COMcheck Software Version 4.1.2.1
Mechanical Compliance Certificate

Project Information

Energy Code:	2018 IECC
Project Title:	Tropical Cafe
Location:	Cameron, North Carolina
Climate Zone:	3a
Project Type:	Alteration

Construction Site:
1546 NC HWY 24 / 87
CAMERON, NC 28326
STORE# NC - 079

Owner/Agent:
Chris Neal
ND Enterprises, LLC
GA
480 297 5577

Designer/Contractor:
Don Penn, PE
1301 Solana Blvd. Bldg. 1, Suite 1420
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Mechanical Systems List

Quantity **System Type & Description**

1 packaged HVAC System 1 (Single Zone):
Heating: 1 each - Central Furnace, Gas, Capacity = 37 kBtu/h
Proposed Efficiency = 80.00% Et, Required Efficiency: 80.00 % Et or 80% AFUE
Cooling: 1 each - Single Package DX Unit, Capacity = 38 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 14.00 SEER, Required Efficiency: 14.00 SEER
Fan System: FAN SYSTEM 1 -- Compliance (Brake HP method) : Passes

Fans:
FAN 1 Supply, Single-Zone VAV, 2000 CFM, 2.0 motor nameplate hp, 1.5 design brake hp (2.0 max. BHP), 0.9 fan efficiency grade

2 packaged HVAC System 1 copy 1 (Single Zone):
Heating: 1 each - Central Furnace, Gas, Capacity = 59 kBtu/h
Proposed Efficiency = 80.00% Et, Required Efficiency: 80.00 % Et or 80% AFUE
Cooling: 1 each - Single Package DX Unit, Capacity = 63 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 14.00 SEER, Required Efficiency: 14.00 SEER
Fan System: FAN SYSTEM 1 -- Compliance (Brake HP method) : Passes

Fans:
FAN 1 Supply, Single-Zone VAV, 2000 CFM, 2.0 motor nameplate hp, 1.5 design brake hp (2.0 max. BHP), 0.9 fan efficiency grade

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2018 IECC requirements in COMcheck Version 4.1.2.1 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Don Penn, PE — Name - Title
Signature
12/15/2020 — Date

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6][3]	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.5, C404.5.1, C404.5.2 [PL6][3]	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.6.3 [PL7][3]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.6.3 [PL7][3]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.7 [PL8][3]	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.7 [PL8][3]	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.7.6 [ME141][3]	HVAC systems serving guestrooms in Group R-1 buildings with > 50 guestrooms: Each guestroom is provided with controls that automatically manage temperature setpoint and ventilation (see sections C403.7.6.1 and C403.7.6.2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.7.4 [ME57][1]	Exhaust air energy recovery on systems meeting Table C403.7.4(1) and C403.7.4(2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.7.5 [ME116][3]	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.11.1, C403.11.2 [ME60][2]	HVAC ducts and plenums insulated in accordance with C403.11.1 and constructed in accordance with C403.11.2, verification may need to occur during Foundation Inspection.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.5, C403.5.1, C403.5.2 [ME62][1]	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.5.3.3 [ME124][1]	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.5.3.4 [ME125][1]	System capable of relieving excess outdoor air during air economizer operation to prevent overpressurizing the building. The relief air outlet located to avoid recirculation into the building.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.5.3.5 [ME126][1]	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.4.1.4 [ME63][2]	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures > 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint >= 80F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.3.3 [ME35][1]	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

COMcheck Software Version 4.1.2.1
Inspection Checklist

Energy Code: 2018 IECC

Requirements: 0.0% were addressed directly in the COMcheck software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR2][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C103.2 [PR4][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C103.2 [PR8][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the exterior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C402.2.6 [ME41][3]	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.8.4 [ME142][2]	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.8.4 [ME142][2]	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.8.5 [ME143][2]	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.8.5 [ME143][2]	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.12.1 [ME71][2]	Systems that heat outside the building envelope are radiant heat systems controlled by an occupancy sensing device or timer switch.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.3 [ME55][2]	HVAC equipment efficiency verified.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values.*
C403.5.5 [ME113][2]	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.2 [ME59][3]	Natural or mechanical ventilation is provided in accordance with International Mechanical Code Chapter 4. Mechanical ventilation has capability to reduce outdoor air supply to minimum per IMC Chapter 4.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.7.1 [ME59][1]	Demand control ventilation provided for spaces >500 ft2 and >25 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.7.2 [ME115][3]	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.3.3 [ME35][1]	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.2.1 [ME53][3]	Air outlets and zone terminal devices have means for air balancing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.5, C403.5.1, C403.5.2 [ME123][3]	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in a condensing unit, have fan-powered condensers that comply with Sections C403.5.1 and refrigeration compressor systems that comply with C403.5.2..	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

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DPE

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CAMERON, NC 28326
STORE# NC - 079

tropical CAFE SMOOTHIE
eat better. feel better.

TSC: NC-079

REVISION
1
2
3

DATE: 12.05.2020

NORTH CAROLINA PROFESSIONAL SEAL 022419 ENGINEER DON PENN
12/15/2020

MECHANICAL

M0.1

GENERAL NEW NOTES:

1. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS WHICH MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
2. COORDINATE THE INSTALLATION OF THE MECHANICAL SYSTEMS WITH OTHER TRADES TO ENSURE A NEAT AND ORDERLY INSTALLATION. INSTALL DUCTWORK AS TIGHT TO STRUCTURE AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATE INSTALLATION OF DUCTWORK TO AVOID CONFLICTS WITH ELECTRICAL PANELS, LIGHTING FIXTURES, ETC. ANY MODIFICATIONS REQUIRED DUE TO LACK OF COORDINATION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO EXTRA COST TO THE OWNER.
3. NEW MECHANICAL EQUIPMENT AND DUCTWORK ARE SHOWN AT APPROXIMATE LOCATIONS. FIELD MEASURE FINAL DUCTWORK LOCATIONS PRIOR TO FABRICATION AND MAKE ADJUSTMENTS AS REQUIRED TO FIT THE DUCTWORK AND PIPING WITHIN THE AVAILABLE SPACE. VERIFY THAT FINAL EQUIPMENT LOCATIONS MEET MANUFACTURER'S RECOMMENDATIONS REGARDING SERVICE CLEARANCE AND PROPER AIRFLOW CLEARANCE AROUND EQUIPMENT.
4. REFER TO ARCHITECTURAL DRAWINGS FOR RELATED CONSTRUCTION DETAILS AS APPLICABLE TO THE HVAC SYSTEM. VERIFY CHASES AND PENETRATIONS SHOWN ON ARCHITECTURAL DRAWINGS THAT ARE INTENDED FOR DUCTWORK AND PIPING MEET REQUIREMENTS.
5. COORDINATE LOCATION OF ROOF MOUNTED HVAC EQUIPMENT AND ROOF PENETRATIONS WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS.
6. INDOOR AIR QUALITY MEASURES: PROTECT INSIDE OF (INSTALLED AND DELIVERED) DUCTWORK AND HVAC UNITS FROM EXPOSURE TO DUST, DIRT, PAINT AND MOISTURE. REPLACE INSULATION THAT HAS GOTTEN WET AT ANY TIME DURING CONSTRUCTION, DRYING THE INSULATION IS NOT ACCEPTABLE. SEAL ANY TEARS OR JOINTS OF INTERNAL FIBERGLASS INSULATION. REMOVE DEBRIS FROM CEILING/RETURN AIR PLENUM INCLUDING DUST. AN INDEPENDENT, PROFESSIONAL DUCT CLEANING COMPANY SHALL VACUUM CLEAN ANY DUCTWORK CONNECTED TO HVAC UNITS THAT WERE OPERATED DURING THE CONSTRUCTION PERIOD AFTER NEW FILTERS, MINIMUM MERV-8, ARE INSTALLED AND PRIOR TO TURNING SYSTEM OVER TO THE OWNER.
7. INSTALL DUCTWORK PARALLEL TO BUILDING COLUMN LINES UNLESS OTHERWISE SHOWN OR NOTED.
8. OVERHEAD HANGERS AND SUPPORTS FOR EQUIPMENT, DUCTWORK SHALL BE FASTENED TO BUILDING JOISTS OR BEAMS. DO NOT ATTACH HANGERS AND SUPPORTS TO THE ABOVE FLOOR SLAB OR ROOF EXCEPT WHERE CONCRETE INSERTS IN CONCRETE SLABS ARE ALLOWED BY THE SPECIFICATIONS.
9. COORDINATE LOCATION OF EQUIPMENT SUPPORTS WITH LOCATION OF EQUIPMENT ACCESS PANELS/DOORS TO ENABLE SERVICE OF EQUIPMENT AND/OR FILTER REPLACEMENT.
10. SEAL PENETRATIONS THROUGH THE BUILDING COMPONENTS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. FIREPROOF PENETRATIONS THROUGH FIRE RATED COMPONENTS IN ACCORDANCE WITH U.L. REQUIREMENTS.
11. COORDINATE THE EXACT MOUNTING SIZE AND FRAME TYPE OF DIFFUSERS, REGISTERS AND GRILLES WITH THE SUPPLIER TO MEET THE CEILING, WALL AND DUCT INSTALLATION REQUIREMENTS.
12. ADJUST LOCATION OF CEILING DIFFUSERS, REGISTERS AND GRILLES AS REQUIRED TO ACCOMMODATE FINAL CEILING GRID AND LIGHTING LOCATIONS.
13. LOCATE AND SET THERMOSTATS AND TEMPERATURE SENSORS AT LOCATIONS SHOWN ON PLANS. VERIFY EXACT LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION. INSTALL THERMOSTATS WITH TOP OF DEVICE AT MAXIMUM 48" AFF TO MEET ADA REQUIREMENTS AND TEMPERATURE SENSORS AT 72" AFF, UNLESS NOTED OTHERWISE ON PLANS. INSTALL WIRING IN CONDUIT PROVIDED BY DIVISION 16.
14. PROVIDE A MANUAL BALANCING DAMPER IN EACH BRANCH DUCT TAKEOFF FROM MAIN SUPPLY, RETURN, OUTDOOR AND EXHAUST AIR DUCTS.
15. PROVIDE A PREFABRICATED 45 DEGREE, HIGH EFFICIENCY, RECTANGULAR/ROUND BRANCH DUCT TAKEOFF FITTING WITH MANUAL BALANCING DAMPER AND LOCKING QUADRANT FOR BRANCH DUCT CONNECTIONS AND TAKE-OFFS TO INDIVIDUAL DIFFUSERS, REGISTERS AND GRILLES.
16. BRANCH DUCTWORK TO AIR OUTLETS SHALL BE SAME SIZE AS OUTLET NECK SIZE UNLESS OTHERWISE NOTED.
17. RIGID DUCTWORK INSULATION: PROVIDE 3/4 LB DENSITY, 2" (R-6) THICK, INSULATION WRAP ON RIGID ROUND, CONCEALED, SUPPLY AND RETURN AIR DUCTS. PROVIDE 1-1/2" (R-6) THICK 1-1/2 LB DENSITY INTERNAL DUCT LINER ON RECTANGULAR SUPPLY AND RETURN AIR DUCTS. DUCT SIZES ON MECHANICAL PLANS INDICATE CLEAR INSIDE AIRFLOW DIMENSIONS, INCREASE SHEET METAL SIZES ACCORDINGLY.
18. PROVIDE THERMAFLEX TYPE M-KE, FLEXMASTER TYPE 8, OR APPROVED EQUAL FLEXIBLE DUCTWORK. FLEXIBLE DUCTWORK SHALL BE LISTED UNDER UL 181 AS CLASS 1 AIR DUCT AND BE PROVIDED WITH INTEGRAL R-6, 3/4 LB DENSITY FIBERGLASS INSULATION. FLEXIBLE DUCTWORK SHALL NOT EXCEED 5'-0" IN LENGTH AND SHALL BE INSTALLED AND SUPPORTED TO AVOID SHARP BENDS AND SAGGING.

MECHANICAL SYMBOLS

NOTE: THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS, ETC. ARE NECESSARILY USED ON THE DRAWINGS.

HVAC EQUIPMENT & DUCTWORK

NOTE: ALL DUCT DIMENSIONS SHOWN ON DRAWINGS ARE INSIDE DIMENSIONS. SEE SECTION 15250 OF THE SPECIFICATION FOR DUCTWORK TO RECEIVE INSULATION OR LINER.

- EXISTING DUCTWORK OR EQUIPMENT TO REMAIN
- EXISTING DUCTWORK OR EQUIPMENT TO BE REMOVED
- BRANCH DUCT WITH 45° RECTANGLE-ROUND BRANCH FITTING AND MANUAL VOLUME DAMPER
- ELBOW WITH TURNING VANES
- RETURN, EXHAUST, OR OUTSIDE AIR DUCT UP
- RETURN, EXHAUST, OR OUTSIDE AIR DUCT DOWN
- SUPPLY AIR DUCT UP
- SUPPLY AIR DUCT DOWN
- EQUIPMENT WITH FLEXIBLE DUCT CONNECTION
- 10" CSD-1 300 CFM — NECK SIZE, TYPE, CFM OF SUPPLY DIFFUSER OR REGISTER
- MANUAL VOLUME DAMPER
- SQUARE TO ROUND TRANSITION
- RD — DUCT MOUNTED SMOKE DETECTOR (SD=SUPPLY/RD=RETURN)
- FD FIRE DAMPER
- FSD FIRE SMOKE DAMPER
- SD SMOKE DAMPER
- VD VOLUME DAMPER
- MD MOTORIZED DAMPER
- HS HUMIDITY SENSOR
- TS TEMPERATURE SENSOR
- H HUMIDISTAT
- T THERMOSTAT
- BD BACKDRAFT DAMPER

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	MC	MECHANICAL CONTRACTOR
BAS	BUILDING AUTOMATION SYSTEM	MIN	MINIMUM
BD	BACKDRAFT DAMPER	NC	NOISE CRITERIA
CFM	CUBIC FEET PER MINUTE	OA	OUTSIDE AIR
DDC	DIRECT DIGITAL CONTROL	RA	RETURN AIR
DX	DIRECT EXPANSION	SA	SUPPLY AIR
EA	EXHAUST AIR	SD	SMOKE DUCT DETECTOR
FFA	FROM FLOOR ABOVE	TFA	TO FLOOR ABOVE
FFB	FROM FLOOR BELOW	TFB	TO FLOOR BELOW
GPM	GALLONS PER MINUTE	TYP	TYPICAL
IN WC	INCHES OF WATER COLUMN	UNO	UNLESS NOTED OTHERWISE
MAX	MAXIMUM	W/	WITH
MBH	1000 BTU PER HOUR	W/O	WITHOUT

STANDARD MOUNTING HEIGHTS

MECHANICAL	(AFF, AFG, UNLESS NOTED OTHERWISE)
THERMOSTATS (USER ADJUSTABLE)(TOP OF DEVICE)	48"
CONTROLS (TOP OF DEVICE)	48"

ANNOTATION

- 1 — MECHANICAL PLAN CALLOUT
- CU 1 — MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
- CONNECTION POINT OF NEW WORK TO EXISTING
- 1 / M1 — DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER
- 1 / M1 — SECTION CUT DESIGNATION

PACKAGED ROOFTOP UNIT SCHEDULE (ELEC HEAT)

MARK	MANUFACTURER	MODEL	SUPPLY FAN				COOLING COIL		EAT		LAT		HEATING PERFORMANCE		MIN.	MIN.	MCA	MOCP	V/PH	WEIGHT	NOTES
			FAN TYPE	CFM	MIN HP	ESP (IN)	REFR. TYPE	NET (MBH)	DB	WB	DB	WB	HIGH TEMP (MBH)	MIN. EFF. (%)	MIN. NO. STAGES	LAT DB (F)	O/A CFM	SEER				LBS	
RTU-1 (NEW)	TRANE	WSC036E3	FC	1,200	1.00	0.5	R-410A	38.0	80.0	67.0	55.0	54.0	37	80	1	90	100	13.0	55	60	208/3	520	A-B
RTU-2 (EXIST)	TRANE	WSC060E3	FC	2,000	1.00	0.5	R-410A	63.0	80.0	67.0	55.0	54.0	59	80	1	90	200	13.0	61	70	208/3	700	A-B

NOTES:
A. PROVIDE 2", 30% EFFICIENT PLEATED THROWAWAY AIR FILTERS.
B. EXISTING 7-DAY PROGRAMMABLE THERMOSTAT WITH STAGED HEATING AND COOLING CAPABILITY AS REQUIRED FOR OPERATION OF STAGED HEATING, ECONOMIZER AND COOLING CONTROLS.

FAN SCHEDULE

MARK	SERVICE (EA, RA, SA)	MANUFACTURER	MOUNTING	MODEL	CFM	ESP (IN)	DRIVE (BELT/DIRECT)	MIN HP	FAN RPM	ELECTRICAL V/PH	ELECTRICAL FLA	NOTES
EF-1	EXHAUST	GREENHECK	CEILING	SP-B110	75	0.25	DIRECT	80W	1140	120/1	-	A-C
EF-2	EXHAUST	GREENHECK	CEILING	SP-B110	75	0.25	DIRECT	80W	1140	120/1	-	A-C
EF-3	EXHAUST	GREENHECK	STRUCTURE	SP-B200	200	0.25	DIRECT	172W	1050	120/1	-	A,B,D

NOTES:
A. MANUFACTURER TO PROVIDE 8" HIGH ROOF CURB AND MODEL GRS-08 SPUN ALUMINUM ROOF CAP WITH INTEGRAL BIRDSCREEN AND BACKDRAFT DAMPER.
B. PROVIDE RUBBER IN SHEAR ISOLATION AND ALL-THREAD HANGING RODS.
C. INTERLOCK FAN OPERATION WITH RESTROOM LIGHT SWITCH.
D. INTERLOCK FAN OPERATION WITH THERMOSTAT TO ENERGERIZE FAN WHEN THE SPACE TEMPERATURE REACHES 90°F.

GRILLE, REGISTER AND DIFFUSER SCHEDULE

MARK	MANUFACTURER	MODEL	FACE TYPE	MOUNTING LOCATION	FACE SIZE (IN)	MAX. NC	MAX. PRESS. DROP (IN. W.C.)	NOTES
CD-1	PRICE	AMD	LOUVERED	LAY-IN	24x24	25	0.05	A-E
CD-2	PRICE	AMD	LOUVERED	GYP.	12x12	25	0.05	A-E
CD-3	PRICE	RCDE	ROUND	DUCT	-	30	0.05	A-D
RG-1	PRICE	80	EGG CRATE	LAY-IN	24x24	25	0.05	A,D,E
RG-2	PRICE	80	EGG CRATE	GYP.	12x12	25	0.05	A,D,E
RG-3	PRICE	530	LOUVERED	DUCT	NECK + 1-3/4	25	0.1	A,C,D

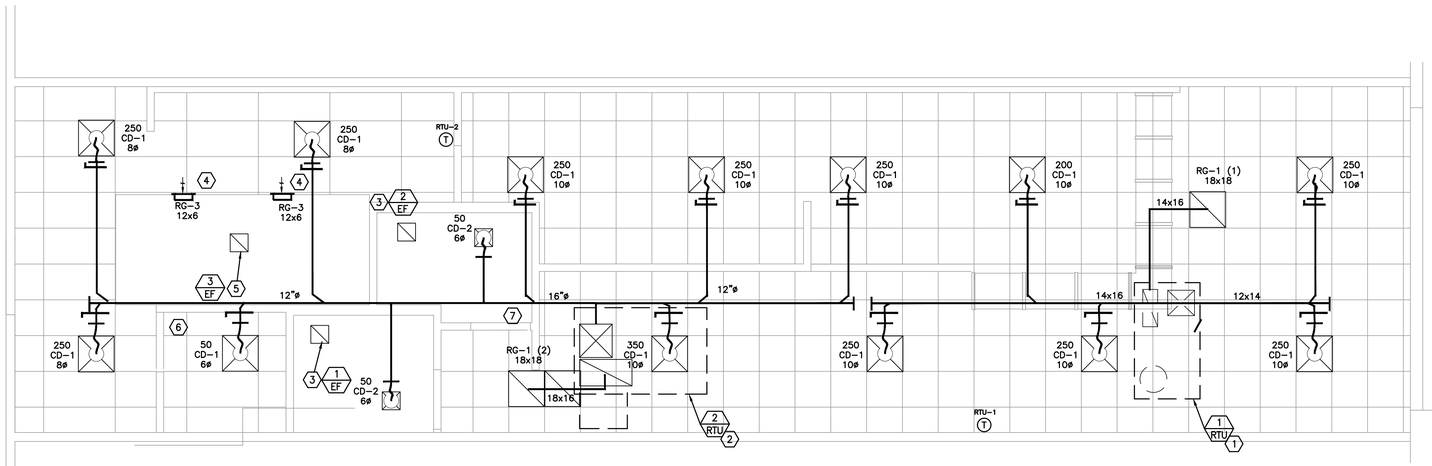
NOTES:
A. NECK SIZE SHOWN ON DRAWINGS. PROVIDE NECK FOR DUCT CONNECTION.
B. 4-WAY THROW PATTERN UNLESS OTHERWISE SHOWN ON DRAWINGS.
C. BRANCH DUCT SIZE SHALL BE SAME AS NECK SIZE UNLESS OTHERWISE SHOWN ON DRAWINGS.
D. BAKED ENAMEL FINISH, WHITE TO MATCH CEILING COLOR.
E. FRAME TYPE TO MATCH CEILING CONSTRUCTION, COORDINATE WITH ARCHITECTURAL RCP.

