ROOFTOP UNITS

UNIT NO.	TONAGE	SUPPLY (CFM)	O.A. (CFM)	EXT. S.P. (IN. W.G.)	COOLING TOTAL (MBH)	COOLING SENS. (MBH)	EWB	GAS HEATING (2 STAGE) INPUT (MBH) 1st	INPUT (MBH) 2nd	OUTPUT (MBH) 1st	OUTPUT (MBH) 2nd	ELECTRICAL VOLT	PHASE	HZ	M.O.C.P.	DISC. F.L.A.	FANS (F.L.A.) INSIDE	FANS (F.L.A.) OUTSIDE	COMPRESSOR KW	COMPRESSOR R.L.A.	WEIGHT (LBS)	SERVING
RTU #1	5.0	1610	450	0.50	50.5	36.9	67	60	—	49	—	208	3	60	40	32	5.9	1.4	6.7	16.0	490	LOBBY
RTU #2	15.0	5250	2610	0.50	176.4	123.4	67	120	150	96	120	208	3	60	110	—	15.8	1.7	16.3	32.1/21.7	1800	SANCTUARY
RTU #3	12.5	3820	2100	0.50	148.3	101.6	67	82	115	65.6	92	208	3	60	70	65	10.6	1.4	14.3	19.0	1050	FELLOWSHIP
RTU #4	15.0	5250	2610	0.50	176.4	123.4	67	120	150	96	120	208	3	60	110	—	15.8	1.7	16.3	32.1/21.7	1800	SANCTUARY
RTU #5	5.0	1520	520	0.50	103.2	83.7	67	60	—	49	—	208	3	60	40	32	5.9	1.4	6.7	16.0	490	OFFICES

AIR HANDLING UNITS SHALL BE A PACKAGED FACTORY FABRICATED UNIT COMPLETE WITH DX COOLING COIL, GAS HEATING, CENTRIFUGAL FAN DISCHARGE SECTION, WITH DISPOSABLE FILTER. UNIT RTU #2, RTU #3 AND RTU #4 SHALL BE CAPABLE OF OPERATING ON ECONOMY CYCLE AS DISCRIBED IN THE SEQUENCE OF OPERATION. UNIT RTU #2, AND RTU #4 SHALL BE EQUIPED WITH A POWER EXHAUST FAN FOR RELIEF AIR. USE TRANE, CARRIER OR APPROVED EQUAL.

DIFFUSER SCHEDULE

DIM.	CFM RANGE	NECK SIZE	MAX. TOTAL PRESS. DROP (W.G.)	N.C.	REMARKS
8"x 8"	0 - 100	6"	.08	20	REFER TO NOTE BELOW
12"x 12"	101 - 200	8"	.08	20	REFER TO NOTE BELOW
15"x 15"	201 - 400	10"	.08	20	REFER TO NOTE BELOW
18"x 18"	401 - 600	12"	.09	20	REFER TO NOTE BELOW

NOTE:
ALL DIFFUSERS TO HAVE A 24"x 24" PERFORATED FACE PLATE TYPE UNLESS NOTED OTHERWISE.
PROVIDE MATCHING RETURN AIR GRILLES WHERE INDICATED. DIFFUSER TO BE OF STEEL CONSTRUCTION, AS MANUFACTURED BY CARNES, KREUGER, TITUS, TUTTLE OR APPROVED EQUAL.

LINEAR DIFFUSER SCHEDULE

NO.	TYPE	CFM	LENGHT	AIR FLOW (CFM/FT)	MAX. TOTAL PRESS. DROP (W.G.)	N.C.	REMARKS
LD-1	3-SLOT	810	4ft.	200	.08	20	REFER TO NOTE BELOW

DIFFUSER TO BE OF STEEL CONSTRUCTION, AS MANUFACTURED BY CARNES, KREUGER, TITUS, TUTTLE OR APPROVED EQUAL.

KITCHEN HOOD EXHAUST FAN

UNIT NO.	SERVING	TOTAL CFM	CFM/FT	STATIC PRESSURE	HP	ELECTRIC V	ELECTRIC Ø	ELECTRIC FLA
KEF #1	KITCHEN HOOD	2000	250	-1.50	0.500	208	1	3.4

NOTE: USE PENN VENTILATION VERTICAL UP-BLAST FUMEX FANS, OR APPROVED EQUAL. FANS SHOULD BE DIRECT DRIVE MODEL.

EXHAUST SCHEDULE

NO	CAPACITY (CFM)	S.P. (IN. W.G.)	RPM	HP (WATTS)	VOLT	PHASE	H_Z	TYPE	DRIVE	SERVING
TEF #1	75	0.25	1050	(47)	120	1	60	CEILING	IN-LINE	PASTOR'S OFF. TOILET
TEF #2	75	0.25	1050	(47)	120	1	60	CEILING	IN-LINE	CHOIR RM. TOILET
PRV #1	450	0.25	1500	1/6	120	1	60	ROOF	DIRECT	BASEMENT
PRV #2	375	0.25	1500	1/6	120	1	60	ROOF	DIRECT	GROUND FLOOR
EF #1	100	0.25	1050	(47)	120	1	60	CEILING	IN-LINE	JANITOR CLOSET
EF #2	150	0.25	1050	(47)	120	1	60	CEILING	IN-LINE	ELECTRICAL RM.
EF #3	400	0.25	1500	1/6	120	1	60	CEILING	DIRECT	ELEVATOR MACH. ROOM

EXHAUST FAN SHALL BE A BELT DRIVE CENTRIFUGAL INLINE FAN.
USE PENN VENTILATION, GREENHECK, CARNES, OR APPROVED EQUAL

FURNACE SCHEDULE

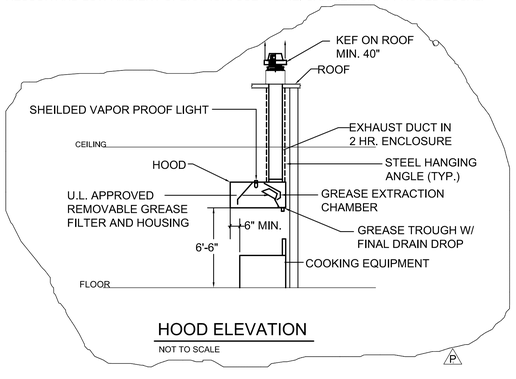
NO	QUANTITY	SUPPLY (CFM)	O.A. (CFM)	EXT. S.P (IN W.G.)	COOLING SENS. (MBH)	COOLING TOTAL (MBH)	COOLING EWB	HEATING OUTPUT (MBH)	HEATING INPUT (MBH)	ELECTRICAL VOLT	ELECTRICAL PHASE	ELECTRICAL HZ	LOCATION
F-1	1	1,450	1000	.5	60	90	68	55.8	60	115	1	60	MECHANCAL RM.
F-2	1	1,450	1000	.5				55.8	60	115	1	60	MECHANCAL RM.
F-3	1	1,450	1000	.5	60	90	68	55.8	60	115	1	60	MECHANCAL RM.
F-4	1	1,450	1000	.5				55.8	60	115	1	60	MECHANCAL RM.

- EACH FURNACE SHALL BE 92% MINIMUM EFFICIENCY, DIRECT VENT CONDENSING TYPE FURNACE. USE CARRIER MODEL 58MXA OR EQUAL.
- EACH UNIT SHALL BE COMPLETE WITH ELECTRONIC AIR CLEANER, FILTER, HUMIDFIER AND DX COOLING COIL.
- UNIT F-1, F-2 AND F-3, F-4 SHALL BE A FURNACE TWINING KIT COMPLETE WITH SINGLE DX COOLING.

CONDENSER SCHEDULE

NO	CAPACITY (MBH)	ENT. AIR °F	LOW TEMP. °F	FAN (CFM)	ELECTRICAL HP	ELECTRICAL VOLT	ELECTRICAL PHASE	ELECTRICAL COMPRESSOR kW	SERVING
C-1	90	95	0	3,000	1/4	208	3	8.14	F-1 & F-2
C-2	90	95	0	3,000	1/4	208	3	8.14	F-3 & F-4

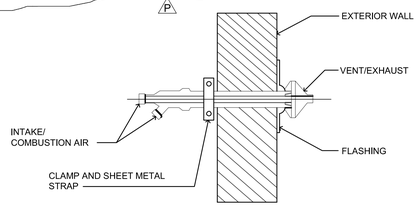
- CONDENSING UNIT SHALL BE AN AIR-COOLED UNIT W/ CONDENSER FAN, SEMI-HERMETIC COMPRESSOR AND LOW AMBIENT OPERATION. USE TRANE, CARRIER OR APPROVED EQUAL.



HOOD ELEVATION

NOT TO SCALE

NOTE:
KITCHEN HOOD SHALL BE CAPTIVEAIRE CO.
MODEL: SND -8FT., LONG
CAPABLE OF 250 CFM / FT. @ 450° COOKING TEMPERATURE



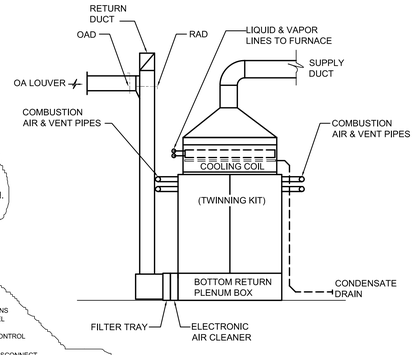
CONCENTRIC WALL VENT DETAIL

N.T.S.

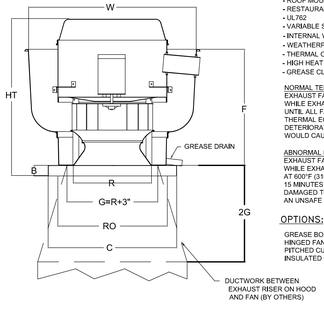
NOTE:
PROVIDE A HORIZONTAL DIRECT VENT SYSTEM WITH CONCENTRIC AIR INTAKE/FLUE. FLUE PIPE MATERIAL AND HORIZONTAL VENT CAP SHALL BE SUPPLIED BY MANUFACTURER.

CONSTRUCTION NOTES

1. DUCT SHALL BE 16 GAUGE GALVANIZED STEEL. ALL JOINTS AND SEAMS SHALL BE WELDED LIQUID-TIGHT
2. DUCT SHALL BE COATED WITH TWO HOUR WIRE PROTECTION MATERIAL USING VERMICULITE OR EQUAL.
3. HOOD SHALL BE CONSTRUCTED OF 18 GAUGE GALVANIZED STEEL.
4. PROVIDE FIELD-INSTALLED STAINLESS STEEL WRAPPER TO ENCLOSE DUCTWORK COMPLETE TO FINISHED CEILING.
5. PROVIDE ANSUL FIRE SUPPRESSION SYSTEM WITH REMOTE MOUNTED AGENT TANKS AND REMOTE MANUEL PULL STATION.
6. HOOD & DUCT SYSTEM SHALL COMPLY WITH N.F.P.A.17 & N.F.P.A.96.



SND SERIES UPBLAST EXHAUST FANS (UL762)



FEATURES:
- ROOF MOUNTED FANS
- RESTAURANT MODEL
- UL762
- VARIABLE SPEED CONTROL
- INTERNAL WIRING
- WEATHERPROOF DISCONNECT
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE)
- HIGH HEAT OPERATION 450°F (149°C)
- GREASE CLASSIFICATION TESTING

NORMAL TEMPERATURE TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 450°F UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

ABNORMAL FLARE-UP TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

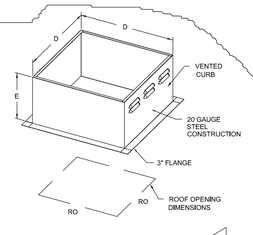
OPTIONS:
GREASE BOX
HINGED FAN
PITCHED CURB
INSULATED CURB

DUL/HFA DIRECT DRIVE
CENTRIFUGAL UP-BLAST EXHAUST FANS DIMENSIONAL DATA

FAN MODEL	HT	W	B	C	F	R	RO	WEIGHT LB
DU50L/HFA	26 3/4	28 7/8	1 1/2	21	21 1/2	13 1/4	17 1/2	55

TWINNING UNIT DETAIL

N.T.S.

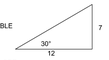


CURB DIMENSIONAL DATA

FAN MODEL	D	E
DU50L/HFA	19 1/2	20

PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE



MECHANICAL NOTES

1. THE CONTRACTOR SHALL LAY HIS OWN WORK AND COORDINATE WORK WITH THAT OF OTHER TRADES AND BE RESPONSIBLE FOR ALL MEASUREMENTS.
2. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE REQUIREMENTS OF INTERNATIONAL MECHANICAL CODE (IMC), AND MARYLAND BUILDING CODES.
3. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS AND PAY FOR ALL FEES CHARGES, AND PERMITS REQUIRED, AS WELL AS FOR ALL HAULING, RIGGING AND TRANSPORTATION CHARGE.
4. THE CONTRACTOR SHALL GUARANTEE AND SERVICE ALL WORKMANSHIP AND MATERIALS TO BE AS REPRESENTED BY HIM AND SHALL REPAIR OR REPLACE, AT NO ADDITIONAL COST TO THE OWNER, ANY PART THEREOF WHICH MAY BECOME DEFECTIVE WITHIN THE PERIOD OF ONE YEAR AFTER THE DATE OF FINAL ACCEPTANCE BY THE OWNER.
5. AT THE COMPLETION OF WORK, ALL SYSTEMS SHALL BE TESTED AND PROVED TO BE OPERATING IN ACCORDANCE WITH THE CAPACITY INDICATED AND PER THE MANUFACTURER'S RECOMMENDATIONS.
6. TURNING VANES SHALL BE USED AT ALL SQUARE ELBOWS ON SUPPLY DUCTS. VANES SHALL BE INSTALLED AS RECOMMENDED BY MANUFACTURER.
7. INSULATE ALL SUPPLY DUCTWORK WITH A MINIMUM 1" FIBERGLASS INSULATION. INSULATION OF ALL DUCTWORK, EQUIPMENT AND PIPING SHALL BE IN ACCORDANCE WITH WITH THE CONTRACT SPECIFICATION AND MANUFACTURER'S INSTRUCTIONS AND SHALL COMPLY WITH CURRENT CODES.
8. PATCH AND SMOOTH ALL HOLES IN EXISTING FLOOR, CEILING, AND WALL SURFACES CAUSED BY ALTERATIONS OR INSTALLATION OF EQUIPMENT.
9. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION OF DUCTWORK AND DIFFUSERS PRIOR TO ANY DEMOLITION. CONNECT NEW DIFFUSERS TO EXISTING DUCT.
10. INTERIOR DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED SHEET STEEL OF PROPER GAUGE PER DUCT DIMENSION AS RECOMMENDED FOR LOW VELOCITY CONSTRUCTION BY THE ASHRAE GUIDE AND DATA BOOK, SMACNA LOW PRESSURE DUCT CONSTRUCTION STANDARD AND NFPA PAMPHLET #90A.
11. THE CONTRACTOR SHALL PROCURE THE SERVICES OF AN INDEPENDENT AIR BALANCE AND TESTING AGENCY, APPROVED BY THE CONTRACTING OFFICER, WHICH SPECIALIZES IN BALANCING AND TESTING OF HVAC SYSTEMS. ADJUST AIR TERMINALS TO PROVIDE AIR FLOWS AS DESIGNED AND SUBMIT WRITTEN REPORT.

SEQUENCE OF OPERATIONS (RTU#1-5)

TEMPERATURE CONTROL SHALL BE MAINTAINED BY MEANS OF A WALL MOUNTED 24 Hr. 7 DAY PROGRAMMABLE MICRO ELECTRONIC THERMOSTAT, (T), LOCATED AS SHOWN ON DRAWINGS. THERMOSTAT SHALL BE CAPABLE OF SUMMER/WINTER CHANGEOVER, SEQUENCING FOR ECONOMY CYCLE COOLING AND NIGHT SET-BACK.

WINTER - ON A FALL IN ROOM TEMPERATURE, BELOW THE SET POINT, ROOM THERMOSTAT, T, SHALL ACTIVATE IT'S RESPECTIVE GAS CONTROL VALVE AND ELECTRONIC IGNITION TO IGNITE THE MAIN BURNERS, AFTER THE HEAT EXCHANGE REACHES IT'S SET POINT, THE INDOOR FAN RELAY SHALL AUTOMATICALLY ACTIVATE THE INDOOR BLOWER, ON A RISE IN ROOM TEMPERATURE, THERMOSTAT, T SHALL DEACTIVATE BURNERS. AFTER THE HEAT EXCHANGER FALLS BELOW IT'S SET TEMPERATURE, THE INDOOR FAN RELAY SHALL DEACTIVATE THE BLOWER.

SUMMER - ON A RISE IN ROOM TEMPERATURE ABOVE THE SET POINT, ROOM THERMOSTAT, T, SHALL CLOSE IT'S CONTACTS TO ACTIVATE THE COMPRESSOR, THE CONDENSER FAN AND THE INDOOR BLOWER. THE OUTDOOR AIR DAMPER, RETURN AIR DAMPER, AND EXHAUST AIR DAMPER SHALL OPEN TO THEIR MINIMUM POSITION SETTINGS, AND THE COOLING CONTACTS CLOSES THE LIQUID SOLENOID VALVE ON THE EVAPORATOR COIL. THE COMPRESSOR CONTINUES OPERATION UNTIL THE SYSTEM IS PUMPED DOWN.

ECONOMY CYCLE - WHEN THE OUTDOOR AIR IS BELOW IT'S SET POINTS THE OUTDOOR ENTHALPY CONTROLLER SHALL ACT THRU ROOM THERMOSTAT, T, TO OPEN THE COOLING CONTACTS AND SHUTOFF THE COOLING CYCLE. THERMOSTAT, T, SHALL DIRECT THE OUTDOOR AIR DAMPER AND EXHAUST AIR DAMPER TO MODULATE TO THEIR MAXIMUM POSITION. ON A RISE ABOVE THE SET POINT, THE OUTDOOR ENTHALPY CONTROLLER SHALL ACT THRU THE ROOM THERMOSTAT, T, TO CLOSE THE COOLING CONTACTS AND ACTIVE THE COOLING CYCLE. THE OUTDOOR AND RETURN AIR DAMPERS SHALL RETURN TO THEIR MINIMUM POSITIONS.

NIGHT SETBACK - ROOM THERMOSTAT, T, SHALL HAVE LOWER SET POINT FOR HEATING AND A HIGHER SET POINT FOR COOLING DURING NIGHT OPERATING HOURS.

SAFETIES - THE SYSTEM SHALL HAVE SMOKE/FIRE DETECTOR AND FREEZESTAT EITHER ONE OF WHICH WILL STOP THE SUPPLY FAN IF IT'S SET POINT IS EXCEEDED AND ALARM.

FELLOWSHIP HALL AIR BALANCE SCHEDULE

UNIT NO.	SUPPLY CFM	RETURN CFM	OUTSIDE AIR CFM	EXHAUST CFM	
ROOF TOP UNIT #3	3820	1710	2100		
TEF #1				75	
EF #1				100	
KEF #1				2000	
TOTAL	3800	1710	2100	1925	
PRESSURIZATION			-75		

Copyright 2004 Philip Aaron Lacy, Architect All rights reserved. No portion of this document may be reproduced without written permission.

Revisions:

		Date:
3	PERMIT	10-3-07
2	PERMIT	01-8-08
1	PERMIT	11/06/08

Engineers:
CHARLES FORD & ASSOCIATES
CONSULTING - ENGINEERS & PLANNERS
4200 GEORGIA AVE., N.W. WASH., D.C. (202) 722-4100

Certification:

Project Title:
BETH SHALOM A.M.E. ZION CHURCH
2501 RITCHIE ROAD
DISTRICT HEIGHTS, MARYLAND 20735
MECHANICAL DETAILS

Philip Aaron Lacy, Architect
4013 21st. Place
Temple Hills, Maryland 20748
Phone: 301-894-7979

Date: NOV. 29, 2005
Scale: 1/8"=1'-0"
Drawn: PAL
Checked: C.FORD
File No. BETH_A01

Drawing No.
M-4
- of -