Construction Tender

Project No: 10-3019

Name of Project: Tank Farm-Increase Cap/Code Compliance Tank #3 Repairs

Project Location: Coral Harbour

Tender Issue Date: March 4, 2015

Tender Reference: C1030192

Form No. GN6215-25-MW – Revision 7 – Feb 11th, 2015
This Form replaces Form GN6215-25-MW – Revision 5 – March 6th, 2013

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Tender

Contract

GOVERNMENT TENDER

Fuel Storage Facility Upgrade
Tank #3 Repairs and Associated Works

Work under this contract consists of, but is not necessarily limited to, the repairs of Tank#3 - an existing 1,350,000L Gasoline Vertical storage tank. Repairs include replacement of tank bottom, roof rafters, modifications to existing piping, granular sub-base, compaction, all works as noted in the drawings and specifications.

- Coral Harbour, Nunavut -

For the purposes of this two (2) phase tender call the provisions of the Nunavummi Nangminiqaqtunik Ikajuuti (NNI Policy) apply.

Tender documents are available electronically for download at http://www.nunavuttenders.ca.

The Inuit Labour requirement for this project is 35%. Comments on this percentage level should be submitted to the Contract Coordinator prior to the Phase 1 Tender Close time and date set out below.

Tender forms together with all required appendices (Phase I Tender Close) in a sealed envelope addressed to the Procurement, Logistics & Contracts Support Office, Department of Community & Government Services, Government of Nunavut, P.O. Box 1000 - Station 1600, Iqaluit, NU X0A 0H0 (Hand Delivered to the 3rd Floor, W. G. Brown Building, Astro Hill Terrace) IN CARE OF: Maggie Nowdlak, Contracts Coordinator, must be received on or before:

Phase I Tender Close: 4 P.M. Local Time, Rankin Inlet, NU, March 31, 2015
See Instructions to Tenderers for Phase II Tender Close requirements

To be considered each tender must be submitted on the forms provided and must be accompanied by the security stated in the tender documents.

Tender Enquiries to:

Maggie Nowdlak, Contract Coordinator
Department of Community & Government Services
Procurement, Logistics & Contracts Support
P.O. Box 1000 Station 1600
Iqaluit, NU X0A 0H0
3rd Floor, W.G. Brown Building

Tel: (867) 975-5443
Fax: (867) 975-5450
Email: MNowdlak@gov.nu.ca

A response to any enquiry received later than seven (7) business days prior to the proposal closing deadline cannot be guaranteed. Any amendments made by the GN to the tender documents will be issued in writing by way of addenda made available via automatic e-mail notification for download from the Nunavut Tenders website (http://www.nunavuttenders.ca). Planholders are solely responsible for retrieving addenda when notified. Planholders who have not registered and downloaded the original documents from this website assume the risk of not receiving addenda.

GOVERNMENT OF NUNAVUT
DEPARTMENT OF COMMUNITY AND GOVERNMENT SERVICES
PROCUREMENT, LOGISTICS & CONTRACT SUPPORT
IQALUIT, NUNAVUT X0A 0H0

HAND DELIVERED TO THE 3RD FLOOR W.G. BROWN BUILDING
PURCHASING, LOGISTICS & CONTRACTS SUPPORT
IN CARE OF: MAGGIE NOWDLAK, CONTRACTS COORDINATOR

TENDER DO NOT OPEN

Project Number: _____

Tender For: _____

Closing Date: _____

Submitted by: _____

Firm's Address: _____

TENDER RECEIVED

DATE _____

TIME _____

RECIEVED BY _____

1. RECEIPT OF TENDERS

1. The NNI Policy applies to this Tender and any resulting Contract.

2. Tenders must be submitted on the forms provided.

3. Failure by the Bidder to comply with these Instructions to Bidders may result in the Tender submitted being disqualified. Disqualification shall be at the sole discretion of the Owner.

4. **This Tender will close in two phases as follows:**

Phase I Tender Close:

(i) The Bidder shall complete the Tender Form and all required appendices except Appendix B-2, and shall submit them no later than the time identified for the Phase I Tender Close.

(ii) For the Phase 1 Close, Tenders must be signed and submitted in a sealed envelope clearly marked with the Project Name, Closing Date and Time, Name and Address of the Bidder on the exterior of the envelope. A sample envelope cover is provided herewith and may be affixed to any envelope. Note that this labelling requirement applies to the outside packaging used by First Air First Pacs, Canadian North Air Cargo Express Envelopes, Canada Post, Fedex, or any other postal or courier packaging, envelopes, parcels, etc. Bidders who do not comply with this instruction assume the risk that their bid will not be delivered on time.

(iii) For greater clarity, the Tender Form does not require a Corporate Seal.

(iv) The Bidder shall indicate on the Appendix "B-1" "General Contractors & Subcontractors Dollar Amount" the bid value and names of all major businesses which will be providing goods and services to the Bidder in order to complete the Work.

(v) At the time established for the Phase I Tender Close, the Owner shall receive Tenders and shall record the names of those who have submitted Tenders. Those Tenders shall remain unopened and held in a secure place by the Owner for a period of 24 hours.

Phase II Tender Close:

(i) Within 24 hours following the Phase I Tender Close, excluding holidays and weekends, the Bidder shall supply to the Owner a detailed Appendix "B-2" "Substantiation of Bid Adjustments" showing the actual amounts of Local, Nunavut, Inuit and Other content in respect to Payroll, Material, Equipment, Transportation, Accommodation and Other Costs.

(ii) This detailed Appendix "B-2" "Substantiation of Bid Adjustments" shall be submitted in a sealed envelope or by facsimile. Tender envelopes must show the Project Name, Closing Date and Time, Name and Address of the Bidder on the exterior of the envelope. Phase 2 tenders must be received prior to the Phase II Tender Close which shall be 24 hours, excluding holidays and weekends, after the Phase I Tender Close. Bidders who do not comply with this instruction assume the risk that their Phase II bid will not be delivered on time.

(iii) Bids shall be opened after the Phase II Tender Close.

(iv) The Bidder shall only receive a bid adjustment when completed Appendix "B-1" "General Contractors & Subcontractors Dollar Amount" and Appendix "B-2" "Substantiation of Bid Adjustments" have been submitted in accordance with the above. Tenders submitted without such a submission or upon Appendix B-2 being received late shall receive no bid adjustment at all.

5. Tenders must be received at the Tender Address by the Owner on or before the exact time and date fixed for their receipt.

6. Any Tender received after the closing time shall be rejected and returned unopened to the Bidder. When only one Tender is received and that Tender is received late, that Tender may be accepted at the sole discretion of the Owner.

7. Tenders shall be opened as soon as practicable after the Tender Close for Phase II in accordance with these instructions.

8. Tenders received by facsimile, except as permitted elsewhere in these Tender Documents, will not be accepted and if received shall be disqualified.

2. AMENDMENTS TO TENDERS

1. Amendments to an original Tender duly submitted, are acceptable provided that the amendment:

   (i) Is received in its entirety on or before the exact time and date fixed, for the Phase I Tender Close (except for amendments to Appendix B-2 Substantiation of Bid Adjustment) and;

   (ii) Is in writing and contains the Tender reference, the Phase I Tender Close date and time, name and address and the signature of the Tenderer

2. Amendments to Tenders may be submitted in person or by facsimile provided that the conditions included in Clause 3.1 are met and in addition:

   (i) Amendments to Tenders delivered by facsimile are transmitted via the Owner's facsimile number:

   (867) 975-5450 in Iqaluit, Nunavut

   (ii) The Owner shall not be held liable for any claim, demand or other action should a facsimile transmission be interrupted, not received in its entirety, received after the stated Phase I Tender Close time and date, received by another facsimile unit other than stated herein, or for any other reason over which the Owner does not have control. For greater certainty, 'received in its entirety' means the facsimile transmission is complete and all pages of the transmission are printed by the Owner's facsimile machine.

   (iii) The amendment should indicate only the applicable changes in such a manner that the total bid is not revealed.

3. Verbal or electronic mail instructions will not be considered as a valid instruction or amendment for Tender purposes, nor shall they be considered as having any bearing upon the Tender submission.

3. INUIT, NUNAVUT AND LOCAL INCENTIVES and Appendices "B-1" and "B-2" and "J"

1. The NNI Policy dated April 20, 2006 applies to this tender and any resulting contract. A copy of this policy is available at the following website: http://www.gov.nu.ca/Nunavut/policies/. This policy can be downloaded in English, Inuktitut, Inuinnaqtun and French.

2. Consistent with the NNI Policy, one of the priorities of the Owner is to ensure that materials, equipment, labour and other goods and services of Local, Nunavut and Inuit businesses are used to the fullest extent practical on this Project. Accordingly, Tenderers are required to invite Inuit, Nunavut and Local companies to bid on subcontracts for the purposes of this Work.

