

SPECIAL PROVISIONS FOR SECTION 750-E: CAMERA LOWERING DEVICE

The 2014 Edition of the New Mexico Department of Transportation Standard Specifications for Highway and Bridge Construction shall apply in addition to the following:

1.0 DESCRIPTION.

1.01 This work shall consist of constructing a Camera Lowering Device complete. It will be used to support and lower a video camera as specified in NMDOT special provisions for CCTV. The Camera Lowering Device is designed to provide the NMDOT with the ability to access video camera, lens housing, PTZ mechanism, cabling, connectors, and other supporting field components without damage or causing degradation of camera operations.

A Camera Lowering Device consists of a camera connection box, disconnect unit, divided support arm, a pole adapter for attachment to the pole top, pole top junction box, conduit mount adapter, lowering cable, portable lowering tool, and all mounting hardware and installation.

The Camera Lowering Device, when specified, will be compatible with the pole on which it is to be mounted.

2.0 MATERIALS.

2.01 General. The Contractor shall furnish and install a Camera Lowering Device. All items furnished, assembled, fabricated or installed under this item shall be new.

A list of materials which the Contractor proposes to install for the Camera Lowering Device together with the drawings and other data shall be submitted to the Project Engineer for approval by the ITS Bureau chief and or the ITS Engineer or their designees.

2.02 CAMERA LOWERING DEVICE (CLD). The camera lowering device shall withstand wind forces of 100 mph with a 30 percent gust factor using a 1.65 safety factor.

All external components of the lowering device shall be made of corrosion resistant materials, powder coated, galvanized, or otherwise protected from the environment by industry-accepted coatings to withstand exposure to a corrosive environment.

The interface and locking components shall be made of stainless steel and or aluminum.

The CLD Manufacturer shall provide weights and / or counterweights as necessary 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.

The CLD Manufacturer shall provide the power and signal connectors for attachment to the bare leads in the pole top and/or camera connection boxes.

The CLD Manufacturer shall provide a mounting flange sufficient for respective camera assembly to the bottom of the camera connection box.

The Contractor shall supply, if not already present, internal conduit in which the lifting cable shall run. The lift unit support system shall be designed to protect the lifting cable from contacting the power and video cabling. The CLD Manufacturer shall provide a conduit mount adapter for housing the lowering cable.

Where plans call for dual camera/CLD installation, the Contractor shall provide and install two internal conduits to protect two lowering cables.

2.02.1 Camera Connection Box. The camera connection box shall be of two piece cast aluminum clamshell design with one hinge side and one latch side to facilitate easy opening. The general shape of the box shall be cylindrical. The box shall be capable of having up to 40 pounds of stabilizing weights. The bottom of the camera connection box shall be drilled and tapped with a 1-1/2" NPT thread to accept industry standard dome housings and be able to be modified to accept a wide variety of other camera mounting.

The connection box shall be gasketed to prevent water intrusion. The bottom of the box shall incorporate a screened and vented hole to allow airflow and reduce internal condensation.

2.02.2 Disconnect Unit. The disconnect unit includes a high strength suspension contact unit, the contact unit housing, and a cast aluminum disconnect unit fitter.

(a) The suspension contact unit shall have a load capacity of 600 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 two latches, which shall securely hold the device and its mounted equipment. The latching mechanism shall operate by alternately raising and lowering the assembly using the winch and 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 female and male socket contact halves of the connector block shall consist of thermosetting synthetic rubber known as Hypalon (Neoprene). The female brass socket contacts and the male high conductivity brass pin contacts shall be permanently molded into the Hypalon body.

The current carrying male contact shall be 1/8 inches in diameter. There shall be two male contacts that are longer than the rest which will make first and break last providing optimum grounding performance. The number of contacts shall be capable of supporting all of the camera's functionality.

The current carrying female contact shall be 1/8 inches in diameter. All of the contacts shall be recessed 0.125 inches from the face of the connector. Cored holes in the rubber measuring 0.25 inches in diameter and

0.125 inches 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 Hypalon body. The current carrying and signal wires (if any) molded to the connector body shall be constructed of #18/1 AWG Hypalon jacketed wire.

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.

(b) The contact unit housing shall be weatherproof with a gasket provided to seal the interior from dust and moisture. All electrical and video coaxial connections between the fixed and lowerable portion of the contact block 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 movable 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.

(c) The disconnect unit fitter is cast aluminum which fits in between the divided support arm and the disconnect unit cover. It shall be weatherproof to protect the pulley and cables and wires inside.

2.03 Divided Support Arm. The divided support arm and receiver brackets shall be designed to self align the contact unit with the pole center line during installation and insure the contact unit cannot twist under high wind conditions.

2.04 Pole Adapter. The pole adapter is required to attach the support arm to the pole top.

2.05 Pole Top Junction Box.

2.06 Conduit Mount Adapter. The lowering device manufacturer shall provide a conduit mount adapter for housing the lowering cable. This adapter shall have an interface to allow the connection of a contractor provided conduit and be located just below the cable stop block at the back of the lowering device. The Contractor shall supply internal conduit in the pole as directed by the lowering device provider.

2.07 Cable. The lowering cable shall be a minimum 1/8-inch diameter stainless steel aircraft cable with a minimum breaking strength of 1740 lb-ft, constructed with seven (7) 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 maybe running through the inside of the pole.

2.08 Winch. CLD winch shall be accessible through a hand hole opening with dimensions of 6"w X 27"h. The winch shall be mounted via tapped holes on the pole and shall be a minimum of 30" from the grade unless otherwise required.

2.09 Portable Lowering Tool. The camera lowering device shall be operated by use of a portable lowering tool. The lowering tool shall be made of steel, cast iron or aluminum components. 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 and a manual winch handle. This lowering tool shall be compatible with accessing the support cable through the hand hole of the pole. The lowering tool shall attach to the pole with one single bolt. The tool will support itself and the load assuring lowering operations and provide a means to prevent freewheeling when loaded.

The lowering tool shall have a reduction gear to reduce the manual effort required to operate the manual winch handle to raise and lower a capacity load. The lowering tool 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 a positive breaking mechanism to secure the cable reel during raising and lowering operations and prevent freewheeling. The manufacturer shall provide a variable speed, heavy-duty reversible drill motor and a minimum of one lowering tool plus any additional tools required by plan notes. The lowering tool shall be made of durable and corrosion resistant materials, powder coated, galvanized, or otherwise protected from the environment by industry-accepted coatings to withstand exposure to a corrosive environment.

All pulleys for the camera lowering device and portable lowering tool shall have sealed, self lubricated bearings, oil tight bronze bearings, or sintered- oil impregnated, bronze bushings.

The lowering tool shall be delivered to the NMDOT ITS engineer upon project completion.

3.0 CONSTRUCTION REQUIREMENTS.

3.01 General. The hardware and support services specified herein are intended to describe the minimum configuration that will be acceptable for a camera lowering system. All changes to this special provision are subject to approval by the ITS Engineer or designee. The Contractor shall provide all drawings, schematics, material lists, fabrication details and specifications to the ITS Engineer or designee for approval 30 days prior to procurement of the equipment.

3.02 Installation/Testing. The lowering device manufacturer, when specified shall provide an onsite factory representative to assist the electrical contractor with the assembly and testing of the first lowering system onto the pole assembly. The manufacturer shall furnish the NMDOT engineer documentation certifying that the electrical contractor has been instructed on the installation, operation and safety features of the lowering device. The contractor shall be responsible for providing applicable maintenance personnel "on site" operational instructions.

The Contractor shall furnish all necessary equipment and labor required for the testing at the site.

The Contractor shall engage the lowering system for three consecutive trials, a trial being defined as a complete disengaging the contact pins, lowering the camera assembly to the ground, hoisting the camera assembly to the top of the pole, and full contact pin engagement. After each trial, the contractor shall demonstrate full functionality of the video system including the pan, tilt, and zoom features. The winch assembly shall neatly unspool and spool and the lowering cable shall remain untangled and clear throughout each trial.

Testing shall be performed in the presence of the ITS Engineer or designee. The contractor shall submit documents containing proposed test procedures, test equipment, and expected results to the Engineer for review at least 30 days prior to performing any tests. Tests shall not be performed without written approval of the ITS Engineer or designee.

3.03 Documentation. The Contractor shall provide manufacturer documentation certifying adherence to the stated wind force criteria utilizing, as a minimum effective projected area, the actual EPA or an EPA greater than that of the camera system to be attached.

The camera-lowering device to be furnished shall be the product of manufacturers with a minimum of three (3) years of experience in the successful manufacturing of camera lowering systems. The lowering device provider shall be able to identify a minimum of three (3) previous projects where the purposed system has been installed successfully for over a one-year period of time each.

The Contractor shall provide two (2) sets of electronic versions and hard copy manuals on the operation, maintenance, and troubleshooting of all system components. The documentation shall include routine maintenance procedures and schedules for all equipment and materials.

4.0 Warranty. All equipment shall have a minimum warranty period of five (5) years from the date of acceptance. Each warranty shall include actual parts and labor for any warranty work performed at the manufacturer's facility. Warranty is to also include on-site diagnostic and repairs [up to two (2) per year] at no additional expense to the Department. If a repair requires more than three (3) working days to complete during the warranty period, temporary replacement equipment shall be installed at no expense to the Department during the warranty period until the original equipment may be reinstalled.

A copy of each written warranty shall be included and submitted by the Contractor and approved by the ITS Engineer or designee prior to construction. The NMDOT shall be designated as the holder of each component warranty. Each warranty shall indicate the manufacturer responsible for the components of the system and contact information for the manufacturer shall be provided with each warranty. The manufacturer shall be responsible for the replacement or repair of any system component that fails during the warranty period. Any replacement or repair of the system shall be done to the satisfaction of NMDOT ITS Engineer or designee during the warranty period.

Each manufacturer shall be available (return response within two hours) via telephone/e-mail/pager 24 hours per day, 365 days per year for technical service assistance. This shall minimally include toll-free telephone support with emergency voice mail/paging features for after hours contact, toll-free nationwide paging, and a complete supply of repair parts and access to manufacturer's technicians to perform additional contracted services.

5.0 METHOD OF MEASUREMENTS.

Camera Lowering Device will be measured by the unit per each.

6.0 BASIS OF PAYMENT.

6.01 The accepted quantities of a Camera Lowering Device will be paid for at the contract unit price per each.

<u>Pay Item</u>	<u>Pay Unit</u>
Camera Lowering Device	Each

6.02 Work Included in Payment. When a Camera Lowering Device is called for in the Contract, the accepted quantity complete in place will be considered full compensation for furnishing all materials, labor, tools, equipment, testing, warranty, and appurtenances necessary to complete the work as directed by the ITS Engineer or designee. Materials shall be considered to include a camera lowering device, which consists of camera connection box, disconnect unit, divided support arm, a pole adapter for attachment to a pole top, pole top junction box, conduit mount adapter, lowering tool, and all cabling and miscellaneous hardware required.

The documentation of the system shall be provided by and at the expense of the Contractor. All documents shall be provided to the ITS Engineer or designee at least 30 days in advance of final acceptance. The documentation shall be approved by the ITS Engineer or designee prior to final acceptance of the Camera Lowering System.

The testing of the system components as an integrated unit shall be done by and at the expense of the Contractor under the direct supervision of the ITS Engineer or designee.

The training of NMDOT staff to operate and maintain the Camera Lowering System shall be done by and at the expense of the Contractor under the direct supervision of the ITS Engineer or designee, when training is specified in the contract.