

CITY OF MORGANTON
CONSTRUCTION SPECIFICATIONS FOR
ELECTRIC SERVICES 600 AMPS AND ABOVE

CITY OF MORGANTON
CONSTRUCTION SPECIFICATIONS FOR MULTI-FAMILY RESIDENTIAL,
COMMERCIAL AND INDUSTRIAL ELECTRIC SERVICE

1. SCOPE

In an effort to avoid confusion and streamline the process of connecting electric services, the City of Morganton Electric Department, (City) has compiled these guidelines.

The guidelines contained within this policy are aimed at providing the general public and design community with the minimum standards and procedural requirements required to design, construct and obtain new, replacement or upgraded connection to the City of Morganton electric system.

Customer owned facilities must be built in accordance with the latest approved version of the National Electrical Code (NEC) and the latest versions of the Building and Fire Safety Codes (NFPA) that have been adopted by the State of North Carolina.

Approval by the authority having jurisdiction must be received by the City before any new, upgraded, or repaired electric service can be energized.

Where there is a conflict with the requirements of City, the NESC, and the NEC, the more stringent requirements shall prevail. If necessary, the utility and the authority having jurisdiction will jointly confer.

Customers shall consult the City when contemplating changes in the size or electrical characteristics of their equipment. The City normally sizes its equipment to serve the actual electrical load of the Customer and not the full potential load of the Customer's service entrance equipment. The City must be notified of customer load increases in advance and be provided the opportunity to replace its equipment, if necessary, prior to the load increase. Damages to City equipment resulting from unauthorized changes shall be the responsibility of the Customer.

The City requires clear access to its facilities at all times and reserves the right to enter the Customer's property to inspect and/or maintain our equipment without notice. If access into a building is required, The City will make every attempt to do this during normal working hours or will make specific arrangements with the property owner.

This guideline pertains to electric services with an NEC calculated load of 600 amps and above.

The City is not responsible for the cost of customer equipment ordered before approval of the plans submitted to the City of Morganton Electric Department.

2. CONTACT NUMBERS

City of Morganton Electric Department	(828) 438 – 5277
City of Morganton Building Inspections	(828) 438 – 5266
Burke County Building Inspections	(828) 764 - 9020
Utility Locating Services (NC ONECALL)	811

Questions and comments may be addressed to the City of Morganton Electric Department.
It is HIGHLY recommended that you contact us before specifying service equipment.

John Steel
Electric Engineering Services Manager
Phone: (828) 438 – 5281

Garrett Rowe
Technical Services Supervisor
Phone: (828) 438 - 5282

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growe@morgantonnc.gov

3. GENERAL ELECTRIC SERVICE REQUIREMENTS

- a. Available service voltages are**:
 - i. 120/240 single phase
 - ii. Single-phase 120/240 will only be connected to residential meter centers with 10 or fewer meters per City transformer location.
 - iii. 120/240 single phase service is only available for Commercial or Industrial service with a total calculated load less than 600 Amps per transformer location.
 - iv. 208 gnd wye/120 three phase
 - v. 480 gnd wye/277 three phase.

**Any existing service that is not one of the above voltages must be converted to an available voltage when installed/upgraded.
- b. Meter centers with an NEC calculated load of 150 KVA, or greater, will be served with three-phase power.
- c. Any existing 3-phase delta loads that are replaced, or modified, must be converted to one of the available service voltages. Notify the City prior to conversion for the needed transformer modification. Current 240 Hi-leg customers may not be required to change if there are no City facilities available in the area for conversion.
- d. Electric services 600 amps and larger require a utility metering transformer (CT) enclosure, unless the utility connection point is made to a multiple meter pack.

- e. For multiple meter packs, the City terminates service conductors on bus extensions only, not directly to the Customer's means of disconnect (Breaker).
- f. The Customer is responsible for providing set screw lugs for the termination of the City service conductors to the bus extensions.
- g. All meter sockets, junction cabinets, and CT enclosures must have a safe work zone clear of vegetation, structures, or any other obstructions. The safe work zone will extend at least 2' to either side of the service equipment and at least 5' in front of the service equipment, measured with doors opened.
- h. Service equipment locations must remain accessible to the City's personnel for as long as it is in use. Clearing of bushes, shrubs, or any other obstacles to the meter location is the responsibility of the customer
- i. If a customer makes service equipment inaccessible (in the opinion of the City), for example, by installing a deck, fence or enclosure, the customer shall, at their expense, either modify the area to provide safe, unobstructed access to the meter, or move the meter socket to a location acceptable to the City.

