

***MARYLAND TRANSPORTATION AUTHORITY***  
***Baltimore, Maryland***

***Request for Proposals***

**ALL FACILITIES**



Contract No. MA-992-000-006

**Furnish and Install CCTV Cameras and Related  
Equipment**

**VOLUME I – SPECIAL PROVISIONS**

Baltimore County, Baltimore City, Harford County,  
Cecil County, Montgomery County, Prince George's  
County, Charles County, Anne Arundel County,  
Queen Anne's County

***June 2007***

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## NOTICE TO BIDDERS

### EMaryland Marketplace Fee

COMAR 21.02.03.06 requires that the successful bidder/offeror under this solicitation pay a fee to support the operation of eMaryland Marketplace. The applicable fee is based on total contract value (including base contract plus all options). A total contract value that is other than an even dollar amount will be rounded to the nearest dollar to determine the appropriate fee level. For example, a total contract value of \$50,000.49 will be rounded to \$50,000 and a Level 1 fee will apply. A total contract value of \$50,000.50 will be rounded to \$50,001 and a Level 2 fee will apply. A copy of COMAR 21.02.03.06 can be found on the eMaryland Marketplace website at [www.eMarylandMarketplace.com](http://www.eMarylandMarketplace.com).

The fee amount must be included within the rate or price of the proposal/bid and may not be quoted as a separate add-on price.

In order to receive a contract award, a vendor must be registered on eMaryland Marketplace. Contractors shall pay the fee as provided by COMAR 21.02.03.06 and in accordance with guidelines issued by the Maryland Department of General Services. These guidelines can be found on the eMaryland Marketplace website at [www.eMarylandMarketplace.com](http://www.eMarylandMarketplace.com).

As provided by COMAR 21.02.03.06 fees on contracts solicited and awarded on or after July 1, 2005 are based on the actual or estimated contract value and are as follows:

<b>Level</b>	<b>Contract Value</b>	<b>Fee</b>
1	\$25,001 - \$50,000	\$100
2	\$50,001 - \$100,000	\$200
3	\$100,001 - \$200,000	\$500
4	\$200,001 - \$500,000	\$1,000
5	\$500,001 - \$1,000,000	\$2,500
6	\$1,000,001 - \$10,000,000	\$5,000
7	\$10,000,001 - \$25,000,000	\$7,500
8	\$25,000,001 - \$50,000,000	\$10,000
9	\$50,000,001 and over	\$15,000

**MARYLAND TRANSPORTATION AUTHORITY**  
**Baltimore, Maryland**

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**Contract No. MA-992-000-006**

**Furnish and Install CCTV Cameras and Related  
Equipment**

Baltimore County, Baltimore City, Harford County, Cecil County,  
Montgomery County, Prince George's County, Charles County, Anne  
Arundel County, Queen Anne's County

***June 2007***

**NOTICE TO BIDDERS/OFFERORS**

A "Pre-Proposal Session" for the purpose of answering or obtaining answers to questions of parties interested in constructing the work relative to Right-of-Way, Utilities, Design, and Construction Details will be conducted at 1:30 p.m. on July 11, 2007, in the Francis Scott Key Bridge Engineering/Construction Building conference room at 304 Authority Drive in Dundalk, Maryland. While attendance at the Pre-Bid conference is not mandatory, this is the offeror's opportunity to raise questions and/or issues of concern regarding the project.

**STATE OF MARYLAND  
NOTICE TO OFFERORS/CONTRACTORS**

In order to help us improve the quality of State proposals solicitations, and to make our procurement process more responsive and business friendly, we ask that you take a few minutes and provide comments and suggestions regarding the enclosed solicitation. Please return your comments with your proposals. If you have chosen not to submit a proposal on this contract, please fax this completed form to: 410-537-7801 to the attention of Robert Jordan.

**Title: Furnish and Install CCTV Cameras and Related Equipment  
Project No: MA992-000-006**

If you have responded with a "no bid", please indicate the reason(s) below:

- Other commitments preclude our participation at this time.
- The subject of the solicitation is not something we ordinarily provide.
- We are inexperienced in the work/commodities required.
- Specifications are unclear, too restrictive, etc. (Explain in REMARKS section.)
- The scope of work is beyond our present capacity.
- Doing business with Maryland Government is simply too complicated. (Explain in REMARKS section.)
- We cannot be competitive. (Explain in REMARKS section.)
- Time allotted for completion of the bid/proposals is insufficient.
- Start-up time is insufficient.
- Bonding/Insurance requirements are restrictive. (Explain in REMARKS section.)
- Bid/Proposals requirements (other than specifications) are unreasonable or too risky. (Explain in REMARKS section.)
- MBE requirements may be difficult to meet. (Explain in REMARKS section.)
- Prior State of Maryland contract experience was unprofitable or otherwise unsatisfactory. (Explain in REMARKS section.)
- Payment schedule is too slow.
- Other: \_\_\_\_\_

2. If you have submitted a bid or proposal, but wish to offer suggestions or express concerns, please use the Remarks Section below. (Use reverse or attach additional pages as needed.)

REMARKS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Offeror's Name: \_\_\_\_\_ Date \_\_\_\_\_

Contact Person: \_\_\_\_\_ Phone (\_\_\_\_\_) \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_



Maryland  
Transportation  
Authority

CONTRACT NO. MA 992-000-006  
F&I CCTV Cameras & Related Equipment  
Section 1. Introduction  
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June 19, 2007

## SPECIAL PROVISIONS

### SP1-1 Project Description

CONTRACT NO: MA 992-000-006

TITLE: Furnish and Install Closed Circuit Television Cameras and Related Equipment

FACILITY: All MdTA Facilities

COUNTY: Baltimore County, Baltimore City, Harford County, Cecil County, Montgomery County, Prince George's County, Charles County, Anne Arundel County, Queen Anne's County

ADVERTISED: June 19, 2007

PRE-PROPOSAL MEETING: A pre-proposal conference will be held on July 11, 2007 at 1:30 p.m. in the Engineering/Construction Conference Room at the Francis Scott Key Bridge, 304 Authority Drive, Baltimore Maryland 21222. Call 410-537-7800 for directions.

SITE VISITS: No pre-bid site visits are anticipated for this Contract.

ALL QUESTIONS DUE: On or before August 3, 2007 at 4:00 p.m.

PROJECT CONTACT: Project Manager: Mr. Robert Jordan, P.E. at 410-537-7851  
Contract Administration: Ms. Maggie Johnson at 410-537-7807

PROPOSALS DUE: 4:00 p.m. August 17, 2007, in the Bid Box on the 2<sup>nd</sup> Floor of the Maryland Transportation Authority, Engineering Building, 300 Authority Drive, Baltimore, MD 21222

CLASSIFICATION: Class E – (\$2,500,001 - \$5,000,000)

CONTRACT TIME: 3 Years, Two 1-Year Options

LIQUIDATED DAMAGES: One Hundred dollars **(\$100.00)** per Calendar Day.

MINIMUM MBE GOALS: 10%

BID DOCUMENTS: Bid Documents can be purchased for \$25.00 between 8:00 a.m. and 6:00 p.m., Monday to Friday at the Stop-In Center located at the Francis Scott Key Bridge, 303 Authority Drive, Baltimore, MD 21222.

ONLINE: Visit the contractor's information center online at [www.mdt.state.md.us](http://www.mdt.state.md.us), select 'Contract Listings', 'Engineering Contracts', 'Construction'.



SPECIAL PROVISIONS

State of Maryland

**Maryland Transportation Authority**

**REQUEST FOR PROPOSALS**

**CONTRACT MA-992-000-006**

**Furnish and Install CCTV Cameras and Related Equipment**

**SECTION 1. INTRODUCTION AND PROCUREMENT OBJECTIVE**

A. Introduction

The Maryland Transportation Authority ("MdTA" or the "Authority") is an agency of the State of Maryland, which finances, operates and maintains a system of toll facilities and other transportation services for public use and convenience. The MdTA is responsible for the operation and maintenance of the Fort McHenry Tunnel, the Baltimore Harbor Tunnel, the Francis Scott Key Bridge, the Thomas J. Hatem Memorial Bridge, the Governor Harry W. Nice Memorial Bridge, the John F. Kennedy Memorial Highway, the Millard E. Tydings Memorial Bridge, and the William Preston Lane, Jr. Memorial Bridge (Bay Bridge). The MdTA's source of funds is separate from Maryland's Transportation Trust Fund. It uses no tax dollars; all MdTA maintenance, operations and capital improvements are funded through toll revenues. The Authority itself is a group of six citizens, appointed to three-year terms by the Governor with the consent of the State Senate, that serves as the policy-setting, decision-making and governing body. The Secretary of Transportation serves as the Chairman of the Transportation Authority. Acting on behalf of the Department of Transportation, the Authority also finances and constructs capital projects to improve Maryland's transportation system, including terminal facilities at the Port of Baltimore and the Baltimore-Washington International Thurgood Marshall Airport.

B. General Description of the Project

The purpose of this project is to furnish, install, integrate, test, commission, maintain and warrant Closed Circuit Television cameras and related equipment. The equipment and software includes the color camera, integrated pressurized dome with pan/tilt unit, MPEG-2 encoders/decoders, MPEG-2 software decoding software and plug-ins, and ancillary hardware and software. The equipment will be installed at various locations throughout the MdTA's jurisdiction, including field cabinets, environmental huts, and at ventilation, administration, police, and maintenance buildings. The CCTV cameras are used to monitor traffic and to detect, verify, and manage freeway incidents. The cameras will be installed to support various new and existing MdTA construction contracts, such as the ICC and I-95 ETC projects among others.

This project will also require the Offeror to provide and execute a preventive and corrective maintenance plan (PCMP) for CCTV cameras and related equipment for the MdTA. This portion of the project will apply to MdTA's existing cameras and future cameras as well. Section 6 provides a listing of existing equipment makes and models.



## SPECIAL PROVISIONS

This contract will provide a means to furnish and deliver CCTV cameras to the MdTA for installation under other construction contracts that will be advertised at future dates. Delivery of CCTV cameras and related equipment may be to any location in the State of Maryland. This Contract will also include NTCIP compliance for each of the cameras. The Offeror must provide a warranty for the integration of the camera, equipment, including cabinet and central hardware and software. The Offeror will be furnishing CCTV cameras and related equipment, and coordinating with construction contractors and the MdTA throughout the duration of this contract. The Offeror will be required to furnish CCTV cameras, MPEG-2 codecs, and related equipment on a Just-In-Time (JIT) delivery process during the installation phase of any of the construction contracts. The Offeror will be required to deliver and install at each site, the required CCTV cameras and related equipment within 30 calendar-days of notice by the MdTA. A major proposal evaluation criterion is a written description and schedule that show how the Offeror will (1) coordinate the ordering, fabrication, and storage of CCTV cameras and related equipment; and (2) assure the delivery of CCTV cameras and equipment on time with the various construction contractors. The Offeror shall provide an experienced technician (s) who will install all CCTV cameras in the future construction contracts. The technician (s) will also wire and test all cameras and related equipment before acceptance by the MdTA. The anticipated Contract time is three (3) years with up to two (2) one-year renewal options. Excluded from this Contract will be poles, fiber optic communications, camera lowering systems, and other construction incidentals.

This Contract will include provisions for the Maryland State Highway Administration (SHA), Coordinated Highways Action Response Team (CHART), and related agencies to purchase CCTV cameras and related equipment from this contract. The cameras and related equipment will remain the property of the vendor/manufacturer until such time that installation, final testing and acceptance of cameras by the MdTA or CHART is completed. It is anticipated that the MdTA will be purchasing and furnishing over 100 CCTV cameras for installation within the State of Maryland. The cameras and related equipment types are identified in the Schedule of Prices. It is understood that the quantities shown are estimated and that the MdTA does not guarantee to purchase those indicated quantities. The purchased quantities may increase or decrease during the contract period. The contract price will remain firm for the entire contract period for any quantity purchased for three (3) years. If the two one-year renewal options are executed by the MdTA, the maximum increase in contract price shall be as specified in Section 3 of this RFP.

### C. Issuing Office - Procurement Officer / Project Engineer

This Request for Proposals (RFP) is being issued on behalf of the MdTA and the State of Maryland by:

Maryland Transportation Authority (MdTA)  
Engineering Division  
300 Authority Drive  
Baltimore, MD 21222

The sole point of contact for purposes of this procurement is the Procurement Officer.

Keith A. Duerling, P.E.  
Director of Engineering  
Telephone: (410) 537-7830  
Email: [kduerling@mdot.state.md.us](mailto:kduerling@mdot.state.md.us)

Once awarded, the Contract will be administered solely by the MdTA Engineering Division and all Contract issues are to be resolved by the MdTA Director of Engineering, or his representative. Any issue



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that has any Contract implications, including cost, Contract time, changes, extra-work orders, and clarifications, must be brought to the attention of, and resolved by the Director of Engineering, or his representative, the Project Engineer (or "Engineer"). Contact with the Project Engineer may be through any of the following means:

Email: [bjordan@mdot.state.md.us](mailto:bjordan@mdot.state.md.us)

Phone: (410) 537-7851

FAX: (410) 537-7801

Written correspondent:

Robert Jordan, P.E.,  
Engineering Division  
Maryland Transportation Authority  
300 Authority Drive  
Baltimore, MD 21222-2200.

### D. Pre-Proposal Conference

A pre-proposal conference will be held on the date and at the time and location specified in Section SP1-1.

Attendance at the pre-proposal conference is not mandatory, but all interested Offerors are encouraged to attend in order to gain the best possible understanding of the RFP and to facilitate better preparation of their proposals.

### E. Site Visits

Refer to Section SP1-1 "SITE VISITS". In the event a site visit is determined to be necessary, all interested Offerors are strongly encouraged to attend to gain the best understanding of the working conditions, site access, existing conditions, and other similar factors.

The Offerors are not permitted to ask questions about the RFP or the project details during the site visits. The site visits are only to allow the Offeror the opportunity to become familiar with the site conditions. The Offerors are permitted to take photos of the site; however, photos may not include employees of the Maryland Transportation Authority, computer screens, or video display monitors. Pictures shall be restricted to items that are necessary for preparing a response to the RFP.

The Offerors are not permitted to use the photographs for any purpose other than the preparation of the RFP and may be required to sign confidentiality agreements, non-disclosure agreements, or similar agreements.

### F. Questions and Inquiries

Facsimile messages of questions or inquiries, or both, will be accepted by providing written notification to the Procurement Officer. Any potential Offeror finding any discrepancy in, or omission from the RFP, or in doubt as to the meaning of an item in the RFP can submit written questions or inquiries, or both, via FAX or email, to the Procurement Officer identified in Paragraph C above, on or before the date specified in Section SP1-1, "ALL QUESTIONS DUE".

The Authority is not obligated to change the RFP in any way, but questions affecting the content of the RFP in a material way, or clarifying the intent, will be answered by means of an addendum to the RFP, which will be sent to all persons who are known to have received the RFP. The Authority will not be



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responsible for communications concerning this RFP which are not in writing and authorized by the Procurement Officer. Questions may be edited for clarity or other reasons deemed to be in the best interest of the State.

### F. Submission Deadline

In order to be considered, the MdTA must receive your proposal at the address below on or before the proposal due date as shown in Section SP1-1.

#### Mailing and package delivery address:

Attn: Keith A. Duerling, P.E.  
Director of Engineering  
Engineering Division  
Maryland Transportation Authority  
300 Authority Drive  
Baltimore, MD 21222

Offerors who submit their proposals by mail should allow sufficient mailing time and internal delivery time to ensure timely receipt of the proposal by the Procurement Officer. Proposals arriving after the closing date and time or unsolicited amendments to proposals will be rejected and returned unopened in accordance with applicable regulations. Offerors shall complete and submit the required proposal information on the forms furnished with the RFP. All proposal forms are to be signed by an individual authorized to bind the Offeror, notarized if so indicated, and placed in the appropriate envelope or package. **Technical Proposals** and **Price Proposals** must be submitted in separate, sealed envelopes or packages addressed to the Procurement Officer. The contents of the envelopes or packages must be clearly marked outside each envelope or package as to their contents, i.e., "**Technical Proposal, Contract MA-992-000-006**" or "**Price Proposal, Contract MA-992-000-006.**" Failure to submit the Proposals in the manner requested may result in the Proposal being rejected as unacceptable.

Proposals will not be opened publicly. Upon request, MdTA will provide a list of Offerors.

### G. Multiple Proposals

Each Offeror may submit only **one (1) Proposal**. If multiple Proposals are received from an Offeror, they will be declared non-responsive, and be automatically rejected by MdTA.

### H. Duration of Offer

Proposals and, if required, best and final offers, submitted in response to this solicitation are irrevocable for a period of one-hundred-eighty (**180**) **calendar-days** following the due date for the receipt of Proposals, or if required, best and final offers. This period may be extended if requested by the Procurement Officer and agreed to by the Offerors in writing.

### I. Bond Requirements

1. All Proposals must be accompanied by acceptable proposal security (Bid Bond) in the amount of: **FIVE PERCENT (5%)** of the amount bid for the Total Contract, NOT including options or option years. The Bid Bond shall be enclosed with the sealed envelope or package containing the Price Proposal. If an Offeror fails to accompany its Proposal with the



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- required proposal security in accordance with these instructions, the Proposal shall be considered as unacceptable and be rejected.
2. The successful Offeror shall be required to furnish, at the time of **award** of the Contract, a Performance Bond in the **FULL AMOUNT (100%) OF THE CONTRACT**.
  3. The successful Offeror shall also be required to furnish at the time of the award of the Contract, a Payment Bond in the **FULL AMOUNT (100%) OF THE CONTRACT**. See previous comment.
  4. Acceptable security for Proposal, Performance and Payment bonds shall be limited to:
    - a. A Bond in a form satisfactory to the State, underwritten by a Surety Company authorized to do business in the State of Maryland;
    - b. A bank certified check, bank cashier's check, bank treasurer's check, or trust account; or
    - c. A pledge of securities backed by the full faith and credit of the United States Government or bonds issued by the State of Maryland.

<End of RFP Section 1>



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### **SECTION 2. GENERAL INFORMATION AND CONTRACT PROVISIONS**

#### **2.1 Purpose**

The purpose of this Section is to provide information to Offerors interested in preparing and submitting Proposals to meet the Authority's requirements for a qualified person or persons to furnish and install CCTV and related equipment throughout the Authority's jurisdiction.

#### **2.2 Revisions to the RFP**

If it becomes necessary or desirable to revise any part of this RFP, or to provide additional information to enable potential Offerors to interpret its provisions, the Authority will issue an addendum, which will be provided to each person who is known to have received a copy of the original RFP. Acknowledgment of the receipt of any and all addenda will be required of each Offeror, and shall accompany the Offeror's Technical Proposal.

#### **2.3 Cancellation of the RFP – Rejection of All Proposals**

The Authority may cancel this RFP, in whole or in part, or may reject all Proposals submitted in response to the RFP, whenever this action is determined to be fiscally advantageous to the Authority or, otherwise, in its best interests.

#### **2.4 Proposal Acceptance, Rejection, Discussions, and Basis for Award**

2.4.1 The Authority reserves the right to accept or reject, in whole or in part, any and all Proposals received in response to this RFP; to waive or permit cure of minor irregularities, and to conduct discussions with all qualified Offerors, who have submitted acceptable Proposals, in any manner necessary to serve the best interests of the State of Maryland. The Authority also reserves the right, in its sole discretion, to award a contract based upon the written Proposals received, without discussions or negotiations.

2.4.2 This procurement is being conducted in accordance with the procurement method referred to in the Code of Maryland Regulations (COMAR), Title 21, State Procurement Regulations, COMAR 21.05.03, as Procurement by Competitive Sealed Proposals. In accordance with COMAR 21.05.03F, the Authority intends to award a contract to the responsible Offeror whose Proposal is determined to be the most advantageous to the Authority, considering price and the evaluation factors set forth herein.

2.4.3 Award of any contract will be subject to the approval of the Maryland Transportation Authority and the Maryland Board of Public Works.

#### **2.5 Oral Presentations, Demonstrations, and Test and Evaluations**

Offerors may be required to make one or more oral presentations, demonstrate their products, or conduct on-site tests and evaluations of their products, at NO cost to the MdTA. The purpose of these activities is to clarify the Offerors' Proposals and to respond to the questions of the Selection and Evaluation Committee. Only those Offerors whose Proposals have been judged to be qualified and are reasonably susceptible of being selected for award will be invited to make oral presentations, demonstrations, or evaluations. If required, these activities will be scheduled



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at the convenience of the Authority after the initial review and be considered as part of the overall evaluation of the Proposals.

### 2.6 **Incurred Expenses**

The Authority will NOT be responsible for any costs incurred by an Offeror in preparing and submitting a response to this RFP, nor for any other associated costs.

### 2.7 **Proposal Form**

2.7.1 Proposals should be prepared simply and economically, providing a straightforward and clear description of the Offeror's Proposal for meeting the requirements of this procurement. Oral, FAX, telegraphic or mailgram Proposals or amendments will not be accepted unless specifically requested in writing by the Procurement Officer. Proposal requirements are stated in Section 3 of this RFP.

2.7.2. Each Offeror's Proposal shall be signed by a corporate officer, partner, proprietor, or another person authorized to legally bind the Offeror. **If the Proposal is signed by an officer other than the President of the Offeror's Organization, evidence of that person's authority to bind the Offeror, such as a corporate resolution, shall be included with the Proposal.**

### 2.8 **Access to Public Records Act Notice**

Each Offeror should give specific attention to the identification of those portions of its Proposal that the Offeror considers to be confidential, proprietary commercial information or trade secrets, and provide justification as to why such materials, upon request, should not be disclosed by the Authority under the Access to Public Records Act, State Government Article, Title 10, Subtitle 6, Annotated Code of Maryland. Technical Proposals which have been classified by the Offeror as proprietary in their entirety are not acceptable and shall be subject to rejection by the Procurement Officer.

### 2.9 **Protests**

Any protest related to this solicitation or the award of a contract must be filed in accordance with Title 15, Subtitle 2, Part III of the State Finance and Procurement Article, Annotated Code of Maryland, and COMAR Title 21 (State Procurement Regulations), Subtitle 10, Administrative and Civil Remedies.

### 2.10 **Minority Business Enterprises (MBE)**

Refer to the MBE requirements in the Request For Proposals (RFP). Refer to Section SP1-1 "MINIMUM MBE GOALS". The Technical Proposal shall address MBE goals and requirements.

### 2.11 **Compliance-with-Law**

By submitting an offer in response to this RFP, the Offeror, if selected for award, agrees that it will comply with all Federal, State and local laws applicable to its activities and obligations under the Contract. By submitting a Proposal in response to this RFP, the Offeror shall be deemed to represent that it is not in arrears in the payment of any obligation due and owing the State of Maryland or any department or unit thereof, including but not limited to the payment of taxes and



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employee benefits, and if selected for award, that it shall not become so in arrears during the term of the Contract.

### **2.12 Acceptance of Terms and Conditions, and Amendments to General Provisions and Conditions**

- 2.12.1 By submitting an offer in response to this RFP, an Offeror, if selected for award, shall be deemed to have agreed to and accepted all of the terms, conditions and requirements set forth in this RFP, including Sections 1-6; Part I (General Provisions) and Part II (Terms and Conditions); and Sections 103 (Engineer's Office), 108 (Mobilization), and 110 (Activities Chart Project Schedule) in the Maryland Department of Transportation, State Highway Administration Standard Specifications of Construction and Materials, dated January 2001. Contracts are also subject to all other requirements of Maryland Law, including the State Finance and Procurement Article, Annotated Code of Maryland, and the Code of Maryland Regulations, (COMAR) Title 21, State Procurement Regulations. The particular attention of all Offerors is directed to Title 17, Subtitle 2, State Finance and Procurement Article, dealing with Prevailing Wage Rates on Public Works Contracts of \$500,000 or more.
- 2.12.2 In the event of a conflict between provisions of the Contract, the RFP, the General Provisions or General Conditions or any other document incorporated by reference into the Contract, the following order of precedence shall determine the prevailing provisions:
- The Contract;
  - The Request for Proposals, including any addenda;
  - The MDOT, SHA "*Standard Specifications of Construction and Materials*", January 2001, as herein amended.
  - The Contractor's Proposal, including any amendments.
- 2.12.3 Part I and Part II of the MDOT, SHA "*Standard Specifications of Construction and Materials*" dated January 2001, shall apply to this Contract. These documents are amended as listed below, and in accordance with the Special Provision Sheets that follow:

#### GP-1.03 Organizational Definitions

Revise the definition of Administration to read as follows:

Administration - The word "Administration" shall mean the Maryland Transportation Authority (MdTA).

#### GP-1.05 Definitions

Add the following definitions:

Highway Standards - The official Book of Standards for Highway and Incidental Structures, edited by the State Highway Administration, with the latest incorporated revisions issued on or before the date of advertisement of the Contract.

#### GP-2-04 Site Investigation

Revise the paragraph to read as follows:



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The Contractor acknowledges that he has investigated and satisfied himself as to the conditions affecting the work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, river stages, tides or similar physical conditions at the site, and confirmation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the work. The Contractor further acknowledges that he has satisfied himself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory INFORMATION IN POSSESSION OF THE AUTHORITY, as well as from information presented by any drawings and specifications made a part of this contract. Any failure by the Contractor to acquaint himself with the available information shall not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The MdTA assumes no responsibility for any conclusions or interpretations made by the Contractor on the basis of the information made available by the MdTA.

### GP-2.07 Proposal Guaranty

Change: In paragraph (a), first line "a guaranty in an amount not less than 5 percent of the amount bid" to read "**a Proposal security (Bid Bond) in the amount of FIVE (5%) PERCENT of the total contract value.**"

### GP-2.13 Opening and Recording of Bids – Delete Paragraph (a) – Opening and Recording

### GP-2.19 Bid Evaluation and Award – Delete in its entirety.

### GP-2.20 Tie Bids – Delete in its entirety.

### GP-4.02 General Provisions Controlling – Delete in its entirety.

### GP-4.03 Entire Contract – Delete in its entirety.

GP-4.10 Warranty of Construction – Delete in its entirety, including the title, and replace with the following:

### GP-4.10 Warranty of Construction and Correction of Defects

#### A. Warranties

- (1) The Contractor warrants that, at the time of completion and acceptance, the work performed under the Contract conforms to the Contract requirements; was performed in a good, workmanlike manner; and is free of defects in design, materials, equipment, and workmanship.
- (2) The Contractor warrants that for the full term of the Contract, (including options) the work performed under this Contract will conform to the Contract requirements and will be free of defects.
- (3) The Contractor warrants that the system, its design, and each of its components, including all hardware and software, are suitable for their intended purposes as an integrated, and fully functioning CCTV system; and that, in all other respects, it shall conform to the Contract



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requirements and design objectives set forth in the RFP. The Contractor further warrants that neither the system nor any component thereof infringes upon or violates any patent, copyright, trade secret, or proprietary right of any other party.

- (4) With respect to the work performed by or obtained from others, the Contractor shall obtain and cause its subcontractors and suppliers to obtain, at a minimum, all expressed and implied warranties that would be given in normal commercial practice; require such warranties to be executed for the benefit of the Authority; and, if directed by the Procurement Officer, enforce such warranties for the benefit of the Authority.
- (5) The warranties herein and the rights and remedies of the Authority relative thereto are in addition to all warranties, rights, and remedies available at law or in equity or elsewhere under this Contract.

### B. Correction of Defects

- (1) For a period of three (3) years after acceptance, or for the full term of the Contract, (including options), whichever is longer, the Authority will require the Contractor to correct any defect in the work or to remedy damage to property, real or personal, at or adjacent to a site, if the damage is the result of the Contractor's failure to conform to Contract requirements, or of a defect in the work or the design for the work. Correction shall include, without limitation, removal and replacement and all other work necessary to correct the defect or remedy the damage.
- (2) The rights and remedies of the Authority under this clause are in addition to those available at law or elsewhere in this Contract.

Note: as mentioned in Section 1, this project will also require the Offeror to provide and execute a preventive and corrective maintenance plan (PCMP) for CCTV cameras and related equipment for the MdTA. This portion of the project will apply to MdTA's existing cameras and future cameras as well. Section 6 provides a listing of existing equipment makes and models.

### Section GP-5.12 Failure to Maintain Entire Project

Delete in its entirety and replace with the following:

Failure on the part of the Contractor, at any time, to RESPOND TO the provisions of GP-5.11, will result in the Procurement Officer's immediately notifying the Contractor to comply with the required maintenance provisions. In the event that the Contractor fails to PROCEED WITH CORRECTIONS TO UNSATISFACTORY MAINTENANCE SO AS TO CONFORM TO THE PROVISION OF GP-5.11 within four (4) hours after receipt of such notice, the Procurement Officer MAY NOTIFY THE CONTRACTOR TO SUSPEND ALL OTHER WORK ON THE CONTRACT UNTIL SUCH TIME AS THE UNSATISFACTORY MAINTENANCE IS CORRECTED. In the event that the Contractor fails to RESPOND TO unsatisfactory maintenance within four (4) hours after receipt of such notice, the Procurement Officer will immediately proceed with adequate forces and equipment to maintain the project, and the entire cost of this maintenance will be deducted from moneys due the Contractor ON THE NEXT MONTHLY ESTIMATE.



## SPECIAL PROVISIONS

### Section GP-7 Legal Relations And Responsibility To Public

Add the following:

#### Section GP-7.37 Software License, etc.

##### (a) DEFINITIONS

Custom Code – shall be any program, script, firmware, software, application, data, protocol, encoding algorithm, or other piece of intellectual property, in whole or in part, meeting any one of the following conditions:

- (1) Developed or created by the Contractor, subcontractors, subcontractors to subcontractors, etc., specifically to satisfy the requirements of this project.
- (2) Not commercially available on the open market as a “shrink wrapped” package, unless specifically agreed to in writing prior to the execution of this Contract.

Licensee – The Maryland Transportation Authority

Licensor – The Contractor

COTS – Commercial-Off-The-Shelf. For software, this means a software package that can be purchased on the open market in a ‘shrink-wrapped’ package. Such a product would have widespread use in many industries for common needs. Examples of COTS products might include, but not be limited to, operating systems, MPEG-2 decoders, office applications such as word processors, spreadsheets, relational databases, Internet browsers, or e-mail applications.

- (b) The CCTV software, including MPEG-2 software decoders, shall be considered COTS products for this project. Any MdTA-specific algorithms, reports, client applications, or user interface code developed for this project shall be considered custom code for this project.

##### (c) COTS PRODUCTS

The Contractor shall provide a valid license agreement for all COTS products. The license MUST be suitable for use on this project. The Contractor is responsible for determining that the use of the COTS products does not violate the license agreements for those products.

The MdTA shall be responsible for licensing third party products on any additional computers within the MdTA not covered in the original Contract.

COTS license agreements shall not be considered a material change to the specifications and requirements of the Contract. The Contractor shall remain responsible to provide a system that functions as specified in the Contract documents.

COTS license agreements shall not require periodic, one-time, or other payment by the MdTA directly to any third party. All costs shall be included in the Contract payments to the Contractor.

COTS license agreements shall not contain self-termination clauses based on date or time, future payments, or any other condition.



## SPECIAL PROVISIONS

### (d) SOFTWARE WARRANTY

- (1) This software warranty is in addition to any warranty requirements of the contract that may also apply to software.
- (2) The Contractor represents and warrants that the system functions correctly with respect to date and time over any date and time, and any date and time field, between 12:00:00 AM January 1, 1990 and 11:59:59 PM December 31, 2099.
- (3) The Contractor represents and warrants that the system does not infringe on any patent, copyright, trademark, or trade secret or other proprietary right of any person.
- (4) Warranty of Title
  - a. The Contractor shall warrant that it has full title and ownership of the software. The Contractor shall further warrant that it has the power and authority to grant license to the Authority as stated herein and that said license will in no way constitute an infringement on or other violation of any copyright, trade secret, trademark, patent or other proprietary right of any third party.
  - b. Indemnification
    - i. The Contractor agrees to indemnify and hold harmless Licensee and its affiliates arising out of, or related to, any claim that Licensee's use or possession of the software or documentation, or the license granted hereunder, infringes on or violates the copyright, trade secret, patent, trade mark, service mark, or other proprietary right of any third party.
    - ii. Licensor shall defend and settle, at its sole expense, all suits or proceedings arising out of the foregoing. No settlement that prevents the Licensee from continuing to use the software, or which modifies the license agreement, shall be made without the Licensee's prior written consent. In all events, Licensee shall have the right to participate at its own expense in the defense of any such suit proceeding through counsel of its own choosing.
- (5) Termination and Default
  - a. Should the Contractor, for any reason, be unable to complete the project, honor the warranty, or provide software maintenance, at any time during the operating life of the software, or prior to delivery of the software, the Authority shall be granted ownership of the software and all source code.
  - b. Should the Authority, for any reason, breach its responsibility under the license agreement, the Contractor's remedial action shall be limited to monetary damages. The software performs critical safety functions for the Authority and the Contractor shall not deny the Authority access to the software, for any reason, by injunctive or other means. The Contractor is prohibited from exercising any actions granted by UCITA (The Uniform Computer Information Transaction Act, Maryland Commercial Law Article § 22) to terminate the use of the software.
  - c. This license agreement shall remain in effect in perpetuity.
  - d. This license is non-terminable. Should the Contractor desire to terminate the license, then all software, copyrights, trade secrets, and patents shall be assigned to the Authority by the Contractor or other owners of the software.
- (6) The effective date of license shall be the date the Contract is executed (signed by all parties).



## SPECIAL PROVISIONS

### (e) CUSTOM CODE – Desired License Terms and Conditions

- (1) The terms and conditions in this section (GP-7.37) shall be considered the final terms and conditions unless clearly modified by a written instrument agreed to and executed by the parties hereto (i.e., the Authority and the Contractor).
- (2) The Authority shall be granted non-exclusive license to use the Custom Code on any number of computers, for any purpose that in the Authority's opinion, is beneficial to the Authority
- (3) The Authority shall have a non-exclusive license to the source code, object code, firmware, executables, and all associated makefiles, resource files, data files, documentation, diagrams, and project files.
- (4) The Contractor's development tools must be Commercial-Off-the-Shelf Software (i.e., available from distributors not affiliated with or related to the Contractor and not subcontracted for this project). Where the Contractor has used any other development tools, a copy thereof shall be included in the deliverables and the Authority, or its designated representative, shall be granted a license to use said development tools in conjunction with software maintenance, support, enhancement, or modification.
- (5) The Authority shall not sell the source, object or any other custom code provided for this project. The Authority shall not transfer the source, object, or any other custom code to any other party except as needed for the continuous maintenance and use of the Authority's CCTV System and subject to the non-disclosure agreement.
- (6) A copy of the source code, object code, firmware, executables, and all associated makefiles, resource files, data files, and project files, shall be delivered to the Authority upon completion of each major milestone and prior to payment for those milestones on CD ROM or other approved media.
- (7) The Authority shall own any and all changes that it makes or those made by third parties that the Authority engages to make such changes.

