INSPECTION POINTS FOR TRAFFIC SIGNAL WORK BEING DONE IN WYANDOTTE COUNTY KANSAS

The following list refers to points during the construction process that will require an on-site inspection or observation before proceeding further with the construction project. The inspection will be completed by a member of the Traffic Signal Department of the Board of Public Utilities. The contractor is required to notify the Traffic Signal Department when they are performing any of the following tasks so they can inspect the process and make any necessary approvals or changes at 913-645-1449 or 913-573-9450.

1. Inspect the materials purchased and being utilized for the construction before starting the project.
2. Inspect the staked positions for the cabinets, pull boxes, and all poles.
3. Observe the boring process to make sure all splices are done properly and with the proper type of conduit or HDPE.
4. Observe the setting of pull boxes and make sure the conduit is piped into them correctly.
5. Inspect all concrete foundations for proper rebar and bolt configurations before concrete is poured.
6. Inspect the job site upon completion for any clean up or grading concerns.
7. Inspect forms before pouring concrete to ensure proper placement of conduit, the number of conduit being installed, and the size of conduits being installed.
2. MATERIALS AND EQUIPMENT

2.1. SCOPE: This section governs furnishing all materials, equipment, and labor required for the fabrication and installation of all traffic signal poles, mast and luminaire arms, visors, and signal heads. This section is applicable to all traffic signal pole mast and luminaire arms shall include a 1-inch rubber reinforcing steel in ASTM A615.
LED Pedestrian Countdown Module Functions

1. **Overview**
   - This system is designed to improve the safety of pedestrians at pedestrian crossings. It features a countdown timer that displays the remaining time before the walk signal begins.

2. **Display**
   - The module shall display a countdown timer. The countdown timer shall display the number of seconds remaining before the walk signal is activated.

3. **Construction**
   - The module shall be constructed of durable materials suitable for outdoor use. It shall be weather-resistant and able to withstand harsh environments.

4. **Power Consumption**
   - The module shall operate on low voltage power to ensure safety and energy efficiency. The power consumption shall not exceed 5 watts.

5. **Environmental Requirements**
   - The module shall be designed to operate in a wide range of environmental conditions. It shall be resistant to dust, moisture, and temperature variations.

6. **Installation**
   - The module shall be installed in a traffic signal cabinet, conforming to the standards specified by the manufacturer. It shall be securely mounted to ensure stability.

7. **Operation**
   - The module shall operate automatically, with the countdown timer starting 5 seconds before the walk signal is activated.

8. **Emergency Override**
   - The module shall provide an emergency override mechanism to stop the countdown timer and activate the walk signal immediately.

9. **Regulations Compliance**
   - The module shall comply with all applicable local, state, and federal regulations related to pedestrian safety and signal operation.

10. **Maintenance**
    - The module shall be designed for ease of maintenance. It shall be accessible for inspection and cleaning to ensure its proper functioning.

11. **Wiring**
    - All electrical connections shall be made using a suitable connector, ensuring proper power and signal transmission.

12. **Material Specifications**
    - The module shall be constructed of high-quality materials suitable for outdoor installation. The materials shall be resistant to corrosion and weathering.

13. **Testing and Inspection**
    - The module shall undergo rigorous testing and inspection to ensure its reliability and performance in various conditions.

14. **Service Life**
    - The module shall be designed to have a service life of at least 10 years, with minimal maintenance requirements.

15. **Legal Compliance**
    - The module shall comply with all current laws and regulations related to pedestrian signals, ensuring the safety and rights of all users.

16. **User Interface**
    - The module shall provide a user-friendly interface for controlling the countdown timer, allowing for easy customization to meet specific needs.

17. **Environmental Impact**
    - The module shall be designed with environmental considerations in mind, minimizing its carbon footprint and energy consumption.

18. **Safety Features**
    - The module shall include built-in safety features to prevent potential hazards and ensure the safety of pedestrians and other users.

19. **Certification and Approval**
    - The module shall be certified and approved by relevant authorities to ensure its compliance with all necessary standards.

20. **Support and Warranty**
    - The manufacturer shall provide support and warranty services to address any issues or concerns that may arise after installation.
plug in base socket contacts shall be gold plated. The connection of all incoming and outgoing circuits from the controller "D" camera, capable of safely dissipating a peak surge current of 5 kA (8 X 20 microsecond) shall be hybrid, solid state devices, one per all outputs from the cabinet power supply. All terminals shall be permanently incorporated a base or socket portion which shall permanently mount to the hand wall of the cabinet in such a position as to be adjustable to allow for a range of inputs from 0 to 24 VDC. The cabinet shall have a minimum length of four feet. The lower front edge of the switch manual control plug shall be wired such that insertion of the plug shall apply +12 VDC and -12 VDC signal to the cabinet. Power supply 1 will be connected to provide power to all devices installed in the controller unit. +24 VDC shall also be provided on the front panel.

3.2 Power Supply

- Power supply 1: 12 VDC, 5 A, 60 Hz, 2.2 KVA
- Power supply 2: 12 VDC, 15 A, 60 Hz, 3.3 KVA
- Power supply 3: 12 VDC, 5 A, 60 Hz, 2.2 KVA

In addition to the main door of the controller cabinet, there shall be an auxiliary door provided in the main door with a lock and standardized police card rack style video processors, SENSYS detection equipment or loop detector equipment. The cabinet assembly shall be warranted against defect in workmanship and material for a period of one year from date of installation, not to exceed 18 months.

All internal cabinet wiring shall be neat in appearance. All cables for connection to the cabinet assembly shall be installed in a neat and organized manner. The MMU shall include two high contrast, large area LCD displays to continuously display the browser and menu options. The keyboard shall be provided with a clear and logical layout for easy operation. The keyboard shall be equipped with a numeric keypad and a function key row. The display shall be capable of displaying a maximum of 25 lines of text per page. The MMU shall be designed to provide a user interface to status, signal voltages and event logs. The event logs shall be provided with a clear and logical layout for easy operation. The keyboard shall be provided with a clear and logical layout for easy operation.

All load switch, flash transfer relay and flasher sockets shall be wired with NEMA load switches. Flash transfer relays shall be wired such that in the normal operating mode they shall be de-energized. Each load switch shall be wired such that in the normal operating mode they shall be de-energized. The police control panel shall also include a phone jack to provide for the insertion of a telephone or telegraph line. The phone jack shall be wired such that the line shall provide for the insertion of a telephone or telegraph line. The phone jack shall be wired such that the line shall provide for the insertion of a telephone or telegraph line.
video detection processor (VDP) capable of processing from one to four video streams to detect vehicles on a roadway using only video images of vehicle traffic. This specification sets forth the minimum requirements for a system that shall be compatible with VRAS video detector firmware shall be activated unless otherwise stated in the plans or special conditions.

2.29.7 Controller Housing

In addition to NEMA requirements, the controller shall provide the following:

- Seven slots with card guides for standard 3U size Versa Module Europe (VME) option and for 3U size PC/104 cards, which are not specified in the NEMA standard.

2.30.2 Logic Inputs

Logos inputs shall be planned in a variety of configurations to allow maximum deployment flexibility. Each configuration shall have an identifiable input to the systemsv of the configuration. The input protocol to each configuration shall be identified and shall be harmonized with the configuration identification. Ports shall be multi-purpose inputs suitable for deployment as described in Table 2.30.1.

2.30.3 Logic Outputs

Logic outputs shall be planned in a variety of configurations to allow maximum deployment flexibility. Each configuration shall have an identifiable input to the systemsv of the configuration. The input protocol to each configuration shall be identified and shall be harmonized with the configuration identification. Ports shall be multi-purpose inputs suitable for deployment as described in Table 2.30.1.

The proposed VDS shall be available in various configurations to allow maximum deployment flexibility. Each configuration shall have an identifiable input to the systemsv of the configuration. The input protocol to each configuration shall be identified and shall be harmonized with the configuration identification. Ports shall be multi-purpose inputs suitable for deployment as described in Table 2.30.1.

The proposed VDS shall be available in various configurations to allow maximum deployment flexibility. Each configuration shall have an identifiable input to the systemsv of the configuration. The input protocol to each configuration shall be identified and shall be harmonized with the configuration identification. Ports shall be multi-purpose inputs suitable for deployment as described in Table 2.30.1.