4. SUBMITTALS AND DRAWINGS

ALL BUILDING OR REMODELING PROJECTS WITH A TOTAL PROJECTED ELECTRIC LOAD RATED AT 600 AMPS OR LARGER MUST SUBMIT A SEPARATE SET OF DRAWINGS TO THE CITY OF MORGANTON ELECTRIC DEPARTMENT. THE DRAWINGS SUBMITTED FOR PLAN APPROVAL TO THE INSPECTIONS DEPARTMENT ARE NOT CONSIDERED AS PART OF THIS SUBMITTAL. PLANS MAY BE SUBMITTED BY EMAIL, OR MAILED TO:

ELECTRIC DEPARTMENT
305 E. UNION ST. SUITE A100
MORGANTON, NC 28655

- a. The initial site plan package submitted to the City of Morganton Electric Department must include:
 - 1. The requested voltage and phase number at the City connection point.
 - 2. The location of the proposed electric service connection point (meter).
 - 3. The submittal must state that the utility attachment will be made in a secondary junction cabinet, CT enclosure, or to a set of lugs in a multiple meter pack.

4. If a multiple meter pack is used, the submittal must have a detail sheet showing the size of the main disconnect, the number of meters, the voltage and number of phases (single, or Three phase) for each meter and the amp rating for each meter location.
5. A detail sheet including service voltage, load calculations in kVA for the entire load past the utility attachment point.
6. The proposed location of a 10'x10' designated area for a pad mounted transformer. (See section 10 for transformer pad location requirements.)

5. ELECTRIC SERVICE GREATER THEN 4000 AMPS:

- a. When the customer utility connection point has a cumulative disconnect sum of 4,000 Amps or greater, the electric service will be metered on the primary side of the transformers.
- b. The customer will be responsible for the cost of all primary metering equipment.
- c. The customer will be responsible for the installation and cost of a secondary buss enclosure at each multiple transformer location. (See section 8 for secondary junction cabinet requirements.)
- d. The customer will excavate, frame and pour the transformer pad(s) per the City's design and following the requirements of section 11.
- e. When a new installation requires multiple transformers to a single customer, each transformer will contain CT's and have a separate meter socket installed for monitoring the load data on each transformer.
- f. The customer will be responsible for the cost of the monitoring CT's and meter socket for each transformer.

6. METER SOCKET AND CT ENCLOSURE INSTALLATION

- a. ALL meter sockets will be of the ringless cover type that do not require a separate locking ring.
- b. Customer meter sockets will not be mounted to pad mounted transformers.
- c. Meter sockets must be mounted within 4' of the CT's.
- d. Meter sockets will be wired according to the drawing on page #12, including test switches and color coding of internal wiring

- e. The test switch assembly must be designed to provide a disconnecting means for the meter socket. Not only must this switch assembly provide isolation from line voltages, it also must short out current transformer secondaries to prevent transformer damage which may occur when the circuit is opened under load. (Automatic Shunt for CT's)
- f. The door(s) to the CT enclosure must be lockable using a padlock and hasp. Locks built in to the latching handle of the CT enclosures will not be accepted.
- g. CT enclosures must be UL listed and be rated as NEMA 3R suited for outdoor locations.
- h. CT enclosures will have a piece of ¾" plywood mounted to the rear wall of the cabinet. The plywood will be large enough to cover to within 1" or less of each side of the CT cabinet.
- i. The minimum size CT enclosure and type will be determined by the main disconnect amperage rating using the following table. Enclosures may be larger than those listed.

600 Amps to 2000 Amps

40" X 40" X 12" Deep

Over 2000 Amps to 4,000 Amps

Fully assemble freestanding or wall mounted cabinet with mechanical connections for utility and customer conductors. See page 15 for an example of an approved cabinet. Other manufacturers may be approved by the City after submittal of the cabinet specifications.

Over 4000 Amps

Primary metered

- j. An equipment bonding conductor must be installed between the meter socket and the CT enclosure. The minimum size bonding conductor will be #6 copper.
- k. The contractor will leave a minimum of 5' of each service entrance conductor inside the CT enclosure
- l. No more than 6 service entrance conductors per phase will be allowed inside the CT enclosure.
- m. Service entrance conductors larger than 600 MCM will not be allowed inside the CT enclosure.
- n. The contractor will supply four (4) insulated, mountable, double set screw type junction blocks that are designed to accept the size of service entrance conductors used. The blocks will have spaces for two times the number of customer service entrance conductors. These junction blocks will be mounted in the back of the CT enclosure by the City unless the cabinet comes pre-assembled by the manufacturer The City will make all connections at the junction block.

