

IDENTIFICATION STAMP
DIVISION OF STATE ARCHITECT
OFFICE OF REGULATION SERVICES
APPL # 02-112027
FILE #: 15-6
DATE JAN 20 2012
PIN # 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

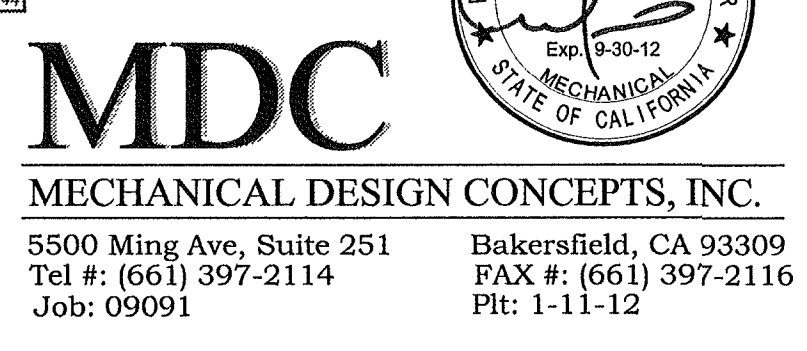
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CAD NUMBER
20010244
CAD DRAWING FILE

DRAWN BY:
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MB
DIVISION OF STATE ARCHITECT
HIGH PERFORMANCE SECTION
APR 18 2012
DATE: 1/16/12

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ORDIZ-MELBY ARCHITECTS, INC. 2010
SHEET TITLE
TITLE 24
BUILDING "A"

SHEET IDENTIFICATION NUMBER
M-515



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

AIR SYSTEM REQUIREMENTS (Part 1 of 2) MECH-2C

Project Name: **BCSD School Building A** Date: **1/5/2012**

Item or System Tags (i.e. AC1, RTU-1, HP-1) | AC-A1 | AC-A2 | AC-A3 | AC-A4

Number of Systems: 4 | 1 | 1 | 1

Indicate Page Reference on Plans or Schedule and Indicate the applicable exception(s).

MANDATORY MEASURES

1/4 Sections	87% AFUE	82% AFUE	82% AFUE
Heating Equipment Efficiency	11500	12.0 EER	12.0 EER
Cooling Equipment Efficiency	11500	12.0 EER	12.0 EER
HVAC Heat Pump Thermostat	11500, 11500	no	no
Furnace Controls/Thermostat	11500, 11500	no	no
Natural Ventilation	12100	8.50 cfm	8.0 cfm
Mechanical Ventilation	12100	no	no
VAV Minimum Position Control	12100	no	no
Demand Control Ventilation	12100	no	no
Fire Control	12100	Programmable Switch	Programmable Switch
Backwash and Strip Control	12100	Subtask Required	Subtask Required
Outdoor Damper Control	12100	Auto	Auto
Isolation Zones	12100	no	no
Pipe Insulation	121	no	no
Duct Location/ R-value	124	ABC, Roof Ins / 4.2	ABC, Roof Ins / 4.2

PRESCRIPTIVE MEASURES

1450.8.5.1	no	no	no
Calculated Design Heating Load	1450.8.5.1	712,000 Btu/hr	103,000 Btu/hr
Proposed Heating Capacity	1450.8.5.1	no	no
Calculated Design Cooling Load	1450.8.5.1	no	no
Proposed Cooling Capacity	1450.8.5.1	587,200 Btu/hr	775,700 Btu/hr
Fan Control	1450.9	Variable Speed	Constant Volume
DP Sensor Location	1450.9	no	no
Supply Pressure Reset (SDC only)	1450.9	no	no
Simultaneous Heat/Cool	1450.9	no	no
Economizer	1450.9	DM Temp (Integrated)	DM Temp (Integrated)
Heat Air Supply Reset	1450.9	Constant Temp	Constant Temp
Cool Air Supply Reset	1450.9	Constant Temp	Constant Temp
Electric Resistance Heating	1450.9	no	no
Ar Cooled Chiller Limitation	1450.9	no	no
Duct Leakage Testing, If Yes, a MECH-4-A must be submitted	1450.9	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 §1454.9 apply.

