MECHANICAL SYMBOLS

(SOME SYMBOLS MAY NOT BE USED ON THE DRAWINGS)

ABBREVIATIONS

%	PERCENT
ABS	ABSOLUTE
ACC	AIR-COOLED CHILLER
ACU	AIR CONDITIONING UNIT
AD	ACCESS DOOR
AF	AIR FOIL
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTITUDE
AMB	AMBIENT
AMCA	AIR MOVEMENT AND CONTROL ASSOCIATION
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATE
ARI	AIR-CONDITIONING AND REFRIGERATION INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR-CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS
AVG	AVERAGE
B	BOILER
BD	BACKDRAFT DAMPER
BG	BELOW GRADE
BEMCS	BUILDING ENERGY MANAGEMENT AND CONTROL SYSTEM
BHP	BRAKE HORSEPOWER
BI	BACKWARD INCLINED
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
CD	COLD DECK
CF	CUBIC FEET
CFM	CUBIC FEET PER MINUTE
CHET	CHILLED WATER EXPANSION TANK
CMPR	COMPRESSOR
COND	CONDENSER
CRAC	COMPUTER ROOM AIR CONDITIONER
CT	COOLING TOWER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CU IN	CUBIC INCH
dB	DECIBEL
DB	DRY BULB
DCP	DISTRIBUTED CONTROL PANEL
DEG	DEGREE
DIA	DIAMETER
DWG	DRAWING
DX	DIRECT-EXPANSION
EAT	ENTERING AIR TEMPERATURE
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
EFF	EFFICIENCY
EL	ELEVATION
ENT	ENTERING
ESP	EXTERNAL STATIC PRESSURE
EXP	EXPANSION
F	FAHRENHEIT
FA	FACE AREA
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FH	FUME HOOD
FLEX	FLEXIBLE
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FRP	FIBERGLASS REINFORCED PIPE
FS	FLOW SWITCH
FSD	COMBINATION FIRE-SMOKE DAMPER
FT	FEET OR FOOT
FTU	FAN TERMINAL UNIT
GA	GAUGE OR GAGE
GAL	GALLONS
GALV	GALVANIZED
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GR	GRAINS
H	ENTHALPY
HD	HEAD
HD	HOT DECK
HG	HEAT GAIN OR MERCURY
HGT	HEIGHT
HP	HORSEPOWER
HPS	HIGH PRESSURE STEAM
HR	HOUR
HTHW	HIGH TEMPERATURE HEATING WATER
HVAC	HEATING/VENTILATING/AIR-CONDITIONING
HVU	HEATING AND VENTILATING UNIT
HWR	HEATING HOT WATER RETURN
HWS	HEATING HOT WATER SUPPLY
HZ	FREQUENCY
ID	INSIDE DIAMETER
IPS	INTERNATIONAL PIPE STANDARD
ips	IRON PIPE SIZE
K	THERMAL CONDUCTIVITY
KH	KITCHEN HOOD
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LF	LINEAR FEET
LG	LENGTH
LPS	LOW PRESSURE STEAM
LTHW	LOW TEMPERATURE HOT WATER
LWT	LEAVING WATER TEMPERATURE
MCA	MINIMUM CIRCUIT AMPACITY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MAX	MAXIMUM
MBH	BTU PER HOUR (THOUSAND)
MIN	MINIMUM
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
N/A	NOT APPLICABLE
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
PD	PUMPED DISCHARGE
PBD	PARALLEL BLADE DAMPER
PH	PHASE (ELECTRICAL)
PPM	PARTS PER MILLION
PRESS	PRESSURE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	PSI ABSOLUTE
PSIG	PSI GAGE
R	RANKINE
R-22	REFRIGERANT (NUMBER INDICATES TYPE)
RA	RETURN AIR
RAF	RELIEF AIR FAN
RECIRC	RECIRCULATE
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SC	SHADING COEFFICIENT
SCFM	CUBIC FEET PER MINUTE-STANDARD CONDITIONS
SD	SMOKE DAMPER
SEC	SECOND
SF	SQUARE FEET
SG	SPECIFIC GRAVITY
SHG	SENSIBLE HEAT GAIN
SHR	SENSIBLE HEAT RATIO
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SQ	SQUARE
SSD	SUB-SOIL DRAINAGE
STD	STANDARD
SUCT	SUCTION
t	TIME
T	TEMPERATURE SENSOR
TD	TEMPERATURE DIFFERENCE
TEMP	TEMPERATURE
TOC	TOP OF CONCRETE
TOD	TOP OF DUCT
TONS	TONS OF REFRIGERATION
TOP	TOP OF PIPE
TOS	TOP OF STEEL
TSP	TOTAL STATIC PRESSURE
T-STAT	THERMOSTAT
TU	TERMINAL UNIT
TYP	TYPICAL
U	HEAT TRANSFER COEFFICIENT
UH	UNIT HEATER
UF	UNDER FLOOR
V	VOLT
VA	VOLT AMPERE
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VENT	VENTILATION
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VP	VELOCITY PRESSURE
W	HUMIDITY RATIO OR WATT
W.C.	WATER COLUMN
W.G.	WATER GAUGE
WB	WET BULB
WT	WEIGHT
YR	YEAR

SHEET SYMBOLS

X **DETAIL TITLE**
SCALE: 1/?" = 1'-0"

TRUE NORTH / N — NORTH ARROW

A / 200 — DEVICE TYPE, AIRFLOW — NECK/CFM BUBBLE

AHU-1 OR RTU-XXX — EQUIPMENT TAG

AIR FLOW INDICATOR

1 — NOTE BY SYMBOL (KEYNOTE)

1 — REVISION

POINT OF CONNECTION (NEW TO EXISTING)

POINT OF DISCONNECTION

MECHANICAL EQUIPMENT

FSD — COMBINATION FIRE/SMOKE DAMPER

FD — FIRE DAMPER

SD — SMOKE DAMPER

FSD — COMBINATION FIRE/SMOKE DAMPER IN VERTICAL SA DUCT

FSD — COMBINATION FIRE/SMOKE DAMPER IN VERTICAL RA DUCT

NEW EQUIPMENT (SIZE, SHAPE WILL VARY)

FUTURE KITCHEN / VENTILATION EQUIPMENT (SIZE, SHAPE WILL VARY)

EQUIPMENT TO REMAIN (SIZE, SHAPE WILL VARY)

SP — DUCT STATIC PRESSURE SENSOR

DP — DIFFERENTIAL PRESSURE SENSOR

T — WALL MOUNTED THERMOSTAT

T — WALL MOUNTED TEMPERATURE SENSOR

CO2 — CARBON DIOXIDE SENSOR

OS — OCCUPANCY SENSOR

DUCTWORK

DIFFUSER FLOW ARROWS (IF NO ARROWS ARE SHOWN, DIFFUSER IS 4-WAY THROW)

SUPPLY DIFFUSER

ROUND SUPPLY DIFFUSER

RETURN REGISTER

EXHAUST REGISTER

SIDEWALL SUPPLY GRILLE

SIDEWALL RETURN GRILLE

LOUVER W/ SCREEN (IN WALL)

SLOT DIFFUSER

LINEAR DIFFUSER

RETURN AIR SLOT DEVICE

MANUAL OPPOSED BLADE DAMPER

MANUAL BLADE DAMPER

90° ELBOW W/ TURNING VANES

90° MITERED ELBOW

45° MITERED ELBOW

90° LONG RADIUS ELBOW

45° LONG RADIUS ELBOW

CONCENTRIC TRANSITION

ECCENTRIC TRANSITION

RECTANGULAR TO ROUND TRANSITION

RECTANGULAR BRANCH TAP (SMACNA 45)

