ITEM 683.18010008 – 75 FOOT CAMERA POLE WITH 2 LOWERING DEVICES

DESCRIPTION:

Under this item, the Contractor shall furnish and install a 75-feet-tall Camera Pole, with 2 Lowering Devices, each of which are to include a fall-arrest safety system for:

1. Closed Circuit Television Camera (CCTV) cameras
2. Wireless Microwave License or Unlicensed Radio equipment or similar Wireless equipment as directed by the Engineer.
3. Various sensors
4. Future Wireless unlicensed frequency microwave unit equipment.

Each of the two (2) Lowering Devices with fall arrest safety systems shall be attached to the pole by support arms. The geographic direction that each of these supports arms is to be oriented is illustrated in the Contract documents, or as directed by the Engineer.

MATERIALS:

General

The 75 feet tall Camera Pole with 2 Lowering Devices that is to be furnished must be compatible with the proposed Camera Assembly equipment and systems to ensure proper integration.

75 Feet Camera Pole Assembly

The Camera Pole assembly shall be 75 feet in height with two (2) lowering devices and anchor bolts. All parts subject to wear, such as pins, rollers, etc. shall be made from stainless steel. All other components of the poles, mounting apparatus, and lowering devices shall be constructed of hot dipped galvanized steel. The poles shall meet the requirements of NYSDOT Standard Specifications Subsection 724-03 as they pertain to a 75 foot tall Camera Pole with 2 support arms and lowering devices. In addition, the natural frequency of the installed pole shall be outside the critical wind velocity (Vc) range of 6 mph to 12 mph. The maximum allowable deflection at the top of pole, with camera, Microwave equipment(s) and lowering devices installed, shall not exceed the following:

1. 1 inch due to 30 mph (non-gust) winds calculated based on the Electronic Industrial Alliance/Telecommunications Industry Alliance (EIA/TIA) RS-222-G.

Each lowering device shall be able to carry and lower a minimum of two devices including cameras, radios or sensors. Each lowering device shall operate independently.

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 208º 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 -80º degrees F to 450º 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 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 cabling that may be running through the inside of the pole.

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.

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.

LOAD CAPACITY

The lowering device shall have a load capacity safety factor of 2 to 1. The maximum load and safety factor calculation shall be calculated by the Contractor and provided to the Engineer for review as per the Documentation section of this specification.

FALL ARREST SAFETY SYSTEM

The Fall-Arrest Safety System shall be designed to minimize accidental falls, or to limit the distance of falls. The Fall-Arrest Safety System shall permit the person to ascend or descend the structure without having to continually manipulate the Fall-Arrest Safety System or any part of the system. Climbing facility of Fall Arrest Safety System shall be designed to support a minimum 350 pound concentrated live load. The support structure for the Fall Arrest Safety System shall be designed to support a uniform live load of 35 psf, but in no case shall the support structure be designed for less than a total live load of 700 pounds. The step surface of Fall Arrest Safety System, such as grating, shall be designed to support two 350 pound loads. These loads are not to be applied concurrently with wind and ice loads.

All components of the Fall- Arrest Safety System— including harness attachment, harness, brake pawl(s), ratchet wheel(s), trolley, rail, and brackets – shall function as a unit during such free-fall downward jerk to prevent the mass from descending. The Fall-Arrest Safety System shall comply with the common fall arresting device standards used industry, including:

- Electronic Industrial Alliance/Telecommunications Industry Alliance (EIA/TIA) RS-222-G, “Structural Standard for Steel Antenna Towers and Antenna Supporting Structure”
- Occupational Safety and Health Administration (OSHA) standards 29 CFR 1910 – 268, pertaining to telecommunications work and other applicable OSHA standard.
- OSHA Class 7216-81, Personal Protective Equipment
ITEM 683.18010008 – 75 FOOT CAMERA POLE WITH 2 LOWERING DEVICES

- ANSI Z359.2.1-M2007 (R 2007) Personal Fall Arrest

POLE CABLELING

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 pins)
- RF LMR-200 cable (If applicable and as per Engineer’s direction)

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

CONSTRUCTION DETAILS:

The Contractor shall survey the location – and drive a stake at the location in order to provide clear marking – for the 75 Foot Camera Pole with 2 Lowering Devices for approval by the Engineer prior to any prefabrication or related construction. The pole and camera locations shown on the plans shall be field checked for any condition that may affect their placement. Where changes are necessary, the exact location will be determined in coordination with the Engineer.

