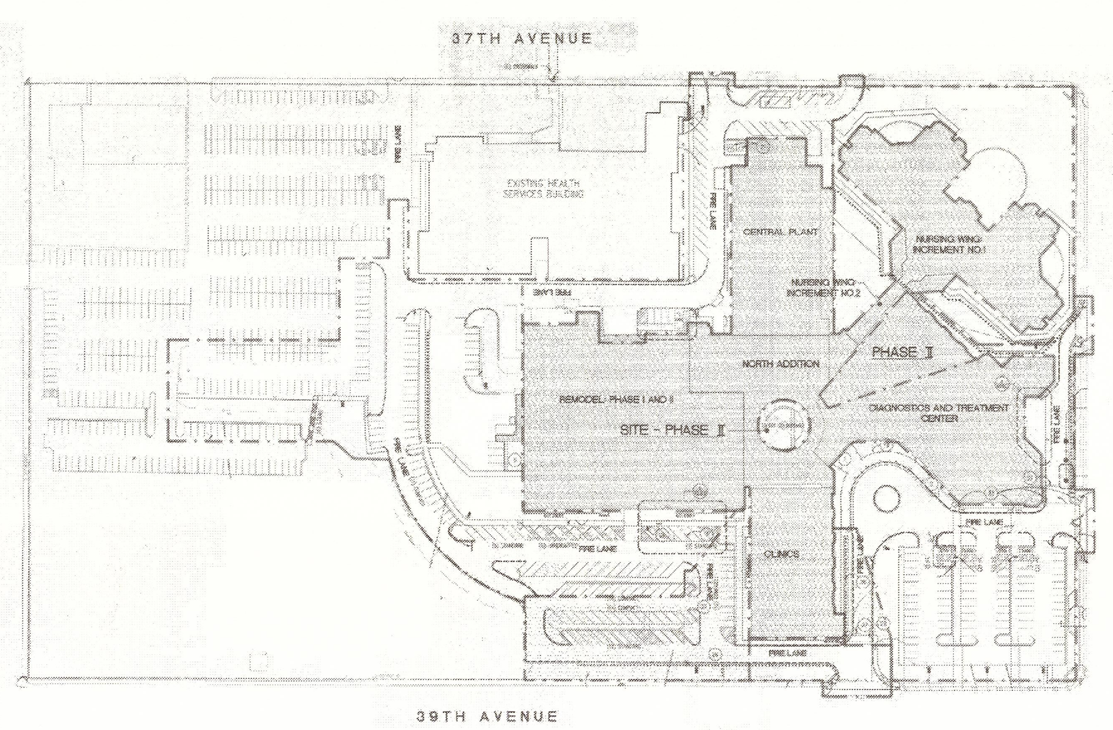
SAN MATEO COUNTY HEALTH CENTER

222 WEST 39TH AVENUE
SAN MATEO
CALIFORNIA 94403

MECHANICAL CONTROLS SYSTEM UPGRADE

KEYPLAN



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		2

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				2

SCOPE OF WORK

UPGRADE CONTROLS WITH NEW JCI CONTROLS. PROVIDE NEW FRONT-END AND NEW JCI CONTROLS IN THE CENTRAL PLANT, CONTROLS FOR AIR HANDLER UNIT AND ASSOCIATED VAV/CV BOXES AT CENTRAL PLAN. UPGRADE CONTROLS FOR AIR HANDLER UNIT(S) AT NORTH ADDITION BUILDING, NURSING WING, CLINIC BUILDING & DIAGNOSTIC & TREATMENT BUILDING. ADD VFD FOR AIR HANDLER UNIT(S) AT DIAGNOSTIC & TREATMENT BUILDING

BUILDING CODE ANALYSIS

OCCUPANCY GROUP: B-4, H-4 (SHOP ONLY)
CONSTRUCTION TYPE: III N
OCCUPANCY LOAD FACTOR (CBC TABLE 1004.1.1)
1-STORIES
SPRINKLERED
YEAR OF CONSTRUCTION: 1991
OSHPD PROJECT NUMBER. HS920974-41
COUNTY PROJECT NUMBER: 570A-0031239

CODES REQUIREMENTS

2013 CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE
PART 1, TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR)
2013 CALIFORNIA BUILDING CODE
PART 2, TITLE 24, CCR
(2009 IBC AND 2010 CALIFORNIA AMENDMENTS)
2013 CALIFORNIA ELECTRICAL CODE
PART 3, TITLE 24, CCR
(2009 NEC AND 2010 CALIFORNIA AMENDMENTS)
2013 CALIFORNIA MECHANICAL CODE
PART 4, TITLE 24, CCR
(2009 UMC AND 2010 CALIFORNIA AMENDMENTS)
2013 CALIFORNIA PLUMBING CODE
PART 5, TITLE 24, CCR
(2009 UPC AND 2010 CALIFORNIA AMENDMENTS)
2013 CALIFORNIA FIRE CODE
PART 9, TITLE 24, CCR
(2009 UFC AND 2010 CALIFORNIA AMENDMENTS)

VICINITY MAP

PROJECT LOCATION

S150566-41-00

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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CONSULTANTS:

SAN MATEO COUNTY HEALTH CENTER
SAN MATEO, CALIFORNIA
CONTROLS UPGRADE

SHEET TITLE:

TITLE SHEET

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

T0.1

SHEET : OF

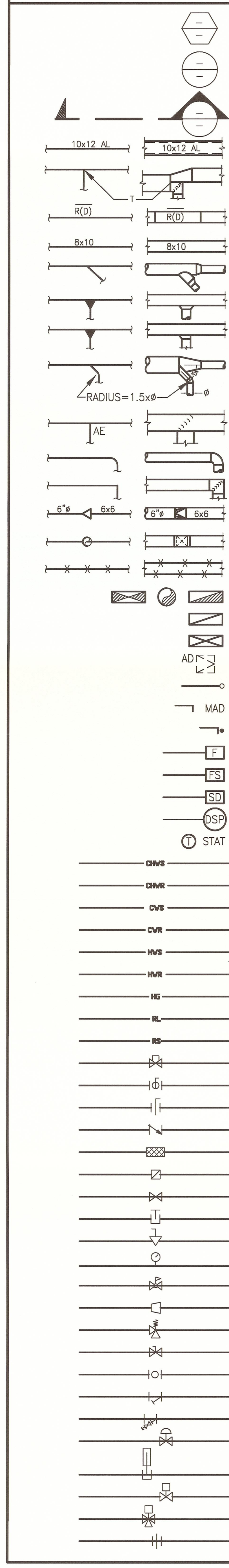
MECHANICAL ABBREVIATIONS

AAV	AUTOMATIC AIR VENT	MBH	BTU PER HOUR (THOUSAND)
ABV	ABOVE	MC	MECHANICAL CONTRACTOR
ABC, OH	ABOVE CEILING, OVERHEAD	MIN	MINIMUM
AC	AIR CONDITIONING	MPS	MEDIUM PRESSURE STEAM
AD	ACCESS DOOR	(N) (E)	NEW, EXISTING
ADA	AMERICANS W/ DISABILITIES ACT	N.C.	NORMALLY CLOSED
AE	AIR EXTRACTOR	NEG	NEGATIVE
AFF	ABOVE FINISHED FLOOR	NIC	NOT IN CONTRACT
AL	ACOUSTICALLY LINED	N.O.	NORMALLY OPEN
AHU	AIR HANDLING UNIT	OBD	OPPOSED BLADE DAMPER
APD	AIR PRESSURE DROP	OC	ON CENTER
BHP	BRAKE HORSEPOWER	OP	OPERATING
BOD	BOTTOM OF DUCT	PH	PHASE
BR	BRANCH	POC	POINT OF CONNECTION
BTU	BRITISH THERMAL UNIT	PSI	POUNDS PER SQUARE INCH
BTUH	BTU PER HOUR	PT	PRESSURE TREATED
CAV	CONSTANT AIR VOLUME	PTDF	PRESSURE TREATED DOUGLAS FIR
CD	CONDENSATE DRAIN	P&TRV	PRESSURE & TEMPERATURE RELIEF VALVE
CFM, f	CUBIC FEET OF AIR PER MINUTE	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
CFS	CUBIC FEET PER SECOND	(R) (D)	RISE, DROP
CL	CENTERLINE	RD, OFL	ROOF DRAIN, OVERFLOW
CO	CLEANOUT	REF	ROOF EXHAUST FAN
CONC.	CONCRETE	REQ'D	REQUIRED
CONN.	CONNECT	RL	REFRIGERANT LIQUID
CR	CONDENSATE RETURN (STEAM)	RPM	REVOLUTIONS PER MINUTE
CS	CURRENT SENSOR	RS	REFRIGERANT SUCTION
CU	CONDENSING UNIT	SAD	SEE ARCHITECTURAL DRAWINGS
CU FT	CUBIC FEET	SED	SEE ELECTRICAL DRAWINGS
CU IN	CUBIC INCHES	SM	SHEET METAL
CVB	CONSTANT VOLUME BOX	SMS	SHEET METAL SCREWS
CW	COLD WATER	SOV	SHUT OFF VALVE
DB	DRY BULB	SS	STAINLESS STEEL
DF	DOUGLAS FIR	SSD	SEE STRUCTURAL DRAWING
DIA, ø	DIAMETER	STL	STEEL
DSP	DUCT STATIC PRESSURE SENSOR	TA, FA	TO ABOVE, FROM ABOVE
EA, OA, RA, SA	EXHAUST, OUTSIDE, RETURN & SUPPLY AIR	TB, FB	TO BELOW, FROM BELOW
E.C.	ELECTRICAL CONTRACTOR	TBR	TO BE REMOVED
ESP	EXTERNAL STATIC PRESSURE	TCC	TEMPERATURE CONTROL CONTRACTOR
EWT	ENTERING WATER TEMPERATURE	TCP	TEMPERATURE CONTROL PANEL
FA	FACE AREA (SQUARE FEET)	THK	THICK
FC	FLEXIBLE CONNECTION	TR	TO REMAIN
FLA	FULL LOAD AMPS	TSP	TOTAL STATIC PRESSURE
FPI	FINS PER INCH	TV	TURNING VANES
FPM	FEET PER MINUTE	TYP	TYPICAL
GALV.	GALVANIZED	UG, UF	UNDERGROUND, UNDER FLOOR
GA	GAUGE	UON	UNLESS OTHERWISE NOTED
GC	GENERAL CONTRACTOR	UTR	UP THROUGH ROOF
GSM	GALVANIZED SHEET METAL	VAC	VOLTS ALTERNATING CURRENT
HP	HORSE POWER	VFD	VARIABLE FREQUENCY DRIVE
HWS	HOT WATER SUPPLY	VIF	VERIFY IN FIELD
HWR	HOT WATER RETURN	WB	WET BULB
HZ	FREQUENCY (HERTZ)	WG	WATER GAUGE
LBS	POUNDS	WOG	WATER OIL GAS PRESSURE RATING
LRA	LOCKED ROTOR AMPS	WP	WATER PRESSURE
LWT	LEAVING WATER TEMPERATURE	WPD	WATER PRESSURE DROP
MAV	MANUAL AIR VENT	WT, AT	WATERTIGHT, AIRTIGHT
MAX	MAXIMUM		

VFD SCHEDULE

SYMBOL	SERVES	MANUFACTURER	MODEL	HP	ELECTRICAL VOLTS	ELECTRICAL PH	ELECTRICAL HZ	FLA	OPERATING WEIGHT LBS.	SEISMIC CERTIFICATION #	REMARKS
1 VFD 1S	DTAHU–1 SA FAN	YASKAWA	Z1000–ZIBI052–3R	40	460	3	60	52	300	OSP–0293–10	DRIVE WITH E–BYPASS, CONTROLS: BACNET MSTP. NEMA 3R ENCLOSURE FOR OUTDOOR INSTALLATION
VFD 1R	DTAHU–1 RA FAN	YASKAWA	Z1000–ZIBI040–3R	10	460	3	60	40	300	OSP–0293–10	DRIVE WITH E–BYPASS, CONTROLS: BACNET MSTP. NEMA 3R ENCLOSURE FOR OUTDOOR INSTALLATION
VFD 2S	DTAHU–2 SA FAN	YASKAWA	Z1000–ZIBI052–3R	30	460	3	60	40	300	OSP–0293–10	DRIVE WITH E–BYPASS, CONTROLS: BACNET MSTP. NEMA 3R ENCLOSURE FOR OUTDOOR INSTALLATION
VFD 2R	DTAHU–2 RA FAN	YASKAWA	Z1000–ZIBI040–3R	7.5	460	3	60	40	300	OSP–0293–10	DRIVE WITH E–BYPASS, CONTROLS: BACNET MSTP. NEMA 3R ENCLOSURE FOR OUTDOOR INSTALLATION
VFD 3S	DTAHU–3 SA FAN	YASKAWA	Z1000–ZIBI052–3R	30	460	3	60	52	300	OSP–0293–10	DRIVE WITH E–BYPASS, CONTROLS: BACNET MSTP. NEMA 3R ENCLOSURE FOR OUTDOOR INSTALLATION
VFD 3R	DTAHU–3 RA FAN	YASKAWA	Z1000–ZIBI040–3R	10	460	3	60	40	300	OSP–0293–10	DRIVE WITH E–BYPASS, CONTROLS: BACNET MSTP. NEMA 3R ENCLOSURE FOR OUTDOOR INSTALLATION
VFD 4S	DTAHU–4 SA FAN	YASKAWA	Z1000–ZIBI052–3R	40	460	3	60	52	300	OSP–0293–10	DRIVE WITH E–BYPASS, CONTROLS: BACNET MSTP. NEMA 3R ENCLOSURE FOR OUTDOOR INSTALLATION
VFD 4R	DTAHU–4 RA FAN	YASKAWA	Z1000–ZIBI040–3R	10	460	3	60	40	300	OSP–0293–10	DRIVE WITH E–BYPASS, CONTROLS: BACNET MSTP. NEMA 3R ENCLOSURE FOR OUTDOOR INSTALLATION

MECHANICAL LEGEND



UNIT TYPE
UNIT NUMBER

DETAIL NUMBER
SHEET NUMBER ON WHICH DETAIL IS FOUND

SECTION NUMBER
SHEET ON WHICH SECTION IS FOUND

ACOUSTICALLY LINED DUCT – DIMENSIONS ARE OUTSIDE

BRANCH TAKE–OFF WITH SPLITTER DAMPER & W/ THROAT SIZE AS INDICATED. TRANSITION TO DUCT SIZES SHOWN.

DUCT RISE (DROP) IN DIRECTION OF AIR FLOW

DUCT – WIDTH x DEPTH

LATERAL WITH CONICAL TRANSITION TO DUCT SIZES INDICATED

CONICAL TEE FROM RECTANGULAR TO ROUND BRANCH

45° ENTRY TEE, RECTANGULAR BRANCH, RECTANGULAR MAIN

45° WYE, CONICAL MAIN AND BRANCH WITH 45° ELBOW, BRANCH 90° TO MAIN

TEE WITH ADJUSTABLE EXTRACTOR. RECTANGULAR MAIN, RECTANGULAR BRANCH

RADIUS ELL. SEE SPECS.

SQUARE ELL WITH TURNING VANES

TRANSITION ROUND TO RECTANGULAR

VERTICAL DUCT RISE OR DROP

DUCTS, PIPES, OR EQUIPMENT TO BE REMOVED

DUCT DROP OR RISE THRU ROOF OR FLOOR

RETURN, OUTSIDE, OR EXHAUST AIR DUCT

SUPPLY DUCT

ACCESS DOOR

AUTOMATIC CONTROL DAMPER

MANUAL AIR DAMPER

VOLUME DAMPER WITH REMOTE BALANCING DEVICE

FIRE DAMPER

FIRE SMOKE DAMPER

SMOKE DETECTOR

DUCT STATIC PRESSURE SENSOR

THERMOSTAT

CHILLED WATER SUPPLY

CHILLED WATER RETURN

CONDENSER SUPPLY

CONDENSER RETURN

HOT WATER SUPPLY

HOT WATER RETURN

HOT GAS LINE

REFRIGERANT LIQUID

REFRIGERANT SUCTION

BALANCING VALVE

BALL VALVE

BUTTERFLY VALVE

CHECK VALVE

FLEXIBLE CONNECTION

FLOW SENSOR

GATE VALVE

PETE'S PLUG

SHUT OFF COCK

PRESSURE GAUGE

PRESSURE REDUCING VALVE

REDUCER

PRESSURE & TEMPERATURE RELIEF VALVE

SHUT OFF VALVE

SITE GLASS

STRAINER

STRAINER & DRAIN VALVE WITH HOSE FITTING

SOLENOID VALVE

THERMOMETER

TWO WAY CONTROL VALVE

THREE WAY CONTROL VALVE

UNION

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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CONSULTANTS:

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SAN MATEO, CALIFORNIA

CONTROLS UPGRADE

SHEET TITLE:

MECHANICAL LEGEND, NOTES, AND SCHEDULES

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

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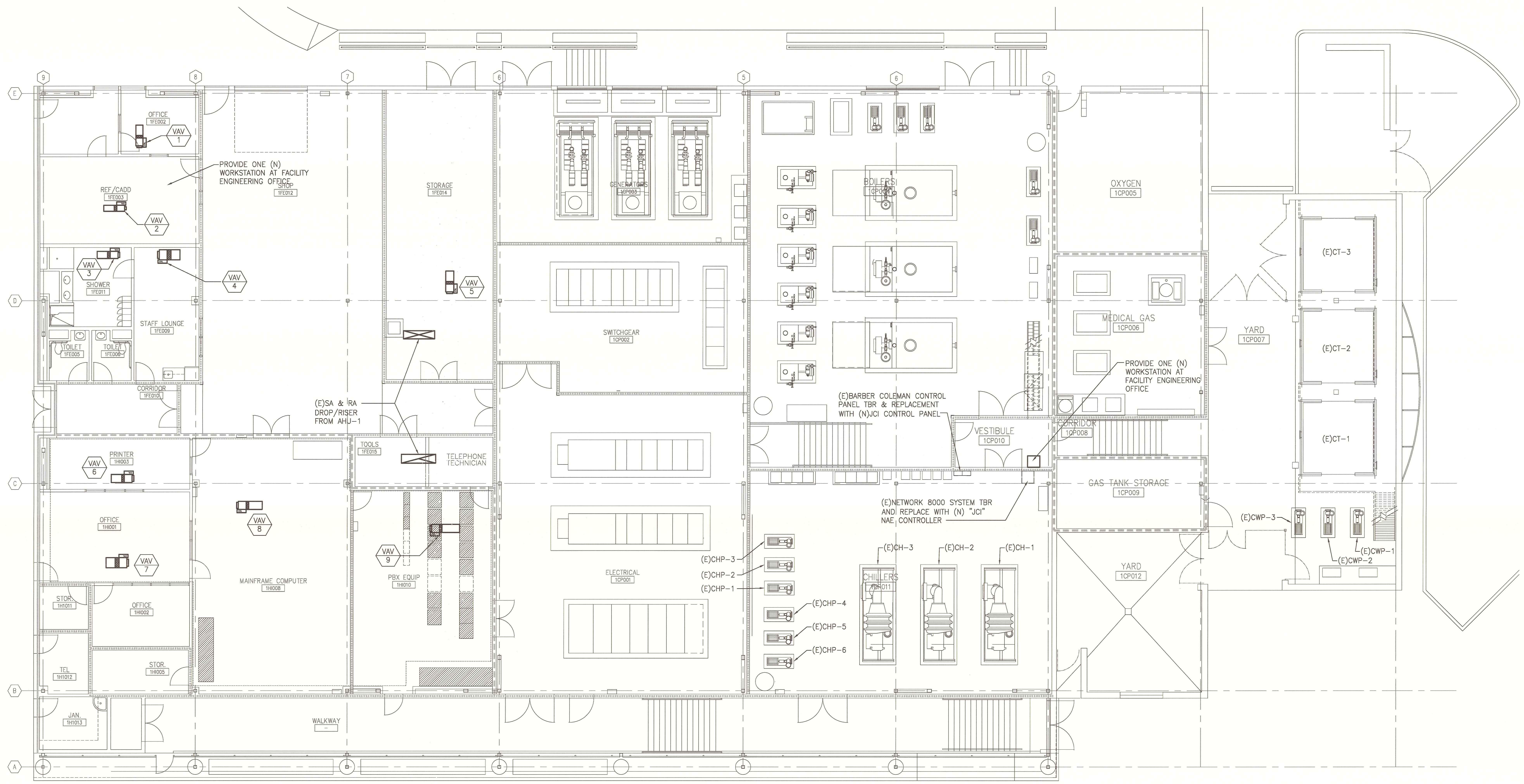

THE SCOPE IS TO CONVERT (E) CAV-1 THRU CAV-9 FROM CONSTANT VOLUME BOX TO VARIABLE VOLUME BOXES, REPLACE EXISTING BOX CONTROLLER WITH NEW VAV CONTROLLER SEE DETAIL B/M6.8 AND C/M6.8 FOR CONTROL SEQUENCE. THE SPACES ARE SERVED BY AHU-1 AND ARE IN CENTRAL PLANT (NON-PATIENT AREA). SEE VAV SCHEDULE BELOW FOR THE AIRFLOW SCHEDULES

A — CENTRAL PLAN MECHANICAL FLOOR PLAN

1/8"=1'-0"

VAV SCHEDULE

SYMBOL	SERVED BY	COOLING AIRFLOW MAX CFM	COOLING AIRFLOW MIN CFM	HEATING AIRFLOW MAX CFM	HEATING AIRFLOW MIN CFM
VAV 1	AHU-1	400	50	160	50
VAV 2	AHU-1	350	60	140	60
VAV 3	AHU-1	740	145	300	145
VAV 4	AHU-1	2400	350	1200	350
VAV 5	AHU-1	850	50	340	50
VAV 6	AHU-1	530	100	200	100
VAV 7	AHU-1	1300	250	550	250
VAV 8	AHU-1	1100	100	N/A	N/A
VAV 9	AHU-1	950	190	N/A	N/A

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CONTROLS UPGRADE

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MECHANICAL CENTRAL PLAN FLOOR PLAN

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8. IN BASE BID CONTRACTOR SHALL ASSUME ALL EXISTING ISOLATION VALVES TO REMAIN AND PROVIDE UNIT COST FOR REPLACEMENT OF VALVE AS ADD ALTERNATE. CONTRACTOR SHALL ASSUME ALL CONTROL VALVE BODY TO REMAIN AND BASE BID IS TO REPLACE ONLY ACTUATORS. PROVIDE UNIT COST FOR CONTROL VALVE REPLACEMENT AS ADD ALTERNATE. THIS NOTE IS APPLICABLE TO ALL DRAWINGS M3.1 THRU M3.6

PRIOR TO ANY DEMO WORK
PRE-MEASURE FOLLOWING VALUES & RECORD.
SUBMIT TO ENGINEER FOR APPROVAL

PREMEASURE DT-AHU-1, 2, 3, & 4 AT MIN. OSA & 100% OSA MODES
TOTAL SUPPLY AIRFLOW
TOTAL RETURN AIRFLOW
TOTAL OSA AIRFLOW
STATIC PRESSURE PROFILE OF UNIT
CHILLED WATER FLOW RATE
HEATING HOT WATER FLOW RATE

PRE-MEASUREMENT NOTES:

1. PITOT READING FOR SUPPLY, RETURN AND OSA AIRFLOW WHERE ACCURATE READING IS NOT POSSIBLE, ALTERNATE IS TO PRE-MEASURE ALL DIFFUSERS IN BOTH MIN. OSA AND 100% OSA TO OBTAIN THE TOTAL SUPPLY AND RETURN AIRFLOW.

GENERAL NOTES:

1. FIELD SURVEY EXISTING DAMPERS. PROVIDE ALL ASSOCIATED PLANNING, MODIFICATION TO ACCOMMODATE NEW DAMPER ACTUATORS. AHU SYSTEMS CAN HAVE DOWNTIME OF VERY LIMITED DURATIONS (NIGHTTIME FOR APPROXIMATELY 5 HOURS, DEPENDING ON SAN MATEO HOSPITAL APPROVAL). PROVIDE NEW DAMPER ACTUATORS AT ONE TIME FOR ONE UNIT WITH MULTIPLE TEAMS TO MINIMIZE DOWNTIME. COORDINATE PLAN FOR REPLACEMENT WITH MEOR AND SAN MATEO HOSPITAL. MINIMUM NUMBER OF DAMPER OPERATOR REQUIRED TO CONTROL RA AND EA DAMPERS AT EACH UNIT ARE:

   QUANTITY TO BE FIELD VERIFIED.
   DT-AHU-1 = 1 DDC DAMPER ACTUATORS
   DT-AHU-2 = 1 DDC DAMPER ACTUATORS
   DT-AHU-3 = 1 DDC DAMPER ACTUATORS
   DT-AHU-4 = 1 DDC DAMPER ACTUATORS

2. EXISTING INLET GUIDE VANES FOR SUPPLY & RETURN FAN SHALL BE LOCKED PERMANENTLY (LINKAGE AND BLADES) IN PLACE TO 100% OPEN POSITION. CONTRACTOR SHALL FIELD SURVEY THE EXISTING CONDITIONS & COORDINATE PLAN FOR LOCKING INLET GUIDE VANES WITH MEOR AND SAN MATEO HOSPITAL. SUBMIT PROPOSED METHODS FOR LOCKING FOR APPROVAL. AHU SYSTEMS CAN HAVE DOWNTIMES OF VERY LIMITED DURATIONS (NIGHTTIME FOR APPROXIMATELY 5 HOURS, DEPENDING ON SAN MATEO HOSPITAL APPROVAL).
3. COMMISSION CONTROL DAMPERS TO PROVIDE PRE-MEASURED AIR VOLUMES IN MIN OA POSITION. VOLUME TO BE SET FOR CFM AS MEASURED UNDER MIN. OA SETTING PRE-MEASUREMENTS.
4. DT-AHU-1, 2, 3 AND 4 HAVE EXISTING TEMPERATURE CONTROL PANEL LOCATED IN AIR HANDLER CABINET TO BE REPLACE WITH NEW CONTROL PANEL. PROVIDE SOFTWARE GRAPHICS AND MAP ALL CONTROLS AND SEQUENCE OF OPERATIONS AT NEW DCC CONTROLS WORK STATION PROVIDED IN THE ENGINEER'S OFFICE AT CENTRAL PLANT.
5. DT-AHU-1, 2, 3 AND 4 SHALL BE PROVIDED W/ NEW SENSORS AND ACTUATORS. SEE M6.4 FOR ALL REQUIREMENTS.
6. DT-AHU-1, 2, 3 AND 4 CHILLED WATER CONTROL VALVE AND HEATING HOT WATER CONTROL VALVE TO BE REPLACED. MATCH EXISTING SIZES AND CV. IF EXISTING CONTROL VALVES ARE BALL VALVES AND IN GOOD CONDITION (VIF) ONLY REPLACE ACTUATORS TO DDC. CONTRACTOR SHALL FIELD VERIFY AND REPLACE ANY LEAKING ISOLATION VALVES AT COIL CONNECTIONS. FREEZE CHILLED AND HEATING HOT WATER LINES AS NECESSARY TO REPLACE ISOLATION VALVES. SEE NOTE # 8
7. RE-BALANCE SUPPLY AND RETURN ALL AIRFLOW TO PRE-MEASURED VALUES. THE SUPPLY AIRFLOW WITH VFD SHALL BE RE-BALANCE TO PRE-MEASURED RATE BASED ON MAINTAINING THE DUCT STATIC PRESSURE AT A SETPOINT THAT CORRESPONDS TO THE PRE-MEASURED AIRFLOW, REGARDLESS OF THE OA DAMPER POSITION OR FILTER LOADING.

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A
DIAGNOSTIC & TREATMENT CENTER
MECHANICAL ROOF PLAN
1/8"=1'-0"

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SAN MATEO, CALIFORNIA
CONTROLS UPGRADE

SHEET TITLE:
MECHANICAL ROOF PLAN DIAGNOSTIC & TREATMENT CENTER

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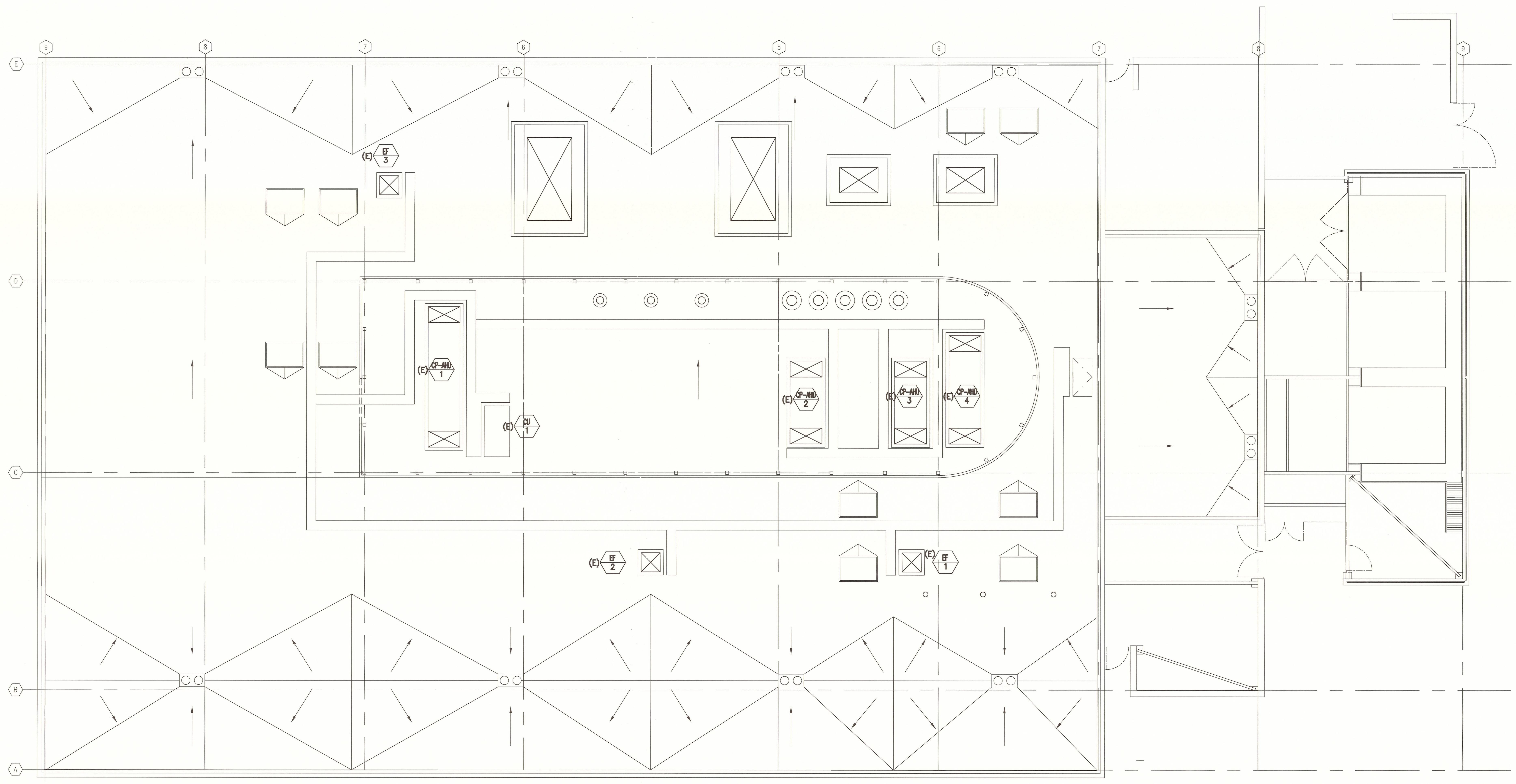

A CENTRAL PLANT MECHANICAL ROOF PLAN

1/8"=1'-0"

PRIOR TO ANY DEMO WORK
PREMEASURE FOLLOWING VALUES & RECORD.
SUBMIT TO ENGINEER FOR APPROVAL

PREMEASURE CP-AHU-1, 2, 4, & 3 AT MIN. OSA & 100% OSA
TOTAL SUPPLY AIRFLOW
TOTAL RETURN AIRFLOW
TOTAL OSA AIRFLOW
STATIC PRESSURE PROFILE OF UNIT
CHILLED WATER FLOW RATE
HEATING HOT WATER FLOW RATE

PRE-MEASUREMENT NOTES:

1. PITOT READING FOR SUPPLY, RETURN AND OSA AIRFLOW WHERE ACCURATE READING IS NOT POSSIBLE, ALTERNATE IS TO PRE-MEASURE ALL DIFFUSERS IN BOTH MIN. OSA AND 100% OSA TO OBTAIN THE TOTAL SUPPLY AND RETURN AIRFLOW.

GENERAL NOTES:

1. FIELD SURVEY EXISTING DAMPERS. PROVIDE ALL ASSOCIATED PLANNING, MODIFICATION TO ACCOMMODATE NEW DAMPER ACTUATOR. AHU SYSTEMS CAN HAVE DOWNTIMES OF VERY LIMITED DURATIONS (NIGHTTIME FOR APPROXIMATELY 2 HOURS, DEPENDING ON SAN MATEO HOSPITAL APPROVAL). PROVIDE NEW DAMPER ACTUATOR AT ONE TIME FOR ONE UNIT WITH MULTIPLE TEAMS TO MINIMIZE DOWNTIME. COORDINATE PLAN FOR REPLACEMENT WITH MEOR AND SAN MATEO HOSPITAL. MINIMUM NUMBER OF DAMPER OPERATOR REQUIRED TO CONTROL RA AND EA DAMPERS AT EACH UNIT ARE:

   QUANTITIES ARE TO BE FIELD VERIFIED
   CP-AHU-1 = 1 DDC DAMPER ACTUATORS
   CP-AHU-2 = 1 DDC DAMPER ACTUATORS
   CP-AHU-3 = 1 DDC DAMPER ACTUATORS
   CP-AHU-4 = 1 DDC DAMPER ACTUATORS

3. COMMISSION CONTROL DAMPERS TO PROVIDE PRE-MEASURED AIR VOLUMES IN MIN OA POSITION. VOLUME TO BE SET FOR CFM AS INDICATED IN ORIGINAL APPROVED DESIGN DOCUMENTS

4. CP-AHU-1, 2, 3 & 4 HAS EXISTING DDC TEMPERATURE CONTROL PANELS LOCATED INSIDE CENTRAL PLANT ARE TO BE REPLACED WITH NEW CONTROL PANEL. PROVIDE SOFTWARE GRAPHICS AND MAP ALL CONTROLS AND SEQUENCE OF OPERATIONS AT NEW DCC CONTROLS WORK STATION PROVIDED IN THE ENGINEER'S OFFICE AT CENTRAL PLANT.

5. CP-AHU-1, 2, 3 & 4 SHALL BE PROVIDED W/ NEW SENSORS AND ACTUATORS. SEE M6.6, M6.7 & M6.8 FOR ALL REQUIREMENTS.

6. CP-AHU-1, 2, 3 & 4 CHILLED WATER CONTROL VALVE AND CP-AHU-3 HEATING HOT WATER CONTROL VALVE TO REMAIN, REPLACE (E) VALVE ACTUATORS WITH DDC ACTUATORS. CONTRACTOR SHALL FIELD VERIFY AND REPLACE ANY LEAKING ISOLATION VALVES AT COIL CONNECTIONS. FREEZE CHILLED AND HEATING HOT WATER LINES AS NECESSARY TO REPLACE ISOLATION VALVES.

7. RE-BALANCE SUPPLY AND RETURN ALL AIRFLOW TO PRE-MEASURED VALUES. THE SUPPLY AIRFLOW WITH VFD SHALL BE RE-BALANCE TO PRE-MEASURED RATE BASED ON MAINTAINING THE DUCT STATIC PRESSURE AT A SETPOINT THAT CORRESPONDS TO THE PRE-MEASURED AIRFLOW, REGARDLESS OF THE OA DAMPER POSITION OR FILTER LOADING.

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

TURLEY & ASSOCIATES
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Exp. 12/31/17
MECHANICAL
STATE OF CALIFORNIA

CONSULTANTS:

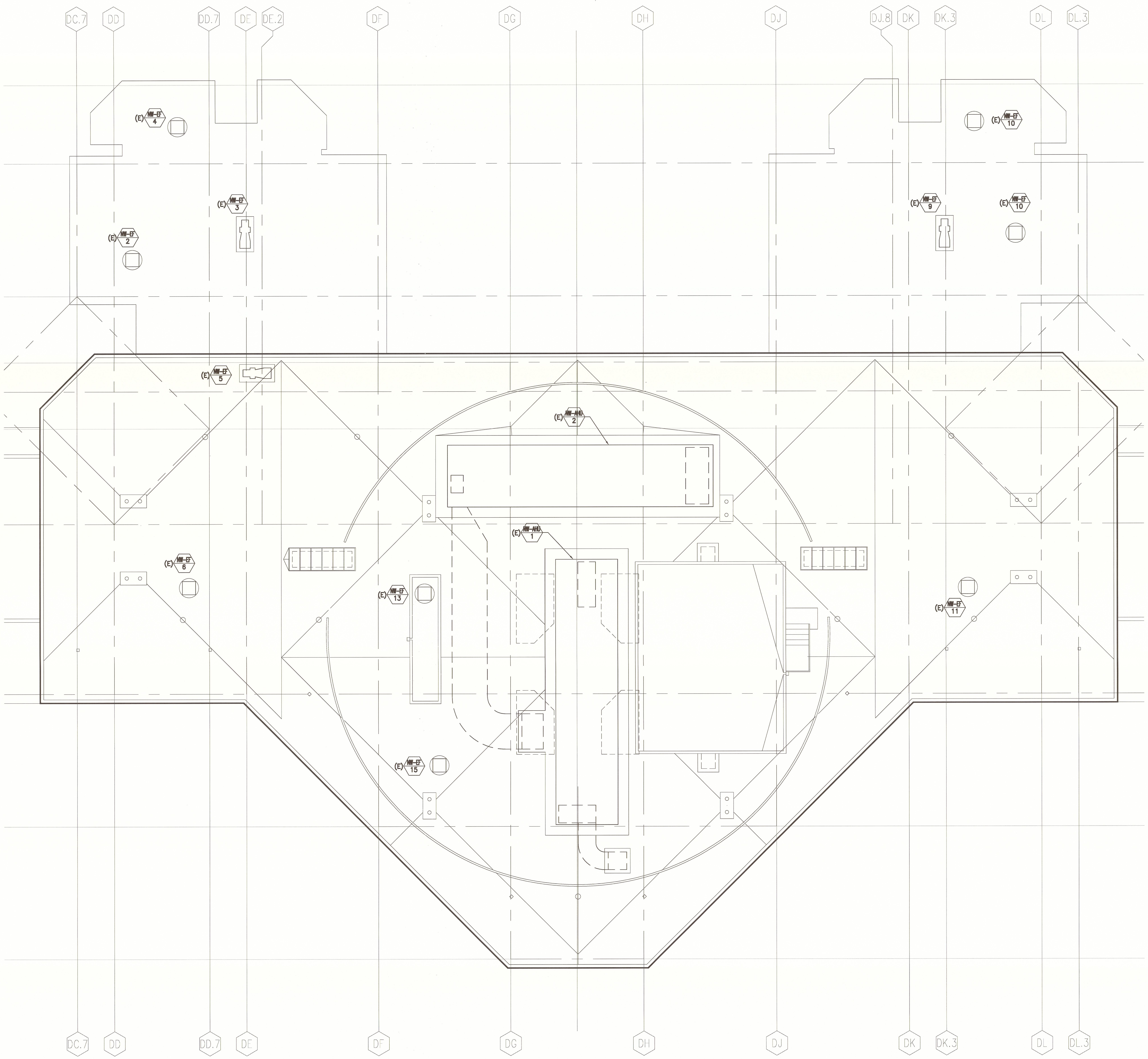
SAN MATEO COUNTY HEALTH CENTER
SAN MATEO, CALIFORNIA
CONTROLS UPGRADE

SHEET TITLE:
CENTRAL PLANT MECHANICAL ROOF PLAN

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:
M3.2

SHEET : OF



A NURSING WING (NW) MECHANICAL ROOF PLAN
1/8"=1'-0"

PRIOR TO ANY DEMO WORK
PREMEASURE FOLLOWING VALUES & RECORD.
SUBMIT TO ENGINEER FOR APPROVAL

PRE-MEASURE NW-AHU-1, AND 2 AT MIN. OSA & 100% OSA MODE
TOTAL SUPPLY AIRFLOW
TOTAL RETURN AIRFLOW
TOTAL OSA AIRFLOW
STATIC PRESSURE PROFILE OF UNIT
CHILLED WATER FLOW RATE
HEATING HOT WATER FLOW RATE

PRE-MEASUREMENT NOTES:

1. PITOT READING FOR SUPPLY, RETURN AND OSA AIRFLOW WHERE ACCURATE READING IS NOT POSSIBLE, ALTERNATE IS TO PRE-MEASURE ALL DIFFUSERS IN BOTH MIN. OSA AND 100% OSA TO OBTAIN THE TOTAL SUPPLY AND RETURN AIRFLOW.

GENERAL NOTES:

1. FIELD SURVEY EXISTING DAMPERS. PROVIDE ALL ASSOCIATED PLANNING, MODIFICATION TO ACCOMMODATE NEW DAMPER ACTUATOR. AHU SYSTEMS CAN HAVE DOWNTIMES OF VERY LIMITED DURATIONS (NIGHTTIME FOR APPROXIMATELY 2 HOURS, DEPENDING ON SAN MATEO HOSPITAL APPROVAL). PROVIDE NEW DAMPER ACTUATOR AT ONE TIME FOR ONE UNIT WITH MULTIPLE TEAMS TO MINIMIZE DOWNTIME. COORDINATE PLAN FOR REPLACEMENT WITH MEOR AND SAN MATEO HOSPITAL. MINIMUM NUMBER OF DAMPER OPERATOR REQUIRED TO CONTROL RA AND EA DAMPERS AT EACH UNIT ARE:

   QUANTITY TO BE FIELD VERIFIED.
   NW-AHU-1 = 2 DDC DAMPER ACTUATORS
   NW-AHU-2 = 2 DDC DAMPER ACTUATORS

3. COMMISSION CONTROL DAMPERS TO PROVIDE PRE-MEASURED AIR VOLUMES IN MIN OA POSITION. VOLUME TO BE SET FOR CFM AS MEASURED UNDER MIN. OA SETTING PRE-MEASUREMENTS.

4. NW-AHU-1, AND NW-AHU-2 HAS EXISTING DDC TEMPERATURE CONTROL PANEL MOUNTED IN AHU CABINET, TO BE REPLACED WITH NEW CONTROL PANEL. PROVIDE SOFTWARE GRAPHICS AND MAP ALL CONTROLS AND SEQUENCE OF OPERATIONS AT NEW DCC CONTROLS WORK STATION PROVIDED IN THE ENGINEER'S OFFICE AT CENTRAL PLANT.

5. AHU-1 AND 2 SHALL BE PROVIDED W/ NEW SENSORS AND ACTUATORS. SEE M6.4 FOR ALL REQUIREMENTS.

6. AHU-1 AND 2 CHILLED WATER CONTROL VALVE AND HEATING HOT WATER CONTROL VALVE TO BE REPLACED. MATCH EXISTING SIZES AND CV. IF EXISTING CONTROL VALVES ARE BALL VALVES AND IN GOOD CONDITION (VIF) ONLY REPLACE ACTUATORS TO DDC. CONTRACTOR SHALL FIELD VERIFY AND REPLACE ANY LEAKING ISOLATION VALVES AT COIL CONNECTIONS. FREEZE CHILLED AND HEATING HOT WATER LINES AS NECESSARY TO REPLACE ISOLATION VALVES.

