



**REQUEST FOR QUOTATION 4303Q  
SUPPLY & INSTALL FIBRE OPTIC CABLE - IRONWOOD**

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 12:00 Noon local time on Friday, June 17, 2011.

**NOTES:**

1. Three (3) copies of 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.

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

Sumita Dosanjh - Buyer II - Contracting Specialist

email: [purchasing@richmond.ca](mailto:purchasing@richmond.ca)

**The deadline for all enquiries is 3:00pm Wednesday, June 8, 2011.**

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REQUEST FOR QUOTATION 4303Q  
FIBRE OPTIC CABLE RICHMOND - IRONWOOD

Name of Bidder: \_\_\_\_\_

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

City: \_\_\_\_\_

Province: \_\_\_\_\_

Postal Code \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Title: \_\_\_\_\_

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

Fax Number: \_\_\_\_\_

## PART A – INSTRUCTIONS TO BIDDERS

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### PART A – INSTRUCTIONS TO BIDDERS

#### **1.0 Description of Requirement**

- 1.1 Quotations are invited for Fibre Optic Cable - Ironwood 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.

#### **2.0 Contract Term- Intentionally Omitted**

#### **3.0 Pricing**

- 3.1 Prices quoted will be in Canadian currency and exclusive 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.

#### **4.0 Inquiries and Clarifications**

- 4.1 It is the sole responsibility of the Bidder to thoroughly examine these documents, and amendments and addenda and satisfy itself as to the full requirements of this RFQ. Inquiries are to be in written form only e-mailed to the contact person shown on the cover page. If required, an amendment or addendum will be published on the following websites:
  - a) BC Bid: <http://www.bcbid.gov.bc.ca/open.dll/welcome?language=En>
  - b) City's website: <http://www.richmond.ca/busdev/tenders.htm>
- 4.2 The City, its agents and employer shall not be responsible for any information given by way of oral or verbal communication.

#### **5.0 Inspection of Site**

- 5.1 Where applicable, Bidders shall inspect the Work Site(s) and make allowances in its Quotation for such conditions as in the sole opinion of the Bidder are warranted. The City makes no representation or warranties as to the condition of the sites. No consideration will be given for extras resulting from conditions that would have been evident during a routine site visit.

## PART A – INSTRUCTIONS TO BIDDERS

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### **6.0 Pre-Bid Meeting**

- 6.1 Note: There will be a pre-bid meeting conducted at 10:00am Monday, June 6, 2011, with sign-in attendance forms. Potential Bidders are asked to meet at Richmond City Hall in meeting room M.1.002 @ 6911 No. 3 Road. The City strongly encourages all potential Bidders to attend this session. No other sessions will be organised or arranged for this project.

### **7.0 Submission of Quotation**

- 7.1 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.
- 7.2 Quotations received after the Closing Time or in locations other than the address indicated, will not be accepted and will be returned unopened.
- 7.3 The Bidder shall submit Three (3) copies of its Quotation in accordance with the instructions stated herein.
- 7.4 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 conditions of this RFQ. All other pages of the Quotation Form must be initialled by the authorized signatory in the spaces provided.
- 7.5 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.
- 7.6 Quotations may be withdrawn by written notice only, provided such notice is received at the Purchasing Services office prior to Closing Time.
- 7.7 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.
- 7.8 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

## PART A – INSTRUCTIONS TO BIDDERS

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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.

### **8.0 Conflict of Interest**

8.1 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.

### **9.0 Evaluation of Quotations**

9.1 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
- e) any other criteria set out in the RFQ.

9.2 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.

9.3 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.

## PART A – INSTRUCTIONS TO BIDDERS

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- 9.4 All sub-contractors of the Bidder will be subject to the same evaluation process. It is the responsibility of the Bidder to guarantee that all its sub-contractors will comply with all the Requirements and terms and conditions set out herein.
- 9.5 Preference may be given to Quotations offering environmentally beneficial products or services.

### **10.0 Acceptance and Rejection of Quotations**

- 10.1 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.
- 10.2 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.
- 10.3 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.

### **11.0 Award of Contract**

- 11.1 Award of a Contract is contingent on funds being approved and the contract award being made by the appropriate City authority.
- 11.2 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:

## PART A – INSTRUCTIONS TO BIDDERS

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- 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 amendments or addenda.
- 11.3 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.
- 11.4 The City is not under any obligation to award a Contract and may elect to terminate this RFQ at anytime.

### **12.0 Publication of the Results of the Request for Quotation**

- 12.1 The City will publish the name of the successful Bidder on the websites listed in section 4.1. No other notices will be issued by the City. Bidders shall visit these websites to obtain the results of this Request for Quotation.

### **13.0 Quantities**

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

### **14.0 Brand Names – Intentionally Omitted**

### **15.0 Alternates and/or Variations to Specifications**

- 15.1 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.
- 15.2 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.
- 15.3 The City is not obligated to accept any alternatives.
- 15.4 The City will determine what constitutes allowable alternatives and/or variations.

## PART A – INSTRUCTIONS TO BIDDERS

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### **16.0 Freedom of Information and Protection of Privacy Act (BC)**

16.1 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.

### **17.0 Confidentiality**

17.1 Information about the City obtained by Bidders must not be disclosed unless prior written authorization is obtained from the City.

17.2 The Contractor agrees that this obligation of confidentiality will survive the termination of the Contract between the Contractor and the City.

### **18.0 Insurance**

18.1 The contractor will be required to Indemnify and Insure the City as shown in the General Conditions of the Contract.

18.2 Bidders shall have the Undertaking of Liability Insurance Form Letter L1-1 within the document completed and submitted with their Quotation.

18.3 All policies and certificates shall be submitted to the Purchasing Section before a contract is issued to carry out the work.

18.4 All bids shall be accompanied by an Undertaking of Surety, an Undertaking of Liability Insurance,

### **19.0 Bid Bond – Intentionally Omitted**

## PART B – GENERAL CONDITIONS

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### PART B – GENERAL CONDITIONS

#### 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 ventures, 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 ventures, 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.”;

## PART B – GENERAL CONDITIONS

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“HST” means the harmonized sales tax administered under the Excise Tax Act (Canada) and any successor tax or levy therefore 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.

“Quotation” means the Bidder’s response 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, refer to contract reference drawings for details unless otherwise stated in this RFQ.

### **2.0 Personnel**

#### **2.1 Qualified Personnel**

The Contractor will provide only professional personnel who have the qualifications, experience and capabilities to perform the Work.

#### **2.2 Replacement of Personnel or Sub-Contractors**

If the City reasonably objects to the performance, experience, qualifications or suitability of any of the Contractor’s personnel or subcontractors then the Contractor will, on written request from the City, replace such personnel or sub-contractors.

#### **2.3 City’s Own Forces and Other Contractors**

The City may have its own work forces and other contractors on the site while the Work is under way. The City will coordinate the work of all contractors on the site and require their coordination with each other. the Contractor will report to

## PART B – GENERAL CONDITIONS

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the City and apparent deficiencies in other contractors' work which would affect the Work, immediately after the deficiencies come to the Contractor's attention.

### **3.0 Sub-contractors**

- 3.1 The Contractor will perform the Work using its own personnel and those subcontractors as may be listed in *Part D - Quotation Form* and approved by the City, and will bind all approved subcontractors to the terms of the Contract Documents, as applicable to the subcontractors' work. The Contractor will be as fully responsible to the City for acts and omissions of subcontractors and of persons directly or indirectly employed by them as for acts and omissions of persons directly employed by the Contractor.
- 3.2 All sub-contractors are the responsibility of the Contractor.
- 3.3 The Contractor shall be held as fully responsible to the City for the acts and omissions of its sub-contractors and of persons directly or indirectly employed by the Contractor, as for the acts and omissions of persons directly employed by it.
- 3.4 The Contractor agrees to ensure performance by every sub-contractor with the terms and requirements of the Contract Documents.
- 3.5 No sub-contractors will be permitted except those expressly named by the Contractor in Part D – quotation form or subsequently permitted in writing by the City pursuant to Section 4.1 of these General Conditions.
- 3.6 The Contractor will list below all subcontractors it intends to use in its performance of the Work, and what parts of the Work each subcontractor will be undertaking (the "Subcontractors").
- 3.7 The Contractor, if awarded the Contract, will engage the listed Subcontractors only, and no others in their stead, without prior written authorization of the City.
- 3.8 The Contractor, if awarded the Contract, will ensure that every Subcontractor is bound by a legal agreement with the same terms and conditions of the Contract.

### **4.0 Independent Contractor**

- 4.1 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.

## PART B – GENERAL CONDITIONS

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### **5.0 Assignment**

- 5.1 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.
- 5.2 Despite Section 4.1, the Contractor may utilize those sub-contractors expressly named in the "List of Subcontractors" of Part D– 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.
- 5.3 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.

### **6.0 Time of the Essence**

- 6.1 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.

### **7.0 Laws, Permits and Regulations**

- 7.1 The laws of British Columbia shall govern the Contract.
- 7.2 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.

### **8.0 Inspection**

- 8.1 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

## PART B – GENERAL CONDITIONS

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(expressed or implied), the City shall have the right either to reject them or to require correction.

8.2 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.