3. Appendix "B-1" must be completed and submitted in accordance with the Phase I Tender Close requirements below.

4. Appendix "B-2" must be completed and submitted in accordance with the Phase 2 Tender Close requirements below. For greater clarity, an Appendix "B-2" that is received late or not received at all will result in denial of any NNI Bid Adjustments the Tenderer would otherwise be entitled to had Appendix "B-2" been received on time.

5. The Tenderer shall show intention to not only meet the Minimum Inuit Labor Requirement prescribed in Appendix J of these Tender Documents, but shall also maximize Inuit, Nunavut and Local Content by using as many Inuit, Nunavut and Local subcontractors and suppliers as possible.

6. If the dollar value of Total Inuit Labor identified by the Tenderer on Appendix "B-2" is less than the Minimum Inuit Labor Requirement set out in Clause 7 of Appendix J, the GN **MAY** accept the Tender, so long as the qualification is removed and the Tenderer is found to be the lowest responsive and responsible Tenderer after application of the Bid Adjustments. The Tenderer will be required to increase the Inuit Labor value identified on the General Contractor Appendix "B-2" with a corresponding decrease in the value identified for "Other" Payroll. This commitment shall be made in writing and the amended B-2 shall be incorporated into the Contract.

7. A Tenderer, who on previous Contracts with a similar Minimum Inuit Labor Requirement failed to meet the Minimum Inuit Labor Requirement, MAY be deemed "not responsible" (as defined in the Government Contract Regulations) for purposes of the present Tender.

8. Failure by a Contractor to expend the proposed dollar values identified on Appendix "B-2" as Inuit, Nunavut and Local Content, including estimates for Inuit, Nunavut and Local Labour, for which the Owner applied NNI Policy Bid Adjustments, will result in application of 'incentive recovery' damages in accordance with GC55 of the Contract at the sole discretion of the Owner and as further described in Appendix J of these Tender Documents..

9. For purposes of this Tender, 'Local' shall be considered to be the community in which the Work is undertaken unless noted otherwise in these Tender Documents.

10. **Joint Ventures:** If a Tender is submitted by more than one party identified as a joint venture, (but not a partnership), for the purposes of the application of the NNI adjustments, each party to the joint venture will be treated as a separate contractor, and the value of their respective Nunavut, Inuit, and Local Content will be treated in the same manner as for separate contractors.

4. SCHEDULE OF UNIT PRICES

1. ~~The Tenderer shall submit a schedule of unit prices on Appendix "C" or Appendix "D". Unit prices shall include the cost to supply and install as appropriate, and shall include all statutory charges, overhead, profit and the Tenderer's contingency allowance.~~

5. OPTIONS & SUBSTITUTIONS SPECIFIED BY THE OWNER - Appendix "E"

1. Tenders shall be based on the materials, methods, firms and equipment named in the Specifications and this shall constitute the base bid. Where more than one material or manufacturer is specified, any one of those specified may be selected and included in base bid.

2. The Owner may wish to consider options or substitutions to the base bid. When the Owner lists items in Appendix "E" "Contractors should indicate the effect on the stipulated price that each item makes to the base bid. The lowest acceptable Tender may be determined by adding or deducting any or all of these items to the base bid. Failure to complete this Appendix "E" when requested may result in the Tender being disqualified as non-responsive, at the sole discretion of the Owner.

6. OPTIONS PROPOSED BY THE TENDERER - Appendix "F"

1. Tenderers may propose their own options in Appendix "F". To be considered the following requirements shall be met:

   (i) Total Tender amount quoted must be based on products specified and not on options.

   (ii) Options proposed shall be listed and any difference in price shown in the appropriate place on Appendix "F".

   (iii) Options proposed must allow for all changes and adjustments in other work as may be necessary to form a complete and finished Project. No additional claims will be considered at a later date.

   (iv) Submissions must contain sufficient information to enable the Owner to determine the acceptability of such proposed options. Include such information as reasons for submission, manufacturing details, performance data, dimensions and clearances, effects on other work and other pertinent facts.

   (v) The Owner reserves the right to accept or reject any option proposed by the Tenderer.

   (vi) By submitting an option on Appendix "F" the Tenderer relinquishes any proprietary right to such option. The Owner reserves the right to release the Option to other Tenderers in order to obtain competitive prices.

7. TRANSPORTATION OF MATERIALS – APPENDIX "H"

1. Modes of transportation of materials and carriers may be determined by the Tenderer except for marine transport in which case Clause 2 of Appendix H shall apply.

8. CONTRACTOR'S CERTIFICATE OF INSURANCE – APPENDIX I

1. The successful Tenderer will be required to provide a certificate of Insurance, in accordance with clause 13.2 (b) herein, in a form substantially similar to the one provided in Appendix I.

9. ADDENDA

1. Addenda issued prior to the Phase I Tender Closing shall be incorporated into the Tender and shall become part of this Tender. Receipt of addenda should be acknowledged on the Tender Form by the Tenderer.

10. TENDER DOCUMENTS - Appendix "A"

1. Tenders shall be based on the documents listed in Appendix "A" "List of Tender Documents".

2. Tenderers should confirm with the Owner or its Consultant prior to completing Tender calculations that each and every Addenda issued prior to Phase I Tender Close has been considered to establish the prices to be Tendered.

11. BID SECURITY AND INSURANCE REQUIREMENTS

1. **When Tendering**

(i) **For a Tender Less than $250,000:** No bid security is required.

(ii) **For a Tender $250,000 and Over:** The Tenderer shall enclose bid security in the form of either:

(a) a Bid Bond, in a form approved by the Federal Treasury Board and from a company whose bonds are acceptable to the Owner, payable to the Owner in an amount of at least 10% of the Tender Price; or

(b) a bid security deposit payable to the Owner in an amount of at least 5% of the Tender Price. The deposit must be a certified cheque, Bank Draft, a bank Irrevocable Letter of Guarantee, or such other bid security as the Owner considers acceptable.

(iii) Bid security may be forfeited, at the discretion of the Owner, if the Tenderer refuses to enter into a contract when called upon to do so.

(iv) The Tenderer understands that if the bid security furnished is not in the approved form, as described herein, the Tender is subject to disqualification, at the sole discretion of the Owner.

2. **Upon Award of Contract**

(i) Upon notification of acceptance of a Tender, the successful Tenderer shall furnish within 14 days of the date of the notification of acceptance:

(a) The security specified in GC56 to GC57 of the attached form of contract;

(b) The Insurance specified in GC58 to GC 62 of the attached form of contract.

3. **Upon Receipt of Contract Security and Insurance**

(i) Upon receipt of the security and Insurance furnished in accordance with 11.2 above:

(a) the Owner will prepare the Contract, in duplicate, for due execution by the successful Tenderer;

(b) the Successful Tenderer will receive, sign and return the Contract, in duplicate, for due execution by the Owner; and

(c) the Owner will return one signed Contract to the successful Tenderer, who will be thereafter referred to as the Contractor.

12. SIGNATURES

1. Tenders are to be signed by the person(s) duly authorized in that behalf, and all such signatures shall be sealed by the appropriate corporate or, where there is no such seal affixed, each signature shall be duly witnessed.

2. The Tenderer, or the person or persons duly authorized to sign on their behalf, must initial and date each and every correction, change, erasure or alteration contained in the completed Tender document.

3. At the sole discretion of the Owner, the failure by the Tenderer to properly sign and execute the Tender may result in the disqualification of the Tender.

13. GOODS AND SERVICES TAX

1. The Tenderer shall exclude the Goods and Services Tax from bid price(s) shown on bid forms and appendices.

2. The Government of Nunavut will pay the Goods and Services Tax (GST) over and above the Tender Price accepted.

14. WORKERS COMPENSATION ACT/COMPANIES ACT /LABOUR STANDARDS ACT AND GENERAL COMPLIANCE WITH LAWS

1. Tenderers are hereby notified that the Owner will check with the appropriate agencies prior to award of a Contract to ensure that the successful Tenderer is in compliance with the Workers Compensation Act, the Companies Act and the Labour Standards Act.

2. The successful Tenderer shall be required to comply, and shall require its subcontractors to comply, with all applicable laws, orders, rules and regulations; and, without limiting the generality of the foregoing, shall at its sole expense comply with all unemployment insurance, Worker's Compensation, Labour Standards including requirements of the Labour Standards Board, income tax, payroll tax, Canada Pension Plan, occupational health and safety and environmental protection legislation.

15. REQUIREMENT FOR USING HOTELS OR BED AND BREAKFAST FACILITIES

1. On contracts where a Commercial Room and Board Facility (as defined below) exists within the community, the successful Tenderer will be required to use a Commercial Room and Board Facility to house and feed all it's directly employed workers and workers employed by any subcontractor or agent or any other business working on the Project. The successful Tenderer, its subcontractors and agents shall not be required to use Commercial Room and Board Facilities for any workers who are Local Residents as defined in the NNI Policy, regardless of who they are employed by.