CONICAL BRANCH TAP

CONICAL LATERAL BRANCH TAKE-OFFS

DUCT CAP

DUCT CONTINUATION - ROUND

DUCT CONTINUATION - RECTANGULAR

AD — DUCT ACCESS DOOR

SUPPLY DUCT (UP / DOWN)

RETURN DUCT (UP / DOWN)

EXHAUST DUCT (UP / DOWN)

ROUND DUCT (UP / DOWN)

18/14 — RECTANGULAR DUCT SIZE (WIDTH / HEIGHT)

18Ø — ROUND DUCT SIZE

FLEXIBLE DUCT CONNECTION

SIDEWALL REGISTER TAP WITH DAMPER

M — MOTORIZED DAMPER

M — OPPOSED BLADE MOTORIZED DAMPER

BD — BACKDRAFT DAMPER

FLEXIBLE DUCT CONNECTION

MAJOR SPLIT

TRANSFER BOOT

PIPING SYMBOLS

PIPING UP

PIPING DOWN

CO — CLEANOUT

1/8"/FT — DIRECTION OF SLOPE

CD — CONDENSATE DRAIN

HVAC DESIGN CRITERIA

ASHRAE FUNDAMENTALS - 2017:

WEATHER STATION - SAN ANTONIO, TX

ELEVATION: 794'

WINTER HEATING DESIGN (99.6%):

20 °F DRY BULB

SUMMER COOLING DESIGN (0.4%):

105 °F DRY BULB

78 °F MEAN COINCIDENT WET BULB

NTD: UPDATE WITH SITE SPECIFIC INFO

GENERAL NOTES

1. REFER TO SPECIFICATIONS FOR MATERIALS AND METHODS FOR CONSTRUCTION.
2. DUCTWORK SIZES SHOWN ARE FREE AIR STREAM DIMENSIONS.
3. INSTALL DUCTWORK AND PIPING TO PROVIDE THE MAXIMUM POSSIBLE CLEAR HEIGHT UNDERNEATH. (BETWEEN STRUCTURE OR CEILING AND TOP OF DUCT).
4. WHERE APPROVAL CODES HAVE BEEN ESTABLISHED BY OSHA, UNDERWRITER'S LABORATORY, AMERICAN CODES, ANSI, ASME, ASA, ASHRAE, ASTM, ARI, NEL, NFPA, SMACNA, OR THE STATE FIRE INSURANCE REGULATORY BODY, FOLLOW THESE STANDARDS WHETHER OR NOT INDICATED ON THE DRAWINGS AND SPECIFICATIONS.
5. PROVIDE THE ENTIRE SYSTEM AND ITS COMPONENT ITEMS OF EQUIPMENT IN OPERATING CONDITION FREE OF OBJECTIONABLE VIBRATION OR NOISE.
6. PERFORM WORK IN ACCORDANCE WITH THE LATEST EDITIONS, REVISIONS, AMENDMENTS OR SUPPLEMENTS OF APPLICABLE STATUTES, ORDINANCES, CODES OR REGULATIONS OF FEDERAL, STATE AND LOCAL AUTHORITIES HAVING JURISDICTION IN EFFECT ON THE DATE BIDS ARE RECEIVED.
7. COORDINATE WORK SO THAT INTERFERENCES BETWEEN PIPING, DUCTWORK, EQUIPMENT, PLUMBING WORK, ELECTRICAL WORK, AND BUILDING STRUCTURE WILL BE AVOIDED.
8. FURNISH ACCESS DOORS FOR INSTALLATION IN WALLS AND CEILINGS WHERE ACCESS IS REQUIRED TO CONCEALED MECHANICAL EQUIPMENT, VALVES, CONTROLS AND OTHER DEVICES.
9. COORDINATE THE EXACT LOCATION OF DRAIN AND MECHANICAL EQUIPMENT LOCATIONS WITH MECHANICAL, ARCHITECTURAL, AND STRUCTURAL DRAWINGS PRIOR TO INSTALLATION.
10. RECTANGULAR ELBOWS SHALL BE LONG-RADIUS ELBOWS UNLESS OTHERWISE SHOWN OR NOTED. SUPPLY AIR STANDARD NON-RADIUS 90° ELBOWS SHALL HAVE TURNING VANES.
11. AIR CONDITIONING LOAD CALCULATIONS BASED ON LOCAL CLIMATE DATA. ADJUST UNIT SIZES, AIRFLOW, DUCT SIZES AND AIR DEVICES TO HVAC LOAD CALCULATIONS BASED ON STORE LOCATION. COORDINATE RTU LOCATIONS, DIMENSIONS, AND WEIGHTS WITH STRUCTURAL ENGINEER AND ARCHITECT.

WHATABURGER

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Prototype Version
Q4 2024

△	Date	Description
1	05.01.2025	ProtoProto Update and City Comments

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CERTIFICATE OF AUTHORITY NO. F-20080

Seal / Signature

STATE OF TEXAS — MATTHEW RICHARD CASE — 128362 — LICENSED — PROFESSIONAL ENGINEER

3-13-25

Project Name PT22M

SWQ BROADWAY ST. & DIXIE FARM RD. PEARLAND, TX 77581

Project Number

25045

Description

GENERAL NOTES, SYMBOLS AND ABBREVIATIONS

Scale

12" = 1'-0"

M0.1

KEYNOTES

1. 30/12 SUPPLY DUCT UP TO RTU-2. PROVIDE DUCT TRANSITION AS REQUIRED TO MATCH UNIT CONNECTION SIZE.
2. 24/22 SUPPLY DUCT UP TO RTU-1. PROVIDE DUCT TRANSITOPN AS REQUIRED TO MATCH UNIT CONNECTION SIZE.
3. CONNECT KITCHEN EXHAUST HOOD ABOVE GRILL UP TO KEF-1 WITH 16" DIA. PRE-FABRICATED UL 1978 LISTED AND LABELED GREASE DUCT. PROVIDE TRANSTIONS ABOVE CEILING AS REQUIRED.
4. 16" EXHAUST DUCT UP TO KEF-1 ON ROOF, RE: A1/M2.1
5. 8"x8" EXHAUST DUCT UP TO EF-1.
6. CONNECT KITCHEN EXHAUST HOOD ABOVE FRYER UP TO KEF-2 WITH 12" DIA. PREFABRICATED UL 1978 LISTED AND LABELED GREASE DUCT. PROVIDE TRANSITIONS ABOVE CEILING AS REQUIRED.
7. 12" EXHAUST DUCT UP TO KEF-2 ON ROOF, RE: A1/M2.1
8. FULLY INSULATED CONDENSATE UP THROUGH ROOF. CONDENSATE TO START HORIZONTAL RUN AS CLOSE TO STRUCTURE INSIDE BUILDING AS POSSIBLE.
9. CONDENSATE DOWN TO FLOOR SINK. TERMINATE CONDENSATE WITH 1" AIR GAP.

GENERAL NOTES

A. REFER TO M0.1 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.

B. SMOKE DETECTORS SHALL BE PROVIDED BY THE FIRE ALARM CONTRACTOR AND INSTALLED IN THE SUPPLY AND RETURN SIDES OF RTU. COORDINATE WIRING FOR SHUTDOWN WITH ELECTRICAL SCOPE. MOUNT SMOKE DETECTORS IN ACCESSIBLE LOCATIONS. REFERENCE M6.1 FOR RTU SCHEDULE. ACTIVATION OF SMOKE DETECTORS SHALL SHUT DOWN RTU AND ACTIVATE THE AUDIBLE AND VISUAL SIGNAL PROVIDED.

