

METAL SUSPENSION SYSTEMS FOR LAY IN PANEL CEILING

- 12 GA. (MIN) HANGER WIRES MAY BE USED FOR UP TO AND INCLUDING 4'-0" x 4'-0" GRID SPACING, ALONG MAIN RUNNER. SPLICES WILL NOT BE PERMITTED IN ANY HANGER WIRES UNLESS SPECIFICALLY APPROVED BY DSA.
- PROVIDE 12 GA HANGER WIRES WITHIN 8" OF THE ENDS OF ALL MAIN AND CROSS RUNNERS OR AT 1/4 OF THE LENGTH OF THE END TEE, WHICHEVER IS LESS AT THE PERIMETER OF THE CEILING AREA.
- PROVIDE TRAPEZE OR OTHER SUPPLEMENTARY SUPPORT MEMBERS AT OBSTRUCTIONS TO MAINTAIN HANGER SPACING. PROVIDE ADDITIONAL HANGERS, STRUTS OR BRACES AS REQUIRED AT ALL CEILING BREAKS, SOFFITS OR DISCONTINUOUS AREA. HANGER WIRES THAT ARE MORE THAN 1 IN 6 OUT OF PLUMB ARE TO HAVE COUNTERBRACED WIRES.
- CEILING GRID MEMBERS MAY BE ATTACHED TO NOT MORE THAN 2 ADJACENT WALLS. CEILING GRID MEMBERS SHOULD BE AT LEAST 1/2 INCH FREE OF OTHER WALLS. IF WALLS RUN DIAGONALLY TO CEILING GRID SYSTEM RUNNERS, ONE END OF MAIN AND CROSS RUNNERS SHOULD BE FREE AND A MINIMUM OF 1/2 INCH CLEAR OF WALL.
- AT THE PERIMETER OF THE CEILING AREA WHERE MAIN OR CROSS RUNNERS ARE NOT CONNECTED TO THE ADJACENT WALL, PROVIDE INTERCONNECTION BETWEEN THE RUNNERS AT THE FREE END TO PREVENT LATERAL SPREADING. A METAL STRUT OR A 16 GA WIRE WITH A POSITIVE MECHANICAL CONNECTION TO THE RUNNERS MAY BE USED. WHERE THE PERPENDICULAR DISTANCE FROM THE WALL TO THE FIRST PARALLEL RUNNERS IS 12" OR LESS, THIS INTERLOCK IS NOT REQUIRED.
- PROVIDE SETS OF 4-#12 GA. SPLAYED BRACING WIRES ORIENTED 90 DEGREES FROM EACH OTHER AT THE FOLLOWING SPACING:
 - FOR SCHOOL BUILDINGS, PLACE SETS OF SPLAY WIRES AT A SPACING NOT MORE THAN 12 FEET BY 12 FEET ON CENTER.
 - PROVIDE SPLAY WIRES AT LOCATIONS NOT MORE THAN 1/2 THE ABOVE SPACING FROM EACH PERIMETER WALL OR AT THE EDGE OF VERTICAL CEILING OFFSETS

