

<p>NCC Tender File #</p>	<p>NG292</p>
<p>Project Description</p>	<p>Greenbelt Research Farm Electrical Infrastructure Upgrade (Phase 2)</p>
<p>Site Visit</p>	<p>A NON MANDATORY site visit will be held on Thursday December 4, 2014 at 11:30 a.m. Ottawa Time. The meeting place will be the Greenbelt Research Farm, 1740 Woodroffe Ave., – main gate, Ottawa, Ontario.</p> <p>All costs incurred by the Bidder to attend the site visit will be at their expense. The NCC will not reimburse any Bidder for expenses related to the site visit.</p> <p>To confirm your attendance at the site visit and to gain access to the grounds, please communicate with NCC Corporate Security at 613-239-5222 or securityscreening@ncc-ccn.ca at least 24 hours prior to the site visit.</p>
<p>Closing date and time</p>	<p>Friday December 12, 2014 at 3:00 p.m. Ottawa time</p>

RETURN TENDERS TO: National Capital Commission 40 Elgin Street, 3rd Floor, Service Centre Ottawa, ON K1P 1C7	NCC Tender Number NG292
	NCC Contract Number
TENDER CLOSING DATE AND TIME: Friday December 12, 2014 at 3:00 p.m., Ottawa time	

DESCRIPTION OF WORK: Greenbelt Research Farm Electrical Infrastructure Upgrade (Phase 2)

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:

Sub Total \$ _____

OHST – 13% \$ _____

TOTAL \$ _____

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The TENDER shall not be withdrawn for a period of 60 days following the date and time of tender closing.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 Tender Number **NG292**

NCC Contract Number

5. APPENDICES

The tender includes [Appendix\(ces\) Nos 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 within [12 weeks](#) from the date of notification of acceptance of the offer.

8. 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.

9. The basis of award is low total cost to the NCC including all taxes.

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

INVITATION TO TENDER & ACCEPTANCE FORM

NCC Tender Number **NG292**

NCC Contract Number

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: payables@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.

INVITATION TO TENDER & ACCEPTANCE FORM	APPENDIX 1
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- 1) The Bidder will subcontract the parts of the work listed below to the subcontractor named for each part. The Bidder agrees not to make changes in the list of subcontractors without the written consent of the NCC Representative. The Bidder understands that for each part of the work identified as Mandatory, if more than one subcontractor is named or no subcontractor is named, or, the Bidder fails to state that the work will be done by its own forces where applicable, the tender will be disqualified.
- 2) The Bidder certifies that tenders for the part(s) of the Work listed below were received from the following subcontractors:

NON-MANDATORY REQUIREMENT:

- (a) Any other work not listed below

Type of Work: _____	Sub-contractor: _____
Type of Work: _____	Sub-contractor: _____
Type of Work: _____	Sub-contractor: _____
Type of Work: _____	Sub-contractor: _____
Type of Work: _____	Sub-contractor: _____
Type of Work: _____	Sub-contractor: _____

~~**MANDATORY REQUIREMENT:** The subcontractors performing the work listed below must be identified. Failure to disclose the name of the sub-contractor for any work identified will result in the disqualification of your tender.~~

- ~~(a) **n/a**~~

~~Sub contractor: _____~~

~~Address: _____~~

- ~~(b) **n/a**~~

~~Sub contractor: _____~~

~~Address: _____~~

- ~~(c) **n/a**~~

~~Sub contractor: _____~~

~~Address: _____~~

- ~~(d) **n/a**~~

~~Sub contractor: _____~~

~~Address: _____~~

Supplier No. / N° du fournisseur

New supplier / Nouveau fournisseur Update / Mise à jour

**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

(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"/>	SIN - mandatory for (1) & (2) NAS - obligatoire pour (1) & (2)	Corporation / Société	Business No. (BN) / N° de l'entreprise (NE)	
GST/HST / TPS et TVH		QST / TVQ (Québec)			
Number / Numéro :		Number / Numéro :			
Not registered / non inscrit		Not registered / non inscrit			
Type of contract / Genre de contrat					
Contract for services only / Contrat de services seulement		Contract for mixed goods & services / Contrat de biens et services		Contract for goods only / Contrat de biens seulement	
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 with this form / Veuillez, s.v.p., envoyer un spécimen de chèque 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 :
Postal Code / Code postal :		

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

E-mail address / Adresse courriel :

PART 'E' - CERTIFICATION / PARTIE 'E' - 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

Please fill in and return to the National Capital Commission with one of your business cheque unsigned and marked « VOID » (for verification purposes).	Veillez remplir ce formulaire et le retourner à la Commission de la capitale nationale avec un spécimen de chèque de votre entreprise non signé et portant la mention « ANNULÉ » (à des fins de vérification).
Mail or fax to: Procurement Assistant, Procurement Services National Capital Commission 202-40 Elgin Street Ottawa, ON K1P 1C7 Fax: (613) 239-5007	Poster ou télécopier à : Assistant à l'approvisionnement Services de l'approvisionnement Commission de la capitale nationale 40, rue Elgin, pièce 202 Ottawa (Ontario) K1P 1C7 Télécopieur : (613) 239-5007

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 and Receivable Officer – (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.

Until we process your completed form, we will still pay you by check.

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, Agent aux comptes fournisseurs et comptes clients – (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.

Nous continuerons à vous payer par chèque jusqu'à ce que nous ayons traité votre formulaire.

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.

- SI01 Tender Documents
- SI02 Enquiries during the Solicitation Period
- SI03 [\[NON MANDATORY\]](#) 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. Contract Officer, Nicole Galipeau, telephone number 613-239-5678 ext. 5191, facsimile number 613-239-5007 or e-mail address nicole.galipeau@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 five (5) calendar 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. Contract Officer shall examine the content of the enquiry and shall decide whether or not 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. Contract Officer named above. Non-compliance with this requirement during the solicitation period can, for that reason alone, result in disqualification of a tender.

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

- 1) A NON MANDATORY site visit will be held on Thursday December 4, 2014 at 11:30 a.m. Ottawa Time. The meeting place will be the Greenbelt Research Farm, 1740 Woodroffe Ave., – main gate, Ottawa, Ontario.
All costs incurred by the Bidder to attend the site visit will be at their expense. The NCC will not reimburse any Bidder for expenses related to the site visit.

To confirm your attendance at the site visit and to gain access to the grounds, please communicate with NCC Corporate Security at **613-239-5222** or securityscreening@ncc-ccn.ca at least 24 hours prior to the site visit.

SI04 REVISION OF TENDER

- 1) A tender may be revised by letter or facsimile in accordance with GI10 of the General Instructions to Bidders. The facsimile number for receipt of revisions is 613-239-5012.

SI05 TENDER RESULTS

- 1) Following solicitation closing, tender results may be obtained by calling the Sr. Contract Officer, Nicole Galipeau, telephone number 613-239-5678 ext. 5191, facsimile number 613-239-5007 or e-mail address nicole.galipeau@ncc-ccn.ca.

SI06 NEGOTIATIONS

- 1) In the event that the lowest compliant tender 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.

**SPECIAL INSTRUCTIONS TO
BIDDERS**

- 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) A public tender opening will be held on [Friday December 12, 2014 shortly after 3:00pm](#) Ottawa time at 40 Elgin Street, Ottawa, Ontario in Room 306.

- 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;
 - (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 initialled by the person or persons signing the tender. Initials shall be original(s). Alterations, corrections, changes or erasures that are not initialled 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" (see Appendix 11).

By signing this form, the Bidder/Proponent certifies that he/she has examined the information provided on the form and that it is correct, complete, and fully discloses the identification of the Contractor.

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 (see Appendix 11).

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 enclosed and sealed in an envelope provided by the Bidder, and shall be addressed and submitted to the office 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) Prior to submitting the tender, the Bidder shall ensure that the following information is clearly printed or typed on the face of the tender envelope:
 - (a) Solicitation Number;
 - (b) Name of Bidder.
- 5) 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 letter or facsimile (fax number only 613-239-5012 provided the revision is received at the office designated for the receipt of tenders, on or before the date and time set for the closing of the solicitation. The letter or facsimile 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 letter or facsimile 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 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 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.



**CONTRACTOR PERFORMANCE EVALUATION REPORT FORM
FORMULAIRE - RAPPORT D'ÉVALUATION DU RENDEMENT DE L'ENTREPRENEUR**

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 ^o . 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			
<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	<input type="text"/>
	Not satisfactory / Non-satisfaisant	6 – 10	
	Satisfactory / Satisfaisant	11 – 16	
	Superior / Supérieur	17 – 20	
Time / Délai d'exécution			
<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	<input type="text"/>
	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			
<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	<input type="text"/>
	Not satisfactory / Non-satisfaisant	6 – 10	
	Satisfactory / Satisfaisant	11 – 16	
	Superior / Supérieur	17 – 20	
		Criteria not applicable / Critère non-applicable	<input type="checkbox"/> N/A / S/O
Contract management / Gestion de contrat			
<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	<input type="text"/>
	Not satisfactory / Non-satisfaisant	6 – 10	
	Satisfactory / Satisfaisant	11 – 16	
	Superior / Satisfaisant	17 – 20	
		Criteria not applicable / Critère non-applicable	<input type="checkbox"/> N/A / S/O
Health and safety / Santé et sécurité			
<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	<input type="text"/>
	Not satisfactory / Non-satisfaisant	6 – 10	
	Satisfactory / Satisfaisant	11 – 16	
	Superior / Satisfaisant	17 – 20	
		Criteria not applicable / Critère non-applicable	<input type="checkbox"/> N/A / S/O
Total points / Pointage total			/100
Comments / Commentaires			
Name / Nom		Title / Titre	Date
		Signature	

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
- 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
▶	<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
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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 :

- 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

- 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 mais 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 c 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
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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, R.S.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 an 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 co-ordinating 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 available to all persons employed on the Work or its site at all times 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;

- (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 as an 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					
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.					
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 la Commission de la capitale nationale					
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

SECURITY REQUIREMENTS

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.

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26 27 16	ELECTRICAL CABINETS AND ENCLOSURES	2
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33 71 73.02	UNDERGROUND ELECTRICAL SERVICE	2

1 DESCRIPTION OF WORK

The General Contractor shall have expertise or hire a sub contractor with expertise in both the civil and electrical aspects of 15kV overhead pole line electrical distribution systems operation and construction.

The General Contractor shall supply, install, test and commission the equipment, and services including but not limited to the following:

- Remove all identified equipment and materials by Tender Documents.
- Procure all new replacement materials and equipment identified in the tender documents.
- Install all new replacement materials and equipment identified in the tender documents.
- To subcontract all related civil work and/or environmental (PCB storage) work required.
- Coordinate all communications work with Bell Canada.
- To subcontract the start-up and commissioning of the upgraded system and provide all warranties.
- Provide as built-drawings.
- Provide O&M manuals and Training/demonstration to NCC maintenance contractor/staff as required.

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 No geotechnical or borehole data is available for this project.

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. Date of the site visit will be confirmed during the tendering stage. The submission of a tender shall be deemed as proof that the tenderer and his subtrades have complied with this requirement. 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 unit 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.
- .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 unit 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 Engineer sufficiently in advance of operations to permit required measurements for payment.

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 may not operate any equipment outside of the limits of work area as identified in the contract drawings.
 - .2 Vehicle access to site is limited to the Greenbelt Research Farm Campus.
 - .3 All trenches shall be closed up daily prior to shutdown to permit vehicle access.
- .2 Areas for work and storage:
 - .1 No material, equipment or vehicles shall be stored/parked on lands other than NCC land.
 - .2 Work and storage area shall be limited. The contractor shall coordinate with the NCC to identify an acceptable location.
- .3 All areas used for work and storage shall be maintained by the contractor and any asphalt, sod, pavers, 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 The Engineer 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.

10 SETTING OUT OF WORK

- .1 Prior to commencement of work only, and not afterwards, the Engineer will provide two survey control points.
- .2 Contractor shall set grades and lay out work in detail from control established by the Engineer.
- .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 Engineer'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 Engineer 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 Engineer.

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 Engineer of findings.
- .3 Submit schedule to and obtain approval from Engineer 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 Engineer 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 Engineer.

- .6 Record locations of maintained, re-routed and abandoned service lines.

14 ADDITIONAL DRAWINGS

- .1 Engineer 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 Engineer and await Engineer'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 SCHEDULING OF WORK AND RESTRICTIONS:

- .1 Provide in form acceptable to Engineer, within 5 working days after Contract award, schedule showing dates for:
 - .1 Submission of shop drawings, material lists and samples.
 - .2 Commencement and completion of work of each Section of Specification.
 - .3 Final completion date within time period required by Contract documents.
- .2 Interim reviews of work progress based on work schedule will be conducted as decided by Engineer and schedule updated by Contractor in conjunction with and to approval of Engineer.
- .3 The contractor shall submit to the Engineer a proposed monthly cash flow chart identifying price breakdown per trade for review and acceptance by the Engineer prior to commencement of the work.
- .4 The contractor shall update the schedule as requested by the Engineer. The contractor shall adhere to the approved schedule and cash flow charts.
- .5 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 Engineer. The contractor shall coordinate commencement of work on site in a manner that material delivery will not hold up the construction process.
- .6 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 01340 Shop Drawings, Product Data, Samples and Mock-Ups.

.7 Scheduling Constraints:

- .1 Standard authorized hours of work are Monday to Friday, 07:00 hours to 18:00 hours. Obtain prior permission through Engineer 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 Engineer.

17 DAMAGES:

- .1 Existing plant material, landscaping, roadways, pathways, structures, finishes and Private 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 as directed by the contract administrator.
- .2 It is understood that restored or replaced work includes labour, equipment and material costs.

18 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.

19 WEIGHING OF MATERIALS:

- .1 Unit Price Items, measured by the tonne for payment purposes, must be accompanied by delivery tickets issued by the supplier of the material, indicating what type of material and net weight in tonnes. 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 Engineer 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.

20 ADDENDAS

- .1 Answers to questions directed to the Engineer, 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.

21 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.

22 ENVIRONMENTAL EMERGENCY PLAN

- .1 The contractor shall have an Environmental Emergency Plan in place.

An Environmental Emergency Plan is required in view of accidental events that could degrade the environment. This Plan must identify such things as the site's designated equipment maintenance areas (ie. refueling, oil changes, lubrication, cleaning) and hazardous materials storage area, which must be at least 30 metres from any watercourse. Properly constructed and maintained spill pans and tarps will be required for all machinery and storage tanks utilized. The contractor must have a spill kit on-site at all times. In the event of an accidental spill of fuel or other pollutant, the Contractor will immediately advise the NCC Emergency Service at 239-5678 Ext. 5353.

23 GUARANTEES AND WARRANTIES

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

24 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

1 GENERAL

- .1 This section specifies general requirements and procedures for contractors submissions of shop drawings, product data, samples and mock-ups to Engineer for review. Additional specific requirements for submissions are specified in individual sections of Divisions 2 to 33.
- .2 Do not proceed with work until relevant submissions are reviewed by Engineer.
- .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 Contractor's responsibility for errors and omissions in submission is not relieved by Engineer's review of submissions.
- .6 Notify Engineer, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Engineer's review of submission, unless Engineer gives written acceptance of specific deviations.
- .8 Make any changes in submissions which Engineer may require consistent with Contract Documents and resubmit as directed by Engineer.
- .9 Notify Engineer, in writing, when resubmitting, of any revisions other than those requested by Engineer.

2 SUBMISSION REQUIREMENTS

- .1 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.
- .2 Allow 5 days for Engineers review of each submission.
- .3 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.
- .4 Submissions shall 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 Contractors 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.

 - .5 After Engineer's review, distribute copies.

3 SHOP DRAWINGS

- .1 Shop drawings: original drawings, or modified standard drawings provided by Contractor, to illustrate details of portions of Work, which are specific to project requirements.

- .2 Maximum sheet size: 595 x 840 mm.

- .3 Submit shop drawings as follows:
 - .1 opaque diazo prints [number Contractor requires for distribution plus 3 copies which will be retained by Engineer].

 - .2 Digital (PDF) submissions for 11" X 17" drawings and smaller are acceptable. Larger drawings must be submitted in hard copy.

- .4 Cross-reference shop drawing information to applicable portions of Contract Documents.

4 PRODUCT DATA

- .1 Product data: manufacturers catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.

- .2 Submit 3 copies of product data.
- .3 Sheet size: 215 x 280 mm, maximum of 3 modules.
- .4 Delete information not applicable to project.
- .5 Supplement standard information to provide details applicable to project.
- .6 Cross-reference product data information to applicable portions of Contract Documents.

5 SAMPLES

- .1 Samples: examples of materials, equipment, quality, finishes, workmanship.
- .2 Where colour, pattern or texture is criterion, submit full range of samples.
- .3 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.

6 MOCK-UPS

- .1 Mock-ups: field-erected example of work complete with specified materials and workmanship.
- .2 Erect mock-ups at locations acceptable to Engineer.
- .3 Reviewed and accepted mock-ups will become standards of workmanship and material against which installed work will be verified.

7 SHOP DRAWINGS REVIEW

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

END OF SECTION

1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Engineer are specified under various sections.

2 APPOINTMENT AND PAYMENT

- .1 Engineer will appoint and pay for services of testing laboratory except for the following:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
 - .4 Mill tests and certificates of compliance.
 - .5 Tests specified to be carried out by Contractor under the supervision of Engineer.
 - .6 Additional tests specified in paragraph 2.2.
- .2 Where tests or inspections by designated testing laboratory reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests or inspections as Engineer may require to verify acceptability of corrected work.

3 CONTRACTOR'S RESPONSIBILITIES

- .1 Furnish labour and facilities to:
 - .1 Provide access to work to be inspected and tested;
 - .2 Facilitate inspections and tests;
 - .3 Make good work disturbed by inspection and test;
 - .4 Provide storage on site for laboratory's exclusive use for storage of equipment and cure test samples.
- .2 Notify Engineer sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Engineer.

END OF SECTION

1 ACCESS

- .1 Provide and maintain adequate access to project site.
- .2 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads. Clean access roads (sweep/flush as necessary) at the end of each day or as directed by the Engineer.

2 STORAGE SHEDS

- .1 Provide adequate weather tight sheds with raised floors, for storage of materials, tools and equipment that are subject to damage by weather.

3 SANITARY FACILITIES

- .1 Contractor to provide private washroom facilities complete with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.
- .2 Maintain in clean condition.

4 TEMPORARY FENCING OF WORK AREA

- .1 The contractor shall erect and maintain black snow fencing around the perimeter of the working areas as directed by the Engineer.

5 REMOVAL OF TEMPORARY FACILITIES

- .1 Remove temporary facilities from site when directed by Engineer.

END OF SECTION

1 FIRES

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

2 DISPOSAL OF WASTES

- .1 Do not bury rubbish and waste materials on site unless approved by Engineer.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

3 DRAINAGE

- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .2 Contractor to apply for and receive a permit to take water from the Ontario Ministry of Environment (MOE).
- .3 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local MOE requirements.

4 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties where indicated.
- .2 Install construction fencing per contract drawings prior to commencement of construction and as described below:
 - .1 Black plastic snow fencing 1.25 m. high
 - .2 Metal “T” bar stakes spaced every 2.4 metres or as required to keep fence stable and secure within the shallow soil condition
 - .3 Be prepared to relocate fence to accommodate temporary pedestrian by-pass as directed by the engineer.
 - .4 Maintain the fence during the entire construction period, until machinery is no longer on site.
- .2 Protect roots of designated trees to drip line 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 topsoil and vegetation.

- .4 Restrict tree and shrub removal to areas indicated or designated by Engineer. Obtain confirmation from the Engineer of all trees and shrubs to be removed prior to removal.

5 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this contract.
- .2 Control emissions from equipment and plant to local authorities emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

6 SPILLS REPORTING

- .1 Be financially responsible to ameliorate the adverse effects of a spill. The discharger is expected to contain and clean up the spilled contaminant or arrange for the contaminant to be contained and cleaned up. He is also expected to restore the spill site to essentially pre-spill conditions where this can reasonably be expected. To achieve this, the discharger may have to remove the contaminated soil and debris and dispose of these materials in an acceptable manner at an approved disposal site.
- .2 The person in charge of a pollutant, at the time of a spill, is considered to have taken a foreseeable risk for which he can prepare himself.
- .3 Prior to commencing construction, the Contractor is to prepare and submit for approval a contingency plan for the control and clean up of a spill. Said submission must adhere to the requirements and regulations of the WHMIS (Work Hazardous Material Information System) and shall include the applicable MSDS (Material Safety Data Sheet) for each substance.
- .4 Any equipment utilized by the contractor which develops a fluid leak shall be immediately removed from the site by the contractor.
- .5 In the event of a spill or other emission of a pollutant into the natural environment, every person responsible for the emission or who causes or permits it must forthwith notify:
 - .1 The Ministry of the Environment Spills Action Centre (SAC)
Tel: 1-800-268-6060.
 - .2 The City of Ottawa.
 - .3 The Owner of the pollutant, if known.

- .4 The person having control of the pollutant, if known, of the spill, of the circumstances thereof, and of the action taken or intended to be taken with respect thereto.

7 WATERCOURSE PROTECTION

- .1 The Contractor shall ensure that no contamination, waste or other substances which may be detrimental to marine life or quality of water shall enter any watercourse as either a direct or indirect result of construction and the Contractor shall meet the requirements of Government authorities or agencies with respect to environmental protection.
- .2 The Contractor shall be prepared to immediately clean up any spills of contamination, waste or other substances which may be either detrimental to marine 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 his construction operations.
- .3 The Contractor shall exercise reasonable care to ensure that sediment run-off does not enter watercourses. Berms, silt screens and other works, as required, shall be constructed at appropriate locations to ensure that turbidity shall be kept to a minimum as determined by the Government authorities and agencies.
- .4 Run-off from construction materials and any stockpiles shall be contained and discharged in a manner that will prevent entry of sediment to watercourses.
- .5 Where dewatering is required, effluent shall be discharged in a manner that will prevent entry of sediment to watercourses.
- .6 Where the Contractor requires work in watercourses or on the banks of watercourses, operation of equipment within such areas shall be kept to a minimum necessary to perform the specified work and proceed in a continuous manner that will minimize the duration of such work.
- .7 The Contractor shall submit a plan indicating how he intends to provide for securing the site against erosion and watercourse siltation problems for the full duration of the construction period, i.e. from start of construction to final completion. The Contractor shall not proceed with excavation of watercourse banks until approval of the sediment control plan is received from the Engineer.
- .8 Various concerned Government agencies will likely be on site during construction and the Contractor shall provide easy access and meet the requirements of those agencies without delay.
- .9 The Contractor shall immediately clean up and dispose of any floating debris which accumulates on the watercourse bed or banks as a result of construction.
- .10 The Contractor shall not make any claim for extra compensation for the cost of fulfilling the obligations set out herein.

NCC

Project Level Classification Template

The purpose of this form is to establish whether a proposed project needs to undergo an environmental effects analysis to determine whether it is likely to cause significant adverse environmental effects as well as to classify it according to the classification levels outlined in ESS' Proposed New Environmental Effects Analysis under the New CEAA (2012) document.

Project Title: Replacement of electrical poles and testing of conductors for PCBs at 1740 Woodroffe Avenue (Greenbelt Research Farm)

NCC Project Manager (PM)/Coordinator: Ken Tiedemann
PM/Coordinator Phone Number: 613-239-5678 ext. 5658

Project Description:

This project involves the removal and replacement of several electrical poles at the Greenbelt Research Farm, which is located at 1740 Woodroffe Avenue. The electrical poles consist of a wooden pole, porcelain insulators, aluminum core steel reinforced overhead line, pole mounted transformers, and steel and copper hardware. The replacement poles are similar and will be installed in the same location as the old poles. Nineteen of the distribution poles have mineral oil filled transformers mounted to them, and these transformers may contain trace amounts of polychlorinated biphenyls (PCBs). Due to the fact that PCBs may have adverse health effects, and to prevent the spread of these contaminants, the poles will be transported to a building onsite where the transformers will be tested for PCBs in a safe, controlled environment. The storage of the PCBs will be performed in accordance with section 25 of the *PCB Regulations*.

Anticipated Project Start Date: October 2013

1. Is this a “designated project”?

Under CEAA 2012, “*designated project*” means one or more physical activities that are
 (a) carried out in Canada or on federal lands;
 (b) designated by regulations made under paragraph 84(a) or designated in an order made by the Minister under subsection 14(2); and
 (c) linked to the same federal authority as specified in those regulations or that order.
 It includes any physical activity that is incidental to those physical activities.

- Yes** **Proceed with the Environmental Assessment as required under CEAA 2012**
 No **Proceed with Question no 2**

2. Is there a “project”?

Under Section 66 of CEAA 2012, “project” means a physical activity that is carried out on federal lands in relation to a physical work and is not a designated project.

- Yes** **Proceed with Question no 3**
- No** **Environmental Effects Analysis not required**

3. Is the project located on NCC lands or on other federal lands over which the NCC exercises any power or performs any duty or function conferred upon it under any Act of Parliament (e.g., the National Capital Act) that would permit a project to be carried out, in whole or in part, on federal lands?

- Yes** **Proceed with Question no 4**
- No** **Environmental Effects Analysis not required**

4. Can this project be excluded from a potential Environmental Effects Analysis to determine whether it could cause significant adverse environmental effects? Yes, if one of the following applies:

- *Excluded by the Exclusion provisions of Section 70 of CEAA 2012:*
 - *(a) in relation to which there are matters of national security;*
 - *(b) that is to be carried out in response to a national emergency for which special temporary measures are being taken under the Emergencies Act;*
or
 - *(c) that is to be carried out in response to an emergency, and carrying out of the project without delay is in the interest of preventing damage to property or the environment or is in the interest of public health or safety.*

- Yes** **Environmental Effects Analysis not required**
- No** **Proceed with Question no 5**

5. Refer to the project level classification guideline in Annex B of the Proposed New Environmental Effects Analysis under the New CEAA 2012 project level classification guideline and determine whether the project level is 0, 1, 2, or 3.

Project Level Classification	
Project title: Replacement of electrical poles and testing of conductors for PCBs at 1740 Woodroffe Avenue (Greenbelt Research Farm)	File No.: CP2218
<input checked="" type="checkbox"/>	Level 0 Project: Project does not require an Environmental Effects Analysis.
<input type="checkbox"/>	Level 1 Project: Project requires completion of a Level 1 Environmental Effects Analysis Checklist , completed below.
<input type="checkbox"/>	Level 2 Project: Project requires completion of an Environmental Effects Analysis Report .
<input type="checkbox"/>	Level 3 Project: Project requires completion of an Environmental Effects Analysis Report .
<p>Rationale for Level Classification:</p> <p>The proposed project is small in scale and involves the replacement of pre-existing structures. The surrounding environment is mostly manicured lawns and agricultural fields, and therefore there will be no impacts to valued ecosystem components.</p> <p>The closest water body is Black Rapids Creek, which is located approximately 1.5 km southwest of the project site. No in water work will take place as part of this project, and fish and fish habitat will not be adversely affected by the project activities.</p> <p>The project will not adversely affect air quality, and it will not produce a significant increase in noise and/or vibration.</p> <p>As the electrical poles are located in grassy areas, and no natural vegetation removal is proposed, there is unlikely to be any adverse environmental effects to vegetation, to species protected under the <i>Species at Risk Act</i>. Although there is the potential for birds to nest on the electrical poles, the project activities take place outside of the migratory birds nesting season (April 1st – August 15th), and therefore it is unlikely for birds protected under the <i>Migratory Birds Convention Act</i> (MBCA) to be impacted by the project.</p> <p>The area has been identified by NCC's AIMT system as a region of low pre-contact archaeological potential. It is unlikely that there will be any impacts to archaeological resources as a result of the project [1].</p> <p>A phase 1 ESA was conducted by DST Consulting Engineers Inc. in 2007 [2] for the entire 1740 Woodroffe property, but no contaminants of potential concern were identified for areas where the proposed work will take place. Therefore, no impacts related to soil quality or</p>	

Project Level Classification

Project title: Replacement of electrical poles and testing of conductors for PCBs at 1740 Woodroffe Avenue (Greenbelt Research Farm)

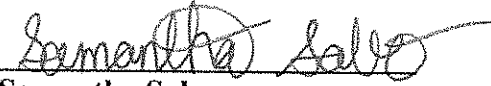

File No.: CP2218

quanity are anticipated.

Based on the foregoing analysis, the proposed project has been classified as a level 0 project. It has been determined by the NCC that with the implementation of mitigation measures the proposed project is unlikely to result in significant adverse environmental effects.

Mitigation Measures:

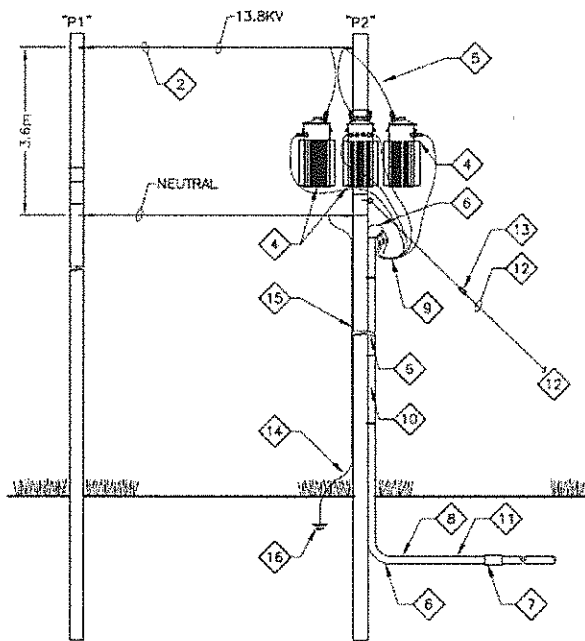
- The contractor will confine the circulation and staging of machinery, equipment and materials to existing paved surfaces, where possible.
- In an effort to divert waste going to landfills, the non-hazardous waste from this project should be, where possible, reused, recycled, or composted.
- All materials should be stored in accordance with provincial and federal regulations, including the *Canadian Environmental Protect Act* and its associated *PCB Regulations* (see section 25 of <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2008-273/page-8.html#docCont>). This includes proper equipment and clothing for the protection of workers, if necessary. The following compliance promotion guide may be of use during the storage and testing of the transformers: <http://www.ec.gc.ca/bpc-pcb/78635459-1DFF-49E0-B851-CBA02986B749/Compliance%20Promotion%20Guide%20%20May%202011.pdf>.
- No archaeological investigation is required for the present project. However, if any archaeological resources or human remains are discovered during the course of the demolition work, all work shall be suspended immediately and the NCC Project Manager and Archaeologist (Ian Badgley, 613-239-5678, Ext. 5751, ian.badgley@ncc-ccn.ca) shall be notified forthwith. Measures for the protection and management of these resources or remains, including contracting a professional archaeologist, will be determined by the NCC Archaeologist. Work shall not be resumed at the location concerned prior to receipt by the NCC Project Manager of written confirmation that these measures have been put in place.
- The contractor shall develop a response plan familiar to the employer and workers and shall ensure that an emergency spill kit is available at the site at all times in case of accidental spill.
- In the event of an accident or spill, the contractor will immediately clean-up the affected area. The contractor must contact the NCC emergency number (613-239-5353), and the NCC PM. If required, remove and dispose contaminated materials at an appropriately licensed facility.
- All materials should be removed at the end of the project, and the site should be reinstated to its original conditions, or better, including the restoration of both topsoil and vegetation.

Project Level Classification	
Project title: Replacement of electrical poles and testing of conductors for PCBs at 1740 Woodroffe Avenue (Greenbelt Research Farm)	File No.: CP2218
<p>References:</p> <p>[1] Personal communication between Samantha Sabo and Ian Badgley, NCC archaeologist, July 24th, 2013.</p> <p>[2] DST Consulting Engineers Inc. 2007. "Phase 1 Environmental Site Assessment – 1740 Woodroffe Avenue, Ottawa, Ontario. NCC Property Asset No. 333274." DST File Number OE06530.</p>	
<p>Prepared by:</p> <p> Samantha Sabo Environmental Assessment Student National Capital Commission</p>	<p>Date: <u>October 18th, 2013</u></p>
<p>Reviewed and Approved by:</p> <p> Meaghan Ferguson Environmental Officer National Capital Commission</p>	<p>Date: <u>Oct 18 2013</u></p>

Figures



Figure 1: Location of the pole replacements at 1740 Woodroffe Avenue.



DETAIL NOTES:	
1.	NEW POLE P1.
2.	NEW OVERHEAD 15KV CONDUCTORS: 3 x #1/0 ACSR
3.	NEW POLE P2 TO REPLACE EXISTING POLE 15B.
4.	NEW 13.8KV/8KV-600V, 3x25KVA (DUAL-VOLTAGE PRIMARY) TRANSFORMERS.
5.	PROVIDE AND CONNECT 3 NEW CUT-OUT SWITCHES C/W 15KV, 5E, STANDARD SPEED FUSES AND DISTRIBUTION CLASS LIGHTNING ARRESTORS.
6.	PROVIDE NEW 53mm PVC CONDUIT C/W F-HEAD SERVICE ENTRANCE CAP.
7.	INTERCEPT EXISTING UNDERGROUND CONDUITS AND MAKE TERMINATION.
8.	PULL NEW 4#3AWG+GND FROM THE F-HEAD TO MAIN SWITCH LOCATED IN THE MAIN ELECTRICAL ROOM.
9.	CONNECT SECONDARY CABLES TO TRANSFORMER TERMINALS.
10.	STRAP PVC CONDUIT EVERY 1000mm TO POLE, USING APPROVED ANCHORS.
11.	COVER REQUIREMENT SHALL BE AS PER OESC TABLE 53 (600mm).
12.	NEW GUY STRAIN, ALLOW FOR ANCHOR ROCK WEDGE, ROCK ANCHOR.
13.	GUY INSULATOR.
14.	GALVANIZED STEEL CLAMP.
15.	#14AWG BARE COPPER GROUND c/w GUARD - PROVIDE CONNECTIONS TO NEUTRAL, TRANSFORMERS, AND LIGHTNING ARRESTORS.
16.	PROVIDE GROUND ROD DRIVEN TO MINIMUM OF 3m.

Figure 2: Components of the electrical pole to be replaced (numbers 6,7,8 and 11 are incorrect – no subsurface work will be done).

1 GENERAL

1.1 General Conditions

- .1 The requirements of this specification take precedence over the requirements of any other specification for the management and disposal of excess material.

1.2 Section Includes

- .1 Requirements for management and disposal of excess materials.
- .2 Specific Site Selection Notification and Property Owner's Release forms necessary for certain excess materials handling.

1.3 Related Work

- .1 Sections

1.4 Definitions

- .1 Bituminous pavement: any combination of asphaltic material and aggregate, excluding asbestos modified asphaltic material.
- .2 Concrete: concrete mixtures produced with Portland cement, which may include blended hydraulic cement, supplementary cement materials, spent debris and silica sand abrasive blasting media from abrasive cleaning of concrete and reinforcing steel, concrete brick, block and associated mortar. Can include embedded steel, and excludes asbestos modified Portland cement concrete mixtures.
- .3 Disposable fill: excess material, other than that disposed of at a certified disposal site, that is managed in berms and mounds, and as fill, other than in road embankments.
- .4 Earth: all soils except those defined as rock, and excludes stone masonry, concrete and other manufactured materials.
- .5 Excess material: Material removed as a result of Work outlined in the Contract, for which management is not specified. Includes surplus and unsuitable materials.
- .6 Fabricated metal and plastic products: metal and plastic products such as culverts, fence materials, and guide rails. Does not include containers, other packing materials, storage tanks, septic tanks, and ancillary equipment associated with sanitary sewage systems, septic systems, and fuel/lubricant dispensing and storage systems.
- .7 Groundwater: subsurface water and water that occurs beneath the water table in soils and rock formations that are fully saturated.
- .8 Masonry: clay brick, stone and associated mortar.
- .9 Natural wood: stumps, trunks, branches, and debris, from tree and shrub removal, and wood products that are not treated, coated or glued.

- .10 Non-Hazardous contaminated material: material identified as unsuitable for re-use on site or unsuitable for disposal as clean fill off-site and must be disposed of as a non hazardous waste at an MOE approved landfill if removed from the site.
 - .11 Re-use: utilization, processing, re-processing or recycling of excess material into a construction material or other useful product, and management by these means for the Contract and other work.
 - .12 Rock: natural beds or massive fragments, of the hard, stable, cemented part of the earth=s crust, igneous, metamorphic, or sedimentary in origin, which may or may not be weathered, and includes boulders having a volume of 1 m or greater.
 - .13 Swamp material: materials within the swamp excavation limits, except those defined as rock, and excludes stone masonry, natural wood and manufactured materials.
 - .14 Waste: excess material managed by re-use or as disposable fill.
 - .15 Waterbody: any body of water or watercourse or wetland, or a portion thereof, and excludes ditches other than those functioning as natural watercourses.
- 1.5 Submission Requirements
- .1 Copy of Site Selection Notification form shall be submitted to Engineer when property is to be used for:
 - .1 Stockpiling for re-use and for disposable fill.
 - .2 Management as disposable fill.
 - .2 Notification shall be submitted prior to commencement of such work.
 - .3 After work is complete, copy of Property Owner's Release form shall be provided to Engineer.
 - .4 Where excess material audit or inventory is imposed by statute, or is condition of the Contract, copy of document shall be provided to Engineer.
- 2 PRODUCTS** Not applicable
- 3 EXECUTION**
- 3.1 Construction
- .1 Management of excess material shall be as described below:
 - .1 Earth, aggregate, swamp material, rock and natural wood: Manage by re-use or disposal off-site.
 - .2 Bituminous pavement, concrete, masonry, fabricated metal and plastic products: Manage by disposal off-site.
 - .3 Where excess materials are suspected of being contaminated or if types of materials are encountered which are not addressed in this specification, direction on management shall be obtained from Engineer.

- .4 Excess material that is mixture of materials shall be disposed of according to most stringent conditions associated with any one of individual constituents.
 - .5 Excess materials shall be managed using methods which prevent their entry into waterbodies and other sensitive areas. These may be identified in Contract. Exceptions may be made when materials are re-used in accordance with requirements specified elsewhere in Contract.
 - .6 Notification requirements shall be complied with and approvals, releases, and agreements shall be obtained that are necessary for management of excess material.
- .2 Management by-re-use shall be as specified. When not specified, management by re-use shall be outside Commission's property.
 - .1 Distance separations described in Table 1 do not apply for:
 - .1 Re-use of excess materials for same purpose.
 - .2 Re-use of bituminous pavement, concrete and masonry within road right-of-way.
 - .3 Re-use of concrete as aggregate in bituminous pavement.
 - .4 Re-use of concrete as rip rap, gabion stone or rock protection in compliance with requirements specified elsewhere in this contract.
 - .3 Management as disposable fill, within Commission's property and on other property designated in Contract, shall be as specified.
 - .4 Management by open burning is not permitted.
 - .5 Stockpiling on the Commission's property and on other property designated in contract shall be as specified, otherwise it shall be outside Commission's property.
 - .1 Stockpiles of bituminous pavement, concrete and masonry shall be located minimum of 30 m from waterbodies and minimum of 100 m from residences unless:
 - .1 Stockpiles are located within the road right-of-way or on property with boundary common to right-of-way. Both must be within Contract limits and be for period not exceeding one hundred and twenty calendar days..
 - .2 Stockpiles are located within provincial or municipal works yards or commercially licensed pit or quarry.
 - .2 Stockpiling of natural wood is subject to management conditions in Table 1. These conditions only apply to stockpiles to be in place for period exceeding one hundred and twenty calendar days.

