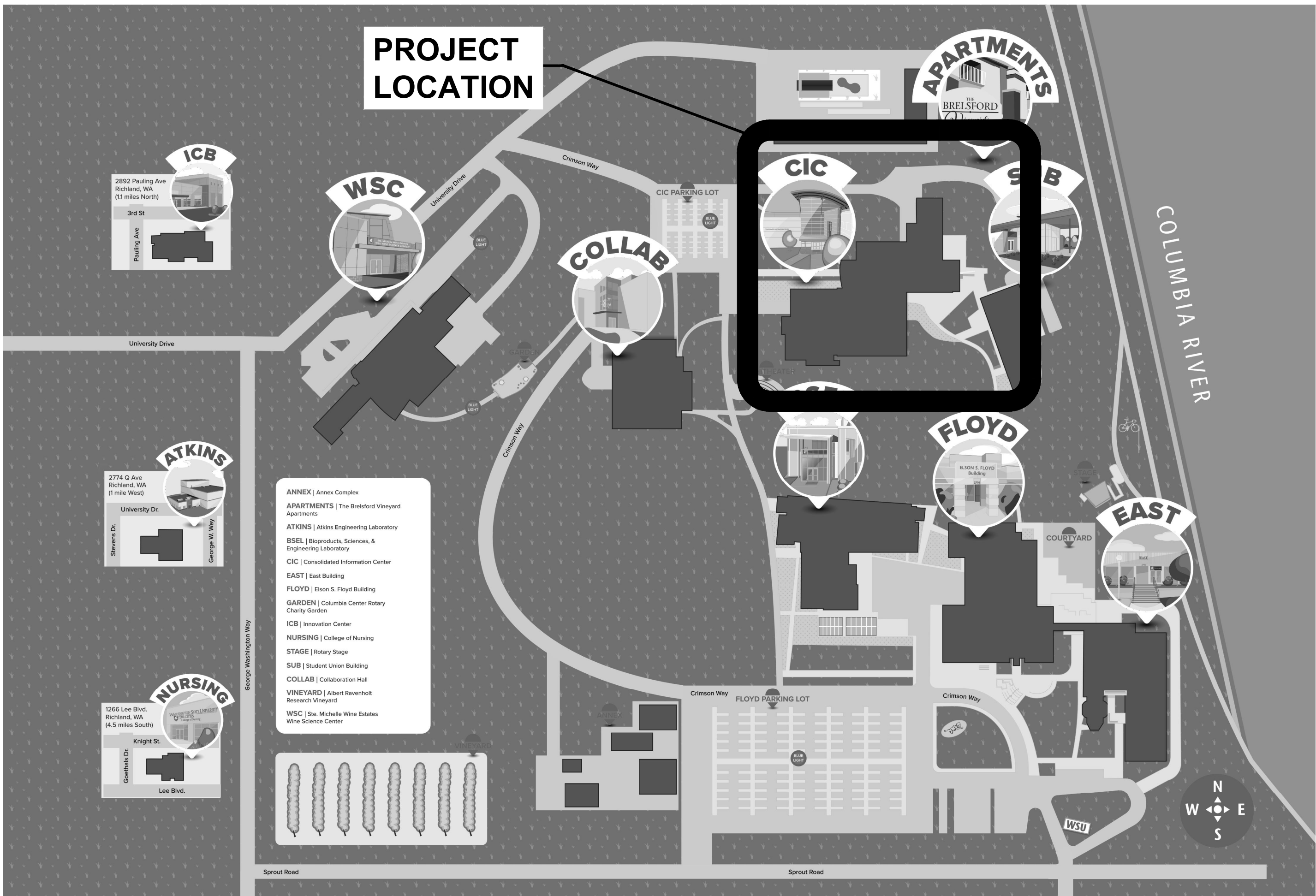


CIC BUILDING (9512)

CHILLED WATER UPGRADES

PROJECT 1744-2022

Washington State University Tri-Cities



KEY PLAN - TRI-CITIES CAMPUS

SCALE: N.T.S.

GENERAL NOTES

1. THE CONTRACTOR SHALL NOTE THIS IS AN OCCUPIED FACILITY. ANY USE OF OCCUPIED AREAS SHALL BE KEPT CLEAN OF CONSTRUCTION MATERIALS AT ALL TIMES.
2. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO EXECUTING ANY WORK AND SHALL NOTIFY THE DEPARTMENT OF FACILITIES OPERATIONS IN WRITING OF ANYTHING DIFFERING FROM THAT SHOWN ON THE DRAWINGS. FAILURE TO DO SO WILL CONSTITUTE THE CONTRACTOR'S ACCEPTANCE OF THE WORK AS SHOWN.
3. ALL WORK SHALL COMPLY WITH ALL CODES, ORDINANCES AND REQUIREMENTS.
4. DO NOT SCALE DRAWINGS; WRITTEN DIMENSIONS SHALL PREVAIL.
5. THE CONTRACTOR SHALL OBTAIN ALL PERMITS REQUIRED PRIOR TO ANY PHASE OF CONSTRUCTION. FEES AND ANY RELATED COSTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
6. EXISTING BUILDINGS, UTILITIES, ETC. OR PORTIONS THEREOF, WHICH ARE DAMAGED BY CONSTRUCTION OPERATIONS SHALL BE REPAIRED OR REPLACED TO THEIR ORIGINAL CONDITION, UNLESS OTHERWISE NOTED TO BE REMODELED PER THE CONTRACT DOCUMENTS.
7. EXACT LOCATIONS OF EXISTING UTILITIES ARE TO BE VERIFIED BY THE CONTRACTOR.
8. THE DUTIES OF THE OWNER/WASHINGTON STATE UNIVERSITY, ITS ENGINEER, AND ITS DESIGNATED CONSULTING ENGINEER DOES NOT INCLUDE DESIGN AND CONSTRUCTION REVIEW SERVICES RELATING TO THE CONTRACTOR'S SAFETY PRECAUTIONS OR TO THE MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED FOR THE CONTRACTOR TO PERFORM HIS WORK.
9. THE PLANS ARE DIAGRAMMATIC AND DO NOT ATTEMPT TO SHOW ALL DETAILS OF CONSTRUCTION.
10. THE CONTRACTOR SHALL THOROUGHLY EXAMINE THE PROJECT SITE TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS, CONNECTION POINTS, ACCESS LIMITATIONS, AND OVERALL CONDITION OF THE EXISTING SYSTEMS PRIOR TO COMMENCEMENT OF WORK.
11. CONTRACTOR SHALL COORDINATE AND COMMUNICATE THEIR WORK WITH THE OCCUPANTS AND WSU PROJECT MANAGER WITH REGARD TO SCHEDULE.
12. COORDINATE SHUT DOWN OF UTILITIES WITH THE OWNER A MINIMUM OF 14 DAYS IN ADVANCE.
13. ALL MATERIALS REMOVED DURING DEMOLITION SHALL BE SALVAGED TO SURPLUS OR PROPERLY DISPOSED UNLESS OTHERWISE NOTED.
14. COORDINATE WITH SPECIFICATIONS. IN CASE OF CONFLICT BETWEEN SPECIFICATIONS AND DRAWINGS THE MORE STRINGENT SHALL APPLY.

PROJECT CONTACTS

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MSI ENGINEERS
AARON DONNELLY
PRINCIPAL MECHANICAL ENGINEER
509-624-1050
AARON@MSI-ENGINEERS.COM

ELECTRICAL PLAN REVIEW NOTE: The loads in this submittal labeled as "FUTURE or SPARE" have no basis in NEC load calculations. ALL SUCH LOADS HAVE NOT BEEN REVIEWED OR APPROVED. Any future alterations labeled as spare or future will require Plan Review with specific equipment load data presented at that time.

Electrical Plan Review Note: Limited Energy and Telecommunication Systems are not subject to Electrical Plan Review. The permit fees shown do not include the fees required for these systems

INDEX of DRAWINGS

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M-001	LEGENDS, ABBREVIATIONS, GENERAL NOTES
M-002	MECHANICAL EQUIPMENT SCHEDULES
M-101	FIRST FLOOR NORTH - MECHANICAL DEMO
M-102	FIRST FLOOR SOUTH - MECHANICAL DEMO
M-103	MECH ROOM AND MEZZANINE LEVEL - MECHANICAL DEMO
M-201	FIRST FLOOR NORTH - MECHANICAL
M-202	FIRST FLOOR SOUTH - MECHANICAL
M-203	MECH ROOM AND MEZZANINE LEVEL - MECHANICAL
M-401	MECHANICAL DETAILS
M-501	SYSTEM DIAGRAMS
M-601	CONTROL DIAGRAMS
E-001	LEGENDS, ABBREVIATIONS, GENERAL NOTES
E-101	FIRST FLOOR NORTH - ELECTRICAL - DEMO
E-102	MECH ROOM AND MEZZANINE LEVEL - ELECTRICAL DEMO
E-201	FIRST FLOOR NORTH - ELECTRICAL
E-202	MECH ROOM - ELECTRICAL
E-501	ELECTRICAL SINGLE-LINE AND DETAILS
E-502	ELECTRICAL DETAILS

BUILDING INFORMATION

BUILDING CODE OF RECORD:
2018 INTERNATIONAL BUILDING CODE
2018 UNIFORM PLUMBING CODE
2018 NATIONAL ELECTRICAL CODE
2018 WASHINGTON STATE ENERGY CODE COMMERCIAL PROVISIONS
2018 INTERNATIONAL EXISTING BUILDING CODE
2018 INTERNATIONAL MECHANICAL CODE
2018 INTERNATIONAL FIRE CODE

PROJECT LOCATION:
CONSOLIDATED INFORMATION BLDG (CIC)
WSU TRI-CITIES CAMPUS
2770 UNIVERSITY DR
RICHLAND, WASHINGTON 99354

SCOPE OF WORK:
THE SCOPE OF THE PROJECT IS TO REPLACE THE CHILLER, IMPLEMENT SELECTIVE UPGRADES TO THE CHILLED WATER PIPING AND CONTROL SYSTEMS, AND TO RECOMMISSION THE SYSTEM.

Washington State Department of
Labor & Industries

Electrical Plan Review

☐ APPROVED ☒ APPROVED AS NOTED

DATE: 9/27/2022 EPR#: 3-58644
BY: Steve Shanholz

SUBJECT TO PERMIT FEE: \$335.40
PROJECT SUBJECT TO CODE AND FIELD INSPECTION

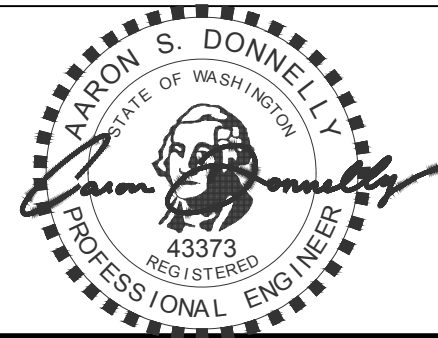
SHEET 1 OF 5 SHEETS

DESIGN FIRM:



CONSULTANTS:

PROVISIONAL STAMP:



Facilities Services PH 509-335-5571
2425 E. Grimes Way FAX 509-335-9304
Pullman, Wa. 99164-1150

CONSOLIDATED INFORMATION CENTER (CIC)

CHILLED WATER UPGRADES

9512

MARK	DATE	DESCRIPTION
	08-09-2022	100% PERMIT SET
	07-07-2022	100% CD FOR OWNER REVIEW
	05-10-2022	90% CD FOR OWNER REVIEW

CAD DWG FILE: T-001

DESIGN BY: ASD

DRAWN BY: JC

CHECKED BY: ASD

PROJECT No. 1744-2022

FILE No. TBD

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SHEET TITLE

PROJECT COVER SHEET

T-001

SHEET 1 OF 19 SHEETS

FILE: P:\2021\21-61\Cad\21-61 M-002.dwg PLOT DATE: October 1, 2015, 7:47 AM ORIGINAL PAPER SIZE: 22" x 34"

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AIR COOLED CHILLER SCHEDULE

#	MFR	MODEL	TYPE	NET TONS	REFRIG	MIN CODE EER	RATED EER	MIN CODE IPLV	RATED IPLV	EVAPORATOR					QTY COMP	CAPACITY CONTROL	QTY FANS	SOUND POWER Lw db(A)	SOUND PRESSURE Lp(A)@3.3Ft	WEIGHT (LBS)	ELECTRICAL			NOTES
										TYPE	GPM	EWT (°F)	LWT (°F)	GLYCOL (%)	PD (FEET)						V/PH	MCA	MOCP	
CH-1	SMARTD	T-CLASS AD DESIGN	OIL-FREE MAG BEARING	200	R134A	9.7	13.7	16.1	26.4	SHELL/TUBE FLOODED	340	59	44	30	3	VSD 10-100%	14	88.9	69.7	16,800	480/3	286	363	①

NOTES:

- ① FEATURES, OPTIONS AND ACCESSORIES SHALL INCLUDE:
- NET CAPACITY RATED AT 115 DEGREES AMBIENT AND 30% PROPYLENE GLYCOL. EFFICIENCIES RATED AT AHRI CONDITIONS.
 - SCOR RATING OF 65KA.
 - VSD'S FACTORY INSTALLED ON CONDENSER FANS.
 - SINGLE POINT POWER CONNECTION, DISCONNECT BY DIV 26.
 - STAINLESS STEEL BASE FRAME.
 - ALUMINUM FINNED COPPER TUBES.
 - FACTORY CONTROLS WITH 12" TOUCHSCREEN AND BACNET MSTP.
 - SOUND DATA MEASURED IN ACCORDANCE WITH AHRI STANDARD 370.

PUMPS

P-#	MFR	MODEL	TYPE	SERVICE	SIZE	FLOW (GPM)	HEAD (FT)	RPM	IMP (IN)	EFF	ELECTRICAL			WT (LBS)	NOTES
											HP	V/PH	RPM		
P-1	ARMSTRONG	4300	SPLIT COUPLED VERTICAL IN-LINE	CHILLER CIRC	3X3-8	340	55	1750 VFD	8.19	77	7.5	460/3	1750	350	①
P-2	ARMSTRONG	4300	SPLIT COUPLED VERTICAL IN-LINE	CHILLED WATER	4X4-11.5	340	80	1750 VFD	9.98	73	15	460/3	1750	350	①

NOTES:

- ① TYPICAL FEATURES / OPTIONS / ACCESSORIES SHALL INCLUDE:
- PERFORMANCE BASED ON 30% GLYCOL.
 - VARIABLE FREQUENCY DRIVE. SEE SPECIFICATIONS.
 - INVERTER DUTY MOTOR
 - SUCTION DIFFUSER

VFD SCHEDULE

VFD-#	SERVICE	MFR	MODEL	ELECTRICAL			DISC. SWITCH	BYPASS SWITCH	NOTES
				HP	V/PH	RPM			
VFD-1	PUMP P-1	ABB	ACH550 OR EQUAL	7.5	460/3	1800	NONE	INTEGRAL ELECTRONIC	①②
VFD-2	PUMP P-2	ABB	ACH550 OR EQUAL	15	460/3	1800	NONE	INTEGRAL ELECTRONIC	①②

NOTES:

- ① FEATURES, OPTIONS AND ACCESSORIES SHALL INCLUDE:
- SEE SPECIFICATION SECTION 230900.
 - NO INTEGRAL DISCONNECT SWITCH/CIRCUIT BREAKER. EXISTING SWITCH IN IMMEDIATE VICINITY.
 - EMI/RFI FILTERS, 5% LINE IMPEDANCE
 - BACNET MSTP COMMUNICATIONS PROTOCOL.
- ② VFDs PROVIDED BY DIV. 23, INSTALLED AND WIRED BY DIV. 26, CONTROLLED BY DIV 23. SEE CONTROL DIAGRAMS.

EXISTING CHILLED WATER COIL DATA

EXISTING EQUIP ID	CFM	OSA CFM	EXISTING CHILLED WATER COIL								ROWS	APD IN.WG.	WPD FT	NOTES
			EDB (°F)	EWB (°F)	LDB (°F)	EWT (°F)	LWT (°F)	GPM						
AH-1	23,200	8,120	87.4	63.0	53.3	44	58	109	6	0.68	10.5			①②
AH-1A	15,000	-	80.0	57.9	63.9	44	68.2	23	4	0.12	11.2			①②
AH-2	11,250	2,000	83.8	61.4	53.1	44	58.8	53	6	0.58	13.2			①②
AH-2A	1,250	-	80.0	59.7	55.4	44	61.4	4.0	2	0.55	10.0			①②③
AH-3	21,600	8,500	88.2	63.3	53.2	44	58.3	121	6	0.01	10.6			①②
AH-3A	5,400	-	80	59.7	53.5	44	59.2	22	4	0.12	5.6			①②
AH-5	1,750	300	101	69.0	53.5	44	85	2.0	3	0.22	5.4			①②④
MAU-1	3,500	3,500	101	69.0	81.8	44	55	15.2	2	0.19	7.14			①②④
FC-1	750	150	84	62	73.0	44	55	4.5	4	NL	2.1			①②
FC-2	750	150	84	62	55	44	55	4.6	4	NL	2.1			①②
FC-3	2,800	750	86	62	55	44	55	15	NL	NL	NL			①②

NOTES:

58.9 373 = 232 TONS X 0.85 DIVERSITY FACTOR = 197 TON CHILLER LOAD

WEIGHTED AVERAGE CHW RETURN TEMP

TOTAL CONNECTED GPM

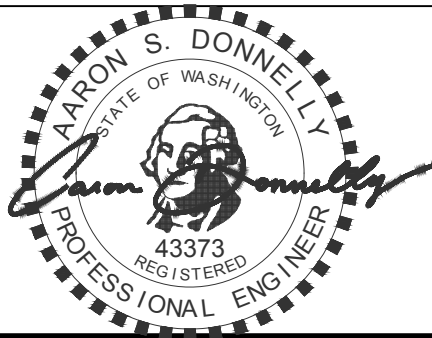
- ① EXISTING INFORMATION TAKEN DIRECTLY FROM ORIGINAL 1995 DOCUMENTS.
- ② COIL PERFORMANCE ORIGINALLY BASED ON 15% GLYCOL, BUT IS CURRENTLY AT 30% GLYCOL.
- ③ FAN IS CAPABLE OF HIGHER CFM. COIL RATED AT LOWER CFM PER ORIGINAL DOCUMENTS. VERIFY.
- ④ OSA NOT LISTED ON ORIGINAL DOCUMENTS. COIL RATING SUGGESTS 100% OSA. VERIFY.