THE SLOPE OF THESE WIRES SHOULD NOT EXCEED 45 DEGREES FROM THE PLANE OF THE CEILING AND SHOULD BE TAUT WITHOUT CAUSING THE CEILING TO LIFT. SPLICES IN BRACING WIRES ARE NOT PERMITTED WITHOUT SPECIAL DSA APPROVAL.
- FASTEN HANGER WIRES WITH NOT LESS THAN 3 TIGHT TURNS. FASTEN SPLAY WIRES WITH 4 TIGHT TURNS. MAKE ALL TIGHT TURNS WITHIN A DISTANCE OF 1 1/2 INCHES. HANGER OR BRACING WIRE ANCHORS TO THE STRUCTURE SHOULD BE INSTALLED IN SUCH A MANNER THAT THE DIRECTION OF THE WIRE ALIGNS AS CLOSELY AS POSSIBLE WITH THE DIRECTION OF THE FORCES ACTING ON THE WIRE.
- SEPARATE ALL CEILING HANGING AND BRACING WIRES AT LEAST 6 INCHES FROM ALL UNBRACED DUCTS, PIPES, CONDUIT ETC.,
- ATTACH ALL LIGHT FIXTURES AND AIR TERMINALS TO THE CEILING GRID RUNNERS WITH SCREWS OR APPROVED FASTENERS AS REQUIRED TO RESIST A HORIZONTAL FORCE EQUAL TO THE FIXTURES.
- FLUSH OR RECESSED LIGHT FIXTURES AND AIR TERMINALS WEIGHING LESS THAN 56 POUNDS MAY BE SUPPORTED DIRECTLY ON THE RUNNERS OF A HEAVY DUTY GRID SYSTEM BUT, IN ADDITION, THEY MUST HAVE A MINIMUM OF 2-#12 GA. SLACK SAFETY WIRES ATTACHED AT DIAGONAL CORNERS AND ANCHORED TO THE STRUCTURE ABOVE.
- CLASSIFICATION OF CEILING GRID: CLASSIFICATION OF CEILING GRID IS "HEAVY DUTY" CHICAGO METALLIC, OR DONN(USG) PER ASTM C635 MANUFACTURER'S CATALOG NUMBER - MAIN RUNNER HEAVY DUTY MAIN TEE OR EQUAL #200-01 OR DX26. MANUFACTURER'S CATALOG NUMBER - CROSS RUNNER CHICAGO METALLIC 1214-01 OR DONN DX 416 CROSS TEES. MANUFACTURER'S CATALOG NUMBER OF DETAIL FOR RUNNER SPLICE N/A. ACOUSTICAL PANELS SHALL BE 5/8" MINIMUM THICK, MINERAL FIBERBOARD OR VINYL-FACED FIBERGLASS LAY-IN PANELS SQUARE EDGE ASTM FLAME SPREAD CLASS T, 24" X 48" MODULAR SIZE, LIGHT REFLECTION 75% MINIMUM, NOISE REDUCTION COEFFICIENT OF 0.65 MINIMUM. MAXIMUM SMOKE DENSITY NOT TO EXCEED 450.

TABLE A HEAVY DUTY GRID COMPONENTS

MANUFACTURER	MAIN TEE	H.D. 4" CROSS TEE	H.D. 2" CROSS TEE
DONN/USG	DX-26	DX-424	DX-216
ARMSTRONG	7301	7341	7323
CHICAGO MET.	200-01	1204-01	1226-01

NOTE: ALL GRID COMPONENTS SHALL BE BY SAME MANUFACTURER

HVAC CFM CHART

MODEL NUMBER	DESCRIPTION	MAX. CFM	UNIT WEIGHT LBS.
WH421-A	3 1/2 TON HEAT PUMP	1400	530
WH482-A	4 TON HEAT PUMP	1550	560
WH602-A	5 TON HEAT PUMP	1700	560

GENERAL NOTES

- HEATING VENTILATING AND AIR CONDITIONING (HVAC)
- HEAT PUMP: SINGLE PACKAGE WALL MOUNTED AIR TO AIR ELECTRIC HEAT PUMP UNIT SHALL BE RATED IN ACCORDANCE WITH ARI STANDARD 240-77.

REFERENCE BRANDS: BARD WH421-XXXXXXX
BARD WH482-XXXXXXX
BARD WH602-XXXXXXX

MAXIMUM AC SIZE FOR THIS BUILDING WILL BE A 5-TON UNIT

ALL UNITS SHALL BE 230/208 VOLT, 1 PHASE SYSTEM, UL TESTED & APPROVED OR COMPARABLE AND MEET CURRENT ENERGY STANDARDS.