2. The following definitions shall apply to this Work:

   (i) "Commercial Room and Board Facility" means a Hotel or a Bed and Breakfast (Tourist Home) that holds a Tourist Establishment Licence issued by the GN under the Travel and Tourism Act.

   (ii) "Community" means the community in which the Work is located as defined in the Contract and includes the entire area within a 20-kilometre radius of the community.

3. The Commercial Room and Board Facility must:

   (i) meet the applicable requirements under the Public Health Act, and of the Eating or Drinking Place Regulations

   (ii) meet all applicable requirements of the Public Health Act the Fire Prevention Act and applicable regulations thereunder, and any other applicable Government of Nunavut or Federal legislation.

16. STORAGE OF PROPANE CYLINDERS

1. The successful Tenderer will be responsible for the proper care and storage of propane cylinders on the job site in accordance with the Nunavut Fire Prevention Act. The penalty for non-compliance is up to $10,000 fine and/or 1 year jail term.

2. A copy of the Nunavut Fire Prevention Act is available by contacting:

   The Fire Marshall's Office
   Department of Community & Government Services
   Government of Nunavut
   Tel: (867) 975-5310 Fax: (867) 975-5453

17. TRANSPORTATION

1. The successful Tenderer shall comply with requirements of Appendix "H" titled "Transportation of Materials".

18. AVAILABILITY OF OWNER STOCKPILED GRANULAR MATERIAL

1. Granular materials are not available from Owner's stockpiles. Tenderers are advised to make enquiries regarding the availability and cost of granular material in the Project community.

   (i) In many communities, purchase of granular materials including delivery and placement, is available from either the local hamlet office or from a local contractor.

   (ii) If the successful Tenderer obtains granular material directly from the local borrow pit/quarry, it must have all required borrow pit/quarry permit(s) in place, and shall submit a copy to the Engineer prior to obtaining the granular materials, and shall pay applicable fees.

      (a) Contact Community & Government Services Regional Office, Planning and Lands Division, to apply for borrow pit/quarry permits; certain Hamlets may be able to grant these permits.

      (b) Tenderers are advised that:

         - the successful Tenderer will be legally bound by the permit to adhere to conditions and requirements stipulated in the borrow pit/quarry permit, and
         - the granting of a borrow pit/quarry permit is subject to a Nunavut Impact Review Board (NIRB) screening process, which can take a number of months for approval."

19. ACCEPTANCE

1. Tenders containing qualifications other than in the manner prescribed may be disqualified at the sole discretion of the Owner.

2. The submission of the lowest or any tender will not necessarily result in the award of a contract. The Owner reserves the right to cancel this Tender, in whole or in part at any time and to re-tender the same for any reason whatsoever without incurring any liability, and no bidder will have any claim against the Owner as a consequence.

3. The Owner reserves the right to negotiate the tendered price solely with the low bidder (after adjustments in accordance with the Nunavummi Nangminiqaqtunik Ikajuuti (NNI Policy), in order to achieve a reduced scope of work and price saving of up to 15%. The Owner further reserves the right to re-invite tenders from the low bidders without going to public tender in order to achieve a reduced scope of work greater than 15%, so long as the fundamental nature of the Project has not changed.

1. PROJECT INFORMATION

Project Title: Tank Farm- Increase Cap/Code Compliance-Tank#3 Repairs

Project Location: Coral Harbour Project Number: 10-3019

Project Owner: The Government of Nunavut, herein the "Owner", represented by the Minister of the

Department of Community and Government Services.

2. OFFER
(Information to be completed by Tenderer)

_____
Company Name(s)

_____
Identify Nature of Multi-party Tenderer (ie: Partnership, Joint Venture, etc)

(herein the "Tenderer") offers to the Owner to furnish all necessary tools, plant, services, materials and labor to execute and complete in a careful and workmanlike manner the Work described in the Plans and Specifications for the prices as set out in Clause 4 or 5 of this Tender Form.

The Tenderer hereby acknowledges receipt of Addenda No. _____ to No. _____ inclusive and hereby agrees they form part of this Tender.

3. GENERAL AGREEMENT (Information to be completed by Tenderer)

The Tenderer agrees:

.1 To substantially perform the Work in compliance with the required completion schedule stated in the Tender Documents, **or if no schedule is stated, to substantially perform the Work within_____ weeks** from the date of notification of acceptance of the Tender, or within a reasonable period of time after award;

.2 That the Project site has been carefully examined, the Work described herein is understood, and the Tenderer has become familiar with local conditions and the character and extent of the Work; has carefully examined every part of the proposed Contract and thoroughly understands its terms and conditions; has determined the sources of supply for the materials required; has investigated labor conditions and has arranged for the continuous performance of the Work described in the Tender Documents;

.3 That the list of Tender Documents included in Appendix "A" shall be and is the complete Tender and the Tenderer's offer is made subject to all provisions contained therein;

.4 That the Tender submitted supersedes and cancels all communications, negotiations, and agreements relating to the Work other than contained in the completed Tender.

4. FOR A CONTRACT BASED ON A LUMP SUM (Information to be completed by Tenderer)

The Tenderer agrees that the following is the lump sum referred to in Clause 2 of this Tender Form and that this is the Tenderer's total Tender Price:

_____DOLLARS ($_____)

An illegible submission may be disqualified at the sole discretion of the Owner. When there is a discrepancy between the written and numerical amount, the lowest version will govern.

5. FOR A CONTRACT PRICE BASED ON UNIT PRICES (Information on Appendix "D" to be completed by Tenderer)

(a) **For a Unit Price Contract, the Tenderer shall complete Appendix "D".**

(b) For a Unit Price Contract, the Contract Value shall be the Total Estimated Contract Price shown on Appendix "D".

(c) When an arithmetic error is identified on Appendix "D", the tendered Unit Price shall take precedence over the Total Estimated Contract Price and the Owner shall correct the arithmetic error as explained below.

(d) The Total Estimated Contract Price shall equal the sum of all Extensions (Column 6) for all items listed on Appendix "D". In the event that an arithmetic error is made in adding the individual Extensions listed in Column 6, the Owner shall correct the arithmetic error.

(e) Each Extension shall be equal to the Estimated Quantity (Column 3) multiplied by the tendered Unit Price (Column 5). In the event that an arithmetic error is made in multiplying the Estimated Quantity (Column 3) by the tendered Unit Price (Column 5) the Owner shall correct the arithmetic error including the Extension and the Total Estimated Contract Price.

(f) The Total Estimated Contract Price is based on estimated quantities; the final Contract amount owing to the Contractor shall be determined by taking the actual quantities that are incorporated in, or made necessary by the Work, as confirmed by count and measurement, and multiplying by the appropriate tendered Unit Price adjusted by any changes that are made in accordance with the provisions of the Contract Documents.

6. DECLARATIONS (Information to be completed by Tenderer)

The Tenderer hereby declares that:

.1 No person, firm or corporation other than the undersigned has any interest in this Tender or in the proposed Contract for which the Tender is made, except as revealed by the Tender or as may be required by the terms of this Contract for which the Tender is made;

.2 This Tender is irrevocable for a period of thirty (30) calendar days from the date of Phase I Tender Close, as described in Instructions to Tenderers 4.6;

.3 The Tenderer acknowledges that the Owner may extend the above thirty (30) day period to sixty (60) days provided that notification of extension is made within fifteen (15) calendar days of the date of Phase I Tender Close and that this extension shall result in an increase or decrease to the Stipulated Price of:

$_____ addition to Stipulated Price

or

$_____ reduction to Stipulated Price

(Any increase and decrease to the Stipulated Price, shall not be subject to an adjustment under the Nunavummi Nangminiqaqtunik Ikajuuti Policy.)

7. SIGNATURES (Information to be completed by Tenderer)

Signed, sealed and submitted for and on behalf of:

Company_____
(Full Legal Business Name)

_____
(Street Address)

_____
(Mailing Address)

_____
(Community, Territory/Province and Postal Code)

Signature _____
(Affix Seal or Witness(es) Needed)

Name & Title _____

Dated at _____ this_____ day of _____, 20___

Witness _____

Name & Title _____

Witness _____

Name & Title _____

Dated at _____ this_____ day of _____, 20____

LIST OF TENDER DOCUMENTS - APPENDIX A

(*Information to be completed by OWNER*)

Project Number: 10-3019

The following is the list or description of the tender documents referred to in the Tender for this Project.