**TABLE 1: EXCESS MATERIAL MANAGEMENT
DISTANCE SEPARATION REQUIREMENTS**

ADJACENT FEATURE	MINIMUM DISTANCE SEPARATION
Groundwater	2 m (above)
Waterbodies	30 m
Water Wells	100 m
Residences	100 m

END OF SECTION

SITE SELECTION NOTIFICATION FOR MANAGEMENT AS DISPOSABLE FILL

Contract Information

Contract No. _____ Owner: _____

The following describes the notification process between the National Capital Commission and the Contractor, wherein the Contractor formally notifies the NCC that agreement has been reached with a third party property owner for the deposition of Contract generated excess material. Such excess material, managed as disposable fill shall be limited to one or a combination of: earth; aggregate; swamp material; rock and natural wood, provided the conditions on management are satisfied.

Site Information

Property Owner(s) for the subject property: _____

Site Location: _____

Quantity and Type of Excess Material used as fill: _____

This is to notify the NCC that permission has been obtained from the property owner(s) named herein for the management of excess materials from this Contract. The property owner has also been provided with a copy of this form and has been advised that a Property Owner=s Release Form will be required. The use of this management site will comply with the following:

Conditions on Management

Bituminous pavement, concrete, masonry, and metal, plastic and polystyrene products will not be accepted for management as disposable fill.

These conditions do not supersede any constraints imposed on this property by Federal, Provincial or Municipal statute or regulations and bylaws made thereto.

Dated this ____ day of _____ 19 ____

Print Contractor=s Name & Field Representative=s Name

Contractor=s Field Representative Signature

Property Owner(s) Signature(s)

SITE SELECTION NOTIFICATION FOR MATERIALS STOCKPILING

Contract Information

Contract No. _____ Owner: _____

The following describes the notification process between the National Capital Commission and the Contractor, wherein the Contractor formally notifies the NCC that agreement has been reached with a third party property owner for the stockpiling of Contract generated excess material. Such excess material, stockpiled for re-use, may be one or a combination of: earth; aggregate; swamp material; rock; concrete; masonry; bituminous pavement; natural wood; metal, plastic and polystyrene, provided the conditions on management are satisfied.

Site Information

Property Owner(s) for the subject property: _____

Site Location: _____

Quantity and Type of Excess Material stockpiled: _____

This is to notify the NCC that permission has been obtained from the property owner(s) named herein for the management of excess materials from this Contract. The property owner has also been provided with a copy of this form and has been advised that a Property Owner=s Release Form will be required. The use of this management site will comply with the following:

Conditions on Management

It is understood that materials are stockpiled to be re-used.

Stockpiles of bituminous pavement, concrete and masonry may only be located:

- .1 a minimum of 30 m from waterbodies; and
- .2 a minimum of 100 m from residences unless such stockpiles are located within a provincial or municipal works yard or in a commercially licensed pit or quarry.

These conditions do not supersede any constraints imposed on this property by Federal, Provincial or Municipal statute or regulations and bylaws made thereto.

Dated this ____ day of _____ 19 ____

Print Contractor=s Name & Field Representative=s Name

Contractor=s Field Representative Signature

Property Owner(s) Signature(s)

96/01/19

Section 01562
Form 3
Page 1 of 1

PROPERTY OWNERS RELEASE

Contract No. _____

Work description: _____

Site Location: _____

I/We _____ being the owner(s) of the above Site, verify that the contractor for the above noted work has placed excess material from the above noted Contract on my/our property with my/our permission. I/We have been advised by the Contractor of the conditions of section 01562 of the specification and have been assured by the contractor that these conditions have been met.

Where materials are managed as disposable fill, I/We agree to be responsible for any subsequent relocation and management of the material so placed.

Dated this ____ day of _____ 19 ____

Print Contractor=s Name & Field Representative=s Name

Contractor=s Field Representative Signature

Property Owner(s) Signature(s)

1 GENERAL

- .1 Use new material and equipment unless otherwise specified.
- .2 Within 5 days of written request by Engineer, submit following information for materials and equipment proposed for supply:
 - .1 name and address of manufacturer,
 - .2 trade name, model and catalogue number,
 - .3 performance, descriptive and test data,
 - .4 manufacturer's installation or application instructions,
 - .5 evidence of arrangements to procure.
- .3 Use products of one manufacturer for material and equipment of same type or classification unless otherwise specified.

2 MANUFACTURERS INSTRUCTIONS

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
- .2 Notify Engineer in writing of any conflict between these specifications and manufacturers instructions. Engineer will designate which document is to be followed.

3 DELIVERY AND STORAGE

- .1 Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.
- .2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.
- .3 Store material and equipment in accordance with suppliers instructions.
- .4 Touch-up damaged factory-finished surfaces to Engineer's satisfaction. Use primer or enamel to match original. Do not paint over name plates.

4 SUBSTITUTION

- .1 No substitutions will be permitted without prior written approval of Engineer.
- .2 Proposals for substitution may only be submitted after award of contract. Such request must include statements of respective costs of items originally specified and the proposed substitution.
- .3 Proposals will be considered by Engineer if:
 - .1 materials selected by tenderer from those specified, are not available;

- .2 delivery date of materials selected from those materials specified would unduly delay completion of contract, or
- .3 alternative material to those specified, which are brought to the attention of and considered by Engineer as equivalent to the material specified and will result in a credit to the Contract amount.
- .4 Should proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on project. Pay for design or drawing changes required as result of substitution.
- .5 Amounts of all credits arising from approval of substitutions will be determined by Engineer and Contract Price will be reduced accordingly.

5 CONSTRUCTION EQUIPMENT AND PLANT

- .1 On request prove to the satisfaction of Engineer that the construction equipment and plant are adequate to manufacture, transport, place and finish work to quality and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.
- .2 Maintain construction equipment and plant in good operating order.

END OF SECTION

Part 1 General

1.1 PRECEDENCE

- .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.2 RELATED SECTIONS

- .1 Section 01340 – Shop Drawings, Product Data, Samples & Mock-ups

REFERENCES

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

1.3 SUBMITTALS

- .1 Make submittals in accordance with Section 01340 – Shop Drawings, Product Data, Samples & Mock-ups.
- .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.
- .3 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports contract administrator weekly.
- .4 Submit copies of reports or directions issued by Federal, and Provincial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit Material Safety Data Sheets (MSDS) to Contract Administrator.
- .7 Contract Administrator will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Contract Administrator within 3 days after receipt of comments from Contract Administrator.
- .8 Contract Administrator's 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.

- .9 Medical Surveillance: Where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Contract Administrator.
- .10 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 commencement of Work.

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 Contract Administrator prior to commencement of Work.

1.7 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with Section Regulatory Requirements.

1.8 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.

1.9 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 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.

1.10 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Health and Safety Act and Regulations for Construction Projects.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.11 UNFORSEEN 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 Ontario having jurisdiction. Advise Contract Administrator 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 minimum 2 years of site-related working experience specific to activities associated with contaminated material (overburden) removal.
 - .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.
 - .5 Be on site during execution of Work.

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 Ontario having jurisdiction, and in consultation with Contract Administrator.

1.14 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.

1.15 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.

END OF SECTION

1 RECORD DRAWINGS

- .1 Engineer will provide two sets of white prints for record drawing purposes.
- .2 Maintain project record drawings and record accurately deviations from Contract documents.
- .3 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.
- .4 Record changes in red. Mark on one set of prints and at completion of project and prior to final inspection, neatly transfer notations to second set and submit both sets to Engineer.
- .5 Record following information:
 - .1 Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.
 - .2 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
 - .3 Field changes of dimension and detail.
 - .4 Changes made by Change Order or Field Order.

END OF SECTION

1 **GENERAL**

1.1 **RELATED SECTIONS**

- .1 Section 01562 – Management and Disposal of Excess Material.

1.2 **MEASUREMENT PROCEDURES**

- .1 Work performed under this Section will be incidental to Work in Section 01562.

1.3 **REFERENCES**

- .1 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
- .2 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A3000-98-A5-98, Portland Cement
 - .2 CAN/CSA-A23.1-00, Concrete Materials and Methods of Concrete Construction

1.4 **PROTECTION OF EXISTING FEATURES**

- .1 Protect existing features in accordance with Section 01500 – Temporary Facilities
- .2 Confirm locations of buried utilities by careful test excavations.
- .3 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.
- .4 Record location of maintained, re-routed and abandoned underground lines.
- .5 Confirm locations of recent excavations adjacent to area of excavation.
- .6 Where required for excavation, cut roots or branches as approved by Engineer.

2 **PRODUCTS – Not applicable**

3 **EXECUTION**

3.1 **SITE PREPARATION**

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.2 **STOCKPILING**

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

3.3 **DEWATERING AND HEAVE PREVENTION**

- .1 Keep excavations free of water while Work is in progress.

3.4 **EXCAVATION**

- .1 Advise Engineer at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Remove concrete masonry and other obstructions encountered during excavation in accordance with Section 01562 – Management and Disposal of Excess Material.
- .3 Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .4 Do not obstruct flow of surface drainage or natural watercourses.
- .5 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

3.5 **BACKFILLING**

- .1 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .2 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.

3.6 **RESTORATION**

- .1 Upon completion of Work, remove waste materials and debris , trim slopes, and correct defects as directed by Construction Manager.
- .2 Replace topsoil as indicated.
- .3 Reinstate lawns to elevation which existed before excavation.
- .4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstate areas affected by Work as directed by Construction Manager.

END OF SECTION

1 **GENERAL – Not applicable**

2 **PRODUCTS**

2.1 **PVC DUCTS AND FITTINGS**

- .1 Rigid PVC duct: to CSA C22.2 No. 211.1, Type DB2/ES2, with moulded fittings, for direct burial expanded flange ends. Nominal length: 6.0 m plus or minus 12 mm.
- .2 Rigid PVC bends, couplings, reducers, bell end fittings, plugs, caps, adaptors same product material as duct, to make complete installation.
- .3 Rigid PVC 90° and 45° bends.
- .4 Rigid PVC 5° angle couplings.
- .5 Expansion joints as required.

2.2 **SOLVENT WELD COMPOUND**

- .1 Solvent cement for PVC duct joints.

2.3 **CABLE PULLING EQUIPMENT**

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

2.4 **MARKERS**

- .1 Concrete type cable markers: as indicated, with words: "Cable", "Joint" or "Conduit" impressed in top surface, with arrows to indicate change in direction of duct runs.

3 **EXECUTION**

3.1 **INSTALLATION**

- .1 Install duct in accordance with manufacturer's instructions.
- .2 Clean inside of ducts before laying.
- .3 Ensure full, even support every 1.5 m throughout duct length.
- .4 Slope ducts with 1 to 400 minimum slope.
- .5 During construction, cap ends of ducts to prevent entrance of foreign materials.
- .6 Pull through each duct steelmandrel not less than 300 mm long and of diameter 6 mm less than internal diameter of duct, followed by stiff bristle brush to remove sand, earth and other foreign matter. Pull stiff bristle brush through each duct immediately before pulling-in cables.
- .7 In each duct install pull rope continuous throughout each duct run with 3.0 m spare rope at each end.
- .8 Install markers as required.

END OF SECTION

PART 1 GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01005 - General Instructions.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for painting exterior metal surfaces and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01005 - General Instructions.
- .3 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Upon request, NCC Representative will furnish qualified products list of paints.

1.2 QUALITY ASSURANCE

- .1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01005 - General Instructions and 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 Separate waste materials for reuse and recycling in accordance with section 01562 - Management and disposal of Excess Material.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Paint:
 - .1 Valspar R-Cure 550 Dark Green Urethane Topcoat, or equivalent.
 - .2 Primer: Valspar R-Cure 200 aray Epoxy Primer, or equivalent.

PART 3 EXECUTION

3.1 PREPARATION

- .1 Remove existing loose and rusted paint from exterior metal surfaces.
- .2 Metal surfaces to be repainted:
 - .1 Clean surfaces by removing loose, cracked, brittle or non-adherent paint, rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with following.
 - .1 Media blast with switchgear de-energized to remove surface rust.
 - .3 Smooth any exterior surface defects with 150 grit sandpaper, using a flexible sandpaper holder or orbital sander. Sanded surface should be even, without wrinkles blisters, or loose paint.
 - .4 Prior to starting paint application ensure degree of cleanliness of surfaces by wiping with a clean dry cloth followed by a clean cloth soaked in solvent such as isopropyl alcohol.
 - .1 Mask all labels and nameplates on the enclosure with painter's tape.
 - .2 Apply primer after surface has been cleaned and before deterioration of surface occurs.
 - .3 Clean surfaces again if rusting occurs after completion of surface preparation.
 - .5 Mixing paint:
 - .1 Prepare the appropriate amount of Valspar R-cure 200 aray epoxy primer (or equivalent), Resin and catalyst to be mixed as directed in technical datasheet.
 - .2 Prepare the appropriate amount of Valspar R-cure 550 dark green urethane topcoat (or equivalent). Resin and catalyst to be mixed as directed in technical datasheet.
 - .6 Number of paint coats: 1 primer, 1 topcoat.
 - .1 Repainting existing metal surfaces.
 - .1 One primer coat to minimum dry film thickness of 1.0 to 1.5 mils.
 - .2 One urethane topcoat to minimum dry film thickness of 1.3 to 1.5 mils.

3.2 APPLICATION

- .1 Manufacturer's Instructions: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Apply primer to clean, exposed bare metal and allow to dry for at least 30 minutes.
- .3 Apply uniform topcoat to switchgear enclosure, and allow to dry for at least 24 hours.
- .4 Remove painters tape from labels and nameplates.

- .5 Where surface to be painted is not under cover, do not apply paint when:
 - .1 Air temperature is below 5 degrees C or when temperature is expected to drop to 0 degrees C before paint has dried.
 - .2 Temperature of surface is over 50 degrees C unless paint is specifically formulated for application at high temperatures.
 - .3 Fog or mist occur at site; it is raining or snowing; there is danger of rain or snow; relative humidity is above 85%.
 - .4 Surface to be painted is wet, damp or frosted.
 - .5 Previous coat is not dry.

- .6 Supply cover when paint must be applied in damp or cold weather. Supply, shelter, or heat surface and surrounding air to comply with temperature and humidity conditions specified. Protect until paint is dry or until weather conditions are suitable.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01005 - General Instructions.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.4 PROTECTION

- .1 Protect painted surfaces from damage during construction.
- .2 Protection of surfaces:
 - .1 Protect surfaces not to receive paint.
 - .2 Prevent contamination of cleaned surfaces by salts, acids, alkalis, corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats of paint. Remove contaminants from surface and apply paint immediately.
 - .3 Protect cleaned and freshly painted surfaces from dust to approval of NCC Representative.
- .3 Repair damage to adjacent materials caused by painting exterior metal surface application installation.

PART 1 GENERAL

1.1 SUMMARY

- .1 Section Includes:
 - .1 General requirements that are common to NMS sections found in Division 26 – Electrical.

1.2 RELATED REQUIREMENTS

- .1 Section 26 05 14 – Power Cable and Overhead Conductors (1001 V).
- .2 Section 26 12 13 – Liquid Filled, Medium Voltage Transformers.
- .3 Section 26 28 13.02 – Outdoor Load Break Switches, and Fuses.
- .4 Section 26 41 00.01 – Primary Lightning Arresters.
- .5 Section 33 71 16.01 – Electrical Pole Lines and Hardware.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA C22.1-15, Canadian Electrical Code, Part 1 (23th Edition), Safety Standard for Electrical Installations.
 - .2 CAN3-C235-83(R2010), Preferred Voltage Levels for AC Systems, 0 to 50,000 V.
 - .3 CSA C22.2 No.65-13, Wire Connectors.
 - .4 CAN/CSA C22.3 No.1-10, Overhead systems.
 - .5 CAN/CSA C57-98 (2011), Electric Power Connectors for use in Overhead Line Conductors.
 - .6 CAN/CSA C22.3 No.7-10, Underground Systems.
- .2 Electrical and Electronic Manufacturer's Association of Canada (EEMAC)
 - .1 EEMAC 2Y-1-1958, Light Gray Colour for Indoor Switch Gear.
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.4 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 nameplates and labels for control items in English and French.
- .4 Use one nameplate or label for both languages.

1.5 SUBMITTALS

- .1 Submittals: in accordance with Section 01005 – General Instructions.
- .2 Product Data: submit WHMIS MSDS in accordance with Section 01005 – General Instructions.
- .3 Submit for review “As-built” single line electrical diagrams in glazed frames and locate where appropriate.
 - .1 Electrical distribution system in main site office.

1.6 RECORD DRAWING

- .1 Show on the record drawings the exact pole and equipment locations and routing of overhead and underground systems.

1.7 SHOP DRAWINGS

- .1 Shop drawing review will be done only to ascertain general compliance with the technical requirements of the tender documents.
- .2 Review of the shop drawings will not release contractor from any responsibility to meet tender document requirements, dimensions and quantities.
- .3 Do not release materials for fabrication or assembly until shop drawings are reviewed by the NCC Representative.
- .4 Submit for review, a minimum of five (5) copies of shop drawings of the following equipment:
 - .1 Poles and hardware.
 - .2 Switches and fusing.
 - .3 Wiring connectors.
 - .4 Transformers.
 - .5 Lightning Arresters.
 - .6 Relays
 - .7 Enclosures
 - .8 Annunciators
 - .9 Insulators
 - .10 Wiring
 - .11 Paint

- .12 Any additional equipment as required by the NCC Representative.

1.8 OPERATION AND MAINTENANCE DATA

- .1 Include in operations and maintenance data:
 - .1 Details of design elements, construction features, component function and maintenance requirements, to permit effective start-up, operation, maintenance, repair, modification, extension and expansion of any portion or feature of installation.

1.9 EQUIPMENT SUBSTITUTION

- .1 All equipment supplied shall be exactly as specified herein.
- .2 Substitutions or alternatives to what is specified will not be accepted after the closing of tenders. Substitution or alternatives must be submitted two weeks prior to tender closing and must be approved by NCC Representative by addenda only.
- .3 All equivalency decisions made by the NCC Representative will be final. The burden of proof of equivalent products both in terms of performance and quality shall be on the Contractor.
- .4 Quality Control: in accordance with Section 01005 – General Instructions.
 - .1 Provide CSA certified equipment and material.
 - .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 to NCC Representative and Consultant.
- .5 Manufacturer's Field Reports: submit to NCC Representative and Consultant manufacturer's written report, within 3 days of review, verifying compliance of Work and electrical system and other systems testing, as described in PART 3 - FIELD QUALITY CONTROL.

1.10 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01005 – General Instructions.
- .2 Qualifications: electrical Work to be carried out by qualified, licensed electricians who hold valid Master Electrical Contractor license or apprentices as per the conditions of Provincial Act respecting manpower vocational training and qualification.
 - .1 Employees registered in provincial apprentices program: permitted, under direct supervision of qualified licensed electrician, to perform specific tasks.
 - .2 Permitted activities: determined based on training level attained and demonstration of ability to perform specific duties.
- .3 Site Meetings:
 - .1 In accordance with Section 01005 – General Instructions.

- .2 Site Meetings: as part of Manufacturer's Field Services described in Part 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.
 - .1 After delivery and storage of products, and when preparatory Work is complete but before installation begins.
 - .2 Twice during progress of Work at 25% and 60% complete.
 - .3 Upon completion of Work.
- .4 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01005 – General Instructions.

1.11 DELIVERY, STORAGE AND HANDLING

- .1 Material Delivery Schedule: provide NCC Representative with schedule within 2 weeks after award of Contract.
- .2 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01562 – Management and Disposal of Excess Material.

1.12 SYSTEM STARTUP

- .1 Instruct NCC Representative and operating personnel 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.

1.13 OPERATING INSTRUCTIONS

- .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, control diagrams, and control sequence for each principal system and item of equipment.
 - .2 Start up, proper adjustment, operating, lubrication, 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 Print or engrave operating instructions and frame under glass or in approved laminated plastic.
- .4 Post instructions where directed.
- .5 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.
- .6 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

PART 2 PRODUCTS

2.1 SUSTAINABLE REQUIREMENTS

- .1 Materials and products in accordance with Section 01005 – General Instructions.

2.2 MATERIALS AND EQUIPMENT

- .1 Provide material and equipment in accordance with Section 01005 – General Instructions.
- .2 Material and equipment to be CSA certified.
- .3 Factory assemble control panels and component assemblies.

2.3 WARNING SIGNS

- .1 Warning Signs: in accordance with requirements of inspection authorities, NCC Representative and Consultant.
- .2 Porcelain enamel signs, minimum size 175 x 250 mm.

2.4 WIRING TERMINATIONS

- .1 Ensure lugs, terminals, screws used for termination of wiring are suitable for copper or aluminum conductors.

2.5 EQUIPMENT IDENTIFICATION

- .1 Identify electrical equipment with nameplates and labels as follows:
 - .1 Nameplates: lamicoid 3 mm thick plastic engraving sheet, matt white finish face, black core, lettering accurately aligned and engraved into core and mechanically attached with self tapping screws.

.2 Sizes as follows:

NAMEPLATE SIZE			
Size	Dimensions	No. of lines	Height of letters
1	10 x 50 mm	1	3 mm
2	12 x 70 mm	1	5 mm
3	12 x 70 mm	2	3 mm
4	20 x 90 mm	1	8 mm
5	20 x 90 mm	2	5 mm
6	25 x 100 mm	1	12 mm
7	25 x 100 mm	2	6 mm

.2 Labels :

- .1 Use clear self adhesive labels "P-touch" type with 4 mm high black letters
 - .2 Identify circuit ID on cover plates of receptacles.
 - .3 Also, identify computer dedicated receptacle (receptacle located beside a data outlet and/or orange receptacles), receptacles dedicated to photocopiers, printers, fridges, microwaves and other equipments of such (receptacle affected by a "D").
 - .4 Identify each fluorescent lighting fixture connected on emergency with a visible red self adhesive label "P-Touch" type, with 3mm high white letters.
- .3 Wording on nameplates and labels to be approved by NCC Representative prior to manufacture.
- .4 Allow for maximum of fifty (50) letters per nameplate and label.
- .5 Identification to be English and French.
- .6 Use one (1) nameplate for both languages.
- .7 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.
- .8 Identify equipment with Size 3 labels engraved "ASSET INVENTORY No. [____]" as directed by NCC Representative.
- .9 Disconnects, starters and contactors: indicate equipment being controlled and voltage.
- .10 Terminal cabinets and pull boxes: indicate system and voltage.
- .11 Transformers: indicate capacity, primary and secondary voltages.

2.6 WIRING IDENTIFICATION

- .1 Identify wiring with permanent indelible identifying markings, coloured plastic tapes, 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 "Labelling" of all branch circuit wiring including phase conductors, neutrals, to be done on both ends of all circuit wires plus in any junction and/or pull boxes located in between using self adhesive labels.

2.7 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 15 m intervals.
- .3 Colours: 25 mm wide prime colour and 20 mm wide auxiliary colour.

Systems	Prime Colour	Auxiliary Colour
up to 250 V	Yellow	
up to 600 V	Yellow	Green
up to 250 V (emergency)	Yellow	Red
up to 600 V (emergency)	Yellow	Green & Red
Fire alarm	Red	
Telephone	Green	
Other communication networks	Green	Blue
Emergency Voice	Red	Blue
Mechanical controls	Yellow & orange	Blue
Other Security Systems	Red	Yellow

2.8 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 "equipment green" finish.
 - .2 Paint indoor switchgear and distribution enclosures light gray to EEMAC 2Y-1.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.
- .2 Do overhead and underground systems in accordance with CSA C22.3 No.1 and No.7 except where specified otherwise.

3.2 NAMEPLATES AND LABELS

- .1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.3 CO-ORDINATION OF PROTECTIVE DEVICES

- .1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.
- .2 Provide coordination study to illustrate selective coordination between new protective devices and upstream substation protection.

3.4 FIELD QUALITY CONTROL

- .1 Conduct following tests in accordance with Section 01005 – General Instructions:
 - .1 Power distribution system including phasing, voltage, grounding and load balancing.
 - .2 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 Testing of overhead conductors insulators, and hardware in accordance with Section 26 05 14 – Power Cable and Overhead Conductors (1001 V), and Section 33 71 16.01 – Electrical Pole Lines and Hardware.
 - .4 Testing of transformers in accordance with Section 26 12 13 – Liquid Filled, Medium Voltage Transformers and Section 26 12 19 – Pad Mounted, Liquid Filled, Medium Voltage Transformers.
 - .5 Testing of lightning arresters in accordance with Section 26 41 00.01 – Primary Lightning Arresters.
 - .6 Testing of loadbreak switches in accordance with Section 26 28 13.02 – Outdoor Load Break Switches, and Fuses.
- .2 Carry out tests in presence of NCC Representative.

- .3 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
- .4 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 - 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 Schedule and pay for site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.
 - .4 Start-up of equipment shall be by manufacturer's of the equipment.

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-C61089-2011, Round Wire Concentric Lay Overhead Electrical Stranded Conductors.
 - .2 International Electrical Testing Association:
 - .1 ANSI/NETA ATS-2013, Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Provide product data in accordance with Section 26 05 00 - Common Work Results for Electrical.
 - .1 Provide manufacturer's printed product literature, specifications, data sheet and include product characteristics, performance criteria, physical size, finish and limitations.

PART 2 PRODUCTS

2.1 PRIMARY OVERHEAD CONDUCTORS (5001 - 15000 V)

- .1 Bare, aluminum, steel reinforced conductors, size as indicated.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Install power cable on pole lines as indicated and in accordance with manufacturer's instructions.
- .2 Provide supports and accessories for installation of high voltage power cable.
- .3 Install stress cones, terminations and splices in accordance with manufacturer's instructions

- .4 Install grounding in accordance with local inspection authority having jurisdiction.
- .5 Provide cable identification tags and identify each phase conductor of power cable.

3.2 FIELD QUALITY CONTROL

- .1 Visual and Mechanical Inspection:
 - .1 Compare cable data with drawings and specifications.
 - .2 Inspect conductors for physical damage.
 - .3 Inspect overhead conductors for proper sag, and clearances between other conductors, buildings, trees, and other structures to ensure compliance with applicable codes and standards.
 - .4 Inspect all bolted electrical connections for high resistance using low-resistance ohmmeter or calibrated torque-wrench method, in accordance with manufacturer's published data or as per NETA ATS.
 - .5 Inspect compression-applied connectors for correct cable match and indentation.
 - .6 Inspect insulators, supports and terminations.
- .2 Electrical Tests:
 - .1 Perform resistance measurements through bolted connections with a low-resistance ohmmeter, if applicable. Investigate any values that deviate from those of similar bolted connections by more than 50% of the lowest value.

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical.
- .2 Section 33 71 73.02 - Underground Electrical Service.

1.2 PRODUCT DATA

- .1 Provide product data in accordance with Section 26 05 00 - Common Work Results for Electrical.

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 1000 V insulation of cross-linked thermosetting polyethylene material rated RW90 XLPE, Jacketted.
- .3 Neutral supported cable: 1, 2 or 3 phase insulated conductors of Aluminum and one neutral conductor of Aluminum steel reinforced, size as indicated. Type: NS90
Insulation: Type NS-1 rated 300 V, Type NSF-2 flame retardant rated 600 V (for 3-phase systems).

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 33 71 73.02 - Underground Electrical Service.
- .2 Cable Colour Coding: to Section 26 05 00 - Common Work Results for Electrical.
- .3 Conductor length for parallel feeders to be identical.

- .4 Lace or clip groups of feeder cables at distribution centres, pull boxes, and termination points.

3.3 INSTALLATION OF BUILDING WIRES

- .1 Install wiring as follows:
 - .1 In underground ducts in accordance with Section 33 71 73.02 - Underground Electrical Service.

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA C22.2 No.65-13, Wire Connectors.
 - .2 CSA C22.2 No.41-13, Grounding and Bonding Equipment.
 - .3 C57-98 (R2011), Electric Power connectors for use in Overhead Line Conductors.

1.3 PRODUCT DATA

- .1 Submit product data in accordance with Section 26 05 00 - Common Work Results for Electrical.

1.4 CERTIFICATES

- .1 Obtain inspection certificate of compliance covering high voltage stress coning from inspection authority and include it with maintenance manuals.

PART 2 PRODUCTS

2.1 CONNECTORS AND TERMINATIONS

- .1 Aluminum compression connectors to CSA C22.2 No.65 and C57 as required sized for conductors.
- .2 Contact aid for aluminum cables where applicable.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Install stress cones, terminations, and splices in accordance with manufacturer's instructions.
- .2 Bond and ground as required to CSA C22.2 No.41.

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE)
 - .1 ANSI/IEEE 837-14, Qualifying Permanent Connections Used in Substation Grounding.
 - .2 ANSI/IEEE 81-12, IEEE Guide for Measuring Earth Resisting Ground Impedance, and Earth Surface Potentials of a Grounding System.
- .2 International Electrical Testing Association:
 - .1 ANSI/NETA ATS-13, Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Rod electrodes: copper clad steel, 19 mm diameter by 3 m long.
- .2 Conductors: bare, stranded, soft annealed copper wire, size No. 4/0 AWG and 2/0 AWG for ground bus, electrode interconnections, metal structures, gradient control mats, transformers, switchgear, motors, ground connections.
- .3 Conductors: bare, stranded soft annealed copper wire, size No. 4 AWG for grounding cable sheaths, raceways, pipe work, screen guards, switchboards, potential transformers.
- .4 Conductors: pvc insulated coloured green, stranded soft annealed copper wire No. 10 AWG for grounding meter and relay cases.

- .5 Conductors: No. 3/0 AWG extra flexible (425 strands) copper conductor for connection of switch mechanism operating rod to gradient control mat, fence gates, vault doors.
- .6 Bolted removable test links.
- .7 Gradient control mat: galvanized steel, size 1.2 x 1.8 m, 150 x 1 50 mm mesh and 6 mm thick.
- .8 Accessories: non-corroding, necessary for complete grounding system, type, size material as indicated, including:
 - .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.
- .9 Wire connectors and terminations: as indicated.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Install continuous grounding system including, electrodes, conductors, connectors and accessories as indicated and to requirements of local authority having jurisdiction.
- .2 Ground fences to grounding system independent of station ground.
- .3 Install connectors and cadweld in accordance with manufacturer's instructions.
- .4 Protect exposed grounding conductors during and after construction.
- .5 Make buried connections, and connections to electrodes, structural steel work, using copper welding by thermit process or permanent mechanical connectors to ANSI/IEEE 837.
- .6 Use mechanical connectors for grounding connections to equipment provided with lugs.
- .7 Use No. 4/0 AWG bare copper cable for main ground bus of substation and No. 2/0 AWG mhd bare copper cable for taps on risers from main ground bus to equipment.
- .8 Use tinned copper conductors for aluminum structures.

3.2 ELECTRODE INSTALLATION

- .1 Install ground rod electrodes. Make grounding connections to station equipment.

- .2 Install ground rod electrodes at transformer and switchgear locations.
- .3 Install gradient control mats. Connect mats to station ground electrode and switch mechanism operating rods.
- 4 Make special provision for installing electrodes that will give acceptable resistance to ground value, where rock or sand terrain prevails.

3.3 EQUIPMENT GROUNDING

- .1 Install grounding connections as indicated to typical station equipment including: metallic water main, line sky wire, neutral, gradient control mats. Non current carrying parts of: transformers, generators, motors, circuit breakers, reclosers, current transformers, frames of gang-operated switches and fuse cutout bases. Cable sheaths, raceways, pipe work, screen guards, switchboards, potential transformers. Meter and relay cases. Any exposed building metal, within or forming part of station enclosure. Sub-station fences, pothead bodies. Outdoor lighting.
- .2 Ground hinged doors to main frame of electrical equipment enclosure with flexible jumper.

3.4 NEUTRAL GROUNDING

- .1 Connect transformer neutral and distribution neutral together using 1000 V insulated conductor to one side of ground test link, the other side of the test link being connected directly to main station ground. Ensure distribution neutral and neutrals of potential transformers are bonded directly to transformer neutral and not to main station ground.
- .2 Interconnect electrodes and neutrals at each grounding installation.
- .3 Connect neutral of station service transformer to main neutral bus with tap of same size as secondary neutral.
- .4 Ground transformer tank with continuous conductor from tank ground lug through connector on ground bus to primary neutral. Connect neutral bushing at transformer to primary neutral in same manner.

3.5 POLE MOUNTED SWITCHING DEVICE GROUNDING

- .1 Drive four ground rods 3 m long at base of each pole on which group-operated line switching devices are mounted.
- .2 Arrange rods in square formation with 3 m sides, located so that operator must stand within square to operate switch.
- .3 Interconnect ground rods with No. 2/0 AWG stranded annealed copper conductor and join to switch operating handle ground wires.

- .4 Connect operating handle of switch to handle base with No. 3/0 AWG extra flexible copper conductor.

3.6 POLE MOUNTED TRANSFORMER GROUNDING

- .1 Drive ground rods at base of each pole on which transformers are mounted and interconnect transformer, system neutral, lightning arresters and ground rods.

3.7 FIELD QUALITY CONTROL

- .1 Visual and Mechanical Inspection:
 - .1 Verify grounding system is in compliance with drawings, specifications, and applicable codes and standards.
 - .2 Inspect physical and mechanical condition.
 - .3 Inspect all bolted electrical connections for high resistance using low-resistance ohmmeter or calibrated torque-wrench method, in accordance with manufacturer's published data or as per NETA ATS.
 - .4 Inspect anchorage.
- .2 Electrical Tests:
 - .1 Perform resistance measurements through bolted connections with a low-resistance ohmmeter, if applicable. Investigate any values that deviate from those of similar bolted connections by more than 50% of the lowest value.
 - .2 Perform fall-of-potential or alternative test in accordance with ANSI/IEEE 81 on the main grounding electrode or system. Resistance between main grounding electrode and ground shall not exceed 1 ohm.
 - .3 Perform point-to-point tests to determine the resistance between the main grounding system and all major electrical equipment frames, system neutral and derived neutral points. Investigate any values that exceed 0.5 ohms.

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 American National Standards Institute :
 - .1 ANSI/IEEE 837-14, Qualifying Permanent Connections Used in Substation Grounding.
- .1 Canadian Standards Association (CSA International)
 - .1 CSA C22.1-15, Canadian Electrical Code, Part 1 (23th Edition), Safety Standard for Electrical Installations.

PART 2 PRODUCTS

2.1 EQUIPMENT

- .1 Clamps for grounding of conductor: size as required to electrically conductive underground water pipe.
- .2 Copper conductor: minimum 6 m long for each concrete encased electrode, bare, stranded, tinned, soft annealed, size as required.
- .3 Rod electrodes: copper clad steel 19 mm diameter by minimum 3 m long.
- .4 Grounding conductors: bare stranded copper, tinned, soft annealed, size as indicated.
- .5 Insulated grounding conductors: green, copper conductors, size as indicated.
- .6 Ground bus: copper, size as indicated, complete with insulated supports, fastenings, connectors.
- .7 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 INSTALLATION GENERAL

- .1 Install complete permanent, continuous grounding system including, electrodes, conductors, connectors, accessories. Where EMT is used, run ground wire in conduit.
- .2 Install connectors in accordance with manufacturer's instructions.
- .3 Protect exposed grounding conductors from mechanical injury.
- .4 Make buried connections, and connections to conductive water main, 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.
- .8 Connect building structural steel and metal siding to ground by welding copper to steel.
- .9 Make grounding connections in radial configuration only, with connections terminating at single grounding point. Avoid loop connections.
- .10 Bond single conductor, metallic armoured cables to cabinet at supply end, and provide non-metallic entry plate at load end.
- .11 Ground secondary service pedestals.

3.2 MAINTENANCE HOLES

- .1 Install conveniently located grounding stud, electrode, size as indicated stranded copper conductor in each maintenance hole.
- .2 Install ground rod in each maintenance hole so that top projects through bottom of maintenance hole. Provide with lug to which grounding connection can be made. Confirm ground resistance meets or exceeds Canadian Electrical Code minimum requirements.

3.3 ELECTRODES

- .1 Make ground connections to continuously conductive underground water pipe on street side of water meter.
- .2 Install water meter shunt.

- .3 Install concrete encased electrodes in building foundation footings, with terminal connected to grounding network.
- .4 Install rod, electrodes and make grounding connections as indicated.
- .5 Bond separate, multiple electrodes together.
- .6 Use size 2/0 AWG copper conductors for connections to electrodes.
- .7 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 SYSTEM AND CIRCUIT GROUNDING

- .1 Install system and circuit grounding connections to neutral of secondary 240 V and 600 V systems.

3.5 EQUIPMENT GROUNDING

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

3.6 GROUNDING BUS

- .1 Install copper grounding bus mounted on insulated supports on wall of electrical room and communication equipment room.
- .2 Ground items of electrical equipment in electrical room and IT equipment in communication equipment room to ground bus with individual bare stranded copper connections size 2/0AWG.

3.7 COMMUNICATION SYSTEMS

- .1 Install grounding connections for telephone, sound, fire alarm, security systems, intercommunication systems as follows:
 - .1 Telephones: make telephone grounding system in accordance with telephone company's requirements.
 - .2 Sound, fire alarm, security systems, intercommunication systems as indicated.

3.8 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 NCC Representative and local authority having jurisdiction over installation.

- .3 Perform tests before energizing electrical system.

END

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 CSA International
 - .1 CAN/CSA-Z809-08, Sustainable Forest Management.
- .2 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .3 Insulated Cable Engineers Association, Inc. (ICEA)
- .4 Sustainable Forestry Initiative (SFI)
 - .1 SFI-2010-2014 Standard.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .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.

PART 2 PRODUCTS

2.1 CABLE PROTECTION

- .1 38 x 140 mm planks pressure treated with copper naphthenate or 5% pentachlorophenol solution, water repellent preservative.

2.2 MARKERS

- .1 Concrete type cable markers: 600 x 600 x 100 mm with words: cable, joint or conduit impressed in top surface, with arrows to indicate change in direction of cable and duct runs.
- .2 Cedar post type markers: to CAN/CSA-Z809 or FSC or SFI 89 x 89 mm, 1.5 m long, pressure treated with copper naphthenate or 5% pentachlorophenol solution, water repellent preservative, with nameplate fastened near post top, on side facing cable or conduit to indicate depth and direction of duct and cable runs.
 - .1 Nameplate: aluminum anodized 89 x 125 mm, 1.5 mm thick mounted on cedar

post with mylar label 0.125 mm thick with words Cable, Joint or Conduit with arrows to indicate change in direction.

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 NCC Representative.
 - .2 Inform NCC Representative 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 NCC Representative.

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 Mark underground splices.
- .3 Where markers are removed to permit installation of additional cables, reinstall existing markers.

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.
 - .3 High Potential (Hipot) Testing.
 - .1 Conduct hipot testing in accordance with manufacturer's recommendations.
- .7 Provide NCC 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 PROTECTION

- .1 Repair damage to adjacent materials caused by cables installation.

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-C2-M91(R2003), Single-Phase and Three-Phase Distribution Transformers, Types ONAN and LNaN.
 - .2 CSA C802.1-13, Minimum Efficiency Values for Liquid Filled Distribution Transformers.
- .2 Electrical and Electronic Manufacturer's Association of Canada
 - .1 EEMAC L9-3-1987, Interchangeability of HV Bushings on Pole Type Distribution Transformers.
- .3 International Electrical Testing Association:
 - .1 ANSI/NETA ATS-13, Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, and limitations.
- .3 Submit shop drawings and indicate:
 - .1 Dimensioned positions of mounting devices.
 - .2 Dimensioned positions of terminations.
 - .3 Identified internal and external component layout on assembly drawing.
 - .4 Insulating liquid capacity.
- .4 Closeout Submittals
 - .1 Provide maintenance data for liquid filled transformers for incorporation into manual specified in Section 26 05 00 - Common Work Results for Electrical.
 - .2 Include insulating liquid maintenance data.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Ship transformers complete with first fill of liquid.

