ITEM 683.9540208– 15 METER CAMERA POLE WITH 2 LOWERING DEVICES

DESCRIPTION
This work shall consist of the furnishing and installing a 15 Meter Camera Pole, with 2 Lowering Devices for:

1. Closed Circuit Television Camera (CCTV) camera
2. Wireless Unlicensed Frequency Ethernet Access Bridge or similar Wireless equipment as directed by the Engineer.

This work shall be in accordance with the Contract documents and as directed by the Engineer.

MATERIALS

General
The 15 Meter Camera Pole with 2 Lowering Devices shall be compatible with the proposed Unlicensed Frequency Ethernet Access Bridge, and the Camera Assembly equipment, both specified and paid for under separate items, to ensure proper integration.

15 Meter Camera Pole Assembly
The Camera Pole assembly shall be 15 meters in height with two looking devices and secured with anchor bolts. All parts subject to wear 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 15 Meter 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 10 km/hr to 20 km/hr. The maximum allowable horizontal deflection at the elevation of cameras shall not exceed the following 25 mm due to 69 km/hr (3 sec.-gust) winds calculated based on the latest version of EIA/TIA RS-222-G.

The Contractor shall furnish and install the Camera Pole with 4 Lowering Devices in compliance with the twist and sway requirements of Electronic Industrial Alliance/Telecommunications Industry Alliance (EIA/TIA) RS-222-G (or latest revision) code or the antenna manufacturers requirements, whichever is more stringent. The maximum allowable horizontal deflection of antennas shall be as per the EIA/TIA RS-222-G (or latest revision) code or as per antenna manufacturer specifications, whichever is more stringent.

LOWERING DEVICES
Lowering Devices shall utilize heavy-duty connectors. The female and male socket contact halves of the connector block shall be made of thermosetting synthetic rubber. This synthetic rubber shall be Hypalon or a thermosetting synthetic rubber of similar constituency and characteristics as approved by the Engineer. The female brass socket contacts and the male high conductivity brass pin contacts shall be permanently molded into the thermosetting synthetic rubber body.

The current carrying male contacts shall be a minimum of 3.18 mm in diameter. There shall be two male contacts that are longer than the rest which will make contact first and break contact last providing optimum grounding performance. 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.
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The current carrying female contacts shall be 3.18 mm I.D. All of the contacts shall be recessed 3.18 mm from the face of the connector. Cored holes in the rubber measuring 6.35 mm in diameter and 3.18 mm deep molded into the connector body are centered on each contact on the face of the connector to create rain-tight seals when mated with the male connector.

The wire leads from both the male and female contacts shall be permanently and integrally molded in the thermosetting synthetic rubber body. The current carrying wires shall be constructed of minimum thickness #18/1 AWG wire with thermosetting synthetic rubber jacketing.

The contacts shall be self-wiping with a shoulder at the base of each male contact so that it will recess into the female block, thereby giving a rain-tight seal when mated.

The Contractor shall submit design computations to the Engineer a minimum of 30 days prior to the construction for the camera poles, pole foundation, lowering devices, and mounting plates. The design computations must be approved, stamped, and signed by a New York State Professional Engineer. The design shall be in accordance with the 2003 (or most recent version with latest revisions) to the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals.

The Engineer shall have thirty (30) working days to review the design computations for the 15 Meter Camera Pole with 2 Lowering Devices.

The lowering devices furnished with the pole shall meet the following additional requirements:
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 3.2mm, stainless steel aircraft cable with a minimum breaking strength of 7740N, constructed with seven strands, each strand consisting of 19 wires. 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.

CONSTRUCTION DETAILS
The Contractor shall survey the location – and drive a stake at the location in order to provide clear marking - for the 15 Meter Camera Pole with 2 Lowering Devices for approval by the Engineer 30 days 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 in accordance with the contract documents. Pole erection shall include installation of attachment fittings as specified in the contract documents as follows:
1. Anchor bolt covers in areas subject to pedestrian traffic
2. Weather heads and couplings
3. Pole cap
4. Cabinet mounting fittings, plates, brackets as needed
5. Reinforced couplings for wire entrances to cabinets
6. Transmission line hoist grips
7. Pole Grounding system.

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 Section 680-3.32 of the NYSDOT Standard Specifications Construction and Materials. If the requirements of the test are not met, additional ground rods, ground rod extensions, electrical bonding of metallic conduit, or other means may be required.

Camera and Antenna Lowering Devices
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. In the case of the radio/antenna lowering device, it shall be designed to support and lower up to two radio/antenna(s) – with maximum equipment weight of 150 kg and capacity for a maximum equipment projection area is 0.26 meter². The antenna lowering device shall be able to lower the antenna, cabling, connectors, and other supporting field components, without damaging the antenna. Both the camera and antenna lowering devices shall consist of a suspension contact unit, support arm and a pole adapter to attach to a 15 meter 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 0.60 meter² as the total of the unshielded area for all equipment and lowering devices.

The lowering device manufacturer shall provide 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 camera lowering device’s suspension contact unit shall have a load capacity of 150 kg 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.

The antenna lowering device’s suspension contact unit shall have a load capacity of 150 kg 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, RF, data and video coaxial connections between the fixed and moveable camera and antenna 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 antenna lowering device components shall be designed to conduct high frequency RF 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 lifting 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 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.

Lowering Device Connector Performance 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 part of Equipment Demonstration Test (Milestone 2) as described in the project’s General Provisions.

The lowering device orientation shall be installed in accordance with the contract documents or as directed by the Engineer. Each lowering device shall be furnish and installed with Ethernet cable Cat.6 and CCTV camera composite cable and Coaxial RF cable (if the connector perform acceptable RF connectivity and be directed by the Engineer) from lowering device connector box to field equipment cabinet as shown in the contract documents.

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 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.

Foundation
The Contractor shall construct a foundation for the 15 Meter 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 items of work in accordance with the contract documents.

METHOD OF MEASUREMENT
This work shall be measured on an each basis for the actual number of 15 Meter Camera Pole with 2 Lowering Devices that are satisfactorily furnished and installed in accordance with the Contract Documents.

BASIS OF PAYMENT
The unit price bid shall include the cost of furnishing, for each 15 Meter Camera Pole with 2 Lowering Devices shall include all materials, labor, and equipment for each 15 Meter Camera Pole with 2 Lowering Devices as necessary to satisfactorily complete the work.

Progress Payments will be made as follows:

- Approval of Shop Drawings: -20%
- Delivery to the Project Site: -30%
- Pole Installation and inspection and Lowering devices Connector Performance Test: -40%
- Project Closeout: -10%