



Contract 2670Q

Supply and Installation of Fibre Optics Cable

Bidders are requested to respond to this Quotation call as instructed subject to the provisions contained herein.

Name of Bidder: _____

Address: _____

City: _____

Province: _____ Postal Code: _____

Telephone No: _____ Fax No.: _____

E-mail: _____

Contact Person: _____

Title: _____

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Instructions to Bidders

1. Sealed quotations, plainly marked on the envelope:

CONTRACT 2670Q - SUPPLY AND INSTALLATION OF FIBRE OPTICS CABLE

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:

Monday, August 29, 2005

2. Quotations received in the Purchasing Section after the above-mentioned time and date will be returned unopened.
3. Quotations must be submitted on the attached Forms and be authorized by a signing officer of the Bidder's company. The entire Request for Quotation must be returned to the City.
4. This Document and completed Forms will become part of the Contract Documents between the City and the successful Bidder.
5. The City reserves the right to accept all or any part of a quotation or to waive irregularities at their own discretion. The lowest or any quotation will not necessarily be accepted.
6. Proprietary names, unless otherwise stated, are used solely to establish standards of materials and finish. Items of other manufacture may be accepted as equal to those specified, at the discretion of the City.
7. The City of Richmond estimates that this contract will be awarded within 2-3 weeks of the closing date. All bidders submitting Quotations for the Project will be advised as to the outcome. Please note that Bid results for those contracts posted on the City Web Site and/or BC Bid will be listed on BC Bid within two (2) weeks of the award of Contract.
8. Prices, in Canadian currency, shall be shown for the work specified and shall include all wages and benefits for those personnel engaged on this contract, expenditures for materials, equipment, travel expenses, assessments for Workers' Compensation, Unemployment Insurance, Canada Pension Plan or any similar statute, costs of subcontracts, insurance premiums, bonds, royalties, permits and licences, taxes, tariffs and duties, overhead, profit, and all other expenditures in connection with the work.

Instructions to Bidders (Cont'd)

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

Bidders shall have the Undertaking of Liability Insurance Form Letter L1-1 (attached) completed and submitted with their Quotation.

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

10. Bidders shall examine the contract documents and visit the site of the work to understand the contract requirements of the project. The City will not make allowances for the contractor's failure to make proper site investigation.
11. Each Bidder shall state on the lists provided to be submitted as part of his quotation, information regarding their previous contracts, subcontractors and equipment that he proposes to use to carry out this contract to completion. It is the intention of the City not to award the contract to any Bidder who does not furnish satisfactory evidence that he has the ability and experience to perform the various works covered under this Contract, and that he has sufficient capital and plant to enable him to execute the said works successfully, and to the satisfaction of the City, and to complete and deliver said works as quoted in his Quotation.
12. Inquires during submission of Quotation should be directed as follows:

Purchasing
David Phipps - Supervisor, Purchasing
Purchasing Section
City of Richmond

Telephone: 604-276-4287

E-mail: purchasing@richmond.ca

Technical
Stephen Matheson
Traffic Technician II, Signals
Transportation Department

Telephone: 604-276-4033

E-mail: smatheson@richmond.ca

Jeff Bycraft
Traffic Signal Systems Technologist
Transportation Department
City of Richmond

Telephone: 604-276-4031

E-mail: jbycraft@richmond.ca

David Gillis
Technical & Network Service
Information Technology Department
City of Richmond

Telephone: 604-276-4001

E-mail: dgillis@richmond.ca

Instructions to Bidders (Cont'd)

13. Quotations may be withdrawn by written notice only, provided such notice is received at the office of the City's Purchasing Department prior to time set as closing time for receiving Quotations.
14. Quotations shall be open for acceptance for 60 days following the submission closing date.
15. Bidders are advised that submissions of quotes shall be in compliance to the Freedom of Information and Privacy Act.
16. **Any interpretation of, additions to, deletions from, or any other corrections to the Contract documents, will be issued as written addenda by the City of Richmond. It is the sole responsibility of the potential bidders to check the City of Richmond Web Site and/or BC Bid to ensure that all available information has been received prior to submitting a bid.**

Quotation Form

Purchasing and Risk Department
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 Annexures, 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:

LUMP SUM TOTAL QUOTED PRICE OF OPTION A: \$ _____

LUMP SUM TOTAL QUOTED PRICE OF OPTION B: \$ _____

PAYMENT TERMS: _____

The above price includes and covers duties, Federal, (including G.S.T.), Provincial Taxes, 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 _____ weeks of acceptance.