OUTSIDE AIR REQUIREMENTS

AREA PURPOSE	GROSS FLOOR AREA (SQ. FT)	CODE OUTSIDE AIR REQUIREMENTS					SYSTEM NUMBER	ACTUAL OUTSIDE AIR (CFM PER UNIT)
		CFM PER SQ. FT	CFM REQD.	CFM PER PERSON	NO. OF PEOPLE	CFM REQD.	RTU-1	100
DINING	567	0.18	102	7.5	37	278	RTU-2	200
SERVICE	600	0.06	36	5.0	2	10		
PREP	400	0.06	24	5.0	2	10		
		TOTAL =	162			298	TOTAL =	300

MECHANICAL PLAN NOTES:

1. NEW 3 TON ROOF TOP UNIT LOCATED ON ROOF STRUCTURAL ZONE FOR ROOF TOP UNITS. ROUTE FULL SIZE SUPPLY AND RETURN AIR DUCTWORK THROUGH ROOF AND TRANSITION TO DUCTWORK INDICATED ON FLOOR PLAN. DIVISION 16 CONTRACTOR SHALL WIRE AND PROVIDE SMOKE DETECTOR ON THE RETURN AIR DUCT. SMOKE DETECTOR SHALL SHUT DOWN ROOF TOP UNIT SUPPLY FAN UPON THE DETECTION OF THE SPACE.
2. EXISTING 5 TON ROOF TOP UNIT LOCATED ON ROOF STRUCTURAL ZONE FOR ROOF TOP UNITS. ROUTE FULL SIZE SUPPLY AND RETURN AIR DUCTWORK THROUGH ROOF AND TRANSITION TO DUCTWORK INDICATED ON FLOOR PLAN. DIVISION 16 CONTRACTOR SHALL WIRE AND PROVIDE SMOKE DETECTOR ON THE RETURN AIR DUCT. SMOKE DETECTOR SHALL SHUT DOWN ROOF TOP UNIT SUPPLY FAN UPON THE DETECTION OF THE SPACE.
3. NEW RESTROOM EXHAUST FAN, 70 CFM EXHAUST.
4. WALL MOUNTED RETURN GRILLE ON WALK-IN ENCLOSURE WALL, OPEN TO THE SPACE ABOVE THE WALK-IN COOLER.
5. EXHAUST FAN ABOVE CEILING HUNG STRUCTURE TO PROVIDE VENTILATION FOR THE WALK-IN COOLER / FREEZER CONDENSERS ABOVE CEILING. INTERLOCKED WITH WALL THERMOSTAT TO ENERGIZE FAN WHEN THE SPACE TEMPERATURE REACHES 90°F. ROUTE 8ø EXHAUST DUCT UP AND PENETRATE ROOF. TERMINATE ON ROOF WITH ROOF CAP. COORDINATE ALL ROOF PENETRATIONS WITH LANDLORD'S APPROVED ROOFER.
6. UNDERCUT OFFICE DOOR 1" FOR RETURN AIR
7. UPON COMPLETION OF DEMO- GC TO PROVIDE SKETCH OF EXISTING DESIGN IF REUSE OF ANY EXISTING DUCTWORK WILL BE USED.



NOTE: SPILL CONDENSATE INTO DOWN SPOUT
FINAL TERMINATION IS SITE STORM SEWER (TYP)

1 MECHANICAL FLOOR PLAN
SCALE: 1/4"=1'-0"

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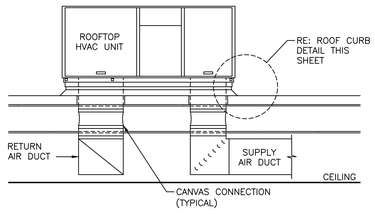
12/15/2020

MECHANICAL FLOOR PLAN

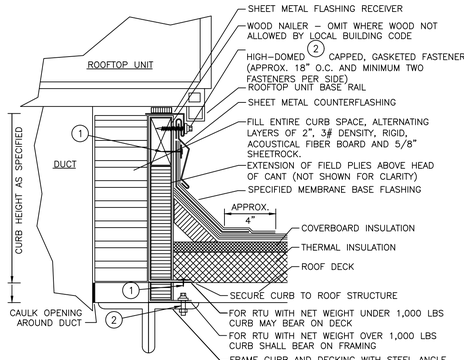
M1



NOTES:

1. PROVIDE OPENING THROUGH ROOF AND ROOF DECK INSULATION NO LARGER THAN REQUIRED TO ALLOW DUCTS TO PASS THROUGH. REFER TO PLANS FOR DUCT SIZES. TRANSITION AS REQUIRED IN ROOF CURB TO RTU SUPPLY AND RETURN OPENINGS.
2. PROVIDE SLOPED ROOF CURB TO INSTALL ROOFTOP UNIT LEVEL TO ENSURE PROPER DRAINAGE. COORDINATE ROOF SLOPE WITH ARCHITECTURAL. FLASH AND COUNTER FLASH ROOF PENETRATIONS, ETC. TO ENSURE WEATHER TIGHT INSTALLATION.

1 ROOFTOP UNIT WITH DUCTWORK DETAIL
NO SCALE

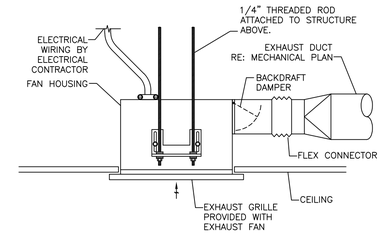


(1) #12x1" SELF DRILLING SCREWS AT 12"O.C.
(2) #14x1-1/2" SELF DRILLING SCREWS AT 18"O.C.

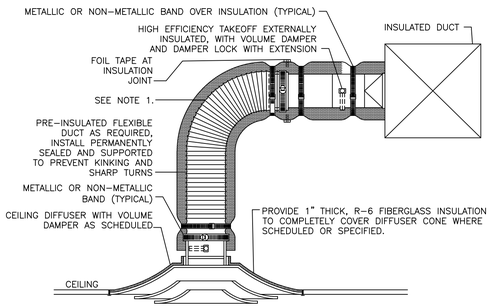
NOTES:

1. CUT METAL DECKING TO ALLOW CURB INSTALLATION ON STEEL FRAMING. AFTER CURB IS SET IN PLACE, TRIM REMAINING METAL DECKING AND INSTALL WITHIN CURB. TACK WELD DECKING TO SUPPORT STEEL. DO NOT WELD INTERIOR DECKING TO ROOF CURB. PROVIDE ADDITIONAL CROSS FRAMING TO SUPPORT INTERIOR DECKING AND FILL MATERIAL AS REQUIRED.

2 ROOF CURB DETAIL
NO SCALE



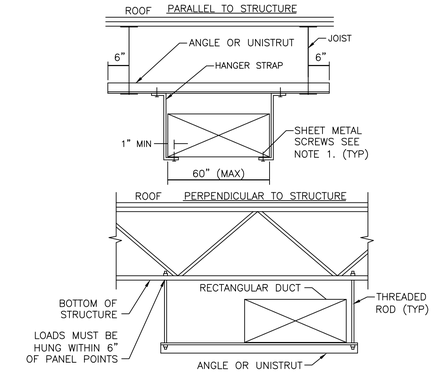
3 SUPPORT DETAIL FOR HUNG EQUIPMENT
NO SCALE



NOTES:

1. EXTEND RIGID METAL DUCT SO THAT MAXIMUM FLEXIBLE DUCT LENGTH DOES NOT EXCEED 5'-0". PROVIDE RIGID 90° ELBOW WHERE REQUIRED TO KEEP FLEXIBLE DUCT WITHIN 5'-0" LENGTH LIMITATION.

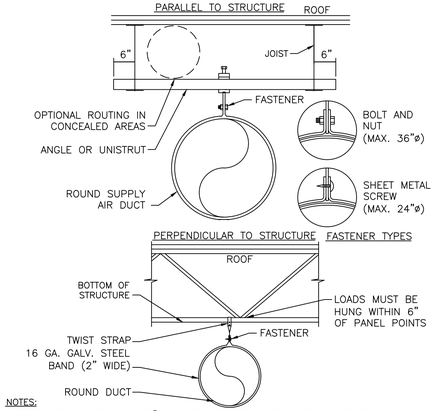
4 LAY-IN TYPE CEILING DIFFUSER DETAIL
NO SCALE



NOTES:

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

5 RECTANGULAR DUCT SUPPORT DETAIL
NO SCALE



NOTES:

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

6 ROUND DUCT SUPPORT DETAIL
NO SCALE

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MECHANICAL DETAILS

M2

15: Heating, Ventilating, and Air Conditioning:

GENERAL INSTRUCTIONS

GENERAL REQUIREMENTS

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

DEFINITIONS

FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION AND SIMILAR OPERATIONS."

INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT THE PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."

PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

FURNISHED BY OWNER OR FURNISHED BY OTHERS: THE ITEM WILL BE FURNISHED BY THE OWNER OR OTHERS. IT IS TO BE INSTALLED AND CONNECTED UNDER THE REQUIREMENTS OF THIS DIVISION, COMPLETE AND READY FOR OPERATION, INCLUDING ITEMS INCIDENTAL TO THE WORK, INCLUDING SERVICES NECESSARY FOR PROPER INSTALLATION AND OPERATION. THE INSTALLATION SHALL BE INCLUDED UNDER THE GUARANTEE REQUIRED BY THIS DIVISION.

ENGINEER: WHERE REFERENCED IN THIS DIVISION, "ENGINEER" IS THE ENGINEER OF RECORD AND THE DESIGN PROFESSIONAL FOR THE WORK UNDER THIS DIVISION, AND IS A CONSULTANT TO, AND AN AUTHORIZED REPRESENTATIVE OF, THE ARCHITECT, AS DEFINED IN THE GENERAL AND/OR SUPPLEMENTARY CONDITIONS, WHEN USED IN THIS DIVISION, IT MEANS INCREASED INVOLVEMENT BY, AND OBLIGATIONS TO, THE ENGINEER, IN ADDITION TO INVOLVEMENT BY, AND OBLIGATIONS TO, THE "ARCHITECT".

AHJ: THE LOCAL CODE AND/OR INSPECTION AGENCY (AUTHORITY) HAVING JURISDICTION OVER THE WORK.

THE TERMS "APPROVED EQUAL", "EQUIVALENT", OR "EQUAL" ARE USED SYNONYMOUSLY AND SHALL MEAN "ACCEPTED BY OR ACCEPTABLE TO THE ENGINEER AS EQUIVALENT TO THE ITEM OR MANUFACTURER SPECIFIED". THE TERM "APPROVED" SHALL MEAN LABELED, LISTED, OR BOTH, BY A NATIONALLY RECOGNIZED TESTING LABORATORY (E.G. UL, ETL, CSA), AND ACCEPTABLE TO THE AHJ OVER THIS PROJECT.

PREBID SITE VISIT

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

MATERIAL AND WORKMANSHIP

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

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

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

COORDINATION

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

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

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

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

ORDINANCES AND CODES

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

PROTECTION OF EQUIPMENT AND MATERIALS

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

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

SUBSTITUTIONS

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

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

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

SHOP DRAWINGS

UPON BEING AWARDED A CONTRACT, SUBMIT TO THE ARCHITECT FOR APPROVAL, SIX (6) COPIES OF MANUFACTURER'S SHOP DRAWINGS FOR EQUIPMENT TO BE FURNISHED UNDER THIS CONTRACT, ITEMS REQUIRING COORDINATION BETWEEN CONTRACTORS AND SHEET METAL DUCTWORK FABRICATION DRAWINGS. BEFORE SUBMITTING SHOP DRAWINGS AND MATERIAL LISTS, VERIFY THAT EQUIPMENT SUBMITTED IS MUTUALLY COMPATIBLE AND SUITABLE FOR THE INTENDED USE, AND WILL FIT THE AVAILABLE SPACE AND ALLOW AMPLE ROOM FOR MAINTENANCE. HIGHLIGHT, MARK, LIST OR INDICATE THE MATERIALS, PERFORMANCE CRITERIA AND ACCESSORIES THAT ARE BEING PROPOSED. SUBMIT SHOP DRAWINGS AS EARLY AS REQUIRED TO SUPPORT THE PROJECT SCHEDULE. ALLOW FOR TWO WEEKS ENGINEER REVIEW TIME PLUS MAILING TIME PLUS A DUPLICATION OF THIS TIME FOR RESUBMITTAL IF REQUIRED.

THE ENGINEER'S CHECKING AND SUBSEQUENT APPROVAL OF SUCH SHOP DRAWINGS WILL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN DIMENSIONS, DETAILS, SIZE OF MEMBERS, QUANTITIES, OMISSIONS OF COMPONENTS OR FITTINGS; COORDINATION OF ELECTRICAL REQUIREMENTS; OR FOR COORDINATING ITEMS WITH ACTUAL BUILDING CONDITIONS. PROCEED WITH THE PROCUREMENT AND INSTALLATION OF EQUIPMENT ONLY AFTER RECEIVING APPROVED SHOP DRAWINGS RELATIVE TO EACH ITEM.

CATALOG DATA SHALL BE PROPERLY BOUND, IDENTIFIED, INDEXED AND TABBED IN A 3-RING BINDER. LABEL THE CATALOG DATA WITH THE EQUIPMENT IDENTIFICATION ACRONYM OR NUMBER AS USED ON THE DRAWINGS AND INCLUDE PERFORMANCE CURVES, CAPACITIES, SIZES, WEIGHTS, MATERIALS, FINISHES, WIRING DIAGRAMS, ELECTRICAL REQUIREMENTS AND DEVIATIONS FROM SPECIFIED EQUIPMENT OR MATERIALS. FOR EQUIPMENT WITH MOTOR STARTERS OR VFDS, INCLUDE SHORT CIRCUIT CURRENT RATINGS. MARK OUT INAPPLICABLE ITEMS. SHOP DRAWINGS WILL BE RETURNED WITHOUT REVIEW IF THE ABOVE MENTIONED REQUIREMENTS ARE NOT MET.

OPERATION AND MAINTENANCE INSTRUCTIONS

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

SUBMIT THREE COPIES OF LITERATURE BOUND IN APPROVED BINDERS WITH INDEX AND TABS SEPARATING EQUIPMENT TYPES TO THE ARCHITECT AT THE TERMINATION OF THE WORK. PAPER CLIPS, STAPLES, RUBBER BANDS, AND MAILING ENVELOPES ARE NOT CONSIDERED APPROVED BINDERS. FINAL APPROVAL OF MECHANICAL SYSTEMS INSTALLED UNDER THIS CONTRACT WILL BE WITHHELD UNTIL THIS EQUIPMENT BROCHURE IS RECEIVED AND DEEMED COMPLETE BY THE ARCHITECT AND ENGINEER. INSTRUCT WORKMEN TO SAVE REQUIRED LITERATURE SHIPPED WITH THE EQUIPMENT ITSELF, FOR INCLUSION IN THIS BROCHURE.

WARRANTIES

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

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

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

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

SPARE PARTS

FURNISH TO OWNER, WITH RECEIPT, THE FOLLOWING SPARE PARTS FOR THE EQUIPMENT FURNISHED FOR THIS PROJECT:

A. ONE SET OF SPARE FILTERS OF EACH TYPE REQUIRED FOR EACH UNIT. IN ADDITION TO THE SPARE SET OF FILTERS, INSTALL NEW FILTERS PRIOR TO TESTING, ADJUSTING, AND BALANCING WORK AND BEFORE TURNING SYSTEM OVER TO OWNER.

B. FURNISH ONE COMPLETE SET OF BELTS FOR EACH FAN.

C. FURNISH THREE OPERATING KEYS FOR EACH TYPE OF AIR OUTLET AND INLET THAT REQUIRE THEM.

CUTTING AND PATCHING

PERFORM CUTTING OF WALLS, FLOORS, CEILINGS, ETC. AS REQUIRED TO INSTALL WORK UNDER THIS SECTION. OBTAIN PERMISSION FROM THE ARCHITECT PRIOR TO CUTTING. DO NOT CUT OR DISTURB STRUCTURAL MEMBERS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT. CUT HOLES AS SMALL AS POSSIBLE. GENERAL CONTRACTOR SHALL PATCH WALLS, FLOORS, ETC. AS REQUIRED BY WORK UNDER THIS SECTION. PATCHING SHALL MATCH THE ORIGINAL MATERIAL AND CONSTRUCTION. REPAIR AND REFINISH AREAS DISTURBED BY WORK TO THE CONDITION OF ADJOINING SURFACES IN A MANNER SATISFACTORY TO THE ARCHITECT.

ACCESS DOORS

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

PENETRATIONS

PROVIDE PREFABRICATED ROOF CURBS MANUFACTURED BY CUSTOM CURB, INC., PATE COMPANY, THYCURB OR APPROVED EQUAL. PROVIDE ROOF CURB WITH FACTORY INSTALLED WOOD NAILER; WELDED, 18 GAUGE GALVANIZED STEEL SHELL, BASE PLATE AND FLASHING; 1-1/2" THICK, 3 POUND RIGID INSULATION; FULLY MITERED 3-INCH RAISED CANT; COVER OF WEATHER-RESISTANT, WEATHER-PROOF MATERIAL AND PIPE COLLAR OF WEATHER-RESISTANT MATERIAL WITH STAINLESS STEEL PIPE CLAMPS.

SEAL ELEVATED FLOOR, EXTERIOR WALL AND ROOF PENETRATIONS WATERTIGHT AND WEATHERTIGHT WITH NON-SHRINK, NON-HARDENING COMMERCIAL SEALANT. PACK WITH MINERAL WOOL AND SEAL BOTH ENDS WITH MINIMUM OF 1/2" OF SEALANT. SEAL AROUND PENETRATIONS OF FIRE RATED ASSEMBLIES. COORDINATE FIRE RATINGS AND LOCATIONS WITH THE ARCHITECTURAL DRAWINGS. REFER TO ARCHITECTURAL SPECIFICATIONS FOR FIRE STOPPINGS. PROVIDE A PRODUCT SCHEDULE FOR UL LISTING, LOCATION, WALL OR FLOOR RATING AND INSTALLATION DRAWING FOR EACH PENETRATION FIRE STOP SYSTEM.

PROVIDE BOX FRAMES FOR RECTANGULAR OPENINGS WELDED 12 GAUGE GALVANIZED STEEL ATTACHED TO FORMS AND OF A MAXIMUM DIMENSION ESTABLISHED BY THE ARCHITECT. NOTIFY THE GENERAL CONTRACTOR OR ARCHITECT BEFORE INSTALLING ANY BOX OPENINGS NOT SHOWN ON THE ARCHITECTURAL OR STRUCTURAL DRAWINGS.

AIR FILTERS

PROVIDE FARR 30/30, PLEATED, THROWAWAY TYPE FILTERS, OR SIMILAR AS MANUFACTURED BY AMERICAN AIR FILTER, FLANDERS OR APPROVED EQUAL, UNLESS OTHERWISE INDICATED. AIR UNITS SHALL HAVE NEW FILTERS INSTALLED WHEN THEY ARE OPERATED BEFORE FINAL ACCEPTANCE.

ELECTRICAL WIRING

LINE VOLTAGE WIRING SHALL BE PROVIDED BY DIVISION 16. LINE VOLTAGE CONTROL AND INTERLOCK WIRING FOR MECHANICAL SYSTEMS SHALL ALSO BE PROVIDED BY DIVISION 16 CONTRACTOR. LOW VOLTAGE CONTROL WIRING SHALL BE PROVIDED BY THE DIVISION 15 CONTRACTOR. FURNISH WIRING DIAGRAMS TO THE DIVISION 16 CONTRACTOR AS REQUIRED FOR PROPER EQUIPMENT HOOKUP. COORDINATE WITH THE DIVISION 16 CONTRACTOR THE ACTUAL WIRE SIZING AMPS FOR MECHANICAL EQUIPMENT (FROM THE EQUIPMENT NAMEPLATE) TO ENSURE PROPER INSTALLATION.

REFRIGERANT AND OIL

PROVIDE FULL REFRIGERANT AND OIL CHARGE IN NEW AIR CONDITIONING REFRIGERATION SYSTEMS, AND MAINTAIN IT FOR FULL TERM OF THE GUARANTEE.

FINAL TESTING AND ADJUSTMENTS

FINAL SYSTEM TESTING, BALANCING AND ADJUSTMENTS SHALL BE PERFORMED BY A CONTRACTOR CERTIFIED BY THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB) OR ASSOCIATED AIR BALANCE COUNCIL (AABC). PERFORM TEST READINGS ON FANS, UNITS, COILS, ETC. AND ADJUST EQUIPMENT TO DELIVER SPECIFIED AMOUNTS OF AIR . PREPARE TESTING AND BALANCING REPORT LOG SHOWING AIR SUPPLY QUANTITIES, AIR ENTERING AND LEAVING TEMPERATURES AND PRESSURES, FAN AND UNIT TEST READINGS, MOTOR VOLTAGE AND AMP DRAWS, ETC., AND SUBMIT SIX COPIES OF THE FINAL COMPILATION OF DATA TO THE ARCHITECT FOR EVALUATION AND APPROVAL BEFORE FINAL INSPECTION OF THE PROJECT. BALANCE AIR SYSTEMS TO WITHIN PLUS OR MINUS 10 PERCENT FOR TERMINAL DEVICES AND BRANCH LINES AND PLUS OR MINUS 5 PERCENT FOR MAIN DUCTS AND AIR HANDLING EQUIPMENT OF THE AMOUNT OF AIR SHOWN ON THE DRAWINGS. FURTHER ADJUSTMENTS SHALL BE MADE TO OBTAIN UNIFORM TEMPERATURE IN SPACES. ADJUST EQUIPMENT TO OPERATE AS INTENDED BY THE SPECIFICATION. ALIGN BEARINGS AND REPLACE BEARINGS THAT HAVE DIRT OR FOREIGN MATERIAL IN THEM WITH NEW BEARINGS WITHOUT ADDITIONAL COST TO THE OWNER. BALANCE CONTRACTOR SHALL INCLUDE IN THE REPORT ANY IMPROPERLY INSTALLED OR MISSING BALANCING DEVICES THAT WOULD NEGATIVELY IMPACT THE SYSTEM OPERATION.

ADJUST THERMOSTATS AND CONTROL DEVICES TO OPERATE AS INTENDED. ADJUST BURNERS, PUMPS, FANS, ETC. FOR PROPER AND EFFICIENT OPERATION. CERTIFY TO ARCHITECT THAT ADJUSTMENTS HAVE BEEN MADE AND THAT SYSTEM IS OPERATING SATISFACTORILY. FURTHER ADJUSTMENTS SHALL BE MADE TO OBTAIN UNIFORM TEMPERATURE IN SPACES. CALIBRATE, SET, AND ADJUST AUTOMATIC TEMPERATURE CONTROLS. CHECK PROPER SEQUENCING OF INTERLOCK SYSTEMS, AND OPERATION OF SAFETY CONTROLS.

BUILDING OPERATION

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

MECHANICAL IDENTIFICATION

PROVIDE MANUFACTURER'S STANDARD PRE-PRINTED, SEMI-RIGID SNAP-ON OR PERMANENT ADHESIVE, PRESSURE-SENSITIVE VINYL PIPE MARKERS.

