CITY OF HARRISONBURG
DEPARTMENT OF FINANCE
AND PURCHASING
409 SOUTH MAIN STREET,
THIRD FLOOR
HARRISONBURG, VA 22801

REQUEST FOR PROPOSAL (RFP) COVER PAGE

ISSUE DATE: December 15, 2015	**REQUEST FOR PROPOSAL NUMBER:** 2016020-PW-P	**FOR:** Traffic Control Cabinet Assemblies
DEPARTMENTS: Public Works	**DATE/TIME OF CLOSING:** January 5, 2016 at 3:00pm local time	**CONTRACT ADMINISTRATOR:** Brad Reed, Transportation Planner
DATE/TIME LAST DAY FOR QUESTIONS: December 28, 2015 at 12:00pm (noon) local time	**DATE/TIME PRE-PROPOSAL MEETING:** N/A	**PRE-PROPOSAL MEETING MANDATORY:** ☐ Yes ☐ No ☑ N/A

Proposals - In accordance with the following and in compliance with all terms and conditions, unless otherwise noted, the undersigned offers and agrees, if the proposal is accepted, to furnish items or services for which prices are quoted, , delivered or furnished to designated points within the time specified. It is understood and agreed that with respect to all terms and conditions accepted by the City of Harrisonburg the items or services offered and accompanying attachments shall constitute a contract.

Sealed proposals, subject to terms and conditions of this Request for Proposal will be received by the City of Harrisonburg Purchasing Office, 409 South Main Street, Third Floor, Harrisonburg, Virginia 22801 until the date/ time specified above for furnishing items or services delivered or furnished to specified destinations within the time specified or stipulated by the vendor(s).

The City does not discriminate against small and minority businesses or faith-based organizations.

VENDOR INFORMATION

Name of Vendor:_____ Telephone #:_____

Address: _____ Federal Employer Identification #:_____

_____ State Corporation Commission #:_____

Contact Name: _____ Contact Email Address:_____

By signing this bid, Vendor(s) certifies, acknowledges, understands and agrees to be bound by the conditions set forth in this RFP.

_____ _____
VENDOR'S LEGALLY AUTHORIZED SIGNATURE **DATE**

_____ _____
PRINT NAME **TITLE**

Please take a moment to let us know how you found out about this Request for Proposal (RFP) – Check one:

☐ City of Harrisonburg Website ☐ eVA Website ☐ Bid Room (Please List) _____

☐ The Daily News Record Newspaper ☐ Notified by City Directly ☐ Posted on Municipal Building bulletin board

☐ Other (Please List) _____

This document must be completed & returned with proposal submission.

Table of Contents

I. INTRODUCTION

The purpose of this Request for Proposal (RFP) by the City of Harrisonburg, Virginia (City) is to solicit sealed proposals from interested firms (Offeror) to provide Traffic Control Cabinet Assemblies, as described here within.

II. BACKGROUND

The City of Harrisonburg was established in 1780 and was named for Thomas Harrison, who donated the land for the Rockingham County Court House, which became the permanent county seat of Rockingham County in 1781. The City was incorporated in 1849 and was proclaimed a city of the first class in April 1990. It now encompasses 17.3 square miles and serves a population of approximately 51,200. The City of Harrisonburg manages a workforce of approximately 790 employees responsible for providing government services to our citizens.

The City Public Works Department has a staff of more than 100 employees and provides the following services, including but not limited to, trash collection, recycling, maintenance of city streets, maintenance of traffic signals and street signs, transportation planning, and construction of new transportation facilities. The Department manages a total of 83 traffic signals and is in the process of transition from TS1 to TS2 Type 1 control cabinets.

III. SCOPE OF WORK

Offerors shall submit a proposal on the attached Cost Proposal Form (Attachment G) for the purchase of two (2) types of traffic control cabinet assemblies. The first is NEMA TS2 Type 1 M60 traffic control cabinet assembly (detailed specifications in Attachment I) and the second is the NEMA TS2 Type 1 P44 traffic control cabinet assembly (detailed specifications in Attachment J). The cabinet assembly shall meet, as a minimum, all applicable sections of the NEMA Standard Publication No. TS2-2003 v. 2.06. Where the differences occur, this specification shall govern.

A. Detailed Specifications

Detailed specifications for the two (2) traffic control cabinet assemblies may be found in the Attachments to this RFP.

- NEMA TS2 Type 1 M60 traffic control cabinet assembly (Attachment I)
- NEMA TS2 Type 1 P44 traffic control cabinet assembly (Attachment J)

B. Order Information & Estimates

The City anticipates an initial order of six (6)TS2 Type 1 P44 units and two (2) TS2 Type 1 M60 units. No minimum amount of units or orders will be guaranteed under this contract.

C. Add/Remove Units

The City reserves the right to add or remove any related traffic control cabinet assemblies, devices and/or accessories related to the systems during the contract term and any subsequent renewals. The City shall incur no penalties for adding and/or removing devices.

D. Delivery of Units

All deliveries shall be made to the City of Harrisonburg Central Stores Warehouse, located at 2111 Beery Road, Harrisonburg, VA 22801. Hours of operation are Monday through Friday from 7:30am to 3:30pm, with the exception of City holidays. All deliveries shall give a minimum of forty-eight (48) hour notice to the Warehouse Manager, Jeffrey Moyer by calling 540-437-4400. Offeror shall list their lead time in *Attachment A*. The successful Offeror will be held strictly to the lead time stated in the proposal document and delivery after this date may incur liquidated damages.

Delivery date and lead times will be taken into consideration during the evaluation of this proposal. All product delivered will be FOB destination. Price provided in the vendor's proposal shall include delivery cost of units. No additional delivery cost shall be added.

E. Liquidated Damages

Due to the timeline and nature of the City's traffic signal project, it is imperative that the devices purchased through this proposal arrive in a timely manner. The successful Offeror will be held strictly to the lead time stated in the Cost Proposal (Attachment G).

Should seller breach its obligation to deliver goods in accordance with the schedule provided for in this contract, the City shall have the option to recover 2% of total proposal cost per day for each calendar day of delay as liquidated damages. Inclement weather and other acts of God will be taken into consideration.

IV. PRE-PROPOSAL MEETING

No pre-proposal meeting will be held for this RFP.

V. PROPOSAL REQUIREMENTS

The proposal shall provide information necessary for City of Harrisonburg to evaluate the qualifications, experience, and expertise of the proposing firm to provide Traffic Control Cabinet Assemblies.

The Offeror is to make a written proposal which presents an understanding of the work to be performed. The proposal should demonstrate and provide evidence that the Offeror has the capabilities, professional expertise, and experience to provide the necessary services as described in this RFP. The Offeror shall ensure that all information required herein is submitted with the proposal. All information provided should be verifiable by documentation requested by the City of Harrisonburg. Failure to provide all information, inaccuracy or

misstatement may be sufficient cause for rejection of the proposal or rescission of an award. Proposals shall be signed by an authorized representative of the Offeror.

In order to enhance the evaluation process and provide each firm an equal opportunity for consideration, adherence to a standardized technical proposal format is required. Responses should be as thorough and detailed as possible so that the City may properly evaluate the firm's capabilities to provide the required services. Unnecessarily elaborate brochures of other presentations beyond that sufficient to present a complete and effective proposal is not desired. Elaborate artwork, expensive paper, bindings, visual and other presentation aids are not required.

The format of each proposal must contain the following elements organized into separate chapters and sections, as the Offeror(s) may deem appropriate:

TAB 1	• Cover Sheet (first page of this RFP), completed; • Table of Contents – all pages are to be numbered; • Cover Letter/Executive Summary on company letterhead signed by a person with the corporate authority to enter into any contract which results from the RFP.
TAB 2	**EXPERIENCE & QUALIFICATIONS OF FIRM** • Attachment H. References List
TAB 3	**PRODUCT INFORMATION**
TAB 4	**REQUIRED FORMS** • Attachment B. Proprietary/Confidential Information Identification Form • Attachment C. State Corporation Commission (SCC) Form • Attachment D. Insurance Requirements Form • Attachment F. Non-Collusion Affidavit
TAB 5	**Addenda**, signed (if any)
TAB 6	**COST** • Attachment G. Cost Proposal
TAB 7	**Other Services** *(optional)*

Below are the items that should be covered in each of the above-listed TAB sections:

A. TAB 2: EXPERIENCE & QUALIFICATIONS OF FIRM:

The Offeror shall provide information on company philosophy, history and areas of expertise as well as a completed Attachment H. References List.

B. TAB 3: PRODUCT INFORMATION

The Offeror shall provide a detailed specification for proposed equipment that matches, as closely as possible, the specification provided in this request. The Offeror is strongly encouraged to include schematics and/or photographs of the proposed equipment so that design and features may be visually assessed. All differences between the proposed product and the requested specification must be provided in a list attached with the proposal. Offeror shall

provide a list of at least three (3) other local, state or public entities that are currently utilizing vendor's specific brand of traffic control cabinet assemblies

C. TAB 7: OTHER SERVICES *(optional)*:

The Offeror may provide information for other services or programs that are available to its clients that may not be specified in this proposal. Additional services should be provided with cost listed as well as details and description of the offering.

VI. GENERAL TERMS & CONDITIONS FOR THE CITY OF HARRISONBURG, VA

Offerors shall review and take into consideration all aspects of the City's General Terms and Conditions listed in Attachment A.

VII. INSURANCE REQUIREMENTS

Offerors shall complete and return with their proposal Attachment D. Insurance Requirements Form.

VIII. INSTRUCTIONS TO OFFERORS

All proposals must be in an opaque, sealed envelope or box and clearly marked: "**Sealed Proposal: Traffic Control Cabinet Assemblies RFP 2016020-PW-P**". Proposals shall clearly indicate the legal name, address and telephone number of the Offeror (company, firm, partnership, or individual). All expenses for making proposal to the City shall be borne by the Offeror.

Offerors shall provide three (3) identical paper copies and one (1) identical electronic copy (on CD or thumb drive) of the proposal documents. Proposal documents shall be mailed or hand-delivered to the **Purchasing Office located at 409 South Main Street, Third Floor, Harrisonburg, VA 22801**. Office hours are Monday through Friday, 8:00am to 5:00pm, except City holidays (www.harrisonburgva.gov/city-holidays). Faxed or emailed proposals will not be accepted. Proposals shall be received by the Purchasing Office no later than **January 5, 2016 at 3:00pm local time**. Any proposals received after this date and time will not be accepted. The City of Harrisonburg is not responsible for delays in the delivery of the mail by the U.S. Postal Service, private couriers, or the inter-office mail system. The Offeror has the sole responsibility to have the proposal received by the Harrisonburg Purchasing Office at the above address and by the above stated time and date.

All documents contained within the proposal submission shall be completed in their entirety and signed and dated where required.

*PLEASE NOTE: The City of Harrisonburg City Hall (409 South Main Street) is currently undergoing construction around the facility. Parking options tend to be congested throughout the day. It is recommended to park on the North side of the Municipal Building at 345 South Main

Street in visitor parking (follow signs). Please take this into account when submitting your bid/proposal document and give yourself enough time to park and take your bid/proposal to the correct office for acceptance.

If City Hall is closed for business at the time scheduled for bid opening, for whatever reasons, sealed proposals will be accepted and opened on the next business day of the City, at the originally scheduled hour.

IX. QUESTIONS

Questions related to the RFP or requests for clarification may be directed to Ms. Pat Hilliard, Procurement Manager for the City of Harrisonburg, by email (Purchasing@harrisonburgva.gov) or by fax (540-432-7779). Oral questions will not be permitted. All responses to inquiries will be in writing and will be posted as addenda on the City's website at www.harrisonburgva.gov/bids-proposals and also on eVA at www.eva.virginia.gov. All questions must be received no later than **December 28, 2015 at 12:00pm (noon) local time**. It is the responsibility of all Offerors to ensure that they have received all addenda and to include signed copies of any and all addenda with their proposal submission.

X. MODIFICATION & WITHDRAWAL OF PROPOSAL

An offeror may modify or withdraw his proposal, either personally or by written request, at any time prior to the scheduled time for opening of proposals. After proposal opening, Code of Virginia 2.2-4330 B. 1. shall apply: "The bidder shall give notice in writing of his claim of right to withdraw his bid within two business days after the conclusion of the bid opening procedure and shall submit original work papers with such notice."

XI. PROPOSAL EVALUATION CRITERIA

Selection of the successful proposal will be based upon submission of proposals meeting the selection criteria. Proposal evaluations will be based on a points scale, using the following minimum selection criteria:

1. Ability to Meet the Specifications [50 Points]
The Offeror shall provide a detailed specification for proposed equipment that matches, as closely as possible, the specification provided in this request. The Offeror is strongly encouraged to include schematics and/or photographs of the proposed equipment so that design and features may be visually assessed. All differences between the proposed product and the requested specification must be provided in a list attached with the proposal.

2. Experience and Qualifications of Offeror [30 Points]
The Offeror shall provide qualifications that demonstrate experience in the traffic signal industry selling products that match the descriptions set forth in the included specifications.

3. Cost Proposal [20 Points]
The supplier shall provide a complete a thorough cost proposal that includes the necessary costs to supply all indicated features and services proposed.

As part of the evaluation process, the City may ask questions of a clarifying nature from Offerors as required. The City may also request an oral presentation and/or demonstration to explain the proposal and answer questions. These product demonstrations shall be carried out at a location of the City's choosing, whereat the supplier shall demonstrate to City staff the proposed cabinet(s) and give a presentation detailing the features of the product. At least one well qualified company representative or product expert shall be present at this demonstration, and by phone and email thereafter, to answer questions from City staff.

The City reserves the right to cancel this RFP at any time or reject any or all proposals received as a result of this RFP if it is in the best interest of the City. The City reserves the right to waive any informality in any proposal.

XII. CONTRACT TERM

The subsequent contract will commence on the date the award is made, and will extend for an initial three (3) year term. The fee(s) will remain firm through the initial contract term and will include all charges that may be incurred in fulfilling the requirements of this initial contract. The City shall have the option to renew the contract for two (2) additional one (1) year terms.

A. PRICE ADJUSTMENTS

Vendor must hold firm pricing for the initial term of the contract. No later than 45 calendar days before the end of the initial term of the contract, Vendor may propose rate increases by written notice to the Contract Administrator. The Contract Administrator may consider price adjustments when determining whether to renew this contract.

All price increases must have supporting documentation sufficient to justify the requested increase. Base documentation on published indices such as the Producer Price Index and/or the result of increases at the manufacturer's level, incurred after contract commencement date. The vendor will receive written approval from the Contract Administrator of any price adjustment and such price adjustment shall be set forth in a written amendment to the contract. Price adjustments shall remain unchanged for at least one (1) calendar year thereafter.

XIII. AWARD OF CONTRACT

Selection shall be made of two or more Offerors deemed to be fully qualified and best suited among those submitting proposals, on the basis of the factors involved in the request for proposals, including price if so stated in the request for proposal. Negotiations shall then be conducted with each of the Offerors so selected. Price shall be considered, but need not be the sole determining factor. After negotiations have been conducted with each Offeror so selected, the City shall select the Offeror which, in its opinion, has made the best proposal, and shall award the contract to that Offeror. Should the City determine in writing and in its sole discretion

that only one Offeror is fully qualified, or that one Offeror is clearly more highly qualified than the others under consideration, a contract may be negotiated and awarded to that Offeror. Once the selection has been made as to which Offeror will be awarded the contract, the Procurement Manager will post a Notice of Award on the City's website at www.harrisonburgva.gov/bid-proposal-award-notifications and also on eVA at www.eva.virginia.gov.

The award documentation will subsequently be followed by a contract incorporating by reference all the requirements, terms and conditions of the solicitation and the Offeror's proposal as negotiated.

Successful Offeror shall contact the Commissioner's Office to obtain proper business licensing for the City of Harrisonburg, if it does not already possess (540-432-7707).

The City reserves the right to make on-site visitations to assess the capabilities of individual Offeror(s) and to contact references provided with the proposal.

The City reserves the right to award a contract(s) to as many Offeror(s) as deemed necessary to fulfill the anticipated requirements of the City of Harrisonburg.

ATTACHMENT A. GENERAL TERMS & CONDITIONS FOR THE CITY OF HARRISONBURG, VA (JUNE 2013)

PURCHASING AND CONTRACTING MANUAL: This solicitation is subject to the provisions of The Purchasing and Contracting Policy Manual for the City of Harrisonburg (City) and any revisions thereto, which are hereby incorporated into this contract in their entirety. A copy of the manual is available for review at www.Harrisonburgva.gov/bids-proposals.

APPLICABLE LAWS AND COURTS: This solicitation and any resulting contract shall be governed in all respects by the laws of the Commonwealth of Virginia and any litigation with respect thereto shall be brought in the courts of the Commonwealth. The contractor shall comply with all applicable federal, state and local laws, rules and regulations.

ANTI-DISCRIMINATION: By submitting their (bids/proposals), (bidders/offerors) certify to the City that they will conform to the provisions of the Federal Civil Rights Act of 1964, as amended, as well as the Virginia Fair Employment Contracting Act of 1975, as amended, where applicable, the Virginians With Disabilities Act, the Americans With Disabilities Act and 2.2-4311 of the *Virginia Public Procurement Act*.

In every contract over $10,000 the provisions below apply:

1. During the performance of this contract, the contractor agrees as follows:

    a. The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

    b. The contractor, in all solicitations or advertisements for employees placed by or on behalf of the contractor, will state that such contractor is an equal opportunity employer.

    c. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting these requirements.

    The contractor will include the provisions of 1. above in every subcontract or purchase order over $10,000, so that the provisions will be binding upon each subcontractor or vendor.

2. The City does not discriminate against small and minority businesses or faith based organizations.

ETHICS IN PUBLIC CONTRACTING: By submitting their (bids/proposals), (bidders/offerors) certify that their (bids/proposals) are made without collusion or fraud and that they have not offered or received any kickbacks or inducements from any other (bidder/offeror), supplier, manufacturer or subcontractor in connection with their (bid/proposal), and that they have not conferred on any public employee having official responsibility for this procurement transaction any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value was exchanged.

IMMIGRATION REFORM AND CONTROL ACT OF 1986: By submitting their (bids/proposals), (bidders/offerors) certify that they do not and will not during the performance of this contract employ illegal alien workers or otherwise violate the provisions of the federal Immigration Reform and Control Act of 1986.

DEBARMENT STATUS: By submitting their (bids/proposals), (bidders/offerors) certify that they are not currently debarred by the Commonwealth of Virginia from submitting bids or proposals on contracts for the type of goods and/or services covered by this solicitation, nor are they an agent of any person or entity that is currently so debarred.

ANTITRUST: By entering into a contract, the contractor conveys, sells, assigns, and transfers to the City all rights, title and interest in and to all causes of action it may now have or hereafter acquire under the antitrust laws of the United States and the Commonwealth of Virginia, relating to the particular goods or services purchased or acquired by the City under said contract.

MANDATORY USE OF CITY FORM AND TERMS AND CONDITIONS FOR IFBs AND RFPs

1. (For Invitation For Bids(ITB):) Failure to submit a bid on the form provided, (if provided) shall be a cause for rejection of the bid. Modification of or additions to any portion of the Invitation for Bids may be cause for rejection of the bid; however, the City reserves the right to decide, on a case by case basis, in its sole discretion, whether to reject such a bid as nonresponsive. As a precondition to its acceptance, the City may, in its sole discretion, request that the bidder withdraw or modify nonresponsive portions of a bid which do not affect quality, quantity, price, or delivery. No modification of or addition to the provisions of the contract shall be effective unless reduced to writing and signed by the parties.

2. (For Request For Proposals(RFP):) Failure to submit a proposal on the form provided, (if provided) shall be a cause for rejection of the bid. Modification of or additions to the General Terms and Conditions of the solicitation may be cause for rejection of the proposal; however, the City reserves the right to decide, on a case by case basis, in its sole discretion, whether to reject such a proposal.

REVISIONS TO THE OFFICIAL ITB/RFP: No offeror shall modify, revise, edit or make any unauthorized change(s) to the original Official Invitation to Bid (ITB) or Official Request for Proposal (RFP). The Official solicitation document and the Addenda(s) are the documents posted on the City of Harrisonburg's web site and/or authorized by the City of Harrisonburg's Purchasing Agent. Any such violation as stated above may result in rejection of the ITB/RFP response. In addition, violations may result in the debarment of the offeror by the City of Harrisonburg.

CLARIFICATION OF TERMS: If any prospective (bidder/offeror) has questions about the specifications or other solicitation documents, the prospective (bidder/offeror) should contact the person whose name appears on the face of the solicitation no later than five working days before the due date. Any revisions to the solicitation will be made only by addendum issued by the buyer.

PAYMENT:

1. To Prime Contractor:

   a. Invoices for items ordered, delivered and accepted shall be submitted by the contractor directly to the payment address shown on the purchase order/contract. All invoices shall show the purchase order number; social security number (for individual contractors) or the federal employer identification number (for proprietorships, partnerships, and corporations).

   b. Any payment terms requiring payment in less than 30 days will be regarded as requiring payment 30 days after invoice or delivery, whichever occurs last. This shall not affect offers of discounts for payment in less than 30 days, however.

   c. All goods or services provided under this contract or purchase order, that are to be paid for with public funds, shall be billed by the contractor at the contract price.

   d. The following shall be deemed to be the date of payment: the date of postmark in all cases where payment is made by mail, or the date of offset when offset proceedings have been instituted as authorized under the Virginia Debt Collection Act.

   e. Individual contractors shall provide their social security numbers, and proprietors , partnerships, and corporations shall provide the City with a federal employer identification number, prior to receiving any payment from the City.

   f. Unreasonable Charges. Under certain emergency procurements and for most time and material purchases, final job costs cannot be accurately determined at the time orders are placed. In such cases, contractors should be put on notice that final payment in full is contingent on a determination of reasonableness with respect to all invoiced charges. Charges which appear to be unreasonable will be researched and challenged, and that portion of the invoice held in abeyance until a settlement

can be reached. Upon determining that invoiced as to those charges which it considers unreasonable and the basis for the determination. A contractor may not institute legal action unless a settlement cannot be reached within thirty (30) days of notification. The provisions of this section do not relieve the City of its prompt payment obligations with respect to those charges which are not in dispute (*Code of Virginia*, 2.2.4363.

2. To Subcontractors:

   a. A contractor awarded a contract under this solicitation is hereby obligated:

      (1) To pay the subcontractor(s) within seven (7) days of the contractor's receipt of payment from the City for the proportionate share of the payment received for work performed by the subcontractor(s) under the contract; or

      (2) To notify the City and the subcontractor(s), in writing, of the contractor's intention to withhold payment and the reason.

   b. The contractor is obligated to pay the subcontractor(s) interest at the rate of one percent per month (unless otherwise provided under the terms of the contract) on all amounts owed by the contractor that remain unpaid seven (7) days following receipt of payment from the City, except for amounts withheld as stated in (2) above. The date of mailing of any payment by U. S. Mail is deemed to be payment to the addressee. These provisions apply to each sub-tier contractor performing under the primary contract. A contractor's obligation to pay an interest charge to a subcontractor may not be construed to be an obligation of the City.

PRECEDENCE OF TERMS: General Terms and Conditions shall apply in all instances. In the event there is a conflict between any of the other General Terms and Conditions and any Special Terms and Conditions in this solicitation, the Special Terms and Conditions shall apply.

QUALIFICATIONS OF (BIDDERS/OFFERORS): The City may make such reasonable investigations as deemed proper and necessary to determine the ability of the (bidder/offeror) to perform the services/furnish the goods and the (bidder/offeror) shall furnish to the City all such information and data for this purpose as may be requested. The City reserves the right to inspect (bidder's/offeror's) physical facilities prior to award to satisfy questions regarding the (bidder's/offeror's) capabilities. The City further reserves the right to reject any (bid/ proposal) if the evidence submitted by, or investigations of, such (bidder/offeror) fails to satisfy the City that such (bidder/offeror) is properly qualified to carry out the obligations of the contract and to provide the services and/or furnish the goods contemplated therein.

TESTING AND INSPECTION: The City reserves the right to conduct any test/inspection it may deem advisable to assure goods and services conform to the specifications.

ASSIGNMENT OF CONTRACT: A contract shall not be assignable by the contractor in whole or in part without the written consent of the City.

CHANGES TO THE CONTRACT: Changes can be made to the contract in any of the following ways:

1. The parties may agree in writing to modify the scope of the contract. An increase or decrease in the price of the contract resulting from such modification shall be agreed to by the parties as a part of their written agreement to modify the scope of the contract.

2. The Purchasing Agent or City delegated agent may order changes within the general scope of the contract at any time by written notice to the contractor. Changes within the scope of the contract include, but are not limited to, things such as services to be performed, the method of packing or shipment, and the place of delivery or installation. The contractor shall comply with the notice upon receipt. The contractor shall be compensated for any additional costs incurred as the result of such order and shall give the City a credit for any savings.

DEFAULT: In case of failure to deliver goods or services in accordance with the contract terms and conditions, the City, after due oral or written notice, may procure them from other sources and hold the contractor responsible for any resulting additional purchase and administrative costs. This remedy shall be in addition to any other remedies, which the City may have.

CANCELLATION OF THE CONTRACT: The City may terminate any agreement resulting from this solicitation at any time, for any reason or for no reason, upon thirty days advance written notice to the Contractor. In the event of such termination the Contractor shall be compensated for services and work performed prior to termination.

TAXES: Sales to the City of Harrisonburg are normally exempt from State sales tax. State sales and use tax certificates of exemption, Form ST-12, will be issued upon request.
(NOT NORMALLY REQUIRED FOR SERVICE CONTRACTS)

USE OF BRAND NAMES: Unless otherwise provided in this solicitation, the name of a certain brand, make or manufacturer does not restrict (bidders/offerors) to the specific brand, make or manufacturer named, but conveys the general style, type, character, and quality of the article desired. Any article which the public body, in its sole discretion, determines to be the equal of that specified, considering quality, workmanship, economy of operation, and suitability for the purpose intended, shall be accepted. The (bidder/offeror) is responsible to clearly and specifically identify the product being offered and to provide sufficient descriptive literature, catalog cuts and technical detail to enable the City to determine if the product offered meets the requirements of the solicitation. This is required even if offering the exact brand, make or manufacturer specified. Normally in competitive sealed bidding only the information furnished with the bid will be considered in the evaluation. Failure to furnish adequate data for evaluation purposes may result in declaring a bid nonresponsive. Unless the (bidder/offeror) clearly indicates in its (bid/proposal) that the product offered is an "equal" product, such (bid/proposal) will be considered to offer the brand name product referenced in the solicitation.**(NOT NORMALLY REQUIRED FOR SERVICE CONTRACTS)**

TRANSPORTATION AND PACKAGING: By submitting their (bids/proposals), all (bidders/offerors) certify and warrant that the price offered for FOB destination includes only the actual freight rate costs at the lowest and best rate and is based upon the actual weight of the goods to be shipped. Except as otherwise specified herein, standard commercial packaging, packing and shipping containers shall be used. All shipping containers shall be legibly marked or labeled on the outside with purchase order number, commodity description, and quantity.**(NOT NORMALLY REQUIRED FOR SERVICE CONTRACTS)**

INSURANCE: By signing and submitting a bid or proposal under this solicitation, the bidder or offeror certifies that if awarded the contract, it will have insurance coverages per the solicitation document at the time the contract is awarded. For construction contracts, if any subcontractors are involved, the subcontractor will have workers' compensation insurance in accordance with 2.2-4332 and 65.2-800 et seq. of the *Code of Virginia*. The bidder or offeror further certifies that the contractor and any subcontractors will maintain these insurance coverages during the entire term of the contract and that all insurance coverages will be provided by insurance companies authorized to sell insurance in Virginia by the Virginia State Corporation Commission. **(NOT NORMALLY REQUIRED FOR GOODS CONTRACTS. INSURANCE IS REQUIRED WHEN WORK IS TO BE PERFORMED ON CITY OWNED OR LEASED FACILITIES OR PROPERTY.)**

AVAILABILITY OF FUNDS: Agreements are made subject to the appropriation of funds by the Harrisonburg City Council and are null and void in the event of non-appropriation by the City Council. Non-appropriation of funds shall not be deemed a cancellation and shall terminate this agreement without recourse and with no liability on the part of the City.

SELECTION PROCESS/AWARD: Upon the award or the announcement of the decision to award a contract as a result of this solicitation, the department will publicly post such notice for a minimum of ten (10) days, or will notify all responsive bidders/offerors.

BID/PROPOSAL ACCEPTANCE PERIOD: Any bid/proposal resulting from this solicitation shall be valid for (30) days. At the end of the (30) days the bid/proposal may be withdrawn at the written request of the Bidder/Offeror. If the bid or proposal is not withdrawn at that time it remains in effect until an award is made or the solicitation is canceled.

EXCUSABLE DELAY: The City shall not be in default of any failure in performance of this agreement in accordance with its terms if such failure arises out of causes beyond its reasonable control and without the fault of or negligence of the City. Such causes may include, but are not restricted to acts of God or the public enemy, fires, flood, epidemics, quarantine restrictions, strikes, freight embargoes, and usually severe weather, but in every case the failure to perform must be beyond the reasonable control and without the fault or negligence of the City.

DRUG-FREE WORKPLACE: During the performance of this contract, the contractor agrees to (i) provide a drug-free workplace for the contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the contractor's workplace and specifying the actions that

will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the contractor that the contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each subcontractor or vendor.

SAFETY and OSHA STANDARDS: All parties performing services for the City shall comply with all Occupational Safety and Health Administration (OSHA), State Occupational Health Standards, and any other applicable rules and regulations. All parties shall be held responsible for the training, supervision, and safety of their employees. Any unsafe acts or hazardous conditions that may cause injury or damage to any persons or property within and around the work site areas under this contract shall be remedied per the regulatory agency's guidelines.

PERMITS AND FEES: All proposals submitted shall have included in price the cost of any business or professional licenses, permits or fees required by the City of Harrisonburg or the Commonwealth of Virginia. The offeror must have all necessary licenses to perform the services in Virginia and, if practicing as a corporation, be authorized to do business in the Commonwealth of VA.

COOPERATIVE PROCUREMENT: This procurement is being conducted on behalf of other public bodies, in accordance with 2.2-4304 (A) of the Code of VA. The successful bidder has the option to provide these same items (services), except architectural and engineering services, at the same prices, awarded as a result of this solicitation to any public body within the Commonwealth of Virginia. If any other Public body decides to use the final contract, the contractor(s) must deal directly with that public body concerning the placement of orders, issuance of the purchase orders, contractual disputes, invoicing and payment. Failure to extend a contract to any public body will have no effect on consideration of your bid.

LIABILITY AND LITIGATION: The City shall not indemnify or hold harmless any Contractor or other third party. The City does not waive any right or release any party from liability, whether on its own behalf or on behalf of any boards, employees or agents. The City does not waive the right to trial by jury for any cause of action arising from the Contract and shall not submit any Contract claim to binding arbitration or mediation. The City shall not be liable to Contractor for any special, punitive or exemplary damages arising from the performance of the contract, including, but not limited to, incidental damages, and lost profit and lost wages, even if such special damages are reasonably foreseeable. Any provision(s) in the Contract contrary to these statements is/are hereby deleted and rendered void.

STATE CORPORATION COMMISSION IDENTIFICATION NUMBER: Pursuant to Code of VA 2.2-4311.2 subsection B, a bidder or offeror organized or authorized to transact business in the Commonwealth pursuant to Title 13.1 or Title 50 is required to include in its bid or proposal the identification number issued to it by the State Corporation Commission (SCC). Any bidder or offeror that is not required to be authorized to transact business in the Commonwealth as a foreign business entity under Title 13.1 or Title 50 or as otherwise required by law is required to include in its bid or proposal a statement describing why the bidder or offeror is not required to be so authorized. Link to the SCC site is http://www.scc.virginia.gov.

ATTACHMENT B. PROPRIETARY/CONFIDENTIAL INFORMATION IDENTIFICATION FORM

Name of Firm/Offeror:_____

Trade secrets or proprietary information submitted by an offeror shall not be subject to public disclosure under the Virginia Freedom of Information Act; however, the offeror must invoke the protections of §2.2-4342F of the Code of Virginia, in writing, either before or at the time the data or other material is submitted. The written notice must specifically identify the data or materials to be protected, including the section of the proposal in which it is contained, as well as the page number(s), and state the reasons why protection is necessary. The proprietary or trade secret material submitted must be identified by some distinct method such as highlighting or underlining and must indicate only the specific words, figures, or paragraphs that constitute a trade secret or proprietary information. In addition, a summary of proprietary information provided shall be submitted on this form. The designation of an entire proposal document, line item prices, and/or total proposal prices as proprietary or trade secrets is not acceptable. If, after being given reasonable time, the offeror refuses to withdraw such a classification designation, the proposal will be rejected.

SECTION/TITLE	PAGE NUMBER(S)	REASON(S) FOR WITHHOLDING FROM DISCLOSURE

☐ Check this box if there are none.

Note: If proprietary/confidential information is identified, Offeror is required to submit a redacted copy of their proposal in addition to the required number of proposals requested.

This document must be completed & returned with proposal submission.

ATTACHMENT C. STATE CORPORATION COMMISSION (SCC) FORM

Virginia State Corporation Commission ("SCC") registration information: **The undersigned Offeror:**

☐ is a corporation or other business entity with the following SCC identification number: _____ **-OR-**

☐ is not a corporation, limited liability company, limited partnership, registered limited liability partnership, or business trust **-OR-**

☐ is an out-of-state business entity that does not regularly and continuously maintain as part of its ordinary and customary business any employees, agents, offices, facilities, or inventories in Virginia (not counting any employees or agents in Virginia who merely solicit orders that require acceptance outside Virginia before they become contracts, and not counting any incidental presence of the Offeror in Virginia that is needed in order to assemble, maintain, and repair goods in accordance with the contracts by which such goods were sold and shipped into Virginia from bidder's out-of-state location) **-OR-**

☐ is an out-of-state business entity that is including with this bid an opinion of legal counsel which accurately and completely discloses the undersigned Offeror's current contacts with Virginia and describes why those contacts do not constitute the transaction of business in Virginia within the meaning of § 13.1-757 or other similar provisions in Titles 13.1 or 50 of the Code of Virginia. **Attach opinion of legal counsel to this form.**

****NOTE**** >> Check the following box if you have not completed any of the foregoing options but currently have pending before the SCC an application for authority to transact business in the Commonwealth of Virginia and wish to be considered for a waiver to allow you to submit the SCC identification number after the due date for proposals (the City reserves the right to determine in its sole discretion whether to allow such waiver): ☐

Signature: _____ Date: _____

Name: _____
(*Print*)

Title: _____

Name of Firm: _____

This document must be completed & returned with proposal submission.

ATTACHMENT D. INSURANCE REQUIREMENTS FORM

By signing and submitting a bid or proposal the vendor certifies that if awarded the contract, they will have the following insurance coverages at the time the contract is awarded.

1.) The contractor will maintain a general liability policy with $1,000,000 combined single limits. Coverage is to be on an occurrence basis with an insurer licensed to conduct business in the Commonwealth of Virginia. The insurer must have an A. M. Best rating of A- or better. **The insurer must list the City of Harrisonburg as an additional insured. The endorsement must be issued by the insurance company. A notation on the certificate of insurance is not sufficient.**

2.) The contractor will maintain workers' compensation coverage in compliance with the laws of the Commonwealth of Virginia. The coverage must have statutory limits and be with an insurer licensed to conduct business in the Commonwealth of Virginia. The insurer must have an A. M. Best rating of A- or better. As an alternative, it is acceptable for the contractor to be insured by a group self insurance association that is licensed by the Virginia Bureau of Insurance. The contractor will also carry employers liability insurance with a limit of at least $100,000 bodily injury by accident/$500,000 bodily injury by disease policy limit/$100,000 bodily injury by disease each employee.

3.) The contractor will maintain automobile liability insurance with limits of at least $1,000,000. The coverage is to be written with a symbol "1". The insurer must be licensed to conduct business in the Commonwealth of Virginia. The insurer must have an A. M. Best rating of A- or better.

With all policies listed above, the insurer or agent of the insurer must issue a certificate of insurance to show evidence of coverage.

BIDDER/OFFEROR STATEMENT

We understand the Insurance Requirements of these specifications and will comply in full if awarded this contract.

Signature: _____ Date: _____

Name:_____Title:_____
(Print)

Name of Firm: _____

****This document must be completed & returned with proposal submission.***

ATTACHMENT E. NON-COLLUSION AFFIDAVIT

Under oath, I hereby affirm under penalty of perjury:

(1) That I am the offeror or a partner of the offeror, or an officer or employee of the offeror's corporation with authority to sign on its behalf;

(2) That the attached proposal or proposals have been arrived at by the offeror and have been arrived at and submitted without collusion or any design to limit bidding or competition;

(3) That the contents of the proposal or proposals have not been communicated to any person not an employee or agent of the offeror on any bid furnished with the proposal or proposals, and will not be communicated to any such person prior to the official opening of the proposal or proposals; and

(4) That I have fully informed myself regarding the accuracy of the statements made in this affidavit.

Signed_____

Title_____

Firm Name _____

CITY OF HARRISONBURG
COMMONWEALTH OF VIRGINIA, to wit:

I, _____, a Notary Public, do certify

that_____whose name is signed to

the foregoing has this date acknowledged the same before me in my City foresaid.

Given under my hand this_____day of_____, 20___.

My Commission expires_____.

_____
Notary Public

This document must be completed & returned with proposal submission.

ATTACHMENT F. CITY OF HARRISONBURG SAMPLE STANDARD CONTRACT RFP

This Contract entered into this ___ day of _____ 20___, by _____ hereinafter called the "Contractor" and City of Harrisonburg, VA, called the "Owner".

WITNESSETH that the Contractor and the Owner, in consideration of the mutual covenants, promises and agreements herein contained, agree as follows:

SCOPE OF CONTRACT: The Contractor shall provide the goods/services to the Owner as set forth in the Contract Documents.

PERIOD OF PERFORMANCE: From _____ through _____.

The contract documents shall consist of:

(1) This signed form;

(2) The entire City of Harrisonburg's Official Request for Proposal (no revisions by the Contractor)

dated: _____

If applicable, any Official City Addenda:

#1, dated: _____

(3) The Contractor's Proposal dated _____ and the attached negotiated modifications (if applicable) to the Proposal, all of which documents are incorporated herein.

IN WITNESS WHEREOF, the parties have caused this Contract to be duly executed intending to be bound thereby.

CONTRACTOR: CITY OF HARRISONBURG, OWNER:

By:_____ By:_____

Title:_____Title:_____

Note: This form is just for reference and is not required to be submitted with your Proposal.

ATTACHMENT G. COST PROPOSAL FORM

	Product	Unit	Unit Price ●
1	NEMA TS2 Type 1 M60 Cabinet Assembly	EA	$
2	NEMA TS2 Type 1 P44 Cabinet Assembly	EA	$

● *Unit Price is based on delivery of product to the City of Harrisonburg Central Stores located at 2111 Beery Road, Harrisonburg, VA 22801. Pricing includes delivery cost, FOB Destination.*

Unit Price in Written Format (Line Item 1): _____

Unit Price in Written Format (Line Item 2): _____

Guaranteed Lead Time on Units (from date of order):

_____

By signing below, I affirm that all product(s) priced above meet or exceed the minimum specifications required and specified within the RFP document.

_____ Signature of Authorized Bidder

_____ Date

_____ Printed Name of Authorized Bidder

_____ Company Name

_____ Title

_____ Company Address

This document must be completed & returned with proposal submission.

ATTACHMENT H. REFERENCES

Indicate below a listing of at least three (3) current or recent client references, either commercial or governmental, that your company is servicing, has serviced, or has provided similar goods or services.

Reference #1

Company:_____ Contact Person:_____

Phone #:_____ Email:_____

Project:_____ Dates of Service:_____

Reference #2

Company:_____ Contact Person:_____

Phone #:_____ Email:_____

Project:_____ Dates of Service:_____

Reference #3

Company:_____ Contact Person:_____

Phone #:_____ Email:_____

Project:_____ Dates of Service:_____

Indicate below a listing of at least one (1) current or recent client/account that has terminated your company's services within the last two (2) years. Account(s) are preferred to be government accounts of a similar size and nature.

Reference #4

Company:_____ Contact Person:_____

Phone #:_____ Email:_____

Project:_____ Dates of Service:_____

This document must be completed & returned with proposal submission.

ATTACHMENT I.

Specifications for

NEMA TS2 Type 1 M60 Cabinet Assembly

Revised November 23, 2015

Prepared by

City of Harrisonburg, VA
Public Works Department
Traffic Engineering Division

TABLE OF CONTENTS

1. Introduction

1.1. This specification sets forth the minimum requirements for an M60 TS2 Type 1 traffic control cabinet assembly. The cabinet assembly shall meet, as a minimum, all applicable sections of the NEMA Standard Publication No. TS2-2003 v. 2.06. Where differences occur, this specification shall govern.

2. Cabinet Design and Construction

2.1. The cabinet shall be constructed from type 5052-H32 aluminum with a minimum thickness of 0.125 Inches.

2.2. At a minimum the cabinet dimensions shall be 60" H x 30" W x 16" D.

2.3. The cabinet shall be designed and manufactured with materials that will allow rigid mounting, whether intended for pole, base or pedestal mounting. The cabinet must not flex on its base.

2.4. A rain channel shall be incorporated into the design of the main door opening to prevent liquids from entering the enclosure. The cabinet door opening must be a minimum of 80 percent of the front surface of the cabinet. A stiffener plate shall be welded across the inside of the main door to prevent flexing.

2.5. The top of the cabinet shall incorporate a 1-inch slope toward the rear to prevent rain accumulation.

2.6. The outside of the cabinet shall have a natural aluminum finish. Sufficient care shall be taken in handling to ensure that scratches are minimized. All surfaces shall be free from weld flash. Welds shall be smooth, neatly formed, free from cracks, blowholes and other irregularities. All sharp edges shall be ground smooth.

2.7. The inside of the cabinet shall be powder coated with a glossy white paint.

2.8. The cabinet shall have a rear door with the same mechanical design as the main door.

2.9. All cabinets shall be supplied with three removable shelves manufactured from 5052-H32 aluminum spaced 12 inches apart. The upper shelf shall hold the detector card rack and the power supply. Shelves shall be a minimum of 10 inches deep. The front edge of the shelves shall have holes punched at least every 6 inches to accommodate tie wrapping of cables/harnesses.

2.10. A rigid slide-out document drawer/tray shall be mounted below the bottom shelf. The tray shall be of sufficient size and strength to hold a complete set of cabinet wiring drawings, intersection diagrams, equipment and programming manuals for all equipment and modules applicable to each cabinet. The tray shall operate by sliding out, then opening a hinged cover to remove documents. After removing the documents and closing the cover, the d shall serve as a suitable resting place for documents or a laptop computer.

2.11. A minimum of one set of vertical "C" channels shall be mounted on each interior wall of the cabinet for the purpose of mounting the cabinet components. The channels shall accommodate spring mounted nuts or studs. All mounting rails shall extend to within 7 inches of the top and bottom of the cabinet.

2.12. The main door and police door-in-door shall close against a weatherproof and dust-proof, closed cell neoprene gasket seal. The gasket material for the main door shall be a minimum of 0.250 inches thick

by 1.00 inch wide. The gasket material for the police door shall be a minimum of 0.250 inches thick by 0.500 inches wide. The gaskets shall be permanently bonded to the cabinet.

2.13. The lower section of the cabinet shall be equipped with a louvered air entrance. The air inlet shall be large enough to allow sufficient air flow per the rated fan capacity. Louvers must satisfy the NEMA rod entry test for 3R ventilated enclosures. A non-corrosive, vermin and insect proof, removable air filter shall be secured to the air entrance. The filter shall fit snugly against the cabinet door wall.

2.14. The main door shall be equipped with a three-point latching mechanism. The handle on the main door shall utilize a shank of 5/8 inches minimum diameter. The handle shall include a hasp for the attachment of an optional padlock. The lock assembly shall be positioned so that the handle shall not cause any interference with the key when opening the cabinet door.

2.15. The main door hinge shall be a one-piece, continuous piano hinge with a stainless steel pin running the entire length of the door. The hinge shall be attached in such a manner that no rivets or bolts are exposed.

2.16. The main door of the cabinet shall include a mechanism capable of holding the door open at approximately 90, 125, and 150 degrees under windy conditions. Manual placement of the mechanism shall not be required by field personnel.

2.17. The main door shall be equipped with a Corbin tumbler lock number 1548-1 or exact equivalent. A minimum of two keys shall be supplied.

2.18. The police door-in-door shall be provided with a treasury type lock Corbin number R357SGS or exact equivalent. A minimum of two keys shall be supplied.

2.19. The complete cabinet circuitry diagram shall also be supplied on a digital compact computer disk in the latest version of both AutoCAD DXF and PDF format.

2.20. A 2" X 4" (minimum size) identification plate with the cabinet circuitry diagram number shall be permanently affixed to the inside of the main cabinet door in the upper right hand corner. An engraved plastic plate is preferred.

3. Main Panel Design and Construction

3.1. The main panel shall be constructed from 5052-H32 brushed aluminum of 0.125 inches minimum thickness and installed so as to minimize flexing when plug-in components are installed.

3.2. The main panel shall be provided with a mounting mechanism which allows easy access to all wiring on the rear of the panel without the removal of any cabinet shelves. Lowering of the main panel shall be accomplished by removing fasteners by hand or with a screwdriver and dropping the main panel forward on a hinging mechanism. The main panel shall be able to be completely removed and replaced.

3.3. The bottom of the main panel shall be at minimum of 9 inches from the bottom of the cabinet and the top shall not extend beyond the height of the first shelf such that it obstructs the panel from being dropped forward for rear access.

4. Terminals and Facilities

4.1. Eight load switch sockets with one load switch per socket, four flash transfer relay sockets with one flash transfer relay per socket, one flasher socket with one flasher, 2 main panel BIU sockets with one BIU for each socket, and one 16-channel detector rack with one BIU shall be provided.

4.2. The eight available channels shall be wired to provide 4 vehicle phases, 2 pedestrian phases, and 2 overlaps. Channels 1 through 4 shall be assigned to vehicle phases 1 through 4. Channels 5 and 6 shall be assigned to overlaps A and B. Channels 7 and 8 shall be assigned to pedestrian phases 2 and 4.

4.3. All load switches shall be supported by a bracket, extending at least half the length of the load switch.

4.4. The load switch position main panels shall have all field wires contained on a row of horizontally mounted terminal blocks. The upper row shall be wired for the pedestrian and overlap field terminations. The lower row shall be reserved for phase one through phase eight vehicle field terminations.

4.5. All field output circuits shall be terminated on a non-fused barrier type terminal block with a minimum rating of 10 amps.

4.6. All field input/output (I/O) terminals shall be identified by permanent alphanumerical labels. All labels shall use standard nomenclature per the NEMA TS2 specification.

4.7. All cabinets shall be wired to flash yellow on phase 2 and red on all other phases. It shall still be possible to change from one color indication to the other by use of a screwdriver. Field termination blocks shall be wired to use four positions per vehicle or overlap phase (green, yellow, and red, flash). It shall not be necessary to de-buss field terminal blocks for flash programming.

4.8. The cabinet shall contain at least one flasher socket (silk screen labeled) capable of operating a 15-amp, 2-pole, NEMA solid-state flasher. The flasher shall be supported by a bracket, extending at least half its length.

4.9. One RC network shall be wired in parallel with each group of three flash-transfer relays and any other relay coils.

4.10. All logic-level, NEMA-controller and Malfunction Management Unit input and output terminations on the main panel shall be permanently labeled. Cabinet prints shall identify the function of each terminal position.

4.11. At a minimum, three 20-position terminal blocks shall be provided at the top of the main panel to provide access to the controller unit's programmable and non-programmable I/O. Terminal blocks for DC signal interfacing shall have a number 6-32 x 7/32 inch screw as minimum.

4.12. A minimum of four terminal positions on the main panel shall be configured to provide 120VAC+ utility power.

4.13. All main panel wiring shall conform to the following wire color:

4.13.1. Green/Walk load switch output – brown wire
4.13.2. Yellow load switch output – yellow wire
4.13.3. Red/Don't Walk load switch output – red wire
4.13.4. MMU (other than AC power) – violet wire

4.13.5. Controller I/O – blue wire
4.13.6. AC Line (power panel to main panel) – black wire
4.13.7. AC Line (main panel) – black wire
4.13.8. AC Neutral (power panel to main panel) – white wire
4.13.9. AC Neutral (main panel) – white wire
4.13.10. Earth ground (power panel) – green wire
4.13.11. Logic ground – gray wire
4.13.12. Flash programming – orange wire
4.13.13. Flash terminal – black wire red or yellow field terminal

4.14. All wiring, 14 AWG and smaller, shall conform to MIL-W-16878/1, type B/N, 600V, 19-strand tinned copper. The wire shall have a minimum of 0.010 inches thick PVC insulation with clear nylon jacket and rated to 105 degrees Celsius. All 12 AWG and larger wire shall have UL listed THHN/THWN 90 degrees Celsius, 600V, 0.020 inches thick PVC insulation and clear nylon jacket.

4.15. Connecting cables shall be sleeved in a braided nylon mesh or poly-jacketed. The use of exposed tie-wraps or interwoven cables is unacceptable. All terminals and facilities configurations shall be provided with an A connector to allow for the intended operation of the cabinet. Mode pins shall allow the user to reconfigure the main panel I/O.

4.16. Connecting cables shall be sleeved in a braided nylon mesh or poly-jacketed. The use of exposed tie-wraps or interwoven cables is unacceptable.

4.17. All Terminals and Facilities configurations shall be provided with BIU wiring assignments consistent with NEMA TS2-1998 specifications.

4.18. All Terminals and Facilities configurations shall be provided with sufficient RS-485 Port 1 communication cables to allow for the intended operation of that cabinet. Each communication cable connector shall be a 15-pin metal shell D subminiature type. The cable shall be a shielded cable suitable for RS-485 communications.

4.19. All main panels shall be pre-wired for a Type-16 Malfunction Management Unit.

4.20. All wiring shall be neat in appearance. All cabinet wiring shall be continuous from its point of origin to its termination point. Butt type connections/splices are not acceptable.

4.21. All connecting cables and wire runs shall be secured by mechanical clamps. Stick-on type clamps are not acceptable.

4.22. The grounding system in the cabinet shall be divided into three separate circuits (AC Neutral, Earth Ground, and Logic Ground). These ground circuits shall be connected together at a single point as outlined in the NEMA TS2 Standard.

4.23. The main panel shall incorporate a relay to remove +24 VDC from the common side of the load switches when the intersection is placed into mechanical flash. The relay shall have a momentary pushbutton to apply power to the load switch inputs for ease of troubleshooting.

4.24. All pedestrian push button inputs from the field to the controller shall be opto-isolated through the BIU and operate at 12 VAC.

4.25. All wire (size 16 AWG or smaller) at solder joints shall be hooked or looped around the eyelet or terminal block post prior to soldering to ensure circuit integrity. Lap joint soldering is not acceptable.

5. Power Panel Design and Construction

5.1. The power panel shall be located on the lower right section of the cabinet interior.

5.2. The power panel shall be wired to provide the necessary filtered power to the load switches, flasher(s), and power bus assembly. The power components shall be equipped with a removable plastic front cover for technician protection. The design will allow a technician to access the main and auxiliary breakers without removing the protective front cover.

5.3. The power panel portion of the main panel shall include the following components:

5.3.1. A minimum of a 30-amp main breaker. This breaker shall supply power to the controller, MMU, signals, cabinet power supply and auxiliary panels. Breakers shall be at minimum, a thermal magnetic type, U.L. listed for HACR service, with a minimum of 10,000 amp interrupting capacity.

5.3.2. A minimum of a 15-amp auxiliary breaker. This breaker shall supply power to the fan, light and GFI utility outlet.

5.3.3. An EDCO model SHA – 1250 Lightning Surge Protection with SHA – 1250 – Base – or an exact equivalent.

5.3.4. A 50 amp, 125 VAC radio interference line filter.

5.3.5. A Crydom Inc. model HA4875 normally-open, panel-mount, 75-amp, solid-state relay or an exact equivalent.

5.3.6. A minimum of two 8-position neutral bus bar capable of connecting three #12 wires per position. One bar shall be positioned on the lower right side of the cabinet and one bar shall be positioned on the lower left side of the cabinet. All bars shall be installed horizontally at a height of 6 to 12 inches from the bottom of the cabinet.

5.3.7. A minimum of two 8-position ground bus bar capable of connecting three #12 wires per position. One bar shall be positioned on the lower right side of the cabinet and one bar shall be positioned on the lower left side of the cabinet. All bars shall be installed horizontally at a height of 6 to 12 inches from the bottom of the cabinet.

5.3.8. A NEMA type 5-15R GFI utility outlet.

5.3.9. One filtered AC power receptacle with 4 outlets. This unit shall be installed on the back side of the left cabinet wall just above the lower shelf.

6. Power Bus Assembly

6.1. The power bus assembly shall be manufactured from 0.090”, 5052-H32 aluminum. It shall provide filtered power for the controller, malfunction management unit, cabinet power supply, and auxiliary equipment. It shall include the SDLC Bus connecting cables wired or plugged into a surface-mounted compression terminal block.

6.2. The power bus assembly shall house the following components:

6.2.1. A minimum of three and a maximum of six power connectors.

6.2.2. Two terminal strips to hardwire the power connectors.

6.2.3. SDLC terminal block with pre-wired cables.

6.3. All cabinet equipment requiring filtered power to operate shall be hardwired directly to the supplied terminal blocks of the power bus assembly.

7. Auxiliary Cabinet Equipment

7.1. The cabinet shall be provided with a thermostatically controlled (adjustable between 80-150 degrees Fahrenheit) ventilation fan in the top of the cabinet plenum. The fan plate shall be removable with the use of simple hand tools for serviceability. A minimum of one exhaust fan shall be provided. The fan shall be a ball bearing type fan and shall be capable of drawing a minimum of 100 cubic feet of air per minute.

7.2. A minimum 60-watt equivalent LED lamp mounted on a 14-inch flexible arm shall be included. The flexible arm shall be permanently mounted to the middle of the cabinet door. The lamp shall have a switch to control power to the light when the cabinet door is open.

7.3. A minimum 18-inch wide LED lighting fixture shall be mounted on the inside top of the cabinet near the front edge. The lamp shall be wired to a door-activated switch mounted near the top right corner of the door.

7.4. All cabinets shall have a door open alarm switch mounted near the top right corner of the door.

7.5. An Intermatic K4021 photocell or an exact equivalent approved photocell shall be wired to a terminal strip for future use. The photocell shall be mounted to the right rear corner on the right face of the cabinet exterior.

7.6. A re-sealable print pouch shall be mounted to the door of the cabinet. The pouch shall be of sufficient size to accommodate one complete set of cabinet prints.

7.7. A minimum of two sets of complete and accurate ANSI size D cabinet drawings shall be supplied with each cabinet. These drawings shall be placed in the re-sealable pouch.

8. Cabinet Test Switches and Police Panel

8.1. A test switch panel shall be mounted on the inside of the main door. The test switch panel shall provide as a minimum the following:

8.1.1. AUTO/FLASH SWITCH: When in the flash position, power shall be maintained to the controller and the intersection shall be placed in flash. The controller shall not be stop timed when in flash. Wired according to NEMA TS2 – 2003 the MMU forces the controller to initiate the start-up sequence when exiting flash.

8.1.2. STOP TIME SWITCH: A three position stop time switch shall be provided, with the middle position being the OFF position. When the upper FLASH STOP TIME ON position is applied, time shall be stopped on the controller only when the intersection enters conflict flash. When the lower STOP TIME ON position is applied, time shall instantly be stopped on the controller.

8.1.3. CONTROL EQUIPMENT POWER ON/OFF: This switch shall control the controller, MMU, and cabinet power supply AC power.

8.1.4. COORD/FREE SWITCH: Cabinet wiring shall include a COORD/FREE switch.

8.2. The police door switch panel shall contain the following:

8.2.1. AUTO/FLASH SWITCH: When in the flash position, power shall be maintained to the controller and the intersection shall be placed in flash. The controller shall not be stop timed when in flash. Wired according to NEMA TS2 – 2003 the MMU forces the controller to initiate the start-up sequence when exiting flash.

8.2.2. AUTO/MANUAL SWITCH: Cabinet wiring shall include an AUTO/MANUAL switch and provisions for a pluggable hand cord. A coiled hand cord shall be provided. The jack for the pluggable hand cord shall be equivalent to the Neutrik USA Inc. model NJ3FP6C locking jack and provide a locking mechanism to prevent the hand cord from being unintentionally pulled out while in use.

8.2.3. All toggle type switches shall be heavy duty and rated 15 amps minimum. Single- or double-pole switches may be provided, as required.

8.3. Any exposed terminals or switch solder points shall be covered with a non-flexible shield to prevent accidental contact.

8.4. All switch functions must be permanently and clearly labeled.

8.5. All wire routed to the police door-in-door and test switch push button panel shall be adequately protected against damage from repetitive opening and closing of the main door.

9. PREEMPT INTERFACE PANEL

9.1. All cabinets shall have a preempt panel mounted on the lower left side of the cabinet wall.

9.2. Cabinet wiring shall be provided for emergency vehicle preemption.

9.3. Cabinet wiring shall be provided for railroad preemption.

10. CONTROLLER TELEMETRY INTERFACE PANEL

10.1. All termination points shall be identified by a unique number and silk screened on the panel.

11. AUXILIARY DEVICES

11.1. Flashers shall meet the following minimum specifications:

11.1.1. The flasher shall be solid state and shall conform to the requirements of section 6.3 of the NEMA TS2 Standard.

11.1.2. Flashing of field circuits for the purpose of intersection flash shall be accomplished by a separate flasher.

11.1.3. The flasher shall be rated at 15 amperes, double pole with a nominal flash rate of 60 FPM.

11.2. Flash Transfer Relays shall meet the following minimum specifications:

11.2.1. All flash transfer relays shall meet the requirements of Section 6.4 of the NEMA TS2 Standard.

11.2.2. The coil of the flash transfer relay must be de-energized for flash operation.

11.2.3. The full complement of relays shall be supplied with each cabinet to allow for maximum phase utilization for which the cabinet is designed.

11.3. A minimum of 6 red load switch jumpers shall be provided with each cabinet.

12. Malfunction Management Unit

12.1. Each cabinet assembly shall be compatible with a Malfunction Management Unit (MMU) as defined by the requirements of Section 4 of the NEMA TS2 Standard.

13. Bus Interface Units

13.1. All Bus Interface Units (BIUs) shall meet the requirements of Section 8 of the NEMA TS2 Standard.

13.2. The full complement of Bus Interface Units shall be supplied with each cabinet to allow for maximum phase and function utilization for which the cabinet is designed.

13.3. Each Bus Interface Unit shall include power on, transmit and valid data indicators. All indicators shall be LEDs.

14. Cabinet Power Supply

14.1. The cabinet power supply shall meet the requirements of Section 5.3.5 of the NEMA TS2 Standard.

14.2. The cabinet power supply shall provide LED indicators for the line frequency, 12 VDC, 12 VAC, and 24 VDC outputs.

14.3. The cabinet power supply shall provide (on the front panel) jack plugs for access to the +24 VDC for test purposes.

14.4. One cabinet power supply shall be supplied with each cabinet assembly, and shall be wired directly to the Power Bus Assembly via a single connector. The power supply shall be integrated on the far right of the top shelf.

15. Vehicle Detection

15.1. One vehicle detector rack shall be provided in each cabinet. The detector rack shall be integrated on the top shelf to the immediate left of the power supply.

15.2. The detector rack shall support up to 16 channels of video detection (either eight 2 channel detectors or four 4 channel detectors), two 2-channel preemption devices, and one BIU.

15.3. The detector rack shall be wired to support two Global Traffic Technologies (GTT) Opticom Model 752 phase selectors (2 channels each) in the two far right slots of the rack. The farthest right slot shall be

capable of supporting one Global Traffic Technologies (GTT) Opticom Model 764 phase selector with 4 channels.

15.4. Detector rack BIU mounting shall be an integral part of the detector rack.

15.5. All BIU rack connectors shall have jumper address pins corresponding to the requirements of the TS2 specification. The jumpers may be moved to change the address of any individual rack.

15.6. These address pins shall control the BIU mode of operation. BIUs shall be capable of being interchanged with no additional programming. Each detector rack shall be powered by the cabinet power supply.

16. TESTING AND WARRANTY

16.1. Testing

16.1.1. Each cabinet assembly shall be tested under signal load for a minimum of 48 hours.

16.1.2. Each assembly shall be delivered with a signed document detailing the final tests performed on the cabinet.

16.1.3. The cabinet shall be assembled and tested by the manufacturer or authorized local distributor to ensure proper component integration and operation.

16.2. Warranty

16.2.1. The cabinet assembly and all other components shall be warranted for a period of one year from date of shipment.

16.2.2. Any defects shall be corrected by the manufacturer or supplier at no cost to the owner, including costs associated with shipping.

ATTACHMENT J.

Specifications for

NEMA TS2 Type 1 P44 Cabinet Assembly

Revised November 23, 2015

Prepared by

City of Harrisonburg, VA
Public Works Department
Traffic Engineering Division

TABLE OF CONTENTS

1. Introduction

1.1. This specification sets forth the minimum requirements for a P44 TS2 Type 1 traffic control cabinet assembly. The cabinet assembly shall meet, as a minimum, all applicable sections of the NEMA Standard Publication No. TS2-2003 v. 2.06. Where differences occur, this specification shall govern.

2. Cabinet Design and Construction

2.1. The cabinet shall be constructed from type 5052-H32 aluminum with a minimum thickness of 0.125 Inches.

2.2. At a minimum the cabinet dimensions shall be 52" H x 44" W x 24" D.

2.3. The cabinet shall be designed and manufactured with materials that will allow rigid mounting, whether intended for pole, base or pedestal mounting. The cabinet must not flex on its base.

2.4. A rain channel shall be incorporated into the design of the main door opening to prevent liquids from entering the enclosure. The cabinet door opening must be a minimum of 80 percent of the front surface of the cabinet. A stiffener plate shall be welded across the inside of the main door to prevent flexing.

2.5. The top of the cabinet shall incorporate a 1-inch slope toward the rear to prevent rain accumulation.

2.6. The outside of the cabinet shall have a natural aluminum finish. Sufficient care shall be taken in handling to ensure that scratches are minimized. All surfaces shall be free from weld flash. Welds shall be smooth, neatly formed, free from cracks, blowholes and other irregularities. All sharp edges shall be ground smooth.

2.7. The inside of the cabinet shall be powder coated with a glossy white paint.

2.8. The cabinet shall have a rear door with the same mechanical design as the main door.

2.9. All cabinets shall be supplied with two removable shelves manufactured from 5052-H32 aluminum spaced 13 inches apart. The upper shelf shall hold the detector card rack and the power supply. Shelves shall be a minimum of 10 inches deep. The front edge of the shelves shall have holes punched at least every 6 inches to accommodate tie wrapping of cables/harnesses.

2.10. A rigid slide-out document drawer/tray shall be mounted below the bottom shelf. The tray shall be of sufficient size and strength to hold a complete set of cabinet wiring drawings, intersection diagrams, equipment and programming manuals for all equipment and modules applicable to each cabinet. The tray shall operate by sliding out, then opening a hinged cover to remove documents. After removing the documents and closing the cover, the d shall serve as a suitable resting place for documents or a laptop computer.

2.11. A minimum of one set of vertical "C" channels shall be mounted on each interior wall of the cabinet for the purpose of mounting the cabinet components. The channels shall accommodate spring mounted nuts or studs. All mounting rails shall extend to within 7 inches of the top and bottom of the cabinet.

2.12. The main door and police door-in-door shall close against a weatherproof and dust-proof, closed cell neoprene gasket seal. The gasket material for the main door shall be a minimum of 0.250 inches thick

by 1.00 inch wide. The gasket material for the police door shall be a minimum of 0.250 inches thick by 0.500 inches wide. The gaskets shall be permanently bonded to the cabinet.

2.13. The lower section of the cabinet shall be equipped with a louvered air entrance. The air inlet shall be large enough to allow sufficient air flow per the rated fan capacity. Louvers must satisfy the NEMA rod entry test for 3R ventilated enclosures. A non-corrosive, vermin and insect proof, removable air filter shall be secured to the air entrance. The filter shall fit snugly against the cabinet door wall.

2.14. The main door shall be equipped with a three-point latching mechanism. The handle on the main door shall utilize a shank of 5/8 inches minimum diameter. The handle shall include a hasp for the attachment of an optional padlock. The lock assembly shall be positioned so that the handle shall not cause any interference with the key when opening the cabinet door.

2.15. The main door hinge shall be a one-piece, continuous piano hinge with a stainless steel pin running the entire length of the door. The hinge shall be attached in such a manner that no rivets or bolts are exposed.

2.16. The main door of the cabinet shall include a mechanism capable of holding the door open at approximately 90, 125, and 150 degrees under windy conditions. Manual placement of the mechanism shall not be required by field personnel.

2.17. The main door shall be equipped with a Corbin tumbler lock number 1548-1 or exact equivalent. A minimum of two keys shall be supplied.

2.18. The police door-in-door shall be provided with a treasury type lock Corbin number R357SGS or exact equivalent. A minimum of two keys shall be supplied.

2.19. The complete cabinet circuitry diagram shall also be supplied on a digital compact computer disk in the latest version of both AutoCAD DXF and PDF format.

2.20. A 2" X 4" (minimum size) identification plate with the cabinet circuitry diagram number shall be permanently affixed to the inside of the main cabinet door in the upper right hand corner. An engraved plastic plate is preferred.

3. Main Panel Design and Construction

3.1. The main panel shall be constructed from 5052-H32 brushed aluminum of 0.125 inches minimum thickness and installed so as to minimize flexing when plug-in components are installed.

3.2. The main panel shall be provided with a mounting mechanism which allows easy access to all wiring on the rear of the panel without the removal of any cabinet shelves. Lowering of the main panel shall be accomplished by removing fasteners by hand or with a screwdriver and dropping the main panel forward on a hinging mechanism. The main panel shall be able to be completely removed and replaced.

3.3. The bottom of the main panel shall be at minimum of 9 inches from the bottom of the cabinet and the top shall not extend beyond the height of the first shelf such that it obstructs the panel from being dropped forward for rear access.

4. Terminals and Facilities

4.1. Sixteen load switch sockets with one load switch per socket, six flash transfer relay sockets with one flash transfer relay per socket, one flasher socket with one flasher, 2 main panel BIU sockets with one BIU for each socket, and one 16-channel detector rack with one BIU shall be provided.

4.2. The sixteen available channels shall be wired to provide 8 vehicle phases, 4 pedestrian phases, and 4 overlaps. Channels 1 through 8 shall be assigned to vehicle phases 1 through 9. Channels 9 through 12 shall be assigned to pedestrian phases 2, 4, 6, and 8. Channels 13 through 16 shall be assigned to overlaps A through D.

4.3. All load switches shall be supported by a bracket, extending at least half the length of the load switch.

4.4. The load switch position main panels shall have all field wires contained on a row horizontally mounted terminal blocks. The upper row shall be wired for the pedestrian and overlap field terminations. The lower row shall be reserved for phase one through phase eight vehicle field terminations.

4.5. All field output circuits shall be terminated on a non-fused barrier type terminal block with a minimum rating of 10 amps.

4.6. All field input/output (I/O) terminals shall be identified by permanent alphanumerical labels. All labels shall use standard nomenclature per the NEMA TS2 specification.

4.7. All cabinets shall be wired to flash yellow on phases 2 & 6 and red on all other phases. It shall still be possible to change from one color indication to the other by use of a screwdriver. Field termination blocks shall be wired to use four positions per vehicle or overlap phase (green, yellow, and red, flash). It shall not be necessary to de-buss field terminal blocks for flash programming.

4.8. The cabinet shall contain at least one flasher socket (silk screen labeled) capable of operating a 15-amp, 2-pole, NEMA solid-state flasher. The flasher shall be supported by a bracket, extending at least half its length.

4.9. One RC network shall be wired in parallel with each group of three flash-transfer relays and any other relay coils.

4.10. All logic-level, NEMA-controller and Malfunction Management Unit input and output terminations on the main panel shall be permanently labeled. Cabinet prints shall identify the function of each terminal position.

4.11. At a minimum, three 20-position terminal blocks shall be provided at the top of the main panel to provide access to the controller unit's programmable and non-programmable I/O. Terminal blocks for DC signal interfacing shall have a number 6-32 x 7/32 inch screw as minimum.

4.12. A minimum of four terminal positions on the main panel shall be configured to provide 120VAC+ utility power.

4.13. All main panel wiring shall conform to the following wire color:

4.13.1. Green/Walk load switch output – brown wire
4.13.2. Yellow load switch output – yellow wire
4.13.3. Red/Don't Walk load switch output – red wire

4.13.4. MMU (other than AC power) – violet wire
4.13.5. Controller I/O – blue wire
4.13.6. AC Line (power panel to main panel) – black wire
4.13.7. AC Line (main panel) – black wire
4.13.8. AC Neutral (power panel to main panel) – white wire
4.13.9. AC Neutral (main panel) – white wire
4.13.10. Earth ground (power panel) – green wire
4.13.11. Logic ground – gray wire
4.13.12. Flash programming – orange wire
4.13.13. Flash terminal – black wire red or yellow field terminal

4.14. All wiring, 14 AWG and smaller, shall conform to MIL-W-16878/1, type B/N, 600V, 19-strand tinned copper. The wire shall have a minimum of 0.010 inches thick PVC insulation with clear nylon jacket and rated to 105 degrees Celsius. All 12 AWG and larger wire shall have UL listed THHN/THWN 90 degrees Celsius, 600V, 0.020 inches thick PVC insulation and clear nylon jacket.

4.15. Connecting cables shall be sleeved in a braided nylon mesh or poly-jacketed. The use of exposed tie-wraps or interwoven cables is unacceptable. All terminals and facilities configurations shall be provided with an A connector to allow for the intended operation of the cabinet. Mode pins shall allow the user to reconfigure the main panel I/O.

4.16. Connecting cables shall be sleeved in a braided nylon mesh or poly-jacketed. The use of exposed tie-wraps or interwoven cables is unacceptable.

4.17. All Terminals and Facilities configurations shall be provided with BIU wiring assignments consistent with NEMA TS2-1998 specifications.

4.18. All Terminals and Facilities configurations shall be provided with sufficient RS-485 Port 1 communication cables to allow for the intended operation of that cabinet. Each communication cable connector shall be a 15-pin metal shell D subminiature type. The cable shall be a shielded cable suitable for RS-485 communications.

4.19. All main panels shall be pre-wired for a Type-16 Malfunction Management Unit.

4.20. All wiring shall be neat in appearance. All cabinet wiring shall be continuous from its point of origin to its termination point. Butt type connections/splices are not acceptable.

4.21. All connecting cables and wire runs shall be secured by mechanical clamps. Stick-on type clamps are not acceptable.

4.22. The grounding system in the cabinet shall be divided into three separate circuits (AC Neutral, Earth Ground, and Logic Ground). These ground circuits shall be connected together at a single point as outlined in the NEMA TS2 Standard.

4.23. The main panel shall incorporate a relay to remove +24 VDC from the common side of the load switches when the intersection is placed into mechanical flash. The relay shall have a momentary pushbutton to apply power to the load switch inputs for ease of troubleshooting.

4.24. All pedestrian push button inputs from the field to the controller shall be opto-isolated through the BIU and operate at 12 VAC.

4.25. All wire (size 16 AWG or smaller) at solder joints shall be hooked or looped around the eyelet or terminal block post prior to soldering to ensure circuit integrity. Lap joint soldering is not acceptable.

5. Power Panel Design and Construction

5.1. The power panel shall be located in the lower right section of the cabinet interior.

5.2. The power panel shall be wired to provide the necessary filtered power to the load switches, flasher(s), and power bus assembly. The power components shall be equipped with a removable plastic front cover for technician protection. The design will allow a technician to access the main and auxiliary breakers without removing the protective front cover.

5.3. The power panel portion of the main panel shall include the following components:

5.3.1. A minimum of a 30-amp main breaker. This breaker shall supply power to the controller, MMU, signals, cabinet power supply and auxiliary panels. Breakers shall be at minimum, a thermal magnetic type, U.L. listed for HACR service, with a minimum of 10,000 amp interrupting capacity.

5.3.2. A minimum of a 15-amp auxiliary breaker. This breaker shall supply power to the fan, light and GFI utility outlet.

5.3.3. An EDCO model SHA – 1250 Lightning Surge Protection with SHA – 1250 – Base – or an exact equivalent.

5.3.4. A 50 amp, 125 VAC radio interference line filter.

5.3.5. A Crydom Inc. model HA4875 normally-open, panel-mount, 75-amp, solid-state relay or an exact equivalent.

5.3.6. A minimum of two 8-position neutral bus bar capable of connecting three #12 wires per position. One bar shall be positioned on the lower right side of the cabinet and one bar shall be positioned on the lower left side of the cabinet. All bars shall be installed horizontally at a height of 6 to 12 inches from the bottom of the cabinet.

5.3.7. A minimum of two 8-position ground bus bar capable of connecting three #12 wires per position. One bar shall be positioned on the lower right side of the cabinet and one bar shall be positioned on the lower left side of the cabinet. All bars shall be installed horizontally at a height of 6 to 12 inches from the bottom of the cabinet.

5.3.8. A NEMA type 5-15R GFI utility outlet.

5.3.9. One filtered AC power receptacle with 4 outlets. This unit shall be installed on the back side of the left cabinet wall just above the lower shelf.

6. Power Bus Assembly

6.1. The power bus assembly shall be manufactured from 0.090”, 5052-H32 aluminum. It shall provide filtered power for the controller, malfunction management unit, cabinet power supply, and auxiliary equipment. It shall include the SDLC Bus connecting cables wired or plugged into a surface-mounted compression terminal block.

6.2. The power bus assembly shall house the following components:

6.2.1. A minimum of three and a maximum of six power connectors.

6.2.2. Two terminal strips to hardwire the power connectors.

6.2.3. SDLC terminal block with pre-wired cables.

6.3. All cabinet equipment requiring filtered power to operate shall be hardwired directly to the supplied terminal blocks of the power bus assembly.

7. Auxiliary Cabinet Equipment

7.1. The cabinet shall be provided with a thermostatically controlled (adjustable between 80-150 degrees Fahrenheit) ventilation fan in the top of the cabinet plenum. The fan plate shall be removable with the use of simple hand tools for serviceability. A minimum of one exhaust fan shall be provided. The fan shall be a ball bearing type fan and shall be capable of drawing a minimum of 100 cubic feet of air per minute.

7.2. A minimum 60-watt equivalent LED lamp mounted on a 14-inch flexible arm shall be included. The flexible arm shall be permanently mounted to the middle of the main cabinet door. The lamp shall have a switch to control power to the light when the cabinet door is open.

7.3. A minimum 18-inch wide LED lighting fixture shall be mounted on the inside top of the cabinet near the front edge. The lamp shall be wired to a door-activated switch mounted near the top right corner of the door.

7.4. All cabinets shall have a door open alarm switch mounted near the top right corner of the door.

7.5. An Intermatic K4021 photocell or an exact equivalent approved photocell shall be wired to a terminal strip for future use. The photocell shall be mounted to the right rear corner on the right face of the cabinet exterior.

7.6. A re-sealable print pouch shall be mounted to the door of the cabinet. The pouch shall be of sufficient size to accommodate one complete set of cabinet prints.

7.7. A minimum of two sets of complete and accurate ANSI size D cabinet drawings shall be supplied with each cabinet. These drawings shall be placed in the re-sealable pouch.

8. Cabinet Test Switches and Police Panel

8.1. A test switch panel shall be mounted on the inside of the main door. The test switch panel shall provide as a minimum the following:

8.1.1. AUTO/FLASH SWITCH: When in the flash position, power shall be maintained to the controller and the intersection shall be placed in flash. The controller shall not be stop timed when in flash. Wired according to NEMA TS2 – 2003 the MMU forces the controller to initiate the start-up sequence when exiting flash.

8.1.2. STOP TIME SWITCH: A three position stop time switch shall be provided, with the middle position being the OFF position. When the upper FLASH STOP TIME ON position is applied, time shall be stopped on the controller only when the intersection enters conflict flash. When the lower STOP TIME ON position is applied, time shall instantly be stopped on the controller.

8.1.3. CONTROL EQUIPMENT POWER ON/OFF: This switch shall control the controller, MMU, and cabinet power supply AC power.

8.1.4. COORD/FREE SWITCH: Cabinet wiring shall include a COORD/FREE switch.

8.2. The police door switch panel shall contain the following:

8.2.1. AUTO/FLASH SWITCH: When in the flash position, power shall be maintained to the controller and the intersection shall be placed in flash. The controller shall not be stop timed when in flash. Wired according to NEMA TS2 – 2003 the MMU forces the controller to initiate the start-up sequence when exiting flash.

8.2.2. AUTO/MANUAL SWITCH: Cabinet wiring shall include an AUTO/MANUAL switch and provisions for a pluggable hand cord. A coiled hand cord shall be provided. The jack for the pluggable hand cord shall be equivalent to the Neutrik USA Inc. model NJ3FP6C locking jack and provide a locking mechanism to prevent the hand cord from being unintentionally pulled out while in use.

8.2.3. All toggle type switches shall be heavy duty and rated 15 amps minimum. Single- or double-pole switches may be provided, as required.

8.3. Any exposed terminals or switch solder points shall be covered with a non-flexible shield to prevent accidental contact.

8.4. All switch functions must be permanently and clearly labeled.

8.5. All wire routed to the police door-in-door and test switch push button panel shall be adequately protected against damage from repetitive opening and closing of the main door.

9. Preempt Interface panel

9.1. All cabinets shall have a preempt panel mounted on the lower left side of the cabinet wall.

9.2. Cabinet wiring shall be provided for emergency vehicle preemption.

9.3. Cabinet wiring shall be provided for railroad preemption.

10. Controller Telemetry Interface Panel

10.1. All termination points shall be identified by a unique number and silk screened on the panel.

11. Auxiliary Devices

11.1. Flashers shall meet the following minimum specifications:

11.1.1. The flasher shall be solid state and shall conform to the requirements of section 6.3 of the NEMA TS2 Standard.

11.1.2. Flashing of field circuits for the purpose of intersection flash shall be accomplished by a separate flasher.

11.1.3. The flasher shall be rated at 15 amperes, double pole with a nominal flash rate of 60 FPM.

11.2. Flash Transfer Relays shall meet the following minimum specifications:

11.2.1. All flash transfer relays shall meet the requirements of Section 6.4 of the NEMA TS2 Standard.

11.2.2. The coil of the flash transfer relay must be de-energized for flash operation.

11.2.3. The full complement of relays shall be supplied with each cabinet to allow for maximum phase utilization for which the cabinet is designed.

11.3. A minimum of 12 red load switch jumpers shall be provided with each cabinet.

12. Malfunction Management Unit

12.1. Each cabinet assembly shall be compatible with a Malfunction Management Unit (MMU) as defined by the requirements of Section 4 of the NEMA TS2 Standard.

13. Bus Interface Units

13.1. All Bus Interface Units (BIUs) shall meet the requirements of Section 8 of the NEMA TS2 Standard.

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13.3. Each Bus Interface Unit shall include power on, transmit and valid data indicators. All indicators shall be LEDs.

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15.4. Detector rack BIU mounting shall be an integral part of the detector rack.

15.5. All BIU rack connectors shall have jumper address pins corresponding to the requirements of the TS2 specification. The jumpers may be moved to change the address of any individual rack.

15.6. These address pins shall control the BIU mode of operation. BIUs shall be capable of being interchanged with no additional programming. Each detector rack shall be powered by the cabinet power supply.

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16.1.1. Each cabinet assembly shall be tested under signal load for a minimum of 48 hours.

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