DESIGN FIRM:



CONSULTANTS:

PROVISIONAL STAMP:



Facilities Services PH 509-335-5571
2425 E. Grimes Way FAX 509-335-9304
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CONSOLIDATED
INFORMATION CENTER
(CIC)

CHILLED WATER UPGRADES

9512

08-09-2022	100% PERMIT SET	
07-07-2022	100% CD FOR OWNER REVIEW	
05-10-2022	90% CD FOR OWNER REVIEW	
MARK	DATE	DESCRIPTION

CAD DWG FILE: M-001	
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DRAWN BY: JC	CHECKED BY: ASD
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SHEET TITLE

MECHANICAL
EQUIPMENT
SCHEDULES

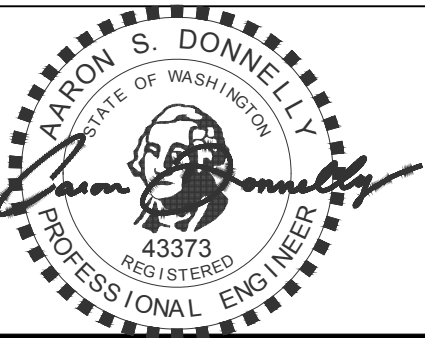
M-002

SHEET 3 OF 19 SHEETS

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Pullman, Wa. 99164-1150

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CHILLED WATER UPGRADES

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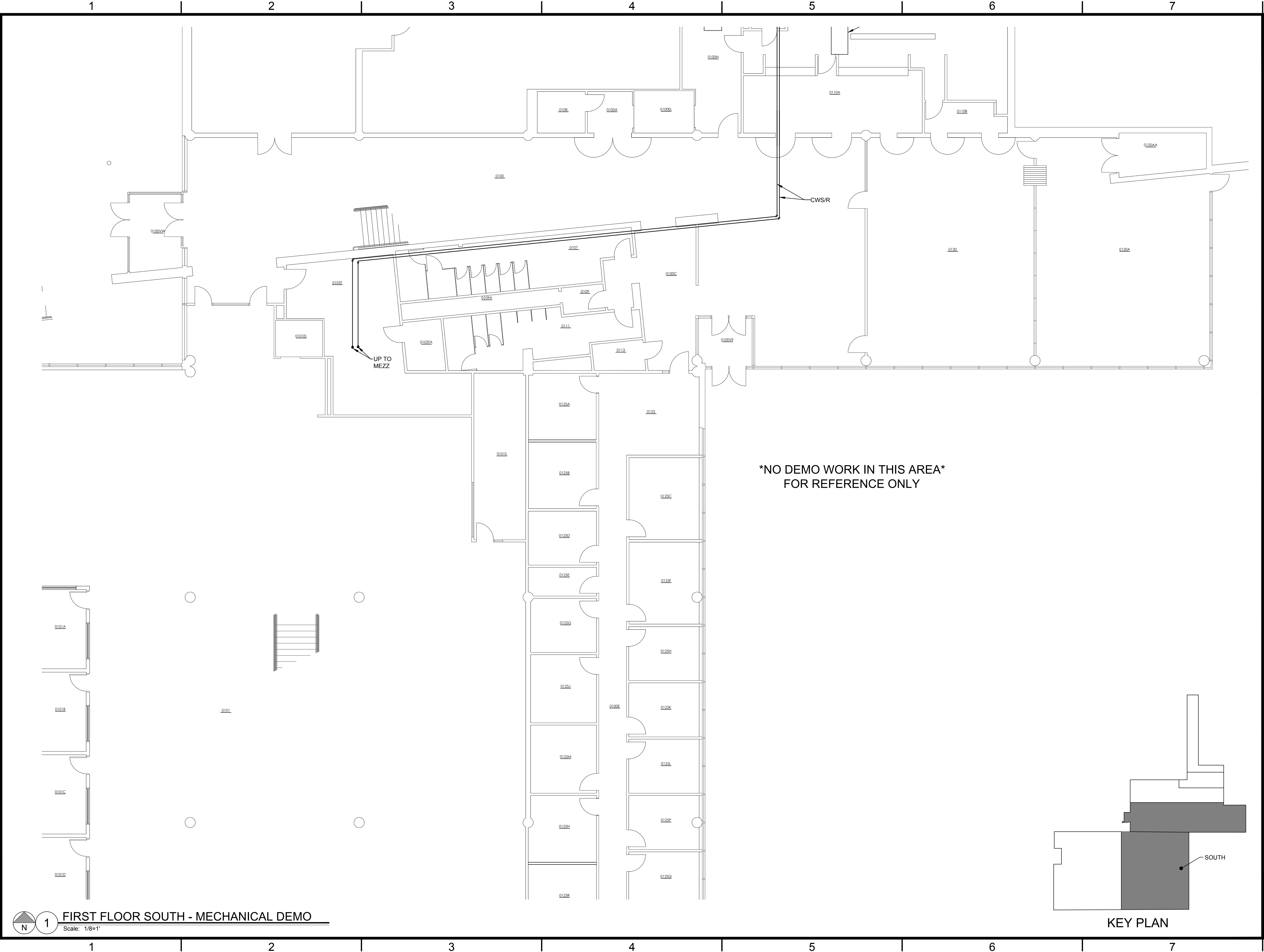
FIRST FLOOR NORTH MECHANICAL DEMO

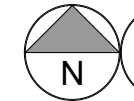
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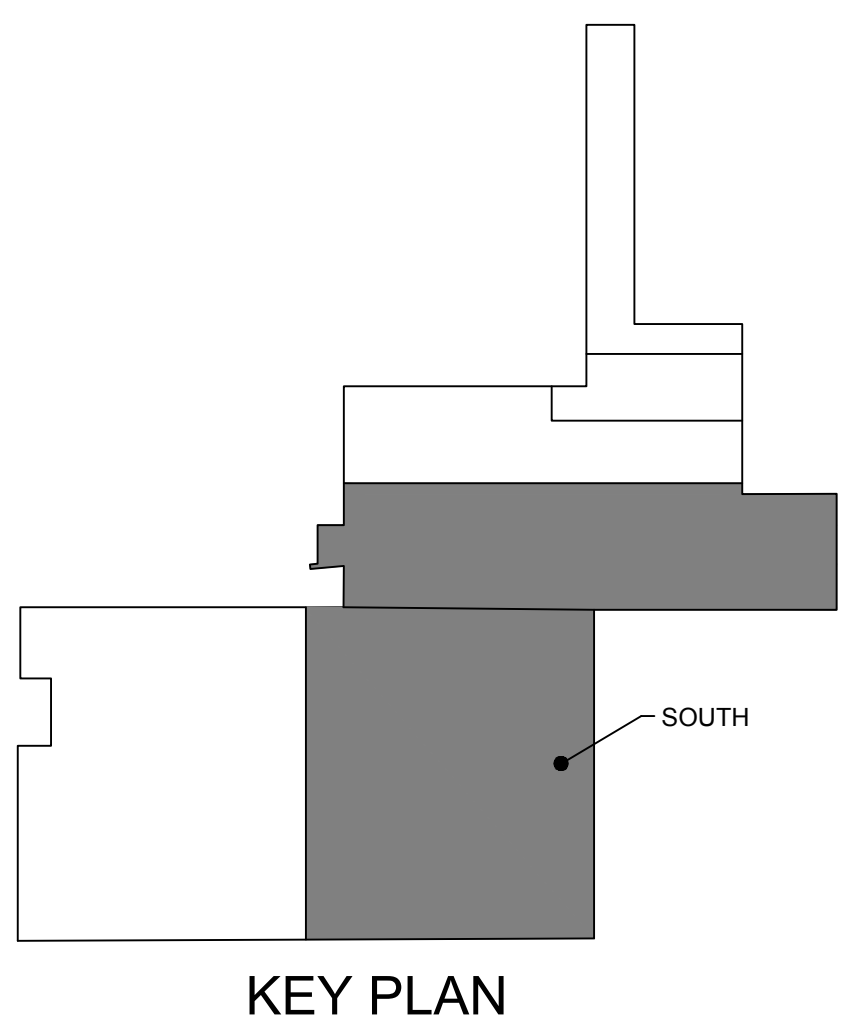
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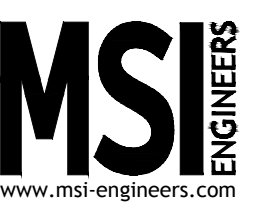
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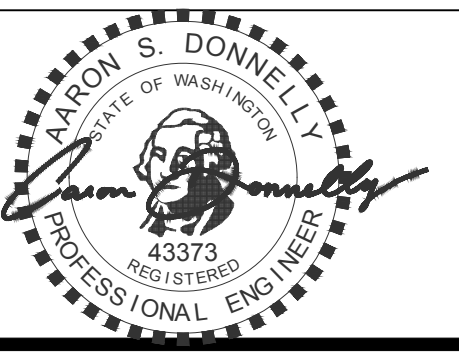


 **1** FIRST FLOOR SOUTH - MECHANICAL DEMO
Scale: 1/8"=1'



DESIGN FIRM:

www.msi-engineers.com

CONSULTANTS:

PROVISIONAL STAMP:


WASHINGTON STATE UNIVERSITY
Facilities Services 2425 E. Grimes Way Pullman, Wa. 99164-1150 PH 509-335-5571 FAX 509-335-9304

CONSOLIDATED INFORMATION CENTER (CIC)

CHILLED WATER UPGRADES

9512

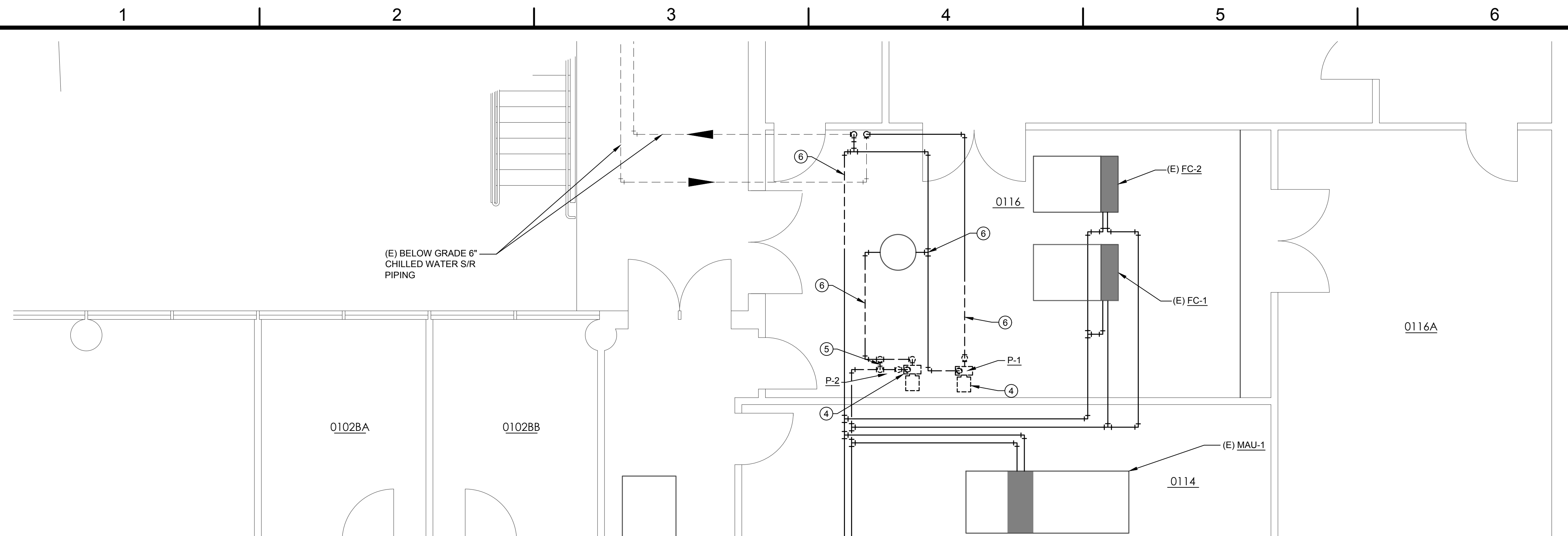
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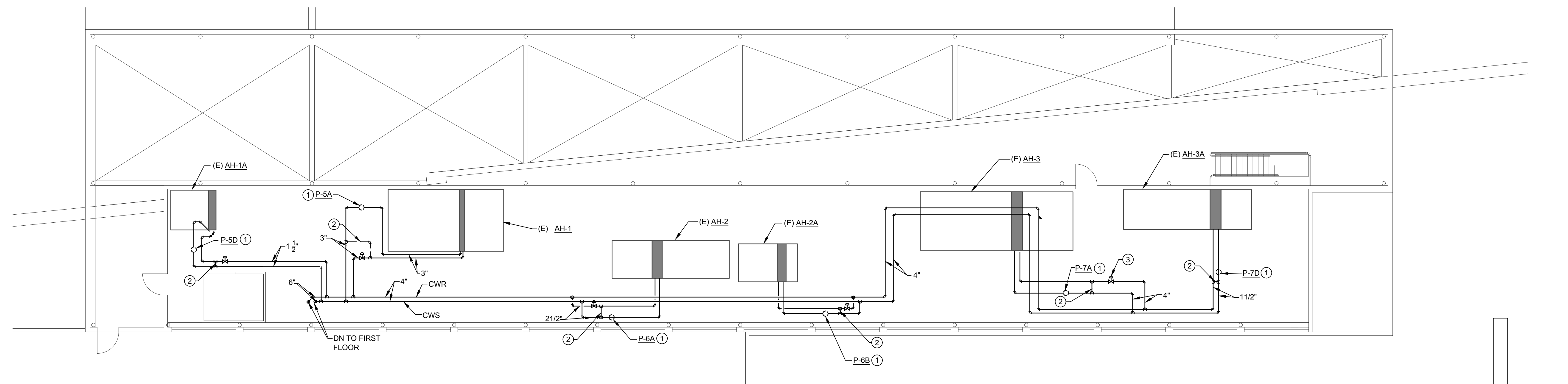
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FIRST FLOOR SOUTH MECHANICAL DEMO

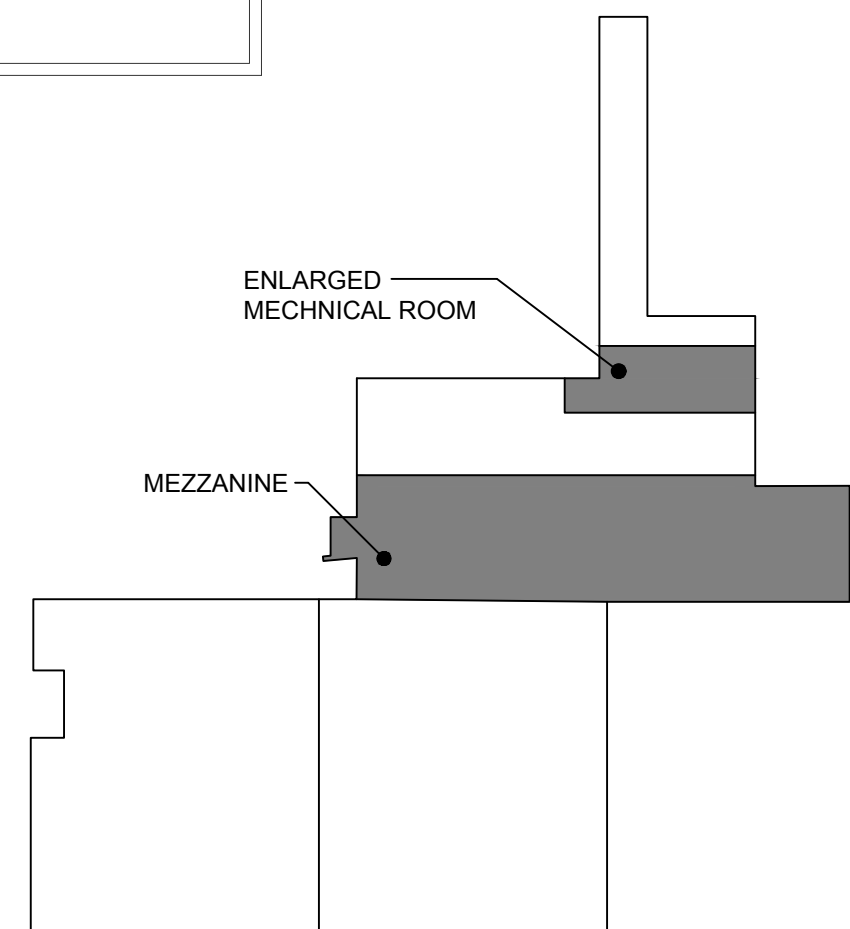
M-102
SHEET 5 OF 19 SHEETS



ENLARGED MECHANICAL ROOM PLAN - MECHANICAL DEMO



MEZZANINE PLAN - MECHANICAL DEMO



KEY PLAN

DESIGN FIRM:



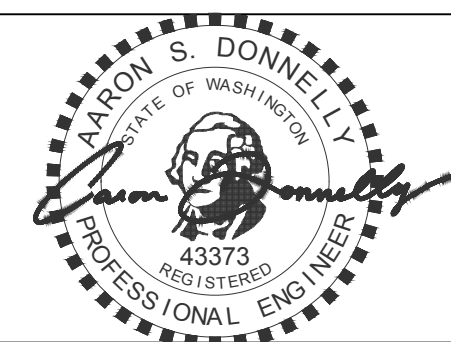
GENERAL NOTES

1. REFER TO PIPING DIAGRAM ON M-501.
2. REFER TO PRE-DEMO TAB NOTES ON M-001.

KEY NOTES

- ① DEMO INLINE COIL CIRCULATION PUMP AND ASSOCIATED BYPASS PIPING.
- ② DEMO BYPASS PIPING AND CAP AT TEES.
- ③ DEMO TWO WAY CONTROL VALVE.
- ④ DEMO HORIZONTAL END SUCTION PUMP.
- ⑤ DEMO BACK PRESSURE VALVE ON BYPASS LEG. LOCK ISOLATION VALVES CLOSED.
- ⑥ DEMO SECTIONS OF 6" CHW PIPING TO ACCOMMODATE NEW WORK. SALVAGE CONTROL DEVICES (SENSORS, WELLS, ETC.) TO BE REUSED. SEE DETAIL 7/MS.02.