7. RE-BALANCE SUPPLY AND RETURN ALL AIRFLOW TO PRE-MEASURED VALUES. THE SUPPLY AIRFLOW WITH VFD SHALL BE RE-BALANCE TO PRE-MEASURED RATE BASED ON MAINTAINING THE DUCT STATIC PRESSURE AT A SETPOINT THAT CORRESPONDS TO THE PRE-MEASURED AIRFLOW, REGARDLESS OF THE OA DAMPER POSITION OR FILTER LOADING.

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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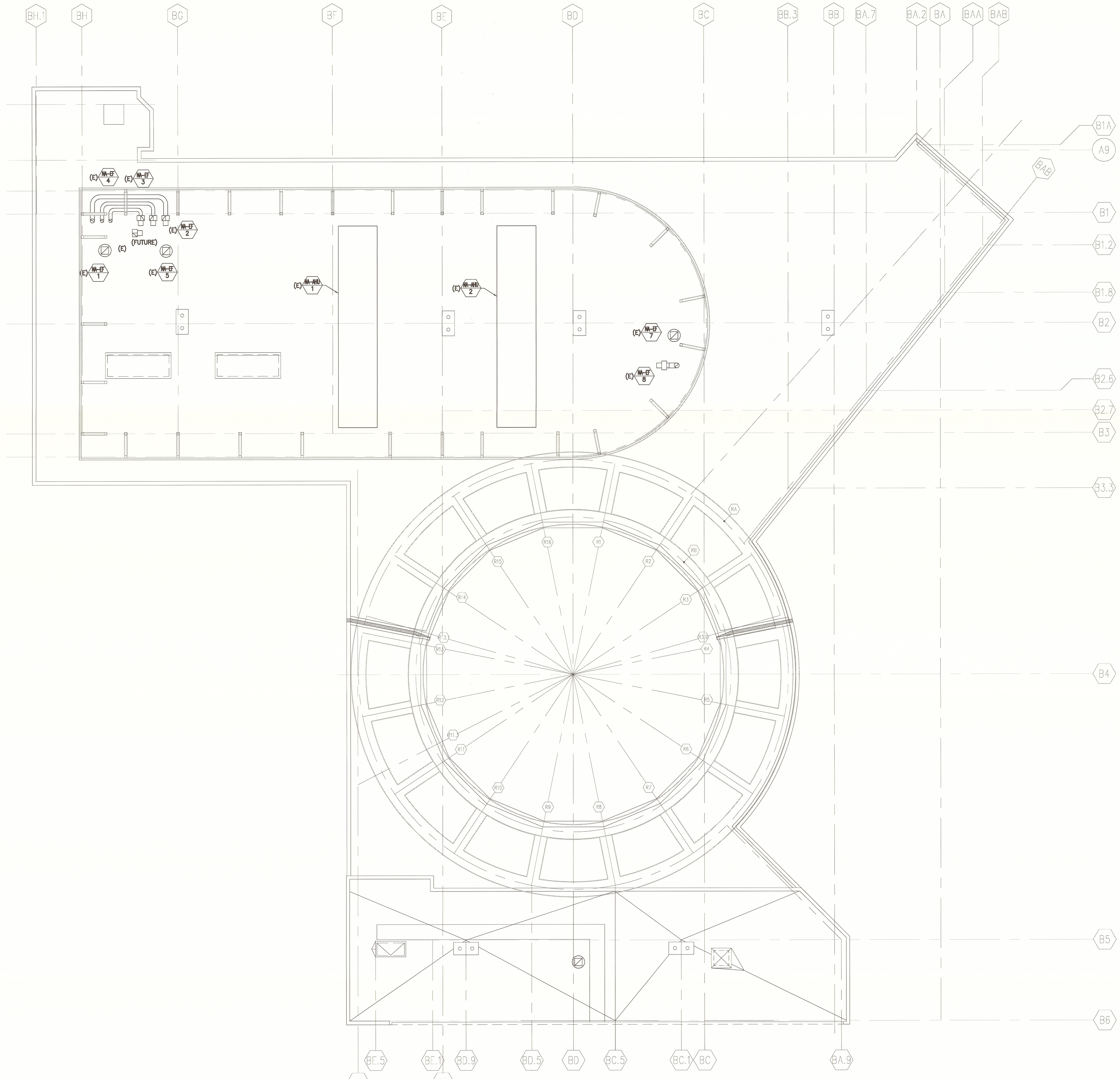
SAN MATEO, CALIFORNIA
CONTROLS UPGRADE

SHEET TITLE:
MECHANICAL ROOF PLAN NURSING WING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:
M3.3

SHEET : OF



A NORTH ADDITION (NA) MECHANICAL ROOF PLAN
1/8"=1'-0"

PRIOR TO ANY DEMO WORK PREMEASURE FOLLOWING VALUES & RECORD. SUBMIT TO ENGINEER FOR APPROVAL.

PREMEASURE NA-AHU-1, AND 2 AT MIN. OSA & 100% OSA
TOTAL SUPPLY AIRFLOW
TOTAL RETURN AIRFLOW
TOTAL OSA AIRFLOW
STATIC PRESSURE PROFILE OF UNIT
CHILLED WATER FLOW RATE
HEATING HOT WATER FLOW RATE

PRE-MEASUREMENT NOTES:

1. PITOT READING FOR SUPPLY, RETURN AND OSA AIRFLOW WHERE ACCURATE READING IS NOT POSSIBLE, ALTERNATE IS TO PRE-MEASURE ALL DIFFUSERS IN BOTH MIN. OSA AND 100% OSA TO OBTAIN THE TOTAL SUPPLY AND RETURN AIRFLOW.

GENERAL NOTES:

1. FIELD SURVEY EXISTING DAMPERS. PROVIDE ALL ASSOCIATED PLANNING, MODIFICATION TO ACCOMMODATE NEW DAMPER ACTUATORS. AHU SYSTEMS CAN HAVE DOWNTIMES OF VERY LIMITED DURATIONS (NIGHTTIME FOR APPROXIMATELY 2 HOURS, DEPENDING ON SAN MATEO HOSPITAL APPROVAL). PROVIDE NEW DAMPER ACTUATORS AT ONE TIME FOR ONE UNIT WITH MULTIPLE TEAMS TO MINIMIZE DOWNTIME. COORDINATE PLAN FOR REPLACEMENT WITH MEOR AND SAN MATEO HOSPITAL. MINIMUM NUMBER OF DAMPER OPERATOR REQUIRED TO CONTROL RA AND EA DAMPERS AT EACH UNIT ARE:

   QUANTITY TO BE FIELD VERIFIED.
   NA-AHU-1 = 1 DDC DAMPER ACTUATORS
   NA-AHU-2 = 1 DDC DAMPER ACTUATORS

3. COMMISSION CONTROL DAMPERS TO PROVIDE PRE-MEASURED AIR VOLUMES IN MIN OA POSITION. VOLUME TO BE SET FOR CFM AS MEASURED UNDER MIN. OA SETTING PRE-MEASUREMENTS.

4. NA-AHU-1, AND NA-AHU-2 HAS EXISTING DDC TEMPERATURE CONTROL PANEL MOUNTED IN AIR HANDLER CABINET TO BE REPLACED WITH NEW CONTROL PANEL. PROVIDE SOFTWARE GRAPHICS AND MAP ALL CONTROLS AND SEQUENCE OF OPERATIONS AT NEW DCC CONTROLS WORK STATION PROVIDED IN THE ENGINEER'S OFFICE AT CENTRAL PLANT.

5. NA-AHU-1 AND NA-AHU-2 SHALL BE PROVIDED W/ NEW SENSORS AND ACTUATORS. SEE M6.4 FOR ALL REQUIREMENTS.

6. NA-AHU-1 AND NA-AHU-2 CHILLED WATER CONTROL VALVE AND HEATING HOT WATER CONTROL VALVE TO BE REPLACED. MATCH EXISTING SIZES AND CV. IF EXISTING CONTROL VALVES ARE BALL VALVES AND IN GOOD CONDITION (VIF) ONLY REPLACE ACTUATORS TO DDC. CONTRACTOR SHALL FIELD VERIFY AND REPLACE ANY LEAKING ISOLATION VALVES AT COIL CONNECTIONS. FREEZE CHILLED AND HEATING HOT WATER LINES AS NECESSARY TO REPLACE ISOLATION VALVES.

7. RE-BALANCE SUPPLY AND RETURN ALL AIRFLOW TO PRE-MEASURED VALUES. THE SUPPLY AIRFLOW WITH VFD SHALL BE RE-BALANCE TO PRE-MEASURED RATE BASED ON MAINTAINING THE DUCT STATIC PRESSURE AT A SETPOINT THAT CORRESPONDS TO THE PRE-MEASURED AIRFLOW, REGARDLESS OF THE OA DAMPER POSITION OR FILTER LOADING.

8. PROVIDE NEW DP SENSOR FOR THE CHILLED WATER AND HOT WATER AT NA-AHU-1. SEE M6.1A AND M6.2 FOR ADDITIONAL REQUIREMENTS

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 03 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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STATE OF CALIFORNIA

CONSULTANTS:

SAN MATEO COUNTY HEALTH CENTER
SAN MATEO, CALIFORNIA
CONTROLS UPGRADE

SHEET TITLE:

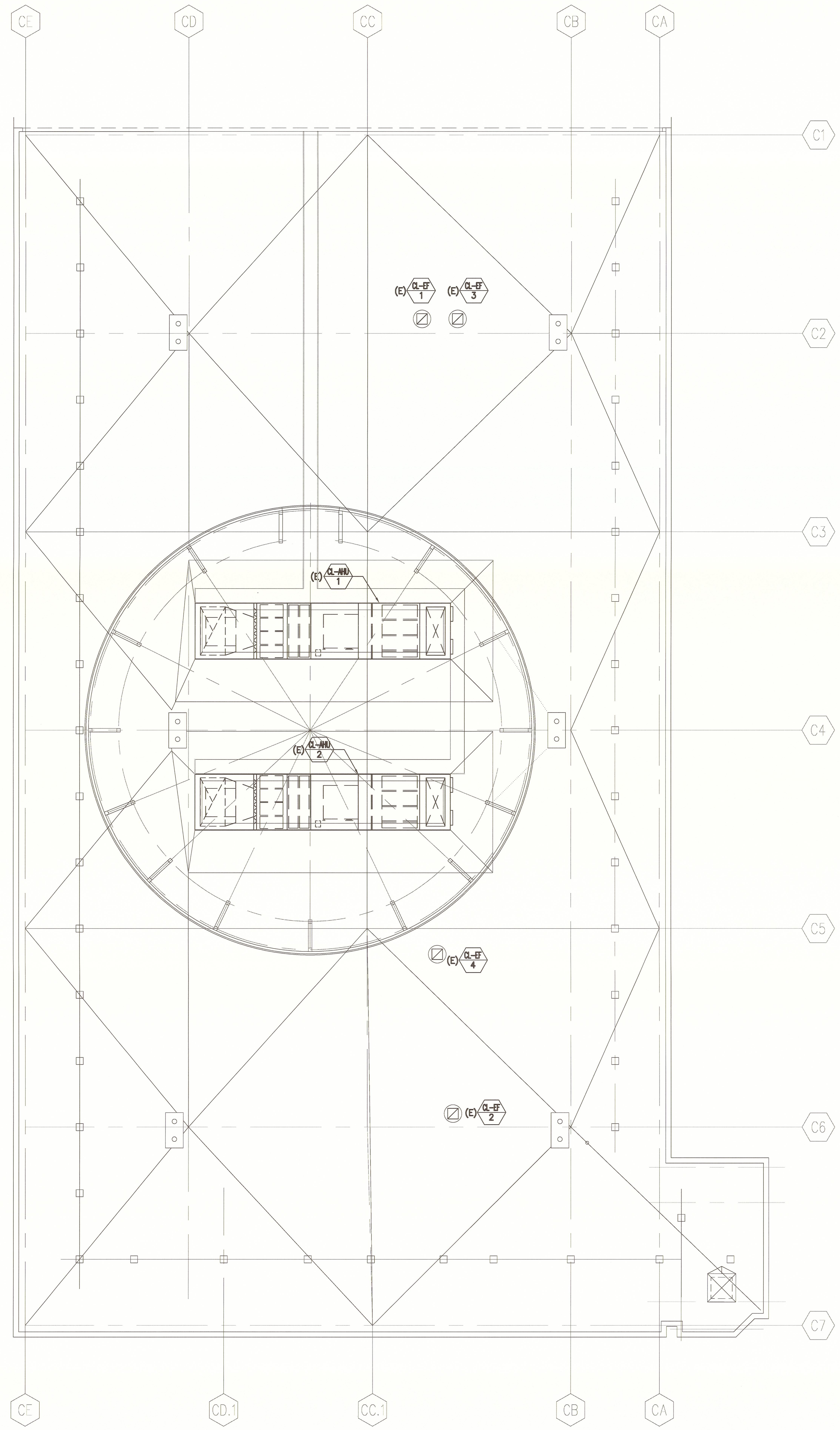
MECHANICAL ROOF PLAN NORTH ADDITION

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M3.4

SHEET : OF



A

CLINIC
MECHANICAL ROOF PLAN
1/8"=1'-0"

PRIOR TO ANY DEMO WORK
PREMEASURE FOLLOWING VALUES & RECORD.
SUBMIT TO ENGINEER FOR APPROVAL

PREMEASURE CL-AHU-1, AND 2 AT MIN. OSA & 100% OSA
TOTAL SUPPLY AIRFLOW
TOTAL RETURN AIRFLOW
TOTAL OSA AIRFLOW
STATIC PRESSURE PROFILE OF UNIT
CHILLED WATER FLOW RATE
HEATING HOT WATER FLOW RATE

PRE-MEASUREMENT NOTES:

1. PITOT READING FOR SUPPLY, RETURN AND OSA AIRFLOW WHERE ACCURATE READING IS NOT POSSIBLE, ALTERNATE IS TO PRE-MEASURE ALL DIFFUSERS IN BOTH MIN. OSA AND 100% OSA TO OBTAIN THE TOTAL SUPPLY AND RETURN AIRFLOW.

GENERAL NOTES:

1. FIELD SURVEY EXISTING DAMPERS. PROVIDE ALL ASSOCIATED PLANNING, MODIFICATION TO ACCOMMODATE NEW DAMPER ACTUATOR. AHU SYSTEMS CAN HAVE DOWNTIMES OF VERY LIMITED DURATIONS (NIGHTTIME FOR APPROXIMATELY 2 HOURS, DEPENDING ON SAN MATEO HOSPITAL APPROVAL). PROVIDE NEW DAMPER ACTUATOR AT ONE TIME FOR ONE UNIT WITH MULTIPLE TEAMS TO MINIMIZE DOWNTIME. COORDINATE PLAN FOR REPLACEMENT WITH MEOR AND SAN MATEO HOSPITAL. MINIMUM NUMBER OF DAMPER OPERATOR REQUIRED TO CONTROL RA AND EA DAMPERS AT EACH UNIT ARE:

   QUANTITIES TO BE FIELD VERIFIED:
   CL-AHU-1 = 1 DDC DAMPER ACTUATORS
   CL-AHU-2 = 1 DDC DAMPER ACTUATORS

3. COMMISSION CONTROL DAMPERS TO PROVIDE PRE-MEASURED AIR VOLUMES IN MIN OA POSITION. VOLUME TO BE SET FOR CFM AS MEASURED UNDER MIN. OA SETTING PRE-MEASUREMENTS.

4. CL-AHU-1, AND CL-AHU-2 HAS EXISTING DDC TEMPERATURE CONTROL PANEL LOCATED IN AHU CABINET TO BE REPLACED WITH NEW CONTROL PANEL. PROVIDE SOFTWARE GRAPHICS AND MAP ALL CONTROLS AND SEQUENCE OF OPERATIONS AT NEW DCC CONTROLS WORK STATION PROVIDED IN THE ENGINEER'S OFFICE AT CENTRAL PLANT.

5. AHU-1 AND 2 SHALL BE PROVIDED W/ NEW SENSORS AND ACTUATORS. SEE M6.5 FOR ALL REQUIREMENTS.

6. AHU-1 AND 2 CHILLED WATER CONTROL VALVE AND HEATING HOT WATER CONTROL VALVE TO BE REPLACED. MATCH EXISTING SIZES AND CV. IF EXISTING CONTROL VALVES ARE BALL VALVES AND IN GOOD CONDITION (VIF) ONLY REPLACE ACTUATORS TO DDC. CONTRACTOR SHALL FIELD VERIFY AND REPLACE ANY LEAKING ISOLATION VALVES AT COIL CONNECTIONS. FREEZE CHILLED AND HEATING HOT WATER LINES AS NECESSARY TO REPLACE ISOLATION VALVES.

7. RE-BALANCE SUPPLY AND RETURN ALL AIRFLOW TO PRE-MEASURED VALUES. THE SUPPLY AIRFLOW WITH VFD SHALL BE RE-BALANCE TO PRE-MEASURED RATE BASED ON MAINTAINING THE DUCT STATIC PRESSURE AT A SETPOINT THAT CORRESPONDS TO THE PRE-MEASURED AIRFLOW, REGARDLESS OF THE OA DAMPER POSITION OR FILTER LOADING.

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 22 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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CONSULTANTS:

SAN MATEO COUNTY HEALTH CENTER
SAN MATEO, CALIFORNIA
CONTROLS UPGRADE

SHEET TITLE:

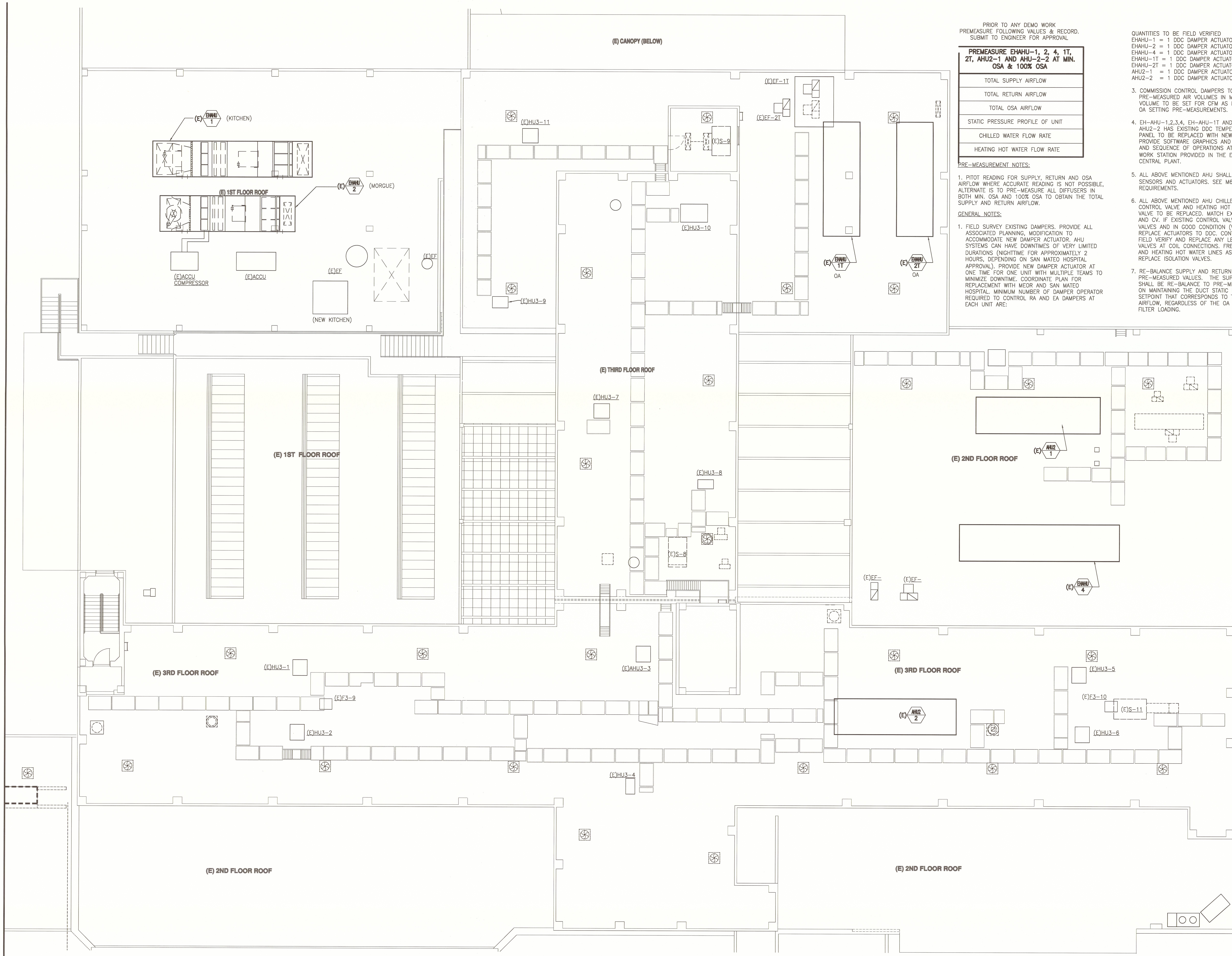
MECHANICAL ROOF PLAN CLINIC

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M3.5

SHEET : OF



PRIOR TO ANY DEMO WORK
PREMEASURE FOLLOWING VALUES & RECORD.
SUBMIT TO ENGINEER FOR APPROVAL

PREMEASURE EHAHU-1, 2, 4, 1T, 2T, AHU2-1 AND AHU-2-2 AT MIN. OSA & 100% OSA
TOTAL SUPPLY AIRFLOW
TOTAL RETURN AIRFLOW
TOTAL OSA AIRFLOW
STATIC PRESSURE PROFILE OF UNIT
CHILLED WATER FLOW RATE
HEATING HOT WATER FLOW RATE

PRE-MEASUREMENT NOTES:

1. PITOT READING FOR SUPPLY, RETURN AND OSA AIRFLOW WHERE ACCURATE READING IS NOT POSSIBLE, ALTERNATE IS TO PRE-MEASURE ALL DIFFUSERS IN BOTH MIN. OSA AND 100% OSA TO OBTAIN THE TOTAL SUPPLY AND RETURN AIRFLOW.

GENERAL NOTES:

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QUANTITIES TO BE FIELD VERIFIED
EHAHU-1 = 1 DDC DAMPER ACTUATORS
EHAHU-2 = 1 DDC DAMPER ACTUATORS
EHAHU-4 = 1 DDC DAMPER ACTUATORS
EHAHU-1T = 1 DDC DAMPER ACTUATORS
EHAHU-2T = 1 DDC DAMPER ACTUATORS
AHU2-1 = 1 DDC DAMPER ACTUATORS
AHU2-2 = 1 DDC DAMPER ACTUATORS

3. COMMISSION CONTROL DAMPERS TO PROVIDE PRE-MEASURED AIR VOLUMES IN MIN OA POSITION. VOLUME TO BE SET FOR CFM AS MEASURED UNDER MIN. OA SETTING PRE-MEASUREMENTS.

4. EH-AHU-1,2,3,4, EH-AHU-1T AND 2T, AND AHU2-1 AND AHU2-2 HAS EXISTING DDC TEMPERATURE CONTROL PANEL TO BE REPLACED WITH NEW CONTROL PANEL. PROVIDE SOFTWARE GRAPHICS AND MAP ALL CONTROLS AND SEQUENCE OF OPERATIONS AT NEW DCC CONTROLS WORK STATION PROVIDED IN THE ENGINEER'S OFFICE AT CENTRAL PLANT.

5. ALL ABOVE MENTIONED AHU SHALL BE PROVIDED W/ NEW SENSORS AND ACTUATORS. SEE M6.# FOR ALL REQUIREMENTS.

6. ALL ABOVE MENTIONED AHU CHILLED WATER CONTROL VALVE AND HEATING HOT WATER CONTROL VALVE TO BE REPLACED. MATCH EXISTING SIZES AND CV. IF EXISTING CONTROL VALVES ARE BALL VALVES AND IN GOOD CONDITION (VIF) ONLY REPLACE ACTUATORS TO DDC. CONTRACTOR SHALL FIELD VERIFY AND REPLACE ANY LEAKING ISOLATION VALVES AT COIL CONNECTIONS. FREEZE CHILLED AND HEATING HOT WATER LINES AS NECESSARY TO REPLACE ISOLATION VALVES.

7. RE-BALANCE SUPPLY AND RETURN ALL AIRFLOW TO PRE-MEASURED VALUES. THE SUPPLY AIRFLOW WITH VFD SHALL BE RE-BALANCE TO PRE-MEASURED RATE BASED ON MAINTAINING THE DUCT STATIC PRESSURE AT A SETPOINT THAT CORRESPONDS TO THE PRE-MEASURED AIRFLOW, REGARDLESS OF THE OA DAMPER POSITION OR FILTER LOADING.

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

A ADMINISTRATION WING
MECHANICAL ROOF PLAN
1/8"=1'-0"

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CONSULTANTS:

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SAN MATEO, CALIFORNIA
CONTROLS UPGRADE

SHEET TITLE:

MECHANICAL ROOF PLAN ADMINISTRATION WING

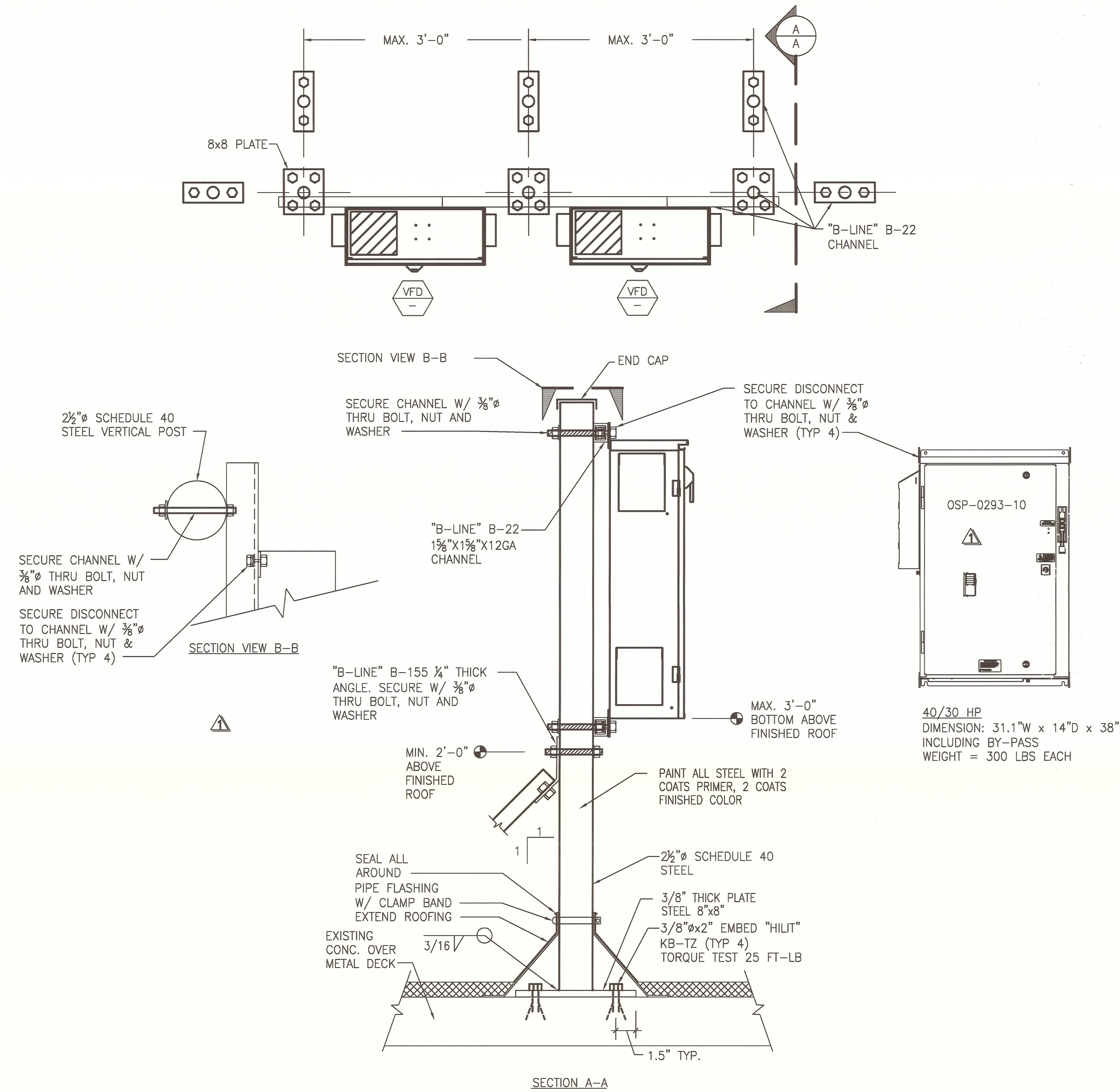
NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M3.6

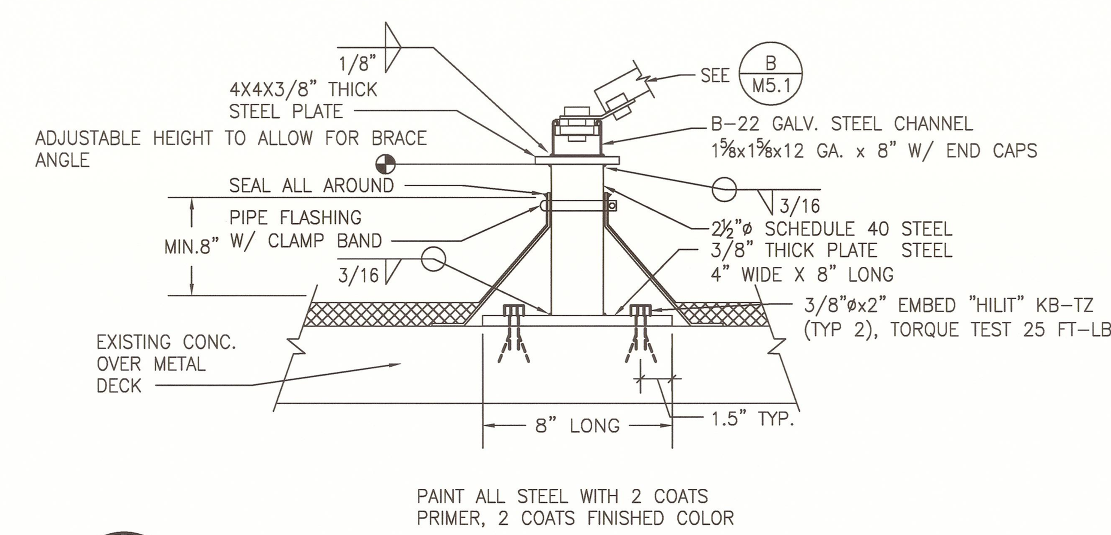
Project Engineer:	BP	Job Number:	13297
Project Manager:	NS	Plot Date: April 28th 2016	
Project Drafter:	MA	Login: nshah	

SHEET : OF



A VFD MOUNTING DETAIL AT PENTHOUSE

NO SCALE



PAINT ALL STEEL WITH 2 COATS PRIMER, 2 COATS FINISHED COLOR

G BRACE SUPPORT DETAIL

NO SCALE

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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SAN MATEO, CALIFORNIA

CONTROLS UPGRADE

SHEET TITLE:

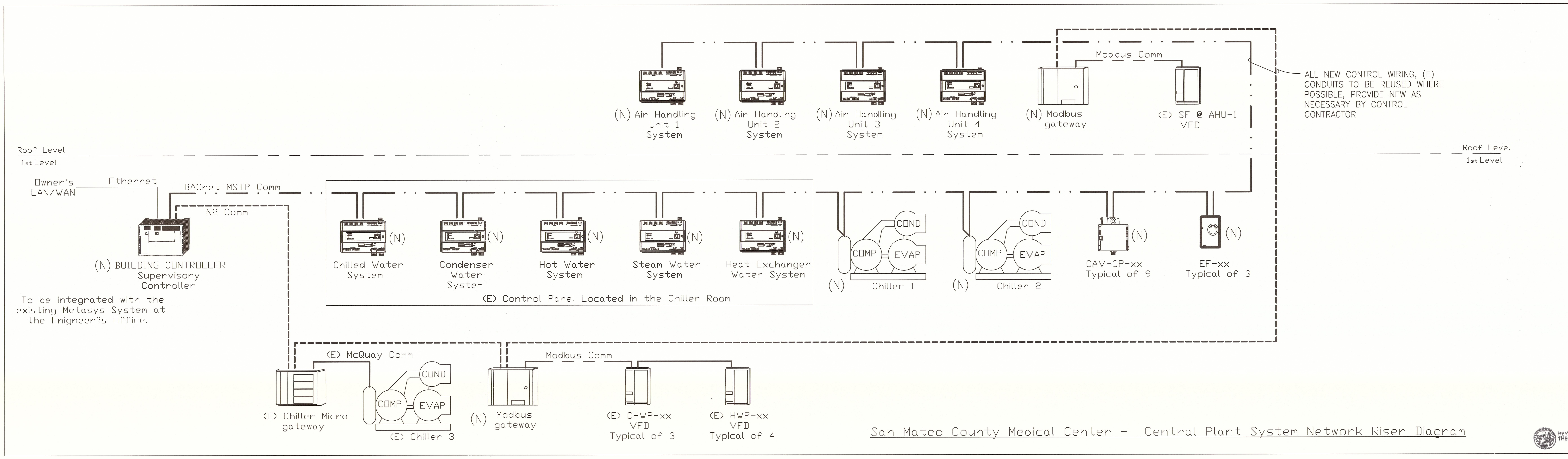
MECHANICAL DETAILS

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

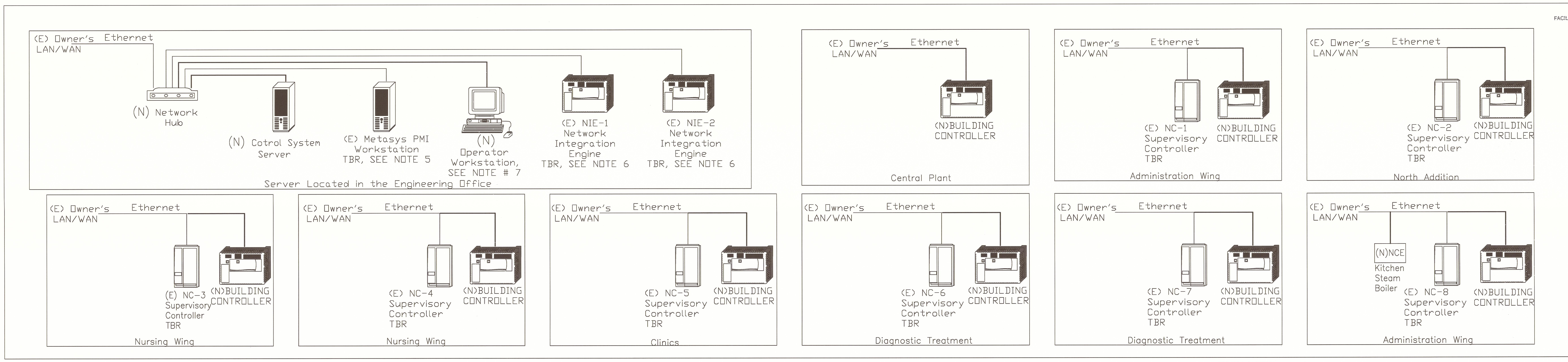
SHEET NUMBER:

M5.1

SHEET : OF



San Mateo County Medical Center - Central Plant System Network Riser Diagram



ENERGY DASHBOARD

CONTROLS CONTRACTOR SHALL PROVIDE AND PROGRAM A SCALABLE ENERGY DASHBOARD (PLATFORM) CAPABLE OF CONSOLIDATING AND NORMALIZING BUILDING SYSTEM DATA INTO A CENTRAL DATABASE AND APPLYING ANALYTICAL TOOLS TO GENERATE GRAPHICAL FRAMEWORK FOR SAN MATEO HOSPITAL.

THE ENERGY DASHBOARD SHALL BE PANOPTIX BY JCI OR KNOW EQUAL (PERISCOPE, DGLOGIK)

ENERGY DASHBOARD SHALL BE CAPABLE OF FOLLOWING

- ABILITY TO UPLOAD SAN MATEO COUNTY IMAGES TO CUSTOMIZE DASHBOARD
- WIDGETS SUCH AS COMPARISONS, WEATHER & GREEN TIPS
- REAL TIME MONITORING OF UTILITY CONSUMPTION AT A CAMPUS LEVEL. MONITORING OF UP TO MIN. OF TEN CONSUMPTION DATA POINTS FOR REPRESENTATION ON THE DASHBOARD

CONTRACTOR SHALL BE RESPONSIBLE TO SCALE PULSE UTILITY METER & SYSTEM DATA POINTS TO REPRESENT ON THE DASHBOARD.

- ONE (1) MAIN ELECTRIC METER
- ONE (1) MAIN GAS METER
- THREE (3) DOMESTIC WATER METER
- CHILLED WATER LOAD
- HEATING HOT WATER LOAD
- STEAM LOAD
- COORDINATE W/ SAN MATEO PROJECT MANAGER FOR ANY ADDITIONAL SUB-METER

SAN MATEO COUNTY MEDICAL CENTER – GLOBAL SYSTEMS NETWORK RISER DIAGRAM

NO SCALE

SHEET NOTES:

1. ALL EQUIPMENT AND WIRING IS NEW UNLESS NOTED EXISTING OR (E).
2. ALL EXISTING SUPERVISORY CONTROLLERS NC-1 THROUGH NC-8 DEDICATED TO INDIVIDUAL BUILDINGS ARE ALREADY CONNECTED TO DOWN STREAM EQUIPMENT AND CONTROLLED BY JCI. CONTRACTOR IS RESPONSIBLE TO MAP ALL NEW AND EXISTING POINTS, AND SEQUENCE OF OPERATIONS WITH NEW APPLICATION DATA SERVER WORK STATION.
3. PROVIDE ALL NECESSARY WIRING AND CONTROL EQUIPMENT DEEMED NECESSARY TO ACCOMPLISH REVISED AND/OR CONTINUED OPERATION OF CONNECTED MECHANICAL EQUIPMENT NOT LIMITED TO AHU, PUMP, BOILERS ETC.
4. EXISTING GPL IN EACH NC (SUPERVISORY CONTROLLER) TO BE RE-WRITTEN AND CONVERTED TO NEW BUILDING CONTROLLER
5. ONCE ALL NCM'S HAVE BEEN REMOVED FROM METASYS PM1. THE PM1 WORKSTATION CAN BE REMOVED.
6. NIE'S UTILIZED TO COMMUNICATE WITH NCM'S TO EXTENDED ARCHITECTURE TO BE REMOVED ONCE ASSOCIATED NC'S ARE DEMOED.
7. PROVIDE TWO NEW OPERATORS WORK STATION, ONE AT OFFICE & ONE AT VESTIBULE NEXT TO CHILLER ROOM
8. **ARCHITECTURE AND CONTROLLERS SHOWN ARE BASED ON METASYS PRODUCT LINE. EQUIVALENT FACILITY EXPLORER (FX) LINE OF CONTROLLERS ARE ACCEPTABLE**

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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SAN MATEO, CALIFORNIA

CONTROLS UPGRADE

SHEET TITLE:

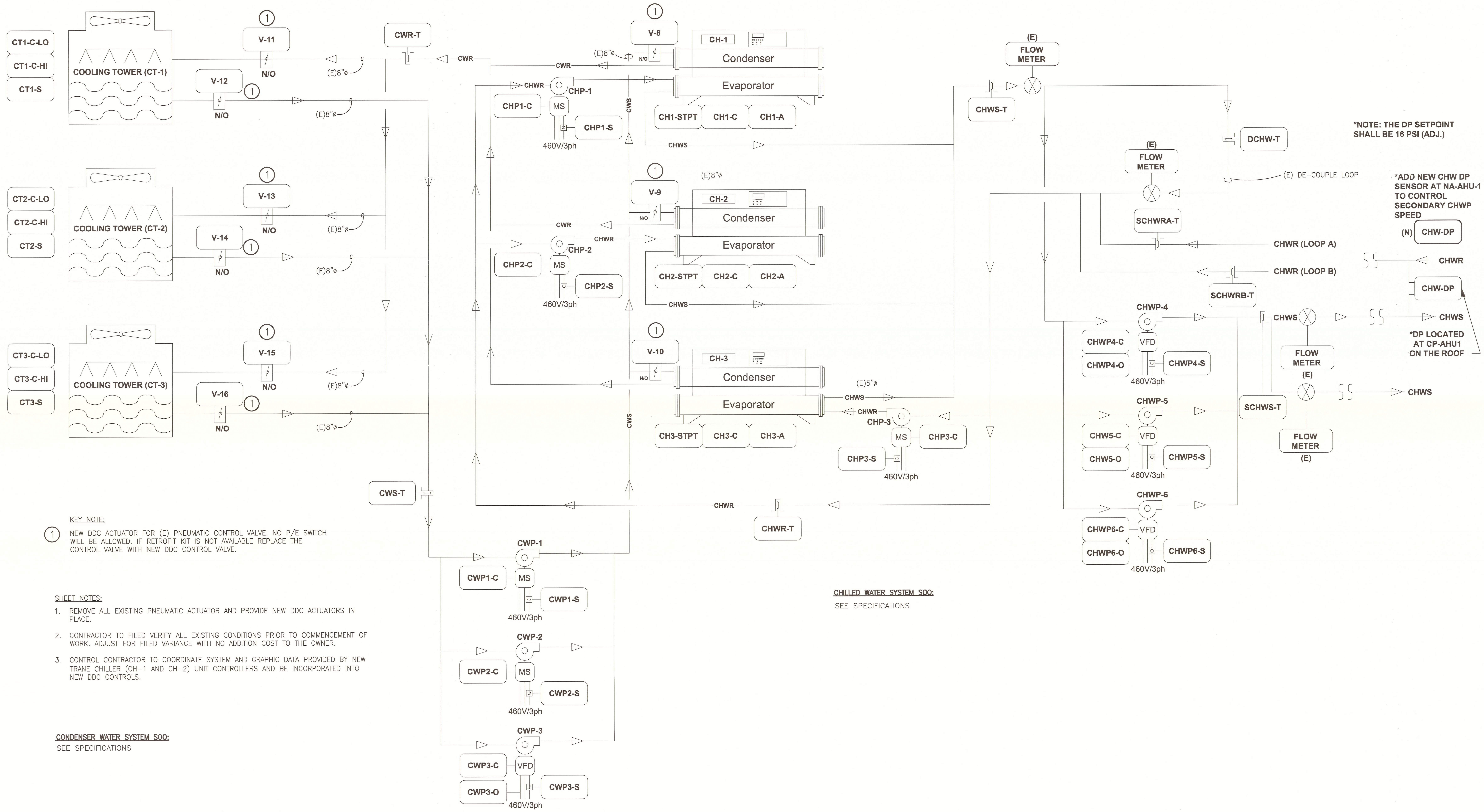
CONTROLS SYSTEM ARCHITECTURE DIAGRAM

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.0

SHEET : OF



KEY NOTE:

1. NEW DDC ACTUATOR FOR (E) PNEUMATIC CONTROL VALVE. NO P/E SWITCH WILL BE ALLOWED. IF RETROFIT KIT IS NOT AVAILABLE REPLACE THE CONTROL VALVE WITH NEW DDC CONTROL VALVE.

SHEET NOTES:

1. REMOVE ALL EXISTING PNEUMATIC ACTUATOR AND PROVIDE NEW DDC ACTUATORS IN PLACE.
2. CONTRACTOR TO FILED VERIFY ALL EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF WORK. ADJUST FOR FILED VARIANCE WITH NO ADDITION COST TO THE OWNER.
3. CONTROL CONTRACTOR TO COORDINATE SYSTEM AND GRAPHIC DATA PROVIDED BY NEW TRANE CHILLER (CH-1 AND CH-2) UNIT CONTROLLERS AND BE INCORPORATED INTO NEW DDC CONTROLS.

