

Safety First



Electric Service and Meter Manual

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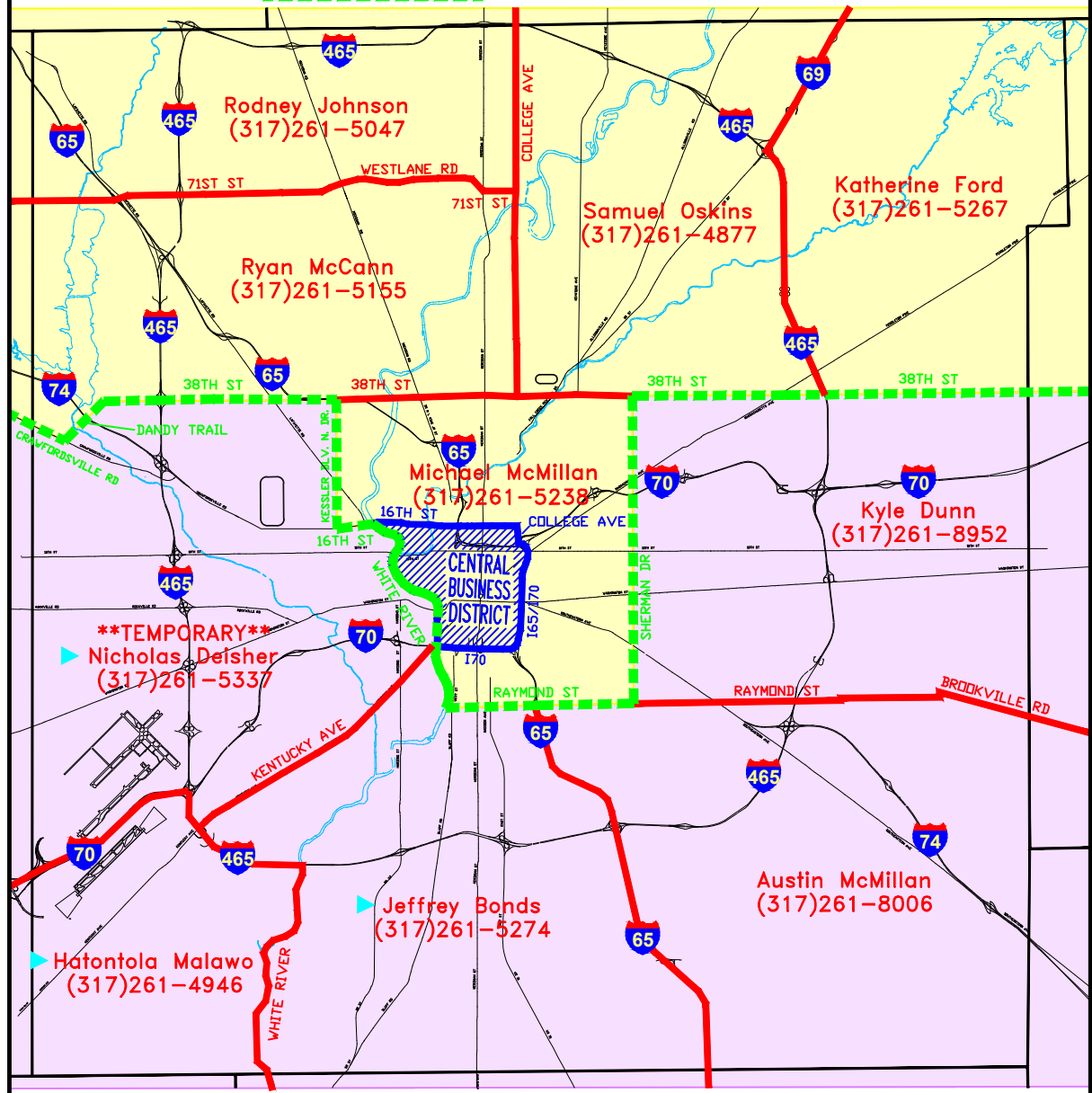
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Scott Weaver
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MAJOR UNDERGROUND PROJECTS

**For Central Business District
please refer to drawing GB0-110.**

NOTE:
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**CUSTOMER PROJECTS
ENGINEERING DISTRICT MAP**



FIRST CONTACT PERSON FOR NEW CENTRAL BUSINESS DISTRICT (CBD) SERVICES (FOR SERVICES OUTSIDE THE CBD PLEASE REFER TO GB0-100)