PROVISIONAL STAMP:



WASHINGTON STATE
UNIVERSITY

Facilities Services PH 509-335-5571
2425 E. Grimes Way FAX 509-335-9304
Pullman, Wa. 99164-1150

CONSOLIDATED
INFORMATION CENTER
(CIC)

CHILLED WATER UPGRADES

9512

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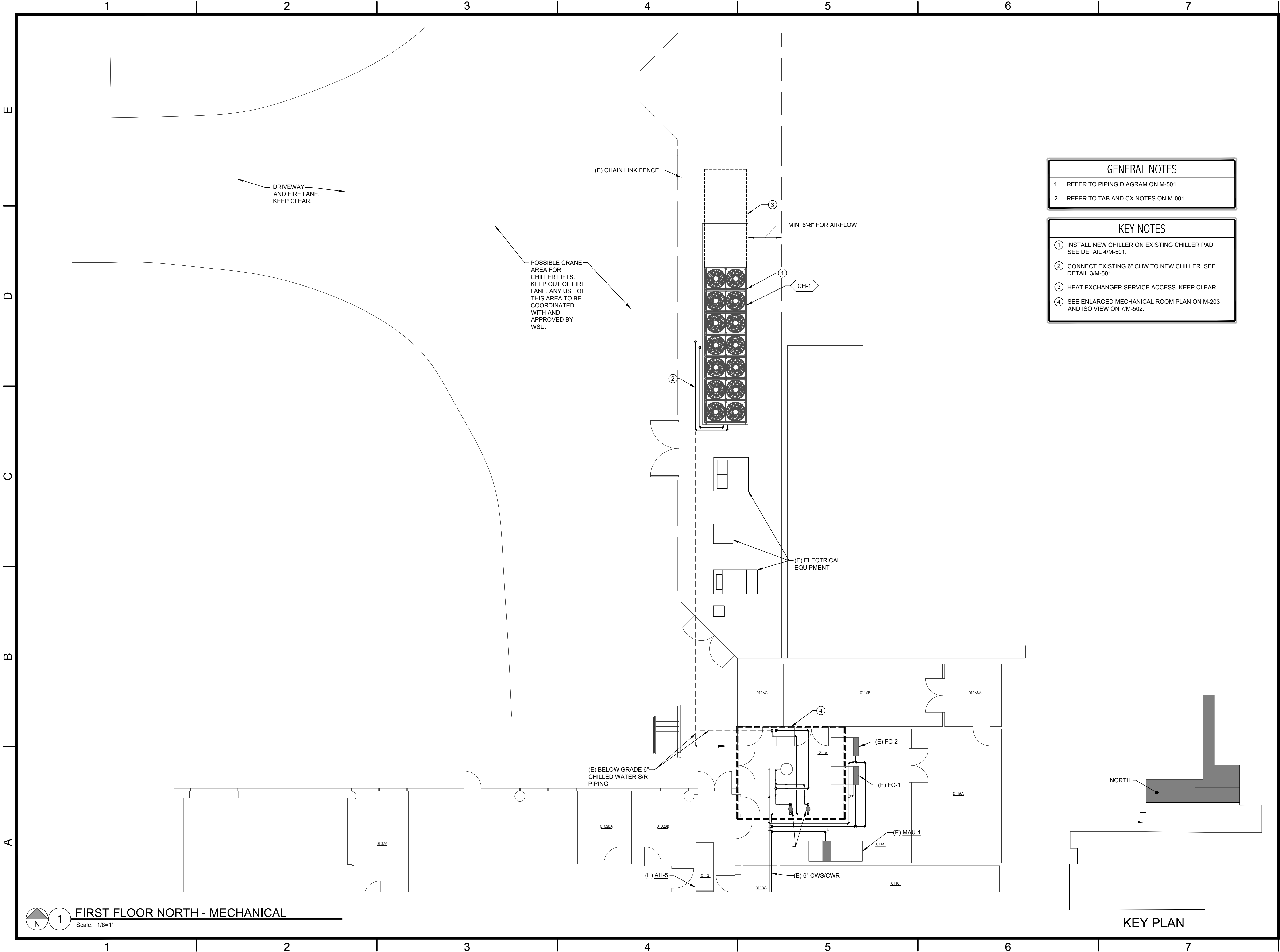
SHEET TITLE

MEZZANINE AND MECHANICAL ROOM DEMO PLANS

M-103

SHEET 6 OF 19 SHEETS

FILE: P:\2021\21-61\Cad\21-61 M-201.dwg PLOT DATE: October 1, 2015, 7:47 AM ORIGINAL PAPER SIZE: 22" x 34"



- GENERAL NOTES
1.

REFER TO PIPING DIAGRAM ON M-501.
2.

REFER TO TAB AND CX NOTES ON M-001.

- KEY NOTES
- ①

INSTALL NEW CHILLER ON EXISTING CHILLER PAD. SEE DETAIL 4/M-501.
- ②

CONNECT EXISTING 6" CHW TO NEW CHILLER. SEE DETAIL 3/M-501.
- ③

HEAT EXCHANGER SERVICE ACCESS. KEEP CLEAR.
- ④

SEE ENLARGED MECHANICAL ROOM PLAN ON M-203 AND ISO VIEW ON 7/M-502.

DESIGN FIRM:

MSI

ENGINEERS

www.msi-engineers.com

CONSULTANTS:

PROVISIONAL STAMP:

AARON S. DONNELLY

STATE OF WASHINGTON

43373

REGISTERED

PROFESSIONAL ENGINEER

WASHINGTON STATE UNIVERSITY

Facilities Services2425 E. Grimes WayPullman, Wa. 99164-1150PH 509-335-5571FAX 509-335-9304

CONSOLIDATED INFORMATION CENTER (CIC)

CHILLED WATER UPGRADES

9512

08-09-2022	100% PERMIT SET	
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CAD DWG FILE: M-101

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PROJECT No. 1744-2022

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SHEET TITLE

FIRST FLOOR NORTH MECHANICAL

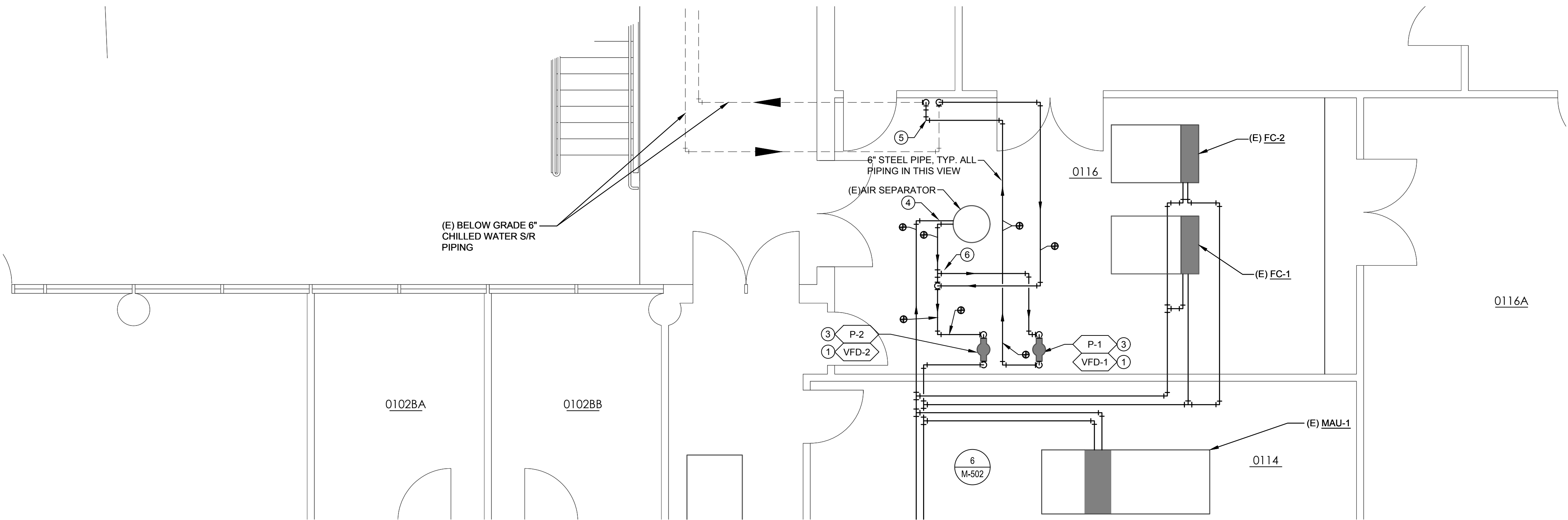
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SHEET7OF19SHEETS

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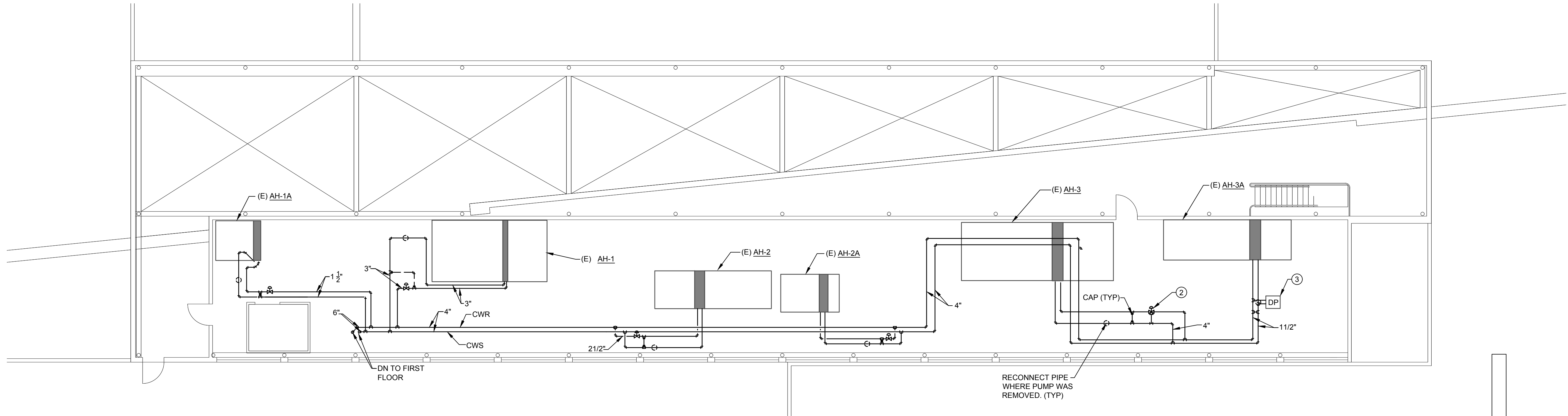
1 2 3 4 5 6 7



- GENERAL NOTES**
- REFER TO PIPING DIAGRAM AND MECH RM PIPING ON M-501.
 - REFER TO TAB AND CX NOTES ON M-001.
- KEY NOTES**
- SEE ELECTRICAL PLANS FOR VFD LOCATION AND MOUNTING.
 - NEW THREE WAY CONTROL VALVE. SEE SPECS, PIPING DIAGRAMS, AND CONTROL DIAGRAM ON M-601.
 - RECONFIGURE PIPING TO ACCOMMODATE NEW PUMP. SEE DETAILS 7 & 8 ON M-502.
 - CONNECT CHW RETURN PIPING TO UNUSED UPPER CONNECTION ON EXISTING AIR SEPARATOR. BLIND FLANGE PREVIOUS CONNECTION.
 - RECONNECT PIPING.
 - CLOSELY SPACED TEES, NO MORE THAN 18" APART TO CREATE A DECOUPLING SECTION OF PIPE BETWEEN CHILLER AND BUILDING LOOPS.

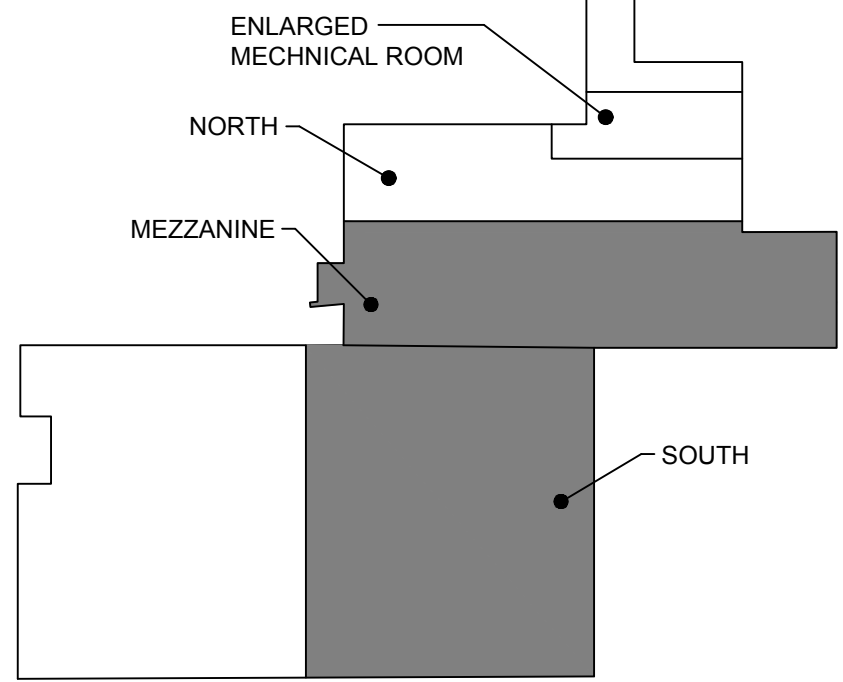
1 MECHANICAL ROOM PLAN - MECHANICAL

Scale: 1/4"=1'



2 MEZZANINE PLAN - MECHNICAL

Scale: 1/8"=1'

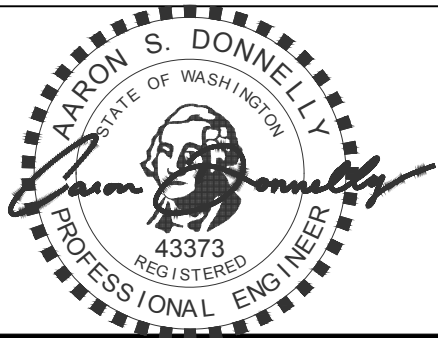


DESIGN FIRM:



CONSULTANTS:

PROVISIONAL STAMP:



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Pullman, Wa. 99164-1150

**CONSOLIDATED
INFORMATION CENTER
(CIC)**

CHILLED WATER UPGRADES

9512

MARK	DATE	DESCRIPTION
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	07-07-2022	100% CD FOR OWNER REVIEW
	05-10-2022	90% CD FOR OWNER REVIEW

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SHEET TITLE

**MEZZANINE AND
MECHANICAL ROOM
PLANS**

M-203

SHEET 9 OF 19 SHEETS

1

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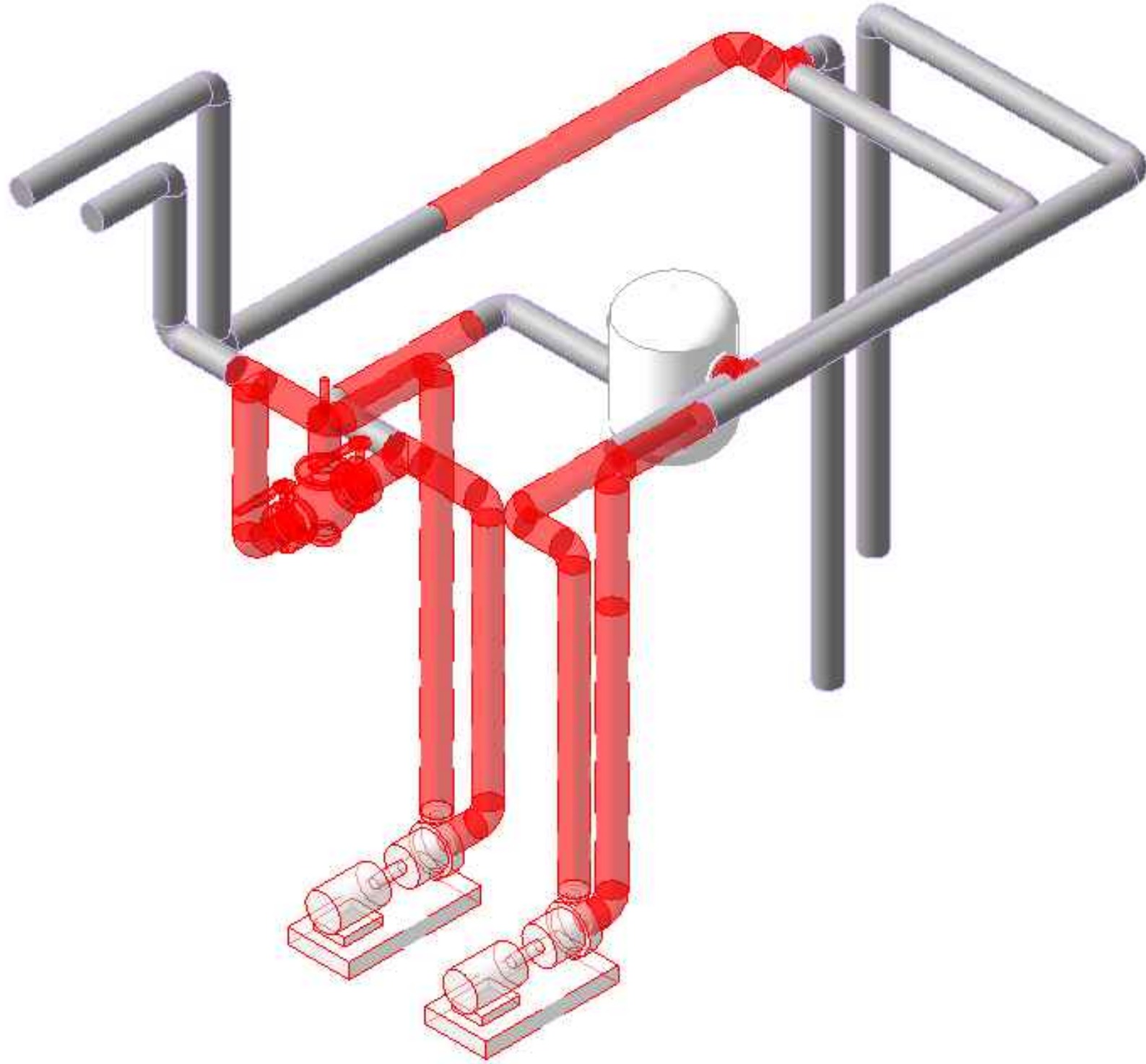
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4

