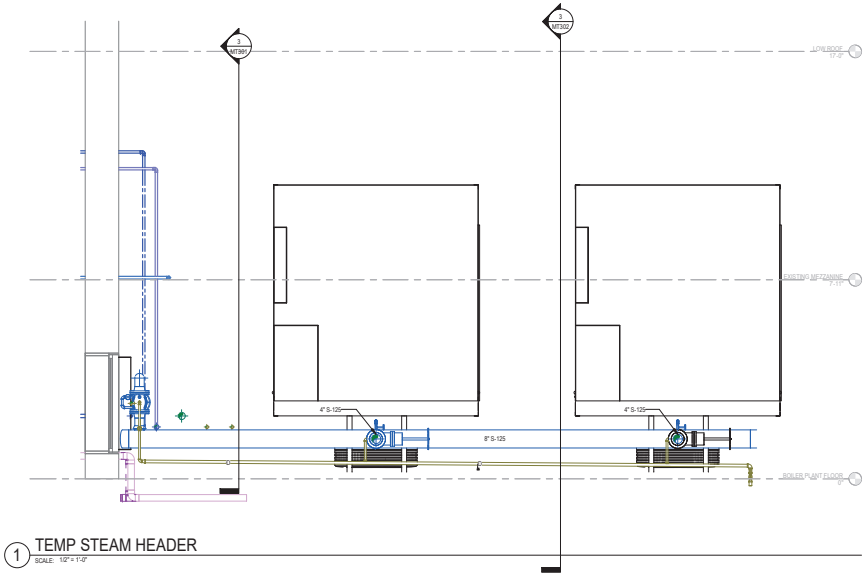
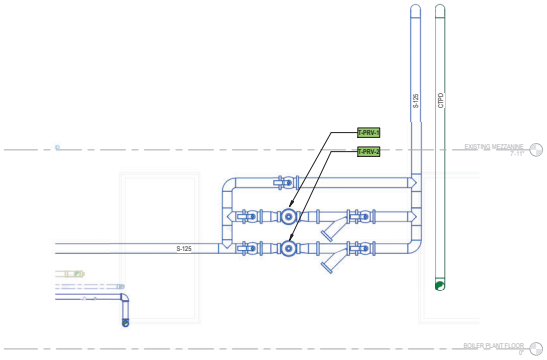


1 TEMP STEAM HEADER
SCALE: 1/2" = 1'-0"



2 TEMP PRV
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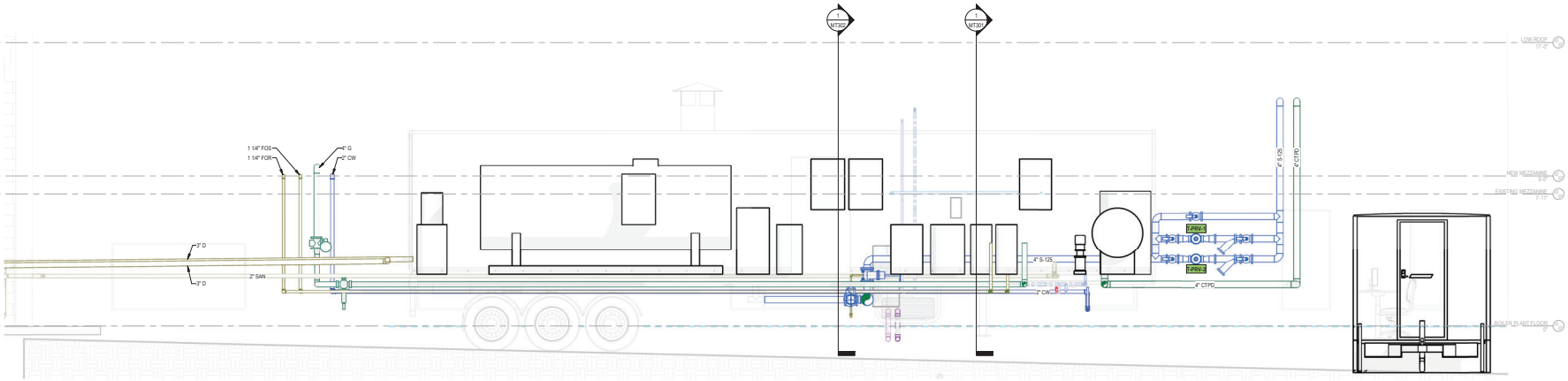

3 TEMPORARY BOILER AND PIPING SECTION
SCALE: 3/8" = 1'-0"

SCALE: 3/8" = 1'-0"

SCALE: 1/2" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jon A. Lalotto, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: MECH TEMPORARY SECTIONS

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025

Checked: LRL

Drawn: DMB

Drawing Number: MT302

Autodesk Docs://0489001/0131/ABS Boiler Replacement/0489001-01-MECHFR25.rvt

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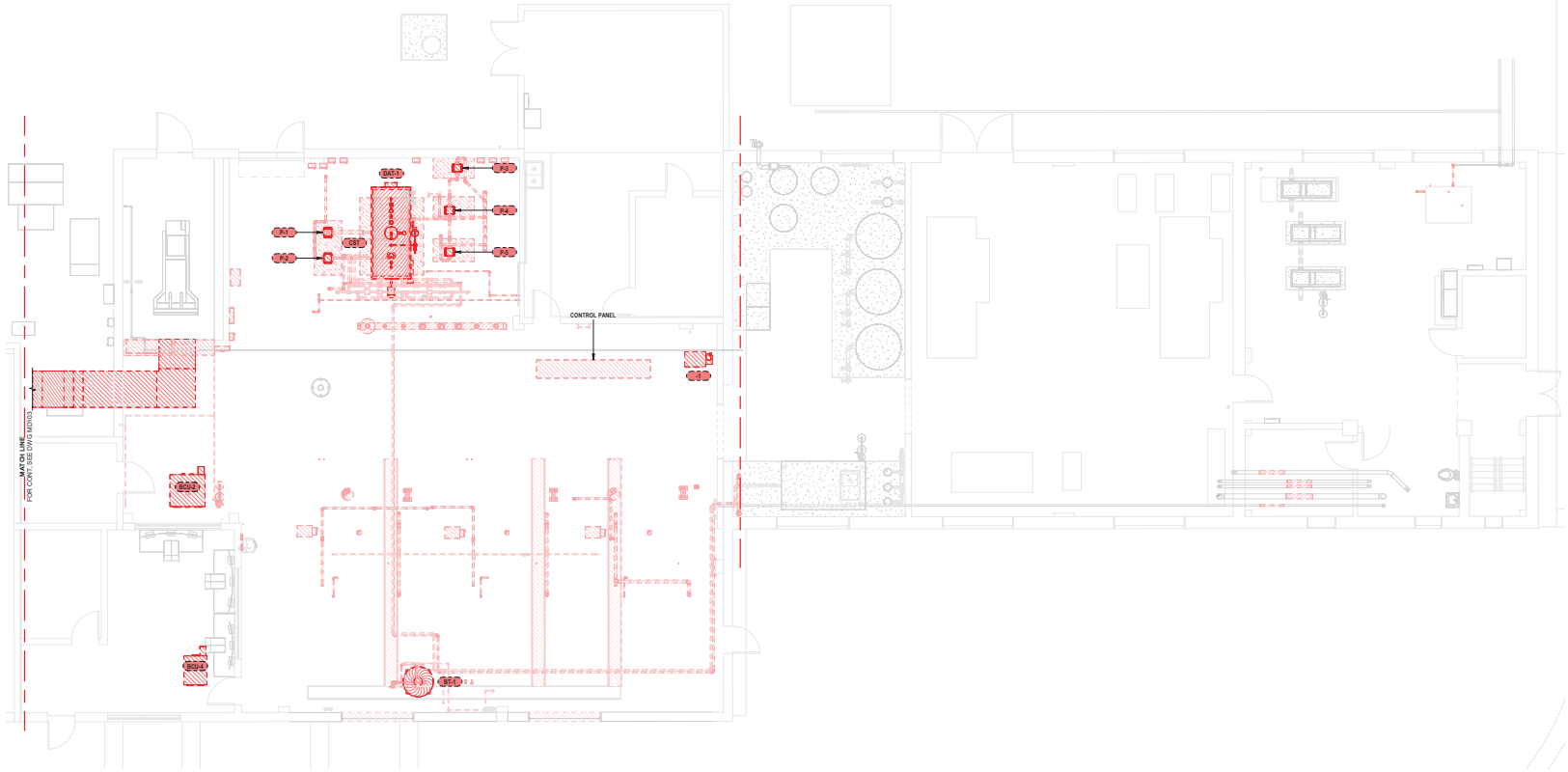
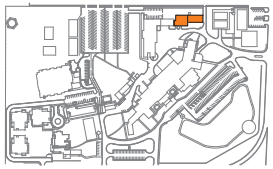


1 MECHANICAL DEMOLITION PLAN - BOILER PLANT FLOOR
SCALE: 3/16" = 1'-0"

GENERAL NOTES

1. OVERALL DEMOLITION FLOOR PLAN. RE: SHEETS MD101A, MD101B, MD101C, MD102, MD102A, MD103 FOR DEMO SCOPES OF WORK.
2. RE: SHEETS M600, M601, M602 FOR EXISTING SYSTEM RISER DIAGRAM.
3. BOILER PLANT EQUIPMENT AND RELATED SAFETY DEVICES SHALL BE TESTED, ANALYZED, DOCUMENTED, AND CERTIFIED PER THE VHA BOILER AND ASSOCIATED PLANT SAFETY DEVICE TESTING MANUAL EIGHTH EDITION OR CURRENT. COMPLY WITH TEST GUIDANCE, PROCEDURES, FAILURE CONSEQUENCES, AND INTERIM SAFETY MEASURE (ISM) REQUIREMENTS FOR EQUIPMENT AND ASSOCIATED SAFETY DEVICES INCLUDING WATER LEVEL CONTROL, PRESSURE CONTAINMENT, FUEL TRAIN SAFETY DEVICES, BURNER AND AIR TRAIN SAFETY DEVICES, INDIVIDUAL STEAM BOILERS, ETC.
4. TESTING, BOILER PLANT INSTRUMENTATION, AUTOMATIC BOILER CONTROL SYSTEMS, BURNER MANAGEMENT SYSTEME, GRAPHIC USER INTERFACE(S) (GUI'S), COMPUTER WORKSTATION(S). REFER TO THE SECTION 23 52 39 FIRE-TUBE BOILERS.
5. COORDINATE DEMO SCOPES WORK AND SEQUENCES WITH TEMPORARY BOILER PLANT INSTALLATION. RE: MT SERIES SHEETS.
6. PROVIDE TEMPORARY WEATHERPROOF PROTECTION FOR PLANT DISTRIBUTION SYSTEMS PENETRATION OPENINGS THROUGH EXTERIOR ENVELOPE (WALLS, ROOF, FLOOR) TO BE REUSED. PROVIDE SEALS FOR PENETRATION OPENINGS THRU INTERIOR WALLS, PARTITIONS, CEILING ASSEMBLIES TO MAINTAIN THE ENVIRONMENT, CONTROL DUST / DEBRIS TO BE REUSED.
7. SEAL UN-USED PLANT DISTRIBUTION SYSTEMS OPENINGS. RE: ARCHITECTURAL DRAWINGS.
8. REMOVE (E) EQUIPMENT AS INDICATED. DISCONNECT STEAM, CONDENSATE, PLUMBING, DRAIN PIPING; ELECTRICAL CONNECTION LINE VOLTAGE POWER, CONTROLS / LOW VOLTAGE POWER AND REMOVE TO POINTS OF DISCONNECTION.
9. REMOVE ASSOCIATED SPECIALTY SYSTEMS, CONTROLS, CONTROLS WIRING, RACEWAY TO POINTS OF DISCONNECTION AS REQUIRED. FIELD VERIFY.
10. RE: PLUMBING DRAWINGS FOR DEMO SCOPE OF WORK.
11. RE: ELECTRICAL DRAWINGS FOR DEMO SCOPE OF WORK.
12. DISCONNECT AND REMOVE (E) STEAM PLANT DISTRIBUTION PIPING AS INDICATED. FIELD VERIFY, COORDINATE WITH TEMPORARY AND NEW CONSTRUCTION DRAWINGS. (E) PIPE SYSTEMS TO REMAIN TO POINTS OF DISCONNECTION INCLUDE:
    A. STEAM AND CONDENSATE MAIN DISTRIBUTION TO PIPE TUNNELS / BUILDINGS
    B. STEAM AND CONDENSATE BRANCH PIPING TO HVAC EQUIPMENT
    C. NATURAL GAS
    D. FUEL OIL SUPPLY / RETURN
    E. LP GAS
    F. SOFTENED WATER, RO WATER
13. REMOVE (E) EQUIPMENT PADS. PREP FLOOR FOR NEW EQUIPMENT PADS AND FLOOR FINISH. RE: ARCH DRAWINGS.
14. RE: SHEET MD101C FOR FUEL GAS PIPING DEMO SCOPE OF WORK.
15. RE: SHEETS MT SERIES SHEETS FOR TEMPORARY BOILER PLANT SCOPES OF WORK.


KEY PLAN

PLAN
TRUE
SCALE: 3/16" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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Dallas, TX 75248
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www.obrieneng.com

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STATE OF TEXAS
Jon A. Palmetto, Jr.
91464
LICENSED
PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: OVERALL MECH DEMOLITION PLAN - BOILER PLANT FLOOR

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

Phase: 100% CONSTRUCTION DOCUMENTS

FULLY SPRINKLERED

Project Title: A/E REPLACE BOILERS

Location: BOILER PLANT

Issue Date: 10/07/2025 | Checked: LRL | Drawn: DMB

Project Number: 519-20-200

Building Number: 2

Drawing Number: MD101

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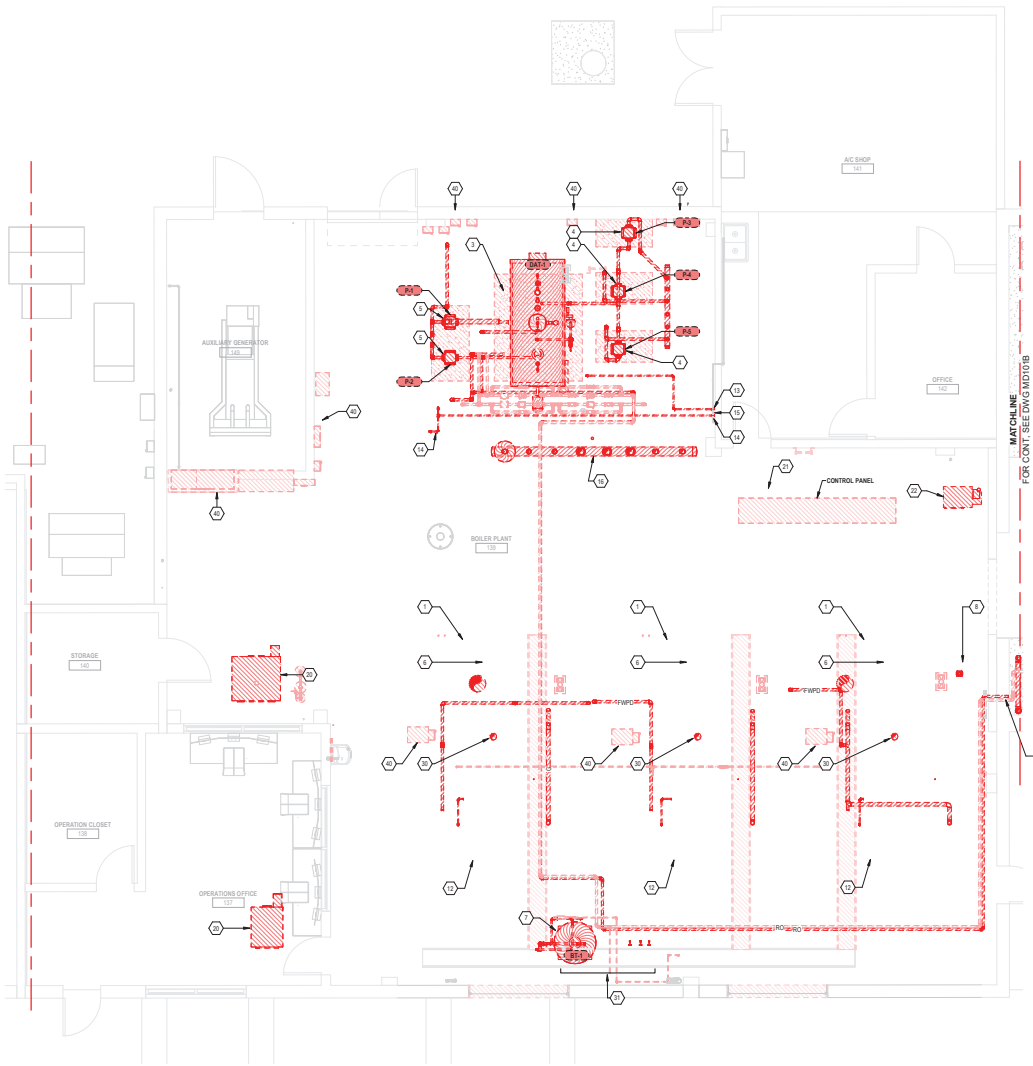


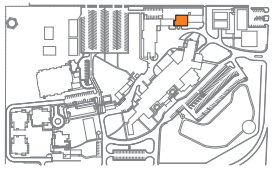
1 MECHANICAL DEMO PIPING PLAN - BOILER PLANT
SCALE: 1/4" = 1'-0"

GENERAL NOTES

1. FIELD VERIFY (E) EQUIPMENT LOCATIONS
2. FIELD VERIFY (E) PIPE ROUTING.
3. RE: SHEET MD102A FOR PIPES UP.
4. RE: SHEET PLUMBING SERIES SHEETS FOR PIPES DN.
5. RE: MT SERIES SHEETS FOR TEMPORARY BOILER PLANT SCOPES OF WORK. COORDINATE DEMO WITH INSTALLATION.
6. RE: M500 SERIES SHEETS FOR BOILER PLANT DIAGRAMS.
7. RE: M600 SERIES SHEETS FOR BOILER PLANT RISER DIAGRAM.
8. RE: M600 SERIES SHEETS FOR BOILER PLANT EQUIPMENT SCHEDULES.
9. RE: MT700 SERIES SHEETS FOR BOILER PLANT MECHANICAL SITE PLAN.
10. RE: P SERIES SHEETS FOR PLUMBING PIPING SCOPES OF WORK.
11. DISCONNECT AND REMOVE (E) STEAM PIPE ASSEMBLIES INCLUDING PIPE APPURTENANCES, VALVES, ACCESSORIES. COORD POINTS OF DISCONNECTION WITH TEMP BOILER PLANT / NEW BOILER PLANT INSTALLATION REQUIREMENTS.
12. DISCONNECT AND REMOVE (E) PCR, GCR PIPE ASSEMBLIES INCLUDING PIPE APPURTENANCES, VALVES, ACCESSORIES. COORD POINTS OF DISCONNECTION WITH TEMP BOILER PLANT / NEW BOILER PLANT INSTALLATION REQUIREMENTS.
13. RE: SHEET MD101C FOR FUEL GAS PIPING DEMO SCOPE OF WORK.

KEY NOTES

No.	DESCRIPTION
1	(E) B-1,2,3: FIRE-TUBE BOILER: DISCONNECT STEAM, FEEDWATER, NATURAL GAS, #2 FUEL OIL, ATOMIZING AIR, RELIEF, BLOWDOWN, AND MISC DRAIN AND CONTROL PIPING, BOILER VENT AND REMOVE. FIELD VERIFY DISCONNECT LOCATIONS. COORDINATE WITH TEMP BOILER / NEW BOILER INSTALL REQUIREMENTS. (FIELD VERIFY: CLEAVERBROOKS CB200X-200, 200BHP, 200PSI MAX PRESS, 8380MBH NG, 6GPH #2 FO, ELECTRIC POWER: 480/3/60 (VPHHZ) 15A, 10MCA, 10HP BLOWER MOTOR; APPROX OVERALL DIMENSIONS: 210"L X 115"W X 67"H, 15,000 LBS (DRY))
3	(E) CST-1: CONDENSATE STORAGE TANK. DISCONNECT (E) PCR, GCR, CD, VENT, RELIEF, MISC. MAKE-UP, DRAIN AND CONTROLS PIPING, POWER. AND REMOVE. TANK IS INSTALLED BELOW (E) DEAERATOR TANK. (APPROX DIMENSIONS: 60" DIA X 108"L, 1200 GAL)
4	(E) FWP-1,2,3: BOILER FEEDWATER PUMPS. DISCONNECT PIPING AND REMOVE PUMP INCLUDING BASE ASSEMBLY. PREP FLOOR FOR NEW PUMP BASE.
5	(E) CDP-1,2: CONDENSATE TRANSFER PUMPS. DISCONNECT PIPING AND REMOVE PUMP INCLUDING BASE ASSEMBLY. PREP FLOOR NEW PUMP BASE.
6	(E) BOILER VENT THRU ROOF. DISCONNECT AND REMOVE. PROVIDE TEMPORARY WEATHERPROOF PROTECTION FOR ROOF OPENING.
7	(E) BDT-1: DISCONNECT PIPING AND REMOVE.
8	DISCONNECT AND REMOVE (E) NG PIPING AS INDICATED.
9	DISCONNECT AND REMOVE (E) DCW PIPING AS INDICATED.
11	RE: SHEET PLUMBING SERIES SHEETS FOR PIPES DN.
12	REMOVE (E) BOILER EQUIPMENT PAD / BASE ASSEMBLY. PREP FLOOR FOR NEW EQUIPMENT BASE PAD.
13	(E) SAMPLE PORT MANIFOLD WITH SINK ASSEMBLY. DISCONNECT PIPING AND REMOVE.
14	(E) PCR/GCR SAMPLE PIPE TO SAMPLE STATION. DISCONNECT AND REMOVE.
15	(E) DA TANK FWS SAMPLE PIPE TO SAMPLE STATION. DISCONNECT AND REMOVE.
16	(E) BOILER PLANT STEAM HEADER. DISCONNECT STEAM, CONDENSATE PIPING, VALVES, ACCESSORIES, AND REMOVE.1
20	(E) BC-1,2: REMOVE (E) BLOWER COIL UNITS AND ASSOCIATED DUCTWORK, AIR TERMINALS, PIPE, CONTROL VALVE ASSEMBLIES. (MAGIC AIRE HBB-04, APPROX DIMENSIONS: 40"L X 28"W X 14.1"H, 117X.9" SA OPENING, 22"X32"RA OPENING)
21	(E) BOILER PLANT INSTRUMENTATION PANEL. REMOVE PANEL AS INDICATED.
22	RELOCATE (E) AIR COMPRESSOR AS INDICATED.
30	(E) 4" DIA HPS. DISCONNECT FROM BOILER OUTLET AND REMOVE BACK TO (E) STEAM HEADER AS INDICATED.
31	REMOVE (E) STEAM EQUIPMENT BLOWDOWN / RELIEF PIPING DN TO (E) BDT AS INDICATED.
40	(E) ELECTRICAL EQUIPMENT. RE: ELEC SHEETS FOR SCOPE.



KEY PLAN

PLAN
TRUE

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

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jason A. Palmetto, Jr.
91464
LICENSED
PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: PARTIAL MECH DEMOLITION PLAN - BOILER PLANT	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Drawing Number: MD101A
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	

Autodesk Docs://0489001/0131/ABB Boiler Replacement/0489001-01-01 MECH R25.rvt

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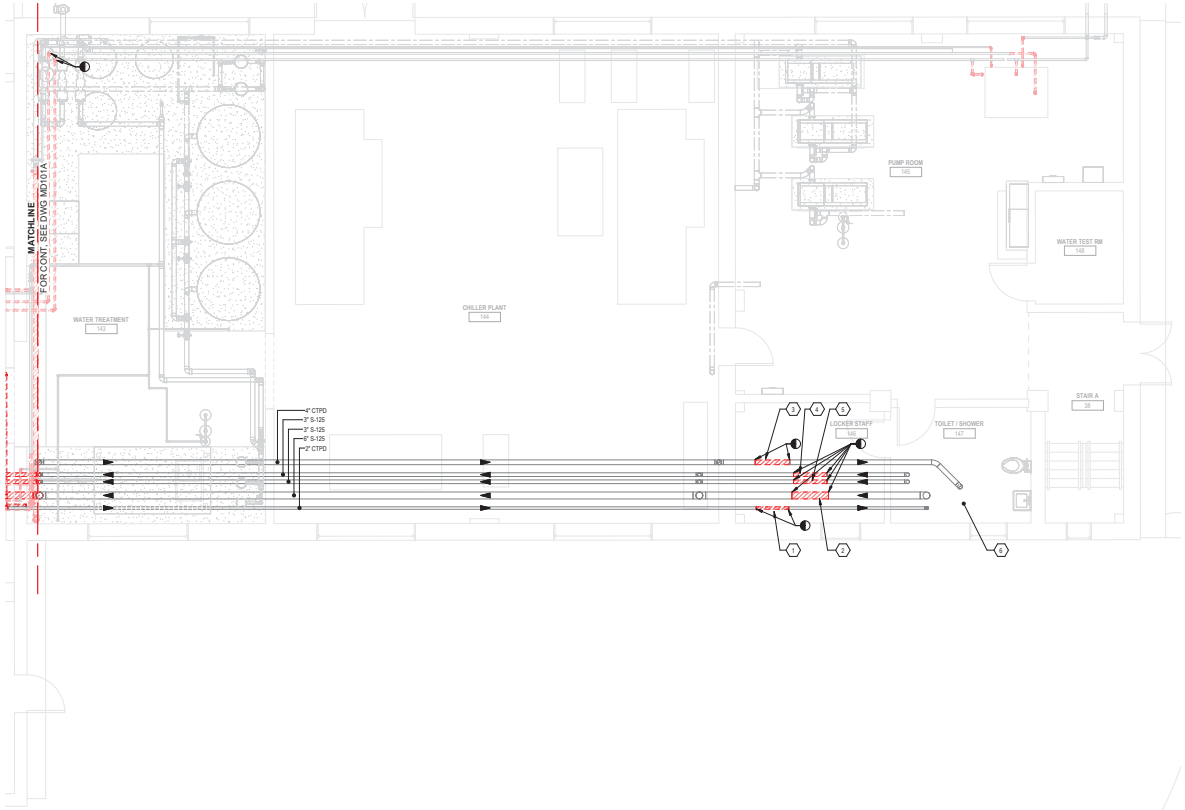


1 MECHANICAL DEMO PLAN - BUILDING 2 EAST

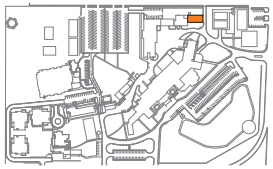
SCALE: 1/4" = 1'-0"

GENERAL NOTES

1. FIELD VERIFY (E) EQUIPMENT LOCATIONS
2. FIELD VERIFY (E) PIPE ROUTING.
3. RE: SHEET MD102, MD102A FOR PIPES UP.
4. RE: SHEET PLUMBING SERIES SHEETS FOR PIPES DN.
5. RE: MT SERIES SHEETS FOR TEMPORARY BOILER PLANT SCOPES OF WORK. COORDINATE DEMO WITH INSTALLATION.
6. RE: M500 SERIES SHEETS FOR BOILER PLANT DIAGRAMS.
7. RE: M600 SERIES SHEETS FOR BOILER PLANT RISER DIAGRAM.
8. RE: M600 SERIES SHEETS FOR BOILER PLANT EQUIPMENT SCHEDULES.
9. RE: MT700 SERIES SHEETS FOR BOILER PLANT MECHANICAL SITE PLAN.
10. RE: PLUMBING P SERIES SHEETS FOR PLUMBING PIPING SCOPES OF WORK.
11. DISCONNECT AND REMOVE (E) STEAM PIPE ASSEMBLIES INCLUDING PIPE APPURTENANCES, VALVES, ACCESSORIES. COORD POINTS OF DISCONNECTION WITH TEMP BOILER PLANT / NEW BOILER PLANT INSTALLATION REQUIREMENTS.
12. DISCONNECT AND REMOVE (E) PCR, GCR PIPE ASSEMBLIES INCLUDING PIPE APPURTENANCES, VALVES, ACCESSORIES. COORD POINTS OF DISCONNECTION WITH TEMP BOILER PLANT / NEW BOILER PLANT INSTALLATION REQUIREMENTS.
13. RE: SHEET MD101C FOR FUEL GAS PIPING DEMO SCOPE OF WORK.

KEY NOTES

No.	DESCRIPTION
1	(E) PCD. INSTALL TEMPORARY BOILER PLANT CONNECTION IN LOCATION AS INDICATED. FIELD VERIFY.
2	(E) HPS DISTRIBUTION PIPE MAIN. INSTALL TEMPORARY BOILER CONNECTION IN LOCATION AS INDICATED. FIELD VERIFY.
3	(E) PCD. INSTALL TEMPORARY BOILER PLANT CONNECTION IN LOCATION AS INDICATED. FIELD VERIFY.
4	(E) HPS DISTRIBUTION PIPE MAIN. INSTALL TEMPORARY BOILER CONNECTION IN LOCATION AS INDICATED. FIELD VERIFY.
5	(E) HPS DISTRIBUTION PIPE MAIN. INSTALL TEMPORARY BOILER CONNECTION IN LOCATION AS INDICATED. FIELD VERIFY.
6	(E) HPS, PCD PIPING TO/FROM STEAM TUNNELS TO REMAIN. FIELD VERIFY ROUTING.



KEY PLAN

PLAN

TRUE

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

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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A/E:
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O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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STATE OF TEXAS
Jim A. Lamberto, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

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Drawing Title: PARTIAL MECH DEMOLITION PLAN - BUILDING 2 EAST	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Building Number: 2
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	Drawing Number: MD101B

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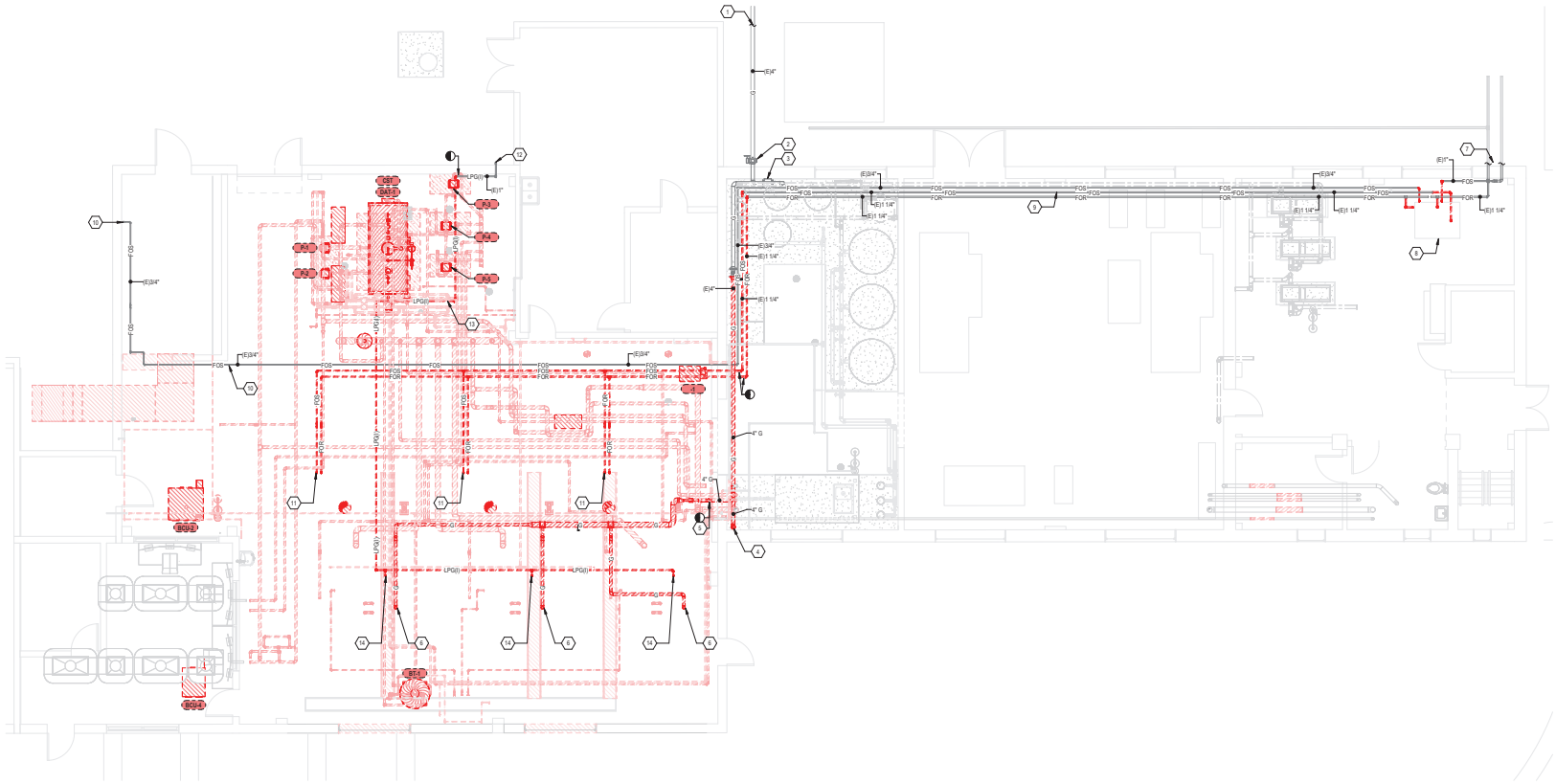


1 MECHANICAL DEMOLITION PLAN - FUEL OIL AND GAS

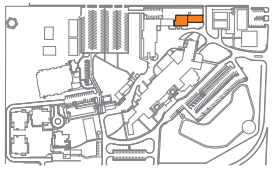
SCALE: 3/16" = 1'-0"

GENERAL NOTES

1. FIELD VERIFY (E) EQUIPMENT LOCATIONS
2. FIELD VERIFY (E) PIPE ROUTING.
3. RE: SHEET MD102, MD102A FOR PIPES UP.
4. RE: SHEET PLUMBING SERIES SHEETS FOR PIPES DN.
5. RE: MT SERIES SHEETS FOR TEMPORARY BOILER PLANT SCOPES OF WORK. COORDINATE DEMO WITH INSTALLATION.
6. RE: M500 SERIES SHEETS FOR BOILER PLANT DIAGRAMS.
7. RE: M600 SERIES SHEETS FOR BOILER PLANT RISER DIAGRAM.
8. RE: M600 SERIES SHEETS FOR BOILER PLANT EQUIPMENT SCHEDULES.
9. RE: MT700 SERIES SHEETS FOR BOILER PLANT MECHANICAL SITE PLAN.
10. RE: PLUMBING P SERIES SHEETS FOR PLUMBING PIPING SCOPES OF WORK.
11. DISCONNECT AND REMOVE (E) STEAM PIPE ASSEMBLIES INCLUDING PIPE APPURTENANCES, VALVES, ACCESSORIES. COORD POINTS OF DISCONNECTION WITH TEMP BOILER PLANT / NEW BOILER PLANT INSTALLATION REQUIREMENTS.
12. DISCONNECT AND REMOVE (E) PCR, GCR PIPE ASSEMBLIES INCLUDING PIPE APPURTENANCES, VALVES, ACCESSORIES. COORD POINTS OF DISCONNECTION WITH TEMP BOILER PLANT / NEW BOILER PLANT INSTALLATION REQUIREMENTS.
13. RE: SHEET MD101C FOR FUEL GAS PIPING DEMO SCOPE OF WORK.

KEY NOTES

No.	DESCRIPTION
1	(E) G MAIN TO GAS SERVICE ENTRANCE TO REMAIN. RE: PLUMBING SHEETS. RE: CIVIL SHEETS.
2	(E) NG SERVICE TO BUILDING (25 PSIG) TO REMAIN.
3	(E) EMERGENCY NG SAFETY SHUTOFF VALVE ASSEMBLY. REPLACE (E) VALVE AS INDICATED.
4	(E) NG BRANCH MAIN ROUTED TO THIS LOCATION. CAPPED TO REMAIN.
5	(E) NG BRANCH MAIN TO BOILER ROOM. DISCONNECT AS INDICATED AND CAP FOR NEW CONSTRUCTION.
6	(E) NG DN TO (E) BOILER GAS PIPE TRAIN. DISCONNECT AND REMOVE BACK TO POINT OF DISCONNECTION AS INDICATED.
7	(E) FOS/FOR MAINS TO FUEL STORAGE TANK TO REMAIN. RE: PLUMBING SHEETS. RE: CIVIL SHEETS.
8	(E) FUEL OIL PUMPS. REPLACE (E) PUMPS AS INDICATED. FIELD VERIFY.
9	(E) FOS / FOR PIPING TO REMAIN.
10	(E) 3/4" FOS PIPING TO (E) GENERATOR FUEL STORAGE TANK TO REMAIN. FIELD VERIFY LOCATION. DISCONNECT AND MODIFY ROUTING TO ACCOMMODATE NEW CONSTRUCTION. COORD ROUTING WITH NEW ELECTRICAL EQUIPMENT. RE: ELECTRICAL DRAWINGS.
11	(E) FOS/FOR DN TO (E) BOILER FUEL PIPE TRAIN. DISCONNECT AND REMOVE BACK TO POINT OF DISCONNECTION AS INDICATED.
12	(E) LPG MAIN TO LPG BULK TANK TO REMAIN. RE: PLUMBING SHEETS. RE: CIVIL SHEETS.
13	(E) LPG MAIN ROUTED TO BOILER ROOM. DISCONNECT AS INDICATED AND CAP FOR NEW CONSTRUCTION.
14	(E) LPG DN TO BOILER GAS TRAIN. DISCONNECT AND REMOVE BACK TO POINT OF DISCONNECTION AS INDICATED.



KEY PLAN

PLAN

TRUE

SCALE: 3/16" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
Revisions:	Date:

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A/E:
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STATE OF TEXAS
Lawrence Bellomo, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: OVERALL MECH DEMOLITION PLAN - FUEL OIL AND GAS

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025 | Checked: LRL | Drawn: MJS

Drawing Number: MD101C

Autodesk Docs://0489001/0131/ABB Boiler Replacement/0489001-01-01 MECH FR25.rvt

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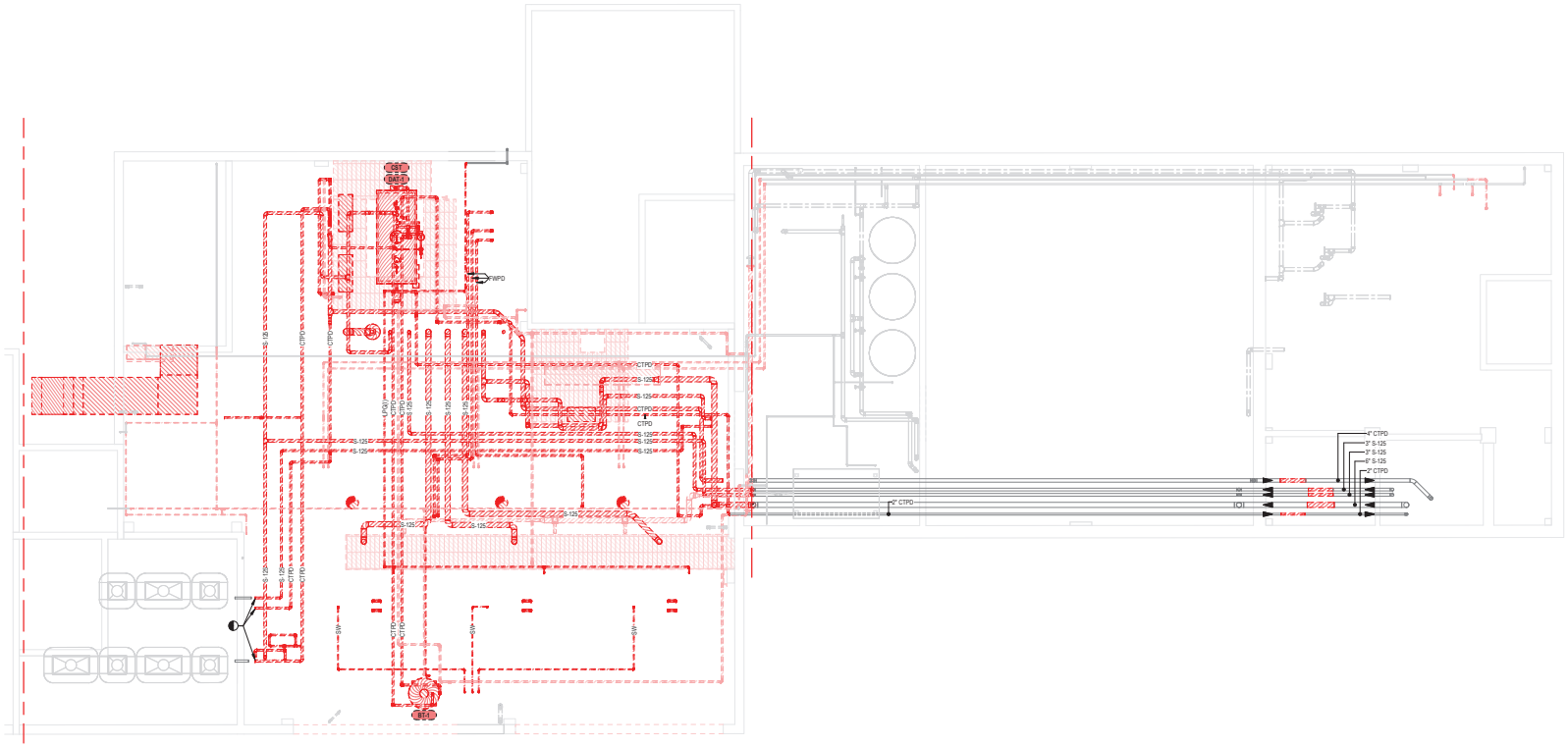
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DAT-1
BT-1
WPD
CTPD
S-125
RS-125
RS-125
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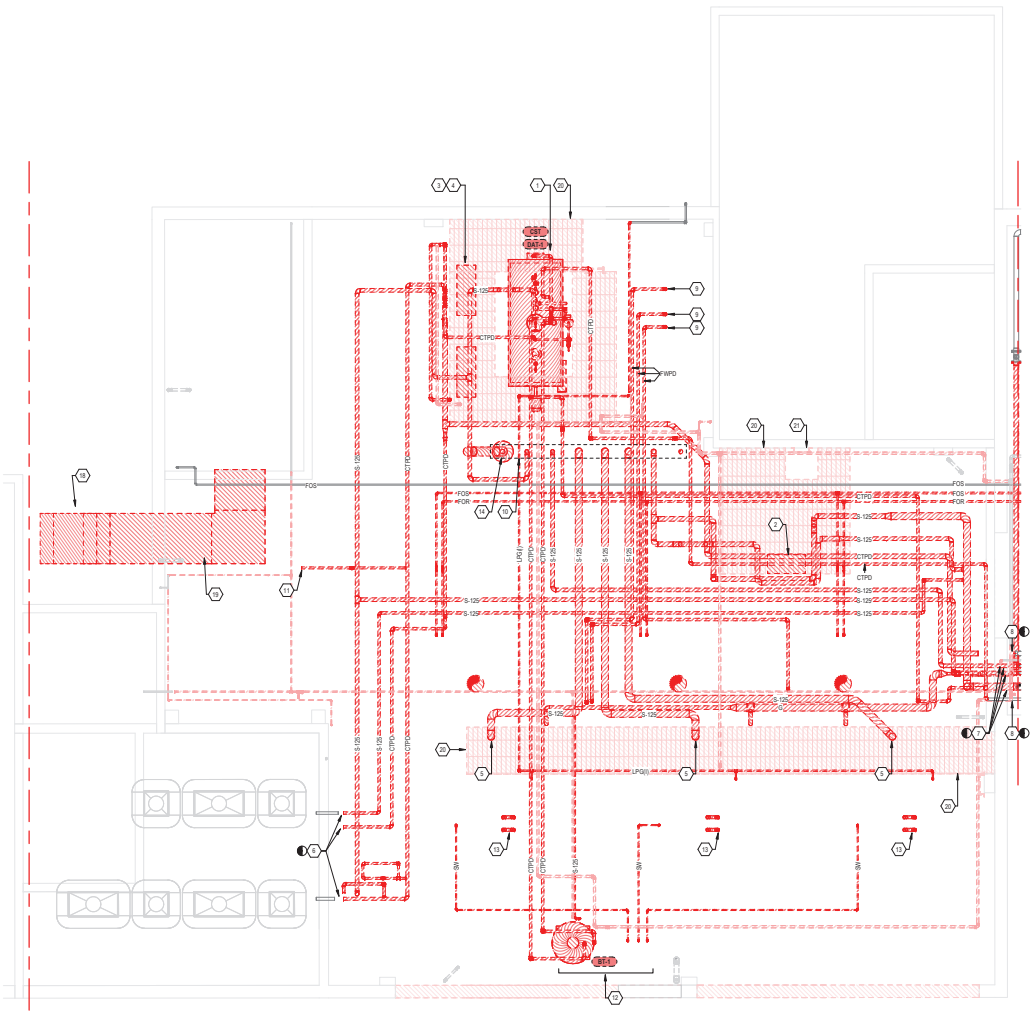
CTPD
RS-125
RS-125
RS-125

GENERAL NOTES

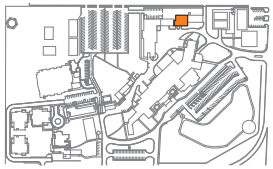
1. FIELD VERIFY (E) EQUIPMENT LOCATIONS
2. FIELD VERIFY (E) PIPE ROUTING.
3. RE: SHEET MD103A FOR PIPES UP.
4. RE: SHEET MD101A FOR PIPES DN.
5. RE: MT SERIES SHEETS FOR TEMPORARY BOILER PLANT SCOPES OF WORK. COORDINATE DEMO WITH INSTALLATION.
6. RE: M600 SERIES SHEETS FOR BOILER PLANT DIAGRAMS.
7. RE: M600 SERIES SHEETS FOR BOILER PLANT RISER DIAGRAM.
8. RE: M600 SERIES SHEETS FOR BOILER PLANT EQUIPMENT SCHEDULES.
9. RE: MT700 SERIES SHEETS FOR BOILER PLANT MECHANICAL SITE PLAN.
10. RE: P SERIES SHEETS FOR PLUMBING PIPING SCOPES OF WORK.
11. DISCONNECT AND REMOVE (E) STEAM PIPE ASSEMBLIES INCLUDING PIPE APPURTENANCES, VALVES, ACCESSORIES. COORD POINTS OF DISCONNECTION WITH TEMP BOILER PLANT / NEW BOILER PLANT INSTALLATION REQUIREMENTS.
12. DISCONNECT AND REMOVE (E) PCR, GCR PIPE ASSEMBLIES INCLUDING PIPE APPURTENANCES, VALVES, ACCESSORIES. COORD POINTS OF DISCONNECTION WITH TEMP BOILER PLANT / NEW BOILER PLANT INSTALLATION REQUIREMENTS.
13. RE: SHEET MD101C FOR FUEL GAS PIPING DEMO SCOPE OF WORK.

KEY NOTES

No.	DESCRIPTION
1	(E) DAT-1: ELEVATED DEAERATOR TANK. DISCONNECT STEAM, CONDENSATE, MAKE-UP WATER, RELIEF, VENT, MISC. DRAIN AND CONTROLS PIPING AND REMOVE. FIELD VERIFY DISCONNECT LOCATIONS. COORDINATE WITH TEMP BOILER AND NEW BOILER INSTALL REQUIREMENTS. (14,000GBH/HR; APPROX OVERALL DIMENSIONS: 48" DIA X 96"L, 600 GAL))
2	(E) PRV-18,19: (E) STEAM PRESSURE REDUCING STATION ASSEMBLIES. DISCONNECT PIPING AND ACCESSORIES AND REMOVE.
3	(E) PRV-20: (E) STEAM PRESSURE REDUCING STATION ASSEMBLIES. DISCONNECT PIPING AND ACCESSORIES AND REMOVE.
4	(E) PRV-16,17: (E) STEAM PRESSURE REDUCING STATION ASSEMBLIES. DISCONNECT PIPING AND ACCESSORIES AND REMOVE.
5	(E) 4" DIA HPS. DISCONNECT FROM BOILER OUTLET AND REMOVE BACK TO (E) STEAM HEADER AS INDICATED.
6	(E) 2", 2", 2-1/2" STEAM BRANCH MAINS. DISCONNECT AS INDICATED. CAP FOR FUTURE CONNECTION.
7	(E) 3", 3", 3", 6" BRANCH MAINS. DISCONNECT AND REMOVE PIPE BACK TO STEAM HEADER AS INDICATED. PROVIDE CAP FOR NEW CONNECTION. PROVIDE CAP FOR TEMP BOILER PLANT.
8	(E) 2", 6" DIA. BRANCH MAIN. DISCONNECT AND REMOVE PIPE BACK TO (E) STEAM HEADER AS INDICATED. PROVIDE CAP FOR NEW CONNECTION. PROVIDE CAP FOR TEMP BOILER PLANT.
9	2-1/2" FWSF/FWR PIPING DN TO (E) FWP-1,2,3. DISCONNECT AND REMOVE PIPING TO (E) DA TANK, CD TANK, AND BOILERS AS INDICATED.
10	REMOVE (E) STEAM PIPING DN TO (E) STEAM HEADER AS INDICATED.
11	REMOVE (E) STEAM PIPING TO (E) HV UNIT.
12	REMOVE (E) STEAM EQUIPMENT BLOWDOWN / RELIEF PIPING DN TO (E) BDT AS INDICATED.
13	(E) 2-1/2" STEAM SAFETY VENT PIPING. DISCONNECT FROM BOILER AND REMOVE THROUGH ROOF. PROVIDE TEMPORARY WEATHERPROOF PROTECTION FOR ROOF OPENING.
14	(E) STEAM MUFFLER DISCHARGE PIPING THRU ROOF. REMOVE PIPING FROM OUTLET TO STEAM HEADER AS INDICATED.
18	REMOVE (E) EXTERIOR SA DUCTWORK AS INDICATED.
19	REMOVE (E) SA DUCTWORK AS INDICATED. REMOVE (E) DUCT MOUNTED STEAM COIL.
20	REMOVE (E) STEEL MEZZ SERVICE PLATFORM. DETACH (E) DISTRIBUTION SYSTEM SUPPORT. PROVIDE TEMPORARY DISTRIBUTION SYSTEM SUPPORT AS REQUIRED. FIELD VERIFY.
21	(E) ROOF HATCH AND ACCESS LADDER TO REMAIN. RE-CONDITION, RE-FINISH. RE: ARCH DRAWINGS.



1 MECHANICAL PIPING PLAN - BOILER PLANT MEZZANINE - DEMO
SCALE: 1/4" = 1'-0"



KEY PLAN

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

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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O'Brien Engineering Inc., Managing Partner
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Dallas, TX 75248
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Jason A. Palmetto, Jr.
91464
LICENSED
PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: PARTIAL MECH DEMOLITION PLAN - BOILER PLANT MEZZANINE

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025 | Checked: LRL | Drawn: DMB

Drawing Number: MD102A

Autodesk Docs://0489001/0131-VABB Boiler Replacement/0489001-0131-MECH R25.rvt

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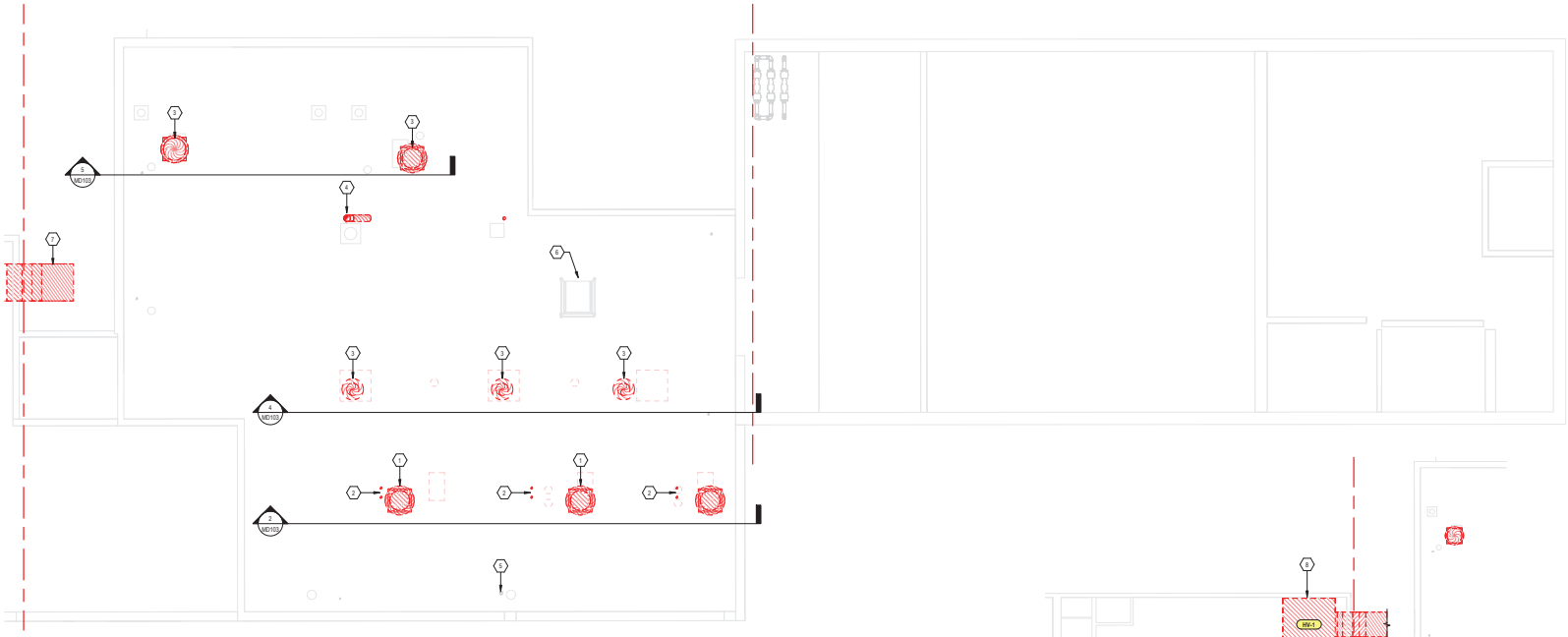
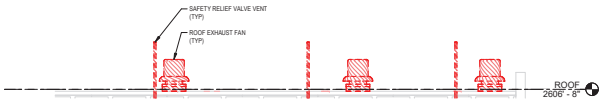
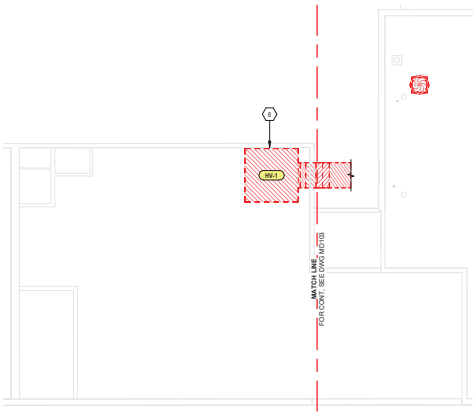


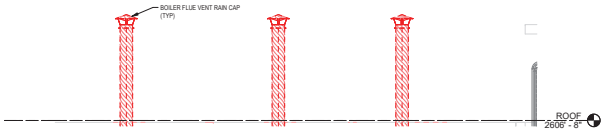
1 MECHANICAL PIPING PLAN - BOILER PLANT ROOF - DEMO
SCALE: 3/16" = 1'-0"



2 ROOF EXHAUST FAN DEMO SECTION
SCALE: 3/16" = 1'-0"



3 PARTIAL ROOF PLAN
SCALE: 1/8" = 1'-0"



4 BOILER FLUE VENT DEMO SECTION
SCALE: 3/16" = 1'-0"

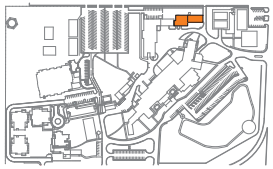
5 GRAVITY VENTILATOR DEMO SECTION
SCALE: 3/16" = 1'-0"

GENERAL NOTES

1. OVERALL DEMOLITION FLOOR PLAN. RE: SHEETS MD101, MD101A, MD101B, MD101C, MD102A, MD103 FOR DEMO SCOPES OF WORK.
2. RE: SHEETS M600, M601, M602 FOR EXISTING SYSTEM RISER DIAGRAM.
4. COORDINATE DEMO SCOPES WORK AND SEQUENCES WITH TEMPORARY BOILER PLANT INSTALLATION. RE: MT SERIES SHEETS.
5. PROVIDE TEMPORARY WEATHERPROOF PROTECTION FOR PLANT DISTRIBUTION SYSTEMS PENETRATION OPENINGS THROUGH EXTERIOR ENVELOPE (WALLS, ROOF, FLOOR) TO BE REUSED. PROVIDE SEALS FOR PENETRATION OPENINGS THRU INTERIOR WALLS, PARTITIONS, CEILING ASSEMBLIES TO MAINTAIN THE ENVIRONMENT, CONTROL DUST / DEBRIS TO BE REUSED.
6. SEAL UN-USED PLANT DISTRIBUTION SYSTEMS OPENINGS. RE: ARCHITECTURAL DRAWINGS.
7. REMOVE (E) EQUIPMENT AS INDICATED. DISCONNECT STEAM, CONDENSATE, PLUMBING, DRAIN PIPING; ELECTRICAL CONNECTION LINE VOLTAGE POWER, CONTROLS / LOW VOLTAGE POWER AND REMOVE TO POINTS OF DISCONNECTION.
8. REMOVE ASSOCIATED SPECIALTY SYSTEMS, CONTROLS, CONTROLS WIRING, RACEWAY TO POINTS OF DISCONNECTION AS REQUIRED. FIELD VERIFY.
9. RE: PLUMBING DRAWINGS FOR DEMO SCOPE OF WORK.
10. RE: ELECTRICAL DRAWINGS FOR DEMO SCOPE OF WORK.
11. DISCONNECT AND REMOVE (E) STEAM PLANT DISTRIBUTION PIPING AS INDICATED. FIELD VERIFY, COORDINATE WITH TEMPORARY AND NEW CONSTRUCTION DRAWINGS. (E) PIPE SYSTEMS TO REMAIN TO POINTS OF DISCONNECTION INCLUDE:
    A. STEAM AND CONDENSATE MAIN DISTRIBUTION TO PIPE TUNNELS / BUILDINGS
    B. STEAM AND CONDENSATE BRANCH PIPING TO HVAC EQUIPMENT
    C. NATURAL GAS
    D. FUEL OIL SUPPLY / RETURN
    E. LP GAS
    F. SOFTENED WATER, RO WATER
12. REMOVE (E) EQUIPMENT PADS. PREP FLOOR FOR NEW EQUIPMENT PADS AND FLOOR FINISH. RE: ARCH DRAWINGS.
13. RE: SHEET MD101C FOR FUEL GAS PIPING DEMO SCOPE OF WORK.
14. RE: SHEETS MT SERIES SHEETS FOR TEMPORARY BOILER PLANT SCOPES OF WORK.

KEY NOTES

No.	DESCRIPTION
1	(E) BOILER FLUE VENT UP THRU ROOF DN THRU ROOF. DISCONNECT AND REMOVE.
2	(E) BOILER SAFETY RELIEF VALVE PIPING DN THRU ROOF. DISCONNECT AND REMOVE.
3	(E) ROOF MOUNTED EXHAUST FAN. DISCONNECT AND REMOVE. SALVAGE AND RETURN TO COR.
4	(E) STEAM MUFFLER EXHAUST PIPE DN THRU ROOF. DISCONNECT AND REMOVE.
5	(E) BLOWDOWN TANK RELIEF PIPE DN THRU ROOF. DISCONNECT AND REMOVE.
6	(E) ROOF HATCH TO REMAIN. RECONDITION AND RE-FINISH. RE: ARCH DRAWINGS.
7	(E) HV UNIT 9A DUCTWORK. REMOVE DUCTWORK AS INDICATED.
8	(E) HV UNIT. DISCONNECT POWER AND PIPING BACK TO SOURCE. REMOVE UNIT.



