



INVITATION TO TENDER & ACCEPTANCE FORM

RETURN TENDERS TO: National Capital Commission at email Bids-soumissions@ncc-ccn.ca TENDER CLOSING DATE AND TIME: Friday, September 3, 2021 at 3:00 p.m., Ottawa time	NCC Tender Number AL1827
	NCC Contract Number
DESCRIPTION OF WORK: National Capital River Pavilion – 501 Sir George-Etienne Cartier Parkway, Ottawa, ON	

1. BUSINESS NAME AND ADDRESS OF BIDDER

Name: _____

Address: _____

Telephone number: _____ Fax number: _____

E-mail address: _____

2. THE OFFER

The Bidder offers to the National Capital Commission (NCC) to perform and complete the work for the above mentioned project in accordance with the tender documents for the total tender amount (to be expressed in numbers only) of:

MAIN SUB-TOTAL (PHASES 1 + 2)	\$ _____
13% OHST	\$ _____
TOTAL ESTIMATED AMOUNT	\$ _____

3. TENDER VALIDITY PERIOD

The tender shall not be withdrawn for a period of 60 days following the date and time of tender closing.

4. CONTRACT DOCUMENTS

1. The following are the contract documents:

- (a) Invitation to Tender & Acceptance Form when signed by the NCC;
- (b) Duly completed Invitation to Tender & Acceptance Form and any Appendices attached thereto;
- (c) Drawings and Specifications;
- (d) General Conditions (GC1 to GC10);
- (e) Supplementary Conditions, if any;
- (f) Insurance Terms;
- (g) Occupational Health and Safety Requirements;
- (h) Addenda
- (i) Any amendments issued or any allowable tender revision received before the date and time set for tender closing;
- (j) Any amendment incorporated by mutual agreement between the NCC and the Contractor before acceptance of the tender; and
- (k) Any amendment or variation of the contract documents that is made in accordance with the General Conditions;
- (l) Security Requirements.

2. The language of the contract documents shall be the language of the Invitation to Tender & Acceptance Form submitted.



NCC
CCN

INVITATION TO TENDER & ACCEPTANCE FORM

NCC Tender Number AL1827

NCC Contract Number

5. APPENDICES

The tender includes Appendix(ces) # I and II to the Invitation to Tender & Acceptance Form.

6. ACCEPTANCE AND CONTRACT

Upon acceptance of the Contractor's offer by the NCC, a binding Contract shall be formed between the NCC and the Contractor. The documents forming the Contract shall be the contract documents referred to in 4 – CONTRACT DOCUMENTS.

7. CONSTRUCTION TIME

The Contractor shall perform and complete the Work no later than December 31, 2021 (phase 2) and June 30, 2022 (phase 1).



8. UNIT PRICE TABLE

The Bidder agrees that:

- (a) the Unit Price Table designates that part of the Work to which a Unit Price Arrangement applies.
- (b) the Price per Unit (excluding taxes) and the Estimated Total Price (excluding taxes) must be entered for each item listed;
- (c) the Price per Unit (excluding taxes) as tender governs in calculating the Total Estimated Amount, and any errors in the extension of the Price per Unit (excluding taxes) and in the addition of the Estimated Total Prices shall be corrected by the NCC in order to obtain the Total Estimated Amount; and
- (d) the following table is the Unit Price Table for the purposes of the tender and the Contract:

Note: Transfer the Total Estimated Amount from the Unit Price Table to item 2 – THE OFFER of this Invitation to Tender & Acceptance Form

			A	B	C = A x B
PHASE 1					
Item	Description	Unit	Qty	Unit Price	Amount
1	Phase 1 Mobilization	L.S.	1		
Capital Pathway Realignment / Stone Steps / Paving / UA Pathway / Planting					
2	Removal and disposal of contaminated soils (if encountered)	m ³	1		
3	Clearing and grubbing <i>(all trees above 10cm DBH have already been removed)</i>	L.S.	1		
4	Tree pruning for safety as required	L.S.	1		
5	Capital Pathway Signage Relocation and installation <i>Regulatory, wayfinding, Map (including all substructures, footings, etc.)</i>	ea	10		
6	Earth excavation, handling and rough grading	m ³	3700		
7	Removal of existing asphalt pathways (temporary pathway and down to shoreline, including subbase)	m ²	680		
8	Removal of existing granular at top of slope	m ²	550		
9	Removal of existing coir mat lining servicing corridor	m ²	65		



10	Removal of existing timber steps on slope	ea	3		\$
11	Installation of Asphalt Pathway <i>(full construction as per detail; includes pad for bike rack)</i>	m ²	355		
12	Line Painting <i>(Capital Pathway)</i>	L.M.	132		
13	Armour stone retaining walls, armour stone for lighting and select armour stones as shown. <i>(full construction as per detail; includes drainage tile, subbase, clear stone, geotextile etc. Average wall ht. 600mm) linear metre calculated by course</i>	L.M.	1015		
14	Granite Steps <i>(1m min. step length, 1.5m max. step length)</i> <i>(full construction as per detail; including pinning)</i>	L.S.	1		
15	Interlocking pavers <i>(full construction as per detail; includes aluminum edging)</i>	m ²	81		
16	Stone dust pathway - universal access <i>(full construction as per detail)</i>	m ²	576		
17	Stainless Steel Railing supply and installation <i>(including all hardware, shop drawings, handrail, etc.)</i>	L.M.	21		
18	Supply and installation of strip drains and piping	L.M.	40		
19	Rounded Riverstone at strip drains	m ³	1		
20	Angular Rip Rap at drainage outlets	m ³	12		
21	Concrete Footing for Signage Entrance Feature <i>(as per detail; sign feature t.b.d.)</i>	ea	2		
22	Wood Pathway Bollard <i>(full construction as per detail)</i>	ea	1		
23	Topsoil and finished grading	m ³	500		
24	Erosion Control Mat	m ²	745		
25	Trees <i>(new planting; includes planting materials as per detail including mulch)</i>	ea	8		
26	Shrubs <i>(new planting; includes planting materials as per detail including mulch)</i>	ea	393		



27	Perennials and Grasses (new planting; includes planting materials as per detail including mulch)	ea	1039		
28	Hydro-Seed Mix Type II (includes 150mm of topsoil)	m ²	740		
29	Hydro-Seed Mix Type III (includes 150mm of topsoil)	m ²	70		
30	Sod	m ²	478		
31	Maintenance and warranty YEAR ONE	L.S.	1		
32	Maintenance and warranty YEAR TWO	L.S.	1		
				Sub-Total	

Landscape Lighting (Upper)					
33	Earth excavation, trenching and back filling	L.S.	1		
34	Supply and installation of landscape lighting (includes conduit and all appurtenances as per details)	ea	23		
35	Coring of armour stone walls for installation of landscape lighting fixtures	ea	23		
36	Installation of lighting fixtures on bridge	ea	10		
37	Lighting controls	L.S.	1		
38	Electrical hand holes	ea	4		
39	Empty conduits for future works	L.S.	1		
				Sub-Total	

Parking Lot Expansion (P3) / Pedestrian Circulation to Lay-By and PXO					
40	Mobilization, reinstatement, removals and demolition as per drawings	L.S.	1		
41	Removal of stormwater infrastructure as indicated on drawings	L.S.	1		
42	Earth excavation and handling	L.S.	1		
43	Supply and installation and/or adjustment of stormwater infrastructure as indicated on drawings	L.S.	1		



44	PXO (Pedestrian Crossing) <i>(including but not limited to signalized PXO, poles, solar power units, raised concrete crosswalk, signage, etc. as per drawings and details)</i>	L.S.	1		
45	Pedestrian Curb Ramp with T.W.S.I. <i>(full construction as per detail)</i>	m ²	12		
46	Asphalt Layby <i>(includes asphalt roadway reinstatement)</i>	m ²	360		
47	Concrete Mountable Curb <i>(layby; full construction as per detail)</i>	L.M.	73		
48	Concrete Barrier Curb <i>(layby; full construction as per detail)</i>	L.M.	80		
49	Line Painting <i>(PXO crosswalk markings, roadway triangles, and roadway lines)</i>	L.S.	1		
50	Asphalt Parking Lot <i>(full construction as per detail)</i>	m ²	702		
51	Concrete Barrier Curb <i>(parking lot; full construction as per detail)</i>	L.M.	128		
52	Asphalt Sidewalks <i>(full construction as per detail)</i>	m ²	235		
53	Line Painting <i>(parking lot)</i>	L.S.	1		
54	Gravel Road <i>(full construction as per detail)</i>	m ²	53		
55	Signage <i>(installation of salvaged signs and/or supply and installation of new signage as indicated on drawings)</i>	ea	9		
56	Lighting installation <i>(fixtures supplied by NCC)</i>	ea	2		
57	Electrical supply and installation	L.S.	1		
58	Topsoil and finished grading	m ³	1210		
59	Erosion Control Mat	m ²	965		
60	Trees <i>(new planting; includes planting materials as per detail including mulch)</i>	ea	7		
61	Hydro-Seed Mix Type II <i>(includes 150mm of topsoil)</i>	m ²	820		



62	Hydro-Seed Mix Type III (includes 150mm of topsoil)	m ²	1225		
63	Sod	m ²	296		
64	Maintenance and warranty YEAR ONE	L.S.	1		
65	Maintenance and warranty YEAR TWO	L.S.	1		
				Sub-Total	

Subtotal Total Phase 1

PHASE 2 SHORELINE					
Item	Description	Unit	Qty	Unit Price	Amount
66	Phase 2 Mobilization	L.S.	1		
Shoreline Works / Lookout / Armour Stone Walls / Steps into River / Rip-rap					
67	Turbidity curtain	L.M.	200		
68	Removal and disposal of contaminated soils (if encountered)	m ³	1		
69	Clearing and grubbing (all trees above 10cm DBH have already been removed)	L.S.	1		
70	Tree pruning for safety as required	L.S.	1		
71	Careful removal of existing shoreline slope: including but not limited to; Vegetation, boulders, gravel, soil, etc. Note: Select boulders will remain on site for re-use	m ²	1850		
72	Earth excavation, handling and rough grading	m ³	400		
73	Armour stone retaining walls, armour stone for lighting and select armour stones as shown. (full construction as per detail; includes drainage tile, subbase, clear stone, geotextile etc. Average wall ht. 600mm) linear metre calculated by course	L.M.	145		
74	Armour stone steps along shoreline; (full construction as per detail; includes drainage tile, subbase, clear stone, geotextile etc.) linear metre calculated by course	L.M.	90		
75	Stone dust pathways (full construction as per detail)	m ²	750		



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76	Rounded Rip-Rap along shoreline <i>(full construction as per detail)</i>	m ³	600		
77	Shoreline lookout on piles <i>(full construction as per details including railing; shop drawings required)</i>	L.S.	1		
78	Mulch forest trail <i>(full construction as per detail)</i>	m ³	5		
79	Mulch surfacing for bike racks	m ³	3		
80	Rounded boulders along shoreline	ea.	25		
81	Wood Gate at storage area <i>(Full construction as per details)</i>	L.S.	1		
82	Supply and installation of custom benches <i>(full construction as per detail)</i>	ea.	4		
83	Supply and installation of waste receptacle <i>(full construction as per detail)</i>	ea.	1		
84	Supply and installation of bike racks <i>(full construction as per detail)</i>	ea.	9		
85	Topsoil and finished grading	m ³	300		
86	Erosion Control Mat	m ²	780		
87	Trees <i>(new planting; includes planting materials as per detail including mulch)</i>	ea	19		
88	Shrubs <i>(new planting; includes planting materials as per detail including mulch)</i>	ea	209		
89	Perennials and Grasses <i>(new planting; includes planting materials as per detail including mulch)</i>	ea	1071		
90	Hydro-Seed Mix Type I <i>(includes 150mm of topsoil)</i>	m ²	520		
91	Maintenance and warranty YEAR ONE	L.S.	1		
92	Maintenance and warranty YEAR TWO	L.S.	1		
				Sub-Total	

Landscape Lighting (Lower)					
93	Earth excavation, trenching and back filling	L.S.	1		
94	Supply and installation of landscape lighting <i>(includes conduit and all appurtenances as per details)</i>	ea	17		

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95	Coring of armour stone walls for installation of landscape lighting fixture	ea	16		
96	Installation of landscape lighting fixtures in armour stone	ea	16		
97	Connections of light fixtures to existing lighting control system	L.S.	1		
98	Electrical hand holes	ea	1		
99	Empty conduits for future works	L.S.	1		
				Sub-Total	
				Subtotal Total Phase 2	
				Main Sub-Total (Phases 1 + 2)	

L.M.=linear metre; m²=square metre; m³=cubic metre; L=litre; KG =kilogram; T=metric tonne; EA=each; WK=week; LS=lump sum; CA =cash allowance; H=hour

9. Basis of Selection: Must pass mandatory technical criteria (see appendix II), then, lowest compliant bidder.

10. I/We acknowledge receipt of the following addenda: _____
(Bidder to enter number of addenda issued, if any) and have included for the requirement of it/them in my/our tendered price.

11. TENDER SECURITY

1. The Bidders shall enclose tender security with its tender in accordance with GI08 TENDER SECURITY REQUIREMENTS.
2. If the security furnished does not comply fully with the requirements referred to in paragraph 1) herein, the tender shall be disqualified.
3. If a security deposit is furnished as tender security, it shall be forfeited in the event that the tender is accepted by the NCC and the Contractor fails to provide Contract Security in accordance with GC9 CONTRACT SECURITY, provided that the NCC may, if it is in the public interest, waive the forfeiture of the security deposit.
4. An Adobe pdf version (or photograph in jpg or equivalent format) of the TENDER SECURITY may be transmitted to the Bid email address provided.



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We hereby offer to supply to the NCC in accordance with the terms and conditions set out herein, the construction work listed above and on any attached sheets at the submitted price(s).

Name and title of person authorized to sign on behalf of Bidder
(please print or type)

Signature

Date

Your tender is accepted to supply to the NCC, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the construction services listed herein and on any attached sheets at the price(s) set out therefore.

Name and title of the person authorized to sign on behalf of the NCC
(please print or type)

Signature

Date

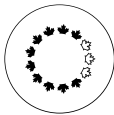
INVOICING

Send the original invoice and 1 copy to:

**Accounts Payable
National Capital Commission
202-40 Elgin Street
Ottawa, ON K1P 1C7**

Or by email at the following address: pavables@ncc-ccn.ca

To ensure prompt payment, please prepare your invoice in accordance with the prices quoted. Errors in invoicing can cause delay of payment. Submit your invoice to the address shown above and clearly indicate the Purchase Order number.



New supplier / Nouveau fournisseur Update / Mise à jour

Supplier No. / N° du fournisseur

SUPPLIER-DIRECT DEPOSIT PAYMENT AND TAX INFORMATION FORM
FOURNISSEUR-FORMULAIRE DE PAIEMENT PAR DÉPÔT DIRECT ET RENSEIGNEMENTS AUX FINS DE L'IMPÔT

For NCC use only / À l'usage de la CCN seulement

PART 'A' - IDENTIFICATION / PARTIE 'A' - IDENTIFICATION

Legal name of entity or individual / Nom légal de l'entité ou du particulier		Operating name of entity or individual (if different from Legal Name) / Nom commercial de l'entité ou du particulier (s'il diffère du nom légal)	
Former Public Servant in receipt of a PSSA Pension / Ancien fonctionnaire qui reçoit une pension en vertu de la LPFP		<input type="checkbox"/> Yes / Oui	<input type="checkbox"/> No / Non
An entity, incorporated or sole proprietorship, which was created by a Former Public Servant in receipt of a PSSA pension or a partnership made of former public servants in receipt of PSSA pension or where the affected individual has a controlling or major interest in the entity. / Une entité, constituée en société ou à propriétaire unique, créée par un ancien fonctionnaire touchant une pension en vertu de la LPFP, ou un partenariat formé d'anciens fonctionnaires touchant une pension en vertu de la LPFP, où les entités dans lesquelles ils détiennent le contrôle ou un intérêt majoritaire.		<input type="checkbox"/> Yes / Oui	<input type="checkbox"/> No / Non
Address / Adresse		Telephone No. / N° de téléphone :	Fax No. / N° de télécopieur :
Postal code / Code postal		()	()

PART 'B' - STATUS OF SUPPLIER / PARTIE 'B' - STATUT DU FOURNISSEUR

IMPORTANT: CHOOSE ONLY ONE OF THE FOLLOWING / CHOISIR SEULEMENT UNE DES OPTIONS SUIVANTES :

(1) Sole proprietor / Propriétaire unique <input type="checkbox"/>	If sole proprietor, provide: / Si propriétaire unique, indiquez :	Last Name / Nom de famille	First name / Prénom	Initial / Initiale
(2) Partnership / Société de personnes <input type="checkbox"/>	(3) Corporation / Société <input type="checkbox"/>			
Business No. (BN) / N° de l'entreprise (NE) -	OR / OU	SIN / NAS -		
GST/HST / TPS et TVH	QST / TVQ (Québec)			
Number / Numéro : _____	Number / Numéro : _____			
Not registered / non inscrit <input type="checkbox"/>	Not registered / non inscrit <input type="checkbox"/>			
Type of contract / Genre de contrat	Contract for mixed goods & services / Contrat de biens et services <input type="checkbox"/>			
Contract for services only / Contrat de services seulement <input type="checkbox"/>	Contract for goods only / Contrat de biens seulement <input type="checkbox"/>			
Type of goods and/or services offered / Genre de biens et / ou services rendus :				

PART 'C' - FINANCIAL INSTITUTION / PARTIE 'C' - RENSEIGNEMENTS SUR L'INSTITUTION FINANCIÈRE

Please send a void cheque or bank letter with this form / Veuillez s.v.p. envoyer un spécimen de chèque ou lettre de banque avec ce formulaire

Branch Number / N° de la succursale : _____	Institution No. / N° de l'institution : _____	Account No. / N° de compte : _____
Institution name / Nom de l'institution : _____		Address / Adresse : _____

PART 'D' - DIRECT DEPOSIT PAYMENT NOTIFICATION / PARTIE 'D' - AVIS DE PAIEMENT PAR DÉPÔT DIRECT

E-mail address / Adresse courriel : _____

PART 'E' - EMAIL ADDRESS TO SEND CONTRACTS / PARTIE 'E' - ADRESSE COURRIEL POUR ENVOYER LES CONTRATS

E-mail address / Adresse courriel : _____

PART 'F' - CERTIFICATION / PARTIE 'F' - CERTIFICATION

I certify that I have examined the information provided above and it is correct and complete, and fully discloses the identification of this supplier.	Je déclare avoir examiné les renseignements susmentionnés et j'atteste qu'ils sont exacts et constituent une description complète, claire et véridique de l'identité de ce fournisseur.		
Where the supplier identified on this form completes Part C, he hereby requests and authorizes the National Capital Commission to directly deposit into the bank account identified in Part C, all amounts payable to the supplier.	Lorsque le fournisseur indiqué sur ce formulaire remplit la partie C, par la présente, il demande et autorise la Commission de la capitale nationale à déposer directement dans le compte bancaire indiqué à la partie C, tous les montants qui lui sont dus.		
_____ Name of authorized person / Nom de la personne autorisée	_____ Title / Titre	_____ Signature	_____ Date
Telephone number of contact person / Numéro de téléphone de la personne ressource : ()			

IMPORTANT

<p>Please fill in and return to the National Capital Commission with a bank letter or one of your business cheques, unsigned, and marked « VOID » (for verification purposes).</p> <p>Mail or email to: contracts@ncc-ccn.ca Procurement Services National Capital Commission 202-40 Elgin Street Ottawa, ON K1P 1C7 Fax: (613) 239-5007</p>	<p>Veillez remplir ce formulaire et le retourner à la Commission de la capitale nationale avec une lettre de banque ou un spécimen de chèque de votre entreprise, non signé, et portant la mention « ANNULÉ » (à des fins de vérification).</p> <p>Poster ou transmettre par courriel à : contracts@ncc-ccn.ca Services de l'approvisionnement Commission de la capitale nationale 40, rue Elgin, pièce 202 Ottawa (Ontario) K1P 1C7 Télécopieur : (613) 239-5007</p>
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SUPPLIER – DIRECT DEPOSIT PAYMENT AND TAX INFORMATION FORM

FOURNISSEUR – FORMULAIRE DE PAIEMENT PAR DÉPÔT DIRECT ET RENSEIGNEMENTS AUX FINS DE L'IMPÔT

Supplier Tax Information

Pursuant to paragraph 221(1) (d) of the *Income Tax Act*, NCC must declare form T-1204, contractual payments of government for services, all payments made to suppliers during the calendar year in accordance to related service contracts (including contracts for mixed goods and services).

The paragraph 237(1) of the *Income Tax Act* and the article 235 of the Income Tax Regulations require the supplier to provide all necessary information below to the organization who prepares the fiscal information forms.

Questions: Sylvie Monette, Accounts Payable Supervisor
(613) 239-5678 ext. 5156 or sylvie.monette@ncc-ccn.ca

Direct deposit payment information

All amounts payable by NCC to the supplier will be deposited directly into the account you identified in part C. A NCC payment advice notice will also be sent to you by e-mail detailing the particularities of the payment to the address identified in part D.

You must notify the NCC of any changes to your financial institution, branch or account number. You will then have to complete a new form.

The account you identified has to hold Canadian funds at a financial institution in Canada.

The advantages of direct deposit payment

Direct deposit payment is a convenient, dependable, safe and timesaving way to receive your invoice payment. Direct deposit payment is completely confidential.

There are fewer risks of direct deposit payment being lost, stolen, or damaged as may happen with cheques.

Funds made by direct deposit payment will be available in your bank account on the same day that we would have mailed your cheque.

Renseignements sur les fournisseurs aux fins de l'impôt

En vertu de l'alinéa 221(1) (d) de la *Loi de l'impôt sur le revenu*, la CCN est tenu de déclarer, à l'aide du formulaire T-1204, Paiements contractuels de services du gouvernement, tous paiements versés aux fournisseurs pendant une année civile en vertu de marchés de services pertinents (y compris les marchés composés à la fois de biens et de services).

Le paragraphe 237 (1) de la *Loi de l'impôt sur le revenu* et l'article 235 du Règlement de l'impôt sur le revenu obligent les fournisseurs à fournir toutes les informations demandées ci-dessous à l'organisme qui prépare les formulaires de renseignements fiscaux.

Questions : Sylvie Monette, Superviseure aux comptes payable
(613) 239-5678 poste 5156 ou sylvie.monette@ncc-ccn.ca

Renseignements sur le paiement par dépôt direct

Tous les montants versés par la CCN au fournisseur seront déposés directement dans le compte identifié à la partie C. Un avis de paiement de la CCN détaillant les particularités du paiement par dépôt direct vous sera envoyé par courriel à l'adresse courriel identifiée à la partie D.

Vous devez aviser la CCN de tout changement d'institution financière, de succursale ou de numéro de compte. Vous devrez donc remplir un nouveau formulaire.

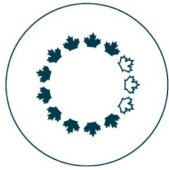
Le compte que vous désignez doit être un compte en monnaie canadienne, détenu dans une institution financière au Canada.

Avantages du paiement par dépôt direct

Le paiement par dépôt direct est une méthode pratique, fiable et sécuritaire, qui permet de gagner du temps dans la réception de vos paiements de factures. Le paiement par dépôt direct est entièrement confidentiel.

Avec les paiements par dépôt direct, il y a moins de risques de perte, de vol ou de dommage, comme cela peut se produire dans le cas des chèques.

Les paiements effectués par paiement par dépôt direct sont versés dans votre compte le jour même où nous aurions posté votre chèque.



**NCC
CCN**

National Capital Commission Commission de la capitale nationale

**APPENDIX II - INVITATION TO TENDER &
ACCEPTANCE FORM**

TECHNICAL QUALIFICATION FOR GENERAL CONTRACTORS

TECHNICAL QUALIFICATION FOR GENERAL CONTRACTORS

**Project: NCC TENDER FILE #AL1827 – NATIONAL CAPITAL RIVER PAVILION – 501 SIR
GEORGE-ETIENNE CARTIER PARKWAY, OTTAWA, ON**

Date: August 12, 2021



APPENDIX II - INVITATION TO TENDER & ACCEPTANCE FORM

TECHNICAL QUALIFICATION FOR GENERAL CONTRACTORS

SECTION 1 – GENERAL INFORMATION

1.1 Process

The purpose of this qualification process is to evaluate the capability of General Contractors for the proposed project. To qualify, a Bidder must have demonstrated a record of successful, timely completion of quality orientated landscaping projects of comparable scale, scope and activities as the NCC –NATIONAL CAPITAL RIVER PAVILION – 501 SIR GEORGE-ETIENNE CARTIER PARKWAY, OTTAWA, ON.

1.2 Project Description

Upper Landscape, Pedestrian Crossing, Layby and Parking Upgrades

- Pedestrian crossing for Sir George Etienne Cartier Parkway for pedestrian security.
- Parking lot upgrades to existing parking lot including asphalt and designated UA parking spaces.
- Installation of a new lay-by / drop off zone
- New access path from the parking lot to the pedestrian crossing
- Armour stone retaining walls bordering new stone dust switchback pathway from the parkway to the base of the pedestrian bridge
- Armour stone retaining walls bordering new stone dust switchback pathway from the base of the bridge to the shoreline
- Installation of Granite steps and railings
- Reinstatement of the existing asphalt multi-use pathway along Sir George Etienne Cartier Parkway
- New native planting scheme for plants, shrubs and trees.
- Landscape lighting

Shoreline Animation

- Removal of invasive species along existing shoreline
- New Rounded Riprap to provide resilient shoreline
- New Armour stone retaining walls bordering new stone dust pathways
- Connection to existing pathway and trail systems
- New site furniture
- Native planting scheme to provide erosion control of existing shoreline and slope
- New multi-use Look-out platform
- Armour stone steps into waterway



APPENDIX II - INVITATION TO TENDER & ACCEPTANCE FORM

TECHNICAL QUALIFICATION FOR GENERAL CONTRACTORS

1.3 Evaluation and Selection of General Contractors to Be Qualified

The NCC will conduct the evaluation of the Qualification process in a fair manner and will treat Bidders equitably. Objective standards will be applied uniformly to Bidders. To that end, the NCC shall name a Technical Evaluation Committee. The Technical Evaluation Committee will be comprised of not less than three NCC Landscape Architects and Project Team Members, they shall assign a pass or fail rating to Bidders' submissions.

1.4 Evaluation Methodology

Following tender close, NCC Procurement will open the submission from each Bidder. Members of the Technical Evaluation Committee will not be given the Bidders financial offers as NCC Procurement will sequester the financial offers until the technical evaluation is completed.

Evaluation step #1

Following bid closing, NCC Procurement will review each submission to verify tender compliance and that the Appendix II was completed and submitted.

- If NCC Procurement is unable to find material for tender compliance and that the Appendix II was not completed or only partially completed, the submission will not be considered further;
- If NCC Procurement finds material for tender compliance and that the Appendix II was fully completed and submitted, it shall forward only the technical part of the submission to the Technical Evaluation Committee for quantitative review.
- The list of documents that will be sent to the Technical Evaluation Committee will consist of strictly the following:
 - Mandatory submittal #1 Project Example 1 - Armour Stone Retaining Walls;
 - Mandatory submittal #2 Project Example 2 - Planting, Seeding, Sodding
 - Mandatory submittal #3 Client References.

Evaluation step #2

Step 2.1: The Technical Evaluation Committee will evaluate all technical submissions forwarded by NCC Procurement and assign a passing or failing grade to each one of them.

The following protocol will be used by the Technical Evaluation Committee when evaluating the Bidder's technical submissions:

- If the Technical Evaluation Committee deems that a technical submission does not meet all the technical requirements, the submission will be assigned a failing grade;
- If the Technical Evaluation Committee deems that a technical submission meets all the technical requirements, the submission will be assigned a passing grade.

The results from the technical evaluation submissions will be sent to NCC Procurement.

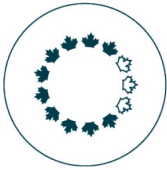


**APPENDIX II - INVITATION TO TENDER &
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Step 2.2: All submissions for which the Technical Evaluation Committee assigned passing grades to will be further evaluated by NCC Procurement to determine the Lowest Compliant Price. Qualification Submissions which fail, in the sole discretion of NCC to meet the Mandatory Requirements will be eliminated from further consideration in the evaluation process.

Step 2.3: NCC Procurement may initiate the contract award process with the lowest compliant Bidder.

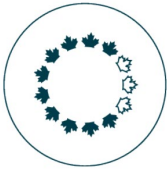


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Pass/Fail Criteria – Information submitted will be evaluated using the following pass/fail criteria:

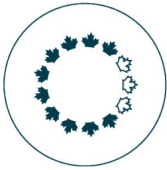
Submittal	Evaluation	Criteria for Passing Grade
Project Example 1 – Armour Stone Retaining Walls	Pass/Fail	<ul style="list-style-type: none"> - Submit Project Example including photos and justification for all technical aspects requested Armour Stone Retaining Walls • Project example must have been in place for at least two (2) years and a minimum of two (2) courses in height (yes / no) • Evidence of stone shaping to achieve level / true stones layers and ensure tight gaps between stones, this should include saw cuts, hammering and stone chiseling (yes / no) • Each row of joints is offset from the one either above or below (yes / no) • Bottom course is partially buried below existing or finished grade (yes / no) • Armour stones are free from large fissures, cracks, fragmenting, excessive shimming or loose material (yes / no) • No evidence of wall movement or signs of erosion (yes / no) • No evidence the grade is being retained solely by the geotextile within the joints (caused by large gaps between stones) (yes / no) • Written explanation and or images of wall structure and drainage, both below and behind respectively (yes / no)



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<p>Project Example 2 – Planting, Seeding, Sodding</p>	<p>Pass/Fail</p>	<p>- Submit Project Example including photos and justification for all technical aspects requested</p> <p><u>Tree Shrub & Perennial Planting:</u></p> <ul style="list-style-type: none"> • Project example must have been in place for at least one (1) year and represent a compressive planting project, not individual species. (yes / no) • Root ball / mass is planted at appropriate depth / grade; no roots are exposed to the elements or visible girdling of the plant. Soil is not built up around the trunk / stem to compensate for planting too high above finished grade. (yes / no) • Root flare is visible and not buried; mulch or soil is not piled around the root flare. (yes / no) • Trees, shrubs, and perennials are pruned according to best horticultural practices Tree leaders have not been pruned, no flush cuts, nursery tags have all been removed. (yes / no) • Tree stakes and ties (if applicable) are installed securely and are not at risk of strangling the tree trunk (yes / no) • Examples of contractor maintenance: i.e. watering schedule, images of installation, weeding, pruning, evidence of warranty replacements (if applicable) (yes / no) <p><u>Seed or Sod:</u></p> <ul style="list-style-type: none"> • Project example must have been in place for at least one (1) year. (yes / no) • Sod seams are no longer visible, and no bare soil is exposed. (yes / no) • Sod soil layer is buried and meets flush with adjacent soft or hardscape elements. (yes / no) • Grading surface is smooth, even, true, and appropriately creates positive drainage patterns. (yes / no)
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Client References	Pass/Fail	- Completed Client Reference form for both project examples
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SECTION 2 – REQUEST FOR QUALIFICATION RESPONSE REQUIREMENTS

2.1 Overview of Section 2

This section provides the Bidders with the information that must be provided in their *Qualification Response*.

2.2 Mandatory submittal #1: Project Example 1

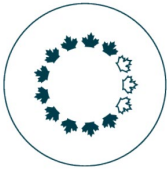
To help the NCC evaluate the Bidder’s ability to meet project requirements and expectations, Bidders shall provide in their own format (up to a maximum of 10 pages), a project example including photos, that meets all criteria included in in the Project Example Checklist. If evidence of a checklist item cannot be achieved, adequate justification should be provided.

2.3 Mandatory submittal #2: Project Example 2

To help the NCC evaluate the Bidder’s ability to meet project requirements and expectations, Bidders shall provide in their own format (up to a maximum of 10 pages), a project example including photos, that meets all criteria included in in the Project Example Checklist. If evidence of a checklist item cannot be achieved, adequate justification should be provided.

2.4 Mandatory submittal #3: Client References

Bidders shall provide Client Reference Forms filled out by the key client representative for the two (2) Project Examples of the General Contractor. One form should be filled in for each project. The NCC may contact these clients for verification and clarification of information within approximately one (1) week from the close of the qualification evaluation. Please ensure that the contact information is correct, current and that the persons identified are generally available. Bidders may provide a secondary client name and contact information.



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GENERAL CONTRACTOR - PROJECT EXAMPLE # 1

Project Name _____

Original Contract Price, excluding HST (\$) _____ Final Contract Price, excluding HST (\$) _____

Reason for variance in cost _____

Project Location (street address & city): _____

Planned Start Date (M/Y) _____ Planned Completion Date (M/Y) _____

Actual Start Date (M/Y) _____ Actual Completion Date (M/Y) _____

Reason for variance in completion date _____

Project Site Superintendent _____

Project Owner

Name and Title _____

Company/Institution & Tel. No. _____

Project Consultant

Name and Title _____

Firm Name & Tel. No. _____



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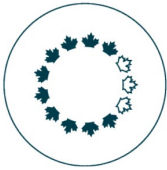
Project Example Checklist (to be completed by General Contractor, and illustrated in photos provided):

Armour Stone Retaining walls:

- | | | |
|---|-----|----|
| • Project example must have been in place for at least two (2) years and a minimum of two (2) courses in height | yes | no |
| • Evidence of stone shaping to achieve level / true stones layers and ensure tight gaps between stones, this should include saw cuts, hammering and stone chiseling | yes | no |
| • Each row of joints is offset from the one either above or below | yes | no |
| • Bottom course is partially buried below existing or finished grade | yes | no |
| • Armour stones are free from large fissures, cracks, fragmenting, excessive shimming or loose material | yes | no |
| • No evidence of wall movement or signs of erosion | yes | no |
| • No evidence the grade is being retained solely by the geotextile within the joints (caused by large gaps between stones) | yes | no |
| Written explanation and or images of wall structure and drainage, both below and behind respectively. | yes | no |

Project Description, specifically elaborating on any of the items pertinent to the projects part of this request for qualification. Continue by adding a maximum of 6 pages per project, including photographs where relevant.

Submit one form per project. All fields must be completed.



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APPENDIX II - INVITATION TO TENDER & ACCEPTANCE FORM

TECHNICAL QUALIFICATION FOR GENERAL CONTRACTORS

GENERAL CONTRACTOR - PROJECT EXAMPLE # 2

Project Name _____

Original Contract Price, excluding HST (\$) _____ Final Contract Price, excluding HST (\$) _____

Reason for variance in cost _____

Project Location (street address & city): _____

Planned Start Date (M/Y) _____ Planned Completion Date (M/Y) _____

Actual Start Date (M/Y) _____ Actual Completion Date (M/Y) _____

Reason for variance in completion date _____

Project Site Superintendent _____

Project Owner

Name and Title _____

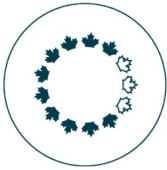
Company/Institution & Tel. No. _____

Project Consultant

Name and Title _____

Firm Name & Tel. No. _____

Project Example Checklist (to be completed by General Contractor, and illustrated in photos provided):



APPENDIX II - INVITATION TO TENDER & ACCEPTANCE FORM

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Tree Shrub & Perennial Planting:

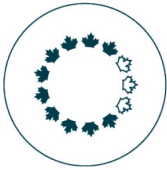
- | | | |
|--|-----|----|
| • Project example must have been in place for at least one (1) year and represent a compressive planting project, not individual species. | yes | no |
| • Root ball / mass is planted at appropriate depth / grade; no roots are exposed to the elements or visible girdling of the plant. Soil is not built up around the trunk / stem to compensate for planting too high above finished grade | yes | no |
| • Root flare is visible and not buried; mulch or soil is not piled around the root flare | yes | no |
| • Trees, shrubs, and perennials are pruned according to best horticultural practices
Tree leaders have not been pruned, no flush cuts, nursery tags have all been removed. | yes | no |
| • Tree stakes and ties (if applicable) are installed securely and are not at risk of strangling the tree trunk | yes | no |
| • Examples of contractor maintenance: i.e. watering schedule, images of installation, weeding, pruning, evidence of warranty replacements (if applicable) | yes | no |

Seed or Sod:

- | | | |
|---|-----|----|
| • Project example must have been in place for at least one (1) year | yes | no |
| • Sod seams are no longer visible, and no bare soil is exposed | yes | no |
| • Sod soil layer is buried and meets flush with adjacent soft or hardscape elements. | Yes | no |
| • Grading surface is smooth, even, true, and appropriately creates positive drainage patterns | yes | no |

Project Description, specifically elaborating on any of the items pertinent to the projects part of this request for qualification. Continue by adding a maximum of 6 pages per project, including photographs where relevant.

Submit one form per project. All fields must be completed.



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TECHNICAL QUALIFICATION FOR GENERAL CONTRACTORS

Mandatory submittal #3 –

CLIENT REFERENCE FORM FOR GENERAL CONTRACTOR PROJECT EXAMPLE # 1

This hereby confirms that the following contractor _____
executed the work for the following project to our satisfaction and that the information presented in the Project
Example submitted by the General Contractor is accurate.

Project Details:

Project name: _____

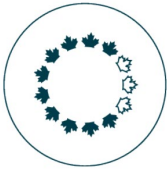
Project Location (street address & city):

I hereby certify the information provided in this client reference form to be true and factual.

Client Name Title Signature

Client Organization Name Telephone Date

All fields must be completed.



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APPENDIX II - INVITATION TO TENDER & ACCEPTANCE FORM

TECHNICAL QUALIFICATION FOR GENERAL CONTRACTORS

CLIENT REFERENCE FORM FOR GENERAL CONTRACTOR PROJECT EXAMPLE # 2

This hereby confirms that the following contractor _____
executed the work for the following project to our satisfaction and that the information presented in the Project Example submitted by the General Contractor is accurate.

Project Details:

Project name: _____

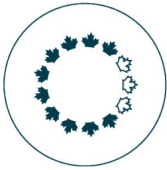
Project Location (street address & city):

I hereby certify the information provided in this client reference form to be true and factual.

Client Name	Title	Signature

Client Organization Name	Telephone	Date

All fields must be completed.



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TECHNICAL QUALIFICATION FOR GENERAL CONTRACTORS

I hereby acknowledge that the information provided is true and correct to the best of my knowledge, and that I have the authority to bind the firm:

Name

Title

Signature

Date

(Bidder) Firm's Name

- SI01 Tender Documents
- SI02 Enquiries during the Solicitation Period
- SI03 [\[Non or Mandatory\]](#) Site Visit
- SI04 Revision of Tender
- SI05 Tender Results
- SI06 Negotiations
- SI07 Tender Validity Period
- SI08 Construction Documents
- SI09 Public Tender Opening

SI01 TENDER DOCUMENTS

- 1) The following are the tender documents:

- (a) Invitation to Tender & Acceptance Form and any Appendices attached thereto;
- (b) Special Instructions to Bidders; and
- (c) General Instructions to Bidders.

Submission of a tender constitutes acknowledgement that the Bidder has read and agrees to be bound by these documents.

SI02 ENQUIRIES DURING THE SOLICITATION PERIOD

- 1) Enquiries regarding this tender must be submitted in writing to the following: Sr. Procurement Advisor Allan Lapensée e-mail address - allan.lapensee@ncc-ccn.ca as early as possible within the solicitation period. Except for the approval of alternative materials as described in GI15 of the General Instructions to Bidders, enquiries should be received no later than seven (7) business days prior to the date set for solicitation closing to allow sufficient time to provide a response. Enquiries received after that time may result in an answer not being provided.
- 2) To ensure consistency and quality of the information provided to Bidders, the Sr. Procurement Advisor shall examine the content of the enquiry and shall decide whether to issue an amendment.
- 3) All enquiries and other communications related to this tender sent throughout the solicitation period are to be directed ONLY to the Sr. Procurement Advisor named above. Non-compliance with this requirement during the solicitation period can, for that reason alone, result in disqualification of a tender.

SI03 [\[NON or MANDATORY\]](#) SITE VISIT

- 1) No site visit is scheduled

SI04 REVISION OF TENDER

- 1) A tender may be revised by email in accordance with GI10 of the General Instructions to Bidders. The email is Bids-soumissions@ncc-ccn.ca .

SI05 TENDER RESULTS

- 1) Item deleted.

SI06 NEGOTIATIONS

- 1) In the event that the highest ranked bidder exceeds the amount of funding the NCC has allocated for the construction phase of the work:
 - (a) by 15% or less, the NCC, at its sole discretion, shall either:
 - (i) cancel the invitation to tender; or
 - (ii) obtain additional funding and, subject to the provisions of GI11 and GI09 of the General Instructions to Bidders, award the Contract to the Bidder submitting the lowest compliant tender; or
 - (iii) revise the scope of the work accordingly and negotiate, with the Bidder submitting the lowest compliant tender, a corresponding reduction in its tender price.
 - (b) by more than 15%, the NCC, at its sole discretion, shall either:
 - (i) cancel the invitation to tender; or
 - (ii) obtain additional funding and, subject to the provisions of GI11 and GI09 of the General Instructions to Bidders, award the Contract to the Bidder submitting the lowest compliant tender; or
 - (iii) revise the scope of the work accordingly and invite those who submitted compliant tenders at the original invitation to tender to re-tender the work.
- 2) If negotiations or a re-tender are undertaken as is contemplated in subparagraphs 1)(a)(iii) or 1)(b)(iii) above, Bidders shall retain the same subcontractors and suppliers as they carried in their original tenders.
- 3) If the NCC elects to negotiate a reduction in the tender price as is contemplated in subparagraph 1)(a)(iii) herein and the negotiations fail to reach an agreement, the NCC shall then exercise either of the options referred to subparagraphs 1)(a)(i) or 1)(a)(ii).

SI07 TENDER VALIDITY PERIOD

- 1) The NCC reserves the right to seek an extension to the tender validity period prescribed in 3 of the Invitation to Tender & Acceptance Form. Upon notification in writing from the NCC, Bidders shall have the option to either accept or reject the proposed extension.
- 2) If the extension referred to in paragraph 1) of SI07 is accepted, in writing, by all those who submitted tenders, then the NCC shall continue immediately with the evaluation of the tenders and its approvals processes.
- 3) If the extension referred to in paragraph 1) of SI07 is not accepted in writing by all those who submitted tenders then the NCC shall, at its sole discretion, either:
 - (a) continue to evaluate the tenders of those who have accepted the proposed extension and seek the necessary approvals; or
 - (b) cancel the invitation to tender.
- 4) The provisions expressed herein do not in any manner limit the NCC's rights in law or under GI11 of the General Instructions to Bidders.

SI08 CONSTRUCTION DOCUMENTS

- 1) The successful contractor will be provided with one paper copy of the sealed and signed plans, the specifications and the amendments upon acceptance of the offer. Additional copies, may be available free of charge upon request by the contractor. If not, obtaining more copies shall be the responsibility of the contractor including costs.

SI09 PUBLIC TENDER OPENING

- 1) No public opening is scheduled.

- GI01 Completion of Tender
- GI02 Identity or Legal Capacity of the Bidder
- GI03 Goods and Services Tax / Harmonized Sales Tax
- GI04 Québec Sales Tax
- GI05 Capital Development and Redevelopment Charges
- GI06 Registry and Pre-qualification of Floating Plant
- GI07 Listing of Subcontractors and Suppliers
- GI08 Tender Security Requirements
- GI09 Submission of Tender
- GI10 Revision of Tender
- GI11 Acceptance of Tender
- GI12 Procurement Business Number
- GI13 Bid Depository
- GI14 Compliance with Applicable Laws
- GI15 Approval of Alternative Materials
- GI16 Performance Evaluation

GI01 Completion of Tender

- 1) The tender shall be:
 - (a) submitted on the Invitation to Tender and Acceptance Form provided through the Government Electronic Tendering Service (GETS) or on a clear and legible reproduced copy of such Invitation to Tender and Acceptance Form that must be identical in content and format to the Invitation to Tender and Acceptance Form provided through GETS or provided by the NCC;
 - (b) based on the Tender Documents listed in the Special Instructions to Bidders;
 - (c) correctly completed in all respects;
 - (d) signed by a duly authorized representative of the Bidder; and
 - (e) accompanied by
 - (i) tender security as specified in GI08; and
 - (ii) any other document or documents specified elsewhere in the solicitation where it is stipulated that said documents are to accompany the tender.
- 2) Subject to paragraph 6) of GI11, any alteration to the pre-printed or pre-typed sections of the Invitation to Tender and Acceptance Form, or any condition or qualification placed upon the tender shall be cause for disqualification. Alterations, corrections, changes or erasures made to statements or figures entered on the Invitation to Tender and Acceptance Form by the Bidder shall be initialed by the person or persons signing the tender. Initials shall be original(s). Alterations, corrections, changes or erasures that are not initialed shall be deemed void and without effect.
- 3) Unless otherwise noted elsewhere in the Tender Documents, facsimile copies of tenders are not acceptable.

GI02 Identity or Legal Capacity of the Bidder

- 1) In order to confirm the authority of the person or persons signing the tender or to establish the legal capacity under which the Bidder proposes to enter into Contract, any Bidder who carries on business in other than its own personal name shall, if requested by the NCC prior to award of contract, provide satisfactory proof of:

- (a) such signing authority; and
- (b) the legal capacity under which it carries on business.

Proof of signing authority may be in the form of a certified copy of a resolution naming the signatory(ies) that is (are) authorized to sign this tender on behalf of the corporation or partnership. Proof of legal capacity may be in the form of a copy of the articles of incorporation or the registration of the business name of a sole proprietor or partnership.

GI03 Goods and Services Tax / Harmonized Sales Tax

- 1) The National Capital Commission (NCC) is a Crown Corporation subject to the Goods and Services Tax (GST), the Ontario Provincial Sales Tax (OST) and the Quebec Sales Tax (QST). The rates quoted are exclusive of the GST and the OST/QST. The successful firm will be required to indicate separately, on all invoices or requests for payments, the amount of Goods and Services Sales Tax (GST), the amount of Ontario Sales Tax (OST) and the amount of Quebec Sales Tax (QST), to the extent applicable, that the Commission must pay. These amounts will be paid to the successful Bidder who is required to make the appropriate remittances to Revenue Canada and the respective provincial governments.

Pursuant to paragraph 221 (1)(d) of the Income Tax Act, payments made by Crown Corporations under applicable service contracts (including contracts involving a mix of goods and services) must be reported on a “T1204” slip. To comply with this requirement, the Bidder is required to provide the following information on the “Supplier – Direct Payment and Tax Information Form” .

This “Supplier – Direct Payment and Tax Information Form” must be completed and returned to the Commission prior to any contract being awarded to your firm.

GI04 Quebec Sales Tax

- 1) See GI03.

GI05 Capital Development and Redevelopment Charges

- 1) For the purposes of GC1.8 LAWS, PERMITS AND TAXES in the General Conditions of the Contract, only fees or charges directly related to the processing and issuing of building permits shall be included. The Bidder shall not include any monies in the tender amount for special municipal development, redevelopment or other fees or charges which a municipal authority may seek as a prerequisite to the issuance of building permits.

GI06 Registry and Pre-qualification of Floating Plant

- 1) Dredges or other floating plant to be used in the performance of the Work must be on Canadian registry. For dredges or other floating plant that are not of Canadian make or manufacture, the Bidder must obtain a certificate of qualification from Industry Canada, if applicable, and this certificate must accompany the tender. Plant so qualified by Industry Canada may be accepted on this project.

GI07 Listing of Subcontractors and Suppliers

- 1) Notwithstanding any list of Subcontractors that the Bidder shall be required to submit as part of the tender, the Bidder submitting the lowest acceptable tender shall, within 24 hours of receipt of a notice to do so, submit all information requested in the said notice including the names of Subcontractors and Suppliers for the part or parts of the Work listed. Failure to do so may result in the disqualification of its tender.

GI08 Tender Security Requirements

- 1) The Bidder shall submit tender security with the tender in the form of a bid bond or a security deposit in an amount that is equal to not less than 10% of the tender amount including all applicable taxes.

The maximum amount of tender security required with any tender is \$2,000,000.00.

- 2) A bid bond shall be in an approved form, properly completed, with original signature(s) and issued by an approved company whose bonds are acceptable to the NCC either at the time of solicitation closing or as identified on the list displayed at the following Website:

<http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=12027>

The approved form for the bid bond is enclosed at the end of this section.

- 3) A security deposit shall be an original, properly completed, signed where required and be either:
 - (a) a bill of exchange, bank draft or money order payable to the NCC;
 - (b) bonds of, or unconditionally guaranteed as to principal and interest by, the Government of Canada; or
- 4) A bill of exchange, bank draft or money order referred to in subparagraph 3)(a) of GI08 shall be certified by or drawn on:
 - (a) a corporation or institution that is a member of the Canadian Payments Association;
 - (b) a corporation that accepts public deposits and repayment of the deposits is unconditionally guaranteed by Her Majesty in right of a province;
 - (c) a corporation that accepts deposits that are insured by the Canada Deposit Insurance Corporation or the "Régie de l'assurance-dépôts du Québec" to the maximum permitted by law;
 - (d) a corporation, association or federation incorporated or organized as a credit union or cooperative credit society that conforms to the requirements of a credit union which are more particularly described in paragraph 137 (6)(b) of the *Income Tax Act*; or
 - (e) Canada Post Corporation.
- 5) If a bill of exchange, bank draft or money order is drawn on an institution or corporation other than a chartered bank, it must be accompanied by proof that the said institution or corporation meets at least one of the criteria described in paragraph 4) of GI08, either by letter or by a stamped certification on the bill of exchange, bank draft, or money order.
- 6) For the purposes of this section, a bill of exchange is an unconditional order in writing signed by the Bidder and addressed to an approved financial institution, requiring the said institution to pay, on demand, at a fixed or determinable time, a certain sum of money to, or to the order of, the NCC.

- 7) Bonds referred to in subparagraph 3)(b) of GI08 shall be provided on the basis of their market value current at the date of solicitation closing, and shall be:
 - (a) payable to bearer;
 - (b) accompanied by a duly executed instrument of transfer of the bonds to the NCC in the form prescribed by the Domestic Bonds of Canada Regulations; or
 - (c) registered as to principal or as to principal and interest in the name of the NCC pursuant to the Domestic Bonds of Canada Regulations.
- 8) As an alternative to a security deposit an irrevocable standby letter of credit is acceptable to the NCC and the amount shall be determined in the same manner as a security deposit referred to above.
- 9) An irrevocable standby letter of credit referred to in paragraph 8) of GI08 shall:
 - (a) be an arrangement, however named or described, whereby a financial institution (the “Issuer”) acting at the request and on the instructions of a customer (the “Applicant”) or on its own behalf:
 - (i) is to make a payment to, or to the order of, the NCC as the beneficiary;
 - (ii) is to accept and pay bills of exchange drawn by the NCC;
 - (iii) authorizes another financial institution to effect such payment or accept and pay such bills of exchange; or
 - (iv) authorizes another financial institution to negotiate against written demand(s) for payment provided that the terms and conditions of the letter of credit are complied with.
 - (b) state the face amount which may be drawn against it;
 - (c) state its expiry date;
 - (d) provide for sight payment to the NCC by way of the financial institution’s draft against presentation of a written demand for payment signed by the NCC Contract Administrator identified in the letter of credit by his/her office;
 - (e) provide that more than one written demand for payment may be presented subject to the sum of those demands not exceeding the face value of the letter of credit;
 - (f) provide that it is subject to the International Chamber of Commerce (ICC) Uniform Customs and Practice for Documentary Credits, 2007 Revision, ICC Publication No. 600;
 - (g) clearly specify that it is irrevocable or deemed to be irrevocable pursuant to article 6 c) of the International Chamber of Commerce (ICC) Uniform Customs and Practice for Documentary Credits, 2007 Revision, ICC Publication No. 600; and
 - (h) be issued or confirmed, in either official language, by a financial institution which is a member of the Canadian Payments Association and is on the letterhead of the Issuer or Confirmer. The format is left to the discretion of the Issuer or Confirmer.
- 10) Tender security shall lapse or be returned as soon as practical following:
 - (a) the solicitation closing date, for those Bidders submitting non-compliant tenders; and

- (b) the administrative tender review, for those Bidders submitting compliant tenders ranked fourth to last on the schedule of tenders; and
 - (c) the award of contract, for those Bidders submitting the second and third ranked tenders; and
 - (d) the receipt of contract security for the successful Bidder; or
 - (e) the cancellation of the solicitation, for all Bidders.
- 11) Notwithstanding the provisions of paragraph 10) of GI08 and provided more than three (3) compliant tenders have been received, if one or more of the tenders ranked third to first is withdrawn or rejected for whatever reason, then the NCC reserves the right to hold the security of the next highest ranked compliant tender in order to retain the tender security of at least three (3) valid and compliant tenders.

GI09 Submission of Tender

- 1) The Invitation to Tender and Acceptance Form, duly completed with the bid security, shall be addressed and submitted to the Bid email designated on the front page of the Invitation to Tender and Acceptance Form for the receipt of tenders.
- 2) Unless otherwise specified in the Special Instructions to Bidders:
 - (a) the tender shall be in Canadian currency;
 - (b) exchange rate fluctuation protection is not offered; and
 - (c) any request for exchange rate fluctuation protection shall not be considered.
- 3) Timely and correct delivery of the tender is the sole responsibility of the Bidder. The tender must be received on or before the date and time set for solicitation closing. Late tenders shall be disqualified.

GI10 Revision of Tender

- 1) A tender submitted in accordance with these instructions may be revised by email (Bids-soumissions@ncc-ccn.ca) provided the revision is received on or before the date and time set for the closing of the solicitation. The revision shall:
 - (a) be on the Bidder's letterhead or bear a signature that identifies the Bidder;
 - (b) for the Total Bid Amount, clearly identify the amount of the current revision. The total aggregate sum of all revisions submitted, including the current revision, shall be shown separately; and
 - (c) for the Price per unit portion of a tender, clearly identify the current revision(s) to the Price(s) per unit and the specific item(s) to which each revision applies. If a revision is to be applied to a specific Item that was previously amended then, in addition to the amount of the current

revision, the total aggregate sum of all revisions submitted, including the current revision, for that Item shall be shown separately.

- 2) A email submitted to confirm an earlier revision shall be clearly identified as "CONFIRMATION ONLY", for each contemplated change.
- 3) Failure to comply with any of the above provisions shall result in the rejection of the non-compliant revision(s) only. The tender shall be evaluated based on the original tender submitted and all other compliant revision(s).

GI11 Acceptance of Tender

- 1) The NCC may accept any tender, whether it is the lowest or not, or may reject any or all tenders.
- 2) Without limiting the generality of paragraph 1) of GI11, the NCC may reject a tender if any of the following circumstances are present:
 - (a) the Bidder, or any employee or subcontractor included as part of the tender, have been convicted under section 121 ("Frauds on the government" & "Contractor subscribing to election fund"), 124 ("Selling or purchasing office"), 380 (Fraud committed against Her Majesty) or 418 ("Selling defective stores to Her Majesty") of the Criminal Code of Canada, or under paragraph 80(1)(d) (False entry, certificate or return), subsection 80(2) (Fraud against her Majesty) or Section 154.01 (Fraud against her Majesty) of the Financial Administration Act;
 - (b) the Bidder's bidding privileges are suspended or are in the process of being suspended;
 - (c) the bidding privileges of any employee or subcontractor included as part of the tender are suspended or are in the process of being suspended, which suspension or pending suspension would render that employee or subcontractor ineligible to tender on the Work, or the portion of the Work the employee or subcontractor is to perform;
 - (d) with respect to current or prior transactions with the NCC
 - (i) the Bidder is bankrupt or if, for whatever reason, its activities are rendered inoperable for an extended period;
 - (ii) evidence, satisfactory to the NCC, of fraud, bribery, fraudulent misrepresentation or failure to comply with any law protecting individuals against any manner of discrimination, has been received with respect to the Bidder, any of its employees or any subcontractor included as part of its tender;
 - (iii) the NCC has exercised, or intends to exercise, the contractual remedy of taking the work out of the contractor's hands with respect to a contract with the Bidder, any of its employees or any subcontractor included as part of its tender; or
 - (iv) the NCC determines that the Bidder's performance on other contracts is sufficiently poor to jeopardize the successful completion of the requirement being tendered on.
- 3). In assessing the Bidder's performance on other contracts pursuant to subparagraph 2)(d)(iv) of GI11, the NCC may consider, but not be limited to, such matters as:
 - (a) the quality of workmanship in performing the Work;
 - (b) the timeliness of completion of the Work;

- (c) the overall management of the Work and its effect on the level of effort demanded of the NCC and its representative; and
 - (d) the completeness and effectiveness of the Contractor's safety program during the performance of the Work.
- 4) Without limiting the generality of paragraphs 1), 2) and 3) of GI11, the NCC may reject any based on an unfavourable assessment of the:
- (a) adequacy of the tender price to permit the work to be carried out and, in the case of a tender providing prices per unit, whether each such price reasonably reflects the cost of performing the part of the work to which that price applies;
 - (b) Bidder's ability to provide the necessary management structure, skilled personnel, experience and equipment to perform competently the work under the Contract; and
 - (c) Bidder's performance on other contracts.
- 5) If the NCC intends to reject a tender pursuant to a provision of paragraphs 1), 2), 3) or 4) of GI11, other than subparagraph 2)(b) of GI11, the NCC shall so inform the Bidder and provide the Bidder ten (10) days within which to make representation, prior to making a final decision on the tender rejection.
- 6) The NCC may waive informalities and minor irregularities in tenders received, if the NCC determines that the variation of the tender from the exact requirements set out in the Tender Documents can be corrected or waived without being prejudicial to other Bidders.

GI12 Procurement Business Number

- 1) Not applicable.

GI13 Bid Depository

- 1) If the solicitation advertisement states that a Bid Depository shall be used, the Bidder shall obtain bids in accordance with local Bid Depository rules and procedures.

GI14 Compliance with Applicable Laws

- 1) By submission of a tender, the Bidder certifies that the Bidder has the legal capacity to enter into a contract and is in possession of all valid licences, permits, registrations, certificates, declarations, filings, or other authorizations necessary to comply with all federal, provincial and municipal laws and regulations applicable to the submission of the tender and entry into any ensuing contract for the performance of the work.
- 2) For the purpose of validating the certification in paragraph 1) of GI14, a Bidder shall, if requested, provide a copy of every valid licence, permit, registration, certificate, declaration, filing or other authorization listed in the request, and shall provide such documentation within the time limit(s) set out in the said request.
- 3) Failure to comply with the requirements of paragraph 2) of GI14 shall result in the disqualification of the tender.

GI15 Approval of Alternative Materials

- 1) When materials are specified by trade names or trademarks, or by manufacturers' or suppliers' names, the tender shall be based on use of the named materials. During the solicitation period,

alternative materials may be considered provided full technical data is received in writing by the Contracting Officer at least seven (7) calendar days, unless otherwise noted in the Tender documents, prior to the solicitation closing date. If the alternative materials are approved for the purposes of the tender, an addendum to the tender documents shall be issued.

GI16 Performance Evaluation

- 1) Bidders shall take note that the performance of the Contractor during and upon completion of the work shall be evaluated by the NCC. The evaluation shall be based on the quality of workmanship, timeliness of completion of the work, project management, contract management and management of health and safety. Should the Contractor's performance be considered unsatisfactory, the Contractor's bidding privileges on future work may be suspended indefinitely. Contractor Evaluation Report Form is enclosed at the end of this section.

BID BOND

Bond Number _____

Amount \$ _____

KNOW ALL MEN BY THESE PRESENTS, that _____ as Principal, hereinafter called the Principal, and _____ as Surety, hereinafter called the Surety, are, subject to the conditions hereinafter contained, held and firmly bound unto the National Capital Commission as Oblige, hereinafter called the NCC, In the amount of _____ dollars (\$ _____), lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

SIGNED AND SEALED this _____ day of _____, _____. WHEREAS, the Principal has submitted a written tender to the NCC, dated the _____ day of _____, _____, for: _____.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION are such that if:

- (a) The Principal, should his tender be accepted within the period be specified by the NCC, or, if no period be specified, within sixty (60) days after closing date of the tender:
 - 1. does execute within a period specified by the NCC, or, if no period be specified therein, within fourteen (14) days after the prescribed forms are presented to him for signature, execute such further contractual documents, if any, as may be required by the terms of the tender as accepted; and does
 - 2. furnish a Performance Bond and a Labour and Material Payment Bond, each in the amount of 50% of the Contract price and satisfactory to the NCC, or other security acceptable to the NCC; or
- (b) the Principal does pay to the NCC the difference between the amount of the Principal's tender and the amount of the Contract entered into by the NCC for the work, supplies and services which were specified in the said tender, if the latter amount be in excess of the former,

then, this obligation shall be void; otherwise it shall remain in full force and effect.

PROVIDED, HOWEVER, that the Surety and the Principal shall not be liable to the NCC for an amount greater than the amount specified in the bond.

PROVIDED FURTHER that the Surety shall not be subject to any suit or action unless such suit or action is instituted and process therefore served upon the Surety at its Head Office in Canada, within twelve (12) months from the date of this bond.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its authorized signing authority, the day and first above written.

SIGNED, SEALED AND DELIVERED in the presence of:

Principal _____

Witness _____

Surety _____

Note: Affix Corporate seal if applicable.

Date	Contract no. / No du contrat
Description of work / Description des travaux	
Contractor's business name / Nom de l'entreprise de l'entrepreneur	Contractor's site superintendent / Contremaître de l'entrepreneur
Contractor's business address / Adresse de l'entreprise de l'entrepreneur	

NCC representative / Représentant de la CCN		
Name / Nom	Telephone no. / N°. de téléphone	E-mail address / Adresse électronique

Contract information / Information sur le contrat	
Contract award amount / Montant du marché adjugé	Contract award date / Date de l'adjudication du marché
Final amount / Montant final	Actual contract completion date / Date réelle d'achèvement du contrat
Number of change orders / Nombre d'ordres de changement	Final certificate date / Date du certificat final

Quality of workmanship / Qualité des travaux exécutés	Category / Catégorie	Scale / Échelle	Points / Pointage
<p>This is the rating of the quality of the workmanship. At final completion the quality of the materials and equipment incorporated in the work must meet the requirements set out in the plans and specifications.</p> <p>Il s'agit de l'évaluation de la qualité des travaux exécutés. À l'achèvement des travaux, la qualité des matériaux et de l'équipement doit satisfaire les exigences établies dans les plans et devis.</p>	Unacceptable / Inacceptable	0 – 5	<div style="border: 1px solid black; width: 60px; height: 60px; margin: auto;"></div>
	Not satisfactory / Non-satisfaisant	6 – 10	
	Satisfactory / Satisfaisant	11 – 16	
	Superior / Supérieur	17 - 20	

Time / Délai d'exécution	Category / Catégorie	Scale / Échelle	Points / Pointage
<p>This is the rating of the timeliness of completion considering the actual completion date compared with the original (or amended) contract completion date and allowing for conditions beyond the control of the contractor.</p> <p>Il s'agit de l'évaluation du délai d'exécution des travaux en prenant en considération la date actuelle d'achèvement des travaux par rapport à la date originale (ou modifiée) et en tenant compte des conditions indépendantes de la volonté de l'entrepreneur.</p>	Unacceptable / Inacceptable	0 – 5	<div style="border: 1px solid black; width: 60px; height: 60px; margin: auto;"></div>
	Late / En retard	6 – 10	
	On time / À temps	11 – 16	
	Ahead of schedule / En avance sur le calendrier	17 - 20	

Project management / Gestion de projet	Category / Catégorie	Scale / Échelle	Points / Pointage
<p>This is the rating of how the project, as described in the drawings and specifications, was managed including co-ordination, quality control, effective schedule development and implementation.</p> <p>Voici l'évaluation de la façon dont le projet décrit dans les documents contractuels a été géré, y compris la coordination, le contrôle de la qualité, l'élaboration d'un calendrier efficace et la mise en œuvre.</p>	Unacceptable / Inacceptable	0 – 5	<div style="border: 1px solid black; width: 60px; height: 60px; margin: auto;"></div>
	Not satisfactory / Non-satisfaisant	6 – 10	
	Satisfactory / Satisfaisant	11 – 16	
	Superior / Supérieur	17 - 20	
	Criteria not applicable / Critère non-applicable		

Contract management / Gestion de contrat	Category / Catégorie	Scale / Échelle	Points / Pointage
<p>This is the rating of how the contract was administered in accordance with the provisions expressed in the "front end" portion of the documents.</p> <p>Voici l'évaluation de la façon dont le contrat a été administré conformément aux dispositions comprises dans la partie « prioritaire » des documents.</p>	Unacceptable / Inacceptable	0 – 5	<div style="border: 1px solid black; width: 60px; height: 60px; margin: auto;"></div>
	Not satisfactory / Non-satisfaisant	6 – 10	
	Satisfactory / Satisfaisant	11 – 16	
	Superior / Satisfaisant	17 - 20	
	Criteria not applicable / Critère non-applicable		

Health and safety / Santé et sécurité	Category / Catégorie	Scale / Échelle	Points / Pointage
<p>This is the rating of the effectiveness of how the occupational health and safety provisions (whether identified in the contract or those of provincial legislation or those otherwise applicable) were managed and administered.</p> <p>Voici l'évaluation de l'efficacité avec laquelle les dispositions relatives à la santé et à la sécurité au travail (dans le contrat, dans les règlements provinciaux ou dans tout autre document) ont été gérées et administrées.</p>	Unacceptable / Inacceptable	0 – 5	<div style="border: 1px solid black; width: 60px; height: 60px; margin: auto;"></div>
	Not satisfactory / Non-satisfaisant	6 – 10	
	Satisfactory / Satisfaisant	11 – 16	
	Superior / Satisfaisant	17 - 20	

Total points / Pointage total **/100**

Comments / Commentaires			

Name / Nom	Title / Titre	Signature	Date

INSTRUCTIONS AND ADDITIONAL INFORMATION (Contractor Performance Evaluation Report)
INSTRUCTIONS ET RENSEIGNEMENTS SUPPLÉMENTAIRES (Rapport d'évaluation du rendement de l'entrepreneur)

QUALITY OF WORKMANSHIP – QUALITÉ DES TRAVAUX EXÉCUTÉS

The NCC representative is to consider how the workmanship compares with:

- the norms in the area in which the work was carried out
- the contractor's compliance with any quality provisions outlined in the drawings and specification
- the quality of workmanship provided by other contractors on similar projects in the same facility/facilities

Le représentant de la CCN doit évaluer la qualité de l'exécution en fonction de ce qui suit :

- le respect des normes s'appliquant aux travaux réalisés
- la conformité de l'entrepreneur aux exigences de qualité comprises dans les dessins et dans les devis
- la qualité de l'exécution des travaux accomplis par d'autres entrepreneurs dans le cadre de projets similaires réalisés dans la même installation ou dans des installations semblables.

TIME / DÉLAIS D'EXÉCUTION

For the purpose of evaluation the contractor's time performance, consideration must be given to conditions beyond the contractor's control including NCC / Consultant / Client performance.

Afin d'évaluer le rendement de l'entrepreneur en matière de délai d'exécution, on doit prendre en considération les conditions indépendantes de la volonté de l'entrepreneur, y compris le rendement de la CCN, de l'expert-conseil et du client.

Consider conditions beyond the contractor's control, e.g.,

Prendre en considération les conditions indépendantes de la volonté de l'entrepreneur, par exemple :

- availability of, and access to the site
- changes in soil or site conditions
- weather extremes
- strikes
- material / equipment supply problems originating from manufacturers/suppliers
- quality of plans and specifications
- major change(s) in scope
- cumulative effect of changes
- was the NCC able to meet its obligations?
- timely decisions, clarifications, approvals, payments in due time
- delays caused by other contractors in the same facility

- disponibilité du chantier et accès au chantier
- modifications des conditions du sol ou du chantier
- température
- grèves
- problèmes d'approvisionnement en matériel et en équipement provenant des manufacturiers/fournisseurs
- qualité des plan et devis
- modifications importantes à l'étendue des travaux
- effets cumulatifs des modifications
- la CCN a-t-elle été capable de remplir ses obligations?
- décisions, clarifications, approbations, paiements en temps opportun
- les retards occasionnés par d'autres entrepreneurs travaillant dans la même installation.

The NCC representative's estimate of a reasonable maximum time allowance resulting from conditions beyond the contractor's control is

L'estimation, par le représentant de la CCN, du temps maximum alloué pour les conditions indépendantes de la volonté de l'entrepreneur est ▶

The period of delay attributable to the contractor is

La période de retard attribuable à l'entrepreneur est ▶

Did the contractor make an effective effort / Est-ce que l'entrepreneur s'est efforcé :

- | | | | |
|---|---|-------------------------------------|------------------------------------|
| - to meet the schedule / de respecter l'échéancier des travaux | ▶ | <input type="checkbox"/> Yes
Oui | <input type="checkbox"/> No
Non |
| - to clean up deficiencies in a reasonable time / de corriger les vices dans un délai raisonnable | ▶ | <input type="checkbox"/> Yes
Oui | <input type="checkbox"/> No
Non |
| Have you recommended assessments and damages for late completion under the contract?
Avez-vous recommandé des dédommagements pour retard d'exécution aux termes du marché? | ▶ | <input type="checkbox"/> Yes
Oui | <input type="checkbox"/> No
Non |

PROJECT MANAGEMENT / GESTION DU PROJET

The extent to which the contractor takes charge of and effectively manages the work has a direct effect on the inputs required of the NCC.

La mesure dans laquelle l'entrepreneur assume efficacement la gestion des travaux a une incidence directe sur les services qu'on attend de la CCN.

Consideration should be given to: Did the contractor

Il faut examiner si l'entrepreneur a :

- | | |
|--|--|
| <ul style="list-style-type: none"> - employ a knowledgeable site superintendent - required additional input from the NCC staff above that which is normal for a project of similar size and nature - promptly commence the work - provide realistic schedules and updates in accordance with the terms of the contract - provide a comprehensive work plan and adhere to its milestones - order material promptly and in such a way as to expedite the progress of the work - provide shop drawings promptly and were they of sufficient detail | <ul style="list-style-type: none"> - fait appel aux services d'un surintendant de chantier expérimenté - demandé au personnel de la CCN une plus grande contribution que ce qui est normal pour un projet de cette importance et de cette nature - commencé les travaux dans les plus brefs délais - fourni un calendrier réaliste et des mises à jour conformément aux modalités du contrat - présenté un plan de travail complet et a respecté les échéances - commandé le matériel rapidement et de façon à accélérer l'avancement des travaux. - fourni rapidement des dessins d'atelier comprenant suffisamment de détails |
|--|--|

PROJECT MANAGEMENT (cont'd) / GESTION DU PROJET (suite)

- effectively manage and complete all Division 1 work site activities
- promptly provide reasonable quotations for changes to the original scope of work
- cooperate when issued directions by the NCC representative
- interpret the contract documents accurately
- establish effective quality control procedures
- effectively coordinate and manage the work of its subcontractors
- promptly correct defective work as the project progressed
- promptly clean-up all deficiencies and incomplete work after issuance of the Interim Certificate of Completion
- satisfactorily clean the work site periodically and at the completion of the project
- g r  et achev  efficacement toutes les activit s sur le chantier de la Division 1
- propos  rapidement des prix raisonnables pour les modifications   l' nonc  des travaux initial
- accept  les directives du repr sentant de la CCN
- interpr t  les documents contractuels avec exactitude
- mis en place des proc dures de contr le de la qualit  efficaces
- coordonn  et g r  efficacement les travaux confi s   des sous-traitants
- corrig  promptement le travail d fectueux en cours de projet
- corrig  rapidement les travaux non acceptables et termin  les travaux incomplets apr s r ception du certificat provisoire d'ach vement
- nettoy  de fa on satisfaisante le chantier p riodiquement ainsi qu'  la fin du projet.

CONTRACT MANAGEMENT / GESTION DU CONTRAT

The effectiveness of the contractor to administer the contract in accordance with the provisions expressed in the "front end" portion of the contract documents.

Consideration should be given to: Did the contractor

- in the time frame specified, provide its contract security, Insurance Certificate fully executed and WSIB form where applicable
- submit progress claims in the correct format, accurately representing the work successfully completed and material delivered to the site but not yet installed for each payment period
- submit a Statutory Declaration correctly completed with each progress claim
- submit an updated Schedule if so specified
- pay subcontractors and suppliers in a timely fashion in accordance with the terms and conditions of its subcontracts
- promptly appoint a competent site superintendent
- notify the NCC representative of all its subcontracting activities
- apply for, obtain and pay for all necessary permits, licenses and certificates
- cooperate with other contractors sent onto the site of the work
- remove a superintendent or unsuitable worker when requested by the NCC representative to do so
- effectively protect the work and the contract documents provided by the NCC
- comply with all warranty provisions up to the date of the Contractor Performance Evaluation Report Form (CPERF)
- effectively manage the site during a suspension or termination of the work to mitigate any additional costs to the NCC
- deal promptly with any claims from creditors
- maintain complete records of the project
- provide information promptly when requested to do so
- expedite and co-operate in the settlement of all disputes

Efficacit  avec laquelle l'entrepreneur a administr  le contrat conform ment aux dispositions continues dans la partie « prioritaire » des documents contractuels.

Il faut examiner si l'entrepreneur a :

- fourni, dans le d lai prescrit, une garantie contractuelle, un certificat d'assurance d ment sign s et le formulaire de la CSST, le cas  ch ant
- pr sent  des r clamations p riodiques dans le bon format, en d crivant avec pr cision les travaux ex cut s et le mat riel livr  sur le chantier mains non encore install , pour chaque p riode de paiement
- pr sent  une d claration solennelle correctement remplie avec chaque r clamation p riodique
- fourni un calendrier   jour, sur demande
- pay  rapidement les sous-traitants et les fournisseurs conform ment aux conditions des contrats de sous-traitance
- d sign  dans les plus brefs d lais un surintendant de chantier qualifi 
- tenu au courant le repr sentant de la CCN de toutes les activit s de sous-traitance
- demand , obtenu et pay  tous les permis, licences et certificats n cessaires
- collabor  avec les autres entrepreneurs envoy s sur le lieu des travaux
- remplac  un surintendant ou un travailleur inapte   la demande du repr sentant de la CCN
- prot g  efficacement les travaux et les documents relativement aux travaux et au contrat fournis par la CCN
- respect  toutes les dispositions de garantie jusqu'  la date du Formulaire Rapport d' valuation du rendement de l'entrepreneur (FRERE)
- g r  efficacement le chantier pendant une suspension des travaux ou lors de leur ach vement, afin de limiter tout co t suppl mentaire pour la CCN
- trait  dans les plus brefs d lais les demandes de paiement des cr anciers
- tenu des dossiers complets sur le projet
- fourni promptement les renseignements demand s
- acc l re et coop re dans le r glement des diff rends

HEALTH AND SAFETY / SANTÉ ET SÉCURITÉ

The effectiveness to which the contractor managed and administered the occupational health and safety provisions as stipulated in the contract documents and those required by provincial legislation or those that would otherwise be applicable to the site of the work.

Consideration should be given to: Did the contractor

- provide the NCC with a copy of its health and safety program prior to award of contract
- provide the NCC with a copy of its site specific hazardous assessment prior to award of contract
- apply for and obtain the provincial Notice of Project prior to commencement of the work
- apply for and obtain the Building Permit prior to commencement of the work
- provide a competent superintendent who
 - is qualified in health and safety matters because of her/his knowledge, training and experience
 - is familiar with the OH&S Act and its Regulations that apply to the site of the work
 - remedies any potential or actual danger of health and safety to those employed at the work site
- respond in a timely manner to any non-compliance safety issues noted by the NCC or a representative of the authority having jurisdiction
- implement its safety program in a proactive manner

Efficacité avec laquelle l'entrepreneur a géré et administré les dispositions relatives à la santé et à la sécurité au travail telles que stipulées dans les documents contractuels et dans les règlements provinciaux ou ceux s'appliquant normalement au lieu des travaux.

Il faut examiner si l'entrepreneur a :

- fourni à la CCN une copie de son programme en matière de santé et de sécurité avant l'octroi du contrat
- fourni à la CCN une copie de son évaluation des dangers pouvant survenir sur les lieux avant l'octroi du contrat
- demandé et obtenu l'avis de projet provincial avant le début des travaux
- demandé et obtenu le permis de construction avant le début des travaux
- engagé un surintendant qui :
 - est qualifié en matière de santé et de sécurité de par ses connaissances, sa formation et son expérience
 - connaît bien les dispositions de la Loi sur la santé et la sécurité au travail et de son règlement qui s'applique sur le lieu des travaux
 - remédie à tout danger possible ou réel en matière de santé et de sécurité pouvant toucher toutes les personnes travaillant sur le lieu des travaux
- traité rapidement tous les problèmes de non-conformité à la sécurité relevés par la CCN ou par un représentant de l'autorité qui a juridiction
- mis en œuvre son programme de sécurité de façon proactive

- GC1.1 INTERPRETATION
 - GC1.1.1 Headings and References
 - GC1.1.2 Terminology
 - GC1.1.3 Application of Certain Provisions
 - GC1.1.4 Substantial Performance
 - GC1.1.5 Completion
- GC1.2 CONTRACT DOCUMENTS
 - GC1.2.1 General
 - GC1.2.2 Order of Precedence
 - GC1.2.3 Security and Protection of Documents and Work
- GC1.3 STATUS OF THE CONTRACTOR
- GC1.4 RIGHTS AND REMEDIES
- GC1.5 TIME OF THE ESSENCE
- GC1.6 INDEMNIFICATION BY CONTRACTOR
- GC1.7 INDEMNIFICATION BY the NCC
- GC1.8 LAWS, PERMITS AND TAXES
- GC1.9 WORKERS' COMPENSATION
- GC1.10 NATIONAL SECURITY
- GC1.11 UNSUITABLE WORKERS
- GC1.12 PUBLIC CEREMONIES AND SIGNS
- GC1.13 CONFLICT OF INTEREST
- GC1.14 AGREEMENTS AND AMENDMENTS
- GC1.15 SUCCESSION
- GC1.16 ASSIGNMENT
- GC1.17 NO BRIBE
- GC1.18 CERTIFICATION - CONTINGENCY FEES
- GC1.19 INTERNATIONAL SANCTIONS

GC1.1 INTERPRETATION

GC1.1.1 Headings and References

- 1) The headings in the contract documents, other than those in the drawings and specifications, form no part of the Contract but are inserted for convenience of reference only.
- 2) A reference made to a part of the Contract by means of numbers preceded by letters is a reference to the particular part of the Contract that is identified by that combination of letters and numbers and to any other part of the Contract referred to therein.
- 3) A reference to a paragraph or subparagraph followed by an identifying number, letter or combination thereof is, unless specifically stated otherwise, a reference to the paragraph or subparagraph that forms part of the clause within which the reference is made.

GC1.1.2 Terminology

- 1) In the Contract

"Contract" means the contract documents referred to as such therein and every other document specified or referred to in any of them as forming part of the Contract, all as amended by agreement of the parties;

"Contract Amount" means the amount set out in the Contract to be payable to the Contractor for the Work, subject to the terms and conditions of the Contract;

"Contract Security" means any security given by the Contractor to the NCC in accordance with the Contract;

"Contractor" means the person contracting with the NCC to provide or furnish all labour, Material and Plant for the execution of the Work under the Contract, and includes the Contractor's superintendent as designated in writing to the NCC;

"Certificate of Completion" means a certificate issued by the NCC when the Work reaches Completion;

"Certificate of Measurement" means a certificate issued by the NCC certifying the correctness of the final quantities, prices per unit and values of labour, Plant and Material performed, used and supplied by the Contractor for the construction of the part of the Work to which a Unit Price Arrangement applies;

"Certificate of Substantial Performance" means a certificate issued by the NCC when the Work reaches Substantial Performance;

"NCC Representative" means the person designated in the Contract, or by written notice to the Contractor, to act as the NCC Representative for the purposes of the Contract, and includes a person, designated and authorized in writing by the NCC Representative to the Contractor;

"herein", "hereby", "hereof", "hereunder" and similar expressions refer to the Contract as a whole and not to any particular section or part thereof;

"Lump Sum Arrangement" means that part of the Contract that prescribes a lump sum as payment for performance of the Work to which it relates;

"Material" includes all commodities, articles, machinery, equipment, fixtures and things required to be furnished in accordance with the Contract for incorporation into the Work;

"NCC" means the National Capital Commission;

"Person" also includes, unless there is an express stipulation in the Contract to the contrary, any partnership, proprietorship, firm, joint venture, consortium or corporation;

"Plant" includes all tools, implements, machinery, vehicles, structures, equipment, articles and things that are necessary for the performance of the Contract, other than Material and those tools customarily provided by a tradesperson in practicing a trade;

"Security screening" is a generic term that applies to all types and levels of personnel security screening including Reliability Status, Site Access, and CONFIDENTIAL, SECRET and TOP SECRET security clearances conducted by the NCC;

"Sensitive Information and Assets" means information or assets that have been identified by the NCC as TOP SECRET, SECRET, CONFIDENTIAL or protected;

"Subcontractor" means a person having a direct contract with the Contractor, subject to GC3.6 SUBCONTRACTING, to perform a part or parts of the Work, or to supply Material customized for the Work;

"Superintendent" means the employee or representative of the Contractor designated by the Contractor to act pursuant to GC2.6 SUPERINTENDENT;

"Supplementary Conditions" means the part of the Contract that amends or supplements the General Conditions;

"Supplier" means a person having a direct contract with the Contractor to supply Plant or Material not customized for the Work;

"Unit Price Arrangement" means that part of the Contract that prescribes the product of a price per unit of measurement multiplied by a number of units of measurement for performance of the Work to which it relates;

"Unit Price Table" means the table of prices per unit set out in the Contract;

"Work" means, subject only to any express stipulation in the Contract to the contrary, everything that is necessary to be done, furnished or delivered by the Contractor to perform the Contract in accordance with the contract documents; and

"Working Day" means a day other than a Saturday, Sunday, or a statutory holiday that is observed by the construction industry in the area of the place of the Work.

GC1.1.3 Application of Certain Provisions

- 1) Any provisions of the Contract that are expressly stipulated to be applicable only to a Unit Price Arrangement are not applicable to any part of the Work to which a Lump Sum Arrangement applies.
- 2) Any provisions of the Contract that are expressly stipulated to be applicable only to a Lump Sum Arrangement are not applicable to any part of the Work to which a Unit Price Arrangement applies.

GC1.1.4 Substantial Performance

- 1) The Work shall be considered to have reached Substantial Performance when:
 - (a) the Work or a substantial part thereof has passed inspection and testing and is, in the opinion of the NCC, ready for use by the NCC or is being used for the intended purposes; and
 - (b) the Work is, in the opinion of the NCC, capable of completion or correction at a cost of not more than
 - (i) 3% of the first \$500,000;
 - (ii) 2% of the next \$500,000; and
 - (iii) 1% of the balanceof the Contract Amount at the time this cost is calculated.
- 2) Where the Work or a substantial part thereof is ready for use or is being used for the purposes intended and:
 - (a) the remainder of the Work or a part thereof cannot be completed by the time specified in the Contract, or as amended in accordance with GC6.5 DELAYS AND EXTENSION OF TIME, for reasons beyond the control of the Contractor; or
 - (b) the NCC and the Contractor agree not to complete a part of the Work within the specified time;

the cost of that part of the Work that was either beyond the control of the Contractor to complete or the NCC and the Contractor have agreed not to complete by the time specified, shall be deducted from the value of the Contract referred to in subparagraph 1)(b) of GC1.1.4, and the said cost shall not form part of the cost of the Work remaining to be done in determining Substantial Performance.

GC1.1.5 Completion

- 1) The Work shall be deemed to have reached Completion when all labour, Plant and Material required have been performed, used or supplied, and the Contractor has complied with the Contract and all orders and directions made pursuant thereto, all to the satisfaction of the NCC.

GC1.2 CONTRACT DOCUMENTS

GC1.2.1 General

- 1) The contract documents are complementary, and what is required by any one shall be as binding as if required by all.
- 2) References in the contract documents to the singular shall be considered to include the plural as the context requires.
- 3) Nothing contained in the contract documents shall create a contractual relationship between the NCC and any Subcontractor or Supplier, their subcontractors or suppliers, or their agents or employees.

GC1.2.2 Order of Precedence

- 1) In the event of any discrepancy or conflict in the contents of the following documents, such documents shall take precedence and govern in the following order:
 - (a) any amendment or variation of the contract documents that is made in accordance with the General Conditions;
 - (b) any amendment issued prior to tender closing;
 - (c) Supplementary Conditions;
 - (d) General Conditions;
 - (e) the duly completed Invitation to Tender and Acceptance Form when accepted;
 - (f) drawings and specifications.

later dates shall govern within each of the above categories of documents.

- 2) In the event of any discrepancy or conflict in the information contained in the drawings and specifications, the following rules shall apply:
 - (a) specifications shall govern over drawings;
 - (b) dimensions shown in figures on a drawings shall govern where they differ from dimensions scaled from the same drawing; and
 - (c) drawings of larger scale govern over those of smaller scale.

GC1.2.3 Security and Protection of Documents and Work

- 1) The Contractor shall guard and protect all sensitive contract information (TOP SECRET, SECRET, CONFIDENTIAL and PROTECTED) including printed and digital documents, drawings, information, models, copies thereof and processing systems, whether supplied by the NCC or the Contractor, against loss or compromise and damage from any cause.
- 2) The Contractor shall limit access to sensitive NCC information only to those with a “need-to-know” and who have been successfully security screened to at least the level of sensitivity of the information.
- 3) The Contractor shall ensure all contract information indicated in paragraph 1) is guarded and protected by any subcontractors, agents or suppliers and access limited only to those with a “need-to-know” and who have been successfully security screened to at least the level of sensitivity of the information.
- 4) The Contractor shall keep confidential all information provided to the Contractor by or on behalf of the NCC in connection with the Work, and all information developed by the Contractor as part of the Work, and shall not disclose any such information to any person without the written permission of the NCC, except that the Contractor may disclose to a subcontractor, authorized in accordance with the Contract, information necessary to the performance of a subcontract. This section does not apply to any information that:
 - (a) is publicly available from a source other than the Contractor; or
 - (b) is or becomes known to the Contractor from a source other than the NCC, except any source that is known to the Contractor to be under an obligation to the NCC not to disclose the information.
- 5) When the Contract, the Work, or any information referred to in paragraph 4) is identified as TOP SECRET, SECRET, CONFIDENTIAL or PROTECTED by the NCC, the Contractor shall, at all times, take all measures reasonably necessary for the safeguarding of the material so identified, including such measures as may be further specified elsewhere in the Contract or provided, in writing, from time to time by the NCC.
- 6) Without limiting the generality of paragraphs 4) and 5) of GC1.2.3, when the Contract, the Work, or any information referred to in paragraph 4) is identified as TOP SECRET, SECRET, CONFIDENTIAL or PROTECTED by the NCC, the NCC shall be entitled to inspect the Contractor's premises and the premises of its subcontractors or suppliers and any other person at any tier, for security purposes at any time during the term of the Contract, and the Contractor shall comply with, and ensure that any such subcontractors or suppliers comply with all written instructions issued by the NCC dealing with the material so identified, including any requirement that employees of the Contractor and its subcontractors and suppliers and any other person at any tier execute and deliver declarations relating to reliability status, site access security clearances and other procedures.
- 7) The Contractor shall report any suspected or actual security incidents immediately to the NCC involving loss, compromise or damage of NCC information or assets.
- 8) The Contractor shall safeguard the Work and the Contract, the specifications, drawings and any other information provided by the NCC to the Contractor, and shall be liable to the NCC for any loss or damage from any causes.

GC1.3 STATUS OF THE CONTRACTOR

- 1) The Contractor is engaged under the Contract as an independent contractor.
- 2) The Contractor, its subcontractors and suppliers and any other person at any tier and their employees are not engaged by the Contract as employees, servants or agents of the NCC.
- 3) For the purposes of the contract the Contractor shall be solely responsible for any and all payments and deductions required to be made by law including those required for Canada or Quebec Pension Plans, Employment Insurance, Worker's Compensation, provincial health or insurance plans, and Income Tax.

GC1.4 RIGHTS AND REMEDIES

- 1) Except as expressly provided in the Contract, the duties and obligations imposed by the Contract and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights, and remedies otherwise imposed or available by law.

GC1.5 TIME OF THE ESSENCE

- 1) Time is of the essence of the Contract.

GC1.6 INDEMNIFICATION BY CONTRACTOR

- 1) The Contractor shall pay all royalties and patent fees required for the performance of the Contract and, at the Contractor's expense, shall defend all claims, actions or proceedings against the NCC charging or claiming that the Work or any part thereof provided or furnished by the Contractor to the NCC infringes any patent, industrial design, copyright trademark, trade secret or other proprietary right enforceable in Canada.
- 2) The Contractor shall indemnify and save the NCC harmless from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings by any third party, brought or prosecuted and in any manner based upon, arising out of, related to, occasioned by, or attributable to the activities of the Contractor, its subcontractors and suppliers and any other person at any tier, in performing the Work.
- 3) For the purposes of paragraph 2) of GC1.6, "activities" means any act improperly carried out, any omission to carry out an act and any delay in carrying out an act.

GC1.7 INDEMNIFICATION BY THE NCC

- 1) Subject to the Crown Liability and Proceedings Act, the Patent Act, and any other law that affects the NCC's rights, powers, privileges or obligations, the NCC shall indemnify and save the Contractor harmless from and against all claims, demands, losses, costs, damage, actions, suits or proceedings arising out of the Contractor's activities under the Contract that are directly attributable to:
 - (a) a lack of or a defect in the NCC's title to the Work site if owned by the NCC, whether real or alleged; or
 - (b) an infringement or an alleged infringement by the Contractor of any patent of invention or any other kind of intellectual property occurring while the Contractor was performing any act for the purposes of the Contract employing a model, plan or design or any other thing related to the Work that was supplied by the NCC to the Contractor.

GC1.8 LAWS, PERMITS AND TAXES

- 1) The Contractor shall comply with all federal, provincial and municipal laws and regulations applicable to the performance of the Work or any part thereof including, without limitation, all laws concerning health and labour conditions and the protection of the environment, and shall require compliance therewith by all of its subcontractors and suppliers at any tier as if the Work were being performed for an owner other than the NCC. The Contractor shall furnish evidence of compliance with such laws and regulations to the NCC at such times as the NCC may reasonably request.
- 2) Unless stipulated otherwise in the Contract, the Contractor shall obtain and maintain all permits, certificates, licences, registrations and authorizations required for the lawful performance of the Work.
- 3) Prior to the commencement of the Work at the site, the Contractor shall tender to a municipal authority an amount equal to all fees and charges that would be lawfully payable to that municipal authority in respect of building permits as if the Work were being performed for an owner other than the NCC.
- 4) Within 10 days of making a tender pursuant to paragraph 3) of GC1.8, the Contractor shall notify the NCC of the amount properly tendered and whether or not the municipal authority has accepted that amount.
- 5) If the municipal authority has not accepted the amount tendered, the Contractor shall pay that amount to the NCC within 6 days after the time stipulated in paragraph 4) of GC1.8.
- 6) For the purposes of this clause, "municipal authority" means any authority that would have jurisdiction respecting permission to perform the Work if the owner were not the NCC.
- 7) Notwithstanding the residency of the Contractor, the Contractor shall pay any applicable tax arising from or related to the performance of the Work under the Contract.
- 8) In accordance with the Statutory Declaration referred to in paragraph 4) of GC5.5 SUBSTANTIAL PERFORMANCE OF THE WORK, a Contractor who has neither residence nor place of business in the province or territory in which work under the Contract is being performed shall provide the NCC with proof of registration with the provincial sales tax authorities in the said province.
- 9) For the purpose of the payment of any applicable tax or the furnishing of security for the payment of any applicable tax arising from or related to the performance of the Work, and notwithstanding the provision that all Material, Plant and interest of the Contractor in all real property, licences, powers and privileges, become the property of the NCC after the time of purchase in accordance with GC3.10 MATERIAL PLANT AND REAL PROPERTY BECOME PROPERTY OF THE NCC, the Contractor shall be liable, as a user or consumer, for the payment or for the furnishing of security for the payment of any applicable tax payable, at the time of the use or consumption of that Material, Plant or interest of the Contractor in accordance with the relevant legislation.

GC1.9 WORKERS' COMPENSATION

- 1) Prior to award of contract, at the time of submitting its first progress claim, at the time of Substantial Performance of the Work, and prior to issuance of the Certificate of Completion, the Contractor shall provide evidence of compliance with workers' compensation legislation applicable to the place of the Work, including payments due thereunder.

- 2) At any time during the term of the Contract, when requested by the NCC, the Contractor shall provide such evidence of compliance by the Contractor, its subcontractors and any other person at any tier and any other person performing part of the Work who is required to comply with such legislation.

GC1.10 NATIONAL SECURITY

- 1) If the NCC determines that the Work is of a class or kind that involves national security, the NCC may order the Contractor to:
 - (a) provide the NCC with any information concerning persons employed or to be employed by the Contractor for purposes of the Contract; and
 - (b) remove any person from the site of the Work if, in the opinion of the NCC, that person may be a risk to the national security;and the Contractor shall comply with the order.
- 2) In all contracts with persons who are to be employed in the performance of the Contract, the Contractor shall make provision for the performance of any obligation that may be imposed upon the Contractor under paragraph 1) of GC1.10.

GC1.11 UNSUITABLE WORKERS

- 1) The NCC shall instruct the Contractor to remove from the site of the Work any person employed by the Contractor for purposes of the Contract who, in the opinion of the NCC, is incompetent or is guilty of improper conduct, and the Contractor shall not permit a person who has been removed to return to the site of the Work.

GC1.12 PUBLIC CEREMONIES AND SIGNS

- 1) The Contractor shall not permit any public ceremony in connection with the Work without the prior consent of the NCC.
- 2) The Contractor shall not erect nor permit the erection of any sign or advertising on the Work or its site without the prior consent of the NCC.

GC1.13 CONFLICT OF INTEREST

- 1) It is a term of the Contract that no individual, for whom the post-employment provisions of the Conflict of Interest and Post-Employment Code for Public Office Holders or the Values and Ethics Code for the Public Service apply, shall derive a direct benefit from the Contract unless that individual is in compliance with the applicable post-employment provisions.

GC1.14 AGREEMENTS AND AMENDMENTS

- 1) The Contract constitutes the entire and sole agreement between the parties with respect to the subject matter of the Contract and supersedes all previous negotiations, communications and other agreements, whether written or oral, relating to it, unless they are incorporated by reference in the Contract. There are no terms, covenants, representations, statements or conditions binding on the parties other than those contained in the Contract.
- 2) The failure of either party at any time to require performance by the other party of any provision hereof shall not affect the right thereafter to enforce such provision. Nor shall the waiver by either

party of any breach of any covenant, term or condition hereof be taken to be held to be a waiver of any further breach of the same covenant, term or condition.

- 3) The Contract may be amended only as provided for in the Contract.

GC1.15 SUCCESSION

- 1) The Contract shall inure to the benefit of and be binding upon the parties hereto and their lawful heirs, executors, administrators, successors and, subject to GC1.16 ASSIGNMENT, permitted assigns.

GC1.16 ASSIGNMENT

- 1) The Contractor shall not make any assignment of the Contract, either in whole or in part, without the written consent of the NCC.

GC1.17 NO BRIBE

- 1) The Contractor represents and covenants that no bribe, gift, benefit, nor other inducement has been nor shall be paid, given, promised or offered directly or indirectly to any official or employee of the NCC or to a member of the family of such a person, with a view to influencing the entry into the Contract or the administration of the Contract.

GC1.18 CERTIFICATION - CONTINGENCY FEES

- 1) In this clause:
 - (a) "contingency fee" means any payment or other compensation that is contingent upon or is calculated upon the basis of a degree of success in soliciting or obtaining a Government contract or negotiating the whole or any part of its terms;
 - (b) "employee" means a person with whom the Contractor has an employer/employee relationship; and
 - (c) "person" includes an individual or a group of individuals, a corporation, a partnership, an organization and an association and, without restricting the generality of the foregoing, includes any individual who is required to file a return with the registrar pursuant to section 5 of the Lobbyists Registration Act R.S.C. 1985 c.44 (4th Supplement) as the same may be amended from time to time.
- 2) The Contractor certifies that it has not directly or indirectly paid nor agreed to pay and covenants that it shall not directly or indirectly pay nor agree to pay a contingency fee for the solicitation, negotiation or obtaining of the Contract to any person other than an employee acting in the normal course of the employee's duties.
- 3) All accounts and records pertaining to payments of fees or other compensation for the solicitation, obtaining or negotiation of the Contract shall be subject to the accounts and audit provisions of the Contract.
- 4) If the Contractor certifies falsely under this section or is in default of the obligations contained therein, the NCC may either take the Work out of the Contractor's hands in accordance with the provisions of the Contract or recover from the Contractor by way of reduction to the Contract Amount or otherwise, the full amount of the contingency fee.

GC1.19 INTERNATIONAL SANCTIONS

- 1) Persons and companies in Canada, and Canadians outside of Canada are bound by economic sanctions imposed by the Government of Canada. As a result, the the NCC cannot accept delivery of goods or services that originate, either directly or indirectly, from the countries or persons subject to economic sanctions.
Details on existing sanctions can be found at:
<http://www.dfait-maeci.gc.ca/trade/sanctions-en.asp>.
- 2) It is a condition of the Contract that the Contractor not supply to the NCC any goods or services which are subject to economic sanctions.
- 3) By law, the Contractor must comply with changes to the regulations imposed during the life of the Contract. During the performance of the Contract should the imposition of sanctions against a country or person or the addition of a good or service to the list of sanctioned goods or services cause an impossibility of performance for the Contractor, the Contractor may request that the Contract be terminated in accordance with GC7.3 TERMINATION OF CONTRACT.

- GC2.1 NCC REPRESENTATIVE'S AUTHORITY
- GC2.2 INTERPRETATION OF CONTRACT
- GC2.3 NOTICES
- GC2.4 SITE MEETINGS
- GC2.5 REVIEW AND INSPECTION OF WORK
- GC2.6 SUPERINTENDENT
- GC2.7 NON-DISCRIMINATION IN HIRING AND EMPLOYMENT OF LABOUR
- GC2.8 ACCOUNTS AND AUDITS

GC2.1 NCC REPRESENTATIVE'S AUTHORITY

- 1) The NCC shall designate an NCC Representative and shall notify the Contractor of the name, address and telephone number of the NCC Representative.
- 2) The NCC Representative shall perform the NCC's duties and functions under the contract.
- 3) The NCC Representative shall be authorized to issue notices, instructions and directions to the Contractor and to accept on behalf of the NCC any notice, order or other communication from the contractor relating to the Work.
- 4) The NCC Representative shall, within a reasonable time, review and respond to submissions made by the Contractor in accordance with the requirements of the Contract.

GC2.2 INTERPRETATION OF CONTRACT

- 1) If, at any time before the NCC has issued a Certificate of Completion, any question arises between the parties about whether anything has been done as required by the Contract or about what the Contractor is required by the Contract to do, and in particular but without limiting the generality of the foregoing, about:
 - (a) the meaning of anything in the drawings and specifications;
 - (b) the meaning to be given to the drawings and specifications in case of any error therein, omission therefrom, or obscurity or discrepancy in their wording or intention;
 - (c) whether or not the quality or quantity of any Material or workmanship supplied or proposed to be supplied by the Contractor meets the requirements of the Contract;
 - (d) whether or not the labour, Plant or Material performed, used and supplied by the Contractor for performing the Work and carrying out the Contract are adequate to ensure that the Work shall be performed in accordance with the Contract and that the Contract shall be carried out in accordance with its terms;
 - (e) what quantity of any of the Work has been completed by the Contractor; or
 - (f) the timing and scheduling of the various phases of the performance of the Work as specified in the Contract;

the question shall be decided, subject to the provisions of GC8 DISPUTE RESOLUTION, by the NCC.

- 2) The Contractor shall perform the Work in accordance with any decisions of the NCC that are made under paragraph 1) of GC2.2 and in accordance with any consequential directions given by the NCC.

- 3) If the Contractor fails to comply with any instruction or direction issued by the NCC pursuant to the Contract, the NCC may employ such methods as the NCC deems advisable to do what the Contractor failed to do, and the Contractor shall, on demand, pay the NCC an amount that is equal to the aggregate of all costs, expenses and damages incurred or sustained by the NCC by reason of the Contractor's failure to comply with such instruction or direction, including the cost of any methods employed by the NCC in doing what the Contractor failed to do.

GC2.3 NOTICES

- 1) Subject to paragraph 3) of GC2.3, any notice, order or other communication may be given in any manner, and if required to be in writing, shall be addressed to the party to whom it is intended at the address in the Contract or at the last address of which the sender has received written notice in accordance with this section.
- 2) Any notice, order or other communication given in writing in accordance with paragraph 1) of GC2.3 shall be deemed to have been received by either party:
 - (a) if delivered personally, on the day that it was delivered;
 - (b) if forwarded by mail, on the earlier of the day it was received or the sixth day after it was mailed; and
 - (c) if forwarded by facsimile or electronic mail, 24 hours after it was transmitted.
- 3) A notice given under GC7.1 TAKING THE WORK OUT OF THE CONTRACTOR'S HANDS, GC7.2 SUSPENSION OF WORK, and GC7.3 TERMINATION OF CONTRACT shall be given in writing and, if delivered personally, shall be delivered, if the Contractor is a sole proprietor, to the Contractor or, if the Contractor is a partnership or corporation, to an officer thereof.

GC2.4 SITE MEETINGS

- 1) In consultation with the NCC, the Contractor shall arrange site meetings at regular intervals, with all involved parties who are to attend, in order to ensure, among other things, the proper co-ordination of the Work.

GC2.5 REVIEW AND INSPECTION OF WORK

- 1) The NCC shall review the Work to determine if it is proceeding in conformity with the Contract and to record the necessary data to make an assessment of the value of Work completed. The NCC shall measure and record the quantities of labour, Plant and Material performed, used or supplied by the Contractor in performing the Work or any part thereof that is subject to a Unit Price Arrangement and, on request, shall inform the Contractor of those measurements, and permit the Contractor to inspect any records pertaining thereto.
- 2) The NCC shall reject Work or Material which in the NCC's opinion does not conform to the requirements of the Contract, and shall require inspection or testing of Work, whether or not such Work is fabricated, installed, or completed. If such Work is not in accordance with the requirements of the Contract, the Contractor shall correct the Work and shall pay the NCC, on demand, all reasonable costs and expenses that were incurred by the NCC in having the examination performed.
- 3) The Contractor shall provide the NCC with access to the Work and its site at all times, and at all times shall provide sufficient, safe, and proper facilities for the review and inspection of the Work by persons authorized by the NCC and any representatives of those authorities having jurisdiction. If parts of the Work are in preparation at locations other than the site of the Work, the NCC shall be given access to such Work whenever it is in progress.

- 4) The Contractor shall furnish the NCC with such information respecting the performance of the Contract as the NCC may require, and render every possible assistance to enable the NCC to verify that the Work is performed in accordance with the Contract, carry out any other duties and exercise any powers in accordance with the Contract.
- 5) If Work is designated for tests, inspections, or approvals in the Contract or by the NCC's instructions, or by laws or ordinances of the place of the Work, the Contractor shall give the NCC reasonable notice of when such Work shall be ready for review and inspection. The Contractor shall arrange for and shall give the NCC reasonable notice of the date and time of inspections, tests or approvals.
- 6) If the Contractor covers, or permits to be covered, Work that has been designated for tests, inspections or approvals before such tests, inspections or approvals are made, completed or given, the Contractor shall, if so directed by the NCC, uncover such Work, have the inspections, tests or approvals satisfactorily made, completed or given and make good the covering of the Work at the Contractor's expense.

GC2.6 SUPERINTENDENT

- 1) Prior to commencing the Work, the Contractor shall designate a Superintendent and shall notify the NCC of the name, address and telephone number of the Superintendent. The Contractor shall keep the Superintendent at the Work site during working hours until the Work has reached completion.
- 2) The Superintendent shall be in full charge of the operations of the Contractor during the performance of the Work and shall be authorized to accept on behalf of the Contractor any notice, order or other communication given to the Superintendent or the Contractor relating to the Work.
- 3) Upon request of the NCC, the Contractor shall remove any Superintendent who, in the opinion of the NCC, is incompetent or has been guilty of improper conduct, and shall forthwith designate another Superintendent who is acceptable to the NCC.
- 4) The Contractor shall not substitute a Superintendent without the written consent of the NCC. If a Superintendent is substituted without such consent, the NCC shall be entitled to refuse to issue any documentation or certification relating to progress payments, Substantial Performance or Completion of the Work until the Superintendent has returned to the Work site or another Superintendent who is acceptable to the NCC has been substituted.

GC2.7 NON-DISCRIMINATION IN HIRING AND EMPLOYMENT OF LABOUR

- 1) For the purposes of this clause, "persons" include the Contractor, its subcontractors and suppliers at any tier and their respective employees, agents, licensees or invitees and any other individual involved in the performance of the Work or granted access to the Work site. A "person" includes any partnership, proprietorship, firm, joint venture, consortium and corporation.
- 2) Without restricting the provisions of paragraph 3) of GC2.6, SUPERINTENDENT, the Contractor shall not refuse to employ and shall not discriminate in any manner against any person because:
 - (a) of that person's race, national origin, colour, religion, age, sex or marital status;
 - (b) of the race, national origin, colour, religion, age, sex, or marital status of any person having any relationship or association with that person; or
 - (c) a complaint has been made or information has been given by or in respect of that person relating to an alleged failure by the Contractor to comply with subparagraphs 2)(a) and 2)(b) of GC2.7.

- 3) Within two Working Days immediately following receipt of a written complaint pursuant to paragraph 2) of GC2.7, the Contractor shall:
 - (a) cause to have issued a written direction to the person or persons named by the complainant to cease all actions that form the basis of the complaint;
 - (b) forward a copy of the complaint to the NCC by registered mail or courier service; and
 - (c) when the Labour Conditions are applicable under the circumstances of the complaint, forward a copy of the complaint to HRSDC - Labour to the attention of the appropriate Director as described in the Labour Conditions ("HRSDC - Labour" means the labour component of the federal Department of Human Resources and Skills Development).
- 4) Within twenty four (24) hours immediately following receipt of a direction from the NCC to do so, the Contractor shall cause to have removed from the site of the Work and from the performance of Work under the Contract, any person or persons whom the NCC believes to be in breach of the provisions of paragraph 2) of GC2.7.
- 5) No later than thirty (30) days after receipt of the direction referred to in paragraph 4) of GC2.7, the Contractor shall cause the necessary action to be commenced to remedy the breach described in the direction.
- 6) If a direction is issued pursuant to paragraph 4) of GC2.7, the NCC may withhold from monies that are due and payable to the Contractor or setoff pursuant to GC5.9 RIGHT OF SETOFF, whichever is applicable, an amount representing the sum of the costs and payment referred to in paragraph 8) of GC2.7.
- 7) If the Contractor fails to proceed in accordance with paragraph 5) of GC2.7, the NCC shall take the necessary action to have the breach remedied and shall determine all supplementary costs incurred by the NCC as a result.
- 8) The NCC may make a payment directly to the complainant from monies that are due and payable to the Contractor upon receipt from the complainant of:
 - (a) a written award issued pursuant to the federal Commercial Arbitration Act, R.S.C. 1985, c. 17 (2nd Supp.);
 - (b) a written award issued pursuant to the Canadian Human Rights Act, RS.C. 1985, c. H-6;
 - (c) a written award issued pursuant to provincial or territorial human rights legislation; or
 - (d) a judgement issued by a court of competent jurisdiction.
- 9) If the NCC is of the opinion that the Contractor has breached any of the provisions of this clause, the NCC may take the Work out of the Contractor's hands pursuant to GC7.1 TAKING THE WORK OUT OF THE CONTRACTOR'S HANDS.
- 10) Subject to paragraph 7) of GC3.6 SUBCONTRACTING, the Contractor shall ensure that the provisions of this clause are included in all agreements and contracts entered into as a consequence of the Work.

GC2.8 ACCOUNTS AND AUDITS

- 1) The Contractor shall, in addition to the requirements expressed in paragraph 6) of GC3.4 EXECUTION OF THE WORK, maintain full records of the Contractor's estimated and actual cost of the Work together with all tender calls, quotations, contracts, correspondence, invoices, receipts and vouchers relating thereto, and shall make them available on request to audit and inspection by the NCC or by persons designated to act on behalf of the NCC.
- 2) The Contractor shall allow any of the persons referred to in paragraph 1) of GC2.8 to make copies of and take extracts from any of the records and material, and shall furnish such persons or entities with any information those persons or entities may require from time to time in connection with such records and material.
- 3) The Contractor shall maintain and keep the records intact until the expiration of two years after the date that a Certificate of Completion has been issued or until the expiration of such other period of time as the NCC may direct.
- 4) The Contractor shall cause all subcontractors at any tier and all other persons directly or indirectly controlled by or affiliated with the Contractor and all persons directly or indirectly having control of the Contractor to comply with the requirements of this clause as if they were the Contractor.

- GC3.1 PROGRESS SCHEDULE
- GC3.2 ERRORS AND OMISSIONS
- GC3.3 CONSTRUCTION SAFETY
- GC3.4 EXECUTION OF THE WORK
- GC3.5 MATERIAL
- GC3.6 SUBCONTRACTING
- GC3.7 CONSTRUCTION BY OTHER CONTRACTORS OR WORKERS
- GC3.8 LABOUR
- GC3.9 TRUCK HAULAGE RATES **(CANCELLED)**
- GC3.10 MATERIAL, PLANT AND REAL PROPERTY BECOME PROPERTY OF THE NCC
- GC3.11 DEFECTIVE WORK
- GC3.12 CLEANUP OF SITE
- GC3.13 WARRANTY AND RECTIFICATION OF DEFECTS IN WORK

GC3.1 PROGRESS SCHEDULE

- 1) The Contractor shall:
 - (a) prepare and submit to the NCC, prior to the submission of the Contractor's first progress claim, a progress schedule in accordance with the requirements set out in the Contract;
 - (b) monitor the progress of the Work relative to the schedule and update the schedule as stipulated by the contract documents;
 - (c) advise the NCC of any revisions to the schedule required as the result of any extension of time for completion of the Contract that was approved by the NCC; and
 - (d) prepare and submit to the NCC, at the time of issuance of a Certificate of Substantial Performance, an update of any schedule clearly showing a detailed timetable that is acceptable to the NCC for the completion of any unfinished Work and the correction of all listed defects.

GC3.2 ERRORS AND OMISSIONS

- 1) The Contractor shall report promptly to the NCC any errors, discrepancies, or omissions the Contractor may discover when reviewing the contract documents. In making a review, the Contractor does not assume any responsibility to the NCC for the accuracy of the review. The Contractor shall not be liable for damage or costs resulting from such errors, discrepancies, or omissions in the contract documents prepared by or on behalf of the NCC that the Contractor did not discover.

GC3.3 CONSTRUCTION SAFETY

- 1) Subject to GC3.7 CONSTRUCTION BY OTHER CONTRACTORS OR WORKERS, the Contractor shall be solely responsible for construction safety at the place of the Work and for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Work. In any emergency, the Contractor shall either, stop the Work, make changes or order extra work to ensure the safety of life and the protection of the Work and neighbouring property.
- 2) Prior to commencing the Work, the Contractor shall notify the authorities having jurisdiction for construction safety at the site of the Work with respect to the intended commencement of the Work, and shall provide such authority with whatever additional information may be required by that authority.

GC3.4 EXECUTION OF THE WORK

- 1) The Contractor shall perform, use or supply and pay for, all labour, Plant, Material, tools, construction machinery and equipment, water, heat, light, power, transportation and other facilities and services necessary for the performance of the Work in accordance with the Contract.
- 2) The Contractor shall, at all times, perform the Work in a proper, diligent and expeditious manner as is consistent with construction industry standards and in accordance with the progress schedule prepared pursuant to GC3.1 PROGRESS SCHEDULE and shall provide sufficient personnel to fulfil the Contractor's obligations in accordance with that schedule.
- 3) Subject to paragraph 4) of GC3.4, the Contractor shall have complete care, custody and control of the Work and shall direct and supervise the Work so as to ensure compliance with the Contract. The Contractor shall be responsible for construction means, methods, techniques, sequences and procedures and for coordinating the various parts of the Work.
- 4) When requested in writing by the NCC, the Contractor shall make appropriate alterations in the method, Plant or workforce at any time the NCC considers the Contractor's actions to be unsafe or damaging to either the Work, existing facilities, persons at the site of the Work or the environment.
- 5) The Contractor shall have sole responsibility for the design, erection, operation, maintenance and removal of temporary structures and other temporary facilities and for the construction methods used in their erection, operation, maintenance and removal. The Contractor shall engage and pay for registered professional engineering personnel, skilled in the appropriate discipline to perform these functions if required by law or by the Contract, and in all cases when such temporary facilities and their methods of construction are of such a nature that professional engineering skill is required to produce safe and satisfactory results.
- 6) The Contractor shall keep at least one copy of current contract documents, submittals, reports, and records of meetings at the site of the Work, in good order and available to the NCC.
- 7) Except for any part of the Work that is necessarily performed away from or off the site of the Work, the Contractor shall confine Plant, storage of Material, and operations of employees to limits indicated by laws, ordinances, permits or the contract documents.

GC3.5 MATERIAL

- 1) Unless otherwise specified in the Contract, all Material incorporated in the Work shall be new.
- 2) Subject to paragraph 3) of GC3.5, if a specified reused, refurbished, or recycled item of Material is not available, the Contractor shall apply to the NCC to substitute a similar item for the one specified.
- 3) If the NCC agrees that the Contractor's application for substitution of a reused, refurbished or recycled item is warranted, and that the substitute item is of acceptable quality and value to that specified and is suitable for the intended purpose, the NCC may approve the substitution, subject to the following:
 - (a) the request for substitution shall be made in writing to the NCC and shall be substantiated by information in the form of the manufacturer's literature, samples and other data that may be required by the NCC;
 - (b) the Contractor shall make the request for substitution in a manner that shall not negatively affect the progress schedule of the Contract and well in advance of the time the item of Material must be ordered;

- (c) substitution of Material shall be permitted only with the prior written approval of the NCC, and any substituted items that are supplied or installed without such approval shall be removed from the site of the Work at the expense of the Contractor, and specified items installed at no additional cost to the NCC; and
- (d) the Contractor shall be responsible for all additional expenses incurred by the NCC, the Contractor, its subcontractors and suppliers at any tier due to the Contractor's use of the substitute.

GC3.6 SUBCONTRACTING

- 1) Subject to the provisions of this clause, the Contractor may subcontract any part of the Work but not the whole of the Work.
- 2) The Contractor shall notify the NCC in writing of the Contractor's intention to subcontract.
- 3) A notification referred to in paragraph 2) of GC3.6 shall identify the part of the Work and the Subcontractor with whom the Contractor intends to subcontract.
- 4) The NCC may for reasonable cause, object to the intended subcontracting by notifying the Contractor in writing within six (6) days of receipt by the NCC of a notification referred to in paragraph 2) of GC3.6.
- 5) If the NCC objects to a subcontracting, the Contractor shall not enter into the intended subcontract.
- 6) The Contractor shall not change, nor permit to be changed, a Subcontractor engaged by the Contractor, in accordance with this clause, without the written consent of the NCC.
- 7) The Contractor shall ensure that all the terms and conditions of the Contract that are of general application shall be incorporated in every other contract issued as a consequence of the Contract, at whatever tier, except those contracts issued solely to suppliers at any tier for the supply of Plant or Material.
- 8) Neither a subcontracting nor the NCC's consent to a subcontracting shall be construed to relieve the Contractor from any obligation under the Contract or to impose any liability upon the NCC.

GC3.7 CONSTRUCTION BY OTHER CONTRACTORS OR WORKERS

- 1) The NCC reserves the right to send other contractors or workers, with or without Plant and Material, onto the site of the Work.
- 2) When other contractors or workers are sent on to the site of the Work, the NCC shall:
 - (a) enter into separate contracts, to the extent it is possible, with the other contractors under conditions of contract that are compatible with the conditions of the Contract;
 - (b) ensure that the insurance coverage provided by the other contractors is co-ordinated with the insurance coverage of the Contractor as it affects the Work; and
 - (c) take all reasonable precautions to avoid labour disputes or other disputes arising from the work of the other contractors or workers.
- 3) When other contractors or workers are sent on to the site of the Work, the Contractor shall:
 - (a) co-operate with them in the carrying out of their duties and obligations;

- (b) co-ordinate and schedule the Work with the work of the other contractors and workers;
 - (c) participate with other contractors and workers in reviewing their construction schedules when directed to do so;
 - (d) where part of the Work is affected by or depends upon the work of other contractors or workers for its proper execution, promptly report to the NCC in writing and prior to proceeding with that part of the Work, any apparent deficiencies in such work. Failure by the Contractor to so report shall invalidate any claims against the NCC by reason of the deficiencies in the work of other contractors or workers except those deficiencies that are not then reasonably discoverable; and
 - (e) when designated as being responsible for construction safety at the place for work, in accordance with the applicable provincial or territorial laws, carry out its duties in that role and in accordance with those laws.
- 4) If, when entering into the Contract, the Contractor could not have reasonably foreseen nor anticipated the sending of other contractors or workers on to the site of the Work and provided the Contractor:
- (a) incurs extra expense in complying with the requirements of paragraph 3) of GC3.7; and
 - (b) gives the NCC written notice of a claim for that extra expense within thirty (30) days of the date that the other contractors or workers were sent onto the Work or its site,

the NCC shall pay the Contractor the cost of the extra labour, Plant and Material that was necessarily incurred, calculated in accordance with GC6.4 DETERMINATION OF PRICE.

GC3.8 LABOUR

- 1) The Contractor shall maintain good order and discipline among the Contractor's employees and workers engaged in the Work shall not employ, on the site of the Work, anyone not skilled in the tasks assigned.

GC3.9 TRUCK HAULAGE RATES

CANCELLED

GC3.10 MATERIAL, PLANT AND REAL PROPERTY BECOME PROPERTY OF THE NCC

- 1) Subject to paragraph 9) of GC1.8 LAWS PERMITS AND TAXES, all Material and Plant and the interest of the Contractor in all real property, licences, powers and privileges purchased, used or consumed by the Contractor for the Work shall, immediately after the time of their purchase, use or consumption be the property of the NCC for the purposes of the Work and they shall continue to be the property of the NCC:
- (a) in the case of Material, until the NCC indicates that the Materials shall not be required for the Work; and
 - (b) in the case of Plant, real property, licences, powers and privileges, until the NCC indicates that the interest vested in the NCC therein is no longer required for the purposes of the Work.
- 2) Material or Plant, that is the property of the NCC by virtue of paragraph 1) of GC3.10, shall not be taken away from the site of the Work nor used nor disposed of except for the purposes of the Work without the written consent of the NCC.

- 3) The NCC is not liable for loss of nor damage from any cause to the Material or Plant referred to in paragraph 1) of GC3.10, and the Contractor is liable for such loss or damage notwithstanding that the Material or Plant is the property of the NCC.

GC3.11 DEFECTIVE WORK

- 1) The Contractor shall promptly remove from the site of the Work and replace or re-execute defective Work whether or not the defective Work has been incorporated in the Work and whether or not the defect is the result of poor workmanship, use of defective Material, or damage through carelessness or other act or omission of the Contractor.
- 2) The Contractor, at the Contractor's expense, shall promptly make good other work destroyed or damaged by such removals or replacements.
- 3) If, in the opinion of the NCC, it is not expedient to correct defective Work or Work not performed as provided for in the Contract documents, the NCC may deduct from the amount otherwise due to the Contractor the difference in value between the Work as performed and that called for by the Contract documents.
- 4) The failure of the NCC to reject any defective Work or Material shall not constitute acceptance of the defective Work or Material.

GC3.12 CLEANUP OF SITE

- 1) The Contractor shall maintain the Work and its site in a tidy condition and free from an accumulation of waste material and debris.
- 2) Before the issue of a Certificate of Substantial Performance, the Contractor shall remove waste material and debris, and all Plant and Material not required for the performance of the remaining Work and, unless otherwise stipulated in the Contract Documents, shall cause the Work and its site to be clean and suitable for occupancy by the NCC.
- 3) Before the issue of a Certificate of Completion, the Contractor shall remove all surplus Plant and Materials and any waste products and debris from the site of the Work.
- 4) The Contractor's obligations described in paragraphs 1) to 3) of GC3.12 do not extend to waste products and other debris caused by the NCC's servants, or by other contractors and workers referred to in GC3.7 CONSTRUCTION BY OTHER CONTRACTORS OR WORKERS.

GC3.13 WARRANTY AND RECTIFICATION OF DEFECTS IN WORK

- 1) Without restricting any warranty or guarantee implied or imposed by law or contained in the Contract, the Contractor shall, at the Contractor's expense:
 - (a) rectify and make good any defect or fault that appears in the Work or comes to the attention of the NCC with respect to those parts of the Work accepted in connection with the Certificate of Substantial Performance within 12 months from the date of Substantial Performance; and
 - (b) rectify and make good any defect or fault that appears in or comes to the attention of the NCC in connection with those parts of the Work described in the Certificate of Substantial Performance within 12 months from the date of the Certificate of Completion;
 - (c) transfer and assign, to the NCC, any subcontractor, manufacturer or supplier extended warranties or guarantees implied or imposed by law or contained in the Contract covering periods beyond the 12 months stipulated above. Extended warranties or guarantees referred to

herein shall not extend the 12-month period whereby the Contractor, except as may be provided elsewhere in the Contract, must rectify and make good any defect or fault that appears in the Work or comes to the attention of the NCC;

- (d) provide, to the NCC prior to the issuance of the Certificate of Completion, a list of all extended warranties and guarantees referred to in paragraph (c) above.
- 2) The NCC may direct the Contractor to rectify and make good any defect or fault referred to in paragraph 1) of GC3.13 or covered by any other expressed or implied warranty or guarantee and the Contractor shall rectify and make good such defect within the time stipulated in the direction.
- 3) A direction referred to in paragraph 2) GC3.13 shall be in writing and shall be given to the Contractor in accordance with GC2.3 NOTICES.

- GC4.1 PROTECTION OF WORK AND PROPERTY
- GC4.2 PRECAUTIONS AGAINST DAMAGE, INFRINGEMENT OF RIGHTS, FIRE AND OTHER HAZARDS
- GC4.3 MATERIAL, PLANT AND REAL PROPERTY SUPPLIED BY THE NCC
- GC4.4 CONTAMINATED SITE CONDITIONS

GC4.1 PROTECTION OF WORK AND PROPERTY

- 1) The Contractor shall protect the Work and its site against loss or damage from any cause and shall similarly protect all Material, Plant and real property under the Contractor's care, custody and control whether or not such Material, Plant and real property are supplied by the NCC to the Contractor.
- 2) The Contractor shall provide all facilities necessary for the purpose of maintaining security and shall assist any person authorized by the NCC to inspect or to take security measures in respect of the Work and its site.
- 3) The NCC may direct the Contractor to do such things and to perform such work as the NCC considers reasonable and necessary to ensure compliance with or to remedy a breach of paragraphs 1) or 2) of GC4.1, and the Contractor, shall comply with such direction.

GC4.2 PRECAUTIONS AGAINST DAMAGE, INFRINGEMENT OF RIGHTS, FIRE AND OTHER HAZARDS

- 1) The Contractor shall do whatever is necessary to ensure that:
 - (a) no person, property, right, easement nor privilege is injured, damaged or infringed upon by reasons of the Contractor's activities in performing the Work;
 - (b) pedestrian and other traffic on any public or private road or waterway is not unduly impeded, interrupted nor endangered by the performance or existence of the Work, Material or Plant;
 - (c) fire hazards in or about the site of the Work are eliminated and any fire is promptly extinguished;
 - (d) the health and safety of all persons employed in the performance of the Work is not endangered by the methods nor means of their performance;
 - (e) adequate medical services are always available to all persons employed on the Work or its site during the performance of the Work;
 - (f) adequate sanitation measures are taken in respect of the Work and its site; and
 - (g) all stakes, buoys and marks placed on the Work or its site by the NCC are protected and are not removed, defaced, altered nor destroyed.
- 2) The NCC may direct the Contractor to do such things and to perform such work as the NCC considers reasonable and necessary to ensure compliance with or to remedy a breach of paragraph 1) of GC4.2, and the Contractor shall comply with the direction of the NCC.

GC4.3 MATERIAL, PLANT AND REAL PROPERTY SUPPLIED BY THE NCC

- 1) Subject to paragraph 2) of GC4.3, the Contractor is liable to the NCC for any loss of or damage to Material, Plant or real property that is supplied or placed in the care, custody and control of the Contractor by the NCC for use in connection with the Contract, whether or not that loss or damage is attributable to causes beyond the Contractor's control.

- 2) The Contractor is not liable to the NCC for any loss or damage to Material, Plant or real property referred to in paragraph 1) of GC4.3 if that loss or damage results from and is directly attributable to reasonable wear and tear.
- 3) The Contractor shall not use any Material, Plant or real property supplied by the NCC except for the purpose of performing the Contract.
- 4) When the Contractor fails to make good any loss or damage for which the Contractor is liable under paragraph 1) within a reasonable time, the NCC may cause the loss or damage to be made good at the Contractor's expense, and the Contractor shall thereupon be liable to the NCC for the cost thereof and shall, on demand, pay to the NCC an amount equal to that cost.
- 5) The Contractor shall keep records of all Material, Plant and real property supplied by the NCC as the NCC requires and shall satisfy the NCC, when requested, that such Material, Plant and real property are at the place and in the condition in which they ought to be.

GC4.4 CONTAMINATED SITE CONDITIONS

- 1) For the purposes of GC4.4, a contaminated site condition exists when a solid, liquid, gaseous, thermal or radioactive irritant or contaminant, or other hazardous or toxic substance or material, including moulds and other forms of fungi, is present at the site of the Work to an extent that constitutes a hazard, or potential hazard, to the environment, property, or the health or safety of any person.
- 2) If the Contractor encounters a contaminated site condition of which the Contractor is not aware or about which the Contractor has not been advised, or if the Contractor has reasonable grounds to believe that such a site condition exists at the site of the Work, the Contractor shall:
 - (a) take all reasonable steps, including stopping the Work, to ensure that no person suffers injury, sickness or death, and that neither property nor the environment is injured or destroyed as a result of the contaminated site condition;
 - (b) immediately notify the NCC of the circumstances in writing; and
 - (c) take all reasonable steps to minimize additional costs that may accrue as a result of any work stoppage.
- 3) Upon receipt of a notification from the Contractor, the NCC shall promptly determine whether a contaminated site condition exists and shall notify the Contractor in writing of any action to be taken, or work to be performed, by the Contractor as a result of the NCC's determination.
- 4) If the Contractor's services are required by the NCC, the Contractor shall follow the direction of the NCC with regard to any excavation, treatment, removal and disposal of any polluting substance or material.
- 5) The NCC, at the NCC's sole discretion, may enlist the services of experts and specialty contractors to assist in determining the existence of, and the extent and treatment of contaminated site conditions, and the Contractor shall allow them access and co-operate with them in the carrying out of their duties and obligations.
- 6) Except as may be otherwise provided for in the Contract, the provisions of GC6.4 DETERMINATION OF PRICE shall apply to any additional work made necessary because of a contaminated site condition.

- GC5.1 INTERPRETATION
- GC5.2 AMOUNT PAYABLE
- GC5.3 INCREASED OR DECREASED COSTS
- GC5.4 PROGRESS PAYMENT
- GC5.5 SUBSTANTIAL PERFORMANCE OF THE WORK
- GC5.6 FINAL COMPLETION
- GC5.7 PAYMENT NOT BINDING ON THE NCC
- GC5.8 CLAIMS AND OBLIGATIONS
- GC5.9 RIGHT OF SETOFF
- GC5.10 ASSESSMENTS AND DAMAGES FOR LATE COMPLETION
- GC5.11 DELAY IN MAKING PAYMENT
- GC5.12 INTEREST ON SETTLED CLAIMS
- GC5.13 RETURN OF SECURITY DEPOSIT

GC5.1 INTERPRETATION

In these Terms of Payment

- 1) The "payment period" means a period of 30 consecutive days or such other longer period as may be agreed between the Contractor and the NCC.
- 2) An amount is "due and payable" when it is due and payable by the NCC to the Contractor according to GC5.4 PROGRESS PAYMENT, GC5.5 SUBSTANTIAL PERFORMANCE OF THE WORK or GC5.6 FINAL COMPLETION.
- 3) An amount is overdue when it remains unpaid on the first day following the day upon which it is due and payable.
- 4) The "date of payment" means the date of the negotiable instrument of an amount due and payable by the NCC.
- 5) The "Bank Rate" means the rate of interest established by the Bank of Canada as the minimum rate at which it makes short term advances to members of the Canadian Payments Association.
- 6) The "Average Bank Rate" means the simple arithmetic mean of the Bank Rate in effect at 4:00 p.m. Ottawa Time each day during the calendar month which immediately precedes the calendar month in which payment is made.

GC5.2 AMOUNT PAYABLE

- 1) Subject to any other provisions of the Contract, the NCC shall pay the Contractor, at the times and in the manner hereinafter set out, the amount by which the amounts payable by the NCC to the Contractor in accordance with the Contract exceed the amounts payable by the Contractor to the NCC, and the Contractor shall accept that amount as payment in full satisfaction for everything furnished and done by the Contractor in respect of the Work to which the payment relates.
- 2) When making any payment to the Contractor, the failure of the NCC to deduct an amount payable to the NCC by the Contractor shall not constitute a waiver of the right to do so, or an admission of lack of entitlement to do so in any subsequent payment to the Contractor.
- 3) No payment other than a payment that is expressly stipulated in the Contract, shall be made by the NCC to the Contractor for any extra expense or any loss or damage incurred or sustained by the Contractor.

GC5.3 INCREASED OR DECREASED COSTS

- 1) The Contract Amount shall not be increased nor decreased by reason of any increase or decrease in the cost of the Work that is brought about by an increase or decrease in the cost of labour, Plant, Material or any wage adjustment arising pursuant to the Labour Conditions.
- 2) Notwithstanding paragraph 1) of GC5.3, if any change, including a new imposition or repeal, of any tax, customs or other duty, charge, or any similar imposition that is imposed under sales, customs or excise tax legislation of the Government of Canada or any Provincial or Territorial legislation, affects the cost of the Work to the Contractor, and occurs:
 - (a) after the date of submission by the Contractor of its tender; or
 - (b) after the date of submission of the last revision, if the Contractor's tender was revised,the Contract Amount shall be adjusted in the manner provided in paragraph 3) of GC5.3.
- 3) If a change referred to in paragraph 2) of GC5.3 occurs, the Contract Amount shall be increased or decreased by an amount established by an examination by the NCC of the relevant records of the Contractor referred to in GC2.8 ACCOUNTS AND AUDITS to be the increase or decrease in the cost incurred by the Contractor that is directly attributable to that change.
- 4) For the purpose of paragraph 2) of GC5.3, if a tax is changed after the tender closing, but public notice of the change has been given by the Minister of Finance or the corresponding Provincial or Territorial authority before that closing, the change shall be deemed to have occurred before the solicitation closing.
- 5) Notwithstanding paragraphs 2) to 4) of GC5.3, no adjustment to the Contract Amount in respect of the Work or a part thereof shall be made for a change in any imposition referred to in this section that occurs after the date required by the Contract for completion of the Work or that part of the Work.

GC5.4 PROGRESS PAYMENT

- 1) On the expiration of a payment period, the Contractor shall deliver to the NCC:
 - (a) a written progress claim in a form acceptable to the NCC that fully describes any part of the Work that has been completed, and any Material that was delivered to the Work site but not incorporated into the Work, during that payment period: and
 - (b) a completed and signed statutory declaration containing a declaration that, up to the date of the progress claim, the Contractor has complied with all lawful obligations with respect to the Labour Conditions and that, in respect of the Work, all lawful obligations of the Contractor to its Subcontractors and Suppliers, referred to collectively in the declaration as "subcontractors and suppliers", have been fully discharged.
- 2) Within 10 days of receipt of a progress claim and statutory declaration from the Contractor, the NCC shall inspect, or cause to have inspected, the part of the Work and the Material described in the progress claim, and shall issue a progress report to the Contractor, that indicates the value of the part of the Work and the Material described in the progress claim that, in the opinion of the NCC:
 - (a) is in accordance with the Contract; and
 - (b) was not included in any other progress report relating to the Contract.

- 3) Subject to GC5.2 AMOUNT PAYABLE, and paragraph 5) of GC5.4, the NCC shall pay the Contractor an amount that is equal to:
 - (a) 95% of the value that is indicated in the NCC's progress report if a labour and material payment bond has been furnished by the Contractor; or
 - (b) 90% of the value that is indicated in the NCC's progress report if a labour and material payment bond has not been furnished by the Contractor.
- 4) Subject to GC5.2, "Amount Payable", and paragraph 5) of GC5.4, the NCC shall pay the Contractor an amount that is equal to 90% of the value that is indicated in the NCC's progress report
- 5) In the case of the Contractor's first progress claim, it is a condition precedent to the NCC's obligation under paragraph 3) of GC5.4 that the Contractor has provided all necessary documentation required by the Contract for the first progress claim and has provided evidence of compliance with workers' compensation legislation applicable to the place of the Work in accordance with GC1.9 WORKERS' COMPENSATION.

GC5.5 SUBSTANTIAL PERFORMANCE OF THE WORK

- 1) If, at any time before the issuance of a Certificate of Completion, the NCC determines that the Work has reached Substantial Performance as described in subparagraph 1) (b) of GC1.1.4 SUBSTANTIAL PERFORMANCE, the NCC shall issue a Certificate of Substantial Performance to the Contractor. The Certificate of Substantial Performance shall state or describe:
 - (a) the date of Substantial Performance;
 - (b) the parts of the Work not completed to the satisfaction of the NCC; and
 - (c) all things that must be done by the Contractor before a Certificate of Completion is issued and before the 12-month warranty period referred to in GC3.13 WARRANTY AND RECTIFICATION OF DEFECTS IN WORK commences for the said parts and all the said things.
- 2) The issuance of a Certificate of Substantial Performance does not relieve the Contractor from the Contractor's obligations under GC3.11 DEFECTIVE WORK.
- 3) Subject to GC5.2 AMOUNT PAYABLE and paragraph 4) of GC5.5, the NCC shall pay the Contractor the amount referred to in paragraph 1) of GC5.2 AMOUNT PAYABLE, less the aggregate of:
 - (a) the sum of all payments that were made pursuant to GC5.4 PROGRESS PAYMENT;
 - (b) an amount that is equal to the NCC's estimate of the cost to the NCC of rectifying defects described in the Certificate of Substantial Performance; and
 - (c) an amount that is equal to the NCC's estimate of the cost to the NCC of completing the parts of the Work described in the Certificate of Substantial Performance other than defects listed therein.
- 4) The NCC shall pay the amount referred to in paragraph 3) of GC5.5 not later than:
 - (a) 30 days after the date of issue of a Certificate of Substantial Performance, or
 - (b) 15 days after the Contractor has delivered to the NCC:

- (i) a statutory declaration containing a declaration by the Contractor that up to the date of the Certificate of Substantial Performance, the Contractor has complied with all lawful obligations with respect to the Labour Conditions, discharged all its lawful obligations to its Subcontractors and Suppliers in respect of the work under the Contract, and discharged its lawful obligations referred to in GC1.8 LAWS, PERMITS AND TAXES;
- (ii) evidence of compliance with workers' compensation legislation in accordance with GC1.9 WORKERS' COMPENSATION; and
- (iii) an update of the progress schedule in accordance with the requirements of GC3.1 PROGRESS SCHEDULE;

whichever is later.

GC5.6 FINAL COMPLETION

- 1) When the NCC is of the opinion that the Contractor has complied with the Contract and all orders and directions made pursuant thereto, and that the Work has been completed as described in GC1.1.5 COMPLETION, the NCC shall issue a Certificate of Completion to the Contractor and, if the Work or a portion of the Work is subject to a Unit Price Arrangement, the NCC shall issue a Certificate of Measurement that shall, subject to GC8, be binding upon and conclusive between the NCC and the Contractor as to the quantities referred to therein.
- 2) Subject to GC5.2 AMOUNT PAYABLE and paragraph 3) of GC5.6, the NCC shall pay the Contractor the amount referred to in GC5.2 AMOUNT PAYABLE, less the aggregate of the sum of all payments that were made pursuant to GC5.4 PROGRESS PAYMENT and GC5.5 SUBSTANTIAL PERFORMANCE OF WORK.
- 3) The NCC shall pay the amount referred to in paragraph 2) of GC5.6 not later than:
 - (a) 60 days after the date of issue of a Certificate of Completion; or
 - (b) 15 days after the Contractor has delivered to the NCC:
 - (i) a statutory declaration which contains a declaration by the Contractor that all of the Contractor's lawful obligations and any lawful claims against the Contractor that arose out of the performance of the Contract have been discharged and satisfied; and
 - (ii) evidence of compliance with workers' compensation legislation in accordance with GC1.9 WORKERS' COMPENSATION;

whichever is later.

GC5.7 PAYMENT NOT BINDING ON NCC

- 1) Neither acceptance of a progress claim or progress report, nor any payment made by the NCC under the Contract, nor partial or entire use or occupancy of the Work by the NCC shall constitute an acceptance by the NCC of any portion of the Work or Material that is not in accordance with the requirements of the Contract.

GC5.8 CLAIMS AND OBLIGATIONS

- 1) The Contractor shall discharge all the Contractor's lawful obligations and shall satisfy all lawful claims against the Contractor arising out of the performance of the Work at least as often as the Contract requires the NCC to pay the Contractor.

- 2) Whenever requested to do so by the NCC, the Contractor shall make a statutory declaration declaring to the existence and condition of any obligations and claims against the Contractor arising out of the performance of the Work.
- 3) In order to discharge lawful obligations of and satisfy lawful claims against the Contractor or its Subcontractors arising out of the performance of the Contract, the NCC may pay an amount that is due and payable to the Contractor directly to the claimant. Such payment is, to the extent of the payment, a discharge of the NCC's liability to the Contractor under the Contract and may be deducted from any amount payable to the Contractor under the Contract.
- 4) For the purposes of paragraph 3) of GC5.8, and subject to paragraph 6) of GC5.8, a claim or obligation shall be considered lawful when it is so determined by:
 - (a) a court of legal jurisdiction;
 - (b) an arbitrator duly appointed to arbitrate the claim; or
 - (c) the written consent of the Contractor authorizing payment of the claim or obligation.
- 5) If a claim or obligation would have been subject to the provisions of Provincial or Territorial lien legislation or, in the Province of Quebec, the law relating to legal hypothecs had the Contractor been performing the Work for an entity other than the NCC:
 - (a) such amount as may be paid by the NCC pursuant to paragraphs 3) and 4) of GC5.8 shall not exceed the amount that the Contractor would have been obliged to pay had the provisions of such legislation or law been applicable to the Work;
 - (b) a claimant need not comply with the provisions of such legislation, setting out the steps by way of notice, registration or otherwise as might have been necessary to preserve or perfect any claim for lien or privilege which the claimant might have had; and
 - (c) for the purposes of determining the entitlement of a claimant, the notice required by paragraph 8) of GC5.8 shall be deemed to replace the registration or provision of notice after the performance of work as required by any applicable legislation and no claim shall be deemed to have expired, become void or unenforceable by reason of the claimant not commencing any action within the time prescribed by such legislation.
- 6) The Contractor shall, at the request of any claimant, submit to binding arbitration those questions that need to be answered to establish the entitlement of the claimant to payment. The arbitration shall have as parties to it any Subcontractor or Supplier to whom the claimant supplied Material, performed work or rented equipment should such Subcontractor or Supplier wish to be adjoined, and the NCC shall not be a party to such arbitration. Subject to any agreement between the Contractor and the claimant, the arbitration shall be conducted in accordance with the governing Provincial or Territorial legislation applicable to the site of the Work.
- 7) Paragraph 3) of GC5.8 shall apply only to claims and obligations:
 - (a) the notification of which has set forth the amount claimed to be owing and the person who by contract is primarily liable and has been received by the NCC in writing before final payment is made to the Contractor pursuant to GC5.6 FINAL COMPLETION, and within 120 days of the date on which the claimant:

- (i) should have been paid in full under the claimant's contract with the Contractor, its Subcontractor or Supplier if the claim is for money that was lawfully required to be held back from the claimant; or
 - (ii) performed the last of the services, work or labour, or furnished the last of the Material pursuant to the claimant's contract with the Contractor or its Subcontractor or Supplier where the claim is for money not lawfully required to be held back from the claimant; and
- (b) the proceedings to determine the right to payment of which, pursuant to paragraph 5) of GC5.8, shall have commenced within one year from the date that the notification required by subparagraph 7)(a) of GC5.8 was received by the NCC.
- 8) Upon receipt of a notice of claim, the NCC may withhold, from any amount that is due and payable to the Contractor pursuant to the Contract, the full amount of the claim or any portion thereof.
- 9) The NCC shall notify the Contractor in writing in a timely manner of receipt of any claim and of the intention of the NCC to withhold funds. At any time thereafter and until payment is made to the claimant, the Contractor may be entitled to post, with the NCC, security in a form acceptable to the NCC in an amount equal to the value of the claim, and upon receipt of such security the NCC shall release to the Contractor any funds that would be otherwise payable to the Contractor, that were withheld pursuant to the provisions of this clause in respect of the claim of any claimant for whom the security stands.

GC5.9 RIGHT OF SETOFF

- 1) Without limiting any right of setoff or deduction given or implied by law or elsewhere in the Contract, the NCC may set off any amount payable to the NCC by the Contractor under the Contract, or under any current contract, against any amount payable to the Contractor under the Contract.
- 2) For the purposes of paragraph 1) of GC5.9, "current contract" means a contract between the NCC and the Contractor:
- (a) under which the Contractor has an undischarged obligation to perform or supply work, labour or material; or
 - (b) in respect of which the NCC has, since the date of the Contract, exercised any right to take the work that is the subject of that contract out of the Contractor's hands.

GC5.10 ASSESSMENTS AND DAMAGES FOR LATE COMPLETION

- 1) For the purposes of this clause:
- (a) the Work shall be deemed to be completed on the date of the Certificate of Completion; and
 - (b) the "period of delay" means the number of days commencing on the day fixed for completion of the Work and ending on the day immediately preceding the day on which the Work is completed but does not include any day within a period of extension granted pursuant to GC6.5 DELAYS AND EXTENSION OF TIME and any other day on which, in the opinion of the NCC, completion of the Work was delayed for reasons beyond the control of the Contractor.
- 2) If the Contractor does not complete the Work by the day fixed for its completion but completes it thereafter, the Contractor shall pay the NCC an amount equal to the aggregate of:
- (a) all salaries, wages and travelling expenses incurred by the NCC in respect of persons overseeing the performance of the Work during the period of delay;

- (b) the cost incurred by the NCC as a result of the inability to use the completed Work for the period of delay; and
 - (c) all other expenses and damages incurred or sustained by the NCC during the period of delay as a result of the Work not being completed by the day fixed for its completion.
- 3) The NCC may waive the right of the NCC to the whole or any part of the amount payable by the Contractor pursuant to paragraph 2) of GC5.10 if, in the opinion of the NCC, it is in the public interest to do so.

GC5.11 DELAY IN MAKING PAYMENT

- 1) Notwithstanding GC1.5 TIME OF THE ESSENCE, any delay by the NCC in making any payment when it is due pursuant to GC5 TERMS OF PAYMENT, shall not be a breach of the Contract by the NCC.
- 2) Subject to paragraph 3) of GC5.11, the NCC shall pay to the Contractor simple interest at the Average Bank Rate plus 3 percent per annum on any amount that is overdue pursuant to paragraph 3) of GC5.1 INTERPRETATION, and the interest shall apply from and include the day such amount became overdue until the day prior to the date of payment.
- 3) Interest shall be paid, on demand by the Contractor, except that:
- (a) in respect of amounts that are less than 15 days overdue, no interest shall be paid in respect of payment made within such 15 days; and
 - (b) interest shall not be payable or paid on overdue advance payments, if any.

GC5.12 INTEREST ON SETTLED CLAIMS

- 1) For the purposes of this clause, a claim means a disputed amount subject to negotiation between the NCC and the Contractor under the Contract.
- 2) A claim is deemed to have been settled when an agreement in writing is signed by the NCC and the Contractor setting out the amount of the claim to be paid by the NCC and the items of work for which the said amount is to be paid.
- 3) A settled claim is deemed to be outstanding from the day immediately following the date the said claim would have been due and payable under the Contract had it not been disputed.
- 4) The NCC shall pay to the Contractor simple interest on the amount of a settled claim at the Average Bank Rate plus 3 per cent per annum from the date the settled claim was deemed to be outstanding until the day prior to the date of payment.

GC5.13 RETURN OF SECURITY DEPOSIT

- 1) After a Certificate of Substantial Performance has been issued, and if the Contractor is not in breach of nor in default under the Contract, the NCC shall return to the Contractor all or any part of a Security Deposit that, in the opinion of the NCC, is not required for the purposes of the Contract.
- 2) After a Certificate of Completion has been issued, the NCC shall return to the Contractor the remainder of any security deposit unless the Contract stipulates otherwise.
- 3) If the security deposit was paid to the NCC, the NCC shall pay interest thereon to the Contractor at a rate established pursuant to section 21(2) of the Financial Administration Act.

- GC6.1 CHANGES IN THE WORK
- GC6.2 CHANGES IN SUBSURFACE CONDITIONS
- GC6.3 HUMAN REMAINS, ARCHAEOLOGICAL REMAINS AND ITEMS OF HISTORICAL OR SCIENTIFIC INTEREST
- GC6.4 DETERMINATION OF PRICE
 - GC6.4.1 Price Determination Prior to Undertaking Changes
 - GC6.4.2 Price Determination Following Completion of Changes
 - GC6.4.3 Price Determination - Variations in Tendered Quantities
- GC6.5 DELAYS AND EXTENSION OF TIME
- GC6.6 ALLOWABLE COSTS FOR CONTRACT CHANGES UNDER GC6.4.1
 - GC6.6.1 General
 - GC6.6.2 Hourly Labour Rates
 - GC6.6.3 Material, Plant and Equipment Costs
 - GC6.6.4 Allowance to the Contractor or Subcontractor

GC6.1 CHANGES IN THE WORK

- 1) At any time before issuance of a Certificate of Completion, Canada may issue orders for additions, deletions or other changes to the Work, or changes in the location or position of the whole or any part of the Work, if the addition, deletion, change or other revision is deemed by Canada to be consistent with the general intent of the Contract.
- 2) An order referred to in paragraph 1) of GC6.1 shall be in writing and given to the Contractor in accordance with GC2.3 NOTICES.
- 3) Upon receipt of an order, the Contractor shall promptly perform the work in accordance with the order as if the order had appeared in and been part of the original Contract.
- 4) If anything done or omitted by the Contractor pursuant to an order increases or decreases the cost of the Work to the Contractor, payment for the work shall be made in accordance with GC6.4 DETERMINATION OF PRICE.

GC6.2 CHANGES IN SUBSURFACE CONDITIONS

- 1) If, during the performance of the Work, the Contractor encounters subsurface conditions that are substantially different from the subsurface conditions described in the tender documents supplied to the Contractor, or a reasonable assumption of fact based thereon, the Contractor shall give notice to Canada immediately upon becoming aware of the situation.
- 2) If the Contractor is of the opinion that the Contractor may incur or sustain any extra expense or any loss or damage that is directly attributable to the changed subsurface conditions, the Contractor shall within 10 days of the date the changed subsurface conditions were encountered, give Canada written notice of intention to claim for that extra expense, loss or damage.
- 3) If the Contractor has given a notice referred to in paragraph 2) of GC6.2, the Contractor shall give Canada a written claim for extra expense, loss or damage no later than 30 days after the date that a Certificate of Substantial Performance is issued.
- 4) A written claim referred to in paragraph 3) of GC6.2 shall contain a sufficient description of the facts and circumstances of the occurrence that is the subject of the claim to enable Canada to determine whether or not the claim is justified, and the Contractor shall supply such further and other information for that purpose as Canada requires.

- 5) If Canada determines that a claim referred to in paragraph 3) of GC6.2 is justified, Canada shall make an extra payment to the Contractor in an amount that is calculated in accordance with GC6.4 DETERMINATION OF PRICE.
- 6) If, in the opinion of Canada, the Contractor effects a saving of expenditure that is directly attributable to a substantial difference between the information relating to subsurface conditions at the site of the Work that is contained in the tender documents, or a reasonable assumption of fact based thereon, and the actual subsurface conditions encountered by the Contractor, the Contract Amount shall be reduced by the amount of the saving of expenditure determined in accordance with GC6.4 DETERMINATION OF PRICE.
- 7) If the Contractor fails to give a notice referred to in paragraph 2) of GC6.2 and a claim referred to in paragraph 3) of GC6.2 within the times stipulated, an extra payment shall not be made to the Contractor in respect of the occurrence.
- 8) Canada does not warrant the content expressed in any subsurface report available for the perusal of the Contractor that does not form part of the tender and contract documents.

GC6.3 HUMAN REMAINS, ARCHAEOLOGICAL REMAINS AND ITEMS OF HISTORICAL OR SCIENTIFIC INTEREST

- 1) For the purposes of this clause
 - (a) "human remains" means the whole or any part of a deceased human being, irrespective of the time of death;
 - (b) "archaeological remains" are items, artefacts or things made, modified or used by human beings in antiquity and may include, but not be limited to, stone, wood or iron structures or monuments, dump deposits, bone artefacts, weapons, tools, coins, and pottery; and
 - (c) "items of historical or scientific interest" are naturally occurring or manufactured objects or things of any age that are not archaeological remains but may be of interest to society because of their historical or scientific significance, value, rarity, natural beauty, or other quality.
- 2) If, during the course of the Work, the Contractor encounters any object, item or thing which is described in paragraph 1) of GC6.3 or which resembles any object, item or thing described in paragraph 1) of GC6.3, the Contractor shall
 - (a) take all reasonable steps, including stopping work in the affected area, to protect and preserve the object, item or thing;
 - (b) immediately notify Canada of the circumstances in writing; and
 - (c) take all reasonable steps to minimize additional costs that may accrue as a result of any work stoppage.
- 3) Upon receipt of a notification in accordance with subparagraph 2)(b) of GC6.3, Canada shall promptly determine whether the object, item or thing is one described in, or contemplated by paragraph 1) of GC6.3, and shall notify the Contractor in writing of any action to be performed, or work to be carried out, by the Contractor as a result of Canada's determination.
- 4) Canada may, at any time, enlist the services of experts to assist in the investigation, examination, taking of measurements or other such recordings, placing of permanent protection around or removing of the object, item or thing encountered by the Contractor, and the Contractor shall, to the satisfaction

of Canada, allow them access and co-operate with them in the carrying out of their duties and obligations.

- 5) Human remains, archaeological remains and items of historical or scientific interest encountered at the site of the Work shall be deemed to be the property of Canada.
- 6) Except as may be otherwise provided for in the Contract, the provisions of GC6.4 DETERMINATION OF PRICE and GC6.5 DELAYS AND EXTENSION OF TIME shall apply.

GC6.4 DETERMINATION OF PRICE

GC6.4.1 Price Determination Prior to Undertaking Changes

- 1) If a Lump Sum Arrangement applies to the Contract or a part thereof, the price of any change shall be the aggregate estimated cost of labour, Plant and Material that is required for the change as agreed upon in writing by the Contractor and Canada plus an allowance for supervision, co-ordination, administration, overhead, margin and the risk of undertaking the work within the stipulated amount, which allowance shall be equal to
 - (a) 20% of the aggregate costs referred to herein for that portion of the Work done by the Contractor's own forces, if the aggregate cost of the Work does not exceed \$50,000;
 - (b) 15% of the aggregate costs referred to herein for that portion of the Work that is done by subcontract, if the aggregate cost of the Work does not exceed \$50,000; or
 - (c) a negotiated percentage of the aggregate costs referred to herein or a negotiated amount
 - (i) if the aggregate cost of the Work exceeds \$50,000; or
 - (ii) if the Contractor and Canada agree in writing.
- 2) If a Unit Price Arrangement applies to the Contract or a part thereof, the Contractor and Canada may, by agreement in writing, add items, units of measurement, estimated quantities and prices per unit to the Unit Price Table.
- 3) A price per unit referred to in paragraph 2) of GC6.4.1 shall be determined on the basis of the aggregate estimated cost of labour, Plant and Material that is required for the additional item as agreed upon by the Contractor and Canada, plus an allowance determined in accordance with paragraph 1) of GC6.4.1.
- 4) To facilitate approval of the price of the change or the additional price per unit as applicable, the Contractor shall submit a cost estimate breakdown identifying, as a minimum, the estimated cost of labour, Plant, Material, each subcontract amount, and the amount of the allowance.
- 5) If no agreement is reached as contemplated in paragraph 1) of GC6.4.1, the price shall be determined in accordance with GC6.4.2.
- 6) If no agreement is reached, as contemplated in paragraphs 2) and 3) of GC6.4.1, Canada shall determine the class and the unit of measurement of the item of labour, Plant or Material and the price per unit shall be determined in accordance with GC6.4.2.

GC6.4.2 Price Determination Following Completion of Changes

- 1) If it is not possible to predetermine, or if there is failure to agree upon the price of a change in the Work, the price of the change shall be equal to the aggregate of

- (a) all reasonable and proper amounts actually expended or legally payable by the Contractor in respect of the labour, Plant and Material that fall within one of the classes of expenditure described in paragraph 2) of GC6.4.2, that are directly attributable to the performance of the Contract;
 - (b) an allowance for profit and all other expenditures or costs, including overhead, general administration costs, financing and interest charges, in an amount that is equal to 10% of the sum of the expenses referred to in subparagraph 1)(a) of GC6.4.2; and
 - (c) interest on the amounts determined under subparagraphs 1)(a) and 1)(b) of GC6.4.2 calculated in accordance with GC5.12 INTEREST ON SETTLED CLAIMS;
- 2) The cost of labour, Plant and Material referred to in subparagraph 1)(a) of GC6.4.2 shall be limited to the following categories of expenditure:
- (a) payments to Subcontractors and Suppliers;
 - (b) wages, salaries, bonuses and, if applicable, travel and lodging expenses of employees of the Contractor located at the site of the Work and that portion of wages, salaries, bonuses and, if applicable, travel and lodging expenses of personnel of the Contractor generally employed at the head office or at a general office of the Contractor provided they are actually and properly engaged on the Work under the Contract;
 - (c) assessments payable under any statutory authority relating to workers' compensation, employment insurance, pension plan or holidays with pay, provincial health or insurance plans, environmental reviews, and GST / HST collection costs;
 - (d) rent that is paid for Plant, or an amount equivalent to the said rent if the Plant is owned by the Contractor, that is necessary for and used in the performance of the Work, if the rent or the equivalent amount is reasonable and use of that Plant has been approved by Canada;
 - (e) payments for maintaining and operating Plant necessary for and used in the performance of the Work, and payments for effecting repairs thereto that, in the opinion of Canada, are necessary for the proper performance of the Contract, other than payments for any repairs to the Plant arising out of defects existing before its allocation to the Work;
 - (f) payments for Material that is necessary for and incorporated in the Work, or that is necessary for and consumed in the performance of the Contract;
 - (g) payments for preparation, delivery, handling, erection, installation, inspection, protection and removal of the Plant and Material necessary for and used in the performance of the Contract; and
 - (h) any other payments made by the Contractor with the approval Canada that are necessary for the performance of the Contract in accordance with the Contract Documents.

GC6.4.3 Price Determination - Variations in Tendered Quantities

- 1) Except as provided in paragraphs 2), 3), 4) and 5) of GC6.4.3, if it appears that the final quantity of labour, Plant and Material under a price per unit item shall exceed or be less than the estimated tendered quantity, the Contractor shall perform the Work or supply the Plant and Material required to complete the item and payment shall be made for the actual Work performed or Plant and Material supplied at the price per unit set out in the Contract.
- 2) If the final quantity of the price per unit item exceeds the estimated tendered quantity by more than 15%, either party to the Contract may make a written request to the other party to negotiate an

amended price per unit for that portion of the item which exceeds 115% of the estimated tendered quantity, and to facilitate approval of any amended price per unit, the Contractor shall, on request, provide Canada with

- (a) detailed records of the actual cost to the Contractor of performing or supplying the tendered quantity for the price per unit item up to the time the negotiation was requested; and
 - (b) the estimated unit cost of labour, Plant and Material required for the portion of the item that is in excess of 115% of the tendered quantity.
- 3) If agreement is not reached as contemplated in paragraph 2) of GC6.4.3, the price per unit shall be determined in accordance with GC6.4.2.
- 4) If it appears that the final quantity of labour, Plant and Material under a price per unit item shall be less than 85% of the estimated tendered quantity, either party to the Contract may make a written request to the other party to negotiate a change to the price per unit for the item if
- (a) there is a demonstrable difference between the unit cost to the Contractor of performing or supplying the estimated tendered quantity and the unit cost to the Contractor for performing or supplying the final quantity; and
 - (b) the difference in unit cost is due solely to the decrease in quantity and not to any other cause.
- 5) For the purposes of the negotiation referred to in paragraph 4) of GC6.4.3
- (a) the onus of establishing, justifying and quantifying a proposed change lies with the party making the request for negotiation; and
 - (b) in no event shall the total price for an item that has been amended as a result of a reduction in quantity pursuant to paragraph 4) of GC6.4.3 exceed the amount that would have been payable to the Contractor had 85% of the tendered quantity actually been performed or supplied.

GC6.5 DELAYS AND EXTENSION OF TIME

- 1) Upon application of the Contractor made before the date first fixed for completion of the Work or before any other date previously fixed under this clause, Canada may extend the time for completion of the Work by fixing a new date if Canada determines that causes beyond the control of the Contractor have delayed its completion.
- 2) The Contractor's application shall be accompanied by the written consent of the bonding company whose bond forms part of the Contract Security.
- 3) Subject to paragraph 4) of GC6.5, no payment, other than a payment that is expressly stipulated in the Contract, shall be made by Canada to the Contractor for any extra expense, loss or damage incurred or sustained by the Contractor due to delay, whether or not the delay is caused by circumstances beyond the control of the Contractor.
- 4) If the Contractor incurs or sustains any extra expense or any loss or damage that is directly attributable to any neglect or delay that occurs after the date of the Contract on the part of Canada in providing any information or in doing any act that the Contract either expressly requires Canada to do or that would ordinarily be done by an owner in accordance with the practice of the trade, the Contractor shall give Canada written notice of intention to claim for that extra expense or loss or damage within ten working days of the date the neglect or delay first occurred.

- 5) When the Contractor has given a notice referred to in paragraph 4) of GC6.5, the Contractor shall give Canada a written claim for the extra expense, loss or damage no later than 30 days after the date that a Certificate of Completion is issued and not afterwards.
- 6) A written claim referred to in paragraph 5) of GC6.5 shall contain a sufficient description of the facts and circumstances of the occurrence that is the subject of the claim to enable Canada to determine whether or not the claim is justified and the Contractor shall supply such further and other information for that purpose as Canada may require.
- 7) If Canada determines that a claim referred to in paragraph 5) of GC6.5 is justified, Canada shall make an extra payment to the Contractor in an amount that is calculated in accordance with GC6.4 DETERMINATION OF PRICE.
- 8) If the Contractor fails to give a notice referred to in paragraph 4) and a claim referred to in paragraph 5) of GC6.5 within the times stipulated, an extra payment shall not be made to the Contractor in respect of the occurrence.

GC6.6 ALLOWABLE COSTS FOR CONTRACT CHANGES UNDER GC6.4.1

GC6.6.1 General

- 1) The Contractor shall submit a cost estimate breakdown for each contemplated change, in accordance with paragraph 4) of GC6.4.1 PRICE DETERMINATION PRIOR TO UNDERTAKING CHANGES. The breakdown shall itemize all labour, material, plant and equipment costs estimated by the Contractor and subcontractors, and the amount of each allowance.
- 2) It is the responsibility of the Contractor to ensure that all prices included in the Contractor's breakdown to the NCC, including those of subcontractors, are fair and reasonable in view of the terms expressed herein.
- 3) The labour hours required for the contemplated change shall be based on the estimated number of hours to perform the work.
- 4) Time spent by a working foreman may be included in the number of labour hours, at a rate agreed to in writing by the Contractor and the NCC.
- 5) Time attributable to material handling, productivity factors and approved rest periods is to be included in the number of hours required by the contemplated change and will not be paid as a separate item under hourly rates.
- 6) Allowances referred to in section 04 below are not to be included in the hourly labour rates.
- 7) Credit for work deleted will only be for the work directly associated with the change.
- 8) When a change deletes work which has not yet been performed, the NCC is entitled to an adjustment in the Contract Amount equal to the cost the Contractor would have incurred had the work not been deleted.
- 9) Allowances referred to in Section 04 below shall not be applied to any credit amounts for deleted work.
- 10) In those cases where the change involves additions and deletions to the work, the allowances referred to in section 04 below shall apply only when the cost of the additions minus the cost of the deletions would result in an increase in the Contract Amount. The percentage allowance shall only be applied to that portion of the costs of the additions that is in excess of the cost of the deletions.

- 11) If the contemplated change in the work necessitates a change in the contract completion date, or has an impact on the work, the Contractor shall identify and include the resulting cost in the breakdown.

GC6.6.2 Hourly Labour Rates

- 1) The hourly labour rates listed in the Contractor's breakdown shall be determined in accordance with the collective agreements that are applicable at the site of the work and shall include:
- (a) the base rate of pay;
 - (b) vacation pay;
 - (c) benefits which includes:
 - (i) welfare contributions;
 - (ii) pension contributions;
 - (iii) union dues;
 - (iv) training and industry funds contributions; and
 - (v) other applicable benefits, if any, that can be substantiated by the Contractor.
 - (d) statutory and legislated requirements, assessed and payable under statutory authority, which includes:
 - (i) Employment Insurance contributions;
 - (ii) Canada Pension Plan or Québec Pension Plan contributions;
 - (ii) Worker's Compensation Board or Commission de la santé et de la sécurité du travail premiums;
 - (iv) Public Liability and Property Damage insurance premiums; and
 - (v) health tax premiums.
- 2) In the case of nonunion labour, all rates claimed shall be in accordance with the terms of the Labour Conditions forming part of this contract and the Contractor must provide satisfactory proof of the rates actually paid.

GC6.6.3 Material, Plant and Equipment Costs

- 1) The costs of all purchases and rentals must be based on the actual amount paid to the suppliers by the Contractor or subcontractor and said costs are to include all applicable discounts.

GC6.6.4 Allowance to the Contractor or Subcontractor

- 1) The allowances determined in accordance with paragraph 1) of GC6.4.1 PRICE DETERMINATION PRIOR TO UNDERTAKING CHANGES shall be considered as full compensation for:
- (a) supervision, co-ordination, administration, overhead, margin and the risk of undertaking the work within the stipulated amount; and

- (b) miscellaneous additional costs related to:
 - (i) the purchase or rental of material, plant and equipment;
 - (ii) the purchase of small tools and supplies;
 - (iii) safety and protection measures; and
 - (iv) permits, bonds, insurance, engineering, as built drawings, commissioning and site office.

GC7.1 TAKING THE WORK OUT OF THE CONTRACTOR'S HANDS

GC7.2 SUSPENSION OF WORK

GC7.3 TERMINATION OF CONTRACT

GC7.4 SECURITY DEPOSIT - FORFEITURE OR RETURN

GC7.1 TAKING THE WORK OUT OF THE CONTRACTOR'S HANDS

- 1) By giving notice in writing to the Contractor in accordance with GC2.3 NOTICES, the NCC, without any other authorization, may take all or any part of the Work out of the Contractor's hands, and may employ such means as the NCC sees fit to have the Work completed if the Contractor:
 - (a) fails to remedy any delay in the commencement or default in the diligent performance of the Work to the satisfaction of the NCC within six days of the NCC giving notice to the Contractor in writing in accordance with GC2.3 NOTICES;
 - (b) defaults in the completion of any part of the Work within the time fixed for its completion by the Contract;
 - (c) becomes insolvent, or has committed an act of bankruptcy, and has neither made a proposal to its creditors nor filed a notice of intention to make such a proposal, pursuant to the Bankruptcy and Insolvency Act;
 - (d) abandons the work;
 - (e) makes an assignment of the Contract without the consent required by GC1.16 ASSIGNMENT;
or
 - (f) otherwise fails to observe or perform any of the provisions of the Contract.
- 2) If the whole or any part of the Work is taken out of the Contractor's hands, the Contractor's right to any further payment that is due or accruing due under the Contract is, subject only to paragraph 3) of GC7.1, extinguished, and the Contractor is liable to pay the NCC, upon demand, an amount that is equal to the amount of all loss and damage incurred or sustained by the NCC in respect of the Contractor's failure to complete the Work.
- 3) If the whole or any part of the Work that is taken out of the Contractor's hands is completed by the NCC, the NCC may pay the Contractor the amount, if any, of the holdback or a progress claim as determined by the NCC that had accrued and was due prior to the date on which the Work was taken out of the Contractor's hands and that is not required for the purposes of having the Work performed or of compensating the NCC for any other loss or damage incurred or sustained by reason of the Contractor's default.
- 4) The taking of the Work or any part thereof out of the Contractor's hands does not relieve the Contractor from any obligation under the Contract or imposed by law except the obligation to complete the performance of that part of the Work that was taken out of the Contractor's hands.
- 5) If the Work or any part thereof is taken out of the Contractor's hands, all Plant and Material and the interest of the Contractor, or its suppliers or subcontractors at any tier, in all real property, licences, powers and privileges acquired, used or provided by the Contractor, or its suppliers or subcontractors at any tier, under the Contract shall continue to be the property of the NCC without compensation.
- 6) When the NCC certifies that any Plant, Material, or any interest of the Contractor is no longer required for the purposes of the Work, or that it is not in the interests of the NCC to retain that Plant, Material, or interest, it shall revert to the Contractor.

- 7) If the Contractor has become insolvent or has committed an act of bankruptcy, and has either made a proposal to its creditors or filed a notice of intention to make such a proposal, pursuant to the Bankruptcy and Insolvency Act, the Contractor shall immediately forward a copy of the proposal or the notice of intention to the NCC.

GC7.2 SUSPENSION OF WORK

- 1) When, in the NCC's opinion, it is in the public interest to do so, the NCC may require the Contractor to suspend performance of the Work either for a specified or an unspecified period, by giving a notice of suspension in writing to the Contractor in accordance with GC2.3 NOTICES.
- 2) When a notice of suspension is received by the Contractor, the Contractor shall suspend all operations in respect of the Work except those that the NCC determines are necessary for the care and preservation of the Work, Plant and Material.
- 3) During a period of suspension, the Contractor shall not remove any part of the Work, Plant or Material from its site without the consent of the NCC.
- 4) If a period of suspension is 60 days or less, the Contractor shall resume the performance of the Work on the expiration of that period, and the Contractor is entitled to be paid the extra costs necessarily incurred by the Contractor as a result of the suspension, determined in accordance with GC6.4 DETERMINATION OF PRICE.
- 5) If a period of suspension is more than 60 days, the NCC and the Contractor may agree that the performance of the Work shall be continued by the Contractor, and the Contractor shall resume performance of the Work subject to any terms and conditions agreed upon by the NCC and the Contractor. If the NCC and the Contractor do not agree that performance of the Work shall be continued by the Contractor, or upon the terms and conditions under which the Contractor shall continue the Work, the notice of suspension shall be deemed to be a notice of termination pursuant to GC7.3 TERMINATION OF CONTRACT.

GC7.3 TERMINATION OF CONTRACT

- 1) The NCC may terminate the Contract at any time by giving a notice of termination in writing to the Contractor in accordance with GC2.3 NOTICES.
- 2) If the Contractor receives a notice of termination, the Contractor shall forthwith cease all operations in performance of the Contract, subject to any conditions stipulated in the notice.
- 3) Subject to paragraph 4) of GC7.3, if the Contract is terminated, the NCC shall pay the Contractor an amount determined to be due to the Contractor pursuant to GC6.4 DETERMINATION OF PRICE less the aggregate of all amounts that were paid to the Contractor by the NCC and all amounts that are due to the NCC from the Contractor pursuant to the Contract.
- 4) In no event shall the total amount payable by the NCC to the Contractor exceed the amount, calculated in accordance with GC5 TERMS OF PAYMENT, that would have been payable to the Contractor had the Contractor completed the Work.
- 5) Payment to the Contractor, if any, shall be made as soon as practicable under the circumstances.

GC7.4 SECURITY DEPOSIT - FORFEITURE OR RETURN

- 1) If the Work is taken out of the Contractor's hands, or the Contractor is in breach of, or in default under, the Contract, the NCC may convert a security deposit to the NCC's own use.

- 2) If the NCC converts a security deposit, the amount realized shall be deemed to be an amount due from the NCC to the Contractor under the Contract.
- 3) Any balance of the amount realized that remains after payment of all losses, damage and claims of the NCC and others shall be paid by the NCC to the Contractor if, in the opinion of the NCC, it is not required for the purposes of the Contract.

- 1) The Contractor may, within 10 days after the communication to the Contractor of any decision or direction referred to in GC6.1 CHANGES IN THE WORK and GC2.2 INTERPRETATION OF CONTRACT, protest that decision or direction.
- 2) A protest referred to in paragraph 1) of GC8 shall be in writing, contain full reasons for the protest, be signed by the Contractor and be given to the NCC.
- 3) If the Contractor gives a protest pursuant to paragraph 2) of GC8, any compliance by the Contractor with the decision or direction that was protested shall not be construed as an admission by the Contractor of the correctness of that decision or direction, or prevent the Contractor from taking whatever action the Contractor considers appropriate in the circumstances.
- 4) The giving of a protest by the Contractor pursuant to paragraph 2) of GC8 shall not relieve the Contractor from complying with the decision or direction that is the subject of the protest.
- 5) Subject to paragraph 6) of GC8, the Contractor shall take any action referred to in paragraph 3) of GC8 within 3 months after the date of the Certificate of Completion referred to in GC5.6 FINAL COMPLETION and not afterwards, except where it is otherwise provided by law.
- 6) The Contractor shall take any action referred to in paragraph 3) of GC8 resulting from a direction under GC3.13 WARRANTY AND RECTIFICATION OF DEFECTS IN WORK, within 3 months after the expiry of a warranty or guarantee period and not afterwards, except where it is otherwise provided by law.
- 7) Subject to paragraph 8) of GC8, if the NCC determines that the Contractor's protest is justified, the NCC shall pay the Contractor the cost of the additional labour, Plant and Material necessarily incurred by the Contractor in carrying out the protested decision or direction.
- 8) Costs referred to in paragraph 7) of GC8 shall be calculated in accordance with GC6.4 DETERMINATION OF PRICE.

GC9.1 OBLIGATION TO PROVIDE CONTRACT SECURITY**GC9.2 TYPES AND AMOUNTS OF CONTRACT SECURITY****GC9.3 IRREVOCABLE STANDBY LETTER OF CREDIT****GC9.1 OBLIGATION TO PROVIDE CONTRACT SECURITY**

- 1) The Contractor shall, at the Contractor's expense and within 7 days after the date that the Contractor receives notice that the Contractor's bid was accepted by the NCC, obtain and deliver Contract Security to the NCC in one or more of the forms prescribed in GC9.2 TYPES AND AMOUNTS OF CONTRACT SECURITY.
- 2) If the whole or a part of the Contract Security provided is in the form of a security deposit, it shall be held and disposed of in accordance with GC5.13 RETURN OF SECURITY DEPOSIT and GC7.4 SECURITY DEPOSIT - FORFEITURE OR RETURN.
- 3) If a part of the Contract Security provided is in the form of a labour and material payment bond, the Contractor shall post a copy of that bond at the site of the Work.
- 4) It is a condition precedent to the release of the first progress payment that the Contractor has provided the Contract Security as specified herein.
- 5) In addition to the limitation imposed in paragraph 4) of GC9.1, the Contractor further acknowledges and agrees that it will not be entitled to have access to the site, nor to commence work pursuant to this contract until it has delivered the Contract Security as specified herein.

GC9.2 TYPES AND AMOUNTS OF CONTRACT SECURITY

- 1) The Contractor shall deliver to the NCC (a), (b) or (c):
 - (a) A performance bond and a labour and material payment bond each in an amount that is equal to not less than 50% of the Contract Amount including taxes
 - (b) A labour and material payment bond in an amount that is equal to not less than 50% of the Contract Amount including taxes, and a security deposit in an amount that is equal to not less than 10% of the Contract Amount including taxes.
 - (c) A security deposit in an amount prescribed by subparagraph 1)(b) of GC9.2, plus an additional amount that is equal to 10% of the Contract Amount including taxes.
- 2) The amount of a security deposit referred to in subparagraph 1)(b) of GC9.2 shall not exceed \$2,000,000 regardless of the Contract Amount including taxes.
- 3) A performance bond and a labour and material payment bond referred to in paragraph 1) of GC9.2 shall be in a form and be issued by a bonding or surety company that is approved by the NCC.
 - (a) The approved form for the performance bond is enclosed at the end of GC9.
 - (b) The approved form for the labour and material payment bond is enclosed at the end of GC9
 - (c) The list of approved bonding or surety companies is displayed at the following Website:
<http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=12027> .
- 4) A security deposit referred to in subparagraphs 1)(b) and 1)(c) of GC9.2 shall be in the form of:

- (a) a bill of exchange, bank draft or money order made payable to the NCC and certified by an approved financial institution or drawn by an approved financial institution on itself; or
 - (b) bonds of, or unconditionally guaranteed as to principal and interest by, the Government of Canada.
- 5) For the purposes of subparagraph 4)(a) of GC9.2:
- (a) a bill of exchange is an unconditional order in writing signed by the Contractor and addressed to an approved financial institution, requiring the said institution to pay, on demand, at a fixed or determinable future time a certain sum of money to, or to the order of, the NCC;
 - (b) if a bill of exchange, bank draft or money order is certified by or drawn on an institution or corporation other than a chartered bank, it must be accompanied by proof that the said institution or corporation meets at least one of the criteria described in subparagraph 5)(c) of GC9.2, either by letter or by a stamped certification on the bill of exchange, bank draft or money; and
 - (c) An approved financial institution is:
 - (i) a corporation or institution that is a member of the Canadian Payments Association as defined in the Canadian Payments Act;
 - (ii) a corporation that accepts deposits that are insured, to the maximum permitted by law, by the Canada Deposit Insurance Corporation or the Régie de l'assurance-dépôts du Québec;
 - (iii) a corporation that accepts deposits from the public if repayment of the deposit is guaranteed by Her Majesty the Queen in right of a province;
 - (iv) a corporation, association or federation incorporated or organized as a credit union or co-operative credit society that conforms to the requirements of a credit union which are more particularly described in paragraph 137(6) of the Income Tax Act; or
 - (v) Canada Post Corporation.
- 6) Bonds referred to in subparagraph 4)(b) of GC9.2 shall be provided on the basis of their market value current at the date of the Contract, and shall be:
- (a) made payable to bearer; or
 - (b) accompanied by a duly executed instrument of transfer of the bonds to the NCC in the form prescribed by the Domestic Bonds of Canada Regulations; or
 - (c) registered as to principal, or as to principal and interest, in the name of the NCC pursuant to the Domestic Bonds of Canada Regulations.

GC9.3 IRREVOCABLE STANDBY LETTER OF CREDIT

- 1) As an alternative to a security deposit, an irrevocable standby letter of credit is acceptable to the NCC, the amount of which shall be determined in the same manner as a security deposit referred to in GC9.2
TYPES AND AMOUNTS OF CONTRACT SECURITY.
- 2) An irrevocable standby letter of credit shall:
 - (a) be an arrangement, however named or described, whereby a financial institution (the “Issuer”) acting at the request and on the instructions of a customer (the “Applicant”) or on its own behalf:

- (i) is to make a payment to, or to the order of, the NCC as the beneficiary;
- (ii) is to accept and pay bills of exchange drawn by the NCC;
- (ii) authorizes another financial institution to effect such payment or accept and pay such bills of exchange; or
- (iv) authorizes another financial institution to negotiate against written demand(s) for payment provided that the terms and conditions of the letter of credit are complied with;
- (b) state the face amount that may be drawn against it;
- (c) state its expiry date;
- (d) provide for sight payment to the NCC by way of the financial institution's draft against presentation of a written demand for payment signed by the NCC;
- (e) provide that more than one written demand for payment may be presented subject to the sum of those demands not exceeding the face value of the letter of credit;
- (f) provide that it is subject to the International Chamber of Commerce (ICC) Uniform Customs and Practice for Documentary Credits, 2007 Revision, ICC Publication No. 600;
- (g) clearly specify that it is irrevocable or deemed to be irrevocable pursuant to article 6 c) of the International Chamber of Commerce (ICC) Uniform Customs and Practice for Documentary Credits, 2007 Revision, ICC Publication No. 600; and
- (h) be issued or confirmed, in either official language in a format left to the discretion of the issuer or confirmer, by an approved financial institution on its letterhead.

PERFORMANCE BOND

Bond Number _____

Amount \$ _____ **KNOW**

ALL MEN BY THESE PRESENTS, that _____ as Principal,
 hereinafter called the Principal, and _____ as Surety, hereinafter
 called the Surety, are, subject to the conditions hereinafter contained, held and firmly bound unto the National Capital Commission as
 Obligee, hereinafter called the NCC, In the amount of _____ dollars
 (\$ _____), lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the
 Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

SIGNED AND SEALED this _____ day of _____, _____ . WHEREAS, the Principal has entered into
 a Contract with the NCC, dated the _____ day of _____,
 for: _____

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION are such that if the Principal shall well and faithfully observe and perform all
 the obligations on the part of the Principal to be observed and performed in connection with the Contract, then this obligation shall be void,
 otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. Whenever the Principal shall be, and declared by the NCC to be, in default under the Contract, the Surety shall
 - (a) if the work is not taken out of the Principal's hands, remedy the default of the Principal,
 - (b) if the work is taken out of the Principal's hands and the NCC directs the Surety to undertake the completion of the work, complete the
 work in accordance with the Contract provided that if a contract is entered into for the completion of the work,
 - (i) it shall be between the Surety and the completing contractor, and
 - (ii) the selection of such completing contractor shall be subject to the approval of the NCC,
 - (c) if the work is taken out of the Principal's hands and the NCC, after reasonable notice to the Surety, does not direct the Surety to
 undertake the completion of the work, assume the financial responsibility for the cost of completion in excess of the moneys
 available to the NCC under the Contract,
 - (d) be liable for and pay all the excess costs of completion of the Contract, and
 - (e) not be entitled to any Contract moneys earned by the Principal, up to the date of his default on the Contract and any holdbacks
 relating to such earned Contract moneys held by the NCC, and the liability of the Surety under this Bond shall remain unchanged
 provided, however, and without restricting the generality of the foregoing, upon the completion of the Contract to the satisfaction of
 the NCC, any Contract moneys earned by the Principal or holdbacks related thereto held by the NCC may be paid to the Surety by
 the NCC.
2. The Surety shall not be liable for a greater sum than the amount specified in this Bond.
3. No suit or action shall be instituted by the NCC herein against the Surety pursuant to these presents after the expiration of two (2) years
 from the date on which final payment under the Contract is payable.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed
 with its corporate seal duly attested by the signature of its authorized signing authority, the day and year first above written.

SIGNED, SEALED AND DELIVERED in the presence of:

Principal _____

Witness _____

Surety _____

Note: Affix Corporate seal if applicable.

LABOUR AND MATERIAL PAYMENT BOND

Bond Number _____

Amount \$ _____

KNOW ALL MEN BY THESE PRESENTS, that _____ as Principal,
hereinafter called the Principal, and _____ as Surety, hereinafter

called the Surety, are, subject to the conditions hereinafter contained, held and firmly bound unto the National Capital Commission as Oblige, hereinafter called the NCC,

In the amount of _____ dollars

(\$ _____), lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety

bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

SIGNED AND SEALED this _____ day of _____, _____ . WHEREAS, the Principal has entered into a Contract

with the NCC, dated the _____ day of _____, _____, for: _____

_____ which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION are such that, if payment is promptly made to all Claimants who have performed labour or services or supplied material in connection with the Contract and any and all duly authorized modifications and extensions of the Contract that may hereafter be made, notice of which modifications and extensions to the Surety being hereby waived, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. For the purpose of this bond, a Claimant is defined as one having a direct contract with the Principal or any Sub-Contractor of the Principal for labour, material or both, used or reasonably required for use in the performance of the Contract, labour and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone services or rental of equipment (but excluding rental of equipment where the rent pursuant to an agreement is to be applied towards the purchase price thereof) directly applicable to the Contract.
2. For the purpose of this Bond, no payment is required to be made in respect of a claim for payment for labour or services performed or material supplied in connection with the Contract that represents a capital expenditure, overhead or general administration costs incurred by the Principal during the currency or in respect of the Contract.
3. The Principal and the Surety hereby jointly and severally agree with the NCC that if any Claimant has not been paid as provided for under the terms of his contract with the Principal or a Sub-Contractor of the Principal before the expiration of a period of ninety (90) days after the date on which the last of such Claimant's labour or service was done or performed or materials were supplied by such Claimant, the NCC may sue on this bond, have the right to prosecute the suit to final judgment for such sum or sums as may be due and have execution thereon; and such right of the NCC is assigned by virtue of Part VIII of the Financial Administration Act to such Claimant.
4. For the purpose of this bond the liability of the Surety and the Principal to make payment to any claimant not having a contract directly with the Principal shall be limited to that amount which the Principal would have been obliged to pay to such claimant had the provisions of the applicable provincial or territorial legislation on lien or privileges been applicable to the work. A claimant need not comply with provisions of such legislation setting out steps by way of notice, registration or otherwise as might have been necessary to preserve or perfect any claim for lien or privilege which the claimant might have had. Any such claimant shall be entitled to pursue a claim and to recover judgment hereunder subject to the terms and notification provisions of the Bond.
5. Any material change in the Contract between the Principal and the NCC shall not prejudice the rights or interest of any Claimant under this Bond who is not instrumental in bringing about or has not caused such change.
6. No suit or action shall be commenced hereunder by any Claimant:
 - (a) Unless such Claimant shall have given written notice within the time limits hereinafter set forth to the Principal and the Surety above named, stating with substantial accuracy the amount claimed. Such notice shall be served by mailing the same by registered mail to the Principal and the Surety at any place where an office is regularly maintained for the transaction of business by such persons or served in any manner in which legal process may be served in the Province or other part of Canada in which the subject matter of the Contract is located. Such notice shall be given
 - (i) in respect of any claim for the amount or any portion thereof required to be held back from the Claimant by the Principal or by the Sub-Contractor of the Principal under either the terms of the Claimant's Contract with the Principal or the Claimant's Contract with the Sub-Contractor of the Principal within one hundred and twenty (120) days after such Claimant should have been paid in full under this Contract;

.../2

- (ii) in respect of any claim other than for the holdback or portion thereof referred to above within one hundred and twenty (120) days after the date upon which such Claimant did or performed the last of the service, work or labour or furnished the last of the materials for which such claim is made under the Claimant's Contract with the Principal or a Sub-Contractor of the Principal
 - (b) After the expiration of one (1) year following the date on which the Principal ceased work on the said Contract, including work performed under the guarantees provided in the Contract;
 - (c) Other than in a court of competent jurisdiction in the province or district of Canada in which the subject matter of the Contract or any part thereof is situated and not elsewhere, and the parties hereto hereby agree to submit to the jurisdiction of such court.
7. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder.
 8. The Surety shall not be entitled to claim any moneys relating to the Contract and the liability of the Surety under this Bond shall remain unchanged and, without restricting the generality of the foregoing, the Surety shall pay all valid claims of Claimants under this Bond before any moneys relating to the Contract held by the NCC are paid to the Surety by the NCC.
 9. The Surety shall not be liable for a greater sum than the amount specified in this bond.

IN TESTIMONY WHEREOF, the Principal has hereto set its hand and affixed its seal, and the Surety has caused these presents to be sealed with its corporate seal duly attested by the signature of its authorized signing authority, the day and year first above written.

SIGNED, SEALED AND DELIVERED in the presence of:

Principal _____

Witness _____

Surety _____

Note: Affix Corporate seal if applicable.

- GC10.1 INSURANCE CONTRACTS
- GC10.2 INSURANCE PROCEEDS
- GC10.3 INSURANCE TERMS
 - GC10.3.1 General
 - GC10.3.1.1 Proof of Insurance
 - GC10.3.1.2 Payment of Deductible
 - GC10.3.2 Commercial General Liability
 - GC10.3.2.1 Scope of Policy
 - GC10.3.2.2 Insured
 - GC10.3.2.3 Period of Insurance
 - GC10.3.3 Builder's Risk / Installation Floater
 - GC10.3.3.1 Scope of Policy
 - GC10.3.3.2 Amount of Insurance
 - GC10.3.3.3 Insurance Proceeds

GC10.1 INSURANCE CONTRACTS

- 1) The Contractor shall, at the Contractor's expense, obtain and maintain insurance contracts in respect of the work and shall provide evidence thereof to the NCC in accordance with the requirements of GC10.
- 2) The insurance contracts referred to in paragraph 1) of GC10.1 shall:
 - (a) be in a form, of the nature, in the amounts, for the periods and containing the terms and conditions specified in GC10; and
 - (b) provide for the payment of claims under such insurance contracts in accordance with GC10.2 INSURANCE PROCEEDS.

GC10.2 INSURANCE PROCEEDS

- 1) In the case of a claim payable under a Builders Risk/Installation (All Risks) insurance contract maintained by the Contractor pursuant to GC10.1 INSURANCE CONTRACTS, the proceeds of the claim shall be paid directly to the NCC, and:
 - (a) the monies so paid shall be held by the NCC for the purposes of the contract; or
 - (b) if the NCC elects, shall be retained by the NCC, in which event they vest in the NCC absolutely.
- 2) In the case of a claim payable under a General Liability insurance contract maintained by the Contractor pursuant to GC10.1 INSURANCE CONTRACTS, the proceeds of the claim shall be paid by the insurer directly to the claimant.
- 3) If an election is made pursuant to paragraph 1) of GC10.2, the NCC may cause an audit to be made of the accounts of the Contractor and of the NCC in respect of the part of the work that was lost, damaged or destroyed for the purpose of establishing the difference, if any, between:
 - (a) the aggregate of the amount of the loss or damage suffered or sustained by the NCC, including any costs incurred in respect of the clearing of the work and its site and any other amount that is payable by the Contractor to the NCC under the contract, minus any monies retained pursuant to subparagraph 1)(b) of GC10.2; and
 - (b) the aggregate of the amounts payable by the NCC to the Contractor pursuant to the contract up to the date of the loss or damage.

- 4) A difference that is established pursuant to paragraph 3) of GC10.2 shall be paid forthwith by the party who is determined by the audit to be the debtor to the party who is determined by the audit to be the creditor.
- 5) When payment of a deficiency has been made pursuant to paragraph 4) of GC10.2, all rights and obligations of the NCC and the Contractor under the contract shall, with respect only to the part of the work that was the subject of the audit referred to in paragraph 3) of GC10.2, be deemed to have been expended and discharged.
- 6) If an election is not made pursuant to subparagraph 1)(b) of GC10.2, the Contractor shall, subject to paragraph 7) of GC10.2, clear and clean the work and its site and restore and replace the part of the work that was lost, damaged or destroyed at the Contractor's expense as if that part of the work had not yet been performed.
- 7) When the Contractor clears and cleans the work and its site and restores and replaces the work referred to in paragraph 6) of GC10.2, the NCC shall pay the Contractor out of the monies referred to in paragraph 1) of GC10.2 so far as they will thereunto extend.
- 8) Subject to paragraph 7) of GC10.2, payment by the NCC pursuant to paragraph 7) of GC10.2 shall be made in accordance with the contract but the amount of each payment shall be 100% of the amount claimed notwithstanding subparagraphs 3)(a) and 3)(b) of GC5.4 PROGRESS PAYMENT.

GC10.3 INSURANCE TERMS

GC10.3.1 General

GC10.3.1.1 Proof of Insurance

- 1) Before commencement of the Work, and prior to contract award, the Contractor shall deposit with the NCC a Certificate of Insurance (approved Insurance form is enclosed at the end of this section).
- 2) Upon request by the NCC, the Contractor shall provide originals or certified true copies of all contracts of insurance maintained by the Contractor pursuant to the provisions contained herein.
- 3) The insurance policies shall be endorsed to provide the NCC with no less than 30 days notice in writing in advance of a cancellation of insurance or any reduction in coverage.

GC10.3.1.2 Payment of Deductible

- 1) Any moneys paid or payable in respect of a deductible amount shall be borne exclusively by the Contractor.

GC10.3.2 Commercial General Liability

GC10.3.2.1 Scope of Policy

- 1) The insurance coverage provided shall not be less than that provided by IBC Form 2100, as amended from time to time, and shall have:
 - (a) an Each Occurrence Limit of not less than \$5,000,000;
 - (b) a Products/Completed Operations Aggregate Limit of not less than \$5,000,000; and
 - (c) a General Aggregate Limit of not be less than \$10,000,000 per policy year, if the policy is subject to such a limit.

- 2) The policy shall either include or be endorsed to include coverage for the following exposures or hazards if the Work is subject thereto:
 - (a) Blasting;
 - (b) Pile driving and caisson work;
 - (c) Underpinning;
 - (d) Removal or weakening of support of any building or land whether such support be natural or otherwise if the work is performed by the insured Contractor.

GC10.3.2.2 Insured

- 1) The policy shall insure the Contractor and shall include the NCC and the Canada Lands Company as additional Insured, with respect to liability arising out of the operations of the Contractor with regard to the work.

GC10.3.2.3 Period of Insurance

- 1) Unless otherwise directed in writing by the NCC, or, otherwise stipulated elsewhere herein, the policy required herein shall be in force and be maintained from the date of contract award until the day of issue of the Certificate of Completion except that the coverage for Completed Operations Liability shall, in any event, be maintained for a period of at least six (6) years beyond the date of the Certificate of Substantial Performance.

GC10.3.3 Builder's Risk / Installation Floater

GC10.3.3.1 Scope of Policy

- 1) The insurance coverage provided by a Builder's Risk policy or an Installation Floater policy shall not be less than that provided by IBC Forms 4042 and 4047, as amended from time to time.
- 2) The policy shall permit use and occupancy of the project, or any part thereof, where such use and occupancy is for the purposes for which the project is intended upon completion.
- 3) The policy may exclude or be endorsed to exclude coverage for loss or damage caused by any of the following:
 - (a) Asbestos;
 - (b) Fungi or spores;
 - (c) Cyber;
 - (d) Terrorism.

GC10.3.3.2 Amount of Insurance

- 1) The amount of insurance shall not be less than the sum of the contract value plus the declared value (if any) set forth in the contract documents of all material and equipment supplied by the NCC at the site of the project to be incorporated into and form part of the finished Work. If the value of the Work is changed, the policy shall be changed to reflect the revised contract value.

GC10.3.3.3 Insurance Proceeds

- 1) The policy shall provide that the proceeds thereof are payable to the NCC may direct in accordance with GC10.2, "Insurance Proceeds".
- 2) The Contractor shall, without delay, do such things and execute such documents as are necessary to effect payment of the proceeds.

• To be completed by the insurer / À être rempli par l'assureur

CONTRACT / MARCHÉ				
Description and location of work / Description et endroit des travaux			Contract no. / N° de contrat	
INSURER / ASSUREUR				
Name / Nom				
Address / Adresse				
No., Street / N°, rue				
City / Ville		Province		Postal code / Code postal
BROKER / COURTIER				
Name / Nom				
Address / Adresse				
No., Street / N°, rue				
City / Ville		Province		Postal code / Code postal
INSURED / ASSURÉ				
Name of contractor / Nom de l'entrepreneur				
Address / Adresse				
No., Street / N°, rue				
City / Ville		Province		Postal code / Code postal
ADDITIONAL INSURED / ASSURÉ ADDITIONNEL				
The National Capital Commission / La Commission de la capitale nationale, et/and, La Société immobilière du Canada / Canada Lands Company				
This insurer certifies that the following policies of insurance are at present in force covering all operations of the Insured, in connection with the contract made between the named insured and the National Capital Commission and the Canada Lands Company.				
L'assureur atteste que les polices d'assurances suivantes sont présentement en vigueur et couvrent toutes les activités de l'assuré en fonction du marché conclu entre l'Assuré dénommé et la Commission de la capitale nationale et La Société immobilière du Canada.				
POLICY / POLICE				
Type Genre	Number Numéro	Inception Date Date d'effet	Expiry Date Date d'expiration	Limit of Liability Limites de garantie
Commercial General Liability Responsabilité civile des entreprises				
Builder's Risk "All Risks" Assurance des chantiers « tous risques »				
Installation Floater "All Risks" Risques d'installation « tous risques »				
Other (list) / Autre (énumérer)				
Each of these policies includes the coverages and provisions as specified in Insurance Terms and each policy has been endorsed to cover the National Capital Commission as an Additional Insured. The Insurer agrees to notify the National Capital Commission in writing thirty (30) days prior to any material change in, or cancellation of any policy or coverage.		Chacune des présentes polices renferment des garanties et dispositions spécifiées aux Conditions d'assurance, et chaque police a été amendée pour couvrir la Commission de la capitale nationale en tant qu'assuré additionnel. L'assureur convient de donner un préavis de trente (30) jours à la Commission de la capitale nationale en cas de changement visant la garantie d'assurance ou les conditions ou de l'annulation de n'importe quelle police ou garantie.		
Name of Insurer's Office or Authorized Employee / Nom du cadre ou de la personne autorisée			Telephone number / Numéro de téléphone	
Signature			Date	

1. General

- 1.1 In this Contract “OHS” means “occupational health and safety”.
- 1.2 With respect to the work to be performed under the Contract, the Contractor covenants and agrees to perform at, and to enforce conformity with, a standard equivalent to or greater than the best practices prevailing in the construction industry at that time.
- 1.3 The Contractor acknowledges that, to the extent that the following matters may be affected by conduct of the work, it is responsible for the:
- 1.3.1 health and safety of persons on site;
 - 1.3.2 safety of property on site;
 - 1.3.3 protection of persons adjacent to the site; and,
 - 1.3.4 protection of the environment.
- 1.4 Without limiting the generality of section 1.3, the Contractor acknowledges that it is required to, and covenants and agrees to, comply and to enforce compliance with all laws or regulations that may be applicable to the conduct of the work including, without limitation:
- (a) the provisions of the *Occupational Health and Safety Act* of Ontario and all regulations, policies or directives issued thereunder for work performed in Ontario;
 - (b) *La Loi sur la santé et la sécurité du travail* of Québec and all regulations, policies or directives issued thereunder for work performed in Québec;
 - (c) Applicable provisions of the *Canada Labour Code, Part II*;
 - (d) Employment standards legislation in the province(s) in which any part of the work is performed; and
 - (e) Any policies or directives issued by the NCC in respect of the subject matter of the contract.
- The NCC will present any such policies or directives referred to in paragraph (e) to the Contractor in written form by not later than the pre-construction meeting. The Contractor is obliged to ensure that the relevant policies and directives have been communicated to and acknowledged by all its employees and that they will be complied with. The NCC reserves the right to require the Contractor to produce evidence satisfactory to the NCC acting reasonably that the Contractor has discharged the foregoing obligations.
- 1.5 By entering into the Contract with the NCC, the Contractor represents and warrants to the NCC that it has informed itself of and is knowledgeable about the obligations imposed by the legislation referred to in 1.4. above.
- 1.6 For purposes of the relevant provincial OHS legislative regime the Contractor acknowledges and agrees that it is the “Constructor” and covenants to discharge and accept all liability for the performance of the obligations of the “Constructor” in respect of the work provided for in the Contract. Notwithstanding a determination by the relevant authority having jurisdiction that the NCC is the “Constructor” in the event of a dispute between the Contractor and the NCC, the Contractor acknowledges and agrees that the Contractor shall be financially responsible for the implementation of protective measures necessary to fulfill the obligations of the “Constructor”.

- 1.7 As between the NCC and the Contractor, the NCC's decision as to whether the Contractor is discharging its obligations in respect of OHS issues shall be definitive. Without limiting the generality of the foregoing, in the event of any dispute with respect to instructions given by the NCC's designated representative, the Contractor may note such dispute, but must nevertheless forthwith comply with any such instructions.
- 1.8 The Contractor hereby indemnifies and agrees to hold harmless the NCC, its agents and employees, from and against any and all claims, demands, losses, costs (including legal fees on a full indemnity basis), damages, actions, suits or proceedings (hereinafter collectively referred to as "claims") by third parties that arise out of or are attributable to the Contractor's errors or omissions in the performance of the Contract. Without limiting the generality of the foregoing, this indemnification extends to any claims related to any violation of any statute or regulation relating to OHS matters.
- 1.9 The NCC shall provide the contractor:
- 1.9.1 a written description of every known and foreseeable health and safety hazard to which persons employed in the performance of the work may be exposed because of the nature of the site;
 - 1.9.2 a list of any prescribed materials, equipment, devices and clothing necessary because of the nature of the site;
 - 1.9.3 with written information indicating the prescribed circumstances and manner to use all prescribed materials, equipment, devices and clothing listed pursuant to 1.9.2; and,
 - 1.9.4 with a copy of any NCC policies and procedures that may be applicable in relation to the work site.
- 1.10 Without limiting the generality of 1.9, prior to the commencement of the work by the contractor, the contractor shall, at the contractor's expense:
- 1.10.1 take all reasonable care to ensure that all persons employed in the performance of the work or granted access to the work or its site are informed of any health and safety hazard described pursuant to 1.9.1;
 - 1.10.2 provide all persons employed in the performance of the work or granted access to the work or its site with prescribed materials, equipment, devices and clothing listed pursuant to 1.9.2;
 - 1.10.3 take all reasonable care to ensure that all persons employed in the performance of the work or granted access to the work or its site are familiar with the prescribed circumstances and manner all prescribed materials, equipment, devices and clothing listed pursuant to 1.9.2; and
 - 1.10.4 take all reasonable care to ensure that all persons employed in the performance of the work or granted access to the work or its site are familiar with policies and procedures referred to in 1.9.4.

2. Qualifications of Personnel

- 2.1 By entering into this agreement the contractor represents and warrants that it has the requisite experience, training, formal certification and equipment to enable it to discharge the obligations enumerated in sections 1.3, 1.4, 1.5 and 1.6 above.
- 2.2 The Contractor represents and warrants that supervisory personnel employed by the Contractor in respect of performance of any part of the work have the requisite experience, authority, training, formal certification and equipment to ensure that the obligations enumerated in sections 1.3, 1.4, 1.5

and 1.6 above are discharged and agrees to deliver such evidence as may be required by the NCC from time to time to verify same.

3. Certification

- 3.1 After receiving notification that its bid has been retained and prior to and as a condition of contract award, the Contractor covenants and agrees to deliver a Worker's Compensation Clearance Certificate. Where the duration of the project is greater than sixty days, the Contractor covenants and agrees to deliver up-dated certificates at least every 60 days. In the event of a failure by the Contractor to deliver up-dated certificates, the NCC shall be entitled to immediately terminate the contract without notice and without incurring any liability to the Contractor.
- 3.2 After receiving notification that its bid has been retained and prior to and as a condition of contract award, the Contractor covenants and agrees to deliver historical information on its injury experience including any pertinent Worker's Compensation Experience Reports. Such historical information shall report data for the previous three years.

4. Plans Policies and Procedures

- 4.1 After receiving notification that its bid has been retained and prior to and as a condition of contract award, the Contractor covenants and agrees to deliver for the review and approval of the NCC:
- (a) A copy of the contractor's OHS policy;
 - (b) A safety program and plan specific to the work to be performed pursuant to the Contract which plan shall include a risk assessment and analysis, a description of safe working methods, injury and incident reporting protocols, regular periodic reporting on compliance with OHS obligations including any policies, practices and procedures otherwise provided for herein, and a site-specific contingency and emergency response plan; and
 - (c) Health and safety training records of personnel and alternates responsible for OHS issues on site.

The Contractor covenants and agrees to deliver the necessary material safety data sheets for the review and approval of the NCC prior to entering the site to perform work related to the relevant material.

Approval by the NCC does not amend the provisions of the Contract with respect to the allocation of liability for discharging or failing to discharge OHS obligations. Such liability remains with the Contractor notwithstanding the granting of such approval.

- 4.2 The Contractor acknowledges and agrees that prior to commencement of work it must attend a pre-construction briefing at which any special or additional practices and procedures to be followed in completing the work are to be established. Without limiting the provisions of section 1.4(e) above, the representatives of the Contractor attending the briefing will be required to deliver a signed acknowledgement that the practices and procedures set out in the pre-construction briefing have been understood and will be complied with.
- 4.3 At any time and from time to time during the performance of the work, the NCC shall have the right to audit the manner in which the Contractor is discharging its OHS obligations and to determine whether the project specification and/or OHS policies, practices and procedures are being complied with. In the event that the audit discloses any failure by the Contractor to discharge such OHS obligations, the NCC shall be entitled to forthwith rectify at the Contractor's expense any such deficiency and the NCC shall have the further right to immediately terminate the contract without notice and without incurring any liability to the Contractor.

- 4.4 The Contractor covenants and agrees to conform with all requirements of the Workplace Hazardous Materials Information System.
- 4.5 The Contractor acknowledges and agrees that where required by any law or regulation applicable to the performance of the work it must establish and maintain a project health and safety committee. The contractor further acknowledges and agrees that it must enable staff to attend all relevant safety meetings, and that the cost of same, including costs attributable to standing down equipment is included in its bid price and is not independently recoverable.
- 4.6 Where required by the relevant provincial regulatory regime, the Contractor acknowledges and agrees that it is responsible for delivery of notice of the project to the relevant regulatory authority, and for the performance of any other administrative activity required to meet the obligations imposed in the pertinent provincial regulatory regime.
- 4.7 **(Optional depending on hazard or scope of project).** The contractor covenants and agrees that it shall employ and assign to the work, a competent OHS professional as Health and Safety Coordinator that must:
- (a) have a minimum two (2) years' site-related working experience specific to activities associated with.(identify specific subject matter)
 - (b) have basic working knowledge of specified occupational safety and health regulations,
 - (c) be responsible for completing health and safety training session and ensuring that personnel not successfully completing the required training are not permitted to enter the site to perform the Work,
 - (d) be responsible for implementing, enforcing daily and monitoring the site-specific Health and Safety Plan, and
 - (e) be on site during execution of the Work.

The parties acknowledge that in lieu of employing an OHS professional, the Contractor may provide same by sub-contracting for such services.

- 4.8 Upon completion of the work the Contractor covenants and agrees to participate with the NCC in a post performance interview to evaluate the performance of the Contractor in respect of the OHS obligations under the contract. Without limiting the generality of the foregoing, the interview will identify areas of compliance and non-compliance in terms of:
- (a) actual performance of the work;
 - (b) reporting or procedural requirements;
 - (c) resolution of deficiencies.

The contractor acknowledges and agrees that the results of the post-completion interview may be relied upon by the NCC in evaluating bids subsequently submitted by the Contractor on other NCC projects.

Security Requirements

The NCC complies with Treasury Board's *Policy on Government Security* and consequently, it will require that the Contractor's employees submit to a personal security screening process (Security Clearance Form TBS/SCT 330-60E). The NCC may also perform a credit check when the duties or tasks to be performed require it or in the event of a criminal record containing a charge/offence of a financial nature.

The NCC reserves the right to not award the Contract until such time as the Contractor's core employees have obtained the required level of security screening as identified by the NCC's Corporate Security. In this case the level of security required will be **Reliability/**~~Site Access/Secret~~.

The NCC also reserves the right to request that the Contractor submit to a *Designated Organisation Screening* and/or *Facility Security Clearance*— depending on the nature of the information it will be entrusted with. In the event that the Contractor does not meet the requirements to obtain the requested clearance, the Contractor shall take the corrective measures recommended by the Canadian Industrial Security Directorate (of PWGSC) or by the NCC's Corporate Security in order to meet these requirements. If no corrective measures are possible or if the Contractor fails to take the recommended measures, then the Contractor shall be in default of its obligations under this Contract and the NCC shall have the rights and remedies listed in section 2.14, including the right to terminate the Contract without further notice to the Contractor.

Additional information

As part of their personal screening, individuals may be required to provide evidence of their status as a Canadian citizen or permanent resident as well as any other information/documentation requested by the NCC's Corporate Security in order to complete the screening.

The NCC reserves the right to refuse access to personnel who fail to obtain the required level of security screening.

The NCC reserves the right to impose additional security measures with respect to this Contract as the need arises.

Company Security Representative

The Contractor shall appoint one Company Security Representative (CSR) as well as one alternate (for companies who have more than five employees).

Selection criteria for the CSR and the alternate are the following:

- They must be employees of the Contractor;
- They must have a security clearance (the NCC will process the clearances once the individuals have been identified).

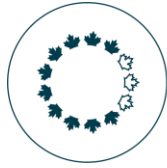
Responsibilities of the Company Security Representative

The CSR's responsibilities are the following:

- Act as liaison between the NCC's Corporate Security and the Contractor to ensure coordination;
- In collaboration with the NCC's Corporate Security, identify the Contractor's employees who will require access to NCC information/assets/sites **as well as any recurring subcontractors** (and their employees) who will require similar access and may not be supervised by the Contractor at all times during such access. Ensure that accurate and complete Personnel Security Screening documentation is

submitted to the NCC's Corporate Security for the employees/subcontractors who have been identified;

- Ensure that employees/subcontractors, upon notification of having been granted a reliability status, sign the *Security Screening Certificate and Briefing Form* and return to the NCC's Corporate Security;
- Ensure that only persons who have been security screened to the appropriate level and who are on a "need-to-know basis" will have access to information and assets;
- Maintain a current list of security screened employees/subcontractors;
- Ensure proper safeguard of all information and assets, including any information/assets entrusted to subcontractors;
- If a Security incident or suspected breach of security occurs, prepare and submit to the NCC an occurrence report as soon as possible.



NATIONAL CAPITAL COMMISSION
COMMISSION DE LA CAPITALE NATIONALE

NATIONAL CAPITAL RIVER PAVILION

501 Sir George-Étienne Cartier Parkway, Ottawa ON

DC19-0103

CONTRACT SPECIFICATIONS

April 2021

**NATIONAL CAPITAL COMMISSION
DESIGN AND CONSTRUCTION DIVISION**

501 Sir George-Étienne Cartier Parkway Rehabilitation
Reference Number: DC 19 0103
PHASE 1 & PHASE 2
Date: April 2021

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END OF SECTION

**UNIT PRICE TABLE
PHASE 1 & PHASE 2**

PHASE 1					
Item	Description	Unit	Qty	Unit Price	Amount
1	Phase 1 Mobilization	L.S.	1		\$ -
Capital Pathway Realignment / Stone Steps / Paving / UA Pathway / Planting					
2	Removal and disposal of contaminated soils (if encountered)	m ³	1		\$ -
3	Clearing and grubbing (all trees above 10cm DBH have already been removed)	L.S.	1		\$ -
4	Tree pruning for safety as required	L.S.	1		\$ -
5	Capital Pathway Signage Relocation and installation Regulatory, wayfinding, Map (including all substructures, footings, etc.)	ea	10		\$ -
6	Earth excavation, handling and rough grading	m ³	3700		\$ -
7	Removal of existing asphalt pathways (temporary pathway and down to shoreline, including subbase)	m ²	680		\$ -
8	Removal of existing granular at top of slope	m ²	550		\$ -
9	Removal of existing coir mat lining servicing corridor	m ²	65		\$ -
10	Removal of existing timber steps on slope	ea	3		\$ -
11	Installation of Asphalt Pathway (full construction as per detail; includes pad for bike rack)	m ²	355		\$ -
12	Line Painting (Capital Pathway)	L.M.	132		\$ -
13	Armour stone retaining walls, armour stone for lighting and select armour stones as shown. (full construction as per detail; includes drainage tile, subbase, clear stone, geotextile etc. Average wall ht. 600mm) linear metre calculated by course	L.M.	1015		\$ -
14	Granite Steps (1m min. step length, 1.5m max. step length) (full construction as per detail; including pinning)	L.S.	1		\$ -
15	Interlocking pavers (full construction as per detail; includes aluminum edging)	m ²	81		\$ -
16	Stone dust pathway - universal access (full construction as per detail)	m ²	576		\$ -
17	Stainless Steel Railing supply and installation (including all hardware, shop drawings, handrail, etc.)	L.M.	21		\$ -
18	Supply and installation of strip drains and piping	L.M.	40		\$ -
19	Rounded Riverstone at strip drains	m ³	1.0		\$ -
20	Angular Rip Rap at drainage outlets	m ³	12		\$ -
21	Concrete Footing for Signage Entrance Feature (as per detail; sign feature t.b.d.)	ea	2		\$ -
22	Wood Pathway Bollard (full construction as per detail)	ea	1		\$ -
23	Topsoil and finished grading	m ³	500		\$ -
24	Erosion Control Mat	m ²	745		\$ -
25	Trees (new planting; includes planting materials as per detail including mulch)	ea	8		\$ -
26	Shrubs (new planting; includes planting materials as per detail including mulch)	ea	393		\$ -

27	Perennials and Grasses (new planting; includes planting materials as per detail including mulch)	ea	1039		\$ -
28	Hydro-Seed Mix Type II (includes 150mm of topsoil)	m ²	740		\$ -
29	Hydro-Seed Mix Type III (includes 150mm of topsoil)	m ²	70		\$ -
30	Sod	m ²	478		\$ -
31	Maintenance and warranty YEAR ONE	L.S.	1		\$ -
32	Maintenance and warranty YEAR TWO	L.S.	1		\$ -
				Sub-Total	\$ -

Landscape Lighting (Upper)					
33	Earth excavation, trenching and back filling	L.S.	1		\$ -
34	Supply and installation of landscape lighting (includes conduit and all appurtenances as per details)	ea	23		\$ -
35	Coring of armour stone walls for installation of landscape lighting fixtures	ea	23		\$ -
36	Installation of lighting fixtures on bridge	ea	10		\$ -
37	Lighting controls	L.S.	1		\$ -
38	Electrical hand holes	ea	4		\$ -
39	Empty conduits for future works	L.S.	1		\$ -
				Sub-Total	\$ -

Parking Lot Expansion (P3) / Pedestrian Circulation to Lay-By and PXO					
40	Mobilization, reinstatement, removals and demolition as per drawings	L.S.	1		\$ -
41	Removal of stormwater infrastructure as indicated on drawings	L.S.	1		\$ -
42	Earth excavation and handling	L.S.	1		\$ -
43	Supply and installation and/or adjustment of stormwater infrastructure as indicated on drawings	L.S.	1		\$ -
44	PXO (Pedestrian Crossing) (including but not limited to signalized PXO, poles, solar power units, raised concrete crosswalk, signage, etc. as per drawings and details)	L.S.	1		\$ -
45	Pedestrian Curb Ramp with T.W.S.I. (full construction as per detail)	m ²	12		\$ -
46	Asphalt Layby (includes asphalt roadway reinstatement)	m ²	360		\$ -
47	Concrete Mountable Curb (layby; full construction as per detail)	L.M.	73		\$ -
48	Concrete Barrier Curb (layby; full construction as per detail)	L.M.	80		\$ -
49	Line Painting (PXO crosswalk markings, roadway triangles, and roadway lines)	L.S.	1		\$ -
50	Asphalt Parking Lot (full construction as per detail)	m ²	702		\$ -
51	Concrete Barrier Curb (parking lot; full construction as per detail)	L.M.	128		\$ -
52	Asphalt Sidewalks (full construction as per detail)	m ²	235		\$ -
53	Line Painting (parking lot)	L.S.	1		\$ -
54	Gravel Road (full construction as per detail)	m ²	53		\$ -
55	Signage (installation of salvaged signs and/or supply and installation of new signage as indicated on drawings)	ea	9		\$ -
56	Lighting installation (fixtures supplied by NCC)	ea	2		\$ -
57	Electrical supply and installation	L.S.	1		\$ -
58	Topsoil and finished grading	m ³	1210		\$ -
59	Erosion Control Mat	m ²	965		\$ -

60	Trees (new planting; includes planting materials as per detail including mulch)	ea	7		\$ -
61	Hydro-Seed Mix Type II (includes 150mm of topsoil)	m ²	820		\$ -
62	Hydro-Seed Mix Type III (includes 150mm of topsoil)	m ²	1225		\$ -
63	Sod	m ²	296		
64	Maintenance and warranty YEAR ONE	L.S.	1		\$ -
65	Maintenance and warranty YEAR TWO	L.S.	1		\$ -
				Sub-Total	\$ -

Subtotal Total Phase 1	
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PHASE 2 SHORELINE					
Item	Description	Unit	Qty	Unit Price	Amount
66	Phase 2 Mobilization	L.S.	1		\$ -
Shoreline Works / Lookout / Armour Stone Walls / Steps into River / Rip-Rap					
67	Turbidity curtain	L.M.	200		\$ -
68	Removal and disposal of contaminated soils (if encountered)	m ³	1		\$ -
69	Clearing and grubbing (all trees above 10cm DBH have already been removed)	L.S.	1		\$ -
70	Tree pruning for safety as required	L.S.	1		\$ -
71	Careful removal of existing shoreline slope: including but not limited to; Vegetation, boulders, gravel, soil, etc. Note: Select boulders will remain on site for re-use	m ²	1850		\$ -
72	Earth excavation, handling and rough grading	m ³	400		\$ -
73	Armour stone retaining walls, armour stone for lighting and select armour stones as shown. (full construction as per detail; includes drainage tile, subbase, clear stone, geotextile etc. Average wall ht. 600mm) linear metre calculated by course	L.M.	145		\$ -
74	Armour stone steps along shoreline; (full construction as per detail; includes drainage tile, subbase, clear stone, geotextile etc.) linear metre calculated by course	L.M.	90		\$ -
75	Stone dust pathways (full construction as per detail)	m ²	750		\$ -
76	Rounded Rip-Rap along shoreline (full construction as per detail)	m ³	600		\$ -
77	Shoreline lookout on piles (full construction as per details including railing; shop drawings required)	L.S.	1		\$ -
78	Mulch forest trail (full construction as per detail)	m ³	5		\$ -
79	Mulch surfacing for bike racks	m ³	3		\$ -
80	Rounded boulders along shoreline	ea.	25		\$ -
81	Wood Gate at storage area (Full construction as per details)	L.S.	1		\$ -
82	Supply and installation of custom benches (full construction as per detail)	ea.	4		\$ -
83	Supply and installation of waste receptacle (full construction as per detail)	ea.	1		\$ -
84	Supply and installation of bike racks (full construction as per detail)	ea.	9		\$ -

85	Topsoil and finished grading	m ³	300		\$ -
86	Erosion Control Mat	m ²	780		\$ -
87	Trees <i>(new planting; includes planting materials as per detail including mulch)</i>	ea	19		\$ -
88	Shrubs <i>(new planting; includes planting materials as per detail including mulch)</i>	ea	209		\$ -
89	Perennials and Grasses <i>(new planting; includes planting materials as per detail including mulch)</i>	ea	1071		\$ -
90	Hydro-Seed Mix Type I <i>(includes 150mm of topsoil)</i>	m ²	520		\$ -
91	Maintenance and warranty YEAR ONE	L.S.	1		\$ -
92	Maintenance and warranty YEAR TWO	L.S.	1		\$ -
				Sub-Total	\$ -

Landscape Lighting (Lower)					
93	Earth excavation, trenching and back filling	L.S.	1		\$ -
94	Supply and installation of landscape lighting <i>(includes conduit and all appurtenances as per details)</i>	ea	17		\$ -
95	Coring of armour stone walls for installation of landscape lighting fixture	ea	16		\$ -
96	Installation of landscape lighting fixtures in armour stone	ea	16		\$ -
97	Connections of light fixtures to existing lighting control system	L.S.	1		\$ -
98	Electrical hand holes	ea	1		\$ -
99	Empty conduits for future works	L.S.	1		\$ -
				Sub-Total	\$ -

Subtotal Total Phase 2	
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Project Sub-Total (PH 1 / 2)	\$ -
Taxes	\$ -
Total Project	\$ -

1.1 TIME OF COMPLETION

- .1 Commencement of preliminary work (detour signage, staging, etc) will be permitted immediately upon notification of acceptance of your offer.
Substantial completion of Phase 1 work is expected before July 2022.
Substantial completion of Phase 2 work is expected before December 2021.
- .2 On-site works shall be limited from Monday to Friday, weekends will be considered in relation to work schedule challenges and can only proceed if received a week in advance and approved by the NCC Contract Administrator.
- .3 The Contractor is advised that the work site is located at 501 Sir George-Étienne Cartier Parkway along the Ottawa River Shoreline on the south shore in Ottawa (Rockcliffe Park), Ontario.
- .4 **The Security clearance status of 'Site access' is required for all employees working on site and is a prerequisite to this contract.**
- .5 **Exact start date for works below the High-water mark will be determined by seasonal water levels and cannot proceed prior to July 15, 2021. This date will be confirmed in writing by the NCC and refers to all work as part of PHASE 2**
- .6 **All vegetation clearing must adhere to date restrictions as per contract documents and EEE.**
- .7 **General Environmental permitting will be obtained and provided by the NCC.**
- .8 **Appropriate mitigation measures relating to the environment must be implemented per the Environmental Effects Evaluation, for the NCC Canadian Environmental Assessment Act 2012 decision.**

1.2 SCOPE OF WORK

- .1 Works under this contract covers erosion control methods, removals of invasive plant material, installation of various pathway types, natural stone walls, natural stone stairs, railings, site furniture, reconstruction of existing layby, PXO crossing, lighting grading and site reinstatement, and complete shoreline revitalization.

To mitigate negative environmental effects on the terrestrial environment, equipment used at site for project construction should be limited to those with rubber tires (not tracks). Sedentary wildlife remaining at the site during construction should be humanely trapped and relocated; this may require permits and written permission by NCC Representative.

The work of this Contract includes, but is not limited to, the following:

1. Supply and installation turbidity curtain.
2. Safety Pruning
3. Earth Excavation and hauling off site
4. Supply and installation of angular and rounded rip rap
5. Supply and installation of armour stone wall
6. Supply and installation of armour stone steps along the shoreline
7. Supply and installation of cantilevered lookout
8. Supply and installation of new geotextile
9. Supply and installation of backfill and Granular(s)
10. Supply and installation of asphalt and pavers
11. Supply and installation of site furniture and railings
12. Supply and installation of landscape lighting

13. Relocation and installation of existing light standards and signage
14. Supply and installation of topsoil and finish grading
15. Supply and installation of plant material and cedar mulch
16. Supply and installation grass in various forms
17. 2 year plant material warranty

1.3 PRE-CONTRACT AWARD CONDITIONS

- .1 Prior to award of the Contract, the Contractor must submit the following acceptable plans to the Contract Administrator no later than 5 business days of receipt of the letter of notification;
 - .1 A Detailed Sediment and Erosion Control Plan (see Sections 01 35 43 – Environmental Procedures & 35 42 19 – Preservation of Watercourses) This plan should identify the exact location of the silt curtain and or turbidity curtain for the project (each end of the silt curtain, around stockpiled topsoil, etc.) and methods planned to stabilize the slope during construction.
 - .2 A work Methodology Plan shall at a minimum identify the Contractors plans for site access and stockpiling, type and size of equipment, and other site preservation or protection methods.
 - .3 If acceptable Plans are not received within 5 business days, the NCC reserves the right to proceed on to the next lowest compliant bidder.
 - .4 The Contractor may be considered in default of the Contract if execution of the accepted Sediment and Erosion Control Plan and/or a Work Methodology Plan is not being executed as approved and/or the work methods being used are determined by the Contract Administrator to be causing unnecessary damage to the project site.

1.4 SPECIAL CONSTRUCTION REQUIREMENTS

- .1 The Contractor will be responsible to protect the subgrade at all times during construction and in particular following moderate to heavy rainfall. Construction traffic on exposed subgrade should be prohibited or limited to equipment which will not damage subgrade.
- .2 The Contractor will be responsible to ensure that the equipment utilized for site preparation, excavation, removals including stripping of topsoil does not cause any damage or disturbance to the subgrade.
- .3 Any damaged subgrade areas caused as a result of construction traffic or construction techniques must be repaired by the Contractor as part of this contract and at no additional cost to the National Capital Commission.
- .4 The reinstatement of the pathway to preconstruction conditions on all areas being used for access, including the removal of any granular material, repairs to recreational asphalt

pathway will be the responsibility of the Contractor and must be included in the tender price.

- .5 The Contractor shall be responsible as part of the tender price for the stripping and reuse of topsoil and approved fill material, or the removal from the site of all excavated non reusable or excess material as well as the supply and placement of all required imported fill material required to execute the work of this contract.
- .6 The Contractor will not be compensated for any additional stripping and/or additional earth or granular backfill materials required as a result of over-excavations not approved and authorized by the NCC Contract Administrator prior to undertaking work.

1.5 CODES, PERMITS AND STANDARDS

- .1 Standards referred to in this Specification (CGSB, CSA, ASTM, OPSD, CHBDC etc.) may be examined at the following location:
 - Public Works and Government Services Canada
 - Standards and Specifications Branch
 - Place du Portage - Phase 3, 11 Laurier Street
 - Hull, Quebec
 - K1A 0S5
- .2 Perform work in accordance with the National Building Code of Canada (current edition) and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .3 Perform work in accordance with contract documents and any other codes and legislation of Federal, Provincial or Local applications provided that in cases of conflict or discrepancy, the more stringent requirements shall apply.
- .4 Obtain and pay for permits, inspector approvals, and other licenses required for this project and also pay any charges incidental to such permits. Provide copy of permits to the NCC Representative.
- .5 **Contractor is to obtain an access permit from the National Capital Commission, NCC Urban Lands.**

1.6 DEFINITIONS

- .1 Wherever the term "NCC Contract Administrator" appears throughout this specification, it shall be construed to mean an Inspector representing the National Capital Commission and including a duly named consultant on their behalf.
- .2 Wherever the terms "or equal", "or approved equal" appear after specific types of materials and items throughout this specification, they shall be construed to mean as being equal in the opinion of the NCC Contract Administrator, in material content, workmanship and quality to that designated as being the minimum acceptable standard, and that the NCC Contract Administrator's written approval must be obtained prior to submitting an alternative, 3 days before close of tender.

1.7 TAXES

- .1 Include in the tender amount, all sales and other taxes levied by the Federal, Provincial and Municipal government or other authority. There will be no refunds made by the National Capital Commission to the Contractor for taxes paid by the Contractor.

1.8 PROTECTION

- .1 Provide and maintain guardrails, fences, barricades, lights and other devices required for protection of workmen and residents in accordance with the requirements of Provincial and Local by-laws and the Canadian Construction Safety Code.
- .2 Protect existing structures against damage until completion of work.
- .3 Take all precautions to protect vegetated areas and specimen trees from any damage.

1.9 DAMAGES

- .1 Damages caused to existing plant material, landscaping, lawns, roadways, pathways, structures, finishes and public utilities due to work of this contract, will be restored to their original condition, replaced or adequate compensation made to affected parties by the Contractor.
- .2 It is understood that restored or replaced work includes, labour, equipment and material costs.
- .3 The restored or replaced work shall be completed within (7) seven days of notification by the NCC Contract Administrator.

1.10 CUTTING, FITTING AND PATCHING

- .1 Execute cutting, fitting and patching of work that may be a requirement to make work fit properly together, to receive or be received by other work.
- .2 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
- .3 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

1.11 SITE VISIT

- .1 Parties intending to submit tenders on the work must visit the site and obtain for themselves all information pertaining to existing conditions affecting the proper execution and completion of the work. The submission of a tender shall be deemed as proof that the tenderer and his sub-trades have complied with this requirement. After claims for additional compensation will not be entertained for any items of labour, equipment or materials required to complete the work that could have been reasonably ascertained by a site examination.

1.12 WORKMANSHIP

- .1 It is a requirement of this contract that qualified tradesmen execute each type of work specified.
- .2 Example: Landscape contractor for landscape work, mason for stonework, carpenter for carpentry work, etc.
- .3 Work unsatisfactorily completed by unqualified tradesmen will be redone and paid for by the Contractor.

1.13 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each of following:
 - .1 Contract drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change orders.

- .5 Other modifications to Contract.
- .6 Field test reports.
- .7 The NCC Environmental Effects Evaluation document.
- .8 Manufacturer's installation and application instructions.
- .9 Copy of current and approved work schedule.

1.14 WORK SCHEDULE

- .1 Provide within 5 working days after Contract award, in form acceptable to NCC Contract Administrator, detailed schedule showing anticipated progress stages and final completion of work within time period specified in Contract documents.
- .2 Interim reviews of work progress based on work schedule will be conducted as decided by NCC Contract Administrator and schedule updated by Contractor in conjunction with and to approval of NCC Contract Administrator.

1.15 DOCUMENTS AND SAMPLES TO BE SUBMITTED

- .1 Within a reasonable timeframe, and according to a predetermined order so as not to delay the work, present the documents and necessary samples for approval by the NCC Site Administrator for revision. A delay in this respect does not constitute a sufficient reason to obtain a work extension, and no demand of this regard will be considered.
- .2 Work for which documents and samples are required should not be undertaken before these required elements have been checked and approved.
- .3 Submit 2 printed copies of the drawings prescribed in the technical sections of the estimate, and any others as reasonably required by the NCC Site Administrator.
- .4 If no drawing is required because the manufacturer's standard is used, submit 2 copies of the charts or documentation of the manufacturer as prescribed in the technical sections of the estimate and required by the NCC Site Administrator.
- .5 Submit the following documents and samples:
 - .1 Samples of angular rip rap (Class IV) as per specification.
 - .2 Technical specifications of topsoil and compost mixture.

1.16 CONTRACTOR'S USE OF SITE

- .1 Limited to area immediately surrounding work and areas designated by the NCC Contract Administrator for material stockpiling and work equipment parking.
- .2 Do not unreasonably encumber site with materials or equipment during construction.
- .3 Move stored products or equipment interfering with operations of N.C.C., other contractors or agencies and the general public.

1.17 SETTING-OUT OF WORK

- .1 The Commission shall furnish the Contractor with the reference co-ordinates necessary for laying out the work of this contract to the successful bidder. **The Contractor shall employ survey personnel with experience in the use of co-ordinates to physically layout work utilizing a total station survey system.**
- .2 Contractor shall assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.
- .3 Provide devices needed to lay out and construct work. Supply such devices as required to facilitate NCC Contract Administrator's inspection of work.
- .4 Supply stakes and other survey markers required for laying out work.
- .5 **Contractor must obtain NCC Contract Administrator's approval of shoreline layout prior to commencing work.**

1.18 PROJECT MEETINGS

- .1 NCC Contract Administrator will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.

1.19 EXISTING SERVICES

- .1 Before commencing work, establish location and extent of **service lines and culverts** in area of work and notify Contract Administrator of findings.
- .2 Where unknown services are encountered, immediately advise Contract Administrator and confirm findings in writing.
- .3 Where work involves adjusting of existing services, carry out work as directed by the Contract Administrator.
- .4 Make good and pay for damage to existing utility lines resulting from work.

1.20 TRAFFIC CONTROL

- .1 Do not infringe on adjacent roads, sidewalks, ramps, loading zones or interfere with normal traffic flow in carrying out the work. If it is necessary to disrupt traffic or occupy thoroughfares for purposes of unloading materials, etc., obtain permission from the Contract Administrator and abide by his instructions regarding the manner, time and delays necessary to carry out these operations. Incidental costs (e.g. for permits, signage, public notification of lane closures, etc.) conforming to these requirements will be paid by Contractor.
- .2 Provide a suitable system of protective barricades, lane markings, signs, lights and other such devices to warn and channel traffic and wherever necessary, the services of a flagman to direct and control traffic. Carry out protection in accordance with the requirements of the Provincial and Local by-laws having jurisdiction over this type of work.
- .3 Where appropriate, provide pathway closed signage.
- .4 Printed signage must be provided in both English and French
- .5 The proposed methods and systems of traffic control and maintenance provisions together with supporting sketches must be submitted to the Contract Administrator upon request following tender closing.

1.21 ADDENDA

- .1 Answers to questions directed to the NCC Contract Administrator, and any amendments to the drawings and specifications during the tender period will be communicated in the form of addenda to all general contractors tendering; such addenda to be considered as and read as part of the specifications and thereby included in the contract documents.

1.22 ADDITIONAL DRAWINGS

- .1 The Commission may furnish additional drawings to the Contractor to assist in the proper execution of the work. These additional drawings will be issued for clarification purposes only. Such drawings shall have the same meaning and intent as if they were included with the plans referred to in Contract Documents.

1.23 CONTRACT DOCUMENTS

- .1 Drawings and specifications are complementary. Items shown or mentioned in one and not in the other are deemed to be included in the contract work.
- .2 If the drawings and specifications differ, the NCC Contract Administrator shall give preference to the Contract document thereof, which best insures the attainment of this

contract's objectives.

1.24 PAYMENT

- .1 This is a unit price contract. Any minor or miscellaneous items indicated on the drawings as being part of the work of this contract must be included by the Contractor in his overhead and indirect charges and incorporated into the unit price bid.
- .2 No separate payment will be made for work performed in respect to any of the special provisions where there is no specific pay item on the schedule of prices. The cost of these works must be appropriated among, and included in, the lump sum bid price.

1.25 ADVERTISING

- .1 No advertising will be permitted on this project.

1.26 COMPACTION OF MATERIALS

- .1 The thickness of granular and crushed stone materials shown on the drawings shall be the real thickness after the materials have been compacted as specified.

1.27 RECORD DRAWINGS

- .1 As work progress, maintain, accurate record to show deviations from contract documents.
- .2 Just prior to NCC Contract Administrator's inspection for issuance of final certificate of completion, supply one (1) set of white prints with all major and minor deviations neatly inked in. The NCC Contract Administrator will provide two (2) sets of clean white prints for this purpose.

1.28 GUARANTEES AND WARRANTIES

- .1 Before completion of work, collect all manufacturer's guarantees and warranties, and deposit to Contract Administrator.

END OF SECTION

PART 1 - GENERAL

- 1.1 Submit to Contract Administrator for review, shop drawings, product data and samples specified.
- 1.2 Until submission is reviewed, work involving relevant product may not proceed.
- 1.3 Shop Drawings
 - .1 Drawings to be originals supplied by contractor, subcontractor, supplier or distributor, illustrating appropriate portion of work:
 - .1 Showing fabrication, layout, setting or erection details as specified in appropriate sections.
 - .2 Identify details by reference to sheet or detail number shown on contract documents.
 - .3 Maximum sheet size 610 x 915 mm.
 - .4 Reproductions for submissions opaque diazo prints.
- 1.4 Product Data
 - .1 Manufacturer's standard schematic drawings, catalogue sheets, diagrams schedules, performance charts, illustrations and other standard descriptive data may be accepted in lieu of shop drawings.
 - .2 Above will only be accepted if they conform to following:
 - .1 Delete information not applicable to project;
 - .2 Supplement standard information to provide additional information applicable to project;
 - .3 Show dimensions and clearances required;
 - .4 Show performances characteristics and capacities.
- 1.5 Samples and Mock-ups
 - .1 Submit samples in sizes and quantities specified.
 - .2 Where colour, pattern or texture is criterion, submit full range of samples.
 - .3 Reviewed samples will become standards of workmanship and material against which installed work will be checked on project.
- 1.6 Co-ordination of Submissions
 - .1 Review shop drawings, product data and samples prior to submission.
 - .2 Verify:
 - .1 Field measurements;
 - .2 Field construction;
 - .3 Catalogue numbers and similar data.
 - .4 Co-ordinate each submission with requirements of work and contract documents. Individual shop drawings will not be reviewed until all related drawings are available.
 - .5 Contractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator's review of submittals.
 - .6 Contractor's responsibility for deviations in submission from requirements of Contract documents is not relieved by Contract Administrator's review of submission, unless Contract Administrator gives written acceptance of specified deviations.
 - .7 Notify Contract Administrator in writing at time of submission, of deviations from requirements of Contract documents.
 - .8 After Contract Administrator's review, distribute copies.
- 1.7 Submission Requirements
 - .1 Schedule submissions at least 10 days before dates reviewed submissions will be needed.
 - .2 Submit number of paper or electronic copies of shop drawings and product data Contractor requires for distribution, plus 2 copies to be retained by Contract Administrator.

- .3 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date;
 - .2 Project title and number;
 - .3 Contractor's name and address;
 - .4 Number of each shop drawings, product data and sample submitted;
 - .5 Other pertinent data.

- 1.8 Submissions shall include:
 - .1 Date and revisions dates;
 - .2 Project title and number;
 - .3 Name of:
 - .1 Contractor;
 - .2 Subcontractor;
 - .3 Supplier;
 - .4 Manufacturer;
 - .5 Separate detailer when pertinent.
 - .4 Identification of product or material;
 - .5 Relation to adjacent structure or materials;
 - .6 Field dimensions, clearly identified as such;
 - .7 Specification Section number;
 - .8 Applicable standards, such as CSA or CGSB numbers;
 - .9 Contractor's stamp, initialed or signed, verifying review of sub-mission, verification of field measurements and compliance with Contract documents.

END OF SECTION

PART 1 - GENERAL

1.1 References

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Province of Ontario Ministry of Labour and the corresponding regulations

1.2 Submittals

- .1 Submit site-specific Health and Safety Plan prior to award of contract. Health and Safety Plan must include:
 - .1 Results of site-specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in the scope of work.
- .2 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.
- .3 Submit copies of incident and accident reports.
- .4 Submit Material Safety Data Sheets (MSDS) to Contract Administrator.
- .5 Names of personnel and alternates responsible for site safety and health, hazards present on site, and use of personal protective equipment.

1.3 Safety Assessment

- .1 Perform site specific safety hazard assessment related to project.

1.4 General Requirements

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to commencing any site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Contract Administrator may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.5 Responsibility

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.6 Compliance Requirements

- .1 Comply with Ontario Ministry of Labour
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.7 Unforeseen Hazards

- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, and follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province of Quebec having jurisdiction. Advise Contract Administrator verbally and in writing.

1.8 Posting of Documents

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province of Quebec having jurisdiction, and in consultation with Contract Administrator.

1.9 Correction of Non-Compliance

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Contract Administrator.
- .2 Provide Contract Administrator with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Contract Administrator may stop Work if non-compliance of health and safety regulations is not corrected.

1.10 Work Stoppage

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

1.11 Personnel Health, Safety, And Hygiene

- .1 Training: Ensure personnel entering site are trained in accordance with specified personnel training requirements.
- .2 Personal Protective Equipment:
 - .1 Workers in direct contact with the existing soil within park shall wear a dust mask and gloves along with the other standard PPE.
 - .2 PPE and protective clothing must be kept clean and well maintained.
 - .3 Dispose of or decontaminate PPE worn on site at end of each workday.

1.12 Excavating

- .1 The Contractor shall ensure no person enters an excavation unless another worker is working above ground close to the excavation or to the means of access to it.
- .2 The Contractor shall arrange the locating and marking of gas, electrical and other services prior to commencing an excavation.
- .3 The Contractor shall obtain approval from Consultant before arranging the shut off and disconnection of a service that may pose a hazard.
- .4 The Contractor shall comply with the requirements of the province of Quebec.

1.13 Chemicals

- .1 The Contractor must provide a list of all chemicals to be used on site and a copy of the Material Safety Data Sheet (MSDS) for each chemical to the Consultant prior to being brought onto the job site.
- .2 The Contractor must ensure each chemical container brought on site is clearly labelled with the identity of the chemical, information for the safe handling of the chemical and the location of the MSDS.
- .3 The Contractor must ensure adequate measures are taken to control the distribution, within the application area or throughout the building, of fumes/vapours before applying flammable, noxious or volatile materials.
- .4 The Contractor may be required to schedule the application of hazardous materials which might affect the well-being of any workers or disrupt work of other Contractors and cannot

be adequately controlled to prevent such occurrences to evening or weekend periods.

- .5 The Contractor must ensure workers wear the required personal protective equipment (respiratory protection, protective clothing, hand protection, eye/face protection, etc.) when working with chemicals.
- .6 The Contractor must ensure the safe use and disposal of all chemicals that they are using. No chemicals and/or chemical waste product shall be disposed of on site without prior approval of Consultant.
- .7 The Contractor may not store chemicals and compressed gas cylinders on site without approval of the Consultant. If approved, the Contractor must ensure incompatible chemicals are stored separately.

PART 2 - PRODUCTS

2.1 Not Used

PART 3 - EXECUTION

3.1 Not Used

END OF SECTION

PART 1 - GENERAL

1.1 DEFINITIONS

- .1 Pollution and environmental damage: the presence of chemical, physical or biological elements that have a deleterious effect on health or ecology, which alters the ecological balance and that negatively affect, or that degrade the aesthetic character, cultural or historical environment.
- .2 Environmental protection: prevention / control of pollution and habitat disturbance and the environment during construction. The prevention of pollution and damage to the environment covers the protection of soil, water, air, biological and cultural resources; it also includes the management of, noise, solid waste chemicals, gases and liquids, radiant energy, radioactive substances and other pollutants.

1.2 Outlines of Work

.1 Provide all supervision, labour, equipment, tools, materials, consumables, transportation and other services necessary for undertaking and completing the Work detailed and specified herein and on the Drawings, including but not limited to:

- 1 Conduct the Work in a manner to prevent detrimental impacts on the Environment (air, water, soil and biota).

1.3 FIRES

- .1 Fires and burning of rubbish on site is not permitted.

1.4 DISPOSAL OF WASTES

- .1 Burying of rubbish and waste materials on site not permitted.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .3 Waste will be managed in accordance with Province of Ontario standards.

1.5 DRAINAGE

- .1 It is prohibited to pump water containing particles of suspended material into waterbodies, sewer systems or drainage systems.
- .2 Properly dispose of drainage materials containing suspended particles or other harmful substances according to the requirements of local authorities.

1.6 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties where indicated.
- .2 Protect roots of designated trees to dripline during excavation and site grading to prevent

- disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .3 Minimize stripping of soil.
 - .4 Where heavy equipment is used around trees, protect trees with temporary fencing.
 - .5 Restrict tree removal to areas indicated or designated by NCC Representative.
 - .6 Trees identified for removal to be marked on site prior to removal.
 - .7 An NCC Representative will review on site and confirm before any removal takes place.
 - .8 Leave stumps 150 mm above grade, do not grind any stumps.
 - .9 Any tree removal that may impact the health of adjacent trees to be reviewed by an NCC Representative.
 - .10 Read and follow all requirements in the Environment and Climate Change Canada (ECCC) species at risk permit (SARA-OR-2020-0521).
 - .11 Maintain the protective buffer around the butternut tree #220 (Bt 220) at all times if no work is occurring in the vicinity.
 - .12 No work shall begin within the protective buffer of Bt 220 without advising the NCC two (2) weeks in advance and receiving permission from the NCC.
 - .13 Follow all recommendations provided by NCC Biologists and hired consultants with regards to work within the protective buffer of Bt 220. .14 Follow approved protocols from the Ontario Invasive Species Council for the removal of invasive plant species, such as buckthorn and dog strangling vine.
 - .15 Follow the approved Clean Equipment Protocols for Machinery to avoid spreading invasive species across the site or off-site.

1.7 WATERCOURSE PROTECTION

- .1 The contractor shall prepare and submit a sedimentation and erosion control plan to the NCC for review seven days prior to commencing work. See section 1.8 below.
- .2 The contractor shall prepare a Spill Response Plan.
- .3 The Contractor shall ensure that no contamination, waste or other substances which may be detrimental to aquatic life or quality of water shall enter the watercourse as either direct or indirect result of construction and the Contractor shall meet all requirements of Government authorities or agencies with respect to environmental protection.
- .3 The Contractor shall be prepared to immediately clean up any spills of contamination, waste or other substances which may be either detrimental to aquatic life or quality of water. In the event of a spill, the Contractor shall immediately commence a clean-up operation. The Contractor shall be liable for all damages and/or charges laid which result, either directly or indirectly, from the spill, or contamination of any kind which results from their construction operations.
- .4 The Contractor shall be responsible for the immediate cleaning and disposal of any floating debris that may accumulate in or near waterways, drainage channels or wetland sites.

- .5 The Contractor shall not make any claim for extra compensation for the cost of fulfilling the obligations set out herein.
- .6 The Contractor shall inform the NCC immediately of any spills or effects on soil or surface water.
- .7 Do not stockpile soil or fine grain materials adjacent to the river. Keep soil stock piles covered with a tarp to prevent erosion and animal nesting.
- .8 No mixing of concrete within 30 m of the river. No concrete washing shall occur on site.
- .9 Inform the NCC if any turtle or other reptile or amphibian species are identified on the construction site.
- .10 All rip-rap being placed below the low-water mark shall be washed prior to placement.

1.8 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this contract. Control emissions from equipment and obtain from local authority's emission requirements. Make sure that the exhaust system of all machinery is in good condition.
- .2 Prevent excavation material, cuttings, construction debris and other foreign materials from contaminating air and waterbody.
- .3 Spray or cover with natural materials any dry and barren soil areas as required.
- .4 Cover garbage and construction waste bins to prevent wind from raising dust or debris.
- .5 Turn off the engines of haulage trucks waiting to be loaded or unloading if waiting time is uncertain or prolonged.
- .6 Keep on the site adequate spill container to satisfy any type of gasoline spill to ensure the removal / disposal of contaminated material to licensed premises.
- .7 Refueling should only be done 15 m from the waterbody over an impermeable surface.
- .8 Emergency Response Plan: If there is a contamination of soil and water caused by a spill or leakage of construction equipment, the contractor shall prepare an emergency response plan and comply with provincial and federal regulations and must notify the department of environmental services.

1.8 SEDIMENT EROSION AND CONTROL PLAN

- .1 Contractor shall ensure that all workers, including subcontractors, are aware of the importance of erosion and sedimentation control measurements and the consequences of failure to comply with requirements of all regulatory agencies.
- .2 Contractor shall exercise due diligence to ensure that runoff sediments do not enter the watercourse. Berms, anti-erosion fences and other best management practices, as determined by the work practices of construction site contractors, shall be constructed at appropriate locations to ensure that turbidity is to be minimized as determined by

government authorities and agencies.

- .3 Minimum erosion and sediment control shall be as follows:
 - .1 Limit the extent of exposed soil at a given time.
 - .2 Replant exposed areas as soon as possible
 - .3 A sediment fence shall be installed around the perimeter of all stocks of all soils to be used or removed from the site. Stocks must be located outside the floodplain and in locations approved by the NCC Representative.
 - .4 Rainwater diversion from the construction zone may be required. If this is the case, stormwater diversions must be placed at regular intervals and towards the grassy areas which slopes downstream and are not subject to construction activities. Sediment control structures may be required at the mouth of each diversion, but it is expected that the grass will filter sediment and deposits, minimizing sediment run-off.
 - .5 Minimize movement of vehicles, machinery and heavy equipment on exposed soils.
- .6 If revegetation is not immediately possible following construction, stabilize the soil using coconut mats or other methods to prevent erosion.
- .7 Use sedimentation barriers in order to reduce sediment influx into the Ottawa River.
- .8 Inspect, maintain and modify the sediment and erosion control measures regularly to ensure effectiveness
- .9 Sediment erosion and control measures will be inspected, maintained and repaired weekly and after each rainfall.
- .10 Maintain sediment barriers in place until disturbed soils have been stabilized

1.9 CONSTRUCTION METHODS

- .1 Contractor shall use construction methods approved by NCC Representative and or provincial authorities.
- .2 Contractor's equipment must be in good working order to reduce emissions of pollutants, dust and odours.

1.10 HAZARDOUS MATERIAL SPILL

The following precautions must be taken by the contractor when using hydrocarbons (fuels, etc.) in order to avoid significant environmental impacts due to accidental spills:

- .1 The Contractor is required to have an Environmental Emergency Plan approved by the NCC Representative;
- .2 The storage of hydrocarbons is prohibited within 15 meters of a watercourse or wetlands and refueling of hydrocarbons is prohibited within 30 meters;
- .3 Equipment must be washed before entering the site to prevent oil and grease from entering the work area;
- .4 Inspections should be carried out before work and often afterwards to detect any leaks (oil, fuel, grease, etc.). If a leak is detected, all necessary measures will be taken

- immediately and any maintenance that needs to be done will be carried out a minimum distance of 60 meters from a watercourse or wetland;
- .5 An emergency cleaning kit for petroleum products must always be available on site. The kit will include at least 30 meters of absorbent socks, one (1) box of absorbent buffer pads, one (1) vacuum of 45 gallons barrel, rope and solid sorbent (powder or granules). The kit must be stored near the equipment and work area and will be easily accessible at all times for quick response;
 - .6 If an oil spill occurs, the Contractor must contain and immediately call the NCC Emergency Hotline at 613-239-5353. Contaminated hydrocarbons and contaminated soils must be disposed of by a company specializing in this field. The company providing the work will be chosen by the NCC.
 - .7 The Contractor shall be prepared to immediately clean up any spills of contaminants, waste or other substances which may be either detrimental to aquatic life or quality of water. In the event of a spill, the Contractor shall immediately commence a clean-up operation. The Contractor shall be liable for all damages and/or charges laid which result, either directly or indirectly, from the spill, or contamination of any kind which results from their construction operations.

1.11 PROTECTION OF WILDLIFE

- .1 Abide by all mitigation measures outlined in DFO Letter of Advice appended to this specification:
 - .1 Complete work outside of the downstream restricted activities period for the Ottawa River – Lac Dollard des Ormeaux (January 1 to July 15)
 - .2 If possible, prioritize work closest to the water to minimize the risk of sedimentation during fish migration
 - .2 A copy of the DFO Letter of Advice must be available on site at all times.
- .3 If required, tree removal should occur prior to April 8th or after August 28th in order to avoid the migratory bird and bat nesting season. A visual verification by field staff is required to confirm the absence of active nests.
- .4 If tree removal occurs during the breeding season (April 8 – August 28), a survey of the trees must be completed by a qualified professional (avian biologist) a maximum of 48 hours prior to the start of the work to confirm the absence of active nests.
- .5 If an active nest of a migratory or species at risk bird is detected, install a protective perimeter fence and contact the NCC Environmental Officer. The appropriate buffer zone and additional mitigation measures will be identified according to the species in question.
- .6 Use a turbidity curtain to avoid sediment from impacting fish habitat and water quality.
- .7 Report all occurrences of reptiles or amphibians at the construction site to the NCC.
- .8 Do not harass, harm or touch any wildlife on site.
- .9 Cover all loose soil stock piles that are outside of silt fencing zones with tarps, to avoid turtle nesting within them.

END OF SECTION

|

PART 1 - GENERAL

1.1 ACCESS

- .1 With Contract Administrator present, prepare photographic inventory of the original condition of all locations where temporary facilities are to be built by the Contractor. Submit a bound record copy of the photographic inventory with locations, labels and descriptions of existing features to the Contract Administrator prior to commencing any work on the temporary facilities.
- .2 Provide and maintain adequate access to the project site.
- .3 Build and maintain temporary roads and temporary watercourse crossings where required or indicated subject to approval of the Contract Administrator. Remove temporary facilities and reinstate site following completion of work.
- .4 If authorized to use existing roads or pathways for access to project site, maintain such roads for duration of contract and make good damages resulting from the Contractor's use of roads or pathways.

1.2 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and by-laws.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.3 REMOVAL OF TEMPORARY FACILITIES

- .1 Remove temporary facilities from site unless directed otherwise by Contract Administrator.
- .2 All areas disturbed shall be reinstated by the Contractor to its original condition at the contractor's expense and to the Contract Administrator's satisfaction.

1.4 TEMPORARY FENCING

- .1 Temporary fencing shall be modu-loc fence panels or approved equal. The height should be of 1.8m and fencing should prevent any public access throughout construction and be securely installed

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Health and Safety

Section 01 35 29

PART 2 - PRODUCTS

2.1 Not Used

PART 3 - EXECUTION

3.1 Conduct cleaning and disposal operations to comply with local ordinances and anti pollution laws.

3.2 Disposal of mineral spirits, oil or paint and varnish solvents in storm or sanitary drainage systems is prohibited.

3.3 Prevent accumulation of wastes which create hazardous conditions.

3.4 Cleaning During Construction

- .1 Maintain project grounds and public properties free from accumulations of waste materials and rubbish on a daily basis.
- .2 Remove waste materials and rubbish from site and haul to an approved dump site.
- .3 Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not interfere with operation of roads and pathways.

3.5 Final Cleaning

- .1 Remove grease, dirt, dust, stains and other foreign materials from finished surfaces.
- .2 Broom clean paved surfaces; rake clean other surfaces of grounds, to satisfaction of Contract Administrator.
- .3 Clean project site in preparation for substantial completion inspection and final inspection.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

- .1 Section 01 35 43 – Environmental Protection
- .2 Section 32 23 10 – Excavation, Backfilling and Trenching

1.2 GENERAL REQUIREMENTS

1. Contaminated soils may be encountered during excavation. The possible locations of contaminated soils are located within the following areas north of the parkway:
 - Eastern edge of the project site near the shoreline. Existing layby curb north to the proposed asphalt pathway.
 - Existing asphalt pathway removal adjacent to the parkway.

Additional contaminated areas may be identified during excavations works. If contaminated soils are confirmed on site, the following procedures shall be followed.

1.3 OUTLINE OF WORK

- .1 Provide all supervision, labour, equipment, tools, materials, consumables, transportation and other services necessary for undertaking and completing the Work detailed and specified herein and, on the Drawings,, including but not limited to:

.1 Appropriate submittals, water management facility, equipment and personnel decontamination, dust and particulate control, pollution control, water control, dewatering, erosion and sediment control, progress cleaning, final decontamination, materials/waste removal and disposal.

1.4 SEQUENCING AND SCHEDULING

- .1 Work shall be sequenced so that vehicles do not travel over areas of the Site that have been remediated.
- .2 Excavation Work shall not commence until all mitigation measures in PART 3 of this Section are in place.
- .3 Excavation of material shall be carried out as per Section 31 23 19 – *Excavation, Backfilling and Trenching*.

1.3 SUBMITTALS

- .1 Submittals for Progress Meetings: Make submittals at least 24 hours prior to scheduled progress meetings, as follows:
 - .1 Updated progress schedule detailing activities. Include review of progress with respect to previously established dates for starting and stopping various stages of work, major problems and actions taken, injury reports, equipment breakdown and material removal.
 - .2 Daily copies of transport manifests, waybills and disposal receipts for waste materials removed from work area.
 - .3 Any other information required by the NCC Representative or relevant to the agenda of the upcoming progress meeting.
- .2 Site Layout: Within 7 days of the date of Notice to Proceed and prior to the mobilization to site, submit site layout drawings showing existing conditions and facilities, construction facilities and

- temporary controls to be provided by the Contractor, including but not limited to following:
- .1 Equipment and personnel decontamination areas.
 - .2 Means of ingress, egress and temporary traffic control facilities.
 - .3 Soil stockpile areas, debris stockpile areas, screening area, etc.
 - .4 Exclusion Zones, Contaminant Reduction Zones, and other zones specified in the Contractor's site-specific Health and Safety Plan.
 - .5 Grading, including contours, required to construct temporary facilities.
- .3 Submit Erosion and Sedimentation Control Plan and an Emergency Spill Plan to the Representative for review and approval seven days prior to beginning construction.

PART 2 - PRODUCTS

2.1 SOIL STOCKPILING FACILITIES

- .1 Provide, maintain and operate storage/stockpiling facilities as indicated in Section 31 23 10 – Excavation, Backfilling and Trenching

2.2 EROSION AND SEDIMENT CONTROL

- .1 Provide and maintain temporary measures, which may include but are not limited to: silt fence barriers, straw bales, geotextiles, riprap, temporary drainage, vegetative cover, and any other construction required to prevent erosion and migration of silt, mud, sediment, and other debris off site or to other areas of the site where damage might result, or that might otherwise be required by Laws and Regulations, specifically the Ottawa River. Ensure that sediment control measures are available during construction. Installation of the erosion and sedimentation control measures should be in accordance with Ontario Provincial Standard Specifications (OPSS).
- .2 Silt Fence Barriers: An assembled, ready to install unit consisting of geotextile attached to driveable posts. Geotextiles shall be uniform in texture and appearance, having no defects, flaws, or tears affecting its physical properties; and shall contain sufficient ultraviolet ray inhibitors and stabilizers to provide a minimum 2-year service life in conditions of outdoor exposure.
- .3 Net Backing: Industrial polypropylene mesh joined to geotextile, at both top and bottom, with double stitching of heavy-duty cord with a minimum width of 750 mm.
- .4 Posts: Sharpened wood or steel, approximately 50 mm square, protruding below bottom of geotextile to allow a minimum 450 mm embedding; post spacing 2.4 m maximum. Securely fasten each post to geotextile and net backing using suitable staples.
- .5 All in water works (below the 2-year flood plain) require the used of a turbidity curtain.

PART 3 - EXECUTION

3.1 GENERAL PROCEDURES

- .1 In order to avoid spreading of contaminated soil around the site, the following precautions will be observed:
 - .1 When circulating over grass areas, machinery will wear fine threaded wide tires to avoid sinking and tearing into the grass and, exposing the contaminated soil underneath. Deep threaded tires and tracks are forbidden;
 - .2 Grass or soft surface areas will not be driven over when wet (eg: after rain) or soft (eg: early spring) ;
 - .3 Right after excavation of contaminated soil, tools, machinery and labourers in contact with contaminated soil will proceed to proper cleansing right over the excavated soil.

3.2 VEHICULAR ACCESS AND PARKING

- .1 Maintenance and Use:
 - .1 Prevent contamination of access roads. Immediately collect debris or material on access roads which are suspected to be contaminated, as determined by the NCC Representative; transport and dispose of in appropriate off-site disposal facility. Clean access roads at least once per shift.
 - .2 The NCC Representative may collect soil samples for chemical analysis from the travelling surfaces of constructed and existing access routes prior to, during and upon completion of work. Excavate and dispose of clean soil contaminated by the Contractor's activities at no additional cost to the NCC Representative.

3.3 DUST AND PARTICULATE CONTROL

- .1 Refer to Section 01 35 43 – Environmental Protection and the Environmental Effects Analysis (EEA)

3.4 EROSION AND SEDIMENT CONTROL

- .1 Refer to Section 01 35 43 – Environmental Protection and the Environmental Effects Analysis (EEA)

3.5 POLLUTION CONTROL

- .1 Provide methods, means and facilities to prevent contamination of soil, water and atmosphere from discharge of noxious toxic substances and pollutants produced by construction operations.
- .2 Be prepared to intercept, clean up and dispose of spills or releases that may occur, whether on land or water. Maintain materials and equipment required for cleanup of spills or releases readily accessible on site.
- .3 Promptly report spills and releases potentially causing damage to the environment to:
 - .1 Authority having jurisdiction or interest in spill or release, including any conservation authority, water supply authorities, drainage authority, road authority and fire department.
 - .2 Owner of pollutant, if known.
 - .3 Person having control over pollutant, if known.
 - .4 The NCC Representative (NCC). 613.239.5000

- .4 Take immediate action to contain and mitigate effects from spill or release on environment and people, using available resources.

3.6 EQUIPMENT DECONTAMINATION

- .1 Decontaminate equipment after working in potentially contaminated work areas, as well as prior to subsequent work or travel in clean areas and prior to leaving the Site.
- .2 As a minimum precaution, perform the following steps during equipment decontamination: Mechanically remove packed dirt, grit and debris by scraping and brushing, without using water. Pay particular attention to tire treads, equipment tracks, springs, joints, sprockets and undercarriages. Scrub surfaces with long handle scrub brushes. If not effective in removing contaminated materials, use high-pressure, low-volume, water as approved by the NCC Representative. Any wash water is to be contained within the remediation limits and directed to retention tanks or equivalent for testing prior to off-site discharge or disposal. Perform assessment, as directed by the NCC Representative, to determine effectiveness of decontamination.
- .3 Each piece of equipment will be inspected by the NCC Representative after decontamination and prior to removal from site and/or travel in clean areas. The NCC Representative will have the right to require that additional decontamination be completed, if deemed necessary.
- .4 Take appropriate measures necessary to minimize drift of mist and spray during decontamination, including provision of windscreens.
- .5 Transfer mud collected in the decontamination area for disposal to an MECP licensed disposal facility.

3.7 WATER CONTROL

- .1 Maintain excavations free of water.
- .2 Protect site from puddling or running water. Grade site to drain. Provide water barriers as necessary to protect site from soil erosion.
- .3 Prevent surface water runoff from leaving work areas.
- .4 Do not discharge decontaminated water, surface water runoff or groundwater or any water feature, off the site (specifically the Ottawa River) or in sewers.
- .5 Control surface drainage, including ensuring that gutters are kept open, water is not directed across or over pavements or sidewalks, except through approved pipes or properly constructed troughs, and runoff from unstabilized areas is intercepted and diverted to suitable outlet.
- .6 Dispose of water in manner not injurious to public health or safety, to property, to the environment (including the Ottawa River) or to any part of work completed or under construction.
- .7 Provide, operate and maintain necessary equipment appropriately sized to keep excavations, staging pads and other work areas free from water.

3.8 PROGRESS CLEANING

- .1 Maintain cleanliness of work areas and surrounding site to comply with federal, provincial, and local fire and safety laws, ordinances, codes, and regulations.
- .2 Coordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

3.9 FINAL DECONTAMINATION

- .1 Perform final decontamination of temporary installations, equipment, and materials which may have come in contact with potentially contaminated materials prior to removal from site.
- .2 Perform decontamination to remove potentially contaminated materials as specified to satisfaction of the NCC Representative. The NCC Representative will direct the Contractor to perform additional decontamination if required.

3.10 REMOVAL AND DISPOSAL

- .1 Remove surplus materials and temporary facilities from site.
- .2 Dispose of all non-contaminated waste materials, litter, debris, and rubbish off site.
- .3 Do not burn or bury rubbish and waste materials on site.
- .4 Do not dispose of volatile or hazardous wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
- .5 Do not discharge waste or wastewaters into storm or sanitary drains, streams or waterways.
- .6 Dispose all contaminated materials at appropriate off-site facility identified by the Contractor and approved by the NCC Representative: Debris including excess construction material, non-contaminated litter and rubbish; disposable PPE worn during final cleaning; wastewater removed from wastewater storage tank, wastewater generated from final decontamination operations including wastewater storage tank cleaning and materials from decontamination pad.
- .7 Dispose of materials in accordance with Section 31 23 10 – Excavation, Backfilling and Trenching, as directed by the NCC Representative.

END OF SECTION

Part 1 GENERAL

1.1 Description of the Work

- .1 The work for the item “railing” covers the requirements for the fabrication, supply and installation of the stainless-steel railings, wood handrails and bench brackets, as shown in the Contract Drawings.

1.2 Related Requirements

- .1 Section 31 37 00 Rip-Rap / Armour stone
- .2 Section 01 33 00 Shop Drawings

1.3 Action and Informational Submittals

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for including product characteristics, performance criteria, physical size, finish and limitations.
 - .3 Provide industry standard acceptable written certification for sustainable sourcing such as:
 - .1 Certificate of Inspection & Environmental Compliance.
 - .2 FSC Certification or equivalent approved.

1.4 Delivery, Storage and Handling

- .1 Deliver, store and handle materials in accordance with manufacturer's recommendations.
- .2 Label, tag or otherwise mark components supplied for installation.
- .3 Storage and Handling Requirements:
 - .1 Store wood and protect from weather, block off ground and separate with stripping, so air may circulate around all faces of members.
 - .2 Protect materials from damage during delivery, storage and handling. Exercise care not to scratch, mark, dent, or otherwise damage.
 - .3 Make adequate provision for delivery and handling stresses.
 - .4 Replace defective or damaged materials with new.
 - .5 Use padded, non-marring slings for handling wood sections.
 - .6 Protect corners with wood blocking.

Part 2 PRODUCTS

2.1 Materials

- .1 All stainless steel, connectors, fasteners, hardware etc. to be Grade 316 and passivated

- .2 **Railing at Granite stairs:** SQUARE tubing, stainless steel posts and continuous channel, matte finish, including all connections, fasteners hardware etc. Exact dimensions to be confirmed by shop drawings.
- .3 **Bench Brackets:** Stainless steel hoop bracket and hardware. Matte finish. Exact dimensions to be confirmed by shop drawings.
- .4 **Wood top Rail:** 38mm lpe hardwood “first export quality/clear all heart” grade. Size and profile as shown in drawings, to be supplied by Timber Holdings Intl., phone: 414-445-8989, or approved equivalent. Railing termination points to be rounded and smooth.
 - .1 Pre-drill fastener holes. Holes to be sized to prevent splitting of railing – confirm with final fastener size.
 - .2 Lumber shall be graded on all sides
 - .3 Lumber to be straight grained and parallel cut without heart center.
 - .4 Lumber to be all heartwood, no sapwood allowed.
 - .5 Lumber to be in sound condition, free from worm holes or knots.
 - .6 No Allowable Imperfections - longitudinal heart cracks, internal cracks, firm or soft sap wood, fungi effects (blue to gray, brown to red, white to yellow, or incipient decay), bow or twist which cannot be removed by normal installation methods and tools.
 - .7 Store wood out of direct sunlight. Allow to acclimate and stabilize to installation environment humidity levels before installation.
- .5 Railing Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Ontario.
 - .2 Proposed welding procedures to be stamped and approved by Canadian Welding Bureau in accordance with CSA W59.
 - .3 Certify that all dimensions and connection details shown are complete and in conformance with the Contract Drawings.
 - .4 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, joints and accessories.
 - .5 Show all hardware and procedures required to install stainless steel mesh including proposed holes or welds as required.

Part 3 EXECUTION

3.1

- .1 **Railing at Granite stairs:** Core drill one hole at the bottom and one hole at the top of the granite stairs once the stairs have been installed as per contract details. Measure onsite the distance between the core drills to facilitate shop drawing production. The railing is to be installed as one piece and secured using epoxy. Ensure positive drainage and epoxy is flush with granite. Do not allow epoxy to cover any part of the granite step outside of the core drill.

Install the wood hand rail cap on site or as part of the railing manufacturing process

END OF SECTION

Part 1 - GENERAL

1.1 Related Sections

- .1 Section 01 35 43 – Environmental Protection.
- .2 Section 31 37 00 – Rip Rap / Armour Stone
- .3 Section 32 91 21 – Topsoil and Finished Grading
- .4 Section 32 14 10 – Unit Paving

1.2 Definitions

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
 - A) Rock : any solid material which cannot be removed by means of heavy duty mechanical excavating equipment with bucket. Frozen material not classified as rock.
 - B) Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
- .3 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

1.3 Outline of Work

- .1 Provide all supervision, labor, equipment, tools, materials, transportation, and other services necessary for undertaking and completing the work as specified in the contract documents.
- .2 Provision of clean Select Sub-Grade Materials (SSM)

1.4 Protection of Existing Features

- .1 Existing buried utilities and structures:
 - A) Prior to commencing excavation Work, notify applicable Owner or authorities having jurisdiction, establish location and state of use of buried utilities and structures. Owners or authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.
 - B) Confirm locations of buried utilities by careful test excavations and hand uncovering in specified areas.
 - C) Record location of maintained, re-routed and abandoned underground lines.

D) Where unknown utilities or structure exist in the area of the excavation, obtain direction of the Contract Administrator before removing or rerouting.

.2 Existing buildings and surface features:

- A) Conduct, with Contract Administrator, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles and structures which may be affected by Work.
- B) Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair to approval of Contract Administrator.
- C) Where required for excavation, cut roots or branches as approved by Contract Administrator.

1.5 Submittals

.1 Prior to the commencement of any Site Work, the Contractor shall submit for the Contract Administrator's review and approval the following:

- .1 Operating procedures respecting the excavation area and the contractor lay down area, including equipment inspection area.
- .2 Quantity and assignment of equipment and staff on the Work Site
- .3 Copies of all applicable Certificates of Approval issued by the Ministry of the Environment (MECP_ under Part V of the Environmental Protection Act for all off-Site waste management and recycling sites selected to receive waste soil and debris, as well as for all waste haulers.
- .4 Copies of all clearance certificates from utility and service companies.
- .5 Inform Contract Administrator at least two (2) weeks prior to commencing work of the proposed source of any imported materials proposed for filling along with analytical test data demonstrating compliance with the Canadian Council of Ministers of the Environment (CCME) Soil Quality Guidelines (SQG) for residential parkland land use.
- .6 Submit 5 kg of samples of type of SSM, capping material and topsoil specified by the Contract Administrator in tightly closed containers to prevent contamination.
- .7 Obtain approval of the Contract Administrator for proposed imported materials prior to bringing them on-Site.

- .2 During and upon completion of the Work, the Contractor shall submit for the Contract Administrator's information the following:
- .1 Documentation pertaining to off-Site disposal and movement of Overburden Material, wastes, recyclables, and all other materials.
 - .2 Daily reports of quantities of Work executed for each relevant item of the Form of Tender.
 - .3 Details about any spill of Overburden Materials or Other Materials on public property and roadways, including the circumstances of the incident, reports to authorities and clean-up efforts.
 - .4 Upon completion of the Work, the Contractor shall submit for the Contract Administrator's review and approval a survey of the final excavation area limits, features and elevations. Survey to be completed at a 5 metre grid spacing plus any significant topographical features such as bedrock ledges, structures, or foundations.
 - .5 Where appropriate, weigh bills from licensed disposal facilities must be turned over to the Contract Administrator, on a daily basis along with the report on quantities of Work executed.

1.6 Reference standards / Testing

- .1 The Contract Administrator may carry out laboratory testing to classify unexpected contamination. Regular laboratory turnaround will be completed for testing. The Contractor is responsible for staging the excavation Work such that laboratory testing does not delay the Work. The Contractor will not be compensated for delays resulting from analytical testing.
- .2 Following approval of the SSM by the Contract Administrator, the Contractor will be responsible for providing continued analytical testing results in accordance with CCME SQG for residential parkland land use for all imported SSM brought to the Sites. Testing will include metals (to include the following elements Ba, Be, B, Cd, Cr, CrVI, Co, Cu, Pb, Mo, Na, Ni, Ag, V, Zn, As, Se, Sb, Hg, U), petroleum hydrocarbons (fractions F1-F4), polycyclic aromatic hydrocarbons and volatile organic compounds, or as approved by the Contract Administrator. Coarse non-soil aggregates are not subject to environmental quality testing. Soil material (i.e. SSM) that is sourced from a provincially licensed pit or quarry will require a single test prior to importing, whereas SSM from a unlicensed site shall be tested once per 200 m³ imported, as required under Ontario Regulation 406/19.

- .3 Ontario Environmental Protection Act, 1990
- .4 Ontario Water Resources Act, 1990
- .5 Ontario Regulation 153/04, Record of Site Condition
- .6 Canadian Council of Ministers on the Environment (CCME) Canadian Soil Quality Guidelines for the Protection of Human Health and the Environment
- .7 Ontario Ministry of Labour: Occupational Health and Safety Act, R.S.O. 1990, c.O.1, as amended
- .8 Ontario Regulation 406/19, On-Site and Excess Soil Management.

PART 2 – PRODUCTS

2.1 Materials

- .1 Selected material from excavation or other sources, approved by Contract administrator for use intended, unfrozen and free from rocks larger than 50 mm, cinders, ashes, sods, refuse or other deleterious materials.

2.2 Haulage Vehicles

- .1 Size and configuration of haulage vehicles will be appropriate for the Site conditions.
- .2 Haulage vehicles will be constructed in a manner to avoid spillage of material, with a tight fitting tailgate closure arrangement complete with locking device.
- .3 Haulage vehicles are to be equipped with appropriate tarpaulins of suitable size and design to minimize dust.
- .4 Vehicles required to access public roads shall be licensed to do so.
- .5 Haulage vehicles required to access public roads shall operate by authorization of a Certificate of Approval (Waste Management System) issued by the Ontario Ministry of the Environment under Part V of the Environmental Protection Act.

PART 3 - EXECUTION

3.1 Site Preparation

- .1 Demarcate excavation boundaries clearly along limits of proposed works and receive approval of NCC contract administrator before proceeding.
- .2 Clearly establish all elements for excavation prior to commencing work
- .3 Construction laydown area, construction fencing, temporary Site access roads shall be constructed, as required to execute the work, and maintained by the Contractor for the duration of the Work.

3.2 Stripping of Topsoil

- .1 Commence topsoil stripping of areas to be regarded or excavated after area has been cleared of brush, weeds and grasses.
- .2 Strip full depth of topsoil. Do not mix topsoil with subsoil.
- .3 Stockpile in locations as directed by Contract Administrator. Stockpile height not to exceed 2 m.
- .4 Dispose of unused topsoil off site at an approved MECP receiving facility.

3.3 Stockpiling

- .1 Stockpile fill materials in areas designated by Contract Administrator. Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.

3.4 Dewatering and Heave Prevention

- .1 Keep excavations free of water while Work is in progress.
- .2 Protect open excavations against flooding and damage due to surface run-off.
- .3 Dispose of water in accordance with Section 01 35 43 - Environmental Protection and Section 01 35 15 – Special Procedures for Contaminated Sites and in manner not detrimental to the public, the natural environment (including waterbodies) or any portion of Work completed or under construction.

3.5 Excavation

- .1 Excavate to lines, grades, elevations and dimensions as indicated.
- .2 Where solid rock is encountered notify Contract Administrator for direction on appropriate construction methods.
- .3 Keep excavated and stockpiled materials a safe distance away from edge of trench as directed by Contract Administrator.
- .4 Restrict vehicle operations directly adjacent to shoreline.
- .5 Dispose of surplus and unsuitable excavated material off site at an MECP approved landfill
- .6 Do not obstruct flow of surface drainage or natural watercourses.
- .7 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .8 Notify Contract Administrator when bottom of excavation is reached.
- .9 Obtain Contract Administrator approval of completed excavation.
- .10 Remove unsuitable material from trench bottom to extent and depth as directed by Contract Administrator.
- .11 Correct unauthorized over-excavation as follows:
 - .1 Fill under bearing surfaces with Granular "B", Type II, and/ or SSM compacted to 95% SPMDD as directed by Contract Administrator.
 - .2 Fill under other areas with approved SSM compacted to 85% density.
- .12 Hand trim make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil. Clean out rock seams and fill with concrete mortar or grout to approval of Contract Administrator.

3.6 Backfilling

- .1 Do not proceed with backfilling operations until Contract Administrator has inspected and approved installations.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Backfilling around installations.
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
- .6 Prior to the placement of backfill where soil remains, the Contractor shall place a geotextile between existing soil and imported fill.

3.7 Restoration

- .1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Contract Administrator.
- .2 Replace topsoil in accordance with Section 32 91 21 – Topsoil and Finish Grading.
- .3 Clean and reinstate areas affected by Work as directed by Contract Administrator.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work	.1	Granular materials	Section 32 11 23
	.2	Excavating, Trenching and Backfilling	Section 31 23 10
	.3	Rip Rap / Armour Stone	Section 31 37 00
1.2 References	.1	CAN/CGSB-4.2-[M88], Textile Test Methods.	
	.2	CAN/CGSB-148.1, Methods of Testing Geotextiles and Geomembranes.	
	.1	No. 3-85, Thickness of Geotextiles.	
	.2	No. 7.3-92, Grab Tensile Test for Geotextiles.	
	.3	No. 6.1-93, Bursting Strength of Geotextiles	
	.4	No. 10-94, Filtration Opening Size	
	.5	No. 4-94, Normal Water Permeability	
1.3 Samples	.1	Submit product data and samples in accordance with Section 01 33 00 - Shop Drawings and Samples.	
	.2	Submit following samples to Contract Administrator at least 1 week prior to commencing work.	
	.1	Minimum length of 2 m of roll width of geotextile.	
1.4 Mill Certificates	.1	Submit to Contract Administrator one copy of mill test data and certificates at least 1 week prior to start of work.	
1.5 Delivery and Storage	.1	During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.	

PART 2 - PRODUCTS

2.1 Geotextile	.1	Non-woven geotextile synthetic fibre fabric, supplied in rolls conforming to OPSS 1860 Non-Woven Class II, or approved equivalent.	
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PART 3 – EXECUTION

3.1 Installation of Geotextile	.1	Place geotextile material by unrolling onto graded surface	
	.2	Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.	
	.3	Overlap each successive strip of geotextile at least 450 mm over previously laid strip.	
	.4	Protect installed geotextile material from displacement, damage or deterioration before and during placements.	
	.5	Cover with granular material within 4 hours of placement.	
	.6	Replace damaged or deteriorated geotextile to approval of NCC Contract Administrator	
3.2 Protection	.1	No vehicles permitted directly on geotextile.	

END OF SECTION

PART 1 – GENERAL

- 1.1 Related Work
- | | | |
|----|----------------------------|------------------|
| .1 | Excavation and backfilling | Section 31 23 10 |
| .2 | Topsoil and Finish Grading | Section 32 91 21 |
| .3 | Seeding | Section 32 92 20 |
| .4 | Planting | Section 32 93 10 |
- 1.2 Approvals and Substitutions
- .1 Submit the sample to NCC Contract Administrator.
- .2 Submit shop drawing showing manufacturers recommended method of application.
- .3 Substitutions will be accepted upon written approval of NCC Contract Administrator before installation of material.

PART 2 – PRODUCTS

- 2.1 Erosion Control Mat
- .1 ECC-2B Biodegradable double coconut as supplied by East coast erosion control or approved equal.
- 2.2 Wood Pegs
- .1 19 x 19 x 200mm wooden pegs. **The use of metal or plastic staples is not acceptable.**

PART 3 - EXECUTION

- 3.1 Preparation of Surface
- .1 Ensure a smooth and even surface prior to placing mat.
- 3.2 Installation
- .1 Unroll the blanket over the newly graded topsoil areas.
- .2 Bury the mat minimum 300 mm in ground and flush with the edge of rock fill and edge of asphalt pathway.
- .3 Construct 150 x 150 mm keys for mat installation at top of the slope. Follow manufacturer's instructions.
- .4 The joint rolls should overlap minimum 150 mm, and be staked through the mat vertically and full length into the ground. Overlap the mat in a downstream direction.
- .5 Each stake will anchor the fibre mesh. The stakes will be spaced at a minimum of 1500 mm intervals in three rows equally spaced across each roll. Follow manufacturer's instructions.

END OF SECTION

1 GENERAL

1.1 Related Sections

.1	Excavating and Backfilling and Trenching	Section 31 23 10
.2	Granular Materials	Section 32 11 23
.3	Geotextile	Section 31 32 21
.4	Submittals	Section 01 33 00
.5	Hand Rail	Section 06 50 10

1.2 Source Quality Control

- .1 The size and quality of all stone (filter, round rip rap and monoliths, small cobble) shall be approved by the NCC Contract Administrator prior to delivery to the site.

2 PRODUCTS

2.1 Materials

Stone materials are to be free from clay lumps, organic material and other deleterious materials, which do not deteriorate when exposed to air and water and shall withstand cycles of wetting and drying and freezing and thawing. Stones must also match the colour of the existing riprap on site.

Armour stone must be reasonably flat on all sides, top, bottom, front, back and each side. Minor stone shaping may be required to ensure tight gaps between stones, this may include saw cuts, hammering and chiselling. A minimum of 40% surface contact between stones is required, with a maximum gap of 10-15mm. In some cases where this gap cannot be achieved smaller rip-rap can be wedged into the gap on the back side only, this method cannot be on the visible side.

Stone steps: to be one solid piece of granite and manufactured for this purpose, stone manipulation on site for the use of stairs will not be accepted unless authorized in writing by an NCC Representative. In the event granite steps must have a seam an alternating pattern will be considered. The pattern will be as follows: Row one, 1.5m x 1.5m (total length 3.0m) , second row 1.0m x 1.0m x 1.0m (total length 3.0m). The pattern must alternate.

- .1 **Angular Riprap:** Clean, washed, boulders. Stone to be granite or limestone with a Specific Gravity of 2.5 or higher.

The gradation of the rock fill to be within average dimensions of 100mm-200mm

A representative sample of the rip rap will be inspected on site. Contractor will ensure that the material is separated on site in such a way that will facilitate visual inspection prior to installation.

- .2 **Round Riprap Class:** clean, washed, rounded hard cobbles or boulders which do not deteriorate when exposed to air and water and shall withstand cycles of wetting and drying and freezing and thawing.
The gradation of the rock fill to be within the limits specified when tested to ASTM C136-83.

Rounded Rip-rap: Boulders at 450 mm (D50) which is approximately 130 kg (assuming close to a sphere). The range in stone size should be from 65 kg to 200 kg.
- .3 **Armour Stone Walls and Steps at Shoreline:** Minimum size to be 750mm x 600mm x 600mm (length, width, height) Armour stone must be reasonably flat on all sides, top, bottom, front, back and each side. Stone shaping will be required to ensure tight gaps between stones, this may include saw cuts, hammering and chiselling. A minimum of 40% surface contact between stones is required, with a maximum gap of 10-15mm.

Armour stone wall Elevations shown on the plans are for reference only. The height and final depths of the walls must be determined on site based on exact site conditions. Contractor should expect site adjustments to the final wall height with additional costs to the project.
- .4 **Free standing armour stone:** Minimum size to be 750mm x 600mm x 750mm (length, width, height) Armour stone must be reasonably flat on all sides, top, bottom, front, back and each side. Stone shaping will be required see notes above.
- .5 **Rounded River Stone:** Clean washed stone 18mm-25mm (1/2"-1"). Stone are to be installed on top of drainage grates, refer to section 33 46 16 Sub drainage. Ensure stones are large enough not to fall through drainage grates.
- .6 **Granite Stone steps:** Stone sizes are to 1000mm x450mm x180mm and 1500mm x 450mm x 180mm (length, width, and height). Black Granite with a flamed / torched finish. All sides to be flat and square. Additional notes above.
- .7 **Rounded boulders at Shoreline:** Minimum size to be 500mm x 500mm x750mm (length, width, height). Boulders to be smooth on all sides and installed as per contract documents. Rounded boulders are placed within the rip-rap shoreline. Final elevation of boulders must be above adjacent rip rap.

3 EXECUTION

3.1 Placement of materials:

- .1 Rip Rap shall be installed over geotextile and to follow the rough shape shown on the contract drawings. This exact shape may be finalized on site by the NCC Representative. Contractor must ensure that all newly placed rip rap meets the requirements specified in Section 2.1.1 and the general dimensions on the contract drawings.
- .2 Ensure no geotextile is visible once installation is complete

3.2 Placement of armour stone walls and free-standing armour stones:

- .1 Ensure stone placements match the design intent and the wall layout is approved by NCC representative. Excavate to depth indicated and seek approval prior to installing new stone wall. Gaps between stones to be saw cut and or chiselled to ensure a tight fit as specified. Any saw cuts must be roughed up using a chisel.

- .2 Fill gaps behind wall with specified granular, topsoil, etc. as indicated on the contract drawings.
- .3 Do not drop stones in place.
- .4 Support and protect existing boulder wall as required during installation of new wall.
- .5 Base course of stone wall **must be partially buried** as indicated on the contractor drawings.
- .6 The use of stone shims will be accepted on a limited case by case basis. Stones must sit level and flat and conform to contract documents.

3.3 River Stone

- .1 Place river stone on top of sub-base as per the contract drawings. Do not drop; place by hand in order to protect the drainage trenches. Ensure all gaps are evenly filled as located on the contract documents.

3.5 Granite Stone steps

- .1 In order to maintain compaction the armour stone wall and the stone steps must be built simultaneously. Install the bottom or lowest stone step first on top of subgrade as per contract documents. Back fill and prepare each side one step at a time. Repeating the process each time a new stone step is added. Each stone is to be stabilized with stainless steel pins.

END OF SECTION

PART 1 – GENERAL

- 1.1 Related Work
- .1 Excavating and Backfilling Section 31 23 10
 - .2 Geotextile Section 31 32 21
- 1.2 Description
- .1 This section is the materials specification for the following granular materials:
 - .1 Granular A (MG-20)
 - .2 Granular B (MG-56)
 - .3 Clear Stone (19mm) (and 50mm)
 - .4 Granular 'D' Stone Dust (Stabilized)
 - .5 Rounded River Stone
- 1.3 References
- .1 Ontario Provincial Standard Specification (OPSS):
 - .1 OPSS 1010 Material Specification for Aggregates – Granular A, B, D and Clear Stone

PART 2 – PRODUCTS

- 2.1 Materials;
General Requirements
- .1 Any granular materials specified for the various works, on the drawings or in other sections of the specifications or by direction of the Contract Administrator, shall conform to this material specification for the class of granular material required.
 - .2 The materials shall be selected or produced from pits or quarries to conform to the requirements specified herein for each class of granular materials.
 - .3 Material retained on the number 4 sieve shall consist of hard durable particles or fragments of stone or gravel.
 - .4 Materials that break up when alternatively frozen and thawed or wetted and dried shall not be permitted.
 - .5 Fine aggregate passing the Number 4 sieve shall consist of natural or crushed sand, and, material passing the Number 200 sieve shall consist of fine mineral particles.
 - .6 The material shall be free from vegetable matter and lumps or balls of clay.
 - .7 The material shall be non-plastic and non-frost susceptible.
 - .8 Blending to obtain the correct gradation will be permitted when

the Contractor demonstrates that he can produce a correct gradation and has a plant capable of producing to the satisfaction of the Contract Administrator.

- .9 The Contractor shall advise the Contract Administrator two weeks in advance of the intent use of any of the specified materials to allow sufficient time for sampling and testing. The Contractor shall submit samples of granular materials to be used in the works if so requested by the Contract Administrator.
- .10 Approval of a sample does not mean acceptance of the whole source. Each load of material received at the job site shall be subject to all the requirements of that material.
- .11 All gradation requirements are shown as percentage by weight passing U.S. Standards Sieves, A.A.S.H.O. M-92-65.

2.2 Materials:
Specific Requirements

- .1 Granular "A":
 - .1 This material shall conform to OPSS 1010.
- .2 Granular "B": Type I and type II
 - .1 This material shall conform to OPSS 1010.
- .3 Clear stone 19mm and 50mm
 - .1 This material shall conform to OPSS 1010.
- .4 Granular "D": as per OPSS 1010
 - .1 This material shall be crushed rock screenings or stone dust.
 - .2 Stabilize with Calcium carbonate or approved equal.
 - .3 Gradation Requirements:

<u>Sieve</u>			<u>% Passing</u>
9.5	mm	(3/8")	100
4.75	mm	(No. 4)	50-100
1.18	mm	(No. 16)	20-55
300	um	(No. 50)	10-30
75	um	(No. 200)	0-12
- .5 Rounded River stone
 - .1 rounded river stone to be between 18- 25mm
 - .2 ensure rounded river stones are larger than the strip drainage cover

END OF SECTION

PART 1 - GENERAL

1.1 Related Works Specified Elsewhere

- .1 Excavation and Backfilling Section 31 23 10
- .2 Granular Section 32 11 23

1.2 References

- .1 Ontario Provincial Standard Specification (OPSS):
 - .1 310, 311
- .2 City of Ottawa Special Provisions 2009:
 - .1 F-3104
- .3 City of Ottawa Standard Detailed Drawings 2009:
 - .1 R-10

1.3 Protect existing items designated to remain and materials designated for salvage and relocation. In event of damage, immediately replace such items or make repairs to the satisfaction of the NCC Representative and at no additional cost to the Commission.

1.4 Site Conditions

- .1 Contractor to contact appropriate utilities to verify presence and location of all overhead and underground services and establish location for all such services in the field before commencing work. Report any discrepancies to the NCC Representative

1.5 Product Data

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit manufacturer's test data and certification that asphalt cement meets requirements of this section.
- .3 Submit asphalt concrete mix design and trial mix test results to NCC Representative for approval and review at least two (2) weeks prior to beginning work.
- .4 Submit manufacturer's certification that hydrated lime meets requirements of this section.

1.6 Delivery, Storage and Handling

- .1 Stockpile fine aggregate separately from coarse aggregate, although separate stockpiles for more than two mix components are permitted.
- .2 Submit to NCC Representative copies of freight and waybills for asphalt cement as shipments are received.
 - .1 NCC Representative reserves the right to check weights as material is received.

PART 2 - PRODUCTS

2.1 Materials

- .1 Performance Graded HL-3 Hot Mix Asphalt – 60mm thick or as indicated.
 - .1 This material shall conform to OPSS 310 as amended by City of Ottawa Special Provisions F-3104
- .2 Tack Coat
 - .1 This material shall conform to OPSS 310 as amended by City of Ottawa Special Provision

F-3107

PART 3 - EXECUTION

3.1 Asphalt Paving

- .1 The Contractor shall notify the NCC Representative five (5) days prior to paving.
- .2 The Contractor must obtain the NCC Representative's approval before placing any asphalt.
- .3 Asphalt is to be placed to thicknesses, grades and lines as shown on plans or as indicated by the NCC Representative.
- .4 The Contractor paving shall be conducted as specified in OPSS 310 or as directed by the NCC Representative.
- .5 Step joints shall be used as indicated where new asphalt will connect to existing pavement.

3.2 Quality Control and Assurance

- .1 OPSS 310 sub-sections 310.07.01 and 310.07.05 are deleted in their entirety.
- .2 The Contractor must supply a minimum of one (1) quality assurance sample and one (1) referee sample to the NCC Representative. The samples shall be randomly chosen or as directed by the NCC Representative. The NCC Representative may request additional samples.
- .3 The samples shall be delivered within 4 hours to a location as specified by the NCC Representative.
- .4 Samples shall be accompanied by the City of Ottawa 'Quality Assurance Sample Data Sheet' for Hot Mix Asphalt and completed to the satisfaction of the NCC Representative.

3.3 Preparation

- .1 Ensure subgrade is compacted smooth and meets required grades as per contract documents.
- .2 Apply tack coat to all existing seams prior to paving.
- .3 Prior to laying mix, clean surfaces of loose and foreign material.

3.4 Placing

- .1 Obtain NCC Representative's approval of base and existing surface and tack coat and prime coat prior to placing asphalt.
- .2 Place asphalt concrete to thicknesses, grades and lines as indicated on the drawings.
- .3 Placing conditions:
 - .1 Place asphalt mixtures only when air temperature is 5 degrees C minimum.
 - .2 When temperature of surface on which material is to be placed falls below 10 degrees C, provide extra rollers as necessary to obtain required compaction before cooling.
 - .3 Do not place hot mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.
- .4 Place asphalt concrete in compacted lifts of thickness as indicated on the drawings.
- .5 Where possible do tapering and levelling where required in lower lifts. Overlap joints by not less than 300mm.
- .6 Spread and strike off mixture with self-propelled mechanical finisher.
 - .1 Construct longitudinal joints and edges true to line markings.
 - .1 NCC Representative to establish lines for paver to follow parallel to centerline of proposed pavement. Position and operate paver to follow established line closely.

3.5 Compaction

- .1 Compaction requirements shall be as specified in OPSS sub-section 310.08.015.03 and meet the requirements specified in OPSS 310, Table 9, to the satisfaction of the NCC Representative
- .2 The Contractor shall conduct the compaction testing and supply the NCC Representative with the results.
- .3 Roll asphalt continuously to density not less than 98%.
- .4 Roll and compact all exposed edges as per contract documents
- .5 Install in lifts not exceeding 60mm – ensure compaction is achieved.

3.6 Finish Tolerances

- .1 Finished asphalt surface to be within 5mm of design elevation but not uniformly high or low.
- .2 Finished asphalt surface not to have irregularities exceeding 5mm when checked with 4.5 m straight edge placed in any direction.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

- .1 Granular Materials Section 32 11 23
- .2 Excavation and Backfilling Section 31 23 10

1.2 MOCK-UPS

Mock-up: a mock-up area shall be provided on site at the time of precast paver installation. This mock-up will be the on-site reference for installation and workmanship. The mock-up area to be approximately 1m². Only precast paver installation matching the approved final mock-up area will be acceptable. The mock-up location to be determined by the NCC Representative.

PART 2 - PRODUCTS

2.1 MATERIALS:

- 1. Model: Series by Unilock or approved equal
Soldier course: Black Granite = 180mm x360mm x80mm
Inset: Ice Grey = 180mm x360mm x80mm
- 2. Joint Filler: polymeric sand HP NextGel Jointing Sand by Techniseal, or approved equal. Colour: GREY
- 3. Sand bedding course: Sand, submit sieve analysis for approval.

PART 3 -EXECUTION

3.1 SUBGRADE

- .1 Ensure that subgrade preparation conforms to levels and compaction required to allow for installation of new pavers.

3.2 SURFACE COURSE

- .1 Install unit paving true to grade, in location, layout and pattern as indicated on drawings. Joints not to exceed 5 mm.
- .2 Where required, cut pavers accurately without damaging edges. No paver shall have the smallest width or length less than 75mm.
- .3 Tamp down and level pavers with mechanical plate vibrator until pavers are true to grade and free of movement.
- .4 Refer to contract drawings for paver pattern.

3.3 JOINT FILLER

- .1 Fill joints with polymeric sand as specified.
- .2 Vibrate the pavers, sweeping polymeric sand dry sand into the joints and vibrating until they are full. This will require at least two or three passes with the vibrator. Surface needs to be dry.

3.4 EDGING

- .1 Install Aluminum edging directly against finished pavers and onto compacted subbase, using galvanized spikes or approved equal.
- .2 Ensure edging runs flush and is free of kinds, bends, or gaps.
- .3 Install as per manufacturers instructions.
- .4 Install edging as indicated on the contract documents

3.5 CLEANING

- .1 With approved method, clean all paving units to the NCC Representative satisfaction.
- .2 Leave site clean to the NCC Representative's satisfaction.

END OF SECTION

PART 1 - GENERAL

- 1.1 References
 - .1 CGSB 1-GP-5M-77, Thinner, Petroleum Spirits, Low Flash (R/84).
 - .2 CGSB 1-GP-12c-68, Standard Paint Colors.
 - .3 CGSB 1-GP-71-83, Method of Testing Paints and Pigments.
 - .4 CGSB 1-GP-74M-79, Paint, Traffic, Alkyd.

PART 2 – PRODUCTS

- 2.1 Materials
 - .1 Paint:
 - .1 To CGSB 1-GP-74M, alkyd traffic paint.
 - .2 Color:
 - .1 to CGSB 1-GP-12C, **YELLOW** 505-308, conforms to CGSB 1-GP-12C
 - .3 Upon request, Contract Administrator will supply a qualified product list of paints applicable to work. Qualified paints may be used but Contract Administrator reserves right to perform further tests.
 - .2 Thinner: to CGSB 1-GP-5M.
- 2.2 Equipment Requirements
 - .1 Paint applicator to be an approved pressure type mobile distributor capable of applying paint in single, double and dashed lines. Applicator to be capable of applying marking components uniformly, as rates specified, and to dimensions as indicated, and to have positive shut-off.

PART 3 – EXECUTION

- 3.1 Condition of Surfaces
 - .1 Pavement surface to be dry, free from ponded water, frost, ice, dust, oil, grease and other foreign materials.
- 3.2 Application
 - .1 Lay out pavement markings and obtain approval by Contract Administrator.
 - .2 Unless otherwise approved by Contract Administrator, apply paint only when air temperature is above 10°C, wind speed is

less than 60 km/h and no rain is forecast within next 4 h.

- .3 Apply traffic paint evenly at rate of 3 m²/L.
- .4 Do not thin paint unless approved by Contract Administrator.
- .5 Symbols and letters to conform to dimensions indicated.
- .6 Paint lines to be of uniform color and density with sharp edges.
- .7 **PATHWAYS:** Width of paint lines to be 60 mm. Meet and match width of line where pathway ties back into existing pathway, taper paint line as required.
- .8 **ROADWAYS:** No Pavement markings, See traffic drawings.
- .9 Thoroughly clean distributor tank before refilling with paint.

3.3 Tolerance

- .1 Paint markings to be within plus or minus 12 mm of dimensions indicated.
- .2 Remove incorrect markings as indicated by Contract Administrator at no additional expense.

3.4 Protection of
Complete Work

- .1 Protect pavement markings until dry.

END OF SECTION

PARTIE 1 - GENERAL

1.1 Related Work Specified Elsewhere

- | | | |
|----|--------------------------|------------------|
| .1 | Excavating & Backfilling | Section 31 23 10 |
| .2 | Seeding | Section 32 92 20 |
| .3 | Sodding | Section 32 92 23 |
| .4 | Hydroseeding | Section 32 92 16 |

1.2 Testing

- .1 Obtain Contract Administrator's initial approval of imported topsoil at source.
- .2 Test existing and imported topsoil for NPK, Mg, soluble salt content, organic matter and pH value prior to delivery to site.
 - 1 Submit 0.5 kg sample of topsoil to testing laboratory and indicate intended use.
 - 2 Determine requirements for amendments to bring pH value of soil to 5.5 to 7.7 level.
 - 3 Submit two copies of soil analysis and recommendations for corrections to Contract Administrator.
 - .4 Inspection and testing of topsoil will be carried out by testing laboratory designated by Contract Administrator.
 - .5 National Capital Commission will pay cost of testing.

1.3 Scheduling of Work

- .1 Schedule placing of topsoil to permit immediate seeding and planting operations.

PARTIE 2 - PRODUCTS

2.1 Topsoil:

- .1 Imported topsoil: friable loam, neither heavy clay nor of very light sandy nature containing 8-15% organic matter for sandy loams to maximum of 25% by volume. Free from subsoil, roots, grass, weeds, toxic materials, stones, foreign objects, and an acidity range (Ph) of 5.5 to 7.5. Topsoil containing crabgrass, couch grass or other noxious weeds, not acceptable.
- .2 Lime: Ground agricultural limestone containing minimum 85% of total carbonates, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve by weight.
- .3 Sulphur: Horticultural Grade
- .4 Topsoil containing crabgrass, couch grass or other noxious weeds is **not acceptable**.

2.2 Live Mulch (compost)

Live™ Mulch as supplied by Gro-Bark 1-888-GRO-BARK or approved equal. Submit sample and name of supplier five (5) days in advance and obtain approval by NCC representative prior to shipping to site.

PARTIE 3 - EXECUTION

3.1 Preparation

- .1 Grade subgrade, eliminating uneven areas and low spots, ensuring positive drainage. Remove stones larger than 50 mm diameter and other deleterious materials. Remove subsoil that has been contaminated with oil, gasoline or calcium chloride. Dispose of removed materials as directed.
- .2 Cultivate all planting areas with 75mm of compost within the first 150mm of growing medium. Do not cultivate soils around existing trees and shrubs.

3.2 Reuse of Existing Topsoil

- .1 limited topsoil can be reused on site. Contract administration to confirm in writing where and if existing excavated soils can be reused on site. All excavated materials to be removed and appropriately disposed of from site.

3.3 Spreading of Topsoil

- .1 Do not spread topsoil until Contract Administrator has inspected and approved subgrade.
- .2 Spread topsoil with adequate moisture in uniform layers during dry weather over approved, dry, unfrozen subgrade, where seeding is indicated.
- .3 Bring topsoil up to finished grade.
- .4 Remove stones, roots, grass, weeds, construction materials, debris and foreign non-organic objects from topsoil.
- .5 Manually spread topsoil around trees, plants, surface utilities and other obstacles.

3.4 Finish Grading

- .1 Fine grade entire top soiled area to contours and elevations as indicated or as directed. Eliminate rough spots and low areas to ensure positive drainage.
- .2 Roll topsoil with 50 kg roller, minimum 900 mm wide, to compact and retain surface.
- .3 Leave surface smooth, uniform, firm against deep foot printing, with fine loose texture.

3.5 Surplus Material

- .1 Dispose of surplus topsoil not required for fine grading/landscaping off site.

END OF SECTION

1 General

1.1 RELATED SECTIONS

- | | | |
|----|----------------------------|------------------|
| .1 | Topsoil and Finish Grading | Section 32 91 21 |
| .2 | Maintenance and warranty | Section 32 93 12 |

1.2 SCHEDULING

- .1 **SPECIAL INSTRUCTIONS:**
Hydroseed before September 30. Timing slightly later is possible if weather conditions are suitable, as determined by the NCC representative (generally daytime temp above 10dC). If seeding must occur outside that weather window, as determined by the NCC representative, undertake dormant seeding using a brilliant seeder applied at a rate of 240kg/Ha, in the timing window as instructed by the NCC (generally when daytime temperatures are below 4dC). Fertilize with 7-24-12 prior to seeding, but do not add water or mulch. Do not water until the following spring. Delay topsoil application until just before seeding. Over-seed bare patches in spring, as determined by NCC approximately late May.
- .2 **REFERENCES**
OPSS 572 – Ontario Provincial Standard Specification, Construction Specification for Seeding
- .3 **PRODUCT DATA**
Provide product data for: Seed mixture, Mulch, cover adhesive, fertilizer
- .4 **SCHEDULING**
Schedule hydraulic seeding to immediately follow preparation of soil surface. See 1.2.1 for special instruction.

2 Products

2.1 MATERIALS

- Seed:
- .1 Grass mixture: “Certified”, “Canada No. 1 Lawn Grass Mixture” in accordance with Government of Canada “Seeds Act” and “Seeds Regulations”
- .2 Mixture Compositions:
- 40% Kentucky Bluegrass
 - 40% Creeping Red Fescue
 - 20% Perennial Ryegrass
- .3 Mulch: specially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with following properties:
- Made from biodegradable newsprintwood fibre, raw cotton fibre and straw, processed to produce fibre lengths of 15mm minimum and 25mm maximum.
 - Greater proportions of ingredients to be straw.

Cover adhesive: water dilutable, liquid dispersion in accordance with OPSS 572.
Water: Free of impurities that would inhibit germination and growth.
Fertilizer: as per OPSS 572.

- .4 Tank(s): Tank(s) used for storage or application of water shall be clean and free of any contaminants which may be hazardous to the growth and development of turf and to the environment in general
- .5 Pumps and Hoses: Hoses used for watering shall be capable of reaching the limits of the Contract site. Pumps shall be under pressure. The outlet end of the hose(s) shall be 25 mm in diameter with a suitable adjustable nozzle or nozzles, and a quick shut-off valve.

3 Execution

3.1 OPERATIONAL CONSTRAINTS

- .1 Seeding shall be carried out from August 15 to September 30. Any minor exceptions must be approved by NCC representative.

3.2 WORKMANSHIP

- .1 Do not spray onto structures, signs, guide rails, fences, plant material, utilities and other than surfaces intended.
- .2 Clean up immediately any material sprayed where not intended, to satisfaction of Contract Administrator.
- .3 Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.

3.3 PREPARATION OF SURFACES

- .1 Fine grade areas to be seeded so it forms a uniform slope, free of humps and hollows that follows the adjacent natural slope profile and proper drainage of surfaces. Ensure areas are free of deleterious and refuse materials.
- .2 Ensure no weeds, debris, gravel and stones 50mm in diameter or large are present.
- .3 Obtain Contract Administrator approval of grade, topsoil depth and outline of areas to receive only mulch (i.e. no seed) before starting to seed.

3.4 PREPARATION OF SLURRY

- .1 Measure quantities of materials by weight or weight-calibrated volume measurement satisfactory to Contract Administrator. Supply equipment required for this work.
- .2 Charge required water into seeder. Add material into hydraulic seeder under agitation. Pulverize mulch and charge slowly into seeder.
- .3 After all material is in the seeder and well mixed, charge tackifier into seeder and mix thoroughly to complete slurry.

3.5 HYDRO SEEDING

- .1 Undertake hydro-seeding in two separate applications.
 - First application to consist of seed and fertilizer slurry at a Sowing rate of 150 kg / ha (17 gram per m²). Fertilizer shall consist of 8-24-12 NPK at a rate of 350kg/ha. The quantity of water shall be as required to form an homogenous slurry, but shall not be less than 7600L
 - Second application to consist of hydraulic mulch. Apply mulch at a rate of 2200 kg per hectare (22 kg per 100 square metres). On erosion prone slopes, hydraulic mulch shall be used in combination with cover adhesive. Apply cover adhesive and water at rates of application indicated in OPS 572.
- .2 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.
- .3 Using correct nozzle for application, using hoses for surfaces difficult to reach and to control application.
- .4 Blend application 300 mm into adjacent grass areas or sodded to form uniform surfaces.
- .5 Hydroseeding must be done when the wind speed is lower than 10km/h.
- .6 Re-apply at no additional costs where application is not uniform.

3.6 PROTECTION OF SEEDED AREAS

- .1 All seeded areas shall be protected as indicated with temporary fencing from time of seeding until final acceptance of seeding. Refer also to Section 01500 – Temporary Facilities.

3.7 MAINTENANCE

- .1 Contractor shall be responsible for maintenance until final acceptance.
- .2 Water seeded areas to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts. Provide all water required to keep soil within and around the root and in the soil at optimum moisture content between 10 and 20% as measured using a General Digital Moisture Meter.
- .3 The contractor shall submit for approval a watering schedule at the beginning of the warranty period and report on actual watering on a bi-weekly basis.
- .4 Cut grass to 60mm whenever it reaches a height of 80mm. Remove clippings.
- .5 Do not apply herbicides or pesticides unless specifically directed to do so by the Contract Administrator.

3.8 ACCEPTANCE

.1 Hydraulically seeded areas shall be accepted provided that the following conditions are met:

- Seeded areas display uniform coverage of seeded species. Turf is free of eroded, bare or dead spots of 150 mm square or greater, and is 98% free of weeds. No surface soil is visible when grass is cut to height of 60 mm.
- Areas seeded after September 30 may be accepted the following spring, approximately six weeks after the start of the growing season provided acceptance conditions are met.
- Hydraulically seeded areas shall not be given final acceptance until they have been inspected and approved by the Contract Administrator
- Any seeded areas which fail to meet the requirements of this specification shall be re-seeded and maintained by the Contractor. Re-seeding shall be subject to the same acceptance conditions.

END OF SECTION

PART 1 – GENERAL

1.1 Related Works

- .1 01 33 00 – Shop Drawings, Product Data and Samples
- .2 32 91 2 – Topsoil and Finish Grading
- .3 32 93 12 – Maintenance and Warranty

PART 2 – PRODUCTS

2.1 MATERIALS

SEED MIX TYPE I - Seasonally Flooded Seed Mix - Sow at 22-25 kg/ha (21-23 lbs/acre)

Bidens ceruna	Nodding Bur Marigold	1
Carex vulpinoidea	Fox Sedge	20
Elymus virginicus	Virginia Wild Rye	25
Helianthus helianthoides	Ox-Eye Sunflower	2
Panicum clandestinum	Deer Tongue	4
Panicum virgatum	Switchgrass	25
Poa palustris	Fowl Bluegrass	23

SEED MIX TYPE II - WOODLAND SEED MIX - SOW AT 22-25 KG/HA (21-23 LBS/ACRE)

<i>Anemone canadensis</i>	Canada Anemone	1
<i>Carex bebbii</i>	Bebbs Sedge	1
<i>Carex crinita</i>	Fringed Sedge	1
<i>Desmodium canadense</i>	Showy Tick Trefoil	30
<i>Eupatorium maculatum</i>	Spotted Joe Pye Weed	2
<i>Geum canadense</i>	White Avens	5
<i>Glyceria striata</i>	Fowl Mannagrass	1
<i>Penstemon digitalis</i>	Foxglove / Beardtongue	9
<i>Poa palustris</i>	Fowl Bluegrass	50

SEED MIX TYPE III - Turfgrass Seed Mix - Sow at 22-25 kg/ha (21-23 lbs/acre)

- .4 Contractor to provide Product Data Sheet for approval by NCC Contract Administrator prior to commencement of work.
- .5 Packages will be individually labeled in accordance with 'Seeds Regulations' and indicate clearly the name of the supplier, species, content, grade and mass.
- .6 Use appropriate mechanical seeder and mulching equipment. The NCC Contract Administrator to approve all proposed products and equipment for the work.

2.2 WATER

- .1 Free of impurities that would inhibit germination and growth.
- .2 Water must be supplied from a designated source.

2.3 CELLULOSE-BASED MULCH (PAPER MULCH)

- .1 Use only cellulose-based mulch if seeds were broadcasted to ensure moisture retention during germination. Do not use a tackifier since wildflower seeds can't penetrate through.

PART 3 - EXECUTION

3.1 WORKMANSHIP

- .1 Do not perform work under adverse field conditions as determined by the NCC Contract Administrator.
- .2 Additional care shall be taken when seeding adjacent to watercourses or paved area to ensure that seed does not spread or blown onto those areas.

3.2 PERMANENT COVER

- .1 Seeding shall not be carried out under adverse conditions, of high wind, frozen ground or ground covered with snow, ice or standing water.
- .2 Sowing shall be done during the following periods:
 - 1. Between May 15 and June 1st;
 - 2. Between September 1st and October 15. (Preferable)
 - 3. Dormant seeding after November 1st when daytime temperatures are consistently below 5°C.

3.3 MECHANICAL PLANTERS

- .1 Use appropriate agriculture broadcast or no till planter seeder. Specific models that can successfully plant native grasses and flowers include the Tye drill, Truax drill, John Deere Rangeland drill, and properly outfitted Brillion seeders.
- .2 Ensure soil cover over all new seeds.
- .3 Roll the seeded area after planting. This step is very important for germination success
- .4 The NCC Contract Administrator to approve all proposed products and equipment for the work.
- .5 Sowing rate to be followed and never increased as it will result in a dominant grass meadow rather than flower meadow where indicated.

3.4 CELLULOSE-BASED MULCH (PAPER MULCH)

- .1 All bare soil areas shall be stabilized with paper mulch immediately after seeding.
- .2 The NCC Contract Administrator to approve all proposed products and equipment for the work.

3.5 MAINTENANCE DURING ESTABLISHMENT AND 2 YEAR WARRANTY PERIOD

Establishment:

- .1 Water seeded areas to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.
- .2 Gully formations and washouts as a result of rain events greater than 20 mm per day shall be repaired, including regrading and re-seeding.
- .3 Seeded areas shall be accepted by the NCC Representative provided that:
 - .1 seeded areas are properly established;
 - .2 seeded areas are free of weeds and bare or dead spots;
 - .3 no surface soil is visible when grass has been cut to a height of 50 mm; (mown lawn only)
- .4 Areas seeded in fall will be accepted the following spring, one month after the beginning of the growing season, provided the acceptance conditions are met.
- .5 The Contractor shall maintain the seeded areas including mowing until acceptance by the NCC Representative. Unacceptable areas shall be reseeded.

First year of maintenance:

- .1 Weed control:
 - a. Mow weeds when they reach a maximum height of at 200-250mm height on a regular basis to prevent them from self-seeding throughout 1st growing season.
 - b. A flail-type mower works best, as it chops up the weeds so they can dry out rapidly. Rotary mowers and sickle bar mowers will not be accepted.
 - c. Do not pull weeds at any time due to soil disturbance. Large weeds can be cut by hand if required.
 - d. If weeds become thick by mid-summer they should be cut back, along with the nurse crop. If weeds are thin, cut when in bloom, before they set seed.
 - e. Do not mow down the year's growth at the end of the season. Leave it to help protect the young plants over the winter. The plant litter and the snow that it catches insulate the soil from rapid changes in soil temperatures, which can cause plant losses due to frost heaving.

Second year of maintenance:

- .1 Weed control:
 - a. Mow the meadow in spring of the second year right to the ground and rake off the cuttings.
 - b. If weeds remain a problem in the second year, mow the meadow in late spring or early summer (before the weeds reach 200-250mm height)
 - c. A flail-type mower works best, as it chops up the weeds so they can dry out rapidly. Rotary mowers and sickle bar mowers will not be accepted.

END OF SECTION

1 General

1.1 RELATED SECTIONS

- .1 Topsoil and Finish Grading Section 32 91 21
Maintenance and Warranty Section 32 93 12

1.2 SCHEDULING

- .1 Schedule laying of sod to coincide with preparation of soil surface.
- .2 Schedule sod installation when frost is not present in the ground or extensive days of hot weather.

2 Products

2.1 MATERIALS

- .1 Number One Turfgrass Nursery Sod: Sod that has been especially sown and cultivated in nursery fields as turfgrass crop.
 - .1 Turfgrass Nursery Sod types:
 - .1 Number One Kentucky Bluegrass Sod - Fescue Sod: Nursery Sod grown solely from seed mixture of cultivars of Kentucky Bluegrass and Chewing Fescue or Creeping Red Fescue, containing not less than 40% Kentucky Bluegrass cultivars and 30% Chewing Fescue or Creeping Red Fescue cultivar(s).
 - .2 Turfgrass Nursery Sod quality:
 - .1 Not more than 2 broadleaf weeds or 10 other weeds per 40square metres.
 - .2 Density of sod sufficient so that no soil is visible from height of 1500mm when mown to height of 50mm.
 - .3 Mowing height limit: 50 to 100mm.
 - .4 Soil portion of sod: 6 to 15mm in thickness.
- .2 Water :
 - .1 Potable.
- .3 Pegs : 19 x 19 x 200 mm wooden pegs.

3 Execution

3.1 PREPARATION

- .1 Verify that grades are correct and prepared in accordance with Section 32 91 21 - Topsoil and Finish Grading. If discrepancies occur, notify Contract Administrator and do not commence work until instructed by Contract Administrator.
- .2 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.
- .3 Fine grade surface free of humps and hollows to smooth, even grade, to tolerance of plus or minus 8 mm, for Turfgrass Nursery Sod, surface to drain naturally.
- .4 Remove and dispose of weeds; debris; stones 25 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site.
- .5 Cultivate fine grade approved by Contract Administrator to 25 mm depth immediately prior to sodding.

- .6 Top of soil layer must meet and match existing grades, do not install sod to high. Sod edge may require minor excavation to ensure the soil layer is properly buried.

3.2 SOD PLACEMENT

- .1 Lay sod within 24 hours of being lifted.
- .2 Lay sod sections in rows, longitudinally, along contours of slopes, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.
- .3 Roll sod as directed by Contract Administrator. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.
- .4 Ensure sod meets and matches edge conditions. Ensure soil layer of sod is below grade when abutting to adjacent conditions.

3.3 SOD PLACEMENT ON SLOPES AND PEGGING

- .1 Start laying sod at bottom of slopes.
- .2 Lay sod sections longitudinally, along contours of slopes.
- .3 Peg sod on slopes steeper than 3 horizontal to 1 vertical, within 1 m of catch basins and within drainage channels. Place pegs as follows:
 - .1 100 mm below top edge at 200 mm on centre for first sod sections along contours of slopes.
 - .2 Not less than 9 pegs per square metre.
 - .3 Drive pegs to 20 mm above soil surface of sod sections.

3.4 MAINTENANCE DURING ESTABLISHMENT PERIOD

- .1 Perform following operations from time of installation until acceptance and in accordance with section 32 93 12 maintenance and warranty.
- .2 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100 mm.
- .3 Cut grass to 50 mm when or prior to it reaching height of 125 mm. Remove clippings which will smother grassed areas as directed by Contract Administrator.
- .4 Maintain sodded areas weed free 95%.

3.5 ACCEPTANCE

- .1 Turfgrass Nursery Sod areas will be accepted by Contract Administrator provided that:
 - .1 Sodded areas are properly established.
 - .2 Sod is free of bare and dead spots.
 - .3 No surface soil is visible from height of 1500mm when grass has been cut to height of 50 mm.
- .2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTION

- .1 32 91 21.01 – Topsoil and Finish Grading
- .2 32 93 12.01 – Plant Maintenance and Warranty

1.2 SOURCE QUALITY CONTROL

- .1 The Contractor shall commence sourcing the specified material immediately upon award of the Contract.
- .2 Plant materials shall be conformed to species specified in the contract document. All plant materials shall be identified with their complete name and caliper.
- .3 No substitutions will be considered unless the Contractor can demonstrate to the NCC Contract Administrator's satisfaction that a prolonged and widespread search for the specified cultivars has been undertaken. The NCC Contract Administrator's written approval of plant substitution is required.
- .4 Obtain approval of source of plant material. Acceptance and selection of plant at its source does not prevent rejection on site prior to or after planting operations.
- .5 After harvesting and prior to shipping any plants from the growing nursery, notify the NCC Contract Administrator to allow for an inspection of the plants at the growing nursery to assure that all harvesting requirements have been satisfied.

1.3 SHIPMENT AND PRE-PLANTING CARE

- .1 All plants shall be inspected by the Contractor for damage in transit. No defective material shall be delivered to the site. Material subsequently damaged shall be replaced immediately at no additional cost to the NCC.
- .2 Protect plant materials against abrasion, exposure and extreme temperature change during transit.
- .3 Keep roots moist and protected from sun and wind

1.4 STORAGE AND PROTECTION

- .1 Protect plant materials from frost, excessive heat, wind and sun during delivery.
- .2 Immediately store and protect plant material which will not be installed within 1 hour after their arrival on site, in storage locations approved by NCC Contract Administrator.
- .3 Protect plant material from damage during transportation
 - .1 When delivery distance is less than 30 km, and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.

- .2 When delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.
- .3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.
- .4 Protect stored plant material from frost, wind and sun and as follows:
 - .1 For pots and containers, maintain moisture level in containers.
 - .3 For balled and burlapped, and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

PART 2 PRODUCTS

2.1 PLANT MATERIALS

- .1 Comply with Guide Specification for Nursery Stock, latest edition, of Canadian Nursery Trades Association referring to size and development of plant material and root ball.
- .2 All plant material to come from a commercial nurseries. The plant material shall be grown in zone 4b or 5a, according to the hardiness zones for plants in Canada established by Agriculture Canada.
- .3 Use plants with strong fibrous root systems free of disease, insects, defects or injuries and structurally sound. Plants must have been root pruned regularly, but not later than one growing season prior to arrival on site.
- .4 Substitution to plant material as indicated on planting plan are not permitted unless written approval has been obtained as to type, variety and size.
- .5 Size indicated are the minimum allowable after pruning.

2.2 WATER

- .1 Free of impurities that would inhibit plant growth.

2.3 MYCORRHIZE INOCULANTS

- .1 Apply mycorrhize inoculants MYKE® PRO LANDSCAPE of Premier Tech Biotechnologies, following application instructions, or an equivalent approved by the NCC and registered in Canada;

2.4 STAKES

- .1 Wood Stake (untreated wood-spf), 50mm x 50mm x 2.44m

2.5 GUYING COLLAR

- .1 Flat, woven polypropylene: DeepRoot; *ArborTie*, or approved equivalent. Color: Green.

2.6 TREE TRUNK PROTECTION

- .1 'Surtronic' fine mesh trunk wraps as supplied by Dendrotik or approved equal.

2.7 MULCH

- .1 Landscaper's cedar mulch. Submit sample and name of supplier five (5) days in advance and obtain approval by NCC representative prior to shipping to site.

2.8 GROWING MEDIUM

- .1 Growing medium according to section 32 91 21.01 – Topsoil and finish grading

2.9 ANTI-DESICCANT

- .1 Wax-like emulsion to provide film over plant surfaces reducing evaporation but permeable enough to permit transpiration.

2.10 BONEMEAL

- .1 Bonemeal: raw bonemeal, finely ground with a minimum analysis of 4% nitrogen and 20% phosphoric acid.

PART 3 EXECUTION

3.1 PRE-PLANTING PREPARATION

- .1 Delivered plant material to be inspected and approved NCC Representative.
- .2 NCC Representative to approve layout mockup of plant material for all beds until advised differently. Planting bed grades will also need to be approved before planting.

3.2 PLANTING TIME

- .1 Plant materials shall be planted from May 15 to June 30 or from August 15 to October 1, unless otherwise approved by the NCC Representative
- .2 The Contractor shall arrange for all plant species recommended for spring only digging, to be dug and containerized in the spring, immediately upon award of the Contract.
- .3 The foliage of deciduous trees which have broken buds shall be sprayed with anti-desiccant to slow down transpiration prior to transplanting.

3.3 EXCAVATION

- .1 Excavate planting holes to width and depth as indicated on drawings.
- .2 The sides of the planting hole shall be scarified so that water and roots can readily penetrate.

- .3 Place mycorrhize inoculants in the bottom of each plant hole as per manufacturer recommendation.

3.4 PLANTING

- .1 Planting trees and shrubs vertically in the places indicated, oriented in a manner to produce the best possible visual effect with the surrounding structures such as buildings, roads and sidewalks.
- .2 For burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball. Do not pull burlap or rope from under root ball.
- .3 For container stocks or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.
- .4 Place plant material at a depth similar to depth in nursery.
- .5 Backfill Growing Medium in 150 mm layers. Tamp each layer to eliminate air pockets. When two thirds of depth of planting pit has been backfilled, fill remaining space with water. After water has penetrated into soil, backfill to finish grade. Form watering saucer as indicated.
- .6 Water plant material thoroughly.
- .7 After soil settlement has occurred, fill with soil to finish grade.
- .8 Spread 100mm of mulch over all areas of bare soil. Mulch heavily contaminated with soil is not acceptable.
- .9 Remove dead and injured branches and branches that rub causing damage to bark.
- .10 Dispose of burlap, wire and container material off site.

3.5 TRUNK PROTECTION

- .1 Install rodent guards protection on deciduous trees as indicated.
- .2 Install trunk protection prior to installation of tree supports.

3.6 TREE SUPPORTS

- .1 Install tree supports as indicated.
- .2 Use two (2) stakes tree support for deciduous trees less than 3 m,
 - .1 Place stake on prevailing wind side, at a 150 mm distance from trunk.
 - .2 Drive stake minimum 300 mm into undisturbed soil beneath roots. Ensure stake is secure, vertical and not split.
 - .3 Install 150 mm long guying collar 1500 mm above grade.

3.7 PROTECTION DURING CONSTRUCTION

- .1 The Contractor shall protect all work and materials from damage due to planting operations; operations by other Contractors; or trespassers. Maintain protection during installation until acceptance. Treat, repair or replace damaged work immediately.
- .2 Damage done to any of the work by the Contractor, or any of their sub-contractors, shall be replaced by the Contractor at their own expense.

3.8 MAINTENANCE PRIOR TO FINAL INSPECTION

- .1 Perform following maintenance operations from time of planting until the project has been approved by the NCC Representative and the interim certificate of Approval has been issued at Substantial Performance.
 - .1 Water to maintain soil moisture conditions, for optimum establishment, growth and health of plant material without causing erosion.
 - .2 If acceptance is delayed due to a drawn out schedule by the Contractor, the Contractor shall be responsible for the scope of maintenance outlined in Section 32 93 12. until final acceptance of the site. The Contractor shall still be responsible for the full term of the warranty as of the date of approval.

3.9 FINAL INSPECTION

- .1 At final inspection, plant material shall be acceptable when it is properly installed, unbroken, shows adequate formation of buds and is free from blight of any description. All planting areas shall be free of weeds, litter and in good order.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORKS

- | | | |
|----|------------------------------|------------------|
| .1 | Planting | Section 32 93 10 |
| .2 | Sodding | Section 32 92 23 |
| .3 | Seeding | Section 32 92 20 |
| .4 | Topsoil and finished grading | Section 32 91 21 |

1.2 WARRANTY

- 1 All plant material shall be warranted for a period of **TWO year** from the date of acceptance.
- 2 The warranty shall cover any defects in materials and workmanship.
- 3 A warranty inspection shall be carried out at the end of the warranty period.
- 4 Extend 1 year warranty on all replacement of plant material.

1.3 DURATION

- .1 Plant material maintenance shall begin immediately after each portion of planting has been completed and shall continue throughout the maintenance and warranty period to the satisfaction of the NCC Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Water: shall be free from any contaminants which could adversely affect plant growth.
- .2 Pruning Tools: shall be designed specifically for horticultural purposes and shall be clean, sharp and in proper, safe, working order. Pruning equipment shall be capable of producing clean, flush cuts without tearing or fraying the bark.

PART 3 - EXECUTION

3.1 OPERATIONAL CONSTRAINTS

- 1 Complete each maintenance operation continuously and complete within a reasonable time period.
- 2 No maintenance equipment, materials or other miscellaneous items may be stored on site.
- 3 All debris, waste and other extraneous material resulting from the maintenance operation shall be removed from the site daily upon completion of maintenance.
- 4 The Contractor shall be fully acquainted with all relevant Provincial and Municipal By-laws and Regulatory Codes relating to the work of this contract, and will be required to

Comply with such by-laws and codes without extra compensation.

- 5 Notify the NCC Representative immediately of damage incurred by pest, disease, mechanical or vandalism.

3.2 INTERIM REPLACEMENT OF PLANT MATERIAL

- .1 Throughout the maintenance and warranty period, units of plant material that are found to be unacceptable will be replaced by the Contractor. Any unacceptable material must be replaced within one month unless otherwise directed by the NCC representative. Weekly inspections must be reported for the first growing season.
- .2 At the discretion of the NCC Representative, plant material that is identified as dead or in a poor or diseased condition shall be immediately removed from the site.

3.3 WATERING

- .1 The Contractor is responsible for interim manual watering of all plant material, from time of planting until the end of the warranty period (24 MONTHS).
- .2 Water all plant material immediately after installation. Thereafter,
 - .1 Water daily for the first week after planting;
 - .2 Water every second day for the next 3 weeks;
- .3 For the first half of the warranty year;
 - 1 The contractor shall submit for approval a watering schedule at the beginning of the warranty period. The watering shall occur at least once a week, on Thursday, Wednesday or Tuesday. Once the day is chosen, the watering shall happen each week at the same day.
 - 2 Provide all water required to keep soil within and around the root and in the soil at optimum moisture content between 10 and 20% as measured using a General Digital Moisture Meter.
 - 3 Proceed to watering with a slow water spray jet oriented toward the growing media.
 - 4 The watering shall be made before 11h am or after 14h30 pm to avoid full sun period. Watering should also be avoided during peak use period between 7-9am, 12-1pm and 3-5pm.
 - 5 Proceed to the watering even on rainy days unless receiving written notice of the NCC representative.
- .4 For the second half of the warranty period, thoroughly water whenever natural precipitation falls below 20 mm per week (Sunday to Saturday) for 2 consecutive weeks. Precipitation data shall be as per Environment Canada from the Macdonald-Cartier Airport weather station.
- .5 Ensure the root zone is thoroughly saturated during each watering operation.
- .6 Repair any damage caused by watering operations.

3.4 WEEDING

- .1 All weeds, dead plants, leaves, branches, paper and other refuse within planting beds shall be removed by hand and disposed of off the Contract site.
- .2 Weeds shall not exceed 5 cm in height between.
- .3 Ensure the entire root system of weeds is removed and not just the above ground growth.
- .4 At a minimum, weeding shall occur:
 - .1 Weekly from June 1 to August 15;
 - .2 Every two weeks from May 1 to May 31, and from August 16 to October 31.
 - .3 A final weeding shall be completed immediately prior to the final warranty inspection.
- .5 The application of herbicides or mechanical weed removers is prohibited.
- .6 Ensure planting beds are weed free prior to the application of mulch material.
- .7 The scope of work also includes weeding of joints between pavers and between curbs.**

3.5 GARBAGE REMOVAL

- .1 Keep planting beds free of garbage and other foreign debris. Remove garbage off-site.

3.6 PEST MANAGEMENT

- .1 Monitor plant material throughout the warranty period for any sign of disease or insect problems. Practice integrated pest management.
- .2 The use of pesticides shall not be permitted.

3.7 WINTER PREPARATION

- .1 In the fall of the warranty year, the Contractor is responsible to ensure that all plant material is watered before freeze-up.

3.8 INCIDENTAL MAINTENANCE

- .1 The Contractor shall, in general, be responsible for any incidental maintenance to ensure healthy plant growth and a satisfactory appearance of plant material.

3.9 REINSTATEMENT

- .1 Any damage to vegetation, hard surfaces, structures or services caused as a result of the Contractor's work methods and practices for plant material maintenance shall be reinstated or repaired to the satisfaction of the NCC Representative. The cost of such reinstatement or repair shall be solely at the Contractor's expense.

3.10 GRASS CUTTING

- .1 The grass shall be mowed through the duration of the warranty period as per the following schedule:
 - April – At least once
 - May through September – Weekly
 - October – through to the end of growing season – Bi-weekly

* If the summer months are hot and dry, frequency can be reduced with written consent from the contract administrator.
- .2 Do not mow grass during exceptional wet periods
- .3 Do not mow grass to less than 50mm or allow grass to reach a height greater than 125mm.
- .4 Remove clippings which will smother grassed areas as directed by Contract Administrator.
- .5 Exercise caution when cutting around trees, infrastructure etc. Do not allow grass cutting equipment to damage tree trunks.

3.11 FINAL WARRANTY INSPECTION

- .1 A one-time inspection of all plant material shall be carried out by the NCC Representative upon completion of the maintenance and warranty period.
- .2 Plant material shall be **acceptable** when it is undamaged, shows adequate growth and formation of buds, and is free from blight of any description. All planting beds and tree pits shall be free of weeds, litter and in good order, including the removal of all tree supports.
- .3 Plant material shall be **unacceptable** when it does not meet this quality standard.
- .4 Units of plant material that are found to be unacceptable will be replaced by the Contractor at the earliest opportunity. The NCC Representative reserves the right to extend the Contractor's maintenance and warranty responsibilities for an additional one-year for replacement plant material.
- .5 In the event that this inspection is satisfactory to the NCC Representative, and that there are no outstanding commitments to the contracted works, the Contractor will be given final approval of the maintenance and warranty requirements.
- .6 Where, in the opinion of the NCC Representative, the Contractor has failed to complete obligations as detailed in this Specification; and further, fails to rectify said deficiency within two days of written notification from the NCC Representative, the NCC Representative reserves the right to retain others to complete the work and deduct incurred expenses from monies owing to the Contractor.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 35 43 – Environmental Protection

1.2 REFERENCES

- .1 American National Standard Institute (ANSI)
 - .1 ANSI A300 (Part 1)-2001, Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices (revision and re-designation of ANSI A300-1995) (includes supplements).
 - .2 ANSI A300 (Part 2)-1998, Tree Care Operations - Tree, Shrub, and Other Woody Plant Maintenance - Standard Practices - Part 2 - Fertilization.
 - .3 ANSI A300 (Part 3)-2000, Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance: Standard Practices - Part 3 - Tree Support Systems (a. Cabling, Bracing, and Guying) (supplement to ANSI A300-1995).
- .2 Canadian Nursery Landscape Association (CNLA)
- .3 International Society of Arboriculture (ISA)
- .4 Ontario Ministry of Agriculture, Food and Rural Affairs
 - .1 Publication 483-2004, Pruning Ornamentals.
- .5 Minister of Agriculture and Agri-Food Canada
 - .1 Plant Protection Act, April 27, 2009

1.3 DEFINITIONS

- .1 Crown Cleaning: consists of selective removal of one or more of following items: dead, dying or diseased branches, weak branches and water sprouts.
- .2 Crown Thinning: consists of selective removal of branches to increase light penetration, air movement and reduce weight.
- .3 Crown Raising: consists of removal of lower tree branches to provide clearance.
- .4 Crown Reduction or Crown Shaping: decreases tree height and/or spread.
- .5 Vista Pruning: is selective thinning of framework limbs or specific crown areas to improve views.
- .6 Crown Restoration: improves structure, form and appearance of trees that have been severely headed or vandalized.

1.4 QUALITY ASSURANCE

- .1 Certification: provide International Society of Arboriculture or Canadian Nursery Landscape Association certification.
- .2 Field Samples: do sample pruning in manner to enable NCC Representative to identify:
 - .1 Knowledge of target areas including branch bark ridge and branch collars.
 - .2 Technique for selection process and pruning used to establish desired form and shape.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Divert wood materials from landfill to composting facility to be approved by NCC Representative

1.6 TOOL MAINTENANCE

- .1 Ensure that tools are clean and sharp throughout pruning operation: do not use tools that crush or tear bark.
- .2 Disinfect tools before each tree is pruned.
- .3 On diseased plant material disinfect tools before each cut.

PART 2 - PRODUCTS

2.1 DISINFECTANT

- .1 20% solution of sodium hypochlorite or 70% solution of ethyl alcohol

PART 3 - EXECUTION

3.1 APPLICATION

- .1 Manufacturer's instructions: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 GENERAL

- .1 Prune in accordance with Pruning Ornamentals and ANSI A300, and as directed by NCC Representative. Where discrepancies occur between standard and specifications, specifications govern.
- .2 Notify NCC Representative immediately of conditions detrimental to health of plant material or operations.

- .3 Prune during plant dormant period or after leaves have matured. Avoid pruning during leaf formation, at time of leaf fall, or when seasonal temperature drops below minus 10 degrees C.
- .4 Retain natural form and shape of plant species.
- .5 Do not:
 - .1 Flush cut branches.
 - .2 Crush or tear bark.
 - .3 Cut behind branch bark ridge.
 - .4 Damage branch collars.
 - .5 Damage branches to remain.

3.3 PRUNING

- .1 Remove dead, dying, diseased and weak growth from plant material to provide crown raising and vista pruning as designated by NCC Representative in order to promote healthy growth.
- .2 Remove live branches that:
 - .1 Interfere with healthy development and structural strength including branches crossed or rubbing more important branches.
 - .2 Are of weak structure including narrow crotches.
 - .3 Obstruct development of more important branches.
 - .4 Are broken.
- .3 Remove live branches to re-establish natural species form including:
 - .1 One or more developing leaders.
 - .2 Multiple growth due to previous topping.
 - .3 Branches extending outward from natural form.
 - .4 Undesirable sucker growth.
- .4 Remove loose branches, twigs and other debris lodged in tree.
- .5 Remove vines.
- .6 For branches under 50 mm in diameter:
 - .1 Locate branch bark ridge and make cuts smooth and flush with outer edge of branch collar to ensure retention of branch collar. Cut target area to bottom of branch collar at angle equal to that formed by line opposite to branch bark ridge.
 - .2 Make cuts on dead branches smooth and flush with swollen callus collar. Do not injure or remove callus collar.
 - .3 Do not cut lead branches unless directed by NCC Representative.
- .7 For branches greater than 50 mm in diameter:
 - .1 Make first cut on lower side of branch 300 mm from trunk, one third diameter of

- branch.
- .2 Make second cut on upper side of branch 500 mm from trunk until branch falls off.
- .3 Make final cut adjacent to and outside branch collar.
- .8 Ensure that trunk bark and branch collar are not damaged or torn during limb removal.
 - .1 Repair damage, or remove damaged area back to next branch collar.
- .9 Remove additional growth designated by NCC Representative.

3.4 ROOT GIRDLING

- .1 For girdling roots one-quarter size of trunk diameter or larger, V-cut girdling root one-half way through at point where root is crossing.
- .2 Remove exposed portion of girdling root as directed by NCC Representative after cleanly cutting root flush with grade on each side of parent root. Do not injure bark or parent root.

3.5 CARE OF WOUNDS

- .1 Shape bark around wound to oblong configuration ensuring minimal increase in wound size. Retain peninsulas of existing live bark.

3.6 TREE REMOVAL

- .1 Trees identified for removal to be marked on site prior to removal.
- .2 An NCC Representative will review on site and confirm before any removal takes place.
- .3 All trees to be felled by an ISA certified arborist
- .4 All Ash trees to be removed as per Section 3.7 below

3.7 EMERALD ASH BORER TREATMENT:

- .1 EAB refers to Emerald Ash Bore
- .2 Ministerial Order refers to the Emerald Ash Borer infested Place Order City of Ottawa, in the Province of Ontario by the Minister of Agriculture and Agri-Food, pursuant to subsection 15(3) of the Plant Protection Act, April 27, 2009.
- .3 Wood Chips in the context of the Ministerial Order shall consist of untreated, raw bark and wood fragments broken or shredded from logs or branches. Chips must be less than 2.5cm in at least any two dimensions.
- .4 Firewood in the context of the Ministerial Order shall consist of non-manufactured, solid wood material, with or without bark, cut into sizes less than 1.2 metres long and less than 25 cm in diameter which may be handled manually.

- .5 Logs in the context of the Ministerial Order shall consist of untreated, raw wood greater than 1.2 metres in length and greater than 25 cm diameter.
- .6 Enclosed vehicle shall be any vehicle transporting regulated wood material that is equipped to preclude the loss of materials, or the escape of EAB, while en route.

3.8 CLEAN-UP

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Collect and compost whenever applicable pruned material daily and remove from site.
- .3 All plant material to be chipped and removed from site, unless otherwise discussed and approved
- .4 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 – GENERAL

1.1 Related Work

.1	Rip Rap and Armour Stone	Section 31 37 00
.2	Excavation and Backfilling	Section 31 23 10
.3	Shop Drawings, Product data, etc.	Section 01 33 00
.4	Granular	Section 32 11 23

1.2 Description of work

- .1 This section is the materials specification for the installation of solid PVC drainage pipes and strip drains as shown on the contract drawings. The drainage pipes will serve to capture storm water, and are to be installed below the armour stone walls and outlet into a bed of rip-rap as indicated on the contract documents.

PART 2 – PRODUCTS

2.1 Materials available at PVC Industrial Products, Geosynthetic systems, Ottawa, or similar retailer:

.1	Solid 100mm diameter PVC drain pipes
.2	100mm x 1200mm Trench drain with removable grate (Upper)
.3	100mm x 600mm Trench drain with removable grate. (Lower)
.4	90 degree / 45 degree elbows for the pipe connections and angles required
.5	PVC connectors
.6	PVC cement to connect all pipes and fittings.
.7	Critter guard at outlets
.8	end caps

PART 3 – EXECUTION

- 3.1** PVC drainage pipes to be installed in conjunction with granular base, piping runs within the compacted granular below the armour stone walls and outlets into a bed of rip-rap. Ensure positive pipe drainage including where outlet meets existing grade.

Trench drain to be installed parallel to Armour stone wall or as indicated in the contract documents.

Trench drain surface is to be buried with river stone as per the contract documents

Assemble pipe in accordance with manufacturer's instructions so when complete the drainage pipe will have a smooth, uniform and watertight connections

Install drainage pipe ensuring uniform support and all sides

Use longest pipe length manufactured where practicable to reduce number of joints on the sub-drain.

Ensure drainage pipe outlet of fully buried with the rip-rap bed. Only the end of the pipe should be visible.

END OF SECTION

PART 1 - GENERAL

- | | | |
|--------------------------------|----|---|
| 1.1 Related Sections | .1 | Section 01 35 43 – Environmental Protection |
| | .2 | This section is to be read in conjunction with all related environmental documents associated with the project. |
| 1.2 Environmental Requirements | .1 | Operation of construction equipment in water is prohibited. |
| | .2 | Dumping excavated fill, waste material, or debris in watercourse is prohibited. |

PART 2 - PRODUCTS

- | | | |
|--|---|---|
| | 1 | Silt fencing and or Turbidity Curtain, see contract drawings. |
|--|---|---|

PART 3 - EXECUTION

- | | | |
|--|----|--|
| 3.1 Navigable Waters Protection | .1 | At least 1 week prior to the start of construction, the Contractor shall provide a Public Safety Plan for working within a navigable waterway for review and approval by the NCC Contract Administrator. |
| 3.2 Existing Flow Conditions | .1 | Maintain existing flow pattern in natural watercourse systems. |
| 3.3 Site Clearing and Plant Protection | .1 | Conduct work to provide minimal disturbance to vegetated buffer zones, including aquatic vegetation. |
| | .2 | Unless otherwise indicated on the drawings or instructed on site by the NCC Contract Administrator, retain and protect all existing trees on site. |
| 3.4 Preservation and Reinstatement of Shoreline boulders | .1 | Preserve and use existing boulders along the shoreline edge as indicated in the contract drawings. |
| 3.5 Machinery | .1 | Machinery shall arrive on site in a clean, washed condition, free of fluid leaks. |
| | .2 | Install stabilized entrance for machinery as indicated on contract drawings |
| 3.6 Reptile and Amphibian Recovery | .1 | Captured turtles, frogs or other wildlife shall be moved to similar habitat outside the work area. |
| | .2 | NCC Contractor Administrator to be present on site for reptile and amphibian recovery. |
| 3.7 Drainage | .1 | Pumping water containing suspended materials into watercourse is prohibited. |
| | .2 | Method of treatment and discharge of pumped water to be submitted |

for approval of NCC Contract Administrator as part of Sediment and Erosion Control Plan.

3.8 Removal of Sediment .1
Barrier, Silt Fencing,
Turbidity curtain

To be removed one week after final NCC completion of work is conducted and approved by contract administrator.

END OF SECTION

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END OF SECTION

1 DESCRIPTION OF WORK

- .1 Work of this Contract comprises general construction of a new lay-by and pedestrian crossover (PXO) on the Sir George Etienne Cartier Parkway. Parking Lot P3 will be reconstructed along with the construction of a new sidewalk linking the Parking Lot P3 to the new PXO. Work under this contract covers include storm sewers, sidewalk and pedestrian crossover, concrete curb, asphalt, electrical including illumination, landscaping, pavement markings and signage and various additional works required to allow for of the works as identified in contract drawings and complete reinstatement of all works to existing conditions.

2 CODES

- .1 Perform work in accordance with National Building Code of Canada (NBC) and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 Meet or exceed requirements of:
 - .1 contract documents,
 - .2 specified standards, codes and referenced documents.

3 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each of following:
 - .1 Contract drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed shop drawings.
 - .5 Change orders.
 - .6 Other modifications to Contract.
 - .7 Field test reports.
 - .8 Copy of approved work schedule.
 - .9 Manufacturers' installation and application instructions.
 - .10 copy of approved on-site traffic and equipment operation plan

4 WORKMANSHIP

- .1 It is a requirement of this contract, that qualified tradesmen execute each type of work specified.
- .2 Example: Landscape Contractor for landscape work, mason for masonry work, etc.
- .3 Work unsatisfactorily completed by unqualified tradesmen shall be redone and paid for by the Contractor.

5 SITE CONDITIONS

- .1 The Geotechnical Reports are available for consultation and may be reviewed by the

tenderer during the tender period at:
National Capital Commission
7th Floor, 40 Elgin Street
Ottawa, Ontario

- .2 The Owner accepts no responsibility for the accuracy of any borehole information. The information is not to be construed in any way as a guarantee of the underground conditions.

6 SITE VISIT

- .1 Parties intending to submit tenders on the work must visit the site and obtain for themselves all information pertaining to existing conditions affecting the proper execution and completion of the work. The submission of a tender shall be deemed as proof that the tenderer and his subtrades have complied with this requirement. After claims for additional compensation will not be entertained for any items of labour or material required to complete the work that could have been reasonably ascertained by a Site Examination.

7 PAYMENT

- .1 Any minor or miscellaneous items indicated on the drawing as being part of the work of this contract and for which there are no specific pay items listed on the price table must be included by the Contractor in his overhead and indirect charges and incorporated into the unit prices which are listed on the unit price table breakdown.
- .2 No separate payment will be made for work performed in respect to any of the special provisions for which there is no specific pay item on the price table. The cost of these works must be appropriated among, and included in, the unit prices bid for the pay items listed.
- .3 Included in the unit prices bid for the respective items shall be, in addition to the actual cost of construction, all other items of work required to complete the contract to the extent indicated on the drawings and specified herein.
- .4 Measurement for Payment
 - .1 Notify NCC Representative sufficiently in advance of operations to permit required measurements for payment for monthly measure.

8 CONTRACTOR'S USE OF SITE

- .1 Use of site: exclusive and complete within the construction area as defined in the contract drawings for execution of work except as follows:
 - .1 Contractor to provide: access and protected passage at all times for pedestrian and cycling traffic along multi-use pathway on the north side of the Sir George Etienne Parkway.

- .2 Contractor to maintain traffic along Sir George Etienne Parkway at all times except during actual construction of the pedestrian crossover. Contractor to provide a schedule and duration of Sir George Etienne Parkway closing. The closing of the Sir George Etienne Parkway will occur over one weekend between 5:00 am Saturday until 9:00pm on Sunday.
- .3 Access to the parking lot and the New Edinburgh Tennis Club via Parking Lot P3 will closed during the reconstruction of the parking lot.
- .2 Use following areas for work and storage:
 - .1 Only the area within the working area as described on the General Layout and Site Restrictions Drawing may be utilized for work and storage within grounds.
 - .3 All areas used for work and storage shall be maintained by the contractor and any asphalt, sod, curbs trees, etc that are damaged due to the contractors use of the area shall be repaired/ reinstated at the contractors cost.

9 PROJECT MEETINGS

- .1 NCC Representative will arrange project meetings and assume responsibility for setting times and recording and distributing minutes. The contractor shall be obligated to attend all meetings at no additional cost. It is expected these will be held weekly or bi-weekly but additional meetings will be held as needed.

10 SETTING OUT OF WORK

- .1 Prior to commencement of work only, and not afterwards, NCC Representative will provide a minimum of two survey control points.
- .2 Contractor shall set grades and lay out work in detail from control established by the NCC Representative.
- .3 Contractor shall assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.
- .4 Contractor shall provide devices needed to lay out and construct work.
- .5 Contractor shall supply such devices as straight edges and templates required to facilitate NCC Representative's inspection of work.
- .6 Contractor shall supply stakes and other survey markers required for laying out work.

11 LOCATION OF EQUIPMENT AND FIXTURES

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform NCC Representative of impending installation and obtain his approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by NCC Representative.

12 CUTTING, FITTING AND PATCHING

- .1 Execute cutting (including excavation), fitting and patch as required to make work fit properly.
- .2 Make cuts straight, with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- .3 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.

13 EXISTING SERVICES

- .1 Where work involves breaking into or connecting to existing services, carry out work at times directed by authorities having jurisdiction, with minimum of disturbance to pedestrian and vehicular traffic.
- .2 Before commencing work, establish location and extent of all service lines in area of Work and notify NCC Representative of findings.
- .3 Submit schedule to and obtain approval from NCC Representative for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .4 Where unknown services are encountered, immediately advise NCC Representative and confirm findings in writing.
- .5 Remove abandoned service lines within 2 m of new structures. Cap or otherwise seal lines at cut-off points as directed by NCC Representative.
- .6 Record locations of maintained, re-routed and abandoned service lines.

14 ADDITIONAL DRAWINGS

- .1 NCC Representative may furnish additional drawings for clarification. These additional drawings have same meaning and intent as if they were included with plans referred to in Contract documents.

15 RELICS AND ANTIQUITIES

- .1 Protect relics, antiquities, items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found during course of work.
- .2 Give immediate notice to NCC Representative and await NCC Representative's written instructions before proceeding with work in this area.
- .3 Relics, antiquities and items of historical or scientific interest remain her Majesty's property.

16 SITE REQUIREMENTS

- .1 **Taxes:**
 - .1 Pay all taxes properly levied by law including Federal, Provincial and Municipal.
 - .2 GST at site is zero rated.

17 SECURITY REQUIREMENTS

The Contracting Authority reserves the right to not award the Contract until such time as the contractor's personnel core employees, as well as any recurring subcontractors, have obtained the required level of security screening as identified by NCC Corporate Security. In this case the level of security required will be **SITE ACCESS***.

17.1 Security screening of individual:

Contracting Authority is ensuring that the proponent meets the appropriate security requirements and that all functions pertaining to Contracting Authority ops are addressed by conducting security screening. If proponent is accredited through Public Services and Procurement Canada (PSPC)/Canadian Industrial Security Directorate (CISD), or any other Federal entity or Crown Corporation, the Contracting Authority may validate the security clearance of the proponent Team. NCC Corporate Security is an approved Federal Government source that may sponsor companies into the Industrial Security Program (ISP).

17.2 Security of Information

When the Contract, the Work, or any information, the Contractor shall, at all times, treat and safeguard the information as per their security classification or designation, in accordance with the Government Security Policy (GSP).

Contracting Authority reserves the right to request that the Contractor submit to an inspection of the premises on Document Safeguarding Capability (DSC) and/or IT Security, depending on the nature of the information it will be entrusted with.

In the event that contractor does not meet the requirements to obtain the requested clearance, the contractor or subcontractor shall take the corrective measures recommended by NCC Corporate Security or CSID in order to meet these requirements.

The Contractor shall ensure that only authorized and security screened employees are given access to documents or records for which they have obtained the appropriate level of security clearance and that these employees treat these documents, records, and the information contained therein, on a need-to-know basis and in accordance with their security classification or designation.

The Contractor shall take all necessary steps to ensure that documents and records, or any information, are not copied, provided to, discussed, or disclosed in any manner whatsoever, to any person or entity, other than Contracting Authority personnel possessing the appropriate security level and authorization, unless expressly authorized by the Contracting Authority.

17.3 Confidentiality and Safeguarding

Any employee contracted by or employed by the contractor are forbidden to discuss issues pertaining to the project, including, but not limited to, to project's layout, design, content and security provisions, except as they relate to the direct provisions of services and Work under this Contract.

Utmost care must be exercised by the Contractor to ensure the safeguarding of any material prepared or received in handling for the duration of this project. The contractor shall not publish or display any documents, photographs, site plans, maps or information related to the project (or collected during the project), in any medium (including the internet). The contractor shall not disclose such material or information to third parties.

The contractor shall return to the Contracting Authority all copies of all site photographs and construction documents, site plans and maps related to the project, including those distributed to anyone associated to this contract.

17.4 Access to site

Unless otherwise indicated, all visits to site shall be coordinated with, and approved through NCC Corporate Security.

18 SCHEDULING OF WORK AND RESTRICTIONS:

- .1 Construction must be complete, reinstated and cleaned up by July, 2022.
- .2 Refer to Section 01 32 16.07 Construction Progress Schedule Bar (Gantt) Chart.

- .3 Interim reviews of work progress based on work schedule will be conducted as decided by NCC Representative and schedule updated by Contractor in conjunction with and to approval of NCC Representative.
- .4 The contractor shall submit to the NCC Representative a proposed monthly cash flow chart identifying price breakdown per trade for review and acceptance by the NCC Representative prior to commencement of the work.
- .5 The contractor shall update the schedule as requested by the NCC Representative. The contractor shall adhere to the approved schedule and cash flow charts.
- .6 The contractor shall schedule the work activities to minimize any disruption to the existing building occupants and their operations. Disruptive work activities and their scheduling shall be done in co-ordination with the NCC Representative. The contractor shall coordinate commencement of work on site in a manner that material delivery will not hold up the construction process.
- .7 Shop drawing submittal: To accommodate long delivery dates on specific items, contractor shall submit shop drawings of such long delivery items within 5 days of receipt of letter of intent to award from the Owner. Refer to section 01 33 00 Submittal Procedures.
- .8 **Scheduling Constraints:**
 - .1 Refer to the article 17 "Security Clearance"
 - .2 Standard authorized hours of work are Monday to Friday, 07:00 hours to 18:00 hours. Obtain prior permission through NCC Representative for work outside of the standard authorized time frame. Assume any extra costs for labour, material or equipment associated with work performed outside of the standard time frame unless specifically requested (in writing) by the NCC Representative.

19 DAMAGES:

- .1 Existing plant material, landscaping, roadways, pathways, structures, finishes and public utilities damaged during the execution of the work of this contract, will be restored to their original condition, replaced, or adequate compensation made to affected parties by the contractor.
- .2 It is understood that restored or replaced work includes labour, equipment and material costs.

20 PERMITS AND BY-LAWS:

- .1 The Contractor shall make himself fully acquainted with all Provincial, Local and other by-laws relating to the work of this contract, as he will be required to comply with such by-laws without extra compensation of any nature.

- .2 Obtain and pay for permits, factory inspector's approval, and other licenses required for this project and also pay any other charges incidental to such permits.

21 WEIGHING OF MATERIALS:

- .1 For payment purposes, delivery tickets issued by the supplier of the material, indicating what type of material and net weight in tonnes must be provided to the NCC Representative. Upon arrival at the site and before off loading, the loads must be approved and delivery ticket signed by the commissions on site representative. A duplicate copy of the signed ticket will be retained by the commission's representative, the original of which shall be retained by the contractor for submission with invoices at the time of payment.
- .2 Weight shown on the delivery ticket must be the net weight of the materials only as weighed on a scale, which is tested and approved by the weight inspectors of the Government of Canada at least once per year. The NCC Representative retains the right to require the Contractor to provide on-site scales without additional charge to the Commission if, in his opinion, he considers the method being followed unsatisfactory.

22 ADDENDAS

- .1 Answers to questions directed to the NCC Representative, and any amendments to the drawings and specifications during the tender period will be communicated in the Form of Addenda to all General Contractors tendering. Such Addenda to be considered as and read as part of the specifications, and thereby included in the Contract Documents.

23 COORDINATION

- .1 Co-ordinate operations of those involved in the work so that it progresses effectively and efficiently.
- .2 Contractor shall notify and get approval from the NCC Representative to work during non-normal working hours.
- .3 Ensure, before any trade or operation starts, that preceding or preparatory work is completed, and that conditions are appropriate to receive work of such trade or operation.
- .4 Ensure that sub-contractors provide properly qualified superintendents on site to supervise trades involved in work. Do not permit change of personnel, except when approved.

24 RECORD DRAWINGS

- .1 As work progresses, maintain, accurate records to show deviations from contract documents.
- .2 Survey, using Total Station Co-ordinates, all underground utilities and any major deviation of layout of project. This information is to be provided to NCC Survey and

Mapping Section on ASCII diskette.

- .3 Just prior to NCC Representative's inspection for issuance of final certificate of completion, supply one (1) set of white prints with all major and minor deviations neatly inked in. The NCC Representative will provide two (2) sets of clean white prints for this purpose.

25 GUARANTEES AND WARRANTIES

- .1 Before completion of work, collect all manufacturer's guarantees and warranties, and deposit to NCC Representative.

26 OPERATIONS AND MAINTENANCE

- .1 Include the following information plus data specified:
 - .1 maintenance instructions;
 - .2 copy of hardware and paint schedules;
 - .3 description: operation of the equipment;
 - .4 guarantees, warranties, and bonds showing:
 - .1 name and address of project;
 - .2 guarantee commencement date (date of Final Certificate of Completion);
 - .3 duration of Guarantee;
 - .4 clear indication of what is being guaranteed and what remedial action will be taken under guarantee;
 - .5 signature and seal of contractor.

END OF SECTION

Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises general construction of a new lay-by and pedestrian crossover (PXO) on the Sir George Etienne Cartier Parkway. Parking Lot P3 will be reconstructed along with the construction of a new sidewalk linking the Parking Lot P3 to the new PXO. Work under this contract covers include storm sewers, sidewalk and pedestrian crossover, concrete curb, asphalt, electrical including illumination, landscaping, pavement markings and signage and various additional works required to allow for of the works as identified in contract drawings and complete reinstatement of all works to existing conditions.

1.2 CONTRACT METHOD

- .1 Construct Work under stipulated price contract.

1.3 CONTRACTOR USE OF PREMISES

- .1 Co-ordinate use of premises under direction of NCC Representative.
- .2 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.4 OWNER OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.5 EXISTING SERVICES

- .1 Notify, NCC Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give NCC Representative 48 hours notice. Minimize duration of interruptions.
- .3 Provide alternative routes for pedestrian and vehicular traffic.
- .4 Establish location and extent of service lines in area of work before starting Work. Notify NCC Representative of findings.
- .5 Where unknown services are encountered, immediately advise NCC Representative and confirm findings in writing.
- .6 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .7 Record locations of maintained, re-routed and abandoned service lines.
- .8 Construct barriers in accordance with Section 01 56 00- Temporary Barriers and Enclosures.

1.6 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each document as follows:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed Shop Drawings.
 - .5 List of Outstanding Shop Drawings.
 - .6 Change Orders.
 - .7 Other Modifications to Contract.
 - .8 Field Test Reports.
 - .9 Copy of Approved Work Schedule.
 - .10 Health and Safety Plan and Other Safety Related Documents.
 - .11 Other documents as specified.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 ACCESS AND EGRESS

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.2 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with NCC Representative to facilitate work as stated.

1.3 EXISTING SERVICES

- .1 Notify, NCC Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give NCC Representative 48 hours of notice for necessary interruption of service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.
- .3 Provide for pedestrian and vehicular traffic.
- .4 Construct barriers in accordance with Section 01 56 00- Temporary Barriers and Enclosures.

1.4 SPECIAL REQUIREMENTS

- .1 Submit schedule in accordance with Section 01 32 16.07- Construction Progress Schedule - Bar (GANTT) Chart.
- .2 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .3 Keep within limits of work and avenues of ingress and egress.
- .4 Ingress and egress of Contractor vehicles at site is limited to the Princess Avenue Gate.

1.5 SECURITY

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.
- .2 Security clearances:
 - .1 Personnel employed on this project will be subject to security check. Obtain clearance, as instructed, for each individual who will require to enter premises.
 - .2 Obtain requisite clearance, as instructed, for each individual required to enter premises.
 - .3 Personnel will be checked daily at start of work shift and provided with pass which must be worn at all times. Pass must be returned at end of work shift and personnel checked out.

- .4 Contractor's personnel will require satisfactory security screening in order to complete Work in premises and on site.

1.6 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions. Smoking is not permitted.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 DEFINITIONS

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
- .3 Baseline: original plan (for project, work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Expressed as workdays.
- .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: significant event in project, usually completion of major deliverable.
- .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .9 Project Planning, Monitoring and Control System: overall system operated by NCC Representative to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.
- .2 Submit to NCC Representative.
- .3 Submit Project Schedule to NCC Representative within 5 working days of receipt of acceptance of Master Plan.

1.4 MASTER PLAN

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 NCC Representative will review and return revised schedules within 5 working days.
- .3 Revise impractical schedule and resubmit within 3 working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.5 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Shop Drawings, Samples.
 - .3 Permits.
 - .4 Mobilization.
 - .5 Completion of Entrance Pit.
 - .6 Completion of Exit Pit.
 - .7 Installation of Sanitary Sewer.
 - .8 Installation of Storm Sewer.
 - .9 Installation of Stormceptor.
 - .10 Watermain Works.
 - .11 Asphalt Paving and Concrete works.
 - .12 Landscaping Reinstatement

1.6 PROJECT SCHEDULE REPORTING

- .1 Update Project Schedule on bi-weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.7 PROJECT MEETINGS

- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather related delays with their remedial measures will be discussed and negotiated. The Contractor should allow for weather normal weather related delays in their schedule.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 03 30 00.09 Cast in Place Concrete – Short Form
- .2 Section 31 00 00.01 Earthwork – Short Form
- .3 Section 31 05 16 Aggregate Materials
- .4 Section 31 23 33.01 Excavation Trenching and Backfilling
- .5 Section 32 11 23 Aggregate Base Course
- .6 Section 32 12 16.01 Asphalt Paving -Short Form
- .7 Section 32 16 15 Concrete Walks, Curbs and Gutters
- .8 Section 32 91 19.13 Topsoil Placement and Grading
- .9 Section 32 92 23 Sodding
- .10 Section 33 41 00 Storm Sewer Utility Drains
- .11 Section 33 65 73 Concrete Encased Duct Banks and Manholes

1.2 ADMINISTRATIVE

- .1 Submit to NCC Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to NCC Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify NCC Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by NCC Representative review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by NCC Representative review.
- .10 Keep one reviewed copy of each submission on site.

1.3 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 2 reviews of each submission.
- .5 Adjustments made on shop drawings by NCC Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to NCC Representative prior to proceeding with Work.
- .6 Make changes in shop drawings as NCC Representative may require, consistent with Contract Documents. When resubmitting, notify NCC Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .8 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.

- .5 Performance characteristics.
- .6 Standards.
- .7 Operating weight.
- .8 Wiring diagrams.
- .9 Single line and schematic diagrams.
- .10 Relationship to adjacent work.
- .9 After NCC Representative review, distribute copies.
- .10 Submit electronic copy and 6 prints of shop drawings for each requirement requested in specification Sections and as NCC Representative may reasonably request.
- .11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by NCC Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by NCC Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.
- .13 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by NCC Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit electronic copies of manufacturers instructions for requirements requested in specification Sections and as requested by NCC Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by NCC Representative.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit electronic and 6 copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by NCC Representative.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by NCC Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and

resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

- .21 The review of shop drawings by NCC Representative is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that NCC Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.4 SAMPLES

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to business address advised at commencement of project by NCC Representative.
- .3 Notify NCC Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by NCC Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to NCC Representative prior to proceeding with Work.
- .6 Make changes in samples which NCC Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 02 41 99 – Demolition for Minor Works.

1.2 REFERENCE STANDARDS

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Province of Ontario
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990, c.0.1, as amended and O. Reg. 213/91 as amended.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .3 Submit copies of reports or directions issued by Federal, or Provincial health and safety inspectors.
- .4 Submit copies of incident and accident reports.
- .5 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 47 15- Sustainable Requirements: Construction.
- .6 NCC Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 10 days.
- .7 NCC Representative review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .8 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.4 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.
- .2 Contractor shall be responsible and assume the Principal Contractor role for each work zone location and not the entire complex. Contractor shall provide a written acknowledgement of this responsibility with 3 weeks of contract award. Contractor to submit written acknowledgement to NCC Representative .
- .3 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.5 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.6 MEETINGS

- .1 Schedule and administer Health and Safety meeting with NCC Representative prior to commencement of Work.

1.7 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with Section 01 41 00- Regulatory Requirements.

1.8 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 NCC Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.9 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Contractor will be responsible and assume the role Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.
- .3 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.10 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990, c. 0.1 and Ontario Regulations for Construction Projects, O. Reg. 213/91.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.11 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise NCC Representative verbally and in writing.

1.12 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
 - .1 Have site-related working experience specific to activities associated with similar construction work.
 - .2 Have working knowledge of occupational safety and health regulations.

- .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
- .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

1.13 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with NCC Representative.

1.14 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by NCC Representative.
- .2 NCC Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.15 BLASTING

- .1 Blasting or other use of explosives is not permitted.

1.16 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2008 Stipulated Price Contract.
- .2 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.
 - .2 EPA General Construction Permit (GCP) 2012.

1.2 DEFINITIONS

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets as requested by NCC Representative.
 - .2 Submit 2 copies of WHMIS MSDS in accordance with 01 35 43- Environmental Procedures.
- .3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review by NCC Representative.
- .4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .5 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .6 Include in Environmental Protection Plan:
 - .1 Name of person responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
 - .3 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures,

- sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
- .4 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
 - .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
- .5 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
 - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
- .6 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .7 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .8 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
- .9 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .10 Waste Water Management Plan identifying methods and procedures for management and discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

1.4 FIRES

- .1 Fires and burning of rubbish on site is not permitted.

1.5 DRAINAGE

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.6 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties.
- .2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2m minimum.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.

1.7 NOTIFICATION

- .1 NCC Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform NCC Representative of proposed corrective action and take such action for approval by NCC Representative.
- .3 NCC Representative may issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 This Section references to laws, by laws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction, and other legally enforceable requirements applicable to Work and that are; or become, in force during performance of Work.

1.2 RELATED REQUIREMENTS

- .1 Section 01 35 29.06 Health and Safety Requirements.

1.3 REFERENCES TO REGULATORY REQUIREMENTS

- .1 Perform Work in accordance with National Building Code of Canada (NBC)] 2015 , Ontario Provincial Standards/Specifications for Roads and Public Works (Nov 2016), City of Ottawa Standards/Specifications (March 2017) including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Specific design and performance requirements listed in the specifications or indicated on the Drawings may exceed the minimum requirements established by the referenced Building Code; these requirements will govern over the minimum requirements listed in the Building Code
 - .1 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.

1.4 HAZARDOUS MATERIAL DISCOVERY

- .1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify NCC Representative.

1.5 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions and municipal by-laws.

1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements: Except as otherwise specified, Constructor shall apply for, obtain, and pay all fees associated with, permits, licenses, certificates, and approvals required by regulatory requirements and Contract Documents, based on General Conditions of Contract and the following:
 - .1 Regulatory requirements and fees in force on date of Bid submission, and
 - .2 Any change in regulatory requirements or fees scheduled to become effective after date of tender submission and of which public notice has been given before date of tender submission

Part 2 Products

2.1 NOT USED

- .1 Not Used.

2.2 EASEMENTS AND NOTICES

- .1 Owner will obtain permanent easements and rights of servitude that may be required for performance of Work.
- .2 Constructor shall give notices required by regulatory requirements.

2.3 PERMITS

- .1 Sewer Discharge (Use) Agreement. Contractor to obtain and pay for permit and fess associated with agreement to allow for works to be completed.
- .2 Permit to Take Water: Contractor to obtain and pay for costs associated with Environmental Activity and Sector Registry (EASR) for dewatering.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 00 00.01 Earthwork-Short Form.

1.2 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-08, Stipulated Price Contract.

1.3 INSPECTION

- .1 Refer to CCDC 2, GC 2.3. The term Consultant may be used interchangeably with NCC Representative.
- .2 Allow NCC Representatives access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by NCC Representative instructions, or law of Place of Work.
- .4 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .5 NCC Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If such Work is found in accordance with Contract Documents, NCC Representative shall pay cost of examination and replacement.

1.4 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

- .1 Notify appropriate agency and NCC Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.6 REJECTED WORK

- .1 Refer to CCDC, GC 2.4. The term Consultant may be used interchangeably with NCC Representative.

- .2 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by NCC Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .3 Make good other Contractor's work damaged by such removals or replacements promptly.
- .4 If in opinion of NCC Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by NCC Representative.

1.7 REPORTS

- .1 Submit 4 copies of inspection and test reports to NCC Representative.

1.8 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs as requested.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06- Health and Safety Requirements and/or 2 copies of MSDS required under the Occupational Health and Safety Act and Regulations.

1.2 GENERAL CONSTRUCTION MATERIALS/PRACTICES

- .1 Materials and Resources
 - .1 Use uncontaminated demolition materials for fill and hardcore and/or granular base.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.
 - .1 Provide TEMPORARY EROSION AND SEDIMENTATION CONTROL PLAN for review.

1.3 INSTALLATION AND REMOVAL

- .1 Provide temporary utilities controls in order to execute work expeditiously.
- .2 Remove from site all such work after use.

1.4 DEWATERING

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.5 WATER SUPPLY

- .1 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.

1.6 TEMPORARY HEATING

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.7 TEMPORARY POWER AND LIGHT

- .1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools.
- .2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal, if required.

1.8 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction, governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on site.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2008, Stipulated Price Contract.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
 - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-0121-M1978(R2003), Douglas Fir Plywood.
 - .3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
 - .4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.
- .4 Public Works Government Services Canada (PSPC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.
- .5 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

1.3 SITE STORAGE/LOADING

- .1 Refer to CCDC 2, GC 3.11.
- .2 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .3 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.4 CONSTRUCTION PARKING

- .1 Parking will not be permitted on site.
- .2 Provide and maintain adequate access to project site.

1.5 SECURITY

- .1 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays, if deemed necessary.

1.6 OFFICES

- .1 Provide marked and fully stocked first-aid case in a readily available location.
- .2 Subcontractors to provide their own offices as necessary. Location of placement, if required, to be confirmed with NCC Representative.
- .3 NCC Representative's Site office.
 - .1 Not required for project.

1.7 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.8 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.9 CONSTRUCTION SIGNAGE

- .1 Provide and erect project sign, if requested, within two weeks of signing Contract, in a location designated by NCC Representative.
- .2 Indicate on sign, name of Owner, Contractor, of design style established by NCC Representative.
- .3 No other signs or advertisements, other than warning signs, are permitted on site.
- .4 Locate project identification sign as directed by NCC Representative and construct as follows:
 - .1 Build concrete foundation, erect framework, and attach signboard to framing.
 - .2 Paint surfaces of signboard and framing with one coat primer and two coats enamel. Colour white on signboard face, black on other surfaces.
 - .3 Apply vinyl sign face overlay to painted signboard face in accordance with installation instruction supplied.
- .5 Direct requests for approval to erect Consultant/Contractor signboard to NCC Representative. For consideration general appearance of Contractor signboard must conform to project identification site sign. Wording in both official languages.
- .6 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.

- .7 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by NCC Representative.

1.10 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by NCC Representative.
- .2 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .3 Protect travelling public from damage to person and property.
- .4 Contractor: responsible for repair of damage to roads caused by construction operations.
- .5 Dust control: adequate to ensure safe operation at all times.

1.11 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material not in construction facilities.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 Ministry of Transportation, Ontario (MTO)
 - .1 Ontario Traffic Manual, Book 7: Temporary Conditions - 2014.

1.2 PROTECTION OF PUBLIC TRAFFIC

- .1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.
- .2 When working on travelled way:
 - .1 Place equipment in position to minimize interference and hazard to travelling public.
 - .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
 - .3 Do not leave equipment on travelled way overnight.
- .3 Close lanes of road only after receipt of written approval from NCC Representative.
 - .1 Before re-routing traffic erect suitable signs and devices to Ontario Traffic Manual, Book 7: Temporary Conditions.
- .4 Keep travelled way graded, free from pot holes and of sufficient width for required number of lanes of traffic.
 - .1 Provide 7m wide minimum temporary roadway for traffic in two-way sections through Work and on detours.
 - .2 Provide 4m wide minimum temporary roadway for traffic in one-way sections through Work and on detours.
- .5 Provide and maintain road access and egress to property fronting along Work under Contract and in other areas, except where other means of road access exist that meet approval of NCC Representative.

1.3 INFORMATIONAL AND WARNING DEVICES

- .1 Provide and maintain signs, and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- .2 Supply and erect signs, delineators, barricades and miscellaneous warning devices to Ontario Traffic Manual, Book 7.
- .3 Continually maintain traffic control devices in use:
 - .1 Check signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
 - .2 Remove or cover signs which do not apply to conditions existing from day to day.

1.4 CONTROL OF PUBLIC TRAFFIC

- .1 Provide competent flag personnel, trained in accordance with, and properly equipped to Ontario Traffic Manual, Book 7: Temporary Conditions for situations as follows:
 - .1 When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.
 - .2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic.
 - .3 Where temporary protection is required while other traffic control devices are being erected or taken down.
 - .4 For emergency protection when other traffic control devices are not readily available.
 - .5 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
 - .6 Delays to public traffic due to contractor's operators: 5 minutes maximum.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
 - .2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-O121-M1978(R2003), Douglas Fir Plywood.

1.2 INSTALLATION AND REMOVAL

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

1.3 GUARD RAILS AND BARRICADES

- .1 Provide secure, barricades around deep excavations.
- .2 Provide as indicated, as required by governing authorities, or as requested by NCC Representative.

1.4 ACCESS TO SITE

- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.5 PUBLIC TRAFFIC FLOW

- .1 Provide and maintain competent signal flag operators, traffic signals, barricades and lights as required to perform Work and protect public.

1.6 FIRE ROUTES

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.7 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2008, Stipulated Price Contract.
- .2 Within text of each specifications section, reference may be made to reference standards.
- .3 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .4 If there is question as to whether products or systems are in conformance with applicable standards, NCC Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .5 Cost for such testing will be born by NCC Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 QUALITY

- .1 Refer to CCDC 2,
- .2 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .3 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .4 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .5 Should disputes arise as to quality or fitness of products, decision rests strictly with NCC Representative based upon requirements of Contract Documents.

1.3 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify NCC Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify NCC Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, NCC Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Remove and replace damaged products at own expense and to satisfaction of NCC Representative.

1.5 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.

1.6 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify NCC Representative in writing, of conflicts between specifications and manufacturer's instructions, so that NCC Representative will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes NCC Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.7 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify NCC Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. NCC Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with NCC Representative, whose decision is final.

1.8 CO-ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

1.9 REMEDIAL WORK

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.10 EXISTING UTILITIES

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, pedestrian and vehicular traffic and/or building occupants.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2008, Stipulated Price Contract.
- .2 Owner's identification of existing survey control points and property limits.

1.2 QUALIFICATIONS OF SURVEYOR

- .1 Qualified registered land surveyor, licensed to practise in Place of Work, acceptable to NCC Representative.

1.3 SURVEY REFERENCE POINTS

- .1 Existing base horizontal and vertical control points are designated on drawings or will be provided by NCC Representative.
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to NCC Representative.
- .4 Report to NCC Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

1.4 SURVEY REQUIREMENTS

- .1 Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
- .2 Establish lines and levels, locate and lay out, by instrumentation.
- .3 Stake for grading and structures.
- .4 Establish pipe invert elevations.

1.5 EXISTING SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify NCC Representative of findings.
- .2 Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by NCC Representative.

1.6 LOCATION OF EQUIPMENT AND FIXTURES

- .1 Location of services and outlets indicated or specified are to be considered as approximate.
- .2 Submit field drawings to indicate relative position of various services and equipment when required by NCC Representative.

1.7 RECORDS

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
- .3 Record locations of maintained, re-routed and abandoned service lines.

1.8 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit name and address of Surveyor to NCC Representative.
- .2 On request of NCC Representative, submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.9 SUBSURFACE CONDITIONS

- .1 Promptly notify Consultant in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.
- .2 After prompt investigation, should NCC Representative determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 02 41 99 Demolition for Minor Works.

1.2 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2008, Stipulated Price Contract.

1.3 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by NCC Representative. Do not burn waste materials on site.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Provide and use marked separate bins for recycling.
- .5 Dispose of waste materials and debris off site.

1.4 FINAL CLEANING

- .1 Refer to CCDC 2, GC 3.13. The term Consultant may be used interchangeably with NCC Representative.
- .2 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .3 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .4 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .5 Remove waste products and debris other than that caused by Owner or other Contractors.
- .6 Remove waste materials from site at regularly scheduled times or dispose of as directed by NCC Representative. Do not burn waste materials on site.
- .7 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .8 Broom clean exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .9 Remove dirt and other disfiguration from exterior surfaces.
- .10 Sweep clean paved areas.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 WASTE MANAGEMENT GOALS

- .1 Accomplish maximum control of solid construction waste.
- .2 Protect environment and prevent environmental pollution damage.
- .3 All soil to be removed from the site is to be tested for contamination prior to removal. The Contractor is to notify the NCC Representative in advance so they can make arrangements for the testing. Test results are to be provided to the NCC Representative who will review and provide approval before any soil is excavated and from the site. Contaminate soil to be taken to a licensed dump site.
- .4 Excess excavated materials inclusive of clean soils, asphalt and concrete, at the direction of the NCC Representative, shall be hauled to dump off site.

1.2 USE OF SITE AND FACILITIES

- .1 Execute Work with minimal interference and disturbance to normal use of premises.

1.3 STORAGE, HANDLING AND PROTECTION

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by NCC Representative.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Protect structural components not removed and salvaged materials from movement or damage.
- .6 Support affected structures. If safety of building is endangered, cease operations and immediately notify NCC Representative.
- .7 Protect surface drainage, mechanical and electrical from damage and blockage.
- .8 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .9 Separate and store materials produced during project in designated areas.
- .10 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off site processing facility for separation.
 - .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
 - .4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

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1.4 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of oil, mineral spirits, volatile materials, waste, paint thinner into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
 - .1 Number and size of bins.
 - .2 Waste type of each bin.
 - .3 Total tonnage generated.
 - .4 Tonnage reused or recycled.
 - .5 Reused or recycled waste destination.
- .4 Remove materials on-site as Work progresses.

1.5 SCHEDULING

- .1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 APPLICATION

- .1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

- .1 Cleaning: clean in accordance with Section 01 74 11- Cleaning.
- .2 Waste Management: separate waste materials.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
 - .2 Source separate materials to be reused/recycled into specified sort areas.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 74 11- Cleaning.

1.2 REFERENCE STANDARDS

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2008, Stipulated Price Contract.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify NCC Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request NCC Representative's inspection.
 - .2 NCC Representative's Inspection:
 - .1 NCC Representative and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Equipment and systems: tested, and fully operational.
 - .4 Certificates required by Utility companies: submitted.
 - .5 Operation of systems: demonstrated to Owner's personnel.
 - .6 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by NCC Representative, and Contractor.
 - .2 When Work incomplete according to NCC Representative, complete outstanding items and request re-inspection.
 - .5 Declaration of Substantial Performance: when NCC Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
 - .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement

for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

- .7 Final Payment:
 - .1 When NCC Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
 - .2 Refer to CCDC 2: when Work deemed incomplete by NCC Representative, complete outstanding items and request re-inspection.
- .8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.4 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 11- Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 23 33 - Excavating, Trenching and Backfilling.

1.2 REFERENCE STANDARDS

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Storage and Protection.
 - .1 Protect in accordance with Section 31 23 33.01- Excavating, Trenching and Backfilling.
 - .2 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of NCC Representative and at no cost to NCC Representative.
 - .3 Remove and store materials to be salvaged, in manner to prevent damage.
 - .4 Store and protect in accordance with requirements for maximum preservation of material.
 - .5 Handle salvaged materials as new materials.

1.4 SITE CONDITIONS

- .1 Site Environmental Requirements.
 - .1 Perform work in accordance with Section 01 35 43- Environmental Procedures.
 - .2 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
 - .3 Do not dispose of waste of volatile materials including but not limited to, mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.
 - .1 Ensure proper disposal procedures are maintained throughout the project.
 - .4 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.
 - .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities and/or as directed by NCC Representative.
 - .6 Protect trees, plants and foliage on site and adjacent properties.

Part 2 Products

2.1 EQUIPMENT

- .1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

Part 3 Execution

3.1 PREPARATION

- .1 Inspect site with NCC Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.
- .4 Disconnect and Cap Designated Mechanical Services.
 - .1 Sewer and Water Lines: Abandon existing sewer and fill with grout as indicated and/or as directed by NCC Representative.

3.2 REMOVAL OPERATIONS

- .1 Remove items as indicated (estimated locations indicated).
- .2 Do not disturb items designated to remain in place.
- .3 Removal of pavements, curbs and gutters:
 - .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by NCC Representative.
 - .2 Protect underlying and adjacent granular materials.
- .4 Prevent contamination with base course aggregates, when removing asphalt pavement for subsequent incorporation into hot mix asphalt concrete paving,
- .5 Excavate at least 300mm below pipe invert, when removing pipes under existing or future pavement area.
- .6 Decommission water wells and monitoring wells in accordance with regulations Provincial.

3.3 REMOVAL FROM SITE

- .1 Remove stockpiled material as directed by NCC Representative, when it interferes with operations of project.

3.4 RESTORATION

- .1 Restore areas and existing works outside areas of demolition to conditions that existed prior to beginning of Work or better.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

3.6 PROTECTION

- .1 Repair damage to adjacent materials or property caused by selective site demolition.

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 Section includes descriptions for demolishing, salvaging, recycling and removing of asphalt paving identified in whole or in part, and for backfilling trenches and excavations resulting from site demolition activities a required by scope of work.

1.2 RELATED REQUIREMENTS

- .1 Section 02 41 99– Demolition for Minor Works

1.3 REFERENCE STANDARDS

- .1 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.
 - .2 Canadian Environmental Protection Act, 1999 (CEPA), c. 33.
- .2 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements: ensure Work is performed in compliance with applicable Provincial regulations .
- .2 Comply with hauling and disposal regulations of Authority Having Jurisdiction.

1.5 SITE CONDITIONS

- .1 Protect existing site features to remain or identified for salvage or re use; make repairs and restore to a similar condition to existing where damage to these items occurs as directed by the NCC Representative and at no cost to Owner:
 - .1 Remove and store salvaged materials to prevent contamination.
 - .2 Store and protect salvaged materials as required for maximum preservation of material.
 - .3 Handle salvaged materials the same as new materials.
- .2 Perform pavement removal work to prevent adverse effects to adjacent watercourses, groundwater and wildlife, and to prevent excess air and noise pollution:
 - .1 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.
 - .2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Authorities Having Jurisdiction.
- .3 Protect existing site features and structures, trees, plants and foliage on site and adjacent properties.

Part 2 Products

2.1 EQUIPMENT

- .1 Not Used.

Part 3 Execution

3.1 PREPARATION

- .1 Verify extent and location of asphalt identified for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities, preserve active utilities traversing site in operating condition.
- .3 Prior to beginning removal operation, inspect and verify with NCC Representative areas, depths and lines of asphalt pavement to be removed.
- .4 Protection: protect existing pavement not designated for removal, light units and structures from damage. In event of damage, immediately replace or make repairs to approval of NCC Representative at no additional cost.

3.2 REMOVAL

- .1 Remove existing asphalt pavement (full depth and partial depth) to lines and grades established by NCC Representative on site .
- .2 Demolition of pavements, curbs and gutters:
 - .1 Square up adjacent surfaces to remain in place by saw cutting or other method acceptable to the NCC Representative on site .
 - .2 Protect underlying and adjacent granular materials where they are exposed and identified to remain.
 - .3 Prevent contamination with base course aggregates, when removing asphalt pavement for subsequent incorporation into hot mix asphalt concrete paving.
- .3 Use equipment and methods of removal and hauling which do not damage or disturb underlying pavement.
- .4 Prevent contamination of removed asphalt pavement by topsoil, underlying gravel or other materials.
- .5 Suppress dust generated by removal process.

3.3 FINISH TOLERANCES

- .1 Finished surfaces in areas where asphalt pavement has been removed to be within +/-5 mm of grade specified but not uniformly high or low. Positive grade to be maintained to ensure no ponding.

3.4 CLEANING

- .1 Cleaning: clean in accordance with Section 01 74 11- Cleaning .

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 02 41 13.13 Paving Removal

1.2 REFERENCE STANDARDS

- .1 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Sustainable Design Submittals:
 - .1 Erosion and Sedimentation Control: submit erosion and sedimentation control plan in accordance with EPA 832/R92-005 and authorities having jurisdiction.

1.4 SITE CONDITIONS

- .1 Take precautions to protect environment.
- .2 If material resembling spray or trowel-applied asbestos or other designated substance be encountered, stop work, take preventative measures, and notify NCC Representative immediately.
 - .1 Proceed only after receipt of written instructions have been received from NCC Representative.
- .3 Notify NCC Representative before disrupting building access or services.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 EXAMINATION

- .1 Inspect site with NCC Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.
- .4 Disconnect, cap, plug or divert, as required, existing public utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or

plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.

- .1 Immediately notify NCC Representative and utility company concerned in case of damage to any utility or service, designated to remain in place.
- .2 Immediately notify the NCC Representative should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

3.2 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to: that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.
- .2 Protection of In-Place Conditions:
 - .1 Prevent movement, settlement, or damage to adjacent landscaping features, structures, utilities to remain in place. Provide bracing and shoring required.
 - .2 Keep noise, dust, and inconvenience to occupants to minimum.
 - .3 Protect building systems, services and equipment.
 - .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
 - .5 Do Work in accordance with Section 01 35 29.06- Health and Safety Requirements.
- .3 Demolition/Removal:
 - .1 Remove items as indicated.
 - .2 Removal of Pavements, Curbs and Gutters:
 - .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by NCC Representative.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.
- .3 Waste Management: separate waste materials for recycling/reuse..
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

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END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 03 30 00 - Cast-in-Place Concrete
- .2 Section 32 16 15 - Concrete Walks, Curbs and Gutter.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Formwork materials:
 - .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121 CAN/CSA-O86.1 CSA O437 Series CSAO153.
 - .2 For concrete with special architectural features, use formwork materials to CAN/CSA-A23.1.
- .2 Tubular column forms: round, spirally wound laminated fiber forms, internally treated with release material.
- .3 Form release agent: non-toxic, biodegradable, low VOC.

PART 3 - EXECUTION

3.1 FABRICATION AND ERECTION

- .1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Obtain NCC Representative's approval for use of earth forms framing openings not indicated on drawings.
- .3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .4 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .5 Align form joints and make watertight. Keep form joints to minimum.
- .6 Clean formwork in accordance with CAN/CSA-A23.1 before placing concrete.

- .7 If slip forming is used, submit details of equipment and procedures for NCC Representative's approval.

3.2 REMOVAL AND RESHORING

- .1 Remove forms so that no damage occurs to the concrete.
- .2 Leave shores in place until concrete has attained sufficient strength to adequately support its own weight together with construction loads likely to be imposed.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 03 10 00 - Concrete Forming and Accessories.
- .2 Section 33 05 13 - Manholes and Catch Basin Structures.
- .3 Section 33 41 00 - Storm Utility Drains.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A5-93, Portland Cement.
 - .2 CAN/CSA-A23.1-94, Concrete Materials and Methods of Concrete Construction.
 - .3 CAN/CSA-A23.2-94, Methods of Test for Concrete.

1.3 CERTIFICATES

- .1 Submit certificates in accordance with Section 01 33 23 – Shop drawings, Product Data and Samples.
- .2 Minimum 2 weeks prior to starting concrete work submit to NCC Representative manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:
 - .1 Portland cement.
 - .2 Blended hydraulic cement.
 - .3 Supplementary cementing materials.
 - .4 Grout.
 - .5 Admixtures.
 - .6 Aggregates.
 - .7 Water.
 - .8 Waterstops.
 - .9 Waterstop joints.
 - .10 Joint filler.
- .3 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1.

- .4 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1.

1.4 QUALITY ASSURANCE

- .1 Minimum 2 weeks prior to starting concrete work, submit proposed quality control procedures for NCC Representative's approval for following items:
 - .1 Hot weather concrete.
 - .2 Cold weather concrete.
 - .3 Curing.
 - .4 Finishes.
 - .5 Joints.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Use trigger operated spray nozzles for water hoses.
- .2 Designate a cleaning area for tools to limit water use and runoff.
- .3 Carefully coordinate the specified concrete work with weather conditions.
- .4 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .5 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, noncombustible material and remove for disposal. Dispose of all waste in accordance with applicable local, provincial and national regulations.
- .6 Choose least harmful, appropriate cleaning method which will perform adequately.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Portland cement: to CAN/CSA-A5.
- .2 Supplementary cementing materials: to CAN/CSA-A23.5.
- .3 Water: to CAN/CSA-A23.1.
- .4 Aggregates: to CAN/CSA-A23.1. Coarse aggregates to be normal density.

- .5 Air entraining admixture: to ASTM C 260.
- .6 Chemical admixtures: to ASTM C 494. NCC Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.
- .7 Curing compound: to CAN/CSA-A23.1 white and to OPSD 1315.
- .8 Premoulded joint fillers:
 - .1 Bituminous impregnated fiber board: to ASTM D 1751.

2.2 MIXES

- .1 Proportion normal density concrete in accordance with CAN/CSA-A23.1, Alternative 1 to give the following :
 - .1 Cement: Type 10 Portland cement.
 - .2 Minimum compressive strength at 28 days: 30 MPa.
 - .3 Minimum cement content: 355 kg/m³ of concrete.
 - .4 Class of exposure: S-3 and C-2.
 - .5 Nominal size of coarse aggregate: 19 mm.
 - .6 Slump at time and point of discharge: 30 to 60 mm.
 - .7 Air content: 5.4 to 8.6% kg/m³.
- .2 Do not change concrete mix without prior revision by NCC Representative. Should change in material source be proposed, NCC Representative shall review the new mix design.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Obtain NCC Representative's approval before placing concrete. Provide 24 hours notice prior to placing of concrete.
- .2 Pumping of concrete is permitted only after approval of equipment and mix.
- .3 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .4 Prior to placing of concrete obtain NCC Representative's approval of proposed method for protection of concrete during placing and curing.
- .5 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

- .6 In locations where new concrete is dowelled to existing work, drill holes in existing concrete. Place steel dowels of deformed steel reinforcing bars and pack solidly with epoxy grout to anchor and hold dowels in positions as indicated.
- .7 Do not place load upon new concrete until authorized by NCC Representative.

3.2 CONSTRUCTION

- .1 Do cast-in-place concrete work in accordance with CAN/CSA-A23.1.
- .2 Joint fillers.
 - .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by NCC Representative. When more than one piece is required for a joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
 - .2 Locate and form expansion joints as indicated. Install joint filler.

3.3 FIELD QUALITY CONTROL

- .1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by NCC Representative.
- .2 Owner will pay for costs of tests.
- .3 NCC Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .4 Inspection or testing by NCC Representative will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

END OF SECTION

Part 1 General

1.1 PRICE AND PAYMENT PROCEDURES

- .1 Measurement and Payment:
 - .1 Measurement for supply, installation and painting of signboards will be based on individual unit .
 - .2 Measurement for supply, painting and installation of sign supports will be based on each complete sign installation.

1.2 REFERENCE STANDARDS

- .1 American Association of State Highway and Transportation Officials (AASHTO)
 - .1 Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, (5th Edition).
- .2 ASTM International
 - .1 ASTM A123/A123M-13 , Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A276-13a , Standard Specification for Stainless Steel Bars and Shapes.
 - .3 ASTM B209M-1] , Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate Metric .
 - .4 ASTM B210M-12 , Standard Specification for Aluminum-Alloy Drawn Seamless Tubes Metric .
 - .5 ASTM B211M-12ea , Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire Metric .
- .3 CSA Group (CSA)
 - .1 CSA G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .4 Canadian General Standards Board (CGSB)
 - .1 CGSB 62-GP-11M-78, Marking Material, Retro-reflective, Enclosed Lens, Adhesive Backing and Amendment.
- .5 Green Seal Environmental Standards (GS)
 - .1 GS-11-[11] , Paints and Coatings.
- .6 Transportation Association of Canada (TAC) Manual of Uniform Traffic Control Devices, Latest Edition (MUTCD).
- .7 Ontario Traffic Manual (OTM) Book 15, and Book 7.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures .
- .2 Product Data:

- .1 Submit manufacturer's instructions, printed product literature and data sheets for traffic signage, including product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions and 01 61 00- Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Sign supports:
 - .1 Steel posts: to CSA G40.21, 4 m long, flanged "U" shaped in cross section, measuring 65 mm wide x 30 mm deep. Metal thickness: 4.5 mm. Hot dipped galvanized: to ASTM A123/A123M
 - .2 Standard tubular supports for small signs: to ASTM B210M.
- .2 Signboards:
 - .1 Aluminum sheet: to ASTM B209M, precut to required dimensions.
 - .1 Thickness for signboards up to 750 mm wide: 1.6 mm minimum.
 - .2 Thickness for signboards 750-1200 mm wide: 2.1 mm minimum.
 - .3 Thickness for refurbishing existing sign panels: 1.0 mm minimum.
 - .2 Aluminum extrusions: to ASTM B211M, 150 mm or 300 mm panels suitable for bolting together.
 - .3 T-shape stiffeners for signboards: to ASTM B210M.
 - .4 Connecting straps and brackets: to ASTM B209M.
 - .5 Aluminum materials: to ASTM B209M.
 - .6 Primer for aluminum: to MPI # 8 , VOC limit of 250 g/L to GS-11 .
 - .7 Silk screen ink:
 - .1 Transparent or opaque colours: selected by NCC , or as indicated.
 - .8 Reflective sheeting and tape: to CGSB 62-GP-11M. Adhesive, class of reflectivity and colour as indicated.
 - .9 Transparent tape: flexible, smooth-surfaced, moisture resistant tape with pressure sensitive adhesive.
 - .10 Clear varnish protective coat: MPI-EXT 6.4H VOC limit of 350 g/L SCAQMD Rule 1113 .

2.2 FABRICATION

- .1 Supports:
 - .1 Connect aluminum support members by welding in accordance with CSA W47.2. Work to be performed by Canadian Welding Bureau qualified members only. Flame cutting of members not permitted.
 - .2 Welds to be of same strength as adjacent member or casting.
 - .3 Reinforce in area of electrical hand holes to equal strength of full section member.
 - .4 Remove sharp edges and burrs.
- .2 Signboards:
 - .1 Aluminum blanks:
 - .1 Degrease, etch and bonderize with chemical conversion coating.
 - .2 Clean surfaces with xylene thinner. Dry.
 - .3 For non-reflective signs, spray face with one coat vinyl pretreatment coating and two finish coats of required colour.
 - .4 For aluminum signboards that are to be painted before installation, spray and bake face of signboards with two coats of enamel in accordance with MPI-EXT 5.4A.
 - .2 Reflective background sheeting and lettering:
 - .1 Cut and apply in accordance with manufacturer's instructions.
 - .2 Clean and protect surface in accordance with manufacturer's instructions.
 - .3 Non-reflective lettering and symbols: cut from vinyl film as specified in CGSB
- .3 Sign identification:
 - .1 Apply sign number and date of installation with 25 mm high [stencil painted] black letters on lower left back face of each signboard.

Part 3 Execution

3.1 INSTALLATION

- .1 Sign support:
 - .1 Erect supports as indicated. Permissible tolerance: 50 mm maximum departure from vertical for direct buried supports. Where separate concrete footings have been placed, erect posts with base plates resting on levelling nuts and restrained with nuts and washers. Permissible tolerance: 12]mm maximum departure from vertical.
 - .2 Coat underside of base plate with corrosion protective paint before installation. Connect shoe base to shaft with inside and outside fillet welds.
 - .3 Close open aluminum tubes and posts with aluminum cap. Cut oblong holes in shoe bases to drain condensation. Install aluminum bolt cover on each base plate restraining nut.
 - .4 Erect posts plumb and square to details as indicated.

- .5 Single channel steel posts:
 - .1 Drive to required depth without damage to posts.
 - .2 If rock or concrete is encountered, drill hole to required depth and set post in sand.
 - .3 In finished concrete surfaces, backfill with concrete or grout. Protect from adverse conditions until cured.
- .2 Signboard:
 - .1 Fasten signboards to supporting posts and brackets as indicated.
 - .2 Fasten lane markers to signboard.
 - .3 Use strapping with crimped or bolted connections where signs fastened to utility poles.
 - .4 Use T-shape aluminum stiffeners to join portions of sign panel on site. Cover face of T-stiffener with material identical to face of sign panel.

3.2 CORRECTING DEFECTS

- .1 Correct defects, identified by NCC, in sign message, consistency of reflectivity, colour or illumination. Correct angle of signboard and adjust luminaire aiming angle for optimum performance during night conditions to approval of NCC.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning .
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning .

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by traffic signage installation and salvage operations.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 CSA Group
 - .1 CSA C22.1-18, Canadian Electrical Code, Part 1 (24th Edition), Safety Standard for Electrical Installations.
 - .2 CAN3-C235-83(R2015), Preferred Voltage Levels for AC Systems, 0 to 50,000 V.
- .2 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)
 - .1 IEEE SP1122-2000, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.
- .3 Ontario Provincial Standards
 - .1 Ontario Electrical Safety Code (OESC) 2018, 27th Edition, and Electrical Safety Authority Bulletins.

1.2 DEFINITIONS

- .1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE SP1122.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for materials and equipment including product characteristics, performance criteria, physical size, finish and limitations. The below are some equipment required:
 - .1 Precast concrete foundations for Lighting poles;
 - .2 Precast concrete foundations for Pedestrian Crossover poles;
 - .3 Lighting poles and fixtures;
 - .4 Pedestrian crossover poles and accessorises
- .3 Shop drawings:
 - .1 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure co-ordinated installation.
 - .2 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.
 - .3 Indicate of drawings clearances for operation, maintenance, and replacement of operating equipment devices.
- .4 Certificates:

- .1 Provide CSA certified equipment.
- .2 Submit test results of installed electrical systems and instrumentation.
- .3 Permits and fees: in accordance with General Conditions of contract.
- .4 Submit certificate of acceptance from authority having jurisdiction upon completion of Work.
- .5 Manufacturer's Field Reports: submit to Departmental Representative manufacturer's written report, within 3 days of review, verifying compliance of Work and electrical system and instrumentation testing, as described in PART 3 - FIELD QUALITY CONTROL.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for equipment for incorporation into manual.
 - .1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.
 - .2 Operating instructions to include following:
 - .1 Wiring diagrams and control sequence for each principal system and item of equipment.
 - .2 Start up, proper adjustment, operating, and shutdown procedures.
 - .3 Safety precautions.
 - .4 Procedures to be followed in event of equipment failure.
 - .5 Other items of instruction as recommended by manufacturer of each system or item of equipment.
 - .3 Post instructions where directed.
 - .4 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.
 - .5 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .3 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .4 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 DESIGN REQUIREMENTS

- .1 Operating voltages: to CAN3-C235.
- .2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
 - .1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.
- .3 Language operating requirements: provide identification labels for control items in French and English.

2.2 MATERIALS AND EQUIPMENT

- .1 Provide material and equipment in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Material and equipment to be CSA certified.
- .3 Factory assemble control panels and component assemblies.

2.3 ELECTRIC MOTORS, EQUIPMENT AND CONTROLS

- .1 Verify installation and co-ordination responsibilities related to motors, equipment and controls, as indicated.

2.4 WARNING SIGNS

- .1 Warning Signs: in accordance with requirements of Departmental Representative

2.5 WIRING TERMINATIONS

- .1 Ensure lugs, terminals, screws used for termination of wiring are suitable for copper conductors.

2.6 EQUIPMENT IDENTIFICATION

- .1 Identify electrical equipment with nameplates as follows:
 - .1 Nameplates: lamicoïd 3 mm thick plastic engraving sheet, black face, white core, lettering accurately aligned and engraved into core mechanically attached with self tapping screws.
 - .2 Sizes as follows:

NAMEPLATE SIZES			
Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

- .2 Wording on labels to be approved by Departmental Representative prior to manufacture.

- .3 Allow for minimum of twenty-five (25) letters per nameplate.
- .4 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.
- .5 Identify equipment with Size 3 labels engraved; as directed by Departmental Representative.
- .6 Disconnects, starters and contactors: indicate equipment being controlled and voltage.
- .7 Terminal cabinets and pull boxes: indicate system and voltage.

2.7 WIRING IDENTIFICATION

- .1 Identify wiring with permanent indelible identifying markings, coloured plastic tapes numbered, on both ends of phase conductors of feeders and branch circuit wiring.
- .2 Maintain phase sequence and colour coding throughout.
- .3 Colour coding: to CSA C22.1.
- .4 Use colour coded wires in communication cables, matched throughout system.

2.8 CONDUIT AND CABLE IDENTIFICATION

- .1 Colour code conduits, boxes and metallic sheathed cables.
- .2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15m intervals.
- .3 Colours: 25mm wide prime colour and 20mm wide auxiliary colour.

Type	Prime	Auxiliary
up to 250 V	Yellow	
Other Communication Systems	Green	Blue

2.9 FINISHES

- .1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.
 - .1 Paint outdoor electrical equipment as directed by Departmental Representative.
 - .2 Paint indoor switchgear and distribution enclosures as directed by Departmental Representative.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative and Consultant.
 - .2 Inform Consultant of unacceptable conditions immediately upon discovery.

- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative and Consultant.

3.2 INSTALLATION

- .1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.
- .2 Do overhead and underground systems in accordance with CAN/CSA-C22.3 No.1 except where specified otherwise.

3.3 NAMEPLATES AND LABELS

- .1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.4 CONDUIT AND CABLE INSTALLATION

- .1 Install conduit and sleeves prior to pouring of concrete.
 - .1 Sleeves through concrete: plastic sized for free passage of conduit, and protruding 50mm.
- .2 If plastic sleeves are used in fire rated walls or floors, remove before conduit installation.
- .3 Install cables, conduits and fittings embedded or plastered over, close to building structure so furring can be kept to minimum.

3.5 MOUNTING HEIGHTS

- .1 Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.
- .2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.

3.6 CO-ORDINATION OF PROTECTIVE DEVICES

- .1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.

3.7 FIELD QUALITY CONTROL

- .1 Load Balance:
 - .1 Measure phase current to panelboards with normal loads (lighting) operating at time of acceptance; adjust branch circuit connections as required to obtain best balance of current between phases and record changes.
 - .2 Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment.
 - .3 Provide upon completion of work, load balance report as directed in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS, phase and neutral currents on panelboards, dry-core transformers and motor control centres, operating under normal load, as well as hour and date on which each load was measured, and voltage at time of test.

- .2 Conduct following tests in accordance with Section 01 45 00 - Quality Control.
 - .1 Power distribution system including phasing, voltage, grounding and load balancing.
 - .2 Circuits originating from branch distribution panels.
 - .3 Insulation resistance testing:
 - .1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
 - .2 Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument.
 - .3 Check resistance to ground before energizing.
- .3 Carry out tests in presence of Departmental Representative and Consultant.
- .4 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
- .5 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
 - .2 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.

3.8 SYSTEM STARTUP

- .1 Instruct Departmental Representative in operation, care and maintenance of systems, system equipment and components.
- .2 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.
- .3 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with aspects of its care and operation.

3.9 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

END OF SECTION

Part 1 General

1.1 PRODUCT DATA

- .1 Provide product data in accordance with Section 01 33 00 - Submittal Procedures.

1.2 DELIVERY, STORAGE AND HANDLING

- .1 Packaging Waste Management: remove in accordance with Section 01 74 19 - Waste Management and Disposal.

Part 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 600V insulation of cross-linked thermosetting polyethylene material rated RW90 XLPE, Jacketted.

Part 3 Execution

3.1 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform tests before energizing electrical system.

3.2 GENERAL CABLE INSTALLATION

- .1 Install cable in trenches in accordance with Section 26 05 43.01 – Installation of Cables in Trenches and in Ducts.
- .2 Terminate cables in accordance with Section 26 05 22 - Connectors and Terminations.
- .3 Cable Colour Coding: to Section 26 05 00 - Common Work Results for Electrical.
- .4 Conductor length for parallel feeders to be identical.
- .5 Lace or clip groups of feeder cables at distribution centres, pull boxes, and termination points.
- .6 Provide numbered wire collars for control wiring. Numbers to correspond to control shop drawing legend. Obtain wiring diagram for control wiring.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 CSA Group
 - .1 CSA C22.1-18, Canadian Electrical Code, Part 1 (24th Edition), Safety Standard for Electrical Installations.
 - .2 CSA C22.2 No.41-13, Grounding and Bonding Equipment (Tri-National Standard, with NMX-J-590ANCE and UL 467).
 - .3 CSA C22.2 No.65-13, Wire connectors (Tri-National Standard, with UL 486A-486B NMX-J-543-ANCE).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for connectors and terminations and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for connectors and terminations for incorporation into manual.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 CONNECTORS AND TERMINATIONS

- .1 Copper long barrel compression connectors to CSA C22.2 No.65 as required sized for conductors.

Part 3 Execution

3.1 INSTALLATION

- .1 Install terminations in accordance with manufacturer's instructions.
- .2 Bond and ground as required to CSA C22.2 No.41.

3.2 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE)
 - .1 ANSI/IEEE 837-02, IEEE Standard for Qualifying Permanent Connections Used in Substation Grounding.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for grounding equipment and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for grounding equipment for incorporation into manual.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect grounding equipment from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 EQUIPMENT

- .1 Rod electrodes: 19 copper clad steel or galvanized steel mm diameter by minimum 3 m long.
- .2 Grounding conductors: bare stranded copper, size as indicated.
- .3 Insulated grounding conductors: green, copper conductors, 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.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for grounding equipment installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative and Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION GENERAL

- .1 Install complete permanent, continuous grounding system including, electrodes, conductors, connectors, accessories.
- .2 Install connectors in accordance with manufacturer's instructions.
- .3 Protect exposed grounding conductors from mechanical injury.
- .4 Make buried connections, and connections electrodes, using permanent mechanical connectors or inspectable wrought copper compression connectors to ANSI/IEEE 837.
- .5 Use mechanical connectors for grounding connections to equipment provided with lugs.
- .6 Soldered joints not permitted.
- .7 Install separate ground conductor to outdoor lighting standards.

3.3 ELECTRODES

- .1 Install rod, electrodes and make grounding connections as indicated.
- .2 Bond separate, multiple electrodes together.
- .3 Make special provision for installing electrodes that will give acceptable resistance to ground value where rock or sand terrain prevails. Ground as indicated.

3.4 EQUIPMENT GROUNDING

- .1 Install grounding connections to typical equipment included in, but not necessarily limited to following list. Service equipment, duct systems, distribution panels, and outdoor lighting.

3.5 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform ground continuity and resistance tests using method appropriate to site conditions and to approval of local authority having jurisdiction over installation.
- .3 Perform tests before energizing electrical system.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 CSA Group (CSA)
 - .1 CAN/CSA C22.2 No. 18-98, Outlet Boxes, Conduit Boxes, and Fittings and Associated Hardware.
 - .2 CSA C22.2 No. 83-M1985(R1999), Electrical Metallic Tubing.
CSA C22.2 No. 211.2-M1984(R1999), Rigid PVC (Unplasticized) Conduit.

Part 2 Products

2.1 CONDUITS

- .1 Electrical metallic tubing (EMT): to CSA C22.2 No. 83, with couplings.
- .2 Rigid pvc conduit: to CSA C22.2 No. 211.2.
- .3 Flexible metal conduit: to CSA C22.2 No. 56, liquid-tight flexible metal.

2.2 CONDUIT FASTENINGS

- .1 One-hole malleable iron straps to secure surface conduits 50 mm and smaller.
 - .1 Two-hole steel straps for conduits larger than 50 mm.
- .2 Channel type supports for two or more conduits at 1 m on centre.
- .3 Threaded rods, 6 mm diameter, to support suspended channels.

2.3 CONDUIT FITTINGS

- .1 Fittings: to CAN/CSA C22.2 No. 18.3, manufactured for use with conduit specified.
Coating: same as conduit.
- .2 Ensure factory "ells" where 90 degrees bends for 25 mm and larger conduits.
- .3 Set-screws acceptable for EMT; use watertight connectors and couplings where required.

2.4 EXPANSION FITTINGS FOR RIGID CONDUIT

- .1 Weatherproof expansion fittings with internal bonding assembly suitable for 100 mm linear expansion.
- .2 Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection.
- .3 Weatherproof expansion fittings for linear expansion at entry to panel.

2.5 FISH CORD

- .1 Polypropylene.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

- .1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.
- .2 Surface mount conduits except where otherwise noted.
- .3 Bend conduit cold. Replace conduit if kinked or flattened more than 1/10th of its original diameter.
- .4 Mechanically bend steel conduit over 19 mm dia.
- .5 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.
- .6 Install fish cord in empty conduits.
- .7 Seal conduits where entering into buildings from underground conduit systems to block entrance of moisture and gases.
- .8 Remove and replace blocked conduit sections. Do not use liquids to clean out conduits.
- .9 Dry conduits out before installing wire.

3.3 SURFACE CONDUITS

- .1 Group conduits wherever possible.
- .2 Do not pass conduits through structural members except as indicated.
- .3 Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.

3.4 CONDUITS UNDERGROUND

- .1 Slope conduits to provide drainage.
- .2 Waterproof joints with heavy coat of bituminous paint.

3.5 CLEANING

- .1 Proceed in accordance with Section 01 74 00 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 CSA Group (CSA)
 - .1 CSA C22.1-18, Canadian Electrical Code, Part 1 (24th Edition), Safety Standard for Electrical Installations.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for cables and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 CABLE PROTECTION

- .1 53mm x 203mm planks pressure treated with clear or copper naphthenate or 5% pentachlorophenol solution, water repellent preservative.

2.2 MARKERS

- .1 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.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for cable installation in accordance with manufacturer's written instructions.

- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been.

3.2 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 are properly terminated, seal ends of lead covered cables 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.

3.3 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 Lay concrete markers flat and centred over cable with top flush with finish grade.

3.4 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform tests using qualified personnel.
 - .1 Include necessary instruments and equipment.
- .3 Check phase rotation and identify each phase conductor of each feeder.
- .4 Check each feeder for continuity, short circuits and grounds.
 - .1 Ensure resistance to ground of circuits is not less than 50 megohms.
- .5 Pre-acceptance tests:
 - .1 After installing cable but before splicing and terminating, perform insulation resistance test with 1000 V megger on each phase conductor.
 - .2 Check insulation resistance after each splice and/or termination to ensure that cable system is ready for acceptance testing.
- .6 Acceptance Tests:
 - .1 Ensure that terminations and accessory equipment are disconnected.

- .2 Ground shields, ground wires, metallic armour and conductors not under test.
- .7 Provide Consultant and Departmental Representative with list of test results showing location at which each test was made, circuit tested and result of each test.
- .8 Remove and replace entire length of cable if cable fails to meet any of test criteria.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

3.6 PROTECTION

- .1 Repair damage to adjacent materials caused by cables installation.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 CSA Group (CSA)
 - .1 CSA C22.2 No. 5-09, Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures (Tri-national standard with UL 489, and NMX-J-266-ANCE-2010).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for circuit breakers and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Certificates:
 - .1 Production certificate of origin must contain:
 - .1 Manufacturer's name and address and person responsible for authentication. Person responsible must sign and date certificate.
 - .2 Licensed dealer's name and address and person of distributor responsible for Contractor's account.
 - .3 Contractor's name and address and person responsible for project.
 - .4 Local manufacturer's representative name and address. Local manufacturer's representative must sign and date certificate.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store circuit breakers in dry location and in accordance with manufacturer's recommendations in clean, well-ventilated area.
 - .2 Store and protect circuit breakers from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 BREAKERS GENERAL

- .1 Circuit breakers to CSA C22.2 No. 5

- .2 Moulded case circuit breaker: match existing panel breakers.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative and Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

- .1 Install circuit breakers as indicated.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 CSA Group
 - .1 CAN/CSA-A14-07 (R2012), Concrete Poles.
 - .2 CSA C22.2 No.206-13, Lighting Poles.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for parking lot lighting and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect parking lot lighting from damage.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 CONCRETE POLES

- .1 Concrete poles for light standards 1 and 2 to be supplied and paid for by NCC. Contractor to coordinate delivery and storage of poles with NCC representative.
- .2 Concrete poles to be installed by contractor. Concrete pole base to be completed by contractor.
- .3 Concrete poles: As per NCC 660.4.1 tapered, finish plain grey, designed for underground wiring.
 - .1 Base mounting type. With cast in place concrete base as per NCC 660.4.2.
 - .2 3050mm long.
 - .3 Access hand hole 500 mm above pole bottom for wiring connections, with reinforcing frame and cover.

- .4 Grounding lug for wire size #6AWG.

2.2 LUMINAIRE MOUNTING BRACKETS

- .1 Mounting brackets aluminum for specified luminaires:
 - .1 Pole adapter bracket, pipe extension, support bracket, and extension arm as per NCC 660.5 series drawings.
 - .2 Arm extension length: 1524mm.
 - .3 Pipe extension length: 3632mm.

2.3 LUMINAIRES

- .1 Luminaire to be supplied and paid for by NCC. Contractor to coordinate delivery and storage of luminaire with NCC representative.
- .2 Luminaires to be installed by contractor.
- .3 Luminaire with cast aluminum weatherproof housing and:
 - .1 As per luminaire schedule.
 - .2 Light Distribution:
 - .1 IES distribution Type III.

2.4 PXO

- .1 Rectangular Rapid Flashing Beacons
 - .1 Pedestrian-activated, high-intensity flashing beacons, consisting of two rectangular yellow indications with two tell-tale end indicators to denote that the beacon is flashing.
 - .2 Must be activated manually by pushbuttons and are to flash in a rapid pattern for a pre-set time.
 - .3 All RRFB's supplied through this tender must be compliant with The Ontario Traffic Manual (OTM) Book 15 (January 2015 Draft Update) applications and requirements and in compliance with all certifications as may be required by law.
 - .4 RFB units shall consist of a solar panel with rechargeable battery. Cold weather upgrades to battery shall be selected where available.
 - .5 RRFB units shall consist of the RRFB and associated beacons, signage, enclosure, wiring, and a push button for activation.
 - .6 RRFB units shall be installed in accordance with the manufacturers installation requirements. The contractor is required to drill/cut the poles as may be required to enable installation.
 - .7 RRFB units shall be installed in accordance with the manufacturers installation requirements. The contractor is required to drill/cut the poles as may be required to enable installation.
 - .8 All RRFB enclosures (and controller/battery cabinet if applicable) shall be powder coated aluminum and shall be weather tight, secure and vandal resistant.
 - .9 The enclosure in which the RRFB's are mounted must be yellow. The yellow colour must be similar to that used on warning signs in the Province of Ontario.
 - .10 All enclosures/cabinets shall have a minimum 5 year corrosion damage warranty.

- .2 Indicators
 - .1 RRFB unit shall be single-sided and provide two LED rectangular-shaped amber indications facing outward toward on-coming traffic.
 - .2 LED indication shall be a minimum of 125mm wide by 50mm high. The two RRFB indications shall be aligned horizontally, with the longer dimension horizontal and with a minimum space between the two indications of 175 mm, measured from inside edge of one indication to the inside edge of the other indication.
 - .3 The RRFB units shall provide a minimum of 20 degrees horizontal pivot. When set the RRFB angle shall remain securely in place.
 - .4 RRFB units shall provide two yellow LED tell-tale end indicators, one facing inward toward the crossover the other facing outward. Each tell-tale indicator shall be a minimum of 5sq.cm.
- .3 Power Requirements
 - .1 RRFB units shall be powered by a rechargeable battery(s) and the battery(s) shall be recharged by solar panel.
 - .2 The power supply must be capable of operating the RRFB unit (from full charge) for a minimum of 20 days without re-charging at an average usage rate of 200 cycles per day at 25 seconds of activation/per cycle.
 - .3 The solar panel and battery(s) must be of sufficient size and capacity to provide the necessary power as recommended by the manufacture to achieve the rated usage as installed where installed in Ottawa, Ontario, Canada.
 - .4 The battery(s) shall be UL certified and field replaceable.
 - .5 The solar panel must be capable of being securely installed on the side of Standard City of Ottawa poles J-6-47 and J-6-49 that the RRFB are mounted on.
 - .6 All brackets and hardware required to mount the solar panels must be supplied with the unit. All brackets and mounting hardware are to be corrosion resistant. Brackets and mounting hardware must be supplied to enable 12 side-of-pole installations and 20 top-of-pole installations.
 - .7 All wiring connections in the RRFB unit components must be capable of being easily installed within the poles specified. All wiring and connections shall be weather tight, secure and vandal resistant.
 - .8 RRFB units must be capable of being connected directly to 120 volt AC power or to be capable of being modified to provide a direct AC connection. In the case where the supplied unit does not provide a direct AC connection an “AC modification package” must be available from the manufacturer which would enable the unit to accept a direct AC connection. The “modification package” must be easily field installable.
 - .9 The power supply including battery and solar panel and all other components must be capable of operating at temperatures between -40°C and +40°C. Any upgrades to the power supply or other components recommended by the manufacturer required to ensure the unit operates at its rated usage, within this temperature range are to be included.
- .4 Push Button

- .1 The unit is to be supplied with an accessible push button for pedestrians to activate the RRFB's. The push button is to be yellow and must be capable of being mounted on the same pole that the RRFB is mounted. Brackets and mounting hardware to attach the pushbutton to the poles specified must be supplied.
- .2 The pushbutton shall have two-tone audible confirmation.
- .5 Operations
 - .1 When activated by the push button, the two yellow indications in each RRFB unit shall flash in a rapidly alternating "wig-wag" flashing sequence (left light on, then right light on) with a duty cycle of 800 milliseconds (ms). The left LED flashes two times in a slow volley each time it is energized (125 ms on and 75 ms off per flash). This is followed by the right LED, which flashes four times in a rapid volley when energized (25 ms on and 25 ms off per flash) and then has a longer flash for 200 ms. The effect is known as a "stutter flash effect" and is compliant with Manual on Uniform Traffic Control Devices (MUTCD) RRFB flash pattern 2/4-1 (2012).
 - .2 The unit's flash pattern shall be capable of being easily set in the field through manual means (switch, dial, etc.).
 - .3 When the RRFB is flashing the two tell-tale end indicators on the unit shall be on, otherwise they are to be off.
 - .4 The time lapse between the push button activation and start of the RRFB flashing should be less than 1 second and in no case more than 3 seconds.
 - .5 If a pedestrian pushes the button midway through a flashing cycle the unit is to reset the RRFB flash duration for another full cycle.
 - .6 The flash rate of each individual yellow indication, as applied over the full on-off sequence of a flashing period of the indication, shall not be between 5 and 30 flashes per second.
 - .7 The flash duration cycle of the RRFB must be variable. The flash duration cycle must be capable of being set (in 5 seconds increments) for a minimum of 5 seconds up to 60 seconds.
 - .8 Generally, more than one RRFB unit is installed at a PXO. The operation of these units must be synchronized to enable the activation of one RRFB unit to automatically activate up to four additional RRFBs.
 - .9 The communication "channel" for the RRFB to be synchronize with other RRFB units, at that location, and shall be capable of being easily set in the field through manual means (switch, dial, etc.).
 - .10 Communication enabling the synchronization of the RRFB units shall be wireless and must operate within a line-of-sight minimum distance of 350m.
 - .11 Communication between RRFB units to enable synchronized activation must be secure and designed to avoid interference between multiple locations or other electrical devices.
 - .12 The RRFB units must provide a night time auto brightness feature. This feature must be capable of being turned off.
 - .13 The RRFB unit shall provide a visual indicator of substandard operating condition.

- .6 Poles
 - .1 Poles and mast arms to be fabricated from 6063-T4 seamless spun aluminum tube, heat treated to T6 temper after welding. Poles shall be designed for mounting on standard City of Ottawa concrete base foundations and provided with all the necessary equipment and accessories required to allow installation of the specified post mounted Rectangular Rapid Flashing Beacons (RRFB).
 - .2 Standard poles, mast arms, brackets and accessories shall be powder coated and painted black to City standards.
 - .3 Mast Arm poles to be as per City Standard J-6-47, with a length of 6.1m (20ft), a thickness of 0.25", and outside diameter of 10.0" at base and 6.625" at top.
 - .4 Tubular poles to be as per City Standard J-6-49, with a length of 5.9m (19ft – 6in), thickness of 0.25", and outside diameter of 6.0" at base and 4.0" at top.
 - .5 Mast arm to be as per City Standard J-6-47, with length as specified on the contract drawings, a thickness of 0.25", and outside diameter (OD) of 6.0" at clamp assembly end and shall taper to 2-7/8" OD at the small end. A 4" long tenon, 2-3/8" OD, shall be welded at the small end.
 - .6 Each pole to be provided with a cast or fabricated aluminum pole cap, fitted and secured to the top of the pole prior to delivery.
 - .7 Contractor to supply all hardware (clamp assemblies, plates, bolt, nut etc.) to City of Ottawa specifications.
- .7 Warranty and Maintenance
 - .1 A five (5) year written warranty is to be provided for workmanship and materials.
 - .2 The RRFB enclosure and controller cabinet (if applicable) shall have a five (5) year written corrosion damage warranty.
 - .3 Parts covered by warranty must be available within twenty (20) calendar days. The supplier shall be responsible for all delivery costs including those for the return of defective components as may be required.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for roadway lighting installation in accordance with manufacturer's written instructions.
 - .1 Inform Consultant and Departmental Representative of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

- .1 Install poles true and plumb, complete with brackets in accordance with manufacturer's instructions.
- .2 Install luminaires on pole and install lamps.
- .3 Check luminaire orientation, level and tilt.

- .4 Connect luminaire to lighting circuit.
- .5 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM D698-[07e1], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).
- .2 CSA International
 - .1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CSA A3000-08, Cementitious Materials Compendium.
- .3 Ontario Provincial Standard Specifications (OPSS)/Ontario Ministry of Transportation
 - .1 OPSS 1004-05, Material Specification for Aggregates - Miscellaneous.
 - .2 OPSS 1010-05, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Co-ordination: arrange with authority having jurisdiction for relocation of buried services that interfere with execution of work.
 - .1 Pay costs of relocating services.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Site Quality Control Submittals: submit in accordance with Section 01 45 00- Quality Control.
 - .1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article.
 - .2 Submit testing results as described in PART 3 - FIELD QUALITY CONTROL.

Part 2 Products

2.1 MATERIALS

- .1 Granular B Type II, Granular A, Select Subgrade to OPSS 1010. Sand to OPSS 1004.
- .2 Unshrinkable fill: proportioned and mixed to provide:
 - .1 Maximum compressive strength of 0.4MPa at 28 days.
 - .2 Maximum Portland cement content of 25kg/m³.
 - .3 Minimum strength of 0.07MPa at 24 hours.
 - .4 Concrete aggregates: to CSA A23.1/A23.2.
 - .5 Cement: to CSA A3000, Type GU.

- .6 Slump: 160 to 200mm.

Part 3 Execution

3.1 EXAMINATION

- .1 Evaluation and Assessment:
 - .1 Examine soil report available on request of NCC Representative.
 - .2 Before commencing work verify locations of buried services on and adjacent to site.

3.2 PREPARATION

- .1 Temporary erosion and sedimentation control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .2 Protection of in-place conditions:
 - .1 Protect excavations from freezing.
 - .2 Keep excavations clean, free of standing water, and loose soil.
 - .3 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
 - .4 Protect buried services that are required to remain undisturbed.

3.3 EXCAVATION

- .1 Shore and brace excavations, protect slopes and banks and perform work in accordance with Provincial or Municipal regulations whichever is more stringent.
- .2 Excavate as required to carry out work.
 - .1 Do not disturb soil or rock below bearing surfaces.
 - .2 Notify NCC Representative when excavations are complete.
 - .3 If bearings are unsatisfactory, additional excavation will be authorized in writing and paid for as additional work.
 - .4 Excavation taken below depths shown without NCC Representative's written authorization to be filled with concrete of same strength as for footings at Contractor's expense.
- .3 Excavate trenches to provide uniform continuous bearing and support for 150mm thickness of pipe bedding material on solid and undisturbed ground.

- .1 Trench widths below point 150mm above pipe not to exceed diameter of pipe plus 600 mm.
- .4 Excavate for slabs and paving to subgrade levels.
 - .1 In addition, remove all topsoil, organic matter, debris and other loose and harmful matter encountered at subgrade level.

3.4 FIELD QUALITY CONTROL

- .1 Contractor is responsible for Quality Control Testing of materials, compaction of backfill and fill. Testing laboratory to designated by Contractor. All costs with completing testing and providing copy of results to NCC Representative to be paid by Contractor.
- .2 Not later than 1 week minimum before backfilling or filling, submit to NCC Representative name of designated testing agency, sample testing results of backfill.
- .3 Do not begin backfilling or filling operations until material results have been reviewed by NCC Representative.
- .4 Contractor to complete compaction tests by approved testing agency.

3.5 BACKFILLING

- .1 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.
- .2 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.
- .3 Compaction of subgrade: compact existing subgrade under walks, paving, and slabs on grade, to same compaction as fill.
 - .1 Fill excavated areas with selected subgrade material compacted as specified for fill.
- .4 Placing:
 - .1 Place backfill, fill and base course material in 150 mm lifts: add water as required to achieve specified density.
- .5 Compaction: compact each layer of material to following densities for material to ASTM D698:
 - .1 To underside of base courses: 98%.
 - .2 Base courses: 100%.
 - .3 Elsewhere: 95%.
- .6 In trenches:
 - .1 Up to 300 mm above conduit: sand placed by hand.
 - .2 Up to 300 mm above pipe: Granular A placed by hand.
 - .3 Over 300 mm above pipe or conduit: native material approved by NCC Representative. Excavated bedrock is suitable for reuse as trench backfill in the lower portion of the trench where the excavation is in rock (i.e. where the trench sidewalls are formed within rock) provided the excavated rock has no particles

greater than 300 mm in diameter. The rock fill can only be placed above the pipe (with a minimum of 300 mm of cover material over the pipe) to minimize the risk of damage due to impact or point loads. A geotextile liner or a 300 mm thick 'choking' layer of Granular B Type II materials must be placed over the top of the rockfill prior to placing the overlying materials. Terrafix 270R or equivalent would be a suitable choice for a geotextile liner.

3.6 GRADING

- .1 Grade so that water will drain away from buildings, walls and paved areas, to catch basins and other disposal areas approved by NCC Representative.
 - .1 Grade to be gradual between finished spot elevations shown on drawings.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 32 91 19.13 – Topsoil Placement and Grading

1.2 REFERENCE STANDARDS

- .1 Ontario Provincial Standard Specification:
 - .1 OPSS 314, Untreated Granular Subbase, Base, Surface, Shoulder and Stockpiling.
 - .2 OPSS 1004, Aggregates - Miscellaneous.
 - .3 OPSS 1010, Aggregates - Base, Subbase Select Subgrade, and Backfill Material.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for aggregate materials and include product characteristics, performance criteria, physical size, finish and limitations, if requested by NCC Representative.
- .3 Samples:
 - .1 Submit test results for granular and sand gradation in accordance with Section 01 33 00 - Submittal Procedures.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.

Part 2 Products

2.1 MATERIALS

- .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.
- .2 Topsoil:
 - .1 All topsoil shall be supplied by the Contractor and satisfy the requirements of Section 32 91 19.13.
- .3 Granulars:
 - .1 Granular A per OPSS 1010.
 - .2 Granular B Type II per OPSS 1010.

- .4 Sand:
 - .1 Conforming to the gradation requirements of mortar sand per OPSS 1004.

2.2 SOURCE QUALITY CONTROL

- .1 Inform NCC Representative of proposed source of aggregates, provide test results and provide access for sampling.
- .2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate alternative source.
- .3 Advise NCC Representative 2 weeks minimum in advance of proposed change of material source.
- .4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

Part 3 Execution

3.1 PREPARATION

- .1 Processing:
 - .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
 - .2 Blend aggregates, as required, including reclaimed materials that meet physical requirements of specification is permitted in order to satisfy gradation requirements for material and, percentage of crushed particles, or particle shapes specified.
- .2 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.
- .3 Stockpiling:
 - .1 Stockpile aggregates on site in locations as allowed by NCC Representative. Do not stockpile on completed pavement surfaces unless allowed by NCC Representative.
 - .2 Stockpile aggregates in sufficient quantities to meet project schedules.
 - .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
 - .4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300mm of pile into Work.
 - .5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.

- .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by NCC Representative within 48 hours of rejection.
- .7 Stockpile materials in uniform layers of thickness as follows:
 - .1 Maximum 1.5m for coarse aggregate and base course materials.
 - .2 Maximum 1.5m for fine aggregate and sub-base materials.
 - .3 Maximum 1.5m for other materials.
- .8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
- .9 Do not cone piles or spill material over edges of piles.
- .10 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.2 CLEANING

- .1 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities:
 Developing Pollution Prevention Plans and Best Management Practices.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 STRIPPING OF TOPSOIL

- .1 Ensure that procedures are conducted in accordance with applicable Provincial requirements.
- .2 Remove topsoil before construction procedures commence to avoid compaction of topsoil.
- .3 Handle topsoil only when it is dry and warm.
- .4 Remove vegetation from targeted areas by non-chemical means and dispose of stripped vegetation by alternative disposal.
- .5 Strip topsoil to depths as directed by NCC Representative.
 - .1 Avoid mixing topsoil with subsoil.
- .6 Dispose of unused topsoil off-site.

3.3 CLEANING

- .1 Proceed in accordance with Section 01 74 11- Cleaning.

- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 23 33 – Excavation, Trenching and Backfilling.
- .2 Section 32 12 16 – Asphalt Paving.

1.2 PROTECTION

- .1 Protect existing fencing, trees, landscaping, natural features, bench marks, buildings, pavement, surface or underground utility lines which are to remain. If damaged, restore to original or better condition unless directed otherwise by NCC Representative in writing
- .2 Maintain access roads to prevent accumulation of construction related debris on roads.

1.3 EXISTING CONDITIONS

- .1 Examine subsurface investigation report.
- .2 Known underground and surface utility lines and buried objects are as indicated on site plan.
- .3 Refer to dewatering in Section 21 23 33.01 – Excavating, Trenching and Backfilling.

Part 2 PRODUCTS

2.1 MATERIALS

- .1 Fill material: in accordance with Section 31 23 33.01 – Excavating, Trenching and Backfilling.
- .2 Excavated or graded material existing on site suitable to use as fill for grading work if approved by NCC Representative.

Part 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contract are acceptable for rough grading installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence NCC Representative.
 - .2 Inform NCC Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and approved by NCC Representative.

3.2 GRADING

- .1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.
- .2 Rough grade to following depths below finish grades:
 - .1 100 mm for grassed areas.
 - .2 200 mm for paving.
- .3 Slope rough grade as indicate on drawings or as directed by NCC Representative.
- .4 Compact filled and disturbed areas to corrected maximum dry density to ASTM D698, as follows:
 - .1 95% under landscaped areas.
 - .2 98% under paved and walk areas.
- .5 Do not disturb soil within branch spread of trees or shrubs to remain.

3.3 TESTING

- .1 Inspection and testing of soil compaction will be carried out by testing laboratory designated by ULC. Costs of tests will be paid by Owner.
- .2 Submit testing procedure, frequency of tests, testing laboratory as designated by ULC or certified testing personnel to NCC Representative for review.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning.
 - .1 Leave work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .4 Remove recycling containers and bins rom site and dispose of materials at appropriate facility.

3.5 PROTECTION

- .1 Protect trees, buildings, surface or underground utility lines which are to remain as directed by NCC Representative. If damaged, restore to original or better condition unless directed otherwise.
- .2 Maintain access roads to prevent accumulation of construction related debris on roads.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 02 41 99 – Demolition for Minor Works
- .2 Section 33 05 16 – Manhole and Catchbasin Structures
- .3 Section 33 41 00 - Storm Utility Drains

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D422-63/2002, Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D698-00a/1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
 - .5 ASTM D1557-02e/1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³).
 - .6 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .1 CSA-A3001-03, Cementitious Materials for Use in Concrete.
 - .2 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .4 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS 1010, Material Specification for Aggregates - Base, Sub-base, Select Subgrade and Backfill Material (April 2004).
 - .2 OPSS 1004, Aggregates - Miscellaneous

1.3 DEFINITIONS

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.

- .1 Rock : solid material in excess of .25 m³ and which cannot be removed by means of heavy duty mechanical excavating equipment [with 0.95 to 1.15 m³ bucket]. Frozen material not classified as rock.
- .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .3 Topsoil:
 - .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
 - .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.
- .4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .6 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .7 Unsuitable materials:
 - .1 Weak, chemically unstable, and compressible materials.
 - .2 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to [ASTM D422] [ASTM C136] : Sieve sizes to [CAN/CGSB-8.1] [CAN/CGSB-8.2].
 - .2 Table:

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 - 45
 - .3 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.
- .8 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse/recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Divert excess aggregate materials from landfill to local quarry/ recycling facility for reuse as directed by NCC Representative

1.5 EXISTING CONDITIONS

- .1 Examine soil reports provided.
- .2 Buried services:
 - .1 Before commencing work verify/establish location of buried services on and adjacent to site.
 - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
 - .3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.
 - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .5 Prior to beginning excavation Work, notify applicable NCC Representative, establish location and state of use of buried utilities and structures. NCC Representative to clearly mark such locations to prevent disturbance during Work.
 - .6 Confirm locations of buried utilities by careful test excavations/soil hydrovac methods as applicable
 - .7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
 - .8 Where utility lines or structures exist in area of excavation, obtain direction of NCC Representative before removing/ re-routing.
 - .9 Record location of maintained, re-routed and abandoned underground lines.
 - .10 Confirm locations of recent excavations adjacent to area of excavation.

Part 2 Products

2.1 MATERIALS

- .1 Granular A backfill - in accordance with OPSS, Volume 2, Specification No. 1010.
- .2 Granular B backfill - Type II in accordance with OPSS, Volume 2, Specification No. 1010.
- .3 Structural Fill: Granular B backfill - Type II in accordance with OPSS, Volume 2, Specification No. 1010.
- .4 Select Subgrade Material (SSM) Fill - SSM in accordance with OPSS, Volume 2, Specification No. 1010.
- .5 Select backfill material: from excavations of other sources, approved by the NCC Representative for use intended, unfrozen and free from rocks larger than 80 mm, cinders, ashes, sods, refuse or other deleterious materials.
- .6 Bedding and surround material - Granular A in accordance with OPSS, Volume 2, Specification No. 1010.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly in accordance with Section 02 41 99 – Demolition for Minor Works.

3.3 PREPARATION/PROTECTION

- .1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to NCC Representative approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .5 Protect buried services and utilities that are required to remain undisturbed.

3.4 STOCKPILING

- .1 Stockpile fill materials in areas designated by NCC Representative.
 - .1 Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.
- .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.5 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations free of water while Work is in progress.

- .2 Provide for NCC Representative's review details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.
 - .1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
- .4 Protect open excavations against flooding and damage due to surface run-off.
- .5 Dispose of water in a manner not detrimental to public and private property, or portion of Work completed or under construction.
 - .1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

3.6 EXCAVATION

- .1 Advise NCC Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Excavate to lines, grades, elevations and dimensions as directed by NCC Representative.
- .3 Remove concrete paving walks and other obstructions encountered during excavation in accordance with Section 02 41 99 – Demolition for Minor Works.
- .4 Excavation must not interfere with bearing capacity of adjacent foundations.
- .5 Do not disturb soil within branch spread of trees or shrubs that are to remain.
 - .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .6 For trench excavation, unless otherwise authorized by NCC Representative in writing, do not excavate more than 10 m of trench in advance of installation operations and do not leave open more than 10 m at end of day's operation.
- .7 Utilize trench boxes/shoring systems (designed by a Profession Engineer) as required to limit disturbance.
- .8 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by NCC Representative.
- .9 Restrict vehicle operations directly adjacent to open trenches.
- .10 Dispose of surplus and unsuitable excavated material off site.
- .11 Do not obstruct flow of surface drainage or natural watercourses.
- .12 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .13 Notify NCC Representative when bottom of excavation is reached.
- .14 Obtain NCC Representative approval of completed excavation.
- .15 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by NCC Representative.
- .16 Correct unauthorized over-excavation as follows:

- .1 Fill under bearing surfaces and footings with concrete specified for footings Type 2 fill compacted to not less than 100% of corrected Standard Proctor maximum dry density.
- .2 Fill under other areas with Type 2 fill compacted to not less than 95 % of corrected Standard Proctor maximum dry density.
- .17 Hand trim, make firm and remove loose material and debris from excavations.
 - .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
 - .2 Clean out rock seams and fill with concrete mortar or grout to approval of NCC Representative.

3.7 BEDDING AND SURROUND OF UNDERGROUND SERVICES

- .1 Place and compact granular material for bedding and surround of underground services as indicated. Place bedding and surround material in unfrozen condition.

3.8 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of following:
 - .1 NCC Representative has inspected and approved installations.
 - .2 NCC Representative has inspected and approved of construction below finish grade.
 - .3 Inspection, testing, approval, and recording location of underground utilities.
 - .4 Removal of concrete formwork.
 - .5 Removal of shoring and bracing; backfill voids with satisfactory soil material.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to match existing surface grades. Compact each layer before placing succeeding layer.
- .5 Backfilling around installations:
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast-in-place concrete within 48 hours after placing of concrete.
 - .3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 0.15 m.
 - .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
 - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from NCC Representative:
 - .2 If approved by NCC Representative, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by NCC Representative.

- .6 Place unshrinkable fill in areas as indicated.

3.9 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 21 - Waste Management and Disposal, trim slopes, and correct defects as directed by NCC Representative.
- .2 Replace topsoil to the satisfaction of the NCC Representative.
- .3 Reinststate lawns to elevation which existed before excavation.
- .4 Reinststate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinststate areas affected by Work as directed by NCC Representative.
- .6 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.
- .7 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

Approved: 2011-06-30

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 No measurement for payment will be made under this Section.

1.2 REFERENCE STANDARDS

- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004 , LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedure .
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for each type of abrasives and solvent used on project.
 - .2 Submit 2 copies of WHMIS SDS in accordance with Section 01 35 43- Environmental Procedures] [01 35 29.06- Health and Safety Requirements .

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions .
- .2 Develop Construction Waste Management Plan related to Work of this Section.

Part 2 Products

2.1 MATERIALS

- .1 Abrasives and solvents used for removal of paint, oil, grease, rubber deposits: proprietary products specially designed for pavement cleaning, subject to approval by NCC.

Part 3 Execution

3.1 REMOVING PAVEMENT MARKINGS

- .1 Remove rubber tire deposits and paint markings, in areas as directed by NCC , by water blasting, rotary grinding, heater planing or other method approved in writing by NCC .
- .2 Exercise care to avoid dislodging of coarse aggregate particles, excessive removal of fines, damage to bituminous binder or damage to joint and crack sealers .
- .3 Do not heat pavement surfaces above 120 degrees C, when using heater planning equipment.

3.2 PAVEMENT SURFACE CLEANING

- .1 Remove sealing compound which has protruded excessively, where directed by NCC.
 - .1 Dispose of removed material as directed by NCC .
- .2 Remove dust, contaminants, loose and foreign materials, oil and grease, in areas as directed by and by method approved in writing by NCC .
- .3 Use rotary power brooms, vacuum sweepers or other approved methods supplemented by hand brooming.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning .
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning .

END OF SECTION

Part 1 General

1.1 MATERIALS

- .1 Board Cladding: to consist of 50 x 100 mm lumber secured around the perimeter of tree trunks with plastic strapping or other means which will not damage the tree.
- .2 Tree Barriers: steel T-rail posts 40 x 40 x 5 x 2440 mm, at 1800 mm o.c., with wood slat snow fencing attached to posts with 9 gauge wire, 13 per post.

Part 2 Execution

2.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for tree and shrub preservation installation in accordance with manufacturer's written instructions.
 - .1 Inform NCC Representative of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied.

2.2 IDENTIFICATION AND PROTECTION

- .1 Tree protection to be installed prior to the start of any on site work..
- .2 Protect plant and root systems from damage, compaction and contamination resulting from construction.
- .3 Ensure no root pruning is done inside drip line. If pruning inside drip line is required consult an arborist or Canadian Certified Horticultural Technician (CCHT) as approved by NCC Representative.
- .4 Install Tree Barriers at drip line of trees within work zone and as directed by NCC Representative adjacent the site. Barriers only to only be removed when if work within the drip line is required, following approval form NCC Representative.

2.3 TRUNK PROTECTION

- .1 Install board cladding vertically around the perimeter of designated deciduous trees within the active work zone.

2.4 TRENCHING AND TUNNELING FOR UNDERGROUND SERVICES

- .1 Excavate manually within zone of root system. Do not sever roots greater than 40 mm diameter except at greater than 500 mm below existing grade. Protect roots, and cut roots cleanly with sharp disinfected tools.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 03 30 00 – Cast-in-place Concrete.
- .2 Section 31 23 33 – Excavation, Trenching, and Backfilling.
- .3 Section 32 12 16 – Asphalt paving.
- .4 Section 32 16 15 – Concrete Walks, Curbs & Gutters.
- .5 Section 01 74 11 – Cleaning.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).
 - .5 ASTM D1557-09, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft³) (2,700kN-m/m³).
 - .6 ASTM D1883-07e2, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
 - .7 ASTM D4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .4 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

Part 2 Products

2.1 MATERIALS

- .1 Granulars:
 - .1 Granular A per OPSS 1010.
 - .2 Granular B Type II per OPSS 1010.

Part 3 Execution

3.1 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 PLACEMENT AND INSTALLATION

- .1 Place granular base after sub-base surface is inspected and approved by NCC Representative.
- .2 Placing:
 - .1 Construct granular base to depth and grade in areas indicated.
 - .2 Ensure no frozen material is placed.
 - .3 Place material only on clean unfrozen surface, free from snow and ice.
 - .4 Begin spreading base material on crown line or on high side of one-way slope.
 - .5 Place material using methods which do not lead to segregation or degradation of aggregate.
 - .6 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
 - .7 Place material to full width in uniform layers not exceeding 150 mm compacted thickness.
 - .8 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
 - .9 Remove and replace that portion of layer in which material becomes segregated during spreading.
- .3 Compaction Equipment:
 - .1 Ensure compaction equipment is capable of obtaining required material densities.

- .4 Compacting:
 - .1 Compact to density not less than 100% corrected maximum dry density.
 - .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
 - .3 Apply water as necessary during compacting to obtain specified density.
 - .4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved in writing by NCC Representative.
 - .5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.
- .5 Proof rolling:
 - .1 For proof rolling use standard roller.
 - .2 Obtain written approval from NCC Representative to use non standard proof rolling equipment.
 - .3 Proof roll at level in granular base as indicated.
 - .1 If use of non standard proof rolling equipment is approved, NCC Consultant to determine level of proof rolling.
 - .4 Make sufficient passes with proof roller to subject every point on surface to three separate passes of loaded tire.
 - .5 Where proof rolling reveals areas of defective subgrade:
 - .1 Remove base, sub-base and subgrade material to depth and extent as directed by NCC Representative.
 - .2 Backfill excavated subgrade with common material and compact in accordance with sub-base material and compact.
 - .3 Replace sub-base material and compact.
 - .4 Replace base material and compact in accordance with this Section.
 - .6 Where proof rolling reveals defective base or sub-base, remove defective materials to depth and extent as directed by NCC Representative and replace with new materials at no extra cost.

3.3 SITE TOLERANCES

- .1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

- .2 Divert unused granular material from landfill to local facility approved by NCC Representative.

3.5 PROTECTION

- .1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by NCC Representative.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 05 16 – Aggregate Materials.
- .2 Section 31 22 13 – Site Grading.

1.2 REFERENCES

- .1 American Association of State Highway and Transportation Officials (AASHTO)
 - .1 AASHTO M320-10, Standard Specification for Performance Graded Asphalt Binder.
 - .2 AASHTO R29-08, Standard Specification for Grading or Verifying the Performance Graded of an Asphalt Binder.
 - .3 AASHTO T245-97(2008), Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.
- .2 Asphalt Institute (AI)
 - .1 AI MS-2-1994, Mix Design Methods for Asphalt Concrete and Other Hot-Mixes.
- .3 ASTM International
 - .1 ASTM C88-05, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
 - .2 ASTM D698-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- .4 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS 310, Construction Specification for Hot Mixed Asphalt.
 - .2 OPSS 314, Construction Specification for Untreated Granular, Subbase, Base, Surface Shoulder and Stockpiling.
 - .3 OPSS 1010, Material Specification for Aggregates, Granular A, B, M and Select Subgrade Material.
 - .4 OPSS 1103, Material Specification for Emulsified Asphalt.
 - .5 OPSS 1150, Material Specification for Hot Mixed Asphalt.
 - .6 OPSS 1151, Material Specification for SuperPave and Stone Mastic Asphalt Mixture

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's test data and certification that asphalt cement meets requirements of this section.
- .3 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.

- .2 Provide design mix and tack coat samples to NCC Representative 2 weeks prior to commencing work.

Part 2 MATERIALS

- .1 Aggregates to: OPSS 1010.
 - .1 Granular A.
 - .2 Granular B Type II.
- .2 Tack coat: SS-01 to OPSS 1103.
- .3 Asphalt cement: to OPSS 1150 and in accordance with the MTO 1998 Guide for the use of Performance Grade Asphalt Cement (PGAC), a PGAC grading of 58-34, Category B.
- .4 HL-3 and Superpave SP 12.5 to OPSS 310.
- .5 Marshall Stability shall be a minimum of 8900 for HL-3.
- .6 Anionic emulsified asphalt: CAN/CGSB-16.2, grade:SS-1.
- .7 Water: clean, portable, free from foreign matter.
- .8 Mix designs will be the responsibility of Contractor.
- .9 No recycled material will be permitted for use on this project.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for asphalt paving in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of NCC Representative.
 - .2 Inform NCC Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied to proceed from NCC Representative.

3.2 FOUNDATIONS

- .1 Foundations for roadways and parking lot comprise:
 - .1 450 mm compacted thickness of granular subbase B Type II .
 - .2 150 mm compacted thickness of granular A.
- .2 Foundations for pedestrian sidewalk comprise:
 - .1 150 mm compacted thickness of granular A.
- .3 Construction of granular foundations: OPSS 314.
- .4 Compaction: compact each lift of granular material to 100% maximum density to ASTM D698. Maximum lift thickness: 150 mm.

3.3 PAVEMENT THICKNESS

- .1 Pavements for roadways and parking lot:
 - .1 Base course: 40 mm SuperPave 12.5 (PG58-34).
 - .2 Wear course: 40 mm SuperPave 12.5 (PG58-34)
- .2 Pavements for pedestrian sidewalk:
 - .1 Wear course: 75 mm HL3.

3.4 PAVEMENT CONSTRUCTION

- .1 Application of prime coat: OPSS 302.
- .2 Construction of asphalt concrete: OPSS 310.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 23 22.01 Excavating Trenching and Back Filling.
- .2 Section 03 30 00 – Cast in Place Concrete

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C117-13, Standard Test Method for Materials Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D698-12, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600 kN-m/m³).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

Part 2 Products

2.1 MATERIALS

- .1 Concrete mixes and materials: in accordance with Section 03 30 00 - Cast-in-Place Concrete.
- .2 Reinforcing steel: in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 Joint filler Curing Compound: in accordance with Section 03 30 00 - Cast-in-Place Concrete.
- .4 Granular base: material to Section 31 05 16 - Aggregate Materials following requirements:
 - .1 Type Granular A (OPSS 1010).
- .5 Fill material: to Section 31 05 16 - Aggregate Materials following requirements:
 - .1 Granular B Type I
 - .2 Crushed stone or gravel.
 - .3 Gradations: within limits specified when tested to ASTM C136ASTM C117. Sieve sizes to CAN/CGSB-8.1.

Part 3 Execution

3.1 GRADE PREPARATION

- .1 Do grade preparation work in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 Construct embankments using excavated material free from organic matter or other objectionable materials.
 - .1 Dispose of surplus and unsuitable excavated material off site.
- .3 Place fill in maximum 150 mm layers and compact to at least 95% of maximum dry density to ASTM D698.

3.2 GRANULAR BASE

- .1 Obtain NCC Representative's approval of subgrade before placing granular base.
- .2 Place granular base material to lines, widths, and depths as indicated.
- .3 Compact granular base in maximum 150 mm layers to at least 100% of maximum density to ASTM D698.

3.3 CONCRETE

- .1 Obtain NCC Representative approval of granular base prior to placing concrete.
- .2 Do concrete work in accordance with Section 03 30 00 - Cast-in-Place Concrete.
- .3 Immediately after floating, give sidewalk surface uniform broom finish to produce regular corrugations not exceeding 2 mm deep, by drawing broom in direction normal to centre line.
- .4 Provide edging as indicated with 10 mm radius edging tool.
- .5 Slip-form pavers equipped with string line system for line and grade control may be used if quality of work acceptable to NCC Representative can be demonstrated. Hand finish surfaces when directed by NCC Representative.

3.4 TOLERANCES

- .1 Finish surfaces to within 3 mm in 3 m as measured with 3 m straightedge placed on surface.

3.5 EXPANSION AND CONTRACTION JOINTS

- .1 Install tooled transverse contraction joints after floating, when concrete is stiff, but still plastic, at intervals of 3 m.
- .2 Install expansion joints as directed by NCC Representative at intervals of 6 m.
- .3 When sidewalk is adjacent to curb, make joints of curb, gutters and sidewalk coincide.

3.6 ISOLATION JOINTS

- .1 Install isolation joints around manholes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structure.

- .2 Install joint filler in isolation joints in accordance with Section 03 30 00 - Cast-in-Place Concrete.
- .3 Seal isolation joints with sealant approved by NCC Representative.

3.7 CURING

- .1 Cure concrete by adding moisture continuously in accordance with CSA-A23.1/A23.2 to exposed finished surfaces for at least 1 day after placing, or sealing moisture in by curing compound as directed by NCC Representative.
- .2 Where burlap is used for moist curing, place two prewetted layers on concrete surface and keep continuously wet during curing period.
- .3 Apply curing compound evenly to form continuous film, in accordance with manufacturer's requirements.

3.8 BACKFILL

- .1 Allow concrete to cure for 7 days prior to backfilling.
- .2 Backfill to designated elevations with material as directed by NCC Representative.

3.9 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Pavement marking: measured by lump sum.
- .2 Pavement marking including reflective glass beads: measured by lump sum .
- .3 Symbols and letters: measured lump sum .

1.2 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM E1360 90 2000 e1, Standard Practice for Specifying Color by Using the Optical Society of America Uniform Color Scales System.
 - .2 ASTM D4797 88, 2004 Standard Test Methods for Chemical and Gravimetric Analysis of White and Yellow Thermoplastic Traffic Marking Containing Lead Chromate and Titanium Dioxide.
- .2 Environment Canada (EC)
 - .1 Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations, SOR/2009-264.
- .3 Green Seal (GS)
 - .1 GS-11-Edition 3.2 (2015) , Standard for Paints and Coatings.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (SDS).
- .5 Ontario Provincial Standard Specifications
 - .1 OPSS 710 Construction Specification for Pavement Marking
 - .2 OPSS 1712 Organic Solvent Based Traffic Paint
 - .3 OPSS 1716 Water-Borne Traffic Paint
 - .4 OPSS 1715 Preformed Plastic Pavement Marking Tape
 - .5 OPSS 1750 Material Specification for Traffic Paint Reflectoring Glass Beads
- .6 Ontario Ministry of Transportation
 - .1 Ontario Traffic Manual (OTM) Book 11
 - .2 Ontario Traffic Manual (OTM) Book 7
 - .3 Ministry of Transportation Designated Sources for Materials (MTO DSM)
- .7 Transportation of Dangerous Goods Act, 1992 (S.C. 1992, c.34) and the latest amendment
- .8 United States Environmental Protection Association (EPA)
 - .1 EPA Method 24 – Determination of Volatile matter Content, Water Content, Density, Volume Solids and Weight Solids of Surface Coatings
- .9

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures .
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature and data sheets for pavement markings and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS SDS in accordance with Section 01 35 29.06- Health and Safety Requirements and 01 35 43- Environmental Procedures .
 - .3 Pre-qualified suppliers of beads and paint are listed on the Ministry of Transportation Designated Sources for Materials (MTO DSM).
 - .4 Prior to the commencement of work, the Contractor shall supply documentation from each of the suppliers of paint, plastic and beads, stating that said materials meet Ministry of Transportation specifications. This documentation is known as Material Safety Data Sheets and is required by law.
 - .5 The Contractor shall submit certification by the manufacturer that the paint supplied conforms with the volatile organic compounds (VOC) ratings as detailed in Section 5.2 of The United States Environmental Protection Association EPA Method 24 – Determination of Volatile matter Content, Water Content, Density, Volume Solids and Weight Solids of Surface Coatings.
 - .6 One-litre samples of solvent based and/or water borne paint to be used on the contract shall be supplied to the NCC as indicated by the Quality Assurance Unit, one month prior to use by the Contractor.
- .3 Samples:
 - .1 Submit to NCC following material sample quantities at least 4 weeks prior to commencing work.
 - .1 Two [L samples of each type of paint.
 - .2 One 1 kg sample of glass beads.
 - .3 Sampling to MPI Painting Manual.
 - .2 Mark samples with name of project and its location, paint manufacturer's name and address, name of paint, MPI specification number and formulation number and batch number.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 77 00- Closeout Submittals .

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions .

1.6 SITE CONDITIONS

- .1 Sustainable Design Provisions:
 - .1 Seasonal restriction for high VOC content traffic marking coatings.

- .1 Traffic marking coating application between May 1st and October 15th subject to seasonal use restriction and have VOC concentration maximum 150 g/L.

Part 2 Products

2.1 MATERIALS

.1 Classification

- .1 Pavement markings are classified as either permanent or temporary based on performance requirements.

.2 Volatile Organic Compounds (VOC)

- .1 All road marking paints must contain less than 150g/L of volatile organic compounds (VOC). Per federal requirements, the traffic marking coating category is subject to an annual use prohibition during the period of May 1 to October 15. During this period, use of traffic marking coating in which the VOC concentration exceeds 150 g/L is prohibited. For the remainder of the year, traffic marking coatings have a VOC concentration limit of 450 g/L for use, manufacture, import, sale and offer for sale.

.3 Organic Solvent Based Traffic

- .1 Organic solvent-based traffic paint shall conform to OPSS 1712.

.4 Preformed Plastic Pavement Marking Tape

- ± Preformed plastic pavement marking tape shall conform to OPSS 1715.

.5 Water-Borne Traffic Paint

- .1 Water-borne traffic paint shall conform to OPSS 1716.

.6 Reflectorizing Glass

- .1 The reflectorizing glass beads shall meet or exceed Ontario Provincial Standard Specification 1750 (OPSS 1750) dated December 1983. OPSS Specifications 1750.09.05 and 1750.09.06 are not applicable.

.7 Additional Specifications to OPSS 1750

- .1 The specifications listed below are in addition to, or shall supersede the OPSS1750 specifications:

.2 Products

- .1 Reflectorizing glass beads must be listed on the MTO current DSM list (section 5.85.38).

.3 Moisture-proof Bead Coating

- .1 Reflectorizing glass beads shall be coated with dual coating. The coating shall have both a moisture resistant silicone coating and an adhesion promoting silane coating.

.4 Roundness

- .1 The provisions from OPSS 1750 Section 1750.07.01 have been deleted and replaced by the following: "Roundness: requires at least 80% by mass of the glass beads to be true spheres".
- .5 Heavy Metal/Contaminant Content of Glass Beads
 - .1 The schedule provided below in Table 1 indicates the maximum concentration limits of metals/contaminants in glass beads.

Table 1: Metals/Contaminants Concentration Limits	
Metal /Contaminant	Maximum Concentration Limit
Arsenic	50 ppm
Lead	90 ppm
Antimony	75 ppm

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates and surfaces to receive pavement markings acceptable for product installation in accordance with MPI instructions prior to pavement markings application.
 - .1 Visually inspect substrate in presence of the NCC .
- .2 Pavement surface: dry, free from water, frost, ice, dust, oil, grease and other deleterious materials.
- .3 The pavement surface must be clean and dry. Contaminants such as dirt, loose asphalt particles and oily residue shall be removed prior to application of pavement marking.
- .4 Proceed with Work only after unacceptable conditions rectified.

3.2 EQUIPMENT REQUIREMENTS

The equipment to be used for application or installation of pavement markings shall be as recommended by the manufacturer of the respective pavement marking material.

- .1 Spray Equipment
 - .1 Spray equipment shall be used for application of solvent based traffic paint and water-borne traffic paint recommended for spray application.
 - .2 Spray equipment shall be fabricated from materials that will not contaminate the traffic paint and other pavement marking materials.
 - .3 The spray equipment shall provide a uniform stripe to the required width and thickness, with sharp edges without excessive splatter or overspray. The equipment shall have the capability to provide pavement markings conforming to

the OTM. The equipment shall be provided with glass bead dispenser to apply overlay glass beads at the recommended rate.

- .4 All vehicles shall be equipped with proper lighting and signage in accordance with OTM Book 7, Temporary Conditions. All vehicles associated with the painting operation shall be equipped with a wireless radio operator communication system so that all drivers and the paint applicator operator can communicate without stopping the painting operation. All crews must be equipped with at least one cellular phone.
- .5 The minimum equipment required for the operation shall include a center-liner and the required follow-up vehicles as stipulated in OTM Book 7.

3.3 TRAFFIC CONTROL

- .1 Application of pavement markings to be undertaken according to approved Traffic Management Plan submitted by Contractor.

3.4 APPLICATION

- .1 Pavement markings: laid out by the Contractor .
- .2 Unless otherwise approved by NCC, apply paint when air temperature minimum 10 degrees C, wind speed maximum 60 km/h and no rain forecast within next 4 hours.
- .3 Apply traffic paint evenly at rate of 3 m²/L to form minimum 8 mil dry film thickness, in accordance with MPI Architectural Painting Specification Manual “Preparation of Surfaces” and “Application” for “Approved Product” listing.
- .4 Do not thin paint unless approved by NCC .
- .5 Symbols and letters to dimensions indicated.
- .6 Paint lines of uniform colour and density with sharp edges.
- .7 Thoroughly clean distributor tank before refilling with paint of different colour.
- .8 Apply glass beads at rate of 0.5 kg/L of painted area immediately after application of paint.
- .9 Pavement Marking Removal
 - .1 Durable markings and traffic paint shall be obliterated or removed as follows:
 - .1 Eliminate existing pavement markings and symbols on both concrete and asphaltic surfaces in such a manner to retain minimum color and/or texture contrast of the pavement surface.
 - .2 Blast by compressed air abrasive blasting or by mobile high-pressure water blasting using an approved product as listed on the MTO DSM Traffic Guidance, Line Removal Systems for Pavement Marking.
 - .3 Vacuum residue, including sand, dust, and marking material, concurrently with the removal operation. Perform this work only in the area where the markings are to be applied.
 - .4 During removal operation, the Contractor shall prevent any residual material or sand, dust, enter drainage, sewer, conveyance or pose a traffic hazard.

- .2 The Contractor shall furnish approved equipment, methods, blast media, and/or as well as traditional blast media as listed in MTO DSM Traffic Guidance, Line Removal Systems for Pavement Marking. The Contractor shall maintain equipment in good working condition and retain well-trained operational staff to perform the removal of pavement markings.
 - .3 The Contractor shall be responsible to take all necessary measures to comply with Federal and Provincial environmental protection requirements, City by-laws, and any other applicable acts and regulations in respect to air, earth and water pollutants.
- .10 Premarking
- .1 The Contractor shall use the pavement marking drawings as noted in Section 7.0 to establish the position of all pavement markings. All permanent pavement markings for stop bars and cross walks must be completed as part of premarking.
 - .2 Premarking inspection may be supplied by the NCC upon request by the Contractor. Five (5) days in advance of completion of premarking, the Contractor shall contact the Contract Administrator and Traffic Services Pavement Markings at Pavement.Markings@ottawa.ca to coordinate for field inspection of premarkings. The inspection will be completed within ten (10) business days of notification.
 - .3 Premarking shall be done using white road marking paint only. Pre-marking should always have smooth lines and transitions should not look “wavy” or disjointed.
 - .4 Spacing for premarking shall be achieved through establishing control points at regular intervals (for example, every 25 m) and less space on curvilinear alignments.
 - .5 Longitudinal markings shall be achieved by a series of uninterrupted, closely spaced spot markings, either squares or circles, to guide the marking truck operator in applying well-aligned longitudinal and transverse pavement markings.
 - .6 Transverse markings (stop bars/crosswalk lines) shall be achieved through use of a continuous fog line, applied using a string line, to produce a straight line.
- .11 Temporary Pavement Marking
- .1 Temporary pavement markings are required when a paved roadway is to be opened to the public prior to the application of permanent pavement markings or for the purpose of construction staging.
 - .2 As part of the work of pavement marking, the Contractor shall apply temporary pavement markings for the centreline and lane lines.
 - .3 For the purposes of this contract all pavement markings and symbols within or adjacent to roundabouts and Pedestrian Crossover’s (PXO’s) are required prior to opening to public traffic. Interim pavement marking requirements will be provided by the Contract Administrator during execution of the work.
 - .4 Temporary pavement markings shall not conflict with permanent pavement markings.
 - .5 Temporary pavement markings placed on final surface course shall be removed once permanent pavement markings are installed.

- .12 Permanent Pavement Marking
 - .1 Permanent pavement markings application includes surface preparation, premarking, temporary pavement marking, removal of temporary pavement markings and placement of permanent pavement markings.
 - .2 When permanent pavement markings cannot be placed prior to the opening to traffic, roadways must have temporary pavement markings. Temporary pavement markings shall not conflict with the placement of permanent pavement markings. The length of time before permanent placement markings are placed is a maximum of 15 working days.
 - .3 Permanent pavement markings must be in place and maintained prior to any winter shut down.
- .13 General
 - .1 All pavement markings shall be accurately spaced and present a clean-cut, uniform appearance during either the day or night.
 - .2 The application of pavement marking materials shall conform to the following requirements and the manufacturer's recommendations.
- .14 Organic Solvent-Based Traffic Paint
 - .1 Paint shall be applied when the pavement surface temperature is 0°C and above, unless otherwise approved in writing by the NCC.
 - .2 The paint temperature shall be between 40°C and 70°C when applied to the pavement.
 - .3 Paint shall be applied at a rate which results in a uniform thickness of 230 ± 25 microns dry film. Reflectorizing glass beads, conforming to OPSS 1750 shall be applied uniformly at a rate as shown in Table 2 below, immediately after paint application, to ensure embedment of the glass beads.
 - .4 Overlay glass beads shall not be applied on to black paint which is used for obliterating existing markings.

Table 2:	
Rate of Application for Overlay Glass Beads per litre of Traffic Paint	
% Volume Solids of Traffic Paint	Glass Beads Required (kg)
40-56	0.7
57-70	0.8

- .15 Water-Borne Traffic Paint
 - .1 Paint shall be applied as specified in Section 9.2 except that the pavement surface temperature shall be minimum 10°C.
- .16 Temporary Preformed Plastic Pavement Marking Tape
 - .1 Temporary removable pavement markings shall be applied conforming to the manufacturer's recommendation and shall be removed as indicated. Removed material shall be disposed outside of the right-of-way.
- .17 Spills

- .1 All materials shall be handled and stored in accordance with recommended procedures to prevent contamination of the environment including land, water or air.
- .2 In the event of a spill or release of any material including, but not limited to, pavement marking primers and sealers, oxygen/acetylene tanks, and cleaning products to the environment, the person in control of the material at the time of the spill shall ensure that: the spill is contained and cleaned up, the environment is restored to pre-spill condition, spill clean-up materials are properly disposed of and all required notifications including the Ministry of the Environment, Conservation and Parks (MOECP) have been promptly made.

3.5 QUALITY ASSURANCE

- .1 General
 - .1 A one-quart sample of each batch of traffic paint intended for use must be sent to the NCC's approved Quality Assurance Laboratory for testing and approval before the batch is shipped, unless other arrangements have been made. A batch shall be the amount of paint which was manufactured and packaged in a single operation. A manufacturer's test report shall be included with the one-quart sample of each batch. The NCC also reserves the right to retest any batch after delivery. Material not meeting the specification shall be removed and replaced by the Contractor at their expense including all costs for handling, retesting and shipping. All tests shall be conducted with ASTM test methods referenced in OPSS 1712 and OPSS 1750 for organic solvent- based paint and reflectorizing glass beads, respectively.
 - .2 In addition, random sampling may be carried out by the Contract Administrator during material application to assess line quality.
- .2 Line Quality
 - .1 Line width, thickness, the nature of the edges and uniformity in appearance will be assessed by Traffic Services as part of the final inspection of the markings.
 - .2 Glass bead distribution will be inspected for evenness in distribution and degree of embedment.
- .3 Measurement of Temperature and Humidity
 - .1 The testing of ambient and surface temperature will be by thermometer, and surface thermometer, respectively.
- .4 Pavement Marking Inspection
 - .1 Once permanent markings have been completed, the Contractor shall notify the Contract Administrator to request inspection.
 - .2 Within five (5) days, Traffic Services will inspect and sign-off on the completed work. Sign-off for payment will be completed by the Contract Administrator.
 - .3 Any workmanship that does not conform to the requirements of OPSS 710 shall be corrected at the Contractor's expense.

- .4 It shall be the Contractor's responsibility to correct any severe tracking situation which was created by the Contractor, or because of inadequate traffic control measures or other errors/omissions on the part of the Contractor.

3.6 MEASUREMENT AND BASIS OF PAYMENT

- .1 Payment at the contract Lump Sum Price for the item "Pavement Markings" shall be full compensation for provision of samples of materials, surface preparation, pavement marking obliterating, premarking, application of temporary pavement markings and application of permanent pavement markings. Payment at the contract price for the above item(s) shall be full compensation for all labour, equipment and material required to do the work.
- .2 Payment shall be based upon the following schedule:
 - .1 75% pro-rated into equal payments over the term of the contract and
 - .2 25% upon final inspection and sign-off of permanent pavement markings.
- .3 This payment schedule may only be modified as agreed upon in writing between the Contractor and the Contract Administrator.

3.7 TOLERANCE

- .1 Paint markings: within plus or minus 2 mm of dimensions indicated.
- .2 Remove incorrect markings in accordance with Section 32 01 11.01- Pavement Cleaning and Marking Removal .
- .3 General
 - .1 A one-quart sample of each batch of traffic paint intended for use must be sent to the NCC's approved Quality Assurance Laboratory for testing and approval before the batch is shipped, unless other arrangements have been made. A batch shall be the amount of paint which was manufactured and packaged in a single operation. A manufacturer's test report shall be included with the one-quart sample of each batch. The NCC also reserves the right to retest any batch after delivery. Material not meeting the specification shall be removed and replaced by the Contractor at their expense including all costs for handling, retesting and shipping. All tests shall be conducted with ASTM test methods referenced in OPSS 1712 and OPSS 1750 for organic solvent- based paint and reflectorizing glass beads, respectively.
 - .2 In addition, random sampling may be carried out by the Contract Administrator during material application to assess line quality.
- .4 Line Quality
 - .1 Line width, thickness, the nature of the edges and uniformity in appearance will be assessed by Traffic Services as part of the final inspection of the markings.
 - .2 Glass bead distribution will be inspected for evenness in distribution and degree of embedment.
- .5 Measurement of Temperature and Humidity
 - .1 The testing of ambient and surface temperature will be by thermometer, and surface thermometer, respectively.

- .6 Pavement Marking Inspection
 - .1 Once permanent markings have been completed, the Contractor shall notify the Contract Administrator to request inspection.
 - .2 Within five (5) days, Traffic Services will inspect and sign-off on the completed work. Sign-off for payment will be completed by the Contract Administrator.
 - .3 Any workmanship that does not conform to the requirements of OPSS 710 shall be corrected at the Contractor's expense.
 - .4 It shall be the Contractor's responsibility to correct any severe tracking situation which was created by the Contractor, or because of inadequate traffic control measures or other errors/omissions on the part of the Contactor.
- .7

3.8 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.
 - .1 Remove insulation material spilled during installation and leave work area ready for application of wall board.

3.9 PROTECTION

- .1 Protect pavement markings until dry.
- .2 Repair damage to adjacent materials caused by pavement marking application.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures
- .2 Section 32 93 10 – Trees, Shrubs and Ground Cover Planting.

1.2 REFERENCES

- .1 Agriculture and Agri-Food Canada
 - .1 The Canadian System of Soil Classification, Third Edition, 1998.
- .2 Canadian Council of Ministers of the Environment
 - .1 PN1340-2005, Guidelines for Compost Quality.

1.3 DEFINITIONS

- .1 Compost:
 - .1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.
 - .2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.
 - .3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below (25) (50)), and contain no toxic or growth inhibiting contaminants.
 - .4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category (A) (B).
- .2 Friable: Soil, which is easily crumbled through fingers when held by hand.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit WHMIS MSDS – Material Safety Data Sheets, in accordance with Section 01 35 29.06 – Health and Safety Requirements.
- .3 Quality control submittals:
 - .1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.
 - .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 QUALITY ASSURANCE

- .1 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.
- .2 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse / recycling in accordance with Section 01 74 21 - Waste Management and Disposal.
- .2 Divert unused soil amendments from landfill to official hazardous material collections site approved by NCC Representative.
- .3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

Part 2 Products

2.1 TOPSOIL

- .1 Topsoil for **planting beds**: variable mixture of sand, silt, clay, organic material and nutrients.
 - .1 Soil texture based on The Canadian System of Soil Classification, to consist of 45 to 70% sand, maximum 35% silt, 14 to 20% clay, and contain minimum 4% organic matter by weight.
 - .2 Final acidity value shall range from pH 6.0 to 7.5 for trees and shrubs.
 - .3 Contain no toxic elements or growth inhibiting materials.
 - .4 Finished surface free from:
 - .1 Debris and stones over 50 mm diameter.
 - .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
 - .3 Man-made materials (including glass, plastic, and asphalt).
 - .5 Consistence: friable when moist.
- .2 Topsoil for **sodded / seeded areas**: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.
 - .1 Soil texture based on The Canadian System of Soil Classification, to consist of maximum 70% sand, and contain 2 to 5% organic matter by weight.
 - .2 Final acidity value shall range from pH 5.5 to 7.5 for turf grasses and be capable of sustaining vigorous plant growth.
 - .3 Contain no toxic elements or growth inhibiting materials.

- .4 Finished surface free from:
 - .1 Debris and stones over 50 mm diameter.
 - .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
 - .3 Man-made materials (including glass, plastic, and asphalt).
- .5 Consistence: friable when moist.

2.2 SOIL AMENDMENTS

- .1 Fertilizer:
 - .1 Fertility: major soil nutrients present in following amounts:
 - .2 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.
 - .3 Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil.
 - .4 Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil.
 - .5 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
 - .6 Ph value: 6.5 to 8.0.
- .2 Peatmoss:
 - .1 Derived from partially decomposed species of Sphagnum Mosses.
 - .2 Elastic and homogeneous, brown in colour.
 - .3 Free of wood and deleterious material which could prohibit growth.
 - .4 Shredded particle minimum size: 5 mm.
- .3 Sand: washed coarse silica sand, medium to course textured.
- .4 Organic matter: unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.
- .5 Limestone:
 - .1 Ground agricultural limestone.
 - .2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
- .6 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.3 SOURCE QUALITY CONTROL

- .1 Contractor is responsible for amendments to supply topsoil as specified.
- .2 Soil testing by recognized testing facility for sand, silt, clay pH, P and K, and organic matter. Topsoil shall be approved by NCC Representative prior to bringing any topsoil on site.
- .3 Testing of topsoil will be carried out by testing laboratory.
 - .1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways. These measures shall follow governmental and agencies requirements and regulations.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 STRIPPING OF TOPSOIL

- .1 Begin topsoil stripping of areas as indicated after area has been cleared of grasses and removed from site.
- .2 Strip topsoil to depths as indicated in the contract documents.
 - .1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.
- .3 Stockpile in locations as indicated.
 - .1 Stockpile height not to exceed 2 m.
- .4 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill.
- .5 Protect stockpiles from contamination and compaction.

3.3 PREPARATION OF EXISTING GRADE

- .1 Contractor to obtain verification / approval of rough grades in writing prior to topsoil placement.
 - .1 If discrepancies occur, notify NCC Representative and do not commence work until instructed by NCC Representative.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.
 - .1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
 - .2 Remove debris which protrudes more than 75 mm above surface.
 - .3 Dispose of removed material off site.
- .4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.
 - .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.4 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

- .1 Place topsoil after NCC Representative has accepted subgrade.

- .2 Spread topsoil in uniform layers not exceeding 150 mm.
- .3 For sodded areas keep topsoil 15 mm below finished grade.
- .4 Spread topsoil to following minimum depths after settlement.
 - .1 150 mm for seeded areas.
 - .2 150 mm for sodded areas.
 - .3 300 mm for flower beds.
 - .4 500 mm for shrub beds.
- .5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.5 FINISH GRADING

- .1 Grade to eliminate rough spots and low areas and ensure positive drainage.
 - .1 Prepare loose friable bed by means of cultivation and subsequent raking.
- .2 Consolidate topsoil to required bulk density using equipment.
 - .1 Leave surfaces smooth, uniform and firm against deep foot printing.

3.6 ACCEPTANCE

- .1 NCC Representative will inspect the topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.7 SURPLUS MATERIAL

- .1 Dispose of materials except topsoil not required off site.

3.8 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Materials and installation for constructing new outfall structures, precast and cast-in-place manholes and catch basins.

1.2 RELATED SECTIONS

- .1 Section 31 23 33.01 - Excavation, Trenching and Backfilling.
- .2 Section 33 41 00 - Storm Utility Drains.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for maintenance holes and catch basin structures and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Precast manhole units: to ASTM C 478M, circular. Top sections eccentric cone or flat slab top type with opening offset for vertical ladder installation. Monolithic bases to be approved by NCC Representative.
 - .1 Acceptable material: as per OPSS 407.
- .2 Precast catch basin sections:
 - .1 Acceptable material: as per OPSS 407.
- .3 Joints: to be made watertight using rubber rings.
- .4 Ladder rungs: to CAN/CSA-G30.18, No.25M billet steel deformed bars, hot dipped galvanized to CAN/CSA-G164, or solid aluminum as per OPSD 405.020. Rungs to be safety pattern (drop step type).
- .5 Adjusting rings: to ASTM C 478M.
- .6 Drop manhole pipe: to be same as sewer pipe.
- .7 Frames, gratings, covers to dimensions as indicated and following requirements:
 - .1 Metal gratings and covers to bear evenly on frames. A frame with grating or

- cover to constitute one unit. Assemble and mark unit components before shipment.
- .2 Gray iron castings: to ASTM A 48/A48M, strength class 30B.
- .3 Castings: coated with two applications of asphalt varnish sand blasted or cleaned and ground to eliminate surface imperfections.
- .4 Manhole frames and covers: to OPSS 407.
- .5 Catch basin frames and covers: to OPSS 407.

- .8 Granular bedding and backfill: in accordance with Section 31 05 16 - Aggregate Materials and following requirement
 - .1 Gradations to OPSS 1010: Granular A.

PART 3 - EXECUTION

3.1 EXCAVATION AND BACKFILL

- .1 Excavate and backfill in accordance with Section 31 23 33.01 - Excavating Trenching and Backfilling and as indicated.
- .2 Obtain approval of NCC Representative before installing manholes or catch basins.

3.2 INSTALLATION

- .1 Construct units in accordance with details indicated, plumb and true to alignment and grade.
- .2 Complete units as pipe laying progresses. Maximum of three units behind point of pipe laying will be allowed.
- .3 Dewater excavation to approval of NCC Representative and remove soft and foreign material before placing concrete base.
- .4 Set precast concrete base on 150 mm minimum of granular bedding compacted to 100% maximum density to ASTM D 698.
- .5 Precast units:
 - .1 Make each successive joint watertight with NCC Representative approved rubber ring gaskets.
 - .2 Clean surplus mortar and joint compounds from interior surface of unit as work progresses.
 - .3 Plug lifting holes with precast concrete plugs set in cement mortar or mastic compound.
- .6 For sewers:
 - .1 Place stub outlets and bulkheads at elevations and in positions indicated.
 - .2 Bench to provide a smooth U-shaped channel for sanitary sewers only. Side height of channel to be full diameter of sewer. Slope adjacent floor at 1 in 20. Curve channels smoothly. Slope invert to establish sewer grade.
- .7 Compact granular backfill to 100% maximum density to ASTM D 698.
- .8 Installing units in existing systems:
 - .1 Where new unit is to be installed in existing run of pipe, ensure full support of

- existing pipe during installation, and carefully remove that portion of existing pipe to dimensions required and install new unit as specified.
- .2 Make joints watertight between new unit and existing pipe.
 - .3 Where deemed expedient to maintain service around existing pipes and when systems constructed under this Project are ready to be put in operation, complete installation with appropriate break-outs, removals, redirection of flows, bypass pumping as necessary, blocking unused pipes or other necessary work.
- .9 Place frame and cover on top section to elevation as indicated. If adjustment required use concrete ring.
 - .10 Clean units of debris and foreign materials. Remove fins and sharp projections. Prevent debris from entering system.
 - .11 Install safety platforms in manholes having depth of 5 m or greater, as indicated.

3.3 ADJUSTING TOPS OF EXISTING UNITS

- .1 Remove existing gratings, frames and store for re-use at locations designated by NCC Representative.
- .2 Sectional units:
 - .1 Raise or lower straight walled sectional units by adding or removing precast sections as required.
 - .2 Raise or lower tapered units by removing cone section, adding, removing, or substituting riser sections to obtain required elevation, then replace cone section. When amount of raise is less than 600 mm use standard manhole brick, moduloc or grade rings.
- .3 Monolithic units:
 - .1 Raise monolithic units by roughening existing top to ensure proper bond and extend to required elevation with mortared brick course for 150 mm or less alteration.
 - .2 Lower monolithic units with straight wall by removing concrete to elevation indicated for rebuilding.
 - .3 When monolithic units with tapered upper section are to be lowered more than 150 mm, remove concrete for entire depth of taper plus as much straight wall as necessary, then rebuild upper section to required elevation with cast-in-place concrete.
 - .4 Install additional manhole ladder rungs in adjusted portion of units as required.
 - .5 Install new grates, & frames.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 05 16 – Aggregate Materials.
- .2 Section 31 23 33 - Excavation, Trenching, and Backfilling

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM D2680-01(2009), Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping.
 - .2 ASTM F794-03(2009), Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter.

1.3 SCHEDULING

- .1 Schedule work to minimize interruptions to existing services and to maintain existing flow during construction.
- .2 Submit schedule of expected interruptions for approval and adhere to approved schedule.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Certification to be marked on pipe.

Part 2 MATERIALS

2.1 PLASTIC PIPE

- .1 Type PSM Poly Vinyl Chloride (PVC): to (ASTM D3034) (CAN/CSA-B1800).
- .2 Standard Dimensional Ration (SDR 28 or 35), as indicated.
- .3 Locked-In gasket and integral bell system.

2.2 PIPE BEDDING AND SURROUND MATERIAL

- .1 Granular A per OPSS 1010.

2.3 BACKFILL MATERIAL

- .1 As indicated.
- .2 In accordance with Section 31 23 33.01 – Excavating, Trenching and Backfilling.
- .3 Unshrinkable fill: in accordance with Section 31 23 33.01 – Excavating, Trenching and Backfilling.

Part 3 Execution

3.1 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .2 Clean pipes and fittings of debris and water before installation, and remove defective materials from site to approval of NCC Representative.

3.2 TRENCHING

- .1 Do trenching Work in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 Protect trench from contents of sewer.
- .3 Trench alignment and depth to approval of NCC Representative prior to placing bedding material and pipe.

3.3 GRANULAR BEDDING

- .1 Place bedding in unfrozen condition.
- .2 Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness to depth of 150 mm.
- .3 Shape bed true to grade and to provide continuous, uniform bearing surface for pipe.
 - .1 Do not use blocks when bedding pipes.
- .4 Shape transverse depressions as required to suit joints.
- .5 Compact each layer full width of bed to at least 95% corrected maximum dry density.
- .6 Fill excavation below bottom of specified bedding adjacent to manholes or catch basins with compacted granular A material.

3.4 INSTALLATION

- .1 Lay pipes on prepared bed, true to line and grade with pipe inverts smooth and free of sags or high points.
 - .1 Ensure barrel of each pipe is in contact with shaped bed throughout its full length.
- .2 Begin laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.
- .3 Joint deflection permitted within limits recommended by pipe manufacturer.
- .4 Water not to flow through pipes during construction.

- .5 Whenever work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
- .6 Install plastic pipe and fittings in accordance with CAN/CSA-B1800.
- .7 Joints:
 - .1 Install gaskets as recommended by manufacturer.
 - .2 Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.
 - .3 Align pipes before joining.
 - .4 Maintain pipe joints free from mud, silt, gravel and other foreign material.
 - .5 Avoid displacing gasket or contaminating with dirt or other foreign material. Remove disturbed or dirty gaskets; clean, lubricate and replace before joining is attempted.
 - .6 Complete each joint before laying next length of pipe.
 - .7 Minimize joint deflection after joint has been made to avoid joint damage.
 - .8 Apply sufficient pressure in making joints to ensure that joint is complete as outlined in manufacturer's recommendations.
- .8 When any stoppage of Work occurs, restrain pipes directed by NCC Representative, to prevent "creep" during down time.
- .9 Plug lifting holes with NCC Representative approved prefabricated plugs, set in shrinkage compensating grout.
- .10 Cut pipes as required for special inserts, fittings or closure pieces, as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
- .11 Make watertight connections to manholes and catchbasins.
 - .1 Use shrinkage compensating grout when suitable gaskets are not available.
- .12 Use prefabricated saddles or approved field connections for connecting pipes to existing sewer pipes.
 - .1 Joint to be structurally sound and watertight.
- .13 Temporarily plug open upstream ends of pipes with removable watertight concrete, steel or plastic bulkheads.

3.5 PIPE SURROUND AND BACKFILL

- .1 Place surround material in unfrozen condition.
- .2 Upon completion of pipe laying, and after NCC Representative has inspected pipe joints, surround and cover pipes as indicated.
 - .1 Leave joints and fittings exposed until field testing is completed.

- .3 Hand place surround material in uniform layers not exceeding 150 mm compacted thickness as indicated.
- .4 Place layers uniformly and simultaneously on each side of pipe.
- .5 Compact each layer from pipe invert to mid height of pipe to at least 95% corrected maximum dry density.
- .6 When field test results are acceptable to NCC Representative place surround material at pipe joints.

3.6 FIELD TESTS

- .1 Repair or replace pipe, pipe joint or bedding found defective.
- .2 Remove foreign material from sewers and related appurtenances by flushing with water.
- .3 Television and photographic inspections:
 - .1 Carry out inspection of installed sewers by television camera, photographic camera or by other related means.
 - .2 Provide CCTV Video and Report.
 - .3 Provide means of access to permit NCC Representative to do inspections.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

END OF SECTION