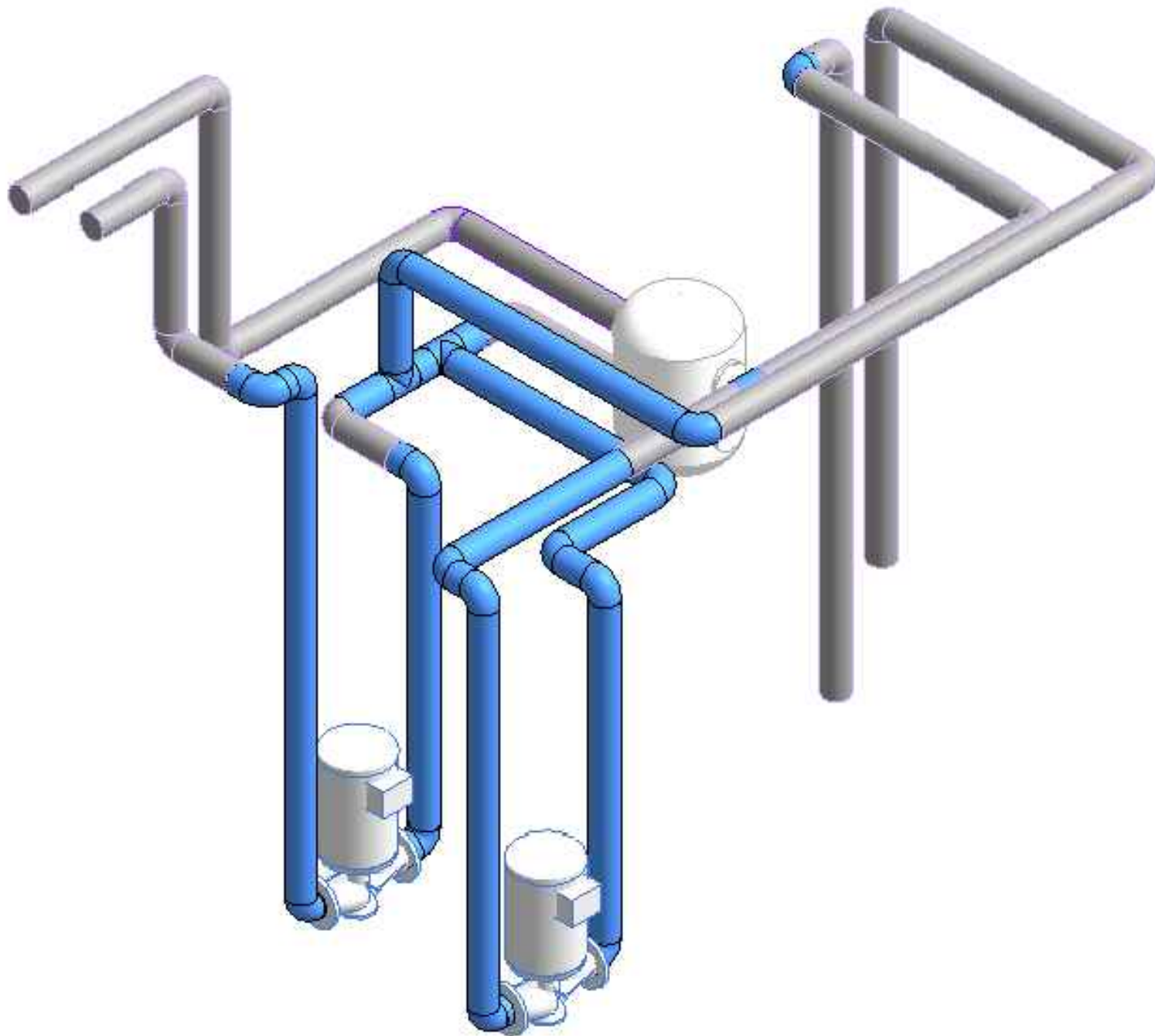
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6

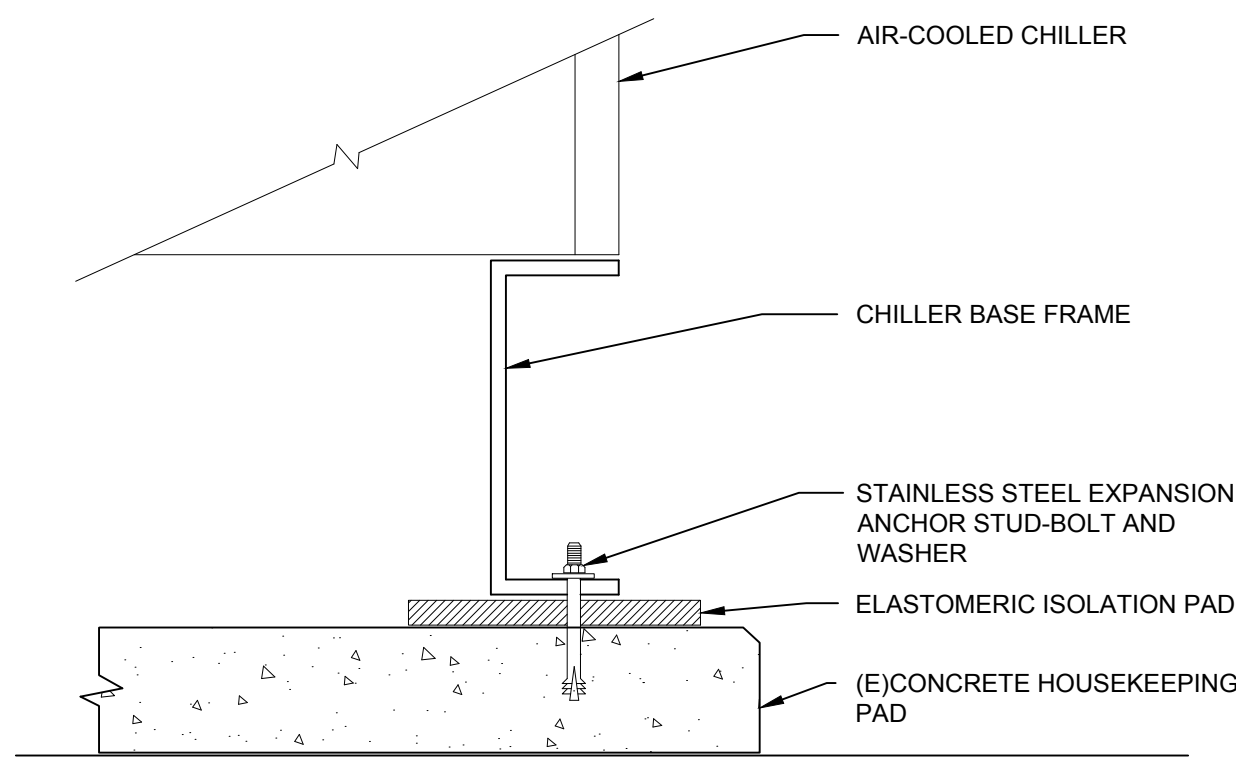
7



7 MECH ROOM PIPING ISO VIEW - DEMOLITION
Scale: NOT TO SCALE



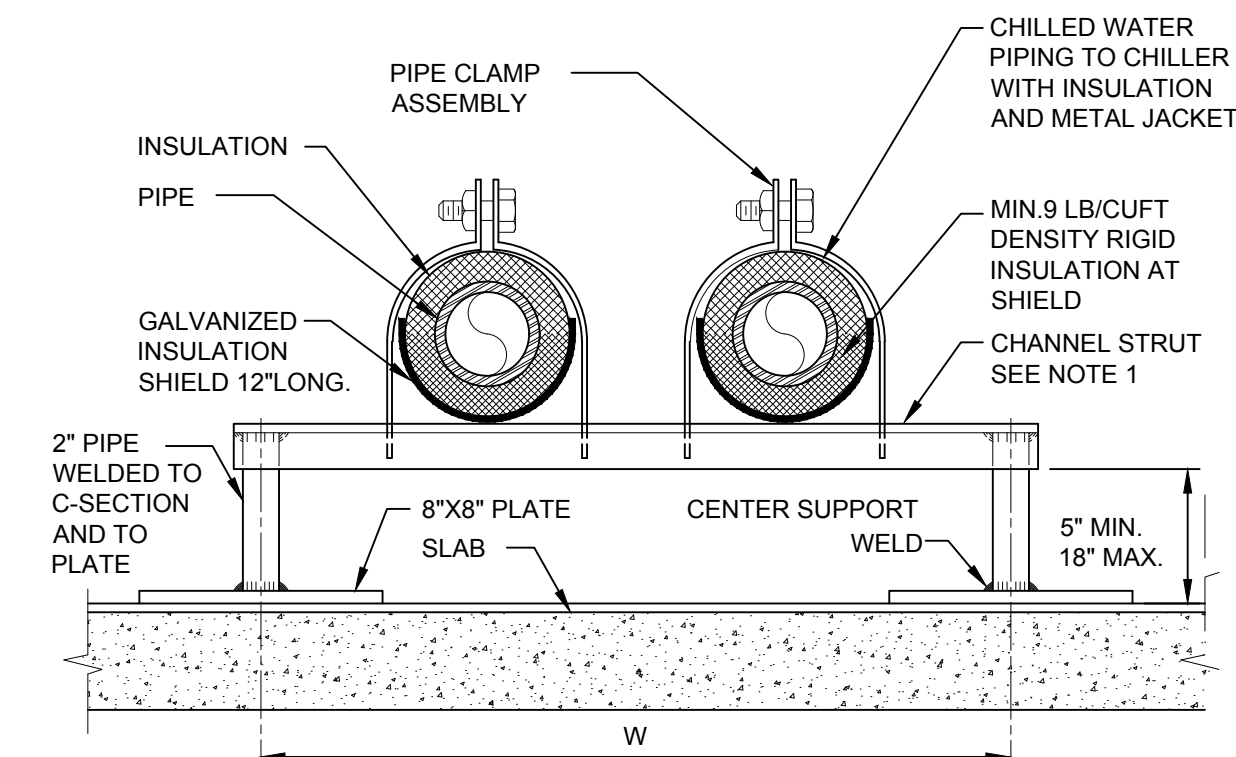
8 MECH ROOM PIPING ISO VIEW - NEW
Scale: NOT TO SCALE



NOTES:

1. PROVIDE ANCHORS AT UNIT PERIMETER SUPPORT RAIL AT SPACING INTERVAL AS RECOMMENDED BY UNIT MANUFACTURER. MINIMUM OF SIX (6) ANCHOR POINTS (3 PER SIDE).

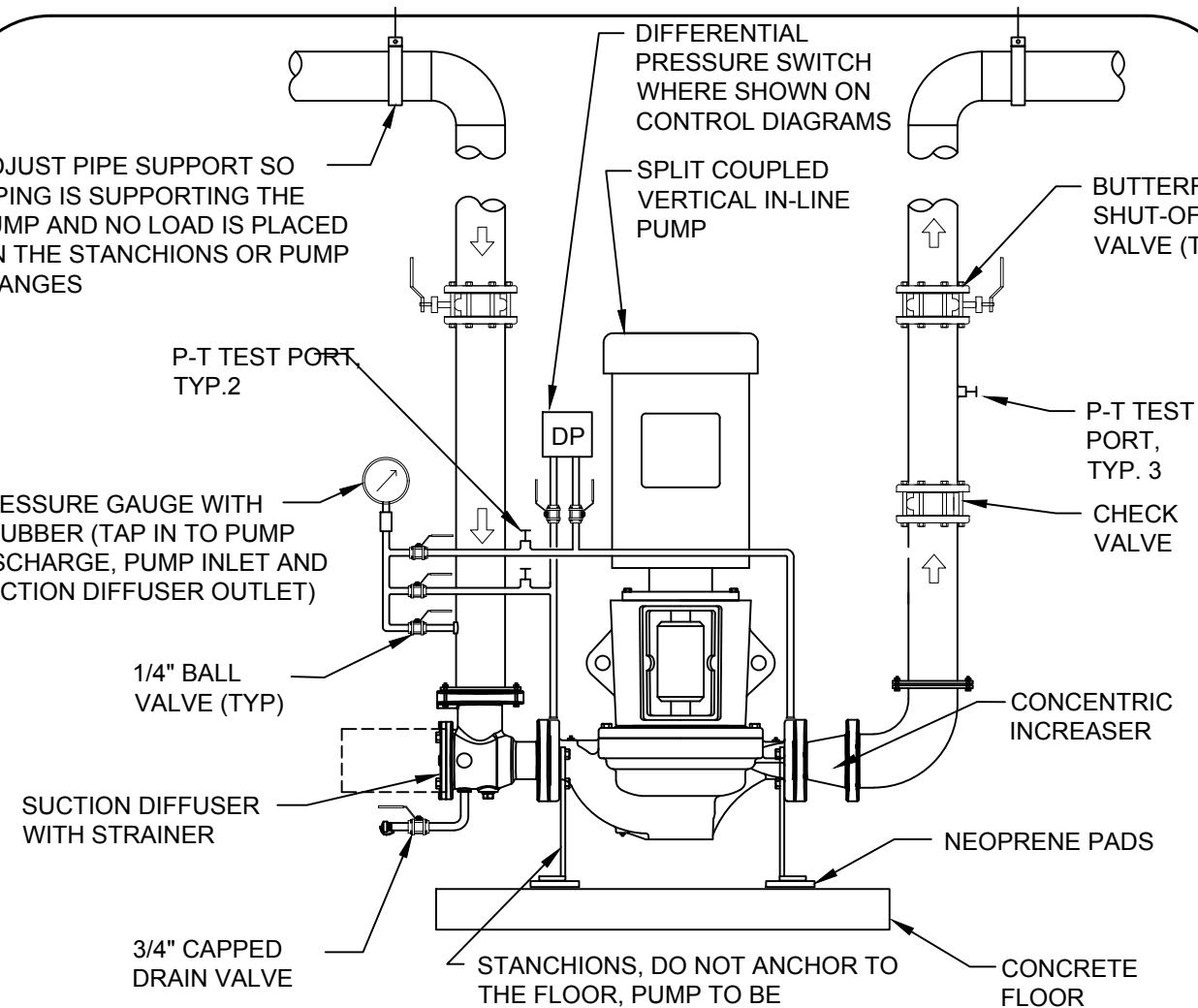
4 CHILLER MOUNTING DETAIL
Scale: NOT TO SCALE



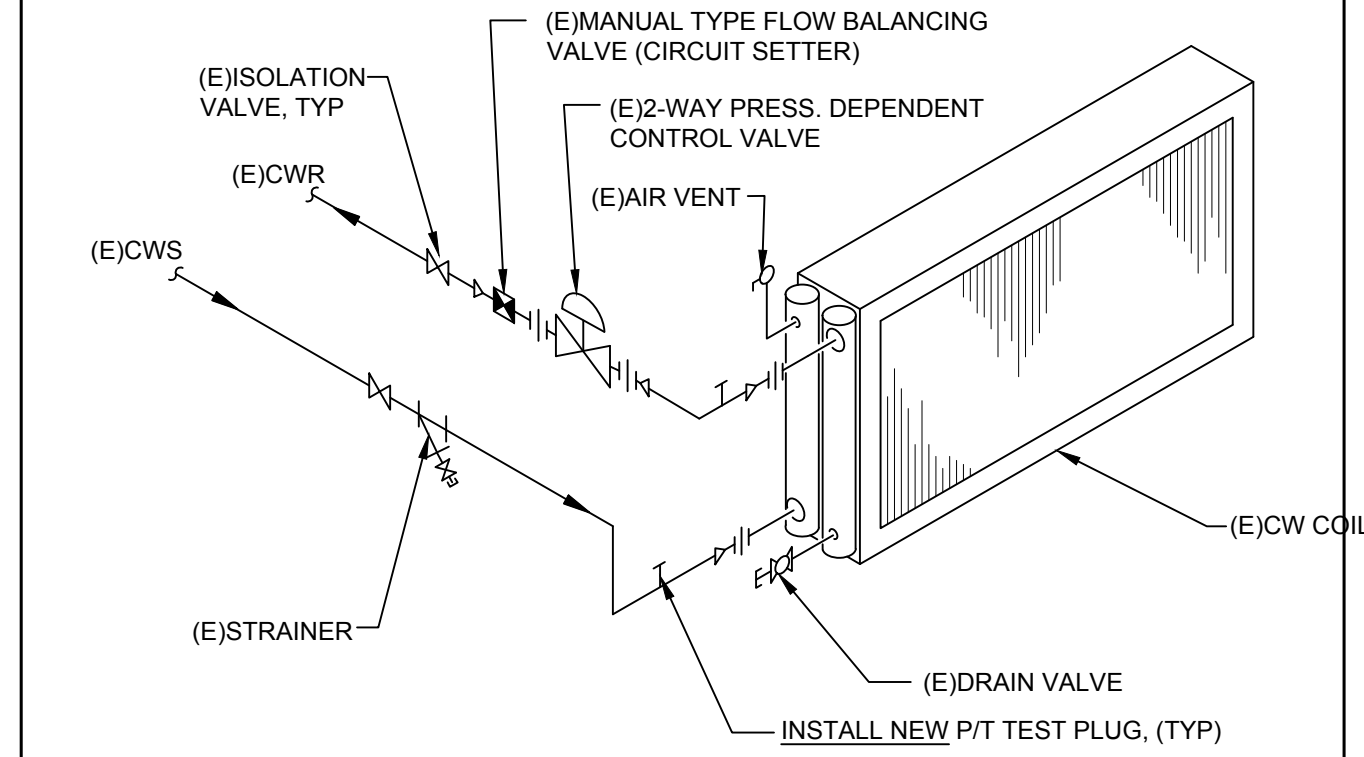
NOTES:

1. PAINT ALL EXPOSED METAL WITH TWO (2) COATS OF RUST-PROOF PAINT.

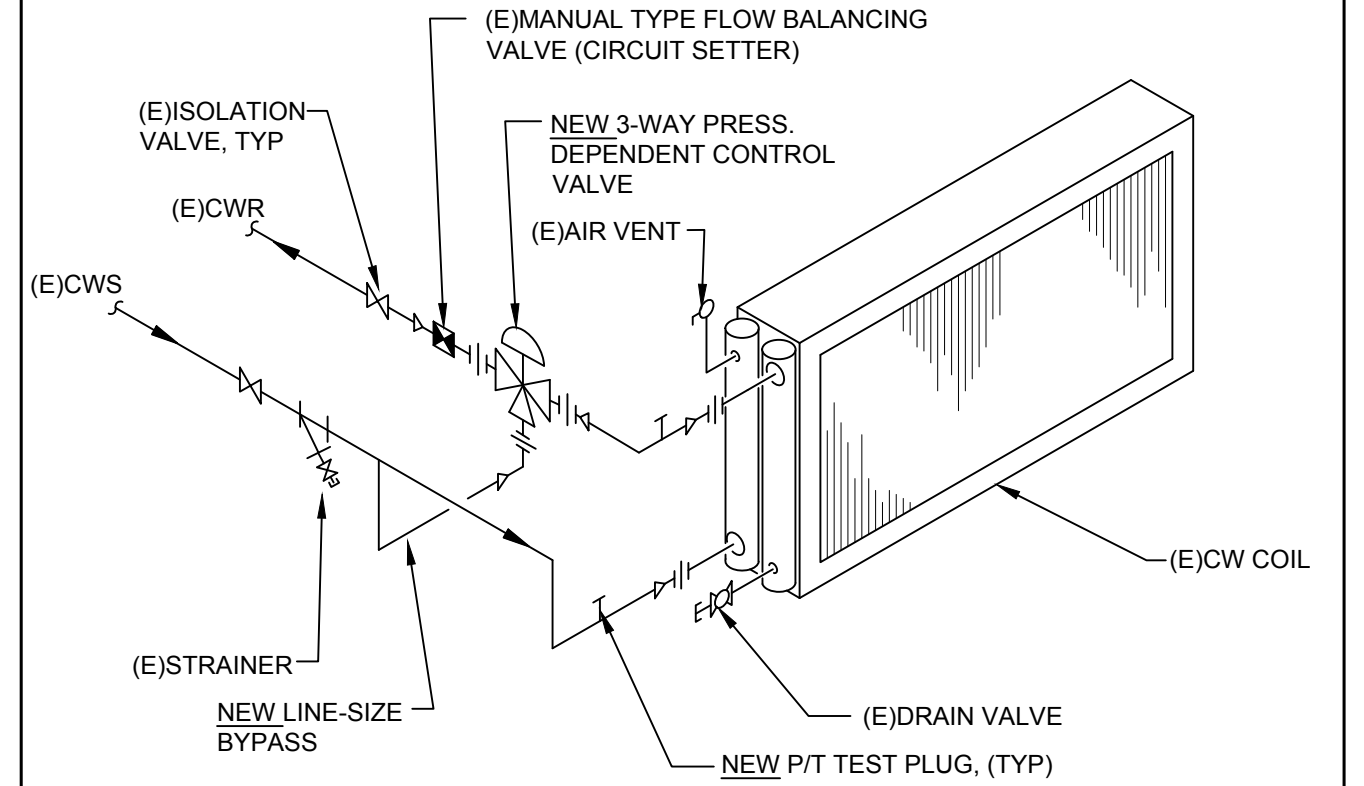
5 EXTERIOR CHILLED WATER PIPING
Scale: NOT TO SCALE



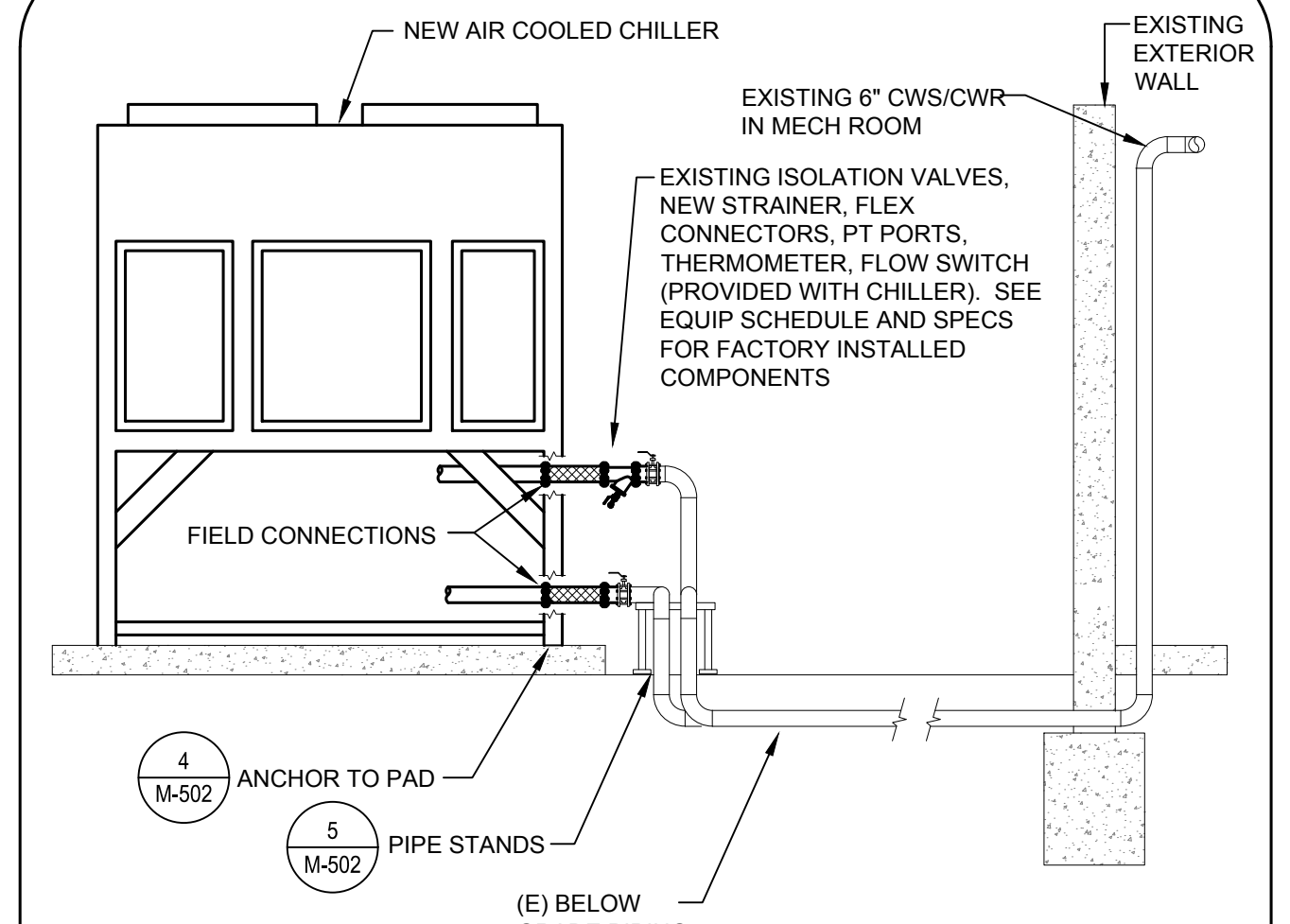
6 VERTICAL IN-LINE PUMP DETAIL
Scale: NOT TO SCALE



1 (EXISTING) COIL PIPING WITH 2-WAY VALVE
Scale: NOT TO SCALE



2 (EXISTING) COIL PIPING WITH NEW 3-WAY VALVE
Scale: NOT TO SCALE



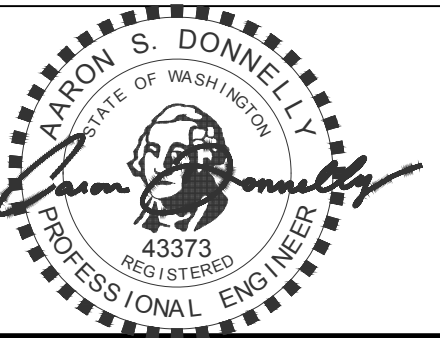
3 CHILLER PIPING DETAIL
Scale: NOT TO SCALE

DESIGN FIRM:



CONSULTANTS:

PROVISIONAL STAMP:



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CHILLED WATER UPGRADES

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CAD DWG FILE: M-101	
DESIGN BY: ASD	CHECKED BY: ASD
DRAWN BY: JC	FILE No. TBD
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SHEET TITLE

MECHANICAL
DETAILS

M-502

SHEET 11 OF 19 SHEETS

FILE: P:\2022\121-61\Cadd\21-61 M-601.dwg PLOT DATE: October 1, 2015, 7:47 AM ORIGINAL PAPER SIZE: 22" x 34"

SEQUENCE OF OPERATION

THE FOLLOWING SEQUENCE SHALL BE INDEPENDENT OF OCCUPANCY STATUS, SCHEDULE, AND SEASON. CHILLER OPERATION SHALL BE LOCKED OUT BELOW 30 DEGREES, OR AS SET BY OWNER.

THE CHILLED WATER PUMP P-2 SHALL BE ENABLED AT MINIMUM SPEED WHEN THERE IS A CALL FOR COOLING FROM ANY ONE ZONE (ADJUSTABLE) AS INDICATED BY A CHILLED WATER CONTROL VALVE BEING DRIVEN OPEN. THE VFD SHALL THEN MODULATE PUMP SPEED TO MAINTAIN THE DIFFERENTIAL PRESSURE AT 10 PSIG (SET DURING TAB) AS MEASURED NEAR THE END OF THE LOOP. THE THREE-WAY CONTROL VALVE(S) SHALL ENSURE MINIMUM FLOW THROUGH THE PUMP AT ALL TIMES. THE CHILLER AND CHILLER CIRC PUMP P-1 SHALL REMAIN OFF.

WHEN P-2 HAS ESTABLISHED FLOW FOR 5-MIN (ADJ) AND THE CALCULATED LOAD (TONS BASED ON THE MEASURED BUILDING LOOP FLOW RATE, SUPPLY AND RETURN TEMPERATURES) REACHES THE CHILLER MINIMUM OPERATING CAPACITY (20-TONS, MFR TO VERIFY), THE BMS SHALL ENABLE THE CHILLER. THE CHILLER FACTORY CONTROLS SHALL THEN RUN THROUGH ITS OWN SAFETIES AND EXECUTE IT'S OWN STARTUP SEQUENCE INCLUDING STARTING THE CHILLER CIRC PUMP P-1 AND VERIFYING FLOW THROUGH THE FLOW SWITCH. PUMP P-1 SHALL OPERATE AT A CONTINUOUS SPEED/CONSTANT FLOW. THE VFD IS FOR INITIAL TESTING/BALANCING AND SOFT START. TESTING AND/OR CX SHALL CONFIRM CHILLER CONTROLS INCLUDE DELAYS TO PREVENT SHORT CYCLING AND PREMATURE PUMP SHUTDOWN.

THE CHILLER CONTROLS SHALL OPERATE TO MAINTAIN THE SUPPLY TEMPERATURE AT THE SETPOINT TRANSMITTED BY THE BMS. THE BMS SHALL RESET THAT SETPOINT BETWEEN 44°F AND 54°F (ADJ) ACCORDING TO THE FOLLOWING SEQUENCE:

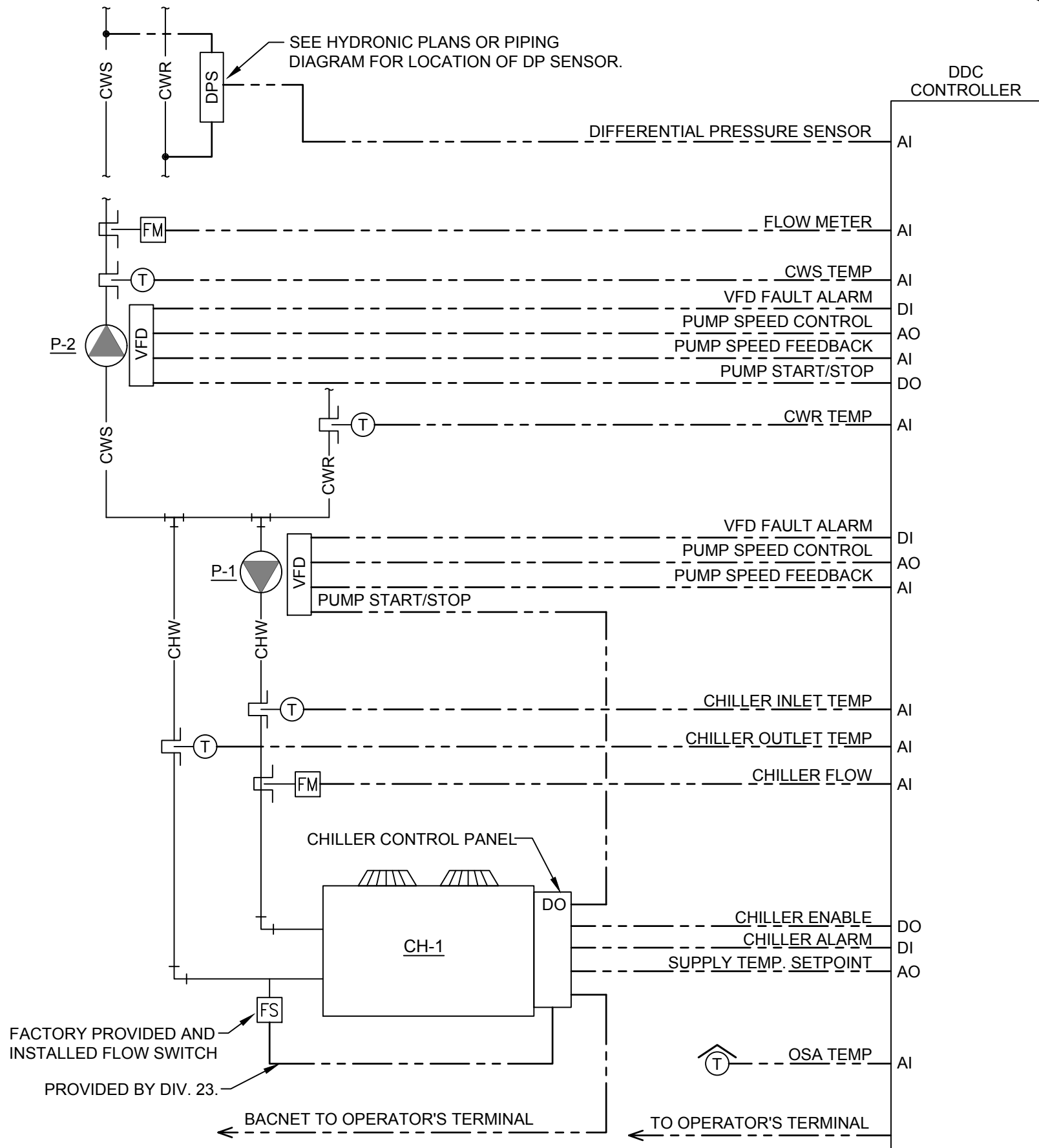
THE SUPPLY TEMP SETPOINT SHALL BEGIN AT 54 DEGREES. IF ANY ONE CHILLED WATER VALVE REACHES 90% OPEN WITH INCREASING DEMAND FROM THE ZONE, THE SUPPLY TEMP SETPOINT SHALL RESET DOWN 1 DEGREE. THIS SEQUENCE SHALL REPEAT AS REQUIRED DOWN TO 44 DEGREES TO KEEP ALL VALVES FROM REACHING 90% OPEN WITH INCREASING DEMAND.

