- CEILING GRID SYSTEMS IN SEISMIC ZONES D, E, F, MUST BE RATED "HEAVY DUTY", AS DEFINED BY ASTM C635. PROVIDE GRID COMPONENTS AS SPECIFIED IN TABLE A BELOW, OR APPROVED EQUAL. GRID METAL FRAMING PIECES SHALL BE DESIGNED TO CARRY A MEAN ULTIMATE TEST LOAD OF NOT LESS THAN 180 LBS. IN COMPRESSION AND TENSION, PER ASTM E580.
- 2. SUSPENSION WIRE SHALL BE CLASS 1 ZINC-COATED (GALVANIZED) CARBON STEEL CONFORMING TO ASTM A641. WIRE SHALL BE #12 GAGE WITH SOFT TEMPER AND A MINIMUM TENSILE STRENGTH OF 70 KSI.
- WHEN HANGER AND BRACING WIRES ARE ATTACHED TO CONCRETE ABOVE, TESTS PER D.S.A. IR 25-2.13 SECTION 6.8 MUST BE PERFORMED. POWER ACTUATED FASTENERS IN CONCRETE ARE NOT ALLOWED FOR BRACING WIRE.
- 4. 12 GA. (MINIMUM) HANGER WIRES MAY BE USED FOR UP TO AND INCLUDING 4'-0" x 4'-0 GRID SPACING, ATTACH TO MAIN RUNNER, SPLICES WILL NOT BE PERMITTED IN ANY HANGER WIRES UNLESS SPECIFICALLY APPROVED BY D.S.A.
- 5. 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.
- 6. 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 AREAS. HANGER WIRES THAT ARE MORE THAN 1:6 OUT OF PLUMB ARE TO HAVE COUNTER-BRACED WIRES.
- CEILING GRID MEMBERS SHALL BE ATTACHED TO TWO (2) ADJACENT WALLS. CEILING GRID MEMBERS SHOULD BE AT LEAST 3/4 INCH CLEAR 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 3/4 INCH CLEAR OF WALL.
- 8. PERIMETER SUPPORT ANGLES SHALL BE AT LEAST 2 INCHES WIDE, OR USE PROPRIETARY ANGLES & SEISMIC CLIPS THAT HAVE A VALID EVALUATION REPORT.
- 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 8" OR LESS. THIS INTERLOCK IS NOT REQUIRED.
- 10. CEILING AREAS EXCEEDING 2,500 SQUARE FEET SHALL HAVE A SEISMIC SEPARATION JOINT
- 11. EXPANSION JOINTS SHALL BE PROVIDED AT INTERSECTIONS OF CORRIDORS, LOBBIES AND OTHER SIMILAR AREAS.
- 12. PENETRATIONS THROUGH THE CEILING, SUCH AS FIRE SPRINKLERS, SHALL HAVE A 2 INCH OVERSIZED RING, SLEEVE OR ADAPTER TO ALLOW FREE MOVEMENT INDEPENDENT OF THE CEILING. ALTERNATE: A FLEXIBLE SPRINKLER FITTING THAT ALLOWS 1 INCH OF MOVEMENT CAN BE USED.
- 13. LATERAL FORCE BRACING IS REQUIRED FOR ALL CEILINGS, EXCEPT CEILING AREAS OF 144 SQUARE FEET OR LESS WITH PERIMETER WALLS THAT ARE DESIGNED TO CARRY THE CEILING LATERAL FORCES. SPACING OF BRACING ASSEMBLIES MUST BE SHOWN ON THE PLANS.
- 14. LATERAL FORCE BRACING CONSISTS OF A SET OF 1 COMPRESSION STRUT AND FOUR #12 GA. SPLAYED BRACING WIRES. ORIENTED 90 DEGREES FROM EACH OTHER AT THE FOLLOWING SPACING: (A) FOR SCHOOL BUILDINGS, PLACE SETS OF SPLAY WIRES AT A SPACING NOT MORE THAN & FEET BY
  - 12 FEET ON CENTER, PER 12 25.2-13 4 5.2 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 D.S.A. APPROVAL.
- 15. COMPRESSION STRUTS SHALL BE ABLE TO RESIST THE VERTICAL PULL INDUCED BY BRACING WIRES, AND
- 16. FASTEN HANGER WIRES WITH NOT LESS THAN 3 TIGHT TURNS WITHIN A DISTANCE OF 3 INCHES. FASTEN SPLAY WIRES WITH 4 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.
- 17. SEPARATE ALL CEILING HANGING AND BRACING WIRES AT LEAST 6 INCHES FROM ALL UNBRACED DUCTS, PIPES, CONDUIT ETC.
- 18. 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' WEIGHT. MINIMUM OF TWO ATTACHMENTS ARE REQUIRED AT EACH LIGHT FIXTURE.
- 19. 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 THEY MUST HAVE A MINIMUM OF TWO #12 GA. SLACK SAFETY WIRES ATTACHED AT DIAGONAL CORNERS AND ANCHORED TO THE STRUCTURE ABOVE. FIXTURES WEIGHING LESS THAN 10 POUNDS MAY HAVE AT LEAST ONE #12 GA. SLACK SAFETY WIRE.
- 20. LIGHT FIXTURES AND OTHER CEILING DEVICES WEIGHING MORE THAN 56 POUNDS SHALL BE INDEPENDENTLY SUPPORTED BY NO LESS THAN FOUR (4) TAUT #12 GAGE WIRES, ATTACHED TO THE STRUCTURE ABOVE. WIRES MUST BE ABLE TO SUPPORT FOUR (4) TIMES THE WEIGHT OF THE UNIT.
- 21. ALL LIGHT-WEIGHT MISCELLANEOUS DEVICES, SUCH AS STROBE LIGHTS, SPEAKERS, ETC., SHALL BE ATTACHED TO THE CEILING GRID PER SECTION 7.3.1 OF D.S.A. IR 25-2.13. IN ADDITION, DEVICES WEIGHING MORE THAN 10 LBS SHALL HAVE A #12 SLACK SAFETY WIRE ANCHORED TO THE STRUCTURE ABOVE PER SECTION 7.2.2 OF D.S.A. IR 25-2.13. DEVICES WEIGHING MORE THAN 20 LBS. SHALL BE SUPPORTED FROM THE STRUCTURE ABOVE PER SECTION 7.3.4 OF D.S.A. IR 25-2.13.
- 22. PANELS THAT WEIGH MORE THAN 0.5 LBS/SQ.FT. (PSF), OTHER THAN MINERAL FIBER ACOUSTIC TILES, SHALL BE POSITIVELY ATTACHED TO CEILING SUSPENSION RUNNERS.
- 23. 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"x48" MODULAR SIZE, LIGHT REFLECTION 75% MINIMUM, NOISE REDUCTION COEFFICIENT OF 0.65 MINIMUM, MAXIMUM SMOKE DENSITY NOT TO EXCEED 450. FLAME SPREAD RATING MAXIMUM OF 200. PANELS ARE NOT ALLOWED TO SUPPORT ANY FIXTURE. TERMINAL OR DEVICE.