CONDENSER WATER SYSTEM SOO:
SEE SPECIFICATIONS

CHILLED WATER SYSTEM SOO:
SEE SPECIFICATIONS

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CONTROLS UPGRADE

SHEET TITLE:
CHILLED & CONDENSER WATER SYSTEM CONTROL DIAGRAM

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:
M6.1A

SHEET : OF

CHILLER & CHILLED WATER SYSTEM

Description	Type	Device	New Device	New Point	Trend Logging Commissioning	Trend Logging Continuous	Calibration	
CH-1 on/off	DO	Connect to chiller enable contact on chiller panel	NO	NO	COV	COV		
CH-2 on/off	DO	Connect to chiller enable contact on chiller panel	NO	NO	COV	COV		
CH-3 on/off	DO	Connect to chiller enable contact "MCQUAY" MICRO GATEWAY	NO	NO	COV	COV		
CH-1 Isolation Valve	DO	V-8	YES	NO	COV	COV		
CH-2 Isolation Valve	DO	V-9	YES	NO	COV	COV		
CH-3 Isolation Valve	DO	V-10	YES	NO	COV	COV		
CH-1 CHWST Setpoint	AO	Connect to input in chiller panel	NO	NO	1 min.	5 min.		
CH-2 CHWST Setpoint	AO	Connect to input in chiller panel	NO	NO	1 min.	5 min.		
CH-3 CHWST Setpoint	AO	Connect to chiller enable contact "MCQUAY" MICRO GATEWAY	NO	NO	1 min.	5 min.		
CH-1 Alarm	DI	Connect to contact in chiller panel	NO	NO	COV	COV		
CH-2 Alarm	DI	Connect to contact in chiller panel	NO	NO	COV	COV		
CH-3 Alarm	DI	Connect to chiller enable contact "MCQUAY" MICRO GATEWAY	NO	NO	COV	COV		
CHP-1 Start (enable)	DO	Connect to contact in starter	NO	NO	COV	COV		
CHP-2 Start (enable)	DO	Connect to contact in starter	NO	NO	COV	COV		
CHP-3 Start (enable)	DO	Connect to contact in starter	NO	NO	COV	COV		
CHP-1 Status	DI	Current Sensor	NO	NO	COV	COV		
CHP-2 Status	DI	Current Sensor	NO	NO	COV	COV		
CHP-3 Status	DI	Current Sensor	NO	NO	COV	COV		
CHWR Temperature Primary Loop	AI	Temperature Sensor	NO	NO	5 min.	15 min.	F	
CHWS temperature Primary Loop	AI	Temperature Sensor	YES	NO	5 min.	15 min.	F	
CHWP-4 Start (enable)	DO	Connect to VFD enable	NO	NO				
CHWP-5 Start (enable)	DO	Connect to VFD enable	NO	NO				
CHWP-6 Start (enable)	DO	Connect to VFD enable	NO	NO				
CHWP-4 Speed	AO	Connect to VFD	NO	NO				
CHWP-5 Speed	AO	Connect to VFD	NO	NO				
CHWP-6 Speed	AO	Connect to VFD	NO	NO				
CHWP-4 Status	DI	Connect to VFD status	NO	NO	COV	COV		
CHWP-5 Status	DI	Connect to VFD status	NO	NO	COV	COV		
CHWP-6 Status	DI	Connect to VFD status	NO	NO	COV	COV		
CHW flow -Primary Supply Loop	AI	Flow Meter	NO	NO	5 min.	10 min.		
CHW flow - De-coupled Loop	AI	Flow Meter	NO	NO	5 min.	10 min.		
SCHWS Flow - Loop A	AI	Flow Meter	NO	NO	5 min.	10 min.		
SCHWS Flow - Loop B	AI	Flow Meter	NO	NO	5 min.	10 min.		
SCHWS Temperture	AI	Temperature Sensor	YES	NO	5 min.	15 min.	F	
SCHWR Temperature - Loop A	AI	Temperature Sensor	YES	NO	5 min.	15 min.	F	
SCHWR Temperature - Loop B	AI	Temperature Sensor	YES	NO	5 min.	15 min.	F	
CHW-DP, Differential Pressure Loop -A	AI	DPT, 0-50 psig, located at AHU-1 AT Central Plant	YES	NO	5 min.	15 min.		LOCATED ON COOLING COIL OF CP-AHU-1
CHW-DP, Differential Pressure Loop -A	AI	DPT, 0-50 psig	YES	YES	5 min.	15 min.		LOCATED ON COOLING COIL OF NW-AHU-1
DCHW-T, DE-COUPLE LOOP TEMPERATURE	AI	Temperature Sensor	NO	NO	5 min.	15 min.	F	

COOLING TOWER & CONDENSER PUMP

Description	Type	Device	New Device	New Point	Trend Logging Commissioning	Trend Logging Continuous	Calibration
CWS-T temperature	AI	Temperature Sensor	YES	NO	5 min.	15 min.	F
CWR-T temperature	AI	Temperature Sensor	YES	NO	5 min.	15 min.	F
CWP-1 Start (enable)	DO	Connect to contact in starter	NO	NO	COV	COV	
CWP-2 Start (enable)	DO	Connect to contact in starter	NO	NO	COV	COV	
CWP-3 Start (enable)	DO	Connect to VFD	NO	NO	COV	COV	
CWP-1 Status	DI	Current Sensor	NO	NO	COV	COV	
CWP-2 Status	DI	Current Sensor	NO	NO	COV	COV	
CWP-3 Status	DI	Connect to VFD	NO	NO	COV	COV	
CWP-3 Speed	AO	Connect to VFD					
CT-1 High Speed Start	DO	Connect to contact in starter	NO	NO	COV	COV	
CT-1 Low Speed Start	DO	Connect to contact in starter	NO	NO	COV	COV	
CT-2 High Speed Start	DO	Connect to contact in starter	NO	NO	COV	COV	
CT-2 Low Speed Start	DO	Connect to contact in starter	NO	NO	COV	COV	
CT-3 High Speed Start	DO	Connect to contact in starter	NO	NO	COV	COV	
CT-3 Low Speed Start	DO	Connect to contact in starter	NO	NO	COV	COV	
CT-1 Status	DI	Current Sensor	NO	NO	COV	COV	
CT-2 Status	DI	Current Sensor	NO	NO	COV	COV	
CT-2 Status	DI	Current Sensor	NO	NO	COV	COV	
CT-1 Isolation Valve	DO	V-11	YES	NO	COV	COV	
CT-1 Isolation Valve	DO	V-12	YES	NO	COV	COV	
CT-2 Isolation Valve	DO	V-13	YES	NO	COV	COV	
CT-2 Isolation Valve	DO	V-14	YES	NO	COV	COV	
CT-3 Isolation Valve	DO	V-15	YES	NO	COV	COV	
CT-3 Isolation Valve	DO	V-16	YES	NO	COV	COV	

REFRIGERAT MONITORING

Description	Type	Device	New Device	New Point	Trend Logging Commissioning	Trend Logging Continuous	Calibration
CHILLER/PUMP BREAK GLASS	DI		NO	NO			
VENTILATION FAN SWITCH	DI		NO	NO			
PURGE SWITCH	DI		NO	NO			
REFRIGERAT MONITORING COMMON ERROR	DI		NO	NO			
REFRIGERANT MONITOR POWER FAILURE	DI		NO	NO			
REFRIGERANT MONITOR TROUBLE	DI		NO	NO			
REFRIGERANT ALARM-A	DI		NO	NO			
REFRIGERANT ALARM-B	DI		NO	NO			
REFRIGERANT MONITOR UPS POWER ON	DI		NO	NO			
REFRIGERANT MONITOR UTILITY POWER ON	DI		NO	NO			

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CONSULTANTS:

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SAN MATEO, CALIFORNIA

CONTROLS UPGRADE

SHEET TITLE:

CHILLED & CONDENSER WATER SYSTEM CONTROL DIAGRAM

NO.	REVISIONS	DATE	BY
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2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.1B

SHEET : OF

TRANE

Proprietary information of Trane. May Only be used to conduct Trane business.

Rev2.1, 11/15/04 KJH

UC800 Chillers
Object Data Points and Configurations for CenTraVac, CenTraVac Duplex, and Panel Upgrade
(Sorted by Instance Number)

NOTE: AI= Analog Inputs, AV= Analog Values, BI= Binary Inputs, BV= Binary Values, MI= Multi-state Inputs, MV= Multi-state Values

Object Type	Instance #	Object Name	CenTraVac	Present Value	Relinquished Default	Range	Units of Measure
AI	1	Unit Average Line Current					Current (Amps)
AI	2	Active Current Limit Setpoint	•				Temperature (°F or °C)
AI	3	Active Base Loading Setpoint	•				Temperature (°F or °C)
AI	4	Unit Power Consumption					Power - Electrical (kW)
AI	5	Calculated Chiller Capacity	•				Power - Cooling (Tons, kW)
AI	7	Active Cool/Heat Setpoint Temperature	•				Temperature (°F or °C)
AI	8	Evaporator Leaving Water Temperature	•				Temperature (°F or °C)
AI	9	Evaporator Entering Water Temperature	•				Temperature (°F or °C)
AI	10	Condenser Entering Water Temperature	•				Temperature (°F or °C)
AI	11	Condenser Leaving Water Temperature	•				Temperature (°F or °C)
AI	12	Approximate Evaporator Water Flow	•				Fluid Flow (gpm, L/S, m3/h)
AI	13	Unfiltered Evap Differential Wtr Press	•				Fluid Pressure (PSI, kPa)
AI	14	Approximate Condenser Water Flow	•				Fluid Flow (gpm, L/S, m3/h)
AI	15	Condenser Differential Water Pressure	•				Fluid Pressure (PSI, kPa)
AI	16	Second Condenser Entering Water Temperature	•				Temperature (°F or °C)
AI	17	Second Condenser Leaving Water Temperature	•				Temperature (°F or °C)
AI	18	AFD Last Diagnostic Code (decimal)					None
AI	18	AFD Last Diagnostic Code Ckt1					None
AI	19	Front Panel Chilled Water Setpoint	•				Temperature (°F or °C)
AI	20	Front Panel Current Limit Setpoint	•				Temperature (°F or °C)
AI	21	Front Panel Hot Water Setpoint	•				Temperature (°F or °C)
AI	22	Front Panel Base Load Setpoint	•				Temperature (°F or °C)
AI	23	External Chilled Water Setpoint	•				Temperature (°F or °C)
AI	24	External Current Limit Setpoint	•				Temperature (°F or °C)
AI	25	External Base Loading Setpoint	•				Temperature (°F or °C)
AI	26	Refrigerant Monitor	•				Parts-per-million (PPM)
AI	27	Evap Rfgt Pressure	•				Fluid Pressure (PSI, kPa)
AI	27	Evaporator Refrigerant Pressure Ckt1					Fluid Pressure (PSI, kPa)
AI	28	Condenser Refrigerant Pressure	•				Fluid Pressure (PSI, kPa)
AI	28	Condenser Refrigerant Pressure Ckt1					Fluid Pressure (PSI, kPa)
AI	29	Differential Refrigerant Pressure	•				Fluid Pressure (PSI, kPa)
AI	30	Oil Tank Pressure	•				Fluid Pressure (PSI, kPa)
AI	30	Oil Tank Pressure Ckt1					Fluid Pressure (PSI, kPa)
AI	31	Oil Pump Discharge Pressure	•				Fluid Pressure (PSI, kPa)
AI	31	Oil Pump Discharge Pressure Ckt1					Fluid Pressure (PSI, kPa)
AI	32	Oil Differential Pressure	•				Fluid Pressure (PSI, kPa)
AI	32	Oil Differential Pressure Ckt1					Fluid Pressure (PSI, kPa)
AI	33	Oil Tank Temperature	•				Temperature (°F or °C)
AI	33	Oil Tank Temperature Ckt1					Temperature (°F or °C)
AI	34	Evaporator Saturated Refrigerant Temperature	•				Temperature (°F or °C)
AI	34	Evaporator Saturated Rfgt Temp Ckt1					Temperature (°F or °C)
AI	35	Condenser Saturated Refrigerant Temperature	•				Temperature (°F or °C)
AI	35	Condenser Saturated Rfgt Temp Ckt1					Temperature (°F or °C)
AI	36	Compressor Refrigerant Discharge Temperature	•				Temperature (°F or °C)
AI	36	Compressor Rfgt Discharge Temp Ckt1					Temperature (°F or °C)
AI	37	IGV1 Percent Open Ckt1					Percent
AI	37	IGV1 Position	•				None
AI	37	Inlet Guide Vane Position First Stage					None
AI	38	IGV2 Percent Open Ckt2					Percent
AI	38	IGV2 Position	•				None
AI	38	Inlet Guide Vane Position Second Stage					None
AI	39	Carbon Tank Temp	•				Temperature (°F or °C)
AI	39	Purge Carbon Tank Temp					Temperature (°F or °C)
AI	39	Purge Carbon Tank Temp Ckt1					Temperature (°F or °C)
AI	40	Purge Liquid Temperature	•				Temperature (°F or °C)
AI	40	Purge Liquid Temperature Ckt1					Temperature (°F or °C)
AI	41	Purge Refrigerant Compressor Suction Temp	•				Temperature (°F or °C)
AI	41	Purge Rfgt Compressor Suction Temp Ckt1					Temperature (°F or °C)
AI	42	Time Until Next Purge Run	•				Time
AI	42	Time Until Next Purge Run Ckt1					Time
AI	43	Pumpout Chiller On-7 Days	•				Time
AI	43	Pumpout Chiller On-7 Days Ckt1					Time
AI	44	Pumpout Chiller Off-7 Days	•				Time
AI	44	Pumpout Chiller Off-7 Days Ckt1					Time
AI	45	Daily Pumpout-24 Hours	•				Time
AI	45	Daily Pumpout-24 Hours Ckt1					Time
AI	46	Pumpout-Life	•				Time
AI	46	Pumpout-Life Ckt1					Time
AI	47	Refrigerant-Life	•				Time
AI	47	Refrigerant-Life Ckt1					Time
AI	48	Compressor Starts	•				Time
AI	48	Compressor Starts Ckt1					Time
AI	49	Compressor Running Time	•				Time
AI	49	Compressor Running Time Ckt1					Time
AI	50	Starter Voltage Phase AB	•				Voltage
AI	50	Starter Voltage Phase AB Ckt1					Voltage
AI	51	Starter Voltage Phase BC	•				Voltage
AI	51	Starter Voltage Phase BC ckt1					Voltage
AI	52	Starter Voltage Phase CA	•				Voltage
AI	52	Starter Voltage Phase CA Ckt1					Voltage
AI	53	Starter Average Phase Voltage	•				Voltage
AI	53	Starter Average Phase Voltage Ckt1					Voltage
AI	54	Starter Current L1	•				Current (Amps)
AI	54	Starter Current L1 Ckt1					Current (Amps)
AI	55	Starter Current L2	•				Current (Amps)
AI	55	Starter Current L2 Ckt1					Current (Amps)
AI	56	Starter Current L3	•				Current (Amps)
AI	56	Starter Current L3 Ckt1					Current (Amps)
AI	57	Average Line Current- Amps	•				Current (Amps)
AI	57	Average Line Current Ckt1					Current (Amps)
AI	58	Starter Current L1 % RLA	•				Percent
AI	58	Starter Current L1 % RLA Ckt1					Percent
AI	59	Starter Current L1 % RLA Ckt2					Percent
AI	59	Starter Current L2 % RLA	•				Percent
AI	60	Starter Current L1 % RLA Ckt3					Percent
AI	60	Starter Current L3 % RLA	•				Percent
AI	61	Average Line Current % RLA	•				Percent
AI	61	Average Line Current % RLA Ckt1					Percent
AI	62	Starter Power Consumption	•				Power - Electrical (kW)
AI	62	Starter Power Consumption Ckt1					Power - Electrical (kW)
AI	63	Starter Load Power Factor	•				None
AI	63	Starter Load Power Factor Ckt1					None
AI	64	Inboard Bearing Temperature	•				Temperature (°F or °C)
AI	64	Inboard Bearing Temperature Ckt1					Temperature (°F or °C)
AI	65	Outboard Bearing Temperature	•				Temperature (°F or °C)
AI	65	Outboard Bearing Temperature Ckt1					Temperature (°F or °C)
AI	66	Motor Winding Temperature #1	•				Temperature (°F or °C)
AI	66	Motor Winding Temperature 1 Ckt1					Temperature (°F or °C)
AI	67	Motor Winding Temperature #2	•				Temperature (°F or °C)
AI	67	Motor Winding Temperature 2 Ckt1					Temperature (°F or °C)
AI	68	Motor Winding Temperature #3	•				Temperature (°F or °C)
AI	68	Motor Winding Temperature 3 Ckt1					Temperature (°F or °C)
AI	69	Frequency	•				Hertz
AI	69	Frequency Ckt1					Hertz
AI	70	AFD Transistor Temperature	•				Temperature (°F or °C)
AI	70	AFD Transistor Temperature Ckt1					Temperature (°F or °C)
AI	71	Evaporator Refrigerant Pressure Ckt2					Fluid Pressure (PSI, kPa)
AI	72	Condenser Refrigerant Pressure Ckt2					Fluid Pressure (PSI, kPa)
AI	74	Oil Tank Pressure Ckt2					Fluid Pressure (PSI, kPa)
AI	75	Oil Pump Discharge Pressure Ckt2					Fluid Pressure (PSI, kPa)
AI	76	Oil Differential Pressure Ckt2					Fluid Pressure (PSI, kPa)
AI	77	Oil Tank Temperature Ckt2					Temperature (°F or °C)
AI	78	Evaporator Saturated Rfgt Temp Ckt2					Temperature (°F or °C)
AI	79	Condenser Saturated Rfgt Temp Ckt2					Temperature (°F or °C)
AI	80	Compressor Rfgt Discharge Temp Ckt2					Temperature (°F or °C)
AI	81	IGV 1 Percent Open Ckt2					Percent
AI	82	IGV 2 Percent Open Ckt2					Percent
AI	83	Purge Carbon Tank Temp Ckt2					Temperature (°F or °C)
AI	84	Purge Liquid Tank Temp Ckt2					Temperature (°F or °C)
AI	85	Purge Rfgt Compressor Suction Temp Ckt2					Temperature (°F or °C)
AI	86	Time Until Next Purge Run Ckt2					Time
AI	87	Pumpout Chiller On 7 Days Ckt2					Time
AI	88	Pumpout Chiller Off 7 Days Ckt2					Time
AI	89	Daily Pumpout-24 Hours Ckt2					Time
AI	90	Pumpout-Life Ckt2					Time
AI	91	Refrigeration-Life Ckt2					Time
AI	92	Compressor Starts Ckt2					Time
AI	93	Compressor Running Time Ckt2					Time
AI	94	Starter Voltage Phase AB Ckt2					Voltage
AI	95	Starter Voltage Phase BC Ckt2					Voltage
AI	96	Starter Voltage Phase CA Ckt2					Voltage
AI	97	Starter Average Phase Voltage Ckt2					Voltage
AI	98	Starter Current L1 Ckt2					Current (Amps)
AI	99	Starter Current L2 Ckt2					Current (Amps)
AI	100	Starter Current L3 Ckt2					Current (Amps)
AI	101	Average Line Current Ckt2					Current (Amps)
AI	102	Starter Current L1 % RLA Ckt2					Percent
AI	103	Starter Current L2 % RLA Ckt2					Percent
AI	104	Starter Current L3 % RLA Ckt2					Percent
AI	105	Average Line Current % RLA Ckt2					Percent
AI	106	Starter Power Consumption Ckt2					Power - Electrical (kW)
AI	107	Starter Load Power Factor Ckt2					None
AI	108	Inboard Bearing Temperature Ckt2					Temperature (°F or °C)
AI	109	Outboard Bearing Temperature Ckt2					Temperature (°F or °C)
AI	110	Motor Winding Temperature 1 Ckt2					Temperature (°F or °C)
AI	111	Motor Winding Temperature 2 Ckt2					Temperature (°F or °C)
AI	112	Motor Winding Temperature 3 Ckt2					Temperature (°F or °C)
AI	113	Frequency Ckt2					Hertz
AI	114	AFD Transistor Temperature Ckt2					Temperature (°F or °C)
AI	115	AFD Last Diagnostic Code Ckt2					None
AI	116	Differential Refrigerant Pressure Ckt1					Fluid Pressure (PSI, kPa)
AI	117	Differential Refrigerant Pressure Ckt2					Fluid Pressure (PSI, kPa)
AV	1	BAS Chilled Water Setpoint	•		6.7°C/44°F		Temperature (°F or °C)
AV	2	BAS Current Limit Setpoint	•		100% RLA		Percent
AV	3	BAS Hot Water Setpoint	•		48.9°C/120°F		Temperature (°F or °C)
AV	4	BAS Base Loading Setpoint	•		50%		Percent
BI	1	Chiller Running	•	0=no (not running) 1=yes (running) Inactive Active			
BI	2	Evaporator Pump Control	•	0=off (pump off) 1=on (pump on) Inactive Active			
BI	3	Evaporator Water Flow	•	0=no flow 1=flow Inactive Active			
BI	4	Condenser Pump Control	•	0=off (pump off) 1=on (pump on) Inactive Active			
BI	5	Condenser Water Flow	•	0=no flow 1=flow Inactive Active			
BI	6	Front Panel Base Loading Command	•	0=auto 1=on			
BI	7	Emergency Stop	•	0=auto 1=on			
BI	8	Manual Override Exists	•	0=false 1=true			
BI	9	Base Loading	•	0=inactive 1=active			
BI	10	Alarm Present	•	0=no 1=yes			
BI	11	Chiller In Auto		0=no 1=yes			
BI	11	Run Enable	•	0=no 1=yes			
BI	12	Local Setpoint Control	•	0=no 1=yes			
BI	13	Maximum Capacity Relay	•	0=off 1=on			
BI	14	Limit Mode Relay Status	•	0=inactive 1=active			
BI	15	Head Relief Request Relay	•	0=off 1=on			
BI	16	Hot Gas Bypass	•	0=inactive 1=active			
BI	17	Purge Compressor Relay	•	0=off 1=on			
BI	18	Pumpout Relay	•	0=off 1=on			
BI	19	Purge Regen Valve Solenoid	•	0=off 1=on			
BI	20	Purge Compressor Relay Ckt2		0=off 1=on			
BI	21	Pumpout Relay Ckt2		0=off 1=on			
BI	22	Purge Regen Valve Solenoid Ckt2		0=off 1=on			
BV	1	BAS Loading Enable	•	0 or 1	NA		
BV	2	BAS Diagnostic Reset	•	0 or 1	NA		
MI	1	Chiller Running Status	•	1=not running 2=starting 3=running 4=stopping			
MI	2	Chiller Control Mode	•	1=not running 2=starting 3=running 4=stopping			
MI	3	Setpoint Source	•	1=BAS/Ext/FP 2=Ext/FP 3=front panel			
MI	4	Active Chilled Water Setpoint Source	•	1=front panel 2=external 3=ice machine 4=BAS			
MI	5	Active Current Limit Setpoint Source	•	1=front panel 2=external 3=ice machine 4=BAS			
MI	6	Active Hot Water Setpoint Source	•	1=front panel 2=external 3=ice machine 4=BAS			
MI	7	Active Base Loading Setpoint Source	•	1=front panel 2=external 3=ice machine 4=BAS			
MI	8	Front Panel Auto/Stop	•	1=stop 2=auto			
MI	9	Front Panel Chiller Control Mode	•	1=cool 2=heat 3=ice 4=free cooling			
MI	10	External Auto Stop	•	1=off 2=auto 3=on			
MI	11	Compressor Running	•	1=stopped 2=running 3=alarm			
MI	11	Compressor Running Ckt1		1=stopped 2=running 3=alarm			
MI	12	Compressor Running Ckt2		1=stopped 2=running 3=alarm			
MV	1	BAS Chiller Auto Stop Command	•	0 or 1	2= auto		
MV	2	BAS Chiller Mode Command	•	0 or 1	1= cool		

CH-1 AND CH-2 POINTS AVAILABLE VIA BACNET. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY EXISTING AVAILABLE POINTS ON EXISTING CHILLER AND SHOW POINTS TO BMS

THE ABOVE LIST DEVELOPED BASED ON THE EXISTING CH-1 AND CH-2 SERIAL NUMBER, ALL POINT TO BE FIELD VERIFIED

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 2 2016
Office of Statewide Health Planning & Development
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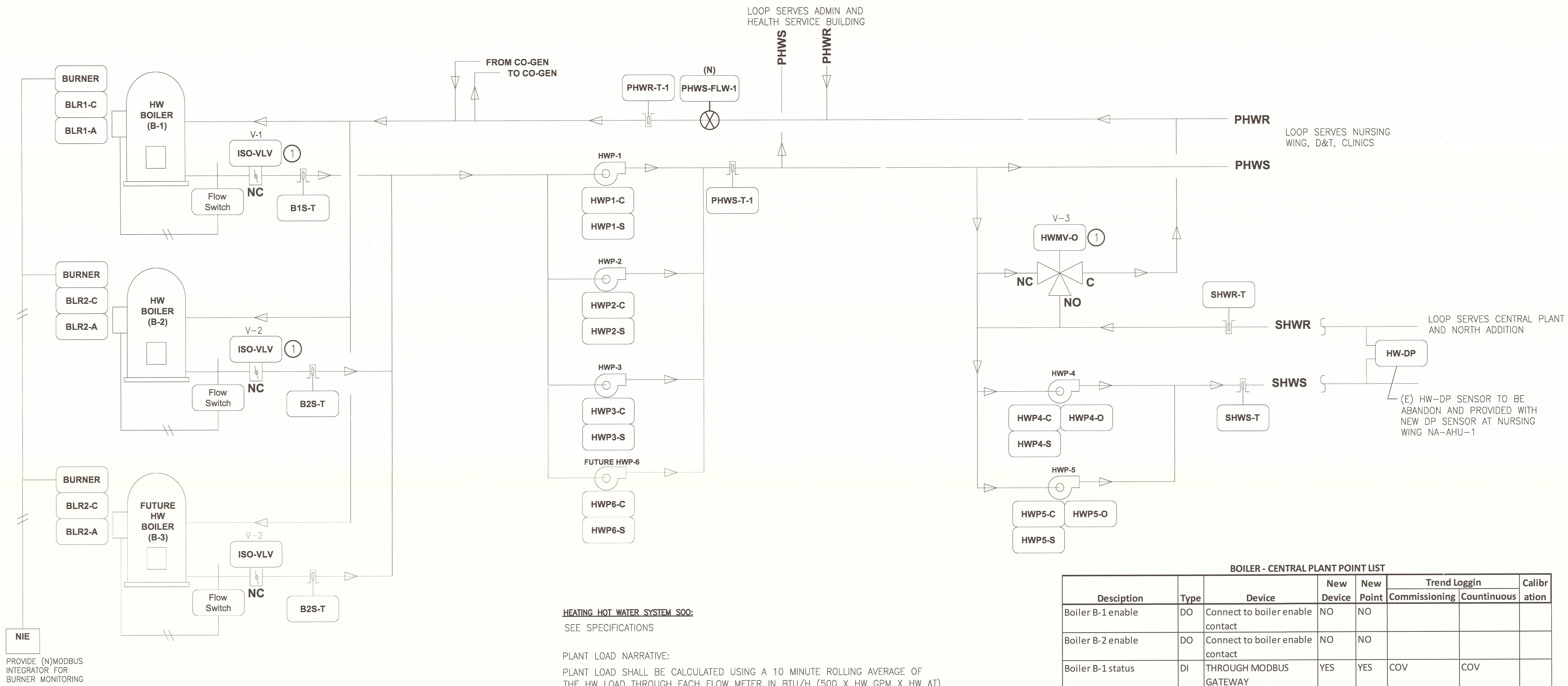
SAN MATEO, CALIFORNIA
CONTROLS UPGRADE

SHEET TITLE:
CHILLED & CONDENSER WATER SYSTEM CONTROL DIAGRAM

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:
M6.1C

SHEET : OF



HEATING HOT WATER SYSTEM SOO:

SEE SPECIFICATIONS

PLANT LOAD NARRATIVE:

PLANT LOAD SHALL BE CALCULATED USING A 10 MINUTE ROLLING AVERAGE OF THE HW LOAD THROUGH EACH FLOW METER IN BTU/H (500 X HW GPM X HW ΔT)

KEY NOTE:

1 NEW DDC CONTROL VALVE. NO P/E SWITCH WILL BE ALLOWED.

SHEET NOTES:

1. REMOVE ALL EXISTING PNEUMATIC VALVES AND PROVIDE FULL DDC VALVES IN PLACE. MATCH 'CV' OF NEW VALVE WITH EXISTING. RECORD CONTROL DRAWINGS INDICATES 'CV' FOR V-1 AND V-2 IS EQUAL TO 275 EACH. AND CV FOR V-3=101.

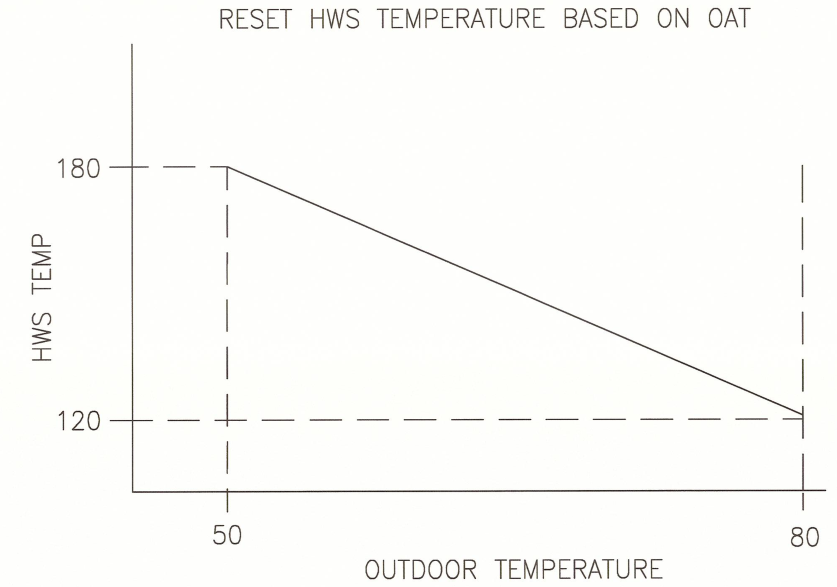
   ALTERNATE: EXISTING BUTTERFLY TYPE CONTROL VALVE BODIES TO REMAIN AND REPLACE ONLY PNEUMATIC ACTUATOR. PROVIDE ALTERNATE COST TO OWNER FOR APPROVAL.

2. CONTRACTOR TO FILED VERIFY ALL EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF WORK. ADJUST FOR FILED VARIANCE WITH NO ADDITION COST TO THE OWNER.

3. CONTROL CONTRACTOR TO PROVIDE, COORDINATE, AND MAP SYSTEM GRAPHIC, AND ALL SEQUENCE OF CONTROLS INCORPORATED INTO NEW DDC CONTROLS.

4. PROVIDE NEW (1) FLOW METER AND (1) ASSOCIATED HW-x TEMPERATURE SENSORS AT LOCATION SHOWN ABOVE

RESET HWS TEMPERATURE BASED ON OAT



A HEATING WATER PIPING CONTROL DIAGRAM

NO SCALE

BOILER - CENTRAL PLANT POINT LIST

Desciption	Type	Device	New Device	New Point	Trend Loggin Commissioning	Trend Loggin Countinuous	Calibration
Boiler B-1 enable	DO	Connect to boiler enable contact	NO	NO			
Boiler B-2 enable	DO	Connect to boiler enable contact	NO	NO			
Boiler B-1 status	DI	THROUGH MODBUS GATEWAY	YES	YES	COV	COV	
Boiler B-2 status	DI	THROUGH MODBUS GATEWAY	YES	YES	COV	COV	
Boiler B-1 alarm	DI	Connect to boiler alarm contact	NO	NO			
Boiler B-2 alarm	DI	Connect to boiler alarm contact	NO	NO			
Boiler B-1 flow switch	AI	[E] flow switch wired to boiler panel	NO	NO			
Boiler B-2 flow switch	AI	[E] flow switch wired to boiler panel	NO	NO			
Boiler B-1 Isolation Valve	DO	V-1, (N) DDC ISO-VALVE WIRED TO BOILER PANEL	YES	YES			
Boiler B-2 Isolation valve - enable	DO	V-2, (N) DDC ISO-VALVE WIRED TO BOILER PANEL	YES	YES			
HWS temperature	AI	B1S-T	NO	NO	1 min.	±2°F	F
HWS temperature	AI	B2S-T	NO	NO	1 min.	±2°F	F
HWP-1 Enable (Start)	DO	Connect to Motor Starter	NO	NO			
HWP-2 Enable (Start)	DO	Connect to Motor Starter	NO	NO			
HWP-3 Enable (Start)	DO	Connect to Motor Starter	NO	NO			
HWP-1 Status	DI	Current Sensor	NO	NO	COV	COV	
HWP-2 Status	DI	Current Sensor	NO	NO	COV	COV	
HWP-3 Status	DI	Current Sensor	NO	NO	COV	COV	
HWP-4 Enable	DO	Connect to VFD	NO	NO			
HWP-5 Enable	DO	Connect to VFD	NO	NO			
HWP-4 Speed	AO	Connect to VFD	NO	NO	1 min.	15 min.	
HWP-5 Speed	AO	Connect to VFD	NO	NO	1 min.	15 min.	
HWP-4 status	DI	Connect to VFD status	NO	NO	COV	COV	
HWP-5 status	DI	Connect to VFD status	NO	NO	COV	COV	
HWS temperature	AI	PHWS-T-1	NO	NO	1 min.	±2°F	F
HWR temperature	AI	PHWR-T-1	NO	NO	1 min.	±2°F	F
Bypass Control Valve	AO	Modulating actuator	YES	NO	1 min.	15 min.	
SHWS temperature	AI	SHWS-T	NO	NO	1 min.	±2°F	F
SHWR temperature	AI	SHWR-T	NO	NO	1 min.	±2°F	F
HW differential pressure	AI	DPT, 0-15 psig	NO	NO	1 min.	15 min.	
HWS temperature	AI	PHWS-T-2	YES	YES	1 min.	±2°F	F
HWR temperature	AI	PHWR-T-2	YES	YES	1 min.	±2°F	F
HWS temperature	AI	PHWS-T-3	YES	YES	1 min.	±2°F	F
HWR temperature	AI	PHWR-T-3	YES	YES	1 min.	±2°F	F
PHWS-FLW-1	AI	PHWS-FLW-1	YES	YES	1 min.	10 min.	
PHWS-FLW-2	AI	PHWS-FLW-2	YES	YES	1 min.	10 min.	

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CONTROLS UPGRADE

SHEET TITLE:

HEATING WATER SYSTEM CONTROL DIAGRAM

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
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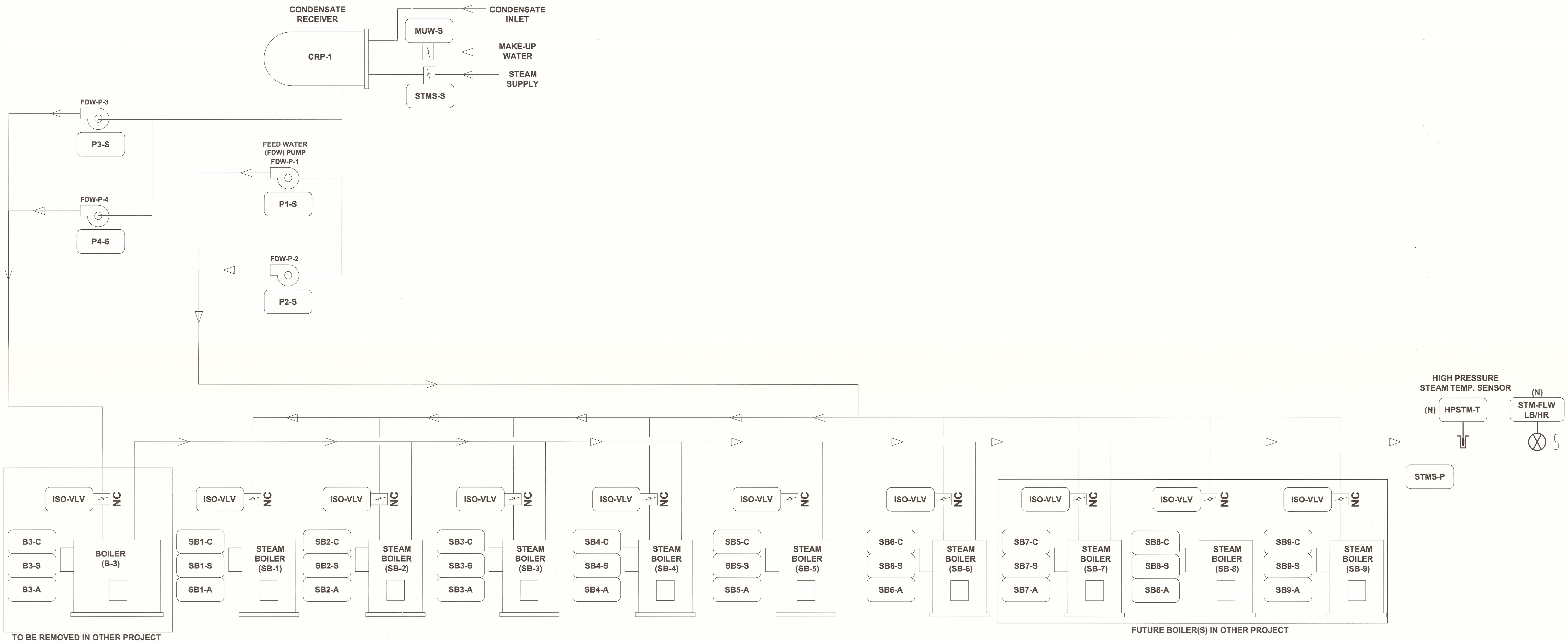

STEAM BOILER SYSTEM SOO:

SEE SPECIFICATIONS

THE NEW STEAM FLOW METER AND MAKE-UP WATER DATA TO BE ADDED FOR CONSUMPTION DATA ON ENERGY DATA

A — CENTRAL PLANT
HOT WATER AND STEAM SYSTEM CONTROL DIAGRAM
NO SCALE

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
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SHEET TITLE:

HOT WATER AND STEAM SYSTEM CONTROL DIAGRAM

NO.	REVISIONS	DATE	BY
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2	OSHPD BCK#2	05/27/16	

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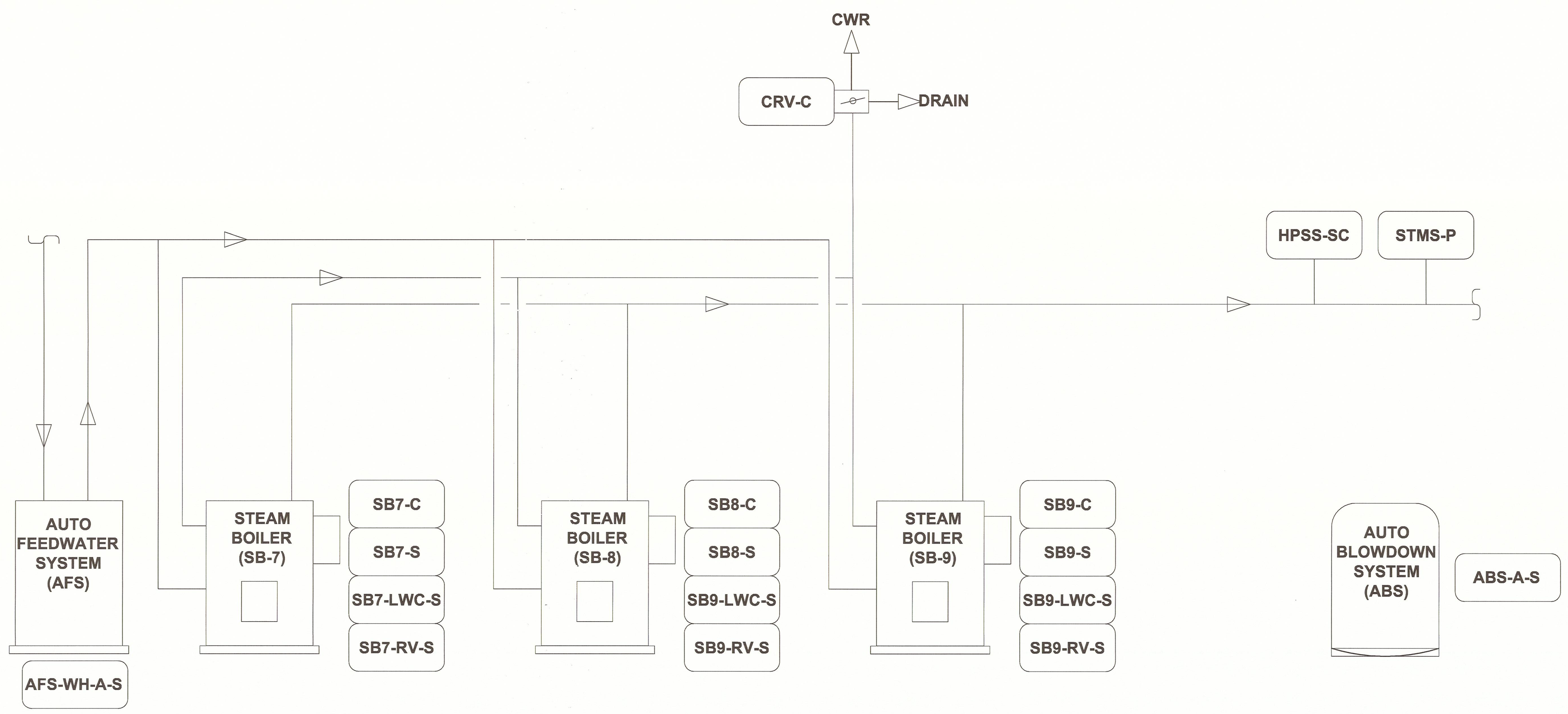

STEAM BOILER SYSTEM SOO:
SEE SPECIFICATIONS

A KITCHEN STEAM SYSTEM (KSS) CONTROL DIAGRAM

NO SCALE

KITCHEN STEAM BOILER (KSS)- POINT LIST

Desciption	Type	Device	New Device	New Point	Trend Loggin Commissioning	Trend Loggin Countinuous	Calibration
Boiler SB-7 enable	DO	Connect to boiler enable contact	NO	NO	COV	COV	
Boiler SB-8 enable	DO	Connect to boiler enable contact	NO	NO	COV	COV	
Boiler SB-9 enable	DO	Connect to boiler enable contact	NO	NO	COV	COV	
Boiler SB-7 status	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-8 status	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-9 status	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-7 Low Water Cutoff status	DI	Connect to boiler SB-7-LWC-S	NO	NO	COV	COV	
Boiler SB-8 Low Water Cutoff status	DI	Connect to boiler SB-8-LWC-S	NO	NO	COV	COV	
Boiler SB-9 Low Water Cutoff status	DI	Connect to boiler SB-9-LWC-S	NO	NO	COV	COV	
Boiler SB-7 Relief Vlave Open Status	DI	Connect to boiler SB-7-RV-S	NO	NO	COV	COV	
Boiler SB-8 Relief Vlave Open Status	DI	Connect to boiler SB-8-RV-S	NO	NO	COV	COV	
Boiler SB-9 Relief Vlave Open Status	DI	Connect to boiler SB-9-RV-S	NO	NO	COV	COV	
Steam Supply Pressure	AI	STMS-P	NO	NO	1 min.	10 min.	
Condensate Return Valve - Enable	DO	CRV-C	NO	NO	COV	COV	
Automatic Blowdown System Alarm Status	DI	ABS-A-S	NO	NO	COV	COV	
Automatic Feedwater System (AFS) Water Harness Alarm Status	DI	AFS-WH-A-S	NO	NO	COV	COV	