KEY PLAN

PLAN
TRUE

SCALE: 3/16" = 1'-0"

Revisions:	Date:
100% CONSTRUCTION DOCUMENTS	10/07/2025
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65% DESIGN DEVELOPMENT	11/21/2024

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O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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Jon A. Lalotto, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: PARTIAL MECH DEMOLITION PLAN - BOILER PLANT ROOF

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025 | Checked: LRL | Drawn: DMB

Drawing Number: MD103

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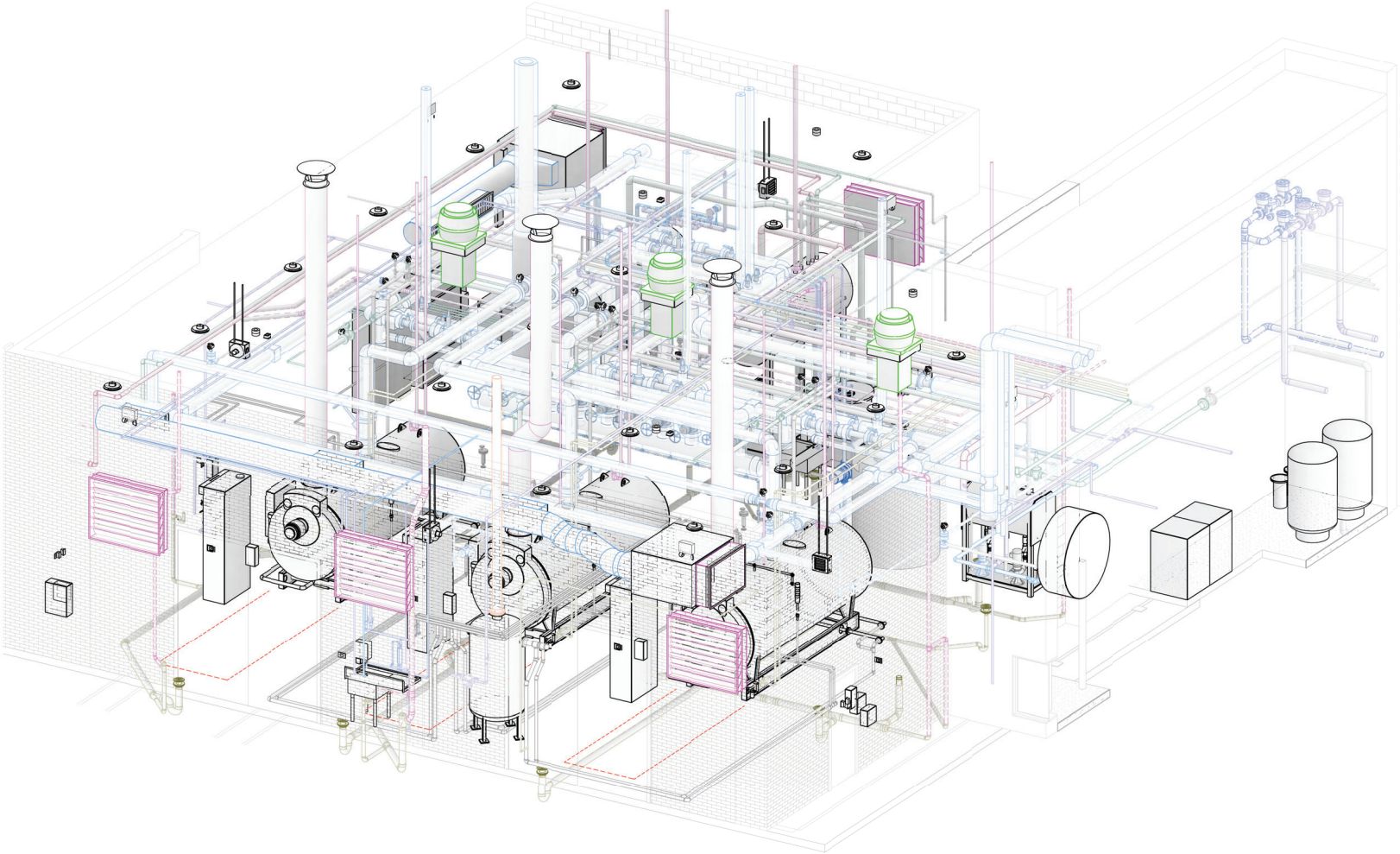
KEY NOTES	
No.	DESCRIPTION



1 3D VIEW - AIRSIDE
SCALE: NONE

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Dallas, TX 75248
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O'Brien Engineering Inc., Managing Partner
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972-233-2288
www.obrieneng.com

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Joseph A. Palermo, Jr.
91464
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PROFESSIONAL ENGINEER

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Drawing Title: 3D VIEW - MECHANICAL HVAC

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

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Location: BOILER PLANT

Issue Date: 10/07/2025 | Checked: LRL | Drawn: DMB

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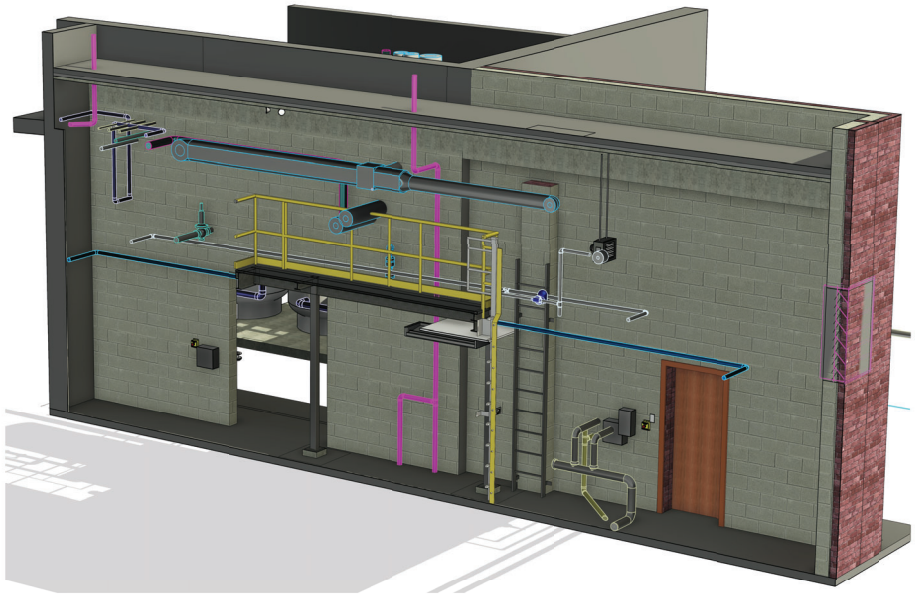
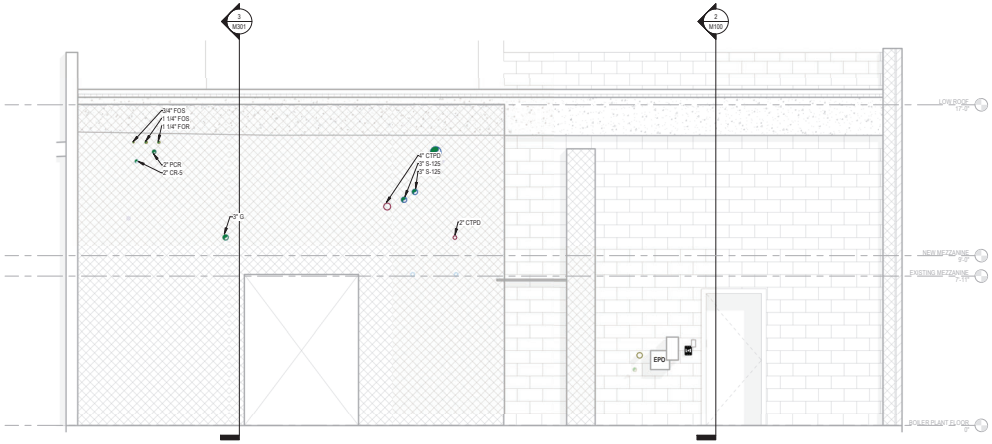


1 3D VIEW - BOILER PLANT WALL PENETRATIONS
SCALE: NONE



2 BOILER PLANT WALL PENETRATIONS
SCALE: 3/8" = 1'-0"

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95% CONSTRUCTION DOCUMENTS	07/25/2025
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Dallas, TX 75248
972-233-2288
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O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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Jon A. Lalotto, Jr.
91464
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PROFESSIONAL ENGINEER

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Drawing Title: 3D VIEW - WALL PENETRATIONS

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025

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Drawing Number: M901

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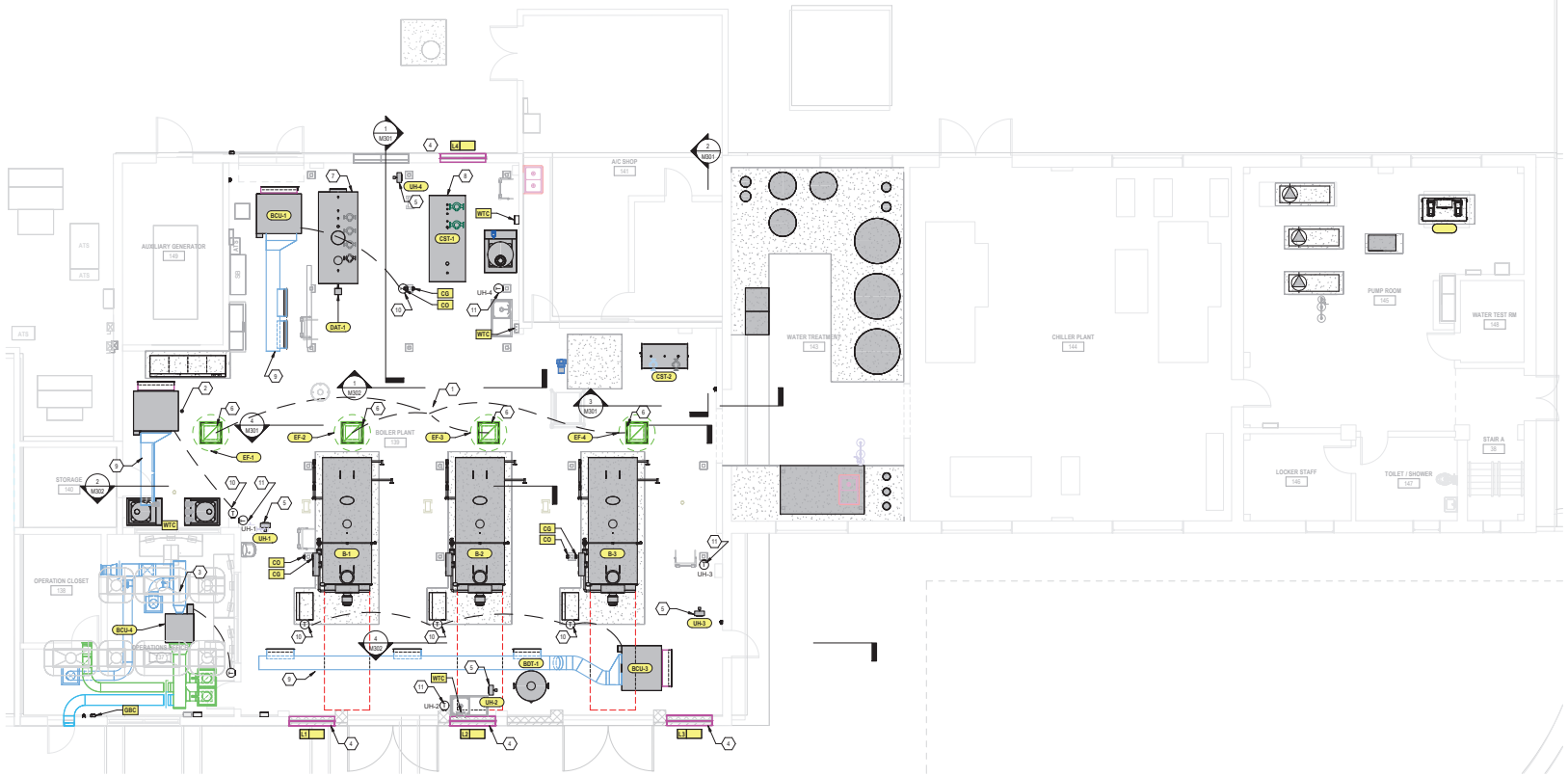
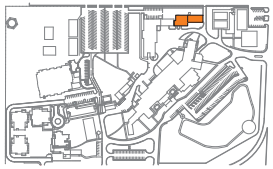


1 OVERALL HVAC PLAN - BOILER PLANT FLOOR

SCALE: 3/16" = 1'-0"

KEY NOTES

No.	DESCRIPTION
1	ADD THERMOSTAT, CONTROLS HVU & RVS
2	ADD HEATING & VENTILATING UNIT, CONTROL w/THERMOSTAT
3	ADD 2 1/2" TON FAN COIL UNIT, CONTROL w/THERMOSTAT
4	ADD INTAKE LOUVER, MANUAL OPERATION
5	ADD STEAM UNIT HEATER
6	ADD ROOF EXHAUST VENT, CONTROL WITH ROOM THERMOSTAT TO MAINTAIN BOILER ROOM TEMPERATURE BELOW 104F. EXTEND EXHAUST DUCT FROM ROOF FAN, TERMINATE 1'0" BELOW ROOF WITH MESH SCREEN, ALL DUCT AND MESH SCREEN SHALL BE STAINLESS STEEL
7	ADD DEAERATOR, FURNISHED w/(2) TRANSFER PUMPS
8	ADD CONDENSATE STORAGE TANK, FURNISHED w/(2) TRANSFER PUMPS
9	PROVIDE STAINLESS STEEL DOUBLE WALL INSULATED ROUND DUCT, SUPPLY PLENUM AND DUCT TRANSITION, DUCT SURFACE SHALL BE CONSTRUCTED WITH SMOOTH AND CONTINUOUS SEAM.
10	MANUAL ON/OFF SWITCH FOR BCU CONTROL
11	THERMOSTAT FOR UH, MAINTAIN BOILER ROOM TEMPERTURE FOR FREEZE PROTECTION.



KEY PLAN

PLAN

TRUE

SCALE: 3/16" = 1'-0"

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95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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17300 Dallas Parkway, Suite 1000
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972-233-2288
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17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
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Jon A. Labatto, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

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Drawing Title: OVERALL MECH HVAC PLAN - BOILER PLANT

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025

Checked: LRL

Drawn: DMB

Drawing Number: MH101

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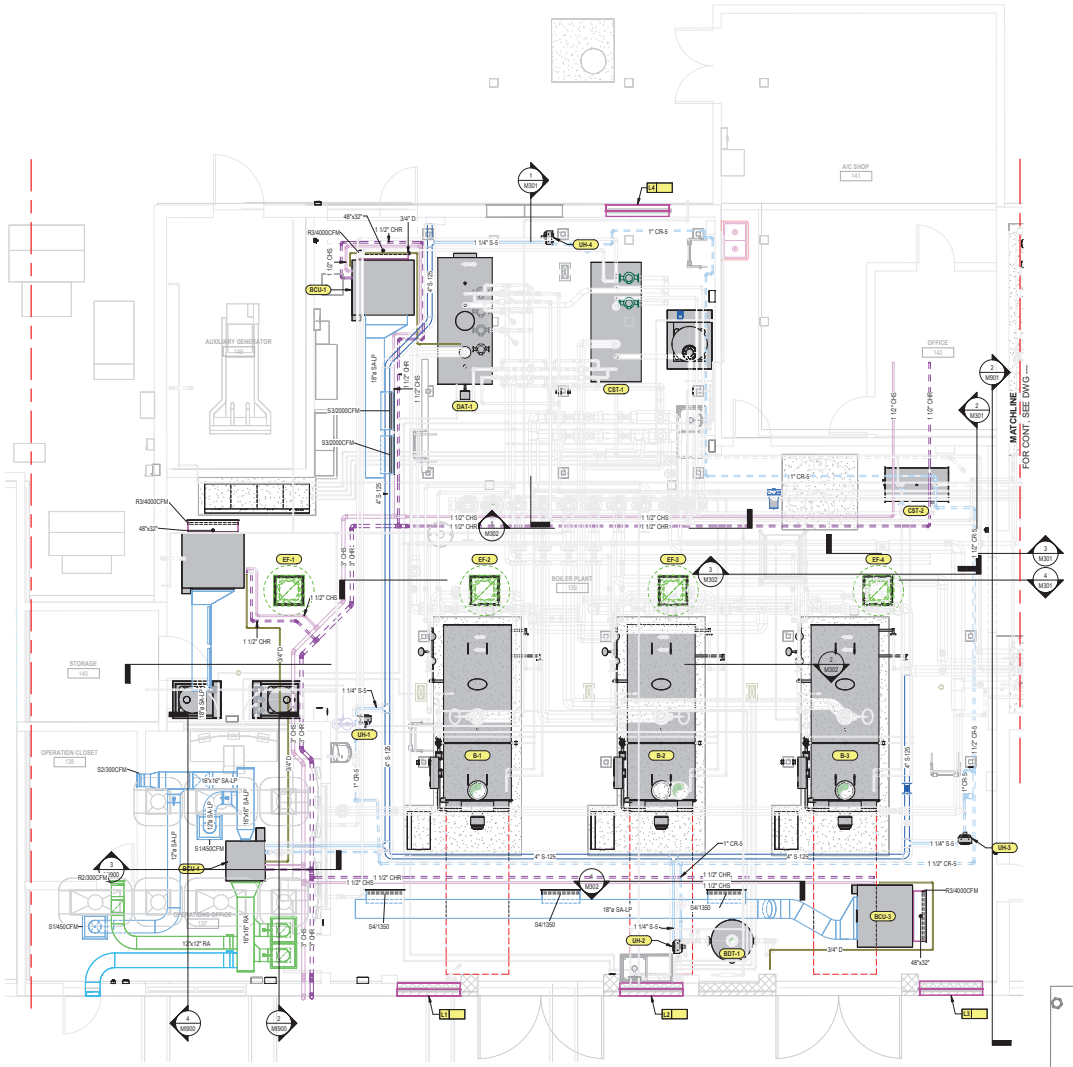
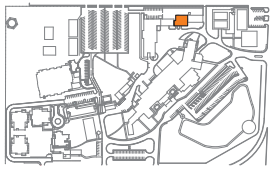


1 PARTIAL MECHANICAL HVAC PIPING PLAN - BOILER PLANT
SCALE: 1/4" = 1'-0"



KEY PLAN

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

100% CONSTRUCTION DOCUMENTS	10/07/2025
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972-233-2288
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91464
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Drawing Title: PARTIAL MECH HVAC PIPING PLAN - BOILER PLANT	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Drawing Number: MH101A
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	

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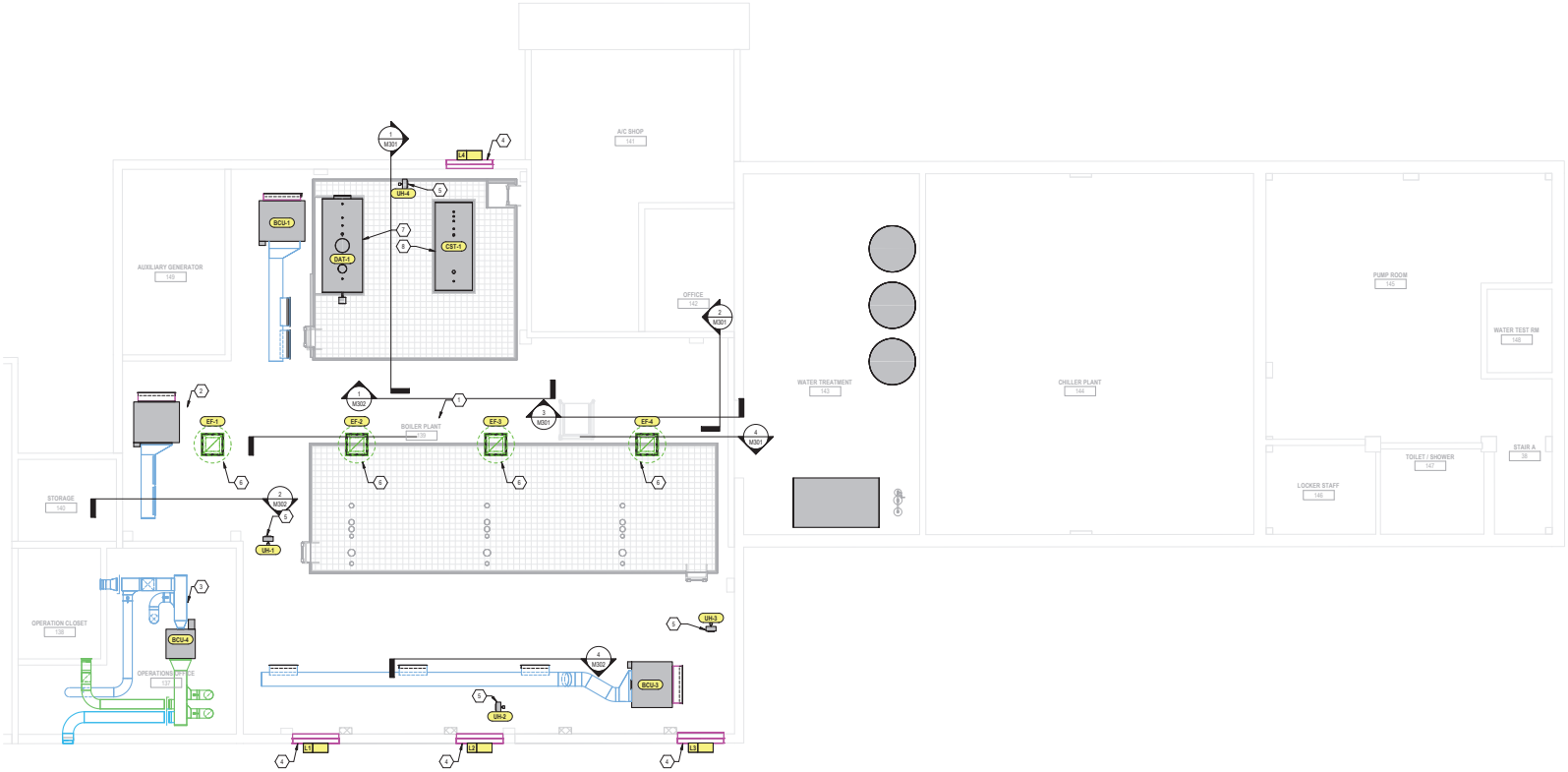
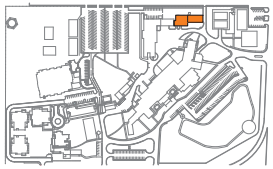
KEY NOTES	
No.	DESCRIPTION
1	ADD THERMOSTAT, CONTROLS HVU & RVS
2	ADD HEATING & VENTILATING UNIT, CONTROL w/THERMOSTAT
3	ADD 2.5T TON FAN COIL UNIT, CONTROL w/THERMOSTAT
4	ADD INTAKE LOUVER, MANUAL OPERATION
5	ADD STEAM UNIT HEATER
6	ADD ROOF EXHAUST VENT, CONTROL WITH ROOM THERMOSTAT
7	ADD DEAERATOR, FURNISHED w/(2) TRANSFER PUMPS
8	ADD CONDENSATE STORAGE TANK, FURNISHED w/(2) TRANSFER PUMPS



1 PARTIAL HVAC PLAN - BOILER PLANT MEZZANINE
SCALE: 3/16" = 1'-0"



KEY PLAN

PLAN
TRUE

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

Revisions:	Date:
100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jon A. Lindemann, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: OVERALL MECH HVAC PLAN - BOILER PLANT MEZZANINE

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025

Checked: LRL

Drawn: DMB

Drawing Number: MH102

VA FORM 08 - 6231

Autodesk Docs://0489001/0131/VBS Boiler Replacement/0489001-01-MECHR25.rvt

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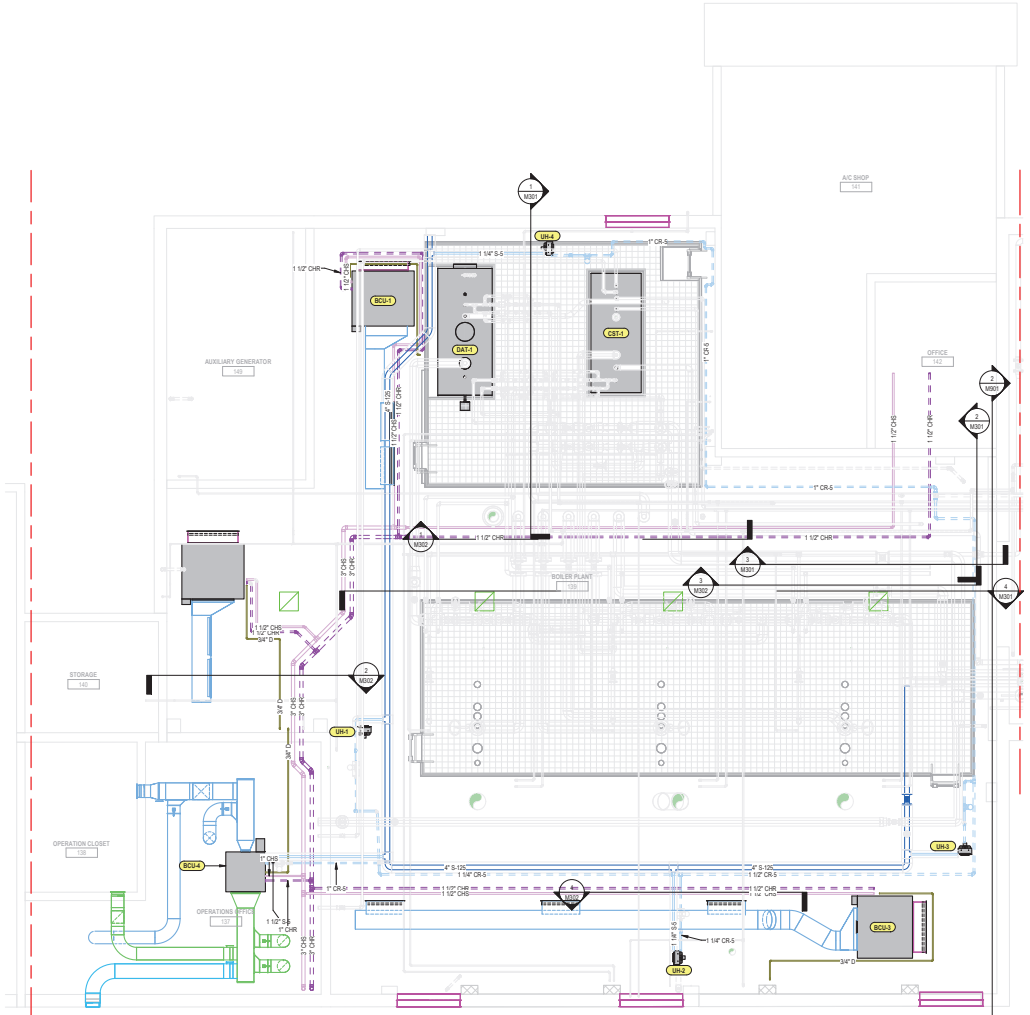
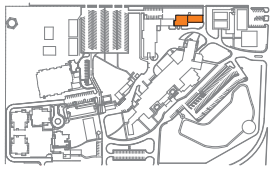


1 PARTIAL HVAC PLAN - BOILER PLANT MEZZANINE
SCALE: 1/4" = 1'-0"



KEY PLAN

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

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jon A. Palmetto, Jr.
91464
LICENSED
PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title	Phase	Project Title	Project Number
PARTIAL MECH HVAC PIPING PLAN - BOILER PLANT MEZZANINE	100% CONSTRUCTION DOCUMENTS	A/E REPLACE BOILERS	519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Drawing Number: MH102A
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	

VA FORM 08 - 6231

Autodesk Docs://0489001013 VABS Boiler Replacement/0489001013 MECHR25.rvt

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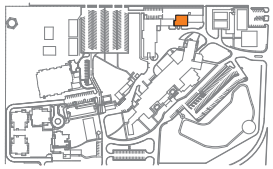
KEY NOTES	
No.	DESCRIPTION

1 OVERALL HVAC PLAN - BOILER PLANT ROOF
SCALE: 1/4" = 1'-0"



KEY PLAN

PLAN
TRUE

0' 1' 2' 3' 4' 5' 10' 15' 20'
SCALE: 1/4" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
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STATE OF TEXAS
Jon A. Palmetto, Jr.
91464
LICENSED
PROFESSIONAL ENGINEER

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VA U.S. Department of Veterans Affairs

Drawing Title: OVERALL MECH HVAC PLAN - BOILER PLANT ROOF

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025 | Checked: LRL | Drawn: DMB

Drawing Number: MH103

VA FORM 08 - 6231

Autodesk Docs://0489001/0131/VBS Boiler Replacement/0489001-01-MECHR25.rvt

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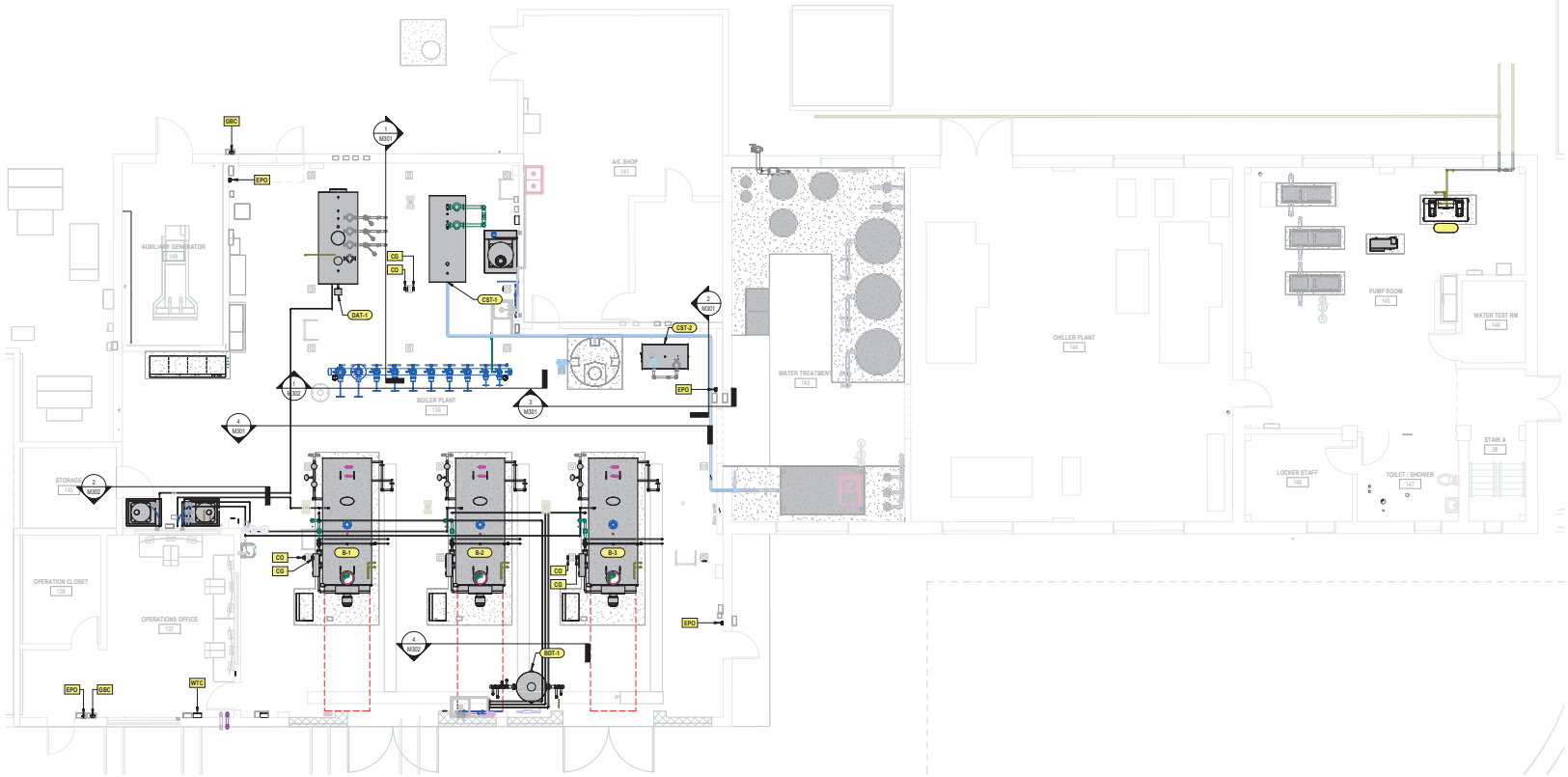


1 OVERALL MECHANICAL PIPING PLAN - BOILER PLANT FLOOR

SCALE: 3/16" = 1'-0"

KEY NOTES

No.	DESCRIPTION

GENERAL NOTES

1. OVERALL FLOOR PLAN. RE: SHEETS MP101A, MP101B, MP101C, MP102, MP102A, MP103 FOR SCOPES OF WORK.

2. RE: SHEETS M600, M601, M602 FOR EXISTING SYSTEM RISER DIAGRAM.

3. ALL DEVICE INSTALLATION, CONFIGURATION, WIRING, AND TESTING SHALL COMPLY WITH VHA BOILER PLANT SAFETY DEVICES TESTING MANUAL.

   A. BOILER PLANT EQUIPMENT AND RELATED SAFETY DEVICES SHALL BE TESTED, ANALYZED, DOCUMENTED, AND CERTIFIED PER THE VHA BOILER AND ASSOCIATED PLANT SAFETY DEVICE TESTING MANUAL EIGHTH EDITION OR CURRENT. COMPLY WITH TEST GUIDANCE, PROCEDURES, FAILURE CONSEQUENCES, AND INTERIM SAFETY MEASURE (ISM) REQUIREMENTS FOR EQUIPMENT AND ASSOCIATED SAFETY DEVICES INCLUDING WATER LEVEL CONTROL, PRESSURE CONTAINMENT, FUEL TRAIN SAFETY DEVICES, BURNER AND AIR TRAIN SAFETY DEVICES, INDIVIDUAL STEAM BOILERS, ETC.

   B. TESTING, BOILER PLANT INSTRUMENTATION, AUTOMATIC BOILER CONTROL SYSTEMS, BURNER MANAGEMENT SYSTEMS, GRAPHIC USER INTERFACE(S) (GUI'S), COMPUTER WORKSTATION(S). REFER TO THE SECTION 23 52 33 F RE-TUBE BOILERS.

4. COORDINATE SCOPES WORK AND SEQUENCES WITH TEMPORARY BOILER PLANT INSTALLATION. RE: MT SERIES SHEETS.

5. PROVIDE TEMPORARY WEATHERPROOF PROTECTION FOR PLANT DISTRIBUTION SYSTEMS PENETRATION OPENINGS THROUGH EXTERIOR ENVELOPE (WALLS, ROOF, FLOOR) TO BE REUSED. PROVIDE SEALS FOR PENETRATION OPENINGS THRU INTERIOR WALLS, PARTITIONS, CEILING ASSEMBLIES TO MAINTAIN THE ENVIRONMENT, CONTROL DUST / DEBRIS TO BE REUSED.

6. SEAL UN-USED PLANT DISTRIBUTION SYSTEMS OPENINGS. RE: ARCHITECTURAL DRAWINGS.

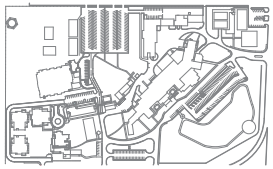
7. RE: PLUMBING DRAWINGS FOR DEMO SCOPE OF WORK.

8. RE: ELECTRICAL DRAWINGS FOR DEMO SCOPE OF WORK.

9. PROVIDE NEW EQUIPMENT PADS. PREP FLOOR FOR NEW EQUIPMENT PADS AND FLOOR FINISH. RE: ARCH DRAWINGS.

10. RE: SHEET MP101C FOR FUEL GAS PIPING SCOPE OF WORK.

11. RE: SHEETS MT SERIES SHEETS FOR TEMPORARY BOILER PLANT SCOPES OF WORK.



KEY PLAN

PLAN

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SCALE: 3/16" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
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972-233-2288
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STATE OF TEXAS
Joshua A. Martinez, Jr.
91464
LICENSED
PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: MECH PIPING PLAN - BOILER PLANT FLOOR	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Drawing Number: MP101
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	

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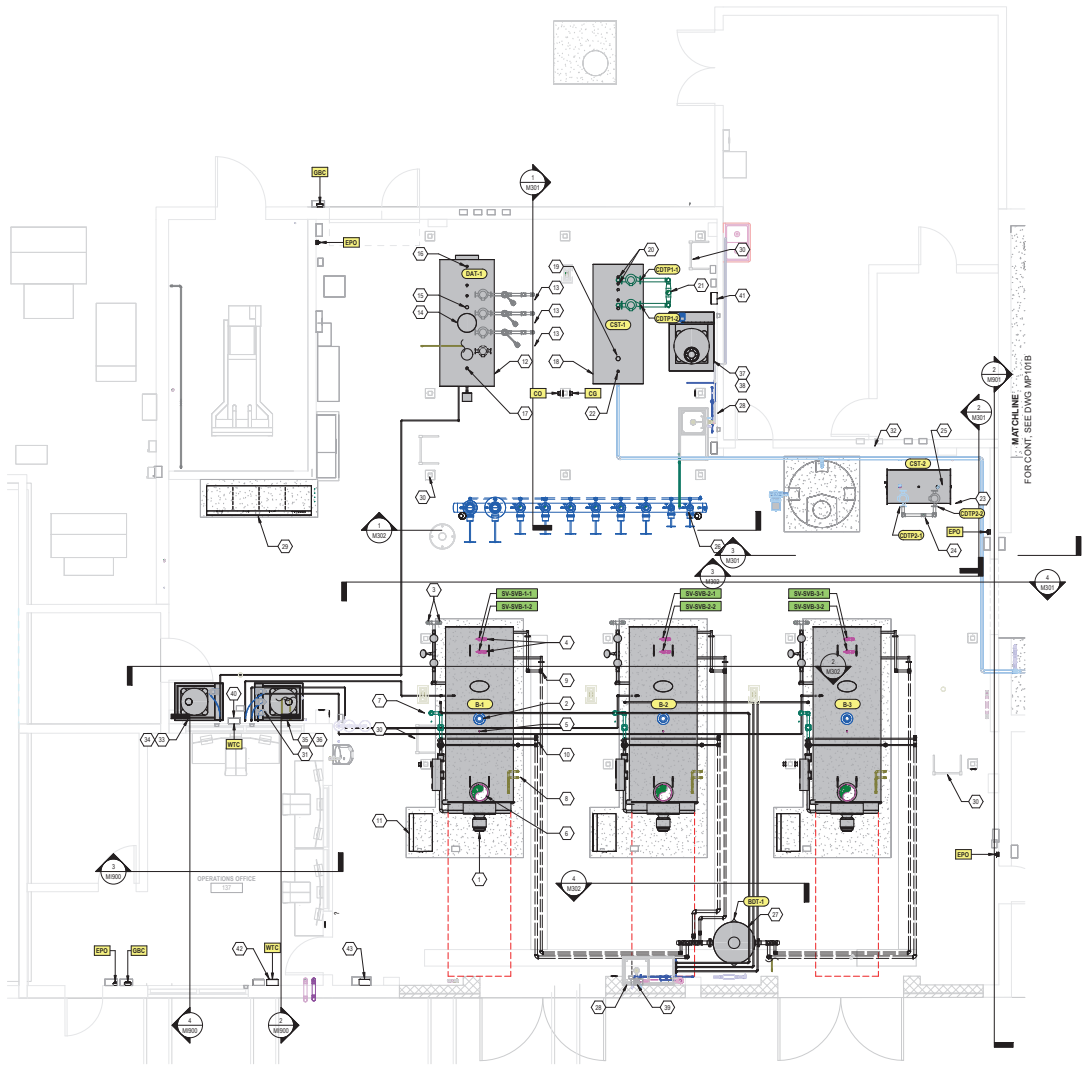


1 PARTIAL MECHANICAL PIPING PLAN - BOILER PLANT

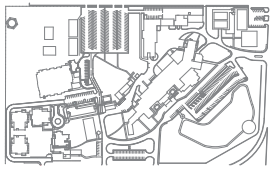
SCALE: 1/4" = 1'-0"

KEY NOTES

No.	DESCRIPTION
1	B-1,2,3: PROVIDE NEW FIRETUBE STEAM BOILER. SET ON NEW EQUIPMENT PAD. RE: ARCHITECTURAL DRAWINGS. RE: STRUCTURAL DRAWINGS. COORDINATE LOCATIONS WITH NEW EXTERIOR WALL ACCESS DOORS, MOBILIZATION PATH.
2	HPS PIPING. ROUTE UP THRU MEZZANINE DECK AS INDICATED. FIELD COORDINATE ROUTING.
3	FWS/FWR BRANCH MAINS. ROUTE UP THRU MEZZANINE DECK AS INDICATED. FIELD COORDINATE ROUTING.
4	BOILER SAFETY RELIEF VALVE VENT PIPING. ROUTE THRU MEZZANINE DECK AS INDICATED. FIELD COORDINATE ROUTING AND PENETRATION LOCATION.
5	BOILER VENT PIPING. ROUTE UP THRU MEZZANINE DECK AS INDICATED. FIELD COORDINATE ROUTING.
6	BOILER STACK VENT. ROUTE UP FROM BOILER THRU ROOF PENETRATION. OFFSET AS REQUIRED. FIELD COORDINATE ROUTING.
7	NG PIPE. ROUTE UP THRU MEZZANINE DECK AS INDICATED. FIELD COORDINATE ROUTING. RE: MP101C.
8	FOS/FOR PIPING. ROUTE THRU MEZZANINE DECK AS INDICATED. RE: MP101C.
9	BD PIPING. ROUTE ON IN TRENCH TO BDT-1 AS INDICATED. RE: ARCHITECTURAL DRAWINGS. RE: STRUCTURAL DRAWINGS FOR TRENCH DIMENSIONS.
10	BD PIPING. ROUTE ON IN TRENCH TO BDT-1. RE: ARCHITECTURAL DRAWINGS, STRUCTURAL DRAWINGS FOR TRENCH DIMENSIONS.
11	BOILER CONTROL PANEL. MOUNT BOILER CONTROLS INCLUDING FLAME SAFEGUARD SYSTEM IN CONTROL PANEL. RE: SPECIFICATIONS.
12	DAT-1: DEAERATOR TANK. PROVIDE PACKAGE DA TANK COMPLETE WITH TRIPLEX PUMP PACKAGE. RE: SPECIFICATIONS. SET ON NEW EQUIPMENT PAD.
13	DAT-1 PUMP DISCHARGE TO THE FEEDWATER HEADER.
14	LPS STEAM. ROUTE LPS FROM MEZZANINE DECK TO DAT-1 AS INDICATED.
15	4" CPTD. ROUTE FROM CDT-1 TO DAT-1 THRU MEZZANINE DECK AS INDICATED. FIELD COORDINATE ROUTING.
16	DAT-1 SAFETY RELIEF VALVE VENT ASSEMBLY. ROUTE DISCHARGE PIPING UP. FIELD COORDINATE ROUTING.
17	4" DAT-1 OXYGEN / NON CONDENSABLE GAS VENT PIPING. ROUTE ROUTE UP THRU ROOF AS INDICATED. FIELD COORDINATE ROUTING.
18	CDT-1: PACKAGED CONDENSATE RECEIVING TANK. PROVIDE NEW CONDENSATE TANK WITH DUPLEX PUMP PACKAGE. RE: SPECIFICATIONS. SET ON NEW EQUIPMENT PAD.
19	4" CPTD. ROUTE THRU MEZZANINE DECK TO CDT-1 AS INDICATED. FIELD COORDINATE ROUTING.
20	3" PCR. ROUTE THRU MEZZANINE DECK TO CDT-1 AS INDICATED. FIELD COORDINATE ROUTE.
21	4" CPTD. ROUTE UP THRU MEZZANINE DECK TO DAT-1 AS INDICATED. FIELD COORDINATE ROUTING.
22	4" TANK VENT. ROUTE UP THRU ROOF AS INDICATED. FIELD COORDINATE ROUTING.
23	CDT-2: PACKAGED CONDENSATE RECEIVING TANK. PROVIDE WITH DUPLEX PUMP PACKAGE. RE: SPECIFICATIONS. SET ON NEW EQUIPMENT PAD.
24	4" CPTD. ROUTE THRU MEZZANINE DECK TO CDT-1 AS INDICATED. FIELD COORDINATE ROUTING.
25	2" DCR. ROUTE DN TO CDT-2 AS INDICATED. FIELD COORDINATE ROUTING.
26	NEW HPS STEAM HEADER. 4" HPS HEADER INLET (B-1), 4" HPS HEADER INLET (B-2), 4" HPS HEADER INLET (B-3), 3" HPS HEADER OUTLET (LAUNDRY BLDG), 4" HPS HEADER OUTLET (MAIN BUILDING), 2" HPS HEADER OUTLET (BOILER PLANT EQUIPMENT) ON TO / UP FROM NEW STEAM HEADER AS INDICATED. RE: SHEETS M302, M605.
27	BDT-1: BLOWDOWN TANK. SET ON EQUIPMENT PAD.
28	FWS/FWR SAMPLING PIPE. TERMINATE AT SAMPLING STATION AND ROUTE UP THRU MEZZANINE DECK AS INDICATED.
29	BOILER PLANT MAIN INSTRUMENTATION AND CONTROL PANEL. RE: DIVISION 23 SPECIFICATIONS.
30	NEW SERVICE ACCESS PLATFORM / MEZZANINE. RE: ARCHITECTURAL DRAWINGS. RE: STRUCTURAL DRAWINGS.
31	CHEMICAL TREATMENT PIPE FROM CHEMICAL TREATMENT TANK SKID TO B-1, B-2, B-3, DA TANK. TERMINATE AT EQUIPMENT CONNECTION. RE: SPECIFICATIONS. FIELD COORDINATE PIPE ROUTING.
32	BOILER SAMPLING PIPING. CONNECT TO BOILER AND ROUTE TO SAMPLING STATION AS INDICATED. FIELD COORDINATE ROUTING.
33	CFS1: CHEMICAL FEED STATION. PROVIDE WITH PRIMARY STORAGE TANK, SECONDARY CONTAINMENT BASIN, PRIMARY STORAGE TANK STAND, PUMP SHELF. (BASIS OF DESIGN: SNYDER SERIES CHEMICAL FEED STATION WITH STAND. CAPACITY: 60 GAL PRIMARY TANK, 90 GAL CONTAINMENT TANK. OVERALL DIMENSIONS: 47"L X 36"W X 58"H. FLOOR MOUNTED. CONNECTIONS: 8" DIA CAP, 4-1/2" DIA ACCESS.)
34	CFP1: COMBO OXYGEN SCAVENGER/CORROSION INHIBITOR CHEMICAL FEED PUMP. CONNECT TO DAT-1 AS INDICATED. PROVIDE DIGITALLY CONTROLLED, DIRECT DRIVE DIAPHRAGM METER PUMP. PROVIDE WITH THERMOPLASTIC CONSTRUCTION ASSEMBLY MATCHED TO CHEMICAL PER MANUFACTURERS RECOMMENDATION. PROVIDE WITH UNIT MOUNTED CONTROLLER WITH UNIT POSITION, FACE ADJUSTMENT FUNCTIONALITY. INCLUDE CONTROLLER DISPLAY WITH 2-LINE LCD DISPLAY, LED BACKLIGHT, ENLARGED PUMP STATUS BAR INDICATOR AT DISTANCE/DARK, PROVIDE WITH PUMP BASE WALL CONVERSION KIT. (BASIS OF DESIGN: WALCHEM IWAKI IX-B SERIES METERING PUMP. PERFORMANCE: .002 - 1.98 GPH FLOW RANGE; 1000:1 TURNDOWN; 200 PSI MAX PRESS RATING. OVERAL DIMENSIONS: 11.5"L X 5.25"W X 12"H, WEIGHT: 10LBS. CONNECTIONS: 3/8" X 1/4" TUBE. ELECT SERVICE: 120/1/60, POWER CORD, 17W, 0.4A)
35	CFS2: CHEMICAL FEED STATION. PROVIDE WITH PRIMARY STORAGE TANK, SECONDARY CONTAINMENT BASIN, PRIMARY STORAGE TANK STAND, PUMP SHELF. (BASIS OF DESIGN: SNYDER SERIES CHEMICAL FEED STATION WITH STAND. CAPACITY: 60 GAL PRIMARY TANK, 90 GAL CONTAINMENT TANK. OVERALL DIMENSIONS: 47"L X 36"W X 58"H. FLOOR MOUNTED. CONNECTIONS: 8" DIA CAP, 4-1/2" DIA ACCESS.)
36	CFP2,B1, CFP-B2, CFP-B3: CAUSTIC CHEMICAL FEED PUMP. CONNECT TO DAT-1 AS INDICATED. PROVIDE DIGITALLY CONTROLLED, DIRECT DRIVE DIAPHRAGM METER PUMP. PROVIDE WITH THERMOPLASTIC CONSTRUCTION ASSEMBLY MATCHED TO CHEMICAL PER MANUFACTURERS RECOMMENDATION. PROVIDE WITH UNIT MOUNTED CONTROLLER WITH UNIT POSITION, FACE ADJUSTMENT FUNCTIONALITY. INCLUDE CONTROLLER DISPLAY WITH 2-LINE LCD DISPLAY, LED BACKLIGHT, ENLARGED PUMP STATUS BAR INDICATOR AT DISTANCE/DARK, PROVIDE WITH PUMP BASE WALL CONVERSION KIT. (BASIS OF DESIGN: WALCHEM IWAKI IX-B SERIES METERING PUMP. PERFORMANCE: .002 - 1.98 GPH FLOW RANGE; 1000:1 TURNDOWN; 200 PSI MAX PRESS RATING. OVERAL DIMENSIONS: 11.5"L X 5.25"W X 12"H, WEIGHT: 10LBS. CONNECTIONS: 3/8" X 1/4" TUBE. ELECT SERVICE: 120/1/60, POWER CORD, 17W, 0.4A)
37	CFS3: CHEMICAL FEED STATION. PROVIDE WITH PRIMARY STORAGE TANK, SECONDARY CONTAINMENT BASIN, PRIMARY STORAGE TANK STAND, PUMP SHELF. (BASIS OF DESIGN: SNYDER SERIES CHEMICAL FEED STATION WITH STAND. CAPACITY: 60 GAL PRIMARY TANK, 90 GAL CONTAINMENT TANK. OVERALL DIMENSIONS: 47"L X 36"W X 58"H. FLOOR MOUNTED. CONNECTIONS: 8" DIA CAP, 4-1/2" DIA ACCESS.)
38	CFP3: AMINES CHEMICAL FEED PUMP. CONNECT TO DAT-1 AS INDICATED. PROVIDE DIGITALLY CONTROLLED, DIRECT DRIVE DIAPHRAGM METER PUMP. PROVIDE WITH THERMOPLASTIC CONSTRUCTION ASSEMBLY MATCHED TO CHEMICAL PER MANUFACTURERS RECOMMENDATION. PROVIDE WITH UNIT MOUNTED CONTROLLER WITH UNIT POSITION, FACE ADJUSTMENT FUNCTIONALITY. INCLUDE CONTROLLER DISPLAY WITH 2-LINE LCD DISPLAY, LED BACKLIGHT, ENLARGED PUMP STATUS BAR INDICATOR AT DISTANCE/DARK, PROVIDE WITH PUMP BASE WALL CONVERSION KIT. (BASIS OF DESIGN: WALCHEM IWAKI IX-B SERIES METERING PUMP. PERFORMANCE: .002 - 1.98 GPH FLOW RANGE; 1000:1 TURNDOWN; 200 PSI MAX PRESS RATING. OVERAL DIMENSIONS: 11.5"L X 5.25"W X 12"H, WEIGHT: 10LBS. CONNECTIONS: 3/8" X 1/4" TUBE. ELECT SERVICE: 120/1/60, POWER CORD, 17W, 0.4A)
39	WTC-A: WALL MOUNTED WATER TREATMENT CONTROLLER. CONNECT TO CHEMICAL FEED STATION PUMPS AS INDICATED. INTERCONNECT WTC'S WITH COMMUNICATIONS CABLE. RE: SPECIFICATION SECTION 230911 INSTRUMENTATION AND CONTROLS FOR BOILER PLANT. RE: SHEET M6600
40	WTC-B: WALL MOUNTED WATER TREATMENT CONTROLLER. CONNECT TO CHEMICAL FEED STATION PUMPS AS INDICATED. INTERCONNECT WTC'S WITH COMMUNICATIONS CABLE. RE: SPECIFICATION SECTION 230911 INSTRUMENTATION AND CONTROLS FOR BOILER PLANT. RE: SHEET M6600
41	WTC-C: WALL MOUNTED WATER TREATMENT CONTROLLER. CONNECT TO CHEMICAL FEED STATION PUMPS AS INDICATED. INTERCONNECT WTC'S WITH COMMUNICATIONS CABLE. RE: SPECIFICATION SECTION 230911 INSTRUMENTATION AND CONTROLS FOR BOILER PLANT. RE: SHEET M6600
42	WTC-D: WALL MOUNTED WATER TREATMENT CONTROLLER. CONNECT TO CHEMICAL FEED STATION PUMPS AS INDICATED. INTERCONNECT WTC'S WITH COMMUNICATIONS CABLE. RE: SPECIFICATION SECTION 230911 INSTRUMENTATION AND CONTROLS FOR BOILER PLANT. RE: SHEET M6600
43	GAS DETECTION SYSTEM CONTROL PANEL. CONNECT TO NEW CO, CG DETECTORS. PROVIDE WITH RS-485 CHANNELS, ONBOARD RELAYS, OUTPUTS FOR ALARM, TROUBLE, AND REMOTE NOTIFICATION, BACNET IP CAPABILITY. PROVIDE WITH BACKLIT LCD DISPLAY. (SIZE: 13"X10"X2.75" (HXWXD), 15LBS, POWER 120/1, 1AMP)

GENERAL NOTES

1. RE: SHEET MP301 FOR VENT PIPE TERMINATION HEIGHTS.
2. RE: SHEET MP102 FOR PIPE, STACK VENT UP.
3. RE: SHEET MP400 SERIES FOR EQUIPMENT ISOMETRICS.
4. RE: SHEET MP800 SERIES FOR PLANT EQUIPMENT ISOMETRICS.
5. RE: M600, M500, M600 SERIES SHEETS FOR DETAILS, SECTION DRAWINGS, SYSTEM FLOW DIAGRAMS, EQUIPMENT SCHEDULES.
6. COORDINATE EQUIPMENT / COMPONENT SERVICE CLEARANCE REQUIREMENTS WITH EQUIPMENT LOCATIONS AND DISTRIBUTION SYSTEMS. FIELD VERIFY.



KEY PLAN

PLAN

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

Revisions:	Date:
100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
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Drawing Title	Phase	Project Title	Project Number
PARTIAL MECH PIPING PLAN - BOILER PLANT FLOOR	100% CONSTRUCTION DOCUMENTS	A/E REPLACE BOILERS	519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Drawing Number: MP101A
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	

VA FORM 08 - 6231

Autodesk Docs://0489001013 VABS Boiler Replacement/0489001013 MECH R25.rvt

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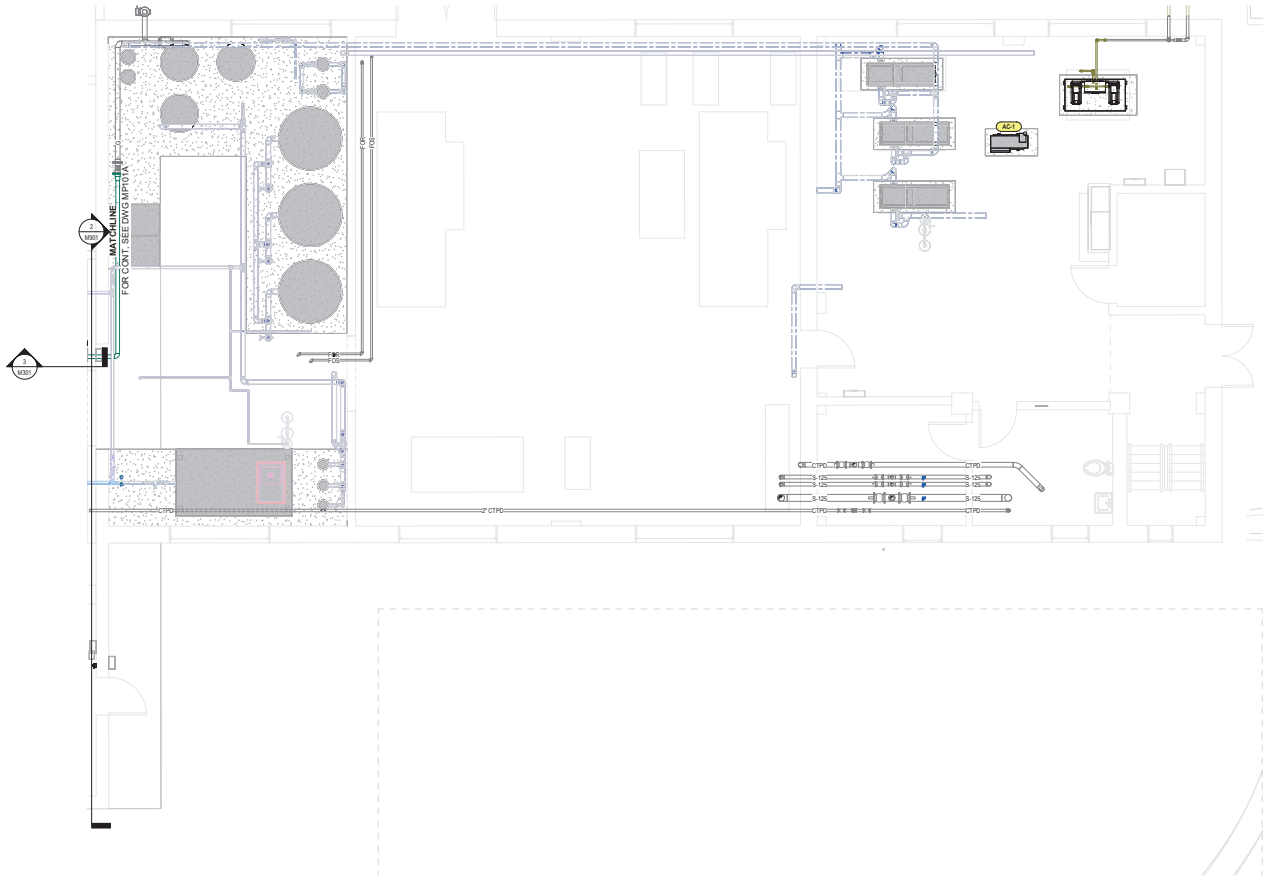
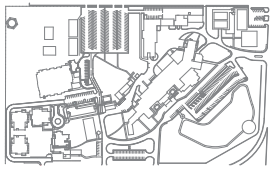


1 PARTIAL MECHANICAL PIPING PLAN - BUILDING 2 EAST
SCALE: 1/4" = 1'-0"

KEY NOTES

No.	DESCRIPTION



KEY PLAN

PLAN
TRUE

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

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Joshua A. Martinez, Jr.
91464
LICENSED
PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: PARTIAL MECH PIPING PLAN - BUILDING 2 EAST

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025

Checked: LRL

Drawn: DMB

Drawing Number: MP101B

Autodesk Docs://0489001/0131/VABS Boiler Replacement/0489001/01 MECH R25.rvt

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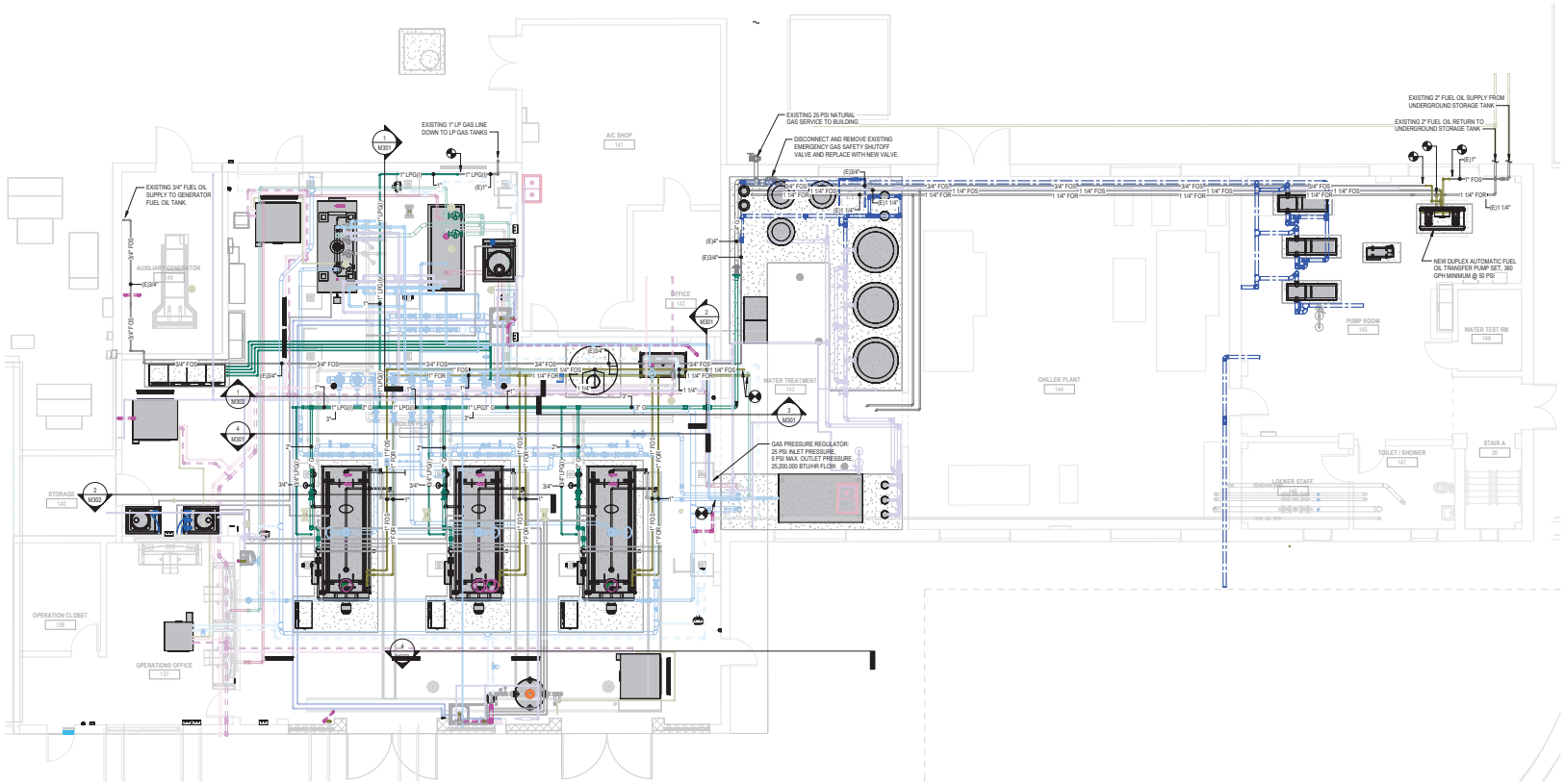
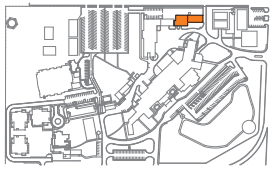
VA FORM 08 - 6231



1 OVERALL MECHANICAL FUEL OIL PIPING PLAN - BOILER PLANT FLOOR

SCALE: 3/16" = 1'-0"



KEY PLAN

PLAN

TRUE

SCALE: 3/16" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
Revisions:	Date:

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17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jon A. Palmetto, Jr.
91464
LICENSED
PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: OVERALL FUEL OIL & GAS PIPING PLAN - BOILER PLANT FLOOR

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025

Checked: LRL

Drawn: MJS

Drawing Number: MP101C

VA FORM 08 - 6231

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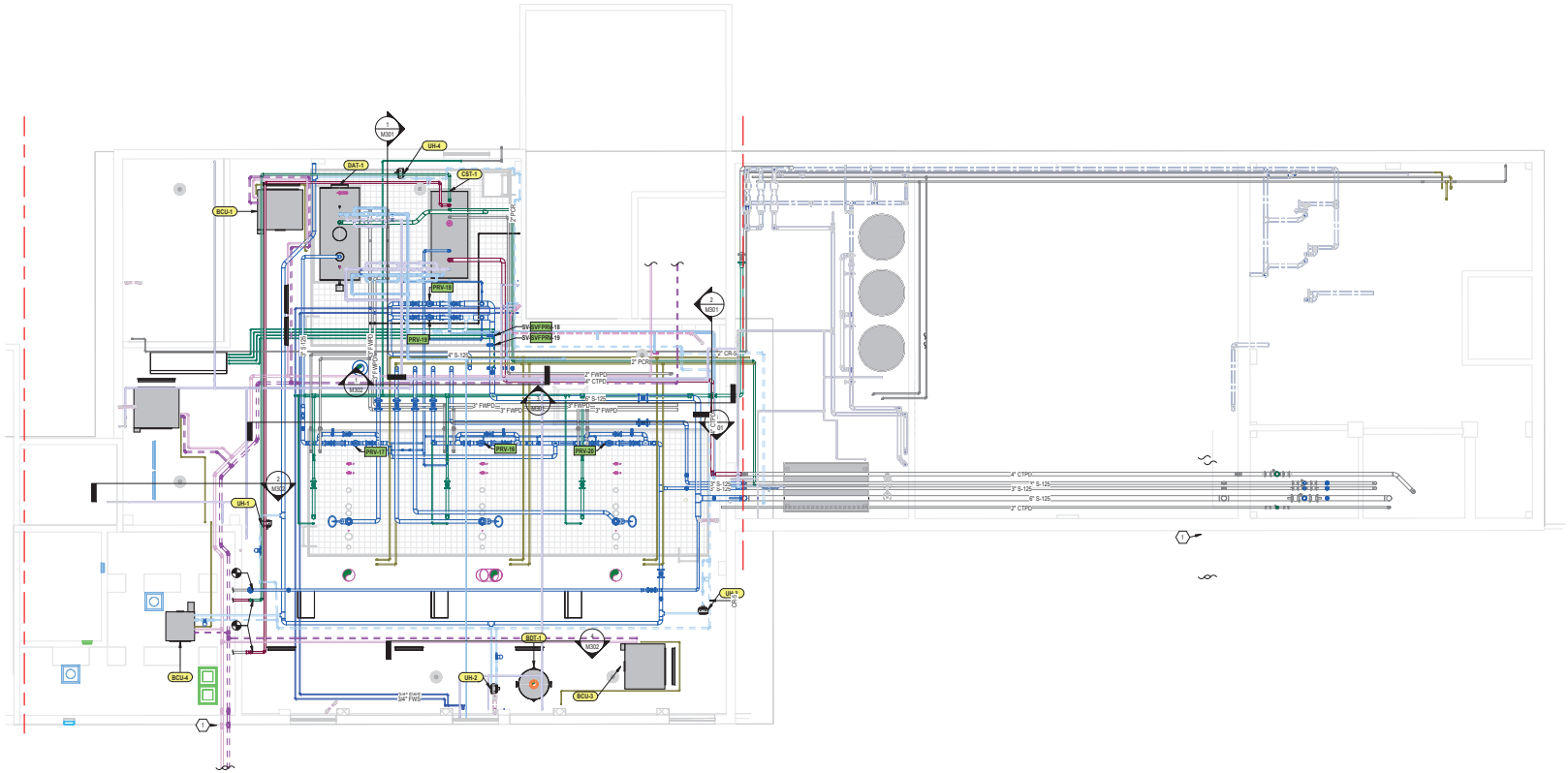


1 OVERALL MECHANICAL PIPING PLAN - BOILER PLANT MEZZANINE

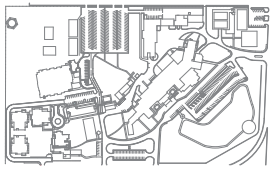
SCALE: 3/16" = 1'-0"

KEY NOTES

No.	DESCRIPTION
1	EXISTING CHILLED WATER SUPPLY AND RETURN PIPES ON BELOW GROUND. SITE VERIFY.