- o. If an electric service requires more than 6 service entrance conductors per phase, or larger than 600 MCM conductors, the contractor will provide and install a City specified secondary junction cabinet. (See section 8 for Secondary Junction Cabinet requirements.)
- p. For all CT enclosures, the location, size and number of utility supply conduits entering the enclosure will be determined by the City. The City will not pierce the enclosure. The contractor must provide proper conduit connectors, locknuts, and protective bushings installed in the enclosure in the number, type and location as determined by the City.
- q. All CT enclosures will be mounted such that the center of the enclosure will be between 3' and 5' above final grade.
- r. All CT meter sockets will be mounted between 3' and 5' above final grade, measured at the center of the meter socket.
- s. Meter sockets for services 600 amps or larger will be mounted within 2' of the CT enclosure. It is acceptable to mount the meter socket on the side of a CT enclosure as long as all clearance requirements are met, and the meter socket does not interfere with the opening of the CT enclosure doors.
- t. All meter sockets and CT enclosures will be mounted to a permanent noncombustible structure.
- u. A 1" PVC conduit with a pull string must be installed between the CT enclosure and the meter socket. This conduit will be used by the City for metering connections and can also be used for the equipment bonding conductor.
- v. Locations with multiple meters will use grouped meter sockets (meter packs) with one point of utility attachment.
- w. For meter packs, the City terminates service conductors on bus extensions only, not directly to the Customer's means of disconnect.
- x. The City connection point must be to set screw lugs capable of securing a range of conductor from 4/0 to 600 MCM.
- y. The number of connection lugs per phase shall be determined by dividing the main disconnect amperage rating by 400.
- z. The uppermost meter socket in a meter pack will not be higher than 6' above finished grade, measured at the center of the meter opening.

7. ELECTRIC ON DEMAND WATER HEATERS

- a. When on demand water heaters will be used, the customer or contractor must notify the City during the planning stages of the project.

8. SECONDARY JUNCTION CABINET REQUIREMENTS

- a. When a secondary junction cabinet is determined to be necessary, by the City, the City will specify, obtain pricing, and order the junction cabinet.
- b. The cost of the junction cabinet must be paid before the cabinet can be ordered. The contractor should allow adequate time between ordering and delivery of the junction cabinet in order to prevent construction delays.
- c. The contractor will excavate, frame, and pour a concrete pad based on the manufacturer's specifications.
- d. The top of the junction cabinet mounting pad will be at least 3" above final grade.
- e. The City will determine the location on each buss inside the cabinet designated for customer connection points.
- f. The contractor will supply, install and make all customer connections of the service entrance conductors inside the junction cabinet.
- g. The City will supply, install, and make conductor connections from the transformer to the junction cabinet.
- h. All conduits entering and leaving the junction cabinet must be installed prior to the forming and pouring of the pad.
- i. The framing of the junction cabinet pad form must be inspected and approved by a representative of the City BEFORE concrete is poured. The contractor will be responsible for removal and replacement of uninspected, incorrectly framed and poured pads.
- j. The junction cabinet location must have a minimum clearance that will allow a safe working space of 6' from any obstruction to access and air circulation on all sides. Obstructions include, but are not limited to, vegetation, buildings, walls, or any other barrier that does not allow the safe access by personnel and free flow of air around the junction cabinet.

9. SITE PREPARATIONS

- a. The contractor must call the City to initiate an on-site meeting with a representative of the City in order to finalize the electric service path. A meeting can be arranged by calling the Electric Department at: (828) 438 – 5277.
- b. Before the utility portion of the electric service installation can begin, the construction site must be graded to within 6” of final grade.
- c. Once the utility installation route has been determined, and before installation can begin, the contractor will provide a clear path, along the entire length of the installation path, free of all obstructions, a minimum of 10’ wide.
- d. Curbing, guttering, sidewalks and any other above or below grade items should be staked or otherwise identified along the path of utility construction.
- e. For underground electric service, the City must be given access to the construction site before curbs, gutters, sidewalks, or any other permanent obstructions are installed.
- f. Contractors should plan for interruption of access to portions of the work site for the construction of electric service facilities.
- g. The City is not responsible for damage to concrete or pavement that has not had time to cure in order to handle heavy vehicle traffic.

10. TRENCHING AND BACKFILLING

- a. The City does not guarantee compaction levels of backfilled trenches.
- b. Any excess dirt or other spoilage remaining after trenching will be the responsibility of the contractor for disposal.
- c. In order to accommodate construction scheduling, the contractor may want to install the underground utilities themselves as specified by the City.

11. TRANSFORMER PAD INSTALLATION

- a. The contractor will excavate, frame and pour a concrete transformer pad to the specifications shown on page # 13.
- b. The framing of the transformer pad form must be inspected and approved by a representative of the City **BEFORE** concrete is poured. The contractor will be responsible for removal and replacement of uninspected, incorrectly framed and poured transformer pads.