,	TABLE A	- HEAVY DUTY GRID	COMPONENTS	
MANUFACTURER	MAIN TEE	H.D. 4' CROSS TEE	H.D. 2' CROSS TEE	RUNNER SPLICE DETAIL
DONN/USG	DX-26	DX-424	DX-216	N/A
ARMSTRONG	7301	XL7341	XL8320	N/A
CHICAGO/ROCKFON	200.01	1274.01	1202.01	N/A
				·
NOTE: ALL GRID COM	PONENTS SHAL	L BE BY THE SAME MA	NUFACTURER.	ngang dinang kantang ang ang ang ang ang ang ang ang ang

#### BARD WALL HUNG

HVAC CFM CHART							
MODEL#	DESCRIPTION	MAX. CFM	UNIT WEIGHT (LBS.)	EER	СОР	CLIMATE ZONE(S)	
CHOTT-X	3-1/2 TOR TICAL PORI				<b>V</b> 1.2		
549H1-A	4 TON HEAT PUMP	1400	550	10.0	3.0	1-16	
	1				317		

### **BARD Q-TEC**

	HVAC CFM CHART							
MODEL#	DESCRIPTION	WAX. CPM	UNIT WEIGHT		COP	CLIMATE ZONE(S)		
Q42H2-4	3-1/2 TON HEAT RUMA	1200		<b>J</b> 9.	3.0	1–16		
Q48H2-4	4 TON HEAT SUMP	1.400	600		3.0	1-16		
Q60H2-A	5 TON HEAT PUMP	1550	600	9.0	3.0	1-16		

