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BRIDGERLAND APPLIED TECHNOLOGY COLLEGE REMODEL

LOGAN, UTAH



State of Utah—Department of Administrative Services
DIVISION OF FACILITIES CONSTRUCTION
AND MANAGEMENT
4110 State Office Building/Salt Lake City, Utah 84114/538-3018

DFCM Project No. - 1047210

DESIGN TEAM PROJECT ENGINEER

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CODE ANALYSIS

APPLICABLE CODES			
	Year	Year	
International Building Code	2009	National Electrical Code	2008
International Mechanical Code	2009	Uniform Code for Building Conservation	2006
International Plumbing Code	2009	ADA Accessibility Guidelines	N/A
International Fire Code	2009		
International Energy Conservation Code	2009		

A. Occupancy and Group: B

Change in Use: Yes No X Mixed Occupancy: Yes No X
Special Use and Occupancy (e.g. High Rise, Covered Mall): N/A

B. Seismic Design Category: N/A Design Wind Speed: N/A mph

C. Type of Construction (circle one): Existing Classified type IIN per 1982 drawings

<u> I </u>	<u> I </u>	<u> II </u>	<u> II </u>	<u> III </u>	<u> III </u>	<u> IV </u>	<u> V </u>	<u> V </u>
A	B	A	B	A	B	HT	A	B

D. Fire Resistance Rating Requirements for the Exterior Walls based on the fire separation distance (in hours):
North: 0 South: 0 East: 0 West: 0

E. Mixed Occupancies: NONE Nonseparated Uses:

F. Sprinklers:
Required: Provided: X Type of Sprinkler System: EXISTING

G. Number of Stories: 1 Building Height: 26 FT

H. Actual Area per Floor (square feet):

I. Tabular Area:

J. Area Modifications:
a) $A_a = A_t + \left[\frac{A_t I_r}{100} \right] + \left[\frac{A_t I_s}{100} \right]$ $I_r = 100 \left[\frac{F}{P} - 0.25 \right] \frac{W}{30}$

b) Sum of the Ratio Calculations for Mixed Occupancies:
 $\frac{\text{Actual Area}}{\text{Allowable Area}} \leq 1$

c) Total Allowable Area for:
1) One Story:
2) Two Story: $A_a(2)$
3) Three Story: $A_a(3)$

d) Unlimited Area Building: Yes No X Code Section:

K. Fire Resistance Rating Requirements for Building Elements (hours).

Element	Hours	Assembly Listing	Element	Hours	Assembly Listing
Exterior Bearing Walls			Floors - Ceiling Floors		
Interior Bearing Walls			Roofs - Ceiling Roofs		
Exterior Non-Bearing Walls			Exterior Doors and Windows		
Structural Frame			Shaft Enclosures		
Partitions - Permanent			Fire Walls		
Fire Barriers			Fire Partitions		
			Smoke Partitions		

L. Design Occupant Load: N/A - No occupants added
Exit Width Required: Exit Width Provided:

M. Minimum Number of Required Plumbing Facilities:
a) Water Closets - Required (m) (f) Provided (m) (f)
b) Lavatories - Required (m) (f) Provided (m) (f)
c) Bath Tubs or Showers: Service Sinks:
d) Drinking Fountains:

FOOTNOTES: I

1) In case of conflict with the U.S. Department of Justice Federal Registers Parts through V - ADA Guidelines and specific reference to the International Building Code Accessibility Chapters, the more restrictive requirement shall govern.

2) Additional Code Information shall be provided at the discretion of the Building Official for Complex Buildings. Including, but not limited to:
a) High Rise Requirements.
b) Atriums.
c) Performance Based Criteria.
d) Means or Egress Analysis.
e) Fire Assembly Locator Sheet.
f) Exterior and Interior Accessibility Route.
g) Fire Stopping, Including Tested Design Number.



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CONTROLS UPGRADE
LOGAN, UTAH

REVISIONS

DFCM PROJECT #: 1047210
CHECKED BY: R.VERNON
DRAWN BY: C.MORGAN
CURRENT BID DATE: 10/12/10

SHEET CONTENTS
GENERAL
PROJECT
INFORMATION

G-001

LEGEND OF MECHANICAL SYMBOLS AND ABBREVIATIONS

MECHANICAL

	POSITIVE PRESSURE DUCT - RISE
	POSITIVE PRESSURE DUCT - DROP
	NEGATIVE PRESSURE DUCT - RISE
	NEGATIVE PRESSURE DUCT - DROP
	ROUND DUCT - RISE
	ROUND DUCT - DROP
	UNDER FLOOR DUCT
	TURNING VANES
	FRESH AIR LOUVER
	RELIEF AIR OR EXHAUST AIR LOUVER
	CEILING SUPPLY DIFFUSER
	CEILING RETURN REGISTER
	CEILING EXHAUST REGISTER, (BALANCE TO MATCH SUPPLY IF RETURN CFM IS NOT SHOWN)
	SIDEWALL SUPPLY REGISTER
	SIDEWALL EXHAUST OR RETURN REGISTER
	CEILING SUPPLY DIFFUSER WITH FLEXIBLE DUCT
	CEILING AIR GRILLE WITH FLEXIBLE DUCT
	CEILING RETURN AIR GRILLE W/ SOUND BOOT
	FLEXIBLE DUCT CONNECTION
	FLEXIBLE DUCT
	FAN
	RECTANGULAR DUCT WITH NET INSIDE DIMENSIONS SHOWN IN INCHES.
	ROUND DUCT WITH NET INSIDE DIMENSIONS SHOWN IN INCHES.
	INCLINED RISE
	INCLINED DROP
	R/W=1. ROUND DUCT SIMILAR TO RECTANGULAR
	RECTANGULAR TO RECTANGULAR OR ROUND TO ROUND DUCT TRANSFORMATION MAXIMUM 15° INCLUDED ANGLE EXCEPT WHERE SHOWN OTHERWISE.
	RECTANGULAR TO ROUND DUCT TRANSFORMATION
	MANUAL VOLUME DAMPER
	ATC DAMPER
	ACCESS PANEL IN DUCT OR PLENUM
	HEATING OR COOLING COIL IN DUCT
	SINGLE DUCT AIR TERMINAL BOX VARIABLE OR CONSTANT VOLUME. MIN. 1-1/2" TERMINAL INLET SIZE. STRAIGHT DUCT AT TERMINAL INLET.
	4-WAY BLOW PATTERN
	3-WAY BLOW PATTERN
	2-WAY BLOW PATTERN
	2-WAY BLOW PATTERN
	1-WAY BLOW PATTERN
	DUCT SMOKE DETECTOR

TOP FIGURES INDICATE NECK SIZE. BOTTOM FIGURE INDICATES CFM.

PLUMBING

	FLOOR SINK
	FLOOR DRAIN
	FLOOR CLEAN-OUT OR CLEAN-OUT TO GRADE
	ROOF DRAIN
	DOWNSPOUT NOZZLE
	ARROW INDICATES DIRECTION OF FLOW IN PIPE
	CHECK VALVE
	PRESSURE REDUCING, SELF CONTAINED VALVE
	ATC VALVE - 2 WAY
	ATC VALVE - 3 WAY
	SOLENOID VALVE
	GATE VALVE
	GLOBE VALVE
	TEMPERATURE AND PRESSURE TEST PORT
	PRESSURE SWITCH
	GAS COCK
	CALIBRATED BALANCING VALVE WITH GPM INDICATED
	REDUCED PRESSURE BACKFLOW PREVENTOR W/ DRAIN PAN
	BRANCH - BOTTOM CONNECTION
	BRANCH - TOP CONNECTION
	BRANCH - SIDE CONNECTION
	RISE OR DROP
	RISE - DOWN (ELBOW)
	RISE - DOWN (ELBOW)
	VENT THRU ROOF
	WATER HAMMER ARRESTOR
	INLINE PUMP
	INLINE PUMP
	CLEAN-OUT
	RELIEF VALVE
	ANGLE VALVE
	FLOW METER
	UNION
	BALANCING COCK
	SHUT-OFF COCK FOR USE WITH PRESSURE GAUGE
	FLEXIBLE EXPANSION JOINT
	THERMOMETER - TEMP RANGE AS INDICATED
	PRESSURE GAUGE WITH SHUT-OFF COCK
	PRESSURE GAUGE WITH PIGTAIL
	LATERAL STRAINER WITH BLOW-OFF VALVE. PROVIDE HOSE END WITH CAP WHERE DISCHARGE IS NOT PIPED TO DRAIN
	BALL VALVE (PIPE SIZES 2" AND SMALLER)
	BUTTERFLY VALVE (PIPE SIZES 2-1/2" AND LARGER)
	MOTOR OPERATED BUTTERFLY VALVE
	VALVE IN RISE
	AIR VENT-MANUAL
	AIR VENT-AUTO
	FLOW SWITCH
	REDUCER
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER

PLUMBING CONT.

	SWITCH
	SENSOR
	90° ELBOW
	45° ELBOW
	STEAM TRAP, F&T=FLOAT & THERMOSTATIC
	LEADER INDICATES DOWNWARD SLOPE
	DEMOLITION
	ALIGNMENT GUIDE
	ANCHOR
	LUBRICATED PLUG COCK

SYMBOLS

	PLUMBING FIXTURES
	POINT OF CONNECTION
	SECTION TAG - TOP FIGURE IS SECTION NO. BOTTOM FIGURE IS SHEET NO.
	DETAIL TAG - TOP FIGURE IS DETAIL NO. BOTTOM FIGURE IS SHEET NO.
	EQUIPMENT IDENTIFICATION
	KEYED NOTE IDENTIFICATION

LINETYPES

	CHEMICAL FEED
	CHILLED WATER SUPPLY
	CHILLED WATER RETURN
	CONDENSER WATER SUPPLY
	CONDENSER WATER RETURN
	DOMESTIC COLD WATER (DCW)
	DOMESTIC HOT WATER (DHW)
	DOMESTIC HOT WATER RETURN (DHW)
	EXISTING PIPING
	EXISTING PIPING TO BE REMOVED
	NATURAL GAS
	HOT GAS
	MAKE UP WATER



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BRIDGERLAND APPLIED TECHNOLOGY COLLEGE CONTROLS UPGRADE LOGAN, UTAH

REVISIONS

SFCM PROJECT #: 1047210 CHECKED BY: R.VERNON DRAWN BY: C.MORGAN CURRENT BID DATE: 10/12/10

SHEET CONTENTS MECHANICAL SYMBOLS

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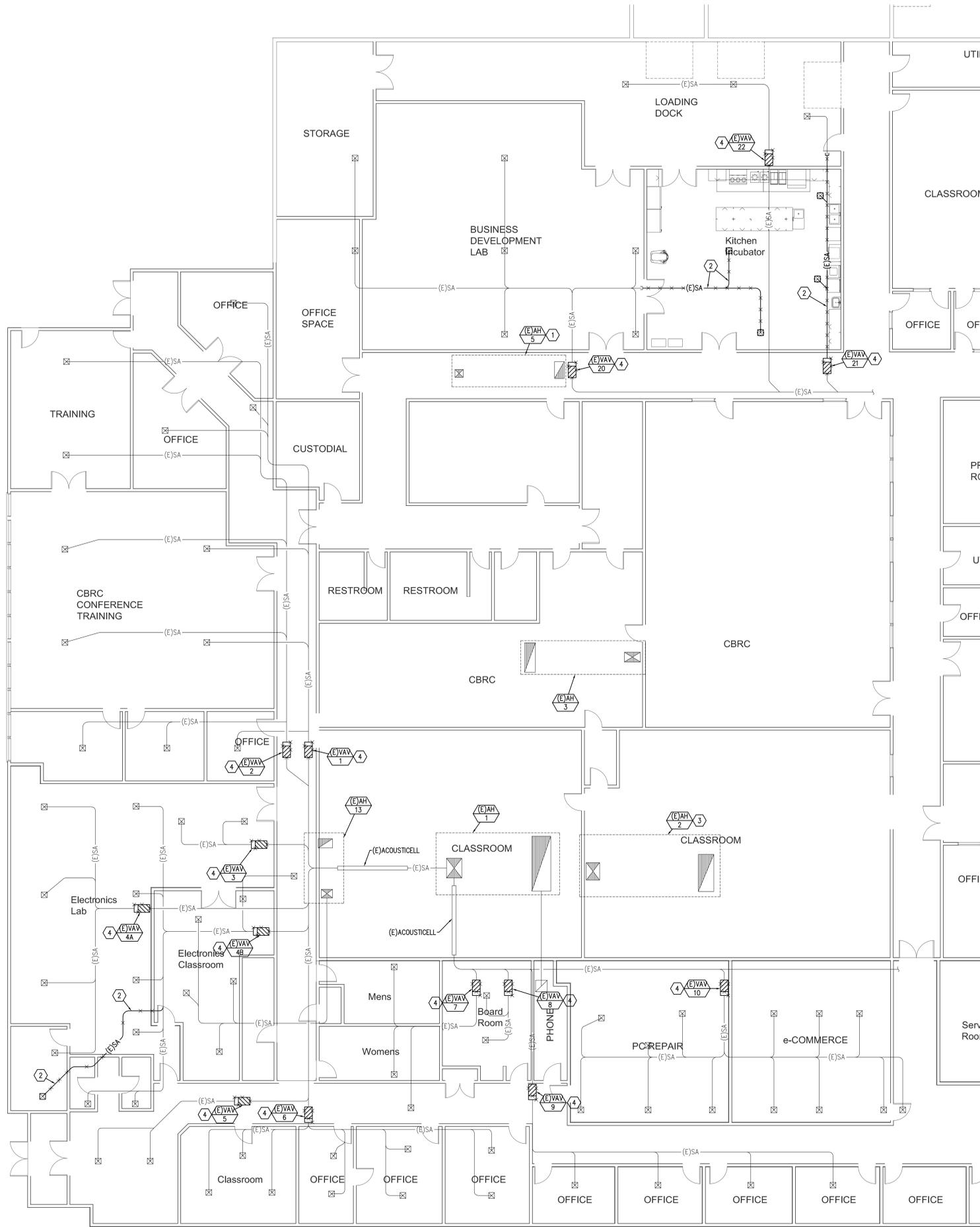
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KEYED NOTES

- 1 ABANDON (E/AH-5 IN PLACE.
- 2 REMOVE DUCT & DIFFUSERS WHERE SHOWN. CAP REMAINING DUCT AIR TIGHT.
- 3 PRIOR TO COMMENCING WORK MEASURE EXISTING AIRFLOW. AFTER AIR HANDLER MODIFICATIONS AS DEPICTED ON SHEET M-801 ARE COMPLETE, RE-BALANCE AIR HANDLER TO MATCH EXISTING AIRFLOW.
- 4 REMOVE & REPLACE EXISTING VAV BOX WITH NEW.