Tender

1. Tender Advertisement
2. Instructions to Tenderers
3. Tender Form
4. Appendices to Tender: A, B, B-1, B-2, C, D, E, F, H, I, and J
5. Addenda (issued during Tender period): Addendum# ____ to ____

Contract

1. Articles of Agreement
2. Terms of Payment **(includes Statutory Declaration and Schedule of Values)**
3. General Conditions
4. Special Provisions: _____
5. Technical or General Specifications

01001	Community and the Environment
01010	Summary of the Work
01014	Work Sequence
01015	Contractor's Use of the Premises
01030	Special Project Procedures
01040	Coordination
01050	Field Engineering
01060	Regulatory Requirements
01070	Abbreviations
01080	Identification Systems
01100	Alternatives
01150	Measurement and Payment
01200	Project Meetings
01300	Submissions
01310	Construction Schedules
01322	Critical Path Method
01340	Shop Drawings and Product Data
01351	Health and Safety for Contaminated Sites
01390	Drawings of Record

01400	Quality Control
01500	Construction Facilities
01600	Materials and Installation\
01650	Substantial Completion Inspection Requirements
01700	Contract Closeout
02223	Excavating, Trenching and Backfilling
02224	Site Work
02831	Fencing, Signs and Markers
03100	Concrete Formwork
03200	Concrete Reinforcement
03300	Cast-In-Place Concrete
05120	Structural Steel
05500	Miscellaneous Metal
09900	Painting
15010	General Mechanical Provisions
15051	Pipe Welding
15060	Tankage
16010	General Electrical Provisions

6. Drawings:

Main Site Storage Facility

M100	Location and Demolition Plans
M101	Floor Layout and Plate Details
M102	Rafter Layout and Piping Details
M501	Nozzle Details
M502	Tank Details

NUNAVUMMI NANGMINIQAQTUNIK IKAJUUTI (NNI POLICY) FORMS - APPENDIX B

LOCAL/NUNAVUT/INUIT EMPLOYMENT AND TRAINING

Local/Nunavut/Inuit employment and training are high priorities with the Government of Nunavut (GN). General Contractors and Sub-contractors contracted for work on Government of Nunavut projects are required to hire Local and Nunavut and Inuit residents to the maximum extent possible. Information regarding available Local and Nunavut and Inuit workers can be obtained from a Federal Government Employment Centre, a Federal Government Outreach Centre, or Hamlet Office, and Education Department Career Centres of the Government of Nunavut.

Federal Government Employment Centres:

Location	Phone Number	Facsimile Number
Rankin Inlet	(867) 645-2853	(867) 645-2148
Iqaluit	(867) 979-6271	(867) 979-6070

Federal Government Outreach Centres or Hamlet Offices:

Location	Phone Number	Facsimile Number
Arviat	(867) 857-2678	(867) 857-2502
Qikiqtarjuaq (Broughton Island)	(867) 927-8832	(867) 927-8120
Cape Dorset	(867) 897-8943	(867) 897-8030
Clyde River	(867) 924-6220	(867) 924-6293
Pond Inlet	(867) 899-8935	(867) 899-8940
Cambridge Bay	(867) 983-2120	(867) 983-2570
Baker Lake	(867) 793-2517	(867) 793-2509
Taloyoak	(867) 561-6341	(867) 561-5057
Kuugaruk (Pelly Bay)	(867) 769-6281	(867) 769-6069
Kugluktuk (Coppermine)	(867) 982-4471	(867) 982-3060
Gjoa Haven	(867) 360-7141	(867) 360-6049
Igloolik	(867) 934-8830	(867) 934-8757
Pangnirtung	(867) 473-8953	(867) 473-8832

Training is encouraged on all construction projects and, in some tenders, will be made a contract requirement. Funding to offset training costs is provided through the Building and Learning strategy, the Apprenticeship Program, the Training On The Job Program and Women in Trades and Technology, and as a contract bonus pursuant to the Nunavummi Nangminiqaqtunik Ikajuuti Policy, Government of Nunavut. Contractors can obtain further information from the Education Department Career Centres, Government of Nunavut.

Education Department Career Centres, Government of Nunavut:

Location	Phone Number	Facsimile Number
Cambridge Bay	(867) 983-7214	(867) 983-2004
Iqaluit	(867) 975-5653	(867) 975-5670
Rankin Inlet	(867) 645-5039	(867) 645-2148
Igloolik	(867) 934-8192	(867) 934-8808

NUNAVUMMI NANGMINIQAQTUNIK IKAJUUTI (NNI POLICY) FORMS - APPENDIX B

EMPLOYMENT REPORT

The successful General Contractor will be required to complete an Employment Report for ALL site employees that have worked on this project. The Contractor is required to complete a standard GN employment report.

A SAMPLE of the required Employment Report is attached on the following page. This form is available from the Owner.

This information **must** be submitted with each Progress Claim on contracts over $100,000.00 as well as with the Substantial Certificate of Completion, updated with the Final Certificate of Completion.

For projects under or equal to $100,000.00 the Employment Report must be submitted with the substantial Certificate of Completion, updated with the Final certificate of Completion. At the sole discretion of the owner, the information may be required with each Progress Claim.

It is the General Contractor's responsibility to obtain the required information from the sub-trades and sub-sub-trades.

The successful General Contractor shall comply with the requirements of Clauses GC52, GC53, GC54 and GC55. Specifically in respect to Clause GC54, if requested to do so by the Owner, the successful General Contractor shall be responsible to obtain an "Employee Verification and Consent Form" included as Appendix "B", page 4.

NUNAVUMMI NANGMINIQAQTUNIK IKAJUUTI (NNI POLICY) FORMS - APPENDIX B

EMPLOYMENT REPORT

Project Name:	Project Location:
General Contractor:	Project No: Contract No:
Report Submitted by (General/Subcontractor):	Reporting Period From: To:

This Employment Report is Submitted With: ***(CHECK ONE)***

☐ Progress Claim No. _____ Date:_____	☐ Substantial Certificate of Completion Date: _____	☐ Final Certificate of Completion Date: _____

Status*	Employee's Name	Job Class**	Date Hired	Date Terminated	Regular Hours	OT Hours	Hours this Claim	Hours to Date	Rate of Pay	Direct Payroll Costs	Other Payroll Costs	Dollars spent this period	Total Dollars spent to date

**** Job Classification Categories to be utilized with this form:**		*** Employee Status and Summary of Employment**	**Total this Period**	**Total to Date**
1. Superintendent	2. Carpenter	(1) Local Nunavut Residents		
3.Electrician	4.Mechanical	(2) Non-Local Nunavut Residents		
5. Drywaller/Painter	6. Carpenter Apprentice	(3) Local Inuit Beneficiaries		
7. Electrical Apprentice	8. Mechanical Apprentice	(4) Non-Local Inuit Beneficiaries		
9. Drywaller/Painter Apprentice	10. Labourer	(5) Other (Non-Nunavut, Non-Inuit) Non-Residents		
	11. Other (specify)	Total Payroll		
		Total Inuit Payroll		
		% Inuit Payroll		

Contractors / Subcontractors Name & Title (Print)	**Contractors / Subcontractors Signature:**	**Date:**
_____	_____	_____

NUNAVUMMI NANGMINIQAQTUNIK IKAJUUTI (NNI POLICY) FORMS - APPENDIX B
EMPLOYEE VERIFICATION AND CONSENT FORM

TO: GOVERNMENT OF NUNAVUT (GN)

My full name is _____
(Print or Type)

My permanent home address is _____
(mailing and physical address)
_____

I am employed by _____
(name of Company you are working for)

working on _____
(Name or Description of Project)

in _____, Nunavut Territory
(Name of Community)

I have lived in Nunavut in _____ for _____ Months
(Name of Community) (Number)

Please provide a minimum of two of the following applicable numbers:

My Nunavut Health Care Card # is _____

My Nunavut Drivers License # is _____

My Nunavut Hunting License # is _____

My NTI Beneficiary # is _____

AND TO WHOM IT MAY CONCERN

I hereby authorize my current employer or any Federal, Provincial or Territorial government department or agency to release particulars of my employment terms or compensation and/or a copy of my Nunavut Health Care Card, Nunavut Driver's License, Nunavut Motor Vehicle Registration, Nunavut General Hunting License, and Nunavut Tunngavik Inc. (NTI) to release my Beneficiary number or card, or any other documentation which the GN may deem helpful or necessary in verifying my place of residence, employment term and compensation or Beneficiary status.

