ELECTRICAL LEGEND (NOTE: NOT ALL SYMBOLS SHOWN ARE USED ON THESE DRAWINGS)

-ONE LINE SYMBOLS-

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	DRAW-OUT CIRCUIT BREAKER (MOLDED/INSULATED CASE)
52	DRAW-OUT POWER CIRCUIT BREAKER
	CONTROL FUSE
	FUSE WITH SWITCH
	SWITCH
PANEL XXX	PANELBOARD
SPD	SPD OR MISC EQUIPMENT
ATS-XX XXX A	AUTOMATIC TRANSFER SWITCH
100A4G	FEEDER DESIGNATION, SEE FEEDER SCHEDULE
	AUTOMATIC TRANSFER SWITCH WITH BY-PASS
E	ENGINE GENERATOR
TX-XXXX	TRANSFORMER
	ENCLOSED BUSWAY
	GROUND BUS
	WEATHERHEAD
M	MOTOR
	DELTA CONNECTION
	WYE CONNECTION
	GROUNDED WYE CONNECTION
	GROUNDED WYE CONNECTION WITH RESISTOR GROUND
	GROUNDED WYE CONNECTION WITH REACTOR GROUND
PM	METERING DEVICE
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	LOAD-BREAK CONNECTOR
##	PROTECTIVE RELAY DEVICE
K	KEY INTERLOCK
2400V,100A, 10SEC. RESISTOR	RESISTOR
	CONTACT NORMALLY OPEN
	CONTACT NORMALLY CLOSED
	SINGLE BATTERY
	MULTIPLE BATTERIES
	LIGHTNING ARRESTOR
	THERMAL ELEMENT, OVERLOAD RELAY

-GENERAL-

SYMBOL	DESCRIPTION
	BRANCH CIRCUIT HOME RUN TO PANELBOARD, DESIGNATION INDICATES PANEL AND CIRCUIT NUMBERS
	CONTROL WIRING
	LIGHTING, ONE-LINE, AND POWER CIRCUITING
	LIGHTING, ONE-LINE, AND POWER CIRCUITING (UNDERGROUND)
	FLEXIBLE CONDUIT
	CONDUIT BREAK SYMBOL
	CONDUIT CAP
	CONDUIT CHANGE IN ELEVATION
	CONDUIT STUB DOWN (OUT OF DRAWING LIMITS)
	CONDUIT STUB UP (OUT OF DRAWING LIMITS)
J	JUNCTION BOX
J	WALL MOUNTED JUNCTION BOX
J	FLOOR MOUNTED JUNCTION BOX
	PUSH BUTTON A = ABORT DA = DURESS ALARM EPO = EMERGENCY POWER OFF IC = INTERCOM ST = SHUNT TRIP
SX	SWITCH SYMBOL SINGLE POLE (IF BLANK) 2 = DOUBLE POLE 3 = THREE-WAY 4 = FOUR-WAY AS = ADJUSTABLE SPEED D = DIMMER K = KEY OPERATED LV = LOW VOLTAGE M = MANUAL MOTOR SWITCH P = WITH PILOT LIGHT OS = OCCUPANCY SENSOR TO = THERMAL OVERLOAD VS = VACANCY SENSOR WP = WEATHERPROOF x = SMALL LETTER INDICATES LUMINARIES CONTROLLED XP = EXPLOSION PROOF
SS	DUAL SWITCH
$	INTERCOM SWITCH
XX	SPECIAL SYSTEMS SYMBOLS: B = BUZZER CH = CHIME CK = CARD READER/KEYPAD CR = CARD READER DA = DURESS ALARM PUSH-BUTTON DC = DOOR CONTACT DM = MOTORIZED DAMPER DO = DOOR OPERATOR DS = DOOR STRIKE EL = ELECTRIC LOCK ES = ELECTRIC STRIKE F = MANUAL PULL STATION FS = FLOW SWITCH GB = GLASSBREAK DETECTOR HC = HANDICAP PUSH-BUTTON IC = INTERCOM CALL STATION KP = KEYPAD MH = MANHOLE MD = MOTION DETECTOR ML = MAGNETIC LOCK OS = OCCUPANCY SENSOR PA = PUBLIC ADDRESS PB = PULLBOX PM = POWER QUALITY METER PS = PRESSURE SWITCH R = REMOTE INDICATING LIGHT RT = REMOTE TEST STATION RX = REQUEST TO EXIT PUSH-BUTTON S = WALL MOUNTED SPEAKER TC = TIME CLOCK TS = TAMPER SWITCH VM = VIDEO MONITOR
XXX	MISC. SYSTEM COMPONENT AMP = AMPLIFIER ANN = ANNUNCIATOR ASD = ADJUSTABLE SPEED DRIVE ATS = AUTOMATIC TRANSFER SWITCH BMS = BALANCED MAGNETIC STRIP CAM = CONTROL ADDRESSABLE MODULE DE = DELAYED EGRESS DMA = DOOR MANAGEMENT ALARM DTC = DATA TERMINAL CABINET DVR = DIGITAL VIDEO RECORDER EC = ELECTRICAL CONTACTOR FAA = FIRE ALARM ANNUNCIATOR FACP = FIRE ALARM CONTROL PANEL FSD = FIRE SMOKE DAMPER MAM = MONITOR ADDRESSABLE MODULE N = NURSE CALL STATION NCS = NURSES CALL MASTER STATION NCT = NURSE CALL TERMINAL CABINET PIR = PASSIVE INFRARED DETECTOR SAP = SECURITY ALARM PANEL SPD = SURGE PROTECTIVE DEVICE VFD = VARIABLE FREQUENCY DRIVE

-POWER-

SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE D = DEDICATED CIRCUIT IG = ISOLATED GROUND DEVICE
GFI	GFI = GROUND FAULT CIRCUIT INTERRUPTER
	FLOOR MOUNTED DUPLEX RECEPTACLE
	FLOOR MOUNTED FOURPLEX RECEPTACLE
	FLOOR MOUNTED SPECIAL PURPOSE RECEPTACLE
	CEILING MOUNTED DUPLEX RECEPTACLE
	CEILING MOUNTED FOURPLEX RECEPTACLE
	CEILING MOUNTED SPECIAL PURPOSE RECEPTACLE
	FOURPLEX RECEPTACLE
	RANGE RECEPTACLE
	SINGLE RECEPTACLE
	SPECIAL PURPOSE RECEPTACLE
	SWITCHED RECEPTACLE
	DUPLEX EMERGENCY/CRITICAL
	FOURPLEX EMERGENCY/CRITICAL
	DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	ENCLOSED CIRCUIT BREAKER
	MOTOR STARTER
	COMBINATION MOTOR STARTER
	DISTRIBUTION PANEL
	EXISTING DISTRIBUTION PANEL
	NEW PANEL, FLUSH MOUNTED
	EXISTING PANEL, FLUSH MOUNTED
	NEW PANEL, SURFACE MOUNTED
	EXISTING PANEL, SURFACE
S	COMBINATION SWITCH AND RECEPTACLE
	CONDUIT SEAL OFF
	FIRE RATED POKE-THROUGH
	PARTITION CIRCUIT SPLIT
	POWER POLE
W	SURFACE RACEWAY
CR	CONTROL RELAY
M	METER
T	TRANSFORMER

-LIGHTING (REFER TO LUMINAIRE SCHEDULE)-

SYMBOL	DESCRIPTION
#x	LUMINARIES # = BRANCH CIRCUIT NUMBER x = SWITCH LEG IDENTIFIER
	SHADING INDICATES LUMINAIRE ON LIFE SAFETY
	SHADING INDICATES PORTION OF LUMINAIRE ON LIFE SAFETY
	WALL MOUNTED LUMINAIRE
	STRIP LIGHT
	STRIP LIGHT WITH JUNCTION BOX
	POLE MOUNTED LUMINAIRE
	LUMINAIRE
	WALL WASHER LUMINAIRE
	ADJUSTABLE LUMINAIRE
	PENDANT LUMINAIRE
	TRACK LIGHTING
P	PHOTOCELL
	EXIT LIGHT (WITH FACES AND DIRECTION ARROWS INDICATED)
	WALL MOUNTED EXIT LIGHT (WITH FACES AND DIRECTION ARROWS INDICATED)
	WALL MOUNTED BATTERY PACK EMERGENCY LIGHT

-FIRE ALARM DEVICES-

SYMBOL	DESCRIPTION
A	ABORT BUTTON
B	BELL
D D	DUCT SMOKE DETECTOR
	FIRE FIGHTER'S TELEPHONE JACK
HX	COMBINATION FIRE HORN/STROBE LIGHT
SX	COMBINATION FIRE SPEAKER/STROBE LIGHT
DX	FIRE ALARM STROBE LIGHT
	FIRE ALARM STROBE, CEILING MOUNT
H	FIRE HORN
H	DUAL PROJECTION FIRE HORN
X	DETECTOR UNDER FLOOR F = FLAME I = IONIZATION TYPE P = PHOTOELECTRIC TYPE T = THERMAL TYPE
	MAGNETIC DOOR HOLD OPEN
X	DETECTOR F = FLAME I = IONIZATION TYPE P = PHOTOELECTRIC TYPE T = THERMAL TYPE
R	BEAM DETECTOR
	PULL STATION/TELEPHONE JACK
S	DELUGE VALVE

-GROUNDING SYMBOLS-

SYMBOL	DESCRIPTION
	GROUND TEST WELL
	GROUNDING CONDUCTOR
	LIGHTNING PROTECTION AIR TERMINAL
	BONDING POINT
G	GROUND BAR
	ELECTRICAL GROUND
	GROUND ROD
	GROUND ROD WITH INSPECTION TEST WELL
	PIGTAIL

-SPECIAL SYSTEMS DEVICES-

SYMBOL	DESCRIPTION
	DATA OUTLET
	COMBINATION TELEPHONE/DATA OUTLET
	TELEPHONE OUTLET
	TELEVISION JACK
	CEILING MOUNTED DATA OUTLET
	CEILING MOUNTED TELEPHONE/DATA OUTLET
	CEILING MOUNTED TELEPHONE OUTLET
	FLOOR MOUNTED DATA OUTLET
	FLOOR MOUNTED TELEPHONE/DATA OUTLET
	FLOOR MOUNTED TELEPHONE OUTLET
TTB	TELEPHONE TERMINAL BOARD
DTB	DATA TERMINAL BOARD
M	MICROPHONE OUTLET
SX	SPEAKER V = WITH INTEGRAL VOLUME CONTROL
S	WALL MOUNTED SPEAKER
V	WALL MOUNTED VOLUME CONTROL
C	CLOCK RECEPTACLE OUTLET
	SECURITY CAMERA
T	THERMOSTAT

-GRAPHIC SYMBOLS-

SYMBOL	DESCRIPTION
1	KEY NOTE
	REVISION NUMBER
X	DETAIL NOTE
X	X = DENOTES ALL LUMINARIES IN THE RESPECTIVE AREA ARE THE TYPE INDICATED, REFER TO LUMINAIRE SCHEDULE
EF-1	MECHANICAL EQUIPMENT TAG
	SHADING INDICATES EQUIPMENT
	HATCHING INDICATES ITEM(S) TO BE REMOVED
A100	ROOM NUMBER
	NORTH ARROW
	DETAIL BUBBLE DETAIL NUMBER SHEET NUMBER - WHERE DETAIL IS SHOWN
	SECTION CUT SECTION NUMBER/LETTER SHEET NUMBER - WHERE SECTION IS SHOWN

- ABBREVIATIONS -

(E)	EXISTING
(N)	NEW
(PART)	PARTIAL CIRCUIT
+XX	MOUNTING HEIGHT IN INCHES. AFF UNO
A	AMP
AB	AMPS BRACING
AC	ABOVE COUNTER TOP
AF	AMP FRAME
AFC	ABOVE FINISHED COUNTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AIC	AMPS INTERRUPTING CAPACITY
AS	AMPS SENSOR
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
BFC	BELOW FINISHED CEILING
C	CONDUIT
CAM	CONTROL ADDRESSABLE MODULE
CB	MOLDED CASE CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT T.V.
CKT	CIRCUIT
CLG	CEILING
CO	CONDUIT ONLY
CUH	CABINET UNIT HEATER
DMC	DUAL MODE CONTROLLER
DTB	DATA TERMINAL BOARD
DTC	DATA TERMINAL CABINET
E/G	ENGINE/GENERATOR
EC	EMPTY CONDUIT
EF	EXHAUST FAN
ELEC	ELECTRIC
ELEV	ELEVATION
EM	EM EMERGENCY
EMERG	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
EP	EXPLOSION PROOF
EWC	ELECTRIC WATER COOLER
EX	EXISTING
F	FUSE
FA	FIRE ALARM
FAA	FIRE ALARM ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL
FAP	FIRE ALARM PANEL
FCU	FAN COIL UNIT
FIXT	FIXTURE
FLR	FLOOR
FLUOR	FLUORESCENT
FTU	FAN TERMINAL UNIT
G	GROUND (EQUIPMENT)
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND (EQUIPMENT)
HC	HANDICAPED
HG	HOSPITAL GRADE
HP	HORSEPOWER
HT	HEAT TRACE
HV	HIGH VOLTAGE
IC	INTERRUPTING CAPACITY
INC	INCANDESCENT
IDF	INTERMEDIATE DISTRIBUTION FRAME

- ABBREVIATIONS -

IG	ISOLATED GROUND
JB	JUNCTION BOX
K	THOUSAND
LTG	LIGHTING
LTS	LIGHTS
LV	LOW VOLTAGE
MAM	MONITOR ADDRESSABLE MODULE
MATV	MASTER ANTENNA TV
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCSW	MOLDED CASE SWITCH
MDF	MAIN DISTRIBUTION FRAME
MDP	MAIN DISTRIBUTION PANEL
MH	MANHOLE
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTG	MOUNTING HEIGHT
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NF	NON FUSED
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
P	POLE
PA	PUBLIC ADDRESS
PB	PULL BOX
PIV	POST INDICATOR VALVE
PNL	PANEL
PWR	POWER
RCPT(S)	RECEPTACLE(S)
RF	RETURN AIR FAN
SBC	STRANDED BARE COPPER
SF	SUPPLY AIR FAN
SO	SPACE ONLY
SP	SPARE
SPD	SURGE PROTECTIVE DEVICE
ST	SHUNT TRIP
SW	SWITCH
T	TRANSFORMER
TEL	TELEPHONE
TF	TRANSFER FAN
TTB	TELEPHONE TERMINAL BOARD
TV	TELEVISION
UF	UNDERFLOOR
UG	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTAGE
VFD	VARIABLE FREQUENCY DRIVE
VP	VAPOR PROOF
VV	VARIABLE VOLUME UNIT
W	WIRE
WG	WIRE GUARD
WP	WEATHERPROOF
WT	WATERTIGHT
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

GENERAL NOTES

ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH LOCAL BUILDING CODES AND THE NATIONAL ELECTRICAL CODE (NEC).

CONTRACTOR SHALL REFERENCE SPECIFICATIONS FOR CONSTRUCTION MATERIALS AND INSTALLATION PROCEDURES. SPECIFICATIONS ARE A PART OF THE CONSTRUCTION DOCUMENTS. SHOULD ANY CONFLICT ARISE BETWEEN THE DRAWINGS AND SPECIFICATIONS, SUCH CONFLICT SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR RESOLUTION.

THESE DRAWINGS ARE DIAGRAMMATIC IN CHARACTER AND DO NOT SHOW MATERIALS FOR A COMPLETE INSTALLATION.

CONTRACTOR SHALL PLAN THE INSTALLATION AND LAYOUT THE WORK AS DIAGRAMMED IN THESE DOCUMENTS. REFER TO THE FLOOR PLANS, SCHEMATICS AND DIAGRAMS OF OTHER TRADES FOR ELECTRICAL REQUIREMENTS, BRANCH CIRCUITS AND ELECTRICAL CONNECTIONS NOT INDICATED ON THESE DOCUMENTS.

ALL PENETRATIONS THROUGH FIRE SEPARATION WALLS ARE TO BE SEALED TO MAINTAIN SEPARATION RATING.

JUNCTION BOXES FOR LUMINARIES ARE NOT INDICATED. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE PROPER NUMBER OF J-BOXES TO MEET LOCAL CODE AND NATIONAL ELECTRICAL CODE.

LOCATIONS AND INFORMATION FOR EXISTING ELECTRICAL DEVICES AND EQUIPMENT SHOWN ON THESE PLANS ARE APPROXIMATE. THIS INFORMATION IS DERIVED FROM FIELD OBSERVATIONS AND RECORD DRAWINGS THAT WERE AVAILABLE AT THE TIME THESE DRAWINGS WERE ISSUED FOR PUBLICATION. THE CONTRACTOR IS TO VERIFY ACTUAL FIELD CONDITIONS PRIOR TO STARTING WORK.

UP-TO-DATE AS-BUILT ELECTRICAL PLANS ARE NOT AVAILABLE FOR THIS BUILDING. INFORMATION FOR EXISTING CIRCUITRY IS BASED ON EXISTING PANEL DIRECTORIES, AVAILABLE DRAWINGS, AND ASSUMPTIONS. IF SIGNIFICANT DISCREPANCIES ARE FOUND THAT CANNOT BE EASILY DEALT WITH, CONTACT THE ARCHITECT OR ENGINEER.

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DOCUMENTS.

REV: 10/31/2013

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

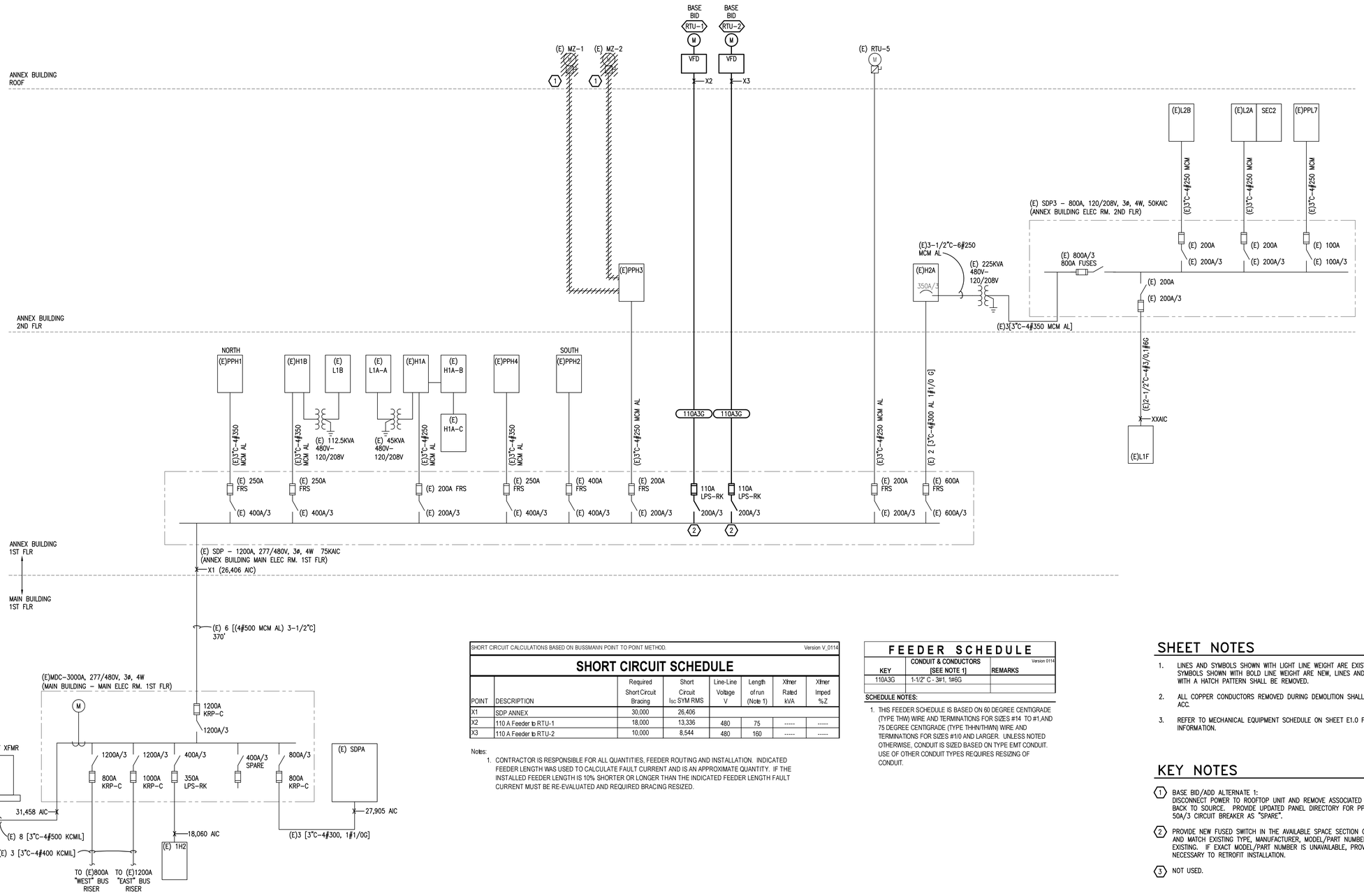
ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

ELECTRICAL LEGEND

DATE: 3/28/2014
SCALE: NONE
DESIGN BY: R. KNOLL
DRAWN BY: R. KNOLL
APPROVED BY: E. BUNCE
PRJ. NO: 18985
CAD FILE: E0.0.dwg
XREF:
RMH Job Number:

SHT.NO. E0.0

REVISION ----



SHORT CIRCUIT CALCULATIONS BASED ON BUSSMANN POINT TO POINT METHOD.							Version V_0114
SHORT CIRCUIT SCHEDULE							
POINT	DESCRIPTION	Required Short Circuit Bracing	Short Circuit I_{SC} SYM RMS	Line-Line Voltage V	Length of run (Note 1)	Xfmer Rated kVA	Xfmer Imped %Z
X1	SDP ANNEX	30,000	26,406				
X2	110 A Feeder to RTU-1	18,000	13,336	480	75	-----	-----
X3	110 A Feeder to RTU-2	10,000	8,544	480	160	-----	-----

Notes:
1. CONTRACTOR IS RESPONSIBLE FOR ALL QUANTITIES, FEEDER ROUTING AND INSTALLATION. INDICATED FEEDER LENGTH WAS USED TO CALCULATE FAULT CURRENT AND IS AN APPROXIMATE QUANTITY. IF THE INSTALLED FEEDER LENGTH IS 10% SHORTER OR LONGER THAN THE INDICATED FEEDER LENGTH FAULT CURRENT MUST BE RE-EVALUATED AND REQUIRED BRACING RESIZED.