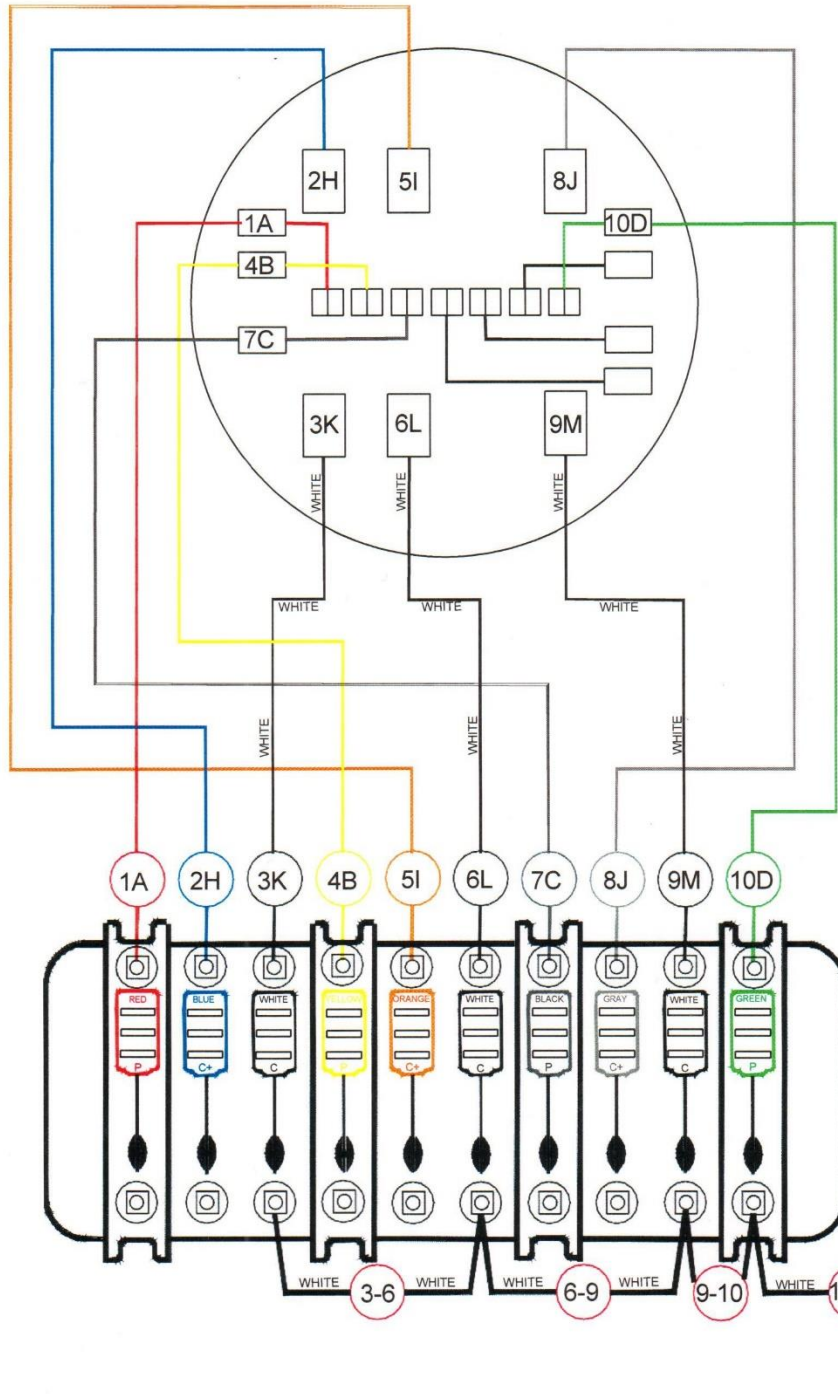
- c. The contractor will remove **all** material used to frame the pad and any excess concrete after the pad has cured, including the framing material and excess concrete inside the interior window of the pad.
- d. All conduits terminating inside the transformer, must be installed before the transformer pad is framed.
- e. The transformer pad location must have a minimum clearance of 3' from any obstruction to air circulation on both sides and the back of the transformer. Obstructions include, but are not limited to, vegetation, buildings, walls, or any other barrier that does not allow the free flow of air around the transformer. (See Page #14)
- f. The transformer pad must have a clear, unobstructed area of not less than 10' directly in front of the opening side (front) of the transformer. (See Page #14)
- g. The transformer pad must be located such to allow an unobstructed access for utility vehicles to back up all the way to the front edge of the transformer pad.
- h. Transformer locations that are exposed to paved areas and/or vehicle traffic must have protective barriers provided and installed by the customer. (See page # 15 for guard post requirements.)