C. THE PILOT RDM SYSTEM SHALL BE MOUNTED AND INSTALLED FLUSH IN THE MANAGER'S OFFICE AT 5' AFF TO CENTER.

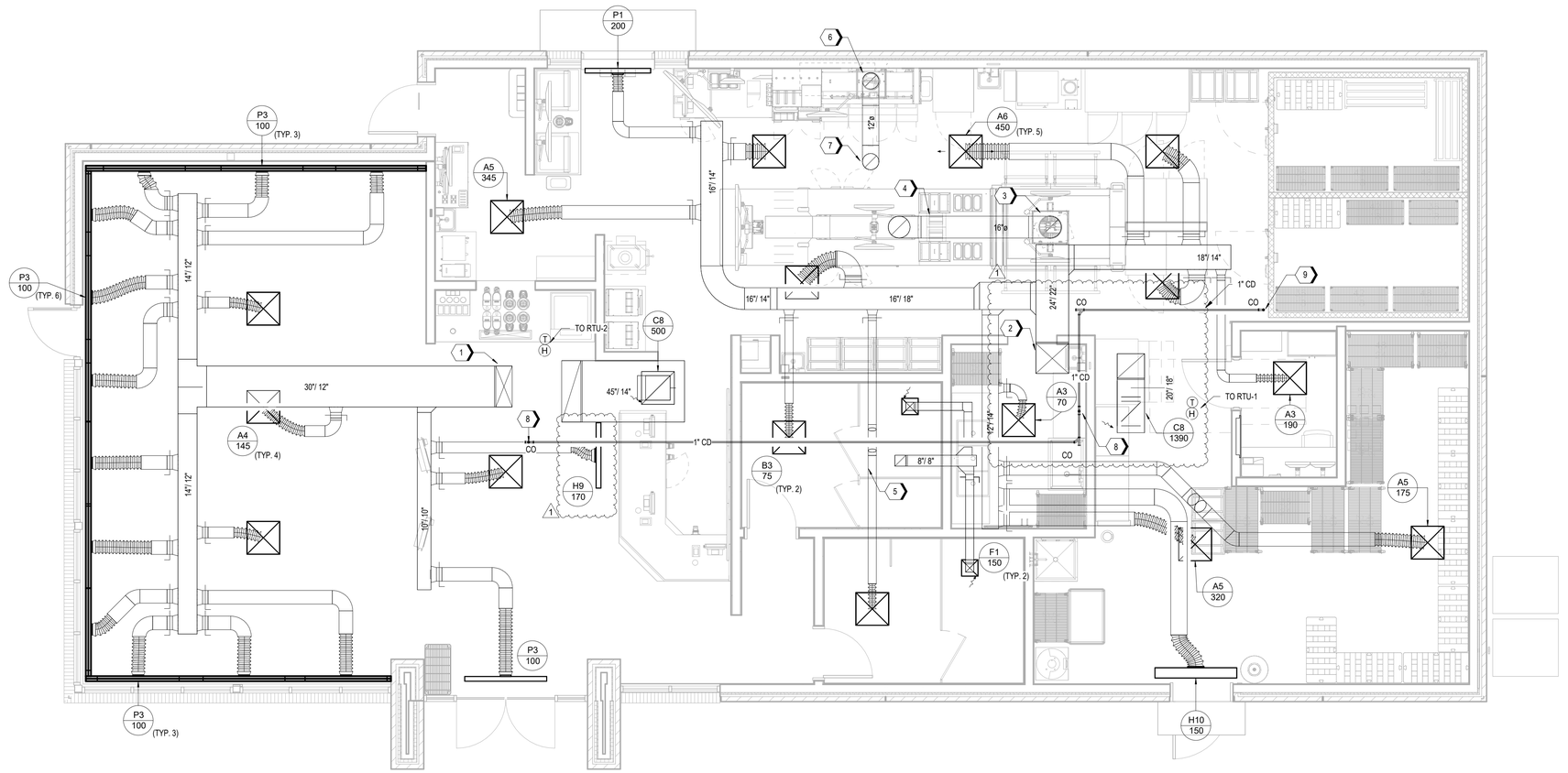
D. PER IECC 2018, PARAGRAPH C408.2.1, A THIRD PARTY SHALL BE HIRED BY THE OWNER AS PART OF THIS PROJECT TO PROVIDE/PERFORM THE FOLLOWING ITEMS:

- A NARRATIVE DESCRIPTION OF THE ACTIVITIES THAT WILL BE ACCOMPLISHED DURING EACH PHASE OF COMMISSIONING, INCLUDING THE PERSONNEL INTENDED TO ACCOMPLISH EACH OF THE ACTIVITES.
- A LISTING OF THE SPECIFIC EQUIPMENT, APPLIANCES OR SYSTEMS TO BE TESTED AND A DESCRIPTION OF THE TESTS TO BE PERFORMED.
- FUNCTIONS TO BE TESTED INCLUDING, BUT NOT LIMITED TO, CALIBRATIONS AND ECONOMIZER CONTROLS.
- CONDITIONS UNDER WHICH THE TEST WILL BE PERFORMED. TESTING SHALL AFFIRM WINTER AND SUMMER DESIGN CONDITIONS AND FULL OUTSIDE AIR CONDITIONS.
- MEASURABLE CRITERIA FOR PERFORMANCE.

E. KITCHEN HOODS, ANSUL FIRE SUPPRESSION SYSTEM AND HOOD CONTROLS SHALL BE OWNER-FURNISHED AND CONTRACTOR-INSTALLED.

F. TEMPERATURE SENSORS "T" AND HUMIDTY SENSORS "H" ARE TO BE CEILING MOUNTED AND TIED INTO THE BUILDING CONTROL SYSTEM.

G. ALL TESTS AND BALANCES TO BE PERFORMED BY A THIRD PARTY - NOT BY MEP SUBCONTRACTOR.



A1 MECHANICAL FLOOR PLAN - LEVEL 1
1/4" = 1'-0"

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1	05.01.2025	ProtoProto Update and City Comments

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128362
LICENSED
PROFESSIONAL ENGINEER
3-13-25

Project Name PT22M

SWQ BROADWAY ST. & DIXIE FARM RD. PEARLAND, TX 77581

Project Number
25045

Description
MECHANICAL FLOOR PLAN

Scale
1/4" = 1'-0"

M1.1

KEYNOTES

1. CENTRIFUGAL UPBLAST GREASE HOOD EXHAUST FAN MOUNTED ON MANUFACTURER PROVIDED ROOF CURB, RE: A2/M5.1
2. CENTRIFUGAL DOWNBLAST EXHAUST FAN MOUNTED ON MANUFACTURER PROVIDED ROOF CURB, RE: A1/M5.1
3. KITCHEN FREEZER CONDENSING UNIT MOUNTED ON ROOFTOP; FURNISHED BY OWNER, COORDINATE EXACT LOCATION ONO SITE AND ROUTE REFRIGERATION (BY OTHERS).
4. KITCHEN REFRIGERATOR CONDENSING UNIT MOUNTED ON ROOFTOP; FURNISHED BY OWNER, COORDINATE EXACT LOCATION ON SITE AND ROUTE REFIGERATION PIPING THROUGH ROOF PENETRATION (BY OTHERS).
5. KITCHEN ICEMAKER CONDENSING UNIT MOUNTED ON ROOFTOP; FURNISHED BY OWNER, COORDINATE EXACT LOCATION ON SITE AND ROUTE REFIGERATION PIPING THROUGH ROOF PENETRATION (BY OTHERS).
6. ROUTE CONDENSATE LINE DOWN THROUGH ROOF. RE:A1/M1.1 FOR CONTINUATION.

GENERAL NOTES

A. REFER TO M0.1 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.

B. SMOKE DETECTORS SHALL BE PROVIDED BY THE FIRE ALARM CONTRACTOR AND INSTALLED IN THE SUPPLY AND RETURN SIDES OF RTU. COORDINATE WIRING FOR SHUTDOWN WITH ELECTRICAL SCOPE. MOUNT SMOKE DETECTORS IN ACCESSIBLE LOCATIONS. REFERENCE M6.1 FOR RTU SCHEDULE. ACTIVATION OF SMOKE DETECTORS SHALL SHUT DOWN RTU AND ACTIVATE THE AUDIBLE AND VISUAL SIGNAL PROVIDED.

