

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	87 N-0684-OI	2019	88	109

11.3.4 MOUNTING

Mount the DMS to the support posts or structure as herein specified, shown on the Plans, or as directed by the Engineer.

11.3.5 DMS ORIENTATION

Orient the DMS such that the face of the sign is towards the roadway. Follow the DMS orientation detail located in the construction drawings for the orientation and exact position of the DMS. Receive approval by the Engineer prior to placement of the foundations.

11.3.6 SECURITY

Change the manufacturer default password to a unique password (KDOT supplied) upon taking possession of and commissioning the controller.

11.3.7 LIGHTNING PROTECTION

Furnish and install lightning protection at every DMS to reduce electrical differential potential. Install all equipment in accordance with the requirements of current editions of UL 96A, NFPA 780, and LPI 175.

12.0 CLOSED CIRCUIT TELEVISION SYSTEM (CCTV)

12.1 DESCRIPTION

Furnish and install the closed circuit television (CCTV) camera and equipment cabinet as specified in the plans. Orient all equipment as shown on the construction drawings. Pay attention to the specific orientation of the pole and the specific mounting orientation of all equipment on the pole.

Provide and install a pole, pole foundation, anchor rods, equipment cabinet, connection hardware, camera lowering device, composite cable, camera lowering tool, surge protection and grounding, air terminal, CCTV communication equipment and cables as specified in the plans.

Install the new CCTV cameras adjacent to and have their operating and communication equipment located in the pole mounted controller cabinets or in ground mounted cabinet assemblies as indicated on the Plans, or as directed by the Engineer.

12.2 MATERIALS

12.2.1 CCTV CAMERA ASSEMBLY

The CCTV camera assembly consists of a high performance color CCTV camera, zoom lens, pan and tilt drive unit, domed enclosure, mounting brackets, connectors and cabling all assembled together into one operational unit. Ensure that the CCTV camera assembly weighs less than 100 lbs and has a center of gravity of less than 24" from the center of the pole.

If an IP camera is required, provide an Axis model Q6052-E IP series dome camera or an approved equal. Ensure an IP video encoder is integrated inside the camera dome assembly. Ensure the encoded video is H.264 (MPEG-4 Part 10/AVC) compliant using the baseline profile. Provide a 100Base-TX network interface that facilitates the transmission of camera control commands and video over an Ethernet based IP network.

The following electrical and environmental requirements are applicable for all CCTV equipment:

1. Power: 120VAC @ 60Hz;
2. Environmental: Operating Temperature: -50° to 50°C; and
3. Operating Humidity: Up to 95% RH non-condensing.

Ensure that the camera operates with a motorized-iris lens and is designed for day and night functionality. Ensure that the shutter speeds are remotely adjustable from 1/60 to 1/10,000 seconds. Ensure that the camera incorporates Digital Signal Processing (DSP) circuitry to provide advanced features such as automatic electronic shutter control, backlight compensation, digital zoom, and image stabilization. Ensure that the camera supports closing of the iris when pointed directly at the sun. Ensure the camera has a minimum horizontal resolution of 470 lines. Ensure the system to noise ratio is no less than 48 db. Ensure that the camera is equipped with Automatic Gain Control (AGC) so that the camera will be capable of remotely controlling the white balance in response to changes in environmental lighting conditions. If the AGC is switchable, set the AGC to the "on" position. Ensure that the camera supports on-screen title generation that will allow the user to define the camera with character specific information.

Ensure the camera is supplied with mechanical and digital zoom capabilities. Ensure the mechanical zoom lens is remotely controlled through the camera unit and has a magnification factor of at least 35x. Ensure the zoom lens has an automatic and manual iris and focus controls. In addition, ensure the camera has at least a 12x digital zoom capability. Ensure the lens aperture range is F1.6 to F2.8 minimum. If camera is HD, mechanical zoom shall be at least 18x.

Provide a camera housing that is pressurized when possible; a non-pressurized dome enclosure is acceptable when a pressurized option is not available. Provide a camera housing that contains the CCTV camera, lens, and pan/tilt drive unit. Securely mount and wire the domed enclosure to the camera-lowering device. Supply all hardware required to mount the domed camera enclosure to the camera lowering device. Provide the domed camera enclosure that is water tight and constructed so that the enclosed equipment will not be affected by rainfall, blowing dust, salt, fungus, and other debris. Supply the unit with a heater to keep the camera and lens within the acceptable operating temperature range.

Ensure that the pan and tilt drive unit allows the remote position of the CCTV camera to view freeway traffic conditions. Fit the units to mount to the CCTV camera and domed enclosure and supply with all of the necessary mounting plates, connectors, brackets and wiring for operation. Ensure the unit allows 360° of continuous panning which is variable from 1 to 40°/second. Ensure the unit allows a minimum of 10 preset positions accurate to within 0.5° accuracy.

Demonstrate that the camera assembly functions with the following video management software packages:

1. For systems integrating with the KC SCOUT, the Genetec Omnicast video distribution system, TransSuite, and Wowza systems.
2. For systems integrating with KDOT ATMS, the MIST CCTV management software and BARCO video wall display in Wichita, KS.

Minimum functionality to be demonstrated shall include the ability to decode and display a video stream using the codes, resolution and frame rate specified and all pan-tilt-zoom, iris, focus and present functions.

Connection Type	Frame Rate Specified	Resolution
Cell Modem	5	CIF 352x240
Broadband Wireless	30	CIF 352x240
Fiber Optic (100 Base FX or Greater)	30	D1 720x480 or 352x240

12.2.2 CCTV CAMERA LOWERING SYSTEM

Ensure that the camera lowering system is designed to support and lower the CCTV camera assembly without damage or causing degradation of camera operations. The camera lowering system device and the pole are interdependent and thus, must be considered a single unit or system. Provide a lowering system that consists of a suspension contact unit, divided channel support arm, pole top adjustable tenon, pole top junction box, conduit mount adapter, and camera connection box. Provide a cable strain relief device/wire mesh grip if not provided by the lowering device supplier.

Ensure that the divided support arm and receiver brackets are designed to self-align the contact unit with the pole center line during installation and ensure the contact unit cannot twist under high wind conditions. Provide a camera-lowering device that withstands sustained 100 mile per hour winds with a 30 percent gust factor using a 1.65 safety factor. Deliver to the Engineer the lowering device manufacturer independent laboratory testing documents certifying adherence to the stated wind force criteria utilizing, as a minimum effective projected area (EPA), the actual EPA or an EPA greater than that of the camera system to be attached.

Provide a camera-lowering device product from a manufacturer with a minimum of 2 years of experience in the successful manufacturing of such systems. Provide documentation by the lowering device provider identifying a minimum of 3 previous projects where the proposed system has been installed successfully.

As part of this contract, the lowering device manufacturer is required to furnish a factory representative to assist with the assembly and testing of the first installation of the lowering system onto the pole assembly. Receive approval by the Engineer for this installation to lowering device manufacturer is required to be available to assist in a second installation or possibly a third installation until the manufacturer and KDOT are satisfied with proper installation. Furnish from the manufacturer the applicable documentation certifying instruction on the installation, operation, and safety features of the lowering device. Provide operational instructions to the Engineer.

Provide the suspension contact unit with a load capacity of 600 pounds with a 4 to 1 safety factor. Use a locking mechanism between the fixed and moveable components of the lowering device. Use a movable assembly with a minimum of 2 latches. Use a latching mechanism that securely holds the device and its mounted equipment. Use a latching mechanism that operates by alternately raising and lowering the assembly using the winch and lowering cable. When latched, ensure that all weight is removed from the lowering cable. Use a fixed unit that has a heavy duty cast tracking guide and means to allow latching in the same position each time. Use a contact unit housing that is weatherproof with a replaceable neoprene gasket provided to seal the interior from dust and moisture. Ensure that the entire unit has a minimum temperature rating of -40 degrees Fahrenheit to +190 degrees Fahrenheit.

Ensure that the prefabricated components of the lift unit support system are designed to preclude the lifting cable from contacting the power or video cabling. Supply an internal 1.25 inch HDPE conduit in the pole for the lifting/lowering cable. Ensure that a conduit mount adapter for housing the lowering cable with an interface to allow the connection of a 1.25 inch HDPE conduit is located just below the cable stop block at the back of the lowering device. Ensure that the only cable permitted to move within the pole or lowering device during lowering or raising is the stainless steel lowering cable. Ensure that all other cables remain stable and secure during lowering and raising operations.

Provide one hand-operated lowering tools for up to 10 lowering devices, and one additional tool for each 10 additional devices. Ensure that the camera lowering device is operated by use of a portable lowering tool. Ensure that the tool consists of a lightweight metal frame and winch assembly with a quick release cable connector and an adjustable safety clutch (socket). Ensure that this tool is compatible with accessing the support cable through the handhole of the pole. When attached to the handhole, the tool will support itself and the load assuring lowering operations and provide a means to prevent freewheeling when loaded. Ensure that the lowering tool has a reduction gear to reduce the manual effort required to operate the lifting handle to raise and lower a capacity load. Provide the lowering tool with an adapter (socket) for operating the lowering device by a portable drill using a clutch mechanism.

Ensure that the lowering tool is equipped with a positive locking mechanism to secure the cable reel during raising and lowering operations and prevent freewheeling. Ensure that the lowering tool is 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. The lowering tools are incidental to other items of work.

Provide a camera junction box that is of two piece clamshell design with one hinge side and one latch side to facilitate easy opening. Ensure that the general shape of the box is cylindrical to minimize the EPA. Ensure that the Camera Junction Box is cast aluminum with stabilizing weights on the outside of the box to increase room on the interior. Ensure that the box is capable of having up to 40 pounds of stabilizing weights. Ensure that the bottom of the Camera Junction Box is 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 mountings. Install gaskets with the junction box to prevent water intrusion. Ensure that the bottom of the box has a screened and vented hole to allow airflow and reduce internal condensation.

Ensure that all pulleys for the camera lowering device and portable lowering tool have sealed, self lubricated bearings, oil tight bronze bearings, or sintered-oil impregnated bronze bushings. Ensure that the lowering cable is a minimum 1/8 inch diameter stainless steel aircraft cable with a minimum breaking strength of 1740 pounds with (7) strands of 19 AWG wire each.

Ensure that all electrical and communications connections between the fixed and movable lowering device components are protected from exposure to the weather by a waterproof seal to prevent degradation of the electrical contacts. Ensure that the electrical connections between the fixed and movable lowering device components are designed and tested to conduct video signals as well as the power for operation of dome environmental controls.

Ensure that the female and male socket contact halves of the connector block are made of a UL94, V0 rated thermosetting synthetic rubber. Ensure that the female barrel or brass socket contacts and the male high conductivity brass pin contacts are permanently encased in this material.

Ensure that the interface and locking components are made of stainless steel or aluminum. Ensure that all external components of the lowering device are 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 lowering unit shall have sufficient weight to disengage the camera and its control components in order that it can be lowered properly. Provide counterweights as necessary to assure that the alignment of pins and connectors are proper for camera support to be raised into position without binding. Ensure that the pole top and/or camera junction boxes have the power and signal connectors for attachment to the bare leads in the pole top and/or junction boxes.

Install a drip shield above the lowering device connection to prevent moisture from infiltrating the camera assembly.

Submit camera pole shop drawings to the Engineer for approval prior to pole and lowering device fabrication.

NO.	DATE	REVISIONS	BY	APP'D
KANSAS DEPARTMENT OF TRANSPORTATION				
ITS EQUIPMENT SPECIFICATIONS				
ITS-S06		VERSION DATE: 05-29-17		
APP'D				
DESIGNED	DETAILED	QUANTITIES	TRACED	
DESIGN CK.	DETAIL CK.	QUAN. CK.	TRACE CK.	