Poles

The poles shall be erected as specified in the contract documents.

Pole erection shall include installation of attachment fittings as specified in the contract documents as follows:

- Anchor bolt covers in areas subject to pedestrian traffic
- Weather heads and couplings
- Pole cap
- Cabinet mounting fittings, plates, brackets as needed
- Reinforced couplings for wire entrances to cabinets.

Grounding

A copper clad ground rod, ground wire and fittings shall be installed as shown in the contract documents. The ground system shall be electrically connected to the grounding terminal on the pole or cabinet.

The grounding system when completed shall be tested in accordance with NYSDOT Standard Specifications Subsection 680-3.32 “Tests”. If the requirements of the testing are not met, additional ground rods, ground rod extensions, electrical bonding of metallic conduit, or other means may be
Camera and Microwave Unit Lowering Devices

Each lowering device shall be designed to support and lower two devices such as two CCTV cameras or two microwave units or one camera and one microwave unit. The closed circuit television camera device include; camera unit, lens, dome type housing, pan/tilt/zoom (PTZ) mechanism, cabling, connectors (video, power and data) and other supporting field components without damage or causing degradation of camera operations. For the case of the microwave unit, the lowering device shall be designed to support and lower up to two microwave units – with maximum equipment weight of 331 lbs and capacity for a maximum equipment area of 4 (Ft)^2. The microwave unit lowering device shall be able to let down the microwave units, cabling, connectors, and other supporting field components, without damaging the microwave units. Both lowering devices shall consist of a suspension contact unit, support arm and a pole adapter to attach to a 75-foot camera pole. The support arm and receiver brackets shall be designed to self-align the contact unit with the pole center line during installation and to insure the contact unit cannot twist under high wind conditions. The CCTV pole shall be designed for minimum 9 (Ft)^2 as the total of the unshielded area for all equipment and lowering devices.

The lowering device manufacturer shall furnish a factory representative to assist the electrical contractor with the assembly and testing of the first set of two lowering systems 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 lowering device’s suspension contact unit shall have a load capacity of 331 lbs 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.

All electrical, Cat. 6 Data and video coaxial connections between the fixed and moveable camera and microwave unit 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 electrical connections between the fixed and moveable microwave unit lowering device components shall be designed to conduct fast Ethernet signals.

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

The Contractor shall obtain weights and/or counterweights as necessary from the camera and/or
ITEM 683.18010008 – 75 FOOT CAMERA POLE WITH 2 LOWERING DEVICES

antenna 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.

Label

The two lowering steel cables should be labeled properly so that one can identified them easily to the corresponding device. The CAT6 and power cables for both lowering arms should also be labeled properly at the lowering tool access hole location.

Lowering Tool

The camera lowering device and microwave unit 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 for accessing the support cable through the hand hole of the pole. When attached through the hand hole, 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.

Fall-Arrest Safety System

The Contractor shall submit to the Engineer shop drawings and cut sheets for the Fall –Arrest Safety System including mounting brackets, bolts, nuts, washers, and other installation hardware 30 days prior to installation of the Fall-Arrest Safety System for approval by the Engineer.

Foundation

The Contractor shall construct a foundation for the 75 Foot CCTV Pole with 2 Lowering Devices that meets the requirements of NYSDOT Standard Specifications Section 680 and appropriate standard sheets. The pole foundation will be paid under the appropriate contract item as specified on the plans.

METHOD OF MEASUREMENT:

The 75 Foot Camera Pole with 2 Lowering Devices shall be measured as the number of complete poles furnished and installed in accordance with the Contract Documents.

BASIS OF PAYMENT:

The unit price bid for each 75 Foot Camera Pole with 2 Lowering Devices shall include all materials, labor, and equipment, necessary to complete the work. The installation of the necessary mounting plates, grounding system, cables, anchor bolts, lifting devices, pole assembly, erection and field galvanizing as required shall be included in the bid price.