Name of Bidder: _____

Address: _____

Telephone No: _____

Name, Signature,
and Title of
Signing Officer: _____

Date: _____

E-mail: _____

Web Address: _____

FORM LETTER LI-1

Undertaking of Liability Insurance

(To be submitted with Quotation)

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 \$2,000,000.00 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:

Dated at _____, British Columbia, this _____ day of _____, 2005.

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.

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. The list shall include only work related to outside physical plant installation similar to the work described in this RFQ.

	DESCRIPTION OF CONTRACT	TOTAL PRICE OF CONTRACT	DATE COMMENCED	DATE COMPLETED
--	-------------------------	-------------------------	----------------	----------------

Owner:

Located at:

Contract for:

Owner:

Located at:

Contract for:

Owner:

Located at:

Contract for:

Owner:

Located at:

Contract for:

(If additional space is required, attach additional)

List of Subcontractors

The Bidder agrees that the subcontractors shown herein is the list of subcontractors that he proposes to use to carry out those part of the work shown on the list and, subject to their approval by the City, the Bidder agrees to so employ the listed subcontractors and no others in their stead.

Nothing contained in the contract documents shall create any contractual relation between any subcontractor and the City.

The Bidder agrees that if he is awarded the contract, he will bind every subcontractor by the terms of the contract documents, as far as applicable to his work.

Description of Parts of Work to be Sublet to Subcontractors	Name, Address, and Telephone Number of Subcontractor(s) to be Used to Carry Out the Various Parts of the Work Described
--	--

List of Equipment

The Bidder proposes to use the equipment listed below in carrying out the work covered by this Contract (list only the major pieces of equipment to be used):

Number of Units	Brief Description of Equipment (state its use, make, age, and general condition)	Check Whether: Owned by Bidder	Rented/ Leased
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(If additional space is require, attach additional)

List of Drawings

Sets of Drawings (Hard Copies) are available at no additional cost, at the Information Counter, Main Floor, Richmond City Hall, 6911, No. 3 Road, Richmond, BC. Please ask for the envelope marked Contract 2670Q.

Drawing No.	Sheet No.	Title
Ec 622	1 of 1	Traffic Signal Communications Conduit, Cable & Junction Boxes WESTMINSTER HIGHWAY (Tiffany Blvd. to No. 2 Road)
Ec 623	1 of 1	Traffic Signal Communications Conduit, Cable & Junction Boxes LYNAS LANE (Granville Avenue to Westminster Highway)
Ec 624	1 of 1	Traffic Signal Communications Conduit, Cable & Junction Boxes GRANVILLE AVENUE (No. 2 Road to Gilbert Road)
Ec 625	1 of 1	Traffic Signal Communications Conduit, Cable & Junction Boxes GRANVILLE AVENUE (Lynas Lane to No. 2 Road)
Ec 626	1 of 1	Traffic Signal Communications Conduit, Cable & Junction Boxes GRANVILLE AVENUE (Gilbert Road to No. 3 Road)
Ec 637	1 of 1	Traffic Signal Communications Conduit, Cable & Junction Boxes GILBERT ROAD (Granville Ave. to Westminster Hwy.)
Ec 638	1 of 1	Traffic Signal Communications Conduit, Cable & Junction Boxes CITY WORKS YARD 5599 LYNAS LANE

Specifications

Location of Work

Within the City of Richmond between City Hall (6911 No. 3 Road) and the City Works Yard (5599 Lynas Lane) via Granville Avenue, Lynas Lane and Westminster Highway. Also, from Fire Hall No. 1 (Granville Avenue vault) to Gateway Theatre via Gilbert Road.

Scope of Work

The Contractor shall supply, install, test and selectively splice fibre optic cable within a City owned communications conduit network as shown on Contract drawings. The conduits range in size between 32mm to 75mm and some sections of the conduit network have existing copper communications cable inside. The existing copper cable must be maintained (operational) during the installation of the fibre optic cable. The entire length of cable from City Hall to the Works Yard shall be on a single reel, including uninterrupted installation in conduit to avoid mid span splices.

Cable installation:

- supply and install fibre optic cable in new (empty) and used (not empty) conduits as indicated on the design drawings.
- splice fibre optic cables at two locations as indicated on the design 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:

The Contractor shall coil the cable at established end points in each building. Cable termination into City supplied/installed patch panels shall be performed by others.

Total Estimated Cable Supply:

144 Fibre – 3,325 metres

48 fibre – 742 metres

Option B – 192 fibre – 3,325 metres

Total Splice Locations: Two

Total Splice Enclosures: Two

FIBRE OPTIC CABLE SPECIFICATION:

Description

This section covers the requirements for fibre optic cable to be installed on an aerial pole line or in underground conduit.