FEEDER SCHEDULE		
KEY	CONDUIT & CONDUCTORS (SEE NOTE 1)	REMARKS (Version 0114)
110A3G	1-1/2" C., 3#1, 1#6G	

SCHEDULE NOTES:
1. THIS FEEDER SCHEDULE IS BASED ON 60 DEGREE CENTIGRADE (TYPE THW) WIRE AND TERMINATIONS FOR SIZES #14 TO #1,AND 75 DEGREE CENTIGRADE (TYPE THHN/THWN) WIRE AND TERMINATIONS FOR SIZES #1/0 AND LARGER. UNLESS NOTED OTHERWISE, CONDUIT IS SIZED BASED ON TYPE EMT CONDUIT. USE OF OTHER CONDUIT TYPES REQUIRES RESIZING OF CONDUIT.

SHEET NOTES

1. LINES AND SYMBOLS SHOWN WITH LIGHT LINE WEIGHT ARE EXISTING, LINES AND SYMBOLS SHOWN WITH BOLD LINE WEIGHT ARE NEW, LINES AND SYMBOLS SHOWN WITH A HATCH PATTERN SHALL BE REMOVED.
2. ALL COPPER CONDUCTORS REMOVED DURING DEMOLITION SHALL BE TURNED OVER TO ACC.
3. REFER TO MECHANICAL EQUIPMENT SCHEDULE ON SHEET E1.0 FOR ADDITIONAL INFORMATION.

KEY NOTES

1. BASE BID/ADD ALTERNATE 1: DISCONNECT POWER TO ROOFTOP UNIT AND REMOVE ASSOCIATED CONDUIT/CONDUCTORS BACK TO SOURCE. PROVIDE UPDATED PANEL DIRECTORY FOR PPH3 DEPICTING ASSOCIATED 50A/3 CIRCUIT BREAKER AS "SPARE".
2. PROVIDE NEW FUSED SWITCH IN THE AVAILABLE SPACE SECTION OF SDP. FIELD VERIFY AND MATCH EXISTING TYPE, MANUFACTURER, MODEL/PART NUMBER AND AIC RATING AS EXISTING. IF EXACT MODEL/PART NUMBER IS UNAVAILABLE, PROVIDE ALL MEANS NECESSARY TO RETROFIT INSTALLATION.
3. NOT USED.

PARTIAL ELECTRICAL ONE–LINE DIAGRAM

SCALE: NONE

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

ELECTRICAL ONE-LINE DIAGRAM

DATE: 3/28/2014
SCALE: NONE
DESIGN BY: R. KNOLL
DRAWN BY: R. KNOLL
APPROVED BY: E. BUNCE
PRJ. NO. 18985
CAD FILE: E01.dwg
XREF:
RMH Job Number:

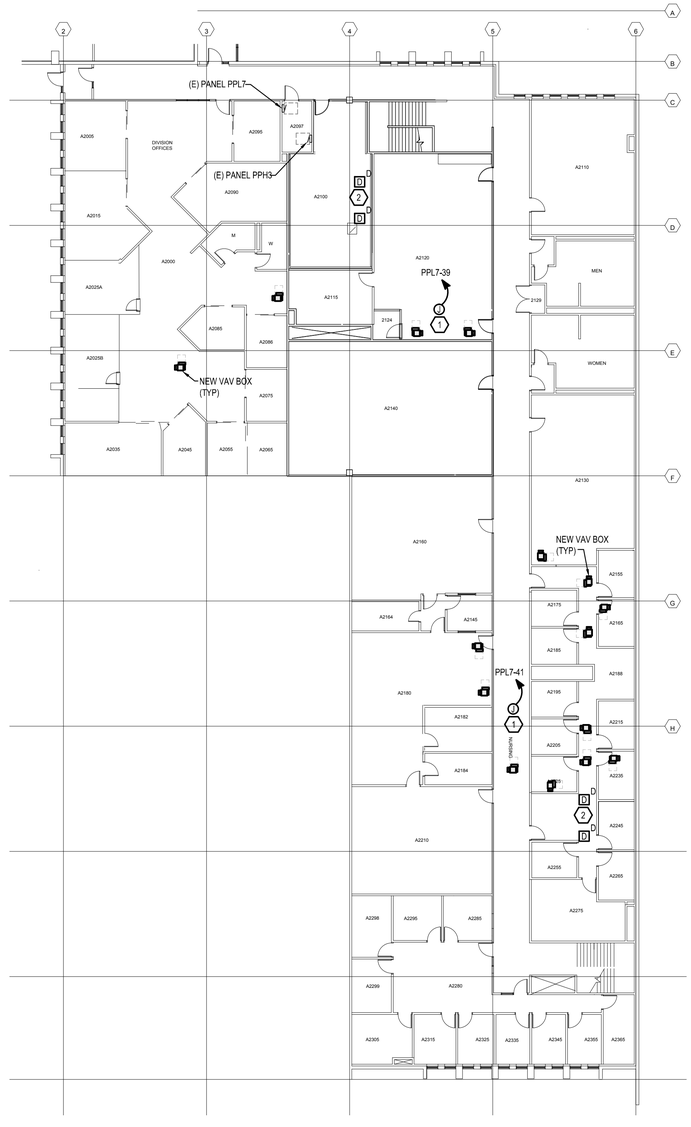
SHT.NO. E0.1

REVISION ----

Created on 2/24/2015
File Path: I:\Jobs\18\18985\Record Drawings\E01.dwg
Save Date 24-Feb-15 by bfarber
Plotted on 2/25/15 by Ben

FIRST FLOOR POWER PLAN

SCALE: 1/16"=1'-0"



SECOND FLOOR POWER PLAN

SCALE: 1/16"=1'-0"

SHEET NOTES

1. LIGHT LINE WEIGHT INDICATES EXISTING, BOLD LINEWEIGHT INDICATES NEW WORK.
2. WORK SHOWN IS INCLUDED IN BOTH BASE BID AND ADD ALTERNATE 1.

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DOCUMENTS.

KEY NOTES

1. PROVIDE 120V CIRCUIT ABOVE ACCESSIBLE CEILING FOR CONTROL POWER TO NEW VAV BOXES VIA CONTROL TRANSFORMER. TRANSFORMER AND ASSOCIATED CONTROL WIRING TO VAV UNITS PROVIDED BY MECHANICAL CONTRACTOR. COORDINATE ALL REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
2. DUCT SMOKE DETECTOR FURNISHED BY ELECTRICAL CONTRACTOR AND INSTALLED AT ALL RETURN AIR INLETS OF THE RETURN RISER BY MECHANICAL. CONTRACTOR SHALL SOLE SOURCE THIS INSTALLATION TO WESTFIRE FIRE PROTECTION SPECIALISTS OF DENVER. INSTALLATION SHALL COMPLY WITH ACC FIRE ALARM INSTALLATION STANDARDS AND SPECIFICATIONS ALREADY IN PLACE.

   EXISTING FACP: GAMEWELL-FCI MODEL E3 FACP LOCATED IN THE ANNEX BUILDING. DUCT SMOKE DETECTORS SHALL PERFORM THE FOLLOWING UPON SMOKE DETECTION IN RETURN DUCTS:
   a. Sound a supervisory signal at the existing Fire Alarm Control Panel
   b. Indicate the location of the duct detector on the fire alarm control panel and annunciators.
   c. Send a Supervisory signal to the Central Station
   d. Shut down the associated Air Handler and close dampers.

ALL NEW DEVICES SHALL BE COMPATIBLE AND MATCH EXISTING SYSTEM'S MANUFACTURER REQUIREMENTS, AND DEVICE TYPE, AND SHALL BE PROVIDED BY A GAMEWELL-FCI LOCAL DISTRIBUTOR. CONTRACTOR SHALL PROVIDE UPDATED FIRE ALARM DRAWINGS TO ACC WHICH SHALL INCORPORATE ALL CHANGES MADE TO EXISTING FIRE ALARM SYSTEM DURING THIS INSTALLATION.

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

FIRST AND SECOND FLOOR POWER PLANS

DATE: 3/28/2014
SCALE: 1/8" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: E11.dwg
XREF:
RMH Job Number:

SHT.NO. E1.1
REVISION ----

Created on 2/24/2015
File Path: H:\Jobs\18985\Record Drawings\E11.dwg
Save Date 24-Feb-15by:faber
Plotted on 2/25/15by:Faber, Ben

PANEL: L1A-A — VOLTAGE: 120/208 V. 3 PH 4 W. — TYPE: PANELBOARD — MOUNTING: SEE PLAN — PANEL COVER: DOOR IN HINGED COVER — NEUTRAL BUS: YES — GROUND BUS: YES ISOLATED GND: NO

FED FROM: H1A

175 AMP MAIN RATED AT 80% 60 HZ
N/A AMP MAIN LUGS
225 AMP BUS
COPPER BUSING
10000 SYMMETRICAL RMS AMPS
PANEL SHORT CIRCUIT RATING

NOTE: 1. EXISTING LOAD, NO CHANGE
2. REMOVE EXISTING 50A/3 SPARE BREAKER
3. NEW LOAD PROVIDE 20A/1 BREAKER

NOTE	DESCRIPTION	CCT VA	BREAKER AMP / P	CCT	PH	CCT	BREAKER AMP / P	CCT VA	DESCRIPTION	NOTE
1	EXIST LOAD	720	20 / 1	1	A	2	20 / 1	720	EXIST LOAD	
1	EXIST LOAD	800	20 / --	3	B	4	20 / 1	720	EXIST LOAD	
1	---	800	-- / 2	5	C	6	20 / 1	720	EXIST LOAD	
1	EXIST LOAD	720	20 / 1	7	A	8	20 / 1	720	EXIST LOAD	
1	EXIST LOAD	720	20 / 1	9	B	10	30 / --	1900	EXIST LOAD	
1	EXIST LOAD	720	20 / 1	11	C	12	-- / 2	1900	---	
1	SNOW MELT	1500	20 / 1	13	A	14	20 / 1	720	EXIST LOAD	
1	EXIST LOAD	720	20 / 1	15	B	16	20 / 1	720	EXIST LOAD	
1	EXIST LOAD	720	20 / 1	17	C	18	20 / 1	720	EXIST LOAD	
1	EXIST LOAD	720	20 / 1	19	A	20	20 / 1	720	EXIST LOAD	
1	RCPT-VENDING	1000	20 / 1	21	B	22	20 / 1	720	EXIST LOAD	
1	RCPT-VENDING	1000	20 / 1	23	C	24	20 / 1	540	EXIST LOAD	
1	HAND DRYER	1500	20 / 1	25	A	26	/ 1	0	SPACE	
1	HAND DRYER	1500	20 / 1	27	B	28	/ 1	0	SPACE	
	SPACE	0	/ 1	29	C	30	/ 1	0	SPACE	
	SPARE	0	50 / --	31	A	32	100 / --	5600	PANEL L1A-B	
	---	0	-- / --	33	B	34	-- / --	5600	---	
	---	0	-- / 3	35	C	36	-- / 3	5600	---	
2,3	***VAV CONTROL CIRC-1ST FLR NW***	***500***	***20 / 1***	37	A	38	20 / 1	540	EXIST LOAD	
2,3	***VAV CONTROL CIRC-1ST FLR NE***	***500***	***20 / 1***	39	B	40	20 / 1	540	EXIST LOAD	
2,3	***VAV CONTROL CIRC-1ST FLR S***	***500***	***20 / 1***	41	C	42	20 / 1	540	EXIST LOAD	

PANEL LOADING SUMMARY

LOAD TYPE	PH A	PH B	PH C	TOTAL	
INCANDESCEN	0.0	0.0	0.0	0.0	kVA
FLUORESCEN	0.0	0.0	0.0	0.0	kVA
RECEPTACLES	5.6	5.1	5.0	15.7	kVA
MOTORS	0.0	0.8	0.8	1.6	kVA
KIT. EQUIP.	0.0	0.0	0.0	0.0	kVA
HEAT	3.0	1.5	0.0	4.5	kVA
COMPUTER	0.0	0.0	0.0	0.0	kVA
OTHER	0.5	2.4	2.4	5.3	kVA
--	5.6	5.6	5.6	16.8	kVA
TOTAL	14.7	15.4	13.8	43.9	kVA

PHASE BALANCE (%)	A-B	B-C	C-A	PF
	95	89	94	93

MIN PANEL AMPACITY	118	AMPERES

NEC DEMAND LOAD SUMMARY

LOAD TYPE	kW		POWER FACT		kVA		DEMAND FACTOR		CALCULATED LOAD	
INCANDESCENT	0.0	@	100%	=	0.0	@	125%	=	0.0	kVA
FLUORESCENT	0.0	@	95%	=	0.0	@	125%	=	0.0	kVA
RECEPTACLES										
FIRST 10 kVA	9.5	@	95%	=	10.0	@	100%	=	10.0	kVA
REMAINDER	5.4	@	95%	=	5.7	@	50%	=	2.9	kVA
MOTORS										
LARGEST	1.3	@	80%	=	1.6	@	125%	=	2.0	kVA
REMAINDER	0.0	@	80%	=	0.0		100%	=	0.0	kVA
KITCHEN EQUIP.	0.0	@	80%	=	0.0	@	100%	=	0.0	kVA
HEAT	4.5	@	100%	=	4.5	@	125%	=	5.6	kVA
COMPUTER	0.0	@	95%	=	0.0	@	100%	=	0.0	kVA
OTHER	4.5	@	85%	=	5.3	@	100%	=	5.3	kVA
--	16.0	@	95%	=	16.8	@	100%	=	16.8	kVA
0 % SPARE	0.0	@	90%	=	0.0	@	100%	=	0.0	kVA
TOTAL	41.0	kW			44.0	kVA			42.6	kVA

THE LOAD ON THIS PANEL HAS INCREASED BY 1.5 KVA

PANEL: PPL7 — VOLTAGE: 120/208 V. 3 PH 4 W. — TYPE: PANELBOARD — MOUNTING: SEE PLAN — PANEL COVER: DOOR IN HINGED COVER — NEUTRAL BUS: YES — GROUND BUS: YES ISOLATED GND: NO

FED FROM: SDP3

AMP MAIN RATED AT 80% 60 HZ
MLO AMP MAIN LUGS
100 AMP BUS
COPPER BUSING
10000 SYMMETRICAL RMS AMPS
PANEL SHORT CIRCUIT RATING

NOTE: 1. EXISTING LOAD, NO CHANGE
2. NEW LOAD PROVIDE 20A/1 BREAKER IN SPACE

NOTE	DESCRIPTION	CCT VA	BREAKER AMP / P	CCT	PH	CCT	BREAKER AMP / P	CCT VA	DESCRIPTION	NOTE
1	EF-28	800	20 / 1	1	A	2	20 / 1	800	EF-33	1
1	EF-20	800	20 / 1	3	B	4	20 / 1	800	EF-29	1
1	EF-23	800	20 / 1	5	C	6	20 / 1	800	EF-31	1
1	RCPT-RTU-5,6	360	20 / 1	7	A	8	20 / 1	500	FIRE ALARM HORN/LT E.	1
1	LIGHTS-RTU-2,5,6,7	400	20 / 1	9	B	10	20 / 1	1080	RCPT-RM A2124	1
	SPACE	0	/ 1	11	C	12	/ 1	0	SPACE	
1	TIMECLOCK CONTROL CIRC	500	20 / 1	13	A	14	/ 1	0	SPACE	
1	EXIST LOAD	1080	20 / 1	15	B	16	20 / 1	800	DOOR CLOSER	1
1	RCPT-RM A2124	1080	20 / 1	17	C	18	20 / --	900	EXIST LOAD	1
	SPACE	0	/ 1	19	A	20	-- / 2	900	---	1
	SPACE	0	/ 1	21	B	22	20 / --	0	SPARE	
	SPARE	0	20 / --	23	C	24	-- / --	0	---	
	---	0	-- / --	25	A	26	-- / 3	0	---	
	---	0	-- / 3	27	B	28	20 / --	0	SPARE	
	SPARE	0	20 / --	29	C	30	-- / --	0	---	
	---	0	-- / --	31	A	32	-- / 3	0	---	
	---	0	-- / 3	33	B	34	/ 1	0	SPACE	
	SPACE	0	/ 1	35	C	36	/ 1	0	SPACE	
	SPACE	0	/ 1	37	A	38	/ 1	0	SPACE	
2	***VAV CONTROL CIRC-2ND FLR N***	***500***	***20 / 1***	39	B	40	/ 1	0	SPACE	
2	***VAV CONTROL CIRC-2ND FLR S***	***500***	***20 / 1***	41	C	42	/ 1	0	SPACE	

PANEL LOADING SUMMARY

LOAD TYPE	PH A	PH B	PH C	TOTAL	
INCANDESCEN	0.0	0.0	0.0	0.0	kVA
FLUORESCEN	0.0	0.4	0.0	0.4	kVA
RECEPTACLES	0.4	2.2	1.1	3.6	kVA
MOTORS	1.6	1.6	1.6	4.8	kVA
KIT. EQUIP.	0.0	0.0	0.0	0.0	kVA
HEAT	0.0	0.0	0.0	0.0	kVA
COMPUTER	0.0	0.0	0.0	0.0	kVA
OTHER	1.9	1.3	1.4	4.6	kVA
--	0.0	0.0	0.0	0.0	kVA
TOTAL	3.9	5.5	4.1	13.4	kVA

PHASE BALANCE (%)	A-B	B-C	C-A	PF
	71	75	95	92

MIN PANEL AMPACITY	38	AMPERES

NEC DEMAND LOAD SUMMARY

LOAD TYPE	kW		POWER FACT		kVA		DEMAND FACTOR		CALCULATED LOAD	
INCANDESCENT	0.0	@	100%	=	0.0	@	125%	=	0.0	kVA
FLUORESCENT	0.4	@	95%	=	0.4	@	125%	=	0.5	kVA
RECEPTACLES										
FIRST 10 kVA	3.4	@	95%	=	3.6	@	100%	=	3.6	kVA
REMAINDER	0.0	@	95%	=	0.0	@	50%	=	0.0	kVA
MOTORS										
LARGEST	0.6	@	80%	=	0.8	@	125%	=	1.0	kVA
REMAINDER	3.2	@	80%	=	4.0		100%	=	4.0	kVA
KITCHEN EQUIP.	0.0	@	80%	=	0.0	@	100%	=	0.0	kVA
HEAT	0.0	@	100%	=	0.0	@	125%	=	0.0	kVA
COMPUTER	0.0	@	95%	=	0.0	@	100%	=	0.0	kVA
OTHER	3.9	@	85%	=	4.6	@	100%	=	4.6	kVA
--	0.0	@	95%	=	0.0	@	100%	=	0.0	kVA
0 % SPARE	0.0	@	90%	=	0.0	@	100%	=	0.0	kVA
TOTAL	12.0	kW			13.0	kVA			13.7	kVA

THE LOAD ON THIS PANEL HAS INCREASED BY 1.0 KVA

MAIN BLDG LOAD CALCULATIONS - MDC, 3000 AMP, 480V, 3-PHASE

EXISTING LOAD	V	PH	FLA	KW	KVA
12 MONTH PEAK DEMAND	480	3	1342.1	1060.0	1115.8
PEAK DEMAND X 125%	480	3	1677.6	1325.0	1394.7
LOAD REMOVED:					
ROOF TOP UNIT MZ-1 (VIA SDP/PPH3 ANNEX)	480	3	-26.8	-17.8	-22.3
ROOF TOP UNIT MZ-2 (VIA SDP/PPH3 ANNEX)	480	3	-26.8	-17.8	-22.3
LOAD ADDED :					
NEW ROOF TOP UNIT RTU-1 VIA SDP ANNEX	480	3	59.4	38.7	49.4
NEW ROOF TOP UNIT RTU-2 VIA SDP ANNEX	480	3	59.4	38.7	49.4
NEW VAV UNITS 1ST & 2ND FLOORS	480	3	3.6	2.4	3.0
TOTAL LOAD			1746.4	1369.2	1452.0
NET CHANGE			68.8	44.2	57.2

NOTE:

IT HAS BEEN DETERMINED THAT MDC HAS ADEQUATE SPARE CAPACITY FOR THE ADDITIONAL LOAD ADDED DURING PROJECT .

EXISTING PEAK DEMAND FOR MDC VERIFIED BY XCEL-12 MONTH BILLING DATA. PEAK DEMAND OCCURRED AUGUST 2013.

ANNEX BLDG LOAD CALCULATIONS - SDP, 1200 AMP, 480V, 3-PHASE

EXISTING LOAD	V	PH	FLA	KW	KVA
12 MONTH PEAK DEMAND	480	3	378.6	299.0	314.7
PEAK DEMAND X 125%	480	3	411.5	325.0	342.1
LOAD REMOVED:					
ROOF TOP UNIT MZ-1 (VIA PANEL PPH3)	480	3	-26.8	-17.8	-22.3
ROOF TOP UNIT MZ-2 (VIA PANEL PPH3)	480	3	-26.8	-17.8	-22.3
LOAD ADDED:					
NEW ROOF TOP UNIT RTU-1	480	3	59.4	38.7	49.4
NEW ROOF TOP UNIT RTU-2	480	3	59.4	38.7	49.4
NEW VAV UNITS 1ST & 2ND FLOORS	480	3	3.6	2.4	3.0
TOTAL LOAD			480.3	369.2	399.3
NET CHANGE			68.8	44.2	57.2

NOTE:

IT HAS BEEN DETERMINED THAT SDP HAS ADEQUATE SPARE CAPACITY FOR THE ADDITIONAL LOADS ADDED DURING PROJECT.

VERIFIED BY 30 DAYS OF 3-PHASE METERING (JAN 9, 2014 - FEB 7, 2014). PEAK DEMAND OCCURRED JAN 21, 2014.