PROVIDE MANUFACTURER'S STANDARD LAMINATED PLASTIC, COLOR CODED EQUIPMENT MARKERS. CONFORM TO THE FOLLOWING COLOR CODE: GREEN FOR COOLING; YELLOW FOR HEATING; YELLOW/GREEN FOR COMBINATION COOLING AND HEATING; BROWN FOR ENERGY RECLAMATION; BLUE FOR OTHER EQUIPMENT TYPES. CONFORM TO ANSI A13.1 FOR HAZARDOUS EQUIPMENT.

PROVIDE STENCILED SIGNS FOR EQUIPMENT IDENTIFICATION AT CONTRACTOR'S OPTION OR WHERE DISTANCE OF REQUIRED IDENTIFICATION REQUIRES LETTERING LARGER THAN 1 INCH HEIGHT. STENCIL PAINT SHALL BE EXTERIOR TYPE, OIL-BASED, ALKYD ENAMEL, MINIMUM 1-1/4 INCH HEIGHT OR GREATER AS REQUIRED FOR LONG DISTANCE IDENTIFICATION, WHITE OR BLACK COLOR FOR BEST CONTRAST.

PROVIDE DUCT MARKERS OR PROVIDE STENCILED SIGNS AND ARROWS INDICATING DUCTWORK SERVICE AND FLOW DIRECTION IN BLACK OR WHITE LETTERING FOR BEST CONTRAST WITH DUCT OR INSULATION COLOR. LOCATE MARKERS MAXIMUM 50 FEET ALONG EACH DUCT SIDE AND WITHIN 5 FEET OF ALL CONTROL AND BALANCING DAMPERS OR BRANCH DUCTS MORE THAN 25 FEET LENGTH AND WITHIN 5 FEET ON EACH SIDE OF WALL, FLOOR, AND CEILING PENETRATIONS. PROVIDE ADDITIONAL MARKERS IN CONGESTED AREAS OR AT MULTIPLE DUCT RUNS AS REQUIRED FOR CLARITY.

DUCT INSULATION, DUCTWORK, ACCESSORIES AND FANS

DUCT INSULATION

PROVIDE DUCT LINER IN RECTANGULAR SUPPLY AND RETURN AIR DUCTWORK. LINER SHALL BE 1-1/2" THICK, 1-1/2 POUND DENSITY FIBERGLASS, MINIMUM R-6.0 CERTAINTEED CORP. "TOUGHGARD" OR EQUIVALENT OWENS-CORNING OR KNAUF LONG TEXTILE FIBER DUCT LINER. LINER SURFACE SHALL SERVE AS A BARRIER AGAINST INFILTRATION OF DUST AND DIRT, SHALL MEET ASTM C 1338 FOR FUNGI RESISTANCE AND SHALL BE CLEANABLE USING DUCT CLEANING METHODS AND EQUIPMENT OUTLINED BY NORTH AMERICAN INSULATION MANUFACTURERS ASSOCIATION (NAIMA) DUCT CLEANING GUIDE. INSTALL WITH LINER ADHESIVE AND MECHANICAL FASTENERS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. DUCTWORK SIZES SHOWN ON DRAWINGS ARE INSIDE CLEAR DIMENSIONS. INCREASE SHEET METAL BY LINER THICKNESS IN BOTH DIRECTIONS WHERE LINER IS INSTALLED.

COVER CONCEALED, RIGID DUCTWORK WITH 2" THICK, 3/4 POUND DENSITY, MINIMUM R-6.0 DUCT WRAP, CERTAINTEED OR EQUIVALENT OWENS-CORNING OR KNAUF WITH HEAVY-DUTY FOIL-SCRIM-KRAFT FACING, AND WITH JOINTS TAPED WITH 3" WIDE FOIL TAPE AS FOLLOWS:

A. ROUND SUPPLY AND RETURN AIR DUCTWORK.

B. ROUND AND RECTANGULAR EXHAUST AND RELIEF AIR DUCTWORK WITHIN 10 FEET OF EXTERIOR DISCHARGE.

INSULATING MATERIALS, ADHESIVES, COATINGS, ETC., SHALL NOT EXCEED FLAME SPREAD RATING OF 25 AND SMOKE DEVELOPED RATING OF 50 PER ASTM E 84. CONTAINERS FOR MASTICS AND ADHESIVES SHALL HAVE U.L. LABEL.

FOR DUCTWORK THAT IS LOCATED EXTERIOR TO THE BUILDING AND INSTALLED WITH SEAMS SEALED WITH SEALANT, PROVIDE 2" (MINIMUM R-8.0) THICK, 3 POUND DENSITY LINER. FOR WELDED DUCTWORK THAT IS EXTERIOR TO THE BUILDING, INSULATE WITH 2" (MINIMUM R-8.0) THICK FIBROUS BOARD INSULATION AND PROVIDE MINIMUM 20 GAUGE ALUMINUM JACKET.

DUCTWORK

PROVIDE GALVANIZED STEEL DUCTWORK AND HOUSINGS AS SHOWN ON DRAWINGS. CONSTRUCT DUCTWORK INCLUDING FITTINGS AND TRANSITIONS IN CONFORMANCE WITH CURRENT SMACNA STANDARDS RELATIVE TO GAUGE, BRACING, JOINTS, ETC. MINIMUM THICKNESS OF DUCT SHALL BE 26-GAUGE SHEET METAL. REINFORCE HOUSINGS AND DUCTWORK OVER 30" WITH 1-1/4" ANGLES NOT LESS THAN 5'-6" ON CENTERS, AND CLOSER IF REQUIRED FOR SUFFICIENT RIGIDITY TO PREVENT VIBRATION. SUPPORT HORIZONTAL RUNS OF DUCT FROM STRAP IRON HANGERS ON CENTERS NOT TO EXCEED 8'-0". DO NOT SUPPORT CEILING GRID, CONDUITS, PIPES, EQUIPMENT, ETC. FROM DUCTWORK. COORDINATE ROUTING OF DUCTWORK WITH OTHER CONTRACTORS SUCH THAT PIPING, ELECTRICAL CONDUIT, AND ASSOCIATED SUPPORTS ARE NOT ROUTED THROUGH THE DUCTWORK.

CONSTRUCT SUPPLY DUCTS TO MEET SMACNA POSITIVE PRESSURE OF 2" W.G. CONSTRUCT RETURN, OUTDOOR AND EXHAUST DUCTWORK UPSTREAM OF FANS TO MEET SMACNA NEGATIVE PRESSURE OF 2" W.G. CONSTRUCT EXHAUST DUCTWORK DOWNSTREAM OF FANS TO MEET SMACNA POSITIVE PRESSURE OF 2" W.G.

DUCTWORK ABOVE ROOF OR OTHERWISE EXTERIOR TO BUILDING SHALL BE MINIMUM #18 GAUGE WITH LONGITUDINAL AND TRANSVERSE JOINTS WELDED OR SEALED AIRTIGHT WITH WEATHERPROOF HEAVY LIQUID SEALANT APPLIED ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

SEAL DUCTWORK WITH HEAVY LIQUID SEALANT, HARDCAST IRONGRIP 601, DESIGN POLYMER DP 1010, UNITED MCGILL DUCT SEALER OR APPROVED EQUAL, APPLIED ACCORDING TO SEALANT MANUFACTURER'S INSTRUCTIONS. FOR DUCTS WITH PRESSURE CLASSIFICATION LESS THAN 2" W.G. SEAL TRANSVERSE JOINTS AIRTIGHT TO MEET SMACNA CLASS C. TAPES AND MASTICS SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A.

PROVIDE RADIUS ELBOWS, TURNS, AND OFFSETS WITH A MINIMUM CENTERLINE RADIUS OF 1-1/2 TIMES THE DUCT WIDTH. WHERE SPACE DOES NOT PERMIT FULL RADIUS ELBOWS, PROVIDE SHORT RADIUS ELBOWS WITH A MINIMUM OF TWO CONTINUOUS SPLITTER VANES. VANES SHALL BE THE ENTIRE LENGTH OF THE BEND. PROVIDE MITERED ELBOWS WHERE SPACE DOES NOT PERMIT RADIUS ELBOWS, WHERE SHOWN ON THE DRAWINGS, OR AT THE OPTION OF THE CONTRACTOR WITH THE ENGINEER'S APPROVAL. MITERED ELBOWS LESS THAN 45 DEGREES SHALL NOT REQUIRE TURNING VANES. MITERED ELBOWS 45-DEGREES AND GREATER SHALL HAVE SINGLE THICKNESS TURNING VANES OF SAME GAUGE AS DUCTWORK, RIGIDLY FASTENED WITH GUIDE STRIPS IN DUCTWORK. VANES FOR MITERED ELBOWS SHALL BE PROVIDED IN ALL SUPPLY AND EXHAUST DUCTWORK AND IN RETURN AND OUTSIDE AIR DUCTWORK THAT HAS AN AIR VELOCITY EXCEEDING 1000 FPM. DO NOT INSTALL VANES IN GREASE DUCTWORK.

DUCTS SHALL BE CONNECTED TO FANS, FAN CASINGS AND FAN PLENUMS BY MEANS OF FLEXIBLE CONNECTORS. FLEXIBLE CONNECTORS SHALL BE NEOPRENE COATED GLASS CLOTH CANVAS CONNECTIONS, DURO-DYNE, ELGEN, VENTFABRIC OR EQUAL. FLEXIBLE CONNECTORS SHALL HAVE A FLAME SPREAD OF 25 OR LESS AND SMOKE DEVELOPED RATING NOT HIGHER THAN 50. MAKE AIRTIGHT JOINTS AND INSTALL WITH MINIMUM 1-1/2" SLACK.

PROVIDE BALANCING DAMPER

GENERAL NOTES:

1. DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF THE WORK. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE TO OBSERVE THE EXISTING CONDITIONS OF THE PROJECT. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY OWNER'S CONSTRUCTION MANAGER OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
2. PROVIDE A CONSTRUCTION RECORD SET OF "AS-BUILT" DOCUMENTS TO THE OWNER'S CONSTRUCTION MANAGER REFLECTING ANY VARIANCES OF INSTALLED PIPING LOCATIONS OR EQUIPMENT CONTRARY TO THE CONSTRUCTION DOCUMENTS, REFER TO SPECIFICATIONS.
3. PROVIDE TO THE OWNER'S CONSTRUCTION MANAGER A COPY OF INSPECTION REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS, REFER TO SPECIFICATIONS.
4. INSTALLATION SHALL COMPLY WITH LEGALLY CONSTITUTED CODES AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION AND ALSO MEET ALL REQUIREMENTS OF THE LANDLORD. OBTAIN A COPY OF THE LANDLORD'S REQUIREMENTS AND REVIEW PRIOR TO SUBMITTING BID.
5. PLANS AND SPECIFICATIONS GOVERN WHERE THEY EXCEED CODE REQUIREMENTS.
6. VERIFY LOCATION AND DEPTH OF UTILITIES AT POINTS OF CONNECTION BEFORE START OF PIPING INSTALLATION.
7. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND MOUNTING HEIGHTS OF PLUMBING FIXTURES.
8. DO NOT SCALE FLOOR PLANS FOR EXACT HORIZONTAL LOCATION OF PIPE ROUTING.
9. INSTALL CONCEALED PIPING TIGHT TO THE STRUCTURE AND AS HIGH AS POSSIBLE. INSTALL EXPOSED PIPING TIGHT TO THE STRUCTURE, WALL OR CEILING AND AS HIGH AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS.
10. VALVES SHALL BE LINE SIZE UNLESS OTHERWISE NOTED.
11. PIPING IN FINISHED AREAS SHALL BE ROUTED CONCEALED; EXPOSED PIPING, WHERE NECESSARY, SHALL BE ROUTED AS HIGH AS POSSIBLE AND TIGHT TO WALLS.
12. COORDINATE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
13. COORDINATE PIPING INSTALLATION WITH STRUCTURAL GRADE BEAMS, FOOTINGS, COLUMN PIERS, ETC. SLEEVE PIPING THROUGH GRADE BEAMS, FOOTING, ETC. WHERE REQUIRED AND AS NOTED ON PLANS. COORDINATE SLEEVE INSTALLATIONS WITH THE ARCHITECT, STRUCTURAL ENGINEER, STRUCTURAL CONTRACTOR AND GENERAL CONTRACTOR BEFORE CONCRETE IS INSTALLED.
14. CLEAN FAUCET AERATORS AND PIPE STRAINERS PRIOR TO TURNING BUILDING OVER TO THE OWNER.
15. PROVIDE TRAP PRIMERS WHERE REQUIRED BY LOCAL AUTHORITIES.
16. COORDINATE PIPE ROUTING AWAY FROM ELECTRICAL PANELS. DO NOT INSTALL PIPING OVER ELECTRICAL PANELS.
17. PAINT ALL EXPOSED GAS AND WATER PIPING USING RUST INHIBITOR PAINT. PAINT AND COLOR SHALL BE COORDINATED WITH THE ARCHITECT AND / OR OWNER.
18. COORDINATE ALL ROOF PENETRATIONS WITH OTHER TRADES. MAINTAIN 10' MINIMUM CLEARANCE FROM ALL AIR INTAKES. MAINTAIN 2' CLEARANCE FROM ALL OTHER EQUIPMENT.
19. INSULATE PIPING ROUTED IN EXTERIOR BUILDING WALLS WITH MINIMUM 2" BATT INSULATION TO PREVENT FREEZING.
20. EXAMINE THE CONTRACT DRAWINGS AND ALL AVAILABLE INFORMATION CONCERNING EXISTING INSTALLATION, STRUCTURE, AND LOCAL CONDITIONS. VISIT THE SITE TO UNDERSTAND THE NATURE AND SCOPE OF ALL WORK TO BE PERFORMED AND VERIFY EXISTING CONDITIONS. THE SUBMISSION OF A BID WILL BE TAKEN AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND THAT ALL EXISTING CONDITIONS HAVE BEEN CONSIDERED. NO ALLOWANCES WILL BE MADE AFTER THE PROJECT HAS BEEN AWARDED FOR FAILURE TO VERIFY EXISTING CONDITIONS. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND THAT OF THESE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
21. PLUMBING CONTRACTOR MUST PROVIDE CAMERA VERIFICATION OF EXACT LOCATION OF WASTE LINE TO GC DURING BID. VERIFICATION MUST BE MADE PRIOR TO ISSUANCE OF PERMIT AND AFTER ACCEPTANCE OF CONTRACT TO PROCEED.
22. CONTRACTOR TO FIELD VERIFY EXISTING DOMESTIC WATER SYSTEM IS PROVIDED WITH A REDUCED PRESSURE BACKFLOW PREVENTER (RPBP). IF NOT EXISTING, PROVIDE AN APPROVED RPBP ASSEMBLY SIZED TO MATCH BUILDING WATER METER. INSTALL NEW RPBP BETWEEN THE WATER METER AND THE BUILDING PER LOCAL JURISDICTION'S REQUIREMENTS.

KITCHEN GENERAL NOTES:

1. REFERENCE THE KITCHEN EQUIPMENT PLUMBING CONNECTION SCHEDULE FOR ITEMS TO BE FURNISHED AND / OR INSTALLED AS REQUIRED TO COMPLETE THE INSTALLATION OF PLUMBING SYSTEMS FOR KITCHEN EQUIPMENT. REFERENCE KITCHEN EQUIPMENT DRAWINGS FOR THE EXACT LOCATION OF EQUIPMENT AND ROUGH-IN. REFERENCE THE KITCHEN EQUIPMENT SHOP DRAWINGS AND COORDINATE WITH THE OWNER FOR EXACT REQUIREMENTS PRIOR TO THE START OF INSTALLATION.
2. PROVIDE ITEMS AND WORK AS REQUIRED FOR A COMPLETE AND WORKING PLUMBING INSTALLATION FOR EACH PIECE OF KITCHEN EQUIPMENT. PROVIDE ROUGH-INS AND CONNECT TO THE KITCHEN EQUIPMENT WITH TRAPS, SUPPLIES, SHUTOFF VALVES, PIPES TO THE WALL, ESCUTCHEONS, ETC AS SHOWN, SPECIFIED AND REQUIRED.
3. VERIFY GAS LOADS AND GAS ROUGH-IN OF KITCHEN EQUIPMENT WITH THE KITCHEN EQUIPMENT SHOP DRAWINGS PRIOR TO INSTALLING GAS PIPING. PROVIDE GAS COCKS, UNIONS, ETC. AS SPECIFIED AND REQUIRED. INSTALL GAS QUICK DISCONNECTS WHERE FURNISHED WITH THE KITCHEN EQUIPMENT.
4. PROVIDE INDIRECT WASTE LINES OF SAME SIZE AS CONNECTION TO EQUIPMENT WITH 3/4" BEING MINIMUM SIZE. ROUTE FROM EQUIPMENT CONNECTION POINTS INDICATED TO FLOOR DRAIN OR FLOOR SINK. PROVIDE AIR GAP OF TWO PIPE DIAMETERS MINIMUM PER CODE.
5. COMPLY WITH HEALTH DEPARTMENT REGULATIONS. PROVIDE CLEARANCE FOR CLEANING BEHIND AND UNDER EXPOSED PIPING AS REQUIRED BY HEALTH DEPARTMENT. CONFORM TO HEALTH DEPARTMENT REQUIREMENTS FOR LOCATIONS OF FLOOR SINKS.
6. PROVIDE AIRTIGHT SEAL AROUND PIPING PENETRATIONS THROUGH WALK-IN COOLER OR FREEZER WALLS OR CEILINGS.
7. DO NOT INSTALL PIPING IN COOLER OR FREEZER WALLS. INSTALL EXPOSED PIPING IN A NEAT APPEARING MANNER.
8. COORDINATE FLOOR DRAIN LOCATION AND FLOOR SLOPE REQUIREMENTS WITH THE ARCHITECT.
9. INSTALL RIM OF FLOOR DRAINS AND FLOOR SINKS BELOW FINISHED FLOOR LEVEL. SLOPE FLOOR TO DRAINS. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION.
10. COORDINATE LOCATION OF VENT, WATER, AND GAS PIPING TO AVOID CONFLICT WITH OTHER TRADES.
11. CLEAN INSTALLED PLUMBING FIXTURES AND EQUIPMENT.
12. PROVIDE WALL BACKING OR SPECIFIED CARRIERS FOR THE PROPER SUPPORT OF INSTALLED WALL HUNG FIXTURES AND EQUIPMENT.
13. PROVIDE VERTICAL LIFT SPRING LOADED CHECK VALVES IN HOT AND COLD WATER SUPPLIES FOR 3-COMPARTMENT SINKS, PRE-RINSE UNITS, JANITOR SINKS, MIXING HOSE BIBBS & MIXING WALL HYDRANTS DOWNSTREAM OF SHUTOFF VALVES.
14. SEAL AROUND INSTALLED FIXTURES AND KITCHEN EQUIPMENT WITH CAULK.
15. PROVIDE APPROPRIATE BACKFLOW PREVENTION DEVICES FOR KITCHEN EQUIPMENT REQUIRING THEM PER LOCAL AUTHORITIES REQUIREMENTS. INSTALL BACKFLOW PREVENTION DEVICES FURNISHED WITH KITCHEN EQUIPMENT.

EQUIPMENT SCHEDULE / MECHANICAL SCHEDULE

ITEM NO	QTY	EQUIPMENT CATEGORY	REMARKS	WATER HOT	WATER COLD	ROUGH-IN HIEGHT	WASTE DIRECT	WASTE INDIRECT	ROUGH-IN HIEGHT	GAS SIZE	GAS MBTU	ROUGH-IN HIEGHT	REMARKS
4	1	THREE COMPARTMENT SINK						(3) 1-1/2"	REMARKS				RUN I.W. TO FLOOR SINK; MANIFOLD DRAINS
5	1	PRE-RINSE FAUCET		1/2"	1/2"	22"							
7	1	MOP SINK	BY OTHERS		1/2"	REMARKS	2"		3"				VERIFY REQUIREMENTS W/LOCAL JURISDICTION
8	1	SERVICE FAUCET		1/2"	1/2"	42"							
21	1	ICE MAKER W/BIN			1/2"	REMARKS		(2) 3/4"	REMARKS				RUN I.W. TO FLOOR SINK; FILTERED CW FROM #22
22	1	WATER FILTER, 3-STAGE			1/2"	84"							P.C. TO RUN CW TO ITEM #21
24	1	PREP SINK		1/2"	1/2"	22"		1-1/2"	REMARKS				P.C. TO RUN I.W. TO FLOOR SINK
31	1	WORK TABLE W/HAND SINK & DUMP SINK		(2) 1/2"	(2) 1/2"	22"	1-1/2"	1-1/2"	18"				P.C. TO RUN I.W. TO FLOOR SINK
36B	1	FILTERED WATER SPIGOT			1/2"	REMARKS							FILTERED CW FROM #36C
36C	1	WATER FILTER, 2-STAGE			1/2"	22"							P.C. TO RUN CW TO ITEM #36B
38	1	ICE BIN, DROP-IN						1"	REMARKS				P.C. TO RUN I.W. TO HUB DRAIN
39	1	HAND SINK		1/2"	1/2"	22"	1-1/2"		18"				
62	1	DRAIN BOARD						1"	REMARKS				P.C. TO RUN I.W. TO HUB DRAIN

PLUMBING EQUIPMENT SCHEDULE

REF. NO	ITEM DESCRIPTION	MANUFACTURER OR CAT. #	REMARKS
AGF	AIR GAP FITTING	ZURN Z - 1024-4 OR EQUAL	3/4" X 1 1/2"
FD	FLOOR DRAIN	ZURN FD-2320-NH3-ST-P	PUSH-ON JOINT OF OUTLET SIZE
FS	FLOOR SINK - INSTALLED FLUSH WITH FINISH FLOOR	WADE W-9140-16-1, 12"X12" OR EQUAL, NICKEL-BRONZE STRAINER 3/4" GRADE	PROVIDE INTERNAL STRAINER
WHA	WATER HAMMER ARRESTOR	PRECISION PLUMBING PRODUCTS TYPE SC OR EQUAL	PROVIDE ACCESS PANEL
FCO	FLOOR CLEAN OUT	ZURN Z1400 OR EQUAL	FLUSH WITH FINISH FLOOR
WCO	WALL CLEAN OUT	ZURN Z1441 OR EQUAL	
TMV	UNDER SINK THERMOSTATIC MIXING VALVE	WATTS LFMMV SERIES OR EQUAL; LEAD FREE	UP TO 1" HW & CW ROUGH-IN VALVE SHALL HAVE INTEGRAL CHECK STOPS. CONCEAL IN WALL CAVITY
BFP	BACK FLOW PREVENTION ASSEMBLY FOR ICE MAKER	WATTS SERIES 9D DUAL CHECK VALVE ASSEMBLY WITH ATMOSPHERIC PORT, OR EQUAL	MIN. WORKING PRESSURE: 25 PSI; MAX. WORKING PRESSURE: 175 PSI
RPZ	REDUCED PRESSURE ZONE-DOUBLE CHECK BACK FLOW PREVENTER	WATTS SERIES LF009, LEAD FREE DOUBLE CHECK VALVE ASSEMBLY, OR EQUAL	LEAD FREE CAST COPPER SILICON ALLOY (1/2" TO 2") MAX. WORKING PRESSURE: 175 PSI
TP	TRAP PRIMER	PRECISION PLUMBING PRODUCTS # PR-500 "PRIME RITE". CORROSION RESISTANT BRASS BODY, "O" RING SEALS, 1/2" INLET AND OUTLET, AND INTEGRAL VACUUM BREAKER.	INSTALL THE VALVE AT A MINIMUM OF 12" ABOVE FINISHED FLOOR.
AP	ACCESS PANEL	JAY R. SMITH # 4762-12"x12" -CL, TYPE 304 STAINLESS STEEL PANEL AND FRAME WITH CONCEALED HINGE, KEY OPERATED CYLINDER LOCK.	PROVIDE WITH NAILER SLOTS FOR INSTALLATION IN STUD WALLS AND ANCHOR STRAPS FOR INSTALLATION IN MASONRY CONSTRUCTION.
HD	HUB DRAIN		
TR	TRENCH DRAIN 5" PRO SERIES CHANNEL DRAIN KIT WITH METAL GRATE	NDS 864GMTL (OR EQUAL) CLASS B. LOADS WITH 61-175 PSI WITH MECHANICAL INTERLOCKING JOINTS AND UV INHIBITORS	USE WITH 3" HUB AND 4" SPIGOT SEWER AND PIPE DRAIN. #4 REBAR TIE CLIPS FOR EASIER INSTALLATION

ELECTRIC WATER HEATER SCHEDULE

MARK	MANUFACTURER/ MODEL#	AREA SERVED	ENERGY SOURCE	TANK SIZE (GALLONS)	INPUT PHASE	INPUT VOLTS	INPUT KW	RECOVERY 80F DEGREE RISE
WH-1	STATE CSB 52 6 IFE	KITCHEN/RESTROOM	ELECTRIC	50	1	208	6.0	31

NOTE:
80F TEMP RISE WITH 140F OPERATING TEMPERATURE
PROVIDE UL LISTED CONVERSION KIT FOR SIMULTANEOUS HEATER ELEMENT OPERATION

NOTE:
PER LANDLORD'S SHELL DRAWINGS A 4" GREASE WASTE LINE IS STUBBED UP TO THIS TENANT'S SPACE- GC MUST CONFIRM INSTALLATION IN THE FIELD OF EXISTING UNIT. NOTIFY DESIGN TEAM IF NOT PROVIDED ON SITE.