Signed _____ _____
Employee Name Employee Signature

_____ _____
Witness Name Witness Signature

_____
Date (Day, Month, Year)

NUNAVUMMI NANGMINIQAQTUNIK IKAJUUTI (NNI POLICY) FORMS - APPENDIX B
BID ADJUSTMENT INFORMATION

1. This contract shall be awarded to the Tenderer who is responsive and responsible (as defined in the Government Contract Regulations) and who has submitted a tender that, after the application of any tender adjustment permitted under the Nunavummi Nangminiqaqtunik Ikajuuti (NNI Policy), is lower than that submitted by any other responsive and responsible Tenderer. Bid and contract requirements have been developed to comply with the letter and the spirit and intent of the NNI Policy.
2. Tenderers are required to identify the dollar value of Own Forces as well as to name ALL subcontractors/suppliers and to identify their dollar value.
3. Dollar value of Own Forces/Subcontractors noted in Appendix "B-1" shall include all amounts listed in Appendix "B-2" (i.e. payroll, transportation, equipment, etc.) for the Tenderer and all subcontractors. B-2 amounts that exceed the B-1 amounts will not be considered for bid adjustment.
4. Dollar value(s) for payroll on Appendix "B-2" shall include all payroll costs for all divisions of work identified as Own Forces.
5. Amendments affecting the tendered price shall require the Tenderer to also amend Appendix "B-1" to reflect the change, prior to the Phase I tender closing.
6. An approved Nunavut Business or Inuit Firm will only receive bid adjustments for subcontractors, suppliers, payroll, and other bid components for those parts of bid that are Own Forces, or that are subcontracted to approved Nunavut businesses and/or Inuit firms, or for payroll to Inuit or Nunavut Residents. Bid adjustments will not be given for those portions of the bid that are not Nunavut or Inuit Content. The definition of "Nunavut Business", "Inuit Firm", "Inuit" and "Nunavut Resident" are to be those definitions in the NNI Policy Definitions Appendix.
7. Any business that is not an approved Nunavut Business, two weeks prior to tender closing, or is not an approved Inuit Firm prior to tender close, will not receive a bid adjustment for their portion of the bid, with the exception of the Inuit and/or Nunavut Payroll components, and amounts listed on Appendix B-1 as subcontracted to Nunavut and/or Inuit firms approved by the foregoing deadlines. Payroll to Inuit and Payroll to Nunavut Residents, need not be supplied by an Inuit Firm or a Nunavut Business to receive a bid adjustment.
8. A Tenderer (General Contractor) that is not a Nunavut Business or an Inuit Firm will only receive bid adjustments for Inuit and/or Nunavut Payroll amounts, and for Inuit and Nunavut amounts identified on Appendix B-1 as going to approved Nunavut Businesses and/or Inuit Firms. A completed Appendix B-2 for each named Nunavut Business and/or Inuit firm listed on Appendix B-1 must be submitted by the General Contractor in order for the Nunavut and/or Inuit subcontractor or supplier amounts to be eligible for bid adjustment.
9. It is important that you include the name of your sub-contractors and suppliers on the B2 forms. The NNI information that is submitted with the Tender (on the B2 forms) is used to determine the lowest NNI Adjusted price. The person doing the NNI review looks for the name of the sub/supplier you have listed in your bid on the NNI and NTI lists of approved businesses (NNI and NTI Registries). If there are no names provided in the B2 forms, there are no adjustments given. If there is not enough room on to list all suppliers, photocopy the B2 form and list the additional suppliers on the copy.
10. To be eligible for an extra adjustment for "Local", the bid amount must first be eligible for an adjustment as a Nunavut business, or an Inuit firm.
11. If there are 2 suppliers with different NNI/NTI status, you put the amount applicable to each supplier in the appropriate column. For example, search the NTI and NNI websites for suppliers of accommodations. If a hotel is not listed in either registry, then put their amount in "Other". If you are using two hotels and only one is on a registry, then put that amount in the appropriate status column, and put the other hotel's amount in the "Other" column. However, include both hotel supplier's names on the 'Accommodation' line item.
12. For "Own Forces" you include only your own expenses. You need to put the amounts for costs to you. Any of your costs to another supplier or sub-contractor must be identified on a separate line item with the company receiving the money identified. The service and company name must be provided. Do not include

any materials you are supplying in your General Expenses line item. Put them in the materials section of the B2 form.

13. For materials, you must identify the materials and the supplier in the materials portion of the B2 in order to receive the Nunavut Business adjustment, even for "Own Forces". Go to the NNI website and search the list approved goods (www.nni.gov.nu.ca/search/suppliers) to find what materials to list in your bid and who can supply them. Be sure to write the commodity name on the B2 beside the supplier's name; for example "Building Construction Materials", "Electrical Equipment", "Floor Covering", "Heating Equipment", etc. If this is not done, the Nunavut Business adjustment will not be given.
14. For companies listed as suppliers of materials, to receive the Nunavut bid adjustment, the company listed must be specifically approved by the GN for Supply of the applicable type of materials 2 weeks prior to the closing.
15. If and when requested by the GN, the Tenderer shall, prior to award, provide the GN with any and all clarifications, substantiations or further explanation about the proposals made by the Tenderer in respect to Local, Nunavut, Inuit and other content contained in their bid and reflected on Appendices "B-1" and "B-2".

GENERAL CONTRACTOR'S & SUB-CONTRACTORS' DOLLAR AMOUNTS
APPENDIX B-1

Project Title: Tank Farm- Increase Cap/Code Compliance-Tank#3 Repairs

Project Location: Coral Harbour Project Number: 10-3019.

Tenderers are required to identify the dollar value of their Own Forces (the work the Bidder will do by itself) as well as ALL of their Sub-Contractors that will be involved in the completion of this Work. This Appendix MUST be submitted no later than the time and date set for the Phase I Tender Close. If this Appendix is not submitted or is incomplete the Tenderer may be disqualified. By signing this Tender, the Tenderer is certifying that the information on this Appendix is correct. Changes to this information will not be accepted after the time and date set for the Phase I Tender Close. The Owner reserves the right to ask the Tenderer for substantiation of information provided.

General Contractor: (Full Business Name)	**Own Forces Amount: ($)** **$**
Sub-Contractors: (Full Business Name)	**Sub-Contract Amount: ($)**
1.	$
2.	$
3.	$
4.	$
5.	$
6.	$
7.	$
8.	$
9.	$
10.	$
Other(s)	**Amount: ($)**
1.	$
2.	$
3.	$
4.	$
5.	$
TOTAL	$

SUBSTANTIATION OF BID ADJUSTMENT - APPENDIX B-2

Project Name:

Project Location:

Project Number:

General Contractor:

TO RECEIVE BID ADJUSTMENTS UNDER THE NNI POLICY, the Tenderer MUST complete and submit this form. This Appendix may be submitted at the Phase I or Phase II Tender Close in accordance with the Instructions to Tenderers. **Indicate the company name as it appears on the GN or NTI list of approved companies, and list materials**. The Nunavut, Local and Inuit status, as defined by the NNI Policy, of named companies will be verified by the Owner. The Owner reserves the right to request substantiation of information provided and make any corrections necessary in accordance with the GN and NTI lists. The dollar value for payroll shall include all divisions of work identified as Own Forces.

General Contractor:

Labour/Payroll (Nunavut, Inuit & Other Labour)	**Nunavut Residents**		**Inuit Residents**		**$ Inuit Labour Bid**	**% Inuit Labour Bid**	**Other Non-Residents**	**Total Payroll**
	Local	**Non-Local**	**Local**	**Non-Local**				
	$	$	$	$	$	%	$	$

Cost Components (Excluding Payroll) (Identify Source of Good/Service)	**Nunavut Content (GN Approved)**		**Nunavut & Inuit Content (GN & NTI Approved)**		**Inuit Content (NTI Approved)**		**Other (Not Approved)**	**Total Cost Components** (Excluding Payroll)
	Local	**Non-Local**	**Local**	**Non-Local**	**Local**	**Non-Local**		
General Expenses:	$	$	$	$	$	$	$	$
Accommodation:	$	$	$	$	$	$	$	$
Sealift:	$	$	$	$	$	$	$	$
Other Transportation:	$	$	$	$	$	$	$	$
Sitework:	$	$	$	$	$	$	$	$
Framing/Structural:	$	$	$	$	$	$	$	$
List Materials & Supplier	**Note: Supplier must be specifically approved by the GN for supply of listed material to receive the Nunavut bid adjustment.**							
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
List Miscellaneous Expenses & Supplier	**Note: The name of the applicable company, or an indication of "Own Forces" must be given, to be considered for bid adjustment.**							
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	
	$	$	$	$	$	$	$	$
TOTAL Payroll & Cost Components	$	$	$	$	$	$	$	$
GC55 Nunavut, Inuit & Local Content	$	$	$	$	$	$	$	

NNI Bid Adjustments	**For GN Projects Division Use Only**							**Totals**
Qualifying Value	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**
Applicable Adjustment	**14%**	**7%**	**21%**	**14%**	**14%**	**7%**	**0%**	**$**
NNI Adjusted Value	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**

SUBSTANTIATION OF BID ADJUSTMENT - APPENDIX B-2

Project Name:

Project Location:

Project Number:

General Contractor:

TO RECEIVE BID ADJUSTMENTS UNDER THE NNI POLICY, the Tenderer MUST complete and submit this form. This Appendix may be submitted at the Phase I or Phase II Tender Close in accordance with the Instructions to Tenderers. **Indicate the company name as it appears on the GN or NTI list of approved companies, and list materials**. The Nunavut, Local and Inuit status, as defined by the NNI Policy, of named companies will be verified by the Owner. The Owner reserves the right to request substantiation of information provided and make any corrections necessary in accordance with the GN and NTI lists. The dollar value for payroll shall include all divisions of work identified as Own Forces.

Mechanical Sub-Contractor:

Labour/Payroll (Nunavut, Inuit & Other Labour)	**Nunavut Residents**		**Inuit Residents**		**$ Inuit Labour Bid**	**% Inuit Labour Bid**	**Other Non-Residents**	**Total Payroll**
	Local	**Non-Local**	**Local**	**Non-Local**				
	$	$	$	$	$	%	$	$

Cost Components (Excluding Payroll) (Identify Source of Good/Service)	**Nunavut Content (GN Approved)**		**Nunavut & Inuit Content (GN & NTI Approved)**		**Inuit Content (NTI Approved)**		**Other (Not Approved)**	**Total Cost Components** (Excluding Payroll)
	Local	**Non-Local**	**Local**	**Non-Local**	**Local**	**Non-Local**		
General Expenses:	$	$	$	$	$	$	$	$
Accommodation:	$	$	$	$	$	$	$	$
Sealift:	$	$	$	$	$	$	$	$
Other Transportation:	$	$	$	$	$	$	$	$
General Plumbing:	$	$	$	$	$	$	$	$
Sprinklers:	$	$	$	$	$	$	$	$
Insulation:	$	$	$	$	$	$	$	$
Sheet Metal:	$	$	$	$	$	$	$	$
Controls:	$	$	$	$	$	$	$	$
List Materials & Supplier	**Note: Supplier must be specifically approved by the GN for supply of listed material to receive the Nunavut bid adjustment.**							
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
List Miscellaneous Expenses & Supplier	**Note: The name of the applicable company, or an indication of "Own Forces" must be given, to be considered for bid adjustment.**							
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
TOTAL Payroll & Cost Components	$	$	$	$	$	$	$	$

GC55 Nunavut, Inuit & Local Content	$	$	$	$	$	$	$	

NNI Bid Adjustments	**For GN Projects Division Use Only**							**Totals**
Qualifying Value	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**
Applicable Adjustment	**14%**	**7%**	**21%**	**14%**	**14%**	**7%**	**0%**	**$**
NNI Adjusted Value	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**

SUBSTANTIATION OF BID ADJUSTMENT - APPENDIX B-2

Project Name:

Project Location:

Project Number:

General Contractor:

TO RECEIVE BID ADJUSTMENTS UNDER THE NNI POLICY, the Tenderer MUST complete and submit this form. This Appendix may be submitted at the Phase I or Phase II Tender Close in accordance with the Instructions to Tenderers. **Indicate the company name as it appears on the GN or NTI list of approved companies, and list materials**. The Nunavut, Local and Inuit status, as defined by the NNI Policy, of named companies will be verified by the Owner. The Owner reserves the right to request substantiation of information provided and make any corrections necessary in accordance with the GN and NTI lists. The dollar value for payroll shall include all divisions of work identified as Own Forces.

Electrical Sub-Contractor:

Labour/Payroll (Nunavut, Inuit & Other Labour)	**Nunavut Residents**		**Inuit Residents**		**$ Inuit Labour Bid**	**% Inuit Labour Bid**	**Other Non-Residents**	**Total Payroll**
	Local	**Non-Local**	**Local**	**Non-Local**				
	$	$	$	$	$	%	$	$

Cost Components (Excluding Payroll) (Identify Source of Good/Service)	**Nunavut Content (GN Approved)**		**Nunavut & Inuit Content (GN & NTI Approved)**		**Inuit Content (NTI Approved)**		**Other (Not Approved)**	**Total Cost Components** (Excluding Payroll)
	Local	**Non-Local**	**Local**	**Non-Local**	**Local**	**Non-Local**		
General Expenses:	$	$	$	$	$	$	$	$
Accommodation:	$	$	$	$	$	$	$	$
Sealift:	$	$	$	$	$	$	$	$
Other Transportation:	$	$	$	$	$	$	$	$
General Electrical:	$	$	$	$	$	$	$	$
Fire Alarm Systems:	$	$	$	$	$	$	$	$
Lighting Control Equip:	$	$	$	$	$	$	$	$
Security System:	$	$	$	$	$	$	$	$
Controls:	$	$	$	$	$	$	$	$
List Materials & Supplier	**Note: Supplier must be specifically approved by the GN for supply of listed material to receive the Nunavut bid adjustment.**							
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
List Miscellaneous Expenses & Supplier	**Note: The name of the applicable company, or an indication of "Own Forces" must be given, to be considered for bid adjustment.**							
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
TOTAL Payroll & Cost Components	$	$	$	$	$	$	$	$

GC55 Nunavut, Inuit & Local Content	$	$	$	$	$	$	$	

NNI Bid Adjustments	**For GN Projects Division Use Only**							**Totals**
Qualifying Value	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**
Applicable Adjustment	**14%**	**7%**	**21%**	**14%**	**14%**	**7%**	**0%**	**$**
NNI Adjusted Value	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**

SUBSTANTIATION OF BID ADJUSTMENT - APPENDIX B-2

Project Name:

Project Location:

Project Number:

General Contractor:

TO RECEIVE BID ADJUSTMENTS UNDER THE NNI POLICY, the Tenderer MUST complete and submit this form. This Appendix may be submitted at the Phase I or Phase II Tender Close in accordance with the Instructions to Tenderers. **Indicate the company name as it appears on the GN or NTI list of approved companies, and list materials**. The Nunavut, Local and Inuit status, as defined by the NNI Policy, of named companies will be verified by the Owner. The Owner reserves the right to request substantiation of information provided and make any corrections necessary in accordance with the GN and NTI lists. The dollar value for payroll shall include all divisions of work identified as Own Forces.

Other Sub-Contractor:

Labour/Payroll (Nunavut, Inuit & Other Labour)	**Nunavut Residents**		**Inuit Residents**		**$ Inuit Labour Bid**	**% Inuit Labour Bid**	**Other Non-Residents**	**Total Payroll**
	Local	**Non-Local**	**Local**	**Non-Local**				
	$	$	$	$	$	%	$	$

Cost Components (Excluding Payroll) (Identify Source of Good/Service)	**Nunavut Content (GN Approved)**		**Nunavut & Inuit Content (GN & NTI Approved)**		**Inuit Content (NTI Approved)**		**Other (Not Approved)**	**Total Cost Components** (Excluding Payroll)
	Local	**Non-Local**	**Local**	**Non-Local**	**Local**	**Non-Local**		
General Expenses:	$	$	$	$	$	$	$	$
Accommodation:	$	$	$	$	$	$	$	$
Sealift:	$	$	$	$	$	$	$	$
Other Transportation:	$	$	$	$	$	$	$	$
Sitework:	$	$	$	$	$	$	$	$
Framing/Structural:	$	$	$	$	$	$	$	$
List Materials & Supplier	**Note: Supplier must be specifically approved by the GN for supply of listed material to receive the Nunavut bid adjustment.**							
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
List Miscellaneous Expenses & Supplier	**Note: The name of the applicable company, or an indication of "Own Forces" must be given, to be considered for bid adjustment.**							
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
	$	$	$	$	$	$	$	$
TOTAL Payroll & Cost Components	$	$	$	$	$	$	$	$

GC55 Nunavut, Inuit & Local Content	$	$	$	$	$	$	$	

NNI Bid Adjustments	**For GN Projects Division Use Only**							**Totals**
Qualifying Value	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**
Applicable Adjustment	**14%**	**7%**	**21%**	**14%**	**14%**	**7%**	**0%**	**$**
NNI Adjusted Value	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**

LIST OF UNIT PRICES FOR
STIPULATED PRICE CONTRACT ADJUSTMENTS ONLY - APPENDIX C

(Information to be Completed by Tenderer and Submitted with Tender)

The following are our unit prices for the units of work listed hereunder. The base price for the work is included in our tender; these unit prices apply only for credits or extras to the Stipulated Price agreed.

TO BE COMPLETED BY THE GN			TO BE COMPLETED BY THE TENDERER	
Unit of Work			Unit Price ($)	
Item	Description	Unit	Addition	Deletion
			$	$

LIST OF UNIT PRICES FOR UNIT PRICE CONTRACTS ONLY - APPENDIX D

(Information to be Completed by Tenderer and Submitted with Tender)

(a) The conditions in Tender Form apply to the completion of this Appendix.

(b) Type or print tendered values clearly. An illegible submission may be disqualified at the sole discretion of the Owner.

TO BE COMPLETED BY THE GN				**TO BE COMPLETED BY THE TENDERER**	
Item	Description	Estimated Quantity	Unit	Unit Price	Estimated Total Price
				Total Estimated Contract Price	

LIST OF OPTIONS & SUBSTITUTIONS SPECIFIED BY THE OWNER - APPENDIX E

(To be Completed by Tenderer and Submitted with Tender)

In accordance with Clause 6 of the Instructions to Tenderers, indicate the effect on the stipulated price for the following options and substitutions listed by the Owner. The Tenderer further agrees that the following prices may be used in the evaluation of the submitted Tender.

All Options, Substitutions and Separate Prices shall include all work necessary for and incidental to the work described.

