

**REGULAR CITY COUNCIL MEETING  
TUESDAY – APRIL 7, 2020 – 6:00 PM  
EVANSDALE CITY HALL**

**AGENDA**

1. Call to order
2. Pledge of Allegiance
3. Roll call
4. Approval of the April 7, 2020 agenda
5. Mayor Beatty to Congratulate Craig Sutton for 30 years of service and his retirement from Public Works
6. Approval of the Consent Agenda – All items listed under the consent agenda will be enacted by one motion. There will be no separate discussion of these items unless a request is made prior to the time Council votes on the motion
  - a. Approval of March 17, 2020 regular meeting minutes
7. Resolution 6394 authorizing payment of bills and transfers
8. Resolution 6395 approving application to Black Hawk Gaming Association for squad car computers and authorize the Mayor to sign said document
9. Resolution 6396 approving the preliminary plans and setting date of bid opening for the Lift Station Generator Project for April 10, 2020 at 2:00 p.m.
10. Resolution 6397 approving compensation for Paramedic Captain - Robert Gipper
11. Resolution 6398 approving compensation for Public Works General Laborer – Jared Wright
12. Resolution 6399 setting date of public hearing for FY2020 budget amendment
13. Request from Clerk Kobliska to purchase waste/recycle carts in an amount not to exceed \$9,619.41 as budgeted for FY2020
14. Request from Wastewater Foreman to repair televising camera in the amount of \$4,100 (a claim has been submitted to our insurance company with a reimbursement estimate of \$3,100)
15. Council to consider the purchase of a cell phone for the Mayor
16. Council to consider “Safer at Home” Proclamation
17. Public discussion
18. Mayor/Council Reports
19. Adjournment

***Due to the State Public Health Emergency Declaration regarding COVID-19, and the Proclamation of Governor Kim Reynolds dated April 2, 2020, this meeting will be conducted electronically pursuant to Iowa Code 21.8 Members of the public wishing to participate in this meeting are encouraged to do so by [provide information for accessing meeting online or by phone].***

CITY HALL  
EVANSDALE, IOWA, MARCH 17, 2020  
CITY COUNCIL  
TROY BEATTY, MAYOR, PRESIDING

The City Council of the City of Evansdale, Iowa met in regular session, according to law, the rules of said Council and prior notice given each member thereof, VIA Go to Meeting application due to public restrictions set during the COVID-19 pandemic at 6:00 p.m. on the above date. Council members present in order of roll call: Beam, Dewater, Seible, Bender, and Walker. Quorum present.

Seible/Walker to approve March 17, 2020 agenda. Ayes-Five. Motion carried.

Walker/Beam to approve the following items on the March 17, 2020 consent agenda. a. Approval of March 3, 2020 regular meeting minutes. b. Accept and place on file the minutes and reports from the following Departments, Boards, and Commissions (n/a=not available): Ambulance & Fire Report (Feb), Building Inspection Report (Feb), Clerk/Treasurer Report (Feb), Code Enforcement Report (Feb), Evansdale Municipal Housing (Feb), Library (Feb), Parks & Rec Dept. (Feb), Planning & Zoning (n/a), Police Dept. (Feb), Storm Water Commission (n/a), and Water Works (Feb). Roll call vote: Ayes-Five.

Generator Presentation by Adrian Holmes, with Bolton & Menk, Inc. Mr. Holmes stated that the plans and specifications had been prepared for the project and that the estimated cost of the project was going to be approximately \$92,000 and would go out to bid on the 10<sup>th</sup> of April 2020. Councilor Seible requested a review of the project before it went out for bid. Councilor Walker responded that we were only approving the project going out to bid not the cost of the project. Walker/Bender to approve advertising for bid the Lift Station Generator Project. Ayes-Four. Nays-One (Seible). Motion carried.

Seible/Dewater to open Public Hearing-FY2021 Budget at 6:09 p.m. Ayes-five. Motion carried. Mayor Beatty stated that the levy rate remained the same since the max levy hearing at 7.94. No public comments were received. Walker/Seible to close the public hearing at 6:10 p.m. Ayes-Five. Motion carried.

Walker/Beam to approve Resolution 6390 adopting the fiscal year budget ending June 30, 2021. Roll call vote. Ayes-Five.

Dewater/Beam to approve Resolution 6391 authorizing payment of bills and transfers. Roll call vote: Ayes-Five.

Seible/Walker to approve request from Mayor to enter into an agreement with Shive-Hattery for the STBG Grant Processing in the amount of \$3,600 and to sign said agreement. Ayes-Five. Motion carried.

Seible/Walker to approve Resolution 6392 approving application to the Black Hawk County Metropolitan Area Transportation Policy Board (MPO) for Surface Transportation Block Grant (STBG) program funding for the Lafayette Road Rehabilitation Project. Roll call vote: Ayes-Five.

Walker/Beam to approve Resolution 6393 amending Resolution 3904 by changing certain rates and charges for pet licensing. Councilor Seible questioned the increase. Chris Schares, Public Works Director stated that expenses have increased and that we were building a better program for our residents. Seible asked for the current revenue total and projected revenue after increase.

Roll call vote: Ayes-Four. Nays-One (Seible).

Walker/Beam to table Ordinance 671 approving the repealing of Chapter 82 Off-Road Utility Vehicles and replacing with the new Chapter, first reading. Roll call vote: Ayes-Five.

Walker/Beam to table the consideration of reciprocation of UTV fees with the cities of Elk Run Heights and Raymond. Ayes-Five. Motion carried.

Walker/Seible to approve the following appointments to the Storm Water Commission: Brian Wirtz with term ending 12-31-21; Char White with term ending 12-31-23; Rick Reuter with term ending 12-31-23, and DeAnne Kobliska with term ending 12-31-21. Ayes-Five. Motion carried.

Walker/Seible to approve request to approve attendance to the Iowa Municipal Clerks Academy for both Deputy City Clerk and City Clerk in the amount of \$1,656.96 as budgeted for FY21. Councilor Walker questioned the dates of conference. Clerk Kobliska responded the end of July 2020. Ayes-Five. Motion carried.

Public discussion: Tom Nichols, Park Board Chair stated that he cancelled the public sign-up for Deerwood Campground and has asked the patrons to mail a check to Evansdale City Hall.

Mayor/Council Reports: Mayor Beatty updated the council on the changes that had taken place due to COVID-19. The conference call with Governor Reynolds stated that she was following suit to help flatten the curve by not having meetings of more than 10 people, limiting the rush or overload for EMS and hospital services. She also ordered all restaurants and bars to be closed to the public but those preparing food would be able to have carryout available. City Hall would be monitoring any changes and try to limit unessential tasks at this time. Councilor Beam questioned if we should address our code of ordinances regarding electronic meetings. Beatty responded that he had reached out to both the Iowa League of Cities and the Iowa Public Information Board regarding electronic meetings and it had been approved under the circumstances. Councilor Dewater questioned access and security for City Hall and if we had received any quotes for the service. Beatty responded that we had only received one quote, that was very reasonable, but that we would try to get something to council as soon as possible. Councilor Seible questioned when the audio/video would be installed. Beatty responded within the next week.

There being no further discussion, Seible/Dewater to adjourn the meeting at 6:34 p.m. Motion carried.

ATTEST:

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Troy Beatty, Mayor

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DeAnne Kobliska, City Clerk

**RESOLUTION 6394**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF EVANSDALE, IOWA, THAT  
THE FOLLOWING BILLS BE PAID AND THE TRANSFERS ARE HEREBY ALLOWED**

ALLEN HOSP	PD-PHYSICAL	736.44
	PD-PHYSICAL	176.46
	<b>TOTAL</b>	<b>912.90</b>
ALLEN HOSP	FD-PHYSICAL	28.00
AMERIGAS	SR-PROPANE	786.58
AUTO PLUS-TOTAL PARTS	PD-WHEEL CLEANER	4.87
	PD-CAR WASH	19.20
	RU-WATER PUMP #57	102.35
	RU-OIL/FILTER #57	20.78
	RU-THERMOSTAT/GASKET	8.89
	RU-THERMOSTAT #57	11.73
	<b>TOTAL</b>	<b>167.82</b>
AUTOMOTIVE SRVC SOLUTIONS	RU-PINS/SOCKET/REMOVAL TOOL	86.64
BDI	RU-TRAILER BEARINGS	210.08
BEATTY, TROY	PY-RMBRS MILEAGE	79.35
	PY-RMBRS MEALS	52.94
	<b>TOTAL</b>	<b>132.29</b>
BLACK HAWK ELECTRICAL	RU-REPLACE EXIT LGHTS BLDG #3	196.54
BLACKHAWK WASTE	MARCH 2020 GARBAGE	17,255.42
	MARCH 2020 RECYCLE	4,322.50
	<b>TOTAL</b>	<b>21,577.92</b>
BOUND TREE MEDICAL	FD-MEDICAL SUPPLIES	74.95
	FD-MEDICAL SUPPLIES	29.98
	<b>TOTAL</b>	<b>104.93</b>
C & C WELDING	FD-EXHAUST FAN REPAIR #202	25.00
CAMPBELL SUPPLY	RU-CUT OFF WHEELS	99.75
CENTURY LINK	SR-INTERNET	78.99
CITY OF WATERLOO	RU-OCT-DEC 19 EDALE DR/DORIS	315.00
	RU-REPAIRS EDALE DR/DORIS	106.88
	RU-OCT-DEC 19 DBQ/EVANS	315.00
	<b>TOTAL</b>	<b>736.88</b>
COURIER	PY-BOA-DEAN PROPERTIES	13.03
	PY-3/3 MINUTES/BILLS	113.29
	<b>TOTAL</b>	<b>126.32</b>
COVENANT MEDICAL	FD-MEDICAL SUPPLIES	31.35
CREATIVE IMPACT	PK-SKATE PARK SIGNAGE	12.00
	PY-RETIREMENT PLAQUE-SUTTON	39.95
	<b>TOTAL</b>	<b>51.95</b>
A-02/04/20 ELECTRIC PUMP	SR-WASTE SLUDGE PUMP RPR	4,643.79
ERA	SR-LAB TESTING	309.81
ESO SOLUTIONS	FD-2020 EMS REPORTING SFTWR	1,489.50
EWV	PD-WATER EXPENSE	57.41
	FD-WATER EXPENSE	57.41
	<b>TOTAL</b>	<b>114.82</b>
IOWA ONE CALL	FEBRUARY LOCATES	3.90
	FEBRUARY LOCATES	3.90
	<b>TOTAL</b>	<b>7.80</b>
IOWA WORKFORCE	RU-STATE UNEMPLOYMENT COMP	470.75
	PD-STATE UNEMPLOYMENT COMP	1,168.49
	FD-STATE UNEMPLOYMENT COMP	141.87
	BLD INSP-STATE UNEMPLOYMENT CO	104.93
	AC-STATE UNEMPLOYMENT COMP	12.12
	LIB-STATE UNEMPLOYMENT COMP	117.07
	PY-STATE UNEMPLOYMENT COMP	211.96
	CH-STATE UNEMPLOYMENT COMP	6.07
	SR-STATE UNEMPLOYMENT COMP	162.66
	<b>TOTAL</b>	<b>2,395.92</b>

KEYSTONE	SR-LAB TESTING	120.00
LJ'S WELDING	PK-EXTENSION TUBE-PARK GATE	8.00
LOCKSPERTS	CH-REKEY CITY HALL	728.88
LOFTUS, DANIEL	FD-3M VALVED MASKS	41.98
MANATTS	PK-POST-DEERWOOD	190.50
MEDIACOM	PD-INTERNET/83849500	128.45
	FD-INTERNET/83849500	128.45
	BI-INTERNET/83849500	47.38
	CH-INTERNET/83849500	47.38
	RU-INTERNET/83849500	96.90
	RU-INTERNET/83849500	136.90
	RU-INTERNET/83849500	47.38
	SR-INTERNET/83849500	47.38
	<b>TOTAL</b>	<b>680.22</b>
MENARDS	RU-SHOP SUPPLIES	5.73
	RU-LAUNDRY SOAP	25.02
	SR-DISTILLED WATER	8.46
	<b>TOTAL</b>	<b>39.21</b>
NORTH CENTRAL LAB	SR-LAB SUPPLIES	534.41
PCC	PY-FEBRUARY AMB BILLING	1,174.10
PLATINUM PEST	LIB-PEST SERVICE	11.25
	CH-PEST SERVICE	33.75
	<b>TOTAL</b>	<b>45.00</b>
A-11/19/19 RACOM	PD-INSTALL CAR CAMER	3,000.00
	PD-ANTENNA/MIRRORS INSTALL	810.00
	<b>TOTAL</b>	<b>3,810.00</b>
A-01/07/20 SANDRY FIRE	FD-BOOTS-1	163.50
	FD-COAT/PANT/BOOTS	4,976.59
	<b>TOTAL</b>	<b>5,140.09</b>
SCOT'S SUPPLY	PK-FUEL HOSE/BLOW GUN	196.90
SIMMERING-CORY & IA CODE	PY-CODE UPDATE	192.00
STATE INDUSTRIAL	SR-ENZYMES	234.00
STOREY KENWORTHY	CH-COPY PAPER	35.99
	CH-DRY ERASE MARKERS	6.09
	RU-PAPER TOWELS	32.09
	RU-WHITE OUT	10.48
	<b>TOTAL</b>	<b>84.65</b>
TED'S	PD-VELCRO	10.98
	FD-4 CYCLE FUEL	20.99
	FD-2 CYCLE OIL	4.98
	FD-SPARK PLUG #202	3.49
	FD-4 CYCLE FUEL	41.98
	PK-ANTIFREEZE/CLAMPS	13.86
	PK-ELECTRICAL REPAIR	4.09
	CH-BATTERIES	10.99
	CH-DOORBELL BATTERY	6.49
	RU-CAP PULLER G-CART	6.02
	RU-TACK CLAW/SCRATCH	8.98
	SR-BATTERIES	25.98
	<b>TOTAL</b>	<b>158.83</b>
VAN METER	RU-7 EXIT SIGNS BLDG #3	59.62
	RU-4 EXIT SIGNS BLDG #3	(34.07)
	<b>TOTAL</b>	<b>25.55</b>
WEBER PAPER	PD-PAPER TOWELS	14.80
	FD-PAPER TOWELS	14.80
	LIB-TISSUE PAPER	13.45
	CH-TISSUE PAPER	40.35
	<b>TOTAL</b>	<b>83.40</b>
WEX	PD-FUEL	836.01
	FD-FUEL	281.13
	BI-FUEL	95.13
	AC-FUEL	34.44

	PK-FUEL	294.29
	RU-FUEL	1,102.48
	SR-FUEL	20.70
	<b>TOTAL</b>	<b>2,664.18</b>
WINDSTREAM	PD-PHONE	108.29
	FD-PHONE	82.69
	LIB-PHONES	40.42
	CH-PHONE	98.21
	EWV-OFFICE	33.74
	RU-PHONE	39.11
	SR-PLANT PHONE	46.60
	<b>TOTAL</b>	<b>449.06</b>
ZARNOTH BRUSH WORKS	RU-MAIN BELT-PELICAN SWEEPER	995.00
	RU-DRIVE RPR #53	72.30
	<b>TOTAL</b>	<b>1,067.30</b>
	001 GENERAL FUND	11,198.95
	002 CAPITAL IMPROVEMENT	5,868.97
	005 STREETS	876.35
	110 ROAD USE TAX	3,675.88
	112 EMPLOYEE BENEFIT	1,762.51
	610 SEWER FUND	7,023.26
	670 LANDFILL/GARBAGE	21,577.92
	<b>GRAND TOTAL:</b>	<b>51,983.84</b>

**PREPAYS:**

84997	BAKER & TAYLOR	LIB-BOOKS/DVD'S	680.30
84999	CAPITAL ONE	LIB-BOOKS/DVD'S/OFFICE SUPPLIES	360.13
85002	AFLAC	P/R DEDUCTION	76.44
85003	METLIFE	LIFE/DENTAL/VISION	2,450.81
85005	MFPRSI	RETIREMENT	10,810.33
85006	POLICE ASSOC	P/R DEDUCTION	60.00
85007	WELLMARK	HEALTH INS	14,655.54
DRAFT	ADVANTAGE ADMIN	HEALTH INS	3,012.75
DRAFT	IPERS	RETIREMENT	7,006.69
DRAFT	TREAS-STATE OF IA	P/R DEDUCTION	2,877.00
	<b>TOTAL PREPAYS</b>		<b>41,989.99</b>

**JANUARY PAYROLL**

EFTPS	30,705.38
BIWEEKLY PR	90,238.84
FIRE PAYROLL	1,741.46
BIANNUAL PARK BOARD	461.68
<b>TOTAL</b>	<b>123,147.36</b>

**FEBRUARY PAYROLL**

EFTPS	19,575.36
BIWEEKLY PR	56,862.55
FIRE PAYROLL	2,463.70
<b>TOTAL</b>	<b>78,901.61</b>

**PASSED AND APPROVED BY THE CITY COUNCIL OF THE CITY OF EVANSDALE, IOWA, ON THIS 7TH DAY OF APRIL 2020**

**ATTEST:**

\_\_\_\_\_  
Troy Beatty, Mayor

\_\_\_\_\_  
DeAnne Kobliska, City Clerk

**RESOLUTION 6395**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF EVANSDALE, IOWA, APPROVING THE APPLICATION TO BLACK HAWK GAMING ASSOCIATION FOR SQUAD CAR COMPUTERS AND AUTHORIZING THE MAYOR TO SIGN SAID APPLICATION**

**WHEREAS**, the City of Evansdale Police Department periodically need to upgrade their squad car computers as software is no longer supported; and

**WHEREAS**, one of the provisions of the Black Hawk Gaming Association grant application process calls for approval by City Council and the Mayor before the application process can begin; and

**WHEREAS**, it is in the city's best interest to apply for said grant to offset the expense of the computers to the city.

**NOW THEREFORE BE IT RESOLVED** that the City Council of the City of Evansdale, Iowa, approves the application to Black Hawk Gaming Association for squad car computers and authorizes the Mayor to sign said application.

**PASSED AND APPROVED THIS 7<sup>TH</sup> DAY OF APRIL 2020**

**ATTEST:**

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**Troy Beatty, Mayor**

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**DeAnne Kobliska, City Clerk**

**RESOLUTION 6396**

**RESOLUTION APPROVING PRELIMINARY PLANS AND SETTING DATE OF  
BID OPENING FOR THE LIFT STATION GENERATOR PROJECT**

**WHEREAS**, the City of Evansdale intends to contract for the Lift Station Generator Project; and

**WHEREAS**, the City of Evansdale requires professional engineering services for preparation of final plans, specifications, and form of contract for bidding the work.

**NOW THEREFORE, BE IT RESOLVED** that the City Council of the City of Evansdale hereby approves preliminary plans and setting date of bid opening for 10:00 a.m. on April 10, 2020; and authorizes Bolton & Menk, Inc. to advertise for said Lift Station Generator Project.

**PASSED AND APPROVED THIS 7<sup>TH</sup> DAY OF APRIL 2020**

**ATTEST:**

\_\_\_\_\_  
**Troy Beatty, Mayor**

\_\_\_\_\_  
**DeAnne Kobliska, City Clerk**

# PROJECT MANUAL

PURCHASE OF TWO GENERATORS AND TRANSFER SWITCHES FOR  
ARBUTUS AVE AND EAST END AVE SANITARY LIFT STATIONS

CITY OF EVANSDALE

EVANSDALE, IOWA



Real People. Real Solutions.

[Bolton-Menk.com](http://Bolton-Menk.com)

SECTION 00005 – CERTIFICATION

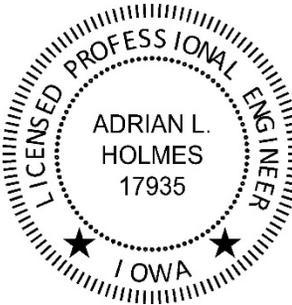
PROJECT MANUAL

for

PURCHASE OF TWO GENERATORS AND TRANSFER SWITCHES  
FOR ARBUTUS AVE AND EAST END AVE SANITARY LIFT STATIONS

CITY OF EVANSDALE

EVANSDALE, IOWA

	<p>I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p> <p>_____ Date: _____</p> <p>Adrian Holmes License No. 17935 My renewal date is December 31, 2021 Pages or sheets covered by this seal: All Pages _____</p>
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**SECTION 00010 - TABLE OF CONTENTS**

Arbutus Ave & E End Ave Sanitary Lift Station Generators and Transfer Switches  
City of Evansdale

CONTRACT DOCUMENTS:

PROJECT MANUAL:

Introductory Information, Quote Requirements, Contract Forms and Conditions of Contract

00005 - CERTIFICATION PAGE

00010 - TABLE OF CONTENTS

00100 - REQUEST FOR QUOTATION

00200 - INSTRUCTIONS TO BIDDERS

00410 - QUOTE ITEMS AND QUANTITIES

00800 - SPECIAL PROVISIONS

DRAWINGS (UNDER SEPARATE COVER):

6 sheets numbered 1.00 through 7.04, inclusive, dated 3/11/2020, and with each sheet bearing the following general title:

Lift Station Generators  
City of Evansdale

**APPENDICES**

None

**This project is based on  
SUDAS STANDARD SPECIFICATIONS, 2020 EDITION  
unless modified herein.**

**\*\*\*\*END OF SECTION\*\*\*\***

## REQUEST FOR QUOTATION

Purchase of Two Generators and Transfer Switches  
For Arbutus Ave And East End Ave Sanitary Lift Stations  
City of Evansdale

Time and Place for Filing Sealed Quotes. Electronic or sealed quotes for the work comprising the repair or improvement as stated below must be filed before 2:00PM on April 10, 2020 in the office of the City Clerk, 123 N. Evans Road, Evansdale, IA or electronically to [cedarrapids@bolton-menk.com](mailto:cedarrapids@bolton-menk.com).

Time for Commencement and Completion of Work. If a quote is accepted, purchase shall commence upon approval of the contract by the City Council and as stated in the Notice to Proceed, anticipated April 21, 2020. Delivery of purchased equipment shall occur on or before June 30, 2020. Liquidated damages of \$100 (One-Hundred Dollars) per calendar day shall be assessed for delivery after June 30, 2020.

Contract Documents. Copies of the project documents are available by request to [cedarrapids@bolton-menk.com](mailto:cedarrapids@bolton-menk.com).

Preference of Products and Labor. By virtue of statutory authority, a preference will be given to products and provisions grown and coal produced within the State of Iowa, to the extent lawfully required under Iowa statutes.

Sales Tax Exemption Certificates. The bidder shall not include sales tax in the quote. The City of Evansdale will distribute tax exemption certificates and authorization letters to the Contractor and all subcontractors who are identified. The Contractor and subcontractor may make copies of the tax exemption certificates and provide a copy to each supplier providing construction materials. These tax exemption certificates and authorization letters are applicable only for this specific project under the Contract.

PROJECT DESCRIPTION: Purchase and delivery of two backup generators and transfer switches, one each for the sanitary lift stations on Arbutus Avenue and East End Avenue. Delivery shall include placement of the generators on concrete pad constructed by the City or under separate contract.

The Notice is given by order of the City Council of the City of Evansdale

## INSTRUCTIONS TO BIDDERS

Purchase of Two Generators and Transfer Switches  
For Arbutus Ave And East End Ave Sanitary Lift Stations  
City of Evansdale

The work comprising the above referenced project shall be constructed in accordance with the SUDAS Standard Specifications, 2020 Edition and as further modified by the supplemental specifications and special provisions included in the contract documents. The terms used in the contract version of the documents are defined in said Standard Specifications. Before submitting a quote, please review the requirements of Division One, General Provisions and Covenants. Please be certain that all documents have been completed properly as failure to complete and sign all documents and to comply with the requirements listed below can cause a submitted quote not to be read.

### ARTICLE 1 - SUBMISSION OF THE QUOTE AND IDENTITY OF BIDDER

- 1.01 The Quote shall be electronic copies or sealed in an envelope, properly identified as the Quote with the project title and the name and address of the bidder. The Quote shall be deposited with the Jurisdiction at or before the time and at the place provided in the Request for Quotations. It is the sole responsibility of the bidder to see that its Quote is delivered to the Jurisdiction prior to the time for opening quotes. Any Quote received after the scheduled time for the receiving of Quotes will be returned to the bidder unopened and will not be considered. No bonds are required for the quotation process.
- 1.02 The following documents shall be completed, signed and returned in the Quote envelope. The quote cannot be read if any of these documents are omitted from the Quote envelope.
  - A. QUOTE – Complete each of the following parts:
- 1.03 Sign the Quote. The signature on the Quote and all Quote attachments must be an original signature in ink signed by the same individual who is the Company Owner or an authorized Officer of the Company; copies or facsimile of any signature will not be accepted.
- 1.04 Documents must be submitted as printed. No alterations, additions, or deletions are permitted. If the Bidder notes a requirement in the contract documents which the Bidder believes will require a conditioned or unsolicited alternate quote, the Bidder must immediately notify the Engineer in writing. The Engineer will issue any necessary interpretation by an addendum.
- 1.05 Division 1 - General Provisions and Covenants of the 2020 SUDAS Standard Specifications is modified as follows:
  - A. Section 1020.1.09B, Unit Price Attachment.  
A computer-generated unit price attachment may be submitted by the Bidder as specified by this Section.
- 1.06 Quote acceptance by the PROJECT OWNER shall be considered a binding contract between the City of Evansdale and the Contractor.

### ARTICLE 2 - PROSECUTION AND PROGRESS OF THE WORK

- 2.01 The work is located in the City of Evansdale, IA.

Work on the improvement shall commence upon approval of the contract by the Council and as stated in the Notice to Proceed. All work under the Contract must be substantially complete on or before June 30, 2020.

2.02 Community Events.

Successful bidder will be required to coordinate with the owner and accommodate the owner's requirements for the following list of events:

None

- 2.03 The City of Evansdale, in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42U.S.C. 2000d to 2000d-4 and title 49 Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively ensure that with any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit quotes in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

**ARTICLE 3 - PREFERENCE OF PRODUCTS AND LABOR**

- 3.01 In accordance with Iowa statutes, a resident bidder shall be allowed preference against a nonresident bidder from a state or foreign country provided that state or foreign country gives or requires any preference to bidders from that state or foreign country. This includes, but is not limited to any preference to bidders, the imposition of any type of labor force preference, or any other form of preferential treatment to bidders or laborers from that state or foreign country. The preference allowed shall be equal to the preference given or required by the state of foreign country in which the nonresident bidder is a resident. In the instance of a resident labor force preference, a nonresident bidder shall apply the same resident labor force preference to a public improvement in this state as would be required in the construction of a public improvement by the state or foreign country in which the nonresident bidder is a resident. If it is determined that this may cause denial of federal funds which would otherwise be available, or would otherwise be inconsistent with requirements of any federal law or regulation, this resident bidder preference shall be suspended, but only to the extent necessary to prevent denial of the funds or to eliminate the inconsistency with federal requirements.

**\*\*\*\*END OF SECTION\*\*\*\***

## QUOTE ITEMS AND QUANTITIES

Purchase of Two Generators and Transfer Switches

For Arbutus Ave And East End Ave Sanitary Lift Stations

City of Evansdale

### QUOTE: PART A – SCOPE

The City of Evansdale, hereinafter called the “Jurisdiction”, has need of a qualified vendor to supply and deliver the two generators and transfer switches as detailed in the attached specifications and drawings. Sitework including construction of concrete generator pad, utility services and electrical connections shall be completed by the City or under separate contract and is not included in this bid.

The undersigned Bidder hereby proposes to supply and deliver to each lift station site the equipment specified in the contract documents, which are officially on file with the Jurisdiction, in the office of the Mayor, at the prices hereinafter provided in Part B of the Quote, for the improvements of the Arbutus Ave & East End Ave Sanitary Lift Station Generators.

### QUOTE: PART B – QUOTE BID ITEMS AND QUANTITIES

UNIT PRICE CONTRACTS: The Bidder must provide the Unit Price, the Total Price, any Alternate Prices, and the Total Costs on the Quote Attachment: Part B – Quote Items and Quantities. In case of discrepancy, the Unit Price governs. The quantities shown on the Quote Attachment: Part B – Quote Items and Quantities are approximate only, but are considered sufficiently adequate for the purpose of comparing quotes. The Total Cost shall be used only for the comparison of quotes. The jurisdiction shall only use the Total Construction Cost for determining the sufficiency of the bid security.

SEE INCLUDED QUOTE ATTACHMENT

### QUOTE: PART C – GENERAL

The Bidder hereby acknowledges that the Jurisdiction, in advertising for public quotes for this project reserves the right to:

1. Reject any or all Quotes. Acceptance of the Quote, if any, to be to the lowest responsible, responsive bidder; and
2. Reject any or all alternates in determining the items to be included in the Contract. Designation of the lowest responsible, responsive bidder to be based on comparison of the total Quote only, not including any alternates; and
3. Make such alterations in the contract documents or in the Quote quantities as it determines necessary in accordance with the contract documents after execution of the contract. Such alterations shall not be considered a waiver of any conditions of the contract documents, and shall not invalidate any of the provisions thereof; and

The Bidder hereby agrees to:

1. Enter into a contract, if this quote is selected, in the form approved by the Jurisdiction, provide proof of registration with the Iowa Division of Labor in accordance with Chapter 91C of the Iowa Code;
2. Provide proof of insurance per SUDAS Section 1070
3. Commence the work upon written Notice to Proceed, and
4. Substantially complete the work on or before June 30, 2020

## QUOTE: PART E – NON-COLLUSION AFFIDAVIT

The Bidder hereby certifies:

1. That this Quote is not affected by, contingent on, or dependent on any other Quote submitted for any improvement with the Jurisdiction; and
2. That no individual employed by the Bidder has employed any person to solicit or procure the work on this project, nor will any employee of the Bidder make any payment or agreement for payment of any compensation in connection with the procurement of this project; and
3. That no part of the quote price received by the Bidder was or will be paid to any person, corporation, firm, association, or other organization for soliciting the quote, other than the payment of their normal compensation to persons regularly employed by the Bidder whose services in connection with the construction of the project were in the regular course of their duties for the Bidder; and
4. That this Quote is genuine and not collusive or sham; that the Bidder has not colluded, conspired, connived, or agreed, directly or indirectly, with any bidder or person, to submit a sham quote or to refrain from bidding; and
5. That the quote has not in any manner, directly or indirectly, sought, by agreement or collusion, or communication or conference, with any person, to fix the quote price of the Bidder or of any other bidder; and
6. That all statements in this Quote are true; and
7. That the individual(s) executing this Quote have the authority to execute this Quote on behalf of the Bidder.

**QUOTE ATTACHMENT**

Purchase of Two Generators and Transfer Switches

For Arbutus Ave and East End Ave Sanitary Lift Stations

City Of Evansdale

**QUOTE: PART B ATTACHMENT - QUOTE ITEMS AND QUANTITIES**

This is a UNIT PRICE CONTRACT. The bidder must provide the Unit Price, the total Price, and the Total Quote Amount; in case of discrepancy, the Unit Price governs. The Quantities shown on the Quote Attachment: Part B - Quote Items and quantities are approximate only but are considered sufficiently adequate for the purpose of comparing quotes. The Jurisdiction shall only use the Total Quote Amount for comparison of quotes.

Purchase and Delivery of Arbutus Avenue Generator and Transfer Switch \$ \_\_\_\_\_

Purchase and Delivery of East End Avenue Generator and Transfer Switch \$ \_\_\_\_\_

TOTAL \$ \_\_\_\_\_

NOTE: IT IS UNDERSTOOD THAT THE ABOVE QUANTITIES ARE ESTIMATED FOR THE PURPOSE OF THIS QUOTE. ALL QUANTITIES ARE SUBJECT TO REVISION BY THE OWNER.

Company Submitting Quote: \_\_\_\_\_

Contact Person: \_\_\_\_\_

**SPECIAL PROVISIONS**

FOR

Purchase of Two Generators and Transfer Switches

For Arbutus Ave and East End Ave Sanitary Lift Stations

City of Evansdale

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1) CONTRACT PROVISIONS

a) Completion Date

- i) All work under the Contract must be substantially complete as detailed in Section 00200.

b) Liquidated Damage

- i) Damages in the amount as detailed in Section 00100 will be assessed for each day the work remains incomplete.

2) DEFINITION AND INTENT

a) The Specifications that apply to the materials and construction practices for this project are defined as follows:

- i) The 2020 Edition of the SUDAS Standard Specifications, except as modified by these Special Provisions to the Technical Specifications.
- ii) Omissions of words or phrases such as “the Contractor shall”, “in accordance with”, “shall be”, “as noted on the Plans”, “according to the Plans”, “a”, “an”, “the” and “all” are unintentional; supply omitted words or phrases by inference.
- iii) “Owner”, “Jurisdiction” and “City” shall mean the City of Evansdale, acting through the Arbutus Ave & East End Ave Sanitary Lift Station Generators Project.
- iv) “Person” shall mean any individual, partnership, limited partnership, joint venture, society, association, joint stock company, corporation, limited liability company, estate, receiver, trustee, assignee, or referee, whether appointed by a court or otherwise, and any combination of individuals.
- v) “Engineer” shall mean the Engineer on Record.
- vi) The intent of the Technical Specifications is to describe the construction desired, performance requirements, and standards of materials and construction.
- vii) “Standard Drawings” shall mean the Figures bound within the SUDAS Standard Specifications and/or the Typical Drawings bound within the plans.
- viii) “Work” shall mean the work to be done and the equipment, supplies, and materials to be furnished under the contract unless some other meaning is indicated by the context.
- ix) “Or equal” shall follow manufacturers names used to establish standards and, if not stated, is implied.

b) Engineer: Bolton & Menk, Inc., 855 Wright Brothers Blvd SW, Ste 2A, Cedar Rapids, IA 52404.

3) GENERAL PROVISIONS AND COVENANTS

a) Division 1 of the General Provisions and Covenants of the 2020 Edition SUDAS Standard Specifications is modified as follows:

- i) Section 1020.1.09B, Unit Price Attachment.
- (a) A computer-generated unit price attachment may be submitted by the Bidder as specified by this Section.
- ii) Section 1050, 1.05 Shop Drawings, Certificates, and Equipment Lists.
- (a) Electronic submittal of shop drawings will be allowed.
- (b) If hardcopy submittals are used, the Contractor shall submit a minimum of three (3) copies plus any additional required by the Contractor.

4) WORK REQUIRED

- a) Work under this contract includes all materials, equipment, transportation, traffic control, and associated work for the purchase and delivery of the Arbutus Ave & East End Ave Sanitary Lift Station Generators as described in the Official Publication.

5) PLANS AND SPECIFICATIONS

- a) The Owner will furnish five (5) sets of plans and specifications to the Contractor after award of the contract. The Contractor shall compensate the Owner for printing costs for additional copies required.

6) SUBMITTALS

- a) Contractor shall provide a schedule showing dates of delivery. Schedule shall be updated as needed or as requested by Engineer due to changes in progress of construction from original schedule. Updates shall be completed within one week of request.
- b) Contractor shall submit the following information for Engineer's review. Three (3) copies plus any additional copies required by Contractor shall be submitted to the Engineer at the preconstruction conference or at least 14 days prior to utilization of the particular item on this project.
  - i) Testing reports.
  - ii) Manufacturer's data for materials that are to be permanently incorporated into the project.
  - iii) Details of proposed methods of any special construction required.
  - iv) Purchase orders and subcontracts without prices.
  - v) Traffic control and staging plan.
  - vi) Such other information as the Engineer may request to insure compliance with contract documents.
  - vii) List of Subcontractors and Suppliers.

7) STANDARDS AND CODES

- a) Construct improvements with best present-day construction practices and equipment.
- b) Conform with and test in accordance with applicable sections of the following standards and codes.
  - i) American Association of State Highway and Transportation Officials (AASHTO).
  - ii) American Society for Testing and Materials (ASTM).
  - iii) Iowa Department of Transportation Standard Specifications (Iowa DOT).
  - iv) American National Standards Institute (ANSI).
  - v) American Water Works Association (AWWA).
  - vi) American Welding Society (AWS).
  - vii) Federal Specifications (FS).
  - viii) Iowa Occupational Safety and Health Act of 1972 (IOSHA).

- ix) Manual of Accident Prevention in Construction by Associated General Contractors of America, Inc. (AGC).
- x) Standards and Codes of the State of Iowa and the ordinances of the Owner.
- xi) Other standards and codes which may be applicable to acceptable standards of the industry for equipment, materials and installation under the contract.

#### 8) CONSTRUCTION GENERAL

- a) Procedures outlined herein are not intended to fully cover all special construction procedures but are offered as an aid to the Contractor in planning work.
- b) Contractor shall cooperate with the City of Evansdale and the Engineer to minimize inconvenience to property owners, other jurisdictions and motorists and to prevent delays in construction and interruption to continuous operation of utility services and site access.
- c) The Contractor is expected to provide adequate personnel and equipment to perform work within the specified time of construction.
- d) Contractor shall install and maintain orange safety fence around all open trenches or open structures when left unattended.
- e) Contractor shall complete surface restoration and clean up activities as construction progresses.

#### 9) EMPLOYMENT PRACTICES

- a) Neither the Contractor nor the Contractor's subcontractors shall employ any person whose physical or mental condition is such that their employment will endanger the health and safety of anyone employed on the Project.
- b) The Contractor shall not commit any of the following employment practices and agrees to include the following clauses in any subcontracts:
  - i) To discharge from employment or refuse to hire any individual because of sex, race, color, religion, national origin, sexual orientation, marital status, age, or disability unless such disability is related to job performance of such person or employee.
  - ii) To discriminate against any individual in terms, conditions, or privileges or employment because of sex, race, color, religion, national origin, sexual orientation, marital status, age, or disability unless such disability is related to job performance of such person or employee.

#### 10) RESPONSIBILITY OF CONTRACTOR

- a) Contractor shall provide supervision of the work.
- b) Contractor shall provide protection of all property from injury or loss resulting from construction operations.
- c) Contractor shall replace or repair objects sustaining any such damage, injury, or loss, to the satisfaction of Owner and Engineer.
- d) Contractor shall cooperate with Owner, Engineer, and representatives of utilities in locating underground utility lines and structures. Incorrect, inaccurate, or inadequate information concerning location of utilities or structures shall not relieve the Contractor of responsibility for damage thereto caused by construction operations.
- e) Contractor shall keep cleanup current with construction operations.

- f) Contractor shall comply with all Federal, State of Iowa, and local laws and ordinances.

11) WORK HOURS/COMMUNITY EVENTS

- a) The Contractor will be required to limit work hours on the Project from 7:00 a.m. to 7:00 p.m., Monday through Saturday, unless otherwise directed by the Engineer.
- b) The following Community Events are scheduled. Contractor is required to coordinate with the Owner as needed to allow use of public property as necessary for the event. If contract continues for multiple years, event is still in force even though dates and locations may change.
  - i) None

12) CONSTRUCTION FACILITIES

- a) Contractor shall provide telephone numbers where Contractor's representative can be reached during work days and on nights and weekends in event of emergency.
- b) Contractor shall provide and maintain suitable sanitary facilities for construction personnel for duration of work; remove upon completion of work.
- c) Contractor shall not store construction equipment, employee vehicles, or materials on streets open to traffic.
- d) Contractor shall provide suitable storage facilities necessary for proper storage of materials and equipment. Location for storage of equipment by Contractor is subject to approval of Engineer.
- e) Contractor will be required to make arrangements for all services required during the construction period and pay for such services at no additional cost to the Owner.

13) PROJECT SUPERVISION

- a) The Contractor shall be represented in person at the construction site at all times that construction operations are proceeding. Representation constitutes a qualified superintendent or other designated, qualified representative capable of providing adequate supervision. The representative must be duly authorized to receive and execute instructions, notices, and written orders from the Engineer.
- b) Resolution of issues that arise during construction relating to traffic control, construction staging, etc. is the responsibility of the Contractor.
- c) Weekly progress meetings, if specified at the preconstruction conference may be held at the project site to review project schedule, coordinate activities, resolve conflicts, and coordinate the construction work. The day and time for this meeting will be set at the preconstruction conference. The Contractor shall provide qualified representation at each meeting.
- d) Refer to Division 1 – General Provisions and Covenants, Section 1080 – Contractual Provisions, Part 1 – Prosecution and Progress of the Work, Section 1.10 Contractors Employees, Methods and Equipment for additional requirements.
- e) Contractor shall provide supervision of all sub-contractors and their personnel while on the site.

14) COORDINATION WITH OTHERS

- a) Contractor shall cooperate and coordinate construction with the Owner, utility companies, affected property owners, and other contractors working in vicinity of this project.

- b) It is the Contractor's responsibility to schedule and coordinate work to minimize construction delays and conflicts.
- c) Contractor shall cooperate and coordinate with property owners prior to beginning work that will affect their parcel.

15) CONSTRUCTION LIMITS

- a) Contractor shall confine the construction operations within the construction limits shown on the plans.
- b) Contractor shall not store equipment, vehicles, or materials within the right-of-way of any streets open to traffic or on temporary access roads at any time.
- c) Areas disturbed outside of construction limits shall be restored at the contractor's expense to the satisfaction of the Jurisdiction.
- d) Contractor shall protect trees, fences, and landscaping within the construction limits not marked for removal.
- e) All work on this project will be within City Right-of-Way, Easements or Public Property.

16) DELIVERY SCHEDULE

- a) The Contractor will prepare and submit to the Engineer a delivery schedule that will assure the completion of the project within the time specified within the Contract.
- b) Adequate equipment and forces shall be made available by the Contractor to start work immediately upon receipt of the Notice to Proceed.
- c) Contractor shall periodically update it as needed due to changes in progress of construction from original schedule or as requested by the Engineer. Updates shall be completed within one week of request.
- d) The Contractor shall be required to meet the final completion date as specified in the written Notice to Proceed.
- e) Contractor shall notify the City and property owners at least 48 hours prior to any street closures.
  - i) Notification shall be provided by written notice placed on the front door. The following items shall be included within the notice:
    - (a) The street name, location and proposed date of street closure
    - (b) The estimated schedule for completion of work
    - (c) The estimated date for reopening of the street
    - (d) Procedure for garbage collection recycling and postal service

17) CONSTRUCTION PHASING

- a) Contractor shall refer to construction staging and traffic control plans when included in construction plans.
- b) Contractor shall include construction phasing on the required construction schedule submittal.

18) EXISTING UTILITIES

- a) Location of utility lines, mains, cables, and appurtenances shown on plans are from information provided by utility companies and records of the Owner.

- b) Prior to construction, Contractor shall contact all utility companies and have all utility lines and services located. The Contractor is responsible for locating utilities in order to confirm their locations ahead of the work.
- c) The Contractor is solely responsible for damage to utilities or private or public property due to utility disruption.
- d) The Contractor shall notify utility company immediately if utility infrastructure is damaged during construction.
- e) The Contractor shall support and protect all utilities that are not moved.
- f) Utility services are not generally shown on plans; protect and maintain services during construction. Notify Jurisdiction and affected property Jurisdictions 48 hours prior to any planned utility service interruptions.
- g) If private utility work occurs within/adjacent to the site during the construction period, Contractor shall coordinate work schedules with the Engineer.
- h) Existing utilities shall remain in substantially continuous operation during construction. Contractor shall select the order and methods of construction that will not interfere with the operation of the utility systems. Interrupt utility services only with approval of Jurisdiction and Engineer.
- i) No claims for additional compensation or time extensions will be allowed to the Contractor for interference or delay caused by utility companies.

19) TRAFFIC CONTROL

- a) Contractor shall furnish, erect, and maintain traffic control devices including signs, barrels, cones, and barricades to direct traffic and separate traffic from work areas. Traffic control shall be in place prior to the closing of any streets.
- b) Contractor shall provide traffic control devices in accordance with the Iowa DOT Standard Specification, Section 2528, Traffic Control, and the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).
- c) Adjustments to the traffic control or the addition of flaggers will be required if, in the opinion of the Engineer, undue traffic congestion occurs.
- d) Contractor shall provide continuous access for police, fire, and other emergency vehicles.
- e) Contractor shall notify the Engineer in writing at least 72 hours prior to the start of any construction operation that will necessitate land closure or internal traffic control signing.

20) INCIDENTAL CONTRACT ITEMS

- a) The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid in the absence of a specific quote item for the work. These costs shall be included in the Unit Price quote for the individual items associated with the stated specific item or work effort. Such items of work include, but are not limited to:

- Construction and removal of temporary access roads
- Construction fencing
- Construction staging & phasing
- Coordination and cooperation with affected property owners
- Coordination and cooperation with the City of Evansdale
- Coordination and cooperation with other Contractors
- Coordination and cooperation with other projects in the area
- Coordination and cooperation with utility companies

Field testing  
Monitoring weather conditions  
Protection of existing trees and plantings not shown as removals  
Protection of existing utilities and light poles  
Removing and reinstalling existing signs  
Site cleanup/restoration  
Temporary safety closures

**\*\*\*\*END OF SECTION\*\*\*\***

## SECTION 16050 - COMMON WORK RESULTS FOR ELECTRICAL

### PART 1 GENERAL

#### 1.1 SECTION SUMMARY

- A. Section Includes, but not limited to:
  - 1. General Requirements for Electrical
  - 2. Equipment and Materials
  - 3. General Workmanship and Installation Requirements for Electrical.

#### 1.2 RELATED SECTIONS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 0 and Division 01 Specification Sections apply to this Section.
- B. Division 16: Electrical
- C. Where a Specification Section refers to other Sections under the Article on Related Sections, this is done for Contractor's convenience only. It shall in no way relieve the Contractor of responsibilities stated in other Sections of the Specifications, even though these Sections are not specifically referenced. The Contractor is responsible for all information contained in this Division's Specifications as well as for information contained in all other Divisions.

#### 1.3 REGULATORY REQUIREMENTS

- A. Meet or exceed all current applicable codes, ordinances and regulations for all installations. Promptly notify the Engineer, in writing, if the contract documents appear to conflict with governing codes and regulations. Contractor assumes all responsibility and costs for correcting non-complying work installed without notifying the Engineer.
- B. Higher quality of workmanship and materials indicated in the Contract Documents takes precedence over that allowed in referenced codes and standards.
- C. Perform all work in compliance with the currently adopted version of the following codes and standards for this project:
  - 1. Energy Codes and Standards:
    - a. International Energy Conservation Code (IECC)
    - b. Illuminating Engineering Society of North America (IESNA)
    - c. American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE 90.1)
  - 2. International Code Council:
    - a. International Building Code (IBC)
    - b. International Fire Code (IFC)
  - 3. National Fire Protection Association Codes and Standards:
    - a. NFPA 70 - National Electrical Code
    - b. NFPA 72 - Fire Alarm Code
    - c. NFPA 101 - Life Safety Code
  - 4. National Electrical Safety Code (ANSI C2)
  - 5. City, State and Local Building Codes and Ordinances
  - 6. City, State and Local Fire Codes and Regulations

7. Occupational Safety and Health Administration Regulations (OSHA)
8. Americans with Disabilities Act (ADA)
9. Uniform Federal Accessibility Standards
10. State Department of Health Codes and Regulations
11. Testing Agencies:
  - a. Underwriters Laboratory
  - b. Intertek ETL

#### 1.4 REFERENCES

- A. Use the Standard where referenced in the specifications by the following abbreviations:
  1. ANSI American National Standards Institute:
    - a. C2 - National Electrical Safety Code.
    - b. C62.41-IEEE - Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.
  2. ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers
  3. CBM – Certified Ballast Manufacturer
  4. EPA-Environmental Protection Agency
  5. ETL – Electrical Testing Laboratory
  6. ICEA - Insulated Cable Engineers Association:
    - a. S-95-658 - Thermoplastic-Insulated Wire and Cable.
    - b. S-65-375 - Rubber-Insulated Wire and Cable.
  7. IEEE Institute of Electrical and Electronic Engineers:
    - a. 112 - Standard Test Procedure for Polyphase Induction Motors and Generators.
    - b. 519 - Recommended Practices and Requirements for Harmonic Control In Electric Power Systems.
  8. IES - Illuminating Engineering Society
  9. LPI - Lightning Protection Institute:
    - a. LPI175 - Lightning Protection System Installation Standard.
  10. NBFU - National Board of Fire Underwriters
  11. NECA – National Electrical Contractor’s Association:
    - a. NECA 1 - Standard Practices for Good Workmanship In Electrical Contracting.
  12. NEC - National Electrical Code
  13. NECA – National Electrical Contractors Association:
    - a. NECA 101 – Standard for Installing Steel Conduit (Rigid, IMC, EMT)
    - b. NECA 102 – Standard for Installing Aluminum Rigid Metal Conduit.
    - c. NECA 111 – Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC).
  14. NEMA National Electrical Manufacturers Association:
    - a. TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
    - b. MG 1 - Motors and Generators.

- c. PB 2 - Deadfront Distribution Switchboards.
  - d. ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2,000 Volts AC or 750 Volts DC.
  - e. 250 - Enclosures for Electrical Equipment (1,000 Volts Maximum).
  - f. WC 5 - (See ICEA S-95-658).
  - g. WC 7 - (See ICEA S-95-658).
15. NESC – National Electric Safety Code
16. NFPA National Fire Protection Association
17. OSHA Occupational Safety and Health Administration:
- a. 29 CFR 1910 - Occupational Safety and Health Standards.
18. UL Underwriters' Laboratories, Inc.:
- a. UL-6 - Rigid Metal Conduit.
  - b. UL-83 - Thermoplastic - Insulated Wires and Cables.
  - c. UL-96 - Lightning Protection Components.
  - d. UL-360 - Liquid-Tight Flexible Steel Conduit.
  - e. UL-467 - Electrical Grounding and Bonding Equipment.
  - f. UL 486D - Insulated Wire Connector Systems for Underground Use or In Damp or Wet Locations.
  - g. UL-508 - Industrial Control Equipment.
  - h. UL-651 - Schedule 40 and 80 Rigid PVC Conduit.
  - i. UL-797 - Electrical Metallic Tubing.
  - j. UL-810 - Capacitors.
  - k. UL-891 - Dead-Front Switchboards.
  - l. UL-913 - Intrinsically Safe Apparatus and Associated Apparatus for Use In Class I, II, and III, Division 1, Hazardous (Classified) Locations.
  - m. UL-935 - Fluorescent-Lamp Ballasts.
  - n. UL-1008 - Transfer Switch Equipment.
  - o. UL-1012 - Power Units Other Than Class 2.
  - p. UL-1029 - High-Intensity-Discharge Lamp Ballasts.
  - q. UL-1277 - Electrical Power and Control Tray Cables With Optional Optical Fiber Members
  - r. UL-1449 - Surge Protection Devices
  - s. UL-1479 - Fire Tests of Through-Penetration Firestops.
  - t. UL-1572 - High Intensity Discharge Lighting Fixtures.

## 1.5 DEFINITIONS

A. The terms defined below apply to all work included in Division 16.

1. The work – The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

2. Furnish – to obtain in new condition ready for installation into the work.
  3. Install – to store, set in place, connect and place into operation into the work.
  4. Provide – to furnish and install.
  5. Connect – to bring service to the equipment and make final attachment including necessary switches, outlets, boxes, terminations, etc.
  6. Conduit – includes in addition to conduit, all fittings, pull boxes, hangers and other supports and accessories related to such conduit.
  7. Concealed – hidden from sight in chases, furred spaces, shafts, hung ceilings, embedded in construction, in crawl spaces or buried.
  8. Exposed: not installed underground nor concealed as defined above.
  9. Building structure or building structural members - consists of steel columns, steel beams, steel joists (top chord and at panel points), concrete walls and concrete block walls. Metal decking, joist bridging and bottom chords of bar joists shall not be construed as building structure nor as a building structural member for the purpose of support.
- B. The drawing and specifications constitute the Contract Documents. Any item noted in the specification or shown on the drawings is included in the Contract Documents.
- C. All electrical details and drawings are diagrammatic, unless specifically noted. Field-verify all dimensions and notify the Engineer of any conflicts of discrepancies, in writing, prior to installation.

## 1.6 QUALITY ASSURANCE

### A. Regulatory Requirements:

1. Initiate, maintain and supervise all safety precautions required with this work in accordance with the regulations of the Occupational Safety and Health Administration (OSHA) and other governing agencies.

### B. Environmental Requirements:

1. Do not remove or disturb any asbestos containing materials from the project. Immediately stop work and notify the Owner if asbestos containing materials are suspected.
2. Do not dispose of any PCB containing materials. Disposal of all PCB containing materials will be the responsibility of the Owner.

### C. Provide new, first quality material for all products specified. Do not reuse materials unless indicated or approved by the Engineer.

### D. Contractor shall have knowledge of latest edition of NFPA 70 (NEC) and additional governing codes. In addition to the work shown in the Contract Documents, Contractor shall provide all work to comply with these references. Additional services will not be awarded for Contractor to perform work to satisfy the AHJ inspection comments. All work is to be included in Base Bid.

### E. Provide equipment specified in this section that has been listed and labeled by a nationally recognized testing laboratory.

### F. Comply with ANSI as applicable to equipment specified in this section.

### G. Comply with NEMA as applicable to equipment specified in this section.

## 1.7 PROJECT/SITE CONDITIONS

### A. Site Inspections:

1. Before submitting a proposal on the work contemplated, examine the site of the proposed work and become thoroughly familiar with existing conditions and limitations. No extra compensation will be

allowed because of misunderstanding as to the amount of work involved nor bidders lack of knowledge of existing conditions which could have been discovered or reasonably anticipated prior to bidding.

2. Conduits, pipes, ducts, lights, devices, speakers, etc., shown on the drawings as existing have been based on existing plans and casual site observations, and may not be installed as originally shown. It is the Contractor's responsibility to visit the site and make exact determination of the existence, location and condition of such facilities prior to submitting a bid.

B. Correlation of Work:

1. Consult the drawings and specifications of all other Divisions for correlating information and lay out work so that it will coordinate with other trades. Verify dimensions and conditions (i.e., finished ceiling heights, footing and foundation elevations, beam depths, etc.) with the Architectural and Structural drawings. Notify the Architect/Engineer of any conflicts that cannot be resolved, in the field, by affected trades. Replacement of work due to lack of coordination and failure to verify existing conditions will be completed at no cost to the Owner.
2. Install all conduit, cable tray, busduct, equipment, etc. allowing proper code and maintenance clearances and to avoid blocking passageways and access panels.
3. Where work must be replaced due to the failure of the Contractor to verify the conditions existing on the job, such replacement must be accomplished at no cost to the Owner. This applies to shop fabricated work as well as to work fabricated in place.
4. Throughout the course of the work, minor changes and adjustments to the installation may be requested by the Engineer. The Contractor shall make adjustments without additional cost to the Owner, where such adjustments are necessary to the proper installation and operation within the intent of the Contract Documents. This does not include work already completed.
5. Obtain exact location of connection to equipment, furnished by others, from the person furnishing the equipment.
6. Include the better quality, greater quantity or higher cost for an item or arrangement where a disagreement exists in the drawings and specifications.

- C. The Contract Documents shall govern in the instances where requirements indicated are greater than those stated in the governing codes and standards.

1.8 FIRESTOPPING

- A. Provide firestopping around all new penetrations, sleeves and openings through all partitions, walls and floors.
- B. Provide UL listed components installed by a certified and factory trained personnel.

1.9 SEQUENCING AND SCHEDULING

- A. Refer to General Conditions and Requirements.

1.10 EQUIPMENT INSTRUCTIONS AND PARTS LITERATURE

- A. Instruction and parts literature are generally packed with electrical equipment and devices. Contractor shall remove this literature from the packing container or equipment enclosure, identify the literature with the equipment to which it applies, and file the literature in loose-leaf binders with index tabs. Each binder shall have an index which lists each piece of equipment and the literature which applies to it. An index tab shall be provided for each piece of equipment.
- B. Contractor shall establish a procedure with the other trades for receiving, identifying, and filing literature for devices which are removed from their packaging and installed by other trades.

1.11 SUBMITTALS

- A. Submit the following items consistent with Division 0 and Division 1. Refer to each Section under Division 16 for additional submittal requirements particular to that Section.
- B. Prior Approvals:
  - 1. Submit approval form for each request for prior approval.
  - 2. Submit hard copy, bound, written requests to use unspecified items, to the Engineer, no later than ten (10) calendar days prior to the bid opening. Submit detailed information for proposed material or equipment specific to the project, clearly indicating all options included in the submittal.
  - 3. Accepted substitutions will be incorporated in an Addendum to the Contract Documents.
  - 4. Contractor is responsible for dimensional differences, electrical requirements and any other resulting changes, when using accepted substitutions. Contractor is responsible for any additional costs incurred as a result of substitutions, including other contractors and Architect/Engineer fees.
  - 5. Material and equipment not specified or accepted in an Addendum will be removed and replaced at no cost or inconvenience to the Owner.
- C. Work Scope Change:
  - 1. If a work scope change is requested and Contractor would like to be awarded additional compensation or a deduct from original contract is requested, Contractor shall provide a schedule of values for all associated proposed work.
    - a. Schedule of values shall include all proposed material, labor and other associated costs. Provide a final lump sum number for all work associated with the change and individual pricing for each item on the schedule of values.
    - b. Engineer may request additional breakdown for improved clarity and Contractor must comply prior approval for the additional compensation or credit.
  - 2. Contractor shall provide actual manufacturer and distributor invoices showing cost of work affected by the work scope change upon request of Engineer and/or Owner representative.
  - 3. Contractor is solely responsible for delay's in schedule where Contractor is required to resubmit documentation, revise requested documentation or provide additional information associated to gaining approval for the work scope change.
- D. Shop Drawings and Manufacturer's Information:
  - 1. Submit in accordance with the Division 0 and Division 1. Unless noted otherwise, submit drawings to the Engineer for review within 30 calendar days after award of Contract.
  - 2. Provide separately-bound documents for each submittal for each section. Combination submittals will be returned to the Contractor without review and count as 1 submittal. Do not combine submittals from multiple sections.
  - 3. Include project name, name of Architect, name of Engineer, contractor, sub-contractor, manufacturer, supplier and sales representative, include name, address, and phone number for the sales representative. Clearly identify section number and description of equipment submitted. Shop drawings not including all of this information will be returned without review, and count as 1 submittal.
  - 4. Examine all shop drawings noting capacity, arrangement and physical dimensions. Clearly mark all relevant items on catalog data and cross-out unrelated information.
  - 5. Submittals for equipment provided by the Electrical Contractor shall bear a stamp or specific written certification from the Electrical Contractor, certifying the submittals have been reviewed and approved by the submitting Electrical Contractor.
  - 6. Provide the following shop drawing and manufacturer information:
    - a. Product Data Sheets :

1. Product and component data sheets which describe all equipment and devices to be provided.
  2. Include all features specified.
  3. Provide dimensioned prints with weights.
  4. Highlight or otherwise accentuate on each data sheet the specified product features and product numbers.
  5. Features or part numbers which do not apply shall be struck through, crossed out, blacked out, or otherwise identified as not applicable.
- b. Composite Drawing:
1. Include power and control wiring for all systems and equipment.
  2. Show basic systems on composite drawing.
  3. Use terminal numbers on drawings and schematics.
  4. Use separate drawings to show details of sub-systems.
  5. Identify sub-system drawing interface points on composite drawing and sub-system drawings; terminal numbers of interface points shall be the same on both drawings.
  6. Revise or redraw manufacturer's standard drawings to meet above requirements.
- c. Record all Changes to Existing Systems:
1. Revise all wiring diagrams and schematic diagrams to show final installation:
    - a. Includes all new and existing equipment diagrams.
- d. Programmable Systems:
1. Description of programmable system operation, including but not limited to input/output functions, control capabilities, configuration procedures, starting setpoints, etc.
  2. Preliminary graphic screens and reports.
    - a. This submittal shall occur prior to shipment of the system.
- e. Manufacturers Installation Instructions:
1. Include with shipment.
7. If the Engineer rejects (Make corrections noted/Submit corrected copy, Rejected/Submit specified item) two (2) times for material under the same section the Engineer will be compensated for the additional reviews. Compensation will be incorporated by Change Order and deducted from the Contractor's application for payment. Contractor is solely responsible for any project delays caused by having to resubmit submittals.
- E. Operating and Maintenance Manuals:
1. Include all the information provided with the approved shop drawings and manufacturer's information.
    - a. Update and complete control system drawings and descriptions for all equipment.
    - b. All documentation shall include modifications made which reflect the final installation.
    - c. Provide all completed testing reports.
  2. Date the manuals with the day, month, and year they are provided to the Owner/Engineer.
  3. Provide manufacturers' user manuals and installation instructions.

4. Provide 3 hard (paper) copies in a 3-ring binder. Provide a table of contents and each piece of equipment or sub-system shall be tabbed.
  5. Provide 2 digital copies in a PDF format saved to a compact disk or USB drive. The saved files shall be clearly identified and organized in a similar manner to the hard copies
    - a. Data saved on the disks shall be accessible and neatly organized.
    - b. Provide a table of contents which utilizes bookmarks and links. The links shall take the reader to a specific page when the reader clicks on the desired title in the table of contents. A link shall be provided for materials associated with each piece of equipment included in the O&M manual.
  6. Record all Changes to Existing Systems
  7. Insert revised documents into the Owner's existing operation and maintenance manuals in place of original documents, if such O&M's exist.
- F. Record Documents:
1. Provide three sets of hard copy record documents and two digital pdf copy. Record Drawings shall be of the same size as the original published contract drawings.
  2. Shall be provided with the O&M's.
  3. Record drawings shall include all work scope changes, including addenda.
  4. Record drawings shall show locations of all above ceiling control devices, such as relays, contacts, control modules, monitor modules, power packs, fire/smoke detection equipment, etc.
  5. Refer to Division 0 and Division 1 for additional Record Drawing requirements.

## **PART 2 PRODUCTS**

### **2.1 EQUIPMENT AND MATERIALS**

- A. All electrical and control equipment and materials shall be provided as specified in the Contract Documents.
- B. All equipment and materials shall be new and shall bear the Underwriters Laboratories (UL) label if such products are listed by UL.
- C. Where applicable, equipment and materials shall conform to ANSI, ICEA, IEEE, and NEMA Standards.

### **2.2 HAZARDOUS LOCATIONS**

- A. An area identified where fire or explosion hazards may exist due to flammable gases, flammable liquid-produced vapors, combustible liquid-produced vapors, combustible dusts or ignitable fibers/flyings.
- B. Installations in areas identified as hazardous locations, at a minimum meet the requirements of the latest edition of the National Electrical Code (NFPA 70). Where specifications are more conservative than the National Electrical Code requirements, the specification shall be followed.
- C. Refer to drawings for hazardous location identification.

## **PART 3 EXECUTION**

### **3.1 CONSTRUCTION LIGHTING & POWER SYSTEM - REMODELING**

- A. Provide construction power and lighting that adheres to the NEC Article 590 – “Temporary Installations”
- B. Refer to Division 1 for temporary electrical services.
- C. For remodeling work in the existing building, use existing building distribution systems for construction power.

- D. Replace all receptacles, switches, coverplates, etc., damaged by any Contractor during the course of construction.
- E. Materials furnished for the temporary light and power system remain Contractor's property. Remove when there is no longer any need for temporary light and power or when directed by the Architect.
- F. Electrical energy costs shall be paid by the Owner.

### 3.2 PREPARATION

#### A. Continuity of Service:

1. No Division 16 systems are to remain inactive at the end of the workday. Assure that the systems are all operational at the end of each workday. Coordinate temporary outages with the Owner.
2. Coordinate/schedule all work with the Owner to minimize any disruptions. Confine all interruptions to the smallest possible area. Provide temporary connections if required to provide continuity of service.
3. Inspect all areas affected by the interruptions and return all automatically controlled equipment, electrically operated equipment to the same operating condition prior to the interruption.

#### B. Use of Facility:

1. Do not disturb normal use of the facility, except within the immediate construction area. Keep walks, driveways, entrances, etc. free and clear of equipment, material and debris.
2. Store all equipment and material in a place and manner that minimizes congestion and is approved by the Owner.

### 3.3 INSTALLATION

#### A. Material and Workmanship

1. Provide new material and equipment, unless noted otherwise. Protect equipment and material from damage, dirt and the weather.
2. Provide the highest quality workmanship and perform all work only by skilled mechanics. Install material and equipment in accordance with manufacturers' recommendations, instructions and current NECA standards.
3. The Engineer reserves the right to reject material or workmanship not in accordance with the specifications, before or after installation.
4. Engineer and Owner have the right to determine if equipment, boxes and covers are not accessible. Where electrical work is determined to be not accessible, Contractor shall modify the work as directed at no additional cost to the Owner.

#### B. Excavation and Backfilling:

1. Conform with the provisions of Division 2 - Sitework for additional requirements for all site work.
2. Provide all excavation and backfilling required to complete the installation of the electrical system.
3. Bed all conduit and structures on a 6" thick compacted layer of granular material. Should unsatisfactory soil conditions be discovered, the Engineer/Architect will inspect the excavation and determine the necessary additional support required.
4. Backfill around conduit and structures by hand using coarse sand, pit run gravel or the native material if it is similar to the above. Remove all large stones, frozen lumps, perishable rubbish and excessive amounts of clay. Carefully compact this material in 6" layers to a depth of 8" above the conduit, cable or duct. Compact to not less than 90% outside the building and 95% within the building limits of maximum density given by ASTM D698-70T (Standard Proctor Density). Architect/Engineer reserves the right to require soil compaction tests in any areas which do not appear to be compacted properly with the cost of the test paid by the Contractor.

5. Replace all existing surface improvements (i.e.,-street pavement, curbs, sidewalks, finish sodding, etc.) removed or damaged in the course of the work unless such improvements are to be reconstructed under the general contract. Make all necessary arrangements to perform such repairs, pay all costs in connection therewith and include them in the bid.

C. Cutting and Patching:

1. Perform all cutting and patching necessary to work, unless specifically delegated to be performed under a different Division.
2. Obtain special permission from the Engineer before cutting structural members or finished material.
3. Perform all patching in a manner as to leave no visible trace and return the area affected to the condition of undisturbed work. Perform all patching by workers experienced, skilled, and licensed for the particular type of work involved. Inferior work will not be accepted.
4. Patch all holes left as a result of demolition of electrical equipment and devices.
5. Drill all holes in masonry with rotary drill. Impact tools are not allowed. Core drill all holes in masonry and concrete for electrical raceway. Provide and dispose of all water required for core drilling. Coordinate with other trades to prevent damage from water.
6. Prevent the spread of dust, debris, and other material into adjacent areas.
7. Replace all ceiling tiles damaged during installation of work, with new tile.

D. Coordination:

1. Coordinate the location of all outlets and associated equipment with architectural and mechanical systems before installation. Work which must be replaced due to the failure of the Contractor to verify the job conditions and coordinate with other disciplines shall be completed at no additional cost to the Owner.
2. Coordinate all door swings in the field before locating devices.
3. Coordinate all equipment dimensions before submitting equipment. This includes all shop fabricated work as well as work fabricated in place. It shall be assumed that equipment submitted has been coordinated by Contractor and the submission indicates Contractor verifies equipment will fit in allocated location space. If Contractor believes there is or finds a workspace issue, Contractor shall notify Engineer prior to submitting equipment. Replacement or modification of equipment and/or space due to lack of coordination and failure to verify existing conditions shall be completed by Contractor at no additional cost to the Owner.
4. Contractor shall be responsible for obtaining exact location of connection to equipment furnished by others, from the person furnishing the equipment.
5. Contractor is responsible for coordinating elevator equipment ratings with the elevator equipment supplier. Incorrect equipment installation due to failure to coordinate equipment ratings shall be replaced by Contractor at no additional cost to Owner.
6. If conduit, wiring or equipment cannot be installed as specified, including but not limited to installing concealed or in designed space, Contractor shall notify Engineer with ample time to review the request before Contractor purchases and/or installs such equipment. Owner and Engineer can not be held responsible for delays in project for Contractor failure to provide ample notice to review and respond to the potential issue.

### 3.4 RECEIVING AND STORING EQUIPMENT

- A. All equipment shall be handled and stored in accordance with the manufacturer's instructions.
- B. In general, equipment packaging is not designed to protect the contents for outdoor storage. As a minimum, Contractor shall store the equipment prior to installation in a clean, dry location free from excessive temperatures, humidity, or foreign materials normally encountered at a Site. If the storage

facility is unheated, Contractor shall provide heating to protect equipment from condensation, which could cause components to corrode or to be otherwise damaged.

### 3.5 EQUIPMENT MOUNTING

- A. Unless noted otherwise, equipment which is not free-standing shall not be mounted on wood panels, but shall be attached to concrete or masonry walls, support channels, or building structural steel.

### 3.6 FIELD QUALITY CONTROL

#### A. Final Observation:

- 1. A final inspection of the electrical systems will be required before the Contract can be closed out. Request a final inspection by the Engineer after all systems are fully completed and operational. The Engineer will schedule an observation and generate a list of items to be corrected or completed before Contract Closeout. If the Contractor notifies the Engineer the work is ready for final observation, final evaluation of control systems, or commissioning exercise by the Contractor, and the Engineer finds the work is not complete enough to perform that observation, the Contractor will compensate the Engineer for his time. The Contractor will then perform the necessary work to complete the project and again request a Final Observation.

### 3.7 CLEAN UP

- A. Keep the premises free from accumulation of waste material or rubbish, caused by his employees or work, at all times. Remove rubbish, tools, scaffolding, and surplus materials from and about the building, and leave work areas "broom clean" or its equivalent upon completion of the work. Clean electrical equipment and remove temporary identification. In case of dispute the Owner will remove the rubbish and charge the cost to the Contractor.
- B. After tests have been made and accepted clean light fixtures, panels and other equipment installed by the Contractor, leaving the entire work area in a clean and complete working order.

### 3.8 PROTECTION

- A. Cover openings and equipment, where set, to prevent obstruction to conduits, breakage, misuse, or disfigurement of equipment. Cover openings in equipment immediately upon uncrating or receipt at the job site and keep covered until permanent connection is made.
- B. Contractor is responsible for any damage to electrical equipment or materials until final acceptance of the entire project by the Owner. Keep all equipment clean materials until final acceptance of the entire project by the Owner.
- C. If a portion of the project is to be occupied by the Owner prior to Substantial Completion of the entire project make arrangements with the Owner to transfer responsibilities for protection and housekeeping.

\*\*\*\*END OF SECTION\*\*\*\*

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## SECTION 16051 - SELECTIVE ELECTRICAL DEMOLITION

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. This Section includes all labor, material, equipment and services necessary and incidental to complete all the selective and or complete demolition and removal of electrical systems in the areas of remodeling or affected by remodeling, and the rework and extension of electrical systems indirectly affected by electrical system served “downstream” from the demolished electrical systems.

#### 1.2 REFERENCES

- A. Sections 16050 and all references contained therein form a part of this Section of the Specifications.

### PART 2 PRODUCTS

#### 2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work: As specified in individual Sections.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Demolition Drawings are diagrammatic and based on casual field observation and existing record documents. Report discrepancies to Architect/Engineer before disturbing existing installation.
- B. Examine the building to determine actual conditions and extent of work prior to bidding the project. Refer any unclear details or conflicts to the Architect/Engineer for clarification prior to bidding the drawings.
- C. Refer to Mechanical, Plumbing and Architectural documents for additional demolition requirements which may be required to include in the bid.
- D. Verify that field measurements and circuiting arrangements are as shown on Drawings.
- E. Verify that abandoned wiring and equipment serve only abandoned facilities.
- F. Beginning of demolition means installer accepts existing conditions.

#### 3.2 PREPARATION

- A. Coordinate phasing of the demolition work with the construction sequence schedule.
- B. Coordinate utility service outages with Utility Company.
- C. Identify and provide new supporting means for existing electrical equipment such as low voltage cabling, conduits, boxes, pull boxes, conduit bodies, and conduit racks that will need additional support due to the demolition of the existing supports. This includes existing systems which are identified to require supports and become exposed when ceilings are removed.
- D. Contractor shall provide new supports for all existing electrical conduit, cabling, fixtures and devices which is not supported per the requirements of the NEC and becomes uncovered due to removal of ceilings or walls.
- E. Erect, and maintain temporary safeguards, including warning signs and lights and barricades for protection of the public, Owner, Contractor’s employees, and existing improvements to remain.

- F. Electrical Service and Process Controls:
  1. Maintain existing system throughout construction in service until new system is complete and ready for service.
  2. Disable system only to make switchovers and connections. Notify and obtain permission from Owner, Architect/Engineer at least 24 hours before partially or disabling system. Minimize outage duration.
  3. Make temporary connections to maintain service in areas adjacent to work area.
- G. Coordinate and sequence demolition so as not to cause shutdown of operation of surrounding areas.
- H. Conduct demolition to minimize interference with adjacent and areas.
- I. Contractor assumes responsibility if damage occurs to any and all devices to be reinstalled. If Contractor finds a damaged piece of equipment prior to demolition, Contractor shall note the equipment and notify the Owner's Representative and Engineer prior to removing the items. If Contractor does not provide the proper notification, Contractor will be held responsible for repairing or replacing the damaged equipment.

### 3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Owner reserves the right of first refusal to obtain material shown to be removed under this contract. Items not retained by the Owner become the property of the Contractor and must be removed from the premises and disposed at no additional costs to the Owner.
- A. Demolish and remove all electrical systems indicated for demolition. No portion of these systems may be abandoned in place.
- B. Demolish and extend existing electrical work under and this Section or as indicated on the Drawings. Remove devices, conduit, wire, boxes, and fastening devices to avoid any interference with new installation.
- C. Remove, relocate, and extend existing installations to accommodate new construction or to maintain systems downstream from demolished area.
- D. Provide supports for all existing electrical equipment that was supported previously by demolished walls, floors, ceiling or other structures. Provide new supports from structural members not slated for demolition, prior to any demolition.
- E. Remove abandoned wiring to source of supply.
- F. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit in walls, floors, or columns back to a point where patching can be adequately performed and patch surfaces.
- G. Disconnect and remove abandoned panelboards, control and distribution equipment.
- H. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- I. Repair adjacent construction and finishes damaged during demolition and extension work.
- J. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.
- K. If conductors are required to be removed and installed in existing raceways, install with new conductors.
- L. Dispose hazardous materials in accordance with State and Federal regulations.

- M. Seal all holes and openings left in walls, ceilings, or floors of hazardous and corrosive locations with appropriate sealing materials and fittings.

### 3.4 EXISTING PANELBOARDS

- A. Identify circuits in existing panel affected by the Work. Where additional circuits are needed, reuse circuits available for reuse. Reuse breakers if possible. Provide new breakers for new equipment unless breakers are specifically noted on the plans to be reused.
- B. Tag unused circuits as spare and turn breakers and/or switches off.
- C. Where existing circuits are indicated to be reused, use sensing measuring devices to verify circuits feeding project area is not in use.
- D. Remove existing wire no longer in use from panel to equipment.
- E. Clean out debris, dust and dirt from existing panelboards which are modified under this project.
- F. Provide updated panelboard schedules at the end of every work shift. Temporary panel schedules may be hand written and posted on or near the panelboard.
- G. Provide new updated machine typed directories in every panelboard modified under this project prior to substantial completion.

### 3.5 CLEANING AND REPAIR

- A. Prior to reinstallation of used equipment, thoroughly inspect each item and report any defects to the Engineer/Architect in writing. Instructions for corrective measures will be given at the time and the Contract amount adjusted accordingly. If no defects are reported, the material will be included under the contractor's one year guarantee.
- B. Equipment: Clean exposed surfaces and interior. Check tightness of electrical connections.
- C. Repair adjacent construction and finishes damaged during demolition and extension work.

### 3.6 INSTALLATION

- A. Install relocated materials and equipment as indicated on the drawings.

\*\*\*\*END OF SECTION\*\*\*\*

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## SECTION 16052 - SUPPORTING DEVICES

### PART 1 GENERAL

#### 1.1 SECTION SUMMARY

- A. Manufactured Supporting Devices.
- B. Fabricated Supporting Devices.
- C. Installation.

#### 1.2 DESCRIPTION OF WORK

- A. Types of supports, anchors, sleeves and seals specified in this section include the following:
  - 1. Clevis hangers
  - 2. Riser clamps
  - 3. C-clamps
  - 4. I-beam clamps
  - 5. One-hole conduit straps
  - 6. Two-hole conduit straps
  - 7. Round steel rods
  - 8. Expansion anchors
  - 9. Toggle bolts
  - 10. Wall and floor seals
- B. Supports, anchors and sleeves furnished as part of factory-fabricated equipment, are specified as part of equipment assembly in other Division 26 sections.

#### 1.3 QUALITY ASSURANCE

- A. Provide supporting devices, of types, sizes, and ratings required that are manufactured by firms regularly engaged in the manufacture of such devices.
- B. Comply with NEC as applicable to construction and installation of electrical supporting devices.
- C. Comply with applicable requirements of ANSI/NEMA std Pub No. FB 1, "Fittings and Supports for Conduit and Cable Assemblies".
- D. Comply with National Electrical Contractors Association's "Standard of Installation" pertaining to anchors, fasteners, hangers, supports and equipment mounting.
- E. Provide electrical components which are UL-listed and labeled.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURED SUPPORTING DEVICES

- A. Provide supporting devices; complying with manufacturer's standard materials, design and construction in accordance with published product information, and as required for a complete installation; and as herein specified. Where more than one type of device meets indicated requirements, selection is Installers' option.

- B. Provide supports and anchors constructed of stainless steel, PVC or equivalent corrosion resistant material in chemical storage rooms.
- C. Structural flat surfaces:
  - 1. Caddy snap close clamp with z shot-fire bracket; mechanical fastener appropriate for deck type; spring steel, snap close conduit opening, static load of 100lbs or greater;
    - a. Conduit Sizes: ½” – 1”
  - 2. Caddy bolt close clamp with z shot-fire bracket; mechanical fastener appropriate for deck type; spring steel, conduit strap with threaded openings and hex-head bolt, static load of 100lbs or greater;
    - a. Conduit Sizes: ½” – 1”
  - 3. One-hole conduit straps for supporting metal conduit; galvanized steel:
    - a. Conduit sizes: ½” & ¾”
  - 4. Two-hole conduit straps for supporting metal conduit; galvanized steel:
    - a. Conduit sizes: 1” and larger.
- D. Beam flange:
  - 1. Caddy clip for supporting conduit to beam flanges; spring steel, snap close conduit opening, static load of 75lbs or greater;
    - a. Conduit sizes: 1/2" & 3/4"
  - 2. Beam Clamp; steel; mechanical bolt fastener to beam; conduit strap with threaded holes and hex-head bolt.
    - a. Conduit sizes: 1/2" – 2”
  - 3. Right angle conduit clamp: cast iron hot dipped galvanized; U-bolt with treaded ends and hex-head nuts.
    - a. Conduit sizes: 2” – 4”
  - 4. One-hole conduit straps for supporting metal conduit; galvanized steel:
    - a. Conduit sizes: ½” & ¾”
  - 5. Two-hole conduit straps for supporting metal conduit; galvanized steel:
    - a. Conduit sizes: 1” and larger.
- E. Rod Type Hangers:
  - 1. Clevis type hangers; galvanized steel; with diameter hole for round steel rod.
  - 2. Rods galvanized steel; hexagon nuts on both ends of rod:
    - a. Conduit size 1/2"-1.5” : Minimum rod size 3/8”.
    - b. Conduit size 2” to 3.5” : Minimum rod size 1/2”.
    - c. Conduit size 4”-5” : Minimum rod size 5/8”.
  - 3. C-clamps for supporting rods to beam flanges; mechanical bolt fastener.
- F. Provide anchors of types, sizes and materials indicated; and having the following construction features:
  - 1. Expansion Anchors: 1/2”.
  - 2. Toggle Bolts: Springhead; 3/16" x 4”.

- G. Provide sleeves and seals, of types, sizes, and material indicated; having the following construction features:
1. Provide Schedule 40 galvanized steel pipe sleeves 1 1/2" larger than O.D. of pipe.
  2. Set all sleeves true to line, grade and position and plumb or level after concrete is poured. Correct any deviation from proper position.
  3. Provide minimum of three (3) concrete anchors for Schedule 40 pipe sleeves.
  4. Provide factory-assembled wall and floor seals. Provide watertight seals around conduit, pipe, or tubing passing through concrete below grad floors and wall. Construct with steel sleeves, malleable iron body, neoprene sealing grommets and rings, metal pressure rings, pressure clamps, and cap screws.
  5. Caulk spaces between pipe and floor sleeves inside the building with a waterproof caulking material. Caulk spaces between pipe and exterior partition sleeves with glass fiber insulation.
  6. Furnish sealable penetration pockets compatible with the building roofing system where conduits pass through the roof. Turn pockets over to the General Contractor.
  7. Provide fire barriers around conduit, pipe, tubing, bus ducts and cables passing through smoke and fire rated floors and walls. Provide CP 25, 303 and PSS7904 Series by 3M, or "Flame-Safe" system by Thomas and Betts Corp for fire seals.
  8. Subject to compliance with requirements, provide water-tight seals by Thunderline or pre-approved equal.
- H. Provide channel strut system for supporting electrical equipment, 16-gage hot dip galvanized steel, or types and sizes indicated; construct with 9/16" dia. holes, 8" o.c. on top surface, with standard green finish, and with the following fittings which mate and match with channel provided:
1. Fixture hangers
  2. Channel hangers
  3. End caps
  4. Beam Clamps
  5. Wiring stud
  6. Thinwall conduit clamps
  7. Rigid conduit clamps
  8. Conduit hangers
  9. U-bolts
- I. Roof supports
1. Cooper B-Line Dura-Blok or equal.

## 2.2 FABRICATED SUPPORTING DEVICES:

- A. Provide sleeves of one of the following:
1. Sheet-metal fabricated from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate from the following gages: 3" and smaller, 20 gage; 4" to 6", 16 gage; over 6", 14 gage. Sheet metal sleeves shall not be used for cable.
  2. Steel-Pipe fabricated from Schedule 40 galvanized steel pipe; remove burrs.
  3. Iron-Pipe fabricated from cast-iron or ductile-iron pipe; remove burrs.

- B. Provide fire barrier sleeve seals for sleeves located in floor and firewalls. Provide approved fire barrier material.

### **PART 3 EXECUTION**

#### **3.1 INSTALLATION OF SUPPORTING DEVICES**

- A. Install hanger, anchors and sleeves in accordance with manufacturer's written instructions and with recognized industry practices to ensure supporting devices comply with requirements of NECA, NEC and ANSI/NEMA. Extend sleeves 3/4" above floor surface.
- B. Coordinate with other electrical work, including raceway and wiring work, as necessary to interface installation of supporting devices with other work.
- C. Install hangers, supports, clamps and attachments to support piping properly from building structure. Support suspended conduit runs threaded rod and galvanized conduit hangers. Attach the hanger rod to concrete structural members with malleable iron inserts, to existing or precast concrete structural members with self-drilling anchors, to structural steel with steel "C" clamps, and to wood with suitable sized lag screws and angles. Support multiple parallel conduit runs on trapeze hangers constructed of steel rod hangers and structural channel. Include three (3) nuts jam-locked, on all threaded rod hangers, to rigidly support the conduit. Install supports with maximum spacings indicated.
- D. Support surface mounted conduit runs with galvanized pipe straps. Fasten pipe straps to masonry surfaces with self-drilling anchors or toggle bolts. Fasten pipe straps to wood or sheetmetal surfaces with pan head sheetmetal screws.
- E. Support wall mounted electrical equipment on 3/4" thick C-D exterior fir plywood painted with two (2) coats of ASA-49 gray enamel.
- F. Provide stainless steel screws where electrical equipment is mounted on or attached to fire treated plywood. Hold equipment away from the plywood with either plastic or stainless steel washers or spacers.
- G. Support all ceiling mounted receptacles with a listed tile bridge spanning the suspended ceiling grid, plus a 1/4" threaded rod anchored to a structurally sound member directly above the outlet box.
- H. Tighten sleeve seal nuts until sealing grommet have expanded to form water-tight seal.
- I. Provide finish of supporting devices in the chemical storage room as follows:
  - 1. Provide PVC-coated galvanized concrete inserts and pipe straps.
  - 2. Provide stainless steel for all bolts, nuts, washers, and screws.
  - 3. Provide PVC-coated individual hangers and trapeze hangers.
  - 4. Provide individual galvanized rods with two (2) coats of epoxy paints.

#### **3.2 ROOF SUPPORT FOR CONDUIT RACKS**

- A. Roof mounted conduits are to be avoided where at all possible. Contractor shall coordinate proposed roof mounted conduit routes with Engineer and Architect to verify other routes are not feasible prior to installation.
- B. Provide Dura-Blok rooftop supports at a minimum of 10' o.c. or per manufacturer's recommendations.

\*\*\*\*END OF SECTION\*\*\*\*

## SECTION 16110 - RACEWAYS, FITTING, AND BOXES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes
  - 1. Conduit.
  - 2. Conduit fittings.
  - 3. Conduit accessories
  - 4. Underground warning tape.
  - 5. Pull and junction boxes.
  - 6. Fire stop material.
  - 7. Execution/Installation.

#### 1.2 REFERENCES

- A. Division 2: Sitework
- B. Section 16050: Common Work Results for Electrical
- C. Section 16450: Grounding and Bonding for Electrical Systems
- D. Section 16052: Supporting Devices
- E. Section 16140: Wiring Devices

#### 1.3 SUBMITTALS

- A. Submit shop drawings and descriptive data in accordance with Section 16050 in addition to the requirements of this section.
- B. Precast concrete:
  - 1. Submit a coordinated set of shop drawings with the precast manufacturer, which indicates electrical box locations, cabinet locations and conduit routing locations.

### PART 2 PRODUCTS

#### 2.1 STEEL RIGID METAL CONDUIT (RMC) AND FITTINGS.

- A. Provide hot-dip galvanized or electro-galvanized (inside and outside) conduit having a bichromate finish conforming to UL standard UL-6.
- B. Provide zinc coated, threaded type fittings, couplings, and bushings.

#### 2.2 RIGID NON-METALLIC CONDUIT (RNMC) AND FITTINGS.

- A. Provide Schedule 40/80 polyvinyl chloride (PVC) rigid plastic conduit conforming to NEMA Specifications TC-2.
- B. Provide plastic fittings, couplings, and bushings per manufacturer's recommendations for rigid non-metallic conduit, designed for use with solvent cement.

#### 2.3 COPPER METAL CLAD (MC) CABLE

- A. Refer to Section 16120 – 600 Volt Conductors and Cables.

## 2.4 OUTLET AND JUNCTION BOXES

- A. Provide galvanized code gauge metal outlet and junction boxes with screw-on covers of type, shape and size listed for each application.
- B. Provide gasketed covers in damp and dusty locations, and also where required to meet the listed use (i.e. wet locations).
- C. Provide cast metal boxes (FS and FD) for all locations where IMC and RMC is required under Section 26 05 33.
- D. Provide 4" square minimum trade size square boxes for all outlet and junction boxes. Provide appropriate mudrings, tile rings or raised covers, depending on the application and allowable installation.
- E. Provide 3½" deep boxes where installed in masonry, including precast construction. Provide 2⅛" minimum deep boxes where installed in non-masonry locations. Shallower boxes (1½", 1¼") are allowed only at locations where the wall cavity depth does not permit deeper boxes to be installed concealed within the wall.
- F. Provide outlet boxes with green grounding pigtail pre-terminated to the interior of the box, to be used to ground the wiring device(s).
- G. Refer to other sections for additional outlet box requirements specific to other systems.
- H. Provide boxes with the appropriate size and quantity of conduit knock outs. Knock outs may be pulled or reamed out to larger sizes on most steel boxes.
- I. Approved steel box manufacturers:
  - 1. Raco
  - 2. Steel City
  - 3. Pre-approved equal
- J. Approved cast metal box manufacturers
  - 1. Appleton
  - 2. Crouse-Hinds
  - 3. Killark
  - 4. Bell
  - 5. Red Dot
  - 6. Pre-approved equal.

## 2.5 INTERIOR PULLBOXES

- A. Provide listed metal boxes with removeable screw-on covers.
- B. Boxes with a dimension larger than 12" shall have a covers attached with hinges and stainless steel screws located within 1/2 inch of each corner opposite the hinges and spaced not more than 12 inches apart.
- C. Size pullboxes to adhere to the NEC.
- D. Provide enclosures that have a NEMA rating that meet or exceed the environment in which they are installed.

- E. Approved manufacturers:
  - 1. Hoffman Enclosures
  - 2. Electro Mechanical Industries (EMI)
  - 3. American Midwest Power (AMP)
  - 4. Pre-approved equal.

## 2.6 UNDERGROUND WARNING TAPE

- A. 6 inches wide, 4-mil polyethylene film.
- B. Vivid, opaque, long-lasting red color with bold, black letters.
- C. Lettering
  - 1. Top line – “...CAUTION CAUTION CAUTION...”
  - 2. Bottom line – “...ELECTRIC LINE BURIED BELOW...”
- D. Approved Manufacturers:
  - 1. Seton Name Plate Corp. No. 210 ELE, EMED Co. Stock No. UT27737-6
  - 2. Approved Equal.

## 2.7 DUCT SEALING COMPOUND

- A. Soft, fibrous, slightly tacky, non-hardening, and easily applied by hand at all working temperatures.
- B. Clean and non-staining.
- C. J.M. Clipper Corp. Duxseal, O-Z/Gedney DUX, or equal.

## 2.8 CONDUIT SEALS

- A. Conduit seals shall be provided wherever conduits penetrate exterior concrete walls below grade, or cross hazardous location boundaries
  - 1. For conduits less than 60 inches below grade; OZ/Gedney Type FSK, or equal.
  - 2. For conduits more than 60 inches below grade; OZ/Gedney Type WSK, or equal.
  - 3. For Class 1 Division 1 or Division 2 hazardous location boundaries, conduits shall be sealed at the point where they leave the room. Fittings shall be "EYS," Appleton or Chico "X" Fiberdam and Apelco or Chico "A" compound, or approved equal.

## 2.9 WIREWAYS

- A. NEMA 12, minimum 14-gauge steel, ANSI 61 gray enamel finish inside and out over phosphatized surfaces.
- B. 14-gauge stainless steel for corrosive environments.
- C. Smooth, rounded edges on all sections and fittings.
- D. Hinge type with screw clamps which are galvanized or stainless steel.
- E. UL listed (UL-870).

## **PART 3 EXECUTION**

### 3.1 CONDUIT SIZES

- A. Conduit size shall be as shown on the Contract Documents or as required by the NFPA 70 with a minimum size of 3/4 inch, except that 1/2 inch may be used to connect to devices which have a knock-out or fitting for only 1/2-inch conduit and punching or reaming a larger knock out is not possible to increase it's size.
  - 1. Contractor shall gain prior approval from Engineer before installaing any 1/2" or smaller conduit.
- B. Verify conduit sizes indicated on the Contract Documents prior to installation. Provide proper size conduit based on the NEC maximum fill requirements, including any derating factors. Where conduit sizes are indicated on the plans, it is a minimum size allowed. It is the Contractor's responsibility to provide the proper conduit size, including any grounding conductors and flexible connections to equipment.
- C. Spare conduits shall be sized per noted in the Contract Documents. Where spare conduit sizes are not identified provide a minium size of 1.25".

### 3.2 INSTALLATION

- A. Installation of conduit shall meet the requirements of the NEC and the National Electrical Contractors Association (NECA) conduit installation standards. Where the documents may conflict, the requirements of the NEC take precedence.
- B. Install all line voltage (120, 208, 277 and 480 volts) conductors in a continuous raceway system.
  - 1. Circuits of different voltage systems shall be installed in separate raceways, unless specifically noted otherwise in the Contract Documents.
- C. Provide pull and junction boxes as required by the NEC and as site pulling requirements dictate.
- D. Conduits entering boxes and equipment from a flat surface shall be provided with an offset 3" from the box to allow the conduit to be fastened securely to the flat surface it is ran on.
- E. Do not route any conduits across rooftops, unless specifically allowed and noted on the plans to do so. Where conduits are allowed to be routed across rooftops, install conductors in Rigid Metal Conduit and provide proper derating of the conductor ampacities to account for the high ambient temperature as required in NEC. Mount conduit on roof blocks specifically designed for the intended environment.
- F. Support all trapezes and all above-ground conduits from the building structure.
- G. Route all horizontal raceway above water piping, where possible.
- H. Do not support conduit with wire, nylon ties, nor perforated pipe straps. Remove wire used for temporary supports.
- I. Do not attach conduit to ceiling support wires.
- J. Run all exposed conduit in a neat, workmanlike manner parallel to the building lines, tight to the wall and ceiling surfaces, and firmly support with conduit clamps or hangers.
- K. Do not run conduits in the following:
  - 1. Columns except to feed column mounted devices.
  - 2. Through structural slabs, beams, or columns, unless approved by the Structural Engineer.
  - 3. Concrete topping.
  - 4. Through the same penetrations through floors and walls as mechanical piping unless noted otherwise or if approved by the Engineer.

- L. Place conduits at least 8" away from all hot piping and surfaces including domestic hot water lines.
  - 1. Boxes shall be a minimum of 3" from any process pipes, unless noted otherwise.
- M. Do not mount conduit on mechanical equipment except where necessary to connect electrical devices mounted on the equipment. Provide flexible conduit in all runs "bridging" vibration mountings.
- N. Do not run conduit on or directly in front of access doors, removable panels, equipment removal spaces, control devices or other spaces necessary for normal maintenance and repair of the equipment.
- O. Install all exterior underground branch circuit conduits continuous from the source to the load. Do not install in-ground boxes as pull boxes. Oversize the conduits if required.
- P. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system. Install exterior underground conduits to drain away from the building.
- Q. Provide suitable fittings to accommodate expansion, contraction and deflection where conduits cross seismic, control and expansion joints. Avoid crossing expansion joints where possible.
- R. Cap or plug conduit ends during construction. Cap or plug ends of conduit that are to remain empty and make watertight. Clean and swab conduits prior to pulling in conductors.
- S. Provide nylon pull string in all empty conduit with a stamped plastic label indicating future use.
- T. Where conduits are stubbed out above walls for use of future or low voltage cabling, provide a bushing on the end of the conduit to protect cabling.
- U. Expansion fittings shall be installed at building expansion joints and where the length of straight run requires it.
- V. Underground Conduit:
  - 1. Underground conduit runs shall have a minimum cover of 2 feet.
  - 2. Conduit shall be sloped to drain to handholes or pull boxes.
  - 3. Rigid metal conduit shall be used for the vertical elbow and riser out of the ground.
  - 4. Rigid metal conduit installed underground or passes through concrete shall have a corrosion resistant coating or covering at the points it makes contact with earth and/or concrete.
  - 5. Contractor shall do all trenching for underground conduit with a minimum size trench. 3 inches of sand shall be placed below and above buried conduit in trench. All fill material shall be placed in 12-inch lifts and compacted to 90-Percent Standard Proctor Density. Underground warning tape shall be laid in the trench approximately 9 inches below the surface.
  - 6. The roadway, sidewalk, or grade beneath which conduit is routed shall be restored to its original or better condition.
    - a. Provide grading, soil, and seeding or sod to restore turf to original or better conditions.
    - b. Coordinate type of soil, seeding and/or sod with Owner to match existing.
  - 7. Excavating, backfilling, and grading shall comply with Division 2.
- W. Conduit installed in slabs shall conform to the following requirements:
  - 1. Conduit shall not be tied parallel to reinforcement bars.
  - 2. Conduit must not be tied to each other and shall be spaced a minimum of 1 1/2 inches apart and preferably 3 inches apart.
  - 3. Whenever possible, conduit should not cross over other conduit. All crossing conduit must be reviewed and approved by the Engineer prior to placement of concrete.

4. Conduit must not be placed on top of the bottom mat of reinforcement bars. There should be a minimum of 1 inch separation from the bottom of the conduit to the top of the steel bars in the bottom mat of steel.
5. Prior to placement of the conduit, the contractor must submit an appurtenance embedment drawing that shows the proposed locations of all conduits.

X. Conduit and Penetration Sealing:

1. Seal all conduits where they pass through exterior walls and where they enter exterior fixtures.
2. Seal all conduits where temperature differential between adjacent spaces is greater than 30 degrees Fahrenheit.
3. Seal all conduit penetrations of smoke or fire rated walls or floors with intumescent type fire barriers.
4. All conduits leaving any hazardous locations shall be sealed internally at the point where they leave the room.

3.3 HAZARDOUS AREAS

- A. Install all conduit and raceways located in hazardous areas in accordance with National Electrical Code requirements for that classification of hazardous locations. Provide all fittings and equipment approved by the Underwriter's for this type of location.
- B. Where it is necessary to install sealing fittings accessible from rooms or areas which are finished, a flush wall or ceiling outlet box is to be installed and the conduit to be sealed run straight through the box with the sealing fitting occurring within the outlet box. Cover the box with a blank plate.
- C. Conduit fittings installed in Class 1, Division 1 and Class 1, Division 2 locations shall be rated for Class 1, Division 1 locations, unless noted otherwise.
- D. Boxes installed in Class 1, Division 1 and Class 1, Division 2 locations shall be rated for Class 1, Division 1 locations, unless noted otherwise.

3.4 OUTLET AND JUNCTION BOX INSTALLATION

- A. Maintain accessibility to all outlet and junction boxes as required by the NEC.
- B. Provide recessed outlet boxes in all new construction, except mechanical and electrical rooms. Outlet boxes in mechanical and electrical rooms may be installed exposed.
- C. Provide concealed junction boxes in all new construction, except mechanical and electrical rooms. Junction boxes in mechanical rooms may be installed exposed.
- D. Mounting heights indicated on the drawings are from the center of the outlet box to the finished floor directly below the outlet. Exterior heights are from inside adjacent door, or if no door, from the first floor above grade, unless noted otherwise.
- E. Do not mount boxes back-to-back and nipped together.
  1. Boxes mounted on opposite sides of a wall shall be mounted on separate studs.
- F. Do not use through-wall boxes unless specifically called out on the plans.
- G. Field-gangable boxes are not allowed. Provide manufactured, multi-gang boxes.
- H. Provide separate switch boxes for lighting dimmer switches to maintain full dimmer rating, if derated wattage/ampere is below the designated circuit ampacity.

- I. Close openings in all outlet boxes during plaster and concrete work with plain paper or slip-on plastic or metal plates.
- J. Provide knockout closures to cap used knockout holes.
- K. Provide FS and FD boxes in wet, damp and exterior locations.
- L. Maintain vapor barriers around boxes and/or provide suitable boxes listed for use in vapor barriers.
- M. Provide air-tight seals for all boxes in air plenums that can allow air to pass through connecting conduit. Repair all damage to insulation and vapor barriers.
- N. Where boxes and concrete are installed in masonry, provide listed equipment or the means acceptable to the AHJ necessary to provide concrete-tight connections and boxes required by the NEC.

### 3.5 INTERIOR PULLBOX INSTALLATION

- A. Provide concealed pullboxes in all new construction, except mechanical and electrical rooms. Pullboxes in mechanical and electrical rooms may be installed exposed.
- B. Terminate all conduits at cabinets and boxes with locknuts and bushings. Provide insulating bushings on all conduit 1" and larger.
- C. Provide pull boxes in accessible locations. Provide accessibility to the pullbox cover. Coordinate location of pull/junction boxes with other divisions (trades) prior to installation. Do not locate pull boxes in exposed finished spaces without the specific approval of the Engineer and Architect.
- D. Provide ½" clear space behind boxes when mounting in wet or damp locations.
- E. Boxes above ACT ceilings shall not be more than 4' from the ceiling. Provide additional supporting hardware and stands to mount equipment if structural ceiling or supports is over 4' from the ACT ceiling.

### 3.6 CONDUIT BODY INSTALLATION

- A. Provide conduit bodies in accessible locations. Provide accessibility to the cover. Coordinate location of conduit bodies with other divisions (trades) prior to installation. Do not locate conduit bodies in exposed finished spaces without the specific approval of the Engineer and Architect.

### 3.7 OPENINGS

- A. Contractor shall review the size and location of all openings to be sure they meet the requirements of the equipment that is furnished and/or installed as a part of this Contract. Contractor shall be responsible for providing all required openings necessary for a complete installation. All required openings are not shown on the Drawings.
- B. All openings shall be filled with an approved sealant, caulking, or grout after the conduit or cable installation is complete. Openings below equipment with an open bottom shall be covered with a galvanized metal sheet (16 gage or heavier) through which the conduits shall be brought. After all conduits have been installed, the core shall be sealed with a minimum of 3 inches of fire retardant material.
- C. Openings through grating shall have the bars of the grating banded.
- D. Special care shall be taken to make a gas-tight seal around all conduits, capillary tubes for remote bulb thermostats, etc. which enter chemical handling rooms, hazardous areas, and other areas designated on the Drawings.
- E. Provide watertight seal around conduit in openings for all roof, below grade and exterior wall penetrations.

### 3.8 IDENTIFICATION

- A. Provide panel and circuit number(s) identification on the cover of all junction boxes and pullboxes located in accessible areas (i.e. above accessible ceilings).
- B. Provide clear, hand-printed lettering using black permanent marker.
- C. Perform stenciling after the building has been painted so that overspray from building painting does not cover up stenciling performed under this specification section. Re-label any boxes that have been painted over by the painter.
- D. Conduit containing control cabling/wiring which utilize Intrinsically Safe methods shall be identified with permanently affixed labels with the wording "Intrinsic Safe Wiring."

### 3.9 RACEWAY AND BOXES APPLICATIONS

- A. Outdoors (Non-Corrosive): Apply products as specified below, unless otherwise indicated:
  - 1. Exposed Conduit: RMC.
  - 2. Underground Conduit: RNMC SCH 40 or 80.
  - 3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  - 4. Boxes and Enclosures, Aboveground: NEMA 3R.
- B. Interior (Non-Corrosive): Comply with the following indoor applications, unless otherwise indicated:
  - 1. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  - 2. Damp or Wet Locations: Rigid metallic conduit.
  - 3. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, stainless steel in damp or wet locations.
  - 4. Exposed Conduit: RMC, LFMC to connect from rigid conduit system where rigid conduit system is impracticable.
- C. Raceway Fittings: Compatible with raceways and suitable for use and location.
  - 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
  - 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with that material. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer.

\*\*\*\*END OF SECTION\*\*\*\*

## SECTION 16120 - 600 VOLT CONDUCTORS AND CABLES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes, but not limited to:
  - 1. Wire
  - 2. Terminals and connectors.
  - 3. Installation.
  - 4. Splices, Taps, and Terminations.
  - 5. Identification.

#### 1.2 REFERENCES

- A. Section 16050 : Common Work Results for Electrical

#### 1.3 SUBMITTALS

- A. Submit shop drawings and descriptive data in accordance with Section 16050.

### PART 2 PRODUCTS

#### 2.1 WIRE

- A. All wire and cable shall be:
  - 1. New and coiled or on reels.
  - 2. Each coil and/or reel shall have a label with the manufacturer's name, trade name of wire, size of wire, and UL label.
- B. Provide conductors with 90°C insulation system, 600 volt rating, U.L. approved and listed for specific application.
- C. Feeder and Branch Circuit Wire:
  - 1. Stranded conductor, unless noted otherwise.
    - a. Solid copper conductors shall be used for lighting and convenience receptacle circuits.
  - 2. THWN insulated for conductor sizes #4 AWG and smaller.
  - 3. XHHW or THWN insulation for conductor sizes #3 AWG and larger.
- D. Provide minimum No. 12 AWG conductor size, unless noted otherwise.
  - 1. Where noted conductors used for control to/from field devices may be less than 12AWG in size providing the following requirements are met:
    - a. Unless otherwise specified elsewhere in these specifications, control wiring shall be not less than No. 14 AWG.
    - b. Control wiring shall be sized such that the voltage drop under in-rush conditions does not adversely affect operation of the controls.
- E. All conductors shall be copper; aluminum conductors will not be allowed.

#### 2.2 WIRE COLOR CODING

A. Contractor may use color coding at his discretion, except for the following colors, which shall be used only as designated below for both power and control circuits.

1. Control Circuits

- a. Dark Blue - Direct current circuits.
- b. Light Blue - Intrinsically safe conductors.
- c. Green - Grounding conductor.
- d. White - Neutral conductor.

2. Power Circuits

	120/240V	208Y/120V	480Y/277V
Phase A	Black	Black	Brown
Phase B	Red	Red	Orange
Phase C		Blue	Yellow
Neutral	White	White	Gray
Ground	Green	Green	Green

3. Use solid colors through Size No. 8 AWG.

4. Use black conductors with tape color identification No. 6 AWG and larger.

2.3 TERMINALS AND CONNECTORS

A. Tool compressed terminals and connectors shall be made of 1 piece seamless highly conductive copper with a uniform tin-plate coating to minimize corrosion.

B. Step-down adapters shall be copper compression type.

C. Electrical spring connectors:

- 1. Solderless, screw-on, reusable pressure cable type, with integral insulation, approved for application used.
- 2. The integral insulator shall have a skirt to completely cover the stripped conductors.

D. Electrical push-in connectors:

- 1. Nylon/PC housing material.
- 2. Copper contacts with tin plating.
- 3. Rated for 221 degree F.
- 4. 2,3 or 4 port as needed per circuit. Do not provide unused ports.
- 5. Sized per wire gauge.
- 6. To be used with wire gauge 12 and smaller.
- 7. UL Listed.
- 8. Manufacturer:
  - a. Ideal
  - b. Or pre-approved equal.

E. Fork Terminals:

- 1. Vinyl or nylon self-insulated locking type.

2. Terminal insulation that supports wire insulation.
  3. Manufacturer:
    - a. Thomas & Betts Type FL
    - b. Burndy Type TP-LF
    - c. Panduit Type PNF
    - d. 3M Type MNG.
- F. Electrical Tape:
1. UL Listed.
  2. Weather resistant.
  3. Moisture resistant vinyl.
  4. Rated for the voltage system which it is applied.
  5. Temperature rating suitable for the application on which it is applied.
- G. Motor Connection Kit:
1. UL Listed.
  2. Qualified to ANSI standards.
  3. Rated to withstand 1000V.
  4. For use on in-line or stub motor lead splices.
  5. Resistant to abrasion.
  6. Installed per manufacturer's recommendations.
- H. Underground Splices for No. 10 AWG and Smaller:
1. Solderless, screw-on, reusable pressure cable type, with integral insulation. Listed for wet locations, and approved for copper and aluminum conductors.
  2. The integral insulator shall have a skirt to completely cover the stripped conductors.
  3. The number, size, and combination of conductors used with the connector, as listed on the manufacturer's packaging, shall be strictly followed.
- I. Underground Splices for No. 8 AWG and Larger:
1. Mechanical type, of high conductivity and corrosion-resistant material. Listed for wet locations, and approved for copper and aluminum conductors.
  2. Insulate with materials approved for the particular use, location, voltage, and temperature. Insulation level shall be not less than the insulation level of the conductors being joined.
  3. Splice and insulation shall be product of the same manufacturer.
- 2.4 CONDUCTOR PULLING COMPOUND
- A. Rated for use with the conductor insulation and conduit material.
  - B. Non-conductive.
  - C. Non-cementing.
  - D. Dry to a fine lubricating powder or a thin film which does not harden in conduit.

- E. UL Listed.
- F. Rated for repeated exposure to high heat or freezing temperatures.

### **PART 3 EXECUTION**

#### **3.1 WIRE INSTALLATION**

- A. Install conductors in accordance with the NEC, as specified, and as shown on the drawings.
- B. Install all conductors in a continuous raceway system.
- C. Splice conductors only in outlet boxes, junction boxes, pullboxes, manholes, or handholes.
- D. Pulling compound shall be approved by the cable manufacturer.
- E. Conductors of different systems (e.g., 120 V and 277 V) shall not be installed in the same raceway.
- F. Examine all wire before installation. Do not use any wire with insulation that is damaged in any way.
- G. Do not pull wire into the conduit until the conduit system is complete. Pull all conductors into raceway at the same time.
- H. Adequate measures shall be employed to determine that the raceways are free of foreign material and moisture before pulling wire or cable.
- I. Test all cable and wire for continuity and for shorts prior to energizing any circuits.
- J. Conductors shall extend at least 3" past the point of the cover on any junction or pull box installed.
- K. For connections to motors, transformers, and vibrating equipment, stranded conductors shall be used only from the last fixed point of connection to the motors, transformers, or vibrating equipment.
- L. Conductors shall be without splice from termination to termination, unless indicated otherwise on the Drawings.
- M. Provide an equipment grounding conductor with each circuit.
- N. The use of a shared neutral on multiwire branch circuits will not be allowed. Each circuit shall be provided with it's own neutral conductor(s), unless noted otherwise in the Contract Documents.
- O. Contractor shall provide conductors of the appropriate rating and quantity for each circuit.
  - 1. Voltage Drop Calculations:
    - a. Wire shall be sized for a voltage drop no greater than 2% measured for circuits used to feed panelboard, distribution panels, switchboards and service equipment.
    - b. Wire shall be sized for a voltage drop no greater than 3% measured from the feeder panelboard or switchgear to it's point of load termination.
    - c. Contractor shall provide documentation of voltage drop calculations upon request of Engineer or Owner.
  - 2. Where multiple conductors are used in a shared raceway, conductor ratings shall be derated per the NEC.
  - 3. Where conductors sizes are specified in the Contract Documents, these sizes are based on copper conductors.

#### **3.2 SPLICES, TAPS AND TERMINATIONS**

- A. Splices to feeders and service entrance conductors are not permitted unless specifically noted on the plans.
- B. Electrical spring connectors shall be used for splices and taps in lighting and 120-volt receptacle circuits and motor leads #10AWG or smaller.
- C. Use pressure or compression type connectors for all splices or taps in copper conductors.
- D. Do not splice conductors of dissimilar metals together.

### 3.3 IDENTIFICATION

- A. Control circuits may be color-coded using available colors, except gray and green. They shall be identified at each terminal at the respective control panel with a label. Imprinted labels shall be protected by a heat shrinkable sleeve.
- B. Each control circuit shall be identified at both ends with the same number; wire number shall be the same as the wire number shown on the Contractor's Equipment Drawings. Spare conductors shall also be identified.

\*\*\*\*END OF SECTION\*\*\*\*

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## SECTION 16640 - SAFETY SWITCHES

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Safety Switches
- B. Corrosion Inhibitor
- C. Installation

#### 1.2 SUBMITTALS

- A. In addition to the requirements of this section, submit shop drawings and descriptive data in accordance with Division 1 and Section 16050.
  - 1. Safety Switch type, size, rating, enclosure type, switches poles, solid poles, HP rating
  - 2. Fuse size and type (if fused)
  - 3. Identification tag/nameplate

### PART 2 PRODUCTS

#### 2.1 SAFETY SWITCHES (DISCONNECT SWITCHES)

- A. General requirements
  - 1. Provide safety switches as disconnects for all utilization equipment as indicated on the Drawings in addition to as required by the governing codes.
  - 2. Provide lockable handle with multiple hasps to allow proper lockout-tagout procedures.
  - 3. Provide NEMA 3R enclosures when mounted outside. Provide bolt-on hub kit(s) for conduit connections in order to maintain NEMA 3R rating.
  - 4. Unless specifically noted otherwise, provide 3-pole with solid neutral bus for landing line and load side neutral conductors.
  - 5. Provide proper size and quantity of lugs to terminate all phase conductors and neutral conductor. Neutral conductors may require more lugs, and a larger size.
  - 6. Provide interior ground lug.
- B. Fused or unfused switch type:
  - 1. Provide heavy duty switch with quick-make, quick-break mechanism with positive interlock.
  - 2. Hinged door with mechanical interlock in the ON position, with defeat mechanism.
  - 3. Provide horsepower rated disconnects, fully rated for load-break and load-make operation.
  - 4. Provide service entrance rated switches where required.
  - 5. Approved manufacturers:
    - a. Cutler-Hammer DH series
    - b. General Electric TH series
    - c. Siemens Type VBII series
    - d. Square-D Class 3110 series
    - e. Allen Bradley 1494 series
    - f. Pre-approved equal.

C. Molded case switch type:

1. Provide molded case type switch where recessed safety switches are shown. Provide switch in a NEMA 1 with flush mounting enclosure.
2. Approved manufacturers:
  - a. Cutler-Hammer
  - b. General Electric
  - c. Siemens
  - d. Square-D

2.2 CORROSION INHIBITOR

A. Vapor phase corrosion inhibitor:

1. Provide 1 year of protection for the enclosure in which it is installed.
2. Approved Manufacturers:
  - a. Crouse-Hinds CID 101
  - b. Hoffman A-HCI
  - c. Zerust VC2
  - d. Or approved equal.

**PART 3 EXECUTION**

3.1 INSTALLATION

- A. Install safety switches with operator handle no higher than 6'-7" above finished floor in front of the safety switch unless otherwise allowed by the NEC.
- B. Mount safety switch as close to the equipment as possible. Provide unistrut rack if necessary.
- C. Do not mount safety switches on removeable panels on the equipment served. Coordinate location of safety switches with the equipment provider prior to installing the switch.
- D. Install safety switches with proper working clearances about the switch.
- E. All disconnect switches mounted outside shall contain a corrosion inhibitor device.
- F. Disconnects for single-phase motors shall be manual motor starters or manual motor starting switches as specified in the Contract Documents.

3.2 IDENTIFICATION

- A. Provide an engraved or laminated plastic nameplate on each switch. Label per the name of the device controlled unless noted otherwise on the plans.
  1. Install nameplate parallel to equipment lines.
  2. Install nameplates outside covers in unfinished areas by mechanical rivets.

\*\*\*\*END OF SECTION\*\*\*\*

## SECTION 16450 - GROUNDING AND BONDING

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Grounding Electrode System
- B. Equipment grounding.

### PART 2 EQUIPMENT

#### 2.1 GROUND RODS

- A. Grounding Electrode System:
  - 1. Provide ¾" x 10' long solid copper electrodes, where ground rods are specified.

#### 2.2 GROUNDING CONNECTORS

- A. Clamps and pressure connectors.
  - 1. Clamps for connection to piping and conduit:
    - a. Approved Manufacturer:
      - 1) OZ Gedney type ABG
      - 2) Burndy "Hyground"
      - 3) Thomas & Betts "Blackburn" Series.
  - 2. Clamps for connection to enclosures and buswork:
    - a. Approved Manufacturer:
      - 1) OZ Gedney type KGM
      - 2) Burndy "Hyground"
      - 3) Thomas & Betts "Blackburn" Series.
  - 3. Bar taps for connection to bus bars which are UL listed (UL-467).
    - a. Approved Manufacturer:
      - 1) OZ Gedney type KGM
      - 2) Burndy "Hyground"
      - 3) Thomas & Betts "Blackburn" Series.
- B. Welded connections using non-reversable exothermic process:
  - 1. Approved Manufacturer:
    - a. Cadweld
    - b. Thermoweld.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

- A. Raceways provided for grounding electrode conductors shall be rigid nonmetallic.

- B. Conductor shall be connected to the equipment ground bus or to the enclosure if there is no ground bus.
- C. Separately derived systems shall be grounded in accordance with NFPA 70.
- D. The grounding bushings on conduits entering distribution equipment, such as service entrance, supervisory control panels, power distribution panelboards, shall be connected to the ground bus in accordance with the requirements of NFPA 70.
- E. The supervisory control panel(s) shall be connected directly to the grounding electrode system with a #6 AWG conductor.
- F. All conductors used for grounding electrode bonding, equipotential bonding and between wall mounted grounding busses shall be copper.

### 3.2 GROUNDING ELECTRODE SYSTEM

- A. Contractor shall provide a grounding electrode system as required per NFPA 70 in addition to items noted in the Contract Documents.
- B. Existing Construction (as allowed by the NEC):
  - 1. Provide a #3/0 conductor bonded to the metal underground water pipe. If metal water pipe is not present, drive a system of rod electrodes on order to satisfy the NEC requirements including Articles 250.53 and 250.56.
  - 2. Bond all the following building members (if present) together to form the grounding system for the building:
    - a. All metal underground water pipes
    - b. Metal frame of the building or structure
- C. Bond the neutral bus to the grounding electrode system at the service entrance switchboard.

### 3.3 EQUIPMENT GROUND

- A. Solidly ground all conduit systems, switch boxes, cabinets, motor frames, switchgear, transformers, and all other permanently installed equipment to form a continuous, permanent and effective grounding system. Bond expansion joints and metal raceway sections.
- B. An equipment grounding conductor shall be installed with each conduit run or cable, includes but not limited to feeder circuits, motor circuits, lighting circuits, and control circuits.

### 3.4 BONDING

- A. Bond all systems per the NEC including raceway, cable tray, enclosures, metal piping systems, structural metal, etc..

### 3.5 SPECIAL REQUIREMENTS

- A. Contractor shall determine if there are any other special grounding requirements for equipment furnished on this Project and shall provide grounding as recommended by the manufacturer.

### 3.6 SPLICES AND TERMINATIONS

- A. In general, splices and terminations of the grounding electrode system shall be brazed, shall be exothermic welded, or shall be made with tool-compressed fittings.
- B. Connections to bus bars or equipment enclosures shall be made with tool-compressed lugs which are bolted to the equipment or with bar taps.

- C. Connections to ground rods shall be exothermic welded. Provide adapter sleeves as required for #6 AWG conductors or smaller.
- D. Connections to copper water piping shall be made with ground clamps.

\*\*\*\*END OF SECTION\*\*\*\*

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## SECTION 16620 - ENGINE GENERATORS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes
  - 1. Outdoor Natural Gas engine driven generator.
  - 2. Receptacles, cables, and other accessories as specified.
- B. Related Sections
  - 1. Division 15
    - 1. Section 16621 – Transfer Switches

#### 1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and Payment
  - 1. All Work and costs of this Section shall be incidental to the Project and included in the Total Base Bid.

#### 1.3 REGULATORY REQUIREMENTS

- A. Equipment shall conform to the following:
  - 1. OSHA
  - 2. Environmental Protection Agency.
  - 3. Governing Pollution Control Agency.
  - 4. National Electrical Code (NFPA 70).

#### 1.4 SUBMITTALS

- A. Submit the following items consistent with Section 16050:
- B. The following information shall be included with each submittal:
  - 1. Engine-generator assembly base dimensions, unit enclosure dimensions, equipment weights and loading data. This information shall include detailed dimension and weight data for the generator silencer and exhaust stack (where applicable).
  - 2. Drawing(s) showing the general arrangement and dimensions of the engine generator unit and the outdoor enclosures (where applicable). Include location of all auxiliary system component connections and engine-mounted equipment.
  - 3. Catalog cut sheets on generator assembly including major on and off-engine auxiliary components (those items not integral with the manufacturer's package purchased from other vendors) indicating size, capacity, performance, design data, materials of construction and operating conditions. If catalog data is not available, include a Bill of Materials for the equipment proposed and all available data.
  - 4. Provide locations of and specifications/dimensions for all required field connections to generator assembly.
  - 5. Provide guaranteed fuel rate data for engine operation. Fuel rates shall include operation at 50 percent, 75 percent and 100 percent of design rated net Standby Power output in kW.

6. Provide guaranteed emission data. Provide supplemental information on other pollutants that are regulated by the governing environmental control agency relevant to this project.
  7. Detailed schematic wiring diagrams showing Automatic Transfer Switch (ATS) wiring terminations, SCADA monitoring terminations, and all other internal and external wiring terminations. Drawings shall be developed custom for this project. Terminal numbers shall be coordinated and reflect the actual terminal numbers used at the ATS and SCADA control panels.
  8. Cable/plug assemblies.
  9. Color chips for enclosure.
  10. Certified copies of factory production test results.
- C. Operation and Maintenance Manual
1. The following information shall be included:
    - a. Include all the information provided with the shop drawings and manufacturer's information.
      - 1) Update and complete control system drawings and descriptions for all equipment.
      - 2) All documentation shall include modifications made which reflect the final installation.
    - b. Operating instructions.
    - c. Maintenance information.
    - d. Recommended spare parts list with pricing.
    - e. Accurate wiring diagrams for trouble shooting purposes.
    - f. Manufacturer's literature on all equipment and systems.
    - g. Name, address, phone number of manufacturer's local representative and maintenance facility.
    - h. Warranty information.
    - i. Copy of test results and certifications.

## 1.5 DESIGN CRITERIA

- A. Ratings shall be for service at 60 Hz, 3-phase, 4-wire, 480/277-volts, and 0.80 power factor.
- B. Engine-generator shall have minimum nominal standby electrical output ratings as described below.
- C. All ratings shall be based upon the equipment located at an elevation of 1,000 feet above sea level.
- D. Engine-generator shall be sized by the manufacturer to operate the required loads, however, engine-generator assembly shall have a standby power output rating of not less than 80kW for the East End Site and 100kW for the Arbutus Site without written approval of Engineer
  1. The following loads shall be started and operated in the order mentioned below:
    - a. Step 1: East End Site
      - 1) Submersible Pump 1
      - 2) Submersible Pump 2
    - b. Step 1: Arbutus Site
      - 1) Submersible Pump 1
      - 2) Submersible Pump 2
      - 3) Electric Unit Heater

- 4) Transformer Feeding Panelboard with Building Loads (receptacles, lighting, etc.)
2. Refer to the Drawings for HP of each motor and the associated motor controller to be used.
3. Instantaneous voltage drop shall not exceed 20 percent as measured at the main switchboard assembly at any time.
- E. Harmonic distortion levels when powered from its associated generator, shall not exceed the guidelines and recommendations put forth by IEEE 519, latest edition. The Point of Common Coupling shall be the service entrance switchboard, motor control center, or distribution panelboard.
- F. Each engine-generator unit shall be emissions certified for the calendar year in which it is installed. Guarantees are to be provided for verification of allowable emission levels for pollutants that are regulated by the governing environmental control agency relevant to this project.

#### 1.6 FACTORY TESTS

- A. All system components and hardware necessary for complete and fully functional standby generation systems shall be factory tested as complete assemblies prior to installation at the project site. These tests shall include, in addition to “standard” factory tests, additional testing as described below.
- B. Factory production tests shall be conducted, certified, and documented by Contractor. Tests shall be performed at rated standby load and at 0.8 power factor in accordance with NFPA 110. These tests shall include, but not be limited to
  1. Steady state voltage and frequency analysis.
  2. Transient response.
  3. Maximum power output analysis.
  4. Supplier’s standard factory engine tests.
  5. Supplier’s standard factory generator tests.
  6. Safety shutdowns.
  7. Hydrostatic test of radiator and oil cooler.
  8. Continuity test and insulation resistance on electrical power and control system components and circuits. Do not include in these tests any device or equipment not design to withstand an insulation resistance test.
  9. 100-percent prime rating block load acceptance test per NFPA 110.
  10. Load carrying capability tests:
    - a. 1 hour at 100-percent prime rated net output (0.8 p.f.).
- C. Data points to be approved by Engineer before testing of engine commences.
- D. The Owner shall retain all copyrights to the test data.

#### 1.7 FIELD LOAD BANK TEST

- A. Provide a 2-hour field load bank test at 100 percent of standby rating.
- B. Record beginning fuel level, ending fuel level, KW load, output voltage, output current, oil pressure, water temperature, and ambient temperature at 15-minute intervals throughout the test.
- C. Include copies of the load bank test in each O&M manual.

#### 1.8 WARRANTY

- A. The Contractor shall be held responsible for any and all defects in workmanship, materials and equipment that may be found in any part of the engine-generator assemblies. Contractor shall immediately replace and make good without expense to the Owner any such faulty parts and damage done by reason of same, during the period of 5 years or 1,500 machine hours, minimum, from the date of final project completion.
- B. Where installed materials and/or equipment carry a manufacturer's warranty for a longer period; the generator assembly supplier shall, at no additional cost to Owner, replace any and all parts that fail during the manufacturers' warranty periods.
- C. All warranties shall be comprehensive covering parts and labor. No deductibles or costs shall be allowed for travel time, service hours, repair parts, tools, etc.
- D. Should the Contractor fail to make good the defective parts within 14 days of such notifications, Owner may replace these parts charging the expense, including labor, to the Contractor.

## **PART 2 PRODUCTS**

### **2.1 APPROVED MANUFACTURERS**

- A. Manufacturers shall have an authorized service organization within a 100 mile radius of the project site.
- B. Acceptable Manufacturers are as follows:
  - 1. Caterpillar.
  - 2. Cummins.
  - 3. Kohler.

### **2.2 NATURAL GAS ENGINE**

- A. Multi-cylinder, 4 cycle, spark ignited, turbo charged for natural gas fuel.
- B. Engine shall be certified to meet all required EPA and governing environmental control agencies air emission limits.
- C. Rated horsepower sufficient to drive the generator at rated kW.
- D. Block, crankshaft, liners, and connecting rods of same quality used in a comparable diesel engine.
- E. Water cooled, thermostatically controlled utilizing an engine mounted radiator with flanges for duct connections. Provide a readily accessible and viewable overflow tank.
- F. 120 volt, 1 phase jacket water heater to maintain engine block at 100 degrees F to assure rapid starting.
  - 1. Provide disconnect/automatic sealing couplers to isolate the heater for replacement of the heater element.
  - 2. The quick disconnect/automatic sealing couplers shall allow the heater element to be replaced without draining the engine cooling system or significant coolant loss.
- G. Pressurized circulating lube oil system complete with filtering system.
- H. Crankcase breather kit.
- I. Heavy duty, dry element type air cleaner with restriction indicator.
- J. Electric isochronous governing system.

- K. DC starting motor capable of cranking engine at starting speed for a duration of at least 30 seconds.
- L. Battery charging alternator.
- M. Vibration isolation dampers between base of generator assembly and concrete pad.
- N. Clear access shall be provided to all filters and to the oil drain to facilitate on site maintenance.
  - A. Readily accessible manual fuel shut off valve.
  - B. Automatic fuel shut off valves, secondary gas pressure regulators, primary gas pressure regulators, test port for measuring gas pressure and gas line piping as needed.]

### 2.3 GENERATOR

- A. Synchronous machine with brushless revolving field.
- B. 480Y/277 volt 3 phase, 4 wire windings.
- C. Separately excited generator that uses a separate permanent magnet generator (PMG) to power the voltage regulator.
- D. Automatic static voltage regulator that senses all 3 phases to regulate output voltage from no load to full load within 0.5 percent, and shall include under-frequency protection.

### 2.4 BATTERY AND CHARGER

- A. Lead acid battery.
- B. Sufficient amp-hour rating to match cyclic starting control for a minimum of 3 cranking cycles.
- C. Automatic standby battery charger with dual charging rates and charging DC ammeter.
- D. Charger shall disconnect either during starting or operation.
- E. The battery package shall be complete with cables and hardware.
- F. Charger shall be mounted within the generator assembly footprint.

### 2.5 AUTOMATIC TRANSFER SWITCH

- A. See Section 16621.

### 2.6 SILENCERS

- A. "Residential Grade" silencer. Provide "Critical Grade" as an alternate.
- B. Attenuation of 30 decibels in the 100 to 250 Hz range, 22 decibels above 4,000 Hz. "Residential Grade"
- C. Attenuation of 35 decibels in the 200 to 500 Hz range, 27 decibels above 500 Hz. "Critical Grade"

### 2.7 SOUND ATTENUATING WEATHERPROOF HOUSING

- A. Operating handles for latching the panels shall be lockable. 2 sets of keys shall be provided.
- B. All metal parts shall be cleaned, primed, and painted with a durable, weather-resistant, semi-gloss, baked enamel finish. Color as selected by the Owner from color chips which shall be provided with the shop drawings.
- C. Stainless steel hinges.

- D. Bird / rodent screens over intake and exhaust louver opens. Screen openings shall be no larger than ¼ inch.
- E. Adequate size to contain the engine-generator set and all accessories including the silencer.
- F. Oil/moisture resistant acoustical insulation.
- G. Sound performance at rated load; 75dBA at 7 meters.
- H. Provide steel cage around exhaust discharge to prevent vandalism.

## 2.8 CONVENIENCE LIGHTS

- A. 2 lamp holders for DC lighting inside the enclosure. Mount the lamp holders for most effective lighting. Provide rough service lamps for each lamp holder.
- B. Control from manual timer in control panel.

## 2.9 SPARE PARTS

- A. Block heater.
- B. Air filter.
- C. Fuel filter.
- D. Oil filter.
- E. Fuses (2 of each type used in generator set).

# **PART 3 EXECUTION**

## 3.1 INSTALLATION

- A. The engine generator set shall be installed complete with all accessories.
- B. Anchor the engine generator set to the concrete pad with stainless steel anchor bolts.
- C. Provide cover plates (painted to match the skid) to cover any openings in the enclosure and / or skid.
- D. Rodent proof the installation by sealing all openings and gaps.

## 3.2 FULL FLUID RESERVOIRS

- A. The batteries, radiator, crankcase, and any other reservoir shall be filled as part of this Contract.

## 3.3 TESTING

- A. Prior to delivery, the engine generator set and all support components shall be factory tested and certified by the manufacturer. Engineer and Owner shall be given a 2-week notice prior to test date.
- B. Prior to field tests, manufacturer's field service representative shall inspect the complete installation to assure that all components have been installed and connected in accordance with the manufacturer's requirements.
- C. After completion of the installation, the generator set and support components shall be field tested by manufacturer's field service representative. The test shall include actual start-up and operation in both the automatic and manual modes. Engineer and Owner shall be given a 2-week notice prior to test date.

### 3.4 TRAINING

- A. After the engine-generator set installation is complete and the manufacturer's field service representative has completed all field testing, the Owners personnel shall receive operation and maintenance instruction.
- B. The instructions shall include demonstration and/or review of features, including but not limited to:
  - 1. All accessories.
  - 2. Lubrication procedures.
  - 3. Removal and installation of filters.
  - 4. Start up and shut down procedures.
  - 5. Power outage simulation.
  - 6. Transfer switch operation.
  - 7. Control panel features.
  - 8. Field adjustment of output voltage.
  - 9. Alarm and shutdown features.

\*\*\*\*END OF SECTION \*\*\*\*

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## SECTION 16621 - TRANSFER SWITCHES

### PART 1 GENERAL

#### 1.1 SECTION SUMMARY

A. This Section includes transfer switches rated 600 V and less, including the following:

1. Automatic transfer switches.

#### 1.2 SUBMITTALS

A. Submit shop drawings and descriptive data in accordance with Section 16050, in addition to the below requirements.

B. Product Data: For each type of product indicated. Include rated capacities, weights, operating characteristics, furnished specialties, and accessories.

C. Dimensioned plans, elevations, sections, and details showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each switch specified.

D. Single-Line Diagram: Show connections between transfer switch, power sources, and load.

E. Field quality-control test reports.

F. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Features and operating sequences, both automatic and manual.
2. List of all factory settings of relays; provide relay-setting and calibration instructions, including software, where applicable.

#### 1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Maintain a service center capable of providing training, parts, and emergency maintenance repairs within a response period of less than eight hours from time of notification.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NEMA ICS 1.

D. Comply with NFPA 70.

E. Comply with UL 1008 unless requirements of these Specifications are stricter.

### PART 2 PRODUCTS

#### 2.1 AUTOMATIC TRANSFER SWITCH

A. Automatic transfer switches shall comply with UL, NEMA, NEC, ANSI, IEEE, and NFPA, and have the following features:

B. Automatic transfer switches shall be open transition switches, 3 pole, electrically operated, mechanically held open contact type, without integral overcurrent protection. Automatic transfer switches utilizing

automatic or non-automatic molded case circuit breakers, insulated case circuit breakers, or power circuit breakers as switching mechanisms are not acceptable.

- C. Automatic transfer switches shall be completely factory-assembled and wired such that only external circuit connections are required in the field.
- D. Ratings:
  - 1. Phases, voltage, continuous current, poles, and withstand and closing ratings shall be as indicated in the Contract Documents.
  - 2. Transfer switches are to be rated for continuous duty at specified continuous current rating on 60Hz systems.
- E. Markings:
  - 1. Markings shall be in accordance with UL 1008.
- F. Tests:
  - 1. Automatic transfer switches shall be tested in accordance with UL 1008. The contacts of the transfer switch shall not weld during the performance of withstand and closing tests when used with the upstream overcurrent device and available fault current specified.
- G. Surge Withstand Test:
  - 1. Automatic transfer switches utilizing solid-state devices in sensing, relaying, operating, or communication equipment or circuits shall comply with IEEE C37.90.1.
- H. Housing:
  - 1. Enclose automatic transfer switches in wall mounted steel cabinets, with metal gauge not less than No. 14, in accordance with UL 508, or in a switchboard assembly in accordance with UL 891, as shown on the drawings.
  - 2. Enclosure shall be constructed so that personnel are protected from energized components during automatic transfer switch maintenance.
  - 3. Finish: Cabinets shall be given a phosphate treatment, painted with rust-inhibiting primer, and finish-painted with the manufacturer's standard enamel or lacquer finish.
- I. Operating Mechanism:
  - 1. Actuated by an electrical operator.
  - 2. Electrically and mechanically interlocked so that the main contact cannot be closed simultaneously in either normal and emergency position.
  - 3. Normal and emergency main contacts shall be mechanically locked in position by the operating linkage upon completion of transfer. Release of the locking mechanism shall be possible only by normal operating action.
  - 4. Contact transfer time shall not exceed six cycles.
  - 5. Operating mechanism components and mechanical interlocks shall be insulated or grounded.
- J. Contacts:
  - 1. Main contacts: Silver alloy.
  - 2. Neutral contacts: Silver alloy, with same current rating as phase contacts.
  - 3. Current carrying capacity of arcing contacts shall not be used in the determination of the automatic transfer switch rating, and shall be separate from the main contacts.

4. Main and arcing contacts shall be visible for inspection with cabinet door open and barrier covers removed.
5. Isolated form 'C' contacts shall be provided for remote indication of
  - a. Normal power available.
  - b. Generator power available.
  - c. Switch in normal position.
  - d. Switch in generator position.

K. Manual Operator:

1. Capable of operation by one person in either direction under no load.

L. Replaceable Parts:

1. Include the main and arcing contacts individually or as units, as well as relays, and control devices.
2. Automatic transfer switch contacts and accessories shall be replaceable from the front without removing the switch from the cabinet and without removing main conductors.

M. Sensing Features:

1. Undervoltage Sensing for Each Phase of Normal Source: Sense low phase-to-ground voltage on each phase. Pickup voltage shall be adjustable from 85 to 100% of nominal, and dropout voltage is adjustable from 75 to 98% of pickup value. Factory set for pickup at 90% and dropout at 85%.
2. Adjustable Time Delay: For override of normal-source voltage sensing to delay transfer and engine start signals. Adjustable from zero to six seconds, and factory set for one second.
3. Voltage/Frequency Lockout Relay: Prevent premature transfer to the engine-generator. Pickup voltage shall be adjustable from 85 to 100% of nominal. Factory set for pickup at 90%. Pickup frequency shall be adjustable from 90 to 100% of nominal. Factory set for pickup at 95%.
4. Time Delay for Retransfer to Normal Source: Adjustable from 0 to 30 minutes, and factory set for 10 minutes to automatically defeat delay on loss of voltage or sustained undervoltage of emergency source, provided normal supply has been restored.
5. Test Switch: Simulate normal-source failure.
6. Switch-Position Indication: Indicate source to which load is connected.
7. Source-Available Indication: Supervise sources via transfer switch normal- and emergency-source sensing circuits.
8. Normal Power Indication: Indicate "Normal Source Available."
9. Emergency Power Indication: Indicate "Emergency Source Available."
10. Transfer Override Control: Overrides automatic retransfer control so that automatic transfer switch shall remain connected to emergency power source regardless of condition of normal source. Control panel shall indicate override status.
11. Engine Starting Contacts: One isolated and normally closed and one isolated and normally open; rated 5 A at 30 V DC minimum.
12. Engine Shutdown Contacts: Time delay adjustable from zero to 15 minutes, and factory set for 5 minutes. Contacts shall initiate shutdown at remote engine-generator controls after retransfer of load to normal source.

N. Controls:

1. Controls shall provide indication of switch status and be equipped with alarm diagnostics.

2. Controls shall control operation of the automatic transfer switches.
  3. The transfer switch shall be equipped with a microprocessor based control panel. The control panel shall perform the operational and display functions of the transfer switch. The display functions of the control panel shall include ATS position and source availability. The digital display shall be accessible without opening the enclosure door and shall be provided with a 4 line by 20 character LCD display screen with touch pad function and display menus. The programming functions shall be pass code protected. The control panel shall be optoisolated from electrical noise and provided with the following inherent control functions and capabilities:
    - a. Multipurpose display for continuous monitoring and control of the ATS functions and settings. All field changeable functions shall be pass code protected and accessible through the keypad.
    - b. Built-in diagnostic display that includes the capturing of historical data, such as number of transfers and time on emergency power source for ease of troubleshooting.
    - c. Touch pad test switch with Fast Test/Load/No Load positions to simulate a normal source failure.
- O. Factory Wiring: Train and bundle factory wiring and label either by color-code or by numbered/lettered wire markers. Labels shall match those on the shop drawings.
- P. Provide input and control logic to allow operator to operate the facility on generator power via future SCADA system for extended periods of time while still maintaining the logic to automatically switch back to normal power should the generator fail.
- Q. A load/no load clock exerciser shall be incorporated within the microprocessor and shall be programmable to start the engine generator set and transfer the load (when selected) for exercise purposes on a weekly basis. The exerciser shall contain a lithium battery for memory retention during an outage.
- R. Approved Manufacturers:
1. ASCO
  2. Russelectric.
  3. Zenith ZTS
  4. Pre-approved equal.

## 2.2 SEQUENCE OF OPERATION

### A. Manual Operation:

1. Operator shall use the control panel on the face of the enclosure to activate the switch to change positions.
2. When a Manual transfer is initiated, the system shall transfer from normal power to generator and vice versa pending the switch present position.
3. Automatic transfer operation shall be disabled.

### B. Automatic Operation:

1. The specified voltage decrease in one or more phases of the normal power source shall initiate the transfer sequence. The automatic transfer switch shall start the engine-generator(s) after a specified time delay to permit override of momentary dips in the normal power source.
2. The automatic transfer switch shall transfer the load from normal to emergency source when the frequency and voltage of the engine-generator(s) have attained the specified percent of rated value.

3. Engine Start: A voltage decrease, at any automatic transfer switch, in one or more phases of the normal power source to less than the specified value of normal shall start the engine-generator(s) after a specified time delay.
4. Retransfer to Normal (All Loads): Automatic transfer switches shall retransfer the load from emergency to normal source upon restoration of normal supply in all phases to the specified percent or more of normal voltage, and after a specified time delay. Should the emergency source fail during this time, the automatic transfer switches shall immediately transfer to the normal source whenever it becomes available. After restoring to normal source, the engine-generator(s) shall continue to run unloaded for a specified interval (initially set to 5 minutes) before shut-down.

### **PART 3 EXECUTION**

#### **3.1 INSTALLATION**

- A. Secure free-standing equipment to a concrete housekeeping pad with the use of stainless steel hardware.
- B. Set field-adjustable intervals and delays, relays, and engine exerciser clock.

#### **3.2 CONNECTIONS**

- A. Wiring to Remote Components: Match type and number of cables and conductors to control and communication requirements of transfer switches as recommended by manufacturer. Increase raceway sizes at no additional cost to Owner if necessary to accommodate required wiring.
- B. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

#### **3.3 FIELD QUALITY CONTROL**

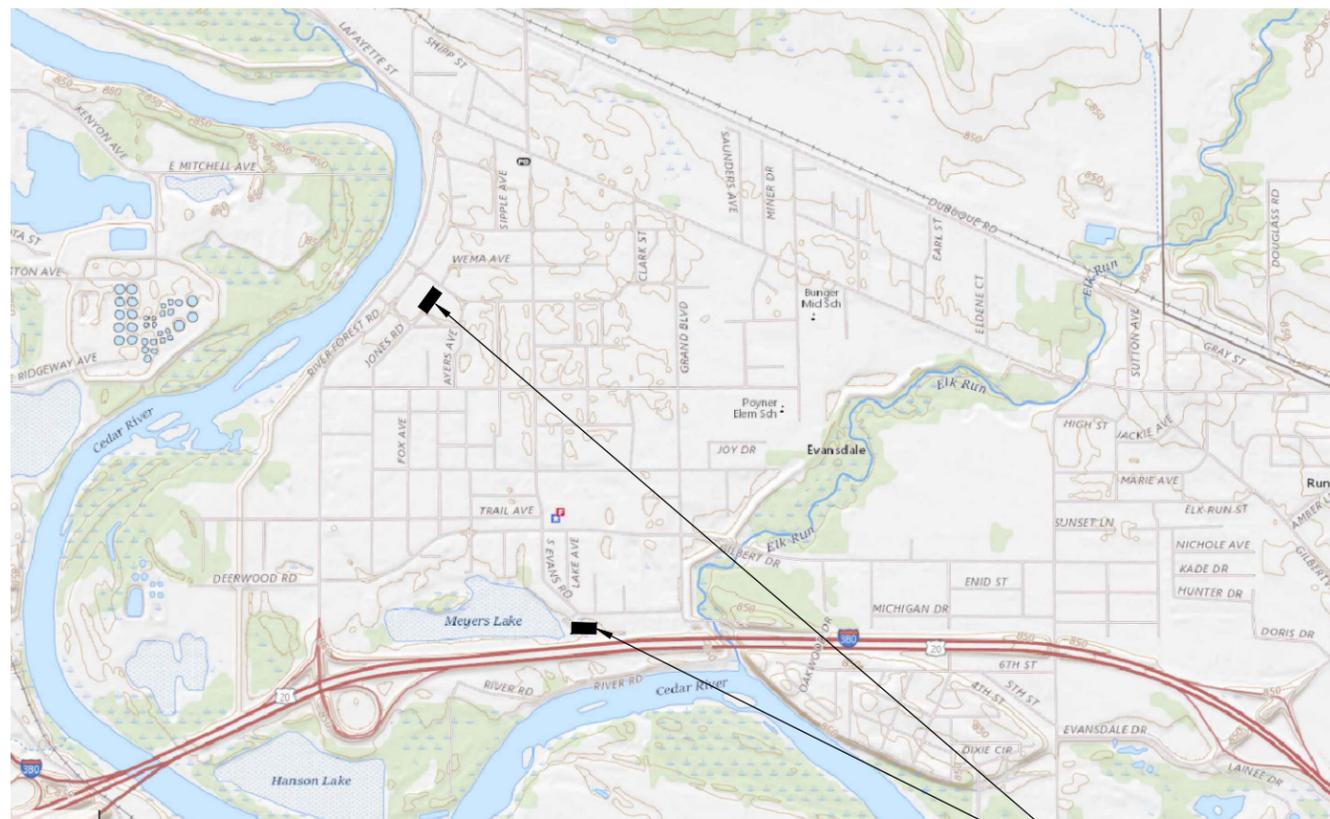
- A. Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.
- B. Perform tests and inspections and prepare test reports.
  1. Review wiring and connection to ensure all conductors and terminals have been properly installed.
  2. After installing equipment and after electrical circuitry has been energized, test for compliance with requirements.
  3. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Include external annunciation and control circuits. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.
    - a. Check for electrical continuity of circuits and for short circuits.
    - b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
    - c. Verify that manual transfer warnings are properly placed.
    - d. Perform manual transfer operation.
  4. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three times.
    - a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
    - b. Simulate loss of phase-to-ground voltage for each phase of normal source.
    - c. Verify time-delay settings.
    - d. Verify pickup and dropout voltages by data readout or inspection of control settings.

- e. Perform contact-resistance test across main contacts and correct values exceeding 500 microhms and values for 1 pole deviating by more than 50 percent from other poles.
  - f. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.
5. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.
- a. Verify grounding connections and locations
- C. Coordinate tests with tests of generator and run them concurrently.
- D. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.
- E. Remove and replace malfunctioning units and retest as specified above.
- 3.4 DEMONSTRATION
- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transfer switches and related equipment.
  - B. Coordinate this training with that for generator equipment.

\*\*\*\*END OF SECTION\*\*\*\*

# CITY OF EVANSDALE, IOWA ARBUS AVENUE AND EAST END AVENUE SANITARY LIFT STATION GENERATORS

2020



SHEET NUMBER	SHEET TITLE
1.00	TITLE SHEET
1.01	SITE PLANS PLAN
7.01	ELECTRICAL LEGEND AND DETAILS
7.02	ELECTRICAL PLAN - ARBUS
7.03	ELECTRICAL PLAN - EAST END AVE
7.04	ELECTRICAL ONE-LINE DIAGRAMS AND DETAILS

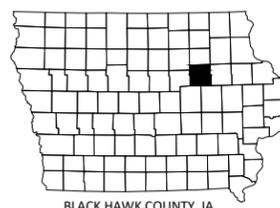
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PLAN REVISIONS		
REV	ISSUED FOR	DATE
0	BID	3/11/2020



MAP OF THE CITY OF EVANSDALE  
BLACK HAWK COUNTY, IA



BLACK HAWK COUNTY, IA

PROJECT LOCATIONS



I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

Adrian L. Holmes  
REG. NO. 17935      DATE: \_\_\_\_\_

MY LICENSE RENEWAL DATE IS 12/31/2021

PAGES OR SHEETS COVERED BY THIS SEAL:  
ALL SHEETS

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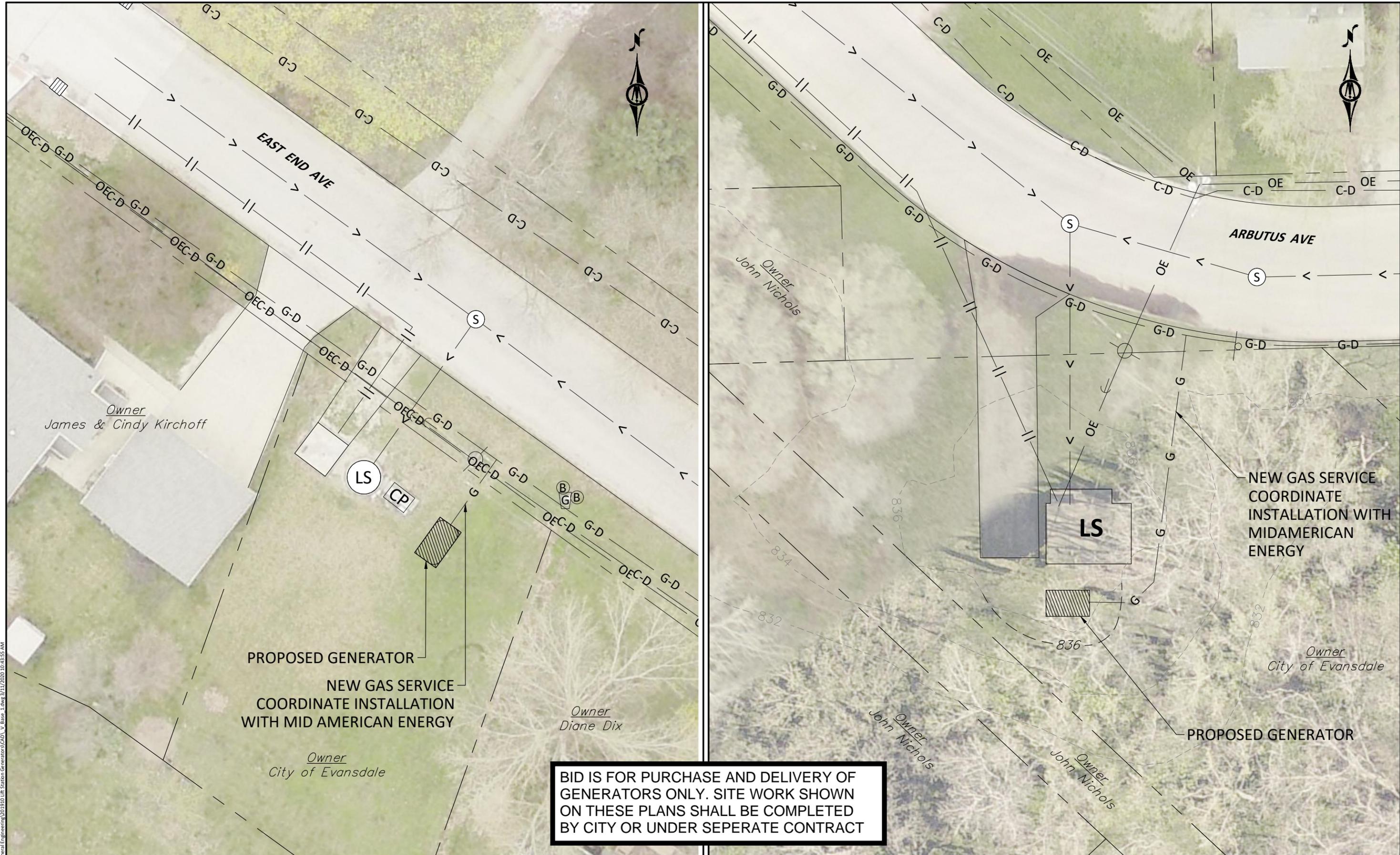


855 WRIGHT BROTHERS BLVD SW, SUITE 2A  
CEDAR RAPIDS, IOWA 52404  
Phone: (319) 362-3219  
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www.bolton-menk.com

DESIGNED	NO.	ISSUED FOR	DATE
JJD	0	BID	3/11/2020
DRAWN	JJD		
CHECKED	ALH		
CLIENT PROJ. NO.			

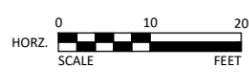
EVANSDALE, IOWA  
LIFT STATION GENERATORS  
GENERATOR LOCATION

SHEET  
1.00



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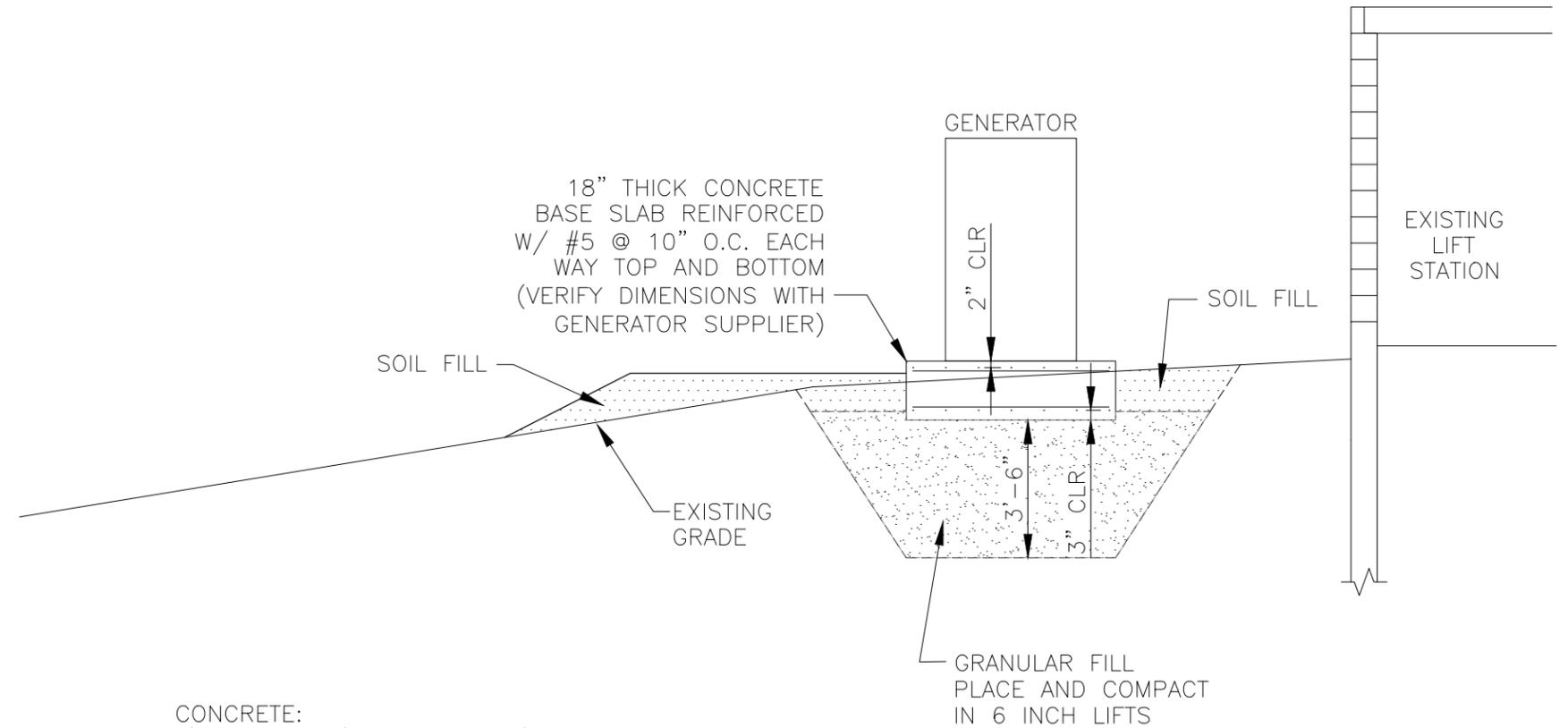
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CLIENT PROJ. NO.			

EVANSDALE, IOWA	SHEET 1.01
LIFT STATION GENERATORS	
GENERATOR LOCATION	

## GENERAL NOTES

1. EXAMINE SITE AND DRAWINGS TO DETERMINE LOCATIONS AND DIMENSIONS OF UTILITIES, AND SITE IMPROVEMENTS.
2. COORDINATE LOCATION OF UTILITY SERVICES AND UTILITY CONDUIT WITH GENERATOR MANUFACTURER AND UTILITY REPRESENTATIVES PRIOR TO FOUNDATION LAYOUT.
3. BEFORE CONSTRUCTION FABRICATION AND ERECTION OF ANY MATERIALS, FIELD VERIFY ALL EXISTING ELEVATIONS, DIMENSIONS AND CONDITIONS AS SHOWN ON THE DRAWINGS AND REPORT DISCREPANCIES TO THE ENGINEER AT ONCE FOR RESOLUTION.
4. REINFORCING BARS SHALL HAVE THE FOLLOWING CONCRETE COVER UNLESS NOTED OTHERWISE.  
FOOTINGS AND OTHER UNFORMED SURFACES: 3"
5. CONCRETE SHALL BE PLACED WITHOUT CONSTRUCTION JOINTS.
6. CAST-IN-PLACE CONCRETE SHALL NOT BE PLACED IN STANDING WATER, ON FROZEN SOIL OR ON FROZEN CONCRETE.
7. BEVEL ALL EXPOSED CORNERS OF CONCRETE 3/4 "x3/4".
8. ALL DISTURBED AREAS SHALL RECEIVE 6 INCHES OF TOPSOIL AND BE SEEDED WITH LAWN GRASS.

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CONCRETE:  
F<sup>'</sup>c=4000psi (AIR ENTRAINED)  
REINFORCING STEEL  
ASTM A615-GRADE60

## PROPOSED GENERATOR SECTION

Not To Scale

LIGHTING	POWER	FIRE ALARM	PROCESS	SCHEMATIC SYMBOLS
<p><b>LUMINAIRE LEGEND</b></p> <p>FIXTURE ID                      'E' DESIGNATES EMERGENCY LIGHT                      CIRCUIT NUMBER                      SWITCH CIRCUIT ID</p> <p>RECESSED LUMINAIRE</p> <p>EMERGENCY EGRESS/LIFE SAFETY SYMBOL</p> <p>NIGHT LIGHT SYMBOL</p> <p>NIGHT LIGHT AND EMERGENCY EGRESS</p> <p>PENDANT MOUNTED</p> <p>CRITICAL POWER</p> <p>RECESSED DOWNLIGHT (ROUND &amp; SQUARE)</p> <p>RECESSED WALL WASH DOWNLIGHT</p> <p>SURFACE MOUNT LIGHT</p> <p>SURFACE MOUNT LIGHT</p> <p>WALL MOUNT LUMINAIRE</p> <p>TRACK LIGHTING</p> <p>EMERGENCY LIGHTING UNIT</p> <p>SHADED REGION INDICATES FACE EXIT SIGN STEM INDICATES WALL MOUNT</p> <p>EXIT SIGN, WITH EMERGENCY LIGHTING</p> <p>POLE MOUNTED LUMINAIRE</p> <p><b>LIGHT CONTROL DEVICE LABELS</b></p> <p>DESCRIPTORS, REFER TO ABBREVIATIONS                      SWITCH CIRCUIT IDENTIFIER                      SWITCH TYPE:                      2=TWO POLE, SINGLE THROW                      3=THREE WAY                      4=FOUR WAY                      D=DIMMER                      P=WITH PILOT LIGHT                      T=TIMER                      SP=SPEED CONTROL                      K=KEYED                      M=MOTOR HORSE POWER RATED                      MS=MANUAL MOTOR STARTER                      H/L=HIGH/LOW CONTROL</p> <p>SWITCH</p> <p>OCCUPANCY SENSOR, CEILING MOUNT</p> <p>OCCUPANCY SENSOR, WALL MOUNT</p> <p>DAYLIGHT SENSOR, CEILING MOUNT</p> <p>DAYLIGHT SENSOR, WALL MOUNT</p> <p>LIGHTING CONTROL STATION</p> <p>EMERGENCY LIGHTING REMOTE HEAD</p>	<p>RECEPTACLE LABELS</p> <p>DESCRIPTORS, REFER TO ABBREVIATIONS:                      G = GROUND FAULT CIRCUIT INTERRUPTER                      GFCI = GROUND FAULT CIRCUIT INTERRUPTER                      AC = MOUNT ABOVE COUNTER TOP                      USB = DEVICE WITH USB CHARGING PORT(S)                      OC = OCCUPANCY CONTROLLED                      X = MOUNTING HEIGHT AFF                      CIRCUIT IDENTIFIER</p> <p>DUPLIX RECEPTACLE</p> <p>DOUBLE DUPLIX RECEPTACLE</p> <p>SWITCHED (SPLIT) RECEPTACLE</p> <p>GENERATOR POWER CIRCUIT</p> <p>CEILING MOUNT RECEPTACLE</p> <p>FLOOR MOUNT</p> <p>SPECIAL PURPOSE RECEPTACLE</p> <p>SIMPLEX RECEPTACLE</p> <p>MOTOR, SINGLE PHASE</p> <p>MOTOR, THREE PHASE</p> <p>DISCONNECT SWITCH</p> <p>DISCONNECT SWITCH, FUSED</p> <p>DISCONNECT SWITCH, ENCLOSED BREAKER</p> <p>COMBINATION MOTOR STARTER</p> <p>ELECTRIC HAND DRYER</p> <p>POWER POLE</p> <p>RETRACTABLE CORD REEL</p> <p>MULTI-OUTLET ASSEMBLY</p> <p>GROUNDING/ELECTRODE BOND POINT</p> <p>RECEPTACLE PEDESTAL</p> <p>IN-GRADE HANDHOLE</p> <p>WALL-MOUNT GROUND BUS</p> <p>RECESSED PANELBOARD</p> <p>PANELBOARD</p> <p>COMMUNICATIONS</p> <p>NUMBER OF PORTS (TYPICAL) TELEPHONE OUTLET</p> <p>DATA OUTLET</p> <p>DATA OUTLET, FLOOR MOUNT</p> <p>TELEVISION OUTLET</p> <p>AUDIO/VIDEO OUTLET</p>	<p>ALARM STROBE, WALL MOUNT</p> <p>ALARM STROBE, CEILING MOUNT</p> <p>ALARM STROBE &amp; HORN/SPEAKER, WALL MOUNT</p> <p>ALARM STROBE &amp; HORN/SPEAKER, CEILING MOUNT</p> <p>ALARM HORN/SPEAKER, WALL MOUNT</p> <p>ALARM HORN/SPEAKER, CEILING MOUNT</p> <p>PULL STATION</p> <p>SMOKE DETECTOR</p> <p>HEAT DETECTOR</p> <p>DUCT SMOKE DETECTOR</p> <p>MAGNETIC DOOR HOLD</p> <p>ALARM CONTROL RELAY</p> <p>FLOW SWITCH</p> <p>TAMPER SWITCH</p> <p>ELECTRIC DAMPER</p> <p>REMOTE ANNUNCIATOR</p> <p>CONTROL PANEL</p> <p>FLOW SWITCH</p> <p>TORQUE SWITCH</p> <p>HUMIDISTAT</p> <p>EMERGENCY STOP PUSHBUTTON</p> <p>CONTROL STATION</p> <p>CORD &amp; PLUG</p> <p>PULL CORD</p> <p>STANDARD ROOM STATION</p> <p>BED AUDIO STATION</p> <p>SCREEN SIZE GRAPHIC TERMINAL</p> <p>MARQUEE</p> <p>NURSE LOCATOR</p> <p>DISCONNECT SWITCH TYPE DESIGNATION</p> <p>STARTER / CONTACTOR</p> <p>CAPACITOR</p> <p>MOTOR STARTER OVERLOADS</p> <p>MOTOR HORSE POWER RATING</p> <p>TRANSFORMER</p> <p>CONDUIT/WIRE RUN, EXPOSED</p> <p>CONDUIT/WIRE RUN, CONCEALED/UNDERGROUND</p> <p>JUNCTION BOX, WALL MOUNT</p> <p>JUNCTION BOX, CEILING MOUNT</p> <p>JUNCTION BOX, FLOOR MOUNT</p> <p>KEYED NOTE</p> <p>EQUIPMENT TAG</p> <p>REVISION TAG</p> <p>CONDUIT/WIRE TAG</p> <p>CONDUIT STUB W/BUSHING</p>	<p>LEVEL TRANSDUCER</p> <p>FLOW METER</p> <p>TEMPERATURE TRANSDUCER</p> <p>SUSPENDED SOLIDS SENSOR</p> <p>DISSOLVED OXYGEN SENSOR</p> <p>GAS DETECTION SENSOR</p> <p>SLUDGE BLANKET SENSOR</p> <p>PH SENSOR</p> <p>SOLENOID</p> <p>MOTORIZED VALVE</p> <p>LIMIT SWITCH</p> <p>PRESSURE SWITCH</p> <p>THERMOSTAT</p> <p>FLOOD SWITCH</p> <p>FLOAT SWITCH</p> <p>MOTORIZED DAMPER</p> <p>PROXIMITY SENSOR</p> <p>FLOW SWITCH</p> <p>TORQUE SWITCH</p> <p>HUMIDISTAT</p> <p>EMERGENCY STOP PUSHBUTTON</p> <p>CONTROL STATION</p> <p>CORD &amp; PLUG</p> <p>ONE-LINE DIAGRAM</p> <p>INCOMING LINE</p> <p>CIRCUIT BREAKER</p> <p>FUSE</p> <p>SWITCH</p> <p>DISCONNECT SWITCH TYPE DESIGNATION</p> <p>STARTER / CONTACTOR</p> <p>CAPACITOR</p> <p>MOTOR STARTER OVERLOADS</p> <p>MOTOR HORSE POWER RATING</p> <p>TRANSFORMER</p> <p>CURRENT TRANSFORMER</p> <p>METER</p> <p>GENERATOR</p> <p>VFD MOTOR CONTROLLER</p> <p>SSRV MOTOR CONTROLLER</p> <p>SURGE PROTECTION DEVICE</p> <p>AUTOMATIC TRANSFER SWITCH</p> <p>LIGHTNING ARRESTOR</p> <p>HEATER</p>	<p>RELAY COIL (NUMBER DENOTED)</p> <p>NORMALLY OPEN CONTACT</p> <p>NORMALLY CLOSED CONTACT</p> <p>THREE POSITION SELECTOR SWITCH (HAND-OFF-AUTO DENOTED)</p> <p>TWO POSITION SELECTOR SWITCH (RUN-OFF DENOTED)</p> <p>PUSH TO TEST PILOT LIGHT (COLOR DENOTED)</p> <p>PILOT LIGHT (COLOR DENOTED)</p> <p>PUSH BUTTON - NORMALLY CLOSED</p> <p>PUSH BUTTON - NORMALLY OPEN</p> <p>CLOSED SWITCH - TIME DELAY OPEN</p> <p>OPEN SWITCH - TIME DELAY CLOSED</p> <p>CLOSED SWITCH, TIME DELAY CLOSED</p> <p>OPEN SWITCH, TIME DELAY OPEN</p> <p>TEMPERATURE SWITCH - CLOSE ON RISING TEMPERATURE</p> <p>TEMPERATURE SWITCH - OPEN ON RISING TEMPERATURE</p> <p>SOLENOID</p> <p>HEATER</p> <p>TERMINAL BLOCK</p> <p>CONNECTION NODE</p>
<p>HEALTH CARE</p> <p>NURSE CALL LIGHT, WALL MOUNT</p> <p>NURSE CALL LIGHT, CEILING MOUNT</p>	<p>HEALTH CARE</p> <p>NURSE CALL LIGHT, WALL MOUNT</p> <p>NURSE CALL LIGHT, CEILING MOUNT</p>	<p>HEALTH CARE</p> <p>NURSE CALL LIGHT, WALL MOUNT</p> <p>NURSE CALL LIGHT, CEILING MOUNT</p>	<p>HEALTH CARE</p> <p>NURSE CALL LIGHT, WALL MOUNT</p> <p>NURSE CALL LIGHT, CEILING MOUNT</p>	<p>HEALTH CARE</p> <p>NURSE CALL LIGHT, WALL MOUNT</p> <p>NURSE CALL LIGHT, CEILING MOUNT</p>
<p>SECURITY</p> <p>CARD READER</p> <p>KEY PAD</p> <p>DOOR CONTACT</p> <p>MOTION DETECTOR</p> <p>GLASS BREAK</p> <p>REQUEST TO EXIT</p> <p>ELECTRIFIED DOOR LOCK</p> <p>CAMERA</p> <p>BELL/CHIME</p> <p>CABLE TRAY</p>	<p>SECURITY</p> <p>MICROPHONE OUTLET</p> <p>SPEAKER, WALL MOUNT</p> <p>SPEAKER, CEILING MOUNT</p> <p>PROJECTOR/SMART BOARD WALL MOUNT</p> <p>PROJECTOR, CEILING MOUNT</p> <p>PROJECTOR CONTROL OUTLET</p> <p>SMARTBOARD CONTROL OUTLET</p> <p>INTERCOM STATION</p> <p>BELL/CHIME</p> <p>CABLE TRAY</p>	<p>SECURITY</p> <p>CONDUIT/WIRE RUN, EXPOSED</p> <p>CONDUIT/WIRE RUN, CONCEALED/UNDERGROUND</p> <p>JUNCTION BOX, WALL MOUNT</p> <p>JUNCTION BOX, CEILING MOUNT</p> <p>JUNCTION BOX, FLOOR MOUNT</p> <p>KEYED NOTE</p> <p>EQUIPMENT TAG</p> <p>REVISION TAG</p> <p>CONDUIT/WIRE TAG</p> <p>CONDUIT STUB W/BUSHING</p>	<p>SECURITY</p> <p>CURRENT TRANSFORMER</p> <p>METER</p> <p>GENERATOR</p> <p>VFD MOTOR CONTROLLER</p> <p>SSRV MOTOR CONTROLLER</p> <p>SURGE PROTECTION DEVICE</p> <p>AUTOMATIC TRANSFER SWITCH</p> <p>LIGHTNING ARRESTOR</p> <p>HEATER</p>	<p>PANELBOARD NAMING LEGEND:</p> <p>DP = DISTRIBUTION PANEL LP = LIGHTING PANELBOARD</p> <p>DP-X-Y : X = FLOOR LEVEL PANEL IS LOCATED Y = # OF PANEL ON THE FLOOR LEVEL</p>

## ELECTRICAL ABBREVIATIONS

1P 2P 3P 4P	1 POLE 2 POLE 3 POLE 4 POLE	F FA FACP FBO FCU FIXT FLA FLR FLUOR FU FVR FVNR	FUSED OR FUSE FIRE ALARM FIRE ALARM CONTROL PANEL FURNISHED BY OTHERS FAN COIL UNIT FIXTURE FULL LOAD AMPS FLOOR FLUORESCENT FUSE FULL VOLTAGE REVERSING FULL VOLTAGE NON-REVERSING	N.C. NEC NEMA	NORMALLY CLOSED NATIONAL ELECTRICAL CODE NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION NOT IN CONTRACT NIGHT LIGHT NORMALLY OPEN NORMAL POWER FACTOR NOT TO SCALE	V VA VDT VERT VFD VFX VOL	VOLT VOLT-AMPERES VIDEO DISPLAY TERMINAL VERTICAL VARIABLE FREQUENCY DRIVE VERIFY VOLUME
A A/C AC ACLG ADO AIC	AMPERE OR AMP AIR CONDITIONER ABOVE COUNTER ABOVE CEILING AUTOMATIC DOOR OPENER AMPERE INTERRUPTING CAPACITY	AF AFF AFG AFCI	ARC FAULT ABOVE FINISHED FLOOR ABOVE FINISHED GRADE ARC FAULT CIRCUIT INTERRUPTER	NIC NL N.O. NPF NTS	NIGHT LIGHT NORMALLY OPEN NORMAL POWER FACTOR NOT TO SCALE	W W/ WG WH W/O WP	WATT OR WIRE WITH WIRE GUARD WATER HEATER WITHOUT WEATHERPROOF
AHU AL ALT AMP AMPL ANNUN APPROX AQSTAT	AIR HANDLING UNIT ALUMINUM ALTERNATE AMPERE AMPLIFIER ANNUNCIATOR APPROXIMATELY AQUASTAT	GA GAL GALV GC GEN GFI	GROUND FAULT CIRCUIT INTERRUPTER GAUGE GALLON GALVANIZED GENERAL CONTRACTOR GENERATOR GROUND FAULT CIRCUIT INTERRUPTER GROUND FAULT CIRCUIT INTERRUPTER	OC OH OL	OCCUPANCY CONTROLLED OVERHEAD OVERLOADS	XFMR XFR	TRANSFORMER TRANSFER
ARCH AS AT ATS AUTO AUX AV AWG	ARCHITECT, ARCHITECTURAL AMP SWITCH AUTOMATIC TRANSFER SWITCH AUTOMATIC AUXILIARY AUDIO VISUAL AMERICAN WIRE GAUGE	HOA HORIZ HP HPF HSP HT HTG HTR HV HVC	HAND-OFF-AUTOMATIC HORIZONTAL HORSEPOWER HIGH POWER FACTOR HIGH SERVICE PUMP HEIGHT HEATING HEATER HIGH VOLTAGE HEATING VENTILATING AND AIR CONDITIONING	PWR	POWER	∠ @ Δ ' " # ∅ CL P X"	ANGLE AT DELTA FEET INCHES NUMBER PHASE CENTER LINE PLATE MOUNTING HEIGHT AFF
BAT BD BLDG BMS	BATTERY BOARD BUILDING BUILDING MANAGEMENT SYSTEM	HWP HZ	HYDRONIC WATER PUMP HERTZ	QTY QZ	QUANTITY QUARTZ		
C CAB CAT CATV CB CCTV CKT CLG COMB CMPR CONN CONST CONT	CONDUIT CABINET CATALOG CABLE TELEVISION CIRCUIT BREAKER CLOSED CIRCUIT TELEVISION CIRCUIT CEILING COMBINATION COMPRESSOR CONNECTION CONSTRUCTION CONTINUATION OR CONTINUOUS CONTRACTOR CONVECTOR CIRCULATING PUMP CURRENT TRANSFORMER CENTER COPPER	IC IG IMC CONDUIT INCAND IR I/W	INTERRUPTING CURRENT ISOLATED GROUND INTERMEDIATE METAL CONDUIT INCANDESCENT INFRARED INTERLOCK WITH	RCPT RQD RM RSC RTU	RECEPTACLE REQUIRED ROOM RIGID STEEL CONDUIT ROOF TOP UNIT		
CONTR CONV CP CT CTR CU	CONTRACTOR CONVECTOR CIRCULATING PUMP CURRENT TRANSFORMER CENTER COPPER	J J-BOX JB KAIC KV KVA KVAR KW KWH	JUNCTION BOX JUNCTION BOX JUNCTION BOX KILOAMPS INTERRUPTING CAPACITY KILOVOLT KILOVOLT-AMPERE KILOVOLT-AMPERE REACTIVE KILOWATT KILOWATT HOUR	SC SEC SHT SIM S/N SPEC SPKR SP	SURFACE CONDUIT SECONDARY SHEET SIMILAR SOLID NEUTRAL SPECIFICATION SPEAKER SPARE		
D DC DCP	DAMPER DIRECT CURRENT DOMESTIC WATER CIRCULATING PUMP	KAIC KV KVA KVAR KW KWH	KILOAMPS INTERRUPTING CAPACITY KILOVOLT KILOVOLT-AMPERE KILOWATT KILOWATT HOUR	SST SSW S/S STA STD SURF SW SWBD SYM SYS	SOLID STATE SELECTOR SWITCH STOP/START PUSHBUTTONS STATION STANDARD SURFACE MOUNTED SWITCH SWITCHBOARD SYMMETRICAL SYSTEM		
DEPT DET DJA DISC DIST DIV DN DPR DS DT DWG	DEPARTMENT DETAIL DIAMETER DISCONNECT DISTRIBUTION DIVISION DOWN DAMPER DISCONNECT/SAFETY SWITCH DOUBLE THROW DRAWING	LCP LCS LOC LT LTG LTNG LV	LIGHTING CONTROL PANEL LOCAL CONTROL STATION LOCATE OR LOCATION LIGHT LIGHTING LIGHTNING LOW VOLTAGE	TEL TERM TL TR TSTAT TTC	TELEPHONE TERMINAL TWIST LOCK TAMPER RESISTANT THERMOSTAT TELEPHONE TERMINAL CABINET TELEVISION TELEVISION TERMINAL CABINET TYPICAL		
EC EF ELEC ELEV EM EMS EMT EP EQUIP EWC EXIST EXH EXP	ELECTRICAL CONTRACTOR EXHAUST FAN ELECTRIC, ELECTRICAL ELEVATOR EMERGENCY ENERGY MANAGEMENT SYSTEM ELECTRICAL METALLIC TUBING ELECTRIC PNEUMATIC EQUIPMENT ELECTRIC WATER COOLER EXISTING EXHAUST EXPLOSION PROOF	MAX M/C MC MCA MCB MCC MDC MDP MFR MH MIC MIN MISC MLO MOA MS MSBD MT MTS MTR	MAXIMUM MOMENTARY CONTACT MECHANICAL CONTRACTOR MAX CIRCUIT AMPACITY MAIN CIRCUIT BREAKER MOTOR CONTROL CENTER MAIN DISTRIBUTION CENTER MAIN DISTRIBUTION PANEL MANUFACTURER MANHOLE MICROPHONE MINIMUM MISCELLANEOUS MAIN LUGS ONLY MULTIOUTLET ASSEMBLY MANUAL MOTOR STARTER MAIN SWITCHBOARD MOUNT MANUAL TRANSFER SWITCH MOTOR, MOTORIZED	UC UE UG UH UNO USB UT UTIL UV	UNDER COUNTER UNDERGROUND ELECTRICAL UNDERGROUND UNIT HEATER UNLESS NOTED OTHERWISE WITH USB CHARGING PORT UNDERGROUND TELEPHONE UTILITY UNIT VENTILATOR OR ULTRAVIOLET		

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DESIGNED	NO.	ISSUED FOR	DATE
CAB	B		2/14/2020
DRAWN			
CHECKED			
ARM			
CLIENT PROJ. NO.	G11.118707		



EXISTING ELECTRICAL EQUIPMENT MOUNTED TO UNI-STRUT SUPPORT ON BACKSIDE OF EXISTING CONTROL PANEL



NON-FUSED 480/277V, 200A/3P DISCONNECT TO REMAIN AS IS

FUSED 480/277V, 200A/3P SERVICE DISCONNECT TO REMAIN AS IS

480/277V, 200A/3P MANUAL TRANSFER SWITCH TO BE DEMOLISHED AND REPLACED WITH NEW 480/277V, 200A/3P AUTOMATIC TRANSFER SWITCH

INTERIOR OF EXISTING NON-FUSED MAIN SERVICE DISCONNECT



INTERIOR OF EXISTING FUSED DISCONNECT



INTERIOR OF EXISTING MANUAL TRANSFER SWITCH



1 PHOTOS OF EXISTING ELECTRICAL EQUIPMENT - EAST END SITE  
NOT TO SCALE

GENERAL NOTES:

- ELECTRICAL EQUIPMENT AND DEVICES SHOWN IN LIGHT (GRAY) LINES ARE EXISTING DEVICES TO REMAIN, UNLESS OTHERWISE NOTED.
- GENERATOR AND AUTOMATIC TRANSFER SWITCH TO BE PROVIDED BY OWNER AND INSTALLED BY CONTRACTOR.
- OWNER TO PROVIDE PAD AND MOUNT THE GENERATOR TO THE PAD, CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMAINDER OF THE INSTALLATION.
- CONTRACTOR RESPONSIBLE FOR COORDINATING INSTALLATION OF NATURAL GAS LINE TO GENERATOR WITH THE UTILITY. CONTRACTOR SHALL PROVIDE ALL EQUIPMENT AND WORK WHICH UTILITY DOES NOT PROVIDE FOR CONNECTING THE GAS LINE TO THE GENERATOR.
- OWNER TO PROVIDE PROGRAMMING FOR THE OMNI MONITORING SYSTEMS.

KEYED NOTES:

- DEMOLISH EXISTING MANUAL TRANSFER SWITCH AND GENERATOR RECEPTACLE, INSTALL NEW AUTOMATIC TRANSFER SWITCH (PROVIDED BY OWNER) IN ITS PLACE. MODIFY EXISTING CONDUIT, CONDUCTORS, AND MOUNTING SUPPORTS AS NECESSARY FOR NEW INSTALLATION. SEE ONE-LINE DIAGRAMS FOR ADDITIONAL INFORMATION.
- INSTALL NEW GENERATOR PROVIDED BY OWNER. SEE ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION. COORDINATE EXACT LOCATION WITH CIVIL SITE PLAN.
- PROVIDE 0.75" C-4#14, 1#14G FROM ATS TO OMNI MONITORING SYSTEM IN EXISTING CONTROL PANEL FOR GENERATOR ALARM SIGNAL AND UTILITY POWER FAIL SIGNAL.
- MODIFY EXISTING CONTROL PANEL AND COVER TO ALLOW THE INSTALLATION OF 2-20A/1P CIRCUIT BREAKERS IN PANEL DP1. BREAKERS SHALL POWER GENERATOR BATTERY CHARGER AND GENERATOR BLOCK HEATER.
- PROVIDE 1.25" C-6#14, 1#14G FROM ATS TO GENERATOR FOR GENERATOR REMOTE START SIGNAL, GENERATOR ALARM SIGNAL, SPARE/FUTURE SIGNAL.
- PROVIDE 1.25" C-4#12, 1#12G FROM 208Y/120V PANELBOARD FOR GENERATOR BLOCK HEATER AND BATTERY CHARGER CIRCUITS.

INTERIOR OF EXISTING CONTROL PANEL SHOWING OMNI MONITORING SYSTEM CONTROLLER



INTERIOR OF EXISTING CONTROL PANEL SHOWING PANELBOARD DP1

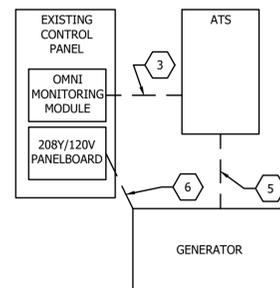
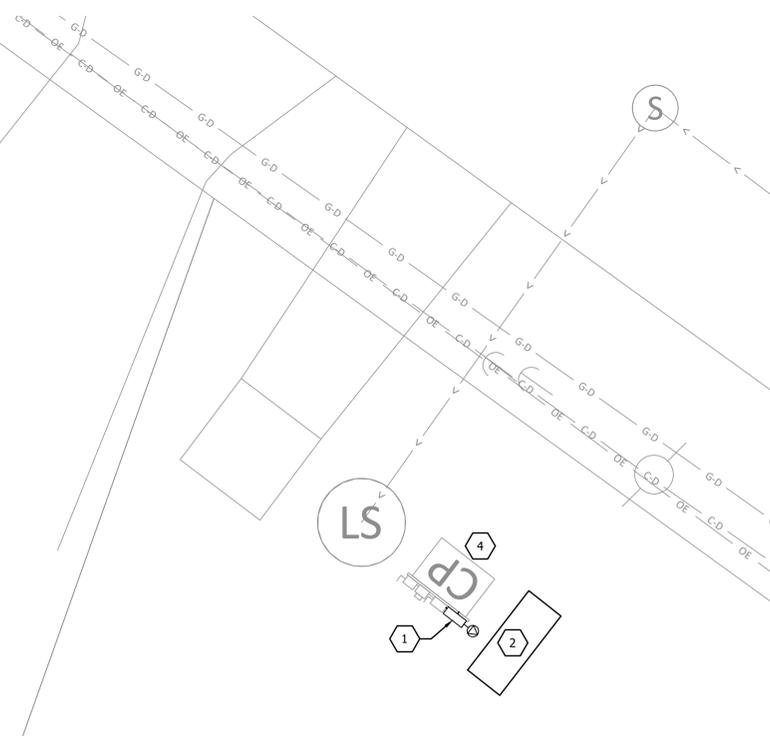


EXISTING CONTROL PANEL INTERIOR DOOR



KEYED NOTES:

- OMNI MONITORING SYSTEM CONTROLLER.
- PANEL DP1. PROVIDE 2-20A/1P SQUARE D CIRCUIT BREAKERS TO POWER NEW GENERATOR LOADS.
- MODIFY EXISTING COVER TO ALLOW FOR INSTALLATION OF NEW CIRCUIT BREAKERS.



4 PHOTOS OF EXISTING CONTROL PANEL - EAST END SITE  
NOT TO SCALE

2 ELECTRICAL PLAN - EAST END SITE

3 GENERATOR WIRING DIAGRAM  
NOT TO SCALE

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DESIGN TREE  
engineering + land surveying  
St. Cloud | Alexandria | Rogers  
320-217-5557

**BOLTON & MENK**

855 WRIGHT BROTHERS BLVD SUITE 2A  
CEDAR RAPIDS, IOWA 52404  
Phone: (319) 362-3219  
Email: CedarRapids@bolton-menk.com  
www.bolton-menk.com

DESIGNED	NO.	ISSUED FOR	DATE
CAB	B		2/14/2020
DRAWN	CAB		
CHECKED	ARM		
CLIENT PROJ. NO.	G11.118707		

EVANSDALE, IA  
LIFT STATION GENERATORS  
ELECTRICAL PLAN - EAST END SITE

SHEET

7.03



**RESOLUTION 6397**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF EVANSDALE, IOWA FIXING COMPENSATION FOR THE PARAMEDIC CAPTAIN OF THE CITY OF EVANSDALE, IOWA FOR FISCAL YEAR 2020**

**BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF EVANSDALE, IOWA:**

That the following person and position named shall be paid the salaries or wages indicated and the clerk is authorized to issue warrants/checks, less legally required or authorized deductions from the amount set out below and make such contributions to I.P.E.R.S., M.F.P.R.S.I., Social Security or other purposes as required by law or authorization of the council.

<u>Employee</u>	<u>Department/Job Title</u>	<u>Proposed Wage</u>	<u>Reason</u>	<u>Effective</u>
Robert Gipper	Paramedic Captain	\$47,000 annual salary	New Hire	03/23/2020

**BE IT FURTHER RESOLVED** by the City Council of the City of Evansdale, Iowa, that the salary and compensation set for the above listed employees shall be in effect beginning March 23, 2020.

**PASSED AND APPROVED THIS 7<sup>TH</sup> DAY OF APRIL 2020**

**ATTEST:**

\_\_\_\_\_  
**Troy Beatty, Mayor**

\_\_\_\_\_  
**DeAnne Kobliska, City Clerk**

**RESOLUTION 6398**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF EVANSDALE, IOWA FIXING COMPENSATION FOR PUBLIC WORKS GENERAL LABORER POSTION OF THE CITY OF EVANSDALE, IOWA FOR FISCAL YEAR 2020**

**BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF EVANSDALE, IOWA:**

That the following person and position named shall be paid the salaries or wages indicated and the clerk is authorized to issue warrants/checks, less legally required or authorized deductions from the amount set out below and make such contributions to I.P.E.R.S., M.F.P.R.S.I., Social Security or other purposes as required by law or authorization of the council.

<u>Employee</u>	<u>Department/Job Title</u>	<u>Proposed Wage</u>	<u>Reason</u>	<u>Effective</u>
Jared Wright	General Laborer	\$16.35/Hr	New Hire	04/13/2020

**BE IT FURTHER RESOLVED** by the City Council of the City of Evansdale, Iowa, that the salary and compensation set for the above listed employees shall be in effect beginning April 13, 2020.

**PASSED AND APPROVED THIS 7<sup>TH</sup> DAY OF APRIL 2020**

**ATTEST:**

\_\_\_\_\_  
**Troy Beatty, Mayor**

\_\_\_\_\_  
**DeAnne Kobliska, City Clerk**

**RESOLUTION 6399**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF EVANSDALE, IOWA, SETTING THE DATE OF PUBLIC HEARING TO AMEND THE CURRENT BUDGET FOR THE FISCAL YEAR ENDING JUNE 30, 2020**

**WHEREAS**, the state code requires cities to amend their estimates of revenue and expenditure appropriations; and

**WHEREAS**, the state code also requires cities to hold a public hearing prior to amending their estimates.

**NOW THEREFORE, BE IT RESOLVED** by the City Council of the City of Evansdale, Iowa, that a public hearing is hereby set for 6:00 PM, Tuesday, April 21, 2020 to hear comments regarding the proposed amendment of the budget for fiscal year ending June 30, 2020.

**BE IT FURTHER RESOLVED** that the City Clerk is hereby directed and authorized to advertise said public hearing according to State Law.

**PASSED AND ADOPTED THIS 7<sup>TH</sup> DAY OF APRIL 2020**

**ATTEST:**

\_\_\_\_\_  
**Troy Beatty, Mayor**

\_\_\_\_\_  
**DeAnne Kobliska, City Clerk**

To: City Council  
From: DeAnne Kobliska  
Date: 03/27/20  
Re: Budget Amendment

---

Attached is the amendment to the FY2020 Budget.

We are amending 3 funds currently as follows:

Road use = \$150,000

Due to the engineering of the Lafayette Road Project the Road Use fund has incurred \$198,000 in engineering fees that will be reimbursed once the project proceeds.

Capital Projects = Transfer out \$110,395

The General fund loaned the Capital Projects fund \$330,000 during the FY17/18 finalization of the River Forest Road Reconstruction Project. We received our final payment from the DOT and need to account for transfer

Let me know if you have questions!!

Thank you,

DeAnne

**NOTICE OF PUBLIC HEARING**  
**AMENDMENT OF FY2019-2020 CITY BUDGET**

The City Council of EVANSDALE in BLACK HAWK County, Iowa  
will meet at EVANSDALE CITY HALL  
at 6:00 p.m. on 04/21/2020  
(hour) (Date)

,for the purpose of amending the current budget of the city for the fiscal year ending June 30, 2020  
(year)  
by changing estimates of revenue and expenditure appropriations in the following functions for the reasons given.  
Additional detail is available at the city clerk's office showing revenues and expenditures by fund type and by activity.

		Total Budget as certified or last amended	Current Amendment	Total Budget after Current Amendment
<b>Revenues &amp; Other Financing Sources</b>				
Taxes Levied on Property	1	1,148,507		1,148,507
Less: Uncollected Property Taxes-Levy Year	2	0		0
<b>Net Current Property Taxes</b>	3	1,148,507	0	1,148,507
Delinquent Property Taxes	4	0		0
TIF Revenues	5	630,730		630,730
Other City Taxes	6	650,425		650,425
Licenses & Permits	7	56,962		56,962
Use of Money and Property	8	34,870		34,870
Intergovernmental	9	644,004		644,004
Charges for Services	10	1,328,864		1,328,864
Special Assessments	11	1,174		1,174
Miscellaneous	12	210,980		210,980
Other Financing Sources	13	4,204,500		4,204,500
Transfers In	14	1,551,765	110,395	1,662,160
<b>Total Revenues and Other Sources</b>	15	10,462,781	110,395	10,573,176
<b>Expenditures &amp; Other Financing Uses</b>				
Public Safety	16	1,412,957		1,412,957
Public Works	17	943,946	150,000	1,093,946
Health and Social Services	18	19,278		19,278
Culture and Recreation	19	477,233		477,233
Community and Economic Development	20	7,726		7,726
General Government	21	433,204		433,204
Debt Service	22	933,145		933,145
Capital Projects	23	2,202,000		2,202,000
Total Government Activities Expenditures	24	6,429,489	150,000	6,579,489
Business Type / Enterprises	25	2,745,428		2,745,428
<b>Total Gov Activities &amp; Business Expenditures</b>	26	9,174,917	150,000	9,324,917
Transfers Out	27	1,551,765	110,395	1,662,160
<b>Total Expenditures/Transfers Out</b>	28	10,726,682	260,395	10,987,077
<b>Excess Revenues &amp; Other Sources Over (Under) Expenditures/Transfers Out Fiscal Year</b>	29	-263,901	-150,000	-413,901
Beginning Fund Balance July 1	30	1,678,499		1,678,499
<b>Ending Fund Balance June 30</b>	31	1,414,598	-150,000	1,264,598

Explanation of increases or decreases in revenue estimates, appropriations, or available cash:

Public Works - Engineering fees for a planned project that was postponed for funding; Transfer out/in repayment to general fund for loan to capital improvement fund

There will be no increase in tax levies to be paid in the current fiscal year named above related to the proposed budget amendment. Any increase in expenditures set out above will be met from the increased non-property tax revenues and cash balances not budgeted or considered in this current budget.

DeAnne Kobliska  
City Clerk/ Finance Officer Name



841 Meacham Rd, Statesville, NC, 28677  
 PHONE: 800-424-0422 FAX: 833-930-1124  
 WQ-10149937

**Sell To:**

Contact Name	Deanne Kobliska	Ship To Name	City of Evansdale
Bill To Name	City of Evansdale	Ship To	123 N Evans Rd
Bill To	123 N Evans Rd Waterloo, IA 50707-1115 USA		Waterloo, IA 50707-1115 USA
Email	cityclerk@cityofevansdale.org		
Phone	(319) 232-6683		

**Quote Information**

Salesperson	Mike Natelborg	Created Date	4/1/2020
Salesperson Email	<a href="mailto:mnatelborg@wastequip.com">mnatelborg@wastequip.com</a>	Expiration Date	5/1/2020
		Quote Number	WQ-10149937
			Please Reference Quote Number on all Purchase Orders

Model	Product Description	Selected Option	Quantity	Sales Price	Total Price
79264	Model 79264 - Toter 64 Gallon EVR II Universal/Nestable Cart	---Body Color - (929) Toter Green Granite ---Lid Color - (200) Black ---Body Hot Stamp on Both Sides (Existing) in White ---Wheels - 10in Sunburst ---Stopbar - Galvanized ---Toter Serial Number Hot Stamped on Front of Cart Body in White ---2/3 Assembled with Lid (down), Stop Bar and Axle Factory Installed ---Warranty - 12 Yrs Cart Body, All other components 10 Yrs	50.00	\$42.25	\$2,112.50
79264	Model 79264 - Toter 64 Gallon EVR II Universal/Nestable Cart	---Body Color - (705) Blue ---Lid Color - (200) Black ---Body Hot Stamp on Both Sides (Existing) in White ---Wheels - 10in Sunburst ---Stopbar - Galvanized ---Toter Serial Number Hot Stamped on Front of Cart Body in White ---2/3 Assembled with Lid (down), Stop Bar and Axle Factory Installed	50.00	\$42.25	\$2,112.50

Payment Terms	Net 30 Days if credit has been established	Subtotal	\$4,225.00
Shipping Terms	FOB Origin	Shipping	\$991.17
		Tax	\$0.00
		Grand Total	\$5,216.17

**Additional Information**

**Additional Terms** Our Quote is a good faith estimate, based on our understanding of your needs. Subject to our acceptance, your Order is an offer to purchase our Products and services in accordance with the Wastequip Terms & Conditions of Sale ("WQ T&C") located at: <https://www.wastequip.com/terms-conditions-of-sale>, as of the date set forth in Section 1(b) of the WQ T&C, which are made a part of this Quote. These WQ T&Cs may be updated from time to time and are available by hard copy upon request.

**Additional Information** Pricing is based on your anticipated Order prior to the expiration of this Quote, including product specifications, quantities and timing, accepted delivery within 45 days of Order acceptance by Toter. Any differences to your Order may result in



841 Meacham Rd, Statesville, NC, 28677  
 PHONE: 800-424-0422 FAX: 833-930-1124  
 WQ-10149940

**Sell To:**

Contact Name	Deanne Kobliska	Ship To Name	City of Evansdale
Bill To Name	City of Evansdale	Ship To	123 N Evans Rd
Bill To	123 N Evans Rd Waterloo, IA 50707-1115 USA		Waterloo, IA 50707-1115 USA
Email	cityclerk@cityofevansdale.org		
Phone	(319) 232-6683		

**Quote Information**

Salesperson	Mike Natelborg	Created Date	4/1/2020
Salesperson Email	<a href="mailto:mnatelborg@wastequip.com">mnatelborg@wastequip.com</a>	Expiration Date	5/1/2020
		Quote Number	WQ-10149940
			Please Reference Quote Number on all Purchase Orders

Model	Product Description	Selected Option	Quantity	Sales Price	Total Price
79264	Model 79264 - Toter 64 Gallon EVR II Universal/Nestable Cart	---Body Color - (929) Toter Green Granite ---Lid Color - (200) Black ---Body Hot Stamp on Both Sides (Existing) in White ---Wheels - 10in Sunburst ---Stopbar - Galvanized ---Toter Serial Number Hot Stamped on Front of Cart Body in White ---2/3 Assembled with Lid (down), Stop Bar and Axle Factory Installed ---Warranty - 12 Yrs Cart Body, All other components 10 Yrs	100.00	\$42.25	\$4,225.00
79264	Model 79264 - Toter 64 Gallon EVR II Universal/Nestable Cart	---Body Color - (705) Blue ---Lid Color - (200) Black ---Body Hot Stamp on Both Sides (Existing) in White ---Wheels - 10in Sunburst ---Stopbar - Galvanized ---Toter Serial Number Hot Stamped on Front of Cart Body in White ---2/3 Assembled with Lid (down), Stop Bar and Axle Factory Installed	100.00	\$42.25	\$4,225.00

Payment Terms	Net 30 Days if credit has been established	Subtotal	\$8,450.00
Shipping Terms	FOB Origin	Shipping	\$1,169.41
		Tax	\$0.00
		Grand Total	\$9,619.41

**Additional Information**

**Additional Terms** Our Quote is a good faith estimate, based on our understanding of your needs. Subject to our acceptance, your Order is an offer to purchase our Products and services in accordance with the Wastequip Terms & Conditions of Sale ("WQ T&C") located at: <https://www.wastequip.com/terms-conditions-of-sale>, as of the date set forth in Section 1(b) of the WQ T&C, which are made a part of this Quote. These WQ T&Cs may be updated from time to time and are available by hard copy upon request.

**Additional Information** Pricing is based on your anticipated Order prior to the expiration of this Quote, including product specifications, quantities and timing, accepted delivery within 45 days of Order acceptance by Toter. Any differences to your Order may result in



**To: Mayor Beatty and Members of the Evansdale City Council**

**From: Chris Even, Wastewater Foreman**

**Date: April 2, 2020**

**Re: Damage to Mainline Camera**

---

The mainline camera that we use for televising the city's sanitary sewer mains was accidentally damaged when we were televising a sanitary sewer main on Saunders Avenue. We use a hook on the end of a long pole to position the camera in and remove the camera from the manhole. I had not noticed that the hook on the end of the pole had begun to work loose and as I was removing the camera from the manhole, the camera and hook rotated enough for the last thread to come out and the hook and camera fell about 8 feet onto the floor of the manhole. After the fall, the video on the camera still worked but the camera lens would not pan.

I sent the camera to the factory for a repair estimate and they are estimating \$4,150.04 to repair the camera. The camera can be used in its current condition but I am only able to look straight down the pipe. The pan feature is used to look down laterals or more closely inspect joints and pipe defects. Operating the camera without the pan feature loses much of the functionality of the camera. I am requesting authorization from the city council to have the camera repaired.



INDUSTRIES, INC.

550 Elizabeth St  
Waukesha, WI 53186-4511

Phone: 262-896-7205 Fax: 262-896-7099

Service Estimate

No.: 284348

Page: 1 of 4

<b>Sold To:</b> Chris Even City of Evansdale 123 N Evans Rd Evansdale IA 50707 USA  <b>Fax:</b> 319-232-1586 <b>Phone:</b> <b>Email:</b> wastewater@cityofevansd 319-493-0639	<b>Ship To:</b> Chris Even City of Evansdale 123 N Evans Rd Evansdale IA 50707 USA  <b>Fax:</b> 319-232-1586 <b>Phone:</b> <b>Email:</b> wastewater@cityofevansd 319-493-0639
---	---

Order Date: 4/1/2020	PO Number: 040120 PE3500	FOB: FOB Dest PPD
Need By: 6/1/2020	Sales Person: Greg Fry	
Terms: Net 30 Days	Ship Via: UPS Ground	

US Dollars

Line	Part Number/Description	Rev	Order Qty	Unit Price	Disc %	Net Price	Net Ext Price
1	PE35001009221 PE35001009221		1.00 EA	0.00	0%	0.00	0.00

Our Part: REPAIR-PE3500

City of Evansdale (EVA003)  
PE35001009221

- The camera was dropped about 8 feet into a manhole which has caused the camera head rotation to become inoperable.

- Video still works

Requested by: Chris Even

ESTIMATE BEFORE REPAIR

\*\*\* TOTAL SUBJECT TO CHANGE FOR TAXES AND FREIGHT \*\*\*  
A restocking charge of 15% will apply to all unused returned parts



INDUSTRIES, INC.

550 Elizabeth St  
Waukesha, WI 53186-4511

Phone: 262-896-7205 Fax: 262-896-7099

REPAIR TECH: Eric Lyon  
COMPONENT S/N: PE35001009221  
TOTAL HOURS: 4

**Service Estimate**

No.: **284348**

Page: 2 of 4

OBSERVED INCOMING PHYSICAL CONDITION: The camera was sent back inside a cardboard box. The camera itself seems to have normal wear, however the camera head moves freely.

SYMPTOMS:

City of Evansdale (EVA003)  
PE35001009221

- The camera was dropped about 8 feet into a manhole which has caused the camera head rotation to become inoperable.
- Video still works

Requested by: Chris Even  
ESTIMATE BEFORE REPAIR

INCOMING TESTS PERFORMED:

- 1-Issue-) The camera head would not pan.
- 1-Cause-) The Clutch was pushed down on the motor shaft and was not making contact with the gear assembly.
- 1-Repaired-)
- 2-Issue-) The both clutches are older models and will need to be replaced.
- 2-Cause-) clutch was never changed.
- 2-Repaired-)
- 3-Issue-) Both the rotate and pan motor shaft function but have divet on the shaft.
- 3-Cause-) Unknown
- 3-Repaired-) Both motors MAY need to be replaced.
- 4-Issue-) The camera was sent to Aries inside a cardboard box.
- 4-Cause-) Unknown
- 4-Repaired-) Added a pelican case and foam to the job.
- 5-Issue-)
- 5-Cause-)
- 5-Repaired-)

<b>Service Labor :</b>	<u>Estimated Hours</u>	<u>Rate</u>	<u>Estimated Total</u>	<u>Discount</u>
	4.0	\$ 133.10	\$ 532.40	0.00

\*\*\* TOTAL SUBJECT TO CHANGE FOR TAXES AND FREIGHT \*\*\*  
**A restocking charge of 15% will apply to all unused returned parts**



INDUSTRIES, INC.

550 Elizabeth St  
Waukesha, WI 53186-4511

Phone: 262-896-7205 Fax: 262-896-7099

Service Estimate

No.: 284348

Page: 3 of 4

Parts - Service

Part	Description	Excl.	Est Qty	Unit Price	Disc %	Net Unit Price	Net Ext Price
130056	O-Ring, 2-039, 0.070 C.S. x 2.739 I.D., Buna-N 70 Durometer, NO SUBSTITUTION	N	1.00	0.96	0%	0.96	0.96
310132	Motor, DC 12V 592:1 Gearhead 14mm Diameter	N	2.00	691.11	0%	691.11	1,382.22
130415	O-Ring, #029, 0.070 C.S. x 1.489 I.D., Buna-N 70 Durometer	N	1.00	0.96	0%	0.96	0.96
130057	O-Ring, 2-040, 0.070 C.S. x 2.864 I.D., Buna-N 70 Durometer	N	1.00	0.94	0%	0.94	0.94
810158	Screw, 4-40 x 1/8 Long Pan PH SS	N	6.00	0.96	0%	0.96	5.76
151030	Camera Clutch Assy, Small Preset Break, PE-Series Self Cleaning	N	2.00	975.44	0%	975.44	1,950.88
810201	Screw, 6-32 x 1/4 82 Degree FL PH SS	N	7.00	0.96	0%	0.96	6.72
460131	Case Assembly, PE3400 PE3500	N	1.00	269.20	0%	269.20	269.20
							<u>3,617.64</u>

\*\*\* TOTAL SUBJECT TO CHANGE FOR TAXES AND FREIGHT \*\*\*  
A restocking charge of 15% will apply to all unused returned parts



INDUSTRIES, INC.

550 Elizabeth St

Waukesha, WI 53186-4511

Phone: 262-896-7205 Fax: 262-896-7099

Service Estimate

No.: 284348

Page: 4 of 4

Aries guarantees this repair for **60 days after receipt**. If this repair does not meet your expectations, please contact us at **(800) 234-7205** (unrelated repairs do not qualify)

Labor Estimate:	532.40
Parts Estimate:	3,617.64
Labor Disc.	0.00
Part Disc.	0.00
Total Order Discount:	0.00
Order Miscellaneous Charges:	0.00
<b>Order Total</b>	<b>\$4,150.04</b>

I have reviewed these charges and agree to all repairs:

Freight - \$15.00

Print Name:

Signature:

Date:

\_\_\_ / \_\_\_ / \_\_\_\_\_

\*\*\* TOTAL SUBJECT TO CHANGE FOR TAXES AND FREIGHT \*\*\*  
A restocking charge of 15% will apply to all unused returned parts

**RESOLUTION TO CALL ON THE GOVERNOR OF IOWA TO ISSUE A STATEWIDE “SAFE AT HOME”  
ORDER**

**Whereas** the COVID-19 global pandemic poses an unprecedented threat to the health and well-being of our community; and

**Whereas** the Governor of Iowa has, on March 17, 2020, proclaimed a State of Public Health Disaster Emergency in the State of Iowa and has taken steps to limit the spread of COVID-19 in our state; and

**Whereas** widespread community transmission of the coronavirus has been identified in counties across Iowa, including confirmation in Black Hawk County on March 31, 2020; and

**Whereas** the body of scientific knowledge available on COVID-19 shows that staying at home is the surest defense against the rapid spread COVID-19, which will in turn ensure that our local medical facilities are not overloaded in the coming weeks.

**Be it resolved:** that the Black Hawk County Board of Supervisors and the undersigned mayors representing cities within Black Hawk County call on the Governor of Iowa to issue a “Safe at Home Order” covering the state of Iowa ordering all Iowans to stay safe at home except for when conducting essential activities.

**Be it further resolved:** that we ask the Governor to utilize the guidance from the U.S. Department of Homeland Security and the Centers for Disease Control to clearly define what is and is not considered to be an essential business, essential non-profit, and essential activity as pertains to this order.