



REQUEST FOR QUOTATION 3768Q
Supply and Delivery of Pole Mount Pedestrian Signal Cabinets

Quotations will be received at the Information Counter, Main Floor, Richmond City Hall, addressed to the Purchasing Section, 6911 No. 3 Road, Richmond, BC, V6Y 2C1, until

Wednesday, June 30, 2010 12:00 noon local time.

NOTES:

1. Quotations shall be in a sealed envelope or package marked with the bidder's Name, the RFQ Title and Number.
2. The Closing time will be conclusively deemed to be the time shown on the clock used by the City for this purpose.
3. Faxed quotations will not be received or considered.
4. Deadline for all questions: **Monday, June 21, 2010 12:00 pm**

All queries related to the RFQ shall be submitted
in writing to the attention of:

Daianna Panni

Buyer 1

purchasing@richmond.ca

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PART A – INSTRUCTIONS TO BIDDERS

REQUEST FOR QUOTATION 3768Q

Supply and Delivery of Pole Mount Pedestrian Signal Cabinets

Name of Bidder: _____

Address: _____

City: _____

Province: _____

Postal Code _____

Telephone Number _____

Contact Person _____

Title: _____

Email Address _____

Fax Number _____

PART A – INSTRUCTIONS TO BIDDERS

PART A – INSTRUCTIONS TO BIDDERS

Description of Requirement

- 1.1 Quotations are invited for supply and delivery of Pole Mount Pedestrian Signal Cabinets as set out herein, for the City of Richmond.
- 1.2 Bidders are required to submit a quotation for the full requirement only. Partial responses will be put aside and given no further consideration.

Contract Term- Intentionally Omitted

Pricing

- 1.3 Prices quoted will be in Canadian currency and inclusive of all taxes, F.O.B. destination to the sites named herein, with all freight, unloading at destination, import duties, brokerage, royalties, handling, overhead, profit and all other costs included.

Inquiries and Clarifications

- 1.4 It is the responsibility of the Bidder to thoroughly examine these documents and satisfy itself as to the full requirements of this RFQ. Inquiries are to be in written form only, faxed or e-mailed to the contact person shown on the cover page. If required, an addendum will be issued to all Bidders.

Submission of Quotation

- 1.5 The response to this Request for Quotations (RFQ) with all accompanying schedules, appendices or addenda submitted by the Bidder will be received up to the closing time on the date and in the place shown on the title page of this RFQ (the “Closing Time”). The Quotation shall be submitted on the forms provided in a sealed envelope or package, marked with the Bidder’s name and the RFQ title and number.
- 1.6 Quotations received after the Closing Time or in locations other than the address indicated, will not be accepted and will be returned unopened.
- 1.7 The Bidder shall submit three (3) copies of its Quotation in accordance with the instructions stated herein.
- 1.8 The Bidder must enter its corporate or legal business name on the final page of the Quotation Form. The Quotation Form must be signed in the place provided by an officer or employee having authority to bind the Bidder to the terms and

PART A – INSTRUCTIONS TO BIDDERS

conditions of this RFQ. All other pages of the Quotation Form must be initialled by the authorized signatory in the spaces provided.

- 1.9 Amendments to a Quotation may be submitted if delivered in writing prior to the Closing Time in a sealed envelope or package, marked with the Bidder's name and the RFQ title and number.
- 1.10 Quotations may be withdrawn by written notice only, provided such notice is received at the Purchasing Services office prior to Closing Time.
- 1.11 All costs associated with the preparation and submission of the Quotation, including any costs incurred by the Bidder after the Closing Time, will be borne solely by the Bidder.
- 1.12 By submitting a Quotation, the Bidder acknowledges and agrees that the City will not be responsible for any costs, expenses, losses, damages (including damages for loss of anticipated profit) or liabilities incurred by the Bidder as a result of or arising out of submitting a Quotation for the proposed Contract, or due to the City's acceptance or non-acceptance of their Quotation or any breach by the City of the bid contract between the City and each of the Bidders or arising out of any contract award not made in accordance with the express or implied terms of the Quotation documents.

Conflict of Interest

- 1.13 By submitting a Quotation, the Bidder warrants that neither it nor any of its officers or directors, or any employee with authority to bind the Bidder, has any financial or personal relationship or affiliation with any elected official or employee of the City or their immediate families which might in any way be seen by the City to create a conflict.

Evaluation of Quotations

- 1.14 Quotations will be evaluated on the basis of the overall best value to City based on quality, service, price and any other criteria set out herein including, but not limited to:
 - a) the Bidder's ability to meet the Requirements, qualifications and competencies set out herein;
 - b) financial offer including but not limited to prices, operating and maintenance costs, warranty, and any life cycle considerations;
 - c) the Bidder's business and technical reputation and capabilities; experience and where applicable, the experience of its personnel; financial stability; track record; and references of current and former customers;
 - d) equipment quality, configuration, age and condition; and

PART A – INSTRUCTIONS TO BIDDERS

- e) any other criteria set out in the RFQ.
- 1.15 Prior to Contract award, the Bidder may be required to demonstrate financial stability. Should the City so request, the Bidder will be required to provide annual financial reports or a set of financial statements prepared by an accountant and covering the last two (2) fiscal years.
- 1.16 The City may, prior to Contract award, negotiate changes to the scope of the Work, the materials, the Specifications or any conditions with any one or more of the Bidders without having any duty or obligation to advise any other Bidders or to allow them to vary its prices as a result of changes to the scope of Work, the materials, the Specifications, or any conditions, and the City shall have no liability to any other Bidder as a result of such negotiations or modifications.
- 1.17 Preference may be given to Quotations offering environmentally beneficial products or services.

Acceptance and Rejection of Quotations

- 1.18 Notwithstanding any other provision in the Quotation documents, the City has in its sole discretion, the unfettered right to:
- a) accept any Quotation;
 - b) reject any Quotation;
 - c) reject all Quotations;
 - d) accept a Quotation which is not the lowest Quotation;
 - e) accept a Quotation that deviates from the Requirements, Specifications or the conditions specified in this Quotation;
 - f) reject a Quotation even if it is the only Quotation received by the City;
 - g) accept all or any part of a Quotation; and
 - h) split the Requirements between one or more Bidders.
- 1.19 All Quotations shall be irrevocable and remain open for a minimum of sixty (60) days after the Closing Time, whether or not another Quotation has been accepted.
- 1.20 The City may waive any non-compliance with the RFQ, the Requirements, the Specifications, or any conditions, including the timing of delivery of anything required by this RFQ and may elect to retain for consideration Quotations which are non-conforming, which do not contain the content or form required by the RFQ or which have not complied with the process for submission set out herein.