STEAM BOILER - CENTRAL PLANT POINT LIST

Desciption	Type	Device	New Device	New Point	Trend Loggin Commissioning	Trend Loggin Countinuous	Calibration
Boiler B-3 enable	DO	Connect to boiler enable contact	NO	NO	COV	COV	
Boiler SB-1 enable	DO	Connect to boiler enable contact	NO	NO	COV	COV	
Boiler SB-2 enable	DO	Connect to boiler enable contact	NO	NO	COV	COV	
Boiler SB-3 enable	DO	Connect to boiler enable contact	NO	NO	COV	COV	
Boiler SB-4 enable	DO	Connect to boiler enable contact	NO	NO	COV	COV	
Boiler SB-5 enable	DO	Connect to boiler enable contact	NO	NO	COV	COV	
Boiler SB-6 enable	DO	Connect to boiler enable contact	NO	NO	COV	COV	
FUTURE - Boiler SB-# enable (TYP. OF 3)							
Boiler B-3 status	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-1 status	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-2 status	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-3 status	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-4 status	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-5 status	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-6 status	DI	Connect to boiler status contact	NO	NO	COV	COV	
FUTURE -Boiler SB-# status (TYP. OF 3)							
Boiler B-3 Alarm	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-1 Alarm	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-2 Alarm	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-3 Alarm	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-4 Alarm	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-5 Alarm	DI	Connect to boiler status contact	NO	NO	COV	COV	
Boiler SB-6 Alarm	DI	Connect to boiler status contact	NO	NO	COV	COV	
FUTURE -Boiler SB-# Alarm (TYP. OF 3)							
Steam Supply Pressure	AI	STMS-P	NO	NO	1 min.	10 MIN.	
Steam temperature	AI	HP-STM-T	YES	YES	1 min.	±2°F	F
Steam Flow Meter	AI	STM-FLW	YES	YES	COV	COV	
DF-1 ALARM	DI	CONNECT TO DEAERATOR STATUS CONTACT	NO	NO	COV	COV	

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CONTROLS UPGRADE

SHEET TITLE:
HOT WATER AND STEAM SYSTEM CONTROL DIAGRAM

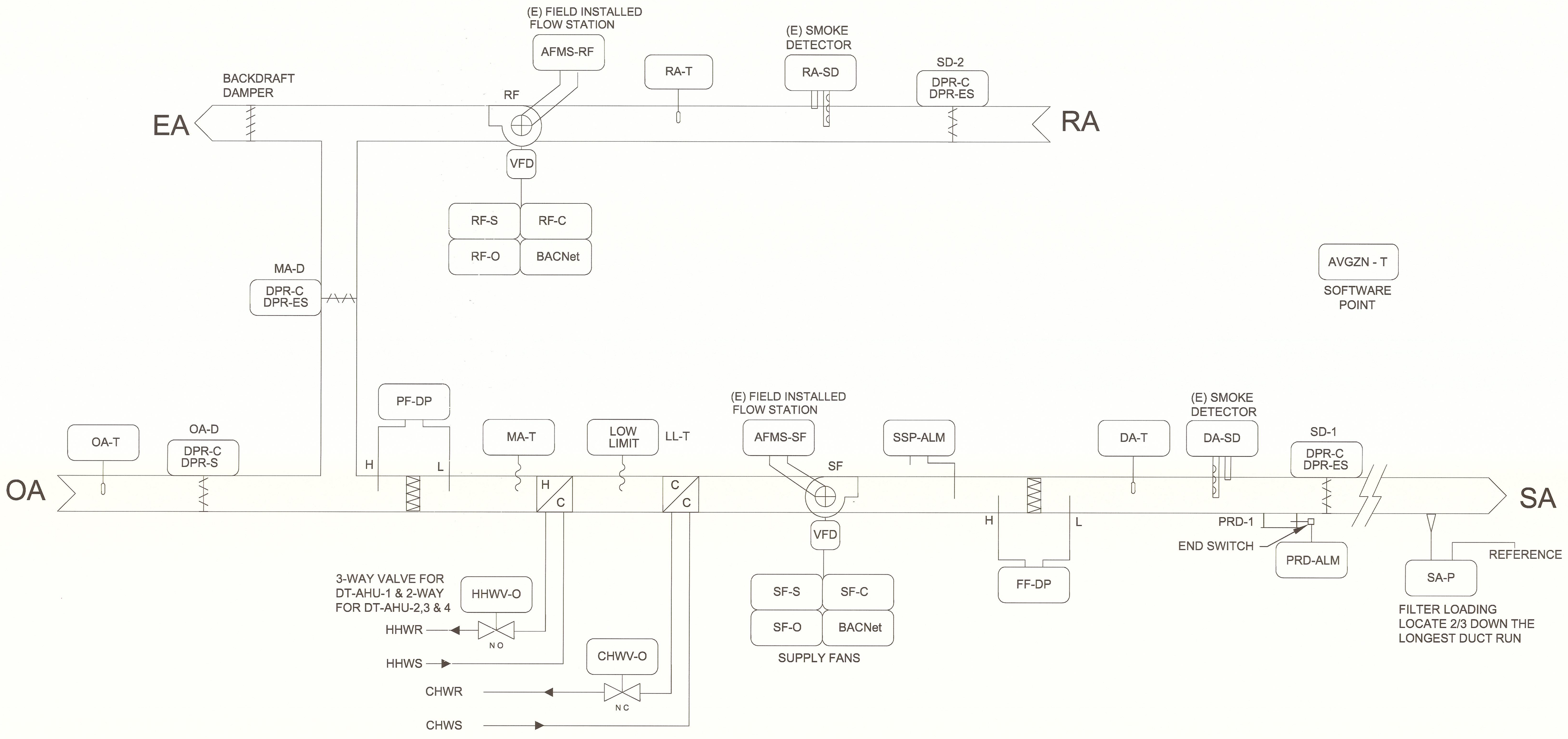
NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:
M6.3B

SHEET : OF

AIR HANDLER #	ASSOCIATED EXHAUST FAN #
DT-AHU-1	DTEF-7 AND DTEF-8
DT-AHU-2	DTEF-3 AND DTEF-4
DT-AHU-3	DTEF-5 AND DTEF-6
DT-AHU-4	DTEF-1 AND DTEF-2

SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.
SEE SPECIFICATIONS SECTION 23 09 93 – 1.1



FOR POINT LIST SEE M6.5

A DT-AHU-1, DT-AHU-2, DT-AHU-3 AND DT-AHU-4

NO SCALE

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CONTROLS UPGRADE

SHEET TITLE:

AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS D&T BUILDING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
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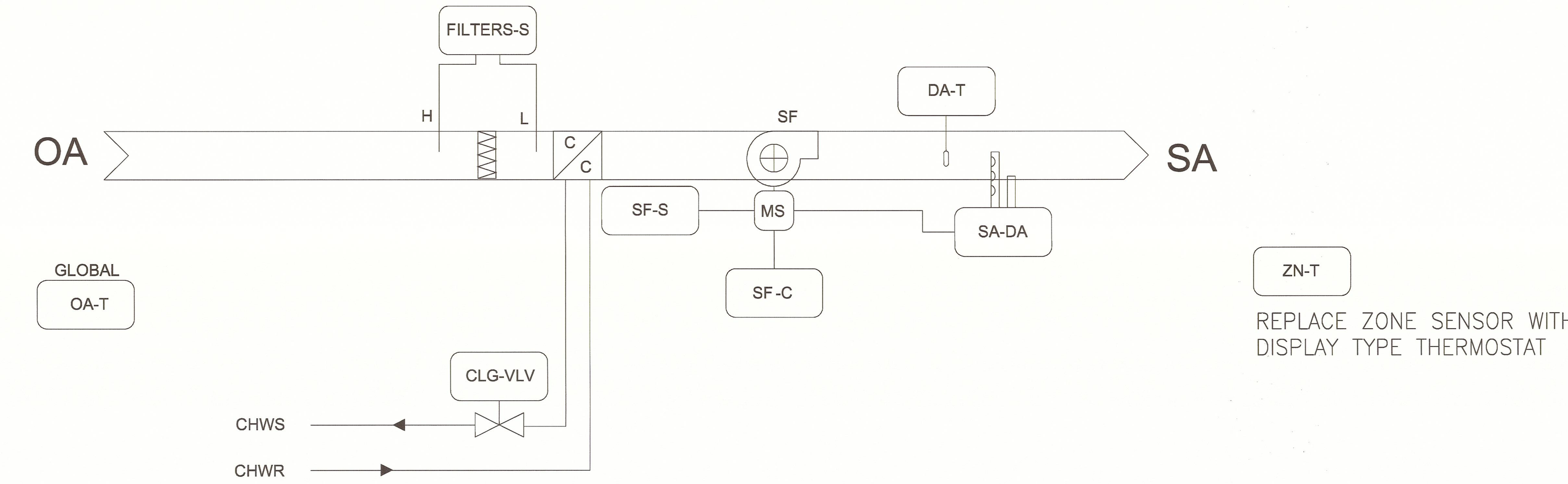
FACILITIES DEVELOPMENT DIVISION

SHEET NUMBER:

M6.4

SHEET : OF

POIN LIST - D&T AHU-1, 2, 3 & 4							
			New	New	Trend Logging		
Description	Type	Device	Device	Point	Commissiong	Continuous	Calibration
Supply Fan Start/Stop	DO	Connect to VFD Run	YES	NO	COV	COV	
Return Fan Start/Stop	DO	Connect to VFD Run	YES	NO	COV	COV	
Supply Fan Speed	AO	Connect to VFD Speed	NO	NO	1 min.	15 min.	
Return Fan Speed	AO	Connect to VFD Speed	NO	NO	1 min.	15 min.	
Supply Fan Status	DI	Connect to VFD Satus (Thru Network)	NO	NO	COV	COV	
Return Fan Status	DI	Connected to VFD Status (Thru Network)	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Actuator on Control Valve	YES	NO	1 min.	15 min.	
Hot Water Control Valve	AO	Actuator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke, SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Duct Alarm (Smoke, RA)	DI	Connect to FA panel	NO	NO	COV	COV	
Filter Pressure Drop	AI	PF-DP	YES	NO		60 min	F
Final Filter Pressure drop	AI	FF-DP	YES	NO	1 min.	15 min.	F
Outdoor Air Temperature	AI	OA-T Sensor	YES	NO	1 min.	15 min.	F
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Return Air Temperature	AI	(N) RA-T Sensor	YES	NO	1 min.	15 min.	F
Supply Air Temperature	AI	SA-T Sensor	YES	NO	1 min.	15 min.	F
Duct Static Pressure	AI	SA-P	YES	NO	1 min.	15 min.	F
Supply Airflow	AI	AFMS-S/F	YES	NO	1 min.	15 min.	
Return Airflow	AI	AFMS-SF	YES	NO	1 min.	15 min.	
Discharge High Pressure Limit Alarm	DI	SSP-ALM. Connect to VFD	YES	NO	COV	COV	
Freeze Alarm (Low Limit)	DI	Low Limit. Connect to VFD	YES	NO	1 min.	15 min.	F
Discharge Pressure Relief Damper	DI	PRD-ALM Connect to end switch	YES	NO	COV	COV	
Damper Command (OA-D), (MA-D)	AO	Modulating actuator	YES	NO	COV	COV	
OA-D Damper Status	DI	Connect to end switch	YES	NO	COV	COV	
MA-D Damper Status	DI	Connect to end switch	YES	NO	COV	COV	
Smoke Damper, Supply (SD-1) & Return (SD-2)	DI / DO	Connect to end switch & Aactuator	NO	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Occupied Command							
Discharge (Supply) Air Temperature Setpoint							
Discharge Air Static Pressure Setpoint							
Damper Alarm - If OA-D & MA-D status does not meet the command, alarm BMS							
Average Zone Temperature Setpoint							



REPLACE ZONE SENSOR WITH DISPLAY TYPE THERMOSTAT

SEQUENCE OF OPERATION

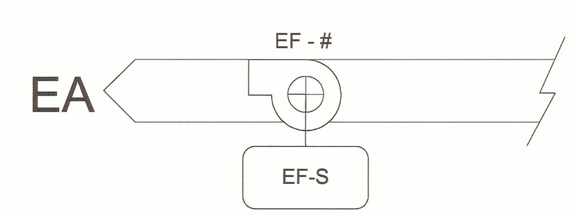
THE DT-AHU-5 SERVES ELECTRICAL ROOM (UNOCCUPIED SPACE):
WHEN ZONE TEMPERATURE IS ABOVE ZONE SETPOINT OF 75 DEG. F (ADJ.) THE AIR HANDLER SUPPLY FAN WILL BE ENERGIZED. IF THE ZONE SETPOINT IS NOT MAINTAINED, RISES 2 DEG. F (ADJ.) THAN THE COOLING COIL VALVE (CLG-VLV) WILL BE MODULATED TO MAINTAIN THE SPACE SETPOINT. WHEN THE SPACE TEMPERATURE IS SATISFIED THE COOLING COIL VALVE WILL BE SHUT-OFF AND THE FAN WILL SHUT-DOWN.

SMOKE MODE OF OPERATION
IF SMOKE IS DETECTED BY THE SUPPLY AIR DUCT SMOKE DETECTOR (SA-SD), A SIGNAL SHALL BE SENT BY THE FIRE ALARM SYSTEM TO THE CONTROLLER. THEN THE SUPPLY AIR FAN SHALL SHUT DOWN. THE OUTSIDE AIR DAMPER SHALL CLOSE

MISCELLANEOUS
THE FILTER SHALL BE MONITORED AND AN ALARM SHALL OCCUR ABOVE THE ADJUSTABLE PRESSURE SETPOINT

POIN LIST - D&T AHU-5							
			New	New	Trend Logging		
Description	Type	Device	Device	Point	Commissiong	Continuous	Calibration
Supply Fan Start/Stop	DO	Connect to motor starter	NO	NO	COV	COV	
Supply Fan Status	DI	Current Sensor	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Actuator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke, SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Filter Pressure Drop	AI	PF-DP	YES	NO		60 min	F
Discharge Air Temperature	AI	DA-T Sensor	YES	YES	1 min.	15 min.	F
Zone Temperature	AI	ZN-T Sensor	YES	NO	1 min.	15 min.	F
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Zone Temperature Setpoint							
Pre-Filter pressure drop setpoint for Alarm							
Outdoor Air Temperature - Global							

A DT-AHU-5
NO SCALE



POINT LIST - D&T -DTEF-1 THRU DTEF-8							
			New	New	Trend Logging		
Description	Type	Device	Device	Point	Commissiong	Continuous	Calibration
EXHAUST FAN STATRT/STOP COMMAND	DO	Connect to Fan motor starter (Interlock w/ AHU)	NO	NO	COV	COV	
Exhaust Fan status	DI	Current Sensor	YES	NO	COV	COV	

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B DTEF-1 THRU DTEF-8
NO SCALE

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CONTROLS UPGRADE

SHEET TITLE:
AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS D&T BUILDING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
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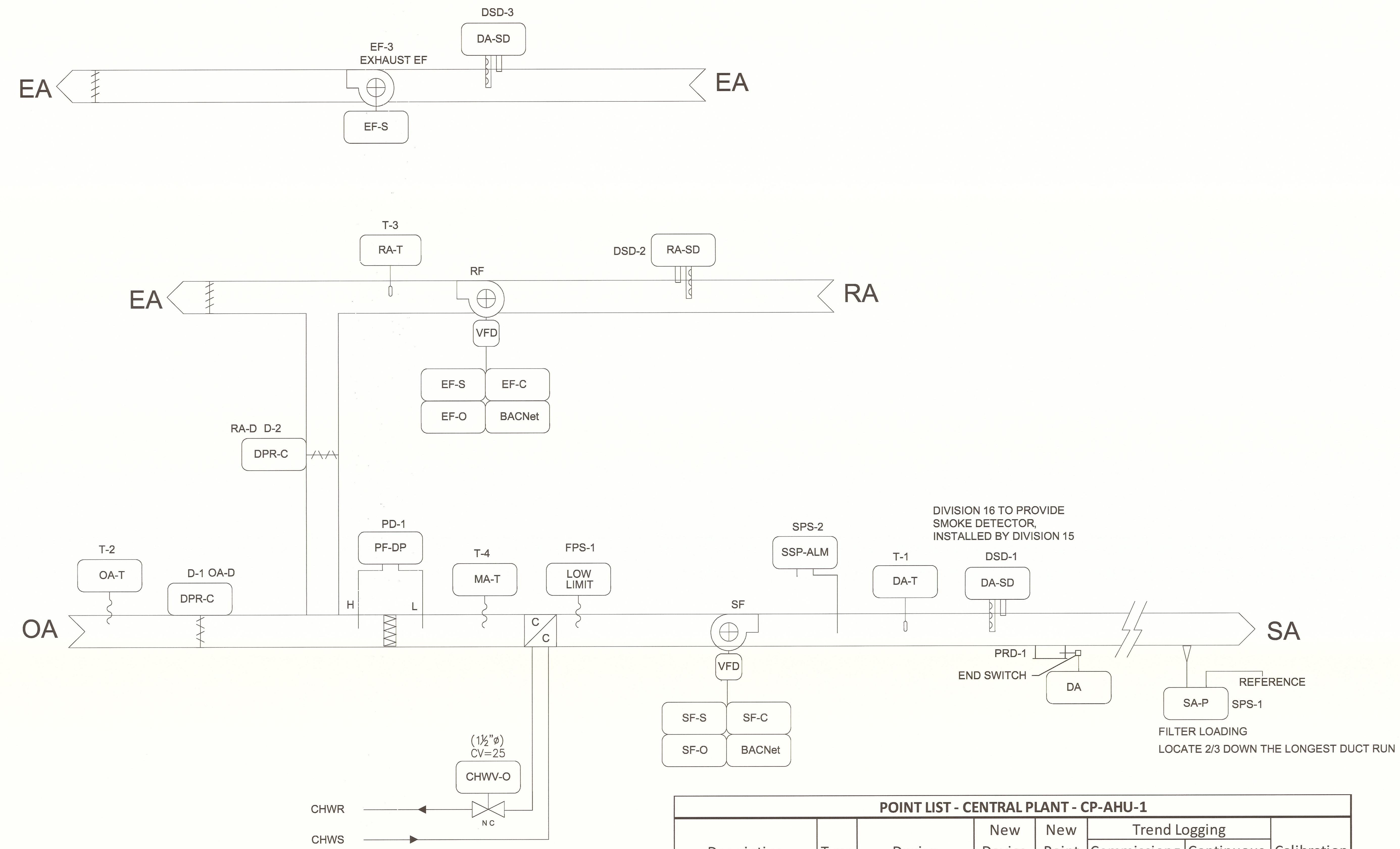

SHEET NOTES:

1. CONTRACTOR TO FILED VERIFY ALL EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF WORK. ADJUST FOR FILED VARIANCE WITH NO ADDITION COST TO THE OWNER.

POINT LIST - CENTRAL PLANT - CP-AHU-1

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
Supply Fan Start/Stop	DO	Connect to VFD Run	NO	NO	COV	COV	
Return Fan Start/Stop	DO	Connect to VFD Run	NO	NO	COV	COV	
Supply Fan Speed	AO	Connect to VFD Speed	NO	NO	1 min.	15 min.	
Return Fan Speed	AO	Connect to VFD Speed	No	NO	1 min.	15 min.	
Supply Fan Status	DI	Connect to VFD Satus	NO	NO	COV	COV	
Return Fan Status	DI	Connected to VFD Status	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke, RA, SA &)	DI	Connect to FA panel	NO	NO	COV	COV	
Outdoor Air Temperature	AI	OA-T Sensor	YES	NO	1 min.	15 min.	F
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Return Air Temperature	AI	RA-T Sensor	YES	NO	1 min.	15 min.	F
Supply Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	HH
Duct Static Pressure	AI	SA-P	YES	NO	1 min.	15 min.	F
Supply Airflow	AI	AFMS-S/F	NO	NO	1 min.	15 min.	
Return Airflow	AI	AFMS-SF	NO	NO	1 min.	15 min.	
Duct High Limit Alarm	DI	SSP-ALM. Connect to VFD	YES	NO	COV	COV	
Freeze Alarm (Low Limit)	DI	Low Limit (FPS-1). Connect to VFD	YES	NO	COV	COV	F
Pressure Relief	DI	SSP-ALM Connect to end switch	YES	NO	COV	COV	
Exhaust Fan Status	DI	Current Switch	YES	NO	COV	COV	
Damper OA-D	AO	Modulating actuator	NO	NO	1 min.	15 min.	
Damper RA-D	AO	Modulating actuator	YES	NO	1 min.	15 min.	
OA-D & RA-D Damper Feedback	DI	Connect to end switch	YES	NO	COV	COV	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	

GENERAL

FURNISH THE DIGITAL CONTROL PANELS AND ALTER EXISTING AS NECESSARY TO ACCOMMODATE ALL SEQUENCE OF CONTROLS.

AHU IS AUTOMATICALLY STARTED/STOPPED BY THE START/STOP PROGRAM IN THE DCP AS DESCRIBED BELOW.

IN THE NORMAL MODE AHU SHALL RUN CONTINUOUSLY.

ANY TIME THE FAN IS TURNED OFF, AHU DAMPERS IN OUTSIDE AIR DAMPER D-1 AND RETURN DAMPER D-2 SHALL CLOSE. THE DAMPERS SHALL BE PROVED OPEN BEFORE THE FANS START.

AUTOMATIC SMOKE OPERATION

FIRE ALARM CONTACTS AND SIGNAL WIRING SHALL BE FURNISHED BY TCP TO AHU AND FIRE ALARM CONTACTS (FACP).

IF SMOKE IS DETECTED BY RETURN AIR DUCT SMOKE DETECTOR DSD-2, OR BY THE GENERAL EXHAUST AIR DUCT SMOKE DETECTOR (DSD-3) OR BY ALARM (SPACE MOUNTED SMOKE DETECTORS IN THE AREA SERVED BY THE AHU AND SPRINKLER SYSTEM IN BUILDING). THE OA DAMPER (D-1) SHALL BE OPEN AND RETURN DAMPER (D-2) SHALL BE CLOSED. THE SUPPLY AND RETURN FANS SHALL RUN AT FULL AIR CAPACITY TO EXHAUST THE AIR EXHAUST RELIEF DAMPER (D-1). ASSOCIATED EXHAUST FAN(S) SHALL REMAIN OPERATING. ALL CV BOXES SHALL REMAIN OPEN. SIGNALS SHALL BE SENT TO DCP TO INDICATE CONDITIONS OF OPERATION OF ALL DAMPERS AND FANS. SIGNAL SHALL BE SENT TO AIR ALARM SYSTEM AND THE OVERRIDE FIREMAN'S CONTROL PANEL.

IF SMOKE IS DETECTED BY THE SUPPLY AIR DUCT SMOKE DETECTOR DSD-1, THE SUPPLY FAN SHALL SHUTOFF, OUTSIDE AIR DAMPER (D-1) AND RETURN DAMPER (D-2) SHALL CLOSE. THE RETURN AIR FAN AND ASSOCIATED GENERAL EXHAUST FAN(S) SHALL CONTINUE TO OPERATE. SIGNAL SHALL BE SENT TO THE DPC TO INDICATE THIS CONDITION OF OPERATION OF ALL DAMPERS AND FANS. SIGNAL SHALL BE SENT TO AIR ALARM SYSTEM AND THE OVERRIDE FIREMAN'S CONTROL PANEL. OTHER AHU SHALL CONTINUE TO OPERATE.

SUPPLY FAN CONTROL: THE VARIABLE SPEED SUPPLY FAN WILL BE STARTED BASED ON A COMMAND FOR THE DDC SYSTEM. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. THE SUPPLY FAN WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE AT SETPOINT. UPON A LOSS OF AIRFLOW, THE SYSTEM WILL AUTOMATICALLY RESTART.

RETURN FAN CONTROL: AFTER THE SUPPLY FAN HAS BEEN STARTED, THE RETURN FAN WILL BE STARTED. THE RETURN FAN WILL MODULATE IN CONJUNCTION WITH THE SUPPLY FAN. THE RETURN FAN WILL LAG THE SUPPLY FAN BY A PERCENTAGE DIFFERENTIAL AIR VOLUME MEASURED AND NOTED IN PRE BALANCING REPORT PROVIDED BY AIR BALANCE CONTRACTOR PRIOR TO COMMENCEMENT OF CONTROLS AND DAMPERS UPGRADE WORK.

BACKDRAFT RELIEF: THE BAROMETRIC BACKDRAFT D-3 SHALL RELIEVE THE PLENUM PRESSURE CREATED BY THE RETURN AIR DAMPER (D-1) WHEN MODULATING TO CLOSE.

ECONOMIZER CONTROL: WHEN THE OUTSIDE AIR TEMPERATURE (OA-T) IS LESS THAN THE RETURN AIR TEMPERATURE (RA-T) MINUS ½ OF THE ECONOMIZER CYCLE DEADBAND, AND THERE IS A CALL FOR COOLING, THE OUTSIDE AIR DAMPER (OA-D) IS COMMANDED OPEN, AND THE RETURN DAMPERS (RA-D) MODULATE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT (DA-T). WHEN THE OUTSIDE AIR TEMPERATURE (OA-T) IS GREATER THAN THE RETURN AIR TEMPERATURE (RA-T) PLUS ½ OF THE ECONOIMZER CYCLE DEADBAND, THE RETURN DAMPERS (RA-D) ARE SET TO THE FULL OPEN POSITION (FULL RETURN) AND THE OUTSIDE AIR DAMPER (OA-D) REMAINS COMMANDED OPEN TO MINIMUM POSITION. THE OUTSIDE AIR DAMPER (OA-D) IS CLOSED WHEN THE AIR HANDLING UNIT IS COMMANDED OFF.

MINIMUM OA CONTROL: THE OA DAMPER WILL OPEN AND CLOSE AS REQUIRED TO MAINTAIN THE MINIMUM OA FLOW SETPOINT. THE FRESH AIR INTAKE OF THE UNIT WILL BE LIMITED TO PREVENT THE PREHEAT TEMPERATURE FROM FALLING BELOW THE LOW LIMIT SETPOINT.

GENERAL EXHAUST: PRESSURE DIFFERENTIAL SWITCH PDS-3 INDICATE THE STATUS OF THE EXHAUST FANS AND ALARM IF NO AIR PRESSURE DIFFERENTIAL DETECTED WHEN FANS ARE PROGRAMMED TO OPERATE.

TEMPERATURE CONTROL: THE DISCHARGE AIR TEMPERATURE SETPOINT WILL BE RESET AS THE OUTDOOR AIR TEMPERATURE CHANGES.

COOLING COIL: THE COOLING COIL WILL MODULATE TO MAINTAIN THE TEMPERATURE SETPOINT. WHEN THE UNIT IS SHUTDOWN, THE COOLING COIL WILL BE COMMANDED TO A PRESET POSITION SHOULD THE OUTDOOR AIR TEMPERATURE FALL BELOW THE LOW OUTDOOR AIR TEMPERATURE SETPOINT. UPON A LOSS OF AIRFLOW, THE COOLING COIL WILL BE OFF.

BACKUP CONSTANT SPEED OPERATION: PROVIDE AUTO BYPASS SWITCH AT VFD FOR SUPPLY FAN MOTOR. UPON FAILURE OF VFD, THE FAN SHALL AUTOMATICALLY OPERATE AT CONSTANT DESIGN SPEED. AND ALARM SIGNAL SHALL BE SENT TO THE DCP TO INDICATE THIS CONDITION OF OPERATION.

A CP-AHU-1 (OFFICE, SHOP & STORAGE)
NO SCALE

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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CONTROLS UPGRADE

SHEET TITLE:

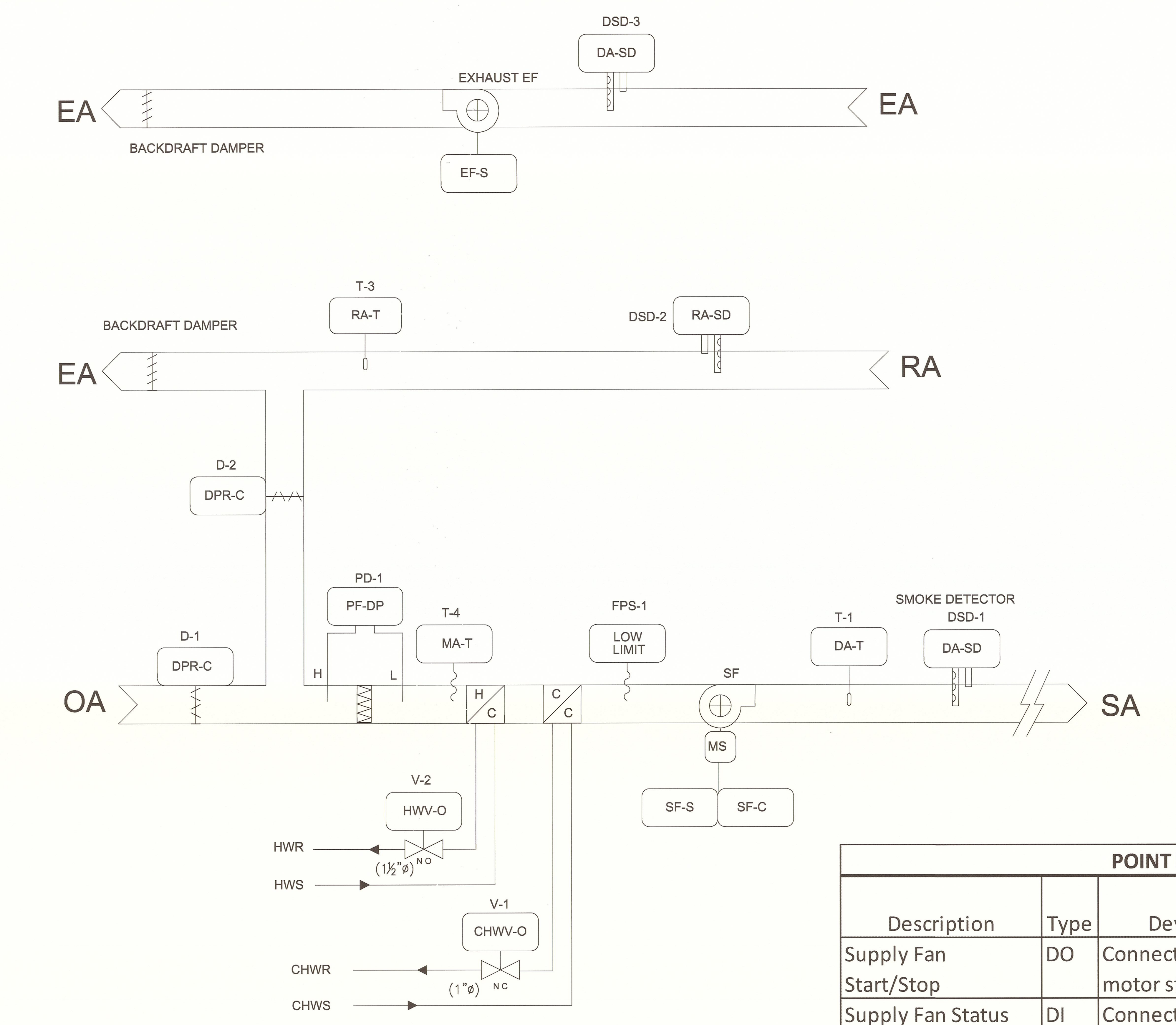
AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.6

SHEET : OF



SHEET NOTES:

1. CONTRACTOR TO FILED VERIFY ALL EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF WORK. ADJUST FOR FILED VARIANCE WITH NO ADDITION COST TO THE OWNER.

POINT LIST - CENTRAL PLANT - CP-AHU-2 & 3

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
Supply Fan Start/Stop	DO	Connect to motor starter	NO	NO	COV	COV	
Supply Fan Status	DI	Connect to motor starter	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Heating Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke, RA, SA & Exhaust)	DI	Connect to FA panel	NO	NO	COV	COV	
Outdoor Air Temperature	AI	OA-T Sensor	YES	NO	1 min.	15 min.	F
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Return Air Temperature	AI	RA-T Sensor	YES	NO	1 min.	15 min.	F
Supply Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	HH
Duct Static Pressure	AI	SA-P	YES	NO	1 min.	15 min.	F
Duct High Limit Alarm	DI	SSP-ALM. Connect to VFD	YES	NO	COV	COV	
Freeze Alarm (Low Limit)	DI	Low Limit (FPS-1). Connect to VFD	YES	NO	COV	COV	F
Pressure Relief	DI	SSP-ALM Connect to end switch	YES	NO	COV	COV	
Exhaust Fan Status	DI	Current Switch	YES	NO	COV	COV	
Damper OA-D	AO	Modulating actuator	NO	NO	1 min.	15 min.	
Damper RA-D	AO	Modulating actuator	YES	NO	1 min.	15 min.	
OA-D & RA-D Damper Feedback	DI	Connect to end switch	YES	NO	COV	COV	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	

GENERAL

FURNISH THE DIGITAL CONTROL PANELS AND ALTER EXISTING AS NECESSARY TO ACCOMMODATE ALL SEQUENCE OF CONTROLS.

AHU IS AUTOMATICALLY STARTED/STOPPED BY THE START/STOP PROGRAM IN THE DCP AS DESCRIBED BELOW.

IN THE NORMAL MODE AHU SHALL RUN CONTINUOUSLY.

ANY TIME THE FAN IS TURNED OFF, THE AIR DAMPER D-1 AND RETURN DAMPER D-2 SHALL CLOSE. THE DAMPERS SHALL BE PROVED OPEN BEFORE THE FANS START.

PRESSURE DIFFERENTIAL SWITCHES PDS-1 AND PDS-2 SHALL INDICATE THE STATUS OF THE SUPPLY AND EXHAUST FANS AND ALARM IF NO AIR PRESSURE DIFFERENTIAL DETECTED WHEN FANS ARE PROGRAMMED TO OPERATE.

APPLIED TO AHU-3 ONLY:

WHEN A SIGNAL IS SENT TO OPERATE THE EXHAUST FAN FROM THE OXYGEN MONITORING CONTROL PANEL THE EXHAUST FAN EF-1 SHALL OPERATE AT FULL CAPACITY.

THE REFRIGERANT EQUIPMENT EQUIPMENT SWITCH SHALL OVERRIDE THE AUTOMATIC CONTROLS AND THE EXHAUST FAN EF-1 SHALL OPERATE AT FULL CAPACITY WHEN THE SWITCH IS TURNED ON.

EF-4 AND EF-5 ARE CONTROLLED VIA ROOM THERMOSTAT AND SHALL RUN AS NEEDED TO SATISFY THE ROOM SET POINT.

AUTOMATIC SMOKE OPERATION

FIRE ALARM CONTACTS AND SIGNAL WIRING SHALL BE FURNISHED BY TCP TO AHU AND FIRE ALARM CONTACTS (FACP).

IF SMOKE IS DETECTED BY THE SUPPLY AIR DUCT SMOKE DETECTOR DSD-1, THE SUPPLY FAN SHALL SHUTOFF, OUTSIDE AIR DAMPER (D-1) AND RETURN DAMPER (D-2) SHALL CLOSE. ASSOCIATED EXHAUST FANS SHALL OPERATE. SIGNAL SHALL BE SENT TO THE DPC TO INDICATE THIS CONDITION OF OPERATION OF ALL DAMPERS AND FANS. SIGNAL SHALL BE SENT TO FIRE ALARM SYSTEM AND THE OVERRIDE FIREMAN'S CONTROL PANEL. OTHER AHU SHALL CONTINUE TO OPERATE.

IF SMOKE IS DETECTED BY RETURN AIR DUCT SMOKE DETECTOR DSD-2, OR BY THE GENERAL EXHAUST AIR DUCT SMOKE DETECTOR (DSD-2) OR BY SPACE MOUNTED SMOKE DETECTORS IN THE AREA SERVED BY THE AHU, THE OA DAMPER (D-1) SHALL BE OPEN AND RETURN DAMPER (D-2) SHALL BE CLOSED. THE SUPPLY FAN SHALL RUN AT FULL AIR CAPACITY. ASSOCIATED EXHAUST FAN(S) SHALL OPERATE. SIGNALS SHALL BE SENT TO DCP TO INDICATE CONDITIONS OF OPERATION OF ALL DAMPERS AND FANS. SIGNAL SHALL BE SENT TO AIR ALARM SYSTEM AND THE OVERRIDE FIREMAN'S CONTROL PANEL.

SUPPLY FAN CONTROL: THE SUPPLY FAN WILL BE STARTED BASED ON A COMMAND FOR THE DDC SYSTEM. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. THE SUPPLY FAN WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE AT SETPOINT. UPON A LOSS OF AIRFLOW, THE SYSTEM WILL AUTOMATICALLY RESTART.

BACKDRAFT RELIEF: THE BAROMETRIC BACKDRAFT D-3 SHALL RELIEVE THE PLENUM PRESSURE CREATED BY THE RETURN AIR DAMPER (D-2) WHEN MODULATING TO CLOSE.

ECONOMIZER CONTROL: WHEN THE OUTDOOR AIR IS COOLER THAN THE ECONOMIZER SETPOINT, THE ECONOMIZER WILL ACT AS THE INITIAL STAGE OF COOLING, WORKING IN SEQUENCE WITH THE COOLING COIL.

GENERAL EXHAUST: PRESSURE DIFFERENTIAL SWITCH PDS-3 INDICATE THE STATUS OF THE EXHAUST FANS AND ALARM IF NO AIR PRESSURE DIFFERENTIAL DETECTED WHEN FANS ARE PROGRAMMED TO OPERATE.

TEMPERATURE CONTROL: THE DISCHARGE AIR TEMPERATURE SETPOINT WILL BE RESET AS THE OUTDOOR AIR TEMPERATURE CHANGES.

COOLING COIL: THE COOLING COIL WILL MODULATE TO MAINTAIN THE TEMPERATURE SETPOINT. WHEN THE UNIT IS SHUTDOWN, THE COOLING COIL WILL BE COMMANDED TO A PRESET POSITION SHOULD THE OUTDOOR AIR TEMPERATURE FALL BELOW THE LOW OUTDOOR AIR TEMPERATURE SETPOINT. UPON A LOSS OF AIRFLOW, THE COOLING COIL WILL BE OFF.

PREHEAT COIL APPLIED TO CP-AHU-3 ONLY: THE PREHEAT COIL WILL MODULATE TO MAINTAIN THE TEMPERATURE SETPOINT. WHEN THE UNIT IS SHUTDOWN, THE PREHEAT COIL WILL BE COMMANDED TO A PRESET POSITION SHOULD THE OUTDOOR AIR TEMPERATURE FALL BELOW THE LOW OUTDOOR AIR TEMPERATURE SETPOINT. UPON A LOSS OF AIRFLOW, THE PREHEAT COIL WILL BE COMMANDED TO A PRESET POSITION SHOULD THE OUTDOOR AIR TEMPERATURE FALL BELOW THE LOW OUTDOOR AIR TEMPERATURE SETPOINT.