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AIR SYSTEM REQUIREMENTS (Part 1 of 2) MECH-2C

Project Name: **BCSD School Building A** Date: **1/5/2012**

Item or System Tags (i.e. AC1, RTU-1, HP-1) | AC-A4 | AC-A5 | AC-A6 | AC-A7

Number of Systems: 1 | 1 | 1 | 1

Indicate Page Reference on Plans or Schedule and Indicate the applicable exception(s).

MANDATORY MEASURES

1/4 Sections	87% AFUE	87% AFUE	87% AFUE
Heating Equipment Efficiency	11500	12.0 EER	12.0 EER
Cooling Equipment Efficiency	11500	12.0 EER	12.0 EER
HVAC Heat Pump Thermostat	11500, 11500	no	no
Furnace Controls/Thermostat	11500, 11500	no	no
Natural Ventilation	12100	392 cfm	699 cfm
Mechanical Ventilation	12100	no	no
VAV Minimum Position Control	12100	no	no
Demand Control Ventilation	12100	no	no
Fire Control	12100	Programmable Switch	Programmable Switch
Backwash and Strip Control	12100	Subtask Required	Subtask Required
Outdoor Damper Control	12100	Auto	Auto
Isolation Zones	12100	no	no
Pipe Insulation	121	no	no
Duct Location/ R-value	124	ABC, Roof Ins / 4.2	ABC, Roof Ins / 4.2

PRESCRIPTIVE MEASURES

1450.8.5.1	no	no	no
Calculated Design Heating Load	1450.8.5.1	103,000 Btu/hr	58,000 Btu/hr
Proposed Heating Capacity	1450.8.5.1	no	no
Calculated Design Cooling Load	1450.8.5.1	no	no
Proposed Cooling Capacity	1450.8.5.1	85,947 Btu/hr	63,142 Btu/hr
Fan Control	1450.9	Constant Volume	Constant Volume
DP Sensor Location	1450.9	no	no
Supply Pressure Reset (SDC only)	1450.9	no	no
Simultaneous Heat/Cool	1450.9	no	no
Economizer	1450.9	DM Temp (Integrated)	DM Temp (Integrated)
Heat Air Supply Reset	1450.9	Constant Temp	Constant Temp
Cool Air Supply Reset	1450.9	Constant Temp	Constant Temp
Electric Resistance Heating	1450.9	no	no
Ar Cooled Chiller Limitation	1450.9	no	no
Duct Leakage Testing, If Yes, a MECH-4-A must be submitted	1450.9	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 §1454.9 apply.

Engr/No. 5.1 by Engr/SDR User Number: 6332 Rev/Code: 2012-01-05T12:01:19 ID: 09091 Page 32 of 44

AIR SYSTEM REQUIREMENTS (Part 1 of 2) MECH-2C

Project Name: **BCSD School Building A** Date: **1/5/2012**

Item or System Tags (i.e. AC1, RTU-1, HP-1) | AC-A1 | AC-A2 | AC-A3

Number of Systems: 4 | 1 | 1

Indicate Page Reference on Plans or Schedule and Indicate the applicable exception(s).

MANDATORY MEASURES

1/4 Sections	87% AFUE	82% AFUE	82% AFUE
Heating Equipment Efficiency	11500	12.0 EER	12.0 EER
Cooling Equipment Efficiency	11500	12.0 EER	12.0 EER
HVAC Heat Pump Thermostat	11500, 11500	no	no
Furnace Controls/Thermostat	11500, 11500	no	no
Natural Ventilation	12100	8.50 cfm	8.0 cfm
Mechanical Ventilation	12100	no	no
VAV Minimum Position Control	12100	no	no
Demand Control Ventilation	12100	no	no
Fire Control	12100	Programmable Switch	Programmable Switch
Backwash and Strip Control	12100	Subtask Required	Subtask Required
Outdoor Damper Control	12100	Auto	Auto
Isolation Zones	12100	no	no
Pipe Insulation	121	no	no
Duct Location/ R-value	124	ABC, Roof Ins / 4.2	ABC, Roof Ins / 4.2