8.3 The City will not be deemed to have accepted the services by virtue of a partial or full payment for it.

### **9.0 Use of Premises**

9.1 The Contractor shall confine the use of the premises for his work as directed by the City and shall comply with regulations which govern the building or institution where the work is located.

9.2 At the conclusion of the work, the Contractor shall clean up and remove all debris and rubbish to the satisfaction of the City.

### **10.0 Light, Power, and Heat**

10.1 The City's supply of electrical energy will be available to the Contractor without charge.

10.2 The City's supply of water will be available to the Contractor without charge.

10.3 The Contractor, upon completion of the work, shall remove temporary connections and extension of services, leaving the existing structures and services undamaged.

### **11.0 Quality of Workmanship and Materials**

11.1 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.

11.2 The whole of the works and the manner of performing this Contract shall be done to the entire satisfaction and approval of the City, and it shall be the sole judge of the work and materials in respect of both quality and quantity, and its decision with regard to work or materials, or as to the meaning and intention of this Contract, or any part or parts thereof, shall be binding and final upon the Contractor.

## PART B – GENERAL CONDITIONS

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- 11.3 All work shall be done in strict conformity with the Contract Documents and drawings which form a part of the Contract. The intent of the contract documents is to include all labour, materials, equipment, services, supplies and all the things necessary for the proper and complete execution of the work.
- 11.4 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.
- 11.5 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.

### **12.0 Warranty**

- 12.1 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).
- 12.2 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.
- 12.3 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.
- 12.4 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.
- 12.5 The Contractor warrants that its employees have the qualifications, experience, knowledge, skills and abilities necessary for the fulfilment of the Contract.

### **13.0 Indemnification and Insurance**

- 13.1 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

## PART B – GENERAL CONDITIONS

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assumed responsibility in the performance or purported performance of the Requirements.

- 13.2 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.
- 13.3 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.
- 13.4 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
- 13.5 The Contractor shall, at his own expense, through the terms of the contract secure, maintain, and pay for the following coverage:
- a) Comprehensive General Liability Insurance with a limit of not less than \$5,000,000 inclusive per occurrence for bodily injury and property damage and \$5,000,000 for personal injury. The policy or policies shall cover all premises and operations necessary or incidental to the performance of this agreement and include but not necessarily be limited to the following coverage:
    1. Contractual liability assumed under this agreement.
    2. Contingent employer's liability with respect to operations of sub-contractors.
    3. Owner's protective liability.
    4. Cross liability.
    5. Automobile liability (non-owned, hired).
    6. Completed operations liability 24 months after completed operations.
    7. Voluntary medical payments.

## PART B – GENERAL CONDITIONS

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- b) "Course of Construction" Property Damage Insurance covering all risks of physical loss or damage on an occurrence basis, including loss of use of property, and including losses or damage from flood or earthquake. The coverage provided shall amount to no less than eighty (80%) percent of the total value of the work done and material delivered to the site, or under the control of the Contractor, payable to the City and Contractor as their interests may appear, and protecting each in such terms as will preclude subrogation claims by the insurer against anyone insured there-under.
- 13.6 The City, its officers, officials, and employees shall be added as an additional insured on all such policies. All such insurance provided by these policies shall be primary regardless of any insurance or self insurance that may be enforced at the time of any loss or claim that insures the City, its officers, officials, and employees.
- 13.7 The policy or policies shall be underwritten by an insurance company or companies licensed to do business in the Province of British Columbia and who meet with the reasonable approval of the City. Prior to the commencement of the work defined by this agreement, the Contractor shall furnish the City through the Office of the Manager Purchasing and Risk a certified original copy of all such policies as evidence that such insurance is in force. The Contractor agrees that such insurance policies cannot be cancelled, lapsed, or materially changed without at least thirty (30) days' written notice to the City.
- 13.8 Maintenance of such insurance and the performance of the Contractor of his obligations under this clause shall not relieve the Contractor of liability under the indemnification provisions here and above set forth. The foregoing insurance provisions shall not limit the insurance required by Municipal, Provincial, or Federal law
- 13.9 It shall be the full responsibility of the Contractor to determine whether any additional insurance coverage is necessary and advisable for its own protection and/or to fulfil its obligations under this Contract. Any such additional insurance shall be provided and maintained by the Contractor its own expense.
- 13.10 It is understood that this agreement is strictly between the Contractor and the City and the Contractor is an independent contractor for the City and no employment relationship, partnership, agency, or joint venture exists between the City, the employees of the Contractor and/or its agents and/or their employees, and/or its Contractors and/or their employees. Any disputes between the Contractor and any of its employees and/or its agents and/or their employees and/or their Contractors and/or their employees shall be resolved by the Contractor with no involvement by the City.

PART B – GENERAL CONDITIONS

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**14.0 Workers' Compensation Board Coverage/Prime Contractor**

- 14.1 The Contractor agrees that it shall at its own expense procure and carry or cause to be procured and carried and paid for, full Workers' Compensation Board coverage for itself and all workers, employees, servants and others engaged in or upon any work or service which is the subject of this contract. The Contractor agrees that the City has the unfettered right to set off the amount of the unpaid premiums and assessments for such Workers' Compensation Board coverage against any monies owing by the City to the Contractor. The City shall have the right to withhold payment under this contract until the Workers' Compensation Board premiums, assessments or penalties in respect of work done or service performed in fulfilling this contract had been paid in full.
- 14.2 The Contractor agrees that it is the Prime Contractor for the purposes of the Workers' Compensation Board Occupational Health and Safety Regulations for the Province of British Columbia. The Contractor shall have a safety program acceptable to the Workers' Compensation Board and shall ensure that all Workers' Compensation Board safety rules and regulations are observed during performance of this contract, not only by the Contractor but by all subcontractors, workers, material men and others engaged in the performance of this contract. Prior to commencement of construction, the Contractor shall complete and file a "Construction Notice of Project" with the Workers' Compensation Board and shall provide a copy of the same to the City confirming that the Contractor shall be the Prime Contractor responsible for coordination of safety and health under Part 3 of the Workers Compensation Act and Part 20 of the WCB Occupational Health and Safety Regulations.
- 14.3 The Contractor shall provide the City with the Contractor's Workers' Compensation Board registration number and a letter from the Workers' Compensation Board confirming that the Contractor is registered in good standing with the Workers' Compensation Board and that all assessments have been paid to the date thereof prior to the City having any obligation to pay monies under this contract. The Contractor shall also provide a signed copy of the Prime Contractor Designation Document.
- 14.4 The Contractor shall indemnify the City and hold harmless the City from all manner of claims, demands, costs, losses, penalties and proceedings arising out of or in any way related to unpaid Workers' Compensation Board assessments owing from any person or corporation engaged in the performance of this contract or arising out of or in any way related to the failure to observe safety rules, regulations and practices of the Workers' Compensation Board, including penalties levied by the Workers' Compensation Board.

## PART B – GENERAL CONDITIONS

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### **15.0 Termination**

- 15.1 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.
- 15.2 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).
- 15.3 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.

### **16.0 Payments**

- 16.1 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.
- 16.2 The City shall make progress payments once a month for work completed and materials on the site upon receipt of the Contractor's invoice.

## PART B – GENERAL CONDITIONS

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16.3 Except for the final payment, the City shall holdback ten (10%) percent of the amount of progress claims. The City shall pay the holdback 55 days after completion of the work upon receipt of the contractor's written claim for final payment accompanied by a Statutory Declaration stating that the Contractor has discharged every obligation and paid or satisfied every just claim incurred by him in connection to the Contract, including claims by his subcontractors, and upon receipt of clearance from the Workers' Compensation Board.

### **17.0 Taxes**

17.1 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).

17.2 Invoices shall show the appropriate amounts for HST.

### **18.0 Non-resident Withholding Tax**

18.1 Regulation 105(1) of the Canadian Income Tax Act requires that payments to non-residents for any work performed in Canada are subject to a Non-resident Withholding Tax of fifteen (15%) percent. Exemption from this withholding tax is available in some circumstances, but the Contractor must apply directly to the Canada Revenue Agency (CRA) at least thirty (30) days before commencing the Work.

### **19.0 Liens**

19.1 The Contractor shall fully 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 inequity or to any claim or liability under the Builders Lien Act, or to any attachment for debt, garnishee process, or otherwise.

### **20.0 Patent Fees**

20.1 The Contractor shall pay all royalties and licence fees and shall save the City harmless from loss on account of suits or claims of infringement of patents in the doing of the work.

### **21.0 Performance Bond**

21.1 If requested by the City, the Bidder should include with its Quotation a letter from its bank that the Contractor has sufficient credit-worthiness to obtain from a

## PART B – GENERAL CONDITIONS

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Canadian Chartered bank an irrevocable perpetual demand letter of credit in the amount of no less than fifty (50%) percent of their bid price.

- 21.2 If requested by the City, the successful Contractor shall, within ten (10) days from the date of acceptance, provide a Performance Bond in the amount of fifty (50%) percent of the total Contract Price. The surety(s), issued by a surety company licensed to transact business in British Columbia, must be in a form and contain terms satisfactory to the City's Director of Legal Services. Cash deposits, certified cheques and letters of credit (in a form satisfactory to the City's Director of Legal Services) in the amount of fifty (50%) percent of the total Contract price are acceptable in lieu of a Performance Bond. No interest will be paid to the Contractor on cash deposits.