Ken Jenkins (317)261-5193

Adam Hokanson (317)261-8733
 David Lufcy (317)261-8955
 Larry Grinter (317)261-5966
 Rachel LeMaire (317)261-5108
 Robert Page (317)224-3175
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**CENTRAL BUSINESS DISTRICT
 ENGINEERING DISTRICT MAP**

MAJOR UNDERGROUND PROJECTS ENGINEERING TEAM

Distributed Generation Contact Information

Level I Applications (10 kW or Smaller)

Contact:

Brandon Stuckey, Interconnections Analyst, (317) 224-5612

Email: aesindianainterconnection@aes.com

Level II and III Applications (Over 10 kW)

First Contact:

Account Management Executives shown on drawing GB0-120

Second Contact:

Brandon Stuckey, Interconnections Analyst, (317) 224-5612

Email: aesindianainterconnection@aes.com

Technical

Joshua Spalding, Planning, (317) 261-8615

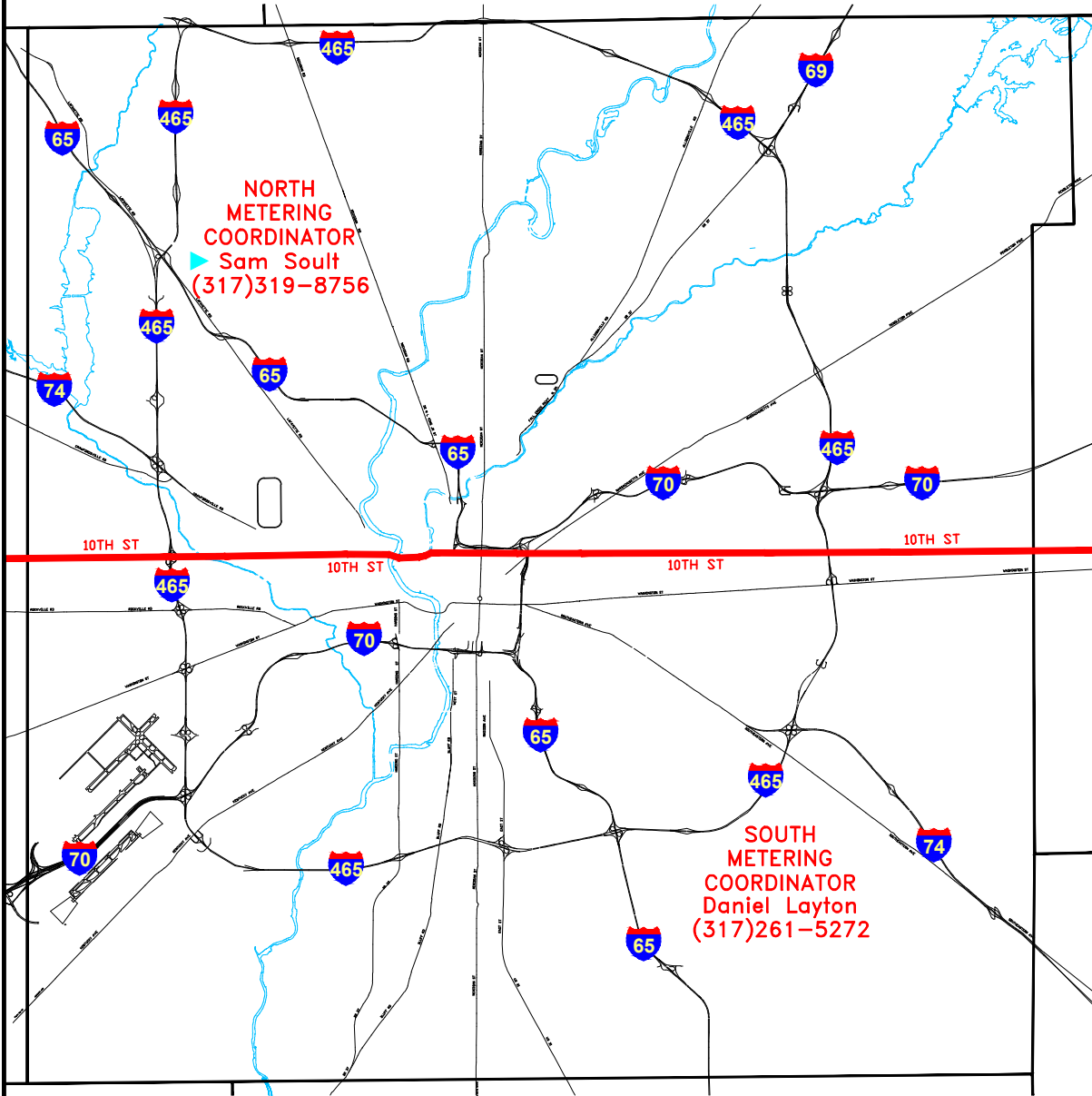
Regulatory

Chad Rogers, Director, Regulatory Affairs, (317) 261-8983

NOTE:

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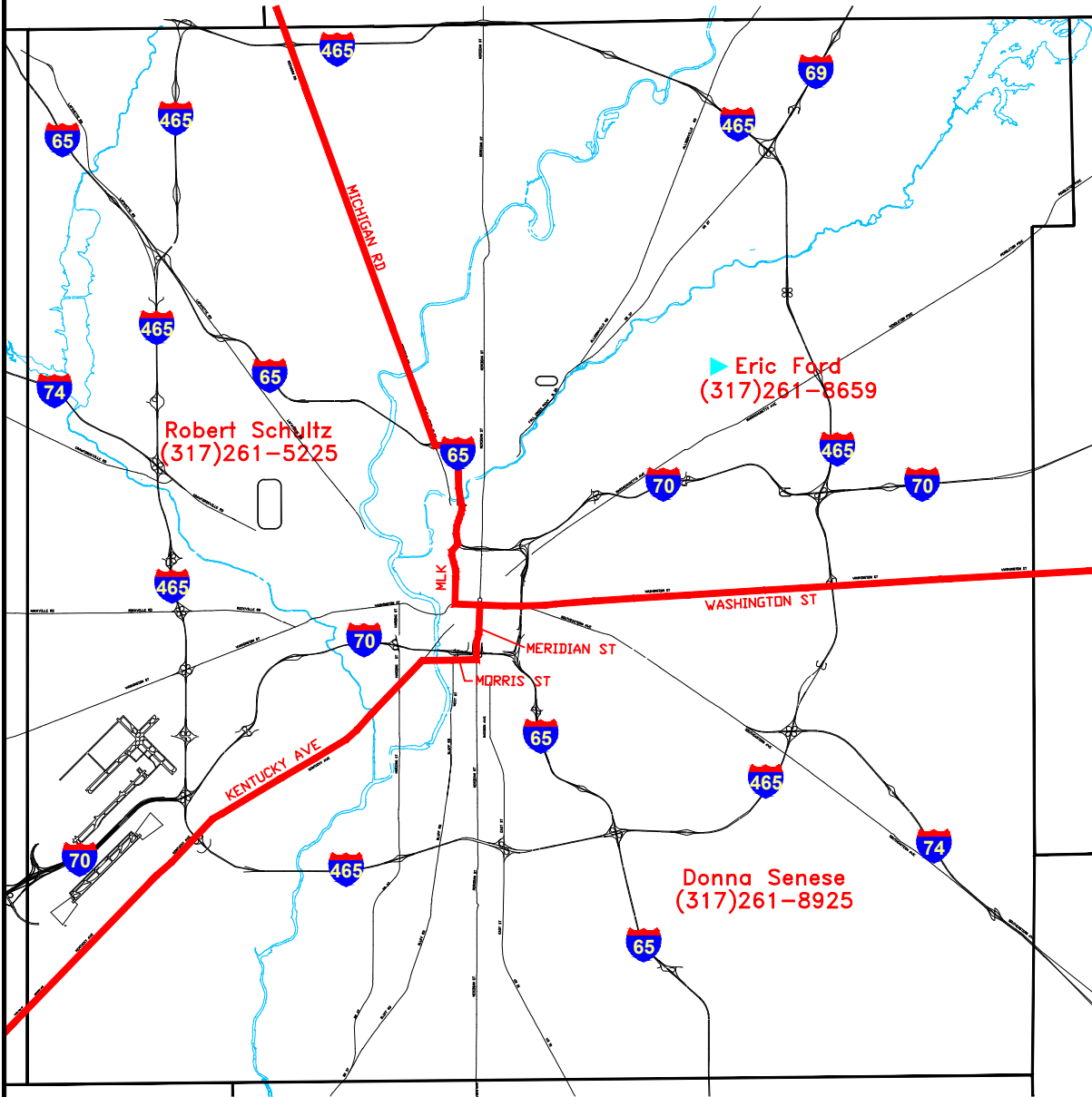
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**CUSTOMER SERVICE
 METERING
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 Michael Vores
 (317)261-8106**