Material Requirements

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

Number of Fibres:	144 fibres and 48 fibres as shown on design drawings. (or option B 192 fibres)
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 fibers shall be encased in a protective polymer coating.
Optical Characteristics:	All fibres shall have an attenuation not greater than 0.3dB/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.

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

Outdoor fibre optic splice enclosures shall provide physical protection for splicing of fibre cables with at least 48 fibres. 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

Fibre Optic Patch Panels will be supplied and installed by the City.

FIBRE OPTIC CABLE INSTALLATION SPECIFICATIONS:

Fibre Optic Cable Installation

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.

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 HPDE pipe.

1. Mechanical pulling
2. 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.

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.

The use of a Kellum grip is acceptable for pulling cable through HDPE. 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.

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.

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 more than one location on one cable end, the complete figure eight shall be flipped.

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.
- In sections where the cable shall be pulled in two directions, the flexible innerduct used for cable protection shall serve as the cable feeder.

Feed the pull line from the innerduct through the cable feeder before the connection is made between the line and the 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.

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 on a floppy disk

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.

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 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 3.5" disks 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

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

Copies of all OTDR fibre tests on computer disks, 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.

Fibre Optic Patch Panel

The fibre optic patch panels shall be supplied and installed by the City.

TEST RESULTS – FIBER OPTIC CABLES
Pre Installation Testing

Wavelength of Test: _____

TABLE 1

Reel Number	Fibre Tested	Measured Attenuation (dB/km)

Tested by: _____ Witnessed by: _____

Date: _____

TEST RESULTS - FIBER OPTIC CABLES
Post Installation Testing

TABLE 2

Power Meter Location	Light Source Location	Fibre Number	Wavelength Measured	Attenuation (dB)

Tested by: _____

Witnessed by: _____

Date: _____

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 you propose to use for this project:

144 fibre cable = _____

192 fibre cable = _____

OPTION A:

All unit prices given are to include labour, equipment, material and all applicable taxes and overhead costs. Quantities given below are an estimate only; the Contractor shall be paid based upon the actual units installed.

A. Supply and install 144 fibre cable in 32mm empty conduit.

Price per metre _____ x estimated quantity 2020 metres = Total \$ _____

B. Supply and install 144 fibre cable in 50mm conduit containing 1 x 25 pair copper cable.

Price per metre _____ x estimated quantity 455 metres = Total \$ _____

C. Supply and install 144-fibre cable in 75mm empty conduit.

Price per metre _____ x estimated quantity 392 metres = Total \$ _____

D. Supply and install 144-fibre cable in 75mm conduit containing 1 x 50 pair copper cable.

Price per metre _____ x estimated quantity 113 metres = Total \$ _____

E. Supply and install 144 fibre cable in 75mm conduit containing 1 x 25 pair copper cable.

Price per metre _____ x estimated quantity 70 metres = Total \$ _____

F. Supply and install 144 fibre cable in 75mm conduit containing 1 x 50 & 1 x 12 pair copper cable.

Price per metre _____ x estimated quantity 20 metres = Total \$ _____

G. Supply and install 144 fibre cable in 75mm conduit containing 1 x 2 fibre cable.

Price per metre _____ x estimated quantity 255 metres = Total \$ _____

H. Supply and install 48 fibre cable in 50mm empty conduit.

Price per metre _____ x estimated quantity 35 metres = Total \$ _____

I. Supply and install 48-fibre cable in 50mm conduit containing 1 x 25 pair copper cable.

Price per metre _____ x estimated quantity 60 metres = Total \$ _____

J. Supply and install 48 fibre cable in 75mm conduit containing 1 x 25 pair copper cable.

Price per metre _____ x estimated quantity 447 metres = Total \$ _____

K. Supply and install 48 fibre cable in 75mm conduit containing 1 x 25 & 1 x 6 pair copper cable.

Price per metre _____ x estimated quantity 200 metres = Total \$ _____

L. Supply and install fibre optic cable splice enclosures.

Price per unit _____ x estimated quantity 2 = Total \$ _____

(Make and model of splice enclosure kit you are proposing to use = _____)

M. Fibre optic cable splicing.

Price per splice _____ x estimated quantity 48 fibres = Total \$ _____

(Cable splicing shall be confined to individual buffer tubes containing 12 fibres per tube. Some or all fibres within these tubes shall be spliced. Splicing details will be finalized with the Contractor after the award of this Contract.)