C. THE PILOT RDM SYSTEM SHALL BE MOUNTED AND INSTALLED FLUSH IN THE MANAGER'S OFFICE AT 5' AFF TO CENTER.

D. PER IECC 2018, PARAGRAPH C408.2.1, A THIRD PARTY SHALL BE HIRED BY THE OWNER AS PART OF THIS PROJECT TO PROVIDE/PERFORM THE FOLLOWING ITEMS:

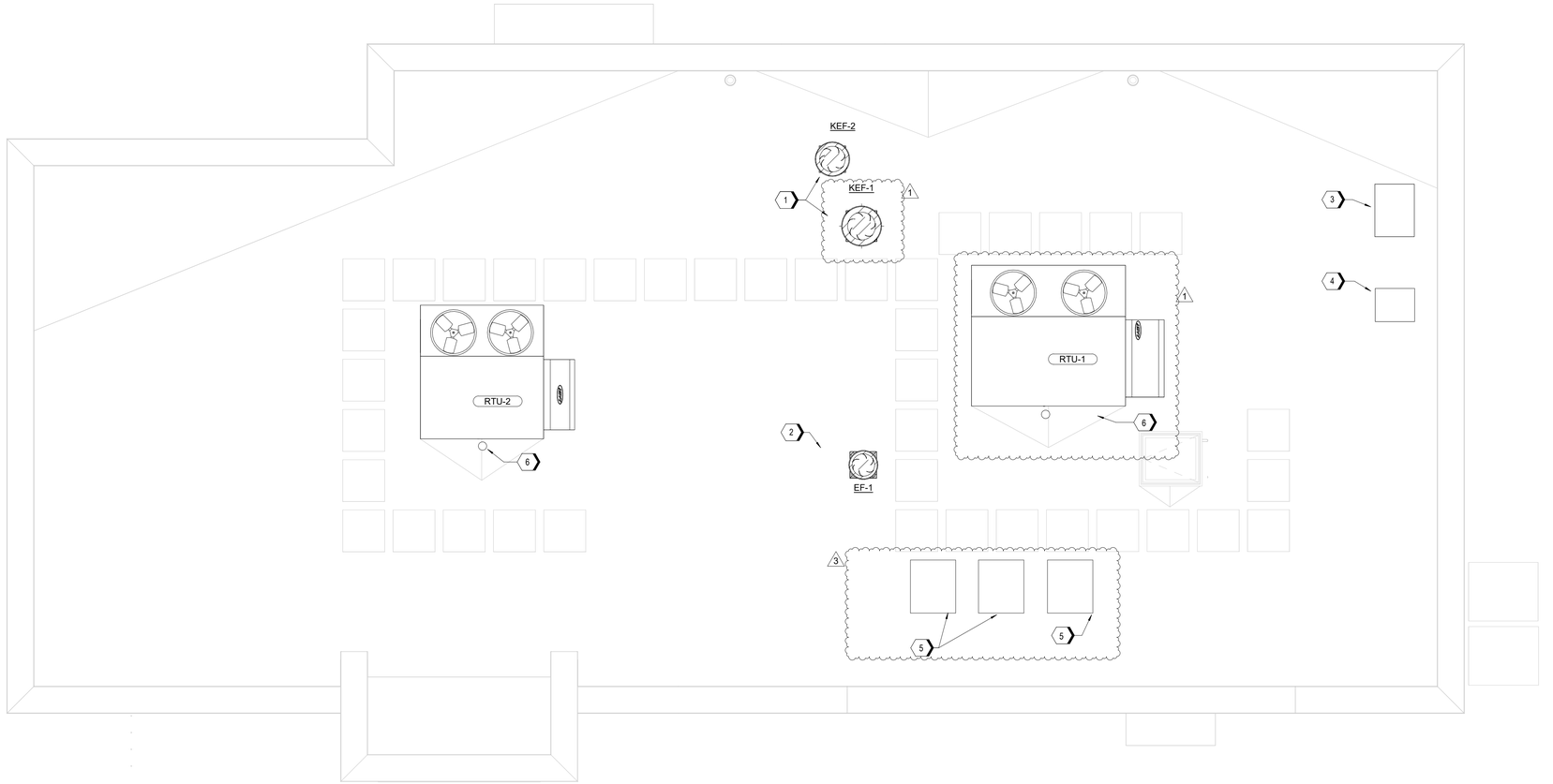
- A NARRATIVE DESCRIPTION OF THE ACTIVITIES THAT WILL BE ACCOMPLISHED DURING EACH PHASE OF COMMISSIONING, INCLUDING THE PERSONNEL INTENDED TO ACCOMPLISH EACH OF THE ACTIVITES.
- A LISTING OF THE SPECIFIC EQUIPMENT, APPLIANCES OR SYSTEMS TO BE TESTED AND A DESCRIPTION OF THE TESTS TO BE PERFORMED.
- FUNCTIONS TO BE TESTED INCLUDING, BUT NOT LIMITED TO, CALIBRATIONS AND ECONOMIZER CONTROLS.
- CONDITIONS UNDER WHICH THE TEST WILL BE PERFORMED. TESTING SHALL AFFIRM WINTER AND SUMMER DESIGN CONDITIONS AND FULL OUTSIDE AIR CONDITIONS.
- MEASURABLE CRITERIA FOR PERFORMANCE.

E. KITCHEN HOODS, ANSUL FIRE SUPPRESSION SYSTEM AND HOOD CONTROLS SHALL BE OWNER-FURNISHED AND CONTRACTOR-INSTALLED.

F. MAINTAIN A MINIMUM CLEARANCE OF 10 FEET BETWEEN OUTSIDE AIR INTAKES AND ANY EXHAUST, FLUES, OR VENTS THROUGH ROOF.

G. ALL TESTS AND BALANCES TO BE PERFORMED BY A THIRD PARTY - NOT BY MEP SUBCONTRACTOR.

H. VERIFY RTU'S ARE LEVEL AND CONDENSATE IS DRAINING PROPERLY.



A1 MECHANICAL ROOF PLAN
1/4" = 1'-0"

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1	05.01.2025	ProtoProto Update and City Comments
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Description
MECHANICAL ROOF PLAN

Scale
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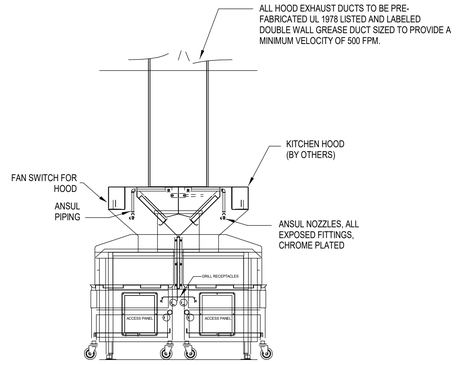
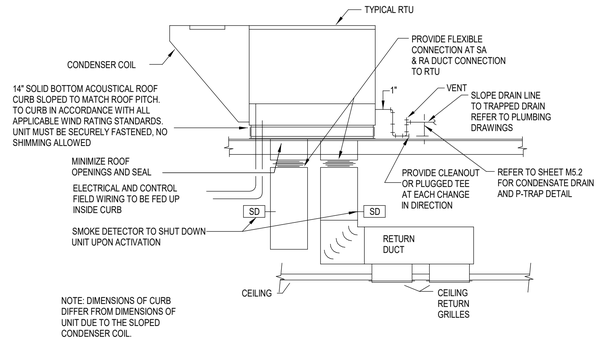
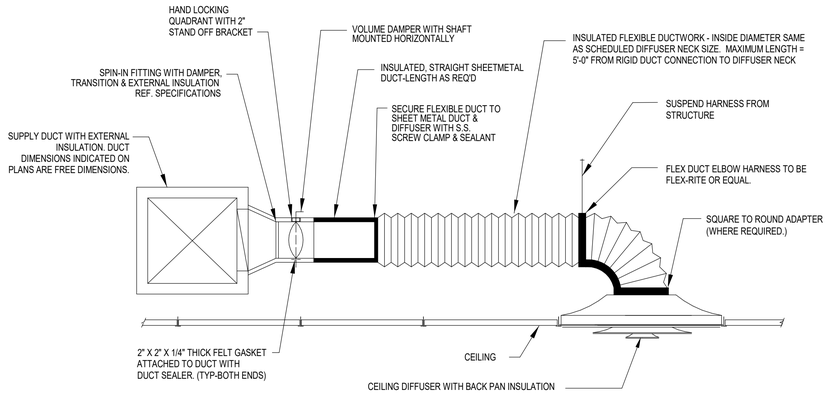
M2.1