EQUIPMENT SCHEDULE

TAG	ITEM DESCRIPTION (SEE NOTE 2)	VOLTS	PH	MOTOR HP	UNIT AMPS	UNIT KVA	UNIT KW	PANEL (SEE NOTE 5)	BREAKER SIZE	FUSING (SEE NOTE 1)	FEEDER	STARTER TYPE	STARTER BY	STARTER LOCATION	LOCAL DISC. SW.	DISC. BY	DISC. LOCATION SEE NOTE 4	REMARKS
RTU-1	ROOF TOP UNIT	460	3	- -	59.4	47.3	38.7	SDP	110	110	SEE ONE-LINE DIAG	VFD	DIV 23	AT UNIT	200A, 3P	- -	- -	SEE NOTES
RTU-2	ROOF TOP UNIT	460	3	- -	59.4	47.3	38.7	SDP	110	110	SEE ONE-LINE DIAG	VFD	DIV 23	AT UNIT	200A, 3P	- -	- -	SEE NOTES

NOTES:

1. FUSE SIZE INDICATED MUST BE USED IN COMBINATION WITH PROPERLY SIZED OVERLOAD RELAYS. UNLESS INDICATED OTHERWISE, FUSES SHALL BE BUSSMANN LPS-RK OR LPN-RK. CONFIRM ACTUAL NAMEPLATE DATA OF EQUIPMENT AND PROVIDE FUSES AS RECOMMENDED BY MANUFACTURER.
2. COORDINATE ELECTRICAL EQUIPMENT REQUIREMENTS WITH THE ACTUAL MECHANICAL EQUIPMENT SUPPLIED.
3. COORDINATE THE REQUIREMENTS WITH THE VFD SUPPLIED. OVERCURRENT PROTECTION, AND FEEDER SIZE SHALL MATCH THAT REQUIRED BY THE VFD NAMEPLATE DATA. ALL MOTOR CIRCUIT CONDUCTORS FOR VFD CIRCUITS SHALL BE STRANDED COPPER.
4. LOCATE DISCONNECT WITHIN SIGHT OF MOTOR. IF CONTROLLER IS WITHIN SIGHT OF MOTOR AND IS EQUIPPED WITH A DISCONNECTING MEANS, A SEPARATE DISCONNECT IS NOT REQUIRED. IF CONTROLLER IS A VFD, COORDINATE WITH MECHANICAL TEMPERATURE CONTROL TO PROVIDE A SAFETY INTERLOCK IN THE DISCONNECT TO INDICATE THE STATUS OF THE DISCONNECT. IF THE DISCONNECT IS OPEN, THE VFD SHALL BE DISABLED.
5. REFER TO PANEL SCHEDULES FOR EXACT CIRCUIT NUMBER.

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DOCUMENTS.

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-239-0218

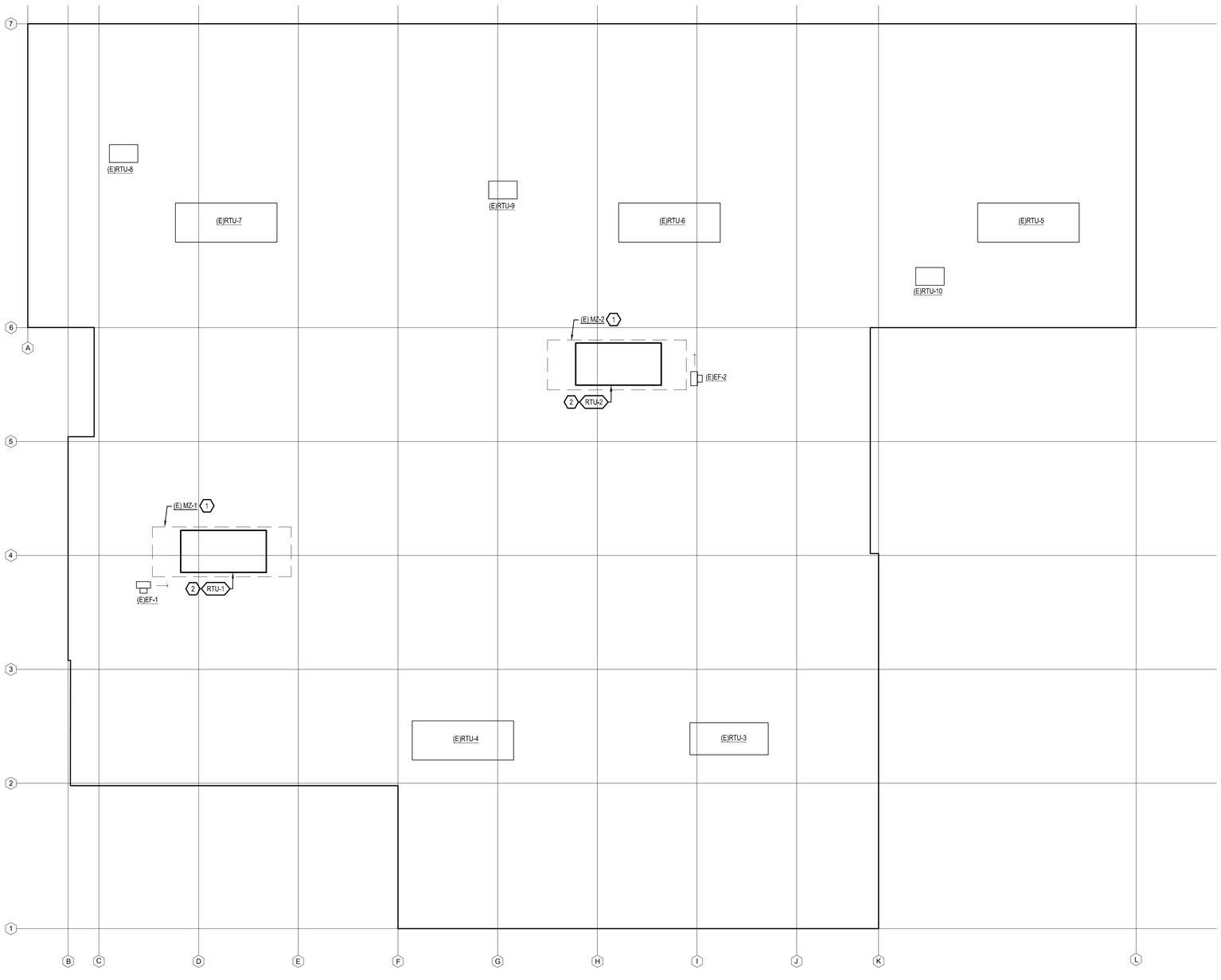
ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

ELECTRICAL SCHEDULES

DATE: 3/28/2014
SCALE: NONE
DESIGN BY: R. KNOLL
DRAWN BY: R. KNOLL
APPROVED BY: E. BUNCE
PRJ. NO: 18985
CAD FILE: E1.0.dwg
XREF:
RMH Job Number:

SHT.NO. E1.0

REVISION ----



ROOF POWER PLAN–DEMOLITION AND NEW WORK

SCALE: 1/16"=1'-0"

SHEET NOTES

1. LINES AND SYMBOLS SHOWN WITH LIGHT LINE WEIGHT ARE EXISTING, LINES AND SYMBOLS SHOWN WITH BOLD LINE WEIGHT ARE NEW, LINES AND SYMBOLS SHOWN WITH A HATCH PATTERN SHALL BE REMOVED.
2. ALL COPPER CONDUCTORS REMOVED DURING DEMOLITION SHALL BE TURNED OVER TO ACC.

KEY NOTES

1. DISCONNECT POWER TO EXISTING ROOFTOP UNIT AND REMOVE ASSOCIATED CONDUIT/CONDUCTORS BACK TO SOURCE. RE-LABEL ASSOCIATED 50A/3 CIRCUIT BREAKER AS SPARE IN PPH3 PANEL DIRECTORY. DISCONNECT ASSOCIATED 120V RECEPTACLE/LIGHTING CIRCUIT AND PRESERVE FOR REUSE.
2. LOCATION OF NEW ROOF-TOP UNIT, REFER TO ELECTRICAL ONE-LINE DIAGRAM ON SHEET E0.2 AND MECHANICAL EQUIPMENT SCHEDULE ON SHEET E1.0 FOR ELECTRICAL REQUIREMENTS. EXTEND AND RECONNECT PRESERVED 120V RECEPTACLE/LIGHTING CIRCUIT TO NEW RECEPTACLE/LIGHTS PROVIDED WITH UNIT. COORDINATE ALL INSTALLATION REQUIREMENTS WITH ACTUAL EQUIPMENT SUPPLIED.

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DOCUMENTS.

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

ROOF POWER PLAN - DEMOLITION AND NEW WORK

DATE: 3/28/2014
SCALE: 1/16" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: E12.dwg
XREF:
RMH Job Number:

SHT.NO. E1.2

REVISION ----

Created on 2/24/2015
File Path: H:\Jobs15\18985\Record Drawings\E12.dwg
Save Date 24-Feb-15by fabber
Plotted on 2/25/15by fabber, Ben

MECHANICAL LEGEND (NOTE: NOT ALL SYMBOLS SHOWN ARE USED ON THESE DRAWINGS)

– PIPING –

ABBR.	SYMBOL	DESCRIPTION
SA		POSITIVE PRESSURE DUCT UP
SA		POSITIVE PRESSURE DUCT DOWN
EA/RA		NEGATIVE PRESSURE DUCT UP
EA/RA		NEGATIVE PRESSURE DUCT DOWN
OA		OUTSIDE AIR INTAKE DUCT UP
OA		OUTSIDE AIR INTAKE DUCT DOWN
		ROUND DUCT UP
		ROUND DUCT DOWN
		CONICAL FITTING WITH DAMPER
		ECCENTRIC FITTING WITH DAMPER
		CONICAL FITTING WITHOUT DAMPER
		ECCENTRIC FITTING WITHOUT DAMPER
		ELBOW WITH TURNING VANES
		ELBOW WITHOUT TURNING VANES
		LONG RADIUS ELBOW
		SHORT RADIUS ELBOW
		SUPPLY DIFFUSER
		SUPPLY DIFFUSER ROUND NECK
		SUPPLY DIFFUSER SQUARE NECK
		EXHAUST/RETURN GRILLE SQUARE NECK
		EXHAUST/RETURN GRILLE ROUND NECK
		RETURN AIR GRILLE
		ROUND DIFFUSER
		SLOT DIFFUSER
		FLEXDUCT
		DUCTWORK
MVD		MANUAL VOLUME DAMPER
		FIRE DAMPER 1-1/2 HOUR UNLESS NOTED
		FIRE/SMOKE DAMPER 1-1/2 HOUR UNLESS NOTED
		SMOKE DAMPER
		MOTORIZED DAMPER
		SECURITY BARRIER
		ACCESS PANEL (SIZE)
		PUMP
		DUCT BREAK
RPBP	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
DCVA	DCVA	DOUBLE CHECK VALVE ASSEMBLY

ABBR.	SYMBOL	DESCRIPTION
		GAS METER
		WATER METER
		2-WAY CONTROL VALVE
		3-WAY CONTROL VALVE
		BALANCE VALVE
		FLOW MEASURING STATION
		BALL VALVE
		BUTTERFLY VALVE
		CHECK VALVE
		GATE VALVE
		GLOBE VALVE
		PRESSURE REDUCING VALVE
		PRESSURE RELIEF VALVE
		HOSE END DRAIN VALVE
		STRAINER
		STRAINER WITH BLOW DOWN VALVE
		PLUG VALVE
		GAS COCK
		SOLENOID VALVE
PRV		PRESSURE REGULATING VALVE
		THERMOWELL
		THERMOMETER WITH THERMOWELL
		UNION
	DE	DIELECTRIC COUPLING
		VENTURI
		AUTOMATIC AIR VENT
		MANUAL AIR VENT
		VACUUM BREAKER
		THERMOMETER
		GAUGE
		GAUGE WITH BALL VALVE
		DIFFERENTIAL PRESSURE GAUGE
		PRESSURE TEMPERATURE/TEST POINT
		PIPE ANCHOR
		PIPE GUIDE
		FLEX CONNECTION
		PIPE CAP
		PIPE BREAK
		FLOW ARROW
	IBT	STEAM TRAP (INVERTED BUCKET TRAP)
	IT	STEAM TRAP (THERMOSTATIC TRAP)
	FTT	STEAM TRAP (FLOAT AND THERMOSTATIC TRAP)
		FIRE SPRINKLER PENDANT HEAD
		FIRE SPRINKLER UPRIGHT HEAD
		FIRE SPRINKLER SIDEWALL HEAD
	TS	TAMPER SWITCH
		OS & Y GATE VALVE

ABBR.	SYMBOL	DESCRIPTION
		PIPE DOWN
		PIPE UP
		TEE OUTLET UP
		TEE OUTLET DOWN
HWS	HWS	HEATING HOT WATER SUPPLY
HWR	HWR	HEATING HOT WATER RETURN
CWS	CWS	CHILLED WATER SUPPLY
CWR	CWR	CHILLED WATER RETURN
CTS	CTS	COOLING TOWER SUPPLY
CTR	CTR	COOLING TOWER RETURN
LPS	LPS	LOW PRESSURE STEAM SUPPLY
LPR	LPR	LOW PRESSURE STEAM RETURN
MPS	MPS	MEDIUM PRESSURE STEAM SUPPLY
MPR	MPR	MEDIUM PRESSURE STEAM RETURN
HPS	HPS	HIGH PRESSURE STEAM SUPPLY
HPR	HPR	HIGH PRESSURE STEAM RETURN
CDS	CDS	CONDENSER WATER SUPPLY
CDR	CDR	CONDENSER WATER RETURN
RL	RL	REFRIGERANT LIQUID
RS	RS	REFRIGERANT SUCTION
RHG	RHG	REFRIGERANT HOT GAS
FOS	FOS	FUEL OIL SUPPLY
FOR	FOR	FUEL OIL RETURN
FOV	FOV	FUEL OIL VENT
CA	CA	COMPRESSED AIR
PC	PC	PUMPED CONDENSATE
D	D	CONDENSATE OR EQUIPMENT DRAIN
GHXS	GHXS	GEOTHERMAL HX SUPPLY
GHXR	GHXR	GEOTHERMAL HX RETURN
DCW		DOMESTIC COLD WATER
DHW		DOMESTIC HOT WATER
DHWC		DOMESTIC HOT WATER CIRCULATING
DTW	T	DOMESTIC TEMPERED WATER
DI	DI	DEIONIZED WATER
V	V	DOMESTIC VENT PIPING
AV	AV	ACID VENT PIPING
W	W	SUSPENDED WASTE
W	W	BURIED WASTE
AW	AW	ACID WASTE
OST	OST	OVERFLOW STORM DRAIN
ST	ST	SUSPENDED STORM DRAIN
ST	ST	BURIED STORM DRAIN
G	G	NATURAL GAS
FL	FL	FIRE LINE
	FHC	FIRE HOSE CABINET
		FIRE DEPARTMENT CONNECTION
		DOWNSPOUT NOZZLE

– CONTROLS –

SYMBOL	DESCRIPTION
T ZONE#	THERMOSTAT WITHZONE CALLOUT
HS ZONE#	HUMIDITY SENSOR WITHZONE CALLOUT
TS ZONE#	TEMP SENSOR WITHZONE CALLOUT
CO	CARBON MONOXIDE DETECTOR
CO_2	CARBON DIOXIDE SENSOR
	DIGITAL INPUT
	ANALOG INPUT
	DIGITAL OUTPUT
	ANALOG OUTPUT
	BI-DIRECTIONAL NETWORK CONNECTION
	FLOW ARROW
FS	FLOW SWITCH
TS	DUCT TEMPERATURE SENSOR
TS	DUCT AVERAGING TEMP. SENSOR
TS	WELL MOUNTED TEMPERATURE SENSOR
MD	MOTORIZED CONTROL DAMPER
TL	TEMPERATURE LOW LIMIT THERMOSTAT
SD	DUCT SMOKE DETECTOR
ES	DAMPER\VALVE END SWITCH
DPS	DIFFERENTIAL PRESSURE SWITCH
HPS	HIGH PRESSURE SWITCH
PS	PRESSURE SWITCH MANUAL RESET
	AQUASTAT
MS	MOTOR STARTER
CR	CONTROL RELAY
VFD	VARIABLE FREQUENCY DRIVE
VFD B/P	VARIABLE FREQUENCY DRIVE WITH BY-PASS
M	ELECTRIC MOTOR
TC	TEMPERATURE CONTROLLER
TT	TEMPERATURE TRANSMITTER
LS	LEVEL SWITCH
LT	LEVEL TRANSMITTER
PT	PRESSURE TRANSMITTER
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
FT	FLOW TRANSMITTER
EPT	ELECTRIC\PNEUMATIC TRANSDUCER
	CURRENT SWITCH/TRANSMITTER
ANN	ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL
CAM	CONTROL ADDRESSABLE MODULE
MAM	MONITOR ADDRESSABLE MODULE
ESR	EMERGENCY STOP RELAY
LC	LEVEL CONTROLLER
EPO	EMERGENCY POWER OFF
AFS	AIR FLOW SWITCH

7. EXISTING DUCTWORK, PIPING AND EQUIPMENT IS DRAWN WITH LIGHT LINES. NEW ITEMS ARE DRAWN WITH DARKER LINES.
8. CONTRACTOR RESPONSIBLE FOR REMOVING CEILING TILES AND GRID AS NEEDED TO ACCOMMODATE ALL WORK. RESTORE CEILING GRID AND TILES TO THEIR ORIGINAL CONDITION.

ABBR.	SYMBOL	DESCRIPTION
RD		ROOF DRAIN
OD		OVERFLOW DRAIN
FS		FLOOR SINK
FD		FLOOR DRAIN
FCO		FLOOR CLEANOUT
GCO		GRADE CLEANOUT
WCO		WALL CLEANOUT
		HORIZONTAL CLEANOUT
HB		HOSE BIBB
SA		SHOCK ABSORBER

– GRAPHIC SYMBOLS –

SYMBOL	DESCRIPTION
#	KEY NOTE
1	REVISION NUMBER
TAG	MECHANICAL EQUIPMENT TAG
	SHADING INDICATES MECHANICAL EQUIPMENT
	HATCHING INDICATES ITEM(S) TO BE REMOVED
	NORTH ARROW
	CONNECT TO EXISTING
EXIST NEW	CONNECT TO EXISTING PIPE
TYPE NECK CFM	DIFFUSER, REGISTER, GRILLE CFM CALLOUT
TYPE NECK CFM	DIFFUSER, REGISTER, GRILLE CFM CALLOUT WITH QUANTITY
TYPE GPM ZONE	BASEBOARD/FINTUBE RADIATION HEATING
LENGTH TYPE CFM ZONE	VAV TERMINAL BOX CALLOUT
DETAIL BUBBLE: 1 / M2.1	DETAIL NUMBER; SHEET NUMBER – WHERE DETAIL IS SHOWN
SECTION CUT: A / M2.2	SECTION LETTER; SHEET NUMBER – WHERE SECTION IS SHOWN

– ABBREVIATIONS –

AFF	ABOVE FINISHED FLOOR	LAT	LEAVING AIR TEMPERATURE
BDD	BACK DRAFT DAMPER	LWT	LEAVING WATER TEMPERATURE
BFF	BELOW FINISH FLOOR	MA	MIXED AIR
CL	CENTERLINE	(N)	NEW
CO	CLEAN OUT	NC	NORMALLY CLOSED
(E)	EXISTING	NO	NORMALLY OPEN
EA	EXHAUST AIR	OA	OUTSIDE AIR
EAT	ENTERING AIR TEMPERATURE	OTCS	OPEN TO CEILING SPACE
ELEV	ELEVATION	RA	RETURN AIR
ESP	EXTERNAL STATIC PRESSURE	SA	SUPPLY AIR
EWT	ENTERING WATER TEMPERATURE	TSP	TOTAL STATIC PRESSURE
FFE	FINISHED FLOOR ELEVATION	VTR	VENT THROUGH ROOF
IE	INVERT ELEVATION		

GENERAL NOTES:

1. CONTRACTOR SHALL REFERENCE SPECIFICATIONS FOR CONSTRUCTION MATERIALS AND INSTALLATION PROCEDURES. SPECIFICATIONS ARE A PART OF THE CONSTRUCTION DOCUMENTS. SHOULD ANY CONFLICT ARISE BETWEEN THE DRAWINGS AND SPECIFICATIONS, SUCH CONFLICT SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR RESOLUTION.
2. ALL PENETRATIONS THROUGH FIRE RATED WALLS OR FLOORS SHALL BE SEALED MAINTAIN SEPARATION RATING.
3. THESE DRAWINGS ARE DIAGRAMMATIC IN CHARACTER AND DO NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING, ETC.
4. ALL DUCTWORK DIMENSIONS SHOWN ARE INTERIOR CLEAR DIMENSIONS. ALLOWANCES FOR DUCT LINER OR INSULATION ARE NOT INCLUDED.
5. LOCATIONS AND INFORMATION FOR EXISTING MECHANICAL DEVICES AND EQUIPMENT SHOWN ON THESE PLANS ARE APPROXIMATE. THIS INFORMATION IS DERIVED FROM FIELD OBSERVATIONS AND RECORD DRAWINGS THAT WERE AVAILABLE AT THE TIME THESE DRAWINGS WERE ISSUED FOR PUBLICATION.
6. REPAIR ALL FIBROUS-GLASS DUCT AND REPLACE CEILING TILES DAMAGED DURING CONSTRUCTION AND WHERE NOTED ON DRAWINGS. REFERENCE SPECIFICATIONS.

REV: 11/13/2013

RECORD SET
DESCRIPTION
2/24/15
DATE
REV.