GENERAL NOTES

- 1. SEE MECHANICAL PLANS FOR REQUIRED AIR HANDLER UPGRADES.
- 2. REMOVE & REPLACE EXISTING PNEUMATIC THERMOSTATS WITH NEW.



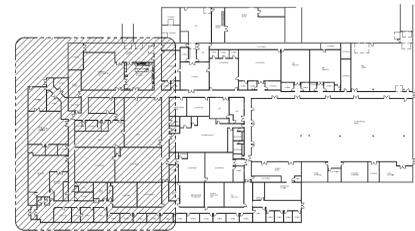
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LOGAN, UTAH



KEY PLAN
NO SCALE

A1 WEST MECHANICAL DEMOLITION PLAN
MD101 NO SCALE

REVISIONS

SFCM PROJECT #:	1047210
CHECKED BY:	R. VERNON
DRAWN BY:	C. MORGAN
CURRENT BID DATE:	10/12/10

SHEET CONTENTS
WEST MECHANICAL DEMOLITION PLAN

MD101

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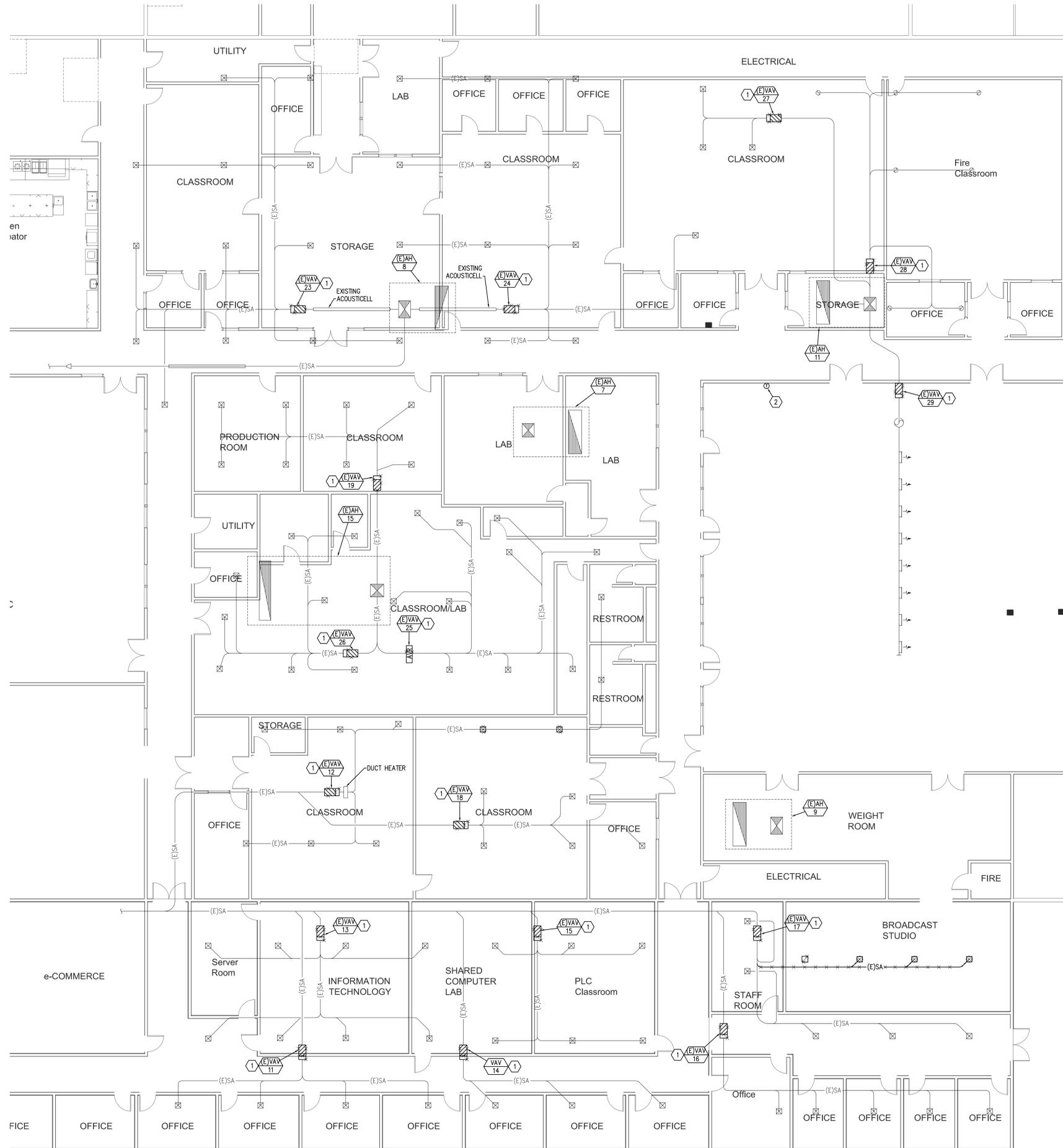
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KEYED NOTES

- 1 REMOVE & REPLACE EXISTING VAV BOX WITH NEW.

GENERAL NOTES

- 1. SEE MECHANICAL PLANS FOR REQUIRED AIR HANDLER UPGRADES.
- 2. REMOVE & REPLACE EXISTING PNEUMATIC THERMOSTATS WITH NEW.



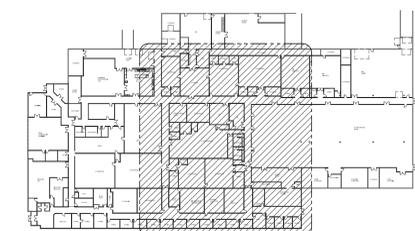
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KEY PLAN
NO SCALE

A1 EAST MECHANICAL DEMOLITION PLAN
MD102 NO SCALE

REVISIONS

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DRAWN BY:	C. MORGAN
CURRENT BID DATE:	10/12/10

SHEET CONTENTS

EAST MECHANICAL DEMOLITION PLAN

MD102

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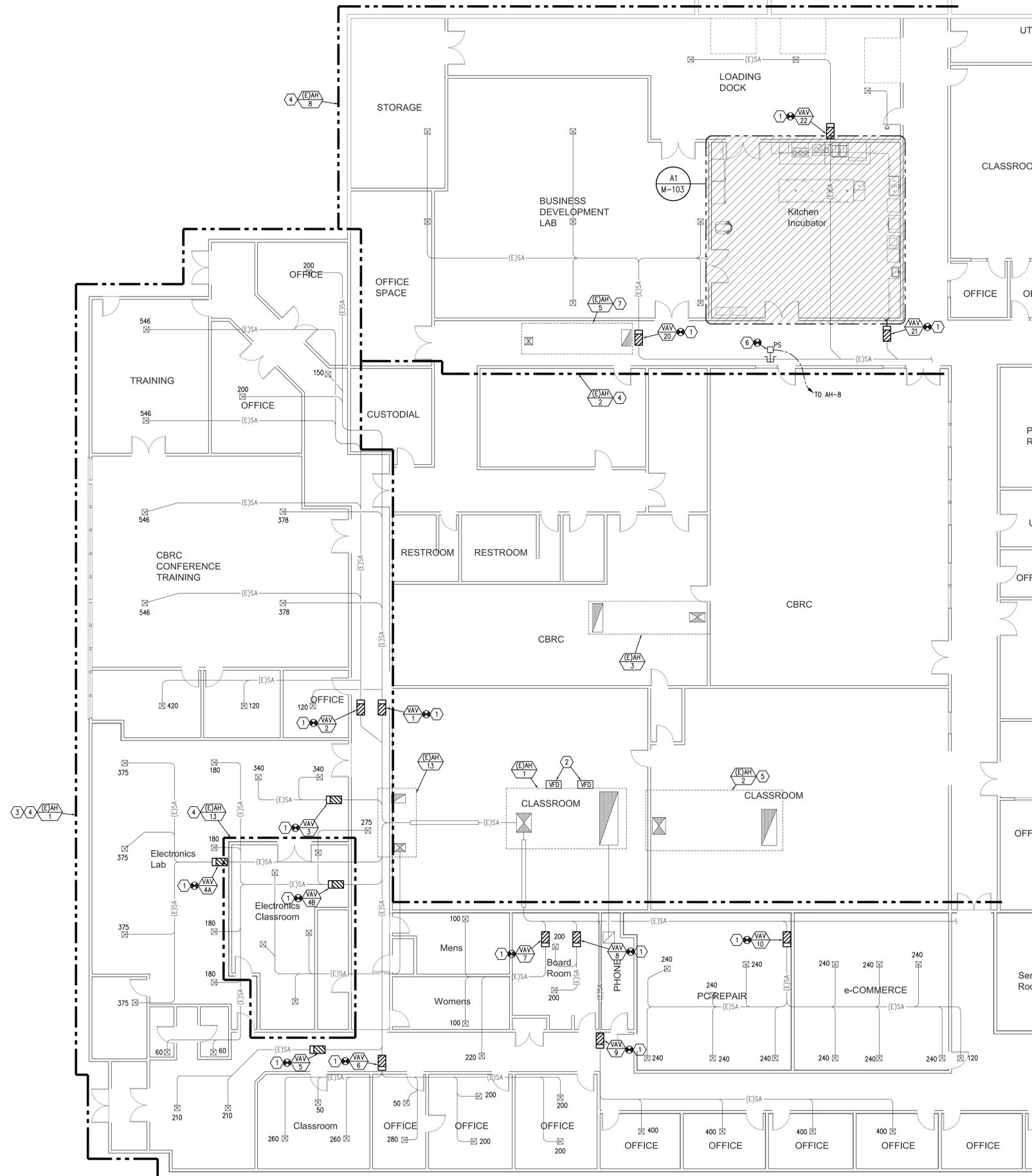
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KEYED NOTES

- 1 REPLACE EXISTING VAV BOX WITH NEW. CONNECTION SHALL BE AIR TIGHT IN ACCORDANCE WITH SPECIFIED PRESSURE CLASSIFICATION.
- 2 NEW WEATHER PROOF VFD. SEE CONTROL DIAGRAMS ON SHEET M-601. PROVIDED AND INSTALLED BY ELECTRICAL. SHOWN FOR INFORMATIONAL PURPOSES ONLY.
- 3 AIR HANDLER 1 - BALANCE EXISTING SUPPLY AIR DIFFUSER TO CFM NOTED.
- 4 DASHED AREA SERVED BY RTU NOTED. SHOWN FOR INFORMATIONAL PURPOSES ONLY.
- 5 REBALANCE AIR HANDLER TO MATCH EXISTING AIRFLOW. SEE SHEETS M101 & M-601.
- 6 INSTALL NEW PRESSURE SENSOR IN EXISTING SUPPLY DUCTWORK.
- 7 ROOFTOP UNIT IS NOT WITHIN THE SCOPE OF THE PROJECT. SHOWN FOR INFORMATIONAL PURPOSES ONLY.

GENERAL NOTES

- 1. SEE AIR HANDLER CONTROLS SCHEMATIC FOR REQUIRED AIR HANDLER UPGRADES.
- 2. REMOVE & REPLACE EXISTING PNEUMATIC THERMOSTATS WITH NEW.
- 3. INSTALL ALL DUCTWORK IN ACCORDANCE WITH SHEET METAL DETAILS ON M-501, & M-502.
- 4. PROVIDE ACCESS TO ALL VALVES AND DAMPERS LOCATED ABOVE CEILINGS.



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KEY PLAN
NO SCALE

A1 WEST MECHANICAL PLAN
M-101 NO SCALE

REVISIONS	

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DRAWN BY:	C. MORGAN
CURRENT BID DATE:	10/12/10

SHEET CONTENTS
WEST MECHANICAL PLAN

M-101

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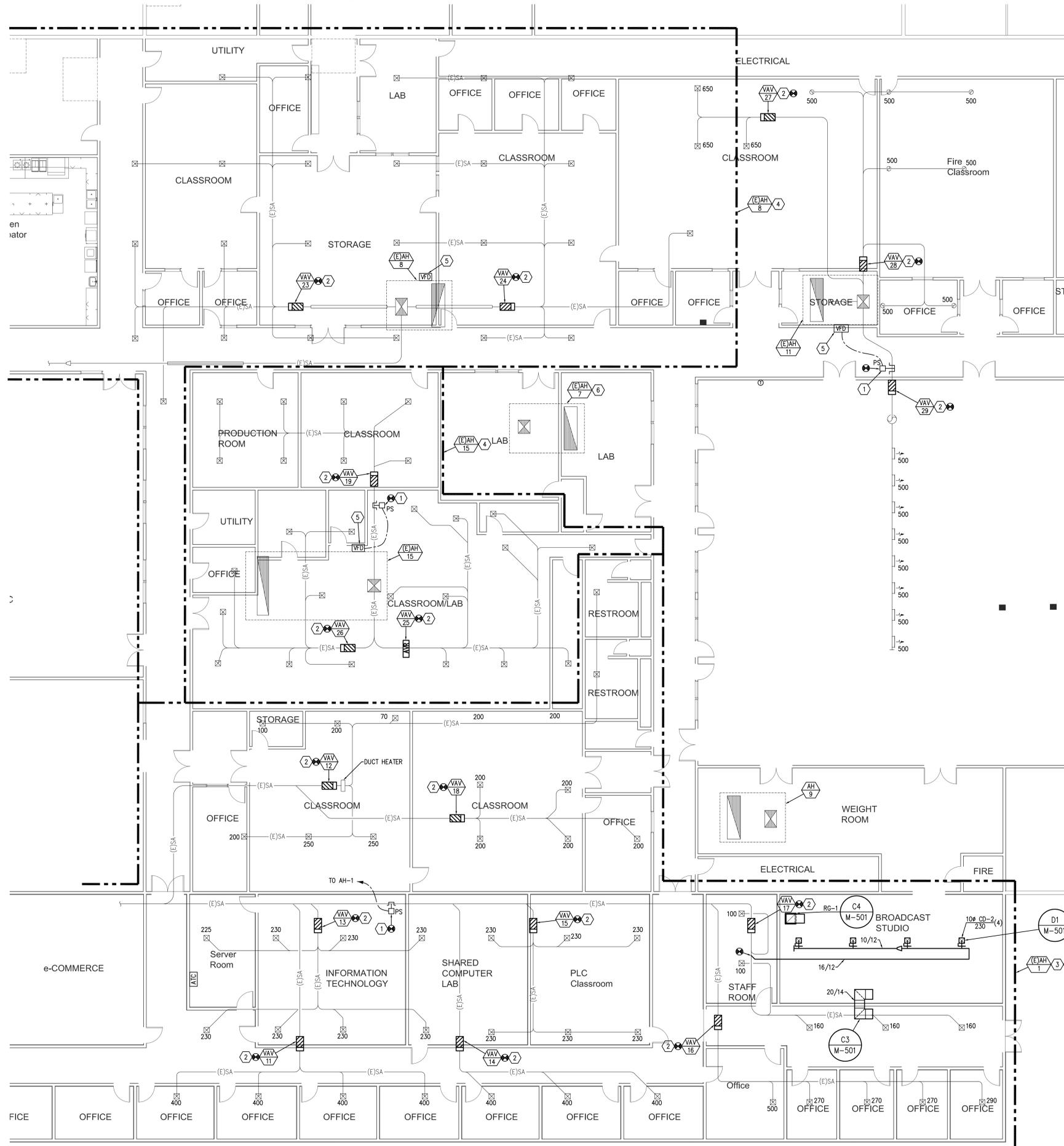
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KEYED NOTES

- 1 INSTALL NEW DUCT PRESSURE SENSOR IN EXISTING SUPPLY DUCTWORK.
- 2 REPLACE EXISTING VAV BOX WITH NEW CONNECTION SHALL BE AIR TIGHT IN ACCORDANCE WITH SPECIFIED PRESSURE CLASSIFICATION.
- 3 AIR HANDLER 1 - BALANCE EXISTING SUPPLY AIR DIFFUSER TO CFM NOTED.
- 4 DASHED AREA SERVED BY RTU NOTED. SHOWN FOR INFORMATIONAL PURPOSES ONLY.
- 5 NEW WEATHER PROOF VFD. SEE CONTROL DIAGRAM ON SHEET M-501. PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. SHOWN FOR INFORMATIONAL PURPOSES ONLY.
- 6 EXISTING ROOFTOP AIR HANDLER NOT IN SCOPE OF PROJECT. SHOWN FOR INFORMATIONAL PURPOSES ONLY.

