOX AND COVER DESIGN, EQUAL TO THOMAS & BETTS " RED DOT" SERIES. PROVIDE TRIM COLOR(S) AS DIRECTED BY ARCHITECT.

PART 2 - EXECUTION

2.I INSTALLATION

- INSTALL ELECTRICAL BOXES IN THOSE LOCATIONS THAT ENSURE ACCESSIBILITY TO ENCLOSED ELECTRICAL WIRING.
- B. DO NOT INSTALL ALUMINUM PRODUCTS IN CONCRETE.
- C. CONSIDER THE OUTLET, JUNCTION, AND PULL BOX LOCATIONS INDICATED ON DRAWINGS APPROXIMATE. STUDY THE GENERAL CONSTRUCTION WITH RELATION TO SPACES AND EQUIPMENT SURROUNDING EACH OUTLET, AND NEATLY INSTALL OUTLETS ACCORDINGLY.

END OF SECTION

SECTION 26 05 80 - MECHANICAL EQUIPMENT

PART I - GENERAL

I.I RELATED WORK

PROVIDE ALL NECESSARY ELECTRICALLY RELATED WORK AS REQUIRED TO RENDER ALL MECHANICAL EQUIPMENT (INCLUDING PLUMBING, HEATING, VENTILATING AND AIR CONDITIONING EQUIPMENT) FULLY OPERATIONAL AND FULLY COMPLIANT WITH NEC. THIS INCLUDES, PRIOR TO ORDERING MATERIALS OR COMMENCING WITH ROUGH-IN, REVIEWING EQUIPMENT SUBMITTAL DATA AND COORDINATING WITH INSTALLING CONTRACTORS TO ENSURE THE CORRECT SIZE, RATING AND QUANTITY OF CONDUCTORS ARE PROVIDED.

PART 2 - EXECUTION

2.I INSTALLATION

- I. PROVIDE DISCONNECT SWITCH AHEAD OF ALL EQUIPMENT, INCLUDING CONTROLS, UNLESS THE MECHANICAL EQUIPMENT COMES WITH INTEGRAL NEC-COMPLIANT DISCONNECT(S). PROVIDE NEMA 3R ENCLOSURES WHERE INSTALLED OUTDOORS AND WHERE INSTALLED INDOORS IN AREAS SUBJECT TO MOISTURE. GROUND METAL FRAMES OF EQUIPMENT BY CONNECTING FRAMES TO THE GROUNDED METAL RACEWAY OR TO A FULL SIZE GREEN GROUND CONDUCTOR OR BOTH. PROVIDE THE NECESSARY ELECTRICAL CONNECTIONS BETWEEN THE SPECIFIED EQUIPMENT AND THE JUNCTION BOX NEAR EQUIPMENT WITH FLEXIBLE METALLIC CONDUIT (LIQUID-TIGHT OUTDOORS) AND MATCHED CONNECTORS (SEE SECTION 26 05 33). WHERE MECHANICAL EQUIPMENT LUGS CANNOT ACCOMMODATE CONDUCTOR SIZES SHOWN ON DRAWINGS, PROVIDE ILSCO CLEARTAP INSULATED MULTI-TAP CONNECTORS.
- 2. SIZES, ELECTRICAL RATINGS, ETC. OF EQUIPMENT AND WIRING SHOWN ON DRAWINGS ARE BASED ON THE RESPECTIVE EQUIPMENT DESIGN BASE MANUFACTURERS. IF DIFFERENT MANUFACTURER(S) OR MODEL(S) ARE ACTUALLY SUPPLIED, PROVIDE NECESSARY COORDINATION IN FIELD (PRIOR TO ORDERING MATERIALS AND PRIOR TO ROUGH-IN) AND PROVIDE THE NECESSARY SIZE OF RELATED ELECTRICAL EQUIPMENT, WIRING, CONDUIT, ETC.
- 3. PRIOR TO FURNISHING SUBMITTALS AND PRIOR TO ROUGH-IN, DETERMINE EXACT ELECTRICALLY RELATED CHARACTERISTICS, LOADS, VOLTAGES, DISCONNECT AND STARTER REQUIREMENTS, LOCATIONS, MOUNTING HEIGHTS, CONNECTION POINTS, ETC. OF MECHANICAL EQUIPMENT.

I. COORDINATE IN FIELD WITH THE RESPECTIVE TRADES AND DETERMINE CASE BY CASE, WHICH EQUIPMENT IS FACTORY LISTED FOR USE WITH HEATING AND AIR CONDITIONING RATED (HACR) BREAKERS. IN AN EFFORT TO MINIMIZE REQUIREMENTS FOR STOCKING OF FUSES BY THE OWNER, UTILIZE HACR BREAKERS AT THE SOURCE PANELBOARDS AS THE NEC REQUIRED OVERCURRENT PROTECTION WHEREVER POSSIBLE (IN LIEU OF FUSING LOCAL DISCONNECT SWITCHES).

C. DISCONNECT SWITCH AND STARTER LOCATIONS

- I. LOCATIONS OF DISCONNECTS AND STARTERS SHOWN ON DRAWINGS ARE INDICATED FOR SCHEMATIC PURPOSES ONLY. DETERMINE EXACT LOCATIONS IN FIELD SO THAT THEY ARE COMPLIANT WITH NEC ARTICLE IIO REQUIREMENTS FOR PANELBOARDS.
- 2. COMMERCIAL KITCHEN EXHAUST HOODS AND RELATED FAN EQUIPMENT
- 3. SEE DETAILS ON DRAWINGS.
- A. REFER TO FOOD SERVICE DRAWINGS, FOOD SERVICE SPECIFICATIONS AND MANUFACTURER'S SUBMITTALS FOR SPECIFIC INFORMATION. FIELD COORDINATE WORK WITH AFFECTED
- B. PROVIDE INTERLOCK WIRING AND CONNECTIONS TO AND FROM THE VARIOUS EQUIPMENT AND CONTROLS.
- c. PROVIDE CONTROL WIRING FROM THE FAN UNITS TO RESPECTIVE REMOTE DUCT STATS.
- D. PROVIDE AUXILIARY CONTROL CIRCUIT WIRING FROM THE FACTORY MICRO-SWITCH IN THE HOOD FIRE SUPPRESSION SYSTEMS TO RESPECTIVE DEDICATED FIRE ALARM SYSTEM MONITOR MODULES TO INITIATE ALARM SIGNAL WHEN RESPECTIVE HOOD FIRE PROTECTION SYSTEM IS
- E. PROVIDE AUXILIARY CONTROL CIRCUIT WIRING FROM THE FACTORY MICRO-SWITCH IN THE HOOD FIRE SUPPRESSION SYSTEM TO CONTACTOR CONTROL COIL(S).
- F. PROVIDE EMPTY OCTAGON BOX FOR MECHANICAL MANUAL PULL STATION (AND INSTALL PULL STATION) FOR EACH HOOD FIRE PROTECTION SYSTEM (MOUNTED AT 48" ABOVE FINISHED FLOOR TO TOP OF OUTLET BOX) WITH (I) I/2" EMPTY CONDUIT ROUTED UP AND OVER TO HOOD AS DIRECTED BY HOOD INSTALLER IN FIELD (W/SWEEP 90'S). FIELD VERIFY LOCATION.
- G. PROVIDE INTERLOCK CONTROL WIRING BETWEEN GAS SOLENOID SHUT OFF VALVES AND RESPECTIVE KITCHEN HOOD FIRE SUPPRESSION SYSTEM. COORDINATE WITH AFFECTED INSTALLERS.

SECTION 26 05 90 - MISCELLANEOUS SPECIALTIES

PART I - GENERAL

I.I RELATED WORK

- A. TIME BASED CONTROL MULTI-PURPOSE TIME CLOCK (365 DAY)
 - . PROVIDE INTERMATIC #ET904I5CR SERIES MULTI-PURPOSE TIME CLOCK (OR EQUAL BY TORK), WHICH IS PROGRAMMABLE 365-DAY/24-HOUR WITH OVERRIDE CONTROLS. PROVIDE FOUR-CHANNEL UNIT PROVIDE REQUIRED EXTERNAL CONTACTORS RELAYS ETC. TO RENDER THE CONTROL SYSTEMS FULLY OPERATIONAL. VERIFY ZONE CONTROL REQUIREMENTS IN FIELD PRIOR TO ROUGH-IN. PROVIDE 100-HOUR CARRYOVER.
 - 2. REFER TO SECTION 26 27 40 FOR DEFINITION OF LIGHTING CONTACTORS. NOTE THAT ANY GIVEN LIGHTING CONTACTOR DESIGNATION MAY ACTUALLY INCLUDE MULTIPLE CONTACTORS DEPENDING ON HOW MANY CIRCUITS ARE CONTROLLED BY THE RESPECTIVE CONTACTOR DESIGNATION.

END OF SECTION

SECTION 26 09 23 - OCCUPANCY SENSORS

PART I - GENERAL

I.I RELATED WORK

- A. PROVIDE LABOR, MATERIALS, TOOLS, APPLIANCES, CONTROL HARDWARE, SENSOR, WIRE, JUNCTION BOXES AND EQUIPMENT NECESSARY FOR AND INCIDENTAL TO THE DELIVERY, INSTALLATION AND FURNISHING OF COMPLETELY OPERATIONAL OCCUPANCY SENSOR LIGHTING CONTROLS, AS DESCRIBED
- PROVIDE PRODUCTS SUPPLIED FROM A SINGLE MANUFACTURER THAT HAS BEEN CONTINUOUSLY INVOLVED IN MANUFACTURING OF OCCUPANCY SENSORS FOR A MINIMUM OF FIVE (5) YEARS.
- PROVIDE OCCUPANCY SENSORS FOR ENTIRE PROJECT THAT ARE ALL MADE BY THE SAME MANUFACTURER, REGARDLESS OF WHERE THE MATERIALS ARE SPECIFIED IN DIVISION 26 DOCUMENTS. PROVIDE COMPONENTS THAT ARE ALL MADE BY THE SAME MANUFACTURER IN CASES WHERE OCCUPANCY SENSOR COMPONENTS ARE ALSO CONNECTED TO A BUILDING LIGHTING CONTROL SYSTEM, REGARDLESS OF WHERE THE MATERIALS ARE SPECIFIED IN DIVISION 26 DOCUMENTS.
- PROVIDE COMPONENTS THAT ARE U.L. LISTED, OFFER A FIVE (5) YEAR WARRANTY AND MEET STATE AND LOCAL APPLICABLE CODE REQUIREMENTS.
- PROVIDE PRODUCTS MANUFACTURED BY AN ISO 9002 CERTIFIED MANUFACTURING FACILITY WITH A DEFECT RATE OF LESS THAN ONE-THIRD OF ONE PERCENT.

PART 2 - SPECIFIC REQUIREMENTS

2.1 ACCEPTABLE MANUFACTURE

BASIS OF DESIGN MANUFACTURER IS WATTSTOPPER. OTHER ACCEPTABLE MANUFACTURERS ARE HUBBELL, SENSOR SWITCH, LEVITON, LUTRON, LC&D AND COOPER GREENGATE CA IN AS MUCH THE SYSTEMS MEET THE INTENT AND FUNCTIONALITY AND SUSTAINABILITY OF THE DESIGN.

2.2 PRODUCTS

- VIDE STANDARD OF QUALITY EQUAL TO WATTSTOPPER: WT-605, WT-600, WT-1105, WT-1100, WT-2205, WT-2200, WT-2250, WT-2255, WP-605, WP-II05, WP-2255, WP-2205, W-500A, W-I000A, W-2000A, W-2000H, UT-300, UT-305, UT-355, WPIR, HB-100, HB-150, DT-200, DT-205, DT-300, DT-305, DT-355, CX-100, CX-105, CI-200, CI-205, CI-300, CI-305, CI-355, CI-12 OR CI-24 SERIES.
- POWER AND AUXILIARY PACKS
 - I. PROVIDE STANDARD OF QUALITY EQUAL TO WATTSTOPPER: BI20E-P, B277E-P, BZ-100, LC-100, CI20E-P, C277E-P, SI20/277-P, AT-I20 OR AT-277 SERIES.

DUAL TECHNOLOGY SENSORS

. PROVIDE SENSORS THAT ARE EITHER WALL MOUNTED, CORNER MOUNTED OR CEILING MOUNTED IN SUCH A WAY AS TO MINIMIZE COVERAGE IN UNWANTED AREAS. PROVIDE PASSIVE INFRARED AND ULTRASONIC TECHNOLOGIES FOR OCCUPANCY DETECTION.

D. GENERAL STANDARDS

- I. PROVIDE SENSORS CAPABLE OF OPERATING NORMALLY WITH ELECTRONIC BALLASTS, PL LAMP SYSTEMS AND RATED MOTOR LOADS.
- 2. PROVIDE SENSORS WITH COVERAGE THAT REMAINS CONSTANT AFTER SENSITIVITY CONTROL HAS BEEN SET. AUTOMATIC REDUCTION IN COVERAGE DUE TO THE CYCLING OF AIR CONDITIONER OR HEATING FANS IS NOT PERMITTED
- 3. PROVIDE SENSORS WITH READILY ACCESSIBLE, USER ADJUSTABLE SETTINGS FOR TIME DELAY AND SENSITIVITY. LOCATE SETTINGS ON THE SENSOR (NOT THE CONTROL UNIT) AND RECESS TO LIMIT TAMPERING
- 4. PROVIDE BYPASS MANUAL OVERRIDE ON EACH SENSOR TO ACCOMMODATE FAILURES. CONFIGURE SO THAT WHEN BYPASS IS UTILIZED, LIGHTING REMAINS ON CONSTANTLY OR CONTROL DIVERTS TO A WALL SWITCH UNTIL SENSOR IS REPLACED. RECESS THIS CONTROL TO PREVENT TAMPERING.
- 5. PROVIDE SENSORS WITH AN LED AS A VISUAL MEANS OF INDICATION AT ALL TIMES TO VERIFY THAT MOTION IS BEING DETECTED DURING BOTH TESTING AND NORMAL OPERATION.
- 6. WHERE SPECIFIED, PROVIDE SENSOR WITH INTERNAL ADDITIONAL ISOLATED RELAY WITH NORMALLY OPEN, NORMALLY CLOSED AND COMMON OUTPUTS FOR USE WITH HVAC CONTROL, DATA LOGGING AND OTHER CONTROL OPTIONS. DO NOT USE SENSORS THAT UTILIZE SEPARATE COMPONENTS OR SPECIALLY MODIFIED UNITS TO ACHIEVE THIS FUNCTION.
- 7. PROVIDE SENSORS WITH UL RATED, 94V-0 PLASTIC ENCLOSURES.

END OF SECTION

PART I - GENERAL

SECTION 26 24 16 - PANELBOARDS

I.I RELATED WORK

A. TYPES OF PANELBOARDS AND ENCLOSURES REQUIRED FOR THE PROJECT INCLUDE THE I. POWER-DISTRIBUTION PANELBOARDS.

2. GENERAL USE PANELBOARDS. PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PANELBOARD PRODUCTS OF ONE OF THE FOLLOWING (FOR EACH TYPE AND RATING OF PANELBOARD AND ENCLOSURE)
 - I. SQUARE D COMPANY.
 - 2. GENERAL ELECTRIC COMPANY.
- SIEMENS/ITE. 4. EATON.

2.2 GENERAL REQUIREMENTS

- A. EXCEPT AS OTHERWISE INDICATED, PROVIDE PANELBOARDS, ENCLOSURES AND ANCILLARY COMPONENTS, OF TYPES. SIZES, AND RATINGS INDICATED, WHICH COMPLY WITH MANUFACTURER'S STANDARD MATERIALS; WITH THE DESIGN AND CONSTRUCTION IN ACCORDANCE WITH PUBLISHED PRODUCT INFORMATION.
- B. PROVIDE PANELBOARDS WITH PROPER NUMBER OF UNIT PANELBOARD DEVICES AS REQUIRED FOR COMPLETE INSTALLATION. WHERE TYPES, SIZES, OR RATINGS ARE NOT INDICATED, COMPLY WITH NEC, UL AND ESTABLISHED INDUSTRY STANDARDS FOR THOSE APPLICATIONS INDICATED.
- C. PROVIDE PANELBOARDS THAT ARE NEW AND MANUFACTURER'S LATEST STANDARD CATALOG DESIGN.
- PROVIDE PANELBOARDS THAT BEAR UL LABELS FOR THEIR SPECIFIC APPLICATIONS.
- PROVIDE PANELBOARDS SUITABLE FOR SERVICE VOLTAGE WITH NUMBER OF BRANCH CIRCUITS OF PROVIDE PANELBOARDS, AND SECTIONS THEREOF IF APPLICABLE, WITH MAIN-LUGS-ONLY OF CAPACITY

EQUAL TO, OR GREATER THAN, THE RATING OR SETTING OF THE OVERCURRENT PROTECTIVE DEVICE

- XT BACK ON THE LINE. PROVIDE PANELBOARD BRANCHES AS SCHEDULED ON THE DRAWINGS.
- PROVIDE CIRCUIT BREAKER PANELBOARD BUS ASSEMBLIES WITH DISTRIBUTED (SEQUENCE) TYPE BUSSING THROUGHOUT, SO THAT ANY TWO ADJACENT SINGLE-POLE BREAKERS, OR SPACES, ARE REPLACEABLE BY A TWO-POLE INTERNAL COMMON TRIP BREAKER, AND SO THAT ANY THREE ADJACENT SINGLE-POLE BREAKERS, OR SPACES, ARE REPLACEABLE BY A THREE-POLE INTERNAL COMMON TRIP BREAKER. THIS APPLIES FOR BRANCH BREAKERS SIZED I5 AMP THROUGH 70 AMP INCLUSIVE. WITHOUT DISTURBING ANY OTHER BREAKER.
- J. PROVIDE DEAD-FRONT SAFETY TYPE PANELBOARDS AS INDICATED, WITH PANELBOARD SWITCHING AND PROTECTIVE DEVICES IN QUANTITIES, RATINGS, TYPES, AND WITH ARRANGEMENT SHOWN. PROVIDE WITH ANTI-TURN SOLDERLESS PRESSURE TYPE MAIN LUG CONNECTORS APPROVED FOR USE WITH COPPER OR ALUMINUM CONDUCTORS.
- PROVIDE FULL-SIZED (100 PERCENT) NEUTRAL BUS. PROVIDE SUITABLE LUGS ON NEUTRAL BUS FOR OUTGOING FEEDERS REQUIRING NEUTRAL CONNECTIONS.
- PROVIDE PANELBOARDS WITH BARE UNINSULATED GROUNDING BARS SUITABLE FOR BOLTING TO ENCLOSURES.
- 2.3 GENERAL USE CIRCUIT BREAKER PANELBOARDS
- A. PROVIDE 208Y/I20V THREE-PHASE GENERAL USE PANELBOARDS EQUAL TO SQUARE D NQOD WITH BOLT-ON BRANCH BREAKERS.

2.4 BUSSING

- A. PROVIDE COPPER BUSSING 2.5 CIRCUIT BREAKER PANELBOARD ENCLOSURES
- A. PROVIDE GALVANIZED SHEET STEEL CABINET TYPE ENCLOSURES, IN SIZES AND NEMA TYPES AS INDICATED, CODE-GAGE, MINIMUM 16-GAGE THICKNESS.
- PROVIDE BOXES WITH CODE-COMPLIANT SIDE AND END GUTTERS (MINIMUM 4 INCHES), AND OF CODE GAUGE GALVANIZED STEEL. PROVIDE BOXES THAT ARE 20 INCHES WIDE MINIMUM, AND 5-3/4 INCHES DEEP MINIMUM. PROVIDE BOXES WITH MULTIPLE KNOCKOUTS AND WIRING GUTTERS.
- C. PROVIDE PANELBOARD TRIMS THAT ARE FLUSH OR SURFACE AS REQUIRED FOR RESPECTIVE APPLICATION, THAT ARE CONSTRUCTED OF CODE GAUGE STEEL. THAT ARE FINISHED WITH RUST INHIBITING PRIME COAT AND THEN FACTORY APPLIED HOT SPRAY LACQUER OR BAKED-ON ENAMEL, AND THAT ARE FACTORY PAINTED MANUFACTURER'S STANDARD LIGHT GRAY. PROVIDE TRIMS COMPLETE WITH CONCEALED HINGES AND CONCEALED TRIM CLAMPS. PROVIDE DOORS WITH FLUSH CHROMIUM PLATED COMBINATION CYLINDER LOCK AND CATCH, AND WITH DIRECTORY SUITABLE FOR CLEAR PLASTIC. PROVIDE LOCKS THAT ARE KEYED ALIKE.
- D. PROVIDE ENCLOSURES THAT ARE FABRICATED BY SAME MANUFACTURER AS PANELBOARDS, WHICH MATE AND MATCH PROPERLY WITH PANELBOARDS TO BE ENCLOSED.

2.6 MOLDED CASE CIRCUIT BREAKERS

- A. PROVIDE FACTORY-ASSEMBLED, MOLDED-CASE CIRCUIT BREAKERS OF FRAME SIZES, CHARACTERISTICS, AND RATINGS INCLUDING RMS SYMMETRICAL INTERRUPTING RATINGS REQUIRED FOR EACH APPLICATION. PROVIDE BREAKERS WITH PERMANENT THERMAL AND INSTANTANEOUS MAGNETIC TRIP, WITH FAULT-CURRENT LIMITING PROTECTION, AND WITH AMPERE RATINGS AS INDICATED.
- B. PROVIDE COORDINATED SERIES-RATED CIRCUIT BREAKERS AS APPLICABLE THROUGHOUT, ACCOMMODATING RESPECTIVE AVAILABLE FAULT CURRENT.
- C. PROVIDE BREAKERS THAT ARE DESIGNED TO BE MOUNTED AND OPERATED IN ANY PHYSICAL POSITION, AND TO BE OPERATED IN A MINIMUM AMBIENT TEMPERATURE OF 40 DEGREES C. PROVIDE BREAKERS WITH MECHANICAL SCREW TYPE REMOVABLE CONNECTOR LUGS, AL/CU RATED.
- D. PROVIDE BRANCH CIRCUIT BREAKERS THAT ARE FULL AMBIENT COMPENSATED THERMAL MAGNETIC MOLDED CASE TYPE, WITH QUICK-MAKE AND QUICK-BREAK ACTION, AND WITH POSITIVE HANDLE TRIP INDICATION (ON BOTH MANUAL AND AUTOMATIC OPERATION). PROVIDE BREAKERS OF THE OVER-THE-CENTER TOGGLE OPERATING TYPE WITH THE HANDLE GOING TO A POSITION BETWEEN "ON" AND "OFF" TO INDICATE AUTOMATIC TRIPPING.

E. PROVIDE BOLT-ON BRANCH BREAKERS. PROVIDE FULL SIZE CIRCUIT BREAKERS. DO NOT PROVIDE "TANDEM" OR "SPLIT" BREAKERS

2.7 FAULT CURRENT RATINGS

A. PROVIDE ELECTRICAL DISTRIBUTION RELATED EQUIPMENT WITH APPROPRIATELY BRACED BUSSING AND PROPERLY RATED BREAKERS, FUSES, ETC. FOR THE AVAILABLE FAULT CURRENTS.

2.8 SERIES COORDINATION

PROVIDE FACTORY SERIES COORDINATION FOR ALL CIRCUIT BREAKERS (INCLUDING BRANCH BREAKERS), RELATIVE TO UPSTREAM BREAKERS, SO THAT ONLY THE BREAKER CLOSEST IN THE CIRCUIT TO THE LOAD TRIPS UPON AN OVERLOAD OR FAULT CONDITION.

PART 3 - EXECUTION

INSTALLATION

- PROVIDE ENCLOSURES FASTENED FIRMLY TO WALLS AND STRUCTURAL SURFACES, ENSURING THAT THEY ARE PERMANENTLY AND MECHANICALLY ANCHORED.
- PROVIDE NEATLY TYPEWRITTEN CIRCUIT DIRECTORY CARD FOR EACH PANELBOARD UPON COMPLETION OF INSTALLATION WORK. INCLUDE THE ACTUAL ROOM NAMES/NUMBERS THAT ARE SELECTED FOR INTERIOR SIGNAGE/DESIGNATION.
- SCHEDULING SHOWN ON DRAWINGS IS SHOWN TO INDICATE FEEDER AND BRANCH CIRCUITING REQUIREMENTS. DETERMINE EXACT NUMBERING SEQUENCE OF CIRCUITS IN FIELD AFTER PERFORMING FINAL BALANCING

END OF SECTION

SECTION 26 27 26 - WIRING DEVICES

PART I - GENERAL

I.I SUMMARY

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 I AND OTHER APPLICABLE UL AND NEMA STANDARDS. VERIFY COLOR SELECTIONS WITH OWNER'S REPRESENTATIVE.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING.