12. SERVICE CONNECTIONS

- a. The contractor will leave a minimum of 5' of each conductor inside a CT enclosure, and a minimum of 6' inside a pad mounted transformer for City use.
- b. The contractor will supply, install and make all customer connections of the service entrance conductors inside a secondary junction cabinet.

The City will supply, install, and make conductor connections from the transformer(s) inside a junction cabinet.

- c. The City will make all primary and secondary connections inside a City provided pad mounted transformer. In the event that the customer provides the transformer, the Customer will be responsible for making all connections inside the secondary compartment of their transformer(s).
- d. The contractor will supply four (4) insulated, mountable, double set screw type junction blocks that are designed to accept the size of service entrance conductors used. The blocks will have spaces for two times the number of customer service entrance conductors. These junction blocks will be mounted in the back of the CT enclosure by the City unless the cabinet comes pre-assembled by the manufacturer. The City will make all connections at the junction block.



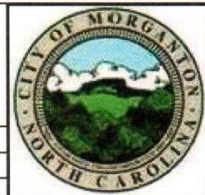
WIRE #	WIRE COLOR
1A	RED
2H	BLUE
3K	WHITE
4B	YELLOW
5I	ORANGE
6L	WHITE
7C	BLACK
8J	GRAY
9M	WHITE
10D	GREEN
3-6	WHITE
6-9	WHITE
9-10	WHITE
10-G	WHITE

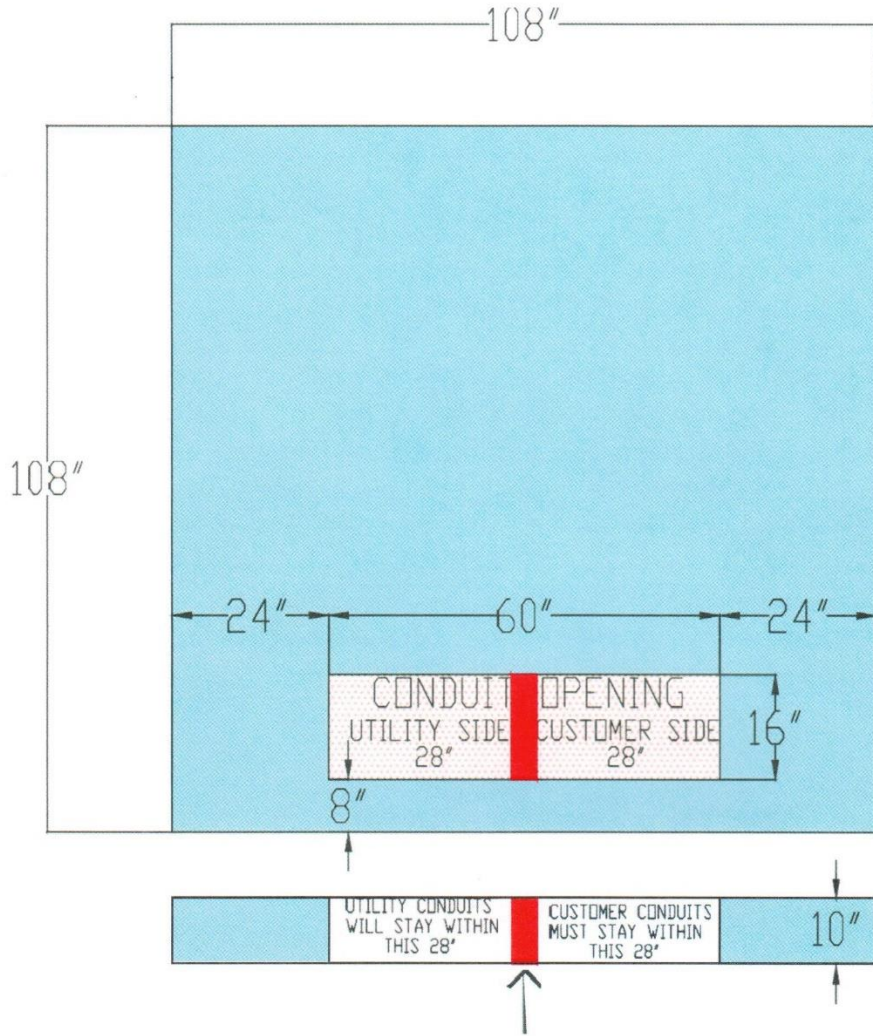
NOTE:
 1.) ALL WIRES TO BE #12 SOLID CONDUCTOR, WITH INSULATION COLOR AS INDICATED BY CHART.