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**METER INSTALLATIONS
 DISTRICT MAP**



**CONSTRUCTION & MAINTENANCE
CONTRACTOR COORDINATOR**

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(317)261-8025

LIGHTING DESIGN TEAM LEADER

Jordan Watkins
(317)261-6196

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**STREET LIGHTING
DISTRICT MAP**

Part V: Metering

500 General information

Information on metering problems, available equipment, and general requirements can be obtained at the Meter Department Office, 3600 North Arlington Avenue, (317) 261-5262 or (317) 261-5227.

100, 200, and 320 ampere single phase self-contained meter fittings shall be furnished and installed by the customer. The company will continue to furnish 2, 3, and 4 gang meter fittings for multi-family homes. The customer is responsible for maintaining his wire and cable connections, see Section 555A.

Meter cabinets and three phase meter fittings will be furnished by the Company for installation by the customer. The Company retains ownership of these meter fittings and the cabinets. However, the customer is responsible for maintaining his wire and cable connections, see Section 555A.

If a meter cabinet and/or instrument transformers have deteriorated to a condition that the installation is no longer safe or metering correctly, it is the responsibility of the customer to have the metering equipment replaced by a qualified electrician. Meter cabinets and three phase meter fittings will be furnished by the Company for installation by the customer. 100, 200, and 320 ampere single phase self-contained meter fittings shall be furnished and installed by the customer. However, all Company meters will always be installed and maintained by the Company. Any failed condition will be determined by a representative from the Company's Meter Department and if the cabinet has failed inspection due to damage, charges may apply for the replacement parts.

The two categories of metering installations are residential and general service. The term general service includes both commercial and industrial applications of electric service. The following is a brief outline of the principal Company requirements relative to the metering installation for each of these categories. At the end of Part VII are drawings depicting typical installations covered in this manual.

505 Equipment for residential installation

A. 100 - 200 ampere overhead or underground

The Company will provide a 200 ampere meter fitting available in 2, 3, and 4 gang. See section 500 for single gang 200 ampere meter fittings.

B. 400 ampere overhead or underground

See section 500 for 320 ampere meter fittings.

C. 600-1600 ampere underground

The Company will furnish a single enclosure containing current transformers and a meter fitting.

D. Location

Metering facilities are to be in hot sequence and located on the outside of the structure in an accessible location agreeable to the Company. See drawing GB5-010 for acceptable meter locations and Section 550A7 for the definition of cold sequence. In general, exceptions for cold sequence are for 480 volt installations and installations in the networked areas covered in Part III.

A clear working space of at least 4 feet shall be maintained in front of the metering facilities. Safe and ready access to this area shall be provided.



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with Page 26A**

510 Multi-family dwellings

Metering shall be installed on the outside of all multi-family dwellings. Information relative to the location of metering facilities and the type of metering equipment to be installed should be obtained before any work is started on multiple meter installations. Only locations that are readily accessible and agreeable to the Company will be acceptable.

When ganged meter fittings are required, the customer shall notify the Meter Department in sufficient time to order and receive these fittings prior to installation time.

515 Meter centers outside of the downtown underground networked service area

Any deviations from this section will require meter department approval prior to purchasing the meter center. For the installation of meter centers in the Downtown Underground Networked Service Area, see Section 517.

