



Subject: Web Camera Design, Installation, and Commissioning Specifications	
Date: June 30, 2005	Author: Kevin Henderson
Bulletin Number: TE-2005-04 Bulletin Type: Guidelines	Effective Date: Immediately
Audience	Standards Affected
All holders of Electrical and Traffic Engineering Manuals	None

BACKGROUND:

Web cameras are installed throughout the Province providing travellers with visual images of road conditions via the Internet. The cameras provide still images which are posted on the Ministry of Transportation’s website located at the following URL: <http://www.th.gov.bc.ca/bchighwaycam/>. Each image is refreshed every 15 minutes for rural roads, and 90 seconds for urban roads. This bulletin and its attachments provide guidelines for the planning, design, installation, commissioning, and maintenance of web cameras.

POLICY:

The installation of Web Cameras may be considered where visual road condition information will be of value to the travelling public. Cameras may also be installed to monitor traffic conditions in areas under construction.(refer to Technical Circular T-09/04-
http://www.th.gov.bc.ca/publications/Circulars/Current/T_Circ/2004/t09-04.pdf

Where cameras are used to visually monitor traffic conditions through construction, they may remain after construction is complete, or be relocated to a more appropriate location at the discretion of the Ministry Highways District. Camera locations must be reviewed with the Ministry Highways District Office prior to design and installation.

Subject to the Ministry District Transportation Manager approval, the cost for the design, supply, installation and commissioning of web cameras will be included in the projects costs. All web camera operating costs and maintenance during construction will be the responsibility of the project. Upon completion of the project, the operating costs and maintenance will be the responsibility of the Ministry Highways District. The cost for relocating temporary cameras after a project is complete will be borne by the Ministry Highways District where they are being permanently installed.

PLANNING:

In order for a site to be considered, a suitable power supply and a communications connection must be available as outlined below.

Communications:

Web cameras require one of the following communication methods to operate.

1. Local Area Network (LAN) - The LAN must be connected to the Internet and be capable of assigning a Static IP address to the camera. Dynamic Host Configuration Protocol (DHCP) can not be used.
2. Cellular 1X (CDMA) - To determine if Cellular 1X coverage is available in the proposed location, consult the service provider’s coverage map. Visit the site with a digital cell phone or a Cellular 1X modem (preferred) to determine the reception level.
3. Hardwired Telephone - A hardwired telephone connection is more reliable in areas with intermittent Cellular 1X coverage.



4. Electrical Power:

Cameras should be located near established Ministry electrical service panels to reduce costs. Where no existing Ministry service is available but there is power in the area, a new Ministry service will be installed.

It is preferred, but not mandatory, that a camera be located in an area where roadway lighting is present so that the lighting enhances the image after daylight hours.

When it has been determined that the proposed site meets the criteria outlined above, the web camera location must be reviewed by the Ministry District Office prior to commencing with design.

DESIGN:

All web camera installations must be detailed on Ministry electrical drawings and submitted to the Ministry Electrical Engineering Centre for approval.

Camera:

The Ministry uses specific technologies and components. The camera components are listed in the attached document. Substituted parts shall be approved by the Electrical Engineering Centre Staff.

Location and Mounting:

A web camera's effectiveness, life span and maintenance schedule may be greatly affected by its location. The web camera should be:

- Mounted on a structure at a minimum height of 8.0 meters above the road grade
- Located to facilitate the access of the camera by maintenance personnel. Due to limitations in the reach of service vehicles, the maximum camera height shall not exceed 13.5 m in Region 1 and 11.0 m in all other Regions
- Mounted on a structure that is unlikely to be damaged from vehicle impacts. This would include structures located outside the Clear Zone, or behind barrier or curb. Cameras must not be located on structures with frangible or breakaway bases.
- Preferably oriented north, northeast or northwest. A camera facing south or east will be adversely affected by sun glare, resulting in the camera becoming ineffective for several hours of the day.

Electrical Power:

The camera requires a 120V circuit fed from a 15A breaker.

The ideal and lowest cost installation is a web camera mounted directly onto an existing service pole with some modification to extend the height of the pole. See the attached drawings which illustrate examples of the web camera mounting options.

INSTALLATION:

The Ministry Regional Manager, Electrical Services must be contacted to arrange the coordination of the installation of web cameras.

COMMISSIONING:

Commissioning will be arranged by the Ministry Electrical Engineering Centre. See the attached schematic drawings for assembly details and testing procedures. The Ministry Representative or the appointed consultant/contractor must:

- Assemble the camera, configure the camera, and test for image uploading in the lab prior to delivery to the site.
- Assign a username and password for the camera and notify the Ministry Electrical Engineering Centre of the assigned values.
- Contact Gord Smith (250-356-8752) to arrange for the Ministry web site to be updated for the new camera.
- Test the camera for image uploading on-site after installation.



TECHNICAL BULLETIN

Ministry of Transportation

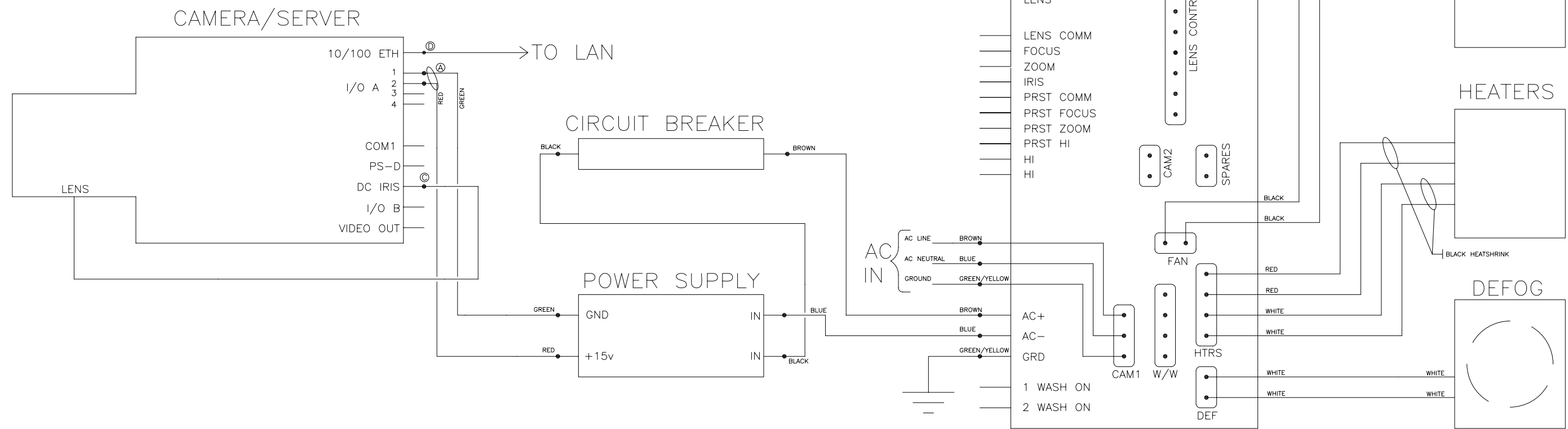
ENGINEERING BRANCH
TRAFFIC, ELECTRICAL, HWY SAFETY AND
GEOMETRIC STANDARDS. SECTION
BULLETIN NUMBER: **TE-2005-04**

MAINTENANCE:

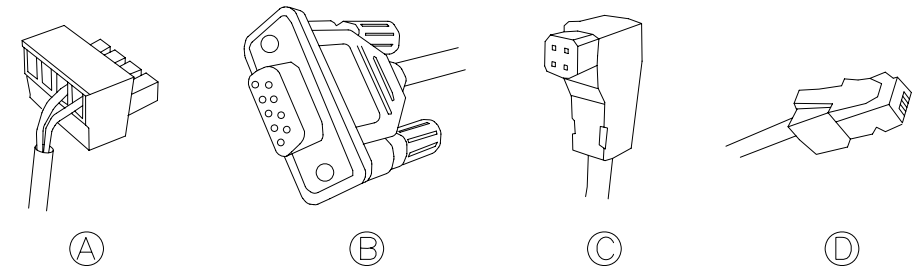
Web cameras require a minimum of bi-annual preventative maintenance which includes cleaning the enclosure window. Corrective maintenance is required when the web camera fails to upload images to the web site, or the uploaded images are of poor quality due to system component failure or an obstructed camera view. All maintenance will be coordinated with the Ministry Regional Manager, Electrical Services. Contact Gord Smith (250-356-8752) for issues related to the Ministry web site.

CONTACT:

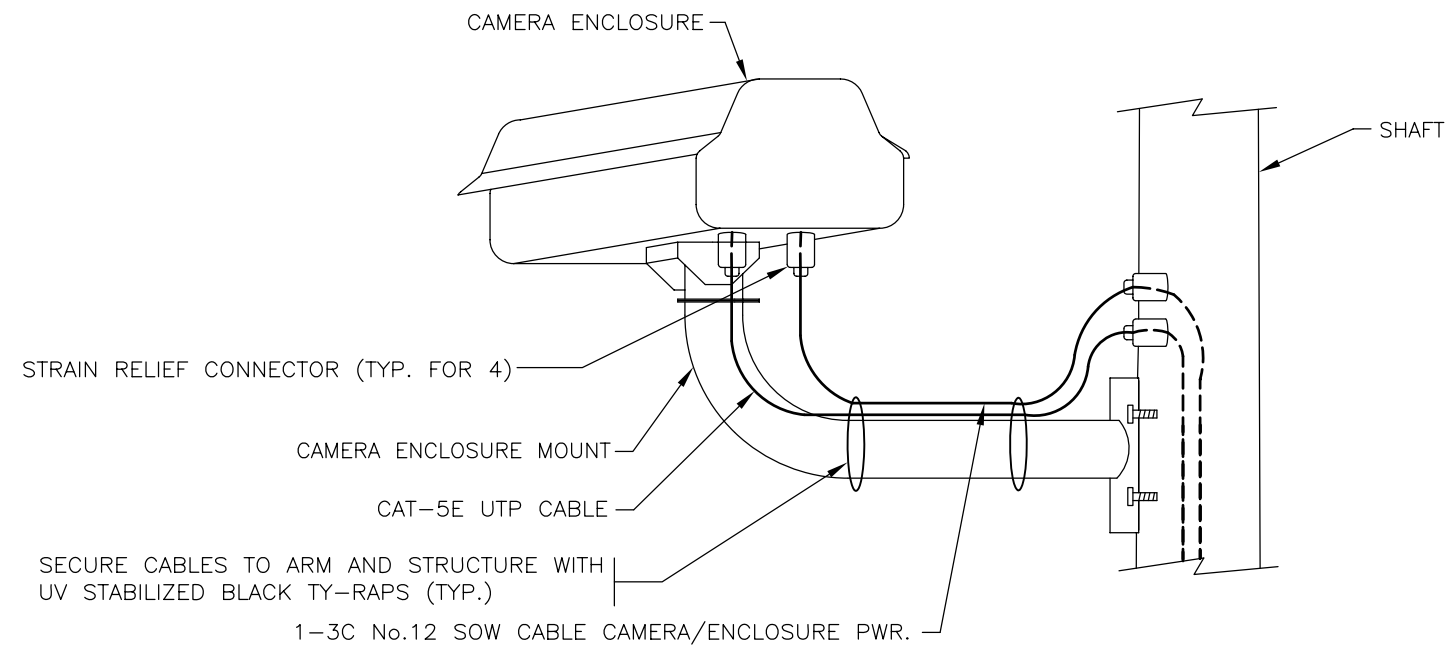
Kevin Henderson, Electrical Engineering EIT
Electrical Engineering Centre
Phone: (604) 660-8067
Email: kevin.henderson@gov.bc.ca



WEB CAMERA COMPONENT SCHEMATIC
N.T.S.



CONNECTOR DETAILS



WEB CAMERA MOUNTING DETAIL
(LAN APPLICATION ONLY)
N.T.S.

SHOP TEST PROCEDURE

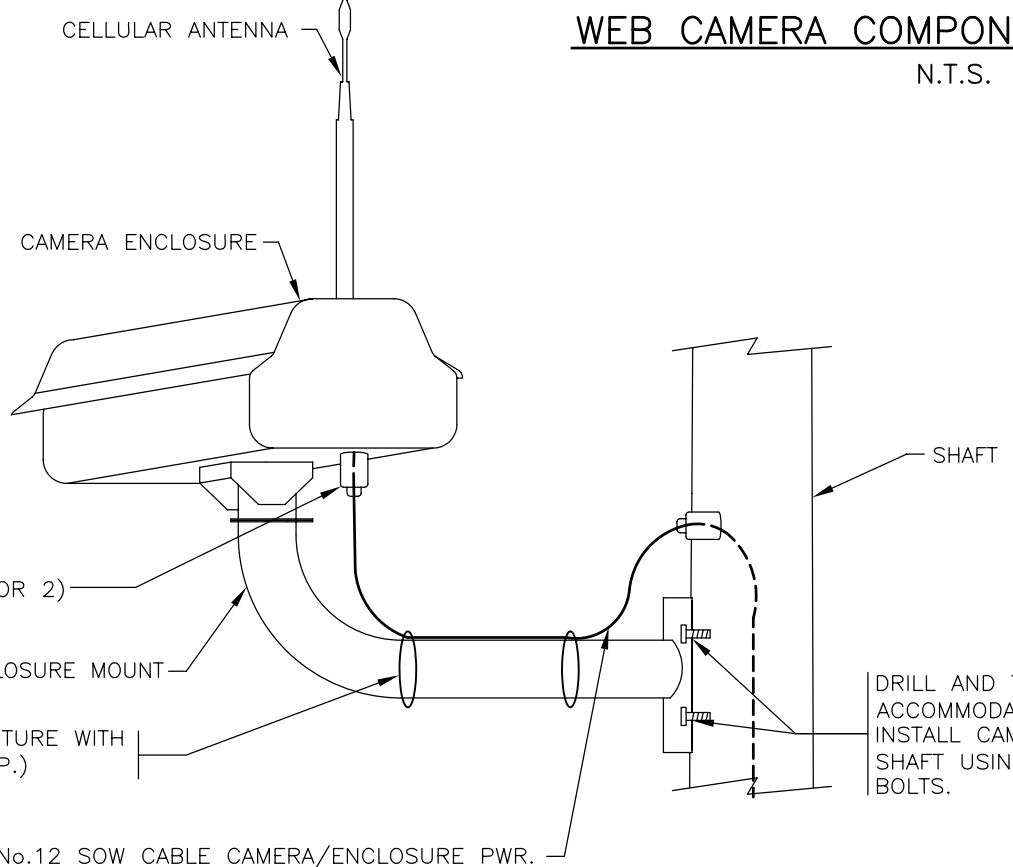
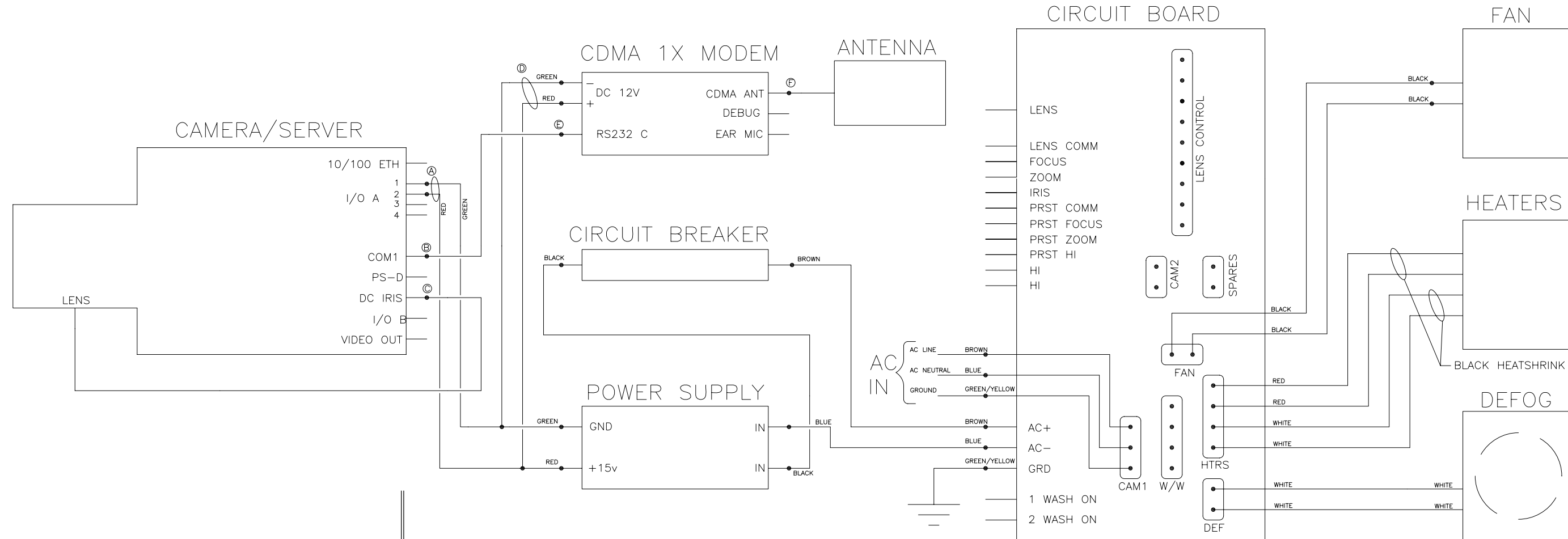
- UNDERTAKE THE FOLLOWING TESTS:
- TEST THE OPERATION OF THE POWER SUPPLY
 - TEST THE OPERATION OF THE MODEM WITHOUT THE WEB CAMERA
 - TEST THE OPERATION OF THE CAMERA
 - CONFIRM IMAGE UPLOADING TO THE FTP SERVER USING THE MODEM
 - CONFIRM DIAL-IN ACCESS TO THE WEB CAMERA VIA A TELEPHONE MODEM

ON-SITE TEST PROCEDURE

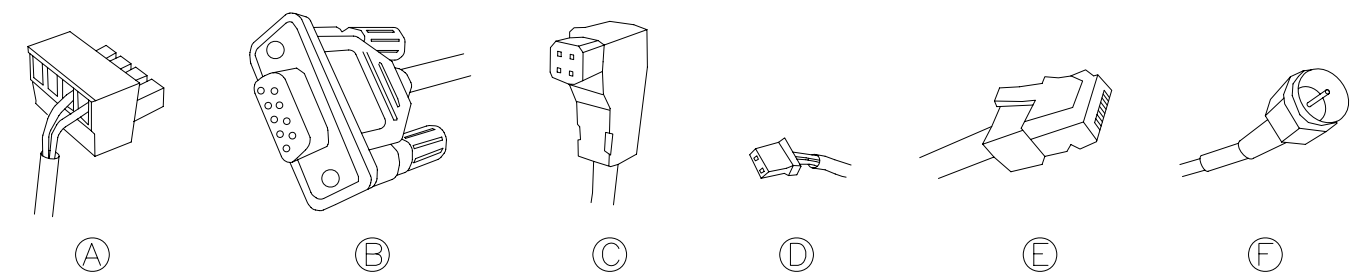
- UNDERTAKE THE FOLLOWING TESTS:
- ADJUST THE AIM, FOCUS AND ZOOM OF THE CAMERA.
 - CONFIRM IMAGE UPLOADING TO THE FTP SERVER USING THE MODEM

No.	Description	Date
J		
I		
H		
G		
F		
E		
D		
C		
B		
A		
REVISION		

MINISTRY OF TRANSPORTATION		
WEB CAMERA SCHEMATIC (LAN)		
	Ministry of Transportation and Highways	Drawing No. 3



DRILL AND TAP 2 HOLES TO ACCOMMODATE 1/4" BOLTS AND INSTALL CAMERA MOUNT ONTO SHAFT USING 2-1/4"x1" LONG BOLTS.



SHOP TEST PROCEDURE

- UNDERTAKE THE FOLLOWING TESTS:
- TEST THE OPERATION OF THE POWER SUPPLY
 - TEST THE OPERATION OF THE MODEM WITHOUT THE WEB CAMERA
 - TEST THE OPERATION OF THE CAMERA
 - CONFIRM IMAGE UPLOADING TO THE FTP SERVER USING THE MODEM
 - CONFIRM DIAL-IN ACCESS TO THE WEB CAMERA VIA A TELEPHONE MODEM

ON-SITE TEST PROCEDURE

- UNDERTAKE THE FOLLOWING TESTS:
- ADJUST THE AIM, FOCUS AND ZOOM OF THE CAMERA.
 - CONFIRM IMAGE UPLOADING TO THE FTP SERVER USING THE MODEM

No.	Description	Date
J		
I		
H		
G		
F		
E		
D		
C		
B		
A		

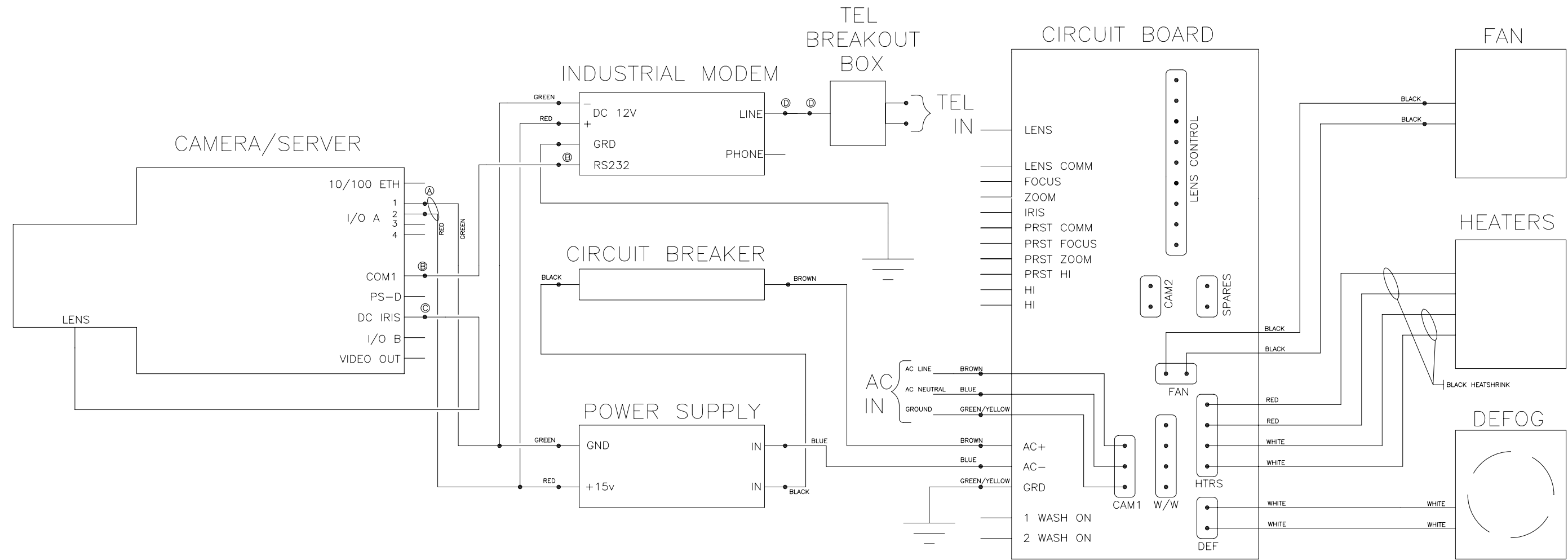
MINISTRY OF TRANSPORTATION

WEB CAMERA SCHEMATIC (CELLULAR 1X)

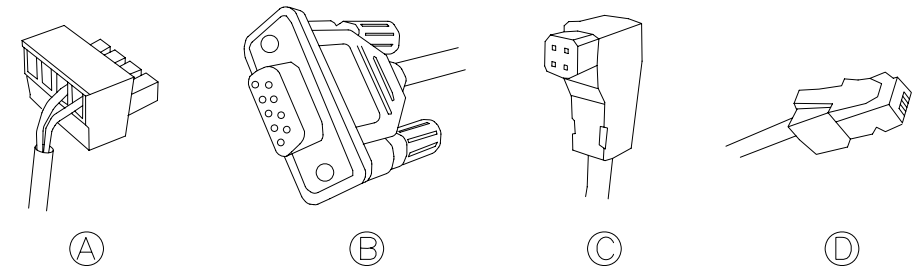
BRITISH COLUMBIA Ministry of Transportation and Highways

Drawing No. 2

6/6/2005 11:19:27 AM, Plotted By: C.E.



WEB CAMERA COMPONENT SCHEMATIC
N.T.S.



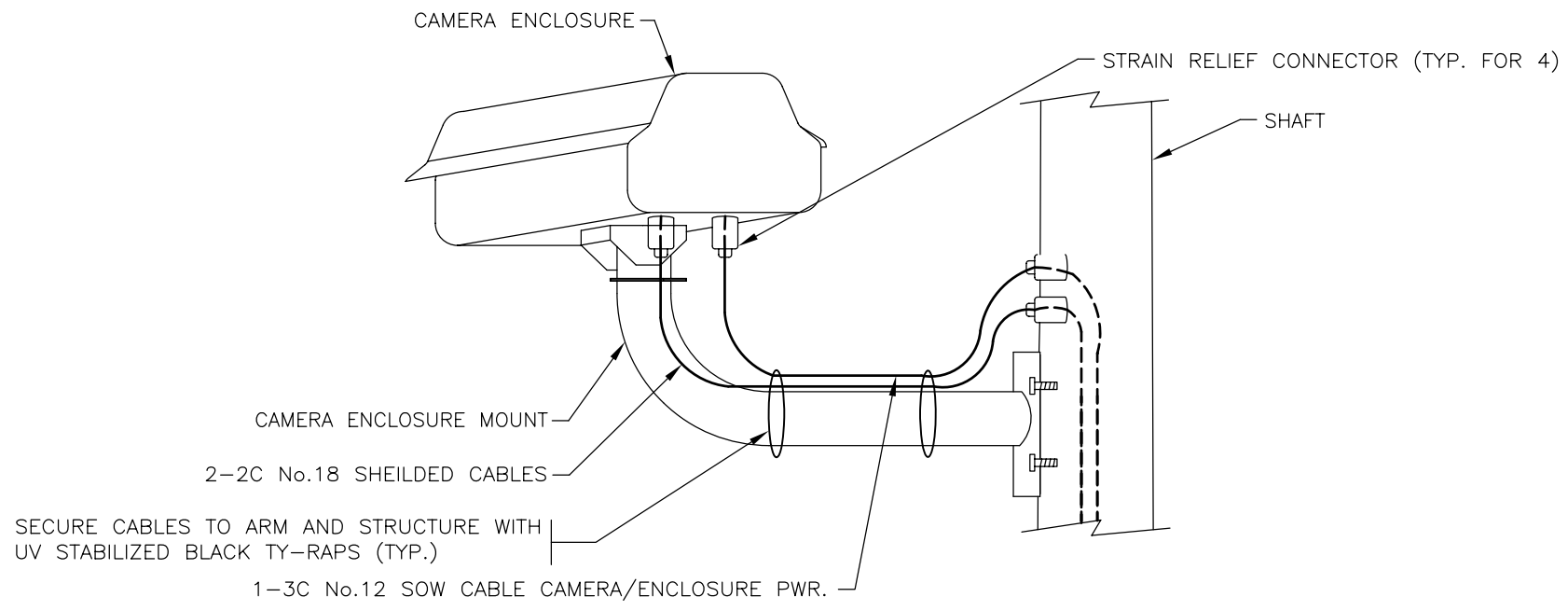
CONNECTOR DETAILS

SHOP TEST PROCEDURE

- UNDERTAKE THE FOLLOWING TESTS:
- TEST THE OPERATION OF THE POWER SUPPLY
 - TEST THE OPERATION OF THE MODEM WITHOUT THE WEB CAMERA
 - TEST THE OPERATION OF THE CAMERA
 - CONFIRM IMAGE UPLOADING TO THE FTP SERVER USING THE MODEM
 - CONFIRM DIAL-IN ACCESS TO THE WEB CAMERA VIA A TELEPHONE MODEM

ON-SITE TEST PROCEDURE

- UNDERTAKE THE FOLLOWING TESTS:
- ADJUST THE AIM, FOCUS AND ZOOM OF THE CAMERA.
 - CONFIRM IMAGE UPLOADING TO THE FTP SERVER USING THE MODEM

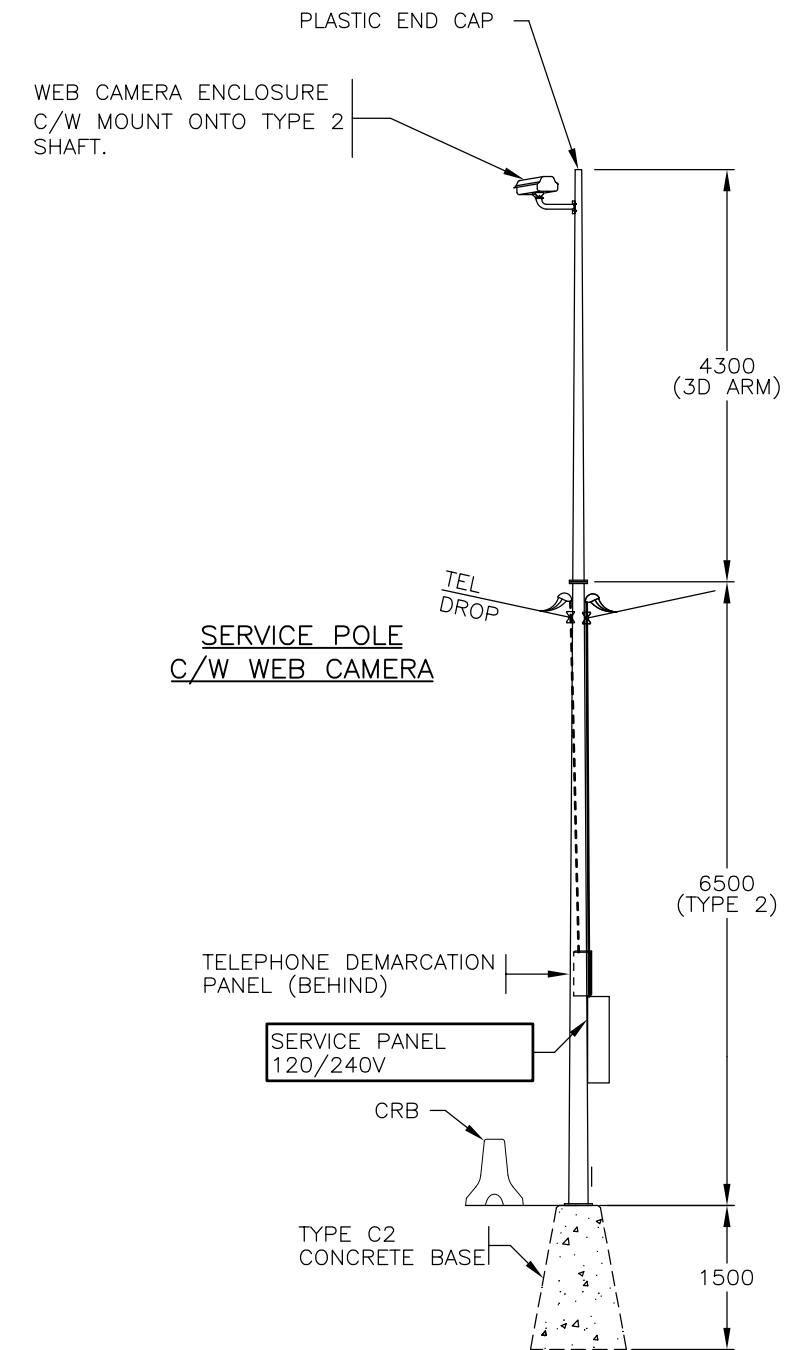
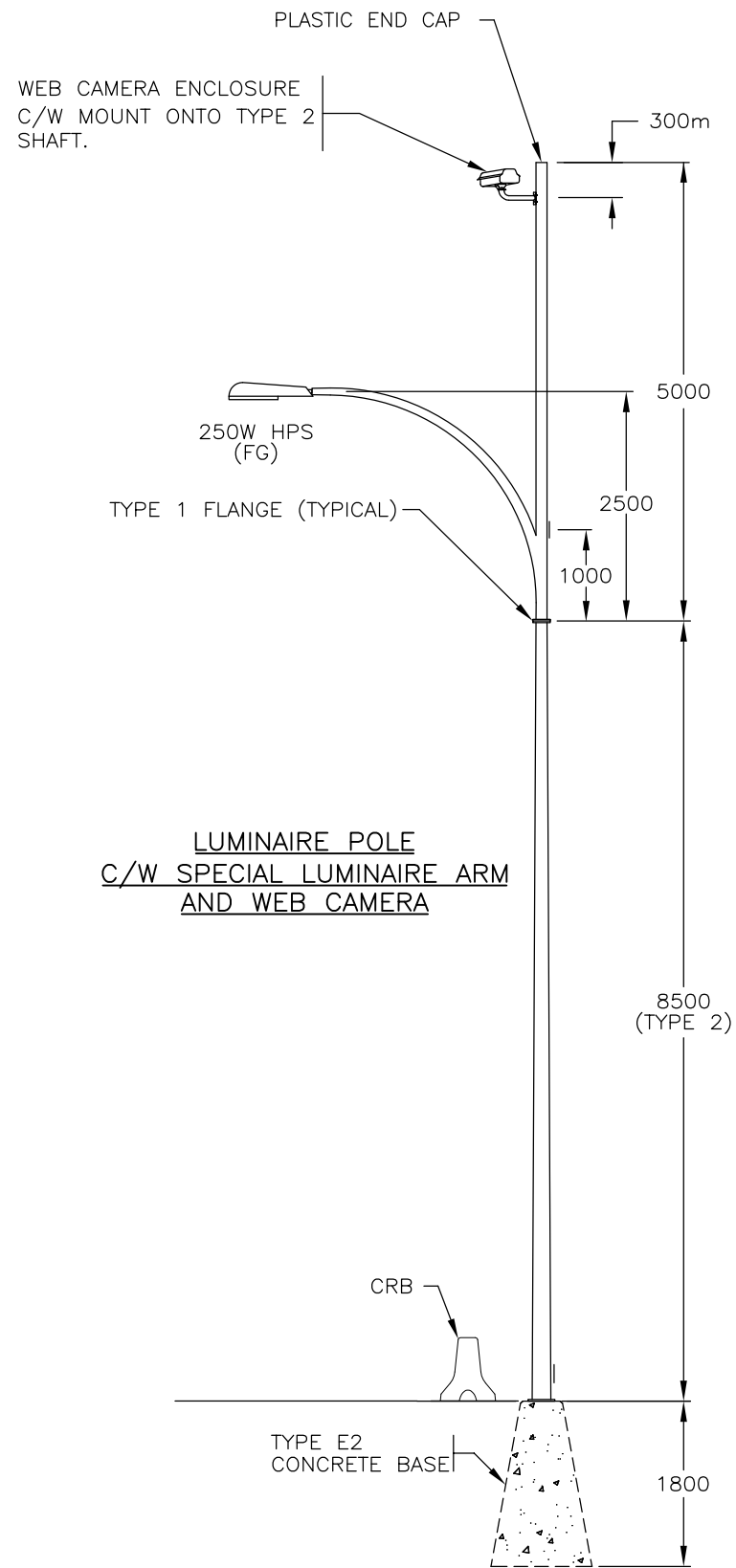
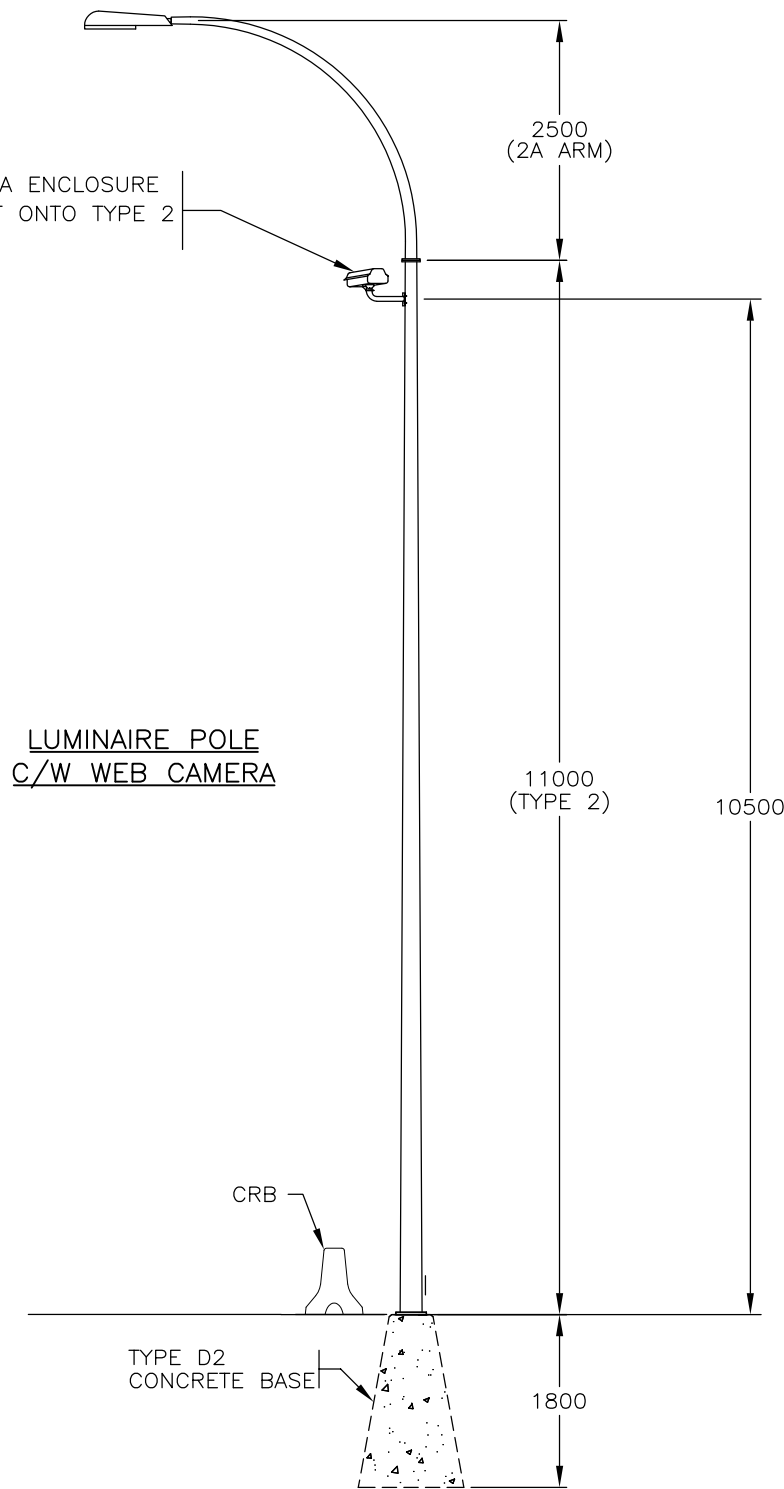


WEB CAMERA MOUNTING DETAIL
(TELEPHONE LINE APPLICATION ONLY)
N.T.S.

No.	Description	Date
J		
I		
H		
G		
F		
E		
D		
C		
B		
A		

REVISION		MINISTRY OF TRANSPORTATION	
		WEB CAMERA SCHEMATIC (TELEPHONE)	
		 BRITISH COLUMBIA Ministry of Transportation and Highways	Drawing No. 4

6/6/2005 11:18:37 AM, Plotted By: C.E.



No.	Description	Date
J		
I		
H		
G		
F		
E		
D		
C		
B		
A		

REVISION

MINISTRY OF TRANSPORTATION

WEB CAMERA MOUNTING EXAMPLES



Drawing No.

1

MINISTRY OF TRANSPORTATION WEB CAMERA APPROVED MATERIALS LIST

1 INTRODUCTION

The Ministry uses specific technologies and components which make up a complete web camera. The camera components are listed in this document. Substituted parts shall be approved by the Electrical Engineering Center Staff.

2 WEB CAMERA MATERIALS

The following is a list of approved materials for a Ministry web camera.

Description	Manufacturer	Model Number
Day/Night Network Camera with Auto Iris and Zoom Lens	Axis	Axis 221
Heat/Blow 120V 105W Pelco Enclosure	Pelco	EH5729-1
Window Defroster	Pelco	WD57-1 120V
Thermal Insulation	Pelco	TI57
Enclosure Mounting Arm	Pelco	EM-1900U
Power Supply	Sola	663-SCP30S15-DN
CDMA 1X Cellular Modem	Anydata Or Airlink Comm.	EM III Dual Raven
Coaxial Cable	Various	LMR 400
Antenna	Max RAD	Various
Telephone Modem	US Robotics	USR5686E