PRESCRIPTIVE MEASURES

1450.8.5.1	no	no	no
Calculated Design Heating Load	1450.8.5.1	712,000 Btu/hr	103,000 Btu/hr
Proposed Heating Capacity	1450.8.5.1	no	no
Calculated Design Cooling Load	1450.8.5.1	no	no
Proposed Cooling Capacity	1450.8.5.1	587,200 Btu/hr	775,700 Btu/hr
Fan Control	1450.9	Variable Speed	Constant Volume
DP Sensor Location	1450.9	no	no
Supply Pressure Reset (SDC only)	1450.9	no	no
Simultaneous Heat/Cool	1450.9	no	no
Economizer	1450.9	DM Temp (Integrated)	DM Temp (Integrated)
Heat Air Supply Reset	1450.9	Constant Temp	Constant Temp
Cool Air Supply Reset	1450.9	Constant Temp	Constant Temp
Electric Resistance Heating	1450.9	no	no
Ar Cooled Chiller Limitation	1450.9	no	no
Duct Leakage Testing, If Yes, a MECH-4-A must be submitted	1450.9	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 §1454.9 apply.

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

Project Name: **BCSD School Building A** Date: **1/5/2012**

Item or System Tags (i.e. AC1, RTU-1, HP-1) | AC-A1 | AC-A2 | AC-A3 | AC-A4

Number of Systems: 4 | 1 | 1 | 1

Indicate Page Reference on Plans or Schedule and Indicate the applicable exception(s).

MANDATORY MEASURES

1/4 Sections	87% AFUE	82% AFUE	82% AFUE
Heating Equipment Efficiency	11500	12.0 EER	12.0 EER
Cooling Equipment Efficiency	11500	12.0 EER	12.0 EER
HVAC Heat Pump Thermostat	11500, 11500	no	no
Furnace Controls/Thermostat	11500, 11500	no	no
Natural Ventilation	12100	8.50 cfm	8.0 cfm
Mechanical Ventilation	12100	no	no
VAV Minimum Position Control	12100	no	no
Demand Control Ventilation	12100	no	no
Fire Control	12100	Programmable Switch	Programmable Switch
Backwash and Strip Control	12100	Subtask Required	Subtask Required
Outdoor Damper Control	12100	Auto	Auto
Isolation Zones	12100	no	no
Pipe Insulation	121	no	no
Duct Location/ R-value	124	ABC, Roof Ins / 4.2	ABC, Roof Ins / 4.2

PRESCRIPTIVE MEASURES

1450.8.5.1	no	no	no
Calculated Design Heating Load	1450.8.5.1	712,000 Btu/hr	103,000 Btu/hr
Proposed Heating Capacity	1450.8.5.1	no	no
Calculated Design Cooling Load	1450.8.5.1	no	no
Proposed Cooling Capacity	1450.8.5.1	587,200 Btu/hr	775,700 Btu/hr
Fan Control	1450.9	Variable Speed	Constant Volume
DP Sensor Location	1450.9	no	no
Supply Pressure Reset (SDC only)	1450.9	no	no
Simultaneous Heat/Cool	1450.9	no	no
Economizer	1450.9	DM Temp (Integrated)	DM Temp (Integrated)
Heat Air Supply Reset	1450.9	Constant Temp	Constant Temp
Cool Air Supply Reset	1450.9	Constant Temp	Constant Temp
Electric Resistance Heating	1450.9	no	no
Ar Cooled Chiller Limitation	1450.9	no	no
Duct Leakage Testing, If Yes, a MECH-4-A must be submitted	1450.9	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 §1454.9 apply.

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MECHANICAL VENTILATION AND REHEAT MECH-3C

Project Name: **BCSD School Building A** Date: **1/5/2012**

Item or System Tags (i.e. AC1, RTU-1, HP-1) | AC-A1 | AC-A2 | AC-A3 | AC-A4

Number of Systems: 4 | 1 | 1 | 1

Indicate Page Reference on Plans or Schedule and Indicate the applicable exception(s).