TOTAL VALUE OF OPTION A: _____ \$

Carry over the total value price to QUOTATION FORM, page 6 under LUMP SUM OPTION A.

OPTION B:

All unit prices given are to include labour, equipment, material and all applicable taxes and overhead costs. Quantities given below are an estimate only; the Contractor shall be paid based upon the actual units installed.

A. Supply and install 192 fibre cable in 32mm empty conduit.

Price per metre _____ x estimated quantity 2020 metres = Total \$ _____

B. Supply and install 192 fibre cable in 50mm conduit containing 1 x 25 pair copper cable.

Price per metre _____ x estimated quantity 455 metres = Total \$ _____

C. Supply and install 192-fibre cable in 75mm empty conduit.

Price per metre _____ x estimated quantity 392 metres = Total \$ _____

D. Supply and install 192-fibre cable in 75mm conduit containing 1 x 50 pair copper cable.

Price per metre _____ x estimated quantity 113 metres = Total \$ _____

E. Supply and install 192 fibre cable in 75mm conduit containing 1 x 25 pair copper cable.

Price per metre _____ x estimated quantity 70 metres = Total \$ _____

F. Supply and install 192 fibre cable in 75mm conduit containing 1 x 50 & 1 x 12 pair copper cable.

Price per metre _____ x estimated quantity 20 metres = Total \$ _____

G. Supply and install 192 fibre cable in 75mm conduit containing 1 x 2 fibre cable.

Price per metre _____ x estimated quantity 255 metres = Total \$ _____

H. Supply and install 48 fibre cable in 50mm empty conduit.

Price per metre _____ x estimated quantity 35 metres = Total \$ _____

I. Supply and install 48-fibre cable in 50mm conduit containing 1 x 25 pair copper cable.

Price per metre _____ x estimated quantity 60 metres = Total \$ _____

J. Supply and install 48 fibre cable in 75mm conduit containing 1 x 25 pair copper cable.

Price per metre _____ x estimated quantity 447 metres = Total \$ _____

K. Supply and install 48 fibre cable in 75mm conduit containing 1 x 25 & 1 x 6 pair copper cable.

Price per metre _____ x estimated quantity 200 metres = Total \$ _____

L. Supply and install fibre optic cable splice enclosures.

Price per unit _____ x estimated quantity 2 = Total \$ _____

(Make and model of splice enclosure kit you are proposing to use = _____)

M. Fibre optic cable splicing.

Price per splice _____ x estimated quantity 48 fibres = Total \$ _____

(Cable splicing shall be confined to individual buffer tubes containing 12 fibres per tube. Some or all fibres within these tubes shall be spliced. Splicing details will be finalized with the Contractor after the award of this Contract.)

TOTAL VALUE OF OPTION B: _____ \$

Carry over the total value price to QUOTATION FORM, page 6 under LUMP SUM OPTION B.

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.

General Conditions Of The Contract

1. Definitions

The two parties to this contract are the Contractor and the City, defined as follows:

The Contractor: The successful bidder for the work upon receipt of a purchase order and written acceptance of his Quotation from the City.

The City: City of Richmond.

Contract Documents: Means and includes the Instructions to Bidders, General Conditions of the Contract, Specifications, Drawings, Quotation Form, and the awarding Purchase Order to the successful bidder.

2. Work to Satisfaction of City

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.

3. Work to be in Conformity with Contract Documents and Drawings

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.

4. Permits

The Contractor shall comply with all codes, laws, regulations, and ordinances which concern the work, and unless otherwise provided herein shall obtain and pay for all applicable permits, licences, and certificates.

5. Use of Premises

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.

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

General Conditions of the Contract (Cont'd)

6. Light, Power, and Heat

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

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

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

7. Warranty

Unless otherwise specified, the Contractor warrants that only the best workmanship and materials will be employed and if, within a period of one (1) year from the date of acceptance of the work by the City, such work or supplies or any portion thereof are found by the City to be defective or faulty due to imperfect or bad workmanship or material, the Contractor agrees to replace such defective supplies and correct such defective work forthwith without expense to the City.

8. Liens

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.

9. Patent Fees

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.

10. Default

- (a) The City may, by notice of default to the Contractor, terminate the whole or any part of this Contract if the Contractor fails to perform any provision of this Contract within the time specified or to perform any other provision of this contract.
- (b) In the event the City terminates this Contract in whole or in part as provided in clause (a), the City may procure supplies or services similar to those so terminated, and the Contractor shall be liable to the City for any excess costs for such similar supplies or services.

General Conditions of the Contract (Cont'd)

- (c) The Contractor shall not be liable for any excess costs under clause (b) if failure to perform the Contract arises by reason of strikes, lockouts, acts of God, or acts of the City.

11. Taxes

Unless otherwise provided herein, the Contractor shall pay all government sales or excise taxes in force at the date of the Agreement, provided that any increase or decrease in such taxes shall increase or decrease the amount due under the Contract accordingly. Invoices shall show the appropriate amounts for Goods and Services Taxes and Provincial Sales Taxes separately.

12. Laws

The laws of British Columbia shall govern the work.

13. Time

Time shall be the essence in this Contract.

14. Assignment

Neither party to the Contract shall assign the Contract without the written consent of the other.

15. Notices

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 and Insurance Department 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.

16. Inquiries

Contractor's inquiries to the City during construction should be directed to the following:

Stephen Matheson
Traffic Technician II - Signals
URBAN DEVELOPMENT DIVISION
City of Richmond

Telephone: 604 276-4033
E-mail: smatheson@richmond.ca

17. Settlement of Complaints Re: Work

If, in the opinion of the Purchasing and Insurance Department, the work is improperly, defectively, or insufficiently performed, or being performed, the Purchasing and

General Conditions of the Contract (Cont'd)

Insurance Department 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 working days, the Purchasing and Risk Department 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.

18. Other Contractors

The City may have his own work forces and other contractors on the site while the work of this Contract is under way. The City shall coordinate the work of all Contractors on the site and require their coordination with each other.

The Contractor shall report to the City any apparent deficiencies in other contractors' work, which would affect the work of this Contract immediately the deficiencies come to his attention.

19. Changes in the Work

The City may make changes to the work; the Contract price, and time being adjusted accordingly. Except for emergencies, all changes will be made by written order.

20. Protection

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.

21. Payments

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

Except for the final payment, the City shall holdback 10% 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.

General Conditions of the Contract (Cont'd)

22. Indemnification and Insurance

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.

The Contractor shall, at his own expense, through the terms of the contract secure, maintain, and pay for the following coverages:

- (a) Comprehensive General Liability Insurance with a limit of not less than \$2,000,000 inclusive per occurrence for bodily injury and property damage and \$2,000,000 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 coverages:
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.
- (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 80% 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 thereunder.

The City, its officers, officials, and employees shall be added as additional named insured on all such policies. All such insurance provided by these policies shall be primary

General Conditions of the Contract (Cont'd)

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.

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 Purchasing and Insurance Department 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 30 days' written notice to the City.

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.

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.

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.

23. Workers' Compensation Board Coverage/Prime Contractor

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.

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

General Conditions of the Contract (Cont'd)

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.

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.

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.



Note: Receipt of this completed form will assist us in calling for future bids. Please complete and submit this form prior to the closing date and time as shown on the Request for Quotation/Proposal/Tender form.
Please remember to include Quotation/Proposal/Tender No. at right.

Quotation/Proposal/Tender

No **2670Q**

A Quotation/Proposal/Tender is not being submitted for the following reason(s):

- | | |
|--|--|
| <input type="checkbox"/> We do not manufacture/supply the required goods/services | <input type="checkbox"/> Cannot obtain raw materials/goods in time to meet delivery requirements |
| <input type="checkbox"/> We do not manufacture/supply to stated specifications | <input type="checkbox"/> Cannot meet delivery requirements |
| <input type="checkbox"/> Specifications are not sufficiently defined | <input type="checkbox"/> Cannot quote/tender a firm price at this time |
| <input type="checkbox"/> Insufficient information to prepare quote/proposal/tender | <input type="checkbox"/> Insufficient time to prepare quote/tender. |
| <input type="checkbox"/> Quantity too small | <input type="checkbox"/> We are unable to competitively quote/tender at this time. |
| <input type="checkbox"/> Quantity too large | <input type="checkbox"/> We do not have facilities to handle this requirement |
| <input type="checkbox"/> Quantity beyond our production capacity | <input type="checkbox"/> Licensing restrictions (please explain) |
| <input type="checkbox"/> Cannot meet packaging requirements | <input type="checkbox"/> Agreements with distributors/dealers do not permit us to sell directly. |
| <input type="checkbox"/> Cannot handle due to present plant loading | <input type="checkbox"/> Other reasons or additional comments (please explain below) |

I / We wish to quote / tender on similar goods / services in future <input type="checkbox"/> Yes <input type="checkbox"/> No	Authorized Company Official – Signature and Title	Date
This space for City of Richmond Comments	Firm Name	
	Address	
	City	
	Province	Postal Code

	Telephone Number
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