CENTRAL WASHINTON UNIVERSITY

400 E University Way, Ellensburg, WA 98926

SAMUELSON DATA CENTER AHU REPLACEMENT

Client Project Number: 17456-02

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LOCATION MAP

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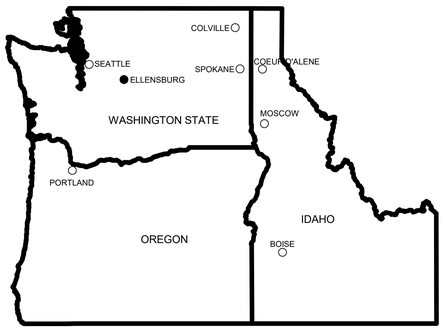
VICINITY MAP



ISSUE DATE _____

ISSUE NUMBER _____

TEMPERATURE CONTROL SYMBOLS

- AF — AIRFLOW MONITOR
- AVERAGING SENSOR
- CO_2 — CARBON DIOXIDE SENSOR
- CO — CARBON MONOXIDE SENSOR
- COIL (HEATING/COOLING)
- # — CONTROL POINT
- CT — CURRENT TRANSDUCER
- 1i — DAMPER MOTOR ACTUATOR IDENTIFICATION
- DP — DIFFERENTIAL PRESSURE SWITCH
- DS — DUCT SMOKE DETECTOR
- ES — END SWITCH
- # — EQUIPMENT IDENTIFICATION
- FILTER
- FS — FLOW SWITCH
- H — HUMIDITY SENSOR
- IN-LINE DEVICE
- R — INTERFACE RELAY
- LIGHT (PILOT OR ANNUNCIATOR)
- LIGHT WITH AUDIO ANNUNCIATION
- LL — LOW LIMIT FREEZESTAT
- MOTOR STARTER
- MOTOR STARTER WITH CURRENT SENSING RELAY
- MOTORIZED DAMPER
- OS — OCCUPANCY SENSOR
- POINT SENSOR
- PS — PRESSURE SENSOR
- PUMP
- RM — REFRIGERANT MONITOR
- S — SENSOR
- S — SOLENOID VALVE ACTUATOR
- SP — STATIC PRESSURE SENSOR
- SWITCH
- G — SWITCH WITH GUARDED COVER
- SWITCH WITH PILOT LIGHT
- TT — TEMPERATURE TRANSMITTER
- TT — TEMPERATURE TRANSMITTER WITH SUN SHIELD
- T — THERMOSTAT
- TC — THERMOSTAT & CO2
- TH — THERMOSTAT AND HUMIDITY SENSOR
- TCH — THERMOSTAT, CO2 AND HUMIDITY SENSOR
- THERMOWELL
- V# — VALVE MOTOR ACTUATOR IDENTIFICATION
- WM — WATERFLOW METER
- 2-WAY MODULATING VALVE
- 3-WAY MODULATING VALVE
- 2-OR 3-WAY MODULATING VALVE (SEE PLANS OR DETAILS FOR REQUIREMENTS)

PIPING SYMBOLS

- VALVE - 2-WAY CONTROL
- VALVE - 3-WAY CONTROL
- VALVE - GLOBE/THROTTLING
- VALVE - SOLENOID
- VALVE WITH TAMPER SWITCH
- AIR SEPARATOR
- ANGLE VALVE
- AUTOMATIC AIR VENT
- CAP
- CHECK VALVE
- CIRCUIT SETTER
- CIRCULATING PUMP
- REDUCER
- ECCENTRIC REDUCER/INCREASER
- ELBOW
- ELBOW DOWN
- ELBOW UP
- ELECTRO-PNEUMATIC CONTROL VALVE
- EXPANSION JOINT
- FLEXIBLE CONNECTION
- FLOW DIRECTION
- 1% — FLOW DIRECTION AND SLOPE
- FS — FLOW SWITCH
- GAUGE COCK
- MANUAL AIR VENT
- PENETRATION (FLOOR OR WALL)
- PIPE ANCHOR
- PIPE CONTINUES ALTHOUGH NOT DRAWN
- PIPE GUIDE
- PIPE SLEEVE
- P-TRAP
- PRESSURE GAUGE
- PS — PRESSURE SWITCH
- PRESSURE AND TEMPERATURE RELIEF VALVE
- PRESSURE INDEPENDENT BALANCING VALVE
- PS — PRESSURE SWITCH
- GAS & WATER PRESSURE REDUCING VALVE (POINTS TOWARDS LOW PRESSURE)
- REDUCER/INCREASER
- SIGHT GLASS
- STRAINER
- TEE
- TEE DOWN
- TEE DOWN TO ELBOW
- TEE UP
- TEE UP TO ELBOW
- TEE UP TO RISE
- THERMOMETER
- THERMOWELL
- THRUST RESTRAINT
- UNION/FLANGE/COUPLING
- VALVE IN RISER
- VENTURI
- WATER HAMMER ARRESTER

HVAC SYMBOLS

- RECTANGULAR SUPPLY DUCT (SECTION)
- RECTANGULAR RETURN DUCT (SECTION)
- RECTANGULAR EXHAUST DUCT (SECTION)
- RECTANGULAR OSA DUCT (SECTION)
- ROUND SUPPLY DUCT (SECTION)
- ROUND RETURN DUCT (SECTION)
- ROUND EXHAUST DUCT (SECTION)
- ROUND OSA DUCT (SECTION)
- FLAT OVAL SUPPLY DUCT (SECTION)
- DUCTWORK WITH INTERNAL LINING
- ALUMINUM/STAINLESS STEEL DUCTWORK (AS SPECIFIED)
- AIR TRANSFER DUCT SLEEVE
- FLEXIBLE DUCT
- UP DN — DUCT OFFSET AND DIRECTION
- ROUND/OVAL MITERED ELL W/ TURNING VANES
- TURNING VANES
- AIR SPLIT TAKEOFF
- BALANCE/VOLUME DAMPER (SEE SPECS FOR TYPE)
- BALANCE/VOLUME DAMPER (SEE SPECS FOR TYPE)
- MOTORIZED CONTROL DAMPER
- FIRE/SMOKE DAMPER
- 12"x12" — RECTANGULAR DUCT SIZE (WIDTHxDEPTH)
- 12"ø — CIRCULAR DUCT DIAMETER
- 12"/12" — FLAT OVAL DUCT SIZE (WIDTH/DEPTH)

- GRD TYPE
- Size — TAG / CFM — GRILLE/REGISTER/DIFFUSER INFORMATION
- AIR FLOW RATE (CFM)
- SIZE
- T — THERMOSTAT
- SUPPLY AIR FLOW
- RETURN AIR FLOW
- # — FIRE/SMOKE DAMPER TYPE
- # — SECURITY GRILLE TYPE
- M — DAMPER MOTOR OPERATOR
- ATTENUATOR
- TERMINAL BOX, HEAT PUMP, OR FAN COIL UNIT
- DUCT SECURITY GRILLE
- RECTANGULAR SUPPLY DIFFUSER (ARROWS INDICATE THROW)
- RECTANGULAR RETURN REGISTER/GRILLE
- RECTANGULAR EXHAUST REGISTER/GRILLE/HOOD
- LINEAR DIFFUSER (ARROWS INDICATE THROW)
- CIRCULAR DIFFUSER (ARROWS INDICATE THROW)
- SIDEWALL DIFFUSER (ARROWS INDICATE THROW)
- LOUVER (ARROWS INDICATE THROW)
- UNIT HEATER

HYDRONIC PIPING LEGEND

- CWR — CHILLED WATER RETURN
- CWS — CHILLED WATER SUPPLY
- CD — CONDENSATE DRAIN
- CDR — CONDENSER RETURN
- CDS — CONDENSER SUPPLY
- GCWR — GLYCOL CHILLED WATER SUPPLY
- GCWS — GLYCOL CHILLED WATER SUPPLY
- HR — HEAT PUMP RETURN
- HS — HEAT PUMP SUPPLY
- HWR — HOT WATER RETURN
- HWS — HOT WATER SUPPLY
- PC — PUMPED CONDENSATE
- RD — REFRIGERANT DISCHARGE
- RG — REFRIGERANT GAS
- RL — REFRIGERANT LIQUID
- SMR — SNOW MELT RETURN
- SMS — SNOW MELT SUPPLY
- TCWR — TEMPERED CHILLED WATER RETURN
- TCWS — TEMPERED CHILLED WATER SUPPLY

STEAM PIPING LEGEND

- HPS — HIGH PRESSURE STEAM
- HPC — HIGH PRESSURE STEAM CONDENSATE
- LPS — LOW PRESSURE STEAM
- LPC — LOW PRESSURE STEAM CONDENSATE
- MPS — MEDIUM PRESSURE STEAM
- MPC — MEDIUM PRESSURE STEAM CONDENSATE
- STM — STEAM

SYMBOLS & ABBREVIATIONS

GENERAL SYMBOLS

- # — KEY NOTE
- EQ# — EQUIPMENT IDENTIFIER
- DETAIL NUMBER / DETAIL REFERENCE / SHEET NUMBER
- 1 / Ref Detail 5 — DETAIL NUMBER / DETAIL REFERENCE / MATCHED SHEET NUMBER / CURRENT SHEET NUMBER
- MATCH LINE REFERENCE
- Sht # — MATCHED SHEET NUMBER
- ROOM NAME — ROOM NAME AND NUMBER
- CONNECTION TO EXISTING (# INDICATES EXISTING SIZE)
- REVISION NUMBER
- SECTION NUMBER
- SIM — SECTION REFERENCE
- A101 — SHEET NUMBER
- N — NORTH ARROW
- CENTER LINE

NOTE:
SYMBOLS AND ABBREVIATIONS ON THE DRAWINGS SHALL BE INTERPRETED IN ACCORDANCE WITH THE LEGENDS WHEREVER APPLICABLE. NOT ALL SYMBOLS AND ABBREVIATIONS IN THE LEGENDS ARE NECESSARILY USED FOR THE PROJECT. ALL SIZES ARE IN INCHES, UNLESS OTHERWISE NOTED.

LINEWEIGHT LEGEND

- NEW WORK
- EXISTING TO REMAIN OR NOT IN CONTRACT
- DEMOLITION
- FUTURE WORK

GENERAL ABBREVIATIONS

ABV	ABOVE
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AF	AIR FLOW
AHU	AIR HANDLING UNIT
AS	AIR SEPARATOR
AL	ALUMINUM
AI	ANALOG INPUT
AO	ANALOG OUTPUT
AAP	AREA ALARM PANEL
AT	ATTENUATOR
BAS	BUILDING AUTOMATION SYSTEM
BLR	BOILER
BLDG	BUILDING
CI	CAST IRON
CLG	CEILING
CWP	CHILLED WATER PUMP
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
CIRC	CIRCULATION
CO	CLEAN-OUT
COIW	CLEAN-OUT IN WALL
COTF	CLEAN-OUT TO FLOOR
COTG	CLEAN-OUT TO GRADE
C	COMMON
CRP	CONDENSATE RETURN PUMP
CU	COPPER
CFM	CUBIC FEET PER MINUTE
DIA or Ø	DIAMETER
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
DDC	DIRECT DIGITAL CONTROL
DIV	DIVISION
DWG	DRAWING
EA	EACH
EMCS	ENERGY MANAGEMENT & CONTROL SYSTEM
EXH	EXHAUST
EA	EXHAUST AIR
EF	EXHAUST FAN
(E)	EXISTING TO REMAIN
ET	EXPANSION TANK
FC	FAN COIL UNIT
FT	FEET
FPM	FEET PER MINUTE
FLR	FLOOR, OR FLOOR MOUNTED
GPM	GALLONS PER MINUTE
GTV	GAS TANK VENT
GA	GAUGE
GF	GLYCOL FEEDER
GRD	GRILL/REGISTER/DIFFUSER
HWP	HEATING WATER PUMP
HT	HEIGHT
H	HIGH
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
IW	INDIRECT WASTE
IE	INVERT ELEVATION
L	LONG
MFR	MANUFACTURER
MAP	MASTER ALARM PANEL
MAX	MAXIMUM
MIN	MINIMUM
MNT	MOUNT(ED)
+XX"	MOUNTING HEIGHT (AFF OR AFG)
(N)	NEW
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NIC	NOT IN CONTRACT
OBVD	OPPOSED BLADE VOLUME DAMPER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OSA	OUTSIDE AIR
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PRV	PRESSURE REDUCING VALVE
RLF	RELIEF FAN
REQ'D	REQUIRED
RA	RETURN AIR
RF	RETURN FAN
RC	ROOF COWL
RM	ROOM
SIM	SIMILAR
SS	STAINLESS STEEL
SP	STATIC PRESSURE
SC	STEAM CONVERTOR
ST	STORAGE TANK
SV	SUMP VENT
SA	SUPPLY AIR
SF	SUPPLY FAN
TU	TERMINAL UNIT
TYP	TYPICAL
UH	UNIT HEATER
VFD	VARIABLE FREQUENCY DRIVE
VEL	VELOCITY
VTR	VENT THRU ROOF
WB	WALL BOX
WC	WATER COLUMN
WF	WATER FLOW
WH	WATER HEATER
W	WIDE
W/	WITH
W/IN	WITHIN
W/O	WITHOUT
ZVB	ZONE VALVE BOX

MECHANICAL ABBREVIATIONS

AHU-#	AIR HANDLING UNIT NUMBER
AS-#	AIR SEPARATOR
AT-#	ATTENUATOR NUMBER
BLR-#	BOILER NUMBER
CD-#	CEILING DIFFUSER
CH-#	CHILLER
CHWP-#	CHILLED WATER PUMP
CU-#	CONDENSER UNIT NUMBER
DACU-#	DUCTLESS SPLIT AIR CONDITIONING UNIT
DCU-#	DUCTLESS SPLIT CONDENSING UNIT
EEU-#	EVAPORATIVE ECONOMIZER UNIT
EF-#	EXHAUST FAN NUMBER
EG-#	EXHAUST GRILLE
EH-#	ELECTRIC HEATER
ERU-#	ENERGY RECOVERY UNIT
ET-#	EXPANSION TANK NUMBER
FC-#	FAN COIL UNIT
GF-#	GLYCOL FEEDER
HX-#	HEAT EXCHANGER
L-#	LOUVER NUMBER
MAU-#	MAKE UP AIR UNIT
RC-#	ROOF COWL NUMBER
RG-#	RETURN GRILLE
RTU-#	ROOFTOP UNIT
SD-#	SLOT DIFFUSER
SC-#	STEAM CONVERTOR
ST-#	STORAGE TANK
TU-#	TERMINAL UNIT
UH-#	UNIT HEATER NUMBER
WH-#	WATER HEATER
VFD-#	VARIABLE FREQUENCY DRIVE
V-#	VENTURI

PHASING & ALTERNATE NOTES:

1. **PHASE 1: DEMOLITION OF EXISTING EVAPORATIVE COOLING UNIT EEU-1. INSTALL NEW AIR HANDLING UNIT WITH CHILLED WATER COOLING ON ROOF. PROVIDE NEW HYDRONIC EQUIPMENT IN MECHANICAL ROOM INCLUDING ALL PIPING, CONTROLS, AND REQUIRED ACCESSORIES. THE NEW AIR HANDLING UNIT IS OFCI.**
2. **PHASE 2: DEMOLITION OF EXISTING EVAPORATIVE COOLING UNIT EEU-2. INSTALL NEW AIR HANDLING UNIT WITH DX COOLING ON ROOF. INSTALL NEW CONDENSING UNIT ON ROOF AND ALL PIPING, CONTROLS, AND REQUIRED CONTROLS. THE NEW AIR HANDLING UNIT AND CONDENSING UNIT ARE OFCI.**
3. **ALTERNATE #1: PROVIDE NEW INDOOR SPLIT SYSTEM UNITS IN LEVEL 1 UPS ELECTRICAL ROOM. PROVIDE ASSOCIATED OUTDOOR CONDENSING UNITS ON ROOF AND ALL PIPING, CONTROLS, AND REQUIRED ACCESSORIES. ALTERNATE 1 IS PART OF BASE BID PHASE 1.**

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07/14/2025

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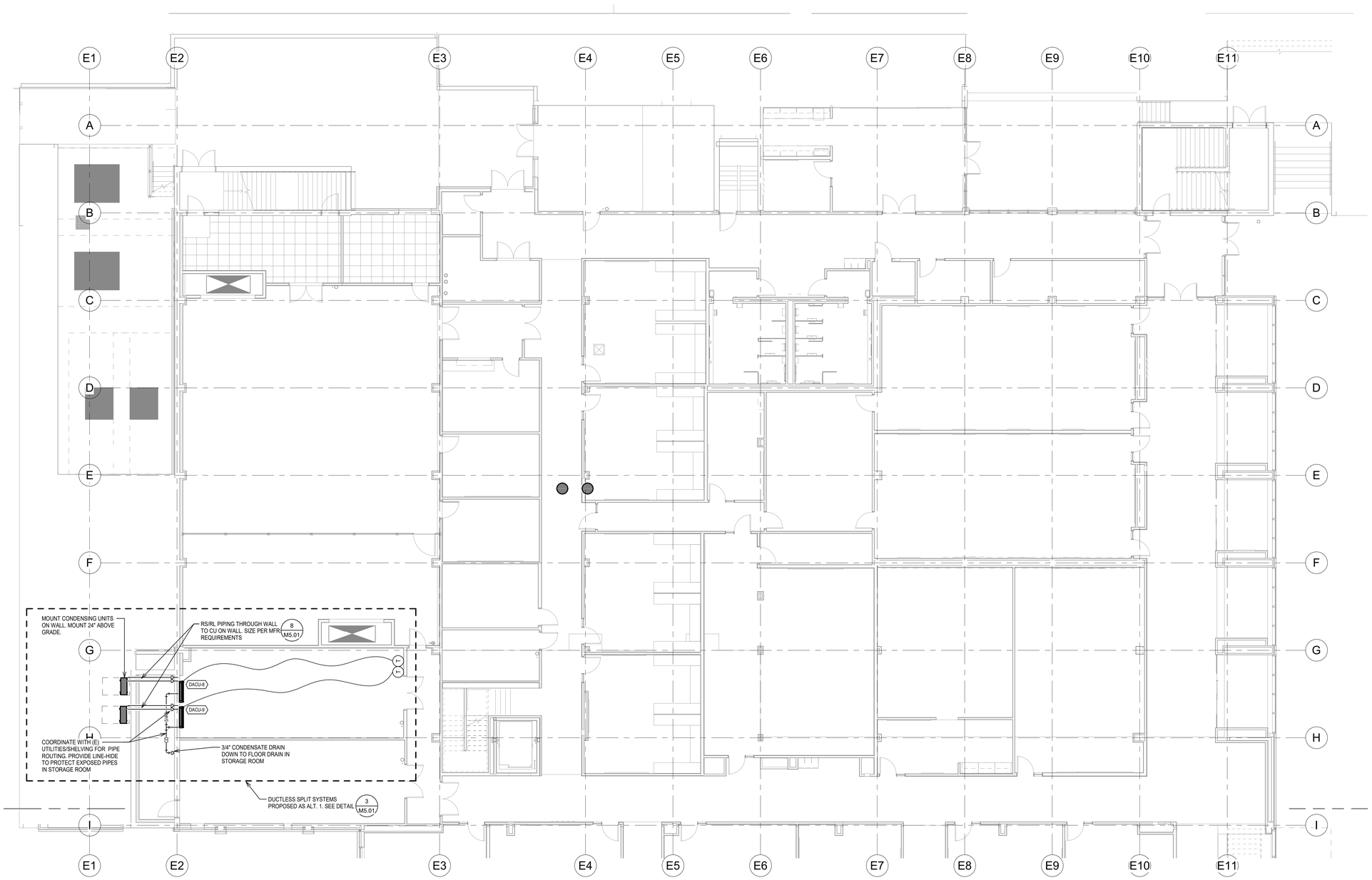
CENTRAL WASHINGTON UNIVERSITY
PROJECT NO. 17456-02
400 E. University Way, Ellensburg, WA 98926

DATE:	07-14-2025 DESCRIPTION
ISSUE:	CONSTRUCTION DOCUMENTS
PROJECT:	2025.702.01
DRAWN:	CMW
CHECKED:	DWJ

ORIGINAL SHEET SIZE: 30"x42"

LEGENDS & ABBREVIATIONS - MECHANICAL

M0.01



LEVEL 1 - MECHANICAL

1/8" = 1'-0"

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LEVEL 1 - FLOOR PLAN - MECHANICAL

M1.01

LEVEL 2 - MECHANICAL

1/8" = 1'-0"

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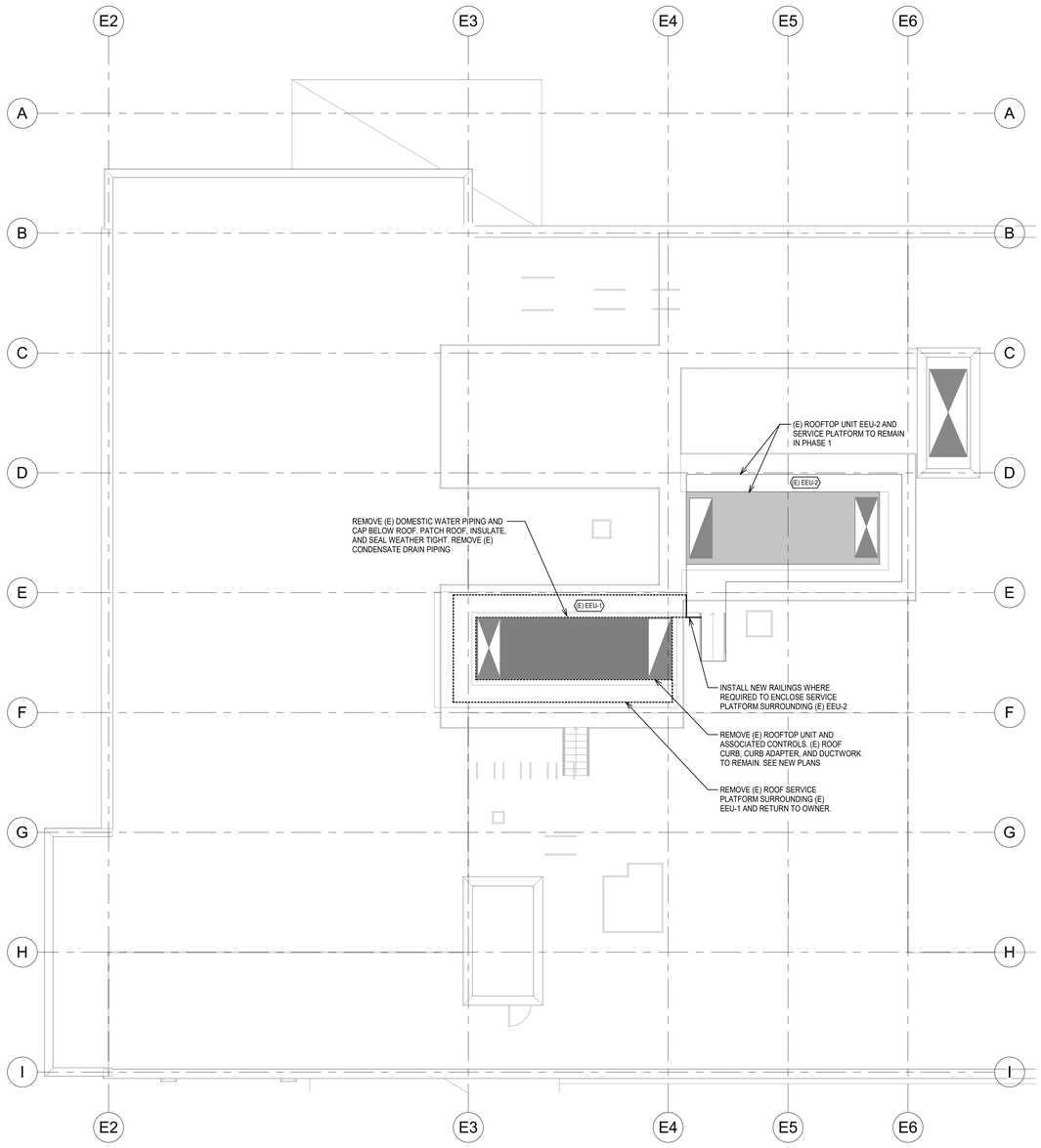
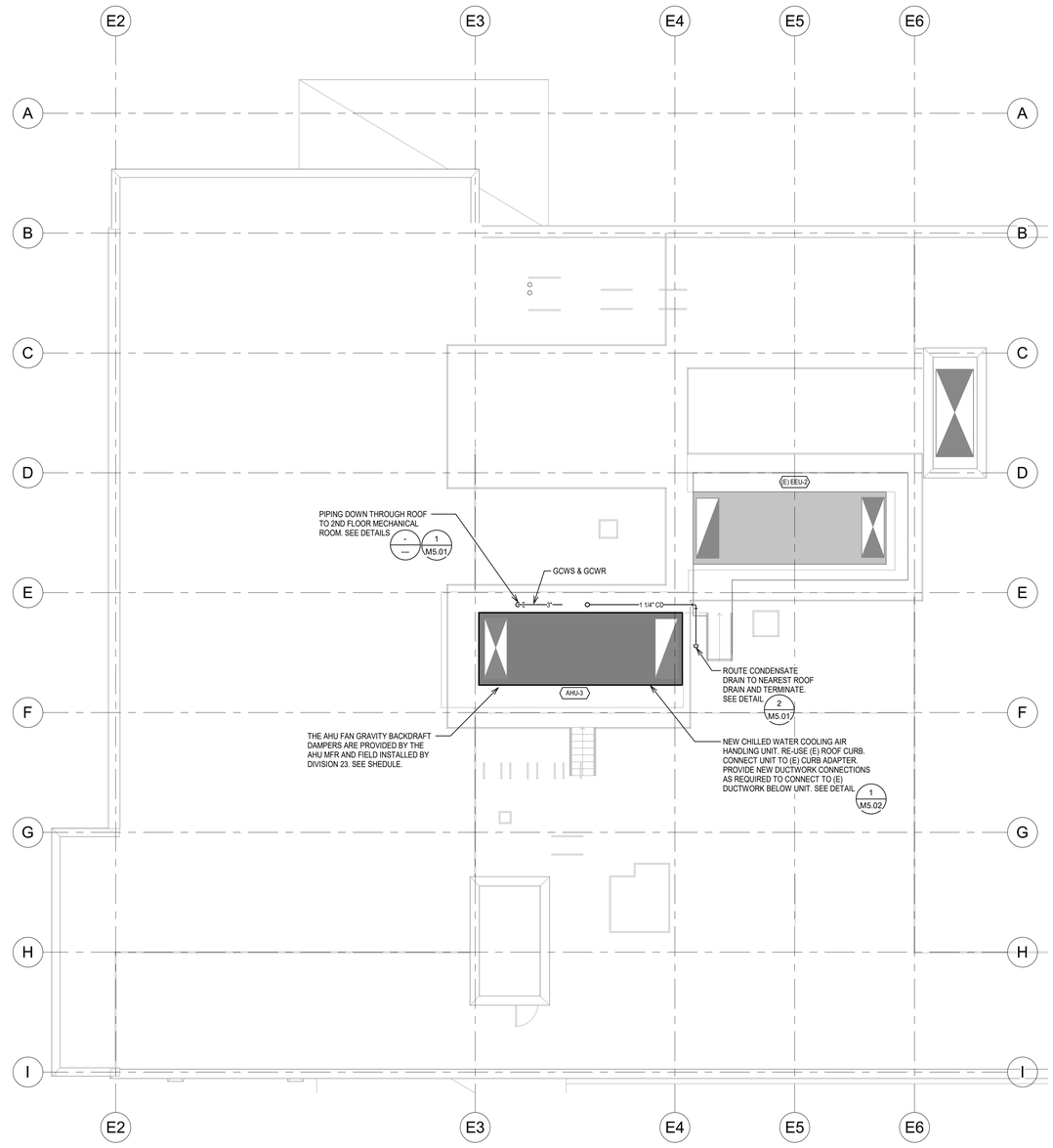
LEVEL 2 - FLOOR PLAN - MECHANICAL

