Winnipeg

Corporate Finance Department
Materials Management Division

REQUEST FOR
QUOTATION

RFQ NO. 510-2003

SUBMISSION DEADLINE: **4:00 P.M. WINNIPEG TIME, FEBRUARY 26, 2004**

If your company name and address are not correctly shown below, please enter or correct it before submitting your Bid.

Contact: _____

Company: _____

Street Address: _____

City/Province: _____

BUYER: Barry Tobin
TELEPHONE NO. (204) 986-2126

SUPPLY AND INSTALLATION OF CLOSED CIRCUIT SECURITY CAMERA SYSTEM BRADY ROAD LANDFILL

Site Meeting: See Clause 4.3 of the Specifications.

THE BID SUBMISSION MUST INCLUDE THIS PAGE (COMPLETED AND SIGNED)

TERMS AND CONDITIONS ATTACHED APPLY EXCEPT AS SUPERSEDED ABOVE OR BY SPECIFICATIONS (IF ANY) ATTACHED.

Early payment discount: _____ % _____ days
(See 1.5 of the Terms and Conditions attached.)

RETURN TO:

THE CITY OF WINNIPEG 510-2003
CORPORATE FINANCE DEPARTMENT
MATERIALS MANAGEMENT DIVISION
185 KING ST MAIN FLOOR
WINNIPEG MB R3B 1J1

PCH6A(EDO):2001-02-23

Contact Person: (print) _____

Telephone Number: _____

Facsimile Number: _____

The Bidder hereby offers to perform the Work in accordance with the Contract for the price(s), in Canadian funds, set out in this Bid.

The Bidder agrees that the Request for Quotation in its entirety shall be deemed to be incorporated in and to form a part of this offer notwithstanding that not all parts thereof are necessarily attached to or accompany this Bid.

The Bidder certifies that the following addenda have been received and agrees that they shall be deemed to form a part of the Contract.

No. 1 ☐ No. 2 ☐ No. 3 ☐ No. 4 ☐

This offer shall be open for acceptance, binding and irrevocable for a period of thirty (30) days following the Submission Deadline.

Signature: _____

TERMS AND CONDITIONS – CONSTRUCTION

1. BIDDING PROCEDURES

1.1 The Bid must be submitted on the forms provided, with all required entries made clearly in ink.

1.2 If the Bidder finds discrepancies or omissions in the Request for Quotation or any part thereof, or is unsure of the meaning or intent thereof, he shall notify the Buyer. The Buyer will, if he deems it necessary, issue addenda to all Bidders. The Bidder is advised to direct all enquiries or comments to the Buyer at least five (5) business days prior to the Submission Deadline to allow time for the preparation and distribution of necessary addenda.

1.3 The Bidder is responsible for investigating the site, the nature of the Work to be done and all local conditions that might affect his Bid or his performance of the Work, and shall assume all risk for conditions existing or arising in the course of the Work which have been or could have been determined through such investigation.

1.4 The Contract is based on the design, methods and materials specified and any proposed substitutes must be clearly identified in the Bid. Where the phrases "or equal" or "or alternative" occur in the Request for Quotation, the Bidder is advised to submit descriptive matter in sufficient detail to permit a judgment as to the merits of any "equal" or "alternative" offered.

1.5 The Bidder may, but is not required to, offer a prompt payment discount. If prompt payment discounts are offered, they will be considered in determining the lowest evaluated responsive Bid.

1.6 The Bid must be submitted enclosed and sealed in an envelope clearly marked with the RFQ Number and the Bidder's name and address. Each envelope must contain only the Bid for one Request for Quotation.

1.7 The Bid must be submitted to the Materials Management Division at the address specified no later than the Submission Deadline specified. Bids received after the Submission Deadline will not be considered.

1.8 The Bid may be withdrawn without penalty at any time prior to the Submission Deadline.

1.9 The Bid shall be open for acceptance, binding and irrevocable for the period of time specified on the cover page. A Bidder who withdraws his Bid after the Submission Deadline but before his Bid has been released or has lapsed shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the City considers appropriate in the circumstances.

1.10 The City may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The City may reject all or any part of any Bid or waive technical requirements if the interests of the City so require. The City may reject any Bid submitted by a Bidder who does not demonstrate, in his Bid or in other information required to be submitted, that he is responsible and qualified. A responsible and qualified Bidder is one that meets the qualifications specified and is not suspended, debarred or in default under any contract with the City.

1.11 Where the Contract is proposed in separate sections or with alternatives, the City shall have the right to award any section separately or to choose any alternative which is in its best interests.

1.12 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive. Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid.

1.13 The Buyer will give notice of the award of the Contract by issuing a Purchase Order to the successful Bidder, or will give notice that no award will be made.

1.14 The Request for Quotation, including but not limited to the specifications, drawings and addenda, and the Contractor's Bid shall be deemed to be incorporated in and to form a part of the Purchase Order notwithstanding that they are not necessarily attached to or accompany said Purchase Order.

1.15 The name of the successful Bidder and the Contract amount will be made available, upon request, to Bidders only after award of Contract.

2. SCOPE OF WORK

2.1 The Work to be done under this Contract shall consist of the supply of labour and materials in accordance with applicable specifications, drawings and addenda.

2.2 The Contractor shall provide and pay for all labour, materials, equipment, tools, temporary works, utilities, licenses and fees necessary to complete the Work. Any work not explicit in the specifications, drawings and addenda, which is reasonably implied, necessary and usually included for such work, shall be deemed to be included in the Work.

3. MATERIALS & WORKMANSHIP

3.1 Materials and workmanship shall be fit for the purpose intended and shall equal or exceed the quality specified.

3.2 All materials to be incorporated in the Work shall be new.

3.3 The Contractor shall be responsible for the storage, transportation and handling of materials until the Work is accepted by the City.

4. ASSIGNMENT

4.1 The Contractor shall not assign the Contract or any payment thereunder without the prior written approval of the City.

5. SUBCONTRACTING

5.1 If the Contractor subcontracts any portion of the Work, he shall:

a) employ only Subcontractors who have successfully carried out work similar in nature, scope and value to the portion of the Work proposed to be subcontracted to them, or who are fully capable of performing the Work required to be done in accordance with the terms of the Contract;
b) enter into contracts or written agreements with his Subcontractors to require them to perform their work in complete conformance with and subject to the terms and conditions of the Contract; and
c) be as fully responsible to the City for acts and omissions of his Subcontractors and of persons directly or indirectly employed by them as for acts and omissions of persons directly employed by him.

6. INDEMNITY

6.1 The Contractor shall save harmless and indemnify the City against all costs, damages or expenses arising from actions, claims, demands and proceedings, by whomsoever brought, made or taken as a result of acts or omissions of the Contractor, his subcontractors, employees or agents in the performance or purported performance of the Work, and more particularly from:

a) accidental injury to or death of any person whether retained by or in the employ of the Contractor or not, arising directly or indirectly by reason of the performance of the Work, or by reason of any trespass on or damage to property;
b) damage to any property owned in whole or in part by the City, or which the City by duty or custom is obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain;
c) damage to, or trespass or encroachment upon, property owned by persons other than the City;
d) failure to pay and obtain a discharge of a notice of claim for lien served upon the City in accordance with the requirements of The Builders' Liens Act;
e) failure to pay a workers compensation assessment, or federal or provincial taxes;
f) unauthorized use of any design, device, material or process covered by letters patent, copyright, trademark or trade name in connection with the Work;
g) inaccuracies in any information provided to the City by the Contractor.

6.2 The City has the right, acting reasonably and upon notice to the Contractor, to settle any such action, proceeding, claim or demand and charge the Contractor with the amount so paid or to be paid in effecting a settlement.

6.3 The Contractor shall pay to the City the value of all legal fees and disbursements required to settle any such claim or to defend the City against any such claim, action, proceeding, claim or demand notwithstanding that the settlement or defence of the said action, proceeding, claim or demand was undertaken on behalf of the City by a salaried employee of the City.

6.4 If the Contractor fails to make any payment required to be made to the City hereunder, the City shall be entitled to deduct the amount of such payment from any payment required to be made by the City to the Contractor under the Contract or take whatever other remedies against the Contractor that the City may have at law.

7. EVENTS OF DEFAULT

7.1 An event of default will be deemed to have occurred if the Contractor:

a) abandons the Work; or
b) is adjudged bankrupt or files for bankruptcy, becomes insolvent, makes a general assignment for the benefit of his creditors, or has a receiver or liquidator appointed in respect of his assets; or
c) in the judgment of the City, is not performing or has not been performing the Work, or any part thereof, in a sound and workmanlike manner and in all respects in strict conformity with the Contract; or
d) in the judgment of the City, is not progressing continuously with the Work or any part thereof, and in such a manner as to ensure the completion of the Work or any part thereof, in accordance with the work schedule; or
e) fails to take down, rebuild, repair, alter or amend any defective or deficient Work, or to remove any defective or deficient material; or
f) fails to remedy defects or deficiencies during the warranty period in the manner and within the time periods specified by the City; or
g) fails to make prompt payment to his subcontractors, his employees or on account of the purchase or rental of equipment or materials; or
h) fails to promptly secure a discharge of a lien or trust claim served upon the City pursuant to The Builders' Liens Act; or
i) fails to comply with any laws, by-laws or statutory regulations; or
j) fails to provide competent supervision for the Work; or
k) fails to submit any schedules, documents or information required by the Contract; or
l) refuses or neglects to comply with an order given by the City;
m) commits any other breach of the Contract.

7.2 Any provision of the Contract may be waived only by express waiver in writing by the City. No express waiver of any provision shall imply the waiver of any other provision.

7.3 If an event of default has occurred, the City may do any one or more of the following:

a) withhold or retain the whole or part of any payment;
b) take the whole of the Work, or any part or parts thereof out of the hands of the Contractor;
c) demand payment for any amount owed to the City.

7.4 The duties and obligations imposed upon the Contractor by the Contract and the rights and remedies available to the City hereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed upon the Contractor or available to the City at law.

8. PRICES AND PAYMENT

8.1 Prices bid shall be gross prices including all applicable duty, freight, cartage, Provincial and Federal Taxes [except Goods and Services Tax (GST), which shall be extra where applicable] and all charges governmental or otherwise paid, and including profit and all compensation which shall be due to the Contractor.

8.2 If the Contractor charges GST, he must show his registration number and the amount of GST separately on the invoice.

8.3 Where The Builders' Liens Act is applicable to the Contract, payments will be subject to such holdbacks as are required to be made thereunder. Interest on holdback amounts will be credited, and holdback amounts will be released, in accordance with said Act.

8.4 Payment will be in Canadian funds net thirty (30) days from receipt of acceptable goods, or receipt and approval of the Contractor's invoice, whichever is later.

FORM B: PRICES
(See 6)

SUPPLY AND INSTALLATION OF CLOSED CIRCUIT SECURITY CAMERA SYSTEM BRADY ROAD LANDFILL

LUMP SUM PRICE

TOTAL BID PRICE (GST and PST extra) (in figures) $ _____

(in words)_____

_____

SEPARATE PRICES TO BE DEDUCTED FROM LUMP SUM PRICE

ITEM NO.	DESCRIPTION	SPEC. REF	UNIT	APPROX. QUANTITY	UNIT PRICE	AMOUNT
1.	Supply and Installation of Cameras #8, 9, and 10	Detailed Specs.	LS	1		

_____
Name of Bidder

FORM H1: PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS THAT

_____
(hereinafter called the "Principal"), and

_____ ,
(hereinafter called the "Surety"), are held and firmly bound unto **THE CITY OF WINNIPEG** (hereinafter called the "Obligee"), in the sum of

_____

_____ dollars ($_____.____)

of lawful money of Canada to be paid to the Obligee, or its successors or assigns, for the payment of which sum the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has entered into a written contract with the Obligee dated the

_____ day of _____ , 20____ , for:

RFQ NO. 510-2003

SUPPLY AND INSTALLATION OF CLOSED CIRCUIT SECURITY CAMERA SYSTEM BRADY ROAD LANDFILL

which is by reference made part hereof and is hereinafter referred to as the “Contract”.

NOW THEREFORE the condition of the above obligation is such that if the Principal shall:

(a) carry out and perform the Contract and every part thereof in the manner and within the times set forth in the Contract and in accordance with the terms and conditions specified in the Contract;
(b) perform the Work in a good, proper, workmanlike manner;
(c) make all the payments whether to the Obligee or to others as therein provided;
(d) in every other respect comply with the conditions and perform the covenants contained in the Contract; and
(e) indemnify and save harmless the Obligee against and from all loss, costs, damages, claims, and demands of every description as set forth in the Contract, and from all penalties, assessments, claims, actions for loss, damages or compensation whether arising under "The Workers Compensation Act", or any other Act or otherwise arising out of or in any way connected with the performance or non-performance of the Contract or any part thereof during the term of the Contract and the warranty period provided for therein;

THEN THIS OBLIGATION SHALL BE VOID, but otherwise shall remain in full force and effect. The Surety shall not, however, be liable for a greater sum than the sum specified above.

AND IT IS HEREBY DECLARED AND AGREED that the Surety shall be liable as Principal, and that nothing of any kind or matter whatsoever that will not discharge the Principal shall operate as a discharge or release of liability of the Surety, any law or usage relating to the liability of Sureties to the contrary notwithstanding.

IN WITNESS WHEREOF the Principal and Surety have signed and sealed this bond the

_____ day of _____ , 20____ .

SIGNED AND SEALED)
in the presence of:)
)
)
_____)
(Witness))
)
)
)
)
)
)
)
)
)

_____
(Name of Principal)

Per: _____ (Seal)

Per: _____

_____
(Name of Surety)

By: _____ (Seal)
(Attorney-in-Fact)

FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT
(PERFORMANCE SECURITY)

_____
(Date)

The City of Winnipeg
Corporate Services Department
Legal Services Division
185 King Street, 3rd Floor
Winnipeg MB R3B 1J1

RE: PERFORMANCE SECURITY - **RFQ NO. 510-2003**

SUPPLY AND INSTALLATION OF CLOSED CIRCUIT SECURITY CAMERA SYSTEM BRADY ROAD LANDFILL

Pursuant to the request of and for the account of our customer,

_____ ,
(Name of Contractor)

_____
(Address of Contractor)

WE HEREBY ESTABLISH in your favour our irrevocable Standby Letter of Credit for a sum not exceeding in the aggregate

_____

_____Canadian dollars.

This Standby Letter of Credit may be drawn on by you at any time and from time to time upon written demand for payment made upon us by you. It is understood that we are obligated under this Standby Letter of Credit for the payment of monies only and we hereby agree that we shall honour your demand for payment without inquiring whether you have a right as between yourself and our customer to make such demand and without recognizing any claim of our customer or objection by the customer to payment by us.

The amount of this Standby Letter of Credit may be reduced from time to time only by amounts drawn upon it by you or by formal notice in writing given to us by you if you desire such reduction or are willing that it be made.

Partial drawings are permitted.

We engage with you that all demands for payment made within the terms and currency of this Standby Letter of Credit will be duly honoured if presented to us at:

_____
(Address)

and we confirm and hereby undertake to ensure that all demands for payment will be duly honoured by us.

All demands for payment shall specifically state that they are drawn under this Standby Letter of Credit.

Subject to the condition hereinafter set forth, this Standby Letter of Credit will expire on

_____ .
(Date)

It is a condition of this Standby Letter of Credit that it shall be deemed to be automatically extended from year to year without amendment from the present or any future expiry date, unless at least 30 days prior to the present or any future expiry date, we notify you in writing that we elect not to consider this Standby Letter of Credit to be renewable for any additional period.

This Standby Letter of Credit may not be revoked or amended without your prior written approval.

This credit is subject to the Uniform Customs and Practice for Documentary Credit (1993 Revision), International Chamber of Commerce Publication Number 500.

_____
(Name of bank or financial institution)

Per: _____
(Authorized Signing Officer)

Per: _____
(Authorized Signing Officer)

SPECIFICATIONS

1. GENERAL

1.1 These Specifications shall be applicable to the Work and shall take precedence over the Terms and Conditions.

2. DEFINITIONS

2.1 When used in this Request for Quotation:

(a) "**Business Day**" means any Calendar Day, other than a Saturday, Sunday, or a Statutory or Civic Holiday;

(b) "**Buyer**" means the person authorized to represent the City in respect of the Request for Quotation;

(c) "**Calendar Day**" means the period from one midnight to the following midnight;

(d) "**Contract**" means the combined documents consisting of the Request for Quotation package and any documents and drawings referred to and incorporated therein together with any submissions required to be made by the Contractor after award, and all amendments to the foregoing;

(e) "**Contract Administrator**" means the person authorized to represent the City in respect of the Contract and is the Buyer unless otherwise specified hereinafter;

(f) "**Contractor**" means the person undertaking the performance of the Work under the terms of the Contract;

(g) "**Site**" means the lands and other places on, under, in or through which the Work is to be performed;

(h) "**Substantial Performance**" shall have the meaning attributed to it in The Builders' Liens Act (Manitoba), or any successor legislation thereto;

(i) "**Total Performance**" means that the entire Work, except those items arising from the provisions of any warranty, have been performed in accordance with the Contract;

(j) "**Work**" means the carrying out and the doing of all things, whether of a temporary or permanent nature, that are to be done by the Contractor pursuant to the Contract and, without limiting the generality of the foregoing, includes the furnishing of all equipment, facilities, material, labour and services necessary for or incidental to the fulfilment of the requirements of the Contract;

(k) "**Working Day**" means any Calendar Day, other than a Saturday, Sunday or a Statutory or Civic Holiday, on which the Contract Administrator determines atmospheric and Site conditions are such that the Contractor is able to work at least seven (7) hours.

2.2 Further to 2.1(e), the Contract Administrator is:

Mr. Neil H. Klassen
Project Manager
Earth Tech (Canada) Inc.
850 Pembina Highway, Winnipeg, Manitoba R3M 2M7
(204) 477-5381
(204) 284-2040

3. WORK

3.1 The Contractor shall supply, deliver and install a complete and functional camera surveillance system at the Brady Road Landfill in accordance with the requirements hereinafter specified.

4. SITE INVESTIGATION

4.1 Further to 1.3 of the Terms and Conditions, this Bidder is responsible for investigating the Site, the nature of the Work to be done and all local conditions that might affect his Bid or his performance of the Work, including:

(a) the location of any utility which can be determined from the records or other information available at the offices of any public authority or person, including a municipal corporation and any board or commission thereof, having jurisdiction or control over the utility;

(b) the nature of the surface and subsurface conditions at the Site;

(c) the location, nature, quality or quantity of the materials to be removed or to be employed in the performance of the Work;

(d) the nature, quality or quantity of the equipment needed to perform the Work;

(e) all matters concerning access to the Site, power supplies, location of existing services, utilities or materials necessary for the completion of the Work; and

(f) all other matters which could in any way affect the performance of the Work;

and shall assume all risk for conditions existing or arising in the course of the Work which have been or could have been determined through such investigation.

4.2 The Bidder shall not rely upon information furnished by the City or any of its servants or agents other than information furnished in writing for or in connection with the Bid or the Contract by the Buyer or the Contract Administrator.

4.3 Further to 1.3 of the Terms and Conditions, the Contract Administrator or an authorized representative will be available at the Site from 9:00 a.m. to 3:00 p.m. on February 17, 2004 to provide Bidders access to the Site.

4.4 The Bidder is advised that due to the unavailability of as-built drawings, which accurately depict the existing site and facilities, a site visit is necessary for the bidders to best determine the installation requirements of this contract.

4.5 The Bidder shall not be entitled to rely on any information or interpretation received at the Site investigation unless that information or interpretation is the Bidder's direct observation, or is provided by the Contract Administrator in writing.

5. SCHEDULE OF WORK

5.1 The Contractor shall achieve Total Performance within 100 Working Days of the award of Contract.

5.2 Work shall be performed between 8:30 a.m. and 4:30 p.m. on Business Days.

6. ADDENDA

6.1 The Buyer may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Request for Quotation, or clarifying the meaning or intent of any provision therein.

6.2 The Buyer will issue each addendum to all Bidders by:

(a) publication at the Materials Management Division's Bid Opportunities internet website at http://www.winnipeg.ca/matmgt/bidopp.asp.

6.3 The Bidder is responsible for ensuring that he/she has received all addenda and shall acknowledge receipt of each addendum on the Request for Quotation cover page. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

6.3.1 The Bidder is advised to check the Materials Management Division's Bid Opportunities internet website for addenda shortly before submitting his/her Bid.

7. BID SUBMISSION

7.1 The Bid Submission consists of the following components:

(a) Request for Quotation cover page completed and signed;

(b) Form B: Prices

7.2 Bids may be submitted by:

(a) personal delivery to the address shown on the Request for Quotation cover page

7.2.1 Bids submitted by internet electronic mail (e-mail) will not be accepted.

8. PRICES

8.1 The Bidder shall state the lump sum price in Canadian funds for the Work on Form B Prices.

8.2 The Bidder shall state the amount in Canadian funds for the following item of work on Form B Prices.

8.2.1 Separate Price– Item No. 1 shall be the amount to be deducted from the Total Bid Price for deletion of the supply and installation of Cameras #8, 9, and 10.

9. INVOICES

9.1 The Contractor shall submit invoices to the location designated on the Purchase Order.

9.2 Invoices must clearly indicate, as a minimum:

(a) the City's Purchase Order (PO) number;

(b) date(s) of Work;

(c) Site(s) or address(s) of Work;

(d) description, quantity and unit price(s) of Work performed;

(e) total amount payable with GST and PST, where applicable, shown as separate amounts; and

(f) where applicable, the Contractor's GST registration number.

9.3 The City will bear no responsibility for delays in approval of invoices that are improperly submitted.

10. WARRANTY

10.1 The Contractor warrants that the Work will be free of any and all defects or deficiencies for a period of one (1) year from the date of Total Performance, except where longer warranty periods are specified in the specifications.

10.2 Upon notification by the Contract Administrator, the Contractor shall, at his/her sole cost and expense, remedy any defect or deficiency identified by the Contract Administrator during the warranty period and any damage that may arise or result from the defect or deficiency or as a result of the correction of same.

10.3 Notwithstanding 10.1 and 10.2 above, if any statute in force in the Province of Manitoba or in the jurisdiction where materials were manufactured requires, or if the manufacturer provides, a longer warranty period or a warranty that is more extensive in its nature, then the provisions of such statute or manufacturer's warranty shall apply.

11. INSURANCE

11.1 The Contractor shall provide and maintain commercial general liability insurance, in the amount of at least two million dollars ($2,000,000.00) all inclusive, with The City of Winnipeg being added as an additional insured, with a cross-liability clause, such liability policy to also contain a contractual liability, an unlicensed motor vehicle liability and a products and completed operations endorsement to remain in place at all times during the performance of the Work and throughout the warranty period;

11.2 Deductibles shall be borne by the Contractor.

11.3 The Contractor shall provide the Contract Administrator with a certified true copy or a certificate of insurance of the policy at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than seven (7) Calendar Days from notification of the award of Contract.

11.4 The Contractor shall not cancel, materially alter, or cause the policy to lapse without providing at least fifteen (15) Calendar Days prior written notice to the Contract Administrator.

12. WORKERS COMPENSATION

12.1 The Contractor shall be registered with the Workers Compensation Board of Manitoba, shall provide and maintain Workers Compensation coverage throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

13. SHOP DRAWINGS

13.1 The Contractor shall submit Shop Drawings of the cameras, mounting details, digital/video recorder, and all related equipment to the Contract Administrator for review and approval prior to manufacture of the equipment produced for this Contract.

13.2 The Contractor shall make any corrections required by the Contract Administrator and shall resubmit corrected copies of each shop drawing.

13.3 Drawings shall show Design Material Specifications and Bill of Materials for use in checking deliveries.

13.4 Drawings shall show performance data for equipment.

14. SERVICES FOR TESTING, START-UP, AND OPERATION OF EQUIPMENT

14.1 The City shall provide, at no cost to the Contractor, all power requirements for the on-site testing, start-up, and operation of the equipment.

14.2 The Contractor shall provide, at his own cost, all necessary materials for the testing, start-up, and operation of the equipment prior to the issuance of Form 203.

15. EVALUATION OF BIDS

15.1 Award of the Contract shall be based on the following bid evaluation criteria:

(a) compliance by the Bidder with the requirements of the Bid Opportunity;

(b) qualifications of the Bidder and the Subcontractors, if any, pursuant to Clause 16;

(c) Total Bid Price;

(d) economic analysis of any approved alternative pursuant to Clause 17.

15.2 Further to 15.1 (a), the Award Authority may reject a Bid as being non-responsive if the Bid Submission is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements if the interests of the City so require.

15.3 Further to 15.1 (b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his Bid Submission or in other information required to be submitted, that he is responsible and qualified.

15.4 Further to 15.1 (c), the Total Bid Price shall be the lump sum price shown on Form B: Prices adjusted, if necessary, as follows:

(a) if the lowest evaluated responsive Bid submitted by a responsible and qualified Bidder is within the budgetary provision for the Work, no adjustment will be made to the lump sum price bid; or

(b) if the lowest evaluated responsive Bid submitted by a responsible and qualified Bidder exceeds the budgetary provision for the Work, the lump sum prices of all responsive Bids submitted by responsible and qualified Bidders will be adjusted by deducting the separate price and the evaluation will be made on the adjusted Total Bid Price.

15.4.1 If there is any discrepancy between the lump sum price written in figures and the lump sum price written in words, the price written in words shall take precedence.

16. QUALIFICATION

16.1 The Bidder shall:

(a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba;

(b) be responsible and not be suspended, debarred or in default of any obligation to the City;

(c) be financially capable of carrying out the terms of the Contract;

(d) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract;

(e) have successfully carried out work, similar in nature, scope and value to the Work; and

(f) employ only Subcontractors who have successfully carried out work similar in nature, scope and value to the portion of the Work proposed to be subcontracted to them, or who are fully capable of performing the Work required to be done in accordance with the terms of the Contract;

(g) have a written workplace safety and health program in accordance with The Workplace Safety and Health Act (Manitoba);

16.2 The Bidder shall be prepared to submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

16.3 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

17. SUBSTITUTES

17.1 Notwithstanding Clause 1.4 of the Terms and Conditions, the Work is based on the Plant, Materials and methods specified in the bid solicitation.

17.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.

17.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least seven (7) Business Days prior to the Submission Deadline.

17.4 The Bidder shall ensure that any and all requests for approval of a substitute:

(a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;

(b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;

(c) identify any anticipated cost or time savings that may be associated with the substitute;

(d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified for Total Performance;

(e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified for Total Performance.

17.5 The Contract Administrator, after assessing the request for approval of a substitute, may at his sole discretion grant approval for the use of a substitute as an "approved equal" or as an "approved alternative", or may refuse to grant approval of the substitute.

17.6 The Contract Administrator will provide a response in writing, at least three (3) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.

17.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he wishes to inform.

17.7 If the Contract Administrator approves a substitute as an "approved equal", the Bidder may use the approved equal in place of the specified item.

17.8 If the Contract Administrator approves a substitute as an “approved alternative”, the Bidder shall base his Total Bid Price upon the specified item but may indicate an alternative price based upon the approved alternative.

17.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

18. PERFORMANCE SECURITY

18.1 If the Contract Price exceeds twenty-five thousand dollars ($25,000.00), the Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:

(a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or

(b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Manitoba, in the form attached (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or

(c) a certified cheque or draft payable to “The City of Winnipeg”, drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.

18.2 The Contractor shall provide the Contract Administrator with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of Purchase Order and prior to the commencement of any Work on the Site.

PART E

SPECIFICATIONS

1. GENERAL

1.1 Work Included

.1 These specifications shall apply to and form an integral part of the Contract and shall take precedence over all other specifications pertaining to the Contract.

.2 Complete and operational electrical system and video surveillance systems required by the drawings and as herein specified.

.3 The following drawings are applicable to the Work:

Drawing No. Drawing Title

Brady Road Landfill CCTV Security Camera Locations:

CS01 Rev. 0 .....Office Buildings and Surrounding Area – Plan and Notes

CS02 Rev. 0 .....Metal/Tire Area – Plan, Schematic and Notes

CS03 Rev. 0 .....Residential and Commercial Tipping Areas – Plan and Notes

.4 The work to be done under this Contract shall consist of the supply, delivery, and installation of a complete closed circuit camera surveillance system in accordance with these specifications. Refer to System Block Diagram No. CS02.

.5 Provide complete camera surveillance system as follows:

.1 Provide digital video system and matrix switcher as follows:

.1 Video vault containing 12 (expandable to 16) camera rack mounted digital video recorder with 17" monitor, power conditioning UPS, console equipment and racking.

.2 RS232 to RS422 converter.

.3 Training, set-up and programming of equipment.

.2 Supply and install 1 interior high resolution colour camera in armoured doom housing for scale house interior with all power, cable and connections required. Camera to be mounted in Scale House at east end (Camera #3).

.3 Supply and install 2 exterior high resolution colour cameras with environmental enclosures, 100 vac-24 vac transformer, power supply, cable and connectors required. Cameras to be mounted on poles (poles supplied and installed under a separate contract) in shop yard as indicated on drawing (Cameras #4 and #5).

.4 Existing camera, presently mounted on office building, to remain in current position (viewing Scale and Scale House). This existing camera to be connected to the new digital video vault equipment (Camera #1). Have contractor ensure camera is

compatible. Provide additional equipment, connections, and wiring as required to make the camera a fully functional component of the surveillance system.

.5 Supply and install two exterior cameras to be located on a mound east of main entrance area. Pole structure to be supplied under a separate contract. Provide all mounting brackets and connections. Camera to be high resolution colour with environmental enclosures, suitable for tower or pole mounting with fibre optic cable connection to main digital vault equipment in office building. Tower cameras to be complete with fibre optic transmitter and receiver, electronics equipment box, fibre optics terminations and patch cables and 100vac-24vac transformers. Provide 120V power supply from office building to tower and install in trench with fibre optic cable (Cameras #6 and #7).

.6 Supply and install a total of 3 remote exterior cameras to be located at scrap metal/tire area, commercial tipping area and residential area. Cameras to be high resolution colour cameras with environmental enclosures, suitable for pole mounting with fibre optic transmitter and receiver. Tower cameras to be complete with fibre optic transmitter and receiver, electronics equipment box, fibre optics terminations, patch cables and 100vac-24vac transformers. Provide 120V from street lighting power distribution panel. Power wiring to be installed overhead from distribution pole to camera pole (Cameras #8, #9, and #10). Cameras #8 and #9 to be fixed mounted, Camera #9 to have pan/tilt/zoom feature.

.7 Supply and install power for all cameras to be fed from existing panels (Office panel for Cameras #3, #4, #5, #6, and #7. Street lighting distribution panel for Cameras #8, #9, and #10).

.8 Provide all trenching required or direct coring required for power cable and fiber optic cable.

1.2 Drawings and Specifications

.1 The General Conditions and Supplementary Conditions are a part of this specification and shall apply to this Division.

.2 The intent of the drawings and specifications is to include all labour, products and services necessary for complete work, tested and ready for operation.

.3 Symbols used to represent various electrical devices often occupy more space on the drawing than the actual device does when installed. In such instances, do not scale locations of devices from electrical symbols. Install these devices with primary regard for usage of wall space, convenience of operation and grouping of devices.

.4 These specifications and the drawings and specifications of all other divisions shall be considered as an integral part of the accompanying drawings. Any item or subject omitted from either the specifications or the drawings but which is mentioned or reasonably specified in and by the others, shall be considered as properly and sufficiently specified and shall be provided.

.5 Provide all minor items and work not shown or specified but which are reasonably necessary to complete the Work.

.6 If discrepancies or omissions in the drawings or specifications are found, or if the intent or meaning is not clear, advise the Contract Administrator for clarification before submitting tender.

.7 Responsibility to determine which Division provides various products and work rests with the Contractor. Additional compensation will not be considered because of differences in interpretation of specifications.

1.3 Quality Assurances

.1 Codes, Rules, Permits and Fees

.1 Comply with all laws, ordinances, rules, regulations, codes and orders of all authorities having jurisdiction relating to this work.

.2 Comply with all rules of the Canadian Electrical Code, CSA Standard C22.1 and the applicable building codes. Do Overhead Lines in accordance with CAN/CSA-C22.3 No. 1 and Underground Systems in accordance with CAN/CSA-C22.3 No. 7 except where specified otherwise.

.3 Quality of work specified and/or shown on the drawings shall not be reduced by the foregoing requirements.

.4 Immediately after award of contract and prior to installation, verify location, arrangement and point of attachment for service and service entrance equipment with supply authority and inspection departments. Failure to do so will render this Division responsible for any corrections necessary without additional compensation.

.5 Give all required notices, submit drawings, obtain all permits, licenses and certificates and pay all fees required for this work.

.6 Furnish a Certificate of Final Inspection and approvals from inspection authority to the Contract Administrator.

.2 Standard of Workmanship:

.1 Execute all work in a competent manner and to present an acceptable appearance when completed.

.2 Employ a competent supervisor and a sufficient number of licensed tradesmen to complete the Work in the required time.

.3 Arrange and install products to fit properly into designated building spaces.

.4 Unless otherwise specified or shown, install products in accordance with recommendations and ratings of manufacturers.

1.4 Submittals

.1 Within 10 days of award of contract, the contractor shall submit a completed equipment procurement schedule which lists the manufacturer and model of equipment, indicating the projected ordering, shop drawing submittal date and delivery dates of all products to meet the required construction schedule.

.2 Submit samples as required where specified in Division 16.

.3 Prior to delivery of any products to job site and sufficiently in advance of requirements to allow ample time for checking, submit shop drawings for review as specified in Division 15.

1.5 Record Drawings

.1 The Contractor shall keep one complete set of white prints at the site office, including all addenda, change orders, site instructions, clarifications and revisions for the purpose of record drawings. As the work on site proceeds, the Contractor shall clearly record in Red Pencil all as-built conditions, which deviate from the original contract documents. Record drawings to include circuiting of all devices, conduit and feeder runs (complete with conductor size and number) and locations of all electrical equipment.

.2 Prior to substantial performance, the contractor shall obtain CAD files of all electrical drawings, using AutoCAD Release 2000, and use the services of a competent CAD operator to transfer all as-built information, including: Addenda, Change Orders, Clarifications, Revisions, Site Instructions and shop drawings. Upon completion, the contractor shall certify, in writing, that the as-built record drawings are complete and that they accurately indicate all electrical services, including exposed as well as concealed items.

.3 Contractor to forward letter of certification and as-built CAD drawings to the Contract Administrator for final review. As-Built drawings to be submitted in the form of one set of CAD files on 3.5" floppy discs and one set of mylar reproducible sepias.

.4 The Contractor may purchase copies of the electrical contract drawings on floppy disc from the Contract Administrator for a fee of $20.00 for each drawing file.

1.6 Operation and Maintenance Manuals

.1 Within 30 days prior to substantial performance, the Contractor shall submit a draft copy of the proposed contents of each maintenance manual to the Contract Administrator for review. Once the draft copy is approved, the Contractor will supply 4 copies in suitably labeled, hard back, D-Ring type commercial binders, each complete with an index and tabbed title sheets for each section. Final copies of manuals to be received by Contract Administrator not less than 7 days prior to substantial performance.

.2 All maintenance manual data shall be printed on 8 1/2" x 11" heavy bond, indexed, tabbed, punched and bound in the binders. Each manual shall have a title sheet, which is labeled "Operation & Maintenance Manual", and lists the Project name, Contractor's & Contract Administrator's names, date submitted, and a Table of Contents for each volume. If a manual exceeds 75 mm in thickness, provide additional manuals as required.

.3 Each section of the manual shall contain the following information:

- Systems Descriptions. A brief synopsis of each system typed and inserted at the beginning of each section. Include sketches and diagrams where appropriate.
- Descriptive and technical data.
- Maintenance and operating instructions for all electrical equipment and controls. (These operating instructions need not be manufacturer's data but may be typewritten instructions in simple language to guide the Owner in the proper operation and maintenance of his installation.)
- Lubricating and servicing intervals recommended.
- A copy of all wiring diagrams complete with wire coding.
- List of spare parts of all electrical equipment complete with names and addresses of sales, service representatives and suppliers.
- Copy of test data
- Include type and accuracy of instruments used to obtain test data.
- Copy of final inspection certificate.
- Copy of the purchase order, showing equipment make and model numbers issued to the manufacturer complete with all addenda . All cost details may be hidden.
- Copy of all warranty certificates.
- Set of final reviewed Shop Drawings.
- Names, addresses, phone numbers and facsimile numbers of Contractor, Contract Administrators, sub-contractors and suppliers used on the Work together with a specification reference of the portion of the Work they undertook.

1.7 Product Handling

.1 Use all means necessary to protect the products of this Division before, during and after installation and to protect products and installed work of all other trades.

.2 Immediately make good any damage by repair or replacement at no additional cost to the Owner and to the approval of the Contract Administrator.

.3 Remove advertising labels from all electrical equipment. Do not remove identification of certification labels.

.4 Remove dirt, rubbish, grease, etc. resulting from this work from all surfaces, including the inside of all cabinets, equipment enclosures, panelboard tubs, etc.

1.8 Contractor Supplied Equipment

.1 Provide any and all required equipment to install the specified system including such things as ladders, scaffolding, man-lifts, scissor lifts, or other equipment to facilitate installation of the surveillance system.

2. PRODUCTS

2.1 Selected Products and Equivalents

.1 Products and materials provided shall be new and free from all defects. Defective products or materials will be rejected, regardless of previous inspections. The Contractor shall be responsible to remove and replace defective products at their expense, and shall be responsible for any resulting delays and associated expenses which result from defective products being rejected. Related materials shall be of the same manufacturer throughout the project.

.2 Products and materials referred to in the specifications by trade names, manufacturer's name and catalogue reference are those that shall be used as the basis for the Tender.

.3 The design has been based on the use of the specified product.

2.2 Quality of Products

.1 All products provided shall be CSA Approved, Canadian Underwriters' Laboratory approved where applicable, and new, unless otherwise specified.

.2 If products specified are not CSA approved, obtain special approval from the local regulatory authority. Pay all applicable charges levied and make all modifications required for approval.

.3 Products provided, if not specified, shall be new, of a quality best suited to the purpose required and their use subject to approval by the Contract Administrator.

2.3 Uniformity of Manufacture

.1 Unless otherwise specifically called for in the Specifications, uniformity of manufacture shall be maintained for similar products throughout the work.

2.4 Product Finishes

.1 Finish all cabinets, panelboards, switchboards, equipment cabinets, cable trays, etc. in ANSI 61 grey enamel unless otherwise specified.

.2 Apply primer on all items that are to be finished on the job.

.3 Touch up all damaged painted finishes with matching lacquer, or, if required by the Contract Administrator, completely repaint damaged surface.

2.5 Use of Products During Construction

.1 Any equipment used for temporary or construction purposes shall be approved by the Contract Administrator.

.2 The warranty period shall not begin until the date of substantial performance of the work.

3. EXECUTION

3.1 Site Examination

.1 Examine the site of work and become familiar with all features and characteristics affecting this work before submitting tender.

.2 No additional compensation will be given for extra work due to existing conditions which such examination should have disclosed.

.3 Report to the Contract Administrator any unsatisfactory conditions that may adversely affect the proper completion of this work.

3.2 Coordination with Other Divisions

.1 Examine the drawings and specifications of all divisions and become fully familiar with their work. Before commencing work, obtain a ruling from the Contract Administrator if any conflict exists, otherwise no additional compensation will be made for any necessary adjustments.

.2 Lay out the work and equipment with due regard to architectural, structural and mechanical features. Architectural and structural drawings take precedence over electrical drawings regarding locations of walls, doors and equipment.

.3 Do not cut structural members without approval of the Contract Administrator.

.4 Coordinate with all Division installing equipment and services, and ensure that there are no conflicts.

.5 Install anchors, bolts, pipe sleeves, hanger inserts, etc. in ample time to prevent delays.

.6 Examine previously constructed work and notify the Contract Administrator of any conditions which prejudice the proper completion of this work. Commencement of this work without such notification shall constitute acceptance of other work.

3.3 Location of Outlets and Luminaires

.1 Electrical drawings are, unless otherwise indicated, drawn to scale and approximate distances and dimensions may be obtained by scaling. Figured dimensions shall govern over scaled dimensions. Where exact dimensions and details are required, refer to the drawings.

.2 Outlet and equipment locations shown on the drawings are approximate. Locations may be revised up to 3 meters to suit construction and equipment arrangements without additional cost to the Owner, provided that the Contractor is notified prior to the installation of the outlets, or equipment.

.3 Maintain luminaire locations wherever possible. Notify the Contract Administrator of conflicts with other services.

.4 Unless otherwise specified or shown, install products in accordance with recommendations and ratings of manufacturers.

3.4 Separation of Services

.1 Maintain separation between electrical wiring system and building piping, ductwork, etc. so that wiring system is isolated (except at approved connections to such systems) to prevent galvanic corrosion.

.2 In particular, contact between dissimilar metals, such as copper and aluminum, in damp or wet locations is not permitted.

.3 Do not support wiring from pipes, ductwork, etc. Hangers for suspended ceilings may be used for the support of wiring only when approval is obtained from the Contract Administrator and the ceiling installer, and approved clips or hangers are used.

3.5 Equipment Identification

.1 3 mm thick plastic lamicoid name plates, black face, white core, mechanically attached with self tapping screws, 6 mm high lettering, to be attached to the front face of the following equipment:

- Camera indicating number identification.
- Associated equipment.

.2 Adjust existing circuit directories in existing panelboards to indicate the area or equipment controlled by each new branch circuit.

.3 Low Voltage Wiring: per manufacturer's standard, i.e., CGE low voltage relay switching system.

.4 Install yellow plastic warning tape, 300 mm below grade, above all underground ducts.

.5 Provide permanent, corrosion resistant warning markers, suitable to the local inspection authority, imbedded in the surface of concrete slabs which are directly above high voltage cables and duct banks.

3.6 Wiring to Equipment Supplied by Others

.1 Equipment supplied by the Owner, or under other Division,, will be moved to the installation site by others. However the electrical connection to the equipment shall be done by this Division.

3.7 Testing

.1 Provide testing for supplied equipment to meet equipment manufacturer’s requirements.

3.8 Instructions to Owner's Personnel

.1 Provide three complete installation operating, servicing and end user manuals for Owner's personnel to ensure that personnel are capable to operate and maintain the system.

3.9 Sealing of Wall and Floor Openings

.1 All conduit and cable entries through outside walls of buildings, through partition walls separating electrical rooms from other areas, through fire separations, and through floors above grade shall be sealed to prevent passage of moisture, dust, gasses, flame, or to maintain pressurization.

.2 Openings shall be sealed when all wiring entries shown on the drawings have been completed.

.3 Sealing material shall be fire resistant and shall not contain any compounds, which will chemically affect the wiring jacket or insulating material. Cable penetrations through fire separations to be sealed.

END OF SECTION

1. GENERAL

1.1 References

.1 CAN/CSA-B72, Installation Code for Lightning Protection Systems.

.2 CEC Part 1 C.22-9, all relevant sections.

1.2 Description of System

.1 System to consist of metallic air terminals, lightning conductors connecting air terminals to ground and interconnected ground electrodes, and/or ground cables.

1.3 Shop Drawings

.1 Submit shop drawings in accordance with D15 and Section 16010.

.2 Indicate materials and methods of attachment of conductors to lightning arresters and electrodes.

1.4 Requirements of Regulatory Agencies

.1 System subject to:

.1 Approval by authority having jurisdiction.

2. PRODUCTS

2.1 Materials

.1 All materials to be approved by the local authority.

.2 A minimum #6 gauge, copper stranded conductor or as per local authority.

.3 Fastenings and attachment straps: As per manufacturer's recommendation and/or local authority.

.4 Electrodes: Dodd & Struthers 15mm x 450mm solid copper, spring mounted, complete with suitable supports.

.5 Groundrods: copper clad, 100 mm x 3 m.

3. EXECUTION

3.1 Installation of Lightning Arresters

.1 Where lightning arresters are installed, they shall be in accordance with Rules 10-1000 and 10-1002 with the addition that a common grounding conductor and common electrode may be used for grounding primary and secondary neutrals and lightning arresters.

.2 Lightning arresters shall be installed in every distributing substation in locations where lightning disturbances are of frequent occurrence and no other adequate protection is provided.

.3 Lightning arresters installed for the protection of utilization equipment:

.1 Shall be installed on top of equipment poles above camera mounted equipment.

.2 Shall be isolated by elevation, enclosed, or made otherwise inaccessible to unauthorized persons.

3.2 Connection of Lightning Arresters

.1 The connection between arrester and line conductor shall be:

.1 Of copper wire or cable not smaller than No. 6 AWG; and

.2 As short and as straight as practicable with a minimum of bends; and

.3 Free of sharp bends and turns.

.4 Thermoweld connection to lightning arrester.

3.3 Insulation of Lightning Arrester Accessories

.1 The insulation from ground and from other conductors for accessories such as gap electrodes and choke coils shall be at least equal to the insulation required at other points of the circuit.

3.4 Spacing or Bonding Electrical and Lightning Rod Systems

.1 Where practicable, a clearance of at least 2 m shall be provided between lightning rod conductors and electrical conductors and equipment, but where this separation is not possible, the ground electrodes for the two systems shall be connected together, at or below ground level, with a copper conductor of a size not less than that of the grounding conductor for the electrical system and in no case shall the bonding conductor be smaller than No. 6 AWG copper.

.2 Install lightning protection in accordance with CAN/CSA.

.3 Bond discharge conductors to service mast or other non-current-carrying electrical parts.

.4 Submit certificate of installation to this office.

3.5 Ground Rod Installation

.1 Ground rods shall be installed a minimum of 600 mm from base of structure.

.2 Ground rods shall be driven to a depth of 300 mm below grade.

.3 Lightning cable shall be connected to ground rod by a suitable termoweld connection.

.4 Resistance for lightning system shall not be greater than 5 ohmg. Test to be witnessed and verified by Contract Administrator or designate.

3.6 Inspection

.1 Obtain inspection certificate from a Code Consultant for discharge conductor passing through any fire supporting membrane.

END OF SECTION

1. GENERAL

1.1 Description

.1 Extend existing secondary grounding system to include new equipment specified. Securely and adequately ground all components of the electrical system in accordance with the requirements of all related sections in the latest Canadian Electrical Code, Local Building Code and the local Electrical Inspection Branch.

.2 The system is to consist of cables, supports, and all necessary materials and inter-connections to provide a complete system. Measured resistance to ground of the network shall not exceed 5 ohms.

.3 All ground conductors shall be run in conduit.

1.2 References

.1 CSA Z32.1, Safety in Anaesthetizing Locations.

2. PRODUCTS

2.1 Equipment

.1 Cables 3/0 and smaller to be connected to ground bars via Burndy Quiklug Type QA-2B connectors. Connections for cables larger than 3/0 shall be brazed.

.2 All ground wires to be stranded copper TWH complete with a green jacket unless otherwise shown.

.3 Uninsulated ground wires shall be bare stranded copper, tinned, soft annealed. Size as indicated.

.4 Non-corroding accessories necessary for grounding system, type, size, material as indicated, including but not necessarily limited to:

.1 Grounding and bonding bushings.

.2 Protective type clamps.

.3 Bolted type conductor connectors.

.4 Thermit welded type conductor connectors.

.5 Bonding jumpers, straps.

.6 Pressure wire connectors.

3. EXECUTION

3.1 General

.1 Extend existing continuous grounding system including, conductors, accessories. Where EMT is used, run ground wire in conduit. All connectors shall be installed in accordance with manufacturers requirements. All frames and metallic enclosures of all electrical equipment and electrically operated equipment shall be grounded through the conduit system or via a ground wire.

.2 All bolted connections must be accessible.

.3 Include a separate green ground wire in all power conduits including branch circuit wiring sized to Canadian Electrical Code.

.4 Expansion joints and telescoping sections of raceways shall be bonded using jumper cables as per Canadian Electrical Code.

.5 Use Burndy compression connectors or approved equal for all grounding splices and terminations unless otherwise shown on the Drawings. For bolted ground connections use Burndy "Durium" or approved equal hardware.

.6 Conduit installed buried in earth or installed in or under grade floor slabs shall have separate ground wire installed, whether the conduits are metal or not.

.7 Protect exposed grounding conductors from mechanical injury.

.8 Soldered joints shall not be permitted.

3.2 Equipment Grounding

.1 Install grounding connections to typical equipment included in, but not necessarily limited to following list. Service equipment, transformers, switchgear, duct systems, frames of motors, motor control centres, starters, control panels, building steel work, generators, elevators and escalators, distribution panels, outdoor lighting.

3.3 Communication Systems

.1 Install grounding connections for telephone, sound, fire alarm, intercommunication systems as follows:

.1 Telephones: make telephone grounding system in accordance with telephone company's requirements.

.2 Sound, fire alarm, security system, intercommunication systems as indicated.

3.4 Field Quality Control

.1 Perform ground continuity and resistance tests using method appropriate to site conditions and to approval of Contract Administrator and local authority having jurisdiction over installation.

.2 Perform tests before energizing electrical system.

.3 Disconnect ground fault indicator during tests.

END OF SECTION

1. GENERAL

1.1 Work Included

.1 Provide a complete system of wiring, making all connections necessary for the installation shown on drawings.

1.2 Special Codes

.1 Install and rate power cables in accordance with the Canadian Electrical Code requirements, or in accordance with IPCEA requirements where permissible.

1.3 References

.1 CSA C22.2 No. 65 Wire Connectors.

2. PRODUCTS

2.1 Materials

.1 Pressure type wire connectors: with current carrying parts same material as conductors sized to fit the conductors as required.

.2 Fixture type splicing connectors: with current carrying parts same material as conductors sized to fit the conductors 10 AWG or less.

2.2 Wire Connectors

.1 Use 3M “Scotchlock”, self-insulated connectors for hand twist wire joints for lighting, small power, and control wiring.

.2 Use T & B non-insulated ring type compression lugs for terminating #10 AWG and smaller motor connections. Tape with rubber and scotchtape. Lugs to accept ten - 32 x 3/8” machine bolts.

3. EXECUTION

3.1 Installation

.1 Remove insulation carefully from ends of conductors and:

.1 Apply coat of zinc joint compound on aluminum conductors prior to installation of connectors.

.2 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CSA C22.2 No. 65.

.3 Install fixture type connectors and tighten. Replace insulating cap.

3.2 Wire Connectors

.1 Select hand twist connectors for wire size and install tightly on conductors.

END OF SECTION

1. GENERAL

1.1 Work Included

.1 Provide and connect all wiring devices for the complete installation.

2. PRODUCTS

2.1 Manufacturer

.1 Wiring devices to be of one manufacture throughout project.

.2 Manufacturers shall be Hubbell, Bryant or Pass & Seymour.

2.2 Devices

.1 The catalogue numbers shown below are for the particular manufacturer's series and all necessary suffixes shall be added for the requirements as stated. All devices shall be specification grade minimum and wherever possible shall be of the same manufacture.

.2 Devices to be brown with stainless steel coverplates in all but mechanical areas unless noted otherwise. Use galvanized steel coverplates in mechanical areas and for surface mounted devices.

2.3 Receptacles

.1 Duplex 15 ampere, 120 volt, 3 wire, ivory, U-ground, as Hubbell No. 5252, with the following features:

.1 Brown urea molded housing.

.2 Suitable for #10 AWG for back and side wiring.

.3 Eight back wired entrances, four side wiring screws.

.4 Break-off links for use as split receptacles.

.5 Triple wipe contacts and rivetted grounding contacts.

2.4 Coverplates

.1 Provide coverplates for all wiring devices, including but not limited to telephone, computer, television, P/A system and sound system.

.2 Use sheet steel utility box cover for wiring devices installed in surface mounted utility boxes.

.3 Use stainless steel 1 mm thick coverplates on all wiring devices mounted in flush-mounted outlet boxes unless otherwise specified.

.4 Weatherproof double lift spring - loaded cast aluminum coverplates, complete with gaskets for single receptacles or switches.

.5 Use gasketted DS cast covers on FS and FD type boxes.

3. EXECUTION

3.1 Installation

.1 Install receptacles vertically in gang type outlet box when more than one receptacle is required in one location.

.2 Protect cover plate finish with paper or plastic film until all painting and other work is finished, then remove paper.

.3 Install suitable common coverplates where wiring devices are grouped. Do not distort plates by tightening screws excessively.

.4 Do not use coverplates meant for flush outlet boxes on surface mounted boxes.

.5 Wherever possible, mount equipment in a straight line at a uniform mounting height, coordinated with other equipment and materials.

.6 Mounting dimensions are to the centre of the devices. Final instructions on mounting heights shall be given by the Contract Administrator or representative at the site. The above shall be used as a guide, but shall be subject to final verification prior to installation.

END OF SECTION

1. GENERAL

1.1 Work Included

.1 Provide a complete system of boxes for the installation of wiring and equipment.

1.2 References

.1 CSA C22.1-Canadian Electrical Codes, Part 1.

2. PRODUCTS

2.1 Outlet and Conduit Boxes General

.1 Size boxes in accordance with CSA C22.1.

.2 102 mm square or larger outlet boxes as required for special devices.

.3 Gang boxes where wiring devices are grouped.

.4 Blank cover plates for boxes without wiring devices.

2.2 Outlet Boxes for Metal Conduit

.1 Materials:

.1 Surface or recessed concealed type: Die formed steel, hot dip galvanized, 1.25 oz./sq. ft. minimum zinc coating.

.2 Surface mounting exposed: Cast ferrous for threaded conduit, with attached lugs, corrosion resistant two coats finish.

.2 Components:

.1 Ceiling outlets, surface mounting, concealed:

.1 101 mm square, depth 54 mm, Iberville 52171 series

.2 119 mm square, depth 54 mm, Iberville 72171 series

.3 Extension ring to change from recessed conduit to exposed conduit, 101 mm octagonal, 38 mm deep square Iberville 53151-1/2 or 38 mm deep octagonal Iberville 51151C or 54 mm deep, Iberville 55171C.

.4 Wall outlets, surface, exposed mounting or used for outdoor outlets: One or more gang, Crouse-Hinds FS series or FD series, condulet.

.5 Covers: Unless wiring devices and plates are mounted, provide blank, round canopy covers to match boxes.

2.3 Conduit Boxes

.1 Cast FS feraloy boxes with factory-threaded hubs and mounting feet for surface wiring of switches and receptacle.

2.4 Fittings - General

.1 Bushing and connectors with nylon insulated throats.

.2 Knock-out fillers to prevent entry of debris.

.3 Conduit outlet bodies for conduit up to 32 mm and pull boxes for larger conduits.

.4 Double locknuts and insulated bushings on sheet metal boxes.

3. EXECUTION

3.1 Installation

.1 Support boxes independently of connecting conduits.

.2 Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.

.3 Install all outlets flush and surface mounted as required for the installation.

.4 Surface mount above suspended ceilings, or in unfinished areas.

.5 Do not distort boxes during installation. If boxes are distorted, replace with new boxes.

.6 Do not use sectional boxes.

.7 Provide boxes sized as required by the Canadian Electrical Code.

.8 Install vapour barrier material to surround and seal all outlet boxes located on exterior walls of building. Maintain wall insulation.

.9 Outlets installed in party walls to be offset by a minimum of one stud space.

.10 Ceiling outlet boxes shall be provided for every surface mounted fixture or row of fixtures installed on suspended "hard" ceilings.

.11 Control junction box.

END OF SECTION

1. GENERAL

1.1 Work Included

.1 Provide a complete system of splitters boxes and cabinets for the installation of wiring and equipment.

1.2 Shop Drawings and Product Data

.1 Submit shop drawings and product data for cabinets in accordance with Section 16010 Electrical General Requirements.

2. PRODUCTS

2.1 Junction Boxes and Pull Boxes, Weatherproof

.1 Materials:

.1 Cast steel, Crouse Hinds, WBJ Series.

2.2 Junction Boxes and Pull Boxes, Indoor Dry Locations

.1 Materials:

.1 Code gauge sheet steel, welded construction, phosphatized and factory paint finish.

.2 Components:

.1 For flush mounting, covers to overlap box by 25 mm minimum all around with flush head cover retaining screws.

.2 Use rolled edges for surface boxes.

.3 Junction boxes mounted in exterior walls shall be complete with box vapour barriers.

2.3 Cabinets

.1 Materials:

.1 Cabinets: Code gauge sheet steel, welded construction, phosphatized and factory paint finish, suitable for field painting.

.2 Locks: to match panelboards.

.3 Backboards: 19 mm GIS fir plywood, one piece per cabinet, covering entire cabinet interior.

.2 Components:

.1 With hinged door and return flange overlapping sides, with handle, lock and catch for surface mounting, size as indicated or to suit.

.2 Surface or flush with trim and hinged door, latch and lock and two keys, size as indicated or to suit. Keyed to match panelboard keys 19mm GIS Fir Plywood backboard.

2.4 Splitters

.1 Materials:

.1 Code gauge sheet steel, welded construction, phosphatized and factory paint finish.

.2 Components:

.1 Formed hinged cover suitable for locking in the closed position.

.2 Main and branch lugs to match required size and number of incoming and outgoing conductors as indicated.

.3 At least three spare terminals on each set of lugs in splitters less than 400 AMP.

3. EXECUTION

3.1 Installation

.1 Junction Boxes and Pull Boxes:

.1 Supply all pull boxes and junction boxes shown on the drawings or required for the installation.

.2 Boxes installed in party walls to be offset by a minimum of one stud space.

.3 Install in inconspicuous but accessible locations, above removable ceilings or in electrical rooms, utility rooms or storage areas.

.4 Identify with system name and circuit designation as applicable.

.5 Size in accordance with the Canadian Electrical Code, as a minimum.

.2 Cabinets:

.1 Mount cabinets with top not greater than 1980 mm above finished floor, coordinated with masonry, panelboards, fire hose cabinets and similar items. Securely fasten backboards to cabinet interiors.

.2 Install terminal block where indicated.

.3 Splitters

.1 Install splitters and mount plumb, true and square to the building lines.

.2 Extend splitters full length of equipment arrangement except where indicated otherwise.

.4 Identification

.1 Provide equipment identification in accordance with Section 16010 - Electrical General Requirements.

END OF SECTION

1. GENERAL

1.1 Work Included

.1 Provide a complete system of wiring, making all connections necessary for the installation shown on drawings.

1.2 References, Codes and Standards

.1 CSA C22.2 No. 0.3 , Test Methods for Electrical Wires and Cables.

.2 Install and rate power cables in accordance with the Canadian Electrical Code requirements, or in accordance with ICEA requirements where permissible.

1.3 Product Data

.1 Submit product data in accordance with Section 16010 - Electrical General Requirements.

2. PRODUCTS

2.1 Building Wires

.1 Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.

.2 Copper conductors: size as indicated, with 600 V insulation of chemically cross-linked thermosetting polyethylene (XLPE) material rated RWU90.

.3 Neutral supported cable: 1 phase insulated conductors of aluminum and one neutral conductor of aluminum steel reinforced, size as indicated. Insulation: Type NS-1 rated 300 V.

2.2 Control Cables

.1 Low energy 300 V control cable: solid annealed copper conductors sized as indicated, with PVC insulation type, TW polyethylene insulation metallized tapes over all conductors and overall covering of PVC jackets.

3. EXECUTION

3.1 General

.1 Minimum conductor size #12 AWG.

3.2 Installation of Building Wires

.1 Install wiring as follows:

.1 In conduit systems in accordance with Section 16111.

.2 In underground ducts in accordance with Section 16107.

3.3 Installation of Control Cables

.1 Install control cables in conduit underground ducts.

.2 Ground control cable shield.

3.4 Workmanship

.1 Before pulling wire, ensure conduit is dry and clean. If moisture is present, thoroughly dry out conduits; vacuum if necessary. To facilitate pulling, recognized specially manufactured wire pulling lubricants may be used. Do not use grease. Employ suitable techniques to prevent damage to wire when ambient temperature is below the minimum permitted for each insulation type. Do not pull wires into incomplete conduit runs.

.2 Installation to be free of opens and grounds. Before energization, measure insulation resistance and comply with the Canadian Electrical Code. Submit data sheet with values measured.

.3 Do not install any conductor smaller than #12 AWG, except where specifically indicated otherwise, i.e. for fire alarm system station circuits, P.A. wiring, etc.

.4 Provide sizes of conductors as shown on drawings. Advise Contract Administrator if problem is foreseen.

.5 Exercise care in stripping insulation from wire. Do not nick conductors.

3.5 Identification, Coding and Balancing

.1 For branch circuit wiring, follow identification system shown on the drawings and as specified in Section 16010 - Electrical General Requirements.

.2 Connect single phase equipment to minimize imbalance on feeders. Adjust branch circuiting shown as required for optimum balancing. Record all changes on "record" drawings.

.3 Colour code all feeders at all terminations, at all points where taps are made, and at all panelboards, switchboards, motor control centres, etc. Use two wraps of 3M #471 plastic film tape 48 mm wide.

.4 Conductors sized No. 10 and smaller are required to be factory coloured, not taped on site.

.5 For direct current wiring use red for positive and black for negative.

3.6 Testing

.1 All power and control wiring shall be tested for insulation resistance value with a 1000 volt megger. Resistance values shall be as recommended by the cable manufacturer.

.2 All wire test results shall be properly tabulated, signed, dated, and submitted to the Contract Administrator.

END OF SECTION

1. GENERAL

1.1 Work Included

.1 Provide a complete system of conduit and fittings for installation of wiring.

2. PRODUCTS

2.1 Rigid Steel Conduit

.1 Galvanized with threaded joints and connections.

.2 Connections in dry locations: steel or malleable iron locknuts inside and outside enclosures. Insulated bushings Thomas & Betts Series 222 or approved alternate.

.3 Connectors subjected to moisture interior and exterior: liquid and dust tight with insulated throat, Thomas & Betts "Bullet Hub" 370 Series or approved alternate.

.4 Fittings: cast metal "Condulet" as manufactured by Crouse-Hinds Canada Ltd. including gasketted covers in damp locations.

.5 Expansion joints: cast metal Crouse-Hinds type XJ or approved alternate.

2.2 E.M.T. Conduit

.1 Fittings in dry locations: Steel or zinc set screw connectors with insulated throat. Steel or zinc set screw couplings.

.2 Fittings in wet locations: steel rain-tite connectors with insulated throat. Steel rain tite couplings.

2.3 Rigid PVC Duct

.1 Duct: Rigid non-metallic conduit of unplasticized polyvinyl chloride Type DB-2, conforming to CSA Standard manufactured by Canron Plastics Ltd.

.2 Accessories: Bell ends, couplings, adapters, bends and other fittings of same material as duct. Use solvent recommended by manufacturer. Horizontal, vertical and foundation spacers as manufactured by Pilgrim Products Ltd.

3. EXECUTION

3.1 Rigid Steel Conduit

.1 Use as raceways for following applications:

.1 In all areas exposed to weather.

.2 Locations where mechanical damage may occur and in mechanical rooms to a height of 1 metre.

.3 Three phase motor wiring (Teck cable may also be used for this application where shown on the drawings).

3.2 E.M.T. Conduit

.1 Use as raceways in surface and concealed areas or in poured concrete above ground level.

.2 It may not be used in damp locations, corrosive atmosphere, underground, outdoors, nor in areas exposed to mechanical damage.

3.3 Rigid PVC Duct

.1 Provide a separate green insulated copper ground wire in all ducts sized as required by the Code.

.2 Terminate ducts with standard bell ends where ducts enter cable pits, junction boxes and building interiors.

.3 Cap ends of unused ducts with plug ends of same material as ducts.

.4 Seal all joints in ducts with solvent cement.

3.4 Workmanship

.1 Install all conduit and wiring concealed, unless otherwise shown on the drawings. Do not recess conduit in columns, except as noted, without permission.

.2 Where conduit is run exposed, run parallel to building lines. Where conduits are grouped (two or more), space evenly, make bends concentric and mount on Unistrut racks.

.3 Lay out conduit to avoid interference with other work. Maintain a minimum clearance of 150 mm from steam or hot water piping, vents, etc.

.4 Where steel conduit is required to be bent, do not heat, and do not bend conduit in such a way as to reduce pipe cross section area at any point. Radii of bends shall be as per Canadian Electrical Code.

.5 For all runs of conduits, do not include more than equivalent of 4 - quarter bends. Provide conduit fittings, pullboxes and junction boxes where necessary. Pulling elbows shall not be used except by special permission.

.6 Where possible, install conduits so that they are not trapped, cap turned up conduits to prevent the entrance of dirt of moisture during construction. Swab out conduit and thoroughly clean internally before wires and cables are pulled.

.7 Take extreme care in reaming ends of all conduit to ensure a smooth interior finish that will not damage the insulation of the wires.

.8 Use insulated non-metallic bushings on all conduit terminations.

.9 Ensure electrical continuity in all conduit systems.

.10 All conduit shown exposed in finished areas is to be free of unnecessary labels and trademarks.

.11 Install a 90 lb. test line in all conduits left empty by this contractor including those which others will pull cables, wires, etc.

.12 Seal conduits with duct seal where conduits are run between heated and unheated areas. Where conduits, cables, or cable trays pierce fire separations, seal openings with Dow Corning 3-6548 sealant or approved equal.

.13 Where conduits pass through walls, they shall be grouped and installed through openings. After all conduits shown on the drawings are installed, wall openings shall be closed with material compatible with the wall construction. Review size and quantity of conduit sleeves with the Contract Administrator.

.14 Where drawings show conduit designations, these conduits shall be identified at each point of termination with Thomas & Betts "Ty-Rap" No. TY532M labels.

.15 Where conduit finish is damaged, repair or replace.

.16 Use "Condulet" fittings for power and telephone type conduit terminations in lieu of boxes where support is not provided.

.17 All branch circuit wiring, home-runs, communication and data to be minimum 20 mm diameter unless otherwise stated.

.18 Provide necessary flashing and pitch pockets, making watertight joints where conduits pass through roof or watertight membranes.

END OF SECTION

1. GENERAL

1.1 Work Included

.1 Provide complete system of underground ducts, fittings and turn-ups for the installation indicated on the drawings.

1.2 Related Work

2. PRODUCTS

2.1 Plastic Polyethylene Pipe

.1 Rigid plastic polyethylene pipe with approved couplings and fittings required to make a complete installation.

2.2 Cable Pulling Equipment

.1 6 mm stranded nylon pull rope tensile strength 5 kN.

3. EXECUTION

.1 Install underground ducts for wiring systems as shown on the drawings and as per manufacturer's instructions.

.2 Provide a separate green insulated copper ground wire in all ducts, even if not shown. Use Canadian Electrical Code to size ground wire.

.3 Pull through each duct wooden mandrel not less than 300 mm long and of diameter 6 mm less than the internal diameter of duct, following by stiff bristle brush to remove sand, earth and other foreign matter. Pull stiff bristle brush through each duct immediately before pulling in cables.

.4 In each duct install pull rope continuous throughout each duct run with 3 m spare rope at each end.

.5 Plug ends of unused ducts with plugs of same material as ducts.

.6 Seal all joints in ducts with solvent cement.

.7 Install marker as required.

.8 Ensure lines and levels for underground ducts are set to obtain proper drainage, coverage, separation, etc. Ensure such conditions are met prior to proceeding with work.

.9 Install ducts in accordance with additional requirements of utility or service company having jurisdiction.

.10 Duct to be directly cored from point source to service location. Provide certified coring contractor to perform all necessary duct coring.

END OF SECTION

1. GENERAL

1.1 Related Work

.1 Direct Buried Underground Cable Ducts Section 16107

2. PRODUCTS

2.1 Markers

.1 Concrete type cable markers: 600 x 600 x 100 mm with words: "cable", "joint" or "conduit" impressed in top surface, with arrows to indicate change in direction of cable and duct runs.

.2 Cedar post type markers: 89 x 89 mm, 1.5 m long, pressure treated with water repellent preservative, with nameplate fastened near post top, on side facing cable or conduit to indicate depth and direction of duct and cable runs.

.1 Nameplates: aluminum anodized 89 x 125 mm, 1.5 mm thick mounted on cedar post with mylar label 0.125 mm thick with words "Cable" "Joint" "Conduit" with arrows to indicate change in direction.

3. EXECUTION

3.1 Cable Installation in Ducts

.1 Install cables as indicated in ducts.

.2 Do not pull spliced cables inside ducts.

.3 Install multiple cables in duct simultaneously.

.4 Use CSA approved lubricants of type compatible with cable jacket to reduce pulling tension.

.5 To facilitate matching of colour coded multiconductor control cables reel off in same direction during installation.

.6 Before pulling cable into ducts and until cables properly terminated, seal ends of lead covered cable with wiping solder; seal ends of non-leaded cables with moisture seal tape.

.7 After installation of cables, seal duct ends with duct sealing compound.

3.2 Markers

.1 Mark cable every 150 m along duct runs and changes in direction.

.2 Where markers are removed to permit installation of additional cables, reinstall existing markers.

.3 Install cedar post type markers.

3.3 Field Quality Control

.1 Perform tests using qualified personnel. Provide necessary instruments and equipment.

.2 Check each feeder for continuity, short circuits and grounds. Ensure resistance to ground of circuits is not less than 50 megohms.

.3 Remove and replace entire length of cable if cable fails to meet test.

END OF SECTION

1. GENERAL

1.1 Section Includes

.1 Refer to Scope of Work in Section 16010 to include the following:

.1 Video Cameras.

.2 Video Handling.

.3 Recording devices.

.4 Transmission methods.

1.2 Reference Documents

.1 Electronic Industries Association (EIA)

.1 REC 12747, Power Supplies

1.3 Reference Standards

.1 Canadian Standards Association (CSA International)

.1 CSA C22.1-2002, Canadian Electrical Code, Part 1 (19th edition) Safety Standard for Electrical Installations.

.2 CAN/CSA-C22.3 No. 1-M87 (R1997), Overhead Systems.

.3 City of Winnipeg Electrical By-Law No. 36/2003.

.2 Underwriters' Laboratories (UL)

.1 UL 294-[1999], Standard for Safety for Access Control System Units.

.3 Underwriters Laboratories of Canada (ULC)

.1 ULC-S317-[1996], Installation and Classification of Closed Circuit Video Equipment (CCVC) Systems for Institutional and Commercial Security Systems.

1.4 Definitions

.1 CCTV: Closed Circuit Television.

.2 CCVC: Closed Circuit Video.

.3 CCD: Charge Coupled Device.

.4 FOV: Field of View.

1.5 Design Performance Requirements

.1 Provide a complete digital video surveillance system as identified in this contract and drawings. Drawings indicate approximate camera locations and fields of view. Prior to installation, confirm camera (and camera support) locations with the Contract Administrator.

.2 Support: Camera functions to be supported by CCTV system.

.1 Provide operator with ability to control all camera functions, from landfill office.

.3 Switching:

.1 Provision to view any camera in system from monitor. Maximum of 12 (expandable to 16) cameras to be viewed at any one time or select any number of connected cameras.

.2 Provision to record 24 hours per day from all connected cameras.

.4 Control: Provision for any camera equipped with motorized zoom lens, pan, and tilt.

.1 Adjust motorized zoom lens.

.2 Set pan and tilt in home position.

.3 Set and clear movement limits of pan and tilt mechanism.

.5 Video recording to be saved on hard drive. System to allow playback without interrupting present recording video. Thirty days of recording for all cameras to be stored on system before archiving will be required.

.6 All cameras may be viewed at one time or any number of selected cameras may be selected for viewing.

.7 Provide ability to display stored ‘video image’ of cardholder, and switch real-time camera to card reader location for specific card usage.

.8 Provide capability to forward video image to selected remote PC.

.9 Overall control of CCTV provided through software control, which provides complete integration of security components.

.10 Environment: design video components and systems to operate with all specified requirements under following ambient temperatures:

.1 Indoor installations:

.1 Temperature: 0C to 30C.

.2 Humidity: 10 to 90%.

.2 Outdoor installations:

.1 Temperature: -40C to 60C.

.2 Humidity: 10 to 100%.

.11 Provide network interface to the City's current wireless network system that allows digital video transmission and remote monitoring access to the entire video surveillance system from remote personal computers on this network.

.12 Digital recording and storage capability for at least 30 continuous (24 hour) days of digital footage from up to 16 cameras. Capability to view real time images and to search and retrieve stored images. Search and retrieve capability to include quick search functions and motion detection options.

.13 Provide security, user and management features to include password protection and security levels/priorities.

.14 Contractor is responsible to review the existing camera and confirm compatibility for use in the new surveillance system. Contractor is responsible for any additional equipment, materials or labour required to completely integrate the camera into the new system.

.15 Contractor to provide all programming as required for all equipment on site to suit the City's requirements.

1.6 Submittals

.1 Product Data: Submit manufacturer's printed product literature, specifications and datasheet in accordance with General Conditions.

.2 Shop Drawings: Submit in accordance with the Specifications and Section 16010.

.1 Submit shop drawings to indicate project layout (from site plan available for use from Contract Administrator), camera locations, point-to-point diagrams, cable schematics, risers, mounting details and identification labeling scheme including:

.1 Functional description of equipment.

.2 Technical data sheets of all devices.

.3 Video camera surveillance chart.

.4 Video interconnection detail drawings.

.3 Samples:

.1 Submit one sample of each camera selected complete with housing, brackets and mounting hardware if requested by the Contract Administrator.

.2 Camera will be returned for incorporation into work as appropriate.

.4 Quality Assurance Submittals: submit the following in accordance with General Conditions.

.1 Test Reports: Submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.

.2 Certificates: Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.1 Submit UL Product Safety Certificates.

.2 Submit verification Certificate that service company is "UL List Alarm Service Company".

.3 Submit verification Certificate that monitoring facility is "UL Listed Central Station".

.3 Instructions: Submit manufacturer's installation instructions.

.4 Manufacturer's Field Services: Submit copies of manufacturer's field reports.

.5 Maintenance Data: Submit maintenance data for incorporation into manual specified in General Conditions. Include the following:

.1 System configuration and equipment physical layout.

.2 Functional description of equipment.

.3 Instructions on operation, adjustment and cleaning.

.4 Illustrations and diagrams to supplement procedures.

.5 Manufacturer's operation instructions.

1.7 Warranty

.1 Project Warranty: All equipment and total installation related to this section shall carry a warrant of a minimum of one year from the date of owner's acceptance. Any equipment warranties longer than one year will remain effective for the specific equipment.

.2 Manufacturer's Warranty: Submit, for Contract Administrator's acceptance, manufacturer's standard warranty document executed by authorized company official.

2. PRODUCTS

2.1 Materials

.1 Video Camera Characteristics:

.1 Colour images.

.2 Sensitivity: lighting requirements, exterior cameras shall be equipped with a digital slow shutter (DSS) to enhance low lighting performance.

.3 Resolution:

.1 Colour: high resolution 480 TVL NTSC format.

.4 Format: 1/3" format CCD imager.

.5 Environment: indoor and outdoor as indicated.

.6 Mounting: visible.

.7 Lens functions: electronic iris for camera indicated.

.8 Operational voltage: Standard 24 VAC input power.

.9 Current consumption: 3.3 watts.

.10 Operation temperature: -40^{C} to +60 ^{C} for exterior enclosed cameras in enclosure, -10 to +50 ^{C} for interior cameras.

.11 Backlight compensation.

.12 Auto-gain control.

.2 Lenses

.1 Fixed Focal Length: 3.6 mm Camera #3.

.2 Variable Focus Lens: 3-8 mm for Cameras #4, #5, #6, #7, #8, #9 and #10.

.3 Auto iris lens with direct drive.

.3 Video Handling

.1 Performance Attributes:

.1 Multiple station digital control system: Solid-state, Video Vault Tower and provide remote control of multiple camera lenses and auxiliary functions, as specified. The video vault shall be a 16 channel input Pentium 4 2.0 GHz processor with CDR/W

floppy drive, 256 MB RAM, 360 GB hard drive and 17" high resolution colour monitor, keyboard, mouse, remote viewing software and rack mounted casing.

.2 Designed to select each camera station individually and provide full remote control of all functions at that camera station.

.3 Operate in conjunction with homing video switcher to automatically assume control of camera that has been "homed" in on.

.4 Capable of being consolidated with the Sequential Switcher.

.5 Controller with capability to select individual (P/T/Z) cameras and allow control and programming of presets, tours, autotours and individual control for pan, tilt and zoom functions.

.6 16 channel duplex video multiplier for viewing analog video, with X2 zoom of video capability.

.2 Control functions required

.1 Power: On and Off.

.2 Station select: individual station (labeled).

.3 Allow full control of cameras.

.4 Pan and tilt: left to right and up and down.

.4 Recording: Digital Recording.

.1 Features:

.1 Records video using a video compression algorithm to allow high quality security video to be recorded at high frame rates and store for extended period of time utilizing a minimum of hard drive space.

.2 All cameras to record continuously 24 hours per day without the need to cease recording, for at least 30 consecutive days before archiving is required. Recording speed of at least 13 frames per second based on 9 camera inputs.

.3 Record high resolution images: 640 x 480 Pixels minimum.

.4 Full digital VCR playback control with up to 10X fast-forward and up to 1/10X slow play back control.

.5 Snapshot capability of being saved to disk and printed to standard printer.

.6 I.D./time and date generator: Provide built-in microprocessor equipped with calendar capable of setting internal timer, display current time and manage other

clock-related functions on monitor and on digital display. Automatic adjust to Daylight Savings.

.5 Camera Housings

.1 Domes: Indoor (Camera #3).

.2 Outdoor: Equipped with heater/blower as may be required to provide suitable temperature within housing for camera operation.

.6 Transmission Methods: Coax or Twisted Pair, Fiber Optics and Wireless as required and indicated for individual applications.

.1 Utilize a distribution line controller to provide interface for data communication with (P/T/Z) camera, suggested manufacturer vicon model # v1400X-IDL.

2.2 Camera Power Supply

.1 Power supply: Each individual camera set-up shall contain a transformer with a primary connection of 110-120 vac and secondary of 24 vac.

2.3 Junction Box

.1 Metal enclosures, weather-proof, sized to handle all system conduit interconnections and related equipment.

2.4 System UPS

.1 Supply and install a powerware UPS rated at 1000 Va; good for ½ hour standy-by operation under full load in event of a power failure.

2.5 Surge Protection

.1 Supply and install 120 VAC power surge protection, suggested manufacturers: EFI, ISS.

3. EXECUTION

3.1 Standard of Quality

.1 Quality of acceptable equipments shall meet the standard of equipment listed as follows:

.1 Video Vault with control tower and controls as manufactures by Zero-One Systems and supplied by ADT Security Services Canada Inc.

.2 Interior Camera and Enclosure: Pelco ICS100-CR3.6

.3 Outdoor Camera and Enclosure: Pelco CC3751H-2 with 13VD series varifocal lens and EH3512-2HD/MT enclosure.

.4 Outdoor Camera and Enclosure with pan, tilt feature: Pelco SD53 CBW–PG–E1.

.5 Fibre Optic Transmitter: ADT S732DVR-EST1

.6 Fibre Optic Receiver: ADT S732BVR-EST1

.7 Wireless Transmitter: SmartSight S1000

3.2 Manufacturer's Instructions

.1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions, and datasheet.

3.3 Installation

.1 Install video surveillance equipment and components in accordance with ULC-S317.

.2 Install all required cable, boxes, mounting hardware, brackets, video cameras and system components in accordance with manufacturer's written installation instructions.

.3 Install components secure, properly aligned and in locations shown on reviewed shop drawings.

.4 All surveillance equipment to be installed in office environment as rack-mounted where practical. All hardware for rack mounting to be supplied and installed under this contract.

.5 Connect cameras to cabling in accordance with installation instructions.

.6 Install ULC labels where required.

.7 Refer to Section 16670 for lightning protection.

.8 Install all outdoor cameras on new or existing poles (new poles supplied by others) no less than 20 feet above grade. Coordinate with pole installer to utilize common trenching for installation of RG6 and #18-4p direct burial cables for cameras.

3.4 Field Quality

.1 Manufacturer's Services:

.1 Have manufacturer or manufacture's representative of products, supplied under this Section, review Work involved in the handling, installation/application, protection and cleaning, of its products and submit written reports, in acceptable format, to verify compliance of Work with Contract.

.2 Manufacturer's Field Services: Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visits, to review Work, at stages listed:

.1 After delivery and storage of products, and when preparatory Work, or other Work, on which the Work of this Section depends, is complete but before installation begins.

.2 Twice during progress of Work at 25% and 60% complete, over and above regularly scheduled site meetings.

.3 Upon completion of the Work, after cleaning is carried out.

.4 Obtain reports, within 3 days of review, and submit, immediately, to Contract Administrator.

3.5 Verification

.1 Perform verification inspections and test in the presence of Engineer and Owner.

.1 Provide all necessary tools, ladders and equipment.

.2 Ensure appropriate subcontractors, manufacturer's representatives and security specialists are present for verification.

.2 Visual verification: Objective is to assess quality of installation and assembly and overall appearance to ensure compliance with Contract Documents. Visual inspection to include:

.1 Sturdiness of equipment fastening.

.2 Non-existence of installation related damages.

.3 Compliance of device locations with reviewed shop drawings.

.4 Compatibility of equipment installation with physical environment.

.5 Inclusion of all accessories.

.6 Device and cabling identification.

.7 Application and location of ULC approval decals.

.3 Technical verification: Purpose to ensure that all systems and devices are properly installed and free of defects and damage. Technical verification includes:

.1 Measurements of tension and power.

.2 Connecting joints and equipment fastening.

.3 Measurements of signals (dB, lux, baud rate, etc).

.4 Compliance with manufacturer's specification, product literature and installation instructions.

.4 Operational verification: Purpose to ensure that devices and systems' performance meet or exceed established functional requirements. Operational verification includes:

.1 Operation of each device individually and within its environment.

.2 Operation of each device in relation with programmable schedule and or/specific functions.

.3 Operation control of camera lens.

.4 Switching of system video recorder to monitor.

.5 Set dwell times.

.6 Demonstrate:

.1 Sequence viewing of cameras on monitor.

.2 Bypass capability.

.3 Display of stored image to cardholder.

3.6 Cleaning and Adjusting

.1 Remove protective coverings from cameras and components.

.2 Adjust cameras for correct function.

.3 Clean camera housing, system components and lens, free from marks, packing tape, and fingerprints, in accordance with manufacturer's written cleaning recommendations.

3.7 Programming

.1 The Contractor to provide all software/hardware programming required for equipment supplied under this Contract to suit the City's requirements. Final requirements for programming will only be determined once the system is installed and operational (i.e. auto pan settings).

4. TRAINING

.1 The Contractor shall include costs for providing training to City staff by a factory-trained representative on the operation and maintenance of the equipment.

.2 Training for the equipment shall be conducted before the operation period as described in Form 203. The training sessions shall be conducted on site. If necessary, instruction can be

held in the City office. The Contractor shall provide a qualified instructor as well as the necessary course materials.

.3 Training shall be provided in four sessions of one half day each (not more than four hours per day for each session). four sessions for training shall be provided: two for operation staff and two sessions for maintenance staff.

.4 The training shall cover operation, programming and maintenance of the entire surveillance system.

.5 The Contract shall not be considered complete, for the purpose of issuing a Certificate of Substantial Performance, until the training has been provided and Form 203 has been signed.

END OF SECTION