LEVITON, HUBBELL, BRYANT, PASS & SEYMOUR, COOPER SWITCHES:

RECEPTACLES: LEVITON, HUBBELL, BRYANT, PASS & SEYMOUR, COOPER

WALL PLATES: LEVITON, HUBBELL, BRYANT, PASS & SEYMOUR, COOPER

2.2 WIRING DEVICE COLORS

2.3 SPECIFICATION GRADE RECEPTACLES

- A. UNLESS SPECIFICALLY INDICATED OTHERWISE, OR DIRECTED OTHERWISE IN FIELD, PROVIDE WHITE COLOR FOR NORMAL UTILITY WIRING DEVICES.
- A. STANDARD SPECIFICATION GRADE DUPLEX/SINGLE RECEPTACLES . PROVIDE DUPLEX RECEPTACLES EQUAL TO LEVITON #5362 SERIES. FOR RECEPTACLE CIRCUITS PROTECTED WITH I5A BREAKERS, PROVIDE NEMA 5-I5R EQUIVALENTS. PROVIDE RECEPTACLES
- EQUAL TO LEVITON #536I SERIES FOR SIMPLEX (SINGLE) APPLICATIONS.
- B. GROUND-FAULT INTERRUPTER SPECIFICATION GRADE RECEPTACLES I. PROVIDE GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLES EQUAL TO LEVITON #8898 SERIES. FOR RECEPTACLE CIRCUITS PROTECTED WITH 15A BREAKERS, PROVIDE NEMA 5-15R
 - 2. RECEPTACLES INDICATED AS GFI MAY BE GFI-PROTECTED BY AN UPSTREAM GFI RECEPTACLE ON THE SAME CIRCUIT ONLY IF LOCATED IN THE SAME ROOM. OTHERWISE PROVIDE A SEPARATE GFI
- RECEPTACLE FOR EACH ONE SHOWN. C. ISOLATED GROUND SPECIFICATION GRADE RECEPTACLES
 - I. PROVIDE DUPLEX ISOLATED GROUND RECEPTACLES EQUAL TO LEVITON #5362-IG. PROVIDE SIMPLEX (SINGLE) ISOLATED GROUND RECEPTACLES EQUAL TO LEVITON #536I-IG. FOR RECEPTACLE CIRCUITS PROTECTED WITH I5A BREAKERS, PROVIDE NEMA 5-I5R EQUIVALENTS. PROVIDE DEDICATED INSULATED ISOLATED GROUND CONDUCTORS (GREEN WITH YELLOW TRACER) FOR EACH APPLICATION.
- . PROVIDE DUPLEX WEATHER RESISTANT RECEPTACLES EQUAL TO LEVITON # W7899 SERIES. FOR RECEPTACLE CIRCUITS PROTECTED WITH 15A BREAKERS, PROVIDE NEMA 5-15R EQUIVALENTS.

D. WEATHER RESISTANT GFCI RECEPTACLES

- 2.4 WIRING DEVICE ACCESSORIES
 - A. WALL PLATES I. PROVIDE SINGLE AND COMBINATION, OF TYPES, SIZES, AND WITH GANGING AND CUTOUTS AS REQUIRED TO ACCOMMODATE EACH APPLICATION. PROVIDE PLATES WHICH MATE AND MATCH WITH WIRING DEVICES TO WHICH ATTACHED. PROVIDE METAL SCREWS FOR SECURING PLATES T DEVICES WITH SCREW HEADS COLORED TO MATCH FINISH OF PLATES. PROVIDE WALL PLATE
 - COLOR TO MATCH WIRING DEVICES UNLESS SPECIFICALLY INDICATED OTHERWISE. 2. PROVIDE STANDARD SIZE WALL PLATES. DO NOT PROVIDE "MIDWAY", "OVERSIZED" ("JUMBO") OR
 - "EXTRA DEEP" WALL PLATES.

3. PROVIDE GALVANIZED STEEL WALL PLATES IN UNFINISHED EXPOSED-CONDUIT AREAS.

4. PROVIDE COMMERCIAL GRADE, SATIN FINISH STAINLESS STEEL WALL PLATES IN FINISHED AREAS. WITH BEVELED EDGES, EQUAL TO LEVITON TYPE 302 SERIES.

5. PROVIDE COMMERCIAL SPECIFICATION GRADE THERMOPLASTIC WALL PLATES IN FINISHED AREAS.

PART 3 - EXECUTION

3.1 INSTALLATION

- PROVIDE GROUNDED (" NEUTRAL") CONDUCTOR IN ALL LIGHTING CONTROL DEVICE (SWITCH, DIMMER,
- OCCUPANCY SENSOR, ETC.) WALL OUTLET BOXES, EVEN IF NOT IMMEDIATELY USED. B. INSTALL RECEPTACLES SO THAT THE GROUND PIN IS ORIENTED IN A CONSISTENT MANNER THROUGHOUT THE FACILITY, SO THAT THE ORIENTATION IS COMPLIANT WITH ALL PREVAILING CODES AND

REGULATIONS, AND SO THAT THE ORIENTATION IS ACCEPTABLE TO THE ELECTRICAL INSPECTOR.

END OF SECTION

DWG DATE: 09-18-2024 DRAWN BY: REVIEWED BY: PROJECT No. DWG TITLE:

ISSUE

DESCRIPTION

DATE

ELECTRICAL

SPECIFICATIONS

SPECIFICATIONS -ELECTRICAL

SECTION 26 05 33 - RACEWAYS FOR ELECTRICAL SYSTEMS (CONTINUED)

PART 2 - PRODUCTS

2.1 ELECTRICAL METALLIC TUBING (EMT)

- A. PROVIDE GALVANIZED OR ZINC COATED STEEL EMT COMPLIANT WITH FS WW-C-563, ANSI C80.3 AND
- PROVIDE EMT FOR ABOVE-GRADE CONDUIT, EXCEPT WHERE INDICATED OTHERWISE HEREIN, UNDER OTHER DIVISION 26 SECTIONS, OR ON DRAWINGS.

2.2 STEEL RIGID METAL CONDUIT (RMC)

- PROVIDE RIGID STEEL, HEAVY WALL, FULL WEIGHT, ZINC-COATED, THREADED TYPE (GALVANIZED AFTER CUTTING/THREADING) CONDUIT CONFORMING TO ANSI C80.1 AND UL 6. PROVIDE ZINC COATING FUSED TO INSIDE AND OUTSIDE WALLS OF CONDUIT.
- PROVIDE GALVANIZED OR ZINC COATED STEEL THREADED FITTINGS.
- C. PROVIDE FOR THE FOLLOWING APPLICATIONS.
 - I. CONDUIT INSTALLED EMBEDDED IN CONCRETE, OR MASONRY
 - 2. CONDUITS (GROUNDED) THAT TURN UP FROM BELOW GRADE OR BELOW SLAB, EXCLUDING THE 90 DEGREE FITTINGS THAT CONNECT TO HORIZONTAL CONDUITS BELOW GRADE OR SLAB.
 - 3. OTHER APPLICATIONS AS INDICATED IN PROJECT MANUAL OR ON DRAWINGS, AS REQUIRED BY NEC, OR AS OTHERWISE REQUIRED FOR SPECIAL PHYSICAL PROTECTION (I.E. NEARBY VEHICULAR/EQUIPMENT TRAFFIC, SITE MAINTENANCE EQUIPMENT, ETC.).

2.3 PVC COATED STEEL RIGID METAL CONDUIT (PVC/RMC)

- A. PROVIDE RIGID STEEL, HEAVY WALL, FULL WEIGHT, THREADED TYPE (GALVANIZED AFTER CUTTING/THREADING INSIDE AND OUT) PVC COATED CONDUIT CONFORMING TO UL 6 STANDARD FOR SAFETY, RIGID METAL CONDUIT, AND UL514B STANDARD FOR SAFETY, FITTINGS FOR CONDUIT AND OUTLET BOXES
- THE PVC COATED GALVANIZED RIGID CONDUIT MUST BE ETL VERIFIED TO THE INTERTEK ETL SEMKO HIGH TEMPERATURE H20 PVC COATING ADHESION TEST PROCEDURE FOR 200 HOURS. THE PVC COATED GALVANIZED RIGID CONDUIT MUST BEAR THE ETL VERIFIED PVC-001 LABEL TO SIGNIFY COMPLIANCE TO THE ADHESION PERFORMANCE STANDARD.
- C. PROVIDE FOR APPLICATIONS SPECIFICALLY DESIGNATED ON DRAWINGS.

2.4 FLEXIBLE METAL CONDUIT

- A. PROVIDE FLEXIBLE METAL CONDUIT COMPLIANT WITH FS WW-C-566 AND UL I, AND FORMED FROM CONTINUOUS LENGTH OF SPIRALLY WOUND, INTERLOCKED ZINC-COATED OR GALVANIZED (INSIDE & OUTSIDE) STRIP STEEL. PROVIDE CONDUIT FITTINGS FOR USE WITH FLEXIBLE STEEL CONDUIT OF THREADLESS HINGED CLAMP TYPE, WITH INSULATED THROATS. PROVIDE STRAIGHT TERMINAL CONNECTORS CONSISTING OF ONE PIECE BODY, FEMALE END WITH CLAMP AND DEEP SLOTTED MACHINE SCREW FOR SECURING CONDUIT, AND MALE THREADED END WITH LOCKNUT. DO NOT USE 45 DEGREE OR 90 DEGREE TERMINAL ANGLE CONNECTORS FOR FLEXIBLE OR WATER-TIGHT FLEXIBLE METAL CONDUIT IN LOCATIONS THAT WILL NOT BE FULLY ACCESSIBLE AFTER COMPLETION OF CONSTRUCTION. PROVIDE FULL SIZE GREEN INSULATED GROUND WIRE FOR ALL APPLICATIONS, REGARDLESS OF LENGTH. PROVIDE FLEXIBLE METAL CONDUIT FOR THE FOLLOWING CONDITIONS AS APPLICABLE.
 - I. PROVIDE FOR FINAL 72 INCHES FROM OUTLET/JUNCTION BOXES TO RECESSED LUMINAIRES THAT ARE LOCATED IN ACCESSIBLE CEILING SYSTEMS. OPTIONALLY, TYPE AC/MC CABLE MAY BE USED FOR "FIXTURE WHIPS" (REFER TO SECTION 26 05 19).
 - PROVIDE FOR FINAL 24-72 INCHES OF CONNECTION TO INDOOR EQUIPMENT THAT IS SUBJECT TO MOVEMENT OR VIBRATION. LEAVE SUFFICIENT SLACK IN FLEXIBLE CONDUIT TO PERMIT MOVEMENT FROM VIBRATION WITHOUT ADVERSELY AFFECTING CONDUITS AND CONNECTIONS.

PART 3 - EXECUTION

- A. GENERAL

 I. PROVIDE CON
 - I. PROVIDE CONDUIT, TUBING AND FITTINGS OF TYPES, GRADES, SIZES AND WEIGHTS (WALL THICKNESSES) FOR APPLICATIONS AS NEEDED TO RENDER ELECTRICAL WORK FULLY OPERATIONAL..
 - PROPERLY SUPPORT AND ANCHOR RACEWAYS FOR THEIR ENTIRE LENGTH USING STRUCTURAL MATERIALS. DO NOT SPAN ANY SPACE UNSUPPORTED.

END OF SECTION

SECTION 26 05 34 - BOXES AND FITTINGS FOR ELECTRICAL SYSTEMS

PART I - PRODUCTS

I.I INDOOR BOXES

A. PROVIDE MINIMUM SIZE OF 4 INCHES SQUARE BY I-I/2 INCHES DEEP FOR OUTLET BOXES AND JUNCTION BOXES. PROVIDE OUTLET BOX ACCESSORIES AS REQUIRED FOR EACH INSTALLATION, INCLUDING BOX SUPPORTS, MOUNTING EARS AND BRACKETS, WALLBOARD HANGERS, BOX EXTENSION RINGS, FIXTURE STUDS, CABLE CLAMPS, AND METAL STRAPS FOR SUPPORTING OUTLET BOXES, WHICH ARE COMPATIBLE WITH OUTLET BOXES BEING USED TO FULFILL INSTALLATION REQUIREMENTS FOR INDIVIDUAL WIRING SITUATIONS. PROVIDE WITH STAINLESS STEEL NUTS, BOLTS, SCREWS AND WASHERS.

I.2 DAMP AND WET LOCATION OUTLET BOXES AND COVERS

- A. PROVIDE CORROSION-RESISTANT WEATHERTIGHT/RAINTIGHT OUTLET WIRING BOXES, OF TYPES, SHAPES AND SIZES, INCLUDING DEPTH OF BOXES, WITH THREADED CONDUIT HOLES FOR FASTENING ELECTRICAL CONDUIT, SUITABLY CONFIGURED FOR EACH APPLICATION, INCLUDING FACE PLATE GASKETS AND CORROSION-RESISTANT PLUGS AND FASTENERS. PROVIDE WEATHERTIGHT OUTLETS FOR INTERIOR AND EXTERIOR LOCATIONS EXPOSED TO WEATHER OR MOISTURE, I.E. IN DAMP OR WET LOCATIONS.
- B. PROVIDE MINIMAL PROFILE ASSEMBLIES THAT ARE RATED NEMA 3R WHILE IN USE AND THAT EMPLOY RECESSED BOX AND COVER DESIGN, EQUAL TO THOMAS & BETTS "RED DOT" SERIES. PROVIDE TRIM COLOR(S) AS DIRECTED BY ARCHITECT.

PART 2 - EXECUTION

2.1 INSTALLATION

- A. INSTALL ELECTRICAL BOXES IN THOSE LOCATIONS THAT ENSURE ACCESSIBILITY TO ENCLOSED ELECTRICAL WIRING.
- B. DO NOT INSTALL ALUMINUM PRODUCTS IN CONCRETE.
- CONSIDER THE OUTLET, JUNCTION, AND PULL BOX LOCATIONS INDICATED ON DRAWINGS APPROXIMATE. STUDY THE GENERAL CONSTRUCTION WITH RELATION TO SPACES AND EQUIPMENT SURROUNDING EACH OUTLET, AND NEATLY INSTALL OUTLETS ACCORDINGLY.

END OF SECTION

SECTION 26 05 80 - MECHANICAL EQUIPMENT

PART I - GENERAL

I.I RELATED WORK

A. PROVIDE ALL NECESSARY ELECTRICALLY RELATED WORK AS REQUIRED TO RENDER ALL MECHANICAL EQUIPMENT (INCLUDING PLUMBING, HEATING, VENTILATING AND AIR CONDITIONING EQUIPMENT) FULLY OPERATIONAL AND FULLY COMPLIANT WITH NEC. THIS INCLUDES, PRIOR TO ORDERING MATERIALS OR COMMENCING WITH ROUGH-IN, REVIEWING EQUIPMENT SUBMITTAL DATA AND COORDINATING WITH INSTALLING CONTRACTORS TO ENSURE THE CORRECT SIZE, RATING AND QUANTITY OF CONDUCTORS ARE PROVIDED.

PART 2 - EXECUTION

2.1 INSTALLATION

A. GENERAL

I. PROVIDE DISCONNECT SWITCH AHEAD OF ALL EQUIPMENT, INCLUDING CONTROLS, UNLESS THE MECHANICAL EQUIPMENT COMES WITH INTEGRAL NEC-COMPLIANT DISCONNECT(S). PROVIDE

NEMA 3R ENCLOSURES WHERE INSTALLED OUTDOORS AND WHERE INSTALLED INDOORS IN AREAS SUBJECT TO MOISTURE. GROUND METAL FRAMES OF EQUIPMENT BY CONNECTING FRAMES TO THE GROUNDED METAL RACEWAY OR TO A FULL SIZE GREEN GROUND CONDUCTOR OR BOTH. PROVIDE THE NECESSARY ELECTRICAL CONNECTIONS BETWEEN THE SPECIFIED EQUIPMENT AND THE JUNCTION BOX NEAR EQUIPMENT WITH FLEXIBLE METALLIC CONDUIT (LIQUID-TIGHT OUTDOORS) AND MATCHED CONNECTORS (SEE SECTION 26 05 33). WHERE MECHANICAL EQUIPMENT LUGS CANNOT ACCOMMODATE CONDUCTOR SIZES SHOWN ON DRAWINGS, PROVIDE ILSCO CLEARTAP INSULATED MULTI-TAP CONNECTORS.

- 2. SIZES, ELECTRICAL RATINGS, ETC. OF EQUIPMENT AND WIRING SHOWN ON DRAWINGS ARE BASED ON THE RESPECTIVE EQUIPMENT DESIGN BASE MANUFACTURERS. IF DIFFERENT MANUFACTURER(S) OR MODEL(S) ARE ACTUALLY SUPPLIED, PROVIDE NECESSARY COORDINATION IN FIELD (PRIOR TO ORDERING MATERIALS AND PRIOR TO ROUGH-IN) AND PROVIDE THE NECESSARY SIZE OF RELATED ELECTRICAL EQUIPMENT, WIRING, CONDUIT, ETC.
- 3. PRIOR TO FURNISHING SUBMITTALS AND PRIOR TO ROUGH-IN, DETERMINE EXACT ELECTRICALLY RELATED CHARACTERISTICS, LOADS, VOLTAGES, DISCONNECT AND STARTER REQUIREMENTS, LOCATIONS, MOUNTING HEIGHTS, CONNECTION POINTS, ETC. OF MECHANICAL EQUIPMENT.

B. HACR BREAKERS

I. COORDINATE IN FIELD WITH THE RESPECTIVE TRADES AND DETERMINE CASE BY CASE, WHICH EQUIPMENT IS FACTORY LISTED FOR USE WITH HEATING AND AIR CONDITIONING RATED (HACR) BREAKERS. IN AN EFFORT TO MINIMIZE REQUIREMENTS FOR STOCKING OF FUSES BY THE OWNER, UTILIZE HACR BREAKERS AT THE SOURCE PANELBOARDS AS THE NEC REQUIRED OVERCURRENT PROTECTION WHEREVER POSSIBLE (IN LIEU OF FUSING LOCAL DISCONNECT

C. DISCONNECT SWITCH AND STARTER LOCATIONS

- I. LOCATIONS OF DISCONNECTS AND STARTERS SHOWN ON DRAWINGS ARE INDICATED FOR SCHEMATIC PURPOSES ONLY. DETERMINE EXACT LOCATIONS IN FIELD SO THAT THEY ARE COMPLIANT WITH NEC ARTICLE IIO REQUIREMENTS FOR PANELBOARDS.
- 2. COMMERCIAL KITCHEN EXHAUST HOODS AND RELATED FAN EQUIPMENT
- 3. SEE DETAILS ON DRAWINGS.
- A. REFER TO FOOD SERVICE DRAWINGS, FOOD SERVICE SPECIFICATIONS AND MANUFACTURER'S SUBMITTALS FOR SPECIFIC INFORMATION. FIELD COORDINATE WORK WITH AFFECTED ENTITIES.
- B. PROVIDE INTERLOCK WIRING AND CONNECTIONS TO AND FROM THE VARIOUS EQUIPMENT AND CONTROLS.
- c. PROVIDE CONTROL WIRING FROM THE FAN UNITS TO RESPECTIVE REMOTE DUCT STATS.
 D. PROVIDE AUXILIARY CONTROL CIRCUIT WIRING FROM THE FACTORY MICRO-SWITCH IN THE HOOD FIRE SUPPRESSION SYSTEMS TO RESPECTIVE DEDICATED FIRE ALARM SYSTEM MONITOR MODULES TO INITIATE ALARM SIGNAL WHEN RESPECTIVE HOOD FIRE
- E. PROVIDE AUXILIARY CONTROL CIRCUIT WIRING FROM THE FACTORY MICRO-SWITCH IN THE HOOD FIRE SUPPRESSION SYSTEM TO CONTACTOR CONTROL COIL(S).
- F. PROVIDE EMPTY OCTAGON BOX FOR MECHANICAL MANUAL PULL STATION (AND INSTALL PULL STATION) FOR EACH HOOD FIRE PROTECTION SYSTEM (MOUNTED AT 48" ABOVE FINISHED FLOOR TO TOP OF OUTLET BOX) WITH (I) I/2" EMPTY CONDUIT ROUTED UP AND OVER TO HOOD AS DIRECTED BY HOOD INSTALLER IN FIELD (W/SWEEP 90'S). FIELD VERIFY LOCATION.
- G. PROVIDE INTERLOCK CONTROL WIRING BETWEEN GAS SOLENOID SHUT OFF VALVES AND RESPECTIVE KITCHEN HOOD FIRE SUPPRESSION SYSTEM. COORDINATE WITH AFFECTED INSTALLERS.

END OF SECTION

SECTION 26 05 90 - MISCELLANEOUS SPECIALTIES

PART I - GENEF

I.I RELATED WORK

A. TIME BASED CONTROL - MULTI-PURPOSE TIME CLOCK (365 DAY)

PROTECTION SYSTEM IS ACTIVATED.

- I. PROVIDE INTERMATIC #ET90415CR SERIES MULTI-PURPOSE TIME CLOCK (OR EQUAL BY TORK), WHICH IS PROGRAMMABLE 365-DAY/24-HOUR WITH OVERRIDE CONTROLS. PROVIDE FOUR-CHANNEL UNIT. PROVIDE REQUIRED EXTERNAL CONTACTORS, RELAYS, ETC. TO RENDER THE CONTROL SYSTEMS FULLY OPERATIONAL. VERIFY ZONE CONTROL REQUIREMENTS IN FIELD PRIOR TO ROUGH-IN. PROVIDE 100-HOUR CARRYOVER.
- 2. REFER TO SECTION 26 27 40 FOR DEFINITION OF LIGHTING CONTACTORS. NOTE THAT ANY GIVEN LIGHTING CONTACTOR DESIGNATION MAY ACTUALLY INCLUDE MULTIPLE CONTACTORS DEPENDING ON HOW MANY CIRCUITS ARE CONTROLLED BY THE RESPECTIVE CONTACTOR DESIGNATION.

END OF SECTION

SECTION 26 09 23 - OCCUPANCY SENSORS

PART I - GENERAL

- I.I RELATED WORK
 - A. PROVIDE LABOR, MATERIALS, TOOLS, APPLIANCES, CONTROL HARDWARE, SENSOR, WIRE, JUNCTION BOXES AND EQUIPMENT NECESSARY FOR AND INCIDENTAL TO THE DELIVERY, INSTALLATION AND FURNISHING OF COMPLETELY OPERATIONAL OCCUPANCY SENSOR LIGHTING CONTROLS, AS DESCRIBED HEREIN.
 - B. PROVIDE PRODUCTS SUPPLIED FROM A SINGLE MANUFACTURER THAT HAS BEEN CONTINUOUSLY INVOLVED IN MANUFACTURING OF OCCUPANCY SENSORS FOR A MINIMUM OF FIVE (5) YEARS.
- C. PROVIDE OCCUPANCY SENSORS FOR ENTIRE PROJECT THAT ARE ALL MADE BY THE SAME MANUFACTURER, REGARDLESS OF WHERE THE MATERIALS ARE SPECIFIED IN DIVISION 26 DOCUMENTS. PROVIDE COMPONENTS THAT ARE ALL MADE BY THE SAME MANUFACTURER IN CASES WHERE OCCUPANCY SENSOR COMPONENTS ARE ALSO CONNECTED TO A BUILDING LIGHTING CONTROL SYSTEM, REGARDLESS OF WHERE THE MATERIALS ARE SPECIFIED IN DIVISION 26 DOCUMENTS.
- D. PROVIDE COMPONENTS THAT ARE U.L. LISTED, OFFER A FIVE (5) YEAR WARRANTY AND MEET STATE AND LOCAL APPLICABLE CODE REQUIREMENTS.
- PROVIDE PRODUCTS MANUFACTURED BY AN ISO 9002 CERTIFIED MANUFACTURING FACILITY WITH A DEFECT RATE OF LESS THAN ONE-THIRD OF ONE PERCENT.

PART 2 - SPECIFIC REQUIREMENTS

2.1 ACCEPTABLE MANUFACTURERS

A. BASIS OF DESIGN MANUFACTURER IS WATTSTOPPER. OTHER ACCEPTABLE MANUFACTURERS ARE HUBBELL, SENSOR SWITCH, LEVITON, LUTRON, LC&D AND COOPER GREENGATE CA IN AS MUCH THE SYSTEMS MEET THE INTENT AND FUNCTIONALITY AND SUSTAINABILITY OF THE DESIGN.

PRODUCTS

CEILING SENSORS

I. PROVIDE STANDARD OF QUALITY EQUAL TO WATTSTOPPER: WT-605, WT-600, WT-II05, WT-II00, WT-2205, WT-2200, WT-2250, WT-2255, WP-605, WP-II05, WP-2255, WP-2205, W-500A, W-1000A, W-2000A, W-2000H, UT-300, UT-305, UT-355, WPIR, HB-I00, HB-I50, DT-200, DT-205, DT-300, DT-305, DT-355, CX-I00, CX-I05, CI-200, CI-205, CI-300, CI-305, CI-355, CI-I2 OR CI-24 SERIES.

B. POWER AND AUXILIARY PACKS I. PROVIDE STANDARD OF QUALITY EQUAL TO WATTSTOPPER: BI20E-P, B277E-P, BZ-100, LC-100,

CI20E-P, C277E-P, SI20/277-P, AT-I20 OR AT-277 SERIES.

C. DUAL TECHNOLOGY SENSORS

I. PROVIDE SENSORS THAT ARE EITHER WALL MOUNTED, CORNER MOUNTED OR CEILING MOUNTED IN SUCH A WAY AS TO MINIMIZE COVERAGE IN UNWANTED AREAS. PROVIDE PASSIVE INFRARED AND ULTRASONIC TECHNOLOGIES FOR OCCUPANCY DETECTION.

D. GENERAL STANDARDS

- PROVIDE SENSORS CAPABLE OF OPERATING NORMALLY WITH ELECTRONIC BALLASTS, PL LAMP SYSTEMS AND RATED MOTOR LOADS.
 PROVIDE SENSORS WITH COVERAGE THAT REMAINS CONSTANT AFTER SENSITIVITY CONTROL
- 2. PROVIDE SENSORS WITH COVERAGE THAT REMAINS CONSTANT AFTER SENSITIVITY CONTROL HAS BEEN SET. AUTOMATIC REDUCTION IN COVERAGE DUE TO THE CYCLING OF AIR

CONDITIONER OR HEATING FANS IS NOT PERMITTED.