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

MECHANICAL LEGEND

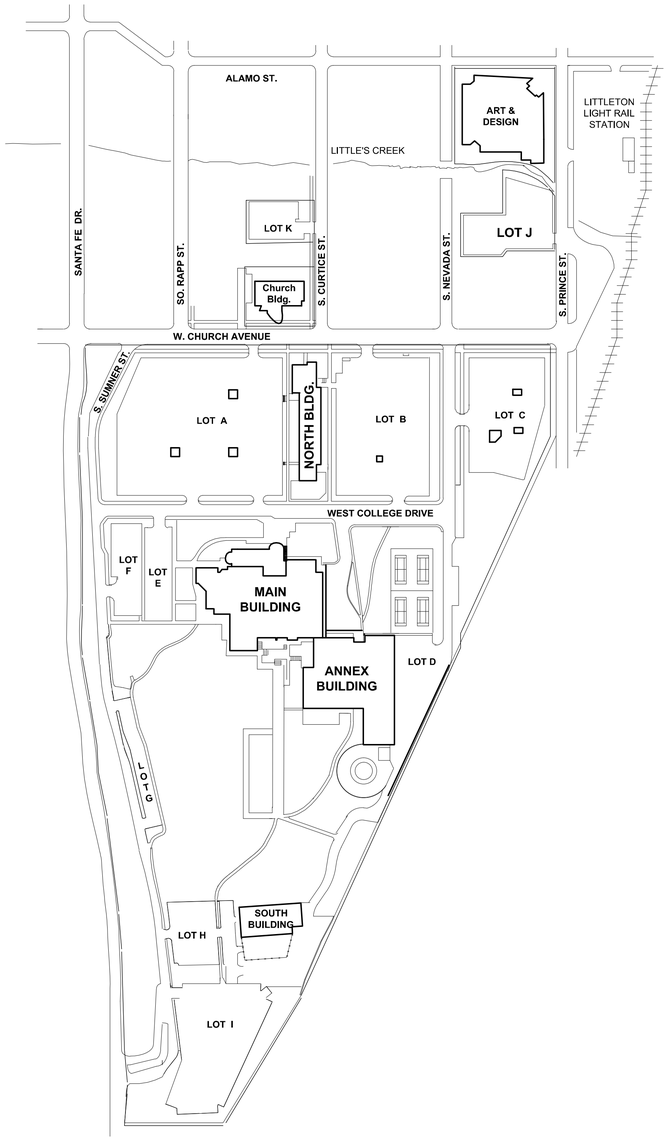
DATE: 3/28/2014
SCALE: 1/16" – 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO. 18985
CAD FILE: M00.dwg
XREF:
RMH Job Number:

SHT.NO. M0.0

REVISION ----

Created on 2/24/2015
File Path: I:\Jobs\18\18985\Record Drawings\M00.dwg
Save Date 24-Feb-15 by bfaber
Plotted on 2/25/2015 by Faber, Ben

ARAPAHOE COMMUNITY COLLEGE
LITTLETON, COLORADO



ANNEX BUILDING
REPLACE ROOFTOP UNITS MZ-1 AND MZ-2
PROJECT NO. M13041
RECORD SET

FEBRUARY 24, 2015

	GENERAL	
G-0.1	Cover Sheet	
	MECHANICAL	
M0.0	Mechanical Legend	
M0.1	Mechanical Schedules	
MD1.1A	First Floor South Ductwork Demoliton Plan	
MD1.1B	First Floor North Ductwork Demolition Plan	
MD1.2	Second Floor Ductwork Demolition Plan	
MD1.3	Mechanical Roof Demolition Plan	
MD2.1B	First Floor North Piping Demolition Plan	
MD2.2	Second Floor Piping Demolition Plan	
M1.1A	First Floor South Ductwork Plan	
M1.1B	First Floor North Ductwork Plan	
M1.2	Second Floor Ductwork Plan	
M1.3	Mechanical Roof New Work Plan	
M2.1A	First Floor South Piping Plan	
M2.1B	First Floor North Piping Plan	
M2.2	Second Floor Piping Plan	
M3.1	Control Schematics	
M4.1	Mechanical Details	
	ELECTRICAL	
E0.0	Electrical Legend	
E0.1	Electrical One Line Diagram	
E1.0	Electrical Schedule	
E1.1	First Floor and Second Floor Power Plans	
E1.2	Roof Power Plan- Demolition and New Work	
	STRUCTURAL	
S1.0	Structural Reports	

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DOCUMENTS.

CAMPUS BUILDINGS REFERENCE – LITTLETON, CO

SCALE: 1"= 20'

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

COVER SHEET

DATE: 3/28/2014
SCALE: NONE
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO. 18985
CAD FILE: G01.dwg
XREF:
RMH Job Number:

SHT.NO. G0.1

REVISION ----

AIR HANDLING UNIT SCHEDULE

TAG	AREA SERVED	TYPE	MIN. OSA CFM	SUPPLY FAN SECTION									RETURN FAN SELECTION								CHILLED WATER COIL										HEATING WATER COIL								FILTER SPEC		ELECTRICAL					MANUFACTURER AND MODEL	NOTES
				TOTAL CFM	TSP IN. W.G.	ESP IN. W.G.	RPM	BHP	HP	VFD	DIA.	TYPE	TOTAL CFM	TSP IN. W.G.	ESP IN. W.G.	RPM	BHP	HP	VFD	DIA.	TYPE	AREA SQ. FT.	NO. COILS	TOTAL MBH	SENS. MBH	EDB °F	EWB °F	LDB °F	LWB °F	GPM	ROWS	APD IN. W.G.	WPD FT. HD.	CFM	MBH	EDB °F	LDB °F	GPM	ROWS	APD IN. W.G.	WPD FT. HD.	INITIAL SPEC/MERV	FINAL SPEC/MERV	V	PH	FLA	MCA	OPD		
RTU-1, 2	ANNEX	MODULAR RTU	7500	25,000	4.87	2.00	1600	26.80	30.00	Y	33"	DD PLENUM	21,400	1.10	0.50	443	8.10	10.00	Y	28"	BD FC DWDI	50	2	650.1	-	79.8	62.7	55	54.5	108.3	6	0.26	5.6	7500	414.70	-7	55	29.2	1	0.15	4.4	F-D/MERV 7	F-F/MERV 11	460	3	59.4	70.4	110	YORK SOLUTION AIR HANDLER 78 X 144	1

GENERAL NOTES:

A. PERFORMANCE IS AT SITE CONDITIONS, 5300' ASL
B. CHILLED FLUID IS WATER AT 45°F EWT AND 57°F LWT
C. HEATED FLUID IS 30% PG SOLUTION AT 180°F EWT AND 150°F LWT
D. APD ON ALL COILS AND COMPONENTS IS AT IS AT COOLING TOTAL CFM. ALL OTHER PERFORMACE IS AT SPECIFIED CFM FOR THAT COMPONENT
E. PROVIDE 120V JUNCTION BOX FOR LIGHTING/OUTLET POWER
F. AIR HANDLERS MAY CONTAIN RESERVE CAPACITY AND CAPACITY FOR DUCT LEAKAGE, BALANCE TO PLAN CFM.

NOTES:

1. OPERATING WEIGHT IS 15208 LBS.

VARIABLE AIR VOLUME UNIT SCHEDULE

TAG	MAX. COOLING CFM	INLET SIZE	OUTLET SIZE	APD IN. WC.	DISCHARGE SOUND POWER							RADIATED SOUND POWER							SOUND ATTENUATOR	MANUFACTURER & MODEL	NOTES
					125	250	500	1K	2K	4K	ROOM NC	125	250	500	1K	2K	4K	ROOM NC			
A	150	4"	12"x8"	0.04	68	67	69	67	60	46	25	69	63	59	56	60	64	25		TITUS ESV	1
B	400	6"	12"x8"	0.2	76	76	79	78	72	59	25	69	63	59	56	60	64	25		TITUS ESV	1
C	700	8"	12"x10"	0.2	76	73	68	66	63	59	25	69	63	59	56	60	64	25		TITUS ESV	1
D	1000	10"	14"x12"	0.2	76	73	68	66	63	59	25	69	63	59	56	60	64	25		TITUS ESV	1
E	1500	12"	16"x16"	0.2	78	78	81	79	72	60	25	69	63	59	56	60	64	25		TITUS ESV	1
F	2100	14"	20"x18"	0.2	78	78	81	79	72	60	25	69	63	59	56	60	64	25		TITUS ESV	1
G	3200	16	24"x18"	0.2	78	78	81	79	72	60	25	69	63	59	56	60	64	25		TITUS ESV	1
H	150	4"	12"x8"	0.4	68	67	69	67	60	46	25	69	63	59	56	60	64	25		TITUS ESV	1, 2
J	400	6"	12"x8"	0.4	76	76	79	78	72	59	25	69	63	59	56	60	64	25		TITUS ESV	1, 2
K	700	8"	12"x10"	0.5	76	73	68	66	63	59	25	69	63	59	56	60	64	25		TITUS ESV	1, 2
L	1000	10"	14"x12"	0.5	76	73	68	66	63	59	25	69	63	59	56	60	64	25		TITUS ESV	1, 2
M	1500	12"	16"x16"	0.5	78	78	81	79	72	60	25	69	63	59	56	60	64	25		TITUS ESV	1, 2
N	2100	14"	20"x18"	0.5	78	78	81	79	72	60	25	69	63	59	56	60	64	25		TITUS ESV	1, 2
O	3200	16"	24"x18"	0.5	78	78	81	79	72	60	25	69	63	59	56	60	64	25		TITUS ESV	1, 2
P	6400	24"x16"	38"x18"	0.5	78	78	81	79	72	60	25	69	63	59	56	60	64	25		TITUS ESV	1, 2

GENERAL NOTES:

A. PROVIDE ACCESS DOOR UPSTREAM OF HEATING COIL.
B. PERFORMANCE IS SPECIFIED AT 5300' ASL.
C. MINIMUM OCCUPIED CFM SHALL BE 30% UNLESS OTHERWISE NOTED. UNOCCUPIED CFM SHALL BE 0.
D. NC LEVELS ARE REFERENCE ONLY

NOTES:

1. DUCT SIZES AND ATTENUATOR SIZES SHALL BE THE SAME AS BOX INLET/OUTLET SIZES, UNLESS OTHERWISE NOTED ON THE DRAWINGS
2. UNIT WITH FACTORY HEATING COIL. SEE HEATING COIL SCHEDULE, THIS SHEET AND PLANS FOR FURTHER INFORMATION.

VAV HEATING COIL SCHEDULE

TAG	HTG. CFM	SENS. MBH	EDB °F	LDB °F	GPM	MANUFACTURER & MODEL	NOTES
HC-1-A1000	432	13.49	55	90.0	1.0	TITUS	
HC-1-A1080	392	12.24	55	90.0	1.1	TITUS	
HC-1-A2035	2,044	63.80	55	90.0	4.5	TITUS	
HC-1-A2090	1,736	54.19	55	90.0	3.8	TITUS	
HC-1-A2110	796	24.85	55	90.0	1.9	TITUS	
HC-1-A2120	1,028	32.09	55	90.0	2.4	TITUS	
HC-2-A1205	40	1.25	55	90.0	0.1	TITUS	
HC-2-A1210	272	8.49	55	90.0	0.7	TITUS	
HC-2-A1485	410	12.80	55	90.0	0.9	TITUS	
HC-2-A1815	230	7.18	55	90.0	0.5	TITUS	
HC-2-A1840	720	22.48	55	90.0	1.6	TITUS	
HC-2-A2130	424	13.24	55	90.0	0.9	TITUS	
HC-2-A2140	1,078	33.65	55	90.0	2.4	TITUS	
HC-2-A2155	120	3.75	55	90.0	0.3	TITUS	
HC-2-A2160	520	16.23	55	90.0	1.2	TITUS	
HC-2-A2175	104	3.25	55	90.0	0.2	TITUS	
HC-2-A2180	828	25.85	55	90.0	1.8	TITUS	
HC-2-A2205	90	2.81	55	90.0	0.2	TITUS	
HC-2-A2265	276	8.62	55	90.0	0.7	TITUS	
HC-2-A2275	316	9.86	55	90.0	0.7	TITUS	
HC-2-A2280	846	26.41	55	90.0	1.9	TITUS	
HC-2-A2315	514	16.05	55	90.0	1.1	TITUS	
HC-2-ALOBBY	240	7.49	55	90.0	0.5	TITUS	

GENERAL NOTES:

1. COIL IS PART OF VAV BOX. SEE VARIABLE AIR VOLUME UNIT SCHEDULE.
2. SEE PLANS FOR VAV ASSOCIATED WITH COIL. CORRESPONDING VAV UNIT ON PLANS OMITS "HC" PREFIX ON THIS SCHEDULE.
3. PERFORMANCE BASED ON LISTED CFM, 30% PROPYLENE GLYCOL SOLUTION, 180°F EWT, 150°F LWT.

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DOCUMENTS.

REV. | DATE | DESCRIPTION
2/24/15 | RECORD SET

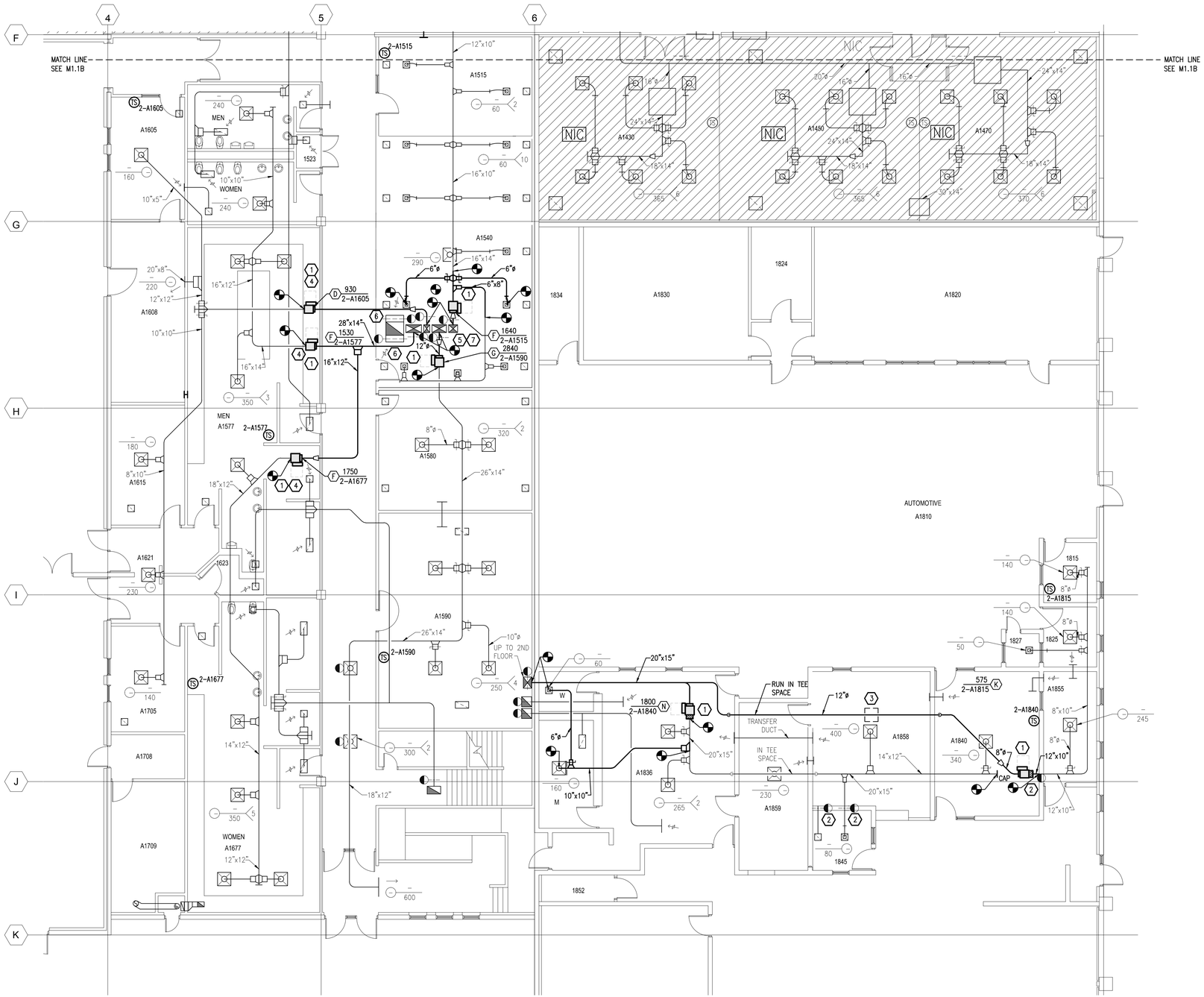
RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

MECHANICAL SCHEDULES

DATE: 3/28/2014
SCALE: 1/16" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: M01.dwg
XREF:
RMH Job Number:

SHT.NO. M0.1
REVISION ----



SHEET NOTES

1. COORDINATE ALL WORK WITH ALL OTHER TRADES.
2. ALL NEW DUCTWORK, INCLUDING TRANSITIONS TO EXISTING FIBERBOARD DUCTWORK DOWNSTREAM OF NEW VAV BOXES, SHALL BE GALVANIZED STEEL. SEE SPECIFICATIONS FOR FURTHER INFORMATION.
3. SEE VARIABLE AIR VOLUME UNIT SCHEDULE, SHEET M1.0, FOR VAV INLET DUCT SIZE.
4. HATCHED AREAS NOT IN CONTRACT.
5. BALANCE AIR DEVICES SERVED BY RTU-1 AND RTU-2 TO CFMs SHOWN.
6. PROVIDE ACCESS DOORS IN ALL NEW SHEET METAL DUCTWORK AT ALL FIRE DAMPERS.
7. SEAL JOINTS ON ALL REUSED SHEET METAL DUCTWORK THAT IS ACCESSIBLE.

KEY NOTES

1. NEW VAV BOX. CONNECT TO EXISTING DUCTWORK.
2. VERIFY THAT EXISTING FIRE DAMPERS SERVED BY NEW AIR HANDLING UNIT ARE FULLY OPEN. REPORT FINDING TO ENGINEER, TYP.
3. PROVIDE AS MANY 24"X24" ACCESS PANELS IN HARD CEILING AS REUQUIRED (ONE SHOWN) FOR NEW DUCT AND PIPING (RE: M2.1A) INSTALLATIONS. PATCH, PAINT AND REPAIR CEILING TO MATCH ORIGINAL.
4. PROVIDE 24"X24" ACCESS PANEL IN HARD CEILING FOR VAV BOX ACCESS. PATCH, PAINT AND REPAIR CEILING TO MATCH ORIGINAL.
5. RESTORE DRYWALL CHASE TO ORIGINAL FIRE RATING. PROVIDE NEW ACCESS DOORS FOR EXISTING FIRE DAMPERS.
6. INSTALL DUCT DETECTORS (FURNISHED BY ELECTRICAL) AT ALL RETURN AIR INLETS TO RETURN RISER.
7. REUSE EXISTING FIRE DAMPERS, TYPICAL. CONNECT TO DAMPER WITH SAME-SIZED SHEET METAL DUCT.

FIRST FLOOR SOUTH DUCTWORK PLAN

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

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DOCUMENTS.

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

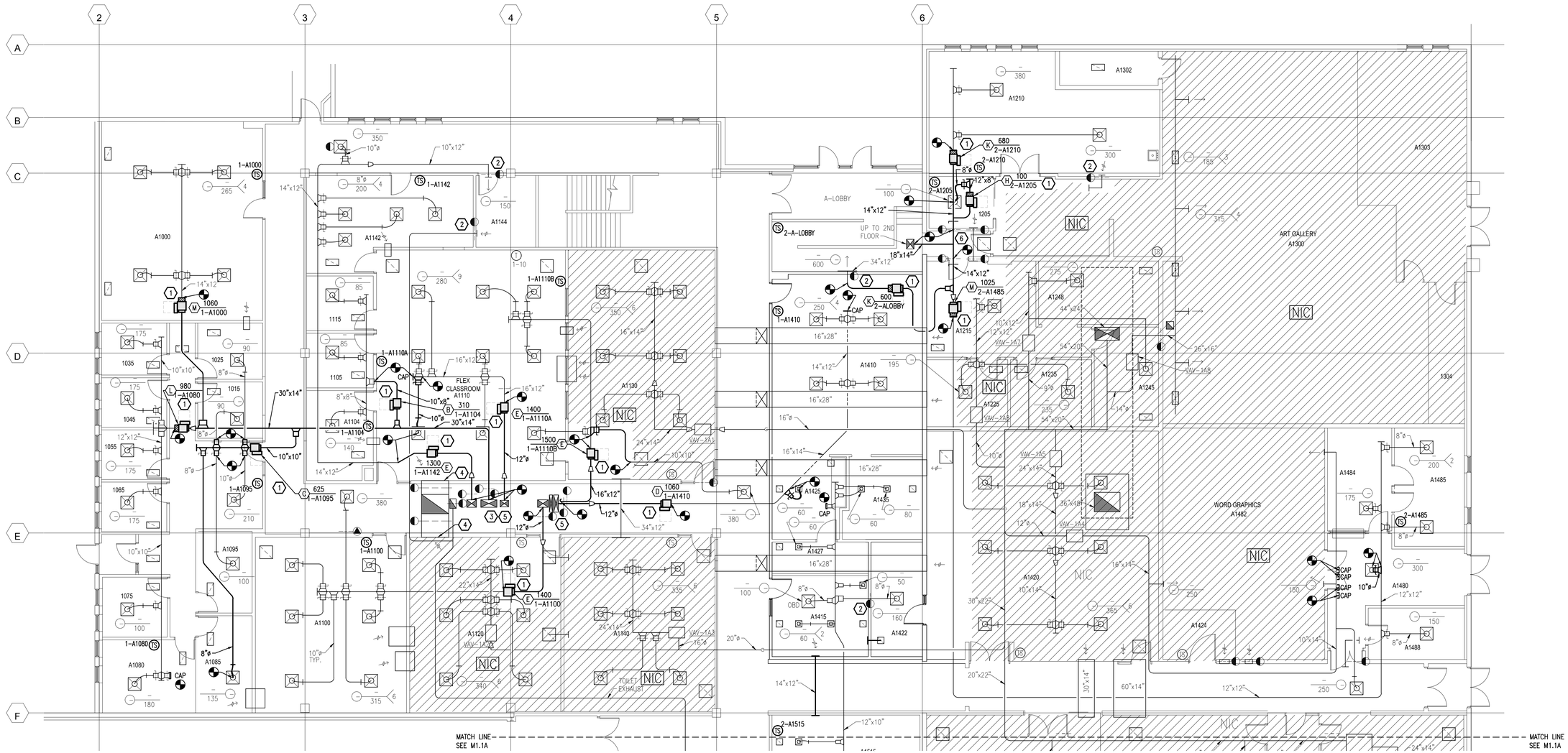
FIRST FLOOR SOUTH DUCTWORK PLAN

DATE:	3/28/2014
SCALE:	1/8" = 1'-0"
DESIGN BY:	B. FABER
DRAWN BY:	B. FABER
APPROVED BY:	R. PHILLIPS
PRJ. NO:	18985
CAD FILE:	M11.dwg
XREF:	
RMH Job Number:	

SHT.NO. M1.1A

REVISION ----

Created on 2/24/2015
File Path: H:\Jobs18\18985\Record Drawings\M11.dwg
Save Data 24-Feb-15by:tober
Plotted on 2/25/15by:Faber, Ben



FIRST FLOOR NORTH DUCTWORK PLAN

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

SHEET NOTES

1. COORDINATE ALL WORK WITH ALL OTHER TRADES.
2. ALL NEW DUCTWORK, INCLUDING TRANSITIONS TO EXISTING FIBERBOARD DUCTWORK DOWNSTREAM OF NEW VAV BOXES, SHALL BE GALVANIZED STEEL. SEE SPECIFICATIONS FOR FURTHER INFORMATION.
3. SEE VARIABLE AIR VOLUME UNIT SCHEDULE, SHEET M1.0, FOR VAV INLET DUCT SIZE.
4. HATCHED AREAS NOT IN CONTRACT.
5. BALANCE AIR DEVICES SERVED BY RTU-1 AND RTU-2 TO CFMs SHOWN.
6. PROVIDE ACCESS DOORS IN ALL NEW SHEET METAL DUCTWORK AT ALL FIRE DAMPERS.
7. SEAL JOINTS ON ALL REUSED SHEET METAL DUCTWORK THAT IS ACCESSIBLE.