C3 LOW PROFILE HOOD DETAIL
N.T.S.

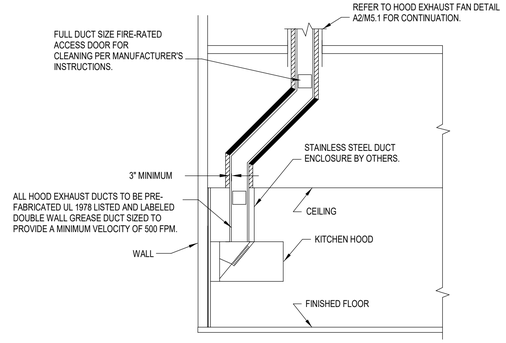


C4 ROOFTOP HVAC UNIT DETAIL
N.T.S.

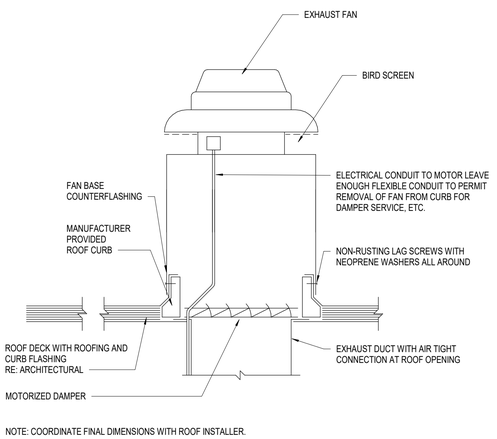


NOTE: INSTALL FLEXIBLE DUCTWORK SUPPORTS AT ALL ROUND NECK OUTLETS/INLETS UNLESS OTHERWISE NOTED ON DRAWINGS.

B2 DIFFUSER CONNECTION DETAIL
N.T.S.

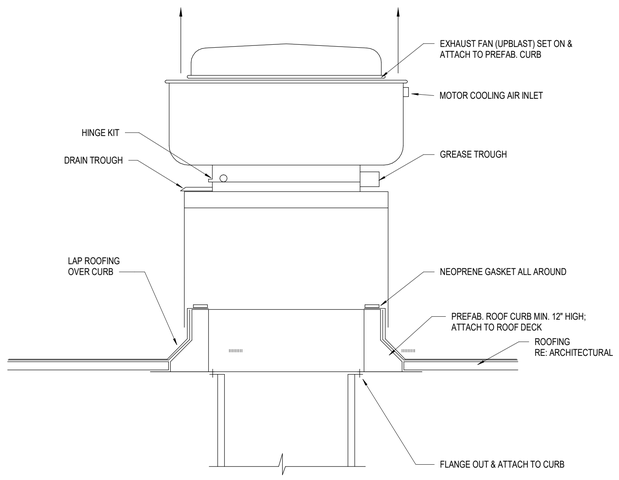


B4 HOOD EXHAUST DUCT DETAIL
N.T.S.

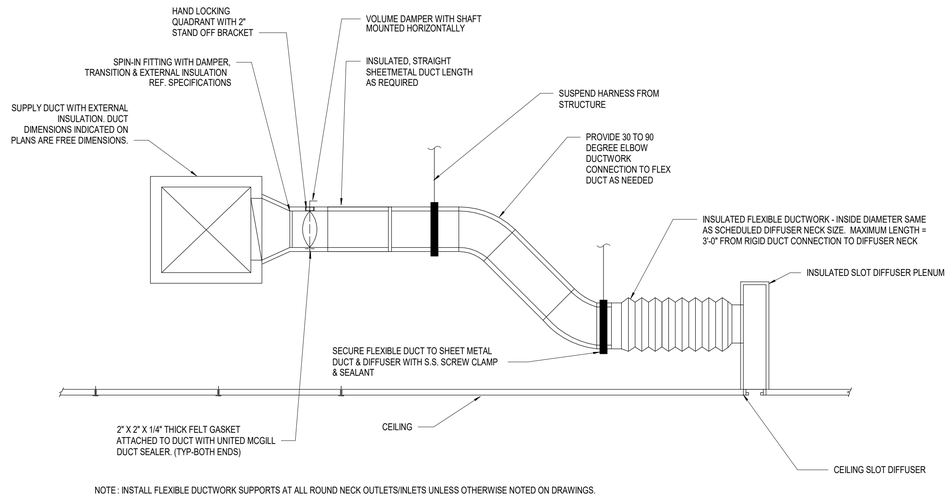


NOTE: COORDINATE FINAL DIMENSIONS WITH ROOF INSTALLER.

A1 ROOF MOUNTED EXHAUST FAN AND CURB DETAIL
N.T.S.



A2 ROOFTOP GREASE EXHAUST FAN DETAIL
N.T.S.



NOTE : INSTALL FLEXIBLE DUCTWORK SUPPORTS AT ALL ROUND NECK OUTLETS/INLETS UNLESS OTHERWISE NOTED ON DRAWINGS.

A3 PLENUM SLOT DIFFUSER DETAIL
N.T.S.

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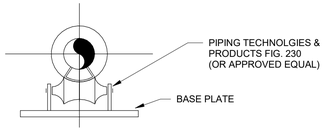
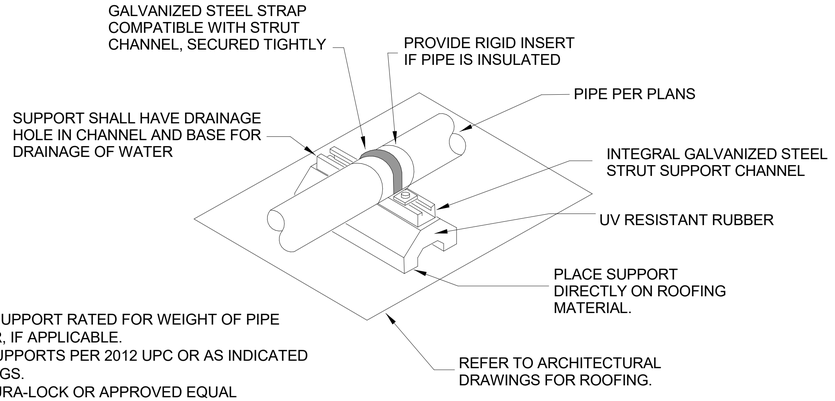
Scale
N.T.S.