PART A – INSTRUCTIONS TO BIDDERS

Award of Contract

- 1.21 Award of a Contract is contingent on funds being approved and the contract award being made by the appropriate City authority.
- 1.22 The City reserves the right to partially award the contract.
- 1.23 The purchase order, the Quotation, the RFQ and such other documents including all amendments or addenda, shall form the basis for the Contract between the Contractor and the City. In the event of a conflict between any of the Contract Documents, the following documents will take precedence and govern over each other in the following order of priority from highest to lowest:
 - a) The City's purchase order including the standard purchase order terms and conditions;
 - b) Or any mutually agreed to amendments between the Bidder and the City;
 - c) The Quotation; and
 - d) The RFQ and any subsequent addenda.
- 1.24 Where the head office of the successful Bidder is located within the City of Richmond and/or where the successful Bidder is required to perform the Service at a site located within the City of Richmond, the successful Bidder is required to have a valid City of Richmond business license prior to Contract execution.
- 1.25 The City is not under any obligation to award a Contract and may elect to terminate this RFQ at anytime.

Quantities

- 1.26 The quantities stated herein are the City's best estimates of its requirements and should not be relied on. Actual quantities may vary.

Alternates and/or Variations to Specifications

- 1.27 Except where stated otherwise herein, the Specifications describe what is considered necessary to meet the performance requirements of the City and Bidders should bid in accordance with such Specifications, or if the Bidder cannot meet the Specifications, the Bidder may offer an alternative which it believes to be the equivalent.
- 1.28 If in addition to bidding on goods, materials, equipment and/or services that meet the Specifications, the Bidder wishes to offer an alternative, the alternative Quotation shall be submitted separately in the same format as the initial Quotation.
- 1.29 The City is not obligated to accept any alternatives.

PART A – INSTRUCTIONS TO BIDDERS

- 1.30 The City will determine what constitutes allowable variations.

Freedom of Information and Protection of Privacy Act

- 1.31 Bidders should note that the City of Richmond is subject to the Freedom of Information and Protection of Privacy Act (British Columbia), which imposes significant obligations on the City's contractors to protect all personal information acquired from the City in the course of providing any service to the City.

Confidentiality

- 1.32 Information about the City obtained by Bidders must not be disclosed unless prior written authorization is obtained from the City.
- 1.33 The Contractor agrees that this obligation of confidentiality will survive the termination of the Contract between the Contractor and the City.

1.0 Definitions

The following words and terms, unless the context otherwise requires, shall have the meanings set out below. Words including the singular number include the plural and vice versa.

“Act of God” means a cataclysmic phenomenon of nature, including earthquake, flood or cyclone. Rain, snow, wind, high water or any other natural phenomenon, which might reasonably have been anticipated from historical records of the general locality of the City, shall be deemed not to be acts of God;

“Bidder” means the individual, partnership, corporation or combination thereof, including joint venturers, who or which sign the Quotation form set out in Part D of this RFQ;

“City” means the municipal corporation, generally known as the City of Richmond.

“City’s Designated Representatives” means the City’s employees or representatives who are authorized in writing to deal with the Contractor on behalf of the City in connection with the goods, materials, equipment and services or to make decisions in connection with the Contract;

“Closing Time” means the closing date, time, and place as set out on the title page of this RFQ;

“Contract” means the agreement formed between the City and the Contractor as evidenced by the purchase order issued to the Contractor by the City;

“Contract Documents” means the purchase order, the Contractor’s Quotation, the RFQ and such other documents as listed in the purchase order, including all amendments or addenda agreed between the parties;

“Contractor” means the successful Bidder individual, partnership, corporation or combination thereof, including joint venturers, who or which is awarded the Contract;

“Delivery Date” means the date the City requires the Contractor to deliver the goods to the City’s Delivery Site;

“F.O.B.” means all costs of freight, insurance, brokerage, customs duties and all other costs of delivery to the site named as F.O.B. will be borne by the Contractor and that ownership and title to all goods, materials, and equipment are transferred to the City when same are delivered by the Contractor to the City and the risk of loss or damage to the goods, materials and equipment transfers to the City only at such time as same are received and accepted by the City at the site named as “F.O.B.”;

“GST” means the goods and services tax administered under the Excise Tax Act (Canada) and any successor tax or levy therefor in force from time-to-time;

“OHS Regulation” means the *Workers Compensation Act* (British Columbia), including without limitation, the Occupational Health & Safety Regulation (BC Regulation 296/97, as amended by BC Regulation 185/99) enacted pursuant to such Act, all as such Act or Regulations are amended or re-enacted from time to time.

“PST” means British Columbia provincial sales tax and any successor tax or levies therefor in force from time-to-time;

“Quotation” means the Bidder’s offer made on the Quotation form set out on Part E of this RFQ with all appendices or addenda submitted by the Bidder in response to the RFQ;

“RFQ” means this Invitation to Quotation including, but not limited to: Part A - Instructions to Bidders; Part B - General Conditions; Part C- Requirements; Part D – Quotation Form;

“Requirements” means all of the Specifications, requirements and services set out in the RFQ that describes the general requirements that the goods, materials, equipment and services must meet and the Contractor must provide;

“Work” means all the labour, materials, equipment, supplies, services and other items necessary for the execution, completion and fulfilment of the Requirements;

“Work Site” means the site where the Work is being performed, < > B.C., unless otherwise stated in this RFQ.

Independent Contractor

1.1 The Contractor, its sub-contractors, the officers, directors, shareholders, partners, personnel, affiliates and agents of the Contractor and its sub-contractors are not, nor are they to be deemed to be, partners, appointees, employees or agents of the City.

Assignment

1.2 Subject to Sections 2.4 and 4.2, the Contractor will not assign, sublet, subcontract, or let out as task work any part of the Work or any of the Contractor’s obligations of the Contract Documents to any third party, and will not assign or otherwise transfer any of the rights of payment under the Contract Documents to any third party, without in each case the prior written consent of the City which consent the City may arbitrarily withhold.

1.3 Despite Section 4.1, the Contractor may utilize those sub-contractors expressly named in Section 10.1 of Part E – Quotation Form but only for the Area of Responsibility set out beside their name, provided always that the Contractor may not substitute or replace those sub-contractors, or permit those sub-contractors to

further assign, sub-let, sub-contract, or let out as task work their obligations under the Contract documents, except in accordance with Section 4.1 above.

- 1.4 If the City should consent to any such assignment, subletting or letting out as task work of all or any part of the Work, the Contractor shall in no way be relieved from its responsibility for the fulfilment of the Work, but shall continue to be responsible for the same in the same manner as if all the Work had been performed by the Contractor.

Time of the Essence

- 1.5 For all requests made by the City pursuant to the Contract, time is of the essence. The acceptance of a late performance, with or without objections or reservations by the City, shall not waive the right to claim damages for such breach nor constitute a waiver of the requirement of timely performance of any obligation remaining to be performed.

Laws, Permits and Regulations

- 1.6 The laws of British Columbia shall govern the Contract.
- 1.7 In carrying out its obligations hereunder, the Contractor shall familiarize itself and comply with all applicable laws, bylaws, regulations, ordinances, codes, specifications and requirements of all regulatory authorities, and shall obtain all necessary licenses, permits and registrations as may be required by law.

Inspection

- 1.8 The services are subject to inspection and in case any of the services are not in conformity with the Requirements of the Contract or the Contractors' warranty (expressed or implied), the City shall have the right either to reject them or to require correction.
- 1.9 The City shall be the final judge of the services and materials in respect of both quality and quantity and its decisions of all questions in dispute with regard thereto will be final.
- 1.10 The City will not be deemed to have accepted the services by virtue of a partial or full payment for it.

Quality of Workmanship and Materials

- 1.11 The Contractor shall perform the services with the degree of care, skill and diligence normally applied in the performance of services of a similar nature and in accordance with sound current professional practices and conforming to the requirements set out in the RFQ.

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- 1.12 Materials, goods and equipment shall be the products of suppliers or manufacturers of established reputation engaged in the supply or manufacture of such materials of equipment.
 - 1.13 Materials are to be applied in accordance with the manufacturer's directions and shall use the techniques and applications best suited for the type of material being used.

Warranty

- 1.14 The Contractor warrants that the goods, materials, equipment and/or services supplied by the Contractor to the City will be in full conformity with the Specifications as well as samples, if any, then this is a sale by sample as well as by description within the meaning of the Sale of Goods Act (BC).
- 1.15 9.2 The Contractor further warrants that the goods, materials and/or equipment are of merchantable quality, and fit for the intended use and will perform according to the requirements set out in the RFQ.
- 1.16 Equipment and materials shall be new, free and clear of all liens, charges and encumbrances, the latest model, and shall be complete with all necessary accessories for operation. All equipment and materials shall be at the risk of the Contractor until delivered to and accepted by the City.
- 1.17 At a minimum, a one (1) year parts and labour warranty shall be provided on all goods, materials, equipment and/or services provided under the Contract.
- 1.18 The Contractor warrants that its employees have the qualifications, experience, knowledge, skills and abilities necessary for the fulfilment of the Contract.

Indemnification and Insurance

- 1.19 The Contractor shall indemnify, hold and save harmless the City from and against all claims, losses, damages, costs, actions and other proceedings made, sustained, brought or prosecuted in a manner based upon, occasioned by or attributable to any injury, including death, property damage, infringement or damage arising from any act or omission of the Contractor, its employees, officers, volunteers, servants, sub-contractors, or agents or persons from whom the Contractor has assumed responsibility in the performance or purported performance of the Requirements.
- 1.20 The Contractor shall indemnify the City from and against any and all liability or expenses by way of legal costs or otherwise in respect of any claim which may be made for a lien or charge at law or in equity or to any claim or liability under the Builders Lien Act, or to any attachment for debt, garnishee process or otherwise.

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- 1.21 The Contractor shall assume the defence of, and indemnify and hold harmless the City and its officers, employees and agents, from and against all claims relating to materials, goods or equipment furnished and to inventions, copyrights, trade marks, or patents and rights thereto used by the Contractor in the execution of the Contract and in subsequent use and/or operation by the City.
- 1.22 The Contractor will indemnify, hold, and save harmless the City from and against all claims, losses, damages, costs, actions, and other proceedings, made, sustained, brought or prosecuted in manner, based upon, occasioned by, attributable to any injury, including death, property damage, infringement, or damage arising from any act or omission of the Contractor, his employees, officers, volunteers, servants, or agents or persons from whom the Contractor has assumed responsibility in the performance or purported performance of this agreement

Termination

- 1.23 The City will advise the Contractor by written notice of its intent to terminate the whole or any part of the Contract in any one of the following circumstances:
- a) if the Contractor fails to make delivery of the goods, materials, equipment and/or services within the time specified, or fails to perform any other provisions, terms or conditions of the Contract within the time specified, or within a reasonable time if no time is specified;
 - b) in the event that the Contractor performs any act or does anything by which the City shall incur any liability whatsoever;
 - c) any failure of the Contractor to meet the safety requirements of the Contract;
 - d) in the event that any creditor of the Contractor causes a writ of execution or similar writ or court order to be served upon the City requiring the City to pay any portion due to the Contractor under the Contracts; or
 - e) in the event that the Contractor is adjudged bankrupt or if it makes a general assignment for the benefit of creditors or if it becomes insolvent or if it should take the benefit of any Act that may be in force for bankrupt or insolvent debtors.
- 1.24 Upon termination of the Contract, the City shall have no obligation to the Contractor except for such services and/or goods as have been supplied up to the date of the termination of the Contract(s).
- 1.25 Upon termination of the Contract(s) in whole or in part, the City may procure similar goods, materials, equipment and/or services and the Contractor shall be liable to the City for any excess costs for such similar goods, materials, equipment and/or services. The Contractor shall not be liable for any excess costs if failure to perform arises by reason of strikes, lockouts, Acts of God or acts of the City. The

City will not be liable where Delivery Sites are not available due to strikes, lockouts or Acts of God.

Payments

- 1.26 The Contractor shall be paid net thirty (30) days from receipt of invoice and acceptance of the goods, materials, equipment and/or services, whichever is the later.
- 1.27 The Contractor may be required to accept payment by purchasing card (MasterCard). Preference may be given to a Bidder who has or is willing to expand their system to provide Level III reporting detail.

Taxes

- 1.28 Unless otherwise provided herein, the Contractor shall pay all sales or excise taxes in force during the term of the Contract, provided that any increase or decrease in such taxes shall increase or decrease the amount due under the Contract(s).
- 1.29 Invoices shall show the appropriate amounts for GST and PST.
- 1.30 Non-resident Withholding Tax – Intentionally Omitted

Protection of Person and Property

- 1.31 The Contractor shall use due care that no persons are injured, no property damaged or lost, and no rights are infringed in the performance of the services, and the Contractor shall be solely responsible for all loss, damages, costs and expenses in respect of any injury to persons, damage of property, or infringement of the rights of others incurred in the performance of the services or caused in any other manner whatsoever by the Contractor, or its employees.
- 1.32 The Contractor shall effectively warn and protect the public and other personnel from any danger as a result of the services being done.

Conduct of the Contract

- 1.33 The City of Richmond's Manager, Purchasing shall have the conduct of the RFQ and the Contract.

Rectification of Damage and Defects

- 1.34 The Contractor shall rectify any loss or damage for which, in the opinion of the City the Contractor is responsible, at no charge to the City and to the satisfaction of the City. Alternatively, the City may repair the loss or damage and the Contractor shall pay to the City the costs of repairing the loss or damage forthwith

upon demand from the City. Where, in the opinion of the City, it is not practical or desirable to repair the loss or damage, the City may estimate the cost of the loss or damage and deduct such estimated amount from the amount owing to the Contractor hereunder..

Dispute Resolution

- 1.35 All claims, disputes or issues in dispute between the City and the Contractor shall be decided by mediation or arbitration, if the parties agree, or failing agreement, in a Court of competent jurisdiction with the Province of British Columbia and be governed by the laws of British Columbia.
- 1.36 In the event that the parties agree to arbitration pursuant to the above, the arbitration shall be governed by the rules of the British Columbia International Commercial Arbitration Centre, except that the arbitrator or arbitrators shall be agreed upon by the parties, and failing agreement by the parties, shall be appointed by a court of competent jurisdiction with the Province of British Columbia.
- 1.37 In the event that the parties agree to arbitration, the arbitration shall take place in the Lower Mainland, British Columbia and be governed by the laws of British Columbia.
- 1.38 The procedure set out in this section is not meant to preclude or discourage informal resolution of disagreements between the City and the Contractor.

Delivery

- 1.39 Deliveries shall be made to 5599 Lynas Lane, Richmond, BC, Stores Department, C/O Traffic Signal Shop between the hours of 8:00 am and 4:00 pm on any normal working day.

Changes in Requirements

- 1.40 The City, without invalidating the Contract, may make changes to the Contract by altering, adding or deducting from the Requirements. Subject to mutual agreement, the Contractor shall proceed with the amended Requirements and the amended Requirements shall be executed under the provisions of the Contract.
- 1.41 The Contractor must not make any changes to from the terms of the Contract unless it shall first have received the written consent of the City and no claims for additional compensation shall be valid unless the change is so ordered.

PART D – QUOTATION FORM

Quotation Form

Purchasing
City of Richmond
6911 No. 3 Road
Richmond, BC V6Y 2C1

The undersigned Bidder, having carefully read and examined the Instructions to Bidders, General Conditions, Requirements, Quotation Form, and having full knowledge of the work required, does hereby offer to provide all necessary materials in strict accordance with the Requirements and to do all therein called for on the terms and conditions and under the provisions therein set forth at the:

OPTION A QUOTED PRICE \$ _____

OPTION B QUOTED PRICE \$ _____

PAYMENT TERMS _____ **EARLY PAYMENT TERMS** _____

The above price includes and covers duties, PST, GST, handling and transportation charges, and all other charges incidental to and forming part of this Quotation.

The undersigned Bidder agrees to complete the whole of the works within _____ working days of acceptance.

Name of Bidder: _____

Address: _____

Telephone No: _____

Name, Signature, and
Title of Signing Officer: _____

Date: _____

E-mail: _____

PART D – QUOTATION FORM

Suppliers are to **define pricing discounts** for various quantities of purchase.

Option A

	Equipment Description	QTY	Unit Cost	Total Cost	Comments
	TS2 Pole Mount Cabinet	22			

(10 delivered by February 25, 2011 and 22 delivered by December 30, 2011)

Subtotal (Option A only) \$ _____

HST (Option A only) \$ _____

TOTAL QUOTED AMOUNT (Option A Only) \$ _____
(carried forward to Quotation Form)

Option B

	Equipment Description	QTY	Unit Cost	Total Cost	Comments
	TS2 Pole Mount Cabinet	33			

(10 delivered by February 25, 2011, 10 delivered by December 30, 2011 and 13 delivered by July 27, 2012)

Subtotal (Option B only) \$ _____

HST (Option B only) \$ _____

TOTAL QUOTED AMOUNT (Option B Only) \$ _____
(carried forward to Quotation Form)

1. Prototype Cabinet – Functional Drawing:

The bidder, in this Quotation submission shall provide a functional drawing (to scale) of the proposed cabinet layout to illustrate the understanding of the specification requirements.

2. Prototype Cabinet – Manufacture:

Following a review of the submitted Quotations, the City (at it’s discretion) may request the submission of a prototype cabinet to be built based upon the functional design drawings and specifications as agreed to by the City and bidder prior to manufacture. The City will agree to purchase this requested prototype for the amount specified in the bidder’s unit cost under Option A above. The bidder agrees to manufacture and deliver this prototype cabinet to the City _____ weeks after receipt of a written request from the City.

Environmental Terms and Conditions of Contract

1.0 Environmental Policy Requirements

1.1 The City of Richmond’s Environmental Purchasing Policy

The City of Richmond’s Environmental Purchasing Policy states:

In order to increase the development and awareness of environmentally sound products and services, City of Richmond staff will review their contracts and tender specifications for goods and services, to ensure that wherever possible and economically feasible, specifications are amended to provide for consideration of environmental characteristics. Consideration may be given to those environmental products that are certified by an independent accredited organization.

The City of Richmond as a whole will endeavour to increase its use of products and services that are more responsible to the environment in the way they are made, used, transported, stored and packaged and disposed of. It is recognized that analysis is required in order to ensure that the products are made available at competitive prices, and that the environmental benefits provided by a product or service should not significantly affect the intended use of that product or service.

- 1.1.1 The City of Richmond reserves the right to request information from bidders that will demonstrate compliance to this environmental purchasing policy.
- 1.1.2 Bidders are asked to supply information on environmentally preferable products and services that meet all specifications and performance requirements.
- 1.1.3 Placing the City of Richmond in breach of its environmental policy or environmental laws will result in the termination or suspension of an agreement, at the sole discretion of the City.

1.2 Environmental impacts in the life cycle of a product or service

- 1.2.1 Environmental purchasing involves considering the costs and environmental consequences of a product or service in all stages of its life cycle, including raw materials acquisition, production, manufacturing, packaging, distribution, operation, maintenance, reuse and disposal.
- 1.2.2 Independent certification programs such as Environmental Choice as well as an increasing number of manufacturers conduct life cycle assessments to answer the question, “What is the environmental burden of a product or

service through all stages of its life cycle?” The City of Richmond is interested in receiving, wherever available, life cycle information relevant to the products or services being considered.

1.3 Characteristics of environmentally preferable products

1.3.1 Environmentally preferable products and services have characteristics that include but are not limited to the following:

- Reduce waste and make efficient use of resources, including energy
- Are reusable or contain reusable parts
- Are recyclable
- Contain post-consumer recycled materials
- Produce fewer polluting by-products and/or safety hazards during manufacture, use or disposal, and
- Have a long service life and/or can be economically and effectively repaired or upgraded.
- Are certified by an independent accredited organization such as the Environmental Choice program

1.4 Packaging

1.4.1 As with products and services, the City of Richmond will endeavour to consider the environmental characteristics of a product’s packaging.

1.4.2 The City prefers that suppliers minimize the amount of packaging used on products or that durable, long-lasting forms of reusable packaging be used. While packaging containing post-consumer recycled material or recyclable packaging is considered better than wasteful packaging, reduced or reusable packaging is preferred.

1.5 Environmental attributes of company

1.5.1 It is desirable that suppliers to the City of Richmond have an environmental policy statement approved at the executive level and implemented across the company.

1.5.2 Suppliers who have pursued environmental certification such as ISO 14001 should include this information with their bid. The ISO 14000 Series is a set of international standards for voluntary environmental management for both private and public organizations. It is designed to promote environmental compliance, ensure a commitment to pollution prevention, and foster continual improvement of environmental performance through efficient environmental management.

1.5.3 The City of Richmond strictly subscribes to an environmental policy that requires all suppliers to be in compliance with all environmental laws and regulations regarding the manufacture, processing, handling, provision, disposal and waste management of goods and services.

1.6 Environmental purchasing resources

1.6.1 The City of Richmond Environmental Purchasing Guide is available from the City of Richmond Web site at:

<http://www.richmond.ca/services/environment/policies/purchasing.htm>



City of Richmond

PEDESTRIAN CABINET ASSEMBLY SPECIFICATIONS – NEMA TS2 TYPE 1

City of Richmond
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PEDESTRIAN CONTROLLER CABINETS

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101 NEMA TS2 TYPE 1 CABINET ASSEMBLY SPECIFICATION

101.1 SCOPE

The City of Richmond would like to transition to the NEMA TS2 standard for traffic signal control equipment. The purpose of this specification is to outline in this document the information required by suppliers to submit a quotation for NEMA TS2 Type 1 pole mounted pedestrian controller cabinet assemblies to the City of Richmond. An effort has been made to provide as much conformity with industry standards as possible, while maintaining the functionality that the City of Richmond requires. A best value product is required that will provide longevity and ease of maintenance.

101.2 APPLICABLE SPECIFICATIONS AND STANDARDS

The complete cabinet assembly must be fully compatible with the standards and publications shown below. In the case of an incompatibility or inconsistency between this specification and the standards and publications noted below, then this specification shall govern. This specification follows the format of the NEMA TS2-2003 v2.06 standard closely. Any changes to the NEMA TS2 standard are noted along with reference to the applicable section in the NEMA TS2-2003 v2.06 standard to which the changes or variances apply.

This specification covers deviations and extensions beyond the following standards:

- .1 NEMA TS2 Traffic Controller Assemblies with NTCIP requirements, Version 02.06
- .2 Canadian Electrical Code (CEC), Part 1 (20th Edition)
- .3 Canadian Standards Association - Cabinets must be marked certifying that the device is approved for use in the Province of British Columbia and conforms to the appropriate CSA or equivalent standard.

101.3 DOCUMENTATION

- .1 Cabinet Drawings

- .1 Two sets of cabinet drawings are to be supplied with each cabinet assembly.
 - .2 Each cabinet shall be supplied with an electronic version of the cabinet drawing. This shall be supplied in an AutoCAD *.DWG format.
 - .3 All wiring and termination points on the cabinet drawing shall be clearly identified on the cabinet drawing.
 - .4 A legend shall be used to indicate the following:
 - .1 The difference between a connection that is soldered to the back of a terminal (back side of the back panel) to wires terminated on the front of the back panel.
 - .2 A relationship between the wire colour coding and function.
 - .5 A note shall be provided on the drawings adjacent to each relay or group of relays denoting that the relay(s) is/are show in the energized (3 colour) state.
- .2 Removable Cabinet Components
- .1 Removable equipment and quantities of each that are to be supplied with the cabinet is shown in Appendix A.

101.4 QUALITY OF MATERIALS AND WORKMANSHIP

The cabinet assembly shall be designed for ease of troubleshooting, maintenance and longevity. If self tapping screws are used, they shall be suitable for use with the material type and thickness specified. The correct tools shall be used for wire crimps and wire ties. Self adhesive wire tie supports are unacceptable. No sharp edges shall exist on panels, shelves, wire ties or other points that may be detrimental to maintenance personnel. Socket head screws shall be used wherever possible.

101.5 WARRANTY

- .1 The supplier shall warrant that all products are free from defects in material and workmanship.
- .2 The warranty period shall be one year from date of product receipt by the City of Richmond.

- .3 During this warranty period, the supplier shall repair or replace any defective product free of cost to the City of Richmond including all shipping costs.
- .4 All defective products shall be repaired or replaced immediately upon notification.

101.6 SUPPLIER QUALITY MANAGEMENT SYSTEM

- .1 The supplier shall have and maintain an approved Quality Management System throughout the contract. The supplier's quality control program shall apply to all stages of the design, procurement, manufacturing, testing and delivery of the product.
- .2 The supplier shall produce suitable evidence of their Quality Management System for the mechanical and electrical procedures.
- .3 The supplier shall produce suitable documented evidence of capability to supply a product that will meet the City of Richmond specifications as outlined in this document. This evidence must be included with the bid package.

101.7 CABINET SPECIFICATION DETAILS

The detailed specification in the following sections (Section 1 – 8) is intended to supplement the NEMA TS2-2003 v2.06 standard. For ease of use, these sections parallel the NEMA TS2-2003 v2.06 standard. In some cases, the section, or portion thereof has been replaced with the information in this specification.

Section 1 – Definitions

The definitions as set forth in the NEMA TS2-2003 v2.06 standard shall apply.

Section 2 – Environmental Requirements

All cabinet assembly equipment shall meet or exceed the environmental requirements as set forth in the section 2 of the NEMA TS2-2003 v2.06 standard.

Section 3 – Controller Units

The controllers provided shall meet or exceed the requirements as set forth in section 3 of the NEMA TS2-2003 v2.06 standard. The controllers shall conform to the TS2 Type A1 format. Controllers shall NOT be supplied as part of this specification.

Section 4 – Malfunction Management Unit

The Malfunction Management Unit shall meet or exceed the specifications set forth in section 4 of the NEMA TS2-2003 v2.06 standard. Malfunction Management Units shall NOT be supplied as part of this specification.

Section 5 – Terminals and Facilities

Terminals and Facilities within the cabinet assembly shall meet or exceed the requirements as set forth in section 5 of the NEMA TS2-2003 v2.06 standard with the following variances:

1. The main back panel shall be manufactured from 3.175 mm aluminum alloy sheet meeting the requirements of ASTM Specification No. 5052-H32 or equivalent.

5.2.4 Printed Circuits

The terminals and facilities layout shall meet or exceed the requirements as set forth in section 5.2.4 of the NEMA TS2-2003 v2.06 specifications with the following variances:

Printed circuits may only be used on low voltage circuits (24 volts or less). They are not acceptable for the transfer of line voltage (120 VAC) signals. It is important that the printed circuit board be mounted so that there is no mechanical strain on the printed circuit board.

5.2.5 Wire

The terminals and facilities layout shall meet or exceed the requirements as set forth in section 5.2.5 of the NEMA TS2-2003 v2.06 specifications with the following variances:

All cabinet wiring shall be colour coded for easy identification of the conductors. The maintenance technician shall be able to readily identify the function of a wire by its colour. This includes both low voltage and line voltage circuits within the cabinet assembly. A legend indicating the wire colour and function shall be noted on the cabinet drawing.

5.2.7 Layout

The terminals and facilities layout shall meet or exceed the requirements as set forth in section 5.2.7 of the NEMA TS2-2003 v2.06 specifications with the following variances:

Due to the limited space available, the power distribution components may be mounted on the main panel.

5.3.1.1 Load Switch and Flasher Positions

Wired load switch and flasher positions shall meet or exceed the requirements as set forth in section 5.3.1.1 and Table 5-2, Configuration 1 of the NEMA TS2-2003 v2.06 specifications

5.3.1.2 Input/Output Terminals

The input and output terminals shall meet the requirements as set forth in section 5.3.1.2 of the NEMA TS2-2003 v 2.06 standard with the following variances:

1. The following inputs and outputs shown on table 5-3 of the NEMA TS2-2003 v2.06 standard are NOT required:
 - a. Dimming Enable (Input)
 - b. TBC On Line
 - c. TBC Aux #3 (Output)
2. In addition to the inputs shown on table 5-3 of the NEMA TS2-2003 v2.06 standard, supplemental logic level DC inputs shall be provided on the back panel for:
 - a. Max II selection, Ring 1
 - b. Max II selection, Ring 2
 - c. Pedestrian Detector 1
 - d. Pedestrian Detector 2 (at field terminal)

- e. Pedestrian Detector 3
 - f. Pedestrian Detector 4 (at field terminal)
 - g. Preempt 1
 - h. Preempt 2
 - i. Local Flash Status
 - j. MMU Flash Status
 - k. Alarm 1
 - l. Alarm 2
2. Logic level DC terminals shall be provided on the back panel for the following MMU functions:
- a. +24 Volt Monitor I (MMU Connector A, Pin S)
 - b. +24 Volt Monitor II (MMU Connector B, Pin R)
 - e. Fault Monitor (MMU Connector A, Pin m)
 - f. Output Relay 2 Common (Logic Ground)
 - h. Output Relay 2 Normally Open (MMU Stop Time)
4. Terminals shall be provided on the back panel for the following MMU AC functions:
- a. Output Relay 1 Common (MMU connector A, Pin W)
 - b. Output Relay 1 Closed output (MMU connector A, Pin p)

5.3.1.3 Power and Control Terminals

The power and control terminals shall meet or exceed the requirements as set forth in section 5.3.1.3 of the NEMA TS2-2003 v 2.06 standard with the following variances:

- 1. A minimum of two terminals shall be provided for each function.

5.3.1.4.1 BIU Rack

The BIU racks shall meet or exceed the requirements as set forth in section 5.3.1.4.1 of the NEMA TS2-2003 v 2.06 standard for a Type 1 configuration with the following variances:

1. All BIU racks shall provide a mechanical method of locking the BIU in place once it is inserted into the DIN connector. The locking mechanism shall be placed in the open or locked position without the use of tools.

5.3.3 Port 1 Communications Cables

The Port 1 Communication Cables shall meet or exceed the requirements as set forth in section 5.3.3 of the NEMA TS2-2003 v 2.06 standard for a Type 1 configuration with the following variances:

1. The total number of Port 1 Communication Cables required for BIU communication is 4.
 - a. Controller: 1
 - b. MMU: 1
 - c. Terminals & Facilities BIU's: 1
 - d. Detector Rack BIU's: 1

5.3.4 Detector Rack

The detector racks shall meet or exceed the requirements as set forth in section 5.3.4 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. A quantity of 1, Type 1 (4 slot) detector racks shall be provided.

5.3.4.4 Detector Loop Connections

The loop detector connections shall meet or exceed the requirements as set forth in section 5.3.4.4 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. A termination panel shall be provided for the connection of up to 8 inductive loops.
2. As a minimum, every second loop connection shall have a terminal for the connection of the lead in cable shield. All shields shall be bonded to ground at this point.

5.3.5 Power Supply

The terminals and facilities power supply shall meet or exceed the requirements as set forth in section 5.3.5 of the NEMA TS2-2003 v 2.06 standard with the following variances:

1. The quantity of power supplies to be supplied is specified in Appendix A.
2. The terminals and facilities power supply shall have indicators that show the output status and fuse integrity for the 12 VAC, 12 VDC and 24 VDC outputs.
3. Test jacks shall be provided on the front of the power supply for +12 VDC, + 24 VDC and DC ground.

5.3.5.1 Power Supply Dimensions

The terminals and facilities power supply shall meet or exceed the requirements as set forth in section 5.3.5.1 of the NEMA TS2-2003 v 2.06 standard with the following variances:

1. The terminals and facilities power supply shall not exceed 216 mm (8.5”) in height.

5.3.5.3 Power Supply – Electrical Requirements

The terminals and facilities power supply shall meet or exceed the requirements as set forth in section 5.3.5.3 of the NEMA TS2-2003 v 2.06 standard with the following variances:

1. The minimum average continuous current capability shall be 5 amps at 12 VDC with less than 0.25 volts peak to peak ripple.

5.3.6.1 Field Terminals – General

The field terminals shall meet or exceed the requirements as set forth in section 5.3.6.1 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. Terminal blocks used for terminating field signals shall be Marathon 1500 or 1600 series of equivalent. Socket head screws are preferred.

5.4.2.1 Grounding System

The grounding system in the cabinet shall meet or exceed the requirements as set forth in section 5.4.2.1 of the NEMA TS2-2003 v 2.06 standard with the following variances:

1. The AC Neutral Bus shall not be connected to the Earth Ground Bus.

5.4.2.2 Electrical Requirements – Disconnecting Means

The rating of all disconnects shall meet or exceed the requirements as set forth in section 5.4.2.2 of the NEMA TS2-2003 v 2.06 standard with the following variances:

1. The Main Power Distribution shall provide the following disconnecting means:
 - a. Qty 1, 20 amp Main Power Distribution circuit breaker
 - b. Qty 1, 15 amp Utility / Auxiliary circuit breaker

5.4.2.3 Signal Bus

The signal bus shall meet or exceed the requirements as set forth in section 5.4.2.3 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. The mercury contactor shall be replaced with a solid state relay with a 50 amp continuous current rating. The contacts of this relay shall be accessible from the front panel. A

protective cover shall be provided for the relay. A Crydom Model CWA4850 or equivalent solid state relay shall be used.

2. The output of the signal bus relay shall be distributed to a bank of 2 panel mount fuses. Each fuse shall have a 5 amp rating. The 120 VAC signal bus power to the load switches shall be distributed from the output of the fuses as follows:
 - a. Fuse 1 – shall provide over current protection for load switch 1 and 2
 - b. Fuse 2 – shall provide over current protection for load switch 3 and 4

5.4.2.4 AC Transient Suppression

Replace section 5.4.2.4 of the NEMA TS2-2003 v2.06 standard with the following specification:

1. Maximum Surge Current – the transient suppression device shall withstand a surge of 40kA based on the IEEE C62.41.2 8 x 20 μ s waveform.
 - a. Let Through Voltage – the following let through voltage levels shall not be exceeded as defined by IEEE C62.41.2 Recommended Practice on Characterization of Surges:
 - i. Category C1 Waveform, L-N: 450 volts
 - ii. Category C3 Waveform, L-N: 700 volts
 - iii. Category B3 Waveform, L-N: 350 volts
2. The surge protection device must be UL 1449 2nd Edition or CSA Notice 516 Approved.
3. The surge protection device shall have an indicator to show that the unit is functioning properly or that the unit has failed.
4. The surge protection device shall be supplied with a set of normally open contacts for remote alarm monitoring.

5.4.2.6 Convenience Receptacle

The convenience receptacle shall meet or exceed the requirements as set forth in section 5.4.2.6 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. No receptacles used shall be of the ground fault type.
2. A utility duplex receptacle shall be provided.

5.4.2.7 Lighting Fixture

The cabinet lighting requirements as set forth in section 5.4.2.3 of the NEMA TS2-2003 v 2.06 standards are to be replaced with the following:

1. An LED light shall be provided in place of an incandescent or fluorescent type.

5.4.2.7.2 Incandescent Fixture

The incandescent fixture requirements as set forth in section 5.4.2.7.2 of the NEMA TS2-2003 v 2.06 standards shall be replaced with the following:

1. Two LED lighting panels shall be used to provide cabinet lighting. One panel shall be mounted on the cabinet ceiling, with the second panel mounted under the controller shelf.
2. Each panel shall use a minimum of 6 white LED's per panel mounted on an aluminum plate, providing a light output of 480 lumens. Each panel shall be a minimum of 380mm long x 114mm wide.
3. A single power supply shall be used to supply power to both panels.

5.4.2.7.3 Lighting Fixture Switch

The On-Off switch requirements as set forth in section 5.4.2.7.3 of the NEMA TS2-2003 v 2.06 standards shall be replaced with the following:

1. A normally closed momentary contact door switch shall be provided for the cabinet light.

5.5.1 Control Switches

The auto/flash switch shall meet the requirements as set forth in section 5.5.1 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. Auto/Flash Switch (Inside Cabinet Door)- an Auto/Flash switch shall be installed on the inside of the cabinet door. When in the flash position, the controller shall remain powered, the flash relays shall be de-energized and the signals shall be in emergency flash mode.
2. Auto/Flash (Police Door) – an Auto/Flash switch shall be installed in the police door assembly. When in the flash position, power shall be maintained to the controller and the intersection shall be placed in flash.
3. Auto/Manual Switch (Inside Cabinet Door) – an auto/manual switch shall be installed within the police door assembly. During normal operation, this switch remains in the auto position. When placed into the manual position, a manual control enable signal is placed to the traffic controller and a logic ground signal is placed on the interval advance switch.

4. Interval Advance Switch (Inside Cabinet Door) – a momentary contact pushbutton interval advance switch shall be provided. The normal controller timings for yellow and red intervals will override the interval advance operation.
5. Controller On/Off (Inside Cabinet Door) – a controller On/Off switch shall be installed on the inside of the cabinet door. When in the off position, power shall be removed from the controller, MMU and cabinet power supply.
6. Signals On/Off (Police Door) – a signals On/Off switch shall be installed in the police door assembly. When in the Off position, the signals shall be dark, the controller shall continue to cycle and an MMU fault condition shall not be generated.

5.5.2 Flash Transfer Control

The flash control circuits shall meet or exceed the requirements as set forth in section 5.5.2 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. A relay shall be provided to remove the 24 VDC supply to the load switches when the signals are in flash mode. The relay terminals shall be available on the front of the panel for troubleshooting purposes. A manual button override shall be provided on the relay. The coil of this relay shall be connected in parallel with the signal bus relay. The relay shall have an indicator light to show when the relay is energized.

Section 6 – Auxiliary Devices

6.2 Three Circuit Solid State Load Switches

The NEMA load switches shall meet or exceed section 6 of the NEMA TS2-2—3 v2.06 standard with the variances as indicated below in 6.2.1.

The quantity of load switches that shall be supplied is specified in Appendix A.

6.2.1 Load Switches – Physical Characteristics

The load switches shall meet or exceed the requirements as set forth in section 6.2 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. Indicators – load switches shall be provided that have one indicator per circuit for both the input and output circuits.

6.3 Solid State Flashers

1. Two pole flashers shall meet or exceeds the NEMA TS2-2003 v2.06 standard.
2. The quantity of two pole emergency flashers required in specified in Appendix A

6.4 Flash Transfer Relays

The flash transfer relays shall meet or exceed the NEMA TS2-2003 v2.06 standard.

The quantity of flash relays that shall be supplied is specified in Appendix A

6.5 Inductive Loop Detector Units

The inductive loop detector units shall meet or exceed the NEMA TS2-2003 v2.06 standard.

The detector type and quantity of inductive loop vehicle detectors that shall be supplied is specified in Appendix A.

Section 7 Cabinets

7.2.2.1 Cabinets – Physical Construction

The cabinet fabrication shall meet or exceed the requirements as set forth in section 7.2.2.1 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. All materials shall be new. The supplier shall be capable of producing a premium grade product which meets the quality, fit and finish noted in this document. The use of CNC equipment is mandatory. The suppliers shop shall be approved to produce CSA listed products.
2. The cabinet and doors shall be fabricated using CNC controlled equipment.
3. Should any part of the cabinet assembly require reinforcing, the reinforcing shall be to acceptable Ministry standards.
4. All welds shall be in accordance with AWS D1.2 or CAN/CSA W59.
5. All aluminum welds shall be done by the Gas Metal Arc welding process, or Gas Tungsten Arc process.
6. All exterior seams shall be of continuously welded construction and shall be ground smooth. All exterior corners shall be rounded to a minimum radius of 3.175 mm. All sharp edges shall be de-burred to a minimum radius of 0.4 mm. to reduce hazards to service personnel.
7. All welds shall have no cracks, inadequate penetration or lack of fusion. They shall be free of slag and spatter.
8. All welds shall have no other defects exceeding the limits in size and frequency of occurrence specified in CAN/CSA W59, Clause 12.

9. Consumables shall be approved by the Canadian Welding Bureau and conform to the requirements of the American Welding Society (AWS) A5.10 for ER5356 aluminum alloy bare welding electrodes.
10. All welding electrodes shall conform to CAN/CSA W48. The deposited weld metal shall provide strength, ductility, impact toughness, and corrosion resistance equivalent to the base metal.
11. Where indicated, stitch welds shall be finished with filler. The size and shape of the bead shall create a uniform appearance and provide an adequate seal. Follow appropriate application procedures to accommodate finishing processes.

7.3 Cabinet Dimensions

The cabinet dimensions shall be as set forth in section 7.3 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. The cabinet dimensions shall be a maximum of 1016 mm (40 inches) High x 508 mm (20 inches) Wide x 457 mm (18 inches) Deep
2. The cabinet must be able to accommodate a traffic controller with the following minimum dimensions: 279 mm (11 inches) High x 394 mm (15.5 inches) Wide x 267 mm (10.5 inches) Deep
3. The cabinet must be able to accommodate an MMU with the following minimum dimensions: 267 mm (10.5 inches) High x 114.3 mm (4.5 inches) Wide x 279.4 (11 inches) Deep

7.5.1 Main Cabinet Door

The main cabinet door requirements as set forth in section 7.5 of the NEMA TS2-2003 v 2.06 standards shall be replaced with the following:

1. The cabinet shall have one hinged main door which permits access to all equipment within the cabinet. It shall also allow visual inspection of all indications and provide adequate access to all of the controls.
2. The door shall be designed for maximum strength and snug fit, and shall be fabricated out of a single sheet of aluminum and have wrap around return for strength and fit.
3. A vented opening shall be provided on the main door to provide cabinet ventilation. Each vent shall accommodate a filter that is a minimum of surface area of 4350 square mm (6.75 square inches)

5. All control and test switches on the inside of the cabinet door shall be protected from the weather and from accidental operation by service technicians. A hinged plexiglass cover shall be used for this purpose.

7.5 Door Hinges

The door hinges shall meet or exceed the requirements as set forth in section 7.5.2 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. The door hinges, pins and bolts shall be made of stainless steel.
2. Hinges shall be installed to allow for the removal and re-attachment of the doors by service personal. The hinges shall not be accessible from the outside if the doors are closed.

7.5.3 Door Stop

The door stop shall meet or exceed the requirements as set forth in section 7.5.3 of the NEMA TS2-2003 v 2.06 standards.

7.5.3 Latches and Locking Mechanism

7.5.4.1 Latching

The latching and locking mechanism shall meet or exceed the requirements as set forth in section 7.5.4.1 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. The guides at the top and bottom of the push rods shall be manufactured so that the latching mechanism does not rattle in a windy environment.

7.6 Shelves

The cabinet shelves shall meet or exceed the requirements as set forth in section 7.6 of the NEMA TS2-2003 v 2.06 standard with the following variances:

1. Two cabinet shelves shall be provided.
2. Both shelves shall span the width of the cabinet.
3. An 8 channel detector rack shall be mounted on the top shelf.

7.7 Finish and Surface Preparation

7.7.2 Aluminum Cabinets

7.7.2.1 Preparation: Painted Cabinets

The preparation of cabinet surfaces shall meet or exceed the requirements as set forth in section 7.7.2.1 of the NEMA TS2-2003 v 2.06 standard with the following variances:

1. The cabinet shall be degreased using an alkaline (or equivalent) process to remove, oil, grease and dirt.
2. The cabinet surfaces shall be rinsed with water.

7.7.2.2 Prime Coat

The prime coat shall meet or exceed the requirements as set forth in section 7.7.2.2 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. An iron phosphate primer coat shall be applied to increase corrosion resistance and improve paint adhesion.
2. A non-chrome (or equivalent) sealer coating shall be applied to provide further corrosion protection.

7.7.2.3 Interior Surfaces

All interior cabinet surfaces shall meet or exceed the requirements as set forth in section 7.7.2.3 of the NEMA TS2-2003 v 2.06 standards with the following variances:

A final coat shall consist of a type Polyester-TGIC powder coat with a minimum thickness of 2.5 mils.

7.7.2.4 Exterior Surfaces

All exterior cabinet surfaces shall meet or exceed the requirements as set forth in section 7.7.2.4 of the NEMA TS2-2003 v 2.06 standards with the following variances:

A final coat shall consist of a type Polyester-TGIC powder coat with a minimum thickness of 2.5 mils.

7.8.1 Pole Mounted Cabinets

The pole mounting system shall meet or exceed the requirements as set forth in section 7.5.4.1 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. Each cabinet shall have two mounting holes located at the bottom and top of the cabinet.
2. The cabinet shall be supplied with two cabinet brackets and the associated stainless hardware to mount the brackets to the cabinet. The mounting brackets shall be designed so that the cabinet can be mounted to the pole using 19 mm (.75 inches) stainless steel banding.

7.9.1 Cooling System Design

The cabinet cooling system requirements as set forth in section 7.9.1 of the NEMA TS2-2003 v 2.06 standards shall be replaced with the following:

1. Each cabinet shall be provided with a fan rated at 2.832 cubic meters per minute (100 cubic feet per minute) minimum.
2. A finger guard shall be installed to prevent accident or injury to hands or fingers.

7.9.2.2 Cooling System Controls

The cooling system requirements as set forth in section 7.9.2.2 of the NEMA TS2-2003 v 2.06 standards shall be replaced with the following:

1. An adjustable thermostat shall be provided for the cabinet fan.
2. The fan thermostat shall cut in at 31⁰C and cut out at 25⁰C.
3. The fan thermostat shall have a minimum contact rating of 9.5 amps at 120 VAC, based on a non-inductive load.

7.9.2.3 Filter

The air filter shall meet or exceed the requirements as set forth in section 7.9.2.3 of the NEMA TS2-2003 v 2.06 standards with the following variances:

1. A disposable commercial grade filter media shall be provided with high fibre content and a high compression rate. A media adhesive shall be used to maintain the filters highly viscous dirt trapping characteristics.
2. The filter shall be housed in an aluminum frame and shall have a galvanized retainer grid to provide support for the filter media.
3. A closed cell gasket shall be provided between the filter and the cabinet door, providing an air tight seal.
4. The filter and frame shall be held firmly in place to provide a positive seal around the filter and also allow for the filter frame to be removed without the use of tools, allowing changing of the filter media.

7.10 Cabinet Heater

The NEMA TS2-2003 v2.06 standard does not cover heaters.

1. Two, 150 watt low density film heaters shall be provided to keep the cabinet dry.
2. The heaters will be installed to prevent damage to any of the cabinet wiring and to protect maintenance personnel.

7.11 Heater Thermostat

The NEMA TS2-2003 v2.06 standard does not cover heater thermostats.

1. An adjustable thermostat shall be provided for the cabinet heater.
2. The thermostat shall cut in at 4⁰C and cut out at 10⁰C
3. The thermostat shall have a minimum contact rating of 9.5 amps at 120 VAC for a non-inductive load.

Section 8 – Bus Interface Unit

The Bus Interface Units shall meet or exceed the NEMA TS2-2003 v2.06 standard.

The quantity of Bus Interface Units to be supplied is specified in Appendix A

Section 9 – Auxiliary Equipment

Communications Interface Panel

The communications interface panel provides a location to interface incoming communications from various sources as required.

1. FSK Communications Surge Protection – surge protection for full duplex FSK telemetry shall be provided. The surge protection shall meet the following specifications:
 - a. Mounting: the surge protection device shall be mounted into a base receptacle for easy replacement.
 - b. Maximum Surge Current (based on the IEEE C62.41.2 8 x 20 μ s waveform: 10 KA
 - c. Clamp Voltage: 8 volts

Fibre Optic Termination Panel

The City will be utilizing a Fibre Optic termination panel to interface to a shelf or detector rack mounted Ethernet switch. A 6 slot Gator Patch device (supplied by others) is proposed to be used for this purpose. The cabinet manufacturer shall allow space and mounting screws or rails for future mounting of this hardware in a vertical position. The approximate dimensions of the termination panel are 50cm wide by 450cm long including mounting plate and fibre cable to coil bend point.

APPENDIX A

MATERIALS QUANTITY

May 2010

Equipment Description	Qty
TS2 Pole Mount Cabinet	1
TS2 Type 2 Controller	0
Power Adaptor Harness for TS2-1 Controller	0
Malfunction Management Unit	0
Bus Interface Unit	0
Cabinet Power Supply	0
Inductive Loop Vehicle Detectors	0
Load Switches	0
Flasher	0
Advance Warning Flashers	0
Flash Transfer Relays	0
Camera Interface Panel	0
Communications Interface Panel	0
Fibre Optic Termination Panel	0

Table 1: Materials Quantity Required

**APPENDIX B
EQUIPMENT SHIPPED**

May 2010

Equipment	Model	Serial Number	Software/ firmware Version	Programming Operations Manual	Maintenance Installation Manual
Controller					
MMU					
Cabinet PS					
BIU 1					
BIU 2					
Loop Det 1					
Loop Det 2					
Loop Det 3					
Loop Det 4					
Load Switch 1					
Load Switch 2					
Load Switch 3					
Load Switch 4					
Flash Relay 1					
Communications Interface Panel					

Table 2: Equipment Shipped