ELECTRIC DEPARTMENT
 CONTACT INFORMATION
 JOHN STEEL (828) 438-5281
 Garrett ROWE (828) 438-5282
 OFFICE (828) 438-5277

**CITY OF MORGANTON ELECTRIC DEPARTMENT
 13 TERMINAL METER BASE WIRING DIAGRAM**

REVISION: ELC13TERM-02
 APPROVAL DATE: 01/24/23
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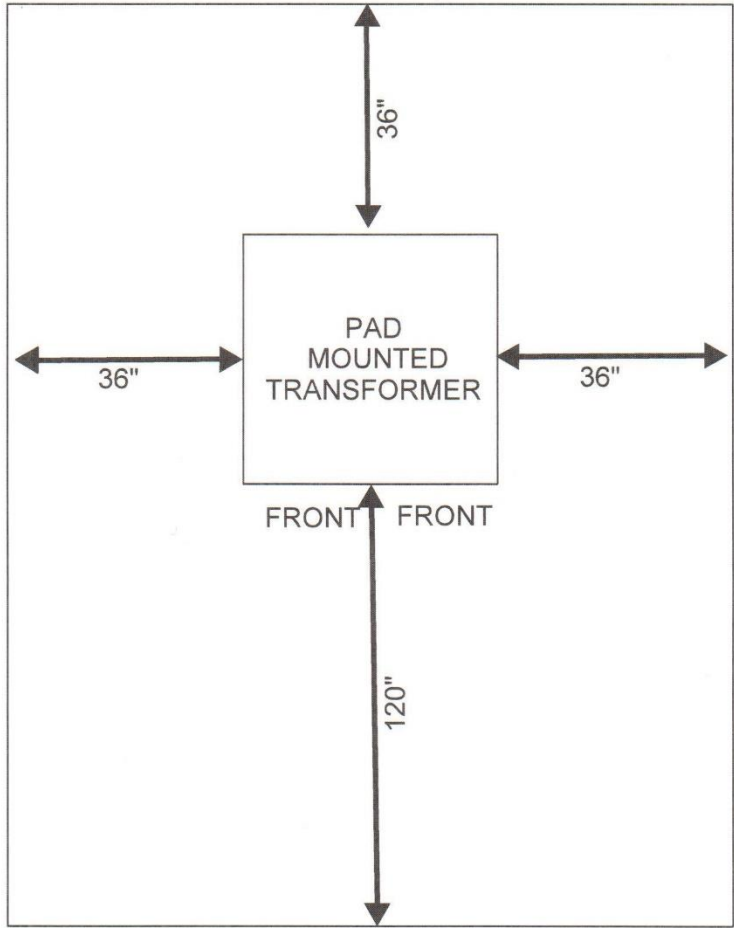


FOUR INCH SPACE WITH NO CONDUITS

NOTES:


1. CUSTOMER TO PROVIDE AND INSTALL TRANSFORMER PAD PER THIS DOCUMENT
2. THE TRANSFORMER PAD FRAMING MUST BE INSPECTED BY A CITY OF MORGANTON ELECTRIC DEPARTMENT REPRESENTATIVE BEFORE BEING POURED.
3. CONTRACTOR WILL BE RESPONSIBLE FOR REMOVING PADS THAT DO NOT MEET THE CITY OF MORGANTON REQUIREMENTS.
4. PROTECTIVE POLES ARE REQUIRED WHEN TRANSFORMERS ARE EXPOSED TO VEHICLE TRAFFIC.
5. TRANSFORMER MUST BE LOCATED IN AN AREA THAT ALLOWS SAFE ACCESS BY CITY OF MORGANTON PERSONNEL IN WET OR DRY CONDITIONS.
6. THE TOP OF THE PAD SHOULD BE 4" ABOVE FINISHED GRADE.
7. PAD TO BE A MINIMUM OF 10" THICK CONSISTING OF 3,000 PSI AT 21 DAYS CONCRETE WITH WIRE MESH REINFORCEMENT.
8. CONDUIT OPENING SHOULD BE CENTERED IN TRANSFORMER PAD, 8" FROM THE FRONT OF THE PAD.