THE BMS SHALL READ, TREND AND RECORD THE FOLLOWING BACNET POINTS FORM TEH CHILLER CONTROLLER:

- ON/OFF STATUS
- CAPACITY (TON-HOURS)

THE BMS SHALL TREND AND RECORD THE FOLLOWING DDC POINTS:

- BUILDING CHW LOOP FLOW RATE (GPM)
- CHILLER LOOP FLOW RATE (GPM)
- BUILDING CHW LOOP SUPPLY AND RETURN TEMPS
- CHILLER SUPPLY AND RETURN TEMPS
- CHILLER CIRC PUMP P-1 STATUS
- BUILDING CHW PUMP P-2 STATUS AND SPEED
- CALCULATED BUILDING LOAD (TONS)
- CALCULATED CHILLER LOAD (TONS)



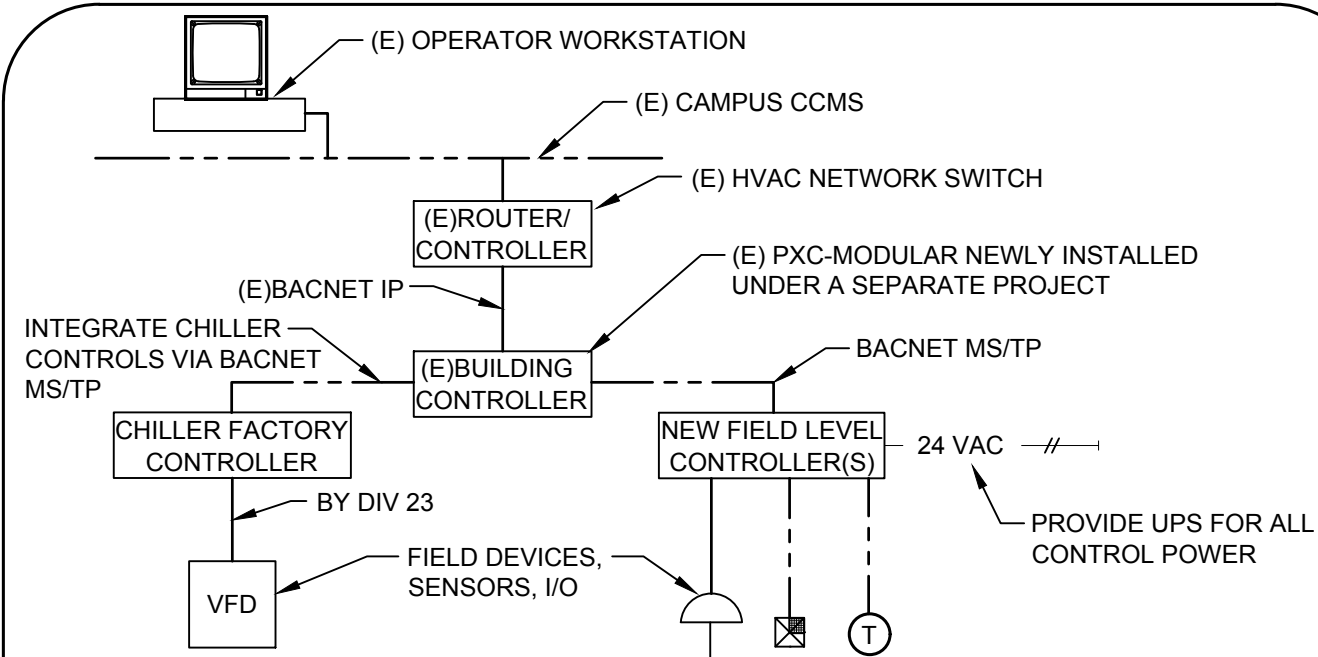
3 CHILLED WATER SYSTEM CONTROL DIAGRAM

Scale: NOT TO SCALE

DM-#	DAMPER ACTUATOR	AI	ANALOG INPUT
DPS-#	DIFFERENTIAL PRESSURE SENSOR	AO	ANALOG OUTPUT
SP-#	STATIC PRESSURE SENSOR	C	COMMON
V-#	MODULATING VALVE ACTUATOR	CIRC	CIRCULATION
☒	MOTOR STARTER	CWR	CHILLED WATER RETURN
☒	MOTOR STARTER W/ CT	CWS	CHILLED WATER SUPPLY
# T	TEMPERATURE SENSOR	DDC	DIRECT DIGITAL CONTROL
# T	TEMPERATURE SENSOR W/SUN SHIELD	DI	DIGITAL INPUT
PS	PRESSURE SENSOR	DO	DIGITAL OUTPUT
A	AIRFLOW PROVING SWITCH	EA	EXHAUST AIR
C	CARBON DIOXIDE SENSOR	EMCS	ENERGY MANAGEMENT & CONTROL SYSTEM
OCG	OCCUPANCY SENSOR	EA	EXHAUST
AMS	AIR MEASURING STATION	HWR	HOT WATER RETURN
FM	FLOW METER, INSERTION TYPE	HWS	WATER SUPPLY
		NC	NORMALLY CLOSED
		NO	NORMALLY OPEN
		OSA	OUTSIDE AIR
		RA	RETURN AIR
		SA	SUPPLY AIR

1 TEMPERATURE CONTROL LEGEND

Scale: NOT TO SCALE



NOTES:

1. THIS DIAGRAM IS TO ILLUSTRATE THE BASIC ARCHITECTURE OF THE EXISTING SIEMENS BUILDING AUTOMATION AND CONTROL SYSTEM. THE CONTROL CONTRACTOR IS RESPONSIBLE FOR INTEGRATING ANY NEW CONTROLS WITH THIS EXISTING SYSTEM IN ACCORDANCE WITH THE OWNERS STANDARDS.
2. CONTROL DIAGRAMS INDICATE A DDC CONTROLLER BUT DO NOT ATTEMPT TO INDICATE THE QUANTITY, MODEL, OR ACCESSORY MODULES REQUIRED FOR THE PROJECT AS THIS IS THE RESPONSIBILITY OF THE CONTROL CONTRACTOR TO DETERMINE THE MOST EFFICIENT CONFIGURATION IN ACCORDANCE WITH THE OWNER'S STANDARDS.
3. COORDINATE OCCUPIED/UNOCCUPIED SCHEDULES, THERMOSTAT AND ALARM REQUIREMENTS, RANGES AND SETPOINTS WITH OWNER.
4. COORDINATE LOCATION OF CONTROLLER ENCLOSURES, PANELS, AND OPERATOR INTERFACE DEVICES WITH DIV 26, THE OWNER AND THE ENGINEER.

2 DDC CONTROL SYSTEM ARCHITECTURE

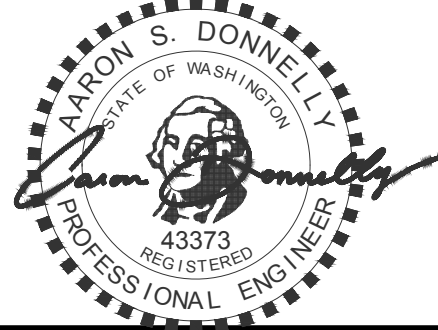
Scale: NOT TO SCALE

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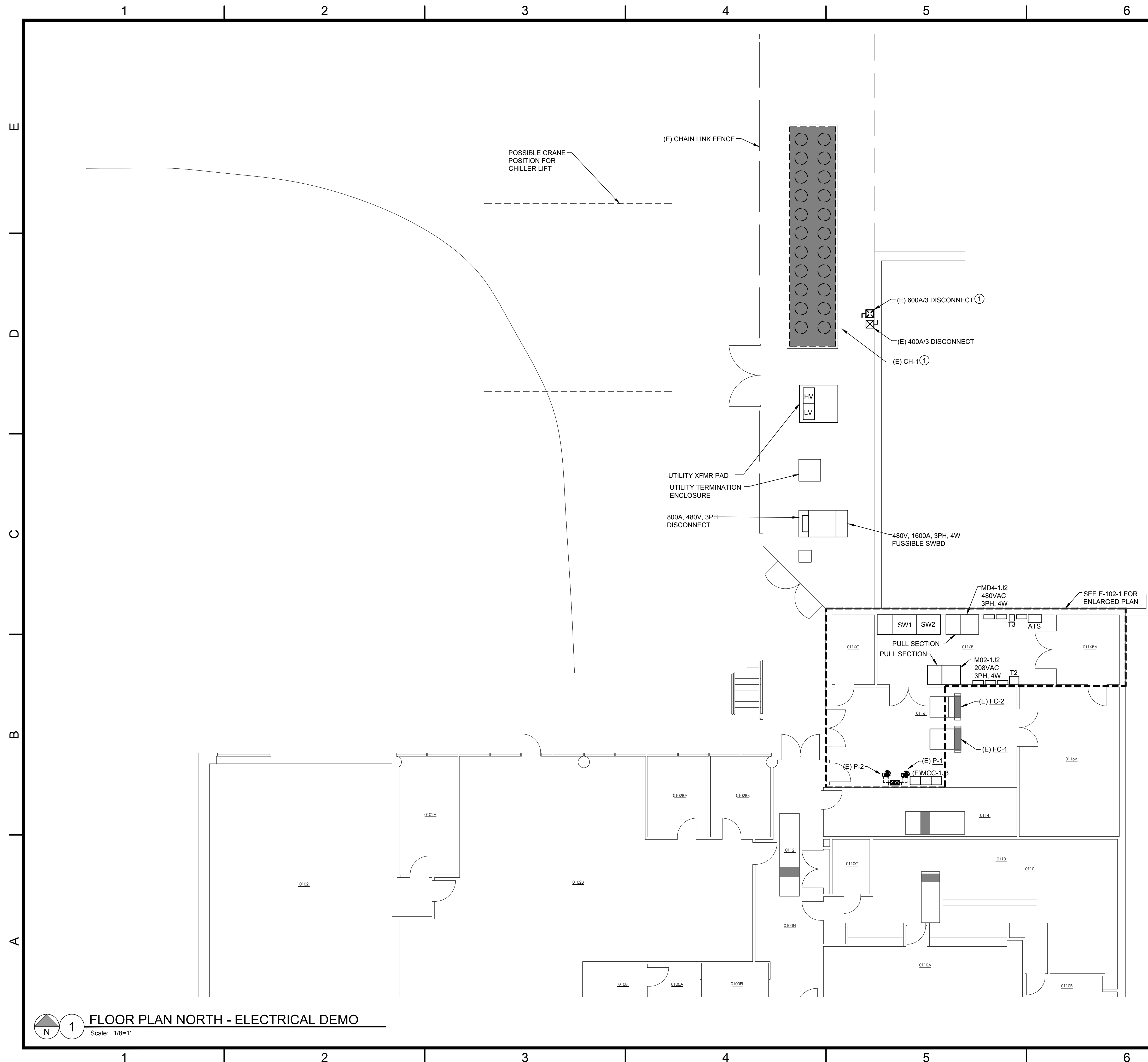
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SHEET TITLE

CONTROL DIAGRAMS

M-601

SHEET 12 OF 19 SHEETS



- ## GENERAL NOTES
- | | |
|-----|--|
| 1. | COORDINATE DEMOLITION REQUIREMENTS WITH GENERAL CONTRACTOR. |
| 2. | ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL ELECTRICAL EQUIPMENT UNLESS OTHERWISE NOTED TO BE RETURNED TO OWNER. |
| 3. | PROVIDE UPDATED TYPED PANEL BOARD SCHEDULE INDICATING "SPARES" FOR REMOVED CIRCUITS. |
| 4. | REMOVE WIRE BACK TO OVERCURRENT PROTECTIVE DEVICE OR TO UPSTREAM DEVICE REMAINING. MAINTAIN CIRCUITING/CONTINUITY TO EXISTING DEVICES NOT AFFECTED BY DEMOLITION. CONCEALED CONDUIT MAY BE ABANDONED IN PLACE. SURFACE CONDUIT NO LONGER USED SHALL BE REMOVED. |
| 5. | REMOVE ELECTRICAL EQUIPMENT, OUTLETS, LIGHTING FIXTURES, ETC. IN AREAS OF GENERAL DEMOLITIONS. EXTEND AND RECONNECT CIRCUITS AS NECESSARY TO MAINTAIN POWER TO AREAS ADJACENT TO GENERAL DEMOLITION. CONNECT NEW LIGHTING AND POWER TO EXISTING CIRCUITS WHERE INDICATED ON THE PLANS. |
| 6. | PROVIDE EXTENSION RINGS, COVER PLATED OR ACCESS DOORS AS NECESSARY TO MAINTAIN ACCESS TO EXISTING WIRING WHERE REQUIRED BY NEW CONSTRUCTION. |
| 7. | PROVIDE BLANK COVER PLATES ON JUNCTION BOXES WHICH ARE NOT REUSED. |
| 8. | PROVIDE CUTTING AND PATCHING AS REQUIRED, WHETHER OR NOT SPECIFICALLY INDICATED. |
| 9. | FIELD VERIFY ALL EXISTING CIRCUITING AND MAKE ADJUSTMENTS AS NECESSARY TO THE CIRCUITING SHOWN ON THE PLANS, AS REQUIRED BY FIELD CONDITIONS. |
| 10. | IF AN ITEM IS TO BE REPLACED, THE CONTRACTOR SHALL RECONNECT ALL EXISTING CONNECTIONS. |

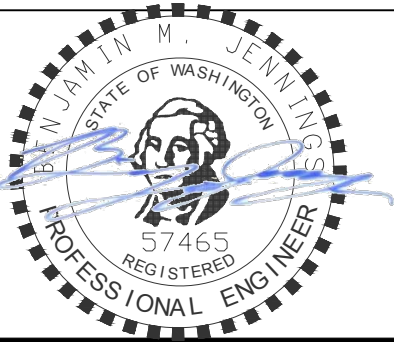
- | KEY NOTES | |
|-----------|---|
| ① | EXISTING EQUIPMENT TO BE DEMOLISHED.
DISCONNECT ALL ASSOCIATED CONDUIT,
CONDUCTORS, DISCONNECTS, ETC. IF NOT TO BE
REUSED. RE:E601 |

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SHEET TITLE

FIRST FLOOR
NORTH -
ELECTRICAL - DEMO

E-101

SHEET 14 OF 19 SHEETS

E

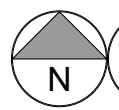
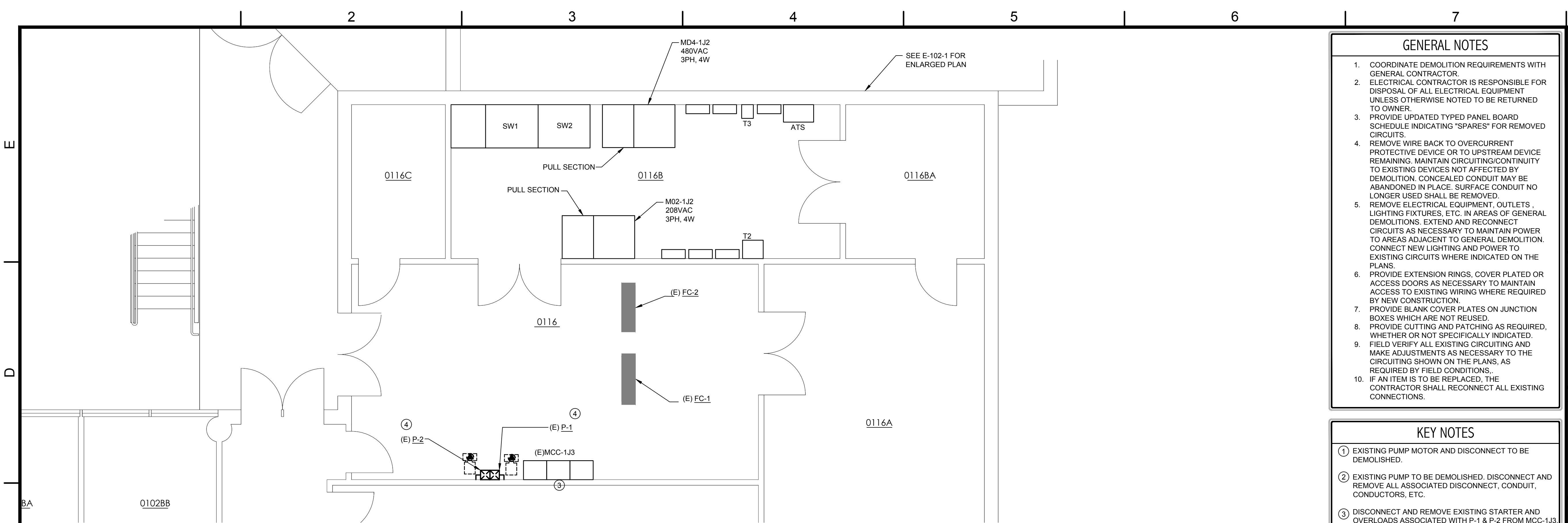
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BA

C

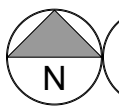
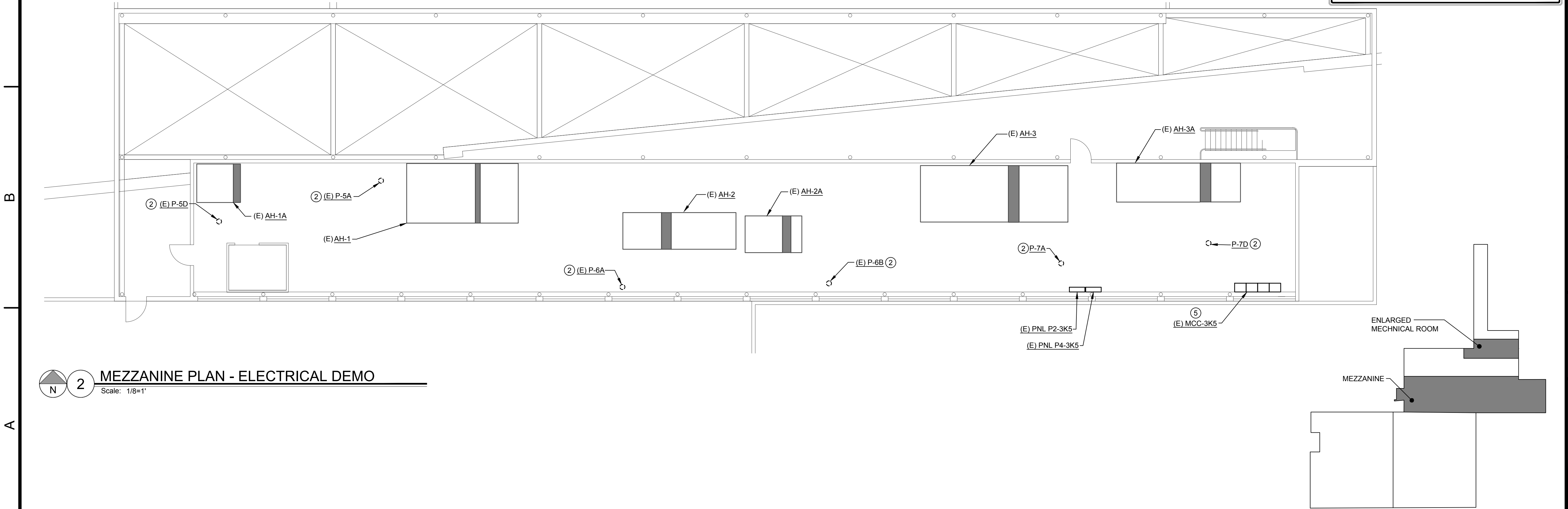
B

