DESCRIPTION:
Under this item, the Contractor shall furnish and install 40 foot poles, mounting apparatus, and lowering devices for CCTV cameras in accordance with the Contract drawings, specifications and standard sheets and as directed by the Engineer.

MATERIALS:
All poles, mounting apparatus, and camera lowering devices shall be constructed of hot dipped galvanized steel and shall meet the requirements of the following subsection included in the NYSDOT Standard Specifications:

Traffic Signal Poles.........................724-03

In addition, the natural frequency of the installed pole shall be outside the critical wind velocity (Vc) range of 6.2 mph to 12.4 mph. The maximum allowable deflection at the top of pole, with camera(s) and lowering device installed, shall not exceed the following:

0.5% of pole height due to 90 mph (non-gust) winds.

1 inch due to 30 mph (non-gust) winds.

The contractor shall submit design computations for the camera poles, lowering devices, and mounting plates. The design computations must be approved, stamped, and signed by a professional engineer licensed in New York State.

The Engineer shall have twenty (20) working days to review the design computations for one CCTV pole and an additional two (2) days for each additional CCTV pole.

The camera lowering device furnished with the poles shall meet the following additional requirements:

All pulleys for the camera lowering device and portable lowering tool shall have sealed, self lubricated bearings or oil-tight bronze bearings. The lowering cable shall be a minimum diameter of 1/8 inch, stainless steel aircraft cable with a minimum breaking strength of 1740 lb-ft, 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 subsection 719-01 Galvanizing and Repair Methods Type 11.

The contact unit housing shall have a replaceable neoprene gasket.
The lowering tool shall be made of steel, cast iron or aluminum components. Steel and cast iron parts shall be galvanized in accordance with subsection 719-01 – “Galvanizing and Repair Methods, Type 11”.

**CONSTRUCTION DETAILS:**
The Contractor shall stake-out the camera pole locations for approval by the Engineer prior to any prefabrication or related construction. Pole and camera locations shown on the contract 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**
Poles shall be erected as specified on the plans, standard sheets, and as directed by the Engineer. Where required, pole foundations are provided under item 680.5001.

Pole erection shall include installation of attachment fittings as specified on the plans and standard sheets 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 on the plans, standard sheets, or as directed by Engineer. 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 subsection 680-3.15 of the Standard Specifications. 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 as directed by the Engineer.

**Camera Lowering Device**
The camera lowering device shall be designed to support and lower a closed circuit television camera, lens, dome type housing, PTZ mechanism, cabling, connectors and other supporting field components without damage or causing degradation of camera operations. The lowering device shall consist of a suspension contact unit, support arm and a pole adapter to attach to a standard mast arm signal 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 lowering device manufacturer shall furnish a factory representative to assist the electrical contractor with the assembly and testing of the first lowering system onto the pole assembly. 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 200 lb. 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 and video coaxial connections between the fixed and moveable 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 lowering device components shall be designed to conduct high frequency data bits and one (1) volt peak to peak video signals as well as the power requirements for operation of dome environmental controls.

The prefabricated components of the lift unit support system shall be designed to preclude the lifting cable from contacting the power or video 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 by installing them through “eye hooks” installed on the inside of the pole. The Eye hooks shall be used on all CCTV poles unless otherwise noted in the Plans.

The Contractor shall obtain weights and/or counterweights as necessary from the camera manufacturer to assure that the alignment of pins and connectors are proper for the camera support to be raised into position without binding. The lowering unit will have sufficient weight to disengage the camera and its control components in order that it can be lowered properly.

**Lowering Tool**

The camera lowering device 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 will support itself and the load assuring lowering operations and provide a means to prevent free wheeling when loaded. Two lowering tools shall be delivered upon project completion. The lowering tools shall have a reduction gear to reduce the manual effort required to operate the lifting handle to raise and
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lower a capacity load. They shall be provided with an adapter for operating the lowering device by a portable drill using a clutch mechanism. Lowering tools shall be equipped with positive locking mechanisms to secure the cable reel during raising and lowering operations. Manufacturer shall provide a variable speed (500 rpm maximum, heavy duty drill motor and any addition tools required by plan notes.

METHOD OF MEASUREMENT:

The CCTV camera poles shall be measured as the number of complete poles furnished and erected in accordance with the specifications, plans, standard sheets, and directions of the Engineer.

BASIS OF PAYMENT:

The unit price bid for each CCTV camera pole shall include all materials, labor, equipment, tools, incidentals, and costs associated with meeting the U.S. Department of Labor Occupational Safety and Health Standards as necessary to complete the work as described in this specification. The item installed in place shall meet all testing requirements to the satisfaction of the Engineer. The installation of the necessary mounting plates, grounding system, anchor bolts, lifting devices, pole assembly, erection and field galvanizing as required shall be included in the bid price.