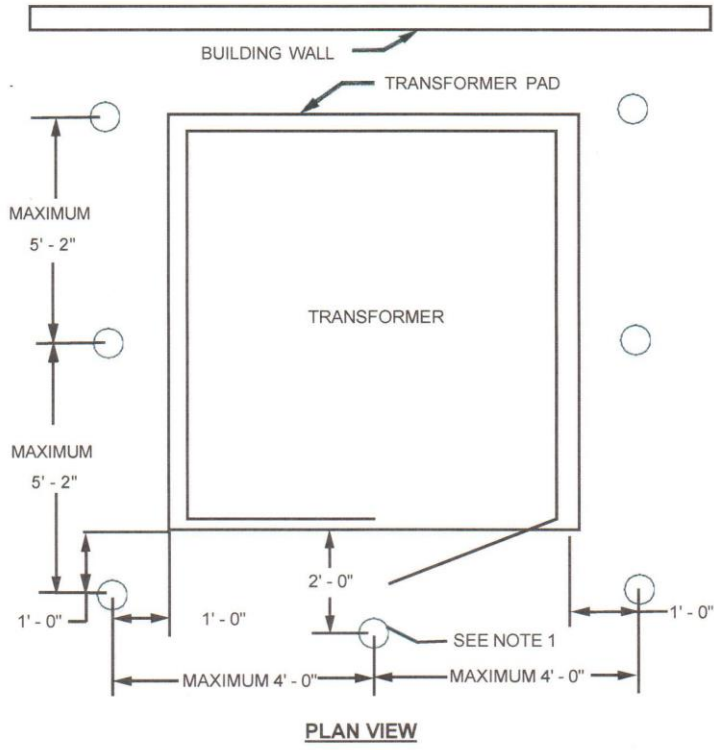
ELECTRIC DEPARTMENT CONTACT INFORMATION JOHN STEEL (828) 438-5281 Garrett ROWE (828) 438-5282 OFFICE (828) 438-5277	CITY OF MORGANTON ELECTRIC DEPARTMENT TRANSFORMER PAD REQUIREMENTS		
	REVISION: ELC TFMPPAD- 02		
	APPROVAL DATE: 01/24/23		
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NOTES:

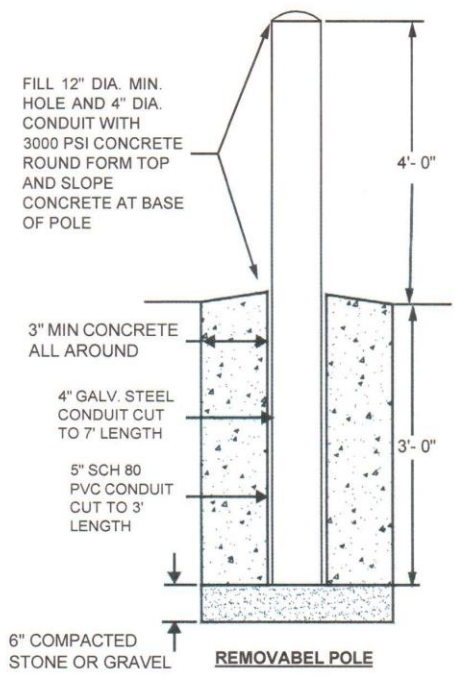
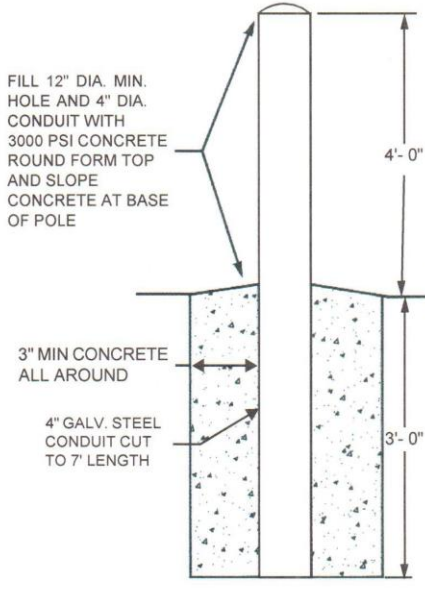
CLEARANCE ENVELOPE SHOWN MARKS THE CLOSEST PERMITTED PLACEMENT OF STRUCTURES, SIGNS, OR PERMANENT PLANTINGS THAT EXTEND MORE THAN 4" ABOVE GRADE.