MECHANICAL VENTILATION (§12100)

Zone/System	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Classroom	4.94	0.30	4.162	1.752	0.74	0.304	0.304							
Pharmacy Area	2.370	0.30	2.070	0.870	0.30	0.304	0.304							
Library	2.340	0.30	2.040	0.840	0.30	0.304	0.304							
Music	2.340	0.30	2.040	0.840	0.30	0.304	0.304							
Mass Office & Phone	4.13	0.15	3.98	1.63	0.7	0.304	0.304							
AC-A1	2.340	0.15	2.19	0.90	0.30	0.304	0.304							
Library Office & Wash	3.00	0.15	2.85	1.15	0.40	0.304	0.304							
AC-A2	3.00	0.15	2.85	1.15	0.40	0.304	0.304							
Faculty Lounge A119	1.630	0.25	1.380	0.570	0.25	0.304	0.304							
Faculty Lounge A120	1.630	0.25	1.380	0.570	0.25	0.304	0.304							
AC-A3	1.630	0.25	1.380	0.570	0.25	0.304	0.304							
Teachers Lounge A143	4.83	0.50	4.33	1.83	0.60	0.304	0.304							
AC-A4	4.83	0.50	4.33	1.83	0.60	0.304	0.304							
AC-A11	1.630	0.25	1.380	0.570	0.25	0.304	0.304							
Boys' Living Area A130	6.42	0.25	6.17	2.67	0.60	0.304	0.304							
AC-A12	6.42	0.25	6.17	2.67	0.60	0.304	0.304							
Admin & Storage	2.47	0.15	2.32	0.97	0.30	0.304	0.304							
AC-A2	2.47	0.15	2.32	0.97	0.30	0.304	0.304							
Totals														

Column 1 Total Design Ventilation Air

REHEAT LIMITATION (§1440)

Zone/System	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Classroom	4.94	0.30	4.162	1.752	0.74	0.304	0.304							
Pharmacy Area	2.370	0.30	2.070	0.870	0.30	0.304	0.304							
Library	2.340	0.30	2.040	0.840	0.30	0.304	0.304							
Music	2.340	0.30	2.040	0.840	0.30	0.304	0.304							
Mass Office & Phone	4.13	0.15	3.98	1.63	0.7	0.304	0.304							
AC-A1	2.340	0.15	2.19	0.90	0.30	0.304	0.304							
Library Office & Wash	3.00	0.15	2.85	1.15	0.40	0.304	0.304							
AC-A2	3.00	0.15	2.85	1.15	0.40	0.304	0.304							
Faculty Lounge A119	1.630	0.25	1.380	0.570	0.25	0.304	0.304							
Faculty Lounge A120	1.630	0.25	1.380	0.570	0.25	0.304	0.304							
AC-A3	1.630	0.25	1.380	0.570	0.25	0.304	0.304							
Teachers Lounge A143	4.83	0.50	4.33	1.83	0.60	0.304	0.304							
AC-A4	4.83	0.50	4.33	1.83	0.60	0.304	0.304							
AC-A11	1.630	0.25	1.380	0.570	0.25	0.304	0.304							
Boys' Living Area A130	6.42	0.25	6.17	2.67	0.60	0.304	0.304							
AC-A12	6.42	0.25	6.17	2.67	0.60	0.304	0.304							
Admin & Storage	2.47	0.15	2.32	0.97	0.30	0.304	0.304							
AC-A2	2.47	0.15	2.32	0.97	0.30	0.304	0.304							
Totals														

Column 1 Total Design Ventilation Air

Notes:

- C Minimum ventilation rate per Section 12100, Table 121.1.
- D Based on fixed seat or the greater of the expected number of occupants and 50% of the CRC occupied load for areas without fixed seating.
- E Required Ventilation Air (REQD V.A.) is the larger of the ventilation rates calculated on an AREA BASIS or OCCUPANCY BASIS (Column D or G).
- F Must be greater than or equal to 1/3 or less than 1/4 of the Design Zone V.A. to make up the difference.
- G Design for supply CFM from CHW at 55% or the design zone outdoor airflow rate per §12100.
- H Condition area (ft²) x 0.4 CFM/ft² or 300 CFM.
- I Minimum 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).

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