The proposed VDS shall be available in various configurations to allow maximum deployment flexibility. Each configuration shall have an identifiable input to the systemsv of the configuration. The input protocol to each configuration shall be identified and shall be harmonized with the configuration identification. Ports shall be multi-purpose inputs suitable for deployment as described in Table 2.30.1.
sensor shall be supplied by the VDS manufacturer.

- The VDS camera shall be compatible with all VDP platforms identified in Table 1. The VDS camera of the lens functions at low temperatures and prevent moisture condensation using an Oxide heater design that maximizes heat transfer to the lens. The output of the camera assembly can be accomplished independently without affecting the user. When the camera and lens are mounted inside the enclosure.

- The lens shall also have an auto-focus feature with a manual override to facilitate user input. The lens shall have a focal length of 3.25mm and shall be equipped with a variable focus range from 1/60th to 1/90,000th second.

- The camera shall include a variable focal length lens with a focal length range from 1.0 lux to 10,000 lux. Measurement of satisfactory video shall be based upon VDP system operation. The camera shall be housed in a weather-tight sealed enclosure. The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The video signal shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The video signal shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.

- The camera shall be powered by 120-240 VAC @ 50/60 Hz. Power shall be isolated from the camera enclosure and power to be removed or installed protective cap.
The wireless battery powered magnetometer vehicle detection system (VDS) shall include the software necessary to configure the AP. The VSN shall include the software necessary to store and retrieve detection data.

2.3.2 Configuration Software

• The VSN shall include the software necessary to configure the VSN.
• The VSN shall include the software necessary to store and retrieve detection data.

2.3.3 Limited Warranty

• The supplier shall provide a limited two-year warranty on the detection equipment, which shall be extended to three years if the customer purchases a three-year maintenance agreement.
• The warranty shall cover all parts and labor for the installation and operation of the system, including the central control unit, push button station, and traffic signal controller cabinet.

2.3.4 Design Considerations

Subsequent to installation of the wireless battery powered magnetometer vehicle detection system (VDS) in the intersection, the system shall be tested for functionality and performance. The testing shall include:

• The system shall transmit the functional requirements of NEMA 2009.4.6

2.3.5 AP Hardware

• The VDS shall be the communication hub of the network.
• The VSN shall be capable of communicating to up to 24 AP's.

2.3.6 Power Supply

• The VDS shall be capable of providing power to the AP and VSN through an Ethernet cable.

2.3.7 Interface Device Hardware

• An EIA-232 communications port shall be provided for local and remote system control.
• Power supply. No adapters shall be required to mount the interface device in a standard rack and shall provide a loop-type handle for easy installation and removal.

2.3.8 Video Ports

• Video inputs and video output shall be made via BNC connectors to ensure signal integrity.

2.3.9 Central Control Unit (CC) & Ped Station Monitor (PSM) Enclosures

• The CC and PSM enclosures shall provide protection for the system components and shall be NEMA 4X rated and IP67 rated.
• The CC and PSM enclosures shall be designed to provide both a push button with a raised vibrating tactile arrow and an ambient noise sensing microphone, which are designed to provide both push button and vibrotactile feedback to the pedestrian.
• The push button shall be located on the front of the enclosure with a tactile arrow located on the back of the enclosure.

2.3.10 Pedestrian Push Button Station (PBS) Enclosures

• The PBS enclosures shall meet NEMA 250 Type 4X standards, shall be certified by the UL, and shall provide a protective barrier between the pedestrian and the vehicular traffic.
• The PBS enclosures shall provide protection for the pedestrian push button, vibrotactile arrow, and ambient noise sensing microphone.
• The PBS enclosures shall be designed to provide both a push button with a raised vibrating tactile arrow and an ambient noise sensing microphone, which are designed to provide both push button and vibrotactile feedback to the pedestrian.
• The push button shall be located on the front of the enclosure with a tactile arrow located on the back of the enclosure.

2.3.11 Loop Detector System

• Inductive loops are rarely used in current projects but they are useful in areas where there is a need for multiple locations to detect vehicles in real-time. The area covered by an inductive loop detector is approximately 12 inches by 12 inches, and this area is generally referred to as a loop. The loops are used to detect vehicles passing through them, and this information is used to control traffic signals, monitor traffic flows, and other purposes. The inductive loop detector is a simple and easy to install device that can be installed in the road or in the pavement, and it is widely used in traffic control systems.

2.3.12 Wireless Battery Magnetometer Vehicle Detection System

• The wireless battery magnetometer vehicle detection system (VDS) includes a magnetic field sensor and a wireless receiver to detect the presence of vehicles on the roadway.
• The wireless receiver transmits the data to a central control unit, which processes the data and provides information to traffic control systems.

2.3.13 Accessible Pedestrian Signal Units

• The system shall be compatible with all National Highway Traffic Safety Administration (NHTSA) certified pedestrian signal units.
• The system shall support both push button and vibrotactile feedback to the pedestrian.

2.3.14 Audio/Visual Pedestrian Signal System

• The system shall include a central control unit, push button station, and traffic signal controller cabinet.
• The system shall work with the vendor Windows XP/7/Vista PC-based program to control the system.

2.3.15 Roadway Accessible Pedestrian Signal (APS)

• The system shall include a central control unit, push button station, and traffic signal controller cabinet.
• The system shall work with the vendor Windows XP/7/Vista PC-based program to control the system.

2.3.16 Field Installation

• The system shall be installed in a manner that ensures proper operation and accessibility for all users.
• The system shall be tested for functionality and performance after installation.

2.3.17 System Operation

• The system shall be capable of operating in a variety of weather conditions and traffic volumes.
• The system shall provide a reliable and effective method for controlling the flow of vehicular traffic and enhancing pedestrian safety.

2.3.18 System Maintenance

• The system shall be regularly maintained to ensure proper operation and accessibility for all users.
• The system shall be tested for functionality and performance after maintenance.

2.3.19 System Disposal

• The system shall be disposed of in an environmentally safe manner.
• The system shall be dismantled and recycled to ensure proper disposal of hazardous materials.
2.41 Maintenance and Support

2.4.1.1 Maintenance and Support

The contractor shall maintain and service the traffic control devices installed as required by the traffic control plan and the MUTCD. All traffic control devices shall remain in a serviceable condition, and the contractor shall provide replacement parts and service as required.

2.4.1.2 Service Boxes

Service boxes shall be installed in accordance with the specifications and the plans. The service boxes shall be located at the appropriate locations as shown on the plans and in accordance with the MUTCD. The service boxes shall be of the appropriate size to accommodate the electrical needs of the traffic control devices.

2.4.1.3 Control Boxes

Control boxes shall be installed in accordance with the specifications and the plans. The control boxes shall be located at the appropriate locations as shown on the plans and in accordance with the MUTCD. The control boxes shall be of the appropriate size to accommodate the electrical needs of the traffic control devices.

2.4.1.4 Wiring

Wiring shall be installed in accordance with the specifications and the plans. The wiring shall be of the appropriate type and size to accommodate the electrical needs of the traffic control devices. All wiring shall be installed in accordance with the latest edition of the National Electrical Code.

2.4.1.5 Power Supply

Power supply shall be installed in accordance with the specifications and the plans. The power supply shall be of the appropriate type and size to accommodate the electrical needs of the traffic control devices. The power supply shall be installed in accordance with the latest edition of the National Electrical Code.

2.4.1.6 Sign Maintenance

Sign maintenance shall be performed in accordance with the specifications and the plans. The signs shall be maintained and serviced as required by the traffic control plan and the MUTCD.

2.4.1.7 Sign Replacement

Sign replacement shall be performed in accordance with the specifications and the plans. The signs shall be replaced as required by the traffic control plan and the MUTCD.

2.4.1.8 Sign Installation

Sign installation shall be performed in accordance with the specifications and the plans. The signs shall be installed at the appropriate locations as shown on the plans and in accordance with the MUTCD.

2.4.1.9 Sign Storage

Sign storage shall be performed in accordance with the specifications and the plans. The signs shall be stored at the appropriate locations as shown on the plans and in accordance with the MUTCD.

2.4.1.10 Sign Maintenance Checklist

Sign maintenance checklist shall be maintained in accordance with the specifications and the plans. The checklist shall be updated as required by the traffic control plan and the MUTCD.

2.4.1.11 Sign Replacement Checklist

Sign replacement checklist shall be maintained in accordance with the specifications and the plans. The checklist shall be updated as required by the traffic control plan and the MUTCD.

2.4.1.12 Sign Installation Checklist

Sign installation checklist shall be maintained in accordance with the specifications and the plans. The checklist shall be updated as required by the traffic control plan and the MUTCD.

2.4.1.13 Sign Storage Checklist

Sign storage checklist shall be maintained in accordance with the specifications and the plans. The checklist shall be updated as required by the traffic control plan and the MUTCD.

2.4.1.14 Sign Maintenance Audit

Sign maintenance audit shall be performed in accordance with the specifications and the plans. The audit shall be conducted at the appropriate intervals as shown on the plans and in accordance with the MUTCD.

2.4.1.15 Sign Replacement Audit

Sign replacement audit shall be performed in accordance with the specifications and the plans. The audit shall be conducted at the appropriate intervals as shown on the plans and in accordance with the MUTCD.

2.4.1.16 Sign Installation Audit

Sign installation audit shall be performed in accordance with the specifications and the plans. The audit shall be conducted at the appropriate intervals as shown on the plans and in accordance with the MUTCD.

2.4.1.17 Sign Storage Audit

Sign storage audit shall be performed in accordance with the specifications and the plans. The audit shall be conducted at the appropriate intervals as shown on the plans and in accordance with the MUTCD.

2.4.1.18 Sign Maintenance Report

Sign maintenance report shall be maintained in accordance with the specifications and the plans. The report shall be updated as required by the traffic control plan and the MUTCD.

2.4.1.19 Sign Replacement Report

Sign replacement report shall be maintained in accordance with the specifications and the plans. The report shall be updated as required by the traffic control plan and the MUTCD.

2.4.1.20 Sign Installation Report

Sign installation report shall be maintained in accordance with the specifications and the plans. The report shall be updated as required by the traffic control plan and the MUTCD.

2.4.1.21 Sign Storage Report

Sign storage report shall be maintained in accordance with the specifications and the plans. The report shall be updated as required by the traffic control plan and the MUTCD.
The signal turn-on shall not occur on Fridays, holidays, after 5:00 p.m. on Tuesday through Thursday, or during the weekend. New signals shall not operate without proper traffic control signal, and only after every control for the previous week has been completed. The Contractor shall be responsible for maintaining the traffic signal system during the warranty period. The Contractor shall be responsible for ensuring that all equipment is installed in accordance with the recommendations and the requirements of the TACTICS field manual and the manufacturer's recommendations. Failure to follow manufacturer's recommendations will make components fail early or never function properly. All components of pavement sensor systems shall be installed in accordance with the manufacturer's recommendations and the requirements of the standard drawings. The holes for the sensor heads shall be plumbed as viewed from the direction in which the face.

3.3.12.2 All traffic signal installation elements shall function properly as a system of components. The contractor shall be responsible for ensuring that all equipment is installed in accordance with the recommendations and the requirements of the TACTICS field manual and the manufacturer's recommendations. Failure to follow manufacturer's recommendations will make components fail early or never function properly. All components of pavement sensor systems shall be installed in accordance with the manufacturer's recommendations and the requirements of the standard drawings. The holes for the sensor heads shall be plumbed as viewed from the direction in which the face.

3.3.12.6 The existing signal controls shall be kept in operation during installation of the proposed improvements. The Contractor shall be responsible for maintaining the traffic signal system during the warranty period. The Contractor shall be responsible for ensuring that all equipment is installed in accordance with the recommendations and the requirements of the TACTICS field manual and the manufacturer's recommendations. Failure to follow manufacturer's recommendations will make components fail early or never function properly. All components of pavement sensor systems shall be installed in accordance with the manufacturer's recommendations and the requirements of the standard drawings. The holes for the sensor heads shall be plumbed as viewed from the direction in which the face.

3.3.12.7 Ongoing traffic signal controls shall be kept in operation during installation of the proposed improvements. The Contractor shall be responsible for ensuring that all equipment is installed in accordance with the recommendations and the requirements of the TACTICS field manual and the manufacturer's recommendations. Failure to follow manufacturer's recommendations will make components fail early or never function properly. All components of pavement sensor systems shall be installed in accordance with the manufacturer's recommendations and the requirements of the standard drawings. The holes for the sensor heads shall be plumbed as viewed from the direction in which the face.

3.3.12.8 The signal turn-on shall not occur on Fridays, holidays, after 5:00 p.m. on Tuesday through Thursday, or during the weekend. New signals shall not operate without proper traffic control signal, and only after every control for the previous week has been completed. The Contractor shall be responsible for maintaining the traffic signal system during the warranty period. The Contractor shall be responsible for ensuring that all equipment is installed in accordance with the recommendations and the requirements of the TACTICS field manual and the manufacturer's recommendations. Failure to follow manufacturer's recommendations will make components fail early or never function properly. All components of pavement sensor systems shall be installed in accordance with the manufacturer's recommendations and the requirements of the standard drawings. The holes for the sensor heads shall be plumbed as viewed from the direction in which the face.

3.3.12.9 Ongoing traffic signal controls shall be kept in operation during installation of the proposed improvements. The Contractor shall be responsible for ensuring that all equipment is installed in accordance with the recommendations and the requirements of the TACTICS field manual and the manufacturer's recommendations. Failure to follow manufacturer's recommendations will make components fail early or never function properly. All components of pavement sensor systems shall be installed in accordance with the manufacturer's recommendations and the requirements of the standard drawings. The holes for the sensor heads shall be plumbed as viewed from the direction in which the face.

3.3.12.10 The signal turn-on shall not occur on Fridays, holidays, after 5:00 p.m. on Tuesday through Thursday, or during the weekend. New signals shall not operate without proper traffic control signal, and only after every control for the previous week has been completed. The Contractor shall be responsible for maintaining the traffic signal system during the warranty period. The Contractor shall be responsible for ensuring that all equipment is installed in accordance with the recommendations and the requirements of the TACTICS field manual and the manufacturer's recommendations. Failure to follow manufacturer's recommendations will make components fail early or never function properly. All components of pavement sensor systems shall be installed in accordance with the manufacturer's recommendations and the requirements of the standard drawings. The holes for the sensor heads shall be plumbed as viewed from the direction in which the face.

3.3.12.11 Ongoing traffic signal controls shall be kept in operation during installation of the proposed improvements. The Contractor shall be responsible for ensuring that all equipment is installed in accordance with the recommendations and the requirements of the TACTICS field manual and the manufacturer's recommendations. Failure to follow manufacturer's recommendations will make components fail early or never function properly. All components of pavement sensor systems shall be installed in accordance with the manufacturer's recommendations and the requirements of the standard drawings. The holes for the sensor heads shall be plumbed as viewed from the direction in which the face.

3.3.12.12 The signal turn-on shall not occur on Fridays, holidays, after 5:00 p.m. on Tuesday through Thursday, or during the weekend. New signals shall not operate without proper traffic control signal, and only after every control for the previous week has been completed. The Contractor shall be responsible for maintaining the traffic signal system during the warranty period. The Contractor shall be responsible for ensuring that all equipment is installed in accordance with the recommendations and the requirements of the TACTICS field manual and the manufacturer's recommendations. Failure to follow manufacturer's recommendations will make components fail early or never function properly. All components of pavement sensor systems shall be installed in accordance with the manufacturer's recommendations and the requirements of the standard drawings. The holes for the sensor heads shall be plumbed as viewed from the direction in which the face.

3.3.12.13 Ongoing traffic signal controls shall be kept in operation during installation of the proposed improvements. The Contractor shall be responsible for ensuring that all equipment is installed in accordance with the recommendations and the requirements of the TACTICS field manual and the manufacturer's recommendations. Failure to follow manufacturer's recommendations will make components fail early or never function properly. All components of pavement sensor systems shall be installed in accordance with the manufacturer's recommendations and the requirements of the standard drawings. The holes for the sensor heads shall be plumbed as viewed from the direction in which the face.

3.3.12.14 The signal turn-on shall not occur on Fridays, holidays, after 5:00 p.m. on Tuesday through Thursday, or during the weekend. New signals shall not operate without proper traffic control signal, and only after every control for the previous week has been completed. The Contractor shall be responsible for maintaining the traffic signal system during the warranty period. The Contractor shall be responsible for ensuring that all equipment is installed in accordance with the recommendations and the requirements of the TACTICS field manual and the manufacturer's recommendations. Failure to follow manufacturer's recommendations will make components fail early or never function properly. All components of pavement sensor systems shall be installed in accordance with the manufacturer's recommendations and the requirements of the standard drawings. The holes for the sensor heads shall be plumbed as viewed from the direction in which the face.

3.3.12.15 Ongoing traffic signal controls shall be kept in operation during installation of the proposed improvements. The Contractor shall be responsible for ensuring that all equipment is installed in accordance with the recommendations and the requirements of the TACTICS field manual and the manufacturer's recommendations. Failure to follow manufacturer's recommendations will make components fail early or never function properly. All components of pavement sensor systems shall be installed in accordance with the manufacturer's recommendations and the requirements of the standard drawings. The holes for the sensor heads shall be plumbed as viewed from the direction in which the face.
ITS CABINET PAD NOTES:
1. ALL CONDUITS SHALL BE RIGIDLY INSTALLED BEFORE CONCRETE IS PLACED.
2. TOP OF PAD TO BE SLOPED TO DRAIN.
3. A #4 SMOOTH COPPER SYSTEM GROUND CABLE SHALL BE INSTALLED THROUGH ONE OF THE PVC CONDUITS BETWEEN THE CONTROLLER AND CLOSEST SERVICE BOX.
4. DUCT SEAL SHALL BE APPLIED AT ALL CONDUIT ENTRANCES AFTER CABLE INSTALLATION.
5. A WATERTIGHT SEAL SHALL BE APPLIED ALONG THE INSIDE AND OUTSIDE EDGES OF THE CABINET WHERE IT ATTACHES TO THE CONCRETE PAD.

TRAFFIC CONTROL
CABINET
SCREENED LOUVERS WITH GUARD PLATES

ISOMETRIC

ELEVATION A-A

SECTION B-B

ELEVATION

PLAN

ISOMETRIC

CONDUITS AS REQUIRED IN PLANS

#4 REBAR - HORIZ/VERT

FACTORY BEND OR ELBOW

30° 34° 30°

CONDUIT AREA 8" X 12"

RAISED CONCRETE PAD
TYPICAL - UNPAVED AREAS, SIDEWALKS, PAVED AREAS

8" LAYER OF 1/2" CLEAN CRUSHED ROCK

CHAMFER ALL TOP EDGES

11" 3"

5. A WATERTIGHT SEAL SHALL BE APPLIED ALONG THE INSIDE AND OUTSIDE EDGES OF THE CABINET WHERE IT ATTACHES TO THE CONCRETE PAD.
## Type 170 Double Wide Cabinet and Base Details

### CABINET AND BASE DETAILS

**ISOMETRIC**

- **TYPE 170 DOUBLE WIDE CABINET**
- **TYPE 170 DOUBLE WIDE CABINET BASE**

**PLAN**

- **CONDUITS AS REQUIRED IN PLANS**
- **NO CONDUITS SHALL BE INSTALLED IN THIS AREA**
- **#4 REBAR - HORIZ./VERT.**

**ELEVATION A-A**

- **FACTORY BEND OR ELBOW**
- **28"**
- **30"**
- **34"**
- **30"**

**SECTION B-B**

- **CHAMFER ALL TOP EDGES**
- **ITS CABINET PAD NOTES:**
  1. ALL CONDUITS SHALL BE RIGIDLY INSTALLED BEFORE CONCRETE IS PLACED.
  2. TOP OF PAD TO BE SLOPED TO DRAIN.
  4. DUCT SEAL SHALL BE APPLIED AT ALL CONDUIT ENTRANCES AFTER CABLE INSTALLATION.
  5. A WATERPROOF SEAL SHALL BE APPLIED ALONG THE INSIDE AND OUTSIDE EDGES OF THE CABINET WHERE IT ABUTS TO THE CONCRETE PAD.

**ELEVATION**

- **SCREENED LOCATORS WITH GUARD PLATES**
- **10" LAYER OF 1/2" CLEAN CRUSHED ROCK**
- **8" LAYER OF 10" CLEAN CRUSHED ROCK**

---

**ITS SYSTEM DETAILS 2 OF 5**

**CITY OF KANSAS CITY, KANSAS**

**PUBLIC WORKS DEPARTMENT**

**TRAFFIC DIVISION**

**DRAWN:**

**DESIGNED:**

**CHECKED:**

**SCALE:**

**DATE:** 5/22/08

**N/A**
COMMUNICATIONS + 1 CABINET

COMMUNICATIONS + 1 CABINET PAD BASE

1. All conduits shall be rigidly installed before concrete is placed.
2. Top of pad to be sloped to drain.
3. Two 1-1/4" solid copper system ground cables shall be installed through one of the PVC conduits between the cabinet and closest service box for both the controller and communications sides of the cabinet.
4. Duct seal shall be applied at all conduit entrances after cable installation.
5. A watertight seal shall be applied along the inside and outside edges of the cabinet where it abuts to the concrete pad.

NOTE: THIS DETAIL IS FOR TWO DISTINCT CABINETS. EACH SHALL HAVE SEPARATE GROUNDING PROVIDED THROUGH ITS PVC CONDUIT TO ITS NEAREST SERVICE BOX.
NO CONDUITS SHALL BE INSTALLED IN THIS AREA

ITS CABINET PAD NOTES:
1. ALL CONDUITS SHALL BE RIGIDLY INSTALLED BEFORE CONCRETE IS PLACED.
2. TOP OF PAD TO BE SLOPED TO DRAIN.
3. TWO 1/0-6 SOLID COPPER SYSTEM GROUND CABLES SHALL BE INSTALLED THROUGH ONE OF THE PVC CONDUITS BETWEEN THE CABINET AND CLOSEST SERVICE BOX FOR BOTH THE CONTROLLER AND COMMUNICATIONS SIDES OF THE CABINET.
4. DUCT SEAL SHALL BE APPLIED AT ALL CONDUIT ENTRANCES AFTER CABLE INSTALLATION.
5. A WATERSTOP SEAL SHALL BE APPLIED ALONG THE INSIDE AND OUTSIDE EDGES OF THE CABINET WHERE IT ABUTS TO THE CONCRETE PAD.

ITS SYSTEM DETAILS 4 OF 5
TYPE 170 DOUBLE WIDE +1 CABINET AND BASE DETAILS
CITY OF KANSAS CITY, KANSAS
PUBLIC WORKS DEPARTMENT
TRAFFIC DIVISION

CONDUITS AS REQUIRED IN PLANS

FACTORY BEND OR ELBOW

RAISED CONCRETE PAD - TYPICAL - UNPAVED AREAS, SIDEWALKS, PAVED AREAS

ISOMETRIC

PLAN

ELEVATION A-A

SECTION B-B

8" LAYER OF 1/2" CLEAN CRUSHED ROCK

34" X 34" CONDUIT AREA

CHAMFER ALL TOP EDGES

TOP EDGES CHAMFER ALL

THE CONCRETE PAD.

AND OUTSIDE EDGES OF THE CABINET WHERE IT ABUTS TO A WATERTIGHT SEAL SHALL BE APPLIED ALONG THE INSIDE 5.

AFTER CABLE INSTALLATION 4.

THE CABINET AND CLOSEST SERVICE BOX FOR BOTH THE CONTROLLER AND COMMUNICATIONS SIDES OF THE CABINET.

TWO 1/0-6 SOLID COPPER SYSTEM GROUND CABLES SHALL BE INSTALLED THROUGH ONE OF THE PVC CONDUITS BETWEEN THE CABINET AND CLOSEST SERVICE BOX FOR BOTH THE CONTROLLER AND COMMUNICATIONS SIDES OF THE CABINET.

Duct seal shall be applied at all conduit entrances after cable installation.

A waterstop seal shall be applied along the inside and outside edges of the cabinet where it abuts to the concrete pad.

1. All conduits shall be rigidly installed before concrete is placed.

2. Top of pad to be sloped to drain.

3. Two 1/0-6 solid copper system ground cables shall be installed through one of the PVC conduits between the cabinet and closest service box for both the controller and communications sides of the cabinet.

4. Duct seal shall be applied at all conduit entrances after cable installation.

5. A waterstop seal shall be applied along the inside and outside edges of the cabinet where it abuts to the concrete pad.
NOTES:
1. ITS SERVICE BOXES SHALL BE ARMORCAST BRAND 30" X 48" OR 36" X 60" POLYMER COMPOSITES, STACKABLE FOR VARYING DEPTHS, RATED FOR 20,000 LBS. LOADING, AND WITH HEAVY DUTY COVERS MEETING DESIGN LOADS OF 22,500 LBS. MINIMUM. BOXES SHALL NOT HAVE BOTTOMS.

2. BOXES ARE NOT TO BE SLOTTED FOR PLACEMENT OVER EXISTING CONDUITS.

3. CONDUITS SHALL NOT BE ELBOWED UP FOR ENTRY THROUGH BOX BOTTOM.

4. ALL INTERCONNECT CONDUITS SHALL BE HDPE SDR 11, BLACK WITH THREE RED STRIPES.

5. AN 6 INCH THICK LAYER OF 1/2 INCH AGGREGATE SHALL BE PROVIDED UNDER ALL SERVICE BOXES.

CONSTRUCTION PROCEDURE FOR OPTICAL FIBER SERVICE BOXES:

1. BOX SHALL BE SET TO LINE AND GRADE.

2. 20 FT LONG PIECES OF CONDUIT SHALL BE INSERTED THROUGH DRILLED HOLES TO FACILITATE FIBER PULLING. CENTER OF CONDUIT PIECES SHALL BE IN CENTER OF BOX.

3. CUT CONDUIT AT CENTER OF BOX AND PULL CONDUIT BACK OR REMOVE MIDDLE PORTION LEAVING 6" OF CONDUIT REMAINING IN THE BOX FOR BOTH ENDS OF CONDUIT. CONDUIT FROM BOX SHALL BE FUSION SPLICED TO MAIN LINE CONDUIT.

4. FIBER CONDUIT SHALL BE 48" DEEP AT THE BOX. FIBER OPTIC CONDUIT SHALL BE 48" DEEP BETWEEN BOXES.

5. FIBER CONDUIT MAY BE FUSION SPLICED TO MAIN LINE FIBER OPTIC CONDUIT, WHERE REQUIRED, A MINIMUM OF 10 FEET AWAY FROM CENTER OF BOX.

6. FIBER CONDUIT HOLES SHALL BE SEALED ON INSIDE AND OUTSIDE OF BOX.
SECONDARY SERVICE DETAIL

BY B.P.U.

CONNECTION
120 V SERVICE
ENTRANCE WITH
COVER

COMPLETE CABLE HOOK-UP. CONTRACTOR TO COORDINATE RISER
HEAD, AND ELECTRICAL ENCLOSURE (IF APPLICABLE). CONTRACTOR TO
SERVICE BOX TO AND UP POLE INCLUDING RISER, STANDOFFS, ENTRANCE
FOR INSTALLING POWER SERVICE CONDUIT AND CABLE FROM MAIN
TRANSFORMER TO MAIN SERVICE BOX. CONTRACTOR IS RESPONSIBLE
# 2 URD DUPLEX OR TRIPLEX CABLE WILL BE INSTALLED FROM
MAIN SERVICE BOX
TO 2' ABOVE GROUND AT BASE
OF SERVICE PILE.

# 2 URD DUOPEX OR TRIPLEX CABLE WILL BE INSTALLED FROM
TRANSFORMER TO MAIN SERVICE BOX. CONTRACTOR IS RESPONSIBLE
FOR INSTALLING POWER SERVICE CONDUIT AND CABLE FROM MAIN
SERVICE BOX TO AND UP POLE INCLUDING RISER, STANDOFFS, ENTRANCE
HEAD, AND ELECTRICAL ENCLOSURE. IF APPLICABLE, CONTRACTOR TO
LEAVE POWER CABLE UNCONNECTED AT ENTRANCE HEAD. BPU WILL
COMPLETE CABLE HOOK-UP. CONTRACTOR TO COORDINATE RISER
HEIGHT AND QUANTITY OF EXCESS CABLE AT ENTRANCE HEAD WITH BPU.

TRAFFIC SIGNAL DETAILS 1 OF 12
NEMA TYPE P AND R CONTROLLER
BASE AND POWER DETAILS
CITY OF KANSAS CITY, KANSAS
PUBLIC WORKS DEPARTMENT
TRAFFIC DIVISION

CONTROLLER PAD TYPE "P" OR "R" DETAILS

NOTES:
1) TYPICAL CABINET PAD INSTALLATIONS WILL
HAVE 2-4", 2-3", 2-2", AND 1-1" SCH. 80 PVC
CONDUITS RUNNING TO CABINET SERVICE
BOX.
2) CONCRETE FOR PAD SHALL BE
COMMERCIAL GRADE.

ANCHOR BOLTS
AS REQUIRED

PLAN

ELEVATION A/A

ELEVATION B/B

ISOMETRIC

CONDUIT FROM SERVICE BOX
TO 2' ABOVE GROUND AT BASE
OF SERVICE POLE.

MAIN SERVICE BOX

CONDUCTOR CONDUITS
2-4" (SCH. 80 PVC)
2-3" (SCH. 80 PVC)
2-2" (SCH. 80 PVC)
1-1" (SCH. 80 PVC)

NOTES:
SEE NOTE 1

GRAY SCHEDULE 80
PVC RISER, OR "P" STEEL, IF
REQUIRED BY BPU.

2" (MIN) GRAY SCHEDULE 80
PVC RISER, OR "P" STEEL, IF
REQUIRED BY BPU.

CONTRACTOR TO INSTALL 2"
GRAY PVC SCHEDULE 80
CONDUIT FROM SERVICE BOX
TO 2' ABOVE GROUND AT BASE
OF SERVICE POLE.

TEMPLE ELECTRIC
STANION ELECTRIC
NORTH SUPPLY
AVAILABLE AT:
McGRAW EDISON # DR2E2
BRACKET JOSLYN # 2357 OR
10" SECONDARY EXTENSION

CONDUIT
GRAY PVC (SCHEDULE 80)

ANCHOR BOLTS
AS REQUIRED

CONDUIT FROM SERVICE BOX
TO 2' ABOVE GROUND AT BASE
OF SERVICE POLE.

MAIN SERVICE BOX

GRAY SCHEDULE 80
PVC RISER, OR "P" STEEL, IF
REQUIRED BY BPU.

CONTRACTOR TO INSTALL 2"
GRAY PVC SCHEDULE 80
CONDUIT FROM SERVICE BOX
TO 2' ABOVE GROUND AT BASE
OF SERVICE POLE.

MAIN SERVICE BOX

GRAY SCHEDULE 80
PVC RISER, OR "P" STEEL, IF
REQUIRED BY BPU.

CONTRACTOR TO INSTALL 2"
GRAY PVC SCHEDULE 80
CONDUIT FROM SERVICE BOX
TO 2' ABOVE GROUND AT BASE
OF SERVICE POLE.

MAIN SERVICE BOX

GRAY SCHEDULE 80
PVC RISER, OR "P" STEEL, IF
REQUIRED BY BPU.

CONTRACTOR TO INSTALL 2"
GRAY PVC SCHEDULE 80
CONDUIT FROM SERVICE BOX
TO 2' ABOVE GROUND AT BASE
OF SERVICE POLE.

MAIN SERVICE BOX

GRAY SCHEDULE 80
PVC RISER, OR "P" STEEL, IF
REQUIRED BY BPU.

CONTRACTOR TO INSTALL 2"
GRAY PVC SCHEDULE 80
CONDUIT FROM SERVICE BOX
TO 2' ABOVE GROUND AT BASE
OF SERVICE POLE.

MAIN SERVICE BOX

GRAY SCHEDULE 80
PVC RISER, OR "P" STEEL, IF
REQUIRED BY BPU.
CONTROLLER CABINET, TYPES "P" AND "R"
(TYPE P CABINET TO BE SUPPLIED WITH 3 SHELVES, TYPE R CABINET TO BE SUPPLIED WITH 4 SHELVES)

CONTROLLER CABINET, TYPES "G" AND "H"
(TYPE P CABINET TO BE SUPPLIED WITH 3 SHELVES, TYPE R CABINET TO BE SUPPLIED WITH 4 SHELVES)

ISOMETRIC

SCREENED VENT

REINFORCEMENT FOR CONDUIT ENTRANCE AND ATTACHMENT.

ISOMETRIC

OPTIONAL SHELF MOUNT

STANDARD SHELF MOUNT

ELEVATION

27 1/2"

48" MIN.

72" MIN. (TYPE R)

60" MIN. (TYPE P)

41 1/2" OPENING

44" MIN.

24" MIN.

SECTION

20 1/2"

16 1/2" - 20 1/2" MIN.

NOTES:
1. THE CONTROLLER CABINET FINISH SHALL BE NATURAL ALUMINUM.
2. THE MATERIAL SHALL BE 0.125" THICK ALUMINUM.
3. POLE ATTACHMENT HARDWARE FOR TWO-POINT ATTACHMENT SHALL BE PROVIDED FOR CONTROLLER CABINET TYPES G AND H.
4. HYBRID CABINETS SHALL NOT BE ACCEPTED.
**Concrete Footing Details**

For bases up to 20' or less, use 3" SCH 80 PVC conduit (to service box). For bases greater than 20', use 4" SCH 80 PVC conduit (to service box). Ground wire shall run from internal grounding nut to clamp on ground rod.

**Grading Note:**

Concrete bases shall be commercial grade.

**Drawing Information:**

City of Kansas City, Kansas
Public Works Department
Traffic Division

**Drawn:**

**Designed:**

**Checked:**

**Scale:**

**Date:**

**Revision:**

**Sheet No.:**

---

**PeDESTAL POLE ANCHOR BOLT SCHEDULE**

<table>
<thead>
<tr>
<th>BOLT SIZE</th>
<th>L</th>
<th>H</th>
<th>T</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>3' X 13'</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
</tbody>
</table>

**PeDESTAL POLE BASE SCHEDULE**

<table>
<thead>
<tr>
<th>BOLT SIZE</th>
<th>L</th>
<th>H</th>
<th>T</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>3' X 13'</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
</tbody>
</table>

**PeDESTAL POLE BASE SCHEDULE**

<table>
<thead>
<tr>
<th>POST FOOTING DIAMETER</th>
<th>DEPTH</th>
<th>&quot;V&quot; BARS</th>
<th>&quot;S&quot; BARS</th>
<th>BOLT CIRCLE (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20&quot; - 26&quot;</td>
<td>8&quot;</td>
<td>8-#6 bars x 2'-6&quot;</td>
<td>16-#5 bars</td>
<td>2'-0&quot;</td>
</tr>
<tr>
<td>27&quot; - 36&quot;</td>
<td>12&quot;</td>
<td>8-#6 bars x 3'-0&quot;</td>
<td>20-#5 bars</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>37&quot; - 48&quot;</td>
<td>16&quot;</td>
<td>8-#6 bars x 4'-0&quot;</td>
<td>24-#5 bars</td>
<td>4'-0&quot;</td>
</tr>
<tr>
<td>49&quot; - 60&quot;</td>
<td>20&quot;</td>
<td>8-#6 bars x 5'-0&quot;</td>
<td>28-#5 bars</td>
<td>5'-0&quot;</td>
</tr>
<tr>
<td>61&quot; - 72&quot;</td>
<td>24&quot;</td>
<td>8-#6 bars x 6'-0&quot;</td>
<td>32-#5 bars</td>
<td>6'-0&quot;</td>
</tr>
</tbody>
</table>

**MAST ARM POLE ANCHOR BOLT SCHEDULE**

<table>
<thead>
<tr>
<th>MAST ARM LENGTH</th>
<th>BOLT SIZE</th>
<th>L</th>
<th>H</th>
<th>T</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>20' OR LESS</td>
<td>3' X 13'</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>22' - 26'</td>
<td>3' X 13'</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>28' - 36'</td>
<td>3' X 13'</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>38' - 48'</td>
<td>3' X 13'</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>50' - 60'</td>
<td>3' X 13'</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
</tbody>
</table>

**MAST ARM POLE AND BASE SCHEDULE**

<table>
<thead>
<tr>
<th>MAST ARM LENGTH</th>
<th>FOOTING DIAMETER</th>
<th>DEPTH</th>
<th>&quot;V&quot; BARS</th>
<th>&quot;S&quot; BARS</th>
<th>BOLT CIRCLE (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20' OR LESS</td>
<td>9&quot;</td>
<td>6'-0&quot;</td>
<td>7-#6 bars x 3'-0&quot;</td>
<td>15-#5 bars @ 12'-0&quot;</td>
<td>16&quot;</td>
</tr>
<tr>
<td>22' - 26'</td>
<td>11'-0&quot;</td>
<td>8-#6 bars x 10'-0&quot;</td>
<td>20-#5 bars @ 12'-0&quot;</td>
<td>16&quot;</td>
<td></td>
</tr>
<tr>
<td>28' - 36'</td>
<td>13'-0&quot;</td>
<td>8-#6 bars x 12'-0&quot;</td>
<td>24-#5 bars @ 12'-0&quot;</td>
<td>17&quot;</td>
<td></td>
</tr>
<tr>
<td>38' - 48'</td>
<td>15'-0&quot;</td>
<td>8-#6 bars x 14'-0&quot;</td>
<td>28-#5 bars @ 12'-0&quot;</td>
<td>18&quot;</td>
<td></td>
</tr>
<tr>
<td>50' - 60'</td>
<td>17'-0&quot;</td>
<td>8-#6 bars x 16'-0&quot;</td>
<td>32-#5 bars @ 12'-0&quot;</td>
<td>21&quot;</td>
<td></td>
</tr>
</tbody>
</table>

* A structural analysis shall be done for mast arms lengths exceeding 65'.

---

**Traffic Signal Details 3 of 12**

City of Kansas City, Kansas
Public Works Department
Traffic Division
NOTE:
1. CABINET SERVICE BOXES AND INTERCONNECT SERVICE BOXES SHALL BE ARMORCAST BRAND 30" X 48" POLYMER COMPOSITES, STACKABLE FOR VARYING DEPTHS, RATED FOR 20,000 LBS. LOADING, AND WITH HEAVY DUTY COVERS MEETING DESIGN LOADS OF 22,000 LBS. MINIMUM BOXES SHALL NOT HAVE BOTTOM.
2. BOXES ARE NOT TO BE SLOTTED FOR PLACEMENT OVER EXISTING CONDUITS.
3. CONDUITS SHALL NOT BE EMBEDDED FOR ENTRY THROUGH BOX BOTTOM.
4. ALL INTERCONNECT CONDUITS SHALL BE HOPE BOX 11, BLACK WITH THREE RED STRIPES.
5. AN 6 INCH THICK LAYER OF 1/2 INCH AGGREGATE SHALL BE PROVIDED UNDER ALL PULL BOXES.
6. CONDUIT FROM SERVICE BOX AND CABINET SHALL BE SCHEDULE 80 PVC. ALL OTHER CONDUIT SHALL BE SCH. 80 PVC OR HEP.

CONSTRUCTION PROCEDURE FOR OPTICAL FIBER SERVICE BOXES:
1. BOX SHALL BE SET TO LINE AND GRADE.
2. BOXES ARE NOT TO BE SLOTTED FOR PLACEMENT OVER EXISTING CONDUITS.
3. CONDUITS SHALL NOT BE EMBEDDED FOR ENTRY THROUGH BOX BOTTOM.
4. ALL INTERCONNECT CONDUITS SHALL BE HOPE BOX 11, BLACK WITH THREE RED STRIPES.
5. AN 6 INCH THICK LAYER OF 1/2 INCH AGGREGATE SHALL BE PROVIDED UNDER ALL PULL BOXES.
6. CONDUIT FROM SERVICE BOX AND CABINET SHALL BE SCHEDULE 80 PVC. ALL OTHER CONDUIT SHALL BE SCH. 80 PVC OR HEP.

