CERTIFICATE OF COMPLIANCE and FIELD INSPECTION ENERGY CHECKLIST (Part 3 of 4) MECH-1C

Project Name: *BCSD School Building H Excersize Rooms* — Date: *1/5/2012*

Required Acceptance Tests

Designer:

This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for mechanical systems. The designer is required to check the applicable boxes by all acceptance tests that apply and listed all equipment that requires an acceptance test. If all equipment of a certain type requires a test, list the equipment description and the number of systems. The NA number designates the Section in the Appendix of the Nonresidential Reference Appendices Manual that describes the test. Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

Building Departments:

Systems Acceptance: Before occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all control devices serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance.
Systems Acceptance: Before occupancy permit is granted. All newly installed HVAC equipment must be tested using the Acceptance Requirements.

The MECH-1C form is not considered a completed form and is not to be accepted by the building department unless the correct boxes are checked. The equipment requiring testing, person performing the test (Example: HVAC installer, TAB contractor, controls contractor, PE in charge of project) and what Acceptance test must be conducted. The following checked-off forms are required for **ALL** newly installed equipment. In addition a Certificate of Acceptance forms shall be submitted to the building department that certifies plans, specifications, installation, certificates, and operating and maintenance information meet the requirements of §10-103(b) and Title-24 Part 6. The building inspector must receive the properly filled out and signed forms before the building can receive final occupancy.

TEST DESCRIPTION		MECH-2A	MECH-3A	MECH-4A	MECH-5A	MECH-6A	MECH-7A	MECH-8A	MECH-9A	MECH-10A	MECH-11A
Equipment Requiring Testing or Verification	Qty	Outdoor Ventilation For VAV & CAV	Constant Volume & Single-Zone Unitary	Air Distribution Ducts	Economizer Controls	Demand Control Ventilation DCV	Supply Fan VAV	Valve Leakage Test	Supply Water Temp. Reset	Hydronic System Variable Flow Control	Automatic Demand Shed Control
48HCL06	2	☑	☑	☐	☑	☑	☐	☐	☐	☐	☑
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CERTIFICATE OF COMPLIANCE and FIELD INSPECTION ENERGY CHECKLIST (Part 4 of 4) MECH-1C

Project Name: *BCSD School Building H Excersize Rooms* — Date: *1/5/2012*

TEST DESCRIPTION		MECH-12A	MECH-13A	MECH-14A	MECH-15A	
Equipment Requiring Testing	Qty.	Fault Detection & Diagnostics for DX Units	Automatic Fault Detection & Diagnostics for Air & Zone	Distributed Energy Storage DX AC Systems	Thermal Energy Storage (TES) Systems	Test Performed By.
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AIR SYSTEM REQUIREMENTS (Part 1 of 2) MECH-2C

Project Name: *BCSD School Building H Excersize Rooms* — Date: *1/5/2012*

	Indicate Air Systems Type (Central, Single Zone, Package, VAV, or etc...)			
Item or System Tags (i.e. AC-1, RTU-1, HP-1)		*AC H-1*	*AC H-2*	
Number of Systems		*1*	*1*	
	Indicate Page Reference on Plans or Schedule and indicate the applicable exception(s)			
MANDATORY MEASURES	**T-24 Sections**			
Heating Equipment Efficiency	112(a)	*81% AFUE*	*81% AFUE*	
Cooling Equipment Efficiency	112(a)	*15 2 SEER / 12.5 EER*	*15 2 SEER / 12.5 EER*	
HVAC Heat Pump Thermostat	112(b), 112(c)	*n/a*	*n/a*	
Furnace Controls/Thermostat	112(c), 115(a)	*n/a*	*n/a*	
Natural Ventilation	121(b)			
Mechanical Ventilation	121(b)	*190 cfm*	*217 cfm*	
VAV Minimum Position Control	121(c)	*No*	*No*	
Demand Control Ventilation	121(c)	*Yes*	*Yes*	
Time Control	122(e)	*Programmable Switch*	*Programmable Switch*	
Setback and Setup Control	122(e)	*Setback Required*	*Setback Required*	
Outdoor Damper Control	122(f)	*Auto*	*Auto*	
Isolation Zones	122(g)	*n/a*	*n/a*	
Pipe Insulation	123			
Duct Location/ R-value	124	*Attic, Roof Ins / 4.2*	*Attic, Roof Ins / 4.2*	
PRESCRIPTIVE MEASURES				
Calculated Design Heating Load	144(a & b)	*n/a*	*n/a*	
Proposed Heating Capacity	144(a & b)	*50,000 Btu/hr*	*50,000 Btu/hr*	
Calculated Design Cooling Load	144(a & b)	*n/a*	*n/a*	
Proposed Cooling Capacity	144(a & b)	*36,713 Btu/hr*	*36,684 Btu/hr*	
Fan Control	144(c)	*Constant Volume*	*Constant Volume*	
DP Sensor Location	144(c)			
Supply Pressure Reset (DDC only)	144(c)			
Simultaneous Heat/Cool	144(d)	*No*	*No*	
Economizer	144(e)	*Fixed Temp (Integrated)*	*Fixed Temp (Integrated)*	
Heat Air Supply Reset	144(f)	*Constant Temp*	*Constant Temp*	
Cool Air Supply Reset	144(f)	*Constant Temp*	*Constant Temp*	
Electric Resistance Heating[1]	144(g)			
Air Cooled Chiller Limitation	144(i)			
Duct Leakage Sealing. If Yes, a MECH-4-A must be submitted	144(k)	*No*	*No*	

1 Total installed capacity (MBtu/hr) of all electric heat on this project exclusive of electric auxiliary heat for heat pumps. If electric heat is used explain which exception(s) to §144(g) apply.