### (f) CUSTOM CODE – Required License Terms and Conditions

- (1) Any changes, modifications, enhancements, or derivative works performed by the Contractor for the Authority are included in the license agreement as if supplied in the original software. This provision shall apply to all extra work orders. **NO NEW LICENSE AGREEMENTS SHALL BE REQUIRED FOR CHANGES, ADDITIONS, MODIFICATIONS, UPGRADES, or OTHER WORK** on this project.
- (2) License agreements shall not alter, supercede, change, or modify any of the terms, conditions, or requirements of the Contract.
- (3) Any license agreements, or other statements, in writing or within the software program, which contain language contrary to the contract documents, shall be unacceptable and not binding in any way on the Authority.
- (4) Upon completion of the Contract, including any option years, the Authority shall have the right to contract for services to maintain and operate the software, including, but not limited to, modifying the source code or configuration, changing database schema, and integrating with other systems. The Authority agrees to require that any other parties involved in maintenance or modification of the source or object files enter into a non-disclosure agreement prior to having access to the source or object files.

### (g) LICENSING – Custom Code and COTS Software.

- (1) **ALL LICENSE INFORMATION, LICENSE AGREEMENTS, COPYRIGHT NOTICES, OR OTHER LEGAL CONDITIONS, FOR ANY AND ALL SOFTWARE SUPPLIED UNDER**



## SPECIAL PROVISIONS

THIS CONTRACT MUST BE SUBMITTED IN THE PROPOSAL. THIS PROVISION ALLOWS THE MDTA AN OPPORTUNITY TO ASSESS LICENSE CONDITIONS AS PART OF THE TECHNICAL PROPOSAL EVALUATION.

- (2) All license information, license agreements, or other legal conditions surrounding the intellectual property must be in the "Software Licensing" section of the Proposal. Any statements outside of that section shall be interpreted as enforceable only to the limit that does not contradict this section and the "Software Licensing" section of the Proposal.
- (3) It is recognized that Proposers may wish to add to, or modify the stated license terms and conditions. Proposers are cautioned that such modifications will be reviewed and will impact the technical score of the Proposal. Any proposed modifications to Sections GP-7.37(a), GP-7.37(b), GP-7.37(c), GP-7.37(d), or GP-7.37(f) may result in rejection of the proposal. Any additions or modifications must be submitted in the proposal and in the appropriate section of the proposal and will be considered when evaluating the Technical Proposal. Additions and modifications to the licensing terms and conditions and deviations from the desired terms and conditions may positively or negatively impact the technical score and shall be evaluated solely by the MdTA.
- (4) UNLESS clearly stated as a modification to Section GP-7.37(a), GP-7.37(b), GP-7.37(c), GP-7.37(d), or GP-7.37(f), all proposed license terms and conditions in the proposal shall be interpreted as enforceable only to the limit which does not contradict these sections.
- (5) Failure to submit license terms in the Proposal shall waive the Contractor's right to assert any license terms beyond those contained in the Contract documents or required by law. No license terms submitted after the final proposal submission shall be considered and shall be returned to the Contractor marked "not-reviewed."
- (6) Any license conditions, agreements, copyright notices, or other legal conditions submitted after the execution of the Contract must contain consideration for the Authority and be approved and signed into execution by both parties to this Contract. The Authority is not obligated to accept or consider such conditions, agreements, copyright notices, or other legal conditions.
- (7) The Proposer or Contractor agrees to perform any and all changes to the Custom Code without requiring additional licensing requirements or modification to existing licensing requirements.

### (h) COPY PROTECTION

- (1) The Authority does not encourage the use of copy protection schemes in the software. This software is intended to serve public interests and transportation safety functions of the Authority. Thus, ANY programming that further complicates or potentially could disrupt the operation of the software is strongly discouraged. However, based on the Contractor's desire to protect marketable software from piracy, copy protection schemes will be accepted ONLY WHERE THE CONTRACTOR ASSUMES COMPLETE LIABILITY IN THE EVENT THAT SUCH SCHEMES CAUSE FAILURE OR DISRUPTION OF USE OF THE SOFTWARE. The implementation of any copy protection scheme shall be considered acceptance of these terms and conditions.
- (2) Any copy protection scheme must be clearly explained to the Authority in the Proposal. Failure to disclose copy protection schemes will result in rejection of the implementation of any scheme not disclosed.
- (3) A failure of a copy protection scheme shall be defined as any event where the software is not accessible, fails to perform a required function, or otherwise does not properly function as a result of a copy protection scheme. The Contractor shall be liable for such



## SPECIAL PROVISIONS

failures. Liability shall include liability for actual, incidental and consequential damages including but not limited to:

- a. Man-hours expended to remedy or work around software failures caused by copy protection schemes.
  - b. Where public safety is compromised and injuries or property damage result and can be linked to the software failure, in whole or in part, the contractor shall be completely liable for such damages or portion thereof attributed to the failure.
  - c. Any loss of revenue.
- (4) Software locks, requiring verification numbers, license numbers, or other contractor or vendor provided information and which require renewal or periodic update shall be updated by the Contractor or his representative whenever necessary. The Contractor is required to visit the site at the appropriate intervals and update the information. At no time shall Authority employees be involved in this process. Remote access to the computer systems is prohibited.
- (5) The software locks/codes shall be provided to the MdTA in the event that hardware or reinstallation of the software is necessary.
- (6) Software locks that are based on hardware hashing or dongles shall require two (2) hour response time, twenty-four (24) hours per day, seven (7) days per week, in perpetuity. These locks prevent the use of software except on pre-authorized computers based on information contained within the hardware of the computer. When MdTA staff installs repaired or replacement parts, the Contractor shall, within two (2) hours, visit the site and update the software locks such that the software is functional. The use of these devices, especially dongles, is strongly discouraged by the Authority. These devices, if required in the Offeror's solution, may adversely affect the scoring of their technical proposal. The Contractor is required to notify the Authority in writing if any software uses such devices.
- (7) Where continued or persistent problems develop with copy protection schemes, and the Authority determines that significant public safety concerns exist, the Authority may direct the Contractor to remove such schemes completely at the Contractor's own expense.

Add the following:

### Section GP-7.38 Non-Disclosure Agreement

The Contractor, and his suppliers, manufacturers, sub-contractors, employees, (hereinafter referred to as *Contractor*) acknowledge that the Maryland Transportation Authority (hereinafter referred to as *MdTA*) may require that proprietary, confidential, trade secret, or copy protected information (all of which is herein after referred to as *Protected Information*) be supplied by the *Contractor* or delivered to the *Contractor*. The *Contractor* agrees to supply such information as indicated in the Contract documents or as directed or requested by the MdTA. Where necessary, the MdTA will provide *Protected Information* to the *Contractor* in order to complete the project. The party providing the *Protected Information* shall hereinafter be referred to as the *Sender*. The party requesting or receiving the Protected Information shall hereinafter be referred to as the *Receiver*.

The *Sender* of *Protected Information* agrees to mark such documents, and only such documents, if not already marked, with the word(s) "Confidential," "Trade Secret," "Proprietary," "Copyright," or "Protected Information." A blanket use of "Confidential," "Trade Secret," "Proprietary," "Copyright," or "Protected Information" on all information is **not** acceptable. Transmittal or communication of information in some non-tangible (e.g., email, FTP) format shall be considered



## SPECIAL PROVISIONS

*Protected Information* where a written notice is forwarded within thirty (30) calendar-days after transmission to clearly indicate the nature of the non-tangible *Protected Information*. It is strongly suggested that the non-tangible information contain some clearly discernable notice of intent to forward a written *Protected Information* notice.

The *Receiver* (be that the *MdTA* or the *Contractor*) agrees not to disclose, copy, sell, or give away such information except where agreed to in writing by the *Sender*. The *Contractor* agrees that the *MdTA* may disclose the information to employees of the *MdTA*, MDOT, SHA, other Contractors, consultants, or agents for the sole purposes of (a) reviewing the information for approval for use on this project; (b) using the information to integrate connecting systems with those supplied by the *Contractor*; (c) maintaining systems supplied by the *Contractor*; (d) other reasons that may be enumerated in the Contract documents; or (e) under court order, subpoena, or similar instrument of the court. The *MdTA* agrees that the *Contractor* may disclose the *Protected Information* to employees of his company, or subcontractors who have also agreed, in writing, to the non-disclosure agreement, for the sole purpose of (a) using the information to integrate connecting systems with those supplied by the *Contractor*; (b) maintaining systems supplied by the *Contractor*; (c) other reasons that may be enumerated in the Contract documents; or (d) under court order, subpoena, or similar instrument of the court.

All Parties agree to require that any other contractors, consultants, or agents sign a similar non-disclosure agreement prior to disclosing any *Protected Information* for any reason to any other party. The *MdTA* and the *Contractor* agree that any information supplied to any other contractors, consultants, or agents will be returned to the *MdTA* or *Contractor* upon completion of the immediate need for such information (i.e., only the *MdTA* and/or *Contractor* will keep copies for permanent storage).

The *Receiver* agrees that only those employees who need access to the *Protected Information* will have access. The *Receiver* agrees to inform each employee, who is granted access to the information, regarding the protection of *Protected Information* under this agreement and to establish policies and procedures, if not already established, to enable the fulfillment of obligations under this agreement.

The *Receiver* agrees to immediately notify the *Sender* of any information, which comes to its attention, which does, or might, indicate that there has been any loss, or reduction of protection of the *Protected Information*. The *Receiver* agrees not to refrain from any reasonable action, where such inaction may result in unauthorized disclosure of *Protected Information* to any person or entity.

If, at any time, the *Receiver* can no longer maintain protection of the *Protected Information*, the *Receiver* agrees to return all such information to the *Sender*. Where return is impossible, or impractical, or computer files are involved, the *Receiver* agrees to destroy and dispose of the *Protected Information* and render it unreadable and unusable to any party.

Section GP-8.01 Subcontracting – Delete in its entirety.

Insert the following:

Except as may be provided elsewhere in the Contract, the Contractor to whom a contract is awarded shall perform with his own organization and with the assistance of workmen under his immediate supervision, work of a value of not less than twenty-five percent (25%) of the total original value of the Contract.



## SPECIAL PROVISIONS

No portion of the Contract shall be subcontracted, assigned or otherwise disposed of except with the written consent of the Procurement Officer. Any assignment, subcontract or other disposition of all or part of this Contract without the express written consent of the Procurement Officer shall be null and void. Consent to subcontract, assign or otherwise dispose of any portion of the Contract, shall not be construed to relieve the Contractor or surety of any responsibility for the fulfilling of all the requirements of the Contract.

The Contractor shall incorporate by reference or otherwise include these General Provisions in every subcontract issued pursuant to or under this Contract, and shall require that the same reference or inclusion be contained in every subcontract entered into by any of its subcontractors.

### **2.13 Insurance Requirements**

The requiring of any and all insurance as set forth in these specifications, or elsewhere, shall be in addition to, and not in any way in substitution for, all the other protection provided under the Contract Documents.

No acceptance or approval, or both, of any insurance by the Authority shall be construed as relieving or excusing the Contractor, or the Surety issuing its bonds, from any liability or obligation imposed upon either or both of them by the provisions of the Contract Documents.

The Contractor shall, at all times during the term of this Contract, maintain in full force and effect the policies of insurance required by this Section. At least annually, the Contractor shall provide to the Authority evidence of the required insurance coverage and, if requested by the Authority, shall provide to the Authority certified true copies of any and all of the policies of insurance.

The Contractor shall not commence work under this Contract until all of the insurance required under this Section has been obtained and approved by the Authority, nor shall the Contractor allow any subcontractor to commence work on its subcontract until the insurance required of the subcontractor has been so obtained and approved. Prior to the start of work, the Contractor shall submit to the Procurement Officer a certificate of insurance indicating that it has obtained the required coverage.

All insurance policies required by this Section, or elsewhere in the Contract Documents, shall be so endorsed as to provide that the insurance carrier will be responsible for giving immediate and positive notice to the Authority in the event of cancellation or material modification of the insurance policy by either the insurance carrier or the Contractor, at least sixty (60) calendar-days prior to any such cancellation or modification.

The Contractor shall purchase and maintain the following insurance during the life of the Contract:

- 2.13.1 Workers' Compensation – The Contractor shall maintain Workers' Compensation insurance as required by the laws of the State of Maryland, and shall include Employer's Liability coverage with a minimum limit of \$1,000,000.
- 2.13.2 Comprehensive General Liability Insurance – The Contractor shall maintain occurrence forms of general liability insurance covering the full scope of this Contract with limits of not less than \$500,000 per occurrence and \$1,000,000 aggregate for personal or bodily injuries, and \$500,000 per occurrence and aggregate for property damage. A combined single limit per occurrence of



## SPECIAL PROVISIONS

\$500,000 with a combined aggregate of \$1,500,000 is acceptable. Such insurance shall include, but shall not be limited to, Comprehensive Broad Form Endorsement covering the following:

- a. All premises and operations;
- b. Products/completed operations;
- c. Independent contractors;
- d. Contractual liability covering oral or written contracts or agreements, including this contract;
- e. Additional interests of employees;
- f. Extended definition of bodily injury;
- g. Personal injury coverage (hazards A, B, and C), with no exclusions for liability assumed contractually or injury sustained by employees of Contractor;
- h. Broad form property damage.

2.13.3 Comprehensive Business Automobile Liability Insurance – The Contractor shall maintain comprehensive business automobile liability insurance covering the use of any motor vehicle to be used in conjunction with this Contract, including hired automobiles and non-owned automobiles, providing not less than the following limits:

\$1,000,000 Bodily Injury each person, and  
\$2,000,000 Bodily Injury each occurrence, and  
\$1,000,000 Property Damage each occurrence.

A combined limit of \$3,000,000 each occurrence is acceptable.

Loading and unloading of any motor vehicle must be covered by endorsement to the automobile liability policy or policies.

2.13.4 Umbrella Liability Insurance – The limits of liability set forth in Paragraphs 2.13.1, 2.13.2, and 2.12.3 above may be provided solely by individual policies, or in combination with an umbrella liability insurance policy which provides coverage at least as broad as the individual underlying policies. If an umbrella policy is purchased, each of the policies specified in Paragraphs 2.13.1, 2.13.2, and 2.13.3 shall be listed as underlying coverage in the umbrella policy.

2.13.5 Other Requirements – In addition to the above requirements, all insurance policies required by this section:

- (1) Shall name the Authority as an additional insured;
- (2) Shall contain provisions or endorsements necessary to assure coverage of claims by one insured against another;
- (3) Shall contain endorsements providing that the Contractor's policies shall be primary to all other insurance available to the Authority for liability arising out of or resulting from the Contractor's operations under the Contract; and
- (4) Shall be issued by reputable insurers authorized to issue such policy or policies in the State of Maryland.

The Contractor shall require all architects, engineers and consultants hired as subcontractors for this contract, to indemnify and hold harmless the Contractor and the Authority from and against all claims suits, judgments, expenses, actions, damages and costs of every name and description, arising out of, or resulting from, the performance of the services of the architect, engineer or consultant under the subcontract.



## SPECIAL PROVISIONS

### 2.14 **Bid/Proposal Affidavit**

All Proposals submitted by Offerors must be accompanied by a completed Bid/Proposal Affidavit. A copy of this Affidavit is included with this RFP.

### 2.15 **Contract Affidavit**

All Offerors are advised that if a Contract is awarded as a result of this solicitation, the successful Offeror will be required to complete a Contract Affidavit. A copy of the Affidavit is included with this RFP for informational purposes. This affidavit need not be submitted with the Offeror's Proposal.

### 2.16 **Liquidated Damages**

Time is of the essence under this Contract. In the event the work is not satisfactorily completed in accordance with the Contract or Project Schedules, damages will be sustained by the Authority. In such event, the Contractor shall pay to the Authority, not as penalty, but as **liquidated damages (LDs) the amount of One Hundred dollars (\$100.00) per calendar day for each day's delay** beyond the contracted completion date for the equipment provided under this Contract. The LDs will be enforced to ensure all corrective maintenance is made timely to repair out-of-service cameras and restore operations within 3 business-days of MdTA notice (as specified in Section 6.23). For tunnel cameras the 3 business-day time limit will begin upon the 1<sup>st</sup> night a tunnel closure is available. These LDs will also be enforced to ensure that all new camera site installations are completed and made operational within 30 calendar-days of MdTA notice (as specified in Section 1 and Section 6).

The assessment of liquidated damages by the Authority against the Contractor does not supersede the right of the Authority to impose other remedies available to it, including, but not limited to, reductions in or withholding of payments to the Contractor.

In addition to any other remedies available to the MdTA in law or under the Contract, in the event that the Contractor fails to provide the services, equipment, or other items required for performance of the Contract within the prescribed time limits, the Authority may elect to provide or obtain services, equipment, or other items necessary to perform under the Contract. In that event, the Contractor will pay the total cost incurred by the Authority for obtaining replacement services, equipment and other items necessary to install, integrate, maintain, and test work specified herein. The Authority will have the unilateral right of source selection when the Contractor is unable to perform. In addition to the replacement costs described above, the Contractor will also be required to pay the liquidated damages set forth above for any delay in performance as well as other damages sustained by the Authority.

### 2.17 **Incorporation by Reference**

All terms and conditions of the RFP and amendments thereto; all provisions of the Offeror's Proposal and submittals in response to the RFP, and amendments thereto; all applicable State and Federal laws, statutory and regulatory provisions and orders are incorporated by reference and made a part of the Contracts to be entered into as a result of this RFP.

### 2.18 **Retention of Records and Audits**



## SPECIAL PROVISIONS

- 2.18.1 The Contractor shall retain all books, records and documents including, but not limited to, cost or pricing data relating to the Contracts, for a period of at least three (3) calendar years after the date of final payment by the Authority hereunder or any applicable statute of limitations, whichever is longer, and shall make them available for inspection and audit by authorized representatives of the Authority, including the Procurement Officer or his designee, at all reasonable times.
- 2.18.2 The Authority may audit, at any reasonable time during the record retention period, the Contractor's books and records relating to:
- Cost or pricing data submitted by the Contractor, and
  - The determination by the Authority of the Contractor's costs or estimated costs in connection with any change order or contractual modification, or proposed change order or contractual modification.
  - Matters involving claims by one party against the other.

The Contractor shall include these provisions in every subcontract.

### **2.19 Continuity of Services**

- 2.19.1 The Contractor recognizes that the services under this Contract must be continued without interruption and that, upon Contract expiration or termination, a successor, either the Authority or another Contractor, may continue them. The Contractor agrees to exercise its best efforts and cooperation to effect an orderly and efficient transition to a successor.
- 2.19.2 The Contractor shall, upon the Procurement Officer's written notice, (a) furnish phase-in, phase-out services for up to one-hundred-eighty (180) calendar-days after this Contract expires, and (b) negotiate in good faith an agreement and plan with a successor to determine the nature and extent of phase-in, phase-out services required. The plan shall specify a training program and a date for transferring responsibilities for each division of work described in the plan, and shall be subject to the Procurement Officer's approval. The Contractor shall provide sufficiently experienced personnel during the phase-in, phase-out period to ensure that the services called for by this Contract are maintained at the required level of proficiency.
- 2.19.3 The Contractor shall allow as many personnel as practical to remain on the job to help the successor maintain the continuity and consistency of the services required by this Contract. The Contractor also shall disclose necessary personnel records and allow the successor to conduct on site interviews with these employees. If selected employees are agreeable to the change, the Contractor shall release them at a mutually agreeable date and negotiate transfer of their earned fringe benefits to the successor.

### **2.19 Prompt Payment of Subcontractors**

The prime Contractor is responsible for timely mailing of payments to all Subcontractors and Suppliers as required in the 2002 edition of the State Finance and Procurement Article of the Annotated Code of Maryland, Section 17-106.

This Contract requires the Contractor to make payment to all Subcontractors within ten (10) calendar-days of receiving payment from the Authority.



## SPECIAL PROVISIONS

Each month, the construction Project Engineer will review the current pay items with the prime Contractor and all involved Subcontractors to ensure that all work satisfactorily completed within specifications is included in the monthly progress payment. For payment purposes, the same quantity totals used to compute the payment to the prime Contractor will be the basis for payment to the Subcontractor.

If the Subcontractor does not receive payment within the required ten (10) calendar-days, the Subcontractor shall notify the Project Engineer in writing of the amount in dispute including the item numbers and payment quantity for each. The Project Engineer will then notify the Procurement Officer of the dispute. The Project Engineer or his representative will verbally contact the prime Contractor within forty-eight (48) hours to ascertain whether or not a performance dispute exists, which necessitates non-payment to the Subcontractor. If a performance dispute exists, the prime Contractor must demonstrate that there is a valid basis to withhold payment from the Subcontractor. If the prime Contractor withholds payment from a Subcontractor, the prime Contractor shall provide to the Subcontractor written notice of the withholding of payment. The notice shall detail the reasons for withholding payment as well as the amount. A copy of the notice shall be provided to the Surety and the Authority. If no valid dispute exists, the prime Contractor will be directed to make immediate payment to the Subcontractor. The Subcontractor will be responsible for notifying the Project Engineer if this payment is not made. Upon receipt of notification, the Project Engineer will schedule a meeting with the Contractor and Subcontractor to verify and discuss the non-payment issue. This meeting will be held at the Authority's offices within two (2) working days of the MdTA's contact with the subcontractor. If it is determined that the prime Contractor has withheld payment to the Subcontractor without cause, further progress payments to the prime Contractor will be withheld until the Subcontractor is paid. In addition, the MdTA may order a suspension of work or other administrative actions as it sees fit.

If an action is taken as stated above the Contractor shall notify the MdTA's Project Engineer when the payment is made. After the MdTA's Project Engineer verifies that the payment has been made to the Subcontractor the MdTA shall release withheld progress payments.

Nothing in this Special Provision shall be construed to prevent the Subcontractor from pursuing a claim with the surety under the prime Contractor's payment bond at any time.



SPECIAL PROVISIONS

**SECTION 110 — ACTIVITIES CHART PROJECT  
SCHEDULE**

See Section 110 of the SHA's *Standard Specifications for Construction and Materials (Part III Technical Requirements)* in conjunction with the changes shown in this Section.

Revise as follows:

Revise the definition of Administration to read as follows:

Administration - The word "Administration" shall mean the Maryland Transportation Authority (MdTA).

**110.01 DESCRIPTION**

**ADD:**

Activity CHART schedules shall be produced for the preventive maintenance of the CCTV cameras only. Schedules for all other work (e.g., installation, repair, etc.) shall be produced as required when the work is assigned.

**110.04 MEASUREMENT AND PAYMENT**

**DELETE:** 110.04 Measurement and Payment in its entirety.

**INSERT:** The following.

Activities chart project schedule will not be measured but the cost to develop, prepare, write, record, meetings, revise, distribute, update and all incidentals necessary to complete the work will be included in the other pay items specified in the Contract Documents.



## SPECIAL PROVISIONS

### **TC 4 CONTROL OF WORK**

See Section TC 4 of the SHA's *Standard Specifications (Part II Terms and Conditions)* in conjunction with the changes shown in this Section.

Revise as follows:

Revise the definition of Administration to read as follows:

Administration - The word "Administration" shall mean the Maryland Transportation Authority (MdTA).

#### **4.01 – SHOP PLANS AND WORKING DRAWINGS**

##### **DELETE SECTION (a) IN ITS ENTIRETY AND REPLACE WITH THE FOLLOWING**

##### **ADD:**

- (a) General. The specifications will be supplemented by working drawings, catalog cuts, schematics, material data, installation plans and manuals, user manuals, and other data necessary to demonstrate to the Engineer adequate control of the work, proper installation and handling, conformance to the specifications, and that the proposed materials and equipment is suitable for the intended use. All authorized alterations affecting the requirements and information given on the working drawings shall be in writing to the Engineer. Any deviations from the Specifications, or Special Provisions shall be clearly highlighted and explained. When reference is made to the working drawings, the interpretation shall be the working drawings as affected by all authorized alterations then in effect. When reference is made to the working drawings, the interpretation shall be that working drawings include working drawings, catalog cuts, schematics, material data, installation plans and manuals, user manuals, and other data necessary to demonstrate to the Engineer adequate control of the work, proper installation and handling, conformance to the specifications, and that the proposed material or equipment is suitable for the intended use.

Working drawings will show details of all structures, lines, grades, typical cross section of roadway, general cross sections, location and designation of all units and elements. Cabinet drawings shall be to-scale showing the location of all equipment proposed to be mounted within the cabinet. One-line diagrams and schematics shall be provided for equipment cabinets showing the interconnection of all devices located therein. Equipment layouts shall include rack-level elevation views as well as floor plans for all equipment racks. All working drawings, regardless if submitted as specified or submitted as equal substitutes, shall be furnished with complete, specific, detailed information from the manufacturer or supplier for the material or equipment the Contractor proposes to furnish, in which the requirements of the Specifications and Special Provisions shall be clearly shown to be met.

When any article is specified by trade name of manufacturer with or without the clause "or equal", it is intended to establish the quality of the article. If the Contractor proposes to use material or equipment of another manufacturer as an "or equal" to the material or equipment specified, all working drawings shall conform to the following requirements, conditions, and procedures:

1. Substitution of equipment or materials other than those specified will be considered, providing, in the opinion of the Engineer, such equipment or material is equal to, or better than specified. The decision of the Engineer with respect to approval or disapproval of any



## SPECIAL PROVISIONS

material or equipment proposed to be substituted as an "or equal" is final. The Contractor shall have no claim of any sort by reason of such decision.

2. If the Contractor proposes to substitute materials or equipment as "or equal" to those specified, it shall be his responsibility to furnish, in addition to the information discussed above, a point by point comparison of the material or equipment specified under the contract and that proposed to be substituted. The burden of responsibility in furnishing this information is with the Contractor.
3. If the substitute material or equipment requires any re-design or affects other aspects of the project, the Contractor shall be responsible to provide such re-design including details and to adjust elements as necessary to achieve the re-design at no additional cost to the Authority. Cost saving re-designs will be considered under the value engineering specifications.

If incomplete or irrelevant data is submitted as evidence of compliance with Specifications, or Special Provisions the data will be returned and the request for approval of working drawings will be denied.

The Contractor shall provide, at no additional cost to the Authority, all required working drawings and shall have them adequately checked, after which they shall be submitted to the Engineer for review. The engineer may reject working drawings and return them for revisions, in which case the Contractor shall submit revised working drawings as required. No items involving working drawings shall be incorporated into the work until working drawings have been accepted by the Engineer, however, acceptance shall not relieve the Contractor of any responsibility in connection with the working drawings.

The working drawings shall be prepared on sheets no smaller than 8.5" x 11" and no larger than 22" x 36". The sheet size and scale of the drawings shall be appropriate for the work depicted. All working drawings shall be submitted by the Contractor, no working drawings submitted directly by subcontractors, fabricators, suppliers, etc. shall be accepted. Acceptance of a material source or equipment source by the Engineer or the Authority shall NOT constitute approval of the material or equipment nor approval of the materials or equipment as a substitute or an "equal" product.

### **ADD:**

- (c) The working drawings shall be submitted electronically as files (FAXES are NOT acceptable). Electronic submission may be made via email for small submissions. Email is the preferred submission method. The email submissions shall be made to the email addresses provided by the Authority upon notice to proceed of the project and shall include [bjordan@mdta.state.md.us](mailto:bjordan@mdta.state.md.us). Where electronic submittals are larger than email can support (currently about 8MB), the submission may be made using one or more of the following alternatives:
  1. Posted on a contractor supported FTP server, or other via another service that may be accessed by the Authority as long as an email notice is made with the 'cover' sheet.
  2. Copied onto a CD, DVD, or other supported data media and submitted to the Authority via standard mail. At least 5 copies of the media shall be provided for in-house distribution.



Maryland  
Transportation  
Authority

CONTRACT NO. MA 992-000-006  
F&I CCTV Cameras & Related Equipment  
Section 2. General Information and Contract Provisions  
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The address to mail such media transfers is:

Maryland Transportation Authority  
Engineering Division  
300 Authority Drive  
Baltimore, MD 21222

ATTN: Robert Jordan

### **ADD:**

- (d) Electronic Submittal Format. All electronic submittals shall be in a format readable by the Authority. The submittals shall be in Adobe portable document format (PDF) compatible with version 6.0 of Adobe Acrobat.

Each submittal shall be a single file. Multi-file submittals shall not be accepted. The first page of each submittal shall be a cover page. The cover page must be in the 8.5 x 11" sheet format. The cover page must include:

1. The Contract number.
2. The Contract title.
3. Submittal Number. For each project(Contract), a sequential number starting with number 1 shall be used. Where a submittal is rejected, or otherwise requires resubmittal or replacement, the Submittal number shall be appended with an "R" followed by the revision number.
4. The Contractor's name, mailing address, contact phone number, contact email address.
5. The relevant line items in the contract that the submittal is associated with.
6. A brief description of the materials or data represented in the submittal package.
7. The date of the submittal.
8. The manufacturer's name, web site address, mailing address, and contact phone number, if applicable.
9. The vendor's or reseller's name, web site address, mailing address, and contact phone number if applicable.
10. The cover page must contain a 6" x 3" blank space where engineering stamps may be placed (electronically) without covering data in the page.

The electronic file must not be secured. The review process for electronic submittals will place electronic stamps and may include electronic comments in the electronic submittals by the Contractor. Any security or compatibility problems that prevent the use of the electronic stamps or electronic commenting will render the submittal unacceptable. The returned file may be secured to prevent accidental changes.



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### ADD:

- (e) File Naming Conventions and Rules. It is necessary and required that file naming conventions and rules be followed to lend to organization and reduce confusion regarding the electronic submissions. Submittals that do not follow the file naming conventions described herein will be rejected without review. Strict adherence to the file naming rules is required. The file names for electronic submissions shall follow these rules:
1. The first five characters must be the first five characters of the contract number. For example, for contract MA992-000-006, the first five characters of the file name must be MA992.
  2. The sixth character must be a dash.
  3. The seventh through ninth characters shall be the text "SUB," which is short for submittal. Which is used to indicate that the file is a submittal from a Contractor.
  4. The tenth character must be a dash.
  5. The eleventh through thirteenth characters must be the submittal number, e.g., 001.
  6. In the event of a re-submittal, the 14<sup>th</sup> character will be an R followed by the re-submittal number.
  7. The remaining filename characters may be any short descriptive characters that may be useful to identify the nature of the submittal (fewer than 40 additional characters)
  8. Examples of filenames:
    - i. MA992-SUB-001-Conduit.pdf
    - ii. MA992-SUB-001R2-Conduit.pdf
    - iii. MA992-SUB-015-Fiber Optic Cable.pdf
  9. After the submittal has been reviewed, the text 'SUB' will be replaced by the text 'TRN' by the Authority and the electronic file with electronic stamps and possibly containing electronic comments will be returned to the contractor via email, CD, DVD, or similar electronic file transfer.

### ADD:

- (f) Upon completion of the project, all electronic files that have been transmitted to the Contractor (TRN's) shall be transferred to CD's, DVD's or other media by the Contractor and provided to the Authority along with as-built data. Data provided shall include any original files in original format, used to generate the PDF submittals, these may include CADD, Visio, Word, Excel, MathCad, Access/DataBase, HTML, JPG/Pictures, Power point, or any other format that may have been used as the originating document. Provide 3 copies of all media.



SPECIAL PROVISIONS

**TC 7 PAYMENT**

See Section TC 7 of the SHA's *Standard Specifications (Part II Terms and Conditions)* in conjunction with the changes shown in this Section.

Revise as follows:

Revise the definition of Administration to read as follows:

Administration - The word "Administration" shall mean the Maryland Transportation Authority (MdTA).

29 **DELETE:** TC-7.02 PAYMENT ALLOWANCES FOR STORED MATERIALS in its entirety.

**INSERT:** The following.

**TC-7.02 PAYMENT ALLOWANCES FOR STORED MATERIALS.**

When the Contractor requests payment allowance for materials, the following terms and conditions shall apply:

- (a) For superstructure members delivered on the project site, an allowance of 100 percent of the material cost plus freight charges as invoiced may be made provided the cost does not exceed 90 percent of the Contract price of the applicable Contract item. The allowance will be based upon validated invoices or bills for material including freight charges, and a copy thereof shall be made a part of the documented records for the project.
- (b) For reinforcement steel, piling, pipe, traffic barrier, signs and sign assemblies, and other nonperishable material in storage on the project, but excluding aggregates, cement, seed, plants, fertilizer or other perishable items, an allowance of 100 percent of the invoiced cost of the material plus freight charges to the Contractor may be made provided the cost does not exceed 90 percent of the Contract price of the applicable Contract item. Such material shall be delivered and stock-piled at the project site, and have been tested by the Administration and found to have conformed to the Specifications or have been accepted under an approved certification program prior to the allowance.
- (c) No allowance will be made for fuels, form lumber, falsework, temporary structures or other materials of any kind which will not become an integral part of the finished construction.

No payment for stored material will be made if it is anticipated that the material will be incorporated into the work within 30 days of the written request.

Only end product manufactured material or fully fabricated products that are awaiting installation or incorporation into the finished work are eligible for prepayment. Components, elements, or ingredients of a finished product are not eligible for prepayment.



## SPECIAL PROVISIONS

- (d)** Material for which an allowance is requested shall be stored in an approved manner in areas within the State of Maryland where damage is not likely to occur. If any of the stored materials are lost or become damaged in any manner, the Contractor shall be responsible for repairing or replacing the damaged materials. The value of the lost or damaged material will be deducted from the Contractor's subsequent estimates until replacement has been accomplished. The request for allowances for any materials stored on private property within the State of Maryland shall be accompanied by a release from the owner and/or tenant of such property agreeing to permit the removal of the materials from the property without cost to the State of Maryland.

The material shall be clearly marked with the Administration's Contract number on individual units. If the material is normally shipped to the project in bundles or other forms of packaging, the Administration's Contract number shall be clearly marked or affixed to the package. When the material is not stored at the actual project site, the material shall be physically separated by fencing or equivalent barrier from other materials stored at the same site. The material shall be accessible to the Administration at all times.

When it is considered impractical to store materials on the actual project, the Engineer may approve storage areas in the vicinity of the actual project which will be considered at the project site.

When storage of the materials within the State of Maryland is not practical, approval shall be obtained from the District Engineer for storage elsewhere. Storage of materials outside the State of Maryland will be subject to the conditions set forth in this provision and limited to materials exceeding twenty-five thousand dollars (\$25 000), which are designed and fabricated exclusively for use on a specific project.

- (e)** Material for which payment has been made, either wholly or partially, shall not be removed from the approved location until such time that it is to be incorporated into the work unless authorized by the Engineer.
- (f)** The Contractor shall submit a written request for payment to the District Engineer at least two weeks prior to the estimate cutoff date established by the District Engineer. The following items shall accompany the written request for payment:
- (1)** Consent of surety specifying the material type and the item(s) in which the material is to be used.
  - (2)** Validated invoices with the signature of an officer of the company supplying the material showing actual cost.
  - (3)** A notarized statement from the Contractor attesting that the invoices as submitted do not include charges or fees for placing, handling, erecting or any other charges or markups other than the actual material cost, sales tax(es), if applicable, and freight charges.
  - (4)** Bills of lading showing delivery of the material. The request for allowances for any materials stored on property outside the State of Maryland shall be accompanied by a release from the owner or tenant of such property agreeing to permit verification by the



## SPECIAL PROVISIONS

Inspector that the material is stored at the approved location, and to permit the removal of the materials from the property without cost to the State of Maryland.

- (5) Inspection test reports, certifications and/or a written statement from the Inspector attesting to the inspection and approval of the material.

Upon receipt of the above by the District Engineer and verification by the Inspector that the material is stored at the approved location, the District Engineer will authorize payment.

- (6) A statement explaining why the material can not be stored on the project, if the Contractor is requesting to store material at a location other than the project site. The statement shall include the methods of storage, separation, and identification to be used by the Contractor. The Contractor shall provide a method of inventory control and withdrawal satisfactory to the Administration which shall be used by the Contractor to monitor materials not stored on the project.

- (7) A breakdown of the Contract line item bid unit price showing the relationship of the cost of the stored material to the costs of all other materials, labor, and components of the work included in the Contract line item unit price bid by the Contractor.

Upon receipt of the above by the District Engineer and verification by the Inspector that the material is stored at the approved location, the District Engineer will authorize payment.

The Contractor shall pay the material provider the amount shown on the invoice within 10 calendar days of receipt of payment from the Administration. Evidence of payment shall be provided to the Administration. Failure to make invoice payments as specified will be cause to deduct the monies from future estimates and/or deny future stored materials payment requests.

Copies of all pertinent data shall be made by the Contractor and distributed to the Inspector for retention as part of the documented records for the project.

### TC-7.03 FORCE ACCOUNT WORK.

#### (e) Subcontracting.

35 **ADD:** The following to the end of the paragraph.

"or five hundred dollars (\$500) which ever sum is greater."

**DELETE:** TC-7.05 PROGRESS PAYMENTS Subsection (a) (3) Variable Retainage

**INSERT:** The following.

- (3) **VARIABLE RETAINAGE.** The Contract will be subject to a variable retainage based upon the Authority's performance evaluations of the Contractor.

Those qualifying may have retainage reduced upon request of the Contractor with consent of surety. This request must be processed through the Construction Manager. If at any



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time during the performance of the project, the evaluation of the Contractor changes, retainage reduction may be reconsidered.

Contractors with "A" evaluations for the last two years may be reduced from 5 percent to 2.0 percent upon request after 15 percent project completion. Project completion percentage will be based upon actual work completed (excluding monies paid for stored materials). An interim evaluation of the current project must be completed and must be an "A". Contractors with "A" evaluations for the last two years may petition to have all retainage at that point released upon completion of a significant milestone. Retainage will continue at 2.0 percent until the next milestone of completion of the contract.

Contractors with "B" evaluations or any combination of "A" and "B" evaluations for the last two years may be reduced from 5 percent to 2.5 percent at 50 percent project completion and remain at that level until released upon final payment. Project completion percentage will be based upon actual work completed (excluding monies paid for stored materials). An interim evaluation of the current project shall be completed and shall be an "A" or "B".

Contractors with "C" evaluations or any combination of "C" and "D" evaluations for the last two years will begin and remain at 5 percent for the life of the project. An interim evaluation of the current project shall be completed and shall be a "C" or better rating.

Contractors with a "D" evaluation for the last two years will begin at 5 percent. Project performance will be evaluated monthly. Should the contractor performance remain at the "D" level, to protect the State's interest 10% of the progress payment will be withheld until performance improves to a "C".

**New Bidders.** Contractors who have not been previously rated by the Authority may be eligible for a reduction in retainage. To be eligible, their past performance on highway and bridge work shall be documented by the government agency with whom they had a contract and their performance shall be documented on Authority forms.

All other Contractors who do not fit into the above criteria would require a 5 percent retainage throughout the life of the Contract.

<End of RFP Section 2>



SPECIAL PROVISIONS

### SECTION 3. PROPOSAL REQUIREMENTS

#### 3.1 Technical Proposal Requirements

- 3.1.1 Each Offeror is required to provide sufficient documentation within its Technical Proposal (Volume I) to completely demonstrate that the Offeror has (a) the financial resources; (b) management background and experience; (c) CCTV design and installation experience; (d) MPEG-2 design and installation experience; (e) technical competence; (f) proven experience in the design, construction, installation, integration, implementation, test, and management of CCTV systems; (g) proven business stability; and (h) any other factors that affirm the Offeror's ability to furnish and install CCTV and related equipment in a just-in-time manner, and to meet the Authority's requirements in this RFP. The information provided shall be sufficient in every way to demonstrate that the Offeror has the capability of performing the Contract, as described in this RFP and in conformance with all applicable laws and regulations.
- 3.1.2 Each Offeror shall submit an original and ten (10) hardcopies of its Volume I – Technical Proposal. The Technical Proposal shall be responsive to all requirements of this RFP. Failure to include in the Technical Proposal a response to each of the requirements of the RFP may result in the rejection of the Proposal by the Authority. The contents of the Technical Proposal package shall be divided into the following Sections:
- a. Letter of Transmittal (3 Pages)
  - b. Scope of Work Summary (5 Pages)
  - c. Qualifications of Offeror (15 Pages)
  - d. Work Plan (15 Pages)
  - e. Appendix for Product Information (Catalog Cuts, Manuals, no page count limit)
  - f. Contract Options (2 Pages)

The Technical Proposal shall be limited to forty (40) pages of size 8.5" x 11". Paper size of 11" x 17" is allowed for figures only and will be counted as two pages toward the 40-page limit. Each page that contains proposal text shall have one-inch margins on all sides. The font type shall be "Times New Roman" or "Arial" with a minimum font size of 10. The proposal text shall be in a ONE-COLUMN format. Each Offeror shall include an electronic copy of the technical proposal on CD-ROM. DO NOT INCLUDE THE PRICE PROPOSAL OR PRICE PROPOSAL DATA ON THE CD-ROM or within the Technical Proposal. Refer to Section 3.2 for the Price Proposal requirements.

#### 3.1.3 Letter of Transmittal

- a. A Letter of Transmittal on the Offeror's official letterhead, not to exceed three (3) typed pages in length, shall be included at the front of the Proposal (after the cover page). A duly authorized representative of the Offeror shall sign the letter of transmittal in ink.
- b. The letter should include a brief introduction of the proposed project team. The letter shall provide the name, title, address, phone number and facsimile number of the person designated by the Offeror to serve as the contact during the selection process.
- c. A statement shall be provided to indicate that the Offeror (a) fully comprehends the nature of the tasks involved in the Scope of Work; and (b) accepts full responsibility for the completion of all of the work required within the proposed schedule if it is selected for the contract award.



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- d. A statement shall be provided certifying that Proposal Security meeting the requirements of Section 1, Paragraph I (Bond Requirements) of this RFP has been included in the Price Proposal package.
- 3.1.4 Scope of Work Summary – The Offeror shall set forth his understanding of what work is to be accomplished. Specific reference must be made to the project requirements, the Specifications applicable to the Project, Addenda to the RFP and all other required criteria. The General System Requirements should be summarized sufficiently to demonstrate the Offeror's understanding of the services and products expected. However, a recopying of the project requirements, as described in this RFP, is neither necessary nor desirable. Special requirements of the project should be discussed and any unique circumstances should be presented. This Section shall be no longer than five (5) pages in length.
- 3.1.5 Qualifications of Offeror
- a. General Corporate Description – The Offeror shall provide a general description of the corporate organization, the management structure, and the capabilities of the Offeror itself and/or of each of any joint venture participants, and of all major subcontractors. This shall include, for each firm, an overview of the organization, its history, general business purpose, parent company (if appropriate), major divisions or subsidiaries, locations of offices, number of employees, etc. This Section shall be no longer than two (2) pages in length.
- b. Personnel – The Offeror shall provide a description of its personnel. This Section shall be no longer than five (5) pages in length – of which four (4) pages are resumes – and meets the following requirements:
- i) The Offeror shall identify each firm and the key persons that will be involved in and committed to furnishing, installing, integrating, testing, commissioning, maintaining, and warranting the CCTV System to be provided under this Contract. Personnel shall be described according to their position, education, experience, the role they will play, and the percentage of their time that will be devoted to this Contract. The Offeror shall also identify its proposed Project Manager.
  - ii) Resumes of Key Personnel (i.e., those who are anticipated to be most responsible for performing work on the project) shall contain sufficient information to permit the Authority to evaluate each person's ability to contribute to the overall effort. Resumes shall show directly related experience and general experience of the Key Personnel. All Key Personnel should be identified on a proposed organization chart as described later in the requirements for the Work Plan. Any changes in the indicated Key Personnel shall be subject to the written approval of the MdTA.
  - iii) The Offeror shall submit resumes for four (4) Key Personnel who are proposed for performing significant productive time on the Project. Each resume shall not exceed one (1) page in length. The Consultant must document in writing that the proposed Key Personnel meet the following requirements:
    - One (1) of the proposed Key Personnel shall be the **Project Manager** experienced in the management of CCTV and MPEG-2 video systems. This individual must remain on the project assignment until its conclusion.



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- One (1) of the proposed Key Personnel shall be the **Technical Lead** for the project. This individual must be a CCTV and MPEG-2 hardware and software expert experienced in the design, procurement, installation, configuration, integration, and test of MPEG-2 CCTV camera system – from the camera site back to central. This individual shall possess a thorough understanding of the theory of operations for CCTV and MPEG-2 video systems and be familiar with MdTA's existing system.
  - Two (2) of the proposed Key Personnel shall be **Field Technicians**. These individuals shall be experts in field installation, field integration and field test of CCTV and MPEG-2 video systems, including the necessary skills to install hardware in equipment racks, run and connect cables, trouble shoot, and integrate the CCTV and MPEG-2 equipment with existing systems. These individuals shall have excellent working knowledge of SMFO, coax, and serial field communication systems and Ethernet-based local area networks.
- c. Project Experience and Ability – The MdTA requires firms that have proven experience in applying credible system integration processes. In their Proposals, Offerors shall describe their approach for integrating CCTV systems into MdTA's existing operation.

The Offeror shall furnish documentation of its own, and its major subcontractors' experience related to the planning, design, construction, installation, integration, and implementation of the CCTV system. The experience statement shall include the Offeror's past experience and present contracts, and provide details on CCTV and MPEG-2 hardware and software utilized, customer satisfaction, and any other appropriate information related to the development, implementation and operation of those systems. The descriptions should indicate any significant similarities and differences between Offeror's systems and the system and services described in this RFP. Information must be provided as to whether the contracts were completed on time and within budget or, if the contracts are ongoing, whether the contracts are on schedule and within budget. The Offeror shall also furnish the name, title, address and phone number of persons who may be contacted by the Authority for verification of the information provided. Information for up to four (4) projects shall be included. Relevant projects shall all be related to CCTV systems for ITS applications; and such systems are installed and have been operational for at least 60 days. At least one of the relevant projects shall be a MPEG-1, MPEG-2 or MPEG-4 based CCTV system. This Section shall be no longer than five (5) pages in length.

- d. Financial Capability – The Offeror, and any subcontractors performing more than \$100,000 of work on this project, shall provide evidence of the firm's financial condition, sufficient in detail to demonstrate its ability to perform all the proposed services. The submission must include audited financial statements, including all schedules, notes, and the opinion of the independent accounting firm for the three most recently completed fiscal years. The statements must represent the entity submitting the proposal, which will be responsible for the performance of all services, not a subsidiary or parent company of the Offeror. The Offeror and subcontractors shall include evidence of their ability to provide the required bonding and insurance. Offerors and subcontractors may provide interim financial information, with a statement attesting to the accuracy of the information signed by the Chief Financial Officer of the firm if such interim information is necessary to provide all of the information required by the Authority. This Section shall be no longer than two (2) pages in length, excluding any audited financial statements.



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- e. Identification of Proposed Subcontractors – The Offeror shall provide a description of their subcontractors. This Section shall be no longer than one (1) page in length and meet the following requirements.
  - i) The Offeror shall identify any subcontractors that will perform more than \$100,000 of work on this project. Such subcontractors may include engineers, construction firms, consultants, equipment suppliers, computer systems suppliers or any other firms who will play a significant role in the project. The information furnished shall include a description of the work to be performed by each subcontractor, and the percentage of the total effort that the work represents. Substituting subcontractors that will perform more than \$100,000 of work on this project shall require the written consent of the Authority.
  - ii) The Offeror shall also provide identification of all Minority Business Enterprises (MBEs) which will be participating in the contract, including an identification of the portion of the work that each MBE firm will perform, and the percentage of the Contract the MBE work represents.

3.1.6 Work Plan. This Section shall be no longer than fifteen (15) pages in length. The Offerors are cautioned that clarity and succinctness are desired and valuable.

- a. General Description – The Offeror shall provide an introductory overview description of the approach that will be used to furnish, install, integrate, test, commission, maintain and warrant Closed Circuit Television cameras and related equipment.
- b. Organizational Chart – The Offeror shall include an organization chart for the project showing the Project Manager and Key Personnel, the proposed support personnel, the firm they work for, and their project responsibilities. The chart should be accompanied with explanatory text on the particular advantages of the structure chosen.
- c. Management and Work Plan – The Offeror shall provide a proposed management and work plan, including, but not limited to, (1) details for overall and day-to-day project management; management controls and procedures for all phases of the project; (2) staffing progress reporting, budget tracking, etc.; (3) an overview of the various work tasks and how they are to be accomplished; and (4) a description of the tasks that will be subcontracted, and to whom they will be subcontracted.
- d. Accomplishment of System Requirements – Recognizing that this is a Deployment Contract, the Offeror shall be specific in their proposed design. During the MdTA's evaluation of Proposals, more definitive and assertive descriptions will have an advantage. Offerors shall clearly explain the CCTV and MPEG-2 models recommended, as well as how their approach mitigates integration risks, such as compatibility with existing central systems. The Offeror must clearly explain how their proposed integration approach ensures compatibility with the existing CCTV system (which is described in more detail in Section 6 of this RFP). Offerors showing an approach with the least technical will receive higher technical scores by the evaluation committee. The Offeror shall also address the following in this Section:
  - i) The Offeror shall provide a description of the how the proposed cameras and MPEG-2 equipment will be compatible with and interface to the existing CCTV system. This description shall include a description of the physical communication interfaces (cable types, connections), and communication protocols to control and obtain status from the Cameras and MPEG-2 codecs. The Offeror shall include any drawings, system



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architecture block diagrams, sketches, charts, graphs, and written narrative required to illustrate the proposed system design, development, implementation and operation, and to support the logic and methodology used to arrive at the proposed design. The Offeror shall show how it is going to work and why the Offeror's system is better than those of its competitors. This section shall also include a description of the Offeror's proposed system architecture and technical solution, including hardware specifications that are fully responsive to the requirements of the CCTV System.

- ii) The Offeror shall address each technical requirement of the system. Provide complete information that will allow the Selection and Evaluation Committee to determine that the project intent, goals and all requirements will be achieved. The Offeror shall provide information on how the requirements for this project will be satisfied.
- iii) The Offeror shall provide a complete, clear, comprehensive itemized list, with descriptions, of all proposed equipment, hardware, and software necessary to satisfy the project's requirements and the Offeror's proposed design. Since the quantities for this project are indefinite, the Offeror shall propose the equipment that is required for a 10-camera CCTV installation. The Offeror shall describe what software is custom (if any), what is COTS, and what is third party. Detailed product information (e.g., specifications, catalog cut sheets, etc.) that would assist in the review and evaluation of the Offeror's Proposal shall be provided in the Appendix of the Proposal. Each item shall have information on the manufacturer, model number, physical and functional characteristics, power requirements, and warranty information. A separate itemized list shall be provided for all spare parts.
- iv) The Offeror shall describe how it will integrate the CCTV System into MdTA's existing operation with minimal downtime to the existing video traffic monitoring network. The Offeror shall identify risks and plan to mitigate those risks and problems that might arise.
- v) The Offeror shall describe its proposed plan for Quality Assurance, Quality Control, Project Control, System Reliability, and the proposed Testing Programs. The Offeror shall address the reliability of its proposed design toward the goal of being able to integrate seamlessly with the existing CCTV System. The Offeror shall describe its past reliability experience and provide contact information for verification.
- vi) The Offeror shall provide a preliminary Project Schedule that shows the milestones for a CCTV camera installation for 10 sites. The proposed schedule shall be one that the Offeror believes to be realistic and attainable. The Offeror shall develop this preliminary project schedule using the Critical Path Method (CPM). The schedule shall include delivery dates for all deliverables as well as scheduled meetings and reviews. The schedule shall include anticipated involvement of Authority personnel or representatives where the Authority's input impacts the schedule, for example, the required schedule for the Authority's approval or delivery of documentation. The preliminary schedule shall include any specific schedule milestone requirements identified in this RFP. The Offeror shall demonstrate how its proposed schedule is streamlined to meet the time constraints and dependencies that may be imposed by other Construction Contractors.
- vii) The Offeror shall provide a description of their proposed approach to each of the following: (a) Software Maintenance program that indicates how upgrades are handled



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for each COTS software product; (b) Warranty Program for each piece of hardware and software; and (c) preventive and corrective maintenance plan (PCMP) for CCTV cameras and related equipment for the MdTA.

viii) The Offeror shall include with the Proposal its Software Licensing Requirements, which will be compared by MdTA against the RFP. This may be provided as an Appendix.

3.1.7 Appendix for Product Information – The purpose of the product information is to assist the MdTA in the review of the Proposal and evaluation of the proposed CCTV camera and related equipment. Product information shall be provided in an Appendix and limited to specifications or catalog cuts for each piece of hardware and software required in the Offeror's proposed design. Other items such as hardware manuals, user's manuals, administrator's manuals are not necessary but can be supplied if desired on a separate CD-ROM. The information in this Appendix does not count against the page limit of the proposal. However, extraneous advertising information that is not helpful in understanding the Proposal is prohibited in this Section. Furthermore, the Offeror should understand that this Section is for COTS product manuals only, and is NOT INTENDED as an overflow section for any material that is called for in the body of the Technical Proposal.

3.1.8 Contract Options – Each Offeror may submit with its Technical Proposal any proposed enhancements or improvements that may be of interest to the Authority. The Offeror must note that the proposed base system must meet all the functional requirements as specified in this RFP and the price must reflect only the base system. The Offeror must include price information for the proposed options, BUT ONLY IN THE PRICE PROPOSAL. The Offeror must clearly differentiate what will be included in the base system and what will be included in any option package. To avoid confusion, the proposed or recommended options must be addressed in a separate section, distinct from the main Proposal. Failure to clearly differentiate between base and options may result in disqualification of a Proposal from consideration for award. This Section shall be no more than two (2) pages in length. *Note: Product Catalog cuts can be included in the Appendix for Product Information, and do not count against the 2 page limit.* If the Offeror chooses not to propose any option, this section of the proposal should be marked as "No Options Proposed" on each page and should not contain any other information. The Offeror should describe the proposed options in the technical proposal in accordance with Sections 3.1.2, 3.1.7 above, and also supply the pricing in the 900x series bid items (for MdTA proposed options) or 1000x series bid items (for Contractor proposed options) of the Cost Proposal.

3.1.9 NO PRICE INFORMATION SHALL BE INCLUDED IN THE TECHNICAL PROPOSAL. INCLUSION OF ANY PRICE INFORMATION IN THE TECHNICAL PROPOSAL MAY RESULT IN DISQUALIFICATION OF A PROPOSAL FROM CONSIDERATION FOR AWARD.

3.1.10 Any other information, data, or documentation that is requested, indicated or implied in the requirements of this RFP, including all required affidavits, shall be provided here.

### 3.2 Price Proposal

The Offeror should understand the following when completing their proposal for this project:

3.2.1 Each Offeror shall submit a completed Volume II – Price Proposal Requirements. The Authority reserves the right to reject in whole or in part offers containing unbalanced or unreasonable Price Proposals for any item(s). The completed Schedule of Prices (SOP) shall be completed, signed, and enclosed with the sealed cost proposal.



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- 3.2.2 The Offeror/Contractor shall adhere to the **Wage Rate Schedule** for Construction Labor provided in Volume II – Price Proposal Requirements.
- 3.2.3 Offeror's shall NOT include additional information in the price proposals. Price proposals shall consist ONLY of the completed forms and schedule of prices. Any and all additional information that the Contractor desires to supply SHALL BE IN THE TECHNICAL PROPOSAL. Inclusion of ANY extraneous, supplemental, or conditional information, or assumptions, exclusions, or exceptions may result in rejection of the proposal.
- 3.2.4 Each Offeror shall enclose with its Price Proposal the required Bid/Proposal Security in the amount stipulated in this RFP.
- 3.2.5 Each Offeror must include as part of its price proposal the total number of labor hours by labor category bid for this job. Hours must be broken down by Prime Contractor versus subcontractor.
- 3.2.5 This contract time shall commence from the date of Notice to Proceed with up to two (2) one-year renewal option periods. If the option for renewal is exercised by the MdTA, successful bidder shall agree to all terms and conditions of this Bid and all subsequent amendments. Renewal options are at the sole discretion of the MdTA. The Contractor shall be required to provide payment and performance bonds equal to the total amount of the contract for the renewal periods at the time those option years are executed.
- 3.2.6 If the option for renewal is exercised by MdTA, the Contractor shall agree that the prices for the renewal period shall not exceed the maximum percent of increase for the applicable renewal period stated.
- Maximum Increase:
- 1st Renewal Period: original price +4.0%  
2nd Renewal Period: 1'st renewal period prices +1.5%
- 3.2.7 This contract is for an indefinite quantity and no adjustments to unit prices will be made for variances from the estimated proposal quantities. It is understood that the quantities shown are estimated and that the MdTA does not guarantee to purchase those quantities, but they may be increased or decreased during the contract period. The Contractor will be paid at the established bid unit price, even if the actual quantity exceeds the estimated proposal quantity.
- 3.2.8 The contract price will remain firm for the entire contract period for any quantity purchased for three (3) years. If the two (2) one (1) year extensions are executed by the MdTA, the maximum increase in contract price shall be as specified in Section 3.2.
- 3.2.9 The Offeror may propose cost saving options to improve their overall proposal. This will require the Offeror to describe the proposed options in the technical proposal in accordance with Sections 3.1.2, 3.1.7, and 3.1.8, and also supply pricing in the 900x series bid items (for MdTA proposed options) or 1000x series bid items (for Contractor proposed options) of the Cost Proposal.
- 3.2.10 There are separate bid items for each major equipment component, and separate bid items for the installation costs for each major equipment component. It should also be understood that there is a separate bid item for installing a complete Camera site (network or fiber). All



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installation costs associated with equipment at a site (e.g., camera, dome, cabinet equipment/wiring, transceivers, network gear, encoders, etc.), exclusive of hub site equipment (e.g., decoders, VDAs, VFRs), should be captured in that bid item. In most cases, the MdTA anticipates using this bid item to cover all installation costs. However, in certain situations MdTA may elect to use the bid items for installing a particular piece of equipment, in cases where only portions of work are required.

- 3.2.11 The MdTA will specify the type of installation required at each camera site. The installation may be a network-based camera or a fiber-based camera. Reference Section 6 for more information.

<End of RFP Section 3>



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### SECTION 4. EVALUATION AND SELECTION PROCEDURES

#### 4.1 Evaluation and Selection Committee

All Proposals received by the submission deadline will be reviewed and evaluated by an Evaluation Committee (Committee) appointed by the Executive Secretary of the MdTA or a named designee. The Committee may seek the advice of others in reviewing the Proposals received, including but not limited to consultants and other advisors. However, the Evaluation Committee will be solely responsible for evaluating the Proposals received and for rendering a final recommendation to the Maryland Transportation Authority.

#### 4.2 RFP Compliance Review

The Procurement Officer will initially review each proposal for compliance with the instructions contained in this Request For Proposals (RFP) and with any other procedures required in conducting this procurement. Failure to comply with any requirement may disqualify an Offeror's Proposal from consideration by the Committee. Each Offeror must assume full responsibility for meeting the requirements of the procurement.

#### 4.3 Technical Evaluation

4.3.1 After the Procurement Officer selects the proposals that meet the submission requirements described in this RFP, the Committee will conduct an evaluation of the technical merit of each proposal. This evaluation will be made on the basis of the evaluation criteria set forth in Section 4.7 below. This step of the overall proposal evaluation may include verification of credentials and stated experience. By submitting a proposal, the Offeror authorizes the MdTA to inquire about the Offeror's stated credentials and experience as the situation warrants.

4.3.2 At the conclusion of Step 1 (as described in Paragraph 4.3.1 above), the Evaluation Committee will determine which proposals are not reasonably susceptible of receiving the award, and will exclude them from further consideration in the evaluation process.

4.3.3 As part of the Technical Evaluation, the Committee may require those Offerors whose proposals merit further consideration (referred hereto as *qualifying Offerors* and *qualifying Proposals*, respectively) to appear before the Committee to make oral presentations, answer questions, provide clarification to their proposals, **and/or demonstrate/test their proposed products** for this Contract. The individual identified as the Project Manager in the Offeror's proposal will be expected to play the primary role in the Offeror's interview and presentation. These Offerors will be asked to elaborate on their proposed approach and products.

4.3.4 The Evaluation Committee will also check the references provided by the Offerors at this time. The purpose of the reference checks will be to determine the level of satisfaction and quality of service that the Offeror has provided to its present and/or past clients. The areas to be verified with the Offeror's client(s) will include general system performance, technical integration, compliance with implementation plans and budgets, general responsiveness, customer satisfaction, and contract compliance – including, but not limited to, adherence to project schedules and technical competency.



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### **4.4 Cost Evaluation**

Separately, and after the completion of the Technical Evaluation, the Procurement Officer will unseal the Cost Proposal of each qualifying Offeror. The Committee shall then perform a thorough evaluation and tabulation of the cost information contained in each Offeror's Cost Proposal. The prices of the Base Contract offers will be evaluated. At the Authority's discretion, the Authority may ask the Offerors to clarify items in the Base Contract. The Authority may direct an Offeror to submit a Best-and-Final Offer for the Base Contract and those options requested by the Authority. If the Offeror fails to provide any requested information, the Offeror's Technical and Cost Proposals will be eliminated from further consideration for contract award. The ranking of proposals will be made on the basis of the Base Contract offer, or a combination of the Base Contract offer and those options (if applicable) that are most advantageous to the State.

### **4.5 Combined Evaluation**

The Committee will then rank the qualifying Offerors based on the combination of their Technical and Cost Proposals. In determining the final ranking of proposals, technical merit will be given more weight than the proposed cost.

### **4.6 Recommendation For Award**

Following the completion of the proposal evaluation process and discussions or negotiations with the Offerors, if any, the Committee will make a recommendation to the Maryland Transportation Authority for award of the Contract to the qualifying Offeror whose proposal is determined to be the most advantageous to the State. Award of a Contract, if any, is subject to the approval of the Maryland Transportation Authority upon the recommendation of the Procurement Officer, and to such other approvals as may be required by State law, including the Maryland Board of Public Works.

### **4.7 Evaluation Criteria – Technical Proposal and Product Demonstration**

The Committee will use the following criteria to evaluate each qualifying Technical Proposal. The criteria shown in Item 1 below are the most important; those in Items 2 through 3 are less important, and are approximately equal to each other in value.

1. The Committee's opinion on the ability of the proposed CCTV camera and related equipment to satisfy the design objectives and the requirements specified in this RFP with the least amount of technical risk. The manufacturer's warranty and any information that demonstrates proven reliability will be considered. The Offeror must also be clear in how the proposed design would ensure compatibility with the existing system. Of particular importance is a clear description of how the Offeror will achieve compatibility with the CHART and Vicon camera protocols, and also how the existing system's Impath MPEG-2 video can be decoded with the Offeror's proposed MPEG-2 equipment.
2. The Qualifications of the Offeror to perform the work required under the Contract, including the following factors:
  - a. The overall management background, experience and the technical competence of the firm to furnish, install, integrate, test, commission, maintain and warrant the Closed Circuit Television cameras and related equipment required by this RFP.



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- b. The qualifications of the principal persons who will be involved in the furnishing, installing, integrating, testing, commissioning, maintaining, and warranting the Closed Circuit Television cameras and related equipment required by this RFP.
  - c. The direct experience of the Offeror's Project Manager in the successful furnishing, installing, integrating, testing, commissioning, maintaining, and warranting the Closed Circuit Television cameras and related equipment required by this RFP.
  - d. The financial capacity and capability of the Offeror to perform all the work required under this Contract, and the ability to provide the required bonding, insurance and indemnification to the State.
  - e. The Offeror's proposed approach to meet the Just-In-Time (JIT) delivery process called for in Section 1 of this proposal.
  - f. The demonstrated ability of the firm and its subcontractors to complete all of the required work in full compliance with the requirements of the RFP and within the proposed schedule offered in the proposal.
  - g. How the Offeror intends to meet the MBE Requirements.
3. The overall quality of the Offeror's proposal for the project, including, but not limited to:
- a. The Offeror's comprehension of the Authority's requirements
  - b. The completeness, depth and clarity of the information provided
  - c. The Offeror's approach to the various aspects of project, including storage, installation and integration of the system, as well as providing just-in-time installation to support various external Construction Contractor's schedules
  - d. The Offeror's solutions to MdTA's desire for compatible MPEG-2 codecs, including web browser plug-ins
  - e. The Offeror's solutions to proposed optional features (e.g., the dual MPEG-2/H.264 codec, the MPEG-2/H.264 decoding software; the dual MPEG-2/MPEG-4 codec and MPEG-2/MPEG-4 decoding software)
  - f. The Offeror's commitment to delivery of the project in accordance with the requirements of the RFP
  - g. A brief description of the Offeror's or Manufacturer's testing (either internal or independent) to ensure compliance with MPEG-2, MPEG-4, H.264, and NTCIP standards identified in Section 6

The evaluation of the Offeror's Technical Proposal may also be affected by the Offeror's oral presentation and response to the questions of the Evaluation Committee. In addition, part of the oral presentation may also include a request to demonstrate the proposed products/solution to address certain key project risks – e.g., how the CHART and Vicon protocols will be addressed, how the existing system's MPEG-2 video can be decoded, solutions to MdTA's desire for a dual MPEG-2/H.264 (or MPEG-2/MPEG-4) codecs, and how MPEG-2 decoding software, including plug-ins are supported. However, oral presentations may not necessarily be required by the Committee in order to make its determination and recommendation.



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**SECTION 5. TECHNICAL DEMONSTRATION**

**5.1 Offeror Qualification**

If an Offeror is deemed to be qualified, but a determination can't be easily made that the Offeror's proposed equipment is compatible with existing equipment, the Offeror may be invited to demonstrate their products to the Maryland Transportation Authority in a 4-week field demonstration and evaluation. MdTA will require the vendor to provide the test equipment (at least one of each type) for the 4-week demonstration, and, at MdTA's request, leave the equipment for additional testing for up to 30 days thereafter. Any equipment, labor, and travel required to support these tests shall be at the expense of the Offeror.

**5.2 Description of Tests**

The invited Offeror shall participate in the 4-week "live" test and demonstration of the proposed system. The tests will be conducted at the MdTA's tunnel facilities. The tests described below will be conducted.

**5.2.1 MPEG-2 Codec Tests**

**Test #1 Objective:** Prove that the Offeror can supply a working MPEG-2 encoder/decoder pair, with SNMP control.

**Test #1 Configuration:** Figure 5-1 illustrates this configuration.

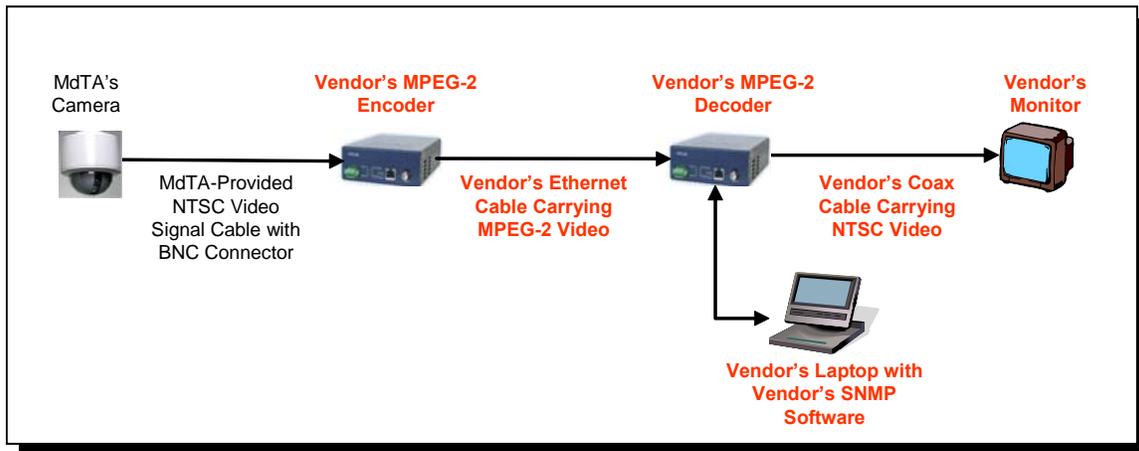


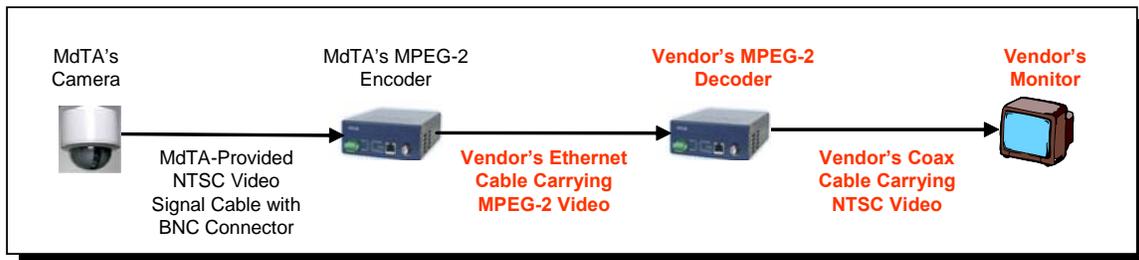
Figure 5-1. Test #1 Configuration – MPEG-2 Encoder/Decoder with SNMP Control



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**Test #2 Objective:** Prove that the Offeror can supply a working MPEG-2 hardware decoder that can decode MdTA's existing Impath MPEG-2 encoded video.

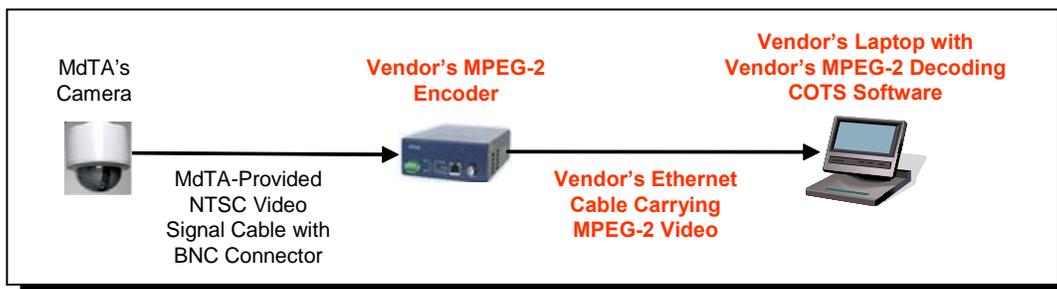
**Test #2 Configuration:** Figure 5-2 illustrates this configuration.



**Figure 5-2. Test #2 Configuration – MPEG-2 Decoder Hardware**

**Test #3 Objective:** Prove that the Offeror can supply a working MPEG-2 software decoder (using a COTS software package) that can decode the Vendor's MPEG-2 encoded video.

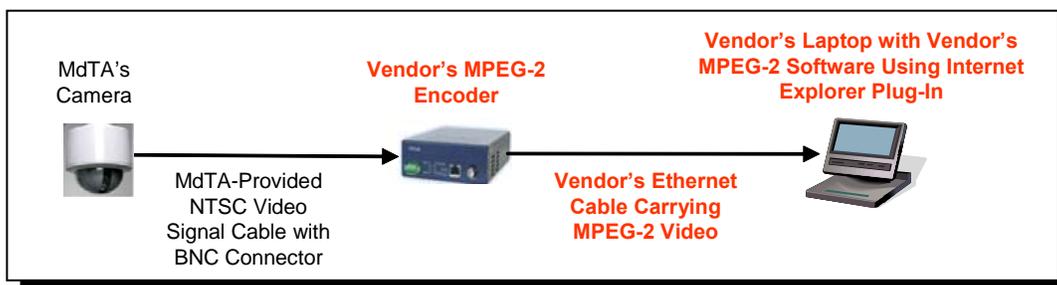
**Test #3 Configuration:** Figure 5-3 illustrates this configuration.



**Figure 5-3. Test #3 Configuration – MPEG-2 Encoder Hardware & Decoding COTS Software**

**Test #4 Objective:** Prove that the Offeror can supply a working MPEG-2 software decoder (using a plug-in to Internet Explorer) that can decode the Vendor's MPEG-2 encoded video.

**Test #4 Configuration:** Figure 5-4 illustrates this configuration.



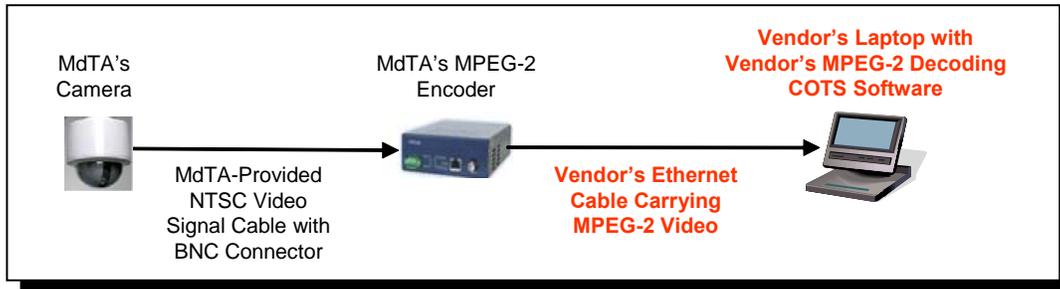
**Figure 5-4. Test #4 Configuration – MPEG-2 Encoder HW & Decoding SW using IE Plug-In**



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**Test #5 Objective:** Prove that the Offeror can supply a working MPEG-2 software decoder (using a COTS software package) that can decode MdTA's existing Impath MPEG-2 encoded video.

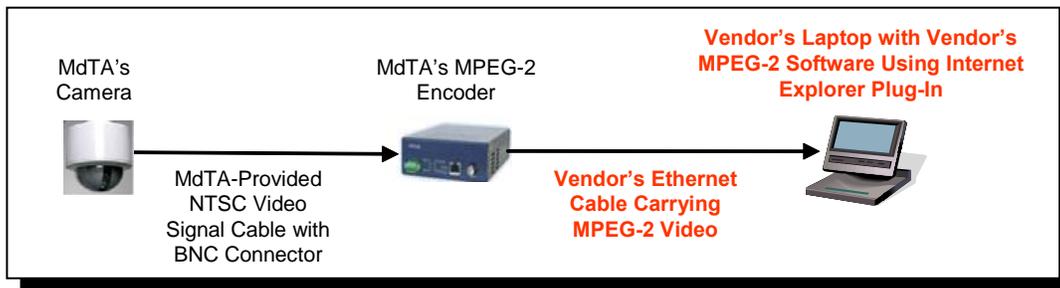
**Test #5 Configuration:** Figure 5-5 illustrates this configuration.



**Figure 5-5. Test #5 Configuration – MPEG-2 Decoding COTS Software**

**Test #6 Objective:** prove that the Offeror can supply a working MPEG-2 software decoder (using a plug-in to Internet Explorer) that can decode MdTA's existing Impath MPEG-2 encoded video.

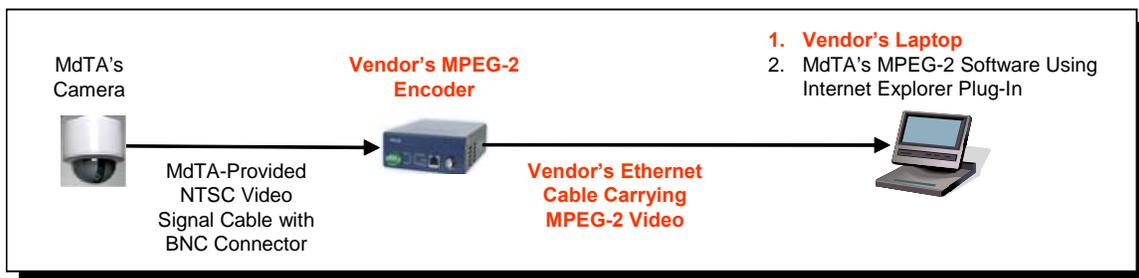
**Test #6 Configuration:** Figure 5-6 illustrates this configuration.



**Figure 5-6. Test #6 Configuration – MPEG-2 Decoder Software using IE Plug-In**

**Test #7 Objective:** prove that the Offeror's MPEG-2 encoder can be decoded using MdTA's existing MPEG-2 software decoder plug-in for Internet Explorer.

**Test #7 Configuration:** Figure 5-7 illustrates this configuration.





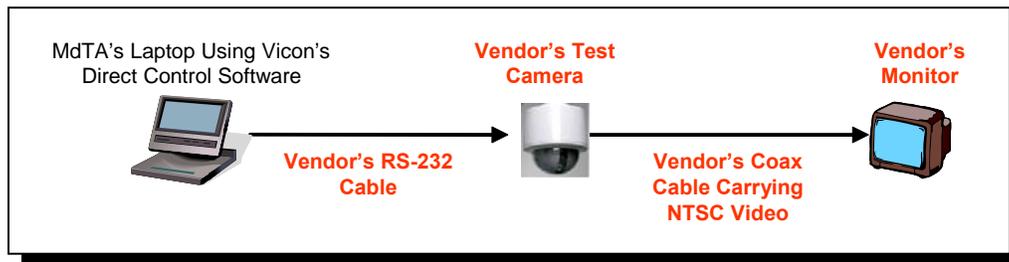
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**Figure 5-7. Test #7 Configuration – MPEG-2 Encoder HW with MdTA’s Decoder SW using IE Plug-In**

**5.2.2 Camera Tests**

**Test #8 Objective:** Prove that the Offeror’s camera can be controlled by the existing system’s Vicon software. Any necessary RS-232 or RS-422 converters shall be supplied by the Offeror.

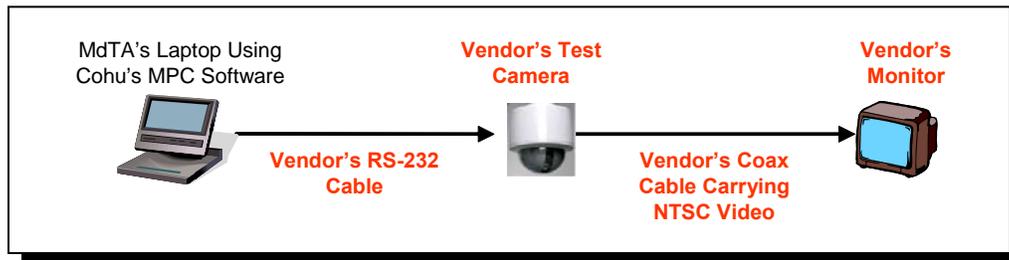
**Test #8 Configuration:** Figure 5-8 illustrates this configuration.



**Figure 5-8. Test #8 Configuration– Camera with Vicon’s Software**

**Test #9 Objective:** Prove that the Offeror’s camera can be controlled by the existing system’s Cohu software.

**Test #9 Configuration:** Figure 5-9 illustrates this configuration.



**Figure 5-9. Test #9 Configuration – Camera with Cohu’s Software**

**Test #10 Objective:** prove that the Offeror’s camera can be controlled using the NTCIP CCTV exerciser program (based on NTCIP 1205 specified in Section 6).

**Test #10 Configuration:** Figure 5-10 illustrates this configuration.



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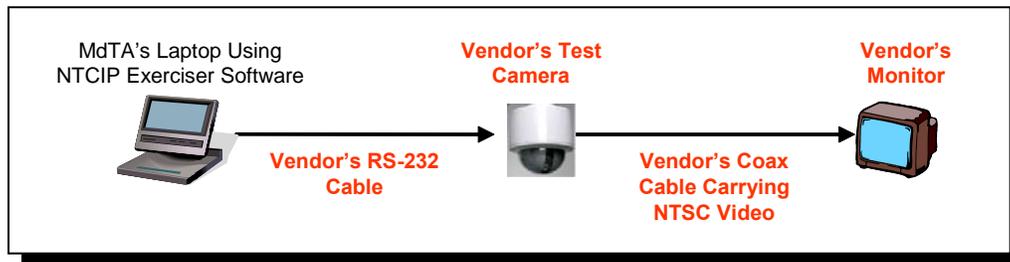


Figure 5-10. Test #10 Configuration – Camera with NTCIP Exerciser Software

**5.2.3 Optional Tests**

The tests in this section are optional. The Offeror can propose these tests if the equipment and functionality is available. These optional tests will be considered during the evaluation of the overall proposed technical solution in accordance with the evaluation criteria described earlier in Section 4.

**5.2.3.1 MPEG-2/H.264 Codec Tests**

These tests are to determine if the Offer can provide an integrated MPEG-2/H.264 codec. The H.264 capability must be compliant with the ISO MPEG-4 14496-Part 10, Advanced Video Coding (AVC) standard.

**Test #11 Objective:** Prove that the Offeror can supply a working H.264 encoder/decoder, with SNMP control.

**Test #11 Configuration:** Figure 5-11 illustrates this configuration.

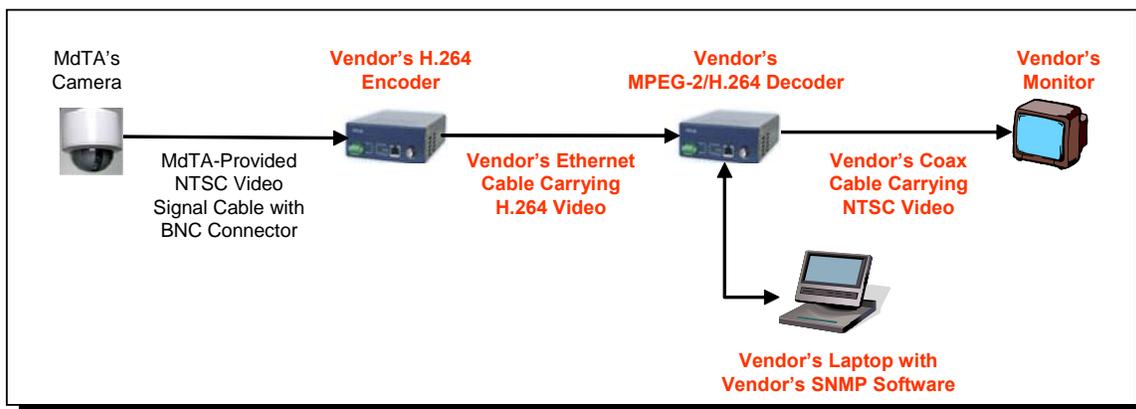


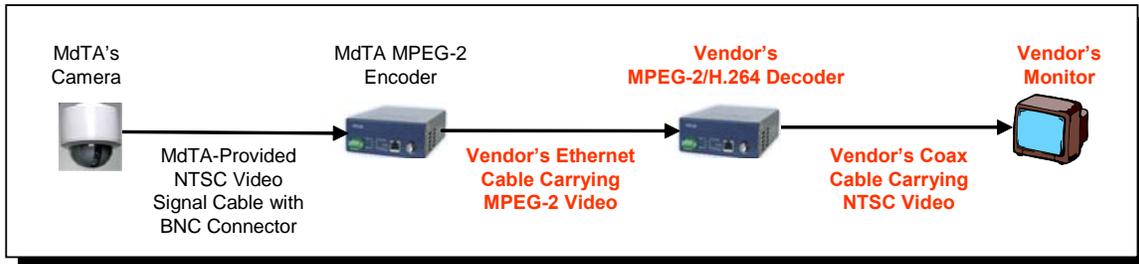
Figure 5-11. Test #11 Configuration – H.264 Encoder & MPEG-2/H.264 Decoder with SNMP Control

**Test #12 Objective:** prove that the Offeror can supply a working MPEG-2/H.264 decoder capable of auto-sensing and decoding MdTA's existing Impath MPEG-2 encoded video.

**Test #12 Configuration:** Figure 5-12 illustrates this configuration.



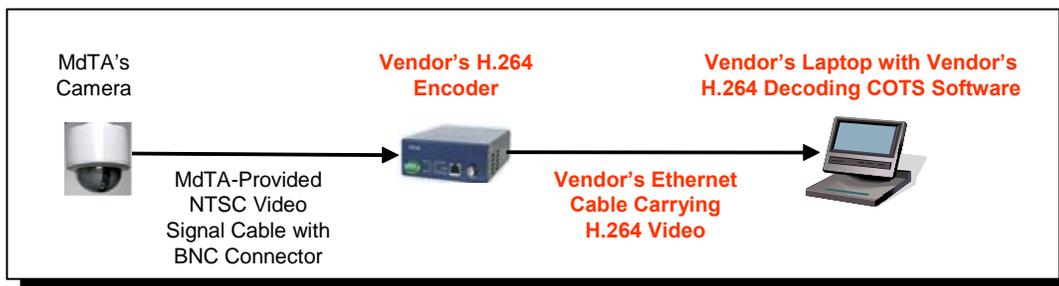
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**Figure 5-12. Test #12 Configuration – MPEG-2/H.264 Decoder with MdTA's MPEG-2 Encoder**

**Test #13 Objective:** prove that the Offeror can supply a working H.264 software decoder (using a COTS software package) that can decode the Vendor's H.264 encoded video.

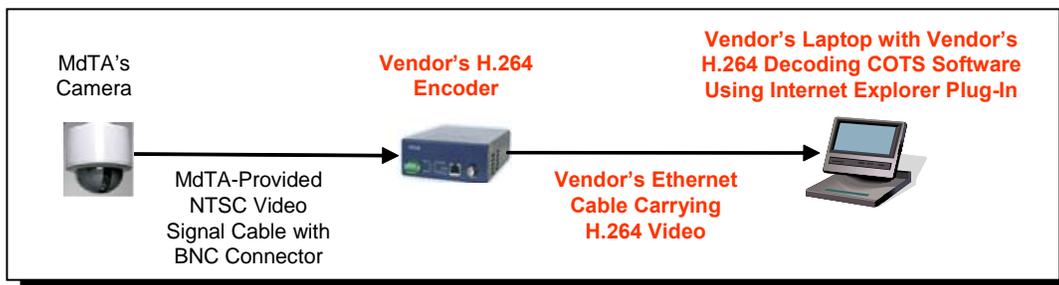
**Test #13 Configuration:** Figure 5-13 illustrates this configuration.



**Figure 5-13. Test #13 Configuration – H.264 Encoder & H.264 Decoding COTS Software**

**Test #14 Objective:** Prove that the Offeror can supply a working H.264 software decoder (using a plug-in to Internet Explorer) that can decode the Vendor's H.264 encoded video.

**Test #14 Configuration:** Figure 5-14 illustrates this configuration.



**Figure 5-14. Test #14 Configuration – H.264 Encoder & H.264 Decoding COTS SW Using IE Plug-In**

**5.2.3.2 MPEG-4 Tests**

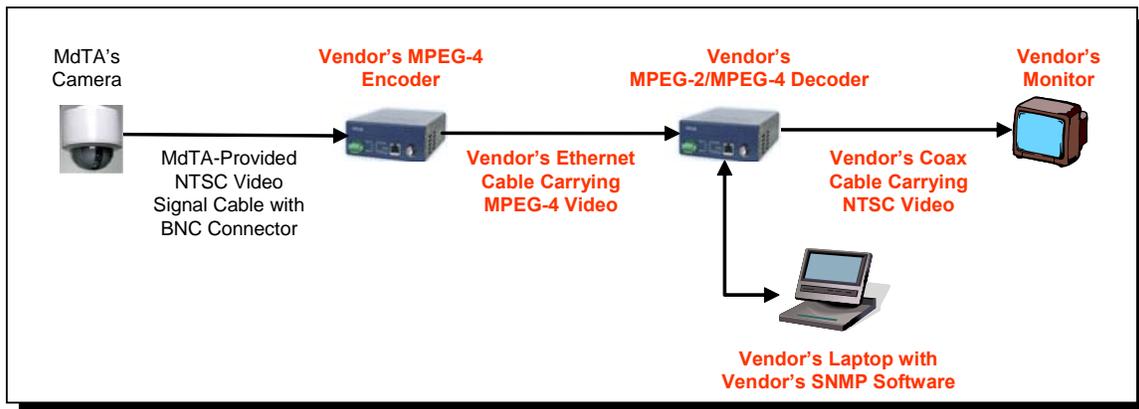


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These tests are to determine if the Offeror can provide an integrated MPEG-2/MPEG-4 codec. The MPEG-4 capability must be compliant with the ISO MPEG-4 14496-Part 2, Simple Profile (SP) at Level 3 standard.

**Test #15 Objective:** Prove that the Offeror can supply a working MPEG-4 encoder/decoder, with SNMP control.

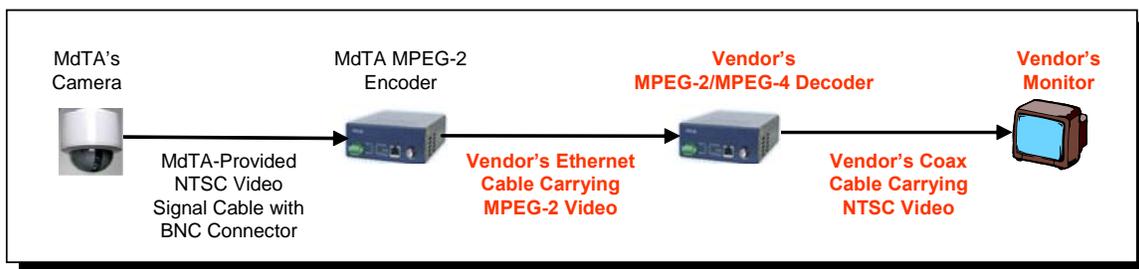
**Test #15 Configuration:** Figure 5-15 illustrates this configuration.



**Figure 5-15. Test #15 Configuration – MPEG-4 Encoder and MPEG-2/MPEG-4 Decoder with SNMP Control**

**Test #16 Objective:** Prove that the Offeror can supply a working MPEG-2/MPEG-4 decoder capable of auto-sensing and decoding MdTA's existing Impath MPEG-2 encoded video.

**Test #16 Configuration:** Figure 5-16 illustrates this configuration.



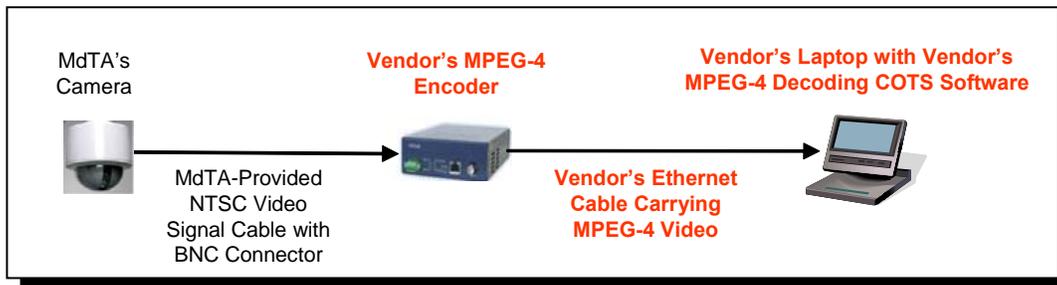
**Figure 5-16. Test #16 Configuration – MPEG-2/MPEG-4 Decoder with MdTA's MPEG-2 Encoder**

**Test #17 Objective:** prove that the Offeror can supply a working MPEG-4 software decoder (using a COTS software package) that can decode the Vendor's MPEG-4 encoded video.

**Test #17 Configuration:** Figure 5-17 illustrates this configuration.



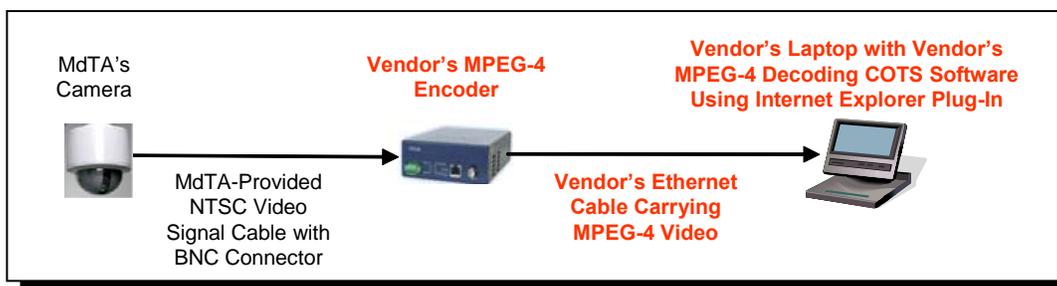
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**Figure 5-17. Test #17 Configuration – MPEG-4 Encoder and MPEG-4 Decoding COTS Software**

**Test #18 Objective:** prove that the Offeror can supply a working MPEG-4 software decoder (using a plug-in to Internet Explorer) that can decode the Vendor's MPEG-4 encoded video.

**Test #18 Configuration:** Figure 5-18 illustrates this configuration.



**Figure 5-18. Test #18 Configuration – MPEG-4 Encoder and MPEG-4 Decoding COTS Software Using IE Plug-In**

### 5.3 Test Conduct

The test and demonstration process will be conducted according to the following guidelines:

- All Offerors selected for the demonstration (herein referred to as "Test Offerors") will use the same NTSC video signal using coax cables with BNC connectors. All Test Offerors' systems will be tested using the same video signals. All Test Offerors must utilize the video signals provided.
- MdTA will provide an NTSC camera feed, an MPEG-2 encoded camera feed, an MPEG-2 software plug-in to Internet Explorer, and the Vicon, CHART/Cohu, and NTCIP Exerciser (if available) central software for these tests. The Test Offeror is responsible for supplying all other hardware, cable connectors, and software at their expense for this activity. Each Test Offeror shall configure their system to produce optimal results. The test evaluation will be made on the basis of the evaluation criteria set forth in Section 5.4 below.
- The Test Offerors will be allowed one day (no more than 8 hours) to install, setup, and configure its system. No other advance testing using MdTA's facilities or MdTA's equipment will be provided to the Offeror.
- The Test Offerors will be allowed 3 additional days to demonstrate all required tests to MdTA.

### 5.4 Test Criteria



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The test and demonstration process will be conducted using the tests identified above, and the pass/fail criteria shown in Table 5-1.

**Table 5-1. Test Criteria**

Test #	Objective	Requirement	Criteria
1.	Prove that the Offeror can supply a working MPEG-2 encoder/decoder pair, with SNMP control.	Mandatory	Pass/Fail for MPEG-2 encoding/decoding Pass/Fail for SNMP control
2.	Prove that the Offeror can supply a working MPEG-2 hardware decoder that can decode MdTA's existing Impath MPEG-2 encoded video.	Mandatory	Pass/Fail
3.	Prove that the Offeror can supply a working MPEG-2 software decoder (using a COTS software package) that can decode the Vendor's MPEG-2 encoded video.	Mandatory	Pass/Fail
4.	Prove that the Offeror can supply a working MPEG-2 software decoder (using a plug-in to Internet Explorer) that can decode the Vendor's MPEG-2 encoded video.	Mandatory	Pass/Fail
5.	Prove that the Offeror can supply a working MPEG-2 software decoder (using a COTS software package) that can decode MdTA's existing Impath MPEG-2 encoded video.	Mandatory	Pass/Fail
6.	Prove that the Offeror can supply a working MPEG-2 software decoder (using a plug-in to Internet Explorer) that can decode MdTA's existing Impath MPEG-2 encoded video.	Mandatory	Pass/Fail
7.	Prove that the Offeror's MPEG-2 encoded signals can be decoded using mdta's existing MPEG-2 software decoder plug-in for Internet Explorer.	Mandatory	Pass/Fail
8.	Prove that the Offeror's camera can be controlled by the existing system's Vicon software.	Mandatory	Pass/Fail
9.	Prove that the Offeror's camera can be controlled by the existing system's Cohu software.	Mandatory	Pass/Fail
10.	Prove that the Offeror's camera can be controlled using the NTCIP CCTV exerciser program (based on NTCIP 1205).	Mandatory	Pass/Fail
11.	Prove that the Offeror can supply a working H.264 encoder/decoder, with SNMP control.	<i>Optional</i>	Pass/Fail for MPEG-2 encoding/decoding Pass/Fail for SNMP control



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Test #	Objective	Requirement	Criteria
12.	Prove that the Offeror can supply a working MPEG-2/H.264 decoder capable of auto-sensing and decoding mdta's existing Impath MPEG-2 encoded video.	<i>Optional</i>	Pass/Fail
13.	Prove that the Offeror can supply a working H.264 software decoder (using a COTS software package) that can decode the Vendor's H.264 encoded video.	<i>Optional</i>	Pass/Fail
14.	Prove that the Offeror can supply a working H.264 software decoder (using a plug-in to Internet Explorer) that can decode the Vendor's H.264 encoded video.	<i>Optional</i>	Pass/Fail
15.	Prove that the Offeror can supply a working MPEG-4 encoder/decoder, with SNMP control.	<i>Optional</i>	Pass/Fail for MPEG-2 encoding/decoding Pass/Fail for SNMP control
16.	Prove that the Offeror can supply a working MPEG-2/MPEG-4 decoder capable of decoding mdta's existing Impath MPEG-2 encoded video.	<i>Optional</i>	Pass/Fail
17.	Prove that the Offeror can supply a working MPEG-4 software decoder (using a COTS software package) that can decode the Vendor's MPEG-4 encoded video.	<i>Optional</i>	Pass/Fail
18.	Prove that the Offeror can supply a working MPEG-4 software decoder (using a plug-in to Internet Explorer) that can decode the Vendor's MPEG-4 encoded video.	<i>Optional</i>	Pass/Fail

<End of RFP Section 5>



## SPECIAL PROVISIONS

### SECTION 6. REQUIREMENTS

This Section describes functional and performance requirements for the CCTV cameras and related equipment. The requirements are partitioned into the following groups:

#### Mandatory:

- CCTV Camera
- MPEG-2 Encoder/Decoder Cards and Chassis
- Hardened MPEG-2 Standalone Encoder Units
- MPEG-2 COTS Decoding Software
- MPEG-2 Software Decoder Plug-In for Internet Explorer
- Rack-mounted Type I UPS
- Type I, Type II, and Type III Racks
- Video Distribution Amplifiers (VDAs)
- Video Fiber Transmitters (VFTs) Type 3, and Video Fiber Receivers (VFRs) Type 3
- Hardened Ethernet Switch

#### Optional:

- Dual-Capable MPEG-2/H.264 Encoder/Decoder
- H.264 COTS Decoding Software
- H.264 Software Decoder Plug-In for Internet Explorer
- Dual-Capable MPEG-2/MPEG-4 Encoder/Decoder
- MPEG-4 COTS Decoding Software
- MPEG-4 Software Decoder Plug-In for Internet Explorer

This Section also includes information on the required installation, testing, documentation, training, submittals, preventative and corrective maintenance tasks, and measurement and basis of payment.

Any deviations from the hardware specifications in this Section shall be fully identified in the Offeror's proposal.

As discussed in Section 1 of this RFP, the Contractor will be required to furnish CCTV cameras, MPEG-2 codecs, and related equipment on a Just-In-Time (JIT) Delivery Process during the installation phase of any of the construction contracts. The Contractor will be required to deliver and install at each site, the required CCTV cameras and related equipment within 30 calendar-days of notice by the MdTA. A major proposal evaluation criterion is a written description and schedule that shows how the Contractor will (1) coordinate the ordering, fabrication, and storage of CCTV cameras and related equipment; and (2) assure the delivery of CCTV cameras and equipment on time with the various construction contractors. The Contractor shall consider the implications of these requirements in their proposal.

For each camera site or each group of camera sites, all construction work will need to be coordinated with the Authority, and a Construction Contractor (who is under a separate contract to build and install other parts of the system such as camera pole, camera lowering system, foundation, power and communications lines, etc.). Table 6-1 provides a list of tasks that the Contractor should use as a guideline for coordinating construction activities and for pricing the scoped work.



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**Table 6-1. Construction Coordination Activities**

TASK NAME	DESCRIPTION	RESPONSIBLE PARTY
NTP	Notice to Proceed	MdTA
Kick-Off Meeting	Initial meeting to discuss the project scope and schedule.	MdTA, Contractor
CCM #1	Construction Coordination Meeting (CCM) with the MdTA, the Contractor and the Construction Contractor to discuss schedule dependencies. The Construction Contractor will provide the proposed pole foundation locations, cabinet locations, and power and communication connections at the cabinet location (tested and ready for connection). This CCM will include a pre-construction site survey, if necessary.	MdTA, Contractor, Construction Contractor
CCTV Design Documentation Submittals	Contractor's submittals (e.g., shop drawings, catalog cuts, etc.) for the CCTV equipment shall be in accordance with the Contract.  Note: The Construction Contractor (from various other projects) will be responsible for other items, including design details pertaining to the camera/pole foundation, lowering system (with safety tether, and cables from the lowering system at the cabinet), and fiber/power connections. A 120V receptacle will be installed by the Construction Contractor in the cabinet. The Construction Contractor is responsible for providing the Contractor with power connections and fiber patch connections in the CCTV cabinet. These fiber connections enable the Contractor-provided equipment to form an Ethernet network allowing the transfer of video and PTZ data.	Contractor
CCTV Design Documentation Submittal Review	MdTA reviews and approves or rejects the submittal(s).	MdTA
Construction Contractor Installation	Construction Contractor infrastructure construction/installation (installation of camera, pole, foundation, lowering system, and fiber/power connections, etc.).	Construction Contractor
CCM #2	CCM with the MdTA, the Contractor and the Construction Contractor will discuss schedule dependencies.	MdTA, Contractor, Construction Contractor
Contractor Installation	The Contractor installs the camera/dome assembly, cables from the dome down the pole to the cabinet, local control panel, and interconnects fiber-optic equipment, Ethernet equipment, MPEG-2 codecs, and other equipment as required.  The camera assembly that is mounted to the lowering device will be installed by the Contractor. As will the encoder and network equipment inside the cabinet or, in some cases, there might be a fiber optic transceiver. The Contractor will install a cable for PTZ control from the encoder (or fiber modem) that will terminate on a DB-9 connector.	Contractor
CCM #3	CCM with the MdTA, the Contractor and the Construction Contractor will discuss schedule dependencies and construction status.	MdTA, Contractor, Construction Contractor
Punch List	Completion of remaining construction items.	MdTA, Contractor, Construction Contractor
Final Documentation Submittal	The Contractor provides as-built documentation, technical documentation, and manuals (operators manual, maintenance manuals, training guides), and final acceptance test procedures in accordance with then Contract.	Contractor
Final Documentation	MdTA reviews and approves or rejects the submittals.	MdTA



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<b>TASK NAME</b>	<b>DESCRIPTION</b>	<b>RESPONSIBLE PARTY</b>
Approval		
Test Procedure Submittal	The Contractor's submittal shall provide detailed procedures on how the system will be tested to verify compliance with all requirements. The procedures shall include standalone CCTV cabinet tests, as well as integrated tests from the AOC Central.	Contractor
Test Procedure Approval	MdTA reviews and approves or rejects the submittals.	MdTA
Operations Training Submittal	The Contractor's training submittal for operations of the CCTV system in accordance with Contract. Thirty (30) calendar-days before system acceptance, the Contractor shall provide System Operational Training for the hardware, software and communications deployed as part of this Contract.	Contractor
Operations Training Submittal Approval	MdTA reviews and approves or rejects the submittals.	MdTA
Operations Training Conduct	Contractor operations training.	Contractor
Acceptance Testing	Acceptance testing to verify functionality of the CCTV site. Includes retesting as required to address discrepancies.	Contractor
Site Commissioned	Official operations and activation declaration.	MdTA
Maintenance Training Submittal	Contractor's training submittal for maintenance of the CCTV system in accordance with Contract. Ninety (90) calendar-days before the maintenance period ends, the Contractor shall provide System Maintenance Training for the hardware, software and communications deployed as part of this Contract.	Contractor
Maintenance Training Submittal Approval	MdTA reviews and approves or rejects the submittals.	MdTA
Maintenance Training Conduct	Contractor maintenance training.	Contractor
Progress Meetings	The Contractor shall meet with MdTA a least once per month for the duration of this Contract, to discuss technical, cost, and schedule progress and issues.	Contractor/MdTA

**MAINTENANCE OF TRAFFIC**

The Authority will be responsible for maintaining traffic for all work under this Contract, including Preventive and Corrective Maintenance work to be performed. It is anticipated that MOT for this project will consist of shoulder closures. The Contractor shall contact the Authority, at least seven (7) calendar-days before beginning work. The Contractor shall provide a schedule of cameras to be serviced and receive authorization from the Authority before beginning work. The Contractor will be required to provide all tools, materials, rental of equipment, materials including attenuator, and all incidentals. The work schedule and traffic control plan will need to be reviewed and approved by the Authority before beginning work.

**DESIGN OVERVIEW**

The Authority will decide on a case-by-case basis, which type of camera installation is to be installed by the Contractor. There are two types of installations the Contractor will be required to install as described below.



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Fiber-Based Camera Installation

For this installation, the following equipment will be required to be furnished, installed, warranted and tested by the Contractor:

- CCTV Camera and Pressurized Dome
- CCTV Camera Cabinet Bulkhead Connection for DB-9 and NTSC Video Connections
- VFT Type 3 fiber-optic modem

Figure 6-1 illustrates the fiber-based camera configuration. All equipment shown is provided by the Contractor, unless noted otherwise. For this configuration, the MPEG-2 encoder/decoder cards, VFRs, and VDAs are installed at the hub site, not the camera cabinet.

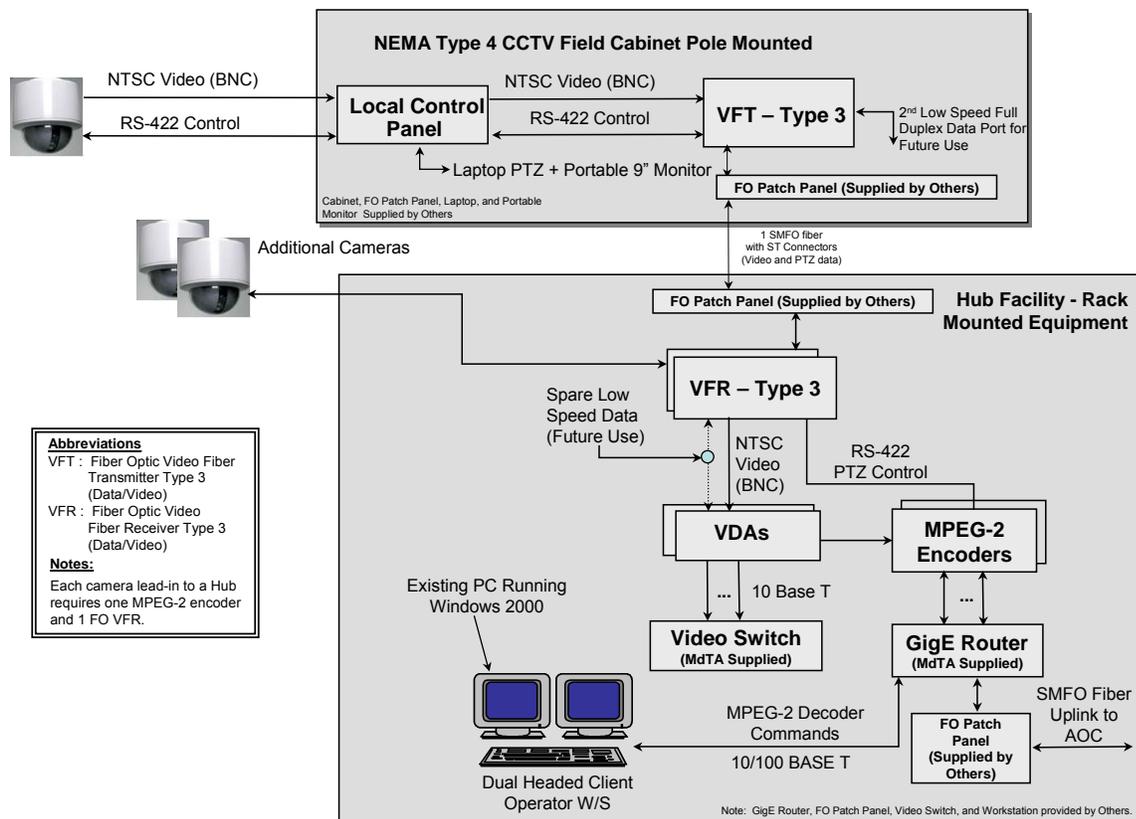


Figure 6-1. Fiber-Based Camera Configuration

Network-Based Camera Installation

For this installation, the following equipment will be required to be furnished, installed, warranted and tested by the Contractor:

- CCTV Camera and Pressurized Dome
- CCTV Camera Cabinet Bulkhead Connection for DB-9 and NTSC Video Connections
- Hardened MPEG-2 Standalone Encoder



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- Hardened Ethernet Switch

Figure 6-2 illustrates the network-based camera configuration. All equipment shown is provided by the Contractor, unless noted otherwise. For this configuration, the MPEG-2 decoder cards and VDAs are installed at the hub site, not the camera cabinet.

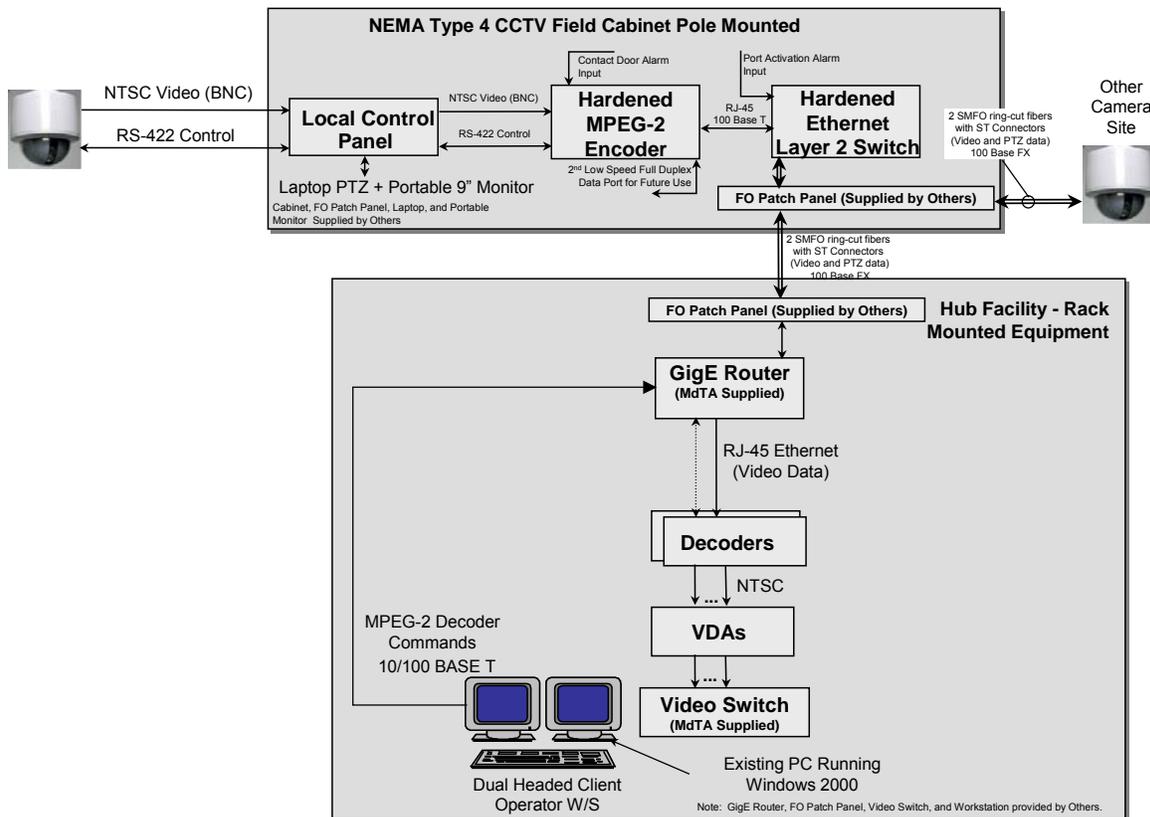


Figure 6-2. Network-Based Camera Configuration

### 6.1 CCTV Camera (Mandatory)

#### DESCRIPTION

This work consists of furnishing, installing, and testing Closed-Circuit Television (CCTV) color/black-and-white (color/BW) camera assemblies as specified in each work assignment, or as directed by the Engineer. The Contractor shall provide the same make camera, model camera, and firmware version of the camera for the entire life of the contract.

#### MATERIALS

All materials shall be new and approved by the Engineer. All equipment shall be the latest revision or product version under production by the equipment supplier. Obsolete, no-longer-supported, or no-longer-produced equipment will not be acceptable.



**SPECIAL PROVISIONS**

Color/BW camera assemblies, cabinets, and all component parts shall meet the latest edition of the National Electrical Manufacturers Association (NEMA) Standards, Underwriters' Laboratory (UL), and Military Standards (MIL) as applicable. The advertising date of this Contract shall be used to determine the date of the applicable standards.

Each camera assembly shall consist of the following:

- Integrated Camera Assembly, including DSP Color/BW camera, zoom lens, control receiver, pan/tilt (PT) unit, and pressurized dome. In addition, a local control panel and either a Video Fiber Transmitter (VFT) Type 3 or a hardened Ethernet switch with fiber connections (as requested by MdTA), a distribution amplifier, and a multi-pin video connector shall be required.
- Camera mounting hardware, including wires, connectors and adapters to connect to the lowering system provided by others.
- Power service distribution and conditioning equipment, including surge suppression
- All cables between the camera and the field equipment cabinet

**CONSTRUCTION**

The Contractor shall furnish and install all hardware, tools, equipment, materials, supplies, and manufactured articles. The Contractor shall also perform all operations and equipment integration necessary to construct fully operational CCTV color/BW camera assemblies that meet the features, functions, and parameters as shown in Tables 6-2 through 6-4. Serial numbers and model numbers, if available, shall be permanently engraved on all removable components and hardware. All conductor-wire runs shall be continuous with no splices. Note that the CCTV camera, PT unit, receiver, and pressurized dome shall be supplied as an integrated unit. The specifications of the dome are provided in a separate table for clarity.

**Table 6-2. CCTV Camera Requirements**

REQ'T NUMBER	FEATURE	SPECIFICATION
1.	Quantity	The Contractor shall furnish, install, and test the proper quantity of cameras as required by the project scope.
2.	Zoom Ratio	The zoom ratio shall be 35x Optical, 12x Digital, 420x Minimum
3.	DSP	The camera shall be a DSP type camera.
4.	Auto Focus	The camera shall have an auto focus with a manual override capability.
5.	Focus Speeds	The camera shall have variable focus speeds, less than 1.8 seconds end to end.
6.	Lens Aperture	The lens maximum aperture shall be F1.6.
7.	Zoom Speeds	The camera shall support variable zoom speeds, from 0 to 200 degree/second. Tele to wide in 3.9 seconds.
8.	On-Screen Direction Indicator	The Contractor shall program sectors for N, S, E, or W direction based on the direction of traffic flow. For I-95 and I-895, traffic shall be assumed to flow North and South along all segments. For I-695, northbound traffic flow direction is that of the Outer Loop, and southbound traffic flow direction is that of the Inner Loop. The Contractor shall consult with the Engineer for other locations.



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REQ'T NUMBER	FEATURE	SPECIFICATION
9.	Privacy Zones/ Sectors/Areas	The camera/receiver shall support a minimum of 16 sectors (or zones or areas) with the ability to blank the video in any sector. Additionally, the camera shall support two sizeable privacy masks that relate to the PTZ position.
10.	On-Screen Zones/ Sectors/Areas	The camera/receiver shall support a minimum of 20 characters for on-screen camera, preset, sector, or alarm titles. The camera shall have an on-screen/video compass display. The compass shall be settable to indicate North.
11.	On-Screen Text	The camera/receiver shall support text for the camera name, preset name, and sector name (alarms and zoom level are not required). The user shall be capable of locating the titles in different positions on the screen image.
12.	On-Screen Logo	Contractor specified.
13.	Variable Speed Tilt	The camera PT unit shall support a variable speed tilt capability with a minimum of 110° per second at the highest rate.
14.	Variable Speed Pan	The camera PT unit shall support a variable speed pan capability with a minimum of 300° per second at the highest rate.
15.	Adjusted Pan/Tilt Speed	The camera PT unit shall support a proportional speed Pan/Tilt capability, where the speed decreases automatically as the zoom level increases.
16.	Pan Range	The camera PT unit shall provide a 360° continuous pan capability, without cable interference or tangling.
17.	Tilt Range	The camera PT unit shall provide a -5° to 95° tilt capability.
18.	Number of Presets/Performance	The camera/receiver shall support a minimum of 79 presets. The movement to the preset shall occur within one second (maximum) and with 0.3 degrees accuracy.
19.	Preset Labels	The camera/receiver shall support a capability to label each preset, with a minimum of 20 characters per preset label.
20.	Patterns/Tours	Contractor Specified. Note that tours at camera level are optional, tours at the switch level are more important. A minimum of eight tours with 32 steps per tour is required. Additionally, there shall be two auto-tours.
21.	Number of Pixels	The camera shall support a minimum of 768H x 494V pixels.
22.	NTSC Resolution	The camera shall support a minimum of 470H TVL NTSC resolution.
23.	Imager/Sensor Size	The camera shall provide an imager/sensor size of 1/4".
24.	Imager Area	Contractor specified.
25.	Lens Size	The camera shall have a 1/4" lens.
26.	Lens Focal Length	The camera shall have a 3.6 mm to 82.8 mm minimal lens focal length.
27.	Color-Auto BW	The camera shall have a Color/BW capability with an automatic and manual selection. The camera shall transition automatically to a BW mode (when in automatic mode) when the luminance reaches a predefined threshold (used during nighttime or low luminance condition).
28.	Lens Sensitivity	The camera sensitivity shall vary between day and night, by reverting to quasi-monochrome operation at night. At all times, the camera shall provide 30 FPS output. Long-term integration is not acceptable.
29.	Auto IRIS	The camera shall provide an auto iris mode with a manual override.
30.	Dome Housing	The camera dome housing shall be provided by the camera manufacturer as an integrated product; see Table 6-3 (Dome Specs).



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REQ'T NUMBER	FEATURE	SPECIFICATION
31.	Dome Mount	The pressurized camera/dome assembly shall accommodate mounting onto the lowering device. The camera must be designed to work with the Construction Contractor's lowering system (the Contractor should recognize that more than one type of lowering system may be used and should plan accordingly). The camera shall connect to the lowering system using a lowering system camera connection box (with weights) provided by the lowering system vendor (the lowering system will be provided under a separate contract). The camera shall interface snug to the camera connection box such that all camera electrical/signal wires are passed through, and that the seal is weather tight. The camera shall come equipped with a pipe adapter (1 ½ inch male NPT pipe) that integrates with the lowering system's camera connection box.
32.	Power Input	The power input to the camera/dome shall support 24-30 VAC range.
33.	Output Signal(s)	The camera shall provide an NTSC video output and be compliant with the NTSC video standard.
34.	AGC	The camera shall be equipped with an AGC circuit with a 30 dB range.
35.	Alarms	No alarm contacts shall be wired.
36.	External Operating Temperature Range	See Dome Specification in Table 6-3.
37.	Surges	The camera/dome assembly shall sustain normal operations when subject to transient voltages, surges, and sags normally experienced on commercial power lines and continual operation at line voltages between 95 volts and 135 volts AC, 50/60 Hz.
38.	Control Receiver	The Contractor shall obtain from the camera manufacturer an integrated control receiver that supports all control functions (e.g., PTZ, iris, focus, presets, etc.) via a remote RS-422 interface.
39.	Protocol	<p>The Contractor shall obtain from the camera manufacturer the camera control/receiver protocol and supply that protocol to the MdTA. A Non-Disclosure Agreement (NDA), if required, is part of the contract. See Section GP7.38. No additional NDA shall be required.</p> <p>The camera must support multiple protocols, including:</p> <ul style="list-style-type: none"> <li>• Cohu's standard 3955 and 3960 protocols; Note: If Cohu cameras are selected the Contractor shall deliver Cohu's CHART protocol (firmware version 2.0 and LCU version 2.2);</li> <li>• Vicon Surveyor 2000 and SVFT camera protocol. The required protocol is Vicon's RS-422 Receiver, Standard and Extended Communications Protocol, that works with Vicon's VPS line of remote positioning devices (e.g., V15UVS, V1310RB, V1200R-LM, etc.);</li> <li>• The camera must support v1.08a of the NTCIP Camera protocol and be compliant with the NTCIP 1205 standard entitled – "National Transportation Communications for ITS Protocol Object Definitions for Closed Circuit Television (CCTV) Camera Control, dated November 2004" and also "NTCIP 1205 Amendment 1 v08, CCTV Camera Control, amendment version v08a, November 2004".</li> </ul> <p>The camera protocol must also be selectable via a dip switch or via a remote firmware flash update.</p> <p>Documentation must be provided with the submittal that explains the procedure for changing the firmware to meet the above requirements.</p>



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REQ'T NUMBER	FEATURE	SPECIFICATION
40.	EIS	The camera manufacturer must provide Electronic Image Stabilization (EIS) firmware (within the camera receiver) that can suppress vibrations at 5 Hz and 10 Hz (or 16 Hz) center frequency.
41.	Video Switch	The camera manufacturer must provide an interface to a COTS matrix switch with a minimum 256 x 32 configuration.
42.	PC Software	The camera must be able to interface to either (1) a camera-vendor multi-user CCTV GUI software package, or (2) a third-party multi-user CCTV GUI software package. The cameras must also have a means to allow the SHA CHART CCTV software to control them without any software protocol changes (see protocol section above). The Contractor's vendor must provide a fully functional maintenance, testing and diagnostics software package, which may be used to (1) test all features and functions of the camera assembly and (2) configure all options and properties that are supported by the camera assembly firmware.
43.	Camera Vendor Qualifications	The camera manufacturer shall have demonstrated experience in having a minimum of 12 outdoor CCTV camera/dome assemblies installed for ITS applications, which are operational for at least six (6) months.
44.	Contractor Qualifications	The Contractor shall have systems integration with ITS experience (including software, hardware, Gigabit Ethernet communications). The Contractor shall have installed at least two (2) similar CCTV systems with 12 or more cameras, operational for at least six (6) months.
45.	Vendor Warranty	The camera/dome assembly must have a three-year minimum warranty, from the date of installation with two one-year options. Technical support must be made available M-F during normal business hours on a 1-800 number. Technical support shall be included in the Warranty and be available for the entire duration of the Warranty at no additional cost.
46.	Contractor Warranty	The Contractor shall supply a one-year warranty commencing after the Acceptance period and after the 90-day Observation Period expires.

Table 6-3. CCTV Dome Requirements

REQ'T NUMBER	FEATURE	SPECIFICATION
1.	Quantity	The Contractor shall furnish, install, and test the quantity of camera domes required by the project scope.
2.	Dome Size	The dome size shall be a maximum of 13" diameter.
3.	External Operating Temperature Range	Unless otherwise specified, the equipment inside the dome shall remain functional with outside temperatures ranging from -30 °C to 55 °C (-22 °F to 131 °F).
4.	Humidity	Unless otherwise specified, the equipment inside the dome shall remain functional with an outside relative humidity from 0-100%.
5.	Heater	The dome enclosure shall have a minimum 70-Watt heater.
6.	Wind Loading	The camera/dome must withstand 80 MPH winds.
7.	Weight	The maximum total weight for the combined camera/dome assembly (including receiver and PT unit) shall be 15 lb or less.
8.	Pressurization	The dome shall have a Pressure Release Valve for safety, and be pressurized by the Contractor with Nitrogen to a minimum of 5 PSI.
9.	Pressure Valve	The dome shall have a standard size Schraeder valve (for nitrogen charging) that is easily located and accessed by a technician.
10.	Pressure Sealant Type	The pressure sealant type shall be O-ring.



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REQ'T NUMBER	FEATURE	SPECIFICATION
11.	Air Contaminants	The unit shall be sealed and have a minimum rating of an IP67 for air contaminants.
12.	Outer Dome Cover	The outer dome shall be constructed of rust-free components.
13.	Sunshield	The dome shall have a UV light resistant outer sunshield.
14.	Lower Dome Cover	The lower dome cover shall be distortion free, cell-cast acrylic plastic or free blown, UV Coated, with no fastening holes (to avoid cracking).
15.	Cables	<p>The camera/dome assembly shall provide a single composite cable containing an RG-59 coax with a stranded center conductor and 95% coverage braided copper shield for video, 22 AWG stranded and shielded conductors as required for RS-422 control data, and 16 AWG stranded conductors for camera power, heater power, and ground, as required.</p> <p>The cabling shall terminate into a single MS-style connector that plugs into the top of the dome.</p>
16.	Pendant Mount Connector Type	The pendant mount connector type shall be a 1.5" NPT male thread.
17.	Surge Protection	There shall be surge protection within the dome enclosure for the video and power. This surge protection is in addition to the surge protection specified for use in the base cabinet.
18.	Power Input	The power input to the camera/dome shall support a 24-30 VAC range. The maximum power shall be 72 W.
19.	Radio Frequency Emission Rating	The camera/dome assembly shall be FCC Class A compliant.
20.	Dome Vendor Qualifications	The dome manufacturer shall have a minimum of 12 installed units of outdoor dome CCTV for ITS applications, which are operational for at least six (6) months.
21.	Vendor Warranty	The camera/dome assembly must have a three-year minimum warranty, from the date of installation with two one-year options. Technical support must be made available M-F during normal business hours on a 1-800 number. Technical support shall be included in the Warranty and be available for the entire duration of the Warranty at no additional cost.
22.	Contractor Warranty	The Contractor shall supply a one-year warranty commencing after the Acceptance period and after the 90-day Observation Period expires.



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**Table 6-4. CCTV Cabinet/Local Control Panel**

REQ'T NUMBER	FEATURE	SPECIFICATION
1.	Cabinet Type	<p>The Cabinet will be supplied by the Construction Contractor.</p> <p>The Contractor should assume the following conditions: Each camera site will have a sealed NEMA 4X, 36"H x 24"W x 24"D pole-mounted cabinet with standard 19" EIA rack rails, with both upper and lower cabinet mounting straps and will be UL listed. The pole-mounting device will have a heavy-duty pole mounting kit, suitable for supporting the cabinet and all specified equipment. The cabinet will have a single access door on the front of the cabinet, hinged on the right or left depending on field conditions. The doorframe openings will be flanged on all four sides. These flanges should increase the strength and prevent dust and liquids from entering the enclosure when the door is opened. The cabinet will have a sun shield that covers the top. The door seal will have a rubber gasket to provide a weather tight seal. The doors will be equipped with three-point latching mechanisms with nylon rollers at the top and bottom. The cabinet enclosure will be 0.125" thick and made of aluminum alloy Type 5052 (or alternatively 14-gauge Type 304 stainless steel) to provide a strong and rigid construction. The door handle will be 0.75" stainless steel round bar and have provision for a padlock. All exterior seams will be sealed tight with a silicone sealant.</p> <p>The cabinet contains a 6-fiber premises interconnect center (PIC) with ST connectors installed by the Construction Contractor. The Construction Contractor will terminate the distribution fibers inside the PIC, and will also furnish and install a 3-meter patch cable from the PIC to a Contractor-provided device. The Construction Contractor will provide multi-stage, hybrid technology surge protection on all circuits entering the cabinet.</p>



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REQ'T NUMBER	FEATURE	SPECIFICATION
2.	Cabinet Equipment/ Local Control Panel	<p>The Contractor shall provide the following.</p> <p>The cabinet shall house a 19" wide Local Control Panel with a DB-9 connection for local PTZ control via a laptop (used by a technician), a VDA with an isolated BNC video connection to display the video on a laptop or a portable monitor. The panel shall also have a connection for a multi-pin video connector that carries the video, control signals, and power from the camera. The Contractor shall also provide either a Video Fiber Transmitter Type 3, or a hardened Ethernet switch with fiber connections and hardened MPEG-2 encoder (as requested by MdTA).</p> <p>The Contractor will install all necessary cables to enable a fully functional CCTV system, including all serial and NTSC cables between the camera, local control panel, and the VFT Type 3 (or MPEG-2 hardened encoder and Hardened Ethernet Switch). The installation shall allow the cameras, when commanded through the CHART software, to receive the PTZ commands over a multi-drop circuit.</p> <p>The Contractor must also configure the field encoder's to receive the PTZ commands (from the existing CHART software in either a Vicon, Cohu or NTCIP protocol as stated in Table 6-2) via multicast from the existing iMPath MPEG-2 master decoder at central. The encoder will in turn output a serial RS-422 signal to either the VFR Type 3 (for fiber-based installations) or output a serial RS-422 directly to the camera (for network-based installations). The Contractor shall be responsible for ensuring the CCTV camera site is fully operational, that all video is jitter-free at the AOC, and that PTZ commands properly and reliably traverse the network.</p>
3.	Vendor Warranty	The cabinet, local control panel and equipment must have at least a 3-year warranty.
4.	Contractor Warranty	The Contractor shall supply a one-year warranty commencing after Acceptance and after the 90-day Observation Period expires.

In addition to the above items, the Contractor shall provide the following services and deliverables:

**Assembly.** All camera components shall be assembled and factory tested prior to delivery to the site.

**Installation.** The camera assemblies shall be delivered to the site as complete units, and installed as specified in the Contract Documents.

1. The camera/dome assembly shall be mounted in accordance with the Engineer's direction and to provide a maximum field of view of the mainline or bridge, and the ramp interchanges. Each camera/dome assembly shall be connected to hardware enclosed in a pole-mounted cabinet for field equipment, as specified in these specifications.
2. The Contractor shall be responsible for any necessary pole-mounting adapters, brackets, and mounting hardware, including extensions, cable entry to the pole, and special anti-vibration brackets for bridge mounts.

**Testing.** The Contractor shall conduct field tests to verify compliance with the Contract Documents and all requirements. The Contractor shall provide a requirement-traceability matrix for each test. The matrix



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shall clearly identify what functionality is being tested and the applicable section(s) in the specifications. All equipment furnished by the Contractor shall be subject to monitoring and testing to determine conformance with all applicable requirements and to ensure the proper operation of the equipment and system. Below are the requirements for testing:

1. The Contractor shall supply all equipment required for conducting the tests.
2. No separate payment will be made for the monitoring, testing, test equipment, and documentation of test results. These costs shall be included in the bid amount for this pay item.
3. If any component or material used in the construction of the system is defective or otherwise unsuitable, or the workmanship does not conform to the accepted standards, the Contractor shall replace such defective parts and materials at no cost to the MdTA.
4. Each camera assembly furnished and installed by the Contractor shall be tested once installed in the field in a standalone fashion. All equipment for conducting the test shall be supplied by the Contractor. No separate payment will be made for the monitoring, testing, test equipment, and documentation of test results. These costs shall be included in the bid amount for this pay item. The tests shall be conducted at the field equipment cabinets, and shall include the following as a minimum:
  - i. Verification of the installation of the specified cables and connections between the camera/dome assembly and the local control panel.
  - ii. Local operation of all CCTV equipment, including exercising the pan, tilt, zoom, focus, iris opening, and power on/off functions while the video picture on a portable monitor is being observed.
  - iii. Demonstration of the camera sensitivity at low light levels to meet the specified requirements and the transition to and from the Color and BW modes.
  - iv. Demonstration of the pan/tilt speed and the extent of the camera movement to meet the specified requirements.
  - v. Measurement of the analog video signal level(s) at the output of the central control receiver (input to the encoder or other digital equipment) with a waveform monitor to verify compliance with NTSC Standards.
  - vi. Test to verify proper camera enclosure pressurization.
  - vii. Setup, selection, and demonstration of pre-programmed or preset positions for each camera.

**Technical Assistance.** The equipment supplier shall provide the Contractor with an authorized manufacturer's representative or qualified technical personnel (acceptable to the MdTA) to assist the Contractor with the installation of all equipment at each site.



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**Documentation.** The Contractor shall provide three (3) sets of operating manuals, service manuals, and maintenance instructions for all components of the system.

**Service Agreement.** The Contractor or equipment manufacturer shall be capable of providing an extended maintenance contract at the Authority's expense after all warranties expire.

**Maintenance.** During the one-year Contractor warranty, the Contractor shall perform preventative maintenance activities (e.g., check and re-pressurize each dome as required, at least twice during the one-year maintenance). Verification of the completion of these activities shall be required. All preventative maintenance work conducted by the Contractor shall be documented and reported in writing to the Authority.

## MEASUREMENT AND PAYMENT

Color/BW PTZ (pan/tilt/zoom) camera assemblies (including the pressurized dome) at the sites will be measured and paid for per each unit furnished, installed, and tested by the Contractor, and accepted by the MdTA. There will be a separate bid item for each piece of equipment (PTZ camera, pressurized dome), and a separate bid item for the installation costs for this particular equipment. It should also be understood that there is a separate bid item for installing a complete Camera site (network or fiber) at any MdTA designated location. All installation costs associated with equipment at a site (e.g., camera, dome, cabinet equipment/wiring, transceivers, network gear, encoders, etc.) should be captured in that bid item. In most cases, the MdTA anticipates using this bid item to cover all installation costs. However, in certain situations MdTA may elect to use the bid items for installing a particular piece of equipment, in cases where only portions of work are required. See Section 3.2 for additional information.

This payment includes, but is not limited to, all materials and labor as may be needed to furnish, install, test, and perform warranty and any other work necessary to make the installation complete, operational, and acceptable. Costs shall include shipment costs to MdTA. The payment for this item covers the color/BW camera assembly and all equipment specified under the "Color/BW Camera Assemblies" above, including, but not limited to, materials, labor, testing and test equipment rental fees (if applicable), and all other incidental expenses necessary to complete the work in an acceptable manner, as specified herein.

Liquidated damages apply as follows for this bid item. Failure to furnish, install, test, and make operational this item within 30 days of advance notification by MdTA will result in a 10% reduction of the pay item for each day late. Exceptions will be made on a case-by-case basis (e.g., external factors will be considered, such as fiber or electrical outages).

Refer to Bid Items 8001, 8002, 8003, 8004, 8016, 8029, 8033, 8034, 8043, and 8044.



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### 6.2 MPEG-2 Encoder/Decoder Cards and Chassis (Mandatory)

#### DESCRIPTION

This work shall consist of furnishing, installing, and testing MPEG-2 encoders and decoders at various hub sites, as directed by the Engineer. The hub sites are co-located in MdTA's Administration, Ventilation, Maintenance, Police, or roadside hut buildings throughout the State of Maryland.

#### MATERIALS

All materials shall be new and approved by the Engineer. All equipment shall be the latest revision or product version under production by the equipment supplier. Obsolete, no-longer-supported, or no-longer-produced equipment will not be acceptable. The Contractor shall provide encoders that are card-based (for installation in a chassis) and also standalone units.

The following equipment shall be furnished, installed, and tested at the hub sites as required:

- MPEG-2 Encoder Cards and Chassis.
- MPEG-2 Decoder Cards and Chassis.
- MPEG-2 COTS Decoding Software.
- MPEG-2 Software Decoder Plug-In for Internet Explorer.

The encoders and decoders must be able to operate with the existing SNMP-based network management software package (being implemented by the MdTA in another CCTV system) that allows setup, configuration, and monitoring of all network parameters for the encoders/decoders from a central location.

#### MPEG-2 ENCODER CARD AND CHASSIS

An MPEG-2 encoder is a device that accepts NTSC video as a BNC input and produces a digitally encoded stream of data in the MPEG-2 format in accordance with ISO13818-2 standard, using an RJ-45 Ethernet output port. The encoders shall meet the following specification:

1. Each encoder shall be mounted in a card cage. The card cage shall: (a) be installed in a standard 19" rack; (b) provide power and ventilation (cooling fans) for the encoder cards; (c) support at least 24 encoders (or 24 decoders); and (d) occupy no more than 7 rack units (RUs). The encoders shall be Impath's Video Surveillance Gateway (VSG) cards or an approved equal product. The chassis used to hold the cards shall be Impath's VSG chassis or an approved equal product.
2. Each encoder card shall have two NTSC-video inputs with BNC-type connectors.
3. Each encoder shall have one 10/100 Base-T Ethernet 802.3 port supporting IPv4, TCP, UDP, IGMP v2, TELNET, and SNMP. The 10/100 Base-T port shall be RJ-45 type and shall be used to transmit two MPEG-2 multi-cast video streams via 802.3 Ethernet, TCP/IP, and IGMP v2.
4. Each encoder shall have two RS-232C/422/485 serial ports supporting data rates of 1200 Bps to 115,200 Bps. The unit shall be configurable for RS-232C, RS-422 or RS-485.
5. The encoder shall fully comply with the IGMP v2 standard. According to the IGMP v2 RFC standard, when a host leaves a multicast group, if it was the last host to reply to a Query with a



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Membership Report for that group, it should send a Leave Group message to the all-routers multicast group (e.g., 224.0.0.2). If it was not the last host to reply to a Query, it may send nothing, as there must be another member on the subnet. The vendor's implementation of IGMPv2 should treat the above statements as mandatory and, therefore, should assume the statements to read: when a host leaves a multicast group, it must send a Leave Group message to the all-routers multicast group (e.g., 224.0.0.2).

6. The Ethernet ports shall also support TELNET and SNMP for configuration, control, and management functions. The encoder shall provide an SNMP MIB that provides access to all configuration parameters and diagnostics, allowing the units to be completely managed via SNMPv2 calls. The Ethernet ports shall also support the RS-232C/422/485 serial links by converting between Ethernet data and serial data, as required. All control and configuration commands, including PTZ via the serial ports, shall be performed using TCP for reliability, not UDP.
7. For compatibility with the software being implemented by the MdTA in another CCTV system, the protocol or SNMP MIB used to control and obtain status from the encoder shall be identical to the protocol used with the current encoders – i.e., Impath's Video Surveillance Gateway (VSG) SNMP MIB. In addition, the encoders must be able to operate with the existing TeleVue SNMP-based software network management package that allows setup, configuration, and monitoring of all network parameters for the encoders/decoders from a central location. Finally, it is imperative that the encoders, supplied as part of this project, allow the currently implemented Impath decoding software to decode them.
8. When operating (e.g., multicasting video), the encoder shall accept remote SNMP configuration messages to perform dynamic video switching, bit rate changes or any other system parameter without a system reboot.
9. The encoding scheme shall be MPEG-2 and shall support both elementary and transport streams. The encoders shall additionally support MPEG-1 in accordance with ISO/IEC 11172-2. The MPEG-2 encoding scheme shall be real-time and support full motion EIA-250C Medium Haul or better quality at 30 frames per second (FPS).
10. The encoder card shall support configurable data rates from 384 Kbps to 12 Mbps for each output. The encoder shall support a 12-Mbps combined data channel capacity for the output video streams (e.g., the maximum is 6 Mbps per stream). The encoder shall be able to maintain smooth, full motion 30 FPS video (after encoding and decoding) at data rates as low as 768 Kbps per output.
11. End-to-end latency shall not exceed 500 ms. The latency shall be demonstrated using one encoder card, one decoder card, two camera inputs, and two monitor outputs. The card shall be configured to MPEG-2 encode both inputs and output at a 3 Mbps data rate per stream (6 Mbps combined) in full-resolution mode. When decoded by the decoders, the NTSC video signal will be fed to the monitors. The monitors shall display each NTSC input in full resolution at 30 FPS. For the latency test, a time measurement shall be obtained. The Contractor shall demonstrate that the difference in time, from the instant a pan command is issued to the camera to the instant the response is visible on the monitor is less than 500 ms.
12. NTSC resolutions of 720x480, 352x480, 352x240, and 192x128 shall be supported.
13. Power input shall be 120V AC  $\pm$ 10% 60Hz.



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14. The operating temperature range shall be -10 °C to 50 °C.
15. The MPEG-2 encoders shall provide the ability to perform firmware updates over the network. This capability is required to enable the MdTA's administrator to update the firmware from a remote location.
16. The encoder must support a local console access, using one of the serial interfaces, to all configuration menus of the product, including the initial IP address. This access will be necessary for troubleshooting purposes. The interface must be menu driven to accommodate novice users.
17. The encoder must support remote TELNET console access to all configuration menus of the product. The interface must be menu driven to accommodate novice users. The console access must be restricted by a username and password to prevent unauthorized access. For ease of management, both the local console and TELNET console must present the same menu commands and structure to the operator.
18. The encoder shall provide an LED display for video, data, LAN interface, and onboard status.
19. The encoder shall be capable of inserting into the video stream up to 4 user-configurable text messages, each of up to 20 characters in length.
20. The encoder shall be able to generate a date and time stamp in the video stream. For accurate time keeping, the encoder shall allow its time to be synchronized to a minimum of 2 time-servers on the customer IP network.
21. The encoder shall provide the ability to adjust image quality to compensate for poor video camera quality. The product must provide the ability to adjust contrast, brightness, hue, and color levels.
22. The encoder shall integrate seamlessly with the MPEG-2 decoder specified below. The encoder shall be able to encode video in MPEG-2 format that can be decoded by the decoder. The encoder shall also support a configuration that allows each serial port on the encoder to be logically associated with a corresponding serial port on the decoder. For example, each serial port on the encoder shall be configurable to allow it to be mated using Ethernet (and a TCP/IP address and port number) to a serial port on the decoder. The encoder shall provide built-in support to receive Ethernet packets and to convert the data to a serial data stream. The encoder shall also provide built-in support to receive serial data and to convert the data to Ethernet packets.

The Contractor may propose alternative solutions that meet the intent of these specifications. Any deviations must be approved in advance by the Engineer. If the Contractor selects an MPEG-2 encoder card or standalone rack mount unit that supports only one NTSC input per card, the Contractor must deliver the units in multiples of two (e.g., if a hub site requires 5 cameras to be encoded, 6 cards shall be provided). This approach ensures that a comparable number of equipment pieces are supplied, if alternative approaches are pursued.

## **MPEG-2 DECODER CARD AND CHASSIS**

An MPEG-2 decoder is a device that receives an MPEG-2 digitally encoded stream in accordance with ISO13818-2 standard, via an RJ-45 Ethernet input, and decodes the data into an NTSC video signal with a BNC output. The decoders shall meet the following specification:



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1. Each decoder shall be mounted into a card cage. The card cage shall: (a) be installed in a standard 19" rack; (b) provide power and ventilation (cooling fans) for the decoder cards; (c) support at least 24 decoders (or 24 encoders); and (d) occupy no more than 7 rack units (RUs). The decoders shall be Impath's Video Surveillance Gateway (VSG) cards or an approved equal product. The chassis used to hold the cards shall be Impath's VSG chassis or an approved equal product.
2. Each decoder card shall have two NTSC video outputs with BNC type connectors.
3. Each decoder card shall have one 10/100 Base-T Ethernet 802.3 port supporting IPv4, TCP, UDP, IGMP v2, TELNET, and SNMP. The 10/100 Base-T port shall be RJ-45 type and shall be used to receive two MPEG-2 multi-cast video streams via 802.3 Ethernet, TCP/IP, and IGMP v2.
4. Each decoder shall have two RS-232C/422/485 serial ports supporting data rates of 1200 Bps to 115,200 Bps. The unit shall be configurable for RS-232C, RS-422 or RS-485.
5. The decoder shall fully comply with the IGMP v2 standard. According to the IGMP v2 RFC standard, when a host leaves a multicast group, if it was the last host to reply to a Query with a Membership Report for that group, it should send a Leave Group message to the all-routers multicast group (e.g., 224.0.0.2). If it was not the last host to reply to a Query, it may send nothing, as there must be another member on the subnet. The vendor's implementation of IGMPv2 should treat the above statements as mandatory and, therefore, should assume the statements to read: when a host leaves a multicast group it must send a Leave Group message to the all-routers multicast group (e.g., 224.0.0.2).
6. The Ethernet ports shall also support TELNET and SNMP for configuration, control, and management functions. The decoder shall provide an SNMP MIB that provides access to all configuration parameters and diagnostics, allowing the units to be completely managed via SNMPv2 calls. The Ethernet ports shall also support the RS-232C/422/485 serial links by converting between Ethernet data and serial data, as required. All control and configuration commands, including PTZ via the serial ports, shall be performed using TCP for reliability, not UDP.
7. For compatibility with the software being implemented by MdTA in another CCTV system, the protocol or SNMP MIB used to control and obtain status from the decoder shall be identical to the protocol used with the current decoders – i.e., Impath's Video Surveillance Gateway (VSG) SNMP MIB. In addition, the decoder must be able to operate with the existing SNMP-based software network management package that allows setup, configuration and monitoring of all network parameters for the encoders/decoders from a central location.
8. When operating (e.g., decoding video), the decoder shall accept remote SNMP configuration messages to perform dynamic video switching, bit rate changes or any other system parameter without a system reboot.
9. The decoding scheme shall be MPEG-2 and the decoder shall be able to auto-sense and decoder either elementary or transport streams.. Decoders shall additionally support MPEG-1 in accordance with ISO/IEC 11172-2. The MPEG-2 encoding scheme shall be real-time and support full motion EIA-250C Medium Haul or better quality at 30 FPS.



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10. The decoder shall support configurable MPEG-2/MPEG-1 data rates from 384 Kbps to 12 Mbps. The decoder shall be able to maintain smooth full motion 30 FPS video (after encoding and decoding) at data rates as low as 768 Kbps.
11. End-to-end latency shall not exceed 500 ms. The latency shall be demonstrated using one encoder card, one decoder card, two camera inputs, and two monitor outputs. The card shall be configured to MPEG-2 encode both inputs and output at a 3 Mbps data rate per stream (6 Mbps combined) in full-resolution mode. When decoded by the decoders, the NTSC video signal will be fed to the monitors. The monitors shall display each NTSC input in full resolution at 30 FPS. For the latency test, a time measurement shall be obtained. The Contractor shall demonstrate that the difference in time, from the instant a pan command is issued to the camera to the instant the response is visible on the monitor is less than 500 ms.
12. NTSC resolutions of 720x480, 352x480, 352x240, and 192x128 shall be supported.
13. Power input shall be 120V AC  $\pm$ 10% 60Hz.
14. The operating temperature range shall be -10 °C to 50 °C.
15. The MPEG-2 decoders shall provide the ability to perform firmware updates over the network. This capability is required to enable the MdTA's administrator to update the firmware from a remote location.
16. The decoder must support a local console access, using one of the serial interfaces, to all configuration menus of the product including the initial IP address. This access will be necessary for troubleshooting purposes. The interface must be menu driven to accommodate novice users.
17. The decoder must support remote TELNET console access to all configuration menus of the product. The interface must be menu driven to accommodate novice users. The console access must be restricted by a username and password to prevent unauthorized access. For ease of management, both the local console and TELNET console must present the same menu commands and structure to the operator.
18. The decoder shall provide an LED display for video, data, LAN interface, and onboard status.
19. The decoder shall have the ability to display or not to display any one of the 4 user-text fields or all 4 text fields on the hardware monitor.
20. Each decoder must have the ability to display or not to display the date and time stamp.
21. The decoder shall have the ability to display or not to display technical support messages. These messages include, but are not limited to, the IP address of the source video stream, video resolution, video format (NTSC/PAL), bit rate, and status messages.
22. The decoder shall have the ability for the user to select which quadrant of the screen to insert the user field, date and time field, or the technical support text.
23. The decoder shall be integrated seamlessly with the MPEG-2 encoder specified above. The decoder shall be able to decode an MPEG-2 video stream that has been encoded by the encoder. The decoder shall also support a configuration that allows each serial port on the decoder to be logically associated with a corresponding serial port on the encoder. For example,



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each serial port on the decoder shall be configurable to allow it to be mated using Ethernet (and a TCP/IP address and port number) to a serial port on the encoder. The decoder shall provide built-in support to receive Ethernet packets and to convert the data to a serial data stream. The decoder shall also provide built-in support to receive serial data and to convert the data to Ethernet packets.

The Contractor may propose alternative solutions that meet the intent of these specifications. Any deviations must be approved in advance by the Engineer. If the Contractor selects an MPEG-2 decoder card or standalone rack mount unit that supports only one NTSC output per card, the Contractor must deliver the units in multiples of two (e.g., if a hub site requires 5 cameras to be decoded, 6 cards shall be provided). This approach ensures that a comparable number of equipment pieces are supplied, if alternative approaches are pursued.

## OTHER EQUIPMENT

In addition to the items above, the following items will be furnished, installed and tested at the various hub sites, but paid for under separate bid items. **Note that the cost for these items should not be included in the cost of the MPEG-2 Encoders and Decoders bid item; they are included here for completeness:**

- A rack-mounted Type I UPS. See below for specifications.
- All necessary Type I 24" W x 84"H free standing equipment racks to mount the encoders and decoders. See below for specifications.
- All necessary Type II 24"W x 36"H wall-mounted equipment racks to mount the encoders and decoders. See below for specifications.
- All necessary Type III 24"W x 48"H wall-mounted equipment racks to mount the encoders and decoders. See below for specifications.
- All necessary VDAs. See below for specifications.
- Video Fiber Transmitters (VFTs) Type 3 and Video Fiber Receivers (VFRs) Type 3, or, alternatively, hardened Ethernet switches. See below for specifications.

## CONSTRUCTION

The Contractor shall contact the MdTA's Project Engineer and coordinate monthly configuration control meetings with the MdTA's networking staff prior to installation of networking equipment and throughout the duration of installation and configuration efforts. This meetings will be consolidated with the Monthly Progress meetings, which will be attended by MdTA's network staff. The Contractor shall be responsible for configuring the equipment as directed by the MdTA's Project Engineer. Meetings shall begin at least one (1) month prior to the start of installation of this equipment and shall continue through at least one (1) month past the conclusion of testing and acceptance of the installed equipment.

The Contractor shall furnish and install all hardware, racks, tools, equipment, software, materials, supplies, and manufactured articles. The Contractor shall also perform all operations and equipment integration necessary to construct a fully operational distributed video network that meets the features, functions, and parameters described in this Section.

Serial numbers and model numbers, if available, shall be permanently engraved on all removable components and hardware.

The Contractor shall install, rack mount, setup, configure, and tune all MPEG-2 Encoders and MPEG-2 Decoders to achieve 30 FPS jitter-free MPEG-2 encoded video at a data rate of 2 Mbps per camera, with



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end-to-end latency of less than 0.5 seconds. The Contractor must also configure the field encoder's to receive the PTZ commands (from the existing CHART software in either a Vicon, Cohu or NTCIP protocol as stated in Table 6-2) via multicast from the existing iMPath MPEG-2 master decoder at central. The encoder will in turn output a serial RS-422 signal to either the VFR Type 3 (for fiber-based installations) or output a serial RS-422 directly to the camera (for network-based installations). The Contractor shall be responsible for ensuring the CCTV camera site is fully operational, that all video is jitter-free at the AOC, and that PTZ commands properly and reliably traverse the network.

### Network Management Software

The Contractor shall test all newly installed encoders and decoders with the existing SNMP-based software network management package, that allows encoder/decoder setup, configuration, monitoring, and fault detection of all network parameters from a central location. This software package is installed on the existing network management server. At Contract award, if necessary, the Authority will provide the Contractor the MIBs for the existing codecs.

The Contractor shall provide proper number of encoder and decoder cards and/or standalone modules as may be required for the camera sites.

In addition to the above items, the Contractor shall provide the following services and deliverables:

- a) **Assembly.** The Contractor, systems integrator and/or vendor shall assemble the equipment.
- b) **Installation.** The equipment shall be delivered to the site and installed as specified in the Contract Documents. The Contractor shall be responsible for any necessary cables, brackets, equipment, media converters, and mounting hardware, including extensions. The equipment shall be mounted, and the software installed, in accordance with the Contractor's approved submittal to provide a fully operational CCTV system and a video network. All required connections and cables (e.g., to the existing video switches) shall be performed by the Contractor.
- c) **Required Demonstrations.** To ensure compliance with all critical requirements, the Contractor shall, prior to both the submittal and procurement process, successfully demonstrate the selected encoder and decoder to MdTA's satisfaction. The Contractor shall work with the selected vendor to demonstrate 30 FPS jitter-free MPEG-2 encoded and then decoded video over a 10-minute time period. The video shall be encoded, decoded and then displayed, in NTSC format, on a video monitor. The Contractor shall also successfully demonstrate the software decoding capability to MdTA's satisfaction, and the remaining requirements identified above.
- d) **Testing.** The Contractor shall conduct encoder/decoder network tests to verify full compliance with Contract documents and all requirements at each installation facility. At a minimum the testing shall occur at two levels: (1) locally at each hub site where encoded video shall be MPEG-2 encoded and decoded out of the GigE switch; and (2) end-to-end at each central facility (any MdTA designated hub site) where video must be encoded at each field hub site and decoded at central. A requirement-traceability matrix shall be provided with each test. The matrix shall clearly identify what functionality is being tested and the applicable section(s) in the specifications. All equipment furnished by the Contractor shall be subject to inspection and testing to determine conformance with all applicable requirements and to ensure proper operation of the equipment and system.
  - i. The Contractor shall supply all equipment required for conducting the tests.



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- ii. No separate payment will be made for the monitoring, testing, test equipment, and documentation of test results. These costs shall be included in the bid for this pay item.
- iii. If any equipment component used in the demonstration of the system is defective or, otherwise, unsuitable, or the workmanship does not conform to the accepted standards, the Contractor shall replace such defective parts and material at no cost to the Authority.
- e) **Technical Assistance.** The equipment supplier shall provide the Contractor with an authorized manufacturer's representative or qualified technical personnel (acceptable to the MdTA) to assist the Contractor with the installation of all equipment and software at each site.
- f) **Documentation.** The Contractor shall supply five (5) sets of documentation for encoders/decoders, which shall at a minimum include a User's Guide.
- g) **Service Agreement.** The manufacturer shall be capable of providing an extended maintenance contract at the Authority's expense and option, after all warranties expire.

## MEASUREMENT AND PAYMENT

Encoders/decoders cards and chassis shall be paid on the basis of each item completed, installed, and tested by the Contractor, and accepted by the MdTA. The cost of the required chassis shall be included as part of the cards. The payment under these items will include all materials and labor as may be necessary to furnish and install, setup, configure, test, warrant, and perform any other work needed to make the installation operational and acceptable at any MdTA designated location. The decoding software shall be considered incidental to this bid item.

Liquidated damages apply as follows for this bid item. Failure to furnish, install, test, and make operational this item within 30 days of advance notification by MdTA will result in a 10% reduction of the pay item for each day late. Exceptions will be made on a case-by-case basis (e.g., external factors will be considered, such as fiber or electrical outages).

Refer to Bid Items 8009, 8010, 8011, 8012, 8013, and 8014.

### **6.3 Hardened MPEG-2 Standalone Encoder (Mandatory)**

The hardened MPEG-2 standalone encoder shall meet all the requirements of the MPEG-2 encoder card, except it shall have the following features:

1. The unit shall be a standalone unit
2. The unit shall have a minimum of 1 NTSC-video input with BNC-type connections and 2 serial-data-port enclosures with DB-9 connections, and 1 Ethernet RJ-45 output
3. The unit shall have a temperature-hardened enclosure for outdoor applications (-34 °C to +74 °C)
4. The unit shall be capable of supporting Motion Detection alarms using contacts
5. The unit shall meet Class B Emission Certification
6. The unit shall be installed at the camera sites or other non-environmentally controlled locations

The Contractor shall use iMPath i4110 or an approved, equal product.



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The Contractor shall be responsible for configuring the equipment as directed by the MdTA's Project Engineer. This shall include any and all configuration settings required (including SNMP management settings, door contact alarm settings, etc.). Any wiring of the cabinet door contact alarms shall be considered incidental to the project.

## MEASUREMENT AND PAYMENT

Hardened Encoder standalone units shall be paid on the basis of each item completed, installed, and tested by the Contractor, and accepted by the MdTA. There will be a separate bid item for the equipment, and a separate bid item for the installation costs for this particular equipment. It should also be understood that there is a separate bid item for installing a complete Camera site (network or fiber) at any MdTA designated location. All installation costs associated with equipment at a site (e.g., camera, dome, cabinet equipment/wiring, transceivers, network gear, encoders, etc.) should be captured in that bid item. In most cases, the MdTA anticipates using this bid item to cover all installation costs. However, in certain situations MdTA may elect to use the bid items for installing a particular piece of equipment, in cases where only portions of work are required. See Section 3.2 for additional information.

The payment under these items will include all materials and labor as may be necessary to furnish and install and secure, setup, configure, test, warrant, and perform any other work needed to make the installation operational and acceptable.

Liquidated damages apply as follows for this bid item. Failure to furnish, install, test, and make operational this item within 30 days of advance notification by MdTA will result in a 10% reduction of the pay item for each day late. Exceptions will be made on a case-by-case basis (e.g., external factors will be considered, such as fiber or electrical outages).

Refer to Bid Items 8015 and 8016.



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### 6.4 **MPEG-2 COTS Decoding Software (Mandatory)**

The Contractor shall provide MPEG-2 decoding software to meet the following specification:

1. The software shall support Windows 2000 or Windows XP
2. The software shall be able to decode any MPEG-2 multicast signal and display the video in a window on the PC
3. The user shall be able to configure the multicast address, for which the software is listening to decode.
4. The decoding software must be able to decode simultaneously at least four (4) MPEG-2 encoded 3 Mb streams on a Pentium IV (minimum 2 GHz processor) computer, from four (4) different cameras.
5. The software shall automatically detect the compression algorithm, resolution, PAL or NTSC signal, and bit rate without any user intervention
6. The software decoder must support Multicast IGMPv2 to decode the multicast Ethernet data
7. The software decoder must have the ability to provide "video tours" of pre-selected cameras, using a user-specified dwell time for each camera in the tour
8. The software shall also provide the ability to fully configure the encoders and decoders via the LAN

The MPEG-2 Encoder/Decoder manufacturer must provide, and the Contractor must install and test, a software decoding package on specified user workstations. The software shall be Impath's ClientVue or equivalent. Ten (10) copies of the software shall be provided. Three (3) copies shall be installed and tested at a single operator workstation at the BHT Administration Building, the FMT Administration Building, and the FSK Engineering Building. The remaining seven (7) copies shall be spare for future installations. The software shall run on the new PC workstations at each bridge facility, which use the Windows 2000 or XP operating system.

## MEASUREMENT AND PAYMENT

MPEG-2 COTS Decoding Software shall be paid on the basis of each item completed, installed, and tested by the Contractor, and accepted by the MdTA. The installation shall occur at any MdTA designated location. The payment under these items will include all materials and labor as may be necessary to furnish and install, setup, configure, test, warrant, and perform any other work needed to make the installation operational and acceptable.

Liquidated damages apply as follows for this bid item. Failure to furnish, install, test, and make operational this item within 30 days of advance notification by MdTA will result in a 10% reduction of the pay item for each day late. Exceptions will be made on a case-by-case basis (e.g., external factors will be considered, such as fiber or electrical outages).

Refer to Bid Item 8017.



## SPECIAL PROVISIONS

### **6.5 MPEG-2 Software Decoder Plug-In for Internet Explorer (Mandatory)**

The Contractor shall provide MPEG-2 software decoder plug-in to meet the following specification:

1. The software shall support Windows 2000 or Windows XP
2. The software shall be able to utilize plug-in supported by Microsoft's Internet Explorer. The plug-in shall permit the decoding of any MPEG-2 multicast signal and the display of the video in a window on the PC
3. The user shall be able to configure/program the multicast address that the software is listening to decode, via HTML programming
4. The software shall automatically detect the compression algorithm, resolution, PAL or NTSC signal, and bit rate without any user intervention
5. The software decoder must support Multicast IGMPv2 to decode the multicast Ethernet data

The MPEG-2 Encoder/Decoder manufacturer must provide, and the Contractor must install and test, the plug-in software on one MdTA designated workstation. A license for 100 users shall be required. The Contractor shall provide the test .HTML/scripting source code, the decoder plug-in, and licenses to MdTA. In addition, two (2) software development kits should be provided to MdTA for each 100-user package provided. MdTA will be responsible for the remaining installations on various users' machines.

## **MEASUREMENT AND PAYMENT**

MPEG-2 Software Decoder Plug-in Software shall be paid on the basis of each item (where each equals a 100-user package) furnished and tested by the Contractor, and accepted by the MdTA. The payment under these items will include all materials and labor as may be necessary to furnish, setup, configure, test, warrant, and perform any other work needed to make the installation operational and acceptable.

Liquidated damages apply as follows for this bid item. Failure to furnish, install, test, and make operational this item within 30 days of advance notification by MdTA will result in a 10% reduction of the pay item for each day late. Exceptions will be made on a case-by-case basis (e.g., external factors will be considered, such as fiber or electrical outages).

Refer to Bid Item 8018.

### **6.6 Rack-Mounted UPS (Mandatory)**

#### **DESCRIPTION**

This work shall consist of furnishing, installing and configuring uninterruptible power supply (UPS) units.

#### **MATERIALS**

The UPS units shall meet the following specifications:

1. All materials shall be new. UPS units and batteries shall have been manufactured within one (1) year of delivery.
2. All UPS units of the same capacity shall be the products of the same manufacturer.



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3. All equipment shall be the latest revision or product version under production by the equipment supplier. Obsolete, no-longer-supported, or no-longer-produced equipment will not be acceptable. The equipment supplier MUST commit to manufacture and supply replacement parts for at least five (5) years from the date of purchase by the Contractor. The MdTA may require a written statement to this effect where policies or commitment cannot be determined.
4. UPS Type I shall be APC® Smart-UPS 2200 RM 3U with network management smart-slot card AP9617, or approved equal having the following specifications and features.
5. Capacity shall be 2200VA/1500W minimum.
6. UPS shall be rated for 15 minutes (minimum) of backup time at 1200Watts.
7. UPS batteries shall be user-replaceable without the need to power down equipment (i.e., hot swappable).
8. UPS shall be rack-mounted and need no more than 4 rack-spaces (4U MAX).
9. UPS shall be managed via a built-in interface. Management interface shall support SNMP, TELNET, and HTTP (web) management via 10 Base-T RJ45 Ethernet port or 10/100 Base-T RJ45 Ethernet port. Management interface shall provide remote shutdown and restart of the UPS and attached electrical devices via http (web) interface; email alert for power outages; SNMP monitoring; and scheduling of UPS self tests.
10. UPS shall have overload, site-wiring fault, and replace battery indicators.
11. Output shall be 120V AC, 60 Hz, sine wave.
12. UPS shall have eight NEMA 5-15R receptacles for connecting devices.
13. UPS shall have integral surge protection and noise filtering. Surge protection shall be rated at 300 joules or more. Surge and filtering shall be UL1449 compliant.
14. UPS shall have an integral control panel with LED bar-graph status display for load and battery, and an indicator LED for overload and on-battery.

## CONSTRUCTION

The Contractor shall furnish and install all hardware, tools, equipment, materials, supplies, and manufactured articles. The Contractor shall also perform all operations and equipment integration necessary to construct a fully operational rack-mounted UPS at any MdTA designated hub location.

The Contractor shall contact the MdTA's Project Engineer and coordinate monthly configuration control meetings with the MdTA's networking staff prior to installation of networking equipment and throughout the duration of installation and configuration efforts. This meetings will be consolidated with the Monthly Progress meetings, which will be attended by MdTA's network staff. The Contractor shall be responsible for configuring the equipment as directed by the MdTA's Project Engineer. Meetings shall begin at least one (1) month prior to the start of installation of this equipment and shall continue through at least one (1) month past the conclusion of testing and acceptance of installed equipment.



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The Contractor shall connect and configure the Management module as directed by MdTA networking staff. The MdTA will provide configuration data including IP address, network mask, host name, and other parameters. The Contractor must provide equipment documentation, including user manual, setup manual, etc., to facilitate MdTA configuration planning.

## MAINTENANCE

Any device placed in service by the Contractor for operation by the MdTA shall be maintained in a good working order.

The Contractor is responsible for maintenance services 24 hours per day, 7 calendar-days per week until the MdTA officially accepts the device.

## WARRANTY

UPS shall be warranted for one (1) year from the date of acceptance. Any failures shall be repaired, or devices replaced, by the Contractor at the Contractor's sole expense.

During the warranty period, the MdTA networking staff will have sole responsibility for configuration and management of the UPS.

## MEASUREMENT AND PAYMENT

All pay items shall include all materials, labor, and equipment necessary to furnish and install a complete, operational, and acceptable system as specified herein. The payment of items shall include all testing and guarantee required by the specifications and special provisions. Any requirements of the specifications, or special provisions not specifically detailed or mentioned in a payment item shall be considered incidental to the pay item(s) below. In addition, the following services/work shall be incidental to the listed pay item(s):

- The Contractor's quality assurance and quality control responsibilities
- Construction stake out and coordination
- Testing as specified in the Special Provisions and Specifications

Each type of device will be measured according to each device furnished, installed, configured, tested, and accepted by capacity (W) of each unit. The installation shall occur at any MdTA designated location. The payment under these items will include all materials and labor as may be needed to furnish and install, configure, test, and perform warranty repairs and service, and any other work necessary to make the installation complete, operational, and acceptable.

Liquidated damages apply as follows for this bid item. Failure to furnish, install, test, and make operational this item within 30 days of advance notification by MdTA will result in a 10% reduction of the pay item for each day late. Exceptions will be made on a case-by-case basis (e.g., external factors will be considered, such as fiber or electrical outages).

Refer to Bid Items 8019 and 8020.



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### 6.7 Type I, II and Type III Racks (Mandatory)

#### DESCRIPTION

This work shall consist of furnishing and installing equipment racks. Equipment racks shall serve as a mounting frame and organizational device for electronic equipment including computers, video encoder/decoders, routers, splice trays, fan trays, cabling, interconnect devices, modems, CSU/DSU's, Uninterruptible Power Supply (UPS), and other devices as needed.

#### MATERIALS

The racks shall meet the following specifications:

1. All materials shall be new.
2. Where multiple equipment racks are required, the Contractor shall furnish equipment racks of the same type, manufactured by the same manufacturer.
3. All equipment shall be the latest revision or product version under production by the equipment supplier. Obsolete, no-longer-supported, or no-longer-produced equipment will not be acceptable.
4. All equipment racks shall meet and be installed in accordance with ANSI/EIA RS-310 and EIA-310-D, where applicable.
5. All equipment racks shall be fully enclosed. Freestanding units shall have front and rear mesh vented doors. Wall units shall have front door only. Side panels shall conceal and protect interior electronics. With doors closed, it shall not be physically possible to directly access the equipment inside.
  - i. All doors and side panels shall have locks. The Contractor shall provide two (2) sets of keys for each rack.
  - ii. All doors shall have lift-off hinges (i.e., upon opening the door, it shall be possible to simply lift the door off its hinge to remove the door).
  - iii. All side panels shall be removable.
  - iv. All doors and side panels shall be constructed of 18-AWG structural steel or better.
  - v. All equipment racks shall have vertical 10/32 mounting rails with nominal 19-inch standard opening suitable for use with standard rack-mounted equipment. Rails shall be made of 12-AWG structural steel, and shall meet applicable EIA standards. Equipment Racks shall be listed with UL1863-Standard for Communication Circuit Assembly.
6. All equipment racks shall be equipped with a fan assembly consisting of three (3) fans at the top of the rack. The fan shall run continuously. The fan shall be a ball bearing, low noise (less than 40 dB) type with minimum capacity of 225 CFM. The fan shall blow exhaust air through the top of the



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enclosure. Additional fan trays shall be supplied, as required. The cost of these fan trays shall be considered incidental to the cost of the rack. For racks that contain equipment occupying more than 75% of the available space, an additional fan tray shall be required, and shall be located at the vertical mid-point of the rack. Each fan tray shall provide a minimum of three (3) 75-CFM fans (225 CFM total), and shall occupy no more than 1 RU space. The Contractor shall size the fans based on the equipment selected, the electrical draw, and BTUs generated.

7. The equipment racks shall be free of sharp edges, burrs, or other defects that may cut wires and cables or create a safety hazard.
8. All equipment racks shall have air intake louvers, or other acceptable air intake, through the front and back doors.
9. All equipment racks shall have a finished appearance. Unpainted metal surfaces are not acceptable. All racks shall be **black** in color.
10. Each rack shall contain one 3-unit fan at the top of the rack.
11. Each rack shall contain one UPS, at the bottom of the rack.
12. All equipment racks shall be equipped with two (2) 72" vertical-cable managers for routing and tying off cables (e.g., video coax, CAT 5 Ethernet, serial, etc.). The cable managers shall be BlackBox RM037 (for Type I and II racks), and BlackBox RM588 (for Type III racks), or equivalent.
13. All racked equipment shall have a minimum of one RU separation between all units. BlackBox RM318 (1 RU), RM217 (2 RU), RM219 (3 RU), RM319 (4 RU), RM222 (5 RU) or RM223 (6 RU) black filler panels, or equivalent, shall be used, as required, to cover all gaps and to provide a finished professional end product.
14. Equipment Rack Type I shall be freestanding, full size with 24" wide (19" rack space opening) x 84" high. Internal dimensions shall be 19" wide by 77" high. Equipment Rack Type I shall have 44U rack spaces. Depth shall be 30" minimum. Equipment Rack Type I shall be BlackBox RM840A-3F (Elite Server-Mount Cabinets) or equivalent.
15. Equipment Rack Type II shall be wall-mounted with 22" wide (19" rack space opening) x 36" high x 20" deep (20" usable space). Equipment Rack Type II shall have 19U rack spaces. Equipment Rack Type II shall be BlackBox RM412A (Elite Series Wall-Mount Cabinets) or equivalent.
16. Equipment Rack Type III shall be freestanding, half-size with 24" wide (19" rack space opening) x 48" high x 36" deep. Equipment Rack Type III shall have 24U rack spaces. Equipment Rack Type III shall be BlackBox RM810A (Elite Series Server-Mount Cabinets) or equivalent.
17. The Contractor shall submit cut sheets of the racks to the MdTA for approval prior to purchasing the racks.
18. The Contractor shall provide a rack elevation, showing the details of the equipment to be installed in rack, for MdTA's review and approval prior to racking and stacking equipment. It is the Contractor's responsibility to ensure that all procured rack-mounted equipment will fit properly in the racks.



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### CONSTRUCTION

The exact location of equipment racks shall be coordinated with the MdTA.

The Contractor shall furnish and install the proper number of equipment racks for all rack-mounted equipment at all proposed installation facilities.

The installation shall be neat and professional.

Upon completion, all installed equipment shall be securely fastened into the equipment rack. Loose equipment, wires, or other appurtenances shall not be acceptable.

Equipment rack doors shall close tightly and securely. Equipment installed in such a way so as to prevent the doors from closing completely, opening completely, or otherwise interfering with the operation of the doors shall be unacceptable.

Equipment racks shall have 36" of clear space in front of and behind each unit. Wall-mounted units shall not require 36" free space behind the unit.

### WARRANTY

Equipment racks shall be warranted for a period of one (1) year from the date of final acceptance.

### MEASUREMENT AND PAYMENT

All pay items shall include all materials, labor, and equipment necessary to furnish and install a complete, operational, and acceptable system as specified herein. The payment of items shall include all testing and guarantee required by the specifications and special provisions. Any requirements of the specifications, or special provisions not specifically detailed or mentioned in a pay item shall be considered incidental to the pay item(s) to be listed in this Section.

In addition, the following services/work shall be incidental to the listed pay items:

- The Contractor's quality assurance and quality control responsibilities
- Testing as specified in the Special Provisions and Specifications

The pay item(s) for this Section includes:

Each type of equipment rack shall be paid on the basis of each item completed, installed, and inspected by the Contractor, and accepted by the MdTA. The installation shall occur at any MdTA designated location. The payment under these items will include all materials and labor as may be needed to perform the furnishing and installation, warranty, and any other work necessary to make the installation complete, operational, and acceptable. Costs shall include shipment costs to MdTA.

Liquidated damages apply as follows for this bid item. Failure to furnish, install, test, and make operational this item within 30 days of advance notification by MdTA will result in a 10% reduction of the pay item for each day late. Exceptions will be made on a case-by-case basis (e.g., external factors will be considered, such as fiber or electrical outages).

Refer to Bid Items 8021, 8022, 8023, 8024, 8025, 8026.



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### 6.8 VDA's (Mandatory)

#### DESCRIPTION

A Video Distribution Amplifier (VDA) shall be a device that accepts, as input, one NTSC video signal and generates multiple NTSC video output signals. The purpose of the VDA is to produce multiple high-quality replicas of the video signal for distribution to other devices. The VDA shall be a GE KTS-250-16 series video distribution amplifier chassis (with cards) or an approved equal product.

#### MATERIALS

Each VDA card in the chassis shall accept one (1) NTSC input and provide 4 NTSC-outputs with the following characteristics.

- a. Bandwidth shall be 10 MHz at  $-3$  dB
- b. Signal to Noise Ratio (SNR) shall be 65 dB or better.
- c. Gain  $0$  dB  $\pm$  1 dB
- d. Impedance  $75 \Omega$ , input and output.
- e. Video Input and Output points shall be BNC type.
- f. Unused outputs shall be self-terminating.
- g. The VDA shall be mountable and compatible with the Video Distribution Amplifier Assembly specified below if assembled into that device.
- h. Standalone VDA's shall be provided with power sources that utilize 120V 60Hz AC and enclosures.

#### CONSTRUCTION

The Video Distribution Amplifier (VDA) Assembly shall be used to assemble multiple VDA's as specified above. The number of inputs shall be as specified in the specifications. The Contractor shall provide one (1) VDA for each input required. The VDA chassis shall be a GE KTS-250-16 video distribution amplifier chassis or an approved equal product.

The assembly shall be rack mounted. Up to 16 VDA-cards shall be assembled into each card cage, which shall require no more than 3U of rack space for the entire chassis. The card cage shall distribute power to each of the mounted VDA's.

The card cage shall have a single point connection for input power, which shall be supplied at 120V 60Hz AC though a power converter device may be used to feed directly to the card cage.

The Contractor shall provide multiple card cages where more than 16 VDA's are required. The Contractor shall furnish and install only the number of VDA's required in each card cage to satisfy the input requirements. The Contractor shall distribute the VDA's among multiple card cages equally.



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All pay items shall include all materials, labor, and equipment necessary to furnish and install a complete, operational, and acceptable system as specified herein. The payment of items shall include all testing and guarantee required by the specifications and special provisions. Any requirements of the specifications, or special provisions not specifically detailed or mentioned in a pay item shall be considered incidental to the pay item(s) to be listed in this section.

In addition, the following services/work shall be incidental to the listed pay items:

- The Contractor's quality assurance and quality control responsibilities
- Testing as specified in the Special Provisions and Specifications

The pay item(s) for this Section includes:

Each VDA chassis shall be paid per each complete chassis with all cards, furnished, installed, and tested by the Contractor, and accepted by the MdTA. The installation shall occur at any MdTA designated location. The payment under these items will include all materials and labor as may be needed to perform the furnishing and rack-mount installation, warranty, and any other work necessary to make the installation complete, operational, and acceptable.

Liquidated damages apply as follows for this bid item. Failure to furnish, install, test, and make operational this item within 30 days of advance notification by MdTA will result in a 10% reduction of the pay item for each day late. Exceptions will be made on a case-by-case basis (e.g., external factors will be considered, such as fiber or electrical outages).

Refer to Bid Items 8027 and 8028.



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### 6.9 VFT and VFR Type 3 (Mandatory)

#### DESCRIPTION

A Video Fiber Transmitter (VFT) is a device that can receive video and data signals as NTSC and RS-232/422/485, respectively, and transmit that data over a fiber optic cable. A Video Fiber Receiver (VFR) is a device that receives video and serial data via a fiber optic cable and outputs the NTSC video signal over Coax and RS-232/422/485 signal via twisted pair. The VFT and VFRs shall meet the following requirements:

1. All video fiber converters must be capable of operation over a temperature range of  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  and 0% to 95% non-condensing humidity.
2. The manufacturer of the converters shall be an ISO-9001-approved company.
3. The video signals shall operate with 75 ohms, 1V p-p NTSC signals, compliant with the RS-250C medium haul video specification.
4. Optical connectors shall be type ST where available. SC or FC type shall require the Engineer's approval.
5. All NTSC video signals shall be transported via coaxial cable and connected with BNC-type connectors.
6. The video fiber converters shall meet the NEMA TS-1/TS-2 and Caltrans specifications (temperature/humidity, shock/vibration, and voltage transient protection).
7. Independent lab verification of environmental testing and compliance shall be provided.
8. Power supplies shall be provided with all Video Fiber Converters for connection to 120V AC standard outlets, unless specifically shown otherwise in the Specifications.

#### MATERIALS

##### VIDEO FIBER TRANSMITTERS TYPE 3

The VFT Type 3 shall meet the following specifications:

1. The video fiber transmitter shall transmit/receive at 1310 nm or 1550 nm over a single-mode fiber optic cable. The transmitter shall transport one NTSC video signal and at least two (2) bi-directional, full-duplex, RS-232C/422/485 data signals. The unit shall be configurable for RS-232C, RS-422 or RS-485 communications. Data transmission shall be 10-bit digitally encoded video. The VFT Type 3 shall be an IFS VDT14330WDM series or an approved, equal product. These units must be compatible with the VFTs being implemented by the MdTA.
2. Optical power budget shall be 20 dB minimum.
3. Video bandwidth of 5 Hz to 10 MHz with an SNR > 67 dB weighted according to RS-250C standards.



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4. LED status indicators shall indicate video sync present, video overload, received data (RS-232C/422/485), transmitted data (RS-232C/422/485), optical carrier detection, and power.
5. RS-232C/422/485 data signals shall be supported at up to 19,200 bits per second, and shall include options for 1200, 2400, 9600, and 19200 bits per second.
6. The VFT Type 3 shall work seamlessly with the VFR Type 3.

## VIDEO FIBER RECIEVER (VFR) TYPE 3

The VFR Type 3 shall meet the following specifications:

1. The video fiber receiver shall transmit/receive at 1310 nm or 1550 nm over a single-mode fiber optic cable. The receiver shall receive one NTSC video signal and at least two (2) bi-directional, full duplex, RS-232C/422/485 data signals. The unit shall be configurable for RS-232C, RS-422 or RS-485 communications. The VFR Type 3 shall be an IFS VDR14330WDM series or an approved, equal product. These units must be compatible with the VFRs being implemented by the MdTA.
2. LED status indicators shall indicate video sync present, video overload, received data (RS-232C/422/485), transmitted data (RS-232C/422/485), optical carrier detection, and power.
3. RS-232C/422/485 data signals shall be supported at up to 19,200 bits per second, and shall include options for 1200, 2400, 9600, and 19200 bits per second.
4. The VFR Type 3 shall work seamlessly with the VFT Type 3.
5. The VFRs shall be installed in a chassis as required.

## CONSTRUCTION

The Contractor shall install and secure the VFTs, as required, in the camera cabinets. The Contractor shall install and rackmount the VFRs and chassis, as required, at the various hub sites. The VFTs/VFRs shall only be required when the hardened Ethernet switch is not used.

## MEASUREMENT AND PAYMENT

All pay items shall include all materials, labor, and equipment necessary to furnish and install a complete, operational, and acceptable system as specified herein. The payment of items shall include all testing and guarantee required by the specifications and special provisions. Any requirements of the specifications, or special provisions not specifically detailed or mentioned in a pay item shall be considered incidental to the pay item(s) to be listed in this Section.

In addition, the following services/work shall be incidental to the listed pay items:

- The Contractor's quality assurance and quality control responsibilities
- Testing as specified in the Special Provisions and Specifications

The pay item(s) for this Section includes:



## SPECIAL PROVISIONS

Each VFT and VFR shall be paid per each complete chassis with all cards, cables (e.g., fiber patch cables, serial cables, etc.) furnished, rackmount installed, and tested by the Contractor, and accepted by the MdTA. The cost of the required chassis shall be included as part of the cards. The installation shall occur at any MdTA designated location. There will be a separate bid item for the equipment, and a separate bid item for the installation costs for this particular equipment. It should also be understood that there is a separate bid item for installing a complete Camera site (network or fiber) at any MdTA designated location. All installation costs associated with equipment at a site (e.g., camera, dome, cabinet equipment/wiring, transceivers, network gear, encoders, etc.) should be captured in that bid item. In most cases, the MdTA anticipates using this bid item to cover all installation costs. However, in certain situations MdTA may elect to use the bid items for installing a particular piece of equipment, in cases where only portions of work are required. See Section 3.2 for additional information.

The payment under these items will include all materials and labor as may be needed to perform the furnishing and installation, warranty, and any other work necessary to make the installation complete, operational, and acceptable.

Liquidated damages apply as follows for this bid item. Failure to furnish, install, test, and make operational this item within 30 days of advance notification by MdTA will result in a 10% reduction of the pay item for each day late. Exceptions will be made on a case-by-case basis (e.g., external factors will be considered, such as fiber or electrical outages).

Refer to Bid Items 8031, 8032, 8033, and 8034.

### **6.10 Hardened Ethernet Switch (Mandatory)**

#### **DESCRIPTION**

The Contractor shall supply a hardened Ethernet Layer 2 switch. The switch shall be installed in each camera cabinet. The hardened Ethernet switch shall only be required when the VFTs/VFRs are not used.

#### **MATERIALS**

The Contractor shall use CISCO 2955 or an approved, equal product.

The unit shall have the following features:

- a) Ethernet port managed Layer 2 switch with six 10/100TX ports and two optical single-mode uplink ports.
- b) The Ethernet switch shall utilize single mode fiber optics capable of bi-directional data transmission of 100 Mbps minimum (though 1000 Mbps is preferred) on two single-mode optical fibers (if different wavelengths are used, bi-directional data on a single single mode fiber is also acceptable).
- c) The Ethernet Switch shall support the Ethernet data IEEE 802.3 protocol using Auto-negotiating.
- d) The Ethernet Switch shall have a minimum of six fixed 10/100TX electrical ports and two optional 10/100TX electrical or 100FX or 100LX single mode fiber optic ports, as required.



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- e) The Ethernet Switch shall have an optional 1000TX electrical port or an optional 1000FX optical port aggregation point.
- f) The Ethernet Switch shall require no in-field electrical or optical adjustments or in-line attenuators to ease installation.
- g) The Ethernet Switch shall provide power, link speed, and fiber port status indicating LED's for monitoring proper system operation.
- h) The Ethernet Switch shall provide a contact closure for an over-temperature alarm.
- i) The Ethernet Switch shall be capable of being SNMP managed and support the MIB2 standard.
- j) The Ethernet Switch shall be capable of generating alarms upon port activation.
- k) The Ethernet Switch shall have redundant power supply connections to minimize single-point failures.
- l) The Ethernet Switch shall provide a serial connection (DB-9 or RJ45-to-DB9) for local management of the device.
- m) The Ethernet Switch shall have a 5-year warranty. It is the responsibility of the Contractor to repair/replace any switch failures during this time period, at no cost to the Authority.
- n) Data Specifications
  - Data Interface: Ethernet IEEE802.3
  - Data Rate: 10, 100; and 1000 Mbps (preferred)
  - Data Inputs: 8 or 9
  - Operation Mode: Duplex
- o) Optical Specifications
  - Optical Fiber: single-mode (9/125 micron)
  - Number of Optical Ports: 2
  - Number of Fibers Required: 2 per port (or 1 if different transmission wavelengths for send/receive are used)
  - Optical Wavelength: 1310 nm (or substitute if different transmission wavelengths for send/receive are used)
  - Optical Power Budget: 13 dB
  - Maximum Distance: 8 miles (15 Km)
- p) Status Indicators
  - Power
  - Link/Speed (LNK)
  - Activity (ACT)
- q) Connectors
  - Optical: ST



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- Power: Terminal Block with Screw Clamps
- Data: RJ-45
- Contact Closure: Terminal Block with Screw Clamps
- Console: 9-Pin Din serial com.

### r) Electrical Specifications

- Power: 12VDC to 24VDC @ 1A
- Current Protection: Automatic resettable solid-state current limiters
- Voltage Regulation: Solid-state, Independent on each board
- Circuit Board: UL 94 flame rated and meets all IPC standards.

### s) Environmental Specifications

- MTBF: >100,000 Hours
- Operating Temp: -10 °C to +60 °C
- Storage Temp: -25 °C to + 85 °C
- Relative Humidity: 0% to 95% (non-condensing). If the product is installed under condensation conditions, the unit shall have conformal coating applied to the printed circuit board.

### t) Regulatory Agencies/Approvals and Listing

- Underwriters Laboratory (UL) Listing Number: I.T.E. 6D16
- Underwriters Laboratory Canada (ULC) Listing Number: I.T.E. 6D16
- UL 94-flame rated PCB board: 94VO

### u) Other

Rack-Mounted Module (19" Rack) – The unit shall be installed in a standard EIA 19" (482.6 mm) rack or wall standoff bracket adequate for the size and weight of the rack-mounted unit. The placement of the unit shall allow provision for cable installation and maintenance as indicated on the approved detail drawings and in compliance with the manufacturer's installation manual.

Optical Fibers – The optical link shall be tested with either a power meter, at a minimum, or OTDR to ensure the link budget (overall path loss) plus an added 3 dB of optical safety margin does not exceed the optical power budget.

- I. All optical connectors on the cable shall be cleaned in compliance to the optical connector manufacturer's specifications and covered with dust caps until connection to the fiber optic module.
- II. All optical connectors shall be covered with dust caps and remain on the module until installing the cable connectors to module.

## CONSTRUCTION

The Contractor shall contact the MdTA's Project Engineer and coordinate monthly configuration control meetings with the MdTA's networking staff prior to installation of networking equipment and throughout the duration of installation and configuration efforts. This meetings will be consolidated with the Monthly Progress meetings, which will be attended by MdTA's network staff. The Contractor shall be responsible for configuring the equipment as directed by the MdTA's Project Engineer. This shall include any and all



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configuration settings required (including SNMP management settings, port activation alarms, etc.). Meetings shall begin at least one (1) month prior to the start of installation of this equipment and shall continue through at least one (1) month past the conclusion of testing and acceptance of installed equipment.

The Contractor shall install and secure the unit in each field camera cabinet. Standard CAT 5E cables shall be used for each connection, as required.

All cables shall meet or exceed the latest version of, and all addenda to, ANSI/TIA/EIA-568-A, ISO/IEC 11801 and TIA draft SP-4195-A for Category 5e Cable.

Patch cables shall be defined as cables connecting a device to a patch panel, wall outlet, or another device. The patch panel provides a connection to permanently installed cabling generally.

Outdoor Cat 5e cables shall be cables installed outdoors for serial data communications among various pieces of outdoor equipment.

Distribution cables shall be cables installed between patch panels, or from a patch panel to a wall outlet, a floor outlet, or an outlet of other types.

All Category 5e cables shall be Color coded as follows:

1. Pair 1 = White/Blue – Blue
2. Pair 2 = White/Orange – Orange
3. Pair 3 = White/Green – Green
4. Pair 4 = White/Brown – Brown

### **CAT 5E PATCH CABLE**

CAT 5e patch cables shall meet the following requirements:

- a) Patch cables: 4-pair cables
- b) Conductor: 24 AWG (stranded tinned copper – 7 strands)
- c) Nominal Capacitance: 14 pF/ft
- d) Characteristic Impedance: 100 ohms +/-15%
- e) Maximum DC Resistance: 9.4 ohms/100 m
- f) Velocity of Propagation: 71% (minimum)

All CAT 5e cables shall be of Unshielded Twisted Pair (UTP) type unless otherwise specified.

Patch cables shall be factory pre-assembled, terminated, and tested to assure a high level of quality control. Terminations shall be rated for CAT 5e use and shall be RJ-45 type. Patch cables shall have stranded wires for improved flexibility and resistance to breakage due to frequent movement.

Each CAT 5e Patch Cable shall be factory transmission tested using laboratory-grade network analyzers to ensure assembly exceeds Category 5e channel performance and a copy of the test results shall be



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included. Performance test shall meet or exceed the proposed SP-4195-A Category 5e specifications. Factory terminated and tested CAT 5e Patch Cables shall be required to achieve consistent Category 5e compatibility. Field termination of plug ends will not be accepted.

The jacket color for CAT 5e patch cables shall be as defined below.

1. Red: Cross-over cables only.
2. Yellow: Connection of workstations, personal computers, and similar devices to a wall outlet or from a patch panel to a router, a switch, or another networking device.
3. Green: inter-connection of network-critical devices such as routers, switches, hubs, transceivers, etc.
4. Black: Connection of video-over-network devices such as encoders, decoders, codecs, CCTV switches, terminal servers, electronic toll collection equipment, traffic management devices, etc.
5. Blue: Connection of auxiliary, non-critical, management devices and network monitoring devices, such as UPS management consoles, SNMP management consoles, test and diagnostic equipment, etc.

The Contractor shall supply CAT 5e patch cables in sufficient lengths and appropriate jacket colors. If the Contractor desires any clarification on the color of specific cables, please contact the Engineer.

All CAT 5e patch cables installed indoors or on cable tray shall be plenum rated.

CAT 5e Connectors – CAT 5e Patch Cable's modular plugs shall exceed FCC CFR 47 part 68 subpart F and IEC 6060603-7 specifications and have 50 micro inches minimum of gold plating over nickel.

### **CAT 5e DISTRIBUTION CABLE**

CAT 5e Distribution cable shall be 4 pair or 24 pair cable as required by the application and as directed by the Engineer and shall comply with the following requirements:

- a) Conductor: 24 AWG (solid bare copper)
- b) Nominal Capacitance: 14 pF/ft
- c) Characteristic Impedance: 100 ohms +/-15%
- d) Maximum DC Resistance: 9.4 ohms/100m
- e) Velocity of Propagation: 71% (minimum)

Note that 24-pair cable may be appropriate for applications such as patch panel-to-patch panel connections; two (2) 24-pair cables will complete the connection between the panels where twelve (12) 4-pair cables would be required. The Contractor may choose between the 4-pair or the 24-pair cables based on a particular application and submit the proposed choice to the Engineer for final approval.

CAT 5e Distribution cables installed in indoor equipment racks or on cable trays shall be plenum rated.

### **OUTDOOR CAT5e CABLE**



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Outdoor CAT5e cables shall be an Unshielded Twisted Pair cable rated for outdoor use and suitable for aerial installation. This type of cables shall be used for serial data transmission and shall meet all the material requirements specified under "952.03 CAT 5e Distribution Cable". The cable shall be rated by the manufacturer for use in EIA-485 serial communication applications.

## MEASUREMENT AND PAYMENT

All pay items shall include all materials, labor, and equipment necessary to furnish and install a complete, operational, and acceptable system as specified herein. The payment of items shall include all testing and guarantee required by the specifications and special provisions. Any requirements of the specifications, or special provisions not specifically detailed or mentioned in a pay item shall be considered incidental to the pay item(s) to be listed in this Section.

In addition, the following services/work shall be incidental to the listed pay items:

- The Contractor's quality assurance and quality control responsibilities
- Testing as specified in the Special Provisions and Specifications

The pay item(s) for this Section includes:

Each Ethernet Switch shall be paid per each complete switch, with any necessary cables, furnished, installed, and tested by the Contractor, and accepted by the MdTA. There will be a separate bid item for the equipment, and a separate bid item for the installation costs for this particular equipment. It should also be understood that there is a separate bid item for installing a complete Camera site (network or fiber) at any MdTA designated location. All installation costs associated with equipment at a site (e.g., camera, dome, cabinet equipment/wiring, transceivers, network gear, encoders, etc.) should be captured in that bid item. In most cases, the MdTA anticipates using this bid item to cover all installation costs. However, in certain situations MdTA may elect to use the bid items for installing a particular piece of equipment, in cases where only portions of work are required. See Section 3.2 for additional information.

The payment under these items will include all materials and labor as may be needed to perform the furnishing and installation, warranty, and any other work necessary to make the installation complete, operational, and acceptable. The installation shall occur at any MdTA designated location.

Liquidated damages apply as follows for this bid item. Failure to furnish, install, test, and make operational this item within 30 days of advance notification by MdTA will result in a 10% reduction of the pay item for each day late. Exceptions will be made on a case-by-case basis (e.g., external factors will be considered, such as fiber or electrical outages).

Refer to Bid Items 8029 and 8030.



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### **6.11 Dual-Capable MPEG-2/H.264 Encoder/Decoder (Optional)**

This is an optional item. If the Contractor has a dual-capable MPEG-2/H.264 encoder/decoder, the draft specifications can be included with the Product Information Appendix submitted with the proposal, and the final specifications submitted after NTP and during the submittal process. The H.264 capability must comply with the ISO MPEG-4 14496-Part 10, Advanced Video Coding (AVC) standard, also known as H.264.

It is MdTA's preference that the decoder is able to auto-sense an MPEG-2 and H.264 video stream and decode it accordingly. The encoder can be manually configurable for MPEG-2 or H.264. It is MdTA's preference that the latency of the unit is comparable to that of the MPEG-2 encoders/decoders specified above (i.e., 500 ms or less). The manufacturer will need to test for and specify the latency.

*Note: The Offeror should describe the proposed options in the technical proposal in accordance with Sections 3.1.2, 3.1.7, and 3.1.8, and also supply the pricing in the 900x series bid items (for MdTA proposed options) or 1000x series bid items (for Contractor proposed options) of the Cost Proposal.*

### **6.12 H.264 COTS Decoding Software (Optional)**

This is an optional item. If the Contractor has H.264 COTS decoding software, the draft specifications can be included with the Product Information Appendix submitted with the proposal, and the final specifications submitted after NTP and during the submittal process.

*Note: The Offeror should describe the proposed options in the technical proposal in accordance with Sections 3.1.2, 3.1.7, and 3.1.8, and also supply the pricing in the 900x series bid items (for MdTA proposed options) or 1000x series bid items (for Contractor proposed options) of the Cost Proposal.*

### **6.13 H.264 Software Decoder Plug-In for Internet Explorer (Optional)**

This is an optional item. If the Contractor has an H.264 software decoder plug-in for Internet Explorer, the draft specifications can be included with the Product Information Appendix submitted with the proposal, and the final specifications submitted after NTP and during the submittal process.

The H.264 Encoder/Decoder manufacturer must provide, and the Contractor must install and test, the plug-in software on one workstation. A license for 100 users shall be required. The Contractor shall provide the test .HTML/scripting source code, the decoder plug-in, and licenses to MdTA. MdTA will be responsible for the remaining installations on various users' machines. In addition, two (2) software development kits should be provided to MdTA for each 100-user package provided.

*Note: The Offeror should describe the proposed options in the technical proposal in accordance with Sections 3.1.2, 3.1.7, and 3.1.8, and also supply the pricing in the 900x series bid items (for MdTA proposed options) or 1000x series bid items (for Contractor proposed options) of the Cost Proposal.*



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### **6.14 Dual-Capable MPEG-2/MPEG-4 Encoder/Decoder (Optional)**

This is an optional item. If the Contractor has a dual-capable MPEG-2/MPEG-4 encoder/decoder, the draft specifications can be included with the Product Information Appendix submitted with the proposal, and the final specifications submitted after NTP and during the submittal process. The MPEG-4 capability must comply with the ISO MPEG-4 14496-Part 2, Simple Profile (SP) at Level 3 standard.

It's MdTA's preference that decoder is able to auto-sense an MPEG-2 and MPEG-4 video stream and decode accordingly. The encoder can be manually configurable for MPEG-2 or MPEG-4. It is MdTA's preference that the latency of the unit is comparable to that of the MPEG-2 encoders/decoders specified above (i.e., 500 ms or less). The manufacturer will need to test for and specify the latency. The ability to decode other manufacturer's MPEG-2 and MPEG-4 encoded video is desired. The Offeror should describe any capabilities they have in this area.

*Note: The Offeror should describe the proposed options in the technical proposal in accordance with Sections 3.1.2, 3.1.7, and 3.1.8, and also supply the pricing in the 900x series bid items (for MdTA proposed options) or 1000x series bid items (for Contractor proposed options) of the Cost Proposal.*

### **6.15 MPEG-4 COTS Decoding Software (Optional)**

This is an optional item. If the Contractor has MPEG-4 COTS decoding software, the draft specifications can be included with the Product Information Appendix submitted with the proposal, and the final specifications submitted after NTP and during the submittal process.

*Note: The Offeror should describe the proposed options in the technical proposal in accordance with Sections 3.1.2, 3.1.7, and 3.1.8, and also supply the pricing in the 900x series bid items (for MdTA proposed options) or 1000x series bid items (for Contractor proposed options) of the Cost Proposal.*

### **6.16 MPEG-4 Software Decoder Plug-In for Internet Explorer (Optional)**

This is an optional item. If the Contractor has an MPEG-4 software decoder plug-in for Internet Explorer, the draft specifications can be included with the Product Information Appendix submitted with the proposal, and the final specifications submitted after NTP and during the submittal process.

The MPEG-4 Encoder/Decoder manufacturer must provide, and the Contractor must install and test, the plug-in software on one workstation. A license for 100 users shall be required. The Contractor shall provide the test .HTML/scripting source code, the decoder plug-in, and licenses to MdTA. MdTA will be responsible for the remaining installations on various users' machines. In addition, two (2) software development kits should be provided to MdTA for each 100-user package provided.

*Note: The Offeror should describe the proposed options in the technical proposal in accordance with Sections 3.1.2, 3.1.7, and 3.1.8, and also supply the pricing in the 900x series bid items (for MdTA proposed options) or 1000x series bid items (for Contractor proposed options) of the Cost Proposal.*

### **6.17 General Installation Guidelines**

The Contractor shall furnish, assemble, install, and test all equipment and software. The equipment and software shall be delivered to the site and installed and tested as specified in the Contract Documents. The Contractor shall be responsible for any necessary cables, brackets, equipment, software, and mounting hardware, including extensions. The equipment shall be mounted in accordance with the specifications to produce a fully operational CCTV system. All equipment shall be rack mounted, where



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possible. All installation activities shall be coordinated in advance with MdTA and shall be performed in a manner that would minimize the downtime of the existing camera network.

The Contractor shall perform the following installation activities (note that the price for performing these tasks shall be included in the Contractor's price proposal):

- a. Install all rack-mounted CCTV and MPEG-2 related equipment, including the camera's local control panel and VFT (or hardened Ethernet Switch) in the field cabinet. Install the VFR (if no hardened Ethernet Switch is used), MPEG-2 encoders/decoders/chassis, UPS, and VDAs at the various hub sites. A minimum of one (1) RU separation between all major units shall be implemented.
- b. Cable all necessary coax, fiber, serial, and Ethernet connections to new equipment.
- c. Install all Ethernet Cat 5e connections of all network nodes (e.g., MPEG-2 encoders/decoders, UPS, Ethernet switches, etc.) to the MdTA-provided network equipment.
- d. Installation of all cables to connect all ports.
- e. Installation checkout, setup and configuration of all hardware.
- f. Installation, setup and checkout of all software (e.g., COTS MPEG-2 Decoding Software, and Internet Explorer Plug-Ins), including license registration as required.
- g. Cabling, including rack-cable routing, ceiling and raised floor cable tray routing, cable tying using cable ties, and typed cable labels on both ends of all video coax, Ethernet and serial cables.
- h. Configuration of IP addresses on all provided network nodes. The address space shall be coordinated and approved by the MdTA's Department of Information Technology (DoIT).
- i. Configuration of all user accounts, databases, configuration files, and any other settings, where required, to assemble a fully functional CCTV system.
- j. Copying to CD-ROM or diskette all final configuration files per Camera/MPEG-2 Encoder/MPEG-2 Decoder and delivery to MdTA.
- k. Any other activity required to make a fully operational and functional CCTV.

### **6.18 General Testing Guidelines**

The Contractor shall conduct central hardware and software tests to verify compliance with the Contract Documents and all requirements at each installation facility. A requirement-traceability matrix shall be provided with each test, clearly identifying what functionality is being tested, and the applicable section(s) in the requirements. The requirements-to-test procedure traceability matrix shall also serve to verify that all requirements are tested, with 100% test coverage. All hardware and software furnished by the Contractor shall be subject to monitoring and testing to determine conformance with all applicable requirements, and to ensure the proper operation of the equipment and system. The Contractor shall supply all equipment required for conducting the tests. During the testing period, the MdTA may also test the system to verify the system is performing properly. It is the responsibility of the Contractor to correct any problems uncovered during this testing.



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If any hardware or software component used in the demonstration or test of the system is defective or otherwise unsuitable, or the workmanship does not conform to the accepted standards, the Contractor shall replace such defective parts and material at no cost to the Authority.

The Contractor shall obtain the services of the manufacturer/vendor for technical installation assistance, field testing, system startup and commissioning, as required. Testing of all equipment furnished and installed under this Contract shall be conducted by, and be the responsibility of the Contractor. The Authority reserves the right to perform any inspections deemed necessary to assure that the equipment conforms to the requirements specified herein.

The Contractor shall make arrangements for the witnessing of tests as requested by the Authority. Full documentation of test results including problems experienced shall be prepared by the Contractor and submitted to the Authority. Any equipment failing the tests shall be replaced or repaired and re-tested at the Contractor's expense.

The Contractor shall perform the following tests:

- Communication Protocol and Firmware Tests.
- Standalone CCTV Field Tests.
- Final Acceptance Tests (FAT) at Central.

With the exception of the Communications Protocol and Firmware Tests, all tests shall be performed on 100 percent of installed equipment.

### **Organization of Tests**

#### **Test Procedures**

Prior to each phase of testing the Contractor shall submit detailed test procedures to the Authority for approval. These procedures shall provide a step-by-step test script that will demonstrate that all the site components are installed and operate correctly. Specification sections and manufacturer's specific features shall be referenced by the test script. The test script will be optimized to accomplish the maximum level of testing with the fewest steps (tasks). The script will contain step numbers, detailed information on what to perform in each step (enough detail for a layperson to follow), a reference to a specification/requirement, space for a date, time, pass/fail designation, and comment along with the task. The test procedures shall be submitted to the Authority for review and approval at least four (4) weeks prior to the start of the first test for each phase.

#### **Test Schedule**

The Contractor shall prepare a schedule for conducting tests. The Contractor shall give a minimum of two (2) weeks advance notice to the Authority before conducting the tests. The notice shall clearly identify the type of test and exact location of the equipment to be tested.

#### **Witnessing of Tests**

Tests conducted by the Contractor shall be witnessed by the Authority or a representative of the Authority.

#### **Test Reports**



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Following the completion of each test, the Contractor shall provide a written report detailing all test results and a proposed course of action for resolving any anomalies. In the event of a requirement deficiency requiring repair or replacement of a component, the Authority will require a full test to be repeated. The Contractor shall not commence Final Acceptance Tests without satisfactorily passing the previous phase of tests and without the written approval to commence testing from the Authority.

### **Communications Protocol and Firmware Tests**

Prior to installation of any equipment on-site, the Contractor shall demonstrate to the satisfaction of the Authority that the proposed CCTV can be successfully controlled and monitored using the existing central system workstation and communications protocols used by CHART. These tests may require the temporary connection of one or more CCTV cameras (physically located at the AOC Central) to the central system for testing purposes. The Contractor's Test Procedures shall clearly define the proposed equipment configuration necessary to conduct this test.

### **Standalone CCTV Camera Field Tests**

Each camera assembly furnished and installed by the Contractor shall be tested once installed in the field in a standalone fashion. Refer to Section 6.1 for more information.

### **Final Acceptance Tests at Central**

Following the completion of all Standalone CCTV Field Tests, Final Acceptance Tests shall be conducted at the AOC Central for each group of cameras installed under a particular Construction Contract. The purpose of this test is to verify that the CCTV System operates as a complete, integrated system in accordance with the requirements of these specifications. These tests shall be conducted primarily from the AOC Central (though some testing may occur at AOC South, AOC North, or another facility). These tests are designed to exercise all functions for each piece of equipment, including, but not limited to, the following:

- Camera – test to verify pan, tilt, zoom, iris on/off, focus near/far, power on/off, etc.) using SHA's CHART software.
- Video switch – test to verify proper integration with the VDAs/video switch, including routing to one or more monitors using SHA's CHART software.
- MPEG-2 encoding/decoding – tests to ensure the encoders/decoders are configured properly.
- SNMP MPEG-2/UPS management – tests to ensure the encoders/decoders and UPS can be managed by the existing MdTA SNMP management software and the new Contractor-provided SNMP management software.
- Software – tests to verify the COTS MPEG-2 decoding software works properly and the Internet Explorer plug-in works properly.

### **Requirements for Successful Completion**

During all phases of testing, all equipment (hardware and firmware) furnished and installed by the Contractor shall operate with the specified level of functionality and reliability, and to the satisfaction of the Authority without unresolved, intermittent, or sporadic failures. Successful completion of the acceptance period will occur at the end of ninety (90) continuous calendar-days of operation without system failure attributable to software or hardware furnished under this project, or ninety (90) calendar-days from the successful completion of the Final Acceptance Tests, whichever is later. That is, if the system operates successfully for sixty (60) calendar-days and then fails, it would then have to operate successfully for ninety (90) consecutive calendar-days to complete a successful test period – or sixty (60) calendar-days beyond the original ninety (90) day period.



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### **System Failures**

A system failure is defined as a condition under which the system is unable to function as a whole or in significant part satisfactorily. While a single component failure may not constitute a system failure, chronic failure of that component or component type or subsystem will be sufficient to be considered a system failure. The Authority will determine if failures experienced in the various testing phases constitute a system failure. General communication failure due to hardware or software furnished under this project, or failure of ten (10) percent or more of the system is considered a system failure in any case.

Communication failure due to a minor component may not be a system failure. Faults affecting all equipment in an area or type of component are considered as system failures. Specifically exempted are failures caused by acts of God or external forces beyond the control of the Contractor. The Authority will advise the Contractor in writing when it considers that a system failure has occurred or chronic failure exists.

### **Repairs During Testing Phases**

The Contractor's warranty for the hardware and software supplied under this project shall provide that in the event of a malfunction during any testing phase, that the defective component, card, module, subassembly or auxiliary device shall be replaced with a working component at no cost to the Authority. Any component of the system which, in the opinion of the Authority fails three or more times prior to the expiration of the Final Acceptance Tests, shall be judged as unsuitable and with the Authority's request, shall be replaced by the Contractor at his expense with a new component of the same type. The unsuitable component shall be permanently removed from the system. All diagnosis and repair shall be performed by a qualified, authorized representative of the manufacturer of the respective equipment. The Contractor shall furnish a letter to the Authority signed by the equipment manufacturer designating the authorized representatives of the equipment manufacturer whom will be used by the Contractor to perform warranty and maintenance work. Any repair, routine maintenance, or other work conducted by the Contractor shall be documented and reported in writing to the Authority. A warranty or field service repair log, organized by equipment type (ID) and date shall be prepared and delivered to the Authority every two months during the warranty period.

### **Traffic Operations During Testing**

All installation and testing activities shall be designed to have the least impact on traffic flows and shall be conducted in close coordination with AOC personnel. All installation and testing activities shall be performed by the Contractor in accordance with Maintenance of Traffic requirements or as directed by the Authority.

#### **6.19 Documentation**

The Contractor shall supply four (4) hard copies and four (4) electronic copies on CD-ROM of all documentation, including, but not limited to, user manuals, hardware manuals, system administration manuals, installation instructions, training materials, test plans, test procedures, as-built design information, configuration files, rack elevation drawings, and cable lists and drawings. Hardware Manuals are required for each type of equipment and a User's Guide for each type of software supplied.

#### **6.20 Spares**

No spares are required to be delivered with this Project. However, the Contractor shall have all required parts on hand to perform the work within 3 business-days of the Notice to Proceed for any installation. In



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In addition, MdTA may purchase, at anytime within the Contract Period of Performance, any equipment required using the designated equipment bid items.

### 6.21 Training

#### DESCRIPTION

This work shall consist of training services, as specified herein.

#### MATERIALS

The Contractor shall provide all classroom-training materials for the MdTA trainees. The Contractor shall submit one copy of the training materials for review and approval by the engineer 30 calendar-days before the beginning of each type of training.

The MdTA shall supply a suitable classroom for the classroom-based training. The classroom shall be located at one of the Baltimore Area facilities including the Francis Scott Key Bridge, Baltimore Harbor Tunnel, or the Fort McHenry Tunnel facilities. The Contractor shall provide laptop computer and projector for any presentations.

#### REQUIREMENTS

The training requirements are as follows:

Thirty (30) calendar-days before system acceptance, the Contractor shall provide System Operational Training for the hardware, software and communications installed as part of this Contract. The training shall consist of two (2) sessions; each session shall accommodate 5-8 MdTA staff. Each training session shall consist of one day of classroom instruction and one day of hands-on training. Separate classes shall be given for each of the following subsystems:

- CCTV assembly: including, but not limited to, operation of the camera; camera assembly installation, removal and replacement; pressurizing and depressurizing the camera assembly; cleaning and routine maintenance of the camera assembly; testing the camera assembly; troubleshooting the camera assembly; and diagnostics.
- MPEG2 Video Coder and Decoder: including, but not limited to, theory of operation, installation, removal and replacement, connections, restoring default factory settings, changing the default factory settings to the MdTA specific settings, testing, troubleshooting, and diagnostics.
- CCTV Software: Any software provided shall be included in training. Lessons shall include installation, configuration, minimum system requirements, troubleshooting, theory of operation, overview of functions, diagnostics, and testing.
- Miscellaneous Hardware: Review the setup, configuration, troubleshooting, repair and replacement of all miscellaneous hardware and software furnished and installed, including, but not limited to, Video Distribution Amplifiers, UPS, and Hardened Ethernet Switch.

Ninety (90) calendar-days before the maintenance period ends, the Contractor shall provide System Maintenance Training for the hardware, software and communications installed as part of this contract. The training shall accommodate 6-7 MdTA maintenance personnel. It shall include two (2) days on



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camera/dome assembly (one day in classroom and one day in the field), and two (2) days on MPEG-2 communications (one day in classroom and one day in the field). The training shall be organized by subsystems, for example, Hardware, CCTV Software, Field Camera, etc.

An MdTA-approved manufacturer's representative(s) shall provide the training.

On-The-Job-Training: After training, and during the Contractor warranty period, the Contractor shall provide on-the-job-training (OJT). Whenever the Contractor provides warranty or maintenance services, one or more MdTA maintenance technicians will accompany the Contractor to observe repairs as part of the OJT. Additionally, where prudent, safe, and non-interfering, the MdTA staff shall be offered the opportunity to participate in repairs and receive hands-on experience with repair work under the guidance of the Contractor.

## MEASUREMENT AND PAYMENT

The specified training services will be measured and paid for as a lump sum bid item. The payment under this item will include all materials and labor as may be needed to perform complete and acceptable training sessions, including the training submittal/approval process as well as preparing for and conducting the training. The level of acceptability will be based on the evaluation of the trainees. The payment schedule is as follows:

- 50% after the training sessions
- 50% after the satisfactory evaluation result

Liquidated damages apply as follows for this bid item. Failure to provide this item within 30 days of advance notification by MdTA will result in a 10% reduction of the pay item for each day late.

Refer to Bid Item 8035.

### **6.22 Warranty Period**

All equipment shall be warranted by the manufacturer for three (3) years from the date of installation. In addition, the Contractor shall supply a one-year Contractor warranty (covering parts and labor), commencing after the Acceptance period and after the 90-day Observation Period expires.

### **6.23 Maintenance and Technical Support Services Contract**

This project will also require the Contractor to provide and execute a preventive and corrective maintenance plan (PCMP) for CCTV cameras and related equipment for the MdTA. The Contractor shall provide the following:

- The Contractor shall supply one work crew, consisting of two technicians and a truck.
- The Contractor shall provide the necessary equipment (e.g., a lift truck with mobile platform, or electric/gas boom lift, or scissors lift, etc.) to provide safe, sturdy access from the tunnel roadway to cameras in the tunnels that are not on lowering devices. The equipment shall grant technician access to the FMT cameras, which are mounted to the ceiling, and the BHT cameras which are mounted to the side walls above the catwalks. The equipment shall provide vertical movement ranging from approximately 5' – 10', and horizontal extensions of at least 5'. It is the Contractor's responsibility to ensure that the proper equipment is provided for technician safety and that provides the adequate vertical and horizontal reach to work in both tunnels. For cameras outside



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of the tunnel, a regular truck (no bucket truck required as all PTZ cameras have lowering systems) is required.

- The Contractor will store all spare parts and supply them to the crews for each job.
- MdTA will schedule preventive maintenance and repairs, and set priority for each job. Corrective maintenance/repair work will have higher priority.
- The Contractor will be paid by the hour for all repair work orders, and unit cost for preventive maintenance work orders. The preventive maintenance cost will include lane-closure cost, as required.

The Contractor shall be responsible for preventive and corrective maintenance of all CCTV equipment installed under this Contract for up to three (3) years (or five years if the two one-year options are invoked) after the CCTV system is commissioned and accepted by the Authority, and after the one-year Contractor warranty expires, or immediately upon contract award for existing equipment not installed under this contract. Any preventive or corrective maintenance required before the above-mentioned dates shall be at the Contractor's expense. No payment for labor or materials will be made to the Contractor for repairs required while the one-year Contractor warranty is in effect. Similarly, no payment will be made for materials after the one-year Contractor warranty has expired, but while the 3-year manufacturer warranty is still in effect.

The Contractor shall provide on-call, on-site, technical support, to address corrective and preventative maintenance for MdTA's CCTV system. This Contract covers corrective and preventative maintenance on any cameras as directed by the Authority. The support is designed to primarily cover MdTA's existing cameras, though it can also be used to provide support for cameras installed as part of this Contract or other cameras throughout the State of Maryland, but only when it is clearly outside the Vendor and Contractor Warranty periods.

For corrective maintenance and repair work, MdTA has established a maximum response time (in hours) and a maximum repair time (in business-days) for each type of devices and typical failures. See Table 6-5 below. These limits are part of the contract's terms and conditions.

**Table 6-5. Established Limits for Response Time and Repair Time for Corrective Maintenance**

<b>EQUIPMENT</b>	<b>REPORTED PROBLEMS</b>	<b>MAXIMUM RESPONSE TIME (Hrs)</b>	<b>MAXIMUM REPAIR TIME (Business Days)</b>
Camera (CCTV)	No video	24	3
	No camera control	36	3
	Partial camera control	36	3
	Camera replacement	24	3

The estimated preventive maintenance interval for CCTV system components is based on the review of available manufacturers' manuals, and discussion with other agencies in the region. Table 6-6 and 6-7 show these estimated maintenance intervals and preventative maintenance items for PTZ Cameras and Fixed Tunnel cameras, respectively. The Contractor should perform all preventative and corrective maintenance in accordance with manufacturer guidelines. The Contractor shall provide a submittal for a preventative maintenance checklist for PTZ and Tunnel cameras based on the information below. Once approved by MdTA, the checklist should be used by the Contractor to perform the work. Signed copies of



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the checklist (with all check marks, notes, and descriptions of corrective actions) should be provided to MdTA upon completion. The Contractor should perform periodic (at least twice per year at two or more camera sites) independent quality assurance of its employees work to ensure the checklist procedures are being adhered to. The Contractor should perform all maintenance work in accordance with MdTA's MOT procedures. It should also be understood that the majority of the maintenance work for Tunnel cameras must be performed during off-hours, normally at night since tunnel closures are required. Consumable items, such as, bulbs, fans, lubricant, fasteners, connectors, cables, etc., are considered incidental to the contract.

**Table 6-6. Preventive Maintenance Tasks for PTZ Cameras**

COMPONENT	MAINTENANCE ACTIVITIES	INTERVAL
Support Structure	Check CCTV pole and foundation for damage (for lightning, leaning, car, vandalism, corrosion damage, etc.). Check for proper clearance of tree branches or brush. Note any required trim work.	12 months
Power Source	Check CCTV power source/pedestal meter. Check all power/conduit runs. Check power distribution unit for proper functioning.	12 months
Dome Pressure	Check dome pressure and fill with dry Nitrogen if pressure is less than 5 PSI. Fill to no more than 10 PSI. <i>Caution: Pressurizing the Housing Assembly beyond 10 PSI, or with an unregulated gas source, can cause severe injury to personnel and permanent damage to the assembly. Do not use any gas type other than dry Nitrogen. The use of Shop Air can introduce moisture into the Housing Assembly that can damage it over time.</i>	6 months
Dome Interior Shield	Check for dust or dirt on the interior of the dome. If dust or dirt accumulates in the Lower Dome's interior, remove it with clean dry pressurized air.	6 months
Dome Exterior Shield	Check the exterior for dirt, grime or streaking. If spots, streaks or stains appear on the exterior, they should be removed with a solution of mild soap or isopropyl alcohol and water using a lint-free soft paper towel. Clean all surfaces with any soft cleaning cloth and a mild glass cleanser suitable for acrylic plastic. Dry with clean, dry pressurized air. Scratches or surface blemishes on the exterior may be removed with a nonabrasive wax using a soft cleaning cloth. Spray with RAIN-X to protect the dome.	6 months
Dome Gaskets	Check the dome's O-ring gasket. Ensure it is seated properly. Apply grease as required.	6 months
Lowering System's Disconnect Unit	Lower the dome. If there are any signs of irregularities in the disconnect (such as bent parts, missing hardware, or frayed cable) contact the factory. Keep the guide pin and the rubber gasket ring greased and cleaned. Brush on <i>Super Lube®</i> by <i>Synco Chemical</i> (can be purchased through <i>Camera Lowering Systems</i> ). The blue block locking cams should be checked. Ensure that the shoulder screw is tightened. (Note: this is a safety issue and is considered a critical check.) Apply lock-tight as required. Check all screws, nuts, and fastenings to ensure that they are tight. Check the composite cable for any irregularities.	6 months



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COMPONENT	MAINTENANCE ACTIVITIES	INTERVAL
Lowering System's Manual Winch	<p>Check the lowering cable for kinks, cut strands, and any irregularities. Do not run the cable using bare hands, as strayed strands could cause cuts and injuries to hands. Replace cable as required.</p> <p>The gears on the winch should be checked for gearing grease. If the gear box looks dry, gear grease should be applied on the gears only, with a small paint brush. The grease should be applied liberally to cover all gears. Recommended grease should be UNIWRI 2 product C163520 Manufactured by Fuchs Lubricants. This grease may be obtained through <i>Camera Lowering Systems, Inc.</i> A drop of 10W-30 oil should be applied in opening of casement (see label on the winch). Only apply one drop annually. After applying, crank the winch at least 3 revolutions to distribute the oil. Check the cable for any kinks, bends, or strayed cut wires. This will tell you if the cable is rubbing on an obstruction. If the cable is damaged, it will be weakened and possibly break. Damaged cables should be replaced. Handle the wire rope with gloves to avoid possible hand cuts caused by strayed wires.</p>	6 months
Fuses	<p>Check all fuses and replace them as necessary. A fuse (F2) is located on the Auxiliary Fan &amp; Heater Interface Board. When necessary, replace it with the following Fuse value and type: F2: 5x20 mm, 4.0 amp, 250 volt, slo-blo. Two fuses (F1 and F2) are located on the Communication/Power Supply Board of the Camera/Drive. When necessary, replace the F1 fuses with 2AG, 1.6 amp, 250 volt, slo-blo; and F2 fuses with 2AG, 2.5 amp, 250 volt, slo-blo.</p>	6 months
Camera Housing/Cables	<p>Inspect all cables and connections in the camera housing. Repair as required.</p>	6 months
Camera Control Receiver	<p>Check pan-tilt-zoom functions using laptop, check connections.</p>	6 months
Surge Protection/Power	<p>Inspect and test surge protection and power connections in the cabinet. Repair as required.</p>	6 months
Video Processing Equipment	<p>Inspect all cables and connections for FO modems, Ethernet switches/routers, and MPEG-2 codecs as required. Tighten and repair as required.</p>	6 months
CCTV Cabinet	<p>Replace any cabinet bulbs as required. Check cabinet for water/air tightness. Seal any holes or gaps as required. Check cabinet entries (e.g., conduit) and re-apply putty and steel wool as required to keep rodents out. Check cabinet supporting brackets. Tighten as required. Check couplings in and around the cabinet, transformer, disconnect box for rust. Apply galvanized touch-up paint, as required, to cabinet, couplings, cabinet bands, and area around handholes. Clean/sweep inside of cabinet as required. Replace any worn or faded cable labels as required. Add new labels as required. Replace any damaged cabinet documentation as required.</p>	6 months
Cable Connections	<p>Check all communication connections (fiber, serial, coax). Check all cable connectors (ST, BNC, DB-9) and components (FO modems, Ethernet switches, A/C couplers) for proper operation. Clean fiber connections in accordance with Corning SMF-28 recommendations. Repair/replace fiber/coax connections/connectors/jumpers/cables as required. Perform fiber OTDR and video signal strength/quality tests using OTDR equipment and waveforms as required. Check all terminal strips for corrosion. Clean as required.</p>	6 months



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COMPONENT	MAINTENANCE ACTIVITIES	INTERVAL
Disconnect Box and LB	Check the disconnect box for blown fuses. Replace them as required. Check for rodents. Clean with blown air as required. Apply putty and steel wool as required to keep rodents out. Check for water leaks. Seal as required. Check couplings in and around the disconnect box for rust. Apply galvanized touch-up paint as required.	6 months
Concrete Pads/Work Area	Spray grass/weed killer around base of pole, and concrete pads as required. Note: All undesirable vegetation growing within camera work pad areas shall be eradicated using a grass and weed killer agent in conformance with the manufacturer's recommendations. During each growing season, the Engineer and the Contractor shall inspect the site on or about May 30, to determine if weed control is acceptable. Eradication shall be performed prior to these inspections. All weeds greater than 6 in. high shall be cut down and removed from the project. Any remaining live weed growth shall be treated with herbicide until eradicated. All herbicide applications shall be as specified in the Maryland Pesticide Applicator's Law and in conformance with the manufacturer's recommendations. The Contractor shall be responsible for replacing and pruning any plant material which is killed or damaged through any act of negligence by the Contractor in applying and handling of the herbicide on the project.	6 months
Firmware	Download manufacture's latest firmware as required by MdTA.	6 months
Presets/Titles	Restore camera presets, titles, and camera settings as required by MdTA.	6 months
Encoder/Decoder Cards	Reset/reseat camera encoder/decoder cards, if required.	6 months
Miscellaneous	Repair and replace any stripped or broke-off screws, with like screws, as required. Repair and replace broken hand-hole chains as required. Lubricate pad lock on cabinet door.	6 months

Table 6-7. Preventive Maintenance Tasks for Fixed Tunnel Cameras

COMPONENT	MAINTENANCE ACTIVITIES	INTERVAL
Support Structure	Check CCTV tunnel mounting and support bracket (for corrosion, alignment, etc.). Realign and refocus the cameras as required by MdTA and to meet the detection zones of the existing Incident Detection system. Note: this requires a minimum of two Contractor provided technicians (one in the tunnel at the camera site, and one at the AOC). Check the Amphanol connection on the rear of the enclosure. Ensure no bent pins and connection is snug. Clean and re-secure the connection.	12 months
Power Source	Check CCTV power source/meter. Check all power/conduit runs. Check power distribution unit for proper functioning.	12 months
Enclosure Pressure	Check enclosure pressure and fill with dry Nitrogen if pressure is less than 5 PSI. Fill to no more than 10 PSI. <i>Caution: Pressurizing the Housing Assembly beyond 10 PSI, or with an unregulated gas source, can cause severe injury to personnel and permanent damage to the assembly. Do not use any gas type other than dry Nitrogen. The use of Shop Air can introduce moisture into the Housing Assembly that can damage it over time.</i>	6 months



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COMPONENT	MAINTENANCE ACTIVITIES	INTERVAL
Enclosure Interior Glass	Check for dust or dirt on the interior of the enclosure. If dust or dirt accumulates in the interior, remove it with clean dry pressurized air.	6 months
Enclosure Exterior Glass	Check the exterior glass for dirt, grime or streaking. If spots, streaks or stains appear on the exterior, they should be removed with a solution of mild soap or isopropyl alcohol and water using a lint-free soft paper towel. Clean all surfaces with any soft cleaning cloth and a mild glass cleanser. Dry with clean, dry pressurized air. Scratches or surface blemishes on the exterior may be removed with a nonabrasive wax using a soft cleaning cloth. Spray with RAIN-X to protect the enclosure lens.	6 months
Camera and Lens	Retract the camera slides. Inspect and clean the camera and camera lens as required. Zoom and focus the lens settings in response to MdTA recommendations.	6 months
Enclosure Gaskets	Check the enclosure's gasket. Ensure it is seated properly. Apply grease as required.	6 months
Enclosure	Clean the external enclosure and vacuum/blow the interior of the enclosure as required.	6 months
Fuses	Check all fuses and replace as necessary.	6 months
CCTV Cabinet	Replace any cabinet bulbs as required. Check cabinet for water/air tightness. Seal any holes or gaps as required. Check cabinet entries (e.g., conduit) and apply putty and steel wool as required to keep rodents out. Check cabinet supporting brackets. Tighten as required. Check couplings in and around the cabinet, transformer, disconnect box for rust. Apply galvanized touch-up paint, as required, to cabinet, couplings, cabinet bands, and area around handholes. Clean/sweep inside of cabinet as required. Replace any worn or faded cable labels as required. Add new labels as required. Replace any damaged cabinet documentation as required.  Note: the boxes for the FMT cameras are in the exhaust ducts. The boxes for the BHT cameras are wall mounted. Technicians should adhere to MdTA guidelines when working in the tunnels.	6 months
Cable Connections	Check all communication connections (fiber, serial, coax). Check all cable connectors (ST, BNC, DB-9). Clean fiber connections in accordance with Corning SMF-28 recommendations. Repair/replace fiber/coax connections/connectors/jumpers/cables as required. Perform fiber OTDR and video signal strength and quality tests using OTDR equipment and waveforms as required. Check all terminal strips for corrosion. Clean as required.	6 months
Firmware	Download manufacture's latest firmware as required by MdTA.	6 months
Presets/Titles	Restore camera presets, titles, and camera settings as required by MdTA.	6 months
Encoder/Decoder Cards	Reset/reseat camera encoder/decoder cards, if required (located at hub sites).	6 months
Miscellaneous	Repair and replace any stripped or broke-off screws, with like screws, as required. Repair and replace broken hand-hole chains as required.	6 months

Table 6-8 provides a description of the preventative maintenance tasks to be performed at any of the designated hub sites.



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**Table 6-8. Preventive Maintenance Tasks for Hub Sites**

COMPONENT	MAINTENANCE ACTIVITIES	INTERVAL
Hardware and Hub Buildings	<ul style="list-style-type: none"> <li>• Inspect for any insect or rodent issues. Cleanup and repair any visible damage.</li> <li>• Replace any bulbs.</li> <li>• Replace HVAC air filters as required.</li> <li>• Clean any equipment fans or collected dust on the outside of equipment only, using compressed air and a small vacuum.</li> <li>• Sweep floors.</li> </ul>	12 months

**MATERIALS**

The Contractor shall provide replacement parts as required to address any corrective/repair type maintenance. The list of repair parts, for which there are separate bid items, include the following equipment:

- MPEG-2 encoder/decoder chassis
- MPEG-2 decoder cards
- MPEG-2 encoder cards
- MPEG-2 hardened standalone encoders
- VDA chassis/cards
- PTZ Camera/Dome Assembly (SVFT-PR23 or comparable)
- VFR Type 3
- VFT Type 3
- UPS
- Hardened Ethernet Switch
- MPEG-2/H.264 Encoder (if supplied)
- MPEG-2/H.264 Decoder (if supplied)
- MPEG-2/MPEG-4 Encoder (if supplied)
- MPEG-2/MPEG-4 Decoder (if supplied)
- Fixed Tunnel Camera
  - Note: existing camera is Vicon VC465-DSP 1/3 Inch Digital Color Camera, with V5-50VF-CS-G 5-50mm, f 1.3, autoiris lens; Contractor should supply an amphenol connector and composite cable to integrate with existing cables. Note: The Offeror should understand that a specialized mil-spec amphenol camera connector and cable is required and may require the cable to be connectorized with a custom connector.
- Tunnel Camera Pressurized Enclosure Assembly
  - Note: existing tunnel camera enclosure is Aigis HS9384 Pressurized Enclosure
- Tunnel Portal Camera
  - Note: existing camera is Vicon VC565-DSP Day/Night with V5-50VF-CS-G 5-50mm, f 1.3, autoiris lens; Contractor should supply an amphenol connector and composite cable to integrate with existing cables. Note: The Offeror should understand that a specialized mil-spec amphenol camera connector and cable is required and may require the cable to be connectorized with a custom connector.



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The Offeror should understand that all cables and necessary connectors should be supplied by the Contractor, and be incidental to the contract bid item.

All other replacement parts will be paid for at the price paid by the Contractor plus a maximum 15% markup.

## MEASUREMENT AND PAYMENT

Preventive Maintenance will be measured and paid for (outside of the warranty periods) at the contract unit price for each PTZ camera, fixed camera, or hub site at any MdTA designated location. The unit price shall include all labor, materials needed for the maintenance of cameras, vehicle rentals including truck attenuators, cleaning materials, and all other incidentals. The Contractor shall provide their own tools. The unit price payment shall cover all compensation for all materials, labor, equipment, and all other incidentals necessary to complete this work. There will be a separate bid item for use of equipment to provide access to cameras not on lowering devices. The Contractor will be reimbursed for all replacement parts as described below.

Corrective Maintenance will be measured and paid for (outside of the warranty periods) at the contract unit price (i.e., hourly rate) per each occurrence as requested by the Authority, which shall include full compensation for all travel costs, labor, vehicle rentals including truck attenuators, materials, and all other incidentals necessary to complete this work. The Contractor shall provide their own tools. There will be a separate bid item for use of equipment to provide access to cameras not on lowering devices.

The Contractor will be reimbursed for all replacement parts outside of the warranty periods. All replacement parts, except those identified in the bid item list, will be paid for at the price paid by the Contractor plus a maximum 15% markup. The markup shall include a 1 year warranty on the supplied item and overhead/handling by the Contractor. The Contractor is required to supply copies of actual invoices and proof of payment (cancelled checks, receipts showing payment, etc.). If materials are bought in a lot, the price of each one in the lot is the total lot price divided by the number of units in the lot.

All replaced parts will become property of the Authority and will be returned to the Authority. There will be no exception to this requirement. Preventive Maintenance will be performed at recommended intervals. Corrective maintenance will be performed as required. MdTA will prioritize the work. The Contractor will be required to provide all tools, materials, rental of equipment, materials including attenuator, and all incidentals. Work schedule and traffic control plan will need to be reviewed and approved by the Authority before beginning work.

Liquidated damages apply as follows for this bid item. Failure to perform preventative maintenance within 7 days of advance notification by MdTA will result in a 10% reduction of the pay item for each day late. Failure to perform corrective maintenance and restore operations within 3 days of advance notification by MdTA will result in a 10% reduction of the pay item for each day late. Exceptions will be made on a case-by-case basis (e.g., external factors will be considered, such as fiber or electrical outages).

Refer to Bid Items 8005, 8006, 8007, 8008, 8037, 8038, 8039, 8040, 8041, and 8042.

### **6.24** Submittals

Shop drawings, catalog cuts, calculations, plans, lists, documentations and information shall be submitted for approval for all software and equipment prior to procurement, including, but not limited to, the following list:



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- All hardware and software, including, but not limited to the CCTV Camera, MPEG-2 Encoder/Decoder Cards and Chassis, Hardened MPEG-2 Standalone Encoder Units, Hardened MPEG-2 Standalone Decoder Units, MPEG-2 COTS Decoding Software, MPEG-2 Software Decoder Plug-In for Internet Explorer, Rack-mounted Type I UPS, Type I, II and III Racks, Video Distribution Amplifiers (VDAs), Video Fiber Transmitters (VFTs) Type 3 and Video Fiber Receivers (VFRs) Type 3, Hardened Ethernet Switches, and any optional equipment/software (e.g., H.264 or MPEG-4 equipment/software).
- All documentation, including, but not limited to user manuals, hardware manuals, system administration manuals, training materials, as-built design information, rack elevation drawings, preventative maintenance checklists, and cable lists and drawings.
- Acceptance Test plans and procedures (including requirements-to-test procedure traceability matrices) for the CCTV and MPEG-2 video systems.

The Contractor is required to determine all materials required, and account for lead times, review times and other factors to assure timely completion of the work. All submittals shall be in the Adobe PDF format (Version 6) and transmitted to MdTA via e-mail. MdTA's electronic submittal procedure is discussed in Section 2 of this RFP. The Contractor shall provide the submittals for each piece of equipment or assembly (e.g., camera/dome assembly, encoder, decoder, etc.) so that they can be reviewed by a member of a multi-disciplinary team. Furthermore, each submittal shall be small enough to be transmitted by e-mail and completely reviewed in approximately two weeks. A large submittal containing multiple items will not be acceptable. The submittals shall be considered incidental to each bid item.

### **6.25 Miscellaneous Repairs, Parts, Maintenance and/or Construction**

A contingent allowance of \$300,000 has been included in the Proposal Form for miscellaneous repairs, parts, maintenance, tree trimming, field cabinet work zone timber/cribbing, and construction that may be deemed necessary by the Engineer during the contract performance period.

This work shall be performed only upon written direction of the Engineer. Upon the direction from the Engineer, the Contractor shall submit a written time and material cost for this task, for the Engineer's review prior to commencing any work. All tree trimming work should be conducted in accordance with Sections 712-714 of the SHA's *Standard Specifications for Construction and Materials, as appropriate*.

The Contractor shall allow two (2) weeks for the review, and notice of approval or rejection of the proposal. If the proposal is rejected, the Contractor shall have no claim for time, materials, or other costs associated with the preparation of the proposal. If the proposal is approved, the costs, if any, associated with preparation of the proposal shall be incidental to the proposal.

In lieu of a proposal, the Engineer may direct the Contractor to perform the work in accordance with the requirements of "Force Account Work" Section GP9.02 of the Specifications.

### **METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

All work performed under this item will be paid for on the basis of approved price proposals and/or force account records submitted in accordance with Section GP9.02 of the Specifications and with the authorization of the Engineer. Approved amounts shall be a full compensation for all labor, equipment, materials, and incidental items complete and in place as directed by the Engineer. Only the agreed upon or documented costs shall be paid from a lump sum amount as specified in the schedule of prices.

Refer to Bid Item 8041.



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**6.26 Monthly Project Management Activities**

**DESCRIPTION**

This work shall consist of the Contractor performing monthly project management activities identified below.

<b>PM Activity</b>	<b>Description of Work</b>
1. Schedule Updates	Provide an updated monthly schedule in MS Project. The monthly schedule shall show all scheduled work such as preventive maintenance and planned maintenance activities.
2. Monthly Maintenance Log Report	Provide a list of maintenance calls/trouble tickets consisting of the devices(s) reported and the date/time of the report. Provide a list of maintenance (both preventative and corrective) performed and cross-reference the list to the maintenance calls. Report shall be organized by ITS device ID, and shall include date, technician name, and detailed description of corrective action(s). The report shall address the status of any maintenance calls/trouble tickets that have no corresponding corrective action.
3. Monthly Progress Report	Provide a written report in MS Word that includes accomplishments, issues, and EWA status. Also, a cumulative MTBF and MTTR for the system and also separately for each major component (camera, FO modems, encoders, decoders, switches) shall be provided.
4. Monthly Status Report	This report shall list all devices covered by the contract and shall list the working condition of those devices on the last date of the reporting period as well as the condition from the last report. The non-working conditions shall be either degraded or failed. A degraded device is one, which provides some use but is not fully functional. A failed device is one, which provides no useable benefit to operations. For each device in a degraded or failed state, the report should list how long the device has been in a non-working state. The contractor is responsible for obtaining the working or non-working status by visiting the AOC once per month at the end of the reporting period and surveying the equipment from the operator's perspective. In addition, the report shall maintain a cumulative status for each device that counts the number of times the device has been shown in a non-working status on the monthly status report.
5. Progress and Construction Meeting Attendance	The Contractor shall attend monthly progress meetings for the project. The Contractor should plan on the average meeting length to be 4 hours. An updated schedule, maintenance log, status report, and progress report shall be delivered at least 1 business day before each meeting. The minimum attendees from the Contractor shall include the Project Manager, Scheduler, Construction Lead, and Technical Lead.
6. Other Minor Project Management Tasks, as required.	This will include meeting support, teleconference support, follow-up to action items, and other miscellaneous duties as required to properly document, report, and manage the project to the satisfaction of the Engineer.

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

This work shall be paid per each month based on satisfactory attendance and reporting at the monthly progress meeting. The payment under this item will include all materials and labor as may be necessary to perform the Monthly Project Management Activities including but not limited to data gathering and analysis, report preparation, schedule updates, meeting attendance, and response to follow-up action



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items from the meeting. Any month in which a meeting is not held for any reason shall not be paid; however reports as required shall be submitted for inclusion in the next monthly meeting. Also, any month in which the scheduled item activities have not been satisfactorily performed or delivered will not be paid.

Refer to Bid Item 8045.

### **6.27 Fiber Locates**

Fiber locates shall consist of locating underground fiber optic, electrical or copper cables, as well as fiber optic or electric manholes. This work shall be performed only upon written direction of the Engineer. Upon the direction from the Engineer, the Contractor shall perform the fiber locate, as per the Engineer's written direction. Fiber locates may be required anywhere within the scope of this contract. The Engineer shall specify the general location and approximate length of the fiber to be located. The Engineer shall also specify if the locate is an emergency or non-emergency locate.

The Contractor shall be responsible for performing the locates. The locates shall indicate, using labeled stakes, flags, and/or highly visible paint marks, the center line of the underground plant. Markings or stakes used for the identification of the underground plant shall be spray painted in "HOT PINK". A distinct color flag or paint should be used to identify manhole locations. Locate accuracy shall be considered to be three (3) feet on either side of the surface center line, unless the locate instructions specifically indicate other boundary limits. The expiration date for the locate shall be no more than 30 days from the date of the original locate. For emergency locates, the work shall be completed within eight (8) business hours of notification. For non-emergency locates, the work shall be completed with two (2) business days of notification. Within one (1) business day of completing the work, the Contractor shall submit to the Engineer a completed form with the following information:

1. Name of Technician
2. Date of Work
3. Starting Time
4. Ending Time
5. Location of Work (starting road name, direction, mile post, and area [e.g., shoulder, gore area, median, etc.] and ending road name, direction, milepost, and area [e.g., shoulder, gore area, median, etc.]
6. Approximate Distance of Locate
7. Any Issues, Notes to Excavating Contractor
8. Digital Picture of Starting Location showing proof of flags and paint
9. Digital Picture of Ending Location showing proof of flags and paint

### **METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Fiber locates will be measured and paid for at the contract unit price (i.e., hourly rate) per each occurrence as requested by the Authority, which shall include full compensation for all labor, materials, and all other incidentals necessary to complete this work. The Contractor shall provide their own locate tools and materials, such as paint, markers and flags, which will be considered incidental to the pay item. In some cases, MdTA may elect to provide the Contractor with special fiber optic markers. The hourly rate will only cover work while at the site related to the fiber locate. Hourly costs shall be recorded rounded to the closest quarter-hour increment. Travel costs will not be included in the hourly rate. For each locate, a mobilization item shall be used to cover travel expenses for bringing the crew and materials to the locate site. Mobilization shall also cover vehicle usage. There shall be no more than one



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mobilization fee per day, and the price will be the same regardless of location, length of locate, or crew size.

Liquidated damages apply as follows for this bid item. Failure to provide this item within eight (8) business hours of advance notification by MdTA for emergency locates, or within two (2) business days of advance notification by MdTA for non-emergency locates, will result in a 10% reduction of the pay item for each day late.

Refer to Bid Items 8046, 8047, and 8048.

<End of RFP Section 6>