M5.1

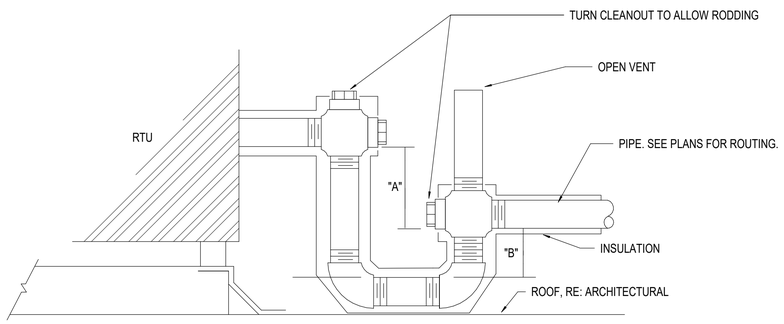


A4 PIPE SUPPORT ROLLER STAND
N.T.S.



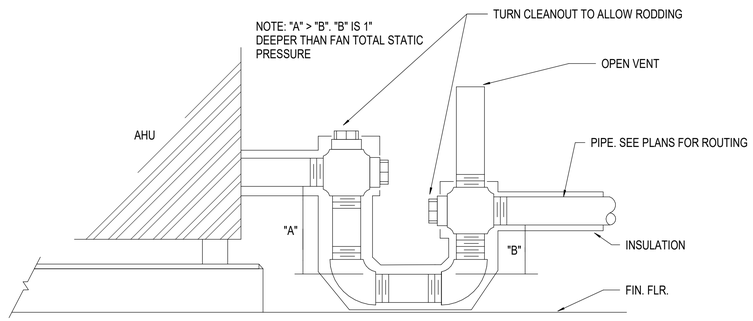
NOTES:
1. SELECT SUPPORT RATED FOR WEIGHT OF PIPE AND WATER, IF APPLICABLE.
2. SPACE SUPPORTS PER 2012 UPC OR AS INDICATED ON DRAWINGS.
3. B-LINE DURA-LOCK OR APPROVED EQUAL

A5 DURA-BLOCK SUPPORT
N.T.S.



NOTE: "A" = TSP+1
"B" = 1/2TSP+1

A1 DRAW-THRU RTU CONDENSATE DRAIN
N.T.S.



A3 BLOW-THRU AHU CONDENSATE DRAIN
N.T.S.

WHATABURGER

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Prototype Version
Q4 2024

△ Date	Description

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Seal / Signature

STATE OF TEXAS
MATTHEW RICHARD CASE
128362
LICENSED
PROFESSIONAL ENGINEER
3-13-25

Project Name PT22M
SWQ BROADWAY ST. & DIXIE FARM RD. PEARLAND, TX 77581

Project Number
25045

Description
MECHANICAL DETAILS

Scale
N.T.S.

M5.2

**THE AMBIENT CONDITIONS FOR THIS PROTOTYPE ARE 105/78 °F DB/WB COOLING AND 20 °F DB HEATING.
CHECK WITH LOCAL ENGINEER FOR REGIONAL CHANGES IN DESIGN CONDITIONS.**

ROOFTOP UNIT SCHEDULE

MARK	RTU-1	RTU-2
SERVES	KITCHEN	DINING
TOTAL AIR (CFM)	3850	2050
OUTSIDE AIR (CFM)	2460	1550
APPROX. EXT S.P. ("WG) *	0.75	0.50
FAN MOTOR (MIN. HP)	3.00	2.00
AMBIENT TEMP. (F)	105	105
COOLING SECTION		
TYPE	DX	DX
REFRIG. TYPE	R-454A	R-454A
FAN RPM	928	1184
ENT. AIR TEMP (DB/WB)	94.2 / 72.6	97.7 / 74.3
LEA. AIR TEMP (DB/WB)	53.1 / 53.1	50.6/50.5
OUTPUT-TOTAL (MBh)	230.3	124.1
OUTPUT-SENS (MBh)	123.0	93.4
HEATING SECTION		
TYPE	GAS	GAS
STAGES	3:1	3:1
ENT. AIR TEMP (DB)	43.5	35.9
LEA. AIR TEMP (DB)	86.6	106.3
INPUT (MBH)	270.0	195.0
OUTPUT (MIN. MBH)	218.0	156.0
ELECTRICAL		
UNIT VOLTS / PHASE	208/3	208/3
MCA	99	68
MOCP	125	80
WEIGHT	2534	1935
FILTER	MERV 8	MERV 8
REFERENCE	CAPTIVEAIRE	CAPTIVEAIRE
MODEL NO.	CAS-HVAC3-20T	CAS-HVAC3-15T
NOTES	1-13	1-13

NOTES:
1. PROVIDE WITH PREMIUM EFFICIENCY MOTORS IN ACCORDANCE WITH NEMA MG-1.
2. PROVIDE WITH SUPPLY AND RETURN SMOKE DETECTORS TO SHUT DOWN UNIT UPON SMOKE DETECTION.
3. PROVIDE WITH TERMINAL STRIP FOR FIELD INSTALLED CONTROLS.
4. UNITS TO BE 2" DOUBLE WALL R-13 CONSTRUCTION WITH 2500 HOUR SALT SPRAY RESISTANT PAINT.
5. UNIT TO HAVE MODULATING HOT GAS REHEAT AND MODULATE HEAT CONTROL.
   MECHANICAL CONTRACTOR RESPONSIBLE FOR INSTALLING (2) FACTORY PROVIDED SUPPLY AIR TEMPERATURE SENSORS.
6. PROVIDE FACTORY INSTALLED HAIL GUARDS
7. PROVIDE 6 ROW DX COIL AND STAINLESS STEEL DRAIN PAN.
8. PROVIDE ULTRA LOW LEAKAGE ECONOMIZER WITH BAROMETRIC RELIEF DAMPER, AND FAULT DETECTION AND DIAGNOSTIC.
9. PROVIDE FACTORY MOUNTED AND WIRED CONDENSATE FLOW SWITCH.
10. PROVIDE STAINLESS STEEL GAS HEAT EXCHANGER WITH MODULATING CONTROL.
11. PROVIDE FACTORY POWERED GFCI CONVENIENCE OUTLET AND NONFUSED DISCONNECT.
12. PROVIDE 14" INSULATED, SOLID BOTTOM CURBED FOR PITCHED ROOF. MECHANICAL CONTRACTOR TO FIELD CUT SUPPLY AND RETURN OPENINGS AS REQUIRED. 1
13. CAPTIVEAIRE UNITS PROVIDED BY WHATABURGER. FACTORY STARTUP IS INCLUDED

EXHAUST FAN SCHEDULE

TAG	TYPE	MANUFACTURER	MODEL	AIR FLOW	TSP (IN W.C.)	RPM	BHP	HP	DRIVE TYPE	VOLTAGE	PHASE	WEIGHT (LBS.)	NOTES
EF-1	ROOF-MOUNTED CENTRIFUGAL DOWNBLAST	GREENHECK	G-080-VG	300 CFM	0.50	1680	0.07	0.10	DIRECT	120	1	44	1,2
KEF-1	ROOF-MOUNTED CENTRIFUGAL UPBLAST	GREENHECK	CUE-140-VG	1995 CFM	1.00	1517	0.66	0.75	DIRECT	208	1	119	2,3,4,6
KEF-2	ROOF-MOUNTED CENTRIFUGAL UPBLAST	GREENHECK	CUE-120-VG	1216 CFM	0.75	1415	0.26	0.50	DIRECT	208	1	96	2,3,5,6

NOTES:
1. PROVIDE INSULATED 12" ROOF CURB.
2. PROVIDE WITH INTEGRAL DISCONNECT SWITCH.
3. PROVIDE GREASE BOX.
4. PROVIDE INSULATED AND VENTED 26" SQUARE ROOF CURB.
5. PROVIDE INSULATED AND VENTED 22" SQUARE ROOF CURB.
6. PROVIDE HINGED ACCESS KIT.

AIR DEVICE SCHEDULE

TAG	MANUFACTURER	MODEL	FACE SIZE	NECK SIZE (IN.)	MAX NC	PATTERN	MOUNTING	SLOT LENGTH	SLOT WIDTH	SLOT QTY	SYSTEM CLASSIFICATION	COMMENTS
A3	TITUS	TMS	24 X 24	6	30	4-WAY	LAY-IN	-	-	-	SUPPLY AIR	1
A4	TITUS	TMS	24 X 24	8	30	4-WAY	LAY-IN	-	-	-	SUPPLY AIR	1
A5	TITUS	TMS	24 X 24	10	30	4-WAY	LAY-IN	<varies>	<varies>	<varies>	SUPPLY AIR	1
A6	TITUS	TMS	24 X 24	12	30	4-WAY	LAY-IN	-	-	-	SUPPLY AIR	1
B3	TITUS	TMS	24 X 24	6	30	4-WAY	FLANGE	-	-	-	SUPPLY AIR	1,2
C8	TITUS	350FLF1	24 X 24	18 X 18	30	4-WAY	LAY-IN	-	-	-	RETURN AIR	
F1	TITUS	50F	12 X 12	6 X 6	30	4-WAY	FLANGE	-	-	-	EXHAUST AIR	2
H9	TITUS	TBDI-30	48 X 3-1/2	8	30	2-WAY	FLANGE	60	3/4	2	SUPPLY AIR	3
H10	TITUS	TBDI-80	60 X 7-1/2	12	30	2-WAY	FLANGE	60	1-1/2	3	SUPPLY AIR	3
L1	TITUS	FL-15-JT	SEE PLANS		30	1-WAY	FLANGE	CONTINUOUS	1-1/2	1		4
P1	TITUS	FBPI	48 X 3-1/2	8	30	-	FLANGE	60	-	-	SUPPLY AIR	3
P3	TITUS	FBPI	60 X 3-1/2	8	30	-	FLANGE	60	-	-	SUPPLY AIR	3

NOTES:
1. PROVIDE BACKPAN INSULATION.
2. PROVIDE PLASTER FRAME FOR MOUNTING IN GYP. CEILING.
3. PROVIDE INSULATED PLENUM.
4. CONTINUOUS LINEAR SLOT DIFFUSER TO BE INSTALLED IN GYP. CEILING. PROVIDE INSULATED SUPPLY AIR PLENUMS AS SCHEDULED FOR A COMPLETE SYSTEM.

KITCHEN HOOD SCHEDULE

Manufacturer	Model	Description	Exhaust Vent Diameter	Exhaust Volume
H&K DALLAS INC.	CUSTOM	87" DOUBLE SIDED GRILL HOOD	1' - 4"	1994 CFM
H&K DALLAS INC.	CUSTOM	10 BASKET FRYER HOOD	1' - 0"	1216 CFM

AIR BALANCE AND VENTILATION CALCULATION:

TOTAL OUTSIDE AIR INTAKE = 4010 CFM

TOTAL GREASE HOOD EXHAUST = 3210 CFM
TOTAL RESTROOM EXHAUST = 300 CFM

OUTSIDE AIRFLOW - (GREASE HOOD EXHAUST AIRFLOW + RESTROOM EXHAUST AIRFLOW) = NET POSITIVE AIRFLOW

4010 CFM - (3210 + 300) = 500 CFM

FLEX DUCT SCHEDULE

CFM RANGE	SIZE (DIAMETER) *
< 50	5
51 - 100	6
101 - 250	8
251 - 400	10
401 - 650	12
651 - 900	14
901 - 1300	16
1301 - 1800	18
1801 - 2300	20

* ALL FLEX DUCT SHALL BE SIZED IN ACCORDANCE W/ FLEX DUCT SCHEDULE. PROVIDE RIGID REDUCER AT NECK OF AIR DEVICE, VAV INLET DUCT, ETC. TO TRANSITION FROM FLEX DUCT SIZE TO DIFFUSER INLET AND/OR EQUIPMENT CONNECTION SIZE. FLEX DUCT NOT TO EXCEED 5ft.

ELECTRIC UNIT HEATER SCHEDULE

MARK	MANUFACTURER & MODEL NO	CFM	FAN MOTOR HP	TOTAL WATTS	BTU	VOLTS	PH	FLA	REMARKS
EUH-1	BERKO HUHAA520	350	-	5 KW	17065	208	3	24	1,2
NOTES:									
1.	PROVIDE INTEGRAL ON/OFF SETPOINT THERMOSTAT, WALL BRACKET MOUNTING KIT FOR WALL MOUNTING AND FACTORY DISCONNECT SWITCH.								
2.	SURFACE, BUILT-IN DISC. & T-STAT W/TAMPER PROOF COVER								

WHATABURGER

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Q4 2024

△	Date	Description
1	05.01.2025	ProtoProto Update and City Comments
3	07.30.2025	2025 Q2 Proto Update

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Project Number
25045

Description
MECHANICAL SCHEDULES

Scale
12" = 1'-0"

M6.1

CONTROL SYMBOLS

AE	ANALYZER ELEMENT
DDC	DIRECT DIGITAL CONTROL
BMS	BUILDING MANAGEMENT SYSTEM
RDC	ROOFTOP UNIT DDC CONTROLLER
FACP	FIRE ALARM CONTROL PANEL
DPI	DIFFERENTIAL PRESSURE INDICATOR
DPS	DIFFERENTIAL PRESSURE SWITCH
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
FE	FLOW ELEMENT
FLTR	FILTER
FS	FLOW SWITCH
H	HUMIDISTAT
HL	HIGH TEMPERATURE LIMIT SWITCH
M	MOTOR
PCV	PRESSURE CONTROL VALVE
PT	PRESSURE TRANSMITTER
SMK	SMOKE DETECTOR
T	TEMPERATURE SENSOR
TCV	TEMPERATURE CONTROL VALVE
TSL	LOW LIMIT THERMOSTAT (FREEZESTAT)
TT	TEMPERATURE TRANSMITTER
VFD	VARIABLE FREQUENCY DRIVE
STARTER	MOTOR STARTER (PROVIDE CONTROL RELAY)
CT	CURRENT TRANSDUCER
OS	OCCUPANCY SENSOR
CO	CARBON MONOXIDE SENSOR
	COMMUNICATION SIGNAL
HPS	HIGH STATIC PRESSURE SENSOR
DA	DAMPER ACTUATOR
CV	CONTROL VALVE
DX	DX COOLING COIL
HC	NATURAL GAS HEATING COIL
HGR	HOT GAS REHEAT
SF	SUPPLY AIR FAN

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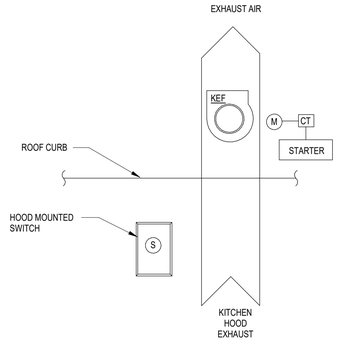


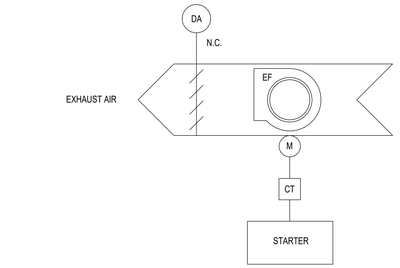
SEQUENCE OF OPERATION

OPERATING CONDITIONS - CONTINUOUS 24/7:
THE KITCHEN HOOD EXHAUST FAN SHALL RUN CONTINUOUSLY WHEN THE KITCHEN HOOD MOUNTED SWITCH IS ON.

INTEGRATED ANSUL FIRE SUPPRESSION SYSTEM
UPON ACTIVATION OF THE INTEGRATED ANSUL FIRE SUPPRESSION SYSTEM DURING NORMAL KITCHEN OPERATION, THE KITCHEN HOOD EXHAUST FAN SHALL REMAIN ENERGIZED.

FIRE/SMOKE CONTROL:
UPON SENSING DUCT SMOKE, THE KITCHEN EXHAUST FAN SHALL BE CYCLED OFF. FAN STATUS SHALL BE REPORTED TO THE BAS.

C2 KITCHEN HOOD EXHAUST FAN CONTROL DIAGRAM
N.T.S.

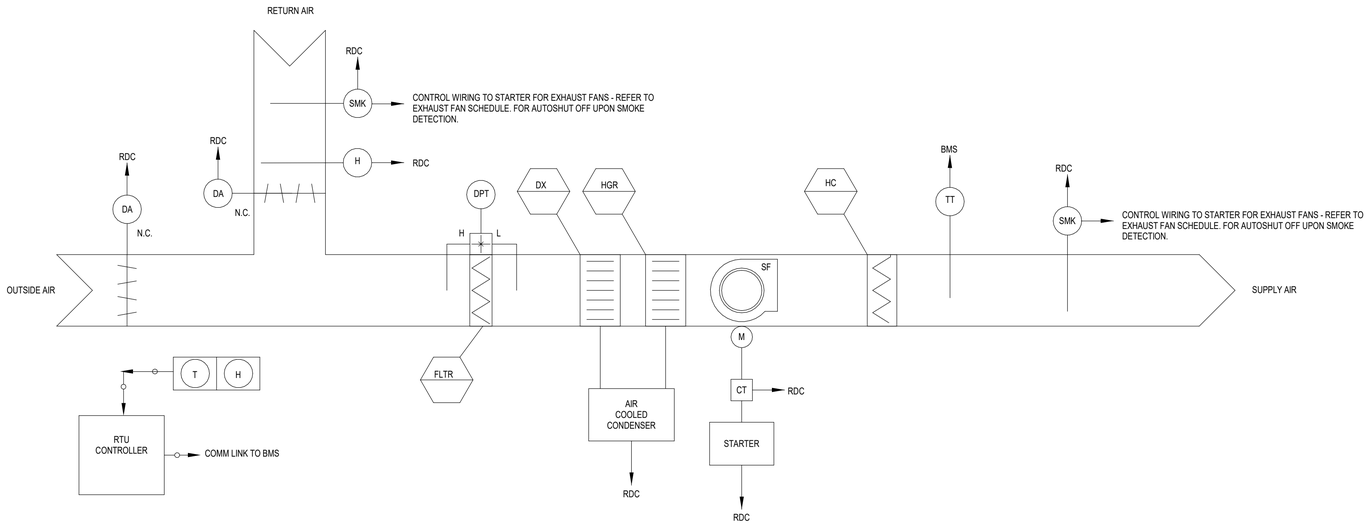


SEQUENCE OF OPERATION

OPERATING CONDITIONS:
THE GENERAL EXHAUST FAN SHALL BE INTERLOCKED WITH THE RESTROOM OCCUPENCY SENSORS. THE EXHAUST FAN SHUTOFF DAMPER SHALL BE INTERLOCKED WITH THE EXHAUST FAN TO OPEN WHEN THE FAN IS ENERGIZED AND CLOSE WHEN THE FAN IS DE-ENERGIZED

ALARMS:
ALARMS SHALL BE PROVIDED AS FOLLOWS:
1. FAN FAILURE: FAN COMMANDED ON BUT STATUS IS OFF.
2. FAN IN HAND: FAN COMMANDED OFF BUT STATUS IS ON.
3. FAN BELT FAILURE: MOTOR AMPERAGE READS ZERO AS MEASURED BY CURRENT TRANSDUCER.

C3 GENERAL EXHAUST FAN CONTROL DIAGRAM
N.T.S.



SEQUENCE OF OPERATION

OPERATING CONDITION - CONTINUOUS 24/7

THE PILOT RTU CONTROLLER (RDC) SHALL PERFORM ALL CONTROL, SAFETY AND INTERLOCKS AS DESCRIBED IN THE SEQUENCE OF OPERATION. THE BMS SHALL MONITOR THE RTU DDC CONTROLLER VIA BMS PROTOCOL COMMUNICATION AND/OR COMBINATION OF DISCRETE INPUT/OUTPUT POINTS. THE BMS SHALL OPERATE THE UNIT CONTINUOUS 24/7. WHEN THE UNIT IS DE-ENERGIZED BY THE BMS, THE FAN SHALL SHUT DOWN, THE OA DAMPER SHALL CLOSE. THE REFRIGERATION SYSTEM SHALL ALSO BE DE-ENERGIZED AND THE HEATING SYSTEM LOCKED OUT OF HEATING MODE.

TEMPERATURE CONTROL
OCCUPIED MODE - THE BMS WILL MAINTAIN THE FOLLOWING SPACE TEMPERATURE SETPOINTS:
- COOLING: 75°F (ADJUSTABLE)
- HEATING: 70°F (ADJUSTABLE)

HUMIDITY CONTROL
IF THE RELATIVE HUMIDITY OF THE RETURN AIR EXCEEDS 60% (ADJUSTABLE) AND THER IS NO CALL FOR COOLING IN THE SPACE, THE RDC SHALL ENABLE DEHUMIDIFICAITON MODE OF THE RTU BASED ON ITS OWN INTERNAL CONTROLS UTILIZING HOT GAS REHEAT.

ECONOMIZER OPPERATION
BASED ON THE RTU INTERNAL CONTROLS, THE RDC SHALL VARY THE OUTSIDE AIR DAMPER POSTION, BASED ON CALL FOR COOLING IN THE SPACE. THERE SHALL BE ONE FAN SPEED. THE RDC SHALL LOAD AND UNLOAD COMPRESSORS BASED ON THE UNIT INTERNAL CONTROLS TO CONDITION OR DEHUMIDIFY THE SPACE AS NEEDED.

SEQUENCE OF OPERATION [CONTINUED]

THE BMS SHALL BE PROGRAMMED SO THAT THE HEATING AND COOLING SYSTEMS SHALL NEVER OPERATE SIMULTANEOUSLY.

UNIT SHUTDOWN:
UNIT SHALL BE DE-ENERGIZED UPON DETECTION OF SMOKE IN DUCT OR BUILDING FIRE ALARM.

ALARMS
THE BMS SHALL MONITOR ALL SAFETIES ON THE REFRIGERATION SYSTEM AND THE HEATING SYSTEM THROUGH THE RDC COMMUNICATION PROTOCOL. ALL ABNORMAL CONDITIONS SHALL BE ALARMED AT THE BMS.

A. FILTERS
THE RDC SHALL MONITOR THE STATIC PRESSURE DROP ACROSS THE FILTER BANK AND ALARM ON HIGH STATIC PRESSURE DROP. A DIFFERENTIAL PRESSURE SWITCH ACROSS THE FILTER SHALL INITIATE FILTER ALARM WHEN THE PRESSURE DROP ACROSS THE FILTER REACHES THE SETPOINT OF 1.0 INCHES W.C. (ADJUSTABLE).

B. FIRE/SMOKE CONTROL
UPON ACTIVATION OF A DUCT SMOKE DETECTOR, THE BMS SHALL RECEIVE AN ALARM.

C. GENERAL ALARM
ANY TROUBLE ALARM OR FAULT WITHIN THE UNIT ONBOARD CONTROLS WILL GENERATE A GENERAL ALARM TO THE BMS.

A1 PACKAGED ROOFTOP UNIT CONTROLS DIAGRAM
N.T.S.

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Description
MECHANICAL CONTROLS

Scale
As indicated

M7.1