### **22.0 Protection of Person and Property**

- 22.1 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.
- 22.2 The Contractor shall effectively warn and protect the public and other personnel from any danger as a result of the services being done.
- 22.3 The Contractor shall maintain protection of all his work and materials from damage and shall protect the City's and any adjoining property from injury due to the Contractor's work.

### **23.0 Clean Up**

- 23.1 The Contractor shall at all times perform the services in an orderly and reasonably tidy manner, and shall at suitable intervals remove any accumulation of rubbish or refuse materials. At no time shall any person employed by the Contractor or by any of its sub-contractors discard any litter or garbage on or adjacent to the delivery site, except into a suitable container.

### **24.0 Character of Workers**

- 24.1 On the written request of the City, the Contractor will remove any employee, Sub-Contractor or agent for any reason including but not limited to the following:
- a) Lack of or failure to obtain any required Security Clearance;
  - b) Intoxication;

## PART B – GENERAL CONDITIONS

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- c) Use of foul, profane, vulgar or obscene language or gestures;
- d) Solicitation of gratuities or tips from any person for services performed under this Agreement;
- e) Wilful, negligent or reckless action in disregard of safety or sanitary requirements or regulations; or
- f) Any action which may constitute a public nuisance or disorderly conduct.

24.2 The Contractor will immediately comply with each such request and will then provide the City with all requested documentation verifying that the employee, Sub-Contractor or agent has been removed from further involvement with this Agreement.

### **25.0 Conduct of the Contract**

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

### **26.0 Rectification of Damage and Defects**

26.1 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.

### **27.0 Failure to Perform**

27.1 If, in the opinion of the Manager Purchasing, the work is improperly, defectively, or insufficiently performed, or being performed, the Manager Purchasing may, in writing, order the Contractor to re-execute or correct the work in accordance with such order; and if the Contractor fails to comply with such order within ten (10) working days, the Manager Purchasing may, at any time thereafter, execute or cause to be executed the order so given, and the Contractor shall, on demand, pay to the City of Richmond, all costs, damages, and expenses incurred in respect thereof or occasioned by reason of the non-compliance by the Contractor with any such orders; and if the Contractor fails to pay such costs, damages, and expenses, the City of Richmond may retain and deduct such costs, damages, and expenses from any amount then or thereafter payable to the Contractor under this Contract.

## PART B – GENERAL CONDITIONS

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- 27.2 Should the Contractor neglect to execute the Requirement properly or fail to perform any provision of the Contract, the City may, without prejudice to any other right or remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment due to the Contractor.
- 27.3 If the Contractor fails to perform any provision of the Contract due to reasons of strike, lockout or other work stoppages, the City may upon ten (10) days written notice to the Contractor terminate the Contract without prejudice to any other right or remedy the City may have.

### **28.0 Dispute Resolution**

- 28.1 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.
- 28.2 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.
- 28.3 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.
- 28.4 The procedure set out in this section is not meant to preclude or discourage informal resolution of disagreements between the City and the Contractor.

### **29.0 Delivery – Intentionally Omitted**

### **30.0 Changes in Requirements**

- 30.1 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.
- 30.2 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 B – GENERAL CONDITIONS

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**31.0 Notices**

- 31.1 Any notice required to be given in this Contract shall be deemed to be duly given to the City if sent by registered mail addressed to the City's Purchasing Manager at Richmond "City Hall, 6911 No. 3 Road, Richmond, BC V6Y 2C1" and to the Contractor if sent by registered mail addressed to the Contractor at the address set forth in the Quotation.

## PART C – REQUIREMENTS

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### PART C - REQUIREMENTS

#### **Scope of Work**

The Contractor shall supply, install, terminate in bulkheads/enclosures, test and selectively splice Some sections of the conduit network have existing copper and/or fibre communications cable inside. (Steveston Hwy. between No. 2 Road and No. 5 Road contains one 6 pair 19 gauge copper cable only.) The existing cable must be maintained (operational) during the installation of the fibre optic cable. The entire length of IT network cable between City buildings shall be on a single reel, including uninterrupted installation in conduit to avoid mid span splices (unless otherwise noted). Traffic signal network cable (if Option B chosen instead of Option A) will be pulled in with appropriate slack loops and left dark under this contract.

#### Cable installation:

- supply and install fibre optic cable in occupied (existing cable) conduit as indicated on the Contract reference drawings. (conduit has been cleaned and pull strings installed)
- terminate/splice fibre optic cables at locations as indicated on the contract reference drawings.
- supply and install splice enclosures as per specifications and manufacturers recommendations.

#### Cable Testing:

- all fibres shall be tested on the reel prior to installation.
- all fibres shall be tested after installation and prior to splicing.
- all fibres shall be tested end to end after splicing.
- all end-to-end tests shall be witnessed by the City and/or it's agent.

#### Documentation:

- the Contractor shall supply the City with copies of all test results as defined in the Fibre Optic Cable Installation Specifications.
- the Contractor shall supply the City with an electronic file of the splice charts. Splicing details shall be finalized with the successful Contractor at a pre-construction meeting after the award of this Contract.

#### Cable termination in buildings:

- supply and install fibre termination cabinets
- coil the cable at established end points in each building and terminate on in-building fibre termination cabinets.

## PART C – REQUIREMENTS

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### **Contractor Qualifications**

The Contractor must be an approved/certified Commscope Systimax Installer capable of providing a Commscope manufacturer 20 year warranty on the installation.

The Contractor shall have proven multiple fibre cable installations in outdoor physical plant. Include references in quotation.

### **Location of Work**

Within the City of Richmond at the following routes and locations:

Reference Drawing – Master drawing – Map-3215

Additional reference for recent 2009 Richmond street photo's available @ Google Street View.

Option A – Fire Hall No. 2 to Public Safety Building 96 Fibre  
Location: 11011 No. 2 Road to 11411 No 5 Road

IT Cable – 96 fibre – single cable, no splices, (start @ the S/W corner of No. 2 Road & Steveston Highway (Fire Hall 2, Comm. Room)) to the Public Safety Building on SW corner of No. 5 Road & Horseshoe Way via Steveston Highway and No. 5 Road. For cable installation to Fire Hall at No 2. Road and Steveston Highway, bring cable into existing 2<sup>nd</sup> floor communication closet and splice onto existing 48 and 96 strand fibre cables in existing 288 strand capable cabinet there (allow for 12 splices). For cable installation at the Public Safety Building at No. 5 Road & Horseshoe Way the 96 fibre cable ends in the vault outside and gets spliced to an existing 24 fibre entrance cable in the same vault (allow for 12 splices). This existing 24 strand entrance cable terminates in the building's main entrance closet on the first floor in a dark cable end in an existing termination/splicing cabinet. Testing of the 12 strands spliced into building to be done at this dark cable end. Testing of the remaining 84 strands to be done in the vault outside.

Option B - Fire Hall No. 2 to Public Safety Building 96 + 12 Fibres  
Location: 11011 No. 2 Road to 11411 No 5 Road

IT Cable – 96 fibre – single cable, no splices, (start @ the S/W corner of No. 2 Road & Steveston Highway (Fire Hall 2, Comm. Room) to the Public Safety Building on SW corner of No. 5 Road & Horseshoe Way via Steveston Highway and No. 5 Road. For cable installation to Fire Hall at No 2. Road and Steveston Highway, bring cable into existing 2<sup>nd</sup> floor communication closet and splice onto existing 48 and 96 strand fibre cables in existing 288 strand capable cabinet there (allow for 12 splices). For cable installation at the Public Safety Building at No. 5 Road & Horseshoe Way the 96 fibre cable ends in the vault outside and gets spliced to an existing 24 fibre entrance cable in the same vault (allow for 12 splices). This existing 24 strand entrance cable terminates in the building's main entrance closet on the first floor in a dark cable end in an existing termination/splicing cabinet. Testing of the 12 strands spliced into building to be done at this dark cable end. Testing of the remaining 84 strands to be done in the vault outside.

## PART C – REQUIREMENTS

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Traffic Signal Cable – 12 fibres – single cable, leave 10Mtr slack loop at each traffic signal along route and at strategic mid-block locations. (start @ the S/W corner of No. 2 Road & Steveston Highway (Fire Hall 2, Comm. Room), end @ cabinet No. 5 Road & Horseshoe Way. Via Steveston Highway, No 5 Road . Total traffic signal cabinet locations = 8. Locations of traffic signals is as follows: Gilbert/Steveston, No. 3/Steveston, No. 4/Steveston, Shell/Steveston, Seaward/Steveston, Coppersmith/Steveston, No. 5/Steveston and No. 5/Horseshoe. If necessary, (to aid in the installation) the traffic signal cable may be strategically cut and capped at these defined future splice locations. If traffic cable is cut and capped at these defined locations, 5m of slack of each cable end must be coiled and labelled as to direction in each box.