GENERAL NOTES

- 1. SEE AIR HANDLER CONTROLS SCHEMATIC FOR REQUIRED AIR HANDLER UPGRADES.
- 2. REMOVE & REPLACE EXISTING PNEUMATIC THERMOSTATS WITH NEW.
- 3. INSTALL ALL DUCTWORK IN ACCORDANCE WITH SHEET METAL DETAILS ON M-501, & M-502.
- 4. PROVIDE ACCESS TO ALL VALVES AND DAMPERS LOCATED ABOVE CEILINGS.

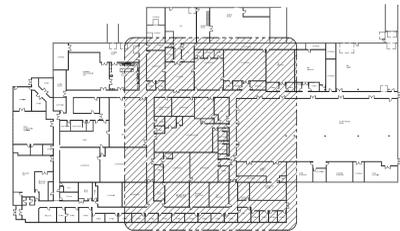


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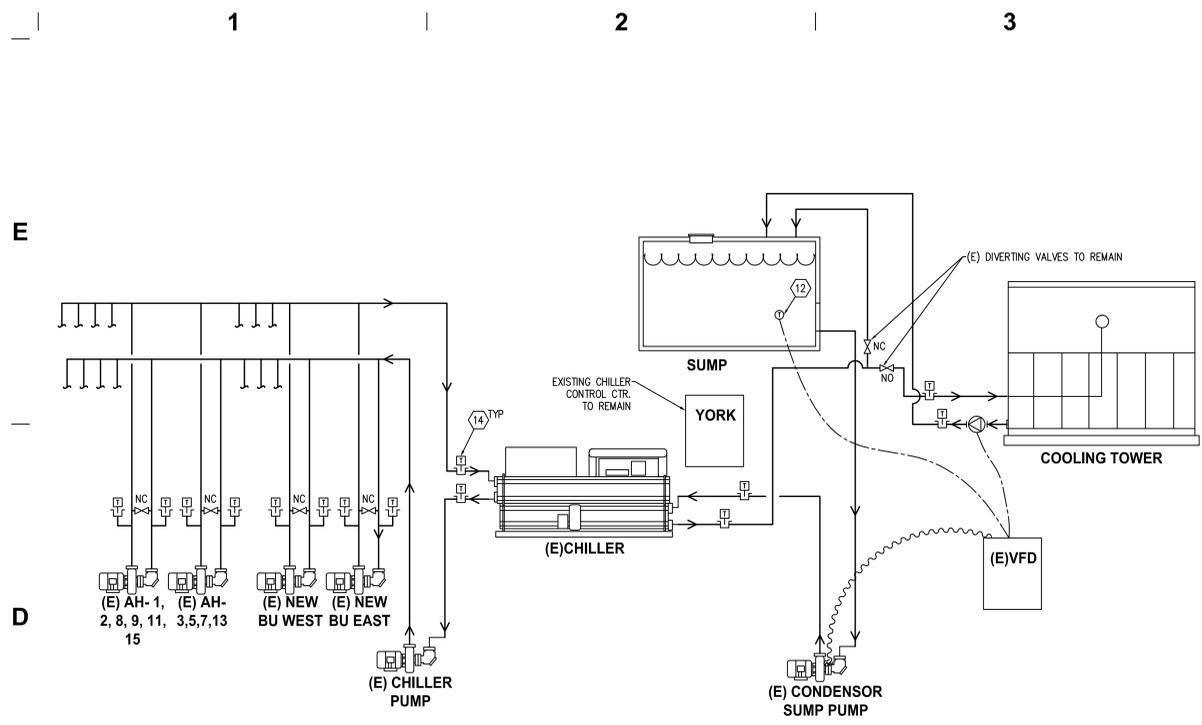
KEY PLAN
NO SCALE

A1 EAST MECHANICAL PLAN
M-102 NO SCALE

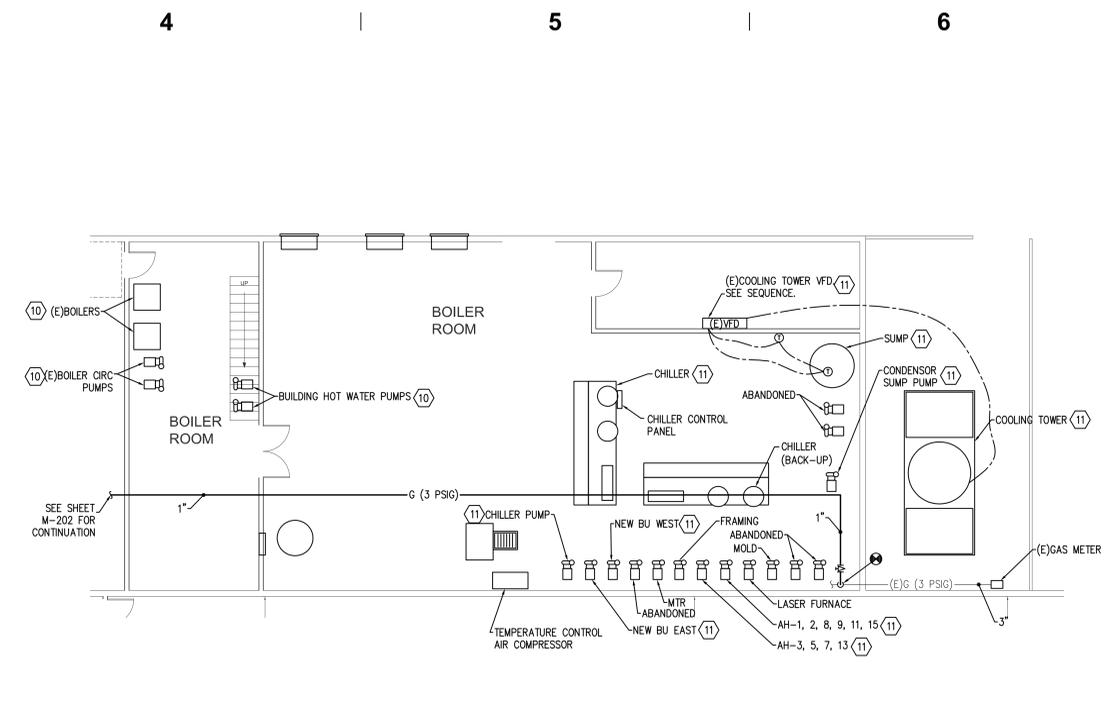
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CURRENT BID DATE:	10/12/10

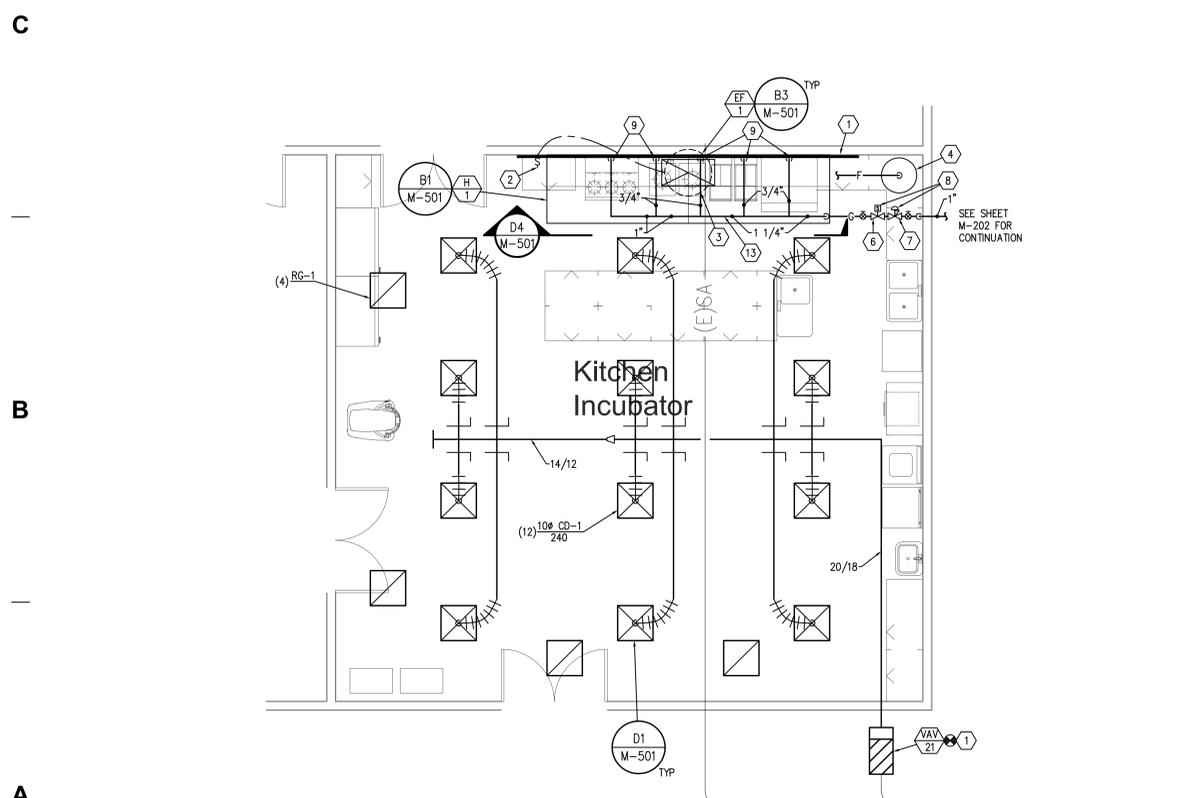
SHEET CONTENTS
EAST MECHANICAL PLAN



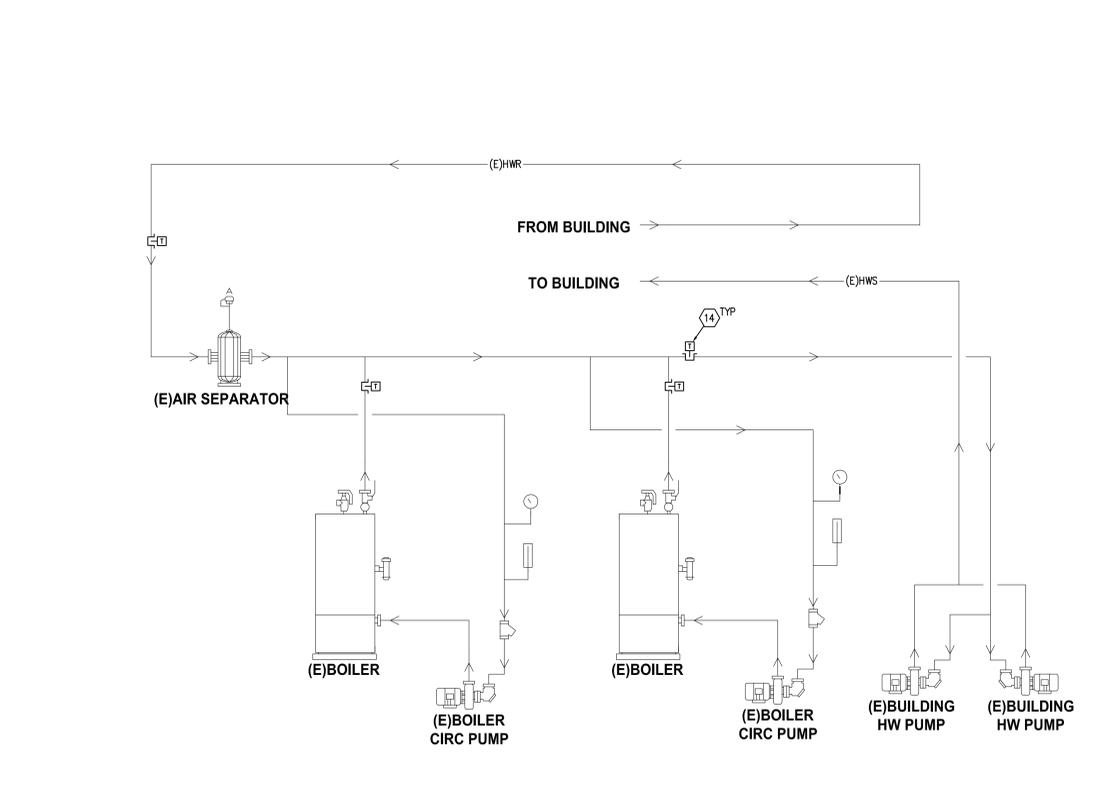
D1 CHILLER SCHEMATIC
M-103 NO SCALE



D4 WEST MECHANICAL PLAN
M-103 SCALE: 1/8"=1'-0"



A1 LARGE SCALE KITCHEN PLAN
M-103 SCALE: 1/4"=1'-0"



A4 BOILER SCHEMATIC
M-103 NO SCALE

GENERAL NOTES

1. PROVIDE ALL CONTROL POINTS AS SPECIFIED & ALL POINTS NECESSARY FOR A COMPLETE OPERATING SYSTEM. SEE BAS SECTION FOR ADDITIONAL REQUIRED CONTROL POINTS.
2. GREASE DUCT MATERIALS: GREASE DUCT SHALL BE CONSTRUCTED OF STEEL NOT LESS THAN 16 GA OR STAINLESS STEEL NOT LESS THAN 18 GA THICKNESS.
3. GREASE DUCT SHALL BE WELDED OR BRAZED LIQUID TIGHT IN ACCORDANCE WITH 2009 IMC - 506.3.2. ALL JOINTS SHALL BE BUTT JOINTS, WELDED FLANGE JOINTS WITH A MAXIMUM FLANGE DEPTH OF 1/2 INCH OR OVERLAPPING DUCT JOINTS OF EITHER THE TELESCOPING OR BELL TYPE IN ACCORDANCE WITH 2009 - IMC - 506.3.2.1. SLOPE ALL GREASE DUCT BACK TO HOOD 2" MIN.
4. GREASE DUCT TEST: PRIOR TO CONCEALING GREASE DUCT, THE DUCT SHALL BE LEAKAGE TESTED IN THE PRESENCE OF THE FIRE MARSHALL & ENGINEER. LEAKAGE TEST SHALL BE A LIGHT TEST OR APPROVED ALTERNATE IN ACCORDANCE WITH 2009-IMC-506.3.5. THE ENTIRE DUCT SYSTEM INCLUDING THE HOOD-TO-DUCT CONNECTION SHALL BE TESTED.
5. GREASE DUCT CLEARANCES: PROVIDE 18 INCHES MINIMUM CLEARANCE TO COMBUSTIBLES INCLUDING PAPER ON GYPSUM WALL BOARD. CLEARANCE TO NON-COMBUSTIBLES SHALL BE 3 INCHES MIN.