GREASE TRAP SIZING

1 Count all contributing fixtures, measure and calculate capacities as follows:

Pot Sinks:

3	18	W x	18	L x	11	D	cu. in / 231 =	46.3 gallons
1	16	W x	20	L x	14	D	cu. in / 231 =	19.4 gallons

Service Sinks:

1	22	W x	22	L x	10	D	cu. in / 231 =	21.0 gallons

1-A TOTAL = 86.7 gallons

2 86.7 Total Gallons from 1-A x 0.75 (fill factors) / 2 minute drain down period = 65.02 GPM

3 1 Number of Floor Sinks or Drains (Except Indirect Wastes from Above) x 0.6 = 0.6 GPM

6-A TOTAL 65.62 GPM

Adjusted Total GPM 66 GPM

WATER PIPE SIZING CHART

FIXTURE UNITS VS. PRESSURE LOSS
IN PSI / 100 FEET FOR TYPE "L" COPPER TUBE

	COLD WATER @ 5 PSI / 100'				HOT WATER @ 5.0 PSI / 100'		
PIPE SIZE	FLUSH TANK SFU	FLUSH VALVE SFU	VELOCITY FEET / SEC	FLOW GPM	FLUSH TANK SFU	VELOCITY FEET / SEC	FLOW GPM
1/2"	1.6	N/A	3.1	2.4	*	*	*
3/4"	6.9	N/A	3.9	6.3	*	*	*
1"	16	N/A	4.9	12.5	*	*	*
1-1/4"	32	4	5.4	22.0	29.2	5	19.5
1-1/2"	59.6	15.8	5.9	35.0	47.5	5	27.5
2"	214	116	7.5	72.0	120	5	48.2
SIZED WITH HAZEN WILLIAMS CONSTANT "C = 135"					* UTILIZE COLD WATER SIZING CHART		

WATER & WASTE FIXTURE CALC

FIXTURE TYPE	QTY	D.F.U. (EA)	TOTAL D.F.U.	HOT S.F.U. (EA)	COLD S.F.U. (EA)	COMBINED S.F.U. (EA)	TOTAL S.F.U. (HOT)	TOTAL S.F.U. (COLD)	TOTAL SERVICE S.F.U.
PUBLIC LAVATORY	2	2.0	4.0	1.50	1.50	2.00	3	3	4.0
SERVICE SINK (MOP BASIN)	1	3.0	3.0	2.25	2.25	3.00	2.25	2.25	3.0
FLOOR DRAIN	1	2.0	2.0	0.00	0.00	0.00	0	0	0.0
PUBLIC WATER CLOSET (1.6 GPF FLUSH TANK)	2	4.0	8.0	0.00	5.00	5.00	0	10	10.0
SPECIALTY KITCHEN EQUIP.									
SINK (HAND OR DUMP)	4	2.0	8.0	1.50	1.50	2.00	6	6	8.0
PREP SINK	1	3.0	3.0	1.50	1.50	2.00	1.5	1.5	2.0
SINK (3 COMPARTMENT)	1	3.0	3.0	3.00	3.00	4.00	3	3	4.0
ICE MACHINE	1	0.5	0.5	0.00	1.00	1.00	0	1	1.0
WATER SPIGOT	1	0.5	0.5	0.00	0.50	0.50	0	0.5	0.5
TOTAL UNITS:	14		32.5				15.75	27.25	33.50

PLUMBING FIXTURE SCHEDULE

PROVIDE AS SPECIFIED OR EQUAL PRODUCT

REF	ITEM	MFR & CAT. NO.	WASTE	TRAP	VENT	H.W.	C.W.
FIXTURES PROVIDED AND INSTALLED BY THE PLUMBING CONTRACTOR (REUSE EXISTING IF PRESENT AND IN WORKING ORDER)							
LV SEE NOTE 1.	WALL HUNG LAVATORY - ADA: VITREOUS CHINA, 20" X 18" PERFORATED STRAINER WITH 1 1/4" OFFSET TAILPIECE. CHROME PLATED 3/8" SUPPLY W/ANGLE STOP & WROT ESCUTCHEON OFFSET, CHROME BRASS P-TRAP, 17 GA. WITH ESCUTCHEON WALL MTD. CARRIER W/HANGER PLATE, CONCEALED ARMS. FAUCET WITH AERATOR, 6" HANDLE 0.5 GPM FLOW, ON 4" CENTERS	AMERICAN STANDARD 0124.024 McGUIRE 155-WC McGUIRE 158WC McGUIRE 8902 JOSAM OR ZURN SYMMONS S-20-2-G-FR-W	2	2	2	1/2	1/2
7 8 SEE NOTE 1.	MOP BASIN ONE-PIECE CONSTRUCTION, 24" X 24" X 10" FLOOR MOUNTED TYPE. FAUCET WITH PAIL HOOK AND HOSE END, VACUUM BREAKER, INTEGRAL STOPS HOSE AND HOSE BRACKET MOP HANGER, 24" X 3", 18 GA. VINYL BUMPER GUARD SILICONE SEALANT	FIAT MSB-2424 FIAT 830-AA FIAT 832-AA FIAT 889-CC FIAT E-77-AA FIAT 833-AA	3	3	2	3/4	3/4
WC SEE NOTE 2.	WATER CLOSET - ADA: VITREOUS CHINA, FLUSH TANK, SIPHON JET, ELONGATED BOWL, 12" ROUGHING, FLOOR MOUNTED, WATER SAVER TYPE, SEAT 19" A.F.F., WHITE SOLID PLASTIC SEAT, OPEN FRONT CHECK HINGE, CHROME PLATED 3/8" SUPPLY W/ANGLE STOP AND WROT. ESCUT.	AMERICAN STANDARD 2108.408 OLSONITE 95 McGUIRE 166	4	INT.	2	-	3/4
FIXTURES PROVIDED BY EQUIPMENT SUPPLIER AND INSTALLED BY THE PLUMBING CONTRACTOR							
4 5 SEE NOTE 1.	3-COMPARTMENT SERVICE SINK: ONE-PIECE CONSTRUCT., 97-1/2"X29-1/2" FLOOR MOUNTED TYPE W/ FOUR LEGS (1) FAUCETS WITH 12" SWING NOZZLE VACUUM BREAKER, INTEGRAL STOPS PERFORATED STRAINER WITH 1 1/4" OFFSET TAILPIECE. BRASS 3/4" SUPPLY W/ANGLE STOP & WROT ESCUTCHEON OFFSET, BRASS P-TRAP, 17 GA. WITH ESCUTCHEON ATMOSPHERIC BACK-FLOW PREVENTOR	ELKAY SE3C18X18218X T&S B-0133-B T&S T&S T&S T&S B-0970-FEZ	3	3	2	3/4	3/4
24 SEE NOTE 1.	1-COMPARTMENT PREP SINK: ONE-PIECE CONSTRUCT., 97-1/2"X29-1/2" FLOOR MOUNTED TYPE W/ FOUR LEGS (1) SINK MIXING FAUCET TWIST WASTE VALVE PERFORATED STRAINER WITH 1 1/4" OFFSET TAILPIECE. BRASS 3/4" SUPPLY W/ANGLE STOP & WROT ESCUTCHEON OFFSET, BRASS P-TRAP, 17 GA. WITH ESCUTCHEON	ELKAY 14-1C16X20-L-18X T&S B-0231 T&S B-3952 T&S T&S T&S	2	2	2	1/2	1/2
39 SEE NOTE 1.	WALL MOUNTED HAND SINK STAINLESS STEEL 14"x10"x5" BOWL PERFORATED STRAINER CHROME PLATED 3/8" SUPPLY W/ANGLE STOP & WROT ESCUTCHEON OFFSET, CHROME BRASS P-TRAP, 17 GA. WITH ESCUTCHEON FAUCET WITH AERATOR, 6" HANDLE 0.5 GPM FLOW, ON 4" CENTERS	ELKAY SEHS-17X INCLUDED McGUIRE 158WC McGUIRE 8902 INCLUDED	2	2	2	1/2	1/2

NOTE:
METERING FAUCETS REQUIRED AT LAVATORIES

HANDICAP ACCESSIBILITY NOTES:

1. ALL FAUCET OPERABLE PARTS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE OPERABLE PARTS SHALL BE 5 POUNDS MAXIMUM.

2. WATER CLOSET FLUSH CONTROLS SHALL BE HAND OPERATED. HAND OPERATED FLUSH CONTROLS SHALL BE LOCATED ON THE OPEN SIDE OF THE WATER CLOSET.

PLUMBING PIPE MATERIAL SCHEDULE

PIPING SYSTEM	ABBREVIATION	PIPING MATERIAL
SANITARY DRAINAGE & VENT (ABOVE GRADE)	S, W OR V	HUBLESS CAST IRON (PVC DWV OPTIONAL)
SANITARY DRAINAGE & VENT (BELOW GRADE)	S, W OR V	SERVICE WEIGHT CAST IRON (PVC DWV OPTIONAL)
POTABLE WATER (ABOVE GRADE)	CW, HW OR HWR	TYPE L HARD DRAWN COPPER WITH SOLDERED JOIUNTS
POTABLE WATER - 2" & SMALLER (BELOW GRADE)	CW, HW OR HWR	TYPE K SOFT ANNEALED COPPER
NATURAL GAS (ABOVE GRADE & ON ROOF)	G	SCHEDULE 40 BLACK STEEL
NATURAL GAS (BELOW GRADE)	G	APPROVED 'PE' PIPE FOR GAS
CONDENSATE DRAIN - 1" & SMALLER	CD	TYPE M HARD DRAWN COPPER (PVC DWV OPTIONAL)
CONDENSATE DRAIN - 1-1/4" & LARGER	CD	TYPE DWV HARD DRAWN COPPER (PVC DWV OPTIONAL)
INDIRECT DRAIN - 1"& SMALLER	ID	TYPE M HARD DRAWN COPPER
INDIRECT DRAIN - 1-1/4" & LARGER	ID	TYPE DWV HARD DRAWN COPPER

REFER TO SPECIFICATIONS FOR FITTINGS, INSTALLATION REQUIREMENTS AND FURTHER INFORMATION

PLUMBING SYMBOLS

ANNOTATION

- (1) PLUMBING PLAN NOTE CALLOUT
- (1) PLUMBING EQUIPMENT DESIGNATION. (CONTRACTOR FURNISHED AND INSTALLED). REFER TO PLUMBING FIXTURE OR EQUIPMENT SCHEDULES
- 1 EQUIPMENT DESIGNATION (OWNER FURNISHED, CONTRACTOR INSTALLED, SEE KITCHEN EQUIPMENT SCHEDULE FOR SPECIFICATIONS)
- RTU / 1 MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
- CONNECTION POINT OF NEW WORK TO EXISTING
- 1 / P1 DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	MH	MANHOLE
AFG	ABOVE FINISHED GRADE	MIN	MINIMUM
AHU	AIR HANDLING UNIT	N/C	NORMALLY CLOSED
BFF	BELOW FINISHED FLOOR	N/O	NORMALLY OPEN
BFG	BELOW FINISHED GRADE	ORD	OVERFLOW ROOF DRAIN
BOP	BOTTOM OF PIPE	PDI	PLUMBING DRAINAGE INSTITUTE
BOS	BOTTOM OF STRUCTURE	PVC	POLYVINYL CHLORIDE
BTU	BRITISH THERMAL UNIT	PRV	PRESSURE REDUCING VALVE
CPVC	CHLORINATED POLYVINYL CHLORIDE	RD	ROOF DRAIN
DN	DOWN	RPM	REVOLUTIONS PER MINUTE
DFU	DRAINAGE FIXTURE UNIT	RTU	ROOFTOP UNIT
DS	DOWNSPOUT	SF	SQUARE FEET, SUPPLY FAN
ETR	EXISTING TO REMAIN	SP	SUMP PUMP
EWC	ELECTRIC WATER COOLER	SS	STAINLESS STEEL, SANITARY SEWER, SOIL STACK
FD	FLOOR DRAIN	TDH	TOTAL DYNAMIC HEAD
FFA	FROM FLOOR ABOVE	TFA	TO FLOOR ABOVE
FFB	FROM FLOOR BELOW	TFB	TO FLOOR BELOW
FF	FINISHED FLOOR	TYP	TYPICAL
FL	FLOW LINE	UL	UNDERWRITERS LABORATORIES, INC.
FLA	FULL LOAD AMPS	UNO	UNLESS NOTED OTHERWISE
FLR	FLOOR	UPS	UNINTERRUPTIBLE POWER SUPPLY
GPM	GALLONS PER MINUTE	V	VOLT(S)
HD	HEAD, HUB DRAIN	VCP	VITRIFIED CLAY PIPE
IE	INVERT ELEVATION	VS	VENT STACK
IN WC	INCHES OF WATER COLUMN	VTR	VENT THROUGH ROOF
JB	JUNCTION BOX	W/	WITH
J-BOX	JUNCTION BOX	W/O	WITHOUT
kW	KILOWATT	WC	WATER COLUMN
MAU	MAKE-UP AIR UNIT	WS	WASTE STACK
MAX	MAXIMUM	WSFU	WATER SUPPLY FIXTURE UNIT
MBH	1000 BTU PER HOUR		

PIPING

- DOMESTIC COLD WATER (CW)
- DOMESTIC HOT WATER (HW)
- T — TRAP PRIMER LINE (T)
- S — SOIL PIPING - ABOVE FLOOR (S)
- S — SOIL PIPING - BELOW FLOOR (S)
- W — WASTE PIPING - ABOVE FLOOR (W)
- W — WASTE PIPING - BELOW FLOOR (W)
- GW — GREASE WASTE - ABOVE FLOOR (GW)
- GW — GREASE WASTE - BELOW FLOOR (GW)
- VBG — VENT BELOW GRADE (VBG)
- VBF — VENT BELOW FLOOR (VBF)
- CD — CONDENSATE DRAIN (CD)
- G — NATURAL GAS (G)
- EXISTING PIPING TO REMAIN
- V — VENT PIPING (V)
- SQUARE FLOOR DRAIN (FS), SIZE & TYPE
- ROUND FLOOR DRAIN (FD), SIZE & TYPE
- BALL VALVE
- CONTROL VALVE
- SHUTOFF VALVE
- CHECK VALVE
- UNION
- CAP
- WALL CLEANOUT (WCO)
- FLOOR CLEANOUT (FCO)
- EXTERIOR CLEANOUT (ECO)
- ELBOW UP
- ELBOW DOWN
- TEE UP
- TEE DOWN
- ELBOW UP WITH SHUT-OFF VALVE (SOV)
- ELBOW DOWN WITH SHUT-OFF VALVE (SOV)
- TEE UP WITH SHUT-OFF VALVE (SOV)
- TEE DOWN WITH SHUT-OFF VALVE (SOV)
- "A" — WATER HAMMER ARRESTER (WHA) WITH PDI SIZES, (A, B, C, D, & E)
- GAS COCK
- TRAP PRIMER
- TRAP PRIMER WITH DISTRIBUTION UNIT

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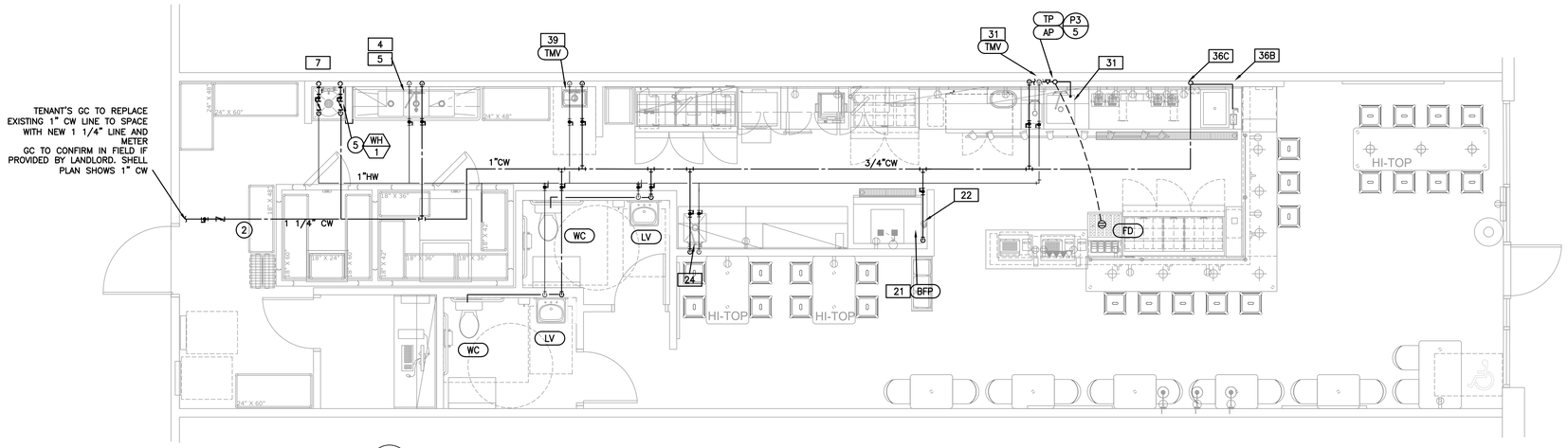
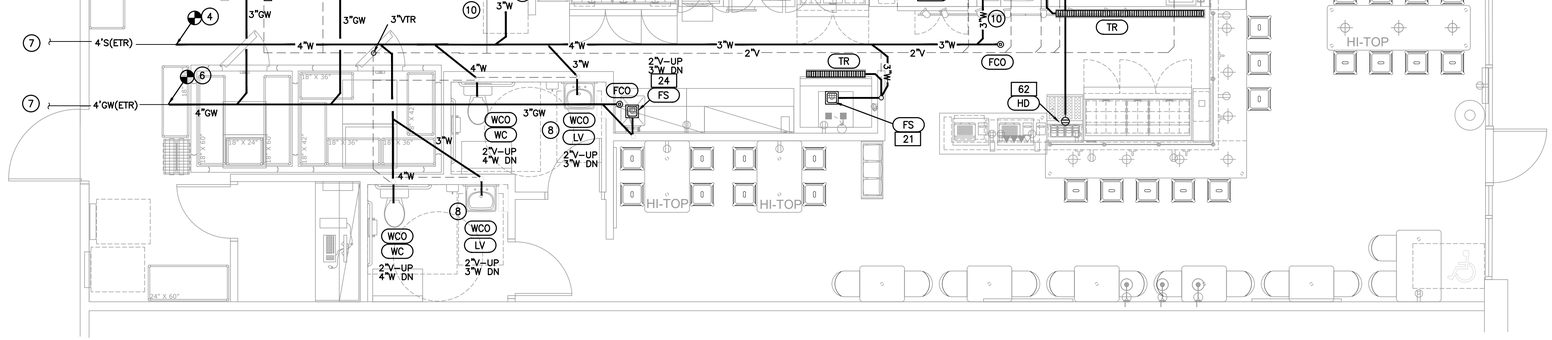
PLUMBING SCHEDULES

P1



1 WATER PIPING PLAN
1/4" = 1'-0"



2 SANITARY & VENT PIPING PLAN
1/4" = 1'-0"

PLUMBING PLAN NOTES:

1. PROVIDE 1" CONDENSATE LINE FROM ROOFTOP UNITS TO ROUTE TO EXTERIOR OF BUILDING TO LANDLORD APPROVED AREA ON SITE. CONDENSATE IS NOT ALLOWED IN THE SANITARY.
2. ROUTE NEW 1 1/4" COLD WATER LINE. PER SHELL PLANS ONLY 1" CW PROVIDED. GC TO CONFIRM IN FIELD AND PROVIDE NEW 1 1/4" CW LINE AND METER PER PLAN. STUB LOCATED ABOVE THE CEILING.
3. NOT USED
4. CONNECT NEW 4" SANITARY WASTE LINE TO EXISTING 4" SANITARY WASTE LINE. VERIFY EXACT SIZE, LOCATION AND INVERT PRIOR TO INSTALLATION.
5. TANK TYPE ELEC WATER HEATER ABOVE MOP SINK, PROVIDE 1" COLD & HOT WATER LINES TO WATER HEATER– SEE MFG SPECS
6. PER LANDLORD'S SHELL DRAWINGS A 4" GREASE WASTE LINE HAS BEEN STUBBED UP TO THIS TENANT'S SUITE. LANDLORD TO CONFIRM INSTALLATION OF 1000 GALLON GREASE INTERCEPTOR. GC TO CONFIRM EXISTING INTERCEPTOR DURING WALK OF SITE DURING BID PHASE.
7. GC TO LOCATE EXACT LOCATION AND DEPTH OF WASTE AND GREASE LINES PRIOR TO START OF WORK.
8. WATERING METERS REQUIRED AT ALL LAVATORIES
9. NOT USED
10. ACCESSIBLE HAND SINK W/ CLEAR SPACE AT EMPLOYEE AREA

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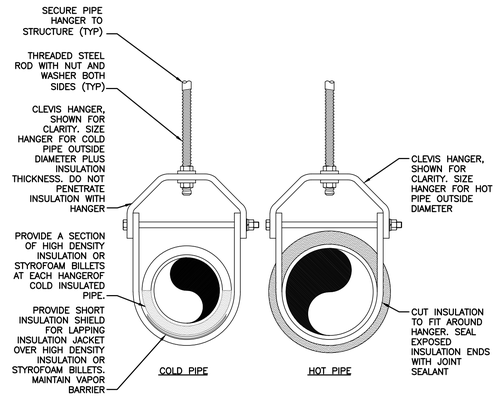
PLUMBING FLOOR PLAN & DETAILS

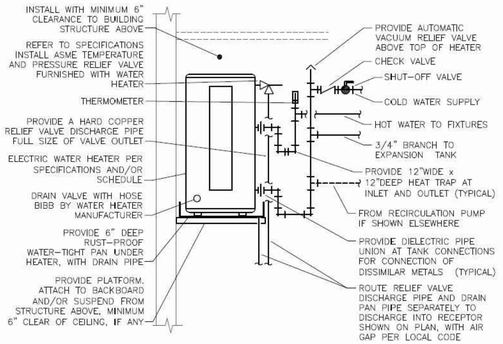
P2

1 NOT USED
NO SCALE



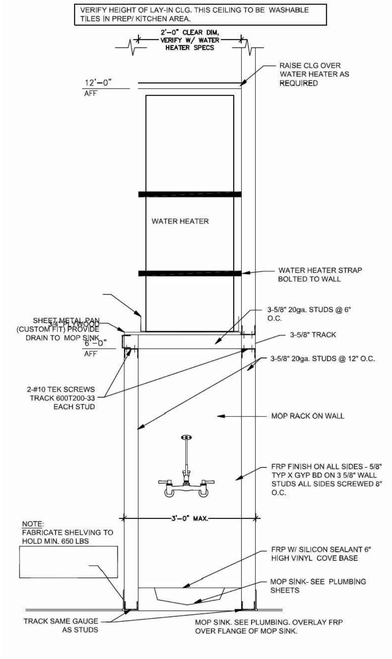
REFER TO SPECIFICATIONS FOR INSULATION TYPES, INSULATION THICKNESSES, HANGER TYPES, HANGER ROD CONNECTIONS TO SRUCTURE AND HANGER SPACING.

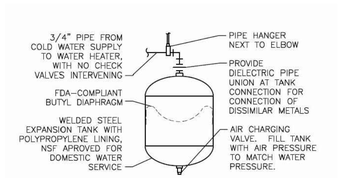
2 INSULATED PIPE HANGER DETAIL
NO SCALE



REFER TO SPECIFICATIONS, SCHEDULES AND NOTES FOR MORE INFORMATION. PIPING ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS. VERIFY CONNECTION SIZES AND LOCATIONS PER MANUFACTURER'S REQUIREMENTS. REFER TO FLOOR PLANS FOR PIPE SIZES. PROVIDE SEISMIC STRAP OR BRACING IF/AS REQUIRED BY LOCAL AUTHORITIES AND/OR SEPARATE DETAIL. INSTALL WITH BOTTOM MINIMUM 6"-6" ABOVE FLOOR IF ABOVE JANITOR'S SINK; OTHERWISE HIGH AS POSSIBLE. PLATFORM SHALL BE PLYWOOD ON UNISTRUT FRAME BRACKETED AND ANCHORED TO WALL, AND/OR SUSPENDED FROM STRUCTURE ABOVE WITH THREADED ROD. POWER WIRING AND DISCONNECT SWITCH ARE SPECIFIED BY ELECTRICAL. INTERLOCK OF AQUASTAT WITH RECIRCULATION PUMP IS SPECIFIED BY ELECTRICAL IF REQUIRED.

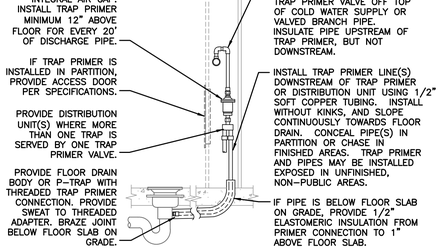
3 ELECTRIC WATER HEATER OVERHEAD
NO SCALE





PIPING ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION PROCEDURE. VERIFY PROPER OPERATION WHEN INSTALLED. PROVIDE SEISMIC STRAP OR BRACING WHEN REQUIRED BY LOCAL AUTHORITIES.

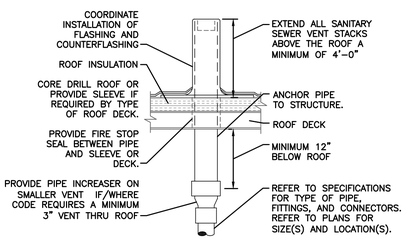
4 SMALL EXPANSION TANK
NO SCALE



PROVIDE TRAP PRIMERS WHERE SHOWN ON FLOOR PLANS, AND WHERE REQUIRED BY LOCAL AUTHORITIES. PIPING ARRANGEMENT SHOWN IS SCHEMATIC: ADJUST TO SUIT FIELD CONDITIONS. REFER TO SPECIFICATIONS AND PLUMBING FIXTURE SCHEDULE FOR MORE INFORMATION. INSTALL TRAP PRIMER VALVE AND DISTRIBUTION UNIT PER MANUFACTURER'S RECOMMENDATIONS.

5 TRAP PRIMER IN/OUT WALL
NO SCALE

6 NOT USED
NO SCALE



LOCATE VTR MINIMUM THREE FEET FROM PROPERTY LINE, TEN FEET HORIZONTAL OR THREE FEET VERTICAL ABOVE ANY BUILDING OPENING OR FRESH AIR INTAKE, TWENTY FIVE FEET FROM ANY OPENING OR FRESH AIR INTAKE IN MEDICAL FACILITIES AND ONE FOOT FROM ANY VERTICAL SURFACE. REFER TO LOCAL CODES FOR OTHER VENT TERMINATION REQUIREMENTS. LOCATE VTR MINIMUM 18" FROM ADJACENT WALL, PARAPET, EXPANSION JOINT, ROOF DRAIN, EQUIPMENT CURB, OR OTHER ROOF FEATURE. OFFSET IN CEILING SPACE WHERE REQUIRED TO MEET THESE CONDITIONS. INSULATE LAST SIX FEET OF VENT PIPE INSIDE BUILDING PER SPECIFICATIONS.

7 VENT THRU ROOF ("VTR")
NO SCALE

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PLUMBING DETAILS

P3

SECTION 15B: PLUMBING:

15B OPERATION AND MAINTENANCE INSTRUCTIONS

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

SUBMIT THREE COPIES OF LITERATURE BOUND IN APPROVED BINDERS TO THE ARCHITECT AT THE TERMINATION OF THE WORK. PAPER CLIPS, STAPLES, RUBBER BANDS, AND MAILING ENVELOPES ARE NOT CONSIDERED APPROVED BINDERS. FINAL APPROVAL OF MECHANICAL SYSTEMS INSTALLED UNDER THIS CONTRACT WILL BE WITHHELD UNTIL THIS EQUIPMENT BROCHURE IS RECEIVED AND DEEMED COMPLETE BY THE ARCHITECT AND ENGINEER. INSTRUCT WORKMEN TO SAVE REQUIRED LITERATURE SHIPPED WITH THE EQUIPMENT ITSELF, FOR INCLUSION IN THIS BROCHURE.

PROVIDE "AS-BUILT" DRAWINGS (SEE SPECIAL CONDITIONS).

15B TRAINING

AT A TIME MUTUALLY AGREED UPON BETWEEN THE OWNER AND CONTRACTOR, PROVIDE THE SERVICES OF A FACTORY TRAINED AND AUTHORIZED REPRESENTATIVE TO TRAIN OWNER'S DESIGNATED PERSONNEL ON THE OPERATION AND MAINTENANCE OF THE EQUIPMENT PROVIDED FOR THIS PROJECT.

PROVIDE TRAINING TO INCLUDE BUT NOT BE LIMITED TO AN OVERVIEW OF THE SYSTEM AND/OR EQUIPMENT AS IT RELATES TO THE FACILITY AS A WHOLE; OPERATION AND MAINTENANCE PROCEDURES AND SCHEDULES RELATED TO STARTUP AND SHUTDOWN, TROUBLESHOOTING, SERVICING, PREVENTIVE MAINTENANCE AND APPROPRIATE OPERATOR INTERVENTION; AND REVIEW OF DATA INCLUDED IN THE OPERATION AND MAINTENANCE MANUALS.

SUBMIT A CERTIFICATION LETTER TO THE ARCHITECT STATING THAT THE OWNER'S DESIGNATED REPRESENTATIVE HAS BEEN TRAINED AS SPECIFIED HEREIN. LETTER SHALL INCLUDE DATE, TIME, ATTENDEES AND SUBJECTS COVERED. CONTRACTOR AND THE OWNER'S REPRESENTATIVE SHALL SIGN THE CERTIFICATION LETTER INDICATING AGREEMENT THAT THE TRAINING HAS BEEN PROVIDED.

SCHEDULE TRAINING WITH OWNER WITH AT LEAST 7 DAYS' ADVANCE NOTICE.

15B WARRANTIES

COORDINATE WITH DIVISION 1 AND GENERAL CONDITIONS TO DETERMINE WHAT THE ACTUAL REQUIREMENTS ARE, AND MODIFY THE FOLLOWING AS REQUIRED SO AS TO NOT CONTRADICT THEM.

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

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

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

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

15B SPARE PARTS

FURNISH TO OWNER, WITH RECEIPT, THE SPARE PARTS TO INCLUDE FAUCET WASHERS AND O-RINGS, FLUSHOMETER REPAIR KITS AND WATER CLOSET TANK REPAIR KITS FOR THE FIXTURES FURNISHED FOR THIS PROJECT.

15B EXCAVATION AND BACKFILLING

PERFORM EXCAVATION AND BACKFILL REQUIRED FOR INSTALLATION OF UNDERGROUND WORK UNDER THIS CONTRACT. TRENCHES SHALL BE OF SUFFICIENT WIDTH. CRIB OR BRACE TRENCHES TO PREVENT CAVE-IN OR SETTLEMENT. DO NOT EXCAVATE TRENCHES CLOSE TO FOUNDATIONS AND WALLS OF NEW BUILDING WITHOUT PRIOR CONSULTATION WITH THE ARCHITECT. USE PUMPING EQUIPMENT IF REQUIRED TO KEEP TRENCHES FREE OF WATER. BACKFILL TRENCHES IN MAXIMUM 6" LAYERS OF WELL-TAMPED DRY EARTH IN A MANNER TO PREVENT FUTURE SETTLEMENT.

EXCAVATION AS HEREIN SPECIFIED SHALL BE CLASSIFIED AS COMMON EXCAVATION. COMMON EXCAVATION SHALL COMPRISE THE SATISFACTORY REMOVAL AND DISPOSITION OF MATERIAL OF WHATEVER SUBSTANCES AND OF EVERY DESCRIPTION ENCOUNTERED, INCLUDING ROCK, IF ANY, WITHIN THE LIMITS OF THE WORK AS SPECIFIED AND SHOWN ON THE DRAWINGS. EXCAVATION SHALL BE PERFORMED TO THE LINES AND GRADES INDICATED ON THE DRAWINGS. EXCAVATED MATERIALS WHICH ARE CONSIDERED UNSUITABLE FOR BACKFILL, AND SURPLUS OF EXCAVATED MATERIAL WHICH IS NOT REQUIRED FOR BACKFILL, SHALL BE DISPOSED OF BY THE CONTRACTOR AT HIS OWN EXPENSE AND RESPONSIBILITY, AND TO THE SATISFACTION OF THE ARCHITECT.

15B COINCIDENTAL DAMAGE

CONTRACTOR SHALL REPAIR STREETS, SIDEWALKS, DRIVES, PAVING, WALLS AND FINISHES ETC. THAT HE DAMAGES IN THE COURSE OF THIS PROJECT. REPAIR MATERIALS SHALL MATCH EXISTING CONSTRUCTION. REPAIR WORK SHALL MEET REQUIREMENTS OF THE LOCAL AUTHORITIES HAVING JURISDICTION AND MEET THE SATISFACTION OF THE ARCHITECT.

15B CUTTING AND PATCHING

OBTAIN PERMISSION FROM THE ARCHITECT BEFORE CUTTING WALLS, FLOORS, CEILINGS, ETC. AS REQUIRED BY THE PROJECT. DO NOT DISTURB STRUCTURAL MEMBERS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT. CUT HOLES AS SMALL AS POSSIBLE. GENERAL CONTRACTOR SHALL PATCH WALLS, FLOORS, ETC. AS REQUIRED BY WORK UNDER THIS SECTION. PATCHING SHALL MATCH ORIGINAL MATERIAL AND CONSTRUCTION. REPAIR AND REFINISH AREAS DISTURBED BY WORK TO THE CONDITION OF ADJOINING SURFACES IN A MANNER SATISFACTORY TO THE ARCHITECT.

15B ROUGH-IN

BEFORE STARTING CONSTRUCTION, COORDINATE WITH OTHER CONTRACTORS REGARDING ROUGH-IN WITH GENERAL CONSTRUCTION. CONCEAL PIPING, CONDUIT AND ROUGH-IN EXCEPT IN UNFINISHED AREAS AND WHERE OTHERWISE SHOWN.

15B ACCESS DOORS

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

15B PENETRATIONS

PROVIDE SLEEVES FOR PIPES PASSING THROUGH ABOVE GRADE CONCRETE OR MASONRY WALLS, CONCRETE FLOOR OR ROOF SLABS. SLEEVES ARE NOT REQUIRED FOR CORE DRILLED HOLES IN EXISTING MASONRY WALLS, CONCRETE FLOORS OR ROOFS. PROVIDE 10 GAUGE GALVANIZED STEEL SLEEVES FOR SLEEVES 6" AND SMALLER. PROVIDE GALVANIZED SHEET METAL SLEEVES FOR LARGER THAN 6". SCHEDULE 40 PVC SLEEVES ARE ACCEPTABLE FOR INSTALLATION IN AREAS WITHOUT RETURN AIR PLENUMS.

SEAL ELEVATED FLOOR, EXTERIOR WALL AND ROOF PENETRATIONS WATERTIGHT AND WEATHERTIGHT WITH NON-SHRINK, NON-HARDENING COMMERCIAL SEALANT. PACK WITH MINERAL WOOL AND SEAL BOTH ENDS WITH MINIMUM OF 1/2" OF SEALANT.

SEAL AROUND PENETRATIONS OF FIRE RATED ASSEMBLIES. COORDINATE FIRE RATINGS AND LOCATIONS WITH THE ARCHITECTURAL DRAWINGS. REFER TO ARCHITECTURAL SPECIFICATIONS FOR FIRE STOPPINGS. PROVIDE A PRODUCT SCHEDULE FOR UL LISTING, LOCATION, WALL OR FLOOR RATING AND INSTALLATION DRAWING FOR EACH PENETRATION FIRE STOP SYSTEM.

EXTEND PIPE INSULATION FOR INSULATED PIPE THROUGH FLOOR, WALL AND ROOF PENETRATIONS, INCLUDING FIRE RATED WALLS AND FLOORS. THE VAPOR BARRIER SHALL BE MAINTAINED. SIZE SLEEVE OR SLIGHTLY LARGER OR 1" ANNULAR CLEAR SPACE BETWEEN INSIDE OF SLEEVE AND OUTSIDE OF INSULATION.

SEAL CONCRETE OR MASONRY EXTERIOR WALL PENETRATIONS BELOW GRADE WITH "WALL PIPES" AND MECHANICAL SLEEVE SEALS. PROVIDE CAST IRON "WALL PIPES" WITH INTEGRAL WATERSTOP RING MANUFACTURED BY JOSAM, JAY R. SMITH, WADE, WATTS OR ZURN. PROVIDE MODULAR MECHANICAL SLEEVE SEALS, MANUFACTURED BY THUNDERLINE / LINK SEAL, CALPICO, INC. AND METRAFLEX.

SEAL ELEVATED CONCRETE SLAB WITH WATER PROOF MEMBRANE PENETRATIONS WITH "WALL PIPES" AND WATER PROOF SEALANT. SECURE WATERPROOF MEMBRANE FLASHING BETWEEN "WALL PIPE" CLAMPING FLANGE AND CLAMPING RING. PROVIDE CAST IRON "WALL PIPES" WITH INTEGRAL WATERSTOP RING MANUFACTURED BY JOSAM, JAY R. SMITH, WADE, WATTS OR ZURN.

PROVIDE SLEEVES FOR HORIZONTAL PIPE PASSING THROUGH OR UNDER FOUNDATION. SLEEVES SHALL BE CAST IRON SOIL PIPE TWO NOMINAL PIPE SIZES LARGER THAN THE PIPE SERVED.

PROVIDE SCHEDULE 40 PVC PIPE SLEEVES FOR VERTICAL PRESSURE PIPE PASSING THROUGH CONCRETE SLAB ON GRADE. SLEEVES SHALL BE ONE NOMINAL PIPE SIZE LARGER THAN THE PIPE SERVED AND TWO PIPE SIZES LARGER THAN PIPE SERVED FOR DUCTILE IRON PIPES WITH RESTRAINING RODS. SEAL WATER-TIGHT WITH SILICONE CAULK.

PROVIDE 1/2" THICK CELLULAR FOAM INSULATION AROUND PERIMETER OF NON-PRESSURE PIPE PASSING THRU CONCRETE SLAB ON GRADE. INSULATION SHALL EXTEND TO 2" ABOVE AND BELOW THE CONCRETE SLAB.

15B ELECTRICAL WIRING

LINE VOLTAGE WIRING SHALL BE PROVIDED BY DIVISION 16. LINE VOLTAGE CONTROL AND INTERLOCK WIRING FOR PLUMBING SYSTEMS SHALL ALSO BE PROVIDED BY DIVISION 16 CONTRACTOR. LOW VOLTAGE CONTROL WIRING SHALL BE PROVIDED BY THE DIVISION 15 CONTRACTOR. FURNISH WIRING DIAGRAMS TO THE DIVISION 16 CONTRACTOR AS REQUIRED FOR PROPER EQUIPMENT HOOKUP. COORDINATE WITH THE DIVISION 16 CONTRACTOR THE ACTUAL WIRE SIZING AMPS FOR PLUMBING EQUIPMENT (FROM THE EQUIPMENT NAMEPLATE) TO ENSURE PROPER INSTALLATION.

15B EQUIPMENT FURNISHED BY OTHERS

FURNISH AND INSTALL ROUGHED-IN WASTES, VENTS AND WATER SERVICES. PROVIDE FINAL CONNECTION TO KITCHEN EQUIPMENT, FURNISHED BY OTHERS, IN LOCATIONS AS INDICATED ON THE DRAWINGS. PROVIDE ACCESSORY ITEMS THAT ARE REQUIRED BUT NOT FURNISHED WITH THE EQUIPMENT, INCLUDING TRAPS, STOP VALVES, P/V'S, INDIRECT DRAIN FROM EQUIPMENT TO FLOOR DRAINS, AND ACCESSORY ITEMS INDICATED OR REQUIRED FOR THE PROPER OPERATION OF THE COMPLETE SYSTEM AT THE TERMINATION OF THE WORK.

DIVISION 15 CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECT ROUGH-IN DIMENSIONS, AND SHALL VERIFY SAME WITH ARCHITECT AND/OR EQUIPMENT SUPPLIER PRIOR TO SERVICE INSTALLATIONS.

15B UTILITY CONNECTIONS

PROVIDE UTILITY CONNECTIONS REQUIRED AND INDICATED ON THE DRAWINGS. INSTALL INTERIOR AND EXTERIOR CONNECTIONS TO "MAINS" AND EXISTING SERVICE LINES COMPLETE AND FUNCTIONING, IN COMPLIANCE WITH THE REQUIREMENTS OF THE CODES HAVING JURISDICTION AND THE SERVING UTILITY INVOLVED. VERIFY THE EXACT LOCATION OF UTILITY MAINS, SERVICE LINES, AND CONNECTION POINTS REQUIRING CONNECTION IN THE FIELD PRIOR TO INSTALLATION. WORK IN CONJUNCTION WITH THE UTILITY INVOLVED IN THE INSTALLATION OF SERVICES. VERIFY THAT INSTALLATION WILL TIE INTO THE EXISTING UTILITY MAINS, SERVICE LINES, AND CONNECTION POINTS AT THE INDICATED INVERT ELEVATION POINT PRIOR TO INSTALLATION. IF THE INSTALLATION WILL NOT TIE INTO THE INDICATED INVERT ELEVATION POINT WHILE MAINTAINING PROPER FALL, NOTIFY THE ARCHITECT AND THE ENGINEER SO THAT AN ALTERNATIVE MAY BE DETERMINED.