- 3. PROVIDE SENSORS WITH READILY ACCESSIBLE, USER ADJUSTABLE SETTINGS FOR TIME DELAY AND SENSITIVITY. LOCATE SETTINGS ON THE SENSOR (NOT THE CONTROL UNIT) AND RECESS TO LIMIT TAMPERING.
- 4. PROVIDE BYPASS MANUAL OVERRIDE ON EACH SENSOR TO ACCOMMODATE FAILURES. CONFIGURE SO THAT WHEN BYPASS IS UTILIZED, LIGHTING REMAINS ON CONSTANTLY OR CONTROL DIVERTS TO A WALL SWITCH UNTIL SENSOR IS REPLACED. RECESS THIS CONTROL TO PREVENT TAMPERING.
- 5. PROVIDE SENSORS WITH AN LED AS A VISUAL MEANS OF INDICATION AT ALL TIMES TO VERIFY THAT MOTION IS BEING DETECTED DURING BOTH TESTING AND NORMAL OPERATION.
- 6. WHERE SPECIFIED, PROVIDE SENSOR WITH INTERNAL ADDITIONAL ISOLATED RELAY WITH NORMALLY OPEN, NORMALLY CLOSED AND COMMON OUTPUTS FOR USE WITH HVAC CONTROL, DATA LOGGING AND OTHER CONTROL OPTIONS. DO NOT USE SENSORS THAT UTILIZE SEPARATE COMPONENTS OR SPECIALLY MODIFIED UNITS TO ACHIEVE THIS FUNCTION.
- 7. PROVIDE SENSORS WITH UL RATED, 94V-0 PLASTIC ENCLOSURES.

END OF SECTION

SECTION 26 24 16 - PANELBOARDS

PART I - GENERAL I.I RELATED WORK

A. TYPES OF PANELBOARDS AND ENCLOSURES REQUIRED FOR THE PROJECT INCLUDE THE FOLLOWING

2. GENERAL USE PANELBOARDS

PART 2 - PRODUCTS

2.I MANUFACTURERS

- A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PANELBOARD PRODUCTS OF ONE OF THE FOLLOWING (FOR EACH TYPE AND RATING OF PANELBOARD AND ENCLOSURE):
 - I. SQUARE D COMPANY.

I. POWER-DISTRIBUTION PANELBOARDS

- 2. GENERAL ELECTRIC COMPANY.
- SIEMENS/ITE.
 EATON.

2.2 GENERAL REQUIREMENTS

- A. EXCEPT AS OTHERWISE INDICATED, PROVIDE PANELBOARDS, ENCLOSURES AND ANCILLARY COMPONENTS, OF TYPES, SIZES, AND RATINGS INDICATED, WHICH COMPLY WITH MANUFACTURER'S STANDARD MATERIALS; WITH THE DESIGN AND CONSTRUCTION IN ACCORDANCE WITH PUBLISHED PRODUCT INFORMATION.
- B. PROVIDE PANELBOARDS WITH PROPER NUMBER OF UNIT PANELBOARD DEVICES AS REQUIRED FOR COMPLETE INSTALLATION. WHERE TYPES, SIZES, OR RATINGS ARE NOT INDICATED, COMPLY WITH NEC, UL AND ESTABLISHED INDUSTRY STANDARDS FOR THOSE APPLICATIONS INDICATED.
- C. PROVIDE PANELBOARDS THAT ARE NEW AND MANUFACTURER'S LATEST STANDARD CATALOG DESIGN.
- D. PROVIDE PANELBOARDS THAT BEAR UL LABELS FOR THEIR SPECIFIC APPLICATIONS.
- E. PROVIDE PANELBOARDS SUITABLE FOR SERVICE VOLTAGE WITH NUMBER OF BRANCH CIRCUITS OF CAPACITY SCHEDULED.
- F. PROVIDE PANELBOARDS, AND SECTIONS THEREOF IF APPLICABLE, WITH MAIN-LUGS-ONLY OF CAPACITY EQUAL TO, OR GREATER THAN, THE RATING OR SETTING OF THE OVERCURRENT PROTECTIVE DEVICE NEXT BACK ON THE LINE.
- G. PROVIDE PANELBOARD BRANCHES AS SCHEDULED ON THE DRAWINGS.
- PROVIDE CIRCUIT BREAKER PANELBOARD BUS ASSEMBLIES WITH DISTRIBUTED (SEQUENCE) TYPE BUSSING THROUGHOUT, SO THAT ANY TWO ADJACENT SINGLE-POLE BREAKERS, OR SPACES, ARE REPLACEABLE BY A TWO-POLE INTERNAL COMMON TRIP BREAKER, AND SO THAT ANY THREE ADJACENT SINGLE-POLE BREAKERS, OR SPACES, ARE REPLACEABLE BY A THREE-POLE INTERNAL COMMON TRIP BREAKER. THIS APPLIES FOR BRANCH BREAKERS SIZED 15 AMP THROUGH 70 AMP INCLUSIVE, WITHOUT DISTURBING ANY OTHER BREAKER.
- J. PROVIDE DEAD-FRONT SAFETY TYPE PANELBOARDS AS INDICATED, WITH PANELBOARD SWITCHING AND PROTECTIVE DEVICES IN QUANTITIES, RATINGS, TYPES, AND WITH ARRANGEMENT SHOWN. PROVIDE WITH ANTI-TURN SOLDERLESS PRESSURE TYPE MAIN LUG CONNECTORS APPROVED FOR USE WITH COPPER OR ALUMINUM CONDUCTORS.
- K. PROVIDE FULL-SIZED (100 PERCENT) NEUTRAL BUS. PROVIDE SUITABLE LUGS ON NEUTRAL BUS FOR OUTGOING FEEDERS REQUIRING NEUTRAL CONNECTIONS.
- L. PROVIDE PANELBOARDS WITH BARE UNINSULATED GROUNDING BARS SUITABLE FOR BOLTING TO ENCLOSURES.
- 2.3 GENERAL USE CIRCUIT BREAKER PANELBOARDS
- A. PROVIDE 208Y/I20V THREE-PHASE GENERAL USE PANELBOARDS EQUAL TO SQUARE D NQOD WITH BOLT-ON BRANCH BREAKERS.

2.4 BUSSING

A. PROVIDE COPPER BUSSING.

- 2.5 CIRCUIT BREAKER PANELBOARD ENCLOSURESA. PROVIDE GALVANIZED SHEET STEEL CABINET TYPE ENCLOSURES, IN SIZES AND NEMA TYPES AS
 - INDICATED, CODE-GAGE, MINIMUM 16-GAGE THICKNESS.

 3. PROVIDE BOXES WITH CODE-COMPLIANT SIDE AND END GUTTERS (MINIMUM 4 INCHES), AND OF CODE GAUGE GALVANIZED STEEL. PROVIDE BOXES THAT ARE 20 INCHES WIDE MINIMUM, AND 5-3/4 INCHES
- C. PROVIDE PANELBOARD TRIMS THAT ARE FLUSH OR SURFACE AS REQUIRED FOR RESPECTIVE APPLICATION, THAT ARE CONSTRUCTED OF CODE GAUGE STEEL, THAT ARE FINISHED WITH RUST INHIBITING PRIME COAT AND THEN FACTORY APPLIED HOT SPRAY LACQUER OR BAKED-ON ENAMEL, AND THAT ARE FACTORY PAINTED MANUFACTURER'S STANDARD LIGHT GRAY. PROVIDE TRIMS COMPLETE WITH CONCEALED HINGES AND CONCEALED TRIM CLAMPS. PROVIDE DOORS WITH FLUSH CHROMIUM PLATED COMBINATION CYLINDER LOCK AND CATCH, AND WITH DIRECTORY SUITABLE FOR CLEAR PLASTIC. PROVIDE LOCKS THAT ARE KEYED ALIKE.

DEEP MINIMUM. PROVIDE BOXES WITH MULTIPLE KNOCKOUTS AND WIRING GUTTERS.

D. PROVIDE ENCLOSURES THAT ARE FABRICATED BY SAME MANUFACTURER AS PANELBOARDS, WHICH MATE AND MATCH PROPERLY WITH PANELBOARDS TO BE ENCLOSED.

2.6 MOLDED CASE CIRCUIT BREAKERS

- A. PROVIDE FACTORY-ASSEMBLED, MOLDED-CASE CIRCUIT BREAKERS OF FRAME SIZES, CHARACTERISTICS, AND RATINGS INCLUDING RMS SYMMETRICAL INTERRUPTING RATINGS REQUIRED FOR EACH APPLICATION. PROVIDE BREAKERS WITH PERMANENT THERMAL AND INSTANTANEOUS MAGNETIC TRIP, WITH FAULT-CURRENT LIMITING PROTECTION, AND WITH AMPERE RATINGS AS INDICATED.
- PROVIDE COORDINATED SERIES-RATED CIRCUIT BREAKERS AS APPLICABLE THROUGHOUT, ACCOMMODATING RESPECTIVE AVAILABLE FAULT CURRENT.
- PROVIDE BREAKERS THAT ARE DESIGNED TO BE MOUNTED AND OPERATED IN ANY PHYSICAL POSITION, AND TO BE OPERATED IN A MINIMUM AMBIENT TEMPERATURE OF 40 DEGREES C. PROVIDE BREAKERS WITH MECHANICAL SCREW TYPE REMOVABLE CONNECTOR LUGS, AL/CU RATED.
- PROVIDE BRANCH CIRCUIT BREAKERS THAT ARE FULL AMBIENT COMPENSATED THERMAL MAGNETIC MOLDED CASE TYPE, WITH QUICK-MAKE AND QUICK-BREAK ACTION, AND WITH POSITIVE HANDLE TRIP INDICATION (ON BOTH MANUAL AND AUTOMATIC OPERATION). PROVIDE BREAKERS OF THE OVER-THE-CENTER TOGGLE OPERATING TYPE WITH THE HANDLE GOING TO A POSITION BETWEEN "ON" AND "OFF" TO INDICATE AUTOMATIC TRIPPING.
- PROVIDE BOLT-ON BRANCH BREAKERS. PROVIDE FULL SIZE CIRCUIT BREAKERS. DO NOT PROVIDE "TANDEM" OR "SPLIT" BREAKERS

2.7 FAULT CURRENT RATINGS

A. PROVIDE ELECTRICAL DISTRIBUTION RELATED EQUIPMENT WITH APPROPRIATELY BRACED BUSSING

AND PROPERLY RATED BREAKERS, FUSES, ETC. FOR THE AVAILABLE FAULT CURRENTS.

2.8 SERIES COORDINATION

A. PROVIDE FACTORY SERIES COORDINATION FOR ALL CIRCUIT BREAKERS (INCLUDING BRANCH BREAKERS), RELATIVE TO UPSTREAM BREAKERS, SO THAT ONLY THE BREAKER CLOSEST IN THE CIRCUIT TO THE LOAD TRIPS UPON AN OVERLOAD OR FAULT CONDITION.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. PROVIDE ENCLOSURES FASTENED FIRMLY TO WALLS AND STRUCTURAL SURFACES, ENSURING THAT THEY ARE PERMANENTLY AND MECHANICALLY ANCHORED.
- B. PROVIDE NEATLY TYPEWRITTEN CIRCUIT DIRECTORY CARD FOR EACH PANELBOARD UPON COMPLETION OF INSTALLATION WORK. INCLUDE THE ACTUAL ROOM NAMES/NUMBERS THAT ARE SELECTED FOR INTERIOR SIGNAGE/DESIGNATION.
- C. SCHEDULING SHOWN ON DRAWINGS IS SHOWN TO INDICATE FEEDER AND BRANCH CIRCUITING REQUIREMENTS. DETERMINE EXACT NUMBERING SEQUENCE OF CIRCUITS IN FIELD AFTER PERFORMING FINAL BALANCING

ND OF SECTION

SECTION 26 27 26 - WIRING DEVICES

PART I - GENERAL

.I SUMMARY

PROVIDE WIRING DEVICES, IN TYPES, CHARACTERISTICS, GRADES, COLORS, AND ELECTRICAL RATINGS FOR APPLICATIONS INDICATED WHICH ARE UL LISTED AND WHICH COMPLY WITH NEMA WD I AND OTHER APPLICABLE UL AND NEMA STANDARDS. VERIFY COLOR SELECTIONS WITH OWNER'S REPRESENTATIVE.

PART 2 - PRODUCTS

2.I MANUFACTURERS

2.2 WIRING DEVICE COLORS

A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING.

SWITCHES: LEVITON, HUBBELL, BRYANT, PASS & SEYMOUR, COOPER DIMMERS: LUTRON

RECEPTACLES: LEVITON, HUBBELL, BRYANT, PASS & SEYMOUR, COOPER WALL PLATES: LEVITON, HUBBELL, BRYANT, PASS & SEYMOUR, COOPER

A. UNLESS SPECIFICALLY INDICATED OTHERWISE, OR DIRECTED OTHERWISE IN FIELD, PROVIDE WHITE COLOR FOR NORMAL UTILITY WIRING DEVICES.

2.3 SPECIFICATION GRADE RECEPTACLES

- A. STANDARD SPECIFICATION GRADE DUPLEX/SINGLE RECEPTACLES
 - I. PROVIDE DUPLEX RECEPTACLES EQUAL TO LEVITON #5362 SERIES. FOR RECEPTACLE CIRCUITS PROTECTED WITH I5A BREAKERS, PROVIDE NEMA 5-I5R EQUIVALENTS. PROVIDE RECEPTACLES EQUAL TO LEVITON #536I SERIES FOR SIMPLEX (SINGLE) APPLICATIONS.
- B. GROUND-FAULT INTERRUPTER SPECIFICATION GRADE RECEPTACLES
 - I. PROVIDE GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLES EQUAL TO LEVITON #8898 SERIES. FOR RECEPTACLE CIRCUITS PROTECTED WITH 15A BREAKERS, PROVIDE NEMA 5-15R EQUIVALENTS.
- 2. RECEPTACLES INDICATED AS GFI MAY BE GFI-PROTECTED BY AN UPSTREAM GFI RECEPTACLE ON THE SAME CIRCUIT ONLY IF LOCATED IN THE SAME ROOM. OTHERWISE PROVIDE A SEPARATE GFI RECEPTACLE FOR EACH ONE SHOWN.

I. PROVIDE DUPLEX ISOLATED GROUND RECEPTACLES EQUAL TO LEVITON #5362-IG. PROVIDE SIMPLEX (SINGLE) ISOLATED GROUND RECEPTACLES EQUAL TO LEVITON #5361-IG. FOR RECEPTACLE CIRCUITS PROTECTED WITH I5A BREAKERS, PROVIDE NEMA 5-I5R EQUIVALENTS.

C. ISOLATED GROUND SPECIFICATION GRADE RECEPTACLES

PROVIDE DEDICATED INSULATED ISOLATED GROUND CONDUCTORS (GREEN WITH YELLOW TRACER) FOR EACH APPLICATION.

D. WEATHER RESISTANT GFCI RECEPTACLES

I. PROVIDE DUPLEX WEATHER RESISTANT RECEPTACLES EQUAL TO LEVITON # W7899 SERIES.

FOR RECEPTACLE CIRCUITS PROTECTED WITH 15A BREAKERS, PROVIDE NEMA 5-15R

EQUIVALENTS.

2.4 WIRING DEVICE ACCESSORIES

- A. WALL PLATES

 I. PROVIDE SINGLE AND COMBINATION, OF TYPES, SIZES, AND WITH GANGING AND CUTOUTS AS REQUIRED TO ACCOMMODATE EACH APPLICATION. PROVIDE PLATES WHICH MATE AND MATCH WITH WIRING DEVICES TO WHICH ATTACHED. PROVIDE METAL SCREWS FOR SECURING PLATES TO DEVICES WITH SCREW HEADS COLORED TO MATCH FINISH OF PLATES. PROVIDE WALL
 - PLATE COLOR TO MATCH WIRING DEVICES UNLESS SPECIFICALLY INDICATED OTHERWISE.

 2. PROVIDE STANDARD SIZE WALL PLATES. DO NOT PROVIDE "MIDWAY", "OVERSIZED" ("JUMBO") OR "EXTRA DEEP" WALL PLATES.
 - "EXTRA DEEP" WALL PLATES.

 3. PROVIDE GALVANIZED STEEL WALL PLATES IN UNFINISHED EXPOSED-CONDUIT AREAS.

 4. PROVIDE COMMERCIAL GRADE, SATIN FINISH STAINLESS STEEL WALL PLATES IN FINISHED
- AREAS, WITH BEVELED EDGES, EQUAL TO LEVITON TYPE 302 SERIES.

 5. PROVIDE COMMERCIAL SPECIFICATION GRADE THERMOPLASTIC WALL PLATES IN FINISHED

PART 3 - EXECUTION

TANT 3 - EXECUT

- 3.1 INSTALLATION

 A. PROVIDE GROUNDED (" NEUTRAL") CONDUCTOR IN ALL LIGHTING CONTROL DEVICE (SWITCH, DIMMER, OCCUPANCY SENSOR, ETC.) WALL OUTLET BOXES, EVEN IF NOT IMMEDIATELY USED.
- B. INSTALL RECEPTACLES SO THAT THE GROUND PIN IS ORIENTED IN A CONSISTENT MANNER THROUGHOUT THE FACILITY, SO THAT THE ORIENTATION IS COMPLIANT WITH ALL PREVAILING CODES AND REGULATIONS, AND SO THAT THE ORIENTATION IS ACCEPTABLE TO THE ELECTRICAL

END OF SECTION

INSPECTOR.

No.	DATE	DESCRIPTION
DWG	DATE:	09-18-2024
DRAV	WN BY:	NYE
REVI	EWED BY:	
PROJ	JECT No.:	
DWG	TITLE:	

ISSUE

SPECIFICATIONS

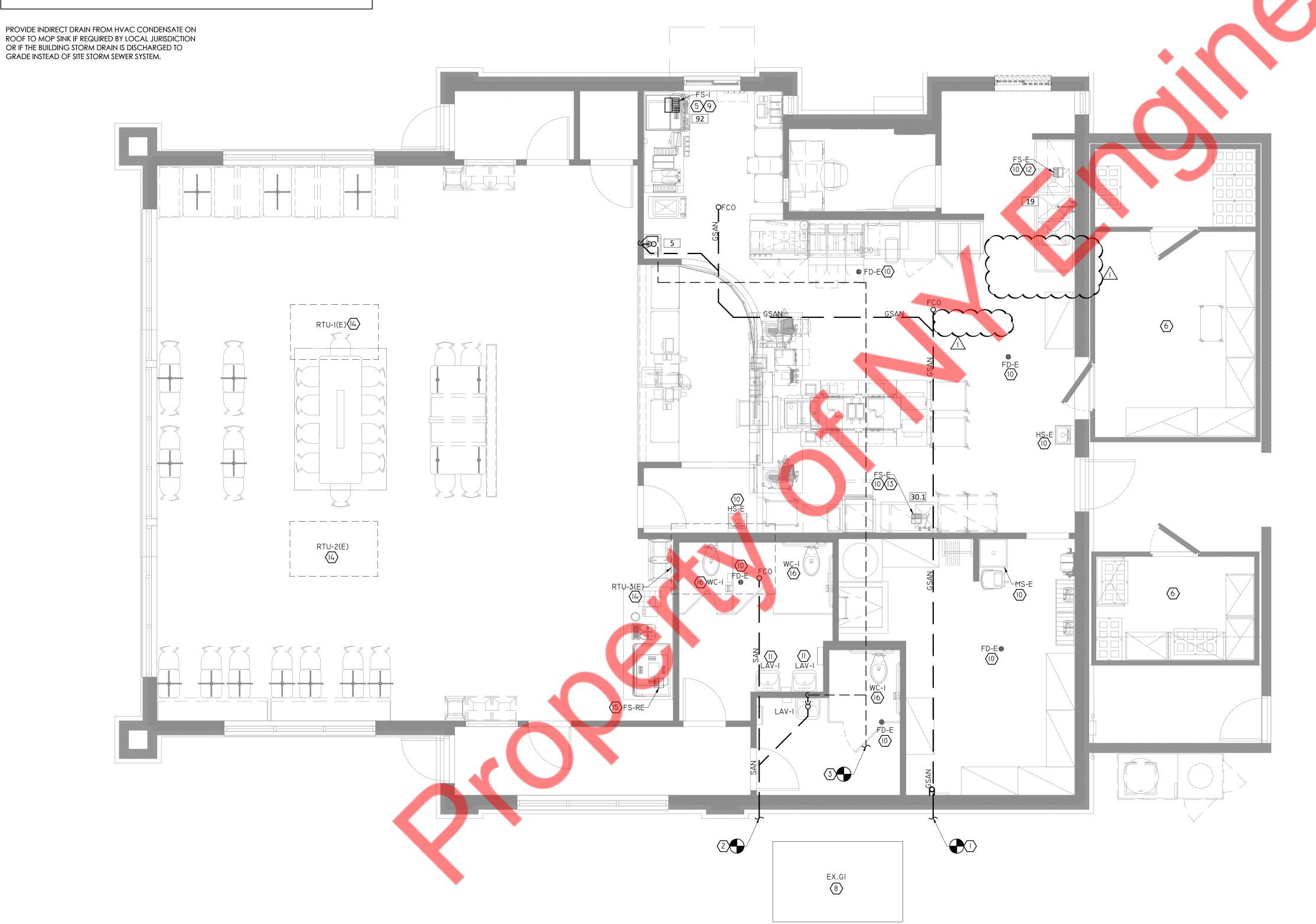
ELECTRICAL

-8

- .. CONTRACTOR SHALL PROVIDE ALTERNATE BID FOR SURESEAL TRAP GUARD OR EQUIVALENT PRODUCT IN LIEU OF TRAP PRIMERS. CONTRACTOR SHALL VERIFY LOCAL CODE
- . CONTRACTOR SHALL FIELD VERIFY EXACT CONTINUATION AND ROUTING OF SANITARY PIPING FOR A PROPER OPERATING SYSTEM. PLUMBING CONTRACTOR SHALL FIELD VERIFY INVERT ELEVATION PRIOR TO SANITARY LINE INSTALLATION AND NOTIFY ARCHITECT/ENGINEER WITH ANY DISCREPANCIES IMMEDIATELY.
- ALL SANITARY PIPING 2-1/2" AND SMALLER SHALL BE INSTALLED WITH A SLOPE OF 1/4" PER FOOT. ALL SANITARY PIPING 3" AND LARGER SHALL BE INSTALLED AT A SLOPE OF 1/8" PER FOOT. PROVIDE PROPER SLOPE FOR VENT PIPING TO DRAIN BACK TO DRAINAGE SYSTEM TO DRAIN ANY ACCUMULATIVE MOISTURE.
-). ALL UNDERGROUND GREASE WASTE PIPING UPSTREAM OF GREASE INTERCEPTOR SHALL BE INSTALLED WITH A SLOPE OF 1/4" PER FOOT.
- . ALL UNDERGROUND GREASE WASTE PIPING TO BE PVC. CAST IRON PIPING SHALL BE USED FOR THE FLOOR DRAIN IN FRONT OF FRYER.
- F. ALL WASTE PIPING SHOWN IS LOCATED BELOW FINISHED FLOOR, U.N.O.
- G. ALL VENT PIPING SHOWN IS LOCATED ABOVE FINISHED CEILINGS AND INSIDE WALLS, U.N.O.
- H. ROOF OVERFLOW DRAINAGE IS BY SCUPPERS. REFER TO THE ARCHITECTURAL DRAWINGS.
- REFER TO STACK DIAGRAM AND SCHEDULES FOR COMPLETE PIPE SIZING INFORMATION.
- J. SMOKE ALL PLUMBING VENT PIPING PRIOR TO CLOSING WALL CAVITIES AND PRIOR TO TURN

QUANTITY DFU PER FIXTURE TOTAL DFU HAND SINK - EX. HAND SINK 2 2 MOP SINK - EX. FLOOR DRAIN - 1 5 5 FLOOR DRAIN - EX 3 FLOOR SINK - EX. 3 TOTAL DRAINAGE FIXTURE UNITS (DFU) CONNECTED TO GREASE INTERCEPTOR AS PER INTERNATIONAL PLUMBING CODE 2021 (UPC TABLE 1014.3.6) MINIMUM REQUIRED GREASE INTERCEPTOR SIZE FOR 460 DFU IS 1,250 GALLONS. REQUIRED CAPACITY OF GREASE INTERCEPTOR = 1,250 GALLONS

GREASE TRAP SIZING CALCULATIONS



CODED NOTES: (#)

- CONNECT 4" GREASE WASTE PIPING TO SITE UTILITY CONTRACTOR PROVIDED SITE GREASE WASTE SEWER 5'-0" OUTSIDE BUILDING WALL. REFER TO CIVIL DRAWINGS FOR CONTINUATION. COORDINATE EXACT POINT-OF-CONNECTION WITH SITE UTILITY CONTRACTOR AND GENERAL TRADES CONTRACTOR.
- CONNECT 4" SANITARY DRAINAGE PIPING TO SITE UTILITY CONTRACTOR PROVIDED SITE SANITARY SEWER 5'-0" OUTSIDE BUILDING WALL. REFER TO CIVIL DRAWINGS FOR CONTINUATION. COORDINATE EXACT POINT-OF-CONNCETION WITH SITE UTILITY CONTRACTOR AND GENERAL TRADES CONTRACTOR.
- CONNECT NEW 3" VENT PIPING TO EXISTING VENT PIPING IN SPACE. CONTRACTOR TO FIELD VERIFY THE SIZE AND LOCATION OF EXISTING VENT PIPING.