GENERAL NOTES

1. OVERALL FLOOR PLAN. RE: SHEETS MP101A, MP101B, MP101C, MP102, MP102A, MP103 FOR SCOPES OF WORK.
2. RE: SHEETS M600, M601, M602 FOR EXISTING SYSTEM RISER DIAGRAM.
3. ALL DEVICE INSTALLATION, CONFIGURATION, WIRING, AND TESTING SHALL COMPLY WITH VHA BOILER PLANT SAFETY DEVICES TESTING MANUAL.
   A. BOILER PLANT EQUIPMENT AND RELATED SAFETY DEVICES SHALL BE TESTED, ANALYZED, DOCUMENTED, AND CERTIFIED PER THE VHA BOILER AND ASSOCIATED PLANT SAFETY DEVICE TESTING MANUAL EIGHTH EDITION OR CURRENT. COMPLY WITH TEST GUIDANCE, PROCEDURES, FAILURE CONSEQUENCES, AND INTERIM SAFETY MEASURE (ISM) REQUIREMENTS FOR EQUIPMENT AND ASSOCIATED SAFETY DEVICES INCLUDING WATER LEVEL CONTROL, PRESSURE CONTAINMENT, FUEL TRAIN SAFETY DEVICES, BURNER AND AIR TRAIN SAFETY DEVICES, INDIVIDUAL STEAM BOILERS, ETC.
   B. TESTING, BOILER PLANT INSTRUMENTATION, AUTOMATIC BOILER CONTROL SYSTEMS, BURNER MANAGEMENT SYSTEMS, GRAPHIC USER INTERFACE(S) (GUI'S), COMPUTER WORKSTATION(S). REFER TO THE SECTION 23 52 39 FIRE-TUBE BOILERS.
4. COORDINATE SCOPES WORK AND SEQUENCES WITH TEMPORARY BOILER PLANT INSTALLATION. RE: MT SERIES SHEETS.
5. PROVIDE TEMPORARY WEATHERPROOF PROTECTION FOR PLANT DISTRIBUTION SYSTEMS PENETRATION OPENINGS THROUGH EXTERIOR ENVELOPE (WALLS, ROOF, FLOOR) TO BE REUSED. PROVIDE SEALS FOR PENETRATION OPENINGS THRU INTERIOR WALLS, PARTITIONS, CEILING ASSEMBLIES TO MAINTAIN THE ENVIRONMENT, CONTROL DUST / DEBRIS TO BE REUSED.
6. SEAL UN-USED PLANT DISTRIBUTION SYSTEMS OPENINGS. RE: ARCHITECTURAL DRAWINGS.
7. RE: PLUMBING DRAWINGS FOR DEMO SCOPE OF WORK.
8. RE: ELECTRICAL DRAWINGS FOR DEMO SCOPE OF WORK.
9. PROVIDE NEW EQUIPMENT PADS. PREP FLOOR FOR NEW EQUIPMENT PADS AND FLOOR FINISH. RE: ARCH DRAWINGS.
10. RE: SHEET MP101C FOR FUEL GAS PIPING SCOPE OF WORK.
11. RE: SHEETS MT SERIES SHEETS FOR TEMPORARY BOILER PLANT SCOPES OF WORK.



KEY PLAN

PLAN

TRUE

SCALE: 3/16" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
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Dallas, TX 75248
972-233-2288
www.obrieneng.com

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O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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STATE OF TEXAS
Jon A. Lalumia, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: OVERALL MECH PIPING PLAN - BOILER PLANT MEZZANINE

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025

Checked: LRL

Drawn: DMB

Drawing Number: MP102

Autodesk Docs://0489001/0131-VABB Boiler Replacement/0489001-01-01 MECH R25.rvt

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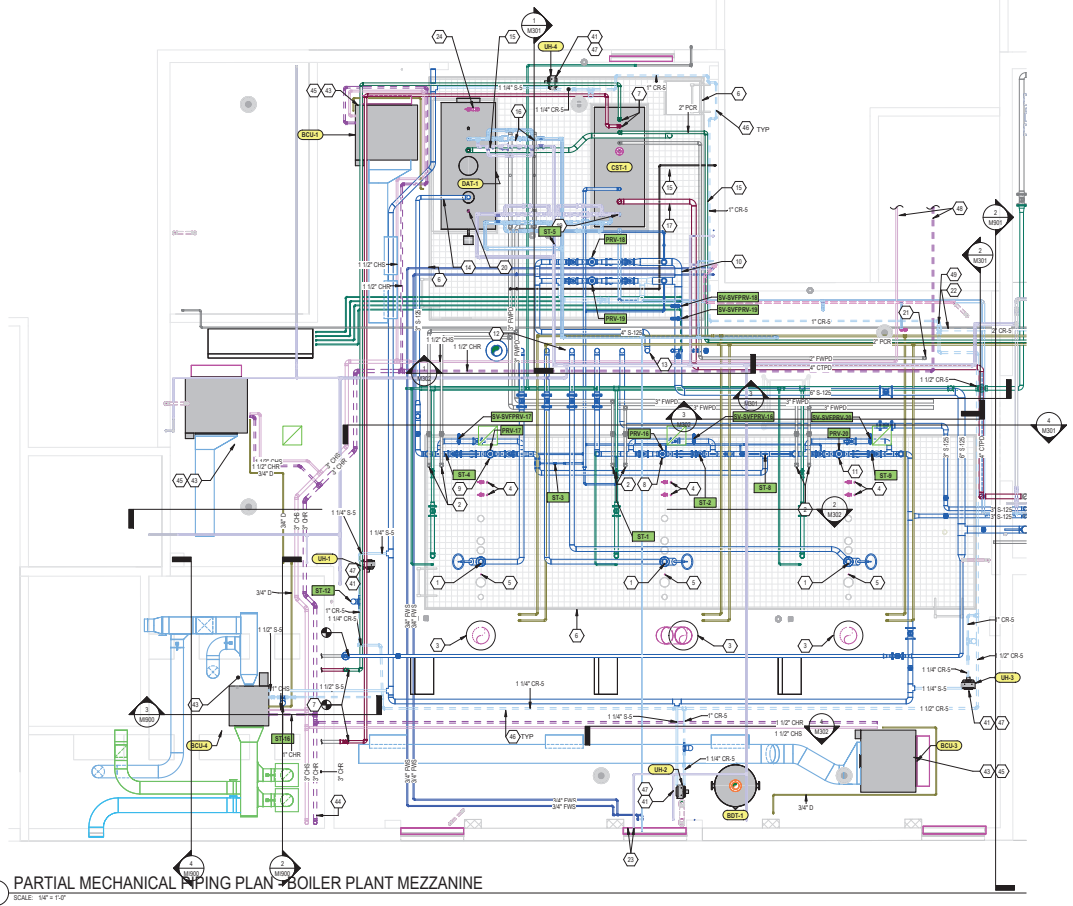
VA FORM 08 - 6231

GENERAL NOTES

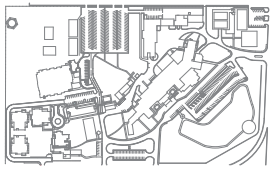
1. RE: SHEET MP301 FOR VENT PIPE TERMINATION HEIGHTS.
2. RE: SHEET MP101 FOR PIPE, STACK VENT ON RE: SHEET MP103 FOR PIPE, STACK VENT UP.
3. RE: SHEET MP400 SERIES FOR EQUIPMENT ISOMETRICS.
4. RE: SHEET MP900 SERIES FOR PLANT EQUIPMENT ISOMETRICS.
5. RE: M500, M500, M600 SERIES SHEETS FOR DETAILS, SECTION DRAWINGS, SYSTEM FLOW DIAGRAMS, EQUIPMENT SCHEDULES.
6. COORDINATE EQUIPMENT / COMPONENT SERVICE CLEARANCE REQUIREMENTS WITH EQUIPMENT LOCATIONS AND DISTRIBUTION SYSTEMS. FIELD VERIFY.

KEY NOTES

No.	DESCRIPTION
1	HPS PIPING. ROUTE UP THRU MEZZANINE DECK TO STEAM HEADER AS INDICATED. FIELD COORDINATE ROUTING.
2	FWSP/WR BRANCH MAINS. ROUTE UP THRU MEZZANINE DECK AS INDICATED. FIELD COORDINATE ROUTING.
3	BOILER STACK VENT. ROUTE UP FROM BOILER THRU ROOF PENETRATION. OFFSET AS REQUIRED. FIELD COORDINATE ROUTING.
4	BOILER SAFETY RELIEF VALVE VENT PIPING. ROUTE THRU MEZZANINE DECK AS INDICATED. ROUTE TO ROOF PENETRATION. FIELD COORDINATE ROUTING AND PENETRATION LOCATION.
5	BOILER VENT PIPING. ROUTE UP THRU MEZZANINE DECK AS INDICATED. FIELD COORDINATE ROUTING.
6	NEW SERVICE ACCESS PLATFORM / MEZZANINE. RE: ARCHITECTURAL DRAWINGS. RE: STRUCTURAL DRAWINGS.
7	CONNECT TO (E) PCR AND ROUTE TO CDT-1 AS INDICATED. FIELD COORDINATE ROUTE
8	PRV-16. PROVIDE PRESSURE STEAM REDUCING VALVE STATION. RE: SHEET M604, SHEET M605.
9	PRV-17. PROVIDE PRESSURE STEAM REDUCING VALVE STATION. RE: SHEET M604, SHEET M605.
10	PRV-18,19. PROVIDE PRESSURE STEAM REDUCING VALVE STATION. RE: SHEET M604, SHEET M605.
11	PRV-20. PROVIDE PRESSURE STEAM REDUCING VALVE STATION. RE: SHEET M604, SHEET M605.
12	4" HPS HEADER INLET (B-1), 4" HPS HEADER INLET (B-2), 4" HPS HEADER INLET (B-3), 3" HPS HEADER OUTLET (LAUNDRY BLDG), 4" HPS HEADER OUTLET (MAIN BUILDING), 3" HPS HEADER OUTLET (BOILER PLANT EQUIPMENT) DN TO / UP FROM NEW STEAM HEADER AS INDICATED. RE: SHEET M302, M605.
13	10" HPS STEAM SILENCER VENT RISER, 2" HPS HEADER VENT RISER. RE: SHEET M302, M605.
14	4" LPS DN TO DAT-1. FIELD COORDINATE ROUTING.
15	4" CPTD. ROUTE FROM CDT-1 TO DAT-1 AS INDICATED. FIELD COORDINATE ROUTING.
16	4" FWSP/WR. ROUTE DN TO DAT-1 AS INDICATED. FIELD COORDINATE ROUTING.
17	4" CPTD. ROUTE TO CDT-1 AS INDICATED. FIELD COORDINATE ROUTING.
19	4" TANK VENT. ROUTE UP THRU ROOF AS INDICATED. FIELD COORDINATE ROUTING.
20	4" DAT-1 OXYGEN / NON-CONDENSABLE GAS VENT PIPING. ROUTE ROUTE UP THRU ROOF AS INDICATED. FIELD COORDINATE ROUTING.
21	4" CPTD. ROUTE FROM CDT-2 TO CDT-1 AS INDICATED. FIELD COORDINATE ROUTING.
22	2" GCR. ROUTE DN TO CDT-2 AS INDICATED. FIELD COORDINATE ROUTING.
23	FWSP/WR SAMPLING PIPE. CONNECT TO FWSP/WR MAINS AND ROUTE TO SAMPLING STATION AS INDICATED.
24	DAT-1 SAFETY RELIEF VALVE VENT PIPING UP.
41	UNIT HEATER. SEE SHEET MH102.
43	BLOWER COIL UNIT. SEE SHEET MH102.
44	EXISTING CHILLED WATER SUPPLY AND RETURN PIPES DROP. SITE VERIFY.
45	INSTALL HYDRONIC PIPES BELOW UNIT THAT DO NOT BLOCK THE UNIT SUPPLY AND RETURN AIR OPENINGS. PROVIDE SUPPLY AND RETURN GRILLES SIZE MATCH WITH OPENINGS.GRAVITY STEAM CONDENSATE DRAIN SLOPE AT 1/8" PER FOOT DOWN TO GRAVITY STEAM CONDENSATE DRAIN MAIN.
46	GRAVITY STEAM CONDENSATE DRAIN PIPE SLOPE AT 1/8" PER FOOT TOWARDS CONDENSATE TANK.
47	GRAVITY STEAM CONDENSATE DRAIN SLOPE AT 1/8" PER FOOT DOWN TO GRAVITY STEAM CONDENSATE DRAIN MAIN.
48	CONNECT CHILLED WATER SUPPLY AND RETURN PIPES TO EXISTING FAN COIL UNIT.
49	CONNECT GRAVITY CONDENSATE DRAIN PIPES DN TO CONDENSATE TANK.



1 PARTIAL MECHANICAL PIPING PLAN - BOILER PLANT MEZZANINE
SCALE: 1/4" = 1'-0"



KEY PLAN

PLAN
TRUE

0' 1' 2' 3' 4' 5' 10' 15' 20'
SCALE: 1/4" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jon A. Lalumia, Jr.
91464
LICENSED
PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title
PARTIAL MECH PIPING PLAN - BOILER PLANT MEZZANINE

Phase
100% CONSTRUCTION DOCUMENTS

Project Title
A/E REPLACE BOILERS

Project Number
519-20-200

Building Number
2

APPROVING OFFICIAL
COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location
BOILER PLANT

Issue Date
10/07/2025

Checked
LRL

Drawn
DMB

Drawing Number
MP102A

Autodesk Docs://0489001/0131/ABB Boiler Replacement/0489001-01-01 MECH R25.rvt

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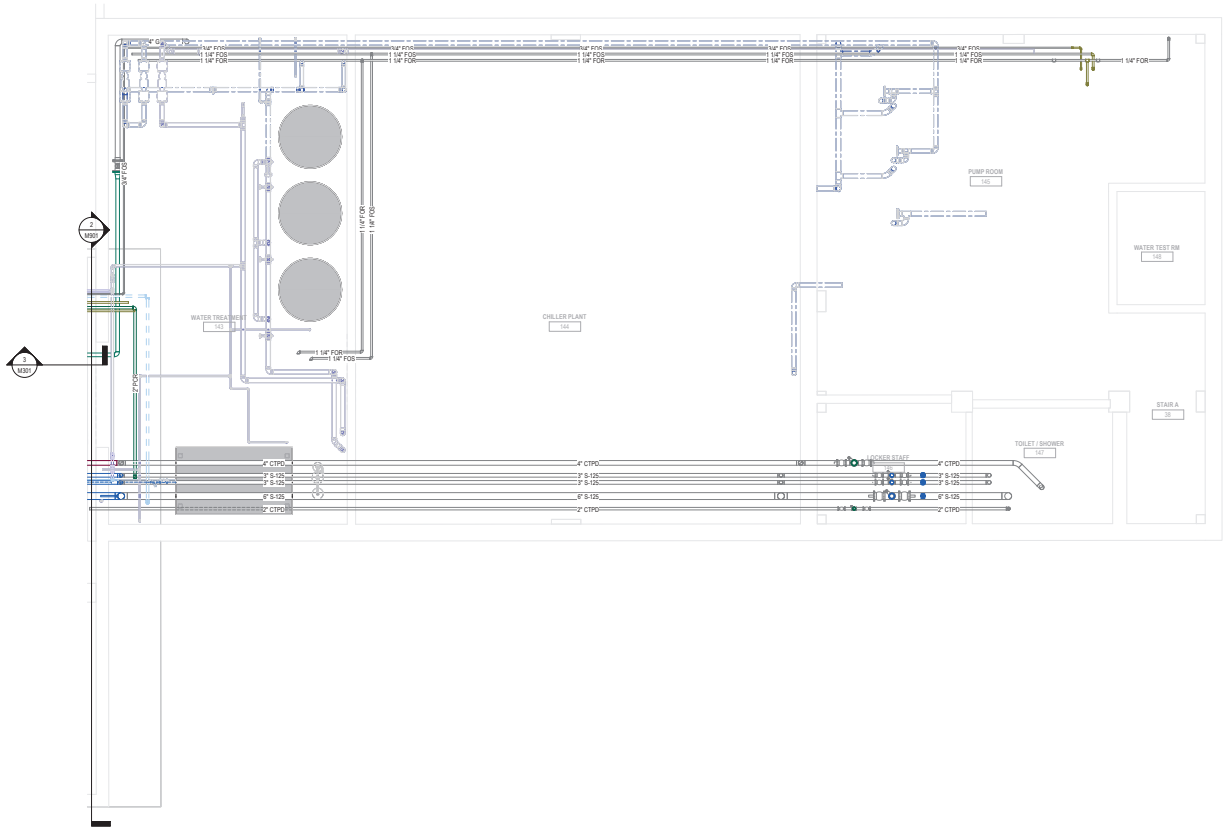
KEY NOTES	
No.	DESCRIPTION



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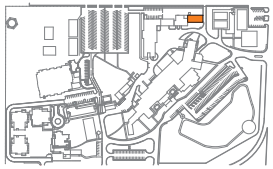
SCALE: 1/4" = 1'-0"



KEY PLAN

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

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STATE OF TEXAS
Jon A. Palmetto, Jr.
91464
LICENSED
PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: PARTIAL MECH PIPING PLAN - BUILDING 2 EAST

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025 | Checked: LRL | Drawn: DMB

Drawing Number: MP102B

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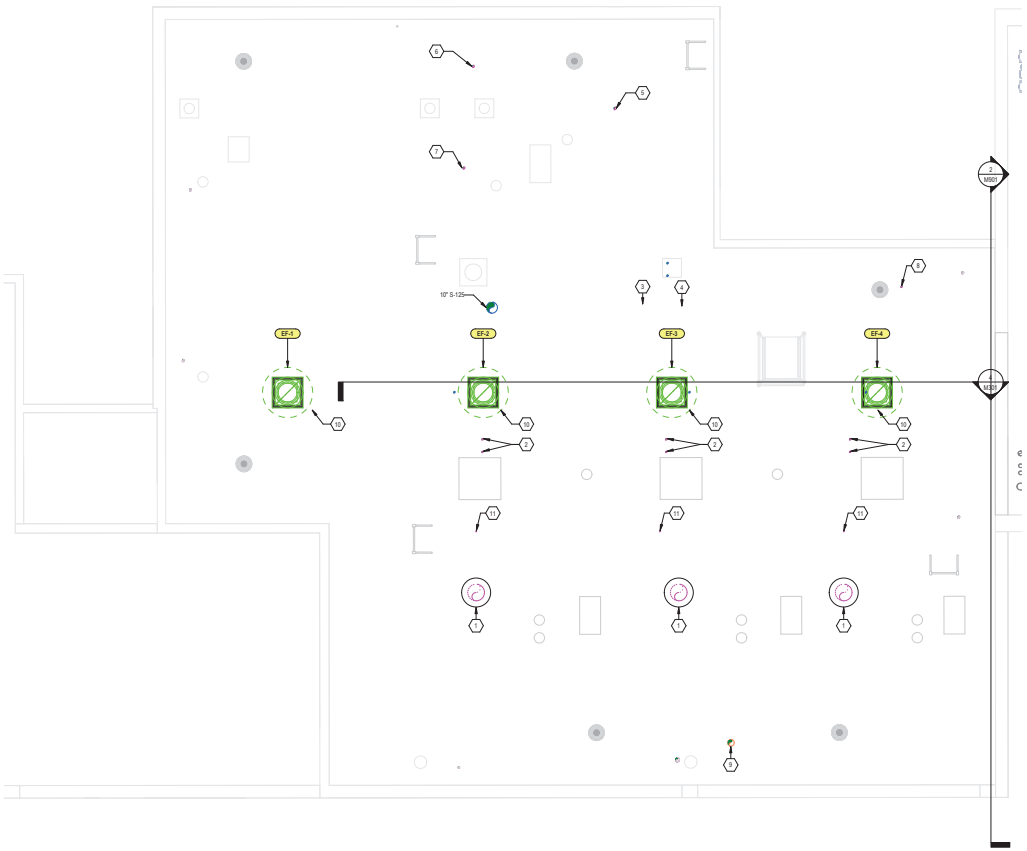
GENERAL NOTES

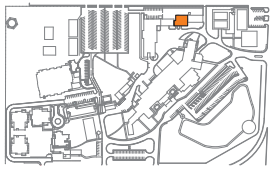
1. OVERALL FLOOR PLAN. RE: SHEETS MP101A, MP101B, MP101C, MP102, MP102A, MP103 FOR SCOPES OF WORK.
2. RE: SHEETS M600, M601, M602 FOR EXISTING SYSTEM RISER DIAGRAM.
3. ALL DEVICE INSTALLATION, CONFIGURATION, WIRING, AND TESTING SHALL COMPLY WITH VHA BOILER PLANT SAFETY DEVICES TESTING MANUAL.
   A. BOILER PLANT EQUIPMENT AND RELATED SAFETY DEVICES SHALL BE TESTED, ANALYZED, DOCUMENTED, AND CERTIFIED PER THE VHA BOILER AND ASSOCIATED PLANT SAFETY DEVICE TESTING MANUAL EIGHTH EDITION OR CURRENT. COMPLY WITH TEST GUIDANCE, PROCEDURES, FAILURE CONSEQUENCES, AND INTERIM SAFETY MEASURE (ISM) REQUIREMENTS FOR EQUIPMENT AND ASSOCIATED SAFETY DEVICES INCLUDING WATER LEVEL CONTROL, PRESSURE CONTAINMENT, FUEL TRAIN SAFETY DEVICES, BURNER AND AIR TRAIN SAFETY DEVICES, INDIVIDUAL STEAM BOILERS, ETC.
   B. TESTING, BOILER PLANT INSTRUMENTATION, AUTOMATIC BOILER CONTROL SYSTEMS, BURNER MANAGEMENT SYSTEMS, GRAPHIC USER INTERFACE(S) (GUI'S), COMPUTER WORKSTATION(S). REFER TO THE SECTION 23 52 39 FIRE-TUBE BOILERS.
4. COORDINATE SCOPES WORK AND SEQUENCES WITH TEMPORARY BOILER PLANT INSTALLATION. RE: MT SERIES SHEETS.
5. PROVIDE TEMPORARY WEATHERPROOF PROTECTION FOR PLANT DISTRIBUTION SYSTEMS PENETRATION OPENINGS THROUGH EXTERIOR ENVELOPE (WALLS, ROOF, FLOOR) TO BE REUSED. PROVIDE SEALS FOR PENETRATION OPENINGS THRU INTERIOR WALLS, PARTITIONS, CEILING ASSEMBLIES TO MAINTAIN THE ENVIRONMENT, CONTROL DUST / DEBRIS TO BE REUSED.
6. SEAL UN-USED PLANT DISTRIBUTION SYSTEMS OPENINGS. RE: ARCHITECTURAL DRAWINGS.
7. RE: PLUMBING DRAWINGS FOR DEMO SCOPE OF WORK.
8. RE: ELECTRICAL DRAWINGS FOR DEMO SCOPE OF WORK.
9. PROVIDE NEW EQUIPMENT PADS. PREP FLOOR FOR NEW EQUIPMENT PADS AND FLOOR FINISH. RE: ARCH DRAWINGS.
10. RE: SHEET MP101C FOR FUEL GAS PIPING SCOPE OF WORK.
11. RE: SHEETS MT SERIES SHEETS FOR TEMPORARY BOILER PLANT SCOPES OF WORK.
12. RE: SHEET MP301 FOR VENT PIPE TERMINATION HEIGHTS.
13. RE: SHEET MP102 FOR PIPE, STACK VENT DIN.
14. RE: SHEET MP400 SERIES FOR EQUIPMENT ISOMETRICS.
15. RE: SHEET MP900 SERIES FOR PLANT EQUIPMENT ISOMETRICS.
16. RE: M000, M500, M600 SERIES SHEETS FOR DETAILS, SECTION DRAWINGS, SYSTEM FLOW DIAGRAMS, EQUIPMENT SCHEDULES.
17. PROVIDE 4" VTR'S FOR VENT PIPES THRU ROOF.

KEY NOTES

No.	DESCRIPTION
1	BOILER VENT STACK AND BREECHING THRU ROOF. INSTALL PRE-ENGINEERED, FACTORY-FABRICATED BOILER VENT STACK AND BREECHING, 18-INCH DIA I.D. INSTALL PER MANUFACTURERS RECOMMENDATIONS. PROVIDE SEALANT. STACK SUPPORT BELOW / ABOVE ROOF PER PER MANUFACTURERS REQUIREMENTS. FIELD COORDINATE ROUTING AND PENETRATION LOCATION.
2	BOILER SAFETY RELIEF VALVE VENT PIPING THRU ROOF. PROVIDE NEW SAFETY RELIEF VENT PIPING. VENT'S TO BE SIZED PER ASME. FIELD COORDINATE ROUTING AND PENETRATION LOCATION.
3	STEAM MUFFLER/SILENCER VENT PIPING. VENT TO BE SIZED PER ASME. FIELD COORDINATE ROUTING AND PENETRATION LOCATION.
4	HEADER VENT PIPING. FIELD COORDINATE ROUTING AND PENETRATION LOCATION.
5	CDT-1 VENT PIPE THRU ROOF.
6	DAT-1 SAFETY RELIEF VALVE VENT PIPING THRU ROOF.
7	DAT-1 OXYGEN / NON-CONDENSABLE GAS VENT PIPING THRU ROOF.
8	CDT-2 VENT PIPE THRU ROOF.
9	BDT-1 VENT PIPE THRU ROOF.
10	ROOF EXHAUST FAN ASSEMBLY. RE: SHEET MH103.
11	BOILER VENT PIPING THRU ROOF.



1 PARTIAL MECHANICAL PIPING PLAN - BOILER PLANT ROOF
SCALE: 1/4" = 1'-0"



KEY PLAN

PLAN
TRUE

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

Revisions:	Date:
100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024

CONSULTANT
A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com
OEI O'BRIEN ENGINEERING | ARCHITECTURE

ARCHITECT/ENGINEER OF RECORD
A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com
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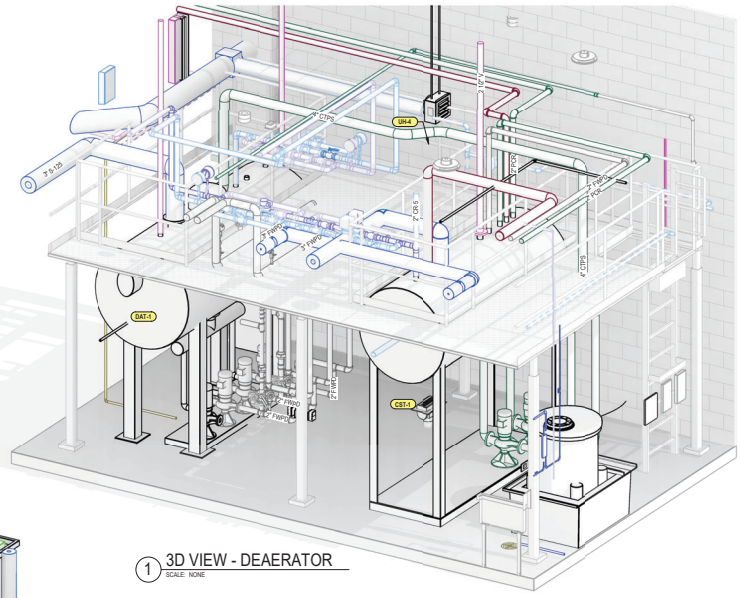
Office of Construction and Facilities Management
VA U.S. Department of Veterans Affairs

Drawing Title	PARTIAL MECH PIPING PLAN - BOILER PLANT ROOF
Phase	100% CONSTRUCTION DOCUMENTS
Project Title	A/E REPLACE BOILERS
Project Number	519-20-200
Building Number	2
APPROVING OFFICIAL	COR, Mr. JOSHUA JUNKIN
	FULLY SPRINKLERED
Location	BOILER PLANT
Issue Date	10/07/2025
Checked	LRL
Drawn	DMB
Drawing Number	MP103A

VA FORM 08 - 6231

Autodesk Docs://0489001/0131/ABB Boiler Replacement/0489001.01.01 MECH R25.rvt

10/16/2025 3:28:53 AM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DAT-1
CST-1
CTPS
FWPS
FWRS
FWRS
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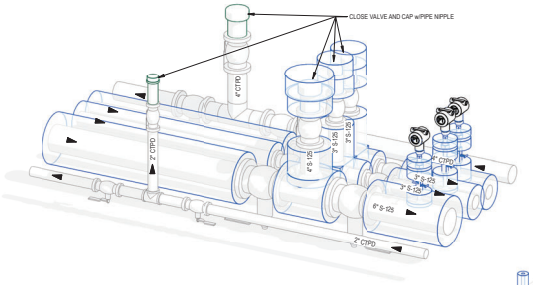
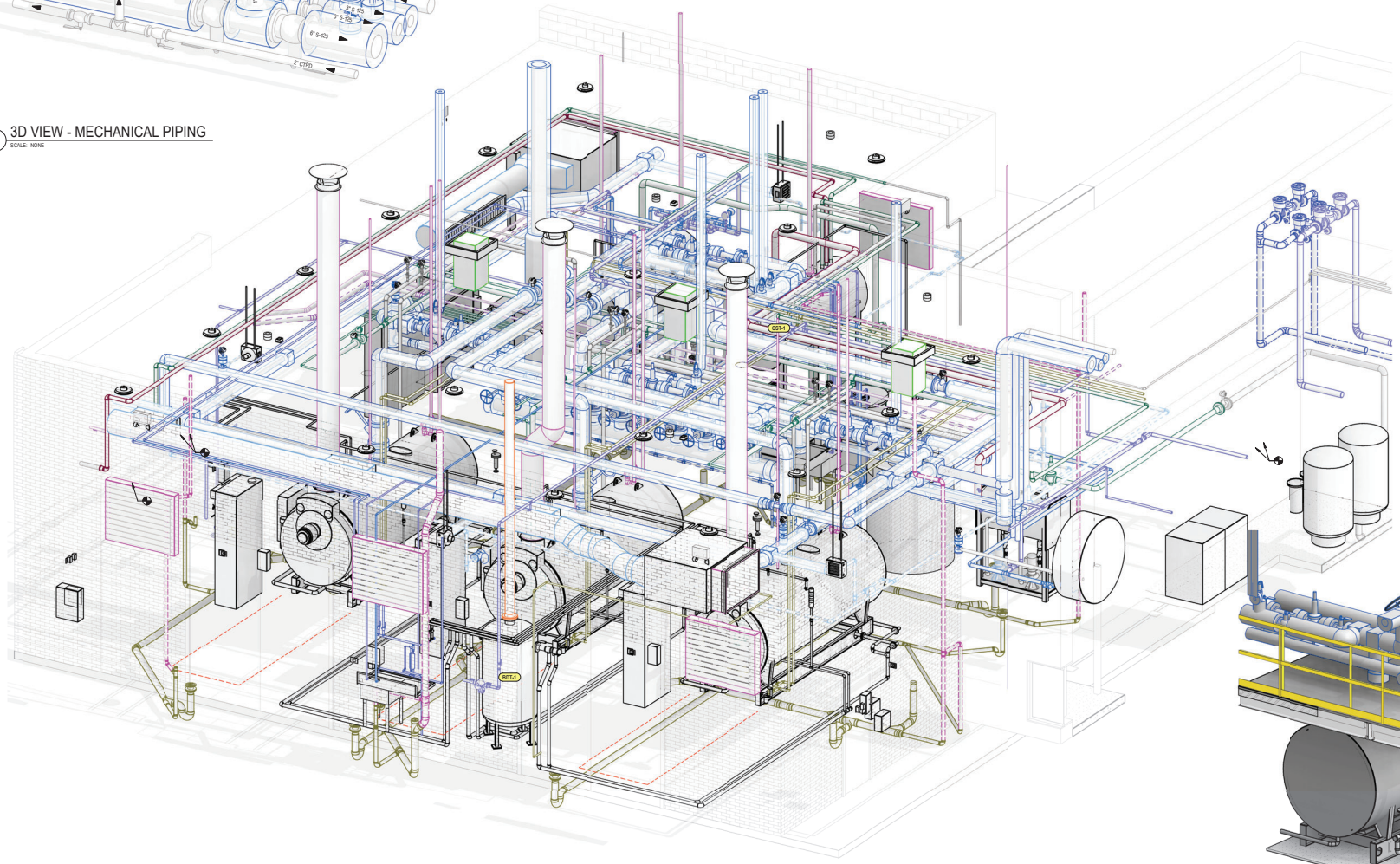


3 3D VIEW - MECHANICAL PIPING
SCALE: NONE



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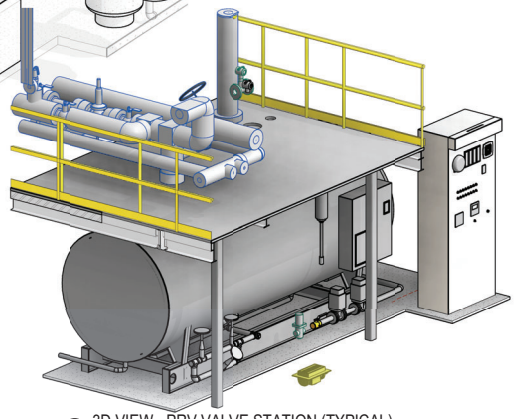

2 3D VIEW - PRV VALVE STATION (TYPICAL)
SCALE: NONE

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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A/E:
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17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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Jon A. Lalotto, Jr.
91464
LICENSED
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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: 3D VIEW - MECHANICAL PIPING

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025

Checked: LRL

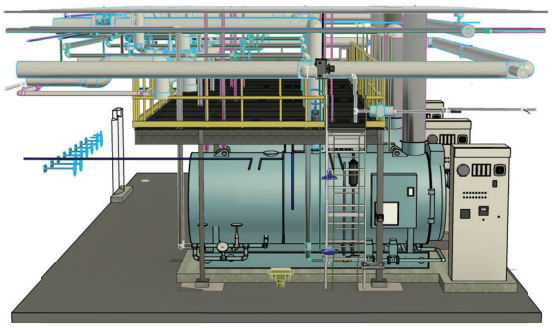
Drawn: DMB

Drawing Number: MP900

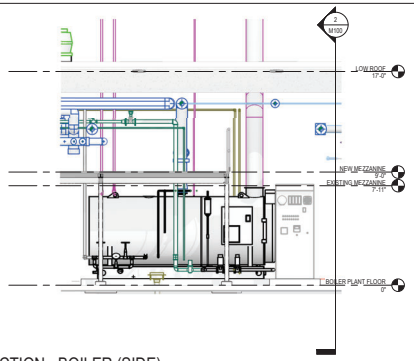
VA FORM 08 - 6231

Autodesk Docs://0489001/0131/ABS Boiler Replacement/0489001-01-01-MECH-R25.rvt

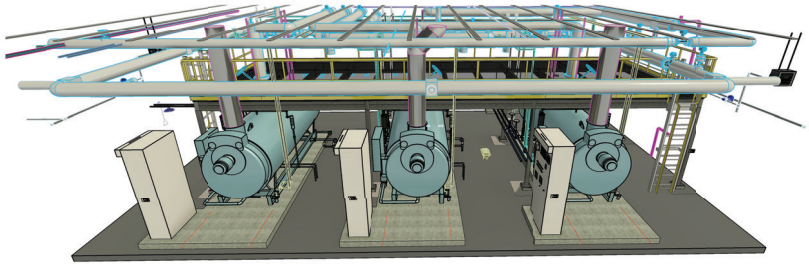
10/16/2025 3:29:50 AM



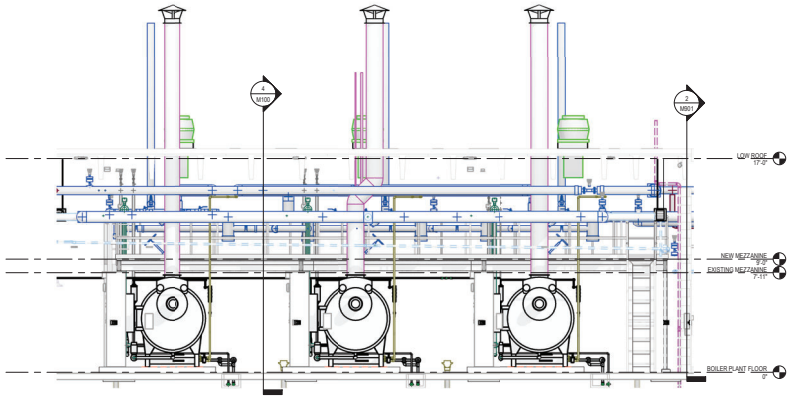
5 3D VIEW - BOILER PLATFORM (SIDE)
SCALE: NONE



4 SECTION - BOILER (SIDE)
SCALE: 1/4" = 1'-0"



3 3D VIEW - BOILER PLATFORM (FRONT)
SCALE: NONE



2 SECTION - BOILER (FRONT)
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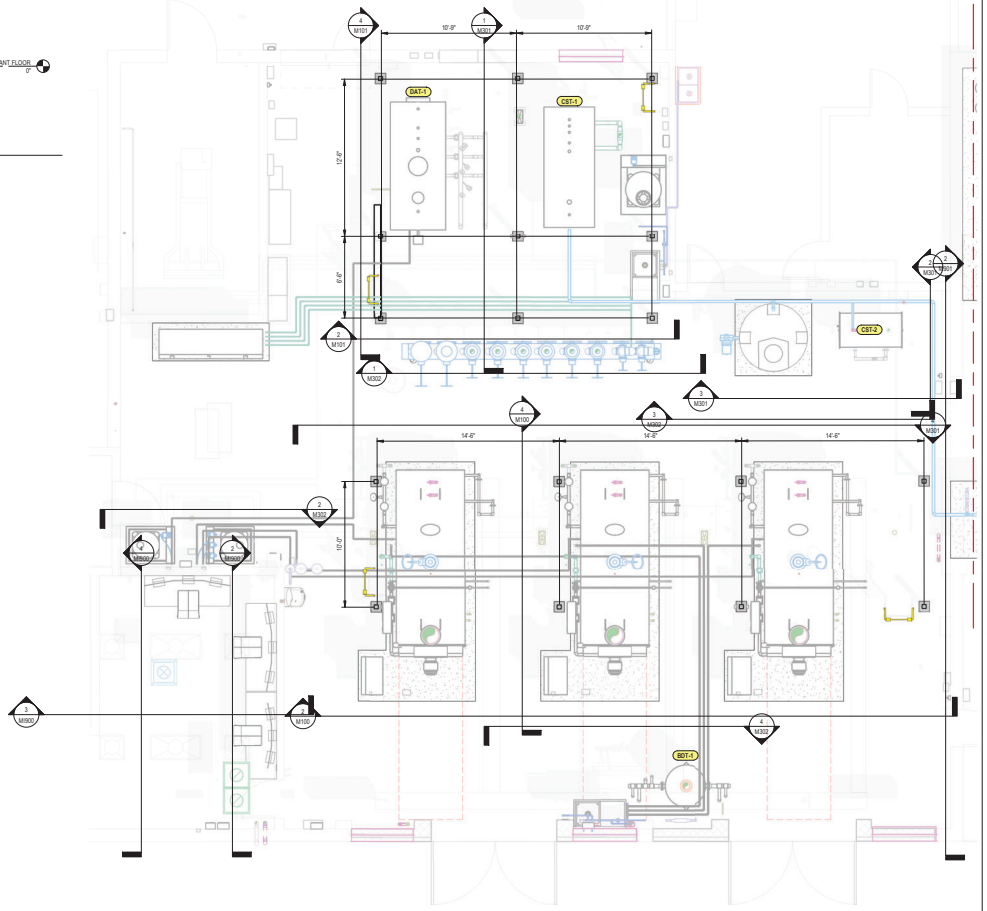

1 STRUCTURAL FLOOR PLAN - ACCESS PLATFORMS
SCALE: 1/4" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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A/E:
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17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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ARCHITECT/ENGINEER OF RECORD

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O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jon A. Lalotto, Jr.
91464
LICENSED
PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: ACCESS PLATFORMS - PLAN, SECTIONS & 3D VIEWS

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025

Checked: LRL

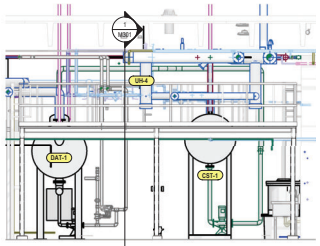
Drawn: DMB

Drawing Number: M100

Autodesk Docs://0489001/0131/ABB Boiler Replacement/0489001-01-01 MECH R25.rvt

10/10/2025 3:30:32 AM

VA FORM 08 - 6231



2 SECTION - DEAERATOR (FRONT)
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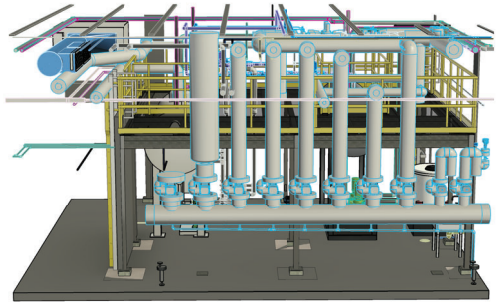

3 3D VIEW - DEAERATOR PLATFORM (FRONT)
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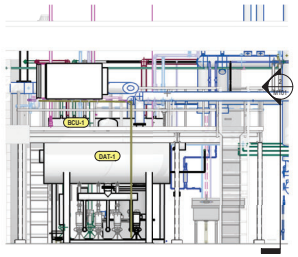

4 SECTION - DEAERATOR (SIDE)
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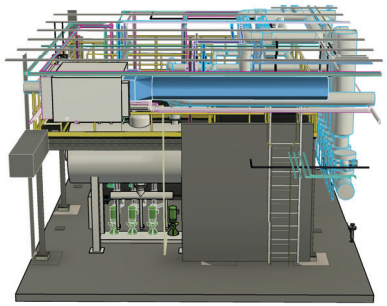

5 3D VIEW - DEAERATOR PLATFORM (SIDE)
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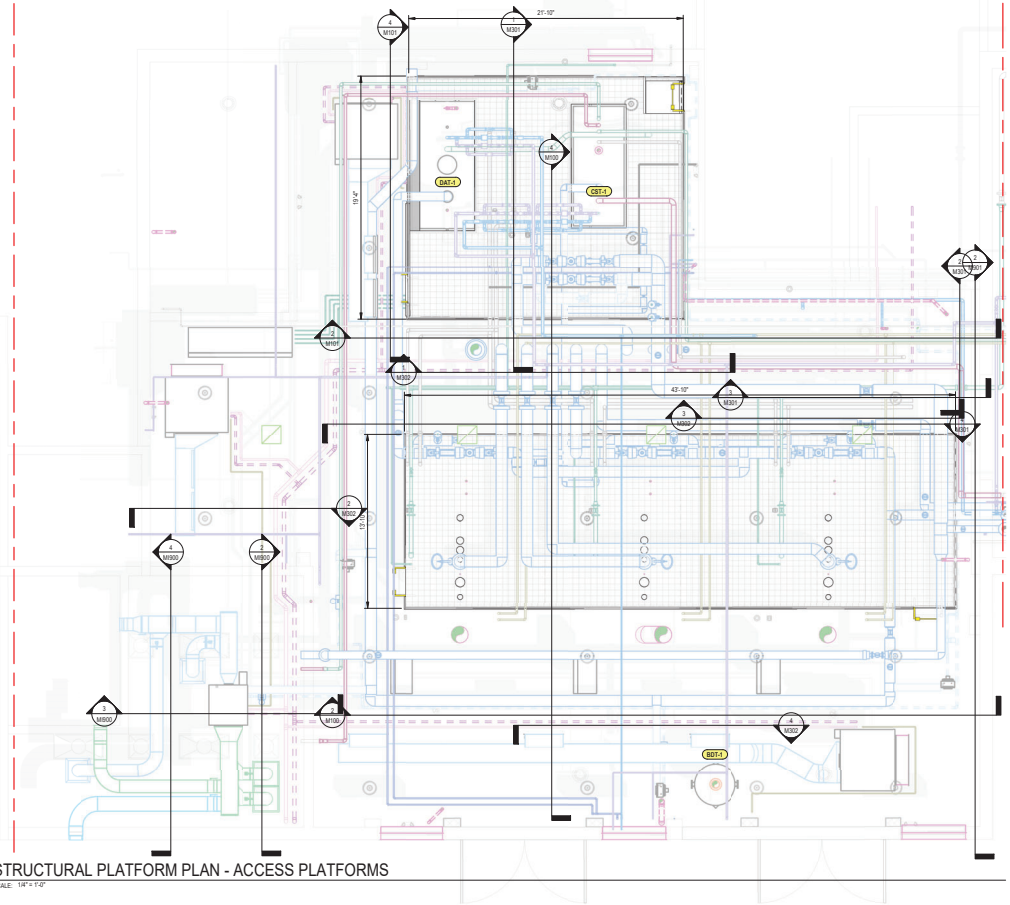

1 STRUCTURAL PLATFORM PLAN - ACCESS PLATFORMS
SCALE: 1/4" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jon A. Palmetto, Jr.
91464
LICENSED
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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: ACCESS PLATFORMS - PLAN, SECTIONS & 3D VIEWS

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025 | Checked: LRL | Drawn: DMB

Drawing Number: M101

VA FORM 08 - 6231

Autodesk Docs://0489001/0131/ABB Boiler Replacement/0489001/0131 MECHFR25.rvt

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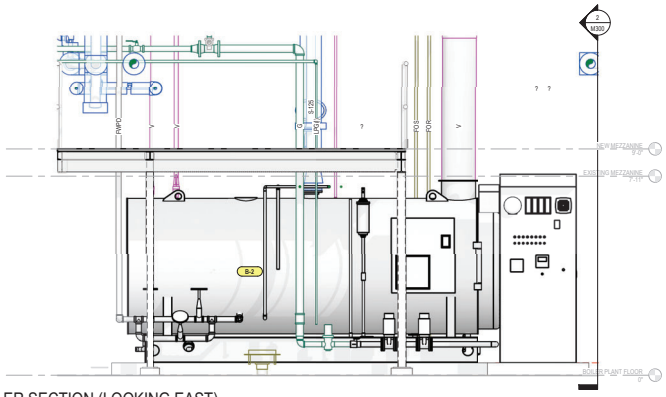
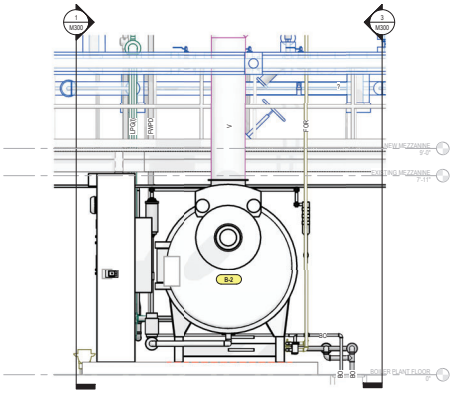
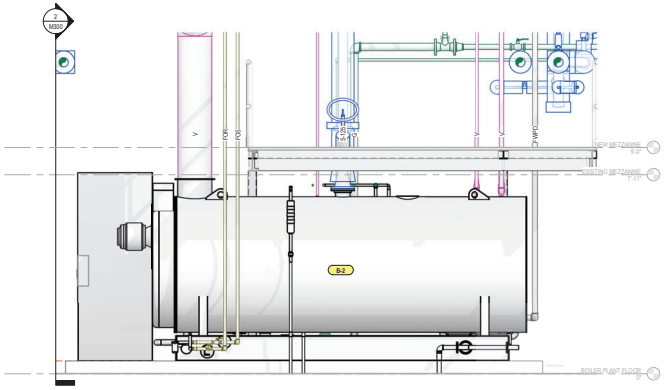


1 BOILER SECTION (LOOKING EAST)
SCALE: 1/2" = 1'-0"



2 BOILER SECTION (LOOKING EAST)
SCALE: 1/2" = 1'-0"



3 BOILER SECTION (LOOKING WEST)
SCALE: 1/2" = 1'-0"

0' 1'-0" 2'-0" 3'-0" 4'-0" 5'-0" 7'-6" 10'
SCALE: 1/2" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
Revisions:	Date:

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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

OEI O'BRIEN ENGINEERING | ARCHITECTURE

ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jason A. Palmetto, Jr.
91464
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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: BOILER SECTIONS

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025

Checked: LRL

Drawn: DMB

Drawing Number: M300

VA FORM 08 - 6231

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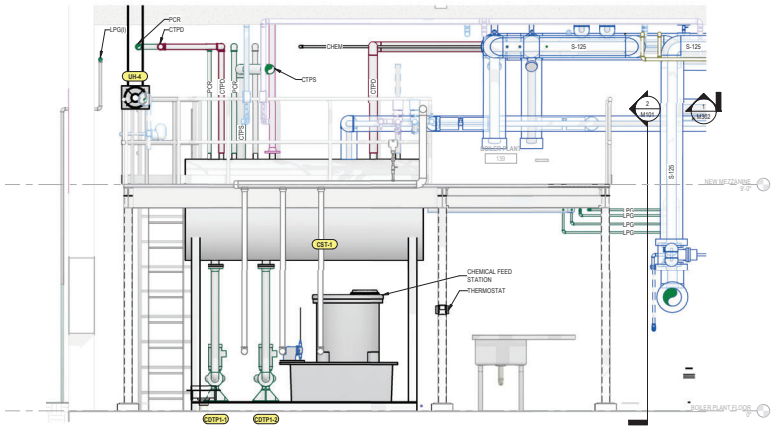
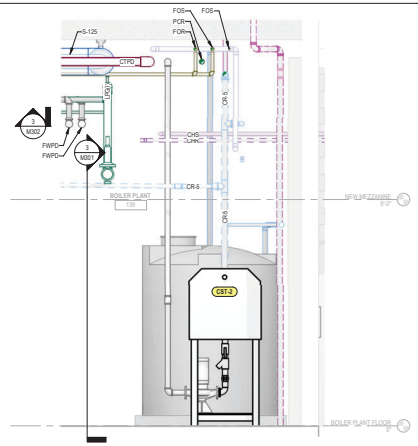
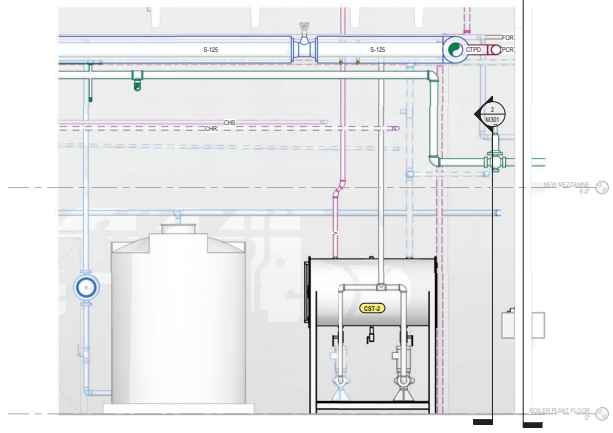


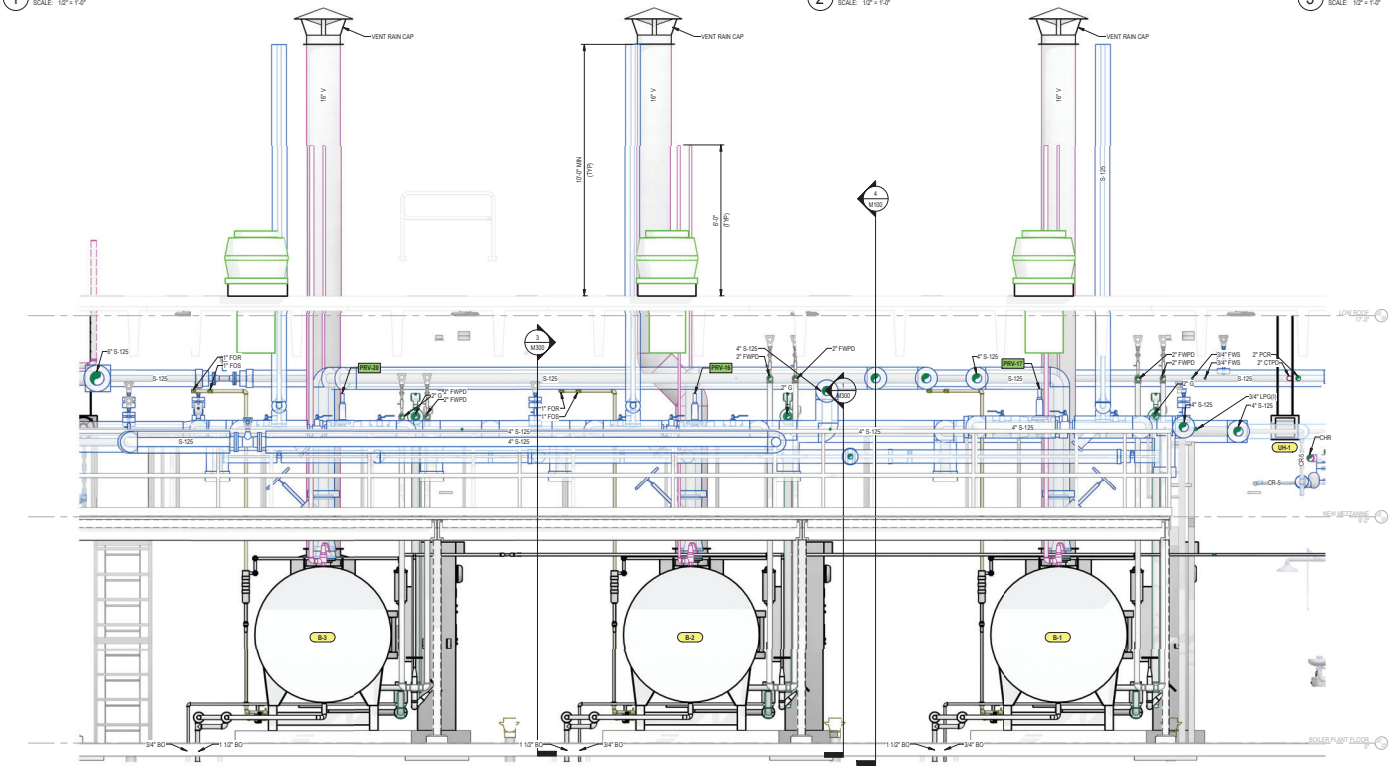
1 DEAERATOR TANKS & PUMPS
SCALE: 1/2" = 1'-0"



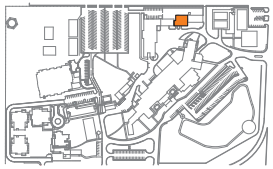
2 CONDENSATE STORAGE TANK & PUMPS
SCALE: 1/2" = 1'-0"



3 CONDENSATE STORAGE TANK & PUMPS
SCALE: 1/2" = 1'-0"



4 BOILER - END VIEW
SCALE: 1/2" = 1'-0"



KEY PLAN

0' 1'-0" 2'-0" 3'-0" 4'-0" 5'-0" 7'-6" 10'
SCALE: 1/2" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
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Jon A. Lalotto, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: MECHANICAL SECTIONS	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Drawing Number: M301
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	

Autodesk Docs://0489001/0131/ABS Boiler Replacement/0489001.01 MECH R25.rvt
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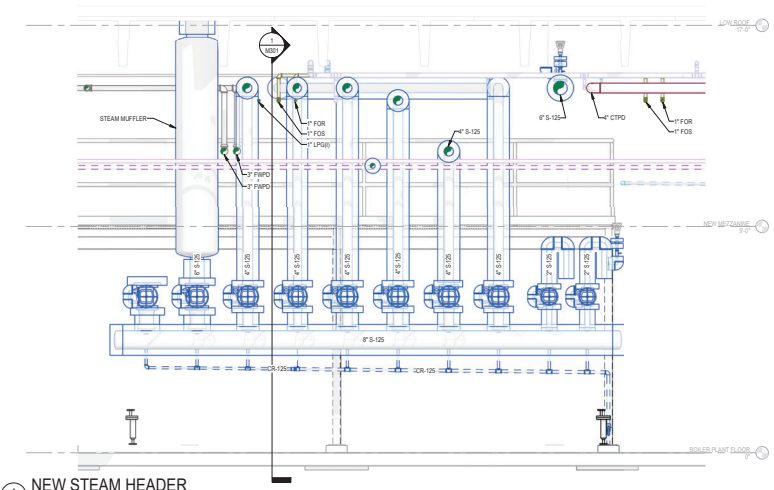
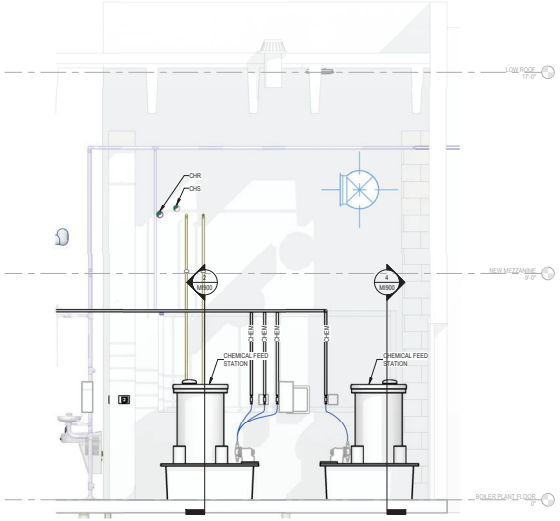
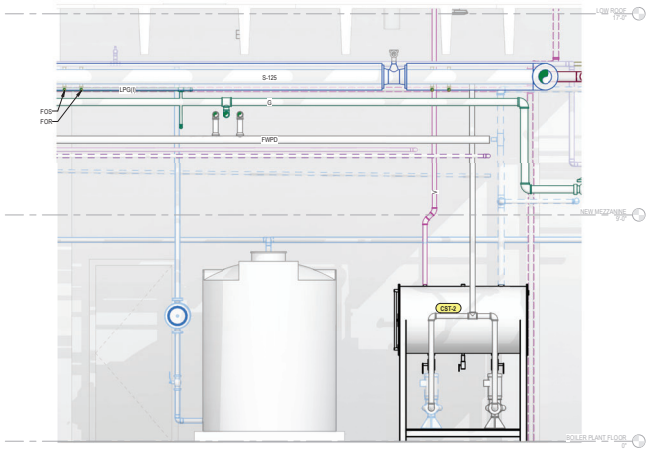
VA FORM 08 - 6231



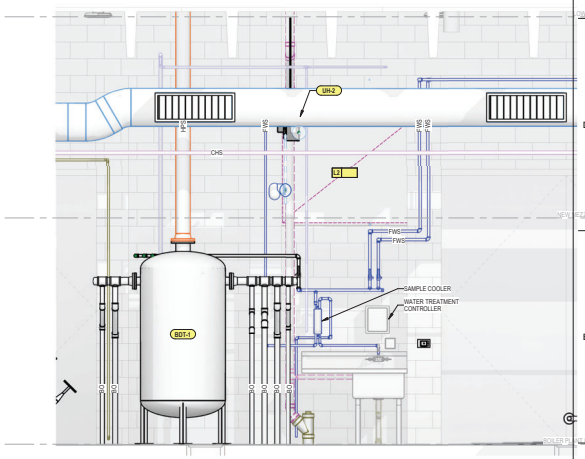
1 NEW STEAM HEADER
SCALE: 1/2" = 1'-0"



2 CHEMICAL FEED STATION SECTION
SCALE: 1/2" = 1'-0"



3 CONDENSATE STORAGE TANK 2 (CST-2) SECTION
SCALE: 1/2" = 1'-0"



4 BLOWDOWN TANK (BDT-1) SECTION
SCALE: 1/2" = 1'-0"

0' 1'-0" 2'-0" 3'-0" 4'-0" 5'-0" 7'-6" 10'
SCALE: 1/2" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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91464
LICENSED PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: MECHANICAL SECTIONS

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025

Checked: LRL

Drawn: DMB

Drawing Number: M302

VA FORM 08 - 6231

Autodesk Docs://0489001/0131/ABS Boiler Replacement/0489001-01-MECHFR25.rvt

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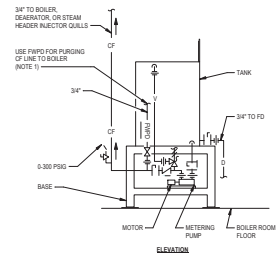
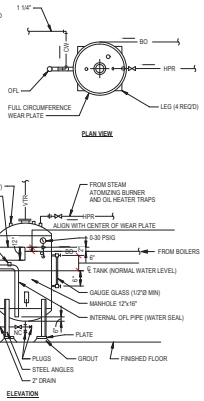


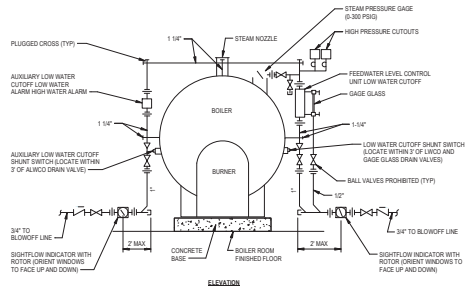
NOTES:
1. DO NOT PROVIDE FWPD ON SYSTEM WHICH SERVES DEARATOR.
2. PROVIDE A SEPARATE CHEMICAL FEED SYSTEM FOR EACH BOILER, FOR THE DEARATOR AND FOR MAIN STEAM.
3. ONE FEED SYSTEM FOR EACH CHEMICAL.

4 CHEMICAL FEED SYSTEM, PUMPED TYPE
SCALE: NONE

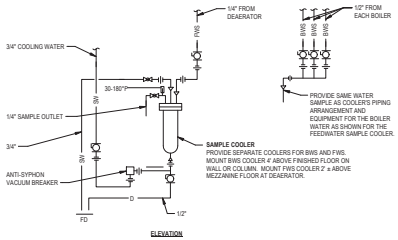
NOTE:
TANK SHALL BE MANUFACTURED AND FURNISHED IN ACCORDANCE WITH THE ASME BOILER AND PRESSURE VESSEL CODE AND AMERICAN NATIONAL STANDARD ANSI/ASME B(P)V VIII-1. INSPECTION AND REGISTRATION ARE WITH THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS.