KEY NOTES

1. NEW VAV BOX. CONNECT TO EXISTING DUCTWORK.
2. VERIFY THAT EXISTING FIRE DAMPERS SERVED BY NEW AIR HANDLING UNIT ARE FULLY OPEN. REPORT FINDING TO ENGINEER, TYP.
3. RESTORE DRYWALL CHASE TO ORIGINAL FIRE RATING. PROVIDE NEW ACCESS DOORS FOR EXISTING FIRE DAMPERS.
4. INSTALL DUCT DETECTORS (FURNISHED BY ELECTRICAL) AT ALL RETURN AIR INLETS TO RETURN RISER.
5. REUSE EXISTING FIRE DAMPERS, TYPICAL. CONNECT TO DAMPER WITH SAME-SIZED SHEET METAL DUCT.
6. PROVIDE VANED TEE AND 24"X24" ACCESS PANEL FOR ITS INSTALLATION.

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-239-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

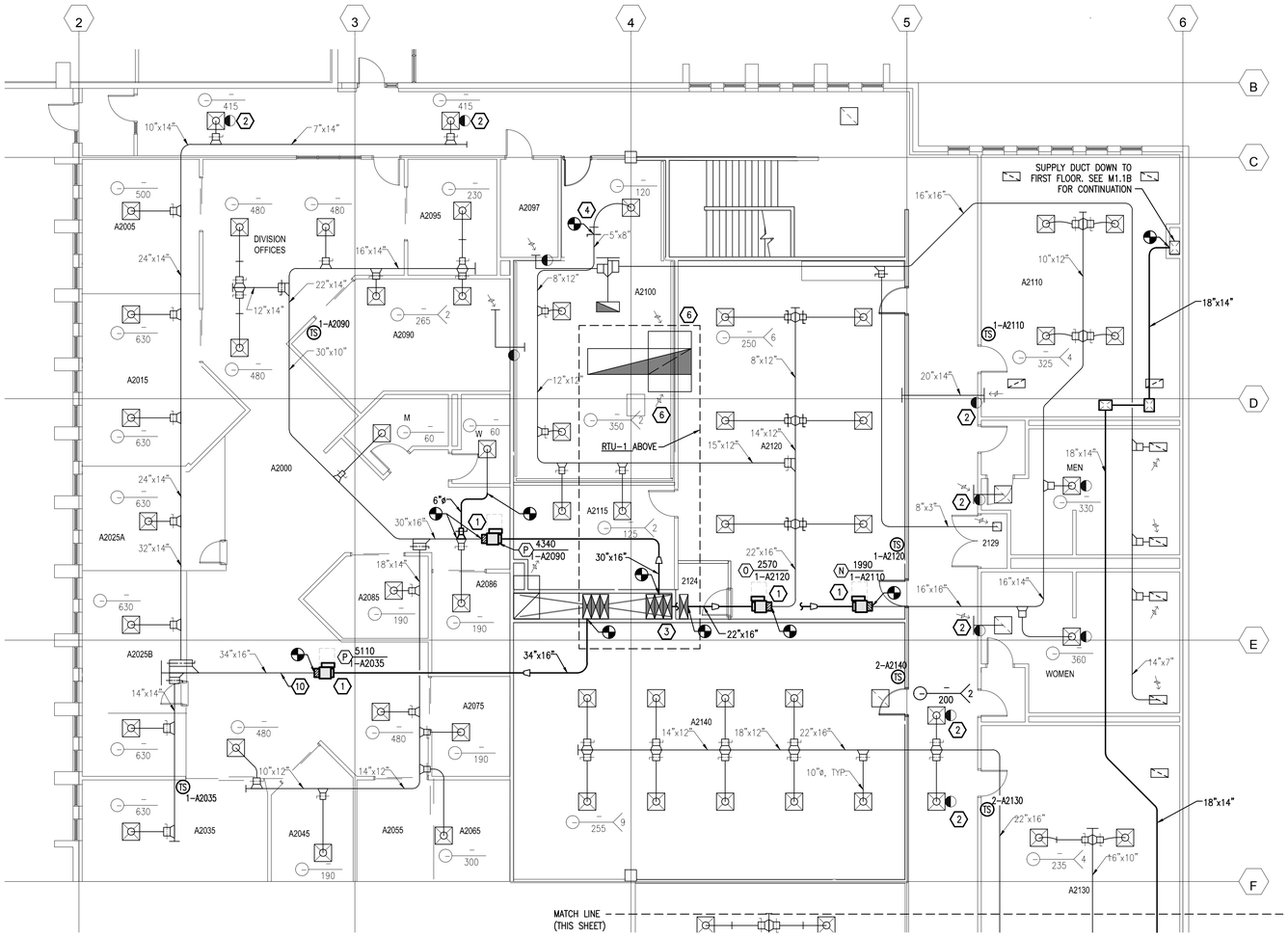
FIRST FLOOR NORTH DUCTWORK PLAN

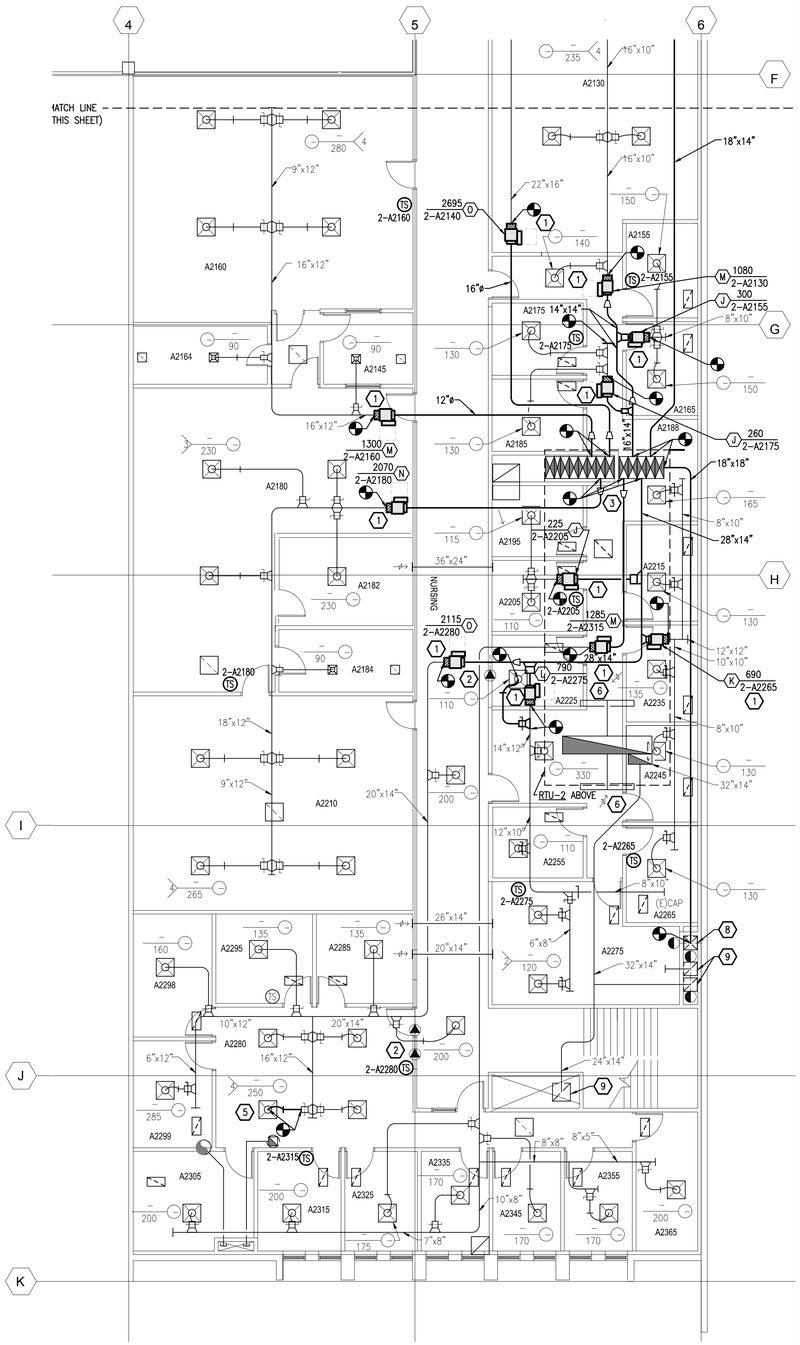
DATE: 3/28/2014
SCALE: 1/8" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: M11.dwg
XREF:
RMH Job Number:

SHT.NO. M1.1B

REVISION ----

Created on 2/24/2015
File Path: H:\Jobs\18\18985\Record Drawings\M11.dwg
Save Date 24-Feb-15 by tkruber
Plotted on 2/25/2015 by Faber, Ben





SHEET NOTES

1. COORDINATE ALL WORK WITH ALL OTHER TRADES.
2. ALL NEW DUCTWORK, INCLUDING TRANSITIONS TO EXISTING FIBERBOARD DUCTWORK DOWNSTREAM OF NEW VAV BOXES, SHALL BE GALVANIZED STEEL. SEE SPECIFICATIONS FOR FURTHER INFORMATION.
3. SEE VARIABLE AIR VOLUME UNIT SCHEDULE, SHEET M1.0, FOR VAV INLET DUCT SIZE.
4. BALANCE AIR DEVICES SERVED BY RTU-1 AND RTU-2 TO CFMs SHOWN.
5. PROVIDE ACCESS DOORS IN ALL NEW SHEET METAL DUCTWORK AT ALL FIRE DAMPERS.
6. SEAL JOINTS ON ALL REUSED SHEET METAL DUCTWORK THAT IS ACCESSIBLE.

KEY NOTES

1. NEW VAV BOX. CONNECT TO EXISTING DUCTWORK.
2. VERIFY THAT EXISTING FIRE DAMPER SERVED BY NEW AIR HANDLING UNIT ARE FULLY OPEN. REPORT FINDING TO ENGINEER, TYP.
3. CONNECT TO EXISTING DUCT WITH SAME-SIZED SHEET METAL DUCT, TYPICAL.
4. PROVIDE NEW MVD.
5. RELOCATED DIFFUSER. SEE MD1.2 FOR FURTHER INFORMATION.
6. INSTALL DUCT DETECTORS (FURNISHED BY ELECTRICAL) AT ALL RETURN AIR INLETS TO RETURN RISER.
7. REUSE EXISTING FIRE/SMOKE DAMPER, TYPICAL. CONNECT TO DAMPER WITH SAME-SIZED SHEET METAL DUCT.
8. SUPPLY DUCT DOWN TO FIRST FLOOR. SEE M1.1A FOR CONTINUATION.
9. RETURN DUCT DOWN TO FIRST FLOOR. SEE M1.1A FOR CONTINUATION.
10. REPAIR THE FIBER BOARD DUCTWORK IN THIS LOCATION. REPAIR SECTION IS APPROXIMATELY 12"X12".

SECOND FLOOR DUCTWORK PLAN

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

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DOCUMENTS.

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

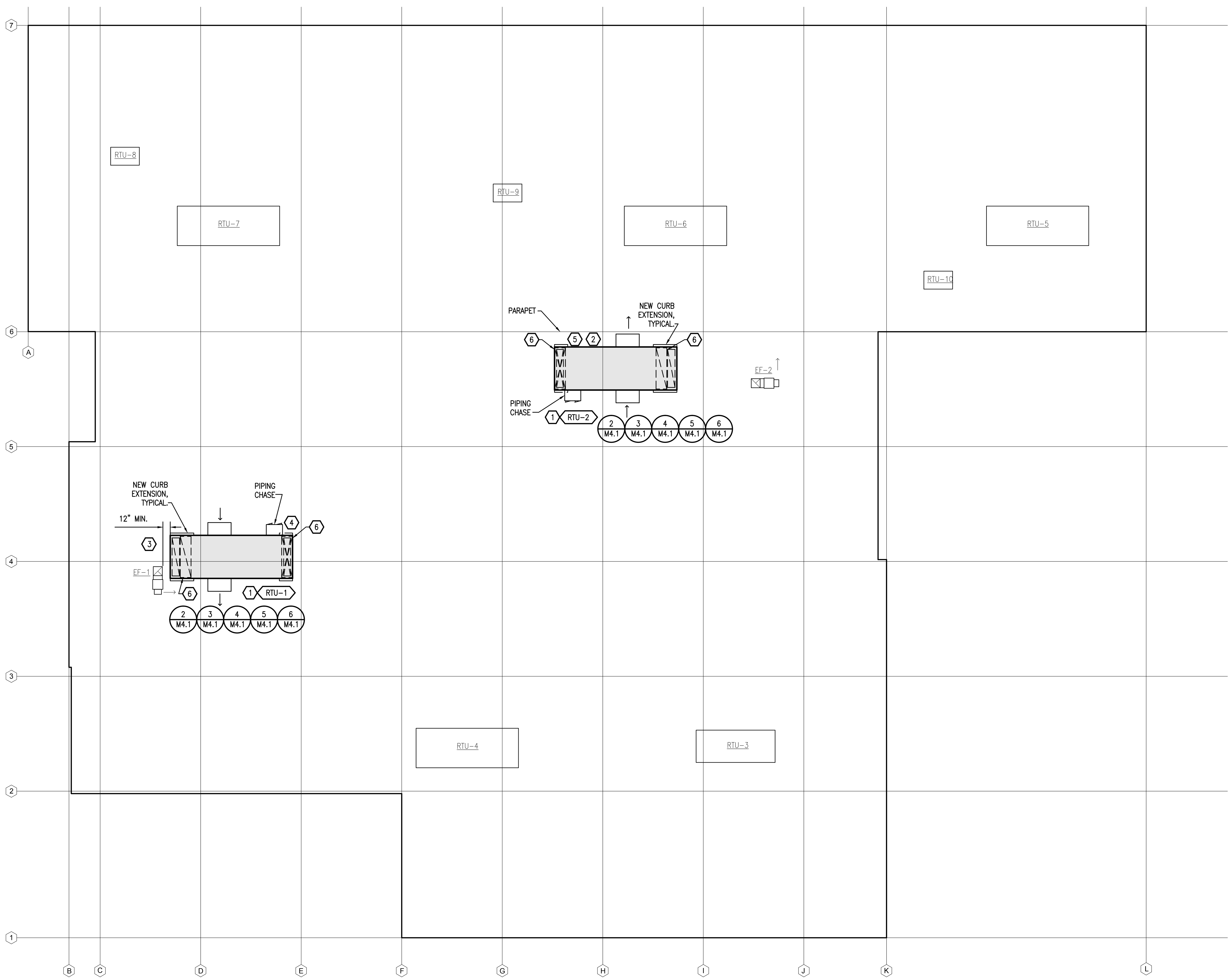
SECOND FLOOR DUCTWORK PLAN

DATE: 3/28/2014
SCALE: 1/8" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: M12.dwg
XREF:
RMH Job Number:

SHT.NO. M1.2

REVISION ----

Created on 2/24/2015
File Path: H:\Jobs18\18985\Record Drawings\M12.dwg
Save Date 24-Feb-15 by bfaber
Plotted on 2/25/2015 by Fisher, Ben



MECHANICAL ROOF NEW WORK PLAN

SCALE: 1/16"=1'-0"

SHEET NOTES

1. COORDINATE ALL WORK WITH ALL OTHER TRADES.
2. REPAIR ALL ROOFING DAMAGED OR ALTERED AS A RESULT OF NEW INSTALLATION WORK. ROOFING REPAIR SHALL BE PERFORMED BY ROOF CHECK, INC., LONGMONT, CO. IN ORDER TO MAINTAIN ROOF WARRANTY.

KEY NOTES

1. NEW ROOFTOP AIR HANDLING UNIT WITH NEW 1'-6" HIGH CURB.
2. PROVIDE STEEL RAIL ABOVE PARAPET. EXTEND 10'-0" BEYOND EACH END OF RTU-2. SEE SHEET S1.0 FOR ADDITIONAL INFORMATION. PRIME TUBING AND FINISH WITH YELLOW EPOXY PAINT.
3. LOCATE NEW RTU-1 AND ITS CURB AT LEAST 12" FROM EXISTING EF-1 DUCT PENETRATION CURB TO ALLOW FOR ROOF REPAIR.
4. PROVIDE DUCT FROM RTU-1 SUPPLY OUTLET TO EXISTING SUPPLY DUCTWORK. TRANSITION AS REQUIRED WITHIN NEW CURB. COVER SPACES BETWEEN EXISTING MULTI-ZONE SUPPLY DUCTS WITH SHEET METAL AND SEAL AIR TIGHT. SUPPLY OUTLET FROM RTU MAY BE OFFSET TO SOUTH OF THE EXISTING SUPPLY OPENING INTO THE BUILDING TO AVOID EXISTING EF-1. NEW CURB IS RETURN PLENUM FOR RTU-1. SEAL INSIDE OF ROOF AND CURB AIRTIGHT. LINE BOTTOM (ROOF) OF RETURN AIR PLENUM WITH SOUND ATTENUATING BOARD (SEE 21-3100). ON SUPPLY AND RETURN SIDE, SEAL GAP BETWEEN ROOF OPENING AND DUCTWORK WITH FOAM, CAULK OR OTHER MEANS TO MAKE IT AIRTIGHT.
5. PROVIDE DUCT FROM RTU-2 SUPPLY OUTLET TO EXISTING SUPPLY DUCTWORK. TRANSITION AS REQUIRED WITHIN NEW CURB. COVER SPACES BETWEEN EXISTING MULTI-ZONE SUPPLY DUCTS WITH SHEET METAL AND SEAL AIR TIGHT. SUPPLY OUTLET FROM RTU IS CENTERED ABOVE THE EXISTING SUPPLY OPENING INTO THE BUILDING. NEW CURB IS RETURN PLENUM FOR RTU-2. SEAL INSIDE OF ROOF AND CURB AIRTIGHT. LINE BOTTOM (ROOF) OF RETURN AIR PLENUM WITH SOUND ATTENUATING BOARD (SEE 21-3100). ON SUPPLY AND RETURN SIDE, SEAL GAP BETWEEN ROOF OPENING AND DUCTWORK WITH FOAM, CAULK OR OTHER MEANS TO MAKE IT AIRTIGHT.
6. EXISTING ROOF PENETRATION TO BE REUSED.

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

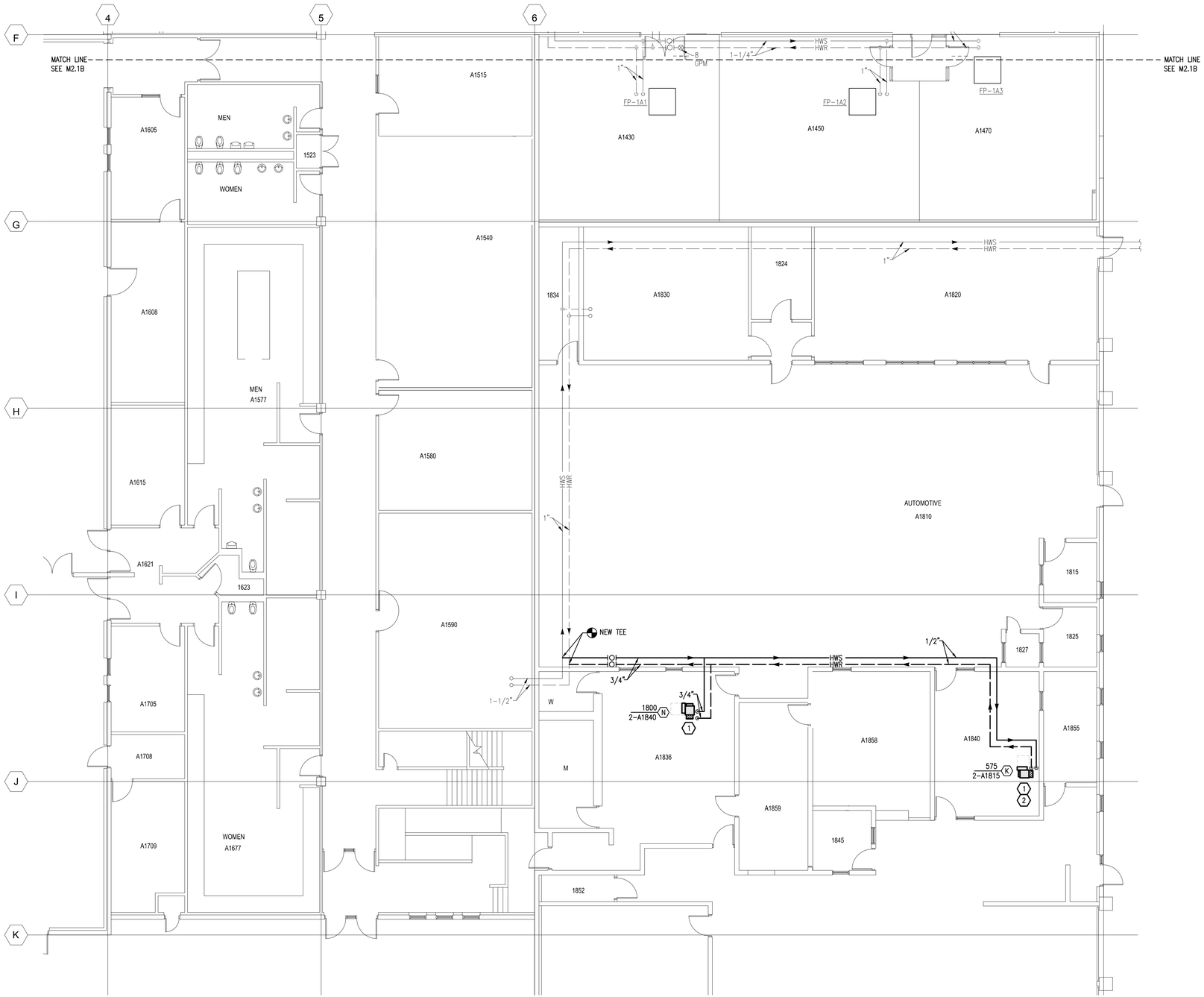
RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

MECHANICAL ROOF NEW WORK PLAN

DATE: 3/28/2014
SCALE: 1/16" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO. 18985
CAD FILE: M13.dwg
XREF:
RMH Job Number:

SHT.NO. M1.3
REVISION ---



FIRST FLOOR SOUTH PIPING PLAN

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

SHEET NOTES

1. COORDINATE ALL WORK WITH ALL OTHER TRADES.
2. SEE VARIABLE AIR VOLUME HEATING COIL SCHEDULE FOR HEATING COIL FLOWS.
3. SEE DETAIL 1, SHEET M4.1 FOR VAV PIPING CONNECTION. ALL VAV BOXES WITH COILS SHALL HAVE 2-WAY CONTROL VALVES UNLESS NOTED OTHERWISE.

