CITY OF DULUTH
PURCHASING DIVISION
Room 100 City Hall
411 West First Street
Duluth, Minnesota 55802-1199
218/730-5340 218/730-5922 FAX
purchasing@duluthmn.gov

Addendum #4
File # 16-0274
Project: Lakewood Water Treatment Plant HVAC System Improvements

This addendum serves to notify all bidders of the following changes to the solicitation documents:

NOTICE
This Addendum is issued to modify, explain or correct the original drawings, specifications and/or previous addendums and is hereby made a part of the Contract Documents.

PROJECT MANUAL

SPECIAL PROVISIONS

SP-10 METHOD ON PAYTMENT

REPLACE SP-10, 1. d. i., ii., & iii. with the following:

"SP-10, 1. d. i. Provide and deliver (1) 200 BTU NG Unit Heater to the city of Duluth at the Lakewood Water Treatment Plant (No Installation shall be included). The Gas-fired power-vented propeller unit heater shall be (1) Modine Model PDP-200HE130 Power-Vented Heater, or equal. Natural gas fired unit heater shall be designed for overhead suspended mounting, heater shall only requires venting, gas, and electric service connections prior to operation. Propeller fan units are classified as zero-static-pressure type, and should not be used with velocity-generating discharge nozzles or ductwork connections. Product shall have CSA Certification for use in the US and Canada 100% shut-off, intermittent pilot-ignition system with continuous retry, at no extra charge. This ignition system shall allow the unit to be field-converted to liquid propane. The unit shall be 80% thermally efficient. The unit shall have a power exhaust that can be rotated 180-degrees. The unit shall be capable of being vented vertically or horizontally. The unit shall be constructed with a blocked vent safety switch, 20 gauge aluminized steel cabinet, 115V control step down transformer with 24V gas controls, Aluminized steel heat exchanger, Aluminized steel burner with stainless steel separator strip Certified to 0.5" W.C., external static pressure single stage standing pilot control system for operation on natural gas, high limit safety control, control terminator board, adjustable motor sheaves on blower models, and Totally enclosed fan/blower motor."

DIVISION 09 96 00 – Finishes

Section 09 96 00 - High Performance Coatings:

CLARIFICATION it is not the intent of this project to repaint all areas of the Lakewood WTP. It is the intent to paint the new materials and areas of the WTP that the majority work is occurring. It is not the intent of the work included in the project to paint new materials that are minor renovations. Refer to direction provided on the drawings, specification, and Finish Schedule Provided on E-23R.

DIVISION – 23 HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

Section 23 98 50 – HVAC Sequence of Operation: Sub-paragraph 3.02.G.

ADD clarification as follows: "System switches for EF-2 and EF-3 in Chlorine Feed and Chlorine Storage Rooms to be housed in NEMA 4X enclosures."

Section 23 21 30 – Hydronic Heat Transfer Equipment: Paragraph 2.01.A and 2.02.A

ADD SIGMA, Airtherm and Vulcan as an approved manufacturer.

Section 23 73 30 – Air-To-Air Energy Recovery Ventilators, Paragraph 2.01.A

ADD Greenheck as an approved manufacturer.

DIVISION 26 – ELECTRICAL

All Sections

CLARIFICATION the CONTRACTOR may ignore references to specification and details that are not included in the Contract Documents. For example 26 90 00 is not included in this project. For clarification refer to Drawing Table of Contents and Project Manual Table of Content(s).

Section 26 23 29.16 Adjustable Frequency Drive – HVAC

CLARIFICATION it is the intent that the integrated and controlled equipment motor control including but not limited to Adjustable/Variable Frequency Drives shall be coordinate and provide with the equipment. All VFD's on the project shall be coordinated to be by the same manufacture. Refer to drawings and schedules for additional information. The project shall furnish and install

all equipment for a complete and operable system as described by the Contract Documents.

Section 26 28 19 – Enclosed Switches

DELETE paragraph 26 28 19, 2.03.

DRAWINGS

Drawing G-2 **REPLACE** with the attached G-2R

Drawing PM-1 Mechanical Floor Plan

CLARIFICAITON the work included under this contract shall furnish and install (2) new sample pumps, rather than relocated the existing. The contractor shall still remove the existing sample pumps. The contractor shall adjust project scope and notes accordingly. Coordinate with all disciplines.

REPLACE Key Note 1 with the following: "Furnish and install new sample pumps SP-1 and SP-2. Sample pumps shall be Goulds MCC Series General Purpose Centrifugal Pump, or equal. The pump shall be 1-1/4" x 1" cast-iron pump with a continuous duty premium Efficient TEFC ¾ horsepower 1-phase motor. Pump shall develop approximately ~82' TDH at deadhead condition and ~46' TDH at 40 gpm."

REPLACE Key Note 3 with the following: "Remove existing SP-1, turn-over to the OWNER. Furnish and install new sample pump SP-1 (Complete). Relocate/Replace the electrical connection and control."

REPLACE Key Note 4 with the following: "Remove existing SP-2, turn-over to the OWNER. Furnish and install new sample pump SP-2 (Complete). Relocate/Replace the electrical connection and control."

Drawing E-3 **REPLACE** with the attached E-3R
Drawing E-6 **REPLACE** with the attached E-6R
Drawing E-7 **REPLACE** with the attached E-7R
Drawing E-8 **REPLACE** with the attached E-8R
Drawing E-10 **REPLACE** with the attached E-10R
Drawing E-14 **REPLACE** with the attached E-14R
Drawing E-15 **REPLACE** with the attached E-15R

Drawing E-16 **REPLACE** with the attached E-16R
Drawing E-17 **REPLACE** with the attached E-17R
Drawing E-18 **REPLACE** with the attached E-18R
Drawing E-19 **REPLACE** with the attached E-19R
Drawing E-22 **REPLACE** with the attached E-22R
Drawing E-23 **REPLACE** with the attached E-23R
Drawing E-24 **REPLACE** with the attached E-24R
Drawing E-25 **REPLACE** with the attached E-25R
Drawing E-26 **REPLACE** with the attached E-26R

Please acknowledge receipt of the Addendum by initially and dating Addendum #4 below the bid form on the invitation for bids.

Posted March 25, 2016

END OF ADDENDUM

SHEET INDEX

G - GENERAL

G-1	TITLE SHEET
G-2R	SHEET INDEX
G-3	LEGEND, SYMBOLS, & ABBREVIATIONS

1

C - CIVIL

C-1	SITE PLAN
C-2	SITE PHOTOS

A-ARCHITECTURAL

A-1	ENLARGED FIRST FLOOR PLAN SOUTH
A-2	ENLARGED FIRST FLOOR PLAN NORTH
A-3	ENLARGED SECOND FLOOR PLAN
A-4	ROOF PLAN
A-5	SECTION AND DETAILS
A-6	DETAILS

M-MECHANICAL

M1.0	MECHANICAL SYMBOLS, & ABBREVIATIONS
M2.1	FIRST FLOOR SOUTH MECHANICAL DEMOLITION
M2.2	FIRST FLOOR NORTH MECHANICAL DEMOLITION
M2.3	SECOND FLOOR SOUTH MECHANICAL DEMOLITION
M2.4	SECOND FLOOR NORTH MECHANICAL DEMOLITION
M2.5	ROOF MECHANICAL DEMOLITION
M3.1	FIRST FLOOR SOUTH HEATING/COOLING PIPING
M3.2	FIRST FLOOR NORTH HEATING/COOLING PIPING
M3.3	SECOND FLOOR SOUTH HEATING/COOLING PIPING
M4.1	FIRST FLOOR SOUTH DUCTWORK
M4.2	FIRST FLOOR NORTH DUCTWORK
M4.3	SECOND FLOOR SOUTH DUCTWORK
M4.4	SECOND FLOOR NORTH DUCTWORK
M4.5	ROOF MECHANICAL PLAN
M5.1	MECHANICAL ROOM PARTIAL PLAN
M5.2	MECHANICAL ROOM PARTIAL PLAN
M5.3	MECHANICAL ROOM PARTIAL PLAN
M5.4	EAST ELEVATION PARTIAL PLAN
M5.5	RAPID MIX ROOM PARTIAL PLAN
M6.1	MECHANICAL DETAILS
M6.2	MECHANICAL DETAILS
M7.1	MECHANICAL EQUIPMENT SCHEDULES
M7.2	MECHANICAL EQUIPMENT SCHEDULES

PM-PROCESS MECHANICAL

PM-1	FIRST FLOOR SOUTH MECHANICAL PLAN DEMOLITION
PM-2	FIRST FLOOR SOUTH MECHANICAL PLAN
PM-3	SAMPLE PUMP PIPING DIAGRAM
PM-4	SAMPLE PUMP PIPING PHOTOS

E - ELECTRICAL

E-1	ELECTRICAL SYMBOLS, & ABBREVIATIONS
E-2	ELECTRICAL SYMBOLS, & ABBREVIATIONS
E-3R	FIRST FLOOR SOUTH ELECTRICAL DEMO
E-4	FIRST FLOOR NORTH ELECTRICAL DEMO
E-5	SECOND FLOOR SOUTH ELECTRICAL DEMO
E-6R	SECOND FLOOR NORTH ELECTRICAL DEMO
E-7R	ROOF ELECTRICAL DEMO
E-8R	FIRST FLOOR SOUTH HEATING/COOLING ELECTRICAL PLAN
E-9	FIRST FLOOR NORTH HEATING/COOLING ELECTRICAL PLAN
E-10R	SECOND FLOOR SOUTH HEATING/COOLING ELECTRICAL PLAN
E-11	FIRST FLOOR SOUTH DUCTWORK ELECTRICAL PLAN
E-12	FIRST FLOOR NORTH DUCTWORK ELECTRICAL PLAN
E-13	SECOND FLOOR SOUTH DUCTWORK ELECTRICAL PLAN
E-14R	SECOND FLOOR NORTH DUCTWORK ELECTRICAL PLAN
E-15R	ELECTRICAL ROOF PLAN
E-16R	PARTIAL ELECTRICAL PLANS
E-17R	ONE-LINE DIAGRAM
E-18R	ONE-LINE DIAGRAM NO. 2
E-19R	ONE-LINE DIAGRAM FOR POWER SUPPLY
E-20	PROCESS RISER DIAGRAM
E-21	ELECTRICAL PHOTOS
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E-23R	ELECTRICAL SCHEDULES NO. 2
E-24R	ELECTRICAL SCHEDULES NO. 3
E-25R	ELECTRICAL SCHEDULES NO. 4
E-26R	ELECTRICAL SCHEDULES NO. 5
E-27	ELECTRICAL DETAILS NO. 1
E-28	ELECTRICAL DETAILS NO. 2
E-29	ELECTRICAL DETAILS NO. 3

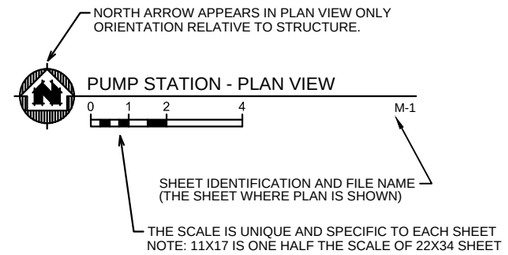
1

DISCIPLINE IDENTIFICATION

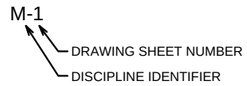
DESIGNATION	DISCIPLINE
G	GENERAL
C	SITE CIVIL
R	REMOVAL/DEMOLITION
S	STRUCTURAL
PM	MECHANICAL
PP	UTILITY PLAN & PROFILE
A	ARCHITECTURAL
M	PLUMBING/HVAC
E	ELECTRICAL

NOTE: FOR CLARITY, IN A FEW LOCATIONS PORTIONS OF WORK FOR A DISCIPLINE MAY BE SHOWN ON SHEET WITH A DIFFERENT DISCIPLINE DESIGNATION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE A COMPLETE AND OPERABLE SYSTEM.

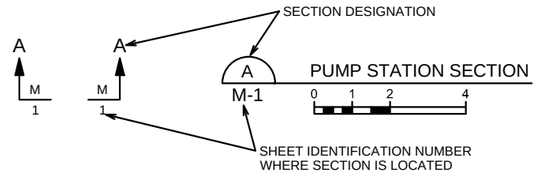
PLAN VIEW LABEL



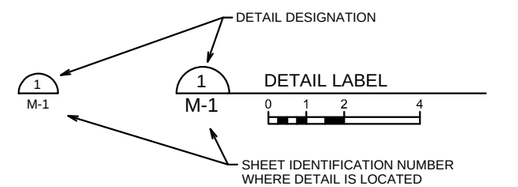
SHEET IDENTIFICATION NUMBERING EXAMPLE



SECTION DESIGNATION



DETAIL DESIGNATION



PROJECT NO.: 00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE: MARCH 2016	DRAWN BY: INIT	.	3/25	ADDENDUM #1	.
F.B. : .	CHECKED BY: SRC	.	.	.	.
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PLOT DATE: 3/25/16, P:\610s\616\00616097\CADD\Construction Documents\ADDENDUM #1\616097 G-2.dwg

I HEREBY CERTIFY THAT THIS PLAN, REPORT, OR SPECIFICATION WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SCOTT R. CHILSON — MARCH 25, 2016 (Date) — 44287 (License No.)

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Web Address: www.msa-ps.com

LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
LAKEWOOD, MN

SHEET INDEX

FILE NO. 00616097

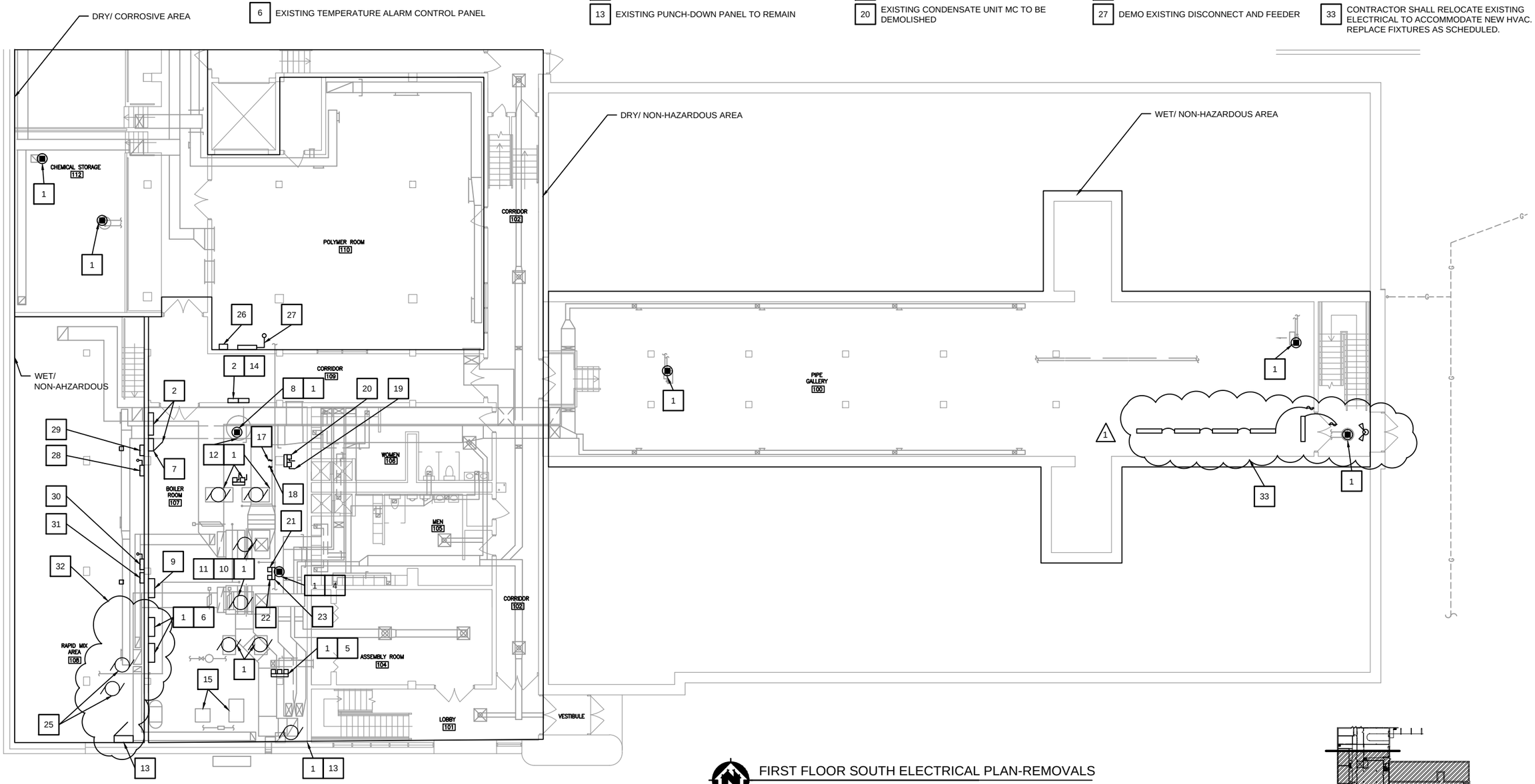
SHEET G-2R

GENERAL NOTES:

1. REFER TO AND COORDINATE WITH M-DRAWINGS.
2. DEMO ALL INSTRUMENTATION, CONNECTIONS, AND EQUIPMENT AS REQUIRED FOR PROJECT COMPLETION.
3. INTENT DIVISION OF DEMOLITION: IT IS THE INTENT OF THE EC SHALL DECOMMISSION, DISCONNECT, AND DEMOLISH ALL EQUIPMENT DEVICES, MATERIAL, ETC RELATED TO ALL POWER CONNECTIONS. HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR DEMO OF EQUIPMENT, MATERIALS, DEVICES, CONTROL, ETC.
4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES: XXX

1. DECOMMISSION, DISCONNECT, AND DEMOLISH EQUIPMENT COMPLETE (ALL CONNECTIONS). REMOVE CONTROL AND POWER CIRCUITS
2. EXISTING ELECTRICAL TO REMAIN
3. EXISTING EF
4. EXISTING VFD
5. EXISTING CIRCULATING PUMP AND OLD BOILER, VFD. DISCONNECTS, MC, ETC TO BE DEMOLISHED
6. EXISTING TEMPERATURE ALARM CONTROL PANEL
7. EXISTING LP - 4A. REFER TO E-19
8. EXISTING WATER HEATER
9. EXISTING STORAGE CABINET TO BE DEMOLISHED
10. EXISTING AIR HANDLER TO BE DEMOLISHED
11. DISCONNECT ALL DEVICES
12. DEMO EXISTING CONDENSATION PUMP AND DEVICES
13. EXISTING PUNCH-DOWN PANEL TO REMAIN
14. LP - 3A & 3B
15. EXISTING BOILER TO REMIAN
16. RELOCATE EXISTING LIGHT FIXTURES AS REQUIRED FOR NEW DUCT WORK
17. EXISTING VACUUM PUMP DISCONNECT TO BE DEMOLISHED
18. EXISTING AIR DRYER DISCONNECT TO BE DEMOLISHED
19. EXISTING CONDENSATE UNIT MC TO BE DEMOLISHED
20. EXISTING CONDENSATE UNIT MC TO BE DEMOLISHED
21. EXISTING AC DISCONNECT TO BE DEMOLISHED
22. EXISTING AHU2 DISCONNECT / MC TO BE DEMOLISHED
23. EXISTING AHU1 DISCONNECT / MC TO BE DEMOLISHED
24. EXISTING VFD TO BE DEMOLISHED
25. EXISTING SAMPLE PUMP TO BE RELOCATED REFER TO PM DRAWINGS
26. DEMO EXISTING XFMR-L3
27. DEMO EXISTING DISCONNECT AND FEEDER
28. DEMO EXISTING XFMR-L4
29. DEMO EXISTING L4 DISCONNECT
30. DEMO EXISTING XFMR-L-3
31. DEMO EXISTING L3 DISCONNECT AND FEEDER
32. IDENTIFY, DISCONNECT AND RELOCATE EXISTING ELECTRICAL FOR CONSTRUCTION NEW ACCESS DOOR AND STAIRS. REFER TO ARCH DRAWINGS.
33. CONTRACTOR SHALL RELOCATE EXISTING ELECTRICAL TO ACCOMMODATE NEW HVAC. REPLACE FIXTURES AS SCHEDULED.



FIRST FLOOR SOUTH ELECTRICAL PLAN-REMOVALS

0 4 8 16

SCALE: 1/8 " = 1'-0" (22x34)
SCALE: 1/16 " = 1'-0" (11x17)

KEY PLAN - FIRST FLOOR

PROJECT NO.: 00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE: MARCH 2016	DRAWN BY: INIT	1	3/25	ADDENDUM #1	.
F.B. : .	CHECKED BY: SRC	.	.	.	.
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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
LAKEWOOD, MN

FIRST FLOOR SOUTH ELECTRICAL PLAN - REMOVAL

FILE NO. 00616097
SHEET E-3R

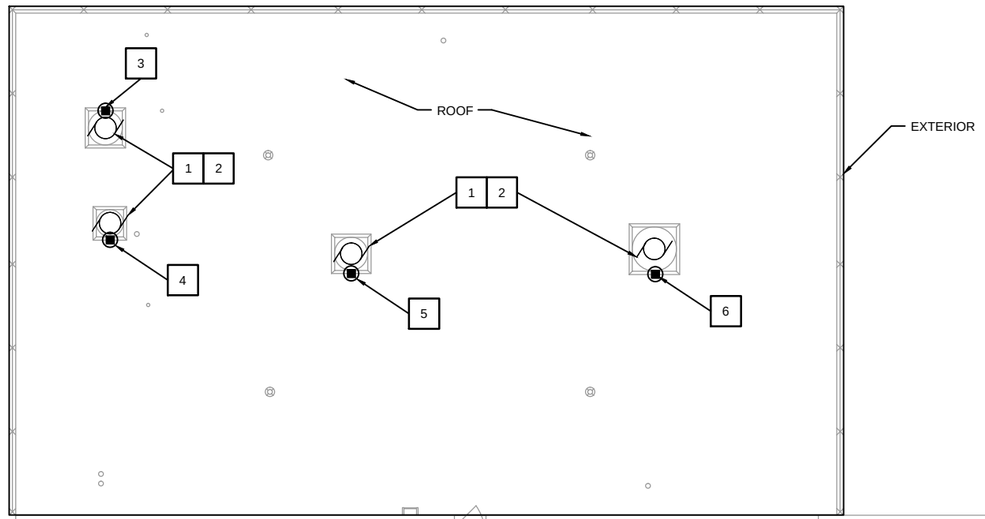
GENERAL NOTES:

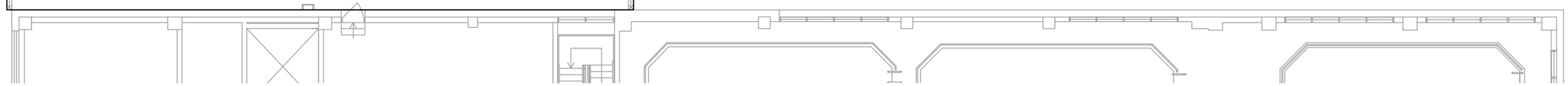
1. REFER TO AND COORDINATE WITH M-DRAWINGS.
2. DEMO ALL INSTRUMENTATION, CONNECTIONS, AND EQUIPMENT AS REQUIRED FOR PROJECT COMPLETION.
3. INTENT DIVISION OF DEMOLITION: IT IS THE INTENT OF THE EC SHALL DECOMMISSION, DISCONNECT, AND DEMOLISH ALL EQUIPMENT DEVICES, MATERIAL, ETC RELATED TO ALL POWER CONNECTIONS. HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR DEMO OF EQUIPMENT, MATERIALS, DEVICES, CONTROL, ETC.
4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES: XXX

1. DECOMMISSION, DISCONNECT, AND DEMOLISH EQUIPMENT COMPLETE (ALL CONNECTIONS). REMOVE CONTROL AND POWER CIRCUITS
2. DEMO / REPLACE EXISTING EF
3. DEMO / REPLACE MD-13
4. DEMO / REPLACE MD-14
5. DEMO / REPLACE MD-12
6. DEMO / REPLACE MD-11

1

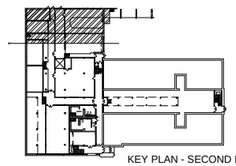




SECOND FLOOR NORTH ELECTRICAL PLAN - REMOVALS

0 4 8 16

SCALE: 1/8 " = 1'-0" (22x34)
SCALE: 1/16 " = 1'-0" (11x17)



KEY PLAN - SECOND FLOOR

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PROJECT DATE: MARCH 2016	DRAWN BY: INIT	1	3/25	ADDENDUM #1	.
F.B. : .	CHECKED BY: SRC	.	.	.	.
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PLOT DATE: 3/25/16, P:\610s\616\00616097\CADD\Construction Documents\ADDENDUM #1\616097 E-6R.dwg

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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
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LAKEWOOD, MN

SECOND FLOOR NORTH ELECTRICAL PLAN - REMOVLAS

FILE NO. 00616097
SHEET E-6R

GENERAL NOTES:

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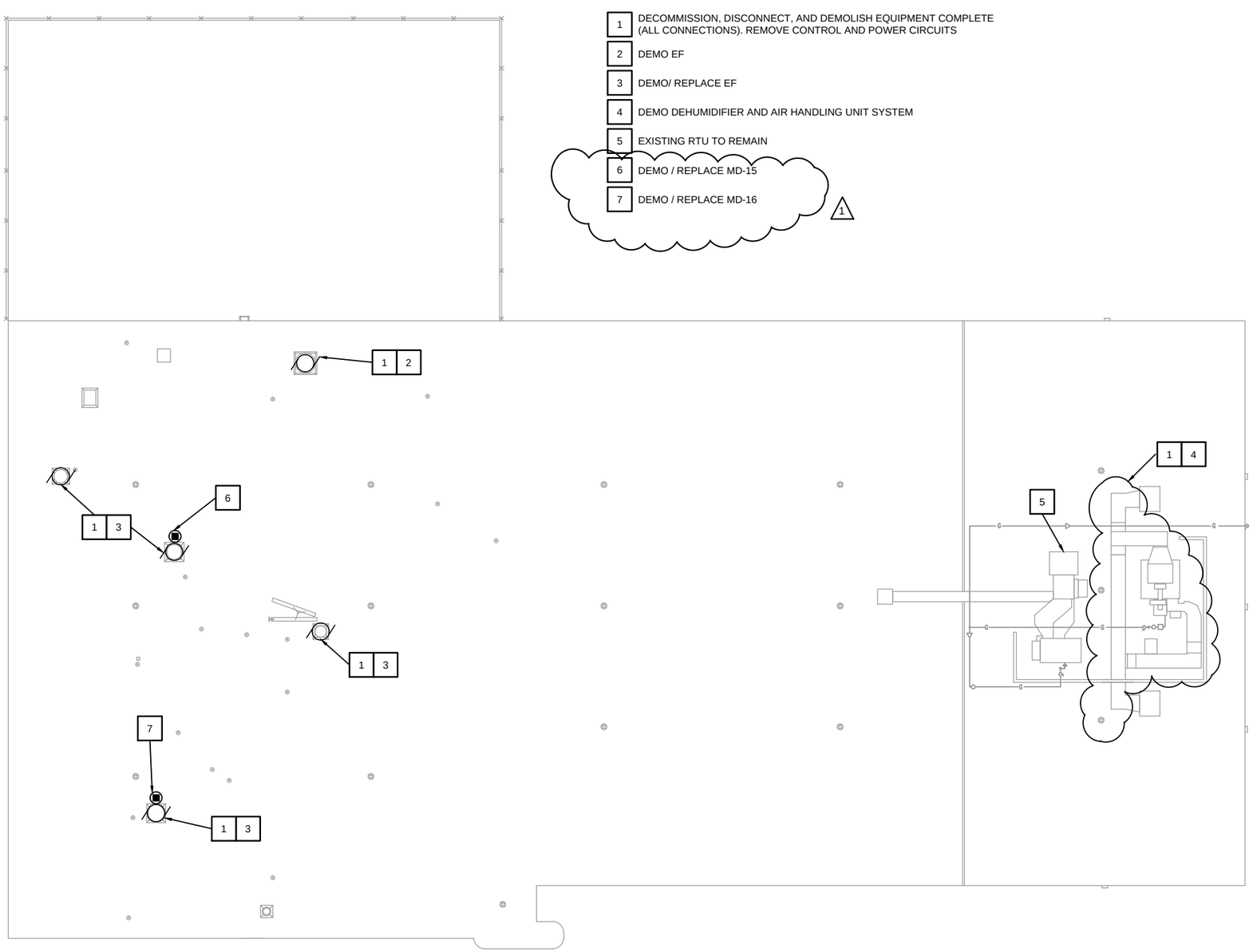
4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES: XXX

1. DECOMMISSION, DISCONNECT, AND DEMOLISH EQUIPMENT COMPLETE (ALL CONNECTIONS). REMOVE CONTROL AND POWER CIRCUITS
2. DEMO EF
3. DEMO/ REPLACE EF
4. DEMO DEHUMIDIFIER AND AIR HANDLING UNIT SYSTEM
5. EXISTING RTU TO REMAIN
6. DEMO / REPLACE MD-15
7. DEMO / REPLACE MD-16

1



ROOF ELECTRICAL PLAN - REMOVALS

0 5 10 20

SCALE: 3/32 " = 1'-0" (22x34)
SCALE: 3/64 " = 1'-0" (11x17)

PROJECT NO.: 00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE: MARCH 2016	DRAWN BY: INIT	1	3/25	ADDENDUM #1	.
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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
LAKEWOOD, MN

ROOF ELECTRICAL PLAN - REMOVALS

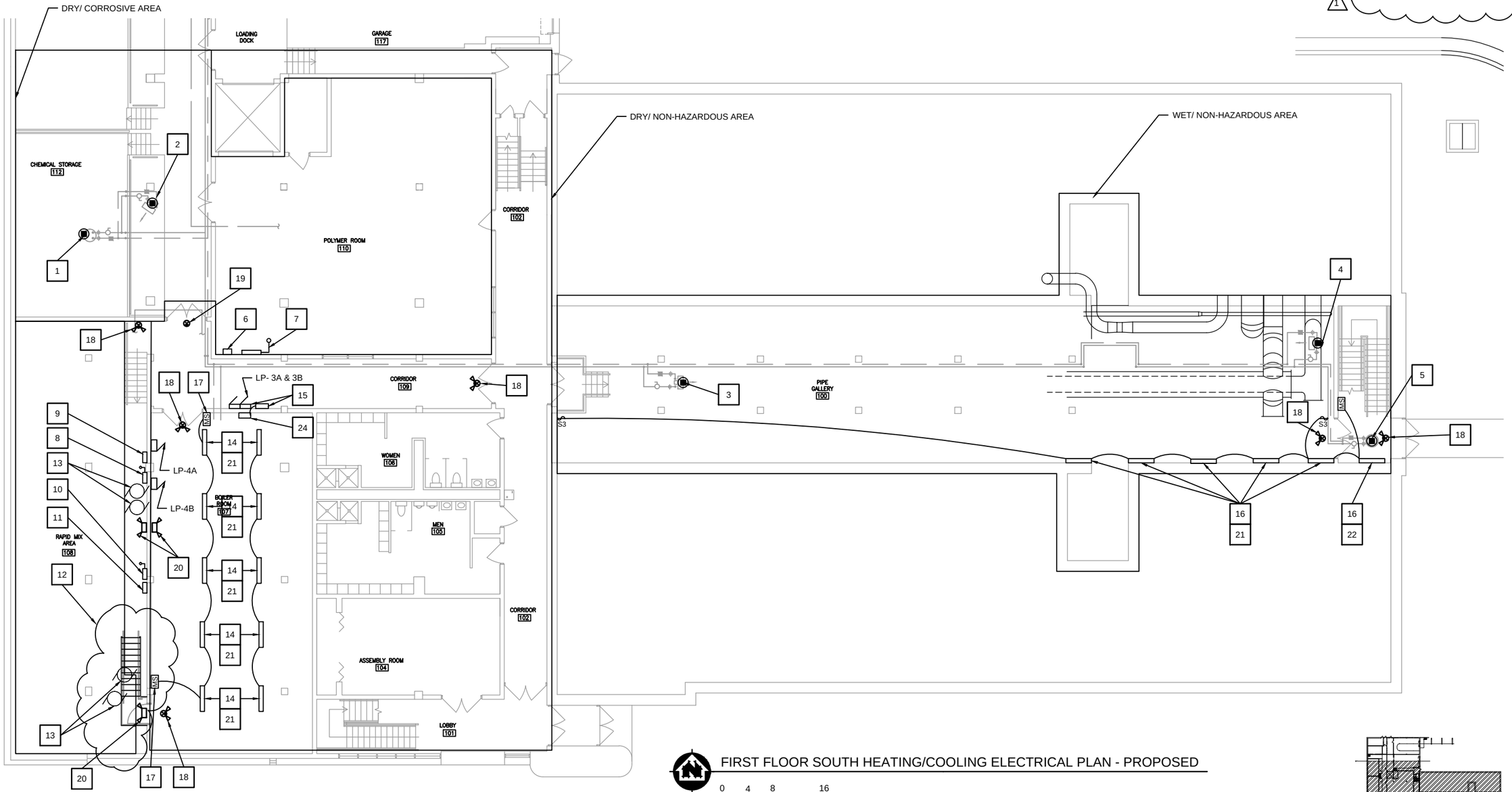
FILE NO. 00616097
SHEET E-7R

GENERAL NOTES:

1. REFER TO AND COORDINATE WITH M-DRAWINGS.
2. DEMO ALL INSTRUMENTATION, CONNECTIONS, AND EQUIPMENT AS REQUIRED FOR PROJECT COMPLETION.
3. INTENT DIVISION OF DEMOLITION: IT IS THE INTENT OF THE EC SHALL DECOMMISSION, DISCONNECT, AND DEMOLISH ALL EQUIPMENT DEVICES, MATERIAL, ETC RELATED TO ALL POWER CONNECTIONS. HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR DEMO OF EQUIPMENT, MATERIALS, DEVICES, CONTROL, ETC.
4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES: XXX

1. CONNECT POWER UH-12, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
2. CONNECT POWER UH-26, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
3. CONNECT POWER UH-9, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
4. CONNECT POWER UH-10, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
5. CONNECT POWER UH-11, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
6. EXISTING XFMR LP-1A&1B DISCONNECT TO BE DEMOLISHED
7. EXISTING XFMR LP-1A&1B TO BE DEMOLISHED
8. DEMOLISH XFMR-L4
9. DEMOLISH L4 DISCONNECT
10. DEMOLISH XFMR-LP/L
11. DEMOLISH LP-LP/L DISCONNECT
12. IDENTIFY, DISCONNECT AND RELOCATE EXISTING ELECTRICAL FOR CONSTRUCTION NEW ACCESS DOOR AND STAIRS. REFER TO ARCH DRAWINGS.
13. EXISTING SAMPLE PUMP AND ELECTRICAL TO BE RELOCATED REFER TO PM DRAWINGS
14. NEW STRUT MOUNTED FIXTURE. MOUNT 8'-10" AFF.
15. REFEED LP-3A/3B
16. NEW WALL MOUNTED FIXTURE REFEED INTO EXISTING CIRCUITS
17. NEW MOTION CONTROL SENSOR
18. NEW BATTERY BU EXIT AND SPOTS
19. NEW BATTERY BU EXIT SIGN
20. EM1 - REFER TO SCHEDULE
21. V1 - REFER TO SCHEDULE
22. V2 - REFER TO SCHEDULE
23. NEW LP-3A/B DISCONNECT REFER TO E-19
24. FURNISH AND INSTALL XMFR-L3A AND DISCONNECT



FIRST FLOOR SOUTH HEATING/COOLING ELECTRICAL PLAN - PROPOSED

0 4 8 16

SCALE: 1/8 " = 1'-0" (22x34)
SCALE: 1/16 " = 1'-0" (11x17)

KEY PLAN - FIRST FLOOR

PROJECT NO.: 00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE: MARCH 2016	DRAWN BY: INIT	1	3/25	ADDENDUM #1	.
F.B. : .	CHECKED BY: SRC	.	.	.	.
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PLOT DATE: 3/25/16, P:\610s\616\00616097\CADD\Construction Documents\ADDENDUM #1\616097 E-8R.dwg

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SCOTT R. CHILSON — MARCH 25, 2016 (Date) — 44287 (License No.)

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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
LAKEWOOD, MN

FIRST FLOOR SOUTH HEATING AND COOLING
ELECTRICAL PLAN - PROPOSED

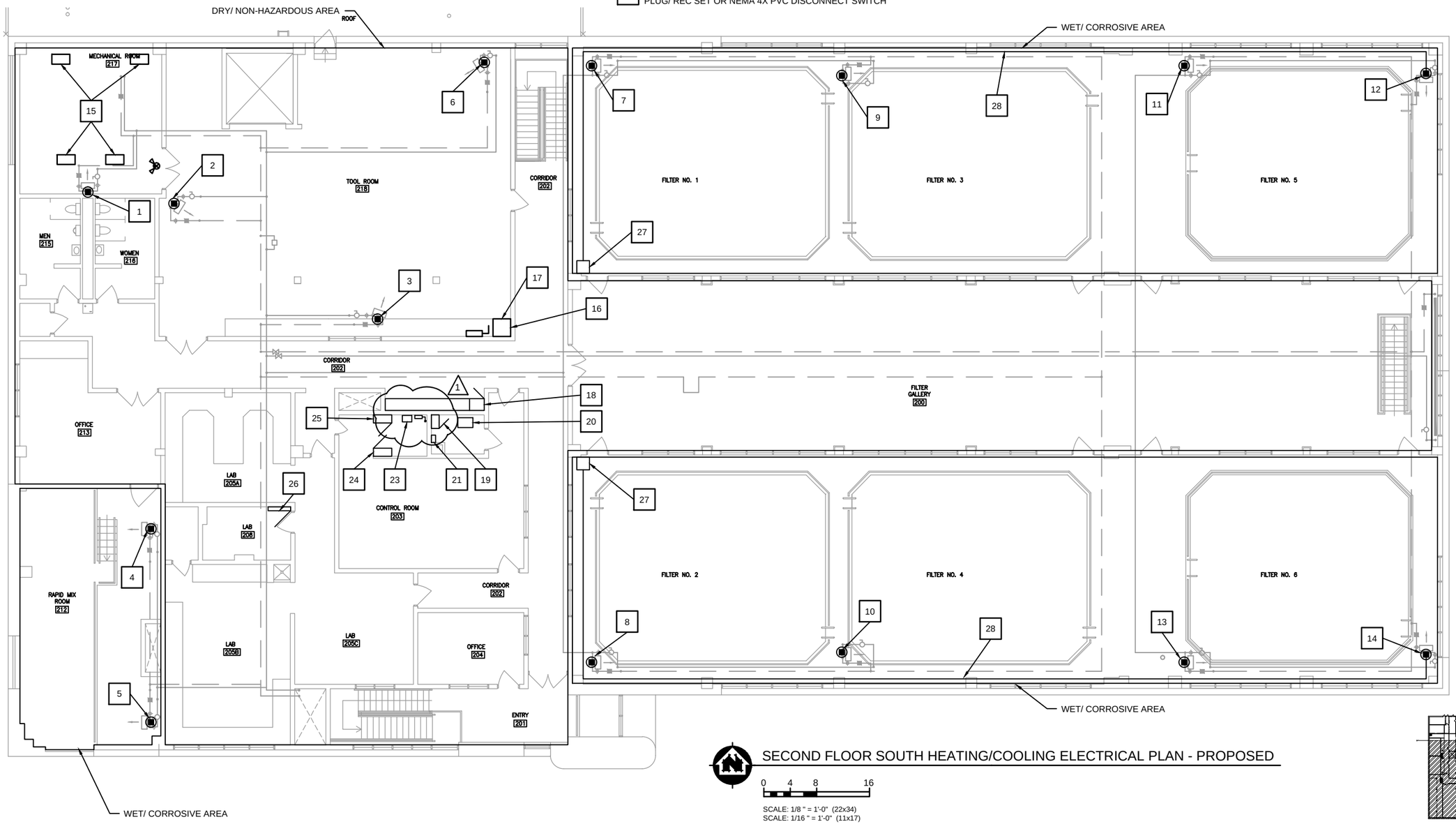
FILE NO. 00616097
SHEET E-8R

GENERAL NOTES:

1. REFER TO AND COORDINATE WITH M-DRAWINGS.
2. DEMO ALL INSTRUMENTATION, CONNECTIONS, AND EQUIPMENT AS REQUIRED FOR PROJECT COMPLETION.
3. INTENT DIVISION OF DEMOLITION: IT IS THE INTENT OF THE EC SHALL DECOMMISSION, DISCONNECT, AND DEMOLISH ALL EQUIPMENT DEVICES, MATERIAL, ETC RELATED TO ALL POWER CONNECTIONS. HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR DEMO OF EQUIPMENT, MATERIALS, DEVICES, CONTROL, ETC.
4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES: XXX

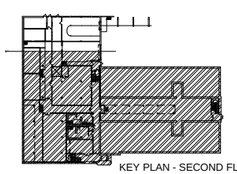
1. CONNECT POWER UH-17, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
2. CONNECT POWER UH-7, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
3. CONNECT POWER UH-8, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
4. CONNECT POWER UH-15, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
5. CONNECT POWER UH-16, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
6. CONNECT POWER UH-6, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
7. CONNECT POWER UH-18, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
8. CONNECT POWER UH-25, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
9. CONNECT POWER UH-19, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
10. CONNECT POWER UH-24, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
11. CONNECT POWER UH-20, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
12. CONNECT POWER UH-21, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
13. CONNECT POWER UH-23, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
14. CONNECT POWER UH-22, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
15. NEW LIGHT FIXTURE (TYP)-V1 FIXTURES
16. EXISTING XFMR-LP/L2 TO REMAIN
17. EXISTING XFMR-LP/L2 DISCONNECT TO REMAIN
18. LP-L2 TO REAMIN-PROVIDE NEW BRANCH FEEDER TO MASTER PPC CONTROLLER AND SERVER
19. EXISTING DATA/ COMM SERVICE AND SWITCH -CONNECT NETWORK MASTER PPC CONTROLS
20. EXISTING SERVER TO REMAIN
21. NEW MASTER PPC CONTROLLER AND NEW SERVER. (FURNISH AND INSTALL NETWORK DATA/COMM/PWR LOOP TO AL HVAC CONTROL DEVICES AND EQUIPMENT PER MC
22. NOT USED (REFER TO E-8R)
23. NEW XFMR-LP-L HOMERUN FROM PP1 FEED ENCLOSED CB DISCONNECT, TO HOMERUN FEED TO LP-L1
24. EXISTING SCADA CONTROL PANEL TO REMAIN
25. FURNISH, INSTALL, AND CONNECT PP1
26. EXISTING LP-L1 TO BE REFED FROM NEW ENCLOSED CB DISCONNECT AND XFMR-LP-L1
27. NEW NEMA 4X PVC BOX, EXTEND UH POWER CIRCUIT
28. NEW 3/4" PVC UH FEEDER CIRCUIT



SECOND FLOOR SOUTH HEATING/COOLING ELECTRICAL PLAN - PROPOSED

0 4 8 16

SCALE: 1/8 " = 1'-0" (22x34)
SCALE: 1/16 " = 1'-0" (11x17)



KEY PLAN - SECOND FLOOR

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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
LAKEWOOD, MN

SECOND FLOOR SOUTH HEATING AND COOLING
ELECTRICAL PLAN - PROPOSED

FILE NO. 00616097
SHEET E-10R

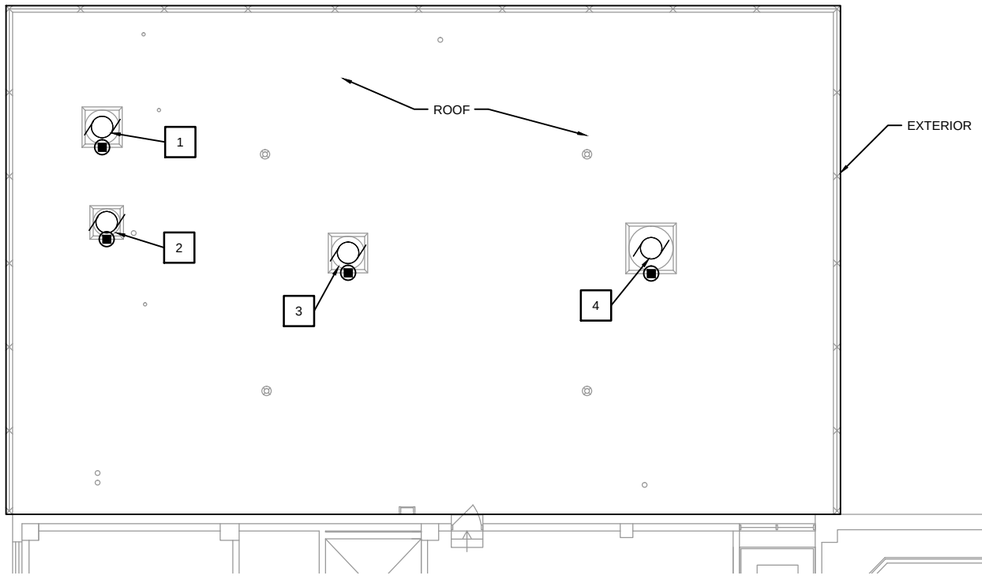
GENERAL NOTES:

1. REFER TO AND COORDINATE WITH M-DRAWINGS.
2. DEMO ALL INSTRUMENTATION, CONNECTIONS, AND EQUIPMENT AS REQUIRED FOR PROJECT COMPLETION.
3. INTENT DIVISION OF DEMOLITION: IT IS THE INTENT OF THE EC SHALL DECOMMISSION, DISCONNECT, AND DEMOLISH ALL EQUIPMENT DEVICES, MATERIAL, ETC RELATED TO ALL POWER CONNECTIONS. HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR DEMO OF EQUIPMENT, MATERIALS, DEVICES, CONTROL, ETC.
4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES: XXX

1. CONNECT POWER EF-4 & MD-13, FURNISH WITH DISCONNECT RATED PLUG/ REC SETS (TYP)
2. CONNECT POWER EF-5 & MD-14, FURNISH WITH DISCONNECT RATED PLUG/ REC SETS (TYP)
3. CONNECT POWER EF-3 & MD-12, FURNISH WITH DISCONNECT RATED PLUG/ REC SETS (TYP)
4. CONNECT POWER EF-2 & MD-11, FURNISH WITH DISCONNECT RATED PLUG/ REC SETS (TYP)

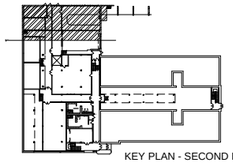
1



SECOND FLOOR SOUTH DUCTWORK ELECTRCAL PLAN - PROPOSED

0 4 8 16

SCALE: 1/8 " = 1'-0" (22x34)
SCALE: 1/16 " = 1'-0" (11x17)



KEY PLAN - SECOND FLOOR

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CITY OF DULUTH
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SECOND FLOOR NORTH DUCTWORK
ELECTRICAL PLAN - PROPOSED

FILE NO. 00616097
SHEET E-14R

GENERAL NOTES:

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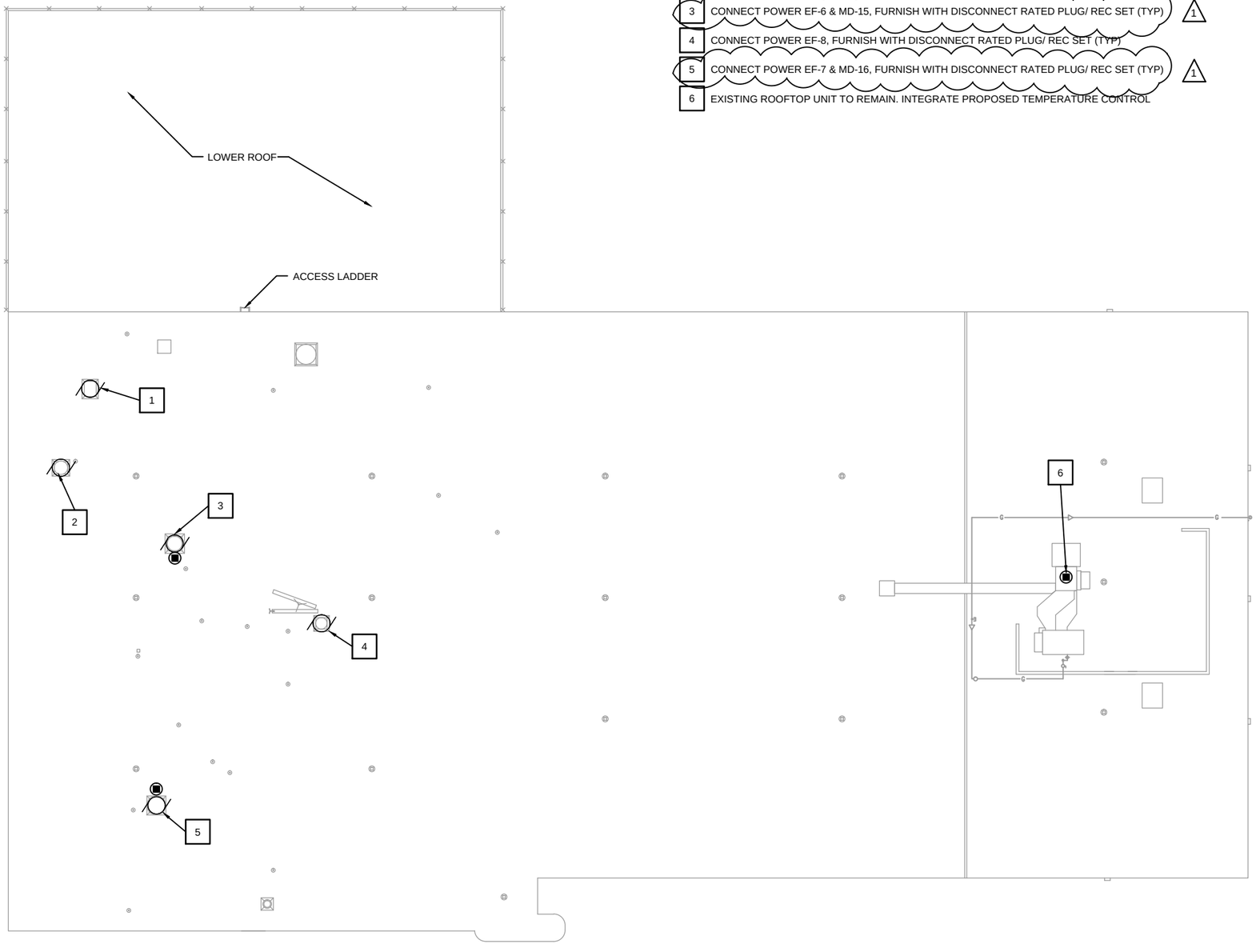
4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES: XXX

1. CONNECT POWER EF-1, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP)
2. CONNECT POWER EF-9, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP)
3. CONNECT POWER EF-6 & MD-15, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP) 1
4. CONNECT POWER EF-8, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP)
5. CONNECT POWER EF-7 & MD-16, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP) 1
6. EXISTING ROOFTOP UNIT TO REMAIN. INTEGRATE PROPOSED TEMPERATURE CONTROL



ROOF DUCTWORK ELECTRCLA PLAN- PROPOSED

0 4 8 16

SCALE: 1/8 " = 1'-0" (22x34)
SCALE: 1/16 " = 1'-0" (11x17)

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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
LAKEWOOD, MN

ROOF DUCTOWRK
ELECTRICAL PLAN - PROPOSED

FILE NO. 00616097
SHEET E-15R

GENERAL NOTES:

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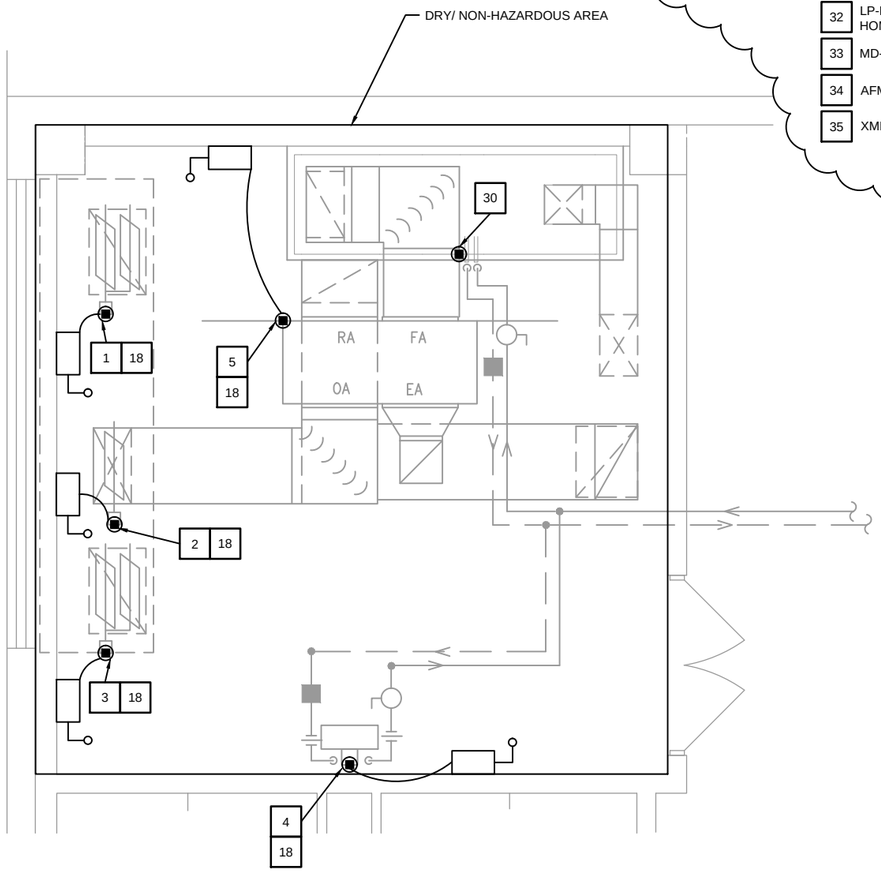
4. REFER TO SCHEDULES FOR WORK.

KEY NOTES: XXX

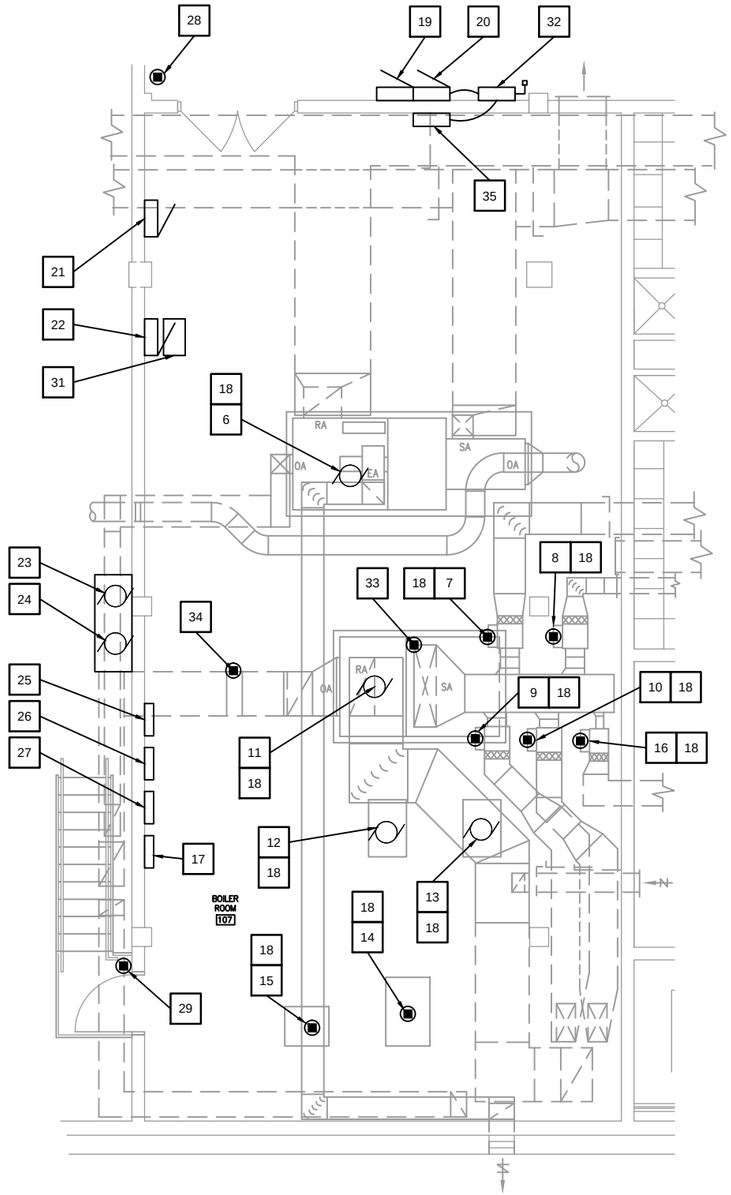
1	MD-1	9	VAV-4
2	MD-10	10	VAV-6
3	MD-2	11	AHU-1
4	UH-17	12	H-1 OR P-1
5	ENV-1	13	H-2 OR P-2
6	D-2	14	B-1 EXISTING TO REMAIN. CONNECT SIGNALS FOR AUTOMATIC CONTROL
7	VAV-1	15	B-2 EXISTING TO REMAIN.CONNECT SIGNALS FOR AUTOMATIC CONTROL
8	VAV-2	16	VAV-5
17	TEMPERATURE CONTROL CABINET		
18	DISCONNECTS SHALL BE DISCONNECT RATED PLUG/ REC SET. WALL DISCONNECT ARE SHOW FOR CLARITY ONLY		
19	LP-1A	25	AHU-VFD
20	LP-1B	26	P-VDF-1
21	LP-4A	27	P-VFD-2
22	LP-4B	28	EXISTING BOILER E-STOP
23	SAMPLE PUMP 1 SP-1	29	FURNISH AND INSTALL NEW BOILER E-STOP
24	SAMPLE PUMP 2 SP-2	30	AHU-3
		31	XFMR-LP-L4B WALL MOUNT ABOVE LP-L4B
		32	LP-L3 ENCLOSED CB DISCONNECT HOMERUN TO XFMR-LP-L3
		33	MD-9
		34	AFMS-1
		35	XMFR-LP-L3



1 UPPER MECHANICAL ROOM ENLARGED PLAN
E-16

0 1 2 4 6

SCALE: 3/8" = 1'-0" (22x34)
SCALE: 3/16" = 1'-0" (11x17)



2 LOWER LEVEL BOILER ROOM ENLARGED PLAN - PROPOSED
E-16

0 2 4 8

SCALE: 3/8" = 1'-0" (22x34)
SCALE: 3/16" = 1'-0" (11x17)

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY: INIT	1	3/25	ADDENDUM #1	.
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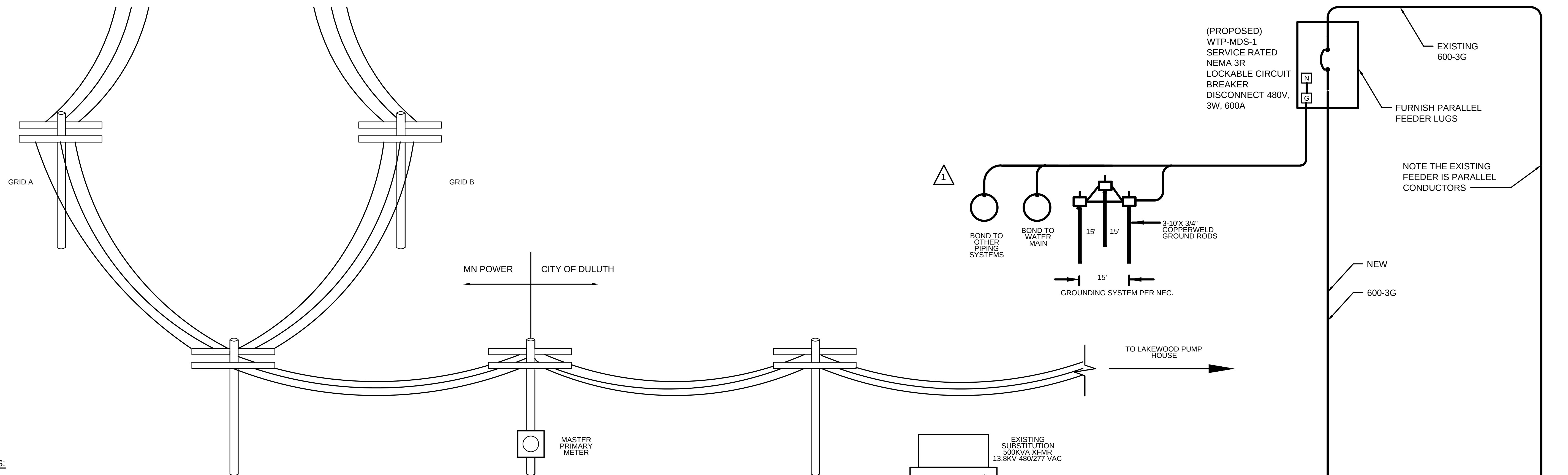
LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
LAKEWOOD, MN

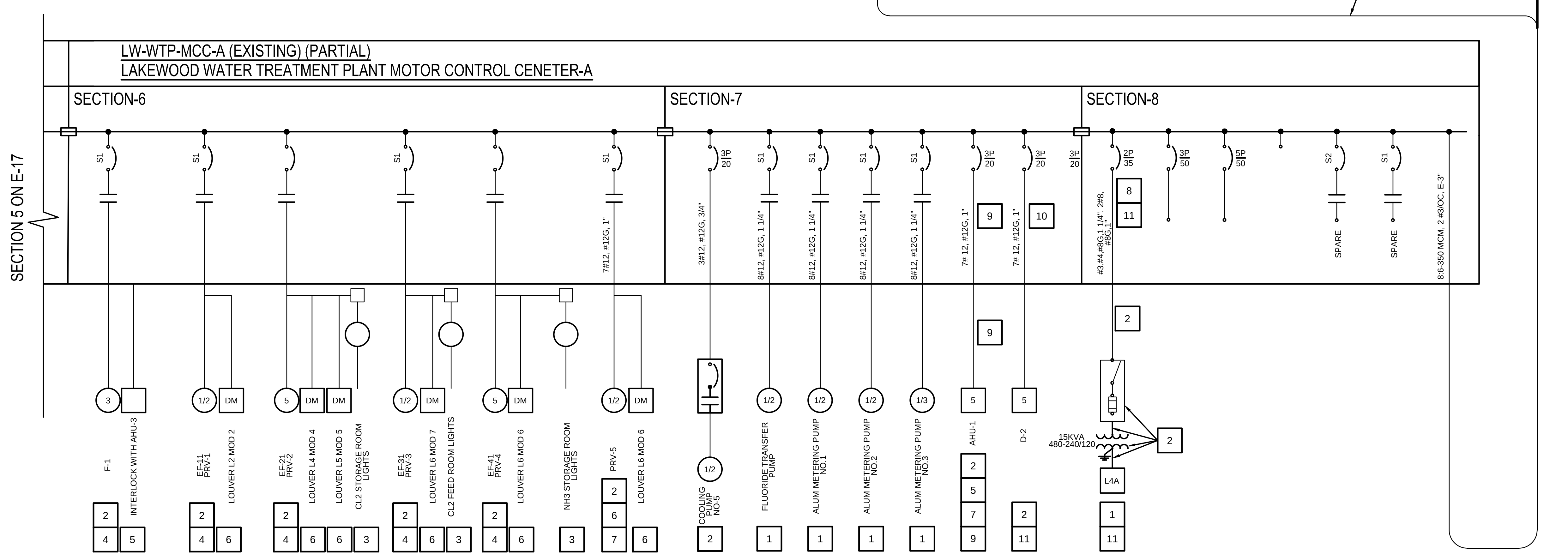
ELECTRCLA PLANS ENLARGED

FILE NO. 00616097
SHEET E-16R



GENERAL NOTES:

1. REFER TO AND COORDINATE WITH M-DRAWINGS.
2. DEMO ALL INSTRUMENTATION, CONNECTIONS, AND EQUIPMENT AS REQUIRED FOR PROJECT COMPLETION.
3. INTENT DIVISION OF DEMOLITION: IT IS THE INTENT OF THE EC SHALL DECOMMISSION, DISCONNECT, AND DEMOLISH ALL EQUIPMENT DEVICES, MATERIAL, ETC RELATED TO ALL POWER CONNECTIONS. HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR DEMO OF EQUIPMENT, MATERIALS, DEVICES, CONTROL, ETC.
4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.



KEY NOTES: XXX

1. EXISTING EQUIPMENT, DEVICES, AND MATERIALS TO REMAIN.
2. DECOMMISSION, DISCONNECT, AND DEMOLISH EXISTING EQUIPMENT, DEVICES, AND CONNECTION MATERIALS COMPLETE. REUSE OF EXISTING CIRCUITS SHALL BE ALLOWED WHEN THE EXISTING CIRCUITS DERIVE FROM AND TERMINATE IN CORRECT LOCATIONS. OTHERWISE THE EXISTING CONTROL, FEEDERS, CIRCUIT, ETC. SHALL BE REMOVED AND REPLACED.
3. REFEED AND FURNISH NEW INTERLOCK CONTROL FOR EXISTING LIGHTING.
4. REUSE EXISTING MOTOR CONTROL AND FEEDER.
5. CONTROL BY MC.
6. REFEED FROM LB-LP4B, FURNISH CONTROL AND INTERLOCKS PER MC.
7. FURNISH AND INSTALL NEW FEEDER, MOTOR CONTROL, AND CONNECTIONS AS SCHEDULED.
8. REPLACE AND UPGRADE MCC BUCKET TO PROVIDE NEW 300/3P CB DISCONNECT BUCKET CIRCUIT BREAKER AND FEEDER. REFER TO E-19.
9. FURNISH AND INSTALL NEW EQUIPMENT, MATERIALS, DEVICES, WIRING, ETC. (COMPLETE).
10. DECOMMISSION FEEDER BUCKET
11. REFEED AS SHOWN ON E-19

PROJECT NO.:	00616097	SCALE: AS SHOWN		NO.	DATE	REVISION	BY
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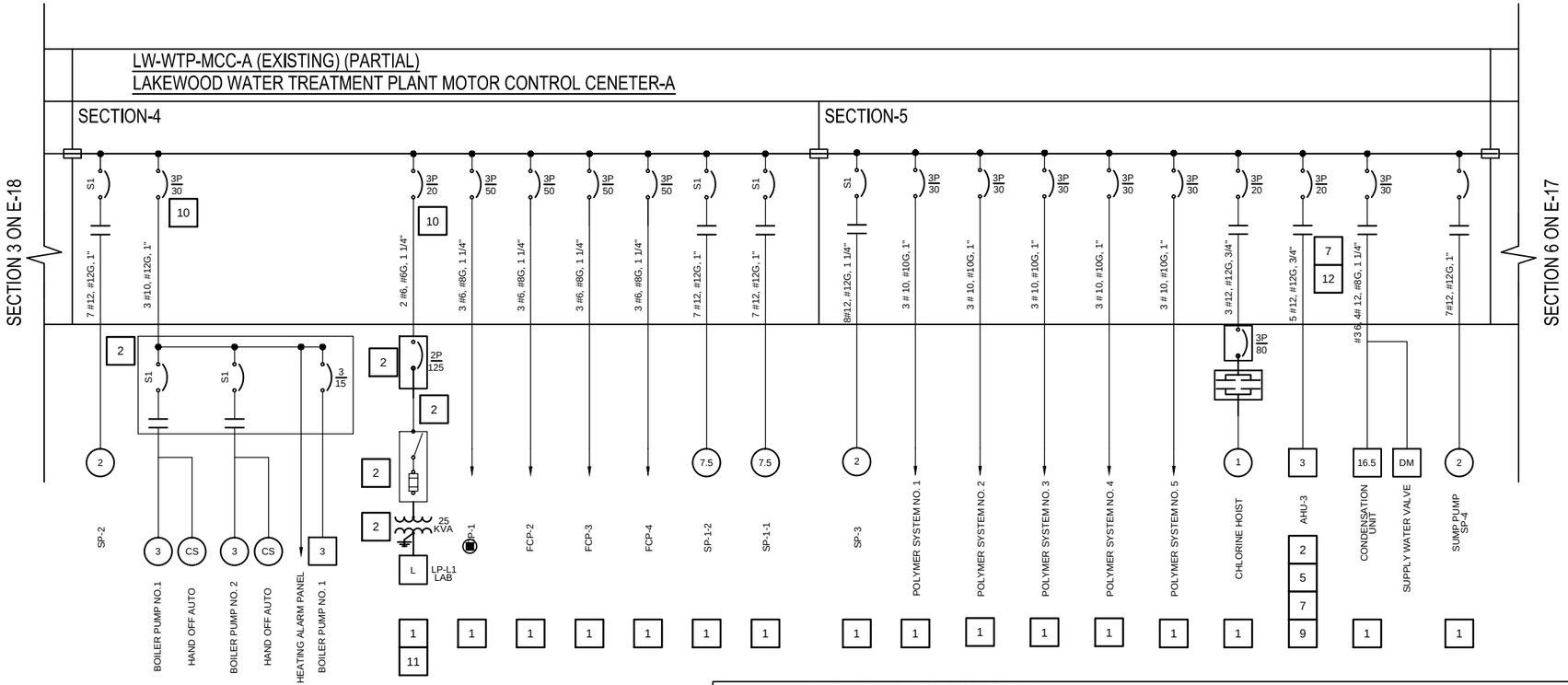
LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

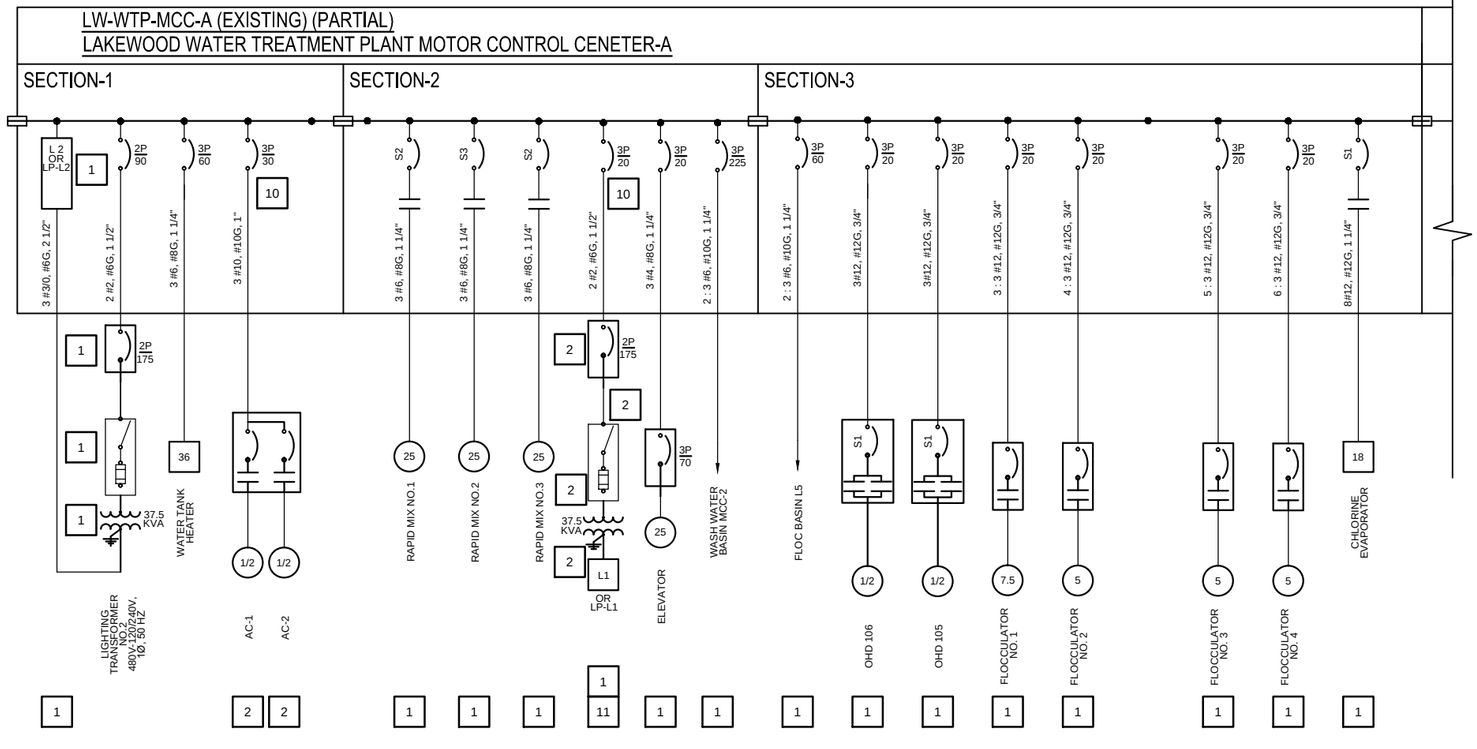
CITY OF DULUTH
LAKEWOOD, MN

EXISTING ONE-LINE DIAGRAM NO.1

FILE NO. 00616097

SHEET E-17R





KEY NOTES: XXX

1. EXISTING EQUIPMENT, DEVICES, AND MATERIALS TO REMAIN.
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3. REFEED AND FURNISH NEW INTERLOCK CONTROL FOR EXISTING LIGHTING.
4. REUSE EXISTING MOTOR CONTROL AND FEEDER.
5. CONTROL BY MC.
6. REFEED FROM LB-LP4B, FURNISH CONTROL AND INTERLOCKS PER MC.
7. FURNISH AND INSTALL NEW FEEDER, MOTOR CONTROL, AND CONNECTIONS AS SCHEDULED.
8. REPLACE OR UPGRADE EXISTING MCC BUCKET TO PROVIDE NEW 50/3P CIRCUIT BREAKER AND FEEDER. REFER TO E-19.
9. FURNISH AND INSTALL NEW EQUIPMENT, MATERIALS, DEVICES, WIRING, ETC. (COMPLETE).
10. DECOMMISSION FEEDER BUCKET.
11. ~~REFEED AS SHOWN ON E-19~~
12. REMOVE EXISTING STARTER AND FEED NEW AHU-3

1

GENERAL NOTES:

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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
LAKEWOOD, MN

EXISTING ONE-LINE DIAGRAM NO. 2

FILE NO. 00616097
SHEET E-18R

GENERAL NOTE:
1. REFER TO SCHEDULES AND SPECIFICATION FOR ADDITIONAL INFORMATION .

WTP-MCC-A (EXISTING PARTIAL)
LAKEWOOD WATER TREATMENT PLANT MOTOR CONTROL CENTER NO. 1
600A HORIZONTAL/300 AMP VERTICAL

EXISTING MCC IS SQUARE D
MODEL 4 MCC

1	2	3	4	5	6	7	8

REMOVE EXSTING SPACE BUCKET AND FURNISH AND INSTALL NEW 300 AMP DISCONNECT BUCKET SQUARE D MODEL 4 MCC

NEW
300-3G

50-3G

NEW J-BOX

NEW
XFMR-LP4B
30 KVA
480-208/120
WALL MOUNTED W/ BRACKET

LOCATED IN
ROOM 107

WTP-PP1
480V, 3W
3Ø, 300 AMP

FURNISH W/ LOCK OUT TABS

40-3G

D-1

D-2

30-3G

70-3G

100-3G

200-4G ((4) #3 & (1) #8G IN 1 1/4" C.)

60-3G ((3) #6 & (1) #8G IN 3/4" C.)

LP4B
208/140V
4W, 3Ø
200 AMP

LOCATED IN
ROOM 107

LP-4A

PRV
7

LGT

LGT

BOILER CONTRACTOR

AKA EF07
CONFIRM SIZE AND RECONNECT

NEW BOILER E-STOP

EXISTING BOILER E-STOP

XFMR-LP-L1
480-240/120
1Ø, 3W
25KVA

XFMR-LP-L3
480-240/120
1Ø, 3W
37.5KVA

LOCATED IN
ROOM 107

150-3G

DS-LP-1

150
3P

LOCATED IN
ROOM 203A

200-3G

DS-LP-23

200
3P

LOCATED IN
HALL

150-3G

200-3G

EXISTING
LP-L1
LAB

EXISTING
LP-3A
&
LP-3B

EXISTING
LP-3B

PROJECT NO.: 00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE: MARCH 2016	DRAWN BY: INIT	1	3/25	ADDENDUM #1	.
F.B. : .	CHECKED BY: SRC	.	.	.	.
.	.	.	.	.	.

PLOT DATE: 3/25/16, P:\610s\616\00616097\CADD\Construction Documents\ADDENDUM #1\616097 E-19R.dwg

I HEREBY CERTIFY THAT THIS PLAN, REPORT, OR SPECIFICATION WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SCOTT R. CHILSON — MARCH 25, 2016 (Date) — 44287 (License No.)

MSA PROFESSIONAL SERVICES
TRANSPORTATION • MUNICIPAL DEVELOPMENT • ENVIRONMENTAL
332 W. Superior Street Duluth, MN 55802
218-722-3915 1-800-777-7380 Fax: 218-722-4548
Web Address: www.msa-ps.com

LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
LAKEWOOD, MN

ONE-LINE DIAGRAM FOR POWER SUPPLY

FILE NO. 00616097

SHEET E-19R

SINGLE PHASE PANEL SCHEDULE — PANEL ID/TAG: LP-L2 (EXISITNG)

TYPE: LIGHTING AND APPLIANCE PANEL (EXISTING TO REMAIN/MODIFY AS REQURIED) | BUS CONSTRUCTION: CU | BUS AMPACITY: 225A
VOLTAGE: 240 WYE /120V | GROUND BUS: YES | MAIN CIRCUIT BREAKER: NONE
PHASE/WIRE: 1P-3W | ISOLATED GROUND BUS: YES | SUB-FEED LUGS: NA
MOUNT: SURFACE | INTERRUPTING CAPACITY: 10 KAIC

	LOADS SERVED LGT	REC.	MECH.	OTHER	DESCRIPTION	LOAD AMP	BKR SIZE	BKR POLE		A AMP	B AMP		BKR POLE	BKR SIZE	LOAD AMP	DESCRIPTION	LOADS SERVED LGT	REC.	MECH.	OTHER	
1					RM 200 LIGHTS		20	1	1	0.0	***	2	1	20		219 LIGHTS					2
3					RM 200 LIGHTS		20	1	3	***	0.0	4	1	20		219 LIGHTS					4
5					RM 200 LIGHTS		20	1	5	0.0	***	6	1	20		219 LIGHTS					6
7					219,214,215,216 LIGHTS		20	1	7	***	0.0	8	1	20		219 LIGHTS					8
9					200,201,202,215,216 LIGHTS		20	1	9	0.0	***	10	1	20		203,211 LIGHTS					10
11					201,202 LIGHTS		20	1	11	***	0.0	12	1	20		218 LIGHTS					12
13					204,203,217 LIGHTS		20	1	13	0.0	***	14	1	20		218 LIGHTS					14
15					205,206 LIGHTS		20	1	15	***	0.0	16	1	20		219,207,208 LIGHTS					16
17					206 LIGHTS		20	1	17	0.0	***	18	1	20		209 LIGHTS					18
19					212,213 LIGHTS 209 CLOCK		20	1	19	***	0.0	20	1	20		BATTERY CHARGER					20
21					INTERCOM		20	1	21	0.0	***	22	1	20		SPACE					22
23					219,200 REC		20	1	23	***	0.0	24	1	20		200,219 REC					24
25					203,205 REC		20	1	25	0.0	***	26	1	20		201,204,205 REC					26
27					212 REC		20	1	27	***	0.0	28	1	20		202,213,212 REC					28
29					202,216 REC		20	1	29	0.0	***	30	1	20		202,215,216,218 REC					30
31					217,216 REC		20	1	31	***	0.0	32	1	20		205 REC					32
33					SPACE		20	1	33	0.0	***	34	1	20		203 REC AND ELEVATOR LIGHT					34
35					FILTER CONSOL NO.1		30	2	35	***	0.0	36	2	30		FILTER CONSOL NO.3					36
37							30	2	37	0.0	***	38	2	30							38
39					FILTER CONSOL NO.2		30	2	39	***	0.0	40	2	30		FILTER CONSOL NO.3					40
41							30	2	41	0.0	***	42	2	30							42
	0	0	0	0	:LOADS BY TYPE											LOADS BY TYPE:	0	0	0	0	

TOTAL AMPS / PHASE: 0.0 0.0 — TOTAL LOADS BY TYPE: 0 0 0 0
KVA / PHASE: 0.0 0.0 — TOTAL CONNECTED KVA: 0.0

GENERAL PANEL CONSTRUCTION NOTES:
1. ALL WORK BY THIS CONTRACTOR TO COMPLY WITH ALL LOCAL, STATE AND NATIONAL ELECTRICAL CODES.
2. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH OTHER TRADES TO AVOID CONFLICTS AND TO VERIFY ALL EQUIPMENT CONNECTION REQUIREMENTS.
3. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEMPER CONTRACT DOCUMENTS AND ENSURING THAT THE SYSTEM IS OPERATIONAL UPON JOB COMPLETION.
4. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEMFOR ALL OWNER-FURNISHED APPLIANCES IN ACCORDANCE WITH NEC ARTICLE 422 AND 440.22.
5. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL BRANCH CIRCUIT WIRING IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AND THESE PROJECT DOCUMENTS
6. PROVIDE ALL POWER WIRING INCLUDING ALL CIRCUITRY CARRYING ELECTRICAL ENERGY FROM PANELBOARD OR OTHER SOURCE THROUGH STARTERS AND DISCONNECTS TO MOTORS, PACKAGED EQUIPMENT, OR PACKAGED CONTROL PANELS. PROVIDE ALL WIRING BETWEEN CONTROL PANELS AND MOTORS. I
7. MOTORS CONNECTED TO EMERGENCY SYSTEMS CIRCUITRY SHALL HAVE CIRCUITRY INSTALLED IN SEPARATE RACEWAY PER NEC ARTICLE 700.
8. PROVIDE SEPARATE GREEN GROUND FOR EACH MOTOR AND EQUIPMENT CONNECTION ROUTED BACK TO INTEGRAL GROUND BUS OF ASSOCIATED PANELBOARD OR MOTOR CONTROL CENTER. GROUND CONDUCTOR SIZES PER NEC ARTICLE 250.122.
9. ALL HEATING, AIR CONDITIONING AND REFRIGERATION EQUIPMENT INSTALLED ON THE EXTERIOR OF THE BUILDING OR ROOF TOP SHALL HAVE A15 AMP, 125V WEATHER-RESISTANT GFCI RECEPTACLE SURFACE MOUNTED IN WEATHERPROOF ENCLOSURE, MOUNTED ADJACENT TO EQUIPMENT.
10. THIS CONTRACTOR SHALL VERIFY ELECTRICAL REQUIREMENTS INCLUDING VOLTAGE, HORSEPOWER, STARTER TYPE, AND DISCONNECTING MEANS FOR MOTORS AND EQUIPMENT PRIOR TO ORDERING CIRCUIT BREAKERS, DISCONNECT SWITCHES, AND STARTERS
11. REFER TO ONE-LINE AND P&ID'S FOR ADDITIONAL INFORMATION AND DETIAL.
12. REFER TO FEEDER SCHEUDLE FOR ADDITIONAL INFORMATION AND DETIAL.

PANEL NOTES:
* NA

SINGLE PHASE PANEL SCHEDULE — PANEL ID/TAG: LP-L4A (EXISTING)

TYPE: LIGHTING AND APPLIANCE PANEL (EXISTING TO REMAIN/MODIFY AS REQURIED) | BUS CONSTRUCTION: CU | BUS AMPACITY: NA
VOLTAGE: 240 WYE /120V (to be refed with 208/120) | GROUND BUS: YES | MAIN CIRCUIT BREAKER: NONE
PHASE/WIRE: 1P-3W | ISOLATED GROUND BUS: YES | SUB-FEED LUGS: YES
MOUNT: SURFACE | INTERRUPTING CAPACITY: 10 KAIC

	LOADS SERVED LGT	REC.	MECH	OTHER	DESCRIPTION	LOAD AMP	BKR SIZE	BKR POLE		A AMP	B AMP		BKR POLE	BKR SIZE	LOAD AMP	DESCRIPTION	LOADS SERVED LGT	REC.	MECH.	OTHER	
1					#4 ZONE HEATERS (*)	4	20	1	1	6.0	***	2	1	20	2	LOWER GALLERY REC					2
3					#3 ZONE HEATERS (*)	4	20	1	3	***	6.0	4	1	20	2	LOWER GALLERY LIGHTS					4
5					LIGHTS FILTER NO.5	4	20	1	5	8.0	***	6	1	20	4	LOWER GALLERY UNIT HEATERS (*)					6
7					2ND FLOOR GALLERY LIGHTS	2	20	1	7	***	3.0	8	1	20	1	STAIRS LIGHTS					8
9					LIGHTS 2ND FLOOR GALLERY	2	20	1	9	5.0	***	10	1	20	3	2ND FLOOR GALLERY REC					10
11					SPARE		20	1	11	***	2.0	12	1	20	2	FILTER NO.6 LIGHTS					12
13					SPARE		20	1	13	4.0	***	14	1	20	4	#2 ZONE HEATERS (*)					14
15					SPARE		20	2	15	***	4.0	16	1	20	4	#1 ZONE HEATERS (*)					16
17							I	2	17	0.0	***	18	2	20		SPARE					18
19					SPACE				19	***	12.0	20	2	20	12	ENTRY GATE					20
21					SPACE				21	12.0	***	22	2	1	12						22
23					SPACE				23	***	0.0	24				SPACE					24
25					SPACE				25	0.0	***	26				SPACE					26
27					SPACE				27	***	0.0	28				SPACE					28
29					SPACE				29	0.0	***	30				SPACE					30
31					SPACE				31	***	0.0	32				SPACE					32
33					SPACE				33	0.0	***	34				SPACE					34
35					SPACE				35	***	0.0	36				SPACE					36
37					SPACE				37	0.0	***	38				SPACE					38
39					SPACE				39	***	0.0	40				SPACE					40
41					SPACE				41	0.0	***	42				SPACE					42
	0	0	0	0	:LOADS BY TYPE											LOADS BY TYPE:	0	0	0	0	

TOTAL AMPS / PHASE: 35.0 27.0 — TOTAL LOADS BY TYPE: 0 0 0 0
KVA / PHASE: 4.9 3.7 — TOTAL CONNECTED KVA: 8.6

GENERAL PANEL CONSTRUCTION NOTES:
1. ALL WORK BY THIS CONTRACTOR TO COMPLY WITH ALL LOCAL, STATE AND NATIONAL ELECTRICAL CODES.
2. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH OTHER TRADES TO AVOID CONFLICTS AND TO VERIFY ALL EQUIPMENT CONNECTION REQUIREMENTS.
3. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEM PER CONTRACT DOCUMENTS AND ENSURING THAT THE SYSTEM IS OPERATIONAL UPON JOB COMPLETION.
4. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEM FOR ALL OWNER-FURNISHED APPLIANCES IN ACCORDANCE WITH NEC ARTICLE 422 AND 440.22.
5. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL BRANCH CIRCUIT WIRING IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AND THESE PROJECT DOCUMENTS
6. PROVIDE ALL POWER WIRING INCLUDING ALL CIRCUITRY CARRYING ELECTRICAL ENERGY FROM PANELBOARD OR OTHER SOURCE THROUGH STARTERS AND DISCONNECTS TO MOTORS, PACKAGED EQUIPMENT, OR PACKAGED CONTROL PANELS. PROVIDE ALL WIRING BETWEEN CONTROL PANELS AND MOTORS. I
7. MOTORS CONNECTED TO EMERGENCY SYSTEMS CIRCUITRY SHALL HAVE CIRCUITRY INSTALLED IN SEPARATE RACEWAY PER NEC ARTICLE 700.
8. PROVIDE SEPARATE GREEN GROUND FOR EACH MOTOR AND EQUIPMENT CONNECTION ROUTED BACK TO INTEGRAL GROUND BUS OF ASSOCIATED PANELBOARD OR MOTOR CONTROL CENTER. GROUND CONDUCTOR SIZES PER NEC ARTICLE 250.122.
9. ALL HEATING, AIR CONDITIONING AND REFRIGERATION EQUIPMENT INSTALLED ON THE EXTERIOR OF THE BUILDING OR ROOF TOP SHALL HAVE A 15 AMP, 125V WEATHER-RESISTANT GFCI RECEPTACLE SURFACE MOUNTED IN WEATHERPROOF ENCLOSURE, MOUNTED ADJACENT TO EQUIPMENT.
10. THIS CONTRACTOR SHALL VERIFY ELECTRICAL REQUIREMENTS INCLUDING VOLTAGE, HORSEPOWER, STARTER TYPE, AND DISCONNECTING MEANS FOR MOTORS AND EQUIPMENT PRIOR TO ORDERING CIRCUIT BREAKERS, DISCONNECT SWITCHES, AND STARTERS
11. REFER TO ONE-LINE AND P&ID'S FOR ADDITIONAL INFORMATION AND DETIAL.
12. REFER TO FEEDER SCHEUDLE FOR ADDITIONAL INFORMATION AND DETIAL.

PANEL NOTES:
* DEMOLISH AND CONNECT NEW
** CONFIRM CONNECTION

SINGLE PHASE PANEL SCHEDULE — PANEL ID/TAG: LP-3A (EXISTING)

TYPE: LIGHTING AND APPLIANCE PANEL (EXISTING TO REMAIN/MODIFY AS REQURIED) | BUS CONSTRUCTION: CU | BUS AMPACITY: 225A
VOLTAGE: 240 WYE /120V | GROUND BUS: YES | MAIN CIRCUIT BREAKER: NONE
PHASE/WIRE: 1P-3W | ISOLATED GROUND BUS: YES | SUB-FEED LUGS: NA
MOUNT: SURFACE | INTERRUPTING CAPACITY: 10 KAIC

	LOADS SERVED LGT	REC.	MECH.	OTHER	DESCRIPTION	LOAD AMP	BKR SIZE	BKR POLE		A AMP	B AMP		BKR POLE	BKR SIZE	LOAD AMP	DESCRIPTION	LOADS SERVED LGT	REC.	MECH.	OTHER	
1					101, 102, 114, 116, 118 LIGHTS		20	1	1	0.0	***	2	1	20		112, 114, 115 LIGHTS					2
3					102, 109, 101 LIGHTS		20	1	3	***	0.0	4	1	20		116 LIGHTS					4
5					100 LIGHTS		20	1	5	0.0	***	6	1	20		104, 103 LIGHTS					6
7					100 LIGHTS		20	1	7	***	0.0	8	1	20		150, 106 LIGHTS					8
9					119 AND MAIN DOOR LIGHTS		20	1	9	0.0	***	10	1	20		117 LIGHTS					10
11					108 LIGHTS		20	1	11	***	0.0	12	1	20		113, 112, 111 LIGHTS					12
13					112		20	1	13	0.0	***	14	1	20		110 (POLY) LIGHTS					14
15					107 (BOILER) (**)		20	1	15	***	0.0	16	1	20		110 (POLY) LIGHTS					16
17					AIR DRYER 107 (*)		20	1	17	0.0	***	18	1	20		OUTSIDE DOORS					18
19					101 AND MAIN DOOR REC.		20	1	19	***	0.0	20	1	20		102,104,105,106 REC					20
21					104 REC.		20	1	21	0.0	***	22	1	20		100 REC					22
23					102,117 REC		20	1	23	***	0.0	24	1	20		110 REC					24
25					107,108,109 REC		20	1	25	0.0	***	26	1	20		110 REC					26
27					112, 114 REC		20	1	27	***	0.0	28	1	20		116 REC					28
29					116, 117 REC		20	1	29	0.0	***	30	1	20		SPARE					30
31					CAUSTIC SODA METERING P No.1		20	1	31	***	0.0	32	1	20		SPARE					32
33					CAUSTIC SODA METERING P No.2		20	1	33	0.0	***	34	1	20		FLOOD LIGHTS					34
35					VACUUM PUMP		20	1	35	***	0.0	36	1	20		FLOOD LIGHTS					36
37					107 & HOT WATER HEATER (**)		20	1	37	0.0	***	38	1	20		FLOOD LIGHTS					38
39					CONTROL POWER AIR CONDITIONER (*)		20	1	39	***	0.0	40	1	20		FLAG POLE					40
41					WALKWAY 7		20	1	41	0.0	***	42	1	20		SIGN					42
	0	0	0	0	:LOADS BY TYPE											LOADS BY TYPE:	0	0	0	0	

TOTAL AMPS / PHASE: 0.0 0.0 — TOTAL LOADS BY TYPE: 0 0 0 0
KVA / PHASE: 0.0 0.0 — TOTAL CONNECTED KVA: 0.0

GENERAL PANEL CONSTRUCTION NOTES:
1. ALL WORK BY THIS CONTRACTOR TO COMPLY WITH ALL LOCAL, STATE AND NATIONAL ELECTRICAL CODES.
2. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH OTHER TRADES TO AVOID CONFLICTS AND TO VERIFY ALL EQUIPMENT CONNECTION REQUIREMENTS.
3. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEM PER CONTRACT DOCUMENTS AND ENSURING THAT THE SYSTEM IS OPERATIONAL UPON JOB COMPLETION.
4. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEM FOR ALL OWNER-FURNISHED APPLIANCES IN ACCORDANCE WITH NEC ARTICLE 422 AND 440.22.
5. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL BRANCH CIRCUIT WIRING IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AND THESE PROJECT DOCUMENTS
6. PROVIDE ALL POWER WIRING INCLUDING ALL CIRCUITRY CARRYING ELECTRICAL ENERGY FROM PANELBOARD OR OTHER SOURCE THROUGH STARTERS AND DISCONNECTS TO MOTORS, PACKAGED EQUIPMENT, OR PACKAGED CONTROL PANELS. PROVIDE ALL WIRING BETWEEN CONTROL PANELS AND MOTORS. I
7. MOTORS CONNECTED TO EMERGENCY SYSTEMS CIRCUITRY SHALL HAVE CIRCUITRY INSTALLED IN SEPARATE RACEWAY PER NEC ARTICLE 700.
8. PROVIDE SEPARATE GREEN GROUND FOR EACH MOTOR AND EQUIPMENT CONNECTION ROUTED BACK TO INTEGRAL GROUND BUS OF ASSOCIATED PANELBOARD OR MOTOR CONTROL CENTER. GROUND CONDUCTOR SIZES PER NEC ARTICLE 250.122.
9. ALL HEATING, AIR CONDITIONING AND REFRIGERATION EQUIPMENT INSTALLED ON THE EXTERIOR OF THE BUILDING OR ROOF TOP SHALL HAVE A 15 AMP, 125V WEATHER-RESISTANT GFCI RECEPTACLE SURFACE MOUNTED IN WEATHERPROOF ENCLOSURE, MOUNTED ADJACENT TO EQUIPMENT.
10. THIS CONTRACTOR SHALL VERIFY ELECTRICAL REQUIREMENTS INCLUDING VOLTAGE, HORSEPOWER, STARTER TYPE, AND DISCONNECTING MEANS FOR MOTORS AND EQUIPMENT PRIOR TO ORDERING CIRCUIT BREAKERS, DISCONNECT SWITCHES, AND STARTERS
11. REFER TO ONE-LINE AND P&ID'S FOR ADDITIONAL INFORMATION AND DETIAL.
12. REFER TO FEEDER SCHEUDLE FOR ADDITIONAL INFORMATION AND DETIAL.

PANEL NOTES:
* DEMOLISH AND CONNECT NEW
** CONFIRM CONNECTION

THREE PHASE PANEL SCHEDULE — PANEL ID/TAG: LP-L4B (PROPOSED)

TYPE: PANELBOARD | BUS CONSTRUCTION: CU | BUS AMPACITY: 250A
VOLTAGE: 208 WYE /120V | GROUND BUS: YES | MAIN CIRCUIT BREAKER: 100A
PHASE/WIRE: 3P-4W | ISOLATED GROUND BUS: YES | SUB-FEED LUGS: NO
MOUNT: SURFACE | INTERRUPTING CAPACITY: 10 KAIC

	LOADS SERVED LGT	REC.	MECH.	OTHER	DESCRIPTION	LOAD AMP	BKR SIZE	BKR POLE		A AMP	B AMP	C AMP		BKR POLE	BKR SIZE	LOAD AMP	DESCRIPTION	LOADS SERVED LGT	REC.	MECH.	OTHER	
1			35.0		LP-L4A	35	60	2	1	46.0	***	***	2	3	30	11				11.0		2
3			27.0			27	I	2	3	***	38.0	***	4	3	30	11	P-VFD-1			11.0		4
5			13.3		HVAC-TCP-1	13.3	20	1	5	***	***	24.3	6	3	30	11				11.0		6
7			9.8		EF-5	9.8	20	1	7	20.8	***	***	8	3	30	11				11.0		8
9			9.8		EF-6	9.8	20	1	9	***	20.8	***	10	3	30	11	P-VFD-2			11.0		10
11			4.4		EF-7	4.4	20	1	11	***	***	15.4	12	3	30	11				11.0		12
13			5.8		EF-8	5.8	20	1	13	9.0	***	***	14	1	20	3.2	UH-18,19,20,21			3.2		14
15			4.4		EF-9	4.4	20	1	15	***	7.6	***	16	1	20	3.2	UH-22,23,24,25			3.2		16
17			10.4		MD-11, 12, 13	7.8	20	1	17	***	***	7.8	18	3	20							18
19					SPARE		20	1	19	0.0	***	***	20	3	20		SPARE					20
21			5.2		MD-1,2	5.2	20	1	21	***	5.2	***	22	3	20							22
23			7.8		MD-14,15,16	7.8	20	1	23	***	***	7.8	24	3	20							24
25			2.6		MD-8 (*)	2.6	20	1	25	2.6	***	***	26	3	20		SPARE					26
27			2.6		MD-9	2.6	20	1	27	***	2.6	***	28	3	20							28
29			2.6		MD-10	2.6	20	1	29	***	***	2.6	30	1	20		SPARE					30
31			2.4		UH-1,2,3	2.4	20	1	31	2.4	***	***	32	1	20		SPARE					32
33			1.6		UH-4,5	1.6	20	1	33	***	1.6	***	34	1	20		SPARE					34
35			2.4		UH-6,7,8	2.4	20	1	35	***	***	15.4	36	1	20	13	MD-3,4,5,6,7			13.0		36
37					SPARE		20	1	37	0.0	***	***	38	1	20		SPARE					38
39			3.2		UH-12,13,14,26	3.2	20	1	39	***	3.2	***	40	1	20		SPARE					40
41			2.4		UH-15,16,17	2.4	20	1	41	***	***	4.8	42	1	20	2.4	UH-9,10,11			2.4		42
	0	0	91	62	:LOADS BY TYPE												LOADS BY TYPE:	0	0	88	0	

TOTAL AMPS / PHASE: 80.8 79.0 78.1 — TOTAL LOADS BY TYPE: 0 0 179 62
KVA / PHASE: 9.7 9.5 9.4 — TOTAL CONNECTED KVA: 28.6

GENERAL PANEL CONSTRUCTION NOTES:
1. ALL WORK BY THIS CONTRACTOR TO COMPLY WITH ALL LOCAL, STATE AND NATIONAL ELECTRICAL CODES.
2. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH OTHER TRADES TO AVOID CONFLICTS AND TO VERIFY ALL EQUIPMENT CONNECTION REQUIREMENTS.
3. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEM PER CONTRACT DOCUMENTS AND ENSURING THAT THE SYSTEM IS OPERATIONAL UPON JOB COMPLETION.
4. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEM FOR ALL OWNER-FURNISHED APPLIANCES IN ACCORDANCE WITH NEC ARTICLE 422 AND 440.22.
5. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL BRANCH CIRCUIT WIRING IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AND THESE PROJECT DOCUMENTS
6. PROVIDE ALL POWER WIRING INCLUDING ALL CIRCUITRY CARRYING ELECTRICAL ENERGY FROM PANELBOARD OR OTHER SOURCE THROUGH STARTERS AND DISCONNECTS TO MOTORS, PACKAGED EQUIPMENT, OR PACKAGED CONTROL PANELS. PROVIDE ALL WIRING BETWEEN CONTROL PANELS AND MOTORS. I
7. MOTORS CONNECTED TO EMERGENCY SYSTEMS CIRCUITRY SHALL HAVE CIRCUITRY INSTALLED IN SEPARATE RACEWAY PER NEC ARTICLE 700.
8. PROVIDE SEPARATE GREEN GROUND FOR EACH MOTOR AND EQUIPMENT CONNECTION ROUTED BACK TO INTEGRAL GROUND BUS OF ASSOCIATED PANELBOARD OR MOTOR CONTROL CENTER. GROUND CONDUCTOR SIZES PER NEC ARTICLE 250.122.
9. ALL HEATING, AIR CONDITIONING AND REFRIGERATION EQUIPMENT INSTALLED ON THE EXTERIOR OF THE BUILDING OR ROOF TOP SHALL HAVE A 15 AMP, 125V WEATHER-RESISTANT GFCI RECEPTACLE SURFACE MOUNTED IN WEATHERPROOF ENCLOSURE, MOUNTED ADJACENT TO EQUIPMENT.
10. THIS CONTRACTOR SHALL VERIFY ELECTRICAL REQUIREMENTS INCLUDING VOLTAGE, HORSEPOWER, STARTER TYPE, AND DISCONNECTING MEANS FOR MOTORS AND EQUIPMENT PRIOR TO ORDERING CIRCUIT BREAKERS, DISCONNECT SWITCHES, AND STARTERS
11. REFER TO ONE-LINE AND P&ID'S FOR ADDITIONAL INFORMATION AND DETIAL.
12. REFER TO FEEDER SCHEUDLE FOR ADDITIONAL INFORMATION AND DETIAL.

PANEL NOTES:
* FURHISH 24 DC TRANSFORMER TO CONNECT

PROJECT NO.: 00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE: MARCH 2016	DRAWN BY: INIT	1	3/25	ADDENDUM #1	.
F.B. : .	CHECKED BY: SRC	.	.	.	.
.	.	.	.	.	.

PLOT DATE: 3/25/16, P:\610s\616\00616097\CADD\Construction Documents\ADDENDUM #1\616097 E-22R.dwg

I HEREBY CERTIFY THAT THIS PLAN, REPORT, OR SPECIFICATION WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SCOTT R. CHILSON — MARCH 25, 2016 (Date) — 44287 (License No.)

MSA PROFESSIONAL SERVICES
TRANSPORTATION • MUNICIPAL
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332 W. Superior Street Duluth, MN 55802
218-722-3915 1-800-777-7380 Fax: 218-722-4548
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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
LAKEWOOD, MN

ELECTRICAL SCHEDULES NO.1

FILE NO. 00616097
SHEET E-22R

SINGLE PHASE PANEL SCHEDULE

PANEL ID/TAG: LP-L1 LAB (EXISITNG)

TYPE: LIGHTING AND APPLIANCE PANEL (EXISTING TO REMAIN/MODIFY AS REQURIED)
VOLTAGE: 240 WYE /120V
PHASE/WIRE: 1P-3W
MOUNT: SURFACE

BUS CONSTRUCTION: CU
GROUND BUS: YES
ISOLATED GROUND BUS: YES

BUS AMPACITY: 225A
MAIN CIRCUIT BREAKER: NONE
SUB-FEED LUGS: NA
INTERRUPTING CAPACITY: 10 KAIC

LOADS SERVED LGT	REC.	MECH.	OTHER	DESCRIPTION	LOAD AMP	BKR SIZE	BKR POLE		A AMP	B AMP		BKR POLE	BKR SIZE	LOAD AMP	DESCRIPTION	LOADS SERVED LGT	REC.	MECH.	OTHER	
				SPARE		20	2	1	0.0	***	2	2	20		206 REC					2
						I	2	3	***	0.0	4	2	I							4
				REC AND FUME HOOD 106		20	1	5	0.0	***	6	1	20		206 REC					6
				REC NE ROOM		20	1	7	***	0.0	8	1	20		206 REC					8
				206 REC		20	1	9	0.0	***	10	2	20		206 REC					10
				SPARE		20	2	11	***	0.0	12	2	I							12
						I	2	13	0.0	***	14	1	20		206 REC					14
				208 REC		30	2	15	***	0.0	16	1	20		206 REC					16
						I	2	17	0.0	***	18	2	20		208 AND 209 REC					18
				220V REC ON WEST WALL		30	2	19	***	0.0	20	2	I							20
						I	2	21	0.0	***	22	2	20		209 REC					22
				AUTOCLAVE 208		20		23	***	0.0	24	2	I							24
				208 AND 209 REC		20		25	0.0	***	26	2	20		NAPCO INCUBATOR					26
				209 AND 213 REC		20		27	***	0.0	28	2	I							28
				209 REC		20		29	0.0	***	30	1	20		REFERIGERATOR 209					30
				213 REC		20		31	***	0.0	32	1	20		REFERIGERATOR 209					32
				213 REC		20		33	0.0	***	34				SPARE					34
				220V REC ON WEST WALL		20	2	35	***	0.0	36				SPACE					36
						I	2	37	0.0	***	38				SPACE					38
				SPACE				39	***	0.0	40				SPACE					40
				SPACE				41	0.0	***	42				SPACE					42
0	0	0	0	:LOADS BY TYPE												LOADS BY TYPE:	0	0	0	0
									TOTAL AMPS / PHASE:							TOTAL LOADS BY TYPE:	0	0	0	0
									KVA / PHASE:											
									0.0	0.0						TOTAL CONNECTED KVA: 0.0				

GENERAL PANEL CONSTRUCTION NOTES:

1. ALL WORK BY THIS CONTRACTOR TO COMPLY WITH ALL LOCAL, STATE AND NATIONAL ELECTRICAL CODES.
2. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH OTHER TRADES TO AVOID CONFLICTS AND TO VERIFY ALL EQUIPMENT CONNECTION REQUIREMENTS.
3. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEM PER CONTRACT DOCUMENTS AND ENSURING THAT THE SYSTEM IS OPERATIONAL UPON JOB COMPLETION.
4. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEM FOR ALL OWNER-FURNISHED APPLIANCES IN ACCORDANCE WITH NEC ARTICLE 422 AND 440.22.
5. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL BRANCH CIRCUIT WIRING IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AND THESE PROJECT DOCUMENTS
6. PROVIDE ALL POWER WIRING INCLUDING ALL CIRCUITRY CARRYING ELECTRICAL ENERGY FROM PANELBOARD OR OTHER SOURCE THROUGH STARTERS AND DISCONNECTS TO MOTORS, PACKAGED EQUIPMENT, OR PACKAGED CONTROL PANELS. PROVIDE ALL WIRING BETWEEN CONTROL PANELS AND MOTORS. I
7. MOTORS CONNECTED TO EMERGENCY SYSTEMS CIRCUITRY SHALL HAVE CIRCUITRY INSTALLED IN SEPARATE RACEWAY PER NEC ARTICLE 700.
8. PROVIDE SEPARATE GREEN GROUND FOR EACH MOTOR AND EQUIPMENT CONNECTION ROUTED BACK TO INTEGRAL GROUND BUS OF ASSOCIATED PANELBOARD OR MOTOR CONTROL CENTER. GROUND CONDUCTOR SIZES PER NEC ARTICLE 250.122.
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11. REFER TO ONE-LINE AND P&ID'S FOR ADDITIONAL INFORMATION AND DETIAL.
12. REFER TO FEEDER SCHEUDLE FOR ADDITIONAL INFORMATION AND DETIAL.

PANEL NOTES:

* NA

THREE PHASE PANEL SCHEDULE

PANEL ID/TAG: DC (EXISTING TO BE DEMOLISHED)

TYPE: PANELBOARD (EXISTING TO REMOVE)
VOLTAGE: 480 WYE /277V
PHASE/WIRE: 3P-4W
MOUNT: SURFACE

BUS CONSTRUCTION: CU
GROUND BUS: YES
ISOLATED GROUND BUS: YES

BUS AMPACITY: NA
MAIN CIRCUIT BREAKER: 200A
SUB-FEED LUGS: NA
INTERRUPTING CAPACITY: NA

LOADS SERVED LGT	REC.	MECH.	OTHER	DESCRIPTION	LOAD AMP	BKR SIZE	BKR POLE		A AMP	B AMP	C AMP		BKR POLE	BKR SIZE	LOAD AMP	DESCRIPTION	LOADS SERVED LGT	REC.	MECH.	OTHER	
								1	0.0	***	***	2									2
				SPACE				3	***	0.0	***	4	3	200		MAIN					4
								5	***	***	0.0	6									6
								7	0.0	***	***	8									8
				FILTER #1 EFFLUENT VALVE		30	3	9	***	0.0	***	10	3	30		FILTER #2 EFFLUENT VALVE					10
								11	***	***	0.0	12									12
								13	0.0	***	***	14									14
				FILTER #2 EFFLUENT VALVE		30	3	15	***	0.0	***	16	3	30		FILTER #4 EFFLUENT VALVE					16
								17	***	***	0.0	18									18
								19	0.0	***	***	20									20
				SPARE		30	3	21	***	0.0	***	22	3	30		SPARE					22
								23	***	***	0.0	24									24
								25	0.0	***	***	26									26
				SPARE		30	3	27	***	0.0	***	28	3	30		SPARE					28
								29	***	***	0.0	30									30
								31	0.0	***	***	32									32
				SPARE		30	3	33	***	0.0	***	34	3	30		SPARE					34
								35	***	***	0.0	36									36
								37	0.0	***	***	38									38
				SPARE		30	3	39	***	0.0	***	40	3	30		SPARE					40
								41	***	***	0.0	42									42
0	0	0	0	:LOADS BY TYPE													LOADS BY TYPE:	0	0	0	0
									TOTAL AMPS / PHASE:								TOTAL LOADS BY TYPE:	0	0	0	0
									KVA / PHASE:												
									0.0	0.0	0.0						TOTAL CONNECTED KVA: 0.0				

GENERAL PANEL CONSTRUCTION NOTES:

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6. PROVIDE ALL POWER WIRING INCLUDING ALL CIRCUITRY CARRYING ELECTRICAL ENERGY FROM PANELBOARD OR OTHER SOURCE THROUGH STARTERS AND DISCONNECTS TO MOTORS, PACKAGED EQUIPMENT, OR PACKAGED CONTROL PANELS. PROVIDE ALL WIRING BETWEEN CONTROL PANELS AND MOTORS. INCLUDE STARTERS, DISCONNECTS, AND OVERLOAD PROTECTION IF NOT INCLUDED IN SPECIFICATIONS. COORDINATE WITH EQUIPMENT SUPPLIER.
7. MOTORS CONNECTED TO EMERGENCY SYSTEMS CIRCUITRY SHALL HAVE CIRCUITRY INSTALLED IN SEPARATE RACEWAY PER NEC ARTICLE 700.
8. PROVIDE SEPARATE GREEN GROUND FOR EACH MOTOR AND EQUIPMENT CONNECTION ROUTED BACK TO INTEGRAL GROUND BUS OF ASSOCIATED PANELBOARD OR MOTOR CONTROL CENTER. GROUND CONDUCTOR SIZES PER NEC ARTICLE 250.122.
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PANEL NOTES:

* NA

THREE PHASE PANEL SCHEDULE

PANEL ID/TAG: PP-1 (PROPOSED)

TYPE: PANELBOARD (PROPOSED)
VOLTAGE: 480 VAC
PHASE/WIRE: 3P-3W
MOUNT: SURFACE

BUS CONSTRUCTION: CU
GROUND BUS: YES
ISOLATED GROUND BUS: YES

BUS AMPACITY: 400A
MAIN CIRCUIT BREAKER: 300A
SUB-FEED LUGS: NONE
INTERRUPTING CAPACITY: 22 KIAC

LOADS SERVED LGT	REC.	MECH.	OTHER	DESCRIPTION	LOAD AMP	BKR SIZE	BKR POLE		A AMP	B AMP	C AMP		BKR POLE	BKR SIZE	LOAD AMP	DESCRIPTION	LOADS SERVED LGT	REC.	MECH.	OTHER	
			36.0		36			1	36.0	***	***	2									2
			36.0	XFMR-LP-L4B	36	50	3	3	***	36.0	***	4	3	300		MAIN					4
			36.0	(LOCK-OUT TAB)	36			5	***	***	36.0	6									6
			52.0	XFMR-LP-L1	52	70	2	7	82.0	***	***	8			30				30.0		8
			52.0	(LOCK-OUT TAB)	52			9	***	82.0	***	10	3	40	30	D-1			30.0		10
			78.0	XFMR-LP-L3	78	100	2	11	***	***	108.0	12			30	(LOCK-OUT TAB)			30.0		12
			78.0	(LOCK-OUT TAB)	78			13	100.0	***	***	14			22				22.0		14
				SPARE		50	2	15	***	22.0	***	16	3	30	22	D-2			22.0		16
								17	***	***	22.0	18			22	(LOCK-OUT TAB)			22.0		18
				SPARE		30	2	19	0.0	***	***	20									20
								21	***	0.0	***	22	3	30		SPARE					22
				SPARE		20	2	23	***	***	0.0	24									24
								25	0.0	***	***	26									26
				SPARE		30	3	27	***	0.0	***	28	3	30		SPARE					28
								29	***	***	0.0	30									30
								31	0.0	***	***	32									32
				SPARE		30	3	33	***	0.0	***	34	3	30		SPARE					34
								35	***	***	0.0	36									36
								37	0.0	***	***	38									38
				SPARE		30	3	39	***	0.0	***	40	3	30		SPARE					40
								41	***	***	0.0	42									42
0	0	0	368	:LOADS BY TYPE													LOADS BY TYPE:	0	0	156	0
									TOTAL AMPS / PHASE:								TOTAL LOADS BY TYPE:	0	0	156	368
									KVA / PHASE:												
									218.0	140.0	166.0						TOTAL CONNECTED KVA: 145.4				

GENERAL PANEL CONSTRUCTION NOTES:

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12. REFER TO FEEDER SCHEUDLE FOR ADDITIONAL INFORMATION AND DETIAL.

PANEL NOTES:

* NA

FINISH/PAINT SCHEDULE

COORDINATE SCHEDULE WITH SPECIFICATION AND OTHER DISCIPLINES

ASSUME PAINT IS NOT REQUIRED IS ROOMS NOT IDENTIFIED IN THE SCHEDULE OR SPECIFICALLY REQURIED IN SPECIFICATION OR DRAWINGS

LOCATION	ROOM	NEW EQUIPMENT	WALLS	NEW MECHANICAL	NEW PIPING	NEW ELECTRICAL
EXTERIOR	D-1	FACTORY	NO	FACTORY	YES	YES
	FANS	FACTORY	NO	NO	NO	NO
	MDS	FACTORY	NO	NO	NO	NO
INTERIOR						
	100	FACTORY	NO	YES	YES	YES
	100 STAIR WELL	FACTORY	YES	YES	YES	YES
	107	FACTORY	YES	YES	YES	YES
	108	FACTORY	EAST WALL ONLY	YES	YES	YES
	109	FACTORY	YES	YES	YES	YES
	110	NO	SW CORNER ONLY	NO	NO	NO
	217	FACTORY	YES	YES	YES	YES
	203	FACTORY	NW WALL ONLY	NO	NO	YES

PROJECT NO.: 00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE: MARCH 2016	DRAWN BY: INIT	1	3/25	ADDENDUM #1	.
F.B.: .	CHECKED BY: SRC	.	.	.	.
.	.	.	.	.	.

PLOT DATE: 3/25/16, P:\610s\616\00616097\CADD\Construction Documents\ADDENDUM #1\616097 E-23R.dwg

I HEREBY CERTIFY THAT THIS PLAN, REPORT, OR SPECIFICATION WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SCOTT R. CHILSON

MARCH 25, 2016 (Date)

44287 (License No.)

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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
LAKEWOOD, MN

ELECTRICAL SHECUDLES NO. 2

FILE NO. 00616097

SHEET E-23R

LUMINAIRE SCHEDULE

ABBREVIATIONS

DW	=	DRY WALL	P	=	PENDANT	S	=	SURFACE
ES	=	EXPOSED STRUCTURE	PL	=	PLASTER	W	=	WALL MOUNTED
LG	=	LAY-IN GRID	R	=	RECESSED	V	=	VARIES

DES.	LAMP DATA		DESCRIPTION	LUMINAIRE		VOLT	BALLAST/ DRIVER CODE	MOUNT	CATELOG SERIAL #	CEILING TYPE	LUMINARIE DEPTH	OPTIONS/ ACCESSORIES CODE #	ACCEPTABLE MANUFACTURERS	SEE NOTE #
	NO.	TYPE		MANUFACTURE	CATELOG SERIES									
V1	1	LED	ROUGH SERVICE FIXTURE	PHILLIPS	LED	MVOLT	GZ10	V	FLUXSTREAM EX 4' 3/800Lm 4000K (LF-4-EZ-38-40-U-LAG-FH360-UNV)	V	~3"	FH360-UNV	OR EQUAL	10-17-A
V2	2	LED	ROUGH SERVICE FIXTURE	LITHONIA	VAP LED	MVOLT	GZ10	V	VAP-4000L-FST-WD-MVOLT-GZ10-40K-80CRI-SF-BSL722-CS89-QMB-MSI10NWL-VAPQMB	V	~4"	VAPQMB	OR EQUAL	10-17-A
EXIT	3	LED	EXIT WITH DUAL EM LAMPS	LITHONIA	LHQM LED	MVOLT	NA	V	LHQM-LED-WHITE-R-HO-SD	V	~9"		OR EQUAL	16-A
EM1	2	LED	EMERGENCY LIGHITNG UNIT	LITHONIA	EU2-LED-M12	MVOLT	NA	V	EU2-LED-M12-784231874493-120/277-1.8	V	~4"			

OPTIONS/ACCESSORIES CODE LISTING:

1	SEMI-SPECULAR REFELECTOR	11	WET LOCATION CONSTRUCTION	21	FURNISH WITH PHOTO CELL
2	LOW IRIDESCENT REFLECTOR	12	STAINLESS STEEL TRIM & DOOR FRAME	22	FURNISH TRIM SUITABLE FOR USE WITH NARROW TEE CEILING GRID
3	FLAT ALUMINUM DOOR FRAME	13	WHITE MILLIGOVE BAFFLE	23	CUSTOM PAINTED FINISH - COLOR AS SELECTED BY ARCHITECT
4	REGRESSED ALUMINUM DOOR FRAME	14	BLACK MILLIGROVE BAFFLE		
5	FLAT STEEL DOOR FRAME	15	FURNISH WITH SLOPE ADAPTER - VERIFY SLOPE		
6	SINGLE GASKET DOOR FRAME	16	FURNISH WITH AUXILIARY EMERGENCY BATTERY PACK		
7	DOUBLE GASKET DOOR FRAME	17	FURNISH WITH WIRE GUARD		
8	TRIPLE-GASKET DOOR FRAME, LENS, & BODY	18	FURNISH CHAIN MOUNTING ACCESSORIES		
9	ANTI-MICROBIAL PROTECTION PAINTED FINISH	19	FURNISH WITH RIGID PENDANT STEMS		
10	DAMP LOCATION CONSTRUCTION	20	FURNISH WITH SWIVEL CANOPY		

BALLAST CODE LISTING: (SEE SPECIFICATION SECTIONS FOR ADDITIONAL INFORMATION)

A	LED DRIVER, FIXED (NON-DIMMED). LED DRIVER MAY BE DIMMABLE, BUT DIMMING IS NOT REQUIRED FOR THIS FIXTURE.
B	LED DRIVER, STEP-DIM.
C	LED DRIVER, DIMMABLE TO 5%.
D	LED DRIVER, DIMMABLE TO 1%.
E	T8 PROGRAMMED START, NORMAL BALLAST FACTOR 0.87, <10% THD, SYLVANIA QUICKTRONIC HIGH EFFICIENCY SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL.
F	T8 PROGRAMMED START, LOW BALLAST FACTOR 0.77, <10% THD, SYLVANIA QUICKTRONIC HIGH EFFICIENCY SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL.
G	T8 PROGRAMMED START, LOW BALLAST FACTOR 0.71, <10% THD, SYLVANIA QUICKTRONIC HIGH EFFICIENCY SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL.
H	T8 PROGRAMMED START, HIGH BALLAST FACTOR 1.2, <10% THD, SYLVANIA QUICKTRONIC HIGH EFFICIENCY SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL.
I	T8 PROGRAMMED START, STEP-DIM, BALLAST FACTOR 0 .87/0.37, <10% THD, SYLVANIA QUICKTRONIC PROFESSIONAL SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL.
J	T8 INSTANT START, NORMAL BALLAST FACTOR 0.87, <10% THD, SYLVANIA QUICKTRONIC HIGH EFFICIENCY SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL.
K	T5HO PROGRAMMED START, 1.0 BALLAST FACTOR, <10% THD, SYLVANIA QUICKTRONIC PROFESSIONAL SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL.
L	T5HO PROGRAMMED START, 1.0 BALLAST FACTOR, <10% THD, SYLVANIA QUICKTRONIC PROFESSIONAL SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL.
M	T5 PROGRAMMED START, 1.0 BALLAST FACTOR, <10% THD, SYLVANIA QUICKTRONIC PROFESSIONAL SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL.
N	H.I.D. LOW FREQUENCY ELECTRONIC UNIVERSAL VOLTAGE, ADVANCE e-VISION, OR EQUAL BY SYLVANIA OR UNIVERSAL.
O	CERAMIC METAL HALIDE (T-6) BALLASTS SHALL BE ADVANCE E-VISION SERIES OR APPROVED EQUAL.
P	PULSE START BALLAST AS MANUFACTURED BY SYLVANIA, UNIVERSAL, OR ADVANCE.
Q	PULSE START BALLAST AS MANUFACTURED BY SYLVANIA, UNIVERSAL, OR ADVANCE.

GENERAL LUMINAIRE SCHEDULE NOTES:

- O SEE SPECIFICATION SECTION FOR ADDITONAL INFORMATION REGARDING LUMINAIRE AND INSTALLATION REQUIREMENTS. PROVIDE OPTIONS AND ACCESSORIES REFERENCED BY THE COLUM TITLED"OPTIONS/ACCESSORIES". MANUFACTURES LISTED AS ACCEPTABLE SHALL MEET ALL REQUIREMENTS AND FEATURES INDICATED. ACCEPTABLE MANUFACTUREERS MUST MEET THE PHOTOMETRIC PERFORMANCE OF THE LISTED UNIT.

- O MANUFACTURE NAMES AND CATELOG NUMBERS ARE USED FOR QUALITY AND PERFOMANCE ONLY. LUMINARES AND OTHER ELECTRICAL DEVICES MANUFACTUREED BY OTHERS SHALL BE EQUALLY ACCEPTABLE PROVIDED THEY MEET OR EXCEED IN PERFORMANCE AND QUALITY AS SPECIFIED.

- O ALL FLUORESCENT LAMP/BALLAST LAMP/BALLASTS WIRED TO THE DIMMING SYSTEM SHALL BE BURNED-IN FOR A MINIMUM OF 100 HOURS PRIOR TO DIMMING SYSTEM SET-UP/PROGRAMMING

- O EACH FLUORESCENT LUMINAIRE SHALL BE SUPPLIED WITH QUICK DISCONNECTING MEANS FOR ALL BALLASTS AS REQURED BY NEX 410.73. PROVIDE THOMAS AND BETTS LD2 OR LD3 OR EQUAL.

- O ALL SELECTION ARE BEST ATTEMPT TO IDENTIFY THE CORRECT ITEM. THE SUPPLIER SHALL COORDINATE AND CONFIRM ALL SELECTION AND APPLCIAITONS BASED ON THE INTENT OF THE CONTRACT.

LUMINAIRE SCHEDULE NOTES:

1

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY: INIT	1	3/25	ADDENDUM #1	.
F.B. :	.	CHECKED BY: SRC	.	.	.	.
.	.	.	.	.	.	.

PLOT DATE: 3/25/16. P:\610s\616\00616097\CADD\Construction Documents\ADDENDUM #1\616097 E-24R.dwg

I HEREBY CERTIFY THAT THIS PLAN, REPORT, OR SPECIFICATION WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SCOTT R. CHILSON — MARCH 25, 2016 (Date) — 44287 (License No.)

MSA PROFESSIONAL SERVICES
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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
LAKEWOOD, MN

ELECTRICAL SCHEDULES NO.3

FILE NO. 00616097
SHEET E-24R

MOTOR AND WIRING COMPARISON SCHEDULE

TAG NUMBER	EQUIPEMENT/DEVICE/MOTOR DESCRIPTION	PROPOSED LOAD (HP)	PROPOSED LOAD (AMPS)	PROPOSED POWER (VOLTS)	PROPOSED POWER (PHASE)	EXISTING LOAD (HP)	EXISTING LOAD (AMPS)	EXISTING POWER (VOLTS)	EXISTING POWER (PHASE)	NOTES
SMP-1	SAMPLER PUMP NO.1	~1	16	120	1	~1	L4	120	1	1,2
SMP-2	SAMPLER PUMP NO.2	~1	16	120	1	~1	L4	120	1	1,2
EF-1	EXHAUST FAN NO.1	1.5	3	480	3	0.5	MCC-A	480	3	1,2
EF-2	EXHAUST FAN NO.2	3	4.8	480	3	5	MCC-A	480	3	1,2
EF-3	EXHAUST FAN NO.3	0.75	1.6	480	3	0.5	MCC-A	480	3	1,2
EF-4	EXHAUST FAN NO.4	0.75	1.6	480	3	0.75	MCC-A	480	3	1,2
EF-5	EXHAUST FAN NO.5	0.5	9.8	120	1	0.5	MCC-A	480	3	1,2
EF-6	EXHAUST FAN NO.6	0.5	9.8	120	1	TBD	L4	120	1	1,2
EF-7	EXHAUST FAN NO.7	0.02	4.4	120	1	TBD	L4	120	1	1,2
EF-8	EXHAUST FAN NO.8	0.25	5.8	120	1	TBD	L4	120	1	1,2
EF-9	EXHAUST FAN NO.9	0.02	4.4	120	1	TBD	L4	120	1	1,2
AHU-1	AIR HANDLING UNIT NO.1	7.5	11	480	3	5	MCC-A	480	3	1,2
AHU-2	AIR HANDLING UNIT NO.2	3	4.8	480	3	5	MCC-A	480	3	1
AHU-3	AIR HANDLING UNIT NO.3	2	3.3	480	3	3	MCC-A	480	3	1,2
D-1	DESICCANT DEHUMIDIFIER NO.1	COMBINED	30	480	3	NA	NA	NA	NA	1,3
	DESICCANT DEHUMIDIFIER NO.1 (SUPPLY FAN)	15	21	480	3	NA	NA	NA	NA	1,3
	DESICCANT DEHUMIDIFIER NO.1 (EXHAUST FAN)	3	4.8	480	3	NA	NA	NA	NA	1,3
	DESICCANT DEHUMIDIFIER NO.1 (REGENERATION FAN)	3	4.8	480	3	NA	NA	NA	NA	1,3
D-2	DESICCANT DEHUMIDIFIER NO.2	COMBINED	20	480	3	NA	NA	NA	NA	1,3
	DESICCANT DEHUMIDIFIER NO.1 (SUPPLY FAN)	10	14	480	3	NA	NA	NA	NA	1,3
	DESICCANT DEHUMIDIFIER NO.1 (EXHAUST FAN)	NA	NA	480	3	NA	NA	NA	NA	1,3
	DESICCANT DEHUMIDIFIER NO.1 (REGENERATION FAN)	3	4.8	480	3	NA	NA	NA	NA	1,3
MD-1	MOTORIZED DAMPER NO.1	0.1	2.6	120	1	TBD	MCC-A	480	TBD	1,2
MD-2	MOTORIZED DAMPER NO.2	0.1	2.6	120	1	TBD	MCC-A	480	TBD	1,2
MD-3	MOTORIZED DAMPER NO.3	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-4	MOTORIZED DAMPER NO.4	0.1	2.6	120	1	TBD	MCC-A	480	TBD	1,2
MD-5	MOTORIZED DAMPER NO.5	0.1	2.6	120	1	TBD	MCC-A	480	TBD	1,2
MD-6	MOTORIZED DAMPER NO.6	0.1	2.6	120	1	TBD	MCC-A	480	TBD	1,2
MD-7	MOTORIZED DAMPER NO.7	0.1	2.6	120	1	TBD	MCC-A	480	TBD	1,2
MD-8	MOTORIZED DAMPER NO.8	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-9	MOTORIZED DAMPER NO.9	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-10	MOTORIZED DAMPER NO.10	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-11	MOTORIZED DAMPER NO.11	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-12	MOTORIZED DAMPER NO.12	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-13	MOTORIZED DAMPER NO.13	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-14	MOTORIZED DAMPER NO.14	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-15	MOTORIZED DAMPER NO.15	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-16	MOTORIZED DAMPER NO.16	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
P-1 = H-1	HEATING SYSTEM PUMP NO.1	3	4.8	208	3	3	MCC-A	480	3	1,2
P-VFD-1	HEATING SYSTEM PUMP NO.1 VFD CONTROL PANEL	3+	~15	208	3	3	MCC-A	480	3	1,2
P-2	HEATING SYSTEM PUMP NO.2	3	4.8	208	3	3	MCC-A	480	3	1,2
P-VFD-2 = H-2	HEATING SYSTEM PUMP NO.2 VFD CONTROL PANEL	3+	~15	208	3	3	MCC-A	480	3	1,2
UH-1	UNIT HEATER NO.1	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-2	UNIT HEATER NO.2	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-3	UNIT HEATER NO.3	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-4	UNIT HEATER NO.4	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-5	UNIT HEATER NO.5	1/20	2	120	1	TBD	LP-L4A	120	1	1,2
UH-6	UNIT HEATER NO.6	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-7	UNIT HEATER NO.7	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-8	UNIT HEATER NO.8	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-9	UNIT HEATER NO.9	TBD	0.26	120	1	TBD	LP-L4A	120	1	1,2
UH-10	UNIT HEATER NO.10	TBD	0.26	120	1	TBD	TBD	TBD	TBD	1,2
UH-11	UNIT HEATER NO.11	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-12	UNIT HEATER NO.12	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-13	UNIT HEATER NO.13	1/20	0.8	120	1	TBD	MCC-A	480	3	1,2
UH-14	UNIT HEATER NO.14	1/20	0.8	120	1	TBD	MCC-A	480	3	1,2
UH-15	UNIT HEATER NO.15	TBD	0.26	120	1	TBD	LP-L4A	120	1	1,2
UH-16	UNIT HEATER NO.16	TBD	0.26	120	1	TBD	LP-L4A	120	1	1,2
UH-17	UNIT HEATER NO.17	TBD	0.16	120	1	TBD	LP-L4A	120	1	1,2
UH-18	UNIT HEATER NO.18	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-19	UNIT HEATER NO.19	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-20	UNIT HEATER NO.20	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-21	UNIT HEATER NO.21	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-22	UNIT HEATER NO.22	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-23	UNIT HEATER NO.23	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-24	UNIT HEATER NO.24	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-25	UNIT HEATER NO.25	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-26	UNIT HEATER NO.26	TBD	0.26	120	1	TBD	TBD	TBD	TBD	1,2
LW-XFMR-L4B	L4B TRANSFORMER	30 Kva	36	480	3	5 kVA	21	240	1	1,4
LP-L4B	LIGHTING AND APPLIANCE PANEL L4B	NA	NA	208/120	3	TBD	TBD	TBD	TBD	1,3
LP-L4A	LIGHTING AND APPLIANCE PANEL L4A	NA	NA	208/120	1	TBD	TBD	240/120	1	1,3
HVAC-TCP-1	HVAC TEMPERATURE CONTROL PANEL	NA	13.3	120	1	TBD	L4	120		1,3

NOTE(S):

(INFORMATION PROVIDED IS THE BEST INFORMAITON AVAILABE. THE CONTRACTOR SHALL PROVIDE PRECONSTRUCTION INSPECTION TO VERIFY ALL CONNECTION ARE CONSISTANT AND RELATIVELY SIMILAR FOR THE PROPOSED APPLICATION.)

(THE CONTRACTOR SHALL NOTE THAT SOME DEVICES ARE FEED AC, BUT HAVE LOCAL DC XFMRS.)

1. CONTRACTOR SHALL FIELD VERFIY ALL EXSITNG CONNECTION AND WIRING. ANY DESCRANCIES FROM THE INFROMATION PROVIDED SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO CONSTRUCITON.
2. WHEN PROPOSED EQUIPMENT POWER REQUIREMENTS ARE DIFFERENT THAN THE EXSITNG, THEN: DEMOLISH EXSITNG AND FURNISH AND INSTALL NEW RACEWAY AND POWER CIRCUIT FROM NEAREST POWER DISTRIBUITON PANEL.
3. FURNISH AND INSTALL NEW RACEWAY AND POWER CIRCUIT FROM NEAREST POWER DISTRIBUTION PANEL
4. FURNISH NEW CB BUCKET AND FEEDER IN EXSING RACEWAY FROM WTP-MCC-A

CONDUIT & BOX SCHEDULE

Area Classification	Voltage	Type	Installation	Use Conduit		Use Box	Supports	Hardware	Location
Exterior/ Non-Hazardous	ALL	ALL	Exposed	GRS	REFER TO SPEC.	CB	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Exterior/ Non-Hazardous	ALL	ALL	Underground	PVC	REFER TO SPEC.	PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Dry / Non-Hazardous	ALL	ALL	Exposed	EMT	REFER TO SPEC.	GS	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Dry / Non-Hazardous	ALL	ALL	Concealed	EMT	REFER TO SPEC.	GS	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Wet / Non-Hazardous	ALL	ALL	Exposed	PGRS/PVC	REFER TO SPEC.	PGRS CAST/PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Wet / Non-Hazardous	ALL	ALL	Concealed	PGRS/PVC	REFER TO SPEC.	PGRS CAST/PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Dry / Corrosive	ALL	ALL	Exposed	PGRS/PVC	REFER TO SPEC.	PGRS CAST/PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Dry / Corrosive	ALL	ALL	Concealed	PGRS/PVC	REFER TO SPEC.	PGRS CAST/PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Wet / Corrosive	ALL	ALL	Exposed	PGRS/PVC	REFER TO SPEC.	PGRS CAST/PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Wet / Corrosive	ALL	ALL	Concealed	PGRS/PVC	REFER TO SPEC.	PGRS CAST/PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED

CONDUIT & BOX SCHEDULE

NOTES:

1. All conduit and racew ays shall be concealed w hen possible.
2. No substitutions shall be allow ed unless w ritten permission to the contrary has been obtained from engineer.
3. Transition to exposed conduit shall comply w ith specified requirements for exposed conduit, regardless of w hether transition is rigid or flexible. Embedded transitions shall be rigid material.
4. All junction boxes not located in associated area shall be enamel coated galvanized steel or brushed aluminum.
5. CONTRACTOR shall furnish and install w ire gutters as required.
6. CONTRACTOR shall only use flex conduit in equipment connections. Use on fixtures and I&C devices shall not be permitted.
7. CONTRACTOR shall only use flex conduit in equipment connections. Use on fixtures and I&C devices shall not be permitted.
8. AFD motor feeders shall be installed in PGRS conduit or Insulated AFD Motor cables installed in PVC.
9. Exposed conduit located in finished areas of the facility shall be painted.
10. CONTRACTOR shall be advised Stainless Steel is not advised for the construciton of this porject on the interior off this facilty. CONTRACTOR shall furinsh and install painted/coated galvanized steel hardw are and related materials to match conduit.
11. Painting of New Electrical Materials. Refer to schedule.

ABBREVIATIONS:

Conduit

PVC:	Schedule 40 Rigid PVC		
GRS:	Galvanized Rigid Steel	GS	Galvanized Steel
PGRS:	PVC-Coated GRS	SS	Stainless Steel
EMT:	Electrical Metallic Tubing	PVC40	SCH 40 PVC
HDPE:	High Density Polyethylene	PVC80	SCH 80 PVC
		ZPS	Zinc Plated Steel
Boxes		PCS	PVC Coated Steel
SB:	Steel Box	S	Steel
CB:	Cast Box	AL	Aluminum
PCB:	PVC-Coated Cast Box		

Supports & Hardw are

PROJECT NO.:	00616097	SCALE: AS SHOWN		NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	1	3/25	ADDENDUM #1	.
F.B. :	.	CHECKED BY:	SRC	.	.	.	.
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PLOT DATE: 3/25/16. P:\610s\616\00616097\CADD\Construction Documents\ADDENDUM #1\616097 E-25R.dwg

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SCOTT R. CHILSON — Date: MARCH 25, 2016 — License No.: 44287

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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
LAKEWOOD, MN

ELECTRICAL SHCEUDLES NO.4

FILE NO. 00616097
SHEET E-25R

FIELD DEVICE AND WIRING SCHEDULE

TAG NUMBER	EQUIPEMENT/DEVICE/MOTOR DESCRIPTION	STATUS EXISTING / PROPOSED / REPLACMENT / RELOCATE	EQUIPMENT/DEVICE DISGNATOR (DEVICE / MOTOR / PANEL / DISCONNECT / OTHER)	LOCATION	LOAD (KVA)	LOAD (HP)	LOAD (AMPS)	POWER (VOLTS)	POWER (PHASE)	BREAKER (SIZE)	BREAKER (POLE)	WIRING (AMP-#G)	MOTOR CONTROLLER TYPE	MOTOR CONTROLLER SIZE	MOTOR CONTROLLER BY	LOCAL EQUIPMENT DISCONNECT (TYPE)	LOCAL EQUIPMENT DISCONNECT (SIZE)	LOCAL EQUIPMENT DISCONNECT (FUSED)	LOCAL EQUIPMENT DISCONNECT (BY)	FIRST SIGNAL/CONTROL CONDUIT DESTINATION	FIRST SIGNAL/CONTROL CONDUIT TYPE	FIRST SIGNAL/CONTROL CONDUIT WIRING	SECOND SIGNAL/CONTROL CONDUIT DESTINATION	SECOND SIGNAL/CONTROL CONDUIT TYPE	SECOND SIGNAL/CONTROL CONDUIT WIRING	POWER CONDUIT DESTINATION	POWER CONDUIT TYPE	POWER CONDUIT WIRING	NOTES
SMP-1		RELOCATE	MOTOR	106	NA	~1	16	120	1	EXISTING	NA	10-4G	EXISTING	EXISTING	MC	NFMP	30	NA	EC	EXISITNG	EXISITNG	EXISITNG	EXISITNG	EXISITNG	EXISITNG	LP-L4B	PWR	35-4G	1,5,7
SMP-2	SAMPLER PUMP NO.2	RELOCATE	MOTOR	106	NA	~1	16	120	1	EXISTING	NA	10-4G	EXISTING	EXISTING	MC	NFMP	30	NA	EC	EXISITNG	EXISITNG	EXISITNG	EXISITNG	EXISITNG	EXISITNG	LP-L4B	PWR	35-4G	1,5,7
EF-1	EXHAUST FAN NO.1	REPLACEMENT	MOTOR	Roof	NA	1.5	3	480	3	EXISTING	3	20-3G	FVNR	EXISTING	MC	NFMP	30	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	WTP-MCC-A	PWR	15-3G	1,3,4,7,8
EF-2	EXHAUST FAN NO.2	REPLACEMENT	MOTOR	Roof	NA	3	4.8	480	3	EXISTING	3	20-3G	FVNR	EXISTING	MC	NFMP	30	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	WTP-MCC-A	PWR	15-3G	1,3,4,7,8
EF-3	EXHAUST FAN NO.3	REPLACEMENT	MOTOR	Roof	NA	0.75	1.6	480	3	EXISTING	3	20-3G	FVNR	EXISTING	MC	NFMP	30	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	WTP-MCC-A	PWR	15-3G	1,3,4,7,8
EF-4	EXHAUST FAN NO.4	REPLACEMENT	MOTOR	Roof	NA	0.75	1.6	480	3	EXISTING	3	20-3G	FVNR	EXISTING	MC	NFMP	30	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	WTP-MCC-A	PWR	15-3G	1,3,4,7,8
EF-5	EXHAUST FAN NO.5	REPLACEMENT	MOTOR	Roof	NA	0.5	9.8	120	1	EXISTING	1	20-2G	FVNR	NEMA 1	MC	NFMP	30	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4B	PWR	20-3G	1,3,4,7,8
EF-6	EXHAUST FAN NO.6	REPLACEMENT	MOTOR	Roof	NA	0.5	9.8	120	1	EXISTING	1	20-2G	FVNR	NEMA 1	MC	NFMP	30	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4B	PWR	15-2G	1,3,4,7,8
EF-7	EXHAUST FAN NO.7	REPLACEMENT	MOTOR	Roof	NA	0.02	4.4	120	1	EXISTING	1	20-2G	FVNR	NEMA 1	MC	NFMP	30	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4B	PWR	15-2G	1,3,4,7,8
EF-8	EXHAUST FAN NO.8	REPLACEMENT	MOTOR	Roof	NA	0.25	5.8	120	1	EXISTING	1	20-2G	FVNR	NEMA 1	MC	NFMP	30	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4B	PWR	15-2G	1,3,4,7,8
EF-9	EXHAUST FAN NO.9	REPLACEMENT	MOTOR	Roof	NA	0.02	4.4	120	1	EXISTING	1	20-2G	FVNR	NEMA 1	MC	NFMP	30	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4B	PWR	15-2G	1,3,4,7,8
ENV-1	ENERGY RECOVERY UNIT	PROPOSED	MOTOR	107	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,6
AHU-1	AIR HANDLING UNIT NO.1	REPLACEMENT	MOTOR	107	NA	7.5	11	480	3	MCP	3	VFD CABLE	VFD	TBD	MC	NFMP	30	NA	EC	AHU-VFD-1	DICRETE SIGNAL	D4	TBD BY MC	TBD BY MC	TBD BY MC	AHU-VFD-1	480 VAC	VFD CABLE	1,3,9
AHU-VFD-1	AIR HANDLING UNIT NO.1 VFD MOTOR CONTROLLER	REPLACEMENT	MOTOR	107	NA	7.5	11	480	3	30	3	30-4G	VFD	TBD	MC	MCB	20	20	EC	HVAC-TCP-1	DISCRETE SIGNAL	D6	HVAC-TCP-1	ANALOG SIGNAL	A1	WTP-MCC-A	480VAC	30-4G	1,2,5,8,9
AHU-2	AIR HANDLING UNIT NO.2	DEMOLISH	MOTOR	107	NA	3	4.8	480	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1
AHU-3	AIR HANDLING UNIT NO.3	REPLACEMENT	MOTOR	217	NA	2	3.3	480	3	MCP	3	20-3G	FVNR	TBD	MC	NFMP	30	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	AHU-MC-3	480 VAC	20-3G	1,3,9
AHU-MC-3	AIR HANDLING UNIT NO.3 MOTOR CONTROLLER	REPLACEMENT	MOTOR	107	NA	3	4.8	480	3	30	3	30-4G	FVNR	TBD	MC	MCB	20	20	EC	HVAC-TCP-1	DISCRETE SIGNAL	D6	TBD BY MC	TBD BY MC	TBD BY MC	WTP-MCC-A	480VAC	20-4G	1,2,5,8,9
AD	AIR DRYER	DEMOLISH	MOTOR	107	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,6
D-1	DESICCANT DEHUMIDIFIER NO.1	PROPOSED	PANEL	OUTSIDE	~30	COMBINED	30	480	3	40	3	40-4G	PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	PP-1	480/277VAC	40-4G	1,2,5,8,9
	DESICCANT DEHUMIDIFIER NO.1 (SUPPLY FAN)	PROPOSED	MOTOR	OUTSIDE	NA	15	21	480	3				PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC				1,2,5,8,9
	DESICCANT DEHUMIDIFIER NO.1 (EXHAUST FAN)	PROPOSED	MOTOR	OUTSIDE	NA	3	4.8	480	3				PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC				1,2,5,8,9
	DESICCANT DEHUMIDIFIER NO.1 (REGENERATION FAN)	PROPOSED	MOTOR	OUTSIDE	NA	3	4.8	480	3				PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC				1,2,5,8,9
D-2	DESICCANT DEHUMIDIFIER NO.2	PROPOSED	PANEL	107	~21	COMBINED	20	480	3	30	3	30-4G	PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	PP-1	480/277VAC	30-4G	1,2,5,8,9
	DESICCANT DEHUMIDIFIER NO.1 (SUPPLY FAN)	PROPOSED	MOTOR	107	NA	10	14	480	3				PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC				1,2,5,8,9
	DESICCANT DEHUMIDIFIER NO.1 (EXHAUST FAN)	PROPOSED	MOTOR	107	NA	NA	NA	480	3				PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC				1,2,5,8,9
	DESICCANT DEHUMIDIFIER NO.1 (REGENERATION FAN)	PROPOSED	MOTOR	107	NA	3	4.8	480	3				PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	PER MFR	MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC				1,2,5,8,9
AFMS-1	AIR FLOW MEASURING STATION	PROPOSED	DEVICE	107	1	NA	6.7	120	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,6
VAV-1	VAV CONTROL UNIT NO.1	PROPOSED	DEVICE	107	0.25	NA	2.6	120	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	1,6
VAV-3	VAV CONTROL UNIT NO.1	PROPOSED	DEVICE	107	0.25	NA	2.6	120	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	1,6
VAV-4	VAV CONTROL UNIT NO.1	PROPOSED	DEVICE	107	0.25	NA	2.6	120	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	1,6
VAV-5	VAV CONTROL UNIT NO.1	PROPOSED	DEVICE	107	0.25	NA	2.6	120	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	1,6
VAV-6	VAV CONTROL UNIT NO.1	PROPOSED	DEVICE	217	0.25	NA	2.6	120	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	1,6
MD-1	MOTORIZED DAMPER NO.1	PROPOSED	MOTOR	217	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-2	MOTORIZED DAMPER NO.2	PROPOSED	MOTOR	107	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-3	MOTORIZED DAMPER NO.3	PROPOSED	MOTOR	218	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-4	MOTORIZED DAMPER NO.4	PROPOSED	MOTOR	116	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-5	MOTORIZED DAMPER NO.5	PROPOSED	MOTOR	116	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-6	MOTORIZED DAMPER NO.6	PROPOSED	MOTOR	115	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-7	MOTORIZED DAMPER NO.7	PROPOSED	MOTOR	115	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-8	MOTORIZED DAMPER NO.8	PROPOSED	MOTOR	202	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-9	MOTORIZED DAMPER NO.9	PROPOSED	MOTOR	107	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-10	MOTORIZED DAMPER NO.10	PROPOSED	MOTOR	217	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-11	MOTORIZED DAMPER NO.11	PROPOSED	MOTOR	ROOF	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-12	MOTORIZED DAMPER NO.12	PROPOSED	MOTOR	ROOF	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-13	MOTORIZED DAMPER NO.13	PROPOSED	MOTOR	ROOF	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-14	MOTORIZED DAMPER NO.14	PROPOSED	MOTOR	ROOF	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-15	MOTORIZED DAMPER NO.15	PROPOSED	MOTOR	ROOF	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
MD-16	MOTORIZED DAMPER NO.16	PROPOSED	MOTOR	ROOF	0.25	0.1	2.6	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
P-1= H-1	HEATING SYSTEM PUMP NO.1	PROPOSED	MOTOR	107	NA	3	4.8	208	3	MCP	3	VFD CABLE	VFD	3HP	MC	NFMP	NA	8	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	P-VFD-1	SHEILDED MTR CABLE	20-3G	1,3,5,7
P-VFD-1	HEATING SYSTEM PUMP NO.1 VFD CONTROL PANEL	PROPOSED	PANEL	107	NA	3+	~15	208	3	30	3	20-4G	VFD	3HP	MC	MCP	30	NA	EC	HVAC-TCP-1	DISCRETE SIGNAL	D6	HVAC-TCP-1	ANALOG SIGNAL	A1	DC	208/120 VAC	30-4G	1,3,5,7
P-2 = H-1	HEATING SYSTEM PUMP NO.2	PROPOSED	MOTOR	107	NA	3	4.8	208	3	MCP	3	VFD CABLE	VFD	3HP	MC	NFMP	NA	8	EC	P-VFD-2	DISCRETE SIGNAL	D2				P-VFD-2	SHEILDED MTR CABLE	20-3G	1,3,5,7
P-VFD-2	HEATING SYSTEM PUMP NO.2 VFD CONTROL PANEL	PROPOSED	PANEL	107	NA	3+	~15	208	3	30	3	20-4G	VFD	3HP	MC	MCP	30	NA	EC	HVAC-TCP-1	DISCRETE SIGNAL	D6	HVAC-TCP-1	ANALOG SIGNAL	A1	DC	208/120 VAC	30-4G	1,3,5,7
UH-1	UNIT HEATER NO.1	PROPOSED	MOTOR	116	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-2	UNIT HEATER NO.2	PROPOSED	MOTOR	116	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-3	UNIT HEATER NO.3	PROPOSED	MOTOR	116	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-4	UNIT HEATER NO.4	PROPOSED	MOTOR	117	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-5	UNIT HEATER NO.5	PROPOSED	MOTOR	117	NA	1/20	2	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-6	UNIT HEATER NO.6	PROPOSED	MOTOR	218	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-7	UNIT HEATER NO.7	PROPOSED	MOTOR	218	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-8	UNIT HEATER NO.8	PROPOSED	MOTOR	218	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-9	UNIT HEATER NO.9	PROPOSED	MOTOR	100	31.25	NA	0.26	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-10	UNIT HEATER NO.10	PROPOSED	MOTOR	100	31.25	NA	0.26	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-11	UNIT HEATER NO.11	PROPOSED	MOTOR	E. ENTRY	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-12	UNIT HEATER NO.12	PROPOSED	MOTOR	112	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-13	UNIT HEATER NO.13	PROPOSED	MOTOR	115	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-14	UNIT HEATER NO.14	PROPOSED	MOTOR	113	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-15	UNIT HEATER NO.15	PROPOSED	MOTOR	212	31.25	NA	0.26	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-16	UNIT HEATER NO.16	PROPOSED	MOTOR	212	31.25	NA	0.26	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-17	UNIT HEATER NO.17	PROPOSED	MOTOR	217	20	NA	0.16	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-18	UNIT HEATER NO.18	PROPOSED	MOTOR	N. FILTER	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-19	UNIT HEATER NO.19	PROPOSED	MOTOR	N. FILTER	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-20	UNIT HEATER NO.20	PROPOSED	MOTOR	N. FILTER	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-21	UNIT HEATER NO.21	PROPOSED	MOTOR	N. FILTER	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-22	UNIT HEATER NO.22	PROPOSED	MOTOR	S. FILTER	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-23	UNIT HEATER NO.23	PROPOSED	MOTOR	S. FILTER	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-24	UNIT HEATER NO.24	PROPOSED	MOTOR	S. FILTER	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-25	UNIT HEATER NO.25	PROPOSED	MOTOR	S. FILTER	NA	1/20	0.8	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
UH-26	UNIT HEATER NO.26	PROPOSED	MOTOR	116	31.25	NA	0.26	120	1	20	1	20-2G	TBD	TBD	MC	NFMP	20	NA	EC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	TBD BY MC	LP-L4A OR B	120VAC	20-2G	1,3,5,8
XFMR-L4B	L4B TRANSFORMER	PROPOSED	XFMR	106	30	NA	NA	480	3	50	3	50-4G	NA	NA	NA	CB	50	NA	EC							PP-1	480 VAC	50-3G	10
LP-L4B	LIGHTING AND APPLIANCE PANEL L4B	PROPOSED	PANEL	116	NA	NA	NA	208/120	3	100	3	100-4G	NA	NA	NA	MAIN CB	100	NA	EC							LW-XFMR-L4B	208/120 VAC	100-4G	10
LP-L4A	LIGHTING AND APPLIANCE PANEL L4A	EXISITNG	PANEL	116	NA	NA	NA	208/120	1	60	2	60-3G	NA	NA	NA	CB	60	NA	EC							LP-L4B	208/120 VAC	100-3G	11
HVAC-TCP-1	HVAC TEMPERATURE CONTROL PANEL	PROPOSED	PANEL	107	2	NA	13.3	120	1	20	1	20-3G	NA	NA	NA	CB	20	NA	EC							LP-L4B	208/120 VAC	100-3G	10
HVAC-MDDC-1	HVAC MASTER DDC CONTROL PANEL	PROPOSED	PANEL	203A	1	NA	6.75	120	1	20	1	20-3G	NA	NA	NA	CB	20	NA	EC							LP-L2	208/120 VAC	100-3G	10
XFMR-LP-1	LP-L1 LAB TRANSFORMER	PROPOSED	XFMR	203A	25	NA	NA	480	1	70	2	70-3G	NA	NA	NA	CB	70	NA	EC							PP-1	480 VAC	70-3G	10
LP-L1	LP-L1 LAB LIGHTING PANEL	EXISTING	PANEL	208	25	NA	150	240/120	1	150	2	150-3G	NA	NA	NA	CB	150	NA	EC							XFMR-LP-L1	240/120 VAC	150-3G	11
XFMR-LP-3A	LP-L3A&B LAB TRANSFORMER	PROPOSED	XFMR	107	37.5	NA	NA	480	1	100	2	100-3G	NA	NA	NA	CB	100	NA	EC							PP-1	480 VAC	100-3G	10
LP-3A	LP-L3A LIGHITNG PANEL	EXISTING	PANEL	LOWER HALL	NA	NA	200	240/120	1	200	2	200-3G	NA	NA	NA	CB	200	NA	EC							XFMR-LP-L3A	240/120 VAC	200-3G	11
PP-1	POWER PANEL NO.1	PROPOSED	PANEL	203A	NA	NA	300	480	3	300	3	300-3G	NA	NA	NA	CB	300	NA	EC							WTP-MCC-A	480 VAC	300-3G	11
WTP-MCC-1	WATER TREATMENT PLANT MOTOR CONTROL CENTER	EXISITNG	PANEL	UPPER HALL	NA	NA	300	480	3	NA	3	600-3G	NA	NA	NA	LUGS	600	NA	EC							WTP-MDS-1	480 VAC	600-3G	11
WTP-MDS-1	WATER TREATMENT PLANT MAIN DISCONNECT SWITCH	PROPOSED	PANEL	EXTERIOR	NA	NA	600	480	3	600	3	600-3G	NA	NA	NA	CB	600	NA	EC							EXISTING SERVICE XFMR	480 VAC	600-3G	10

ELECTRICAL WIRING SCHEDULE GENERAL NOTES:

1. ALL WORK BY THIS CONTRACTOR TO COMPLY WITH ALL LOCAL, STATE AND NATIONAL ELECTRICAL CODES.
2. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH OTHER TRADES TO AVOID CONFLICTS AND TO VERIFY ALL EQUIPMENT CONNECTION REQUIREMENTS.
3. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEM PER CONTRACT DOCUMENTS AND ENSURING THAT THE SYSTEM IS OPERATIONAL UPON JOB COMPLETION.
4. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEM FOR ALL OWNER-FURNISHED APPLIANCES IN ACCORDANCE WITH NEC ARTICLE 422 AND 440.22.
5. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL BRANCH CIRCUIT WIRING IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AND THESE PROJECT DOCUMENTS
6. PROVIDE ALL POWER WIRING INCLUDING ALL CIRCUITRY CARRYING ELECTRICAL ENERGY FROM PANELBOARD OR OTHER SOURCE THROUGH STARTERS AND DISCONNECTS TO MOTORS, PACKAGED EQUIPMENT, OR PACKAGED CONTROL PANELS. PROVIDE ALL WIRING BETWEEN CONTROL PANELS AND MOTORS. I
7. MOTORS CONNECTED TO EMERGENCY SYSTEMS CIRCUITRY SHALL HAVE CIRCUITRY INSTALLED IN SEPARATE RACEWAY PER NEC ARTICLE 700.
8. PROVIDE SEPARATE GREEN GROUND FOR EACH MOTOR AND EQUIPMENT CONNECTION ROUTED BACK TO INTEGRAL GROUND BUS OF ASSOCIATED PANELBOARD OR MOTOR CONTROL CENTER. GROUND CONDUCTOR SIZES PER NEC ARTICLE 250.122.
9. ALL HEATING, AIR CONDITIONING AND REFRIGERATION EQUIPMENT INSTALLED ON THE EXTERIOR OF THE BUILDING OR ROOF TOP SHALL HAVE A 15 AMP, 125V WEATHER-RESISTANT GFCI RECEPTACLE SURFACE MOUNTED IN WEATHERPROOF ENCLOSURE, MOUNTED ADJACENT TO EQUIPMENT.
10. THIS CONTRACTOR SHALL VERIFY ELECTRICAL REQUIREMENTS INCLUDING VOLTAGE, HORSEPOWER, STARTER TYPE, AND DISCONNECTING MEANS FOR MOTORS AND EQUIPMENT PRIOR TO ORDERING CIRCUIT BREAKERS, DISCONNECT SWITCHES, AND STARTERS
11. REFER TO ONE-LINE AND P&ID'S FOR ADDITIONAL INFORMATION AND DETIAL.
12. REFER TO FEEDER SCHEUDLE FOR ADDITIONAL INFORMATION AND DETIAL.
13. ALL SIZES PROVIDED SHALL BE CONSIDERED A MINIMUM. ACTUAL SIZES SHALL BE CONFIRMED TO MATCH ACTUAL APPLICATION AND ACTUAL EQUIPMENT.
14. ALL DEVICES, INSTURMENT, EQUIPMENT, ETC...SHALL BE LOOP NETWORKED PER MECHANICAL CONTRACTOR AND DDC CONTROL.

ELECTRICAL WIRING SCHEDULE LEGEND:

MOTOR CONTROLLERS:
FVNR = FULL VOLTAGE NON-REVERSING STARTER (ACROSS THE LINE ELECTRONIC MAG STARTER)
FVR = FULL VOLTAGE REVERSING STARTER (ACROSS THE LINE ELECTRONIC MAG STARTER)
2SP = 2-SPEED FULL VOLTAGE STARTER
SSRV = SOLID STATE REDUCED VOLTAGE (REDUCED VOLTAGE SMART MOTOR CONTROLLER - SOFT START)
VFD = VARIABLE FREQUENCY DIRVE

DISCONNECT:
F = FUSED
NF = NON-FUSED
NFMP = NON-FUSED MOTOR PLUG AND RECEPTCLE
CB = CIRCUIT BREAKER

BY:
GC = GENERAL CONTRACTOR
EC = ELECTRICAL CONTRACTOR
MC = MECHANICAL CONTRACTOR

WIRING LEGEND:
Ax = ANALOG SIGNAL = 2C#16 SHEILDED, TWISTED PAIR) (x = # OF TWISTED PAIRS)
Dx = DISCRETE SIGNAL = #14 THHN WIRE (x = # OF WIRES)
Mx = MANUFACTURE CABLE (x = # OF CABLES)
Ex = CAT5e (x = # OF CAT5e CABLES)
Px = POWER CIRCUIT (x = NUMBER OF CONDUCTOR + G / REFER TO ONE-LINE DIAGRAM)

NOTE(S):

1. DEMOLISH EXISTING
2. CONNECT NEW EQUIPMENT
3. CONNECT NEW EQUIPMENT WITH NEW DISCONNECT RATED PLUG/REC SET (TYPICAL)
4. REUSE EXISITNG MOTOR FEEDERS
5. REPLACE EXISTING MOTOR CIRCUIT, RACEWAY, ETC...AND CONNECT EQUIPMENT
6. NO POWER CONNECTION EXPECTED (BY MC)
7. RELOCATE EXISTING MOTOR CONTROLLER, REFEED TO PROPOSED LOCATION
8. CONTROL WIRING BY MC
9. NEW MOTOR CIRCUIT, RACEWAY, ETC...AND CONNECT EQUIPMENT
10. NEW FEEDER CIRCUIT, RACEWAY, ETC...AND CONNECT EQUIPMENT
11. NEW FEEDER CIRCUIT, RACEWAY, ETC...AND CONNECT EXISTING EQUIPMENT

PROJECT NO.: 00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY	
PROJECT DATE: MARCH 2016	DRAWN BY: INIT	1	3/25	ADDENDUM #1	.	
F.B.: .	CHECKED BY: SRC	.	.	.	.	
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PLOT DATE: 3/25/16, P:\610s\616\00616097\CADD\Construction Documents\ADDENDUM #1\616097 E-26R.dwg

I HEREBY CERTIFY THAT THIS PLAN, REPORT, OR SPECIFICATION WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SCOTT R. CHILSON — MARCH 25, 2016 (Date) — 44287 (License No.)

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ELECTRICAL SCHEDULES NO. 5

FILE NO. 00616097

SHEET E-26R