KEYED NOTES

1. PROVIDE & INSTALL 430 18 GA STAINLESS STEEL NON-COMBUSTIBLE SURFACE BEHIND THE GREASE HOOD & EXTENDING 18 INCHES BEYOND BOTH SIDES OF HOOD, 18 INCHES ABOVE HOOD & TO THE FINISHED FLOOR. SEE HOOD SECTION.
2. COORDINATE EXHAUST FAN CONTROL LOCATION WITH OWNER.
3. CONNECT TO HOOD WITH CONTINUOUS INTERNAL OR EXTERNAL LIQUID TIGHT WELDED OR BRAZED JOINTS. SUCH JOINT SHALL BE SMOOTH, ACCESSIBLE FOR INSPECTION & WITHOUT GREASE TRAPS. TRANSITION TO 22/22 & EXTEND & CONNECT TO EXHAUST FAN AS SHOWN. WRAP DUCT WITH 2 LAYERS OF 1-1/2" THICK FIRE RESISTIVE DUCT WRAP 2 HOUR RATING. MAINTAIN CLEARANCES AS REQUIRED BY CODE.
4. ANSUL FIRE SUPPRESSION SYSTEM. COORDINATE LOCATION WITH OWNER. SEE SCHEDULE.
5. INSTALL OWNER PROVIDED KITCHEN HOOD ABOVE DISHWASHERS. BLANK OFF SUPPLY CONNECTION. REMOVE FIRE SUPPRESSION SYSTEM IN ITS ENTIRETY. EXHAUST DUCT SHALL BE WELDED 316 STAINLESS STEEL. SLOPE BACK TO HOOD 2" MINIMUM.
6. AUTOMATIC GAS SHUT-OFF VALVE PROVIDED BY HOOD FIRE SUPPRESSION SYSTEM INSTALLED BY PLUMBER.
7. 3 LB TO 4 OZ GAS PRESSURE REGULATOR. SHUT-OFF VALVES, AND SOLENOID VALVE BELOW CEILING. GAS PRESSURE REGULATOR LOAD IS 589 OZH. VENT TO OUTSIDE.
8. INSTALL GAS PRV AND AUTOMATIC SHUT-OFF VALVE IN STAINLESS STEEL WALL BOX. SHOWN FOR CLARITY. WALL BOX SHALL BE INSTALLED IN 6" STUD WALL NEXT TO KITCHEN HOOD.
9. CONNECT EACH PIECE OF GAS FIRED EQUIPMENT WITH ITS OWN SHUT-OFF VALVE AND FLEXIBLE PIPE.
10. EXISTING HYDRONIC HEATING EQUIPMENT TO REMAIN. SEE BOILER SCHEMATIC THIS SHEET.
11. EXISTING CHILLED WATER EQUIPMENT TO REMAIN. SEE CHILLER SCHEMATIC THIS SHEET.
12. EXISTING RANK TEMPERATURE SENSOR TO REMAIN.
13. INSTALL GAS LINE TIGHT AGAINST WALL. SHOWN AWAY FROM WALL FOR CLARITY.
14. INSTALL BAS TEMPERATURE SENSOR AS SHOWN.



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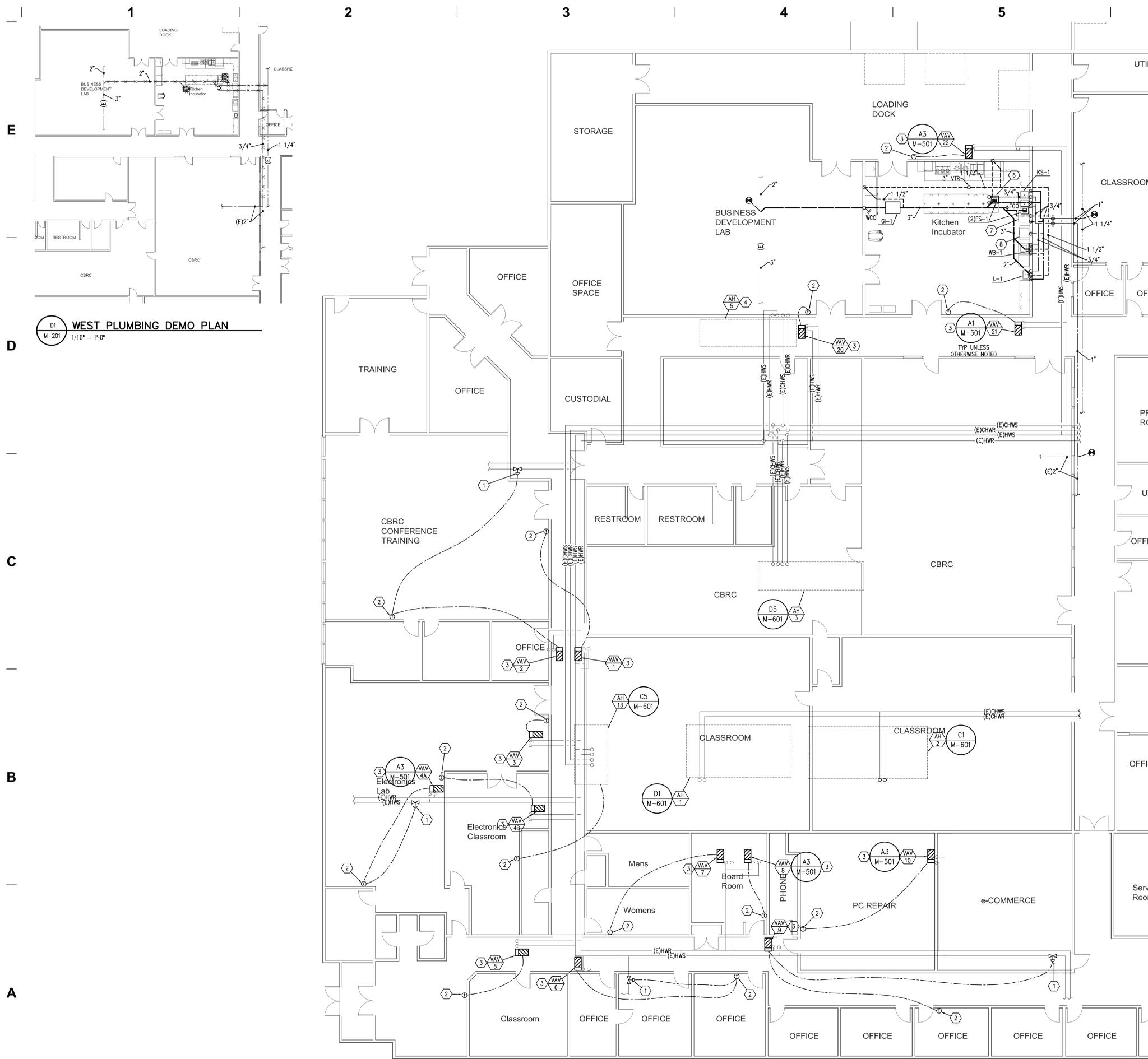
REVISIONS

NO.	DATE	DESCRIPTION

SHEET CONTENTS
MECHANICAL ROOM & KITCHEN PLAN

SFCM PROJECT #: 1047210
CHECKED BY: R.VERNON
DRAWN BY: C. MORGAN
CURRENT BID DATE: 10/12/10

M-103



D1 WEST PLUMBING DEMO PLAN
M-201 1/16" = 1'-0"

A1 WEST MECHANICAL PIPING PLAN
M-201 1/8" = 1'-0"

KEYED NOTES

- 1 NEW 1" DDC 2-POSITION CONTROL VALVE. CV SHALL BE 4 AT 4 GPM.
- 2 REPLACE EXISTING T-STAT WITH NEW DDC THERMOSTAT.
- 3 REPLACE EXISTING VAV BOX WITH NEW.
- 4 ROOFTOP IS NOT WITHIN THE SCOPE OF THE PROJECT. SHOWN FOR INFORMATIONAL PURPOSES ONLY.
- 5 RUN HOT AND COLD WATER AND VENT PIPING BELOW SLAB TO COUNTER MOUNTED SINK.
- 6 OWNER PROVIDED SINK WITH FAUCET. PROVIDE AND INSTALL POWERS E480 MIXING VALVE ON HOT WATER SUPPLY. MAKE ALL REQUIRED CONNECTIONS.
- 7 OWNER PROVIDED DISH WASHER MAKE ALL REQUIRED CONNECTIONS DISCHARGE WASTE INTO ADJACENT FLOOR SINK.
- 8 LOCATION OF FUTURE DISHWASHER NOT INCLUDED IN THE SCOPE OF THIS PROJECT.

GENERAL NOTES

1. REMOVE & REPLACE (E) T-STATS WITH NEW DDC. SEE SEQUENCE OF OPERATIONS.



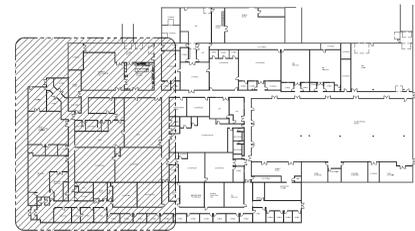
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CONTROLS UPGRADE
LOGAN, UTAH



KEY PLAN
NO SCALE

REVISIONS

NO.	DESCRIPTION	DATE

SHEET CONTENTS
WEST MECHANICAL PIPING PLAN

SFCM PROJECT #: 1047210
CHECKED BY: R. VERNON
DRAWN BY: C. MORGAN
CURRENT BID DATE: 10/12/10

M-201

1

2

3

4

5

6

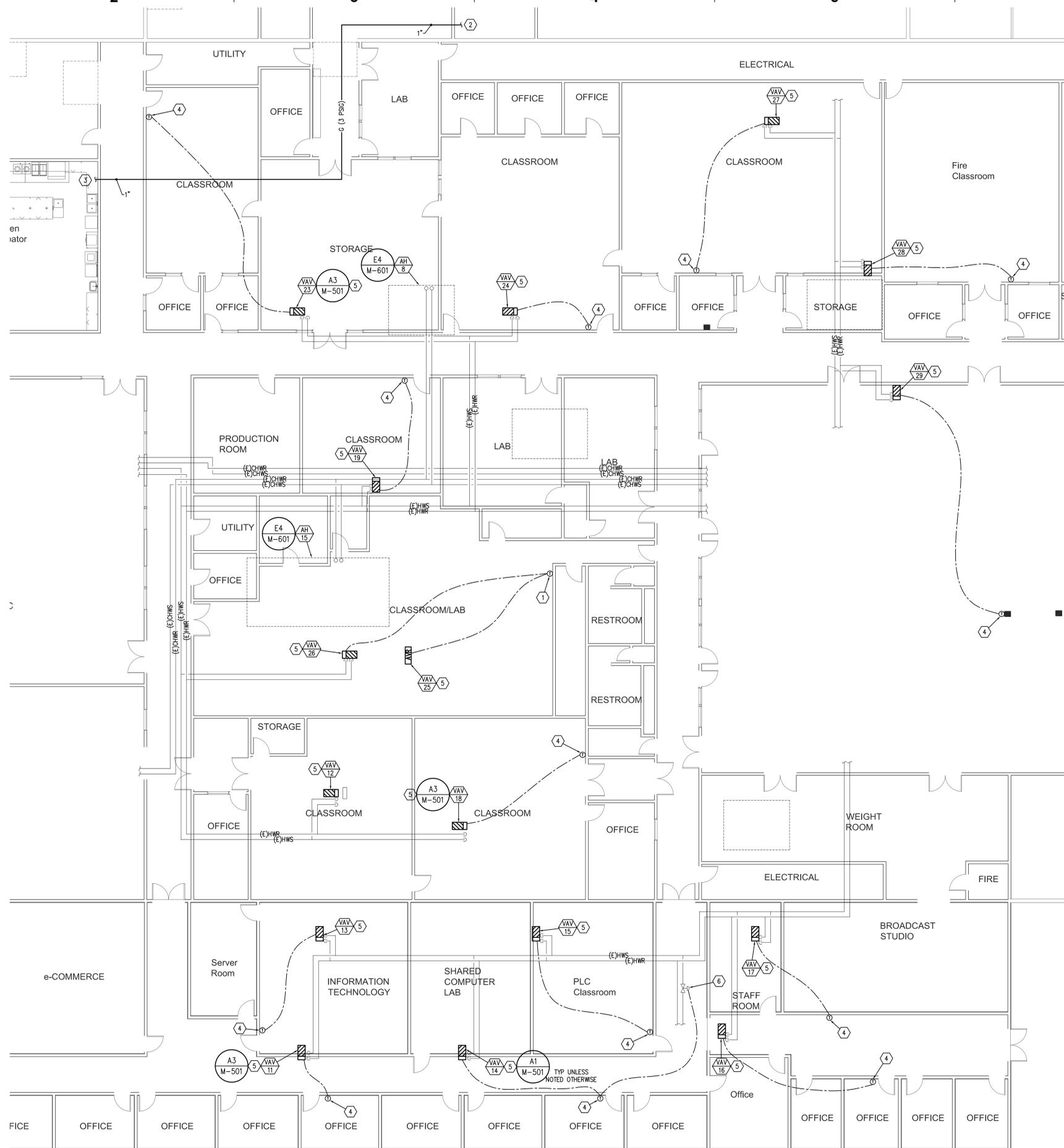
E

D

C

B

A



KEYED NOTES

- 1 PROVIDE T-STAT WITH SLIDE BAR.
- 2 SEE DETAIL D4/M-103 FOR CONTINUATION.
- 3 SEE LARGE SCALE KITCHEN PLAN FOR CONTINUATION.
- 4 REPLACE EXISTING T-STAT WITH NEW DDC THERMOSTAT.
- 5 REPLACE EXISTING VAV BOX WITH NEW.
- 6 NEW 1" DDC 2 POSITION CONTROL VALVE. CV SHALL BE 4 AT 40PM.