TRAFFIC SIGNAL DETAILS 4 OF 12
JUNCTION BOX AND SERVICE BOX DETAILS
CITY OF KANSAS CITY, KANSAS
PUBLIC WORKS DEPARTMENT
TRAFFIC DIVISION
STREET LIGHTING & SIGNAL POLE

PEDESTRIAN PUSH BUTTON

SECONDARY SERVICE DETAIL

FOR SPAN WIRE INSTALLATION

TYPICAL SPAN WIRE INSTALLATION

ALUMINUM SIGNAL PEDESTAL POLE

NOTES:
1. PEDESTRIAN PUSH BUTTON SHALL BE PARALLEL TO THE CROSSWALK AND FACING THE INTERSECTION.
2. COUNT DOWN TIMER SHALL FACE THE CROSSWALK.
VIDEO DETECTION CAMERA MOUNTING DETAILS

LUMINAIRE BRACKET MOUNT

POLE-SIDE MOUNT

MAST ARM MOUNT

NOTE:
1. ALL CONDUITS CONTAINING PTZ CABLES SHALL BE RED HDPE SCHEDULE 80 OR SCHEDULE 80 PVC UNLESS OTHERWISE NOTED.
2. PTZ CAMERA SHALL BE MOUNTED AND ORIENTATED SO THAT THE POLE ARM DOES NOT OBSCURE VIEW OF CAMERA.
3. MOUNTING BRACKET SHALL BE SKYBRACKET CABLE CLAMP KIT (888-888-1230 -6).

NOTE:
* TUBE EXTENSION SHALL BE 12" UNLESS OTHERWISE NOTED.
**QUADRAPOLE LOOP DETECTOR DETAIL**

- All Loops
  - 2" deep
  - 1-1/2" wide
  - 1-1/2" thick

- Detector Lead in Cable and Loop wire shall be continuous runs without splices. Twist loop wires 2 turns per foot between the detector lead in cable and loop.

- Loop slots cut in the base may be reduced in depth by the surface of the pavement.

- Fill slots with a hot-applied, rubberized asphalt sealant to within 1/8" of pavement surface.

- Detector lead in cable and loop wire shall be continuous runs without splices. Twist loop wires 2 turns per foot between the detector lead in cable and loop.

- Loop slots cut in the base may be reduced in depth by the surface course to be applied.

**ALTERNATE METHOD**

- Detector Lead in Cable and Loop wire shall be continuous runs without splices. Twist loop wires 2 turns per foot between the detector lead in cable and loop.

- Loop slots cut in the base may be reduced in depth by the surface of the pavement.

- Fill slots with a hot-applied, rubberized asphalt sealant to within 1/8" of pavement surface.

**MULTIPLE TURN LOOP DETECTOR DETAIL**

- One turn of all loops.
- 2" deep
- 1-1/2" wide
- 1-1/2" thick

- Detector Lead in Cable and Loop wire shall be continuous runs without splices. Twist loop wires 2 turns per foot between the detector lead in cable and loop.

- Loop slots cut in the base may be reduced in depth by the surface of the pavement.

- Fill slots with a hot-applied, rubberized asphalt sealant to within 1/8" of pavement surface.

**VEHICLE SENSOR NODE**

- **Node Installation**
  1. Prior to installation, note sensor's ID, lane number, and location in lane.
  2. Unless otherwise specified, install the sensor in the middle of the lane.
  3. Core a hole at least 2 1/2" deep, so that sensor will be a minimum of 6" below surface.
  4. Install sensor flat in the bored hole with arrow painted in direction of travel.
  5. If multiple sensors per lane are installed, they should be 20' apart, unless otherwise noted.

- **Paved Areas**
  - Top 2" of backfill to be constructed of same material as pavement surface.
  - 2" saw cut.
  - Backfill with diggable flowable fill or compacted 3/4" crushed stone.

- **Unpaved Areas**
  - Top 2" of backfill to be constructed of same material as pavement surface.
  - 2" saw cut.
  - Backfill with diggable flowable fill or compacted 3/4" crushed stone.

**VEHICLE SENSOR NETWORK**

- **Pole Mount Detail**
  - Street light or signal pole.
  - Mounting bracket manufacturer supplied.
  - Repeaters or access point antenna.

**Trenching**

- Paved Areas
  - Top 2" of backfill to be constructed of same material as pavement surface.
  - 2" saw cut.
  - Backfill with diggable flowable fill or compacted 3/4" crushed stone.

- Unpaved Areas
  - Top 2" of backfill to be constructed of same material as pavement surface.
  - 2" saw cut.
  - Backfill with diggable flowable fill or compacted 3/4" crushed stone.
**R10-10L**

**LEFT TURN SIGNAL**

- Drill one hole at stated dimensions. Level sign and drill the second hole.

---

**STREET NAME**

- Between words

---

**SIGN BRACKET DETAIL**

- 5/16" O.D. by 5/16" thick aluminum mounting bracket
- 5/16" x .025 stainless steel strap
- 1/2" stainless steel strap seal

Bolt holes shall be field drilled. Installation sequence shall be to loosely bolt sign to brackets. Band the brackets on mast arm and tighten the bolts during final tightening of bolt. The fiber washer shall be held in place so that it does not turn with the bolt. Improper tightening of bolt will result in sign face damage.

---

**R10-12**

**LEFT TURN YIELD ON GREEN**

- Drill one hole at stated dimensions. Level sign and drill the second hole.

---

**R10-SPECIAL**

**LEFT TURN YIELD ON FLASHING**

- Drill one hole at stated dimensions. Level sign and drill the second hole.

---

**TRAFFIC SIGNAL DETAILS 8 OF 12**

**SIGN DETAILS**

**CITY OF KANSAS CITY, KANSAS**

**PUBLIC WORKS DEPARTMENT**

**TRAFFIC DIVISION**

**NOTES:**
1. Overhead street name and regulatory signs shall be subsidiary to "traffic signal installation."
2. All overhead street name sign face sheeting shall be VIP sheeting.
3. All overhead street name signs shall have legends centered on the face. The letter spacing shall be 100% the spacing in FHWA's standard alphabets for highway signs.
4. Actual size drawings of the proposed signs shall be submitted to the engineer for approval.
5. Regulatory sign blanks shall be 0.080-inch aluminum. Mounting bracket and banding shown in the sign bracket detail shall be used.

---

**COLORS**

- Legend: Black (Non-Reflective)
- Background: White (Reflective)

---

**CITY OF KANSAS CITY, KANSAS PUBLIC WORKS DEPARTMENT TRAFFIC DIVISION**

**DATE:** 3/20/2017

**CADconform Certify This File**

---

**CHECKED:**

**DESIGNED:**

**DRAWN:**

**N/A**

**SHEET NO.:**

**SCALE:**
## BILL OF MATERIALS

### BILL OF MATERIALS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEMA CONTROLLER UNIT  - SEE NOTE 1</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MALFUNCTION MANAGEMENT UNIT  - SEE NOTE 3</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SURGE PROTECTOR</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOAD SWITCH</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLASHER</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLASH TRANSFER RELAY</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DETECTOR, 2-CHANNEL</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DETECTOR, 4-CHANNEL</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POLE MOUNTED CABINET</td>
<td>EACH</td>
<td></td>
<td>TYPE</td>
</tr>
<tr>
<td>PAD MOUNTED CABINET (FULL TS-8)</td>
<td>EACH</td>
<td></td>
<td>TYPE</td>
</tr>
<tr>
<td>BUS UNIT UNIT (GAL)</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRAFFIC SIGNAL HEAD</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIGNAL HEAD MOUNTING BRACKET</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BACK PLATE</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.E.D. LENS</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEDESTRIAN PUSH BUTTON w/ APS &amp; R10-3e SIGN</td>
<td>EACH</td>
<td></td>
<td>SEE NOTE 4</td>
</tr>
<tr>
<td>MAST ARM POLE</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRAFFIC SIGNAL POLEAL ALUMINUM</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td># POSITION TERMINAL BLOCK</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVICE BOX, 24&quot; IAA</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CABINET SERVICE BOX, 30&quot; X 48&quot;</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JUNCTION BOX, 24&quot; IAA</td>
<td>EACH</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### LUMINAIRES