ELECTRIC DEPARTMENT CONTACT INFORMATION JOHN STEEL (828) 438-5281 Garrett ROWE (828) 438-5282 OFFICE (828) 438-5277	CITY OF MORGANTON ELECTRIC DEPARTMENT PAD MOUNTED TRANSFORMER CLEARANCE REQUIREMENTS		
	REVISION: ELC TFMRL- 02		
	APPROVAL DATE: 01/24/23		
	JS		



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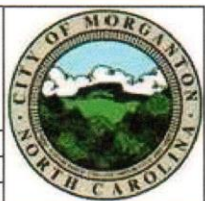
1. ON THREE PHASE PAD MOUNTED TRANSFORMERS, THIS POLE SHALL BE CENTRALLY LOCATED 2'-0" IN FRONT OF THE TRANSFORMER BETWEEN THE DOORS TO ACCOMODATE THE DOOR SWING AND SHALL BE REMOVABLE.
2. TRANSFORMER PROTECTION POLES SHALL BE INSTALLED ON ALL SIDES OF THE TRANSFORMER WHICH ARE SUBJECT TO VEHICLE TRAFFIC.
3. POLES SHALL BE PAINTED YELLOW.
4. CUSTOMER MAY PROVIDE AN ALTERNATE DESIGN FOR A REMOVABLE BARRIER, BUT IT MUST BE APPROVED BY A CITY ENGINEER.
5. ANY THREE - PHASE PAD MOUNTED TRANSFORMERS THAT ARE EXPOSED TO PAVED AREAS AND/OR VEHICULAR TRAFFIC SHALL HAVE PROTECTIVE BARRIERS PROVIDED AND INSTALLED BY THE CUSTOMER.



ELECTRIC DEPARTMENT
CONTACT INFORMATION
JOHN STEEL (828) 438-5281
Garrett ROWE (828) 438-5282
OFFICE (828) 438-5277

**CITY OF MORGANTON ELECTRIC DEPARTMENT
GUARD POST REQUIREMENTS**

REVISION: ELC GPR- 02
APPROVAL DATE: 01/24/23
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Utility Metering Transformer Cabinet

Introduction

Lake Shore Electric Metering Transformer Cabinets are UL Listed and Utility Company Compliant. They provide a safe, convenient and standardized method to install, test and maintain the following equipment:

- Current Transformers
- Potential (Voltage) Transformers

Typically, services over 400 Amps are required to have a conforming enclosure to house Utility provided metering current transformers. The Lake Shore Electric Utility Metering Transformer Cabinet provides the solution.

Product Features

- UL 414 Listed
- 100% Rated Copper Bus
- Ampacity Range: 800 thru 4000A
- Top or Bottom Entry/Exit
- NEMA 1, 3R, & 3R Stainless Enclosures Available
- Standardized bus bar arrangement with removable center link. (4" Width Standard) For use with donut type current transformers.
- Bar Type Current Transformers are Installed in Place of Removable Links
- Standard cabinets have split, hinged doors with removable center post.

Factory Options

- Utility Compliance: Specify When Ordering
- Custom Mechanical Lugs: Specify When Ordering
 - Wire Range
 - # of Cables
 - Line or Load Side or Both

Accessories

- 18" Floor Stands for JCTC & MCTC Model Wall Mount Enclosures

Recommendations

The CT Cabinets are capable of other configurations outside the standard setup. Please consult the factory for further information on equipment outside the standard packages.

Here are Some Customized Examples

- Mounting Panel
- Z-Brackets
- Channel Style
- Enclosure Only



CT Cabinet Order Guide

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MODEL SERIES	CURRENT RATING						
JCTC	0800 = 800 Amps						
MCTC	1000 = 1000 Amps 1200 = 1200 Amps						
SCTC	2000 = 2000 Amps 3000 = 3000 Amps 4000 = 4000 Amps						
CUSTOMER CONNECTIONS							
M = Mechanical Lugs N = NEMA Hole Pattern							
ENCLOSURE TYPE							
A = NEMA 1 Wall Mount B = NEMA 1 Freestanding ² E = NEMA 3R Wall Mount F = NEMA 3R Freestanding ² K = NEMA 3R Wall Mount Stainless L = NEMA 3R Freestanding Stainless ²							
FOR FUTURE USE							

² For SCTC Models Only

Part Number Example: MCTC1200NA0000 (Model MCTC, 1200 Amps, NEMA 2 Hole Pattern, in a NEMA 1 Wall Mount Enclosure; No Options Selected)

CT CABINET SPECIFICATIONS					
Model Prefix	Ampacity Rating	kAIC Rating 480V	Dimensions H x W x D (inches)	Customer Connections	
				Mechanical Lugs (MCM)	NEMA 2 Hole
JCTC	800A	50	60x42x12	(2) #2-600	2
MCTC	1200A		66x48x18	(4) 4/0-500	4
SCTC	2000A	50	84x54x24	(8) 300-800	6
	3000A			(12) 300-800	10
	4000A	100*			

* 100kAIC Rating Applies to SCTC 4000 Amp Model Only



Contact Information
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sales@lake-shore-electric.com
www.lake-shore-electric.com

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 Lake Shore Electric
 205 Willis Street
 Bedford, OH 44146

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