PART 2 PRODUCTS

2.1 TRANSFORMER CHARACTERISTICS

- .1 Transformers: to CAN/CSA C2.
- .2 Liquid cooled, outdoor, distribution transformers type LNAN c/w selector switch for dual primary voltage.
- .3 Dual Primary voltage: .8 kV and 4.8 kV LN, 60 Hz, wye connected.
- .4 Secondary voltage as indicated on drawings.
- .5 Capacity: kVA as indicated on drawings.
- .6 Basic impulse level: 95 kV, (HV), 30 kV (LV).
- .7 Polarity: additive.
- .8 Impedance: not less than 4%.
 - .1 Single phase transformers with same impedance, from same manufacturer, when used in multi-phase configuration.
 - .2 Transformers operating in parallel to have same impedance.
- .9 Minimum efficiency as prescribed by CSA C802.1.

2.2 MOUNTING

- .1 Transformers suitable for pole.

2.3 VIBRATION DAMPERS

- .1 Anti-vibration mountings to isolate not less than 90% of disturbing vibrations.

2.4 VOLTAGE TAPS

- .1 Four-2.5% taps, 2-FCAN, 2-FCBN.

2.5 TAP CHANGER

- .1 Externally operated off-load tap changer.

2.6 HIGH VOLTAGE BUSHINGS

- .1 Bushings: to EEMAC L9-3.
- .2 One high voltage bushing on single phase transformers.

2.7 INSULATING LIQUID

- .1 Insulating liquid: transformer oil.

2.8 ACCESSORIES

- .1 Hanger irons and adapter plates.
- .2 Top filter press connection.

2.9 FINISH

- .1 Finish tank exterior in accordance with Section 26 05 00 - Common Work Results for Electrical.

2.10 EQUIPMENT IDENTIFICATION

- .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Owner's equipment reference label: size 7.

2.11 SOURCE QUALITY CONTROL

- .1 Provide test certificates to NCC Representative for the following:
 - .1 Ratio.
 - .2 No load loss and exciting current.
 - .3 Load loss.
 - .4 Impedance.
 - .5 Dielectric (induced voltage and applied potential tests).
 - .6 Winding resistance.
 - .7 Pressure test.
 - .8 Insulation resistance/dissipation factor test.

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 transformers only after other work in area is completed and in accordance with manufacturer's instructions.

- .2 Ensure concrete pad fully cured for 28 days before installation of transformers.
- .3 Use spreader bars on slings when lifting transformers into place.
- .4 Set and secure transformers in place rigid, plumb, square.
- .5 Ensure internal connections are mechanically tight.
- .6 Make connections.
- .7 Connect transformer ground terminal to system ground.
- .8 Fill transformers when required with metal hose and ensure care is taken to prevent contamination of liquid and components.
- .9 Set taps to produce rated secondary voltage at no-load.

3.3 FIELD QUALITY CONTROL

- .1 Visual and Mechanical Inspection:
 - .1 Compare equipment nameplate data with drawings and specifications.
 - .2 Inspect physical and mechanical condition.
 - .3 Inspect anchorage, alignment and grounding.
 - .4 Verify the bushings are clean.
 - .5 Verify that alarm, control, and trip settings on temperature indicators are as specified.
 - .6 Verify operation of all alarm, control, and trip circuits from temperature and level indicators, pressure relief device, and fault pressure relay, if applicable.
 - .7 Inspect all bolted electrical connections for high resistance using low-resistance ohmmeter or calibrated torque-wrench method, in accordance with manufacturer's published data or as per NETA ATS-2013.
 - .8 Verify correct liquid level in tanks and bushings.
 - .9 Perform inspections and mechanical tests as recommended by the manufacturer.
 - .10 Verify presence of transformer surge arresters.
 - .11 Verify de-energized tap-changer position is left as specified.
- .2 Electrical Tests:
 - .1 Perform resistance measurements through bolted connections with a low-resistance ohmmeter, if applicable. Investigate any values that deviate from those of similar bolted connections by more than 50% of the lowest value.
 - .2 Perform insulation resistance tests, winding-to-winding, and each winding-to-ground. Apply voltage in accordance with manufacturer's published data, or 5000VDC, if data is not available. Investigate any resistance values that are lower than manufacturer's recommendation or the minimum prescribed by NETA ATS. Calculate polarization index to ensure it is not less than 1.0.
 - .3 Perform turns ratio tests at all tap positions. Results shall not deviate by more than one-half percent from either the adjacent coils or the calculated ratio.
 - .4 Perform insulation power-factor or dissipation-factor tests on all windings. Methods and results shall be in accordance with manufacturer's published data, or as per NETA ATS, in the absence of such data.

.5 Perform insulation power-factor or dissipation-factor tests on each bushing equipped with a power-factor/capacitance tap. Investigate values that vary from nameplate values by more than 10%. In the absence of a power-factor/capacitance tap, perform hot-collar tests. These tests shall be in accordance with the test equipment manufacturer's published data. Hot-collar tests are evaluated on milliampere/milliwatt loss basis, and the results should be compared to values of similar bushings.

.6 Perform excitation current tests in accordance with test equipment manufacturer's published data.

.7 Measure the resistance of each high-voltage winding in each de-energized tap-changer position. Measure the resistance of each low-voltage winding in each de-energized tap-changer position, if applicable.

3.4 CLEANING

.1 Proceed in accordance with Section 01005 - General Instructions.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical.
- .2 Section 26 41 00.01 - Primary Lighting Arresters.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers, Inc. (IEEE)
 - .1 ANSI/IEEE 386-06, Separable Insulated Connector Systems for Power Distribution Systems Above 600 V.
- .2 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-C2-M91 (R2003), Single-Phase and Three Phase Distribution Transformers, Types ONAN and LNaN.
 - .2 CAN/CSA-C227.3-06 (R2011), Low-Profile, Single-Phase, Dead Front, Pad-Mounted Distribution Transformers with Separable Insulated High-Voltage Connectors.
 - .3 CSA C227.4-06 (R2011), Three-Phase Dead Front Pad-Mounted Distribution Transformers with Separable Insulated High-Voltage Connectors.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 26 05 00 - Common Work Results for Electrical .
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, and limitations.
- .3 Submit shop drawings and indicate:
 - .1 Anchoring method and dimensioned foundation template.
 - .2 Dimensioned cable entry locations.
 - .3 Dimensioned cable termination height.
 - .4 Provide Technical data:
 - .1 KVA rating.
 - .2 Primary and Secondary voltages.
 - .3 Primary and Secondary Winding Configuration.
 - .4 Frequency.
 - .5 Full load efficiency.
 - .6 BIL for HV sections.
 - .7 Impedance.
 - .8 Maximum losses, no load and full load.
 - .9 Sound level.

- .5 For dual voltage transformers the manufacturer must provide, evidence that the current limiting back up fuse will coordinate with the bayonet fuse at both voltages and protect against catastrophic failure of the transformer tank.
- .4 Identified internal and external component layout on assembly drawing.
- .5 Insulating liquid capacity.
- .6 Submit primary fuse time-current characteristics.
- .7 Quality Assurance Submittals:
 - .1 Certificates: submit production certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .2 Instructions: submit manufacturer's installation instructions.
- .8 Closeout Submittals:
 - .1 Provide operation and maintenance data for pad mounted distribution transformers for incorporation into manual specified in Section 26 05 00 - Common Work Results for Electrical.
 - .2 Include insulating liquid maintenance data.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01562 - Management and Disposal of Excess Material.

PART 2 PRODUCTS

2.1 EQUIPMENT

- .1 Low profile single-phase pad mounted distribution transformers: to CAN/CSA-C227.3.
- .2 Three phase dead front pad mounted distribution transformers: to CSA C227.4.
- .3 Separable insulated connectors for power distribution systems above 600 V: to ANSI/IEEE 386.
- .4 Oil filled pad mounted distribution transformers complete with primary and secondary cable compartments, primary disconnecting switch options and accessories to form complete factory assembled, self-contained, steel fabricated for mounting on concrete pad.
- .5 High voltage bushings for connection to distribution system through separable insulated connectors for dead front operation.
- .6 Separable insulated connectors.
- .7 Spade type low voltage terminals.

- .8 Connectors for primary and secondary cables.
- .9 Primary protection: oil immersed, dual sensing Bay O Net type fuses in series with current limiting fuses inside tank.
- .10 Primary gang operated oil immersed load break switch located behind viewing window showing switch blade in an open or close position. 16kA, 28kV, 400A. Switch in separate compartment interlocked with fusing cabinet and primary feeder cabinet.
- .11 Mechanical interlock to prevent access to secondary compartment unless supply is isolated. Tamper resistant to meet CAN/CSA C227.
- .12 Three lightning arresters: to Section 26 41 00.01 - Primary Lighting Arresters.
- .13 Load break inserts for elbow connectors.
- .14 Stays to hold compartment doors in 110 degrees open position.

2.2 TRANSFORMER CHARACTERISTICS

- .1 Dual primary voltage shall be: 13800GrdY/8000V X 8320GrdY/4800V.
- .2 Secondary voltage: as indicated on drawings.
- .3 Capacity: as indicated on drawings.
- .4 Basic impulse level: 125 kV.
- .5 Maximum rms short-circuit: 16kA.
- .6 Impedance: not less than 4.25%.

2.3 VOLTAGE TAPS

- .1 Four-2.5% taps, 2-FCAN, 2-FCBN.

2.4 TAP CHANGER

- .1 Externally operated off-load tap changer, with provision for padlocking on 3 phase units.

2.5 ACCESSORIES

- .1 Liquid temperature thermometer with two sets of contacts.
- .2 Liquid level gauge with one set of contacts.
- .3 Pressure relief device.
- .4 25 mm drain valve.

- .5 25 mm filler plug.
- .6 Voltage selector switch.
- .7 Drip shield on each Bay O Net.

2.6 GROUNDING

- .1 Copper grounding bus size 6 x 50 mm.
- .2 Connectors for grounding conductors size as indicated.

2.7 FINISH

- .1 Finish exterior of unit in accordance with Section 26 05 00 - Common Work Results for Electrical.

2.8 EQUIPMENT IDENTIFICATION

- .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Nameplate showing information in accordance with CSA C2.

2.9 WARNING SIGNS

- .1 Provide warning signs in accordance with Section 26 05 00 - Common Work Results for Electrical.

2.10 SOURCE QUALITY CONTROL

- .1 Submit to NCC Representative standard factory test certificates of each transformer and type test of each transformer with high voltage accessories in accordance with CSA C2.
- .2 Tests shall include but not necessarily be limited to:
 - .1 Phase-Relation and Ratio: the test shall demonstrate proper phase-relation and turns ratio within 0.5% of the nominal voltage ratio.
 - .2 Demag Test to remove any residual magnetism in preparation for an impulse test and to demonstrate that the exciting current does not exceed the designed limit.
 - .3 Applied Voltage test of the H.V. to verify the dielectric integrity of insulation structures between the high voltage and low voltage, and high voltage and ground.
 - .4 Applied Voltage test of the L.V. to verify the dielectric integrity of insulation structures between the low voltage and high voltage, and low voltage and ground.
 - .5 Induced Voltage Test to verify the dielectric strength of turn to turn, layer to layer, phase to phase and other insulation structures within the transformer.
 - .6 No load (excitation) loss and excitation current test to measure the no load (excitation) current with rated voltage applied.

- .7 Impedance voltage and Load Loss test to measure the load loss and the impedance voltage at rated current.
- .8 Full wave impulse test to verify the dielectric strength of the insulation structures within the transformer against line voltage surges.
- .9 continuity test to verify transformer circuit and component integrity.

2.11 MANUFACTURER'S

- .1 Acceptable Manufacturer's:
 - .1 Carte Internationa.l
 - .2 Pioneer.
 - .3 Camtran.
 - .4 ABB.

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 INSPECTION

- .1 Check factory made connections of transformer unit for mechanical security and electrical continuity.
- .2 Check transformer insulating liquid for correct quantity and specification according to manufacturer's instructions.

3.3 INSTALLATION

- .1 Ensure concrete pad is fully cured before transformer is installed.
- .2 Set and secure transformer unit in place, rigid, plumb and square.
- .3 Make connections.
- .4 Connect transformer unit ground bus to system ground.
- .5 Ensure care is taken to prevent contamination of liquid and components when field filling transformers.
- .6 Use only metal hose when field-filling transformer with oil: do not use rubber hose.
- .7 Set taps to produce rated secondary voltage at no-load.

3.4 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Carry out following insulation tests using megger with 20,000 megohm scale and resulting insulation resistance corrected to base of 20 degrees C.
 - .1 High voltage to ground with secondary grounded for duration of test.
 - .2 Low voltage to ground with primary grounded for duration of test.
 - .3 High to low voltage.
- .3 Inspect primary and secondary connections for tightness and for signs of overheating.
- .4 Inspect and clean bushings and insulators.
- .5 Check oil level and temperature indicators.
- .6 Set transformer taps to rated voltage as specified.
- .7 Inspect for oil leaks and excessive rusting.
- .8 Inspect oil level.
- .9 Check fuses for correctness of type and size.
- .10 Check for grounding and neutral continuity between primary and secondary circuits of transformer.

3.5 CLEANING

- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 National Electrical Manufacturers Association (NEMA)
 - .1 NEMA 250-2008, Enclosures for Electrical Equipment (1000 Volts Maximum).
- .2 The Munsell System of Colour Notation.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for electrical cabinets and enclosures 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 Province of Ontario, Canada.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Enclosure constructed with 2.7 mm thick minimum steel, with weather and corrosion resistant finish to NEMA 250, Munsell Notation 7.5GY3.5/1.5, size as indicated.
- .2 Entire enclosure to be capable of withstanding maximum impact force of 86 MN/m² area without rupture of material.
- .3 Removable enclosure panels with formed edges, galvanized steel external fasteners removable only from inside enclosure.
- .4 Equip enclosure with hot dipped galvanized mounting rails 1.3 m adjustable horizontally and vertically to enable mounting of equipment at any location within housing.
 - .1 Rails: 14 mm holes and 50 x 14 mm slots on 100 mm centres for horizontal adjustment.
 - .2 Holes in side panel flanges in 60 mm increments for vertical adjustment.
- .5 Cover: tamperproof, bolt-on, domed to shed water.
- .6 Door: 3 point latching, with padlocking means.

- .7 Ventilation panel constructed to allow air circulation yet preventing entry of foreign objects, wild life, and vermin.
- .8 Enclosure construction such as to allow configuration of single or ganged enclosures.
- .9 Enclosure capable of being shipped in knocked-down condition.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Assemble enclosure in accordance with manufacturer's instructions and securely mount on building structure with channels, supports and fastenings.
- .2 Mount equipment in enclosure.
- .3 Label electrical cabinets and enclosure to Section 26 05 00 - Common Work Results for Electrical.

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI) /Institute of Electrical and Electronics Engineers (IEEE)
 - .1 IEEE C37.42-2009, IEEE Standard Specifications for High-Voltage (> 1000 V) Expulsion-Type Distribution-Class Fuses, Fuse and Disconnecting Cutouts, Fuse Disconnecting Switches, and Fuse Links, and Accessories Used with These Devices.
- .2 Electrical and Electronic Manufacturers Association of Canada (EEMAC)
 - .1 EEMAC G1-1-1958, Indoor and Outdoor Switch and Bus Insulators.
- .4 International Electrical Testing Association:
 - .1 ANSI/NETA ATS-13, Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for outdoor load break switches fuses and cutouts 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 Province of Ontario, Canada.
 - .1 Indicate on drawings:
 - .1 Load break mechanism.
 - .2 Switching type.
 - .3 Mounting design.
 - .4 Fuse holder mechanism.
 - .5 Gang operating mechanism.
 - .6 Load rating.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 26 05 00 - Common Work Results for Electrical.

- .2 Operation and Maintenance Data: submit operation and maintenance data for outdoor load break switches fuses and cutouts for incorporation into manual.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Fuses: to ANSI C37.42.
- .2 Insulators: to EEMAC G1-1.
- .3 Fuse cutouts and fuse links: to ANSI C37.42.

2.2 FULL LOAD AIR BREAK SWITCHES

- .1 Upright mounted, side break, gang operated, single throw, 3 pole.
- .2 Rating 900 A, 14.4 kV (nominal), 17.0 kV (maximum), 110 kV BIL.
 - .1 Momentary RMS asymmetrical 65 000 A, peak.
- .3 Insulators: three per pole, standard station post type, or equivalent, 25 kV.
- .4 Contacts:
 - .1 Silver-plated, fixed contacts.
 - .2 Silver-nickel-plated copper spring loaded multi-contact switch blade contacts.
- .5 Interrupter unit to permit opening and closing under rated full load currents consists of:
 - .1 Mechanism actuated by levers for operating contacts.
 - .2 Bolted to fixed contact assembly of switch.
 - .3 Shunt contact bolted to switch blade actuates interrupter unit when blade is moved to open or closed position.
- .6 Switch base: 5 mm formed channel galvanized steel drilled for universal mounting on wood.
- .7 Interphase mechanism assembly, driven by:
 - .1 Rotating type operating mechanism with field-installed handle.
- .8 Switch shall be furnished with the following:
 - .1 Key interlock for "locked open" application at operating handle.
 - .2 Wildlife protection.
 - .3 Provisions for mounting six surge arresters.

2.3 HIGH – VOLTAGE AIR BREAK SWITCH

- .1 Vertical, three-pole double-break integer style.

- .2 Ratings:
 - .1 46 kV (nominal), 48.3 kV (maximum), 250 kV BIL.
 - .2 600A Interrupting.
 - .3 25,000A 3-second rating (RMS Symmetrical).
 - .4 40,000A momentary (asymmetrical).
- .3 Interphase drive, factory assembled on a single base.
- .4 Interphase and vertical operating pipe as indicated in drawings.
- .5 Operating mechanism c/w:
 - .1 Handle.
 - .2 Rod guides or guide bearings.
 - .3 Couplings.
 - .4 Bell crank assembly.

2.4 FUSE CUTOUTS

- .1 Outdoor open cutout, vertical mounted, c/w fuseholder, continuous rating 200 A at 15 kV, interrupting rating 12 kA, hook stick operate, load break tool horns.

2.5 FUSE LINKS

- .1 Fuse links: electrically and mechanically interchangeable between various makes and types, button head design. Sized as indicated.

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 outdoor load break switches and fuses installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of NCC Representative.
 - .2 Inform NCC Representative 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 NCC Representative.

3.2 INSTALLATION

- .1 Install in accordance with manufacturer's instructions.
- .2 Connect switch terminals to primary circuit, in parallel with midspan insulators.
- .3 Mount fuse cutouts.

3.3 FIELD QUALITY CONTROL

- .1 Visual and Mechanical Inspection:
 - .1 Compare equipment nameplate data with drawings and specifications.
 - .2 Inspect physical and mechanical condition.
 - .3 Inspect anchorage, alignment, grounding and required clearances.
 - .4 Verify the unit is clean.
 - .5 Perform mechanical operator tests in accordance with manufacturer's published data, if applicable.
 - .6 Verify correct blade alignment, blade penetration, travel stops, arc interrupter operation, and mechanical operation.
 - .7 Inspect all bolted electrical connections for high resistance using low-resistance ohmmeter or calibrated torque-wrench method, in accordance with manufacturer's published data or as per NETA ATS.
 - .8 Verify correct operation of all indicating and control devices, if applicable.
 - .9 Verify appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
 - .10 Verify that each fuseholder has adequate mechanical support and contact integrity.
 - .11 Verify that fuse size and types are in accordance with drawings.

- .2 Electrical Tests:
 - .1 Perform resistance measurements through bolted connections with a low-resistance ohmmeter, if applicable. Investigate any values that deviate from those of similar bolted connections by more than 50% of the lowest value.
 - .2 Perform contact-resistance test across each switchblade and cutout.
 - .3 Perform insulation resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Test voltage shall be in accordance with manufacturer's published data or 2500VDC, if such data is unavailable. . Investigate any resistance values that are lower than manufacturer's recommended minimum. Dielectric withstand voltage tests should not proceed until insulation-resistance levels are raised above minimum values.
 - .4 Perform a dielectric withstand voltage test on each pole with switch closed. Test each pole to ground with all other poles grounded. Test voltage shall be in accordance with manufacturer's published data or as prescribed by NETA ATS, if such data is unavailable. If no evidence of distress or insulation failure is observed by the end of the total time of voltage application, the equipment is considered to have passed the test.
 - .5 Measure fuse resistance. Investigate values that deviate from each other by more than 15 percent.

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)
 - .1 ANSI/IEEE C62.11-12, Standard for Metal-Oxide Surge Arresters for AC Power Circuits (> 1kV).
 - .2 International Electrical Testing Association:
 - .1 ANSI/NETA ATS-13, Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for primary lighting arresters 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 Province of Ontario, Canada.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Operation and Maintenance Data: submit operation and maintenance data for primary lighting arresters for incorporation into manual.

1.5 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 dry location and in accordance with manufacturer's

recommendations in clean, dry, well-ventilated area.

.2 Store and protect primary lighting arresters from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Arrester component parts: to ANSI/IEEE-C62.11.

.2 Arrester characteristics: (13.8kV system):

.1 Intermediate and distribution arresters.

.2 System highest voltage line to ground: 12 kV.

.3 MCOV (maximum continuous operating voltage): 10.2 kV.

.4 Outdoor type.

.5 Radio influence voltage: maximum 250 microVolts.

.6 Housing: polymer.

.3 Arrester characteristics (44kV system):

.1 Intermediate class arresters.

.2 System highest voltage line to ground: 48kV.

.3 MCOV (maximum continuous operating voltage): 39.0kV.

.4 Outdoor type.

.5 Radio influence voltage: 250 microvolts.

.6 Housing: polymer.

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 primary lighting arresters installation 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 and after receipt of written approval to proceed from NCC Representative.

3.2 INSTALLATION

.1 Mount intermediate arresters on gang-operated load break switches, transformer poles, and substation tower.

.2 Mount distribution arresters on cross arms adjacent to service cable pot head and as close to transformers as possible.

- .3 Connect line terminals to phase conductors.
- .4 From arrester ground terminal run No.4 AWG copper ground wire down pole to ground rod.
- .5 From arrester ground terminal run shortest possible No.4 AWG conductor to secondary neutral of transformer.
- .6 Mount arresters adjacent to primary bus and connect line terminals to phase conductors. Connect ground terminals to ground bus.

3.3 FIELD QUALITY CONTROL

- .1 Visual and Mechanical Inspection:
 - .1 Compare equipment nameplate data with drawings and specifications.
 - .2 Inspect physical and mechanical condition.
 - .3 Inspect anchorage, alignment, grounding and required clearances.
 - .4 Verify the arresters are clean.
 - .5 Inspect all bolted electrical connections for high resistance using low-resistance ohmmeter or calibrated torque-wrench method, in accordance with manufacturer's published data or as per NETA ATS.
 - .6 Verify ground lead on each device is individually attached to a ground electrode.
- .2 Electrical Tests:
 - .1 Perform resistance measurements through bolted connections with a low-resistance ohmmeter, if applicable. Investigate any values that deviate from those of similar bolted connections by more than 50% of the lowest value.
 - .2 Perform insulation-resistance test on each arrester, phase terminal-to-ground. Apply voltage in accordance with manufacturer's published data or 2500VDC, if data is not available. Investigate any resistance values that are lower than manufacturer's recommendation or the minimum prescribed by NETA ATS.
 - .3 Test grounding connection to ensure a resistance of less than 0.5 ohms between arrester ground terminal and ground system.

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical.
- .2 Section 26 05 14 - Power Cable and Overhead Conductors (1001 V).
- .3 Section 26 05 22 - Connectors and Terminations.
- .4 Section 26 05 27 - Grounding - Primary.
- .5 Section 26 12 13 - Liquid Filled, Medium Voltage Transformers.
- .6 Section 26 28 13.02 - Outdoor Load Break Switches, Fuses and Cutouts.
- .7 Section 26 41 00.01 - Primary Lightning Arrestors.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)/National Electrical Manufacturers (NEMA)
 - .1 ANSI/NEMA C29.17-2013, Composite-Line Post Type Insulators.
 - .2 ANSI/NEMA C29.18-2013, Composite-Distribution Line Post Type Insulators.
 - .3 ANSI/NEMA C29.3-1986(R2012), Wet-Processed Porcelain Insulators-(Spool Type).
 - .4 ANSI/NEMA C29.4-1989(R2012), Wet-Processed Porcelain Insulators (Strain Type).
 - .5 ANSI/NEMA C29.5-1984(R2012), Wet-Process Porcelain Insulators (Low- and Medium-Voltage Pin Type).
- .2 Canadian Electrical Association Purchasing Specification (CEA)
 - .1 CEA LWIWG-02-96, Line Post Composite Insulator for Overhead Distribution Lines.
- .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-G12-14, Zinc-Coated Steel Wire Strand.
 - .2 CAN/CSA-C83-96(R2011), Communication and Power Line Hardware.
 - .3 CAN/CSA-O80 Series-08, Wood Preservation.
 - .4 CAN/CSA-O15-05 (R2014), Wood Utility Poles and Reinforcing Stubs.
- .4 Electrical and Electronic Manufacturers' Association of Canada (EEMAC)
 - .1 EEMAC 1B-1, 1957, Standard for Wet Process Porcelain Insulators (Strain Type).
 - .2 EEMAC 2B-1, 1957, Standard for Wet Process Porcelain Insulators (Spool Type).
- .5 Local Utility Standards

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet 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 Province of Ontario, Canada indicating:
 - .1 Materials.
 - .2 Method of anchorage.
 - .3 Number of anchors.
 - .4 Supports.
 - .5 Reinforcement.
 - .6 Assembly details.
 - .7 Accessories.

1.4 QUALITY ASSURANCE

- .1 Quality assurance submittals: submit following in accordance with Section 26 05 00 - Common Work Results for Electrical.
 - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .2 Perform work to comply with applicable Provincial/Territorial regulations.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements:
 - .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Wood preservation: to CAN/CSA O80 Series.
- .2 Power line hardware: to CAN/CSA-C83.

- .3 Wood utility poles full-length CCA (copper chromium arsenic) treated: to CAN/CSA-O15, western red cedar or red pine, Class 2, preservative treated. Penta-treated poles are not acceptable.
 - .1 16.77 m long poles for primary circuits only.
 - .2 16.77 m long poles for primary and secondary circuits.
 - .3 16.77 m long poles for secondary circuits only.
- .4 Reinforcing stubs: to CAN/CSA-O15, wood species red pine, Class 2.

2.2 CROSSARMS

- .1 Steel cross arms, minimum 2286 mm length to Hydro Ottawa GMS0043:
 - .1 For primary circuits, where indicated on drawings.
 - .1 For each cross arm:
 - .1 Two -32 x 6 mm galvanized steel braces.
 - .2 One -9 x 38 mm galvanized steel lag screw.
 - .3 Two -9 x 114 mm galvanized steel bolts.
 - .4 Through bolts and double arm bolts as required.
 - .2 Galvanized steel post type brackets (1 per post type insulator):
 - .1 Back to back insulators with common through bolts.
 - .2 Horizontally mounted post type insulators require 1 - 22 cm or 1 - 45.5 cm standoff bracket per insulator.
 - .3 Vertically mounted post type insulators require 1 - pole top, or 1 - pole top angle bracket.
 - .4 Provide through bolts and nuts and washers for each bracket as required.
- .3 Galvanized bolt eye (1 per suspension/dead end insulator) for dead end, high angle corner:
 - .1 Strain insulator rod and link installed as required.
- .4 Cluster mount bracket for three single-phase transformer and recloser assembly.
- .5 Single mount bracket for one single-phase transformer and recloser assembly.

2.3 INSULATORS

- .1 Secondary insulators:
 - .1 Spool type: to ANSI/NEMA C29.3 mounted on secondary racks, for secondary runs.
- .2 Guy strain insulators:
 - .1 Strain type: nominal rating 1500 lbs, one per guy wire.
- .3 Post type insulators: to ANSI/NEMA C29.17 ANSI/NEMA C29.18 CEA LWIWG-02, nominal rating 28 kV.
- .4 Suspension/dead end insulators nominal rating 28 kV.

2.4 GUY AND ANCHORS

- .1 Guy wire: to CAN/CSA-G12, 9.525 mm (3/8") nominal diameter, stranded, galvanized steel copperweld for dead ends and guys.
- .2 Guy clamps: three-bolt heavy duty or preform grip type.
- .3 Eye bolt: 19 mm thimble, length to suit, four hole guy straps and 16 mm machine bolt with square washer to attach guy wire to pole.
- .4 Anchor rod: 25 mm diameter x 2.7 m long, galvanized steel with thimble eye.
- .5 Anchor: manufacturer's standard, approved by NCC Representative.
 - .1 Heavy duty expanding type: 305mm (12 inch).
 - .2 Power installed screw anchor (PISA), double helix, 254mm (10 inch x 254 mm (10 inch) x 25.4 mm (1 inch)) minimum.
 - .3 Log anchor in earth or swamp.
 - .4 Rock anchor.
- .6 Guy guard: plastic, colored yellow, 2.7 m long.

2.5 PRIMARY CONDUCTORS

- .1 In accordance with Section 26 05 14 - Power Cable and Overhead Conductors (1001 V).

2.6 TRANSFORMERS

- .1 In accordance with Section 26 12 13 - Liquid Filled, Medium Voltage Transformers.

2.7 FUSE CUTOUPS

- .1 In accordance with Section 26 28 13.02 - Outdoor Load Break Switches, Fuses and Cutouts.

2.8 LOAD BREAK SWITCHES

- .1 In accordance with Section 26 28 13.02 - Outdoor Load Break Switches, Fuses, and Cutouts.

2.9 LIGHTNING ARRESTERS

- .1 In accordance with Section 26 41 00.01 - Primary Lightning Arresters.

2.10 WIRE CONNECTORS

- .1 In accordance with Section 26 05 22 - Connectors and Terminations.

2.11 GROUND RODS, GROUND CONDUCTORS AND GRADIENT MAT

- .1 In accordance with Section 26 05 27 - Grounding - Primary.

2.12 EQUIPMENT IDENTIFICATION

- .1 Rustproof number nails with 50 mm high designated number.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Install electrical pole lines and hardware in accordance with manufacturer's written recommendations and specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 PREPARATION OF POLES

- .1 Where poles require shortening, cut piece from top only.
- .2 Cut parallel plane crossarm gains in face of pole for single and double arming, spacing as indicated.
- .3 Bore hole in center of each gain for crossarm bolt.
- .4 Drill crossarms for insulators, through bolts, double arm bolts and brace bolts.
 - .1 Pre-drill treated crossarms to standard spacing.
- .5 Fasten insulators to crossarms as indicated on drawings.
- .6 Install crossarms and braces.

3.3 INSTALLATION

- .1 Locate and dig pole holes.
 - .1 Make holes large enough to allow space for tamping backfill.
- .2 Set poles.
- .3 Align poles with insulator brackets at right angles to pole line on straight runs.
- .4 At change in direction of line, set insulator brackets to bisect angle formed by change.
- .5 Set poles to maintain even grade.
 - .1 Allow for contour of terrain and do not exceed grading of 1.5 m per pole.
- .6 Replace backfill in 150 mm layers.
 - .1 Tamp each layer, and apply final layer to drain water away from pole.

- .7 Locate and install guy wires and anchors at dead-ends, at non-tangent poles, corner poles, and start of branch feeders.
- .8 Insert anchor at least 1.8 m into ground. Backfill and tamp in 150 mm layers.
- .9 Install insulators.
- .10 Locate and construct transformer platform between 2 poles.
- .11 Install number nails on each pole.
- .12 Identify primary circuit on pole showing phasing of each conductor, every 1000 m and including origin of primary pole.

3.4 FIELD QUALITY CONTROL

- .1 Perform tests and field inspection for pole lines and hardware prior to energization.
- .2 Use qualified tradespersons for installation, termination and testing of high voltage power lines and hardware.
- .3 Engage an independent testing agent approved by the NCC to perform test and inspection on high voltage power lines and equipment, to Hydro Ottawa (HOL) standard of acceptance.
- .4 Submit test result and inspection certificate for review.

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 - Common Work Results for Electrical.
- .2 Section 26 05 43.01 - Installation of Cables in Trenches and in Ducts.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Product data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Underground ducts: rigid type DB2, size as indicated.
- .2 Conductors: copper, type RW-90 , size and number of conductors as indicated .
- .3 Concrete: to CAN/CSA A23.1/A23.2.
- .4 Backfill: clean and free of debris.
- .5 Pulling Iron:
 - .1 22 mm diameter hot dipped galvanized steel bar with exposed triangular shaped opening.

PART 3 EXECUTION

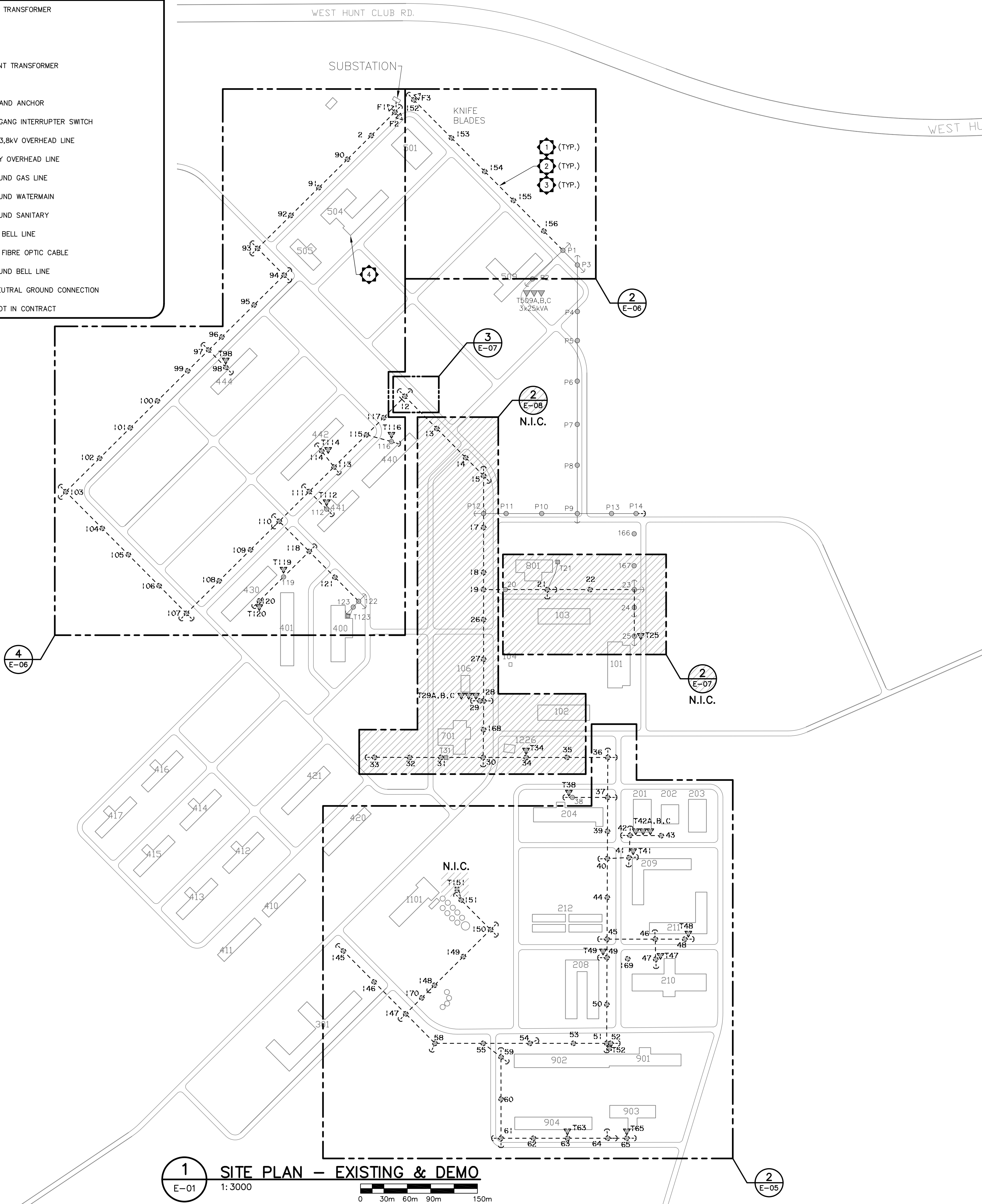
3.1 INSTALLATION

- .1 Install cables in trenches and in ducts in accordance with Section 26 05 43.01 - Installation of Cables in Trenches and in Ducts.
- .2 Allow adequate conductor length for connection to supply by power supply authority.
- .3 Install meter socket and conduit.
- .4 Allow adequate conductor length for connection to service equipment.
- .5 Install concrete encased ducts for electrical systems as indicated and in accordance with CAN/CSA A23.1.
- .6 Install pulling irons as required.
- .7 Seal ducts and conduits at building entrance location after installation of cable.

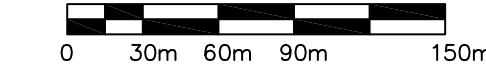
3.2 FIELD QUALITY CONTROL

- .1 Site Tests:
 - .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
 - .2 Perform additional tests if required by authority having jurisdiction.
- .2 Submit written test results to NCC Representative for review.

LEGEND	
SYMBOL	DESCRIPTION
□T#	PADMOUNT TRANSFORMER
○#	POLE
○P#	NEW POLE
▽T#	POLE MOUNT TRANSFORMER
▽F#	FEEDER
→	DOWNGUY AND ANCHOR
—	3-PHASE GANG INTERRUPTER SWITCH
—	PRIMARY 13.8KV OVERHEAD LINE
—	SECONDARY OVERHEAD LINE
—G	UNDERGROUND GAS LINE
—W	UNDERGROUND WATERMAIN
—S	UNDERGROUND SANITARY
—B	OVERHEAD BELL LINE
—F	OVERHEAD FIBRE OPTIC CABLE
—U/G	UNDERGROUND BELL LINE
—	SYSTEM NEUTRAL GROUND CONNECTION
N.I.C.	N.I.C. = NOT IN CONTRACT



1 SITE PLAN – EXISTING & DEMO
1:3000



GENERAL NOTES:

- A. EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO BE DEMOLISHED IS SHOWN IN THICK DASHED LINES.
- B. EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO REMAIN IS SHOWN IN THIN SOLID LINES.
- C. EXCEPT AS NOTED OTHERWISE, ALL NEW EQUIPMENT IS SHOWN IN THICK SOLID LINES.
- D. CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF WIRING, INSULATORS, CROSSARMS, SWITCHING EQUIPMENT, FUSING, CUTOUPS AND ALL HARDWARE ON AND BETWEEN POLES DESIGNATED FOR DEMOLITION. CONTRACTOR IS TO REMOVE POLES AND REINSTATE GROUND (GRASS, PAVEMENT, ETC.) TO MATCH SURROUNDING AREAS. CONTRACTOR IS RESPONSIBLE FOR OBTAINING LOCATES FOR ALL EXISTING UNDERGROUND SERVICES WITHIN AREAS OF SITE WHERE WORK IS BEING PERFORMED.
- E. ALL MODIFICATIONS TO COMMUNICATIONS SERVICES TO BE DONE BY BELL CANADA, ARRANGED AND PAID FOR DIRECTLY BY THE NCC, OUTSIDE OF THIS PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ALL COMMUNICATIONS CABLES AND EQUIPMENT ON ALL POLES BEING REMOVED UNDER THIS CONTRACT. CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING AND COORDINATING WORK DIRECTLY WITH BELL CANADA.