M1.02



ROOF PLAN - PHASE 1 - MECHANICAL - DEMO

1/8" = 1'-0"



ROOF PLAN - PHASE 1 - MECHANICAL

1/8" = 1'-0"

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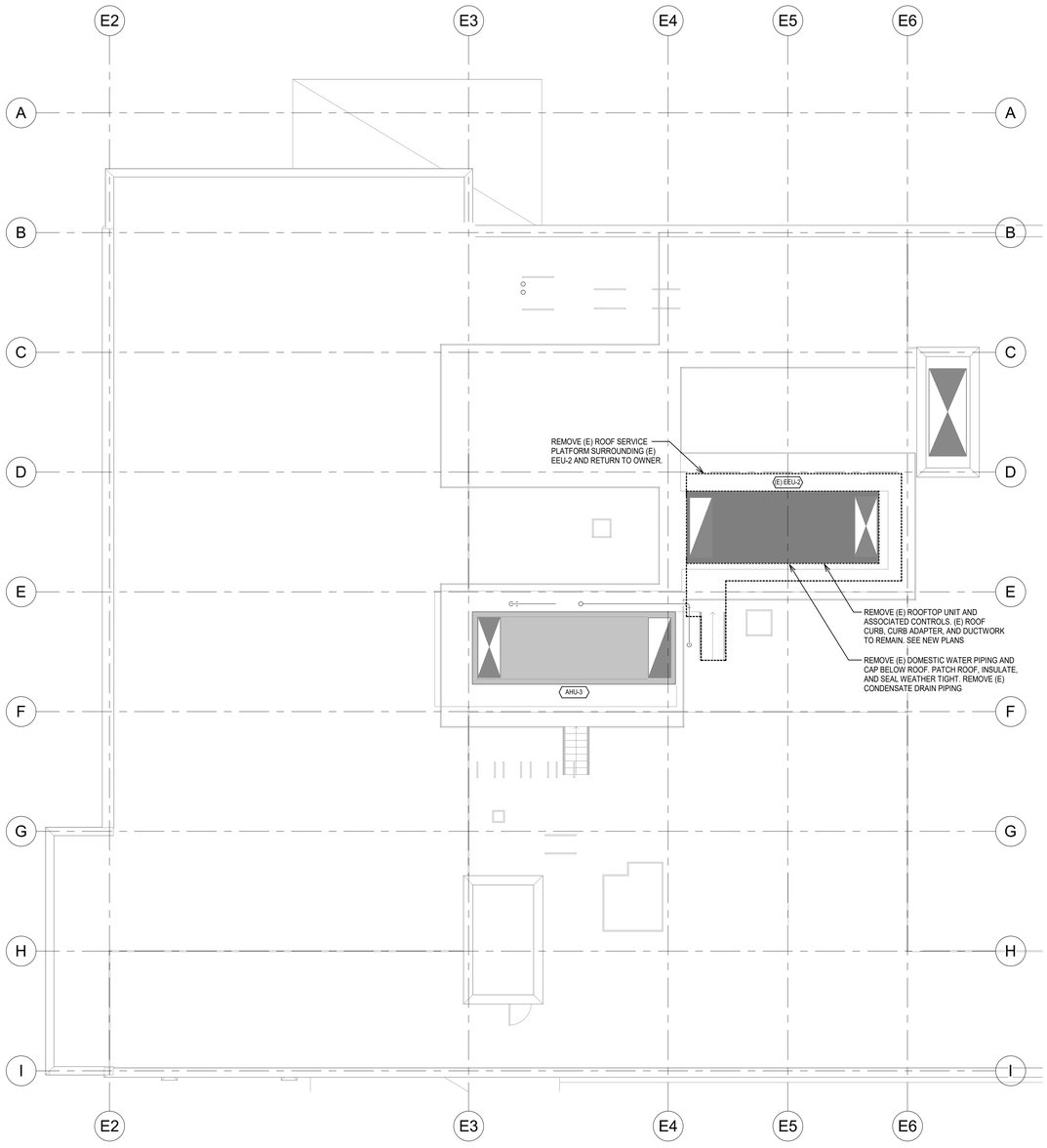
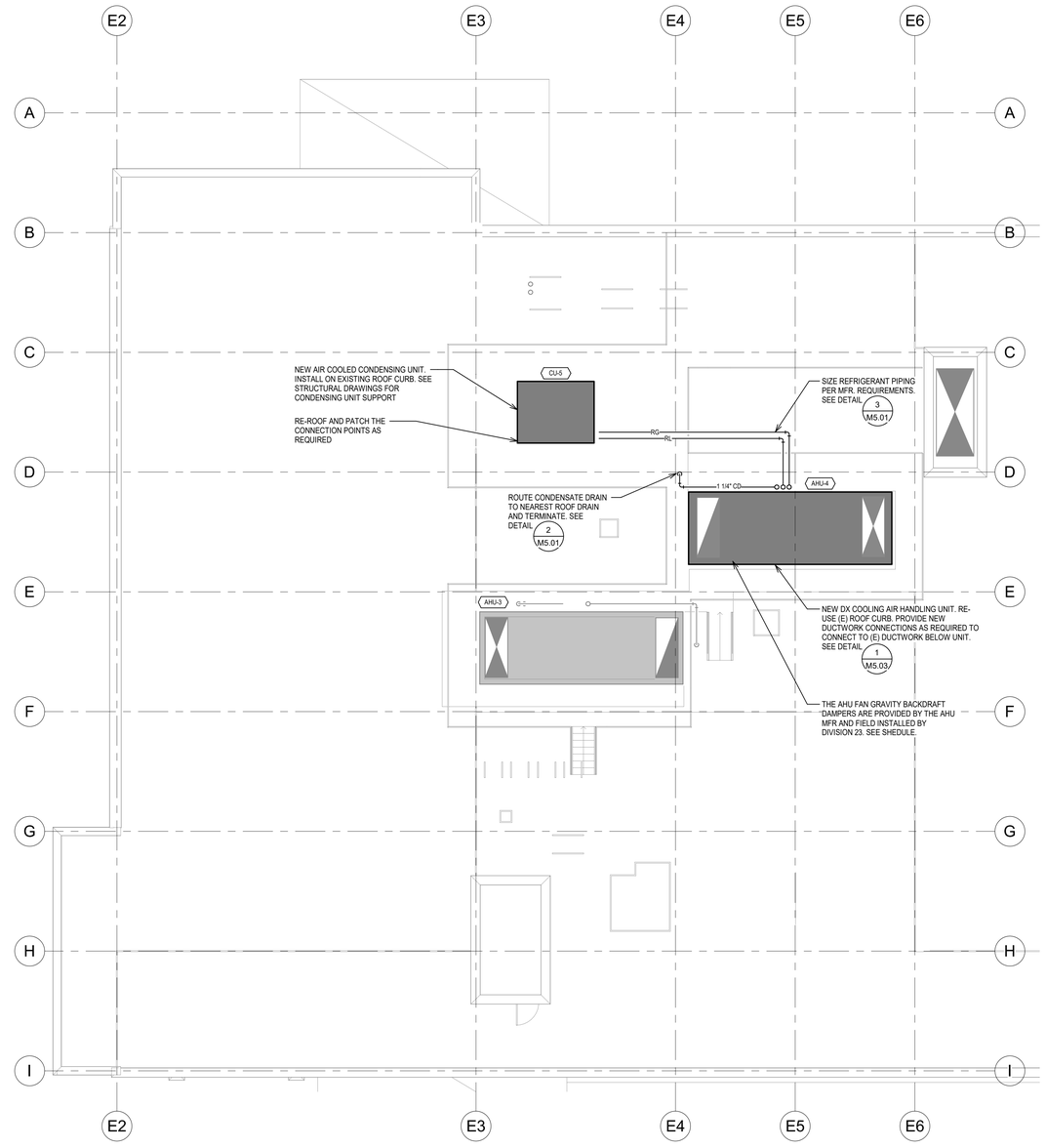
ROOF - FLOOR PLAN - PHASE 1 - DEMO & NEW

M1.03



ROOF PLAN - PHASE 2 - MECHANICAL - DEMO

1/8" = 1'-0"



ROOF PLAN - PHASE 2 - MECHANICAL

1/8" = 1'-0"

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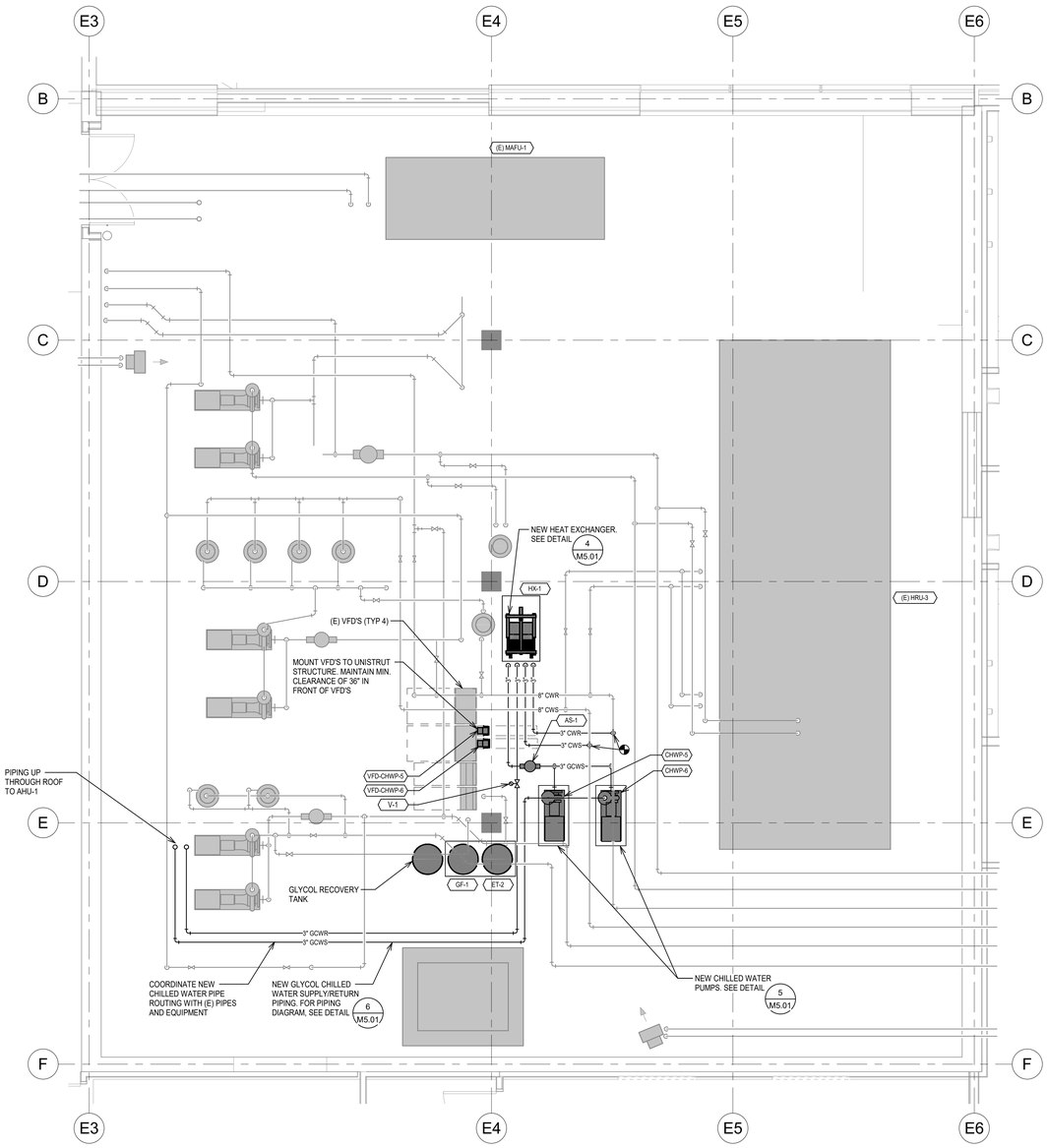
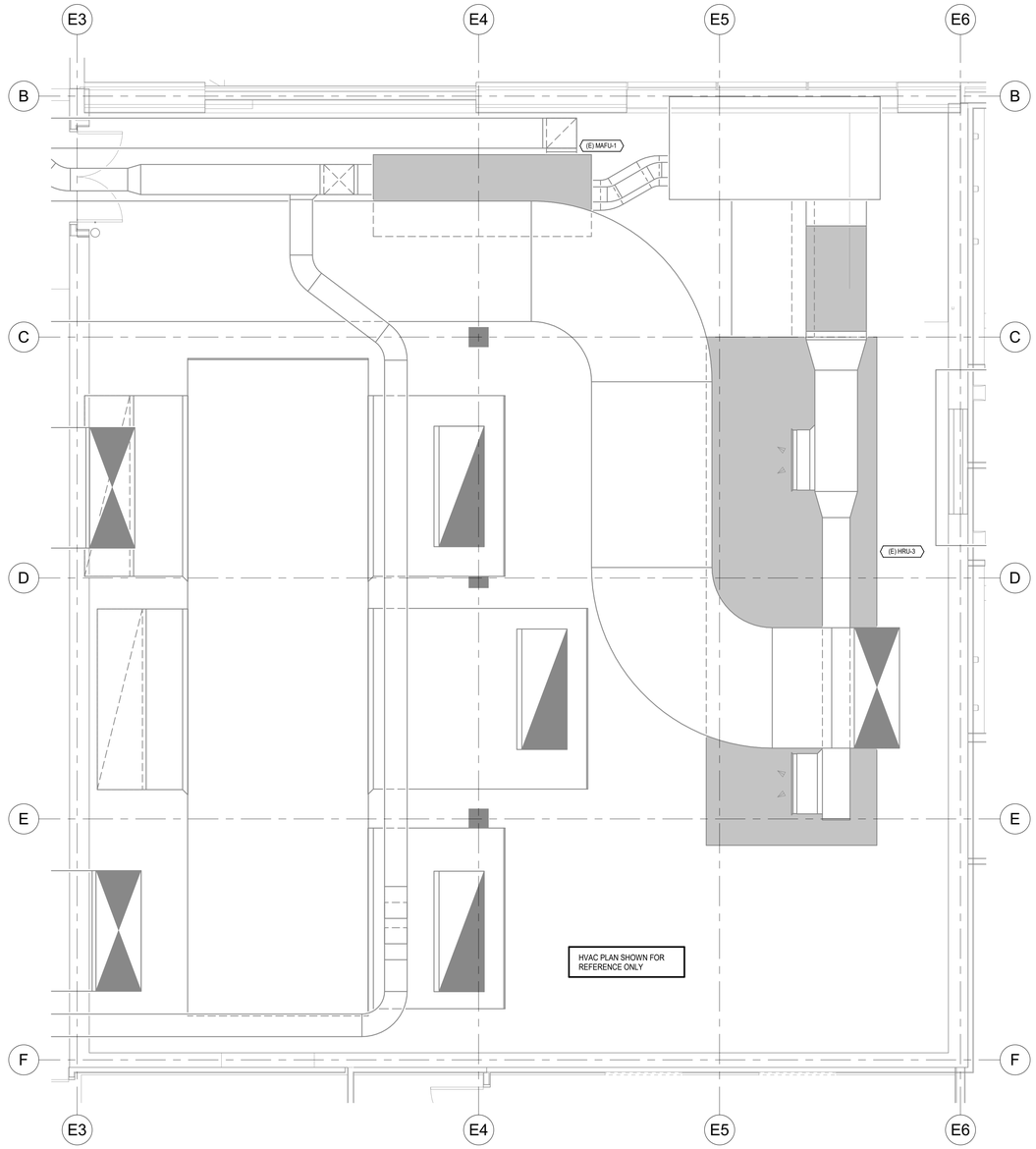
ROOF - FLOOR PLAN - PHASE 2 - DEMO & NEW

M1.04



2 LEVEL 2 - ENLARGED - HYDRONICS
1/4" = 1'-0"



1 LEVEL 2 - ENLARGED - HVAC
1/4" = 1'-0"

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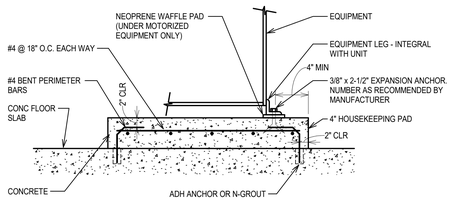
ENLARGED PLANS - MECHANICAL

M4.01



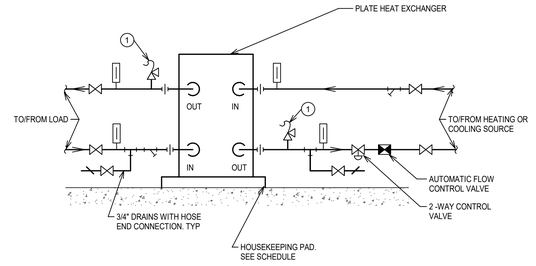
7 HOUSEKEEPING PAD & EQUIPMENT ANCHOR
N.T.S.

GENERAL NOTES:

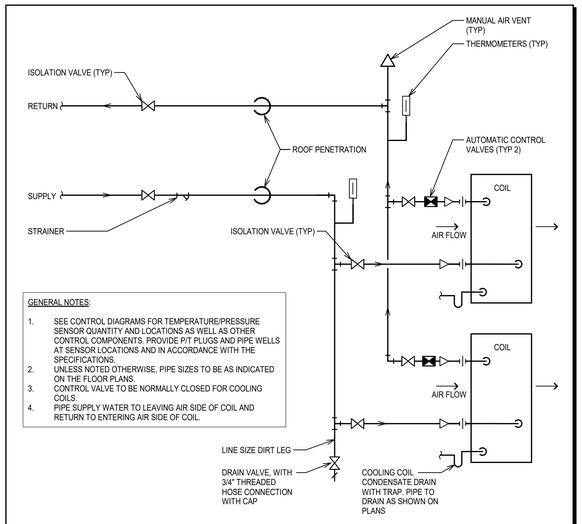
1. SEE CONTROL DIAGRAMS FOR TEMPERATURE/PRESSURE SENSOR QUANTITY AND LOCATIONS AS WELL AS OTHER CONTROL COMPONENTS. PROVIDE P/T PLUGS AND PIPE WELLS AT SENSOR LOCATIONS AND IN ACCORDANCE WITH THE SPECIFICATIONS.

KEY NOTES:

1. ASME SAFETY RELIEF. SET AT PRESSURE RATING OF HEAT EXCHANGER. PIPE DISCHARGE OF GLYCOL FLUIDS TO GLYCOL DRUM. INSTALL SUFFICIENTLY HIGH TO ALLOW DISCHARGE WITH NO VERTICAL LIFT.



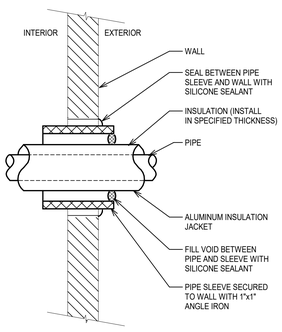
4 WATER HEAT EXCHANGER
N.T.S.



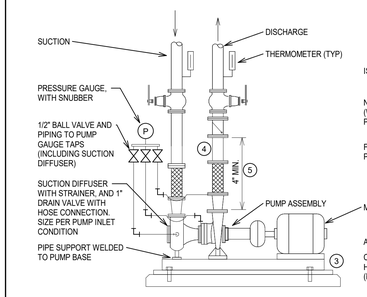
GENERAL NOTES:

1. SEE CONTROL DIAGRAMS FOR TEMPERATURE/PRESSURE SENSOR QUANTITY AND LOCATIONS AS WELL AS OTHER CONTROL COMPONENTS. PROVIDE P/T PLUGS AND PIPE WELLS AT SENSOR LOCATIONS AND IN ACCORDANCE WITH THE SPECIFICATIONS.
2. UNLESS NOTED OTHERWISE, PIPE SIZES TO BE AS INDICATED ON THE FLOOR PLANS.
3. CONTROL VALVE TO BE NORMALLY CLOSED FOR COOLING COILS.
4. PIPE SUPPLY WATER TO LEAVING AIR SIDE OF COIL AND RETURN TO ENTERING AIR SIDE OF COIL.

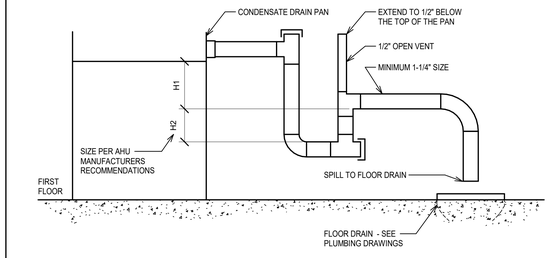
1 DUAL COIL PIPING DIAGRAM (M)
N.T.S.



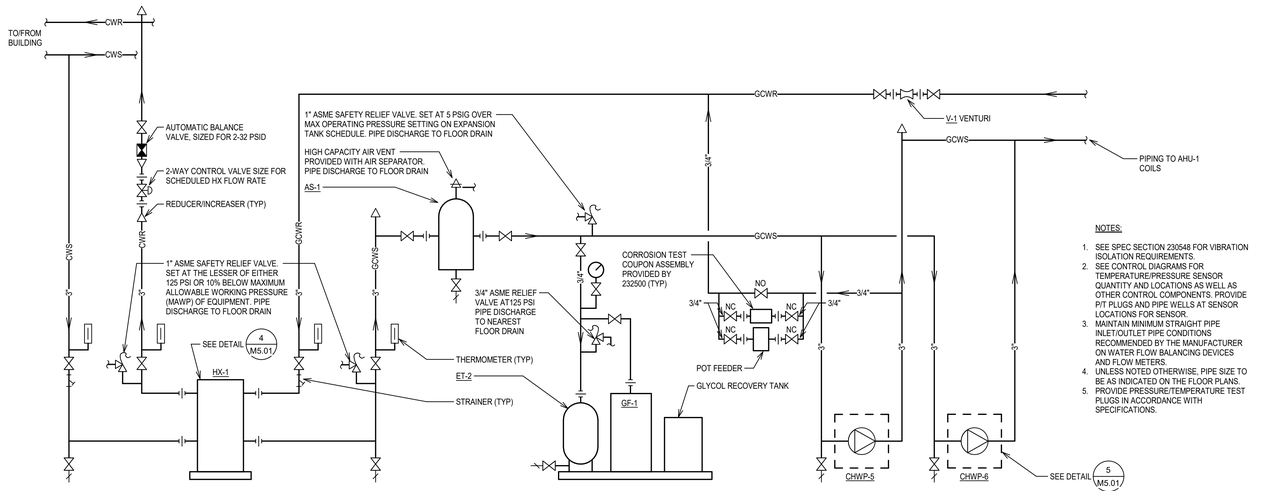
8 INSULATED PIPE WALL PENETRATION DETAIL
N.T.S.