NOTES:

AHU-2 SERVES ELECTRICAL AND GENERATOR ROOM

AHU-3 SERVIES CHILLER ROOM

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

A

CP-AHU-2 & CP-AHU-3

NO SCALE

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SAN MATEO, CALIFORNIA
CONTROLS UPGRADE

SHEET TITLE:

AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

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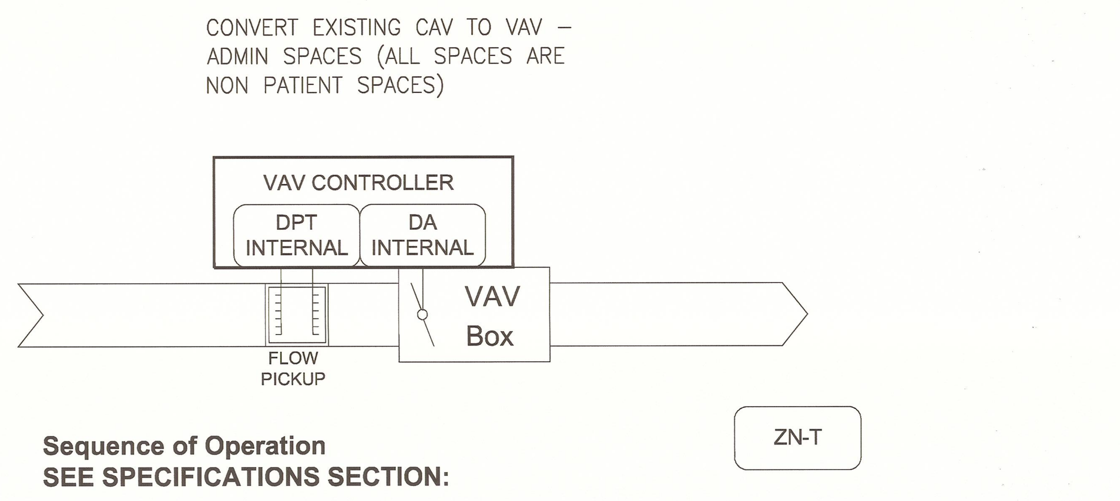
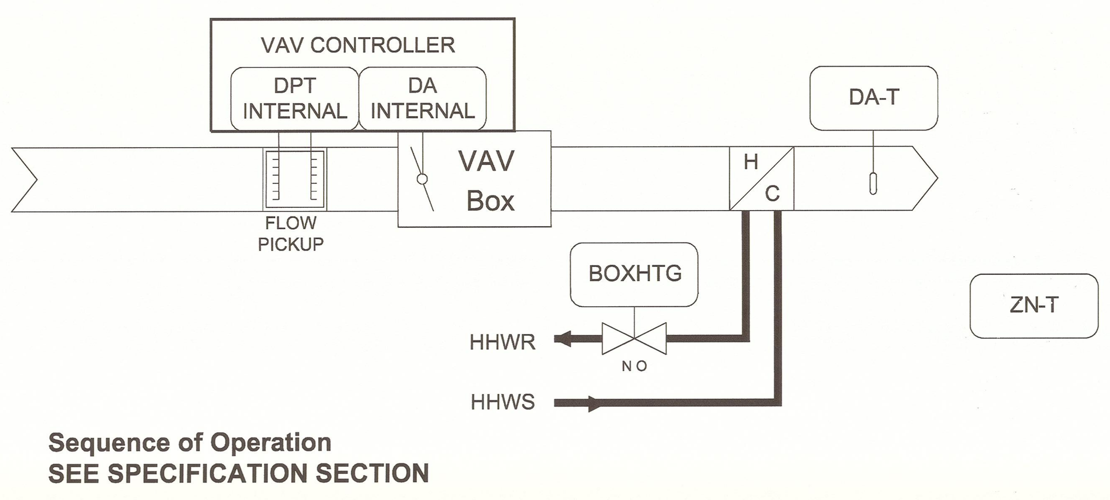
M6.7

SHEET: OF



B VAV BOX – COOLING ONLY (CAV-8 & CAV-9)

NO SCALE

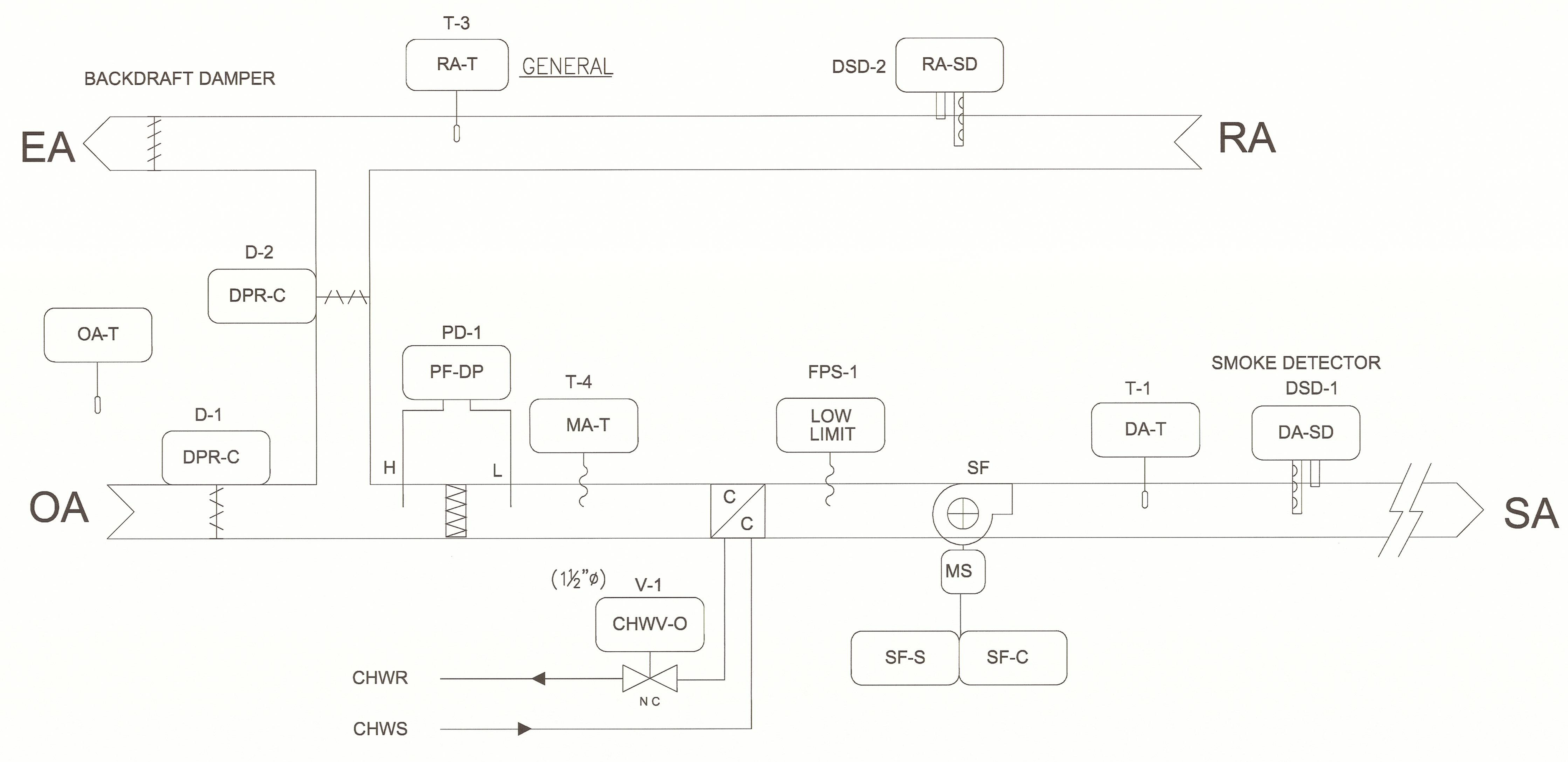


C VAV BOX – WITH REHEAT (CAV-1 THRU CAV-7)

NO SCALE

POINT LIST - VAV WITH REHEAT							
Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
VAV Box Damper Position	AO	Modulating Actuator	YES	NO	1 min.	15 min.	
HW Valve Signal	AO	New Modulating Actuator and Valve	YES	NO	1 min.	15 min.	
Supply Airflow	AI	Crossflow Sensor*	NO	NO	1 min.	15 min.	
Supply air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Zone Temperature	AI	Thermostat	YES	NO	1 min.	60 min	
Local Overrdie	DI	Integrated with room Temperature Sensor	YES	NO	1 min.	15 min.	F
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Occupied Command							
Zone Temperature Setpoint							
* Provide and connect new DPT to existing crossflow sensor from new VAV Controller							

POINT LIST - VAV COOLING ONLY							
Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
VAV Box Damper Position	AO	Modulating Actuator	YES	NO	1 min.	15 min.	
Supply Airflow	AI	Crossflow Sensor*	NO	NO	1 min.	15 min.	
Zone Temperature	AI	Thermostat	YES	NO	1 min.	60 min	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Occupied Command							
Zone Temperature Setpoint							
* Provide and connect new DPT to existing crossflow sensor from new VAV Controller							



A CP-AHU-4 BOILER & MED. GAS ROOM

NO SCALE

POINT LIST - CENTRAL PLANT - CP-AHU-4							
Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
Supply Fan Start/Stop	DO	Connect to motor starter	NO	NO	COV	COV	
Supply Fan Status	DI	Current Sensor, Connect to motor starter	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke, RA, SA & Exhaust)	DI	Connect to FA panel	NO	NO	COV	COV	
Outdoor Air Temperature	AI	OA-T Sensor	YES	NO	1 min.	15 min.	F
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Return Air Temperature	AI	RA-T Sensor	YES	NO	1 min.	15 min.	F
Supply Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	HH
Freeze Alarm (Low Limit)	DI	Low Limit (FPS-1). Connect to VFD	YES	NO	COV	COV	F
Damper OA-D	AO	Modulating actuator	NO	NO	1 min.	15 min.	
Damper RA-D	AO	Modulating actuator	YES	NO	1 min.	15 min.	
OA-D & RA-D Damper Feedback	DI	Connect to end switch	YES	NO	COV	COV	

FURNISH THE DIGITAL CONTROL PANELS AND ALTER EXISTING AS NECESSARY TO ACCOMMODATE ALL SEQUENCE OF CONTROLS.

AHU IS AUTOMATICALLY STARTED/STOPPED BY THE START/STOP PROGRAM IN THE DCP AS DESCRIBED BELOW.

IN THE NORMAL MODE AHU SHALL RUN CONTINUOUSLY.

ANY TIME THE FAN IS TURNED OFF, THE AIR DAMPER D-1 AND RETURN DAMPER D-2 SHALL CLOSE. THE DAMPERS SHALL BE PROVED OPEN BEFORE THE FANS START.

PRESSURE DIFFERENTIAL SWITCHES PDS-1 SHALL INDICATE THE STATUS OF THE SUPPLY AND EXHAUST FANS AND ALARM IF NO AIR PRESSURE DIFFERENTIAL DETECTED WHEN FANS ARE PROGRAMMED TO OPERATE.

AUTOMATIC SMOKE OPERATION

FIRE ALARM CONTACTS AND SIGNAL WIRING SHALL BE FURNISHED BY TCP TO AHU AND FIRE ALARM CONTACTS (FACP).

IF SMOKE IS DETECTED BY THE SUPPLY AIR DUCT SMOKE DETECTOR (DSD-1), THE RETURN AIR DUCT SMOKE DETECTOR (DSD-2), OR BY SPACE MOUNTED SMOKE DETECTORS IN THE AREA SERVED BY THE AHU, THE SUPPLY FAN SHALL SHUTOFF, OUTSIDE AIR DAMPER (D-1) AND AND RETURN AIR DAMPER (D-2) SHALL CLOSE. SIGNAL SHALL BE SENT TO THE DPC TO INDICATE THIS CONDITION OF OPERATION OF ALL DAMPERS AND FAN. SIGNAL SHALL BE SENT TO FIRE ALARM SYSTEM AND THE OVERRIDE FIREMAN'S CONTROL PANEL. OTHER AHU SHALL CONTINUE TO OPERATE.

SUPPLY FAN CONTROL: THE SUPPLY FAN WILL BE STARTED BASED ON A COMMAND FOR THE DDC SYSTEM. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. THE SUPPLY FAN WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE AT SETPOINT. UPON A LOSS OF AIRFLOW, THE SYSTEM WILL AUTOMATICALLY RESTART.

BACKDRAFT RELIEF: THE BAROMETRIC BACKDRAFT D-3 SHALL RELIEVE THE PLENUM PRESSURE CREATED BY THE RETURN AIR DAMPER (D-2) WHEN MODULATING TO CLOSE.

ECONOMIZER CONTROL: WHEN THE OUTDOOR AIR IS COOLER THAN THE ECONOMIZER SETPOINT, THE ECONOMIZER WILL ACT AS THE INITIAL STAGE OF COOLING, WORKING IN SEQUENCE WITH THE COOLING COIL.

TEMPERATURE CONTROL: THE DISCHARGE AIR TEMPERATURE SETPOINT WILL BE RESET AS THE OUTDOOR AIR TEMPERATURE CHANGES.

COOLING COIL: THE COOLING COIL WILL MODULATE TO MAINTAIN THE TEMPERATURE SETPOINT. WHEN THE UNIT IS SHUTDOWN, THE COOLING COIL WILL BE COMMANDED TO A PRESET POSITION SHOULD THE OUTDOOR AIR TEMPERATURE FALL BELOW THE LOW OUTDOOR AIR TEMPERATURE SETPOINT. UPON A LOSS OF AIRFLOW, THE COOLING COIL WILL BE OFF.

SHEET NOTES:

1. REMOVE ALL EXISTING PNEUMATIC VALVES AND PROVIDE FULL DDC VALVES IN PLACE. MATCH 'CV' OF NEW VALVES WITH EXISTING. RECORD CONTROL DRAWINGS INDICATES 'CV' FOR V-1=25.0.
   'CV' FOR CONSTANT VOLUME BOXE'S VALVE IS REVISED DUE TO REVISED AIRFLOW
   CAV-1 = 0.30
   CAV-2 = 0.30
   CAV-3 = 0.60
   CAV-4 = 2.30
   CAV-5 = 0.65
   CAV-6 = 0.40
   CAV-7 = 1.00
2. CONTRACTOR TO FILED VERIFY ALL EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF WORK. ADJUST FOR FILED VARIANCE WITH NO ADDITION COST TO THE OWNER.

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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SHEET TITLE:

AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS

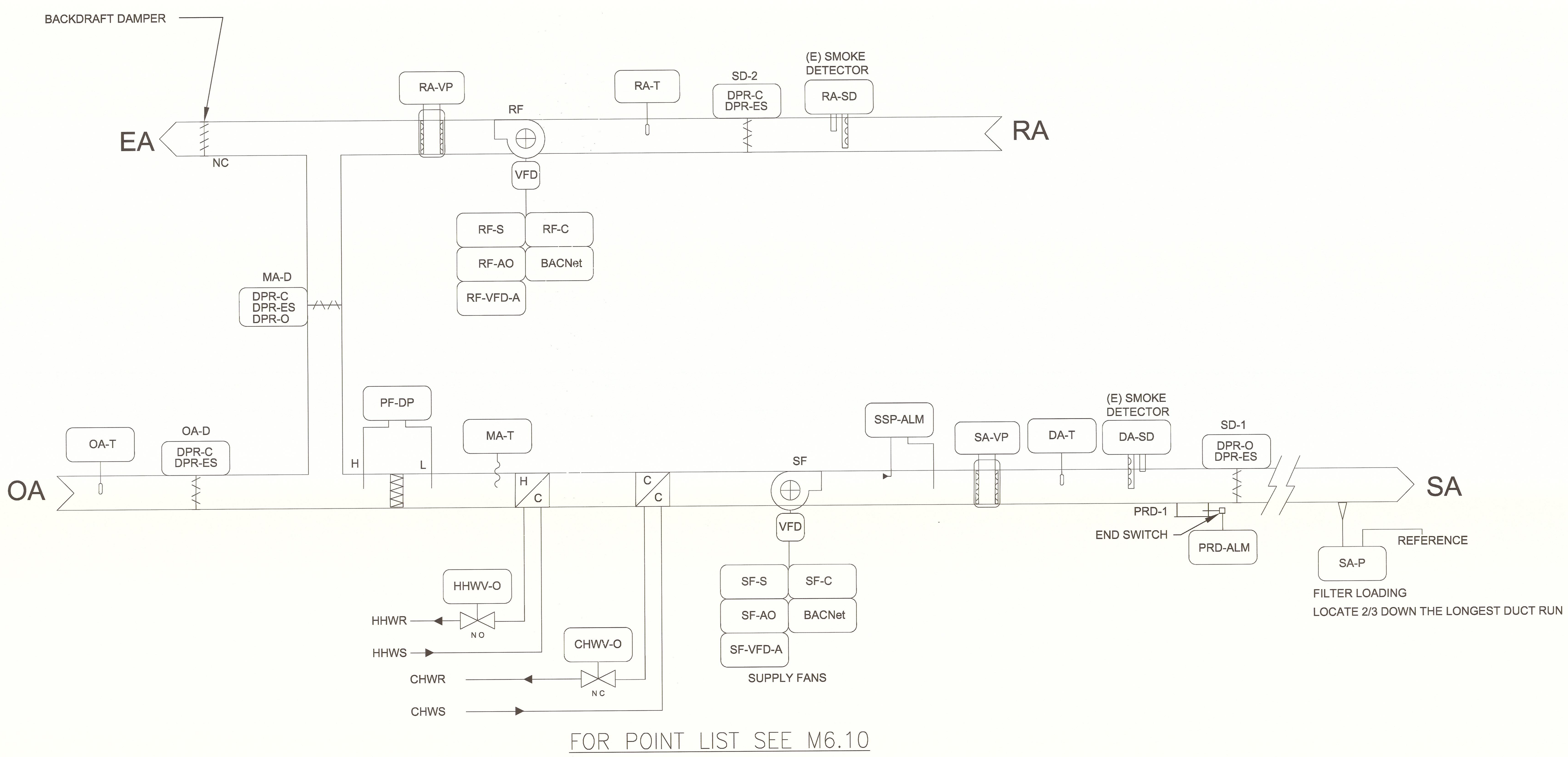
NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.8

SHEET : OF

SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.
SEE SPECIFICATIONS SECTION 23 09 93 – 1.1



FOR POINT LIST SEE M6.10

A — CL–AHU–1 AND CL–AHU–2
NO SCALE

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SHEET TITLE:

AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS - CLINIC BUILDING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

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FACILITIES DEVELOPMENT DIVISION

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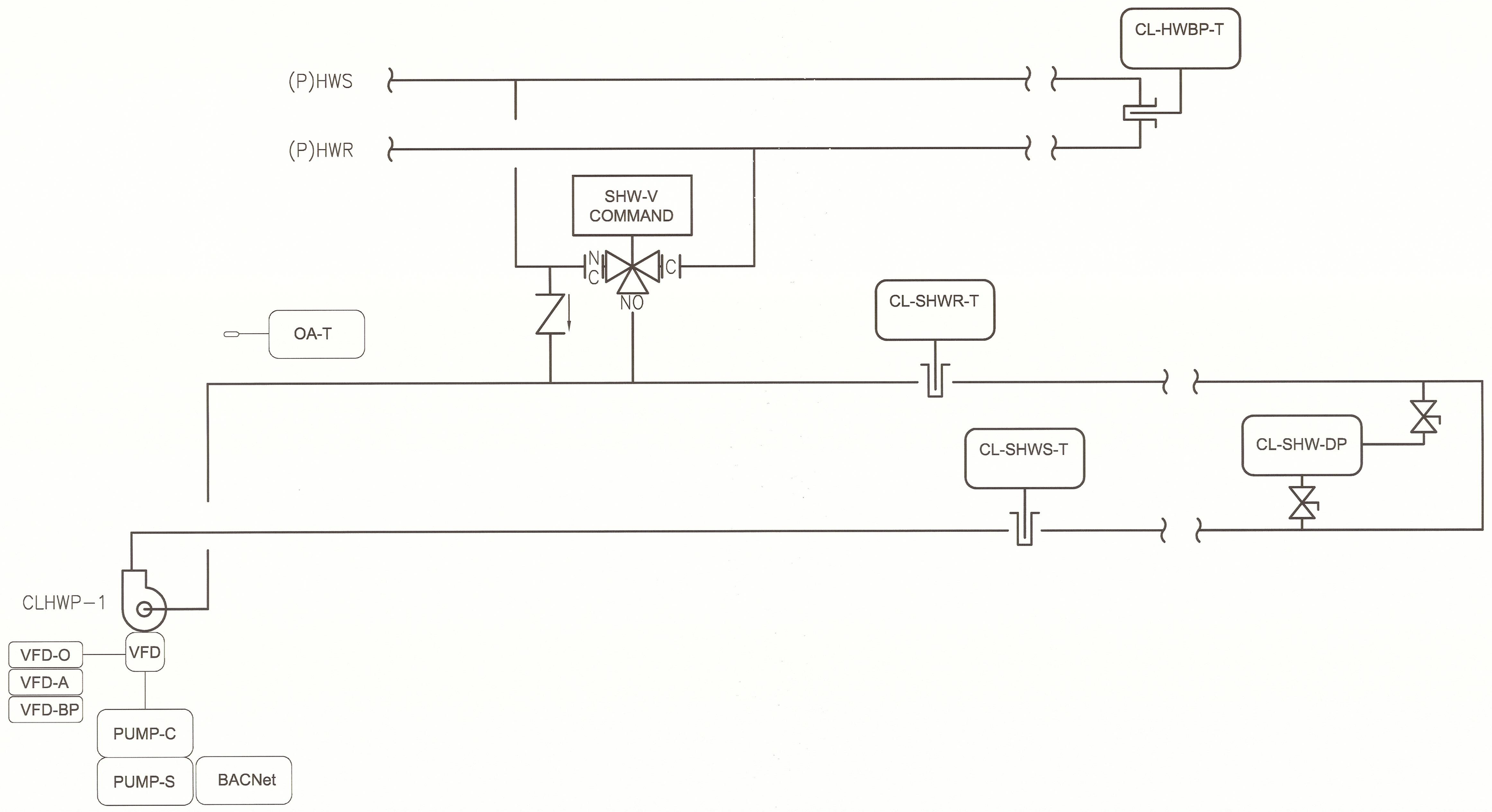
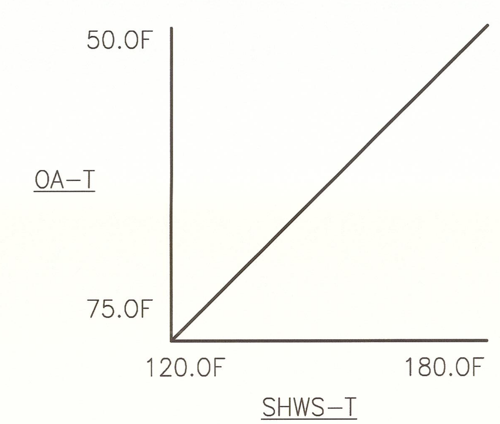


SEQUENCE OF OPERATION–HEATING HOT WATER SECONDARY LOOP CONTROL DIAGRAM.
OCCUPIED MODE
DURING THE OCCUPIED MODE OPERATION THE SECONDARY PUMPS SHALL BE START/STOPPED BY THE CONTROLLER. ONE PUMP SHALL OPERATE AT ALL TIMES. A FLOW SENSOR IS PROVIDED TO INDICATE FLOW. THE HOT WATER SUPPLY AND RETURN TEMPERATURE SHALL BE MONITORED BY TEMPERATURE SENSORS\. THE HOT WATER SUPPLY TEMPERATURE SHALL BE MAINTAINED BY MODULATING A 3-WAY MIXING VALVE IN THE PRIMARY LOOP. THE HOT WATER SUPPLY TEMPERATURE IS TO BE RESET BY THE FOLLOWING SCHEDULE:

OUTSIDE AIR TEMP	HOT WATER SUPPLY TEMP
75.OFF	120.OF
50.OF	180.OF

FLOW IN THE SECONDARY HEATING HOT WATER SUPPLY LOOP IS TO BE CONTROLLED BY MODULATING THE HOT WATER PUMPS' VFD. SHALL MODULATE TO MAINTAIN AN ADJUSTABLE MINIMUM DIFFERENTIAL PRESSURE IN THE SECONDARY WATER LOOP. THE VFD SHALL BE PROVIDED WITH AN AUTO BYPASS. UPON FAILURE OF THE VFD, THE PUMP SHALL AUTOMATICALLY OPERATE AT A CONSTANT SPEED.



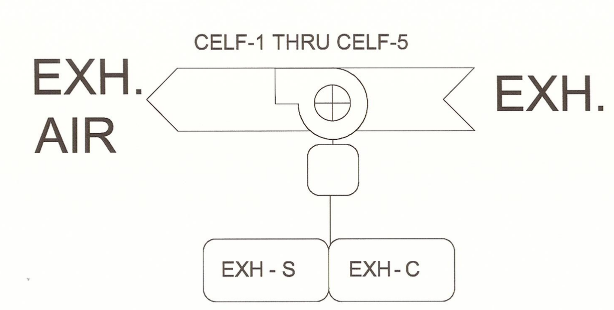
SECONDARY HOT WATER
RESET SCHEDULE

POINT LIST - CLINIC SECONDARY HOT WATER LOOP

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
SHW Supply Temperature	AI	Temperature Sensor	YES	NO	1 min.	15 min.	F
SHW Return Temperature	AI	Temperature Sensor	YES	NO	1 min.	15 min.	F
SHW loop differential pressusure	AI	DP	YES	NO	1 min.	15 min.	
Secondary hot water control valve	AO	Acutator on Control Valve	YES	NO	COV	COV	
Primary hot water bypass loop Temperature	AI	Temperature Sensor	YES	NO	1 min.	15 min.	F
Pump-1 Run Command	AI	Connect to VFD	NO	NO	COV	COV	
Pump-1 Status	DI	Connect to VFD	NO	NO	COV	COV	
Pump-1 VFD Alarm	DI	Connect to VFD	NO	NO	COV	COV	
Pump-1 VFD Speed	AI	Connect to VFD	NO	NO	COV	COV	

Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS
Occupied Command - Run Pump
OA-T - Global Input
SHW Differential Pressure Setpoint
SHW supply temperature setpoin (reset)
OSA-L - SHW supply temperature reset (Input-Lo)
OSA-HI - SHW supply temperature reset (Input-HI)
SHWS-L - SHW supply temperature reset (Output-Lo)
SHWS-HI - SHW supply temperature reset (Output-HI)

B CLINIC SECONDARY HOT WATER LOOP
NO SCALE



SEQUENCE OF OPERATION:
OCCUPIED MODE: DURING THE OCCUPIED MODE OPERATION THE EXHAUST FAN SHALL BE COMMANDED ON BY BMS TO RUN CONTINUOUSLY. CURRENT SWITCH INDICATE THE STATUS OF THE EXHAUST FANS AND ALARM BMS IF NO CURRENT IS DETECTED WHEN FANS ARE PROGRAMMED TO OPERATE.

POINT LIST - CLINC - CLEF-1 THRU CLEF-5

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
EXHAUST FAN STATRT/STOP COMMAND	DO	Connect to Fan motor starter	NO	NO	COV	COV	
Exhaust Fan status	DI	Connect to current sensor	YES	NO	COV	COV	

Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS
Alarm - If status does not meet the command than alarm at the BMS

A EXHAUST FAN
CONTROLS DIAGRAM CLEF-1 THRU CLEF-5
NO SCALE

POINT LIST - CLINC - CL-AHU-1 and CL-AHU-2

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Return Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Supply Fan Speed	AO	Connect to VFD Speed	NO	NO	1 min.	15 min.	
Return Fan Speed	AO	Connect to VFD Speed	No	NO	1 min.	15 min.	
Supply Fan Status	DI	Connected to VFD Status (Thru Network)	NO	NO	COV	COV	
Return Fan Status	DI	Connected to VFD Status (Thru Network)	NO	NO	COV	COV	
Supply Fan VFD Alarm	DI	Connect to VFD	NO	NO	COV	COV	
Reutrn Fan VFD Alarm	DI	Connect to VFD	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Hot Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke, SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Duct Alarm (Smoke, RA)	DI	Connect to FA panel	NO	NO	COV	COV	
Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Outdoor Air Temperature	AI	OA-T Sensor	YES	NO	1 min.	15 min.	F
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Return Air Temperature	AI	RA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Duct Static Pressure	AI	SA-P	YES	NO	1 min.	15 min.	
Supply (Airflow) air velocity pressure	AI	SA-VP	YES	NO	1 min.	15 min.	
Return (Airflow) air velocity pressure	AI	RA-VP	YES	NO	1 min.	15 min.	
Duct High Pressure Limit Alarm	DI	SSP-ALM. Connect to VFD	YES	NO	COV	COV	
Pressure Relief Status	DI	PRD-S Connect to end switch at PRD-1	YES	NO	COV	COV	
Command (OA-D), (MA-D)	AO	Modulating actuator	NO	NO	1 min.	15 min.	
OA-D Status	DI	Connect to end switch	YES	NO	COV	COV	
MA-D Status	DI	Connect to end switch	YES	NO	COV	COV	
MA-D Override on fire	DO	Modulating actuator	NO	NO	COV	COV	
Supply Air Smoke Damper Command SD-1	DO	Connect Damper Aactuator	NO	NO	COV	COV	
Supply Air Smoke Damper Status SD-1	DI	Connect to end switch	NO	NO	COV	COV	
Return Air Smoke Damper Command SD-2	DO	Connect Damper Aactuator	NO	NO	COV	COV	
Return Air Smoke Damper Status SD-2	DI	Connect to end switch	NO	NO	COV	COV	

Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS
Occupied Command
Discharge (Supply) Air Temperature Setpoint
CL-AHU-2 only: GPL process Hi Zone Temperature (reset)
Discharge Air Static Setpoint

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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CONSULTANTS:

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CONTROLS UPGRADE

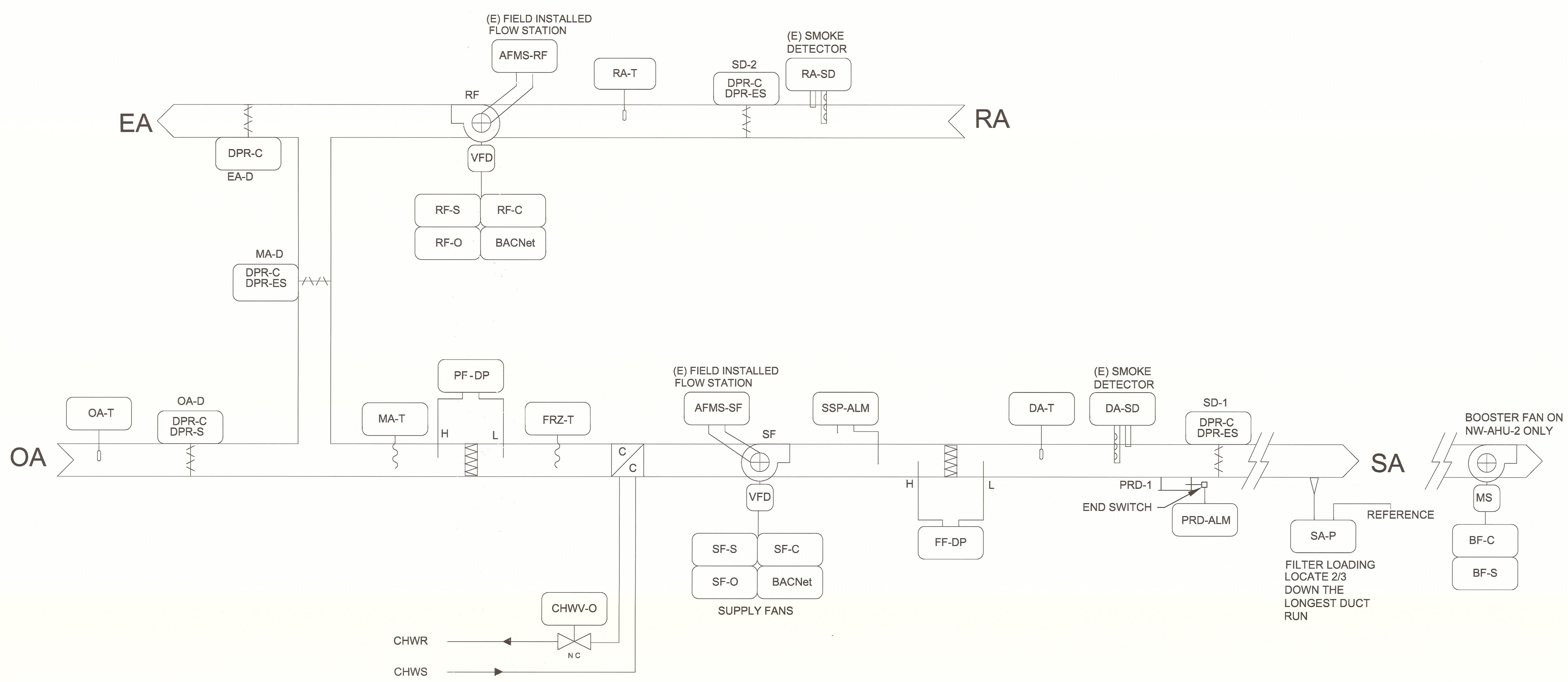
SHEET TITLE:
AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS CLINIC BUILDING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:
M6.10

SHEET : OF

SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.
SEE SPECIFICATIONS SECTION 23 09 93 – 1.1



FOR POINT LIST SEE M6.12

A NW–AHU–1 AND NW–AHU–2
NO SCALE

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CONTROLS UPGRADE

SHEET TITLE:

AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS NURSING WING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.11

SHEET : OF

POINT LIST - NW-AHU-1

Description	Type	Device	New Device	New Point	Trend Logging: Commissioning	Trend Logging: Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Return Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Supply Fan VFD Command (speed)	AO	Connect to VFD	NO	NO	1 min.	15 min.	
Return Fan VFD Command (speed)	AO	Connect to VFD	No	NO	1 min.	15 min.	
Supply Fan Status	DI	Connected to VFD Status (Thru Network)	NO	NO	COV	COV	
Return Fan Status	DI	Connected to VFD Status (Thru Network)	NO	NO	COV	COV	
Supply Fan VFD Alarm	DI	Connected to VFD Status	NO	NO	COV	COV	
Return Fan VFD ALARM	DI	Connected to VFD Status	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Duct Alarm (Smoke RA)	DI	Connect to FA panel	NO	NO	COV	COV	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Final Filter Pressure drop	AI	FF-DP	YES	NO	1 min.	15 min.	
Outdoor Air Temperature	AI	OA-T Sensor	YES	NO	1 min.	15 min.	F
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Return Air Temperature	AI	RA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Duct Static Pressure	AI	SA-SP	YES	NO	1 min.	15 min.	
Supply Airflow	AI	SA-VP	YES	NO	1 min.	15 min.	
Return Airflow	AI	RA-VP	YES	NO	1 min.	15 min.	
Duct High Limit Alarm	DI	SSP-ALM. Connect to VFD	YES	NO	COV	COV	
Freeze Alarm (Low Limit)	DI	Low Limit. Connect to VFD	YES	NO	COV	COV	F
Pressure Relief Status	DI	PRD-ALM Connect to end switch	YES	NO	COV	COV	
Command Damper (OA-D), (MA-D), (EA-D)	AO	Modulating actuator	NO	NO	COV	COV	
OA-D Status	DI	CONNECT TO END SWITCH	YES	NO	COV	COV	
RA-D Status	DI	Connect to end switch	YES	NO	COV	COV	
MA-D Override on Fire	DO	Connect to modulating actuator	NO	NO	COV	COV	
EA-D Status	DI	Connect to end switch	YES	NO	COV	COV	
Zone Temperature - SA reset	AI	Zone Sensor	NO	NO	1 min.	15 min.	F
Smoke Damper, Supply (SD-1) & Return (SD-2)	DI / DO	Connect to end switch & Actuator	NO	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint (Reset)							
Duct Static Pressure setpoint (Adjustable)							
Supply Airflow Value in CFM (based on VP sesnor)							
Return Airflow Value in CFM (based on VP sesnor)							

POINT LIST - NW-AHU-2

Description	Type	Device	New Device	New Point	Trend Logging: Commissioning	Trend Logging: Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Return Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Supply Fan VFD Command (speed)	AO	Connect to VFD	NO	NO	1 min.	15 min.	
Return Fan VFD Command (speed)	AO	Connect to VFD	No	NO	1 min.	15 min.	
Supply Fan Status	DI	Connected to VFD Status (Thru Network)	NO	NO	COV	COV	
Return Fan Status	DI	Connected to VFD Status (Thru Network)	NO	NO	COV	COV	
Supply Fan VFD Alarm	DI	Connected to VFD Status	NO	NO	COV	COV	
Return Fan VFD ALARM	DI	Connected to VFD Status	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Duct Alarm (Smoke RA)	DI	Connect to FA panel	NO	NO	COV	COV	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Final Filter Pressure drop	AI	FF-DP	YES	NO	1 min.	15 min.	
Outdoor Air Temperature	AI	OA-T Sensor	YES	NO	1 min.	15 min.	F
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Return Air Temperature	AI	RA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Duct Static Pressure	AI	SA-SP	YES	NO	1 min.	15 min.	
Supply Airflow	AI	SA-VP	YES	NO	1 min.	15 min.	
Return Airflow	AI	RA-VP	YES	NO	1 min.	15 min.	
Duct High Limit Alarm	AI	SSP-ALM. Connect to VFD	YES	NO	COV	COV	
Freeze Alarm (Low Limit)	DI	Low Limit. Connect to VFD	YES	NO	COV	COV	F
Pressure Relief Status	DI	PRD-ALM Connect to end switch	YES	NO	COV	COV	
Command Damper (OA-D), (MA-D), (EA-D)	AO	Modulating actuator	NO	NO	COV	COV	
OA-D Status	DI	CONNECT TO END SWITCH	YES	NO	COV	COV	
RA-D Status	DI	Connect to end switch	YES	NO	COV	COV	
MA-D Override on Fire	DO	Connect to modulating actuator	NO	NO	COV	COV	
EA-D Status	DI	Connect to end switch	YES	NO	COV	COV	
Zone Temperature - SA reset	AI	Zone Sensor	NO	NO	1 min.	15 min.	F
Booster Fan, Start/Stop & Status	DO/ DI	Motor Starter & Current Sensor	NO	NO	COV	COV	
Smoke Damper, Supply (SD-1) & Return (SD-2)	DI / DO	Connect to end switch & Actuator	NO	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint (Reset)							
Duct Static Pressure setpoint (Adjustable)							
Supply Airflow Value in CFM (based on VP sesnor)							
Return Airflow Value in CFM (based on VP sesnor)							

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
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JUN 02 2016
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CONTROLS UPGRADE

SHEET TITLE:

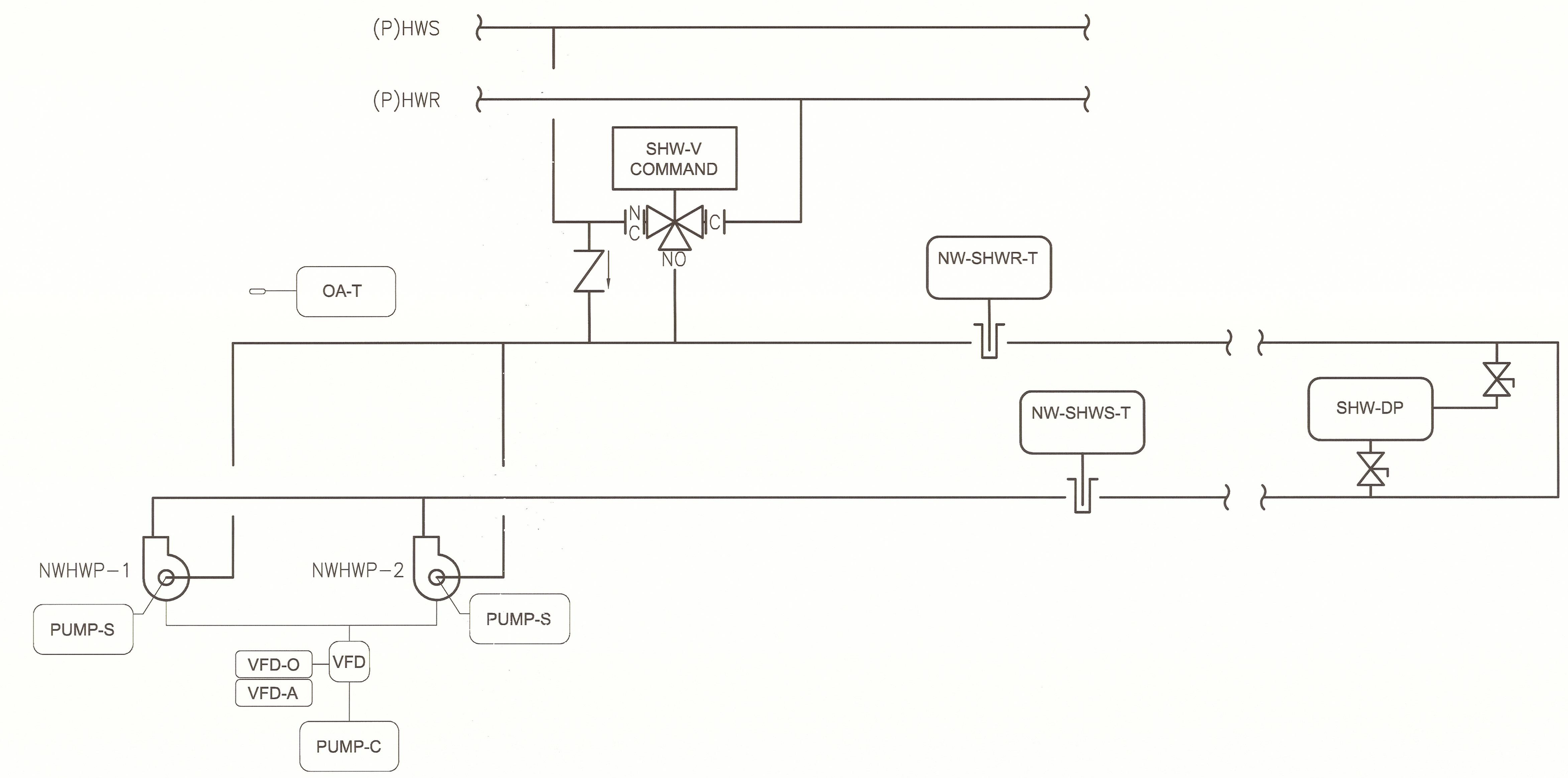
AIR HANDING UNIT SYSTEM CONTROLS POINT LIST NURSING WING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.12

SHEET : OF

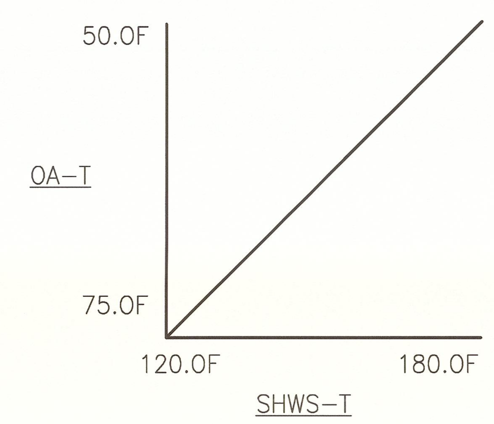


SEQUENCE OF OPERATION-HEATING HOT WATER SECONDARY LOOP CONTROL DIAGRAM.
OCCUPIED MODE
DURING THE OCCUPIED MODE OPERATION THE SECONDARY PUMPS SHALL BE START/STOPPED BY THE CONTROLLER. ONE PUMP SHALL OPERATE AT ALL TIMES. A FLOW SENSOR IS PROVIDED TO INDICATE FLOW. THE HOT WATER SUPPLY AND RETURN TEMPERATURE SHALL BE MONITORED BY TEMPERATURE SENSORS\. THE HOT WATER SUPPLY TEMPERATURE SHALL BE MAINTAINED BY MODULATING A 3-WAY MIXING VALVE IN THE PRIMARY LOOP. THE HOT WATER SUPPLY TEMPERATURE IS TO BE RESET BY THE FOLLOWING SCHEDULE:

OUTSIDE AIR TEMP	HOT WATER SUPPLY TEMP
75.0FF	120.0F
50.0F	180.0F

FLOW IN THE SECONDARY MEATING HOT WATER SUPPLY LOOP IS TO BE CONTROLLED BY MODULATING THE HOT WATER PUMPS' VFD. SHALL MODULATE TO MAINTAIN AN ADJUSTBLE MINIMUM DIRRERENTIAL PRESSURE IN HTE SECONDARY WATER LOOP. A CHANGEOVER OUTPUT IS PROVIDED TO SELECT THE PUMP THE VFD IS CONTROLLING. THE VFD SHALL BE PROVIDED WITH AN AUTO BYPASS. UPON FAILURE OF THE VFD, THE PUMP SHALL AUTOMATICALLY OPERATE AT A CONSTANT SPEED.

A RENT LONG SHALL BE PROVIDED FOR THE HOT WATER SUPPLY TEMPERATURE, THE OUTSIDE AIR TEMPERATURE, AND HOT WATER FLOW TO BE PRINTED OUT AT THE OPERATOR WORKSTATION. RUNTIME FOR THE PUMPS SHALL ALSO BE TRACKED FOR THE HOT WATER PUMPS. ALARMS SHALL OCCUR AT THE OPERATOR WORKSTATION FOR LOW AND HIGH WATER TEMPERAUTRES AND NO FLOW CONDITIONS AT THE OPERATOR WORKSTATION.

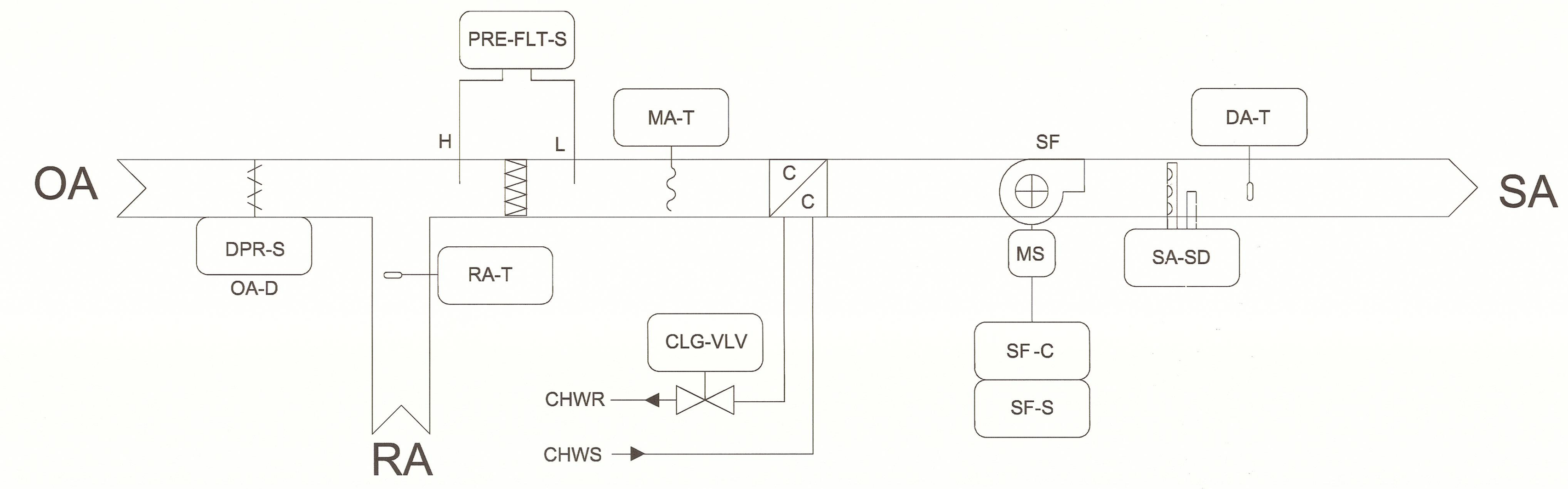


SECONDARY HOT WATER RESET SCHEDULE

POINT LIST - NURSING WING SECONDARY HOT WATER LOOP

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
SHW Supply Temperature	AI	Temperature Sensor	YES	NO	1 min.	15 min.	F
SHW Return Temperature	AI	Temperature Sensor	YES	NO	1 min.	15 min.	F
SHW loop differential pressusure	AI	DP	YES	NO	1 min.	15 min.	
Secondary hot water control valve	AO	(N)Acutator on (E)Control Valve*	YES	NO	COV	COV	
Pump Run Command	AO	Connect to VFD	NO	NO	COV	COV	
Pump-1 Status	DI	Connect to VFD	NO	NO	COV	COV	
Pump-2 Status	DI	Connect to VFD	NO	NO	COV	COV	
Pump Selector	BO	Connect to VFD	NO	NO	COV	COV	
Pump VFD Alarm	DI	Connect to VFD	NO	NO	COV	COV	
Pump Output	DO	Connect to VFD	NO	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Occupied Command							
SHW Differential Pressure Setpoint							
SHW supply temperature setpoin (reset)							
OSA-L - SHW supply temperature reset (Input-Lo)							
OSA-HI - SHW supply temperature reset (Input-HI)							
SHWS-L - SHW supply temperature reset (Output-Lo)							
SHWS-HI - SHW supply temperature reset (Output-HI)							
*IF VALVE IS GLOBE TYPE VALVE, REPLACE WITH BALL VALVE TYPE CONTROL VALVE AND DDC ACTUATOR							

C — NURSING WING SECONDARY HOT WATER LOOP
NO SCALE

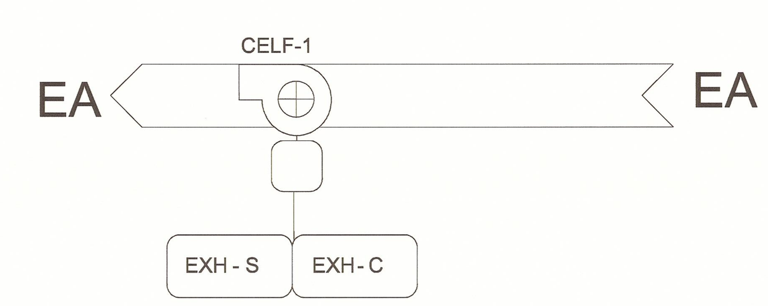


SEQUENCE OF OPERATION:
A DISCHARGE AIR SENSOR (DA-T), THROUGH THE DCP SHALL SEQUENCE THE ECONOMIZER DAMPERS (OA-D & RA-D) AND/OR CONTROL THE COOLING VALVES TO MAINTAIN THE TEMPERATURE SETPOINT THAT IS RESET BY THE RETURN AIR SENSOR (RA-T). THE SETPOINT AND DEADBAND SHALLBE ADJUSTABLE AT THE AHU DCP.