#### CARRIER ROOF MOUNT

HVAC CFM CHART						
MODEL#	DESCRIPTION	MAX. CFM	UNIT WEIGHT	SEIR	CLIMATE ZONE(S)	
50VT-A42	3-1/2 TON HEAT PUMP	1400		<b>1</b> 1	116	
50VT-A48	4 TON HEAT TOWN	.1000	+0V	-4	1-16	
50VT-A60	5 TON HEAT PUMP	1750	515	14	1-16	

## CARRIER SPLIT DX SYSTEM

HVAC CFM CHART							
MODEL#	DESCRIPTION	AIR HANDLER MODEL#	and the second second section is the second	UNIT WEIGH	EXTERIOR UNIT WEIGHT (LBS.)	SEER	CLIMATE ZONE(S)
25HBB4-42	3-1/2 TO 1 H.AT. JM	FX4CN043	Sea.		246	14	1-16
25HBB4-48	4 TON HEAT TOWN	1740110100	4040		240	14	1-16
25HBB4-60	5 TON HEAT PUMP	FX4CN0600	4046	198	279	14	1-16

HVAC SCHEDULE					
mandetassendagen op overleven de de det och ele en verden verden er op och en verden er och en verden er och e	# OF HVAC				
BUILDING SIZE	3½ TON HVAC	4 TON HVAC	5 TON HVAC		
☐ 24' × 40'	1				
□ 36' x 40'		1			
☐ 48' x 40'	2				
⊠ 60' x 40'		2			
⊠ 72' x 40'	3		2		
□ 84' x 40'		3			
□ 96' x 40'	4		3		
□ 108' x 40'		4			
□ 120' x 40'	5				

INSULATION SCHEDULE							
ZONE WALL		ROOFS		FLOORS (NON-CONCRETE)	CONCRETE FLOORS		
ng-graph many constraints of the		BATTS	OTHER	(NON CONCRETE)			
1-14, & 15	*R-13	**R-19	***R-1	R-13	44000		
16	*R-13	**R-19	***R-1	R-13	44/100		

- \*R-5 RIGID INSULATION TO BE USED OVER METAL FRAMED WALLS
- \*\*R-19 w/ 22 GA WIRE @ 16" O.C.
- \*\*\*R-1 MAY BE ACHEIVED w/ POLYSTYRENE OR INSULATION TAPE APPLIED TO

# TOP FLANGE OF PURLINS, OR EQUAL.

## HEATING VENTILATING AND AIR CONDITIONING (HVAC)

- 1. HEAT PUMP: SINGLE PACKAGE WALL-MOUNTED AIR-TO-AIR ELECTRIC HEAT PUMP UNIT SHALL BE RATED IN ACCORDANCE WITH A.R.I. STANDARD 240-77. 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 F. 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.