- A. With prior approval of the Meter Department, meter centers may be provided, installed, and maintained by the customer. Both single and three phase meter centers shall be in a vertical stack of no more than four (4) positions. However, if due to space constraints, the contractor may request a waiver for a vertical stack of five (5) positions. This request shall be submitted to the Company Meter Layout group for prior approval before ordering the equipment. All customer provided meter centers shall be UL listed or listed by another Nationally Recognized Testing Laboratory (NRTL).
- B. Residential meter centers fed from single phase, 120/240 volt shall have a maximum rating of 800 amps per meter center and limited to a maximum rating of 225 amps per position. Each position shall have a ringless cover, horn bypass, and have a disconnecting means on the load side.
- C. Residential meter centers fed from commercial three phase 120/208 volt, four wire, wye source shall have ringless covers with a horn bypass. A 5th jaw shall be installed at the 9:00 position and connected to the neutral by the customer. Individual meters shall be balanced across the three phases and neutral with a maximum of 200 amps per position. 120/240 volt single phase meter centers shall not be permitted to connect to 120/208 volt three phase services.

Three phase meter positions at 120/208 volt shall have ring-less covers and bypass levers with a maximum rating of 225 amps per position.
- D. Single phase and three phase services of the same voltage from the same meter center are permitted. With approval by the Meter Department the largest disconnecting means shall not be greater than 300 amperes for a three-phase service. (For instance, a house panel.)

517 Meter centers in the downtown underground networked service area

- A. All meter centers shall be located on the outside ground floor of the structure in an accessible location if the building is equal to or less than eight stories. If the building is nine or more stories, the meters may be installed on every 3rd floor in an area agreeable to the Meter Department. Provisions shall be made for the use of a company key for access, keyless entry is not acceptable. Additionally, a 3/4" conduit sleeve shall be provided to the outside of the building for the installation of an outside antenna for remote metering. This conduit sleeve shall be sealed against the weather by the customer. See Section 520 and 560R for more information.
- B. Residential meter centers, 120/208, 3-wire, single phase fed from commercial three phase 120/208 volt, four wire, wye source shall have ring-less covers with a bypass lever. A 5th jaw shall be installed at the 9:00 position and connected to the neutral by the customer. Individual meters shall be balanced across the three phases and neutral with a maximum of 200 amps per position. 120/240 volt single phase meter centers shall not be permitted to connect to 120/208 volt three phase services.
- C. Three phase meter positions at 120/208 or 120/240 volt shall have ring-less covers and bypass levers with a maximum rating of 225 amps per position.
- D. Single phase or three phase meter centers shall have a disconnecting means for the entire meter center and additionally a disconnecting means shall be located on the line side of each meter position.

A clear and level working space of at least 4 feet shall be maintained in front of the face of the meters. Safe and ready access to this area shall be provided.

- E. All initial connections in a meter center shall be made by the customer.
- F. Single phase and/or three phase meter centers and service equipment (commonly known as a meter/main) are permitted if provided, installed, and maintained by the customer. Unmetered service cable shall be separated from the customer's service equipment or overcurrent devices by a factory installed barrier.
- G. Each individual meter fitting in all multiple meter installations shall be correctly identified by a permanent form of metal tag (or the equivalent thereof) which indicates the building address and type of service to be served by each meter. Markings with pencils, crayons, paper tags, etc. will not be acceptable. Insofar as practical, it is preferable in multi-family dwellings that the numbering arrangement be in an orderly sequence in each group. Multi-meter installations not identified will not be connected. The Company will install and bill meters in multiple installations according to markings supplied by the electrical contractor and under no circumstances will assume responsibility for errors which are the result of incorrectly identified meter fittings.

555 Maintaining meter security

- A. It is unlawful to break seals and/or locks on Company meters or to remove meters without notifying the Service Connection Division on telephone number (317) 261-8133.

Cooperation will be extended at the request of the customer for normal maintenance or under emergency conditions. Request shall be made to the Service Connection Division for these cases.

- B. The Company reserves the right to seal all meters, metering equipment and fused or unfused switches, together with any enclosures, gutters or raceways containing unmetered circuits, whether any of such equipment has been furnished by the Customer or the Company. This is reflected in the "[Rules and Regulations, Section 17.2](#)" that are approved by the Indiana Utility Regulatory Commission.
- C. Electricity used on construction services shall be metered. Services that have been disconnected by the company are to be restored only by AES Indiana personnel. Unmetered circuits and bypassed meter fittings will be disconnected, an energy diversion charge, and pro-rated billing will be assessed.

557 Installation of surge protective device and other devices at meter sockets

The installation of any meter adapter surge suppressor or any similar interface devices between the meter and meter socket is not acceptable and prohibited. If any surge suppressor or other similar interface device such as a generator connection, is found installed between the meter and meter fitting, Company field personnel will remove the device.