POINT LIST - NW-AHU-3

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to SA Fan MCC	NO	NO	COV	COV	
Supply Fan Status	DI	Connect to SA Fan MCC	NO	NO	COV	COV	
Chilled Water Control Valve	AO	(N)Acutator on (E)Control Valve*	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke, SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Return Air Temperature	AI	(N) RA-T Sensor	YES	NO	1 min.	15 min.	F
Supply Air Temperature	AI	SA-T Sensor	YES	NO	1 min.	15 min.	F
Command Damper (OA-D)	AO	Modulating actuator	NO	NO	COV	COV	
OA-D Status	DI	Connect to end switch	YES	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Occupied Command							
Discharge (Supply) Air Temperature Setpoint							
*IF VALVE IS GLOBE TYPE VALVE, REPLACE WITH BALL VALVE TYPE CONTROL VALVE AND DDC ACTUATOR							

A — NW-AHU-3
NO SCALE



POINT LIST - NURSING WING - NWEF-1 THRU NWEF-15

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
EXHAUST FAN STATRT/STOP COMMAND	DO	Connect to Fan motor starter	NO	NO	COV	COV	
Exhaust Fan status	DI	Connect to current sensor	NO	NO	COV	COV	

B — EXHAUST FAN CONTROLS DIAGRAM NWEF-1 THRU NWEF-15
NO SCALE

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JUN 02 2016
Office of Statewide Health Planning & Development
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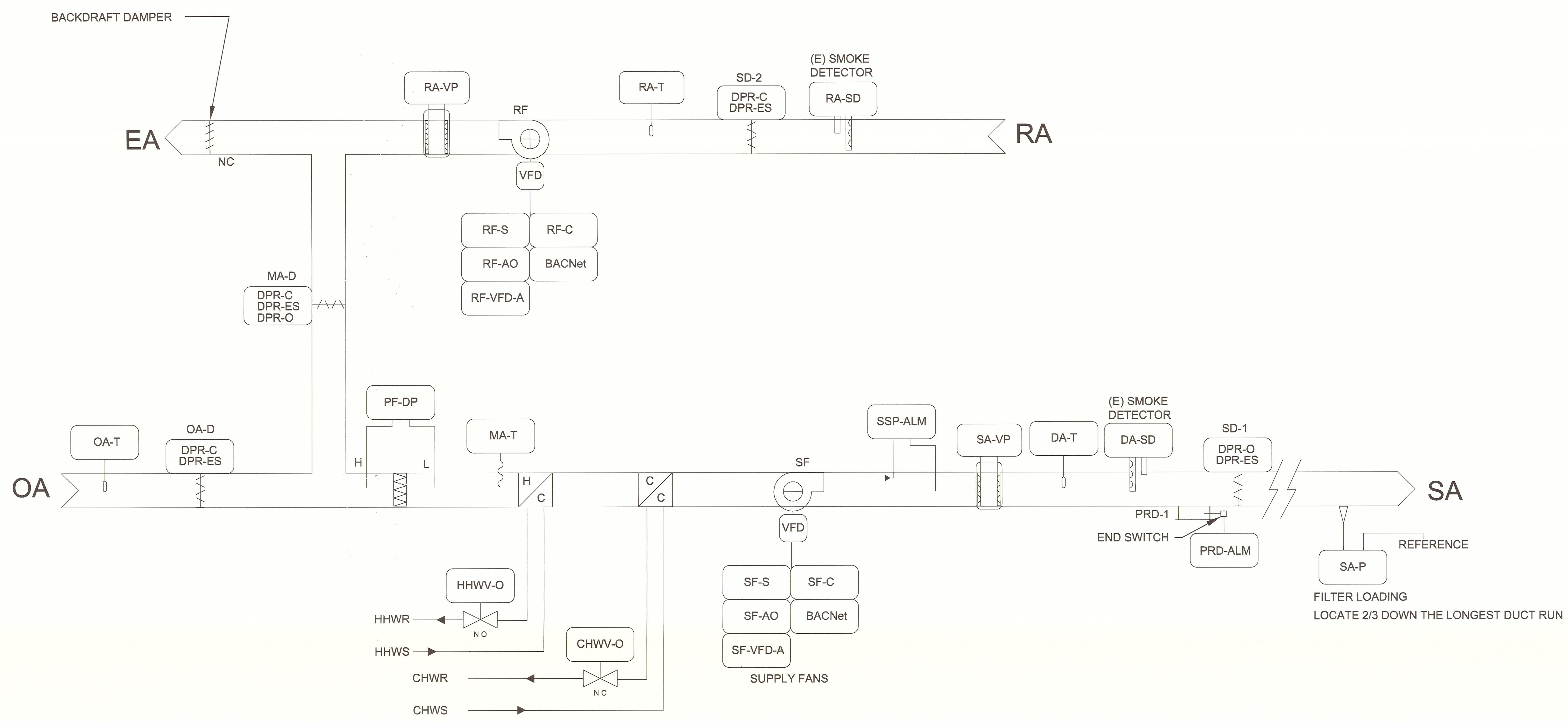
CONTROLS UPGRADE

SHEET TITLE:
AHU AND HEATING HOT WATER SECONDARY LOOP CONTROL DIAGRAM NURSING WING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:
M6.13

SHEET : OF



FOR POINT LIST SEE M6.15

SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.
SEE SPECIFICATIONS SECTION 23 09 93 – 1.1

A NA–AHU–1 AND NA–AHU–2

NO SCALE

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CONTROLS UPGRADE

SHEET TITLE:

AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS NORTH ADDITION

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.14

SHEET : OF

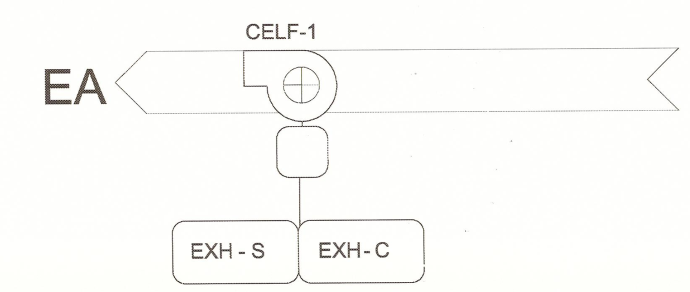
POINT LIST - NORTH ADDITION - NA-AHU-1 and NA-AHU-2

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Return Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Supply Fan Speed (AO)	AO	Connect to VFD Speed	NO	NO	1 min.	15 min.	
Return Fan Speed (AO)	AO	Connect to VFD Speed	No	NO	1 min.	15 min.	
Supply Fan Status	DI	Connected to VFD Status (Thru Network)	NO	NO	COV	COV	
Return Fan Status	DI	Connected to VFD Status (Thru Network)	NO	NO	COV	COV	
Supply Fan VFD Alarm	DI	Connect to VFD	NO	NO	COV	COV	
Reutrn Fan VFD Alarm	DI	Connect to VFD	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Hot Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke, SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Duct Alarm (Smoke, RA)	DI	Connect to FA panel	NO	NO	COV	COV	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Final Filter Pressure drop	AI	FF-DP	YES	NO	1 min.	15 min.	
Outdoor Air Temperature	AI	OA-T Sensor	YES	NO	1 min.	15 min.	F
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Return Air Temperature	AI	RA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Duct Static Pressure	AI	SA-SP	YES	NO	1 min.	15 min.	
Supply (Airflow) air velocity pressure	AI	SA-VP	YES	NO	1 min.	15 min.	
Return (Airflow) air velocity pressure	AI	RA-VP	YES	NO	1 min.	15 min.	
Duct High Limit Alarm	AI	SSP-ALM. Connect to VFD	YES	NO	COV	COV	
Pressure Relief Status	DI	PRD-S Connect to end switch at PRD-1	YES	NO	COV	COV	
Damper Command OA-D, MA-D	AO	Modulating actuator	NO	NO	1 min.	15 min.	
OA-D Status	DI	Connect to end switch	YES	NO	COV	COV	
MA-D Status	DI	Connect to end switch	YES	NO	COV	COV	
MA-D Override on fire	DO	Modulating actuator	NO	NO	COV	COV	

CONTINUES – SEE TO THE LEFT

POINT LIST - NORTH ADDITION - NA-AHU-1 and NA-AHU-2

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
SA Smoke Damper Command SD-1	AO	Connect Damper Aactuator	NO	NO	COV	COV	
Supply Air Smoke Damper Status SD-1	DI	Connect to end switch	NO	NO	COV	COV	
RA Smoke Damper Command SD-2	AO	Connect Damper Aactuator	NO	NO	COV	COV	
RA Smoke Damper Status SD-2	DI	Connect to end switch	NO	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint - Zone Request							
NA-AHU-2 only: Zone Temperature (reset) for Discharge air setpoint							
Discharge air static pressure setpoint							

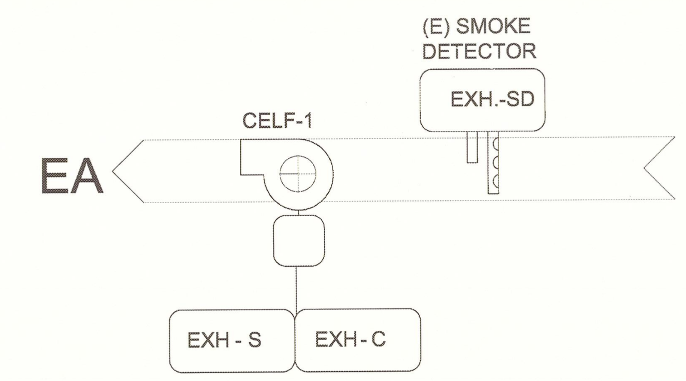


POINT LIST - NORTH ADDITION - NAEF-2,3, 4 & 6 (FUME HOODS)

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
EXHAUST FAN STATRT/STOP COMMAND	DO	Connect to Fan motor starter	NO	NO	COV	COV	
Exhaust Fan status	DI	Connect to current sensor	NO	NO	COV	COV	

A — FUME HOOD EXHAUST FAN CONTROLS DIAGRAM NAEF–2,3,4 & 6

NO SCALE



POINT LIST - NORTH ADDITION - NAEF-1, 5, 7 & 8

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
EXHAUST FAN STATRT/STOP COMMAND	DO	Connect to Fan motor starter	NO	NO	COV	COV	
Exhaust Fan status	DI	Connect to current sensor	NO	NO	COV	COV	
Duct Alarm (Smoke, Exh.)	DI	Connect to FA panel	NO	NO	COV	COV	

B — GENERAL EXHAUST FAN CONTROLS DIAGRAM NAEF–1,5,7 & 8

NO SCALE

NO WORK, SHOWN FOR REFERENCE ONLY. THE CONTROLLER BY VMA CONTROLLER INSIDE BUILDING

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 10 2016
Office of Statewide Health Planning & Development
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CONTROLS UPGRADE

SHEET TITLE:

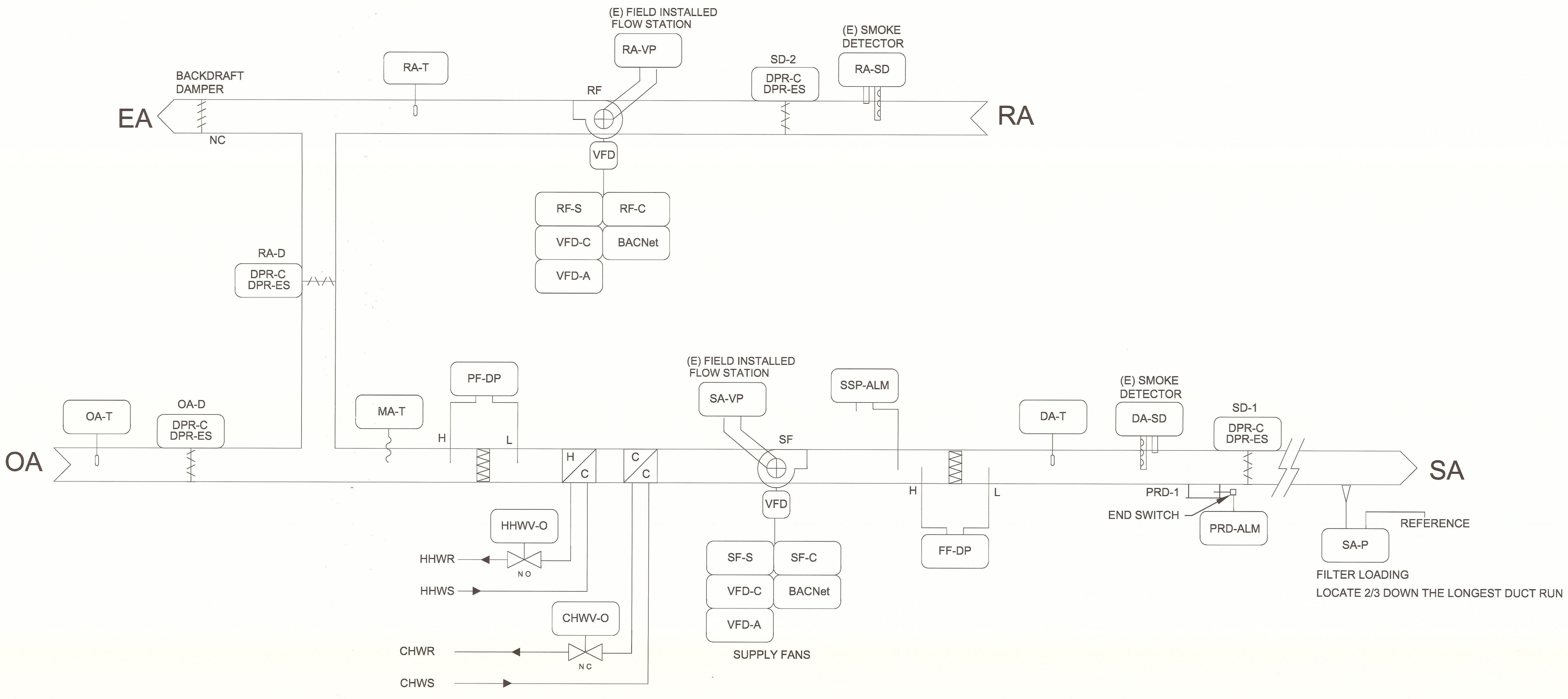
AHU POINT LIST AND EXHAUST FAN DIAGRAM NORTH ADDITION

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.15

SHEET : OF



FOR POINT LIST SEE M6.17

SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.
SEE SPECIFICATIONS SECTION 23 09 93 – 1.1

(A) ADMINISTRATION BUILDING
EHAHU-1, 2 AND 4
NO SCALE

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
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JUN 02 2016
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CONTROLS UPGRADE

SHEET TITLE:
AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS ADMINISTRATION BUILDING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:
M6.16

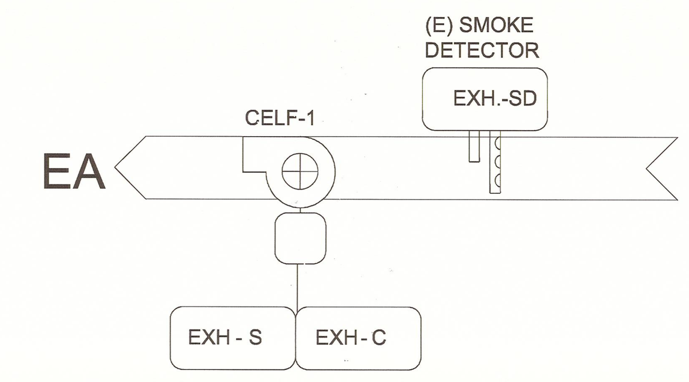
SHEET : OF

POINT LIST - ADMIN-EAHU-3 AND KEF-1

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to VFD	NO	NO	COV	COV	
Supply Fan VFD Command (speed)	DO	Connect to VFD	NO	NO	1 min.	15 min.	
Supply Fan Status	DI	Connect to VFD Satus	NO	NO	COV	COV	
Supply Fan VFD Alarm	DI	Connected to VFD Status	NO	NO	COV	COV	
Supply Fan VFD Bypass	DI	Connect to VFD	NO	NO	COV	COV	
Exhaust Fan Start/Stop Command	DO	Connect to KEF-1 Fan MCC	NO	NO	COV	COV	
Exhaust Fan Status	DI	Current Sensor	YES	NO	1 min.	15 min.	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Heating Hot Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke, SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Outdoor Air Temperature	AI	OA-T sensor	YES	NO	1 min.	15 min.	F
Supply (Discharge) Air Temperature	AI	SA-T Sensor	YES	NO	1 min.	15 min.	F
Duct Static Pressure	AI	SA-SP	YES	NO	1 min.	15 min.	
Supply Airflow	AI	SA-VP	NO	NO	1 min.	15 min.	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Occupied Command							
Discharge (Supply) Air Temperature Setpoint							

POINT LIST - ADMIN BUILDING-EAHU-1, EAHU-2 AND EAHU-4

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Return Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Supply Fan VFD Command (speed)	DO	Connect to VFD	NO	NO	1 min.	15 min.	
Return Fan VFD Command (speed)	DO	Connect to VFD	No	NO	1 min.	15 min.	
Supply Fan Status	DI	Connect to VFD Satus	NO	NO	COV	COV	
Return Fan Status	DI	Connected to VFD Status	NO	NO	COV	COV	
Supply Fan VFD Alarm	DI	Connected to VFD Status	NO	NO	COV	COV	
Return Fan VFD ALARM	DI	Connected to VFD Status	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Heating Hot Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Duct Alarm (Smoke RA)	DI	Connect to FA panel	NO	NO	COV	COV	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Final Filter Pressure drop	AI	FF-DP	YES	NO	1 min.	15 min.	
Outdoor Air Temperature	AI	OA-T Sensor	YES	NO	1 min.	15 min.	F
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Return Air Temperature	AI	RA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Duct Static Pressure	AI	SA-SP	YES	NO	1 min.	15 min.	
Supply Airflow	AI	SA-VP	NO	NO	1 min.	15 min.	
Return Airflow	AI	RA-VP	NO	NO	1 min.	15 min.	
Duct High Limit Alarm	AI	SSP-ALM	YES	NO	COV	COV	
Pressure Relief Status	DI	PRD-ALM Connect to end switch	YES	NO	COV	COV	
OA-D Command	AO	Modulating actuator	NO	NO	COV	COV	
RA-D Command	AO	Modulating actuator	NO	YES	COV	COV	
OA-D Status	DI	CONNECT TO END SWITCH	YES	NO	COV	COV	
RA-D Status	DI	Connect to end switch	YES	NO	COV	COV	
RA-D Override on Fire	AO	Connect to modulating actuator	NO	NO	COV	COV	
Zone Temperature - SA reset	AI	Zone Sensor	NO	NO	1 min.	15 min.	F
Smoke Damper, Supply (SD-1) & Return (SD-2)	DI / AO	Connect to end switch & Aactuator	YES	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint (Reset)							
Duct Static Pressure setpoint							
Supply Airflow Value in CFM (based on VP sesnor)							
Return Airflow Value in CFM (based on VP sesnor)							

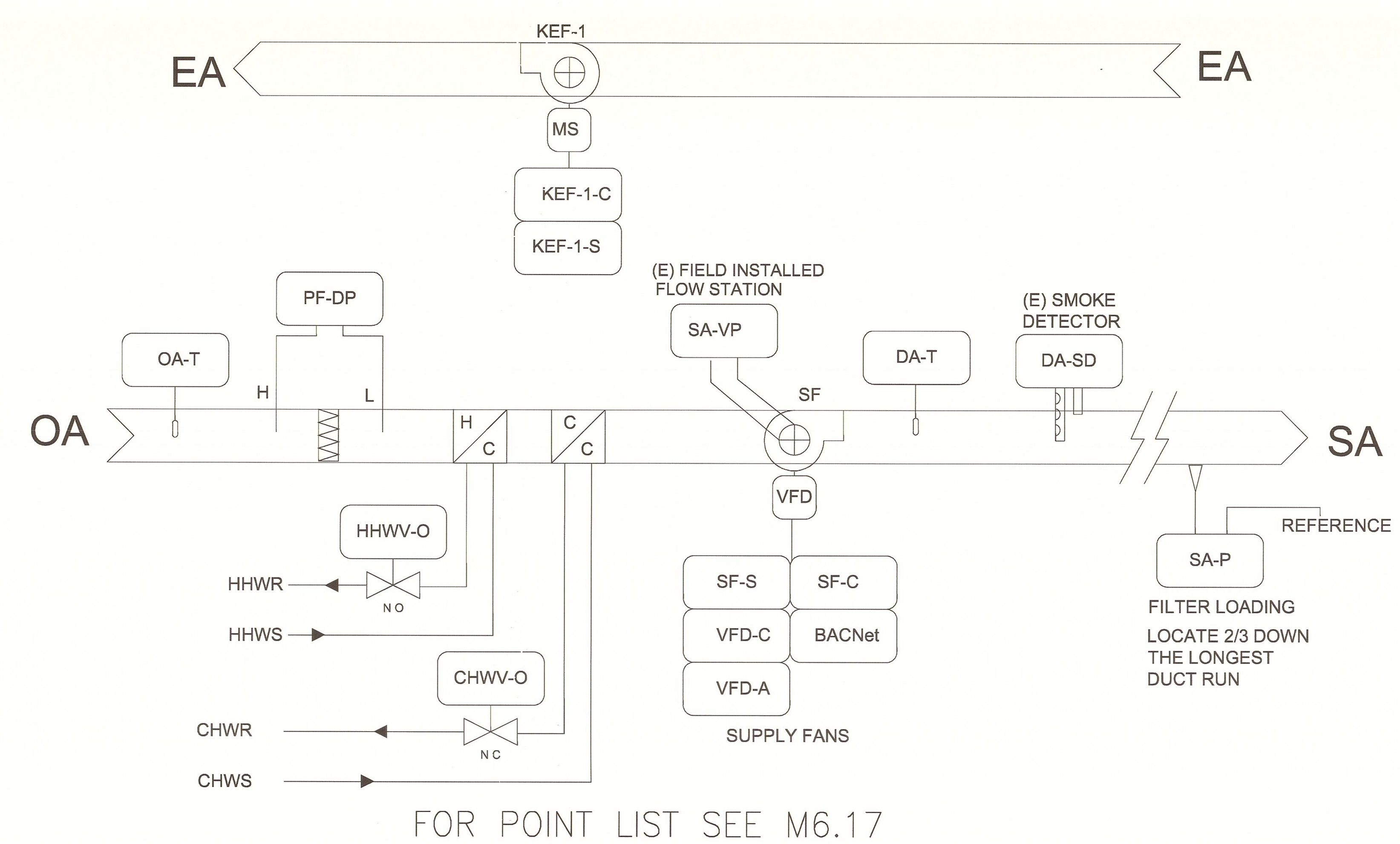


POINT LIST - AMINISTRATION BUILDING - EHEF-1 THRU 6

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
EXHAUST FAN STATRT/STOP COMMAND	DO	Connect to Fan motor starter	NO	NO	COV	COV	
Exhaust Fan status	DI	Connect to current sensor	NO	NO	COV	COV	
Duct Alarm (Smoke, Exh.)	DI	Connect to FA panel	NO	NO	COV	COV	

A GENERAL EXHAUST FAN CONTROLS DIAGRAM EHEF-1,2,3,4,5 AND 6

NO SCALE



FOR POINT LIST SEE M6.17

SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.

1. GENERAL
   1.1 FURNISH THE NEW DIGITAL CONTROL PANELS, (DCP) AS INDICATED ON PLANS.
   1.2 AHU IS AUTOMATICALLY STARTED/STOPPED BY THE START/STOP PROGRAM IN THE DCP AS DESCRIBED BELOW.

2. OCCUPIED MODE
   THE OCCUPIED MODE WILL BE ENABLED FROM A CONTACT IN THE KITCHEN HOOD CONTROL PANEL. WHEN IN THE OCCUPIED MODE, THE SUPPLY AND EXHAUST FAN WILL RUN CONTINUOUSLY.

   UNOCCUPIED MODE
   WHEN THE KITCHEN HOOD CONTROL PANEL CONTACT DISABLES THE OCCUPIED MODE THE SUPPLY FAN AND EXHAUST FAN SHALL STOP.

3. SUPPLY AIR TEMPERATURE CONTROL
   THE HOT WATER VALVE (HHWV-O) AND THE CHILLED WATER VALVE (CHWV-O) SHALL BE MODULATED IN SEQUENCE TO MAINTAIN THE 55°F (ADJUSTABLE) SUPPLY TEMPERATURE SETPOINT.

4. STATIC PRESSURE CONTROL FILTER LOADING
   A STATIC PRESSURE SENSOR IN THE SUPPLY AIR STREAM SHALL MONITOR DUCT STATIC PRESSURE AND THE SUPPLY FAN VFD SHALL BE MODULATED TO MAINTAIN THE ADJUSTABLE STATIC PRESSURE SETPOINT.

5. MISCELLANEOUS
   THE PRE-FILTER SHALL BE MONITORED AND AN ALARM SHALL OCCUR ABOVE THE ADJUSTABLE PRESSURE SETPOINT. AN ALARM SHALL OCCUR WHEN THE STATUS OF THE FANS DOES NOT EQUAL THE CONDITION OF THE FANS.

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
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JUN 02 2016
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FACILITIES DEVELOPMENT DIVISION

B ADMINISTRATION BUILDING EHAHU – 3 AND KEF-1

NO SCALE

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SHEET TITLE:

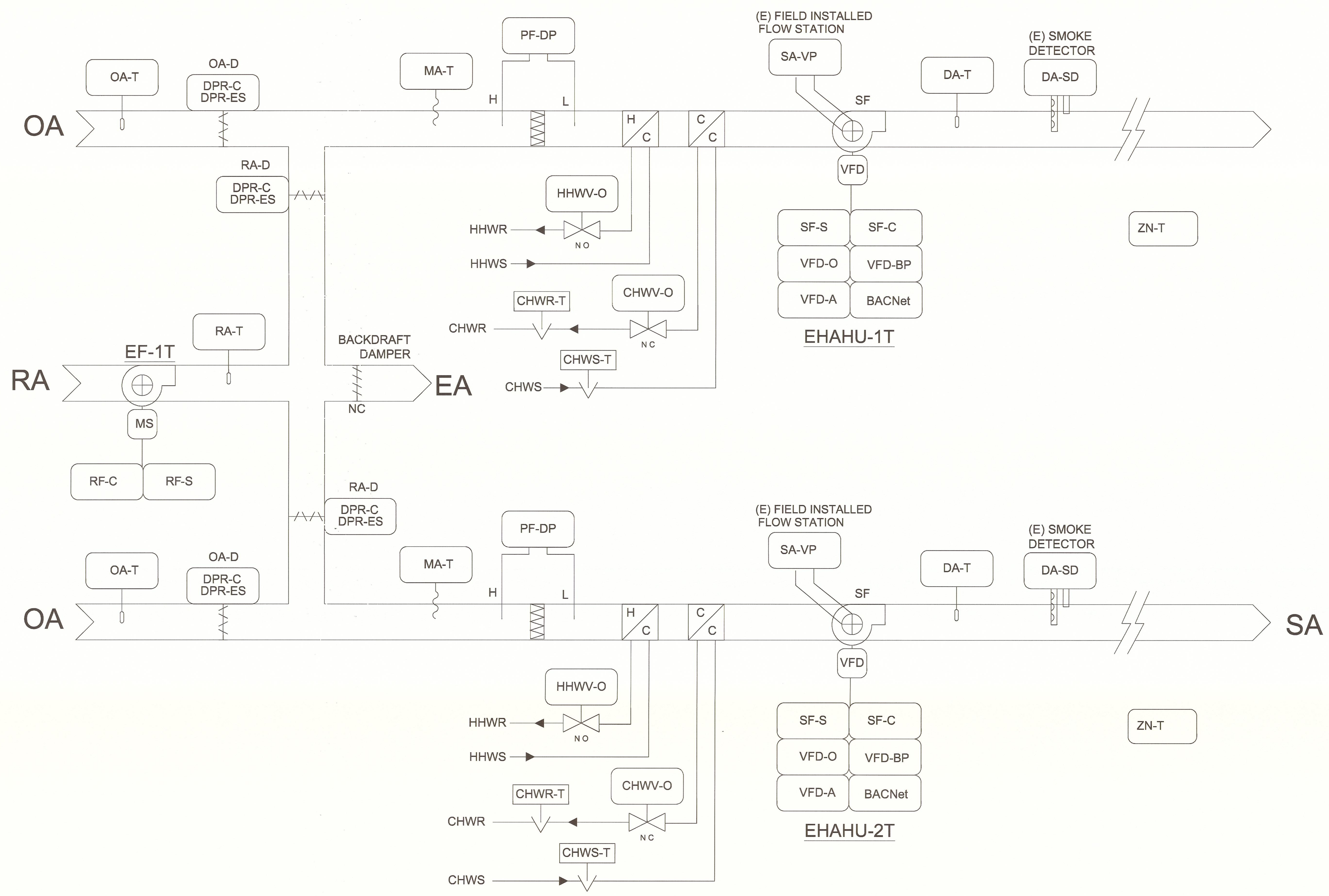
AHU POINT LIST AND EXHAUST FAN DIAGRAM ADMINISTRATION BUILDING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.17

SHEET : OF



FOR POINT LIST SEE M6.24

SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.
SEE SPECIFICATIONS SECTION 23 09 93 – 1.1

A ADMINISTRATION BUILDING
EHAHU–1T & 2T
NO SCALE

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
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CONTROLS UPGRADE

SHEET TITLE:

AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS ADMINISTRATION BUILDING

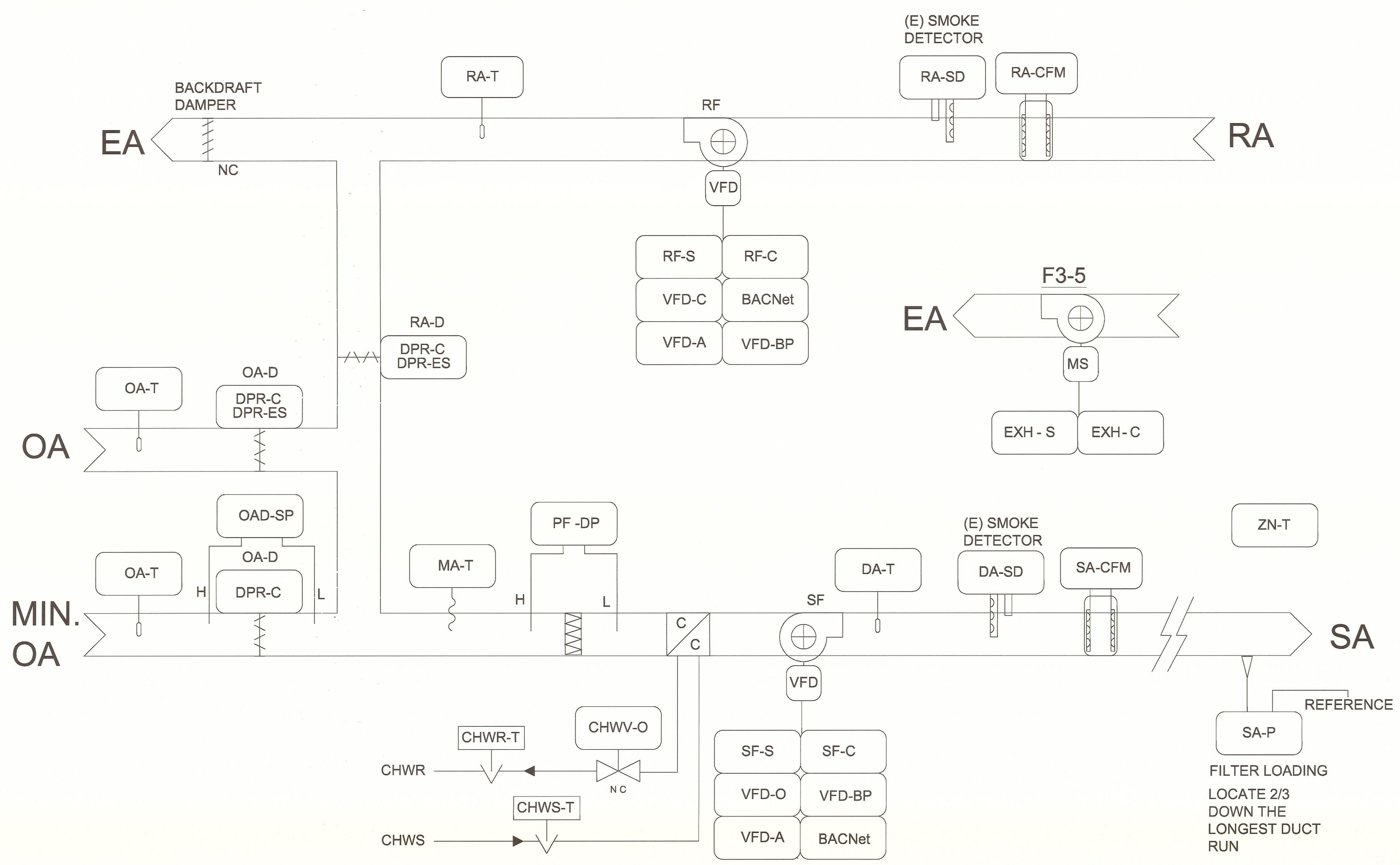
NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.18

SHEET : OF

SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.
SEE SPECIFICATIONS SECTION 23 09 93 – 1.1

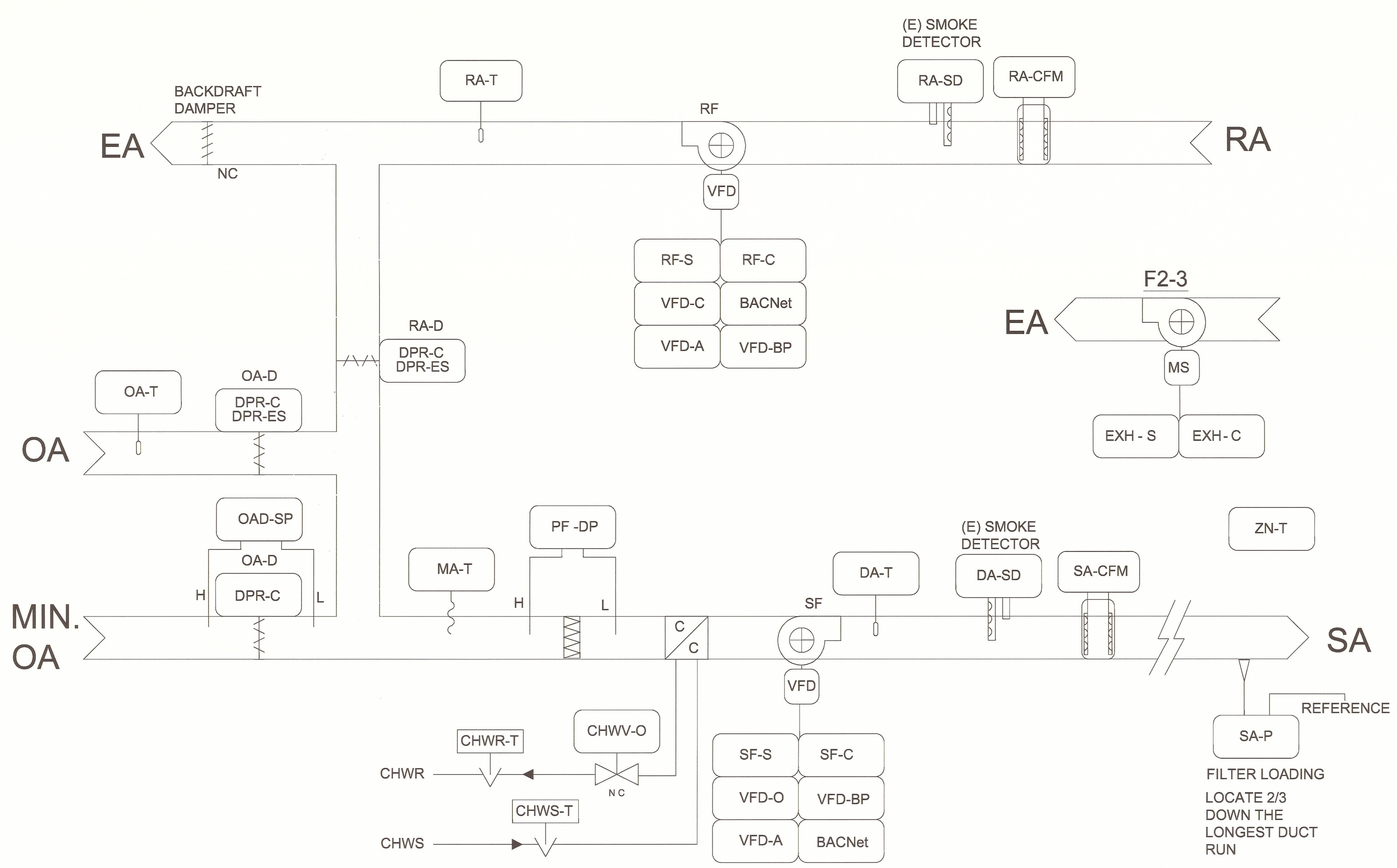


FOR POINT LIST SEE M6.24

B

ADMINISTRATION BUILDING AH2–2

NO SCALE



FOR POINT LIST SEE M6.24

A

ADMINISTRATION BUILDING AH2–1

NO SCALE

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CONTROLS UPGRADE

SHEET TITLE:

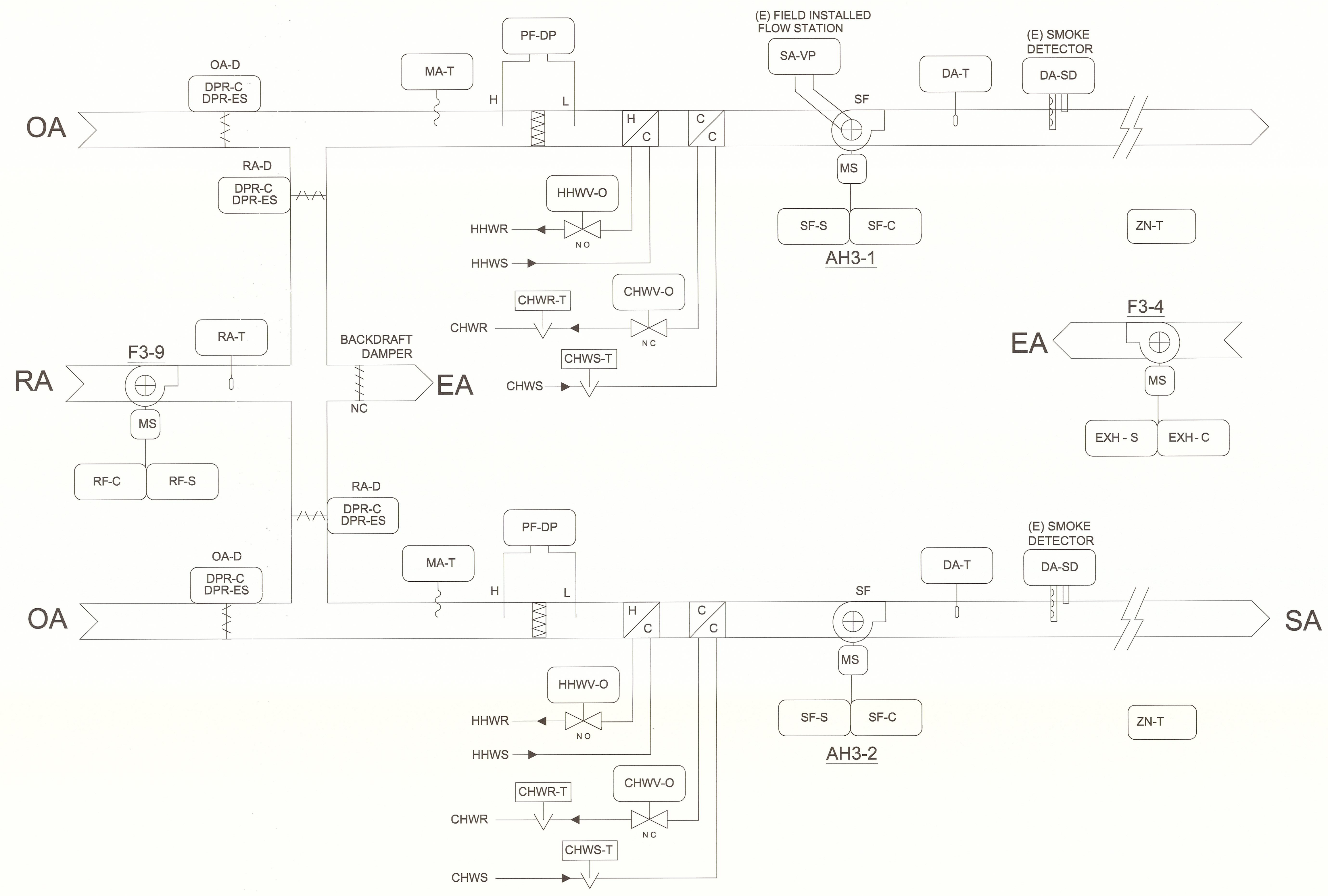
AHU POINT LIST AND EXHAUST FAN DIAGRAM ADMINISTRATION BUILDING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.19

SHEET : OF



FOR POINT LIST SEE M6.25

SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.
SEE SPECIFICATIONS SECTION 23 09 93 – 1.1

A

ADMINISTRATION BUILDING
AH3–1 AND AH3–2
NO SCALE

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CONTROLS UPGRADE

SHEET TITLE:

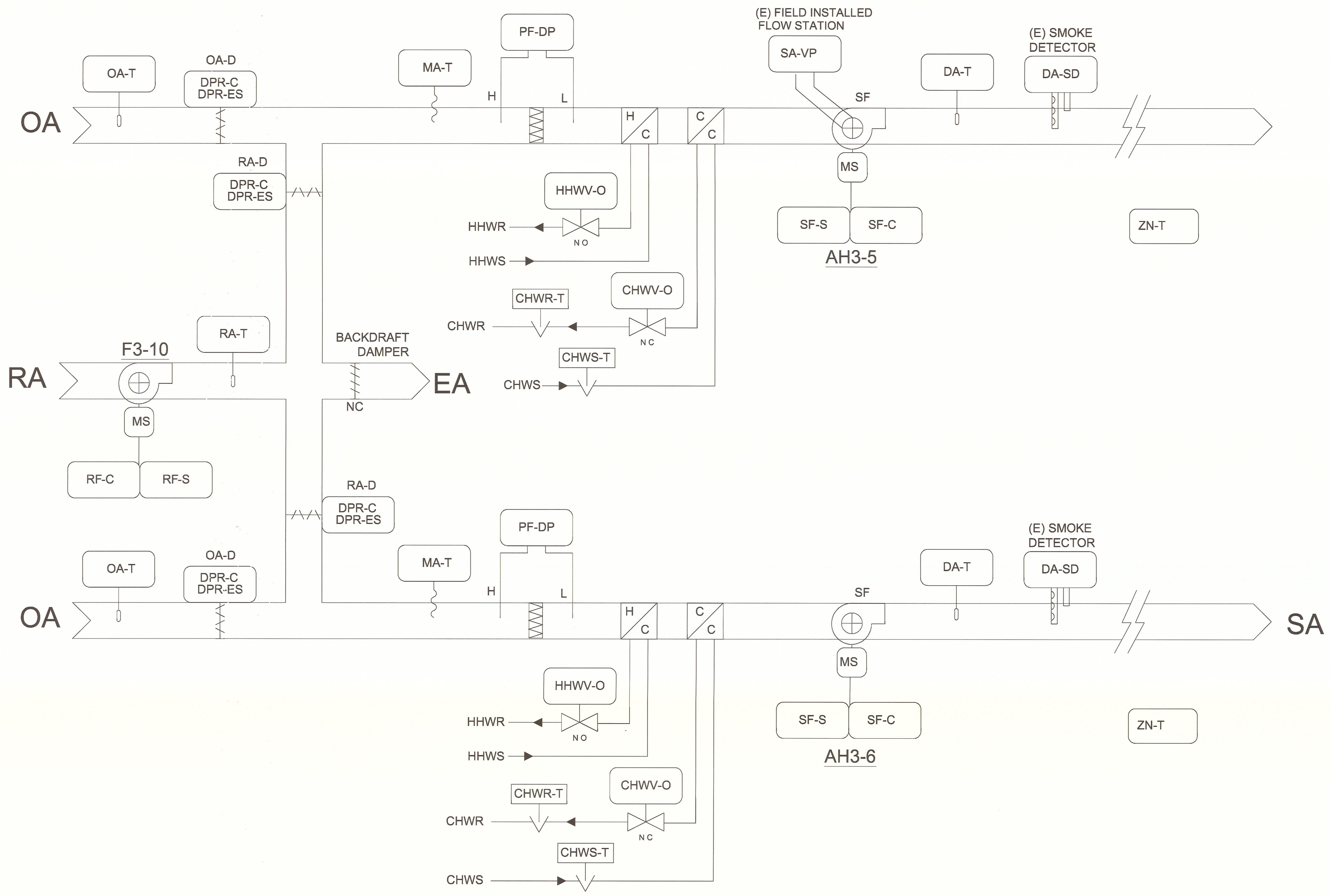
AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS ADMINISTRATION BUILDING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.20

SHEET : OF



SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.
SEE SPECIFICATIONS SECTION 23 09 93 – 1.1

FOR POINT LIST SEE M6.26

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JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

ADMINISTRATION BUILDING
AH3–5 AND AH3–6

A

NO SCALE

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CONTROLS UPGRADE

SHEET TITLE:

AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS ADMINISTRATION BUILDING

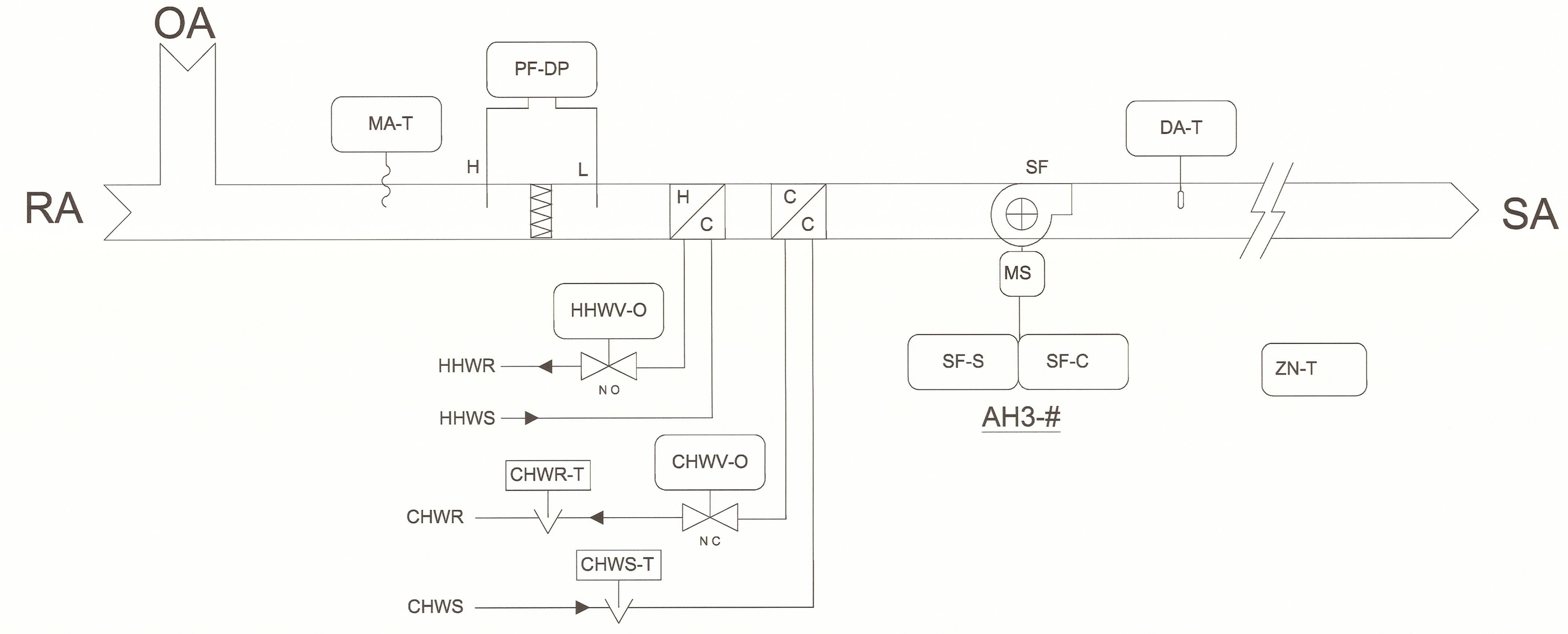
NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.21

SHEET : OF

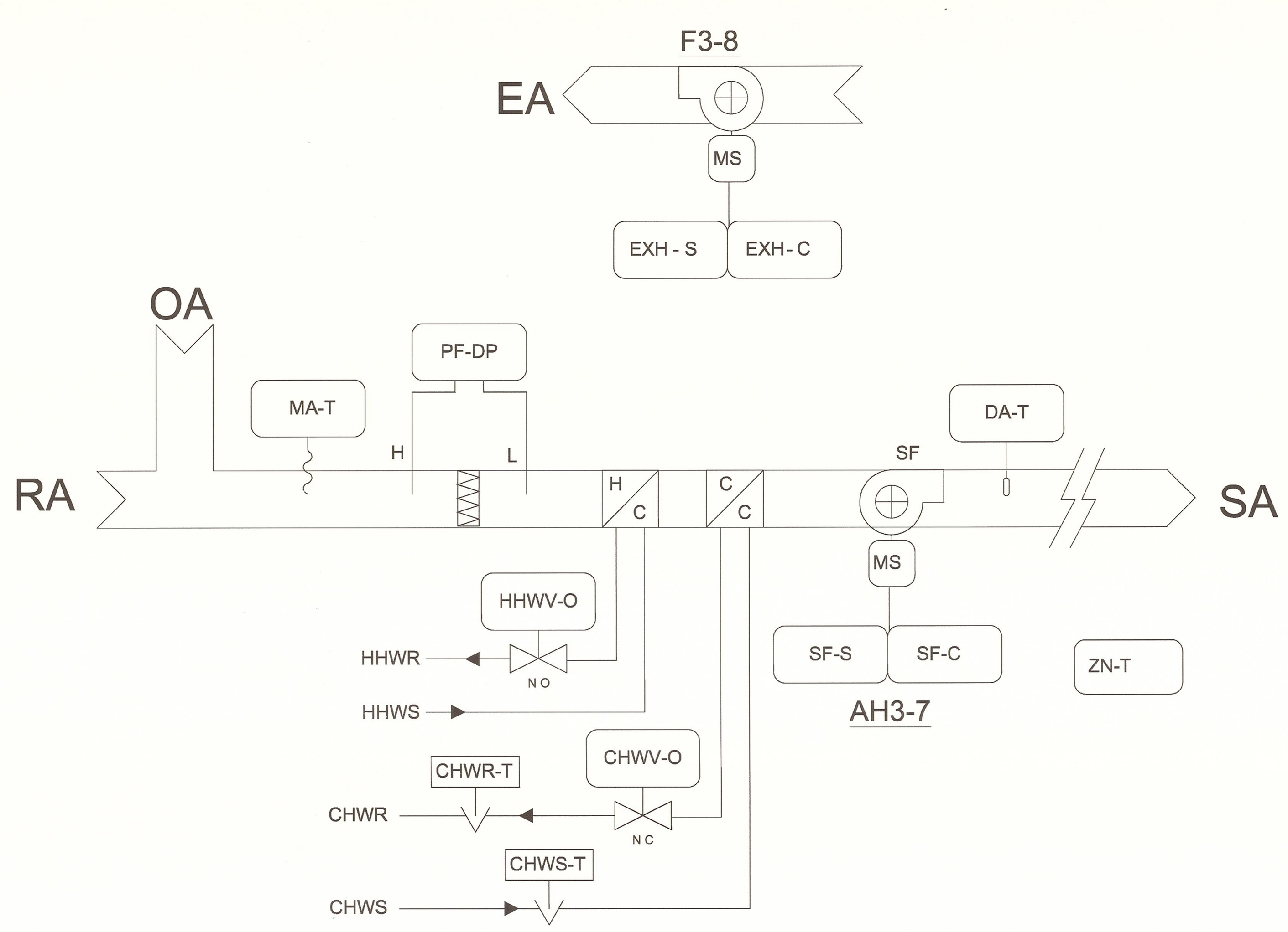
SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.
SEE SPECIFICATIONS SECTION 23 09 93 – 1.1



FOR POINT LIST SEE M6.26

(A) ADMINISTRATION BUILDING AH3–3, AH3–4, AH3–9 AND AH3–11

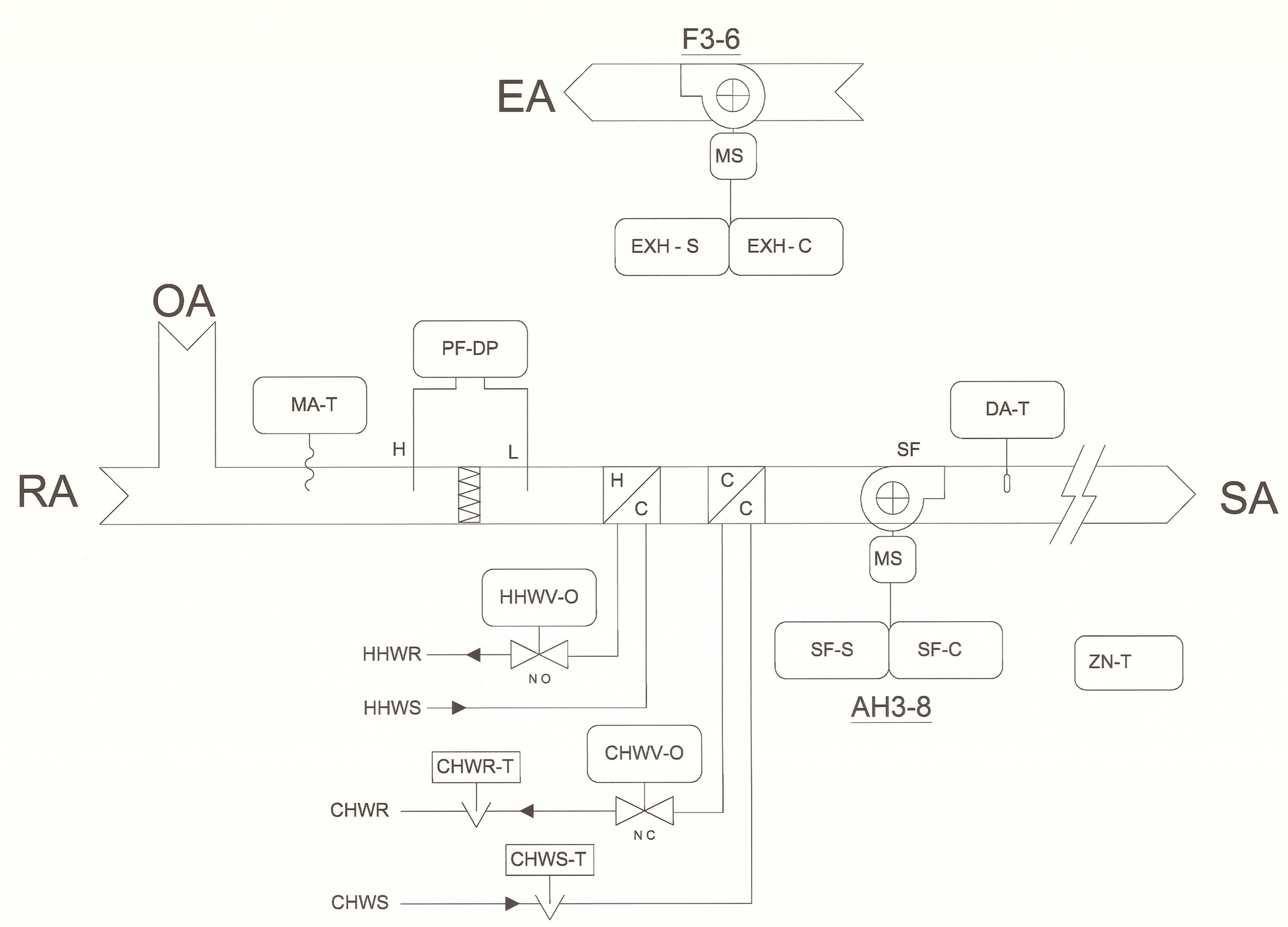
NO SCALE



FOR POINT LIST SEE M6.26

(B) ADMINISTRATION BUILDING AH3–7

NO SCALE



FOR POINT LIST SEE M6.26

(C) ADMINISTRATION BUILDING AH3–8

NO SCALE

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CONTROLS UPGRADE

SHEET TITLE:

AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS ADMINISTRATION BUILDING

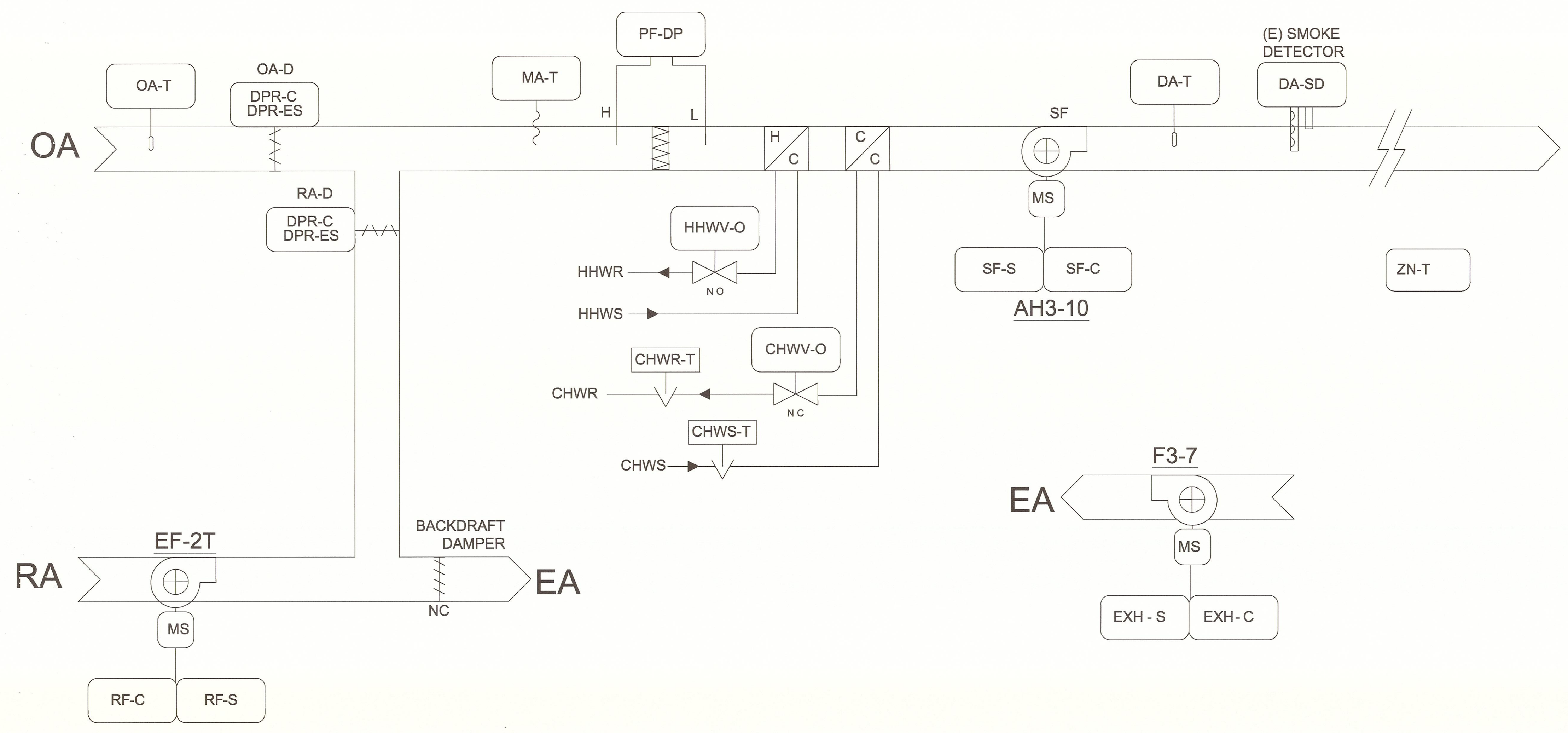
NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.22

SHEET : OF

SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.
SEE SPECIFICATIONS SECTION 23 09 93 – 1.1



FOR POINT LIST SEE M6.26

ADMINISTRATION BUILDING
A AH3–10
NO SCALE

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Exp. 12/31/17
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STATE OF CALIFORNIA

CONSULTANTS:

SAN MATEO COUNTY HEALTH CENTER
SAN MATEO, CALIFORNIA

CONTROLS UPGRADE

SHEET TITLE:

AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS ADMINISTRATION BUILDING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.23

SHEET : OF

POINT LIST - ADMIN BUILDING-AH2-1

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Return Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Supply Fan VFD Command (speed)	DO	Connect to VFD	NO	NO	1 min.	15 min.	
Return Fan VFD Command (speed)	DO	Connect to VFD	No	NO	1 min.	15 min.	
Supply Fan Status	DI	Connect to VFD Satus	NO	NO	COV	COV	
Return Fan Status	DI	Connected to VFD Status	NO	NO	COV	COV	
Supply Fan VFD Alarm	DI	Connected to VFD Status	NO	NO	COV	COV	
Return Fan VFD ALARM	DI	Connected to VFD Status	NO	NO	COV	COV	
Exhaust Fan Command	DO	Connect to F2-3	NO	NO	COV	COV	
Exhaust Fan Status	AI	Connect to F2-3 Current Sensor	YES	NO	COV	COV	
Chilled Water Supply Temperature	AI	CHWS-T Sensor	YES	NO	1 min.	15 min.	F
Chille Water Return Temperature	AI	CHWR-T Sensor	YES	NO	1 min.	15 min.	F
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Duct Alarm (Smoke RA)	DI	Connect to FA panel	NO	NO	COV	COV	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Outdoor Air Temperature	AI	OA-T Sensor	YES	NO	1 min.	15 min.	F
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Duct Static Pressure	AI	SA-SP	YES	NO	1 min.	15 min.	
Supply Airflow	AI	SA-CFM	NO	NO	1 min.	15 min.	
Return Airflow	AI	RA-CFM	NO	NO	1 min.	15 min.	
OA-D Command	AO	Modulating actuator	NO	NO	COV	COV	
MIN-OA-D Command	AO	Modulating actuator	NO	NO	COV	COV	
RA-D Command	AO	Modulating actuator	NO	YES	COV	COV	
MIN-OA-D Status	DI	Connect to Pressure Differential	YES	NO	COV	COV	
RA-D Status	DI	Connect to end switch	YES	YES	COV	COV	
Zone Temperature - SA reset	AI	Zone Sensor	NO	NO	1 min.	15 min.	F
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint (Reset)							
Duct Static Pressure setpoint							
O.A. MAX. - Outdoor Air Reset 70 deg. F (ADJ.), O.A. Min - Outdoor air reset 65 deg. F (ADJ.)							
CS-OBJ - Master Enable							

POINT LIST - ADMIN BUILDING-AH2-2

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Return Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Supply Fan VFD Command (speed)	DO	Connect to VFD	NO	NO	1 min.	15 min.	
Return Fan VFD Command (speed)	DO	Connect to VFD	No	NO	1 min.	15 min.	
Supply Fan Status	DI	Connect to VFD Satus	NO	NO	COV	COV	
Return Fan Status	DI	Connected to VFD Status	NO	NO	COV	COV	
Supply Fan VFD Alarm	DI	Connected to VFD Status	NO	NO	COV	COV	
Return Fan VFD ALARM	DI	Connected to VFD Status	NO	NO	COV	COV	
Exhaust Fan Command	DO	Connect to F3-5	NO	NO	COV	COV	
Exhaust Fan Status	AI	Connect to F3-5 Current Sensor	YES	NO	COV	COV	
Chilled Water Supply Temperature	AI	CHWS-T Sensor	YES	NO	1 min.	15 min.	F
Chille Water Return Temperature	AI	CHWR-T Sensor	YES	NO	1 min.	15 min.	F
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Duct Alarm (Smoke RA)	DI	Connect to FA panel	NO	NO	COV	COV	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Outdoor Air Temperature	AI	OA-T Sensor	YES	NO	1 min.	15 min.	F
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Duct Static Pressure	AI	SA-SP	YES	NO	1 min.	15 min.	
Supply Airflow	AI	SA-CFM	NO	NO	1 min.	15 min.	
Return Airflow	AI	RA-CFM	NO	NO	1 min.	15 min.	
OA-D Command	AO	Modulating actuator	NO	NO	COV	COV	
MIN-OA-D Command	AO	Modulating actuator	NO	NO	COV	COV	
RA-D Command	AO	Modulating actuator	NO	YES	COV	COV	
MIN-OA-D Status	DI	Connect to Pressure Differential	YES	NO	COV	COV	
RA-D Status	DI	Connect to end switch	YES	YES	COV	COV	
Zone Temperature - SA reset	AI	Zone Sensor	NO	NO	1 min.	15 min.	F
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint (Reset)							
Duct Static Pressure setpoint							
O.A. MAX. - Outdoor Air Reset 70 deg. F (ADJ.), O.A. Min - Outdoor air reset 65 deg. F (ADJ.)							
CS-OBJ - Master Enable							

POINT LIST - ADMIN BUILDING-EAHU-1T AND EAHU-2T

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to VFD Run	NO	NO	COV	COV	
Supply Fan VFD Command (speed)	DO	Connect to VFD	NO	NO	1 min.	15 min.	
Supply Fan Status	DI	Connect to VFD Satus	NO	NO	COV	COV	
Supply Fan VFD Alarm	DI	Connected to VFD Status	NO	NO	COV	COV	
Supply Fan VFD Bypass	DI	Connect to VFD	NO	NO	COV	COV	
Return Fan Command	DO	Connect to EF-1T	NO	NO	COV	COV	
Return Fan Status	AI	Connect to EF-1TCurrent Sensor	YES	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Chilled Water Supply Temperature	AI	CHWS-T Sensor	YES	NO	1 min.	15 min.	F
Chille Water Return Temperature	AI	CHWR-T Sensor	YES	NO	1 min.	15 min.	F
Heating Hot Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Duct Alarm (Smoke SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Outdoor Air Temperature	AI	OA-T Sensor	YES	NO	1 min.	15 min.	F
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Return Air Temperature	AI	RA-T Sensor	YES	YES	1 min.	15 min.	F
OA-D Command	AO	Modulating actuator	NO	NO	COV	COV	
RA-D Command	AO	Modulating actuator	NO	YES	COV	COV	
OA-D Status	DI	CONNECT TO END SWITCH	YES	NO	COV	COV	
RA-D Status	DI	Connect to end switch	YES	NO	COV	COV	
Zone Temperature - SA reset	AI	Zone Sensor	NO	NO	1 min.	15 min.	F
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint (Reset)							
Occupied Command							
Zone Temperature Setpoint							

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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CONSULTANTS:

SAN MATEO COUNTY HEALTH CENTER
SAN MATEO, CALIFORNIA
CONTROLS UPGRADE

SHEET TITLE:

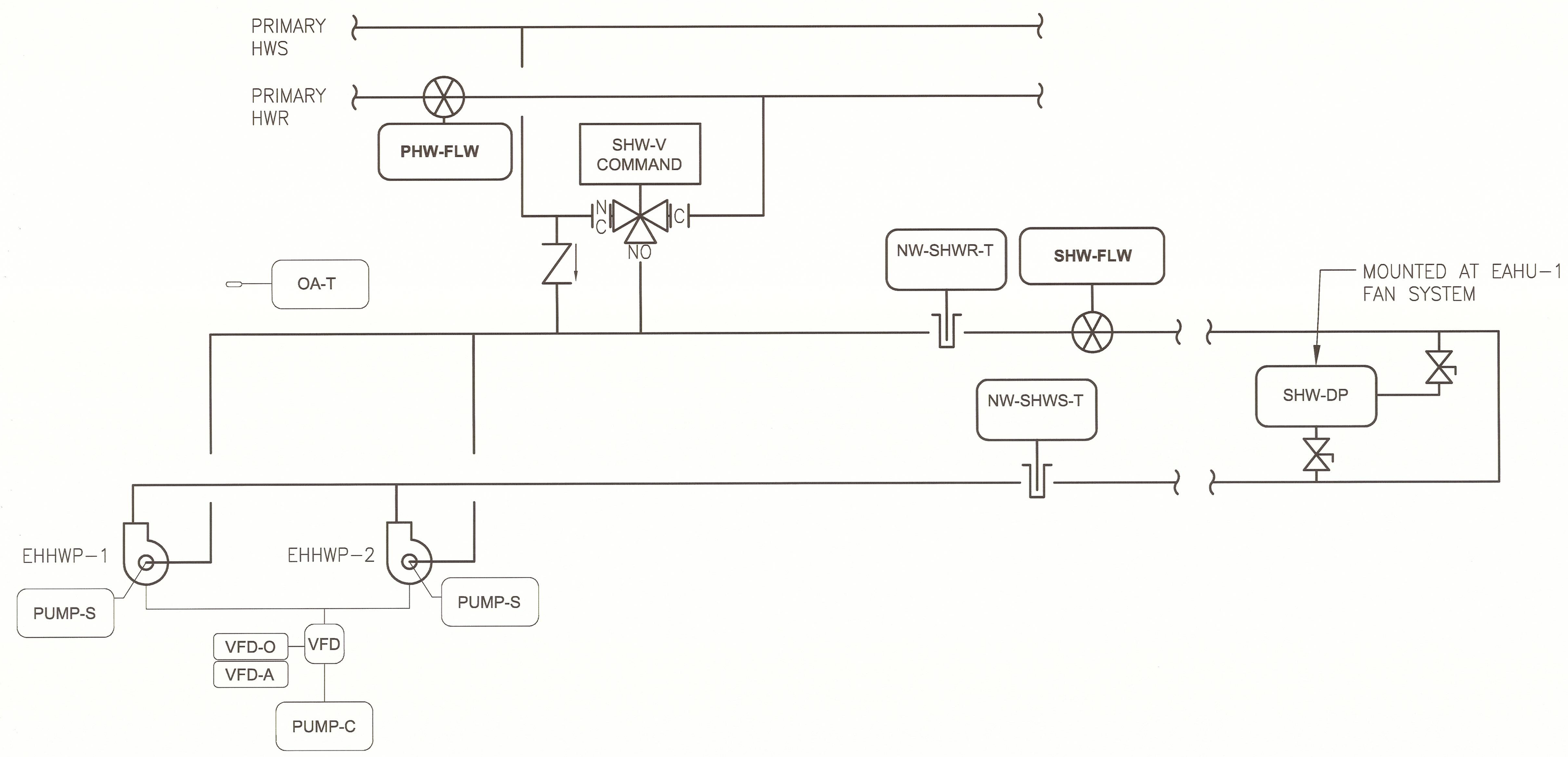
AHU POINT LIST ADMINISTRATION BUILDING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.24

SHEET : OF

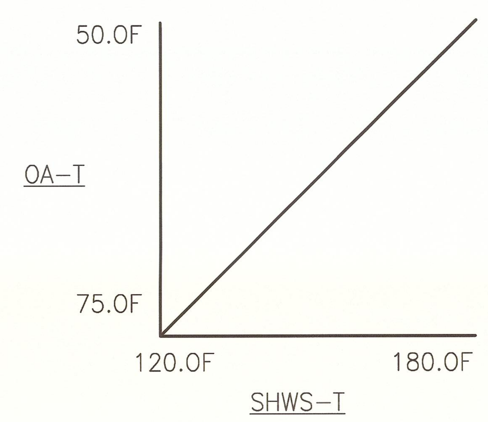


SEQUENCE OF OPERATION–HEATING HOT WATER SECONDARY LOOP CONTROL DIAGRAM.
OCCUPIED MODE
DURING THE OCCUPIED MODE OPERATION THE SECONDARY PUMPS SHALL BE START/STOPPED BY THE CONTROLLER. ONE PUMP SHALL OPERATE AT ALL TIMES. A FLOW SENSOR IS PROVIDED TO INDICATE FLOW. THE HOT WATER SUPPLY AND RETURN TEMPERATURE SHALL BE MONITORED BY TEMPERATURE SENSORS\. THE HOT WATER SUPPLY TEMPERATURE SHALL BE MAINTAINED BY MODULATING A 3-WAY MIXING VALVE IN THE PRIMARY LOOP. THE HOT WATER SUPPLY TEMPERATURE IS TO BE RESET BY THE FOLLOWING SCHEDULE:

OUTSIDE AIR TEMP	HOT WATER SUPPLY TEMP
75.OFF	120.OF
50.OF	180.OF

FLOW IN THE SECONDARY HEATING HOT WATER SUPPLY LOOP IS TO BE CONTROLLED BY MODULATING THE HOT WATER PUMPS' VFD. SHALL MODULATE TO MAINTAIN AN ADJUSTABLE MINIMUM DIFFERENTIAL PRESSURE IN THE SECONDARY WATER LOOP. A CHANGEOVER OUTPUT IS PROVIDED TO SELECT THE PUMP THE VFD IS CONTROLLING. THE VFD SHALL BE PROVIDED WITH AN AUTO BYPASS. UPON FAILURE OF THE VFD, THE PUMP SHALL AUTOMATICALLY OPERATE AT A CONSTANT SPEED.

A TRENT LONG SHALL BE PROVIDED FOR THE HOT WATER SUPPLY TEMPERATURE, THE OUTSIDE AIR TEMPERATURE, AND HOT WATER FLOW TO BE PRINTED OUT AT THE OPERATOR WORKSTATION. RUNTIME FOR THE PUMPS SHALL ALSO BE TRACKED FOR THE HOT WATER PUMPS. ALARMS SHALL OCCUR AT THE OPERATOR WORKSTATION FOR LOW AND HIGH WATER TEMPERATURES AND NO FLOW CONDITIONS AT THE OPERATOR WORKSTATION.



SECONDARY HOT WATER RESET SCHEDULE

POINT LIST - ADMIN BUILDING SECONDARY HOT WATER LOOP

Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
SHW Supply Temperature	AI	Temperature Sensor	YES	NO	1 min.	15 min.	F
SHW Return Temperature	AI	Temperature Sensor	YES	NO	1 min.	15 min.	F
SHW loop differential pressusure	AI	DP	YES	NO	1 min.	15 min.	
Secondary hot water control valve	AO	Acutator on Control Valve	YES	NO	COV	COV	
Pump Run Command	AO	Connect to VFD	NO	NO	COV	COV	
Pump-1 Status	DI	Connect to VFD	NO	NO	COV	COV	
Pump-2 Status	DI	Connect to VFD	NO	NO	COV	COV	
Pump Selector	BO	Connect to VFD	NO	NO	COV	COV	
Pump VFD Alarm	DI	Connect to VFD	NO	NO	COV	COV	
Pump Output	DO	Connect to VFD	NO	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Occupied Command							
SHW Differential Pressure Setpoint							
SHW supply temperature setpoin (reset)							
OSA-L - SHW supply temperature reset (Input-Lo)							
OSA-HI - SHW supply temperature reset (Input-HI)							
SHWS-L - SHW supply temperature reset (Output-Lo)							
SHWS-HI - SHW supply temperature reset (Output-HI)							

A SECONDARY HOT WATER LOOP
NO SCALE

POINT LIST - ADMIN BUILDING-AH3-1 AND AH3-2

Description	Type	Device	New Device	New Point	Trend Logging Commissioning	Trend Logging Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to Supply Fan	NO	NO	COV	COV	
Supply Fan Status	DI	Connect to Current Sensor	NO	NO	COV	COV	
Return Fan Command	DO	Connect to F3-9	NO	NO	COV	COV	
Return Fan Status	AI	Connect to F3-9 Current Sensor	YES	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Heating Hot Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Chilled Water Supply Temperature	AI	CHWS-T Sensor	YES	NO	1 min.	15 min.	F
Chille Water Return Temperature	AI	CHWR-T Sensor	YES	NO	1 min.	15 min.	F
Duct Alarm (Smoke SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Return Air Temperature	AI	RA-T Sensor	YES	YES	1 min.	15 min.	F
OA-D Command	AO	Modulating actuator	NO	NO	COV	COV	
RA-D Command	AO	Modulating actuator	NO	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint (Reset)							
Occupied Command							
Zone Temperature Setpoint							

POINT LIST - ADMIN BUILDING - F3-4

Description	Type	Device	New Device	New Point	Trend Logging Commissioning	Trend Logging Continuous	Calibration
EXHAUST FAN STATRT/STOP COMMAND	DO	Connect to Fan motor starter	NO	NO	COV	COV	
Exhaust Fan status	DI	Connect to current sensor	NO	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Alarm - If status does not meet the command than alarm at the BMS							

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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CONSULTANTS:

SAN MATEO COUNTY HEALTH CENTER
SAN MATEO, CALIFORNIA
CONTROLS UPGRADE

SHEET TITLE:
CONTROLS DIAGRAM ADMINISTRATION BUILDING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:
M6.25

SHEET : OF

POINT LIST - ADMIN BUILDING-AH3-10

Description	Type	Device	New Device	New Point	Trend Logging: Commissioning	Trend Logging: Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to Supply Fan	NO	NO	COV	COV	
Supply Fan Status	DI	Connect to Current Sensor	NO	NO	COV	COV	
Return Fan (EF-2T) Command	DO	Connect to EF-2T	NO	NO	COV	COV	
Return Fan Status	AI	Connect to EF-2T Current Sensor	YES	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Heating Hot Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Chilled Water Supply Temperature	AI	CHWS-T Sensor	YES	NO	1 min.	15 min.	F
Chille Water Return Temperature	AI	CHWR-T Sensor	YES	NO	1 min.	15 min.	F
Duct Alarm (Smoke SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
OA-D Command	AO	Modulating actuator	NO	NO	COV	COV	
RA-D Command	AO	Modulating actuator	NO	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint (Reset)							
Occupied Command							
Zone Temperature Setpoint							

POINT LIST - ADMIN BUILDING - F3-7

Description	Type	Device	New Device	New Point	Trend Logging: Commissiong	Trend Logging: Continuous	Calibration
EXHAUST FAN STATRT/STOP COMMAND	DO	Connect to Fan motor starter	NO	NO	COV	COV	
Exhaust Fan status	DI	Connect to current sensor	YES	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Alarm - If status does not meet the command than alarm at the BMS							

POINT LIST - ADMIN BUILDING-AH3-7

Description	Type	Device	New Device	New Point	Trend Logging: Commissioning	Trend Logging: Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to Supply Fan	NO	NO	COV	COV	
Supply Fan Status	DI	Connect to Current Sensor	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Heating Hot Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Chilled Water Supply Temperature	AI	CHWS-T Sensor	YES	NO	1 min.	15 min.	F
Chille Water Return Temperature	AI	CHWR-T Sensor	YES	NO	1 min.	15 min.	F
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint (Reset)							
Occupied Command							
Zone Temperature Setpoint							

POINT LIST - ADMIN BUILDING - F3-8

Description	Type	Device	New Device	New Point	Trend Logging: Commissioning	Trend Logging: Continuous	Calibration
EXHAUST FAN STATRT/STOP COMMAND	DO	Connect to Fan motor starter	NO	NO	COV	COV	
Exhaust Fan status	DI	Connect to current sensor	YES	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Alarm - If status does not meet the command than alarm at the BMS							

POINT LIST - ADMIN BUILDING-AH3-8

Description	Type	Device	New Device	New Point	Trend Logging: Commissioning	Trend Logging: Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to Supply Fan	NO	NO	COV	COV	
Supply Fan Status	DI	Connect to Current Sensor	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Heating Hot Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Chilled Water Supply Temperature	AI	CHWS-T Sensor	YES	NO	1 min.	15 min.	F
Chille Water Return Temperature	AI	CHWR-T Sensor	YES	NO	1 min.	15 min.	F
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint (Reset)							
Occupied Command							
Zone Temperature Setpoint							

POINT LIST - ADMIN BUILDING - F3-6

Description	Type	Device	New Device	New Point	Trend Logging: Commissiong	Trend Logging: Continuous	Calibration
EXHAUST FAN STATRT/STOP COMMAND	DO	Connect to Fan motor starter	NO	NO	COV	COV	
Exhaust Fan status	DI	Connect to current sensor	YES	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Alarm - If status does not meet the command than alarm at the BMS							

POINT LIST - ADMIN BUILDING-AH3-5 AND AH3-6

Description	Type	Device	New Device	New Point	Trend Logging: Commissioning	Trend Logging: Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to Supply Fan	NO	NO	COV	COV	
Supply Fan Status	DI	Connect to Current Sensor	NO	NO	COV	COV	
Return Fan Command	DO	Connect to F3-9	NO	NO	COV	COV	
Return Fan Status	AI	Connect to F3-9 Current Sensor	YES	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Heating Hot Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Chilled Water Supply Temperature	AI	CHWS-T Sensor	YES	NO	1 min.	15 min.	F
Chille Water Return Temperature	AI	CHWR-T Sensor	YES	NO	1 min.	15 min.	F
Duct Alarm (Smoke SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Return Air Temperature	AI	RA-T Sensor	YES	YES	1 min.	15 min.	F
OA-D Command	AO	Modulating actuator	NO	NO	COV	COV	
RA-D Command	AO	Modulating actuator	NO	NO	COV	COV	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint (Reset)							
Occupied Command							
Zone Temperature Setpoint							

POINT LIST - ADMIN BUILDING-AH3-3, AH3-4, AH3-9 AND AH3-11

Description	Type	Device	New Device	New Point	Trend Logging: Commissioning	Trend Logging: Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to Supply Fan	NO	NO	COV	COV	
Supply Fan Status	DI	Connect to Current Sensor	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Heating Hot Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Chilled Water Supply Temperature	AI	CHWS-T Sensor	YES	NO	1 min.	15 min.	F
Chille Water Return Temperature	AI	CHWR-T Sensor	YES	NO	1 min.	15 min.	F
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint (Reset)							
Occupied Command							
Zone Temperature Setpoint							

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APPROVED
JUN 22 2016
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SAN MATEO, CALIFORNIA
CONTROLS UPGRADE

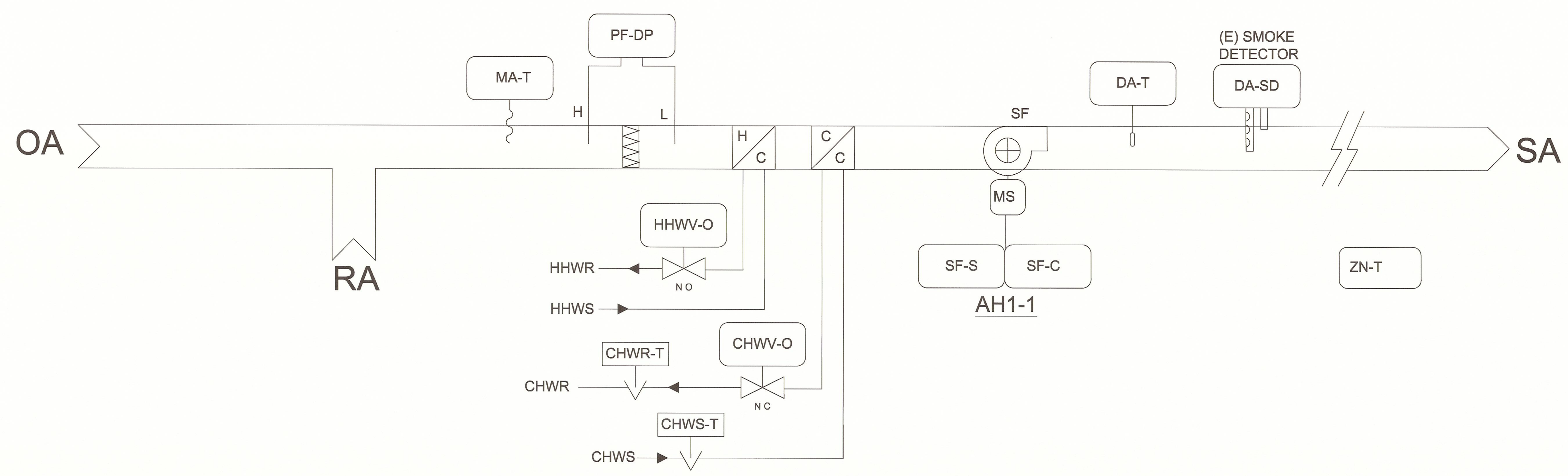
SHEET TITLE:
CONTROLS DIAGRAM ADMINISTRATION BUILDING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:
M6.26

SHEET : OF

SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.
SEE SPECIFICATIONS SECTION 23 09 93 – 1.1



POINT LIST - ADMIN BUILDING-AH1-1							
			New	New	Trend Logging		
Description	Type	Device	Device	Point	Commissiong	Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to Supply Fan	NO	NO	COV	COV	
Supply Fan Status	DI	Connect to Current Sensor	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Heating Hot Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Chilled Water Supply Temperature	AI	CHWS-T Sensor	YES	NO	1 min.	15 min.	F
Chille Water Return Temperature	AI	CHWR-T Sensor	YES	NO	1 min.	15 min.	F
Duct Alarm (Smoke SA)	DI	Connect to FA panel	NO	NO	COV	COV	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Discharge (Supply) Air Temperature Setpoint							
Occupied Command							
Zone Temperature Setpoint							