A



ENLARGED MECHANICAL ROOM PLAN - ELECTRICAL DEMO

Scale: 1/4"=1'



MEZZANINE PLAN - ELECTRICAL DEMO

Scale: 1/8"=1'

GENERAL NOTES

- COORDINATE DEMOLITION REQUIREMENTS WITH GENERAL CONTRACTOR.
- ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL ELECTRICAL EQUIPMENT UNLESS OTHERWISE NOTED TO BE RETURNED TO OWNER.
- PROVIDE UPDATED TYPED PANEL BOARD SCHEDULE INDICATING "SPARES" FOR REMOVED CIRCUITS.
- REMOVE WIRE BACK TO OVERCURRENT PROTECTIVE DEVICE OR TO UPSTREAM DEVICE REMAINING. MAINTAIN CIRCUITING/CONTINUITY TO EXISTING DEVICES NOT AFFECTED BY DEMOLITION. CONCEALED CONDUIT MAY BE ABANDONED IN PLACE. SURFACE CONDUIT NO LONGER USED SHALL BE REMOVED.
- REMOVE ELECTRICAL EQUIPMENT, OUTLETS, LIGHTING FIXTURES, ETC. IN AREAS OF GENERAL DEMOLITIONS. EXTEND AND RECONNECT CIRCUITS AS NECESSARY TO MAINTAIN POWER TO AREAS ADJACENT TO GENERAL DEMOLITION. CONNECT NEW LIGHTING AND POWER TO EXISTING CIRCUITS WHERE INDICATED ON THE PLANS.
- PROVIDE EXTENSION RINGS, COVER PLATED OR ACCESS DOORS AS NECESSARY TO MAINTAIN ACCESS TO EXISTING WIRING WHERE REQUIRED BY NEW CONSTRUCTION.
- PROVIDE BLANK COVER PLATES ON JUNCTION BOXES WHICH ARE NOT REUSED.
- PROVIDE CUTTING AND PATCHING AS REQUIRED, WHETHER OR NOT SPECIFICALLY INDICATED.
- FIELD VERIFY ALL EXISTING CIRCUITING AND MAKE ADJUSTMENTS AS NECESSARY TO THE CIRCUITING SHOWN ON THE PLANS, AS REQUIRED BY FIELD CONDITIONS.
- IF AN ITEM IS TO BE REPLACED, THE CONTRACTOR SHALL RECONNECT ALL EXISTING CONNECTIONS.

KEY NOTES

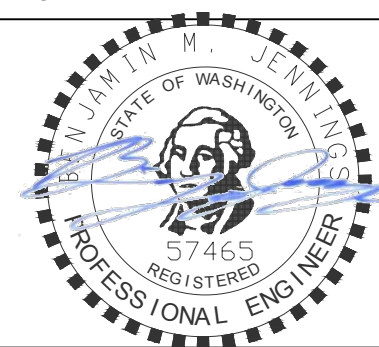
- EXISTING PUMP MOTOR AND DISCONNECT TO BE DEMOLISHED.
- EXISTING PUMP TO BE DEMOLISHED. DISCONNECT AND REMOVE ALL ASSOCIATED DISCONNECT, CONDUIT, CONDUCTORS, ETC.
- DISCONNECT AND REMOVE EXISTING STARTER AND OVERLOADS ASSOCIATED WITH P-1 & P-2 FROM MCC-1J3. RE:E-502
- EXISTING PUMP TO BE REPLACED IN PLACE WITH NEW INVERTER DUTY RATED MOTOR/PUMP. DISCONNECT AND REMOVE ALL ASSOCIATED DISCONNECT, CONDUIT, CONDUCTORS, ETC. BACK TO MCC.
- EXISTING LOADS TO BE REMOVED. RE:E-502-1 FOR ADDITIONAL INFORMATION.

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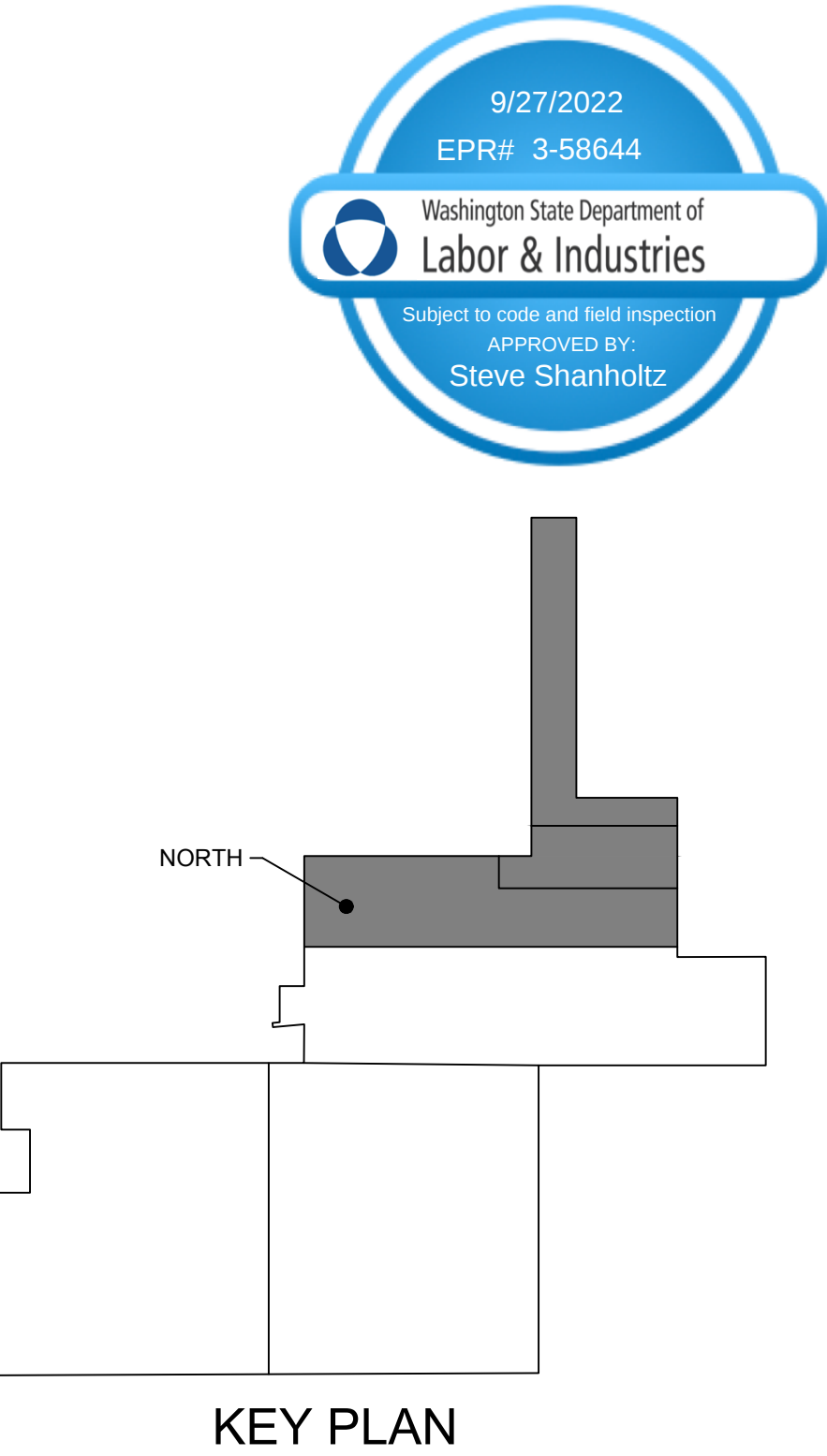
SHEET TITLE

MECH ROOM AND
MEZZANINE LEVEL -
ELECTRICAL - DEMO

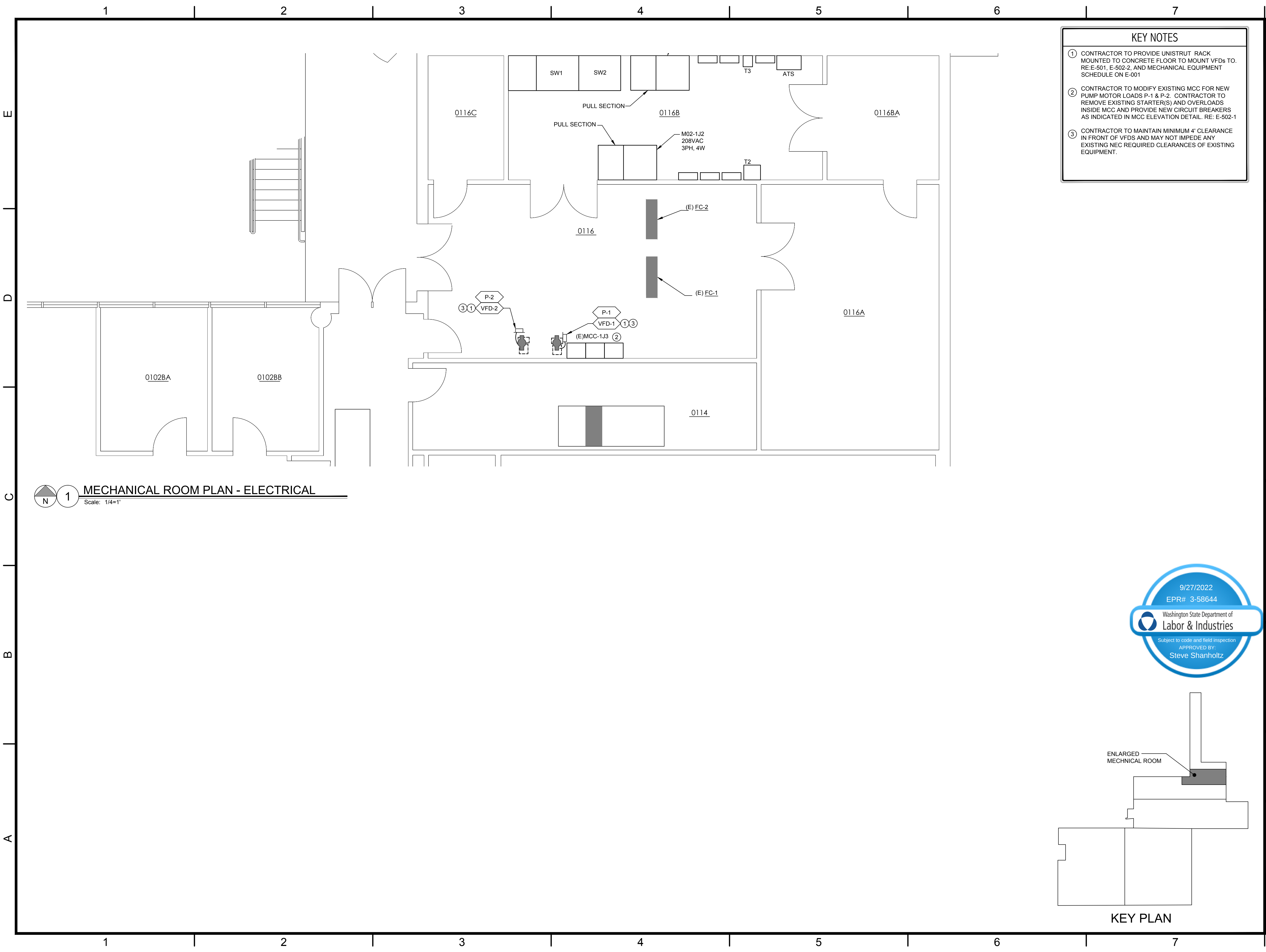
E-102

SHEET 15 OF 19 SHEETS

KEY PLAN



SHEET 16 OF 19 SHEETS



- KEY NOTES
- 1

CONTRACTOR TO PROVIDE UNISTRUT RACK MOUNTED TO CONCRETE FLOOR TO MOUNT VFDs TO. RE: E-501, E-502-2, AND MECHANICAL EQUIPMENT SCHEDULE ON E-001
- 2

CONTRACTOR TO MODIFY EXISTING MCC FOR NEW PUMP MOTOR LOADS P-1 & P-2. CONTRACTOR TO REMOVE EXISTING STARTER(S) AND OVERLOADS INSIDE MCC AND PROVIDE NEW CIRCUIT BREAKERS AS INDICATED IN MCC ELEVATION DETAIL. RE: E-502-1
- 3

CONTRACTOR TO MAINTAIN MINIMUM 4' CLEARANCE IN FRONT OF VFDs AND MAY NOT IMPEDE ANY EXISTING NEC REQUIRED CLEARANCES OF EXISTING EQUIPMENT.

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CAD DWG FILE: E-202

DESIGN BY: BMJ

DRAWN BY: BMJ

CHECKED BY: BMJ

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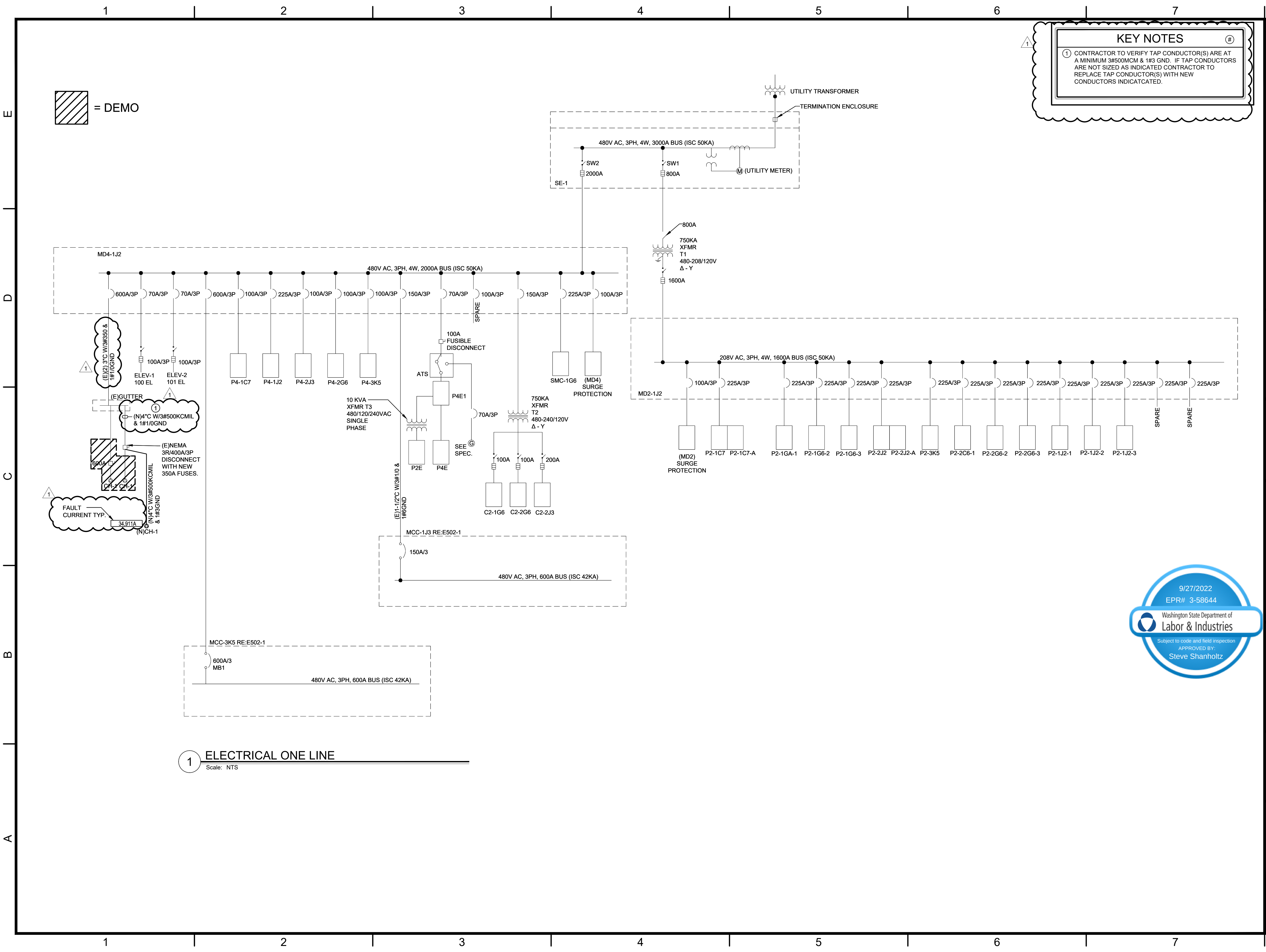
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SHEET TITLE

MECH ROOM - ELECTRICAL

E-202

SHEET 17 OF 19 SHEETS



KEY NOTES

1 CONTRACTOR TO VERIFY TAP CONDUCTOR(S) ARE AT A MINIMUM 3#500MCM & 1#3 GND. IF TAP CONDUCTORS ARE NOT SIZED AS INDICATED CONTRACTOR TO REPLACE TAP CONDUCTOR(S) WITH NEW CONDUCTORS INDICATED.