MECHANICAL VENTILATION AND REHEAT MECH-3C

Project Name: *BCSD School Building H Excersize Rooms* — Date: *1/5/2012*

	MECHANICAL VENTILATION (§121(b)2)								REHEAT LIMITATION (§144(d))				
	AREA BASIS			OCCUPANCY BASIS					VAV MINIMUM				
A	B	C	D	E	F	G	H	I	J	K	L	M	N
Zone/System	Condition Area (ft^2)	CFM per ft^2	Min CFM By Area B X C	Number Of People	CFM per Person	Min CFM by Occupant E X F	REQ'D V.A. Max of D or G	Design Ventilation Air CFM	50% of Design Zone Supply CFM	B X 0.4 CFM / ft^2	Max. of Columns H, J, K, 300 CFM	Design Minimum Air Setpoint	Transfer Air
Excersise #1	*1,254*	*0.15*	*188*				*188*	*190*					
AC H-1						*Total*	*188*	*190*					
Excersise #1	*1,438*	*0.15*	*216*				*216*	*217*					
AC H-2						*Total*	*216*	*217*					
			Totals						Column I Total Design Ventilation Air				

C	Minimum ventilation rate per Section §121, Table 121-A.
E	Based on fixed seat or the greater of the expected number of occupants and 50% of the CBC occupant load for egress purposes for spaces without fixed seating.
H	Required Ventilation Air (REQ'D V.A.) is the larger of the ventilation rates calculated on an AREA BASIS or OCCUPANCY BASIS (Column D or G).
I	Must be greater than or equal to H, or use Transfer Air (column N) to make up the difference.
J	Design fan supply CFM (Fan CFM) x 50%; or the design zone outdoor airflow rate per §121.
K	Condition area (ft^2) x 0.4 CFM / ft^2; or
L	Maximum of Columns H, J, K, or 300 CFM
M	This must be less than or equal to Column L and greater than or equal to the sum of Columns H plus N.
N	Transfer Air must be provided where the Required Ventilation Air (Column H) is greater than the Design Minimum Air (Column M). Where required, transfer air must be greater than or equal to the difference between the Required Ventilation Air (Column H) and the Design Minimum Air (Column M), Column H minus M.

ENVELOPE MANDATORY MEASURES: NONRESIDENTIAL ENV-MM

Project Name: *BCSD School Building H Excersize Rooms* — Date: *1/5/2012*

DESCRIPTION

Building Envelope Measures:

§118(a).	Installed insulating material shall have been certified by the manufacturer to comply with the California Quality Standards for insulating material, Title 20 Chapter 4, Article 3.
§118(c):	All Insulating Materials shall be installed in compliance with the flame spread rating and smoke density requirements of Sections 2602 and 707 of Title 24, Part 2.
§118(f):	The opaque portions of framed demising walls in nonresidential buildings shall have insulation with an installed R-value of no less than R-13 between framing members.
§117(a):	All Exterior Joints and openings in the building that are observable sources of air leakage shall be caulked, gasketed, weatherstripped or otherwise sealed.
§116(a) 1:	Manufactured fenestration products and exterior doors shall have air infiltration rates not exceeding 0.3 cfm/ft.^{2} of window area, 0 3 cfm/ft.^{2} of door area for residential doors, 0 3 cfm/ft.^{2} of door area for nonresidential single doors (swinging and sliding), and 1.0 cfm/ft.^{2} for nonresidential double doors (swinging).
§116(a) 2:	Fenestration U-factor shall be rated in accordance with NFRC 100, or the applicable default U-factor.
§116(a) 3:	Fenestration SHGC shall be rated in accordance with NFRC 200, or NFRC 100 for site-built fenestration, or the applicable default SHGC.
§116(b):	Site Constructed Doors, Windows and Skylights shall be caulked between the unit and the building, and shall be weatherstripped (except for unframed glass doors and fire doors)

MECHANICAL MANDATORY MEASURES: NONRESIDENTIAL MECH-MM

Project Name: *BCSD School Building H Excersize Rooms* — Date: *1/5/2012*

Equipment and System Efficiencies

§111.	Any appliance for which there is a California standard established in the Appliance Efficiency Regulations will comply with the applicable standard.
§115(a):	Fan type central furnaces shall not have a pilot light
§123.	Piping, except that conveying fluids at temperatures between 60 and 105 degrees Fahrenheit, or within HVAC equipment, shall be insulated in accordance with Standards Section 123.
§124.	Air handling duct systems shall be installed and insulated in compliance with Sections 601, 602, 603, 604, and 605 of the CMC Standards.