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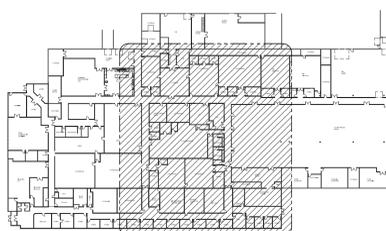
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SFCM PROJECT #: 1047210
CHECKED BY: R.VERNON
DRAWN BY: C. MORGAN
CURRENT BID DATE: 10/12/10

SHEET CONTENTS
EAST MECHANICAL
PIPING PLAN



KEY PLAN
NO SCALE

A1 EAST MECHANICAL PIPING PLAN
M-202 NO SCALE



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KEYED NOTES

- 1 REMOVE AND REPLACE EXISTING FAN MOTOR WITH NEW NEMA PREMIUM EFFICIENT VFD COMPATIBLE MOTOR. FIELD VERIFY COMPATIBILITY WITH AIR HANDLER. SEE ELECTRICAL PLANS FOR FURTHER INFORMATION. NOTED ON THIS SHEET FOR INFORMATIONAL PURPOSES ONLY. FAN MOTORS ARE AS FOLLOWS:
AH-1:
SUPPLY: 25-HP; 23.1 BHP; 460/3/60; 1750 RPM.
RETURN: 10-HP; 8.3 BHP; 460/3/60; 1750 RPM.
AH-2:
SUPPLY: 20-HP; 11.1 BHP; 460/3/60; 1750 RPM.
RETURN: 10-HP; 4.99 BHP; 460/3/60; 1750 RPM.
AH-3:
SUPPLY: 10-HP; 7.5 BHP; 460/3/60; 1750 RPM.
AH-8:
SUPPLY: 20-HP; 19.8 BHP; 460/3/60; 1346 RPM.
AH-9:
SUPPLY: 15-HP; 11.6 BHP; 460/3/60; 1505 RPM.
AH-11:
SUPPLY: 20-HP; 15.3 BHP; 460/3/60; 1023 RPM.
AH-13:
SUPPLY: 5-HP; 1.4 BHP; 460/3/60; 2483 RPM.
AH-15:
SUPPLY: 20-HP; 16.6 BHP; 460/3/60; 1054 RPM.
- 2 REMOVE EXISTING FAN INLET VANE. REPLACE WITH NEW VFD AS SHOWN. SEE PLANS FOR NEW LOCATION.
- 3 REMOVE EXISTING DX COOLING COIL.
- 4 INSTALL NEW DDC RETURN AIR SENSOR.
- 5 REPLACE (E) PNEUMATIC 3-WAY CONTROL VALVE WITH NEW DDC. SEE DETAILS AS SHOWN AND BS SHEET M-501 FOR COIL PIPING DETAILS.
- 6 INSTALL NEW DDC DISCHARGE AIR TEMPERATURE SENSOR. SEE PLANS FOR QUANTITY.
- 7 INSTALL NEW DDC FREEZE STAT.
- 8 REMOVE (E) FAN INLET VANE. SHEAVE FAN AS REQUIRED TO ATTAIN EXISTING AIRFLOW.
- 9 INSTALL NEW HIGH LIMIT & DUCT PRESSURE SENSORS.
- 10 REPLACE (E) PNEUMATIC CONTROL VALVE WITH NEW DDC. SEE SHEETS M-201 & M-202.
- 11 FILTER DIFFERENTIAL PRESSURE SWITCH.

GENERAL NOTES

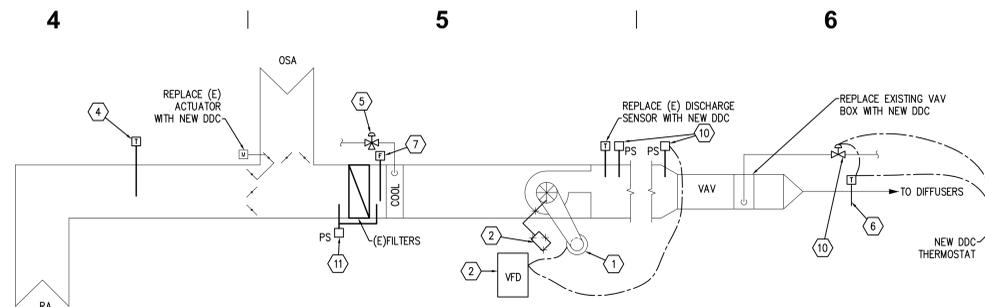
1. WITH EXCEPTION TO AH-1 WHICH SHALL BE BALANCED TO O'M'S NOTED; PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL PERFORM A CROSS FLOW MEASUREMENT OF EACH EXISTING RTU AIRFLOW WHERE NOTED & SUBMIT TO THE ENGINEER FOR REVIEW. THE AIR HANDLER SHALL BE BALANCED TO MATCH EXISTING AFTER SPECIFIED MODIFICATIONS ARE COMPLETE.

REVISIONS	

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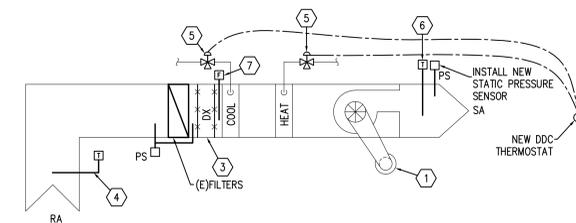
SHEET CONTENTS
MECHANICAL
SCHEMATIC
DIAGRAMS

M-601

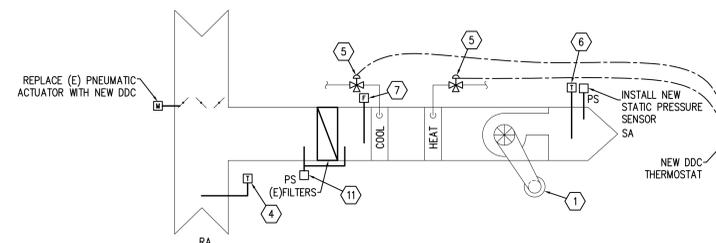


NOTES:
REPLACE (E) VAV BOXES & ASSOCIATED THERMOSTATS WITH NEW. REMOVE (E) FAN INLET VANES & FAN MOTORS AS NOTED. INSTALL SUPPLY & RETURN VFD'S. LOCATE AS SHOWN ON PLANS. FIELD VERIFY APPROPRIATE LOCATION OF TEMPERATURE SENSORS. LOCATE SUPPLY FAN PRESSURE SENSOR AS SHOWN ON PLANS.

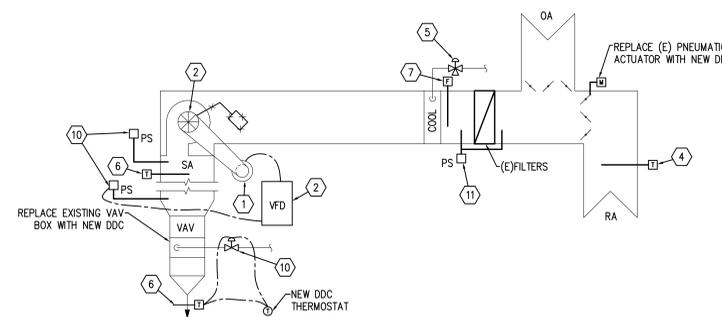
E4 CONTROL DIAGRAM AH-8, & AH-15 (VAV RE-HEAT, ECONOMIZER W/ BAROMETRIC RELIEF)
M-601 NO SCALE



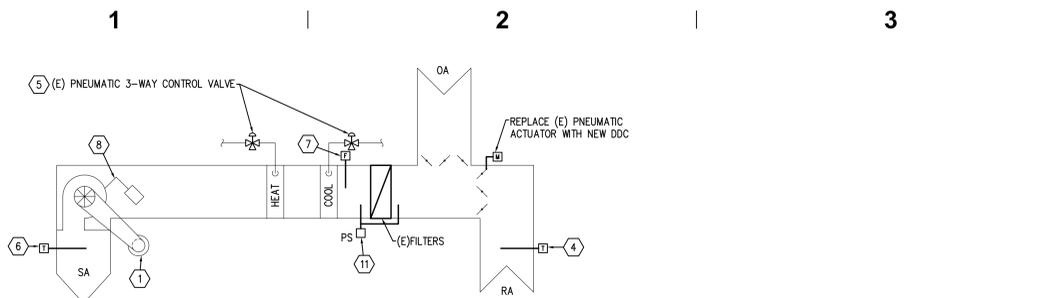
D5 CONTROL DIAGRAM AH-3 (CONSTANT VOLUME SINGLE ZONE DX COOLING NO OUTSIDE AIR)
M-601 NO SCALE



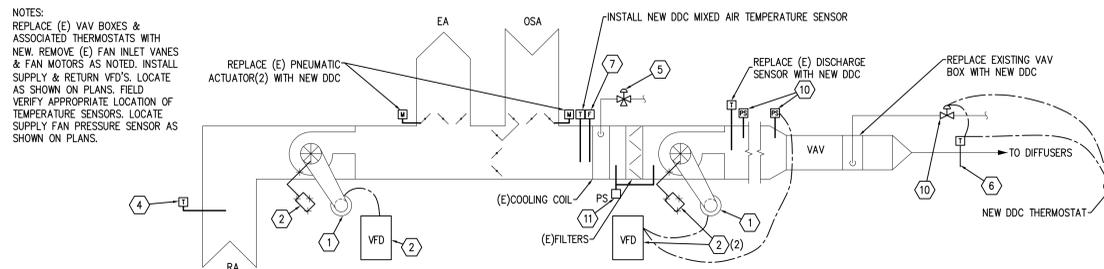
C5 CONTROL DIAGRAM AH-13 (CONSTANT VOLUME SINGLE ZONE, ECONOMIZER W/ BAROMETRIC RELIEF NO OUTSIDE AIR)
M-601 NO SCALE



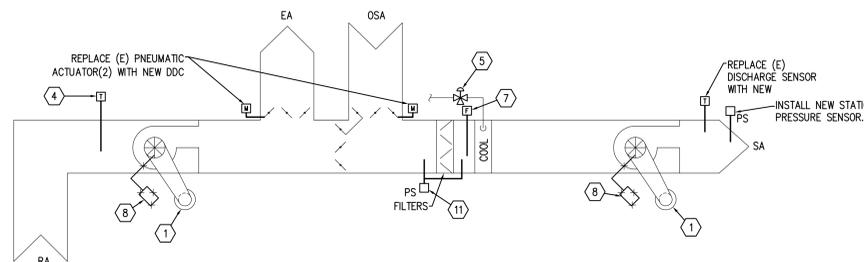
B5 CONTROL DIAGRAM AH-11 (VAV RE-HEAT, ECONOMIZER, W/ BAROMETRIC RELIEF)
M-601 NO SCALE



E1 CONTROL DIAGRAM AH-9 (CONSTANT VOLUME SINGLE ZONE, ECONOMIZER W/ BAROMETRIC RELIEF NO OUTSIDE AIR)
M-601 NO SCALE



D1 CONTROL DIAGRAM AH-1 (VAV RE-HEAT, ECONOMIZER W/ MODULATING PRESSURE CONTROL)
M-601 NO SCALE



C1 CONTROL DIAGRAM AH-2 (CONSTANT VOLUME, SINGLE ZONE, ECONOMIZER)
M-601 NO SCALE

CONTROL VALVE SCHEDULE				
EQUIP ID	COIL	GPM	CV	
AH-1	COOLING COIL	121	42.7	
AH-2	COOLING COIL	77	27.2	
AH-3	COOLING COIL	21	7.4	
	HEATING COIL	12	4.2	
AH-6	COOLING COIL	80	28.3	
AH-9	COOLING COIL	68	24	
	HEATING COIL	10	3.5	
AH-11	COOLING COIL	84	29.7	
AH-13	COOLING COIL	6.6	2.3	
	HEATING COIL	1.2	0.4	
AH-15	COOLING COIL	90	31.8	

EXHAUST FAN SCHEDULE															
ID	MANUFACTURER AND MODEL NUMBER	MODEL	LOCATION	SERVICE	AIR FAN				ELECTRICAL			PHYSICAL		NOTES	
					MAXIMUM AIRFLOW RATE (CFM)	STATIC PRESSURE (IN. WATER)	OUTLET VELOCITY (FPM)	FAN SPEED (RPM)	MOTOR SIZE (HP)	MOTOR BHP (HP)	MOTOR SPEED (RPM)	VOLTPH/PHZ	DIAMETER / HEIGHT (IN)		WEIGHT (LBS)
EF-1	GREENHECK CUBE-180	CUBE 180-10	KITCHEN ROOF	TYPE I HOOD	3375	0.9	1303	1165	1.5	1	1725	460/3/60	35.4 DIA / 28.7	168	(1)(2)(3)(4)

- (1) ALL CAPACITIES AT 4,800 FT ELEVATION.
- (2) ROOF MOUNTED GREASE EXHAUST FAN (UL 762) COMPLETE WITH PRE-FAB ROOF CURB, HINGED BASE W/ FLEXIBLE CABLES, BIRDSCREEN, INTEGRAL THERMAL OVERLOAD PROTECTION, ELECTRICAL DISCONNECT, GREASE TRAP DRAIN, DIGITAL CONNECTION, MOTORIZED BACKDRAFT DAMPER WITH INTERLOCK BY MECHANICAL.
- (3) EXTERNAL STATIC PRESSURE LISTED IS BASED ON INFORMATION PROVIDED BY OTHERS. CONTRACTOR SHALL COORDINATE ACTUAL AIRFLOW AND STATIC PRESSURE DROP WITH KITCHEN SUPPLIER PRIOR TO SUBMITTING EXHAUST FAN FOR APPROVAL. SEE HOOD SCHEDULE.
- (4) CONTROL: SEE HOOD SCHEDULE.

