

**STATE OF NEW JERSEY
BUREAU OF ITS ENGINEERING
DEPARTMENT OF TRANSPORTATION
TRENTON, NEW JERSEY 08625**

SPECIFICATIONS FOR CAMERA LOWERING SYSTEM

These specifications describe the minimum acceptable design and operating requirements for the individual components of Camera Lowering System.

SECTION I - Camera Lowering Device

Ensure that the Camera Lowering Device is designed to support, raise and lower a pole mounted dome type camera complying with the following:

1-1 Standards

- a. AASHTO - Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals, with Latest Interim.
- b. National Fire Protection Code (NFPA), NFPA 70, National Electrical Code (NEC)

1-2 Basic Design

Ensure that the Camera Lowering Device consists of the following:

- a. A suspension contact unit
- b. Divided support arm
- c. A pole adapter and suspension contact unit fitter
- d. Control Cable and Pulleys
- e. Camera junction box
- f. Communications composite cable

1-3 Performance and requirements

Design wind velocity:	100mph with a 30 percent gust factor
Design safety factor:	1.50-Safety factor
Minimum effective projected area:	Exceeds unit with attached camera
Load capacity:	200 lbs. with a 4:1 Safety factor

1-4 Environment

Operating temperature range:	-20°F to +158 °F
Relative humidity:	0 to 95 percent non-condensing

1-5 Electrical Power

Operating voltage:	120 volt AC
Voltage range:	105 to 125 volts AC at 60 hertz

1-6 Materials

- a. Structural components are to be heavy-duty cast aluminum alloy or stainless steel unless otherwise noted on contract plans.
- b. Housing seals are to be flexible polymer water-tight gaskets
- a. All dissimilar metals are to be protected from corrosion for the life of the device.
- b. All external components are to be made of corrosion resistant material and protected from the environment by industry-accepted coatings to withstand exposure to the environment.

1-7 Suspension Contact Unit

Basic Configuration

- a. Load capacity is required to be 200 lbs. with a 4:1 safety factor.
- b. Suspension contact unit housing is to be weatherproof with gasket seal.
- c. The camera lowering junction box is to accept an NPT 1.5" pipe mount.
- d. Provide locking mechanism between the fixed and moveable components.
- e. The fixed unit is to have a heavy duty cast tracking guide.

Electrical Contacts

- a. Mated pin and socket contacts
- b. Self aligning contact molded housing
- c. All provide a rain tight seal when mated

Connection

The composite communication cable (up to 150 ft unless otherwise specified or required) is to be continuous run to the ground mounted controller camera and sized for the camera pole height to which it is mounted.

1-8 Divided Support Arm

- a. Minimum 2 inch divided connecting arm.
- b. Provide rigid connection between the suspension contact unit and pole adapter fitter.
- c. Separate cable runs for electrical and signal wires.
- d. Supports the suspension contact unit and camera assembly.

1-9 Suspension Contact Unit Fitter

Suspension contact unit fitter is to rigidly connect the suspension contact unit to isolate the moving lowering cable from the electrical and video cables.

Material : Heavy-duty cast aluminum alloy.
Pulleys: High strength and low resistance.

1-10 Pole Adapter Fitter

Pole adapter fitter is to rigidly connect the pole to the divided arm support and to isolate the moving lowering cable from the electrical and video cables.

Material: Heavy-duty cast aluminum alloy.
Pulleys: High strength and low resistance

1-11 Control Cable & Pulley

Ensure that pulleys have sealed, self lubricated bearings, oil tight bronze bearings or sintered bronze bushings.

Ensure that:

- a. Lowering control cable is a minimum 1/8-inch diameter stranded stainless steel cable.
- b. Minimum breaking strength is 1740 lbs.
- c. Control cable guides are located within the pole.

1-12 Camera Junction Box

Ensure that:

- a. The camera junction box that connects the camera to the lowering device has a two-piece design with a 1.5" NPT pipe receptacle for easy camera mounting.
- b. Material is corrosion resistant cast aluminum.
- c. It contains a large capacity-splicing compartment for camera power, signal leads, and connectors.
- d. There is ample room for securely mounting and accessing lightning protection devices for power, data and video, isolated from the junction box itself.
- e. It is provided with weights and/or counterweights to assure the alignment of pins and connectors.
- f. The power and signal connectors are provided for attachment to the bare leads in the junction box or camera dome to make the system operational.

1-13 Composite Cable

Provide the camera lowering device with a direct continuous run (no splices) of composite cable (up to 150' unless otherwise specified or required), wired and sealed from the top connector to the ground mounted controller camera sized for the camera pole height to which it is mounted. Standard cabling will consist of RG-6 coax cable, low capacitance data cable with individually shielded pairs with a common shield and drain and 16 gauge low voltage power cable. Ensure the cables are suitable for wet environments, burial underground in duct and are certified to same.

1-14 Test Cable

Supply a control cable and harness to plug into the suspension contact unit to provide the capability to fully test the camera and its functions while being serviced on the ground before the camera is hoisted to the locked position at the top of the pole.

SECTION II - Winch Assembly and Accessories

Provide a built-in permanent winch assembly with cable mounted inside the pole that is accessible via a hand hole. Ensure that it operates using portable electrical drill and also by using a manual crank handle. Provide a Portable Drill and a Drill Adaptor Assembly for operating the lowering device. Also provide a Manual Hand Crank Assembly with crank handle to operate the lowering device manually without a drill as a backup. The built-in winch is to have a quick release cable connector and an adjustable safety clutch. The portable drill is to be an adequately sized variable speed, industrial-duty reversible motor electric drill.

Ensure that the built-in winch is:

- a. Accessible through the pole hand hole for repairs, operation or replacement.
- b. Securely attached inside the pole.
- c. Supporting itself and the load assuring lowering/raising operations.
- d. Preventing freewheeling when loaded.
- e. Provided with reducing gear to reduce the loading effort.
- f. Ready for quick connect/disconnect of Drill Adaptor Assembly for portable drill operation.
- g. Ready for quick connect/disconnect of Manual Hand Crank Assembly for manual operation.

2-1 Winch Assembly Specifications:

- Gear Ratio: 15:1
- Vertical lift max.: 1,000 lbs.
- Pulling capacity single line: 1,000 lbs
- Pulling capacity double line: 1,900 lbs
- Drum capacity for 1/8 in. cable: 140 ft.
- Drum capacity for 3/16 in. cable: 61 ft.
- Gear ratio: 15:1
- Length: 7-1/2 in.
- Width: 11-13/16 in.
- Height: 15-19/32 in.
- Weight: 21 lbs max

2-2 Drill Adapter Assembly and Portable Electric Drill

Portable Electric Drill with Overload Clutch

- 1/2" drill chuck
- Variable speed up to 500 rpm max.
- Heavy duty reversible motor

Drill Adapter Assembly

- 7/16" drill motor adapter
- Torque limiter
- 7/16" hex drive adapter
- Extension shaft
- 1-1/8 in. hex impact socket with part release access

2-3 Manual Hand Crank Assembly

- 1-1/8 in. hex socket with part release access
- Extension shaft
- Arm with rotating handle to steady assembly