PROVIDE SERVICE PIPING AND ACCESSORIES REQUIRED TO COMPLETE UTILITY CONNECTIONS THAT ARE NOT FURNISHED BY THE SERVING UTILITY. COORDINATE WITH THE SERVING UTILITY COMPANY REGARDING ITEMS FURNISHED, WORK PERFORMED, AND PERMITS AND INSPECTIONS REQUIRED. PAY ASSOCIATED FEES OR CHARGES.

15B MISCELLANEOUS REMODELING WORK

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

NEW FLOOR DRAINS SHALL BE CONNECTED TO THE EXISTING SANITARY DRAINAGE SYSTEM AS SHOWN ON THE DRAWINGS OR AS REQUIRED. SAW-CUT EXISTING CONCRETE FLOOR AS REQUIRED TO INSTALL NEW UNDERFLOOR LINES, AND PATCH TO MATCH EXISTING SUB-FLOOR. REFER TO ARCHITECTURAL SPECIFICATIONS FOR FINISH FLOOR PATCHING REQUIREMENTS.

EXISTING PLUMBING FIXTURES WHERE INDICATED ON THE DRAWINGS TO BE REUSED SHALL BE CLEANED, REPAIRED, PROVIDED WITH NEW WASHERS, ETC. AS REQUIRED TO PUT THEM INTO GOOD OPERATING CONDITION.

MAKE CONNECTION OF NEW PIPE TO SIMILAR EXISTING WASTE, WATER AND GAS PIPE USING STANDARD FITTINGS AND JOINING PRACTICES.

15B BUILDING OPERATION

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

15B SYSTEM TESTING AND ADJUSTING

UPON COMPLETION OF EACH PHASE OF THE INSTALLATION, TEST EACH SYSTEM IN CONFORMANCE WITH LOCAL CODE REQUIREMENTS AND AS NOTED BELOW. FURNISH LABOR AND EQUIPMENT REQUIRED TO TEST PLUMBING WORK INSTALLED UNDER THIS CONTRACT, AND ASSUME COSTS INVOLVED IN MAKING THE TESTS, AND REPAIRING AND/OR REPLACING DAMAGE RESULTING THEREFROM.

NOTIFY THE ARCHITECT AND THE AUTHORITY HAVING JURISDICTION, THREE (3) WORKING DAYS PRIOR TO MAKING PLUMBING SYSTEM TESTS. INSTALLATION OF WORK SCHEDULED FOR WORK UNCOVERED UNTIL THE REQUIRED TESTS HAVE BEEN COMPLETED, BUT IF NECESSARY DUE TO CONSTRUCTION PROCEDURE, TESTS ON PORTIONS OF THE WORK MAY BE MADE, AND WHEN SATISFACTORY, THE WORK MAY BE CONCEALED. TEST PIPING BEFORE INSULATION IS INSTALLED, AND BEFORE BACKFILL. PIPES, JOINTS, FLANGES, VALVE STEMS, ETC., SHALL BE LEAK TIGHT. REPAIR OR REPLACE SYSTEM DEFECTS WITH NEW MATERIALS. CAULKING OF DEFECTIVE JOINTS, CRACKS OR HOLES WILL NOT BE PERMITTED. REPEAT TESTS AFTER DEFECTS HAVE BEEN ELIMINATED. MAKE TESTS IN THE PRESENCE OF THE ADMINISTRATIVE AUTHORITY AND/OR THE OWNER'S AUTHORIZED REPRESENTATIVE.

UPON COMPLETION OF THE SYSTEMS INSTALLATION, AND PRIOR TO ACCEPTANCE BY THE ARCHITECT AND ENGINEER, MAKE GENERAL OPERATING TESTS TO DEMONSTRATE THAT EQUIPMENT AND SYSTEMS ARE INSTALLED IN ACCORDANCE WITH AND ARE FUNCTIONING IN CONFORMANCE WITH THE INTENT OF THE DRAWINGS AND SPECIFICATIONS. AS A PART OF THESE TESTS, OPEN EVERY WATER OUTLET TO ENSURE COMPLETE SYSTEM FLUSHING, REMOVE AND CLEAN FAUCET AERATORS, CLEAN STRAINERS, LIGHT PILOT LIGHTS, AND OPERATE EVERY PIECE OF EQUIPMENT FURNISHED UNDER THIS CONTRACT TO DEMONSTRATE PROPER FUNCTIONING.

TEST THE DRAINAGE AND VENT SYSTEM BY PLUGGING OPENINGS WITH TEST PLUGS EXCEPT THOSE AT THE TOP OF THE STACKS. FILL THE SYSTEM WITH WATER; TEST RESULTS WILL BE SATISFACTORY IF THE WATER LEVEL REMAINS STATIONARY FOR NOT LESS THAN ONE (1) HOUR. SUBJECT THE DRAINAGE AND VENT SYSTEM TO A PRESSURE OF AT LEAST TEN (10) FEET OF WATER. IF LEAKS DEVELOP, REPAIR THEM AND REPEAT THE TEST.

TEST THE DOMESTIC WATER SYSTEM BY FILLING IT WITH WATER AND THEN ISOLATING THE SYSTEM FROM ITS SOURCE. KEEP THE SYSTEM CLOSED FOR A PERIOD OF TWENTY-FOUR HOURS, WITH NO FIXTURE BEING USED. THE PRESSURE DIFFERENTIAL FOR THIS TEST PERIOD SHALL NOT EXCEED 10 PSIG. TEST WATER PIPING TO A 125 PSI HYDROSTATIC PRESSURE.

FOR LOW PRESSURE NATURAL GAS SYSTEMS, SUBJECT THE PIPE TO 10 PSIG AIR PRESSURE FOR A PERIOD OF ONE HOUR. THE RESULTING PRESSURE DIFFERENTIAL FOR THIS PERIOD SHALL BE 0 PSIG. TEST PER GAS COMPANY REQUIREMENTS WHERE REQUIRED.

15B GUARANTEE

THE WORK TO BE PERFORMED UNDER THIS CONTRACT SHALL INCLUDE THE FURNISHING, INSTALLATION, AND CONNECTION OF PLUMBING SYSTEMS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS. BY SIGNING THE CONTRACT, THE CONTRACTOR ACKNOWLEDGES THAT HE HAS SATISFIED HIMSELF WITH THE SITE AND THE EXISTING CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED, AND THE DRAWINGS AND SPECIFICATIONS PERTAINING THERETO, AND HE INDICATES THAT HE WILL COMPLY WITH THE REQUIREMENTS AND INTENT OF PERTINENT DOCUMENTS IN THE PERFORMANCE OF THE WORK.

GUARANTEE THAT THE PLUMBING INSTALLED UNDER THIS CONTRACT IS FREE OF DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF JOB ACCEPTANCE BY THE OWNER. THIS SHALL INCLUDE A GUARANTEE THAT THE PLUMBING INSTALLED UNDER THIS CONTRACT WILL PERFORM WITHIN THE NOISE LIMITATIONS SPECIFIED AND WILL NOT TRANSMIT OBJECTIONABLE NOISE THROUGH THE BUILDING STRUCTURE. REPAIR OR REPLACE ANY PLUMBING EQUIPMENT OR PIPING INSTALLED UNDER THIS CONTRACT WHICH DEVELOPS DEFECTS IN WORKMANSHIP OR MATERIALS WITHIN THE GUARANTEE PERIOD, AND WHICH CAUSES OTHER PARTS OF THE BUILDING TO BECOME DAMAGED, AT NO EXPENSE TO THE OWNER.

15B PLUMBING PIPING

15B PIPING MATERIALS

MATERIALS SPECIFIED OR NOTED ON THE DRAWINGS ARE SUBJECT TO THE APPROVAL OF LOCAL CODE AUTHORITIES. VERIFY APPROVAL BEFORE INSTALLING ANY MATERIAL OR JOINING METHOD.

DOMESTIC WATER (COLD, HOT): DOMESTIC WATER PIPING INSTALLED ABOVE THE FLOOR SLAB INSIDE THE BUILDING SHALL BE TYPE "L" HARD DRAWN COPPER TUBE WITH WROUGHT COPPER FITTINGS AND SOLDERED CONNECTIONS MADE UP WITH 95/5 SOLDER. BRAZED MECHANICALLY FORMED TEE CONNECTIONS (T-DRILL) MAY BE USED IN COPPER LINES WHERE APPROVED BY CODE. CONNECTION SHALL BE MADE WITH BRAZED SILVER SOLDER (SILFOS) JOINTS IN CONFORMANCE WITH MANUFACTURER'S INSTRUCTIONS.

UNDERGROUND DOMESTIC WATER PIPING 2" AND SMALLER SHALL BE TYPE "K" SOFT TEMPER COPPER TUBING WITH FLARED COPPER ALLOY FITTINGS AND CONNECTIONS, OR TYPE "K" HARD TEMPER TUBING WITH SOLDERED JOINTS AND WROUGHT COPPER FITTINGS AND SILVER SOLDER (SILFOS) JOINTS. INSTALL AS FEW UNDERGROUND COPPER PIPING JOINTS AS POSSIBLE. AT BUILDING SERVICE ENTRANCE, NO JOINTS SHALL BE INSTALLED UNDER OR WITHIN 5 FEET OF THE BUILDING. INSTALL DOMESTIC WATER PIPING BELOW GRADE OUTSIDE BUILDING AT ADEQUATE DEPTH TO PREVENT FREEZING.

INTERIOR WASTE AND VENT BELOW SLAB: WASTE AND VENT PIPE BELOW SLAB INSIDE BUILDING SHALL BE SERVICE WEIGHT CAST IRON SOIL PIPE WITH HUB AND SPIGOT FITTINGS WITH NEOPRENE GASKET JOINTS, MEETING ASTM A74, MANUFACTURED BY AB & I FOUNDRY, CHARLOTTE OR TYLER PIPE AND BEARING THE TRADEMARK OF THE CISPI AND NSF. HUBLESS WASTE AND VENT PIPE IS NOT PERMITTED BELOW BASE SLAB. PVC SCHEDULE 40 DWV ASTM D2665 PIPE WITH PVC MEETING ASTM B1784, "SOLID WALL" CELL CLASS 12454-B WITH ASTM 2665 SOCKET FITTINGS WITH SOLVENT WELD JOINTS IS ALSO PERMITTED WHERE APPROVED BY CODE.

INTERIOR WASTE AND VENT ABOVE SLAB: WASTE AND VENT PIPE ABOVE SLAB INSIDE BUILDING SHALL BE HUBLESS CAST IRON SOIL PIPE AND FITTINGS, MEETING ASTM A888 AND CISPI 301, MANUFACTURED BY AB & I FOUNDRY, CHARLOTTE OR TYLER PIPE AND BEARING THE TRADEMARK OF THE CISPI AND NSF. PVC SCHEDULE 40 DWV ASTM D2665 PIPE WITH PVC MEETING ASTM B1784, "SOLID WALL" CELL CLASS 12454-B WITH ASTM 2665 SOCKET FITTINGS WITH SOLVENT WELD JOINTS IS ALSO PERMITTED WHERE APPROVED BY CODE. (NOTE: PVC PIPING IS NOT ALLOWED IN CEILING RETURN AIR PLENUMS)

NATURAL GAS: GAS PIPING ABOVE GROUND SHALL BE SCHEDULE 40 BLACK STEEL WITH MALLEABLE IRON SCREWED FITTINGS, OR STANDARD WELDED FITTINGS.

CONNECTIONS TO PLUMBING FIXTURES AND EQUIPMENT: 1-1/4" AND LARGER WASTE CONNECTIONS FROM FIXTURE TRAPS TO CAST IRON PIPE SHALL BE "DWV" COPPER WITH WROUGHT COPPER DRAINAGE PATTERN FITTINGS WITH COPPER SWEAT OR COMPRESSION JOINTS AT FIXTURE TRAP CONNECTIONS AND THREADED JOINTS AT CONNECTIONS TO CAST IRON PIPE.

INDIRECT AND CONDENSATE DRAIN INSIDE BUILDING: INDIRECT AND CONDENSATE DRAIN PIPE INSTALLED INSIDE THE BUILDING SHALL BE TYPE SCHEDULE 40 PVC PIPE AND FITTINGS WITH SOLVENT WELD JOINTS WHERE ALLOWED BY CODE. (NOTE: PVC PIPING IS NOT ALLOWED IN CEILING RETURN AIR PLENUMS.) INSTALL CLEANOUTS AT ELBOWS GREATER THAN 45 DEGREES.

INDIRECT AND CONDENSATE DRAIN OUTSIDE BUILDING: INDIRECT AND CONDENSATE DRAIN PIPE INSTALLED OUTSIDE THE BUILDING ABOVE GROUND SHALL BE SCHEDULE 40 PVC PIPE AND FITTINGS WITH SOLVENT WELD JOINTS WHERE ALLOWED BY CODE. TERMINATE CONDENSATE AT THE MOP SINK AND THE INDIRECT DRAINS WHERE INDICATED ON THE PLANS. INSTALL CLEANOUTS AT ELBOWS GREATER THAN 45 DEGREES.

15B PIPING AND EQUIPMENT INSULATION

DOMESTIC COLD WATER, HOT WATER, INDIRECT AND CONDENSATE DRAIN PIPE (WITHIN BUILDING): ONE-PIECE FIBERGLASS GLASS WORK WITH FACTORY-APPLIED ASJ SELF-SEALING LAP TO PROVIDE A CONTINUOUS VAPOR BARRIER BY CERTAINTEED, OWENS-CORNING OR ARMSTRONG. FOR HOT PIPING, PROVIDE PIPE THICKNESS AND RISER CLAMPS SIZED FOR THE OUTSIDE DIAMETER OF PIPING. BUTT INSULATION TO HANGER OR RISER CLAMP FOR VERTICAL PIPE. SEAL EXPOSED INSULATION WITH INSULATION SEALER. EXCEPTION: FOR VERTICAL PIPING: PROVIDE CLAMPS SIZED FOR THE OUTSIDE DIAMETER OF THE VERTICAL PIPE AND EXTEND CLAMP THROUGH INSULATION. SEAL PENETRATIONS OF INSULATION AND VAPOR BARRIER WITH WET COAT OF VAPOR BARRIER LAP CEMENT. FOR COLD PIPING AT HANGERS PROVIDE 8" LONG SECTIONS OF HIGH DENSITY, HIGH TEMPERATURE CALCIUM SILICATE BY JOHNS-MANVILLE, FIBERGLASS BY KNAUF, OR 8" LONG STYROFOAM BILLETS BY DOW OR FLEXIBLE UNICELLULAR PIPING INSULATION MEETING ASTM C 534-01A, TYPE I WITH INTEGRAL HIGH DENSITY PIPE SUPPORTS AND ENCASED IN STEEL INSULATION SHIELD BY COOPER OR ERICO, OR APPROVED EQUAL. INSULATION SHALL BE CONTINUOUS ALONG THE PIPE SURFACE, EXCEPT AT VALVES, UNIONS, AND WHERE PIPING IS EXPOSED AT FIXTURES. PROVIDE 1" FIBERGLASS INSULATION ON VENT PIPING WITHIN SIX FEET OF VENT THROUGH THE OF ROOF. PROVIDE FIBERGLASS INSULATION ON DOMESTIC COLD AND HOT WATER PIPES INSTALLED IN WALLS AND CHASES. PROVIDE FIBERGLASS INSULATION ON DOMESTIC COLD AND HOT WATER PIPES INSTALLED IN WALLS AND CHASES. PROVIDE INSULATION PROTECTION SHIELD AT EACH HANGER FOR INSULATED PIPING.

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

15B PIPING JOINTS

COPPER TUBING: JOINTS IN HARD TEMPER TUBING SHALL BE SOLDERED JOINTS USING LEAD-FREE 95/5 SOLDER EXCEPT WHERE TUBING IS INSTALLED BELOW GRADE OR BELOW THE BASE SLAB, WHERE JOINTS SHALL BE SOLDERED WITH SILVER SOLDER (SILFOS). JOINTS IN SOFT TEMPER COPPER TUBING SHALL BE OF THE FLARED TYPE INSTALLED IN COMPLIANCE WITH THE FITTING MANUFACTURER'S RECOMMENDATIONS.

THREADED STEEL PIPE: THREADED JOINTS SHALL BE FULL AND CLEAN, CUT WITH NOT MORE THAN THREE (3) THREADS EXPOSED BEYOND THE FITTINGS. MAKE JOINTS TIGHT WITH GRAPHITE BASE PIPE JOINT COMPOUND AND PAINT EXPOSED THREADS OF FERROUS PIPE WITH ACID-RESISTING PAINT AFTER PIPING HAS BEEN TESTED AND PROVED TIGHT. NO CAULKING, JAMP-WICK OR OTHER MATERIAL WILL BE PERMITTED FOR CORRECTION OF DEFECTIVE JOINTS.

CAST IRON PIPE BELOW GRADE: JOINTS IN BELL AND SPIGOT CAST IRON WASTE AND VENT PIPE SHALL BE NEOPRENE COMPRESSION GASKETS, TYSEAL OR EQUAL.

CAST IRON PIPE ABOVE GRADE: JOINTS IN HUBLESS PIPE SHALL BE STANDARD CISPI 310 NSF CERTIFIED BY ANACO, IDEAL, MISSON OR TYLER. UNIFORM IN HEIGHT PROVIDING SMOOTH CONNECTIONS TO ROOF DRAINS, SHALL BE HEAVY DUTY COUPLINGS MEETING ASTM C1540 AND FM 1680, ANACO HUSKY #SD-4000 OR CLAMP-ALL "HI TORQUE" 125 IN. LB.

PVC PIPE: CLEAN JOINTS FREE FROM DEBRIS AND MOISTURE. APPLY PVC PRIMER MEETING ASTM F656 TO EACH JOINT. APPLY SOLVENT CEMENT MEETING ASTM D2564 AND MAKE JOINT WHILE WET AND IN ACCORDANCE WITH ASTM D2855.

PIPE ADAPTERS: MAKE CONNECTION OF NEW WASTE PIPE TO NEW OR EXISTING DISSIMILAR WASTE PIPE USING ADAPTER COUPLINGS. PROVIDE FERNCO, PROFLEX 3000 SERIES OR MISSION FLEXSEAL 4856 SERIES WITH NEOPRENE CENTER GASKET WITH STAINLESS STEEL SHIELD AND HOSE CLAMPS FOR CONNECTING DISSIMILAR PIPES ABOVE GRADE. PROVIDE FERNCO, 1056 SERIES OR MISSION SEWER COUPLINGS WITH NEOPRENE GASKET AND STAINLESS STEEL CLAMPS FOR CONNECTING DISSIMILAR PIPES BELOW GRADE AND COAT STAINLESS STEEL BANDS WITH MASTIC.

15B PIPING INSTALLATION

GENERAL: CLEAN PIPE THOROUGHLY PRIOR TO INSTALLATION. REAM ENDS OF PIPE TO REMOVE BURRS. CUT PIPE ACCURATELY TO MEASUREMENTS TAKEN ON THE JOB. INSTALL WITH ADEQUATE CLEARANCE FOR INSTALLATION OF COVERINGS WHERE REQUIRED. PIPE SHALL NOT BE SPRUNG TO BENT. NEATLY ALIGN PIPE, CONNECT IT SECURELY, A

COMcheck Software Version 4.1.2.1

Interior Lighting Compliance Certificate

Project Information

Energy Code: 2018 IECC
Project Title: Tropical Cafe
Project Type: Alteration

Construction Site:
1546 NC HWY 24 / 87
CAMERON, NC 28326
STORE# NC - 079

Owner/Agent:
Chris Neal
ND Enterprises, LLC
GA
480 297 5577

Designer/Contractor:
Don Penn, PE
1301 Solana Blvd. Bldg. 1, Suite 1420
Westlake, TX 76262
+1 817 410 2858

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B X C)
1-Common Space Types:Dining Area - Family Restaurant	1400	0.71	994
		Total Allowed Watts =	994

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Common Space Types:Dining Area - Family Restaurant (1400 sq.ft.)				
LED 2x4: 24 T / TE: LED Linear 11W:	4	11	44	484
LED 12W: 6 R: LED A Lamp 12W:	1	24	12	288
Track: track: Wattage based on total luminaires	0	0	80	80
LED 10 w: PL: LED MR 10W:	1	3	10	30
Fan: 120 w fan light: Other:	1	1	10	10
		Total Proposed Watts =		892

Interior Lighting PASSES

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2018 IECC requirements in COMcheck Version 4.1.2.1 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Don Penn, PE — Name - Title
Signature
12/15/2020 — Date

COMcheck Software Version 4.1.2.1

Exterior Lighting Compliance Certificate

Project Information

Energy Code: 2018 IECC
Project Title: Tropical Cafe
Project Type: Alteration
Exterior Lighting Zone: 2 (Neighborhood business district)

Construction Site:
1546 NC HWY 24 / 87
CAMERON, NC 28326
STORE# NC - 079

Owner/Agent:
Chris Neal
ND Enterprises, LLC
GA
480 297 5577

Designer/Contractor:
Don Penn, PE
1301 Solana Blvd. Bldg. 1, Suite 1420
Westlake, TX 76262
+1 817 410 2858

Allowed Exterior Lighting Power

A Area/Surface Category	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B X C)
Pedestrian and vehicular entrances and exits	1 ft of door	14	Yes	14
			Total Tradable Watts (a) =	14
			Total Allowed Watts =	14
			Total Allowed Supplemental Watts (b) =	400

(a) Wattage tradeoffs are only allowed between tradable areas/surfaces.
(b) A supplemental allowance equal to 400 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Proposed Exterior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Main entry (1 ft of door width): Tradable Wattage				
LED 1: Other:	1	2	9	18
		Total Tradable Proposed Watts =		18

Exterior Lighting PASSES

Exterior Lighting Compliance Statement

Compliance Statement: The proposed exterior lighting alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed exterior lighting systems have been designed to meet the 2018 IECC requirements in COMcheck Version 4.1.2.1 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Don Penn, PE — Name - Title
Signature
12/15/2020 — Date