### 2. 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.
- 4. SUPPLY AIR DIFFUSERS SHALL BE 675 CFM MAXIMUM, 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, CERTAINTEED, OR EQUAL AND 90-B: UL #131 TEST, CLASS 1 RATING WITH "SMACNA".
- 5. REGISTERS AND DIFFUSERS: PROVIDE THREE (MINIMUM) 4-WAY THROW AIR DIFFUSERS AS MANUFACTURED BY CARNES, TITUS, HART AND COOLEY, METALAIRE, SHOEMAKER, BARBER-COLEMAN OR KRUEGER COMMERCIAL GRADE GRILLS AND REGISTERS.
- 6. AIR CONDITIONING CONTROLS: PROVIDE ELECTRONIC PROGRAMMABLE THERMOSTAT. THERMOSTAT SHALL HAVE THE FOLLOWING FUNCTIONS:
  - A. 5 AND 2 WEEKDAY/WEEKEND PROGRAMMING DAYS WITH 4 SEPARATE TIME/TEMPERATURE SETTINGS FOR A 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 RODGERS IF92-371. MOUNT TOP OF BOX @ 48" A.F.F. MAX
- THERMAL INSULATION
- ROOF INSULATION: R-19 WITH 22 GA. WIRE ♥ 16" O.C. & R-1 TOP OF PURLINS.
- WALLS INSULATION: R-13 KRAFT FACED. (R-5 INSULATION OVER METAL FRAMED WALLS)
- NON-CONCRETE FLOORS INSULATION: R-13
- CONCRETE FLOORS INSULATION: N/A
- FLAME SPREAD AND SMOKE DEVELOPMENT SHALL CONFORM TO CALIFORNIA BUILDING CODE SEC.
- 8. FACTORY-MADE AIR DUCTS
- FACTORY-MADE AIR DUCTS SHALL BE APPROVED FOR THE USE INTENDED OR SHALL CONFORM TO THE REQUIREMENTS OF C.M.C. SECTION 601.0.
- 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 C.M.C. SECTION 601.0 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
- C.M.C. SECTION 601.0. C. DUCT SUPPORT FLEX DUCT TO BE SUPPORTED WITH 1-1/2" WIDE x26 GA. GALV. STRAP @ MAX 6'-0" O.C. ATTACH TO RAFTER WITH TWO #8 S.M.S. @ EACH END.
- SUPPLY AIR PLENUM TO BE SUPPORTED WITH 1-1/2" WIDE x26 GA. GALV. STRAPS MINIMUM 2
- 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 WITH TWO #8 S.M.S.
- 9. FIREBLOCKING SHALL BE PROVIDED IN THE FOLLOWING LOCATIONS: A. IN CONCEALED SPACES OF STUD WALLS AND PARTITIONS, INCLUDING FURRED SPACES;
- B. AT THE CEILING AND FLOOR LEVELS;
- C. AND AT 10-FOOT (3048mm) INTERVALS BOTH VERTICAL AND HORIZONTAL. REFERENCE 2013 CBC SECTION 718.
- 10. THE INTERIOR ENVIRONMENT SHALL BE ASSEMBLED WITH PRODUCTS THAT CONTRIBUTE TO A HEALTHY INDOOR AIR QUALITY (IAQ). THE FOLLOWING SHALL COMPLY TITLE 24, PART 11 ("CAL-GREEN"):
  - ADHESIVES, SEALANTS, CAULKS SECTION 5.504.4.1
  - SECTION 5.504.4.3 PAINTS, COATINGS
  - AEROSOL PAINTS & COATINGS SECTION 5.504.4.3.1 CARPET SYSTEMS SECTION 5.504.4.4
  - . CARPET SHALL MEET CRI'S "GREEN LABEL PLUS" PROGRAM, NSF/ANSI '140 GOLD'
  - LEVEL, OR OTHER APPROVED TESTING PER 5.504.4.4. CARPET CUSHION OR PAD SECTION 5.504.4.4.1
  - 1. CUSHION/PAD SHALL MEET THE CRI'S "GREEN LABEL" PROGRAM.
  - COMPOSITE WOOD PRODUCTS SECTION 5.504.4.5
  - 1. ALL COMPOSITE WOODS MUST NOT EXCEED THE FORMALDEHYDE LIMITS AS SPECIFIED IN ARB'S "AIR TOXICS CONTROL MEASURE" (17 CCR 93120), OR
  - NON-EXEMPT MATERIALS PER TABLE 5.504.4.5. G. RESILIENT FLOORING SYSTEMS SECTION 5.504.4.6
  - 1. RESILIENT FLOORING SHALL BE CERTIFIED UNDER THE "FLOORSCORE" PROGRAM BY RFCI, COMPLY WITH CA-CHPS 01350, OR OTHER APPROVED TESTING PER 5.504.4.6.



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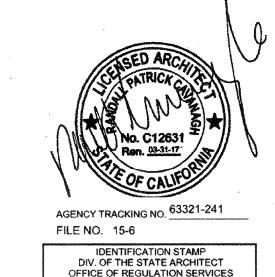
24' x 40' THRU 120' x 40' 2:12 PITCHED ROOF

SITE SPECIFIC PROJECT NAME

SHEET TITLE

**CEILING & MECHANICAL** NOTES, SCHEDULES

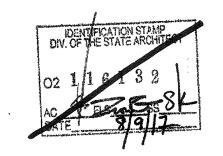
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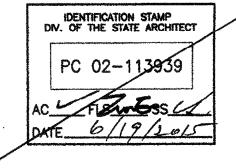
DATE PROJECT SPECIFIC STATE AGENCY APPROVAL

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ORIGINAL PC STATE AGENCY APPROVAL



PRÉ-CHECK (PC) DOCUMENT - CODE: 2013 CBC A SEPARATE PROJECT APPLICATION FOR CONSTRUCTION IS REQUIRED

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AS NOTED

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DATE: