DIVISION 26 – ELECTRICAL

A. General Instructions:

1. Codes, Permits and Inspections:
   a. Wiring shall be in accordance with latest edition National Electrical Code (NEC), NFPA, and/or applicable local, state, and Utility Company rules, laws, codes, and ordinances.
   b. Secure all permits and inspections required for the installation of the electrical work.
   c. All work shall comply with the latest edition of the Americans With Disabilities Act (ADA).
   d. Pay all fees associated with new utility services.

2. Verifications:
   a. Verify mounting heights and locations of electrical equipment before installation or rough–in.
   b. Verify exact location of electrical service entrance including point of service and system characteristics.

3. Wiring Methods:
   a. The Electrical Contractor shall cooperate with other Contractors and install equipment in proper sequence so as not to interfere with the progress of other Contractors.
   b. All materials shall be new and carry the Underwriter's Label or be "listed" by that group, and be fully equal to makes specified.
   c. Use only insulated copper conductors in conduit. Use flexible conduit for connections to motors and similar equipment.
   d. All wiring shall be concealed and all outlets shall be flush mounted in finished spaces except as noted otherwise.
   e. All systems wiring in return air plenums shall be in conduit or be plenum rated.

4. Tests:
   a. This Contractor shall be responsible for performing all tests necessary to prevent concealment of defective or improper work.
   b. Upon completion of work, test the installation thoroughly and render it free from shorts, grounds or improper connections.

5. Guarantee:
   a. This Contractor shall guarantee that all defective items of workmanship, material, labor or mechanical operation developing within one (1) year from the date of final acceptance of completed installation shall be replaced to the complete satisfaction of the Owner.

6. Workmanship:
   a. Electrical equipment shall be installed in a neat and workmanlike manner. Unsightly installations shall be removed or reworked at no additional expense to the Owner.

7. Identification of Disconnecting Means:
   a. Provide a permanent nameplate for each disconnect switch indicating its purpose. The marking shall be of sufficient durability to withstand the environment it is installed in as required by N.E.C. Section 110.22 and 230.72(A).

B. Electrical Equipment:

1. Conduits:
   a. All conduit installed in earth, concrete, below concrete on earth, or exposed to weather shall be rigid steel or intermediate metal conduit. Electrical metallic tubing for all dry interior runs. Fittings shall be fully approved in accordance with N.E.C
   b. Flexible or P.V.C. conduit may be used where not exposed to damage and approved by N.E.C. and local codes.
   c. Provide a ground wire sized per N.E.C. Art. 250.122 in all conduits, both metallic and nonmetallic.
   d. Conduit shall be installed and sized according to code requirements and protected from damage during construction.
   e. Conduit may be re–routed where such action does not adversely affect the intended design or circuiting.
   f. Final connections to all kitchen and mechanical equipment shall be with U. L. approved liquidtite conduit. Liquidtite and fittings shall be U.L. listed for grounding.

2. Conductors:
   a. Conductors shall be copper, generally with 600 volt rated insulation. Branch circuit wiring min. size #12 Type "THW" or "THWN/THHN" as required. Service entrance, feeder conductors Type "THWN/THHN" or "XHHW". Low voltage wire shall be Type "TF" or "TFF" minimum #18 gauge unless noted otherwise. All other types shall be as required by N.E.C.
   b. All conductors shall be color coded with type and size marking. Connections to service equipment, feeder panels shall be made with solderless lugs. All splices, taps, connections to service entrance conductors shall be made by bronze solderless lugs. All other splices, connections shall be pressure type connectors.
   c. Insulate joints, splices with Scotch #33 plastic tape or plastic moulded jackets.

3. Outlet Boxes and Plaster Rings:
   a. Outlet boxes shall be galvanized steel of type and size approved for particular installation requirements.
   b. Use 4" square box with suitable plaster ring installed flush with finish materials in stud or concrete walls.
   c. Use standard octagon boxes for ceiling light outlets. All boxes shall be securely mounted to building construction and flush with finish materials.

4. Wall Receptacles:
   a. Duplex receptacles shall be "Specification Grade", back or side wired, grounding type. Manufacturer shall be Hubbell or equal.
   b. Weatherproof receptacles (indicated WP) shall be weather resistant GFCI duplex receptacles with extra–duty, weatherproof while–in–use metallic cover plate.

5. Grounding:
   a. Provide system ground as required by N.E.C. and utility company if not already existing.
   b. Bond mechanical equipment frames.
   c. Bond all service entrance equipment and conduit system.
   d. An equipment grounding conductor sized per N.E.C. Art. 250.122 shall be provided in all conduits. The ground wire is required for both metallic and nonmetallic conduit installations.

6. Branch Circuit Panels
   a. Branch circuit lighting panels equal to Square D, G.E., Siemens, or Cutler Hammer, with thermal magnetic breakers and ground buses. Load center construction is not permitted. Electrical Contractor shall obtain available short circuit current from local Utility co. Panelboards shall be U.L. listed for available fault current. Breakers and panels shall be fully rated or U.L. series rated with specified fuses (50,000 AIC minimum).
   b. Breakers shall have individual plastic cases sized as scheduled. Two pole breakers shall be common trip (single pole units with tie bars are not acceptable).
   c. Panel shall be mounted as noted on the drawings. Provide with a hinged door and a neatly typed circuit directory card.
   d. Re–assign circuits to properly balance the loads on the phases if final connections and tests show it to be advisable.

7. Equipment Supplied By Other Contractors And/Or The Owner
   a. The Electrical Contractor shall furnish, install and connect all wiring, conduit, boxes, toggle switches, thermal switches, disconnect switches, remote pushbutton stations, etc., for all equipment requiring electrical power that is either furnished or specified by other contractors and/or the Owner, shown on drawings or listed below. The E.C. shall receive, install and connect all magnetic starters and controllers, capacitors, power factor correction devices, transformers, alarms, bells, horns, relays, remote switches for equipment supplied by others (i.e. starters or capacitors or power factor correction devices for Mechanical Equip., etc.). In general, all major equipment will be specified to be factory prewired with only service and interconnecting required at the site by the Electrical Contractor; however,the E.C. shall check all Divisions of the specification to verify whether the equipment is specified to be factory prewired. If not, then it shall be the responsibility of the Electrical Contractor to provide the complete wiring of the equipment in accordance with wiring diagrams provided by other Contractors and/or Owner to the Electrical Contractor. All interconnecting of equipment shall be by the Electrical Contractor.
   b. All line and low voltage wiring and connections required to control the equipment are a part of this section. All wiring shall be in conduit.
   c. It shall be assumed the Contractor is familiar with the equipment to be furnished by the other Contractors and/or the Owner in connection with this work and that provisions for such connections and work have been included in the Contractor's price. In no case will extra remuneration be allowed for such work.
   d. Connections to all equipment have been designed from units as specified on the drawings or in the specifications. In the event equipment or control differs on approved mechanical shop drawings it shall be the responsibility of the supplying contractor to coordinate the electrical connections to the units and reimburse electrical contractor for any changes in the electrical system design. These changes shall not involve additional cost to the Owner.

GENERAL NOTES

1. ALL ELECTRICAL WORK SHALL COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC) & THE AMERICANS WITH DISABILITIES ACT (ADA).
2. REFER TO RELATED CIVIL DRAWINGS FOR RELATED INFORMATION.
3. REFER TO THE SPECIFICATIONS FOR DATA NOT ON THE DRAWINGS.
4. ALL MOUNTING HEIGHTS TO CENTERLINE OF ITEM UNLESS OTHERWISE NOTED. VERIFY ALL OUTLET LOCATIONS ON THE JOB PRIOR TO ROUGH–IN.
5. CONDUIT RUN W/CONDUCTORS AS INDICATED & GROUND WIRE SIZED PER N.E.C. 250.122. CONDUIT SIZE AS REQUIRED.
6. WHEN INCREASED CONDUCTOR SIZES ARE SHOWN ON THE PLANS, THE LARGER CONDUCTOR SIZE SHALL BE USED THROUGHOUT THE LENGTH OF THE CIRCUIT, INCLUDING NEUTRAL AND GROUND.
7. BRANCH CIRCUITS ARE INDICATED AS ONE CIRCUIT HOME RUNS WITH INDIVIDUAL NEUTRALS. A MAXIMUM OF THREE CIRCUITS (MAXIMUM OF THREE PHASE CONDUCTORS) MAY BE GROUPED IN A SINGLE CONDUIT. WHERE MULTIPLE CIRCUITS ARE LOCATED IN THE SAME RACEWAY, JUNCTION BOX OR ENCLOSURE, NEUTRALS SHALL BE MARKED OR LABELED TO INDICATE WHICH CIRCUIT THEY ARE ASSOCIATED WITH. SEE SPECIFICATION SECTION "LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES" FOR ADDITIONAL INFORMATION.

ELECTRICAL SHEET INDEX

SHEET NO.	DESCRIPTION
E001	ELECTRICAL LEAD SHEET
E201	ELECTRICAL SITE DEMOLITION PLAN
E401	ELECTRICAL SITE POWER PLAN
E501	ELECTRICAL DETAILS
E502	ELECTRICAL DETAILS
E601	ELECTRICAL ONE–LINE DIAGRAMS
E602	CONTROLS SCHEMATIC AND SCHEDULE

CONTROL CABLES CONDUIT SCHEDULE

# OF CABLES	ESTIMATED CONDUIT SIZE
1	1/2"
2	3/4"
3	1"
5	1 1/4"
7	1 1/2"
13	2"
18	2 1/2"
29	3"
38	3 1/2"

NOTE:
ABOVE CONDUIT SIZES DEPEND ON ACTUAL CABLES INSTALLED. VERIFY CABLE SIZES & ADJUST CONDUIT AS REQUIRED. RUN ALL CONTROL CABLES IN SEPARATE CONDUIT FROM POWER CIRCUITS. ALSO RUN SHIELDED & LAN LAN CABLES IN SEPARATE CONDUIT FROM OTHER CONTROLS. CONTRACTOR CAN SIZE CONDUIT FOR ACTUAL CABLE SIZE, PER N.E.C. FILL TABLE WITH 25% SPARE CAPACITY. SUBMIT CALCULATIONS.

SYMBOL LIST

SYMBOL	DESCRIPTION	MOUNTING
WP	WEATHERPROOF	
UON	UNLESS OTHERWISE NOTED	
	GROUND FAULT DUPLEX RECEPTACLE	18"AFF
J	JUNCTION BOX	
'A'	BRANCH CIRCUIT PANEL & PANEL DESIG.	72" TO TOP
	ELECTRICAL DISTRIBUTION EQUIPMENT	
X–X	EQUIPMENT – SEE EQUIPMENT CONNECTION SCHEDULE	
#12	CONDUIT HOME RUN, 1 CIRCUIT. 2#12 & 1#12 GRD. GEN. NOTE 5 & 6	CEIL./WALL
	CONDUIT RUN 2#12 & 1#12 GRD.– 1"C.	CEIL./WALL
	CONDUIT RUN 2#12 & 1#12 GRD.– 1"C.	EARTH/FLOOR
	CONDUIT HOME RUN, 1 CIRCUIT. 2#12 & 1#12 GRD. 1"C.	CEIL./WALL
	CONDUIT HOME RUN, 2 CIRCUITS. 4#12 & 1#12 GRD. 1"C.	CEIL./WALL
	CONDUIT HOME RUN, 3 CIRCUITS. 6#12 & 1#12 GRD. 1"C.	CEIL./WALL
	CONDUIT RUN PARTIAL CIRCUIT. 2#12 & 1#12 GRD. 1"C.	CEIL./WALL
	CONDUIT HOME RUN, 2 CIRCUITS PHASE CONDUCTORS (#12 UON) NEUTRAL CONDUCTOR (#12 UON) SWITCH LEGS (#12 UON) GROUND CONDUCTOR (#12 UON)	CEIL./WALL
	CONTACTS (NORMALLY OPEN, CLOSED)	
	CIRCUIT BREAKER	
	DISCONNECT (SEE EQUIP CONN SCHED) (VOLTAGE / SWITCH SIZE / FUSE SIZE / # OF POLES NOTED IF EQUIPMENT NOT SCHEDULED)	
	GROUND CONNECTION	
	LIGHTNING ARRESTOR	
1	FEEDER DESIGNATION	
SPD	SURGE PROTECTIVE DEVICE	
# A 2P / # AF AT	CIRCUIT BREAKER (MOLDED CASE NON–ADJUSTABLE TRIP / ADJUSTABLE TRIP) (# OF POLES IF OTHER THAN 3)	
	3ø TRANSFORMER (DELTA PRIMARY / WYE SECONDARY)	
PANEL / SPD	PANELBOARD (WITH BUILT–IN SPD)	
M	METER (UTILITY / PANEL MOUNTED)	
HP / KW	EQUIPMENT (SINGLE MOTOR / MULTI–MOTOR OR OTHER TYPE AS NOTED)	
N E ATS	TRANSFER SWITCH (ATS = AUTOMATIC, MTS = MANUAL) (SIZE / VOLTAGE / POLES / AIC RATING / NEMA RATING) (NEMA RATING IF OTHER THAN NEMA–1)	
#	CONDUIT HOME RUN, DISCRETE CONTROLS. NUMBER OF CIRCUITS	

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CITY OF WICHITA

RICHARD W. WHITE
LICENSED
23147
03/09/2022
KANSAS
PROFESSIONAL ENGINEER

SANITARY SEWER IMPROVEMENTS

LIFT STATION NO. 16

AT
POPLAR STREET,
SOUTH OF E. 37TH STREET N

GARY JANZEN, P.E. - CITY ENGINEER
CITY OF WICHITA PROJECT NO. 468-2020-019216 S0013

Issue:		

JOB NO.	217043-007
DATE	MARCH 2022
PM	RWW
DESIGNED BY	DCG
DRAWN BY	BAC
CHECKED BY	RWW

ELECTRICAL LEAD SHEET

E001

SAVED 3/9/2022 10:47:31 AM BY BEN.CHAPLIN
PLOTTED 3/9/2022 1:53:13 PM BY BEN CHAPLIN
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