5 BASE MOUNTED END SUCTION PUMP DETAIL
N.T.S.



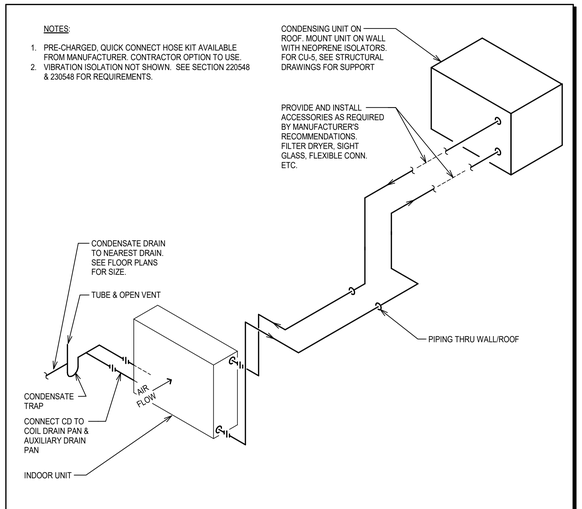
2 CONDENSATE PAN DRAIN TRAP (M)
N.T.S.



NOTES:

1. SEE SPEC SECTION 230548 FOR VIBRATION ISOLATION REQUIREMENTS.
2. SEE CONTROL DIAGRAMS FOR TEMPERATURE/PRESSURE SENSOR QUANTITY AND LOCATIONS AS WELL AS OTHER CONTROL COMPONENTS. PROVIDE P/T PLUGS AND PIPE WELLS AT SENSOR LOCATIONS FOR SENSOR.
3. MAINTAIN MINIMUM STRAIGHT PIPE INLET/OUTLET PIPE CONDITIONS RECOMMENDED BY THE MANUFACTURER ON WATER FLOW BALANCING DEVICES AND FLOW METERS.
4. UNLESS NOTED OTHERWISE, PIPE SIZE TO BE AS INDICATED ON THE FLOOR PLANS.
5. PROVIDE PRESSURE/TEMPERATURE TEST PLUGS IN ACCORDANCE WITH SPECIFICATIONS.

6 GLYCOL CHILLED WATER DIAGRAM
N.T.S.



NOTES:

1. PRE-CHARGED, QUICK CONNECT HOSE KIT AVAILABLE FROM MANUFACTURER. CONTRACTOR OPTION TO USE.
2. VIBRATION ISOLATION NOT SHOWN. SEE SECTION 220548 & 230548 FOR REQUIREMENTS.

3 REFRIGERANT PIPING DETAIL
N.T.S.

MW Engineers
601 W. First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.3025
mwengineers.com

ANTHONY JAMES SIMONDS
STATE OF WASHINGTON
54570
REGISTERED
PROFESSIONAL ENGINEER

07/14/2025

CENTRAL WASHINGTON UNIVERSITY
CWU 1891

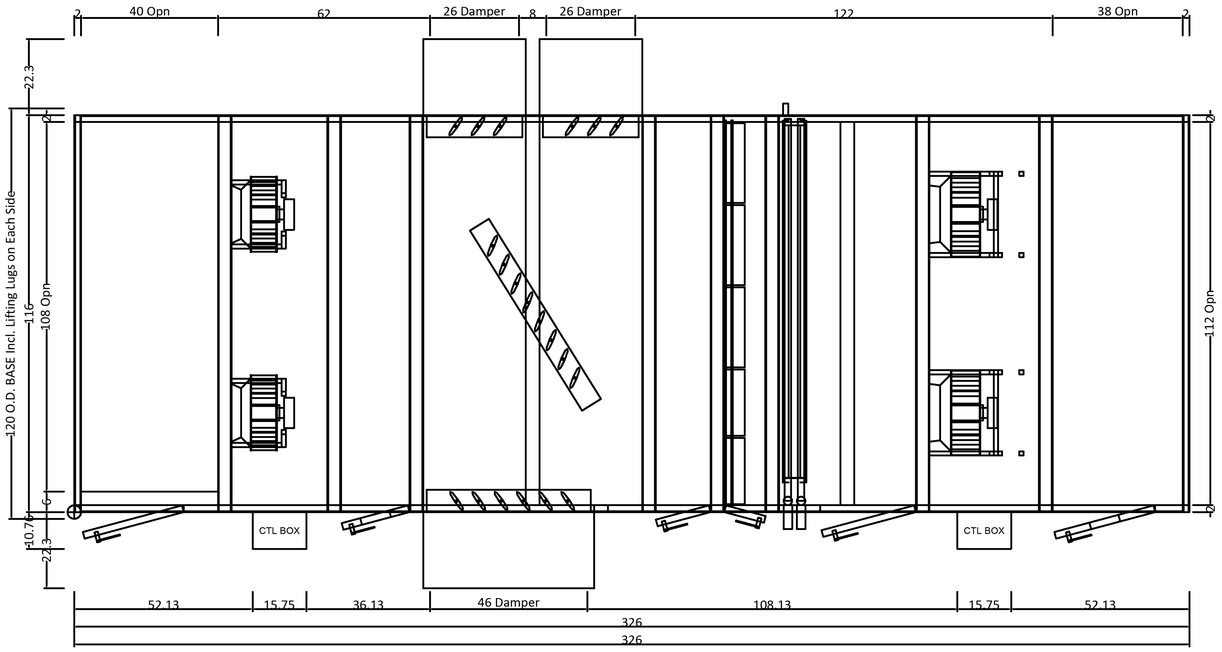
SAMUELSON AHU REPLACEMENT
CENTRAL WASHINGTON UNIVERSITY
PROJECT NO. 17456-02
400 E. University Way, Ellensburg, WA 98926

DATE:	07-14-2025 DESCRIPTION
ISSUE:	CONSTRUCTION DOCUMENTS
PROJECT:	2025.702.01
DRAWN:	CMW
CHECKED:	DWJ

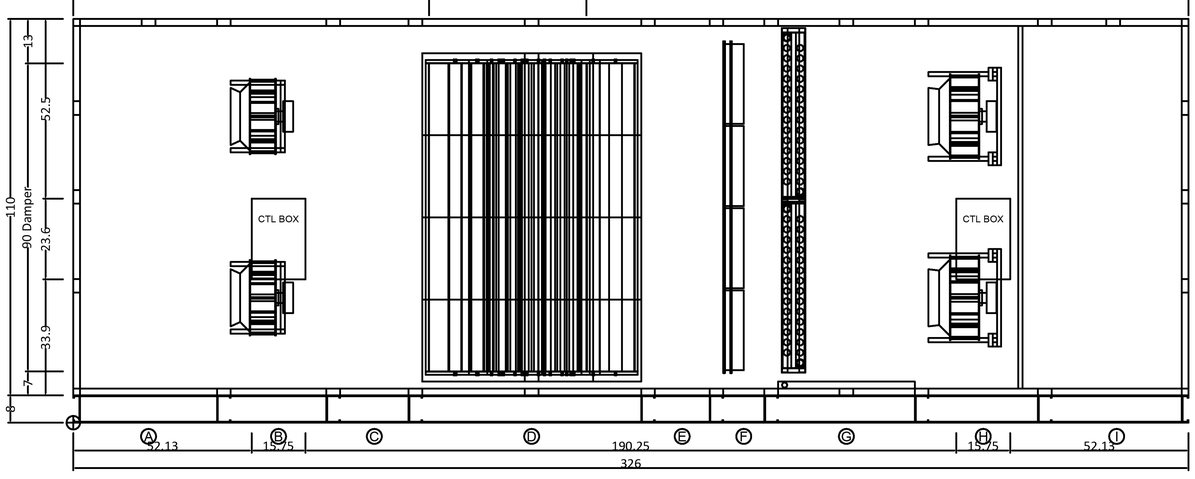
ORIGINAL SHEET SIZE: 30"x42"

DETAILS - MECHANICAL

M5.01



PLAN VIEW



ELEVATION VIEW

Component Key		
Ⓐ	Plenum Section	
	Opening Location:	Bottom
	Opening Size:	40 ins x 108 ins
	Right Door (WxH):	30 ins x 68 ins
Ⓑ	Return Fan	
	Fan Type:	Centrifugal - Plenum
	Fan Size (Class):	560 (2)
	Air Flowrate:	8387.5 cfm
	T.S.P:	0.9 insWg
	Motor Power:	6.1 HP
	Control box door swing:	15.75 ins
Ⓒ	Access Section	
	Right Door (WxH):	20 ins x 68 ins
Ⓓ	Double Mixing Box	
Ⓔ	Access Section	
	Right Door (WxH):	16 ins x 68 ins
Ⓕ	Panel and Bag Filter	
	Pre Filter Type:	Pleated (MERV 8)
	Bag Filter Type:	Pre Pleat M13
	Right Door (WxH):	12 ins x 106 ins
Ⓖ	Chilled Water coil	
	Coil Model:	5WL0804B
	Total Capacity:	786406.0 Btu/hr
	Right Door (WxH):	28 ins x 68 ins
Ⓗ	Supply Fan	
	Fan Type:	Centrifugal - Plenum
	Fan Size (Class):	630 (2)
	Air Flowrate:	8387.5 cfm
	T.S.P:	4.5 insWg
	Motor Power:	11.6 HP
	Control box door swing:	15.75 ins
Ⓘ	Plenum Section	
	Opening Location:	Bottom
	Opening Size:	38 ins x 112 ins
	Right Door (WxH):	30 ins x 68 ins

Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.

Plan/Elevation - No Ends	Unit Tag: AHU-DC-1 ECM + Hydronic 6.24.2025		Sales Office: Air Reps, LLC			
Product: Custom Air Handler	Project Name: CWU Samuelson Data Center		Sales Engineer:			
Model: OAH073GDCM	July 1, 2025	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.

DAIKIN
13600 Industrial Park Blvd, Minneapolis, MN 55441
www.DaikinApplied.com Software Version: 13.72

1 CHILLED WATER COOLING AIR HANDLING UNIT DETAIL - AHU-3
N.T.S.

MW Engineers
601 W. First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.3025
mwengineers.com

ANTHONY JAMES SIMONDS
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07/14/2025

CENTRAL WASHINGTON UNIVERSITY
CWU
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SAMUELSON AHU REPLACEMENT
CENTRAL WASHINGTON UNIVERSITY
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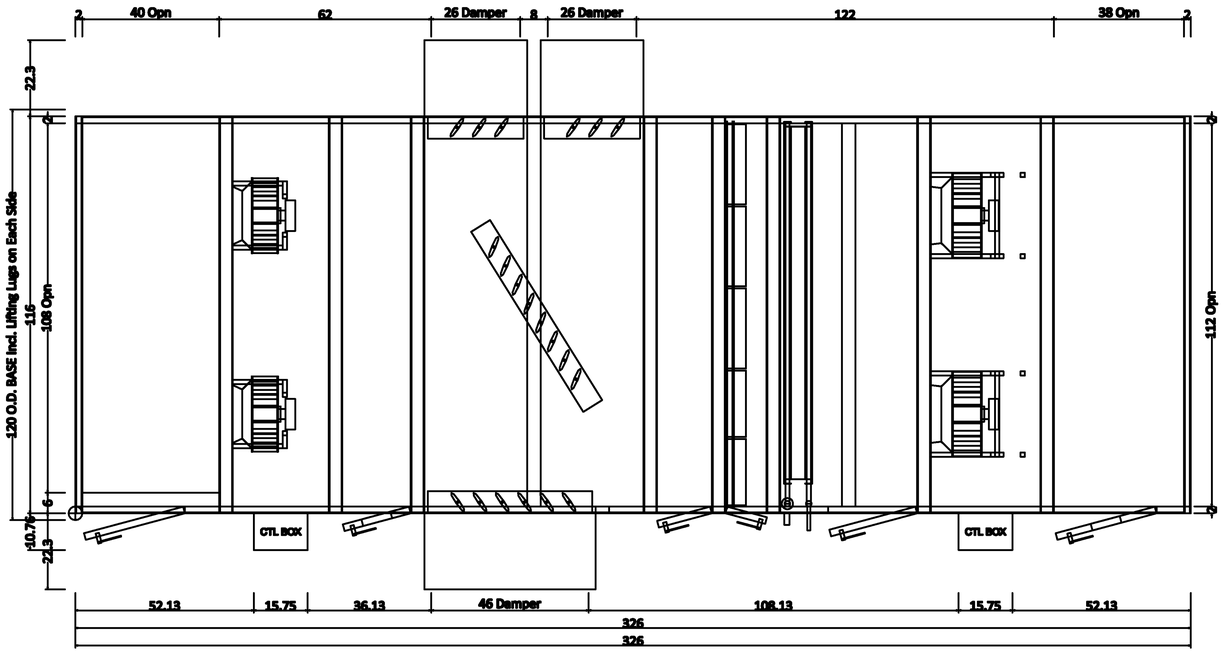
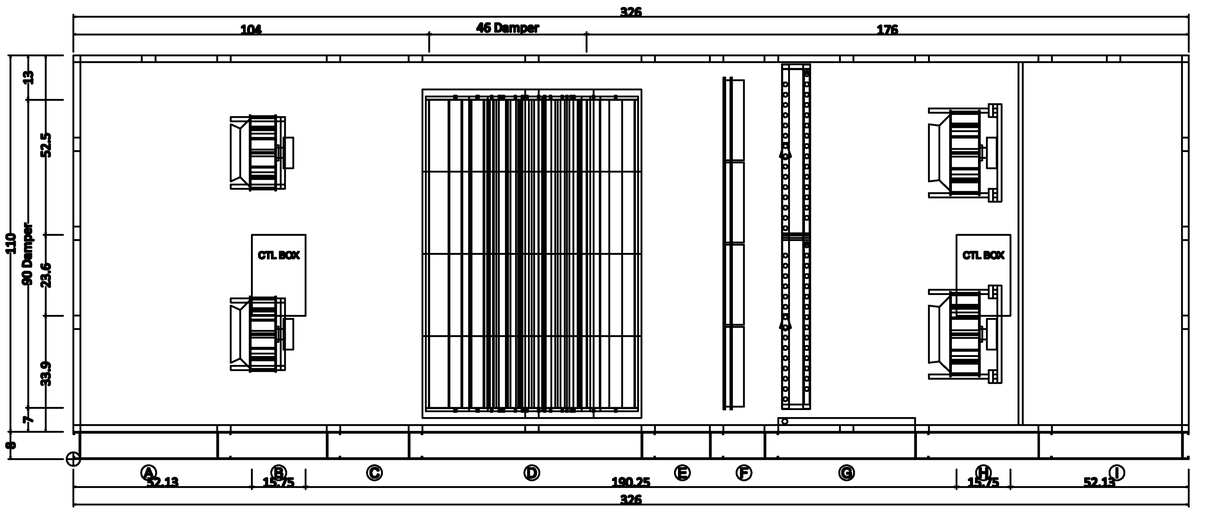
PROJECT:	2025.702.01
DRAWN:	CMW
CHECKED:	DWJ
	ORIGINAL SHEET SIZE: 30"x42"

DETAILS - MECHANICAL

M5.02



PLAN VIEW



ELEVATION VIEW

Component Key		
Ⓐ	Plenum Section	
	Opening Location:	Bottom
	Opening Size:	40 ins x 108 ins
	Right Door (WxH):	30 ins x 68 ins
Ⓑ	Return Fan	
	Fan Type:	Centrifugal - Plenum
	Fan Size (Class):	560 (2)
	Air Flowrate:	8387.5 cfm
	T.S.P:	0.9 insWg
	Motor Power:	6.1 HP
	Control box door swing:	15.75 ins
Ⓒ	Access Section	
	Right Door (WxH):	20 ins x 68 ins
Ⓓ	Double Mixing Box	
Ⓔ	Access Section	
	Right Door (WxH):	16 ins x 68 ins
Ⓕ	Panel and Bag Filter	
	Pre Filter Type:	Pleated (MERV 8)
	Bag Filter Type:	Pre Pleat M13
	Right Door (WxH):	12 ins x 106 ins
Ⓖ	DX Coil	
	Coil Model:	5EJ0604B
	Total Capacity:	812084.0 Btu/hr
	Right Door (WxH):	26 ins x 68 ins
Ⓗ	Supply Fan	
	Fan Type:	Centrifugal - Plenum
	Fan Size (Class):	630 (2)
	Air Flowrate:	8387.5 cfm
	T.S.P:	4.5 insWg
	Motor Power:	11.6 HP
	Control box door swing:	15.75 ins
Ⓘ	Plenum Section	
	Opening Location:	Bottom
	Opening Size:	38 ins x 112 ins
	Right Door (WxH):	30 ins x 68 ins

Opening dimensions shown are for unit only, refer to curb drawing for duct opening dimensions.

Plan/Elevation - No Ends	Unit Tag: AHU-DC-1 ECM + DX 6.24.2025			Sales Office: Air Reps, LLC		
Product: Custom Air Handler	Project Name: CWU Samuelson Data Center			Sales Engineer:		
Model: OAH073GDCM	July 1, 2025	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/-0.25"	Dwg Units: in

All opening dimensions have a 1" mounting flange along the inner edge. The actual airflow area of the opening is 2" smaller in each dimension.

DAIKIN
13600 Industrial Park Blvd, Minneapolis, MN 55441
www.DaikinApplied.com Software Version: 13.72

1 DX COOLING AIR HANDLING UNIT DETAIL - AHU-4
N.T.S.

MW Engineers
601 W. First Ave, Ste 1300
Spokane, WA 99201, USA
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mwengineers.com

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54570
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07/14/2025

CENTRAL WASHINGTON UNIVERSITY
CWU 1891

SAMUELSON AHU REPLACEMENT
CENTRAL WASHINGTON UNIVERSITY
PROJECT NO. 17456-02
400 E. University Way, Ellensburg, WA 98926

DATE:	07-14-2025 DESCRIPTION
ISSUE:	CONSTRUCTION DOCUMENTS
PROJECT:	2025.702.01
DRAWN:	CMW
CHECKED:	DWJ
	ORIGINAL SHEET SIZE: 30"x42"

DETAILS - MECHANICAL

M5.03

PHASE 1 - AIR HANDLING UNITS - CHILLED WATER COOLING - OFCI

NOTES:
1. PROVIDE 2" MERV 8 FACE LOAD PRE-FILTERS AND 4" MERV 13 FINAL FILTERS. FILTER LOADING ACCOUNTS FOR 2.0" OF ESP. SEE 234000.
2. PROVIDE WITH ECM MOTORS CONTROLLED WITH A 0-10V DC INPUT FROM BAS.
3. PROVIDE SINGLE POINT ELECTRICAL CONNECTION FOR SUPPLY & RETURN FAN ARRAYS AND SEPARATE 120V CABINET LIGHT CIRCUIT.
4. PROVIDE SUPPLY FAN AIRFLOW MONITORING STATIONS FOR EACH FAN CELL AND TOTALIZER TRANSDUCER WITH ANALOG OUTPUT TO EMCS.
5. PROVIDE SAFETY SCREENS AROUND FAN ASSEMBLIES AND FIELD INSTALLED GRAVITY BACKDRAFT DAMPERS.
6. SEE SPEC 230548 FOR VIBRATION ISOLATION.
7. MOTORS SUPPLIED WITH THIS EQUIPMENT SHALL FULLY COMPLY WITH THE MOTOR REQUIREMENTS SPECIFIED IN SPECIFICATION SECTION 230513 - MOTORS.
8. SUPPLY & RETURN DUCT SMOKE DETECTORS BY DIV. 28 HARDWIRED FOR UNIT SHUT-DOWN.
9. AIR HANDLERS HAVE 100% ECONOMIZER CAPABILITIES.
10. FAN MOTORS SHALL HAVE N+1 REDUNDANCY (CAPABLE OF FULL AIRFLOW WITH ALL FANS OPERATING BELOW 60 HZ UPON FAILURE OF ONE FAN).
11. PROVIDE 2 ADDITIONAL SUPPLY FANS AND 2 ADDITIONAL RETURN FANS FOR OWNER STOCK.
12. MECHANICAL CONTRACTOR TO FIELD VERIFY EXISTING CRUB ADAPTER SIZE.
13. AIR HANDLERS SHALL BE FURNISHED BY THE OWNER AND INSTALLED BY THE CONTRACTOR. IT IS THE CONTRACTORS RESPONSIBILITY TO COORDINATE WITH APPROVED SUBMITTALS FOR ALL REQUIRED CONNECTIONS AND MODIFICATIONS REQUIRED FOR THE INSTALL OF THE EQUIPMENT.

				SUPPLY FANS												RETURN FANS												COOLING COIL (30% PG)																UNIT ELECTRICAL				OPERATING	NOISE CRITERIA: MAXIMUM FAN SOUND POWER (dB)													
												MOTOR									MOTOR							SIZE																					125		250		500		1000		2000		4000		8000		
TAG	MFR	MODEL	SERVICE	TYPE	CFM	QTY	SIZE	TSP	ESP	RPM	FEI	SCCR	BHP	HP	V	PH	TYPE	CFM	QTY	SIZE	TSP	ESP	RPM	FEI	SCCR	BHP	HP	V	PH	CFM	QTY	HEIGHT	WIDTH	BTU/H (TOTAL)	BTU/H (SENS)	GPM	EAT DB	EAT WB	LAT DB	LAT WB	APD (IN.)	EWT	LWT	WPD (FT)	ROWS	FPI	MCA	MOCP	V	PH	WEIGHT (LBS)	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	NOTES
AHU-3	DAIKIN	OAH073GDCM	DATA CENTER	AIRFOIL	8,388	4	25"	4.54	2.00	1910	1.13	10	10.2	12	460	3	AIRFOIL	8,388	4	22"	0.93	0.75	1520	1.10	10	2.6	6	460	3	33,550	2	48"	103"	786,406	786,406	112	92	66	69	58	0.30	52	67	11.70	4	8	86.4	100	460	3	12,000	80	85	80	92	76	91	79	95	71	93	75	90	69	83	ALL

PHASE 1 - CIRCULATING PUMPS

NOTES:
1. PROVIDE WITH INVERTER DUTY MOTOR FOR USE WITH VARIABLE SPEED DRIVE.
2. PROVIDE WITH END SUCTION DIFFUSER.
3. SELECT WITH 30% PROPYLENE GLYCOL.

TAG	TYPE	MFR	MODEL	SERVICE	GPM	WPD (FT)	MAX SHUT-OFF WPD (FT)	EFFICIENCY %	SUCTION SIZE	DISCHARGE SIZE	RPM	BHP	HP	V	PH	NOTES
CHWP-5	END SUCTION	ARMSTRONG	4280-1505	AHU-1 CHILLED WATER COIL	112	75.00	85.00	74	2"	1 1/2"	3167	2.86	5.0	460	3	ALL
CHWP-6	END SUCTION	ARMSTRONG	4280-1505	AHU-1 CHILLED WATER COIL	112	75.00	85.00	74	2"	1 1/2"	3167	2.86	5.0	460	3	ALL

PHASE 1 - PLATE AND FRAME HEAT EXCHANGER

NOTES:
1. SINGLE WALL HEAT EXCHANGER.
2. PROVIDE GLUE-FREE TYPE NBR GASKETS.
3. INDIVIDUAL SINGLE SHEET 304 SS PLATES.
4. PROVIDE FLANGED PIPE OUTLET/INLET CONNECTOR.
5. SEE DETAIL 4 ON SHEET M5.01

				DIMENSIONS				HOT SIDE						COLD SIDE						
TAG	MFR	MODEL	SERVICE	LENGTH (")	WIDTH (")	HEIGHT (")	CONNECTION SIZE (")	FLUID	GPM	EWT (deg F)	LWT (deg F)	WPD (FT)	BTU/H	FLUID	GPM	EWT (deg F)	LWT (deg F)	WPD (FT)	NOTES
HX-1	ARMSTRONG	A87NG-150-84-1000	AHU-1 COOLING	44"	24"	93"	3"	30% PG	112	67	52	17	841,177	WATER	90	48	67	12	ALL

PHASE 1 - GLYCOL FEEDER

NOTES:
1. SIMPLEX CONTROL WITH LOW WATER DRY CONTACT ALARM.
2. PROVIDE WITH INTEGRAL CONTROL PANEL AND 120V POWER CORD.
3. PROVIDE WITH HIGH PRESSURE SWITCH, PRESSURE GAUGE, AND ADJUSTABLE PRESSURE CONTROL.
4. GLYCOL MIX USED FOR SYSTEMS SHALL CONSIST OF DEMINERALIZED OR PURE WATER.
5. MOTORS SUPPLIED WITH THIS EQUIPMENT SHALL FULLY COMPLY WITH THE MOTOR REQUIREMENTS SPECIFIED IN SPECIFICATION SECTION 230513 - MOTORS

						DISCHARGE PRESSURE (PSIG)	ELECTRICAL		
TAG	MFR	MODEL	STYLE	SERVICE	% GLYCOL		V	PH	NOTES
GF-1	IAT	G550-1-HT	SIMPLEX	CHILLED WATER	30	30.00	120	1	ALL

PHASE 1 - AIR SEPARATOR

NOTES:
1. HIGH EFFICIENCY AIR AND DIRT SEPARATOR WITH INTERNAL PACKING FOR BUBBLE AND DIRT COALESCENCE. PROVIDE WITH HIGH CAPACITY AUTOMATIC AIR VENT, UPPER FLUSHING COCK WITH HOSE THREADS, BOTTOM BLOW-DOWN VALVE.
2. PROVIDE WITH REMOVABLE HEAD

TAG	MFR	MODEL	SERVICE	SIZE (")	GPM	MAX WPD (FT)	NOTES
AS-1	SPIROTHERM	VDN300	AHU-1 CHILLED WATER	3"	112	2.00	ALL

PHASE 1 - MECHANICAL HOUSEKEEPING PADS

NOTES:
1. THIS IS A SCHEDULE OF CONCRETE PADS REQUIRED FOR MECHANICAL EQUIPMENT.
2. SIZES ARE APPROXIMATE AND ARE FOR REFERENCE ONLY.
3. DIVISION 23 CONTRACTOR SHALL DETERMINE ACTUAL SIZE BASED ON EQUIPMENT SUBMITTALS.
4. DIVISION 23 SHALL FURNISH SIZES AND FINAL LOCATIONS TO GENERAL CONTRACTOR.
5. SEE DETAIL 2/M5.02

SHEET REFERENCE	EQUIPMENT	LENGTH (FT)	WIDTH (FT)	HEIGHT (IN.)	NOTES
M4.01	CHWP-5	4' - 0"	2' - 0"	0' - 4"	ALL
M4.01	CHWP-6	4' - 0"	2' - 0"	0' - 4"	ALL
M4.01	GF-1, ET-1	2' - 4"	4' - 8"	0' - 4"	ALL
M4.01	HX-1	4' - 4"	2' - 6"	0' - 4"	ALL

PHASE 1 - VENTURIS

NOTES:
1. PROVIDE WITH END CONNECTIONS (FLANGED OR WELDED) SUITABLE FOR PIPING SYSTEM.

TAG	MFR	SIZE (") - BETA RATIO	SERVICE	FLOW (GPM)	PRESSURE DROP (FT)	NOTES
V-1	HYSPAN	3" - 478	AHU-1 CHILLED WATER	112.0 GPM	1.0	1

PHASE 1 - EXPANSION TANKS

NOTES:
1. THE WATER TREATMENT CONTRACTOR SHALL INDEPENDENTLY DETERMINE THE VOLUME OF THE SYSTEM FOR THE PURPOSES OF THE BID. THIS SCHEDULE IS NOT INTENDED TO BE USED FOR THE DETERMINATION OF CHEMICAL TREATMENT QUANTITIES.

				VOLUME (GAL.)			PRESSURE (PSIG)		TEMPERATURE (°F)			
TAG	MFR	MODEL	SERVICE	TANK	ACCEPTANCE	SYSTEM	INITIAL FILL	MAX.	MIN.	MAX.	% GLYCOL	NOTES
ET-2	BELL & GOSSETT	D-15	AHU-1 CHILLED WATER	7.8	6.3	230.0	30.00	75.00	45	100	30	ALL

PHASE 1 - VFD'S

GENERAL NOTES:
1. DRIVES LOCATED INDOORS SHALL BE PROVIDED IN A NEMA 1 ENCLOSURE UNLESS NOTED OTHERWISE.

TAG	MFR	TYPE (FULLY FEATURED / MICRODRIVE	CONTINUOUS TEMPERATURE RATING (104 / 120) (F°)	VFD FURNISHED BY	VFD INSTALLED BY	QTY	HP	ENCLOSURE (INDOOR / OUTDOOR / PLENUM)	LOCATION (LOCAL / REMOTE)	INTEGRAL DISCONNECT	FUSED DISCONNECT	ELECTRONIC BYPASS	NOTES
VFD-CHWP-5	ABB	FULLY FEATURED	104	230923	DIV 26	1	5	INDOOR	LOCAL	Yes	Yes	No	ALL
VFD-CHWP-6	ABB	FULLY FEATURED	104	230923	DIV 26	1	5	INDOOR	LOCAL	Yes	Yes	No	ALL

ALT. 1 - SPLIT SYSTEM CONDENSING UNITS (OUTDOOR)

NOTES:
1. PROVIDE WITH LOW AMBIENT COOLING ACCESSORIES REQUIRED TO ALLOW FOR OPERATION DOWN TO -4° F.
2. OUTDOOR UNIT (DCU-X) POWERS INDOOR UNIT (DACU-X)
3. PROVIDE WITH WALL MOUNTING BRACKET.
4. PROVIDE REFRIGERANT PIPING AS REQUIRED BETWEEN INDOOR AND OUTDOOR UNITS.

				COOLING @ 96 F									
TAG	MFR	MODEL	INDOOR UNIT	CAPACITY BTU/H	AMBIENT TEMP. (F)	SEER	REFRIGERANT TYPE	MCA	MOCP	V	PH	OPERATING WEIGHT (LBS)	NOTES
DCU-8	DAIKIN	RKF24BVJU9	DACU-9	22,400	96	21	R-32	21.4	25	208	1	120.00	ALL
DCU-9	DAIKIN	RKF24BVJU9	DACU-8	22,400	96	21	R-32	21.4	25	208	1	120.00	ALL

ALT. 1 - SPLIT SYSTEM FAN COIL UNITS (INDOOR)

NOTES:
1. 24V CONTROL VOLTAGE BETWEEN INDOOR AND OUTDOOR UNIT WITH BUILT IN C.V. TRANSFORMER.
2. PROVIDE WITH HARD WIRED WALL MOUNT LOW VOLTAGE CONTROLLER. STAT INTEGRAL WITH FAN UNIT.
3. PROVIDE WITH INTEGRAL SUPPLY/RETURN GRILLE AND FILTER.
4. SEE SCHEDULE THIS SHEET FOR DCU PERFORMANCE.
5. PROVIDE WITH OVERFLOW CONDENSATE PAN SWITCH.

					COOLING COIL		INDOOR FAN COIL UNIT				
TAG	MFR	MODEL	OUTDOOR UNIT	FAN CFM	BTU/H	SEER	V	PH	MCA	REFRIGERANT TYPE	NOTES
DACU-8	DAIKIN	FTKF24BVJU9	DCU-8	500	22,400	21	208	1	15	R-32	ALL
DACU-9	DAIKIN	FTKF24BVJU9	DCU-9	500	22,400	21	208	1	15	R-32	ALL

PHASE 2 - AIR HANDLING UNITS - DX COOLING - OFCI

NOTES:
1. PROVIDE 2" MERV 8 FACE LOAD PRE-FILTERS AND 4" MERV 13 FINAL FILTERS.
2. PROVIDE WITH ECM MOTORS CONTROLLED WITH A 0-10V DC INPUT FROM BAS.
3. PROVIDE SINGLE POINT ELECTRICAL CONNECTION FOR SUPPLY & RETURN FAN ARRAYS AND SEPARATE 120V CABINET LIGHT CIRCUIT.
4. PROVIDE SUPPLY FAN AIRFLOW MONITORING STATIONS FOR EACH FAN CELL AND TOTALIZER TRANSDUCER WITH ANALOG OUTPUT TO EMCS.
5. PROVIDE SAFETY SCREENS AROUND FAN ASSEMBLIES AND FIELD INSTALLED GRAVITY BACKDRAFT DAMPERS.
6. SEE SPEC 230548 FOR VIBRATION ISOLATION.
7. MOTORS SUPPLIED WITH THIS EQUIPMENT SHALL FULLY COMPLY WITH THE MOTOR REQUIREMENTS SPECIFIED IN SPECIFICATION SECTION 230513 - MOTORS.
8. SUPPLY & RETURN DUCT SMOKE DETECTORS BY DIV. 28 HARDWIRED FOR UNIT SHUT-DOWN.
9. AIR HANDLERS HAVE 100% ECONOMIZER CAPABILITIES.
10. FAN MOTORS SHALL HAVE N+1 REDUNDANCY (CAPABLE OF FULL AIRFLOW WITH ALL FANS OPERATING BELOW 60 HZ UPON FAILURE OF ONE FAN).
11. PROVIDE 2 ADDITIONAL SUPPLY FANS AND 2 ADDITIONAL RETURN FANS FOR OWNER STOCK.
12. MECHANICAL CONTRACTOR TO FIELD VERIFY EXISTING CRUB ADAPTER SIZE.
13. AIR HANDLERS SHALL BE FURNISHED BY THE OWNER AND INSTALLED BY THE CONTRACTOR. IT IS THE CONTRACTORS RESPONSIBILITY TO COORDINATE WITH APPROVED SUBMITTALS FOR ALL REQUIRED CONNECTIONS AND MODIFICATIONS REQUIRED FOR THE INSTALL OF THE EQUIPMENT.

				SUPPLY FANS												RETURN FANS												DX COIL																UNIT ELECTRICAL				OPERATING	NOISE CRITERIA: MAXIMUM FAN SOUND POWER (dB)													
												MOTOR									MOTOR							SIZE																					125		250		500		1000		2000		4000		8000		
TAG	MFR	MODEL	SERVICE	TYPE	CFM	QTY	SIZE	TSP	ESP	RPM	FEI	BHP	HP	V	PH	TYPE	CFM	QTY	SIZE	TSP	ESP	RPM	FEI	SCCR	BHP	HP	V	PH	CFM	QTY	HEIGHT	WIDTH	BTU/H (TOTAL)	BTU/H (SENS)	REFRIGERANT TYPE	EAT DB	EAT WB	LAT DB	LAT WB	APD (IN.)	ROWS	FPI	MCA	MOCP	V	PH	WEIGHT (LBS)	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	NOTES
AHU-4	DAIKIN	OAH073GDCM	DATA CENTER	AIRFOIL	8,388	4	22"	4.51	2.0	1906	1.13	10.2	12	460	3	AIRFOIL	8,388	4	22"	0.93	0.75	1520	1.1	10	2.6	6	460	3	33,550	2	48"	103"	812,084	809,485	R-32	92	66	69	58	0.27	4	6	86.4	100	460	3	12,000	80	85	80	92	76	91	79	95	71	93	75	90	69	83	ALL

PHASE 2 - AIR COOLED CONDENSING UNIT - OFCI

NOTES:
1. DISCONNECT BY DIV. 26
2. EER AND SEER/IEER LISTED AT AHRI RATING CONDITIONS.
3. PROVIDE WITH MICROTECH MICROPROCESS-BASED CONTROL SYSTEM.
4. PROVIDE WITH BACNET INTERFACE.
5. PROVIDE WITH LOW SOUND OPTIONS.
6. PROVIDE WITH RESTRAINED SPRING VIBRATION ISOLATION FOR MOUNT TO STRUCTURAL SUPPORT. SEE STRUCTURAL PLANS.
7. PROVIDE WITH VARIABLE SPEED COMPRESSORS.
8. PROVIDE WITH LOW AMBIENT CONTROL DOWN TO -10°F.
9. DX CONDENSING UNIT SHALL BE FURNISHED BY THE OWNER AND INSTALLED BY THE CONTRACTOR. IT IS THE CONTRACTORS RESPONSIBILITY TO COORDINATE WITH APPROVED SUBMITTALS FOR ALL REQUIRED CONNECTIONS AND MODIFICATIONS REQUIRED FOR THE INSTALL OF THE EQUIPMENT.

			COOLING					CONDENSER FANS		COMPRESSOR		ELECTRICAL						OPERATING	NOISE CRITERIA: CASE RADIATED SOUND POWER (dB)							
TAG	MFR	MODEL	COOLING AMBIENT TEMP	RATED CAPACITY (BTUH)	REFRIGERANT	EER	SEER/ IEER	#	FLA	#	RLA	MCA	MOCP	V	PH	HZ		WEIGHT (LBS)	125	250	500	1000	2000	4000	8000	NOTES
CU-5	DAIKIN	DCSA075	105	829572	R32	11.8	17.3	6	2	4	30.1	132	150	460	3	60		5,500	79	85	90	91	90	88	84	ALL

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07/14/2025

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SAMUELSON AHU REPLACEMENT
CENTRAL WASHINGTON UNIVERSITY
PROJECT NO. 17456-02
400 E. University Way, Ellensburg, WA 98926

DATE: 07-14-2025 DESCRIPTION
ISSUE: CONSTRUCTION DOCUMENTS
PROJECT: 2025.702.01
DRAWN: CMW
CHECKED: DWJ
ORIGINAL SHEET SIZE: 30"x42"

SCHEDULES - MECHANICAL

M6.01

SEQUENCE OF OPERATION

OCCUPIED MODE
THE SUPPLY AND RETURN FANS SHALL BE ON AND SHALL OPERATE CONTINUOUSLY. THE SUPPLY FAN SHALL MODULATE THE ECM MOTOR VIA 0-10V CONTROL SIGNAL TO MAINTAIN 50% OF THE SCHEDULED SUPPLY AIRFLOW. THE RETURN FANS SHALL TRACK THE SUPPLY FANS.

THE DISCHARGE AIR TEMPERATURE AT THE AHU SHALL BE RESET TO SATISFY THE RETURN TEMPERATURE SENSOR TT-14. THE ROOM IS CONTROLLED TO THE RETURN AIR TEMPERATURE SET POINT. (68 DEGREES) ADJUSTABLE.

ON A CALL FOR COOLING, THE FIRST STAGE OF COOLING SHALL BE ENABLED. STAGE ONE COOLING CONSISTS OF ECONOMIZER COOLING BY OPENING THE ECONOMIZER DAMPER AND MODULATING MIXING BOX DAMPERS TO PROVIDE UP TO 100% OUTSIDE AIR FOR FREE COOLING AT REDUCED FAN SPEED. STAGE 2 ECONOMIZER COOLING SHALL CONTINUE COOLING BY INCREASING FAN AIRFLOW TO FULL AIRFLOW. ON A FURTHER CALL FOR COOLING, WITH FANS AT FULL AIRFLOW, STAGE 3 COOLING SHALL BE ENABLED AND THE CONDENSING UNIT SHALL MODULATE THE COMPRESSORS TO SATISFY THE DISCHARGE AIR TEMPERATURE CONTROL. THE REVERSE SHALL OCCUR UPON REDUCED DEMAND FOR COOLING. STAGE 1 AND 2 ECONOMIZER COOLING SHALL BE LOCKED OUT WHEN OUTSIDE AIR TEMPERATURES ARE WARMER THAN 2 DEGREES BELOW THE RETURN AIR TEMPERATURE. MIXING DAMPER CONTROLS SHALL BE OVER-RIDDEN TO PREVENT THE MIXED AIR TEMPERATURE IN ECONOMIZER COOLING FROM DROPPING BELOW 75 DEGREES (ADJUSTABLE).

CONDENSING UNIT COOLING:
THE CONDENSING UNIT FACTORY CONTROLS SHALL START/STOP THE CONDENSING UNIT FANS. THE FACTORY CONTROLS SHALL MODULATE AND STAGE COMPRESSORS TO SATISFY THE AHU UNIT CALL FOR COOLING. THE LEAD COMPRESSOR SHALL ROTATE ON A MONTHLY BASIS. THIS DX COOLED UNIT IS BACKUP AND SHALL OPERATE ONCE A MONTH FOR 24 HOURS (ADJ).

BAS SHALL HAVE READ ONLY POINTS AVAILABLE:
- REFRIGERANT SUCTION & DISCHARGE TEMPERATURE
- FAN STATUS
- COMPRESSOR STAGING AND STATUS

ALARMS
- COMPRESSOR FAILURE
- FAN FAILURE
- FILTER HIGH STATIC PRESSURE
- COMPRESSOR ALARM
- CONDENSER FAN ALARM.

FAULT DETECTION AND DIAGNOSTICS:
THE BAS SHALL BE CONFIGURED TO DETECT AIR TEMPERATURE SENSOR FAILURE, ECONOMIZING FAILURE & DAMPER FAULT. ALARM FAILURE TO BAS OPERATING TERMINAL BAS SHALL INDICATE THE CURRENT MODE OF OPERATION (COOLING, ECONOMIZER), IF FREE COOLING IS AVAILABLE, MIXED AIR TEMPERATURE, LOW LIMIT OVERRIDE STATUS, AND THE CURRENT VALUE OF EACH SENSOR AT THE OPERATING TERMINAL. CONTROLLER SHALL BE CAPABLE OF MANUALLY INITIATING EACH OPERATING MODE.

SAFETIES:
- A DETECTION OF 35° TEMPERATURE AT THE DISCHARGE AIR TEMP CONTROL SHALL ALARM THE BAS, STOP THE FANS, POSITION THE MIXING DAMPERS TO THE FULL RECIRCULATING POSITION.

Energy Management & Control System Points Identification

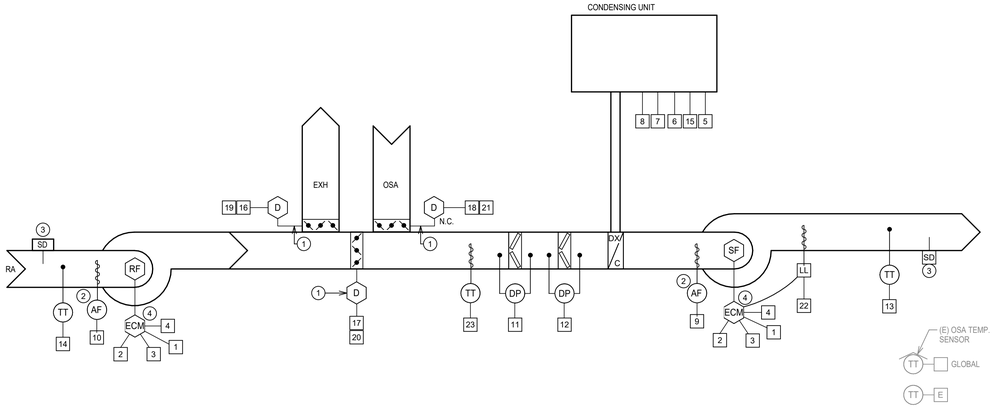
Tag	Name/Function	AI	AO	DI	DO	Remarks
1	Fan Start/Stop				✓	
2	Fan Speed		✓			
3	Fan Status/Alarm			✓		
4	Equipment Portal					BACNet MSTP
5	Condensing Unit Enable/Disable				✓	
6	Status/Alarm			✓		
7	Refrigerant Circuit Alarm			✓		
8	Refrigerant Circuit Alarm			✓		
9	Airflow	✓				4-20 Ma High Span
10	Airflow	✓				4-20 Ma High Span
11	Filter Pressure Drop	✓				
12	Filter Pressure Drop	✓				
13	Supply Air Temp	✓				
14	RA Temp	✓				
15	Equipment Portal					BACNet IP
16	Modulate Damper		✓			
17	Modulate Damper		✓			
18	Modulate Damper		✓			
19	Damper Position	✓				
20	Damper Position	✓				
21	Damper Position	✓				
22	Low Limit Alarm			✓		HARD WIRED FOR UNIT SHUTDOWN
23	Mixed Air Temp	✓				
24						
25						
26						
27						
28						
29						
30						
31						

GENERAL NOTES:

1. ALL EQUIPMENT INCLUDING BUT NOT LIMITED TO FANS AND CORRESPONDING VFD'S, SHALL BE INDIVIDUALLY CONTROLLED. POINTS ARE IDENTIFIED AS DESCRIPTORS AND ARE NOT INDICATIVE OF TOTAL POINTS.

(#) KEYNOTES:

1. SECTION 230923 TO FURNISH ACTUATORS AND SHIP TO AHU FACTORY FOR FACTORY INSTALLATION - DAMPERS AND LINKAGE PROVIDED WITH AHU.
2. FOR FAN ARRAY, AHU MFR. SHALL HAVE AN AIRFLOW PANEL THAT SUMS FAN AIRFLOW FOR SINGLE OUTPUT TO BAS. CONSULT AHU MANUFACTURER FOR SINGLE OR MULTIPLE TRANSDUCERS.
3. SMOKE DETECTOR PROVIDED BY DIV. 28, HARD WIRED FOR SHUT-DOWN. ACTIVATION OF A DUCT SMOKE DETECTOR SHALL ALARM THE EMCS AND INDICATE LOCATION OF THE DETECTOR ALARM.
4. WHEN AHU HAS FAN ARRAY, THE ECM MOTORS WILL BE FACTORY WIRED TOGETHER FOR SINGLE POINT CONTROL BY THE BAS.



2 AHU DATA ROOM CONTROL DIAGRAM - DX COOLING - PHASE 2
N.T.S.

SEQUENCE OF OPERATION

OCCUPIED MODE
THE SUPPLY AND RETURN FANS SHALL BE ON AND SHALL OPERATE CONTINUOUSLY. THE SUPPLY FAN SHALL MODULATE THE ECM MOTOR VIA 0-10V CONTROL SIGNAL TO MAINTAIN 50% OF THE SCHEDULED SUPPLY AIRFLOW. THE RETURN FANS SHALL TRACK THE SUPPLY FANS.

THE DISCHARGE AIR TEMPERATURE AT THE AHU SHALL BE RESET TO SATISFY THE RETURN TEMPERATURE SENSOR TT-14. THE ROOM IS CONTROLLED TO THE RETURN AIR TEMPERATURE SET POINT. (68 DEGREES) ADJUSTABLE.

ON A CALL FOR COOLING, THE FIRST STAGE OF COOLING SHALL BE ENABLED. STAGE ONE COOLING CONSISTS OF ECONOMIZER COOLING BY OPENING THE ECONOMIZER DAMPER AND MODULATING MIXING BOX DAMPERS TO PROVIDE UP TO 100% OUTSIDE AIR FOR FREE COOLING AT REDUCED FAN SPEED. STAGE 2 ECONOMIZER COOLING SHALL CONTINUE COOLING BY INCREASING FAN AIRFLOW TO FULL AIRFLOW. ON A FURTHER CALL FOR COOLING, WITH FANS AT FULL AIRFLOW, STAGE 3 COOLING SHALL BE ENABLED AND THE CHILLED WATER VALVE SHALL MODULATE TO SATISFY THE DISCHARGE AIR TEMPERATURE CONTROL. THE REVERSE SHALL OCCUR UPON REDUCED DEMAND FOR COOLING. STAGE 1 AND 2 ECONOMIZER COOLING SHALL BE LOCKED OUT WHEN OUTSIDE AIR TEMPERATURES ARE WARMER THAN 2 DEGREES BELOW THE RETURN AIR TEMPERATURE. MIXING DAMPER CONTROLS SHALL BE OVER-RIDDEN TO PREVENT THE MIXED AIR TEMPERATURE IN ECONOMIZER COOLING FROM DROPPING BELOW 75 DEGREES (ADJUSTABLE).

GLYCOL CHILLED WATER CONTROL:
THE COOLING SYSTEM SHALL BE ENABLED UPON DEMAND FOR STAGE 3 COOLING. COOLING WILL BE AVAILABLE YEAR ROUND. WITH NO DEMAND FOR COOLING AT THE COIL, THE PUMPS SHALL BE OFF AND V-1 SHALL BE CLOSED TO THE CENTRAL CHILLED WATER LOOP.

UPON DEMAND FOR COOLING THE CAMPUS CHILLED WATER VALVE V-1 SHALL OPEN TO THE HEAT EXCHANGER. VALVE V-1 SHALL MODULATE TO MAINTAIN SUPPLY WATER TEMPERATURE SETPOINT AT TT-27 OF 52°F (ADJ.).

THE LEAD SYSTEM PUMP SHALL START AND SHALL CONTROL TO MAINTAIN AHU SUPPLY DISCHARGE TEMPERATURE 75°F (ADJ). THIS SHALL BE RESET TO UP TO 80°F (ADJ). AHU SUPPLY TEMP CONTROLS TO MAINTAIN RETURN TEMPERATURE.

THE PUMPS SHALL ALTERNATE LEAD/LAG POSITION BASED UPON RUNTIME. UPON FAILURE OF THE LEAD PUMP, THE LAG PUMP SHALL START AND MOVE INTO THE LEAD POSITION. FAILURE OF THE PUMP SHALL ALARM THE OPERATOR'S TERMINAL.

ANY PUMP SHUT DOWN BY A POWER FAILURE SHALL AUTOMATICALLY RESTART UPON RESTORATION OF POWER. WHEN RESTARTED PUMPS SHALL SLOWLY RAMP UP TO SET SPEED TO MINIMIZE ELECTRICAL SYSTEM PEAK DRAW.

23 09 23 SHALL PROVIDE A BTUH METER FOR TRACKING OF COOLING LOADS AND SYSTEM FLOW.
- PEAK DEMAND: THE BAS SHALL TREND THE PEAK (HIGH AND LOW) DEMAND. THE PEAK READINGS SHALL BE TRENDED ON A DAILY, MONTH-TO-DATE AND YEAR-TO-DATE BASIS.
- USAGE: THE BAS SHALL TREND USAGE TO PROVIDE CONSUMPTION. USAGE SHALL BE TRENDED ON A DAILY, MONTH-TO-DATE AND YEAR-TO-DATE BASIS.

ALARMS
- PUMP FAILURE
- FAN FAILURE
- FILTER HIGH STATIC PRESSURE

FAULT DETECTION AND DIAGNOSTICS:
THE BAS SHALL BE CONFIGURED TO DETECT AIR TEMPERATURE SENSOR FAILURE, ECONOMIZING FAILURE & DAMPER FAULT. ALARM FAILURE TO BAS OPERATING TERMINAL BAS SHALL INDICATE THE CURRENT MODE OF OPERATION (COOLING, ECONOMIZER), IF FREE COOLING IS AVAILABLE, MIXED AIR TEMPERATURE, LOW LIMIT OVERRIDE STATUS, AND THE CURRENT VALUE OF EACH SENSOR AT THE OPERATING TERMINAL. CONTROLLER SHALL BE CAPABLE OF MANUALLY INITIATING EACH OPERATING MODE.

SAFETIES:
- A DETECTION OF 35° TEMPERATURE AT THE DISCHARGE AIR TEMP CONTROL SHALL ALARM THE BAS, STOP THE FANS, POSITION THE MIXING DAMPERS TO THE FULL RECIRCULATING POSITION.

Energy Management & Control System Points Identification

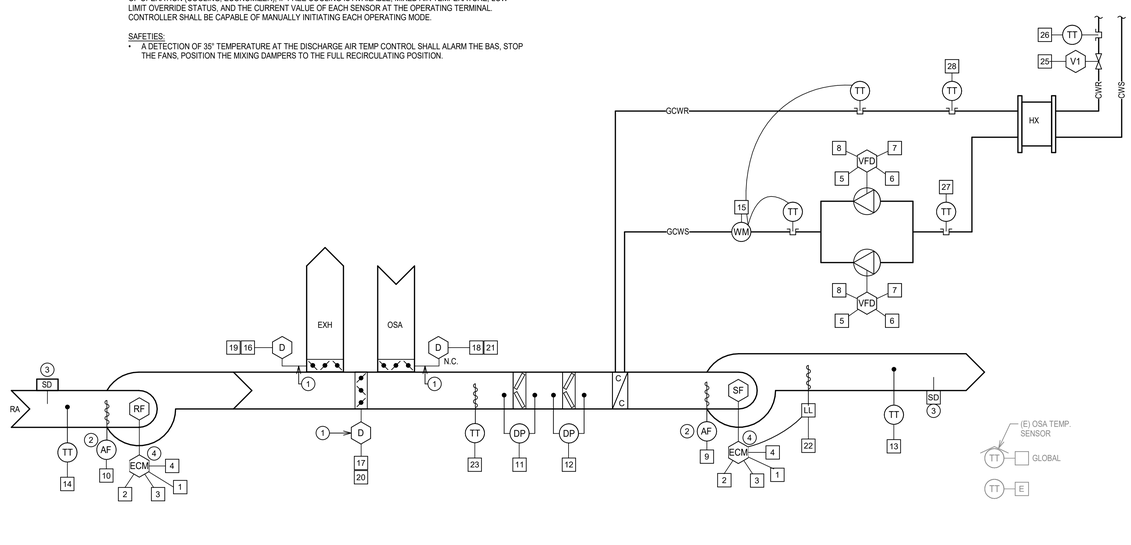
Tag	Name/Function	AI	AO	DI	DO	Remarks
1	Fan Start/Stop				✓	
2	Fan Speed		✓			
3	Fan Status/Alarm			✓		
4	Equipment Portal					BACNet MSTP
5	VFD Pump Start/Stop				✓	
6	VFD Pump Speed		✓			
7	VFD Status			✓		
8	Equipment Portal					BACNet MSTP
9	Airflow	✓				4-20 Ma High Span
10	Airflow	✓				4-20 Ma High Span
11	Filter Pressure Drop	✓				
12	Filter Pressure Drop	✓				
13	Supply Air Temp	✓				
14	RA Temp	✓				
15	BTUH Meter					(FLOW,TEMP, BTUH) BACNet IP
16	Modulate Damper		✓			
17	Modulate Damper		✓			
18	Modulate Damper		✓			
19	Damper Position	✓				
20	Damper Position	✓				
21	Damper Position	✓				
22	Low Limit Alarm			✓		
23	Mixed Air Temp	✓				
24						
25	Modulate Valve HX Control		✓			
26	HX CW Outlet Temp	✓				
27	Glycol CWS Temp	✓				
28	Glycol CWR Temp	✓				
29						
30						
31						

GENERAL NOTES:

1. ALL EQUIPMENT INCLUDING BUT NOT LIMITED TO FANS AND CORRESPONDING VFD'S, SHALL BE INDIVIDUALLY CONTROLLED. POINTS ARE IDENTIFIED AS DESCRIPTORS AND ARE NOT INDICATIVE OF TOTAL POINTS.

(#) KEYNOTES:

1. SECTION 230923 TO FURNISH ACTUATORS AND SHIP TO AHU FACTORY FOR FACTORY INSTALLATION - DAMPERS AND LINKAGE PROVIDED WITH AHU.
2. FOR FAN ARRAY, AHU MFR. SHALL HAVE AN AIRFLOW PANEL THAT SUMS FAN AIRFLOW FOR SINGLE OUTPUT TO BAS. CONSULT AHU MANUFACTURER FOR SINGLE OR MULTIPLE TRANSDUCERS.
3. SMOKE DETECTOR PROVIDED BY DIV. 28, HARD WIRED FOR SHUT-DOWN. ACTIVATION OF A DUCT SMOKE DETECTOR SHALL ALARM THE EMCS AND INDICATE LOCATION OF THE DETECTOR ALARM.
4. WHEN AHU HAS FAN ARRAY, THE ECM MOTORS WILL BE FACTORY WIRED TOGETHER FOR SINGLE POINT CONTROL BY THE BAS.



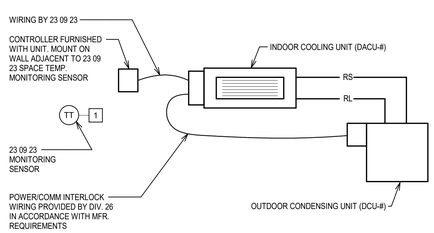
1 AHU DATA ROOM CONTROL DIAGRAM - CHILLED WATER - PHASE 1
N.T.S.

Energy Management & Control System Points Identification

Tag	Name/Function	AI	AO	DI	DO	Remarks
1	Space Temp	✓				High Temp Alarm

SEQUENCE OF OPERATION:

SS AND CU SHALL CYCLE UPON DEMAND FOR COOLING FROM UNIT PROVIDED SPACE SENSOR. SPACE TEMPERATURE ABOVE 80° (OR AS SET) SHALL SEND ALARM TO EMCS.



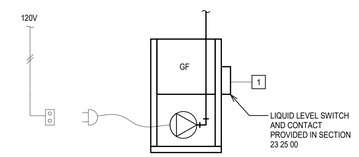
4 DUCTLESS SPLIT SYSTEM CONTROL - ALT #1
N.T.S.

Energy Management & Control System Points Identification

Tag	Name/Function	AI	AO	DI	DO	Remarks
1	Alarm			✓		

SEQUENCE OF OPERATION:

INDICATION OF LOW GLYCOL LEVEL SHALL GENERATE AN ALARM AT THE OPERATOR'S TERMINAL.



3 GLYCOL FEEDER CONTROL - PHASE 1
N.T.S.

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07/14/2025

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SAMUELSON AHU REPLACEMENT
CENTRAL WASHINGTON UNIVERSITY
PROJECT NO. 17456-02
400 E. University Way, Ellensburg, WA 99926

DATE:	07-14-2025 DESCRIPTION
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	ORIGINAL SHEET SIZE: 30"x42"

CONTROL DIAGRAMS

M7.01

SYMBOLS & ABBREVIATIONS

FIRE ALARM SYMBOLS

- DOOR HOLD OPEN
- DUCT SMOKE DETECTOR
- FIRE ALARM CONTROL PANEL
- FIRE ALARM ANNUNCIATOR PANEL
- FIRE ALARM SLAVE PANEL
- FIRE BELL
- FLOW SWITCH
- HEAT DETECTOR (CEILING MOUNTED)
- HEAT DETECTOR (WALL MOUNTED)
- HORN (WALL MOUNTED)
- HORN (CEILING MOUNTED)
- MANUAL PULL STATION
- MICROPHONE
- MONITOR MODULE
- OSID BEAM. SEE FLOOR PLANS FOR MOUNTING HEIGHT. OSID-R INDICATES REFLECTOR
- OUTPUT RELAY
- SMOKE DETECTOR (CEILING MOUNTED)
- SMOKE DETECTOR (WALL MOUNTED)
- SPEAKER (WALL MOUNTED)
- SPEAKER (CEILING MOUNTED)
- SPEAKER STROBE (WALL MOUNTED)
- SPEAKER STROBE (CEILING MOUNTED)
- STROBE (WALL MOUNTED)
- STROBE (CEILING MOUNTED)
- TAMPER DETECTOR (WITH VALVE)
- TAMPER DETECTOR (WITHOUT VALVE)

SCHEMATIC SYMBOLS

- AMP METER
- AUTOMATIC TRANSFER SWITCH
- AUTOMATIC TRANSFER SWITCH (4-POLE BYPASS ISOLATION)
- CIRCUIT BREAKER
- CIRCUIT BREAKER (GFI)
- 3P-1600 AF / 1200 AT — INDICATES A BREAKER WITH A 1600 AMP FRAME AND A 1200 AMP TRIP SETTING
- CONTACT (N.C.)
- CONTACT (N.O.)
- CONTACT (REMOTE, N.C.)
- CONTACT (REMOTE, N.O.)
- DISCONNECT SWITCH
- ELECTRONIC INTERLOCK
- ENCLOSED CIRCUIT BREAKER
- FEEDER IDENTIFICATION
- FUSE
- FUSIBLE SWITCH
- GENERATOR
- GROUND
- GROUNDED WYE
- INDUCTOR
- LINE TAP
- METER
- MOTOR
- PNL — PANELBOARD (# INDICATES NAME)
- PNL — PANEL OR CABINET
- SEPARABLE CONNECTIONS
- SPACE IN PANELBOARD
- SWITCH
- SPD — SURGE PROTECTION DEVICE
- TRANSFORMER
- VOLT METER

POWER SYMBOLS

- CONDUIT DROP
- CONDUIT RISE
- DISCONNECT SWITCH
- DISTRIBUTION PANEL
- ELECTRICAL PANEL
- JUNCTION BOX
- METER
- MOTOR
- MOTOR STARTER
- MOTOR STARTER (MANUAL)
- PUSH TYPE SWITCH
- RECEPTACLE, 20 AMP DUPLEX
- RECEPTACLE, CEILING MOUNTED
- RECEPTACLE, CEILING 20 AMP DUPLEX
- RECEPTACLE, CEILING DUPLEX STANDBY POWER
- RECEPTACLE, CEILING DUPLEX UPS BACKED
- EQ-# — EQUIPMENT TAG. REFER TO EQUIPMENT SHEDULE SHEET FOR DETAILS.
- RECEPTACLE, DUPLEX
- RECEPTACLE, DUPLEX FLOOR MOUNTED
- RECEPTACLE, DUPLEX GFI
- RECEPTACLE, DUPLEX ISOLATED GROUND
- RECEPTACLE, DUPLEX SWITCHED
- RECEPTACLE, DUPLEX STANDBY POWER
- RECEPTACLE, DUPLEX UPS BACKED
- RECEPTACLE, DUPLEX WITH USB
- RECEPTACLE, QUAD
- RECEPTACLE, QUAD FLOOR MOUNTED
- RECEPTACLE, FLOORBOX. 'X' INDICATES THE QUANTITY OF DUPLEX OUTLETS TO BE INSTALLED. 'Y' INDICATES THE FLOORBOX TYPE. REFER TO SHEET EXXX FOR DETAILS ON EACH TYPE.
- RECEPTACLE, SINGLE
- RECEPTACLE, SPECIAL
- RECEPTACLE, SPECIAL FLOOR MOUNTED
- T — TRANSFORMER
- CONCEALED CONDUIT: UNLESS OTHERWISE INDICATED, DENOTES 3/4"C-2#12+1#12G
- SURFACE MOUNTED RACEWAY

GENERAL SYMBOLS

- # — KEY NOTE
- EQ-# — EQUIPMENT IDENTIFIER
- DETAIL NUMBER / DETAIL REFERENCE / SHEET NUMBER
- DETAIL NUMBER / DETAIL REFERENCE / MATCHED SHEET NUMBER / CURRENT SHEET NUMBER (Ref Sht/Ref Dtl)
- MATCH LINE REFERENCE / Sht # — MATCHED SHEET NUMBER
- ROOM NAME AND NUMBER
- CONNECTION TO EXISTING (# INDICATES EXISTING SIZE)
- REVISION NUMBER
- SECTION NUMBER / SECTION REFERENCE / SHEET NUMBER (SIM, A101)
- NORTH ARROW
- CENTER LINE

NOTE:
SYMBOLS AND ABBREVIATIONS ON THE DRAWINGS SHALL BE INTERPRETED IN ACCORDANCE WITH THE LEGENDS WHEREVER APPLICABLE. NOT ALL SYMBOLS AND ABBREVIATIONS IN THE LEGENDS ARE NECESSARILY USED FOR THE PROJECT. ALL SIZES ARE IN INCHES, UNLESS OTHERWISE NOTED.

LINEWEIGHT LEGEND

- NEW WORK
- EXISTING TO REMAIN OR NOT IN CONTRACT
- DEMOLITION
- FUTURE WORK

ANNOTATION

+XX" MOUNTING HEIGHT (AFF OR AFG)

(n)x"C-a#b+c#d
- n = QUANTITY OF CONDUIT
- x = SIZE OF CONDUIT
- a = QUANTITY OF CONDUCTORS
- b = CONDUCTOR WIRE SIZE
- c = QUANTITY OF GROUND
- d = GROUND WIRE SIZE

ABBREVIATIONS

Ø	DIAMETER	LSI	INDICATES A BREAKER WITH FULLY ADJUSTABLE LONG TIME, SHORT TIME AND INSTANTANEOUS TRIP CHARACTERISTICS
ABV	ABOVE		
AFF	ABOVE FINISH FLOOR		
AFG	ABOVE FINISH GRADE	LSIA	INDICATES A BREAKER WITH FULLY ADJUSTABLE LONG TIME, SHORT TIME, INSTANTANEOUS AND GROUND FAULT ALARM TRIP CHARACTERISTICS
AL	ALUMINUM		
AR	AS REQUIRED		
ATS	AUTOMATIC TRANSFER SWITCH	LSIG	INDICATES A BREAKER WITH FULLY ADJUSTABLE LONG TIME, SHORT TIME, INSTANTANEOUS AND GROUND FAULT TRIP CHARACTERISTICS
BLDG	BUILDING		
C	CONDUIT		
CCT	CIRCUIT	MAX	MAXIMUM
CKT	CIRCUIT	MFR	MANUFACTURER
CLG	CEILING	MIN	MINIMUM
CO	CONDUIT ONLY WITH 1/4" POLYPROPYLENE PULL ROPE	MMS	MANUAL MOTOR STARTER
CP	CHROME PLATED	MNT	MOUNT(ED)
CT	CURRENT TRANSFORMER	(N)	NEW
CU	COPPER	N	NEUTRAL
DIA	DIAMETER	NL	NIGHT LIGHT
DISC	DISCONNECT	N.C.	NORMALLY CLOSED
DIST	DISTRIBUTION	NIC	NOT IN CONTRACT
DIV	DIVISION	N.O.	NORMALLY OPEN
DWG	DRAWING	NORM	NORMAL
DX	DUPLEX	UNO	UNLESS NOTED OTHERWISE
(E)	EXISTING TO REMAIN	PNL	PANEL
EA	EACH	QIG	QUAD ISOLATED GROUND
EM	EMERGENCY	REQ'D	REQUIRED
FLR	FLOOR, OR FLOOR MOUNTED	RM	ROOM
FT	FEET	SIM	SIMILAR
G	GROUND	SPST	SINGLE POLE/SINGLE THROW SWITCH
GA	GAUGE	SS	STAINLESS STEEL
GFI	GROUND FAULT INTERRUPT	SW	SWITCH
GND	GROUND	T	TAMPER PROOF RECEPTACLE
H	HIGH	TYP	TYPICAL
HT	HEIGHT	W	WIDE
IG	ISOLATED GROUND	W/	WITH
IN	INCHES	W/IN	WITHIN
L	LONG	W/O	WITHOUT
LI	INDICATES A BREAKER WITH FULLY ADJUSTABLE LONG TIME AND INSTANTANEOUS TRIP CHARACTERISTICS	WP	WEATHERPROOF, RECEPTACLES TO BE GFI
		X	EXISTING DEVICE TO BE REPLACED WITH NEW DEVICE AT SAME LOCATION
		XFMR	TRANSFORMER

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JOEL RAGAN ENELOW — STATE OF WASHINGTON — 55377 — REGISTERED PROFESSIONAL ENGINEER

07/14/2025

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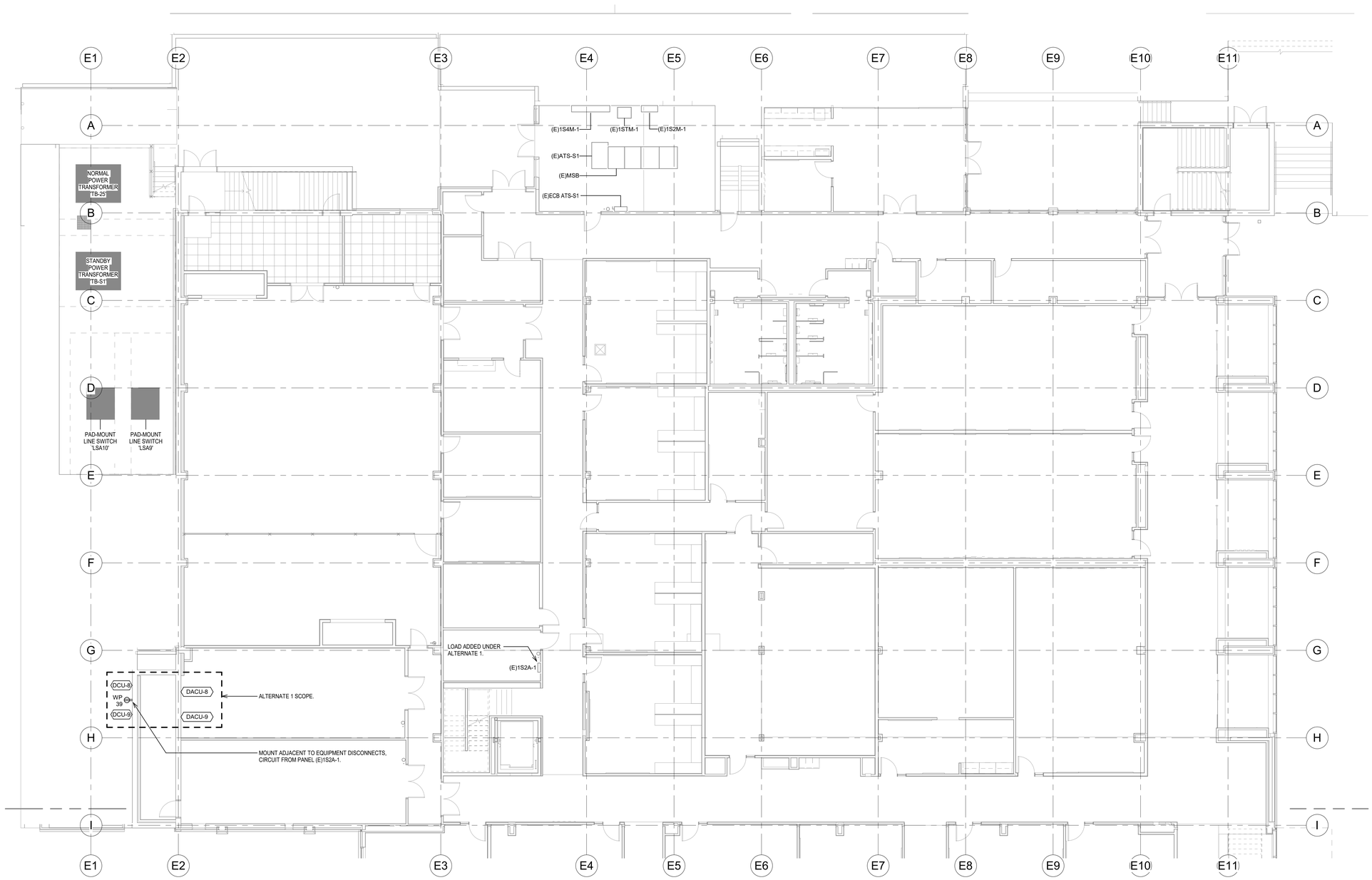
CHECKED:	JRE

ORIGINAL SHEET SIZE: 30"x42"

LEGENDS & ABBREVIATIONS - ELECTRICAL

E0.01



LEVEL 1 - ELECTRICAL

1/8" = 1'-0"

NOTES:

1. NOT USED.

(#) KEY NOTES:

1. NOT USED.

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07/14/2025

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SAMUELSON AHU REPLACEMENT

CENTRAL WASHINGTON UNIVERSITY

PROJECT NO. 17456-02

400 E. University Way, Ellensburg, WA 98926

DATE:	07-14-2025 DESCRIPTION
ISSUE:	CONSTRUCTION DOCUMENTS
PROJECT:	2025.702.01
DRAWN:	AJL
CHECKED:	JRE

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LEVEL 1 FLOOR PLAN - ELECTRICAL

E1.01

LEVEL 2 - ELECTRICAL

1/8" = 1'-0"

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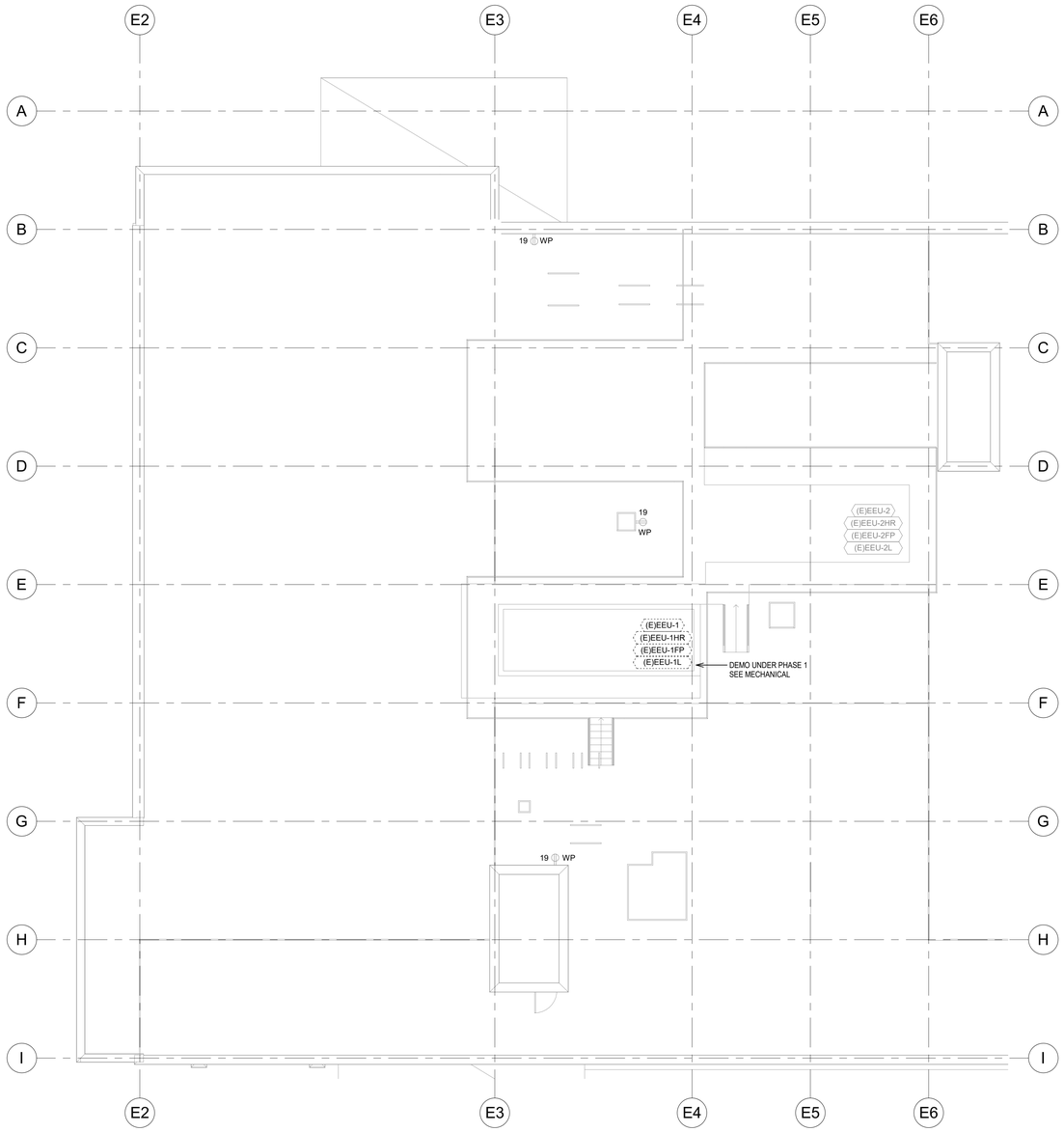
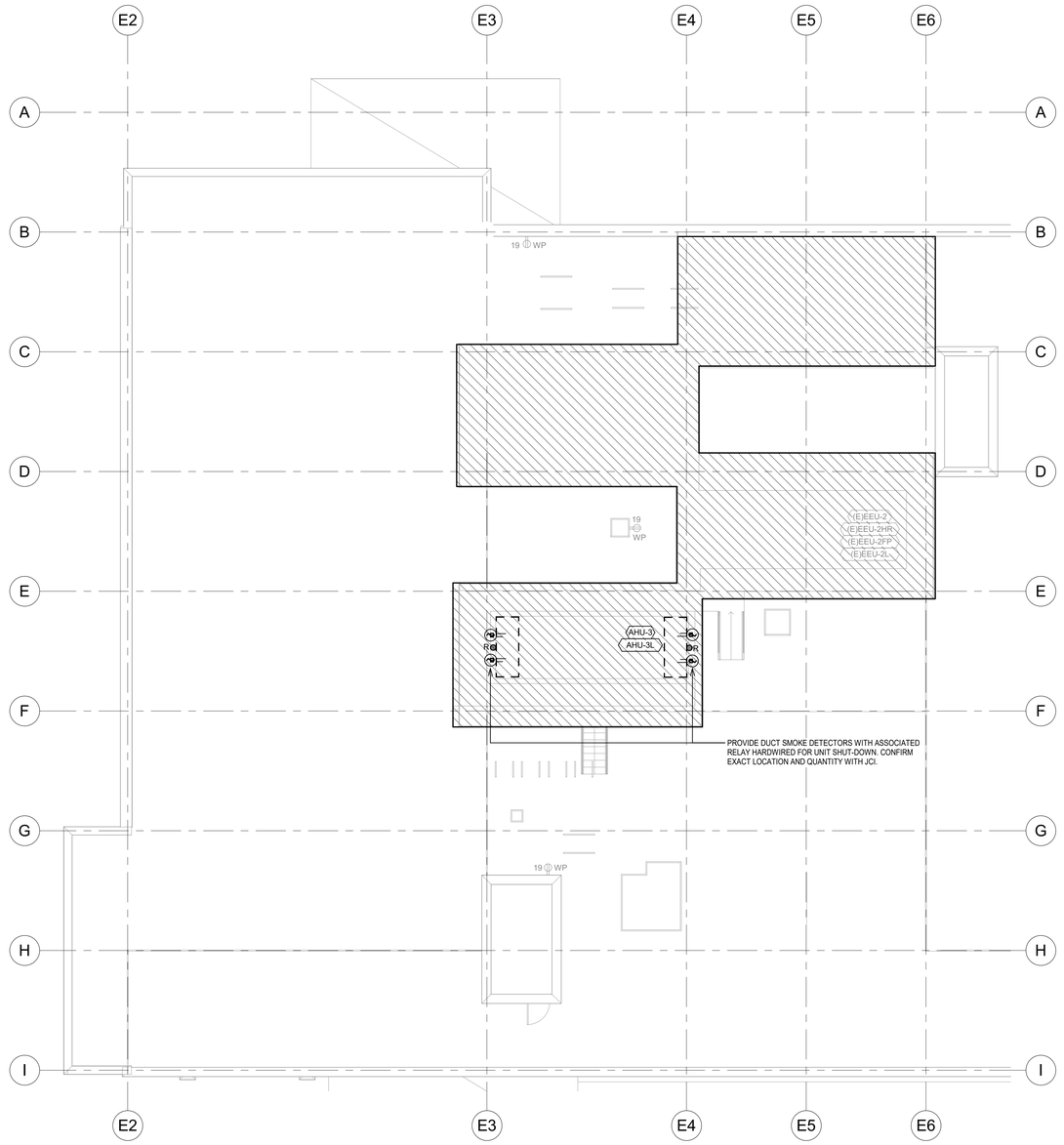
LEVEL 2 FLOOR PLAN - ELECTRICAL

E1.02



ROOF PLAN - PHASE 1 - ELECTRICAL - DEMO

1/8" = 1'-0"



ROOF PLAN - PHASE 1 - ELECTRICAL

1/8" = 1'-0"

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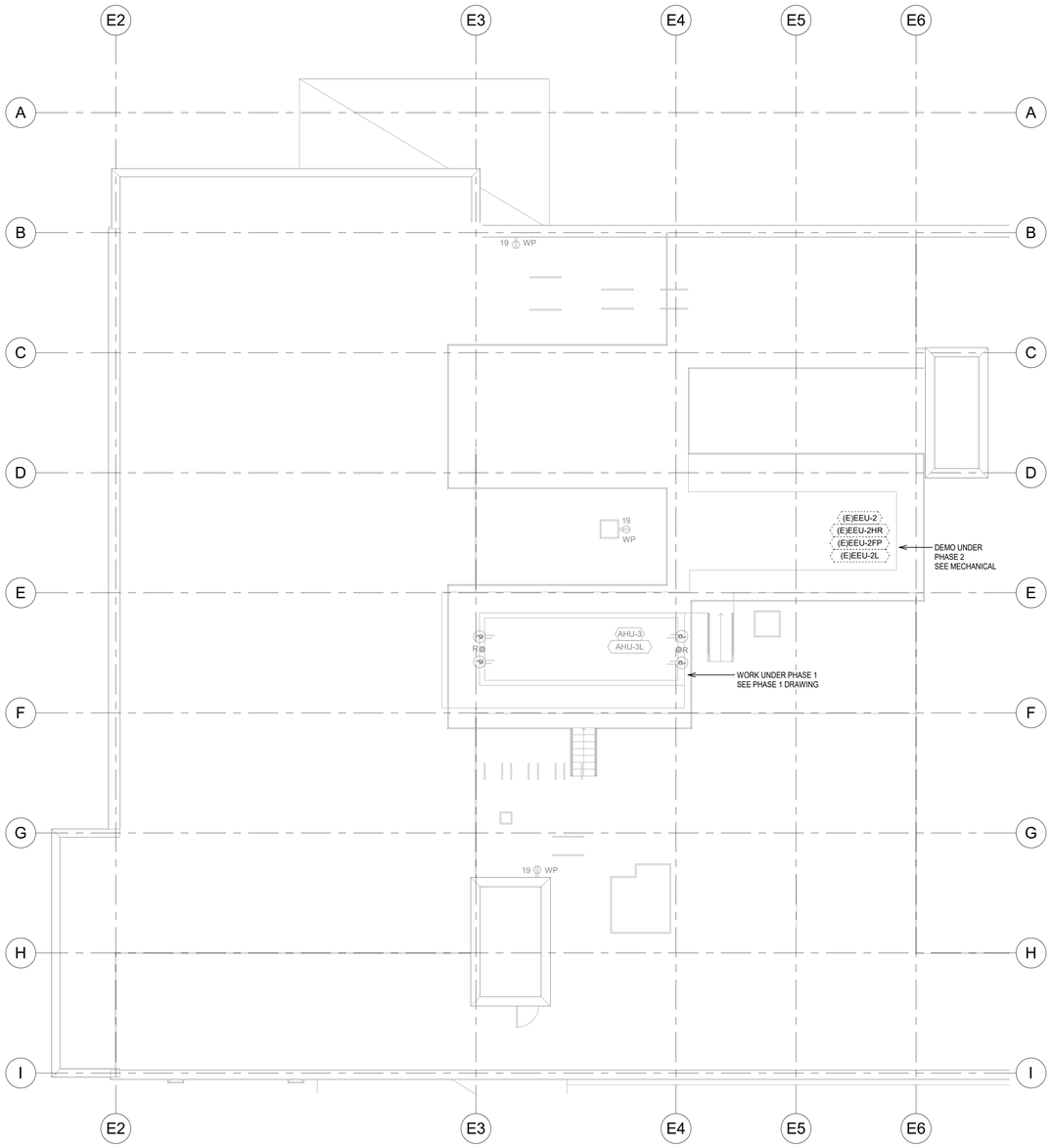
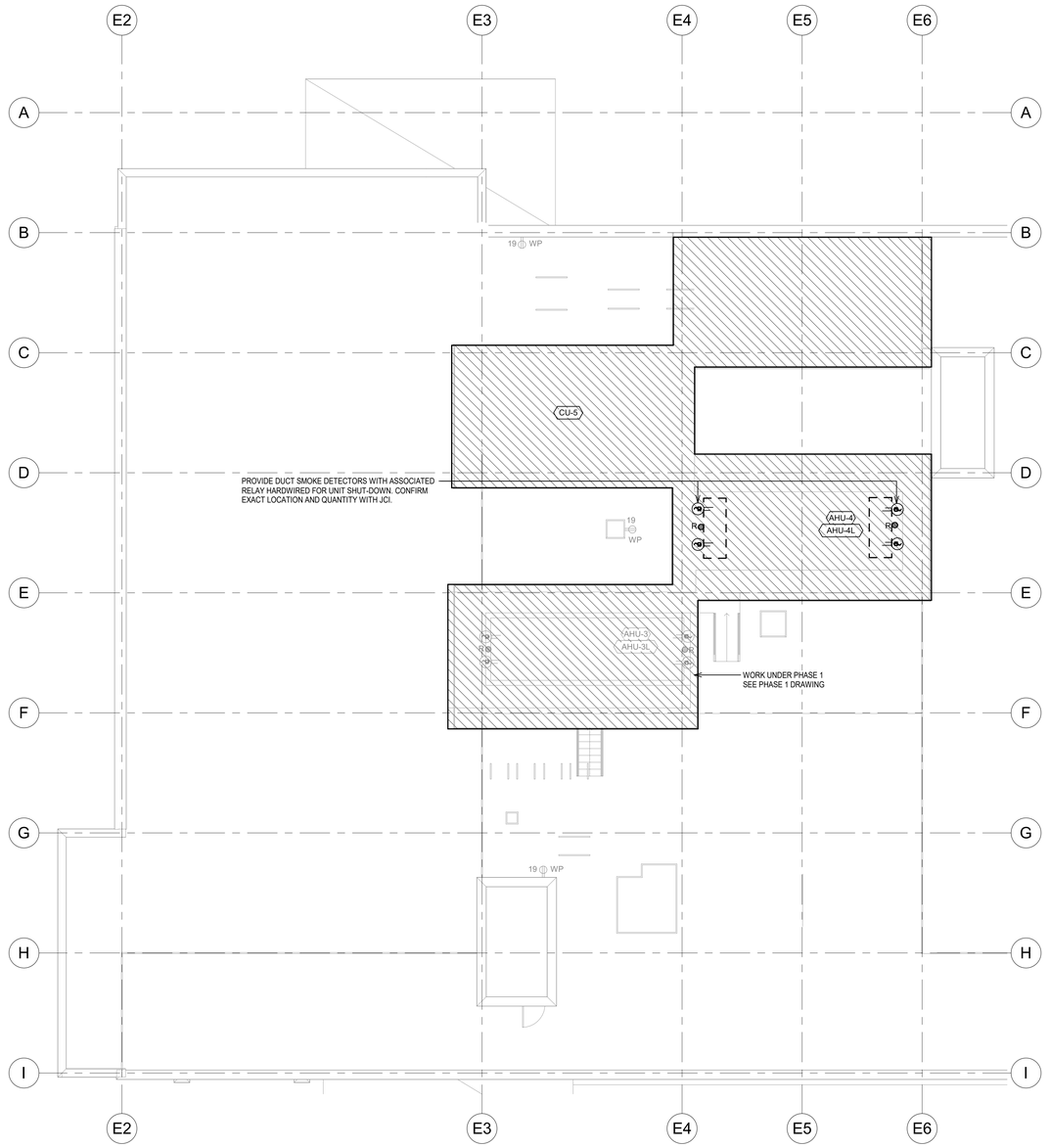
ROOF PLAN - PHASE 1 - ELECTRICAL

E1.03



ROOF PLAN - PHASE 2 - ELECTRICAL - DEMO

1/8" = 1'-0"



ROOF PLAN - PHASE 2 - ELECTRICAL

1/8" = 1'-0"

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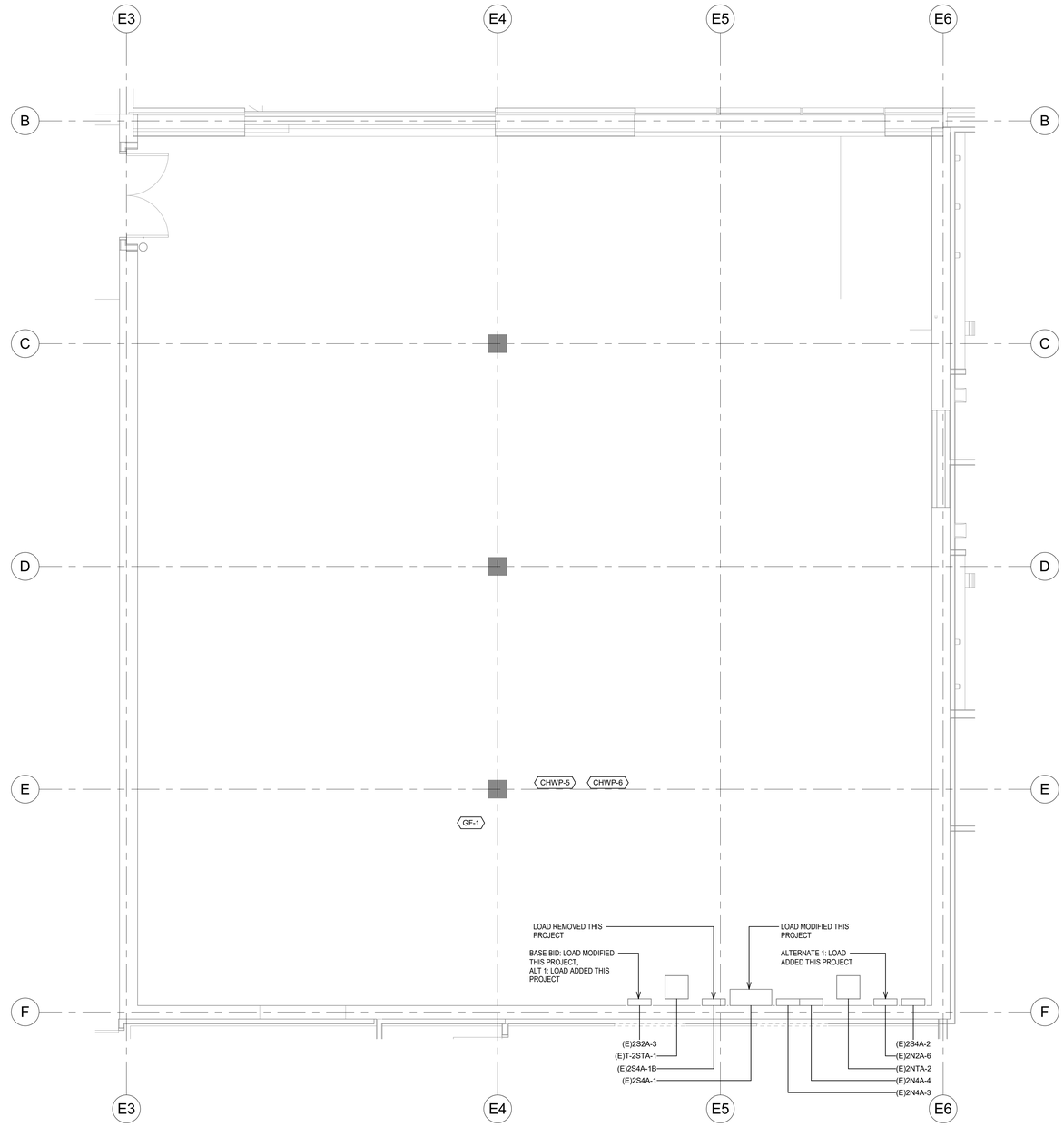
ROOF PLAN - PHASE 2 - ELECTRICAL

E1.04



1 LEVEL 2 - PHASE 1 - ENLARGED PLAN - POWER
1/4" = 1'-0"

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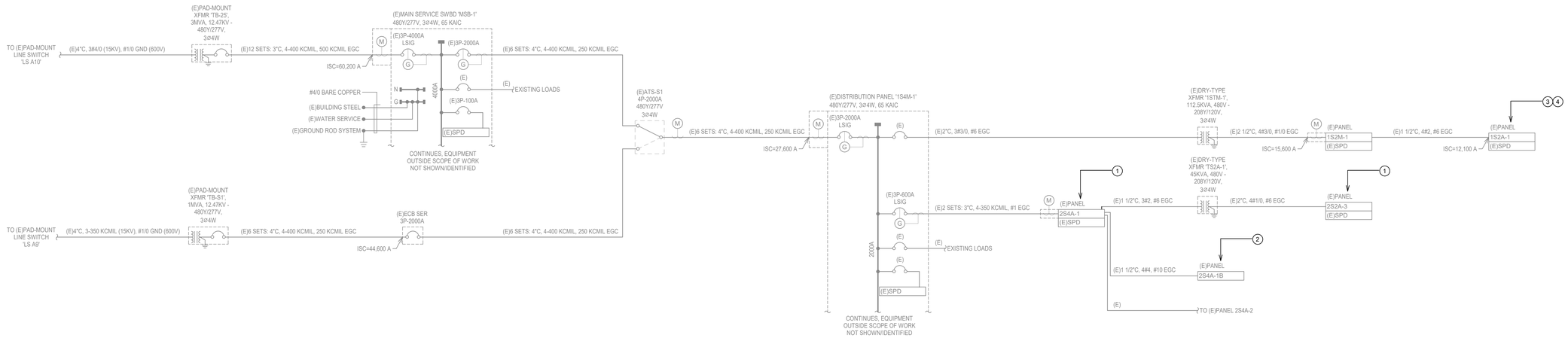
ENLARGED PLANS - ELECTRICAL

E4.01



NOTES:

A. ONE-LINE DIAGRAM SHOWN FOR REFERENCE. EXISTING ELECTRICAL DISTRIBUTION SYSTEM WILL NOT BE MODIFIED UNDER THE SCOPE OF WORK OF THIS PROJECT.
B. EXISTING PARTIAL ONE-LINE DIAGRAM CREATED FROM AS-BUILT DRAWINGS AND FIELD NOTES. CONFIRM EXISTING CONDITIONS PRIOR TO EXECUTION OF WORK.
C. FAULT CURRENT VALUES ARE NOT SHOWN FOR EQUIPMENT WHERE FAULT CURRENTS ARE LESS THAN 10,000 AMPS, OR FOR EQUIPMENT OUTSIDE THE SCOPE OF WORK OF THIS PROJECT.

(#) KEY NOTES:

1. LOAD MODIFIED THIS PROJECT.
2. LOAD REMOVED THIS PROJECT.
3. LOAD ADDED THIS PROJECT.
4. SCOPE OF WORK PERFORMED UNDER ALTERNATE 1.

1 PARTIAL EXISTING ONE-LINE DIAGRAM - ELECTRICAL

N.T.S.

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CHECKED:		Checker

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ONE-LINE DIAGRAM - ELECTRICAL

E5.01

MECHANICAL EQUIPMENT SCHEDULE - ELECTRICAL

GENERAL NOTES:
1. COORDINATE CONNECTION DETAILS WITH EQUIPMENT VENDOR PRIOR TO ROUGH-IN.
2. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL DETAILS AND REQUIREMENTS.
3. PROVIDE NEMA 3R RATED EQUIPMENT WHERE INSTALLED OUTDOORS.
4. COORDINATE FUSE SIZES WITH EQUIPMENT VENDOR, EQUIPMENT NAMEPLATES AND SHOP DRAWINGS PRIOR TO ORDERING FUSES OR DISCONNECTS.
5. PROVIDE NEMA STARTER WHERE INDICATED ON THE SCHEDULE. PROVIDE AT MINIMUM THE SIZE INDICATED.
6. WIRE SIZES ARE FOR COPPER CONDUCTORS UNLESS SPECIFICALLY INDICATED OTHERWISE.
7. WHERE TOGGLE SWITCHES, MANUAL MOTOR STARTERS(MMS) AND MOTOR RATED SWITCHES(MRS) ARE INDICATED FOR EQUIPMENT INSTALLED IN FINISHED AREAS, THEY SHALL BE MOUNTED IN AN ADJACENT, CONCEALED, AND ACCESSIBLE LOCATION.

EQUIPMENT SPECIFIC NOTES:
1. OUTDOOR CONDENSING UNIT CIRCUIT POWERS OUTDOOR UNIT AND INDOOR UNIT. SEE MECHANICAL DRAWINGS FOR DETAILS. CIRCUIT SHALL BE STRANDED WIRE.
2. EQUIPMENT INDICATED WITH 'I' AMPS LOAD IS REDUNDANT OR WILL NOT OPERATE SIMULTANEOUSLY WITH ITS COUNTERPART. SEE MECHANICAL SCHEDULES FOR DETAILS.
3. EQUIPMENT IS FURNISHED WITH INTEGRAL THERMAL OVERLOAD PROTECTION FOR THE MOTOR.
4. UTILIZE EXISTING RACEWAY. PROVIDE NEW CONDUCTORS AS NEEDED. CONFIRM EXISTING CONDITIONS PRIOR TO ORDERING EQUIPMENT.
5. UTILIZE EXISTING RACEWAY AND DISCONNECT. PROVIDE NEW FUSES AND CONDUCTORS. CONFIRM EXISTING CONDITIONS PRIOR TO ORDERING EQUIPMENT.
6. SCOPE OF WORK PERFORMED IN PHASE 1.
7. SCOPE OF WORK PERFORMED IN PHASE 2.
8. SCOPE OF WORK PERFORMED UNDER ALTERNATE 1.
9. VFD FURNISHED BY DIV 23, INSTALLED BY DIV 26.

Equipment Name	Description	Voltage	Phase	HP	Amps	kVA	Starter	Disconnect	Fuse Size	# of Sets	Conduit Size	Wire Size/Qty (AWG)	Panel	Circuit Number	Notes
AHU-3	AIR HANDLING UNIT (OFCI)	480 V	3	--	86.4 A	71.832 kVA	--	(E)3P-200A	100A	1	2"	4#1+1#6G	(E)2S4A-1	31,33,35	5,6
AHU-3L	AHU-3 UNIT LIGHTING	120 V	1	--	15 A	1.800 kVA	--	--	--	1	3/4"	3#10+1#10G	(E)2S2A-3	27	4,6
AHU-4	AIR HANDLING UNIT (OFCI)	480 V	3	--	86.4 A	71.832 kVA	--	(E)3P-200A	100A	1	2"	4#1+1#6G	(E)2S4A-1	32,34,36	5,7
AHU-4L	AHU-4 UNIT LIGHTING (OFCI)	120 V	1	--	15 A	1.800 kVA	--	--	--	1	3/4"	3#10+1#10G	(E)2S2A-3	29	4,7
CHWP-5	CHILLED WATER PUMP	480 V	3	--	7.6 A	6.319 kVA	DIV 23	3P-30A FS	12 A	1	3/4"	3#12+1#12G	(E)2S4A-1	8,10,12	6,9
CHWP-6	CHILLED WATER PUMP	480 V	3	--	7.6 A	6.319 kVA	DIV 23	3P-30A FS	12 A	1	3/4"	3#12+1#12G	(E)2S4A-1	26,28,30	6,9
CU-5	CONDENSING UNIT (OFCI)	480 V	3	--	132 A	109.743 kVA	PACKAGED	3P-200A	150A	1	2"	4#1/0+1#6G	(E)2S4A-1	7,9,11	7
DACU-8	SPLIT SYSTEM AC UNIT	208 V	1	--	0 A	0.000 kVA	PACKAGED	TOGGLE SW	--	1	3/4"	2#12+1#12G	(E)1S2A-1	29,31	1,2,3,8
DACU-9	SPLIT SYSTEM AC UNIT	208 V	1	--	0 A	0.000 kVA	PACKAGED	TOGGLE SW	--	1	3/4"	2#12+1#12G	(E)1S2A-1	33,35	1,2,3,8
DCU-8	SPLIT SYSTEM CONDENSING UNIT	208 V	1	--	21.4 A	4.451 kVA	PACKAGED	2P-60A FS	25 A	1	1"	2#10+1#10G	(E)1S2A-1	29,31	1,8
DCU-9	SPLIT SYSTEM CONDENSING UNIT	208 V	1	--	21.4 A	4.451 kVA	PACKAGED	2P-60A FS	25 A	1	1"	2#10+1#10G	(E)1S2A-1	33,35	1,8
GF-1	GLYCOL FEED PUMP	120 V	1	--	2 A	0.240 kVA	--	5-15R GFCI RECEPT	--	1	3/4"	2#12+1#12G	(E)2S2A-3	21	6

MAIN SWITCHBOARD MSB-1 LOAD SUMMARY AND DEMAND CALCULATION

Description	Dwelling Units (VA)	Hotels, Apt w/o Cooking (VA)	Lighting (VA)	Receptacles (VA)	Continuous Equipment (VA)	Non-Cont. Equipment (VA)	Motors (VA)	Largest Motor (VA)	Kitchen (VA)	Welders (VA)	X-Ray (VA)
Panel 2S2A-3 Added Loads	0	0	4320	0	0	240	0	0	0	0	0
Panel 2S4A-1 Added Loads	0	0	0	0	0	253341	12636	6318	0	0	0
Panel 1S2A-1 Added Loads	0	0	0	180	0	10272	0	0	0	0	0
Subtotal Connected Load	0	0	4320	180	0	263853	12636	N/A	0	0	0
Total Connected Load	>	>	>	>	>	>	>	>	>	>	280989
Demand Factor Multiplier	NEC Table 220-11	NEC Table 220-11	1.25	First 10kVA + 50% of Add'l	1.25	1.00	1.00	25% of Largest	1.00	1.00	0.50
Demand Load Totals	0	0	5400	180	0	263853	12636	1580	0	0	0
Total Dmnd (Total Load w/Demand Factors)		**>**	**>**	**>**	**>**	**>**	**>**	**>**	**>**	**>**	**283649**

Notes:
1. Maximum demand of 410.98 kVA acquired from permanently installed demand meter.
2. Existing Main Switchboard MSB-1 has 4000A bus and is protected by Ground Fault Protected MCB at 4000A.

	Exist Max Dmnd		410980
	Dmnd Factor (Exist Max Dmnd Multiplier)		1.25
		kVA	Amps
Total Connected Load + Exist Max Dmnd		691.97	832.31
Total Dmnd + Exist Max Dmnd w/Dmnd Factor		797.37	959.09

DISTRIBUTION PANEL 1S4M-1 LOAD SUMMARY AND DEMAND CALCULATION

Description	Dwelling Units (VA)	Hotels, Apt w/o Cooking (VA)	Lighting (VA)	Receptacles (VA)	Continuous Equipment (VA)	Non-Cont. Equipment (VA)	Motors (VA)	Largest Motor (VA)	Kitchen (VA)	Welders (VA)	X-Ray (VA)
Panel 2S2A-3 Added Loads	0	0	4320	0	0	240	0	0	0	0	0
Panel 2S4A-1 Added Loads	0	0	0	0	0	253341	12636	6318	0	0	0
Panel 1S2A-1 Added Loads	0	0	0	180	0	10272	0	0	0	0	0
Subtotal Connected Load	0	0	4320	180	0	263853	12636	N/A	0	0	0
Total Connected Load	>	>	>	>	>	>	>	>	>	>	280989
Demand Factor Multiplier	NEC Table 220-11	NEC Table 220-11	1.25	First 10kVA + 50% of Add'l	1.25	1.00	1.00	25% of Largest	1.00	1.00	0.50
Demand Load Totals	0	0	5400	180	0	263853	12636	1580	0	0	0
Total Dmnd (Total Load w/Demand Factors)		**>**	**>**	**>**	**>**	**>**	**>**	**>**	**>**	**>**	**283649**

Notes:
1. Maximum demand of 159.05 kVA acquired from permanently installed demand meter.
2. Existing Distr Panel 1S4M-1 has 2000A bus and is protected by Ground Fault Protected MCB at 2000A.

	Exist Max Dmnd		159050
	Dmnd Factor (Exist Max Dmnd Multiplier)		1.25
		kVA	Amps
Total Connected Load + Exist Max Dmnd		440.04	529.28
Total Dmnd + Exist Max Dmnd w/Dmnd Factor		482.46	580.31

DISTRIBUTION PANEL 2S4A-1 LOAD SUMMARY AND DEMAND CALCULATION

Description	Dwelling Units (VA)	Hotels, Apt w/o Cooking (VA)	Lighting (VA)	Receptacles (VA)	Continuous Equipment (VA)	Non-Cont. Equipment (VA)	Motors (VA)	Largest Motor (VA)	Kitchen (VA)	Welders (VA)	X-Ray (VA)
Panel 2S2A-3 Added Loads	0	0	4320	0	0	240	0	0	0	0	0
Panel 2S4A-1 Added Loads	0	0	0	0	0	253341	12636	6318	0	0	0
Subtotal Connected Load	0	0	4320	0	0	253581	12636	N/A	0	0	0
Total Connected Load	>	>	>	>	>	>	>	>	>	>	270537
Demand Factor Multiplier	NEC Table 220-11	NEC Table 220-11	1.25	First 10kVA + 50% of Add'l	1.25	1.00	1.00	25% of Largest	1.00	1.00	0.50
Demand Load Totals	0	0	5400	0	0	253581	12636	1580	0	0	0
Total Dmnd (Total Load w/Demand Factors)		**>**	**>**	**>**	**>**	**>**	**>**	**>**	**>**	**>**	**273197**

Notes:
1. Maximum demand of 84.35 kVA acquired from permanently installed demand meter.
2. Existing Distr Panel 2S4A-1 has 600A bus and is protected by MCB at 600A.

	Exist Max Dmnd		84350
	Dmnd Factor (Exist Max Dmnd Multiplier)		1.25
		kVA	Amps
Total Connected Load + Exist Max Dmnd		354.89	426.86
Total Dmnd + Exist Max Dmnd w/Dmnd Factor		378.63	455.43

DISTRIBUTION PANEL 1S2M-1 LOAD SUMMARY AND DEMAND CALCULATION

Description	Dwelling Units (VA)	Hotels, Apt w/o Cooking (VA)	Lighting (VA)	Receptacles (VA)	Continuous Equipment (VA)	Non-Cont. Equipment (VA)	Motors (VA)	Largest Motor (VA)	Kitchen (VA)	Welders (VA)	X-Ray (VA)
Panel 1S2A-1 Added Loads	0	0	0	180	0	10272	0	0	0	0	0
Subtotal Connected Load	0	0	0	180	0	10272	0	N/A	0	0	0
Total Connected Load	>	>	>	>	>	>	>	>	>	>	10452
Demand Factor Multiplier	NEC Table 220-11	NEC Table 220-11	1.25	First 10kVA + 50% of Add'l	1.25	1.00	1.00	25% of Largest	1.00	1.00	0.50
Demand Load Totals	0	0	0	180	0	10272	0	0	0	0	0
Total Dmnd (Total Load w/Demand Factors)		**>**	**>**	**>**	**>**	**>**	**>**	**>**	**>**	**>**	**10452**

Notes:
1. Maximum demand of 6.33 kVA acquired from permanently installed demand meter.
2. Existing Distr Panel 1S2M-1 has 400A bus and is protected by MCB at 400A.

	Exist Max Dmnd		6330
	Dmnd Factor (Exist Max Dmnd Multiplier)		1.25
		kVA	Amps
Total Connected Load + Exist Max Dmnd		16.78	46.58
Total Dmnd + Exist Max Dmnd w/Dmnd Factor		18.36	50.97

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ORIGINAL SHEET SIZE: 30"x42"

SCHEDULES - ELECTRICAL

E6.01

CIRCUIT BREAKER PANELBOARD

Name: **(E)2S2A-3** Bus: **150 A**
Mounting: **Surface** Main: **150 A MCB**
Skirting: **None** Volts: **120/208** NEMA Rating: **1**
Short Circuit Rating: **10,000 AIC** Phase: **3** Wire: **4** Type: **Wye**

	Breaker	Outlets			Motor			Phase				Breaker	Outlets			Motor			
Ckt#	Amp	P	Qty	Cat	HP	Notes	Location/Description	Load (VA)	A	B	C	Ckt#	Amp	P	Qty	Cat	HP	Notes	Location/Description	Load (VA)
1	20	2	1	Z	-	1	(E)DCU-1	1350	X			2	20	2	1	Z	-	1	(E)DCU-5	250
3							"	1350		X		4							"	250
5	20	2	1	Z	-	1	(E)DCU-2	1350			X	6	20	2	1	Z	-	1	(E)DCU-6	250
7							"	1350	X			8							"	250
9	20	2	1	Z	-	1	(E)DCU-3	1350		X		10	20	2	1	Z	-	1	(E)DCU-7	250
11							"	1350			X	12							"	250
13	20	2	1	Z	-	1	(E)DCU-4	1350	X			14	30	3	1	Z	-	1	(E)EF-8	790
15							"	1350		X		16							"	790
17	20	1	1	Z	-	1	(E)EF-7	40			X	18							"	790
19	20	1	1	Z	-	1	(E)EF-4	1170	X			20	20	1	1	Z	-	1	(E)EF-3	1950
21	20	1	1	Z	-	3,5	GF-1	240		X		22	20	1	1	Z	-	1	(E)EF-6	2340
23	20	1	1	Z	-	1	(E)EF-5	700			X	24	20	2	1	Z	-	1	(E)CU-4	2340
25	-	1	-	-	-	-	Space		X			26							"	2340
27	30	1	1	L	-	2,5	AHU-3L	2160		X		28	20	1	1	C	-	1	(E)fSD	500
29	30	1	1	L	-	2,6	AHU-4L	2160			X	30	-	1					Space	
31	-	1	-	-	-	-	Space		X			32	25	1	1	Z	-	1	(E)EF-1	1920
33	-	1	-	-	-	-	Space			X		34	30	3	-	-	-	-	(E)SPD	
35	20	1	1	Z	-	1	(E)BAS	500			X	36							"	
37	-	1	-	-	-	-	Space		X			38							"	
39	-	1	-	-	-	-	Space			X		40	-	1					Space	
41	-	1	-	-	-	-	Space				X	42	-	1					Space	

Connected Load Phase A: 12720 VA
Connected Load Phase B: 10580 VA
Connected Load Phase C: 9730 VA
Total Connected Load: 33030 VA
Total Demand Load: 34235 VA
(E) Maximum Demand: VA
Minimum Feeder Size: 95 Amps

	Category	Connected Load	Demand Load	Demand Factor	# or Items
D	Dwelling Units	0	0	* See Below	n/a
H	Hotel, Apt w/o Ckg	0	0	* See Below	n/a
L	Lighting	4320	5400	1.25	2
R	Receptacle<10kVA	0	0	First 10kVA + 50% Add'l	0
C	Continuous Eqpmt	500	625	1.25	1
Z	Non-Cont Eqpmt	28210	28210	1.00	17
M	Motors	0	0	1.00	0
M	Largest Motor	0	0	25% of Largest	1
K	Kitchen Equipment	0	0	1.00	0
W	Welding Equipment	0	0	1.00	0
X	X-Ray Equipment	0	0	0.50	0

* Per NEC Table 220-11

Notes:
1. Existing load to remain.
2. Load modified this project.
3. Load added this project. Provide connection to new equipment.
4. Provide circuit breaker, size as indicated.
5. Scope of work performed under Phase 1.
6. Scope of work performed under Phase 2.

CIRCUIT BREAKER PANELBOARD

Name: **(E)2S4A-1** Bus: **600 A**
Mounting: **Surface** Main: **600 A MCB**
Skirting: **None** Volts: **277/480** NEMA Rating: **1**
Short Circuit Rating: **35,000 AIC** Phase: **3** Wire: **4** Type: **Wye**

	Breaker	Outlets			Motor			Phase				Breaker	Outlets			Motor			
Ckt#	Amp	P	Qty	Cat	HP	Notes	Location/Description	Load (VA)	A	B	C	Ckt#	Amp	P	Qty	Cat	HP	Notes	Location/Description	Load (VA)
1	60	3	1	-	-	1	(E)2S4A-1B Panel	0	X			2	100	3	1	-	-	2	(E)2S2A-3 Via Xfmr 2STA-1	0
3							"	0		X		4							"	0
5							"	0			X	6							"	0
7	150	3	1	Z	-	2,3,6	CU-5	36581	X			8	20	3	1	M	5	2,3,4,5	CHWP-5	2106
9							"	36581		X		10							"	2106
11							"	36581			X	12							"	2106
13	150	3	-	-	-	-	(E)SPARE	0	X			14	35	3	1	Z	-	1	(E)CU-2	0
15							"	0		X		16							"	0
17							"	0			X	18							"	0
19	15	3	1	Z	-	1	(E)CU-1	0	X			20	20	3	1	Z	-	1	(E)SF-2	0
21							"	0		X		22							"	0
23							"	0			X	24							"	0
25	15	3	1	Z	-	1	(E)CU-3	0	X			26	20	3	1	M	5	3,5	CHWP-6	2106
27							"	0		X		28							"	2106
29							"	0			X	30							"	2106
31	100	3	1	Z	-	3,4,5	AHU-3	23933	X			32	100	3	1	Z	-	3,4,6	AHU-4	23933
33							"	23933		X		34							"	23933
35							"	23933			X	36							"	23933
37	20	3	-	-	-	-	(E)Meter	0	X			38	30	3	-	-	-	-	(E)SPD	0
39							"	0		X		40							"	0
41							"	0			X	42							"	0

Connected Load Phase A: 88659 VA
Connected Load Phase B: 88659 VA
Connected Load Phase C: 88659 VA
Total Connected Load: 265977 VA
Total Demand Load: 267557 VA
(E) Maximum Demand: VA
Minimum Feeder Size: 322 Amps

	Category	Connected Load	Demand Load	Demand Factor	# or Items
D	Dwelling Units	0	0	* See Below	n/a
H	Hotel, Apt w/o Ckg	0	0	* See Below	n/a
L	Lighting	0	0	1.25	0
R	Receptacle<10kVA	0	0	First 10kVA + 50% Add'l	0
C	Continuous Eqpmt	0	0	1.25	0
Z	Non-Cont Eqpmt	253341	253341	1.00	7
M	Motors	12636	12636	1.00	2
M	Largest Motor	6318	1579.5	25% of Largest	1
K	Kitchen Equipment	0	0	1.00	0
W	Welding Equipment	0	0	1.00	0
X	X-Ray Equipment	0	0	0.50	0

* Per NEC Table 220-11

Notes:
1. Existing load to remain.
2. Disconnect and remove load.
3. Load added this project. Provide connection to new equipment.
4. Provide circuit breaker, size as indicated.
5. Scope of work performed under Phase 1.
6. Scope of work performed under Phase 2.
7. Schedule shown for scope of work. Reference load summary for calculation.

CIRCUIT BREAKER PANELBOARD

Name: **(E)1S2A-1** Bus: **100 A**
Mounting: **Surface** Main: **100 A**
Skirting: **None** Volts: **120/208** NEMA Rating: **1**
Short Circuit Rating: **22,000 AIC** Phase: **3** Wire: **4** Type: **Wye**

	Breaker	Outlets			Motor			Phase				Breaker	Outlets			Motor			
Ckt#	Amp	P	Qty	Cat	HP	Notes	Location/Description	Load (VA)	A	B	C	Ckt#	Amp	P	Qty	Cat	HP	Notes	Location/Description	Load (VA)
1	20	1	4	R	-	1	(E)Recept 158B, 158G	720	X			2	20	1	3	R	-	1	(E)Recept 158C	540
3	20	1	4	R	-	1	(E)Recept 158B, 158G	720		X		4	20	1	2	R	-	1	(E)Recept 158C	360
5	20	1	4	R	-	1	(E)Recept 158B, 158G	720			X	6	20	1	2	R	-	1	(E)Recept 158C	360
7	20	1	3	R	-	1	(E)Recept 158D	540	X			8	20	1	1	R	-	1	(E)Recept 158C	180
9	20	1	2	R	-	1	(E)Recept 158D	360		X		10	20	1	1	R	-	1	(E)Recept 158D	180
11	20	1	2	R	-	1	(E)Recept 158D	360			X	12	20	1	2	R	-	1	(E)Recept 150B	360
13	20	1	4	R	-	1	(E)Recept 150C	720	X			14	20	1	2	R	-	1	(E)Recept 150B	360
15	20	1	2	R	-	1	(E)Recept 150C	360		X		16	20	1	2	R	-	1	(E)Recept 150A	360
17	20	1	1	Z	-	1	(E)HDCP-1 Rm 150A	500			X	18	20	1	2	R	-	1	(E)Recept 150A	360
19	20	1	1	Z	-	1	(E)VEWSDCP-1 Rm 150A	500	X			20	20	1	1	C	-	1	(E)FACP Rm 162	500
21	20	1	1	Z	-	1	(E)CACP-1 Rm 150A	500		X		22	20	1	1	C	-	1	(E)Ltg Ctrls, Nlight Rm	500
23	20	1	1	R	-	1	(E)Recept 152	180			X	24	20	1	-	-	-	-	(E)SPARE	
25	20	1	4	R	-	1	(E)Recept 162	720	X			26	20	1	-	-	-	-	(E)SPARE	
27	20	1	4	R	-	1	(E)Recept 162	720		X		28	20	1	1	C	-	1	(E)DDC Ctrl Xfmrs, HVAC	500
29	25	2	1	Z	-	2,3,4,5	DCU-8, DACU-8	2568			X	30	30	3	-	-	-	-	(E)SPD	
31						2,5	"	2568	X			32							"	
33	25	2	1	Z	-	2,3,4,5	DCU-9, DACU-9	2568		X		34							"	
35						2,5	"	2568			X	36	20	1	-	-	-	-	(E)SPARE	0
37	20	1	-	-	-	-	(E)SPARE	0	X			38	20	1	-	-	-	-	(E)SPARE	0
39	20	1	1	R	-	3,5	WP Recept, West Ext	180		X		40	20	1	-	-	-	-	(E)SPARE	0
41	20	1	-	-	-	-	(E)SPARE	0			X	42	20	1	-	-	-	-	(E)SPARE	0

Connected Load Phase A: 7348 VA
Connected Load Phase B: 7308 VA
Connected Load Phase C: 7976 VA
Total Connected Load: 22632 VA
Total Demand Load: 23007 VA
(E) Maximum Demand: VA
Minimum Feeder Size: 64 Amps

	Category	Connected Load	Demand Load	Demand Factor	# or Items
D	Dwelling Units	0	0	* See Below	n/a
H	Hotel, Apt w/o Ckg	0	0	* See Below	n/a
L	Lighting	0	0	1.25	0
R	Receptacle<10kVA	9360	9360	First 10kVA + 50% Add'l	52
C	Continuous Eqpmt	1500	1875	1.25	3
Z	Non-Cont Eqpmt	11772	11772	1.00	5
M	Motors	0	0	1.00	0
M	Largest Motor	0	0	25% of Largest	1
K	Kitchen Equipment	0	0	1.00	0
W	Welding Equipment	0	0	1.00	0
X	X-Ray Equipment	0	0	0.50	0

* Per NEC Table 220-11

Notes:
1. Existing load to remain.
2. Disconnect and remove existing spare circuit breaker.
3. Load added this project. Provide connection to new equipment.
4. Provide circuit breaker, size as indicated.
5. Scope of work performed under ALTERNATE 1.

CIRCUIT BREAKER PANELBOARD

Name: **(E)2S24A-1B** Bus: **60 A**
Mounting: **Surface** Main: **MLO**
Skirting: **None** Volts: **120/208** NEMA Rating: **1**
Short Circuit Rating: **35,000 AIC** Phase: **3** Wire: **4** Type: **Wye**

	Breaker	Outlets			Motor			Phase				Breaker	Outlets			Motor			
Ckt#	Amp	P	Qty	Cat	HP	Notes	Location/Description	Load (VA)	A	B	C	Ckt#	Amp	P	Qty	Cat	HP	Notes	Location/Description	Load (VA)
1	20	2	-	-	-	2	SPARE, GFCI	0	X			2	20	2	-	-	-	2	SPARE, GFCI	0
3							"	0		X		4							"	0
5	20	2	-	-	-	2	SPARE, GFCI	0			X	6	20	2	-	-	-	-	(E)SPARE, GFCI	0
7							"	0	X			8							"	0
9	20	2	-	-	-	2	SPARE, GFCI	0		X		10	20	2	-	-	-	-	(E)SPARE, GFCI	0
11							"	0			X	12							"	0
13	-	3	-	-	-	-	Space	0	X			14	-	3	-	-	-	-	Space	0
15							"	0		X		16							"	0
17							"	0			X	18							"	0
19							END OF PANEL		X			20							END OF PANEL	
21										X		22								
23											X	24								
25									X			26								
27										X		28								
29											X	30								
31									X			32								
33										X		34								
35											X	36								
37									X			38								
39										X		40								
41											X	42								

Connected Load Phase A: 0 VA
Connected Load Phase B: 0 VA
Connected Load Phase C: 0 VA
Total Connected Load: 0 VA
Total Demand Load: 0 VA
(E) Maximum Demand: VA
Minimum Feeder Size: 0 Amps

	Category	Connected Load	Demand Load	Demand Factor	# or Items
D	Dwelling Units	0	0	* See Below	n/a
H	Hotel, Apt w/o Ckg	0	0	* See Below	n/a
L	Lighting	0	0	1.25	0
R	Receptacle<10kVA	0	0	First 10kVA + 50% Add'l	0
C	Continuous Eqpmt	0	0	1.25	0
Z	Non-Cont Eqpmt	0	0	1.00	0
M	Motors	0	0	1.00	0
M	Largest Motor	0	0	25% of Largest	1
K	Kitchen Equipment	0	0	1.00	0
W	Welding Equipment	0	0	1.00	0
X	X-Ray Equipment	0	0	0.50	0

* Per NEC Table 220-11

Notes:
1. Existing load to remain.
2. Disconnect and remove load. Turn breaker to OFF position. Label as SPARE.

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07/14/2025

CENTRAL WASHINGTON UNIVERSITY
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SAMUELSON AHU REPLACEMENT
CENTRAL WASHINGTON UNIVERSITY
PROJECT NO. 17456-02
400 E. University Way, Ellensburg, WA 98926

DATE: 07-14-2025 DESCRIPTION
ISSUE: CONSTRUCTION DOCUMENTS
PROJECT: 2025.702.01
DRAWN: AJL
CHECKED: JRE
ORIGINAL SHEET SIZE: 30"x42"

SCHEDULES - ELECTRICAL

E6.02

General Structural Notes

(THE FOLLOWING APPLY UNLESS SHOWN OTHERWISE ON THE DRAWINGS.)

CRITERIA:

1. ALL MATERIALS, WORKMANSHIP, DESIGN, AND CONSTRUCTION SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS, AND THE INTERNATIONAL BUILDING CODE (IBC) WITH WASHINGTON STATE ADMINISTRATIVE CODE AMENDMENTS, 2021 EDITION.

2. THE EXISTING STRUCTURE HAS NOT BEEN EVALUATED OR STRENGTHENED TO CONFORM TO CURRENT SEISMIC CODE REQUIREMENTS AS PART OF THIS PROJECT SCOPE. THE ALTERATIONS SHOWN ARE IN CONFORMANCE WITH SECTIONS 502 AND 503 OF THE INTERNATIONAL EXISTING BUILDING CODE (IEBC), 2021 EDITION.

3. DESIGN LOADING CRITERIA:

   RISK CATEGORY IBC TABLE 1604.5 III

4. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS AND ALL OTHER CONTRACT DOCUMENTS FOR BIDDING AND CONSTRUCTION. CONTRACTOR SHALL VERIFY DIMENSIONS AND CONDITIONS FOR COMPATIBILITY AND SHALL NOTIFY ARCHITECT OF ALL DISCREPANCIES PRIOR TO CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE BUILDING LAYOUT DIMENSIONS (GRID LAYOUTS, SITE COORDINATES, ETC.) AMONGST ALL TRADES, INCLUDING SHOP FABRICATED ITEMS.

5. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS, MEMBER SIZES AND CONDITIONS PRIOR TO COMMENCING ANY WORK AND PRIOR TO SUBMITTING SHOP DRAWINGS. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS ARE INTENDED AS GUIDELINES ONLY AND MUST BE VERIFIED. THE EXISTING CONDITIONS SHOWN ON THE DRAWINGS ARE BASED EITHER ON SITE OBSERVATION, ORIGINAL DRAWINGS OR WERE ASSUMED BASED ON EXPECTED CONDITIONS. IF THE EXISTING CONDITIONS DO NOT CLOSELY MATCH THE CONDITIONS SHOWN ON THE DRAWINGS, OR IF THE EXISTING MATERIALS ARE OF QUESTIONABLE OR SUBSTANDARD QUALITY, NOTIFY THE ENGINEER PRIOR TO COMMENCING ANY WORK.

6. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING, BOTH FOR VERTICAL LOADS AND LATERAL STABILITY, FOR THE STRUCTURE AND STRUCTURAL COMPONENTS UNTIL ALL FINAL CONNECTIONS HAVE BEEN COMPLETED IN ACCORDANCE WITH THE DRAWINGS.

7. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED TO PERFORM THE WORK.

8. CONTRACTOR-INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO FABRICATION OR CONSTRUCTION. CHANGES SHOWN ONLY ON SHOP DRAWINGS WILL NOT SATISFY THIS REQUIREMENT.

9. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND THE STRUCTURAL ENGINEER.

10. ALL STRUCTURAL SYSTEMS COMPOSED OF COMPONENTS TO BE FIELD ERECTED SHALL BE SUPERVISED BY THE SUPPLIER DURING MANUFACTURING, DELIVERY, HANDLING, STORAGE AND ERECTION IN ACCORDANCE WITH INSTRUCTIONS PREPARED BY THE SUPPLIER.

11. SHOP DRAWINGS FOR STRUCTURAL STEEL SHALL BE SUBMITTED TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR REVIEW PRIOR TO FABRICATION OF THESE ITEMS.

12. SHOP DRAWING REVIEW: DIMENSIONS AND QUANTITIES ARE NOT REVIEWED BY THE ENGINEER OF RECORD, AND THEREFORE MUST BE VERIFIED BY THE CONTRACTOR. THE CONTRACTOR SHALL REVIEW AND STAMP DRAWINGS PRIOR TO REVIEW BY ENGINEER OF RECORD. SUBMITTALS SHALL BE SUBMITTED ELECTRONICALLY IN PDF FORMAT.

    SHOP DRAWING SUBMITTALS PROCESSED BY THE ENGINEER ARE NOT CHANGE ORDERS. THE PURPOSE OF SHOP DRAWING SUBMITTALS BY THE CONTRACTOR IS TO DEMONSTRATE TO THE ENGINEER THAT THE CONTRACTOR UNDERSTANDS THE DESIGN CONCEPT BY INDICATING WHICH MATERIAL IS INTENDED TO BE FURNISHED AND INSTALLED AND BY DETAILING THE INTENDED FABRICATION AND INSTALLATION METHODS. IF DEVIATIONS, DISCREPANCIES, OR CONFLICTS BETWEEN SHOP DRAWING SUBMITTALS AND THE CONTRACT DOCUMENTS ARE DISCOVERED EITHER PRIOR TO OR AFTER SHOP DRAWING SUBMITTALS ARE PROCESSED BY THE ENGINEER, THE DESIGN DRAWINGS AND SPECIFICATIONS SHALL CONTROL AND SHALL BE FOLLOWED.

13. DEFERRED SUBMITTALS SHALL BE DESIGNED BY AN ENGINEER REGISTERED IN THE STATE OF WASHINGTON. IT IS CONTRACTOR'S RESPONSIBILITY TO VERIFY THE SUBMITTAL AND SCHEDULE REQUIREMENTS WITH THE LOCAL JURISDICTION. THE COMPONENT DESIGNER SHALL BE A REGISTERED STRUCTURAL ENGINEER IF REQUIRED BY THE BUILDING OFFICIAL OF THE LOCAL JURISDICTION. BUILDING COMPONENT SUBMITTALS SHALL INCLUDE THE DESIGNING PROFESSIONAL ENGINEER'S STAMP AND SHALL BE APPROVED BY THE COMPONENT DESIGNER PRIOR TO CURSORY REVIEW BY THE ENGINEER OF RECORD FOR LOADS IMPOSED ON THE BASIC STRUCTURE. THE COMPONENT DESIGNER IS RESPONSIBLE FOR CODE CONFORMANCE PER ASCE 7-16 CHAPTER 13, INCLUDING ACCOMMODATION FOR STRUCTURAL RELATIVE DISPLACEMENTS PER SECTION 13.3.2 AND ALL NECESSARY BRACING, SUPPORTS OR CONNECTIONS NOT SPECIFICALLY CALLED OUT ON THE ARCHITECTURAL OR STRUCTURAL DRAWINGS. SEE THE DESIGN LOADING CRITERIA FOR BUILDING DISPLACEMENTS AS REQUIRED. DEFERRED SUBMITTALS SHALL INDICATE LOCATION, MAGNITUDE AND DIRECTION OF ALL LOADS IMPOSED ON BASIC STRUCTURE. DESIGN CALCULATIONS SHALL BE INCLUDED IN THE SUBMITTAL. THE CONTRACTOR SHALL FORWARD DEFERRED SUBMITTALS TO THE BUILDING OFFICIAL WHERE REQUIRED.

    THE FOLLOWING BUILDING COMPONENTS SHALL BE DEFERRED SUBMITTALS FOR THIS PROJECT:
    MECHANICAL & ELECTRICAL COMPONENTS & DISTRIBUTION SYSTEMS (SEE NOTE 14)

14. MECHANICAL & ELECTRICAL COMPONENTS & DISTRIBUTION SYSTEMS DESIGN FOR CODE PRESCRIBED GRAVITY AND SEISMIC/WIND LOADS SHALL BE PROVIDED BY AN ENGINEER REGISTERED IN THE STATE OF WASHINGTON, EXCEPT FOR ELEMENTS SPECIFICALLY SHOWN AND DETAILED ON THE STRUCTURAL DRAWINGS. THE MECHANICAL/ELECTRICAL CONTRACTOR MUST HIRE THE ENGINEER AND IS RESPONSIBLE FOR ALL COSTS RELATED TO THE PURCHASE AND INSTALLATION OF NECESSARY SUPPORTS, BRACING AND ANCHORAGE. SEISMIC BRACING AND ANCHORAGE DESIGN SHALL COMPLY WITH CHAPTER 13 OF ASCE 7-16. SEE TABLE 13.6-1 FOR APPLICABLE COMPONENTS AND DISTRIBUTION SYSTEMS SEISMIC DESIGN COEFFICIENTS. WHERE APPLICABLE, THE DESIGN SHALL ACCOMMODATE RELATIVE DISPLACEMENTS PER SECTION 13.6.4.2. SEE GENERAL STRUCTURAL NOTE 13 FOR ADDITIONAL INFORMATION.

STATEMENT OF SPECIAL INSPECTIONS (STRUCTURAL):

13. STATEMENT OF SPECIAL INSPECTIONS - STRUCTURAL ITEMS (SEISMIC DESIGN CATEGORY D):

    DEFINITIONS:
    THE SEISMIC FORCE RESISTING SYSTEM FOR THIS STRUCTURE CONSISTS PRIMARILY OF EXISTING SHEAR WALLS, FLOOR/ROOF DIAPHRAGMS, AND STRUT MEMBERS.

    SPECIAL INSPECTIONS AND TESTING SHALL BE PERFORMED BY THE OWNER APPOINTED INSPECTION AGENCY IN ACCORDANCE WITH CHAPTER 17 OF THE IBC WITH REPORTS PER IBC SECTION 1704.2.4 SUBMITTED TO THE OWNER, ARCHITECT, STRUCTURAL ENGINEER, CONTRACTOR, AND BUILDING OFFICIAL FOR EACH DAY SPECIAL INSPECTIONS OR TESTING IS PERFORMED. THESE INSPECTIONS ARE IN ADDITION TO THE INSPECTIONS SPECIFIED IN IBC SECTION 110. SEE TABLES BELOW FOR ADDITIONAL INFORMATION.

STRUCTURAL ITEMS	SPECIAL INSPECTION FREQUENCY	IBC REFERENCE
STRUCTURAL STEEL FABRICATION, ERECTION, AND NONDESTRUCTIVE TESTING*		
SPECIAL INSPECTION AND NONDESTRUCTIVE TESTING FOR STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE QUALITY ASSURANCE (QA) INSPECTION REQUIREMENTS OF AISC 360-16 CHAPTER N. CONTINUOUS INSPECTION SHALL BE PERFORMED AT "P" TASKS DEFINED IN AISC 360-16; PERIODIC INSPECTION SHALL BE PERFORMED AT "O" TASKS DEFINED IN AISC 360-16. ADDITIONAL SPECIAL INSPECTION AND TESTING REQUIREMENTS FOR THE STRUCTURAL STEEL SEISMIC SYSTEM SHALL BE PER AISC 341-16 CHAPTER J AS INDICATED BELOW.		
SHOP AND FIELD WELDING	CONTINUOUS/PERIODIC (QA PER AISC 360 CH. N5.4)	1705.2.1
HIGH STRENGTH BOLTING	CONTINUOUS/PERIODIC (QA AISC 360 CH. N5.6)	1705.2.1
MATERIAL VERIFICATION (IDENTIFICATION MARKS AND MANUFACTURER'S TEST REPORTS)	PERIODIC	1705.2.1
EXPANSION BOLTS, INSERTS & CONCRETE SCREWS	PERIODIC INCLUDING TORQUE TESTS IN ACCORDANCE WITH APPROVED ICC-ES REPORTS	TABLE 1705.3 ITEM 4
EPOXY GROUTED RODS OR REBAR	PERIODIC INCLUDING INSPECTION OF EMBEDMENT DEPTH AND HOLE CLEANLINESS PRIOR TO ALL INSTALLATIONS (CONTINUOUS FOR UPWARDLY INCLINED ANCHORS)	TABLE 1705.3 ITEM 4, ACI 318-14 SECTION 17.8

    * STRUCTURAL STEEL QUALITY ASSURANCE INSPECTIONS, EXCEPT NONDESTRUCTIVE TESTING, MAY BE WAIVED IF APPROVED BY THE OWNER AND BUILDING OFFICIAL FOR WORK PERFORMED ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION IN ACCORDANCE WITH IBC SECTION 1704.2.5.1.

    STRUCTURAL OBSERVATION PER IBC SECTION 1704.6 IS NOT REQUIRED FOR THIS STRUCTURE.

ANCHORAGE:

14. EPOXY-GROUTED RODS OR REBAR TO CONCRETE SPECIFIED ON THE DRAWINGS SHALL BE ONE OF THE FOLLOWING INSTALLED IN STRICT ACCORDANCE WITH THE ICC-ES REPORTS INDICATED AND MANUFACTURER'S INSTRUCTIONS INCLUDING MINIMUM EMBED REQUIREMENTS: "SET-3G" AS MANUFACTURED BY SIMPSON STRONG-TIE COMPANY, INC. (ICC-ES NO. 2508); OR "HIT-HY 200" AS MANUFACTURED BY HILTI, INC. (ICC-ES NO. 3187, "SAFE-SET" INSTALLATION WITH HOLLOW CARBIDE DRILL BIT IS PERMITTED); OR "PURE110+" AS MANUFACTURED BY DEWALT (ICC-ES NO. 3298), OR "AC200+" AS MANUFACTURED BY DEWALT (ICC-ES NO. 4027). SUBSTITUTES PROPOSED BY CONTRACTOR SHALL BE SUBMITTED FOR REVIEW WITH ICC-ES REPORTS INDICATING EQUIVALENT OR GREATER LOAD CAPACITIES. IN ADDITION, SUBSTITUTIONS SHALL MEET ICC-ES ACCEPTANCE CRITERIA AC308. SPECIAL INSPECTION OF EPOXY-GROUTED ANCHOR INSTALLATION IS REQUIRED. NOTIFY ENGINEER IF ANCHOR LOCATIONS CONFLICT WITH REINFORCING STEEL – DO NOT CUT REINFORCING OR REDUCE EMBEDMENT DEPTHS WITHOUT PRIOR APPROVAL. INSTALLATION OF ADHESIVE ANCHORS HORIZONTALLY OR UPWARDLY INCLINED TO SUPPORT SUSTAINED TENSION LOADS SHALL BE PERFORMED BY CERTIFIED PERSONNEL IN CONFORMANCE TO ACI 318-14 SECTION 17.8.2.2. HOLES SHALL BE HAMMER DRILLED AND DRY.

    EPOXY GROUTED RODS OR REBAR SHALL NOT BE USED AS SUBSTITUTES FOR CAST-IN-PLACE ANCHOR BOLTS, THREADED RODS, OR REINFORCING STEEL UNLESS SPECIFICALLY APPROVED BY THE STRUCTURAL ENGINEER. FIELD FIXES OR OTHER CONDITIONS NOT ADDRESSED IN THE DOCUMENTS MUST BE SPECIFICALLY APPROVED BY THE STRUCTURAL ENGINEER, INCLUDING EMBEDMENT DEPTHS.

    UNLESS OTHERWISE NOTED, PROVIDE THE FOLLOWING EMBEDMENT DEPTHS FOR ANCHORS AT CONCRETE:

    3/8"Ø ROD OR #3 BAR . . . . . 4"
    1/2"Ø ROD OR #4 BAR . . . . . 5"
    5/8"Ø ROD OR #5 BAR . . . . . 7"
    3/4"Ø ROD OR #6 BAR . . . . . 9"
    7/8"Ø ROD OR #7 BAR . . . . . 12"
    1"Ø ROD OR #8 BAR . . . . . 15"

15. CONCRETE SCREW ANCHORS SHALL BE ONE OF THE FOLLOWING INSTALLED IN STRICT ACCORDANCE WITH THE ICC-ES REPORTS INDICATED AND MANUFACTURER'S INSTRUCTIONS INCLUDING MINIMUM EMBED REQUIREMENTS: "TITEN HD" AS MANUFACTURED BY SIMPSON STRONG-TIE COMPANY (ICC-ES NO. 2713); OR "KWIK HUS-EZ" AS MANUFACTURED BY HILTI, INC. (ICC-ES NO. 3027); OR "SCREW-BOLT+" AS MANUFACTURED BY DEWALT (ICC-ES NO. 3889). SUBSTITUTES PROPOSED BY CONTRACTOR SHALL BE SUBMITTED FOR REVIEW WITH ICC-ES REPORTS INDICATING EQUIVALENT OR GREATER LOAD CAPACITIES. IN ADDITION, SUBSTITUTIONS SHALL MEET ICC-ES ACCEPTANCE CRITERIA AC193. SPECIAL INSPECTION IS REQUIRED FOR ALL CONCRETE SCREW ANCHOR INSTALLATION. CONCRETE SCREW ANCHORS SHALL NOT BE USED AS SUBSTITUTES FOR EMBEDDED ANCHOR BOLTS OR EXPANSION BOLTS UNLESS SPECIFICALLY APPROVED BY THE STRUCTURAL ENGINEER. NOTIFY ENGINEER IF SCREW ANCHOR LOCATIONS CONFLICT WITH REINFORCING STEEL – DO NOT CUT REINFORCING OR REDUCE EMBEDMENT DEPTHS WITHOUT PRIOR APPROVAL.

STEEL:

16. STRUCTURAL STEEL DESIGN, FABRICATION, AND ERECTION SHALL BE BASED ON THE LATEST EDITIONS OF THE A.I.S.C. SPECIFICATIONS AND CODES:

    1. SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS-ALLOWABLE STRESS AND PLASTIC DESIGN, OR LOAD AND RESISTANCE FACTOR DESIGN SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS.

    2. CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES, ADOPTED JUNE 15, 2016.

       IN REFERENCE TO SECTION 4.1, THE FABRICATOR SHALL NOT ASSUME BID PACKAGES CONSTITUTE RELEASING THE DRAWINGS FOR CONSTRUCTION WITHOUT EXPLICIT DIRECTION TO DO SO BY THE OWNER.

    3. SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS.

    4. QUALITY CONTROL SHALL BE IN ACCORDANCE WITH AISC 360 CHAPTER N (AISC 341 CHAPTER J FOR STEEL SEISMIC SYSTEM).

    CONTRACTOR SHALL ALSO COMPLY WITH OSHA REGULATION 29 CFR PART 1926 SUBPART R - STEEL ERECTION, PUBLISHED JANUARY 18, 2001. MISCELLANEOUS PLATES FOR GUYING CABLE ATTACHMENTS, TEMPORARY JOIST BRACING, ETC. SHALL BE ADDED AS REQUIRED. CONTRACTOR SHALL EVALUATE COLUMNS AND PROVIDE ADEQUATE BASE PLATE SHIMS, ADDITIONAL TEMPORARY ERECTION BOLTS/CLIPS, GUYS, OR TEMPORARY BRACING AS REQUIRED PER SECTION 1926.755.

17. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING REQUIREMENTS: WIDE FLANGE AND WT STEEL SHAPES SHALL CONFORM TO ASTM A992, Fy = 50 KSI. ANGLES, CHANNELS, AND RODS SHALL CONFORM TO ASTM A36, Fy = 36 KSI. STEEL PLATES SHALL CONFORM TO ASTM A572, Fy = 50 KSI. STEEL PIPE SHALL CONFORM TO ASTM A53, TYPE E OR S, GRADE B, Fy = 35 KSI. STRUCTURAL TUBING (HSS) SHALL CONFORM TO ASTM A500, GRADE C, Fy = 50 KSI. ANCHOR BOLTS OR ANCHOR RODS SHALL CONFORM TO ASTM F1554 (36 KSI). STEEL-TO-STEEL CONNECTION BOLTS SHALL CONFORM TO ASTM A325-N. THREADED RODS FOR EPOXY GROUTED CONNECTIONS SHALL CONFORM TO ASTM A36 OR ASTM F1554 (36 KSI).

18. DIMENSIONAL TOLERANCE FOR STRUCTURAL STEEL MEMBERS SHALL BE PER THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES, SECTION 6.4 AND ASTM SPECIFICATION A6. UNLESS SPECIFICALLY ALLOWED BY THE ENGINEER, COLUMN MEMBERS SHALL NOT BE MODIFIED BY THE ROTARY STRAIGHTENING PROCESS.

19. BOLTS IN CONNECTIONS NOT SPECIFIED AS SLIP-CRITICAL NEED ONLY BE TIGHTENED TO THE SNUG TIGHT CONDITION. THE SNUG TIGHT CONDITION IS DEFINED AS THE TIGHTNESS THAT EXISTS WHEN ALL PLIES IN A JOINT ARE IN FIRM CONTACT. IF A SLOTTED HOLE OCCURS IN AN OUTER PLY, A FLAT HARDENED WASHER OR COMMON PLATE WASHER SHALL BE INSTALLED OVER THE SLOT.

20. HOLE SIZES IN STEEL MEMBERS FOR CONNECTIONS TO CONCRETE OR MASONRY SHALL BE AS FOLLOWS UNLESS SPECIFIED OTHERWISE ON THE DRAWINGS:

ANCHOR TYPE	MAXIMUM HOLE DIA. OVER NOMINAL BOLT DIA.
CAST-IN-PLACE ANCHOR BOLTS	1/16" *
EXPANSION BOLTS	1/16" *
EPOXY GROUTED BOLTS	1/8" *

    * USE OF LARGER HOLES WOULD REQUIRE THE USE OF WELDED PLATE WASHERS AND WOULD REQUIRE PRIOR APPROVAL BY THE STRUCTURAL ENGINEER.

    HARDENED OR COMMON PLATE WASHERS ARE REQUIRED BELOW ALL NUTS WHERE OVERSIZED HOLES ARE USED AND SHALL BE SIZED TO COVER ENTIRE HOLE.

21. ALL WELDING SHALL BE IN CONFORMANCE WITH A.I.S.C. AND A.W.S. STANDARDS AND SHALL BE PERFORMED BY W.A.B.O. CERTIFIED WELDERS USING E70XX ELECTRODES. ONLY PREQUALIFIED WELDS (AS DEFINED BY A.W.S.) SHALL BE USED. DO NOT PAINT OR GALVANIZE AREAS OF PIECES TO BE FIELD WELDED, OR REMOVE PAINT AND GALVANIZING IN FIELD PRIOR TO WELDING. WELDING OF GRADE 60 REINFORCING BARS (IF REQUIRED) SHALL BE PERFORMED USING LOW HYDROGEN ELECTRODES. WELDING WITHIN 4" OF COLD BENDS IN REINFORCING STEEL IS NOT PERMITTED. SEE REINFORCEMENT NOTE FOR MATERIAL REQUIREMENTS OF WELDED BARS.

    THE WELD SYMBOLS SHOWN ON THE DRAWINGS ARE INTENDED ONLY TO AID THE CONTRACTOR IN THE DETERMINATION OF FIELD VERSUS SHOP WELDING. THE CONTRACTOR SHALL WORK WITH THE FABRICATOR AND ERECTOR TO COORDINATE THE FINAL DETERMINATION OF FIELD VERSUS SHOP WELDS TO ACCOMMODATE THE CONSTRUCTION SEQUENCING OF THE PROJECT.

SHEET INDEX

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SEATTLE, WA 98101

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07/10/25

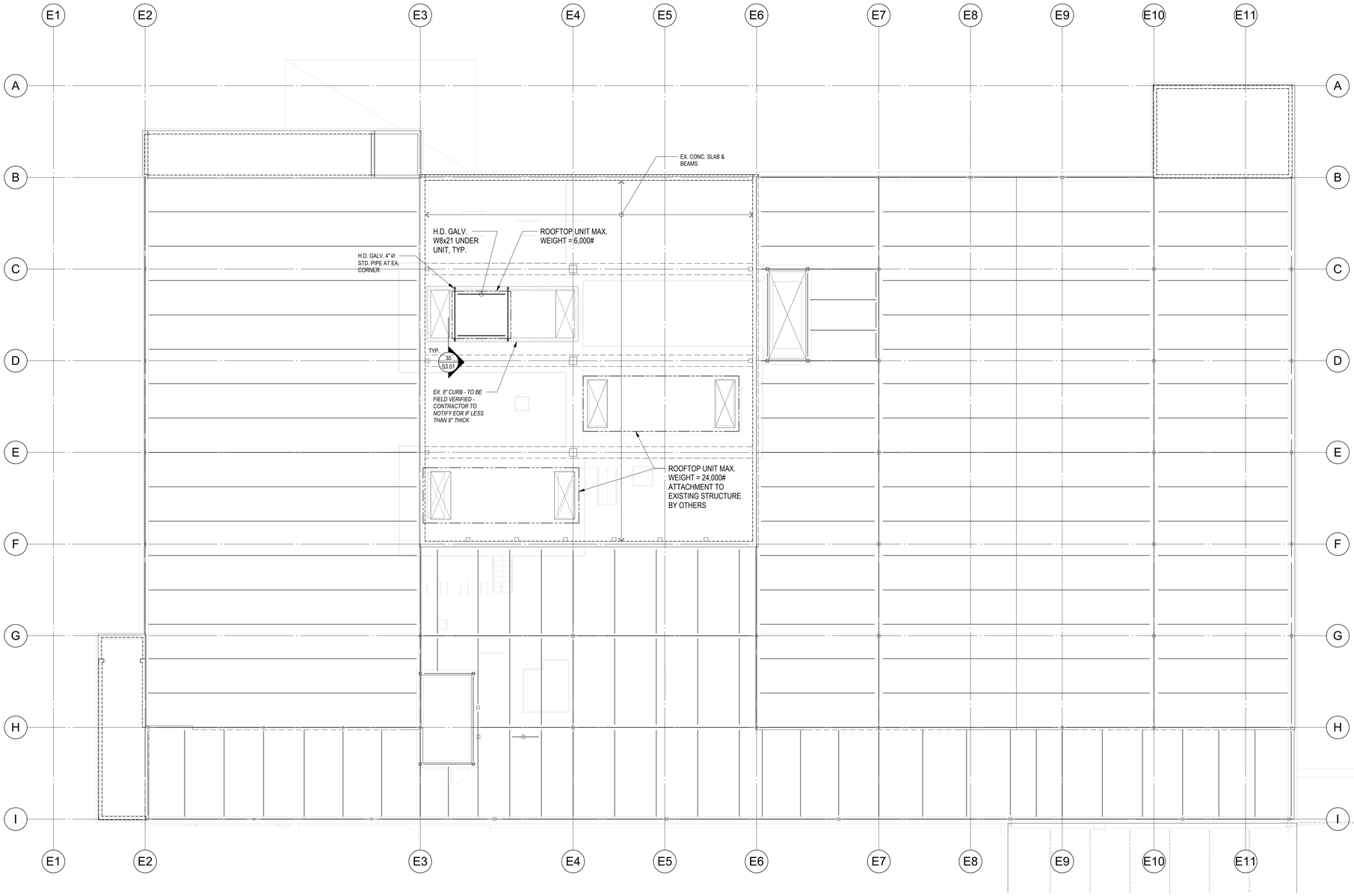
SAMUELSON AHU REPLACEMENT
CENTRAL WASHINGTON UNIVERSITY
PROJECT NO. 17456-02
400 E. University Way, Ellensburg, WA 98926

DATE:	07-14-2025 DESCRIPTION
ISSUE:	CONSTRUCTION DOCUMENTS
PROJECT:	S25166
DRAWN:	MRM
CHECKED:	YC/BWB

ORIGINAL SHEET SIZE: 30"x42"

GENERAL STRUCTURAL NOTES

S0.01



(E) ROOF

1/8" = 1'-0"

NOTE: ALL DIMENSIONS, ELEVATIONS, AND LOCATIONS OF EXISTING STRUCTURAL COMPONENTS ARE BASED ON INFORMATION GATHERED FROM ORIGINAL DRAWINGS OR CURSORY FIELD MEASUREMENTS AND ARE SHOWN FOR INFORMATION ONLY. CONTRACTOR SHALL FIELD MEASURE AND VERIFY ALL CONDITIONS PRIOR TO COMMENCING ANY WORK. NOTIFY ENGINEER WHERE CONDITIONS VARY FROM THOSE SHOWN. DO NOT CUT ANY EXISTING REINFORCEMENT.

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BENJAMIN W. RATLIFF — STATE OF WASHINGTON — 69025 — PROFESSIONAL ENGINEER — 07/10/25

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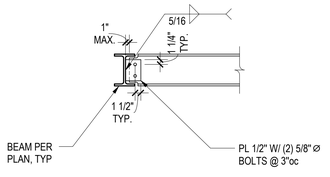
PLAN

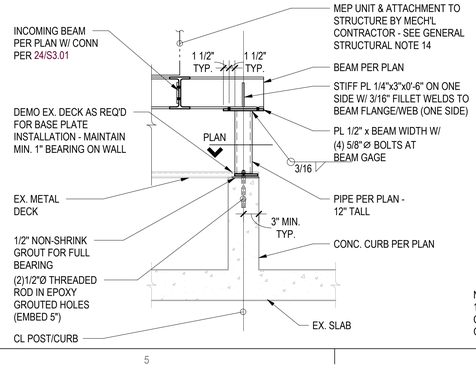
S1.01

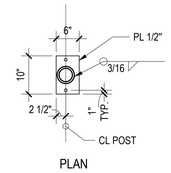
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30



NOTES:
1. ALL STEEL AND STEEL CONNECTIONS SHALL BE HOT DIP GALVANIZED, U.O.N.

5402





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5401

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DETAILS

S3.01