ID	MANUFACTURER AND MODEL NUMBER	INLET SIZE (IN)	AIR				FLUID (2)								COIL				REMARKS
			COOLING MAXIMUM AIR (5) (CFM)	HEATING MAXIMUM AIR (CFM)	MINIMUM AIR (3) (CFM)	ENTERING AIR TEMP. DB (DEG. F)	LEAVING AIR TEMP. DB (DEG. F)	S.P. LOSS AT MAX 1" H2O CFM (4) (IN H2O)	NC AT 1" H2O S.P. (1)	HEAT LOAD (MB)	TOTAL FLUID FLOW (GPM)	ENT. FLUID TEMP (DEG. F)	WORKING FLUID	MAX. FLUID PRESSURE DROP (FT)	MIN. COIL ROWS	PIPE SIZE (IN)	BALANCING VALVE SIZE (IN)		
V-1	TITUS-ESV-3	16	2800	1680	580	52	100	0.7	26	69.6	3.5	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-2	TITUS-ESV-3	24X16 FO	4200	2520	1260	52	100	0.7	29	104.3	5	180	H. WATER	1.5	2	1	3/4	1.2,3,4,5,6	
V-3	TITUS-ESV-3	10	1100	660	230	52	100	0.65	26	27.3	2	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-4A	TITUS-ESV-3	16	2800	1680	580	52	100	0.7	26	69.6	3.5	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-4B	TITUS-ESV-3	12	1600	960	325	52	100	0.65	26	39.7	2.5	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-5	TITUS-ESV-3	8	700	420	145	52	100	0.65	28	17.4	1.5	180	H. WATER	1	2	3/4	1/2	1.2,3,4,5,6	
V-6	TITUS-ESV-3	16	2800	1680	580	52	100	0.7	26	69.6	3.5	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-7	TITUS-ESV-3	8	700	420	145	52	100	0.65	28	17.4	1.5	180	H. WATER	1	2	3/4	1/2	1.2,3,4,5,6	
V-8	TITUS-ESV-3	8	400	420	145	52	100	0.65	28	17.4	1.5	180	H. WATER	1	2	3/4	1/2	1.2,3,4,5,6	
V-9	TITUS-ESV-3	16	2800	1680	580	52	100	0.7	26	69.6	3.5	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-10	TITUS-ESV-3	14	2200	1320	450	52	100	0.65	26	54.6	3	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-11	TITUS-ESV-3	16	2800	1680	580	52	100	0.7	26	69.6	3.5	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-12	TITUS-ESV-3	16	2800	1680	580	52	100	0.7	26	69.6	3.5	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-13	TITUS-ESV-3	14	1835	1320	450	52	100	0.65	26	54.6	3	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-14	TITUS-ESV-3	12	1600	960	325	52	100	0.65	26	39.7	2.5	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-15	TITUS-ESV-3	14	1380	1320	450	52	100	0.65	26	54.6	3	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-16	TITUS-ESV-3	12	1600	960	325	52	100	0.65	26	39.7	2.5	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-17	TITUS-ESV-3	12	1600	960	325	52	100	0.65	26	39.7	2.5	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6,7	
V-18	TITUS-ESV-3	10	100	660	230	52	100	0.7	29	104.3	5	180	H. WATER	1.5	2	1	3/4	1.2,3,4,5,6	
V-19	TITUS-ESV-3	24X16 FO	4200	2520	1260	52	100	0.7	29	104.3	5	180	H. WATER	1.5	2	1	3/4	1.2,3,4,5,6	
V-20	TITUS-ESV-3	16	2800	1680	580	52	100	0.7	26	69.6	3.5	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-21	TITUS-ESV-3	16	2800	1680	580	52	100	0.7	26	69.6	3.5	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-22	TITUS-ESV-3	10	1100	660	230	52	100	0.65	26	27.3	2	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-23	TITUS-ESV-3	24X16 FO	4200	2520	1260	52	100	0.7	29	104.3	5	180	H. WATER	1.5	2	1	3/4	1.2,3,4,5,6	
V-24	TITUS-ESV-3	24X16 FO	4200	2520	1260	52	100	0.7	29	104.3	5	180	H. WATER	1.5	2	1	3/4	1.2,3,4,5,6	
V-25	TITUS-ESV	24X16 FO	7500	4500	1260	-	-	-	-	-	-	-	-	-	-	-	-	1.4,5,6,8	
V-26	TITUS-ESV-3	24X16 FO	7500	4500	1260	52	77	0.7	40	147.0	5	180	H. WATER	1.5	2	1	3/4	1.2,3,4,5,6	
V-27	TITUS-ESV-3	14	2200	1320	450	52	100	0.65	26	54.6	3	180	H. WATER	1	2	3/4	3/4	1.2,3,4,5,6	
V-28	TITUS-ESV-3	24X16 FO	4200	2520	1260	52	100	0.7	29	104.3	5	180	H. WATER	1.5	2	1	3/4	1.2,3,4,5,6	
V-29	TITUS-ESV-3	24X16 FO	4200	2520	1260	52	100	0.7	29	104.3	5	180	H. WATER	1.5	2	1	3/4	1.2,3,4,5,6	

- 1. MAXIMUM DISCHARGE NC AT BOX DIFFERENTIAL PRESSURE BASED ON ARI STANDARD 880-89
- 2. COIL HEATING CAPACITY BASED ON HEATING MAXIMUM AIR FLOW (60% OF MAXIMUM COOLING CFM).
- 3. MINIMUM CFM IS LOWEST CONTROLLABLE CFM SETTING (BASED ON 400 FPM INLET VELOCITY).
- 4. MAXIMUM STATIC PRESSURE DROP PERMISSIBLE ACROSS BOX AND COIL AT MAXIMUM COOLING CFM.
- 5. BOX COOLING MAXIMUM IS THE SUM OF DIFFUSERS CFM VALUES AS SHOWN IN THE DRAWINGS. BOX MINIMUM CFM TO BE SET AT 30% OF THIS MAXIMUM.
- BOX HEATING CFM TO BE SET AT 60% OF THIS SAME MAXIMUM. TYPICAL UNLESS OTHERWISE NOTED.
- 6. PRESSURE INDEPENDENT TYPE BOX.
- 7. COMPLETE WITH INTEGRAL SOUND ATTENUATOR.
- 8. BOX IS VARIABLE AIR VOLUME ONLY. NO RE-HEAT.

KITCHEN HOOD SCHEDULE												
ID	MANUFACTURER	MODEL	SERVICE	FIRE SUPPRESSION	TYPE	AIR TYPE	AIR		PHYSICAL			NOTES
							MAXIMUM AIRFLOW RATE (CFM)	STATIC PRESSURE (IN. WATER)	INLET HEIGHT ABOVE ROOF (IN)	TOTAL HEIGHT (IN)	THROAT LENGTH / WIDTH (IN)	
H-1	GREENHECK	GHEW-16-S	TYPE I GREASE HOOD	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

1) SEE TYPE 1 KITCHEN HOOD SCHEDULE ON SHEET M-501.

NATURAL GAS REQUIREMENTS					
EQUIP. NO.	QTY.	LOCATION	EQUIPMENT	EQUIP BTUH INPUT	TOTAL CFH
RANGE	1	KITCHEN	RANGE	188,000	214
OVEN	1	KITCHEN	OVEN	140,000	159
FRYER	1	KITCHEN	FRYER	90,000	102
1 BURNER	1	KITCHEN	1 BURNER	50,000	57
1 BURNER	1	KITCHEN	1 BURNER	50,000	57
TOTAL KITCHEN (BTUH) =		518,000			
BTU/CUBIC FT. =		880			
TOTAL KITCHEN CFH=		589			
EXISTING 3 PSIG GAS METER ON CONCRETE PAD.					

GRILLES, REGISTERS AND DIFFUSERS				
ID	MANUFACTURER	MODEL	MAX NC	DESCRIPTION
CD-1	EH PRICE	LFD	30	LAMINAR FLOW DIFFUSER. REMOVEABLE FACE, C.W./ INLET DAMPER. FRAME SHALL BE FOR SURFACE OR LAY-IN MOUNTING AS REQUIRED BY CEILING TYPE. LAY-IN FRAMES SHALL BE 24" x 24", 24" x 12" OR 12" x 12" AS REQUIRED TO FIT CEILING TILE SPACE AVAILABLE.
CD-2	EH PRICE	SPD	20	SQUARE PLAQUE FACE CEILING DIFFUSERS. REMOVEABLE FACE, C.W./O.B.D. FRAME SHALL BE FOR SURFACE OR LAY-IN MOUNTING AS REQUIRED BY CEILING TYPE. LAY-IN FRAMES SHALL BE 24" x 24", 24" x 12" OR 12" x 12" AS REQUIRED TO FIT CEILING TILE SPACE AVAILABLE.
RG-1	EH PRICE	PDDR	30	PERFORATED FACE RETURN AIR UNIT. REMOVEABLE FACE & CORE. FRAME SHALL BE FOR SURFACE OR LAY-IN MOUNTING AS REQUIRED BY CEILING TYPE. LAY-IN FRAMES HSLL BE 24" x 24", 24" x 12" OR 12" x 12" AS REQUIRED TO FIT CEILING TILE SPACE AVAILABLE. AIR QUANTITY SHALL MATCH ROOM SUPPLY OR EXHAUST AIR QUANTITY.

PLUMBING FIXTURE SCHEDULE						
ID	FIXTURE	CW (IN)	HW (IN)	W (IN)	V (IN)	NOTES
FS-1	FLOOR SINK	--	--	3	2	
L-1	LAVATORY	1/2	1/2	1 1/2	1 1/2	WALL MOUNTED ADA
KS-1	SINK	1/2	1/2	-	-	FLOOR MOUNTED INDIRECT WASTE
WB-1	WASHER BOX	3/4	3/4	2	2	--
GI-1	GREASE INTERCEPTOR	--	--	3	--	--

1. ALL UNDER GROUND WASTE AND VENT SHALL BE 2" OR GREATER PER DRAWINGS.



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Van Boerum & Frank Assoc., 2003

BRIDGERLAND APPLIED TECHNOLOGY COLLEGE
CONTROLS UPGRADE
LOGAN, UTAH

REVISIONS

SFCM PROJECT #: 1047210
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SHEET CONTENTS
MECHANICAL
SCHEDULES

MECHANICAL EQUIPMENT SCHEDULE

MARK	DESCRIPTION	ELECTRICAL									
		VPH	LOAD (KW)	HP	FLA	MCA	MOCP	DISCONNECT SIZE/POLE	FUSE SIZE	NOTES	
AH-1 SF	AIR HANDLER SUPPLY FAN	480V/3	25	34							1.2
AH-1 RF	AIR HANDLER RELIEF FAN	480V/3	10	14							1.3
AH-8	AIR HANDLER	480V/3	20	27							1.4
AH-11	AIR HANDLER	480V/3	20	27							1.4
AH-15	AIR HANDLER	480V/3	20	27							1.4
EF-1	EXHAUST FAN	480/3	1.5	3				300			7.8
EF-2	EXHAUST FAN	480/3	1.5	3				300			7.8,9

VPH=Hz = VOLTAGE / PHASE / HERTZ
MCA = MINIMUM CIRCUIT AMPACITY
MOCP = MAXIMUM OVER CURRENT PROTECTION LISTED BY THE MANUFACTURER

NOTES:
(1) PROVIDE WITH FUSES SIZED TO THE MAX. LISTED BY THE MANUFACTURER.
(2) PROVIDE A VFD TOSHIBA MODEL NUMBER Q24270ARSN001 OR APPROVED EQUIVALENT
(3) PROVIDE A VFD TOSHIBA MODEL NUMBER Q24110ARSN001 OR APPROVED EQUIVALENT
(4) PROVIDE A VFD TOSHIBA MODEL NUMBER Q24220ARSN001 OR APPROVED EQUIVALENT
(5) PROVIDE A VFD TOSHIBA MODEL NUMBER Q24180ARSN001 OR APPROVED EQUIVALENT
(6) PROVIDE A VFD TOSHIBA MODEL NUMBER Q24055ARSN001 OR APPROVED EQUIVALENT
(7) PROVIDE NEMA 3R DISCONNECT ON UNIT.
(8) PROVIDE A NEMA SIZE 0 STARTER
(9) PROVIDE A NEMA SIZE 0 STARTER WITH TRANSFORMER (SQ D. 8539GL36007M02V81) OR APPROVED EQUIVALENT

PANEL B2		VOLTAGE	240 / 120	MOUNTING	FEED	175	MAINS	DIMS.	SPECIAL EQUIPMENT											
TYPE	EXISTING	PHASE	1	WIRES	3	FLUSH	TOP	LUGS	5.75" D											
LOCATION	AIC	AMPS	X	SURFACE	BOTTOM	X	BREAKER	35" H												
CIR NO.	CIRCUIT DESCRIPTION	CODELTS	CO	MIS	P	AMP	SIZE	LOAD	A	C	LOAD	SIZE	AMP	P	MIS	CO	LTS	CODE	DESCRIPTION	CIR NO.
1	EXISTING LOAD								0		0								EXISTING LOAD	2
3	EXISTING LOAD								0		0								EXISTING LOAD	4
5	EXISTING LOAD								0		0								EXISTING LOAD	6
7	EXISTING LOAD								0		0								EXISTING LOAD	8
9	EXISTING LOAD								0		0								EXISTING LOAD	10
11	EXISTING LOAD								0		0								EXISTING LOAD	12
13	EXISTING LOAD								0		0								EXISTING LOAD	14
15	EXISTING LOAD								0		0								EXISTING LOAD	16
17	EXISTING LOAD								0		0								EXISTING LOAD	18
19	EXISTING LOAD								0		0								EXISTING LOAD	20
21	REFRIGERATOR	1.4		1	20	805	1405				500	500	20	1					REFRIGERATOR	16
23	BURNER RANGE	1.4		1	20	600					600	600	20	1					BURNER RANGE	22
25	FRYER	1.4		1	20	600	780				1200	600	20	1					BURNER RANGE	24
27	MIXER	1.4		2	20	1150					1150	1150	20	1					EXISTING LOAD	28
29	EXISTING LOAD																		EXISTING LOAD	30

VA 3195 3855 7 KVA 1 = SEE DRAWINGS FOR CONDUIT & CONDUCTOR SIZE
DIV 3195 3855 AV AMPS 2 = SHUNT TRIP BREAKER 5 = GFCI BREAKER
AMPS 28 30 28 A 3 = SUBFEED BREAKER 6 = GFEP BREAKER
4 = PROVIDE NEW BREAKER TO MATCH EXISTING WITH EQUIVALENT AIC RATING

PANEL B3		VOLTAGE	240 / 120	MOUNTING	FEED	175	MAINS	DIMS.	SPECIAL EQUIPMENT											
TYPE	EXISTING	PHASE	1	WIRES	3	FLUSH	TOP	LUGS	5.75" D											
LOCATION	AIC	AMPS	X	SURFACE	BOTTOM	X	BREAKER	35" H												
CIR NO.	CIRCUIT DESCRIPTION	CODELTS	CO	MIS	P	AMP	SIZE	LOAD	A	C	LOAD	SIZE	AMP	P	MIS	CO	LTS	CODE	DESCRIPTION	CIR NO.
1	EXISTING LOAD								0		0								EXISTING LOAD	2
3	EXISTING LOAD								0		0								EXISTING LOAD	4
5	EXISTING LOAD								0		0								EXISTING LOAD	6
7	EXISTING LOAD								0		0								EXISTING LOAD	8
9	EXISTING LOAD								0		0								EXISTING LOAD	10
11	EXISTING LOAD								0		0								EXISTING LOAD	12
13	EXISTING LOAD								0		0								EXISTING LOAD	14
15	EXISTING LOAD								0		0								EXISTING LOAD	16
17	EXISTING LOAD								0		0								EXISTING LOAD	18
19	EXISTING LOAD								0		0								EXISTING LOAD	20
21	DISHWASHER	1.4		2	40	1440	3360				5040	2880	30	1					DISHWASHER	20
23	EXISTING LOAD								0		1440	1920	20	1					WASHING MACHINE	22
25	EXISTING LOAD								0		0								EXISTING LOAD	24
27	EXISTING LOAD								0		0								EXISTING LOAD	26
29	EXISTING LOAD								0		0								EXISTING LOAD	28

VA 3360 6480 10 KVA 1 = SEE DRAWINGS FOR CONDUIT & CONDUCTOR SIZE
DIV 3360 6480 AV AMPS 2 = SHUNT TRIP BREAKER 5 = GFCI BREAKER
AMPS 54 41 A 3 = SUBFEED BREAKER 6 = GFEP BREAKER
4 = PROVIDE NEW BREAKER TO MATCH EXISTING WITH EQUIVALENT AIC RATING

PANEL B4		VOLTAGE	240 / 120	MOUNTING	FEED	175	MAINS	DIMS.	SPECIAL EQUIPMENT											
TYPE	EXISTING	PHASE	1	WIRES	3	FLUSH	TOP	LUGS	5.75" D											
LOCATION	AIC	AMPS	X	SURFACE	BOTTOM	X	BREAKER	35" H												
CIR NO.	CIRCUIT DESCRIPTION	CODELTS	CO	MIS	P	AMP	SIZE	LOAD	A	C	LOAD	SIZE	AMP	P	MIS	CO	LTS	CODE	DESCRIPTION	CIR NO.
1	EXISTING LOAD								0		0								EXISTING LOAD	2
3	EXISTING LOAD								0		0								EXISTING LOAD	4
5	EXISTING LOAD								0		0								EXISTING LOAD	6
7	EXISTING LOAD								0		0								EXISTING LOAD	8
9	EXISTING LOAD								0		0								EXISTING LOAD	10
11	EXISTING LOAD								0		0								EXISTING LOAD	12
13	EXISTING LOAD								0		0								EXISTING LOAD	14
15	EXISTING LOAD								0		0								EXISTING LOAD	16
17	EXISTING LOAD								0		0								EXISTING LOAD	18
19	EXISTING LOAD								0		0								EXISTING LOAD	20
21	EXISTING LOAD								0		0								EXISTING LOAD	22
23	EXISTING LOAD								0		0								EXISTING LOAD	24
25	EXISTING LOAD								0		0								EXISTING LOAD	26
27	EXISTING LOAD								0		0								EXISTING LOAD	28
29	EXISTING LOAD								0		0								EXISTING LOAD	30

VA 2880 2880 6 KVA 1 = SEE DRAWINGS FOR CONDUIT & CONDUCTOR SIZE
DIV 2880 2880 AV AMPS 2 = SHUNT TRIP BREAKER 5 = GFCI BREAKER
AMPS 24 24 24 A 3 = SUBFEED BREAKER 6 = GFEP BREAKER
4 = PROVIDE NEW BREAKER TO MATCH EXISTING WITH EQUIVALENT AIC RATING

ELECTRICAL SYMBOL SCHEDULE

SYMBOL	DEVICE/FIXTURE	DESCRIPTION	NOTES
[Symbol]	DUCT SMOKE DETECTOR		
[Symbol]	MOTOR		
[Symbol]	MOTOR ON ROOF		
[Symbol]	DUPLEX CONVENIENCE OUTLET, GROUNDING TYPE	(6)	
[Symbol]	DUPLEX CONVENIENCE OUTLET - GFI	(6)	
[Symbol]	DISCONNECT SWITCH	(8) (13)	
[Symbol]	FUSED DISCONNECT SWITCH	(8) (13)	
[Symbol]	MAGNETIC STARTER WITH DISCONNECT	(8) (13) (14)	
[Symbol]	WRING IN CON IN CEILING OR WALL		
[Symbol]	CONDUIT TURNED UP		
[Symbol]	CIRCUIT HOME RUN TO PANEL 3 CONDUCTORS INCLUDING THE EQUIPMENT GROUND CONDUCTOR.		
[Symbol]	CIRCUIT HOME RUN TO PANEL NUMBER OF ARROW HEADS INDICATE NUMBER OF CIRCUITS. SLASH MARKS INDICATE NUMBER OF CONDUCTORS. EX TWO CIRCUITS, FOUR CONDUCTORS, COMMON NEUTRAL AND THREE CIRCUITS WITH 7 CONDUCTORS (SEPARATE NEUTRAL PER CIRCUIT). BOTH EX INCLUDE AN EQUIP. GROUND.		
[Symbol]	WRING IN CON IN GROUND OR FLOOR		
[Symbol]	CONDUIT TURNED DOWN		

INSTALL CONDUIT AS DRAWN ON THE PLANS. THE ONLY EXCEPTIONS ARE THOSE AUTHORIZED IN WRITING BY THE ENGINEER. ALL CONDUITS SHALL INCLUDE AN EQUIPMENT GROUND CONDUCTOR SIZED PER NEC.

NOTES/ABBREVIATIONS
AFF - ABOVE FINISHED FLOOR, AFG - ABOVE FINISHED GRADE,
AIC - AMPS INTERRUPTING CAPACITY, BC - BARE COPPER, BFC - BELOW FINISHED CEILING,
BFG - BELOW FINISHED GRADE, CND. OR C - CONDUIT, CIG - INSTALLED IN CEILING,
CT - CURRENT TRANSFORMER, DFA - DROP FROM ABOVE, EC - ELECTRICAL CONTRACTOR,
EV - ELECTRO VOICE, GC - GENERAL CONTRACTOR, GND - GROUND,
MC - MECHANICAL CONTRACTOR, MCA - MINIMUM CIRCUIT AMPS,
P.C. - PLUMBING CONTRACTOR, POC - POINT OF CONNECTION, POS - POINT OF SALES,
RMC - RIGID METAL CONDUIT, SCA - SHORT CIRCUIT AMPERES,
TC - TEMP. CONTROL CONTRACTOR, UNO - UNLESS NOTED OTHERWISE, VA - VOLT/AMPS,
VF - VERIFY IN FIELD, WF - WEATHER PROOF/NEMA 3R

- SEE LIGHTING FIXTURE SCHEDULE FOR TYPE AND SPECIFICS.
- SEE LIGHTING FIXTURE SCHEDULE FOR MOUNTING OF FIXTURE.
- WIRE FIXTURE FROM ADJACENT J-BOX
- PROVIDE UN-SWITCHED CONDUCTOR TO EMERGENCY BALLAST
- PROVIDE DIRECTIONAL ARROWS AS SHOWN ON THE PLANS
- ACCEPTABLE EQUALS ARE P&S, LEVITON, COOPER, HUBBELL
- ACCEPTABLE EQUALS ARE HUBBELL, WATT STOPPER, SENSOR SWITCH
- ACCEPTABLE EQUALS ARE GENERAL ELECTRIC, ALLEN-BRADLEY, SQUARE D
- ACCEPTABLE EQUALS ARE LEVITON, P&S, HUBBELL, COOPER
- ACCEPTABLE EQUALS ARE INTERMATIC, PARAGON, EZ-CONTROL
- USE A 4" X 4" BOX WITH A MUD RING TO MATCH THE DEVICE AND INSTALLATION.
- PROVIDE MUD RING AND/OR BOX COVER APPROPRIATE FOR DEVICE/FIXTURE SERVED.
- USE HEAVY DUTY FOR 480 VOLT.
- SIZE TO THE EQUIPMENT BEING CONTROLLED
- PROVIDE A FLOOR BOX HUBBELL SIFPB/SISP, TWO HXJSEBK, ONE IM2K1BK, AND FIVE IM1BK W/FLANGE TO MATCH FLOOR TYPE.
- PROVIDE A FLOOR BOX HUBBELL SIFPB/SISP WITH ONE IM2K1BK, TWO IM1BK AND ONE HB1212BK
- ACCEPTABLE EQUALS ARE HUBBELL, ORTRONICS, SIEMON
- MATCH THE VOLTAGE OF THE RELAY WITH THAT OF THE CONTROLLING CIRCUIT.
- MOUNT SWITCH AT DOOR JAMB PER MANUFACTURER'S INSTRUCTIONS.
- FEED THE STYLE LINE RECEP. FROM THE GFCI OUTLET SO BOTH ARE GFCI PROTECTED.
- PROVIDE HANDY BOX (RACO 663 OR EQUAL) MOUNT DIRECTLY TO FURNACE FUSE 15 AMP OR AS INDICATED ON PLANS.
- SWITCH WITH LIGHTS UNLESS INDICATED OTHERWISE.
- PROVIDE DEVICE UL LISTED TO BE USED WITH THE EXISTING FIRE ALARM PANEL SYSTEM
- PROVIDE TIMER INTERVAL AS SHOWN ON DRAWINGS OR LISTED IN SPECIFICATIONS.
- USE POWER PACK BZ-100E-P
- PROVIDE RACEWAY WITH OUTLETS 12" ON CENTER. UNO.

CONDUIT/CONDUCTOR SCHEDULE

MARK	AMPS	CONDUIT	CONDUCTOR	REMARKS		
		CABLE	QTY	SIZE	INSL	
B2-22	20	3/4"	2	12	(1)	(2)
B2-23	20	3/4"	3	12	(1)	(2)
B2-24	30	3/4"	2	10	(1)	(2)
B2-25	50	3/4"	2	8	(1)	(2)

NOTE:
(1) THIN/THWN-2.
(2) ALL CONDUIT SHALL CONTAIN A SEPARATE EQUIPMENT GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH THE NEC. ACCOUNT FOR PARALLEL RUNS.

SUFFIX:
"A" INDICATES ALUMINUM CONDUCTORS
"Y" INDICATES YELLOW ISOLATED GROUND CONDUCTOR IN ADDITION TO THE GROUND CONDUCTOR IN NOTE ABOVE.

GENERAL NOTES

- THE ELECTRICAL SYSTEMS DEFINED BY THESE PLANS AND SPECIFICATIONS ARE TO BE CONSTRUCTED AS COMPLETE AND OPERABLE SYSTEMS AND SHALL BE BID WITH THIS INTENT. THE CONTRACTOR SHALL VISIT THE SITE, READ ALL THE RELEVANT DOCUMENTS AND BECOME FAMILIAR WITH THE TYPE OF CONSTRUCTION AND WORK TO BE ACCOMPLISHED. SHOULD ANY ERROR, OMISSION OR CONFLICT EXIST IN EITHER THE PLANS OR SPECIFICATIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING BEFORE SUBMITTING HIS BID PRICE SO A CHANGE CAN BE ISSUED IN A PRE-BID ADDENDUM. OTHERWISE, THE CONTRACTOR AND/OR EQUIPMENT SUPPLIER SHALL SUPPLY THE PROPER MATERIALS AND LABOR TO INSTALL COMPLETE AND OPERABLE SYSTEMS AT THEIR OWN EXPENSE. WHEN EACH ELECTRICAL SYSTEM IS COMPLETE, THE CONTRACTOR SHALL TEST AND CONFIRM ITS PROPER OPERATION. ANY INCOMPLETE SYSTEM SHALL BE MADE COMPLETE AND OPERABLE.
- THE ARCHITECTURAL AND MECHANICAL PLANS ARE CONSIDERED A PART OF THE ELECTRICAL DOCUMENTS SO FAR AS ANY ELECTRICAL ITEMS THEY MAY CONTAIN. THE ELECTRICAL CONTRACTOR SHALL REFER TO AND COORDINATE WITH THEM. NO EXTRA COST SHALL BE ALLOWED FOR FAILURE TO COORDINATE THE CONTRACT DOCUMENTS WITH OTHER TRADES AND/OR IF EQUIPMENT DIMENSIONS ARE GREATER THAN SPECIFIED AND/OR DIMENSIONED ON THE PLANS.
- NO ADDITIONS TO THE CONTRACTOR BID WILL BE ALLOWED FOR CHANGES MADE NECESSARY BY INTERFERENCE WITH OTHER WORK.
- THE ELECTRICAL CONTRACTOR SHALL PROVIDE EQUIPMENT, MATERIALS AND LABOR FOR THE CONNECTIONS OF ALL EQUIPMENT SHOWN ON THE PLANS - ARCHITECTURAL, MECHANICAL, ETC.
- THIS PROJECT IS TO BE INSTALLED IN STRICT ACCORDANCE WITH LOCAL AND STATE CODES AND THE NEC. IF AT ANY TIME DURING CONSTRUCTION, OR AFTER, SOMETHING IS FOUND TO BE INSTALLED IN VIOLATION OF THE CODES LISTED ABOVE, IT SHALL BE CORRECTED AT THE CONTRACTORS EXPENSE.
- THE EC SHALL INSTALL A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN EACH CONDUIT. CONDUIT SHALL NOT BE USED AS AN EQUIPMENT GROUNDING CONDUCTOR. THE EC SHALL GROUND THE ELECTRICAL SYSTEM IN ACCORDANCE WITH LOCAL AND NATIONAL CODES.
- ELECTRICAL CONTRACTOR SHALL CONFIRM MINIMUM CODE (NEC) WORKING CLEARANCE BEFORE INSTALLING ANY ELECTRICAL PANELS OR CABINETS AND SHALL MOVE THE PANELS AT HIS EXPENSE IF REJECTED BY AN INSPECTOR. IF CLEARANCE IS NOT POSSIBLE, THE DESIGNER SHALL BE NOTIFIED IMMEDIATELY IN WRITING.
- THE CONTRACTOR SHALL ALLOW THE MOVEMENT, BEFORE ROUGH-IN, OF ANY ELECTRICAL PANEL, DEVICE, ETC. A DISTANCE OF 10 FEET WITHOUT REQUIRING ADDITIONAL COST TO THE PROJECT.
- THE ELECTRICAL CONTRACTOR SHALL SECURE ALL CONDUIT TO THE STRUCTURE AS IT IS SET IN PLACE USING INDUSTRY STANDARD METHODS AND PRACTICES.
- TO ASSURE ALL DEVICES ARE RIGIDLY SET, THE ELECTRICAL CONTRACTOR SHALL SECURE ALL DEVICE BOXES WITH BRACKETS, HANGERS, ETC. DESIGNED FOR THE APPLICATION. ANY DEVICE BOXES NOT SECURED WILL BE MADE SECURE AT THE CONTRACTORS EXPENSE.
- BEFORE ANY ELECTRICAL CONDUIT, BOXES, ETC. ARE COVERED (FLOOR, CEILING, WALLS, ETC.), THEY SHALL BE APPROVED BY THE INSPECTING OFFICER (INSPECTOR). THE UNCOVERING AND REPLACEMENT OF ELECTRICAL WORK FOR THE INSPECTION PURPOSES WILL BE AT THE COST OF THE ELECTRICAL CONTRACTOR.
- DO NOT INSTALL CONDUIT IN BOND BEAMS.
- DURING CONSTRUCTION, THE ELECTRICAL

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KEYED NOTES

1. EC SHALL PROVIDE (1) 20 AMP 120V DEDICATED CIRCUIT FROM PANEL INDICATED FOR VAV CONTROL IN ACCESSIBLE CEILING SPACE CENTRALLY LOCATED TO SERVE NO MORE THAN 5 VAV BOXES. COORDINATE EXACT LOCATION WITH MC PRIOR TO ROUGH-IN. MC WILL PROVIDE LV TRANSFORMER AND WILL MAKE CONNECTIONS TO EACH VAV. PROVIDE NEW 20 AMP SINGLE POLE BREAKER TO MATCH EXISTING WITH AN EQUIVALENT AIC RATING IN PANEL INDICATED. UPDATE THE PANELBOARD CIRCUIT DIRECTORIES AS REQUIRED FOR NEW CIRCUITS.
2. APPROXIMATE LOCATION SHOWN FROM RECORD DRAWINGS. EC TO FIELD VERIFY EXACT LOCATION AND AVAILABLE PANELBOARD SPACE PRIOR TO BID.
3. CIRCUITS WHERE SHOWN ARE FROM RECORD DRAWINGS AND SHOWN FOR REFERENCE ONLY. CONTRACTOR TO FIELD VERIFY EXACT CIRCUITS. DISCONNECT AND REMOVE SUPPLY AND/OR EXHAUST FAN DISCONNECT IN PREPARATION FOR NEW VFD'S. EXISTING CONDUIT AND CONDUCTORS ARE TO BE REUSED TO THE FULLEST EXTENT POSSIBLE. PROTECT FROM DAMAGE DURING DEMOLITION. EXTEND NEW CONDUIT AND CONDUCTORS AS REQUIRED FOR NEW VFD LOCATION. COORDINATE DEVICE SALVAGE WITH OWNER PRIOR TO DISPOSAL. CONNECT NEW VFD'S AS SCHEDULED.
4. PROVIDE NEW UL LISTED DUCT SMOKE DETECTORS COMPATIBLE WITH THE EXISTING FIRE ALARM SYSTEM. PROVIDE (1) 20 AMP 120V CIRCUIT FROM PANEL INDICATED IN ACCESSIBLE CEILING SPACE AND CONNECT TO A CONTROL MODULE AS SHOWN FOR CONTROL. PROVIDE NEW 20 AMP SINGLE POLE BREAKER TO MATCH EXISTING WITH AN EQUIVALENT AIC RATING IN PANEL INDICATED. UPDATE THE PANELBOARD CIRCUIT DIRECTORIES AS REQUIRED FOR NEW CIRCUITS. PROVIDE NEW CONDUIT AND CONDUCTORS AS REQUIRED FOR CONNECTION TO THE FIRE ALARM SYSTEM. PROVIDE ADDITIONAL PROGRAMMING AS REQUIRED FOR NEW DEVICES AND TEST THE SYSTEM TO ENSURE THAT THE FIRE ALARM SYSTEM IS COMPLETE AND FUNCTIONING TO LIKE NEW CONDITIONS.
5. PROVIDE CONNECTION THROUGH AN AUXILIARY CONTACT IN THE ANSUL SYSTEM TO THE EXISTING FIRE ALARM SYSTEM INITIATION DEVICE LOOP AND EXTEND CONDUIT AND CONDUCTORS AS REQUIRED SUCH THAT AN ANSUL SYSTEM ALARM WILL SEND AN ALARM SIGNAL TO THE FIRE ALARM PANEL.
6. INDICATED SPACES OR SPARES. CONTRACTOR TO FIELD VERIFY CAPACITY AND AVAILABLE PANEL AND BREAKER SPACE PRIOR TO BID AND SHALL ENSURE THAT THE PANELS ARE NOT OVERLOADED. TYPICAL FOR ALL CIRCUITS INDICATED IN THE PROJECT.
7. PROVIDE CONTACTOR AND ENCLOSURE PER DETAIL 1 ON SHEET E-001. EC SHALL PROVIDE THE REQUIRED SIZE AND QUANTITY OF CONTACTORS NECESSARY TO CONTROL POWER TO ALL EQUIPMENT UNDER THE HOOD. EC SHALL ROUTE ALL EQUIPMENT POWER LOCATED UNDER THE HOOD THROUGH THE CONTACTORS. COORDINATE CONTACTOR ENCLOSURE LOCATION WITH OWNER PRIOR TO ROUGH-IN. CONTROL CONTACTORS THROUGH AN AUXILIARY CONTACT IN THE ANSUL SYSTEM.
8. PROVIDE SWITCH AND CONNECTION TO EF-1 CONTACTOR AS REQUIRED FOR CONTROL.
9. CONFIRM ALL EQUIPMENT CONNECTIONS, MOUNTING HEIGHTS, AND NEMA PLUG CONFIGURATIONS WITH OWNER AND EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN. TYPICAL FOR ALL DEVICES IN THE KITCHEN.
10. ANSUL SYSTEM CONTROL STATION.



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• Van Boerum & Frank Assoc., 2003

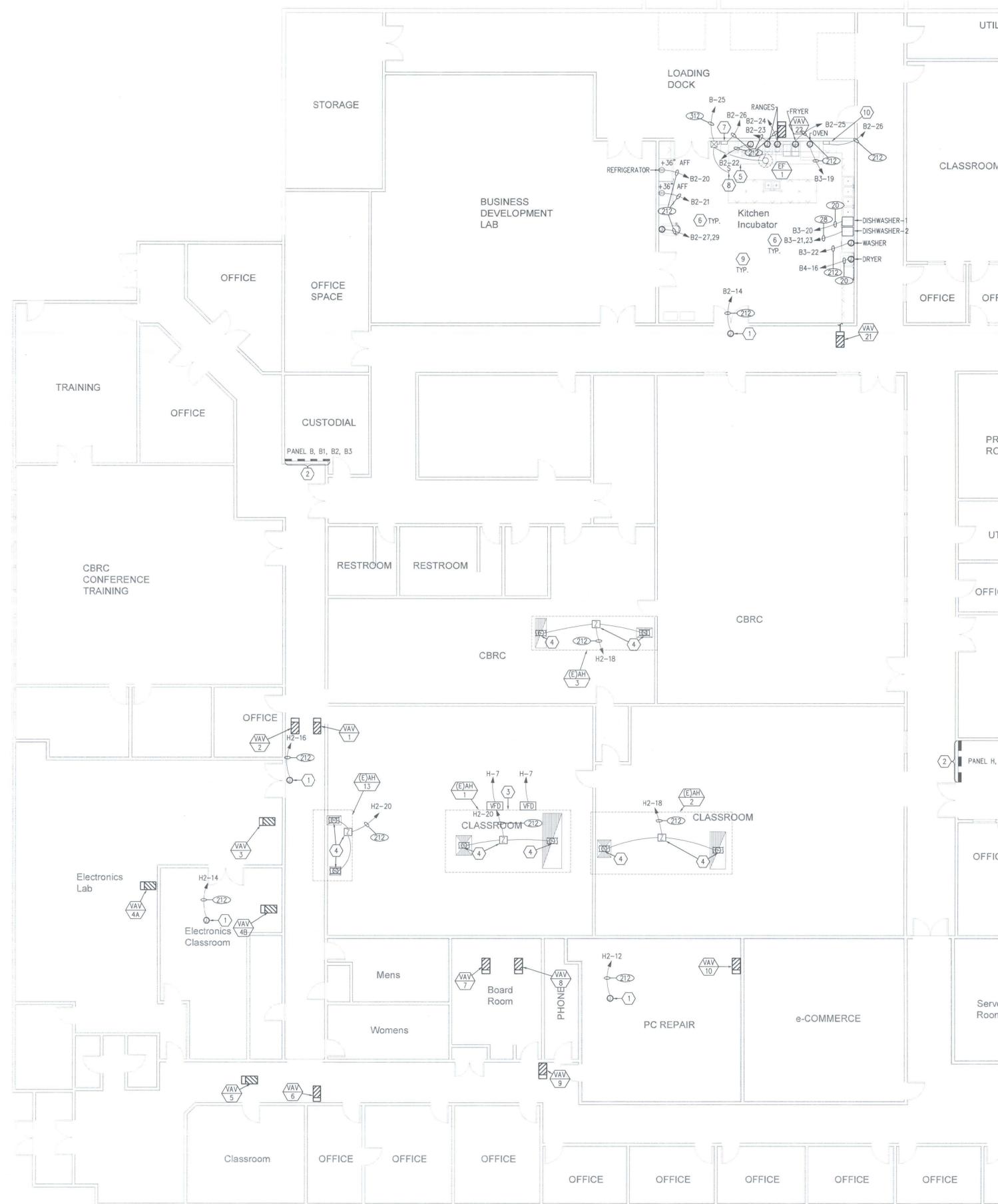
BRIDGERLAND APPLIED TECHNOLOGY COLLEGE
CONTROLS UPGRADE
LOGAN, UTAH

REVISIONS

VBFA PROJECT #: 10215
CHECKED BY: BH
DRAWN BY: LDT
CURRENT/BID DATE: 10/12/10

SHEET CONTENTS
WEST
POWER
PLAN

E-101



WEST POWER PLAN

E-101 SCALE: 1/8" = 1'-0"

0' 8' 16'

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UTIL

LOADING DOCK

STORAGE

BUSINESS DEVELOPMENT LAB

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KEYED NOTES

1. EC SHALL PROVIDE (1) 20 AMP 120V DEDICATED CIRCUIT FROM PANEL INDICATED FOR VAV CONTROL IN ACCESSIBLE CEILING SPACE CENTRALLY LOCATED TO SERVE NO MORE THAN 5 VAV BOXES. COORDINATE EXACT LOCATION WITH MC PRIOR TO ROUGH-IN. MC SHALL INSTALL A LV TRANSFORMER AND MAKE CONNECTIONS TO EACH VAV. PROVIDE NEW 20 AMP SINGLE POLE BREAKER TO MATCH EXISTING WITH AN EQUIVALENT AIC RATING IN PANEL INDICATED. UPDATE THE PANELBOARD CIRCUIT DIRECTORIES AS REQUIRED FOR NEW CIRCUITS.
2. APPROXIMATE LOCATION SHOWN FROM RECORD DRAWINGS. EC TO FIELD VERIFY EXACT LOCATION AND AVAILABLE PANELBOARD SPACE PRIOR TO BID.
3. EC SHALL PROVIDE (1) 20 AMP 120V DEDICATED CIRCUIT FROM PANEL INDICATED FOR AIC PANEL POWER. COORDINATE EXACT LOCATION WITH MC PRIOR TO ROUGH-IN. PROVIDE NEW 20 AMP SINGLE POLE BREAKER TO MATCH EXISTING WITH AN EQUIVALENT AIC RATING IN PANEL INDICATED. UPDATE THE PANELBOARD CIRCUIT DIRECTORIES AS REQUIRED FOR NEW CIRCUITS.
4. CIRCUITS WHERE SHOWN ARE FROM RECORD DRAWINGS AND SHOWN FOR REFERENCE ONLY. CONTRACTOR TO FIELD VERIFY EXACT CIRCUITS, DISCONNECT AND REMOVE SUPPLY AND/OR EXHAUST FAN DISCONNECT IN PREPARATION FOR NEW VFD'S. EXISTING CONDUIT AND CONDUCTORS ARE TO BE REUSED TO THE FULLEST EXTENT POSSIBLE. PROTECT FROM DAMAGE DURING DEMOLITION. EXTEND NEW CONDUIT AND CONDUCTORS AS REQUIRED FOR NEW VFD LOCATION. COORDINATE DEVICE SALVAGE WITH OWNER PRIOR TO DISPOSAL. CONNECT NEW VFD'S AS SCHEDULED.
5. PROVIDE NEW UL LISTED DUCT SMOKE DETECTORS COMPATIBLE WITH THE EXISTING FIRE ALARM SYSTEM. PROVIDE (1) 20 AMP 120V CIRCUIT FROM PANEL INDICATED IN ACCESSIBLE CEILING SPACE AND CONNECT TO A CONTROL MODULE AS SHOWN FOR CONTROL. PROVIDE NEW 20 AMP SINGLE POLE BREAKER TO MATCH EXISTING WITH AN EQUIVALENT AIC RATING IN PANEL INDICATED. UPDATE THE PANELBOARD CIRCUIT DIRECTORIES AS REQUIRED FOR NEW CIRCUITS. PROVIDE NEW CONDUIT AND CONDUCTORS AS REQUIRED FOR CONNECTION TO THE FIRE ALARM SYSTEM. PROVIDE ADDITIONAL PROGRAMMING AS REQUIRED FOR NEW DEVICES AND TEST THE SYSTEM TO ENSURE THAT THE FIRE ALARM SYSTEM IS COMPLETE AND FUNCTIONING TO LIKE NEW CONDITIONS.

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Original drawings remain the property of the Engineer and as such the Engineer retains total ownership and control. The design represented by these drawings are sold to the client for a one time use, unless otherwise agreed upon in writing by the Engineer.

Van Boerum & Frank Assoc., 2003

BRIDGERLAND APPLIED TECHNOLOGY COLLEGE
CONTROLS UPGRADE
LOGAN, UTAH

REVISIONS	

VBFA PROJECT #:	10215
CHECKED BY:	BH
DRAWN BY:	LDT
CURRENT BID DATE:	10/12/10

SHEET CONTENTS
EAST
POWER
PLAN

E-102

N
EAST POWER PLAN
E-102 SCALE: 1/8" = 1'-0"
0' 8' 16'