GENERAL NOTES

1. ALL WORK TO BE IN ACCORDANCE WITH THE NEC AND ALL APPLICABLE RULES, REGULATIONS AND ORDINANCES.
2. ALL MATERIAL SHALL BE NEW, FREE OF DEFECTS, OF THE QUALITY SPECIFIED AND CONFORM TO NFPA, NEMA, UL AND ANSI STANDARDS IN EVERY CASE WHERE SUCH A STANDARD HAS BEEN ESTABLISHED FOR THE PARTICULAR TYPE TYPE OF MATERIAL.
3. COORDINATE ALL REQUIREMENTS PRIOR TO SUBMITTING BID AND COMMENCING WORK.
   - 3.a. VERIFY ALL LANDLORD REQUIREMENTS PRIOR TO SUBMITTING BID AND INCLUDE ALL REQUIRED WORK THEREIN.
   - 3.b. CONTRACTOR SHALL FIELD VERIFY ALL CONDITIONS AND COORDINATE WITH LANDLORD AND LOCAL UTILITY COMPANIES PRIOR TO SUBMITTING BIDS. VERIFY SCOPE OF WORK WITH LANDLORD'S ELECTRICIAN.
   - 3.c. VERIFY WATER HEATER AND RTU LOADS DURING BID PROCESS.
   - 3.d. ALL CONTRACTORS SHALL VERIFY ALL EQUIPMENT REQUIREMENTS PRIOR TO COMMENCING WITH THE WORK.
   - 3.e. FIELD VERIFY PHYSICAL SPACE ALLOCATIONS FOR NEW EQUIPMENT.
   - 3.f. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY EXACT LOCATION OF ALL LIGHTING FIXTURES IN MECHANICAL, ELECTRICAL, AND OTHER EQUIPMENT ROOMS WHERE CONDUITS, DUCT WORK, PIPING, ETC., ARE PRESENT TO AVOID CONFLICT AND ENABLE PROPER ILLUMINATION DISTRIBUTION.
4. CLAIMS FOR ADDITIONAL COSTS DUE TO LANDLORD REQUIREMENTS ESTABLISHED ON THE DRAWINGS, IN THE SPECIFICATIONS OR IN THE LANDLORD DESIGN CRITERIA, INCLUDED IN THE PROJECT MANUAL WILL NOT BE ACCEPTED. CLAIMS FOR ADDITIONAL COSTS DUE TO LANDLORD REQUIREMENTS ESTABLISHED AFTER AWARD OF CONTRACT SHALL BE NEGOTIATED AS A CHANGE ORDER.
5. ELECTRICAL CONTRACTOR TO PROVIDE LOCK OUT AND TAG OUT SYSTEM ONCE BUILDING BECOMES ENERGIZED AND SHALL BE RESPONSIBLE FOR MAINTAINING "SAFE WORK" ENVIRONMENT.
6. PROVIDE PROPER GROUNDING FOR ALL EQUIPMENT, RACEWAYS ETC. AS PER NEC.
7. PROVIDE DISCONNECTS, FUSES, OVERLOAD PROTECTION AND PROPER CONTROL & POWER WIRING FOR OTHER EQUIPMENT SUCH AS HVAC, MECHANICAL AND ANY OTHER SPECIAL EQUIPMENT THAT MAY BE USED FOR THIS PROJECT. VERIFY THE ROUGH-IN DETAILS, ACTUAL LOCATIONS, WIRE SIZES AND ANY OTHER DETAILS WITH THE RESPONSIBLE TRADES AND FOLLOW THE ACTUAL INSTALLATION INSTRUCTIONS FOR THE EQUIPMENT BEING INSTALLED. COORDINATE WITH THE OTHER TRADES.
8. ELECTRICAL CONTRACTOR SHALL SECURE KITCHEN EQUIPMENT SPECIFICATION SHEETS PRIOR TO ROUGH-IN AND INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS, INCLUDING WIRE SIZE AND ELECTRIC LOAD.
9. RECEPTACLES SHALL BE COMMERCIAL GRADE, RATED FOR 125-VOLT, 20-AMPERES, NEMA 5-20R.
   - 9.a. PROVIDE GROUND FAULT CIRCUIT INTERRUPTER (GFCI) TYPE RECEPTACLES LOCATED IN BATHROOMS, COMMERCIAL AND INSTITUTIONAL KITCHENS, OUTDOORS, AND ROOF TOPS OF ANY OCCUPANCY.
   - 9.b. ALL RECEPTACLES IN PREP AREA SHALL BE MOUNTED AT 48" AFF UNLESS OTHERWISE NOTED. CONFIRM OUTLET LOCATIONS IN SALES AREA WITH EQUIPMENT SUPPLIER AND CASEWORK FABRICATOR.
   - 9.c. RECEPTACLES SHALL BE BLACK WITH STAINLESS STEEL COVER PLATES.
   - 9.d. RECEPTACLES IN PUBLIC AREAS SHALL BE THE TAMPER PROOF TYPE.
10. ALL DISCONNECTS, FIXTURES, AND OTHER ELECTRICAL COMPONENTS THAT ARE SUBJECT TO THE OUT SIDE WEATHER ELEMENTS MUST HAVE THE WEATHERPROOF ENCLOSURES.
11. ALL WIRE TO BE COPPER THW, THWN, THHN, OR XHHW, #12 AWG MINIMUM. ALL CONDUITS TO BE EITHER RIGID STEEL OR EMT AS ALLOWED BY CODE. ALL EMT, FLEX CONDUITS, MC CABLES, AND NON-METALLIC CONDUITS MUST HAVE GROUND WIRE PER NEC. THIS IS A NON-RESIDENTIAL JOB, THEREFORE TYPE NM (ROMEX) OR SIMILAR WIRING METHODS SHALL NOT BE USED.
   - 11.a. ALUMINUM CONDUCTORS ARE NOT PERMITTED UNLESS NOTED OTHERWISE FOR A SPECIFIC USE.
   - 11.b. FOR HOMERUNS OVER 80 FEET, USE ONE SIZE LARGER WIRE. FOR HOMERUNS OVER 135 FEET, USE TWO SIZE LARGER WIRE.
   - 11.c. SEAL CONDUITS THAT PASS FROM ONE ENVIRONMENT TO ANOTHER OR SUBJECT TO DIFFERENT TEMPERATURES AS REQUIRED BY NEC 300.7(A).
12. PANELBOARDS SHALL BE NEW WITH RATINGS AS SHOWN IN PANEL SCHEDULES. TYPE LISTED IS TO ESTABLISH A LEVEL OF QUALITY. APPROVED MANUFACTURERS INCLUDE SQUARE D, SIEMENS, CUTLER HAMMER, AND GE. PROVIDE COPPER GROUND BUS AND FULLY RATED NEUTRAL. PROVIDE TYPED PANEL DIRECTORY FOR EACH PANEL.
   - 12.a. CIRCUIT BREAKERS SHALL BE THE BOLT-ON TYPE.
   - 12.b. ALL BREAKERS THAT ARE TO BE USED TO SUPPLY LIGHTING LOADS MUST BE RATED FOR SWITCHING DUTY. PROVIDE LOCK-ON DEVICES FOR THE NIGHT LIGHT CIRCUIT AND OTHER CIRCUITS THAT MAY BE SO DIRECTED BY THE ARCHITECT.
   - 12.c. ELECTRIC CONTRACTOR SHALL FURNISH AND INSTALL SHUNT TRIP BREAKERS ON ALL ELECTRIC APPLIANCES AND RECEPTACLES UNDER EXHAUST HOOD.
13. PANELS AND DISCONNECTS SHALL BE LABELED WITH PHENOLIC PLASTIC PLATES.
14. THE LIGHT FIXTURE SCHEDULE INDICATES GENERAL DESCRIPTION OF LIGHTING FIXTURES AND MANUFACTURERS CATALOG NUMBERS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE CORRECT CEILING CONFIGURATION AND PROVIDE THE FIXTURES WITH ALL NECESSARY TRIMS AND MOUNTING HARDWARE SO THAT BOTH THE CEILING SYSTEM AND THE FIXTURE CONSTRUCTION MATCHES. VERIFY THE RECESSED FIXTURES TO ASCERTAIN THAT THEY WILL MATCH WITH THE CEILING OR WALL DETAILS ALL FIXTURES TO BE MOUNTED IN A NEAT, EYE-PLEASING MANNER. HEIGHTS AND LOCATIONS THAT ARE SUBJECT TO THE FINAL CONFIRMATION BY THE OWNER OR ARCHITECT IN THE FIELD.
   - 14.a. NO LIGHT FIXTURE SUBSTITUTIONS SHALL BE APPROVED WITHOUT WRITTEN PERMISSION FROM THE ARCHITECT, ENGINEER, OR THE CITY.
   - 14.b. ALL FLUORESCENT LIGHTING FIXTURES MUST BE EQUIPPED WITH ELECTRONIC BALLASTS.
   - 14.c. FLUORESCENT FIXTURES THAT UTILIZE DOUBLE-ENDED LAMPS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE SHALL HAVE A DISCONNECTING MEANS EITHER INTERNAL OR EXTERNAL TO EACH LUMINARIES (FIXTURE) WITH THE LINE SIDE TERMINALS OF THE DISCONNECTING MEANS GUARDED PER NEC 410.130. WHERE LUMINAIRE IS CONNECTED TO A MULTI-WIRE BRANCH CIRCUIT, THE DISCONNECTING MEANS SHALL SIMULTANEOUSLY BREAK ALL THE SUPPLY CONDUCTORS TO THE BALLAST, INCLUDING THE GROUNDED CONDUCTOR.
15. A JUNCTION BOX MUST BE PROVIDED WITH ALL EXIT LIGHTS CONNECTED TO MORE THAN ONE SET OF CONDUCTORS UNLESS THE EXIT LIGHT FIXTURE IS FURNISHED WITH AN APPROVED OUTLET BOX FOR THROUGH WIRING.
16. IN THE FOOD SERVICE AND KITCHEN AREAS THE CONTRACTOR SHALL PROVIDE SAFETY-TYPE LAMPS, FIXTURES OR OTHER GLASS SUSPENDED OVER EXPOSED FOOD IN ANY STEP OF PREPARATION OR OTHERWISE PROTECT AGAINST FOOD CONTAMINATION IN CASE OF GLASS BREAKAGE.
17. PROVIDE A PHOTOCELL TO CONTROL EXTERIOR SIGNS SO THEY AUTOMATICALLY TURN ON WHEN DARK, ALONG WITH A TIMER THAT WILL SHUT OFF AUTOMATICALLY AT 2AM. TIME CLOCK SHALL BE 365 DAY PROGRAMMABLE.
18. ALL FIRE ALARM SYSTEM MODIFICATIONS MUST BE PERFORMED BY OWNER

ELECTRICAL SYMBOLS LEGEND

SYMBOL	DESCRIPTION	ABBREVIATIONS
A-1,3,5	HOMERUN – TEXT DESIGNATES PANEL AND CIRCUIT NUMBERS. CONDUCTORS SHALL BE #12 AWG IN A 3/4" CONDUIT UNLESS NOTED OTHERWISE. LONG HASH MARKS INDICATE NEUTRAL CONDUCTORS, SHORT HASH MARKS INDICATE NUMBER OF PHASE CONDUCTORS. NO HASH MARKS INDICATE 3#12 IN A 3/4" C. PROVIDE A CODE-SIZED GROUND IN EACH CONDUIT.	A AMPERES AFC AVAILABLE FAULT CURRENT AFF ABOVE FINISHED FLOOR AIC AMPERE INTERRUPTING CURRENT AL ALUMINUM
	UNDER-SLAB ELECTRICAL CONDUIT	C CONDUIT CB CIRCUIT BREAKER CBIC CIRCUIT BREAKER INTERRUPTING CURRENT CU COPPER
$x	SWITCH, MOUNT AT 48" AFF X REPRESENTS IDENTIFIERS AS FOLLOWS: 3 3-WAY SWITCH M MOTOR RATED SWITCH	EC ELECTRICAL CONTRACTOR EX EXISTING F FUSE
	WALL MOUNT OCCUPANCY SENSOR, PASSIVE IR MOUNT AT 48" AFF	G GROUND GFI GROUND FAULT INTERRUPTER
TC	TIME CLOCK	HD HEAVY DUTY H HOT HT HEIGHT
DS	DAYLIGHT SENSOR	INC INCANDESCENT
J	JUNCTION BOX	LTS LIGHTS
x	DUPLEX RECEPTACLE, MOUNT AT 18" AFF UNO X REPRESENTS IDENTIFIERS AS FOLLOWS: NONE NONE 44" MTG HT OTHER THAN STANDARD WP WEATHERPROOF OUTLET IG ISOLATED GROUND	KW KILOWATT KVA KILOVOLT-AMPERE MCB MAIN CIRCUIT BREAKER MLO MAIN LUG ONLY MSB MAIN SWITCHBOARD MFR MANUFACTURER MTG MOUNTING
SW	DUPLEX RECEPTACLE FOR SHOW WINDOW PER NEC 210.62, INSTALL IN CEILING SO FACEPLATE IS FLUSH WITH FINISHED CEILING	N NEUTRAL N1 NEMA 1 N3R NEMA 3R NF NON-FUSED
	GROUND FAULT CIRCUIT INTERRUPTER (GFCI) RECEPTACLE, MOUNT AT 18" AFF UNO	PH, ø PHASE P POLE
	SPECIAL APPLICATION RECEPTACLE	
	20" WIDE PANELBOARD	
	DISCONNECT SWITCH D-A 30A/240V, 2P, F, NEMA-1	SES SERVICE ENTRANCE SECTION
EF	MOTOR EF EXHAUST FAN, 120/1, FRACTIONAL	TMB TELEPHONE MOUNTING BOARD
	TELEPHONE OUTLET, MOUNT AT 54" AFF W WALL MOUNT TELEPHONE	UNO UNLESS NOTED OTHERWISE
	DATA OUTLET, MOUNT AT 18" AFF	V VOLT VA VOLT-AMPS
	TELEPHONE/DATA OUTLET, MOUNT AT 18" AFF	W WIRE WP WEATHERPROOF
	TELEVISION OUTLET, MOUNT AT 72" AFF	

NOTE: MOUNTING HEIGHTS INDICATED ARE TYPICAL UNLESS NOTED OTHERWISE.

ADDITIONAL NOTES FOR GENERAL CONTRACTOR

1. IT IS THE RESPONSIBILITY OF THE GC TO FIELD VERIFY EXISTING CONDITIONS DURING THE BID PROCESS AND COORDINATE THE SCOPE OF WORK WITH THE LANDLORD.
2. GC SHALL REVIEW ALL ELECTRICAL SPECIFICATIONS AND EQUIPMENT SHEETS FOR REQUIRED ELECTRICAL NEEDS. PRIOR TO CONSTRUCTION, CONSULT DESIGNER AND TENANT FOR POSSIBLE SUB PANEL MAY BE NEEDED.
3. GC SHALL OBTAIN AND VERIFY ELECTRICAL LOADS OF WATER HEATER AND ROOF-TOP UNIT(S) DURING THE BID PROCESS.
4. GC TO OBTAIN SHOP DRAWINGS OF WALK-IN COOLER AND/OR FREEZER AND CONFIRM ELECTRICAL REQUIREMENTS.

OCCUPANCY SENSOR SCHEDULE

SYMBOL	DESCRIPTION	MANUFACTURER	CATALOG NO.
	WALL MOUNT OCCUPANCY SENSOR	LEVITON HUBBELL	RLVSW-4LW AD 1277W1
DS	CEILING MOUNT DAYLIGHT SENSOR PROVIDE POWER PACK/CONTROLLER	LEVITON HUBBELL	PCC1D-W NXDS

NOTE: PROVIDE POWER PACK AND/OR ROOM CONTROLLER AS REQUIRED TO INTERFACE DEVICES

ELECTRICAL DRAWING INDEX

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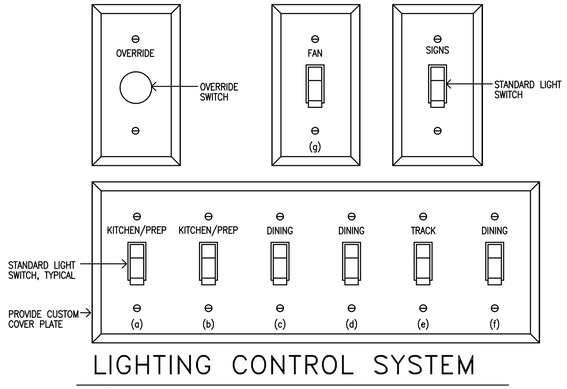
SYMBOL LEGEND AND NOTES

E1



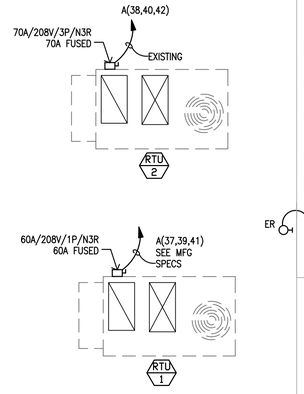
LIGHTING CONTROL SYSTEM

NO SCALE

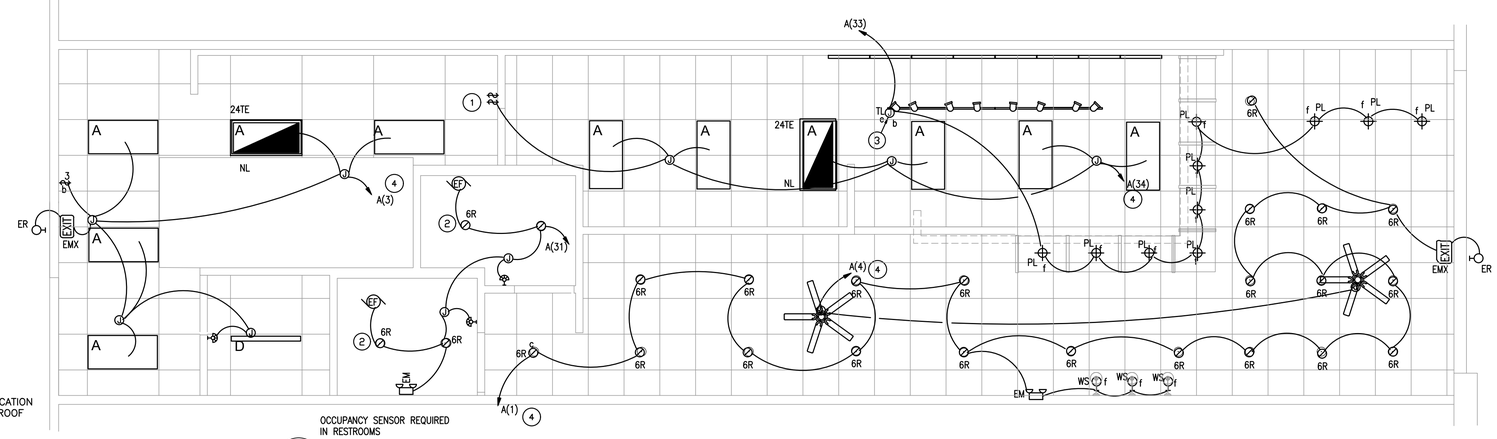
LIGHT FIXTURE SCHEDULE

TYPE	SYMBOL	DESCRIPTION	MANUFACTURER	CATALOG NUMBER	VOLT/WATT	LAMPS	MOUNTING	LOCATION	NOTES
6R	⊘	6" LED RECESSED NC HOUSING, GU24 BASE, WHITE TRIM		20801082 20800761 20809977	120V 12 W	LED	RECESS	CEILING	4,5
LS		SURFACE MOUNTED LUMINAIRE		72002753	120V 44 W	LED	SURFACE	CEILING	4,5
24T		2X4 RECESSED LED TROFFER, ACRYLIC LENS, SMOOTH SIDE DOWN		20800844	120V 44 W	LED	RECESS	CEILING	4,5
24TE		2X4 RECESSED LED TROFFER, ACRYLIC LENS, SMOOTH SIDE DOWN, EMERGENCY BATTERY		20800852	120V 44 W	LED	RECESS	CEILING	2,4,5
TL		LED SINGLE CIRCUIT TRACK HEAD 4' TRACK–WHITE 8' TRACK–WHITE WHITE CONNECTOR LIVE END FEED–WHITE		18644197 18622804 18622846 18622888 18622961	120V 10 W	LED	TRACK	CEILING	4,5,6
PL		BLUE GLASS PENDANT LED LAMP		86703397 43907403	120V 10 W	LED	PENDANT	CEILING	3,4,5
WS		LED GOOSENECK WALL SCONE		6619813 43907403	120V 9 W	LED	SURFACE	WALL	4,5,7
CF		CEILING FAN–WHITE		50069353 518730 522608	120V		PENDANT	WALL	4,5,8
EMX EX	EXIT	LED EMERGENCY/EXIT COMBO LED EXIT COMBO		90902167 90900301	UNV		SURFACE	WALL,CEILING	1,2,4,5
EM		LED EMERGENCY LIGHT		90902167	UNV	LED	SURFACE	WALL,CEILING	2,4,5
ER		EXTERIOR EMERGENCY LIGHTING UNIT, UL924		–		LED	SURFACE	WALL	2,4,5

NOTES:
1. INSTALL SO BOTTOM OF FIXTURE IS 4–INCHES ABOVE DOOR FRAME.
2. 90 MINUTE BATTERY BACKUP.
3. INSTALL SO BOTTOM OF FIXTURE IS AT 7'–0" ABOVE FINISHED FLOOR.
4. LUMINAIRES AND LAMPS SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR AND PURCHASED THROUGH HERMITAGE LIGHTING NATIONAL ACCOUNTS CONTACT: JD RYAN (615) 843–3394
5. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR RECEIVING, STORING, AND INSTALLING LIGHT FIXTURES AND LAMPS. ELECTRICAL CONTRACTOR SHALL REPORT ANY DAMAGE OR MISSING PARTS FOR LIGHT FIXTURES TO HERMITAGE LIGHTING WITHIN 48 HOURS OF RECEIVING LIGHT FIXTURES.
6. PROVIDE CURRENT LIMITER PER PLAN NOTES, BLACK AND CURRENT LIMITING ELECTRICAL FEED, BLACK, AND ALL REQUIRED FEED POINT CONNECTORS FOR INSTALLATION. PROVIDE LED LAMPS TO BE TCP # LED8P20D40KNFLB. REFER TO NOTE 4.
7. INSTALL SO CENTER OF WALL PLATE IS AT 8'–6" ABOVE FINISHED FLOOR.
8. INSTALL SO BOTTOM OF FAN IS AT 8'–6" ABOVE FINISHED FLOOR.