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

PROVIDE DRAINAGE PIPING FROM ICE MACHINE AND BEVERAGE DISPENSER TO FS-I PER MANUFACTURER INSTRUCTIONS.

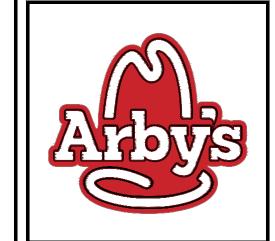
EXISTING COOLER AND FREEZER TO REMAIN WITH EXISTING CONDENSATE PIPING. CONTRACTOR TO FIELD VERIFY THE EXISTING DRAIN LOCATION. IF NOT PROVIDE NEW HUB DRAIN WITH APPROVED AIR GAP AS PER CODE.

- REFER TO CIVIL DRAWINGS FOR EXACT LOCATION AND CAPACITY OF EXISTING GREASE INTERCEPTOR. CONTRACTOR TO COORDINATE WITH LANDLORD/ARCHITECT THAT THE EXISTING GREASE INTERCEPTOR IS SUFFICIENT FOR NEWLY ADDED FIXTURES.
- PLUMBING FIXTURES TO REMAIN WITH EXISTING SANITARY AND VENT PIPING. CONTRACTOR

TO FIELD VERIFY THE CONDITION OF EXISTING FIXTURE AND PIPING. REPLACE IF REQUIRED.

- EXISTING PLUMBING FIXTURES TO REMAIN WITH EXISTING SANITARY AND VENT PIPING. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING FIXTURE AND PIPING. REPLACE IF REQUIRED.
- EXISTING RESTROOM LAVATORIES TO BE REPLACED IN KIND WITH NEW FIXTURE AT SAME LOCATION. RECONNECT EXISTING SANITARY AND VENT PIPING FROM NEW FIXTURE TO EXISTING SANITARY AND VENT PIPING. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING PIPING AND UPGRADE IF REQUIRED.
- 12. ROUTE INDIRECT WASTE PIPING FROM 3-COMP SINK TO EXISTING FLOOR SINK WITH APPROVED AIR GAP AS PER CODE.
- 13. ROUTE INDIRECT WASTE FROM PREP SINK TO EXISTING FLOOR SINK WITH APPROVED AIR GAP AS PER CODE.
- 4. EXISTING RTU-I(E), RTU-2(E) AND RTU-3(E) WILL REMAIN WITH EXISTING CONDENSATE PIPING AND ASSOCIATED FITTINGS. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING CONDENSATE PIPING. REPLACE IF REQUIRED.
- 15. THE EXISTING FLOOR SINK TO BE REMOVED. CONTRACTOR TO CAP THE PIPING.
- 16. EXISTING WATER CLOSET TO BE REPLACE IN KIND WITH NEW FIXTURE AT SAME LOCATION. RECONNECT EXISTING SANITARY PIPING TO NEW PLUMBING FIXTURE. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING PIPING AND UPGRADE IF REQUIRED.

DESCRIPTION	ABBREV.	SYMBOL
SANITARY WASTE PIPING	SAN	SAN
GREASE WASTE PIPING	GSAN	<u> </u>
VENT PIPING	V	
GAS PIPING	G	G
GAS SHUT-OFF VALVE		4>
CLEAN OUT TO GRADE	COTG	
WALL CLEAN OUT	WCO	wco
COLD WATER PIPING	CW	
HOT WATER PIPING	HW	
HOT WATER RETURN	HWR	
FILTERED WATER PIPING	FW	
BALL VALVE	BV	$-\!-\!$
BACKFLOW PREVENTOR	BFP	─
CAP		CAP E
VENT THRU ROOF	VTR	
TEE UP		
TEE DOWN		
90° UP		0
90° DOWN		C
HUB DRAIN	HD	
FLOOR CLEAN OUT	FCO	FCOO
GRADE CLEAN OUT	GCO	
BELOW FINISHED FLOOR	BFF	
POINT OF CONNECTION		lacktriangle
FLOOR DRAIN	FD	
FLOOR SINK	FS	
WATER CLOSET	wc	
LAVATORY	LAV	



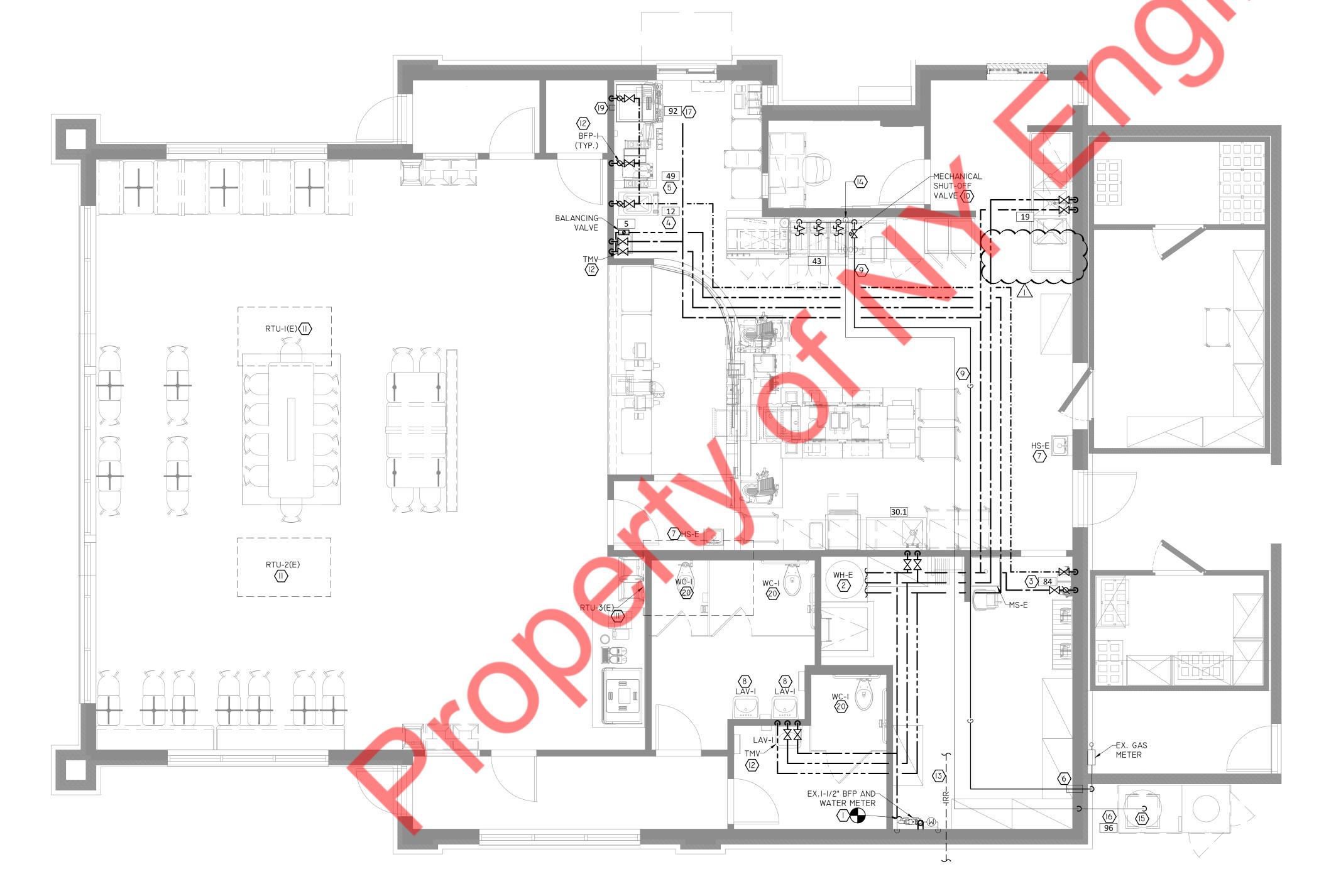
	- 1:	SSUE
No.	DATE	DESCRIPTION
1	10/31/2024	PERMIT COMMENTS
DWG	DATE:	09-18-2024
DRAV	WN BY:	NYE
REVI	EWED BY:	
PROJ	JECT No.:	
DWG	TITLE:	
	PLU	MBING

SANITARY AND

VENT PLAN

PLUMBING SANITARY AND VENT PLAN

- A. PLUMBING CONTRACTOR SHALL PROVIDE ALTERNATE BID FOR SURESEAL TRAP GUARD OR EQUIVALENT TRAP GUARD AS OPPOSED TO TRAP PRIMERS IF LOCAL CODE PERMITS THE USE OF TRAP GUARDS.
- B. THE BASIS OF DESIGN FOR THE DOMESTIC COLD WATER SYSTEM SHALL BE PEX PIPING SYSTEM.
- C. REFER TO SCHEDULE ON SHEET P-5 FOR ADDITIONAL PIPE SIZING INFORMATION.
- D. ROUTE PIPING UP IN TRUSS SPACE WHERE CEILING SPACE IS LIMITED.
- E. TRAP PRIMER/VALVES TO BE IN AN ACCESSIBLE SPACE ABOVE CEILING, IF NOT PROVIDE A MINIMUM 12"x12" ACCESS PANEL, OR LARGER IF REQUIRED TO ADEQUATELY ACCESS THE TRAP PRIMER/VALVES. REFER TO DETAIL ON SHEET P-4.
- F. ALL GAS PIPING IN CONCEALED AREAS SHALL BE WELDED.



CODED NOTES:

- I. CONNECT I-I/2" WATER LINE TO EXISTING I-I/2" WATER LINE WITH EXISTING BACKFLOW PREVENTER AND WATER METER. COORDINATE EXACT LOCATION AND POINT-OF-CONNECTION WITH SITE UTILITY CONTRACTOR AND ARBY'S CONSTRUCTION MANAGER. ALSO COORDINATE THE PRESSURE AVAILABLE TO SATISFY THE EXISTING I-I/2" WATER LINE.
- 2. EXISTING WATER HEATER WITH EXISTING PLUMBING CONNECTIONS TO REMAIN. CONTRACTOR TO VERIENT THE CAPACITY OF EXISTING WATER HEATER IS SUFFICIENT FOR NEWLY ADDED
- 3. I/2" CW WITH BALL SHUT OFF VALVE AND ASSE 1022 LISTED BFP 6" BELOW CEILING TO WATER BOOSTER FILTER SYSTEM (84). COORDINATE EXACT REQUIREMENTS WITH SODA VENDOR. REFER TO WATER FILTER SYSTEM DETAIL ON SHEET P-4.
- 4. CONNECT TO FILTERED WATER LINE ABOVE CEILING AND PROVIDE 1/2" FW DROP IN WALL TO 21" AFF FOR SHAKE MACHINE (12). PROVIDE BALL STOP VALVE, ASSE 1022 LISTED BFP AND FINAL CONNECTION TO EQUIPMENT. COORDINATE EXACT REQUIREMENTS WITH SODA VENDOR.
- 5. CONNECT TO FILTERED WATER LINE ABOVE CEILING AND PROVIDE 1/2" FW DROP DOWN IN WALL AND UNDER COUNTERTOP TO 44" AFF FOR COFFEE MAKER (49). PROVIDE BALL SHUTOFF VALVE, ASSE 1022 LISTED BFP AND FINAL CONNECTION TO EQUIPMENT. COORDINATE EXACT REQUIREMENTS WITH SODA VENDOR.
- 6. ROUTE GAS PIPING INTO BUILDING AND RISE IN WALL CAVITY TO ABOVE CEILING WITHIN TRUSS SPACE. PROVIDE WATERTIGHT SEAL AT WALL PENETRATION. PAINT EXTERIOR PIPING TO MATCH EXTERIOR WALL FINISHES. COORDINATE COLOR WITH CONSTRUCTION MANAGER
- 7. EXISTING PLUMBING FIXTURES TO REMAIN WITH EXISTING CW, HW AND HWR PIPING. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING FIXTURE AND PIPING. REPLACE IF REQUIRED.
- 8. EXISTING RESTROOM LAVATORIES TO BE REPLACED IN KIND WITH NEW FIXTURE AT SAME LOCATION. RECONNECT EXISTING CW, HW AND HWR PIPING FROM NEW FIXTURE TO EXISTING CW, HW & HWR PIPING. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING PIPING AND UPGRADE IF REQUIRED.
- 9. GAS PIPING ROUTED ABOVE CEILING WITHIN TRUSS SPACE.
- 10. PROVIDE 1-1/4" GAS PIPING DOWN THROUGH CEILING TO MECHANICAL GAS SHUT-OFF VALVE.

 MECHANICAL GAS SHUT-OFF VALVE FURNISHED BY HOOD MANUFACTURER AND INSTALLED BY

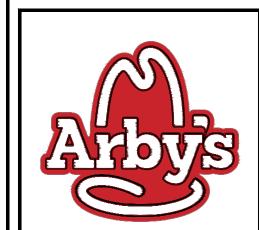
 THE PC. MANUAL SHUT-OFF VALVE PROVIDED BY PC. INSTALL MECHANICAL VALVE AND

 MANUAL VALVE BELOW CEILING. REFER TO GAS RISER DIAGRAM ON P-3 SHEET AND DETAIL

 ON SHEET P-1.
- II. EXISTING RTU-I(E), RTU-2(E) AND RTU-3(E) WILL REMAIN WITH EXISTING GAS PIPING AND ASSOCIATED FITTINGS. CONTRACTOR TO FIELD VERIFY THE SIZE, LOCATION AND PRESSURE OF EXISTING GAS PIPING. UPGRADE IF REQUIRED.
- 12. PROVIDE A THERMOSTATIC MIXING VALVE AT LAVATORY AND HAND SINK. SET AT TEMPERATURE OF MAX 110°F.
- 13. IF IRRIGATION SYSTEM IS REQUIRED, PROVIDE I" TAP, METER AND ASSE 1013 BACKFLOW ASSEMBLY INSIDE BUILDING FOR IRRIGATION SYSTEM. DO NOT PROVIDE IF NOT REQUIRED. CONTRACTOR TO VERIFY REQUIREMENTS WITH CONSTRUCTION MANAGER AND LOCAL CODE AUTHORITY.
- 14. PC SHALL ROUTE 3/4" GALVANIZED USED FRYER GREASE PIPING DOWN ON WALL AND HORIZONTALLY TO THE FRYERS PER MANUFACTURERS RECOMMENDATIONS. SECURE INLET PIPE TO WALL WITH STANDOFF BRACKETS AND PIPE COVER, REFER TO PIPE COVER DETAIL ON SHEET P-3. REFER TO NOTE 16 AND 17 FOR COORDINATION.
- I5. USED FRYER GREASE PIPING ROUTED ABOVE CEILING. INSTALL PIPE PER MANUFACTURERS RECOMMENDATIONS WITH I/8" MIN SLOPE TO ALLOW FOR RESIDUAL GREASE TO DRAIN INTO STORAGE TANK WHEN THE SYSTEM IS NOT IN USE.
- 16. USED FRYER GREASE HOLDING TANK (96) BY KITCHEN EQUIPMENT SUPPLIER.
- 17. CONNECT TO SODA PROVIDED FILTERED WATER LINE ABOVE CEILING AND PROVIDE 1/2" FW DROP TO 84" AFF TO ICE MAKER (92) WITH WHIP CONNECTOR FURNISHED BY SODA VENDOR. PROVIDE BALL SHUTOFF VALVE, ASSE 1022 LISTED BFP AND FINAL CONNECTION TO EQUIPMENT. COORDINATE EXACT REQUIREMENTS WITH SODA VENDOR.

NOT USED.

- 19. PROVIDE 4" CONDUIT IN WALL BETWEEN SODA DISPENSERS FOR SODA CONDUIT. PROVIDE 12X12 CUT OUT HOLE UNDER DRIVE THROUGH COUNTER TO CONNECT SODA LINES.
- 20. EXISTING WATER CLOSET TO BE REPLACE IN KIND WITH NEW FIXTURE AT SAME LOCATION. RECONNECT EXISTING CW PIPING TO NEW PLUMBING FIXTURE. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING PIPING AND UPGRADE IF REQUIRED.

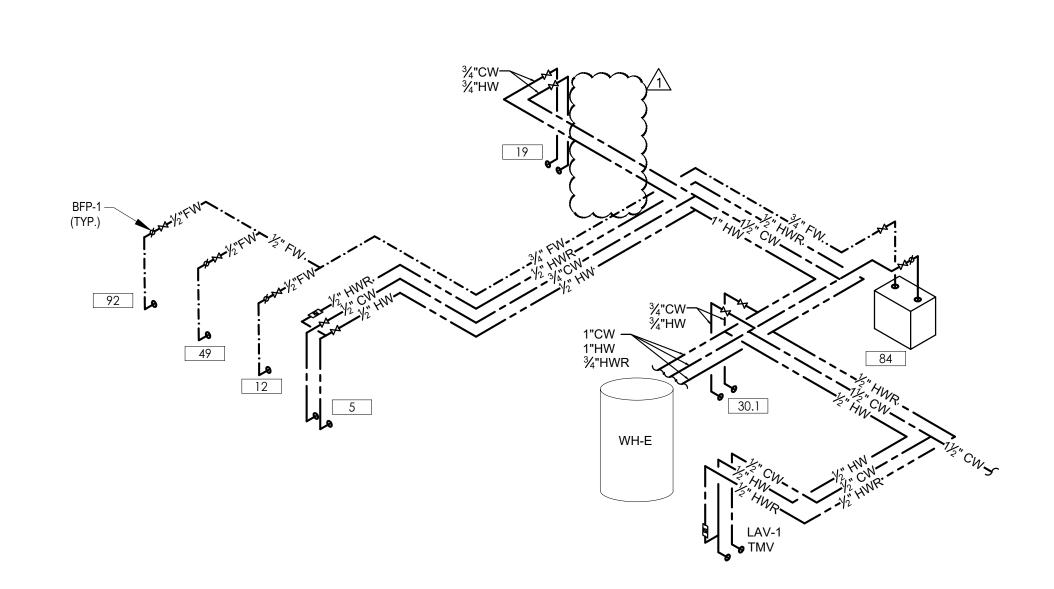


	1:	SSUE
No.	DATE	DESCRIPTION
1	10/31/2024	PERMIT COMMENTS
DWG	DATE:	09-18-2024
DRA	WN BY:	NYE
REVI	EWED BY:	
PRO	JECT No.:	
DWG	TITLE:	

PLUMBING WATER AND GAS PLAN

CUEET NO

P-2

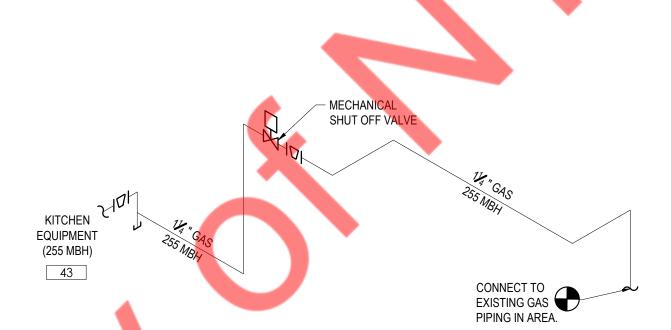


FCOG 1-10-2.

FC

1 WATER RISER DIAGRAM
N.T.S.

WASTE AND VENT STACK DIAGRAM



NATURAL GAS PIPING SYSTEM
PROVIDE A COMPLETE GAS PIPING SYSTEM TO
SERVE GAS EQUIPMENT FURNISHED BY OTHERS, AS
NOTED ON THE DRAWINGS. PROVIDE EITHER
THREADED STEEL OR MALLEABLE IRON PIPE WITH
MALLEABLE FITTINGS OR WELDED STEEL. PROVIDE
ALL UNIONS, SHUT-OFF VALVES AND DIRT LEGS
REQUIRED BY NFPA-54 AND GOVERNING LOCAL
CODES AND AT EACH GAS APPLIANCE CONNECTION.
PROVIDE ALL TESTS, METERS, INSPECTIONS,
HANGERS AND EQUIPMENT CONNECTIONS REQUIRED
FOR A COMPLETE AND OPERATING SYSTEM.
NOTES:

1. GAS PIPING TO BE SCHEDULE 40 STEEL PIPE W/125 CAST IRON SCREWD FITTINGS

2. GAS SYSTEM TO BE INSTALLED BY QUALIFIED LICENSED CONTRACTOR.

3. VERIFY ALL EQUIPMENT BTUS'S PRIOR TO INSTALLATION. ADJUST PIPE SIZE ACCORDING TO 2021 INTERNATIONAL FUEL GAS CODE, TABLE 402.4(2).

4. PROVIDE PRESSURE REGULATOR AT ALL EQUIPMENTS.

GAS LOA	D SUMMARY
EQUIPMENT	MBH LOAD
KITCHEN EQUIPMENT	255
TOTAL LOAD	255

GAS PIPE SIZING PER 2021 INTERNATIONAL FUEL GAS CODE, TABLE 402.4(2)

GAS INLET PRESSURE — LESS THAN 2 PSI.

PRESSURE DROP — 0.5" WC

<u>SPECIFIC GRAVITY</u> - 0.60

EQUIVALENT LENGTH OF PIPE = 100 FT

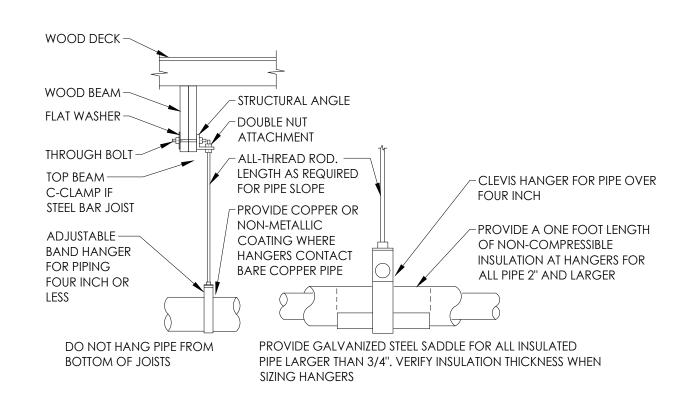
2	GAS RISER DIAGRAM
3	N.T.S.

	[:	SSUE
No.	DATE	DESCRIPTION
1	10/31/2024	PERMIT COMMENTS
DWG	DATE:	09-18-2024
DRAV	WN BY:	NYE
REVI	EWED BY:	
PRO	JECT No.:	
DWG	TITLE:	

PLUMBING RISERS,
DETAILS AND
SCHEDULES

SHEET No.

P-3



PROVIDE UPPER ATTACHMENT AS REQUIRED FOR CASES NOT SHOWN HERE. DO NOT INSTALL HANGER INSIDE INSULATION OR OTHERWISE PENETRATE VAPOR BARRIER. DO NOT HANG ONE PIPE FROM ANOTHER. TRAPEZE HANGERS MAY BE USED FOR MULTIPLE PARALLEL PIPES. HANGER SPACING FOR PIPE SIZE: COPPER: 4"=12"; 3"=11"; 2-1/2"=10"; 2"=9"; 1-1/2"=8'; 1-1/4"=7'; 1"=6'; 3/4"=6'; 1/2"=5'. CAST IRON: 10' AND ONE NEAR ALL JOINTS. STEEL: 4"=14'; 3"=12'; 2-1/2"=11'; 2"=10'; 1-1/2"=9'; 1"=7'; 3/4"=6'; 1/2"=5'. LOCATE HANGERS AS CLOSE AS POSSIBLE TO TURNS AND TEES OF PIPE. PROVIDE SUPPLEMENTARY STEEL STRUTS BETWEEN JOISTS IF REQUIRED. LOCATE HANGERS TO TAKE LOAD OFF OF EQUIPMENT CONNECTIONS. ANCHOR WATER PIPE AGAINST SWAYING DUE TO CHANGES IN WATER VELOCITY. PROVIDE SEISMIC BRACING IF/AS REQUIRED BY LOCAL AUTHORITIES. CHAINS OR PERFORATED STRAP IRON OR STEEL IS NOT ACCEPTABLE. REFER TO CODES AND SPECIFICATIONS FOR FURTHER INFORMATION.

PIPE HANGER DETAIL

PROVIDE CLEANOUTS IN TURNS/ENDS —

OF PIPE. USE DWV COPPER FITTINGS

IF SIZE IS LARGER THAN 1"

SLOPE PIPE AS MUCH AS —

MAKE CONNECTION TO

EQUIPMENT AS REQUIRED

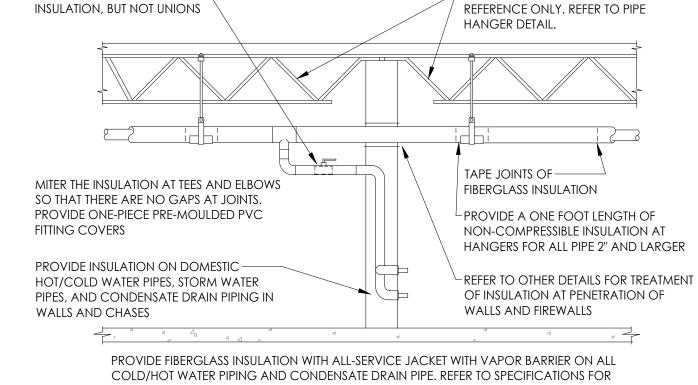
POSSIBLE TOWARD DISCHARGE

MAKE PIPE MINIMUM ONE SIZE LARGER –

3/4". USE TYPE "M" OR "L" HARD COPPER

THAN EQUIPMENT CONNECTION, MINIMUM

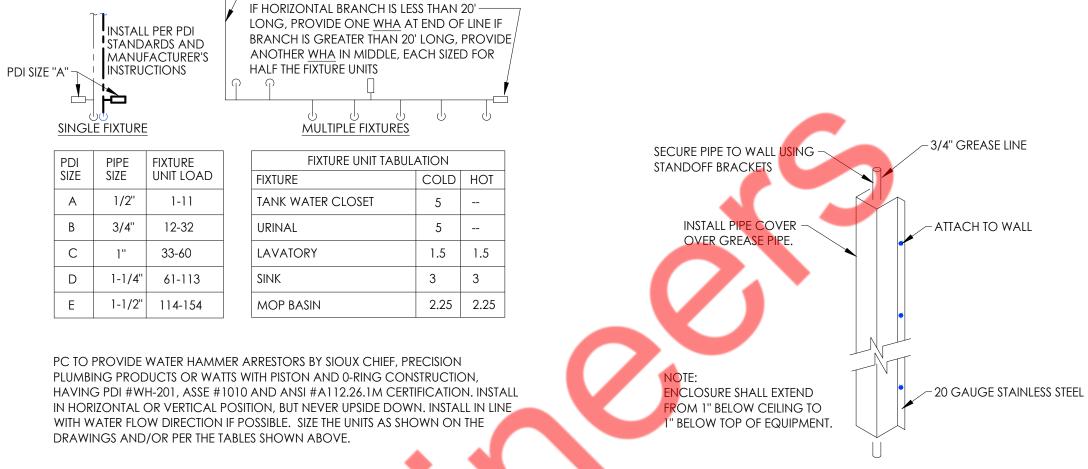
SIZED PER S. COMM 82.30.



FURTHER INFORMATION REGARDING INSULATION. INSTALL ALL ITEMS PER SPECIFICATIONS AND MANUFACTURERS INSTRUCTIONS. MAINTAIN VAPOR BARRIER ON COLD PIPING BY MEANS OF SEALANT AND TAPE. FLAME-SPREAD AND SMOKE-DEVELOPED INDEXES SHALL NOT EXCEED 25/50. SEAL EXPOSED ENDS OF FIBERGLASS INSULATION WITH ADHESIVE



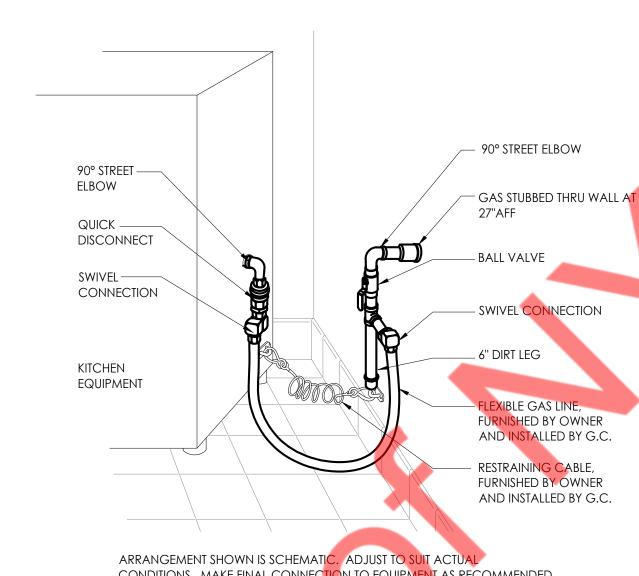
COVER VALVE BODIES WITH—



WATER HAMMER ARRESTERS DETAIL

HOT OR COLD WATER SUPPLY

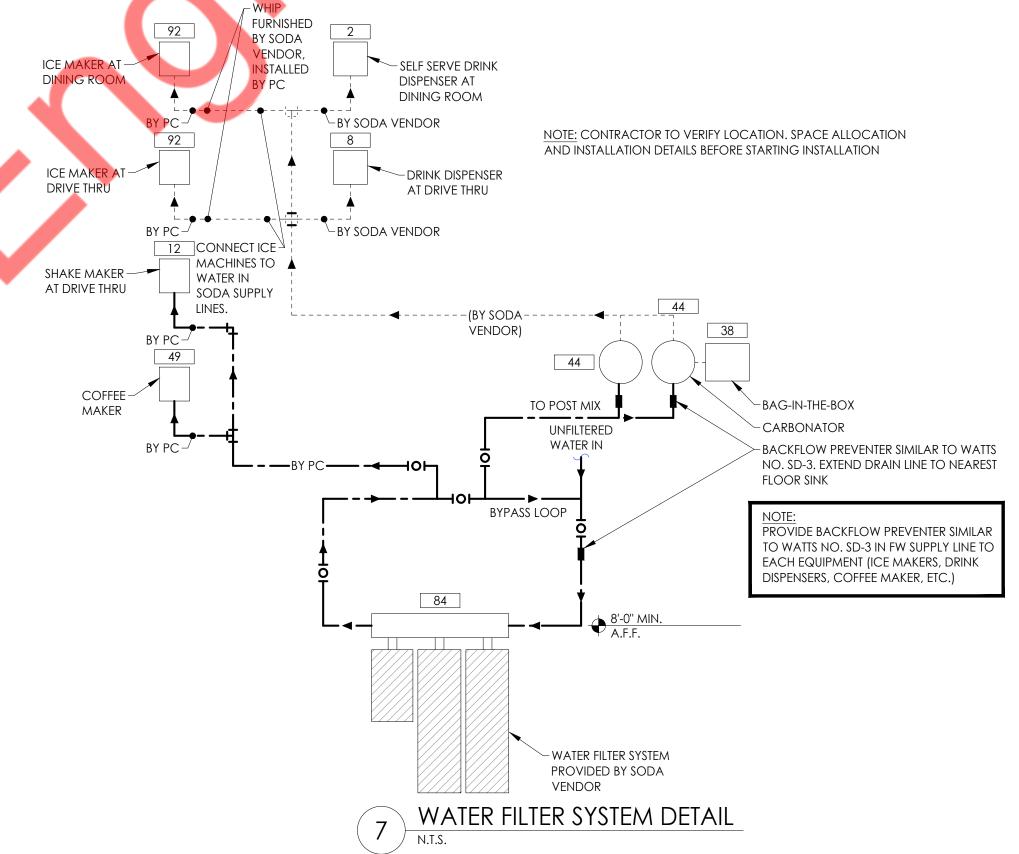




→ ROOF STRUCTURE SHOWN FOR

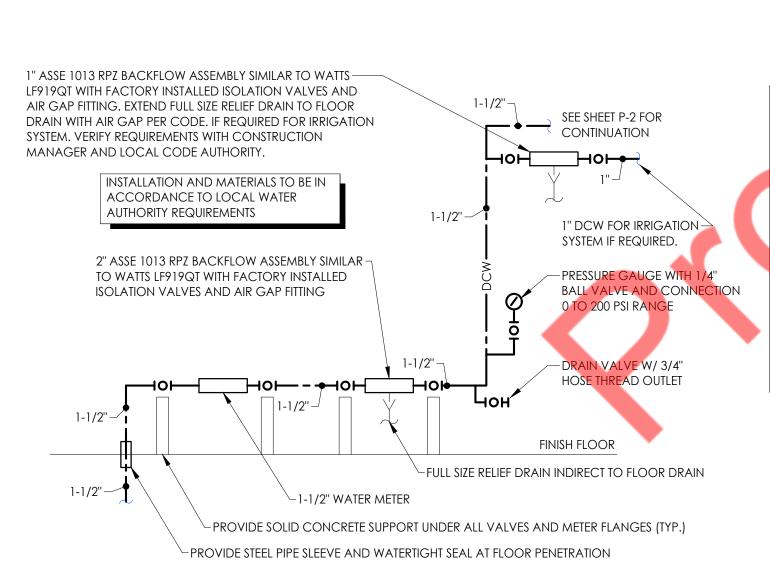
CONDITIONS. MAKE FINAL CONNECTION TO EQUIPMENT AS RECOMMENDED BY MANUFACTURER. PROVIDE WELDED FITTINGS/JOINTS IN ANY CONCEALED, UNSLEEVED LOCATION.

KITCHEN GAS CONNECTION DETAIL



5 INDIRECT DRAIN CONNECTION DETAIL 5 N.T.S.

WATER SERVICE ENTRANCE



-DISCHARGE INTO CENTER HOLE OF

GAP SUFFICIENT TO REMOVE GRATE

PIPE DIAMETERS AND AT LEAST ONE

INCH AIR GAP

PROVIDE TRAP WHEN INDIRECT WASTE

EXCEED 30" LENGTH

ROUTE PIPE INCONSPICUOUSLY AND UNOBTRUSIVELY. HANG PIPE AS REQUIRED.

DO NOT INSULATE INDIRECT DRAIN PIPE WHEN INSTALLED EXPOSED IN FOOD

SERVICE FACILITY. REFER TO LOCAL CODES FOR FURTHER INFORMATION.

NOTE: ALL INDIRECT WASTE AND LOCAL PIPING EXCEEDING 30" LENGTH SHALL BE

AND STRAINER, MINIMUM GAP = TWO

-RIM OF FLOOR SINK IS TO BE MOUNTED FLUSH WITH FINISH FLOOR UNLESS DICTATED OTHERWISE BY AHJ

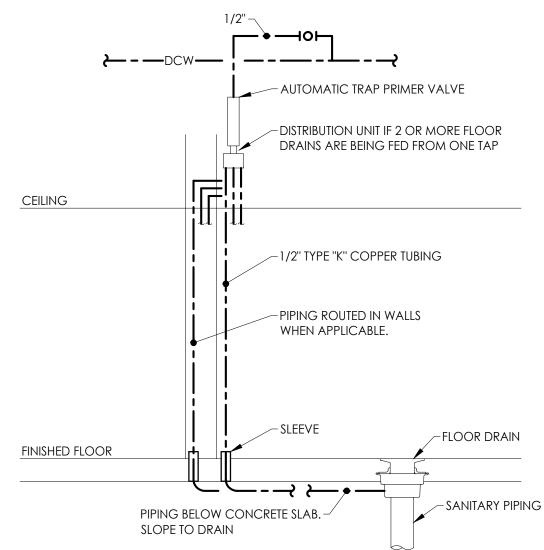
GRATE OF WASTE RECEPTACLE WITH AIR

WATER SERVICE NOTES

WATER SERVICE ENTRANCE MATERIALS, INSTALLATION, AND ALL COMPONENTS (INCLUDING BUT NOT LIMITED TO METERS AND BACKFLOW PREVENTERS) TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL WATER AUTHORITY, VERIFIED IN ADVANCE OF ANY WORK.

2. ALL REDUCED PRESSURE ZONE PRINCIPLE BACKFLOW PREVENTERS TO BE COMPLETE APPROVED ASSEMBLIES INCLUDING BUT NOT LIMITED TO TEST COCKS AND AIR GAP FITTINGS AT VENT/DRAIN CONNECTION POINT. ASSEMBLIES TO BE AS LISTED IN ASSE 1013, APPROVED BY THE LOCAL BACKFLOW PREVENTION AUTHORITY.

PROVIDE FLOOR AND WALL SUPPORT ASSEMBLIES AS REQUIRED TO SECURE AND SUPPORT ITEMS INDICATED AT STRUCTURE. PIPE STANDS EQUAL TO GRINNELL FIG. 62, WALL BRACKETS EQUAL TO GRINNELL FIG. 199.



TRAP RPIMER DETAIL

No. DATE	DESCRIPTION
DWG DATE:	09-18-2024
DRAWN BY:	NYE
REVIEWED BY:	
PROJECT No.:	
DWG TITLE:	

SHEET No.

DETAILS

EXISTING WATER HEATER SCHEDULE								
TAG	DESCRIPTION	STORAGE	RECOVERY	ELECTRIC INPUT	MANUFACTURER/ MODEL NO.			
EX.WH	ELECTRIC STORAGE WATER HEATER	50 GALLONS	109 GPH @ 90° RISE	24 KW, 208V, 3 PH.	A.O. SMITH			

COMMENTS:

1. PROVIDE RECIRCULATION PUMP AND EXPANSION TANK IF NOT EXISTING.

2. SET HOT WATER SUPPLY TEMPERATURE TO 140 DEGREES F

GAS CONNECTED LOAS SCHEDULE									
TAG	EQUIPMENT	INLET CONNECTION	MIN. SUPPLY INLET PRESSURE (WC)	INPUT LOAD (CFH)					
43	3-BANK DEEP FRYER	3/4"	3.5"	225					
RTU-1(E)	ROOF TOP UNIT - EX.	1"	4"	110					
RTU-2(E)	ROOF TOP UNIT - EX.	1"	4"	115					
RTU-3(E)	ROOF TOP UNIT - EX.	1-1/4"	4"	224					

	DRAIN AND CLEANOUT SCHEDULE								
TAG	ITEM	MANUFACTURER	MODEL NO.	COMMENTS					
FS-1	FLOOR SINK INDIRECT WASTE RECEPTOR	ZURN		PVC PLASTIC FLOOR RECEPTOR WITH 12" X 12" SQUARE TOP, 6" DEEP SUMP BODY, PVC BODY, PVC LOOSE SET 1/2 GRATE, STAINLESS STEEL DEBRIS BASKET AND ANCHOR FLANGE. PROVIDE OUTLET WITH P-TRAP. PROVIDE WITH FLASHING COLLAR WHERE REQUIRED.					
FCO	FINISHED AREA FLOOR CLEANOUT	ZURN	CR06NIC3N	LIGHT-DUTY CAST IRON CLEANOUT WITH GAS TIGHT POLYPROYLENE PLUG, AND 6" DIA. ADJUSTABLE SCORIATED NICKEL BRONZE TOP.					
WCO	FINISHED WALL CLEANOUT	ZURN	Z1441	PROVIDE CLEANOUT TEE. PROVIDE COUNTERSUNK ABS TAPERED THREAD PLUG AND ROUND SMOOTH STAINLESS STEEL WALL ACCESS COVER AND SECURING SCREW.					

									PLU	IMBING FIXTURE SC	CHEDULE
		FIXTU	JRE						ACCESSORIES		
TAG	ITEM	MANUFACTURER	MODEL	CW	HW	DRAIN	VENT	ITEM	MANUFACTURER	MODEL	DESCRIPTION
	WC-1 WATER CLOSET							SEAT	ZURN	Z5955SS-EL	ADA COMPLIANT FLOOR MOUNTED WHITE VITREOUS CHINA TOILET, ELONGATED BOWL, 16-1/2" RIM HEIGHT, EXPOSED 1-1/2" TOP SPUD, 1.28 GPF, PROVIDE
WC-1		ZURN	ZURN Z5665-BWL1	1"	-	4''	2"	FLUSHOMETER	ZURN	ZER6000AV-HET	FLOOR BOLTS, WAX RING & BOLT COVERS. PROVIDE HEAVY-DUTY PLASTIC ELONGATED OPEN FRONT SEAT LESS COVER WITH STAINLESS STEEL SELF-SUSTAINING CHECK HINGES. PROVIDE CHROME PLATED BRASS 1.28 GPF HARD WIRED SENSOR ACTIVATED FLUSHMETER WITH MANUAL OVERRIDE FLUSH
								-	-	-	BUTTON.
								FAUCET	ZURN	Z6915-CWB-F	
								DRAIN	ZURN	Z8743-6-PC	ADA COMPLIANT WALL MOUNTED WHITE VITREOUS CHINA LAVATORY, 4" CENTER FAUCET HOLES, OVERFLOW. PROVIDE CHROME PLATED BRASS 4"
								TRAP	ZURN	Z8702-9BWCBX-WC-PC	CENTERSET HARD WIRED SENSOR ACTIVATED FAUCET, 0.5 GPM VANDAL RESISTANT SPRAY HEAD. PROVIDE CHROME PLATED GRID STRAINER DRAIN WITH
LAV-1	LAVATORY	ZURN	Z5344	3/8"	3/8"	" 1-1/4"	1-1/2"	SUPPLY	ZURN	Z8802-XL-LR-LK-Q-PC	CHROME PLATED BRASS TAILPIECE. PROVIDE CHROME PLATED BRASS P-TRAP WITH CLEANOUT, WALL BEND AND WALL FLANGE. PROVIDE CHROME PLATED BRASS LOOSE KEY ANGLE BALL STOP WITH CHROME PLATED FLEXIBLE COPPER SUPPLY RISERS. PROVIDE CHROME FINISH ASSE 1070 LISTED UNDER-SINK
								ASSE 1070 TMV	ZURN WILKINS	ZW1070XL	THERMOSTATIC MIXING VALVE SET AT 105°F. PROVIDE MOLDED VINYL SAFETY COVERS FOR ALL EXPOSED SUPPLY AND DRAIN PIPING. PROVIDE RIGID
								PIPING COVER	ZURN	Z8946-1-NT	IN-WALL CONCEALED ARM LAVATORY SUPPORT SYSTEM.
								CARRIER	ZURN	Z1231-F/Z-5344	
								FAUCET	Е	E	
	MS-E EX.MOP SINK							HOSE & BRACKET	Е	E	
MS-E		existing	EXISTING	E	E E	E	E	MOP HANGER	Е	E	EXISTING TO REMAIN
								BUMPER GUARDS	Е	E	
								WALL GUARDS	E	E	

							KITCHE	N EQUI	PMENT PLU	MBING	SCHEDULE
			GENERAL INFORMATION								PLUMBING INFORMATION
TA	G	QTY	DESCRIPTION	PROVIDED BY	INSTALLED BY	DCW	FW	DHW	DRAIN	GAS	REMARKS
2	<u>)</u>	1	12-head Drink dispenser	OWNER	OWNER	-	BY SODA VENDOR	-	3/4" & 1/2"	-	3/4" DRAIN FROM BIN & 1/2" DRAIN FROM TOWER.
5	5	1	Wall mounted hand Sink	OWNER	GC	1/2"	-4	1/2"	1-1/2"	-	G.C. TO RUN PLUMBING AND CONNECT PROVIDE WITH ASSE 1070 LISTED MIXING VALVE SIMILAR TO THE WATTS LEAD FREE LFMMV-UT-M1. SET THE MIXED OUTLET WATER TEMPERATURE AT 110°F.
8	3	1	8-HEAD DRIVE-THRU DRINK DISPENSER W/ OVERHEAD ICE MAKER ABOVE (SEE #92)	OWNER	OWNER	-	BY SODA VENDOR	-	3/4" & 1/2"	-	3/4" DRAIN FROM ICE MAKER & 1/2" DRAIN FROM TOWER.
12	2	1	SHAKE MACHINE	OWNER	GC	7	1/2"		-	-	REQUIRES A SERVER 3 PUMP RAIL FOR SYRUPS. PROVIDE A 1/2" X 3/8" LEAD-FREE CHROME PLATED BRASS 1/4-TURN BALL STOP, WATTS #SD-3 ASSE 1022 LISTED LISTED DUAL CHECK BACKFLOW PREVENTER W/INLET STRAINER AND FOOD GRADE PLASTIC TUBING ON SUPPLY CONNECTION.PROVID E FLEXIBLE HOSE CONNECTION TO SHAKE MACHINE AND MAKE FINAL CONNECTION.
. 19		1	3 COMPARTMENT SINK	OWNER	GC	1/2"	-	1/2"	1-1/2" F.S.	-	16" AFF (DCW AND DHW), 8" AFF (DRAIN), G.C. TO RUN PLUMBING AND CONNECT. INCLUDES (1) B231 FAUCET WITH 12" SPOUT, (1) B133B FAUCET W/ BACKSPLASH MOUNT, (1) B-157 PRE-RINSE FAUCET AND (3) LEVER WASTES
(u					
30)	1	PREP TABLE 2/ BACKSPLASH AND HAND SINK	OWNER	GC	1/2"	-	1/2"	1-1/2"	-	16" AFF (DCW AND DHW), 8" AFF (DRAIN), G.C. TO RUN PLUMBING AND CONNECT. INCLUDES (1)B231 FAUCET WITH 12"
43	3	1	3 BANK, 6 BASKET FRYER W/ NATURAL GAS	OWNER	GC	-	-	-	-	1"	(3) @ 75,000 BTU/H INPUT PER FRYPOT, FACTORY MANIFOLD TO (1) CONNECTION TOTAL 225,000 BTU/H., 1" CONNECTION AT 11.5" AFF. G.C. TO HOOK UP QUICK DISCONNECT (SUPPLIED BY KES). INCLUDE DORMONT GAS HOSE KIT #16100-KIT-48. ALSO INCLUDE DIVERTER KIT TO ALLOW HOOK-UP TO DARLING 1500 H UNIT.
49	9	1	COFFEE MAKER	OWNER	GC	-	1/4"	-	-	-	PROVIDE A 1/2" X 1/4" LEAD-FREE CHROME PLATED BRASS 1/4-TURN BALL STOP, WATTS #SD-3 ASSE 1022 LISTED LISTED DUAL CHECK BACKFLOW PREVENTER W/INLET STRAINER AND FOOD GRADE PLASTIC TUBING ON SUPPLY CONNNECTION.
60	0	1	DRIVE-THRU COUNTER W/ HAND SINK	OWNER	GC	1/2"	-	1/2"	1-1/2"	-	16" AFF (DCW AND DHW), 8" AFF (DRAIN), G.C. TO RUN PLUMBING AND CONNECT.
84	4	1	WATER BOOST MODULAR FILTER SYSTEM	OWNER	GC	3/8"	3/8"	-	-	-	PROVIDE A 1/2" X 3/8" LEAD-FREE CHROME PLATED BRASS 1/4-TURN BALL STOP, WATTS #SD-3 ASSE 1022 LISTED LISTED DUAL CHECK BACKFLOW PREVENTER W/INLET STRAINER, PRESSURE GAUGE AND UNION AT INLET CONNECTION. PROVIDE UNION, SWING CHECK VALVE, PRESSURE GAUGE, BALL SHUTOFF VALVE AND FOOD GRADE PLASTIC TUBING AT OUTLET CONNECTION.
92	2	2	ICE MAKER	OWNER	GC	-	1/2"	-	-	-	(1) Unit mounts on Pepsi Unit at Drive Thru, (1) Unit mounts on Item #2 Imi Cornelius ed300 beverage dispenser in Dining Area. Remote condenser icvd-0695, Line set RC21 control wires from condensing Unit to Coil. Provide A 1/2" X 3/8" Lead-free Chrome Plated Brass 1/4-turn Ball Stop, watts #SD-3 asse 1022 Listed Listed Dual Check Backflow Preventer W/Inlet Strainer and food grade Plastic Tubing on Supply Connnection.



	1	SSUE
No.	DATE	DESCRIPTION
1	10/31/2024	PERMIT COMMENTS
DWG	DATE:	09-18-2024
DRAV	WN BY:	NYE
REVI	EWED BY:	
PROJ	JECT No.:	
DWG	TITLE:	

PLUMBING SCHEDULES

SHEET No

P-5

SPECIFICATIONS - DIVISION 22 - PLUMBING

SECTION 220500 - COMMON WORK RESULTS FOR PLUMBING

PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
- A. HANGERS AND SUPPORTS FOR PLUMBING PIPING EQUIPMENT:

APPROVAL FROM AUTHORITIES HAVING JURISDICTION.

- 1. STRUCTURAL PERFORMANCE: HANGERS AND SUPPORTS SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED ACCORDING TO ASCE/SEI 7.
- a. DESIGN SUPPORTS FOR MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, AND SYSTEM CONTENTS.
- b. DESIGN EQUIPMENT SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS AND COMPONENTS.
- c. DESIGN SEISMIC-RESTRAINT HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT AND OBTAIN
- 2.2 SLEEVES AND SLEEVE SEALS
- A. GALVANIZED-STEEL-PIPE SLEEVES: ASTM A 53/A 53M, TYPE E, GRADE B, SCHEDULE 40, ZINC COATED, WITH
- B. PVC-PIPE SLEEVES: ASTM D 1785, SCHEDULE 40.
- C. GALVANIZED-STEEL-SHEET SLEEVES: 0.0239-INCH MINIMUM THICKNESS; ROUND TUBE CLOSED WITH WELDED LONGITUDINAL JOINT.
- A. STANDARD: ASTM C 1107/C 1107M, GRADE B, POST-HARDENING AND VOLUME-ADJUSTING, DRY, HYDRAULIC-CEMENT GROUT.
- 1. CHARACTERISTICS: NONSHRINK; RECOMMENDED FOR INTERIOR AND EXTERIOR APPLICATIONS
- 2. DESIGN MIX: 5000-PSI, 28-DAY COMPRESSIVE STRENGTH.
- 3. PACKAGING: PREMIXED AND FACTORY PACKAGED.
- 2.4 ESCUTCHEONS AND FLOOR PLATES
- A. ONE-PIECE, DEEP-PATTERN TYPE: DEEP-DRAWN, BOX-SHAPED BRASS WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS.
- B. ONE-PIECE, STAMPED-STEEL TYPE: WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS
- C. ONE-PIECE FLOOR PLATES: CAST-IRON FLANGE WITH HOLES FOR FASTENERS.
- 2.5 PRESSURE GAGES AND TEST PLUGS
- A. DIRECT-MOUNTED, METAL-CASE, DIAL-TYPE PRESSURE GAGES:
- 1. STANDARD: ASME B40.100.
- 2. CASE: SEALED OPEN-FRONT, PRESSURE RELIEF TYPE(S); CAST ALUMINUM OR DRAWN STEEL 4-1/2-INCH 3.3 GENERAL EQUIPMENT INSTALLATIONS NOMINAL DIAMETER.
- 3. MOVEMENT: MECHANICAL, WITH LINK TO PRESSURE ELEMENT AND CONNECTION TO POINTER.
- 4. DIAL: NONREFLECTIVE ALUMINUM WITH PERMANENTLY ETCHED SCALE MARKINGS GRADUATED IN PSI.
- 5. POINTER: DARK-COLORED METAL
- 6. WINDOW: PLASTIC.
- 7. RING: METAL.
- 8. ACCURACY: GRADE A, PLUS OR MINUS 1 PERCENT OF MIDDLE HALF OF SCALE RANGE.
- B. TEST PLUG: CORROSION-RESISTANT BRASS OR STAINLESS-STEEL BODY WITH TWO SELF-SEALING RUBBER END OF SECTION CORE INSERTS AND GASKETED AND THREADED CAP, WITH EXTENDED STEM FOR UNITS TO BE INSTALLED IN INSULATED PIPING. MINIMUM PRESSURE AND TEMPERATURE RATING 500 PSIG AT 200 DEG F.
- 2.6 HANGERS AND SUPPORTS FOR PLUMBING PIPING EQUPMENT
- A. CARBON-STEEL PIPE HANGERS AND SUPPORTS:
- DESCRIPTION: MSS SP-58, TYPES 1 THROUGH 58, FACTORY-FABRICATED COMPONENTS.
- 2. GALVANIZED METALLIC COATINGS: PREGALVANIZED OR HOT DIPPED
- 3. NONMETALLIC COATINGS: PLASTIC COATING, JACKET, OR LINER.
- 4. PADDED HANGERS: HANGER WITH FIBERGLASS OR OTHER PIPE INSULATION PAD OR CUSHION TO SUPPORT BEARING SURFACE OF PIPING.
- 5. HANGER RODS: CONTINUOUS-THREAD ROD, NUTS, AND WASHER MADE OF CARBON STEEL.
- B. COPPER PIPE HANGERS:
- 1. DESCRIPTION: MSS SP-58, TYPES 1 THROUGH 58, COPPER-COATED-STEEL, FACTORY-FABRICATED COMPONENTS.
- 2. HANGER RODS: CONTINUOUS-THREAD ROD, NUTS, AND WASHER MADE OF COPPER-COATED STEEL.
- C. FASTENER SYSTEMS:
- 1. MECHANICAL-EXPANSION ANCHORS: INSERT-WEDGE-TYPE, ZINC-COATED STEEL ANCHORS, FOR USE IN HARDENED PORTLAND CEMENT CONCRETE; WITH PULL-OUT, TENSION, AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS WHERE USED.
- D. MISCELLANEOUS MATERIALS:
- 1. STRUCTURAL STEEL: ASTM A 36/A 36M, CARBON-STEEL PLATES, SHAPES, AND BARS; BLACK AND
- 2. GROUT: ASTM C 1107, FACTORY-MIXED AND -PACKAGED, DRY, HYDRAULIC-CEMENT, NONSHRINK AND NONMETALLIC GROUT; SUITABLE FOR INTERIOR AND EXTERIOR APPLICATIONS.
- a. PROPERTIES: NONSTAINING, NONCORROSIVE, AND NONGASEOUS.
- b. DESIGN MIX: 5000-PSI, 28-DAY COMPRESSIVE STRENGTH.
- PART 3 EXECUTION
- 3.1 GENERAL PIPING INSTALLATIONS
- A. INSTALL PIPING FREE OF SAGS AND BENDS.
- B. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.
- 1. INSTALL SLEEVES FOR PIPING PASSING THROUGH PENETRATIONS IN FLOORS, PARTITIONS, ROOFS, AND
- 2. INSTALL SLEEVES IN CONCRETE FLOORS, CONCRETE ROOF SLABS, AND CONCRETE WALLS AS NEW SLABS AND WALLS ARE CONSTRUCTED.
- a. USE GROUT AND SEAL THE SPACE OUTSIDE OF SLEEVES IN SLABS AND WALLS WITHOUT SLEEVE-SEAI
- 3. INSTALL SLEEVES FOR PIPES PASSING THROUGH INTERIOR PARTITIONS.
- 4. FIRE-BARRIER PENETRATIONS: MAINTAIN INDICATED FIRE RATING OF WALLS, PARTITIONS, CEILINGS, AND FLOORS AT PIPE PENETRATIONS. SEAL PIPE PENETRATIONS WITH FIRESTOP MATERIALS. COMPLY WITH REQUIREMENTS FOR FIRESTOPPING SPECIFIED IN SECTION 078446 "PENETRATION FIRESTOPPING."
- D. ESCUTCHEONS AND FLOOR PLATES:
- 4. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FINISHED FLOORS.
- 5. INSTALL ESCUTCHEONS WITH ID TO CLOSELY FIT AROUND PIPE, TUBE, AND INSULATION OF PIPING AND WITH OD THAT COMPLETELY COVERS OPENING.
- 6. INSTALL FLOOR PLATES FOR PIPING PENETRATIONS OF EQUIPMENT-ROOM FLOORS.
- 7. INSTALL FLOOR PLATES WITH ID TO CLOSELY FIT AROUND PIPE, TUBE, AND INSULATION OF PIPING AND WITH OD THAT COMPLETELY COVERS OPENING.
- F. METERS AND GAGES:

- 1. INSTALL DIRECT-MOUNTED PRESSURE GAGES IN PIPING TEES WITH PRESSURE GAGE LOCATED ON PIPE AT THE MOST READABLE POSITION.
- 2. INSTALL METERS AND GAGES ADJACENT TO MACHINES AND EQUIPMENT TO ALLOW SERVICE AND
- MAINTENANCE OF METERS, GAGES, MACHINES, AND EQUIPMENT.
- 3. ADJUST FACES OF METERS AND GAGES TO PROPER ANGLE FOR BEST VISIBILITY G. INSTALL UNIONS AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT.
- H. INSTALL DIELECTRIC UNIONS AND FLANGES TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS IN GAS
- I. INSTALL DIELECTRIC COUPLING AND NIPPLE FITTINGS TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS IN WATER PIPING.
- 3.2 HANGERS AND SUPPORTS
- A. COMPLY WITH MSS SP-69 AND MSS SP-89. INSTALL BUILDING ATTACHMENTS WITHIN CONCRETE OR TO 2.3 ADHESIVES STRUCTURAL STEEL
- B. INSTALL HANGERS AND SUPPORTS TO ALLOW CONTROLLED THERMAL AND SEISMIC MOVEMENT OF PIPING
- C. INSTALL POWDER-ACTUATED FASTENERS AND MECHANICAL-EXPANSION ANCHORS IN CONCRETE AFTER
- CONCRETE IS CURED. DO NOT USE IN LIGHTWEIGHT CONCRETE OR IN SLABS LESS THAN 4 INCHES THICK. D. LOAD DISTRIBUTION: INSTALL HANGERS AND SUPPORTS SO PIPING LIVE AND DEAD LOADING AND STRESSES FROM MOVEMENT WILL NOT BE TRANSMITTED TO CONNECTED EQUIPMENT.
- E. HORIZONTAL-PIPING HANGERS AND SUPPORTS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SPECIFICATION SECTIONS, INSTALL THE FOLLOWING TYPES:
- 1. ADJUSTABLE STEEL CLEVIS HANGERS (MSS TYPE 1): FOR SUSPENSION OF NONINSULATED OR INSULATED
- STATIONARY PIPES, NPS 1/2 TO NPS 30. 2. PIPE HANGERS (MSS TYPE 5): FOR SUSPENSION OF PIPES, NPS 1/2 TO NPS 4, TO ALLOW OFF-CENTER
- CLOSURE FOR HANGER INSTALLATION BEFORE PIPE ERECTION. 3. ADJUSTABLE STEEL BAND HANGERS (MSS TYPE 7): FOR SUSPENSION OF NONINSULATED STATIONARY
- 4. ADJUSTABLE BAND HANGERS (MSS TYPE 9): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES,
- 5. ADJUSTABLE SWIVEL-RING BAND HANGERS (MSS TYPE 10): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 2.
- F. VERTICAL-PIPING CLAMPS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM
- SPECIFICATION SECTIONS, INSTALL THE FOLLOWING TYPES:
- 1. EXTENSION PIPE OR RISER CLAMPS (MSS TYPE 8): FOR SUPPORT OF PIPE RISERS, NPS 3/4 TO NPS 20. 2. CARBON- OR ALLOY-STEEL RISER CLAMPS (MSS TYPE 42): FOR SUPPORT OF PIPE RISERS, NPS 3/4 TO 2.5 SEALANTS

PIPES, NPS 1/2 TO NPS 8.

- A. INSTALL EQUIPMENT TO ALLOW MAXIMUM POSSIBLE HEADROOM UNLESS SPECIFIC MOUNTING HEIGHTS ARE NOT INDICATED.
- B. INSTALL EQUIPMENT LEVEL AND PLUMB, PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND
- COMPONENTS, UNLESS OTHERWISE INDICATED. C. INSTALL MECHANICAL EQUIPMENT TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS. CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH MINIMUM INTERFERENCE
- TO OTHER INSTALLATIONS. EXTEND GREASE FITTINGS TO ACCESSIBLE LOCATIONS. D. INSTALL EQUIPMENT TO ALLOW RIGHT OF WAY FOR PIPING INSTALLED AT REQUIRED SLOPE

SECTION 220523 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

NPS 20, IF LONGER ENDS ARE REQUIRED FOR RISER CLAMPS.

- PART 1 GENERAL
- 1.1 SECTION REQUIREMENTS
- 1. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.
- PART 2 PRODUCTS
- 2.1 SYSTEM DESCRIPTION
- A. ASME COMPLIANCE: ASME B16.10 AND ASME B16.34 FOR FERROUS VALVE DIMENSIONS AND DESIGN
- B. NSF COMPLIANCE: NSF 61 FOR VALVE MATERIALS FOR POTABLE-WATER SERVICE.
- 2.2 GENERAL-DUTY VALVES
- A. VALVE SIZES: SAME AS UPSTREAM PIPING UNLESS OTHERWISE INDICATED
- B. VALVES IN INSULATED PIPING: WITH 2-INCH STEM EXTENSIONS.
- C. END CONNECTIONS: THREADS SHALL COMPLY WITH ANSI B1.20.1. FLANGES SHALL COMPLY WITH ANSI B16.24 FOR BRONZE VALVES. SOLDER-JOINT CONNECTIONS SHALL COMPLY WITH ANSI B16.18.
- D. ONE-PIECE, COPPER-ALLOY BALL VALVES: LEAD FREE BRONZE BODY WITH CHROME-PLATED BRASS BALL, MTFE SEATS, AND 600-PSIG MINIMUM CWP RATING.
- E. TWO-PIECE, COPPER-ALLOY BALL VALVES: LEAD FREE BRONZE BODY WITH FULL-PORT, CHROME-PLATED
- BRASS BALL; RPTFE SEATS; AND 600-PSIG MINIMUM CWP RATING AND BLOWOUT-PROOF STE F. LEAD FREE BRONZE, SWING CHECK VALVES: CLASS 125, BRONZE BODY WITH BRONZE DISC AND SEAT.
- PART 3 EXECUTION 3.1 INSTALLATION
- A. USE BALL VALVES FOR SHUTOFF DUTY AND FOR THROTTLING [
- B. LOCATE VALVES FOR EASY ACCESS AND PROVIDE SEPARATE SUPPORT WHERE NECESSARY.
- C. INSTALL VALVES FOR EACH FIXTURE AND ITEM OF EQUIPMENT
- D. INSTALL VALVES IN HORIZONTAL PIPING WITH STEM AT OR ABOVE CENTER OF PIPE. E. INSTALL VALVES IN A POSITION TO ALLOW FULL STEM MOVEMENT.
- F. INSTALL CHECK VALVES FOR PROPER DIRECTION OF FLOW IN HORIZONTAL POSITION WITH HINGE PIN
- **END OF SECTION**

MBING INSULATION SECTION 220700 - PL

- PART 2 PRODUC
- 2.1 PERFORMANCE REQUIREME A. INSULATION INSTALLED INDOORS: FLAME-SPREAD INDEX OF 25 OR LESS, AND SMOKE-DEVELOPED INDEX OF 50 OR LESS ACCORDING TO ASTM E 84.
- 2.2 INSULATION MATERIALS
- MINERAL-FIBER, PREFORMED PIPE INSULATION: COMPLY WITH ASTM C 547, TYPE I, GRADE A, WITH FACTORY-APPLIED ASJ.
 - PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING: JOHNS MANVILLE; MICRO-LOK.
 - b. KNAUF INSULATION; 1000-DEGREE PIPE INSULATION.
- c. OWENS CORNING; FIBERGLAS PIPE INSULATION.
- 2. TYPE I, 850 DEG F MATERIALS: MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN COMPLY WITH ASTM C 547, TYPE I, GRADE A, WITH FACTORY-APPLIED ASJ. FACTORY-APPLIED JACKET 3.2 INDOOR PIPING INSULATION SCHEDULE

- REQUIREMENTS ARE SPECIFIED IN "FACTORY-APPLIED JACKETS" ARTICLE
- B. PROTECTIVE SHIELDING PIPE COVERS:
- 1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
- a. MCGUIRE MANUFACTURING.
- b. PLUMBEREX. c. TRUEBRO; A BRAND OF IPS CORPORATION.
- d. ZURN INDUSTRIES, LLC; TUBULAR BRASS PLUMBING PRODUCTS OPERATION.
- 2. DESCRIPTION: MANUFACTURED PLASTIC WRAPS FOR COVERING PLUMBING FIXTURE HOT- AND COLD-WATER SUPPLIES AND TRAP AND DRAIN PIPING. COMPLY WITH AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS.
- A. MINERAL-FIBER ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2, GRADE A.
- . FOR INDOOR APPLICATIONS, ADHESIVE SHALL HAVE A VOC CONTENT OF 80 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
- 2. ADHESIVE SHALL COMPLY WITH THE TESTING AND PRODUCT REQUIREMENTS OF THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES' "STANDARD PRACTICE FOR THE TESTING OF VOLATILE ORGANIC END OF SECT EMISSIONS FROM VARIOUS SOURCES USING SMALL-SCALE ENVIRONMENTAL CHAMBERS."
- 2.4 MASTICS
- A. VAPOR-BARRIER MASTIC: WATER BASED; SUITABLE FOR INDOOR USE ON BELOW AMBIENT SERVICES. FOR INDOOR APPLICATIONS, USE MASTICS THAT HAVE A VOC CONTENT OF 50 G/L OR LESS.
- 2. WATER-VAPOR PERMEANCE: ASTM E 96/E 96M, PROCEDURE B, 0.013 PERM AT 43-MIL DRY THICKNESS.
- 3. SERVICE TEMPERATURE RANGE: MINUS 20 TO PLUS 180 DEG F
- 4. SOLIDS CONTENT: ASTM D 1644, 58 PERCENT BY VOLUME AND 70 PERCENT BY WEIGHT
- B. BREATHER MASTIC: WATER BASED; SUITABLE FOR INDOOR AND OUTDOOR USE ON ABOVE AMBIEN
- 1. WATER-VAPOR PERMEANCE: ASTM F 1249, 1.8 PERMS AT 0.0625-INCH DRY FILM THICKNESS.
- 2. SERVICE TEMPERATURE RANGE: MINUS 20 TO PLUS 180 DEG F

3. SOLIDS CONTENT: 60 PERCENT BY VOLUME AND 66 PERCENT BY WEIGHT

- 4. COLOR: WHITE.
- A. JOINT SEALANTS: 1. MATERIALS SHALL BE COMPATIBLE WITH INSULATION MATERIALS, JACKETS, AND SUBSTRATES.
- 2. PERMANENTLY FLEXIBLE, ELASTOMERIC SEALAN
- 3. SERVICE TEMPERATURE RANGE: MINUS 100 TO PLUS 300 DEG F.
- 4. COLOR: WHITE OR GRAY. 5. FOR INDOOR APPLICATIONS, SEALANTS SHALL HAVE A VOC CONTENT OF 420 G/L OR LESS.
- B. ASJ FLASHING SEALANTS:
- 1. MATERIALS SHALL BE COMPATIBLE WITH INSULATION MATERIALS, JACKETS, AND SUBSTRATES.
- 2. FIRE- AND WATER-RESISTANT, FLEXIBLE, ELASTOMERIC SEALANT.
- 3. SERVICE TEMPERATURE RANGE: MINUS 40 TO PLUS 250 DEG F.
- . For indoor applications, sealants shall have a voc content of 420 G/L or less. 2.6 FACTORY-APPLIED JACKETS
- A. INSULATION SYSTEM SCHEDULES INDICATE FACTORY-APPLIED JACKETS ON VARIOUS APPLICATIONS. WHEN FACTORY-APPLIED JACKETS ARE INDICATED, COMPLY WITH THE FOLLOWING: . ASJ: WHI<mark>TE, K</mark>raft-Paper, fiberglass-reinforced scrim with aluminum-foil backing;
- COMPLYING WITH ASTM C 1136, TYPE I.
- ASJ TAPE: WHITE VAPOR-RETARDER TAPE MATCHING FACTORY-APPLIED JACKET WITH ACRYLIC ADHESIVE, COMPLYING WITH ASTM C 1136.
- WIDTH: 3 INCHES. THICKNESS: 11.5 MILS.
- . ADHESION: 90 OUNCES FORCE/INCH IN WIDTH
- 4. ELONGATION: 2 PERCENT.
- 5. TENSILE STRENGTH: 40 LBF/INCH IN WIDTH.
- 6. ASJ TAPE DISKS AND SQUARES: PRECUT DISKS OR SQUARES OF ASJ TAPE.
- PART 3 EXECUTION
- 3.1 PIPE INSULATION INSTALLATION A. COMPLY WITH REQUIREMENTS OF THE MIDWEST INSULATION CONTRACTORS ASSOCIATION'S "NATIONAL COMMERCIAL & INDUSTRIAL INSULATION STANDARDS" FOR INSULATION INSTALLATION ON PIPES AND
- B. INSULATION INSTALLATION AT INTERIOR WALL AND PARTITION PENETRATIONS (THAT ARE NOT FIRE RATED): INSTALL INSULATION CONTINUOUSLY THROUGH WALLS AND PARTITIONS.
- D. MINERAL-FIBER INSULATION INSTALLATION: . INSULATION INSTALLATION ON STRAIGHT PIPES AND TUBES: WHERE VAPOR BARRIERS ARE INDICATED,

C. INSULATION INSTALLATION AT FIRE-RATED WALL, PARTITION, AND FLOOR PENETRATIONS: INSTALL

INSULATION CONTINUOUSLY THROUGH PENETRATIONS. SEAL PENETRATIONS. COMPLY WITH

SEAL LONGITUDINAL SEAMS, END JOINTS, AND PROTRUSIONS WITH VAPOR-BARRIER MASTIC AND JOINT 2. FOR INSULATION WITH FACTORY-APPLIED JACKETS ON ABOVE AMBIENT SURFACES, SECURE LAPS WITH

3. FOR INSULATION WITH FACTORY-APPLIED JACKETS ON BELOW AMBIENT SURFACES, DO NOT STAPLE

- LONGITUDINAL TABS BUT SECURE TABS WITH ADDITIONAL ADHESIVE AS RECOMMENDED BY INSULATION MATERIAL MANUFACTURER AND SEAL WITH VAPOR-BARRIER MASTIC AND FLASHING SEALANT.
- E. INTERIOR PIPING SYSTEM APPLICATIONS: INSULATE THE FOLLOWING PIPING SYSTEMS:

REQUIREMENTS IN SECTION 078400.

DOMESTIC HOT WATER.

OUTWARD CLINCHED STAPLES AT 6 INCHES O.C.

- 2. RECIRCULATED DOMESTIC HOT WATER. 3. EXPOSED WATER SUPPLIES AND SANITARY DRAINS OF FIXTURES FOR PEOPLE WITH DISABILITIES
- F. DO NOT APPLY INSULATION TO THE FOLLOWING SYSTEMS, MATERIALS, AND EQUIPMENT:
- FLEXIBLE CONNECTORS. 2. SANITARY DRAINAGE AND VENT PIPING.
- DRAINAGE PIPING LOCATED IN CRAWLSPACES UNLESS OTHERWISE INDICATED.
- 4. CHROME-PLATED PIPES AND FITTINGS, EXCEPT FOR PLUMBING FIXTURES FOR PEOPLE WITH DISABILITIES. 5. PIPING SPECIALTIES, INCLUDING AIR CHAMBERS, UNIONS, STRAINERS, CHECK VALVES, PLUG VALVES, AND FLOW REGULATORS.

- A. DOMESTIC COLD WATER:
- 1. NPS 1 AND SMALLER: INSULATION SHALL BE THE FOLLOWING:
- a. MINERAL-FIBER, PREFORMED PIPE INSULATION, TYPE I: 1/2 INCH THICK.
- 2. NPS 1-1/4 AND LARGER: INSULATION SHALL BE THE FOLLOWING:
- a. MINERAL-FIBER, PREFORMED PIPE INSULATION, TYPE I: 1 INCH THICK.
- B. DOMESTIC HOT AND RECIRCULATED HOT WATER
- 1. NPS 2 AND SMALLER: INSULATION SHALL BE THE FOLLOWING: a. MINERAL-FIBER, PREFORMED PIPE INSULATION, TYPE I: 1 INCH THICK.
- C. EXPOSED SANITARY DRAINS, DOMESTIC WATER, DOMESTIC HOT WATER, AND STOPS FOR PLUMBING
- FIXTURES FOR PEOPLE WITH DISABILITIES:
- 1. ALL PIPE SIZES: INSULATION SHALL BE THE FOLLOWING: a. PROTECTIVE SHIELDING PIPING COVERS.
- b. MANUFACTURED PLASTIC WRAPS FOR COVERING PLUMBING FIXTURE HOT- AND COLD-WATER SUPPLIES AND TRAP AND DRAIN PIPING. COMPLY WITH AMERICANS WITH DISABILITIES ACT (ADA)

- SECTION 221116 DOMESTIC WATER PIPING
- PART 2 PRODUCTS

REQUIREMENTS.

- POTABLE-WATER PIPING AND COMPONENTS SHALL COMPLY WITH NSF 14 AND NSF 61.
- A. CPVC PIPING: ASTM F 441/F 441M, SCHEDULE 40 PIPE WITH ASTM F 438, CPVC SCHEDULE 40 SOCKET-TYPE
- uponor pex tube and fittings: $\,$ astm f 877, SDR 9 pex tubing and astm f 1807, Metal insert-type
- FITTINGS WITH COPPER OR STAINLESS-STEEL CRIMP RINGS. 1. MANIFOLD: ASTM F 877 PLASTIC OR CORROSION-RESISTANT-METAL ASSEMBLY, WITH A PLASTIC OR
- CORROSION-RESISTANT-METAL VALVE FOR EACH OUTLET.
- C. SPECIAL-DUTY VALVES: 1. COMPLY WITH REQUIREMENTS IN SECTION 220523 "GENERAL-DUTY VALVES FOR PLUMBING PIPING" FOR
- GENERAL-DUTY METAL VALVES. 2. COMPLY WITH REQUIREMENTS IN SECTION 221119 "DOMESTIC WATER PIPING SPECIALTIES" FOR BALANCING VALVES, DRAIN VALVES, BACKFLOW PREVENTERS, AND VACUUM BREAKERS.
- D. TRANSITION FITTINGS: MANUFACTURED PIPING COUPLING OR SPECIFIED PIPING SYSTEM FITTING. SAME SIZE AS PIPES TO BE JOINED AND PRESSURE RATING AT LEAST EQUAL TO PIPES TO BE JOINED. E. FLEXIBLE CONNECTORS: STAINLESS-STEEL, CORRUGATED-METAL TUBING WITH WIRE-BRAID COVERING.
- WORKING-PRESSURE RATING A MINIMUM OF 200 PSIG.
- PART 3 EXECUTION
- 3.1 INSTALLATION A. COMPLY WITH REQUIREMENTS IN SECTION 220500 "COMMON WORK RESULTS FOR PLUMBING" FOR BASIC
- PIPING INSTALLATION REQUIREMENTS. B. INSTALL WALL PENETRATION SYSTEM AT EACH SERVICE PIPE PENETRATION THROUGH FOUNDATION WALL. MAKE INSTALLATION WATERTIGHT. COMPLY WITH REQUIREMENTS IN SECTION 220500 "COMMON WORK RESULTS FOR PLUMBING" FOR WALL PENETRATION SYSTEMS.
- INSIDE THE BUILDING AT EACH DOMESTIC WATER SERVICE ENTRANCE. COMPLY WITH REQUIREMENTS IN SECTION 220500 "COMMON WORK RESULTS FOR PLUMBING" FOR PRESSURE GAGES AND SECTION 221119 "DOMESTIC WATER PIPING SPECIALTIES" FOR DRAIN VALVES AND STRAINERS.

C. INSTALL SHUTOFF VALVE, HOSE-END DRAIN VALVE, STRAINER, PRESSURE GAGE, AND TEST TEE WITH VALVE,

D. INSTALL DOMESTIC WATER PIPING WITHOUT PITCH FOR HORIZONTAL PIPING AND PLUMB FOR VERTICAL

- E. COMPLY WITH REQUIREMENTS IN SECTION 220500 "COMMON WORK RESULTS FOR PLUMBING" FOR BASIC
- 1. SOLDERED JOINTS: COMPLY WITH PROCEDURES IN ASTM B 828 UNLESS OTHERWISE INDICATED. F. COMPLY WITH REQUIREMENTS IN SECTION 220500 "COMMON WORK RESULTS FOR PLUMBING" FOR PIPE
- HANGER AND SUPPORT DEVICES. 1. INSTALL VINYL-COATED HANGERS FOR CPVC PIPING WITH THE FOLLOWING MAXIMUM HORIZONTAL
- SPACING AND MINIMUM ROD DIAMETERS:
- a. NPS 1 AND SMALLER: 36 INCHES WITH 3/8-INCH ROD.

b. NPS 1-1/4 TO NPS 2: 48 INCHES WITH 3/8-INCH ROD.

c. NPS 2-1/2 TO NPS 3-1/2: 48 INCHES WITH 1/2-INCH ROD.

