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1.0 PURPOSE AND APPLICABILITY

This standard operating procedure (SOP) describes installation and site documentation requirements for automatic visibility monitoring camera systems operated according to IMPROVE Protocol, and Web-based digital camera systems.

Camera-based visibility monitoring, referred to as scene monitoring by the IMPROVE Program, is an efficient way to document events and trends and is an effective way to communicate visibility relationships to decision-makers and to the public. Slides, movie film, and digital images do not, however, provide quantitative information about the cause of visibility impairment. Aerosol and optical properties of the atmosphere must be independently monitored where cause and effect relationships are required.

The automatic camera visibility monitoring station takes 35 mm slides or high-resolution digital images of a selected vista at user-selected times throughout the day. The station can also be outfitted with an 8 mm time-lapse camera to record the dynamics of visibility events. Self-contained, battery-powered, automatic camera visibility monitoring systems are easily installed and operated at any location. Digital camera systems designed for use as Web cameras require an AC or DC power supply and a communication system (e.g., telephone modem, satellite communications, Internet Service Provider).

The purpose of this standard operating procedure is to assure consistent, quality data and minimize data loss by:

- Installing procured camera systems according to manufacturers' specifications.
- Configuring digital systems' software to site-specific monitoring requirements.
- Ensuring that visibility monitoring systems are installed in locations that view important scenic features, monitors the same air mass of associated aerosol and/or optical instrumentation, and are secure from potential vandalism (see SOP 4055, *Site Selection For Scene Monitoring Equipment*).
- Training site operators on camera system requirements and routine maintenance procedures (see SOP 4120, *Automatic Camera System Maintenance (IMPROVE Protocol)*, and its associated technical instructions).
- Performing thorough on-site specification measurements.
- Documenting collected site specification measurements on the Visibility Monitoring Photographic Site and Target Specifications Form.

This SOP serves as a guideline to facilitate the following:

- Installing and configuring camera systems for monitoring.
- Completing the Visibility Monitoring Photographic Site and Target Specifications Form and the HRDC or RDCS Digital Camera Site Configuration Information Form.

2.0 RESPONSIBILITIES

2.1 PROJECT MANAGER

The project manager shall:

- Provide the field specialist final site configuration materials including photographic documentation, maps, approved installation location, vista, and configuration specifications.
- As required, review the determined site preparation and installation requirements and installation schedule with the project-specific Contracting Officer's Technical Representative (COTR).

2.2 FIELD SPECIALIST

The field specialist shall:

- Schedule the system installation.
- As required, review the determined site preparation and installation requirements with the local contact.
- Arrange for electrical power, telephone service, and Internet Service Provider (ISP) service, as needed.
- Maintain communications with the local contact during site preparation. Verify that all required site preparation is completed prior to the installation.
- Prepare software according to digital camera system site-specific operation.
- Obtain permission from private or public landowners to access the scene monitoring location for installation and training.
- Schedule an operator training session for all identified operator(s) and the primary local contact.
- Install all camera system equipment according to installation and configuration requirements provided by the project manager.
- Complete the Visibility Monitoring Photographic Site and Target Specifications Form and the HRDC or RDCS Digital Camera Site Configuration Information Form.
- Enter all site specification information in the Quality Assurance Database.

2.3 LOCAL (ON-SITE) CONTACT

The local contact shall:

- Review the determined site preparation and installation requirements with the field specialist.
- Identify and contact local landowners, primary contacts, and site operators regarding site installation and routine maintenance requirements.

- Perform any necessary site preparation required prior to the installation (e.g., tree removal, clear site access).
- Maintain communications with the field specialist and local landowners to confirm scheduled installation requirements.
- Schedule the operator training session with pertinent routine servicing personnel and the field specialist.
- Provide on-site equipment and tools required for the determined mounting configuration.
- Provide site access and installation assistance as needed.
- Verify site location and geographic reference specifications documented by the field specialist.

3.0 REQUIRED EQUIPMENT AND MATERIALS

3.1 SITE INSTALLATION EQUIPMENT AND MATERIALS

Materials required to install a camera system depend on the type of installation and surface material to which the enclosure is mounted. Standard equipment and materials required for any camera system installation include:

- Standard tool kit with adjustable crescent wrench, channel-lock pliers, standard combination wrench set, screwdrivers (flat-head and Phillips-head), wire snips, needle-nose pliers, regular pliers, wire ties, and electrical tape
- Brunton compass
- GPS unit
- Level
- Site location maps
- Documentation camera (digital or with 35 mm print film)

Equipment and materials specific to 35 mm or remote digital camera systems (RDCDs) include:

- Weatherproof camera system enclosure (Hoffman-type) provided with:
 - Four 1" carriage bolts (3/8" diameter)
 - Four 3/8" nuts and lock washers
 - Clear silicone seal
- Double-plated mounting post
- Camera system components and tripod mount

Equipment and materials specific to Web-based digital camera systems (HRDCs) include:

- Weatherproof camera system enclosure (Pelco-type) provided with:
 - Sun shield, thermal insulation, and thermostatically controlled resistive heaters, fan, and window defroster
 - Camera power circuitboard
 - Thermostat circuitboard
- RS-232 serial or USB interface
- 110 volt AC to 24 volt AC or DC power supply
- Image capture desktop computer
- Uninterruptible power supply
- ARS_DIGICAM software
- System options include:
 - Pan/tilt mounting system
 - Wired link
 - Wireless link
 - Satellite Internet communication link
 - Solar-powered system

The following site installation equipment and materials requirements have been categorized by mounting configuration.

3.1.1 Pre-Existing Concrete or Rock Installation

Standard equipment and tools required to install an automatic camera system in pre-existing concrete or rock include:

- Hammer drill (AC or battery, depending on line power availability)
- 5/8" hammer bit and 5/8" star drill
- Two pound (2 lb.) hand sledge hammer
- Hack saw
- Threaded rod and rock/concrete epoxy mounting method hardware:
 - Four 6" lengths of 1/2" threaded rod
 - Four to six 1/2" rock/concrete inserts (5/8" outside diameter)
 - Four to six 1/2" rock/concrete epoxy capsules
- Rock/concrete inserts and bolts mounting method hardware:
 - Eight or more 1/2" nuts and twelve or more washers
 - Four lock washers
 - Four 1/2" bolts (1-1/2" or 2" in length)

3.1.2 Soil Installation

Standard equipment and tools required to install an automatic camera system in soil include:

- Shovel
- Wheelbarrow
- 7-10 gallons of water (two 5-gallon water containers for transport, if necessary)
- Four 1/2" foundation J-bolts (8" to 12" in length)
- Eight 1/2" nuts and washers
- Four lock washers
- Thin plywood template of post mounting plate hole pattern (with pre-drilled mounting holes)
- Two to four bags of concrete mix

3.1.3 Wood Platform Installation

Standard equipment and tools required to install an automatic camera system in a wood surface or platform include:

- Drill (AC or battery, depending on line power availability)
- Drill bit set (up to 3/8" in diameter)
- Four 3/8" lag screws (1-1/2" to 3" in length, depending on wood thickness). Four washers and four lock washers

or

- Four 1/2" carriage bolts (length depending on wood thickness). Eight nuts, eight washers and four lock washers

If there is adequate access to the underside of the wood surface, it is preferable to use carriage bolts instead of lag screws.

3.1.4 Concrete Pad Installation

Standard equipment and tools required to install an automatic camera system in a concrete pad include:

- Drill (AC or battery, depending on line power availability)
- 1/2" drill bit

- Wood saw
- 30" x 30" piece of 1/2" thick plywood
- Two 30" lengths of 2" x 4" lumber
- Two 27" lengths of 2" x 4" lumber
- Twenty-four or more 1" or 1-1/2" wood screws
- Twelve or more 2-1/2" or 3" wood screws
- Two to four bags of concrete mix (enough for 1.5 cubic feet of concrete)
- Four 1/2" x 6" carriage bolts (entire length must be threaded)
- Eight 1/2" nuts, 12 washers, and 4 lock washers
- Thin plywood template of post mounting plate hole pattern (with pre-drilled mounting holes)

3.1.5 Existing Structure Installation

Mounting on existing structures include many possibilities such as mounting on a roof, inside a wall surface, adjacent to a wall, or tower mount. The image capture desktop computer, part of the Web-based digital camera systems, is usually located on a desk inside a building, but can be mounted in a separate weatherproof enclosure. Depending on the specific type of structure installation, mounting posts, brackets, and hardware may vary.

3.2 SITE DOCUMENTATION MATERIALS

The following materials are generally required to complete the site documentation process:

- Photographs of the site, final equipment configuration, and scenic vista(s)
- On-site documentation acquired by the field specialist during installation, required to complete the Visibility Monitoring Photographic Site and Target Specifications Form and the HRDC or RDCS Digital Camera Site Configuration Information Form
- Topographic maps of the area
- Ruler, protractor, and calculator

4.0 METHODS

This section describes site installation and documentation procedures and includes five (5) major subsections:

- 4.1 Site Preparation and Communication
- 4.2 Vista Alignment
- 4.3 Installation of Automatic Camera Equipment
- 4.4 Operator Training
- 4.5 Site Documentation

4.1 SITE PREPARATION AND COMMUNICATION

Prior to any installation site visit:

- Review the determined site preparation and installation requirements with the site-specific local contact.
- Schedule all site preparation activities.
- Maintain communications with the local contact during site preparation. Verify that all required site preparation is completed prior to the installation.
- Document the primary site operator(s) and back-up operator(s).
- Obtain permission from private or public landowners to access the monitoring location for installation and training.
- Schedule the site installation visit and operator training session.
- Prepare software configuration settings for digital camera systems.
- Arrange for any necessary installation assistance, as well as tools and equipment (e.g., wheelbarrow, water containers).

Once on site:

- Ensure that the selected visibility monitoring location views important scenic features, monitors the same air mass of associated aerosol and/or optical instrumentation, and is secure from potential vandalism.
- Verify the proposed installation configuration and time scheduled for the final training session.

4.2 VISTA ALIGNMENT

Before the automatic camera system can be installed, the mounting post (if used) must be appropriately aligned on the selected monitoring vista (target).

- Stand the mounting post on the installation spot.
- Determine the post orientation by aligning either short edge of the top mounting plate on the center of the expected vista (target).
- Minor camera alignment adjustments are made with the camera tripod mount after installation of the post and enclosure is complete.
- If the camera is mounted on an existing structure, eyeball the alignment, then make minor adjustments after the camera is functional.

4.3 INSTALLATION OF AUTOMATIC CAMERA EQUIPMENT

The automatic camera system mounting post, enclosure, monitoring equipment, computer, and communications links will be installed in best accordance with the approved siting configuration specifications. These installations are described in the following subsections.

4.3.1 Mounting Post Installation

Mounting post installation procedures depend on the type of installation and surface material to which the post is mounted. The mounting posts may be attached to pre-existing concrete or rock, in soil, in a wood platform, or to a new concrete pad.

ATTACHMENT TO PRE-EXISTING CONCRETE OR ROCK

If vandalism is a concern or if the mounting surface is uneven, use threaded rods and rock/concrete epoxy capsules for mounting; otherwise, use rock/concrete inserts and bolts. A diagram depicting both techniques for pre-existing concrete or rock surface mounting is provided as Figure 4-1.

Threaded Rod and Rock/Concrete Epoxy:

- Using the post bottom mounting plate as a template, drill holes for the 1/2" diameter threaded rod segments. Refer to the instructions on the rock/concrete epoxy capsule box for hole diameter, depth, hole preparation, threaded rod preparation, and use of the epoxy capsules. Normally a 5/8" diameter hammer drill bit is used to drill a hole 4" deep.
- After the epoxy has set, screw a nut, with washer, on each rod section. Place the mounting post over the rods.
- Level the mounting post by adjusting the nuts. Verify that the mounting plate rests evenly on all four nuts.
- Using washers, lock-washers, and nuts, secure the mounting plate.
- To prevent vandalism or theft, bend over the tops of the threaded rods or damage the rod threads so that the nuts cannot be removed.

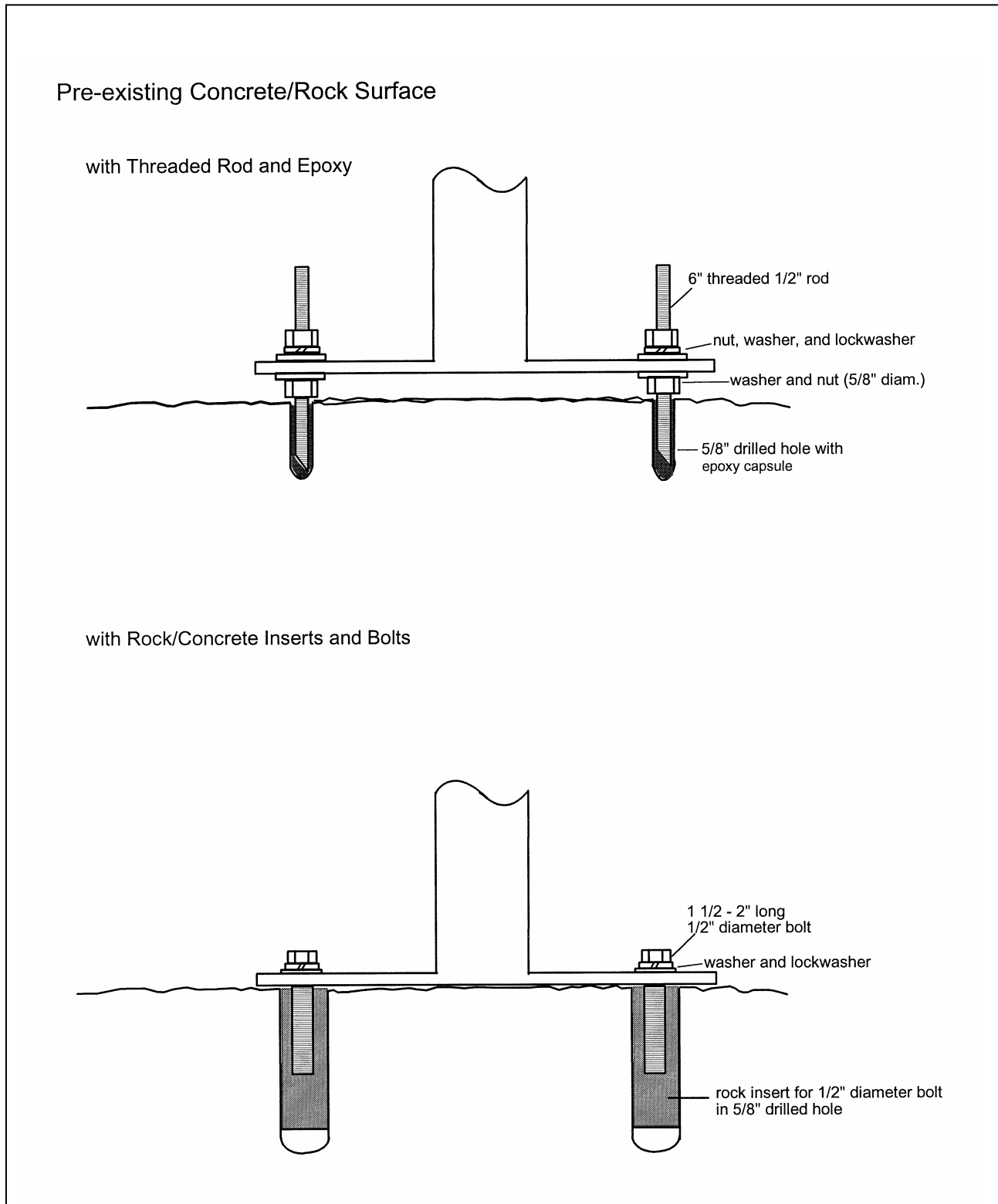


Figure 4-1. Mounting Post Configuration in Pre-Existing Concrete/Rock Surface.

ATTACHMENT TO
PRE-EXISTING
CONCRETE OR ROCK
(continued)

Rock/Concrete Inserts and Bolts:

- Using the post bottom mounting plate as a template, drill holes (typically 5/8" in diameter for 1/2" diameter bolts with inserts) slightly deeper than the length of the insert. Since the mounting plate hole insert alignment is critical, it is advisable to prepare one hole at a time and secure the mounting plate before proceeding with the next hole.
- Tap the insert into the hole and secure the post mounting plate with a bolt, washer, and lock washer. Proceed one hole at a time as noted above.
- Minor leveling adjustments can be made by placing additional washers between the mounting plate and the mounting surface.
- This type of post attachment is more vulnerable to theft or vandalism. Other deterrents such as lock and chaining the post should be considered.

ATTACHMENT TO
CONCRETE PIER IN SOIL

The hole size, amount of concrete, type of hardware used, and other installation related hardware may vary depending on the observed mounting soil conditions and determined configuration requirements. A diagram depicting a concrete pier installation in soil is provided as Figure 4-2.

- Assemble wood template and J-bolts with nuts so that at least 1-1/2" of thread protrudes above the template.
- Dig a hole 1-1/2 feet in diameter and 1-1/2 to 2 feet deep. Fill the hole to ground level with concrete.

Note: The concrete/water mix should be fluid enough that it will mold around the J-bolts.

- Place the template assembly on the wet concrete and work the J-bolts into the concrete as shown in Figure 4-2. Be careful to verify that the template is aligned on the selected vista (Section 4.2).
- Allow the concrete to set for least 10 hours. Drying time depends on soil temperature. If cold weather or heavy rain is expected, protect the concrete with insulating or waterproof cover.
- Place nuts and washers on the J-bolts and place the mounting post over the bolts.

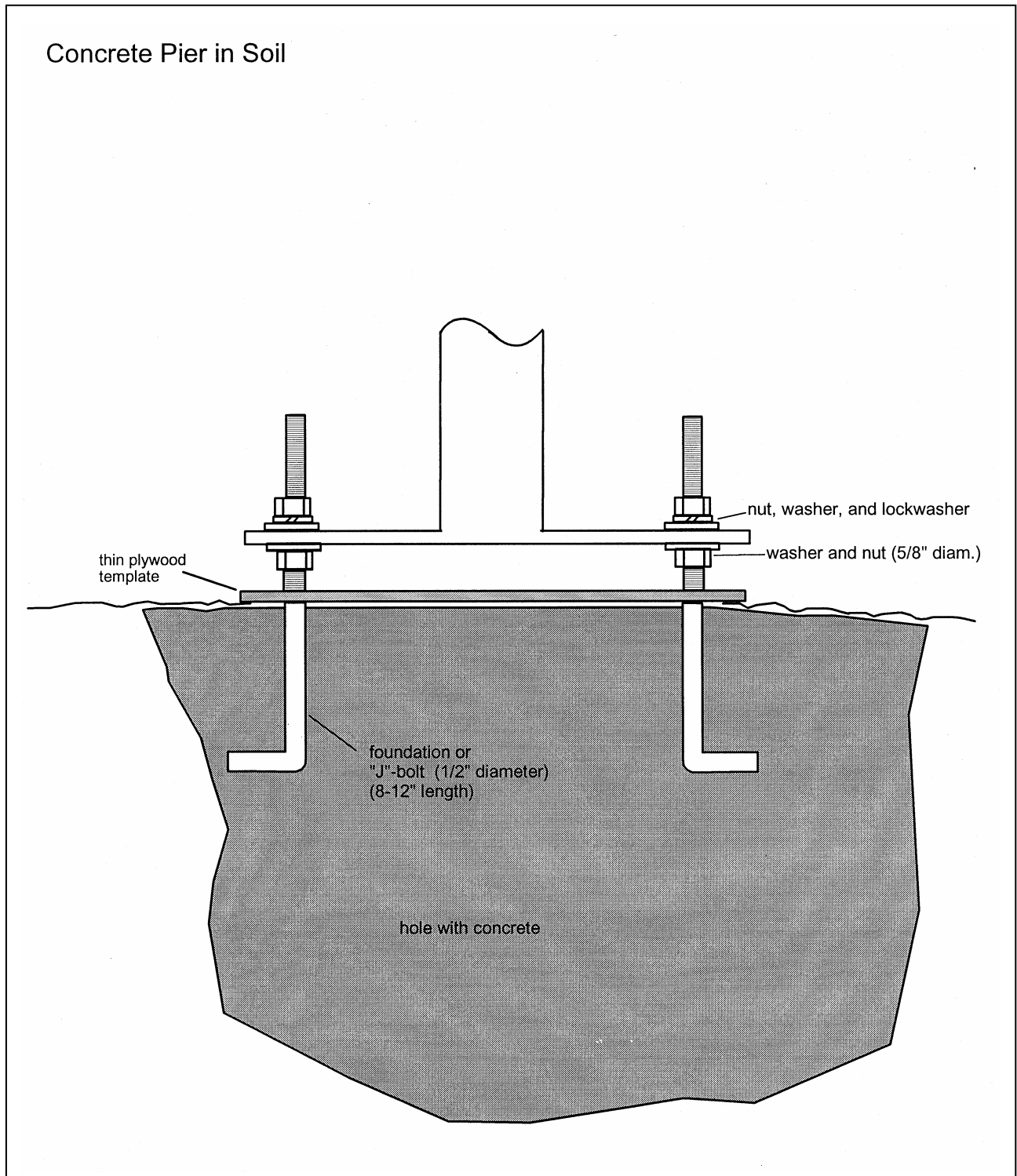


Figure 4-2. Mounting Post Configuration in Concrete Pier in Soil Surface.

ATTACHMENT TO
CONCRETE PIER IN SOIL
(continued)

- Level the post by adjusting the nuts. Verify that the mounting plate rests evenly on all four nuts.
- Using washers, lock-washers, and nuts, secure the mounting plate.
- To prevent vandalism or theft, bend over the tops of the threaded rods or damage the rod threads so that the nuts cannot be removed.

ATTACHMENT TO WOOD

Depending on the thickness of the wood platform and underside access, mounting can be accomplished with lag screws or carriage bolts. If there is adequate access to the underside of the wood surface, carriage bolts are more stable and often more of a vandalism deterrent than lag screws. The installation procedures, whether using carriage bolts or lag screws, are similar. A diagram depicting both methods for wood surface mounting is provided as Figure 4-3.

- Using the bottom post mounting plate as a template, drill holes for the screws or bolts in the wood.
- Secure the post mounting plate to the wood surface with the bolts or screws, using washers and lock washers.
- Minor leveling adjustments of the post can be done by placing additional washers between the wood surface and the mounting plate.

This type of installation is relatively vulnerable to theft or vandalism. Other deterrents such as lock and chaining the post should be considered.

ATTACHMENT TO
CONCRETE PAD

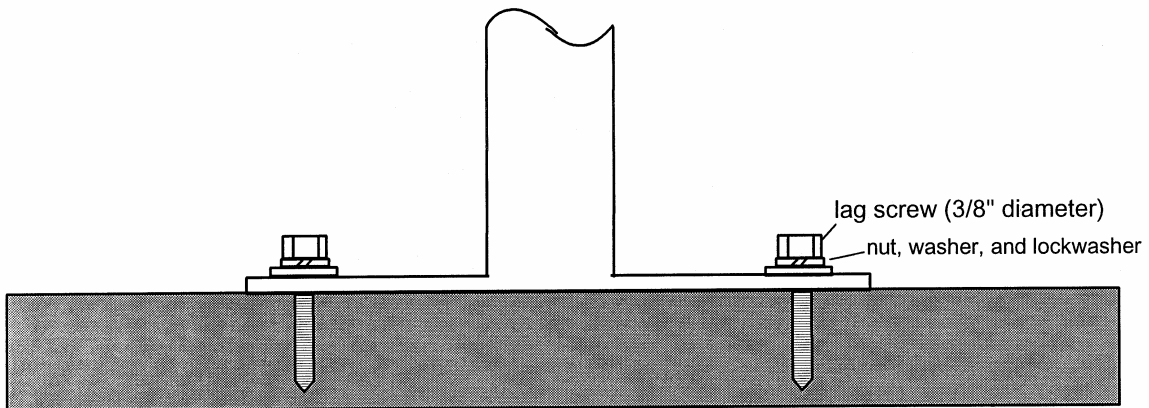
Concrete pad installations are normally preferred on roof surfaces or in locations where the site cannot be permanently altered. Due to weight (approximately 200 pounds), it is advisable to pour a concrete pad after the form has been placed at the installation site. If a concrete form and pad will be exposed to weather for an extended period, the wood should be sealed and/or painted.

A diagram depicting the pad form and hardware attachment is provided as Figure 4-4.

- Attach the 2" x 4" lumber to the large 1/2" plywood square.
 - The shorter (1-1/2") wood screws are used to secure the plywood to the 2" x 4"s.
 - The longer (2-1/2" to 3") screws are used at the corners to attach the 2" x 4"s to each other.

Attachment to Wood Surface

with Lag Screws



with Carriage Bolts

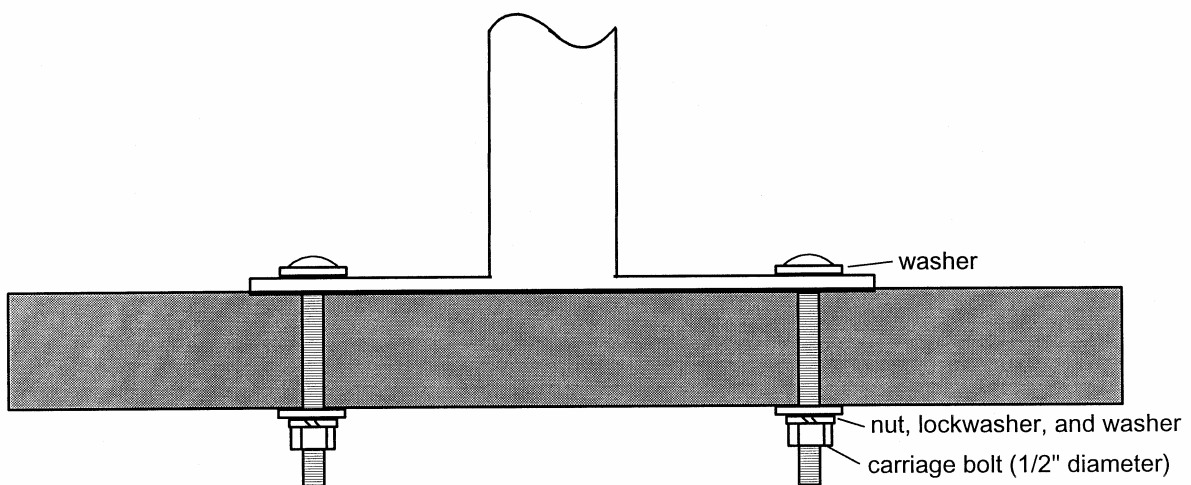


Figure 4-3. Mounting Post Configuration in Wood Surface.

Concrete Pad Form and Carriage Bolt Attachment

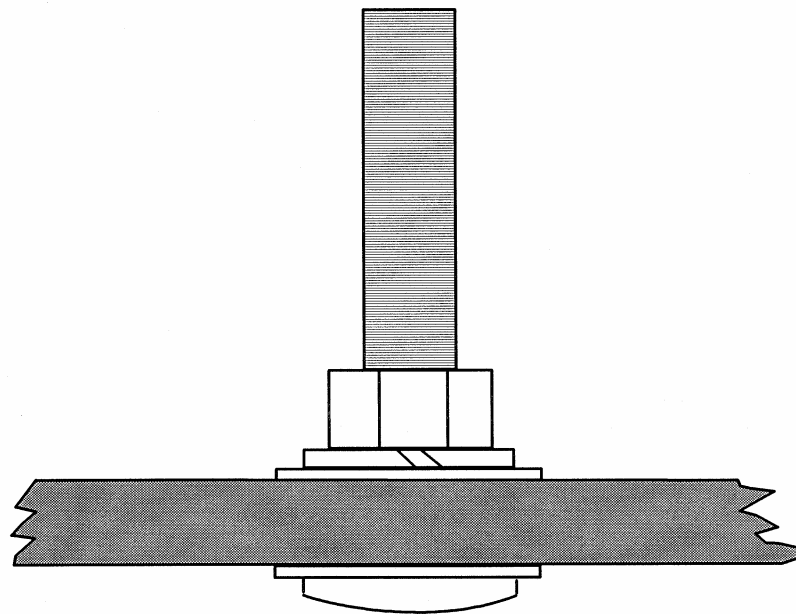
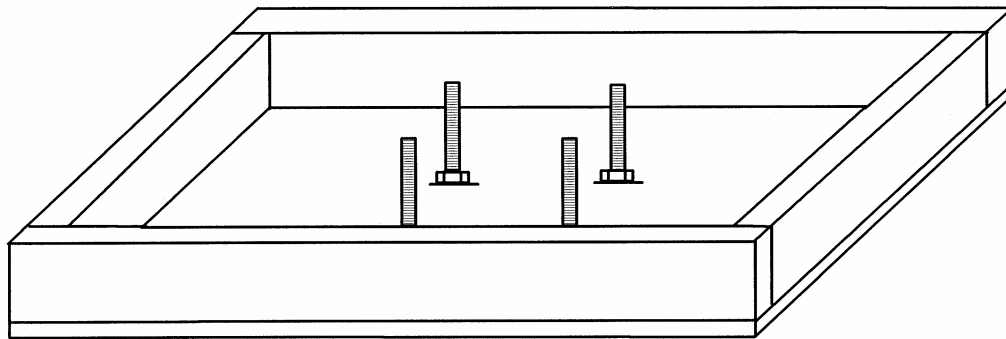


Figure 4-4. Mounting Post Configuration on Concrete Pad.

ATTACHMENT TO
CONCRETE PAD (continued)

- Using the bottom post mounting plate as a template, drill four holes, 1/2" in diameter, in the plywood.
- Attach each of the four carriage bolts to the form using two washers, a lock washer, and a nut.
- Set the pad form on the installation site and fill to the top edge with concrete. Place the thin plywood template of the bottom post mounting plate over the tops of carriage bolts to ensure correct alignment.

Note: The concrete/water mix should be fluid enough that it will mold around the J-bolts.

- Allow the concrete to set for at least 10 hours. Drying time depends on air temperature. If cold weather or precipitation is expected, protect the concrete with an insulating and/or waterproof cover.
- After the concrete has set, remove the thin plywood template and attach the mounting post to the concrete pad with washers, lock washers, and nuts.
- Minor leveling adjustments of the post can be done by placing additional washers between the concrete surface and the mounting plate.
- To prevent vandalism or theft, bend over the tops of the carriage bolts or damage the threads so that the nuts cannot be removed.

4.3.2 Mounting Brackets Installation

Mounting brackets installation procedures depend on the type of installation and surface material to which the brackets are mounted. The brackets may be mounted adjacent to a wall or on a tower. Types of installation and hardware may vary from site to site, depending upon existing structure type. Example mounting installations using mounting brackets are shown in Figure 4-5.

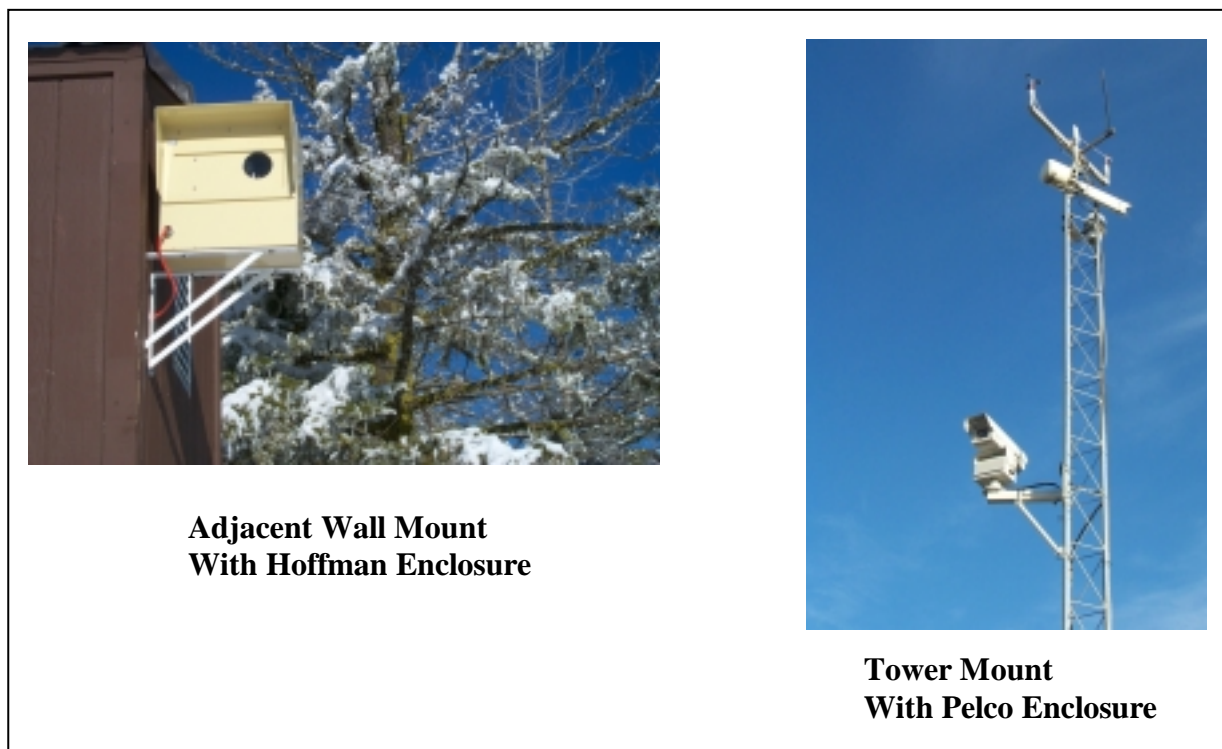


Figure 4-5. Example Camera Enclosure Mounting Types Using Mounting Brackets.

4.3.3 Enclosure Installation

If using a post and Hoffman-type enclosure, enclosure installation involves three processes: mounting the sunshield, the enclosure, and the camera equipment. If using a Pelco-type enclosure, the sunshield is part of the enclosure and needs no additional mounting.

MOUNT SUNSHIELD

As depicted in Figure 4-6, prior to attaching the enclosure to the installed mounting post, mount the sunshield hood to the enclosure using the three screws and nuts provided with the shield. Run a bead of clear silicone sealant around the outside edge of the hood where it contacts the enclosure.

MOUNT ENCLOSURE

Mount the Hoffman-type enclosure to the mounting plate with the four (4) short carriage bolts, lock washers, and nuts provided with the enclosure, as depicted in Figure 4-7. The rounded carriage bolt heads should be on the underside of the mounting plate.

Mount the Pelco-type enclosure to the mounting post or brackets with appropriate hardware. Various types of posts and brackets may be used, depending upon the specific siting configuration.

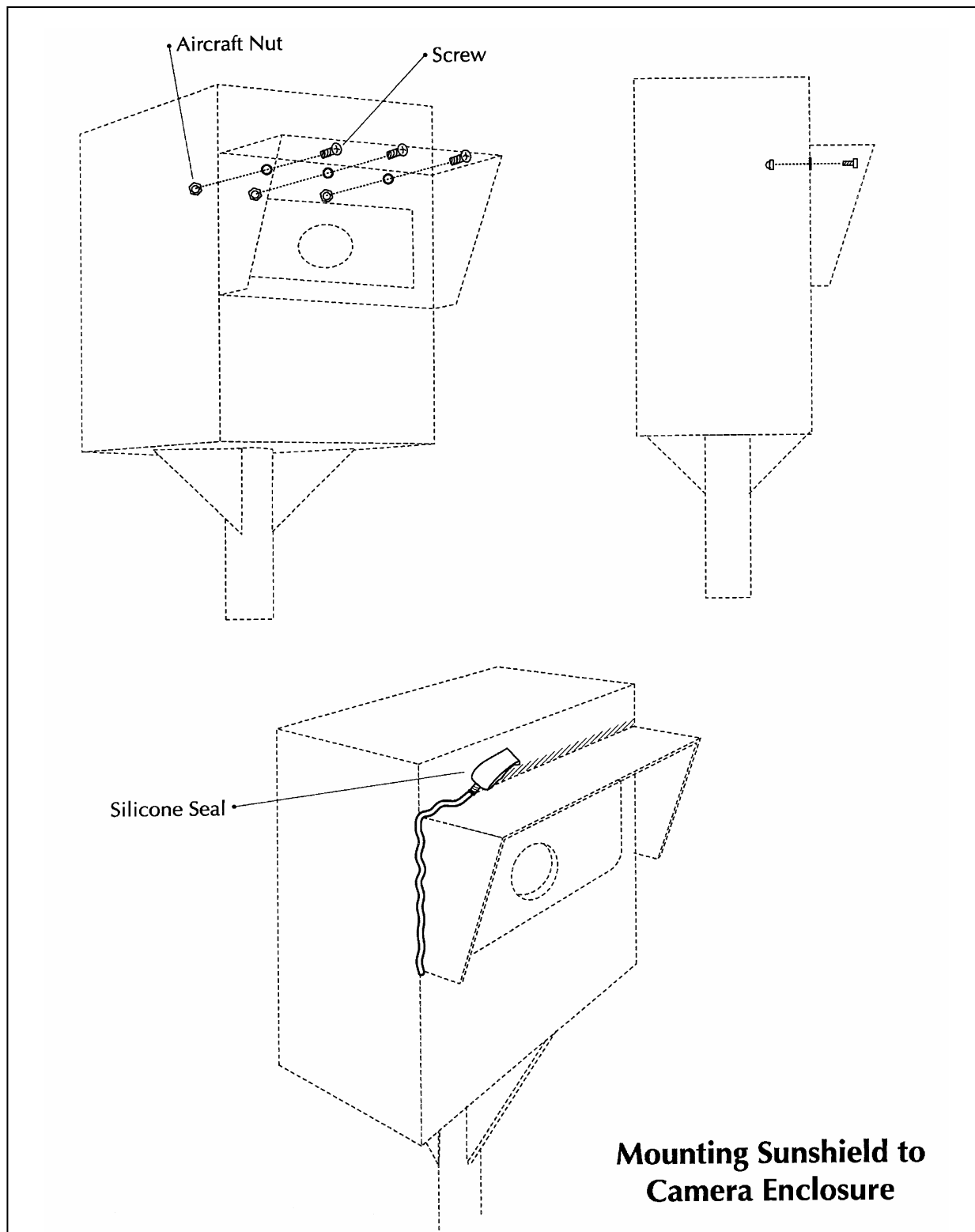


Figure 4-6. Enclosure Sunshield Mounting Configuration.

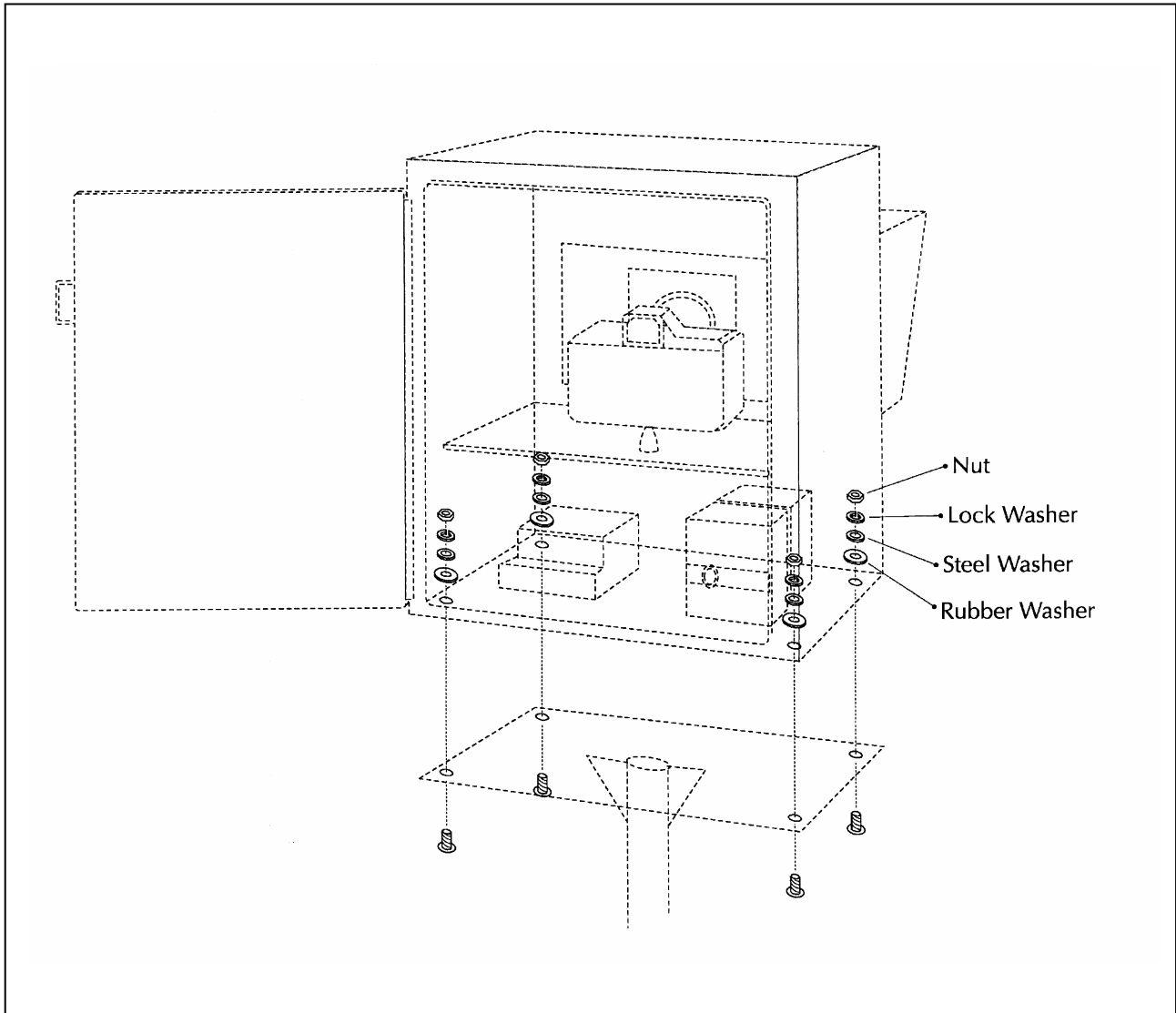


Figure 4-7. Enclosure Mounting Configuration.

MOUNT CAMERA EQUIPMENT

Mount the automatic camera equipment inside the enclosure. Detailed camera mounting diagrams are provided in the Site Operator's Manual for Automatic Visibility Monitoring Camera Systems.

HRDC camera equipment is already installed in the enclosure prior to shipment to a monitoring location. Refer to TI 4120-3850, *Routine Site Operator Maintenance Procedures for the High-Resolution Digital Camera System (HRDC)* and TI 4005-1095, *Procurement and Testing Procedures for the High-Resolution Digital Camera System (HRDC)* for component descriptions and diagrams.

4.3.4 Installing Power Supply, Computer, and Communication Links

High-resolution digital camera systems (HRDCs) require a power supply, computer, and communication links. Installing these components is discussed below.

POWER SUPPLY

The power supply to operate the Web-based HRDC system is mounted in a separate enclosure from the camera. The systems may be powered by 24 volts AC or DC.

HRDC power supply equipment is already installed in the enclosure prior to shipment to a monitoring location. Refer to TI 4120-3850 and TI 4005-1095 for component descriptions and diagrams.

COMPUTER

The HRDC's image capture desktop computer is usually housed inside a building, but may also be mounted in a separate weatherproof enclosure alongside the power supply.

The computer is already installed in the enclosure prior to shipment to a monitoring location, with Windows operating system and communication software installed. Refer to TI 4120-3850 and TI 4005-1095 for component descriptions and diagrams.

COMMUNICATIONS LINKS

Various communications links may be used for HRDC systems, including telephone lines, FTP sites, ISP service, modems, and satellite communications. These services are usually arranged by the project manager and site operators.

4.4 OPERATOR TRAINING

Operator training is provided by the field specialist following the completion of the camera system installation and configuration. Site operators are trained on camera system requirements and routine maintenance procedures. A Site Operator's Manual for Automatic Visibility Monitoring Camera Systems is also provided. This manual contains standard operating procedures and technical instructions applicable to the specific camera monitoring equipment located at the site. Additional manufacturer's instruction booklets and pertinent maintenance documentation forms are also provided.

4.5 SITE DOCUMENTATION

Site documentation for the camera systems includes the Visibility Monitoring Photographic Site and Target Specifications (Figure 4-8) and the HRDC or RDCS Digital Camera Site Configuration Information Form (Figures 4-9 and 4-10). These forms are discussed in detail in the following subsections. Site documentation procedures must be completed upon any of the following:

- Installation or removal of a camera system
- Change in location or vista of a camera system
- Significant changes of specification information included on the forms

4.5.1 Visibility Monitoring Photographic Site and Target Specifications Form

4.5.1.1 Camera Location and Geographic Reference

SITE NAME	Record the full site name including the type of site (e.g., National Park, etc.).
STATION TYPE/FOCAL LENGTH	Record the automatic camera configuration (35 mm and/or 8 mm system and lens focal length (e.g., 50 mm, 135 mm, etc.)).
OBSERVATIONS/DAY	Record the periods in which photograph(s) are taken (e.g., 0900, 1200, and 1500; or 7:00 a.m. through 5:00 p.m. at 1-minute intervals).
ELEVATION, LONGITUDE, AND LATITUDE	Record the elevation (in meters) of the camera location. Record the longitude and latitude of the station in degrees, minutes, and seconds.
MAP REFERENCE	Record references for any maps available and/or used to complete this form. Note the map name, scale, and source of the map.
NETWORK	Record the network name (e.g., IMPROVE) in this field.

VISIBILITY MONITORING
PHOTOGRAPHIC SITE AND TARGET SPECIFICATIONS

Site Name: _____
Station Type/Focal Length: _____
Observations/Day: _____
Elevation (M): _____
Longitude: _____
Latitude: _____
Map Reference: _____
Network: _____

Site Abbreviation: _____
Installation Date: _____
Installation By: _____
Site Specs By: _____
Date: _____
Previous Update: _____

Contacts: _____
Address: _____
Phone #, Fax #: _____

VISTA IDENTIFICATION		VISTA SPECIFICATIONS					
No.	Name	Dist. (km)	Elev. (m)	Bearing (°)	Elev. Angle	Site Path Elev. (m)	Rayleigh Coef.

NO.	VISTA COVER TYPE	PHOTOGRAPHIC REFERENCE

COMMENTS: _____

Figure 4-8. Visibility Monitoring Photographic Site and Target Specifications Form.

**HRDC-DIGITAL CAMERA
SITE CONFIGURATION INFORMATION**

Site Name

Project Information:	
Site Abbreviation	
ARS Project Name	
ARS Project Manager	
Technical Support Requirements	

Site Contact:	
Contact	
Telephone / Fax	
E-mail	
Address	
Project Contact:	
Contact	
Telephone / Fax	
E-mail	
Address	

General Site Information: (site specifications and photographs provided elsewhere)	
Start Date / Stop Date	
Site Description	
Mounting Configuration	
Zoom Setting	
Capture Frequency	

Camera Instrumentation:		Owner:	Date Applied:
System Type			
Camera			
Power supply			
Enclosure type			
Warranty			

Computer Instrumentation:			
Computer System			
Warranty			

-- continued --

Figure 4-9. Example HRDC Digital Camera Site Configuration Information Form.

Communication:		Date Applied:
Computer Configuration		
Modems:		
ISP Dialup:		
Logger:		
PC anywhere:		
Login Name		
Password		
Black Box Codes:		
Operating System:		
User Name:		
Password:		
ISP Information:		
ISP		
DNS – Primary (IP#)		
Secondary (IP#)		
User Name/ Log-in:		
Password:		
FTP Site		
Dialup Number		
Billing for ISP		
Technical Support # ISP		
Starband:		
Host IP		
Software		
LAN Information:		
Hub?		
Other Devices		
Serial to Cat 5 connections?		

Power Configuration:		Date Applied:
UPS Backup Reserve Time		
APC Battery Backup		

Air Quality Data Collection:		Owner:	Proximity to Camera / DAS
Datalogger(s)			
Communication Method			

-- continued --

Figure 4-9 (continued). Example HRDC Digital Camera Site Configuration Information Form.

Associated Air Quality Instrumentation:		Owner:	Proximity to Camera / DAS
Transmissometer			
Nephelometer			
Aerosol			
Gaseous			
Meteorological			

Comments :	Enter comments or notes. History of equipment changes, etc.

Date last revised:	Person making changes / reason for changes:

Figure 4-9 (continued). Example HRDC Digital Camera Site Configuration Information Form.

**RDCS-DIGITAL CAMERA
SITE CONFIGURATION INFORMATION**

Site Name

Project Information:	
Site Abbreviation	
ARS Project Name	
ARS Project Manager	
Technical Support Requirements	

Site Contact:	
Contact	
Telephone / Fax	
E-mail	
Address	
Project Contact:	
Contact	
Telephone / Fax	
E-mail	
Address	

General Site Information: (site specifications and photographs provided elsewhere)	
Start Date / Stop Date	
Site Description	
Mounting Configuration	
Zoom Setting	
Program Setting	

-- continued --

Figure 4-10. Example RDCS Digital Camera Site Configuration Information Form.

Camera Instrumentation:		Owner:	Date Applied:
System [Type	Enter RDCS-100 or other type		
Camera	Enter manufacturer and model		
Power Configuration	Enter AC or solar power		
Computer System	Enter type of system and software version		
Controller	Enter controller number and software version		
Warranty	Enter equipment type and delivery date		

Additional Air Quality Instrumentation:		Owner:
Transmissometer	Enter manufacturer and model	
Nephelometer	Enter manufacturer and model	
Aerosol	Enter manufacturer and model	
Gaseous	Enter type, manufacturer, and model	
Meteorological	Enter type, manufacturer, and model	

Comments :	Enter comments or notes. History of equipment changes, etc.
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Date last revised:	Person making changes / reason for changes:

Figure 4-10 (continued). Example RDCS Digital Camera Site Configuration Information Form.

4.5.1.2 Installation and Site Contact Documentation

SITE ABBREVIATION	Record the four (4) character site abbreviation code.
INSTALLATION DATE	Record the date and time the camera system was installed.
INSTALLATION BY	Record the name of the person(s) who installed the system.
SITE SPECIFICATIONS, VERIFICATION, AND DATE COMPLETED	Record the name of the person(s) who completed and verified the site specifications, the date they were completed, and the date of the previous specification update.
SITE CONTACTS	Record the name, telephone, and fax numbers for any site operator(s), primary contact(s), and supervisor(s).
SITE MAILING ADDRESS AND SHIPPING ADDRESS	Record the site mailing address, the address to which correspondence is sent via US Mail, and the shipping address, the address to which UPS can deliver parcels. The shipping address cannot be a post office box.

4.5.1.3 Vista Identification and Specifications

VISTA NAME	Record the name of the monitored vista or the most dominant scenic feature(s)/target(s) in the vista.
DISTANCE	Record the distance in kilometers from the camera location to the dominant scenic feature. If only the vista name is known, document the approximate distance (in kilometers) to the most distant land feature.
ELEVATION	Record the ground level elevation in meters of the most dominant scenic feature, using the best available source (map, altimeter, etc.).
BEARING	Record the bearing from true north (in degrees) of the most dominant scenic feature from the camera location.
ELEVATION ANGLE	Calculate the elevation angle between the camera location and the most dominant scenic feature:
	$Elevation\ Angle = \left(\frac{Feature\ Elevation(m) - Site\ Elevation(m)}{dis\ tan\ ce(km) \times 100} \right) \tan^{-1}$
SITE PATH ELEVATION	Calculate the mean site path elevation between the camera location and the mean site path elevation:

$$Mean\ Site\ Path\ Elevation = \frac{Feature\ Elevation(m) + Site\ Elevation(m)}{2}$$

4.5.1.4 Photographic Reference and Comments

VISTA COVER TYPE	Record the dominant characteristics of the terrain in the vista and vegetative cover-type.
PHOTOGRAPHIC REFERENCE	Attach separate photographs (3" x 5" color prints preferred) of the: <ul style="list-style-type: none">• Selected site vista(s) with identified dominant scenic features.• Cardinal direction views from the camera location (N,E,S,W).• Camera system configuration and components.
COMMENTS	Document any dominant stationary or mobile pollutant influence on the site, listing the source and pollutant. Document any pertinent information regarding the lens configuration or installation configuration (e.g., enclosure mounted on lookout tower railing). Document any other information that is special to the site, such as site access, etc.

4.5.2 HRDC or RDCS Digital Camera Site Configuration Information Form

The HRDC and RDCS Digital Camera Site Configuration Information Forms are similar and vary only slightly. Details are provided in the following subsections.

4.5.2.1 Project Information

SITE ABBREVIATION	Record the site code abbreviation.
ARS PROJECT NAME	Record the project code and dates of contract term.
ARS PROJECT MANAGER	Record the project manager's name.
TECHNICAL SUPPORT REQUIREMENTS	Record contract requirements such as term of technical support.

4.5.2.2 Site and Project Contacts

CONTACT	Record the name of the contact person on site and the name of the project/client contact.
TELEPHONE / FAX	Record the site telephone and/or fax number and client telephone and/or fax number.

E-MAIL Record the e-mail address of the site contact person and client.

ADDRESS Record the site mailing address of the contact person and the mailing address of the client.

4.5.2.3 General Site Information

START DATE/STOP DATE Record the beginning and ending dates of monitoring

SITE DESCRIPTION Record general site location, view information, latitude, longitude, elevation, etc.

MOUNTING
CONFIGURATION Record specific camera mounting information.

ZOOM SETTING Record the zoom setting of the camera system.

CAPTURE FREQUENCY /
PROGRAM SETTING Record the frequency the camera is programmed to take photographs.

4.5.2.4 Camera and Computer Instrumentation

SYSTEM TYPE Record the camera system type, either an HRDC-1, HRDC-R, or RDCS-100 system.

CAMERA Record the manufacturer and model of the camera.

POWER
SUPPLY/CONFIGURATION Record power supply voltage, and whether it is powered by AC, DC, or solar power.

ENCLOSURE TYPE Record the manufacturer and model of the enclosure.

WARRANTY Record the equipment type and delivery date.

COMPUTER SYSTEM Record the type of system and software version.

CONTROLLER Record the PDA controller number and software version for remote digital camera systems (RDCS).

4.5.2.5 Communication Information and Power Configuration

MODEMS Record modem information including: ISP Dialup type and model, logger modem type and model, PCAnywhere information (number to dial in, login name, and password), and Black Box Codes (enter the telephone switcher code).

OPERATING SYSTEM	Record the type of system and software version, user name, and password.
ISP	Record the Internet Service Provider, DNS (domain name system) (primary IP number and secondary IP number), user name, and password.
FTP SITE	Record the host name, dialup telephone number, billing method and period of billing contract, and telephone number of ISP technical support.
STARBAND	Record the primary IP number and type of software and version.
LAN INFORMATION	Record hub information and other devices connected to the hub. Record serial to CAT5 connection information.
UPS BACKUP RESERVE TIME	Record a time estimate.
APC BATTERY BACKUP	Record manufacturer, model, and voltage.

4.5.2.6 Additional Air Quality Instrumentation Information

DATALOGGER(S)	Record the manufacturer and model of any dataloggers, and their location/distance from the image computer.
COMMUNICATION METHOD	Record the communication method and location/distance from the image computer.
ASSOCIATED AIR QUALITY INSTRUMENTATION	Record the manufacturer and model for any other instrumentation such as transmissometer, nephelometer, aerosol, gaseous, and meteorological equipment, and location/distance from the image computer.
COMMENTS	Record any comments or additional notes.