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CAD DWG FILE: E-501
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SHEET TITLE

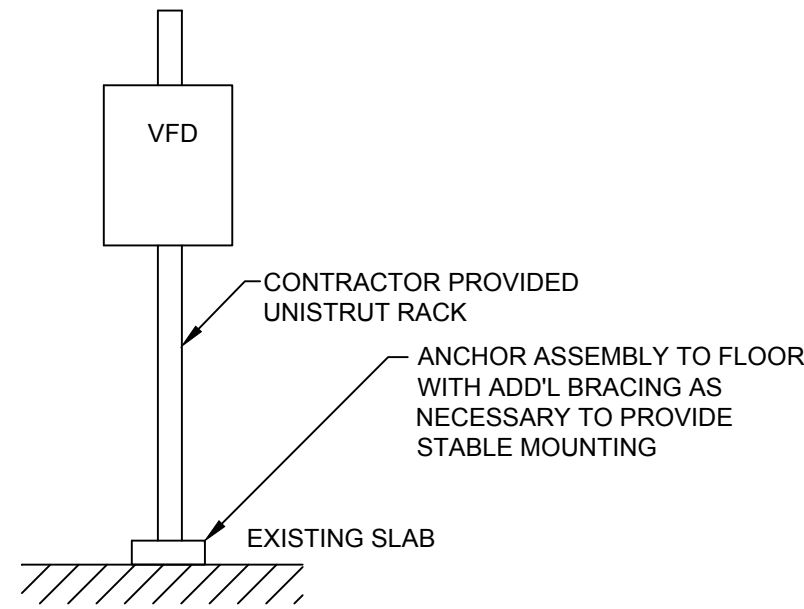
ELECTRICAL SINGLE LINE AND DETAILS

E-501

SHEET 18 OF 19 SHEETS

E
D
C
B
A

1234567

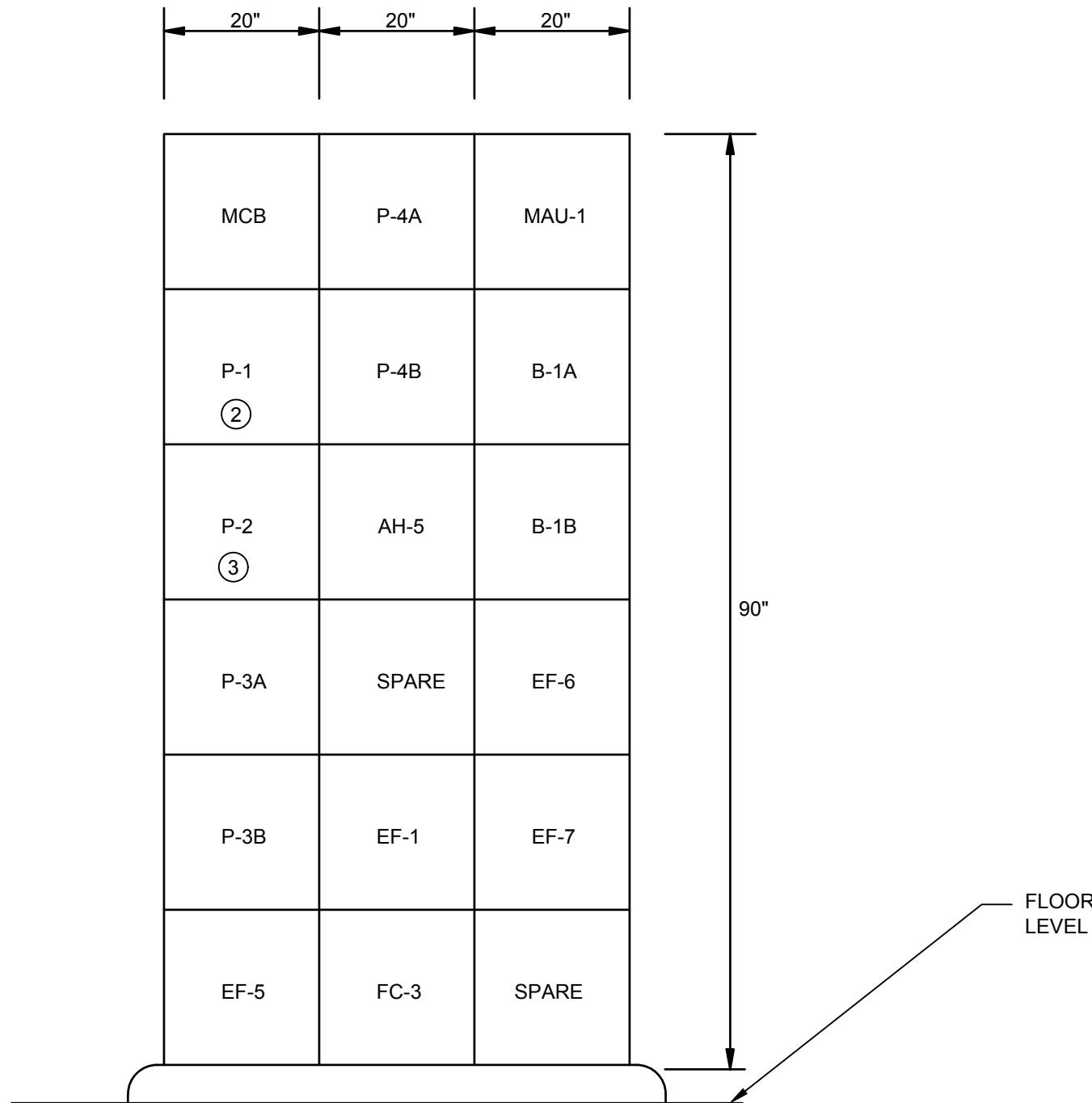


NOTE:
1. DETAIL IS MEANT TO CONVEY GENERAL LAYOUT AND MATERIALS. CONTRACTOR TO VERIFY AND PROVIDE ALL NECESSARY MOUNTING HARDWARE.

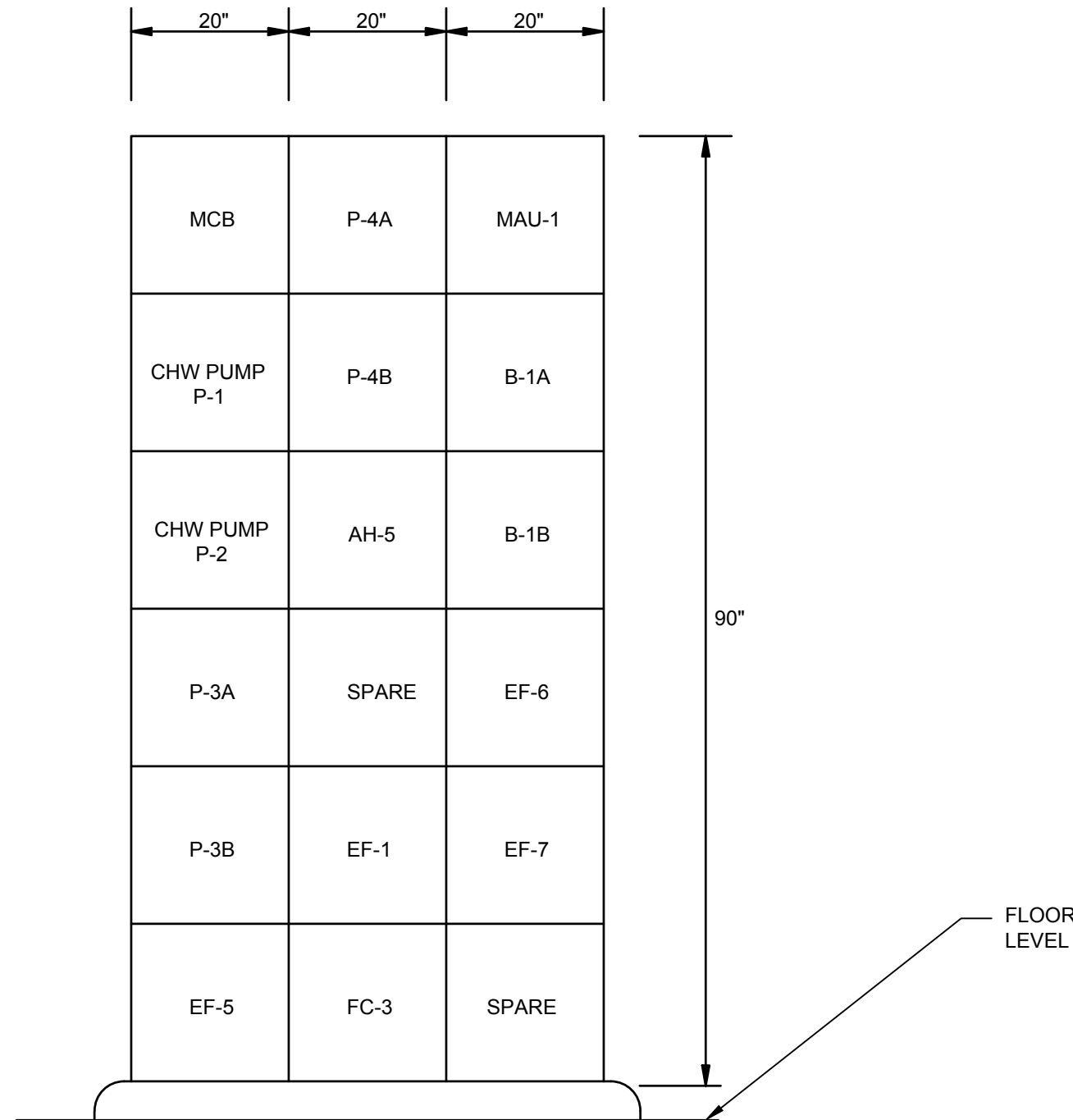
2 VFD ELEVATION
Scale: NOT TO SCALE

KEY NOTES

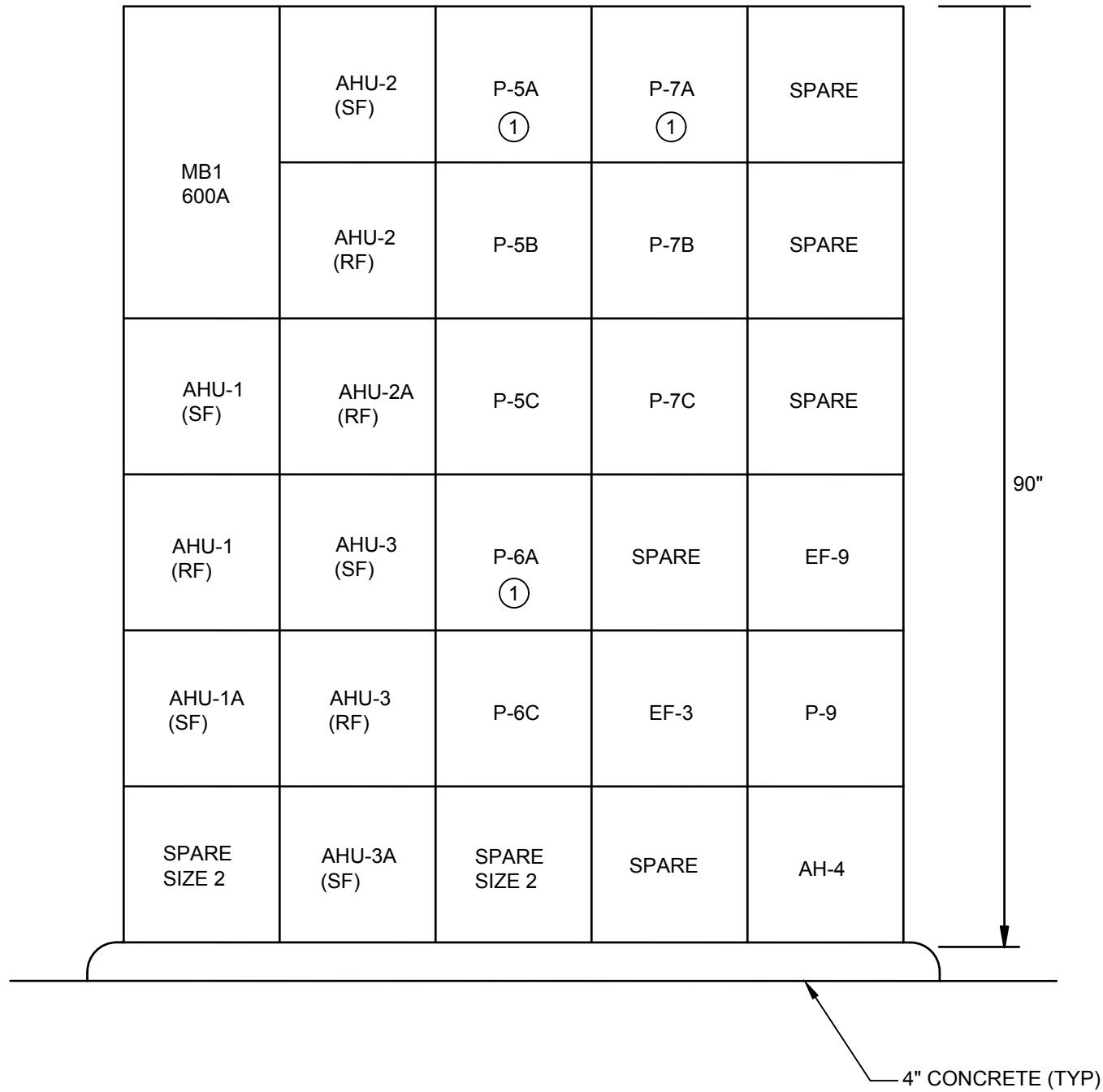
- ① LOAD TO BE REMOVED. LABEL BUCKET AS SPARE.
② EXISTING BUCKET TO BE MODIFIED. REMOVE EXISTING STARTER/OVERLOADS AND FUSE/DISCONNECT. ROVIDE NEW 3-POLE 20A BREAKER TO FEED 'VFD-1'.
③ EXISTING BUCKET TO BE MODIFIED. REMOVE EXISTING STARTER/OVERLOADS AND FUSE/DISCONNECT. PROVIDE NEW 3-POLE 40A BREAKER TO FEED 'VFD-2'.



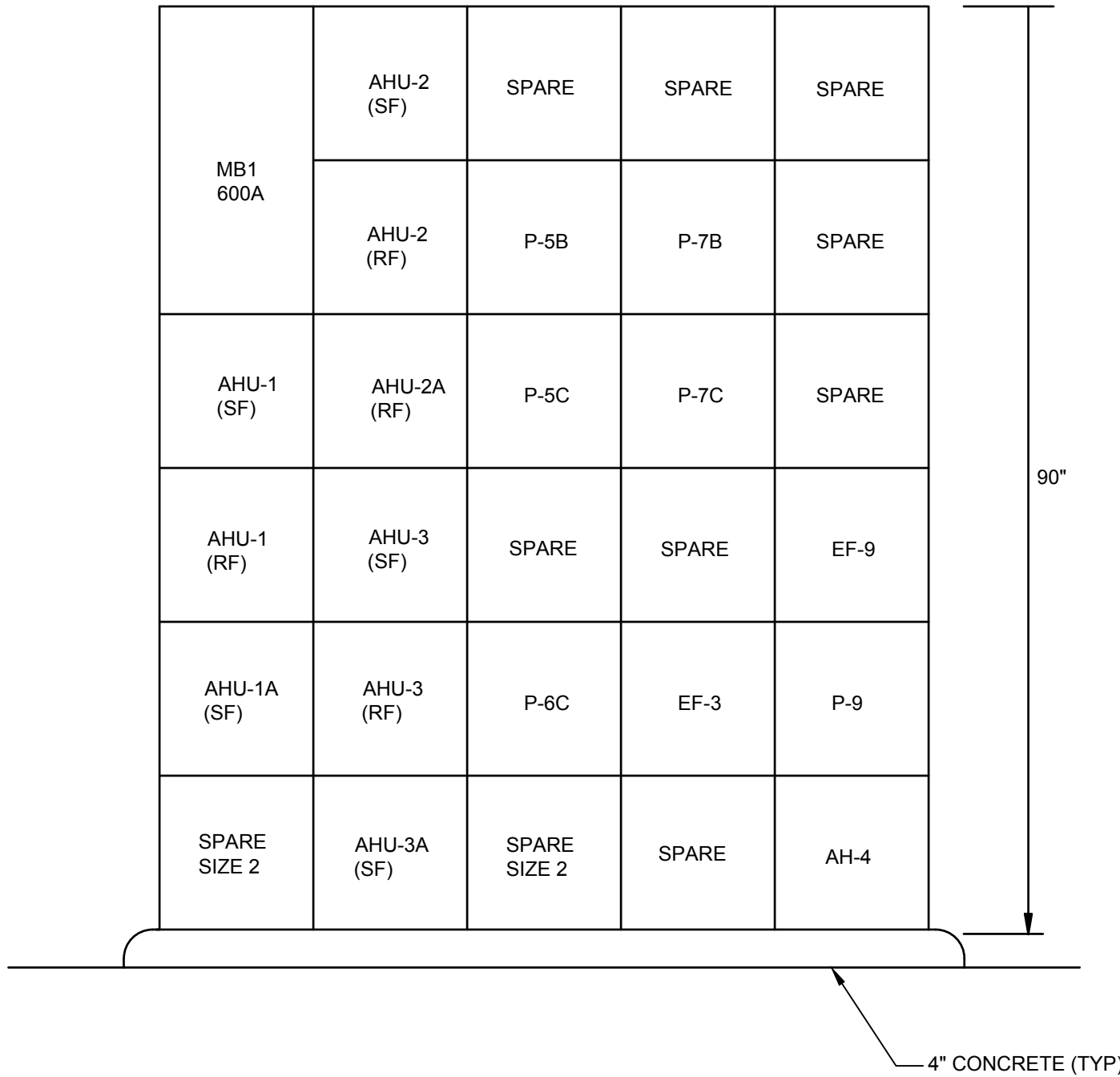
MCC-1J3 ELEVATION PREVIOUS
SCALE: NTS



MCC-1J3 ELEVATION NEW
SCALE: NTS



MCC-3K5 ELEVATION PREVIOUS
SCALE: NTS



MCC-3K5 ELEVATION NEW
SCALE: NTS

1 MCC ELEVATION(S)
Scale: NOT TO SCALE

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E-502

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