KEY NOTES

1. NEW VAV BOX WITH REHEAT COIL.
2. PROVIDE 3-WAY CONTROL VALVE PER DETAIL 1, SHEET M4.1, FOR THIS VAV BOX.

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DOCUMENTS.

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

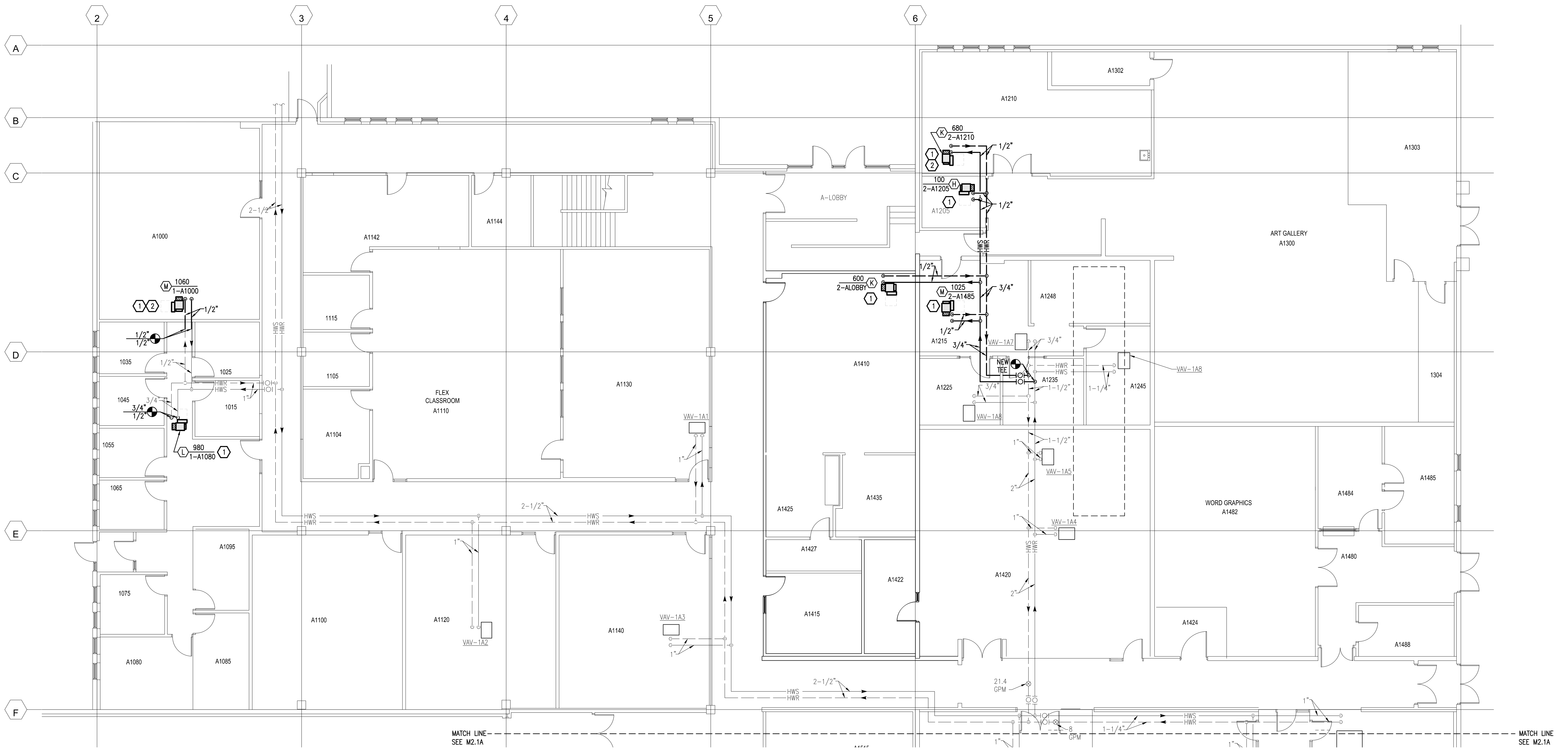
FIRST FLOOR SOUTH PIPING PLAN

DATE: 3/28/2014
SCALE: 1/8" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: M21.dwg
XREF:
RMH Job Number:

SHT.NO. M2.1A

REVISION ----

Created on 2/24/2015
File Path: H:\Jobs18\18985\Record Drawings\M21.dwg
Save Data 24-Feb-15 by tstober
Plotted on 2/25/2015 by Ben



FIRST FLOOR NORTH PIPING PLAN

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

SHEET NOTES

1. COORDINATE ALL WORK WITH ALL OTHER TRADES.
2. SEE VARIABLE AIR VOLUME HEATING COIL SCHEDULE FOR HEATING COIL FLOWS.
3. SEE DETAIL 1, SHEET M4.1 FOR VAV PIPING CONNECTION. ALL VAV BOXES WITH COILS SHALL HAVE 2-WAY CONTROL VALVES, UNLESS NOTED OTHERWISE.

KEY NOTES

1. NEW VAV BOX WITH REHEAT COIL.
2. PROVIDE 3-WAY CONTROL VALVE PER DETAIL 1, SHEET M4.1, FOR THIS VAV BOX.

Created on 2/24/2015
File Path: H:\Jobs18\18985\Record Drawings\M21.dwg
Save Date 24-Feb-15 by bfaber
Plotted on 2/25/2015 by Faber, Ben

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

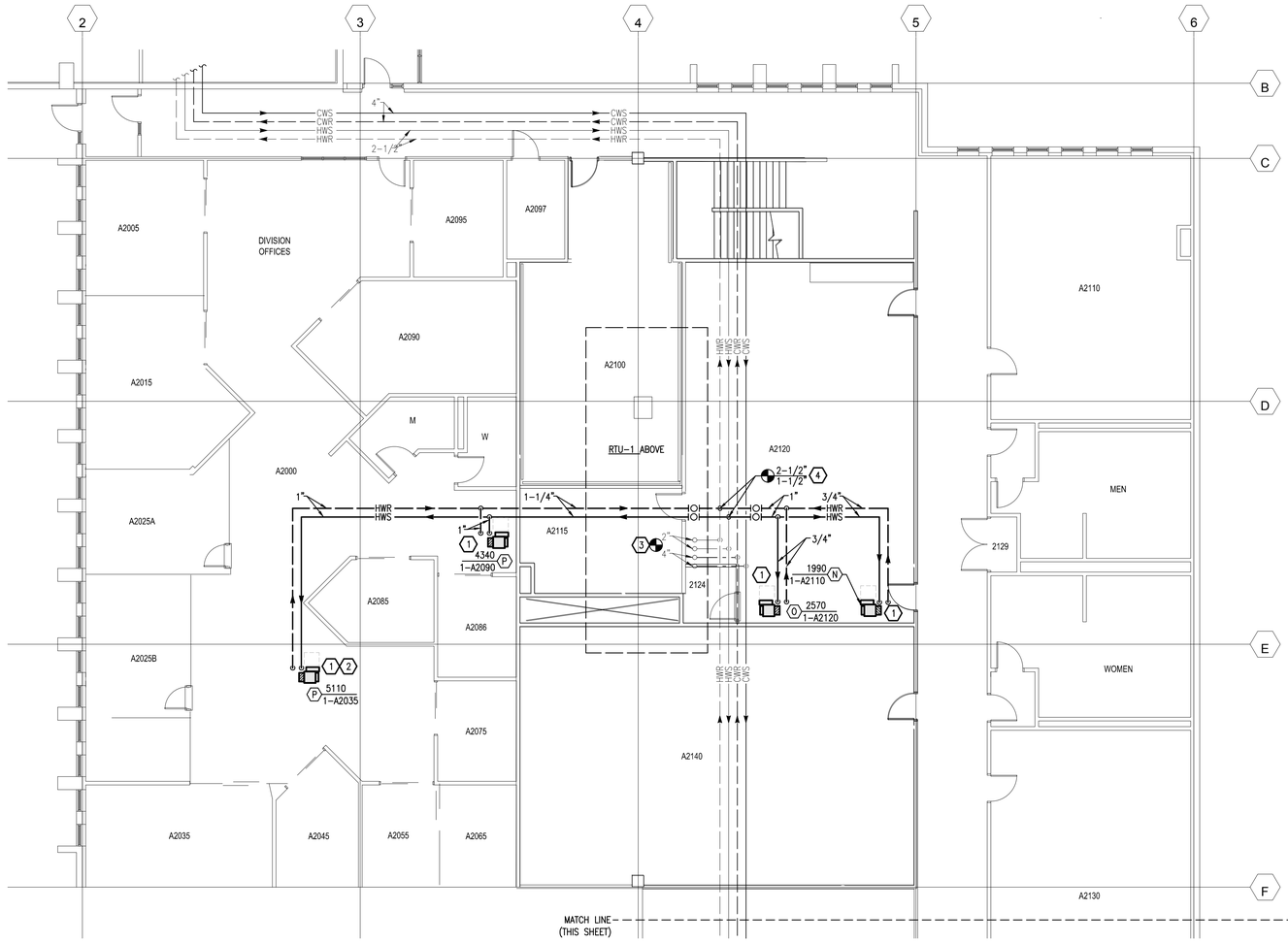
RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

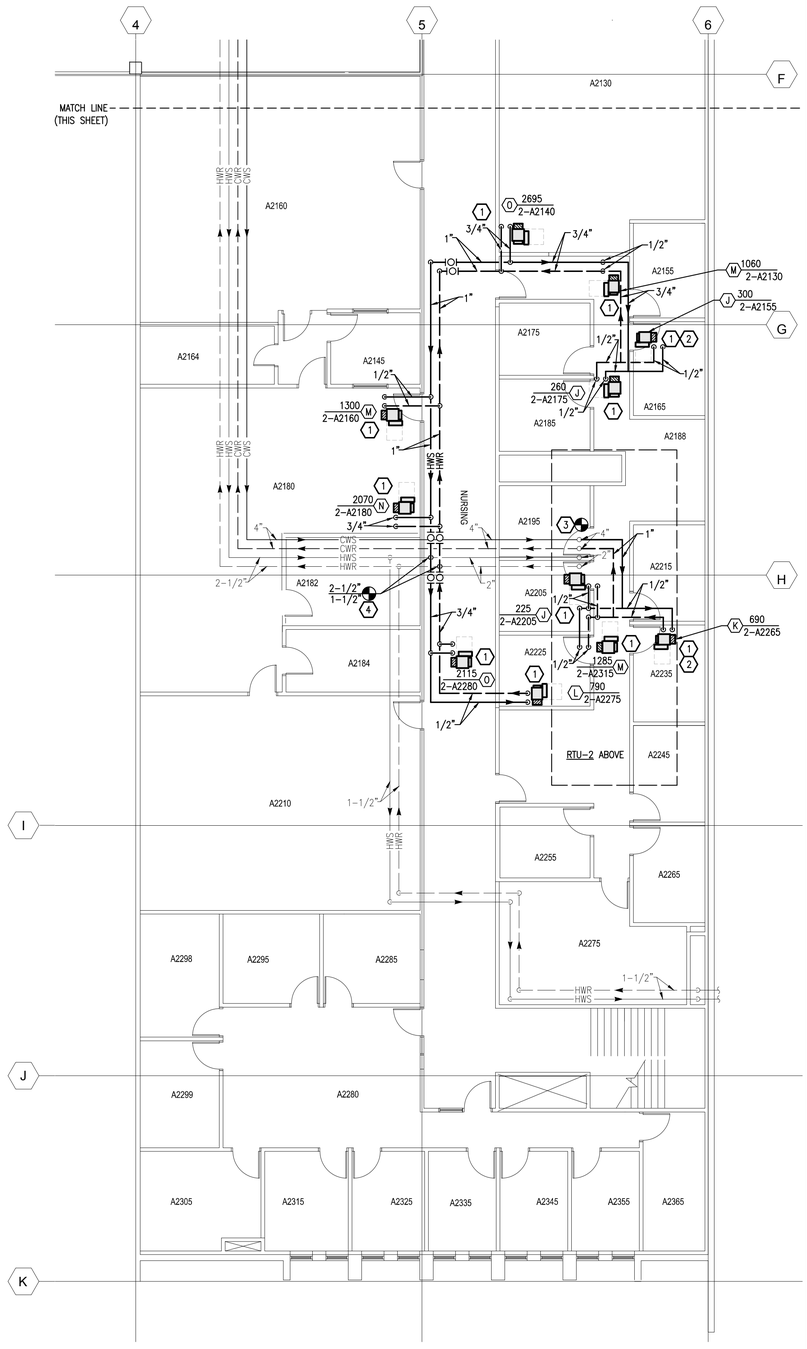
ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

FIRST FLOOR NORTH
PIPING PLAN

DATE: 3/28/2014
SCALE: 1/8" - 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: M21.dwg
XREF.
RMH Job Number:

SHT.NO. M2.1B
REVISION ----





SHEET NOTES

1. COORDINATE ALL WORK WITH ALL OTHER TRADES.
2. SEE VARIABLE AIR VOLUME HEATING COIL SCHEDULE FOR HEATING COIL FLOWS.
3. SEE DETAILS 1, SHEET M4.1 FOR VAV PIPING CONNECTION. ALL VAV BOXES WITH COILS SHALL HAVE 2-WAY CONTROL VALVES, UNLESS NOTED OTHERWISE.

KEY NOTES

(1) NEW VAV BOX WITH REHEAT COIL.

(2) PROVIDE 3-WAY CONTROL VALVE PER DETAIL 1, SHEET M4.1, FOR THIS VAV BOX.

(3) CONNECT EXISTING CHILLED WATER AND HEATING WATER PIPING TO NEW AIR HANDLING UNIT ABOVE. REPAIR TORN AND MISSING PIPE INSULATION BELOW THE ROOF. CORE DRILL ROOF UNDER AIR HANDLING UNIT'S PIPING CHASE.

(4) PROVIDE A WELDED TEE CONNECTION TO THE EXISTING PIPING WITH A 1-1/2" BRANCH.

SECOND FLOOR PIPING PLAN

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

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DOCUMENTS.

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

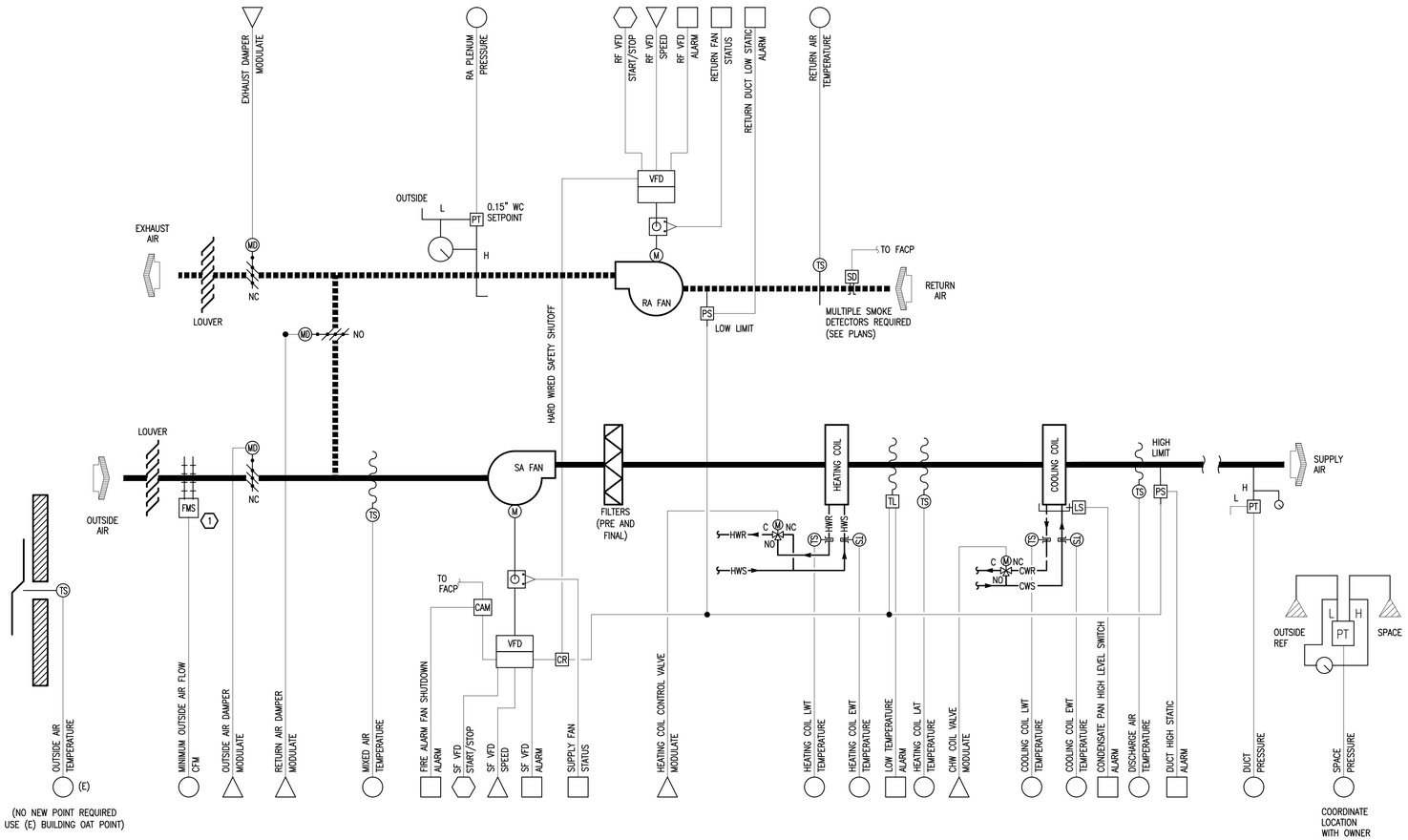
SECOND FLOOR PIPING PLAN

DATE: 3/28/2014
SCALE: 1/8" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: M22.dwg
XREF:
RMH Job Number:

SHT.NO. M2.2

REVISION ----

Created on 2/24/2015
File Path: H:\Jobs\18985\Record Drawings\M22.dwg
Save Date 24-Feb-15by:faber
Plotted on 2/25/15by:faber, Ben



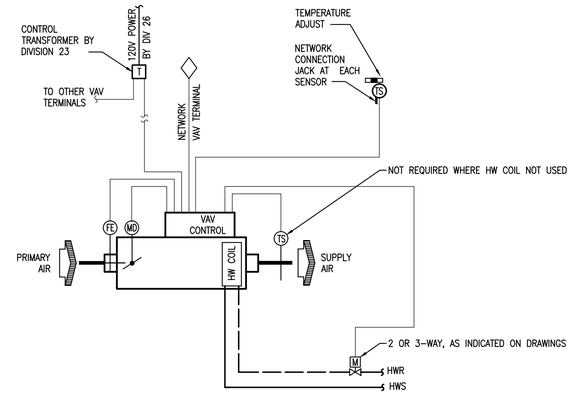
1 VAV RTU-1 AND RTU-2 CONTROL DIAGRAM
M3.1 SCALE: NONE

SHEET NOTES

1. EXISTING CONTROLS ARE PNEUMATIC AND DDC. DEMO ALL EXISTING CONTROLS AND REPLACE WITH NEW DDC CONTROLS AS SHOWN. CAP AND SEAL ALL REMAINING PNEUMATIC AIR LINES. REMOVE PNEUMATIC LINES BACK TO THE MAIN RISER.
2. DAMPER ACTUATORS SUPPLIED BY THE TEMPERATURE CONTROLS CONTRACTOR.

KEY NOTES

1 MOUNT AIRFLOW MEASUREMENT GRID IN SPACE BETWEEN THE OA LOUVER AND THE OA DAMPER. COORDINATE WITH THE SHEETMETAL CONTRACTOR.



2 VAV TERMINAL CONTROL DIAGRAM
M3.1 SCALE: NONE

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

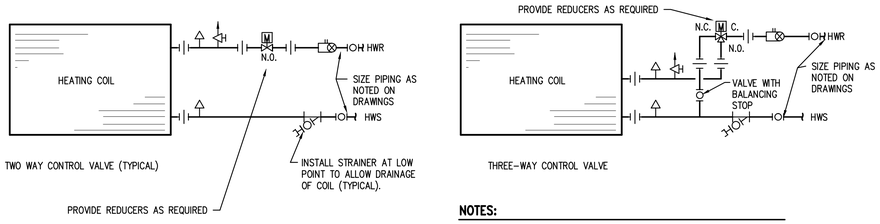
CONTROL SCHEMATICS

DATE: 3/28/2014
SCALE: 1/16" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: M31.dwg
XREF.
RMH Job Number:

SHT.NO. M3.1

REVISION ----

Created on 2/24/2015
File Path: H:\Jobs18\18985\Record Drawings\M31.dwg
Save Date 24-Feb-15 by bfaber
Plotted on 2/25/2015 by Faber, Ben

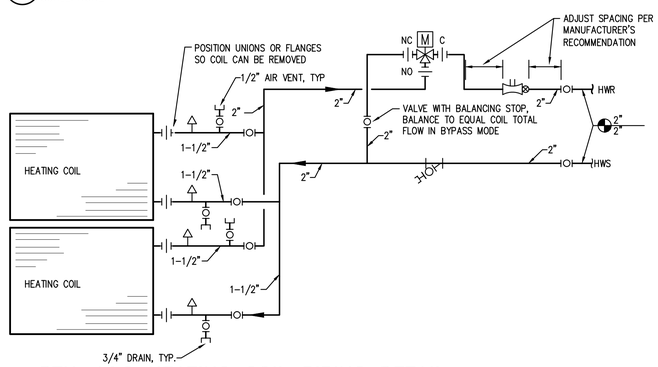


NOTES:

1. THREE WAY CONTROL VALVES ONLY WHERE NOTED ON THE DRAWINGS.

1 M4.1 TERMINAL REHEAT COIL PIPING DIAGRAM

SCALE: NONE

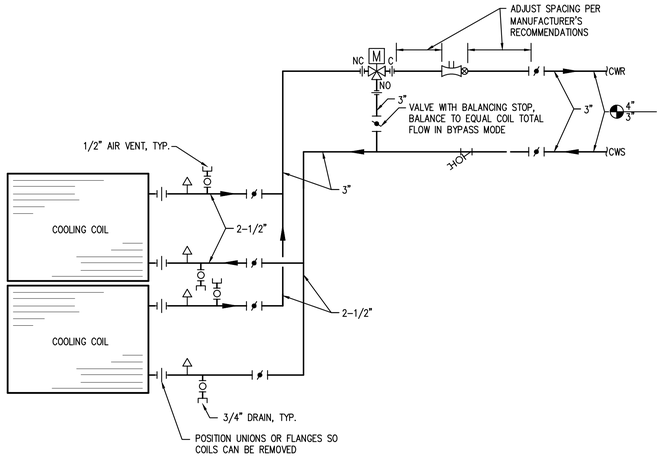


2 M4.1 RTU-1&2 HEATING COIL PIPING DETAIL

SCALE: NONE

NOTES:

1. INSTALL FLOW MEASURING DEVICES PER MANUFACTURER'S RECOMMENDATIONS.
2. REDUCERS SHALL BE PROVIDED AT TEMPERATURE CONTROL VALVE WHERE REQUIRED.
3. PROVIDE BALANCING STOPS ON THE ISOLATION VALVE ON THE LEAVING WATER BRANCH OF EACH COIL SECTION AND ON THE COIL BYPASS VALVE.
4. COIL PIPING TO BE INSIDE RTU. MAINTAIN ACCESS TO THE COIL COMPARTMENT AS MUCH AS POSSIBLE.

