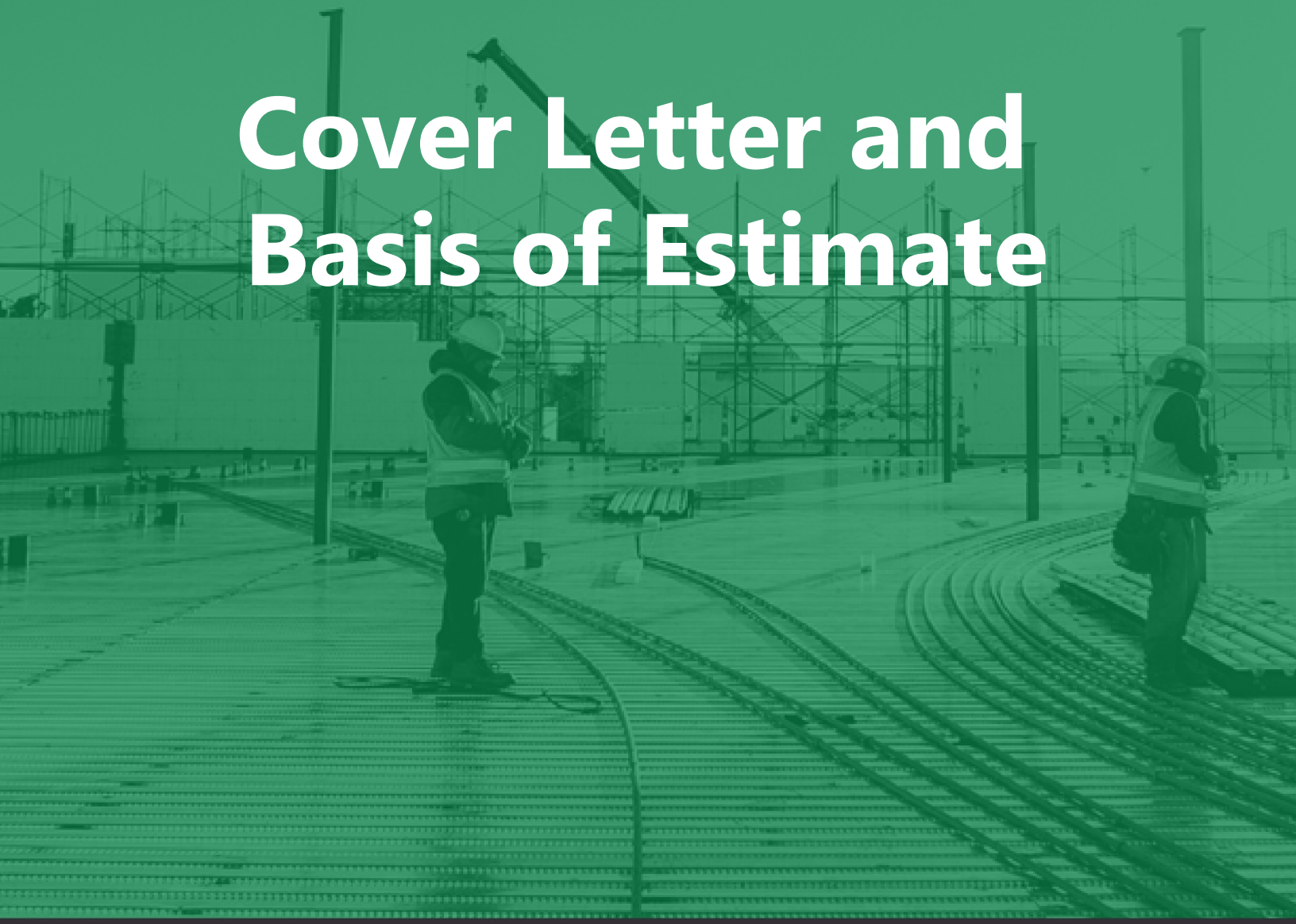
CORE PRECONSTRUCTION

Village of Orland Park - Elevated Tank No. 7 Electrical Improvements

Job Order Contract (JOC) Proposal

9/27/2021

Cover Letter and Basis of Estimate



601 SW Water St.
Peoria, IL 61602

T 309.404.4700

September 27, 2021

VIA EMAIL
Joel Van Essen – Village of Orland Park Public Works Director
email: jvanessen@orlandpark.org
15655 Ravinia Ave.
Orland Park, IL 60462

RE: JOB ORDER CONTRACT (JOC) PROPOSAL | Village of Orland Park – Elevated Tank No. 7 Electrical Improvements
Procurement: OMNIA Partners Contract #R200103

Hello,
On behalf of CORE Construction, I am pleased to submit our Job Order Contract (JOC) proposal for the Elevated Tank No. 7 Electrical Improvements project located at 13605 Cherry Lane, Orland Park, IL.

Estimate Summary:

BASE BID =	$168,482.36
CONTINGENCY =	$16.800.00
TOTAL BASE BID PROPOSAL =	**$185,282.36**
ALTERNATE #1 ADD (modify electrical at existing well house due to ComEd service change) =	$11,610.00

Enclosed you will find the Basis of Estimate, Scope of Work, OMNIA Compliance Estimate with RS Means backup, and other supporting documentation.

Thank you for this opportunity, and please do not hesitate to contact me directly with any questions or comments.

Respectfully submitted,

Steve Paul

Steve Paul
Director of Special Projects and Job Order Contracting
CORE Construction

BASIS OF ESTIMATE

The Basis of Estimate (BOE) is a written narrative explanation clarifying the scope, assumptions, and exclusions CORE used in establishing the Job Order Contracting (JOC) Proposal dated September 27, 2021 per OMNIA Partners Contract #R2001103.

ASSUMPTIONS, CLARIFICATIONS, & EXCLUSIONS

Although CORE has excluded some items from our estimate, pricing can be made available as alternates for most of these items upon Owner request.

Schedule

- Anticipated construction start: December 2021
- Expected duration of construction: 4 weeks
- **Overtime:** the project schedule and associated cost includes no overtime labor or off-shift labor. Only normal union working hours for on-site operations are included in the project schedule.
- **Phasing:** this project includes no phasing, additional phasing resulting in a project delay or increase in project duration will result in an additional cost to the Contractor which will be paid by the Owner via revision to the contract amount, T & M, or Change Order.
- Refer to general assumptions, any Owner or Owner agent action or inaction resulting in delay or deviation from this schedule's specified dates will incur additional cost to the Contractor which will be paid by the Owner via revision to the contract amount, T & M, or Change Order.

Contingency & Allowances

- **Construction Contingency of $8,400.00** is included in this estimate – Construction Contingency is intended to be used at CORE's discretion to cover costs that have not been identified as a trade-specific scope on the GMP setting documents and may require further clarification or coordination. These costs may include scope gap, coordination issues between trades, and missed scope during the competitive bidding process. Construction Contingency does not account for design revisions or additional scope requests made by the Owner or Architect.

- **Owner Contingency of $8,400.00** is included in this construction budget. Owner Contingency is intended to be used at the Owner's discretion to cover unforeseen conditions, design revisions, or additional scope requests made by the Owner and/or Design Team.

General Assumptions

1. The pricing in this budget is valid for 14 days. Due to current market conditions, any additional project cost escalations will be paid from included Owner Contingency.
2. CORE has included labor at prevailing wages for all Trade Partners and self-performance unless specifically noted otherwise in this estimate.
3. The Date of Commencement of Construction under the Project Authorization shall be 10 working days after the latest of the following is received by CORE Construction:
    - Project Authorization fully executed by Owner.
    - Issuance of Site Permit, Building Permit, and any other permits required to commence the Work and maintain unhindered progress.
    - Full access to the Project Site or location of the Work, & availability of materials and manpower.
    - Owner's Notice to Proceed.
4. This estimated budget is to be considered a "lump sum" estimate, not a line-item estimate. This estimate is prepared for a specific site location, size of project and project schedule. No part of the estimate can be changed without affecting the rest of the parts. However, part of CORE's Preconstruction services scope includes determining how changes affect the overall budget.

Specific Exclusions to the Estimate

The following items are **not** included in this estimate:

1. Design fees or other professional services fees
2. Hazardous material testing, survey and abatement
3. Material testing and inspections including 3rd party testing or field quality control testing
4. Sales tax
5. Builders Risk is provided by CORE. Deductible is by Owner
6. Separate Owner and Contractor Liability Insurance Policy including OCIP or CCIP insurance requirements
7. Unforeseen utility conditions
8. Costs for unforeseen conditions that could be uncovered throughout the construction process
9. Costs associated with underground conflicts
10. Liquidated damages
11. Legal expenses

12. All existing utilities and/or service relocation known or unknown.
13. Voice and data communications systems
14. Signage
15. Winter Conditions

Other Scope Specific Assumptions and Clarifications

00 – General Conditions and Soft Cost Items

1. Items included in this estimate:
    a. Supervision
    b. General Liability Insurance
    c. Builder's Risk Insurance
    d. Payment and Performance bond
    e. Construction clean-up
2. Items **not** included in this estimate:
    a. Temporary enclosures, barricades, or fencing
    b. Segregated waste dumpsters
    c. Job Trailer is not included
    d. Parking permits, charges or metered parking, on-site parking is assumed at no cost to the Contractor
    e. Security – no cost for security guard or surveillance cameras is included in this estimate
    f. Temporary electrical power for the site, assumed utilization of existing on site
    g. Final cleaning

01 - Demolition

1. Scope included in this estimate:
    a. Demolition of existing electrical within the water tower as indicated.
2. Scope **not** included in this estimate:
    a. Demolition of any plumbing or other scope items at the water tower.

02 - Electrical

1. Scope included in this estimate:
    a. New 120/240v electrical service fed from new ComEd transformer. Costs for changes related to existing transformer, new transformer, and ComEd service are excluded.
    b. 4-gang meter socket.

c. Furnish and install weather tight NEMA 4x enclosure adjacent to the 4-gang meter socket.
d. Furnish and install 14kW Kohler generator and automatic transfer switch. Transfer switch will be installed in the enclosure, and emergency stop button provided.
e. Provide a 100-amp panel inside the enclosure. Panel will feed generator auxiliary 120v circuits.
f. Furnish and install an additional panel within the water tower per drawing E5.1.
g. New fixtures provided per drawings.
h. Power per drawings, including furnish & install (2) unit heaters with t-stats.
i. All raceways within the tower shall be aluminum rigid conduit. Boxes shall be FS/FD cast type.
j. Reinstall existing control panels as indicated.
k. All equipment within the tower shall be mounted on stainless steel Unistrut per detail C on E5.1.
l. Concrete pad for generator and enclosure by others.
m. Excavation for underground feeds.

2. Scope **not** included in this estimate:
   a. Concrete work and equipment/utility pads
   b. Aluminum floor grating and associated hardware/supports
   c. Cutting, patching, and painting
   d. Any plumbing or gas piping work
   e. Transformers
   f. Fire Alarm work and/or monitoring
   g. Lightning Protection
   h. Fault current study
   i. Electrical work at the existing well house (see Alternate #1 below)

Alternate #1 Add - $11,610.00

a. Demo existing meter socket on the exterior of the building.
b. Remove existing wiring from meter to ComEd transformer. Existing conduit stubbed up the building shall be cut and abandoned just below grade.
c. Provide new 100-amp, 120/240v single phase service utilizing a spare meter in the 4-gang meter provided for the work associated with the base water tower work scope.
d. Underground PVC conduit provided with (3) #3 wires from meter to the exterior of the building including excavation. Trench shall be backfilled utilizing existing spoils.
e. Demo existing 480v disconnect on the inside.
f. Provide a new 100-amp service entrance rated disconnect in the location where the 480v disconnect was installed.
g. Provide new grounding electrode from the service disconnect per code.

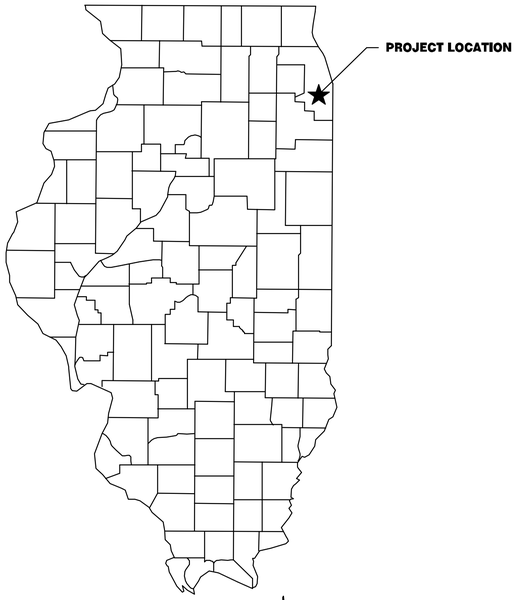
h. Re-feed existing Westinghouse panel from the newly installed disconnect.
i. Existing Westinghouse enclosure rewired to utilize the 12 circuit 120/240v panel.
j. Same conditions and exclusions as noted for base bid.

End of Basis of Estimate

ELEVATED TANK NO. 7 ELECTRICAL IMPROVEMENTS

FOR THE

VILLAGE OF ORLAND PARK
COOK COUNTY, ILLINOIS



AREA MAP
NOT TO SCALE

LOCATION MAP
NOT TO SCALE

INDEX OF DRAWINGS

SHEET TITLE	SHEET NUMBER	DRAWING NUMBER
TITLE SHEET, PROJECT LOCATION, AND LIST OF DRAWINGS	1	G0.1
SITE PLAN	2	C1.1
TANK ELEVATION AND PLANS	3	DASM1.1
GROUND LEVEL ELECTRICAL PLANS	4	E1.1
ONE-LINE DIAGRAM AND DETAILS	5	E5.1

ADDRESS

13605 CHERRY LANE
ORLAND PARK, IL 60462

PARCEL DESCRIPTION
S2 T36N R12E

1170 SOUTH HOUBOLT ROAD
JOLIET, IL 60431
815 744-4200
815 744-4215 FAX
WWW.STRAND.COM
IDFPR NO. 184-001273

CONTRACT 2-2021

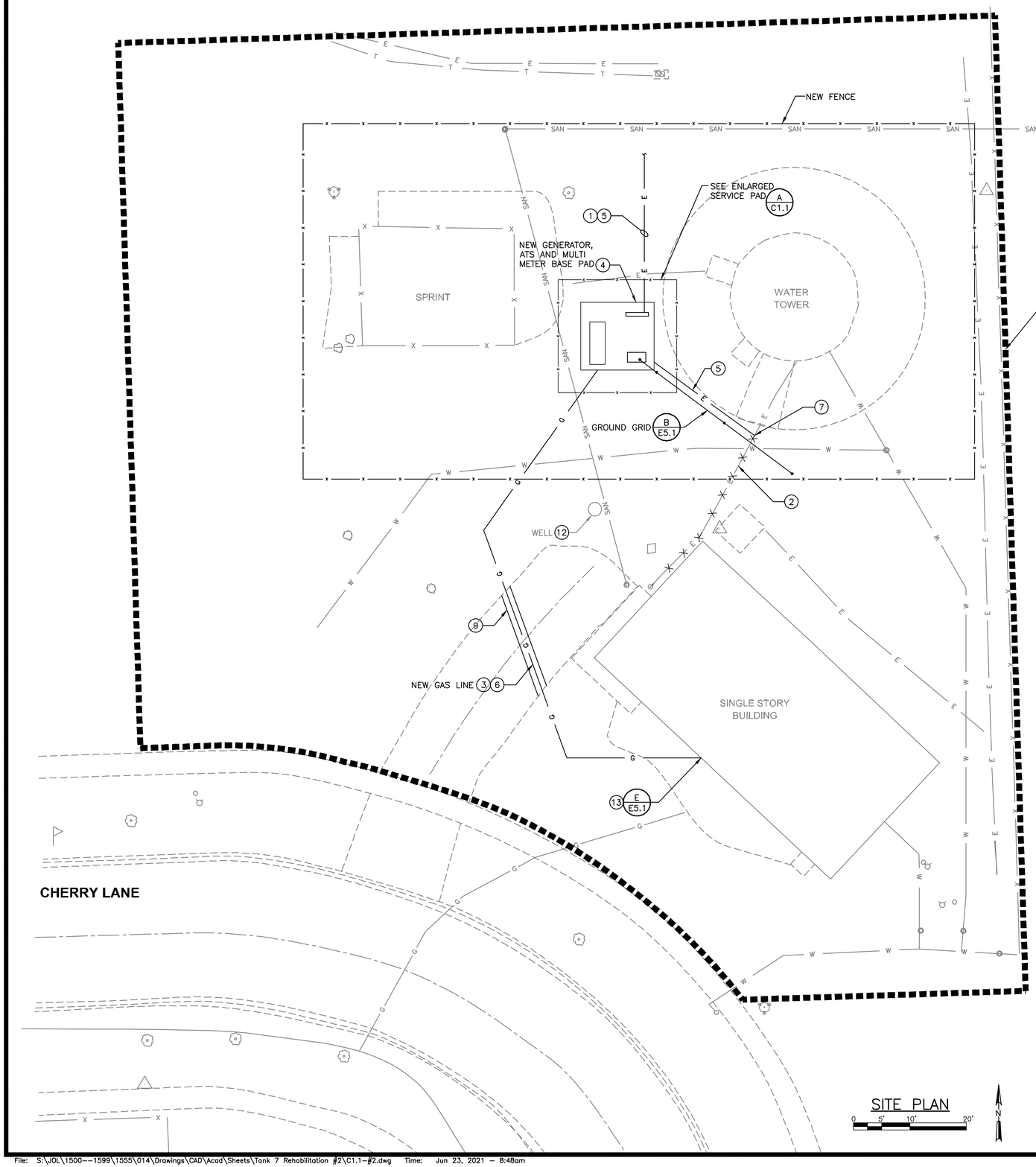
BRENT M. STUDNICKA
062-056361
REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

Brent M Studnicka
7/6/2021
Exp. 11/30/2021

STRAND ASSOCIATES®

ISSUED FOR BID: JULY 6, 2021

File: S:\JOL\1500--1599\1555\014\Drawings\CAD\Acad\Sheets\Tank 7 Rehabilitation #2\G0.1-#2.dwg Time: Jun 23, 2021 - 8:46am



GENERAL NOTES:

1. T–MOBILE ANTENNAS AND CABLES MOUNTED ON TANK ARE ANTICIPATED TO BE REMOVED PRIOR TO PROJECT.
2. SITE SHALL BE RESTORED TO CONDITIONS EQUIVALENT TO THOSE FOUND PRIOR TO PROJECT.
3. PROTECT ALL EXISTING STRUCTURES ON SITE.
4. CONTRACTOR TO LOCATE EXISTING UTILITIES IN AREA OF SITE PRIOR TO WORK.

KEY NOTES:

(1) COORDINATE WITH UTILITY COMPANY TO PROVIDE A 120/240V SINGLE PHASE, 3–WIRE 400 AMP ELECTRICAL SERVICE FROM THE UTILITY CONNECTION POINT TO THE UTILITY MULTI METER BASE. COORDINATE UTILITY CONNECTION POINT WITH UTILITY. SEE SPECIFICATION SECTION 26 21 00 FOR ADDITIONAL INFORMATION.

(2) DEMOLISH EXISTING ELECTRICAL CONDUIT AFTER NEW SERVICE HAS BEEN INSTALLED.

(3) NEW 2" GAS SERVICE TO GENERATOR.

(4) GENERATOR ATS AND MULTI METER BASE SHALL BE PLACED ON A PAD.

(5) REFER TO ONE–LINE DIAGRAM ON DRAWING E5.1 FOR CONDUIT AND CONDUCTOR SIZE AND QUANTITY.

(6) CONTRACTOR SHALL INSTALL NEW GAS LINE FROM EXISTING GAS LINE IN BUILDING TO PROPOSED GENERATOR. COORDINATE GAS SHUT DOWN IN BUILDING WITH OWNER.

(7) CONNECT PROPOSED CONDUIT TO EXISTING CONDUIT THAT PENETRATES THE EXISTING FOUNDATION.

(8) E–STOP CONTROL STATION FURNISHED BY SECTION 26 32 13 EQUIPMENT SUPPLIER AND INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR. PROVIDE 2~#14 IN 3/4" CONDUIT FROM CONTROL STATION TO GENERATOR CONTROL PANEL.

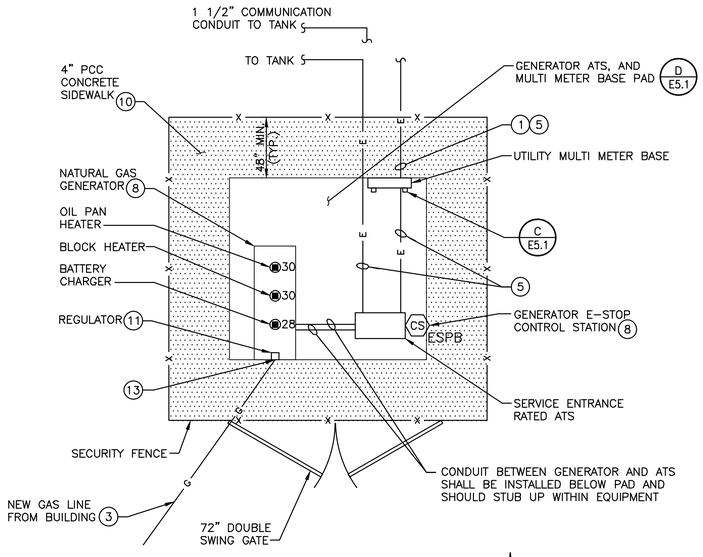
(9) SAWCUT AND REMOVE ASPHALT AS REQUIRED. REPAIR WITH COLD PATCH.

(10) SIDEWALKS SHALL BE A MINIMUM OF 5–FEET WIDE BY 5 INCHES THICK AND SHALL SLOPE AWAY FROM THE PAD AT A RATE OF 1/4 INCH PER FOOT. CONCRETE SHALL BE AS SPECIFIED IN SECTION 03 30 00. SIDEWALKS SHALL BE CONSTRUCTED ON 3 INCHES OF COMPACTED GRANULAR FILL. THEY SHALL HAVE TOOLED JOINTS OF 1–INCH MINIMUM DEPTH AT APPROXIMATELY 5–FOOT CENTERS WITH 1/2–INCH PREFORMED EXPANSION JOINT FILLER AT APPROXIMATELY 25–FOOT CENTERS WITH ONE AT ALL CORNERS AND LOCATED ANYWHERE SIDEWALKS ABUT STRUCTURES AND BUILDINGS.

(11) PROVIDE REGULATOR AT GENERATOR.

(12) CONTRACTOR SHALL PROTECT EXISTING WELL AND APPURTENANCES.

(13) ALL EXPOSED NATURAL GAS PIPING SHALL BE PAINTED. SURFACE PREPARATION SHALL BE PER SSPC SP2/3. PROVIDE TWO COATS OF SHERWIN WILLIAMS DTM ACRYLIC B66 ON PREPARED PIPING.



A C1.1 ENLARGED SERVICE PAD
NO SCALE

N

LEGEND

X	EXISTING FENCE
OH	EXISTING OVERHEAD ELECTRIC
	EXISTING SIDEWALK
	EXISTING ELECTRIC POLE
	EXISTING TREE
E	EXISTING UNDERGROUND ELECTRIC
G	EXISTING UNDERGROUND GAS
	EXISTING POLE MOUNTED TRANSFORMER
E	PROPOSED UNDERGROUND ELECTRIC
G	PROPOSED UNDERGROUND GAS
	EXISTING HEDGELINE
	EXISTING MANHOLE
	EXISTING HYDRANT
	EXISTING SIGN
	PROPERTY LINE/AREA OF SITE
	FIXED ELECTRICAL CONNECTION
CS	CONTROL STATION

NO.	REVISIONS	DATE:

SITE PLAN

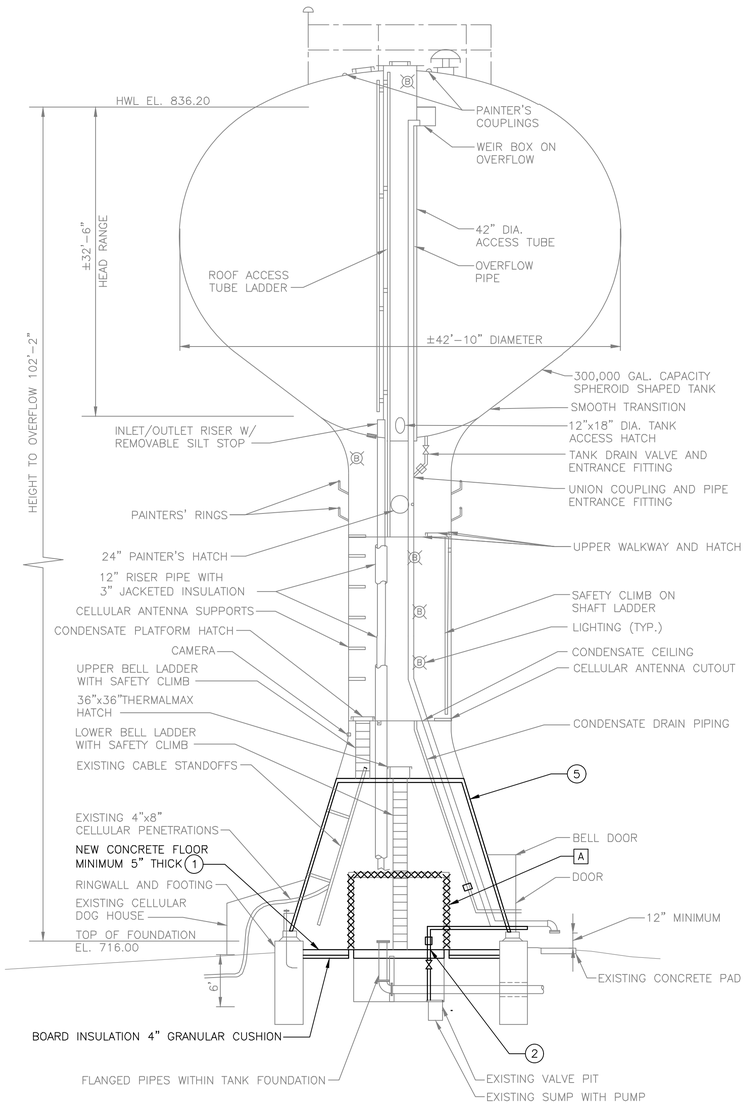
ELEVATED TANK NO. 7 ELECTRICAL IMPROVEMENTS
VILLAGE OF ORLAND PARK
COOK COUNTY, ILLINOIS

JOB NO.
1555.014

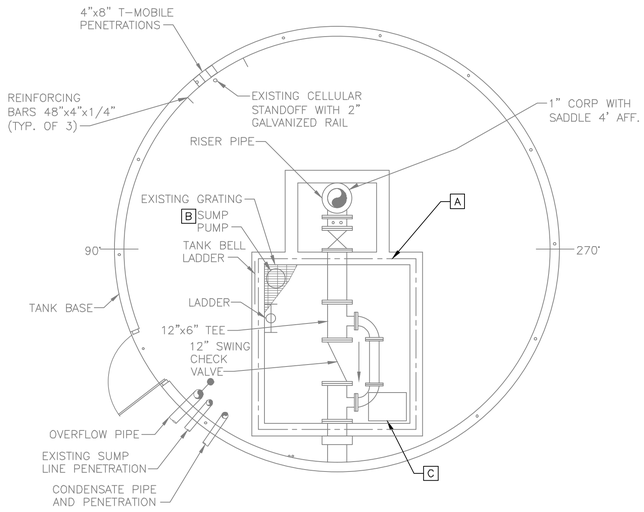
PROJECT MGR.
ANAND SRIDHAR

STRAND ASSOCIATES®

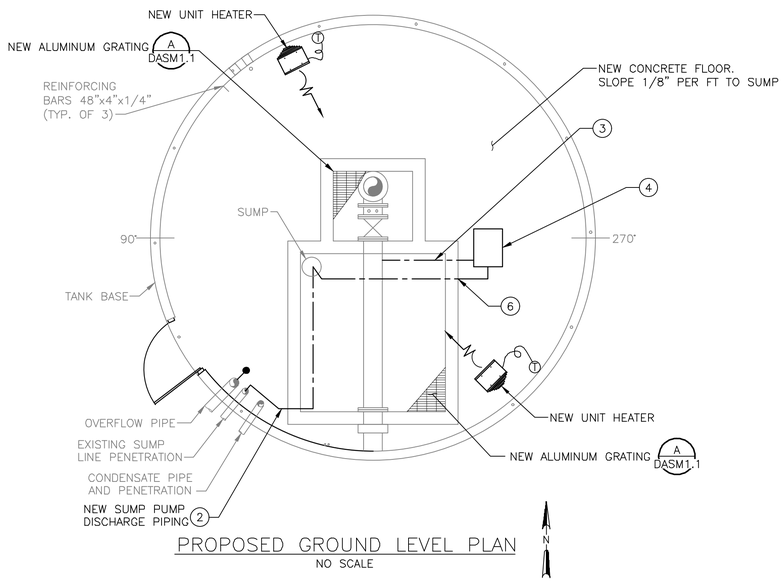
SHEET
2
C1.1



SINGLE PEDESTAL SPHEROID
NO SCALE



DEMOLITION GROUND LEVEL PLAN
NO SCALE



PROPOSED GROUND LEVEL PLAN
NO SCALE

GENERAL NOTES:

1. WELDING TO THE COATED TANK WALL IS NOT ACCEPTABLE.

KEY NOTES:

(1) NEW CONCRETE FLOOR SHALL USE WELDED FIBER FABRIC AS SPECIFIED.

(2) NEW 2" GALVANIZED SUMP LINE. TIE INTO EXISTING TANK WALL COUPLING. PROVIDE CHECK VALVE AND DRAIN VALVE.

(3) EXTEND SAMPLE TAP PIPING TO NEW SAMPLE TAP AND SINK WITH 3/4" COPPER PIPE.

(4) NEW SAMPLE TAP AND SINK. NEW COPPER FROM EXISTING TAP TO LOCATION AS SHOWN. INSTALL NEW DRAIN LINE FROM SINK TO SUMP.

(5) INSULATE BASE CONE WALLS AND CEILING WITH FOAM INSULATION AS SPECIFIED.

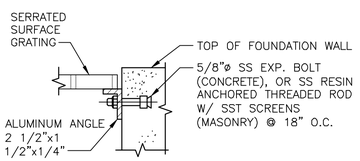
(6) 1 1/2" PVC DRAIN PIPE FROM SAMPLE SINK TO SUMP.

DEMOLITION KEY NOTES:

[A] DEMOLISH ABOVE GRADE VALVE ROOM, LIGHTS, AND SAMPLE TAP.

[B] REMOVE SUMP PUMP DISCHARGE PIPING.

[C] DEMOLISH AND REMOVE UNIT HEATER AND CONDUIT.



SIZE	SUPPORT ANGLE	MAX. SPAN
1"x3/16"	1 1/4"x1 3/4"x1/4"	2'-6"
1 3/4"x3/16"	2"x2"x1/4"	5'-0"
2"x3/16"	2"x2"x1/4"	6'-0"

NOTES:

1. PROVIDE 4"x3"x3/8" ALUMINUM SUPPORT ANGLE ACROSS OPENINGS. BOLT ENDS OF ANGLE TO SIDES OF OPENINGS WITH S.S. EXP. BOLTS. LOCATE ANCHOR BOLTS MIN. 4" FROM EDGES OF OPENING.
2. CUT GRATING SUPPORT ANGLES TO PROVIDE CLEARANCE FOR STOP PLATE GROOVES.
3. APPLY BITUMINOUS PAINT COATING TO ALUMINUM SURFACES IN CONTACT WITH CONCRETE.

A DASM1.1 ALUMINUM GRATING
NO SCALE

NO.	REVISIONS	DATE:

TANK ELEVATION AND PLANS

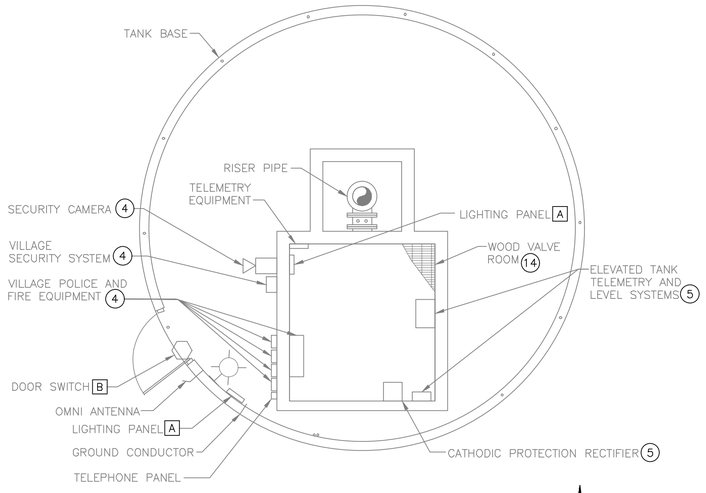
ELEVATED TANK NO. 7 ELECTRICAL IMPROVEMENTS
VILLAGE OF ORLAND PARK
COOK COUNTY, ILLINOIS

JOB NO. 1555.014

PROJECT MGR. ANAND SRIDHAR

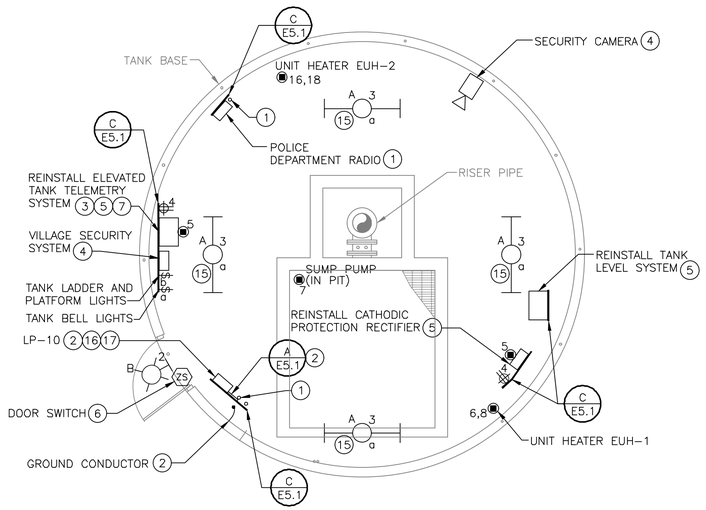
STRAND ASSOCIATES®

SHEET 3 DASM1.1



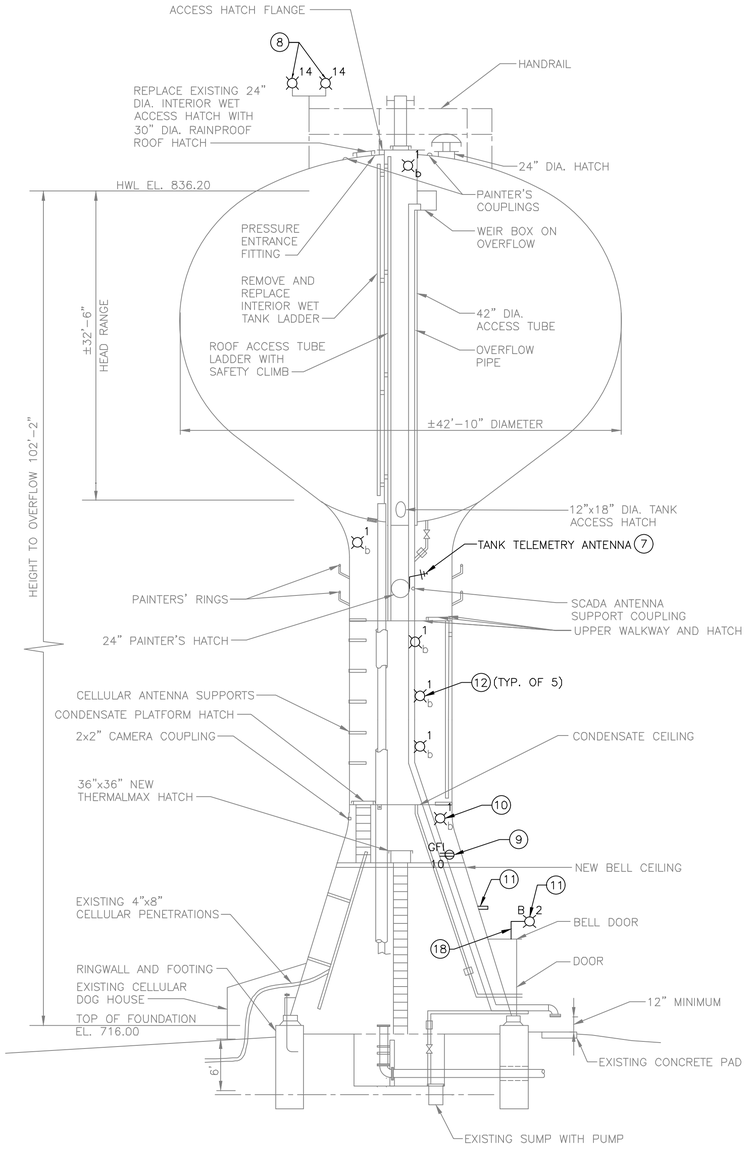
EXISTING GROUND LEVEL ELECTRICAL PLAN

NO SCALE



GROUND LEVEL ELECTRICAL PLAN

NO SCALE



SINGLE PEDESTAL SPHEROID

NO SCALE

DEMOLITION NOTES:

A REMOVE EXISTING LIGHTING PANEL AND ALL ASSOCIATED BRANCH CIRCUIT WIRING. RETAIN CONDUIT FOR REUSE WITH LP-10. REMOVE EXISTING ELECTRIC FEED CONDUIT TO TWO FEET BELOW GRADE AND PREPARE FOR EXTENSION TO NEW LP-10.

B REMOVE EXISTING DOOR SWITCH AND ASSOCIATED WIRING. RETAIN CONDUIT FOR REUSE WITH NEW DOOR SWITCH.

GENERAL NOTES:

1. TRAIN CABLING ALONG TANK WALL IN A NEAT AND ORGANIZED MANNER. PROVIDE CABLE SUPPORTS PER CABLE MANUFACTURER RECOMMENDATIONS AND AT MANUFACTURER RECOMMENDED SUPPORT SPACING.
2. NO NEW PENETRATIONS THROUGH THE TANK BELL OR THE FOUNDATION ARE ALLOWED.

KEY NOTES:

(1) PROVIDE A 2" CONDUIT UNDERGROUND FROM LP-10 TO THE POLICE DEPARTMENT RADIO MOUNTING STAND FOR OWNER USE.

(2) TELECOMMUNICATIONS GROUNDING BUS BAR, LP-10 AND TANK STEEL SHALL BE BONDED TO TANK GROUND.

(3) CONTRACTOR SHALL DOCUMENT ALL EXISTING ELEVATED TANK NO. 7 SCADA SIGNALS TO/FROM THE SCADA CABINET INCLUDING SIGNAL DESCRIPTION (IE TANK LEVEL) AND SHALL SUBMIT TO ENGINEER/OWNER FOR APPROVAL. CONTRACTOR SHALL RELOCATE EXISTING SCADA CABINET TO MOUNTING PLATES ALONG TANK WALL. EXTEND/REPLACE/REROUTE EXISTING WIRES AND CONDUIT AS REQUIRED.

(4) OWNER WILL RELOCATE EXISTING VILLAGE SECURITY SYSTEM, SECURITY CAMERA AND POLICE DEPARTMENT RADIO.

(5) CONTRACTOR SHALL RELOCATE EXISTING ELEVATED TANK TELEMETRY PANEL, CATHODIC PROTECTION RECTIFIER, AND TANK LEVEL SYSTEM PANEL. EXTEND WIRES, CONDUIT AND TUBING AS REQUIRED.

(6) PROVIDE 2~#14 AND #14 GROUND IN 3/4" CONDUIT FROM DOOR SWITCH TO TANK TELEMETRY SYSTEM. CONDUIT SHALL BE INSTALLED UNDERGROUND.

(7) PROVIDE NEW SCADA ANTENNA CABLE FROM ELEVATED TANK TELEMETRY PANEL TO ANTENNA.

(8) REMOVE FAA LIGHT AND CONDUIT. INSTALL NEW FAA LIGHT SUPPORT STAND AND NEW FAA FIXTURE. FAA FIXTURE SHALL BE RAISED TO HIGHEST POINT OF TANK WITH NO OBSTRUCTIONS. FIXTURE SHALL BE P&R TECHNOLOGIES MODEL 860-1R01-002, OR EQUAL. PROVIDE PHOTOELECTRIC CONTROLLER CONFORMING TO FAA SPECIFICATION L-810 IN FAA CIRCULAR AC70/7460-1K. CONTROLLER SHALL BE CROUSE HINDS TYPE PEC NO. 52010, OR EQUAL.EXTEND CONDUIT AND WIRE TO FAA FIXTURE.

(9) CONDUIT STANDOFFS FOR RECEPTACLE FURNISHED BY CONTRACT 1-2021 CONTRACTOR.

(10) CONDUIT STANDOFF FOR FIXTURE FURNISHED BY CONTRACT 1-2021 CONTRACTOR. PROVIDE NEW FIXTURE MATCHING THOSE USED TO REPLACE THE EXISTING FIXTURE.

(11) COUPLING THROUGH TANK BELL FURNISHED BY CONTRACTOR 1-2021 CONTRACTOR. ALL CONDUIT, WIRE, AND FIXTURE SUPPORT TO EXTERIOR FIXTURE LOCATED ABOVE DOOR BY THIS CONTRACTOR.

(12) REPLACE EXISTING INTERIOR FIXTURES WITH 2600 LUMEN MINIMUM LED FIXTURES. FIXTURES SHALL BE VAPOR PROOF, BRACKET TYPE, WITH CAST ALUMINUM GUARD.

(13) NOT USED.

(14) VALVE ROOM STRUCTURE BEING DEMOLISHED AS SHOWN ON DASM1.1.

(15) FIXTURES SHALL BE MOUNTED AT 9.5' AFF. SUPPORT FIXTURE FROM NEW BELL CEILING STRUCTURAL SUPPORT MEMBERS.

(16) EXTEND EXISTING ELECTRIC FEED CONDUIT THAT PENETRATES THE FOUNDATION TO LP-10.

(17) PROVIDE NEW CONDUCTORS FOR ALL BRANCH CIRCUITS EXCEPT FOR WIRING TO LIGHTS IN STEM AND DOUBLE OBSTRUCTION LIGHTS.

(18) PROVIDE MOUNTING FOR EXTERIOR FIXTURE SUCH THAT FIXTURE IS LOCATED ABOVE THE DOOR. MOUNTING SHALL NOT MAR EXTERIOR COATING OR REQUIRE DRILLING OF BELL DOOR STRUCTURE.

NO.	REVISIONS	DATE:

GROUND LEVEL ELECTRICAL PLANS

ELEVATED TANK NO. 7 ELECTRICAL IMPROVEMENTS
VILLAGE OF ORLAND PARK
COOK COUNTY, ILLINOIS

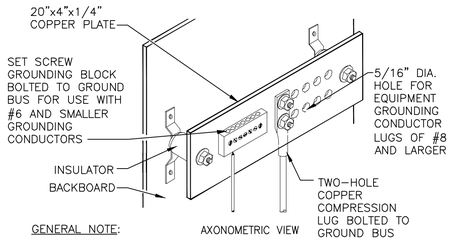
JOB NO.
1555.014

PROJECT MGR.
ANAND SRIDHAR

STRAND ASSOCIATES®

SHEET
4
E1.1

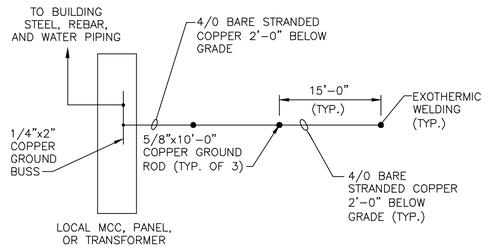
File: S:\JOL\1500--1599\1555\014\Drawings\CAD\Acad\Sheets\Tank 7 Rehabilitation #2\E1.1.dwg Time: Jun 09, 2021 - 11:22am



GENERAL NOTE:

1. TELECOMMUNICATION CONTRACTOR SHALL BOND ALL METAL RACKS AND ENCLOSURES IN ALL TELECOMMUNICATIONS ROOMS TO THE GROUND BUS BAR WITH #6 AWG COPPER

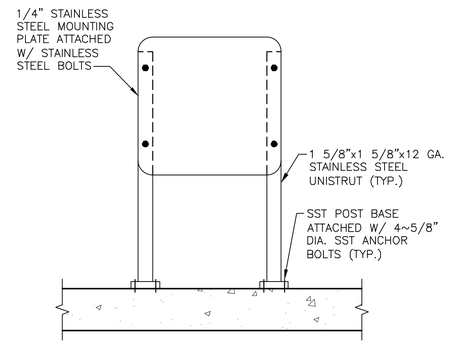
A E5.1 TELECOMMUNICATIONS GROUNDING BUS BAR DETAIL
NO SCALE



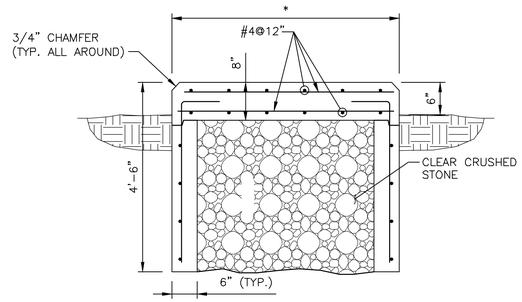
NOTES:

1. PROVIDE GROUND ROD MAINTENANCE AND INSPECTOR WELL AT FIRST COPPER GROUND ROD. WELL TO CONSIST OF A 12-INCH DIAMETER PVC TUBE WITH SCREW TOP TO ALLOW ACCESS TO GROUND ROD AND SLOTS CUT TO MATCH CONDUCTOR SIZE AND CONFIGURATION.

B E5.1 GROUND GRID
NO SCALE



C E5.1 METER BASE/CONTROL STATION MOUNTING
NO SCALE

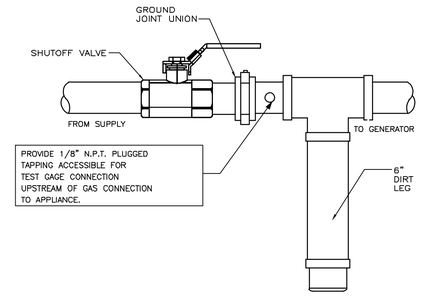


SECTION

* DETERMINE DIMENSION BASED ON ACTUAL EQUIPMENT. DIMENSIONS EXTEND PAD SIX INCHES PAST EQUIPMENT, ALL SIDES

CONCRETE SHALL HAVE A 28-DAY MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI, MINIMUM CEMENT CONTENT OF SIX SACKS PER CUBIC YARD, AND A MAXIMUM OF 5.5 GALLONS OF TOTAL WATER PER SACK. THE SLUMP OF THE CONCRETE SHALL BE WITHIN THE RANGE OF 2 TO 3 1/2 INCHES. AN AIR-ENTRAINING ADMIXTURE CONFORMING TO ASTM C260, EQUAL TO "DAREX," SHALL BE USED IN ALL CONCRETE TO OBTAIN 4% TO 7% AIR CONTENT. A WATER REDUCER MEETING ASTM C494 TYPE A REQUIREMENTS SHALL BE INCLUDED IN THE MIX. MIXES SHALL BE DESIGNED TO ACCORDANCE WITH ACI 211.1.

D E5.1 GENERATOR PAD
NO SCALE



E E5.1 NATURAL GAS CONNECTION
NO SCALE

LIGHTING PANEL LP-10

Service: 120/240V, 1ϕ, 3W — Enclosure: NEMA 1 — Mounting: Surface
Main Breaker: 100A M.C.B. — Main Bus: Copper
Location: Tank Bell — SCIC: 10 kAIC

Room Number/Description	Amps	Poles	Cct. #	Phase A	Phase B	Phase A	Phase B	Cct. #	Amps	Poles	Room Number/Description
Tank Ladder and Platform Lights	20	1	1	321		314		2	20	1	Exterior Lights
Tank Bell Lights	20	1	3		114		540	4	20	1	Tank Bell Receptacles
Elevated Tank Telemetry Panel	20	1	5	500		1500		6	20	2	EUH-1
Sump Pump	20	1	7		1200		1500	8			
Cathodic Protection Panel	20	1	9	1000		180		10	20	1	Platform Receptacle
Owner Radio Cabinet+	20	1	11		1200		0	12	20	1	Spare
Spare	20	1	13			186		14	20	1	Double Obstruction Lights
Spare	20	1	15		0		1500	16	20	2	EUH-2
Owner Telemetry Panel No. 3+	20	1	17	500		1500		18			
Spare	60	2	19		0		0	20	20	1	Spare
			21	0		0		22	20	1	Spare
Spare	20	1	23		0		0	24	20	1	Spare
Spare	20	1	25	0		0		26	20	1	Spare
Spare	20	1	27		0		50	28	20	1	Generator Battery Charger
Spare	20	1	29	0		650		30	20	1	Generator Oil and Coolant Heaters
Total Load per Phase per Side (VA)				2321	2514	4330	3690				

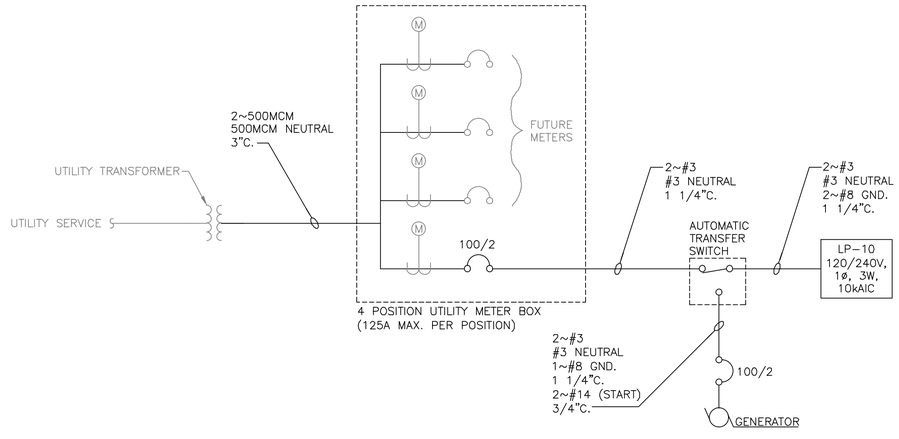
Total Load Phase A (VA)	6651	VA	+ Circuit wiring by Owner	Total Connected Load (A)	53 A
Total Load Phase B (VA)	6104	VA		Total Connected Load + 25%	66 A
Total Connected Load (VA)	12755	VA			
				Feeder Load	66 A

FIXTURE SCHEDULE

Fixture Type	Manufacturer(s)	Model Number	Lamp Type	Mounting	Remarks
A	Emium	EL-MC-TP-03-60-DW	60W LED	Surface	
B	Emium	EL-MS-WPI-30W-DW	30W LED	Wall	Fixture shall include 120V photocell control.

LEGEND:

- A-2/b — FIXTURE SYMBOL (TYPICAL) A-INDICATES FIXTURE TYPE; 2-INDICATES CIRCUIT NUMBER; b-INDICATES SWITCHING; SOLID CIRCLE INDICATES ALWAYS ON
- INCANDESCENT, LED, HID, SURFACE OR PENDANT
- INCANDESCENT, LED, HID, WALL
- $ — SINGLE POLE
- 2(XY) — CIRCUIT NUMBER (TYPICAL); OTHERWISE SHOWN PANEL DESIGNATION (TYP.)
- DUPLEX, 125 VOLT, WP INDICATES WEATHERPROOF
- DUPLEX, 125 VOLT, 48" AFF
- DOUBLE DUPLEX, 125 VOLT, 48" AFF
- FIXED EQUIPMENT CONNECTION
- AUTOMATIC TRANSFER SWITCH (ONE-LINE DIAGRAM)
- CIRCUIT BREAKER (ONE-LINE DIAGRAM)
- M — METER (ONE-LINE DIAGRAM)
- PANELBOARD
- CS — CONTROL SWITCH
- ZS — LIMIT SWITCH
- UNIT HEATER



ONE-LINE DIAGRAM
NO SCALE

NO.	REVISIONS	DATE:

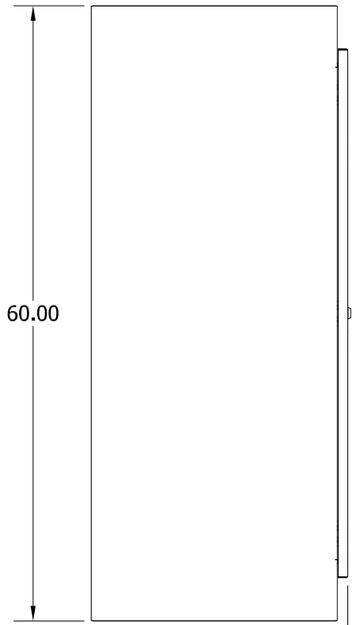
ONE-LINE DIAGRAM AND DETAILS

ELEVATED TANK NO. 7 ELECTRICAL IMPROVEMENTS
VILLAGE OF ORLAND PARK
COOK COUNTY, ILLINOIS

JOB NO. 1555.014
PROJECT MGR. ANAND SRIDHAR

STRAND ASSOCIATES®

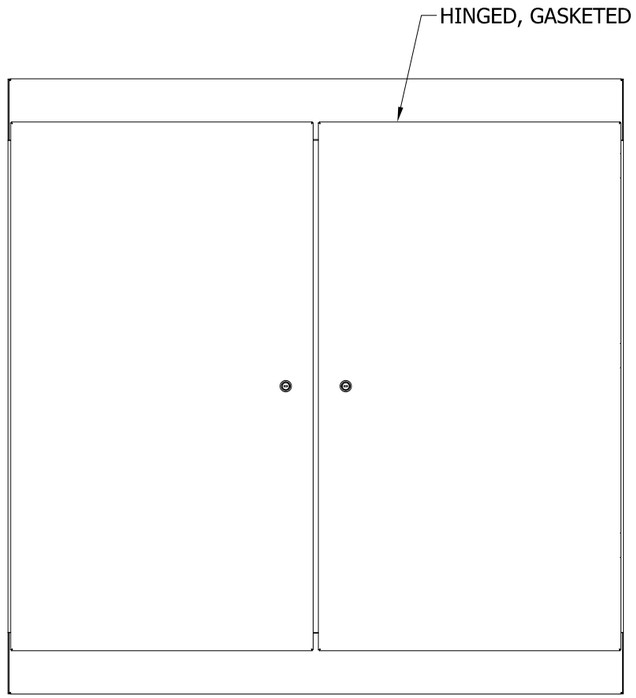
SHEET 5 **E5.1**



LEFT SIDE VIEW

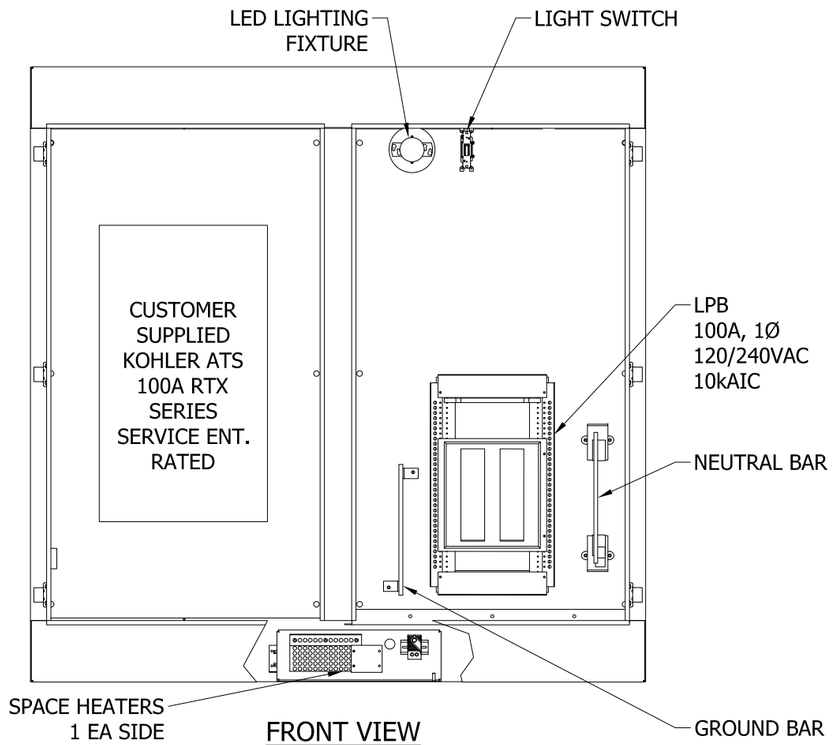
24.00

25.03

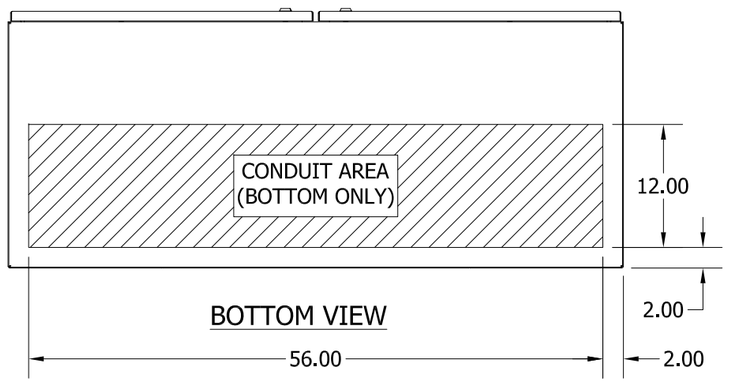


FRONT VIEW

60.00



FRONT VIEW
DOORS, DEADFRONTS OFF



BOTTOM VIEW

56.00

OUTLINE NOTES:

1) GENERAL ENCLOSURE CONSTRUCTION:
   A) FREESTANDING ENCLOSURE NEMA 4X
   B) FABRICATED FROM 14GA STAINLESS STEEL
   C) NATURAL FINISH
   D) TWO HINGED FRONT DOORS
   E) PADLOCKABLE LATCHES
   F) GASKETED DOORS
   G) SYSTEM MUST HAVE ALL DOORS INSTALLED FOR PROPER OPERATION
   H) ALL DIMENSIONS EXPRESSED IN INCHES

REV	DESCRIPTION	BY	APV	ECN	DATE
-					
-					
A	ORIGINAL RELEASE	CJA			9/22/20

LAKE SHORE ELECTRIC Corp
BEDFORD, OHIO U.S.A.

WIRING DIAGRAM
SERVICE PEDESTAL

SCALE: 1:32 | DRN: CJA 09/22/20 | CHK: --- --/--/-- | APV: --- --/--/--

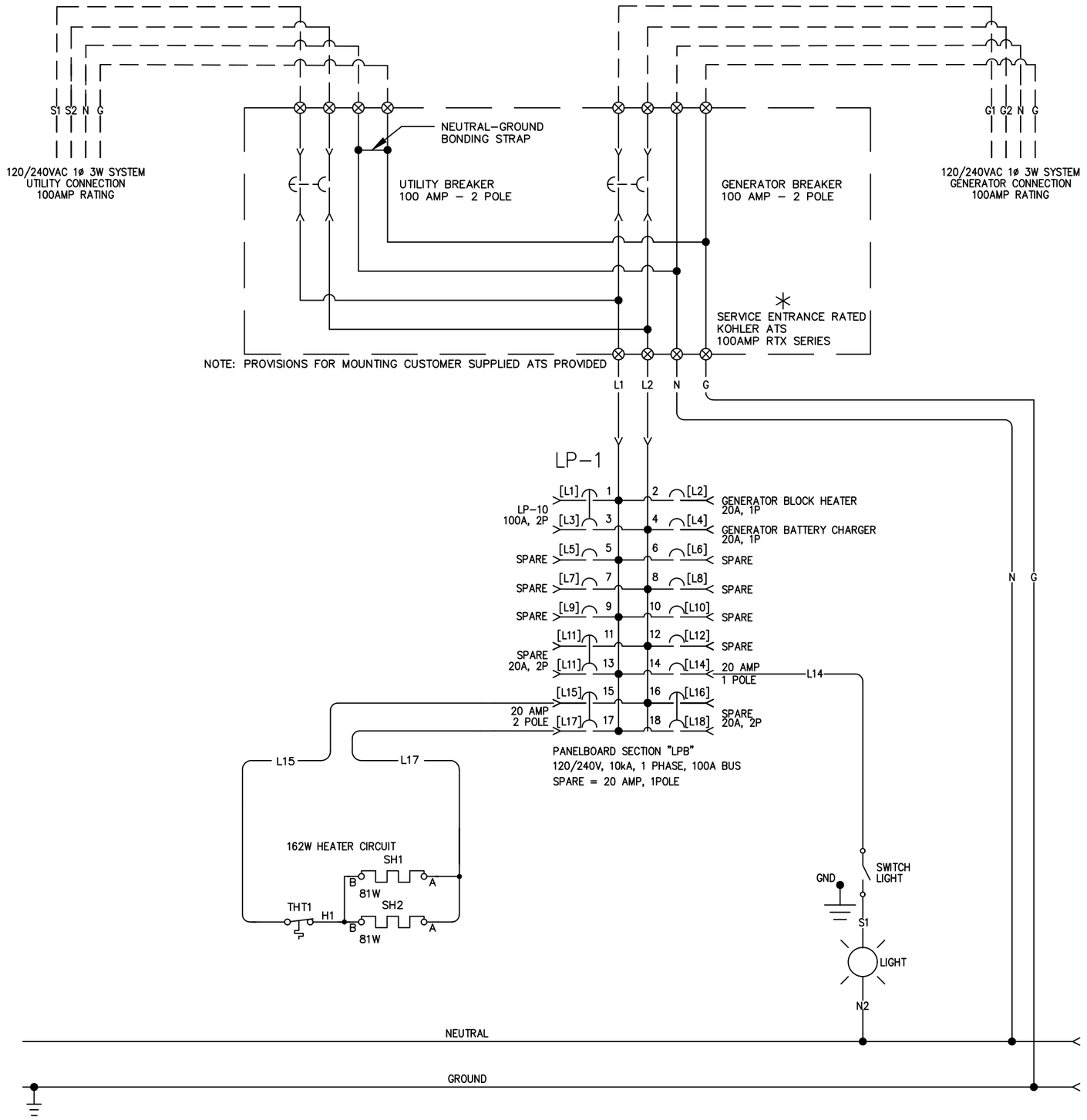
PROJ: ORLAND PARK WATER TANK
SERVICE ENTRANCE CABINET,NEMA 4X

CUSTOMER:
-
ORCHARD ELECTRIC
-

DWG NUMBER
200578-02
-

QUOTE/JOB#:
201033

PG 1 OF 1



NOTES

1) RELAY & TIMER CONTACTS LOCATION: (LINE # = LOCATED IN DC SCHEMATIC) (WIRE #'S = LOCATED IN AC SCHEMATIC)
2) NOMENCLATURE DISCRIPTIONS, IF NOT ON THIS DRAWING (REFER TO LAKE SHORE STANDARD NOMENCLATURE - ES103)
3) COMPONENT LOCATION MARKER, USED WHEN LOCATED IN A DIFFERENT SECTION: (0 = LOCATED OUTSIDE OF SECTION)
4) CUSTOMER CONNECTION TERMINAL BLOCK (TB1)
5) CUSTOMER CONNECTION TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
6) LAKE SHORE CONNECTION TERMINAL BLOCK (TB2 OR TB3)
7) LAKE SHORE CONNECTION TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
8) LAKE SHORE SEC. TO SEC. TERMINAL BLOCK (TB4)
9) LAKE SHORE SEC. TO SEC. TERMINAL BLOCK (LOCATED ON PC BOARD OR BLACK BOX)
10) CUSTOMER ENGINE TERMINAL BLOCK (ETB)
11) CUSTOMER WIRING
12) CUSTOMER CABLING
13) CUSTOMER SUPPLIED EQUIPMENT
14) LAST WIRE # USED -

DC CONTROL CIRCUIT	000
AC CONTROL CIRCUIT	100
AC C.T. CIRCUIT	200
AC INSTRUMENT CIRCUIT	300
AC REGULATOR CIRCUIT	400
48VDC CONTROL CIRCUIT	500
125VDC CONTROL CIRCUIT	600

NOTE: ALL WIRE TO BE #12 GAGE SIS WIRE UNLESS OTHERWISE NOTED.

REV	DESCRIPTION	BY	APV	DATE
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

LAKE SHORE ELECTRIC Corp
BEDFORD, OHIO U.S.A.

WIRING DIAGRAM
SERVICE PEDESTAL

SCALE: 1:32 | DRN: MJD 09/21/20 | CHK: --- --/--/-- | APV: --- --/--/--

PROJ: ORLAND PARK WATER TANK
-

CUSTOMER:
-
ORCHARD ELECTRIC
-

DWG NUMBER
200578-02
-

QUOTE/JOB#:
201033

PG 1 OF 1

BILL OF MATERIAL

ITEM	DESCRIPTION
KOHLER ATS RTX MOUNTING PROVISIONS	SERVICE ENTRANCE RATED, 100 AMP, 2 POLE, CUSTOMER SUPPLIED, KOHLER AUTOMATIC TRANSFER SWITCH, STYLE RTX, MOUNTING PROVISIONS PROVIDED, MANUFACTURE: KOHLER (1 REQUIRED)
PANELBOARD "LP-1"	240/120 VOLT, 100 AMP, 1 PHASE - 3 WIRE, CUTLER-HAMMER TYPE MLO PANEL (1 REQUIRED) BREAKER LIST 10,000 AIC @ 240 VOLTS, CUTLER-HAMMER TYPE "BAB" OR "BAB-H" - 100 AMP 2 POLE CATALOG #BAB2100H (1 REQUIRED) - 20 AMP 2 POLE CATALOG #BAB2020 (3 REQUIRED) - 20 AMP 1 POLE CATALOG #BAB1020 (10 REQUIRED)
SPACE HEATERS	350 WATT,250 VOLT, HEATREX HEATER DAYTON CATALOG #276-6 (1 REQUIRED)
LIGHT SWITCH	SINGLE POLE, 20 AMP, BROWN, LEVITON CATALOG #CS-120-2 (1 REQUIRED)
PLASTIC LIGHT BASE	(WITH 100 WATT INCANDESCENT LIGHT BULB) LEVITON CATALOG #8829-CW2 (1 REQUIRED)

REV	DESCRIPTION	BY	APV	DATE
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

LAKE SHORE ELECTRIC Corp
BEDFORD, OHIO U.S.A.

PARTS LIST
SERVICE PEDESTAL

SCALE: 1:1	DRN: MJD 09/21/20	CHK: --- --/--/--	APV: --- --/--/--

PROJ: ORLAND PARK WATER TANK
-

CUSTOMER:
-
ORCHARD ELECTRIC
-

DWG NUMBER
200578-00
-

QUOTE/JOB#: 201033

PG 1 OF 1

KOHLER®

Models: 14RCA(L)

Multi-Fuel
LPG/Natural Gas

ISO 9001 KOHLER® NATIONALLY REGISTERED

The Kohler® Advantage

- **High Quality Power**
  Kohler home generators provide advanced voltage and frequency regulation along with ultra-low levels of harmonic distortion for excellent generator power quality to protect your valuable electronics.
- **Extraordinary Reliability**
  Kohler is known for extraordinary reliability and performance and backs that up with a premium 5-year or 2000 hour limited warranty.
- **Powerful Performance**
  Exclusive Powerboost™ technology provides excellent starting power. The Kohler 14 kW generator can easily start and run a 5 ton air conditioner. §
- **Aluminum Enclosure**
  - Attractive aluminum enclosure allows installation as close as 18 inches from your home or small business. †
  - Enclosure panels can be removed without tools to allow easy access for maintenance and service.

Standard Features

- **RDC2 Controller**
  - One digital controller manages both the generator set and transfer switch functions (with optional Model RXT).
  - Electronic speed control responds quickly to varying demand.
  - OnCue® Plus Generator Management System for remote monitoring is included with the generator.
- **Kohler Command PRO Engine Features**
  - Kohler Command PRO® OHV engine with hydraulic valve lifters for reliable performance without routine valve adjustment or lengthy break-in requirements.
- **Designed for Easy Installation**
  - Sturdy aluminum base can be mounted on gravel or a concrete mounting pad.
  - Fuel and electrical connections through the enclosure wall eliminate the need for stub-ups through the base.
  - Customer connection terminal block located near the controller allows easy access for field wiring.
  - Designed for outdoor installation only.
- **Certifications**
  - Meets emission regulations for U.S. Environmental Protection Agency (EPA) with both natural gas and LPG.
  - UL 2200/cUL listed (60 Hz model).
  - CSA certification available (60 Hz model).
  - Accepted by the Massachusetts Board of Registration of Plumbers and Gas Fitters.
  - Meets 181 mph wind rating.
- 14RCAL models packaged with a Model RXT automatic transfer switch are available. See page 4 and the Model RXT ATS specification sheet.
- **Warranty**
  - 5-year/2000 hour limited warranty for on-grid (standby) applications in locations served by a reliable utility source.
  - 18 month/1000 hour limited warranty for off-grid (non-standby) applications.

Generator Ratings

				Standby Ratings				Non-Standby Ratings				Line Circuit Breaker	
				Natural Gas		LPG		Natural Gas		LPG			
Alt.	Voltage	Phases	Hz	kW/kVA	Amps	kW/kVA	Amps	kW/kVA	Amps	kW/kVA	Amps	Amps	Poles
2F5	120/240	1	60	12/12	50	14/14	58	12/12	50	14/14	58	70	2
	120/208	3	60	12/15	41	13/16	45	12/15	41	13/16	45	50	3
2G5	120/240	3	60	12/15	36	13/16	39	12/15	36	13/16	39	50	3
	277/480	3	60	12/15	18	13/16	20	12/15	18	13/16	20	25	3

Note: The line circuit breaker is automatically selected based on the generator set model and voltage configuration.

RATINGS: Standby ratings apply to installations served by a reliable utility source. All single-phase units are rated at 1.0 power factor. The standby rating is applicable to variable loads with an average load factor of 80% for the duration of the power outage. No overload capacity is specified at this rating. Ratings are in accordance with ISO-3046/1, BS5514, AS2789, and DIN 6271. GENERAL GUIDELINES FOR DERATING: *ALTITUDE*: Derate 4% per 305 m (1000 ft.) elevation above 153 m (500 ft.). *TEMPERATURE*: Derate 2% per 5.5°C (10°F) temperature increase above 16°C (60°F). Availability is subject to change without notice. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler Co. generator distributor for availability.

§ Check the appliance manufacturer's specifications for actual power requirements. Consult a Kohler® Power Systems professional to calculate your exact residential power system requirements.

† Meets NFPA guidelines for 18 inch clearance to combustible materials. Check state and local codes for minimum distance required from a structure.

Alternator Specifications

Alternator Specifications

Specifications	Alternator
Manufacturer	Kohler
Type	2-Pole, Rotating Field
Leads, quantity	
2F5	4
2G5	12
Voltage regulator	Digital
Insulation:	NEMA MG1-1.66
Material	Class H
Temperature rise	130°C Standby
Bearing: quantity, type	1, Sealed
Coupling	Direct
Amortisseur windings	Full
Voltage regulation, no-load to full-load RMS	±1.0%
One-step load acceptance	100% of Rating
Peak motor starting kVA:	(35% dip for voltages below)
240V, 1 ph	2F5 (4 lead) 33 (60 Hz)
240 or 480 V, 3 ph	2G5 (12 lead) 54 (60 Hz)

Alternator Features

- Compliance with NEMA, IEEE, and ANSI standards for temperature rise.
- Self-ventilated and dripproof construction.
- Windings are vacuum-impregnated with epoxy varnish for dependability and long life.
- Superior voltage waveform and minimum harmonic distortion from skewed alternator construction.
- Digital voltage regulator with ±1.0% no-load to full-load RMS regulation.
- Rotating-field alternator with static exciter for excellent load response.
- Total harmonic distortion (THD) from no load to full load with a linear load is less than 5%.

Application Data

Engine

Engine Specifications	
Manufacturer	Kohler
Engine: model, type	CH740 4-Cycle
Cylinder arrangement	V-2
Displacement, cm^3 (cu. in.)	725 (44)
Bore and stroke, mm (in.)	83 x 67 (3.27 x 2.64)
Compression ratio	9:1
Main bearings: quantity, type	2, PTO Side-Load Sleeve Bearings
Rated RPM	
60 Hz	3600
Max. engine power at rated rpm, kW (HP)	
LPG, 60 Hz	17.6 (23.6)
Natural gas, 60 Hz	15.3 (20.5)
Cylinder head material	Aluminum
Valve material	Steel/Stellite®
Piston type and material	Aluminum Alloy
Crankshaft material	Heat Treated, Ductile Iron
Governor: type	Electronic
Frequency regulation, no load to full load	Isochronous
Frequency regulation, steady state	±0.5%
Air cleaner type	Dry

Engine Electrical

Engine Electrical System	
Ignition system	Electronic, Capacitive Discharge
Starter motor rated voltage (DC)	12
Battery (purchased separately):	
Ground	Negative
Volts (DC)	12
Battery quantity	1
Recommended cold cranking amps:	
(CCA) rating for - 18°C (0°F)	500
Group size	51

Exhaust

Exhaust System	
Exhaust temperature exiting the enclosure at rated kW, dry, °C (°F)	260 (500)

Lubrication

Lubricating System	
Type	Full Pressure
Oil capacity (with filter), L (qt.)	1.8 (1.9)
Oil filter: quantity, type §	1, Cartridge
Oil cooler	Integral

§ Kohler recommends the use of Kohler Genuine oil and filters.

Fuel Pipe Size

Minimum Gas Pipe Size Recommendation, in. NPT

Pipe Length, m (ft.)	Natural Gas 193,000 Btu/hr.	LPG 203,000 Btu/hr.
8 (25)	3/4	3/4
15 (50)	1	3/4
30 (100)	1	1
46 (150)	1 1/4	1
61 (200)	1 1/4	1

Fuel Requirements

Fuel System	
Fuel types	Natural Gas or LPG
Fuel supply inlet	1/2 NPT
Fuel supply pressure, kPa (in. H_2O):	
Natural gas	1.2- 2.7 (5-11)
LP	1.7- 2.7 (7-11)

Fuel Composition Limits *	Nat. Gas	LPG
Methane, % by volume (minimum)	90 min.	—
Ethane, % by volume (maximum)	4.0 max.	—
Propane, % by volume	1.0 max.	85 min.
Propene, % by volume (maximum)	0.1 max.	5.0 max.
C_4 and higher, % by volume	0.3 max.	2.5 max.
Sulfur, ppm mass (maximum)	25 max.	
Lower heating value, MJ/m^3 (Btu/ft^3), (minimum)	33.2 (890)	84.2 (2260)

* Contact your local distributor for suitability and rating derates based on fuel compositions outside these limits.

Operation Requirements

Fuel Consumption, m^3/hr. (cfh) @ 60Hz

% Load	Natural Gas		LPG	
100	5.4	(193)	2.3	(81)
75	4.7	(163)	2.1	(75)
50	3.5	(124)	1.8	(60)
25	2.6	(93)	1.2	(45)
Exercise	1.7	(60)	0.8	(30)

Nominal fuel rating: Natural gas: 37 MJ/m^3 (1000 $Btu/ft.^3$)
LPG: 93 MJ/m^3 (2500 $Btu/ft.^3$)

LPG conversion factors: 8.58 $ft.^3$ = 1 lb.
0.535 m^3 = 1 kg
36.39 $ft.^3$ = 1 gal.

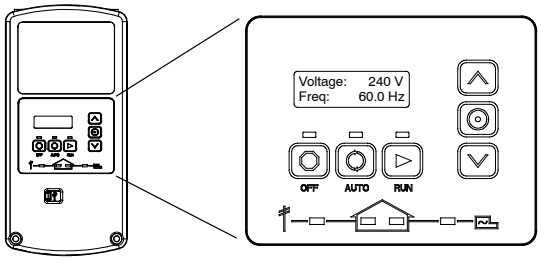
Generator Set Sound Data

Model 14RCA 8 point logarithmic average sound levels are 62 dB(A) during weekly engine exercise and 67dB(A) during full-speed generator diagnostics and normal operation.*

All sound levels are measured at 7 meters with no load.

* Lowest of 8 points measured around the generator. Sound levels at other points around generator may vary depending on installation parameters.

RDC2 Controller



The RDC2 controller provides integrated control for the generator set, Kohler® Model RXT transfer switch, programmable interface module (PIM), and load shed kit.

RDC2 Controller Features

- Membrane keypad:
  - OFF, AUTO, and RUN pushbuttons
  - Select and arrow buttons for access to system configuration and adjustment menus
- LED indicators for OFF, AUTO, and RUN modes

RDC2 Controller Features, Continued

- LED indicators for utility power and generator set source availability and ATS position (Model RXT transfer switch required)
- LCD display:
  - Two lines x 16 characters per line
  - Backlit display with adjustable contrast for excellent visibility in all lighting conditions
- Scrolling system status display:
  - Generator set status
  - Voltage and frequency
  - Engine temperature
  - Oil pressure
  - Battery voltage
  - Engine runtime hours
- Date and time displays
- Smart engine cooldown senses engine temperature
- Digital isochronous governor maintains steady-state speed at all loads
- Digital voltage regulation: ±1.0% RMS no-load to full-load
- Automatic start with programmed cranking cycle
- Programmable exerciser can be set to start automatically on any future day and time, and run every week or every two weeks
- Exercise modes:
  - Unloaded weekly exercise with complete system diagnostics
  - Unloaded full-speed exercise
  - Loaded full-speed exercise (Model RXT ATS required)
- Front-access mini USB connector for SiteTech™ or USB Utility connection
- Integral Ethernet connector for Kohler® OnCue® Plus
- Built-in 2.5 amp battery charger
- Remote two-wire start/stop capability for optional connection of a Model RDT transfer switch
- Diagnostic messages: Displays diagnostic messages for the engine, generator, Model RXT transfer switch, programmable interface module (PIM), and load management device.
- Maintenance reminders
- System settings:
  - System voltage, frequency, and phase
  - Voltage adjustment
  - Measurement system, English or metric
- ATS status (Model RXT ATS required):
  - Source availability
  - ATS position (normal/utility or emergency/generator)
  - Source voltage and frequency
- ATS control (Model RXT ATS required):
  - Source voltage and frequency settings
  - Engine start time delay
  - Transfer time delays
  - Voltage calibration
  - Fixed pickup and dropout settings
- Programmable Interface Module (PIM) status displays:
  - Input status (active/inactive)
  - Output status (active/inactive)
- Load control menus:
  - Load status
  - Test function

KOHLER

KOHLER CO., Kohler, Wisconsin 53044 USA
Phone 920-457-4441, Fax 920-459-1646
For the nearest sales and service outlet in the US and Canada, phone 1-800-544-2444
KOHLERPower.com

Generator Set Standard Features

- Battery cables
- EPA certified fuel system
- Aluminum sound enclosure
- Critical silencer
- Field-connection terminal block
- Fuel solenoid valve and secondary regulator
- Line circuit breaker
- Multi-fuel system, LPG/natural gas, field-convertible
- Oil drain extension with shutoff valve
- OnCue® Plus Generator Management System
- Premium 5-year/2000 hour limited standby warranty
- 18-month/1000 hour limited warranty for non-standby (off-grid) applications
- RDC2 generator set/ATS controller
- Rodent-resistant construction
- Sound-deadening, flame-retardant foam per UL 94, class HF-1

Available Options

Approvals and Listings

❑ CSA approval

Concrete Mounting Pads

❑ Concrete mounting pad, 3 in. thick
❑ Concrete mounting pad, 4 in. thick (recommended for storm-prone areas)

Electrical Accessories

❑ Battery
❑ Battery heater, 120VAC
❑ Battery heater, 240VAC
❑ Cold weather package, 120VAC
❑ Cold weather package, 240VAC
❑ Emergency stop kit
❑ PowerSync® Automatic Paralleling Module (APM) (single phase only; parallel two 14kW residential generator sets with the RDC2 controller)
❑ Programmable interface module (PIM) (provides 2 digital inputs and 6 relay outputs)

Fuel System Accessories

❑ Flexible fuel line (included on QS models)
❑ Carburetor heater, 120 VAC
❑ Carburetor heater, 240 VAC
Carburetor heater is recommended for reliable starting at temperatures below 0°C (32°F)

Literature

❑ General maintenance literature kit
❑ Overhaul literature kit
❑ Production literature kit

Maintenance

❑ Maintenance kit (includes air filter, oil, oil filter, and spark plugs)

Automatic Transfer Switches and Accessories

❑ Model RDT ATS
❑ Model RXT ATS
❑ Model RXT ATS with combined interface/load management board
❑ Load shed kit for RXT or RDT
❑ Power relay modules (use up to 4 relay modules for each load management device)
❑ Other Kohler® ATS

14RCAL Model Packages

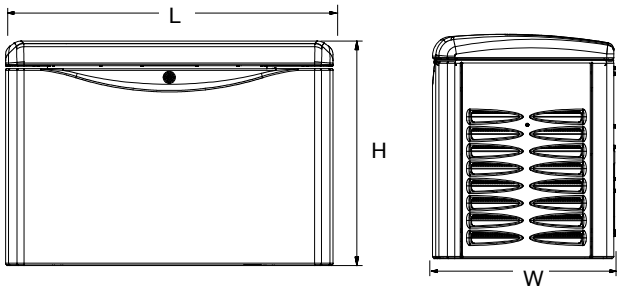
❑ 14RCAL with 100 amp RXT with 16-space load center and NEMA 1 steel enclosure for indoor installation
❑ 14RCAL with 200 amp service entrance-rated Model RXT with combined interface/load management board and corrosion-resistant NEMA 3R aluminum enclosure

Warranty

❑ 5- Year Comprehensive Limited Warranty
❑ 10- Year Comprehensive Limited Warranty

Generator Set Dimensions and Weights

Generator Set Size, L x W x H:	1193 x 666 x 817 mm (47 x 26.2 x 32.2 in.)
Shipping Weight:	
14RCA Generator Set	200 kg (440 lb.)
14RCAL with 100 A RXT ATS w/LC:	227 kg (500 lbs.)
14RCAL with 200 A RXT SE ATS	222 kg (490 lb.)



NOTE: Dimensions are provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

DISTRIBUTED BY:

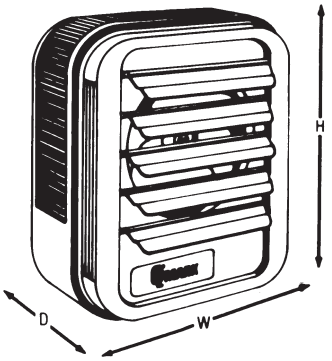
MUH SERIES

QMARK®
A Marley Engineered Products Brand

470 Beauty Spot Rd. E, Bennettsville, SC 29512
visit www.qmarkmep.com for more info

ARCHITECT'S AND ENGINEER'S SPECIFICATIONS*

- Unit mounts either horizontally or vertically. Totally versatile. For factories, warehouses, garages, stores, shipping rooms, power stations. Can be used for primary, supplementary, spot, or dual-system heating.
- Wide range of optional control kits are field installable, increasing the MUH adaptability to the specification market.
- Forced air unit heater with 10 power ratings; from 3KW to 50 KW heating output; 208, 240, 277 and 480V, 10,230 to 170,500 BTU/hr.
- 32 compatible models (no need to try to assemble a heating system from 70 or 80 models!)
- Heavy gauge die-formed steel housing. Two-toned, smartly styled with stainless steel louvers.
- Advanced pull-through air flow design draws air across heating element for more even air distribution and cooler element operation.
- Specially designed venturi outlet to meet that added throw as required in vertical position.
- Branch circuit fusing (when required).
- Completely enclosed fan motor.
- 1- or 3-phase wiring on 5 through 10 KW 208/240V and 15 KW 208V units (field interchangeable).
- Aluminum-finned, copper clad steel sheath heating element has longer useful life, because of cooler sheath temperature and faster heat dissipation.
- 24V control transformer standard on most models, providing a safer and more accurate means of temperature control. 3KW and 5KW, 208-277V, have line voltage controls as standard (24V control available on made-to-order basis).
- Automatic reset linear thermal cut-out, capillary type, provides protection over entire length of element areas (Manual reset protection available on made-to-order basis).
- 2-speed fan selector switch (25 to 50 KW models).
- Fan delay feature eliminates cold drafts. Element heats up before fan cuts in, then fan continues to distribute heat after element shuts off.
- Ruggedly built, yet lighter weight for easier installation. No piping flutes, valves, or traps.
- Individually adjustable discharge louvers to control air flow.
- Choice of optional diffusers for variety of air patterns, maximizing heat concentration and coverage in the vertical position.
- Meets all UL, NEC, and OSHA requirements.



DIMENSIONS

CAT. NO.	HEIGHT	WIDTH	DEPTH
MUH-03 & 05	16"	14"	7 1/2"
MUH-07 & 10	21 3/4"	19"	7 1/2"
MUH-15 & 20	21 3/4"	19"	12 3/4"
MUH-25 & 30	30"	26 5/8"	11 3/4"
MUH-40 & 50	30"	26 5/8"	17 1/8"

SELECTION CHART

CAT. NO.	VOLTS	ELECTRICAL DATA				CONTROL VOLT (1)	2 STAGE ELEMENT CONTROL	AIR DELIVERY DATA			FAN MOTOR DATA			MAXIMUM EFFECTIVE MOUNTING HEIGHT		HORI. AIR THROW	WIRE SIZE	INSTALLED WEIGHT (LBS.) W/BRACK.
		PHASE	KW	BTU/HR. 000	AMPS (3)			CFM(2)	FPM(2)	ΔT(°F)	VOLTS	RPM(2)	HP	HORIZ.	VERT.			
MUH03-81	208	1Ø	3.0	10.2	14.5	208	N/A	350	800	27 °	208	1600	1/100	8	9	12	AWG 12	27
MUH03-21	208/240	1Ø	2.2/3.0	7.5/10.2	11.0/12.5	208/240	N/A	350	800	27 °	208/240	1600	1/100	8	9	12	AWG 12	27
MUH03-71	277	1Ø	3.0	10.2	11.0	277	N/A	350	800	27 °	277	1600	1/100	8	9	12	AWG 14	27
MUH03-31	347	1Ø	3.0	10.2	8.6	24	N/A	350	800	27 °	347	1600	1/100	8	9	12	AWG 14	27
MUH03-41	480	3Ø	3.0	10.2	3.6	24	N/A	350	800	27 °	480	1600	1/100	8	9	12	AWG 14	27
MUH03-61	600	3Ø	3.0	10.2	2.9	24	N/A	350	800	27 °	600	1600	1/100	8	9	12	AWG 14	27
MUH05-81	208	1-3Ø	5.0	17.0	24.0	208	5A	350	800	45 °	208	1600	1/100	8	9	12	AWG 10	27
MUH05-21	208/240	1-3Ø	3.7/5.0	12.6/17.0	18.0/21.0	208/240	5A	350	800	45 °	208/240	1600	1/100	8	9	12	AWG 10	27
MUH05-71	277	1Ø	5.0	17.0	18.0	277	N/A	350	800	45 °	277	1600	1/100	8	9	12	AWG 10	27
MUH05-31	347	1Ø	5.0	17.0	14.4	24	N/A	350	800	45 °	347	1600	1/100	8	9	12	AWG 10	27
MUH05-41	480	3Ø	5.0	17.0	6.0	24	N/A	350	800	45 °	480	1600	1/100	8	9	12	AWG 14	27
MUH05-61	600	3Ø	5.0	17.0	4.8	24	N/A	350	800	45 °	600	1600	1/100	8	9	12	AWG 10	27
MUH-07-8	208	1-3Ø	7.5	25.6	36.0	24	5B	650	970	37 °	208	1600	1/30	9	14	18	AWG 6	38
MUH-07-2	208/240	1-3Ø	5.6/7.5	19.1/25.6	27.0/31.3	24	5B	650	970	37 °	208/240	1600	1/30	9	14	18	AWG 8	38
MUH-07-7	277	1Ø	7.5	25.6	27.0	24	5B	650	970	37 °	277	1600	1/30	9	14	18	AWG 8	38
MUH-07-3	347	1Ø	7.5	25.6	21.6	24	5B	650	970	37 °	347	1600	1/30	9	14	18	AWG 14	38
MUH-07-4	480	3Ø	7.5	25.6	9.0	24	5B	650	970	37 °	480	1600	1/30	9	14	18	AWG 14	38
MUH-07-6	600	3Ø	7.5	25.6	7.3	24	5B	650	970	37 °	600	1600	1/30	9	14	18	AWG 14	38
MUH-10-8	208	1-3Ø	10.0	34.1	48.0	24	5B	650	970	49 °	208	1600	1/30	9	14	18	AWG 4	38
MUH-10-2	208/240	1-3Ø	7.5/10.0	25.6/34.1	36.0/42.0	24	5B	650	970	49 °	208/240	1600	1/30	9	14	18	AWG 6	38
MUH-10-7	277	1Ø	10.0	34.1	36.0	24	5B	650	970	49 °	277	1600	1/30	9	14	18	AWG 6	38
MUH-10-3	347	1Ø	10.0	34.1	28.8	24	5B	650	970	49 °	347	1600	1/30	9	14	18	AWG 14	38
MUH-10-4	480	3Ø	10.0	34.1	12.0	24	5B	650	970	49 °	480	1600	1/30	9	14	18	AWG 14	38
MUH-10-6	600	3Ø	10.0	34.1	9.7	24	5B	650	970	49 °	600	1600	1/30	9	14	18	AWG 14	38
MUH-15-8	208	1-3Ø	15.0	51.2	72.0	24	5A	910	1640	52 °	208	1530	1/20	11	20	35	AWG 2	53
MUH-15-2	208/240	3Ø	11.2/15.0	38.2/51.2	31.3/36.1	24	5C	910	1640	52 °	208/240	1530	1/20	11	20	35	AWG 6	53
MUH-15-4	480	3Ø	15.0	51.2	18.0	24	5C	910	1640	52 °	480	1530	1/20	11	20	35	AWG 10	53
MUH-15-6	600	3Ø	15.0	51.2	14.5	24	5C	910	1640	52 °	600	1530	1/20	11	20	35	AWG 12	53
MUH-20-8	208	3Ø	20.0	68.2	56.0	24	5A	1320	2060	48 °	208	1500	1/10	12	23	41	AWG 4	60
MUH-20-2	208/240	3Ø	15.0/20.0	51.2/68.2	41.2/48.0	24	5C	1320	2060	48 °	208/240	1500	1/10	12	23	41	AWG 4	60
MUH-20-4	480	3Ø	20.0	68.2	24.0	24	5C	1320	2060	48 °	480	1500	1/10	12	23	41	AWG 10	60
MUH-20-6	600	3Ø	20.0	68.2	19.3	24	5C	1320	2060	48 °	600	1500	1/10	12	23	41	AWG 12	60
MUH-25-2	208/240	3Ø	18.7/25.0	63.8/85.2	52.0/60.0	24	5A	2100/1800	2100/2030	38 °/44 °	208/240	1600/1375	1/4	13	23	50	AWG 3	93
MUH-25-4	480	3Ø	25.0	85.2	30.0	24	5C	2100/1800	2100/2030	38 °/44 °	480	1600/1375	1/4	13	23	50	AWG 8	93
MUH-25-6	600	3Ø	25.0	85.2	24.2	24	5C	2100/1800	2100/2030	38 °/44 °	600	1600/1375	1/4	13	23	50	AWG 10	93
MUH-30-8	208	3Ø	30.0	102.3	84.0	24	5A	2100/1800	2100/2030	45 °/53 °	208	1600/1375	1/4	12	20	50	AWG 1	93
MUH-30-2	208/240	3Ø	22.5/30.0	76.7/102.3	63.0/72.3	24	5A	2100/1800	2100/2030	45 °/53 °	208/240	1600/1375	1/4	12	20	50	AWG 2	93
MUH-30-4	480	3Ø	30.0	102.3	36.0	24	5C	2100/1800	2100/2030	45 °/53 °	480	1600/1375	1/4	12	20	50	AWG 6	93
MUH-30-6	600	3Ø	30.0	102.3	29.0	24	5C	2100/1800	2100/2030	45 °/53 °	600	1600/1375	1/4	12	20	50	AWG 8	93
MUH-40-2	208/240	3Ø	30.0/40.0	102.3/136.4	83.4/96.4	24	5A	3000/2600	3260/2900	42 °/49 °	208/240	1525/1420	1/2	15	28	60	AWG 1/0	114
MUH-40-4	480	3Ø	40.0	136.4	48.0	24	5A	3000/2600	3260/2900	42 °/49 °	480	1525/1420	1/2	15	28	60	AWG 4	114
MUH-40-6	600	3Ø	40.0	136.4	38.7	24	5A	3000/2600	3260/2900	42 °/49 °	600	1525/1420	1/2	15	28	60	AWG 6	114
MUH-50-8	208	3Ø	50.0	170.5	139.0	24	5A	3000/2600	3260/2900	53 °/61 °	208	1525/1420	1/2	15	25	60	AWG 4/0	114
MUH-50-2	208/240	3Ø	37.5/50.0	127.3/170.5	104.2/120.4	24	5A	3000/2600	3260/2900	53 °/61 °	208/240	1525/1420	1/2	15	25	60	AWG 3/0	114
MUH-50-4	480	3Ø	50.0	170.5	60.2	24	5A	3000/2600	3260/2900	53 °/61 °	480	1525/1420	1/2	15	25	60	AWG 4	114
MUH-50-6	600	3Ø	50.0	170.5	48.3	24	5A	3000/2600	3260/2900	53 °/61 °	600	1525/1420	1/2	15	25	60	AWG 3	114

Note:

1. All standard units are supplied with a low voltage control transformer and contactor (24V) except MUH-03 & 05, 208, 240 & 277 volt models. Low voltage control on these units are available on made to order. All units are also available on special order for 120 volt control; internal and transformer or external without transformer.
2. On dual voltage units; CFM, FPM, and RPM are shown at higher voltage.
3. On dual phase units, maximum amp draw is listed for respective voltage.
4. 25 thru 50 KW models have two speed motors and dual CFM ratings.

5A. Standard.

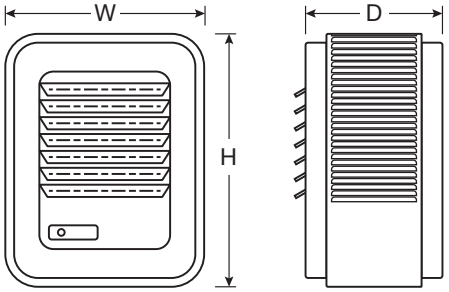
5B. Optional - made to order - amp load unbalanced on 3 Phase.

5C. Optional - made to order - amp load balanced on 3 Phase.

MUH SERIES
UNIT HEATER

DIMENSIONS

CATALOG NO.	HEIGHT (IN)	WIDTH (IN)	DEPTH (IN)
MUH03 & 05	16	14	7-1/2
MUH07 & 10	21-3/4	19	7-1/2
MUH15 & 20	21-3/4	19	12-3/4
MUH25 & 30	30	26-5/8	11-3/4
MUH40 & 50	30	26-5/8	17-1/8

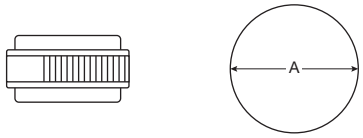
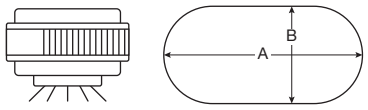


OPTIONAL FIELD-INSTALLED CONTROLS

CATALOG NO.	UPC	DESCRIPTION	ELECTRICAL RATING	COMPATIBLE WITH
UHMT1	6 85360 15241 7	Single Pole Internal Thermostat-Temp Range: 40°- 85°F	25A @ 120, 240VAC Res. 22A @ 277VAC Res.	All MUH Series Heaters (except MUH0521 3 PH, MUH0581 3 PH which use UHMT2)
UHMT2	6 85360 15242 4	Two Stage Internal Thermostat-Temp Range: 40°- 85°F	25A @ 120, 240VAC Res. 22A @ 277VAC Res. 125VA	MUH0521 3 PH, MUH0581 3 PH, MUH158, MUH208, MUH252, MUH302, MUH308, MUH402, MUH404, MUH406, MUH502, MUH504, MUH506, MUH508
MCFS	6 85360 04637 2	Internal Summer Fan Switch 250, 480, 600V.A.C. 1,2 OR 3 PH	Pilot Duty 6A, 600VAC Res. 2 HP	All MUH Series Heaters
MRFS1	6 85360 04708 9	Remote Summer Fan Switch (Line Voltage)	2 HP, 250-480VAC	All MUH Series Heaters
MRFS2	6 85360 04709 6	Remote Summer Fan Switch with Relay (24V Coil-Single Pole Normally Open)	6 AFL, 35 ALR, 250VAC, 60Hz 3 AFL, 18 ALR, 480VAC, 60Hz	All MUH Series Heaters (except MUH0321, MUH0371, MUH0381, MUH0521, MUH0571, MUH0581) Units unless optional control transformer is supplied
MHRT	6 85360 04694 5	Heat Recovery Thermostat with Relay (24V Coil-Single Pole Normally Open) Hi - 120°F, Low - 60°F	6 AFL, 35 ALR, 250VAC, 60Hz 3 AFL, 18 ALR, 480VAC, 60Hz	All MUH Series Heaters (except MUH0321, MUH0371, MUH0381, MUH0521, MUH0571, MUH0581) Units unless optional control transformer is supplied
MPDS25	6 85360 04703 4	Power Disconnect Switch (3-Pole)	30A @ 600VAC, Res.	MUH0321, MUH0341, MUH0371, MUH0381, MUH0521, MUH0541, MUH0571, MUH0581, MUH073, MUH074, MUH076, MUH104, MUH106, MUH154, MUH156, MUH204, MUH206
MPDS60	6 85360 04704 1	Power Disconnect Switch (3-Pole)	80A @ 600VAC, Res.	MUH072, MUH077, MUH078, MUH102, MUH103, MUH107, MUH108, MUH152, MUH202, MUH208, MUH252, MUH254, MUH256, MUH304, MUH306, MUH404, MUH406, MUH504, MUH506

NOTE: Any field installed options assembled in the factory require added surcharge. See price book for charges. MPDS60 disconnect switch is not suitable for field installation on 7.5kw and 10kw unit heaters.

DIFFUSER SELECTOR TABLES FOR VERTICAL MOUNTING

CATALOG NO.	DESCRIPTION	CATALOG NO.	MAX. MOUNTING HEIGHT	(A) DIMENSION	DIFFUSER PATTERN AND AREA
NONE NONE	WITHOUT DIFFUSER No diffuser needed where a straight downflow air pattern is required. For maximum air throw, remove louvers. Any of three diffusers can be added to basic heater.	MUH03 &MUH05 MUH07 & MUH10	9 14	18 26	
NONE NONE		MUH15 MUH20	20 23	35 40	
NONE NONE		MUH25 MUH30	23 20	63 55	
NONE NONE		MUH40 MUH50	28 25	70 63	
MLDS MLDM	LOUVER DIFFUSER Permits directional (straight line) air flow as in air curtain application over doorways. Rectangular coverage, Louvers can be turned in either direction.	MUH03 & MUH05 MUH07 & MUH10	9 14	25(A) 12(B) 39(A) 19(B)	
MLDM MLDM		MUH15 MUH20	18 20	50(A) 25(B) 56(A) 28(B)	
MLDL MLDL		MUH25 MUH30	23 20	72(A) 36(B)	
MLDL MLDL		MUH40 MUH50	24 22	88(A) 44(B) 80(A) 40(B)	

MUH SERIES
UNIT HEATER

OPTIONAL MOUNTING BRACKETS

CATALOG NO.	UPC	COMPATIBLE WITH	SHIP WT. (LBS)
B10	6 85360 15229 5	MUH03 - 10	8
B20	6 85360 15230 1	MUH15 & 20	10
B30	6 85360 15231 8	MUH25 & 30	13
B50	6 85360 15232 5	MUH40 & 50	15

OPTIONAL CEILING MOUNTING BRACKETS

CATALOG NO.	UPC	COMPATIBLE WITH	SHIP WT. (LBS)
CMB10	6 85360 15236 3	MUH03 - 10	3
CMB20	6 85360 15237 0	MUH15 & 20	4
CMB30	6 85360 15238 7	MUH25 & 30	5
CMB50	6 85360 15239 4	MUH40 &50	6

OPTIONAL VERTICAL CEILING MOUNTING BRACKETS

CATALOG NO.	UPC	COMPATIBLE WITH	SHIP WT. (LBS)
VDMB5	6 85360 15245 5	MUH03 - 05	5
VDMB20	6 85360 15246 2	MUH07 - 20	7
VDMB50	6 85360 15247 9	MUH25 - 50	9

MOUNTING LIMITATIONS: Unit heaters should not be used in potentially explosive atmospheres. The finish is not intended for direct salt spray exposure in marine applications or the highly corrosive atmospheres of swimming pools, chemical storage bins, etc. Do not install unit heaters above recommended maximum mounting height. Obstructions must not block unit heater air inlet or discharge. Heaters must be mounted at least 7 ft. above the floor to prevent accidental contact with the heating element or fan blade which could cause injury.

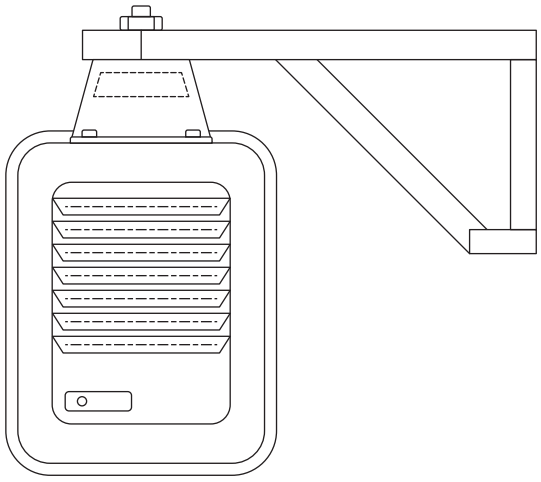
FACTORY-INSTALLED OPTIONS FOR CONTROLS & ACCESSORIES

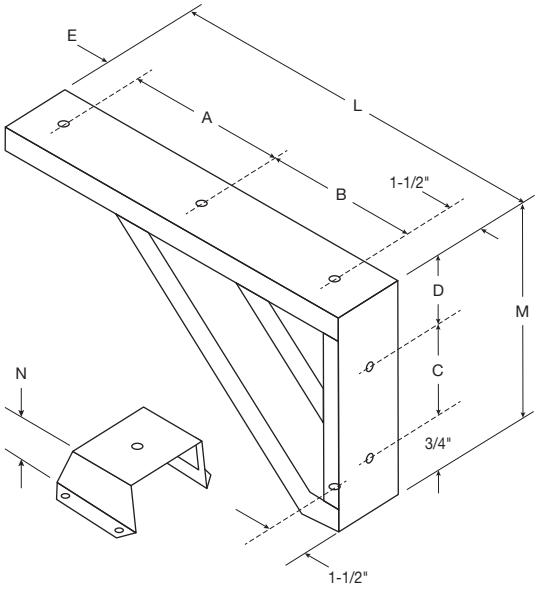
DESCRIPTION
MUH03 & 05 (208, 208/240, 277V Supply) 24 or 120V Control Transformer and Power Contactor 24 or 120V H.C. Power Contactor
MUH03 & 05 (480V Supply) & MUH07 thru MUH50 Optional 120V Control
2-Stage Control of Elements (See Note 5)
Manual Reset
Outlet Mesh (Bird Screen) For all MUH Heaters

NOTE: Any factory-installed options require added surcharge. See price book for charges or contact factory.

BRACKET SIZE

DIMENSION	3-20 kW (IN.)	25-50 kW (IN.)
A	7-1/4	9-7/16
B	9-1/2	14-3/8
C	7-1/4	12-1/8
D	11-5/16	2-1/16
E	2-1/4	3
L	20-1/2	28-15/16
M	9-15/16	14-15/16
N	3-1/4	4-1/2





THERMOSTATS | **LINE VOLTAGE**




	MS26	MD26	M601W	M602W	M601TPW	M602TPW	M611W	M612W
ACTION	Snap Action		Snap Action		Snap Action		Snap Action	
TYPE	SPST	DPST	SPST	DPST	SPST	DPST	SPST	DPST
WATT RATING	Model MD26 has Positive OFF		Model M602W has Positive OFF		Model M602TPW has Positive OFF		Model M612W has Positive OFF	
120V	22A		22A		22A		22A	
208V	22A		22A		22A		22A	
240V	22A		22A		22A		22A	
277V	18A		18A		18A		18A	
PILOT DUTY	No		Yes 125VA		Yes 125VA		Yes 125VA	
TEMP. RANGE (ºF)	50ºF to 80ºF		45ºF to 75ºF		45ºF to 75ºF		45ºF to 75ºF	
DIFFERENTIAL	+/- 5ºF		+/- 4ºF		+/- 4ºF		+/- 2 1/2ºF	
FEATURES	These economy thermostats are the snap action type that are used in apartment construction. Good thermostat for its value. Ideal for radiant cove heaters and baseboard.		These bi-metal snap-action thermostats are sensitive. Large knob allow for easy adjustment.		Same as M601W and M602W except the cover mounting cover offer tamper-proof feature.		Built-in heat anticipator assures closer control of room temperature.	



	M600MTP	M600S	T100	T200	WR651	WR661
ACTION	Modulation (2-stage)	Simultaneous switching (double ckt)	Snap Action with Heat Anticipator		Creep (Hydraulic) Action	
TYPE	DPST		SPST	DPST	SPST	DPST
WATT RATING						
120V	22A	22A	22A		22A	
208V	22A	22A	22A		22A	
240V	22A	22A	22A		22A	
277V	18A	18A	18A		na	
PILOT DUTY	Yes 125VA	Yes 125VA	Yes 125VA		No	
TEMP. RANGE (ºF)	50ºF to 80ºF	50ºF to 80ºF	50ºF to 90ºF		40ºF to 85ºF	
DIFFERENTIAL	Accuracy: Within 3ºF of setpoint	Accuracy: Within 3ºF of setpoint	+/- 2 1/2ºF		+/- 2ºF	
FEATURES	One thermostat controls two separate heating circuits and reduces input during light load periods. Second stage activates when temperature drops to approx. 1-1/2ºF below the first stage turn-ON temperature.	Simultaneous control of two heating loads. Used where the total load slightly exceeds capacity of a single switch, where two thermostats are impractical. Both switches are calibrated to operate at approx. the same temperature.	Line voltage thermostat with everything; Performance, reliability, durability, and a large knob. Built-in heat anticipation assures close temperature regulation. Large knob for easy rotation.		Extra-sensitive element in control knob senses radiant heat as well as air temperature for ultimate control. May cause slight radio or television interference in outlying fringe areas.	

860 SERIES
LED OBSTRUCTION LIGHT

FEATURES / BENEFITS

- Available as a single or dual unit
- Available in 12VDC, 24VDC, 48VDC, 120VAC, and 220VAC versions (50 or 60HZ)
- Earth grounding provisions provided
- Unique optically designed lens to enhance LED operation and provide 360° visibility
- State-of-the-art high-flux LED technology
- Lasts years longer than an incandescent
- Weather/corrosion resistant lamp assembly and housing
- Self-contained wiring compartment eliminates additional boxes
- Threaded 1" and 3/4" bottom hub for mounting
- Can be operated steady or flashed (controller not supplied)
- 5 year warranty
- Resistant to shock and vibration
- IP 65 / IP 66 / NEMA 4X rated

US PATENT# 6,425,678

Certified to: **FAA AC NO: 150/5345-43F**
Canadian Aviation Regulation CAR 621.19
(Transport Canada)

Compliant to: **ICAO**
(Annex 14 - Fourth Edition, July 2004)

APPLICATION

- The 860 Series is the FAA type L810 red LED obstruction light. Designed for steady burning, this fixture is used to mark any obstacle that may present hazards to aircraft navigation. The US patent office has issued patent number 6,425,678 B1 for this series.

OPERATING CONDITIONS

- Temperature: -67°F to +131°F (-55°C to +55°C)

FINISH

- Cast Aluminum
- Stainless Steel Hardware

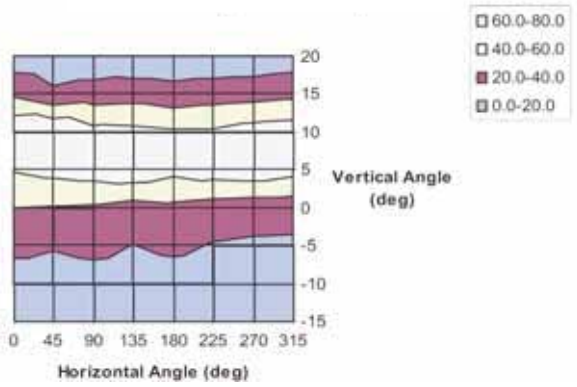
P&R Technologies, Inc.
P.O. Box 554
Portland, Oregon 97207

www.pr-tech.com
Phone 503-292-8682
Toll Free 800-722-8078
Fax 503-292-8697

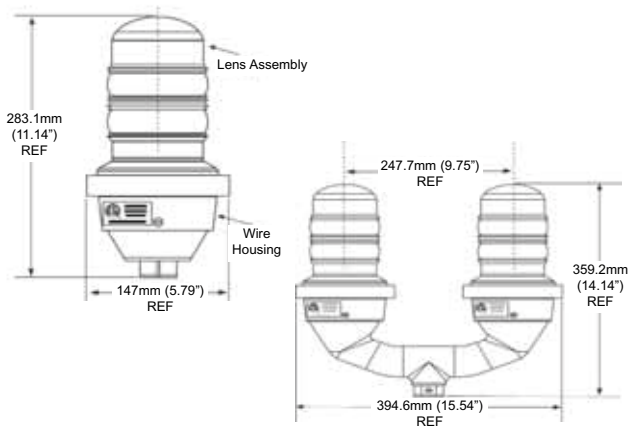
A4703 ISO 9001
Dialight Corporation

PHOTOMETRIC DATA

L810 Isotropic Intensity Chart



MECHANICAL DIMENSIONS



ORDERING INFORMATION

Single Units

Part Number	Volts
860-1R01-001*	120 VAC
860-6R01-001**	120 VAC
860-1R02-001	220 VAC
860-1R03-001*	12 VDC
860-3R03-001 (Low wattage)	12 VDC
860-1R05-001*	24 VDC
860-6R05-001**	24 VDC
860-1R04-001*	48 VDC

Replacement Light Assemblies

Part Number	Volts
860-1R01	120 VAC
860-6R01**	120 VAC
860-1R02	220 VAC
860-1R03	12 VDC
860-3R03 (Low wattage)	12 VDC
860-1R05	24 VDC
860-6R05**	24 VDC
860-1R04	48 VDC

Dual Units

Part Number	Volts
860-1R01-002*	120 VAC
860-6R01-002**	120 VAC
860-1R02-002	220 VAC
860-1R03-002*	12 VDC
860-3R03-002 (Low wattage)	12 VDC
860-1R05-002*	24 VDC
860-6R05-002**	24 VDC
860-1R04-002*	48 VDC

**** FAA approved***
***** Canadian Spec***

WEIGHTS & MEASUREMENTS

PART NUMBER	APPROX. SHIPPING WEIGHT	CONTAINER DIMENSIONS
Single Unit	7.14 lbs	16" x 9" x 8"
Dual Unit	16.06 lbs	22" x 17" x 9"

ELECTRICAL SPECIFICATIONS

	PF	VA	OPERATING VOLTAGE Min	Typ	Max	WATTS (W) Min	Typ	Max	AMPS
120VAC UNITS	.3	46.5	92	120	132	10	14.5	17.5	120mA
220VAC UNITS (60Hz)	.17	72	198	220	264	11	14.5	17.5	120mA
220VAC UNITS (50Hz)	-	-	198	220	264	12	14	17	-
12VDC UNITS (STANDARD)	-	-	10	12	14	20	24.5	29	2.0 A
12VDC UNITS (LOW WATTAGE)	-	-	10	12	14	7.0	7.50	8.8	.62 A
24VDC UNITS	-	-	21	24	27	17	22	29	920mA
48VDC UNITS	-	-	43	48	53	11	13.5	16	275mA

P&R Technologies, Inc.
P.O. Box 554
Portland, Oregon 97207

www.pr-tech.com
Phone 503-292-8682
Toll Free 800-722-8078
Fax 503-292-8697

emium™

emium lighting, see differently

INTERIOR LIGHTING

Linear LED Fixtures

5 Year Full Product Warranty
50,000 hrs rated life

Emium linear LED fixtures offer a cost-effective, energy-efficient lighting crossover solution that combines aesthetic appeal, quality, and professional level performance for a wide variety of environments and applications.

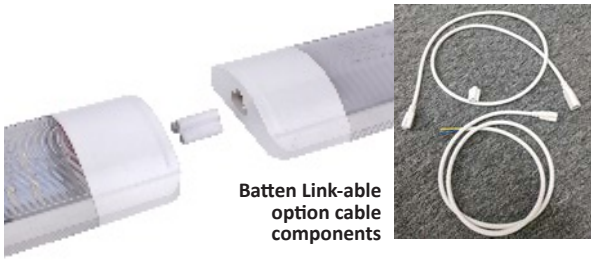
Ideal for commercial environments demanding high visibility, factory and warehouse work stations, and retail drug and grocery store isles.

The waterproof "TP" version is an excellent replacement for fluorescent vapor tight fixtures. Their IP65 rating make them impervious to the elements (water, dust, insects, etc.). Can be use in virtually any environment.

Emium carries a complete line of products to meet all types of commercial needs. Our products are engineered to install very simply and make the transition from HID or fluorescent lighting very cost-effective.

FEATURES

- Available in two housing design configurations, Tri-proof and Batten
- Can be series linked or installed independently for stand-alone applications
- Exceptional illumination in a small utilitarian package
- TP Version rated IP65 waterproof
- Reduce energy consumption and operating costs by 70% or more.
- Maintenance free operation - lasts 10x longer than conventional lighting



Batten Link-able option cable components

for more information email info@emium.com
or call 224.735.3435 | www.emium.com

for more information email info@emium.com
or call 224.735.3435 | www.emium.com

emium
emium lighting, see differently

INTERIOR LIGHTING

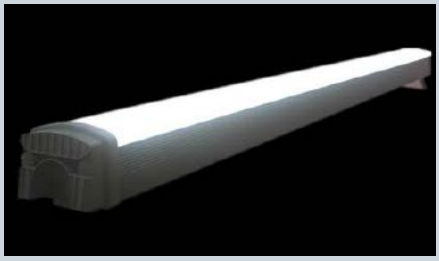
Ordering Guide: **Linear LED Fixture:** **Example: EL-MC-BA-01-20W-50K**

Fixture Type	Housing	Wattage	CCT (X,X00) Kelvin	
EL-MC				**NOTE:** EL-MC-TP options available include 0-10V dimming, Micro-wave Motion Sensor, Emergency back-up module.
EL-MC Linear LED Series	**BA-01** Batten **TP-03** Tri-proof	**20** 20W **30** 30W **40** 40W **60** 60W	**35K** 3500K **40K** 4000K **50K** 5000K	

SPECIFICATIONS

Model	EL-MC-BA-01-20	EL-MC-BA-01-40	EL-MC-TP-03-30	EL-MC-TP-03-60
Length	2’	4’	2’	4’
Power Consumption	20W	40W	30W	60W
Lumen Output	2,800	5,600	3,200	6,300
Waterproof Rating	IP54		IP65	
Control Options	N/A		Dimmable, Micro-wave Motion Sensor, Emergency back-up module.	
Input Voltage	100 - 277VAC			
Mounting Options	Surface, T-Grid, Suspended, Cove			
Color Temp	3500K 4000K 5000K		4000K 5000K	
CRI	> 82			
Link-ability	Specify linkable or non-link for flush to junction box installations		Yes, standard	
Rated Life	More than 50,000 hrs.			

EL-MC-BA-01-40
Able to link up to 14, 2 ft. fixtures, and up to 6, 4 ft. fixtures end to end.



EL-MC-TP-03-60
Able to link up to 10, 4 ft. fixtures, and up to 20, 2 ft. fixtures end to end.

emium™

emium lighting, see differently

EXTERIOR LIGHTING

Angle Adjustable LED Wall Packs

5 Year Full Product Warranty

The Emium slim angle adjustable wall pack is available in four wattage options for a variety of applications including building perimeter, entrances, stairways and security lighting. The WP10 series of luminaries provides a low-profile architectural style with the power of bright, energy efficient LEDs. It has a rugged aluminum construction with multi-mount capabilities. 0° to +90° tilt adjustments.

Maintenance free operation - lasts 10+ times longer than conventional lighting.

Photocell option is available.

0-10V dimming capability.

FEATURES

Sealed die-casting profile for outdoor applications.

Suitable for applications requiring 3G testing prescribed by ANSI C136.31.

Tempered UV coated flat lens provide outstanding performance, uniformity and glare control.

Estimated 50,000-hour LED lifespan based on IES LM-80 results and TM-21 calculations.

DLC PREMIUM · UL LISTED · WET LOCATION · FC

for more information email info@emium.com
or call 224.735.3435 | www.emium.com

for more information email info@emium.com
or call 224.735.3435 | www.emium.com

emium
emium lighting, see differently

EXTERIOR LIGHTING

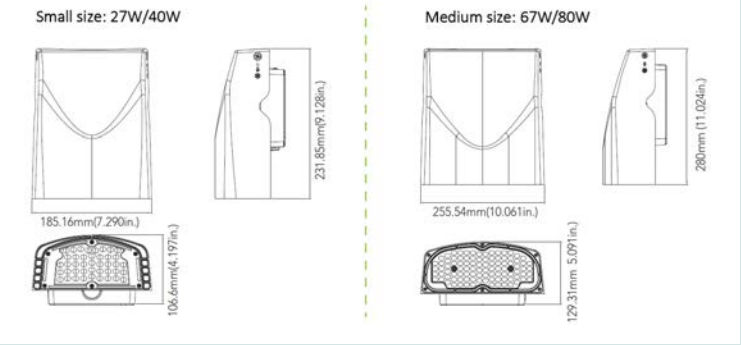
Ordering Guide: Angle Adjustable Wall Pack: Example - EL-MS-WP10-40W27V-50KD-D

Fixture Type	Wattage	Voltage	CCT (X,X00) Kelvin	Finish	Dimmable
EL-MS-WP10					
EL-MS-WP10 Adjustable Wall Pack	**27W** **40W** **67W** **80W**	**27V** 120-277V	**40K** 4000K **50K** 5000K	**D -** Dark Bronze **B -** Black **W -** White	**D** 0-10V DIM **Blank** NO DIM

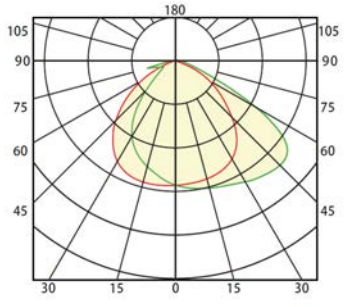
SPECIFICATIONS

Model	EL-MS-WP10-27W27V	EL-MS-WP10-40W27V	EL-MS-WP10-67W27V	EL-MS-WP10-80W27V
Power	27W	40W	67W	80W
Lumen Output	Up to 3,600	Up to 5,200	Up to 8,800	Up to 10,500
Input Voltage	120 - 277VAC, Greater than 0.9 power factor, Less than 20% harmonic distortion			
Color Temp	4000K 5000K			
CRI	+ 70CRI			
Controls	0-10V dimming – standard (27W no dimming) Photocell – optional			
Operating Temperature	Suitable for operation in -40°F to 104°F ambient environments			
Housing Finish	Dark Bronze (standard), Black, White			
Rated Life	More than 50,000 hrs			

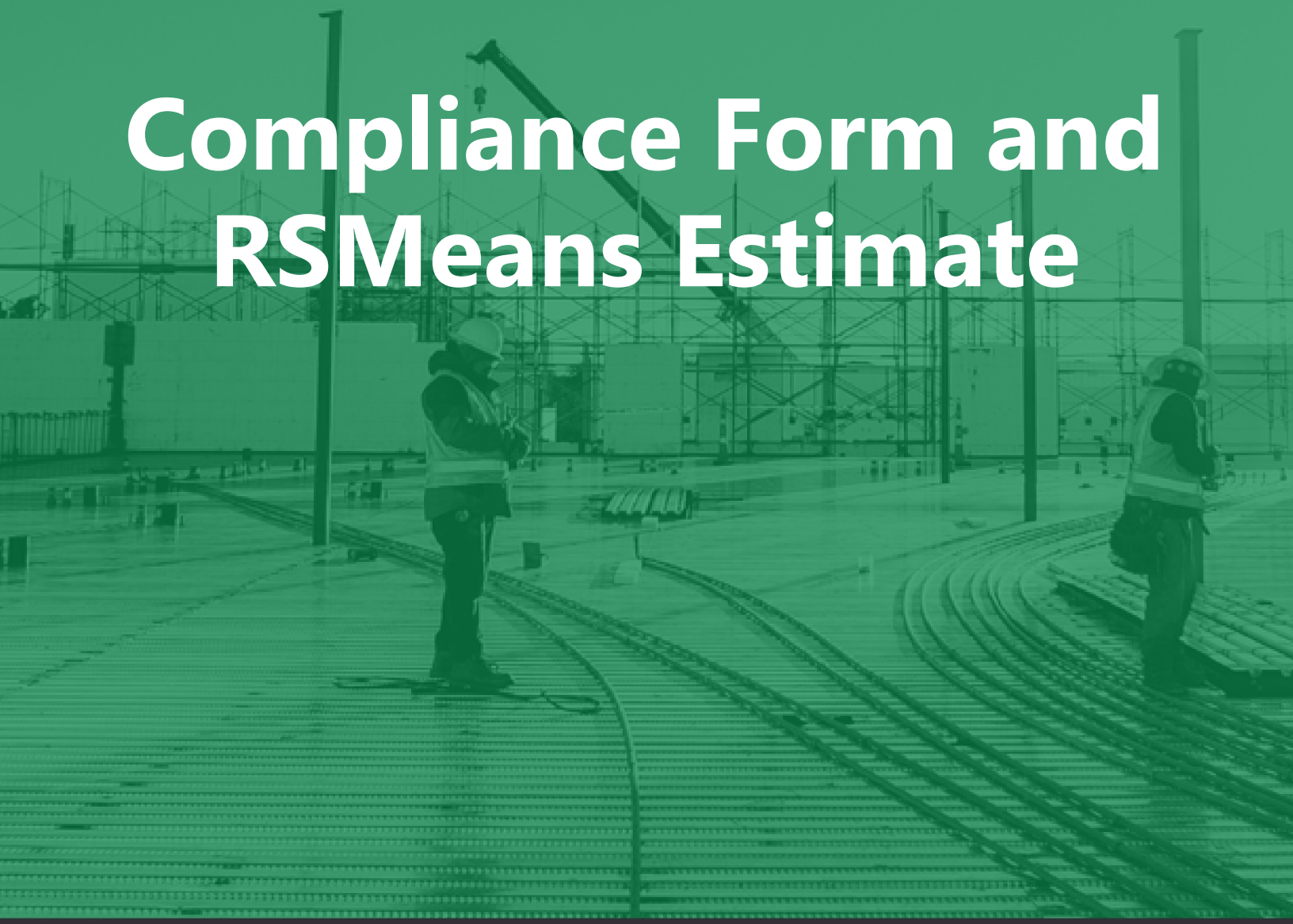
DIMENSIONS
unit: mm/inch



PHOTOMETRICS



Compliance Form and RSMeans Estimate



OMNIA COMPLIANCE ESTIMATE

9/27/2021

Village of Orland Park -Water Tower Electrical Improvements

Division Totals		
Division 01 - General Requirements	$	**13,125.00**
Division 02 - Existing Conditions		
Division 03 - Concrete	$	-
Division 04 - Masonry		
Division 05 - Metals	$	-
Division 06 - Wood, Plastics, and Composites		
Division 07 - Thermal and Moisture Protection	$	-
Division 08 - Openings		
Division 09 - Finishes		
Division 10 - Specialties	$	-
Division 11 - Equipment	$	-
Division 12 - Furnishings		
Division 13 - Special Construction	$	-
Division 14 - Conveying Equipment	$	-
Division 21 - Fire Suppression	$	-
Division 22 - Plumbing	$	-
Division 23 - Heating, Ventilating, and Air Conditioning (HVAC)	$	**1,272.28**
Division 26 - Electrical	$	**103,953.79**
Division 27 - Communications	$	**298.48**
Division 28 - Electronic Safety and Security	$	-
Division 31 - Earthwork	$	-
Division 32 - Exterior Improvements	$	-
Division 33 - Utilities	$	-
Division 34 - Transportation	$	-
RS MEANS PRICING TOTAL (MODIFIED BY CITY COST INDEX)	$	**118,649.55**
OMNIA CONTRACT COEFFICIENT (MEANS BASED PRICING ONLY)		**1.42**
SUBTOTAL	$	**168,482.36**
NON PREPRICED LINE ITEM DIRECT COSTS	$	-
NON PREPRICED LINE INDIRECT COSTS	$	-
SUBTOTAL	$	**168,482.36**
P&P BOND		**(Included in Divisionary Breakdowns)**
TOTAL PRICE	$	**168,482.36**
CONTINGENCY	$	**16,800.00**
PROPOSED PRICE	$	**185,282.36**