Controls

§122(e):	Each space conditioning system shall be installed with one of the following:
1A.	Each space conditioning system serving building types such as offices and manufacturing facilities (and all others not explicitly exempt from the requirements of Section 112 (d)) shall be installed with an automatic time switch with an accessible manual override that allows operation of the system during off-hours for up to 4 hours. The time switch shall be capable of programming different schedules for weekdays and weekends and have program backup capabilities that prevent the loss of the device's program and time setting for at least 10 hours if power is interrupted; or
1B.	An occupancy sensor to control the operating period of the system; or
1C.	A 4-hour timer that can be manually operated to control the operating period of the system.
2.	Each space conditioning system shall be installed with controls that temporarily restart and temporarily operate the system as required to maintain a setback heating and/or a setup cooling thermostat setpoint.
§122(g):	Each space conditioning system serving multiple zones with a combined conditioned floor area more than 25,000 square feet shall be provided with isolation zones. Each zone: shall not exceed 25,000 square feet, shall be provided with isolation devices, such as valves or dampers that allow the supply of heating or cooling to be setback or shut off independently of other isolation areas; and shall be controlled by a time control device as described above.
§122(c):	Thermostats shall have numeric setpoints in degrees Fahrenheit (F) and adjustable setpoint stops accessible only to authorized personnel
§122(b).	Heat pumps shall be installed with controls to prevent electric resistance supplementary heater operation when the heating load can be met by the heat pump alone
§122(a&b):	Each space conditioning system shall be controlled by an individual thermostat that responds to temperature within the zone. Where used to control heating, the control shall be adjustable down to 55 degrees F or lower. For cooling, the control shall be adjustable up to 85 degrees F or higher. Where used for both heating and cooling, the control shall be capable of providing a deadband of at least 5 degrees F within which the supply of heating and cooling is shut off or reduced to a minimum.

Ventilation

§121(e):	Controls shall be provided to allow outside air dampers or devices to be operated at the ventilation rates as specified on these plans.
§122(f):	All gravity ventilating systems shall be provided with automatic or readily accessible manually operated dampers in all openings to the outside, except for combustion air openings.
§121(f):	Ventilation System Acceptance. Before an occupancy permit is granted for a newly constructed building or space, or a new ventilating system serving a building or space is operated for normal use, all ventilation systems serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance

Service Water Heating Systems

§113(c)	Installation
3.	Temperature controls for public lavatories. The controls shall limit the outlet Temperature to 110° F.
2.	Circulating service water-heating systems shall have a control capable of automatically turning off the circulating pump when hot water is not required.

APPROVED
DIVISION OF STATE ARCHITECT
HIGH PERFORMANCE SECTION
APP #____ DATE: 1-18-12

MDC
MECHANICAL DESIGN CONCEPTS, INC.
5500 Ming Ave, Suite 251 — Bakersfield, CA 93309
Tel #: (661) 397-2114 — FAX #: (661) 397-2116
Job: 09091 — Plt: 1-11-12

REGISTERED PROFESSIONAL ENGINEER — MARK JAMES BASKIN — No. M26578 — Exp 9-30-12 — MECHANICAL — STATE OF CALIFORNIA

ORDIZ MELBY ARCHITECTS, INC.
5500 MING AVENUE SUITE 280
BAKERSFIELD, CALIFORNIA 93309
TELEPHONE (661) 832-5258
FACSIMILE (661) 832-4291

LICENSED ARCHITECT — DANNY ESPINEDA ORDIZ — No. C-14728 — MAY 31, 2013 RENEWAL DATE — STATE OF CALIFORNIA

DANNY E. ORDIZ, AIA
ARCHITECT C-14,728

WILLIAM J. MELBY, AIA
ARCHITECT C-16,835

IDENTIFICATION STAMP
DIVISION OF STATE ARCHITECT
OFFICE OF REGULATION SERVICES
APPL. #:02-112027
FILE #: 15-6
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DATE JAN 2 0 2012

PTN # 63321-112

NEW ELEMENTARY SCHOOL
9801 HIGHLAND KNOLLS DR
BAKERSFIELD
CALIFORNIA
93306

NEW MIDDLE SCHOOL
4115 VINELAND ROAD
BAKERSFIELD
CALIFORNIA
93306

FOR:

BAKERSFIELD CITY SCHOOL DISTRICT
1300 BAKER STREET
BAKERSFIELD
CALIFORNIA
93305

MARK	DATE	DESCRIPTION
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JOB NUMBER:
200101244
CAD DRAWING FILE:

DRAWN BY:
KW
CHECKED BY:
MB

CHECK AND VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT DISCREPANCIES TO THE ARCHITECT.

SHEET TITLE

TITLE 24
BUILDING "H"

SHEET IDENTIFICATION NUMBER

M-529