	Effect on Stipulated Price ($) (To be Completed by Tenderer and Submitted with Tender)	
Description of Options & Substitutions (To be Completed by the GN)	$ Addition to Stipulated Sum Price	$ Reduction to Stipulated Sum Price

LIST OF OPTIONS PROPOSED BY THE TENDERER - APPENDIX F

(Information to be Completed by Tenderer and Submitted with Tender)

In accordance with the Instructions to Tenderers, the Tenderer may propose options or substitutions below. The cost of such options and substitutions are NOT included in the Stipulated Price.

If this form is not used, the Tenderer should draw a line through the form and initial.

	Effect on Stipulated Price ($)	
Description of Options & Substitutions proposed by Tenderer	$ Addition to Stipulated Price	$ Reduction to Stipulated Price

TRANSPORTATION OF MATERIALS - APPENDIX H

1. Transportation/shipping and handling of materials and all associated costs thereof are the responsibility of the Contractor unless otherwise noted. **Modes of transporting materials shall be decided by the Contractor unless by marine transport in which case Clause 2 of this Appendix shall apply.**

2. Whenever marine (water) transport is to be utilized, the Contractor shall use the Government of Nunavut specified carriers, and space shall be booked directly with the carriers, as follows:

2.1 For the following communities in the following regions:

(Area A) High Arctic including North Baffin: Arctic Bay, Clyde River, Grise Fiord, Nanisivik, Pond Inlet, Qikiqtarjuaq, Resolute Bay, and Kugaaruk as far as Nanisivik

and

(Area B) Foxe Basin: Hall Beach, Igloolik, and Repulse Bay

and

(Area D) South Baffin: Cape Dorset, Kimmirut, and Pangnirtung

THE CARRIER IS:

Nunavut Sealink and Supply Inc. (NSSI)
By ships loading at the Port of Ste-Catherine, Quebec
Contact: Daniel Desgagnés
Phone: (450) 635-0833 or Toll Free (866) 732-5438
Fax: (450) 635-5126

and

(Area F) Kugaaruk from Nanisivik:

THE CARRIER IS:

Canadian Coast Guard
Contact: John – Perry – Perrozzino
Phone: (613) 998-1585
Fax: (613) 991-9261

2.2 For (Area C) Iqaluit:

THE CARRIER IS:

Nunavut Eastern Arctic Shipping (NEAS)
by ships loading at the Port of Valleyfield, Quebec
Contact: Paul Ghaleb
Phone: (877) 225-6327 (Toll Free)
Fax: (514) 523-7875

2.3 **For (Area E) the Kivalliq Region**: Arviat, Baker Lake, Chesterfield Inlet, Coral Harbour, Rankin Inlet, Sanikiluaq, and Whale Cove

THE CARRIER IS:

Nunavut Sealink and Supply Inc. (NSSI) by ships loading at the Port of

Ste-Catherine, Quebec
Contact: Daniel Desgagnés
Phone: (450) 635-0833 or Toll free (866) 732-5438
Fax: (450) 635-5126

OR

Nunavut Sealink and Supply Inc. (NSSI)
by ships loading at the Port of Churchill, Manitoba
Contact: Francois Gaudreua
Phone: (450) 635-0833 or Toll free (866) 732-5438
Fax: (204) 943-5458

NOTE: **For transport to Sanikiluaq, services are from Port of St. Cahterine only.**

2.4 **For (Area G) the following communities in the Kitikmeot Region**: Bathurst Inlet, Cambridge Bay, Gjoa Haven, Kugluktuk, Taloyoak and Umingmaktok (Bay Chimo):

THE CARRIER IS:

Northern Transportation Company Limited (NTCL)
by barges loading at Hay River, Northwest Territories
Contact: Scott Dryden
Phone: (780) 969-3893 Ext. 7984 or 1-604-353-0311
Fax: (780) 441-3934

OR

Nunavut Sealink and Supply Inc. (NSSI)
By ships loading at the Port of Ste-Catherine, Quebec
Contact: Daniel Desgagnés
Phone: (450) 635-0833 or Toll free (866) 732-5438
Fax: (450) 635-5126

3. The annual shipping rates offered by marine carriers are dependent upon anticipated cargo quantities including the materials for construction projects; therefore, Contractors are to bid using the published sailing schedules and rates available from the above marine carriers. These schedules and rates are also available from the Department of Community & Government Services, Purchasing, Logistics & Contract Support Division, Contact: John Paton, Manager Logistics at (867) 975-5437.

4. If a Contractor uses a marine carrier other than the marine carrier specified by the GN under this Appendix without having obtained the GN's prior written authorization to do so, the Contractor shall be solely responsible for any extra freight costs, administrative costs or any other costs incurred by the GN which result either directly or indirectly from the Contractor's failure to use the GN specified marine carrier as set out in this Appendix. The Contractor shall issue a credit in favour of the GN for any monies saved by the Contractor obtained from using a marine carrier other than the specified marine carriers identified in this Appendix.

5. In exceptional or extraordinary circumstances, where a specified marine carrier's sailing schedule is in substantial conflict with the project schedule, the GN will review the circumstances, taking into account the potential adverse impact on the project and the specified marine carrier's interests, and, at its sole discretion, the GN may provide authorization to allow the relevant cargo to be shipped with a marine carrier other than a specified marine carrier; such authorization must be in writing and must be obtained prior to contracting for the marine transport.

CONTRACTOR'S CERTIFICATE OF INSURANCE - APPENDIX I

INSURED: _____

SCHEDULE OF MANDATORY INSURANCE			
Type of Insurance	**Insurer, Policy Number**	**Policy Period**	**Limit of Liability/Amount**
COMPREHENSIVE GENERAL LIABILITY INCLUDING NON-OWNED AUTOMOBILE LIABILITY		From: To:	BODILY INJURY $ _____ Each Person $ _____ Each Accident $ _____ Aggregate Products PROPERTY DAMAGE $ _____ Each Accident $ _____ Aggregate Products **Or**, BODILY INJURY & PROPERTY DAMAGE $ _____ Inclusive $ _____ Aggregate Products
AUTOMOBILE LIABILITY (OWNED/LEASED VEHICLES)		From: To:	BODILY INJURY $ _____ Each Person $ _____ Each Accident PROPERTY DAMAGE $ _____ Each Accident **Or**, BODILY INJURY & PROPERTY DAMAGE $ _____ Inclusive
ADDITIONAL COVERAGES REQUIRED MARKED BY [ ]			
[ ] UMBRELLA LIABILITY		From: To:	$ Limits $ _____ S.I.R.
[ ] CONTRACTOR'S EQUIPMENT		From: To:	
[ ] OTHER			

This is to certify that policies as described above have been issued through the undersigned to the Insured named above and are in force at this time. If cancelled or changed in any manner, for any reason, during the period of coverage as stated herein so as to affect this certificate, immediate written notice will be given by the undersigned to the Department. **(Be sure to also complete and sign the 2nd page of this form.)**

CONTRACTOR'S CERTIFICATE OF INSURANCE - APPENDIX I – PAGE 2

PARTICULARS OF INSURANCE

GENERAL LIABILITY

[ ] Premises Property and Operations
[ ] Products and Completed Operations
[ ] Blanket Contractual - All Written Agreements
[ ] Occurrence Property Damage
[ ] Broad Form Property Damage
[ ] Contingent Employers Liability
[ ] Personal Injury
[ ] Employees as Additional Insureds
[ ] Cross Liability - Severability Of Interests
[ ] Blasting, Collapse, Underpinning
[ ] Exclusions deleted as follows:
[ ] Owners' & Contractors' Protective Liability
[ ]
[ ]

AUTOMOBILE LIABILITY

[ ] S.E.F. No. 4a Explosive Endorsement
[ ] S.E.F. No. 21b Blanket Fleet Endorsement
[ ]

[ ] **AIRCRAFT LIABILITY**
[ ]

[ ] **WATERCRAFT LIABILITY**
[ ]

REMARKS (STATE DEDUCTIBLES) IF ANY

THIS IS TO CERTIFY THAT INSURANCE AS DESCRIBED AS ABOVE IS IN FORCE AT THIS TIME.

Name and Address of Insurance Agent, Broker or Insurance Company

Written notice of any changes or cancellation of this policy shall be sent to the Owner at the following address:

Date _____

By _____
(Authorized Representative)

CONTRACTOR'S OBLIGATIONS TO PROVIDE INUIT CONTENT - APPENDIX J

1.0 GENERAL

.1 This contract pertains to work in Nunavut and contains provisions regarding minimum prescribed levels of Inuit Labour that must be met or exceeded in the performance of the work. The requirements set out in this Appendix J to meet minimum prescribed levels of Inuit Labour is a fundamental term of the contract. The minimum prescribed level of Inuit Labour shall be complied with.

.2 If the amount of Inuit Labour identified by the bidder on Appendix "B-2" of the tender is less than with the tender requirements, this would result in an obvious qualification to the tender submission by the bidder that would ordinarily cause the tender to be considered non-responsive.