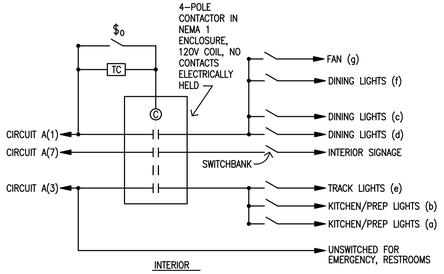
NOTE: SEE MECHANICAL SHEET FOR EXACT LOCATION PLACED IN STRUCTURAL APPROVED AREA ON ROOF BY LANDLORD. EXISTING.



1 LIGHTING FLOOR PLAN
SCALE: 1/4"=1'–0"

A(5) ROUTE THROUGH TIME CLOCK AND PHOTOCELL

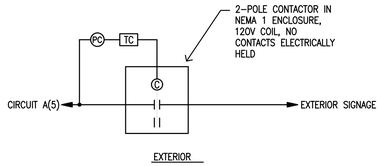
PROVIDE 120V CONNECTION FOR SIGN, FIELD COORDINATE LOCATION, SIGN PROVIDED BY OTHERS, PROVIDE DISCONNECT AS REQUIRED BY NEC 600



$o OVERRIDE SWITCH, 0–2 HOUR, SPRING WOUND TYPE, TORK OR EQUIVALENT, LOCATE IN KITCHEN

TC TIME CLOCK SHALL BE A DIGITAL, 2–CHANNEL, 365 DAY, HOLIDAY AND SEASONAL PROGRAMMING WITH HOLIDAY SKIP OPTIONS TORK # DG100A OR APPROVED EQUAL

DS DAYLIGHT SENSOR



TC TIME CLOCK SHALL BE A DIGITAL, 2–CHANNEL, 365 DAY, HOLIDAY AND SEASONAL PROGRAMMING WITH HOLIDAY SKIP OPTIONS TORK # DG100A OR APPROVED EQUAL

PC PHOTOCELL TORK OR EQUIVALENT

SIGN CONTROL DETAIL

NO SCALE

GENERAL NOTES

A. EMERGENCY AND EXIT NIGHT LIGHTS SHALL BYPASS SWITCHING.

B. SEE ARCHITECTURAL DRAWINGS FOR DETAILS AND INTERIOR ELEVATIONS FOR MOUNTING HEIGHTS.

C. COORDINATE EXTERIOR LIGHT FIXTURES WITH ARCHITECT AND PROPERTY OWNER.

SHEET NOTES

1. LIGHT SWITCH BANK AND SIGN SWITCH BANK TO BE LOCATED HERE. SEE LIGHTING CONTROL SYSTEM DETAIL ON DRAWING E2.0.
2. CONTROL EXHAUST FAN WITH LIGHTS IN RESTROOM.
3. PROVIDE 1A (120W) CURRENT LIMITER CIRCUIT BREAKER AT FIRST TRACK IN CIRCUIT. WIRE ALL TRACK SECTIONS IN SERIES SO THAT CURRENT LIMITER LIMITS CURRENT ON ENTIRE COMBINED TRACK LENGTH TO 1–AMPS.
4. TO LIGHT SWITCH BANK REFER TO NOTE 1 ABOVE.

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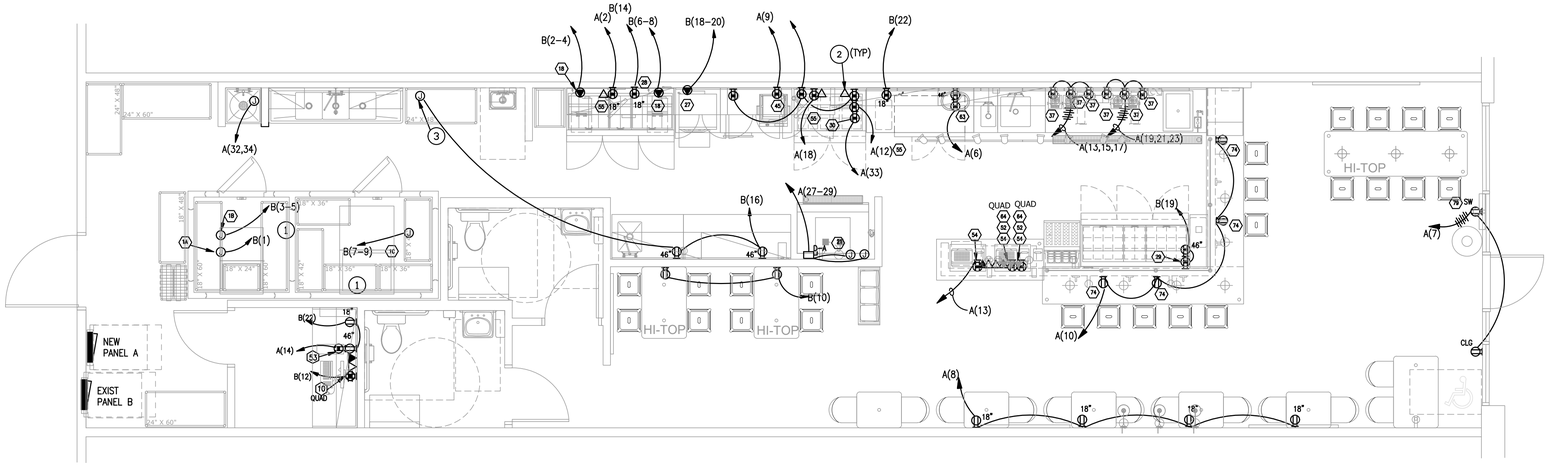
ELECTRICAL LIGHTING & ROOF PLAN

E2



1 POWER FLOOR PLAN
SCALE: 1/4"=1'-0"

ELECTRICAL NOTE:
ALL SINGLE PHASE RECEPTACLES RATED AT 150V TO GROUND OR LESS, 50 AMPERES OR LESS AND THREE PHASE RECEPTACLES RATED 150V VOLTS TO GROUND OR LESS, 100 AMPERES OR LESS INSTALLED IN KITCHENS SHELL BE GFCI PROTECTED.

EQUIPMENT SCHEDULE

ID	DESCRIPTION	MANUFACTURER	CATALOG NUMBER	VOLTS	AMPS	DISCONNECT	RECEPTACLE	MTG HEIGHT
1A	WALK-IN COOLER/FREEZER			120	10.0	JB		108"
1B	WALK-IN COOLER REFRIGERATION, SELF-CONT.	BY FRANCHISEE		208	11.5	JB		108"
1C	WALK-IN FREEZER REFRIGERATION, SELF-CONT.	BY FRANCHISEE		208	18.1	JB		108"
9	EXISTING ELECTRIC WATER HEATER			208	4.5KW	EXISTING		EXISTING
10	SURVEILLANCE SYSTEM			120	8.0		5-20R QUAD IG	12" FROM CEILING
12	JOLT PRINTER	BY FRANCHISEE		120	3.1		5-20R IG	46"
21	ICE MAKER WITH BIN	BY FRANCHISEE		208	12.2	30A/2P		72"
25	MICROWAVE OVEN	BY FRANCHISEE		120	13.0		5-20R	54"
27	MICROWAVE CONVECTION OVEN	BY FRANCHISEE		208	27.4		6-30R	46"
28	REFRIGERATED PREP TABLE, 30 PAN	BY FRANCHISEE		120	12.0		5-20R	18"
29	REFRIGERATED PREP TABLE, 30 PAN	BY FRANCHISEE		120	12.0		5-20R	18"
30	REFRIGERATED PREP TABLE, 18 PAN	BY FRANCHISEE		120	7.2		5-20R	18"
37	BLENDER, BAR TYPE	BY FRANCHISEE		120	15.0		5-20R	46"
45	PANINI PRESS 1.8KW	BY FRANCHISEE		120	15.0		5-20R	46"
52	POS TERMINAL	BY FRANCHISEE		120	1.0		5-20R IG	24"
53	POS SYSTEM BACK OF HOUSE	BY FRANCHISEE		120	0.25 EA.		5-20R IG	12" FROM CEILING
54	POS PRINTER	BY FRANCHISEE		120	0.5 EA.		5-20R IG	24"
55	KDS MONITOR	BY FRANCHISEE		120	1.0		5-20R IG	67"
57	ON CUE	BY FRANCHISEE		208	15.9		6-20R	46"
63	UNDERCOUNTER REFRIGERATOR	BY FRANCHISEE		120	4.5		5-20R	24"
64	EMV CARD READER			120	1.0		SHARED QR	24"
74	USB ENABLED CONVENIENCE OUTLET COUNTER			120	15.0 CRT		5-20R	32"
77	BANQUET USB OUTLET			120	15.0 CRT		5-20R	16"
79	TROPICAL SMOOTHIE NEON SIGN	BY FRANCHISEE		120	3.0		5-20R	FEED FROM ABOVE
80	TROPICAL SMOOTHIE CAFE EXTERIOR SIGN			120				

NOTES:
A. ALL DEDICATED CIRCUIT SHALL HAVE ORANGE RECEPTACLES.
B. ITEM 1A MAKE CONNECTION TO LIGHTS, ALARM CLOCKS, DOOR FRAME HEATERS, PORTS AND SILLS.
C. ELECTRICAL CONTRACTOR SHALL INSTALL AND WIRE ALL LIGHT FIXTURES IN WALK-IN COOLER/FREEZERS.
D. FOR ITEM 80 REFER TO LIGHTING PLAN FOR LOCATIONS.

SHEET NOTES

1. COORDINATE POWER CONNECTIONS FOR WALK-IN COOLER AND FREEZER EQUIPMENT WITH EQUIPMENT SUPPLIER. MAKE ADJUSTMENTS AS REQUIRED FOR PROPER CONNECTIONS AND CODE COMPLIANCE.
2. PROVIDE 1" CONDUIT ROUGH-IN FROM DATA OUTLET TO ACCESSIBLE CEILING.
3. PROVIDE JUNCTION BOX ABOVE CEILING FOR DROP CORD CONVENIENCE OUTLET, 46" ABOVE FINISHED FLOOR. SECURE DROP CORD TO STRUCTURE AS NEEDED.

GENERAL NOTES

A. ELECTRICAL CONTRACTOR SHALL VERIFY ALL CONNECTION REQUIREMENTS FOR ALL EQUIPMENT SUPPLIED BY OTHERS PRIOR TO ROUGH-IN. COORDINATE NEMA PLUG CONFIGURATION FOR EQUIPMENT AND PROVIDE MATCHING RECEPTACLE WHERE APPLICABLE.

B. COORDINATE MECHANICAL AND PLUMBING EQUIPMENT REQUIREMENTS WITH OTHER TRADES.

C. COORDINATE EXACT LOCATION, QUANTITIES, AND INSTALLATION REQUIREMENTS OF EQUIPMENT IN MILLWORK.

D. ALL RECEPTACLES IN KITCHEN AND WITHIN 6-FT OF A SINK SHALL BE GFCI RATED.

E. ALL EXTERIOR DISCONNECTS SHALL BE WEATHERPROOF.

F. PROVIDE GROUNDING IN ACCORDANCE WITH NEC 250. PROVIDE A #6 CU GROUND TO ANY NEW METAL GAS PIPING SYSTEMS.

G. FINAL CONNECTION TO ALL HARD-WIRED EQUIPMENT SHALL BE MADE WITH LIQUID-TITE FLEXIBLE CONDUIT.

H. PROVIDE SEAL-OFFS FOR ALL CONDUITS ENTERING OR LEAVING WALK-IN BOXES.

I. ALL CIRCUITS SHALL HAVE AN INSULATED GROUND WIRE SIZED PER NEC 250 BUT NOT SMALLER THAN #12 AWG.

J. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL DISCONNECT SWITCHES, CONDUIT, AND WIRE FOR EQUIPMENT. INSTALL UNDER SUPERVISION OF EQUIPMENT SUPPLIER.

K. WHERE RECEPTACLES IN KITCHEN ARE CONSIDERED NOT ACCESSIBLE DUE TO EQUIPMENT, PROVIDE GFCI CIRCUIT BREAKER IN LIEU OF GFCI RECEPTACLE TO COMPLY WITH CODE.

L. ALL DEDICATED CIRCUITS TO HAVE ORANGE RECEPTACLES.

M. ELECTRICAL CONTRACTOR SHALL PROVIDE ROUGH-IN FOR ALL LOW VOLTAGE CABLING. COORDINATE WITH LOW VOLTAGE CONTRACTOR. REFER TO DETAIL ON THIS SHEET.

PANELBOARD: A (NEW)

BUS AMPS: 400A
MAIN SIZE/TYPE: 400A MCB
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

A/C RATING: FCA +10% MINIMUM, FULLY RATED
SERVES:
MOUNTING: SURFACE
LOCATION: KITCHEN

EQUIPMENT GROUND BUS
ISOLATED GROUND BUS

CKT NO.	DESCRIPTION	VOLTAMPS/PHASE A	B	C	WIRE NO.	BKR AMP	P	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE A	B	C	DESCRIPTION	CKT NO.
1	LIGHTING (DINING) / EM	1,200	`	`	(2)#12, (1)#12G	20	1	1	20	(2)#12, (1)#12G	1,440	`	`	REFRIG PREP TABLE (28)	2
3	LIGHTING (KITCHEN) / EM	`	1,400	`	(2)#12, (1)#12G	20	1	1	20		`		`	SPARE	4
5	EXTERIOR SIGN	`	`	1,200	(2)#12, (1)#12G	20	1	1	20	(2)#12, (1)#12G	`	`	540	UNDERCOUNTER REFR (63)	6
7	RECEPTACLE (SHOW WINDOW)	400	`	`	(2)#12, (1)#12G	20	1	1	20	(2)#12, (1)#12G	800	`	`	RECEPTACLE DINING	8
9	PANINI PRESS	`	1,800	`	(2)#12, (1)#12G	20	1	1	20	(2)#12, (1)#12G	`	1,000	`	RECEPTACLE DINING	10
11	MICROWAVE (25)	`	`	1,500	(2)#12, (1)#12G	20	1	1	20	(2)#12, (1)#12G	`	`	200	KDS MONITOR (55)	12
13	POS PRINTER & TERMINAL (52,54)	800	`	`	(2)#12, (1)#12G	20	1	1	20	(2)#12, (1)#12G	200	`	`	POS SYSTEM (53)	14
15	BLENDER BAR TYPE (37)	`	1,500	`	(2)#12, (1)#12G	20	1	1	20	(2)#12, (1)#12G	`	1,000	`	GENERAL RECEPTACLE	16
17	BLENDER BAR TYPE (37)	`	`	1,500	(2)#12, (1)#12G	20	1	1	20	(2)#12, (1)#12G	`	`	200	KDS MONITOR (55)	18
19	BLENDER BAR TYPE (37)	1,500	`	`	(2)#12, (1)#12G	20	1	1	20	(2)#12, (1)#12G	`	`	`	SPARE	20
21	BLENDER BAR TYPE (37)	`	1,500	`	(2)#12, (1)#12G	20	1	1			`	`	`	SPACE	22
23	BLENDER BAR TYPE (37)	`	`	1,500	(2)#12, (1)#12G	20	1	1			`	`	`	SPACE	24
25	BLENDER BAR TYPE (37)	1,500	`	`	(2)#12, (1)#12G	20	1			(4)#3, (1)#8 G	14,122	`	`	PNLBD B	26
27	ICE MAKER W/ BIN (21)	`	1,269	`	(2)#10, (1)#10G	30	2	3	100	1-1/4" C	`	6,300	`		28
29		`	`	1,269							`	`	10,370		30
31	RESTROOM LIGHTING	840	`	`	(2)#12, (1)#12G	20	1	2	30	(2)#8,(1)#10G	3,000	`	`	ELEC WATER HEATER	32
33	SPARE	`	`	`						1"C	`	3,000	`	SEE MFG SPECS	34
35	SPACE	`	`	`							`	`	`	SPARE	36
37	NEW- SEE MFG SPECS	6,600	`	`							7,320	`	`	EXISTING	38
39	RTU-1	`	6,600	`	NEW	60	3	3	70	EXISTING	`	7,320	`	RTU-2	40
41	32 MCA	`	`	6,600	SEE MFG						`	`	7,320	32 MCA	42
	SUBTOTAL	12,840	14,069	13,569							26,882	18,620	18,630	SUBTOTAL	

		LOAD	CONN. VA	DF	LOAD	CONN. VA	DF	
TOTAL PHASE A - VA	39,722	COOLING	41,760	1.00	REFRIGERATION	14,178	1.00	
AMPS	331	HEATING		0	SIGN/DISPLAY	1,200	1.25	
TOTAL PHASE B - VA	32,689	LIGHTING	3,440	1.25	KITCHEN	30,300	0.65	
AMPS	272	RECEPTACLES	10,600	1.0/.5	EXISTING		1.00	
TOTAL PHASE C - VA	32,199	MOTORS	-2,486	1.00	LARGE MOTOR	2,486	1.25	TOTAL DEMAND
AMPS	268	SUPP HEAT		1.00	SHOW WINDOW	400	1.25	95,587 VA
TOTAL PNLBD - VA	104,610	MISC EQUIP	2,732	1.00	LTG TRACK		1.00	265 A
AMPS	290							

PANELBOARD NOTES
PROVIDE TYPE WRITTEN DIRECTORY
GF - GFCI TYPE CIRCUIT BREAKER
IG - ISOLATED GROUND CIRCUIT

LTG TRACK - TRACK LENGTH
SIGN/DISPLAY - SIGNAGE & DISPLAY CASE

PANELBOARD: B (EXISTING)

BUS AMPS: 125A
MAIN SIZE/TYPE: MLO
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

FAULT CURRENT:
A/C RATING: N/A
SERVES:
MOUNTING: SURFACE
LOCATION: KITCHEN

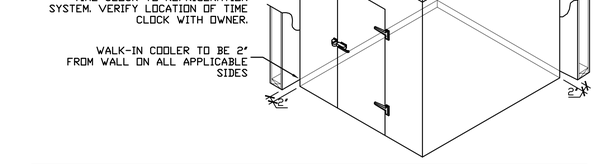
EQUIPMENT GROUND BUS

CKT NO.	DESCRIPTION	VOLTAMPS/PHASE A	B	C	WIRE NO.	BKR AMP	P	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE A	B	C	DESCRIPTION	CKT NO.
1	WALK-IN COOLER/FREEZER (1A)	1,200	`	`	(2)#12, (1)#12G	20	1	2	20	(2)#12, (1)#12G	1,650	`	`	ON CUE (57)	2
3	WALK-IN COOLER (1B)	`	1,196	`	(2)#12, (1)#12G	20	2				`	1,650	`		4
5		`	`	1,196				2	20	(2)#12, (1)#12G	`	`	1,650	ON CUE (57)	6
7	WALK-IN FREEZER (1C)	1,882	`	`	(2)#12, (1)#12G	20	2				1,650	`	`		8
9		`	1,882	`				1	20	(2)#12, (1)#12G	`	600	`	RECEPTACLE DINING	10
11	MICROWAVE CONVECTION	`	`	2,850	(2)#8, (1)#10G	30	2	1	20	(2)#12, (1)#12G	`	`	960	SURVEILLANCE SYSTEM (10)	12
13	OVEN (27)	2,850	`	`				1	20	(2)#12, (1)#12G	600	`	`	GENERAL RECEPTACLE	14
15		`	`	`				1	20	(2)#12, (1)#12G	`	572	`	JOLT PRINTER (12)	16
17	REFRIG PREP TABLE (30)	`	`	864	(2)#12, (1)#12G	20	1	2	30	(2)#8, (1)#10G	`	`	2,850	MICROWAVE CONVECTION	18
19	REFRIG PREP TABLE (29)	1,440	`	`	(2)#12, (1)#12G	20	1				2,850	`	`	OVEN (27)	20
21		`	`	`			1	1	20	(2)#12, (1)#12G	`	400	`	GENERAL RECEPTACLE	22
23		`	`				1	1			`	`			24
	SUBTOTAL	7,372	3,078	4,910							6,750	3,222	5,460	SUBTOTAL	

		LOAD	CONN. VA	DF	LOAD	CONN. VA	DF	
TOTAL PHASE A - VA	14,122	COOLING		1.00	REFRIGERATION	9,660	1.00	
AMPS	118	HEATING		0	SIGN/DISPLAY		1.25	
TOTAL PHASE B - VA	6,300	LIGHTING		1.25	KITCHEN	18,000	0.80	
AMPS	53	RECEPTACLES	1,800	1.0/.5	EXISTING		1.00	
TOTAL PHASE C - VA	10,370	MOTORS		1.00	LARGE MOTOR		1.25	TOTAL DEMAND
AMPS	86	SUPP HEAT		1.00	SHOW WINDOW		1.25	27,192 VA
TOTAL PNLBD - VA	30,792	MISC EQUIP	1,332	1.00	LTG TRACK		1.00	75 A
AMPS	85							

PANELBOARD NOTES

LTG TRACK - TRACK LENGTH
SIGN/DISPLAY - SIGNAGE & DISPLAY CASE

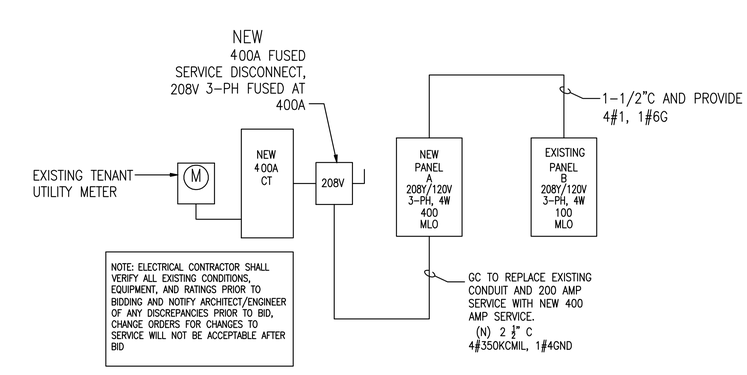


GENERAL NOTES

ALL INTERCONNECTING CONDUIT TO BE RUN ABOVE WALK-IN. EXPOSED INTERIOR CONDUIT WILL NOT BE ACCEPTABLE EXCEPT FOR THE CONDITIONS SHOWN AND NOTED IN THE ABOVE ILLUSTRATION.

SEAL ALL PENETRATIONS THRU-OUT WALK-IN. SEAL ALL INSIDE ELECTRICAL CONDUIT WITH THERMAL PLASTIC.

WALK-IN REFRIGERATION ELECTRICAL DIAGRAM



ONE-LINE DIAGRAM

NO SCALE

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ELECTRICAL POWER PLAN

E3