Cost Estimate Report

Village of Orland Park

Orland Park, IL, 60462

13605 Cherry Lane

Date: 09/27/2021

Orland Park Water Tower Electrical Impro

Predictive Year 2021 Quarter 4 as of Year 2021 Quarter 3

Unit Detail Report

Prepared By: Brian Fiedler The Core Group LTD

LineNumber		Description	Quantity	Unit	Total Incl. O&P	Ext. Total Incl. O&P
Division 01	**General Requirements**					
013113200020		Field personnel, clerk, average	1.00	Week	$750.00	$750.00
013113200220		Field personnel, project manager, maximum	1.00	Week	$4,325.00	$4,325.00
013113200280		Field personnel, superintendent, maximum	2.00	Week	$4,025.00	$8,050.00
Division 01	**General Requirements Subtotal**					**$13,125.00**
Division 23	**Heating, Ventilating, and Air Conditioning (HVAC)**					
238333103320		Electric heating, wall heaters with fan, commercial, 3,000 watt	2.00	Ea.	$627.23	$1,254.46
238333103320		Insurance, all-risk, maximum	1.00	Job	$3.89	$7.78
238333103320		Insurance, standard builders risk, maximum	1.00	Job	$5.02	$10.04
Division 23	**Heating, Ventilating, and Air Conditioning (HVAC) Subtotal**					**$1,272.28**
Division 26	**Electrical**					
260505100100	Note: Line #'s include general electrical demolition	Conduit, rigid galvanized steel, 1/2" to 1" diameter, electrical demolition, remove conduit to 10' high, including fittings & hangers	1,000.00	L.F.	$4.09	$4,090.00
260505100100		Labor adjustment factor (electrical), add to labor, cramped shaft	1.00		$1.43	$1,431.50
260505100100		Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high	1.00		$1.02	$1,022.50
260505100100		Insurance, all-risk, maximum	1.00	Job	$0.03	$25.36
260505100100		Insurance, standard builders risk, maximum	1.00	Job	$0.03	$32.72
260519900100		Wire, copper, stranded, 600 volt, #12, type THW, normal installation conditions in wireway, conduit, cable tray	40.00	C.L.F.	$109.02	$4,360.80
260519900100		Labor adjustment factor (electrical), add to labor, cramped shaft	1.00		$31.54	$1,261.54

LineNumber	Description	Quantity	Unit	Total Incl. O&P	Ext. Total Incl. O&P
260519900100	Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high	1.00		$22.53	$901.10
260519900100	Insurance, all-risk, maximum	1.00	Job	$0.68	$27.04
260519900100	Insurance, standard builders risk, maximum	1.00	Job	$0.87	$34.89
260519900120	Wire, copper, stranded, 600 volt, #10, type THW, normal installation conditions in wireway, conduit, cable tray	14.00	C.L.F.	$129.14	$1,807.96
260519900120	Labor adjustment factor (electrical), add to labor, cramped shaft	1.00		$34.51	$483.14
260519900120	Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high	1.00		$24.65	$345.10
260519900120	Insurance, all-risk, maximum	1.00	Job	$0.80	$11.21
260519900120	Insurance, standard builders risk, maximum	1.00	Job	$1.03	$14.46
260519900140	Wire, copper, stranded, 600 volt, #8, type THW, normal installation conditions in wireway, conduit, cable tray	2.00	C.L.F.	$156.42	$312.84
260519900140	Labor adjustment factor (electrical), add to labor, cramped shaft	1.00		$43.20	$86.39
260519900140	Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high	1.00		$30.86	$61.71
260519900140	Insurance, all-risk, maximum	1.00	Job	$0.97	$1.94
260519900140	Insurance, standard builders risk, maximum	1.00	Job	$1.25	$2.50
260519900200	Wire, copper, stranded, 600 volt, #3, type THW, normal installation conditions in wireway, conduit, cable tray	5.00	C.L.F.	$362.69	$1,813.45
260519900200	Labor adjustment factor (electrical), add to labor, cramped shaft	1.00		$69.02	$345.12
260519900200	Insurance, all-risk, maximum	1.00	Job	$2.25	$11.24
260519900200	Insurance, standard builders risk, maximum	1.00	Job	$2.90	$14.51
260519900350	Wire, copper, stranded, 600 volt, 4/0, type THW, normal installation conditions in wireway, conduit, cable tray	1.00	C.L.F.	$1,071.12	$1,071.12
260519900350	Insurance, all-risk, maximum	1.00	Job	$6.64	$6.64
260519900350	Insurance, standard builders risk, maximum	1.00	Job	$8.57	$8.57
260519900490	Wire, copper, stranded, 600 volt, 500 kcmil, type THW, normal installation conditions in wireway, conduit, cable tray	3.00	C.L.F.	$1,974.73	$5,924.19
260519900490	Insurance, all-risk, maximum	1.00	Job	$12.24	$36.73
260519900490	Insurance, standard builders risk, maximum	1.00	Job	$15.80	$47.39
260526800090	Grounding rod, copper clad, 10' long, 5/8" diameter	3.00	Ea.	$195.37	$586.11
260526800090	Insurance, all-risk, maximum	1.00	Job	$1.21	$3.63
260526800090	Insurance, standard builders risk, maximum	1.00	Job	$1.56	$4.69
260526805500	Equipotential earthing bar	1.00	Ea.	$644.03	$644.03
260526805500	Insurance, all-risk, maximum	1.00	Job	$3.99	$3.99
260526805500	Insurance, standard builders risk, maximum	1.00	Job	$5.15	$5.15

LineNumber	Description	Quantity	Unit	Total Incl. O&P	Ext. Total Incl. O&P
260529200650	Strap, steel, 2 holes, rigid steel conduit, 4" diameter	20.00	Ea.	$13.75	$275.00
260529200650	Labor adjustment factor (electrical), add to labor, cramped shaft	1.00		$4.32	$86.38
260529200650	Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high	1.00		$3.09	$61.70
260529200650	Insurance, all-risk, maximum	1.00	Job	$0.09	$1.70
260529200650	Insurance, standard builders risk, maximum	1.00	Job	$0.11	$2.20
260533130500	Aluminum conduit, 3/4" diameter, to 10' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	880.00	L.F.	$13.94	$12,267.20
260533130500	Labor adjustment factor (electrical), add to labor, cramped shaft	1.00		$3.84	$3,378.76
260533130500	Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high	1.00		$2.74	$2,413.40
260533130500	Insurance, all-risk, maximum	1.00	Job	$0.09	$76.06
260533130500	Insurance, standard builders risk, maximum	1.00	Job	$0.11	$98.14
260533131000	Aluminum conduit, 1-1/4" diameter, to 10' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	15.00	L.F.	$18.69	$280.35
260533131000	Labor adjustment factor (electrical), add to labor, cramped shaft	1.00		$4.93	$74.02
260533131000	Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high	1.00		$3.53	$52.88
260533131000	Insurance, all-risk, maximum	1.00	Job	$0.12	$1.74
260533131000	Insurance, standard builders risk, maximum	1.00	Job	$0.15	$2.24
260533131050	Aluminum conduit, 2" diameter, to 10' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	15.00	L.F.	$23.85	$357.75
260533131050	Labor adjustment factor (electrical), add to labor, cramped shaft	1.00		$5.76	$86.42
260533131050	Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high	1.00		$4.11	$61.72
260533131050	Insurance, all-risk, maximum	1.00	Job	$0.15	$2.22
260533131050	Insurance, standard builders risk, maximum	1.00	Job	$0.19	$2.86
260533131830	Rigid galvanized steel conduit, 1-1/4" diameter, to 10' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	130.00	L.F.	$22.86	$2,971.80
260533131830	Labor adjustment factor (electrical), add to labor, cramped shaft	1.00		$5.76	$748.93
260533131830	Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high	1.00		$4.12	$534.95
260533131830	Insurance, all-risk, maximum	1.00	Job	$0.14	$18.43
260533131830	Insurance, standard builders risk, maximum	1.00	Job	$0.18	$23.77
260533131970	Rigid galvanized steel conduit, 4" diameter, to 10' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	20.00	L.F.	$75.73	$1,514.60
260533131970	Labor adjustment factor (electrical), add to labor, cramped shaft	1.00		$17.37	$347.41

LineNumber	Description	Quantity	Unit	Total Incl. O&P	Ext. Total Incl. O&P
260533131970	Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high	1.00		$12.41	$248.15
260533131970	Insurance, all-risk, maximum	1.00	Job	$0.47	$9.39
260533131970	Insurance, standard builders risk, maximum	1.00	Job	$0.61	$12.12
260533161600	Outlet boxes, cast, weatherproof receptacle cover, 1 gang	3.00	Ea.	$18.31	$54.93
260533161600	Insurance, all-risk, maximum	1.00	Job	$0.11	$0.34
260533161600	Insurance, standard builders risk, maximum	1.00	Job	$0.15	$0.44
260533351080	Flexible metallic conduit, sealtite, 1/2" diameter	15.00	L.F.	$8.46	$126.90
260533351080	Insurance, all-risk, maximum	1.00	Job	$0.05	$0.79
260533351080	Insurance, standard builders risk, maximum	1.00	Job	$0.07	$1.02
260533351090	Flexible metallic conduit, sealtite, 3/4" diameter	5.00	L.F.	$11.71	$58.55
260533351090	Insurance, all-risk, maximum	1.00	Job	$0.07	$0.36
260533351090	Insurance, standard builders risk, maximum	1.00	Job	$0.09	$0.47
260533351200	Flexible metallic conduit, sealtite, 1-1/4" diameter	5.00	L.F.	$23.01	$115.05
260533351200	Insurance, all-risk, maximum	1.00	Job	$0.14	$0.71
260533351200	Insurance, standard builders risk, maximum	1.00	Job	$0.18	$0.92
260533351500	Flexible metallic conduit, sealtite, connectors, plain, 1/2" diameter	6.00	Ea.	$17.64	$105.84
260533351500	Insurance, all-risk, maximum	1.00	Job	$0.11	$0.66
260533351500	Insurance, standard builders risk, maximum	1.00	Job	$0.14	$0.85
260533351700	Flexible metallic conduit, sealtite, connectors, plain, 3/4" diameter	2.00	Ea.	$24.35	$48.70
260533351700	Insurance, all-risk, maximum	1.00	Job	$0.15	$0.30
260533351700	Insurance, standard builders risk, maximum	1.00	Job	$0.20	$0.39
260533352000	Flexible metallic conduit, sealtite, connectors, insulated, 1-1/4" diameter	2.00	Ea.	$43.79	$87.58
260533352000	Insurance, all-risk, maximum	1.00	Job	$0.27	$0.54
260533352000	Insurance, standard builders risk, maximum	1.00	Job	$0.35	$0.70
260590101120	Service & panel, residential, w/10 branch breakers, w/RGS conduit & wire, 100 amp, incl 24' SE-AL cable, service eye, meter socket	2.00	Ea.	$1,747.14	$3,494.28
260590101120	Insurance, all-risk, maximum	1.00	Job	$10.83	$21.66
260590101120	Insurance, standard builders risk, maximum	1.00	Job	$13.98	$27.95
261316103900	Circuit breaker, 2 pole, 15 to 60 amp, type FA	2.00	Ea.	$860.89	$1,721.78
261316103900	Insurance, all-risk, maximum	1.00	Job	$5.34	$10.68
261316103900	Insurance, standard builders risk, maximum	1.00	Job	$6.89	$13.77
262413400160	Circuit breakers, 1 pole, 240 V, 15 to 60 amp, FA frame, for feeder section	13.00	Ea.	$269.20	$3,499.60

LineNumber	Description		Quantity	Unit	Total Incl. O&P	Ext. Total Incl. O&P
262413400160	Insurance, all-risk, maximum		1.00	Job	$1.67	$21.70
262413400160	Insurance, standard builders risk, maximum		1.00	Job	$2.15	$28.00
262713102030	Meter center, main fusible switch, 1P 3W 120/240V, 400 A		4.00	Ea.	$2,082.59	$8,330.36
262713102030	Insurance, all-risk, maximum		1.00	Job	$12.91	$51.65
262713102030	Insurance, standard builders risk, maximum		1.00	Job	$16.66	$66.64
262723403600	Surface raceway, metal, Junction boxes, no. 1500		26.00	Ea.	$74.01	$1,924.26
262723403600	Insurance, all-risk, maximum		1.00	Job	$0.46	$11.93
262723403600	Insurance, standard builders risk, maximum		1.00	Job	$0.59	$15.39
263213160470	Generator set, natural gas/LP,liquid cooled, 3 ph 4 wire, 120/240 V, 27kW, aluminum enclosure	Note: Generator qty adjusted to account for 14kW provided.	0.75	Ea.	$27,748.94	$20,811.71
263213160470	Insurance, all-risk, maximum		1.00	Job	$172.04	$129.03
263213160470	Insurance, standard builders risk, maximum		1.00	Job	$221.99	$166.49
263623100030	Automatic transfer switches, enclosed, 2 pole, 120/240 volt, 100 amp		1.00	Ea.	$1,948.61	$1,948.61
263623100030	Insurance, all-risk, maximum		1.00	Job	$12.08	$12.08
263623100030	Insurance, standard builders risk, maximum		1.00	Job	$15.59	$15.59
265619550100	Roadway area luminaire, LED fixture, 72 LEDS, 120 V AC or 12 V DC, equal to 60 watt, incl lamp	Note: FAA Lighting	2.00	Ea.	$986.23	$1,972.46
265619550100	Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high		1.00		$91.42	$182.84
265619550100	Insurance, all-risk, maximum		1.00	Job	$6.12	$12.23
265619550100	Insurance, standard builders risk, maximum		1.00	Job	$7.89	$15.78
265623550120	Exterior LED fixture, wall mounted, indoor/outdoor, 66 watt, incl lamps		10.00	Ea.	$454.62	$4,546.20
265623550120	Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high		1.00		$20.08	$200.80
265623550120	Insurance, all-risk, maximum		1.00	Job	$2.82	$28.19
265623550120	Insurance, standard builders risk, maximum		1.00	Job	$3.64	$36.37
265623550420	Exterior LED fixture, wall pack, poly w/photocell, 50 watt, incl lamps		1.00	Ea.	$1,098.86	$1,098.86
265623550420	Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high		1.00		$61.71	$61.71
265623550420	Insurance, all-risk, maximum		1.00	Job	$6.81	$6.81
265623550420	Insurance, standard builders risk, maximum		1.00	Job	$8.79	$8.79
Division 26	**Electrical Subtotal**					**$103,953.79**
Division 27	**Communications**					
271533103860	Coaxial cable, 75 ohm, RG A/U #59 cable		1.50	C.L.F.	$165.78	$248.67

LineNumber	Description	Quantity	Unit	Total Incl. O&P	Ext. Total Incl. O&P
271533103860	Labor adjustment factor (electrical), add to labor for elevated installation (above floor level), 20' to 24.5' high	1.00		$30.85	$46.28
271533103860	Insurance, all-risk, maximum	1.00	Job	$1.03	$1.54
271533103860	Insurance, standard builders risk, maximum	1.00	Job	$1.33	$1.99
Division 27 Communications Subtotal					**$298.48**
Subtotal					**$118,649.55**

Grand Total **$118,649.55**

Note: LineNumber items above may not include every scope of work item related to this project or match the exact scope of work per plans, but it reflects an accurate value to complete the project as defined in the Basis of Estimate.