 - THE SYSTEM SHALL MAINTAIN AN AUTOMATICALLY CONTROLLED INDOOR CLASSROOM TEMPERATURE OF 78 DEGREES
 - WHEN THE OUTDOOR DRY BULB TEMPERATURE VARIES BETWEEN 100 DEGREES F. IN THE SUMMER
 - THE SYSTEM MUST MAINTAIN THE ABOVE TEMPERATURE WHEN THE DAMPER IS ADJUSTED TO USE APPROXIMATELY ONE THIRD FRESH AIR
 - DUCTWORK:
 - CONSTRUCT ALL DUCTWORK OF GALVANIZED SHEET METAL IN ACCORDANCE WITH C.M.C., ASHRAE GUIDE EQUIPMENT VOLUME AND SMACNA LOW VELOCITY DUCT CONSTRUCTION MANUAL LATEST EDITIONS. ALL DUCTWORK SHALL BE INSULATED WITH 1" THICK FIBERGLASS DUCT WRAP WITH VAPOR BARRIER. PROVIDE 1" DUCT ATTENUATION AT ALL DUCTWORK WITHIN 2'-0" OF HVAC UNIT.
 - NON-METALLIC DUCTWORK OPTION: IN ACCESSIBLE CONCEALED PORTIONS OF DUCT SYSTEM RIGID 1" FIBERGLASS OR INSULATED FLEX-DUCT WITH VAPOR BARRIER MAY BE SUBSTITUTED FOR SHEET METAL DUCTWORK. ALL DUCTWORK WITHIN 2'-0" OF THE HVAC UNIT AND ALL INTERFACE CONNECTIONS SHALL BE METAL. DUCTWORK AND REINFORCEMENT SHALL BE DESIGNED FOR 2" STATIC PRESSURE. REFERENCE BRANDS: OWENS-CORNING FIBERGLASS DUCTBOARD, 1" THICK, AND MICRO-AIRE, TYPE 475. NON-METALLIC DUCTWORK SHALL CONFORM TO NFPA 90-A AND SMACNA CLASS 1 RATING.
 - AIR DUCT INSULATION AND LININGS SHALL COMPLY WITH FLAME SPREAD LESS THAN OR EQUAL TO 25, SMOKE GENERATION LESS THAN OR EQUAL TO 50.
 - SUPPLY AIR DIFFUSERS SHALL BE 675 CFM MAX. 12" ROUND. 1" FIBERGLASS OR FLEXDUCT DUCTWORK SPECIFICALLY DESIGNED TO PROVIDE AIR THERMAL COOLING SYSTEMS. 24"x8"x1" MICRO-AIRE TYPE #475 OWENS-CORNING, KNAUF, CERTAINTED, OR EQUAL AND 90- B: UL #131 TEST, CLASS 1 RATING WITH "SMACNA".
 - REGISTERS AND DIFFUSERS: PROVIDE THREE (MIN) 4-WAY THROW AIR DIFFUSERS AS MANUFACTURED CARNES, TITUS, HART AND COOLEY, METALAIRE, SHOEMAKER, BARBER-COLEMAN OR KRUEGER COMMERCIAL GRADE GRILLS AND REGISTERS
 - AIR CONDITIONING CONTROLS. THERMOSTAT: PROVIDE ELECTRONIC PROGRAMMABLE THERMOSTAT. THERMOSTAT SHALL HAVE THE FOLLOWING FUNCTIONS.
 - 5 AND 2 WEEKDAY/WEEKEND PROGRAMMING WITH 4 SEPARATE TIME/TEMPERATURE SETTING FOR 24-HOUR PERIOD.
 - KEY BOARD LOCKOUT SWITCH.
 - PROGRAMMABLE DISPLAY.
 - 2-HOUR OVERRIDE MINIMUM.
 - STATUS INDICATED LED'S.
 - BATTERY BACK-UP. PROVIDE LOCKING CLEAR THERMOSTAT COVER WITH THERMOSTAT COVER WITH ACCESS HOLE FOR PROGRAM OVERRIDE. WHITE RODERS IF92-371. MOUNT @ +60" w/COVER (SEALED-SETTING ADJUSTMENTS CAN BE DONE BY SERVICE PERSONNEL ONLY.) +48" UNSEALED.
 - THERMAL INSULATION
 - ROOF INSULATION: R-19 UNFACED.
 - WALLS INSULATION: R-13 KRAFT FACED.
 - FLOORS INSULATION: CONCRETE FLOOR FLAME SPREAD AND SMOKE DEVELOPMENT SHALL CONFORM TO CALIFORNIA BUILDING CODE SEC. 719.
 - FACTORY-MADE AIR DUCTS. FACTORY-MADE AIR DUCTS SHALL BE APPROVED FOR THE USE INTENDED OR SHALL CONFORM TO THE REQUIREMENTS OF U.M.C. STANDARD NO. 6-1. EACH PORTION OF A FACTORY-MADE AIR DUCT SYSTEM SHALL BE IDENTIFIED BY THE MANUFACTURER WITH A LABEL OR OTHER SUITABLE IDENTIFICATION INDICATING COMPLIANCE WITH U.M.C. STANDARD NO. 6-1 AND ITS CLASS DESIGNATION. THESE DUCTS SHALL BE LISTED AND SHALL BE INSTALLED IN ACCORDANCE WITH THE TERMS OF THEIR LISTING AND THE REQUIREMENTS OF UMC STD. 6-1.