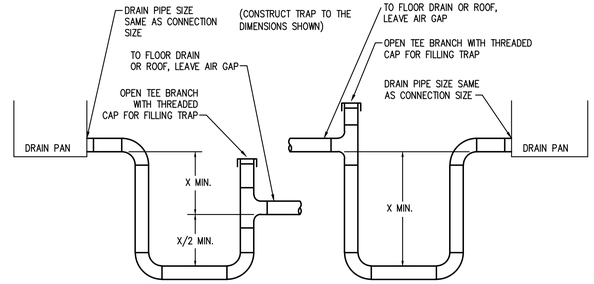


3 M4.1 RTU-1&2 COOLING COIL PIPING DETAIL

SCALE: NONE

NOTES:

1. INSTALL FLOW MEASURING DEVICES PER MANUFACTURER'S RECOMMENDATIONS.
2. REDUCERS SHALL BE PROVIDED AT TEMPERATURE CONTROL VALVE WHERE REQUIRED.
3. PROVIDE BALANCING STOPS ON THE ISOLATION VALVE ON THE LEAVING WATER BRANCH OF EACH COIL SECTION.
4. COIL PIPING TO BE INSIDE RTU. MAINTAIN ACCESS TO THE COIL COMPARTMENT AS MUCH AS POSSIBLE.



UNIT	X-DIMENSION
–	–

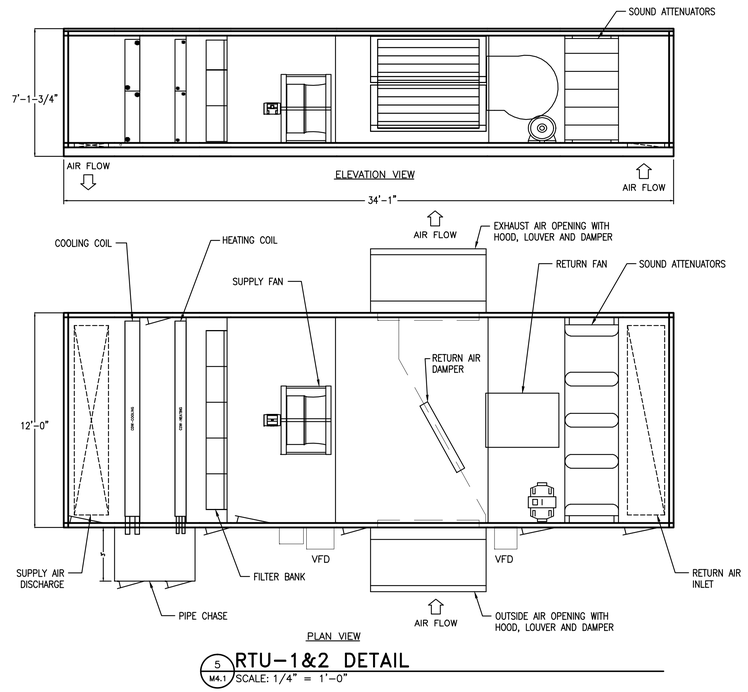
UNIT	X-DIMENSION
RTU-1&2 CHW	4"

NOTES:

1. CONSTRUCT TRAPS LOCATED OUTDOORS FROM SCHED. 40 PVC PIPE AND FILL WITH A WATER/GLYCOL MIXTURE.

4 M4.1 DRAIN PAN TRAP DETAIL

SCALE: NONE



5 M4.1 RTU-1&2 DETAIL

SCALE: 1/4" = 1'-0"

Created on 2/24/2015
File Path: H:\Jobs\15\15885\Record Drawings\M41.dwg
Save Data 24-Feb-15by:bfaber
Plotted on 2/25/2015by:Ben

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

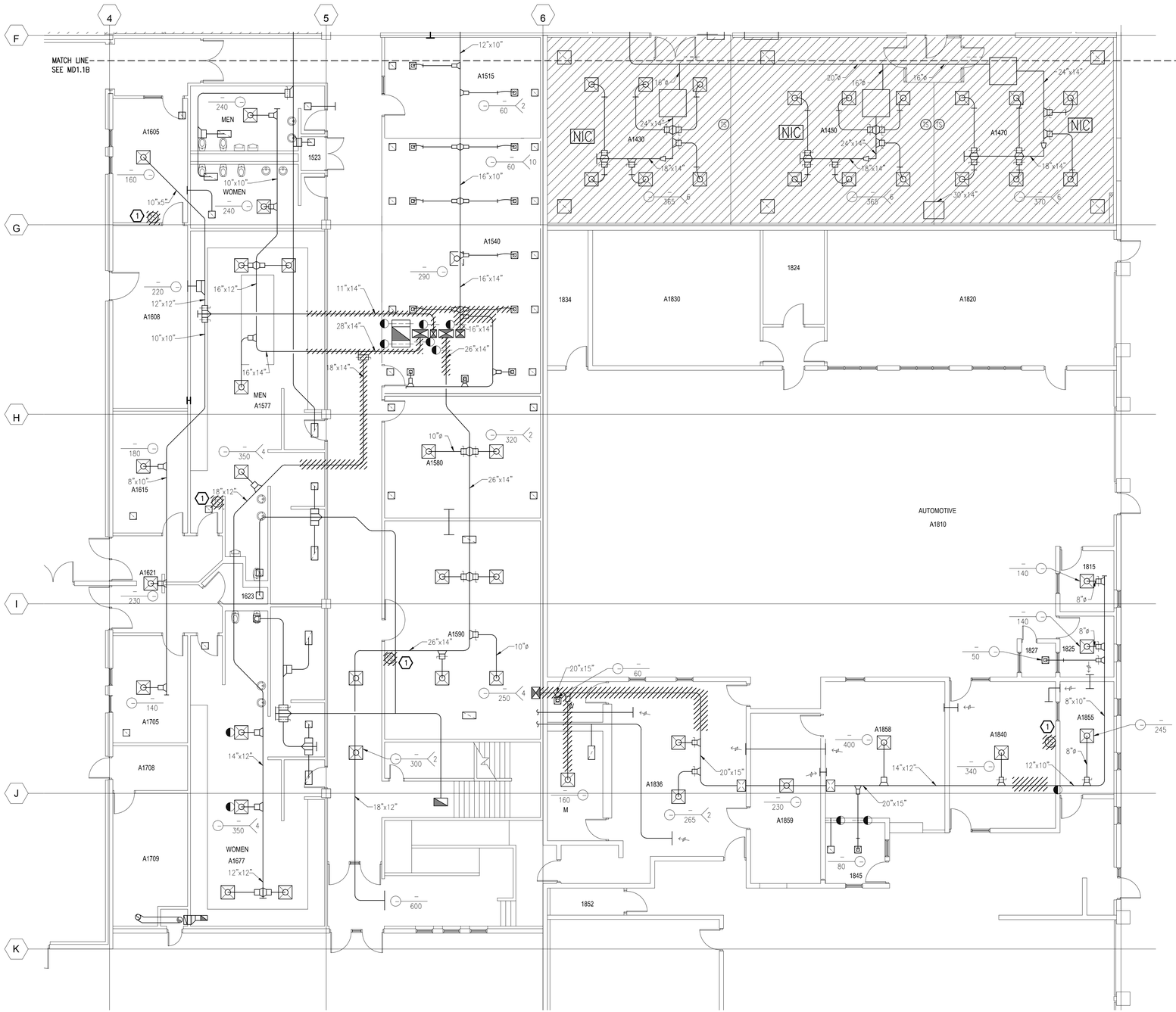
ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

MECHANICAL DETAILS

DATE: 3/28/2014
SCALE: 1/16" – 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: M41.dwg
XREF:
RMH Job Number:

SHT.NO. M4.1

REVISION ----



SHEET NOTES

1. REMOVE HATCHED DUCTWORK TO ACCOMMODATE NEW WORK. SEE SHEET M1.1A FOR FURTHER INFORMATION.
2. COORDINATE ALL WORK WITH ALL OTHER TRADES.
3. HATCHED AREAS NOT IN CONTRACT.

KEY NOTES

(1) REMOVE PNEUMATIC TEMPERATURE SENSOR. PATCH AND PAINT WALL. REMOVE AND CAP AIR LINES AT MAIN CONNECTION.

FIRST FLOOR SOUTH DUCTWORK DEMOLITION PLAN

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

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

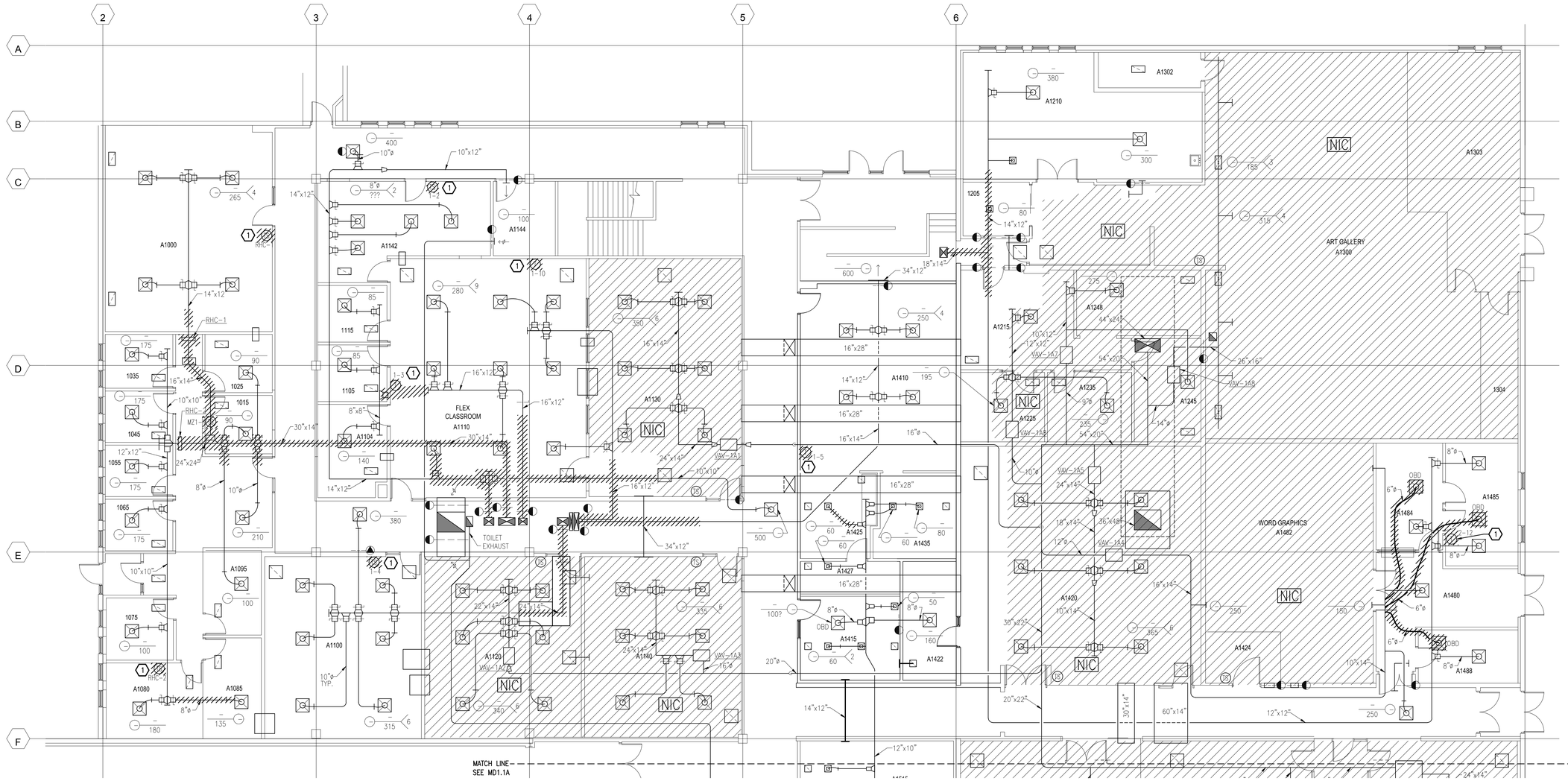
FIRST FLOOR SOUTH DUCTWORK DEMOLITION PLAN

DATE: 3/28/2014
SCALE: 1/8" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: MD11.dwg
XREF:
RMH Job Number:

SHT.NO. MD1.1A

REVISION ----

Created on 2/24/2015
File Path: H:\Jobs18\18985\Record Drawings\MD11.dwg
Save Data 24-Feb-15 by tabor
Plotted on 2/25/2015 by Faber, Ben



FIRST FLOOR NORTH DUCTWORK DEMOLITION PLAN

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

SHEET NOTES

1. REMOVE HATCHED DUCTWORK TO ACCOMMODATE NEW WORK. SEE SHEET M1.1B FOR FURTHER INFORMATION.
2. COORDINATE ALL WORK WITH ALL OTHER TRADES.
3. HATCHED AREAS NOT IN CONTRACT.

KEY NOTES

(1) REMOVE PNEUMATIC TEMPERATURE SENSOR. PATCH AND PAINT WALL. REMOVE AND CAP AIR LINES AT MAIN CONNECTION.

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

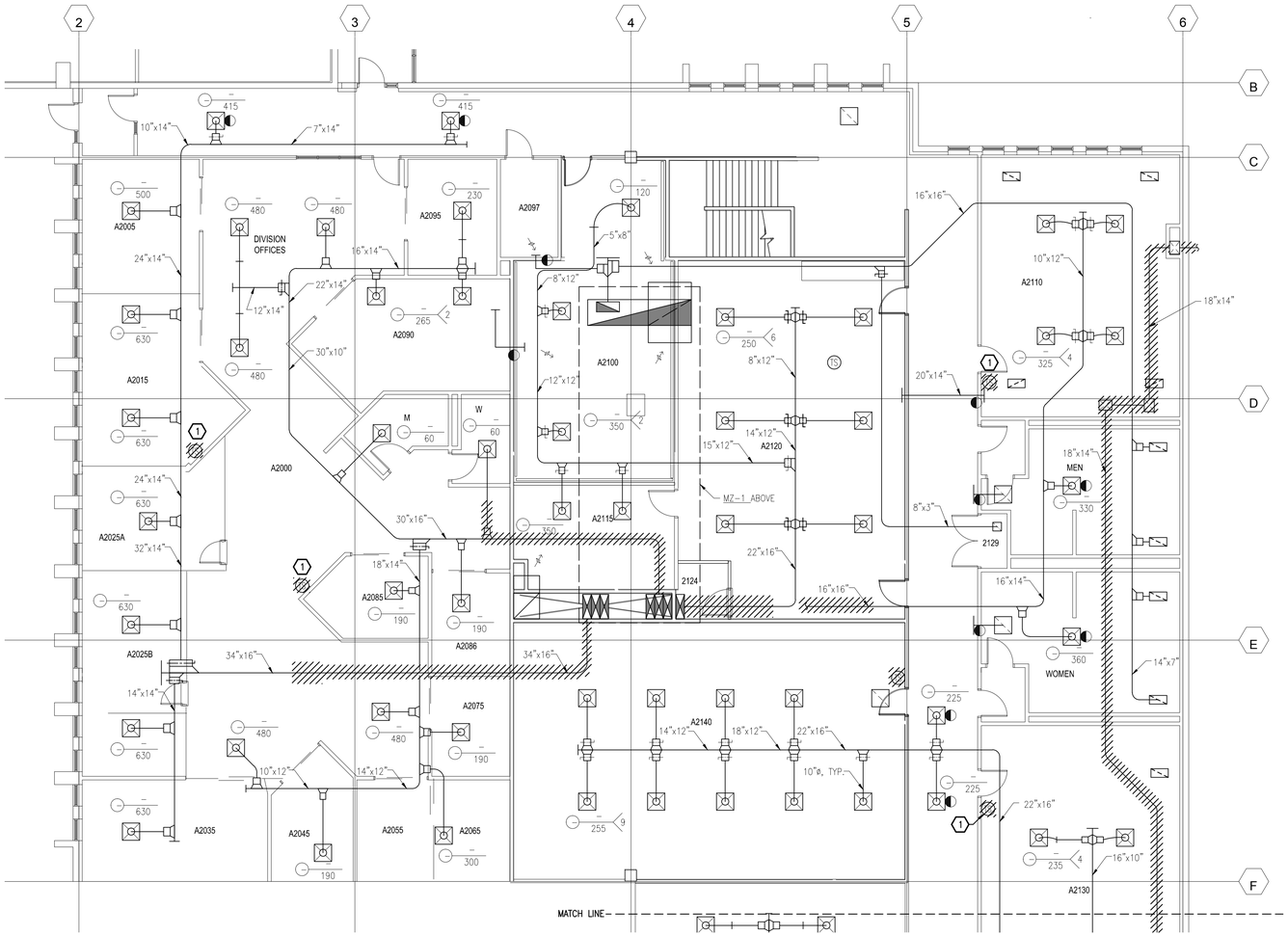
FIRST FLOOR NORTH DUCTWORK DEMOLITION PLAN

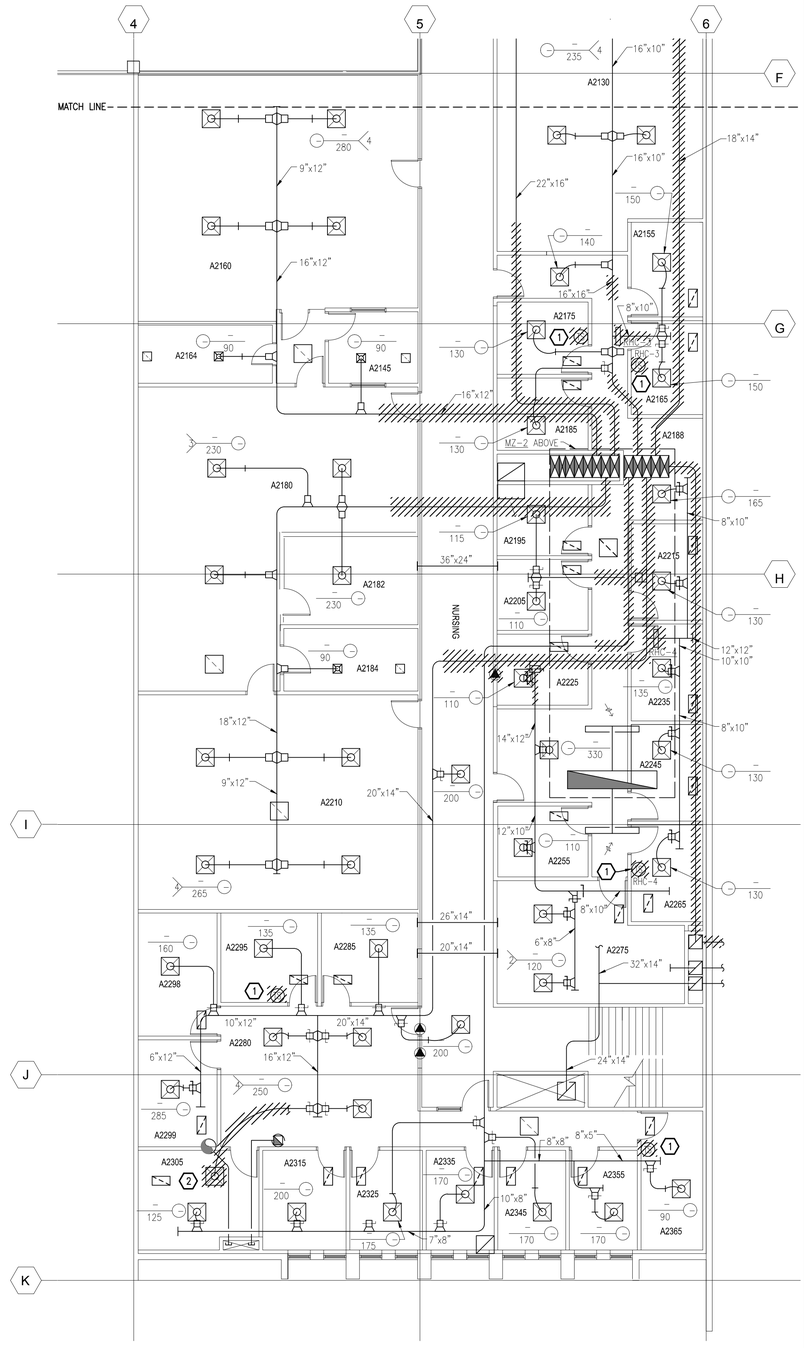
DATE: 3/28/2014
SCALE: 1/8" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: MD11.dwg
XREF:
RMH Job Number:

SHT.NO. MD1.1B

REVISION ----

Created on 2/24/2015
File Path: H:\Jobs18\18985\Record Drawings\MD11.dwg
Save Date 24-Feb-15by faber
Plotted on 2/25/15 by Faber, Ben





SHEET NOTES

1. REMOVE HATCHED DUCTWORK TO ACCOMMODATE NEW WORK. SEE SHEET M1.2 FOR FURTHER INFORMATION.

KEY NOTES

1. REMOVE PNEUMATIC TEMPERATURE SENSOR. PATCH AND PAINT WALL. REMOVE AND CAP AIR LINES AT MAIN CONNECTION.
2. SAVE DIFFUSER FOR RELOCATION. SEE M1.2 FOR NEW LOCATION.

SECOND FLOOR DUCTWORK DEMOLITION PLAN

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

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DOCUMENTS.

