ITEM 683.04300108 – EXTERNALLY MOUNTED LOWERING DEVICE FOR CCTV CAMERA

DESCRIPTION

This work shall consist of furnishing and installing an externally mounted lowering device for CCTV Camera on an existing structure.

MATERIALS

GENERAL

The lowering device shall be compatible with the proposed camera equipment specified and paid for under separate items, to ensure proper integration.

LOWERING DEVICE

Each Lowering device shall be able to carry and lower a minimum of two devices including Cameras or Radio.

Lowering Devices shall utilize heavy-duty connectors. The female and male socket contact halves of the connector block shall be made of either a thermosetting synthetic rubber or shall be built-up of multiple component blocks designed for outdoor telecommunications and/or automotive “under the hood” applications with a minimum heat distortion temperature of 208 degrees F, as approved by the Engineer. Any materials used to seal and/or waterproof the built-up connector shall be 100% silicone sealant with a temperature range of -80 degrees F to 450 degrees F.

The current carrying male and female contacts shall be corrosion resistant, high conductivity or CAT. 5e/6 cable). Each contact shall be rated up to 600V, 7A Max and shall be derated according to the wire used in the application. The number of contacts shall be dictated by the requirements of the device(s) to be mounted thereto. The number of contacts shall be enough to satisfy the maximum number of equipment items to be lowered.

- MECHANICAL

All pulleys for the camera and antenna lowering devices and portable lowering tools shall have sealed, self lubricated bearings or tight bronze bearings sealed and lubricated with oil. The lowering cable shall be a minimum diameter of 0.125 inches, stainless steel aircraft cable with a minimum breaking strength of 391 lbs. The lowering cable shall be housed inside of a conduit to prevent it from contacting any camera or radio power or communication cabling.

The interface and locking components shall be made of stainless steel. All external components of the lowering device shall be made of corrosion resistant materials. All components fabricated from steel or cast iron shall be galvanized in accordance with NYSDOT Standard Specifications Subsection 719-01 Galvanized Coatings and Repair Methods, Type II. The contact unit housing shall have a replaceable neoprene gasket.
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- LOWERING TOOL

The lowering tool shall be made of steel, cast iron or aluminum components. Steel and cast iron parts shall be galvanized in accordance with NYSDOT Standard Specifications Subsection 719-01 Galvanized Coatings and Repair Methods, Type II.

LOWERING DEVICE EQUIPMENT CABLING

Each Lowering device shall have the following power, data and control cables assignment:

- Four (4) Pairs Ethernet Cable 1 (Cat. 6 Outdoor Rated) for Digital Device 1 – IP camera (8 pins),
- Four (4) Pairs Ethernet Cable 2 (Cat. 6 Outdoor Rated) for Digital Device 2 – IP Device (8 pins),
- Two (2) conductor # 12 AWG AC Power (2 pins)
- Ground wire (one Pin),
- Seven Conductors (7) Alarm or control cable, (7 Pin)
- RF LMR-200 cable (If applicable and as per Engineer direction)

All Cables shall be outdoor rated cables applicable for vertical and horizontal installation. The Contractor shall coordinate the electrical, data and control cables installation with the Engineer and the Transportation Management Center.

CONSTRUCTION DETAILS

The camera lowering device shall be designed to support and lower a closed circuit television camera, lens, dome type housing, pan/tilt/zoom (PTZ) mechanism, cabling, connectors and other supporting field components without damage or causing degradation of camera operations. The camera lowering device shall consist of a suspension contact unit, support arm, conduit, conduit supports and a pole adapter to attach to the exterior surface of an existing cell tower. The support arm and receiver brackets shall be designed to self-align the contact unit with the tower center line during installation and to insure the contact unit cannot twist under high wind conditions.

The lowering device manufacturer shall provide a factory representative to assist the electrical Contractor with the assembly and testing of the lowering system onto the pole assembly at the site location as specified on the plans. The Contractor shall furnish the Engineer with documentation certifying that the electrical Contractor has been instructed on the installation, operation and safety features of the lowering device.

The camera lowering device’s suspension contact unit shall have a load capacity of 330 pounds with a 4 to 1 safety factor. There shall be a locking mechanism between the fixed and moveable components of the lowering device. The moveable assembly shall have a minimum of 2 latches. This latching mechanism shall securely hold the camera and its control equipment free of vibration or motion between the components. The latching mechanism shall operate by alternately raising and lowering the assembly using the winch and lowering cable. When latched, all weight shall be removed from the lowering cable. The fixed unit shall have a heavy duty cast tracking guide and means to allow latching in the same position each time. The contact unit housing shall be weatherproof with a replaceable gasket provided to seal the interior from dust and moisture.
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All electrical, RF, data and video coaxial connections between the fixed and moveable camera lowering device components shall be protected from exposure to the weather by a waterproof seal to prevent degradation of the electrical contacts. The electrical connections between the fixed and moveable camera lowering device components shall be designed to conduct high frequency data bits, and one (1) volt peak to peak CCTV video signals as well as the power requirements for operation of CCTV dome environmental controls.

The prefabricated components of the lift unit support system shall be designed to preclude the lifting cable from contacting any electrical cabling. All cables shall remain stable and secure during lowering and raising operations.