<table>
<thead>
<tr>
<th>LUMINAIRES</th>
<th>EACH</th>
<th>SEE LIGHTING PLANS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LUMINAIRES</td>
<td>EACH</td>
<td>SEE LIGHTING PLANS</td>
</tr>
</tbody>
</table>

### PHOTOCELLS

<table>
<thead>
<tr>
<th>PHOTOCELLS</th>
<th>EACH</th>
<th></th>
</tr>
</thead>
</table>

### FUSES

<table>
<thead>
<tr>
<th>FUSES</th>
<th>EACH</th>
<th></th>
</tr>
</thead>
</table>

### OVERHEAD STREET NAME SIGN

<table>
<thead>
<tr>
<th>OVERHEAD STREET NAME SIGN</th>
<th>EACH</th>
<th></th>
</tr>
</thead>
</table>

### BUS INTERFACE UNIT

<table>
<thead>
<tr>
<th>BUS INTERFACE UNIT</th>
<th>EACH</th>
<th></th>
</tr>
</thead>
</table>

### TRAFFIC DIVISION

<table>
<thead>
<tr>
<th>TRAFFIC DIVISION</th>
<th>NO.</th>
<th></th>
</tr>
</thead>
</table>

### BID ITEM

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>TRAFFIC SIGNAL INSTALLATION</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VIDED DETECTION SYSTEM</td>
</tr>
</tbody>
</table>

### QUANTITIES FOR INFORMATION ONLY

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>TRAFFIC SIGNAL DETAILS 9 OF 12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>XX STREET &amp; XX STREET (STA. XX+XX0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BILL OF MATERIALS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CITY OF KANSAS CITY, KANSAS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PUBLIC WORKS DEPARTMENT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TRAFFIC DIVISION</td>
</tr>
</tbody>
</table>

### SIGNAL FACES

<table>
<thead>
<tr>
<th>SIGNAL FACES</th>
<th></th>
</tr>
</thead>
</table>

### SIGNAL SUMMARY

<table>
<thead>
<tr>
<th>SIGNAL SUMMARY</th>
<th></th>
</tr>
</thead>
</table>

### LIGHTING DETECTION PROCESSOR

<table>
<thead>
<tr>
<th>LIGHTING DETECTION PROCESSOR</th>
<th>EACH</th>
<th></th>
</tr>
</thead>
</table>

### VIDEO DETECTION PROCESSOR

<table>
<thead>
<tr>
<th>VIDEO DETECTION PROCESSOR</th>
<th>EACH</th>
<th></th>
</tr>
</thead>
</table>

### LOOP SEALANT

<table>
<thead>
<tr>
<th>LOOP SEALANT</th>
<th>AS REQ'D</th>
<th></th>
</tr>
</thead>
</table>

### PRE-FORMED LOOP

<table>
<thead>
<tr>
<th>PRE-FORMED LOOP</th>
<th>EACH</th>
<th></th>
</tr>
</thead>
</table>

### CONDUIT 1" & FITTINGS, RED-HOSE & SCHEDULE 86

<table>
<thead>
<tr>
<th>CONDUIT 1&quot; &amp; FITTINGS, RED-HOSE &amp; SCHEDULE 86</th>
<th>LIN FT</th>
<th></th>
</tr>
</thead>
</table>

### CONDUIT 2" & FITTINGS, RED-HOSE & SCHEDULE 86

<table>
<thead>
<tr>
<th>CONDUIT 2&quot; &amp; FITTINGS, RED-HOSE &amp; SCHEDULE 86</th>
<th>LIN FT</th>
<th></th>
</tr>
</thead>
</table>

### CONDUIT 3" & FITTINGS, RED-HOSE & SCHEDULE 86

<table>
<thead>
<tr>
<th>CONDUIT 3&quot; &amp; FITTINGS, RED-HOSE &amp; SCHEDULE 86</th>
<th>LIN FT</th>
<th></th>
</tr>
</thead>
</table>

### CONDUIT 4" & FITTINGS, RED-HOSE & SCHEDULE 86

<table>
<thead>
<tr>
<th>CONDUIT 4&quot; &amp; FITTINGS, RED-HOSE &amp; SCHEDULE 86</th>
<th>LIN FT</th>
<th></th>
</tr>
</thead>
</table>

### CONDUIT 1" & FITTINGS, PVC & SCHEDULE 83

<table>
<thead>
<tr>
<th>CONDUIT 1&quot; &amp; FITTINGS, PVC &amp; SCHEDULE 83</th>
<th>LIN FT</th>
<th></th>
</tr>
</thead>
</table>

### CONDUIT 2" & FITTINGS, PVC & SCHEDULE 83

<table>
<thead>
<tr>
<th>CONDUIT 2&quot; &amp; FITTINGS, PVC &amp; SCHEDULE 83</th>
<th>LIN FT</th>
<th></th>
</tr>
</thead>
</table>

### CONDUIT 3" & FITTINGS, PVC & SCHEDULE 83

<table>
<thead>
<tr>
<th>CONDUIT 3&quot; &amp; FITTINGS, PVC &amp; SCHEDULE 83</th>
<th>LIN FT</th>
<th></th>
</tr>
</thead>
</table>

### CONDUIT 4" & FITTINGS, PVC & SCHEDULE 83

<table>
<thead>
<tr>
<th>CONDUIT 4&quot; &amp; FITTINGS, PVC &amp; SCHEDULE 83</th>
<th>LIN FT</th>
<th></th>
</tr>
</thead>
</table>

### ACCESS POINTS

<table>
<thead>
<tr>
<th>ACCESS POINTS</th>
<th>EACH</th>
<th></th>
</tr>
</thead>
</table>

### REPEATERS

<table>
<thead>
<tr>
<th>REPEATERS</th>
<th>EACH</th>
<th></th>
</tr>
</thead>
</table>

### PAVEMENT SENSORS

<table>
<thead>
<tr>
<th>PAVEMENT SENSORS</th>
<th>EACH</th>
<th></th>
</tr>
</thead>
</table>

### MOUNTING BRACKETS FOR ACCESS POINTS & REPEATERS

<table>
<thead>
<tr>
<th>MOUNTING BRACKETS FOR ACCESS POINTS &amp; REPEATERS</th>
<th>EACH</th>
<th></th>
</tr>
</thead>
</table>

### CAT 5E OUTDOOR CABLE

<table>
<thead>
<tr>
<th>CAT 5E OUTDOOR CABLE</th>
<th>LIN FT</th>
<th></th>
</tr>
</thead>
</table>

### NOTES

1. THE TRAFFIC SIGNAL INSTALLATION SHALL BE COMPLETE AND THE CONTRACTOR SHALL FURNISH AND INSTALL ALL EQUIPMENT AND MATERIALS NECESSARY FOR THE SATISFACTORY OPERATION OF ELECTRICAL APPARATUS AND FOR COMPLETE OPERATION OF THE TRAFFIC SIGNAL SYSTEM WHETHER SPECIFICALLY MENTIONED OR NOT, UNLESS OTHERWISE NOTED.

2. THE TRAFFIC SIGNAL SHALL UTILIZE ITS VIDEO DETECTION EQUIPMENT WITH EDGECONNECT NETWORK INTERFACE CARDS.

3. THE TRAFFIC SIGNAL CONTROLLER SHALL BE EAGLE ATC M62 WITH A EBERLY MALFUNCTION MANAGEMENT UNIT (MMUQ-16LE(IP)).

4. THE PUSH BUTTON SHALL BE EZCOMMUNICATOR 2-WIRE NAVIGATOR APS SYSTEM WITH ETHERNET CAPABILITY.
ANCHOR BOLT

END GALVANIZED AT LEAST 12" PER BOLT WITH THREADED (2) HEX NUTS AND (2) WASHERS

(4) ANCHOR BOLTS WITH "Z" POLE BASE

T = TUBE WALL THICKNESS

0.25" THICK BACKUP RING

DETAIL 9 POLE BASE

DETAIL 10 ANCHOR BOLT

1/4" ANCHOR BOLTS WITH (2) HEX NUTS AND (2) WASHERS PER BOLT WITH THREADED END GALVANIZED AT LEAST 12"