SPECIFIC NOTES:

- 1. PRIOR TO DEMOLITION OF OVERHEAD LINE, INDIVIDUAL NEW SECTIONS OF OVERHEAD LINE MUST BE FULLY CONSTRUCTED, AS DETAILED ON DRAWING E-05 TO E-08. CONTRACTOR TO COORDINATE A SHUTDOWN TO ENERGIZE EACH NEW SECTION OF OVERHEAD LINE, AS IT IS CONSTRUCTED USING PROCEDURES OUTLINED ON SINGLE-LINE DIAGRAM. EXISTING OVERHEAD LINE AND POLE HARDWARE MAY BE REMOVED FOLLOWING SHUTDOWN BUT POLES MUST REMAIN IN PLACE TO SUPPORT COMMUNICATIONS UNTIL TRANSFERRED TO NEW POLES BY BELL CANADA.
- 2. COMMUNICATION SERVICES WILL BE TRANSFERRED FROM OLD POLES TO NEW BY BELL CANADA, FOLLOWING COMPLETION OF NEW LINE. BELL WILL CUT THE EXISTING LINE AT APPROPRIATE POLES AND CONTRACTOR WILL BE RESPONSIBLE FOR SUBSEQUENT REMOVAL OF ALL COMMUNICATIONS CABLES AND EQUIPMENT FROM POLES BEING REMOVED.
- 3. PROVIDE GUYING AND ANCHORING AS REQUIRED TO BALANCE LOADS RESULTING FROM DEAD-ENDS, ANGLES IN POLE LINE, LATERAL TAKE OFFS, CHANGES IN CONDUCTOR SIZE, UNEVEN GROUND (HILLS), AND EQUIPMENT WEIGHT. MAINTAIN A MINIMUM SEPARATION OF 1.5m BETWEEN ANCHORS AND ALLOW ADEQUATE SPACE FOR THE INSTALLATION OF DEDICATED COMMUNICATION GUYS AND ANCHORS (BY OTHERS).
- 4. TRANSFORMERS DESIGNATED FOR DEMOLITION ARE TO BE MOVED TO BUILDING 504 FOR STORAGE. PROVIDE STEEL PALLETS FOR TRANSFORMERS AND BUILD CONCRETE CURB AROUND TRANSFORMERS FOR CONTAINMENT. CONTAINMENT SHALL BE CONSTRUCTED LARGE ENOUGH TO CONTAIN TWICE THE VOLUME OF OIL WITHIN THE LARGEST TRANSFORMER OR THE TOTAL VOLUME OF OIL WITHIN ALL OF THE TRANSFORMERS (WHICHEVER IS GREATER). CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ANY OPENINGS IN THE FLOOR AND CONTAINMENT CURB/WALL ARE CLOSED AND SEALED TO PREVENT OIL LEAKAGE. FLOOR, CURBING, AND ANY MATERIALS USED IN CONTAINMENT THAT MAY COME IN CONTACT WITH TRANSFORMER OIL MUST BE TREATED WITH AN IMPERVIOUS, DURABLE, PCB-RESISTANT COATING, SHOULD SUCH MATERIALS BE CAPABLE OF ABSORBING OIL OR PCB'S. CONTRACTOR IS RESPONSIBLE FOR CONFORMING TO ALL APPLICABLE FEDERAL AND LOCAL REGULATIONS REGARDING THE HANDLING AND STORAGE OF EQUIPMENT CONTAINING CHLOROBIPHENYLS (PCBS). TESTING THE TRANSFORMERS FOR PCB CONTENT IS OUTSIDE OF THE SCOPE OF THIS PROJECT AND WILL BE CONDUCTED BY OTHERS.

DRAWING LIST:

E-01	ELECTRICAL SITE PLAN – PHASE 2 EXISTING AND DEMOLITION	
E-02	ELECTRICAL SITE PLAN – PHASE 2 FINAL CONFIGURATION	
E-03	SINGLE LINE DIAGRAM PHASE 2 DEMOLITION AND NEW WORK	
E-04	SINGLE LINE DIAGRAM PHASE 2 FINAL CONFIGURATION	
E-05	ELECTRICAL PARTIAL SITE PLAN PHASE 2A NEW CONSTRUCTION AND DEMOLITION	
E-06	ELECTRICAL PARTIAL SITE PLAN PHASE 2B & 2C NEW CONSTRUCTION AND DEMOLITION	
E-07	ELECTRICAL PARTIAL SITE PLAN PHASE 2D & 2E NEW CONSTRUCTION AND DEMOLITION	
E-08	ELECTRICAL PARTIAL SITE PLAN PHASE 2F & 2G NEW CONSTRUCTION AND DEMOLITION	N.I.C.
E-09	PARTIAL SINGLE LINE DIAGRAMS PHASE 2A,B,C,D,E,F,G – EXISTING, DEMOLITION AND NEW CONSTRUCTION	
E-10	POLE TYPE DETAILS – (1 OF 3)	
E-11	POLE TYPE DETAILS – (2 OF 3)	
E-12	POLE TYPE DETAILS – (3 OF 3)	
E-13	EXISTING & NEW POLE SCHEDULES – (1 OF 2)	
E-14	EXISTING & NEW POLE SCHEDULES – (2 OF 2)	
E-15	DETAILS & NEW TRANSFORMER SCHEDULE	
E-16	SUBSTATION PLAN AND SINGLE LINE DIAGRAM MODIFICATIONS AND REPAIRS	N.I.C.
E-17	COMMUNICATIONS SITE PLAN – PHASE 2 EXISTING AND DEMOLITION	
E-18	COMMUNICATIONS SITE PLAN – PHASE 2 FINAL CONFIGURATION	



Real Estate Management, Design and Construction Branch
Direction de la gestion de l'immobilier, design et construction

Design and Construction Division
Division design et construction
director - Daniel Miron - directeur

consultant
expert-conseil



300-2611 QUEENSWAY DRIVE
OTTAWA (ONTARIO) CANADA, K2B 8K2
TEL: 613-829-2900 | FAX: 613-829-8299 | WWW.WSPGROUP.COM



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projet

**PHASE 2
ELECTRICAL INFRASTRUCTURE
DESIGN AT GREENBELT
RESEARCH FARM (GRF)**

drawing
dessin

**ELECTRICAL SITE PLAN
PHASE 2 EXISTING
AND DEMOLITION**

approved by
approuvé par K. BOCHERT

designed by
conçu par K. BOCHERT

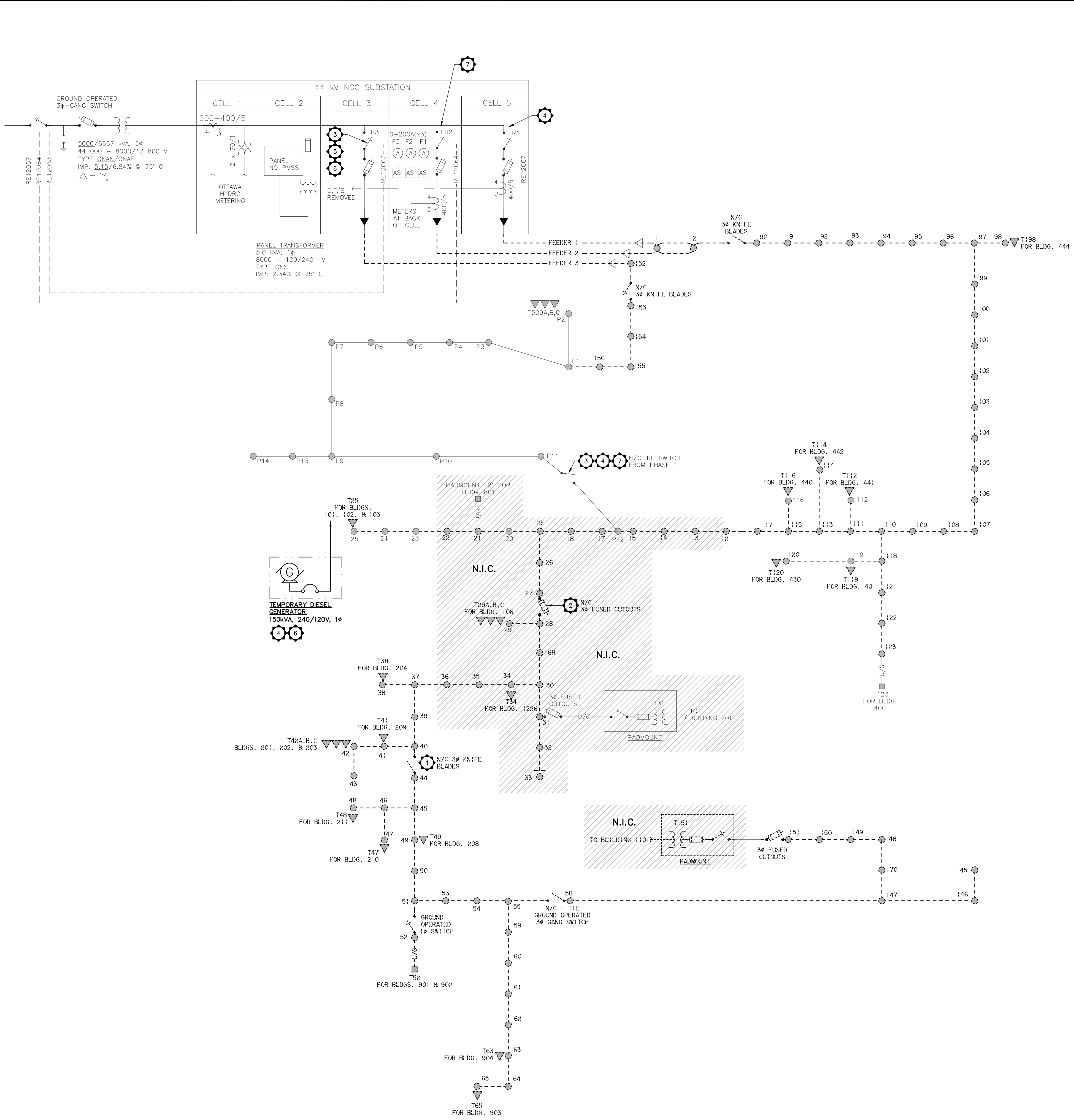
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date MARCH 2014 scale
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GENERAL NOTES:

- EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO BE DEMOLISHED IS SHOWN IN THICK DASHED LINES.
- EXCEPT AS NOTED OTHERWISE ALL EXISTING EQUIPMENT TO BE RELOCATED IS SHOWN IN THICK DASHED LINES AND IS MARKED WITH THE LETTER 'R'.
- EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO REMAIN IS SHOWN IN THIN SOLID LINES.
- EXCEPT AS NOTED OTHERWISE, ALL NEW EQUIPMENT IS SHOWN IN THICK SOLID LINES.
- EXISTING POLES RETAINED FOR COMMUNICATIONS SYSTEMS ONLY ARE NOT SHOWN ON SINGLE LINE.

SPECIFIC NOTES:

- PHASE 2A SHUTDOWN:** DE-ENERGIZE SECTION OF OVERHEAD LINE BY OPENING KNIFE BLADE SWITCHES TO ALLOW CONNECTION OF NEW LINE AND NEW SERVICE TO BUILDING 1101. REFER TO DRAWING E-05 FOR WORK TO BE PERFORMED DURING SHUTDOWN. FOLLOWING COMPLETION OF WORK, RESTORE POWER BY CLOSING KNIFE BLADE SWITCHES.
- PHASE 2A SHUTDOWN #2:** DE-ENERGIZE SECTION OF OVERHEAD LINE USING CUTOUTS TO ALLOW CONNECTION OF NEW LINE, REPLACEMENT OF POLE 36 AND SERVICES TO 200 SERIES BUILDINGS. FOLLOWING COMPLETION OF WORK, RESTORE POWER USING CUTOUTS.
- PHASE 2B SHUTDOWN:** DE-ENERGIZE FEEDER 3 OVERHEAD LINE BY OPENING LOADBREAK SWITCH ON POLE P11 AND SWITCH "FR3" AT SUBSTATION. REFER TO DRAWING E-06 FOR WORK TO BE PERFORMED DURING SHUTDOWN. FOLLOWING COMPLETION OF WORK, RESTORE POWER BY CLOSING SWITCH "FR3", LEAVING SWITCH ON POLE P11 OPEN.
- PHASE 2C SHUTDOWN:** DE-ENERGIZE FEEDER 1 OVERHEAD LINE BY OPENING SWITCH "FR1" AT SUBSTATION, ENSURING TIE SWITCH AT POLE P11 IS OPEN. REFER TO DRAWING E-06 FOR WORK TO BE PERFORMED DURING SHUTDOWN. FOLLOWING COMPLETION OF WORK, RESTORE POWER BY CLOSING TIE SWITCH AT POLE P11, LEAVING FEEDER 1 SWITCH "FR1" OPEN AND LOCKED OUT AT THE SUBSTATION. PROVIDE AND CONNECT TEMPORARY DIESEL GENERATOR TO POWER BUILDING 101 DURING SHUTDOWN. CONTRACTOR MUST COVER ALL APPLICABLE RENTAL, HOOKUP, TRANSPORTATION, FUELLING AND REMOVAL CHARGES FOR TEMPORARY GENSET.
- PHASE 2D SHUTDOWN:** DE-ENERGIZE FEEDER 3 OVERHEAD LINE BY OPENING SWITCH "FR3" AT SUBSTATION. REFER TO DRAWING E-07 FOR WORK TO BE PERFORMED DURING SHUTDOWN. FOLLOWING COMPLETION OF WORK, RESTORE POWER BY CLOSING SWITCH "FR3" AT SUBSTATION.
- PHASE 2D SHUTDOWN #2:** DE-ENERGIZE FEEDER 3 OVERHEAD LINE BY OPENING SWITCH "FR3" AT SUBSTATION. REFER TO DRAWING E-07 FOR WORK TO BE PERFORMED DURING SHUTDOWN. FOLLOWING COMPLETION OF WORK, RESTORE POWER BY CLOSING SWITCH "FR3" AT SUBSTATION. PROVIDE AND CONNECT TEMPORARY DIESEL GENERATOR TO POWER BUILDING 101 DURING SHUTDOWN. CONTRACTOR MUST COVER ALL APPLICABLE RENTAL, HOOKUP, TRANSPORTATION, FUELLING AND REMOVAL CHARGES FOR TEMPORARY GENSET.
- PHASE 2E SHUTDOWN:** DE-ENERGIZE SECTION OF OVERHEAD LINE SUPPLYING 400 SERIES BUILDINGS BY OPENING LOADBREAK SWITCH AT POLE P11. REFER TO DRAWING E-07 FOR WORK TO BE PERFORMED DURING SHUTDOWN. FOLLOWING COMPLETION OF WORK, RESTORE POWER BY CLOSING SWITCH "FR2" AT SUBSTATION, ENERGIZING NEW FEEDER, LEAVING TIE SWITCH AT POLE P11 OPEN.

N.I.C.

LEGEND	
SYMBOL	DESCRIPTION
	LOAD-BREAK SWITCH
	DISCONNECT SWITCH
	FUSE
	AMMETER
	VOLTMETER
	CURRENT METER SWITCH
	THREE PHASE CURRENT TRANSFORMER
	POTENTIAL TRANSFORMERS
	STRESS CONE
	LIGHTNING ARRESTER
	PADMOUNT TRANSFORMER
	POLE
	POLE MOUNT TRANSFORMER
	FUSED SWITCH
	TRANSFORMER
	DISTRIBUTION LINE
	EMERGENCY GENERATOR
	BREAKER
	N.I.C. = NOT IN CONTRACT



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300-2611 QUEENSWAY DRIVE
 OTTAWA (ONTARIO) CANADA, K2B 8K2
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**PHASE 2
 ELECTRICAL INFRASTRUCTURE
 DESIGN AT GREENBELT
 RESEARCH FARM (GRF)**

drawing
 dessin

**SINGLE LINE DIAGRAM
 PHASE 2 EXISTING AND
 DEMOLITION**

approved by
 approuvé par K. BOCHERT

designed by
 conçu par K. BOCHERT

drawn by
 dessiné par J.-P. DUBÉ

date
 MARCH 2014

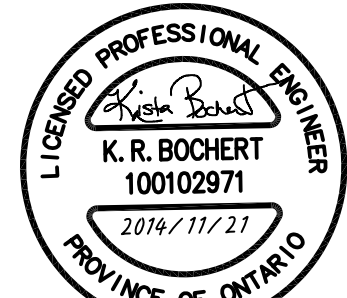
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PHASE 2
ELECTRICAL INFRASTRUCTURE
DESIGN AT GREENBELT
RESEARCH FARM (GRF)

drawing
dessin

ELECTRICAL PARTIAL SITE PLAN
PHASE 2A DEMOLITION
AND NEW CONSTRUCTION

approved by
approuvé par K. BOCHERT

designed by
conçu par K. BOCHERT

drawn by
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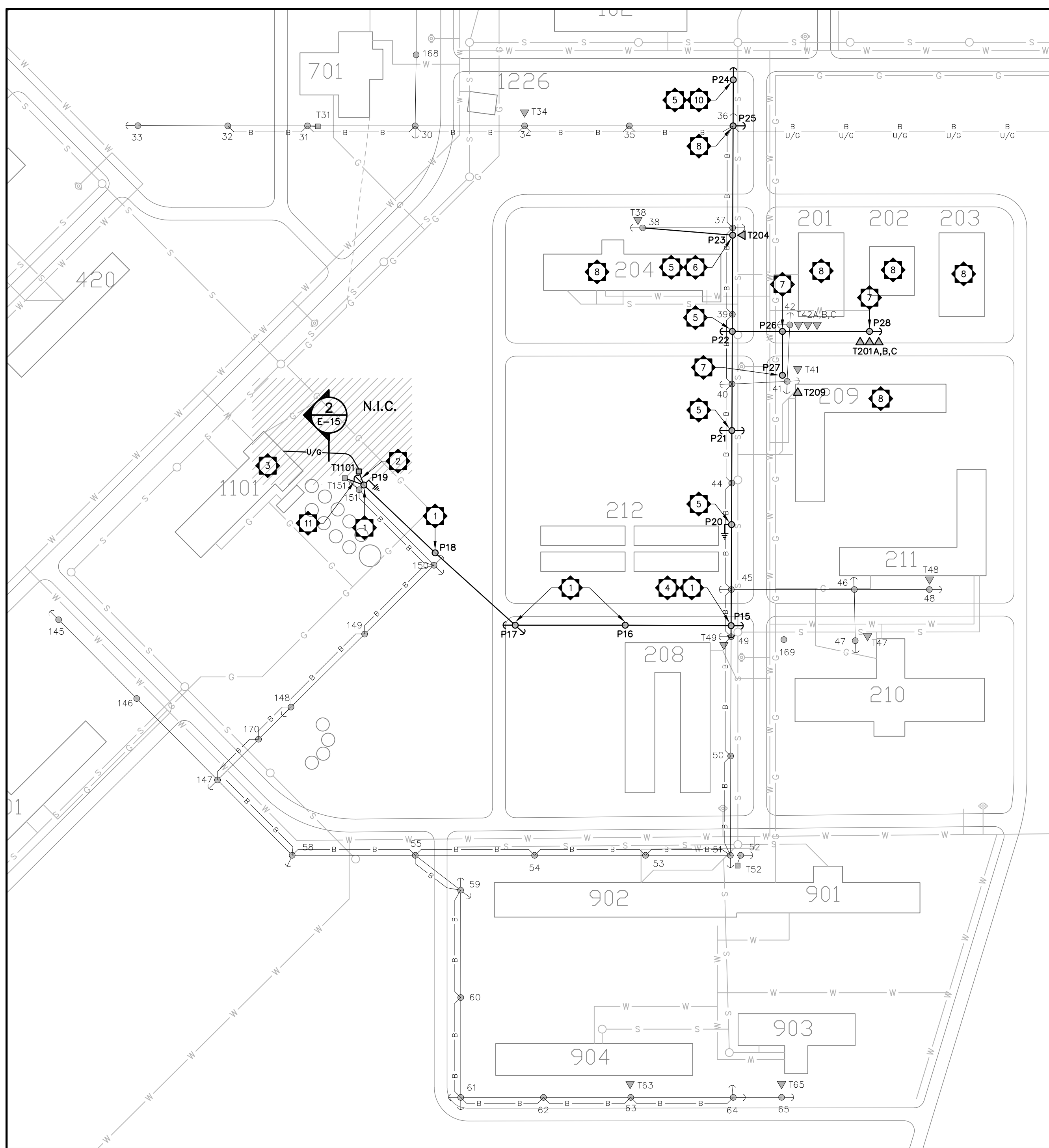
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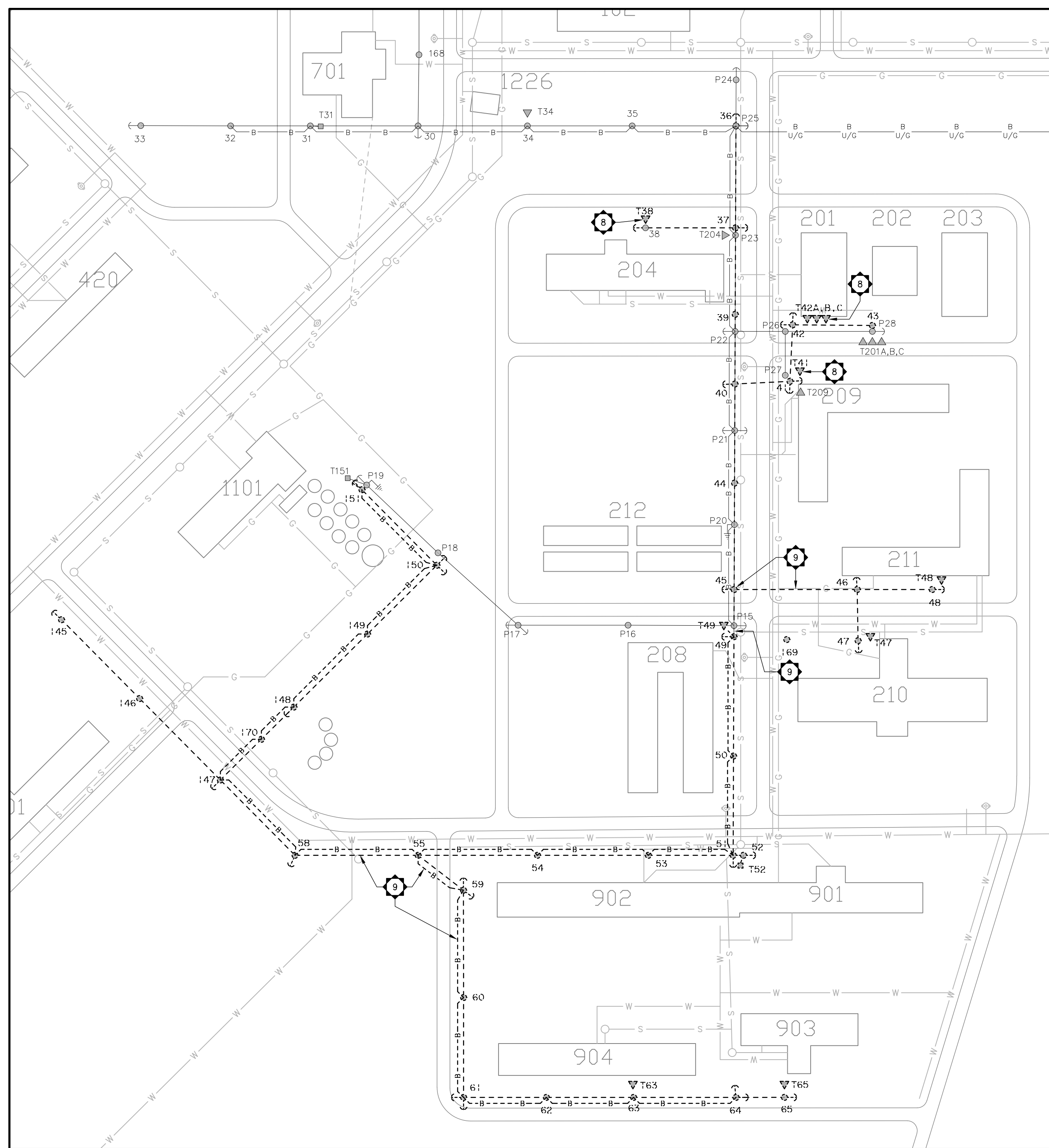
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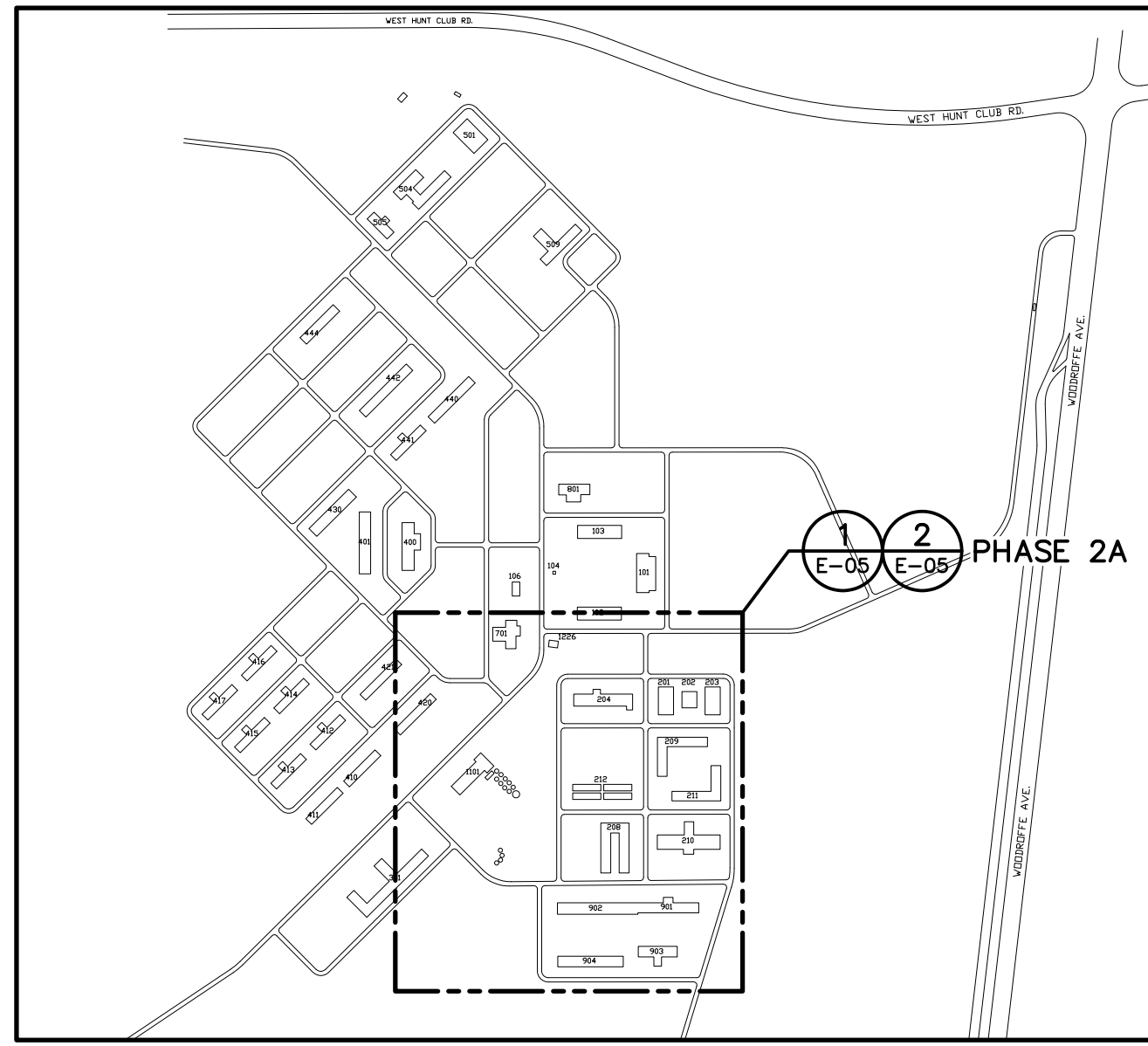
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1 PHASE 2A - STEP 1 - NEW CONSTRUCTION
E-05 1:1500



2 PHASE 2A - STEP 2 - DEMOLITION
E-05 1:1500



KEY PLAN - PHASE 2A

1:10000

GENERAL NOTES:

- EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO BE DEMOLISHED IS SHOWN IN THICK DASHED LINES.
- EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO REMAIN IS SHOWN IN THIN SOLID LINES.
- EXCEPT AS NOTED OTHERWISE, ALL NEW EQUIPMENT IS SHOWN IN THICK SOLID LINES.
- CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF WRING, INSULATORS, CROSSARMS, SWITCHING EQUIPMENT, FUSING, CUTOUPS AND ALL HARDWARE ON AND BETWEEN POLES DESIGNATED FOR DEMOLITION. CONTRACTOR IS TO REMOVE POLES AND REINSTATE GROUND (GRASS, PAVEMENT, ETC.) TO MATCH SURROUNDING AREAS. CONTRACTOR IS RESPONSIBLE FOR OBTAINING LOCATES FOR ALL EXISTING UNDERGROUND SERVICES WITHIN AREAS OF SITE WHERE WORK IS BEING PERFORMED.
- ALL MODIFICATIONS TO COMMUNICATIONS SERVICES TO BE DONE BY BELL CANADA, ARRANGED AND PAID FOR DIRECTLY BY THE NCC, OUTSIDE OF THIS PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ALL COMMUNICATIONS CABLES AND EQUIPMENT ON ALL POLES BEING REMOVED UNDER THIS CONTRACT.

SPECIFIC NOTES:

- INSTALL NEW POLES P15-P19 IN ACCORDANCE WITH SCHEDULE (DRAWING E-13), MAINTAINING SERVICE TO BUILDING 1101, AS WELL AS 200 SERIES BUILDINGS.
- PROVIDE NEW CONCRETE PAD AND TRANSFORMER T1101 TO SERVE BUILDING 1101 ADJACENT TO EXISTING PADMOUNT TRANSFORMER. AS SPECIFIED IN TRANSFORMER SCHEDULE (DRAWING E-15), INSTALL NEW PRIMARY UNDERGROUND CABLES FROM NEW POLE P19 AND UNDERGROUND SECONDARY DUCTBANK C/W NEW CABLES TO BUILDING.
- PHASE 2A SHUTDOWN #1: REFER TO DRAWING E-03. ARRANGE WEEKEND SHUTDOWN TO DISCONNECT EXISTING PADMOUNT TRANSFORMER AND PRIMARY SWITCHGEAR FROM EXISTING POLE #151, AND CONNECT NEW TRANSFORMER. NEW TRANSFORMER MUST BE FULLY CONNECTED, TESTED, AND NEW SERVICE OPERATIONAL BEFORE MONDAY MORNING AT 6AM. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF EXISTING TRANSFORMER, PRIMARY SWITCHGEAR, CONCRETE PAD, AND REINSTATEMENT OF GROUNDS TO MATCH SURROUNDING AREAS, DURING REGULAR BUSINESS HOURS, FOLLOWING RESTORATION OF POWER.
- DURING SAME SHUTDOWN (SEE NOTE #3), CONNECT NEW FULL-HEIGHT TRANSITION POLE P15 TO EXISTING LINE. POLE P15 TO HAVE 2 x 300cm² CROSSARMS - ONE LOWER CROSSARM PERPENDICULAR TO EXISTING LINE AND ONE AT HIGHER LEVEL, FACING NEW POLE P16. INTERCEPT EXISTING LINE, CONNECTING TO INSULATORS ON LOWER CROSSARM. TAP OFF EACH PHASE, CONNECTING TO INSULATORS ON UPPER CROSSARM. STRING NEUTRAL FROM ADJACENT EXISTING POLES #45 AND #49 BELOW BOTH CROSSARMS. REFER TO DETAIL ON DRAWING E-12.
- INSTALL AND INTERCONNECT NEW POLES P20-P24 IN LINE WITH EXISTING OVERHEAD LINE, MAINTAINING SERVICE TO ALL BUILDINGS FOR THE DURATION OF CONSTRUCTION.
- INSTALL NEW TRANSFORMER FOR BUILDING 204 ON NEW POLE P23. SECONDARY CABLES TO BE CONNECTED TO EXISTING POLE #38 DURING SHUTDOWN (NOTE #8).
- INSTALL NEW POLES P26-P28 AND TRANSFORMERS FOR BUILDINGS 201, 202, 203, AND 209 NEXT TO EXISTING POLES #41, #42, AND #43. MAKE PRIMARY TRANSFORMER CONNECTIONS TO NEW LINE, MAINTAINING SERVICE TO BUILDINGS. SECONDARY CABLES TO BE CONNECTED DURING SHUTDOWN (NOTE #8).
- PHASE 2A SHUTDOWN #2: REFER TO DRAWING E-03. ARRANGE WEEKEND SHUTDOWN TO REPLACE POLE #36 WITH NEW P25 AND CONNECT NEW LINE TO EXISTING. DISCONNECT EXISTING SERVICES AND CONNECT NEW SERVICES TO BUILDINGS 201, 202, 203, 204 AND 209. NEW TRANSFORMERS MUST BE FULLY CONNECTED, TESTED AND NEW SERVICES TO BUILDINGS OPERATIONAL BEFORE MONDAY MORNING AT 6AM. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF EXISTING TRANSFORMERS, CABLES, CUTOUPS, AND HARDWARE DURING REGULAR BUSINESS HOURS, FOLLOWING RESTORATION OF POWER.
- DURING SAME SHUTDOWN (NOTE #8), DISCONNECT LINE BETWEEN NEW POLE P15 AND EXISTING POLE #49 TO FACILITATE REMOVAL OF POLES #49-#65 AND #145-#151 & #170. ADD GUY/ANCHOR TO POLE P15 TO FORM DEAD END. CONTRACTOR SHALL REMOVE POLES, ALONG WITH OTHERS DESIGNATED FOR DEMOLITION, AND REINSTATE GROUNDS TO MATCH SURROUNDING AREAS, AFTER COMMUNICATIONS SERVICES ARE TRANSFERRED TO NEW POLES BY BELL CANADA.
- POLE P24 TO BE CONNECTED TO POLE P25 VIA INSULATORS ON CROSSARM (I.E. SERVICE TAP). CONSTRUCT TEMPORARY DEAD-END AT P24. PROVIDE INSULATORS (IN "TRIANGLE") FOR FUTURE EXTENSION OF LINE PERPENDICULAR TO NEW.
- PHASE 2A SHUTDOWN #1: REFER TO DRAWING E-03. ARRANGE WEEKEND SHUTDOWN TO DISCONNECT EXISTING PADMOUNT TRANSFORMER AND PRIMARY SWITCHGEAR FROM EXISTING POLE #151, AND RECONNECT TO NEW POLE P19. NEW TRANSFORMER MUST BE FULLY RECONNECTED, AND OPERATIONAL BEFORE MONDAY MORNING AT 6AM.

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**PHASE 2
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**ELECTRICAL PARTIAL SITE PLAN
PHASE 2B & 2C DEMOLITION
AND NEW CONSTRUCTION**

approved by
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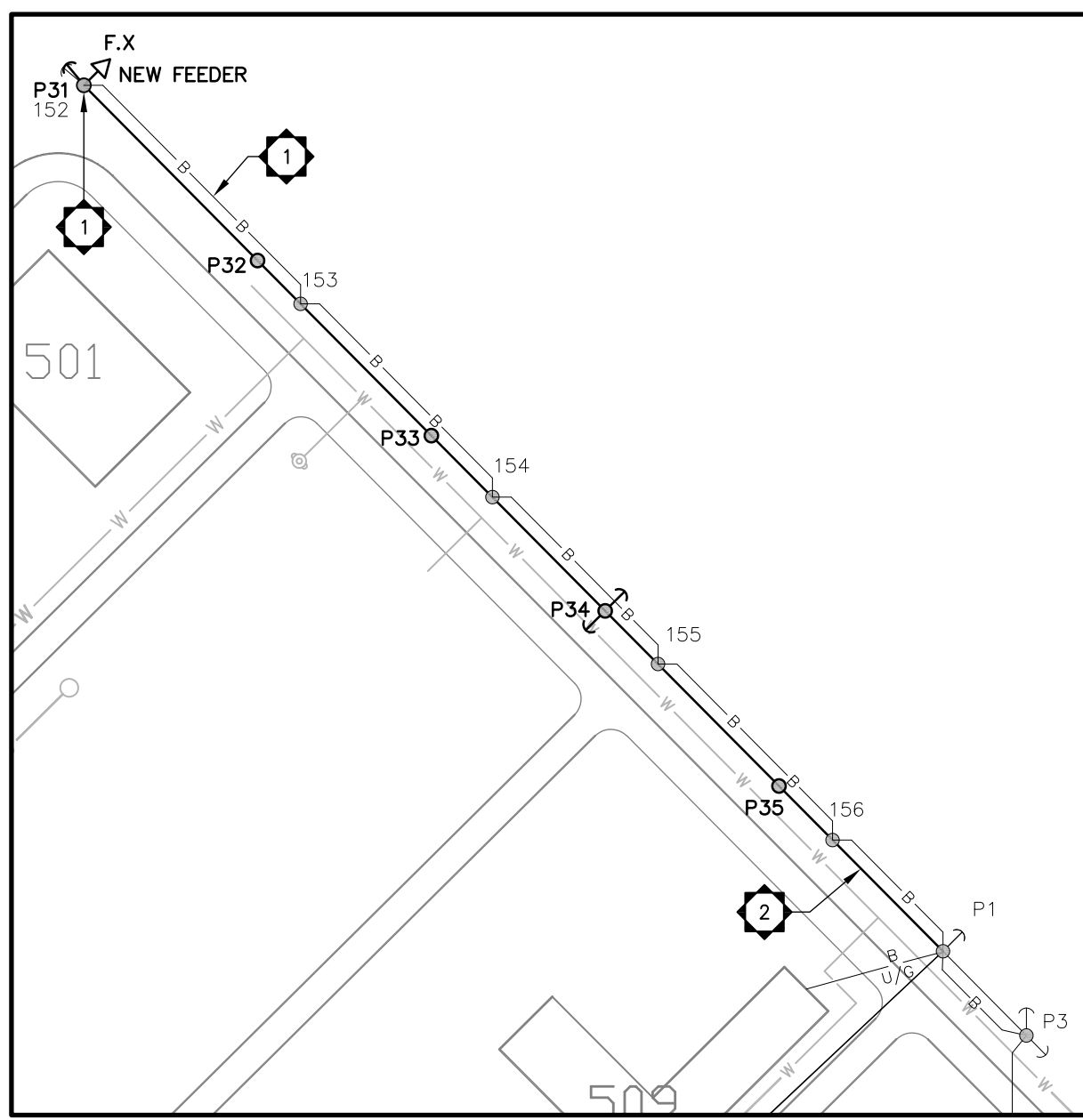
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GENERAL NOTES:

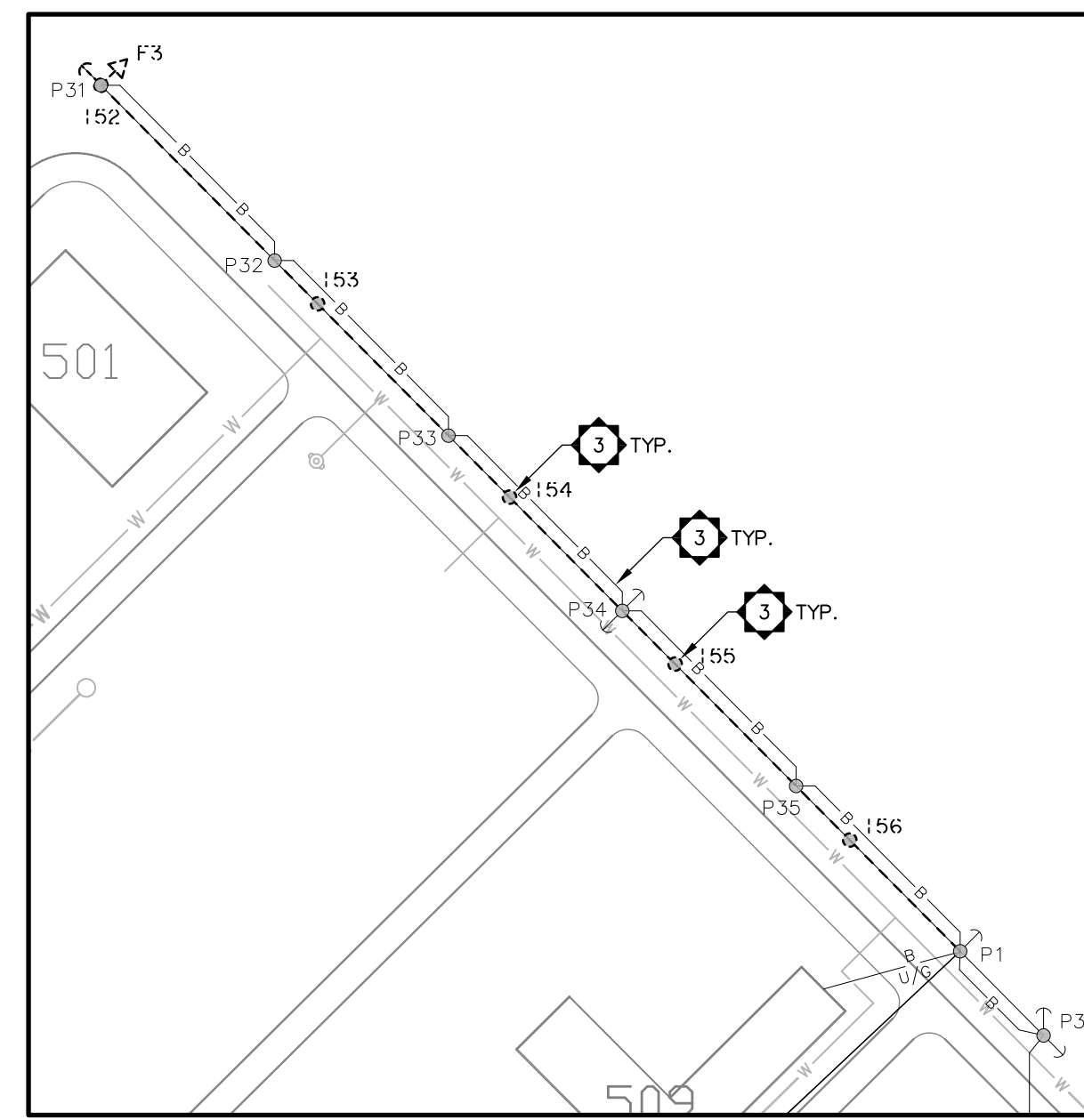
- A. EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO BE DEMOLISHED IS SHOWN IN THICK DASHED LINES.
- B. EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO REMAIN IS SHOWN IN THIN SOLID LINES.
- C. EXCEPT AS NOTED OTHERWISE, ALL NEW EQUIPMENT IS SHOWN IN THICK SOLID LINES.
- D. CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF WIRING, INSULATORS, CROSSARMS, SWITCHING EQUIPMENT, FUSING, CUTOUTS AND ALL HARDWARE ON AND BETWEEN POLES DESIGNATED FOR DEMOLITION. CONTRACTOR IS TO REMOVE POLES AND REINSTATE GROUND (GRASS, PAVEMENT, ETC.) TO MATCH SURROUNDING AREAS. CONTRACTOR IS RESPONSIBLE FOR OBTAINING LOCATES FOR ALL EXISTING UNDERGROUND SERVICES WITHIN AREAS OF SITE WHERE WORK IS BEING PERFORMED.
- E. ALL MODIFICATIONS TO COMMUNICATIONS SERVICES TO BE DONE BY BELL CANADA, ARRANGED AND PAID FOR DIRECTLY BY THE NCC, OUTSIDE OF THIS PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ALL COMMUNICATIONS CABLES AND EQUIPMENT ON ALL POLES BEING REMOVED UNDER THIS CONTRACT.