DUCT SUPPORT
FLEX DUCT TO BE SUPPORTED WITH 1-1/2" WIDE X 26 GA. GALV. STRAP @ MAX 6'-0" O.C. ATTACH TO RAFTER W/2 #8 SMS @ EACH END.
SUPPLY AIR PLENUM TO BE SUPPORTED WITH 1-1/2" WIDE X 26 GA. GALV. STRAPS MIN. 2 PER PLENUM.
SUPPLY AIR BOX AND DIFFUSERS TO BE SUPPORTED WITH (2) 12 GA. HANGER WIRES TO BOX @ OPPOSITE CORNERS.
SUPPLY AIR BOX AND DIFFUSERS TO BE BRACED WITH (2) 12 GA. SLACK WIRES TO BOX @ OPPOSITE CORNERS. ATTACH SUPPLY AIR DIFFUSERS TO CEILING GRID TO RESIST A LATERAL LOAD EQUAL TO THE WEIGHT OF THE DIFFUSER AND SUPPLY AIR BOX W/2 #8 SMS.

- FIREBLOCKING: SHALL BE PROVIDED IN THE FOLLOWING LOCATION
- IN CONCEALED SPACES OF STUD WALLS AND PARTITIONS, INCLUDING FURRED SPACES, AT THE CEILING AND FLOOR LEVELS AND AT 10'-FOOT (3048mm) INTERVALS BOTH VERTICAL AND HORIZONTAL. SEE CBC SECTION 717.2

INSULATION SCHEDULE

ZONE	WALL	ROOFS	FLOORS
1-14 & 16	R -13	R -19	R -13
15	R -13	R -30	R -13

HVAC SCHEDULE

BUILDING SIZE	# OF HVAC		
	3 1/2 TON HVAC	4 TON HVAC	5 TON HVAC
24' x 40'	1		
36' x 40'		1	
48' x 40'	2		
60' x 40'		2	
72' x 40'			2
84' x 40'			2
96' x 40'		3	
108' x 40'			3
120' x 40'			3

REVISIONS

NO	DATE	DESCRIPTION

DATE: 12/02/04
SCALE: NOTED
DRAWN BY: RL
SERIAL NO.:

CUSTOMER:
2:12 PITCHED ROOF 24' x 40' THRU 120' x 40' RELOCATABLE CLASSROOMS
CEILING & MECHANICAL NOTES



APPROVALS:



IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
PC 02-109895
AC: FLS: CH: SS: CL
DATE: 3/23/2007

PROJECT No.
PC
M3-C

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