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

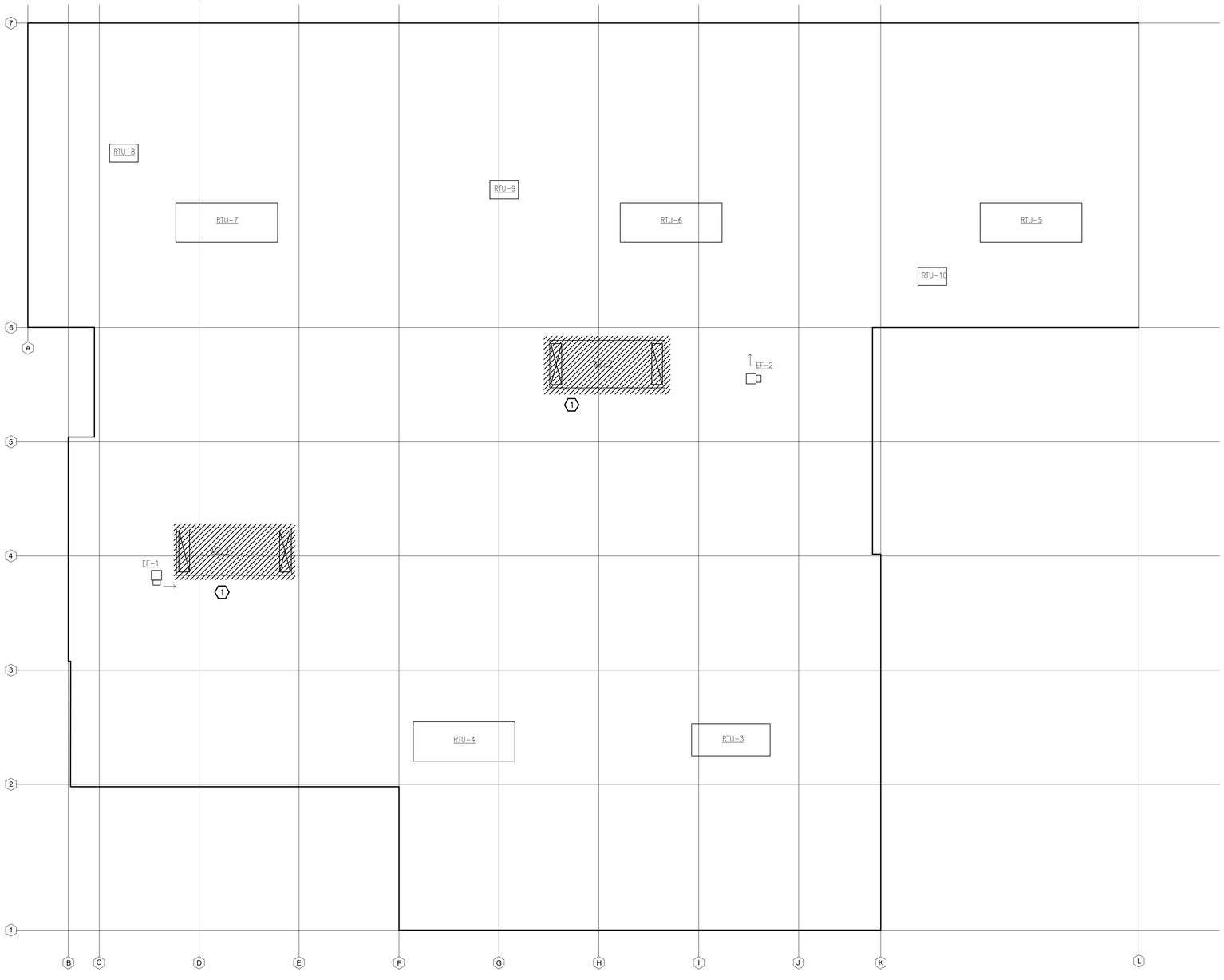
SECOND FLOOR DUCTWORK DEMOLITON PLAN

DATE: 3/28/2014
SCALE: 1/8" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: MD12.dwg
XREF:
RMH Job Number:

SHT.NO. MD1.2

REVISION ----

Created on 2/24/2015
File Path: H:\Jobs\18\18985\Record Drawings\MD12.dwg
Save Date 24-Feb-15by bfaber
Plotted on 2/25/15by Faber, Ben



SHEET NOTES

1. COORDINATE ALL WORK WITH ALL OTHER TRADES.

KEY NOTES

(1) REMOVE EXISTING ROOFTOP UNIT, CURB AND CONTROLS. CAP PNEUMATIC TUBING BACK TO MAINS. SALVAGE CONTROL PANELS AND ANY REUSABLE CONTROLS FOR REUSE IN NEW UNITS.

MECHANICAL ROOF DEMOLITION PLAN

SCALE: 1/16"=1'-0"

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DOCUMENTS.

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

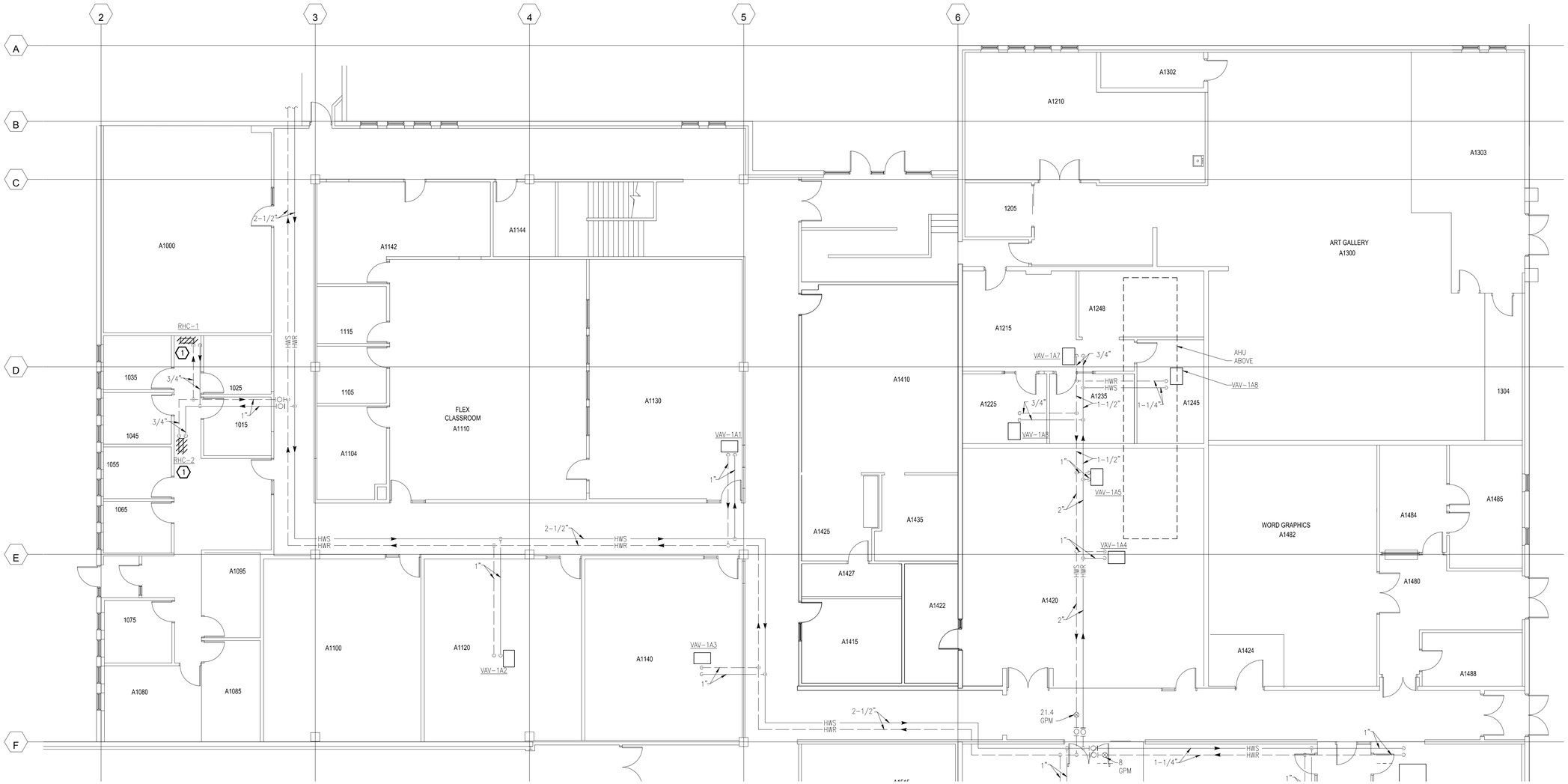
MECHANICAL ROOF DEMOLITION PLAN

DATE:	3/28/2014
SCALE:	1/16" = 1'-0"
DESIGN BY:	B. FABER
DRAWN BY:	B. FABER
APPROVED BY:	R. PHILLIPS
PRJ. NO:	18985
CAD FILE:	MD13.dwg
XREF.	
RMH Job Number:	

SHT.NO. MD1.3

REVISION ----

Created on 2/24/2015
File Path: H:\Jobs18\18985\Record Drawings\MD13.dwg
Save Date 24-Feb-15 by bhibber
Plotted on 2/25/2015 by Shaw, Ben



SHEET NOTES

1. COORDINATE ALL WORK WITH ALL OTHER TRADES.
2. SEE SHEET M2.1B FOR NEW WORK.

KEY NOTES

(1) REMOVE EXISTING REHEAT COIL, VALVES AND CONTROLS. REMOVE AND CAP PNEUMATIC AIR LINES AT MAIN CONNECTION.

FIRST FLOOR NORTH PIPING DEMOLITION PLAN

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

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

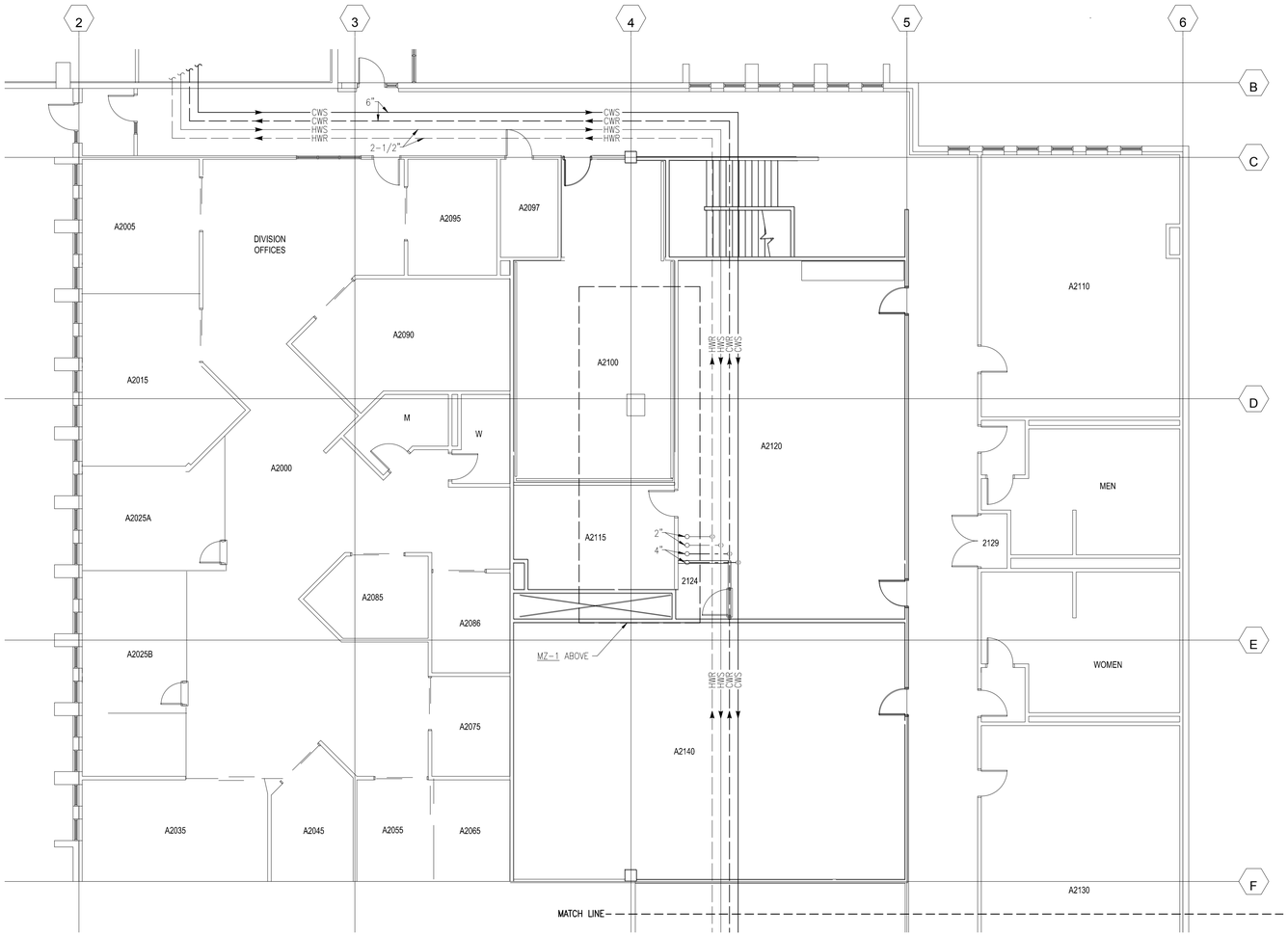
FIRST FLOOR PIPING DEMOLITION PLAN

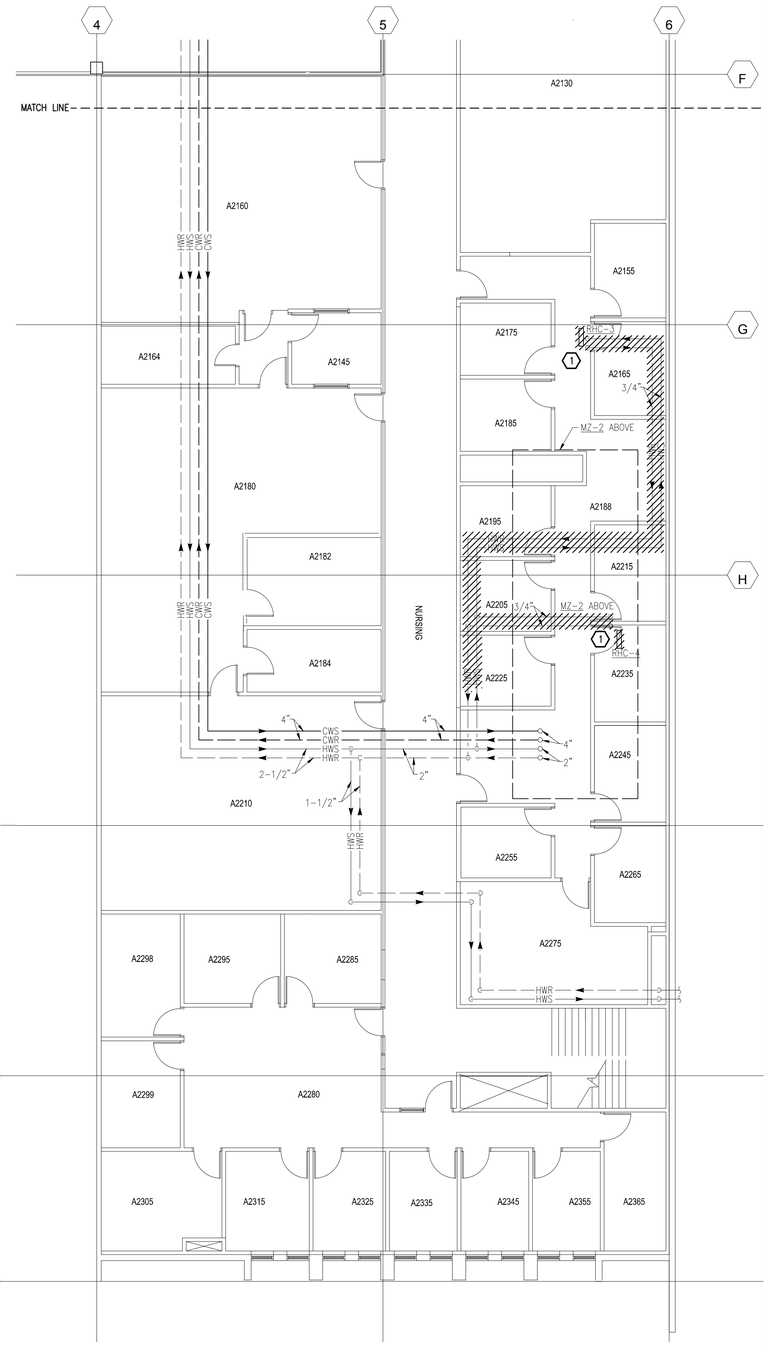
DATE: 3/28/2014
SCALE: 1/8" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: MD21.dwg
XREF:
RMH Job Number:

SHT.NO. MD2.1B

REVISION ----

Created on 2/24/2015
File Path: H:\Jobs18\18985\Record Drawings\MD21.dwg
Save Date 24-Feb-15 by jfaber
Plotted on 2/25/2015 by Faber, Ben





SHEET NOTES

1. COORDINATE ALL WORK WITH ALL OTHER TRADES.
2. SEE SHEET M2.2 FOR NEW WORK.

KEY NOTES

(1) REMOVE EXISTING REHEAT COIL, VALVES AND CONTROLS. REMOVE AND CAP PNEUMATIC AIR LINES AT MAIN CONNECTION.

SECOND FLOOR PIPING DEMOLITION PLAN

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

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DOCUMENTS.

REV.	DATE	DESCRIPTION
	2/24/15	RECORD SET

RMH GROUP
engineering + design
12600 West Colfax Avenue
Lakewood, Colorado 80215
Phone 303-239-0909
Fax 303-235-0218

ARAPAHOE COMMUNITY COLLEGE
ANNEX BUILDING
REPLACE ROOFTOP UNITS

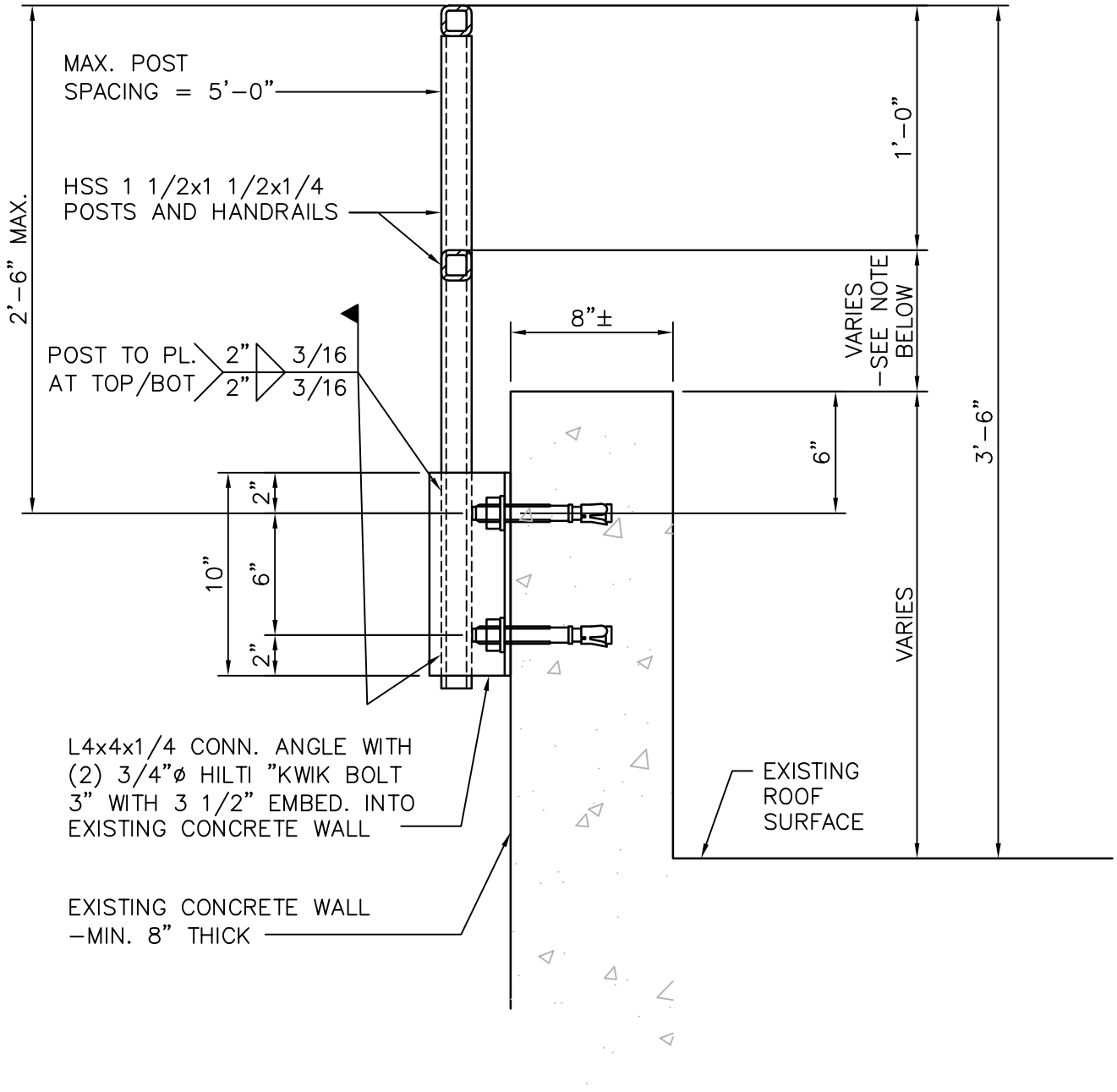
SECOND FLOOR PIPING DEMOLITION PLAN

DATE: 3/28/2014
SCALE: 1/8" = 1'-0"
DESIGN BY: B. FABER
DRAWN BY: B. FABER
APPROVED BY: R. PHILLIPS
PRJ. NO: 18985
CAD FILE: MD22.dwg
XREF:
RMH Job Number:

SHT.NO. MD2.2

REVISION ----

Created on 2/24/2015
File Path: H:\Jobs\18985\Record Drawings\MD22.dwg
Save Date 24-Feb-15by faber
Plotted on 2/25/15by faber, Ben



REVISED TYPICAL GUARDRAIL

1 1/2" = 1'-0"

NOTE:
IF RAIL HEIGHT ABOVE EXISTING T.O. WALL IS GREATER THAN 12", ADD AN ADDITIONAL RAIL WITH MAX. VERTICAL SPACING OF 12"

BAUR & ASSOCIATES
CONSULTING ENGINEERS
2551 31st Street Boulder, CO 80301
303-444-9121 (v) 303-415-1070 (f)
www.jcbaur.com Project No. 14001

PROJECT:	ARAPAHOE COMMUNITY COLLEGE RTUS
SHEET TITLE:	REVISED GUARDRAIL DETAIL
DATE: 11-12-14	SCALE: AS NOTED

SK-1.0