3 BOILER BLOWOFF TANK
SCALE: NONE



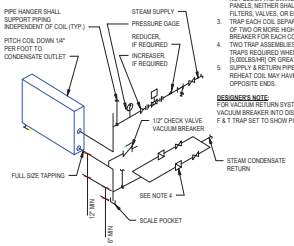
2 FIRE TUBE BOILER AUXILIARY WATER LEVEL SAFETY PIPING
SCALE: NONE



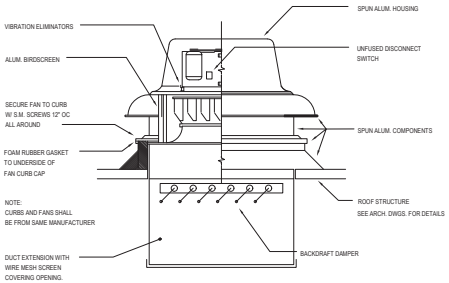
1 WATER SAMPLE COOLERS - BOILER WATER AND FEEDWATER
SCALE: NONE

NOTES:
1. WHEN COIL IS INCLUDED IN CASING MOUNTED ON VIBRATION ISOLATOR UNITS, THE RUNOUT PIPING FOR CONNECTIONS TO COIL SHALL BE INSTALLED WITH SWING JOINTS TO ALLOW FOR THE VIBRATION.
2. PIPING SHALL BE INSTALLED IN SUCH MANNER THAT IT WILL NOT BLOCK THE SWING OR USE OF ACCESS DOORS OR PANELS; NEITHER SHALL IT BLOCK THE SERVICING OF FILTERS, VALVES, OR EQUIPMENT.
3. TRAP EACH COIL SEPARATELY WHEN INSTALLED IN A BANK OF TWO OR MORE HIGH. ALSO PROVIDE SEPARATE VACUUM BREAKER FOR EACH COIL.
4. TWO TRAP ASSEMBLIES IN PARALLEL ARE SHOWN. TWO TRAPS REQUIRED WHEN CONDENSATE LOAD IS 2400 KG/HR (5,000LBS/HR) OR GREATER.
5. SUPPLY & RETURN PIPES ARE SHOWN FROM SAME END. REHEAT COIL MAY HAVE SUPPLY & RETURN PIPES FROM OPPOSITE ENDS.

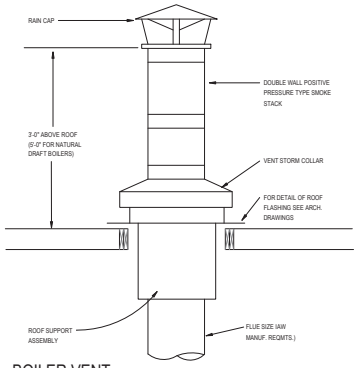
DESIGNER'S NOTE:
FOR VACUUM RETURN SYSTEMS CONNECT 1/2" CHECKVALVE VACUUM BREAKER INTO DISCHARGE SIDE OF TRAP SET. CHANGE F & T TRAP SET TO SHOW PIPING LOCATION CONNECTION.



8 STEAM COIL CONNECTIONS
SCALE: NONE



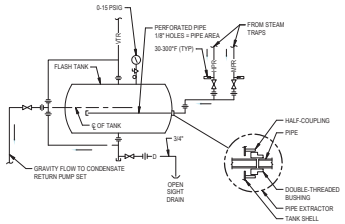
7 ROOF EXHAUST FAN
SCALE: NONE



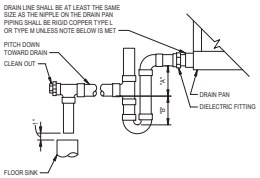
6 BOILER VENT
SCALE: NONE

STEAM PRESSURE (PSIG)	TANK AREA (SQ. FT.)
NOTE 1	**NOTE 2**
150	3.71
125	3.40
110	3.15
110	3.00
60	2.23
30	1.34

NOTES:
1. PRESSURE UPSTREAM OF STEAM TRAPS ON HPR AND MPR LINES.
2. LENGTH x DIAMETER AT CENTER OF TANK PER 1,000 LBS/HR OF CONDENSATE. TANK AT ATMOSPHERIC PRESSURE.



5 FLASH TANK
SCALE: NONE

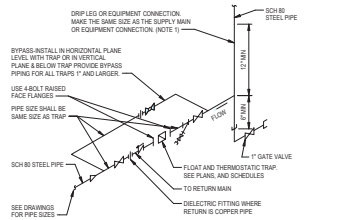


NOTE:
1. CPVC PIPE MAY BE USED ONLY IF APPROVED BY LOCAL VA AND IS INDOORS AND DOES NOT PASS THROUGH RATED BARRIERS.
2. DIELECTRIC FITTING TO BE USED WHEN TWO DISSIMILAR METALS ARE TO BE CONNECTED.

UNIT TYPE	"A"*	"B"*
DRAW THRU	2" + "X"	"S"
BLOW THRU	1" (MIN)	"S"

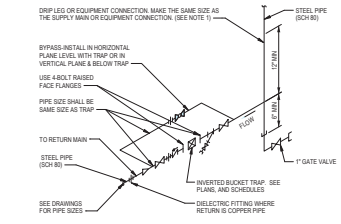
** WHERE "X" = STATIC PRESSURE IN FAN*

12 AIR HANDLING UNIT DRAIN TRAP DETAIL
SCALE: NONE



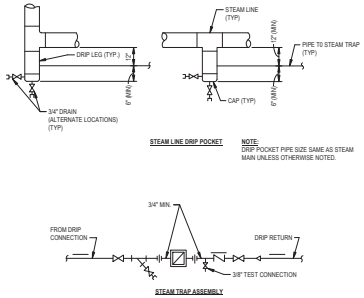
NOTE:
ALL DRIP POINTS ON STEAM MAINS SHALL BE PROVIDED WITH A 12" MINIMUM HIGH DRIP LEG FROM BOTTOM OF STEAM MAIN TO TRAP INLET. DRIP LEG SHALL HAVE 6" SCALE POCKET BELOW TRAP INLET.

11 FLOAT AND THERMOSTATIC STEAM TRAP ASSEMBLY
SCALE: NONE



NOTES:
1. ALL DRIP POINTS ON STEAM MAINS SHALL BE PROVIDED WITH A 12" MINIMUM HIGH DRIP LEG FROM BOTTOM OF STEAM MAIN TO TRAP INLET. DRIP LEG SHALL HAVE 6" SCALE POCKET BELOW TRAP INLET.
2. PROVIDE BYPASS PIPING.

10 INVERTED BUCKET STEAM TRAP ASSEMBLY
SCALE: NONE



9 STEAM TRAP ASSEMBLY AND STEAM LINE DRIP POCKET
SCALE: NONE

Revisions:	Date:
100% CONSTRUCTION DOCUMENTS	10/07/2025
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65% DESIGN DEVELOPMENT	11/21/2024

CONSULTANT
A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com
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O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
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Office of Construction and Facilities Management
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Drawing Title: MECHANICAL DETAILS	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Drawing Number: M501
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	

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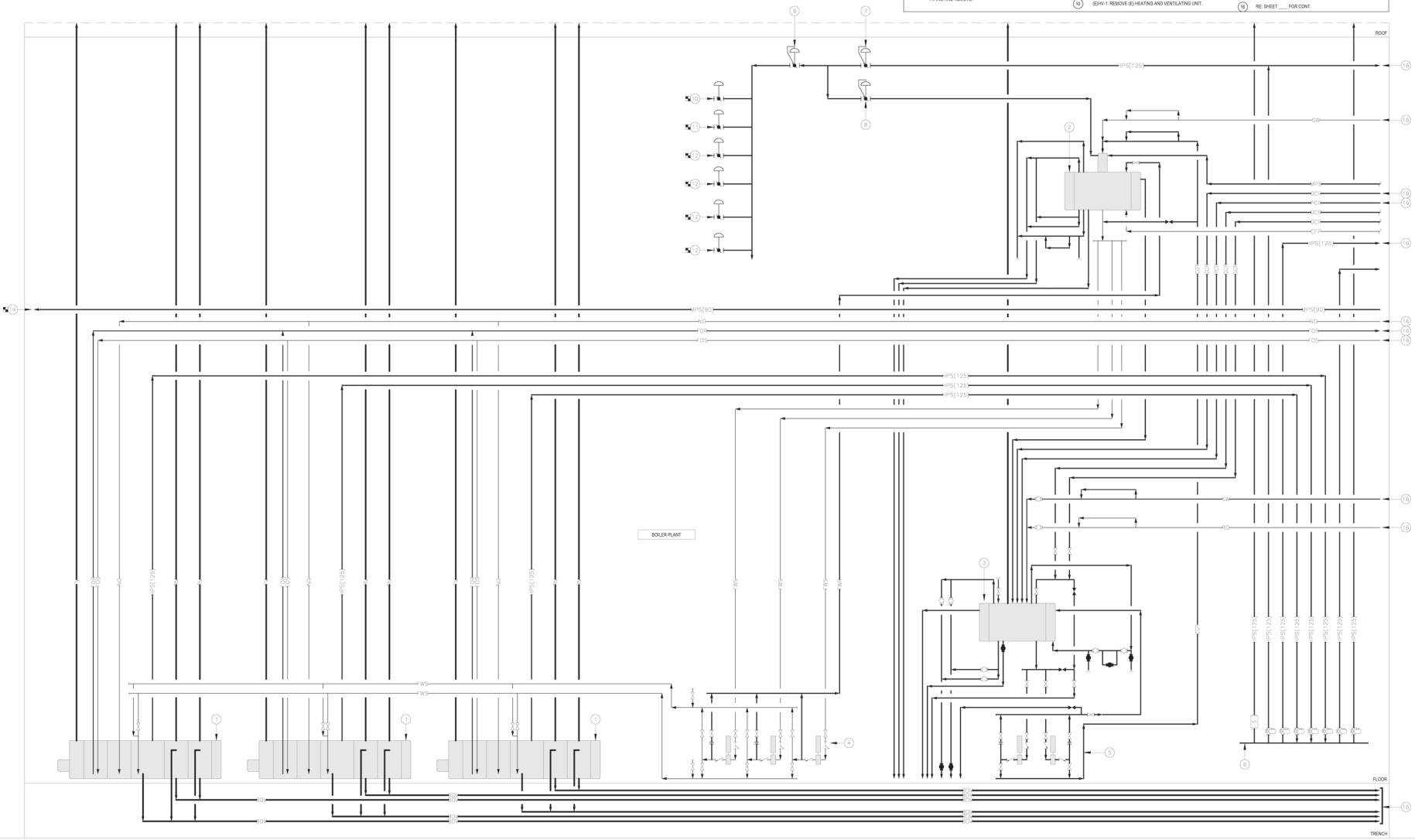
KEYNOTES [1-30] (SHEET M601)

1. (E) B-1,2,3: REMOVE (E) FIRE TUBE BOILER.
2. (E)DAT-1: REMOVE (E) DEARATOR TANK.
3. (E)CDT-1: REMOVE (E) CONDENSATE RETURN TANK.
4. (E)FWP-1,2,3: REMOVE (E) FEEDWATER PUMPS.
5. (E)CDP-1,2,3: REMOVE (E) CONDENSATE PUMPS.
6. (E) BOILER PLANT MAIN STEAM HEADER. DISCONNECT PIPING AND REMOVE.
7. (E)PRV-16: REMOVE (E) STEAM PRESSURE REDUCING VALVE ASSEMBLY. (130PSI / 40PSI INLET/OUTLET, 2600 LB/HR (2700 LB/HR MAX), 1"Ø BYPASS.
8. (E)PRV-17: REMOVE (E) STEAM PRESSURE REDUCING VALVE ASSEMBLY. (40PSI / 5 PSI INLET/OUTLET, 1450 LB/HR (1450 LB/HR MAX), [illegible]"Ø BYPASS)
9. (E)PRV-20: REMOVE (E) STEAM PRESSURE REDUCING VALVE ASSEMBLY. (40PSI/5PSI INLET/OUTLET, 1150 LB/HR MAX), [illegible]"Ø BYPASS.
10. (E)HV-1: REMOVE (E) HEATING AND VENTILATING UNIT.
11. (E)FCU-1: REMOVE (E) FAN COIL UNIT.
12. (E)UH-1: REMOVE (E) UNIT HEATER.
13. (E) DHWG-1: (E) DOMESTIC HOT WATER GENERATOR TO REMAIN.
14. (E) 2"Ø, 90PSI STEAM TO BLDG3 TO REMAIN.
15. (E) ___ Ø, 5 PSI STEAM TO (E) WATER TREATMENT ROOM, CHILLER PLANT, AND PUMP ROOM TO REMAIN.
16. RE: SHEET ____ FOR CONT.



Revisions:	Date:
100% CONSTRUCTION DOCUMENTS	10/07/2025
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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jon A. Lalotto, Jr.
91464
LICENSED
PROFESSIONAL ENGINEER

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Drawing Title: FLOW DIAGRAM	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Building Number: 2
		Issue Date: 10/07/2025 / Checked: LRL / Drawn: DMB	Drawing Number: M600

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KEYNOTES [31-60] (SHEET M602)

31 (E) BDT-1,2: REMOVE (E) BLOWDOWN TANK.

32 (E) ST-1: (E) RO WATER STORAGE TANK TO REMAIN.

33 RO WATER FILTERATION TO REMAIN (CULLIGAN)(E)

34 (E)F-2: WATER FILTRATION TO REMAIN.

35 (E)F-3: WATER FILTRATION TO REMAIN.

36 (E) WATER FILTRATION TO REMAIN (CHARCOAL)

37 (E) F-4: WATER FILTRATION TO REMAIN.

38 (E) WATER STORAGE TANKS TO REMAIN.

39 (E) F-5: WATER FILTRATION TO REMAIN.

40 (E) FDP-1,2: (E) FUEL OIL PUMPS TO REMAIN.

41 (E) NATURAL GAS SAFETY SHUT-OFF VALVE TO REMAIN.

42 SEE SHEET ____ FOR CONT.

43 SEE SHEET ____ FOR CONT.

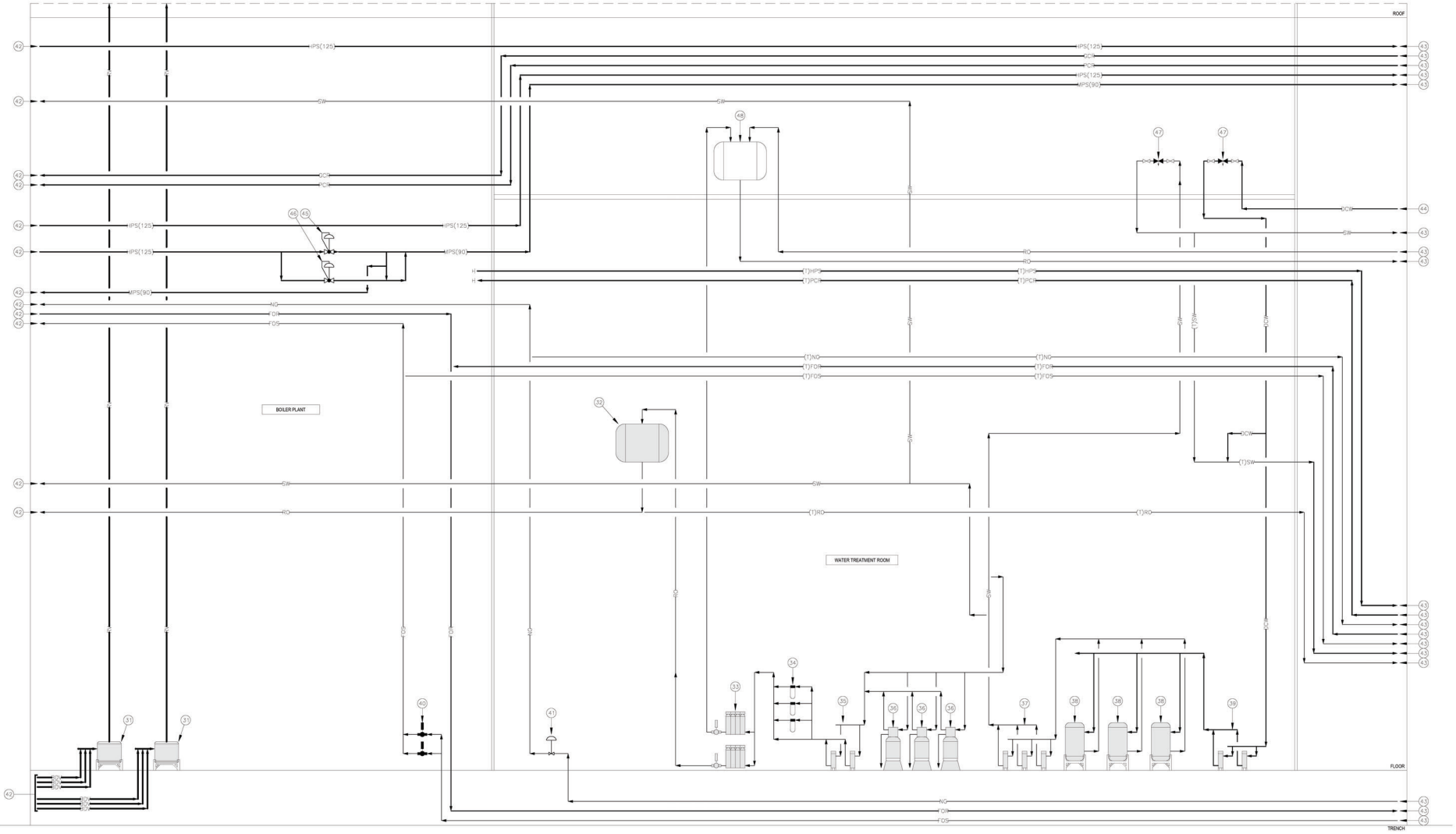
44 (E) DCW BRANCH MAIN TO WATER TREATMENT ROOM.

45 (E) PRV-18: REMOVE (E) STEAM PRESSURE REDUCING VLAVE ASSEMBLY. (130 PSI / 90 PSI INLET / OUTLET, 3500 LB/HR (4400 LB/HR MAX) WITH 1-1/4"Ø BYPASS).

46 (E) PRV-19: REMOVE (E) STEAM PRESSURE REDUCING VALVE ASSEMBLY. (130 PSI/90PSI INLET/OUTLET, 7500 LB/HR (9970 LB/HR MAX) WITH 1-1/2"Ø BYPASS)

47 (E) BFP ASSEMBLY TO REMAIN.

48 (E) RO TANK TO REMAIN.



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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jerry L. Ellerbe, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

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VA U.S. Department of Veterans Affairs

Drawing Title: FLOW DIAGRAM

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025

Checked: LRL

Drawn: DMB

Drawing Number: M601

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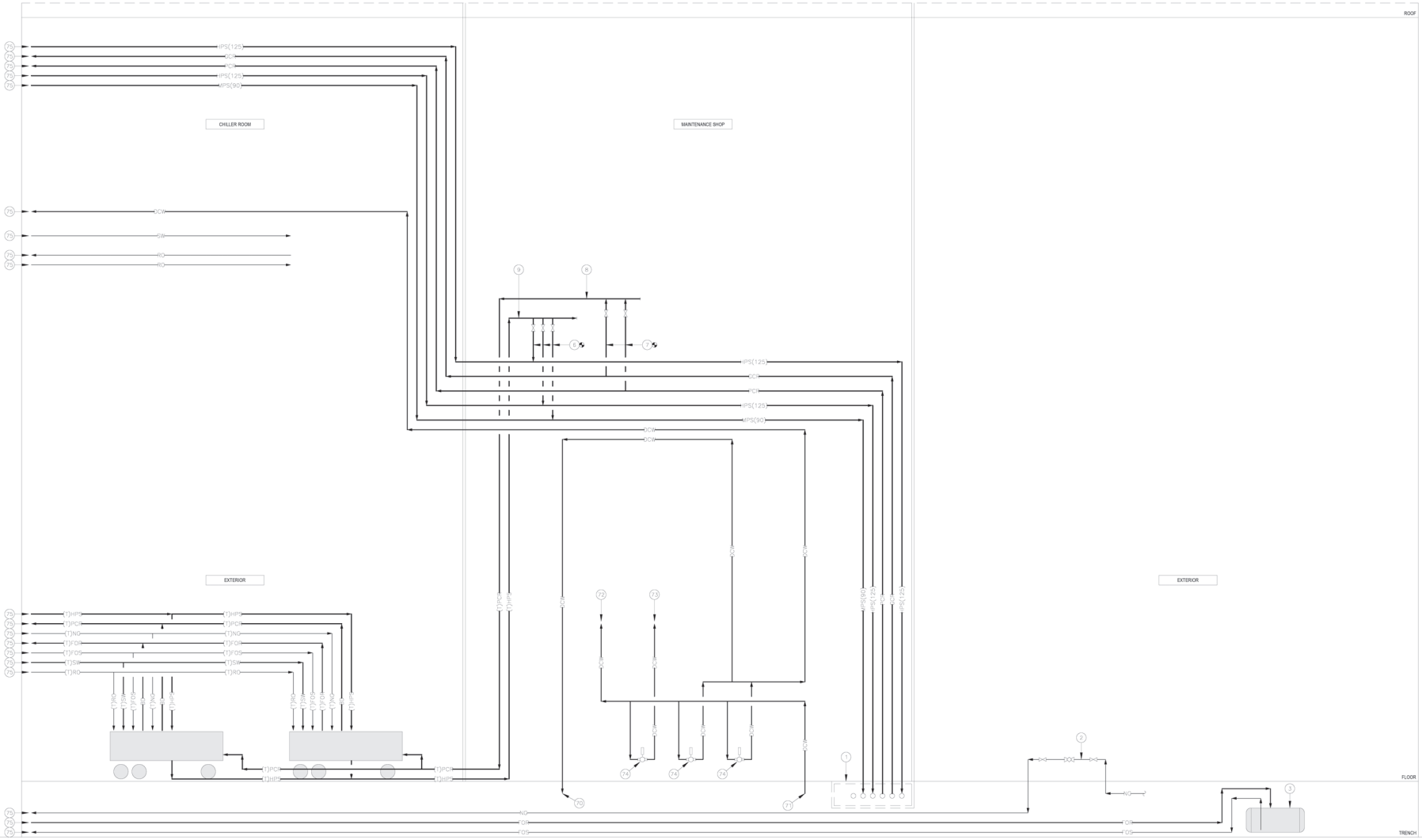
KEYNOTES [61-90] (SHEET M603)

61. (E) STEAM AND CONDENSATE RETURN PIPES TO (E) TUNNEL TO REMAIN.
62. (E) NATURAL GAS SERVICE ENTRANCE TO REMAIN.
63. (E) NO.2 FUEL OIL STORAGE TANK TO REMAIN.
64. TBP-1,2: PROVIDE NEW TEMPORARY BOILER PLANT UNITS.
65. CONNECT TEMP STEAM SUPPLY MAIN TO (E) STEAM PIPING AS INDICATED.
66. CONNECT TEMP STEAM SUPPLY MAIN TO (E) STEAM PIPING AS INDICATED.
67. CONNECT TEMP CONDENSATE RETURN TO (E) CONDENSATE RETURN AS INDICATED.
68. PROVIDE TEMP CONDENSATE RETURN HEADER.
69. PROVIDE TEMP STEAM SUPPLY HEADER.
70. DCW TO COOLING TOWER.
71. DCW FROM CITY UTILITY.
72. COOLING TOWER MAKE-UP WATER SUPPLY.
73. DCW TO IRRIGATION
74. (E) DOMESTIC WATER PUMPS TO REMAIN.
75. SEE SHEET ___ FOR CONT.



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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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Jon A. Palmetto, Jr.
91464
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Drawing Title: FLOW DIAGRAM	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Drawing Number: M602
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	

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STEAM PRESSURE REDUCING VALVE SCHEDULE

TAG	SYSTEM AND/OR SERVICE	SIZE	PRESSURE (PSIG) INLET	PRESSURE (PSIG) OUTLET	FLOW CAPACITY (lbs/hr) LOAD	FLOW CAPACITY (lbs/hr) FULL PORT	FLOW CAPACITY (lbs/hr) DIFFERENTIAL PRESSURE	FLOW COEFFICIENT (Cv)	PORT	CONNECTION TYPE	MODEL SERIES
PRV-16	PRV-17, PRV-20	3"	130	40	2,600	4,200	3,400	16.2	STANDARD	NPT	2100 SPS-60
PRV-17	DA TANK	3"	40	5	1,450	2,120	1,750	26.7	STANDARD	NPT	2100 SPS-30
PRV-18	MAIN HOSPITAL	3"	130	90	3,500	7,500	4,200	26.7	STANDARD	250# FLANGE	2300 SPS-175
PRV-19	MAIN HOSPITAL	3"	130	90	7,500	11,400	8,650	50.3	FULL	250# FLANGE	2300 SPS-175
PRV-20	BOILER ROOM HVAC EQUIPMENT	3"	40	5	1,150	1,250	1,250	20.2	FULL	NPT	2100 SPS-30

NOTES:
1. REGULATOR ASSEMBLY SHALL CONSIST OF MAIN VALVE AND SEPARATE SPRING PILOT.
2. REGULATOR SHALL BE PILOT ACTUATED, DIAPHRAGM OPERATED TYPE.
3. BASIS OF DESIGN: HOFFMAN SPECIALTIES OR EQUIVALENT

BLOWDOWN SEPERATOR SCHEDULE

TAG	MODEL	LOCATION (ROOM) NO.	LOCATION (ROOM) NAME	CAPACITY (GAL)	TANK SIZE LENGTH	TANK SIZE DIAMETER	HOLDING CAPACITY (ft³)	EMPTY WEIGHT (lb)	PIPE SIZES BLOWOFF INLET	PIPE SIZES DRAIN	PIPE SIZES COLD WATER INLET	PIPE SIZES OUTLET	PIPE SIZES VENT
BDT-1	BDT	139	BOILER PLANT	387	42"	52"	25.8	1,100	1 1/2"	2"	3"	5"	5"

NOTES:
1. PROVIDE FLANGED AUTOMATIC COOLER PIPING MATCHED TO DRAIN SIZE WITH THERMOMETER, PIPE CONNECTION FOR TEMP SENSOR, DCW CONNECTION.
2. PROVIDE 1-1/4" DCW AUTOMATIC AFTER COOLER CONTROL VALVE, STRAINER, MODULATING TEMP CONTROLLER, AND CHECK VALVE ASSEMBLY. SIZE BASED UPON 40 PSIG MIN WATER INLET PRESSURE.
3. PROVIDE WITH 12" NPT GAUGE GLASS CONNECTIONS.
4. PROVIDE WITH 12"X16" MANWAY ACCESS
5. BASIS OF DESIGN: SHIPCO BLOWDOWN TANK OR EQUIVALENT

LOUVER SCHEDULE

TAG	MODEL	DIMENSIONS TOTAL W x H x T in	FREE AREA (ft2)	AIRFLOW (CFM)	VELOCITY (FPM)
L1	BLS20/DD	60"x48"x5"	0.57	2,650	280
L2	BLS20/DD	60"x48"x5"	0.57	2,650	280
L3	BLS20/DD	60"x48"x5"	0.57	2,650	280
L4	BLS20/DD	60"x48"x5"	0.57	2,650	280

NOTES:
1. PROVIDE BLAST RESISTANT STATIONARY LOUVER WITH WEATHER AND INSECT PROTECTION.
2. THE WIDTH OF THE LOUVER MUST NOT EXCEED 4 FEET.
3. DRAINABLE LOUVER.
4. MINIMUM 50% FREE AREA.
5. BASIS OF DESIGN: RUSKIN OR EQUIVALENT

STEAM TRAP SCHEDULE

TAG	MODEL	TYPE	SERVES	LOCATION	PRESSURE (psig) INLET	PRESSURE (psig) DIFFERENTIAL	INLET PIPE SIZE (in.)	CAPACITY(lb/hr)
ST-1	TD52	THERMODYNAMIC	PRV-16	BOILER ROOM	130	105.00	1/2"	300
ST-2	TD52	THERMODYNAMIC	PRV-16	BOILER ROOM	40	35.00	1/2"	300
ST-3	TD52	THERMODYNAMIC	PRV-17	BOILER ROOM	40	35.00	1/2"	200
ST-4	TD52	THERMODYNAMIC	PRV-17	BOILER ROOM	5	4.00	1/2"	200
ST-5	TD52	THERMODYNAMIC	PRV-18,PRV-19	BOILER ROOM	130	105.00	1/2"	1,100
ST-6	TD52	THERMODYNAMIC	PRV-18	BOILER ROOM	90	75.00	1/2"	400
ST-7	TD52	THERMODYNAMIC	PRV-19	BOILER ROOM	90	75.00	1/2"	750
ST-8	TD52	THERMODYNAMIC	PRV-20	BOILER ROOM	40	35.00	1/2"	150
ST-9	TD52	THERMODYNAMIC	PRV-20	BOILER ROOM	5	4.00	1/2"	150
ST-10	IBV-C-116-DN15	INVERTED BUCKET	STEAM HEAD	BOILER ROOM	146	116.00	1/2"	1,400
ST-11	IBV-C-116-DN15	INVERTED BUCKET	STEAM HEAD	BOILER ROOM	146	116.00	1/2"	1,400
ST-12	FT450	FLOAT & THERMOSTATIC	UH-1	BOILER ROOM	5	0.25	1"	100
ST-13	FT450	FLOAT & THERMOSTATIC	UH-2	BOILER ROOM	5	0.25	1"	100
ST-14	FT450	FLOAT & THERMOSTATIC	UH-3	BOILER ROOM	5	0.25	1"	100
ST-15	FT450	FLOAT & THERMOSTATIC	UH-4	BOILER ROOM	5	0.25	1"	100
ST-16	FT450	FLOAT & THERMOSTATIC	BCU-4	BOILER ROOM	5	0.25	1"	100

NOTES:
1. F&T TRAPS SHALL BE MECHANICAL BALL FLOAT TYPE HAVING STEEL BODIES, HORIZONTAL LINE CONNECTIONS, AND STAINLESS-STEEL VALVE HEADS, SEATS AND BALL FLOATS STAINLESS STEEL BALANCED PRESSURE THERMOSTATIC AIR VENT CAPABLE OF WITHSTANDING 45 F (25 °C) OF SUPERHEAT AND RESISTING WATERHAMMER WITHOUT SUSTAINING DAMAGE.
2. F&T TRAP ASSEMBLY SHALL INCLUDE PIPELINE STRAINER, FULL PORT ISOLATING VALVES, DRIP-LEG BEFORE THE TRAP. TRAP INSTALLED BELOW THE DRAINAGE POINT OF EQUIPMENT THAT ACCOMMODATES FLOAT ARM ACTION WITH THE FLOW DIRECTION AS INDICATED ON THE BODY. TRAP SHALL BE MAINTAINED WITHOUT DISTURBING THE PIPING CONNECTIONS.
3. IVB TRAP ASSEMBLY SHALL INCLUDE PIPELINE STRAINER, FULL PORT ISOLATING VALVES, DRIP-LEG BEFORE THE TRAP. TRAP INSTALLED BELOW THE DRAINAGE POINT IN A VERTICAL POSITION WITH TOP COVER, BOTTOM INLET CONNECTION THAT ACCOMMODATES BUCKET MECHANISM ACTION WITH THE FLOW DIRECTION AS INDICATED ON THE BODY. TRAP SHALL BE MAINTAINED WITHOUT DISTURBING THE PIPING CONNECTIONS. INSTALL REQUIRED DOWNSTREAM PIPE ACCESSORIES 42" DOWNSTREAM OF DEVICE.
4. THERMODYNAMIC TRAP SHALL BE STAINLESS STEEL THERMODYNAMIC DISC TYPE WITH CENTERLINE CONNECTIONS OPERABLE ALL POSITIONS, INTEGRAL SEAT DESIGN WITH HARDENED DISC AND SEATING SURFACES WITH INTEGRAL INSULATING CAP.
5. THERMODYNAMIC TRAP ASSEMBLY SHALL INCLUDE PIPELINE STRAINER, FULL PORT ISOLATING VALVES.
6. BASIS OF DESIGN: SPIRAX SARCO OR EQUIVALENT

AIR TERMINAL SCHEDULE

TAG	MODEL	DESCRIPTION	FINISH	MOUNTING	NC (MAX)	NOTES	SYSTEM AND/OR SERVICE
R1	PMR	24X24 PERFORATED RETURN, 12" NECK	#26 WHITE	SURFACE	25		RETURN AIR
R2	350RL	14X14 LOUVERED STEEL GRILLE 12X12 NECK	#26 WHITE	WALL	25	1	RETURN AIR
R3	350RL-SS	36X16 LOUVERED STAINLESS STEEL GRILLE,36X14 NECK	#26 WHITE	DUCT	30	1,2	RETURN AIR
S1	TMS	24"x24 STEEL, HIGH PERFORMANCE THREE CONE,12" NECK	#26 WHITE	SURFACE	25		SUPPLY AIR
S2	300RS	14X14 LOUVERED STEEL GRILLE 12X12 NECK	#26 WHITE	WALL	25	1	SUPPLY AIR
S3	300RS-SS	36X16 LOUVERED STAINLESS STEEL GRILLE,36X14 NECK	#26 WHITE	DUCT	30	1,2	SUPPLY AIR
S4	300RS-SS	36X14 LOUVERED STAINLESS STEEL GRILLE,36X12 NECK	#26 WHITE	DUCT	30	1,2	SUPPLY AIR

NOTES:
1. PROVIDE OPPOSED BLADE DAMPER.
2. PROVIDE STAINLESS STEEL AIR TERMINALS.
3. BASIS OF DESIGN: TITUS OR EQUIVALENT

STEAM UNIT HEATER SCHEDULE

TAG	MODEL	LOCATION (ROOM) NO.	LOCATION (ROOM) NAME	AIRFLOW (CFM)	MIN. CAPACITY (BTUH)	STEAM PRESSURE ENTERING HEATER (PSIG)	STEAM CONDENSATE(lb/hr)	ELECTRICAL DATA MOTOR HP	ELECTRICAL DATA V/Ph/Hz
UH-1	HC 4TL	139	BOILER PLANT	855	32,000.0	5.00	33	0.1	115/1/60
UH-2	HC 4TL	139	BOILER PLANT	855	32,000.0	5.00	33	0.1	115/1/60
UH-3	HC 4TL	139	BOILER PLANT	855	32,000.0	5.00	33	0.1	115/1/60
UH-4	HC 4TL	139	BOILER PLANT	855	32,000.0	5.00	33	0.1	115/1/60

NOTES:
1. PROVIDE PIPE HANG KIT.
2. PROVIDE THERMOSTAT AND ON/OFF MANUAL SWITCH.
3. PROVIDE STEAM TRAPS FOR THE STEAM COIL PIPING.
4. PROVIDE UNIT WITH BACnet ABILITY TO INTERFACE WITH BMS.
5. BASIS OF DESIGN: MODINE OR EQUIVALENT

HVAC FANS SCHEDULE

TAG	MODEL	LOCATION	SYSTEM AND/OR SERVICE	AIRFLOW (CFM)	ESP ("WG)	FAN TYPE	FAN MIN. EFFICIENCY (%)	FAN DRIVE	FAN MAX. RPM	MOTOR ELECTRICAL BHP	MOTOR ELECTRICAL HP	MOTOR ELECTRICAL V/Ph/Hz	WEIGHT (lb)
EF-1	ACRU-B210	ROOF	BOILER RM	2,650	0.50	UPBLAST CENTRIFUGAL	60	BELT	1,725	0.4	1	460/3/60	145
EF-2	ACRU-B210	ROOF	BOILER RM	2,650	0.50	UPBLAST CENTRIFUGAL	60	BELT	1,725	0.4	1	460/3/60	145
EF-3	ACRU-B210	ROOF	BOILER RM	2,650	0.50	UPBLAST CENTRIFUGAL	60	BELT	1,725	0.4	1	460/3/60	145
EF-4	ACRU-B210	ROOF	BOILER RM	2,650	0.50	UPBLAST CENTRIFUGAL	60	BELT	1,725	0.4	1	460/3/60	145

NOTES:
1. CONTROLLED VIA BMS TO RUN DURING OCCUPIED HOURS AND INTERLOCK WITH AIR HANDLING UNITS.
2. FACTORY UNIT-MOUNTED DISCONNECT (FACTORY-WIRED).
3. FACTORY BACKDRAFT DAMPER.
4. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
5. PROVIDE WITH F-W VARIABLE SPEED CONTROLLER .
6. PROVIDE FACTORY MADE ROOF CURB.
7. FANS ARE CONTROLLED BY THERMOSTAT TO MAINTAIN BOILER ROOM TEMPERATURE UNDER 104F.
8. PROVIDE UNIT WITH BACnet ABILITY TO INTERFACE WITH BMS.
9. BASIS OF DESIGN: COOK OR EQUIVALENT

TWO PIPE AND FOUR-PIPE FAN COIL UNIT SCHEDULE

TAG	MANUFACTURER	MODEL	LOCATION (ROOM) NO.	LOCATION (ROOM) NAME	AIRFLOW (CFM)	ESP ("WG)	COOLING REQUIREMENTS CAPACITY (BTUH) SENSIBLE	CAPACITY (BTUH) TOTAL	TEMPERATURE (°F) AIR EAT DR	EAT WB	LAT DB	LAT WB	WATER EWT	WATER LWT	FLOW (GPM)	FACE VELOCITY (FPM)	PRESSURE DROP (ft H2O)	RUNOUT SIZE (in.)	HEATING REQUIREMENTS MIN. CAPACITY (MBTUH)	COIL AIR PRESSURE DROP ("WG)	TEMPERATURE (°F) AIR EAT	LAT	STEAM PRESSURE (psig)	MOTOR HP	FAN DATA V	Ph	Hz	AMPS (A) FLA	MCA	MOCP	SPEED CONTROL	FILTER (MERV)	NOTES
BCU-1	MAGIC AIRE	HCA40	139	BOILER PLANT	0	0.60	96,000.0	137,000.0	85	71	63	61	45	58	21	450	5.90	1 3/8"	0.0	0.00	0	0	0	3	460	3	60	4	4	15	VFD	13	1-6,8,9
BCU-2	MAGIC AIRE	HCA40	139	BOILER PLANT	0	0.60	96,000.0	137,000.0	85	71	63	61	45	58	21	450	5.90	1 3/8"	0.0	0.00	0	0	0	3	460	3	60	4	4	15	VFD	13	1-6,8,9
BCU-3	MAGIC AIRE	HCA40	139	BOILER PLANT	0	0.60	96,000.0	137,000.0	85	71	63	61	45	58	21	450	5.90	1 3/8"	0.0	0.00	0	0	0	3	460	3	60	4	4	15	VFD	13	1-6,8,9
BCU-4	MAGIC AIRE	HCA12	137	OPERATIONS OFFICE	0	0.75	26,400.0	41,500.0	85	71	63	61	45	56	8	450	6.70	1"	53.6	0.33	60	101	5	1	120	1	60	10	12	20	VFD	13	1-9

NOTES:
1. PROVIDE DRAIN PAN WITH WATER LEVEL DETECTOR, DETECTOR CONFORMING TO UL 508, SEND ALARM AND SHUT ON UNIT PRIOR TO OVERFLOW OF THE PAN.
2. PROVIDE CASING WITH DOUBLE WALL INSULATION.
3. PROVIDE FILTER SECTION.
4. PROVIDE NON-FUSE DISCONNECT SWITCH AND CONDENSATE OVERFLOW SWITCH.
5. PROVIDE VFD AND THERMOSTAT.
6. PROVIDE SUPPLY (TITUS 300FL OR EQUAL) AND RETURN (TITUS 350FL) GRILLES AT THE UNIT SUPPLY AND RETURN OPENINGS, SIZE MATCH WITH THE OPENINGS.
7. PROVIDE STEAM TRAPS FOR THE STEAM COIL PIPING.
8. PROVIDE UNIT WITH BACnet ABILITY TO INTERFACE WITH BMS.
9. BASIS OF DESIGN: MAGIC AIRE OR EQUIVALENT

BOILER PLANT · FIRE-TUBE STEAM BOILER SCHEDULE, PACKAGED TYPE, SHOP ASSEMBLED

TAG	LOCATION (ROOM) NO.	LOCATION (ROOM) NAME	TYPE	SYSTEM	MODEL	DESIGN PRESSURE (psi)	DESIGN RATING BHP	NOx EMISSIONS	FUEL 1	FUEL 2	STEAM CAPACITY (lb/hr)	HEATING SURFACE (ft²)	WEIGHT (lbs) SHIPPING	WEIGHT (lbs) WATER	OPERATING VOLUME (gal)	BLOWER MOTOR HP	V/Ph/Hz	AIR COMPRESSOR (HP)	NOTES
NEW BOILER																			
B-1	139	BOILER PLANT	FIRE-TUBE	STEAM	CBEX-2W	200	200	30	NATURAL GAS	NO. 2 OIL	6,900	750	14,210	9,060	1,086	20	460/3/60	3	RE: NOTES
B-2	139	BOILER PLANT	FIRE-TUBE	STEAM	CBEX-2W	200	200	30	NATURAL GAS	NO. 2 OIL	6,900	750	14,210	9,060	1,086	20	460/3/60	3	RE: NOTES
B-3	139	BOILER PLANT	FIRE-TUBE	STEAM	CBEX-2W	200	200	30	NATURAL GAS	NO. 2 OIL	6,900	750	14,210	9,060	1,086	20	460/3/60	3	RE: NOTES
TEMPORARY BOILER																			
T-B-1			FIRE-TUBE	STEAM	200HP,690LB/HR	200	200	30	NATURAL GAS	NO. 2 OIL	6,900	750	14,210	9,060	1,086	20	460/3/60	3	RE: NOTES, TRAILER-MOUNTED
T-B-2			FIRE-TUBE	STEAM	200HP,690LB/HR	200	200	30	NATURAL GAS	NO. 2 OIL	6,900	750	14,210	9,060	1,086	20	460/3/60	3	RE: NOTES, TRAILER-MOUNTED

NOTES:
1. HORIZONTAL, PACKAGED, FACTORY FABRICATED AND ASSEMBLED FIRE-TUBE BOILER WITH TRIM, ACCESSORIES AND CONTROLS FOR GENERATING STEAM
2. GAS-FIRED BOILER EMISSIONS NOT TO EXCEED ALLOWABLE AMBIENT AIR QUALITY STANDARDS IN GOVERNING JURISDICTION AND INDICATED VALUES.
   A. CARBON MONOXIDE: 50 PARTS PER MILLION AT ANY POINT FROM 100 PERCENT TO 50 PERCENT FIRING RATE; 100 PARTS PER MILLION AT ANY POINT BELOW 50 PERCENT FIRING RATE.
   B. NITROGEN COMPOUNDS: 30 PARTS PER MILLION (DRY VOLUME BASIS AND CORRECTED TO 3 PERCENT OXYGEN) AT ANY POINT FROM 100 PERCENT TO LOW FIRE.
   C. HYDROCARBON AND VOLATILE ORGANIC COMPOUNDS: 20 PARTS PER MILLION (DRY VOLUME BASIS AND CORRECTED TO 3 PERCENT OXYGEN) AT ANY POINT FROM 100 PERCENT TO LOW FIRE.
   D. PARTICULATE MATTER: 0.01 LB/MMBTU.
3. MULTIPLE BOILER OPERATION: EQUIP INDIVIDUAL BOILERS IN MULTIPLE BOILER APPLICATIONS WITH INTEGRAL CONTROLS AND A SINGLE STAND-ALONE MASTER CONTROL PANEL TO CONTROL EACH BOILER. CONFIGURE CONTROLS SO ANY BOILER CAN BE TAKEN OUT OF SERVICE WITH POWER DISCONNECTED AND NOT IMPACT MULTIPLE BOILER OPERATION.
4. STEAM BOILER CONNECTIONS:
   A. CONNECTIONS FOR STEAM SUPPLY, FEEDWATER, LEVEL CONTROLS, AND CHEMICAL TREATMENT
   B. BOTTOM AND SURFACE BLOWDOWN CONNECTIONS
   C. CONNECTIONS FOR SAFETY RELIEF VALVE(S), DRAIN, AND EXHAUST STACKSTEAM OUTLET – 4"
   D. CONNECTION SIZES: FEEDWATER –1-1/2", BLOWDOWN– 1-1/4", STACK –16", VENT –2-1/2", SAFETY VALVE IN – 1-1/4" / OUT – 1-1/2"
   E. T-B-1,2 CONNECTION SIZES: STEAM OUTLETS – 4", 2", CONDENSATE RETURN – 1" INLET, 2" OUTLET, DRAIN –1", OVERFLOW –2" NPT, BLOWDOWN SEPARATOR – 3", FUEL FILL – 2", FUEL DRAIN –1/2"
5. FUEL:
   A. NATURAL GAS AND NO. 2 FUEL OIL DUEL FUEL BURNER WITH INTEGRAL LOW NOX SYSTEM LISTED AND APPROVED FOR THE APPLICATION INCLUDING FGR (FLUE GAS RECIRCULATION) SHUTOFF VALVE ASSEMBLY, FGR METERING VALVE, PANEL, ETC.
   B. GAS PILOT, ELECTRIC IGNITION
   C. NFPA 85 COMPLIANT GAS / FUEL OIL PIPE TRAINS TO BE PROVIDED AND CONFIGURED PER VHA BOILER AND ASSOCIATED PLANT SAFETY DEVICE TESTING MANUAL. RE: MECHANICAL DRAWINGS. RE: MECHANICAL SPECIFICATIONS.
   D. PROVIDE OEM LOW PRESSURE AIR ATOMIZING AIR COMPRESSOR SYSTEM INCLUDING CONTROLS AND ACCESSORIES FACTORY MOUNTED OR SHIPPED LOOSE FOR FIELD MOUNTING AS REQUIRED.
6. BLOWER
   A. PROVIDE FORCED DRAFT BLOWER WITH VARIABLE SPEED DRIVE CONTROLLED THROUGH BOILER'S INTEGRAL CONTROLS IN PER SEQUENCE OF OPERATION AND INTEGRATED FUEL SAFEGUARD BURNER MANAGEMENT SYSTEM.
7. STEAM BOILER TRIM
   A. SAFETY RELIEF VALVE. SIZE AND CAPACITY: AS REQUIRED FOR EQUIPMENT ACCORDING TO THE MOST RECENT EDITION OF THE ASME BOILER AND PRESSURE VESSEL CODE. RE: MECHANICAL DRAWINGS.
   B. PRESSURE GAGE, WATER COLUMN, BOTTOM BLOWDOWN VALVES, TDS ELECTRICALLY OPERATED SURFACE BLOWDOWN VALVES, PROVIDE STOP VALVES, PROVIDE STOP-CHECK VALVES, MODULATING FEEDWATER CONTROL VALVES, CHEMICAL TREATMENT INJECTION QUILL
8. INTEGRATED BOILER-CONTROL SYSTEM SHALL INCLUDE CONTROL OF BURNER MANAGEMENT FOR FLAME SAFETY, BOILER MODULATION, AND OPERATOR INTERFACE FUNCTIONS WITH FEATURES AND FUNCTIONS AS REQUIRED FOR PRESSURE CONTROL, WATER-LEVEL CONTROL, BOILER EMERGENCY SHUTDOWN, CHEMICAL FEED SYSTEM INTERFACE, BURNER SAFETY CONTROLS FOR STEAM BOILERS, BURNER FLAME SAFEGUARD CONTROLS, COMBUSTION-AIR CONTROLS, OXYGEN TRIM SYSTEM, SURFACE BLOWDOWN CONTROL, DRAFT CONTROL, PARALLEL POSITIONING FOR INDEPENDENT FUEL AND AIR CONTROL FOR ENHANCED FUEL EFFICIENCY, DDC SYSTEM INTERFACE, CONTROL ENCLOSURE(S).
   A. SEPARATE FLAME SAFEFUARD SHALL PROVIDE AUTOMATIC SEQUENCING THROUGH STANDBY, PREPURGE, PILOT FLAME ESTABLISHING PERIOD, MAIN FLAME ESTABLISHING PERIOD, RUN, FLAME PROVING / LOCKOUT, POSTPURGE.
9. RE: MECHANICAL DRAWINGS AND SPECIFICATIONS FOR BOILER CONTROLS, BURNER MANAGEMENT SYSTEM REQUIREMENTS. SINGLE POINT POWER CONNECTION. NOTE: 3 PHASE POWER SHALL NOT BE WIRED THROUGH CONTROL ENCLOSURE.
10. BASIS OF DESIGN: CLEAVERBROOKS OR EQUIVALENT

B-1
B-2
B-3

FIRE-TUBE STEAM BOILER

PACKAGED TYPE, SHOP ASSEMBLED
MAXIMUM CONTINUOUS CAPACITY REQUIRED: **6,900** LBS/HR STEAM AT OPERATING PRESSURE
BOILER HORSEPOWER: **200**
OPERATING PRESSURE: **80-125** PSIG MAXIMUM AT HIGH FIRE
STEAM QUALITY: **99%** MINIMUM
DESIGN PRESSURE: **200** PSIG MINIMUM
FEEDWATER TEMPERATURE: **220°F,** MINIMUM, **228°F** NORMAL
HEATING SURFACE: **1,000** SQ FT MINIMUM
FUEL: **NATURAL GAS, NO. 2 FUEL OIL**
MINIMUM CONTINUOUS FIRING RATE: **690** LB/HR STEAM OUTPUT
SAFETY VALVE SETTINGS: **145** PSIG FIRST VALVE, 5 PSIG BETWEEN VALVES
HIGH PRESSURE CUTOUT SETTINGS: **140 PSIG FIRST CUT OUT, 145 PSIG SECOND CUTOUT**
FORCED DRAFT FAN MOTOR: **20HP, 480V/3PH/60HZ**
CONTROL PANEL MINIMUM CIRCUIT AMP RATING: **22.000 AMPS**
FUEL TRAIN / AIR ATOMIZATION CUTOUT, OPERATING PRESSURES:
NATURAL GAS SUPPLY PRESSURE: **5 PSIG**
NO. 2 FUEL: FUEL OIL LOW CUTOUT **32 PSIG** HIGH CUTOUT **44 PSIG** , NORMAL OPERATING PRESSURE
STEAM NOZZLE FORCES AND MOMENTS, SEE DRAWING NO.: **M-**
ALTITUDE: **1,000 FT** ABOVE SEE LEVEL

CONDENSATE STORAGE TANK SCHEDULE

TAG	VOLUME (GAL) NET	VOLUME (GAL) DISH HEAD	VOLUME (GAL) 2:1 DISH HEAD	SIZE (in.) DIAMETER	SIZE (in.) LENGTH	SIZE (in.) INLET	SIZE (in.) OVERFLOW	SIZE (in.) VENT	SIZE (in.) DRAIN	NOTES
CST-1	800	1,016	1,060	48"	120"	6"	3"	6"	1 1/2"	1-10
CST-2	200	296	317	36"	60"	6"	2 1/2"	4"	1"	1-10

NOTES:
1. PACKAGE INCLUDES TANK, DUPLEX WATER PUMPS, ELECTRIC PUMP CONTROLLER, TANK CONTROLS, TANK SUPPORT STAND, PUMP BASE MOUNTS
2. PROVIDE ELEVATED HORIZONTAL, WELDED STEEL TANK. CONFIRM MANUF RECOMMENDED HEIGHT PER PUMP NPSH REQUIREMENTS.
3. TANK NET STORAGE CAPACITY / VOLUME TO OVERFLOW LINE
4. PROVIDE WITH CAST IRON BASKET INLET STRAINER WITH BRONZE SCREEN FOR RECEIVER INLET(S), PUMP CONTROLLER, HI / LOW LEVEL WATER CONTROLS, MAGNETIC FLOAT-FLAG TYPE WATER LEVEL GAUGE WITH AUTO SHUTOFF, MAGNESIUM ANODE, THERMOMETER, PUMP PRESSURE GAUGRES, ISOLATION VALVES.
5. FLANGE MOUNTED PUMPS
6. MECHANICAL SEAL RATED FOR 250 DEG F
7. CONTROL PANEL WITH NUMBERED TERMINAL STRIP(S), REMOVABLE CONTROL MOUNTING BASE, HINGED DOOR WITH THE FOLLOWING PER PUMP:
   A. COMBINATION MAGNETIC STARTERS WITH CIRCUIT BREAKERS, COVER INTERLOCK, LOCK-OUT / TAG-OUT CONFIGURATION
   B. HAND, AUTOMATIC, OFF SWITCHES
   C. MOMENTARY CONTACT TEST PUSH BUTTONS
   D. PILOT RUN LIGHTS
   E. INDEPENDENT PUMP CONTROL CIRCUIT
8. COORDINATE NUMBER AND LOCATION OF REQUIRED CONNECTIONS WITH MECHANICAL DRAWINGS.
9. SINGLE POINT POWER CONNECTION
10. BASIS OF DESIGN: SHIPCO PUMPS OR EQUIVALENT

CONDENSATE STORAGE TANK PUMP SCHEDULE

TAG	LOCATION (ROOM): NO.	LOCATION (ROOM): NAME	SYSTEM EQUIPMENT	DESCRIPTION	TEMPERATURE (°F)	TYPE	MODEL	FLOW (gpm)	HEAD (ft)	NPSH (ft)	MOTOR DATA HP	MOTOR DATA RPM	MOTOR DATA V/Ph/Hz
CDTP-1-1	139	BOILER PLANT	STEAM CONDENSATE RETURN STORAGE	PUMPED CONDENSATE	200	CENTRIFUGAL 2 STAGE LOW NPSH	P-SERIES	60	20	8	1	3,500	460/3/60
CDTP-1-2	139	BOILER PLANT	STEAM CONDENSATE RETURN STORAGE	PUMPED CONDENSATE	200	CENTRIFUGAL 2 STAGE LOW NPSH	P-SERIES	60	20	8	1	3,500	460/3/60
CDTP2-1	139	BOILER PLANT	STEAM CONDENSATE RETURN STORAGE	PUMPED CONDENSATE	200	CENTRIFUGAL 2 STAGE LOW NPSH	P-SERIES	5	15	4	3/4	3,500	480/3/60
CDTP2-2	139	BOILER PLANT	STEAM CONDENSATE RETURN STORAGE	PUMPED CONDENSATE	200	CENTRIFUGAL 2 STAGE LOW NPSH	P-SERIES	5	15	4	3/4	3,500	480/3/60

FEEDWATER PUMP SCHEDULE (DEAERATOR TANK PACKAGE)

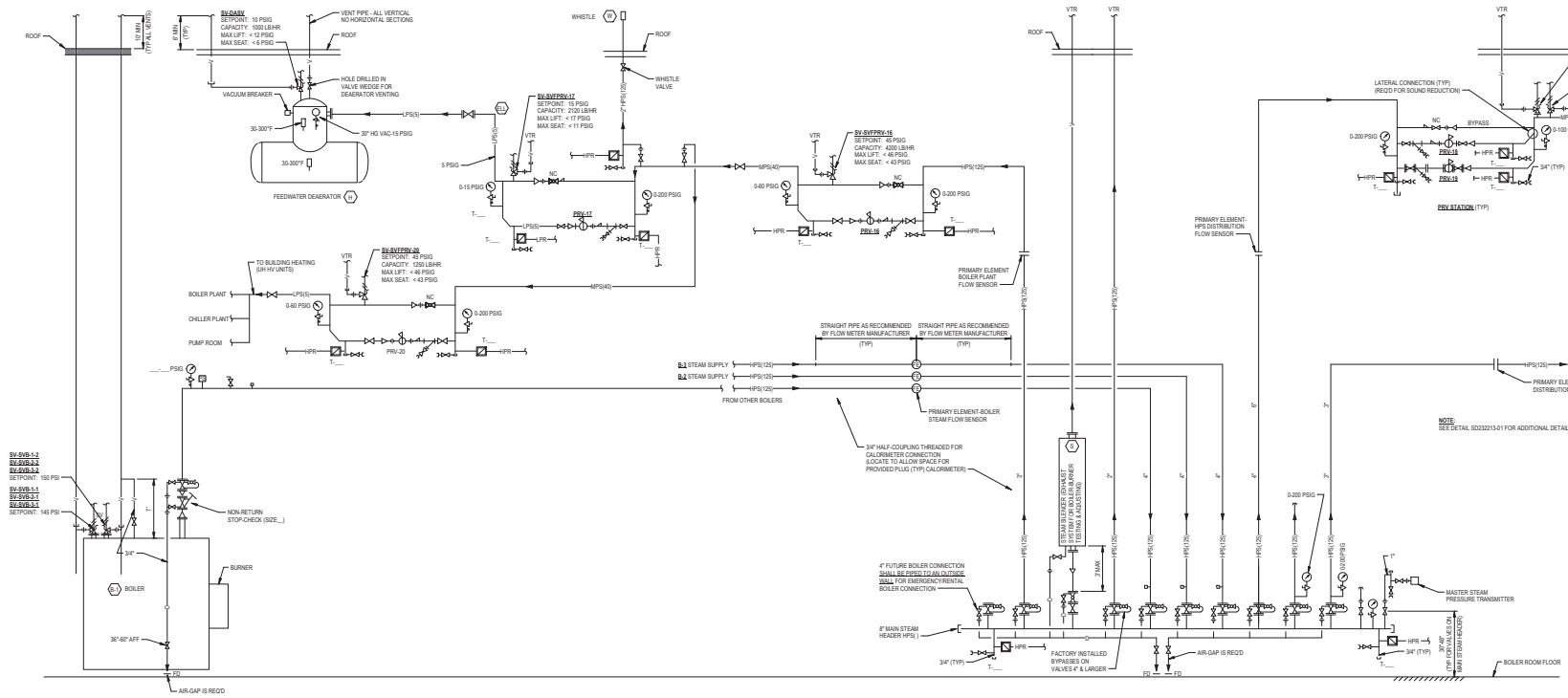
TAG	LOCATION (ROOM) BUILDING	LOCATION (ROOM) NO.	LOCATION (ROOM) NAME	SYSTEM EQUIPMENT	DESCRIPTION	MODEL	TEMPERATURE (°F)	TYPE	CIRCULATING FLUID DESCRIPTION	CIRCULATING FLUID FLOW (GPM)	CIRCULATING FLUID HEAD (ft)	CIRCULATING FLUID NPSH AVAILABLE (ft)	CIRCULATING FLUID TEMPERATURE (°F)	FAN DATA HP	FAN DATA RPM	FAN DATA V/Ph/Hz
FWP-1	BLDG 2	139	BOILER PLANT	DA TANK PACKAGE	BOILER FWS	CR 10-12 K	225	CENTRIFUGAL VERTICAL MULTI-STAGE	TANK PACKAGE BUILT IN PUMP	40	460	10	212	10.0	3,500	460/3/60
FWP-2	BLDG 2	139	BOILER PLANT	DA TANK PACKAGE	BOILER FWS	CR 10-12 K	225	CENTRIFUGAL VERTICAL MULTI-STAGE	TANK PACKAGE BUILT IN PUMP	40	460	10	212	10.0	3,500	460/3/60
FWP-3	BLDG 2	139	BOILER PLANT	DA TANK PACKAGE	BOILER FWS	CR 10-12 K	225	CENTRIFUGAL VERTICAL MULTI-STAGE	TANK PACKAGE BUILT IN PUMP	40	460	10	212	10.0	3,500	460/3/60
FWP-3	BLDG 2	139	BOILER PLANT	DA TANK PACKAGE	BOILER FWS	CR 10-12 K	225	CENTRIFUGAL VERTICAL MULTI-STAGE	TANK PACKAGE BUILT IN PUMP	40	460	10	212	10.0	3,500	460/3/60

NOTES:
1. PROVIDE VARIABLE SPEED CONTROLLER FOR EACH PUMP
2. PROVIDE WITH BYPASS ORIFICES
3. 12 IMPELLAR, 12 STAGES, 3.66 IN DIA CONFIGURATION
4. 2" PUMP FLANGED SUCTION / DISCHARGE CONNECTIONS
5. TEFC PUMP MOTORS, 90% FULL LOAD MOTOR EFFICIENCY
6. PROVIDED WITH DEAERATOR TANK PACKAGE
7. BASIS OF DESIGN: GRUNDFOS OR EQUIVALENT

DEAERATOR TANK PACKAGE SCHEDULE

TAG	TYPE	MODEL	RATED CAPACITY (lb/hr)	FWS SETPOINT TEMPERATURE (°F)	STEAM PRESSURIRE (psig)	REMOVAL LIMIT OXYGEN (cc/liter)	REMOVAL LIMIT CARBON DIOXIDE MEASURABLE LEVEL	STORAGE CAPACITY (GAL) MIN	STORAGE CAPACITY (GAL) MAX	ASME PRESSURE VESSEL CONSTRUCTION DESIGN PRESSURE
DAT-1	HORIZONTAL SPRAY TYPE	OM-150-30-10-4	30,000.0	225	5	0.005	0	20	1,600	50

NOTES:
1. TANK STAND WITH PUMP MOUNT BASES, FEEDWATER PUMPS. RE: FEEDWATER PUMP SCHEDULE.
2. 150# FLANGED CONNECTIONS: 8" STEAM INLET, 6" WATER OUTLET, 3" MED TEMP CONDENSATE RETURN
3. 3000# NPT CONNECTIONS: 3" INLET WATERFLOW TEMP CONDENSATE RETURN, 1.5" HIGH TEMP CONDENSATE RETURN
4. 3000# NPT SPARE COUPLINGS: 1", 1.25", 1.5", 3"
5. MISC. CONNECTIONS: 2" TANK DRAIN, 1.5" VENT VALVE, 1.5" VENT VALVE/VACUUM BREAKER, 3" TANK OVERFLOW, (



1 STANDARD STEAM BOILER PLANT PIPING DETAIL

SCALE: NONE

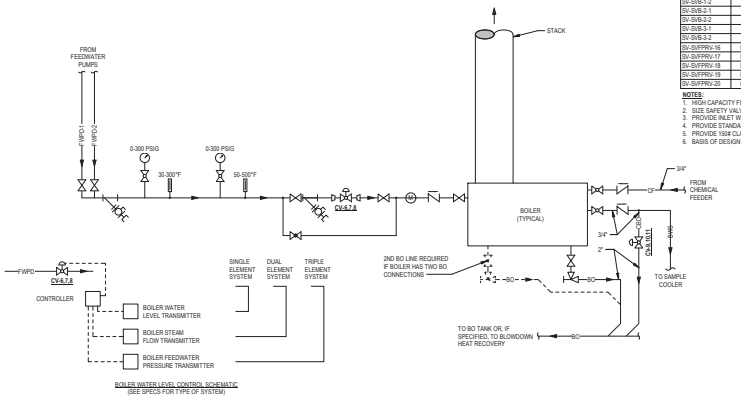
STEAM SAFETY VALVE SCHEDULE

TAG	SERVICE	INLET		OUTLET		MODEL	STEAM (lb/hr)		AREA (in²)		ORIFICE	TEMPERATURE (°F)		PRESSURE (psi)	
		SIZE	CONNECTION	SIZE	CONNECTION		FLOW	MAX FLOW	CALCULATED	DESIGN		OPERATING	RATING	OPERATING	SET
SV-SVB-1-1	B-1	1-1/2"	FLANGED 300#	2-1/2"	FLANGED 150#	1.5J2.5HSL-36-C-02	6,900	9,736	0.940	1.327	J	365	750	125	145
SV-SVB-1-2	B-1	1-1/2"	FLANGED 300#	2-1/2"	FLANGED 150#	1.5J2.5HSL-36-C-02	6,900	9,736	0.940	1.327	J	365	750	125	145
SV-SVB-2-1	B-2	1-1/2"	FLANGED 300#	2-1/2"	FLANGED 150#	1.5J2.5HSL-36-C-02	6,900	9,736	0.940	1.327	J	365	750	125	145
SV-SVB-2-2	B-2	1-1/2"	FLANGED 300#	2-1/2"	FLANGED 150#	1.5J2.5HSL-36-C-02	6,900	9,736	0.940	1.327	J	365	750	125	145
SV-SVB-3-1	B-3	1-1/2"	FLANGED 300#	2-1/2"	FLANGED 150#	1.5J2.5HSL-36-C-02	6,900	9,736	0.940	1.327	J	365	750	125	145
SV-SVB-3-2	B-3	1-1/2"	FLANGED 300#	2-1/2"	FLANGED 150#	1.5J2.5HSL-36-C-02	6,900	9,736	0.940	1.327	J	365	750	125	145
SV-SVFPRV-16	PRV-16	-	-	-	-	-	3,400	4,200	-	-	-	-	-	40	-
SV-SVFPRV-17	PRV-17	-	-	-	-	-	1,750	2,120	-	-	-	-	-	5	-
SV-SVFPRV-18	PRV-18	-	-	-	-	-	4,200	7,500	-	-	-	-	-	90	-
SV-SVFPRV-19	PRV-19	-	-	-	-	-	8,650	11,400	-	-	-	-	-	90	-
SV-SVFPRV-20	PRV-20	-	-	-	-	-	1,250	1,250	-	-	-	-	-	5	-

NOTES:
1. HIGH CAPACITY FLANGED STEEL STEAM SAFETY PRESSURE RELIEF VALVES, DIRECT SPRING OPERATED, FULL NOZZLE, OPEN BONNET.
2. SIZE SAFETY VALVE VENT PIPE TO PREVENT STEAM RELEASE AT VENT PIPE INLET. REF. ANSI B31.1 POWER PIPING CODE, APPENDIX H FOR VENT PIPE SIZING.
3. PROVIDE INLET WITH STANDARD CONNECTIONS. PROVIDE OUTLET ASME B16.5 CONNECTIONS.
4. PROVIDE STANDARD LIFTING LEVER
5. PROVIDE 150# CLASS DRIP PAN ELBOW
6. BASIS OF DESIGN: CROSBY CONVENTIONAL PRESSURE RELIEF SAFETY VALVES OR EQUIVALENT.