2. INSTALL VINYL-COATED HANGERS FOR PEX PIPING WITH THE FOLLOWING MAXIMUM HORIZONTAL

- d. INSTALL SUPPORTS FOR VERTICAL CPVC PIPING EVERY 60 INCHES FOR NPS 1 AND SMALLER, AND EVERY 72 INCHES FOR NPS 1-1/4 AND LARGER.
- SPACING AND MINIMUM ROD DIAMETERS: a. NPS 1 AND SMALLER: 32 INCHES WITH 3/8-INCH ROD.

PIPING JOINT CONSTRUCTION.

- b. INSTALL HANGERS FOR VERTICAL PEX PIPING EVERY 48 INCHES.
- 3.2 INSPECTING AND CLEANING
- 1. FILL DOMESTIC WATER PIPING. CHECK COMPONENTS TO DETERMINE THAT THEY ARE NOT AIR BOUND AND THAT PIPING IS FULL OF WATER. 2. TEST FOR LEAKS AND DEFECTS IN NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN

B. CLEAN AND DISINFECT POTABLE DOMESTIC WATER PIPING BY FILLING SYSTEM WITH WATER/CHLORINE

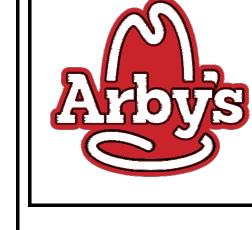
SOLUTION WITH AT LEAST 50 PPM OF CHLORINE. ISOLATE WITH VALVES AND ALLOW TO STAND FOR 24

- HOURS. FLUSH SYSTEM WITH CLEAN, POTABLE WATER UNTIL NO CHLORINE IS IN WATER COMING FROM SYSTEM AFTER THE STANDING TIME
- 3.3 PIPING SCHEDULE

ALTERED, EXTENDED, OR REPAIRED.

A. INSPECT AND TEST PIPING SYSTEMS AS FOLLOWS:

A. ABOVEGROUND DISTRIBUTION PIPING: PEX PIPING. B. BELOWGROUND DISTRIBUTION PIPING: PEX PIPING INSTALLED IN PROTECTIVE PVC CONDUIT.



DATE DESCRIPTION DWG DATE: 09-18-2024 DRAWN BY: REVIEWED BY PROJECT No. DWG TITLE:

PLUMBING

SPECIFICATIONS - DIVISION 22 - PLUMBING (CONTINUED) 2. BODY MATERIAL: BRONZE. 2. CASING: STAINLESS STEEL WITH COMPANION-FLANGE CONNECTIONS. 2.1 PERFORMANCE REQUIREMENTS A. DRAINAGE PIPING SPECIALTIES SHALL BEAR LABEL, STAMP, OR OTHER MARKINGS OF SPECIFIED TESTING AGENCY A. DRAWINGS INDICATE VALVE TYPES TO BE USED. WHERE SPECIFIC VALVE TYPES ARE NOT INDICATED, THE SEAT: BRONZE, REPLACEABLE. 3. MOTOR: AUTOMATIC ADJUSTABLE, WET-ROTOR, PERMANENT MAGNET. FOLLOWING REQUIREMENTS APPLY: 4. SUPPLY CONNECTIONS: NPS 3/4 THREADED OR SOLDER-JOINT INLET. 2.3 MOTORS 2.2 MANUFACTURED UNITS - AS INDICATED ON DRAWINGS 1. SHUTOFF DUTY: USE BRONZE BALL VALVES FOR PIPING NPS 2 AND SMALLER. 5. OUTLET CONNECTION: GARDEN-HOSE THREAD COMPLYING WITH ASME B1.20.7. A. COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, ENCLOSURE TYPE, AND EFFICIENCY A. FLOOR CLEANOUTS: PER STANDARD ASME A 112.36.2M-2002 2. THROTTLING DUTY: USE BRONZE BALL VALVES FOR PIPING NPS 2 AND SMALLER REQUIREMENTS FOR MOTORS. 6. PRESSURE RATING: 125 PSIG. 3. HOT-WATER-PIPING, BALANCING DUTY: MEMORY-STOP BALANCING VALVES. B. MOTOR SIZES: MINIMUM SIZE AS INDICATED. IF NOT INDICATED, LARGE ENOUGH SO DRIVEN LOAD WILL NOT 7. VACUUM BREAKER: INTEGRAL, NONREMOVABLE, DRAINABLE, HOSE-CONNECTION VACUUM BREAKER C. FLOOR DRAINS: PER STANDARD ASME A112.6.3-2001. REQUIRE MOTOR TO OPERATE IN SERVICE FACTOR RANGE ABOVE 1.0. 4. DRAIN DUTY: HOSE-END DRAIN VALVES. COMPLYING WITH ASSE 1011. D. CAST IRON FLOOR SINKS: PER STANDARD ASME A112.6.7-2001 B. INSTALL BALL VALVES CLOSE TO MAIN ON EACH BRANCH AND RISER SERVING TWO OR MORE PLUMBING FIXTURES 8. FINISH FOR EQUIPMENT ROOMS: ROUGH BRONZE, OR CHROME OR NICKEL PLATED. E. PVC PLASTIC FLOOR SINKS: PER STANDARD ASME A112.6.7-2001 OR EQUIPMENT CONNECTIONS AND WHERE INDICATED. A. TIMERS: ELECTRIC, FOR CONTROL OF HOT-WATER CIRCULATION PUMP 9. FINISH FOR SERVICE AREAS: CHROME OR NICKEL PLATED. PART 3 - EXECUTION C. INSTALL BALL VALVES ON INLET TO EACH PLUMBING EQUIPMENT ITEM, ON EACH SUPPLY TO EACH PLUMBING FIXTURE 1. TYPE: PROGRAMMABLE, SEVEN-DAY CLOCK WITH MANUAL OVERRIDE ON-OFF SWITCH. 10. FINISH FOR FINISHED ROOMS: CHROME OR NICKEL PLATED. NOT HAVING STOPS ON SUPPLIES, AND ELSEWHERE AS INDICATED. 3.1 INSTALLATION 2. PROGRAMMABLE SEQUENCE OF OPERATION: UP TO TWO ON-OFF CYCLES EACH DAY FOR SEVEN DAYS. 11. OPERATION FOR EQUIPMENT ROOMS: WHEEL HANDLE OR OPERATING KEY D. INSTALL DRAIN VALVE AT BASE OF EACH RISER, AT LOW POINTS OF HORIZONTAL RUNS, AND WHERE REQUIRED TO A. INSTALL CLEANOUTS AT GRADE AND EXTEND TO WHERE BUILDING SANITARY DRAINS CONNECT TO BUILDING PART 3 - EXECUTION DRAIN WATER DISTRIBUTION PIPING SYSTEM. 12. OPERATION FOR SERVICE AREAS: OPERATING KEY 3.1 INSTALLATION E. INSTALL SWING CHECK VALVE ON DISCHARGE SIDE OF EACH PUMP AND ELSEWHERE AS INDICATED. 13. OPERATION FOR FINISHED ROOMS: OPERATING KEY INSTALL FLOOR DRAINS AT LOW POINTS OF SURFACE AREAS TO BE DRAINED. SET GRATES OF DRAINS FLUSH WITH A. INSTALL PUMPS WITH ACCESS FOR PERIODIC MAINTENANCE, INCLUDING REMOVAL OF MOTORS, IMPELLERS, FINISHED FLOOR UNLESS OTHERWISE INDICATED. F. INSTALL BALL VALVES IN EACH HOT-WATER CIRCULATING LOOP AND DISCHARGE SIDE OF EACH PUMP. 14. INCLUDE OPERATING KEY WITH EACH OPERATING-KEY HOSE BIBB. COUPLINGS, AND ACCESSORIES. NSTALL FLOOR-DRAIN FLASHING COLLAR OR FLANGE SO NO LEAKAGE OCCURS BETWEEN DRAIN AND END OF SECTION 15. INCLUDE INTEGRAL WALL FLANGE WITH EACH CHROME- OR NICKEL-PLATED HOSE BIBB, B. SUPPORT PUMPS AND PIPING SO WEIGHT OF PIPING IS NOT SUPPORTED BY PUMP VOLUTE. ADJOINING FLOORING. MAINTAIN INTEGRITY OF WATERPROOF MEMBRANES WHERE PENETRATED. I. NONFREEZE WALL HYDRANTS: C. INSTALL ELECTRICAL CONNECTIONS FOR POWER, CONTROLS, AND DEVICES. TALL INDIVIDUAL TRAPS FOR FLOOR DRAINS CONNECTED TO SANITARY BUILDING DRAIN, UNLESS OTHERWISE SECTION 221119 - DOMESTIC WATER PIPING SPECIALTIES 1. STANDARD: ASME A112.21.3M FOR CONCEALED OR EXPOSED-OUTLET, SELF-DRAINING WALL HYDRANTS. D. SUSPEND IN-LINE PUMPS INDEPENDENT FROM PIPING. USE CONTINUOUS-THREAD HANGER RODS AND VIBRATIO PART 2 - PRODUCTS PROVIDE A 2" MINIMUM AIR-GAP OR 2 TIMES THE PIPE DIAMETER (WHICHEVER IS GREATER) ON INDIRECT-WASTE ISOLATION HANGERS. FABRICATE BRACKETS OR SUPPORTS AS REQUIRED FOR PUMPS. PRESSURE RATING: 125 PSIG. PIPING DISCHARGE INTO SANITARY DRAINAGE SYSTEM. 2.1 GENERAL REQUIREMENTS FOR PIPING SPECIALTIES E. CONNECT PIPING WITH VALVES THAT ARE AT LEAST THE SAME SIZE AS PIPING CONNECTING TO PUMP 3. OPERATION: LOOSE KEY A. POTABLE-WATER PIPING AND COMPONENTS SHALL COMPLY WITH NSF 61 AND NSF 14. F. INSTALL SUCTION AND DISCHARGE PIPE SIZES EQUAL TO OR GREATER THAN DIAMETER OF PUMP N 4. CASING AND OPERATING ROD: OF LENGTH REQUIRED TO MATCH WALL THICKNESS. INCLUDE WALL CLAMP. 2.2 PERFORMANCE REQUIREMENTS G. INSTALL SHUTOFF VALVE AND STRAINER ON SUCTION SIDE OF PUMPS. SECTION 22 34 00 - FUEL-FIRED, DOMESTIC WATER HEATERS A. MINIMUM WORKING PRESSURE FOR DOMESTIC WATER PIPING SPECIALTIES: 125 PSIG UNLESS OTHERWISE INDICATED. 6. OUTLET: CONCEALED, WITH INTEGRAL VACUUM BREAKER AND GARDEN-HOSE THREAD COMPLYING WITH H. INSTALL NONSLAM CHECK VALVE AND THROTTLING VALVE ON DISCHARGE SIDE OF PUMPS 2.3 MANUFACTURED UNITS ASME B1.20.7. PART 1 - GENERAL I. INSTALL THERMOSTATS IN HOT-WATER RETURN PIPING. 7. BOX: DEEP, FLUSH MOUNTED WITH COVER A. PIPE-APPLIED, ATMOSPHERIC-TYPE VACUUM BREAKERS: J. INSTALL TEST PLUGS ON SUCTION AND DISCHARGE OF EACH PUMP. INSTALL AT INTEGRAL PRESSURE GAGE 1.1 SUMMARY TAPPINGS WHERE PROVIDED. STANDARD: ASSE 1001. 8. BOX AND COVER FINISH: CHROME PLATED. A. SECTION INCLUDES: 9. OUTLET: EXPOSED, WITH INTEGRAL VACUUM BREAKER AND GARDEN-HOSE THREAD COMPLYING WITH END OF SECTION 2. SIZE: NPS 1/4 TO NPS 3, AS REQUIRED TO MATCH CONNECTED PIPING. 1. COMMERCIAL, GAS-FIRED, TANKLESS, DOMESTIC-WATER HEATERS ASME B1.20.7. BODY: BRONZE. 2. DOMESTIC-WATER HEATER ACCESSORIES. 10. NOZZLE AND WALL-PLATE FINISH: POLISHED NICKEL BRONZE. SECTION 221316 - SANITARY WASTE AND VENT PIPING 4. INLET AND OUTLET CONNECTIONS: THREADED. 11. OPERATING KEYS: ONE WITH EACH WALL HYDRANT. 1.2 QUALITY ASSURANCE FINISH: CHROME PLATED. PART 2 - PRODUCTS J. BALL-VALVE-TYPE, HOSE-END DRAIN VALVES: A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A B. HOSE-CONNECTION VACUUM BREAKERS QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION. 1. STANDARD: MSS SP-110 FOR STANDARD-PORT, TWO-PIECE BALL VALVES. 2.1 PERFORMANCE REQUIREMENTS 1. STANDARD: ASSE 1011. A. COMPONENTS AND INSTALLATION SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING MINIMUM WORKING B. NSF COMPLIANCE: FABRICATE AND LABEL EQUIPMENT COMPONENTS THAT WILL BE IN CONTACT WITH POTABLE 2. PRESSURE RATING: 400-PSIG MINIMUM CWP. 2. BODY: BRONZE, NONREMOVABLE, WITH MANUAL DRAIN. WATER TO COMPLY WITH NSF 61, "DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS." PRESSURE UNLESS OTHERWISE INDICATED: 3. SIZE: NPS 3/4. 3. OUTLET CONNECTION: GARDEN-HOSE THREADED COMPLYING WITH ASME B1.20.7. 1. SOIL, WASTE, AND VENT PIPING: 10-FOOT HEAD OF WATER 4. BODY: COPPER ALLOY 4. FINISH: CHROME OR NICKEL PLATED BRONZE B. PIPING MATERIALS SHALL BEAR LABEL, STAMP, OR OTHER MARKINGS OF SPECIFIED TESTING AGENCY. 5. BALL: CHROME-PLATED BRASS. A. SPECIAL WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OF C. REDUCED-PRESSURE-PRINCIPLE BACKFLOW PREVENTERS: C. COMPLY WITH NSF/ANSI 14, "PLASTICS PIPING SYSTEMS COMPONENTS AND RELATED MATERIALS," FOR PLASTIC REPLACE COMPONENTS OF FUEL-FIRED, DOMESTIC-WATER HEATERS THAT FAIL IN MATERIALS OR WORKMANSHIP 6. SEATS AND SEALS: REPLACEABLE PIPING COMPONENT WITHIN SPECIFIED WARRANTY PERIOD. 1. STANDARD: ASSE 1013. 7. HANDLE: VINYL-COVERED STEEL 1. FAILURES INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING: 2.2 PIPES AND FITTINGS 2. OPERATION: CONTINUOUS-PRESSURE APPLICATIONS. 8. INLET: THREADED OR SOLDER JOINT. A. PVC PLASTIC, DWV PIPE AND FITTINGS: ASTM D 2665, SCHEDULE 40, PLAIN ENDS WITH PVC SOCKET-TYPE, DWV PIPE a. STRUCTURAL FAILURES INCLUDING STORAGE TANK AND SUPPORTS. 3. PRESSURE LOSS: 12 PSIG MAXIMUM, THROUGH MIDDLE THIRD OF FLOW RANGE. FITTINGS. 9. OUTLET: THREADED, SHORT NIPPLE WITH GARDEN-HOSE THREAD COMPLYING WITH ASME B1.20.7 AND CAP WITH b. FAULTY OPERATION OF CONTROLS. 4. BODY: LEAD FREE BRONZE OR STAINLESS STEEL FOR NPS 2 AND SMALLER. BRASS CHAIN. . ADHESIVE PRIMER: ASTM F 656. c. DETERIORATION OF METALS, METAL FINISHES, AND OTHER MATERIALS BEYOND NORMAL USE. 5. END CONNECTIONS: THREADED FOR NPS 2 AND SMALLER. K. WATER-HAMMER ARRESTERS: ADHESIVE PRIMER SHALL HAVE A VOC CONTENT OF 550 G/L OR LESS WHEN CALCULATED ACCORDING TO 2. WARRANTY PERIODS: FROM DATE OF SUBSTANTIAL COMPLETION 6. CONFIGURATION: DESIGNED FOR HORIZONTAL, STRAIGHT-THROUGH FLOW. 40 CFR 59, SUBPART D (EPA METHOD 24). 1. STANDARD: ASSE 1010 OR PDI-WH 201 a. GAS-FIRED, TANKLESS, DOMESTIC-WATER HEATERS: 7. ACCESSORIES 2. SOLVENT CEMENT: ASTM D 2564. 2. TYPE: COPPER TUBE WITH PISTON. 1) HEAT EXCHANGER: TEN YEARS. a. VALVES NPS 2 AND SMALLER: BALL TYPE WITH THREADED ENDS ON INLET AND OUTLET. a. PVC SOLVENT CEMENT SHALL HAVE A VOC CONTENT OF 510 G/L OR LESS WHEN CALCULATED ACCORDING 3. SIZE: ASSE 1010, SIZES AA AND A THROUGH F, OR PDI-WH 201, SIZES A THROUGH F. 2) CONTROLS AND OTHER COMPONENTS: FIVE YEARS. 40 CFR 59, SUBPART D (EPA METHOD 24). b. AIR-GAP FITTING: ASME A112.1.2, MATCHING BACKFLOW-PREVENTER CONNECTION. 3) THERMAL EXPANSION TANK: FIVE YEARS. SUPPLY-TYPE, TRAP-SEAL PRIMER DEVICE: D. WATER REGULATORS: 1. STANDARD: ASSE 1018 PART 3 - EXECUTION PART 2 - PRODUCTS 1. STANDARD: ASSE 1003. 2. PRESSURE RATING: 125 PSIG MINIMUM. 3.1 PIPING INSTALLATION 2. PRESSURE RATING: INITIAL WORKING PRESSURE OF 150 PSIG. A. DOMESTIC WATER COMPRESSION TANKS: 3. BODY: BRONZE. A. INSTALT WALL PENETRATION SYSTEM AT EACH PIPE PENETRATION THROUGH FOUNDATION WALL. MAKE 3. DESIGN OUTLET PRESSURE SETTING: 60 PSIG. INSTALLATION WATERTIGHT. COMPLY WITH REQUIREMENTS IN SECTION 220513 "COMMON WORK RESULTS FOR 4. INLET AND OUTLET CONNECTIONS: NPS 1/2 THREADED, UNION, OR SOLDER JOINT. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE PLUMBING" FOR WALL PENETRATION SYSTEMS. FOLLOWING: RETAIN OPTION IN FIRST SUBPARAGRAPH BELOW IF MANUFACTURER'S NAME AND MODEL NUMBER 4. BODY: LEAD FREE BRONZE WITH CHROME-PLATED FINISH FOR NPS 2 AND SMALLER. 5. GRAVITY DRAIN OUTLET CONNECTION: NPS 1/2 THREADED OR SOLDER JOINT. ARE INDICATED IN SCHEDULES OR PLANS ON DRAWINGS; DELETE OPTION AND INSERT MANUFACTURER'S NAME s. MAKE CHANGES IN DIRECTION FOR SOIL AND WASTE DRAINAGE AND VENT PIPING USING APPROPRIATE BRANCHES, 5. END CONNECTIONS: THREADED FOR NPS 2 AND SMALLER. AND MODEL NUMBER IF NOT INCLUDED ON DRAWINGS. 6. FINISH: CHROME PLATED, OR ROUGH BRONZE FOR UNITS USED WITH PIPE OR TUBE THAT IS NOT CHROME BENDS, AND LONG-SWEEP BENDS. SANITARY TEES AND SHORT-SWEEP 1/4 BENDS MAY BE USED ON VERTICAL STACKS IF CHANGE IN DIRECTION OF FLOW IS FROM HORIZONTAL TO VERTICAL. USE LONG-TURN, DOUBLE E. MEMORY-STOP BALANCING VALVES: a. AMTROLINC. Y-BRANCH AND 1/8-BEND FITTINGS IF TWO FIXTURES ARE INSTALLED BACK TO BACK OR SIDE BY SIDE WITH COMMON M. WATER FILTERS: CARTRIDGE TYPE, INCLUDING HOUSING, FITTINGS, FILTER CARTRIDGES, AND CARTRIDGE END CAPS. 1. STANDARD: MSS SP-110 FOR TWO-PIECE, COPPER-ALLOY BALL VALVES. DRAIN PIPE. STRAIGHT TEES, ELBOWS, AND CROSSES MAY BE USED ON VENT LINES. DO NOT CHANGE DIRECTION b. RHEEM-RUUD. OF FLOW MORE THAN 90 DEGREES. USE PROPER SIZE OF STANDARD INCREASERS AND REDUCERS IF PIPES OF PART 3 - EXECUTION 2. PRESSURE RATING: 400-PSIG MINIMUM CWP. c. WATTS WATER TECHNOLOGIES, CO. DIFFERENT SIZES ARE CONNECTED. REDUCING SIZE OF DRAINAGE PIPING IN DIRECTION OF FLOW IS PROHIBITED. 3.1 INSTALLATION 3. SIZE: NPS 2 OR SMALLER. C. LAY BURIED BUILDING DRAINAGE PIPING BEGINNING AT LOW POINT OF EACH SYSTEM. INSTALL TRUE TO GRADES A. INSTALL BACKFLOW PREVENTERS IN EACH WATER SUPPLY TO MECHANICAL EQUIPMENT AND SYSTEMS AND TO 4. BODY: LEAD FREE COPPER ALLOY. AND ALIGNMENT INDICATED, WITH UNBROKEN CONTINUITY OF INVERT. PLACE HUB ENDS OF PIPING UPSTREAM. 2. DESCRIPTION: STEEL, PRESSURE-RATED TANK CONSTRUCTED WITH WELDED JOINTS AND FACTORY-INSTALLED OTHER EQUIPMENT AND WATER SYSTEMS THAT MAY BE SOURCES OF CONTAMINATION. COMPLY WITH AUTHORITIES BUTYL-RUBBER DIAPHRAGM. INCLUDE AIR PRECHARGE TO MINIMUM SYSTEM-OPERATING PRESSURE AT TANK. INSTALL REQUIRED GASKETS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS FOR USE OF LUBRICANTS. 5. PORT: FULL PORT. CEMENTS, AND OTHER INSTALLATION REQUIREMENTS. MAINTAIN SWAB IN PIPING AND PULL PAST EACH JOINT AS 3. CONSTRUCTION: 6. BALL: CHROME-PLATED BRASS. B. INSTALL WATER REGULATORS WITH INLET AND OUTLET SHUTOFF VALVES. INSTALL PRESSURE GAGES ON INLET AND a. TAPPINGS: FACTORY-FABRICATED STEEL, WELDED TO TANK BEFORE TESTING AND LABELING. INCLUDE SEATS AND SEALS: REPLACEABLE. D. INSTALL SOIL AND WASTE DRAINAGE AND VENT PIPING AT THE FOLLOWING MINIMUM SLOPES, UNLESS OTHERWISE ASME B1.20.1 PIPE THREAD. C. INSTALL BALANCING VALVES IN LOCATIONS WHERE THEY CAN EASILY BE ADJUSTED 8. END CONNECTIONS: SOLDER JOINT OR THREADED. b. Interior finish: Comply with NSF 61 Barrier materials for Potable-Water tank linings, including HORIZONTAL SANITARY DRAINAGE PIPING: 2 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING D. INSTALL TEMPERATURE-ACTUATED, WATER MIXING VALVES WITH CHECK STOPS OR SHUTOFF VALVES ON INLETS AND EXTENDING FINISH INTO AND THROUGH TANK FITTINGS AND OUTLETS. 9. HANDLE: VINYL-COVERED STEEL WITH MEMORY-SETTING DEVICE. NPS 2-1/2 AND SMALLER; 1 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING NPS 3 AND LARGER. WITH SHUTOFF VALVE ON OUTLET. c. AIR-CHARGING VALVE: FACTORY INSTALLED. F. THERMOSTATIC, WATER MIXING VALVES: 2. VENT PIPING: ALL VENT AND BRANCH VENT PIPING SHALL BE GRADED AND CONNECTED TO DRAIN BACK E. INSTALL Y-PATTERN STRAINERS FOR WATER ON SUPPLY SIDE OF EACH CONTROL VALVE, WATER PRESSURE-REDUCING TOWARD VERTICAL FIXTURE VENT OR TOWARD VENT STACK. C. GAS SHUTOFF VALVES: ANSI Z21.15/CSA 9.1-M, MANUALLY OPERATED. FURNISH FOR INSTALLATION IN PIPING 1. STANDARD: ASSE 1017. VALVE, SOLENOID VALVE AND PUMP. G. INSTALL PVC SOIL AND WASTE DRAINAGE AND VENT PIPING ACCORDING TO ASTM D 2665. D. GAS PRESSURE REGULATORS: ANSI Z21.18/CSA 6.3, APPLIANCE TYPE. INCLUDE 1/2-PSIG PRESSURE RATING AS 2. PRESSURE RATING: 125 PSIG MINIMUM UNLESS OTHERWISE INDICATED. F. INSTALL WATER-HAMMER ARRESTERS IN WATER PIPING ACCORDING TO PDI-WH 201. REQUIRED TO MATCH GAS SUPPLY. G. INSTALL SUPPLY-TYPE, TRAP-SEAL PRIMER VALVES WITH OUTLET PIPING PITCHED DOWN TOWARD DRAIN TRAP A H. INSTALL UNDERGROUND PVC SOIL AND WASTE DRAINAGE PIPING ACCORDING TO ASTM D 2321. 3. TYPE: EXPOSED-MOUNTED, THERMOSTATICALLY CONTROLLED, WATER MIXING VALVE. AUTOMATIC GAS VALVES: ANSI Z21.21/CSA 6.5, APPLIANCE, ELECTRICALLY OPERATED, ON-OFF AUTOMATIC VALVE. MINIMUM OF 1 PERCENT, AND CONNECT TO FLOOR-DRAIN BODY, TRAP, OR INLET FITTING. ADJUST VALVE FOR DO NOT ENCLOSE, COVER, OR PUT PIPING INTO OPERATION UNTIL IT IS INSPECTED AND APPROVED BY AUTHORITIES 4. MATERIAL: LEAD FREE BRONZE BODY WITH CORROSION-RESISTANT INTERIOR COMPONENTS PROPER FLOW. HAVING JURISDICTION. F. SOURCE QUALITY CONTROL 5. CONNECTIONS: THREADED OR UNION INLETS AND OUTLET. 3.2 FIELD QUALITY CONTROL J. COMPLY WITH REQUIREMENTS IN SECTION 220513 "COMMON WORK RESULTS FOR PLUMBING" FOR BASIC PIPING 1. HYDROSTATICALLY TEST COMMERCIAL DOMESTIC-WATER HEATERS TO MINIMUM OF ONE AND ONE-HALF 6. ACCESSORIES: MANUAL TEMPERATURE CONTROL, CHECK STOPS ON HOT- AND COLD-WATER SUPPLIES, AND JOINT CONSTRUCTION. A. PERFORM THE FOLLOWING TESTS AND INSPECTIONS: TIMES PRESSURE RATING BEFORE SHIPMENT. ADJUSTABLE, TEMPERATURE-CONTROL HANDLE. 1. TEST EACH PRESSURE VACUUM BREAKER, REDUCED-PRESSURE-PRINCIPLE BACKFLOW PREVENTER, AND K. COMPLY WITH REQUIREMENTS IN SECTION 220513 "COMMON WORK RESULTS FOR PLUMBING" FOR PIPE HANGER 2. DOMESTIC-WATER HEATERS WILL BE CONSIDERED DEFECTIVE IF THEY DO NOT PASS TESTS AND INSPECTIONS. 7. TEMPERED-WATER SETTING: AS SPECIFIED ON DRAWINGS AND SUPPORT DEVICES. DOUBLE-CHECK BACKFLOW-PREVENTION ASSEMBLY ACCORDING TO AUTHORITIES HAVING JURISDICTION AND PREPARE TEST AND INSPECTION REPORTS. THE DEVICE'S REFERENCE STANDARD 8. PRESSURE DROP AT DESIGN FLOW RATE: NOT EXCEED 15 PSIG. 3.2 PIPE SCHEDULE 2. Domestic water piping specialties will be considered defective if they do not pass tests and a. aboveground applications: pvc plastic, dwv pipe and fittings with solvent-cemented joints, copper 9. VALVE FINISH: CHROME PLATED. DRAINAGE TUBE AND FITTINGS WITH SOLDERED JOINTS. PVC PLASTIC PIPE AND FITTINGS SHALL NOT BE PERMITTED 10. PIPING FINISH: CHROME PLATED. FOR INSTALLATION IN RETURN AIR PLENUMS OR LOCATIONS EXPOSED TO RETURN AIR PLENUMS. PREPARE TEST AND INSPECTION REPORTS. G. Y-PATTERN STRAINERS: B. BELOWGROUND APPLICATIONS: PVC PLASTIC, DWV PIPE AND DRAINAGE-PATTERN FITTINGS WITH CEMENTED 1. PRESSURE RATING: 125 PSIG MINIMUM UNLESS OTHERWISE INDICATED. 2. BODY: LEAD FREE BRONZE FOR NPS 2 AND SMALLER. **END OF SECTION** TION 221123 - DOMESTIC WATER PUMPS 3. END CONNECTIONS: THREADED FOR NPS 2 AND SMALLER. T 2 - PRODUCTS SECTION 221319 - SANITARY WASTE PIPING SPECIALTIES 4. SCREEN: STAINLESS STEEL WITH ROUND PERFORATIONS UNLESS OTHERWISE INDICATED 2.1 PERFORMANCE REQUIRMENTS 5. PERFORATION SIZE: ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A 1.1 SECTION REQUIREMENTS a. STRAINERS NPS 2 AND SMALLER: 0.020 INCH. QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION. 6. DRAIN: PIPE PLUG. B. COMPLY WITH UL 778 FOR MOTOR-OPERATED WATER PUMPS.