560 General requirements

- A. A signed sketch shall be provided for all current transformer rated metering installations by the customer's electrical contractor. The sketch shall include location of the metering and all distances from windows, doors, gas meters, stairways, corners of buildings and posts if required.
- B. All meter fittings and cabinets are to be surface mounted on the exterior of the building or free standing; flush mounted meter fittings and cabinets are not permitted.
- C. To provide adequate clearance for testing and maintenance, a conduit nipple (a minimum of 4 inches long) shall be provided between the meter fitting and any other electrical equipment.
- D. Facilities to accommodate socket type meters installed at any location served by two phases and a neutral of the three phase, four wire 120/208 volt, wye system, shall be equipped with a neutral terminal block. The neutral terminal block (fifth terminal) shall be furnished by the Company and installed on the left side of fitting by the electrical contractor. (See Drawing GB1-060.)
- E. A maximum of 4 conductors may be connected to the line or load side of the current transformer.

Part VI: Power quality and electric service reliability

600 Service reliability

Reliability of service is of prime importance to both the Company and the Customer. The Company's record of excellent service reliability is the result of sound engineering, system design and carefully implemented maintenance programs.

Despite these efforts, power system disturbances do occur. Generally, most of the Customer equipment can tolerate short-term voltage variations. But in today's electronic world, the inability of microprocessors and electronic controls to tolerate power system disturbances can result in equipment problems and downtime.

The Company encourages care in the design of the electrical system, and in the installation of power conditioning equipment. This will promote satisfactory operation of customer equipment and prevent electrical problems to the Company's and other Customers' equipment. The Customer should consider the following items as a guide for electrical system design where power quality is an important factor:

- (a.) Wiring and grounding practices that comply with the current edition of the Indiana Electrical Code.
- (b.) Dedicated circuits for electronic systems.
- (c.) Multistage surge protective device (SPD).
- (d.) Single phasing protection for motors.
- (e.) Derated or "K" rated transformers for load with high harmonic content.
- (f.) Line reactors for protection of adjustable speed-drive motors.
- (g.) Uninterruptible power supply (battery or rotary).
- (h.) Back-up or emergency generation for some applications.

Should there be any questions about the application of these concepts, please call the Company's Power Quality Consultant on (317) 261-8382. The consultant will be most happy to assist you in obtaining the electric service to meet your needs.

D. Impulsive transient

Lightning is a prime example of an impulsive transient and can cause damaging over voltages to appear on both Company and Customer electrical facilities. Multistage surge protective device (SPD) protection is necessary to avoid catastrophic equipment failure. IEEE/ANSI C62.41.1 - 2002 and C62.41.2-2002 provide information to properly coordinate equipment withstand capability and environmental characteristics to ensure proper protection. Customer specifications for the design and operation of electrical systems should include multistage SPD protection.

E. Voltage Unbalance and/or Single Phasing

Voltage unbalance results from a load that is not balanced between phases. Voltage unbalance can occur by various means, including a phase loaded significantly heavier than another and loss of one or two phases of a three phase power system. Loss of one or two phases of a three phase power system that serves motor load at Customer locations is often called "single phasing". Voltage unbalance may result in motor damage due to heating. Appropriate protection for these conditions cannot be economically provided by the Company. Therefore, it is the Customers' responsibility to provide and maintain protection for multi-phase equipment that may be adversely affected by these conditions. The Company assumes no liability for equipment damaged by a loss of phase condition.

F. Voltage Sag

A voltage sag is a short duration voltage decrease. Voltage sags are usually associated with power system faults but can also be caused by switching heavy loads, starting of motors, etc.

Voltage sags caused by power system faults often have a different voltage on each phase, generally have durations of a second or less, and are more likely to occur during adverse weather conditions. Smaller voltage changes occur more often than large voltage changes. Thus, equipment with greater sensitivity is more likely to experience problems. Customer equipment that cannot tolerate a voltage sag due to power system faults should be specified with the capability to ride through this condition.

Voltage sags caused by switching heavy loads, starting motors are best controlled by the Customer. Customer systems should include electrical and/or mechanical devices to limit the sag at the point of delivery to 2% below the impressed voltage at the point of delivery. Please contact the Company for assistance at specific locations.