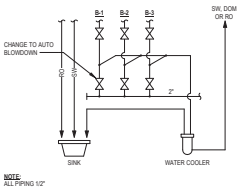
GENERAL NOTES

1. BOILER PLANT EQUIPMENT AND RELATED SAFETY DEVICES SHALL BE TESTED, ANALYZED, DOCUMENTED, AND CERTIFIED PER THE VHA BOILER AND ASSOCIATED PLANT SAFETY DEVICE TESTING MANUAL EIGHTH EDITION OR CURRENT. COMPLY WITH TEST GUIDANCE, PROCEDURES, FAILURE CONSEQUENCES, AND INTERIM SAFETY MEASURE (ISM) REQUIREMENTS FOR EQUIPMENT AND ASSOCIATED SAFETY DEVICES INCLUDING WATER LEVEL CONTROL, PRESSURE CONTAINMENT, FUEL TRAIN SAFETY DEVICES, BURNER AND AIR TRAIN SAFETY DEVICES, INDIVIDUAL STEAM BOILERS, ETC.
2. TESTING, BOILER PLANT INSTRUMENTATION, AUTOMATIC BOILER CONTROL SYSTEMS, BURNER MANAGEMENT SYSTEMS, GRAPHIC USER INTERFACE(S) (GUI'S), COMPUTER WORKSTATION(S). REFER TO THE SECTION 23 52 39 FIRE-TUBE BOILERS.



2 BOILER FEEDWATER FLOW DIAGRAM

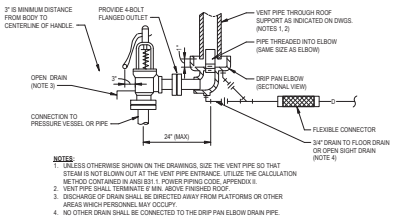
SCALE: NONE



NOTE:
ALL PIPING 1/2"

3 WATER SAMPLE STATION DETAIL

SCALE: NONE



NOTES:
1. UNLESS OTHERWISE SHOWN ON THE DRAWINGS, SIZE THE VENT PIPE SO THAT STEAM IS NOT BLOWN OUT AT THE VENT PIPE ENTRANCE. UTILIZE THE CALCULATION METHOD CONTAINED IN ANSI B31.1: POWER PIPING CODE, APPENDIX II.
2. VENT PIPE SHALL TERMINATE 6' MIN. ABOVE FINISHED ROOF.
3. DISCHARGE OF DRAIN SHALL BE DIRECTED AWAY FROM PLATFORMS OR OTHER AREAS WHICH PERSONNEL MAY OCCUPY.
4. NO OTHER DRAIN SHALL BE CONNECTED TO THE DRIP PAN ELBOW DRAIN PIPE.

4 SAFETY VALVE STEAM

SCALE: NONE

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

OEI O'BRIEN ENGINEERING | ARCHITECTURE

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A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jon A. Labatto, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: DIAGRAMS

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BOILER PLANT

Issue Date: 10/07/2025 | Checked: LRL | Drawn: DMB

Drawing Number: M604

VA FORM 08 - 6231

Autodesk Docs://049800/1013 VABS Boiler Replacement/049800101013 MECH R25.rvt

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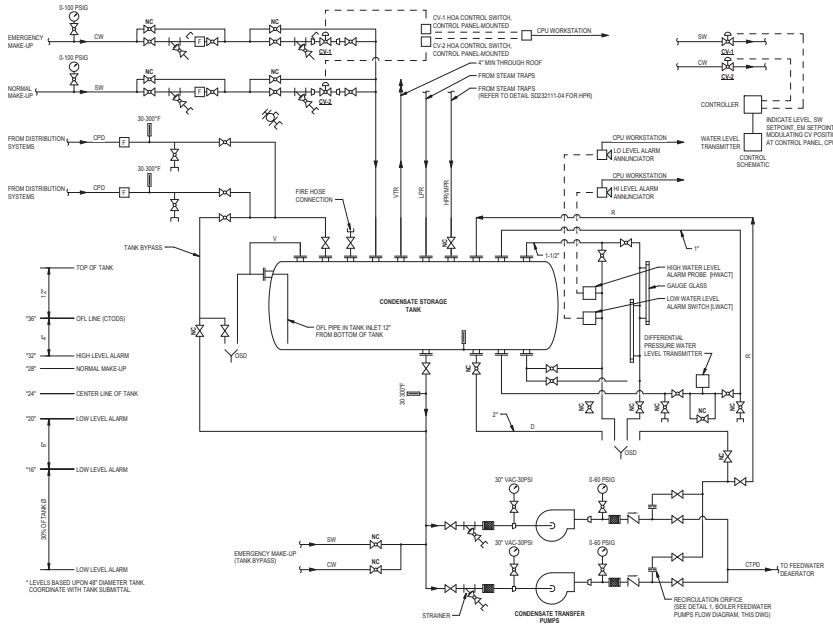
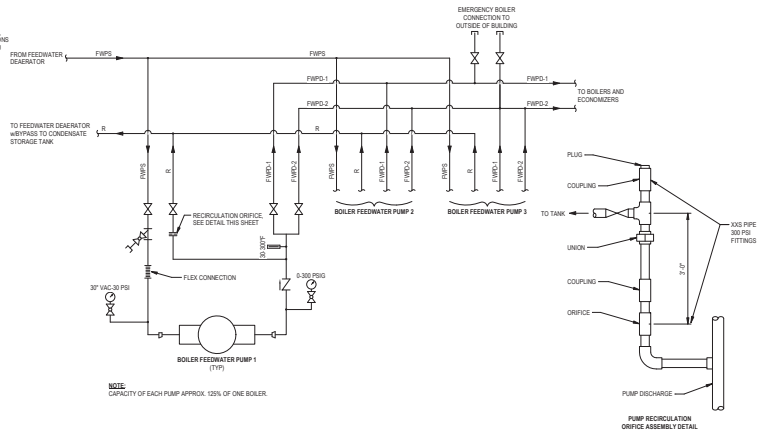
GENERAL NOTES

1. BOILER PLANT EQUIPMENT AND RELATED SAFETY DEVICES SHALL BE TESTED, ANALYZED, DOCUMENTED, AND CERTIFIED PER THE VHA BOILER AND ASSOCIATED PLANT SAFETY DEVICE TESTING MANUAL EIGHTH EDITION OR CURRENT. COMPLY WITH TEST GUIDANCE, PROCEDURES, FAILURE CONSEQUENCES, AND INTERIM SAFETY MEASURE (ISM) REQUIREMENTS FOR EQUIPMENT AND ASSOCIATED SAFETY DEVICES INCLUDING WATER LEVEL CONTROL, PRESSURE CONTAINMENT, FUEL TRAIN SAFETY DEVICES, BURNER AND AIR TRAIN SAFETY DEVICES, INDIVIDUAL STEAM BOILERS, ETC.
2. TESTING, BOILER PLANT INSTRUMENTATION, AUTOMATIC BOILER CONTROL SYSTEMS, BURNER MANAGEMENT SYSTEMS, GRAPHIC USER INTERFACE(S) (GUI'S), COMPUTER WORKSTATION(S). REFER TO THE SECTION 23 52 39 FIRE-TUBE BOILERS.



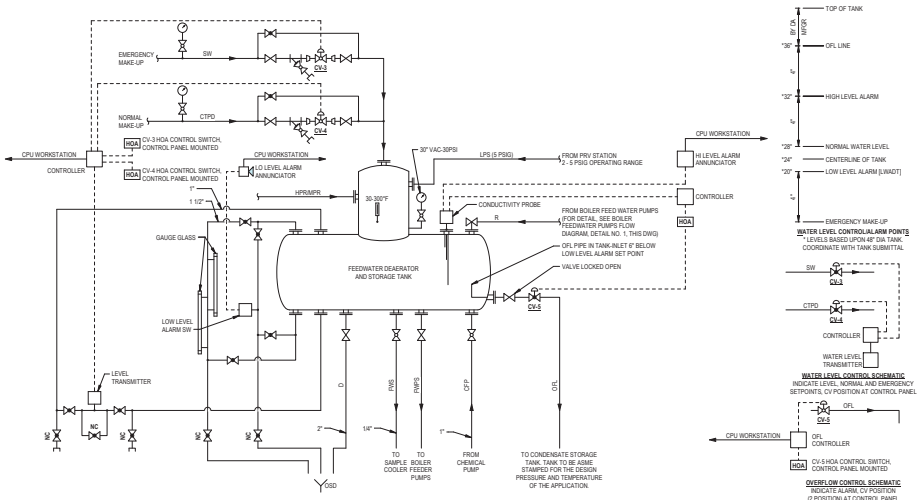
2 CONDENSATE STORAGE AND TRANSFER

SCALE: NONE



1 BOILER FEEDWATER PUMPS FLOW DIAGRAM

SCALE: NONE

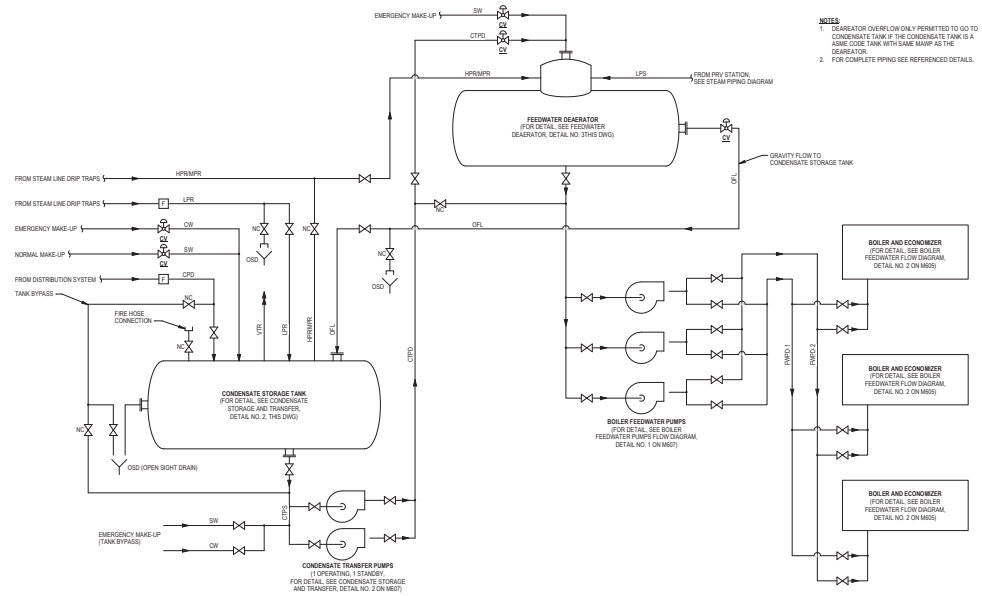


3 FEEDWATER DEAERATOR

SCALE: NONE

NOTES:

1. DEAREATOR OVERFLOW ONLY PERMITTED TO GO TO CONDENSATE TANK IF THE CONDENSATE TANK IS A ASME CODE TANK WITH SAME MAWP AS THE DEAREATOR.
2. FOR COMPLETE PIPING SEE REFERENCED DETAILS.



4 CONDENSATE AND BOILER FEEDWATER

SCALE: NONE

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: DIAGRAMS	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Drawing Number: M605
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	

VA FORM 08 - 6231

Autodesk Docs://04890/10133/ABS Boiler Replacement/04890010133 MECHR25.rvt

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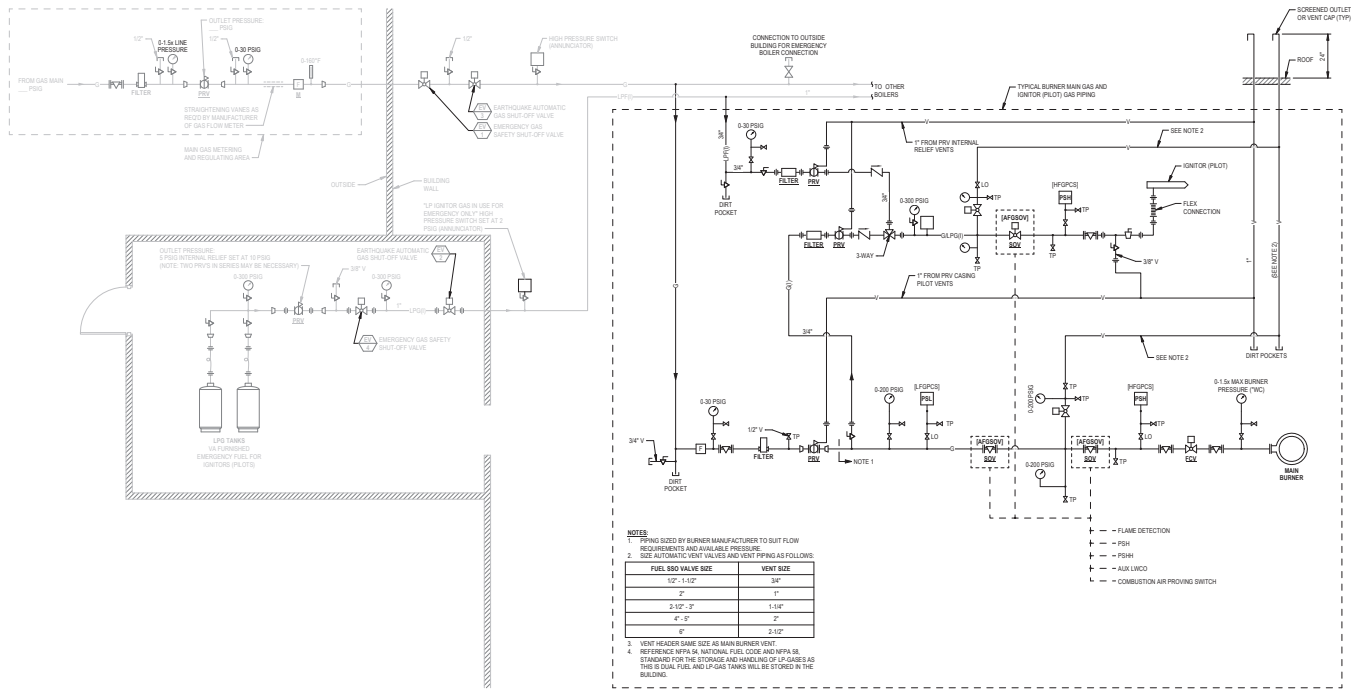


NOTES:

1. PIPING SIZED BY BURNER MANUFACTURER TO SUIT FLOW REQUIREMENTS AND AVAILABLE PRESSURE.
2. SIZE AUTOMATIC VENT VALVES AND VENT PIPING AS FOLLOWS:

FUEL SSO VALVE SIZE	VENT SIZE
1/2" - 1-1/2"	3/4"
2"	1"
2-1/2" - 3"	1-1/4"
4" - 5"	2"
6"	2-1/2"

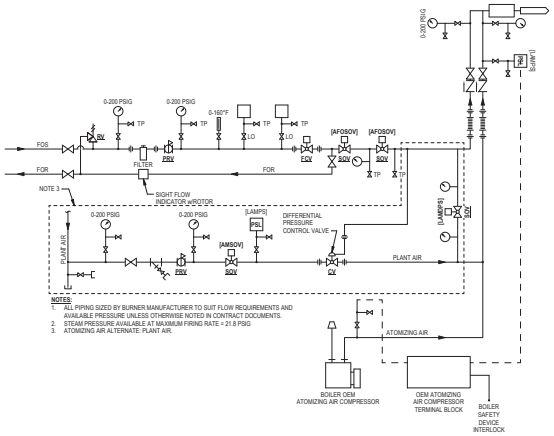
3. VENT HEADER SAME SIZE AS MAIN BURNER VENT.
4. REFERENCE NFPA 54, NATIONAL FUEL CODE AND NFPA 98, STANDARD FOR THE STORAGE AND HANDLING OF LP-GASES AS THIS IS DUAL FUEL AND LP-GAS TANKS WILL BE STORED IN THE BUILDING.

GENERAL NOTES

1. BOILER PLANT EQUIPMENT AND RELATED SAFETY DEVICES SHALL BE TESTED, ANALYZED, DOCUMENTED, AND CERTIFIED PER THE VHA BOILER AND ASSOCIATED PLANT SAFETY DEVICE TESTING MANUAL EIGHTH EDITION OR CURRENT. COMPLY WITH TEST GUIDANCE, PROCEDURES, FAILURE CONSEQUENCES, AND INTERIM SAFETY MEASURE (ISM) REQUIREMENTS FOR EQUIPMENT AND ASSOCIATED SAFETY DEVICES INCLUDING WATER LEVEL CONTROL, PRESSURE CONTAINMENT, FUEL TRAIN SAFETY DEVICES, BURNER AND AIR TRAIN SAFETY DEVICES, INDIVIDUAL STEAM BOILERS, ETC.
2. TESTING, BOILER PLANT INSTRUMENTATION, AUTOMATIC BOILER CONTROL SYSTEMS, BURNER MANAGEMENT SYSTEMS, GRAPHIC USER INTERFACE(S) (GUI'S), COMPUTER WORKSTATION(S). REFER TO THE SECTION 23 52 39 FIRE-TUBE BOILERS.

1 NATURAL GAS & LIQUIFIED PETROLEUM GAS - BURNER & IGNITOR FUEL

SCALE: NONE



NOTES:

1. ALL PIPING SIZED BY BURNER MANUFACTURER TO SUIT FLOW REQUIREMENTS AND AVAILABLE PRESSURE UNLESS OTHERWISE NOTED IN CONTRACT DOCUMENTS.
2. STEAM PRESSURE AVAILABLE AT MAXIMUM FIRING RATE = 21.8 PSIG
3. ATOMIZING AIR ALTERNATE: PLANT AIR.

2 NO. 2 BURNER FUEL OIL SYSTEMS AND BURNER FUEL SYSTEMS

SCALE: 12" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jon A. Lamotte, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title	Phase	Project Title	Project Number
DIAGRAMS	100% CONSTRUCTION DOCUMENTS	A/E REPLACE BOILERS	519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Drawing Number: M606
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	

VA FORM 08 - 6231

Autodesk Docs://0489001/0131/ABB Boiler Replacement/0489001-01-MECHR25.rvt

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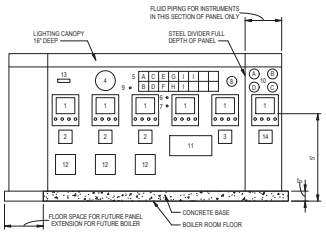


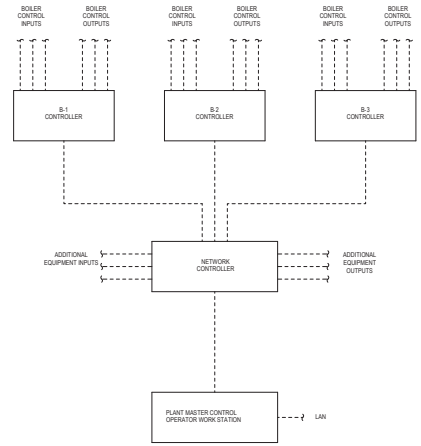
ELEVATION

1 BOILER PLANT INSTRUMENTATION PANEL

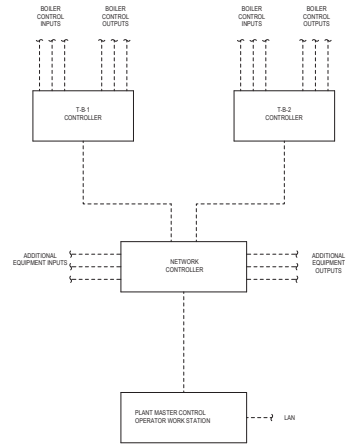
SCALE: 1/2" = 1'-0"

ITEM NO.	DESCRIPTION
1.	BOILER / BOILER PLANT DIGITAL DATA RECORDER
	A. STEAM FLOW: INDICATE, RECORD, INTEGRATE, (0-100,000 LB/HR)
	B. BOILER OUTLET FLUE GAS TEMPERATURE: RECORD (0-1,000°F)
	C. FLUE GAS OXYGEN CONTENT: RECORD (0-10% OXYGEN)
	D. HIGH PRESS STEAM DIST: RECORD, INTEGRATE, (0-100,000 LB/HR)
	E. MED PRESS STEAM DIST: RECORD, INTEGRATE, (0-100,000 LB/HR)
	F. LAUNDRY STEAM DIST: RECORD, INTEGRATE, (0-100,000 LB/HR)
	G. BOILER PLANT STEAM: RECORD, INTEGRATE, (0-100,000 LB/HR)
	H. STEAM HEADER PRESS: RECORD (0-300 PSIG)
	I. BOILER FEEDWATER TEMP: RECORD (0-300°F)
	J. OUTSIDE AIR TEMP: RECORD (-30°F TO +120°F)
2.	BOILER CONTROL STATIONS (MANUAL/AUTOMATIC, BIAS) (THESE CONTROL STATIONS MAY BE LOCATED ON THE BURNER CONTROL PANELS INSTEAD OF ON THE INSTRUMENTATION PANEL)
	A. COMBUSTION CONTROL SUBMASTER
	B. DRAFT CONTROL (WHEN SPECIFIED)
	C. OXYGEN TRIM (WHEN SPECIFIED)
3.	MASTER STEAM PRESSURE CONTROLLER
4.	CLOCK
5.	ALARM ANNUNCIATOR
	A. CONDENSATE STORAGE TANK HIGH LEVEL
	B. CONDENSATE STORAGE TANK LOW LEVEL
	C. FEEDWATER HEATER HIGH LEVEL
	D. FEEDWATER HEATER LOW LEVEL
	E. HIGH STEAM HEADER PRESS
	F. EMERGENCY GAS VALVE CLOSED
	G. HIGH NATURAL GAS HEADER PRESS (SET AT 5 PSIG ABOVE MAIN REGULATOR SET PRESS)
	H. LP IGNITER GAS IN USE-FOR EMERGENCY ONLY (PROVIDE HIGH PRESS SWITCH SET AT 2 PSIG)
	I. LOW EXCESS AIR BOILER NO. (PROVIDE ONE POINT FOR EACH BOILER, SET AT ___ % OXYGEN)

ITEM NO.	DESCRIPTION
6.	ANNUNCIATOR ACKNOWLEDGE BUTTON
7.	ANNUNCIATOR TEST BUTTON
8.	ANNUNCIATOR BELL / HORN
9.	EMERGENCY GAS SAFETY SHUT OFF VALVE CONTROL
10.	PRESSURE GAUGES
	A. STEAM HEADER (0-200 PSIG)
	B. NATURAL GAS HEADER (0-15 PSIG)
	C. FUEL OIL HEADER (0-200 PSIG)
	D. BOILER FEEDWATER HEADER (0-300 PSIG) (WHEN HEADER SERVING ALL BOILERS IS PROVIDED)
11.	START-STOP BUTTONS AND PILOT LIGHTS FOR PUMPS
12.	SMOKE DENSITY MONITOR (WHEN SPECIFIED)
13.	REMOTE REGISTER FOR GAS METER (WHEN SPECIFIED)
14.	FEEDWATER DEAERATOR TANK AND CONDENSATE STORAGE TANK WATER LEVEL CONTROL STATION



PLANT MASTER CONTROL DIAGRAM



TEMPORARY PLANT MASTER CONTROL DIAGRAM

2 PLANT MASTER CONTROL DIAGRAM

SCALE: NONE

GENERAL NOTES

1. BOILER PLANT EQUIPMENT AND RELATED SAFETY DEVICES SHALL BE TESTED, ANALYZED, DOCUMENTED, AND CERTIFIED PER THE VHA BOILER AND ASSOCIATED PLANT SAFETY DEVICE TESTING MANUAL EIGHTH EDITION OR CURRENT. COMPLY WITH TEST GUIDANCE, PROCEDURES, FAILURE CONSEQUENCES, AND INTERIM SAFETY MEASURE (ISM) REQUIREMENTS FOR EQUIPMENT AND ASSOCIATED SAFETY DEVICES INCLUDING WATER LEVEL CONTROL, PRESSURE CONTAINMENT, FUEL TRAIN SAFETY DEVICES, BURNER AND AIR TRAIN SAFETY DEVICES, INDIVIDUAL STEAM BOILERS, ETC.
2. TESTING, BOILER PLANT INSTRUMENTATION, AUTOMATIC BOILER CONTROL SYSTEMS, BURNER MANAGEMENT SYSTEMS, GRAPHIC USER INTERFACE(S) (GUI'S), COMPUTER WORKSTATION(S). REFER TO THE SECTION 23 52 39 FIRE-TUBE BOILERS.

A. REPRESENTATIVES OF THE DESIGNER OF THE INSTRUMENTATION, AUTOMATIC BOILER CONTROL, BURNER MANAGEMENT SYSTEM(S) SHALL DEMONSTRATE PROPER OPERATION AND CALIBRATION OF ALL COMPONENTS, COMPUTER PROGRAMS, AND ENTIRE SYSTEMS TO THE COR. BOILER/BURNER TESTING SHALL BE CONDUCTED DURING THE BOILER/BURNER TESTS. FURNISH PERSONNEL, INSTRUMENTATION, AND EQUIPMENT NECESSARY TO PERFORM CALIBRATION AND TESTING. ALL CALIBRATION WORK MUST BE COMPLETED PRIOR TO THE TESTING.

B. BURNER MANAGEMENT (SAFETY CONTROL) SYSTEMS: ALL TESTS SHALL BE BASED ON THE VHA BOILER PLANT SAFETY DEVICES TESTING MANUAL. ALSO REFER TO SECTION 23 52 39, FIRE-TUBE BOILERS.

C. STEAM FLOW MEASURING: DEMONSTRATE PROPER CALIBRATION OF EACH FLOW RATE SIGNAL AND INDICATION AND EACH TOTALIZER SIGNAL AND INDICATION TO COR OR THEIR REPRESENTATIVE PRIOR TO THE START OF THE FINAL BOILER TESTING.

D. TESTING SHALL DEMONSTRATE PROPER CALIBRATION OF INPUT AND OUTPUT DEVICES, THE PROPER OPERATION OF ALL EQUIPMENT, PROPER EXECUTION OF THE SEQUENCE OF OPERATION, PROPER TUNING OF CONTROL LOOPS AND MAINTAINING OF ALL SET POINTS.

E. DOCUMENT ALL TESTS WITH DETAILED REPORT OF TEST RESULTS. EXPLAIN IN DETAIL THE NATURE OF EACH FAILURE AND CORRECTIVE ACTION TAKEN.

F. DURING AND AFTER COMPLETION OF THE PRETESTS, AND AGAIN AFTER THE FINAL ACCEPTANCE TESTS, IDENTIFY, DETERMINE CAUSES, REPLACE, REPAIR AND CALIBRATE EQUIPMENT THAT FAILS TO COMPLY WITH CONTRACT REQUIREMENTS OR THE STANDARDS OF THE MANUFACTURER, AND RETEST. PROVIDE WRITTEN REPORT TO COR.

G. DEMONSTRATE ALL SAFETY AND OPERATING INTERLOCKS.

H. DEMONSTRATE THAT PROGRAMMING IS NOT LOST AND THAT THE CONTROL AND INSTRUMENTATION SYSTEM PERFORMS THE CORRECT SEQUENCE OF CONTROL AND INSTRUMENT FUNCTIONS AFTER A LOSS OF POWER.

I. FURNISH TO COR GRAPHED TRENDS OF CONTROL LOOPS TO DEMONSTRATE THAT THE CONTROL LOOPS ARE STABLE AND THAT SET POINTS ARE MAINTAINED. TREND DATA SHALL BE INSTANTANEOUS AND THE TIME BETWEEN DATA POINTS SHALL NOT BE GREATER THAN ONE MINUTE.

J. SIGNAL TRANSMISSION SYSTEM EQUIPMENT:
   1. GROUND ROD TESTS: BEFORE ANY WIRE IS CONNECTED TO THE GROUND RODS, USE A PORTABLE GROUND TESTING INSTRUMENT TO TEST EACH GROUND OR GROUP OF GROUNDS.
   2. COAXIAL CABLE TESTS: IMPLEMENT NEMA WC 63.2 AS A MINIMUM.
   3. COMPUTER WORKSTATION SOFTWARE OPERATION TEST: TEST ABILITY TO PROPERLY COMMUNICATE WITH AND OPERATE THE CONTROL SYSTEMS.

K. DEMONSTRATE THE ABILITY TO EDIT THE PROGRAMS OFF AND ON LINE.

L. DEMONSTRATE OPERATION OF ALL ALARM POINTS.

M. DEMONSTRATE THE RECEIPT, DISPLAY, AND SAVING OF TREND AND STATUS REPORTS.

N. DEMONSTRATE DISPLAY AND OPERATION OF ALL GRAPHICS.

O. DEMONSTRATE ALL PROGRAM CALCULATING FUNCTIONS AND REPORT GENERATION.

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
Revisions:	Date:

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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS
Jon A. Palmetto, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title	Phase	Project Title	Project Number
CONTROLS DIAGRAMS	100% CONSTRUCTION DOCUMENTS	A/E REPLACE BOILERS	519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Drawing Number: MI600
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	

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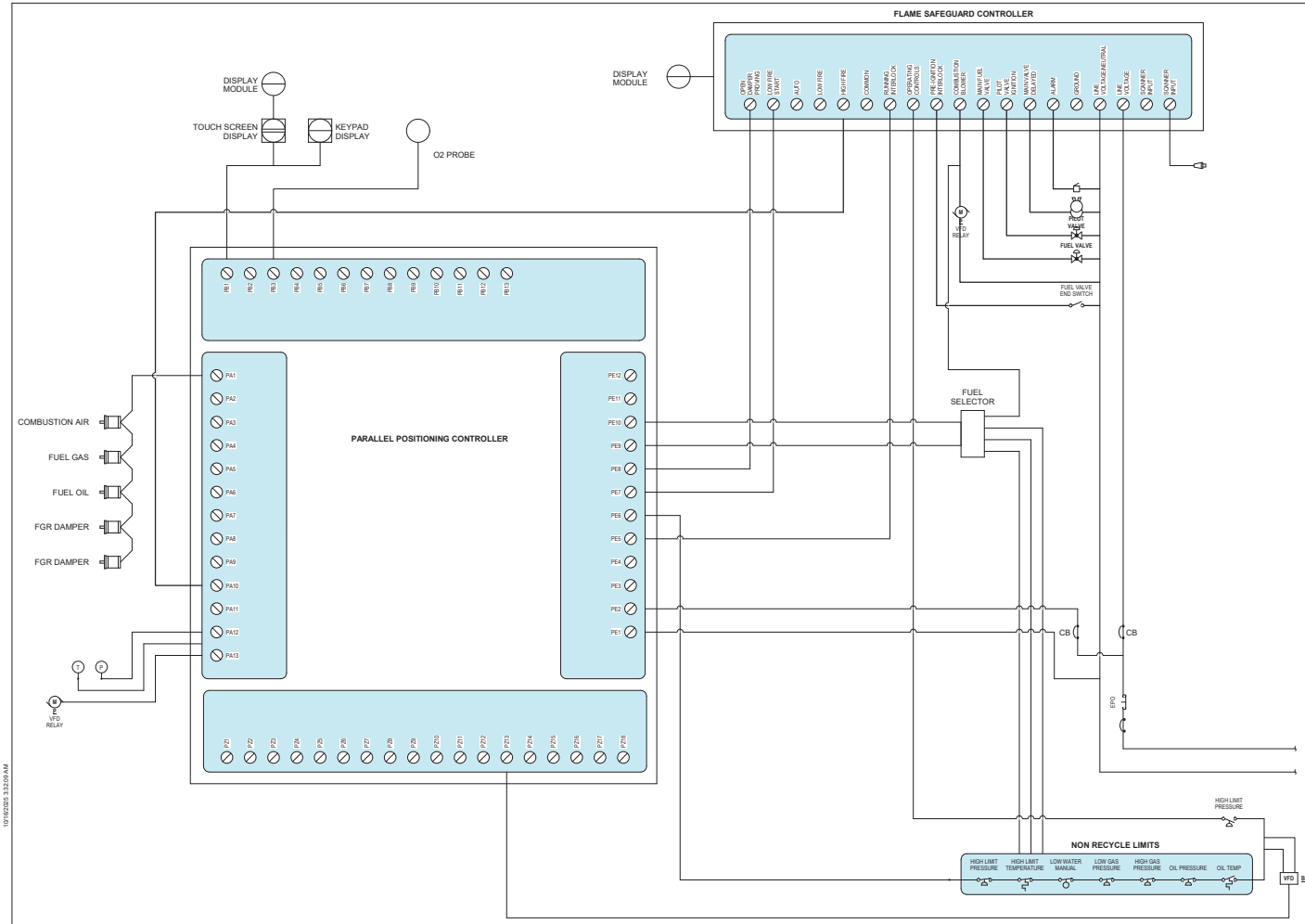

3 Flame Safeguard SOC Copy 1

SCALE: 12" = 1'-0"

1. **FIRE TUBE STEAM BOILERS (B-1,2,3)**
   A. GENERAL:
      1. BOILER CONTROLS SHALL CONSIST OF BOILER OPERATING CONTROLS AND SEPARATE / INDEPENDENT FLAME SAFEGUARD.
      2. BOILERS SHALL BE ONLINE OR OFFLINE. BOILER CONTROLS SHALL OPERATE ONLINE BOILERS IN STANDBY, AUTOMATIC OR MANUAL MODE. OFFLINE BOILERS SHALL BE DE-ENERGIZED, AND IN LOCK-OUT, TAG-OUT CONFIGURATION.
      3. BOILERS SHALL BE CONTROLLED IN SEQUENCE AS FOLLOWS: STANDYBY, PREPURGE, IGNITION, PILOT TRIAL FOR IGNITION (PTFI) PILOT FLAME ESTABLISHING PERIOD, MAIN FLAME TRIAL FOR IGNITION (MTFI) MAIN FLAME ESTABLISHING PERIOD, RUN (AUTOMATIC, MANUAL), POSTPURGE, STANDBY WITH INTERLOCK ANNUNCIATORS.
      4. FLAME SAFEGUARD SHALL BE PROVIDED WITH CHECK-RUN/TEST SWITCH FOR BURNER SEQUENCE INTERRUPTIONS: PRE-PURGE AND PURGE (HIGH FIRE PURGE, LOW FIRE PURGE), PILOT TRIAL FOR IGNITION, MAIN FLAME TRIAL FOR IGNITION, LOW FIRE, RUN CYCLE FIRING RATE ADJUSTMENTS, PILOT FLAME MIN TURNDOWN TESTS.
      5. BOILER SHALL NOT BE STARTED AUTOMATICALLY OR REMOTELY. BOILERS SHALL NOT BE CONFIGURED FOR LEADLAG SEQUENCING AND LEADLAG CONTROL IS PROHIBITED.
      6. COMBUSTION AIR CONTROLS
         a. THE BOILER OPERATING CONTROLS AND FLAME SAFEGUARD CONTROLLER SHALL OPERATE BOILER PARALLEL POSITIONING CONTROLLER, FLUE GAS OXYGEN TRIM, FLUE GAS RECIRCULATION, VARIABLE FREQUENCY CONTROLLED FORCED DRAFT FAN, FORCED DRAFT FAN DAMPERS, FUEL FLOW CONTROL VALVES, FGR DAMPERS, BOILER OUTLET PRESSURE DRAFT CONTROL, AND FEEDWATER CONTROL VALVES IN SEQUENCE TO CONTROL BURNER FIRING RATES TO MAINTAIN STEAM HEADER PRESSURE.
      7. *SURFACE BLOWDOWN*
         a. PROVIDE CONDUCTIVITY SENSOR AND CONTROL CIRCUITRY TO OPERATE AN AUTOMATIC CONTROL VALVE IN SURFACE BLOWDOWN PIPING TO MAINTAIN TOTAL DISSOLVED SOLIDS (TDS) WITHIN BOILER MANUFACTURER'S PRESCRIBED LEVEL
      8. *CAMPUS BUILDING ENERGY MANAGEMENT SYSTEM INTERFACE*
         a. ENABLE BUILDING ENERGY MANAGEMENT SYSTEM TO MONITOR AND DISPLAY BOILER STATUS AND ALARMS.
      9. *CHEMICAL FEED SYSTEM INTERFACE*
         a. DRY CONTACTS TO INTERFACE CONTROL AND OPERATION OF CHEMICAL FEED PUMP.
2. **BOILER CONTROL PANEL (B-1,2,3)**
   A. GENERAL:
      1. BOILER CONTROL PANEL SHALL BE FREE-STANDING OR BOILER MOUNTED CONTROL PANEL ENCLOSURE WITH FRONT MOUNTED CONTROL STATION, CONTROL SWITCHES, INSTRUMENTS, INDICATORS, ETC. INDEPENDENT CONTROLLERS, RELAYS, AND OTHER COMPONENTS MOUNTED SHALL BE MOUNTED ON SUBASES IN THE INTERIOR OF THE ENCLOSURE.
   B. CONTROL STATION
      1. CONTROL STATIONS SHALL INCLUDE INDEPENDENT CONTROLLER DISPLAYS WITH ASSOCIATED KEYPADS INTEGRATED INTO TOUCH-SCREEN CONTROL STATION. NETWORK TOUCH SCREEN CONTROL STATION TO BOILER CONTROL AND BURNER MANAGEMENT SYSTEMS / CONTROLLERS. CONTROL STATION SHALL INDICATE BURNER MANAGEMENT CONTROL STATUS AND DIAGNOSTICS INCLUDING CONTROL ON, PRE-PURGE, PILOT TRIAL FOR IGNITION, MAIN FLAME TRIAL FOR IGNITION, IGNITER FLAME SIGNAL, MAIN FLAME SIGNAL, POST PURGE, BURNER OFF. ALL DIAGNOSTIC INFORMATION AVAILABLE FROM BURNER MANAGEMENT SYSTEM, CONTINUOUS INDICATION OF FLAME SIGNAL. TOUCH SCREEN SHALL PROVIDE CONTINUOUS DISPLAY OF CRITICAL OPERATING PARAMETERS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING: STEAM PRESSURE, WATER LEVEL, DRAFT PRESSURE, FIRING RATE.
3. **PLANT MASTER CONTROL PANEL (PMC-1)**
   A. GENERAL:
      1. PLANT MASTER CONTROL PANEL SHALL BE A FREE-STANDING CONTROL PANEL ENCLOSURE WITH FRONT MOUNTED CONTROL STATIONS, CONTROL SWITCHES, INSTRUMENTS, INDICATORS, ETC. INDEPENDENT CONTROLLERS, RELAYS, AND OTHER COMPONENTS MOUNTED SHALL BE MOUNTED ON SUBASES WITHIN THE INTERIOR OF THE ENCLOSURE.
      2. *PLANT MASTER CONTROL PANEL FUNCTION / DISPLAYS:*
         a. PLANT MASTER CONTROL PANEL SHALL INCLUDE: MASTER STEAM PRESSURE CONTROL STATION, BOILER/BURNER SUBMASTER CONTROL STATIONS, GAUGES FOR STEAM HEADER PRESSURE, FEEDWATER HEADER PRESSURE FOR EACH BOILER, FUEL HEADER PRESSURES, PUSH BUTTON STATIONS AND INDICATION LIGHTS FOR PUMP CONTROL, CLOCK
      3. *ALARMS:*
         a. CONDENSATE STORAGE TANK HIGH, LOW WATER LEVEL
         b. FEEDWATER DEAERATOR STORAGE TANK HIGH, LOW WATER LEVEL
         c. STEAM HEADER PRESSURE HIGH, LOW PRESSURE
         d. EMERGENCY GAS VALVE CLOSED
         e. OIL TANKS HIGH, LOW LEVEL PER TANK
         f. BOILER LOW EXCESS AIR PER BOILER
         g. NATURAL GAS HEADER HIGH PRESSURE
         h. LP IGNITER (PILOT) GAS IN USE
         i. FUEL OIL HIGH, LOW TEMPERATURE (HEATED OIL ONLY)
         j. FEEDWATER LOW PRESSURE PER HEADER
         k. RE: CONTROL PANEL DETAILS
6. **BOILER OPERATING CONTROLLER (BOC):**
   A. GENERAL:
      1. BOILER OPERATING CONTROLLER SHALL INTERFACE WITH BURNER MANAGEMENT SYSTEM FOR AUTOMATIC POSITIONING OF FORCED DRAFT FAN DAMPER(S), FORCED DRAFT FAN SPEED, FUEL FLOW CONTROL VALVES DURING PRE-PURGE, IGNITION, SHUTDOWN AND POST-PURGE WITH INTERLOCKS TO PROVE PROPER POSITIONS OF FORCED DRAFT FAN DAMPERS, FORCED DRAFT FAN SPEED, FUEL FLOW CONTROL VALVES FOR IGNITION AND RUNNING CYCLES.
   B. PARALLEL POSITIONING COMBUSTION CONTROL (PPCC) (AIR/FUEL RATIO, EXCESS AIR)
      1. BOC/PPCC SHALL CONTROL FORCED DRAFT FAN DAMPER ASSEMBLY AND FUEL FLOW CONTROL VALVE DRIVE UNITS (SERVO MOTORS, ACTUATORS) IN SEQUENCE WITH FORCED DRAFT FAN VARIABLE FREQUENCY DRIVE TO MAINTAIN AIR/FUEL RATIO SETPOINT(S).
   C. AUTOMATIC FLUE GAS OXYGEN TRIM SYSTEM
      1. BOC/PPCC SHALL ESTABLISH SEPARATE CHARACTERIZED SET POINT CURVES FOR EACH FUEL. THE FLUE GAS OXYGEN ANALYZER SHALL SIGNAL THE BOC/PPCC TO MODULATE COMBUSTION AIR FLOW TO MAINTAIN AIR/FUEL RATIO (EXCESS AIR) AT ALL FIRING RATES.
   D. FLUE GAS RECIRCULATION (FGR) CONTROL
      1. BOC/PPCC SHALL CONTROL FGR DAMPER(S) AUTOMATICALLY DURING PRE-PURGE CYCLE IN SEQUENCE WITH INTERLOCKS TO PROVE FGR DAMPERS IN POSITION PRIOR TO IGNITION AND DURING BOILER OPERATION TO MAINTAIN NOX EMISSION SETPOINT LIMITS.
   E. BOILER WATER LEVEL CONTROL (SINGLE ELEMENT)
      1. BOC SHALL MODULATE POSITION OF FEEDWATER CONTROL VALVE AUTOMATICALLY IN SEQUENCE WITH BOILER WATER LEVEL SENSOR TO MAINTAIN SETPOINT.
   F. FLAME SAFEGUARD CONTROLLER (FSGC)
      1. FSCO SHALL PROVIDE AUTOMATIC BURNER FLAME SAFEGUARD CONTROLS AND MONITORING SYSTEM FOR BURNER IGNITION SEQUENCING, OPERATING CYCLE, AND SHUT-DOWN SEQUENCING. SYSTEM SHALL INCLUDE MICROPROCESSOR BASED SOLID STATE FIXED OPERATING CONTROL SEQUENCE, CONFIGURABLE TO INCLUDE START, PRE-PURGE, PILOT AND MAIN FUEL IGNITION, RUN, AND POST PURGE CYCLES, SELF-CHECKING ULTRAVIOLET (UV) FLAME SCANNER AND AMPLIFIER, FLAME ON VISUAL INDICATION, BURNER CYCLE DISPLAY, FAULT CODE INDICATIONS OF FLAME SAFEGUARD TRIP FUNCTIONS, FIRST-OUT DIAGNOSTIC ANNUNCIATION DISPLAY, NON-RECYCLE TYPE BURNER SAFETY SHUTDOWN TRIP FUNCTION INTERLOCKS, PILOT AND MAIN FLAME FAILURE, HIGH AND LOW FIRE PROVING SWITCH, RUNNING INTERLOCKS OPEN, FALSE FLAME SIGNAL, FUEL VALVE OPEN, COMMUNICATION WITH MONITORING SYSTEMS, AND ACCESSORIES. MOUNT CONTROLLERS, CONTROL SWITCHES AND DISPLAYS IN AND ON INDIVIDUAL BOILER CONTROL PANELS.
      2. *CONTROL PANEL DISPLAY:*
         a. INDICATORS SHALL BE ON DEDICATED DISPLAY(S) SEPARATE FROM TOUCH SCREEN STATION AND INCLUDE THE FOLLOWING:
         b. BURNER CYCLE
         c. INSTANTANEOUS STATUS OF STANDBY, START, RUN, AND SHUTDOWN.
         d. CONTROL POWER ON, IGNITION, MAIN FUEL VALVE OPEN, FLAME FAILURE
         e. FSGC RESET BUTTON
      3. *ANNUNCIATOR DISPLAY AND ALARM:*
         a. INTERLOCK IDENTIFICATION
         b. BURNER STATUS INCLUDING CONTROL ON, PRE-PURGE, TRIAL FOR IGNITION, IGNITER FLAME SIGNAL, MAIN FLAME SIGNAL, POST PURGE, BURNER OFF
         c. CONTINUOUSLY INDICATE FLAME SIGNAL STRENGTH
         d. FIRST OUT TEXTUALIZED MESSAGE, AUDIBLE ALARM ANNUNCIATION FOR THE FOLLOWING INTERLOCKS:
            1. FLAME FAILURE
            2. PURGE AIRFLOW LOW
            3. COMBUSTION AIR LOW
            4. FALSE COMBUSTION AIR (SWITCH ACTIVATED WITH COMBUSTION AIR FLOW)
            5. HIGH MAIN GAS FUEL PRESSURE
            6. LOW MAIN GAS FUEL PRESSURE
            7. HIGH OIL PRESSURE
            8. LOW OIL PRESSURE
            9. LOW IGNITER (PILOT) GAS PRESSURE
            10. LOW OIL TEMPERATURE (HEATED OIL SYSTEMS ONLY)
            11. FUEL SAFETY SHUT-OFF VALVES PROOF OF CLOSURE NOT CLOSED PRIOR TO IGNITION CYCLE
            12. LOW FIRE POSITION NOT ATTAINED PRIOR TO IGNITION CYCLE
            13. LOW ATOMIZING MEDIA (AIR) STATIC PRESSURE AT ATOMIZING MEDIA SERVICE CONNECTION TO BURNER PIPING
            14. LOW ATOMIZING OIL DIFFERENTIAL PRESSURE; WHERE BURNER DOES NOT MAINTAIN DIFFERENTIAL PRESSURE PROVIDE LOW ATOMIZING MEDIA PRESSURE AT BURNER.
            15. HIGH STEAM PRESSURE
            16. HIGH-HIGH STEAM PRESSURE
            17. LOW WATER CUTOFF
            18. FGR IMPROPER DAMPER POSITION
            19. LOW FLUE GAS OXYGEN
            20. HIGH FURNACE PRESSURE
            21. BUILDING COMBUSTION AIR INTAKE LOUVER(S) CLOSED
            22. SAFETY DEVICE INTERLOCKS, SAFETY SYSTEM INTERLOCKS:
            23. BOILER EMERGENCY SHUTDOWN INTERLOCKS, CARBON MONOXIDE DETECTION SYSTEM, COMBUSTIBLE FUEL GAS DETECTION, EMERGENCY FUEL GAS SHUTOFF VALVES
   G. SAFETY DEVICE INTERLOCKS
      1. ALL SAFETY DEVICES SHALL BE HARDWIRED DIRECTLY TO THE FLAME SAFEGUARD CONTROLLER WITHOUT PASSING THRU ANY OTHER DEVICE OR CONTROL SYSTEM. RE: VHA BOILER PLANT SAFETY DEVICES TESTING MANUAL FOR TESTING REQUIREMENTS INCLUDING PIPE, VALVE, WIRING CONFIGURATIONS TO SUPPORT TESTING. SAFETY SHUTDOWN AND MANUAL RESET REQUIRED FOR, BUT NOT LIMITED TO:
      2. *BURNER SAFETY DEVICE INTERLOCKS*
         a. HIGH CUTOFF (PRESSURE)
         b. AUDIBLE ALARM
         c. FLAME SIGNAL DETECTED PRIOR TO IGNITION CYCLE
         d. PRE-IGNITION INTERLOCK OPEN DURING PRE-PURGE
         e. HIGH FIRE PURGE INTERLOCK FAILS TO CLOSE WITHIN TEN MINUTES OR LESS AFTER FIRING RATE DRIVE UNIT IS COMMANDED TO DRIVE TO HIGH FIRE
         f. LOW FIRE INTERLOCK FAILS TO CLOSE WITHIN TEN MINUTES OR LESS AFTER FIRING RATE DRIVE UNIT IS COMMANDED TO DRIVE TO LOW FIRE
         g. IGNITER (PILOT) OR MAIN BURNER FAILS TO IGNITE
         h. MALFUNCTION OF FLAME DETECTOR
         i. MALFUNCTION OF PROGRAMMER
         j. MALFUNCTION OF FLAME SIGNAL AMPLIFIER
         k. COMBUSTION AIR PROVING SWITCH ACTUATED PRIOR TO START-UP OF FORCED DRAFT FAN
         l. LOCK-OUT INTERLOCK OPEN DURING PRE-PURGE (AFTER 15 SECONDS), IGNITION OR RUN PERIOD
         m. INTERLOCK OPEN
         n. FLAME FAILURE
         o. BUILDING COMBUSTION AIR INTAKE LOUVERS CLOSED
         p. FORCED DRAFT FAN MOTOR OPERATION INTERLOCK
         q. ATOMIZING AIR COMPRESSOR MOTOR ENERGIZED INTERLOCK
         r. FORCED DRAFT FAN DAMPER: PARALLEL POSITIONING SYSTEM DRIVE UNIT INTERLOCK SWITCHES
         s. FGR DAMPERS POSITION INTERLOCK
         t. PRE-PURGE AIRFLOW INTERLOCK
         u. COMBUSTION AIR PROVING INTERLOCK
         v. HIGH AND LOW MAIN BURNER FUEL (GAS AND OIL) AND LOW IGNITER (PILOT) GAS PRESSURE INTERLOCKS
         w. LOW OIL TEMPERATURE INTERLOCK (HEATED OIL ONLY)
         x. LOW ATOMIZING MEDIA PRESSURE, DIFFERENTIAL PRESSURE AND FLOW INTERLOCKS
         y. MAIN FUEL (GAS AND OIL) AUTOMATIC SAFETY SHUT-OFF VALVES PROOF-OF-CLOSURE (OVER TRAVEL) INTERLOCKS
         z. LOW FIRE POSITION OF FUEL FLOW CONTROL VALVES INTERLOCKS
         aa. HIGH, AND HIGH-HIGH BOILER STEAM PRESSURE LIMIT AND INTERLOCK
         bb. LOW BOILER WATER LEVEL INTERLOCKS
         cc. LOW WATER CUTOFF (LEVEL)
         dd. AUX LOW WATER CUTOFF (LEVEL)
         ee. LOW FLUE GAS OXYGEN ALARM AND INTERLOCK
         ff. HIGH FURNACE PRESSURE INTERLOCK
         gg. BUILDING COMBUSTION AIR INTAKE INTERLOCK: PROVE OUTSIDE AIR BUILDING WALL LOUVERS ARE OPEN
7. **EMERGENCY FUEL SAFETY SHUT-OFF VALVE CONTROL:**
   A. PROVIDE MAINTAINED CONTACT, EMERGENCY SAFETY SHUT-OFF PUSH-PULL CONTROL SWITCHES WITH MUSHROOM HEADS ON OUTSIDE FACE OF PANEL, CONTROL ROOM, AND AT ALL PERSONNEL DOORWAYS, OR ROUTES OF EGRESS FROM THE OPERATING FLOOR. THE SHUT-OFF SHALL SHUTDOWN THE MAIN AND IGNITER EMERGENCY SAFETY SHUT-OFF VALVES FROM POWER SOURCE ON THE NATURAL GAS, AND SHUTDOWN ALL OTHER FUEL SOURCES. TURN OFF THE FUEL OIL PUMPS. VALVES SHALL REMAIN CLOSED AND PUMPS REMAIN OFF WHEN SWITCH IS PULLED OUT. SHALL REQUIRE A MANUAL RESET OR RESTART
8. **MISC. BOILER PLANT MECHANICAL EQUIPMENT:**
   A. RE: MECHANICAL SPECIFICATIONS FOR INSTRUMENTATION AND CONTROL REQUIREMENTS FOR THE FOLLOWING:
   B. DEARATOR TANK, FEEDWATER PUMPS
   C. CONDENSATE RECEIVER TANKS, CONDENSATE PUMPS
   D. CHEMICAL FEED PUMPS
   E. CARBON MONOXIDE DETECTION
   F. COMBUSTIBLE FUEL GAS DETECTION
9. **COMPUTER WORK STATION AND PROGRAMMING:**
   A. GENERAL
      1. THE INDIVIDUAL BOILER PLANT CONTROLLERS AND INSTRUMENTATION SYSTEM SHALL BE NETWORKED WITH CENTRAL COMPUTER WORKSTATION(S) TO PROVIDE REMOTE OPERATION OF THE CONTROLLERS, CUSTOM GRAPHIC DISPLAY OF INFORMATION, ALARM MESSAGE DISPLAY, REPORT GENERATION, HISTORICAL TRENDING AND REMOTE TUNING OF CONTROLLERS. ALL CONTROL FUNCTIONS SHALL BE ACCOMPLISHED WITHIN THE INDIVIDUAL CONTROLLERS AND SHALL BE MONITORED BY THE CENTRAL COMPUTER SO THAT THE INTEGRITY OF THE CONTROL SYSTEM SHALL NOT BE DEPENDENT ON THE STATUS OF THE CENTRAL COMPUTER OR THE INTERCONNECTING NETWORK. BURNER MANAGEMENT (FLAME SAFETY CONTROL) SYSTEMS SHALL NOT BE CONTROLLABLE FROM THE WORKSTATION BUT SHALL BE MONITORED FROM THE WORKSTATION FOR STATUS AND ACCESS TO HISTORICAL DATA. MODEM AND SOFTWARE SHALL PROVIDE REMOTE COMMUNICATION WITH DIAGNOSTIC AND STATUS INDICATIONS.
   B. REMOTE OPERATION OF CONTROLLERS:
      1. PROVIDE CAPABILITY TO OPERATE CONTROLLERS LOCALLY AT THE CONTROL AND INDICATING STATIONS AND, EXCEPT FOR BURNER MANAGEMENT (FLAME SAFETY) CONTROLS, REMOTELY AT THE COMPUTER WORKSTATION. FOR SAFETY, IT SHALL BE POSSIBLE TO DEFEAT THE REMOTE CONTROL FROM THE FRONT PANEL OF EACH INDIVIDUAL CONTROLLER, PREVENTING ANY STATUS CHANGES FROM BEING INITIATED AT THE COMPUTER WORKSTATION. THE CONTROLLERS INCLUDE: MASTER STEAM PRESSURE, BOILER/BURNER SUB-MASTER, BURNER FUEL/COMBUSTION AIR, BOILER DRAFT, BURNER OXYGEN TRIM, BOILER FEEDWATER LEVEL, DEARATOR WATER LEVEL, CONDENSATE STORAGE TANK WATER LEVEL.
      2. THE OPERATING PERSONNEL, WHEN CONTROLLERS ARE SO ENABLED, SHALL HAVE REMOTE CONTROL OF FUNCTIONS FROM THE COMPUTER WORK STATION INCLUDING MANUAL / AUTOMATIC MODE SELECTION, SET POINT ADJUSTMENT, PID TUNING PARAMETERS, CONTROLLER ANALOG / DISCRETE OUTPUT VALUES.
   C. GRAPHICS
      1. THE GRAPHICS SHALL DISPLAY STATUS, TEMPERATURES, PRESSURES, LEVELS, FLOW RATES OF INDIVIDUAL BOILERS INCLUDING TRENDS; STATUS, TEMPERATURES, PRESSURES, LEVELS, FLOW RATES OF PRIMARY BOILER PLANT EQUIPMENT INCLUDING DEARATOR TANK, PUMPS, CONDENSATE TANKS, CHEMICAL FEED SYSTEM, WATER TREATMENT , FUEL PIPING/STORAGE SYSTEMS, STEAM HEADER, ETC.
      2. RE: MECHANICAL SPECIFICATIONS.
      3. DISPLAY NO. 1 (ONE DISPLAY PER BOILER): INDIVIDUAL BOILER PRESSURE-COMPENSATED STEAM FLOW RATE, LB/HR; FLUE GAS OXYGEN, PERCENT; BOILER STACK TEMPERATURE, °F; ECONOMIZER FLUE GAS OUTLET TEMPERATURE, °F. PERCENT OPACITY (IF OPACITY MONITOR IS PROVIDED); FUEL FLOW RATE (IF FUEL METERS ARE PROVIDED ON THE BOILERS), GPM; FEEDWATER FLOW RATE (IF FEEDWATER METERS ARE PROVIDED ON THE BOILERS) GPM.
      4. DISPLAY NO. 2: PRESSURE-COMPENSATED STEAM FLOW RATE FOR: TOTAL OF ALL BOILERS, IN-PLANT STEAM LINE; AND EACH DISTRIBUTION STEAM LINE, LB/HR; TOTAL PLANT FUEL FLOW RATE, GPM.
      5. DISPLAY NO. 3: OUTSIDE AIR TEMPERATURE, °F; FEEDWATER TEMPERATURE, °F; STEAM HEADER PRESSURE, PSIG.
      6. COMMUNICATION WITH BURNER MANAGEMENT (FLAME SAFEGUARD) CONTROL SYSTEMS: PROVIDE MEANS TO COMMUNICATE WITH EACH BURNER SAFETY CONTROL SYSTEM TO DETERMINE STATUS, OPERATING HOURS, FLAME SIGNAL STRENGTH, HISTORY OF LOCKOUTS, NUMBER OF SHORT CIRCUIT EVENTS, OTHER DATA NECESSARY FOR REMOTE TROUBLE-SHOOTING.
      7. RE: MECHANICAL SPECIFICATIONS. RE: MECHANICAL CONSTRUCTION DOCUMENTS FOR CPU WORKSTATION PLAN.

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

OEI O'BRIEN ENGINEERING | ARCHITECTURE

ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

OEI - LBL

STAMP

STATE OF TEXAS
Joseph A. Palermo, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title	Phase	Project Title	Project Number
CONTROLS DIAGRAMS	100% CONSTRUCTION DOCUMENTS	A/E REPLACE BOILERS	519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Drawing Number: MI601
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	

Autodesk Docs://0489001013 VABS Boiler Replacement/0489001013 MECHPR25.rvt

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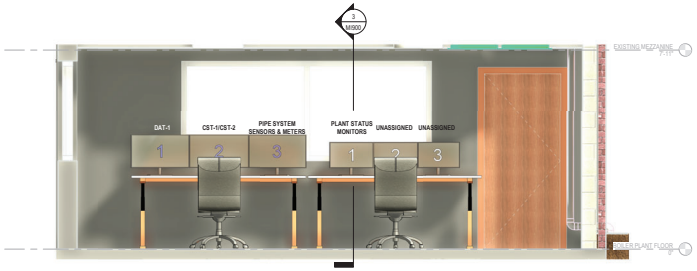
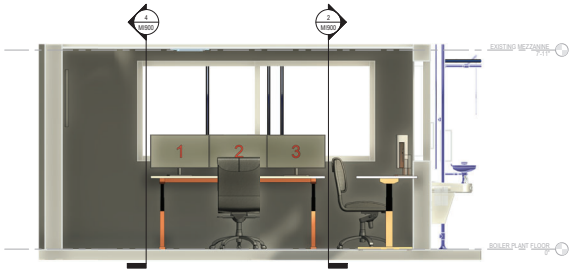
VA FORM 08 - 6231

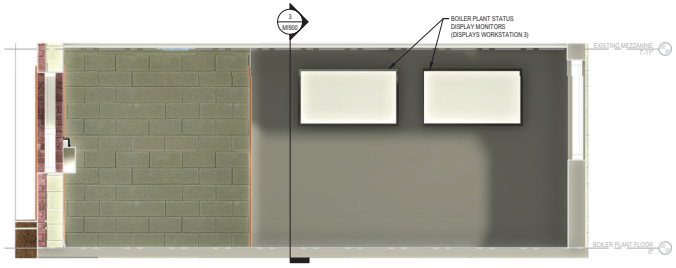
1 OPERATIONS OFFICE - 3D VIEW PLAN
SCALE: NONE



2 OPERATIONS OFFICE SECTION (LOOKING EAST)
SCALE: 1/2" = 1'-0"



3 OPERATIONS OFFICE SECTION (LOOKING NORTH)
SCALE: 1/2" = 1'-0"



4 OPERATIONS OFFICE SECTION (LOOKING WEST)
SCALE: 1/2" = 1'-0"

5 3D Control Room (North Wall)
SCALE: NONE

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

OEI O'BRIEN ENGINEERING | ARCHITECTURE

ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

OEI - LBL

STAMP

STATE OF TEXAS
Jon A. Lalotto, Jr.
91464
LICENSED PROFESSIONAL ENGINEER

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: OPERATIONS OFFICE - 3D VIEW AND SECTIONS	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BOILER PLANT	Drawing Number: MI900
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: DMB	

VA FORM 08 - 6231

Autodesk Docs://0489001/0131 VABS Boiler Replacement/0489001-01-MECH-R25.rvt

10/10/2025 3:32:41 AM

WEST TEXAS VA HEALTHCARE SYSTEM

A/E REPLACE BOILERS

519-20-200

BIG SPRING, TEXAS

GENERAL NOTES

1. **GENERAL REQUIREMENTS**
   A. **GENERAL**
      1. **DESCRIPTION**: FURNISH AND INSTALL ELECTRICAL SYSTEMS, MATERIALS, EQUIPMENT, AND ACCESSORIES IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS. CAPACITIES AND RATINGS OF MOTORS, TRANSFORMERS, CONDUCTORS AND CABLE, SWITCHBOARDS, SWITCHGEAR, PANELBOARDS, MOTOR CONTROL CENTERS, GENERATORS, AUTOMATIC TRANSFER SWITCHES, AND OTHER ITEMS AND ARRANGEMENTS FOR THE SPECIFIED ITEMS ARE SHOWN ON THE DRAWINGS.
      2. ELECTRICAL SERVICE ENTRANCE EQUIPMENT AND ARRANGEMENTS FOR TEMPORARY AND PERMANENT CONNECTIONS TO THE ELECTRIC UTILITY COMPANY'S SYSTEM SHALL CONFORM TO THE ELECTRIC UTILITY COMPANY'S REQUIREMENTS. COORDINATE FUSES, CIRCUIT BREAKERS AND RELAYS WITH THE ELECTRIC UTILITY COMPANY'S SYSTEM, AND OBTAIN ELECTRIC UTILITY COMPANY APPROVAL FOR SIZES AND SETTINGS OF THESE DEVICES.
      3. CONDUCTOR AMPACITIES SPECIFIED OR SHOWN ON THE DRAWINGS ARE BASED ON COPPER CONDUCTORS, WITH THE CONDUIT AND RACEWAYS SIZED PER NEC. ALUMINUM CONDUCTORS ARE PROHIBITED.
      4. THE LATEST INTERNATIONAL BUILDING CODE (IBC), UNDERWRITERS LABORATORIES, INC. (UL), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE), AND NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CODES AND STANDARDS ARE THE MINIMUM REQUIREMENTS FOR MATERIALS AND INSTALLATION.
      5. THE DRAWINGS AND SPECIFICATIONS SHALL GOVERN IN THOSE INSTANCES WHERE REQUIREMENTS ARE GREATER THAN THOSE STATED IN THE ABOVE CODES AND STANDARDS.
      6. TEST STANDARDS: ALL MATERIALS AND EQUIPMENT SHALL BE LISTED, LABELED, OR CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) TO MEET UNDERWRITERS LABORATORIES, INC. (UL), STANDARDS WHERE TEST STANDARDS HAVE BEEN ESTABLISHED. MATERIALS AND EQUIPMENT WHICH ARE NOT COVERED BY UL STANDARDS WILL BE ACCEPTED, PROVIDING THAT MATERIALS AND EQUIPMENT ARE LISTED, LABELED, CERTIFIED OR OTHERWISE DETERMINED TO MEET THE SAFETY REQUIREMENTS OF A NRTL. MATERIALS AND EQUIPMENT WHICH NO NRTL ACCEPTS, CERTIFIES, LISTS, LABELS, OR DETERMINES TO BE SAFE, WILL BE CONSIDERED IF INSPECTED OR TESTED IN ACCORDANCE WITH NATIONAL INDUSTRIAL STANDARDS, SUCH AS ANSI, NEMA, AND NETA. EVIDENCE OF COMPLIANCE SHALL INCLUDE CERTIFIED TEST REPORTS AND DEFINITIVE SHOP DRAWINGS.
      7. MATERIALS AND EQUIPMENT PROTECTION: MATERIALS AND EQUIPMENT SHALL BE PROTECTED DURING SHIPMENT AND STORAGE AGAINST PHYSICAL DAMAGE, VERMIN, DIRT, CORROSIVE SUBSTANCES, FUMES, MOISTURE, COLD AND RAIN.
      8. WORK PERFORMANCE:
         a. ALL ELECTRICAL WORK SHALL COMPLY WITH REQUIREMENTS OF THE LATEST NFPA 70 (NEC), NFPA 70B, NFPA 70E, NFPA 99, NFPA 110, OSHA PART 1910 SUBPART J – GENERAL ENVIRONMENTAL CONTROLS, OSHA PART 1910 SUBPART K – MEDICAL AND FIRST AID, AND OSHA PART 1910 SUBPART S – ELECTRICAL, IN ADDITION TO OTHER REFERENCES REQUIRED BY CONTRACT.
         b. JOB SITE SAFETY AND WORKER SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR.
         c. FOR WORK THAT AFFECTS EXISTING ELECTRICAL SYSTEMS, ARRANGE, PHASE AND PERFORM WORK TO ASSURE MINIMAL INTERFERENCE WITH NORMAL FUNCTIONING OF THE FACILITY. REFER TO ARTICLE OPERATIONS AND STORAGE AREAS UNDER SECTION GENERAL REQUIREMENTS.
         d. NEW WORK SHALL BE INSTALLED AND CONNECTED TO EXISTING WORK NEATLY, SAFELY AND PROFESSIONALLY. DISTURBED OR DAMAGED WORK SHALL BE REPLACED OR REPAIRED TO ITS PRIOR CONDITIONS, AS REQUIRED BY SECTION GENERAL REQUIREMENTS.
         e. COORDINATE LOCATION OF EQUIPMENT AND CONDUIT WITH OTHER TRADES TO MINIMIZE INTERFERENCE.
      9. EQUIPMENT INSTALLATION AND REQUIREMENTS:
         a. EQUIPMENT LOCATION SHALL BE AS CLOSE AS PRACTICAL TO LOCATIONS SHOWN ON THE DRAWINGS.
         b. WORKING CLEARANCES SHALL NOT BE LESS THAN SPECIFIED IN THE NEC.
         c. ELECTRICAL SERVICE ENTRANCE EQUIPMENT AND ARRANGEMENTS FOR TEMPORARY AND PERMANENT CONNECTIONS TO THE ELECTRIC UTILITY COMPANY'S SYSTEM SHALL CONFORM TO THE ELECTRIC UTILITY COMPANY'S REQUIREMENTS. COORDINATE FUSES, CIRCUIT BREAKERS AND RELAYS WITH THE ELECTRIC UTILITY COMPANY'S SYSTEM, AND OBTAIN ELECTRIC UTILITY COMPANY APPROVAL FOR SIZES AND SETTINGS OF THESE DEVICES.
      10. EQUIPMENT ID
         a. IN ADDITION TO THE REQUIREMENTS OF THE NEC, INSTALL AN IDENTIFICATION SIGN WHICH CLEARLY INDICATES INFORMATION REQUIRED FOR USE AND MAINTENANCE OF ITEMS SUCH AS SWITCHBOARDS SWITCHGEAR, PANELBOARDS, CABINETS, MOTOR CONTROLLERS, FUSED AND NON-FUSED SAFETY SWITCHES, GENERATORS, AUTOMATIC TRANSFER SWITCHES, SEPARately ENCLOSED CIRCUIT BREAKERS, INDIVIDUAL BREAKERS AND CONTROLLERS IN SWITCHBOARDS, SWITCHGEAR AND MOTOR CONTROL ASSEMBLIES, CONTROL DEVICES AND OTHER SIGNIFICANT EQUIPMENT.
         b. INSTALL ADHESIVE ARC FLASH WARNING LABELS ON ALL EQUIPMENT AS REQUIRED BY THE LATEST NFPA 70E. LABEL SHALL SHOW SPECIFIC AND CORRECT INFORMATION FOR SPECIFIC EQUIPMENT BASED ON ITS ARC FLASH CALCULATIONS.
   B. **SUBMITTALS**
      1. SUBMIT SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES IN APPROPRIATE SUBMITTAL PACKAGES.
      2. APPROVAL SHALL BE OBTAINED FOR ALL MATERIALS AND EQUIPMENT BEFORE DELIVERY TO THE JOB SITE. DELIVERY, STORAGE OR INSTALLATION OF MATERIALS AND EQUIPMENT WHICH HAS NOT MET PRIOR APPROVAL WILL NOT BE PERMITTED.
      3. ALL SUBMITTALS SHALL INCLUDE SIX COPIES OF ADEQUATE DESCRIPTIVE LITERATURE, CATALOG CUTS, SHOP DRAWINGS, TEST REPORTS, CERTIFICATIONS, SAMPLES, AND OTHER DATA NECESSARY FOR THE TO ASCERTAIN THAT THE PROPOSED MATERIALS AND EQUIPMENT COMPLY WITH DRAWING AND SPECIFICATION REQUIREMENTS. CATALOG CUTS SUBMITTED FOR APPROVAL SHALL BE LEGIBLE AND CLEARLY IDENTIFY SPECIFIC MATERIALS AND EQUIPMENT BEING SUBMITTED.
      4. SUBMITTALS FOR INDIVIDUAL SYSTEMS AND EQUIPMENT ASSEMBLIES WHICH CONSIST OF MORE THAN ONE ITEM OR COMPONENT SHALL BE MADE FOR THE ENTIRE ASSEMBLY AS A WHOLE. PARTIAL SUBMITTALS WILL NOT BE CONSIDERED FOR APPROVAL.
      5. SUBMIT AS REQUIRED FOR SYSTEMS AND EQUIPMENT SPECIFIED IN THE TECHNICAL SECTIONS. FURNISH IN HARDCOVER BINDERS OR AN APPROVED EQUIVALENT.
      6. APPROVALS WILL BE BASED ON COMPLETE SUBMISSION OF SHOP DRAWINGS, MANUALS, TEST REPORTS, CERTIFICATIONS, AND SAMPLES AS APPLICABLE.
      7. WARRANTY
         a. ALL WORK PERFORMED AND ALL EQUIPMENT AND MATERIAL FURNISHED UNDER THIS DIVISION SHALL BE FREE FROM DEFECTS AND SHALL REMAIN SO FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE OF THE ENTIRE INSTALLATION.
2. **LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**
   A. **GENERAL**
      1. **DESCRIPTION**: FURNISHING, INSTALLATION, CONNECTION, AND TESTING OF THE ELECTRICAL CONDUCTORS AND CABLES FOR USE IN ELECTRICAL SYSTEMS RATED 600 V AND BELOW, INDICATED AS CABLE(S), CONDUCTOR(S), WIRE, OR WIRING IN THIS SECTION.
      2. **SUBMITTALS**
         a. SHOP DRAWINGS: SUBMIT SUFFICIENT INFORMATION TO DEMONSTRATE COMPLIANCE WITH DRAWINGS AND SPECIFICATIONS.
         b. SHOP DRAWINGS: ELECTRICAL RATINGS AND INSULATION TYPE FOR EACH CONDUCTOR AND CABLE.
         c. SUBMIT THE FOLLOWING DATA FOR APPROVAL: ELECTRICAL RATINGS AND INSULATION TYPE FOR EACH CONDUCTOR AND CABLE.
         d. SUBMIT THE FOLLOWING DATA FOR APPROVAL: SPLICING MATERIALS AND PULLING LUBRICANT.
   B. **PRODUCTS**
      1. **CONDUCTORS AND CABLES**
         a. CONDUCTORS AND CABLES SHALL BE IN ACCORDANCE WITH ASTM, NEMA, NFPA, UL, AS SPECIFIED, AND AS SHOWN ON THE DRAWINGS.
         b. ALL CONDUCTORS SHALL BE COPPER.
         c. SINGLE CONDUCTOR AND CABLE:
            - NO. 12 AWG: MINIMUM SIZE, EXCEPT WHERE SMALLER SIZES ARE SPECIFIED HEREIN OR SHOWN ON THE DRAWINGS.
            - NO. 8 AWG AND LARGER: STRANDED.
            - NO. 10 AWG AND SMALLER: SOLID, EXCEPT SHALL BE STRANDED FOR FINAL CONNECTION TO MOTORS, TRANSFORMERS, AND VIBRATING EQUIPMENT.
            - INSULATION: THHN-THWN AND XHHW-2. XHHW-2 SHALL BE USED FOR ISOLATED POWER SYSTEMS.
         d. COLOR CODE:
            - NO. 10 AWG AND SMALLER: SOLID COLOR INSULATION OR SOLID COLOR COATING.
            - NO. 8 AWG AND LARGER: COLOR-CODED USING ONE OF THE FOLLOWING METHODS:
            - SOLID COLOR INSULATION OR SOLID COLOR COATING.
            - STRIPES, BANDS, OR HASH MARKS OF COLOR SPECIFIED.
            - COLOR USING 19 MM (0.75 INCHES) WIDE TAPE.
         e. FOR MODIFICATIONS AND ADDITIONS TO EXISTING WIRING SYSTEMS, COLOR CODING SHALL CONFORM TO THE EXISTING WIRING SYSTEM.
         f. LIGHTING CIRCUIT "SWITCH LEGS", AND 3-WAY AND 4-WAY SWITCH "TRAVELING WIRES," SHALL HAVE COLOR CODING THAT IS UNIQUE AND DISTINCT (E.G., PINK AND PURPLE) FROM THE COLOR CODING INDICATED ABOVE. THE UNIQUE COLOR CODES SHALL BE SOLID COLOR IN ACCORDANCE WITH THE NEC. COORDINATE COLOR CODING IN THE FIELD CLIENT PROJECT REPRESENTATIVE.
         g. COLOR CODE FOR ISOLATED POWER SYSTEM WIRING SHALL BE IN ACCORDANCE WITH THE NEC.
            - 208/120V PHASE 480/277V
            - BLACK A A BROWN
            - RED B B ORANGE
            - BLUE C C YELLOW
            - WHITE NEUTRAL GRAY*
            - * OR WHITE WITH COLORED (OTHER THAN GREEN) TRACER.
      2. **SPLICES**
         a. SPLICES SHALL BE IN ACCORDANCE WITH NEC AND UL.
         b. ABOVE GROUND SPLICES FOR NO. 10 AWG AND SMALLER:
            - SOLDERLESS, SCREW-ON, REUSABLE PRESSURE CABLE TYPE, WITH INTEGRAL INSULATION, APPROVED FOR COPPER AND ALUMINUM CONDUCTORS.
            - THE INTEGRAL INSULATOR SHALL HAVE A SKIRT TO COMPLETELY COVER THE STRIPPED CONDUCTORS.
            - THE NUMBER, SIZE, AND COMBINATION OF CONDUCTORS USED WITH THE CONNECTOR, AS LISTED ON THE MANUFACTURER'S PACKAGING, SHALL BE STRICTLY FOLLOWED.
         c. ABOVE GROUND SPLICES FOR NO. 8 AWG TO NO. 4/0 AWG:
            - COMPRESSION, HEX SHAPED, OR SINGLE CLAMP- TYPE OF HIGH CONDUCTIVITY AND CORROSION-RESISTANT MATERIAL, LISTED FOR USE WITH COPPER AND ALUMINUM CONDUCTORS.
            - INSULATE WITH MATERIALS APPROVED FOR THE PARTICULAR USE, LOCATION, VOLTAGE, AND TEMPERATURE. INSULATION LEVEL SHALL BE NOT LESS THAN THE INSULATION LEVEL OF THE CONDUCTORS BEING JOINED.
            - SPLICE AND INSULATION SHALL BE FACTORY OF MANUFACTURER.
            - ALL BOLTS, NUTS, AND WASHERS USED WITH SPLICES SHALL BE ZINC-PLATED STEEL.
      3. **CONNECTIONS**
         a. MECHANICAL TYPE OF HIGH CONDUCTIVITY AND CORROSION-RESISTANT MATERIAL, LISTED FOR USE WITH COPPER AND ALUMINUM CONDUCTORS.
         b. LONG BARREL COMPRESSION TYPE OF HIGH CONDUCTIVITY AND CORROSION-RESISTANT MATERIAL, WITH MINIMUM OF TWO COMPRESSION INDENTS PER WIRE, LISTED FOR USE WITH COPPER AND ALUMINUM CONDUCTORS.
         c. ALL BOLTS, NUTS, AND WASHERS USED TO CONNECT CONNECTIONS AND TERMINATIONS TO BUS BARS OR OTHER TERMINATION POINTS SHALL BE ZINC-PLATED STEEL.
      4. **CONTROL WIRING**
         a. UNLESS OTHERWISE SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS, CONTROL WIRING SHALL BE AS SPECIFIED HEREIN, EXCEPT THAT THE MINIMUM SIZE SHALL BE NOT LESS THAN NO. 14 AWG.
         b. CONTROL WIRING SHALL BE SIZED SUCH THAT THE VOLTAGE DROP UNDER IN-RUSH CONDITIONS DOES NOT ADVERSELY AFFECT OPERATION OF THE CONTROLS.
   C. **EXECUTION**
      1. **GENERAL**
         a. INSTALLATION SHALL BE IN ACCORDANCE WITH THE NEC, AS SHOWN ON THE DRAWINGS, AND MANUFACTURER'S INSTRUCTIONS.
         b. INSTALL ALL CONDUCTORS IN RACEWAY SYSTEMS.
         c. SPLICE CONDUCTORS ONLY IN OUTLET BOXES, JUNCTION BOXES, PULLBOXES, MANHOLES, OR HANDHOLES.
         d. CONDUCTORS OF DIFFERENT SYSTEMS (E.G., 120 V AND 277 V) SHALL NOT BE INSTALLED IN THE SAME RACEWAY.
         e. INSTALL CABLE SUPPORTS FOR ALL VERTICAL FEEDERS IN ACCORDANCE WITH THE NEC. PROVIDE SPLIT WEDGE TYPE WHICH FIRMLY CLAMPS EACH INDIVIDUAL CABLE AND TIGHTENS DUE TO CABLE WEIGHT.
         f. IN PANELBOARDS, CABINETS, WIREWAYS, SWITCHES, ENCLOSURES, AND EQUIPMENT ASSEMBLIES, NEATLY FORM, TRAIN, AND TIE THE CONDUCTORS WITH NON-METALLIC TIES.
         g. FOR CONNECTIONS TO MOTORS, TRANSFORMERS, AND VIBRATING EQUIPMENT, STRANDED CONDUCTORS SHALL BE USED ONLY FROM THE LAST FIXED POINT OF CONNECTION TO THE MOTORS, TRANSFORMERS, OR VIBRATING EQUIPMENT.
         h. USE EXPANDING FOAM OR NON-HARDENING DUCT-SEAL TO SEAL CONDUITS ENTERING A BUILDING, AFTER INSTALLATION OF CONDUCTORS.
         i. NO MORE THAN THREE BRANCH CIRCUITS SHALL BE INSTALLED IN ANY ONE CONDUIT.
      2. **SPLICES AND TERMINATIONS INSTALLATION**: SPLICES AND TERMINATIONS SHALL BE MECHANICALLY AND ELECTRICALLY SECURE, AND TIGHTENED TO MANUFACTURER'S PUBLISHED TORQUE VALUES USING A TORQUE SCREWDRIVER OR WRENCH.
      3. **CONDUCTOR IDENTIFICATION**: WHEN USING COLORED TAPE TO IDENTIFY PHASE, NEUTRAL, AND GROUND CONDUCTORS LARGER THAN NO. 8 AWG, APPLY TAPE IN HALF-OVERLAPPING TURNS FOR A MINIMUM OF 75 MM (3 INCHES) FROM TERMINAL POINTS, AND IN JUNCTION BOXES, PULLBOXES, AND MANHOLES. APPLY THE LAST TWO LAPS OF TAPE WITH NO TENSION TO PREVENT POSSIBLE UNWINDING. WHERE CABLE MARKINGS ARE COVERED BY TAPE, APPLY TAGS TO CABLE, STATING SIZE AND INSULATION TYPE.
      4. **FEEDER CONDUCTOR IDENTIFICATION**: IN EACH INTERIOR PULLBOX AND EACH UNDERGROUND MANHOLE AND HANDHOLE, INSTALL BRASS TAGS ON ALL FEEDER CONDUCTORS TO CLEARLY DESIGNATE THEIR CIRCUIT IDENTIFICATION AND VOLTAGE. THE TAGS SHALL BE THE EMBOSSED TYPE, 40 MM (1-1/2 INCHES) IN DIAMETER AND 40 MILS THICK. ATTACH TAGS WITH PLASTIC TIES.
      5. **EXISTING CONDUCTORS**: UNLESS SPECIFICALLY INDICATED ON THE PLANS, EXISTING CONDUCTORS SHALL NOT BE REUSED.
      6. **CONTROL WIRING INSTALLATION**: INSTALL A SEPARATE POWER SUPPLY CIRCUIT FOR EACH SYSTEM, EXCEPT WHERE OTHERWISE SHOWN ON THE DRAWINGS.
      7. **ACCEPTANCE CHECKS AND TESTS**
         a. AFTER INSTALLATION BUT BEFORE CONNECTION TO UTILIZATION DEVICES, SUCH AS FIXTURES, MOTORS, OR APPLIANCES, TEST CONDUCTORS PHASE-TO-PHASE AND PHASE-TO-GROUND RESISTANCE WITH AN INSULATION RESISTANCE TESTER. EXISTING CONDUCTORS TO BE REUSED SHALL ALSO BE TESTED.
         b. PERFORM PHASE ROTATION TEST ON ALL THREE-PHASE CIRCUITS
3. **GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**
   A. **GENERAL**
      1. **DESCRIPTION**: FURNISHING, INSTALLATION, CONNECTION, AND TESTING OF GROUNDING AND BONDING EQUIPMENT, INDICATED AS GROUNDING EQUIPMENT IN THIS SECTION.
      2. "GROUNDING ELECTRODE SYSTEM" REFERS TO GROUNDING ELECTRODE CONDUCTORS AND ALL ELECTRODES REQUIRED OR ALLOWED BY NEC, AS WELL AS MADE, SUPPLEMENTARY, AND LIGHTNING PROTECTION SYSTEM GROUNDING ELECTRODES.
      3. THE TERMS "CONNECT" AND "BOND" ARE USED INTERCHANGEABLY IN THIS SECTION AND HAVE THE SAME MEANING.
      4. **SUBMITTALS**
         a. SHOP DRAWINGS:
            - SUBMIT SUFFICIENT INFORMATION TO DEMONSTRATE COMPLIANCE WITH DRAWINGS AND SPECIFICATIONS.
            - SUBMIT PLANS SHOWING THE LOCATION OF SYSTEM GROUNDING ELECTRODES AND CONNECTIONS, AND THE ROUTING OF ABOVEGROUND AND UNDERGROUND GROUNDING ELECTRODE CONDUCTORS.
   B. **PRODUCTS**
      1. **GROUNDING AND BONDING CONDUCTORS**
         a. EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSULATED STRANDED COPPER, EXCEPT THAT SIZES NO. 10 AWG AND SMALLER SHALL BE SOLID COPPER. INSULATION COLOR SHALL BE CONTINUOUS GREEN FOR ALL EQUIPMENT GROUNDING CONDUCTORS, EXCEPT THAT WIRE SIZES NO. 4 AWG AND LARGER SHALL BE IDENTIFIED PER NEC.
         b. BONDING CONDUCTORS SHALL BE BARE STRANDED COPPER, EXCEPT THAT SIZES NO. 10 AWG AND SMALLER SHALL BE BARE SOLID COPPER. BONDING CONDUCTORS SHALL BE STRANDED FOR FINAL CONNECTION TO MOTORS, TRANSFORMERS, AND VIBRATING EQUIPMENT.
         c. CONDUCTOR SIZES SHALL NOT BE LESS THAN SHOWN ON THE DRAWINGS, OR NOT LESS THAN REQUIRED BY THE NEC, WHICHEVER IS GREATER.
         d. INSULATION: THHN-THWN AND XHHW-2. XHHW-2 SHALL BE USED FOR ISOLATED POWER SYSTEMS.
      2. **GROUND RODS**: CONCRETE ENCASED ELECTRODE SHALL BE NO. 4 AWG BARE COPPER WIRE, INSTALLED PER NEC.
      3. **GROUND CONNECTIONS**:
         a. BELOW GRADE:
            - BELOW GRADE AND INACCESSIBLE LOCATIONS: EXOTHERMIC-WELDED TYPE CONNECTORS.
         b. ABOVE GRADE:
            - BONDING JUMPERS: LISTED FOR USE WITH ALUMINUM AND COPPER CONDUCTORS. FOR WIRE SIZES NO. 8 AWG AND LARGER: USE COMPRESSION-TYPE CONNECTORS. FOR WIRE SIZES SMALLER THAN NO. 8 AWG: USE MECHANICAL TYPE LUGS. CONNECTORS OR LUGS SHALL USE ZINC-PLATED STEEL BOLTS, NUTS, AND WASHERS. BOLTS SHALL BE TORQUED TO THE VALUES RECOMMENDED BY THE MANUFACTURER.
            - CONNECTION TO BUILDING STEEL: EXOTHERMIC-WELDED TYPE CONNECTORS.
            - CONNECTION TO GROUNDING BUS BARS: LISTED FOR USE WITH ALUMINUM AND COPPER CONDUCTORS. USE MECHANICAL TYPE LUGS, WITH ZINC-PLATED/CADMIUM-PLATED/ STEEL BOLTS, NUTS, AND WASHERS. BOLTS SHALL BE TORQUED TO THE VALUES RECOMMENDED BY THE MANUFACTURER.
         c. EQUIPMENT RACK AND CABINET GROUND BARS: PROVIDE SOLID COPPER GROUND BARS DESIGNED FOR MOUNTING ON THE FRAMEWORK OF OPEN OR CABINET-ENCLOSED EQUIPMENT RACKS. GROUND BARS SHALL HAVE MINIMUM DIMENSIONS OF 6.3 MM (0.25 INCH) THICK X 19 MM (0.75 INCH) WIDE, WITH LENGTH AS REQUIRED OR AS SHOWN ON THE DRAWINGS. PROVIDE INSULATORS AND MOUNTING BRACKETS.
         d. GROUND TERMINAL BLOCKS: AT ANY EQUIPMENT MOUNTING LOCATION (E.G., BACKBOARDS AND HINGED COVER ENCLOSURES) WHERE RACK-TYPE GROUND BARS CANNOT BE MOUNTED, PROVIDE MECHANICAL TYPE LUGS, WITH ZINC-PLATED STEEL BOLTS, NUTS, AND WASHERS. BOLTS SHALL BE TORQUED TO THE VALUES RECOMMENDED BY THE MANUFACTURER.
         e. GROUNDING BUS BAR: PRE-DRILLED RECTANGULAR COPPER BAR WITH STAND-OFF INSULATORS, MINIMUM 6.3 MM (0.25 INCH) THICK X 100 MM (4 INCHES) HIGH IN CROSS-SECTION, LENGTH AS SHOWN ON THE DRAWINGS, WITH HOLE SIZE, QUANTITY, AND SPACING PER DETAIL SHOWN ON THE DRAWINGS. PROVIDE INSULATORS AND MOUNTING BRACKETS.
   C. **EXECUTION**
      1. **GENERAL**
         a. INSTALLATION SHALL BE IN ACCORDANCE WITH THE NEC, AS SHOWN ON THE DRAWINGS, AND MANUFACTURER'S INSTRUCTIONS.
         b. SYSTEM GROUNDING
            - SECONDARY SERVICE NEUTRALS: GROUND AT THE SUPPLY SIDE OF THE SECONDARY DISCONNECTING MEANS AND AT THE RELATED TRANSFORMER.
            - SEPARATELY DERIVED SYSTEMS (TRANSFORMERS DOWNSTREAM FROM THE SERVICE ENTRANCE): GROUND THE SECONDARY NEUTRAL.
            - ISOLATION TRANSFORMERS AND ISOLATED POWER SYSTEMS SHALL NOT BE SYSTEM GROUNDED.
         c. EQUIPMENT GROUNDING: METALLIC PIPING, BUILDING STRUCTURAL STEEL, ELECTRICAL ENCLOSURES, RACEWAYS, JUNCTION BOXES, OUTLET BOXES, CABINETS, MACHINE FRAMES, AND OTHER CONDUCTIVE ITEMS IN CLOSE PROXIMITY WITH ELECTRICAL CIRCUITS, SHALL BE BONDED AND GROUNDED.
      2. **INACCESSIBLE GROUNDING CONNECTIONS**
         a. MAKE GROUNDING CONNECTIONS, WHICH ARE NORMALLY BURIED OR OTHERWISE INACCESSIBLE, BY EXOTHERMIC WELD.
      3. **SECONDARY VOLTAGE EQUIPMENT AND CIRCUITS**
         a. MAIN BONDING JUMPER: BOND THE SECONDARY SERVICE NEUTRAL TO THE GROUND BUS IN THE SERVICE EQUIPMENT.
         b. METALLIC PIPING, BUILDING STRUCTURAL STEEL, AND SUPPLEMENTAL ELECTRODE(S):
         c. PROVIDE A GROUNDING ELECTRODE CONDUCTOR SIZED PER NEC BETWEEN THE SERVICE EQUIPMENT GROUND BUS AND ALL METALLIC WATER PIPE SYSTEMS, BUILDING STRUCTURAL STEEL, AND SUPPLEMENTAL OR MADE ELECTRODES. PROVIDE JUMPERS ACROSS INSULATING JOINTS IN THE METALLIC PIPING.
         d. PROVIDE A SUPPLEMENTAL ELECTRODE AS SHOWN ON THE DRAWINGS AND BOND TO THE GROUNDING ELECTRODE SYSTEM.
         e. SWITCHGEAR, SWITCHBOARDS, UNIT SUBSTATIONS, PANELBOARDS, MOTOR CONTROL CENTERS, ENGINE-GENERATORS, AUTOMATIC TRANSFER SWITCHES, AND OTHER ELECTRICAL EQUIPMENT:
         f. CONNECT THE EQUIPMENT GROUNDING CONDUCTORS TO THE GROUND BUS.
         g. CONNECT METALLIC CONDUITS BY GROUNDING BUSHINGS AND EQUIPMENT GROUNDING CONDUCTOR TO THE EQUIPMENT GROUND BUS.
         h. EXTERIOR: EXTERIOR TRANSFORMERS SUPPLYING INTERIOR SERVICE EQUIPMENT SHALL HAVE THE NEUTRAL GROUNDED AT THE TRANSFORMER SECONDARY. PROVIDE A GROUNDING ELECTRODE AT THE TRANSFORMER. SEPARATELY DERIVED SYSTEMS (TRANSFORMERS DOWNSTREAM FROM SERVICE EQUIPMENT): GROUND THE SECONDARY NEUTRAL AT THE TRANSFORMER. PROVIDE A GROUNDING ELECTRODE CONDUCTOR FROM THE TRANSFORMER TO THE NEAREST COMPONENT OF THE GROUNDING ELECTRODE SYSTEM OR THE GROUND BAR AT THE SERVICE EQUIPMENT.
      4. **RACEWAY**
         a. CONDUIT SYSTEMS
            - GROUND ALL METALLIC CONDUIT SYSTEMS. ALL METALLIC CONDUIT SYSTEMS SHALL CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR.
            - NON-METALLIC CONDUIT SYSTEMS, EXCEPT NON-METALLIC FEEDER CONDUITS THAT CARRY A GROUNDED CONDUCTOR FROM EXTERIOR TRANSFORMERS TO INTERIOR OR BUILDING-MOUNTED SERVICE ENTRANCE EQUIPMENT, SHALL CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR.
            - METALLIC CONDUIT THAT ONLY CONTAINS A GROUNDING CONDUCTOR, AND IS PROVIDED FOR ITS MECHANICAL PROTECTION, SHALL BE BONDED TO THAT CONDUCTOR AT THE ENTRANCE AND EXIT FROM THE CONDUIT.
            - METALLIC CONDUITS WHICH TERMINATE WITHOUT MECHANICAL CONNECTION TO AN ELECTRICAL EQUIPMENT HOUSING BY MEANS OF LOCKNUT AND BUSHINGS OR ADAPTERS, SHALL BE PROVIDED WITH GROUNDING BUSHINGS. CONNECT BUSHINGS WITH A EQUIPMENT GROUNDING CONDUCTOR TO THE EQUIPMENT GROUND BUS.
            - FEEDERS AND BRANCH CIRCUITS: INSTALL EQUIPMENT GROUNDING CONDUCTORS WITH ALL FEEDERS, AND POWER AND LIGHTING BRANCH CIRCUITS.
            - BOXES, CABINETS, ENCLOSURES, AND PANELBOARDS: BOND THE EQUIPMENT GROUNDING CONDUCTOR TO EACH PULLBOX, JUNCTION BOX, OUTLET BOX, DEVICE BOX, CABINETS, AND OTHER ENCLOSURES THROUGH WHICH THE CONDUCTOR PASSES (EXCEPT FOR SPECIAL GROUNDING SYSTEMS FOR INTENSIVE CARE UNITS AND OTHER CRITICAL UNITS SHOWN).
            - BOXES, CABINETS, ENCLOSURES, AND PANELBOARDS: PROVIDE LUGS IN EACH BOX AND ENCLOSURE FOR EQUIPMENT GROUNDING CONDUCTOR TERMINATION.
         b. RECEPTACLES SHALL NOT BE GROUNDED THROUGH THEIR MOUNTING SCREWS. GROUND RECEPTACLES WITH A JUMPER FROM THE RECEPTACLE GREEN GROUND TERMINAL TO THE DEVICE BOX GROUND SCREW AND A JUMPER TO THE BRANCH CIRCUIT EQUIPMENT GROUNDING CONDUCTOR.
         c. GROUND LIGHTING FIXTURES TO THE EQUIPMENT GROUNDING CONDUCTOR OF THE WIRING SYSTEM. FIXTURES CONNECTED WITH FLEXIBLE CONDUIT SHALL HAVE A GREEN GROUND WIRE INCLUDED WITH THE POWER WIRES FROM THE FIXTURE THROUGH THE FLEXIBLE CONDUIT TO THE FIRST OUTLET BOX.
         d. **CORROSION INHIBITORS**: WHEN MAKING GROUNDING AND BONDING CONNECTIONS, APPLY A CORROSION INHIBITOR TO ALL CONTACT SURFACES. USE CORROSION INHIBITOR APPROPRIATE FOR PROTECTING A CONNECTION BETWEEN THE METALS USED.
         e. **CONDUCTIVE PIPING**: BOND ALL CONDUCTIVE PIPING SYSTEMS, INTERIOR AND EXTERIOR, TO THE GROUNDING ELECTRODE SYSTEM. BONDING CONNECTIONS SHALL BE MADE AS CLOSE AS PRACTICAL TO THE EQUIPMENT GROUND BUS.
         f. **LIGHTNING PROTECTION SYSTEM**: BOND THE LIGHTNING PROTECTION SYSTEM TO THE ELECTRICAL GROUNDING ELECTRODE SYSTEM.
         g. **MAIN ELECTRICAL ROOM GROUNDING**: PROVIDE GROUND BUS BAR AND MOUNTING HARDWARE AT EACH MAIN ELECTRICAL ROOM WHERE INCOMING FEEDERS ARE TERMINATED, AS SHOWN ON THE DRAWINGS. CONNECT TO PIGTAIL EXTENSIONS OF THE BUILDING GROUNDING ELECTRODE SYSTEM, AS SHOWN ON THE DRAWINGS.
         h. **EXTERIOR LIGHT POLES**: PROVIDE 6.1 M (20 FEET) OF NO. 4 AWG BARE COPPER COILED AT BOTTOM OF POLE BASE EXCAVATION PRIOR TO POUR, PLUS ADDITIONAL UNSPLICED LENGTH IN AND ABOVE FOUNDATION AS REQUIRED TO REACH POLE GROUND STUD.
         10. **GROUND ROD INSTALLATION**
         a. FOR OUTDOOR INSTALLATIONS, DRIVE EACH ROD VERTICALLY IN THE EARTH, UNTIL TOP OF ROD IS 610 MM (24 INCHES) BELOW FINAL GRADE.
         b. FOR INDOOR INSTALLATIONS, LEAVE 100 MM (4 INCHES) OF EACH ROD EXPOSED.
         c. WHERE BURIED OR PERMANENTLY CONCEALED GROUND CONNECTIONS ARE REQUIRED, MAKE THE CONNECTIONS BY THE EXOTHERMIC PROCESS, TO FORM SOLID METAL JOINTS. MAKE ACCESSIBLE GROUND CONNECTIONS WITH MECHANICAL PRESSURE-TYPE GROUND CONNECTORS.
4. **RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS**
   A. **GENERAL**
      1. DESCRIPTION: FURNISHING, INSTALLATION, AND CONNECTION OF CONDUIT, FITTINGS, AND BOXES, TO FORM COMPLETE, COORDINATED, GROUNDED RACEWAY SYSTEMS. RACEWAYS ARE REQUIRED FOR ALL WIRING UNLESS SHOWN OR SPECIFIED OTHERWISE.
      2. THE TERM CONDUIT, AS USED IN THIS SPECIFICATION, SHALL MEAN ANY OR ALL OF THE RACEWAY TYPES SPECIFIED.
      3. SUBMITTALS
         a. SHOP DRAWINGS: SIZE AND LOCATION OF MAIN FEEDERS, SIZE AND LOCATION OF PANELS AND PULL-BOXES, LAYOUT OF REQUIRED CONDUIT PENETRATIONS THROUGH STRUCTURAL ELEMENTS, RACEWAY TYPES AND SIZES, CONDUIT BODIES, CONNECTORS AND FITTINGS, JUNCTION AND PULL BOXES, TYPES AND SIZES.
   B. **PRODUCTS**
      1. **MATERIALS**
         a. CONDUIT SIZE: IN ACCORDANCE WITH THE NEC, BUT NOT LESS THAN 13 MM (0.5-INCH) UNLESS OTHERWISE SHOWN.
      2. **MATERIALS – CONDUIT**:
         a. SIZE: IN ACCORDANCE WITH THE NEC, BUT NOT LESS THAN 13 MM (0.5-INC

GENERAL NOTES

5. **WET OR DAMP LOCATIONS**
   a. USE RIGID STEEL OR IMC CONDUITS UNLESS AS SHOWN ON DRAWINGS.
   b. PROVIDE SEALING FITTINGS TO PREVENT PASSAGE OF WATER VAPOR WHERE CONDUITS PASS FROM WARM TO COLD LOCATIONS, I.E., REFRIGERATED SPACES, CONSTANT-TEMPERATURE ROOMS, AIR-CONDITIONED SPACES, BUILDING EXTERIOR WALLS, ROOFS, OR SIMILAR SPACES.
6. **MOTORS AND VIBRATING EQUIPMENT**
   a. USE FLEXIBLE METAL CONDUIT FOR CONNECTIONS TO MOTORS AND OTHER ELECTRICAL EQUIPMENT SUBJECT TO MOVEMENT, VIBRATION, MISALIGNMENT, CRAMPED QUARTERS, OR NOISE TRANSMISSION.
   b. USE LIQUID-TIGHT FLEXIBLE METAL CONDUIT FOR INSTALLATION IN EXTERIOR LOCATIONS, MOISTURE OR HUMIDITY LADEN ATMOSPHERE, CORROSIVE ATMOSPHERE, WATER OR SPRAY WASH-DOWN OPERATIONS, INSIDE AIRSTREAM OF HVAC UNITS, AND LOCATIONS SUBJECT TO SEEPAGE OR DRIPPING OF OIL, GREASE, OR WATER.
   c. PROVIDE A GREEN EQUIPMENT GROUNDING CONDUCTOR WITH FLEXIBLE AND LIQUID-TIGHT FLEXIBLE METAL CONDUIT.
7. **CONDUIT SUPPORTS**
   a. SUPPORT MULTIPLE CONDUIT RUNS WITH TRAPEZE HANGERS. USE TRAPEZE HANGERS THAT ARE DESIGNED TO SUPPORT A LOAD EQUAL TO OR GREATER THAN THE SUM OF THE WEIGHTS OF THE CONDUITS, WIRES, INSULATION ITSELF, AND AN ADDITIONAL 50 KG (200LBS). ATTACH EACH CONDUIT WITH U-BOLTS OR OTHER APPROVED FASTENERS.
   b. SUPPORT CONDUIT INDEPENDENTLY OF JUNCTION BOXES, PULL-BOXES, FIXTURES, SUSPENDED CEILING T-BARS, ANGLE SUPPORTS, AND SIMILAR ITEMS.
   c. VERTICAL SUPPORTS. VERTICAL CONDUIT RUNS SHALL HAVE RISER CLAMPS AND SUPPORTS IN ACCORDANCE WITH THE NEC AND AS SHOWN. PROVIDE SUPPORTS FOR CABLE AND WIRE WITH FITTINGS THAT INCLUDE INTERNAL WEDGES AND RETAINING COLLARS.
8. **BOX INSTALLATION**
   a. BOXES FOR CONCEALED CONDUITS:
      - FLUSH-MOUNTED
      - PROVIDE RAISED COVERS FOR BOXES TO SUIT THE WALL OR CEILING, CONSTRUCTION, AND FINISH.
   b. IN ADDITION TO BOXES SHOWN, INSTALL ADDITIONAL BOXES WHERE NEEDED TO PREVENT DAMAGE TO CABLES AND WIRES DURING PULLING IN OPERATIONS OTHERWISE THAN THE EQUIVALENT OF 4-90 DEGREE BENDS ARE NECESSARY.
   c. LOCATE PULLBOXES SO THAT COVERS ARE ACCESSIBLE AND EASILY REMOVED. COORDINATE LOCATIONS WITH PIPING AND DUCTWORK WHERE INSTALLED ABOVE CEILINGS.
   d. OUTLET BOXES MOUNTED BACK-TO-BACK IN THE SAME WALL ARE PROHIBITED. A MINIMUM 600 MM (24 INCH) CENTER-TO-CENTER LATERAL SPACING SHALL BE MAINTAINED BETWEEN BOXES.
   e. FLUSH-MOUNTED WALL OR CEILING BOXES SHALL BE INSTALLED WITH RAISED COVERS SO THAT THE FRONT FACE OF RAISED COVER IS FLUSH WITH THE WALL. SURFACE-MOUNTED WALL OR CEILING BOXES SHALL BE INSTALLED WITH SURFACE-STYLE FLAT OR RAISED COVERS.
   f. MINIMUM SIZE OF OUTLET BOXES FOR GROUND FAULT CIRCUIT INTERRUPTER (GFCI) RECEPTACLES IS 100 MM (4 INCHES) SQUARE X 55 MM (2.125 INCHES) DEEP, WITH DEVICE COVERS FOR THE WALL MATERIAL AND THICKNESS INVOLVED.
   g. ON ALL BRANCH CIRCUIT JUNCTION BOX COVERS, IDENTIFY THE CIRCUITS WITH BLACK MARKER.

5. **LIGHTING CONTROLS**
   A. **GENERAL**
      1. **DESCRIPTION**: FURNISHING, INSTALLATION AND CONNECTION OF THE LIGHTING CONTROLS.
      2. **SUBMITTALS**
         a. SUBMIT THE FOLLOWING INFORMATION FOR EACH TYPE OF LIGHTING CONTROLS: MATERIAL AND CONSTRUCTION DETAILS, PHYSICAL DIMENSIONS AND DESCRIPTION, PHYSICAL DIMENSIONS AND DESCRIPTION, WIRING SCHEMATIC AND CONNECTION DIAGRAM, INSTALLATION DETAILS.
   B. **PRODUCTS**
      1. **ELECTRONIC TIME SWITCHES**: ELECTRONIC, SOLID-STATE PROGRAMMABLE UNITS WITH ALPHANUMERIC DISPLAY, COMPLYING WITH UL 917.
      2. **OUTDOOR PHOTOELECTRIC SWITCHES**: SOLID STATE, WITH SPST, DPST DRY CONTACTS RATED FOR 1800 VA TUNGSTEN OR 1000 VA INDUCTIVE, COMPLYING WITH UL 773A.
      3. **TIMER SWITCHES**: DIGITAL SWITCHES WITH BACKLIT LCD DISPLAY, 120/277 VOLT RATED, FITTING AS A REPLACEMENT FOR STANDARD WALL SWITCHES.
      4. **CEILING-MOUNTED PHOTOELECTRIC SWITCHES**: SOLID-STATE, LIGHT-LEVEL SENSOR UNIT, WITH SEPARATE RELAY UNIT.
      5. **INDOOR OCCUPANCY SENSOR**: DUAL-TECHNOLOGY TYPE: CEILING MOUNTING; COMBINATION PIR AND ULTRASONIC DETECTION METHODS, FIELD-SELECTABLE.
         a. DETECTION COVERAGE: SHALL BE SUFFICIENT TO PROVIDE COVERAGE AS REQUIRED BY SENSOR LOCATIONS SHOWN ON DRAWING.
      6. **LIGHTING CONTROL SYSTEM – DISTRIBUTIVE RELAY TYPE SYSTEM DESCRIPTION**
         a. THE LIGHTING CONTROL SYSTEM SHALL BE NETWORK OF REMOTE RELAY MODULES CONNECTED TO A DIGITAL NETWORK VIA NETWORK HUBS AND CONTROLLED THROUGH A SYSTEM SERVER / CENTRAL STATION. LIGHTING DIGITAL NETWORK WITH THE SYSTEM SERVER. SYSTEM INCLUDES ALL ASSOCIATED CONTROL DEVICES CONNECT TO THE RELAY MODULES AND COMMUNICATE VIA THE NETWORK INTERFACES AND WIRING, HUBS, RELAY MODULES, RELAYS, PHOTOCELLS, SWITCHES, DIMMERS, TIME CLOCK, AND OCCUPANCY SENSORS. SYSTEM SHALL UTILIZE DISTRIBUTED RELAYS MODULES, ALLOWING THESE RELAY MODULES TO BE LOCATED ADJACENT TO THE ASSOCIABLE CEILINGS IN OR ADJACENT TO ROOMS THEY ARE CONTROLLING.
         b. SYSTEM SHALL INCLUDE ONE CENTRAL STATION WITH OPERATING SOFTWARE, DATA NETWORK, AND BACNET IP COMMUNICATION WITH OTHER SYSTEMS AS DESCRIBED. SYSTEM COMMUNICATION PROTOCOL SHALL BE COMPATIBLE WITH THE BUILDING AUTOMATION SYSTEM SPECIFICATIONS 23 09 23, DIGITAL DIRECT DDC CONTROL SYSTEM FOR HVAC.
         c. SYSTEM SERVER / CENTRAL STATION SHALL PROVIDE PROGRAMMABLE OPERATION OF LIGHTS CONNECTED VIA SYSTEM RELAYS AND CONTROLLED WITH SYSTEM DEVICES. SYSTEM SOFTWARE SHALL PROVIDE CONTROL OF RELAYS AND CONTROL DEVICES, TIME AND SEQUENCE SCHEDULING, TIMED OUT AND BLINK LIGHT OPERATION AND MONITORING AND REPORTING OF SYSTEM EVENTS AND COMPONENTS. INITIAL PROGRAMMING SHALL BE AS SHOWN ON PLANS AND SCHEDULES.
         d. RELAY MODULES: MOUNTED IN NEMA ENCLOSURE WITH PHYSICALLY SEPARATE 120/277 VOLT WIRING COMPARTMENT FROM LOW VOLTAGE CONTROL WIRING. PROVIDE LOW VOLTAGE DIGITAL COMMUNICATION TO CONTROL DEVICES AS SHOWN ON DRAWINGS AND SCHEDULES. SUPPLEMENTAL POWER PACKS SHALL BE PROVIDED AS REQUIRED FOR MULTIPLE CONTROL DEVICES. THIS EQUIPMENT SHALL BE IDENTIFIED IN SHOP DRAWING SUBMISSION. DIMMABLE RELAY MODULES SHALL BE PROVIDED WHERE INDICATED. RELAY MODULES SHALL CONTAIN UP TO 4 RELAYS. RELAY MODULES SHALL BE LABELED WITH ROOM NUMBER THAT RELAYS CONTROL LIGHTING WITHIN.
         e. SINGLE-POLE RELAYS: MECHANICALLY HELD UNLESS OTHERWISE INDICATED, SPST-NO, MOMENTARY PULSED TYPE, RATED 20 A, 125 VOLT AC FOR TUNGSTEN FILAMENTS AND 20 A, 277 VOLT AC FOR ELECTRONIC BALLASTS, 50,000 CYCLES AT RATED CAPACITY.
         f. CONTROL DEVICES: ALL OCCUPANCY SENSORS (ULTRASONIC, IR AND DUAL TECHNOLOGY TYPE), PHOTOCELLS, SWITCHES AND TIMERS SHALL BE PROVIDED WITH SYSTEM AND DESIGNED TO OPERATE ON SYSTEM NETWORK. SUPPLEMENTAL POWER PACKS SHALL BE PROVIDED AS REQUIRED FOR MULTIPLE CONTROL DEVICES. THIS EQUIPMENT SHALL BE IDENTIFIED IN SHOP DRAWING SUBMISSION.
   C. **EXECUTION**
      1. **INSTALLATION**
         a. INSTALLATION SHALL BE IN ACCORDANCE WITH THE NEC, MANUFACTURERS INSTRUCTIONS, AS SHOWN ON THE DRAWINGS, AND AS SPECIFIED.
         b. AIMING FOR WALL-MOUNTED AND CEILING-MOUNTED MOTION SENSOR SWITCHES SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
         c. LOCATE PHOTOELECTRIC SENSORS AS INDICATED AND IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS. ADJUST SENSOR FOR THE AVAILABLE LIGHT LEVEL AT THE TYPICAL WORK PLANE FOR THAT AREA.
      2. **ACCEPTANCE CHECKS AND TESTS**
         a. PERFORM IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
         b. UPON COMPLETION OF INSTALLATION, CONDUCT AN OPERATING TEST TO SHOW THAT EQUIPMENT OPERATES IN ACCORDANCE WITH REQUIREMENTS OF THIS SECTION.
6. **DISTRIBUTION SWITCHBOARDS**
   A. **GENERAL**
      1. **DESCRIPTION**: FURNISHING, INSTALLATION, CONNECTION, AND TESTING OF THE LOW-VOLTAGE CIRCUIT-BREAKER DISTRIBUTION SWITCHBOARDS, (INDICATED AS SWITCHBOARDS) IN THIS SECTION.
   B. **PRODUCTS**
      1. SHALL BE IN ACCORDANCE WITH IEEE, NEMA, NFPA, UL, AS SHOWN ON THE DRAWINGS, AND HAVE THE FOLLOWING FEATURES:
      2. SWITCHBOARD SHALL BE A COMPLETE, GROUNDED, CONTINUOUS-DUTY, INTEGRAL ASSEMBLY, DEAD- FRONT, DEAD-REAR, SELF- SUPPORTING, MOTOR-CONTROL TYPE SWITCHBOARD ASSEMBLY, TAMPERPROOF, WEATHERPROOF. FOR SWITCHBOARD ASSEMBLY AS DESIGNED. INCORPORATE DEVICES SHOWN ON THE DRAWINGS AND ALL RELATED COMPONENTS REQUIRED TO FULFILL OPERATIONAL AND FUNCTIONAL REQUIREMENTS.
      3. RATINGS SHALL NOT BE LESS THAN SHOWN ON THE DRAWINGS. SHORT CIRCUIT RATINGS SHALL NOT BE LESS THAN THE AVAILABLE FAULT CURRENT SHOWN.
      4. COORDINATE ALL REQUIREMENTS WITH THE ELECTRIC UTILITY COMPANY SUPPLYING ELECTRICAL SERVICE TO THE SWITCHBOARD. THE INCOMING ELECTRIC UTILITY FEEDER AND REVENUE METERING INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE ELECTRIC UTILITY COMPANY.
      5. **TYPE 1**: SWITCHBOARD SHALL BE FRONT ACCESSIBLE WITH THE FOLLOWING FEATURES:
      6. **TYPE 2**: SWITCHBOARD SHALL BE REAR ACCESSIBLE WITH THE FOLLOWING FEATURES:
      7. BUS BARS AND INTERCONNECTIONS
      8. PROVIDE COPPER PHASE AND NEUTRAL BUSES, FULLY RATED FOR THE AMPERAGE AS SHOWN ON THE DRAWINGS FOR THE ENTIRE LENGTH OF THE SWITCHBOARD. BUS LAMINATIONS SHALL HAVE A MINIMUM OF 6 MM (1/4 INCH) SPACING.
      9. THE BUS AND BUS COMPARTMENT SHALL BE DESIGNED SO THAT THE ACCEPTABLE NEMA STANDARD TEMPERATURE RISES ARE NOT EXCEEDED.
      10. **MAIN BONDING JUMPER**: AN UN-INSULATED COPPER BUS, SIZE AS SHOWN ON DRAWINGS, SHALL INTERCONNECT THE NEUTRAL AND GROUND BUSES, WHEN THE SWITCHBOARD IS USED TO ESTABLISH THE SYSTEM COMMON GROUND POINT.
      11. ALL BOLTS, NUTS, AND WASHERS SHALL BE ZINC-PLATED STEEL. BOLTS SHALL BE TORQUED TO THE VALUES RECOMMENDED BY THE MANUFACTURER.
      12. MAKE PROVISIONS FOR FUTURE BUS EXTENSIONS BY MEANS OF BOLT HOLES OR OTHER APPROVED METHOD.
      13. **MAIN CIRCUIT BREAKERS**
         a. TYPE I OR TYPE II SWITCHBOARDS: PROVIDE MOLDED CASE MAIN CIRCUIT BREAKERS AS SHOWN ON THE DRAWINGS. CIRCUIT BREAKERS SHALL BE THE SOLID STATE ADJUSTABLE TRIP TYPE.
      14. **FEEDER CIRCUIT BREAKERS**
         a. PROVIDE MOLDED CASE CIRCUIT BREAKERS AS SHOWN ON THE DRAWINGS.
         b. NON-ADJUSTABLE TRIP MOLDED CIRCUIT BREAKERS:
            - MOLDED CASE CIRCUIT BREAKERS SHALL HAVE AUTOMATIC, TRIP FREE, NON-ADJUSTABLE, INVERSE TIME CHARACTERISTICS, AND INSTANTANEOUS TRIP.
            - BREAKER FEATURES SHALL BE AS FOLLOWS:
              1. A RUGGED, INTEGRAL HOUSING OF MOLDED INSULATING MATERIAL.
              2. SILVER ALLOY CONTACTS
              3. ARC QUENCHERS AND PHASE BARRIERS FOR EACH POLE.
              4. QUICK-MAKE, QUICK-BREAK, OPERATING MECHANISMS.
              5. A TRIP ELEMENT FOR EACH POLE. THERMAL MAGNETIC TYPE WITH LONG TIME DELAY AND INSTANTANEOUS CHARACTERISTICS. A COMMON TRIP BAR FOR ALL POLES AND A SINGLE OPERATOR.
              6. ELECTRICALLY AND MECHANICALLY TRIP FREE.
              7. AN OPERATING HANDLE WHICH INDICATES ON, TRIPPED, AND OFF POSITIONS.
              8. LINE AND LOAD CONNECTIONS SHALL BE BOLTED.
              9. AN OVERLOAD ON ONE POLE OF A MULTIPLOE BREAKER SHALL AUTOMATICALLY CAUSE ALL THE POLES OF THE BREAKER TO OPEN.
         c. **ADJUSTABLE TRIP MOLDED CASE CIRCUIT BREAKERS**:
            - PROVIDE MOLDED CASE, SOLID STATE ADJUSTABLE TRIP TYPE CIRCUIT BREAKERS.
            - TRIP UNITS SHALL HAVE FIELD ADJUSTABLE TRIPPING CHARACTERISTICS AS FOLLOWS:
            - LONG TIME PICKUP , LONG TIME DELAY, SHORT TIME PICKUP, SHORT TIME DELAY, INSTANTANEOUS, GROUND FAULT PICKUP, GROUND FAULT DELAY.
         d. WHERE SHOWN IN SAME FRAME SIZE SHALL BE INTERCHANGEABLE WITH EACH OTHER.
      15. **ELECTRIC UTILITY COMPANY EQUIPMENT**
         a. PROVIDE SEPARATE COMPARTMENT FOR ELECTRIC UTILITY COMPANY METERING EQUIPMENT AS SHOWN ON DRAWINGS.
   C. **EXECUTION**
      1. **INSTALLATION**
         a. INSTALL SWITCHBOARDS IN ACCORDANCE WITH THE NEC, AS SHOWN ON THE DRAWINGS, AND AS RECOMMENDED BY THE MANUFACTURER.
         b. ANCHOR SWITCHBOARDS WITH RUSTPROOF BOLTS, NUTS, AND WASHERS NOT LESS THAN 13 MM (1/2 INCH) DIAMETER, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, AND AS SHOWN ON DRAWINGS.
         c. INTERIOR LOCATION. MOUNT SWITCHBOARD ON CONCRETE SLAB. UNLESS OTHERWISE INDICATED, THE SLAB SHALL BE AT LEAST 100 MM (4 INCHES) THICK. THE TOP OF THE CONCRETE SLAB SHALL BE APPROXIMATELY 100 MM (4 INCHES) ABOVE FINISHED FLOOR. EDGES ABOVE FLOOR SHALL HAVE 12.5 MM (1/2 INCH CHAMFER. THE SLAB SHALL BE OF ADEQUATE SIZE TO PROJECT AT LEAST 200 MM (8 INCHES) BEYOND THE EQUIPMENT. PROVIDE CONDUIT TURNUPS AND CABLE ENTRANCE SPACE REQUIRED BY THE EQUIPMENT TO BE MOUNTED. SEAL VOIDS AROUND CONDUIT OPENINGS IN SLAB WITH WATER- AND OIL-RESISTANT CAULKING OR SEALANT. CUT OFF AND BUSH CONDUITS 75 MM (3 INCHES) ABOVE SLAB SURFACE. CONCRETE WORK SHALL BE AS SPECIFIED IN SECTION 03 30 00, CAST-IN-PLACE CONCRETE.

7. **PANELBOARDS**
   A. **GENERAL**
      1. **DESCRIPTION**: FURNISHING, INSTALLATION, AND CONNECTION OF PANELBOARDS.
      2. **SUBMITTALS**
         a. SUBMIT SUFFICIENT INFORMATION TO DEMONSTRATE COMPLIANCE WITH DRAWINGS AND SPECIFICATIONS. INCLUDE ELECTRICAL RATINGS, DIMENSIONS, MOUNTING DETAILS, MATERIALS, REQUIRED CLEARANCES, TERMINATIONS, WEIGHT, CIRCUIT BREAKERS, WIRING AND CONNECTION DIAGRAMS, ACCESSORIES, AND NAMEPLATE DATA.
         b. SUBMIT SUFFICIENT INFORMATION TO DEMONSTRATE COMPLIANCE WITH DRAWINGS AND SPECIFICATIONS.
   B. **PRODUCTS**
      1. **GENERAL REQUIREMENTS**
         a. PANELBOARDS SHALL BE IN ACCORDANCE WITH NEC, NEMA, UL, AS SPECIFIED, AND AS SHOWN ON THE DRAWINGS.
         b. PANELBOARDS SHALL HAVE MAIN BREAKER OR MAIN LUGS, BUS SIZE, VOLTAGE, PHASES, NUMBER OF CIRCUIT BREAKER MOUNTING SPACES, TOP OR BOTTOM FEED, FLUSH OR SURFACE MOUNTING, BRANCH CIRCUIT BREAKERS, AND ACCESSORIES AS SHOWN ON THE DRAWINGS.
         c. PANELBOARDS SHALL BE COMPLETELY FACTORY-ASSEMBLED WITH MOLDED CASE CIRCUIT BREAKERS AND INTEGRAL ACCESSORIES AS SHOWN ON THE DRAWINGS OR SPECIFIED HEREIN.
         d. NON-REDUCED SIZE COPPER BUS BARS, RIGIDLY SUPPORTED ON MOLDED INSULATORS, AND FABRICATED FOR BOLT-ON TYPE CIRCUIT BREAKERS.
         e. BUS BAR CONNECTIONS TO THE BRANCH CIRCUIT BREAKERS SHALL BE THE 'DISTRIBUTED PHASE" OR "PHASE SEQUENCE" TYPE.
         f. MECHANICAL LUGS FURNISHED WITH PANELBOARDS SHALL BE CAST, STAMPED, OR MACHINED METAL ALLOYS LISTED FOR USE WITH THE CONDUCTORS TO WHICH THEY WILL BE CONNECTED.
         g. NEUTRAL BUS SHALL BE 200% RATED, MOUNTED ON INSULATED SUPPORTS.
         h. GROUNDING BUS BAR SHALL BE ONE-PIECE FORMED STEEL BAR OR FORMED SHEET STEEL WITH END AND SIDE PANELS WELDED, RIVETED, OR BOLTED AS REQUIRED.
         i. PROVIDE MANUFACTURER'S STANDARD OPTION FOR PREPUNCHED KNOCKOUTS ON TOP AND BOTTOM ENDWALLS.
         j. INCLUDE REMOVABLE INNER DEAD FRONT COVER, INDEPENDENT OF THE PANELBOARD COVER.
      2. **TRIMS**
         a. HINGED "DOOR-IN-DOOR" TYPE.
         b. INTERIOR HINGED DOOR WITH HAND-OPERATED LATCH OR LATCHES, AS REQUIRED TO PROVIDE ACCESS ONLY TO CIRCUIT BREAKER OPERATING HANDLES. NOT TO ENERGIZED PARTS.
         c. OUTER HINGED COVER SHALL BE SECURELY MOUNTED TO THE PANELBOARD ENCLOSURE WITH FACTORY BOLTS, SCREWS, CLIPS, OR OTHER FASTENERS, REQUIRING A KEY OR TOOL FOR ENTRY. HAND-OPERATED LATCHES ARE NOT ACCEPTABLE.
         d. INNER AND OUTER DOORS SHALL OPEN LEFT TO RIGHT.
         e. TRIMS SHALL BE FLUSH OR SURFACE TYPE AS SHOWN ON THE DRAWINGS.
      3. **MOLDED CASE CIRCUIT BREAKERS**
         a. CIRCUIT BREAKERS SHALL BE PER UL, NEC, AS SHOWN ON THE DRAWINGS, AND AS SPECIFIED.
         b. CIRCUIT BREAKERS SHALL BE BOLT-ON TYPE.
         c. CIRCUIT BREAKERS SHALL HAVE MINIMUM INTERRUPTING RATING AS REQUIRED TO WITHSTAND THE AVAILABLE FAULT CURRENT, BUT NOT LESS THAN:
            - 120/208 V PANELBOARD: 10,000 A SYMMETRICAL.
            - 120/240 V PANELBOARD: 10,000 A SYMMETRICAL.
            - 277/480 V PANELBOARD: 14,000 A SYMMETRICAL.
         d. CIRCUIT BREAKERS SHALL HAVE AUTOMATIC, TRIP FREE, NON-ADJUSTABLE, INVERSE TIME, AND INSTANTANEOUS MAGNETIC TRIPS FOR LESS THAN 400 A FRAME. CIRCUIT BREAKERS WITH 400 A FRAMES AND ABOVE SHALL HAVE MAGNETIC TRIP, ADJUSTABLE FROM 5X TO 10X.
      3. **CIRCUIT BREAKER FEATURES SHALL BE AS FOLLOWS**
         a. A RUGGED, INTEGRAL HOUSING OF MOLDED INSULATING MATERIAL.
         b. SILVER ALLOY CONTACTS.
         c. ARC QUENCHERS AND PHASE BARRIERS FOR EACH POLE.
         d. QUICK-MAKE, QUICK-BREAK, OPERATING MECHANISMS.
         e. A TRIP ELEMENT FOR EACH POLE. THERMAL MAGNETIC TYPE WITH LONG TIME DELAY AND INSTANTANEOUS CHARACTERISTICS, A COMMON TRIP BAR FOR ALL POLES AND A SINGLE OPERATOR.
         f. ELECTRICALLY AND MECHANICALLY TRIP FREE.
         g. AN OPERATING HANDLE WHICH INDICATES CLOSED, TRIPPED, AND OPEN POSITIONS.
         h. AN OVERLOAD ON ONE POLE OF A MULTIPLE BREAKER SHALL AUTOMATICALLY CAUSE ALL THE POLES OF THE BREAKER TO OPEN.
         i. GROUND FAULT CURRENT INTERRUPTING BREAKERS, SHUNT TRIP BREAKERS, LIGHTING CONTROL BREAKERS (INCLUDING ACCESSORIES TO SWITCH LINE CURRENTS), OR OTHER ACCESSORY DEVICES OR FUNCTIONS SHALL BE PROVIDED WHERE SHOWN ON THE DRAWINGS.
   C. **EXECUTION**
      1. **INSTALLATION**
         a. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS, THE NEC, AS SHOWN ON THE DRAWINGS, AND AS SPECIFIED.
         b. LOCATE PANELBOARDS SO THAT THE PRESENT AND FUTURE CONDUITS CAN BE CONVENIENTLY CONNECTED.
         c. INSTALL A PRINTED SCHEDULE OF CIRCUITS IN EACH PANELBOARD AFTER APPROVAL. SCHEDULES SHALL REFLECT FINAL LOAD DESIGNATIONS, ROOM NUMBERS, AND ROOM NAMES CONNECTED TO EACH CIRCUIT BREAKER. SCHEDULES SHALL BE PRINTED ON THE PANELBOARD DIRECTORY CARDS AND BE INSTALLED IN THE APPROPRIATE PANELBOARDS
         d. MOUNT PANELBOARDS SUCH THAT THE MAXIMUM HEIGHT OF THE TOP CIRCUIT BREAKER ABOVE THE FINISHED SLAB SHALL NOT EXCEED 1980 MM (78 INCHES).
         e. PROVIDE BLANK COVER FOR EACH UNUSED CIRCUIT BREAKER MOUNTING SPACE.
         f. PANELBOARD ENCLOSURES SHALL NOT BE USED FOR CONDUCTORS FEEDING THROUGH, SPLICED, OR TAPPING OFF TO OTHER ENCLOSURES OR DEVICES.

8. **MOTOR CONTROL CENTERS**
   A. **GENERAL**
      1. **DESCRIPTION**: FURNISHING, INSTALLATION, CONNECTION, AND TESTING OF THE MOTOR CONTROL CENTERS.
   B. PRODUCTS
      1. **GENERAL REQUIREMENTS**
         a. MOTOR CONTROL CENTERS SHALL COMPLY WITH NFPA, NEMA, UL, AND AS SHOWN ON DRAWINGS.
         b. RATINGS SHALL BE NOT LESS THAN SHOWN ON DRAWINGS. INTERRUPTING RATINGS SHALL BE NOT LESS THAN THE MAXIMUM SHORT CIRCUIT CURRENTS AVAILABLE AT THE MOTOR CONTROL CENTER LOCATION, AS SHOWN ON DRAWINGS.
         c. ENCLOSURE SHALL BE NEMA-TYPE RATED 1, 3R, OR 12 AS INDICATED ON DRAWINGS OR AS REQUIRED PER THE INSTALLED ENVIRONMENT.
      2. **BUS BARS AND INTERCONNECTIONS**
         a. HORIZONTAL AND VERTICAL BUS RATINGS SHALL BE AS SHOWN ON DRAWINGS. HORIZONTAL BUS BARS SHALL BE FULLY RATED FOR THE ENTIRE LENGTH OF THE MOTOR CONTROL CENTERS.
         b. ALL BOLTS, NUTS, AND WASHERS SHALL BE ZINC-PLATED STEEL, TORQUED TO THE VALUES RECOMMENDED BY THE MANUFACTURER.
         c. A GROUND BUS SHALL EXTEND ACROSS THE ENTIRE LENGTH OF THE MOTOR CONTROL CENTERS.
   C. **EXECUTION**
      1. **INSTALLATION**
         a. INSTALL MOTOR CONTROL CENTERS IN ACCORDANCE WITH THE NEC, AS SHOWN ON THE DRAWINGS, AND AS RECOMMENDED BY THE MANUFACTURER.
         b. INTERIOR LOCATION. MOUNT MOTOR CONTROL CENTERS ON CONCRETE SLAB. UNLESS OTHERWISE INDICATED, THE SLAB SHALL BE AT LEAST 100 MM (4 INCHES) THICK. THE TOP OF THE CONCRETE SLAB SHALL BE APPROXIMATELY 100 MM (4 INCHES) ABOVE FINISHED FLOOR. EDGES ABOVE FLOOR SHALL HAVE 15 MM (1/2 INCH) CHAMFER. THE SLAB SHALL BE OF ADEQUATE SIZE TO PROJECT AT LEAST 100 MM (8 INCHES) BEYOND THE EQUIPMENT. PROVIDE CONDUIT TURNUPS AND CABLE ENTRANCE SPACE REQUIRED BY THE EQUIPMENT TO BE MOUNTED. SEAL VOIDS AROUND CONDUIT OPENINGS IN SLAB WITH WATER- AND OIL-RESISTANT CAULKING OR SEALANT. CUT OFF AND BUSH CONDUITS 75 MM (3 INCHES) ABOVE SLAB SURFACE. CONCRETE WORK SHALL BE AS SPECIFIED IN SECTION CAST-IN-PLACE CONCRETE.

9. **BUSWAYS**
   A. **GENERAL**
      1. **DESCRIPTION**: FURNISHING, INSTALLATION, CONNECTION, AND TESTING OF BUSWAYS FOR USE IN ELECTRICAL SYSTEMS RATED 600 V AND BELOW.
   B. **PRODUCTS**
      1. BUSWAY SHALL BE IN ACCORDANCE WITH NEMA AND UL.
      2. FOR INDOOR LOCATIONS: PLUG-IN OR FEEDER TYPE AS DESIGNED. TOTALLY ENCLOSED AND MOISTURE RESISTANT.
      3. SHORT CIRCUIT CURRENT RATING SHALL NOT BE LESS THAN 42,000 A, OR AS REQUIRED TO WITHSTAND THE AVAILABLE FAULT CURRENT SHOWN ON THE DRAWINGS, WHICHEVER IS HIGHER.
      4. **BUS BARS**: SHALL BE FULL ROUND EDGE RECTANGULAR COPPER OF SUFFICIENT CROSS-SECTION TO PROVIDE FULL CURRENT RATING WITHOUT EXCEEDING A TEMPERATURE RISE OF 50° C ABOVE A 40° C AMBIENT.
      5. **HOUSINGS**
         a. SHALL BE STEEL OR ALUMINUM, WITH CONTINUOUS MOUNTING RAILS.
         b. FOR BUSWAYS THAT PASS THROUGH FIRE-RESISTANT RATED CONSTRUCTION, INCORPORATE LISTED FIRE STOPS WITHIN THE BUSWAY HOUSINGS AND EXTERNAL FLANGES.
         c. PROVIDE MANUFACTURER'S FITTINGS AND ACCESSORIES, INCLUDING BUT NOT LIMITED TO ELBOWS, TEES, TAP BOXES, TRANSFORMER TAPS, END BOXES, EXPANSION FITTINGS, OFFSETS, ADAPTERS, HANGERS, AND MOUNTING HARDWARE.
   C. **EXECUTION**
      1. **INSTALLATION**
         a. INSTALLATION SHALL BE IN ACCORDANCE WITH THE NEC, AS SHOWN ON THE DRAWINGS, AND MANUFACTURER'S INSTRUCTIONS.
         b. SUPPORT BUSWAYS AS REQUIRED BY THE NEC AND AS REQUIRED BY MANUFACTURER'S SHOP DRAWINGS.
         c. COORDINATE ALL OF THE BUSWAY TERMINATIONS TO EQUIPMENT TO ENSURE PROPER PHASING.
         d. INSTALL FIRE-STOP ASSEMBLIES PER SECTION FIRESTOPPING WHERE BUSWAYS PENETRATE FIRE-RESISTANT CONSTRUCTION.

10. **WIRING DEVICES**
   A. **GENERAL**
      1. DESCRIPTION: FURNISHING, INSTALLATION, CONNECTION, AND TESTING OF WIRING DEVICES.
   B. **PRODUCTS**
      1. **RECEPTACLES**
         a. GENERAL: ALL RECEPTACLES SHALL COMPLY WITH NEMA, NFPA, UL, AND AS SHOWN ON THE DRAWINGS.
            - RECEPTACLES SHALL HAVE PROVISIONS FOR BACK WIRING WITH SEPARATE METAL CLAMP TYPE TERMINALS (FOUR MINIMUM) AND SIDE WIRING FROM FOUR CAPTIVELY HELD BINDING SCREWS.
         b. DUPLEX RECEPTACLES - HOSPITAL GRADE: SHALL BE USE THE HOSPITAL GRADE, SINGLE PHASE, 20 AMPERE, 120 VOLTS, 2-POLE, 3-WIRE, NEMA 5-20R, WITH BREAK-OFF FEATURE FOR TWO-CIRCUIT OPERATION.
            - SWITCHED DUPLEX RECEPTACLES SHALL BE WIRED SO THAT ONLY THE TOP RECEPTACLE IS SWITCHED. THE LOWER RECEPTACLE SHALL BE UNSWITCHED.
         c. DUPLEX RECEPTACLES ON EMERGENCY CIRCUIT:
            - IN ROOMS WHERE THE EMERGENCY POWERED GENERAL LIGHTING, THE EMERGENCY RECEPTACLES SHALL BE OF THE SELF- ILLUMINATED TYPE.
         d. GROUND FAULT CIRCUIT INTERRUPTER (GFCI) DUPLEX RECEPTACLES: SHALL BE AN INTEGRAL UNIT, HOSPITAL-GRADE, SUITABLE FOR MOUNTING IN A STANDARD OUTLET BOX, WITH END-OF-LIFE INDICATION AND PROVISIONS TO ISOLATE THE FACE DUE TO INTERNAL WIRING. GFCI RECEPTACLES SHALL BE SELF- TEST RECEPTACLES IN ACCORDANCE WITH UL 943.
         e. DUPLEX RECEPTACLES – NON-HOSPITAL GRADE: SHALL BE THE SAME AS DUPLEX RECEPTACLES – HOSPITAL GRADE IN ACCORDANCE WITH SECTIONS 2.1A AND 2.1B OF THIS SPECIFICATION, EXCEPT FOR THE HOSPITAL GRADE LISTING. RECEPTACLES, 20, 30, AND 50 AMPERE, 250 VOLTS, SHALL BE COMPLETE WITH APPROPRIATE CORD GRIP PLUG.
         g. WEATHERPROOF RECEPTACLES: SHALL CONSIST OF A DUPLEX RECEPTACLE, MOUNTED IN BOX WITH A GASKETED, WEATHERPROOF, CAST METAL COVER PLATE AND CAP OVER EACH RECEPTACLE OPENING. THE CAP SHALL BE PERMANENTLY ATTACHED TO THE COVER PLATE BY A SPRING-HINGED FLAP. THE WEATHERPROOF INTEGRITY SHALL NOT BE AFFECTED WHEN HEAVY DUTY SPECIFICATION OR HOSPITAL GRADE ATTACHMENT PLUG CAPS ARE INSERTED. COVER PLATES ON OUTLET BOXES MOUNTED FLUSH IN THE WALL SHALL BE GASKETED TO THE WALL IN A WATERTIGHT MANNER.
      2. **TOGGLE SWITCHES**
         a. TOGGLE SWITCHES SHALL BE TOTALLY ENCLOSED TUMBLER TYPE WITH NYLON BODIES. HANDLES SHALL BE IVORY IN COLOR UNLESS OTHERWISE DESCRIBED OR SHOWN ON THE DRAWINGS.
            - SHALL BE SINGLE UNIT TOGGLE, BUTT CONTACT, QUIET AC TYPE. HEAVY- DUTY GENERAL-PURPOSE USE WITH AN INTEGRAL SELF GROUNDING MOUNTING STRAP WITH BREAK-OFF PLASTERS EARS AND PROVISIONS FOR BACK WIRING WITH BINDING SCREWS. WIRING CLAMPS AND SIDE WIRING WITH CAPTIVELY HELD BINDING SCREWS.
            - SWITCHES SHALL BE RATED 20 AMPERES A

ABBREVIATIONS

1PH	SINGLE PHASE
1P	SINGLE POLE
2/C	TWO-CONDUCTOR
3/C	THREE-CONDUCTOR
3PH	THREE-PHASE
4/C	FOUR-CONDUCTOR
4W	FOUR-WIRE
A/C UNIT	AIR CONDITIONING UNIT
A/E	ARCHITECT/ENGINEER
AAP	ALARM ANNUNCIATOR PANEL
AC	ALTERNATING CURRENT OR ARMORED CABLE
ACC	ACCESSIBLE
ADDL	ADDITIONAL
ADJ	ADJACENT, ADJOINING
AF	AMPERE FRAME OR AMP FUSE
AFC	ABOVE FINISHED COUNTER, AUTOMATIC FREQUENCY CONTROL, OR AVAILABLE FAULT CURRENT
AFCI	ARC-FAULT CURRENT INTERRUPTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFIB	ARC FAULT CIRCUIT INTERRUPTER CIRCUIT BREAKER.
AF/GF	ARC FAULT AND GROUND FAULT CIRCUIT INTERRUPTER
Ah	AMPERE HOUR
AHJ	AUTHORITY HAVING JURISDICTION
AIC	AMPERE INTERRUPTING CAPACITY
ALT	ALTERNATE
AMB	AMBIENT
AMP	AMPERE
ARCH	ARCHITECT
ASC	AMPS SHORT CIRCUIT
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AV	AUDIO VISUAL
BAT	BATTERY
BD	BOARD
BFF	BELOW FINISHED FLOOR
BLDG	BUILDING
BRK	RBREAKER
BYP	BYPASS
C	CONDUIT
CAB	CABINET (MOUNTED)
CALC	CALCULATE
CAP	CAPACITY
CAT	CATALOG
CATV	COMMUNITY ANTENNA TELEVISION
CCR	CONTROL CONTRACTOR
CCTV	CLOSED CIRCUIT TELEVISION
cd	CANDELA
CD	CONSTRUCTION DOCUMENTS
CF	CONTRACTOR FINISHED
CFCI	CONTRACTOR FINISHED/CONTRACTOR INSTALLED
CFE	CONTRACTOR FINISHED EQUIPMENT
CHW	CHILLED WATER
CHWP	CHILLED WATER PUMP
CKT	CIRCUIT
CKT BRKR OR CB	CIRCUIT BREAKER
CLF	CURRENT LIMITING FUSE
CLG	CEILING
COAX	COAX CABLE
COMM	COMMUNICATION
COMPT	COMPARTMENT
CONC	CONCRETE
CONT	CONTINUE
CONTR	CONTRACTOR
COORD	COORDINATE
CPT	CONTROL POWER TRANSFORMER
CRI	COLOR RENDERING INDEX
CT	CURRENT TRANSFORMER
CTV	CABLE TELEVISION
CU	COPPER
CUR	CURRENT
dB	DECIBEL
DC	DIRECT CURRENT
DCP	DIMMER CONTROL PANEL
DEG C	DEGREES CELCIUS
DEG F	DEGREES FAHRENHEIT
DEMO	DEMOLITION
DIAG	DIAGRAM
DISC	DISCONNECT
DISTR PNL	DISTRIBUTION PANEL
DMR SW	DIMMER SWITCH
DPDT	DOUBLE POLE, DOUBLE THROW
DPST	DOUBLE POLE, SINGLE THROW
DRSW	DOOR SWITCH
DS	DISCONNECT SWITCH
DWG	DRAWING
EL	ELEVATION
ELEC	ELECTRIC OR ELECTRICAL
ELEV	ELEVATOR
EMER	EMERGENCY
EMI	ELECTROMAGNETIC INTERFERENCE
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
EPO	EMERGENCY POWER OFF
EPRF	EXPLOSION PROOF
ESMT	EASEMENT
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EXIST OR (E)	EXISTING
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FC	FOOTCANDLE
FIXT	FIXTURE
FLA	FULL LOAD AMPS
FLUOR	FLUORESCENT
FP	FIRE PROTECTION
FSD	FIRE SMOKE DAMPER
FT	FEET OR FOOT
FU SW	FUSED SWITCH
FVNR	FULL VOTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
G	ELECTRICAL GROUND
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTER
GFIB	GROUND FAULT CIRCUIT INTERRUPTER VIA CIRCUIT BREAKER.
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HT	HEIGHT
HZ	HERTZ
IESNA	ILLUMINATION ENGINEERING SOCIETY OF NORTH AMERICA
IMC	INTERMEDIATE METAL CONDUIT
INCAND	INCANDESCENT
IR	INFRARED
IWH	INSTANTANEOUS WATER HEATER
J-BOX	JUNCTION BOX
kV	KILOVOLT
kVA	KILOVOLT AMPERE
kVAr	KILOVOLT AMPERE PER HOUR
kVAR	KILOVOLT AMPERE REACTIVE
kW	KILOWATT
kWh	KILOWATT HOUR
kWHM	KILOWATT HOUR METER
LED	LIGHT EMITTING DIODE
LF	LINEAR FEET (FOOT)
LP	LIGHT POLE
LPS	LOW PRESSURE SODIUM
LRA	LOCKED ROTOR AMPS
LT	LIGHT
LTG	LIGHTING
LTG PNL	LIGHTING PANEL
LTNG	LIGHTNING
LV	LOW VOLTAGE
MAX	MAXIMUM
MC	METAL-CLAD
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MD	MOTORIZED DAMPER
MECH	MECHANICAL
MH	MANHOLE
MIN	MINIMUM
MOCP	MAXIMUM OVERCURRENT PROTECTION
MLA	MAIN LUGS ONLY
MT	MOUNT
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH
MV	MEDIUM VOLTAGE
MVA	MEGAVOLT AMPERE
MW	MEGAWATT
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT OR N	NEUTRAL
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OL	OVERLOAD
P	POLE
PB	PULL BOX
PEC	PHOTOELECTRIC CELL
PED	PEDESTAL
PEND	PENDANT
PF	POWER FACTOR
PH	PHASE
PNL	PANEL
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE (PLASTIC)
PWR	POWER
RCP	REFLECTED CEILING PLAN
RE	RELOCATED EXISTING
REC	RECESSED
RECPT	RECEPTACLE
RM	ROOM
RMS	ROOT MEAN SQUARE
REQD	REQUIRED
SCC	SHORT CIRCUIT CAPACITY
SD	SMOKE DETECTOR
SF	SQUARE FOOT (FEET)
SHT	SHEET
SI	INTERNATIONAL SYSTEM OF UNITS
SPEC	SPECIFICATION
SPST	SINGLE POLE, SINGLE THROW
SURF	SURFACE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TEL	TELEPHONE
TV	TELEVISION
TYP	TYPICAL
UFD	UNDERFLOOR DUCT
UGND	UNDERGROUND
UL	UNDERWRITERS LABORATORY
UON	UNLESS OTHERWISE NOTED
USB	RECEPTACLE w/INTEGRATED UNIVERSAL SERIAL BUS PORT
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTIL	UTILITY
V	VOLT
VA	VOLT AMPERE
VAR	VOLT AMPERE REACTIVE
VFD	VARIABLE FREQUENCY DRIVE
VOLT	VOLTAGE
W	WATT
WH	WATER HEATER
WP	WEATHERPROOF
XFER	TRANSFER
XFMR	TRANSFORMER

ELECTRICAL SYMBOLS

- 20 AMP DUPLEX RECEPTACLE (NEMA 5-20R) MOUNTED AT 18" A.F.F. TO CENTER LINE OF OUTLET UNLESS NOTED OTHERWISE.
- 20 AMP QUADRUPLEX RECEPTACLE (NEMA 5-20R) MOUNTED AT 18" A.F.F. TO CENTER LINE OF OUTLET UNLESS NOTED OTHERWISE.
- 20 AMP DUPLEX RECEPTACLE (NEMA 5-20R) MOUNTED ABOVE COUNTER. REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION AND MOUNTING HEIGHT.
- 20 AMP DUPLEX RECEPTACLE (NEMA 5-20R), RECESSED FLOOR MOUNTED. PROVIDE SQUARE BRUSHED NICKEL FINISH COVER PLATE WITH RECESS DEVICE. FLIP TOP COVER WITH NON-RECESS DEVICE WILL NOT BE ACCEPTED. FLOOR BOX SHALL BE LISTED FOR PROPOSED LOCATION AS REQUIRED.
- 20 AMP QUADRUPLEX RECEPTACLE (NEMA 5-20R), RECESSED FLOOR MOUNTED. PROVIDE SQUARE BRUSHED NICKEL FINISH COVER PLATE WITH RECESS DEVICES. FLIP TOP COVER WITH NON-RECESS DEVICES WILL NOT BE ACCEPTED. FLOOR BOX SHALL BE LISTED FOR PROPOSED LOCATION AS REQUIRED.
- 20 AMP DUPLEX RECEPTACLE (NEMA 5-20R) AND COMMUNICATIONS DUAL SERVICE FLOOR BOX, RECESSED FLOOR MOUNTED. PROVIDE 1" CONDUIT SLEEVE WITH PULL STRING, STUB INTO ACCESSIBLE CEILING SPACE. PROVIDE SQUARE BRUSHED NICKEL FINISH COVER PLATE WITH RECESS DEVICES. FLIP TOP COVER WITH NON-RECESS DEVICES WILL NOT BE ACCEPTED. FLOOR BOX SHALL BE LISTED FOR PROPOSED LOCATION AS REQUIRED.
- 20 AMP QUADRUPLEX RECEPTACLE (NEMA 5-20R) AND COMMUNICATIONS DUAL SERVICE FLOOR BOX, RECESSED FLOOR MOUNTED. PROVIDE 1" CONDUIT SLEEVE WITH PULL STRING, STUB INTO ACCESSIBLE CEILING SPACE. PROVIDE SQUARE BRUSHED NICKEL FINISH COVER PLATE WITH RECESS DEVICES. FLIP TOP COVER WITH NON-RECESS DEVICES WILL NOT BE ACCEPTED. FLOOR BOX SHALL BE LISTED FOR PROPOSED LOCATION AS REQUIRED.
- 20 AMP DUPLEX RECEPTACLE (NEMA 5-20R), CEILING MOUNTED.
- 20 AMP QUADRUPLEX RECEPTACLE (NEMA 5-20R), CEILING MOUNTED.
- MULTI OUTLET HARD WIRED PLUG STRIP WITH USB CHARGING, 9" DEVICE SPACING, STEEL, ALUMINUM FINISH. MOUNT HIGH UP, UNDER COUNTER TOP UNLESS NOTED OTHERWISE. WIREMOLD 2000 SERIES OR EQUIVALENT WITH ALTERNATING DEVICES. LENGTH PER PLAN.
- (NEMA) SPECIAL PURPOSE POWER DEVICE, COORDINATE EXACT NEMA NUMBER DEVICE WITH EQUIPMENT PLUG UNLESS NOTED OTHERWISE.
- COMMUNICATIONS OUTLET. PROVIDE 1" CONDUIT SLEEVE WITH PULL STRING, STUB INTO ACCESSIBLE CEILING SPACE. MOUNT AT 18" A.F.F. TO CENTER OF OUTLET UNLESS NOTED OTHERWISE.
- COMMUNICATIONS OUTLET, CEILING MOUNTED.
- RECEPTACLE AND COMMUNICATIONS OUTLET. PROVIDE (2) 1" CONDUIT SLEEVES WITH CABLING, STUB INTO ACCESSIBLE CEILING SPACE. COORDINATE MOUNTING HEIGHT OF BOX WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH IN. PROVIDE FOUR GANG, RECESSED MOUNTED STEEL BOX WITH VOLTAGE SWIDER AND OPTIONAL COVER PLATE. ARLINGTON TV5861O OR EQUIVALENT.
- TELEVISION OUTLET. PROVIDE 1" CONDUIT SLEEVE WITH PULL STRING, STUB INTO ACCESSIBLE CEILING SPACE. MOUNT AT 18" A.F.F. TO CENTER LINE OF OUTLET UNLESS NOTED OTHERWISE.
- TELEVISION OUTLET, CEILING MOUNTED.
- (J) JUNCTION BOX
- EV CHARGING STATION SINGLE
- EV CHARGING STATION DOUBLE
- PROPOSED ROUTING OF LOW VOLTAGE WIRING FOR DIAGRAMMATIC PURPOSES ONLY.
- EMERGENCY EXIT SIGN, WALL MOUNTED. EXIT SIGN SHALL BE MOUNTED WITHIN 6'-8" ABOVE TOP OF EGRESS DOOR FRAME.
- EMERGENCY EXIT SIGN. FOR CEILING(S) WITH A HEIGHT LESS THAN OR EQUAL TO 6'-8" ABOVE TOP OF EGRESS DOOR FRAME. EXIT SIGN SHALL BE CEILING SURFACE MOUNTED. FOR CEILING(S) WITH A HEIGHT GREATER THAN 6'-8" ABOVE TOP OF EGRESS DOOR FRAME, EXIT SIGN SHALL BE CEILING SUSPENDED AT OR ABOVE THE LINE OF SIGHT.
- LED LIGHT FIXTURE - REFER TO LIGHT FIXTURE SCHEDULE FOR FIXTURE TYPE
- $ SINGLE POLE, 20 AMP, SWITCH. MOUNT 42" A.F.F. TO CENTERLINE OF SWITCH UNLESS NOTED OTHERWISE.
- $3 3-WAY, 20 AMP, SWITCH. MOUNT 42" A.F.F. TO CENTERLINE OF SWITCH UNLESS NOTED OTHERWISE.
- $D SINGLE POLE, 20 AMP, SWITCH WITH DIMMER. MOUNT 42" A.F.F. TO CENTERLINE OF SWITCH UNLESS NOTED OTHERWISE.
- $D SINGLE POLE SWITCH WITH 0-10V DIMMER. MOUNT 42" A.F.F. TO CENTERLINE OF SWITCH UNLESS NOTED OTHERWISE.
- $3D 3-WAY DIMMER, 20 AMP, SWITCH. MOUNT 42" A.F.F. TO CENTERLINE OF SWITCH UNLESS NOTED OTHERWISE.
- $3D 3-WAY SWITCH WITH 0-10V DIMMER. MOUNT 42" A.F.F. TO CENTERLINE OF SWITCH UNLESS NOTED OTHERWISE.
- $OR LIGHTING CONTROL OVERRIDE SWITCH FOR MANUAL CONTROL OF ASSIGNED RELAY PANEL ZONES. MATCH SWITCH WITH RELAY PANEL SYSTEM PROVIDED. REFER TO OVERRIDE SWITCH SCHEDULE IN LIGHTING PLANS FOR ASSIGNED ZONES
- $M SINGLE POLE, 20 AMP, MOTION (PIR) ONLY SWITCH. MOUNT 42" A.F.F. TO CENTERLINE OF SWITCH UNLESS OTHERWISE NOTED. SENSOR SWITCH "WSX" SERIES. PROVIDE DOUBLE POLE WHEN (2) CONTROLLED CIRCUITS.
- $MS SINGLE/DOUBLE RELAY, 20 AMP MOTION/SOUND SWITCH. PASSIVE (PIR) AND ULTRASONIC (US) DUAL TECHNOLOGY. MOUNT 42" A.F.F. TO CENTERLINE OF SWITCH UNLESS NOTED OTHERWISE. SENSOR SWITCH "WSX-PDT" SERIES. PROVIDE DOUBLE POLE WHEN (2) CONTROLLED CIRCUITS.
- (M) SINGLE/DOUBLE POLE LINE VOLTAGE MOTION SENSOR, PASSIVE (PIR) SENSORSWITCH "CMR" SERIES. PROVIDE DOUBLE POLE WHEN (2) CONTROLLED CIRCUITS.
- (MS) LINE VOLTAGE, MOTION/SOUND SENSOR, PASSIVE (PIR) AND ULTRASONIC (US) DUAL TECHNOLOGY. SENSORSWITCH "CMR-PDT" SERIES.
- (M) AAP LINE VOLTAGE MOTION SENSOR, PASSIVE (PIR), WET LOCATION RATED ATLAS LIGHTING PRODUCTS "MS800WL" SERIES
- (M) LV LOW VOLTAGE MOTION SENSOR, PASSIVE (PIR) SENSORSWITCH "CM" SERIES.
- (MS) LV LOW VOLTAGE MOTION/SOUND SENSOR, PASSIVE (PIR) AND ULTRASONIC (US) DUAL TECHNOLOGY. SENSORSWITCH "CM-PDT" SERIES
- (SP) SELF CONTAINED, PLENUM RATED, DUAL CIRCUIT POWER PACK WITH 20 AMP RATING. SENSORSWITCH "PP" SERIES.
- ELECTRICAL PANELBOARD, SURFACE MOUNTED
- ELECTRICAL PANELBOARD, RECESSED MOUNTED
- FUSIBLE DISCONNECT SWITCH A = POLES, B= FRAME SIZE, C= FUSE RATING
- GROUNDING ELECTRODE AND CONDUCTOR SYSTEM
- TRANSFORMER
- TELEPHONE WOOD BACKBOARD
- (T) THERMOSTAT LOCATION. REFER TO MECHANICAL DRAWINGS FOR MOUNTING HEIGHT AND SPECIFICATIONS. PROVIDE JUNCTION BOX IN WALL BEHIND THERMOSTAT WITH 1" CONDUIT SLEEVE WITH PULL STRING, STUB INTO ACCESSIBLE CEILING SPACE. CONDUIT AND BOXES SHALL BE CONCEALED / RECESSED IN CONCRETE BLOCK (CMU) WALLS.
- (CO-P) CARBON MONOXIDE CONTROL PANEL (ELECTRICAL POWER REQUIRED). REFER TO MECHANICAL DRAWINGS FOR REQUIREMENTS AND SPECIFICATIONS.
- GARAGE DOOR CONTROL SWITCH. PROVIDE CONNECTIONS ACCORDING TO MANUFACTURER RECOMMENDATIONS
- GARAGE DOOR MOTION SENSOR. PROVIDE CONNECTIONS ACCORDING TO MANUFACTURER RECOMMENDATIONS

GENERAL FLOOR BOX NOTE:
- REFER TO ARCHITECTURAL PLANS FOR DIMENSIONS AND FINAL LOCATIONS PRIOR TO ROUGH IN.

COMMUNICATION SYMBOLS

- OUTLET, COMBINATION TELEPHONE/DATA COMMUNICATION
- CATV — CABLE TELEVISION LINE (CATV)
- CCTV — CLOSED CIRCUIT TELEVISION LINE = CCTV. MINIMUM 1" CONDUIT
- FO — FIBEROPTICS LINE = FO
- T — TELEPHONE LINE = T
- I — INTERCOM LINE = I. MINIMUM 3/4" CONDUIT.
- S — SOUND LINE = S
- NC — NURSE CALL LINE = NC. MINIMUM 3/4" CONDUIT.
- R — RADIO CONDUIT RUN, MINIMUM 3/4" CONDUIT.
- (C) TELECOMMUNICATIONS MANHOLE
- FLOOR RECEPTACLE, TELEPHONE
- J — OUTLET TELEPHONE; LETTER INDICATES AS FOLLOWS: J = JACK TYPE W = WALL TYPE
- OUTLET DATA ONLY
- OUTLET; LETTER INDICATES AS FOLLOWS: A = AUDIO V = VIDEO I = INTERCOM
- (S) X — SPEAKER, CEILING MOUNTED, "X" INDICATES THE TYPE, PROVIDE SCHEDULE ON LEGEND
- (S) X — SPEAKER, WALL MOUNTED, "X" INDICATES THE TYPE, PROVIDE SCHEDULE ON LEGEND. MTD. 7'-6" AFF UNLESS OTHERWISE NOTED.
- R — RADIO CHANNEL SELECTOR FACILITIES, MTD. 4'-6" AFF UNLESS OTHERWISE NOTED.
- R M — SPEAKER PROGRAM SELECTOR SWITCH & VOLUME CONTROL MTD. 4'-6" AFF UNLESS OTHERWISE NOTED.
- M — OUTLET, TELEVISION BLACK = 4 11/16" MASTER ANTENNA OUTLET BOX w/BLANK COVER, MTD 18" AFF UNLESS OTHERWISE NOTED. C = CAMERA (CCTV SYSTEM), 18" AFF. M = MONITOR (CCTV SYSTEM).
- NCS — NURSE'S CALL MASTER STATION MTD ON NURSE'S COUNTER TOP UNLESS OTHERWISE NOTED.
- NCT — NURSE CALL TERMINAL CABINET.
- N J — NURSE CALL STATION
  - 2 = DUPLICATE FACILITIES FOR TWO BEDS (SEPARATE INDICATORS AT MASTER STATION) MTD 5'-0" AFF UNLESS OTHERWISE NOTED.
  - D = DUTY STATION. MTD 5'-0" AFF UNLESS OTHERWISE NOTED
  - E = MTD 6'-0" AFF FOR SHOWER LOCATION, MTD 4'-6" AFF FOR TUB LOCATION, & MTD 3'-0" AFF FOR TOILET LOCATION.
  - P = PSYCHIATRIC CORRIDOR STATION WITH KEY SWITCH.
  - S = AUDIO VISUAL MALL STATION (STAFF) MTD 5'-0" AFF UNLESS OTHERWISE NOTED.
  - U = UTILITY CALL STATION, MTD 5'-0" AFF UNLESS OTHERWISE NOTED.
- 2 N — NURSE CALL STATION
  - 2 = NURSE'S CALL DOME LIGHT (SUFFIX INDICATES NO. OF LAMP) MTD 6" ABOVE DOOR.
  - D = CORRIDOR DOME LIGHT.
  - I = AUXILIARY INTERSECTIONAL DOME LIGHT.
- TELEPHONE TERMINAL CABINET
- TB — TELEPHONE BACKBOARD (WALL MOUNTED)
- M R — 3-POLE TWIST-LOCK RECEPTACLE FOR MICROPHONE. MTD 4'-6" AFF.
- REMOTE DICTATING OUTLET MTD 1'-6" AFF UNLESS OTHERWISE NOTED.
- INTERCOM STATION (REFER TO SPECS. FOR FUNCTIONAL OPERATION OF INSTRUMENT & TYPE REQUIRED.)
- S — INTERCOM STAFF STATION.

NOTE:
1. FOR WHEELCHAIR PATIENT USE MOUNT TELEPHONE OUTLET 36" AFF TO BOTTOM OF OUTLET BOX.
2. DESK PHONES - MOUNT OUTLET 1'-6" AFF.
3. PAY PHONES - MOUNT OUTLET 4'-0" AFF.
4. HEIGHT OF TELECART OUTLETS SHALL BE AS INDICATED ON BEDWALLS OR RMPU DETAILS.
5. SEE VA BARRIER FREE DESIGN GUIDE (PG-18-13).

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

OEI O'BRIEN ENGINEERING | ARCHITECTURE

ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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STATE OF TEXAS — SHAUN P. DORAN — 152013 — LICENSED PROFESSIONAL ENGINEER
10/07/2025

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: SYMBOLS & LEGENDS	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BIG SPRING, TEXAS	Drawing Number: E003
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: SPD	

VA FORM 08 - 6231

Autodesk Docs://0489001013 VABS Boiler Replacement/0489001013 ELEC R26.rvt

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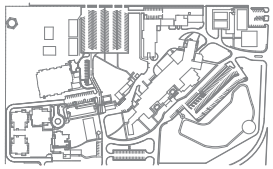
1 OVERALL EXISTING SITE PLAN
1/16" = 1'-0"

KEY NOTES	
NO.	DESCRIPTION



KEY PLAN

PLAN
TRUE

0' 2' 4' 6' 8' 10' 15' 20' 25'
SCALE: 1/8" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
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Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

OEI O'BRIEN ENGINEERING | ARCHITECTURE

ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title
ELECTRICAL EXISTING SITE PLAN

Phase
100% CONSTRUCTION DOCUMENTS

Project Title
A/E REPLACE BOILERS

Project Number
519-20-200

Building Number
2

APPROVING OFFICIAL
COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location
BIG SPRING, TEXAS

Issue Date
10/07/2025

Checked
LRL

Drawn
PSV

Drawing Number
E701

VA FORM 08 - 6231

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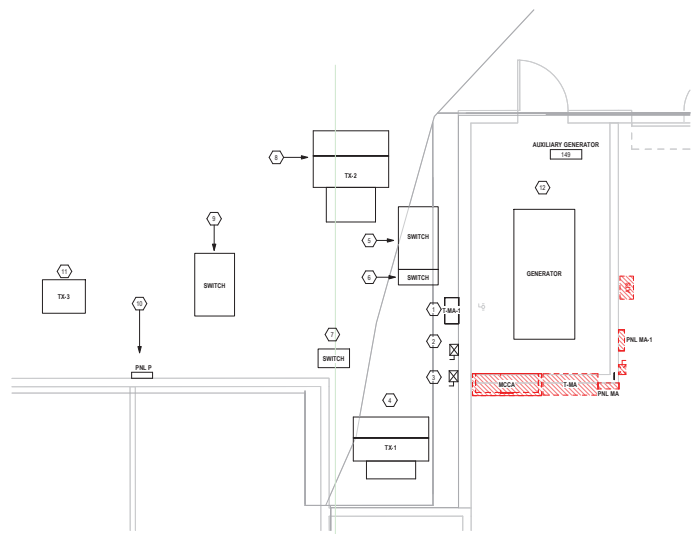
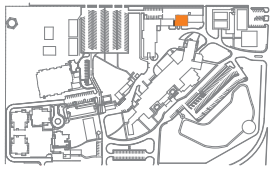


1 EXISTING ELECTRICAL EQUIPMENT LAYOUT (REFERENCE ONLY)
1/4" = 1'-0"

KEY NOTES

NO.	DESCRIPTION
1	(E) T-MA-1: LOW VOLTAGE TRANSFORMER. (E) TRANSFORMER TO REMAIN. FIELD VERIFY. (EATON MODEL DRY TYPE TRANSFORMER 30kVA, 480V-208/120V D-Y).
2	(E) DISCONNECT SWITCH. LINE FEED MA-1 TRANSFORMER TO REMAIN. (EATON MODEL)
3	(E) HEAVY DUTY SAFETY SWITCH. (E) LINE FEED PANEL MA-1 TO REMAIN. (CUTLER-HAMMER MODEL HEAVY DUTY SAFETY SWITCH, 200A, 250V).
4	(E) TX-1: HIGH VOLTAGE TRANSFORMER. (E) BOILER PLANT TRANSFORMER TO REMAIN. FIELD VERIFY. (PAD MOUNTED TRANSFORMER 1000kVA, 12.5kV- 480/277V).
5	(E) MANUAL TRANSFER SWITCH. (E) SWITCHGEAR MANUAL SWITCH TO REMAIN. FIELD VERIFY. (TRANSFER SWITCH 12.5kV-480V).
6	(E) DISCONNECT SWITCH TO REMAIN. FIELD VERIFY. (DISCONNECT SWITCH 400A, 900A, 3P).
7	(E) TVSS/BREAKER: TRANSFER SWITCH. (E) TVSS/BREAKER BOILER PLANT TO REMAIN. FIELD VERIFY. (TRANSFER SWITCH 12.5kV-480V).
8	(E) TX-2: HIGH VOLTAGE TRANSFORMER. (E) TRANSFORMER TO REMAIN. FIELD VERIFY. (PAD MOUNTED TRANSFORMER 2000kVA, 12.5kV- 480V).
9	(E) SHORT CIRCUIT SWITCH. (E) SWITCH FROM BUILDING 15 TO REMAIN. FIELD VERIFY. (SERVES 1500kVA & 2000kVA TRANSFORMERS).
10	(E) PNL - P: DISTRIBUTION PANEL. (E) DISTRIBUTION PANEL P TO REMAIN. FIELD VERIFY. (EATON MODEL)
11	(E) TX-3: LOW VOLTAGE TRANSFORMER. (E) TRANSFORMER TO REMAIN. FIELD VERIFY. (DRY TYPE TRANSFORMER 385kVA, 12.5kVA- 208/120V D-Y).
12	(E) G-1: STAND BY GENERATOR. (E) GENSET TO REMAIN. FIELD VERIFY. (CATERPILLAR MODEL 3306 STANDBY GENSET 288 kVA, 230 kW, 480V, 3PH, 60HZ



KEY PLAN

PLAN
TRUE

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

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

OEI O'BRIEN ENGINEERING | ARCHITECTURE

ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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SHAUN P. DORAN
152013
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PROFESSIONAL ENGINEER
10/07/2025

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: EXISTING ELECTRICAL EQUIPMENT LAYOUT

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BIG SPRING, TEXAS

Issue Date: 10/07/2025

Checked: LRL

Drawn: PSV

Drawing Number: E401

VA FORM 08 - 6231

Autodesk Docs://0489001/0131 VABS Boiler Replacement/0489001-01-01 ELEC R26.rvt

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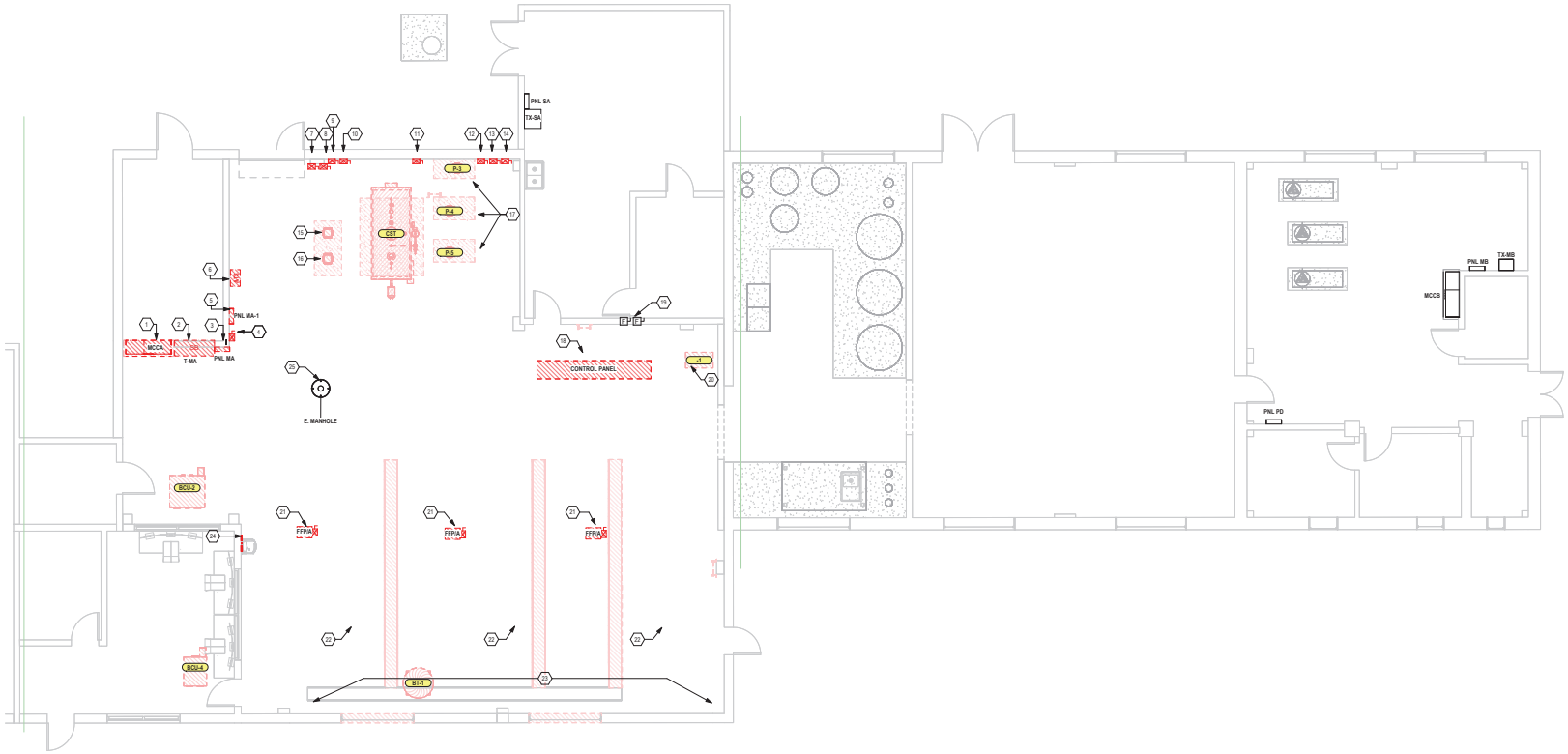
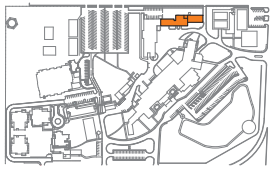


1 ELECTRICAL POWER PLAN - BOILER PLANT FLOOR - DEMO
3/16" = 1'-0"

KEY NOTES

NO.	DESCRIPTION
1	(E) MCCA: MOTOR CONTROL CENTER. DISCONNECT POWER AND DEMOLISH (E) MOTOR CONTROL CENTER MCCA. REMOVE (E) WIRING, CONDUITS BACK TO THE EQUIPMENT. REMOVE (E) ELECTRICAL CIRCUITS AND RECONNECT TO THE (N) MCCA. FIELD VERIFY. (GENERAL ELECTRIC, CAT. NO. - 4TA0808L01). MOTOR CONTROL CENTER, 600A, 480V, 3PH, 3W, 60HZ).
2	(E) T-MA: LOW VOLTAGE TRANSFORMER. DISCONNECT POWER AND DEMOLISH (E) TRANSFORMER "MA" TRANSFORMER. INTEGRAL PART OF MCCA. REMOVE (E) WIRING, CONDUITS BACK TO THE EQUIPMENT. REMOVE (E) ELECTRICAL CIRCUITS AND RECONNECT TO THE (N) TRANSFORMER. FIELD VERIFY. (DRY TYPE TRANSFORMER, 30KVA, 480V-208/120V, D-Y).
3	(E) PNL MA: DISTRIBUTION PANEL. DISCONNECT POWER AND DEMOLISH (E) DISTRIBUTION PANEL MA. REMOVE (E) WIRING, CONDUITS BACK TO THE EQUIPMENT. REMOVE (E) ELECTRICAL CIRCUITS AND RECONNECT TO NEW PANEL MA. FIELD VERIFY. (DISTRIBUTION PANEL 208/120V, 3PH, 4W).
4	(E) DISCONNECT SWITCH. DISCONNECT POWER AND DEMOLISH (E) SUPPLY FAN DISCONNECT SWITCH. REMOVE (E) WIRING, CONDUITS BACK TO THE EQUIPMENT. FIELD VERIFY.
5	(E) PNL MA-1: DISTRIBUTION PANEL. DISCONNECT POWER AND DEMOLISH (E) DISTRIBUTION PANEL MA-1. REMOVE (E) WIRING, CONDUITS BACK TO THE EQUIPMENT. REMOVE (E) ELECTRICAL CIRCUITS AND RECONNECT TO NEW PANEL MA. FIELD VERIFY. (DISTRIBUTION PANEL 280/120V, 3PH, 4W).
6	(E) ATS-B: AUTOMATIC TRANSFER SWITCH. DISCONNECT POWER AND DEMOLISH (E) STANDBY POWER TRANSFER SWITCH. REMOVE (E) WIRE, CONDUIT BACK TO EQUIPMENT. REMOVE (E) ELECTRICAL CONNECTION AND RECONNECT TO (N) TRANSFER SWITCH. FIELD VERIFY. (KHOLER POWER SYSTEMS TRANSFER SWITCH, 400A).
7	(E) BOILER TRANSFER PUMP #5 DISCONNECT SWITCH. DISCONNECT POWER AND REMOVE (E) DISCONNECT SWITCH. REMOVE (E) WIRE, CONDUIT BACK TO PANEL. FIELD VERIFY. (GENERAL ELECTRIC MODEL DISCONNECT, 480V HEAVY DUTY).
8	(E) BOILER TRANSFER PUMP #5 MOTOR CONTROLLER. DISCONNECT POWER AND REMOVE (E) MOTOR CONTROLLER. REMOVE (E) WIRE, CONDUIT BACK TO PANEL. FIELD VERIFY. (BAY POWER MODEL MOTOR CONTROLLER).
9	(E) BOILER TRANSFER PUMP #6 DISCONNECT SWITCH. DISCONNECT POWER AND REMOVE (E) DISCONNECT SWITCH. REMOVE (E) WIRE, CONDUIT BACK TO PANEL. FIELD VERIFY. (GENERAL ELECTRIC MODEL DISCONNECT, 480V HEAVY DUTY).
10	(E) BOILER TRANSFER PUMP #6 MOTOR CONTROLLER. DISCONNECT POWER AND REMOVE (E) MOTOR CONTROLLER. REMOVE (E) WIRE, CONDUIT BACK TO PANEL. FIELD VERIFY. (BAY POWER MODEL MOTOR CONTROLLER).
11	(E) DISSCONNECT SWITCH. DISCONNECT POWER AND DEMOLISH (E) FRESH AIR FAN DISSCONNECT SWITCH. REMOVE (E) WIRING, CONDUITS BACK TO THE EQUIPMENT. FIELD VERIFY. (SQUARE D MODEL 209V SAFETY SWITCH).
12	(E) BOILER FEEDWATER PUMP #7 DISSCONNECT SWITCH. DISCONNECT POWER AND REMOVE (E) DISCONNECT SWITCH. REMOVE (E) WIRE, CONDUIT BACK TO PANEL. FIELD VERIFY. (GENERAL ELECTRIC MODEL 480V HEAVY DUTY DISCONNECT SWITCH).
13	(E) BOILER FEEDWATER PUMP #8 DISSCONNECT SWITCH. DISCONNECT POWER AND REMOVE (E) DISCONNECT SWITCH. REMOVE (E) WIRE, CONDUIT BACK TO PANEL. FIELD VERIFY. (GENERAL ELECTRIC MODEL 480V HEAVY DUTY DISCONNECT SWITCH).
14	(E) BOILER FEEDWATER PUMP #9 DISSCONNECT SWITCH. DISCONNECT POWER AND REMOVE (E) DISCONNECT SWITCH. REMOVE (E) WIRE, CONDUIT BACK TO PANEL. FIELD VERIFY. (GENERAL ELECTRIC MODEL 480V HEAVY DUTY DISCONNECT SWITCH).
15	(E) CONDENSATE TRANSFER PUMP #5. DISCONNECT POWER AND REMOVE (E) BOILER CONDENSATE PUMP CONNECTION AND (E) WIRE, CONDUIT BACK TO PANEL. FIELD VERIFY. (PUMP, 1HP).
16	(E) CONDENSATE TRANSFER PUMP #6. DISCONNECT POWER AND REMOVE (E) BOILER CONDENSATE PUMP CONNECTION AND (E) WIRE, CONDUIT BACK TO PANEL. FIELD VERIFY. (PUMP, 1HP).
17	(E) BOILER FEEDWATER PUMP #7, #8, #9. DISCONNECT POWER AND REMOVE (E) BOILER FEEDWATER PUMP CONNECTION BACK TO MOTOR CONTROLLER. REMOVE (E) WIRE, CONDUIT BACK TO PANEL. FIELD VERIFY. (PUMP, 10HP).
18	(E) HVAC CONTROL CENTER. DISCONNECT POWER AND DEMOLISH (E) HVAC CONTROL CENTER. REMOVE (E) WIRING, CONDUITS BACK TO THE EQUIPMENT. REMOVE (E) ELECTRICAL CONNECTION AND RECONNECT TO (N) HVAC CONTROL CENTER. FIELD VERIFY.
19	(E) DISSCONNECT SWITCH. (E) AIR COMPRESSOR DISSCONNECT SWITCH TO REMAIN. FIELD VERIFY. (GENERAL ELECTRIC MODEL 480V HEAVY DUTY DISCONNECT SWITCH).
20	(E) AIR COMPRESSOR TO REMAIN. FIELD VERIFY
21	(E) FFPA: FREE-STANDING FLAME FAILURE/ ANNUCIATOR CABINET. DISCONNECT POWER AND REMOVE (E) ANNUCIATOR CABINET. REMOVE (E) WIRE, CONDUIT BACK TO PANEL. FIELD VERIFY.
22	(E) REMOVE BOILER AND BOILER MOTOR STARTER CONNECTIONS. DISCONNECT POWER AND REMOVE (E) STARTER/ TERMINAL CABINET MOUNTED ON BOILER. REMOVE (E) WIRE, CONDUIT BACK TO PANEL. FIELD VERIFY. (DISCONNECT SWITCH - 480V).
23	(E) REMOVE (E) JUNCTION BOX, LIGHTING FIXTURES, SWITCHES. DISSCONNECT POWER AND REMOVE WIRE, CONDUIT BACK TO PANEL. FIELD VERIFY.
24	(E) ANNUNCIATOR CONTROL PANEL. DISCONNECT POWER AND REMOVE (E) ANNUNCIATOR CONTROL PANEL, WIRE, CONDUITS BACK TO THE PANEL. FIELD VERIFY.
25	(E) MANHOLE #5: UNDERGROUND CABLING SERVICE ENTRANCE TO REMAIN. CONFIRM ELECTRICAL SERVICE DISTRIBUTION THROUGH MANHOLE. FIELD VERIFY SOURCE TERMINATION AND CAMPUS DISTRIBUTION IS INDEPENDENT OF ANY DISTRIBUTION THROUGH THIS MANHOLE.



KEY PLAN

PLAN
TRUE

SCALE: 3/16" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

OEI O'BRIEN ENGINEERING | ARCHITECTURE

ARCHITECT/ENGINEER OF RECORD

A/E:
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O'Brien Engineering Inc., Managing Partner
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Dallas, TX 75248
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10/07/2025

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title
ELECTRICAL DEMOLITION PLAN - BOILER PLANT FLOOR

Phase
100% CONSTRUCTION DOCUMENTS

Project Title
A/E REPLACE BOILERS

Project Number
519-20-200

Building Number
2

APPROVING OFFICIAL
COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location
BIG SPRING, TEXAS

Issue Date
10/07/2025

Checked
LRL

Drawn
PSV

Drawing Number
ED101

VA FORM 08 - 6231

Autodesk Docs://0489001/0131 VABS Boiler Replacement/0489001-013 ELEC RDL.rvt

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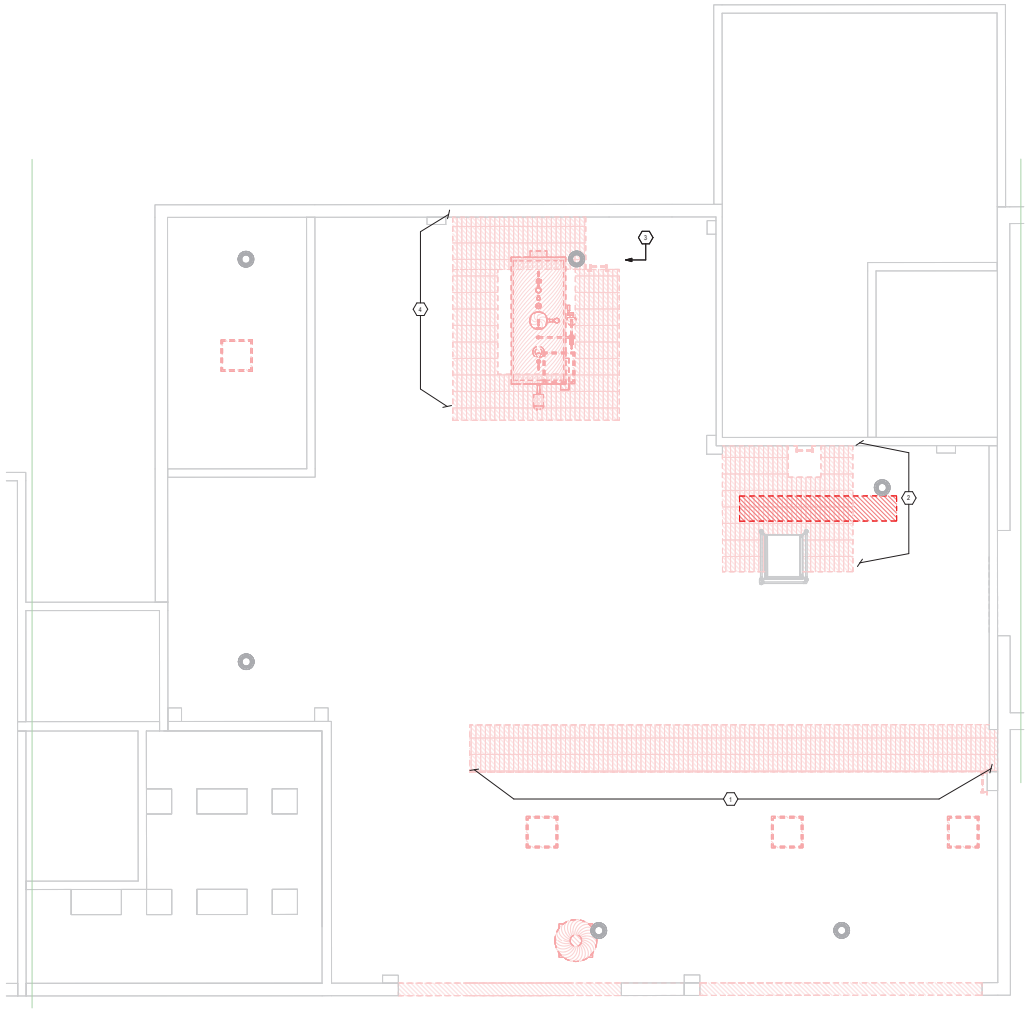
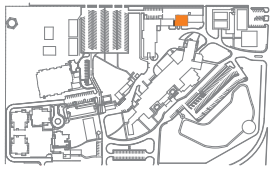
KEY NOTES	
NO.	DESCRIPTION
1	(E) BOILER STARTER/TERMINAL CABINET, FFPS ANNUCIATOR CABINET. DISCONNECT POWER AND REMOVE (E) BOILER CONNECTIONS. REMOVE (E) WIRING, CONDUITS, JUNCTION BOXES ATTACHED TO THE MEZZANINE BACK TO PANEL. FIELD VERIFY.
2	(E) CONTROLS. DISCONNECT POWER AND REMOVE (E) CONTROL CONNECTIONS. REMOVE (E) WIRING, CONDUITS, JUNCTION BOXES ATTACHED TO THE MEZZANINE BACK TO EQUIPMENT. FIELD VERIFY.
3	(E) JUNCTION BOX, CABLES. DISCONNECT POWER AND REMOVE (E) FEED WATER PUMP DISCONNECT SWITCH CONNECTIONS BACK TO THE PANEL. REMOVE (E) WIRING, CONDUITS ATTACHED TO THE MEZZANINE. FIELD VERIFY.
4	(E) JUNCTION BOX, CABLES. DISCONNECT POWER AND REMOVE (E) TRANSFER PUMP DISCONNECT SWITCH CONNECTIONS BACK TO THE PANEL. REMOVE (E) WIRING, CONDUITS ATTACHED TO THE MEZZANINE. FIELD VERIFY.



1 ELECTRICAL POWER PLAN - BOILER PLANT MEZZANINE - DEMO
1/4" = 1'-0"



KEY PLAN

PLAN
TRUE

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

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
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Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

OEI O'BRIEN ENGINEERING | ARCHITECTURE

ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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10/07/2025

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: ELECTRICAL DEMOLITION PLAN - BOILER PLANT MEZZANINE

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BIG SPRING, TEXAS

Issue Date: 10/07/2025 | Checked: LRL | Drawn: PSV

Drawing Number: ED102

VA FORM 08 - 6231

Autodesk Docs://04890/01013 VABS Boiler Replacement/04890-01013 ELEC R26.rvt

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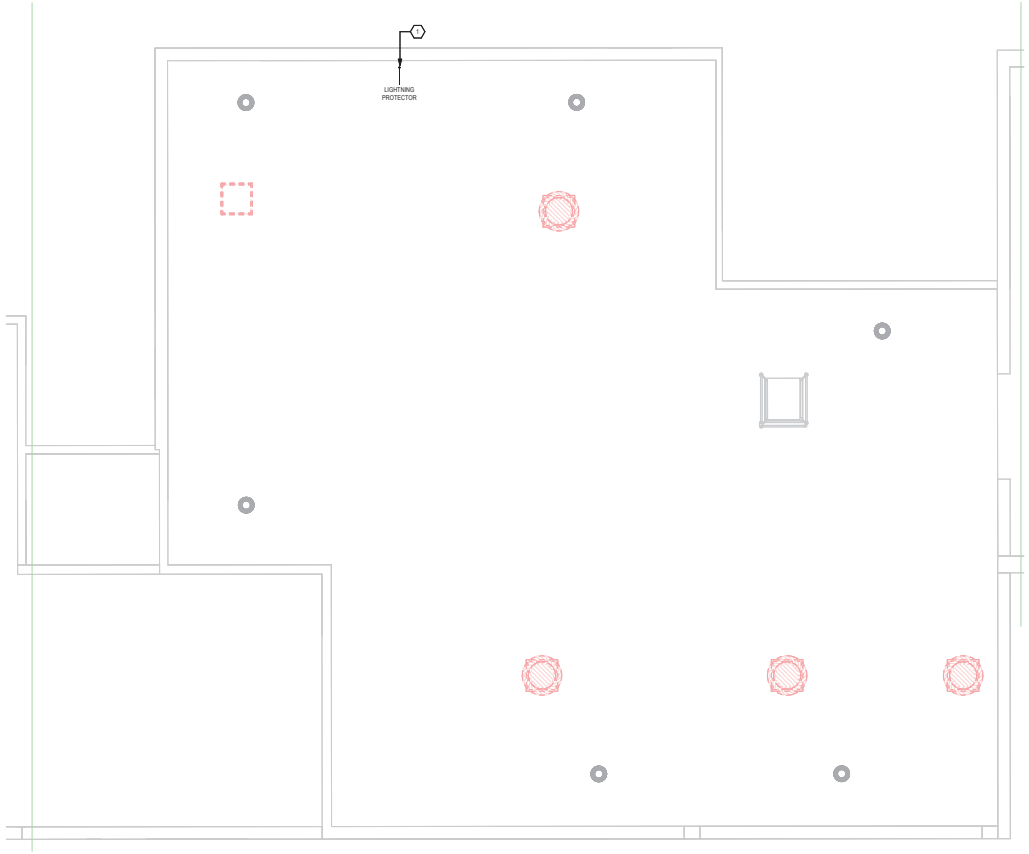
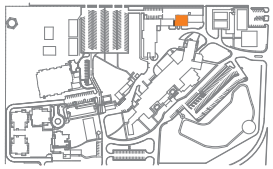
KEY NOTES	
NO.	DESCRIPTION
1	(E) LIGHTNING ARRESTER ROD. (E) LIGHTNING ARRESTER TO REMAIN. FIELD VERIFY.



1 ELECTRICAL POWER PLAN - BOILER PLANT ROOF - DEMO
1/4" = 1'-0"



KEY PLAN

PLAN
TRUE

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

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

OEI O'BRIEN ENGINEERING | ARCHITECTURE

ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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VA U.S. Department of Veterans Affairs

Drawing Title: ELECTRICAL DEMOLITION PLAN - BOILER PLANT ROOF

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BIG SPRING, TEXAS

Issue Date: 10/07/2025

Checked: LRL

Drawn: PSV

Drawing Number: ED103

VA FORM 08 - 6231

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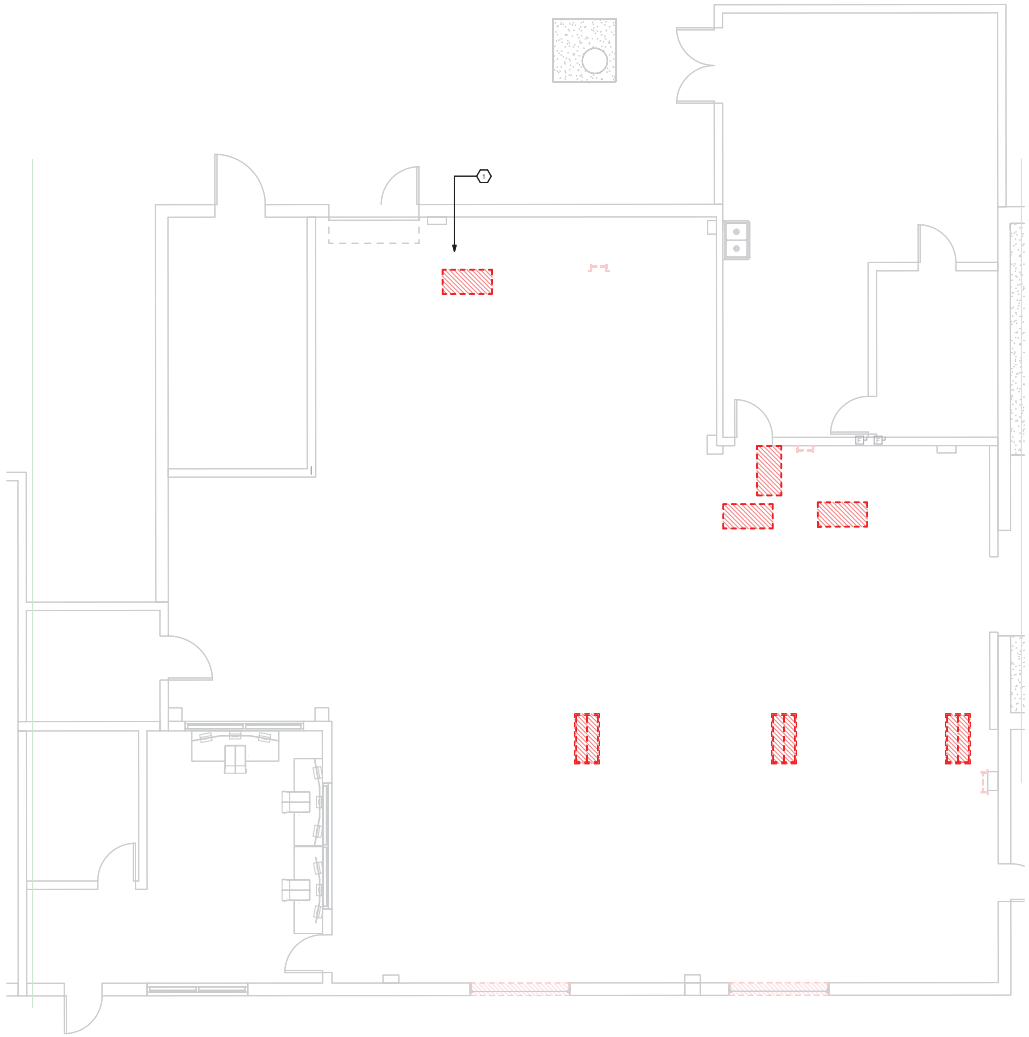
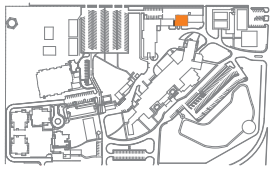
KEY NOTES	
NO.	DESCRIPTION
1	(E) LIGHTING FIXTURES (TYPICAL). DISCONNECT POWER AND REMOVE (E) FIXTURE "B" LIGHTING FIXTURES CONNECTIONS. REMOVE (E) WIRING, CONDUITS BACK TO PANEL. FIELD VERIFY. (FIXTURE "B": RECESSED, 4-LAMP, FLUORESCENT TROFFER 2'X4').