2.2 DOMESTIC WATER PUMPS

A. HOT WATER CIRCULATOR PUMP, RP-1:

1. BASIS-OF-DESIGN PRODUCT: GRUNDFOS ALPHA 15-55SF, AS INDICATED ON DRAWINGS.

H. HOSE BIBBS:

1. STANDARD: ASME A112.18.1 FOR SEDIMENT FAUCETS.

PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED

PART 2 - PRODUCTS

a. INCLUDE RATED CAPACITIES, OPERATING CHARACTERISTICS, AND ACCESSORIES FOR GREASE

Arbys

ISSUE

No. DATE DESCRIPTION

DWG DATE: 09-18-2024

DRAWN BY: NYE

REVIEWED BY:

PROJECT No.:

DWG TITLE:

PLUMBING SPECIFICATIONS

CHEET NA

P-7

SPECIFICATIONS - DIVISION 22 - PLUMBING (CONTINUED)

PART 3 - EXECUTION

3.1 DOMESTIC WATER HEATER INSTALLATION

HEATERS THAT DO NOT HAVE TANK DRAINS.

- A. INSTALL PRESSURE RELIEF VALVES IN WATER PIPING FOR DOMESTIC WATER HEATERS WITHOUT STORAGE. EXTEND COMMERCIAL-WATER-HEATER RELIEF-VALVE OUTLET, WITH DRAIN PIPING SAME AS DOMESTIC-WATER PIPING IN CONTINUOUS DOWNWARD PITCH, AND DISCHARGE BY POSITIVE AIR GAP ONTO CLOSEST FLOOR DRAIN.
- B. INSTALL WATER-HEATER DRAIN PIPING AS INDIRECT WASTE TO SPILL BY POSITIVE AIR GAP INTO OPEN DRAINS OR OVER FLOOR DRAINS, INSTALL HOSE-END DRAIN VALVES AT LOW POINTS IN WATER PIPING FOR DOMESTIC-WATER
- C. INSTALL THERMOMETER ON OUTLET PIPING OF DOMESTIC-WATER HEATERS. COMPLY WITH REQUIREMENTS FOR THERMOMETERS SPECIFIED IN SECTION 220500 - "COMMON WORK RESULTS FOR PLUMBING".
- 3.2 FIELD QUALITY CONTROL
- A. PERFORM TESTS AND INSPECTIONS.
- 1. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS, AND TO ASSIST IN
- 2. LEAK TEST: AFTER INSTALLATION, CHARGE SYSTEM AND TEST FOR LEAKS. REPAIR LEAKS AND RETEST UNTIL NO
- 3. OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER
- 4. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND
- EQUIPMENT. B. DOMESTIC-WATER HEATERS WILL BE CONSIDERED DEFECTIVE IF THEY DO NOT PASS TESTS AND INSPECTIONS.
- C. PREPARE TEST AND INSPECTION REPORTS. 3.3 DEMONSTRATION
- A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN COMMERCIAL, GAS-FIRED, STORAGE, DOMESTIC-WATER HEATERS. END OF SECTION

SECTION 224000 - PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. SUBMITTALS:
- 1. PRODUCT DATA FOR EACH TYPE OF PLUMBING FIXTURE, INCLUDING TRIM, FITTINGS, ACCESSORIES, APPLIANCES, APPURTENANCES, EQUIPMENT, AND SUPPORTS.
- 2. DOCUMENTATION INDICATING FLOW AND WATER CONSUMPTION REQUIREMENTS

PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
- A. REGULATORY REQUIREMENTS: COMPLY WITH REQUIREMENTS IN ICC A117.1, "ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES", PUBLIC LAW 90-480, "ARCHITECTURAL BARRIERS ACT"; AND PUBLIC LAW 101-336, "AMERICANS WITH DISABILITIES ACT" FOR PLUMBING FIXTURES FOR PEOPLE WITH DISABILITIES.
- B. REGULATORY REQUIREMENTS: COMPLY WITH REQUIREMENTS IN PUBLIC LAW 102-486, "ENERGY POLICY ACT," ABOUT WATER FLOW AND CONSUMPTION RATES FOR PLUMBING FIXTURES.
- C. NSF STANDARD: COMPLY WITH NSF 61, "DRINKING WATER SYSTEM COMPONENTS HEALTH EFFECTS," FOR FIXTURE MATERIALS THAT WILL BE IN CONTACT WITH POTABLE WATER.
- D. FIXTURES SHALL BE PROVIDED AS SCHEDULED ON THE DRAWINGS

PART 3 - EXECUTION

- 3.1 INSTALLATIONS
- A. INSTALL FITTING INSULATION KITS ON FIXTURES FOR PEOPLE WITH DISABILITIES.
- B. INSTALL FIXTURES WITH FLANGES AND GASKET SEALS.
- C. INSTALL TANKS FOR ACCESSIBLE, TANK-TYPE WATER CLOSETS WITH LEVER HANDLE MOUNTED ON WIDE SIDE OF
- D. FASTEN WALL-HANGING PLUMBING FIXTURES SECURELY TO SUPPORTS ATTACHED TO BUILDING SUBSTRATE WHEN
- SUPPORTS ARE SPECIFIED, AND TO BUILDING WALL CONSTRUCTION WHERE NO SUPPORT IS INDICATED. E. FASTEN FLOOR-MOUNTED FIXTURES TO SUBSTRATE. FASTEN FIXTURES HAVING HOLES FOR SECURING FIXTURE TO WALL CONSTRUCTION, TO REINFORCEMENT BUILT INTO WALLS.
- F. FASTEN WALL-MOUNTED FITTINGS TO REINFORCEMENT BUILT INTO WALLS.
- G. FASTEN COUNTER-MOUNTING PLUMBING FIXTURES TO CASEWORK.
- H. SECURE SUPPLIES TO SUPPORTS OR SUBSTRATE WITHIN PIPE SPACE BEHIND FIXTURE.
- FIXTURE.

I. SET MOP BASINS IN LEVELING BED OF CEMENT GROUT.

- J. INSTALL INDIVIDUAL SUPPLY INLETS, SUPPLY STOPS, SUPPLY RISERS, AND TUBULAR BRASS TRAPS WITH CLEANOUTS AT
- K. INSTALL WATER-SUPPLY STOP VALVES IN ACCESSIBLE LOCATIONS.
- L. INSTALL TRAPS ON FIXTURE OUTLETS. OMIT TRAPS ON FIXTURES HAVING INTEGRAL TRAPS. OMIT TRAPS ON INDIRECT 3.1 INDOOR PIPING INSTALLATION WASTES UNLESS OTHERWISE INDICATED.
- M. INSTALL ESCUTCHEONS AT WALL, FLOOR, AND CEILING PENETRATIONS IN EXPOSED, FINISHED LOCATIONS AND WITHIN CABINETS AND MILLWORK. USE DEEP-PATTERN ESCUTCHEONS WHERE REQUIRED TO CONCEAL PROTRUDING
- N. SEAL JOINTS BETWEEN FIXTURES AND WALLS, FLOORS, AND COUNTERS USING SANITARY-TYPE, ONE-PART, MILDEW-RESISTANT, SILICONE SEALANT. MATCH SEALANT COLOR TO FIXTURE COLOR.
- O. INSTALL PIPING CONNECTIONS BETWEEN PLUMBING FIXTURES AND PIPING SYSTEMS AND PLUMBING EQUIPMENT. INSTALL INSULATION ON SUPPLIES AND DRAINS OF FIXTURES FOR PEOPLE WITH DISABILITIES. END OF SECTION

SECTION 221623 - FACILITY NATURAL-GAS PIPING

PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
- A. MINIMUM OPERATING-PRESSURE RATINGS:
- 1. PIPING AND VALVES: 100 PSIG MINIMUM UNLESS OTHERWISE INDICATED.
- B. NATURAL-GAS SYSTEM PRESSURE WITHIN BUILDING: ONE DISTRIBUTION PRESSURE. 14" W.C., BUT NOT MORE IH, 2.0 PSIG.
- 2.2 PIPES, TUBES, AND FITTINGS
- A. STEEL PIPE: ASTM A 53/A 53M, BLACK STEEL, SCHEDULE 40, TYPE E OR S, GRADE B.
- 1. MALLEABLE-IRON THREADED FITTINGS: ASME B16.3, CLASS 150, STANDARD PATTERN.
- 2. WROUGHT-STEEL WELDING FITTINGS: ASTM A 234/A 234M FOR BUTT WELDING AND SOCKET WELDING
- 3. UNIONS: ASME B16.39, CLASS 150, MALLEABLE IRON WITH BRASS-TO-IRON SEAT, GROUND JOINT, AND
- 4. PROTECTIVE COATING FOR UNDERGROUND PIPING: FACTORY-APPLIED, THREE-LAYER COATING OF EPOXY, ADHESIVE, AND PE.
- B. CORRUGATED, STAINLESS-STEEL TUBING: COMPLY WITH ANSI/IAS LC 1; INCLUDE FLAME-RETARDANT PE COATING, COPPER-ALLOY THREADED ENDS, AND STRIKER PLATES.
- 2.3 SPECIALTIES

- A. APPLIANCE FLEXIBLE CONNECTORS:
- 1. INDOOR, FIXED-APPLIANCE FLEXIBLE CONNECTORS: COMPLY WITH ANSI Z21.24.
- 2. INDOOR, MOVABLE-APPLIANCE FLEXIBLE CONNECTORS: COMPLY WITH ANSI Z21.69.
- 3. OUTDOOR, APPLIANCE FLEXIBLE CONNECTORS: COMPLY WITH ANSI Z21.75.
- 4. CORRUGATED STAINLESS-STEEL TUBING WITH POLYMER COATING B. STRAINERS: ASTM A 126, CLASS B, CAST-IRON BODY, Y-PATTERN, FULL SIZE OF CONNECTING PIPING, CWP RATING
- C. WEATHERPROOF VENT CAP: CAST- OR MALLEABLE-IRON INCREASER FITTING WITH CORROSION-RESISTANT WIRE SCREEN, WITH FREE AREA AT LEAST EQUAL TO CROSS-SECTIONAL AREA OF CONNECTING PIPE AND THREADED-END CONNECTION.
- A. GENERAL REQUIREMENTS FOR METALLIC MANUAL GAS SHUTOFF VALVES: COMPLY WITH ASME B16.33.

OF 125 PSIG. INCLUDE 40-MESH STARTUP STRAINER, AND PERFORATED STAINLESS-STEEL BASKET.

- 1. CWP RATING: 125 PSIG.
- B. ONE-PIECE, BRONZE BALL VALVE WITH BRONZE TRIM: MSS SP-110.
- 2. BALL: CHROME-PLATED BRASS.
- STEM: BRONZE; BLOWOUT PROOF.
- 4. SEATS: REINFORCED TFE; BLOWOUT PROOF.

1. BODY: BRONZE, COMPLYING WITH ASTM B 584.

- 5. PACKING: SEPARATE PACKNUT WITH ADJUSTABLE STEM PACKING THREADED ENDS.
- 6. CWP RATING: 600 PSIG.

2.4 VALVES

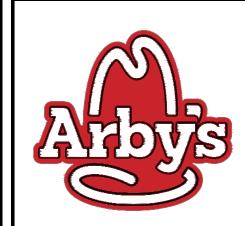
- 7. LISTING: VALVES NPS 1 AND SMALLER SHALL BE LISTED AND LABELED BY AN NRTL ACCEPTABLE TO AUTHORITIES
- 8. SERVICE: SUITABLE FOR NATURAL-GAS SERVICE WITH "WOG" INDICATED ON VALVE BODY.
- C. TWO-PIECE, FULL-PORT, BRONZE BALL VALVES WITH BRONZE TRIM: MSS SP-110.
- 1. BODY: BRONZE, COMPLYING WITH ASTM B 584.
- 2. BALL: CHROME-PLATED BRONZE.
- 3. STEM: BRONZE; BLOWOUT PROOF.
- 4. SEATS: REINFORCED TFE; BLOWOUT PROOF.
- 5. PACKING: THREADED BODY PACKNUT DESIGN WITH ADJUSTABLE STEM PACKING.
- 6. CWP RATING: 600 PSIG.
- 7. LISTING: VALVES NPS 1 AND SMALLER SHALL BE LISTED AND LABELED BY AN NRTL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
- 8. SERVICE: SUITABLE FOR NATURAL-GAS SERVICE WITH "WOG" INDICATED ON VALVE BODY.
- D. BRONZE PLUG VALVES: MSS SP-78.
- 1. BODY: BRONZE, COMPLYING WITH ASTM B 584.
- 2. PLUG: BRONZE.
- 3. OPERATOR: SQUARE HEAD OR LUG TYPE WITH TAMPERPROOF FEATURE WHERE INDICATED.
- 4. PRESSURE CLASS: 125 PSIG.
- 5. LISTING: VALVES NPS 1 AND SMALLER SHALL BE LISTED AND LABELED BY AN NRTL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
- 6. SERVICE: SUITABLE FOR NATURAL-GAS SERVICE WITH "WOG" INDICATED ON VALVE BODY.
- E. CAST-IRON, NONLUBRICATED PLUG VALVES: MSS SP-78.
- 1. BODY: CAST IRON, COMPLYING WITH ASTM A 126, CLASS B. 2. PLUG: BRONZE OR NICKEL-PLATED CAST IRON.
- 3. SEAT: COATED WITH THERMOPLASTIC.
- 4. STEM SEAL: COMPATIBLE WITH NATURAL GAS.
- 5. OPERATOR: SQUARE HEAD OR LUG TYPE WITH TAMPERPROOF FEATURE WHERE INDICATED,
- 6. PRESSURE CLASS: 125 PSIG.
- 7. LISTING: VALVES NPS 1 AND SMALLER SHALL BE LISTED AND LABELED BY AN NRTL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
- 8. SERVICE: SUITABLE FOR NATURAL-GAS SERVICE WITH "WOG" INDICATED ON VALVE BODY.
- F. ELECTRICALLY OPERATED, AUTOMATIC GAS VALVES: COMPLY WITH UL 429.
- 2.5 PRESSURE REGULATORS
- A. GENERAL REQUIREMENTS: SINGLE STAGE, STEEL JACKETED, AND CORROSION RES<mark>ISTA</mark>NT. INCLU<mark>DE</mark> ELEVATION COMPENSATOR.
- B. LINE PRESSURE REGULATORS: ANSI Z21.80; 2-PSIG MAXIMUM INLET PRESSURE. FACTORY- OR FIELD-INSTALLED, STAINLESS-STEEL SCREEN IN VENT OPENING IF NOT CONNECTED TO VENT PIPING.
- C. APPLIANCE PRESSURE REGULATORS: ANSI Z21.18; 2-PSIG MAXIMUM INLET PRESSURE. REGULATOR MAY INCLUDE VENT LIMITING DEVICE, INSTEAD OF VENT CONNECTION, IF APPROVED BY AUTHORITIES HAVING JURISDICTION.

PART 3 - EXECUTION

- A. COMPLY WITH REQUIREMENTS IN SECTION 220500 "COMMON WORK RESULTS FOR PLUMBING" FOR BASIC PIPING INSTALLATION REQUIREMENTS.
- B. INSTALL PIPING IN CONCEALED LOCATIONS UNLESS OTHERWISE INDICATED AND EXCEPT IN EQUIPMENT ROOMS AND SERVICE AREAS.
- C. INSTALL ESCUTCHEONS AT PENETRAT<mark>IONS OF INTERIOR WALLS, CEILINGS, AND FLOORS.</mark> D. FIRE-BARRIER PENETRATIONS: MAINTAIN INDICATED FIRE RATING OF WALLS, PARTITIONS, CEILINGS, AND FLOORS AT
- PIPE PENETRATIONS. SEAL PIPE PENETRATIONS WITH FIRESTOP MATERIALS. COMPLY WITH REQUIREMENTS IN SECTION 078413 "PENETRATION FIRESTOPPING.
- E. INSTALL GAS STOPS FOR SHUTOFF TO APPLIANCES WITH LOW-PRESSURE GAS SUPPLY.
- F. INSTALL NATURAL-GAS PIPING AT UNIFORM GRADE OF 2 PERCENT DOWN TOWARD DRIP AND SEDIMENT TRAPS. G. USE ECCENTRIC REDUCER FITTINGS TO MAKE REDUCTIONS IN PIPE SIZES. INSTALL FITTINGS WITH LEVEL SIDE DOWN.
- H. CONNECT BRANCH PIPING FROM TOP OR SIDE OF HORIZONTAL PIPING.
- I. INSTALL UNIONS IN PIPES NPS 2 AND SMALLER, ADJACENT TO EACH VALVE, AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT. UNIONS ARE NOT REQUIRED AT FLANGED CONNECTIONS.
- n<mark>s</mark>tall strainer on inlet of each line pressure regulator and automatic or electrically operated
- TALL PRESSURE GAGE PLUG UPSTREAM AND DOWNSTREAM FROM EACH LINE REGULATOR.
- CONNECT GAS PIPING TO EQUIPMENT AND APPLIANCES WITH SHUTOFF VALVES AND UNIONS. INSTALL GAS VALVE
- UPSTREAM FROM AND WITHIN 72 INCHES OF EACH APPLIANCE USING GAS. INSTALL UNION OR FLANGED CONNECTIONS DOWNSTREAM FROM VALVES.
- M. EXTEND RELIEF VENT CONNECTIONS FOR SERVICE REGULATORS, LINE REGULATORS, AND OVERPRESSURE PROTECTION DEVICES TO THE OUTDOORS AND TERMINATE WITH WEATHERPROOF VENT CAP.
- N. DO NOT USE NATURAL-GAS PIPING AS GROUNDING ELECTRODE.
- 3.2 PIPING JOINT CONSTRUCTION
- A. THREADED JOINTS: THREAD PIPE WITH TAPERED PIPE THREADS COMPLYING WITH ASME B1.20.1.
- B. WELDED JOINTS: CONSTRUCT JOINTS ACCORDING TO AWS D10.12M/D10.12, USING QUALIFIED PROCESSES AND WELDING OPERATORS.
- C. JOINTS IN STEEL PIPING WITH PROTECTIVE COATING: APPLY JOINT COVER KITS TO PIPE AFTER JOINING TO COVER,

- SEAL, AND PROTECT JOINTS.
- D. FLANGED JOINTS: INSTALL GASKET MATERIAL, SIZE, TYPE, AND THICKNESS APPROPRIATE FOR NATURAL-GAS SERVICE. INSTALL GASKET CONCENTRICALLY POSITIONED.
- 3.3 VALVE INSTALLATION A. INSTALL MANUAL GAS SHUTOFF VALVE FOR EACH GAS APPLIANCE AHEAD OF CORRUGATED STAINLESS-STEEL TUBING, ALUMINUM, OR COPPER CONNECTOR.
- B. INSTALL REGULATORS AND OVERPRESSURE PROTECTION DEVICES WITH MAINTENANCE ACCESS SPACE ADEQUATE FOR SERVICING AND TESTING.
- 3.4 INDOOR PIPING SCHEDULE FOR SYSTEM PRESSURES MORE THAN 7" W.C. AND LESS THAN 5 PSIG.
- A. ABOVEGROUND, BRANCH PIPING NPS 1 AND SMALLER SHALL BE THE FOLLOWING:
- 1. CORRUGATED STAINLESS-STEEL TUBING WITH MECHANICAL FITTINGS HAVING SOCKET OR THREADED ENDS TO MATCH ADJACENT PIPING.
- 2. STEEL PIPE WITH MALLEABLE-IRON FITTINGS AND THREADED JOINTS.
- B. ABOVEGROUND, DISTRIBUTION PIPING SHALL BE THE FOLLOWING:
- 1. STEEL PIPE WITH MALLEABLE-IRON FITTINGS AND THREADED JOINTS.
- C. UNDERGROUND, BELOW BUILDING, SHALL BE[ONE OF] THE FOLLOWING:
- 1. STEEL PIPE WITH MALLEABLE-IRON FITTINGS AND THREADED JOINTS.
- 2. STEEL PIPE WITH WROUGHT-STEEL FITTINGS AND WELDED JOINTS. D. CONTAINMENT CONDUIT: STEEL WITH WROUGHT-STEEL FITTINGS AND WELDED JOINTS. COAT PIPE AND FITTINGS WITH PROTECTIVE COATING FOR STEEL PIPING.
- E. CONTAINMENT CONDUIT VENT PIPING: STEEL PIPE WITH MALLEABLE-IRON FITTINGS AND THREADED OR WROUGHT-STEEL FITTINGS WITH WELDED JOINTS. COAT UNDERGROUND PIPE AND FITTINGS WITH PROTECTIVE COATING FOR STEEL PIPING.

END OF SECTION



DATE DESCRIPTION DWG DATE: 09-18-2024 DRAWN BY: REVIEWED BY: PROJECT No .:

PLUMBING

DWG TITLE: