ELECTRICAL SPECIFICATIONS:

GENERAL ELECTRICAL SPECIFICATIONS

A. THE ELECTRICAL CONTRACTOR (EC) SHALL PROVIDE POWER TO THE BLOWER SKID ASSEMBLY FROM THE EXISTING POWER DISTRIBUTION SYSTEM. SERVICE TO THE ASSEMBLY SHALL BE RATED AND SIZED AS RECOMMENDED BY THE BLOWER SKID SUPPLIER. OVERCURRENT PROTECTION, WIRE, AND CONDUIT SHALL BE SIZED ACCORDING TO THE NATIONAL ELECATRICAL CODE AND THE SPECIFICATIONS HEREIN.

B. EC SHALL PROVIDE ALL MATERIAL, EQUIPMENT, PARTS, AND LABOR AND SHALL RENT, PURCHASE, OR POSSESS ALL TOOLS AND EQUIPMENT NECESSARY TO COMPLETE ALL ASPECTS OF THE WORK IMPLICITLY SHOWN OR IMPLIED BY THESE DRAWINGS AND SPECIFICATIONS. ALL MATERIALS, EQUIPMENT, PARTS, AND LABOR ARE THE RESPONSIBILITY OF THE EC UNLESS SPECIFICALLY STATED OTHERWISE. BY SUBMITTING BID FOR THIS CONTRACT, THE EC DECLARES A FULL UNDERSTANDING OF ALL SITE CONDITIONS AND THEIR IMPACT ON SCOPE OF WORK, FULLY UNDERSTANDS THE DRAWINGS AND SPECIFICATIONS, FULLY UNDERSTANDS THE SCOPE OF WORK, FULLY UNDERSTANDS HIS/HER SCOPE OF WORK, AND FULLY UNDERSTANDS HIS/HER OBLIGATIONS TO FULFILL ALL OF THE CONTRACT REQUIREMENTS.

C. ALL ELECTRICAL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES AND STANDARDS AND BE SUBJECT TO APPROVAL OF THE STATE ELECTRICAL INSPECTOR.
   2014 NATIONAL ELECTRIC CODE (NFPA 70)
   NFPA NATIONAL FIRE PROTECTION ASSOCIATION
   NESC NATIONAL ELECTRICAL SAFETY CODE
   IEEE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
   NEMA NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
   UL UNDERWRITERS LABORATORIES, INC.
   APPLICABLE STATE AND LOCAL CODES

D. SUBMIT SHOP DRAWINGS AND ASSOCIATED DOCUMENTATION IN ACCORDANCE WITH ALL PROVISIONS OF THE SPECIFICATIONS AND CONTRACT.

E. REVIEW OF MANUFACTURER'S DRAWINGS OR SCHEDULES DOES NOT RELIEVE THE SUBCONTRACTOR FROM RESPONSIBILITY FOR ERRORS OR OMISSIONS IN MANUFACTURER'S DRAWINGS OR SCHEDULES AND DEVIATION FROM CONTRACT DRAWINGS OR TECHNICAL SPECIFICATIONS.

F. SUBCONTRACTOR SHALL FURNISH AND INSTALL ALL HANGERS, SUPPORTS, STRAPS, BOXES, FITTINGS, AND OTHER NECESSARY APPURTENANCES NOT INDICATED ON THE DRAWINGS BUT WHICH ARE REQUIRED FOR A COMPLETE AND PROPERLY INSTALLED SYSTEM.

G. BLACKOUTS, SLEEVES, AND INSERTS SHALL BE INSTALLED TO AVOID, SO FAR AS POSSIBLE, THE CUTTING AND DRILLING OF CONCRETE AND MASONRY.

H. SUPPLY ALL TEMPORARY ELECTRICAL DISTRIBUTION AND LIGHTING AS NEEDED TO COMPLETE WORK.

I. THE LOCATION OF EQUIPMENT SHOWN ON THE DRAWINGS IS APPROXIMATE. EC IS TO DETERMINE THE EXACT LOCATION OF CONDUIT AND ELECTRICAL EQUIPMENT BASED ON STRUCTURAL AND MECHANICAL EQUIPMENT LOCATIONS. LOCATIONS OF STRUCTURAL SYSTEMS AND MECHANICAL SYSTEMS TAKE PRECEDENCE OVER LOCATIONS OF CONDUIT RUNS WHERE CONFLICTS OCCUR.

J. IF THIRD PARTY PROVIDED EQUIPMENT OR MATERIAL IS DAMAGED OR INCOMPLETE, THIS FACT SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER WHO WILL ARRANGE FOR THE APPROPRIATE FACTORY OR TECHNICAL PEOPLE TO REPAIR OR REPLACE THE EQUIPMENT AS MAY BE SPECIFIED.

K. UPON COMPLETION OF THE WORK, EC SHALL FURNISH TO OWNER ONE (1) COMPLETE SET OF PRINTS WHICH ARE MARKED AND REVISED "AS BUILT" FOR ELECTRICAL SCHEMATICS, ALL DETAIL SHOP DRAWINGS, BILLS OF MATERIALS, CONDUIT AND CABLE INSTALLATION, ALL TEST REPORTS FULLY COMPLETED, AND ALL EQUIPMENT INSTALLATION MANUALS.

TESTING

A. TEST ALL WIRING FOR CONTINUITY AFTER INSTALLATION AND PRIOR TO HOOKUP OF ELECTRICAL EQUIPMENT TO ENSURE THAT THE SYSTEM IS FREE FROM SHORT CIRCUITS AND UNINTENTIONAL GROUNDS.

B. TEST GROUNDING SYSTEM AT ORIGIN OF EACH SEPARATELY DERIVED VOLTAGE SYSTEM AND AT EACH PIECE OF DISTRIBUTION EQUIPMENT TO VERIFY CONFORMANCE WITH NEC ARTICLE 250.

C. VERIFY INSULATION RESISTANCE TEST ON EACH CONDUCTOR. TEST EACH CONDUCTOR WITH RESPECT TO GROUND AND ADJACENT CONDUCTORS. APPLIED VOLTAGE SHALL BE 1000 VDC. TEST ACCORDING TO NETA ATS-2015 (ACCEPTANCE TESTING SPECIFICATIONS). TEST VALUES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S DATA, OR IN THE ABSENCE OF SUCH DATA, MINIMUM RESISTANCE SHALL BE 100 MEGAOHMS.

D. TEST ALL THREE-PHASE FEEDERS FOR PROPER PHASE SEQUENCE. PERFORM TEST USING PHASE SEQUENCE INDICATOR. VERIFY THAT PHASE SEQUENCE HAS BEEN MAINTAINED FROM POINT OF SUPPLY OF EACH SEPARATELY DERIVED SYSTEM THROUGHOUT THE SYSTEM.

E. APPLY POWER TO CIRCUITS AND VERIFY THAT ALL CIRCUITS AND DEVICES ARE FUNCTIONING PROPERLY AS SHOWN ON THE SCHEMATICS.

F. TEST ALL EQUIPMENT, WIRING, AND INSTALLED CIRCUITS AS DETAILED IN THE TECHNICAL SPECIFICATIONS. VERIFY THE PROPER ELECTRICAL FUNCTION OF ALL EQUIPMENT. VERIFY THE PROPER ELECTRICAL FUNCTION OF ALL FIELD DEVICES. REPAIR ANY DEFICIENCIES AND RE-TEST UNTIL ALL CIRCUITS FUNCTION PROPERLY AS DETAILED ON THE DRAWINGS. CALIBRATE AND/OR ADJUST ALL FIELD DEVICES. PROVIDE WRITTEN DOCUMENTATION TO OWNER VERIFYING THAT THE ABOVE TESTS HAVE BEEN COMPLETED AND DETAILING THE RESULTS OF SAID TESTS. EXECUTE ABOVE WORK AS DETAILED ON THE DRAWINGS AND SPECIFIED HEREIN.

ELECTRICAL SERVICE:

A. PROVIDE A NEW 208V OR 240V, SINGLE PHASE, OVERHEAD ELECTRICAL SERVICE. COORDINATE REQUIREMENTS WITH THE POWER COMPANY.

B. PROVIDE A SERVICE ENTRANCE RATED, FUSIBLE DISCONNECT SWITCH. SIZE FUSES AS RECOMMENDED BY THE BLOWER SYSTEM MANUFACTURER. MOUNT ON A FREE-STANDING EQUIPMENT RACK. INSTALL SWITCH A MINIMUM OF 6' AWAY FROM THE BLOWER ENCLOSURE.

C. INSTALL UTILITY METER ON EQUIPMENT RACK WITH SERVICE DISCONNECT.

D. FROM SERVICE DISCONNECT PROVIDE CONDUIT/WIRE THROUGH UTILITY METER TO UTILITY POLE, AND RISER WITH WEATHERHEAD ON UTILITY POLE. PROVIDE 5' OF CONDUCTOR BEYOND WEATHERHEAD FOR CONNECTION BY UTILITY COMPANY.

E. PROVIDE A MINIMUM OF ONE 5/8" X 10' LONG COPPER-CLAD GROUND ROD AND CONNECT TO SERVICE DISCONNECT. PROVIDE A BONDING CONDUCTOR FROM GROUND ROD TO METER SOCKET.

F. PROVIDE CONDUIT AND WIRE FROM SERVICE DISCONNECT TO BLOWER ENCLOSURE AND MAKE FINAL CONNECTION TO CONTROL PANEL.

RACEWAYS AND BOXES:

A. RIGID STEEL CONDUIT SHALL BE HOT DIPPED GALVANIZED, THREADED TYPE, ANSI C80.1, UL 6.

B. INTERMEDIATE STEEL CONDUIT SHALL BE HOT DIPPED GALVANIZED, ANSIC80.1, UL 1242.

C. RIGID NONMETALLIC CONDUIT SHALL BE PVC, SCHEDULE 80, RATED FOR DIRECT BURIAL, NEMA TC-2, UL 651.

D. LIQUID TIGHT FLEXIBLE METAL CONDUIT SHALL BE CONTINUOUS WOUND, INTERLOCKED GALVANIZED STEEL OR ALUMINUM WITH A FLEXIBLE, LIQUID TIGHT PVC JACKET, UL 360.

E. CONDUIT BODIES SHALL BE THREADED, GALVANIZED CAST IRON, UL 514B.

F. BUSHINGS SHALL BE MALLEABLE IRON, GALVANIZED, WITH INTEGRALLY MOLDED INSULATION, UL 514B, NEMA FB-1.

G. CONDUIT HUB ASSEMBLIES SHALL BE CAST METAL, RIBBED BODY WITH FEMALE THREADS, O-RING GASKET, INTEGRAL CONDUIT NIPPLE WITH INSULATED THROAT, GROUNDING TYPE LOCKNUT, UL 514B.

H. EXPLOSION-PROOF SEALS SHALL BE RATED FOR USE IN CLASS I, DIVISION 2, GROUP D ATMOSPHERES.

I. EXPLOSION-PROOF COUPLINGS SHALL HAVE BRAIDED WIRE OUTER JACKET, INSULATING INNER LINER, THREADED ENDS, AND BE LIQUID-TIGHT. COUPLINGS SHALL BE RATED FOR USE IN CLASS I, DIVISION 2, GROUP D LOCATIONS.

J. PULL/JUNCTION BOXES SHALL BE RATED NEMA 4X. BOXES INSTALLED IN HAZARDOUS LOCATIONS SHALL BE RATED FOR SUCH USE.

K. SUPPLY ONLY CONDUIT AND FITTINGS THAT ARE UL LISTED AND LABELED FOR THE LOCATIONS IN WHICH THEY ARE BEING INSTALLED.

L. CONDUIT CONNECTIONS TO MOTORS OR VIBRATING EQUIPMENT SHALL BE WITH LIQUID TIGHT FLEXIBLE CONDUIT. MAXIMUM LENGTH OF CONDUIT SHALL BE 36 INCHES.

M. CONDUIT INSTALLED UNDERGROUND SHALL BE DIRECT BURY RIGID NONMETALLIC CONDUIT IN NON-HAZARDOUS LOCATIONS. IN HAZARDOUS LOCATIONS THE CONDUIT SHALL BE CONCRETE ENCASED IN A MINIMUM OF 2". RIGID STEEL CONDUIT OR INTERMEDIATE STEEL CONDUIT SHALL BE USED FOR THE LAST 24" OF UNDERGROUND RUN TO EMERGENCE OR POINT OF CONNECTION TO ABOVE GROUND RACEWAY.

N. EXPOSED CONDUIT SHALL BE RIGID STEEL CONDUIT OR INTERMEDIATE STEEL CONDUIT.

O. USE THREADED FITTINGS AND CONDUIT BODIES.

P. USE HAZARDOUS LOCATION SEALING FITTING WHERE REQUIRED BY THE NEC.

Q. USE EXPANDING FOAM FIRE STOP SEALANT IN FIRE RATED WALL, FLOOR, AND CEILINGS.

R. USE MECHANICAL SEALS IN EXTERIOR BELOW GRADE WALLS, FLOORS, AND CEILINGS.

S. USE DUCT SEALING PUTTY OR EXPANDING FOAM SEALANT FOR ALL OTHER CONDUIT SEALS.

T. CONDUIT RUN IN EXPOSED AREAS SHALL BE NEAT IN APPEARANCE. SUITABLE AND APPROVED CONDUIT FITTINGS SHALL BE USED. WHERE EXPOSED CONDUIT IS ATTACHED TO REINFORCED CONCRETE WALLS, IT SHALL BE FASTENED BY LEAD CINCH OR EXPANSION ANCHORS ONLY, USING SPACERS AND GALVANIZED MALLEABLE IRON ONE-HOLE CONDUIT STRAPS.

U. EC TO DETERMINE BEST ROUTING FOR CONDUIT SHOWN ON THE DRAWINGS. ALL CONDUIT ROUTING SHALL BE APPROVED BY OWNER PRIOR TO INSTALLATION.

V. ALL PULL/JUNCTION BOXES SHALL BE KEPT TO A MINIMUM. NEC REQUIRED PULL AND JUNCTION BOXES ARE NOT SHOWN ON THE DRAWINGS.

W. UNDERGROUND CONDUITS SHALL BE INSTALLED A MINIMUM OF 24" BELOW FINAL GRADE.

X. ALL UNDERGROUND WORK MUST BE INSPECTED AND APPROVED PRIOR TO COVERING.

Y. THE INSTALLATION WITHIN THE BLOWER ENCLOSURE SHALL MEET THE REQUIREMENTS OF THE NEC FOR CLASS I, DIVISION 2 LOCATIONS. THE INSTALLATION WITHIN 5 FEET OF ANY OPENING IN THE ENCLOSURE SHALL MEET THE REQUIREMENTS OF THE NEC FOR CLASS I, DIVISION 2 LOCATIONS.

LOW VOLTAGE CONDUCTORS:

A. CONDUCTORS SHALL BE COPPER WITH 600 VOLT TYPE XHHW INSULATION. PROVIDE ONLY STRANDED CONDUCTORS THAT ARE UL LABELED AND OF AMERICAN MANUFACTURER.

B. PROVIDE COLOR CODING FOR INDIVIDUAL CONDUCTORS AS FOLLOWS:
   208 VAC
   PHASE A BLACK
   PHASE B RED
   PHASE C BLUE

C. THE AMPACITY OF ALL CONDUCTORS SHALL BE BASED ON THE THERMAL RATING OF THE FUSE OR CIRCUIT BREAKER ON THE LINE SIDE OF THE CONDUCTORS. ALL CONDUCTORS FOR DISTRIBUTION AND CONTROL EQUIPMENT TERMINATIONS SHALL BE BASED ON FULL 75 DEGREE C AMPACITY. ALL CONDUCTORS FOR APPLIANCE AND UTILIZATION EQUIPMENT TERMINATIONS RATED 100 AMPERES OR LESS SHALL BE BASED ON 60 DEGREE C AMPACITY.

D. WIRE MUST BE CONTINUOUS AND UNSPLICED FROM THE SOURCE TO THE LOAD. ONLY APPROVED TERMINATIONS SHALL BE USED.

E. DERATE CONDUCTOR AMPACITY IF MULTIPLE CIRCUITS ARE TO BE COMBINED IN CONDUIT PER NEC.

GROUNDING AND BONDING:

A. ALL EQUIPMENT MUST BE BONDED TO THE GROUNDING SYSTEM.

B. PROVIDE AN EQUIPMENT GROUND CONDUCTOR IN ALL POWER AND CONTROL CONDUITS AND BOND EQUIPMENT AND DEVICES TO GROUND SYSTEM.

C. INSTALL GROUNDING ACCORDING TO NEC ARTICLE 250.

ELECTRICAL IDENTIFICATION:

A. EQUIPMENT LABELS: EACH ELECTRICAL COMPONENT INCLUDING ALL DISCONNECT SWITCHES, CONTROL PANELS, AND TERMINAL BOXES FOR AUXILIARY SYSTEMS SHALL BE IDENTIFIED WITH A LAMACOID NAMEPLATE ON THE FRONT COVER OR TRIM WITH ITS NAME AND/OR DESIGNATION NUMBER OR LETTER, THE VOLTAGE AVAILABLE WITHIN THE PANEL, AND THE POWER SOURCE LOCATION.

B. WIRE LABELS: MARK EACH CONDUCTOR, BOTH POWER AND CONTROL, WITH WIRE NUMBERS AT EACH TERMINAL, JUNCTION, ETC. USING PRINTED WRAP-AROUND VINYL TYPE WIRE MARKERS.

C. UNDERGROUND MARKING TAPE: A 2" WIDE, METAL-COATED MYLAR DETECTABLE TAPE SHALL BE BURIED THE FULL LENGTH OF ALL UNDERGROUND RUNS. WARNING ON TAPE TO READ: "CAUTION BURIED ELECTRIC LINE BELOW".

DISCONNECT SWITCHES:

A. DISCONNECT SWITCHES SHALL BE FUSIBLE, NEMA HEAVY DUTY TYPE, MOUNTED IN A NEMA 4X STAINLESS STEEL ENCLOSURE. SWITCHES INSTALLED IN HAZARDOUS LOCATIONS SHALL BE RATED FOR SUCH USE.

B. RATING, CAPACITY AND NUMBER OF POLES SHALL BE AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER AND PER THE REQUIREMENTS OF THE NEC.

C. FUSIBLE SWITCHES SHALL HAVE CLASS R FUSE CLIPS.

EQUIPMENT ENCLOSURES:

A. ENCLOSURES FOR ELECTRICAL EQUIPMENT AND DEVICES SHALL BE STAINLESS STEEL, RATED NEMA 4X. ENCLOSURES INSTALLED IN HAZARDOUS LOCATIONS SHALL BE RATED FOR CLASS I, DIVISION 2.

FUSES:

A. FUSES SHALL BE UL CLASS RK-1.

B. FURNISH ONE SET OF THREE SPARE FUSES TO THE OWNER FOR EACH SIZE AND TYPE USED.

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project title
CLOSED CITY OF GREENVILLE LANDFILL
FIXED EXPLOSIVE GAS MITIGATION SYSTEM
LIVINGSTON ROAD
DARKE COUNTY
GREENVILLE, OHIO 45331

sheet title
ELECTRICAL SPECIFICATIONS

CADD#: E1-0-16183

project number
16183

STATE OF OHIO
DOUGLAS L. POWELL
E-57325
REGISTERED PROFESSIONAL ENGINEER

drawn	DLP
design	DLP
checked	GAR

issued for — date

sheet
E1.0