TABERNACLE BAPTIST CHURCH HVAC CALCULATIONS

SANCTUARY & REAR AREAS:

Project Tabernacle Church Sanctuary & Rear Area HVAC Calculations
Wed Nov 18 16:02:39 EST 2009

The Btuh Gain for 65.8206 SqFt of North and Shaded Single Pane Glass = 1974.618
The Btuh Gain for 65.8206 SqFt of South Single Pane Glass = 5265.648

The Btuh Gain for 727 SqFt of Wood R-13 & 1/2" Gypsum Wall Number 1 = 1672.1
The Btuh Gain for 727 SqFt of Wood R-13 & 1/2" Gypsum Wall Number 2 = 1672.1
The Btuh Gain for 874.552 SqFt of Wood R-13 & 1/2" Gypsum Wall Number 3 = 2011.4696
The Btuh Gain for 874.552 SqFt of Wood R-13 & 1/2" Gypsum Wall Number 4 = 2011.4696

The Btuh Gain for 3702 SqFt of Ceiling and Roof Combo R-19; Ceiling Number 1 = 18585.6

The Btuh Gain for 3702 SqFt of Area Lighting in an Office = 11616

The Sanctuary & Rear Area Outside Fresh Air #1 = 3484.8 cfm
The Btuh Gain for Outside Fresh Air #1 = 104544

The Total Outside Fresh Air CFM = 3484.8
This is in accordance with International Mechanical Code 2006

The Total BTUh Gain = 149353.0052

The Total Tons of HVAC needed = 12.4460837666667

LOBBY & FRONT AREAS:

Project Tabernacle Baptist Church Lobby & Front Area HVAC Calculations
Wed Nov 18 16:09:12 EST 2009

The Btuh Gain for 87.7608 SqFt of East and West Single Pane Glass = 9653.688
The Btuh Gain for 51.7524 SqFt of Windows in Doors = 683.13168

The Btuh Gain for 180 SqFt of Wood R-13 & 1/2" Gypsum Wall Number 1 = 414
The Btuh Gain for 180 SqFt of Wood R-13 & 1/2" Gypsum Wall Number 2 = 414
The Btuh Gain for 711.5 SqFt of Wood R-13 & 1/2" Gypsum Wall Number 3 = 1636.45
The Btuh Gain for 711.5 SqFt of Wood R-13 & 1/2" Gypsum Wall Number 4 = 1636.45

The Btuh Gain for 723 SqFt of Ceiling and Roof Combo R-19; Ceiling Number 1 = 3470.4

The Btuh Gain for 723 SqFt of Area Lighting in an Office = 2169

The Lobby & Front Area Outside Fresh Air #1 = 650.7 cfm
The Btuh Gain for Outside Fresh Air #1 = 19521

The Total Outside Fresh Air CFM = 650.7
This is in accordance with International Mechanical Code 2006

The Total BTUh Gain = 39598.11968

The Total Tons of HVAC needed = 3.29984330666667

TOTAL CHURCH BUILDING:

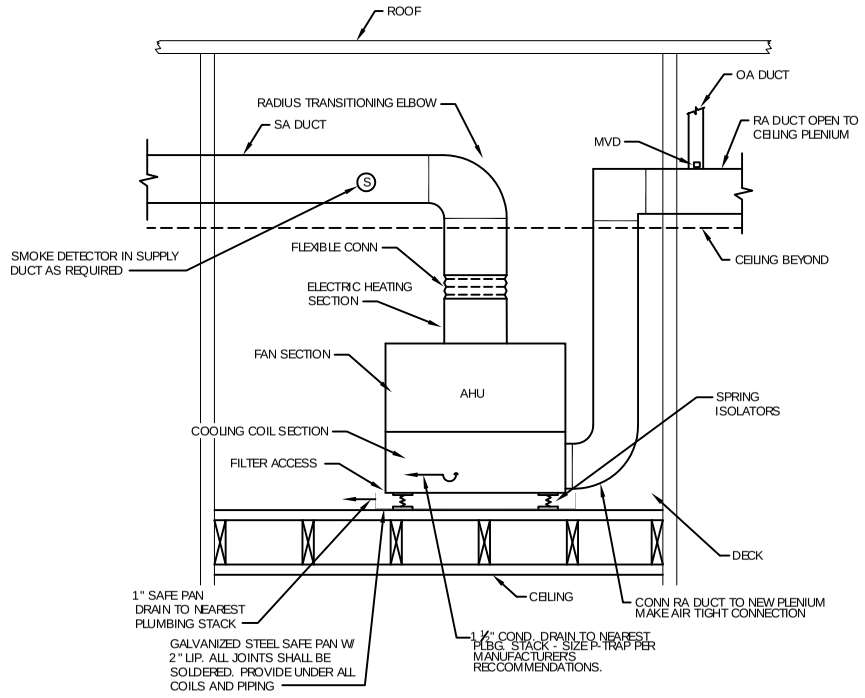
The Total Tons of HVAC needed for the Sanctuary & Rear Areas = 12.4460837666667

The Total Tons of HVAC needed for the Lobby & Front Areas = 3.29984330666667

Therefore, the Total Tons of HVAC needed for the entire Church = 15.7459233333334 Minimum

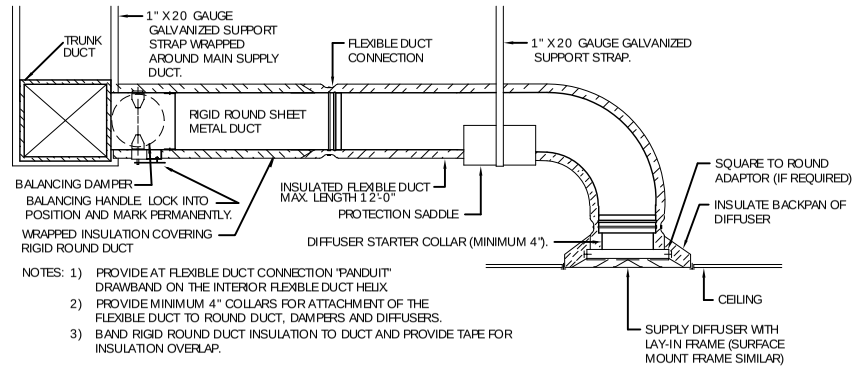
HVAC NOTES

1. CONCEALED DUCTWORK TO BE UL-181, CLASS 1, FIBERGLASS DUCTBOARD. DUCTS SHALL BE SIZED TO LIMIT AIN DUCTS TO 1000 CFM & SECONDARY DUCTS TO 800 CFM. TO BE INSTALLED PER SMACNA STANDARDS.
2. EXPOSED DUCTWORK TO BE GALVANIZED SHEET METAL PER SMACA STANDARDS. LINE WITH NEOPRENE COATED 1.0," 1.5 POUNDS PER CUBIC FOOT DUCT INSULATION.
3. ROUND FLEXIBLE DUCT TO BE UL-181, CLASS 1, AIR DUCT MATERIALS.
4. DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS.
5. IN ALL SYSTEMS 2000 CFM AND OVER, BUT LESS THAN 15,000 CFM, SMOKE DETECTORS SHALL BE INSTALLED, IN ACCORDANCE WITH NFPA 72E & NFPA 90A, IN THE RETURN DUCT DOWNSTREAM OF THE AIR HANDLING UNIT AND ALL FILTERS TO AUTOMATICALLY STOP THE FAN.
6. PROVIDE U.L. LISTED 125 'F' FIRESTAT IN RETURN AIR OF EACH SYSTEM UNDER 2000 CFM TO SHUT DOWN THE FAN IN THE EVENT OF FIRE.
7. PROVIDE U.L. RATED FIRE DAMPERS WHERE REQUIRED AT ALL DUCT PENETRATIONS OF FIRE-RATED ASSEMBLIES AND WHERE REQUIRED BY CODE, INCLUDING OUTSIDE AIR INTAKES.
8. CONDENSATE DRAINS TO BE PVC PIPE RUN TO PLUMBERS P-TRAP WITHIN FIVE FEET OF AIR HANDLING UNITS.
9. ALL AIR HANDLING SYSTEMS TO BE BALANCED TO ASSURE PROPER AIR FLOWS PER PLANS.
10. ALL THERMOSTATS TO BE AUTOMATIC CHANGEOVER WITH HEAT SWITCH.
11. EXHAUST FAN EQUAL TO BROAN MODEL NO. 100 CF. OR EQUAL. FAN SHALL BE CONTROLLED BY A SWITCH ON THE WALL IN THE SAME LOCATION AS LIGHT SWITCH(S). PROVIDE BACK DRAFT DAMPER.
12. PROVIDE AND INSTALL WATER PROOF GRILLE VENT IN PROPER ROOF LOCATION FOR PLUMBING FIXTURE EXHAUST.
13. ALL SUPPLY AIR VENTS SHALL BE EQUIPPED WITH AIR CONTROL DAMPERS.
14. LOCATE OUTDOOR UNITS AS SHOWN ON ARCH. DWGS.
15. REFRIGERANT LINES SHALL BE SIZED BY UNIT MANUFACTURER AND INSTALLED ACCORDING TO MANUFACTURERS INSTRUCTIONS.
16. FRESH AIR SHALL BE SUPPLIEDTO EACH AIR HANDLER THROUGH EXTERIOR WALL DUCT SUPPLIED WITH A CONTROL DAMPER.
17. INSTALL FIRE DAMPER WHERE S.A. & R.A. DUCTS PENETRATE 1 HOUR RATED CEILINGS.
18. ALL ELECTRICAL, MECHANICAL, AND PLUMBING PENETRATING FIRE WALLS SHALL BE FIRE CAULKED. (PENETRATIONS THROUGH RATED CONSTRUCTION SHALL BE SEALED WITH A MATERIAL CAPABLE OF PREVENTING THE PASSAGE OF FLAMESAND HOT GASES WHEN TESTED IN ACCORDANCE WITH ASTM-EB-14).
19. ALL MECHANICAL SYMBOLS ARE DRAWN DIAGRAMATICALLY, CONTRACTOR TO VERIFY WITH OWNER LOCATIONS OF VENTS, DAMPERS, REGISTERS, ETC.
20. REFER TO STRUCTURAL DRAWINGS TO COORDINATE LOCATION(S) & MOUNTING OF MECHANICAL EQUIPMENT.
21. FLEXIBLE DUCTWORK LENGTH NOT TO EXCEED 10'-0".
22. REFER TO REFLECTED CEILING PLAN FOR FINAL GRILLE AND DIFFUSER LOCATIONS AND COORDINATE AS REQUIRED.
23. FINAL LOCATION OF TEMPERATURE CONTROLS TO BE COORDINATED WITH OWNER AT JOB SITE.
24. PROVIDE AND INSTALL SMOKE DETECTORS AS APPROVED BY LOCAL AHJ'S. PLACE NEAR R/A AND S/A OPENINGS OF AHU AND PROVIDE, WITH ACCESS PANEL, WIRING BY ELECTRICAL CONTRACTOR.
25. FRESH AIR INTAKES ARE REQUIRED TO HAVE MOTORIZED OR GRAVITY DAMPERS TO SHUT OFF WHEN SYSTEM IS NOT RUNNING. ALL THERMOSTATS MUST BE PROGRAMABLE. SEE SECTIONS 502.4.4 OR 503.2.4.3 OF THE 2006 INTERNATIONAL ENERGY CODE.



NOTES:
1. ON UNITS UNDER 5 TONS PROVIDE FIRESTAT IN THE RETURN AIR WIRED TO SHUT DOWN THE UNIT WHEN TEMPERATURE IS EXCEEDED.
2. ON UNITS 5 TONS AND LARGER, PROVIDE A SMOKE DETECTOR IN THE SUPPLY AND THE RETURN AIR DUCTS WIRED TO SHUT DOWN THE UNIT WHEN SMOKE IS DETECTED. THE SMOKE DETECTOR IN THE RETURN AIR DUCT MAY BE ELIMINATED IF CONTRACTOR RECEIVES APPROVAL FROM THE LOCAL AUTHORITY HAVING JURISDICTION.

AIR HANDLING UNIT INSTALLATION DETAIL
N.T.S.



NOTES: 1) PROVIDE AT FLEXIBLE DUCT CONNECTION "PANDUIT" DRAWBAND ON THE INTERIOR FLEXIBLE DUCT HELIX.
2) PROVIDE MINIMUM 4" COLLARS FOR ATTACHMENT OF THE FLEXIBLE DUCT TO ROUND DUCT, DAMPERS AND DIFFUSERS.
3) BAND RIGID ROUND DUCT INSULATION TO DUCT AND PROVIDE TAPE FOR INSULATION OVERLAP.

DIFFUSER CONNECTION DETAIL-FLEX DUCT
N.T.S.

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NEW
CHURCH

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MECHANICAL
NOTES

REV:

SCALE: AS NOTED
JOB#: 2050
DATE: 2-8-10
SHEET 21

M-2

OF 25