## PART C – REQUIREMENTS

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### Option C - Ironwood Library 12 Fibre IT Entrance Cable Location: 11688 Steveston Highway, Unit 8200

IT Cable – 12 fibres – single cable, splice 12 cable to 96 cable (allow for 4 splices) in the vault in front parking lot of 11411 No 5 Road (Public Safety Building) where the 96 strand cable terminates. Install cable from this vault north up No 5 Road through existing 5686 JB north of Horseshoe Way on the west side of No. 5 Road at back corner of building up to the 2<sup>nd</sup> floor Library Communications room. Terminate in Communications room, second floor. Total building termination locations = 1. Total underground splice locations = 1. Splicing details to be provided following Contract Award.

#### **FIBRE OPTIC CABLE SPECIFICATION:**

##### Description

This section covers the requirements for fibre optic cable to be installed in existing underground conduit.

#### **Material Requirements**

All Fibre optic cable shall be supplied to the following specifications or better:

(Preferred manufacturer: Commscope Systimax Teraspeed singlemode # 5028 xxxA WXBK (where xxx indicates strand count) or approved alternate)

Number of Fibres:	96 and 12 fibres as shown on design drawings.
Construction:	Cable shall be loose tube construction with a sheath consisting of medium or high-density polyethylene construction. The cable shall be all dielectric construction. Cable shall be suitable for buried or underground installation. Cable shall have a dry block to keep out water.
Physical Characteristics:	Minimum static bending radius shall not be greater than 10 X cable diameter. The minimum-bending radius during installation and under tension shall not be greater than 20 X the cable diameter. Cable shall be able to withstand a pulling tension of 2500N without any resulting damage. The cable shall have a maximum outside diameter of no more than 0.75”(19.05mm).
Environmental:	Cable shall be suitable for operation over a temperature range of -20°C to +60°C.
Buffer Tubes:	All fibres shall be housed in buffer tubes. Buffer tubes shall be colour coded as per EIA 455 standards. Twelve fibres per buffer tube.
Fibres:	All fibres shall be singlemode, with nominal core diameter of 8.3-9.0µm and nominal cladding diameter of 125µm. All fibres shall be encased in a protective polymer coating.
Optical Characteristics:	All fibres shall have an attenuation not greater than 0.35dB/km at 1300nm and 0.25dB/km at 1550nm
Packaging:	All cable shall be supplied on wooden reels, with both ends of the cable accessible for testing. Each reel shall be clearly labelled with “City of Richmond Fibre Cable”, as well as the cable code, length, and date of manufacture. All reels shall be protected with solid (2x4) wooden lagging, intended for export shipment.

## PART C – REQUIREMENTS

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### **Factory Testing**

The bandwidth and attenuation of every fibre in each cable shall be tested in the factory. Measurements shall be taken at 1300nm and 1550nm.

These factory test results shall be provided with the cable. One copy shall be delivered to the City and one copy shall be attached to the cable reel, inside the lagging, prior to shipment.

### **FIBRE OPTIC OUTDOOR CABLE SPLICE ENCLOSURES:**

This specification section covers all splicing and termination materials required for the fibre optic network. These materials include outdoor fibre optic splice enclosures and fibre optic patch panels.

Outdoor fibre optic splice enclosures, intended for use in underground pull box locations shall provide physical protection for splicing of fibre cables as noted on the drawings. The splice enclosure shall be suitable for outdoor use.

Physical:	The splice enclosure shall protect the fibres from moisture and mechanical damage, and shall be suitable for installation in a subterranean splice vault. The enclosure shall provide sufficient space to enclose all splice trays required, as well as at least 1.83m (6 feet) of loose tube buffers from cables entering the enclosure.
Materials:	All materials in the splice enclosure shall not support galvanic cell action.
Re-entry:	The splice enclosure shall be re-enterable in a manner that does not reduce the protection offered by the unit.
Strain Relief:	Strain relief provisions suitable for outside plant cables shall be made for each cable entering the enclosure.
Splice Trays:	Fibre Optic Splice Trays suitable for fusion splicing shall be supplied with each enclosure. Sufficient trays shall be supplied to splice all fibres in the enclosure, placing no more than 12 fibres on a tray.
Waterproofing	The enclosure shall be able to withstand 1-meter head of water without any water ingress in the closure.

### Fibre Optic Patch Panels

1. In-building fibre optic patch panel enclosures for Options A & B are existing (Systemax 600G2 1U and 2U units using LC connectors). In-building fibre optic LIU style patch panel for Option C shall be supplied by the bidder.

### Fibre Optic Patch Panels/cords:

- Fibre Optic splice materials, bulkheads, pigtails and all required accessories will be supplied, installed and terminated for Options A, B & C under this contract
- Supply Commscope Systemax LIU and all needed accessories sized for min 24 strands for Option C
- All terminations to be high density LC type connectors
- Provide qty 12 of Commscope Teraspeed LC/LC 1.6mtr patch cords # FPCWLCLC22

## PART C – REQUIREMENTS

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### **FIBRE OPTIC CABLE INSTALLATION SPECIFICATIONS:**

#### **Fibre Optic Cable Installation**

##### **Junction Box and Vault Status**

There is a separate project by others underway which will be complete before cable installation begins, to upgrade and replace existing JB's and Vaults to deeper, larger ones as necessary along the install route and to remove most of the 90 degree elbows within these boxes. This will provide the needed slack loop locations for our future cable maintenance needs and provide a good workable pathway to aid your installation effort.

##### **Conduit Cleaning and Stringing**

Conduit cleaning and stringing has been completed by the City in preparation for the fibre cable installation. In the event conduit sections found by the bidder to be blocked shall be reported to the City to take remedial action.

##### **Cable**

Care will be exercised at all times to ensure that the fibre optic cable is not bent with a radius of less than 20 X the cable diameter during installation and less than 10 X the cable diameter after completion of the installation.

When cable on a reel is to be installed in two directions from a central point, or the installation of a cable run is completed in stages, the contractor shall utilize a figure eight method to coil cable. Any damaged cable sections shall be replaced from splice to splice by the Contractor at his expense.

The cable will be continuous between stations and/or splices as indicated on the plans. The Contractor shall not cut the cable to aid in installation, unless approved in writing by the City.

##### **Cable and Reel Marking Verification**

Inspect the reel and cable for possible damage caused during transportation or handling. Watch for protruding nails or damaged reel flanges.

All damage to reels or cable shall be reported to the City for inspection before pulling.

If it is necessary to roll the reel to the desired location, roll it in the direction of the arrow on the reel.

When handling a heavy cable reel, maintain careful control of its movement. Never permit a reel to tilt.

Where uneven ground conditions are encountered, provide a substantial runway of heavy planks, levelled with blocking, to prevent tilting.

## PART C – REQUIREMENTS

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Prior to setting up a reel, verify the reel number, size, and length of the cable with the information given on the reel assignment sheet.

### **Cable Reel Set-Up**

Set up the reel at the service box at the conduit section in which the cable is to be placed.

The reel should be aligned with the duct and in such a position that the cable can be passed from the top of the reel in a long, smooth bend into the duct without twisting. Never leave a rotating reel unattended.

When a cable reel trailer is not available or cannot be used, cable reel jacks may be used. However, stability and proper installation are very important when using jacks. Make sure spacers are placed on the shaft in both cases to prevent binding

Ensure there is adequate space for figure-eighting the cable.

If the duct line in which the cable shall be pulled, contains a curve or bend, set-up the reel at the service box/manhole nearer to the curve if conditions permit.

### **Cable Installation**

The contractor shall use either of the following methods to install the fibre cable in the conduit.

- A. Mechanical pulling
- B. Pneumatic (blowing)

The following specification pertain mainly to mechanical pulling of cable, however portions of the specification also applies to other methods such as pneumatic.

### **Installation Specifications**

A dynamometer shall be used for all pulling operations.

Running line dynamometers or tension Limiters shall be used to determine pulling tension applied to the cable during placement.

Maximum pulling tensions for cable pulled in conduit shall not exceed 600 lbs. or amount specified by cable manufacturer.

Cable shall not be subjected to a dynamic bending radius of less than 20 times the outside diameter of the cable.

The minimum static bending radius for cable in place shall be 10 times the outside diameter of the cable.

## PART C – REQUIREMENTS

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Where feasible, continuous cable pulls shall not be made through more than one 90-degree bends or more than a total of 180 degrees in conduit bends. However, when this is not possible, the cable pull shall be monitored to ensure that the pulling tension shall not exceed 2700N (600 lbs) or the amount specified by the manufacturer.

Record cable footage or meter markings at all service box locations and utility crossings.

Cable shall not be cut without approval from the City.

Where fibre cable is being installed into empty conduit, add a metallic tracer wire to that portion of the link.

The use of a Kellum grip is acceptable for pulling cable through conduit. It is recommended that the central strength member and/or kevlar be woven into and secured onto the grip on these pulls.

600 lb. breakaway swivel shall be used on all underground cable pulls.

Cable lubrication shall be used to reduce pulling tension on longer segments of the cable placement operation. Only approved pulling lubricants shall be used.

For IT cable at each splice location a 30 m coil of fibre shall be left on each cable end for the splicing and storage of slack cable. This is the length required before preparing the cable for splicing. There will also be a requirement for an additional 10m of slack IT cable to be installed at strategic locations along the route. These locations will be finalized with the Contractor prior to cable installation.

At each traffic signal location and approximately each 200 metres at least a 10 m coil of fibre shall be left in the selected junction boxes for storage of slack cable slack. Actual junction box locations and actual estimated slack in each box will be finalized with the Contractor prior to cable installation.

All cable ends shall be sealed until spliced and tested, and directional tags shall be placed at each location to indicate direction of cable.

All cable shall be on-reel tested upon receipt at the storage yard, and a copy of the completed test reports on diskette shall be issued to the City.

Cable shall be tested again after placement.

Non-disposable reels shall be handled and transported with care to a location as designated by the City for return to cable vendor.

When figure-eighting is performed (in pulling operations) in more than one location on one cable end, the complete figure eight shall be flipped.

## PART C – REQUIREMENTS

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A hydraulic cable pick-up reel or bull wheel may be used to pull cable at intermediate manholes instead of making a second figure eight, providing the reel has a 700 mm diameter or greater drum.

When pulling cable from two directions, always set up to pull the longest section first to minimize figure-eighting.

When it is not possible to locate the pulling apparatus adjacent to the service box, a 'C' manhole sheave should be used.

Where the service box/manhole opening does not permit the use of 71 cm diameter sheaves, a quadrant block shall be used to ensure a dynamic bending radius of at least 6 m.

A cable feeder shall be used to protect and guide the cable into the duct.

- Where an extension section is required, its nozzle end shall be placed in the bell end of the main section.
- The cable feeder also shall be used to feed lubricant onto the moving cable.

Always place the appropriate fusible link and swivel between the cable pulling eye and the pull line.

Place a marker consisting of several turns of friction tape on the pull line, 6 m from the cable end. This marker shall be used to indicate when the cable is about to enter the manhole.

Before starting the pull, check the equipment carefully to minimize the chance of interruption once pulling has started.

Inspect the cable reel to ensure there are no factory reel defects, exposed nails, splinters, or similar hazards that could cause cable damage.

Verify that the cable was wrapped properly at the factory.

A pulling speed of 24 to 30 m per minute is required.

Watch the cable carefully as it unreels, continually inspecting it for sheath defects or damage.

If a cable defect or damage is noticed during the pull, stop the pull and have the City inspect the cable before resuming the pull.

When stops are necessary, the pull line operator shall stop the pulling operation, but shall not release tension unless signalled to do so. In starting up again, the inertia of the cable shall be overcome by gradually increasing the tension in steps a few seconds apart until the cable starts to move.

## PART C – REQUIREMENTS

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### **Fibre Optic Splicing**

#### Splicing

Prior to splicing, the optical length of each cable section shall be recorded on the splice loss worksheet.

All fibres shall be spliced in accordance with and as designated in the splice assignment sheets that will be finalized at the pre-construction meeting after the award of this Contract. Splice assignment sheets shall be provided by the Contractor.

All fibres are to be fusion spliced and organized, spliced and secured in the splice closure.

All spliced fibres shall be protected by sleeve or splice pack.

To ensure acceptable splices prior to closing the splice case, each splice shall be monitored during the splicing operation using an OTDR.

Each splice is to be tested bi-directionally at 1550 nm or 1310 nm as directed by The City.

- The maximum splice loss, in one direction, shall be 0.05 dB.
- The bi-directional average loss shall be 0.05 dB.
- The OTDR test results shall be submitted to the City in PDF format on a CD-ROM/DVD-ROM.

Negative losses, or gains, shall be added to positive losses and averaged to determine the bi-directional splice loss. Gains or loss may not exceed 0.1 dB and shall be within ten percent (10%) of each other when tested bi-directionally.

If after five attempts, or where high negative loss values are being consistently obtained and the average splice loss objective cannot be met, the City shall be notified and continue as follows:

In the presence of the City an additional three attempts to splice the cable shall be made. If the splice then meets the specifications, splicing activities can be completed at this location.

If the splice fails to meet the specifications after attempting to splice the cable in front of the City, a 3 ft. section of cable from each of the cables being spliced shall be cut off, and given to the City.

- The splicing shall then be re-attempted.
- If after five additional attempts, the splice fails to meet the performance objectives the above procedure shall be repeated.

## PART C – REQUIREMENTS

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It is imperative that all out-of-limit splices be reported and documented immediately with the City. Failure to do so could cause re-entry into the splice for re-splicing.

### Testing

An Optical Time Domain Reflectometer (OTDR) capable of producing fibre test documentation in PDF format on computer disks and on a laser printer shall be used.

These disks along with the software needed to view and record the test data, shall be turned over to City two days after testing is completed.

All test equipment shall be calibrated within ninety days prior to testing.

A sticker with the date of calibration from the factory or certified test lab shall be fixed to equipment.

A certification document shall accompany all test data for that piece of equipment.

For purposes of OTDR testing, bare fibre adapters (delimiters) may be used.

The OTDR shall be capable of storing traces electronically and shall have suitable dynamic range and performance characteristics.

A patch cord of sufficient length to ensure that start of the fibre under test is not in the “dead zone” of the OTDR shall be used for all testing, and the first connector of the link under test shall be visible on the trace.

Prior to testing, all fibre optic connectors and bare fibre ends shall be properly cleaned using a residue free alcohol solution (better than 91 % de-natured alcohol and distilled water) and compressed air.

The vertical and horizontal scales used on the OTDR shall be expanded to maximize the amount of detail shown on the OTDR trace, even if these parameters can be adjusted later using display software.

The fibre number and end points of the fibre link under test (“from” and “to”) shall be recorded electronically on the OTDR with the trace.

OTDR traces shall be recorded on CD-ROM/DVD-ROM in MS-DOS formatted files. As applicable, the software and applicable licenses required to read the OTDR traces shall be provided to the City at no extra charge.

The Sub-Contractor shall ensure that traces identify the end points of the fibre under test and the fibre designation. If this information is not provided by the trace itself, a cross-reference table between the stored trace file name and the fibre designation shall be provided

## PART C – REQUIREMENTS

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### **Bi-directional OTDR splice test**

Each fibre at each point shall be tested bi-directionally at 1310 nm or 1550 nm with an OTDR capable of long range and high resolution testing.

The test shall be from an end point designated by the City.

The test results shall be submitted to the City on a “Splice Loss Worksheet”.

### **End-to-End Bi-directional Span Test**

Each fibre of each span shall be tested at 1310 nm or 1550 nm, as directed by the City, from end point to end point.

End-to-end span losses shall be within the loss calculations specified for each span.

This test shall be performed after all of the splicing within the span has been completed, splice cases closed, encapsulated and positioned.

### **End-to-End Power Test**

Each fibre of each span shall be tested in both directions from end-to-end using a 1310 nm stabilized high light source and power meter.

The results of this test are to be recorded on the test data sheets provided and submitted to the City.

### **Cable Fault Path**

Where applicable the cable fault path (armour sheath or metallic member) shall be tested for continuity between each splice and the results recorded on a splice loss worksheet provided.

### **Documentation**

Test data results shall be submitted to the City on the applicable test data forms.

The test data forms shall be completely and legibly filled out.

Test data results shall be submitted as a neatly organized and indexed document for each span.

The document shall contain the following:

- Splice attempt worksheet(s).
- Splice loss worksheet(s).
- Span overview.
- Splice assignment sheet.
- Contractor and/or subcontractors comments

## PART C – REQUIREMENTS

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- Identification of test equipment used for each test and accompanying calibration certificate

Copies of all OTDR fibre tests on computer CD-ROM/DVD-ROM, labelled with endpoints and the date of the test. Final test results shall be recorded on the test record forms included as Tables 1 and 2.

### **In-Building Fibre Cable Terminations**

The contractor shall coil service loops of cable at established end points in each building. Fibre cable shall be terminated into existing or supplied/installed patch panels and any wall mount racks needed to support them. Contractor shall supply and install any needed required plywood backing on the walls of the Communication rooms for these racks/enclosures. The fibre termination cabinet for Option C to be supplied shall be Commscope Systimax model #: 100A3 LIU type (no alternates) with all required accessories. For options A or B the cabinets at the end buildings are existing. The cabinets at No 2 Firehall are a Systimax 600G2 4U termination and 4U splicing enclosures with existing 96 and 48 strand cables and space to accommodate this new 96 strand IT cable. The cabinet at the Public Safety building is a Systimax 360G2 with room to accept the 24 strand entrance cable for splicing to an existing singlemode riser cable.

Fibre Optic Patch Panels/cords:

- The Fibre Optic patch panels and any required accessories detailed above will be supplied, installed and terminated to under this contract
- All terminations to be high density LC type connectors
- Provide qty 12 of Commscope Teraspeed LC/LC 1.6mtr patch cords # FPCWLCLC22

PART C – REQUIREMENTS

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**TEST RESULTS – FIBRE OPTIC CABLES**  
**Pre Installation Testing**

Wavelength of Test: \_\_\_\_\_

**TABLE 1**

<b>Reel Number</b>	<b>Fibre Tested</b>	<b>Measured Attenuation (dB/km)</b>

Tested by: \_\_\_\_\_ Witnessed by: \_\_\_\_\_

Date: \_\_\_\_\_



PART C – REQUIREMENTS

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**SCHEDULE OF ESTIMATED QUANTITIES AND PRICES:**

(Unit prices for the supply and installation of fibre optic cable shall include all cable testing and documentation.) Please supply the manufacturer's make and model of the fibre optic cable proposed for this project, multiple cable options for manufacturers and pricing is acceptable:

Quantities given below are an estimate only; the Contractor shall be paid based upon the actual units used for each Option. Cable estimates here include cable slack. Actual junction box locations and cable slack in each box will be finalized with the Contractor prior to cable installation.

PART C – REQUIREMENTS

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**Option A – Fire Hall No. 2 to Public Safety Building 96 Fibres**

A. Supply and install 96 fibre cable in conduit with existing cable as per contract reference drawings and instructions.

Price per metre \_\_\_\_\_ x estimated quantity 6500 metres =

Subtotal \$ \_\_\_\_\_ HST \$ \_\_\_\_\_ Total \$ \_\_\_\_\_

B. IT Cable – Firehall No 2 – Fusion splice 12 strands from single packet of the 96 strand cable to 12 strands of existing 96 and 48 strand cables in the 2<sup>nd</sup> floor communication closet.

Price per single strand termination \_\_\_\_\_ x quantity \_12\_ strands =

Subtotal \$ \_\_\_\_\_ HST \$ \_\_\_\_\_ Total \$ \_\_\_\_\_

C. IT Cable – Public Safety Building – Fusion splice 12 strands from single packet of the 96 strand cable to single packet of existing 24 strand entrance cable in outside vault with contractor supplied splice enclosure.

Price per single strand termination \_\_\_\_\_ x quantity \_12\_ strands =

Subtotal \$ \_\_\_\_\_ HST \$ \_\_\_\_\_ Total \$ \_\_\_\_\_

D. Install underground fibre optic cable splice enclosure. To be supplied by the City.

Price per unit \_\_\_\_\_ x estimated quantity \_1\_ =

Subtotal \$ \_\_\_\_\_ HST \$ \_\_\_\_\_ Total \$ \_\_\_\_\_

**TOTAL VALUE OF OPTION A**

**Subtotal\$** \_\_\_\_\_

**HST\$** \_\_\_\_\_

**Total\$** \_\_\_\_\_

Carry over the total value price to QUOTATION FORM, page 6 under TOTAL QUOTED PRICE OF OPTION A.

PART C – REQUIREMENTS

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**Option B – Fire Hall No. 2 to Public Safety Building 96 + 12 Fibres**

A. Supply and install 96 and 12 Fibre cables in conduit with existing cable as per contract reference drawings and instructions.

Price per metre \_\_\_\_\_ x estimated quantity 6500 metres =

Subtotal \$ \_\_\_\_\_ HST \$ \_\_\_\_\_ Total \$ \_\_\_\_\_

B. IT Cable – Firehall No 2 – Fusion splice 12 strands from single packet of the 96 strand cable to 12 strands of existing 96 and 48 strand cables in the 2<sup>nd</sup> floor communication closet.

Price per single strand termination \_\_\_\_\_ x quantity \_12\_ strands =

Subtotal \$ \_\_\_\_\_ HST \$ \_\_\_\_\_ Total \$ \_\_\_\_\_

C. IT Cable – Public Safety Building – Fusion splice 12 strands from single packet of the 96 strand cable to single packet of existing 24 strand entrance cable in outside vault with contractor supplied splice enclosure.

Price per single strand termination \_\_\_\_\_ x quantity \_12\_ strands =

Subtotal \$ \_\_\_\_\_ HST \$ \_\_\_\_\_ Total \$ \_\_\_\_\_

D. Install underground fibre optic cable splice enclosure. To be supplied by the City.

Price per unit \_\_\_\_\_ x estimated quantity \_1\_ =

Subtotal \$ \_\_\_\_\_ HST \$ \_\_\_\_\_ Total \$ \_\_\_\_\_

**TOTAL VALUE OF OPTION B**

**Subtotal\$** \_\_\_\_\_

**HST\$** \_\_\_\_\_

**Total\$** \_\_\_\_\_

Carry over the total value price to QUOTATION FORM, page 6 under TOTAL QUOTED PRICE OF OPTION B.

PART C – REQUIREMENTS

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**Option C – Ironwood Library Splice + 12 Fibre Entrance Cable**

A. Supply and install 12 fibre entrance cable into existing splice enclosure (as noted in Options A & B) in vault outside 11411 No 5 Road (Public Safety Building). Splice 4 strands of the 12 strand cable to 4 strands (all going back to No 2 Firehall) in one tube of the new 96 strand cable terminating in this vault under option A or option B above. In conduit with existing cable as per drawings.

Price per metre \_\_\_\_\_ x estimated quantity 400 metres =

Subtotal \$ \_\_\_\_\_ HST \$ \_\_\_\_\_ Total \$ \_\_\_\_\_

B. In - Building termination – Supply and install Commscope Systimax model #: 100A3 LIU type (no alternates)  
Total building termination locations = 1 (Ironwood Library – 2<sup>nd</sup> floor Communication room).

Subtotal \$ \_\_\_\_\_ HST \$ \_\_\_\_\_ Total \$ \_\_\_\_\_

C. IT Cable – Terminate 4 strands from single packet on LC connectors in the supplied 100A3 LIU in the Library 2<sup>nd</sup> floor communication closet.

Price per single strand termination \_\_\_\_\_ x quantity 4 strands =

Subtotal \$ \_\_\_\_\_ HST \$ \_\_\_\_\_ Total \$ \_\_\_\_\_

**TOTAL VALUE OF OPTION C:**

**Subtotal\$** \_\_\_\_\_

**HST\$** \_\_\_\_\_

**Total\$** \_\_\_\_\_

Carry over the total value price to QUOTATION FORM, page 6 under TOTAL QUOTED PRICE OF OPTION C.

PART E – DISTRIBUTION LIST

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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, Undertaking of Liability Insurance, Quotation Form, Quotation Annexure, General Conditions of Contract, Specifications and Drawings, and having full knowledge of the work required, does hereby offer to provide all necessary materials in strict accordance with the Specifications and to do all therein called for on the terms and conditions and under the provisions therein set forth at the:

**TOTAL QUOTED PRICE OF OPTION A: \$** \_\_\_\_\_

**TOTAL QUOTED PRICE OF OPTION B: \$** \_\_\_\_\_

**TOTAL QUOTED PRICE OF OPTION C: \$** \_\_\_\_\_

**PAYMENT TERMS** \_\_\_\_\_ **EARLY PAYMENT TERMS** \_\_\_\_\_

The above price includes and covers duties, handling and transportation charges, and all other charges incidental to and forming part of this Quotation, except for H.S.T.

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

PART E – DISTRIBUTION LIST

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Name of Bidder: \_\_\_\_\_

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

\_\_\_\_\_

E-mail: \_\_\_\_\_

Telephone No: \_\_\_\_\_

Name, Signature, and  
Title of Signing Officer: \_\_\_\_\_

\_\_\_\_\_

Date: \_\_\_\_\_

PART E – DISTRIBUTION LIST

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**Undertaking of Liability Insurance**

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

Dear Sirs:

We, the undersigned (insert insurance company's name) \_\_\_\_\_ do hereby undertake and agree to insure the Contractor in the amount of \$5,000,000.00 as outlined in the attached "General Conditions of the Contract" and agree to:

- a. Name the City of Richmond, its officers, officials, agents, and employees as additional insured in connection with the work being proposed by the Contractor.
- b. State that such policy applies to each insured in the same manner and to the same extent as if separate policy had been issued to each insured named in the policy.
- c. State that the policy cannot be cancelled, lapsed, or materially changed without at least 30 days written notice of cancellation delivered to the City Clerk of the City of Richmond at 6911 No. 3 Road, Richmond, BC V6Y 2C1.
- d. State that coverage provided by such insurance shall protect the Contractor and the City of Richmond during the performance of the works and services specified in the attached Form of Quotation and specifically that the insurance required by such Quotation shall be consistent with the requirements therein.

if the Contract is awarded to (insert bidder's name) \_\_\_\_\_

EXCEPTIONS:

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Dated at \_\_\_\_\_, British Columbia, this \_\_\_\_ day of \_\_\_\_\_, 2011.

BY: \_\_\_\_\_ TITLE: \_\_\_\_\_

This form must be signed by the Insurance Company or an authorized Broker on behalf of the Insurance Company.

A SEPARATE FORM MUST BE SIGNED FOR EACH POLICY IF MORE THAN ONE POLICY IS APPLICABLE.





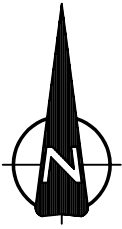
PART E – DISTRIBUTION LIST

**List of Previous Contracts**

The Bidder has recently undertaken and completed the Contracts described following and authorizes the City of Richmond to inquire as to the nature of the Bidders performance on these contracts.

	DESCRIPTION OF CONTRACT	TOTAL PRICE OF CONTRACT	DATE COMMENCED	DATE COMPLETED
Company:  Contact Name:  Phone:  E-mail:				
Company:  Contact Name:  Phone:  E-mail:				
Company:  Contact Name:  Phone:  E-mail:				
Company:  Contact Name:  Phone:  E-mail:				

(If additional space is required, attach additional



SEE COMM - 3

- 37--- JB #37
- 66--- JB #66
- 86--- JB #5686
- V--- VAULT
- X--- COMMUNICATION JB THROUGH POINT
- T--- COMMUNICATION JB-PROPOSED TRAFFIC FIBRE SPLICE POINT
- IT--- COMMUNICATION JB-PROPOSED IT FIBRE SPLICE POINT
- S--- COMMUNICATION JB-EXISTING COPPER SPLICE POINT
- TRAFFIC SIGNAL CABINET

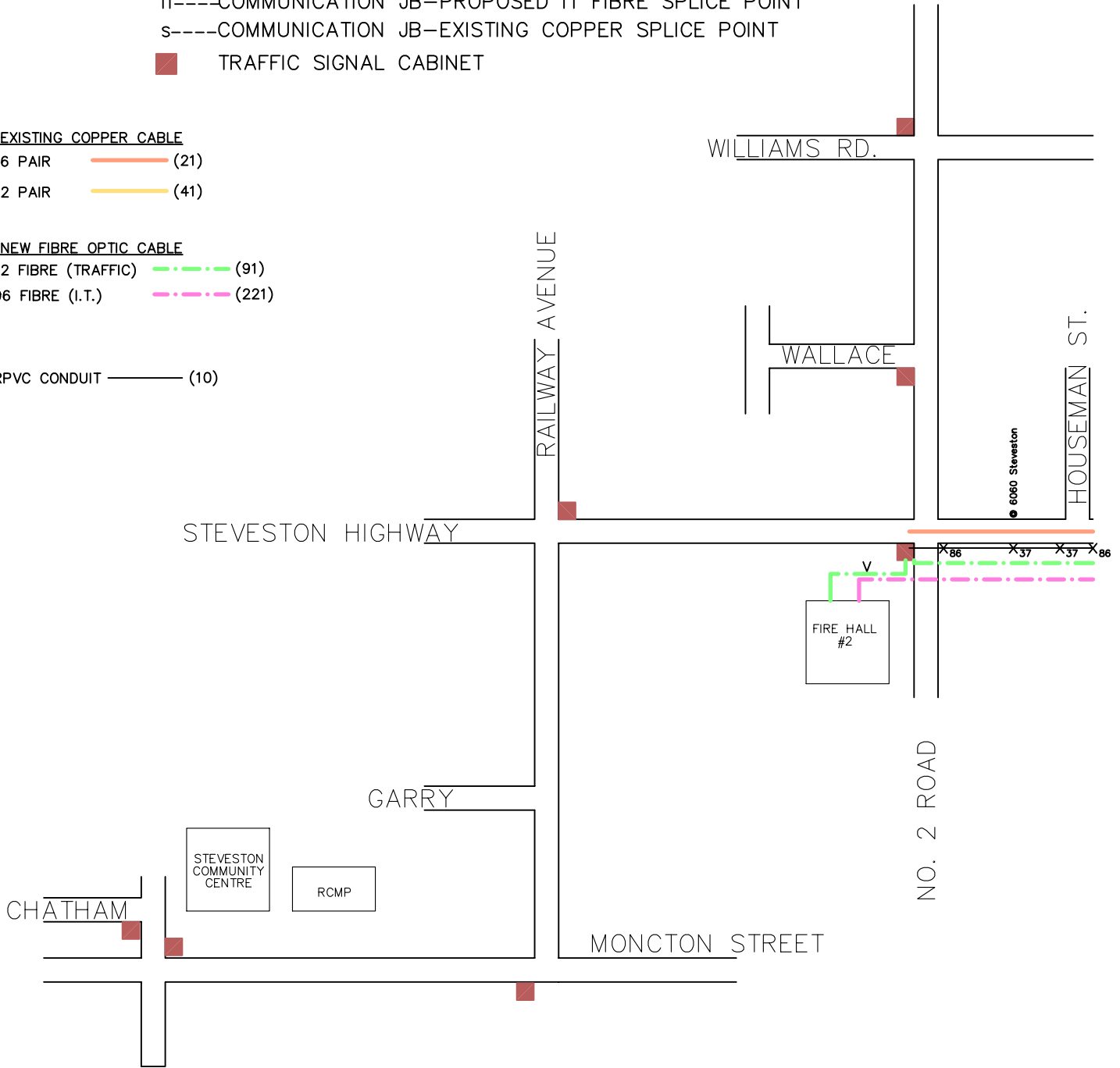
EXISTING COPPER CABLE

- 6 PAIR (21)
- 12 PAIR (41)

NEW FIBRE OPTIC CABLE

- 12 FIBRE (TRAFFIC) (91)
- 96 FIBRE (I.T.) (221)

RPVC CONDUIT (10)

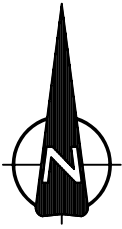


SEE COMM - 5

- x COMMUNICATION JB
- COMMUNICATION JB WITH ELBOW
- s COMMUNICATION JB WITH SPLICE

CITY OF RICHMOND

DES: JRB/SLM	ENG:	COMMUNICATIONS CONDUIT/CABLE NETWORK CONTROLLERS, JUNCTION BOXES & CABLE SPLICE POINTS	DR. No. COMM-2
DR: BJ	DATE: MAY/11		SHEET No.
CHK:	SCALE: N.T.S.		1 OF 1

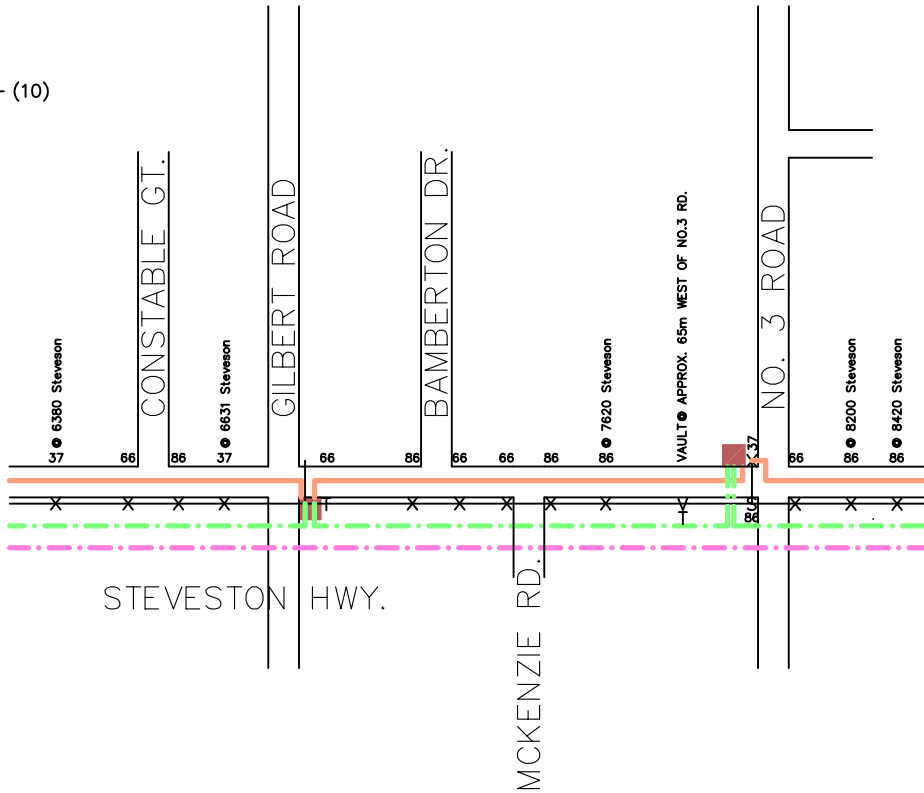


- 37---JB #37
- 66---JB #66
- 86---JB #5686
- v---VAULT
- x---COMMUNICATION JB THROUGH POINT
- T---COMMUNICAITON JB-PROPOSED TRAFFIC FIBRE SPLICE POINT
- IT---COMMUNICATION JB-PROPOSED IT FIBRE SPLICE POINT
- S---COMMUNICATION JB-EXISTING COPPER SPLICE POINT
- TRAFFIC SIGNAL CABINET

EXISTING COPPER CABLE  
 6 PAIR      ——— (21)  
 12 PAIR     ——— (41)

NEW FIBRE OPTIC CABLE  
 12 FIBRE (TRAFFIC)    - - - - (91)  
 96 FIBRE (I.T.)       - - - - (221)

RPVC CONDUIT      ——— (10)



SEE COMM - 2

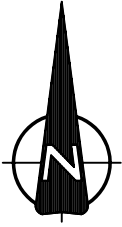
SEE COMM - 8

CITY OF RICHMOND

DES: JRB/SLM	ENG:
DR: BJ	DATE: MAY/11
CHK:	SCALE: N.T.S.

COMMUNICATIONS CONDUIT/CABLE NETWORK  
 CONTROLLERS, JUNCTION BOXES  
 & CABLE SPLICE POINTS

DR. No. COMM-5
SHEET No. 1 OF 1



- 37--- JB #37
- 66--- JB #66
- 86--- JB #5686
- V--- VAULT
- X--- COMMUNICATION JB THROUGH POINT
- T--- COMMUNICATION JB-PROPOSED TRAFFIC FIBRE SPLICE POINT
- IT--- COMMUNICATION JB-PROPOSED IT FIBRE COIL POINT
- S--- COMMUNICATION JB-EXISTING COPPER SPLICE POINT
- TRAFFIC SIGNAL CABINET

**EXISTING COPPER CABLE**

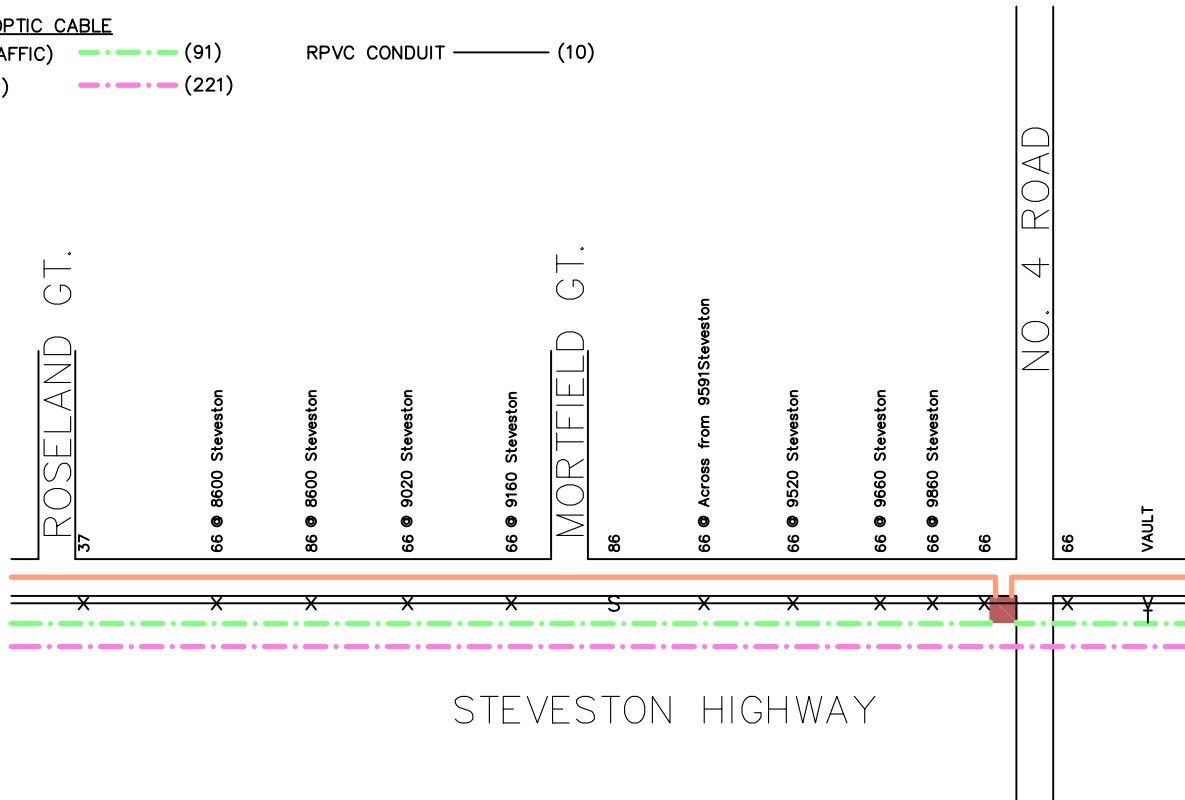
- 6 PAIR (21)
- 12 PAIR (41)

**NEW FIBRE OPTIC CABLE**

- 12 FIBRE (TRAFFIC) (91)
- 96 FIBRE (I.T.) (221)

RPVC CONDUIT (10)

SEE COMM - 5



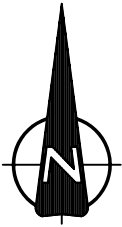
SEE COMM - 12

CITY OF RICHMOND

DES: JRB/SLM	ENG:
DR: BJ	DATE: MAY/11
CHK:	SCALE: N.T.S.

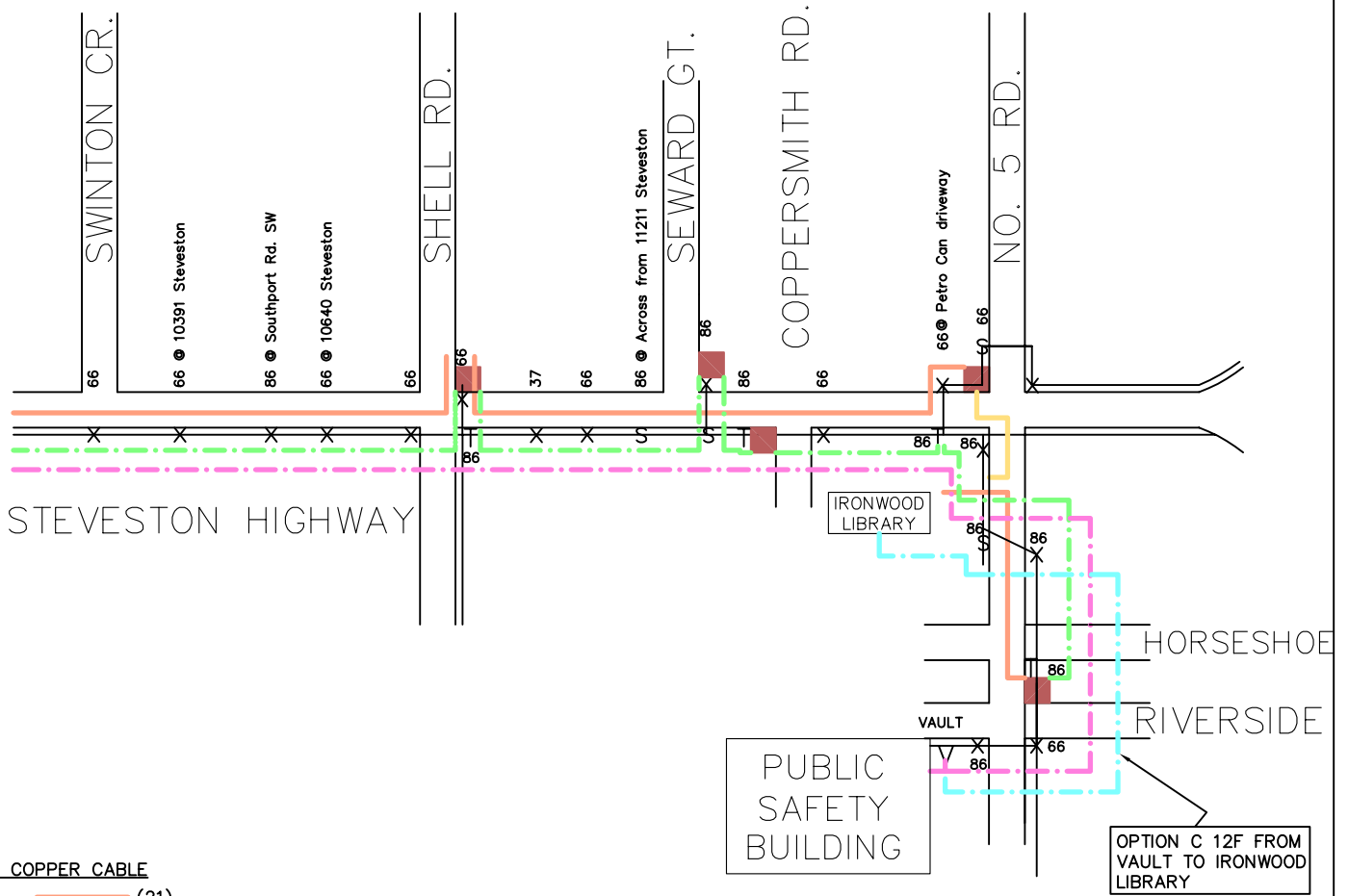
COMMUNICATIONS CONDUIT/CABLE NETWORK  
CONTROLLERS, JUNCTION BOXES  
& CABLE SPLICE POINTS

DR. No. COMM-8
SHEET No. 1 OF 1



- 37--- JB #37
- 66--- JB #66
- 86--- JB #5686
- V--- VAULT
- X--- COMMUNICATION JB THROUGH POINT
- T--- COMMUNICATION JB-PROPOSED TRAFFIC FIBRE SPLICE POINT
- IT--- COMMUNICATION JB-PROPOSED IT FIBRE SPLICE POINT
- S--- COMMUNICATION JB-EXISTING COPPER SPLICE POINT
- TRAFFIC SIGNAL CABINET

SEE COMM - 8



EXISTING COPPER CABLE

- 6 PAIR (21)
- 12 PAIR (41)

NEW FIBRE OPTIC CABLE

- 12 FIBRE (TRAFFIC) (91)
- 12 FIBRE (I.T.) (131)
- 96 FIBRE (I.T.) (221)

RPVC CONDUIT (10)

CITY OF RICHMOND

DES: JRB/SLM	ENG:
DR: BJ	DATE: MAY/11
CHK:	SCALE: N.T.S.

COMMUNICATIONS CONDUIT/CABLE NETWORK  
CONTROLLERS, JUNCTION BOXES  
& CABLE SPLICE POINTS

DR. No. COMM-12
SHEET No. 1 OF 1