SPECIFIC NOTES:

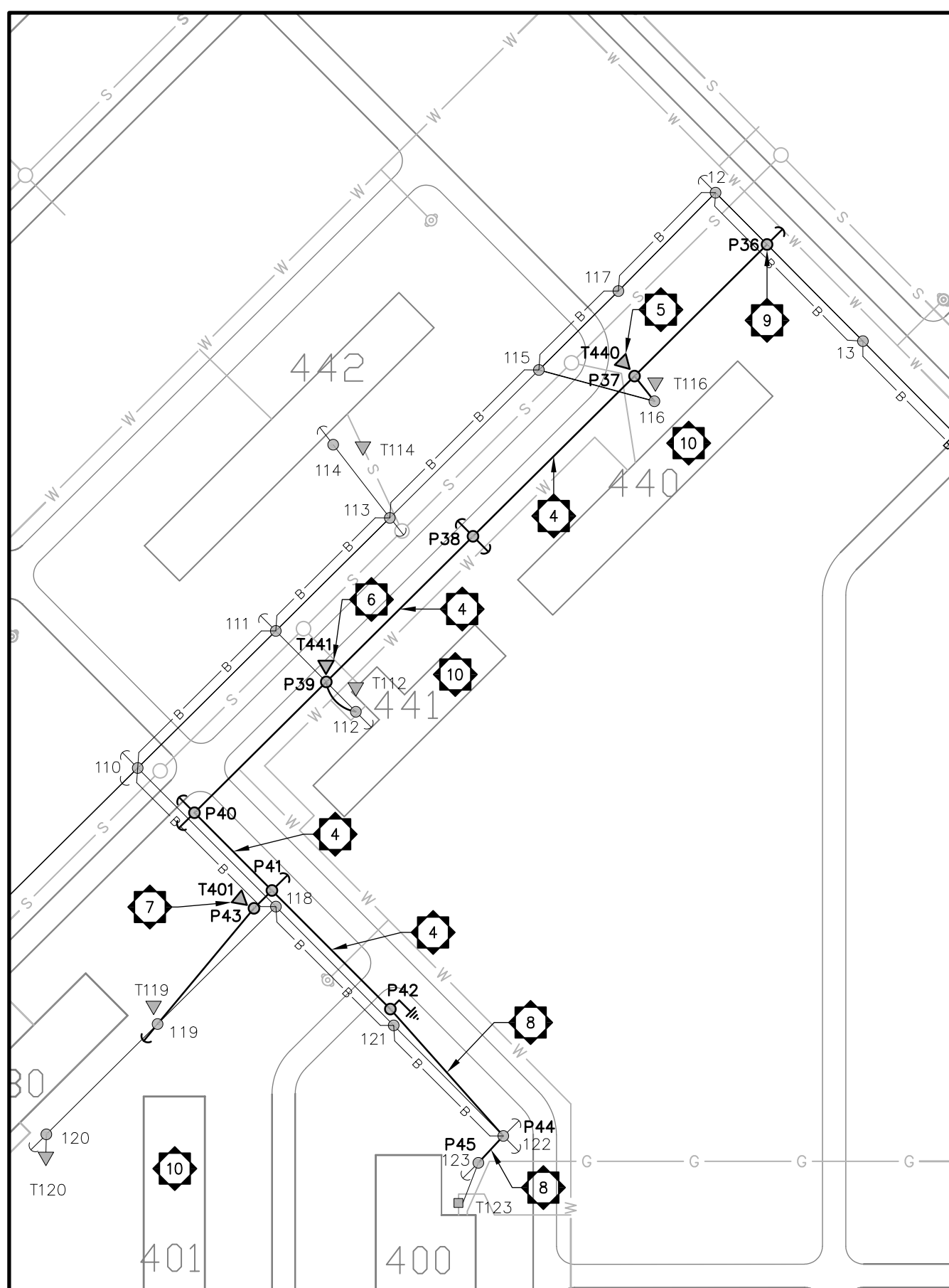
1. **PHASE 2B SHUTDOWN:** REFER TO DRAWING E-03. DISCONNECT AND LOCK OUT FEEDER F3 AT 44KV SUBSTATION TO DE-ENERGIZE LINE, AND INSTALL NEW POLES P31-P35, LINES AND HARDWARE MAY BE REMOVED FROM EXISTING POLES #152-156 AND POLES CUT TO FACILITATE INSTALLATION OF NEW LINE, BUT POLES MUST REMAIN TO SUPPORT COMMUNICATION SERVICES UNTIL THEY ARE TRANSFERRED TO NEW POLES BY BELL CANADA FOLLOWING CONSTRUCTION.
2. CONNECT NEW LINE TO EXISTING AND ENERGIZE NEW LINE "F.X" FROM 44KV SUBSTATION.
3. REMOVE EXISTING POLES, ANY REMAINING LINES, HARDWARE, AND ANCHORS, INCLUDING COMMUNICATION LINES AND EQUIPMENT AND REINSTATE GROUNDS TO MATCH SURROUNDING AREAS, DURING REGULAR BUSINESS HOURS, FOLLOWING RESTORATION OF POWER AND COMPLETION OF WORK BY BELL CANADA.
4. INSTALL AND INTERCONNECT NEW POLES P36-P43, MAINTAINING SERVICE TO ALL BUILDINGS FOR THE DURATION OF CONSTRUCTION.
5. INSTALL NEW TRANSFORMER FOR BUILDING 440 ON NEW POLE P37. SECONDARY CABLES TO BE CONNECTED TO EXISTING POLE #116 DURING SHUTDOWN (NOTE #8).
6. INSTALL NEW TRANSFORMER FOR BUILDING 441 ON NEW POLE P39. SECONDARY CABLES TO BE CONNECTED TO EXISTING POLE #112 DURING SHUTDOWN (NOTE #8).
7. INSTALL NEW TRANSFORMER FOR BUILDING 401 ON NEW POLE P43. SECONDARY CABLES TO BE CONNECTED TO EXISTING POLE #119 DURING SHUTDOWN (NOTE #8).
8. **PHASE 2C SHUTDOWN:** REFER TO DRAWING E-03. ARRANGE WEEKEND SHUTDOWN TO RECONNECT EXISTING POLES #122 AND #123 TO NEW LINE, BY PROVIDING NEW CONDUCTORS BETWEEN NEW POLE P42 AND EXISTING POLE #122 AND REPLACING CONDUCTORS BETWEEN POLES #122 AND #123 TO MATCH NEW (#1/0 ACSR). POLES #122 AND #123 TO BE DESIGNATED AS P44 AND P45, RESPECTIVELY.
9. DURING SAME SHUTDOWN (SEE NOTE #8), CONNECT NEW FULL-HEIGHT TRANSITION POLE P36 TO EXISTING LINE. POLE P36 TO HAVE 2 x 300cm CROSSARMS - ONE LOWER CROSSARM PERPENDICULAR TO EXISTING LINE AND ONE AT HIGHER LEVEL, FACING NEW POLE P37. INTERCEPT EXISTING LINE, CONNECTING TO INSULATORS ON LOWER CROSSARM. TAP OFF EACH PHASE, CONNECTING TO INSULATORS ON UPPER CROSSARM. STRING NEUTRAL FROM ADJACENT EXISTING POLES #12 AND #13 BELOW BOTH CROSSARMS. SEE POLE TYPE "L".
10. DURING SAME SHUTDOWN (SEE NOTE #8), DISCONNECT EXISTING SERVICES AND CONNECT NEW SERVICES TO BUILDINGS 401, 440 AND 441. NEW TRANSFORMERS MUST BE FULLY CONNECTED, TESTED AND NEW SERVICES TO BUILDINGS OPERATIONAL BEFORE MONDAY MORNING AT 6AM. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF EXISTING TRANSFORMERS, CABLES, CUTOUTS, AND HARDWARE DURING REGULAR BUSINESS HOURS, FOLLOWING RESTORATION OF POWER.
11. FOLLOWING COMPLETION OF WORK, RESTORE POWER BY CLOSING NORMALLY OPEN SWITCH ON POLE P11, KEEPING FEEDER F1 OPEN AND LOCKED OUT AT THE SUBSTATION.
12. CONTRACTOR SHALL REMOVE ALL POLES DESIGNATED FOR DEMOLITION, AND REINSTATE GROUNDS TO MATCH SURROUNDING AREAS, AFTER COMMUNICATIONS SERVICES ARE TRANSFERRED TO NEW POLES BY BELL CANADA.



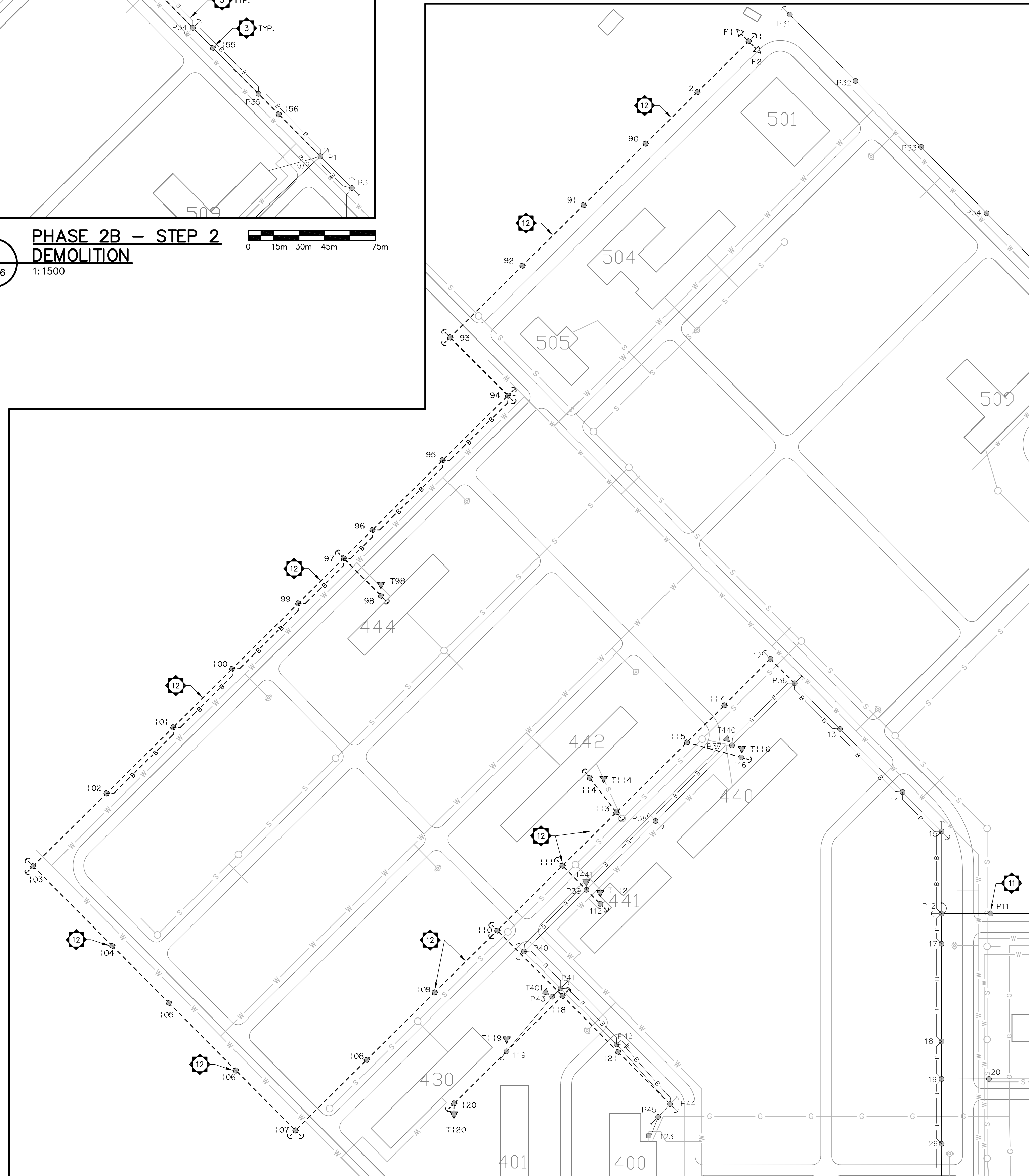
**1 PHASE 2B - STEP 1
NEW CONSTRUCTION**
E-06 1:1500



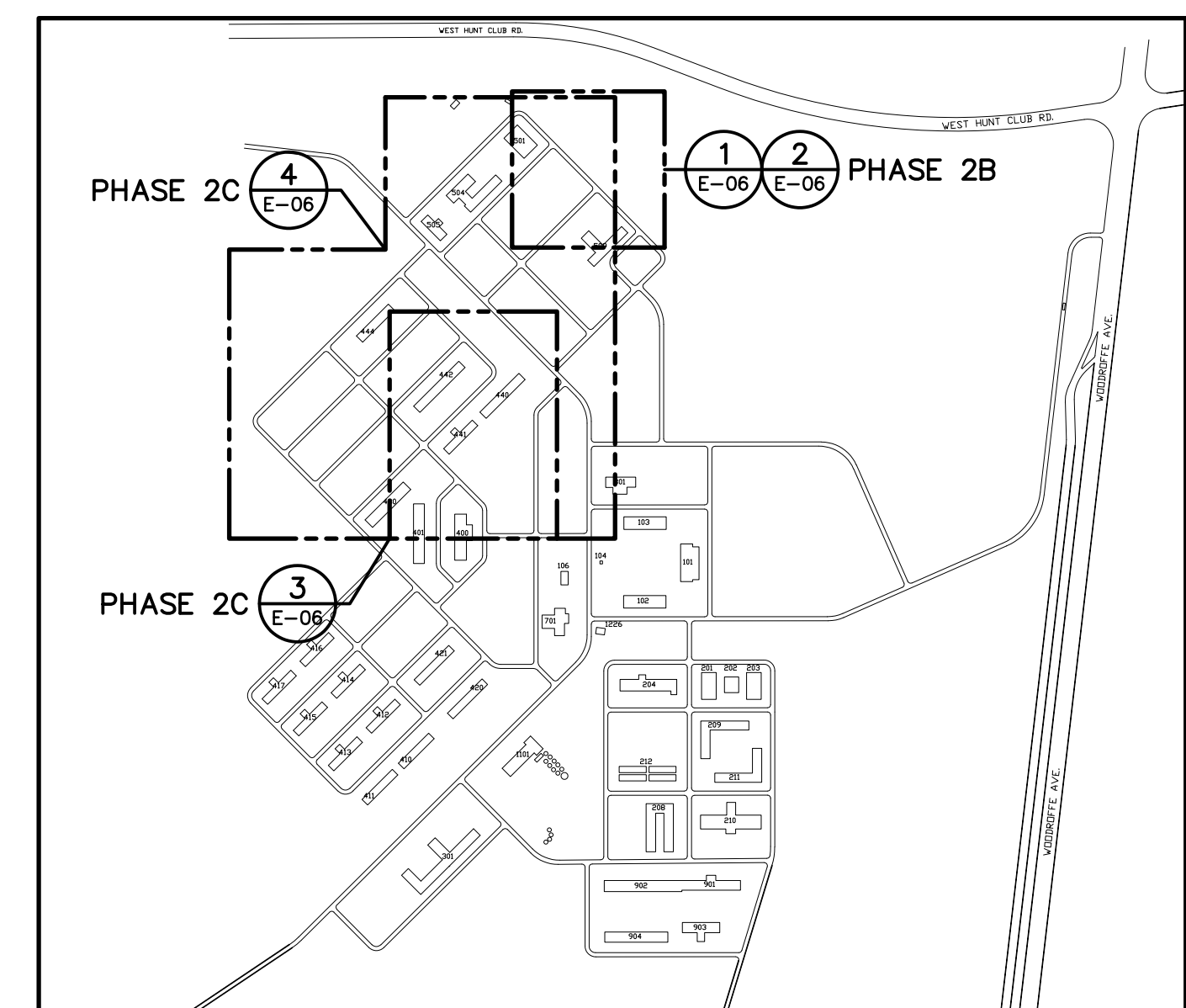
**2 PHASE 2B - STEP 2
DEMOLITION**
E-06 1:1500



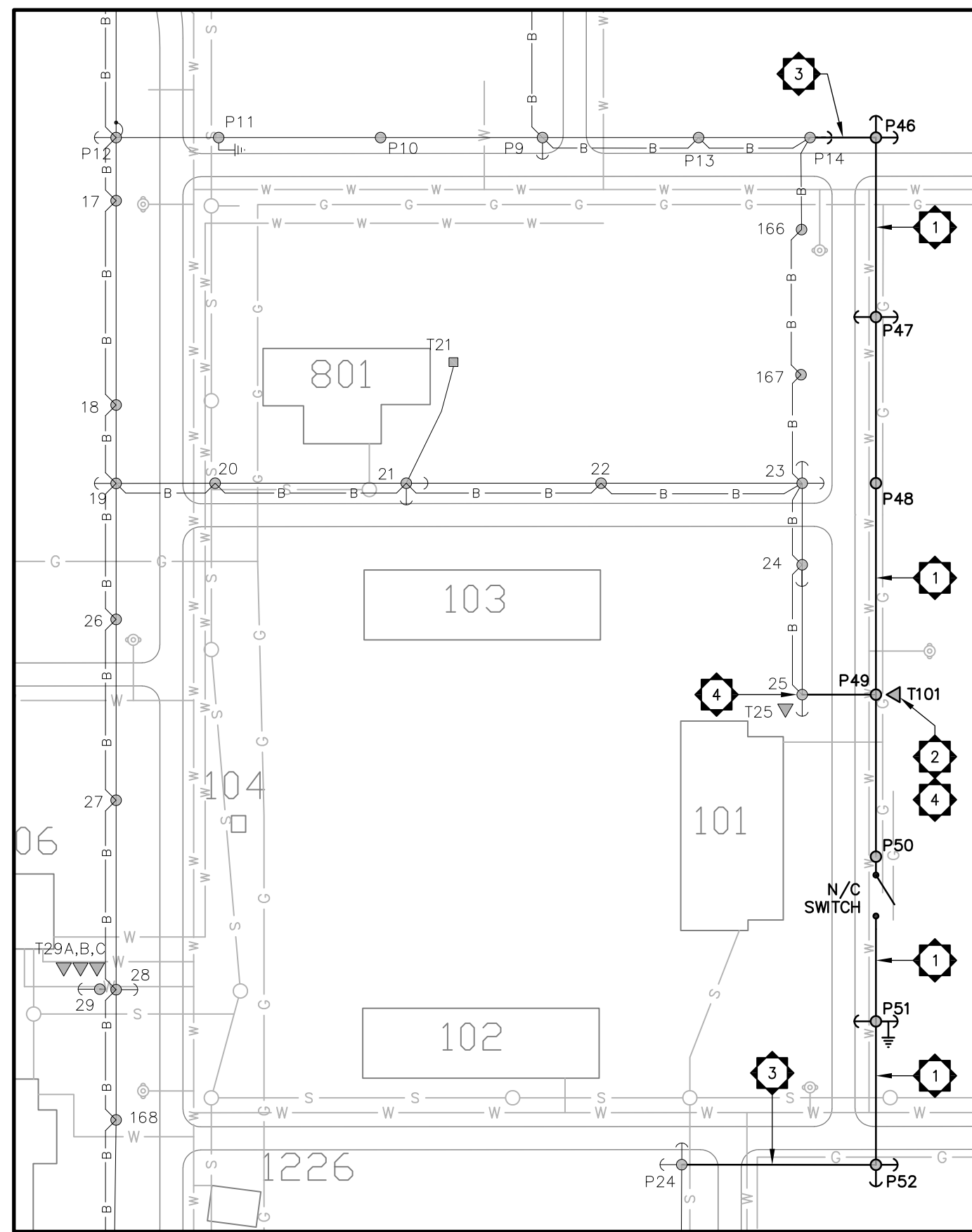
**3 PHASE 2C - STEP 1
NEW CONSTRUCTION**
E-06 1:1500



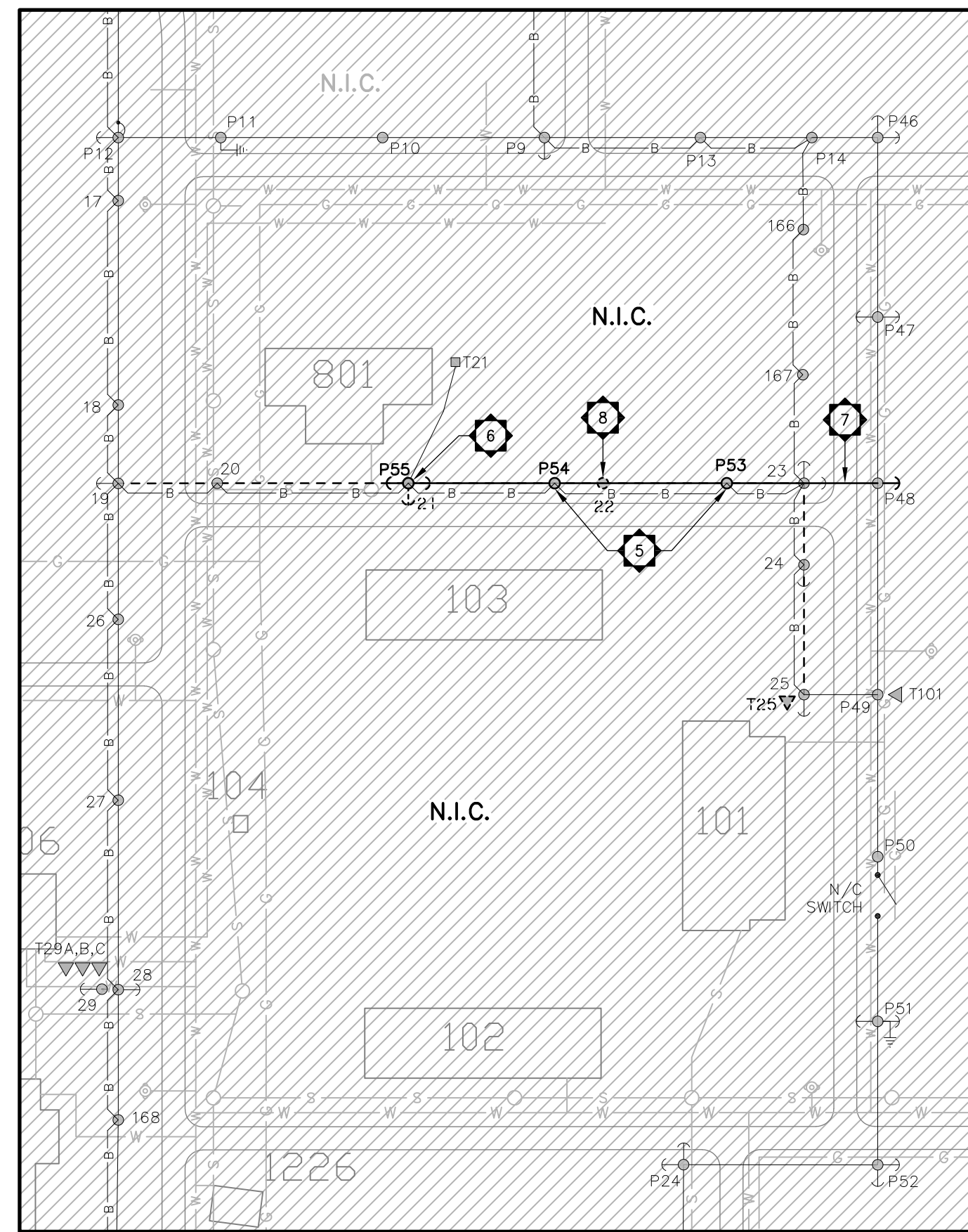
4 PHASE 2C - STEP 2 - DEMOLITION
E-06 1:1500



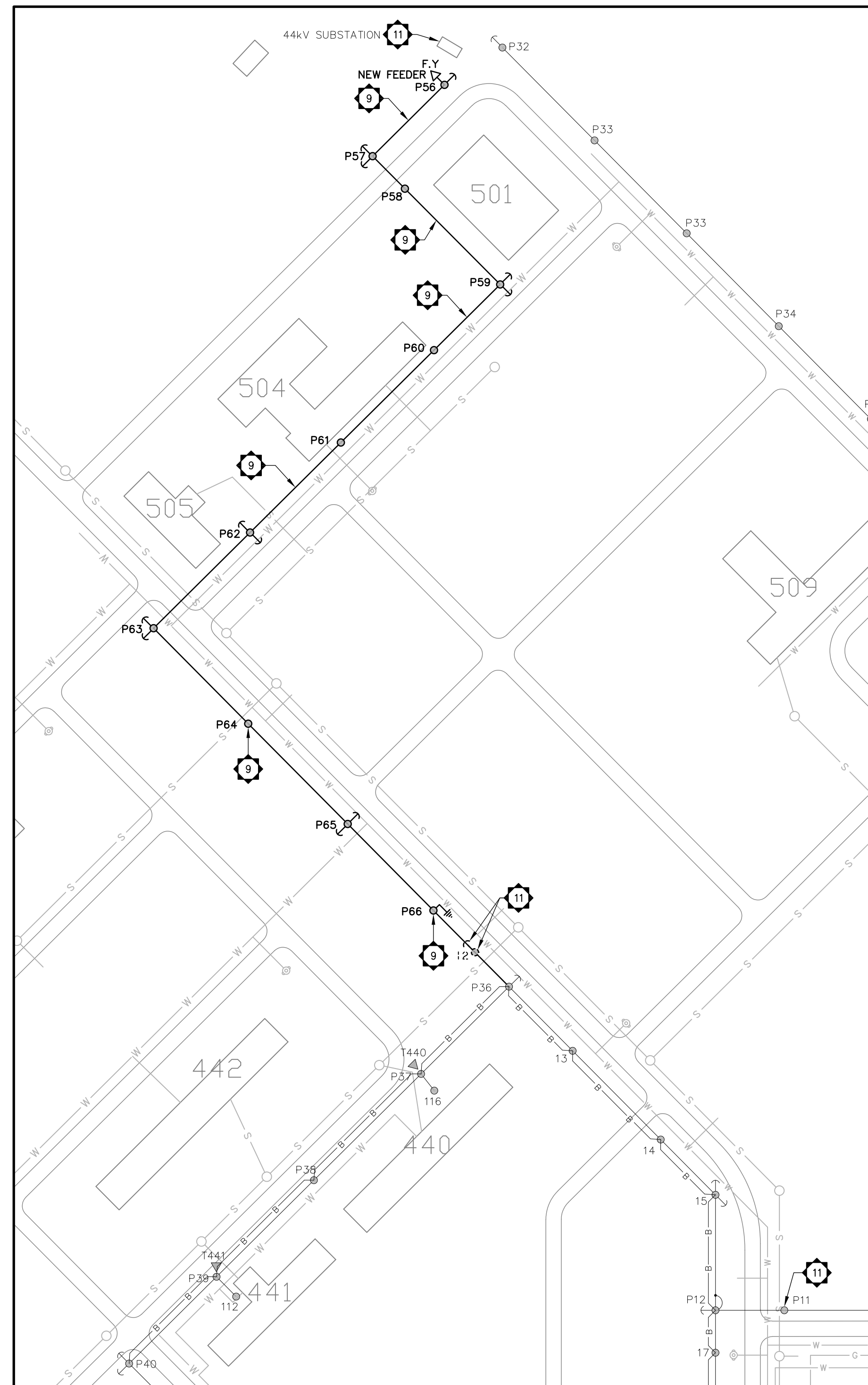
KEY PLAN - PHASE 2B & 2C
1:10000



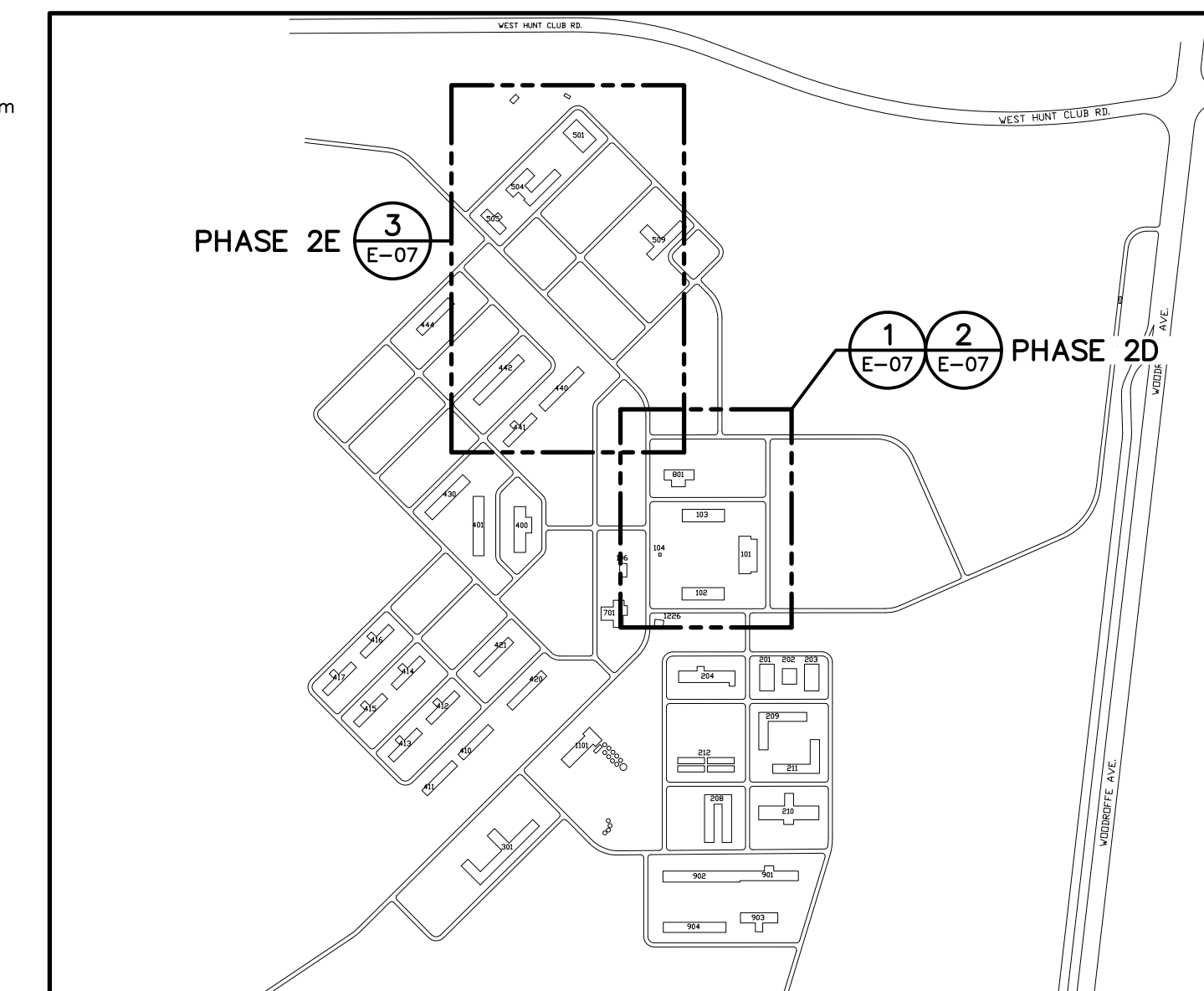
1 PHASE 2D - STEP 1 - NEW CONSTRUCTION
E-07 1:1500



2 PHASE 2D - STEP 2 - NEW CONSTRUCTION AND DEMOLITION
E-07 1:1500



3 PHASE 2E - NEW CONSTRUCTION AND DEMOLITION
E-07 1:1500



KEY PLAN - PHASE 2D & 2E
1:10000

GENERAL NOTES:

- EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO BE DEMOLISHED IS SHOWN IN THICK DASHED LINES.
- EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO REMAIN IS SHOWN IN THIN SOLID LINES.
- EXCEPT AS NOTED OTHERWISE, ALL NEW EQUIPMENT IS SHOWN IN THICK SOLID LINES.
- CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF WIRING, INSULATORS, CROSSARMS, SWITCHING EQUIPMENT, FUSING, CUTOUTS AND ALL HARDWARE ON AND BETWEEN POLES DESIGNATED FOR DEMOLITION. CONTRACTOR IS TO REMOVE POLES AND REINSTATE GROUND (GRASS, PAVEMENT, ETC.) TO MATCH SURROUNDING AREAS. CONTRACTOR IS RESPONSIBLE FOR OBTAINING LOCATES FOR ALL EXISTING UNDERGROUND SERVICES WITHIN AREAS OF SITE WHERE WORK IS BEING PERFORMED.
- ALL MODIFICATIONS TO COMMUNICATIONS SERVICES TO BE DONE BY BELL CANADA, ARRANGED AND PAID FOR DIRECTLY BY THE NCC, OUTSIDE OF THIS PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ALL COMMUNICATIONS CABLES AND EQUIPMENT ON ALL POLES BEING REMOVED UNDER THIS CONTRACT.

SPECIFIC NOTES:

- INSTALL AND INTERCONNECT NEW POLES P46-P52, MAINTAINING SERVICE TO ALL BUILDINGS FOR THE DURATION OF CONSTRUCTION.
- INSTALL NEW TRANSFORMER FOR BUILDING 101 ON NEW POLE P49. SECONDARY CABLES TO BE CONNECTED TO EXISTING POLE 25 DURING SHUTDOWN (NOTE #3).
- PHASE 2D SHUTDOWN #1:** REFER TO DRAWING E-03. ARRANGE WEEKEND SHUTDOWN TO INTERCONNECT NEW AND EXISTING LINES AT POLES P24 & P52 AND POLES P14 & P46.
- DURING SAME SHUTDOWN (SEE NOTE #3), DISCONNECT EXISTING TRANSFORMER T25, SUPPLYING BUILDING 101 AND REMOVE FROM POLE #25. PROVIDE NEW F-HEAD ON POLE #25 AND CONNECT NEW TRANSFORMER SECONDARY CABLES (IN ACCORDANCE WITH SCHEDULE ON DRAWING E-15) FROM POLE P49. NEW TRANSFORMER MUST BE FULLY CONNECTED, TESTED AND NEW SERVICE TO BUILDING 101 WITHIN 8 HOURS. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF REMAINING HARDWARE NO LONGER REQUIRED DURING REGULAR BUSINESS HOURS, FOLLOWING RESTORATION OF POWER.
- INSTALL AND INTERCONNECT NEW POLES P53 & P54 IN LINE WITH EXISTING OVERHEAD LINE, MAINTAINING SERVICE TO ALL BUILDINGS.
- PHASE 2D SHUTDOWN #2:** REFER TO DRAWING E-03. ARRANGE WEEKEND SHUTDOWN TO REPLACE POLE #21 WITH NEW POLE P55, AND RECONNECT AND SECURE EXISTING UNDERGROUND COMMUNICATIONS AND PRIMARY TRANSFORMER CABLES TO NEW POLE.
- DURING SAME SHUTDOWN (NOTE #6), INTERCONNECT POLES P48 AND P53.
- CONTRACTOR SHALL REMOVE POLE #22 AND REINSTATE GROUNDS TO MATCH SURROUNDING AREA, AFTER COMMUNICATIONS SERVICES ARE TRANSFERRED TO NEW POLES BY BELL CANADA.
- INSTALL AND INTERCONNECT NEW POLES P56-P66, MAINTAINING SERVICE TO ALL BUILDINGS.
- PHASE 2E SHUTDOWN:** REFER TO DRAWING E-03. ARRANGE WEEKEND SHUTDOWN OF 400 SERIES BUILDINGS (BY OPENING SWITCH ON POLE P11), DISCONNECT AND REMOVE POLE #12 AND INTERCONNECT LINES AT POLES P66 & P36.
- RESTORE POWER TO 400 SERIES BUILDINGS BY ENERGIZING NEW FEEDER "F,Y" FROM 44kV SUBSTATION (KEEPING SWITCH ON POLE P11 OPEN). REFER TO SINGLE-LINE DIAGRAM.



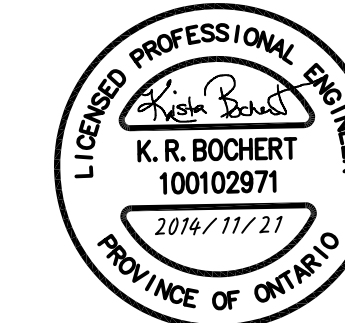
Real Estate Management, Design and Construction Branch
Direction de la gestion de l'immobilier, design et construction

Design and Construction Division
Division design et construction
director - Daniel Miron - directeur

consultant
expert-conseil



300-2611 QUEENSWAY DRIVE
OTTAWA (ONTARIO) CANADA, K2B 8K2
TEL.: 613-829-2000 | FAX: 613-829-8286 | WWW.WSPGROUP.COM



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C	ISSUED FOR TENDER	2014/11/21
B	ISSUED FOR ESA PLANS APPROVAL	2014/04/28
A	ISSUED FOR 100% REVIEW	2014/03/31
no.	description	date

project
projet

**PHASE 2
ELECTRICAL INFRASTRUCTURE
DESIGN AT GREENBELT
RESEARCH FARM (GRF)**

drawing
dessin

**ELECTRICAL PARTIAL SITE PLAN
PHASE 2D & 2E DEMOLITION
AND NEW CONSTRUCTION**

approved by
approuvé par K. BOCHERT

designed by
conçu par K. BOCHERT

drawn by
dessiné par J.-P. DUBÉ

date
MARCH 2014

scale
échelle

NCC project no.
no. du projet de la CCN AL1493

sheet no.
no. de la feuille E-07



Issued or revised
émis ou révisé

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B	ISSUED FOR ESA PLANS APPROVAL	2014/04/28
A	ISSUED FOR 100% REVIEW	2014/03/31

project
projet

**PHASE 2
ELECTRICAL INFRASTRUCTURE
DESIGN AT GREENBELT
RESEARCH FARM (GRF)**

drawing
dessin

**ELECTRICAL PARTIAL SITE PLAN
PHASE 2F & 2G DEMOLITION
AND NEW CONSTRUCTION**

approved by
approuvé par K. BOCHERT

designed by
conçu par K. BOCHERT

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dessiné par J.-P. DUBÉ

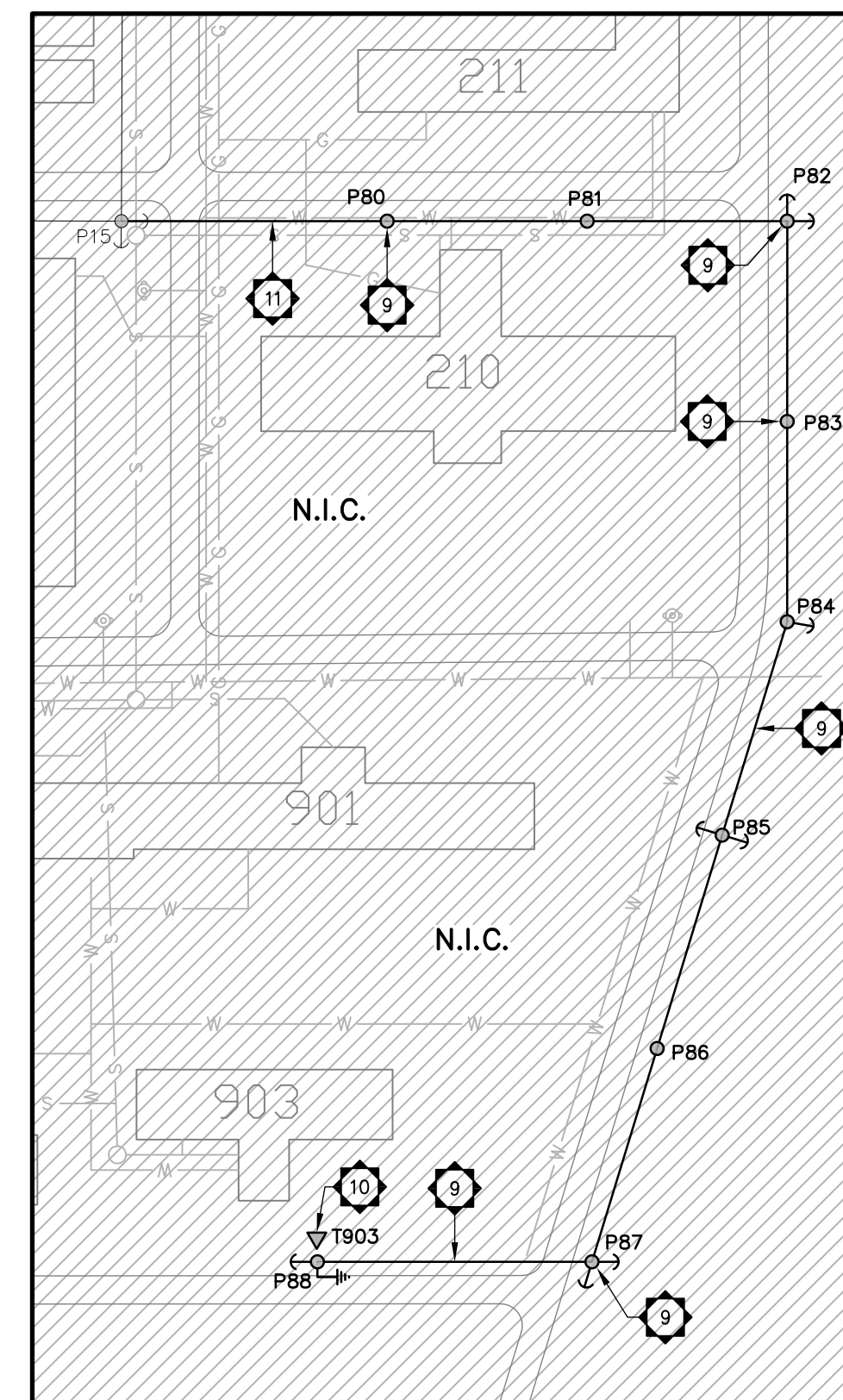
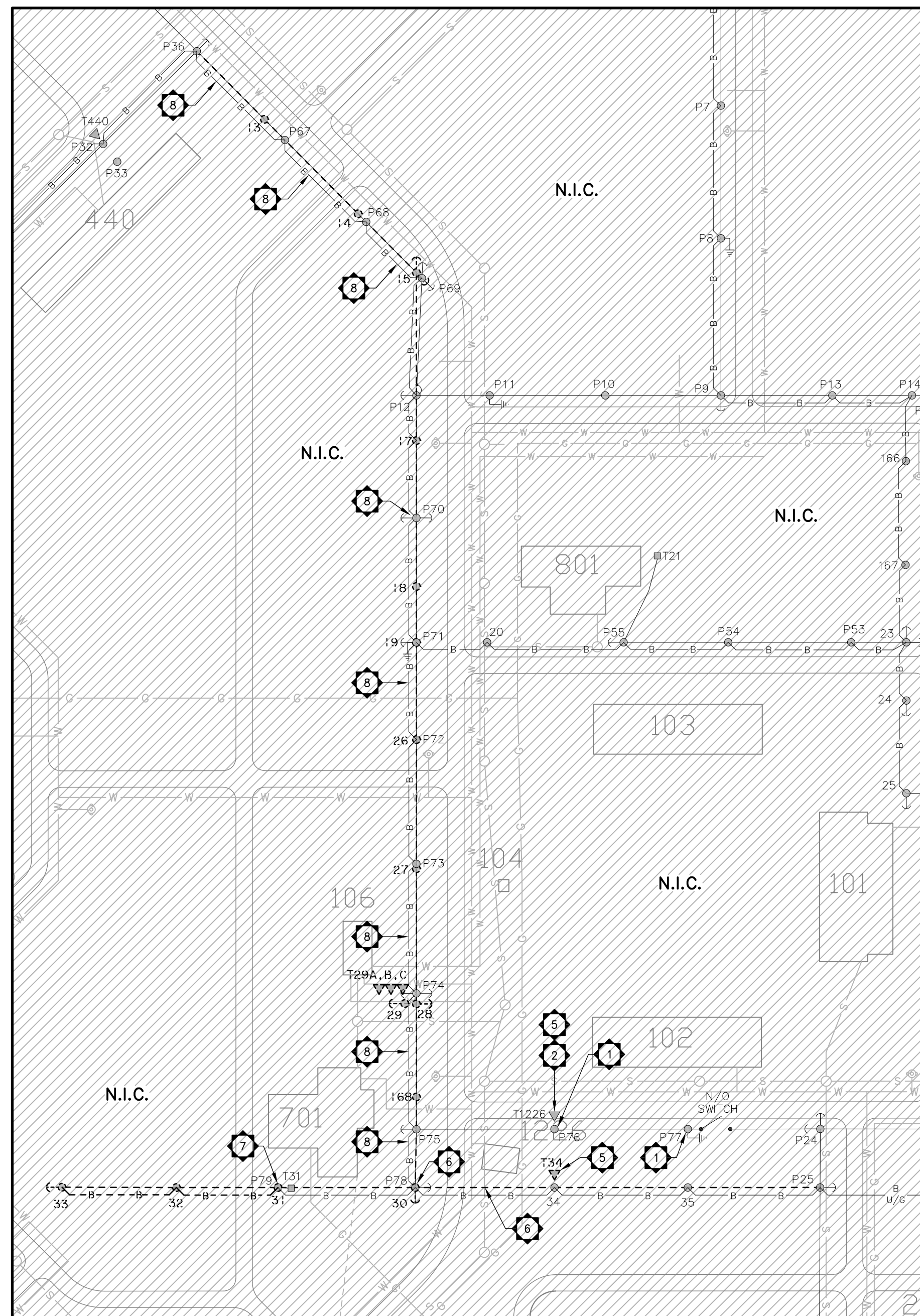
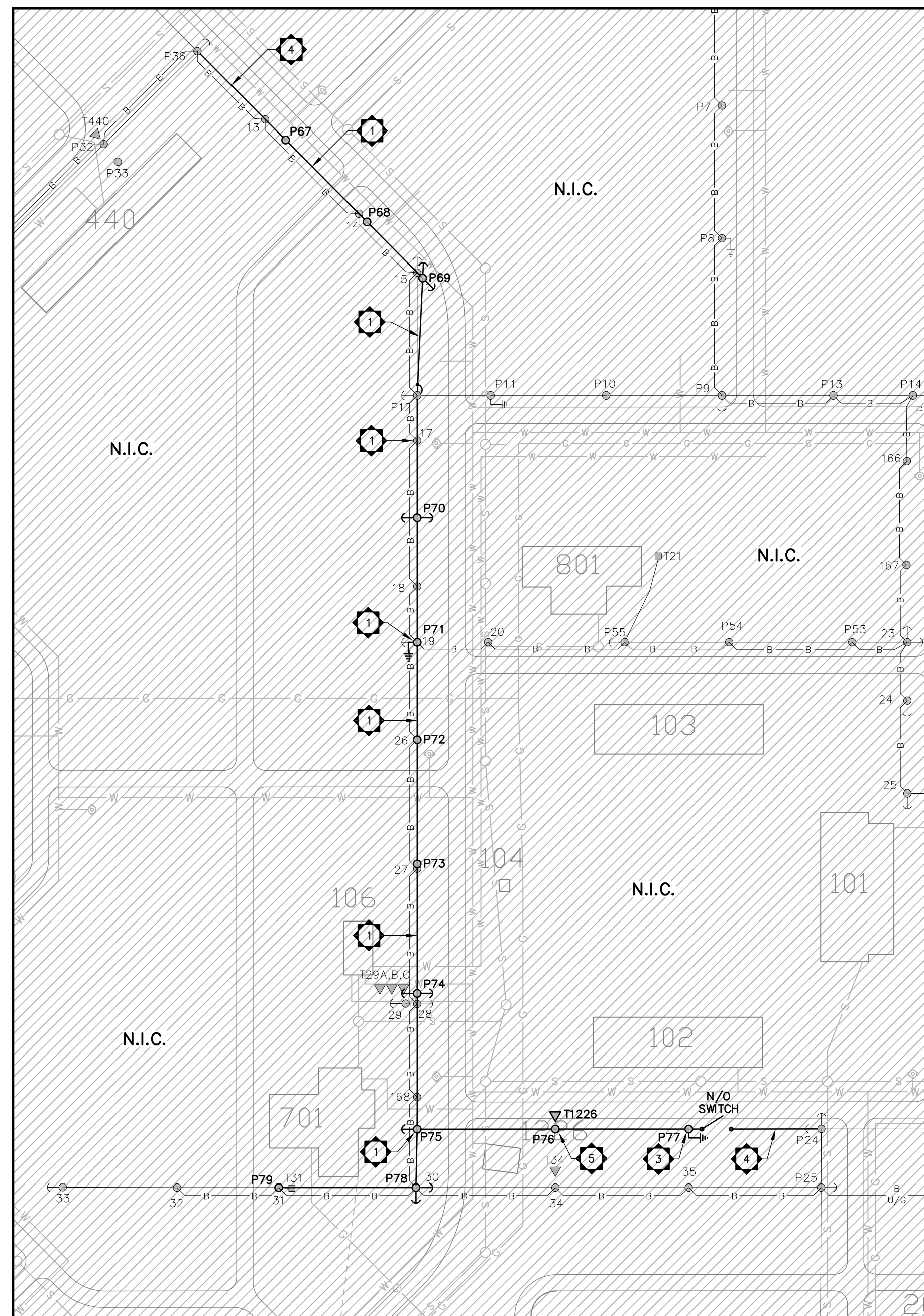
date
MARCH 2014

scale
échelle

NCC project no.
no. du projet de la CCN

sheet no.
no. de la feuille

AL1493 **E-08**



1 PHASE 2F - STEP 1 - NEW CONSTRUCTION
E-08 1:1500
N.I.C. 0 15m 30m 45m 75m

2 PHASE 2F - STEP 2 - DEMOLITION
E-08 1:1500
N.I.C. 0 15m 30m 45m 75m

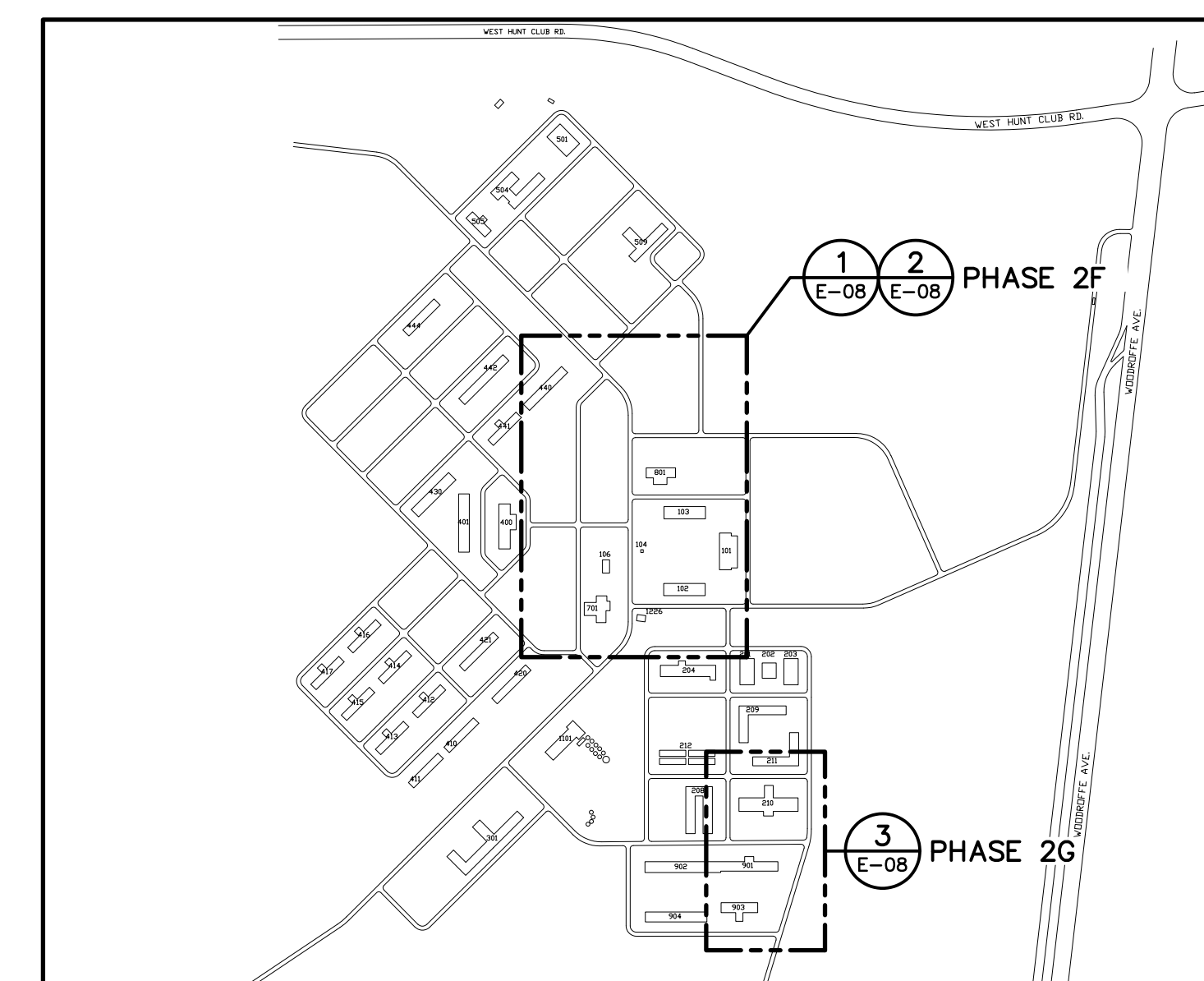
3 PHASE 2G - STEP 1
E-08 1:1500
N.I.C. 0 15m 30m 45m 75m

GENERAL NOTES:

- EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO BE DEMOLISHED IS SHOWN IN THICK DASHED LINES.
- EXCEPT AS NOTED OTHERWISE, ALL EXISTING EQUIPMENT TO REMAIN IS SHOWN IN THIN SOLID LINES.
- EXCEPT AS NOTED OTHERWISE, ALL NEW EQUIPMENT IS SHOWN IN THICK SOLID LINES.
- CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF WIRING, INSULATORS, CROSSARMS, SWITCHING EQUIPMENT, FUSING, CUTOUTS AND ALL HARDWARE ON AND BETWEEN POLES DESIGNATED FOR DEMOLITION. CONTRACTOR IS TO REMOVE POLES AND REINSTATE GROUND (GRASS, PAVEMENT, ETC.) TO MATCH SURROUNDING AREAS. CONTRACTOR IS RESPONSIBLE FOR OBTAINING LOCATES FOR ALL EXISTING UNDERGROUND SERVICES WITHIN AREAS OF SITE WHERE WORK IS BEING PERFORMED.
- ALL MODIFICATIONS TO COMMUNICATIONS SERVICES TO BE DONE BY BELL CANADA, ARRANGED AND PAID FOR DIRECTLY BY THE NCC, OUTSIDE OF THIS PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ALL COMMUNICATIONS CABLES AND EQUIPMENT ON ALL POLES BEING REMOVED UNDER THIS CONTRACT.

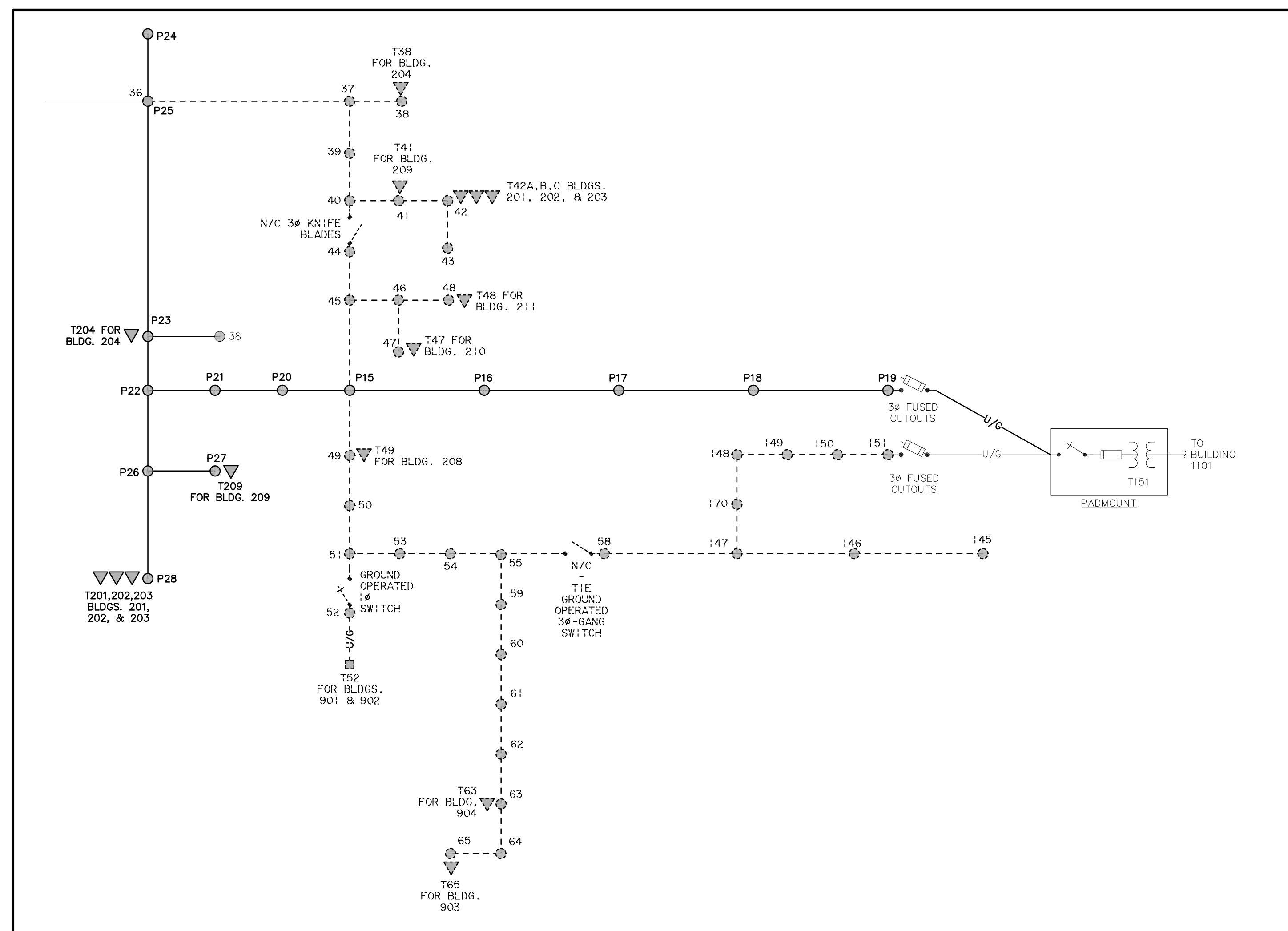
SPECIFIC NOTES:

- INSTALL AND INTERCONNECT NEW POLES P67-P77, MAINTAINING SERVICE TO ALL BUILDINGS FOR THE DURATION OF CONSTRUCTION. LINES AND HARDWARE MAY BE REMOVED FROM EXISTING POLES #19 AND #26-P33 AND POLES OUT TO FACILITATE INSTALLATION OF NEW LINE, BUT POLES MUST REMAIN TO SUPPORT COMMUNICATION SERVICES UNTIL THEY ARE TRANSFERRED TO NEW POLES BY BELL CANADA FOLLOWING CONSTRUCTION.
- INSTALL NEW TRANSFORMER FOR BUILDING 1226 ON NEW POLE P76. SECONDARY CABLES TO BE CONNECTED TO EXISTING POLE #34 DURING SHUTDOWN (NOTE #4).
- INSTALL NEW 3-PHASE GANG INTERRUPTER SWITCH ON POLE P77.
- PHASE 2F SHUTDOWN: REFER TO DRAWING E-04. ARRANGE WEEKEND SHUTDOWN TO INTERCONNECT NEW AND EXISTING LINES AT POLES P36 & P67 AND POLES P24 & P77.
- DURING SAME SHUTDOWN (SEE NOTE #4), DISCONNECT EXISTING SERVICES AND CONNECT NEW SERVICES TO BUILDING 1226. NEW TRANSFORMER MUST BE FULLY CONNECTED, TESTED AND NEW SERVICES TO BUILDINGS OPERATIONAL BEFORE MONDAY MORNING AT 6AM. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL EXISTING TRANSFORMER, CABLES, CUTOUTS, AND HARDWARE DURING REGULAR BUSINESS HOURS, FOLLOWING RESTORATION OF POWER.
- DURING SAME SHUTDOWN (NOTE #4), REPLACE POLE #30 WITH NEW POLE P78. REINSTATE ALL COMMUNICATION SERVICES INSTALLED ON POLE #30 TO NEW POLE P78. CONNECT 15.8kV PRIMARY BETWEEN P78 AND NEW POLE P75 AND CONNECT NEW PRIMARY WIRING TO EXISTING POLE #31 FOR SERVICE TO BUILDING 701 BUT DO NOT RE-ESTABLISH PRIMARY CONNECTION TO POLE #34. POLES #34 AND #35 TO REMAIN FOR OVERHEAD COMMUNICATIONS AND SECONDARY CIRCUITS ONLY. 15.8kV PRIMARY LINES TO BE REMOVED FOLLOWING RESTORATION OF POWER.
- DURING SAME SHUTDOWN (NOTE #4), REPLACE POLE #31 WITH NEW POLE P79 AND RECONNECT AND SECURE EXISTING UNDERGROUND COMMUNICATIONS AND PRIMARY TRANSFORMER CABLES TO NEW POLE.
- CONTRACTOR SHALL REMOVE ALL POLES DESIGNATED FOR DEMOLITION, AND REINSTATE GROUND TO MATCH SURROUNDING AREAS, AFTER COMMUNICATIONS SERVICES ARE TRANSFERRED TO NEW POLES BY BELL CANADA.
- INSTALL AND INTERCONNECT NEW POLES P80-P88, MAINTAINING SERVICE TO ALL BUILDINGS FOR THE DURATION OF CONSTRUCTION.
- INSTALL NEW TRANSFORMER FOR BUILDING 903 ON NEW POLE P88. RECONNECT EXISTING SECONDARY CABLES TO BUILDING 903.
- PHASE 2G SHUTDOWN: REFER TO DRAWING E-04. ARRANGE 3-HOUR SHUTDOWN TO INTERCONNECT NEW AND EXISTING LINES AT POLES P80 & P15.

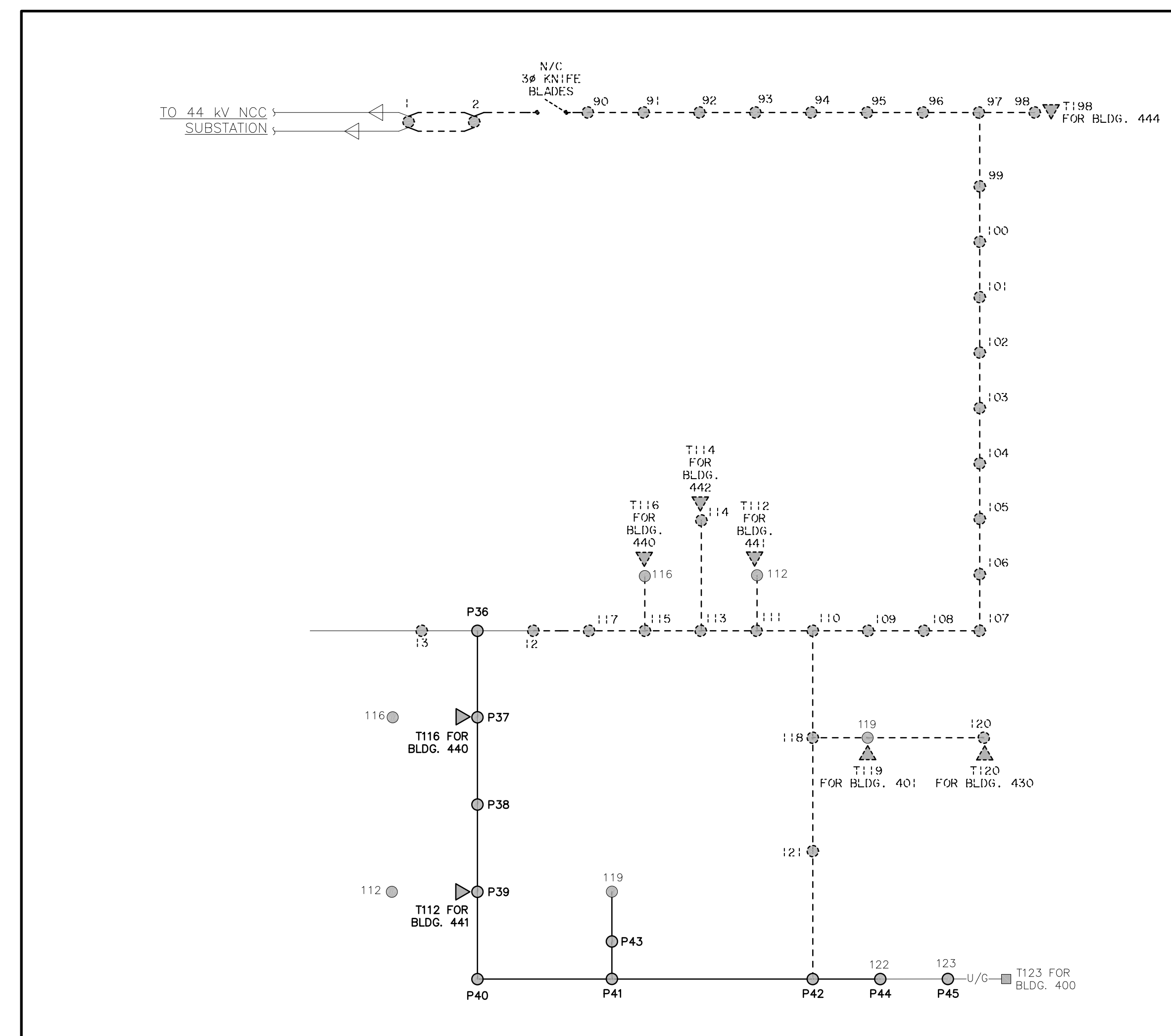


KEY PLAN - PHASE 2F & 2G
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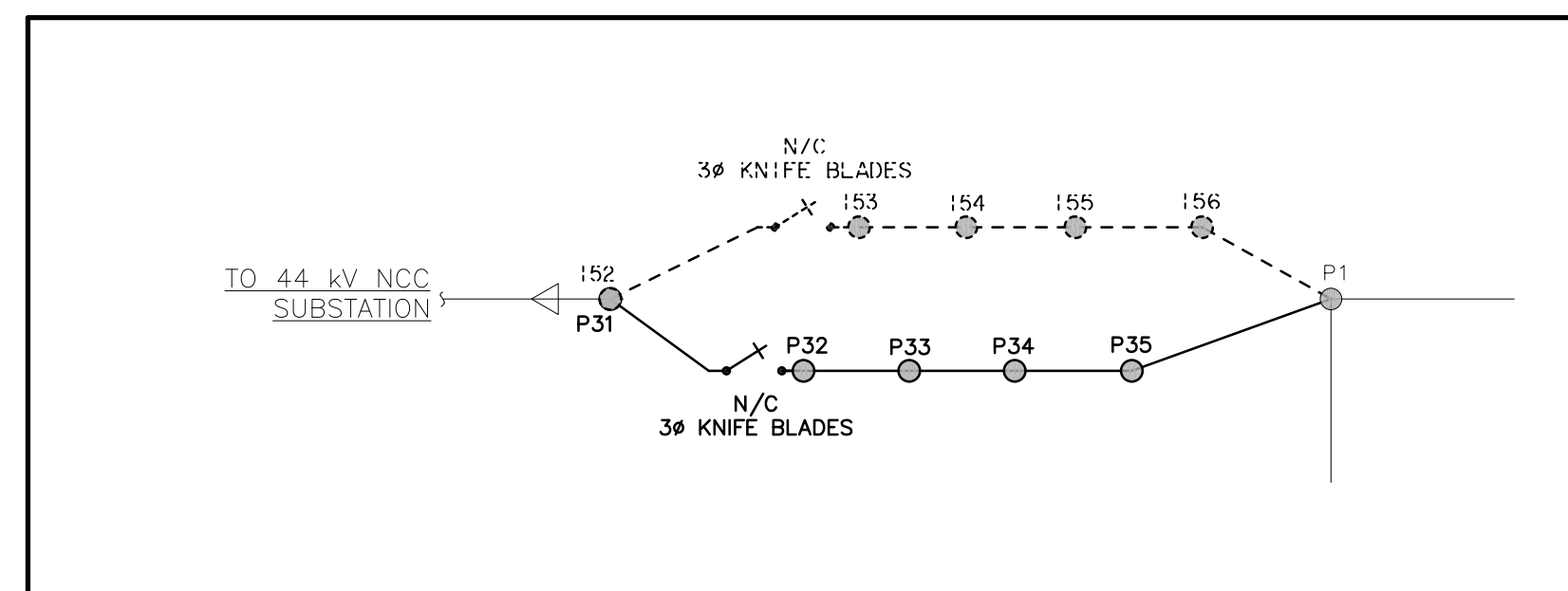
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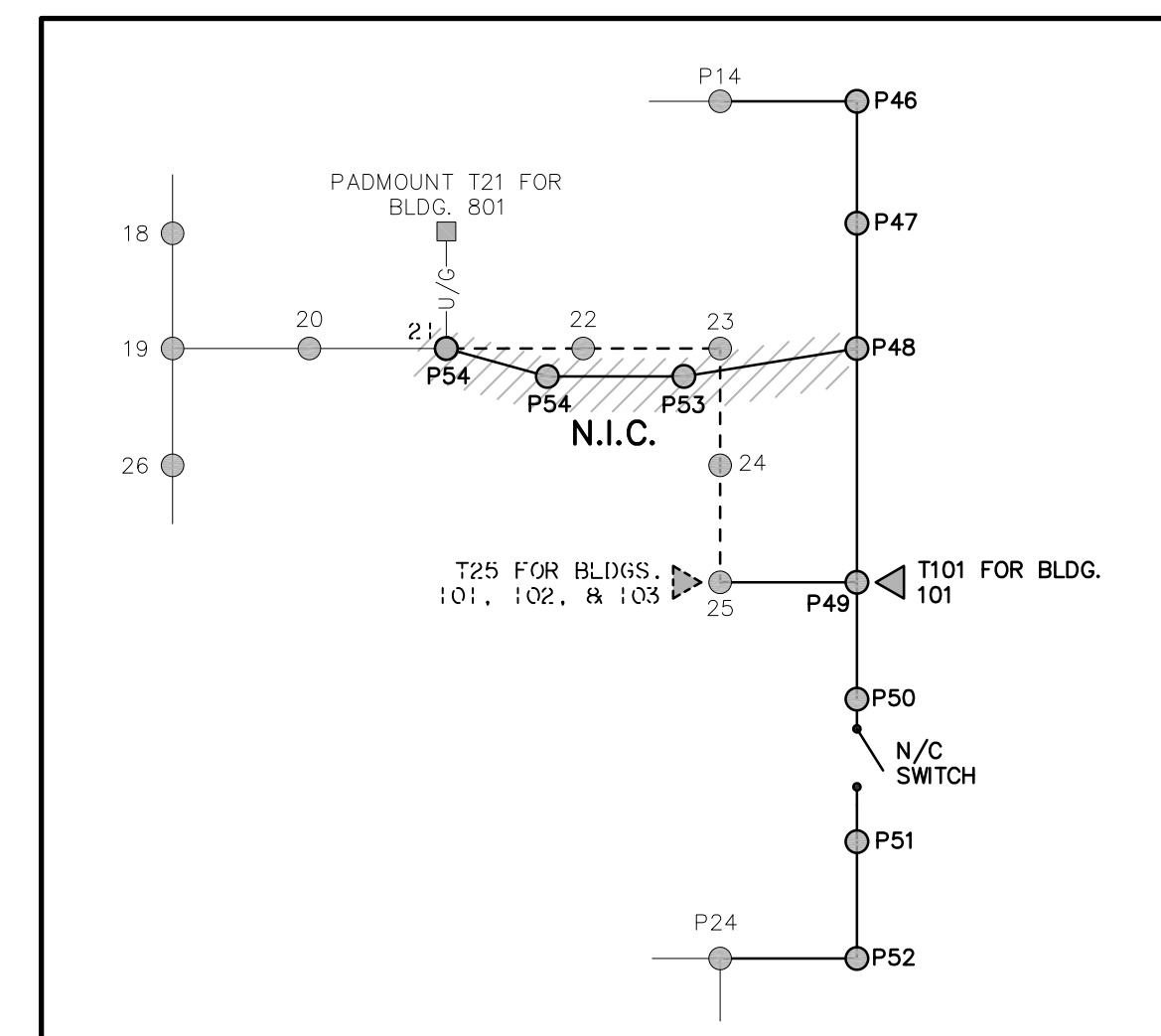
1 PHASE 2A - PARTIAL SINGLE LINE DIAGRAM
E-09 NONE



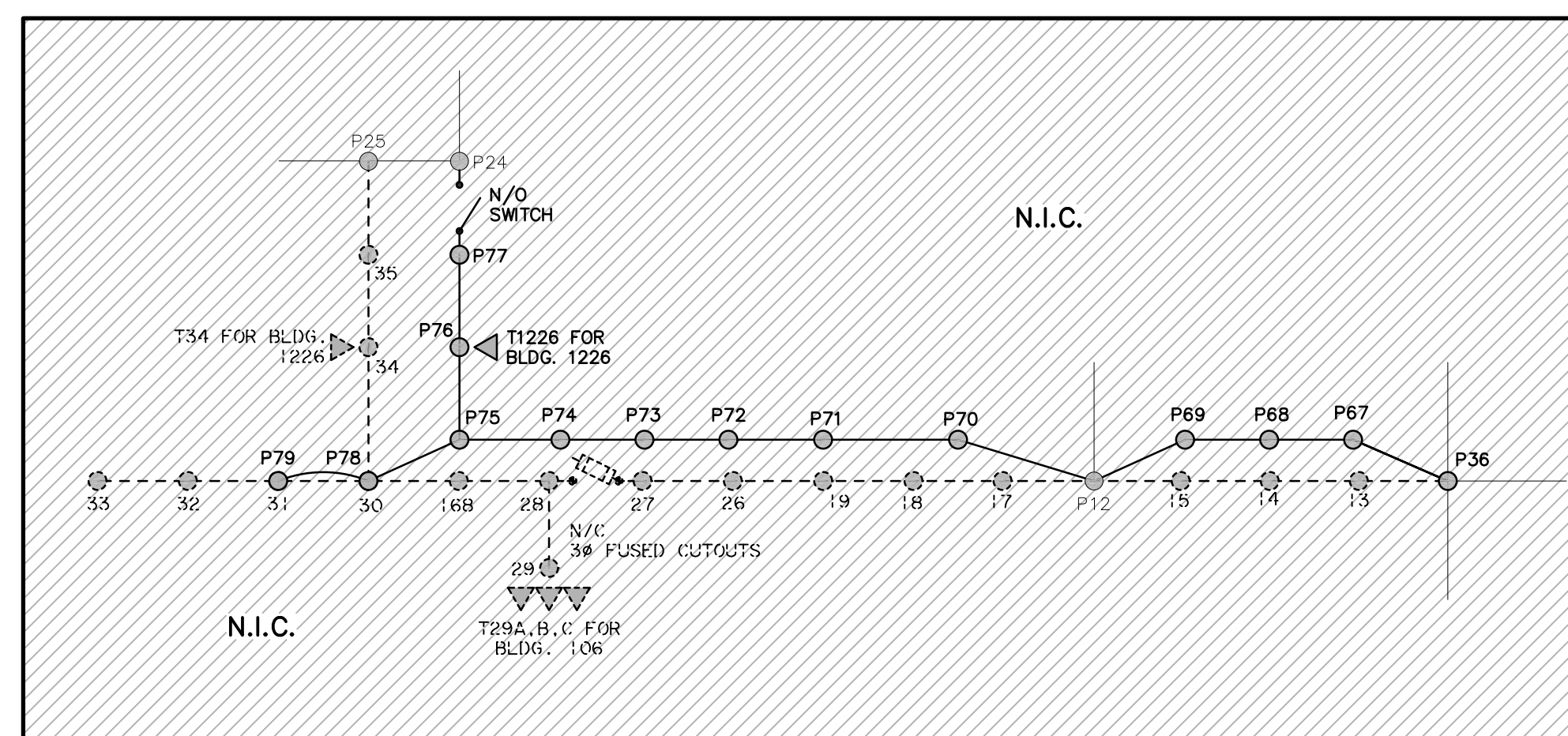
3 PHASE 2C - PARTIAL SINGLE LINE DIAGRAM
E-09 NONE



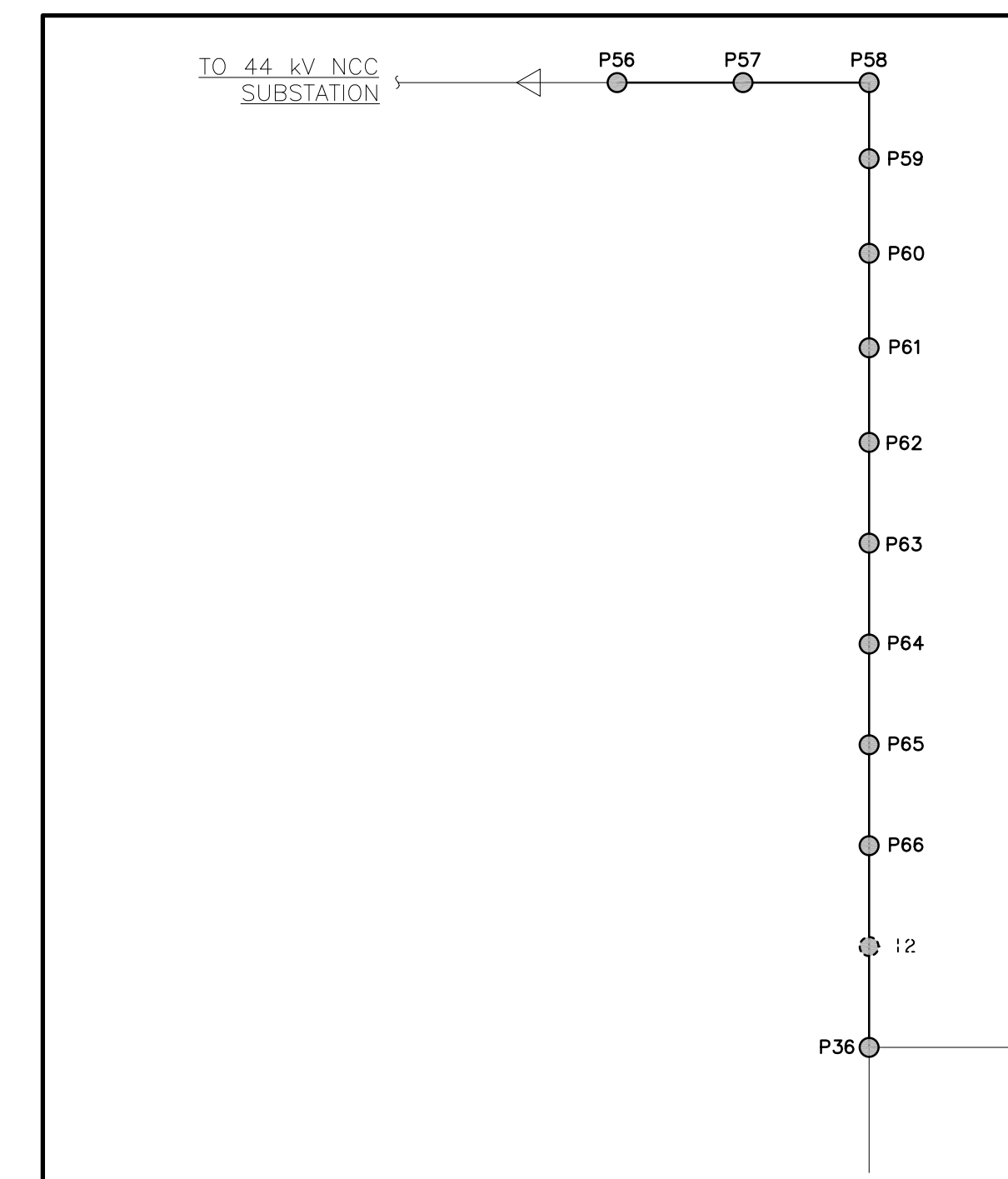
2 PHASE 2B - PARTIAL SINGLE LINE DIAGRAM
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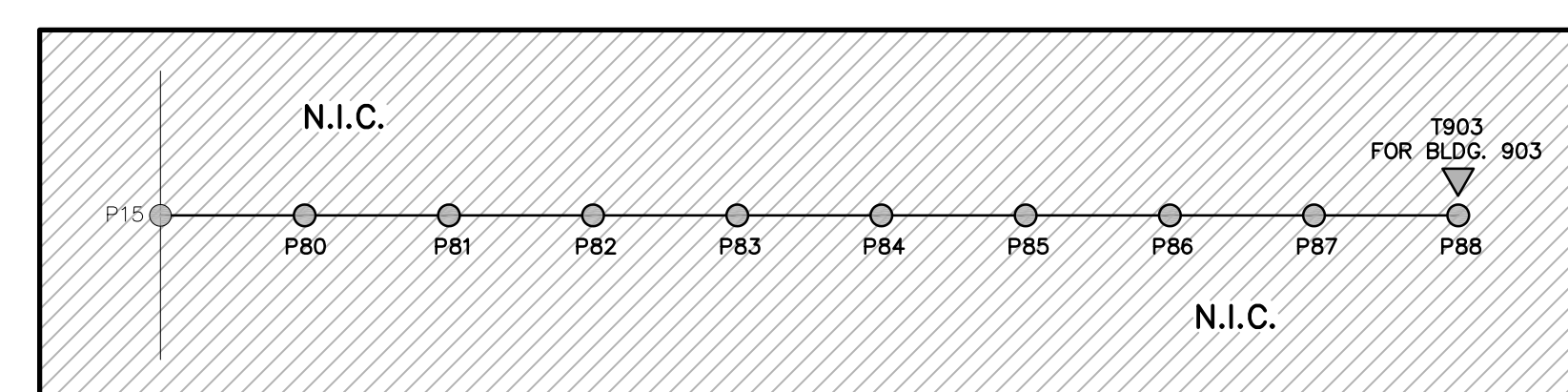
4 PHASE 2D - PARTIAL SINGLE LINE DIAGRAM
E-09 NONE



6 PHASE 2F - PARTIAL SINGLE LINE DIAGRAM
E-09 NONE
N.I.C.



5 PHASE 2E - PARTIAL SINGLE LINE DIAGRAM
E-09 NONE



7 PHASE 2G - PARTIAL SINGLE LINE DIAGRAM
E-09 NONE
N.I.C.



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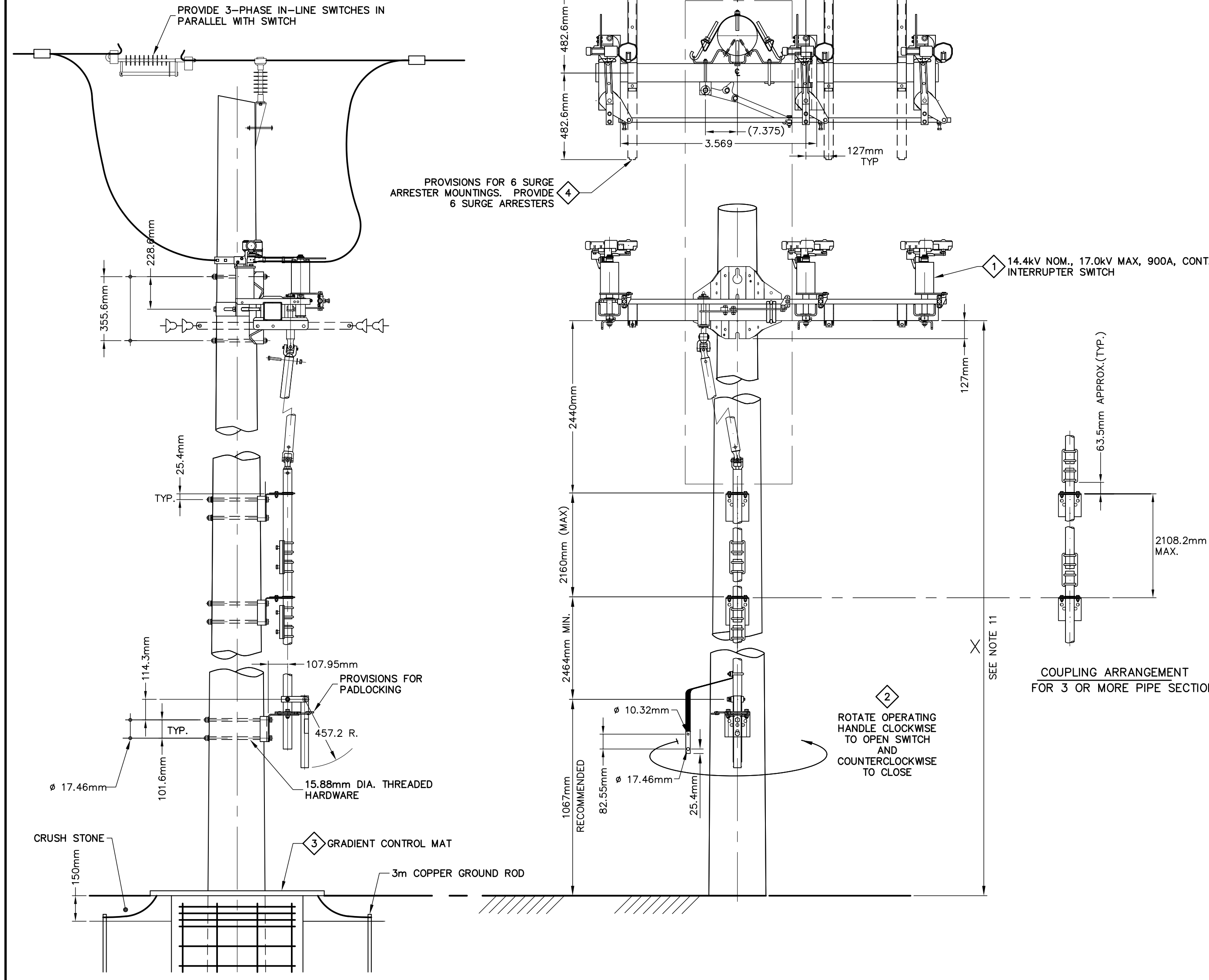
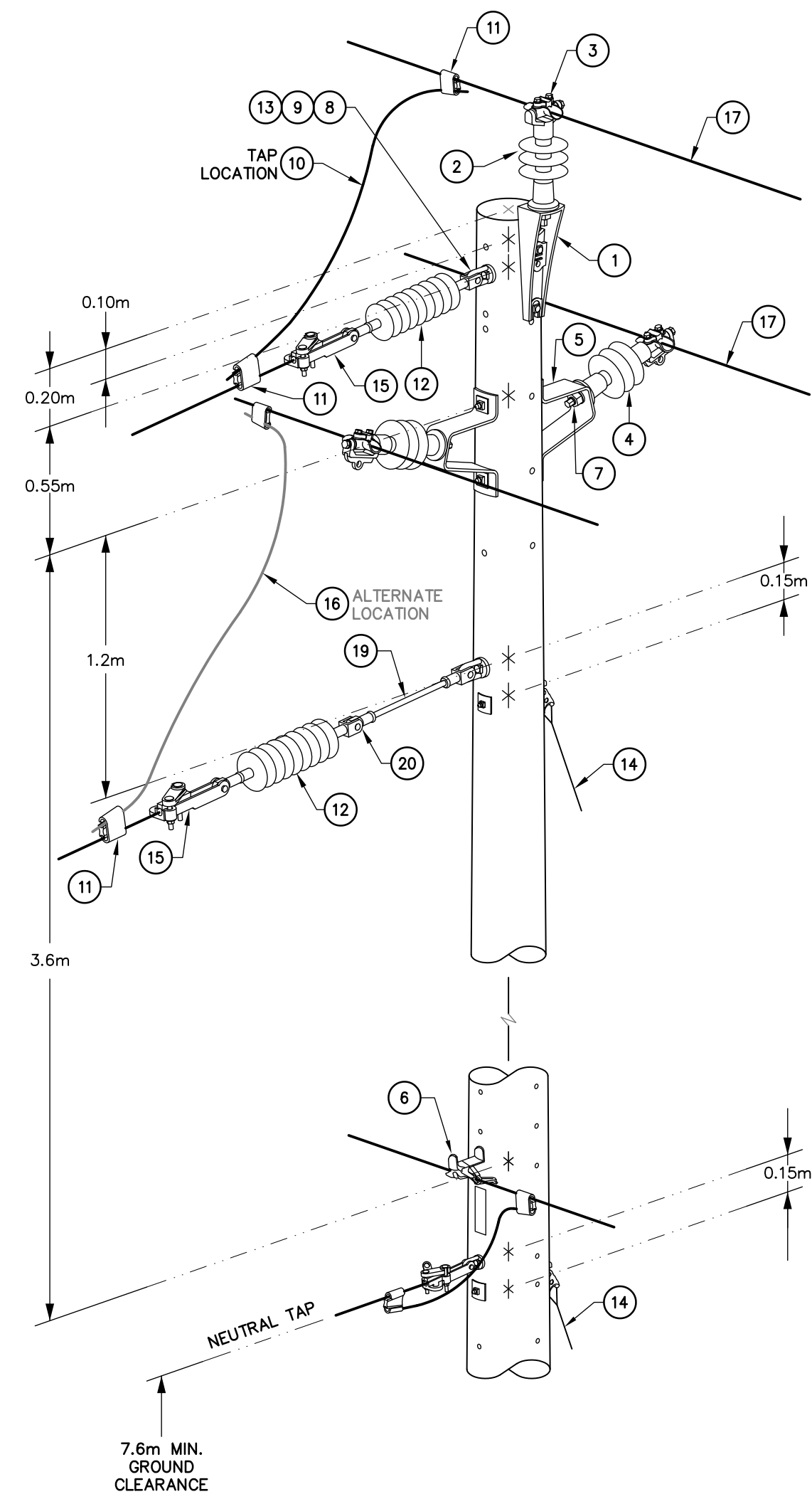
PHASE 2
ELECTRICAL INFRASTRUCTURE
DESIGN AT GREENBELT
RESEARCH FARM (GRF)

drawing / dessin

PARTIAL SINGLE LINE DIAGRAMS
PHASE 2A,B,C,D,E,F,G
EXISTING, DEMOLITION
AND NEW CONSTRUCTION

approved by / approuvé par	K. BOCHERT
designed by / conçu par	K. BOCHERT
drawn by / dessiné par	J.-P. DUBÉ
date	MARCH 2014
scale / échelle	
NCC project no. / no. du projet de la CCN	
sheet no. / no. de la feuille	
AL1493	E-09

DETAIL NOTES:	
ITEM NO.	DESCRIPTION
1	BRACKET, POLE TOP, TANGENT
2	VERTICAL LINE POST INSULATOR
3	CONDUCTOR CLAMP
4	HORIZONTAL LINE POST INSULATOR
5	INSULATOR STAND-OFF BRACKET FOR MAX. 75m SPAN
6	CLAMP, NEUTRAL CONDUCTOR
7	STUD, INSULATOR
8	16mm BOLT
9	16mm LOCK WASHER
10	TAP LOCATION (CHOOSE PHASE TO BALANCE LOAD - SEE ITEM 16)
11	CONNECTOR, WEDGE TYPE
12	INSULATOR, DEAD-END
13	BOLT EYE FOR 16mm BOLT
14	GUY CLAMP AND WIRE (9mm DIAMETER, STEEL GRADE 190)
15	CLEVIS BAIL, OR CLAMP, CONDUCTOR, BOLTED, DEAD-END
16	ALTERNATE TAP LOCATION
17	CONDUCTOR, #1/0 ACSR
18	16mm X 50.8mm X 50.8mm SQUARE WASHER
19	457mm INSULATOR, STRAIN
20	LINK, DOUBLE EYE
21	NUT EYE, FOR 16mm BOLT

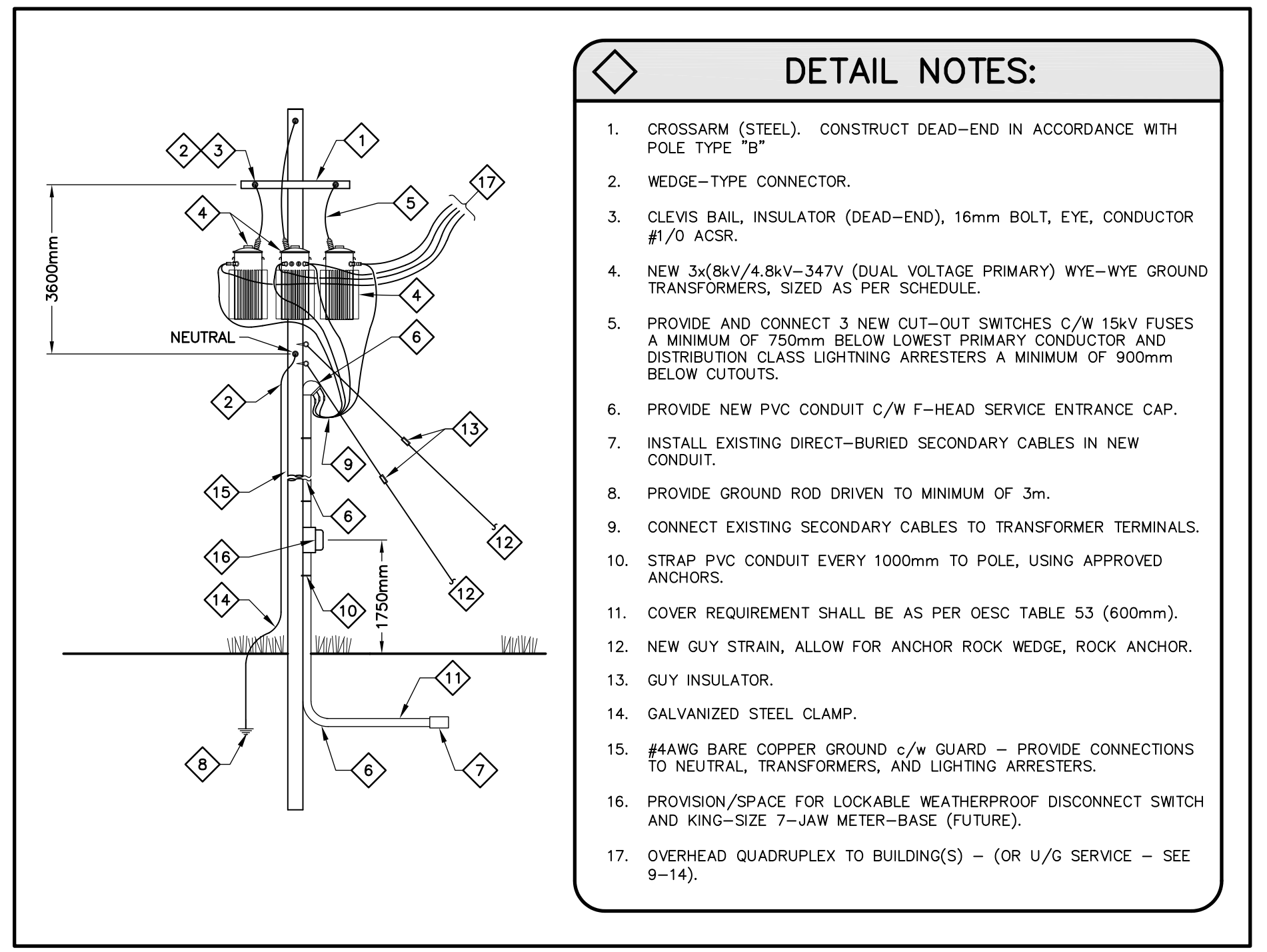


DETAIL NOTES:	
1	CONNECT ALL NON-CURRENT-CARRYING METAL COMPONENTS OF NEW SWITCH TO SYSTEM GROUND USING #2/OAWG STRANDED BARE COPPER CONDUCTOR. USE FLEXIBLE GROUND STRAPS AND COMPRESSION CONNECTORS AS REQUIRED.
2	CONNECT SWITCH OPERATING HANDLE TO SYSTEM GROUND USING EXTRA-FLEXIBLE CONDUCTOR, BRAID AND/OR STRANDED BARE COPPER CONDUCTOR NOT LESS THAN #2/OAWG COPPER.
3	PROVIDE 1.2m X 1.8m HOT DIP GALVANIZED GRADIENT CONTROL MAT ON A MINIMUM OF 150mm CRUSHED STONE, CONNECTED TO 2 GROUND RODS USING #2/OAWG STRANDED BARE COPPER CONDUCTOR.
4	CONNECT 6 LIGHTNING ARRESTERS TO SYSTEM GROUND USING #2/OAWG COPPER CONDUCTOR.

ALL DIMENSIONS IN mm UNLESS OTHERWISE SPECIFIED.

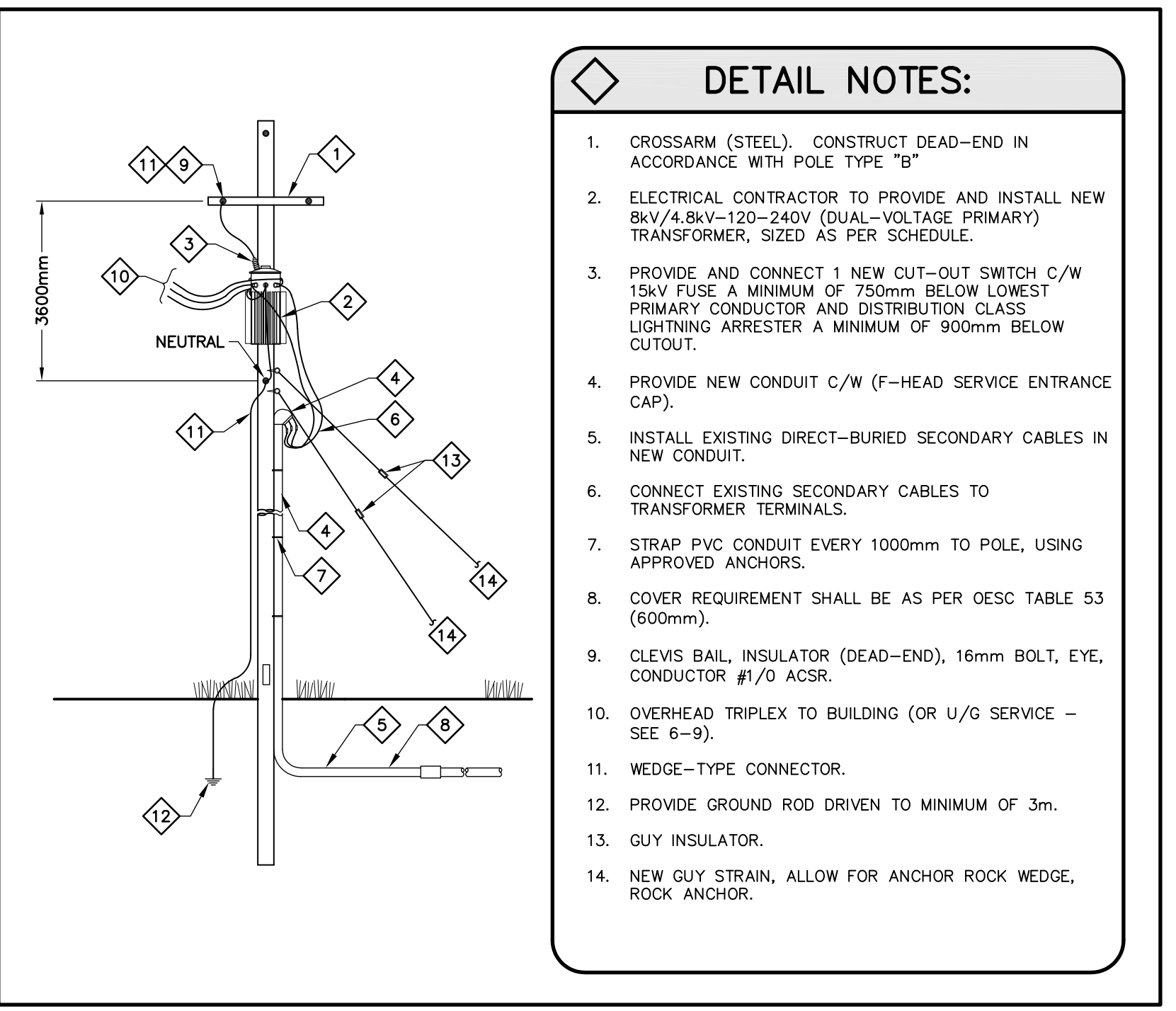
1 POLE TYPE "D" PRIMARY 3-PHASE POLE WITH 1-PHASE SERVICE TAP - 13.8kV
E-11 N.T.S.

2 POLE TYPE "E" 3-PHASE GANG INTERRUPTER SWITCH
E-11 N.T.S.



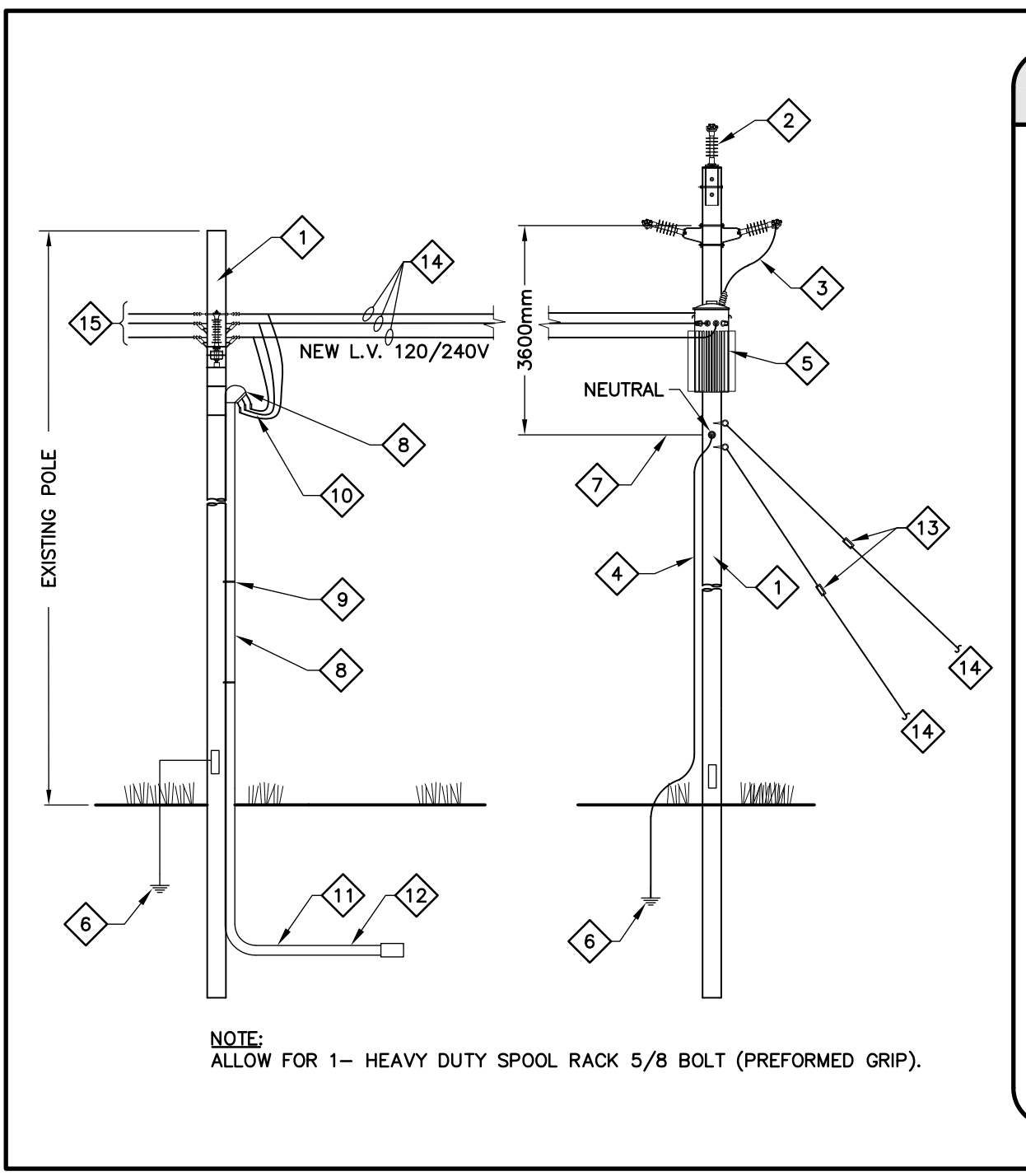
DETAIL NOTES:	
1	CROSSARM (STEEL). CONSTRUCT DEAD-END IN ACCORDANCE WITH POLE TYPE "B"
2	WEDGE-TYPE CONNECTOR.
3	CLEVIS BAIL, INSULATOR (DEAD-END), 16mm BOLT, EYE, CONDUCTOR #1/0 ACSR.
4	NEW 3x(8kV/4.8kV-347V (DUAL VOLTAGE PRIMARY) WYE-WYE GROUND TRANSFORMERS, SIZED AS PER SCHEDULE.
5	PROVIDE AND CONNECT 3 NEW CUT-OUT SWITCHES C/W 15kV FUSES A MINIMUM OF 750mm BELOW LOWEST PRIMARY CONDUCTOR AND DISTRIBUTION CLASS LIGHTNING ARRESTERS A MINIMUM OF 900mm BELOW CUTOUTS.
6	PROVIDE NEW PVC CONDUIT C/W F-HEAD SERVICE ENTRANCE CAP.
7	INSTALL EXISTING DIRECT-BURIED SECONDARY CABLES IN NEW CONDUIT.
8	PROVIDE GROUND ROD DRIVEN TO MINIMUM OF 3m.
9	CONNECT EXISTING SECONDARY CABLES TO TRANSFORMER TERMINALS.
10	STRAP PVC CONDUIT EVERY 1000mm TO POLE, USING APPROVED ANCHORS.
11	COVER REQUIREMENT SHALL BE AS PER OESC TABLE 53 (600mm).
12	NEW GUY STRAIN, ALLOW FOR ANCHOR ROCK WEDGE, ROCK ANCHOR.
13	GUY INSULATOR.
14	GALVANIZED STEEL CLAMP.
15	#4AWG BARE COPPER GROUND C/W GUARD - PROVIDE CONNECTIONS TO NEUTRAL, TRANSFORMERS, AND LIGHTNING ARRESTERS.
16	PROVISION/SPACE FOR LOCKABLE WEATHERPROOF DISCONNECT SWITCH AND KING-SIZE 7-JAW METER-BASE (FUTURE).
17	OVERHEAD QUADRUPLIX TO BUILDING(S) - (OR U/G SERVICE - SEE 9-14).

3 POLE TYPE "F" 3-PHASE TRANSFORMER POLE
E-11 N.T.S.



DETAIL NOTES:	
1	CROSSARM (STEEL). CONSTRUCT DEAD-END IN ACCORDANCE WITH POLE TYPE "B"
2	ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL NEW 8kV/4.8kV-120-240V (DUAL-VOLTAGE PRIMARY) TRANSFORMER, SIZED AS PER SCHEDULE.
3	PROVIDE AND CONNECT 1 NEW CUT-OUT SWITCH C/W 15kV FUSE A MINIMUM OF 750mm BELOW LOWEST PRIMARY CONDUCTOR AND DISTRIBUTION CLASS LIGHTNING ARRESTERS A MINIMUM OF 900mm BELOW CUTOUT.
4	PROVIDE NEW CONDUIT C/W F-HEAD SERVICE ENTRANCE CAP.
5	INSTALL EXISTING DIRECT-BURIED SECONDARY CABLES IN NEW CONDUIT.
6	CONNECT EXISTING SECONDARY CABLES TO TRANSFORMER TERMINALS.
7	STRAP PVC CONDUIT EVERY 1000mm TO POLE, USING APPROVED ANCHORS.
8	COVER REQUIREMENT SHALL BE AS PER OESC TABLE 53 (600mm).
9	CLEVIS BAIL, INSULATOR (DEAD-END), 16mm BOLT, EYE, CONDUCTOR #1/0 ACSR.
10	OVERHEAD TRIPLEX TO BUILDING (OR U/G SERVICE - SEE 6-9).
11	WEDGE-TYPE CONNECTOR.
12	PROVIDE GROUND ROD DRIVEN TO MINIMUM OF 3m.
13	GUY INSULATOR.
14	NEW GUY STRAIN, ALLOW FOR ANCHOR ROCK WEDGE, ROCK ANCHOR.

4 POLE TYPE "G" 1-PHASE TRANSFORMER POLE
E-11 N.T.S.



DETAIL NOTES:	
1	EXISTING HYDRO POLE TO BE USED FOR CONNECTIONS TO NEW BUILDING.
2	POLE FRAMING TO BE DONE AS PER POLE TYPE "A"
3	PROVIDE AND CONNECT 1 NEW CUT-OUT SWITCH C/W 15kV FUSE A MINIMUM OF 750mm BELOW LOWEST PRIMARY CONDUCTOR AND DISTRIBUTION CLASS LIGHTNING ARRESTERS A MINIMUM OF 900mm BELOW CUTOUT.
4	BARE COPPER GROUND IN 21mm CONDUIT. PROVIDE CONDUIT GUARD FOR GROUND CONDUCTOR.
5	ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL NEW 8kV/4.8kV-120-240V (DUAL-VOLTAGE PRIMARY) TRANSFORMER, SIZED AS PER SCHEDULE.
6	PROVIDE GROUND ROD DRIVEN TO MINIMUM OF 3m.
7	WEDGE-TYPE CONNECTOR.
8	PROVIDE NEW CONDUIT C/W F-HEAD SERVICE ENTRANCE CAP.
9	STRAP PVC CONDUIT EVERY 1000mm TO POLE, USING APPROVED ANCHORS.
10	CONNECT EXISTING SECONDARY CABLES TO TRANSFORMER TERMINALS.
11	INSTALL EXISTING DIRECT-BURIED SECONDARY CABLES IN NEW CONDUIT.
12	COVER REQUIREMENT SHALL BE AS PER OESC TABLE 53 (600mm).
13	GUY INSULATOR.
14	NEW GUY STRAIN, ALLOW FOR ANCHOR ROCK WEDGE, ROCK ANCHOR.
15	OVERHEAD TRIPLEX TO BUILDING (OR U/G SERVICE - SEE 10, 11 & 12).
16	PROVIDE NEW OVERHEAD LV CONDUCTORS 120/240V, 1PH, 3W, THREE (3) CONDUCTOR TRIPLEX - NEUTRAL SUPPORTED CABLE C/W PVC JACKET, SIZED IN ACCORDANCE WITH TRANSFORMER SCHEDULE (DWG. E-15).

5 POLE TYPE "H" TRANSFORMER & SECONDARY SERVICE POLES
E-11 N.T.S.

issued or revised
émis ou révisé

no.	description	date
C	ISSUED FOR TENDER	2014/11/21
B	ISSUED FOR ESA PLANS APPROVAL	2014/04/28
A	ISSUED FOR 100% REVIEW	2014/03/31

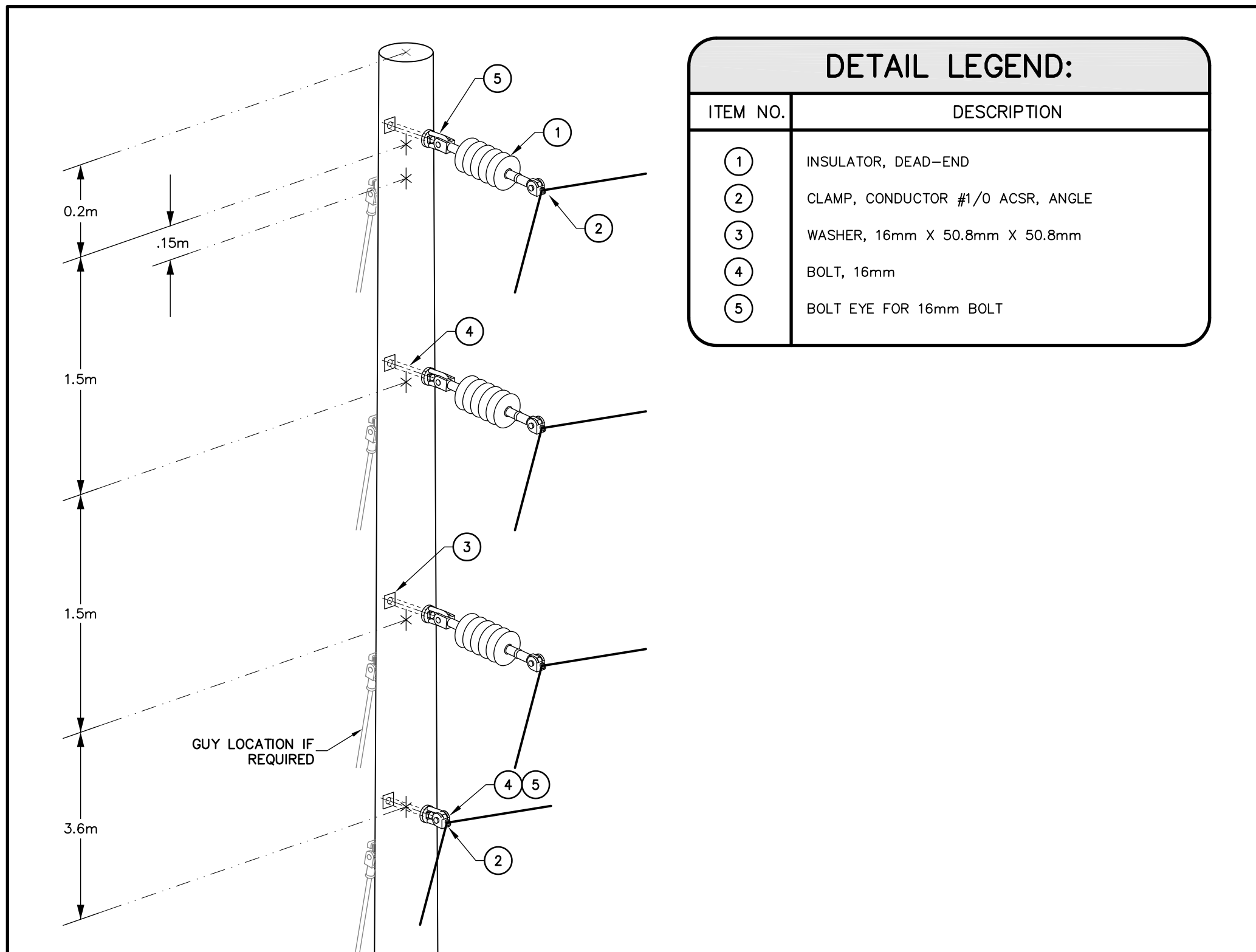
project
projet

PHASE 2
ELECTRICAL INFRASTRUCTURE
DESIGN AT GREENBELT
RESEARCH FARM (GRF)

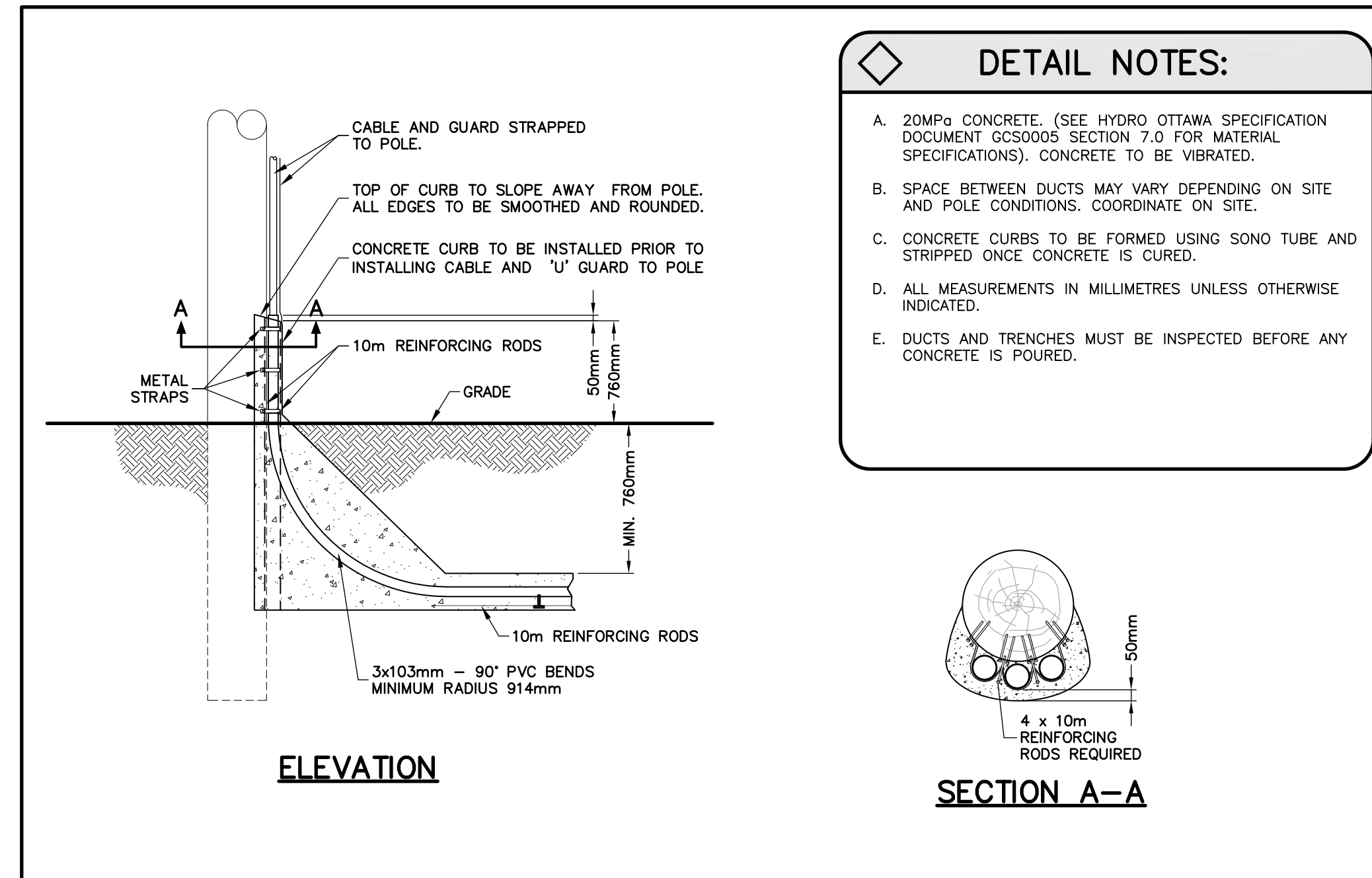
drawing
dessin

POLE TYPE DETAILS
(2 OF 3)

approved by
approuvé par K. BOCHERT
designed by
conçu par K. BOCHERT
drawn by
dessiné par J-P. DUBÉ
date
MARCH 2014
scale
échelle
NCC project no.
no. du projet de la CCN
sheet no.
no. de la feuille
AL1493



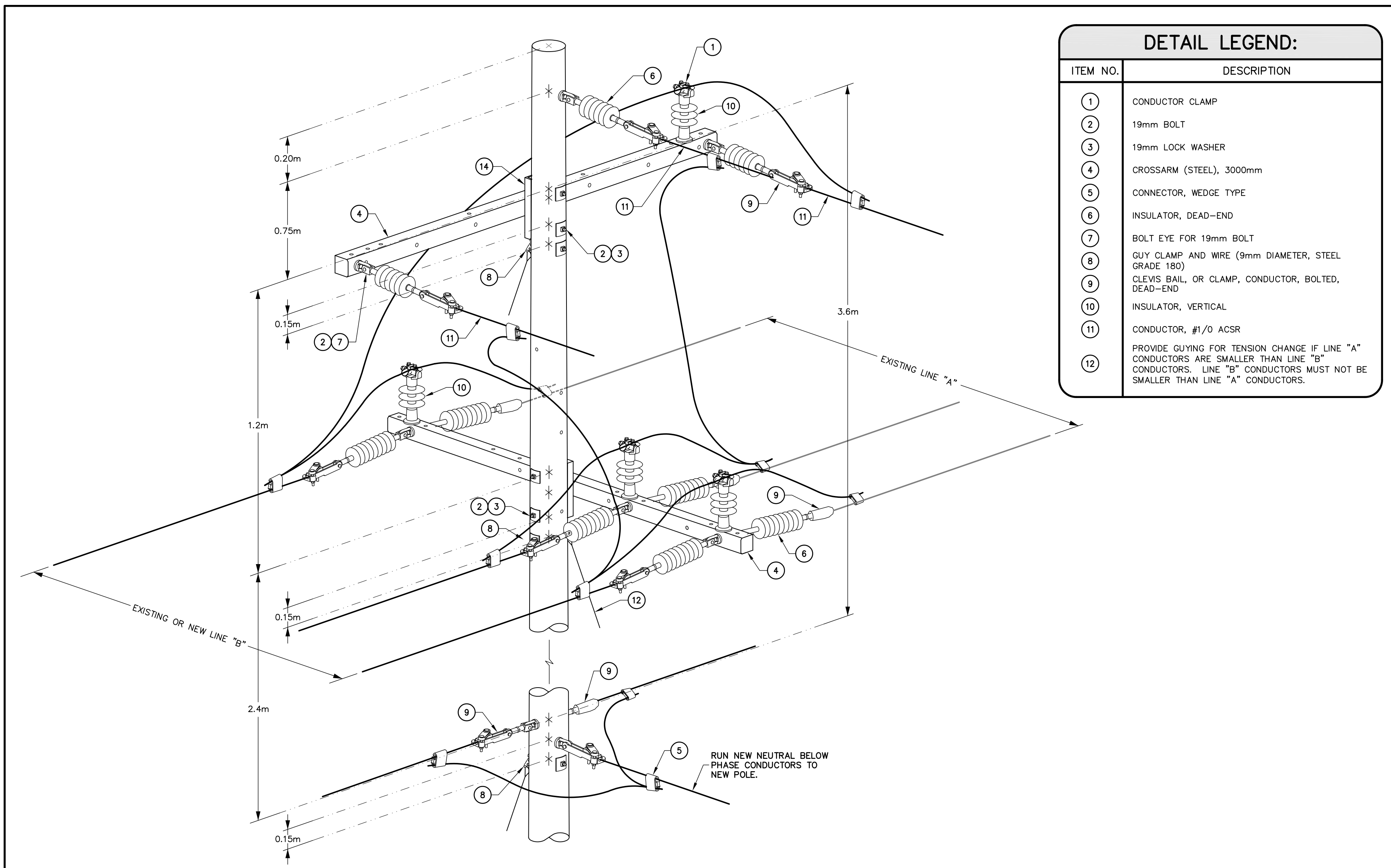
DETAIL LEGEND:	
ITEM NO.	DESCRIPTION
①	INSULATOR, DEAD-END
②	CLAMP, CONDUCTOR #1/0 ACSR, ANGLE
③	WASHER, 16mm X 50.8mm X 50.8mm
④	BOLT, 16mm
⑤	BOLT EYE FOR 16mm BOLT



DETAIL NOTES:	
A.	20MPa CONCRETE. (SEE HYDRO OTTAWA SPECIFICATION DOCUMENT GCS0005 SECTION 7.0 FOR MATERIAL SPECIFICATIONS). CONCRETE TO BE VIBRATED.
B.	SPACE BETWEEN DUCTS MAY VARY DEPENDING ON SITE AND POLE CONDITIONS. COORDINATE ON SITE.
C.	CONCRETE CURBS TO BE FORMED USING SONO TUBE AND STRIPPED ONCE CONCRETE IS CURED.
D.	ALL MEASUREMENTS IN MILLIMETRES UNLESS OTHERWISE INDICATED.
E.	DUCTS AND TRENCHES MUST BE INSPECTED BEFORE ANY CONCRETE IS POURED.

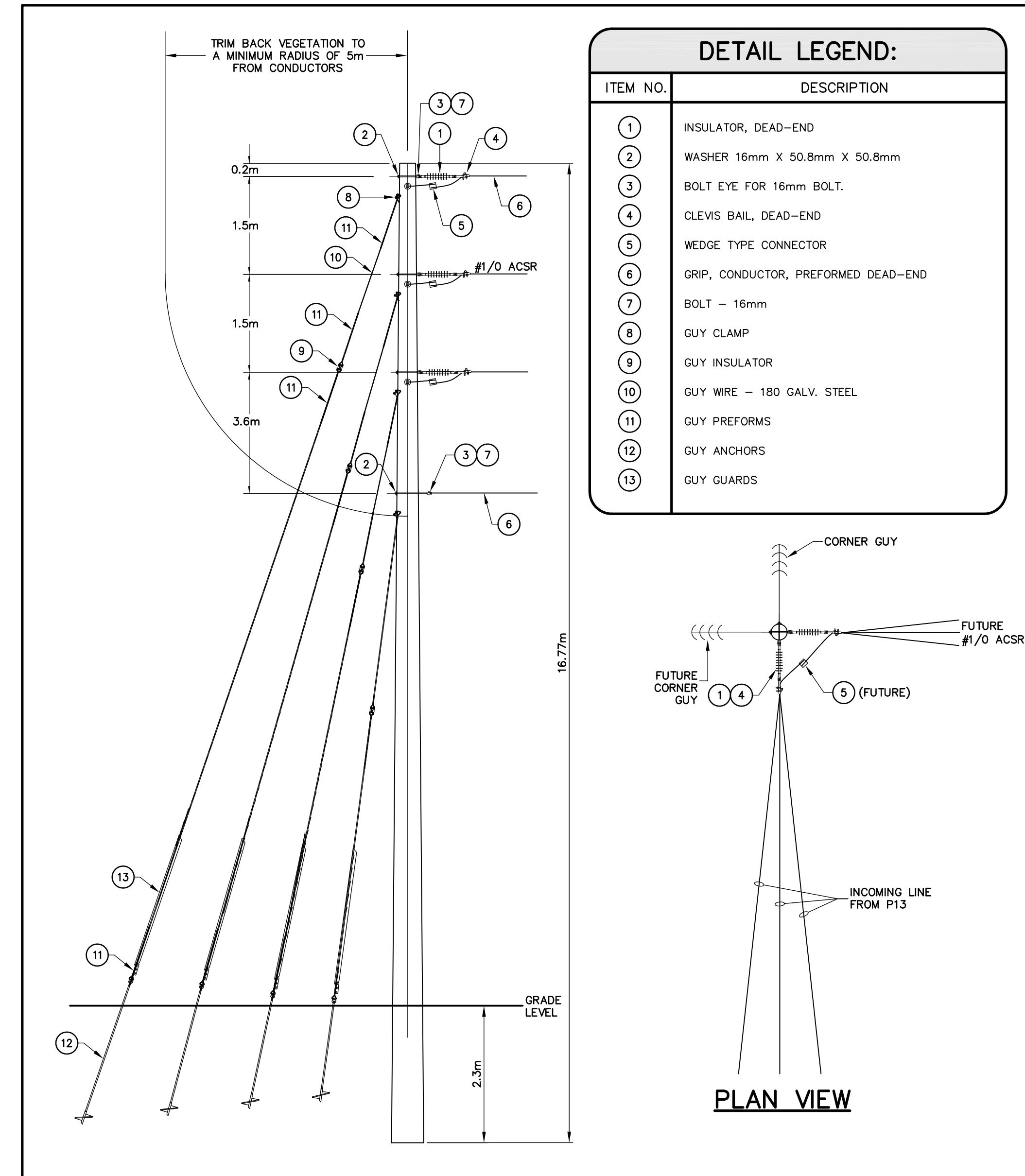
② POLE TYPE "K"
PRIMARY RISER POLE
E-12 N.T.S.

① POLE TYPE "J"
PRIMARY 3-PHASE LINE ANGLE 16° TO 60° - 13.8kV
E-12 N.T.S.



DETAIL LEGEND:	
ITEM NO.	DESCRIPTION
①	CONDUCTOR CLAMP
②	19mm BOLT
③	19mm LOCK WASHER
④	CROSSARM (STEEL), 3000mm
⑤	CONNECTOR, WEDGE TYPE
⑥	INSULATOR, DEAD-END
⑦	BOLT EYE FOR 19mm BOLT
⑧	GUY CLAMP AND WIRE (9mm DIAMETER, STEEL GRADE 150)
⑨	CLEVIS BAIL OR CLAMP, CONDUCTOR, BOLTED, DEAD-END
⑩	INSULATOR, VERTICAL
⑪	CONDUCTOR, #1/0 ACSR
⑫	PROVIDE GUYING FOR TENSION CHANGE IF LINE "A" CONDUCTORS ARE SMALLER THAN LINE "B" CONDUCTORS. LINE "B" CONDUCTORS MUST NOT BE SMALLER THAN LINE "A" CONDUCTORS.

③ POLE TYPE "L"
PRIMARY 3-PHASE TRANSITION POLE - 13.8kV
E-12 N.T.S.



DETAIL LEGEND:	
ITEM NO.	DESCRIPTION
①	INSULATOR, DEAD-END
②	WASHER 16mm X 50.8mm X 50.8mm
③	BOLT EYE FOR 16mm BOLT.
④	CLEVIS BAIL, DEAD-END
⑤	WEDGE TYPE CONNECTOR
⑥	GRIP, CONDUCTOR, PREFORMED DEAD-END
⑦	BOLT - 16mm
⑧	GUY CLAMP
⑨	GUY INSULATOR
⑩	GUY WIRE - 180 GALV. STEEL
⑪	GUY PREFORMS
⑫	GUY ANCHORS
⑬	GUY GUARDS

④ POLE TYPE "M"
PRIMARY 3-PHASE LINE ANGLE 61-90 DEG. - 13.8kV
E-12 N.T.S.

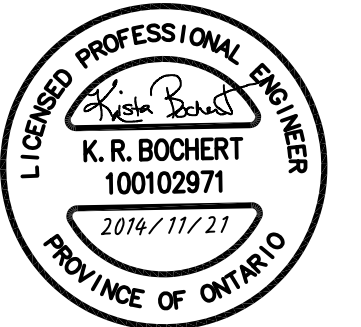


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no.	description	date

PHASE 2
ELECTRICAL INFRASTRUCTURE
DESIGN AT GREENBELT
RESEARCH FARM (GRF)

POLE TYPE DETAILS
(3 OF 3)

approved by / approuvé par	K. BOCHERT
designed by / conçu par	K. BOCHERT
drawn by / dessiné par	J.-P. DUBÉ
date	MARCH 2014
scale / échelle	
NCC project no. / no. du projet de la CCN	sheet no. / no. de la feuille
AL1493	E-12



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no. description date
project
projet

PHASE 2
ELECTRICAL INFRASTRUCTURE
DESIGN AT GREENBELT
RESEARCH FARM (GRF)

drawing
dessin

DETAILS &
NEW TRANSFORMER
SCHEDULE

approved by
approuvé par K. BOCHERT

designed by
conçu par K. BOCHERT

drawn by
dessiné par J.-P. DUBÉ

date
MARCH 2014

scale
échelle

NCC project no. sheet no.
no. du projet de la CCN no. de la feuille

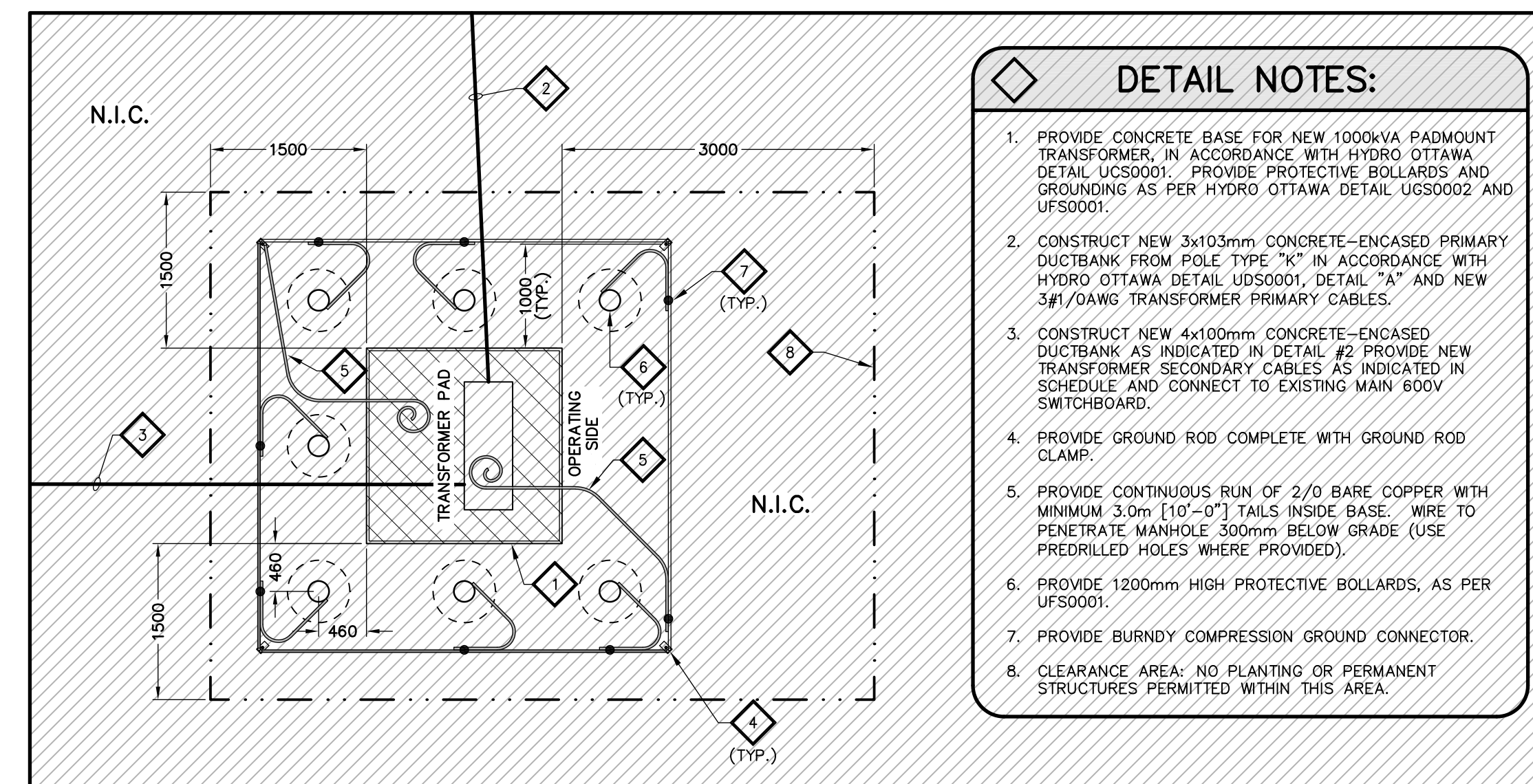
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E-15

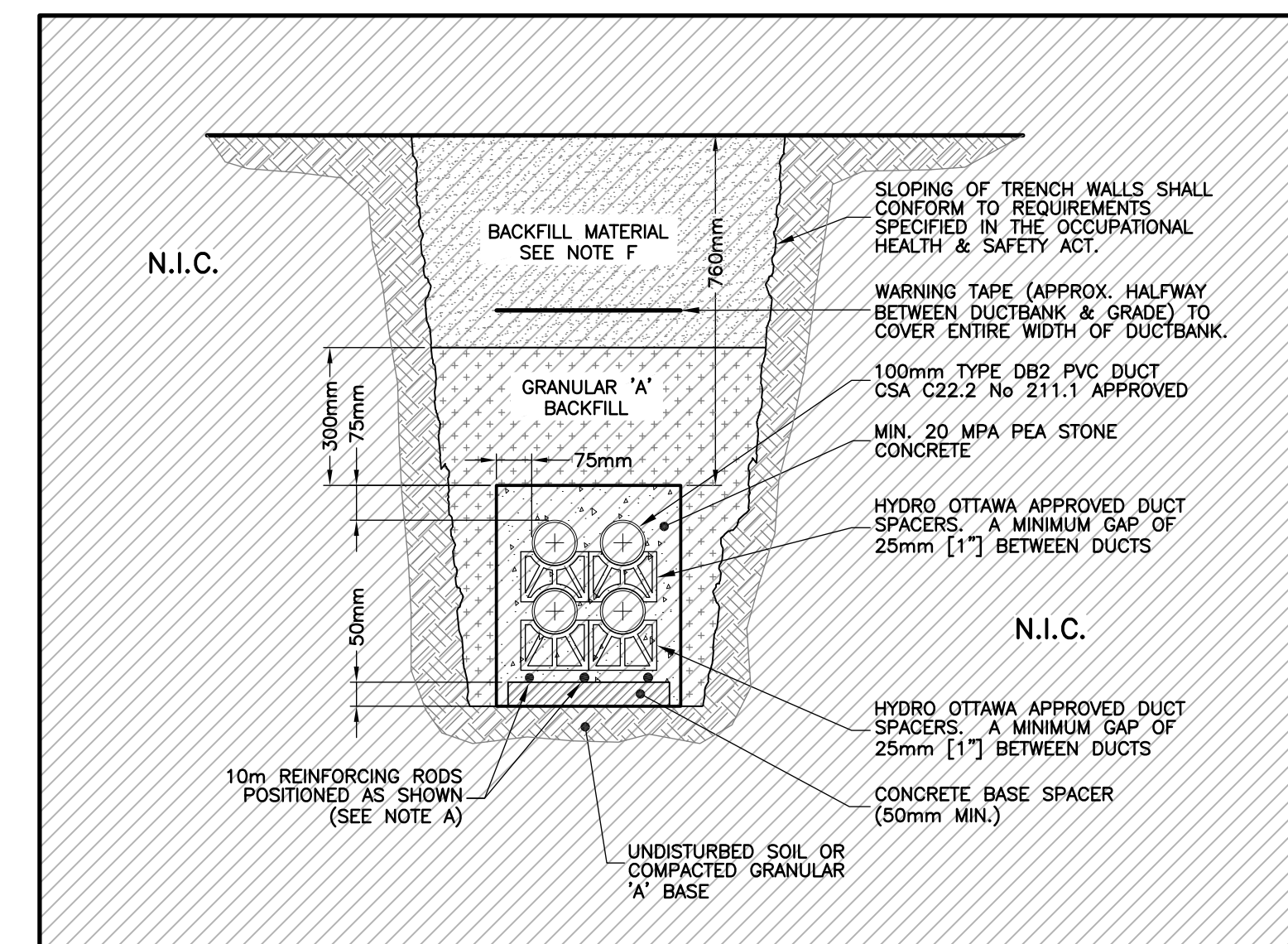
NEW TRANSFORMER SCHEDULE

CONSTRUCTION PHASE	TRANSFORMER No. (TX)	POLE/PAD	KVA	PRIMARY VOLTAGE	SECONDARY VOLTAGE	CONFIG	SECONDARY WIRING	FUSING
N.I.C.	2A	T201A,B,C	P28	3x25	4.8/8kV	600(347)V	WYE-WYE #4AWG NS90 QUADRUPEX O/H TO EACH BLDG. (201, 20, 203)	3x8A, 14.4kV XS
	2A	T204	P23	100	4.8/8kV	120/240V	1ø 3#750MCM Cu + GND U/G (EXISTING CONDUIT)	40A, 14.4kV XS
	2A	T209	P27	75	4.8/8kV	120/240V	1ø 3#500MCM Cu + GND U/G (EXISTING CONDUIT)	25A, 14.4kV XS
N.I.C.	2A	T1101	PAD	1000	13.8kV	600(347)V	WYE-WYE 4x(4#500MCM Cu + GND-103mmC)	65A, CLF & BAYONET
2B	---	---	---	---	---	---	---	---
2C	T401	P43	5	4.8/8kV	120/240V	1ø	#6AWG NS90 TRIPLEX O/H TO EXISTING POLE #119	2A, 14.4kV XS
	T440	P37	100	4.8/8kV	120/240V	1ø	2x #3/0AWG NS90 TRIPLEX O/H TO EXISTING POLE #116	40A, 14.4kV XS
	T441	P39	100	4.8/8kV	120/240V	1ø	2x #3/0AWG NS90 TRIPLEX O/H TO EXISTING POLE #112	40A, 14.4kV XS
2D	T101	P49	100	4.8/8kV	120/240V	1ø	#500KCMIL NS90 TRIPLEX O/H TO EXISTING POLE #25	20A, 14.4kV XS
N.I.C.	2F	T1226	P76	25	4.8/8kV	120/240V	1ø #2AWG NS90 TRIPLEX O/H TO EXISTING POLE #34	10A, 14.4kV XS
N.I.C.	2G	T903	P87	75	4.8/8kV	120/240V	1ø 3#500MCM Cu + GND U/G (EXISTING CONDUIT)	25A, 14.4kV XS

ABBREVIATIONS: "U/G" = UNDERGROUND "O/H" = OVERHEAD "CLF" = CURRENT LIMITING FUSE "XS" = CUTOUTS/FUSE LINKS

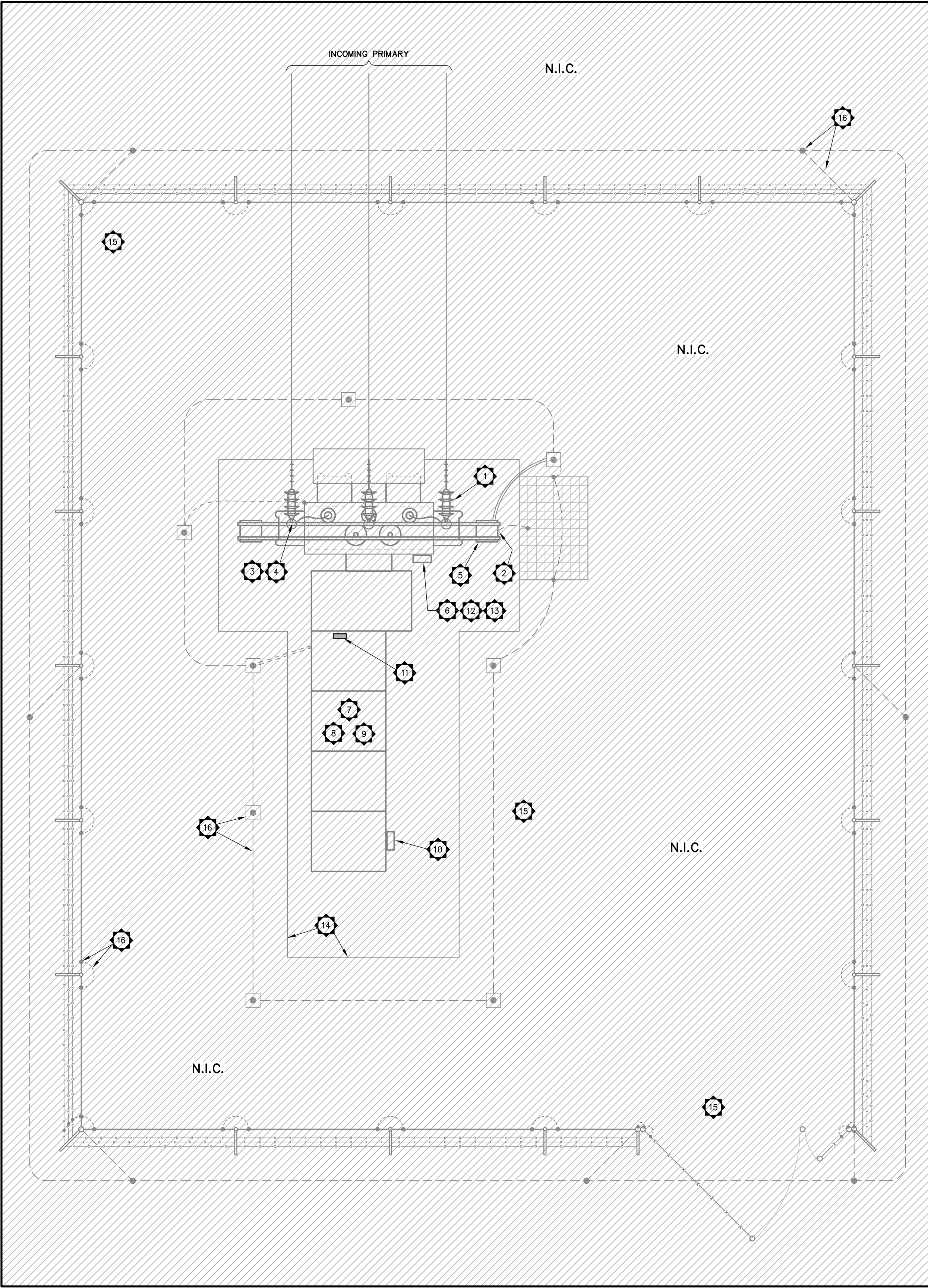


1 NEW PADMOUNT TRANSFORMER
E-15 1:50
N.I.C.

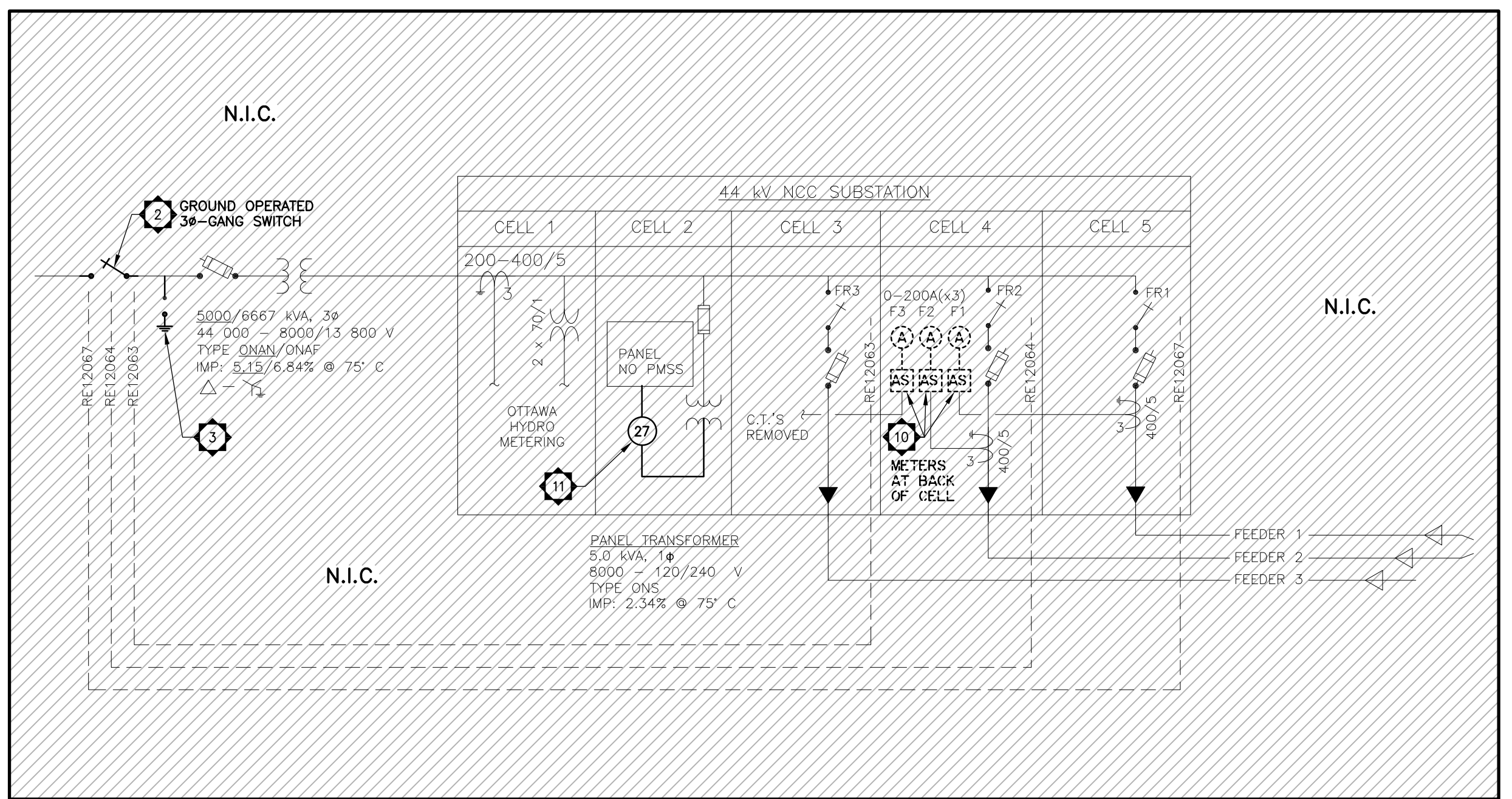


2 NEW 2x2x100mm CONCRETE DUCT BANK SECTION
E-15 N.T.S.
N.I.C.

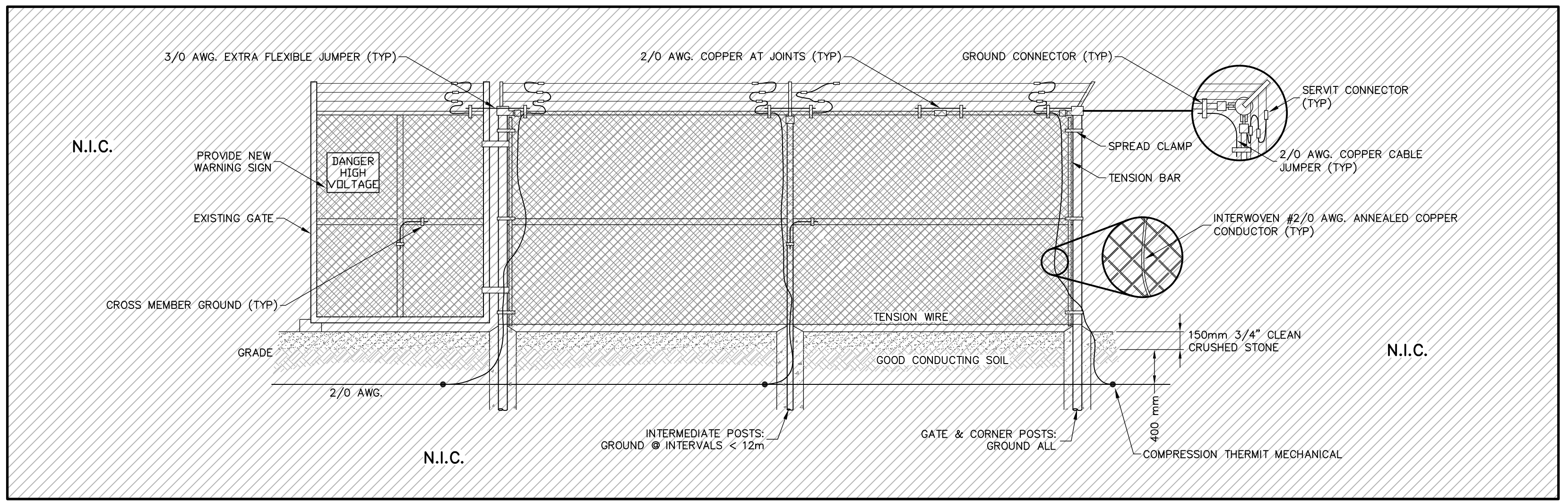
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1 SUBSTATION MODIFICATIONS AND REPAIRS
E-16 1:50
N.I.C.



2 SUBSTATION SINGLE LINE DIAGRAM – MODIFICATIONS AND REPAIRS
E-16 NONE
N.I.C.



3 TYPICAL FENCE GROUNDING DETAIL
E-16 NONE
N.I.C.

SPECIFIC NOTES: N.I.C.

1. REPLACE IPS BUS INSULATORS WITH NEW POLYMER 46kV, 250kVBL (IR-214) INSULATORS AND PROVIDE EXTENSIONS FOR IPS BUS AS REQUIRED.
2. REPLACE 44kV AIR BREAK SWITCH AND OPERATING HANDLE AT BASE.
3. REPLACE INTERMEDIATE CLASS 46kV, 39kV MCOV LIGHTNING ARRESTERS.
4. REPLACE ALL RUSTED TOWER STRUCTURE HARDWARE WITH STRUCTURALLY SOUND.
5. ENSURE THAT ALL BASE ANCHORING HARDWARE IS STRUCTURALLY SOUND.
6. REPLACE CONTROL CABINET ON 5MVA TRANSFORMER WITH NEW 316 STAINLESS STEEL NEMA 3R ENCLOSURE INCLUDING DIN RAIL TERMINAL BLOCKS, CONTROL RELAYS AND SIS CONTROL WIRING.
7. ON 15kV SWITCHGEAR REPLACE ALL SEALS AND GASKETS APPROVED BY OEM (NEMA 3R RATING).
8. ON 15kV SWITCHGEAR REPLACE ALL STRIPPED AND RUSTED HARDWARE WITH 316 STAINLESS STEEL HARDWARE.
9. PREPARE, PRIME AND PAINT ENTIRE 15kV SWITCHGEAR.
10. REMOVE EXISTING ABANDONED CONTROL CABINET INCLUDING AMP METERS AND VOLT METERS, AND MAKE ELECTRICALLY SAFE.
11. PROVIDE UNDER-VOLTAGE/LOSS OF PHASE AT 120/240V PANEL.
12. PROVIDE ALARM/ANNUNCIATOR PANEL WITH COMMUNICATIONS AND CONNECT UNDER-VOLTAGE RELAY, TRANSFORMER SUDDEN PRESSURE AND TRANSFORMER OVER TEMPERATURE.
13. PROVIDE ALARM SIGNAL TO PROPERTY MANAGEMENT OFFICE BUILDING 1226.
14. CHIP ALL LOOSE CONCRETE, RESURFACE AND REPAIR CONCRETE BASE AND MAKE STRUCTURALLY SOUND.
15. SPRAY AND REMOVE ALL VEGETATION IN SUBSTATION AND ADD CLEAR STONE TO IMPROVE STEP AND TOUCH POTENTIAL.
16. REPAIR ALL GROUND GRID CONNECTIONS IN THE SUBSTATION INCLUDING THERMITE WELDS, FENCING, GROUND RODS, BOND WIRES, ETC.

LEGEND

SYMBOL	DESCRIPTION
	LOAD-BREAK SWITCH
	DISCONNECT SWITCH
	FUSE
	AMMETER
	VOLTMETER
	CURRENT METER SWITCH
	THREE PHASE CURRENT TRANSFORMER
	POTENTIAL TRANSFORMERS
	STRESS CONE
	LIGHTNING ARRESTER
	PADMOUNT TRANSFORMER
	POLE
	POLE MOUNT TRANSFORMER
	FUSED SWITCH
	TRANSFORMER
	DISTRIBUTION LINE
	EMERGENCY GENERATOR
	BREAKER
	UNDERVOLTAGE RELAY
	N.I.C. = NOT IN CONTRACT



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A	ISSUED FOR 100% REVIEW	2014/03/31
project description		
project		

PHASE 2
ELECTRICAL INFRASTRUCTURE
DESIGN AT GREENBELT
RESEARCH FARM (GRF)

SUBSTATION PLAN AND
SINGLE LINE DIAGRAM
MODIFICATIONS AND REPAIRS

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date / MARCH 2014 / échelle
NCC project no. / no. du projet de la CCN sheet no. / no. de la feuille
AL1493 E-16