1 ELECTRICAL LIGHTING PLAN - BOILER PLANT FLOOR - DEMO
1/4" = 1'-0"



KEY PLAN

PLAN
TRUE

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

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
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972-233-2288
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OEI O'BRIEN ENGINEERING | ARCHITECTURE

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A/E:
OEI-LBL Joint Venture LLC
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Dallas, TX 75248
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10/07/2025

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title
ELECTRICAL LIGHTING DEMOLITION PLAN - BOILER PLANT

Phase
100% CONSTRUCTION DOCUMENTS

Project Title
A/E REPLACE BOILERS

Project Number
519-20-200

Building Number
2

APPROVING OFFICIAL
COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location
BIG SPRING, TEXAS

Issue Date
10/07/2025

Checked
LRL

Drawn
PSV

Drawing Number
ED104

VA FORM 08 - 6231

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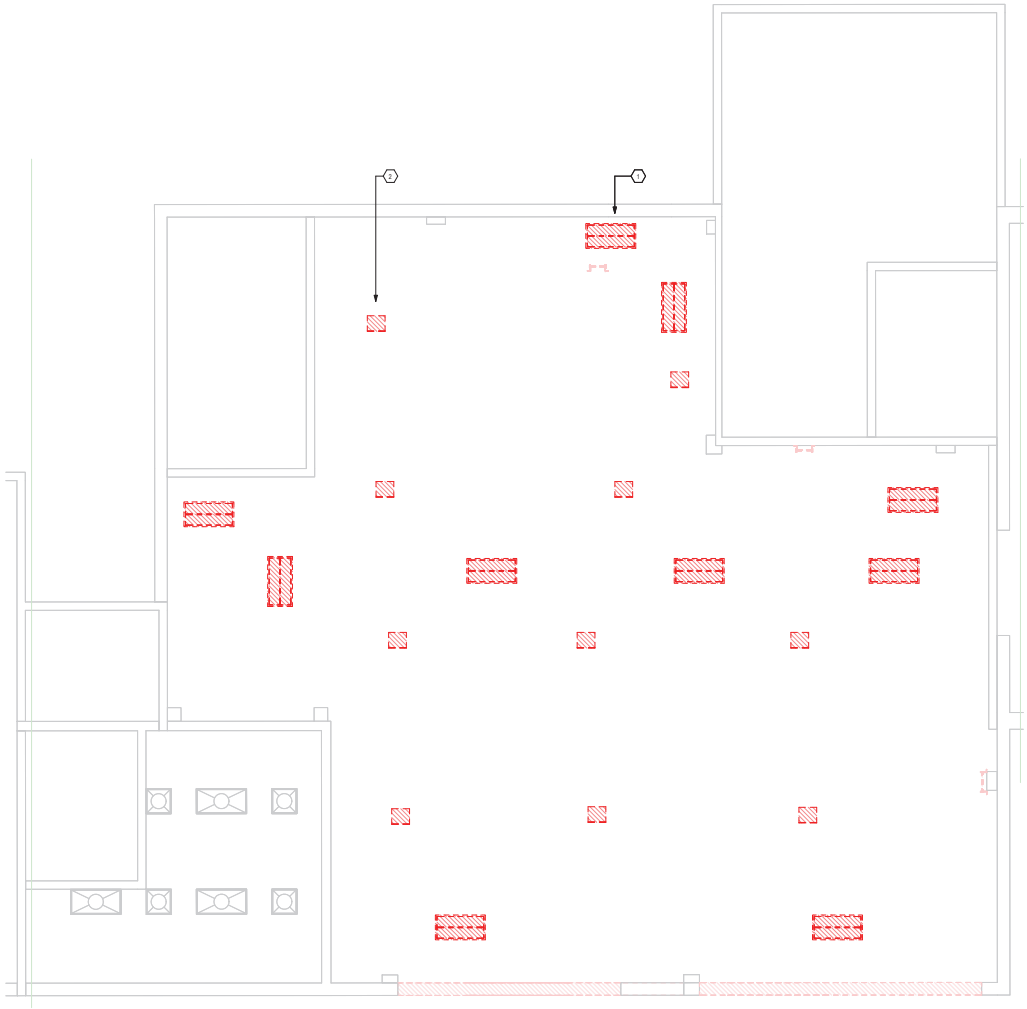
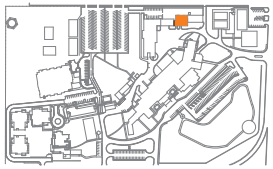
KEY NOTES	
NO.	DESCRIPTION
1	(E) LIGHTING FIXTURES (TYPICAL). DISCONNECT POWER AND REMOVE (E) FIXTURE "B" LIGHTING FIXTURES CONNECTIONS. REMOVE (E) WIRING, CONDUITS BACK TO PANEL. FIELD VERIFY. (FIXTURE "B" : RECESSED, 4-LAMP, FLUORESCENT TROFFER 2'X4').
2	(E) LIGHTING FIXTURES (TYPICAL). DISCONNECT POWER AND REMOVE (E) FIXTURE "C" LIGHTING FIXTURES CONNECTIONS. REMOVE (E) WIRING, CONDUITS BACK TO PANEL. FIELD VERIFY. (FIXTURE "C" : 120V, WEATHERPROOF CAST ALUMINUM HOUSING).



1 ELECTRICAL LIGHTING PLAN - BOILER PLANT MEZZANINE - DEMO
1/4" = 1'-0"



KEY PLAN

PLAN
TRUE

0' 1' 2' 3' 4' 5' 10' 15' 20'
SCALE: 1/4" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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10/07/2025

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: ELECTRICAL LIGHTING DEMO PLAN - BOILER PLANT MEZZANINE

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BIG SPRING, TEXAS

Issue Date: 10/07/2025

Checked: LRL

Drawn: PSV

Drawing Number: ED105

VA FORM 08 - 6231

Autodesk Docs://0489001/0131/ABS Boiler Replacement/0489001-0131-ELEC R26.rvt

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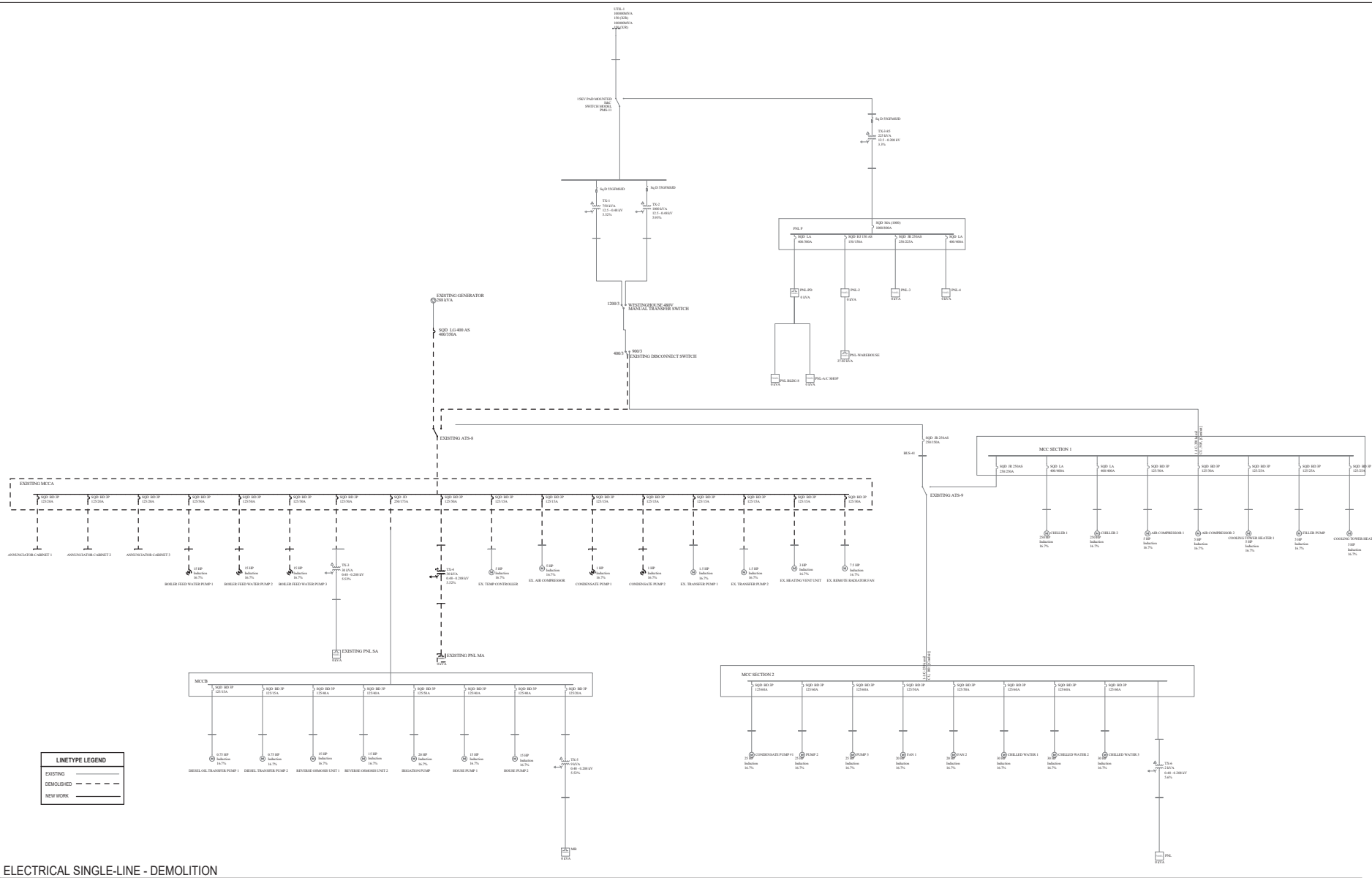

1 ELECTRICAL SINGLE-LINE - DEMOLITION

SCALE: NONE

LINETYPE LEGEND

EXISTING	
DEMOLISHED	
NEW WORK	

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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PROFESSIONAL ENGINEER
10/07/2025

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: ELECTRICAL SINGLE LINE DIAGRAM - DEMOLITION	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BIG SPRING, TEXAS	Drawing Number: ED601
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: PSV	

VA FORM 08 - 6231

Autodesk Docs://0489001/013 VABS Boiler Replacement/0489001013 ELEC RDL.rvt

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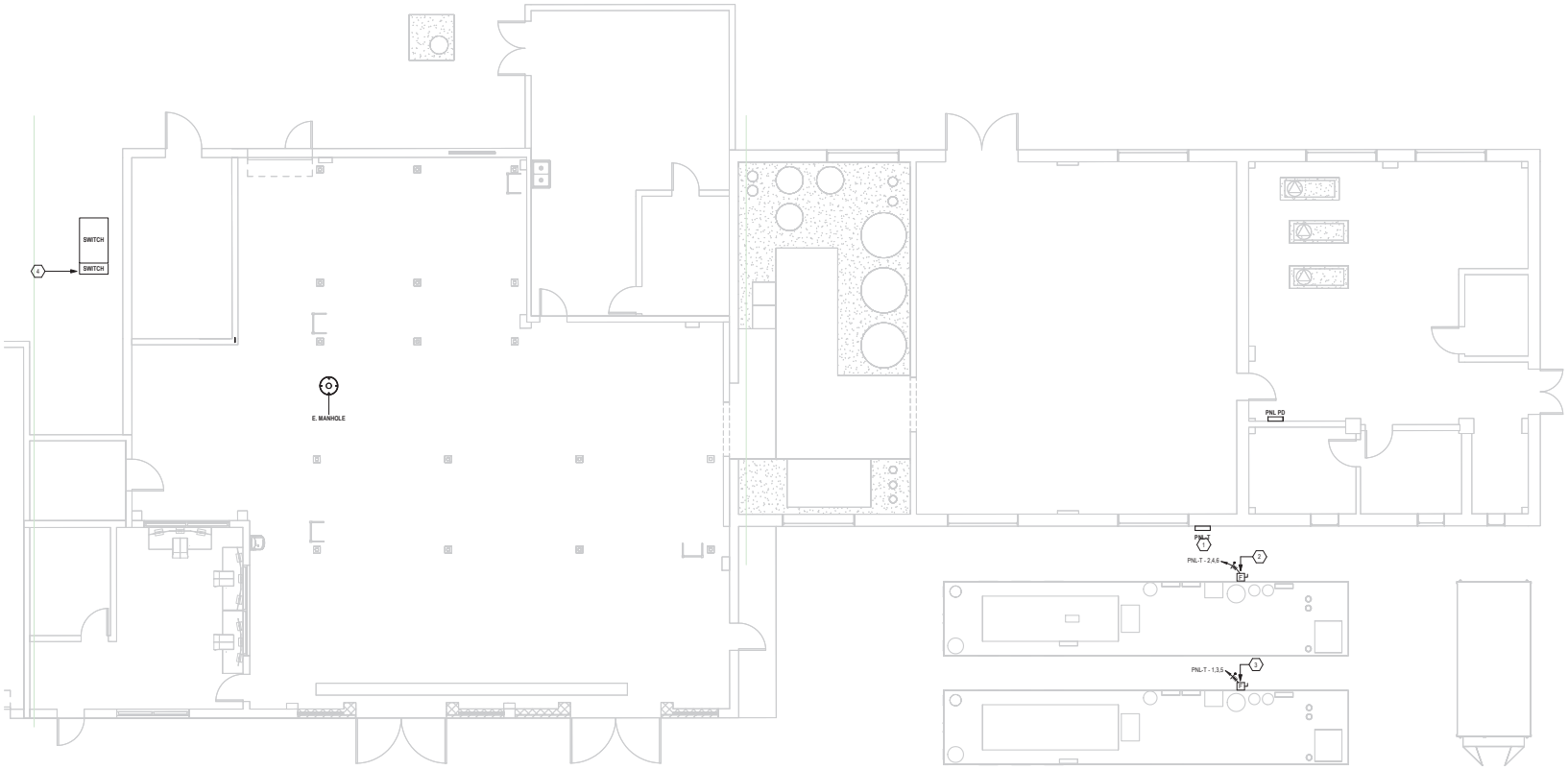
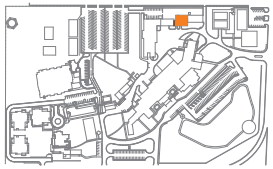


1 ELECTRICAL POWER PLAN - BOILER PLANT FLOOR - TEMPORARY
3/16" = 1'-0"

KEY NOTES	
NO.	DESCRIPTION
1	PNL-T: TEMPORARY MAIN DISTRIBUTION PANEL. CONNECT THE TEMPORARY BOILER T-B-1 & T-B-2 MAIN DISCONNECT PANEL. COORDINATE TEMPORARY BOILER CONNECTIONS WITH THE TEMPORARY BOILER VENDOR. FIELD VERIFY. (480V PANEL)
2	TEMPORARY BOILER T-B-1 MAIN DISCONNECT. BREAKER PANEL. CONNECT TEMPORARY BOILER T-B-1 TO THE TEMPORARY PANEL PNL-T. TEMPORARY BOILER MAIN DISCONNECT SWITCH, BREAKER PANEL, CABLES AND INSTALLATION PROVIDED BY THE TEMPORARY BOILER VENDOR. COORDINATE ELECTRICAL TERMINATION IN THE TEMPORARY PANEL PNL-T WITH THE TEMPORARY BOILER VENDOR. FIELD VERIFY. (480V, 3PH, 60HZ, 60AMPS).
3	TEMPORARY BOILER T-B-2 MAIN DISCONNECT. BREAKER PANEL. CONNECT TEMPORARY BOILER T-B-2 TO THE TEMPORARY PANEL PNL-T. TEMPORARY BOILER MAIN DISCONNECT SWITCH, BREAKER PANEL, CABLES AND INSTALLATION PROVIDED BY THE TEMPORARY BOILER VENDOR. COORDINATE ELECTRICAL TERMINATION IN THE TEMPORARY PANEL PNL-T WITH THE TEMPORARY BOILER VENDOR. FIELD VERIFY. (480V, 3PH, 60HZ, 60AMPS).
4	(E) DISCONNECT SWITCH. DISCONNECT POWER AND CONNECT THE TEMPORARY PANEL PNL-T TO THE DISCONNECT SWITCH DURING THE CONSTRUCTION PROCESS. TEMPORARY BOILER T-B-1 & T-B-2 ARE CONNECTED THROUGH THE PNL-T. RECONNECT THE (N) ELECTRICAL CONNECTION BACK TO (E) DISCONNECT SWITCH AFTER THE CONSTRUCTION.



KEY PLAN

PLAN
TRUE

SCALE: 3/16" = 1'-0"

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

OEI O'BRIEN ENGINEERING | ARCHITECTURE

ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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152013
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10/07/2025

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: ELECTRICAL TEMPORARY PLAN - BOILER PLANT FLOOR

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BIG SPRING, TEXAS

Issue Date: 10/07/2025 | Checked: LRL | Drawn: PSV

Drawing Number: ET101

VA FORM 08 - 6231

Autodesk Docs://0489001/0131/ABS Boiler Replacement/0489001-01-ELEC R26.rvt

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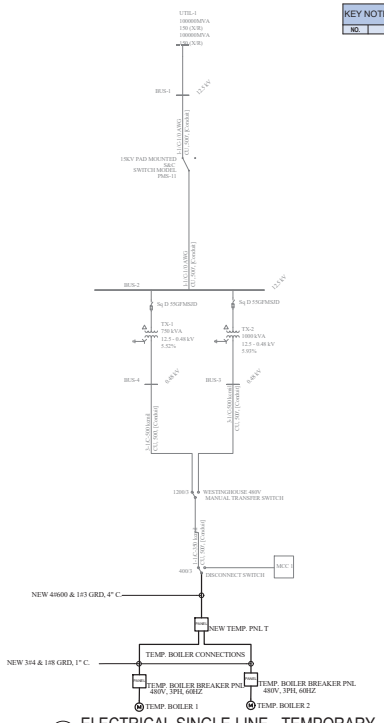
KEY NOTES	
NO.	DESCRIPTION



1 ELECTRICAL SINGLE-LINE - TEMPORARY

SCALE: NONE

LINETYPE LEGEND	
EXISTING	
DEMOLISHED	
NEW WORK	

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
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17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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152013
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VA U.S. Department of Veterans Affairs

Drawing Title: ELECTRICAL SINGLE LINE - TEMPORARY	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BIG SPRING, TEXAS	Drawing Number: ET601
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: PSV	

VA FORM 08 - 6231

Autodesk Docs://0489001/013 VABS Boiler Replacement/0489001-013 ELEC R26.rvt

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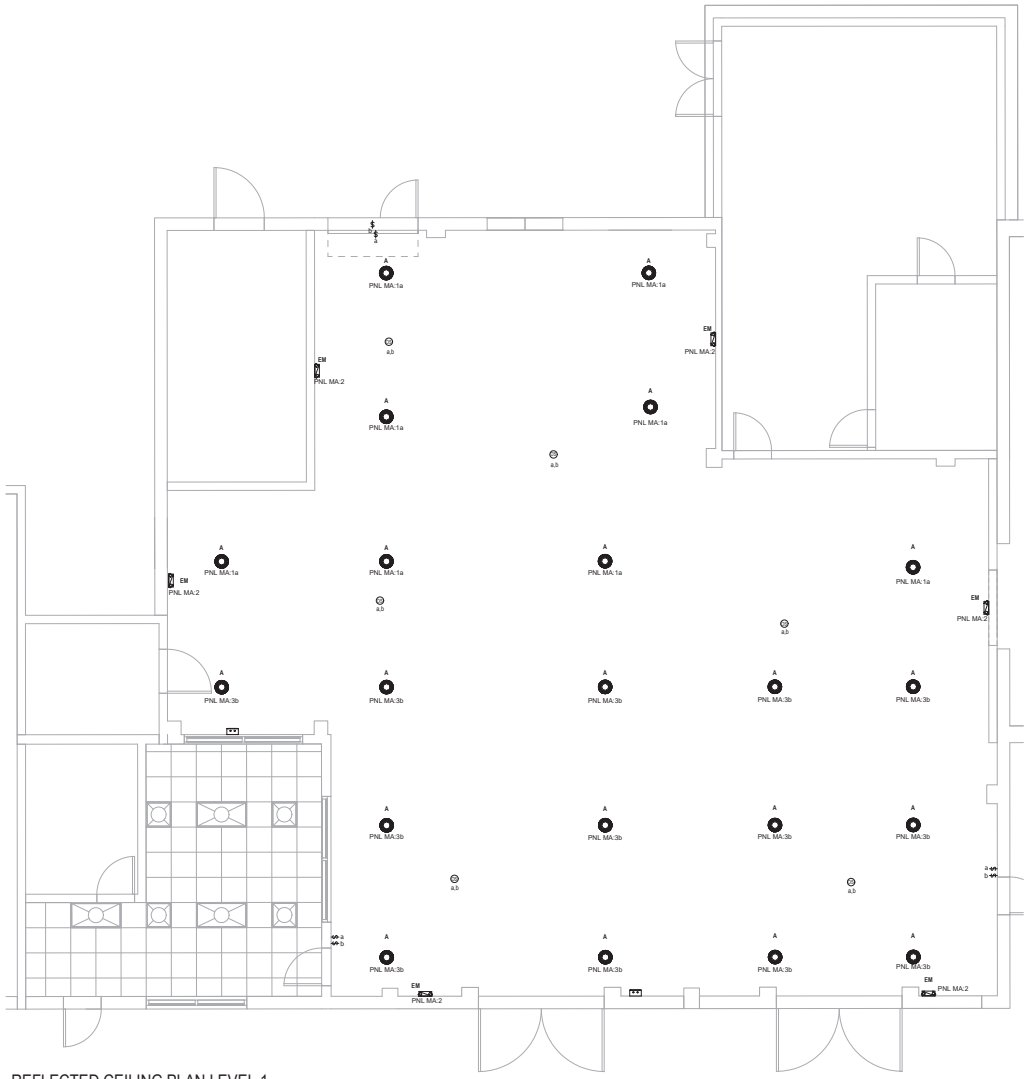
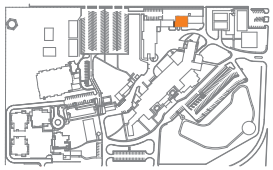
KEY NOTES	
NO.	DESCRIPTION



1 REFLECTED CEILING PLAN LEVEL 1
1/4" = 1'-0"



KEY PLAN

PLAN
TRUE

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

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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A/E:
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O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: ELECTRICAL LIGHTING PLAN - BOILER PLANT FLOOR

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BIG SPRING, TEXAS

Issue Date: 10/07/2025

Checked: LRL

Drawn: PSV

Drawing Number: EL101

VA FORM 08 - 6231

Autodesk Docs://0489001/0131/VBS Boiler Replacement/0489001-01-01 ELEC R26.rvt

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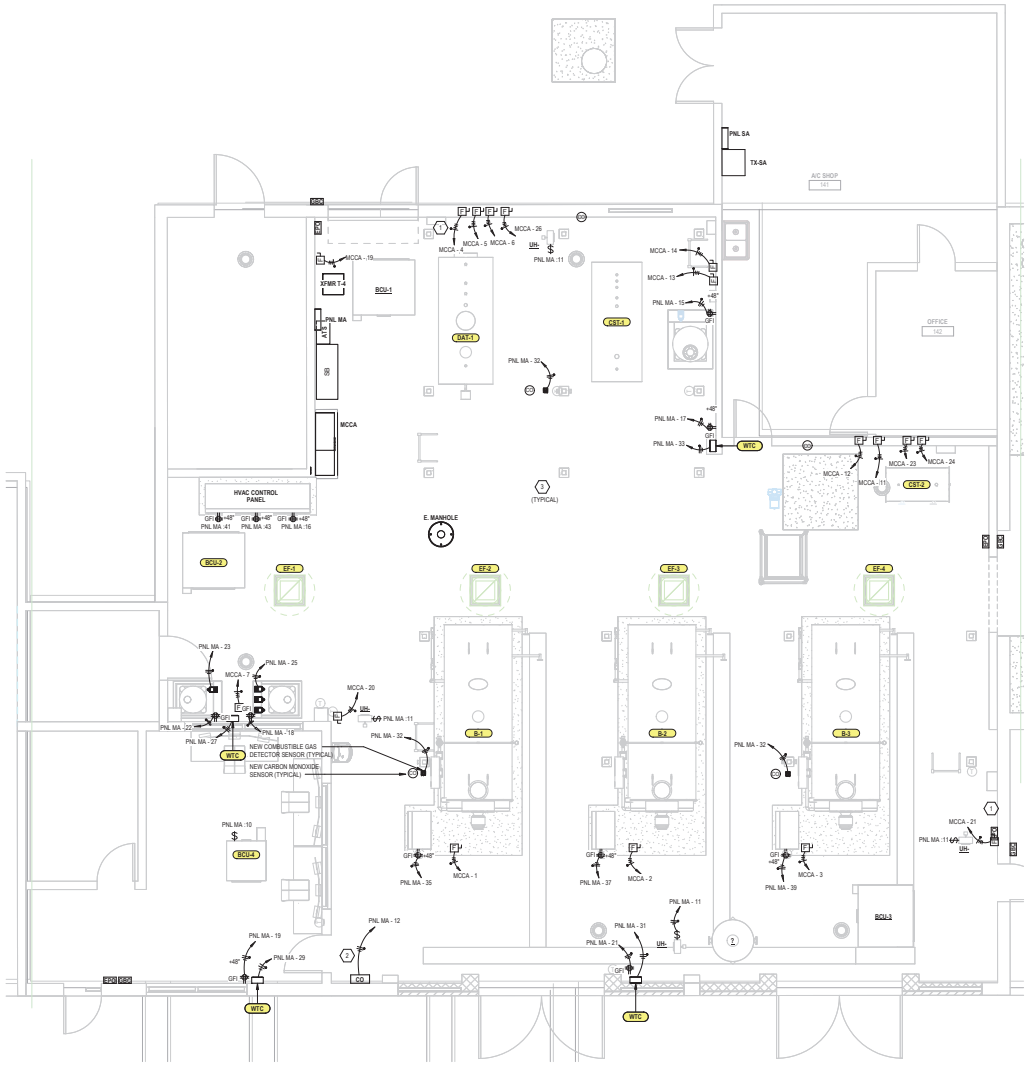
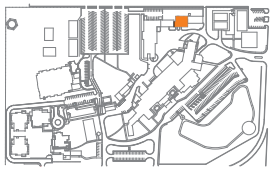
KEY NOTES	
NO.	DESCRIPTION
1	PROVIDE NEW EMERGENCY POWER OFF PUSH BUTTON. CONNECT TO B-1,2,3 AND T-B-1,2. BUTTON SHALL SHUTOFF GAS/FUEL SUPPLY TO BOILER. PROVIDE ADDITIONAL NC CONTACTS AS REQUIRED TO CONNECT EPO BUTTONS IN SERIES. (3#3 & 1#8 GRD, 1-1/4" C.) (TYPICAL)
2	CO DETECTION SENSOR CONTROL PANEL. CONNECT TO NEW SENSORS AS INDICATED.
3	E.C. TO PROVIDE 24VDC POWER SUPPLIES AS REQUIRED FOR FLOW METERS AND PRESSURE SENSORS. COORDINATE WITH THE MECHANICAL DRAWINGS FOR TYPES AND QUANTITIES. CONNECT TO SPARE 20A, 1P BREAKERS IN PANEL MA AS REQUIRED. CIRCUITING SHOWN FOR REFERENCE ONLY.



1 ELECTRICAL POWER PLAN - BOILER PLANT FLOOR
1/4" = 1'-0"



KEY PLAN

PLAN TRUE

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

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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VA U.S. Department of Veterans Affairs

Drawing Title: ELECTRICAL POWER PLAN - BOILER PLANT FLOOR

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

Phase: 100% CONSTRUCTION DOCUMENTS

FULLY SPRINKLERED

Project Title: A/E REPLACE BOILERS

Location: BIG SPRING, TEXAS

Issue Date: 10/07/2025

Checked: LRL

Drawn: PSV

Project Number: 519-20-200

Building Number: 2

Drawing Number: EP101

Autodesk Docs://0489001/0131 VABS Boiler Replacement/0489001-013 ELEC R26.rvt

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VA FORM 08 - 6231

KEY NOTES	
NO.	DESCRIPTION
1	E.C. TO PROVIDE 24VDC POWER SUPPLIES AS REQUIRED FOR FLOW METERS AND PRESSURE SENSORS. COORDINATE WITH THE MECHANICAL DRAWINGS FOR TYPES AND QUANTITIES. CONNECT TO SPARE 20A,1P BREAKERS IN PANEL MA AS REQUIRED. CIRCUITING SHOWN FOR REFERENCE ONLY.

1 ELECTRICAL POWER PLAN - BOILER PLANT MEZZANINE
SCALE: NONE

2 ENLARGED PLAN - TRANSMITTERS
1/2" = 1'-0"

3 ENLARGED PLAN - TRANSMITTERS
1/2" = 1'-0"

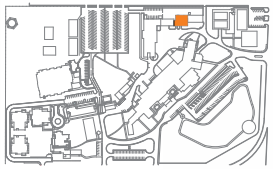
4 ENLARGED PLAN - TRANSMITTERS
1/2" = 1'-0"

5 ENLARGED PLAN - TRANSMITTERS
SCALE: NONE

6 ENLARGED PLAN - TRANSMITTERS
SCALE: NONE

7 ENLARGED PLAN - TRANSMITTERS
SCALE: NONE

8 ENLARGED PLAN - TRANSMITTERS
SCALE: NONE



KEY PLAN

PLAN
TRUE

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

Revisions:	Date:
100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024

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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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17300 Dallas Parkway, Suite 1000
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972-233-2288
www.obrieneng.com

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VA U.S. Department of Veterans Affairs

Drawing Title	Phase	Project Title	Project Number
ELECTRICAL POWER PLAN - BOILER PLANT MEZZANINE	100% CONSTRUCTION DOCUMENTS	A/E REPLACE BOILERS	519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BIG SPRING, TEXAS	Drawing Number: EP102
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: PSV	

VA FORM 08 - 6231

Autodesk Docs://0489001/0131/ABS Boiler Replacement/0489001-01-01 ELEC PQE.rvt

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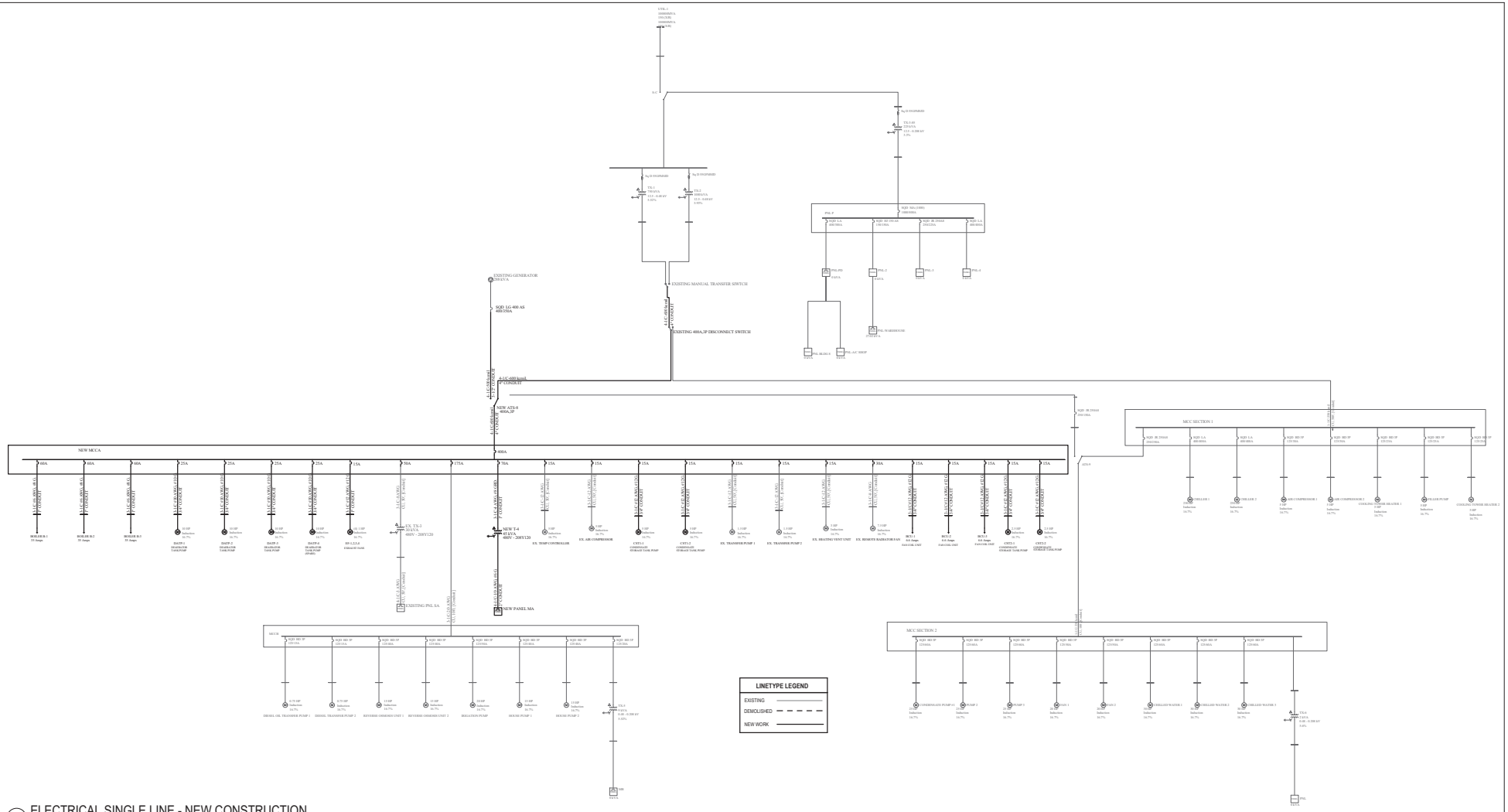

1 ELECTRICAL SINGLE LINE - NEW CONSTRUCTION
SCALE: NONE

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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ARCHITECT/ENGINEER OF RECORD

A/E:
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O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
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Drawing Title: ELECTRICAL SINGLE LINE DIAGRAM - NEW CONSTRUCTION

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

Phase: 100% CONSTRUCTION DOCUMENTS

FULLY SPRINKLERED

Project Title: A/E REPLACE BOILERS

Location: BIG SPRING, TEXAS

Issue Date: 10/07/2025 | Checked: LRL | Drawn: PSV

Project Number: 519-20-200

Building Number: 2

Drawing Number: EP601

VA FORM 08 - 6231

Autodesk Docs://0489001/0313 VABS Boiler Replacement/0489001-03 ELEC R26.rvt

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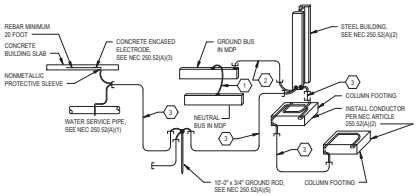


KEY NOTES:

1. BARE COPPER MAIN BONDING JUMPER PER NEC 250.28.
2. BARE COPPER GROUNDING ELECTRODE CONDUCTOR PER NEC 250.66.
3. BARE COPPER GROUNDING ELECTRODE BONDING JUMPER PER NEC 250.53.

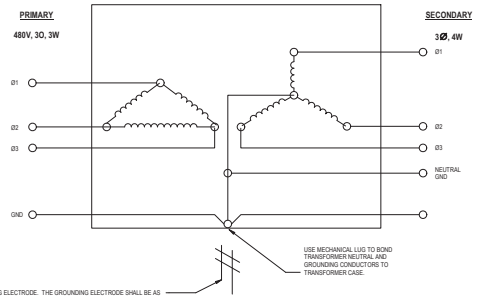
GENERAL NOTES:

ALL GROUNDING ELECTRODES AS DESCRIBED IN THE NATIONAL ELECTRICAL CODE, 2014 EDITION, SECTION 250.52(A)(1) THROUGH (A)(8), THAT ARE PRESENT AT EACH BUILDING OR STRUCTURE SERVED SHALL BE BONDED TOGETHER TO FORM THE GROUNDING ELECTRODE SYSTEM. GROUNDING ELECTRODES AS DESCRIBED IN THE NATIONAL ELECTRICAL CODE, 2017 EDITION, SECTIONS 250.52 (A)(1), (A)(2), (A)(3), AND (A)(7), SHALL BE SUPPLEMENTED WITH A ROD ELECTRODE AS DESCRIBED IN SECTION 250.52 (A)(5)(b). WHERE NO OTHER GROUNDING ELECTRODE IS PRESENT A ROD ELECTRODE SHALL BE PERMITTED TO BE THE SOLE GROUNDING ELECTRODE.

EXCEPTION: CONCRETE-ENCASED ELECTRODES OF EXISTING BUILDINGS OR STRUCTURES SHALL NOT BE REQUIRED TO BE PART OF THE GROUNDING ELECTRODE SYSTEM WHERE THE STEEL REINFORCED BARS OR RODS ARE NOT ACCESSIBLE FOR USE WITHOUT DISTURBING THE CONCRETE.

1 GROUNDING ELECTRODE SYSTEM DETAIL

SCALE: NONE



NEC 250.30(4)-GROUNDING ELECTRODE. THE GROUNDING ELECTRODE SHALL BE AS NEAR AS PACTICABLE TO, AND PREFERABLY IN THE SAME AREA AS, THE GROUNDING ELECTRODE CONDUCTOR CONNECTION TO THE SYSTEM. THE GROUNDING ELECTRODE SHALL BE THE NEAREST OF ONE OF THE FOLLOWING.

1. METAL WATER PIPE GROUNDING ELECTRODE AS SPECIFIED IN NEC 250.52(A)(1)
2. STRUCTURAL METAL GROUNDING ELECTRODE AS SPECIFIED IN NEC 250.52(A)(2)

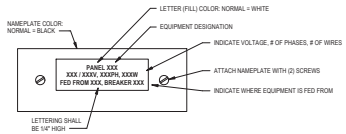
EXCEPTION #1: ANY OF THE OTHER ELECTRODES IDENTIFIED IN 250.52(A) SHALL BE USED IF THE ELECTRODES SPECIFIED BY 250.30(A)(4) ARE NOT AVAILABLE.

EXCEPTION #2: TO (1) AND (2): IF SEPARATELY DERIVED SYSTEM ORIGINATES IN LISTED EQUIPMENT SUITABLE FOR USE AS SERVICE EQUIPMENT, THE GROUNDING ELECTRODE USED FOR THE SERVICE OR FEEDER EQUIPMENT SHALL BE PERMITTED AS THE GROUNDING ELECTRODE FOR THE SEPERATELY DERIVED SYSTEM.

250.30 (A) GROUNDED SYSTEMS. ALL SEPARATELY DERIVED AC SYSTEM THAT IS GROUNDED SHALL COMPLY WITH 250.30(A)(1) THROUGH (A)(8)

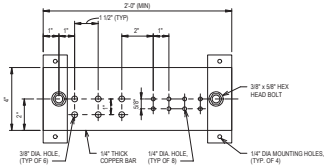
2 DRY TYPE TRANSFORMER GROUNDING DETAIL

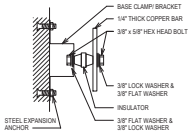
SCALE: NONE



3 PANELBOARD NAMEPLATE DETAIL

SCALE: NONE





SECTION

NOTES:

1. ALL HARDWARE SHALL BE STAINLESS STEEL.
2. PROVIDE 1 MOUNTING POINT PER 12" OF BAR LENGTH.
3. HOLES MAY BE ADDED IF REQUIRED.

4 GROUNDING BAR DETAIL

SCALE: NONE

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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A/E:
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O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
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10/07/2025

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: ELECTRICAL POWER DETAILS	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BIG SPRING, TEXAS	Drawing Number: E501
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: PSV	

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DISTRIBUTION PANEL: MCCB

VOLTAGE: 480/277 Wye		**BUSS RATING:** 175 A	**ENCLOSURE:** NEMA 1
PHASE: 3	**WIRE:** 4	**MAINS TYPE:** MCB	**MOUNTING:** FLOOR
SUPPLY FROM: MCCA		**MAINS RATING:** 175 A	**LOCATION:** PUMP ROOM 37
ISCA:		**AIC RATING:** 12kAIC	**NEW / EXISTING:** Existing

NOTES:

TAG	LOAD NAME	FRAME	TRIP	POLES	LSIG	A	B	C	NOTES
1	Existing Load - Diesel Oil Transfer...	125 A	15 A	3		0.2	0.2	0.2	
2	Existing Load - Diesel Oil Transfer...	125 A	15 A	3		0.2	0.2	0.2	
3	Existing Load - Reverse osmosis...	125 A	40 A	3		0.4	0.4	0.4	
4	Existing Load - Reverse osmosis...	125 A	40 A	3		0.4	0.4	0.4	
5	Existing Load - Irigation Pump	125 A	50 A	3		5.0	5.0	5.0	
6	Existing Load - House Pump 1	125 A	40 A	3		3.7	3.7	3.7	
7	Existing Load - House Pump 2	125 A	40 A	3		0.4	0.4	0.4	
8	TX-MB (9KVA) - PNL MB	125 A	20 A	3		0.0	0.0	0.0	
9	Space	--	--	1		--			--
10	Space	--	--	1		--			--
11	Space	--	--	1		--			--
12	Space	--	--	1		--			--
13	Space	--	--	1		--			--
14	Space	--	--	1		--			--
15	Space	--	--	1		--			--
16	Space	--	--	1		--			--
						10.2	10.2	10.2	**TOTAL KVA PER PHASE**
						37	37	37	**TOTAL AMPS PER PHASE**

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTAL LOAD	
RECEPTACLE				**TOTAL CONNECTED AMPS:**	37 A
LIGHTING				**TOTAL DEMAND AMPS:**	37 A
HVAC				**TOTAL CONNECTED KVA:**	30573 VA
EQUIPMENT				**TOTAL DEMAND KVA:**	30573 VA
EV SERVICE EQUIPMENT					

100% CONSTRUCTION DOCUMENTS	10/07/2025
95% CONSTRUCTION DOCUMENTS	07/25/2025
65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

CONSULTANT

A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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ARCHITECT/ENGINEER OF RECORD

A/E:
OEI-LBL Joint Venture LLC
O'Brien Engineering Inc., Managing Partner
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com

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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: ELECTRICAL PANEL SCHEDULES - EXISTING	Phase: 100% CONSTRUCTION DOCUMENTS	Project Title: A/E REPLACE BOILERS	Project Number: 519-20-200
			Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN	FULLY SPRINKLERED	Location: BIG SPRING, TEXAS	Drawing Number: E601
		Issue Date: 10/07/2025 · Checked: LRL · Drawn: PSV	

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BRANCH CIRCUIT PANEL: PNL-T

VOLTAGE: 480/277 Wye
PHASE: 3 **WIRE:** 4
SUPPLY FROM:
ISCA:
NOTES:

BUSS RATING: 400A
MAINS TYPE: MCB
MAINS RATING: 400 A
AIC RATING:

ENCLOSURE: NEMA 3R
MOUNTING: SURFACE
LOCATION:
NEW / EXISTING: Temporary

CKT	CIRCUIT DESCRIPTION	TRIP	POLES	VA (PHASE A)		VA (PHASE B)		VA (PHASE C)		POLES	TRIP	CIRCUIT DESCRIPTION	CKT
1	MH - HVAC EQUIPMENT	20 A	3	16,628	16,628					3	20 A	MH - HVAC EQUIPMENT	2
3	--	--	--			16,628	16,628			--	--	--	4
5	--	--	--					16,628	16,628	--	--	--	6
7	Spare	20 A	1	0	0					1	20 A	Spare	8
9	Spare	20 A	1			0	0			1	20 A	Spare	10
11	Spare	20 A	1					0	0	1	20 A	Spare	12
13	Spare	20 A	1	0	0					1	20 A	Spare	14
15	Spare	20 A	1			0	0			1	20 A	Spare	16
17	Spare	20 A	1					0	0	1	20 A	Spare	18
19	Spare	20 A	1	0	0					1	20 A	Spare	20
21	Spare	20 A	1			0	0			1	20 A	Spare	22
23	Spare	20 A	1					0	0	1	20 A	Spare	24
25	Spare	20 A	1	0	0					1	20 A	Spare	26
27	Spare	20 A	1			0	0			1	20 A	Spare	28
29	Spare	20 A	1					0	0	1	20 A	Spare	30
			Total Load:	33.3 kVA		33.3 kVA		33.3 kVA					
			Total Amps:	120 A		120 A		120 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTAL LOAD	
MH - HVAC EQUIPMENT	99766 VA	100.00%	99766 VA	**TOTAL DIVERSIFIED AMPS**	120 A
				TOTAL CONNECTED AMPS	120 A
				TOTAL DIVERSIFIED LOAD	99.8 kVA
				TOTAL CONNECTED LOAD	99.8 kVA

Revisions:	Date:
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65% DESIGN DEVELOPMENT	11/21/2024

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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: ELECTRICAL PANEL SCHEDULES - TEMPORARY

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BIG SPRING, TEXAS

Issue Date: 10/07/2025 | Checked: LRL | Drawn: PSV

Drawing Number: E602

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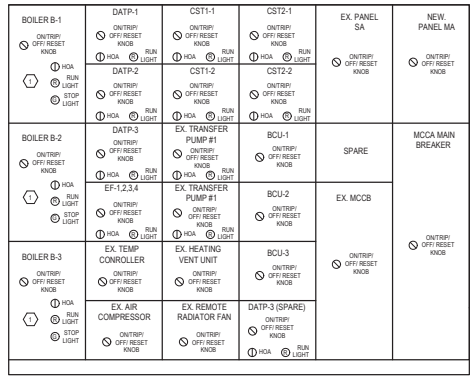
NEW MOTOR CONTROL CENTER MCCA



1 MCCA FRONT ELEVATION
SCALE: NONE

KEY NOTES	
NO.	DESCRIPTION
1	PROVIDE AUX CONTACTS IN MCC BUCKET FOR CONNECTION TO EPO SWITCH FOR BOILER SHUTDOWN. REFER TO BOILER EPO WIRING DIAGRAM ON THIS DRAWING. COORDINATE ALL REQUIREMENTS WITH THE MECHANICAL DRAWINGS AND BOILER MANUFACTURER CONTROLS DIAGRAM.

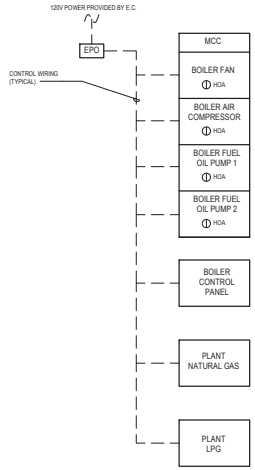
MAIN SWITCHBOARD: MCCA

VOLTAGE: 480/277 Wye
PHASE: 3 **WIRE:** 4
SUPPLY FROM: UTILITY
ISCA: 31,211 A
BUSS RATING: 400 A
MAINS TYPE: MCB
MAINS RATING: 400 A
AIC RATING: 42kAIC
ENCLOSURE: NEMA 1
MOUNTING: FLOOR
LOCATION: BOILER PLANT 33
NEW / EXISTING: New Construction

NOTES: SUITABLE FOR USE AS SERVICE ENTRANCE
PROVIDE GROUND FAULT PROTECTION PER NEC

TAG	LOAD NAME	FRAME	TRIP	POLES	LSIG	A	B	C	NOTES
1	BOILER 1	100 A	60 A	3		9.8	9.8	9.8	
2	BOILER 2	100 A	60 A	3		9.8	9.8	9.8	
3	BOILER 3	100 A	60 A	3		9.8	9.8	9.8	
4	DATP-1	100 A	20 A	3		3.9	3.9	3.9	
5	DATP-2	100 A	20 A	3		3.9	3.9	3.9	
6	DATP-3	100 A	20 A	3		3.9	3.9	3.9	
7	EF-1,2,3,4	60 A	15 A	3		2.3	2.3	2.3	
8	EXISITING LOAD	100 A	50 A	3		11.1	11.1	11.1	
9	MCCB	225 A	175 A	3		10.2	10.2	10.2	
10	EXISTING LOAD	100 A	50 A	3		11.1	11.1	11.1	
11	TEMP CONTROL AIR...	60 A	20 A	3		1.2	1.2	1.2	
12	TEMP CONTROL AIR...	60 A	20 A	3		1.2	1.2	1.2	
13	CST1-1	60 A	15 A	3		2.1	2.1	2.1	
14	CST1-2	60 A	15 A	3		2.1	2.1	2.1	
15	Existing Load	60 A	15 A	3		0.4	0.4	0.4	
16	Existing Load	60 A	15 A	3		0.4	0.4	0.4	
17	Existing Load	60 A	20 A	3		0.0	0.0	0.0	
18	Existing Load	60 A	20 A	3		0.0	0.0	0.0	
19	BCU-1	400 A	20 A	3		1.1	1.1	1.1	
20	BCU-2	400 A	20 A	3		1.1	1.1	1.1	
21	BCU-3	400 A	20 A	3		1.1	1.1	1.1	
22	PANEL MA VIA XFMR T-1	100 A	70 A	3		4.0	7.4	4.0	
23	CST2-1	60 A	15 A	3		1.3	1.3	1.3	
24	CST2-2	60 A	15 A	3		1.3	1.3	1.3	
25	Existing Load AUXILIARY...	400 A	20 A	3		0.4	0.4	0.4	
26	DATP-3 (STANDBY) 10 HP	400 A	20 A	3		0.0	0.0	0.0	
27	Spare	400 A	20 A	1		0.0			–
28	Spare	400 A	20 A	1		0.0			–
29	Spare	400 A	20 A	1		0.0			–
30	Spare	400 A	20 A	1		0.0			–
31	Spare	400 A	20 A	1		0.0			–
32	Spare	400 A	20 A	1		0.0			–
						93.6	97.1	93.7	TOTAL KVA PER PHASE
						338	351	338	TOTAL AMPS PER PHASE

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTAL LOAD	
RECEPTACLE	4320 VA	100.00%	4320 VA	TOTAL CONNECTED AMPS:	342 A
LIGHTING	1485 VA	100.00%	1485 VA	TOTAL DEMAND AMPS:	342 A
HVAC	168484 VA	100.00%	168484 VA	TOTAL CONNECTED KVA:	284397 VA
EQUIPMENT	7200 VA	100.00%	7200 VA	TOTAL DEMAND KVA:	284397 VA
EV SERVICE EQUIPMENT					



NOTE: THIS DIAGRAM IS DRAWN FOR GENERAL INFORMATION PURPOSES ONLY. DIAGRAM WILL VARY FOR DIFFERENT MANUFACTURERS. CONTRACTOR SHALL SUBMIT DIAGRAMS FROM THE MANUFACTURER SELECTED AND SHALL USE THOSE DIAGRAMS FOR INSTALLATION AFTER REVIEW.

2 BOILER EPO WIRING DIAGRAM
SCALE: NONE

BRANCH CIRCUIT PANEL: PNL MA

VOLTAGE: 120/208 Wye
PHASE: 3 **WIRE:** 4
SUPPLY FROM: XFMR T-4
ISCA:
NOTES:
BUSS RATING: 200A
MAINS TYPE: MCB
MAINS RATING: 150 A
AIC RATING: 14kAIC
ENCLOSURE: NEMA 1
MOUNTING: SURFACE
LOCATION: BOILER PLANT 33
NEW / EXISTING: New Construction

CKT	CIRCUIT DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	CIRCUIT DESCRIPTION	CKT
1	L-BOILER RM	20 A	1	520	120					1	20 A	L-EM BATTERY PACKS	2
3	L-BOILER RM	20 A	1			840	0			1	20 A	EX-RECP.	4
5	EX-R	20 A	1					0	0	1	20 A	EX-RECP.	6
7	EX-R	20 A	1	0	0					1	20 A	EX. BATTERY CHARGER	8
9	EX. GEN BLOCK HEATER	20 A	1			0	1,200			1	20 A	BCU-4	10
11	UNIT HEATERS	20 A	1					400	360	1	20 A	CO DETECTION PANEL	12
13	EX. FAN COIL INIT	20 A	1	0	0					1	20 A	EX. H&V UNIT PUMP	14
15	R-DED. CCT	20 A	1			360	360			1	20 A	HVAC CONTROL PNL R-DED. CCT	16
17	R-DED. CCT	20 A	1					360	360	1	20 A	R-DED. CCT	18
19	R-DED OPERATIONS OFFICE 31	20 A	1	360	0					1	20 A	PT - STEAM SUPPLY MAIN	20
21	R-DED. CCT	20 A	1			360	360			1	20 A	R-DED. CCT	22
23	CHEMICAL FEED PUMP CFP-1	20 A	1					48	0	1	20 A	PT - PRV DISCHARGE	24
25	CHEMICAL FEED PUMP CFP-B1, B2, B3	20 A	1	101	0					1	20 A	FLOW METER - STEAM SUPPLY MAIN	26
27	WTR. TREATMENT CONTROLLER...	20 A	1			1,800	0			1	20 A	PT - FEED WTR BRANCH MAIN	28
29	WTR. TREATMENT CONTROLLER...	20 A	1					1,800	0	1	20 A	FLOW METER - NATURAL GAS	30
31	WTR. TREATMENT CONTROLLER...	20 A	1	1,800	360					1	20 A	CO SENSOR	32
33	WTR. TREATMENT CONTROLLER...	20 A	1			1,800	0			1	20 A	Spare	34
35	BOILER 1, DED. OUTLET	20 A	1					360	0	1	20 A	Spare	36
37	BOILER 2, DED. OUTLET	20 A	1	360	0					1	20 A	Spare	38
39	BOILER 3, DED. OUTLET	20 A	1			360	0			1	20 A	Spare	40
41	HVAC CONTROL PNL R-DED. CCT	20 A	1					360	0	1	20 A	Spare	42
43	MH - RECEPTACLE BOILER PLANT...	20 A	1	360	0					1	20 A	Spare	44
45	FLOW METER - BOILER 2	20 A	1			0	0			1	20 A	Spare	46
47	FLOW METER - BOILER 1	20 A	1					0	0	1	20 A	Spare	48
49	FLOW METER - BOILER 3	20 A	1	0	0					1	20 A	Spare	50
51	PT - FEED WATER SUPPLY MAIN	20 A	1			0	0			1	20 A	Spare	52
53	FLOW METER - PRV DISCHARGE	20 A	1					0	0	1	20 A	Spare	54
		Total Load:		4.0 kVA		7.4 kVA		4.0 kVA					
		Total Amps:		33 A		62 A		34 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTAL LOAD	
HVAC	1600 VA	100.00%	1600 VA	TOTAL DIVERSIFIED AMPS	43 A
Other	869 VA	100.00%	869 VA	TOTAL CONNECTED AMPS	43 A
MH - EQUIPMENT	7200 VA	100.00%	7200 VA	TOTAL DIVERSIFIED LOAD	15.5 kVA
MH - LIGHTING	1485 VA	100.00%	1485 VA	TOTAL CONNECTED LOAD	15.5 kVA
MH - RECEPTACLE	4320 VA	100.00%	4320 VA		

Revisions:	Date:
100% CONSTRUCTION DOCUMENTS	10/07/2025
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65% DESIGN DEVELOPMENT	11/21/2024

CONSULTANT
A/E:
O'Brien Engineering, Inc.,
17300 Dallas Parkway, Suite 1000
Dallas, TX 75248
972-233-2288
www.obrieneng.com
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Drawing Title: ELECTRICAL PANEL SCHEDULES - NEW
Phase: 100% CONSTRUCTION DOCUMENTS
Project Title: A/E REPLACE BOILERS
Project Number: 519-20-200
Building Number: 2
APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN
FULLY SPRINKLERED
Location: BIG SPRING, TEXAS
Issue Date: 10/07/2025
Checked: LRL
Drawn: PSV
Drawing Number: E603

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LIGHTING FIXTURE SCHEDULE

MARK	DESCRIPTION	MODEL	LAMP	LUMENS	WATTAGE	COLOR TEMPERATURE	VOLTAGE	Mounting	Notes
A	13" DIAMETER ROUND HIGH BAY WITH WIDE DISTRIBUTION, WET LOCATION RATED, AND 0-10V DIMMABLE DRIVER.	GE #LPS-0-09-10-8-40-V-RI-WHTE SERIES	LED	9,000	65 W	4000 K	120 V	SUSPENDED	1,2

GENERAL NOTES:
- EMERGENCY FIXTURES INDICATED IN THIS SCHEDULE SHALL BE CAPABLE OF 90 MINUTE BATTERY BACK-UP OPERATION.
- PROVIDE COMPATIBLE EMERGENCY BATTERY PACK WITHOUT LAMPS (DUAL-LITE LM SERIES OR EQUAL) FOR ALL REMOTE HEAD TYPE EMERGENCY FIXTURES. INSTALL ON INTERIOR SIDE OF WALL AND LOCATE ABOVE ACCESSIBLE CEILING WHEN CEILINGS ARE PRESENT.
- COORDINATE EXACT LOCATION AND FINISH OPTIONS OF ALL EMERGENCY REMOTE TEST SWITCHES WITH ARCHITECT PRIOR TO ROUGH-IN AND CONNECT FOR OPERATION.
- CONTRACTOR IS RESPONSIBLE FOR SECURING ANY SUSPENDED LIGHT FIXTURE(S) WHICH SWAY OR MOVE DUE TO AIR PRODUCING MECHANICAL EQUIPMENT OR EXTERIOR WIND WITH RIGID SUPPORT(S).
- FINISHES OF ALL FIXTURES INDICATED IN THIS SCHEDULE SHALL MATCH THE FINISH ADJACENT TO THE CEILING/WALL THE FIXTURE IS MOUNTED IN/ON UNLESS NOTED OTHERWISE. PROVIDE CUSTOM COLOR FINISH IF FINISH REQUIRED IS NOT A STANDARD FIXTURE OPTION.
- ALL LINEAR FIXTURES INSTALLED IN A 4'x 4' CEILING SYSTEM SHALL BE MOUNTED SO THAT THE BOTTOM OF THE FIXTURE IS FLUSH WITH THE CEILING SYSTEM. RESRESSED MOUNTING OF FIXTURES SHALL NOT BE ACCEPTABLE. PROVIDE CREE CR-HDC MOUNTING CLIP KIT AS REQUIRED.

NOTES:
1. VERIFY CEILING TYPES PRIOR TO ORDERING FIXTURES.
2. VERIFY EXACT MOUNTING HEIGHT WITH ARCHITECTURAL DRAWINGS.
3. MOUNT FIXTURE AT HEIGHT AS INDICATED (BOTTOM OF FIXTURE), COORDINATE WITH EQUIPMENT PRIOR TO ROUGH IN.
4. MOUNT FIXTURE AT HEIGHT AS INDICATED (CENTER OF FIXTURE), COORDINATE WITH EQUIPMENT PRIOR TO ROUGH IN.
5. COORDINATE EXACT LENGTHS PRIOR TO ORDERING TO ACHIEVE LENGTH AS INDICATED ON PLANS.

EMERGENCY LIGHTING FIXTURE SCHEDULE

MARK	DESCRIPTION	MODEL	LAMP	LUMENS	WATTAGE	COLOR TEMPERATURE	VOLTAGE	MOUNTING	NOTES
EM	WALL MOUNTED LED EMERGENCY BATTERY BACKUP FIXTURE WITH 2 LAMPS	EU2C	LED				120 V		

GENERAL NOTES:
- EMERGENCY FIXTURES INDICATED IN THIS SCHEDULE SHALL BE CAPABLE OF 90 MINUTE BATTERY BACK-UP OPERATION.
- PROVIDE COMPATIBLE EMERGENCY BATTERY PACK WITHOUT LAMPS (DUAL-LITE LM SERIES OR EQUAL) FOR ALL REMOTE HEAD TYPE EMERGENCY FIXTURES. INSTALL ON INTERIOR SIDE OF WALL AND LOCATE ABOVE ACCESSIBLE CEILING WHEN CEILINGS ARE PRESENT.
- COORDINATE EXACT LOCATION AND FINISH OPTIONS OF ALL EMERGENCY REMOTE TEST SWITCHES WITH ARCHITECT PRIOR TO ROUGH-IN AND CONNECT FOR OPERATION.
- SUSPENDED EXIT SIGNS SHALL BE SUPPORTED WITH PAINTED STEMS AND CONCEALED MOUNTING PLATES BY PENDANT SYSTEMS OR EQUAL. (EXCEPTIONS TO THIS REQUIREMENT INCLUDE WAREHOUSE, STORAGE AND INDUSTRIAL SPACES.)
- EXIT SIGNS LOCATED AT STOREFRONT EXITS AND ADJACENT CEILING IS GREATER THAN 12' A.F.F. SHALL BE INSTALLED CENTERED ON HORIZONTAL MULLION OF THE STOREFRONT SYSTEM ABOVE THE DOORWAY. ALL WIRING SHALL BE CONCEALED WITHIN MULLIONS AND SIGN SHALL BE INSTALLED FLUSH. NO VISIBLE BACK BOXES SHALL BE ALLOWED.

NOTES:
1. VERIFY CEILING TYPES PRIOR TO ORDERING FIXTURES.
2. VERIFY EXACT MOUNTING HEIGHT WITH ARCHITECTURAL DRAWINGS.
3. MOUNT FIXTURE AT HEIGHT AS INDICATED (BOTTOM OF FIXTURE), COORDINATE WITH EQUIPMENT PRIOR TO ROUGH IN.
4. MOUNT FIXTURE AT HEIGHT AS INDICATED (CENTER OF FIXTURE), COORDINATE WITH EQUIPMENT PRIOR TO ROUGH IN.

LIGHTING CONTROLS SCHEDULE

Control Type	Room Number	Type	Switch Control Area	Panel	Circuit Number	Count
		OS - Ceiling				6
		Single Pole				6

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65% DESIGN DEVELOPMENT	11/21/2024
Revisions:	Date:

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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: ELECTRICAL LIGHTING SCHEDULES

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: A/E REPLACE BOILERS

Project Number: 519-20-200

Building Number: 2

APPROVING OFFICIAL: COR, Mr. JOSHUA JUNKIN

FULLY SPRINKLERED

Location: BIG SPRING, TEXAS

Issue Date: 10/07/2025

Checked: LRL

Drawn: PSV

Drawing Number: E604

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