A

ADMINISTRATION BUILDING
AH1–1 CONTROL DIAGRAM
NO SCALE

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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CONTROLS UPGRADE

SHEET TITLE:

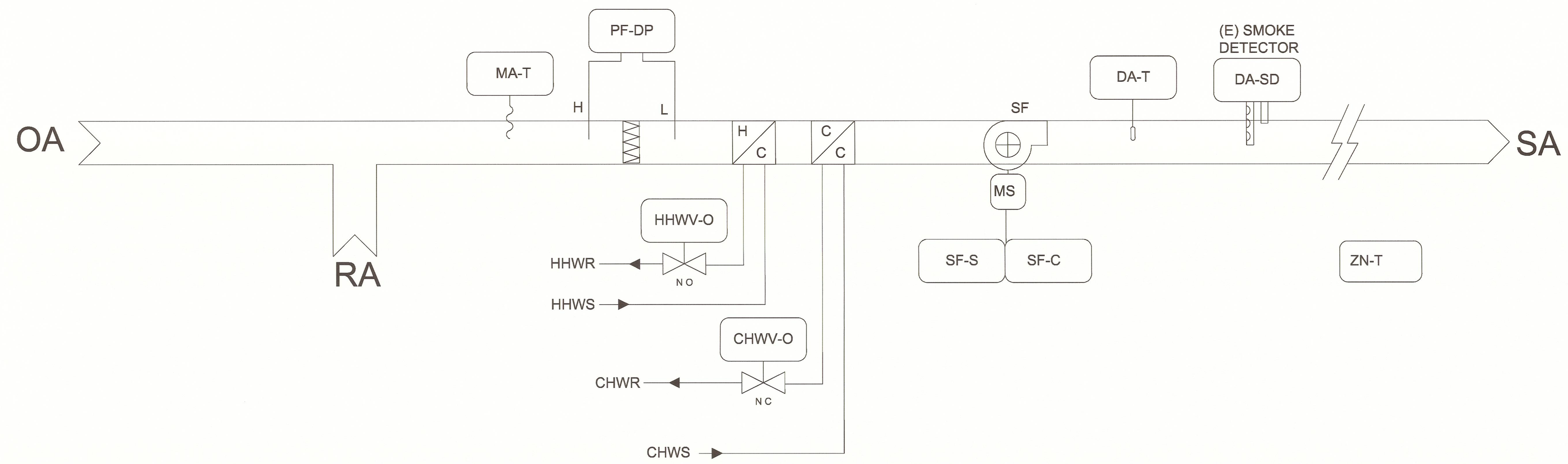
AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS ADMINISTRATION BUILDING

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

M6.27

SHEET : OF



SEQUENCE OF OPERATION FOR CV AHU WITH ECONOMIZER AND SMOKE CONTROL.
SEE SPECIFICATIONS SECTION 23 09 93 – 1.1

POINT LIST - ADMIN BUILDING-FC1-1 THRU FC1-4 AND FC3-1							
Description	Type	Device	New Device	New Point	Trend Logging Commissiong	Trend Logging Continuous	Calibration
Supply Fan Start/Stop Command	DO	Connect to Supply Fan	NO	NO	COV	COV	
Supply Fan Status	DI	Connect to Current Sensor	NO	NO	COV	COV	
Chilled Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Heating Hot Water Control Valve	AO	Acutator on Control Valve	YES	NO	1 min.	15 min.	
Pre- Filter Pressure Drop	AI	PF-DP	YES	NO	1 min.	60 min	
Mixed Air Temperature	AI	MA-T Sensor	YES	NO	1 min.	15 min.	F
Discharge (Supply) Air Temperature	AI	DA-T Sensor	YES	NO	1 min.	15 min.	F
Zone Temperature	AI	Thermostat	NO	NO	1 min.	60 min	
Programmed Points : TCC SHALL PROGRAM FOLLOWING POINT IN BMS							
Occupied Command							
Zone Temperature Setpoint							

A
ADMINISTRATION BUILDING
FC1–1 THRU FC1–4 AND FC3–1
NO SCALE

POINT LIST - VFD					
Description	Type	Device	Trend Logging Commissioning	Trend Logging Continuous	Calibration
Fault reset	DO	Through network	COV	COV	–
On/off status	DI	Through network	COV	COV	–
Fault (Critical Alarm)	DI	Through network	COV	COV	–
Minor Alarm	DI	Through network	COV	COV	–
Fault Text	DI	Through network (convert code to plain English text)	COV	COV	–
Alarm Text	DI	Through network (convert code to plain English text)	COV	COV	–
Keypad in hand/auto	DI	Through network	COV	COV	–
Minimum frequency set point	AO	Through network	±5%	±5%	–
Maximum frequency set point	AO	Through network	±5%	±5%	–
Acceleration rate	AO	Through network	±5%	±5%	–
Deceleration rate	AO	Through network	±5%	±5%	–
Actual frequency	AI	Through network	1 min	15 min	–
AC output voltage	AI	Through network	±10%	±10%	F
Current	AI	Through network	15 min	60 min	F
VFD temperature	AI	Through network	60 min	60 min	F
Power, kW	AI	Through network	1 min	15 min	F
Energy, MWh	AI	Through network	15 min	60 min	–
DC Bus Voltage	AI	Through network	±10%	±10%	F

B
VFD POINT LIST
APPLICABLE AT UNITS W/ VFD
NO SCALE

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
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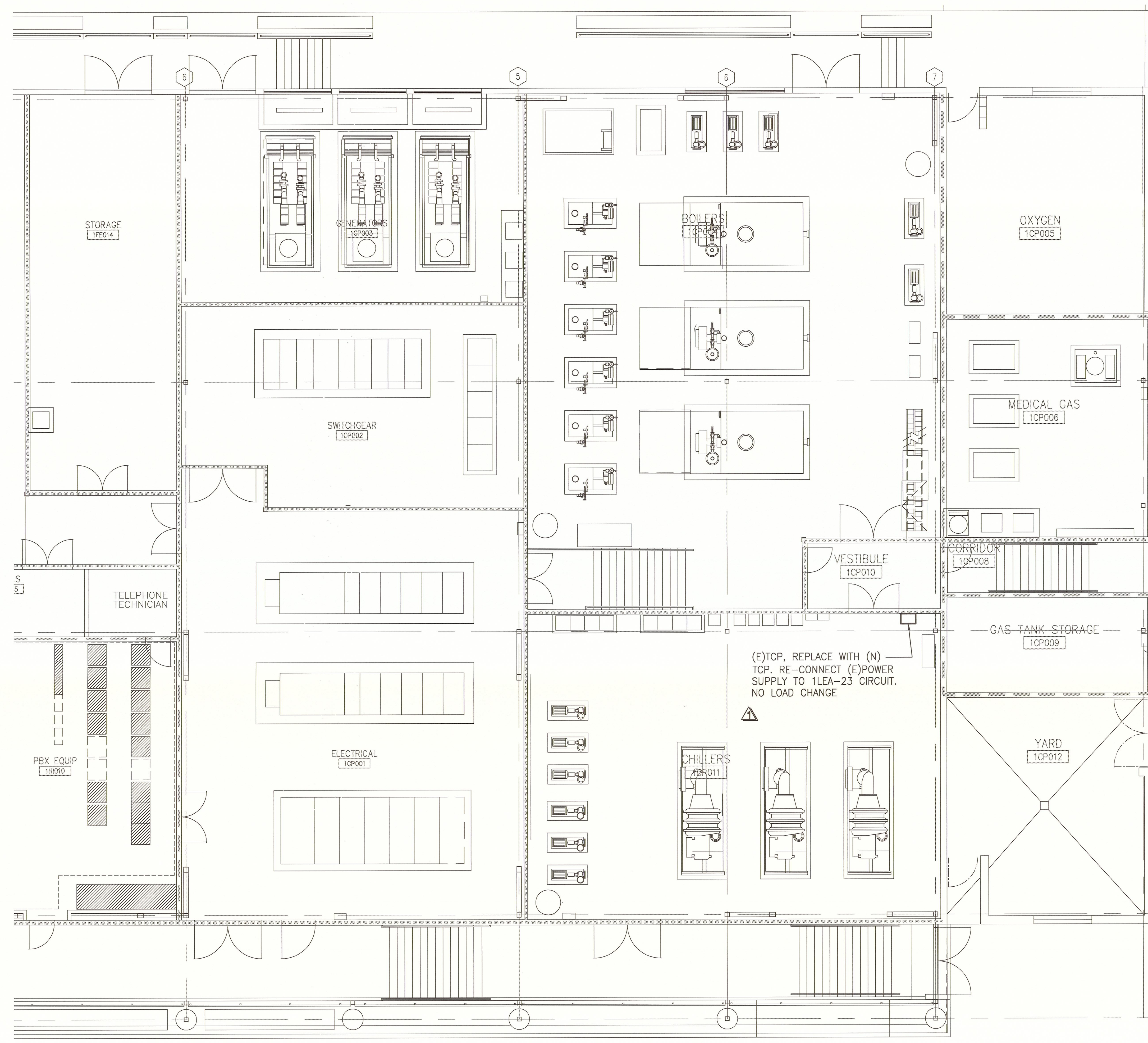
CONTROLS UPGRADE

SHEET TITLE:
AIR HANDING UNIT SYSTEM CONTROLS DIAGRAMS ADMINISTRATION BUILDING & GENERAL

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

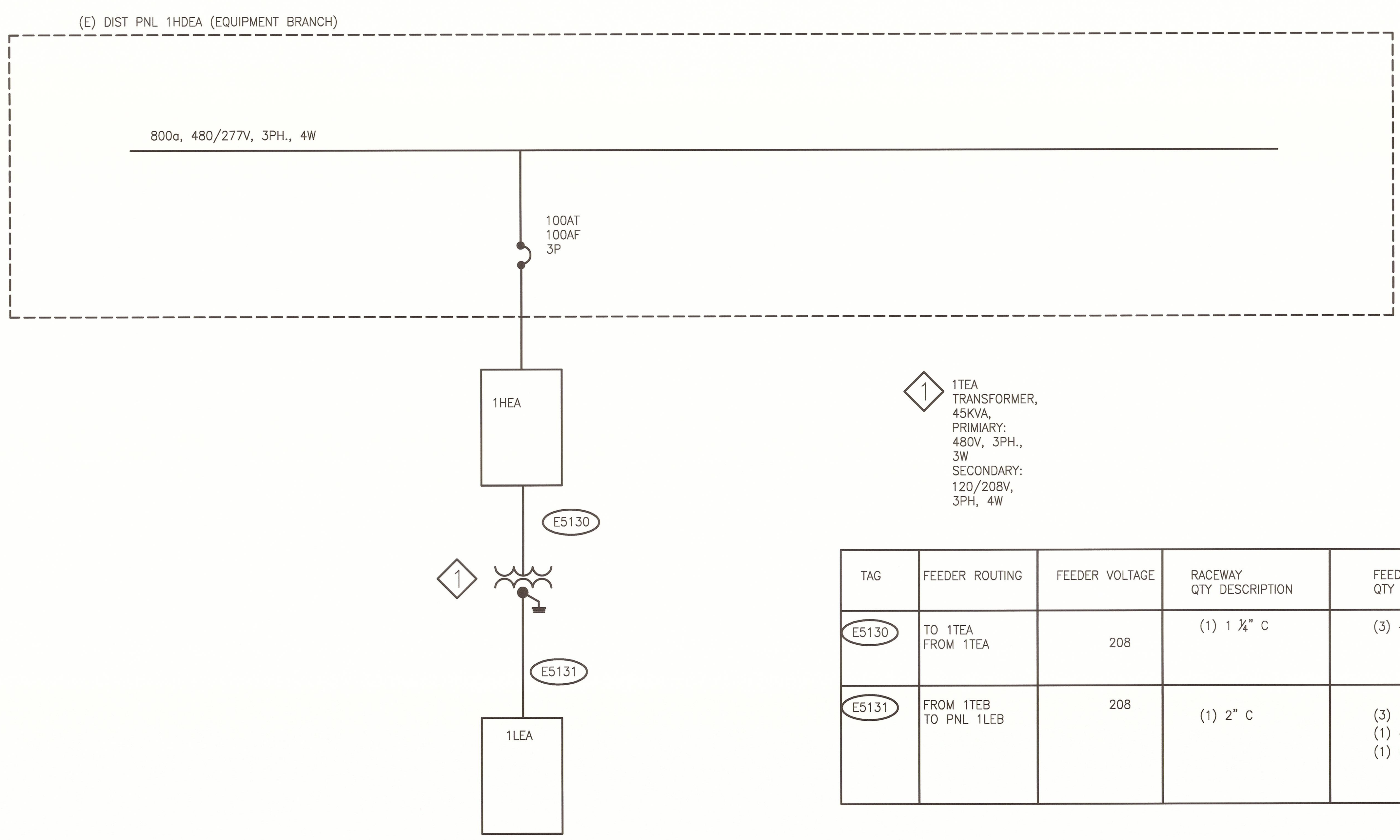
SHEET NUMBER:
M6.28

SHEET : OF



A CENTRAL PLANT ELECTRICAL FLOOR PLAN

1/8"=1'-0"



1 1TEA TRANSFORMER, 45KVA, PRIMARY: 480V, 3PH., 3W SECONDARY: 120/208V, 3PH, 4W

TAG	FEEDER ROUTING	FEEDER VOLTAGE	RACEWAY QTY DESCRIPTION	FEEDER DESCRIPTION QTY SIZE INSUL GRND
E5130	TO 1TEA FROM 1TEA	208	(1) 1 ¼" C	(3) 4 C THWN 8
E5131	FROM 1TEB TO PNL 1LEB	208	(1) 2" C	(3) 1/0 C THWN 6 (1) 4/0 NEUTRAL (1) 6 IG

B CENTRAL PLANT ELECTRICAL ONE-LINE DIAGRAM

NO SCALE

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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CONTROLS UPGRADE

SHEET TITLE:

ELECTRICAL CENTRAL PLANT PLAN

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

E2.0

SHEET : OF

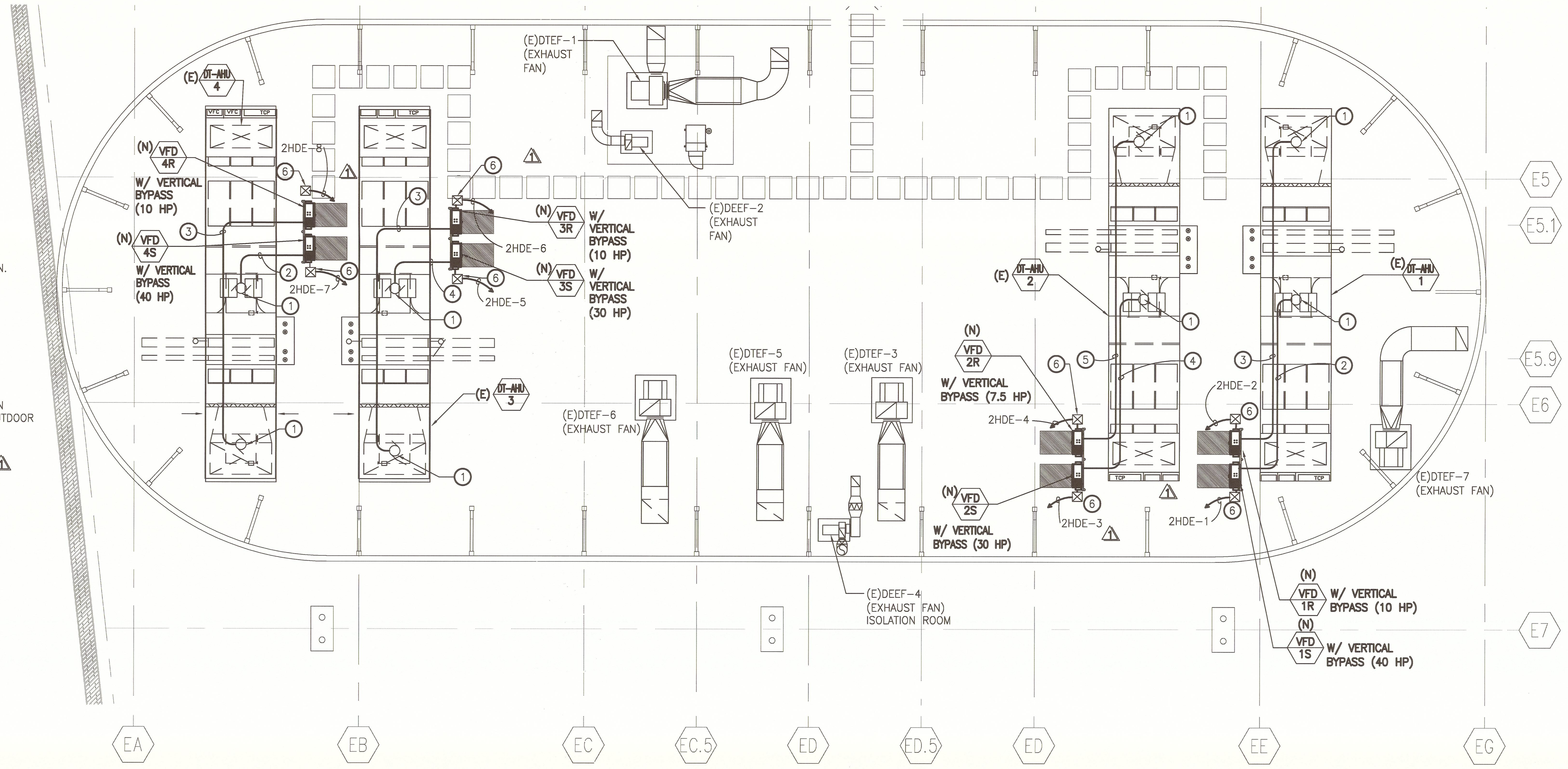
LOAD SCHEDULE: 9470 2HDE — 3 PHASE 3 WIRE

O.C. Device type: BREAKERS			Mounting: FREE STAND			Voltage LL: 480		
Device Family: BOLT ON			Enclosure: NEMA 1			Voltage LG:		
Bus Amps: 600			Comments: 400A MCB			Fault Duty: 19622		
Ck No	Bus No	Load Desc.	Demand Code	Connected kVA	Demand kVA	Design kVA	Design Amps	OC Device Requirements
1		DTAHU-1 SF	10	33.2	33.2	41.5	49.	SEE SINGLE LINE
2		DTAHU-1 RF	9	9.1	9.1	9.1	10.	SEE SINGLE LINE
3		DTAHU-2 SF	9	33.2	33.2	33.2	39.	SEE SINGLE LINE
4		DTAHU-2 RF	9	9.1	9.1	9.1	10.	SEE SINGLE LINE
5		DTAHU-3 SF	9	33.2	33.2	33.2	39.	SEE SINGLE LINE
6		DTAHU-3 RF	9	9.1	9.1	9.1	10.	SEE SINGLE LINE
7		DTAHU-4 SF	9	33.2	33.2	33.2	39.	SEE SINGLE LINE
8		DTAHU-4 RF	9	11.6	11.6	11.6	13.	SEE SINGLE LINE
9		DTEF-1	9	6.3	6.3	6.3	7.	SEE SINGLE LINE
10		DTEF-2	9	2.1	2.1	2.1	2.	SEE SINGLE LINE
11		DTEF-3	9	9.1	9.1	9.1	10.	SEE SINGLE LINE
12		DTEF-4	9	1.5	1.5	1.5	1.	SEE SINGLE LINE
13		DTEF-5	9	4.0	4.0	4.0	4.	SEE SINGLE LINE
14		DTEF-6	9	9.1	9.1	9.1	10.	SEE SINGLE LINE
15		2TEC	1	15.0	15.0	15.0	18.	SEE SINGLE LINE
16		SPACE						
17		SPACE						
18		SPACE						
19		SPACE						
20		SPACE						
21		SPACE						
22		SPACE						
23		SPACE						
		TOTAL LOADS		218.8	218.8	227.1	273.	

D — D&T BUILDING ELECTRICAL PANEL SCHEDULE

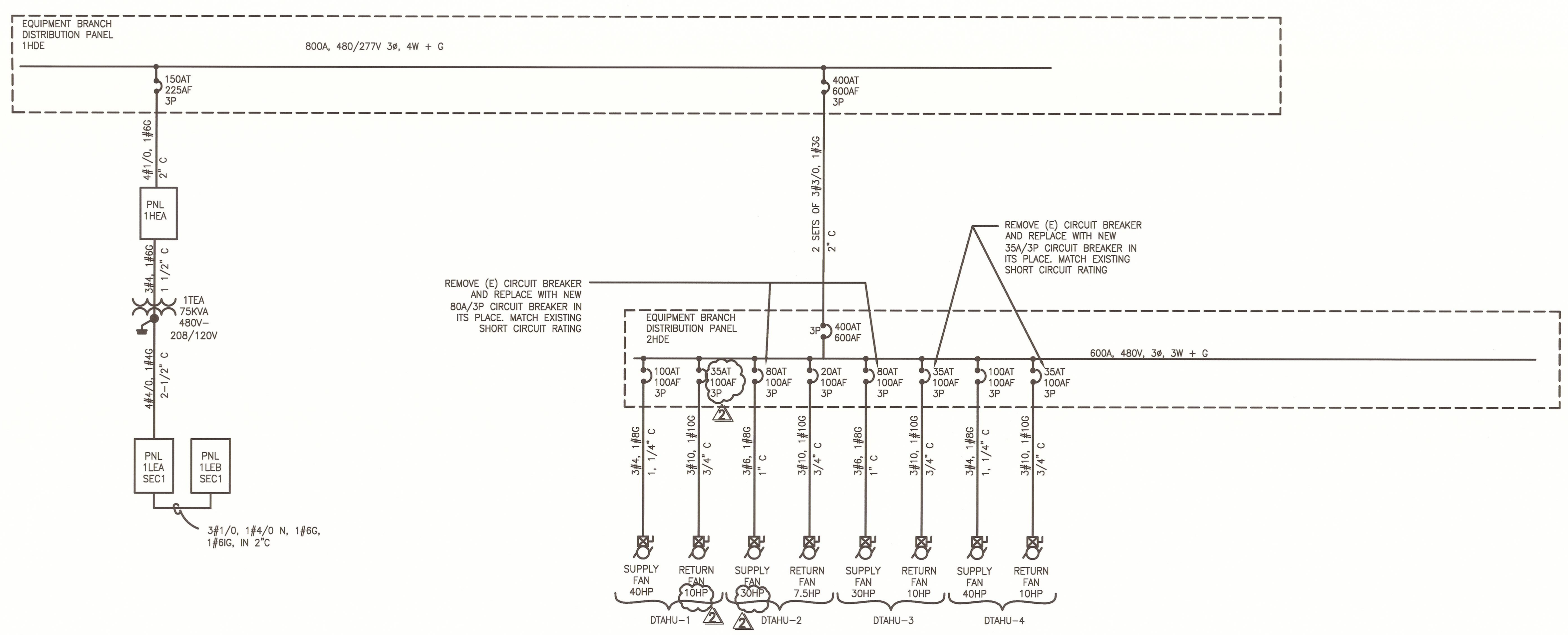
NO SCALE

1. (E) FAN MOTOR SHALL REMAIN. RECONNECT AS INDICATED
2. (N)1¼"C – 3#4 & 1#8G
3. (N)¾"C – 3#10 & 1#10G
4. (N)1"C – 3#6 & 1#8G
5. (N)¾"C – 3#10 & 1#10G
6. PROVIDE NEW DISCONNECTS IN WEATHER ENCLOSURE FOR OUTDOOR INSTALLATION



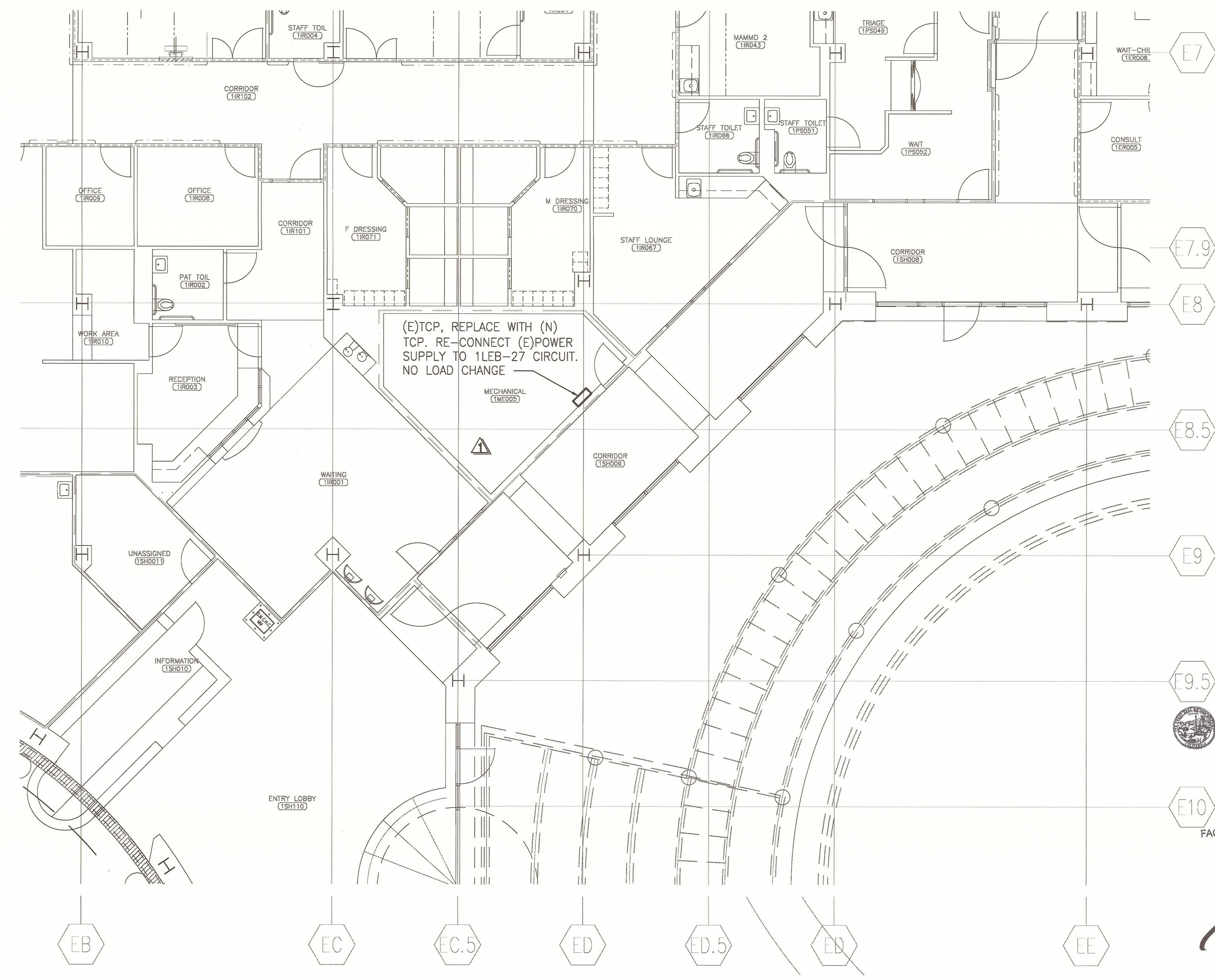
A — PARTIAL D&T ELECTRICAL 1ST FLOOR PLAN

1/8"=1'-0"



C — D&T BUILDING ELECTRICAL ONE-LINE DIAGRAM

NO SCALE



B — PARTIAL D&T ELECTRICAL 1ST FLOOR PLAN

1/8"=1'-0"

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR APPROVED JUN 02 2016 Office of Statewide Health Planning & Development FACILITIES DEVELOPMENT DIVISION

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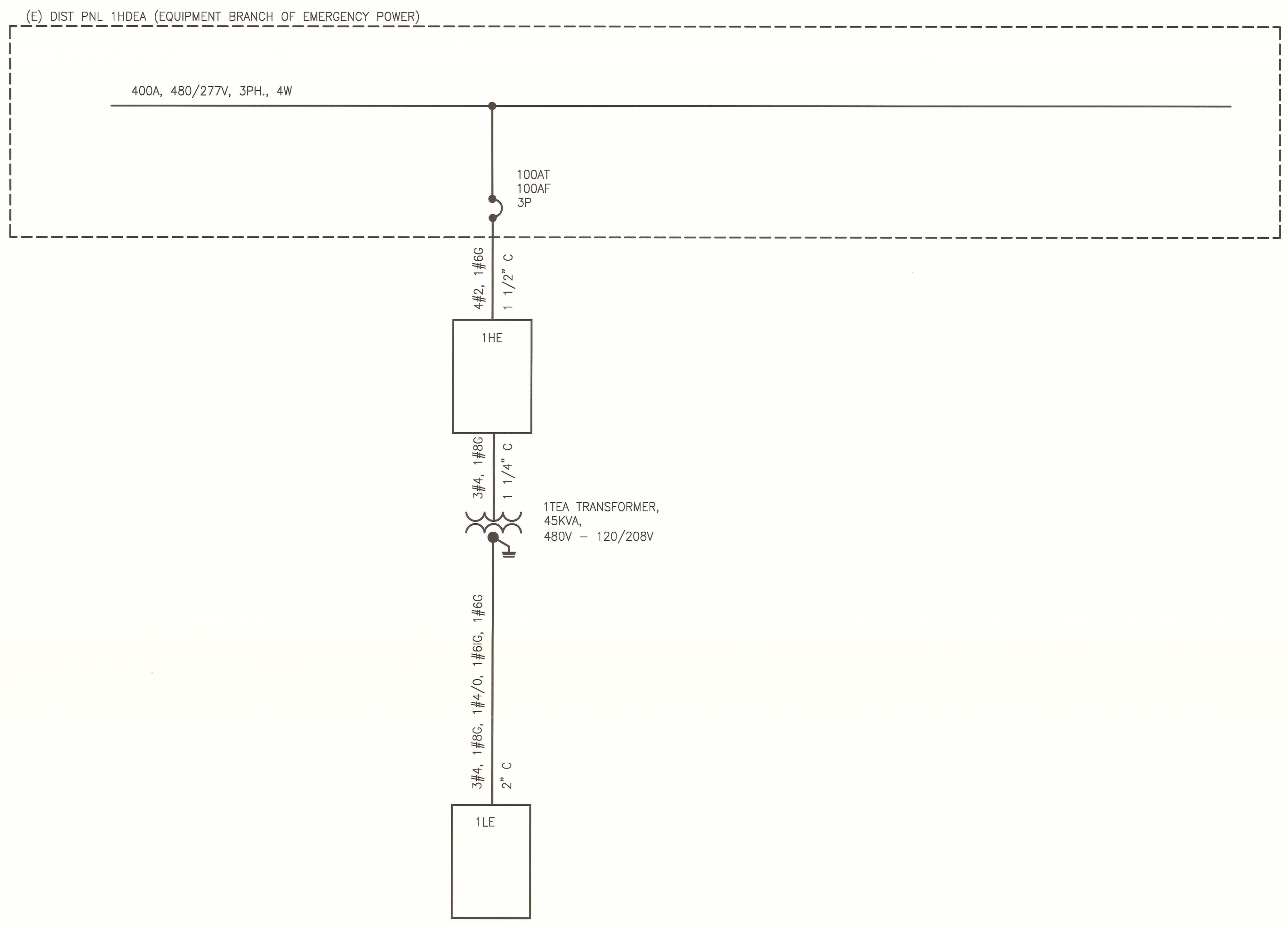
CONTROLS UPGRADE

SHEET TITLE: D&T ELECTRICAL PLAN

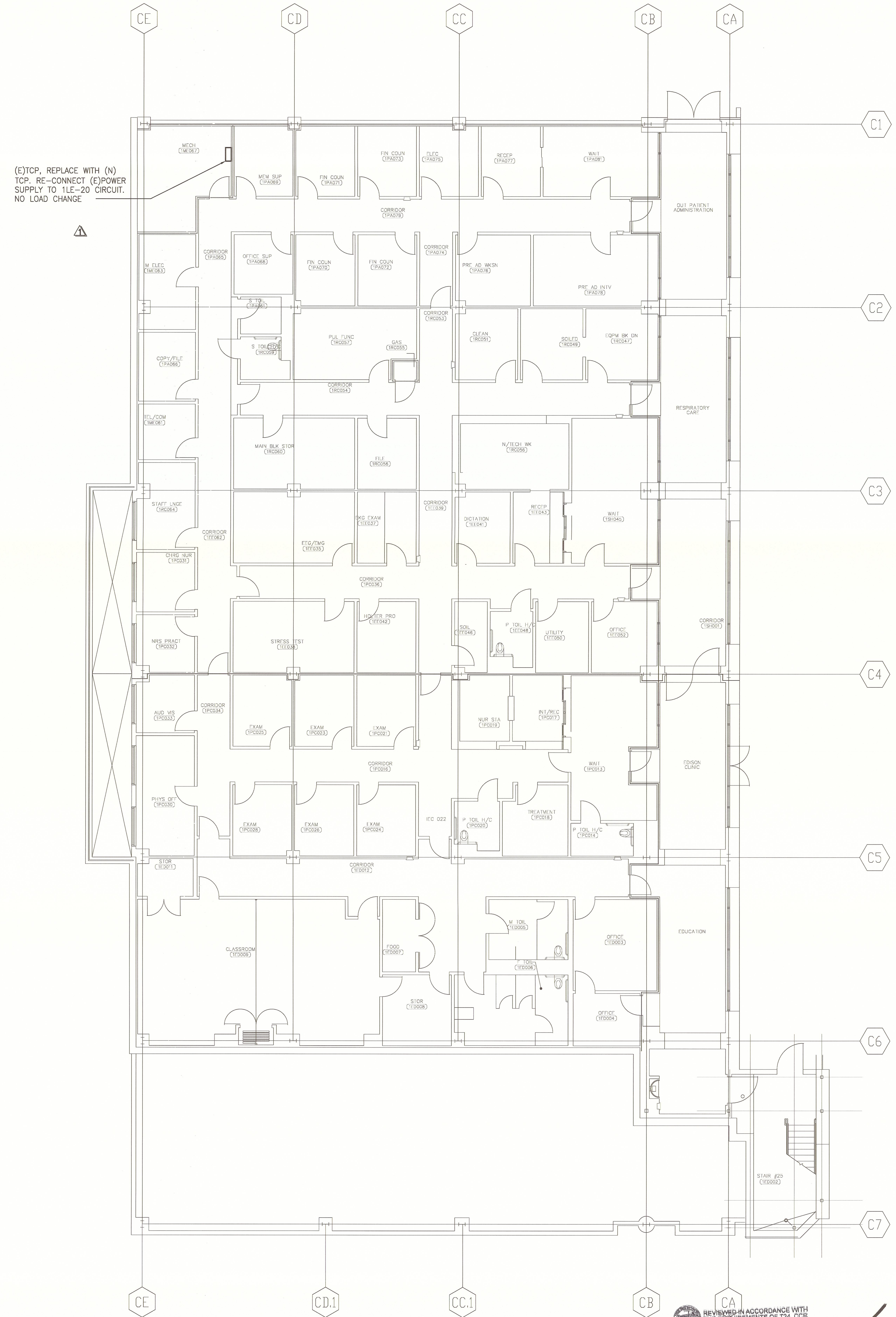
NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER: E2.1

SHEET : OF



C CLINIC BUILDING ELECTRICAL ONE-LINE DIAGRAM
NO SCALE



B CLINIC ELECTRICAL 1ST FLOOR PLAN
1/8"=1'-0"

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
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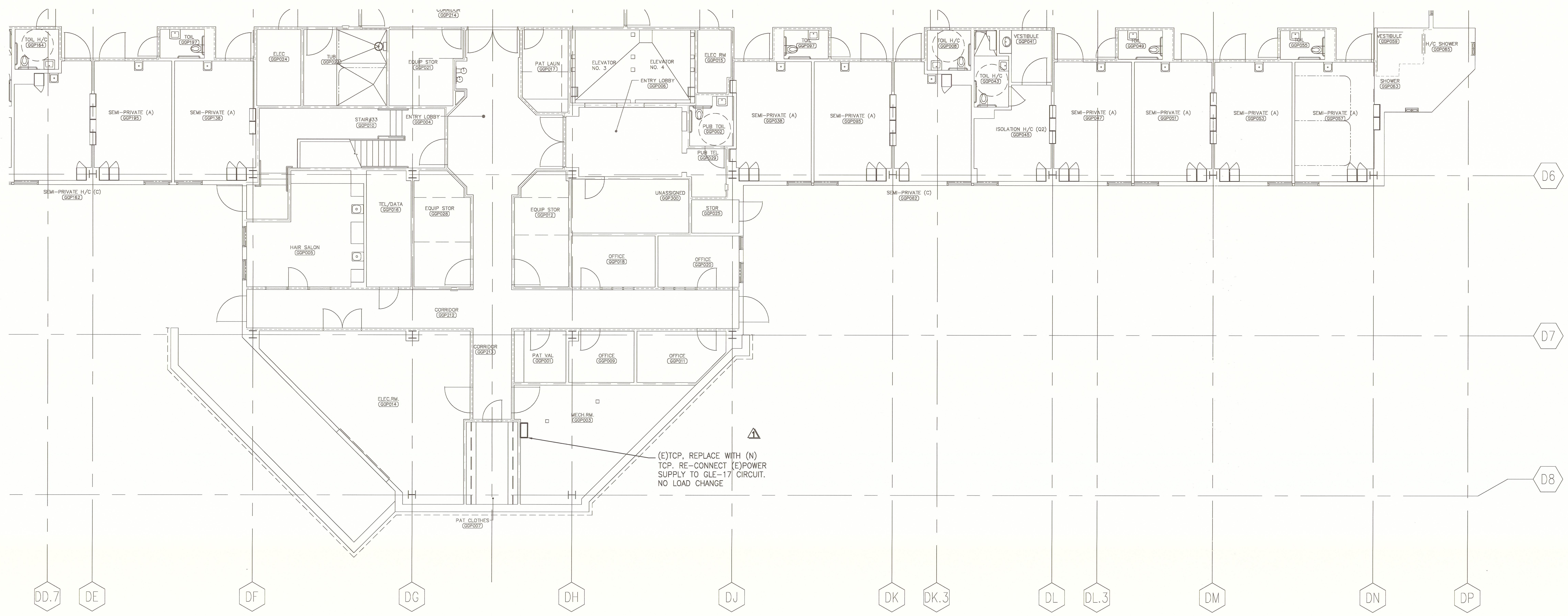
CONTROLS UPGRADE

SHEET TITLE:
CLINIC BUILDING ELECTRICAL PLAN

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:
E2.2

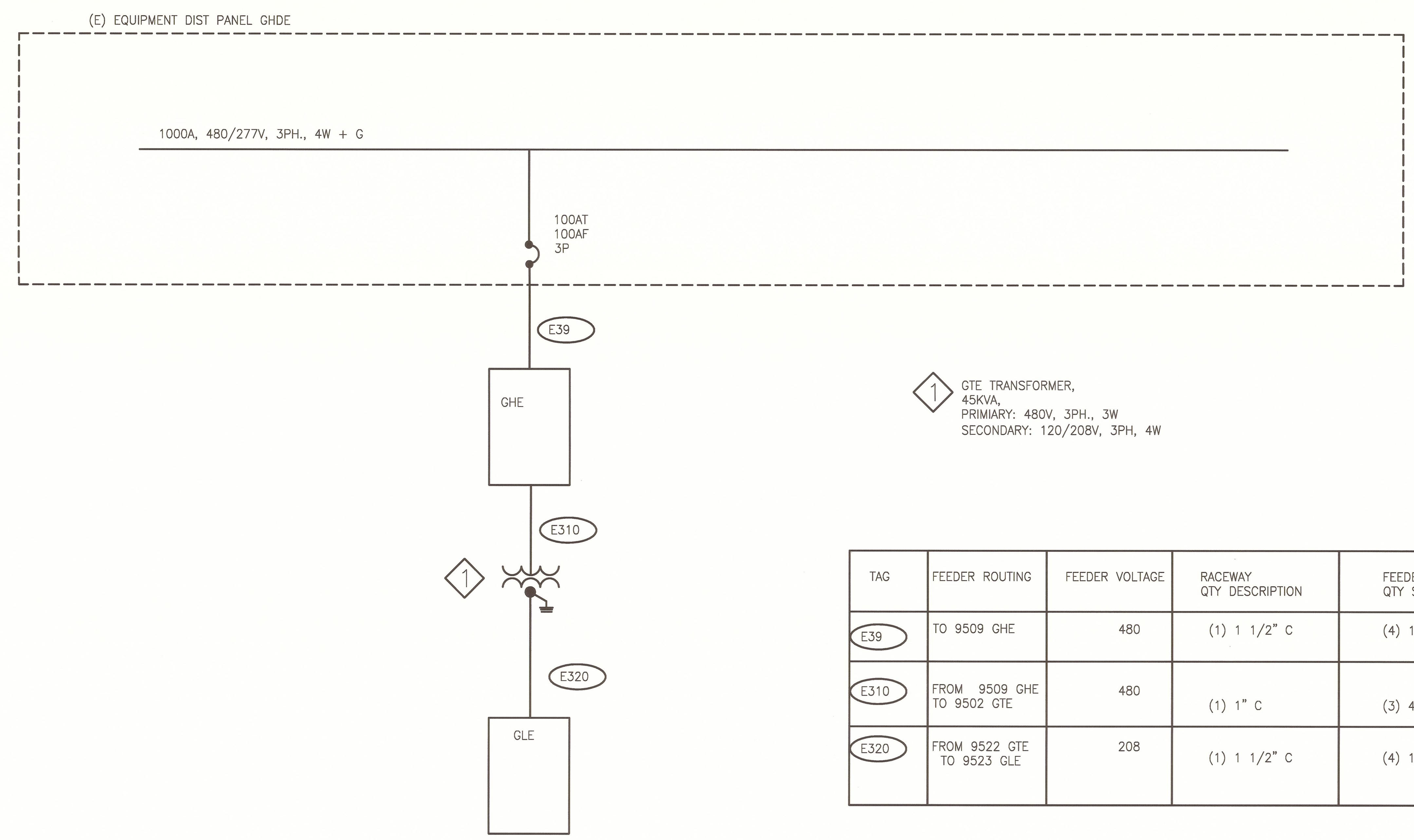
SHEET : OF



PARTIAL NURSING WING ELECTRICAL FLOOR PLAN

A

1/8"=1'-0"



1 GTE TRANSFORMER,
45KVA,
PRIMIARY: 480V, 3PH., 3W
SECONDARY: 120/208V, 3PH, 4W

TAG	FEEDER ROUTING	FEEDER VOLTAGE	RACEWAY QTY DESCRIPTION	FEEDER DESCRIPTION QTY SIZE INSUL GRND
E39	TO 9509 GHE	480	(1) 1 1/2" C	(4) 1 C THWN 8
E310	FROM 9509 GHE TO 9502 GTE	480	(1) 1" C	(3) 4 C THWN 8
E320	FROM 9522 GTE TO 9523 GLE	208	(1) 1 1/2" C	(4) 1/0 C THWN 6

NURSING WING ELECTRICAL ONE-LINE DIAGRAM

B

NO SCALE

REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24, CCR
APPROVED
JUN 02 2016
Office of Statewide Health Planning & Development
FACILITIES DEVELOPMENT DIVISION

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CONTROLS UPGRADE

SHEET TITLE:

NURSING WING ELECTRICAL PLAN

NO.	REVISIONS	DATE	BY
1	OSHPD BCK#1	03/01/16	
2	OSHPD BCK#2	05/27/16	

SHEET NUMBER:

E2.3

SHEET : OF