The Contractor shall obtain weights and/or counterweights as necessary from the lowering device manufacturer to assure that the alignment of pins and connectors are proper for the device’s support to be raised into position without binding. The lowering unit shall have sufficient weight for disengagement so that it can be lowered properly.

Lowering Tool

The camera lowering device and antenna lowering device each shall be operated by use of a portable lowering tool. The tool shall consist of a lightweight metal frame and winch assembly with cable as described herein, a quick release cable connector, an adjustable safety clutch and a variable speed industrial duty electric drill motor. This tool shall be compatible by accessing the support cable. When attached, the tool shall support itself and the load assuring lowering operations and provide a means to prevent uncontrolled freewheeling drops when loaded. One lowering tool per pole shall be delivered upon contract completion. The lowering tool shall have a reduction gear to reduce the manual effort required to operate the lifting handle to raise and lower a capacity load. It shall be provided with an adapter for operating the lowering device by a portable drill using a clutch mechanism. The Lowering tool shall be equipped with positive locking mechanism to secure the cable reel during raising and lowering operations. For each pole installed the manufacturer shall provide one variable speed drill (500 rpm maximum) that has a heavy-duty drill motor and any additional tools required by plan notes.

a. Lowering Device Test

The Contractor shall perform the following test as part of the Lowering device approval.

- Lowering Device Connector Test

The Contractor shall provide a demonstration of the lowering device connector (for video, RF signal and Ethernet connectivity). This test shall be performed as per direction of the Engineer. The contractor shall coordinate schedule of this test with the Transportation Management Center. The test method shall be based on the UL Standard 2556: Wire and Cable Test Method, Standard TIA-566-C (Continuity Test).
• Electrical Test
All Lowering device cables including Ethernet, Serial Data, Power, Ground and control cables shall be tested prior to installation. After assembly and installation of the lowering device the cables shall be tested from the Lowering device junction box at the pole to the field equipment cabinet / Cable Termination point. The Test shall be performed with Ethernet/Data Cable Tester (Ethernet and Serial) and Multi-meter (Power and Ground).

• Lowering Device Operation Test
After installation of all equipment on the Camera Pole, the Contractor shall perform the lowering device operation test. Under this test, all full functionality and operation of all devices including cameras, radios and/or sensors will be tested before and after lowering device actions. As a minimum, each lowering device and associated field equipment shall be lowered and raised five (5) times. All equipment shall be returned to their original positions and no misalignment should be observed. The radio antennas alignment shall not be affected by the lowering device operation and the performance of the wireless link and cameras shall not be adversely affected. Based on the installed equipment on each lowering device, the contractor shall submit the Lowering Device Operation Test Plan to the Transportation Management Center for review and approval.

• 90 Days Operation Test:
After successfully completion of the Lowering Device Operation Test the lowering device shall be in use and the connectivity of the CCTV camera or Radio equipment on the Lowering device will be monitor by the Transportation Management Center for a duration of 90 days. During this period, the contractor may lower the CCTV or Radio equipment as per Regional TMC request. At the End of 90 days period, no equipment function and operational issue should be observed. If any issue or maintenance is required, the Contractor shall fix the problem and 90 days Operation Test shall be started again.

Documentation:
Within 60 days of Authorization to Proceed, the Contractor shall submit the following for review and approval:

A. Externally Mounted Lowering Device Design Submission
   The package shall include but not limited to:
   • Lowering Device Cut Sheets
   • Pole Mounting Design Shop Drawings
   • Pole Mounting Design Calculations
   • Lowering Device Shop Drawings
   • Lowering Device Wiring Drawings
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- Lowering Device Connector Information and Test Data
- Lowering Device multi device/equipment mounting support/fixture Shop Drawing
- Camera, Radio, Antenna and other equipment mounting Detail Drawing
- Cables and Wiring Labeling Details
- Lowering Device Connector Pin assignment Details
- Cabinet Equipment Placement
- Lowering Device Connector Performance Test Plan

The design computations must be approved, stamped, and signed by a New York State Professional Engineer. The design shall be in accordance with the 2013 (or most recent version with latest revisions) to the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals.

The Engineer will approve the submission or respond with comments within 15 working days of receiving the Contractor’s submission.

B. Final Camera Pole Drawing Package, The Final Drawing Package shall be approved by the Transportation Management Center prior to final acceptance. The Final Drawing Package shall include but not limited to:

- Lowering Device Orientation, installed equipment, Cabinet, pull boxes and cables and wires Details- As Built Copy
- Design Final Shop Drawings- As Built Copy
- Lowering Device Final Wiring Drawings - As Built Copy
- Camera, Radio, Antenna and other equipment mounting Detail Final Shop Drawing - As Built Copy
- Cables and Wiring Labeling Final Details

- Lowering Device Connector Final Pin assignment Details

All drawings shall be 11 x 17 in size. All drawings shall be submitted in hard copy, electronic, and CAD/Microstation (latest version used by NYSDOT) formats.

The Engineer will approve the submission or respond with comments within 30 working days after receiving the Contractor’s submission.

METHOD OF MEASUREMENT

The work will be measured as the number of externally mounted lowering devices satisfactorily furnished, installed and tested in accordance with the contract documents.

BASIS OF PAYMENT

The unit price bid shall include the cost of labor, materials and equipment necessary to complete the work, including all tests, piping and supports.