.3 For an Inuit Labour level achieved which differs from the level prescribed, a bonus or penalty will be assessed in accordance with the NNI Policy, specifically Articles 12.3 and 12.4 of the Policy. A bonus would be for exceeding the minimum prescribed Inuit Labour level, and a penalty would be for not meeting the minimum prescribed Inuit Labour level.

.4 "Inuit Labour" and "Inuit Goods and Services" identified on the tender forms shall receive a bid adjustment in accordance with the NNI Policy and the adjustment percentages indicated on Appendix B-2 forms. "Inuit Goods and Services" means "Inuit Content" as defined in the Nunavummi Nangminiqaqtunik Ikajuuti (NNI) Policy definition appendix; the NNI Policy is attached as tender Appendix "J

.5 Damages as described in contract General Condition GC 55 may apply if the Inuit Labour and/or Inuit Goods and Services proposed by the Contractor on the tender Appendix B-2 forms are not met. In addition, if the minimum prescribed levels of Inuit Labour identified on page 4 of this Appendix is not met, then for future tenders where there are similar prescribed minimum levels for Inuit Labour , the Contractor may be deemed "not responsible" (as defined in the Government Contract Regulations.)

2.0 DEFINITIONS

.1 "Inuit (singular Inuk)" means a person described in Article 1.1.1 of the Nunavut Land Claims Agreement (NLCA) and who has enrolled himself or herself on the Inuit Enrolment List under Article 35 of the NLCA.

.2 "Inuit firm" means an entity which complies with the legal requirements to carry on business in the Nunavut Settlement Area, and which is,

.1 a limited company with at least 51% of the company's voting shares beneficially owned by Inuit, or

.2 a cooperative controlled by Inuit, or
.3 an Inuk sole proprietorship or partnership; and
.4 is included on Nunavut Tunngavik Inc. (NTI)'s Inuit Firms Registry

.3 "Labour"

For the purpose of this contract and specifically Appendix J, "Labour" means the Labour (including Inuit labour) used on the job in any capacity and including, for example, tradespeople, administrative staff and professional staff whether in a head office or in a site office and attributable to this project. "Inuit Labour" refers to the status of employees and may be directly provided by the general contractor or indirectly through a sub contractor, and is not necessarily through an Inuit Firm.

.4 "Goods and Services"

For the purpose of this contract and specifically Appendix J, "Goods and Services" means the entire dollar value of the Work including Labour. For further clarification "Inuit Goods and Services" includes all labour of Inuit firms attributable to and paid from the Contract. "Inuit Goods and Services" are to have the same meaning as the term "Inuit Content" used in the General Conditions of the Construction Contract.

.5 "Inuit Content"

"Inuit Content" is defined as the dollar value of the goods and services required by the Contract supplied by any Inuit Firm or Inuit sole proprietorship and Inuit Labour. Inuit Content may include:

i. goods and services supplied by an Inuit Firm or Inuit supplier acting as the General Contractor. These are referred to as "own forces";
ii. goods and services supplied by an Inuit Firm or Inuit supplier so long as these goods and services are required for the completion of the Contract and are paid for by the Contract.
iii. Inuit labour by an Inuit Firm or a non-Inuit Firm.

3.0 REQUIREMENTS

.1 The Contractor shall maximize the value of Inuit Labour and Inuit Goods and Services and shall meet or exceed the Inuit Labour minimum level identified in this appendix when bidding. In the performance of the work, the Contractor shall meet or exceed the amounts tendered on Appendix B-2.

.2 The Contractors shall submit records on a monthly basis, or as specified, indicating the amount of Inuit Labour and Inuit Goods and Services used. No payment shall be due or payable to the Contractor if the Contractor fails to supply these reports to the Owner.

4.0 FAILURE TO ACHIEVE INUIT CONTENT REQUIREMENTS

In addition to the bonus or penalty prescribed by the Nunavummi Nangminiqaqtunik Ikajuuti (NNI) Policy for exceeding or not meeting the minimum prescribed Inuit Labour level set out on page 4 of this Appendix J; the following damages may apply for not meeting Inuit Labour and /or Inuit Goods and Services requirements:

.1 There is a requirement to provide no less than the levels of Inuit Labour and Inuit Goods and Services tendered by the Contractor on Appendix B-2 of the tender. Failure to meet this requirement by achieving the levels tendered may result in the Owner applying damages described in the contract General Condition GC 55.

.2 Additionally, if the contractor fails to meet the prescribed minimum Inuit Labour set out on page 4 of this Appendix J, then for future tenders where there are similar prescribed minimum levels for Inuit Labour the Owner may deem the Contractor to be "not responsible" (as defined in the Government Contract Regulations).

.3 The Owner may terminate this contract prior to Final Completion if the Contractor has not demonstrated compliance with the requirement to attain the prescribed minimum levels of Inuit Labour set out on page 4 of this Appendix J.

5.0 INDEMNIFICATION

.1 The Contractor shall indemnify the Owner against any claim brought by any person because of any failure by the Contractor to achieve the prescribed levels of Inuit Labour prescribed by this contract.

6.0 WAIVER OF INUIT CONTENT REQUIREMENTS

.1 The prescribed level of Inuit Labour shall only be reduced when sufficient Inuit Labour is not available and the Contractor has requested and received prior approval by the Owner in writing to reduce the prescribed levels.

Inuit Labour

It is a fundamental term of this contract that the contractor shall maximize the value of Inuit labour used to perform the Work. Therefore the GN has set a minimum percent by dollar value for the use of Inuit labour. The Inuit labour content may be provided by the general contractor or any subcontractor and may include professional or administrative staff or skilled or unskilled trades people, and not necessarily through an Inuit Firm. The minimum may only be reduced where sufficient Inuit labour is not available and the approval of the Owner has been obtained in writing.

For the purposes of this contract the GN has prescribed that the following minimum percent of the total labour for this job by dollar value shall be provided by Inuit workers.	35% **Prescribed** minimum level of Inuit labour as a percent of total labour by dollar value.

Substantiation

In order to substantiate the amount of Inuit Labour the general contractor shall be responsible for providing an amalgamated employment report that shall reflect the Inuit labour used by the general contractor and any other sub-contractor or supplier. The general contractor shall submit this employment report with every Progress Claim. Receipt of an employment report shall be a condition precedent to the release of a progress payment, an interim payment and/or a final payment.

If requested, the general contractor shall also provide a completed "Employee Verification and Consent Form" for an Inuit worker.

Construction Contract

Project No: 10-3019

Name of Project: **Tank Farm-Increase Cap/Code Compliance Tank #3 Repairs**

Project Location: **Coral Harbour**

Contract Number: **C1030192**

Government of Nunavut

Form No. 6215-25-MW – Revision 5 – February 2015
This Form replaces Form No. 6215-25-MW – Revision 4 – April 2008

FIXED PRICE CONTRACT

Contract Number: C130192
This Agreement is awarded as a result of RFT 10-3019

ARTICLES OF AGREEMENT

These Articles of Agreement, effective on the date this Contract is executed by both Parties (the "**Effective Date**").

BETWEEN:

THE GOVERNMENT OF NUNAVUT
(hereinafter, the "**Owner**")

-and-

_____
(hereinafter, the "**Contractor**")

Witness that in consideration for the mutual promises and obligations contained in the Contract, the Owner and the Contractor covenant and agree as follows:

A1 CONTRACT DOCUMENTS

1.1 The documents forming the Contract between the Owner and the Contractor, referred to herein as the Contract Documents are all of those documents referred to on Appendix A of the Tender and:

1.1.1 Any addenda issued during the Tender period and identified in Clause 2 of the Tender; and

1.1.2 Any amendment or variation of the Contract Documents that is made in accordance with the General Conditions.

1.2 The Owner hereby designates _____ or his designate as the Owner's Representative for the Department of _____ of the Government of Nunavut.

1.3 The Contractor hereby designates _____ as the Contractor's Representative.

A2 DATE OF COMPLETION OF WORK AND DESCRIPTION OF WORK

2.1 The Contractor shall, between the Effective Date of the Contract and the **31st day of October, 2015**, in a careful and workmanlike manner, diligently perform and complete the following work:

Repairs of Tank#3-an existing 1,350,000L Gasoline Vertical storage tank:
Repairs include, but are not limited to the replacement of tank bottom, roof rafters,
modifications to existing piping, granular sub-base, compaction, all Work as noted in the plans
and specifications.

A3 CONTRACT AMOUNT

3.1 Subject to A3.2, the total sum of _____ shall be paid by the Owner to the Contractor in consideration of the performance of the Work (the "**Contract Price**").

3.2 The Contract Price is subject to increases, decreases, deductions, reductions, and set-off, as permitted under the terms of the Contract. The Owner shall pay the Contractor at the times and in the manner that is set out or referred to in the Contract

A4 FINANCIAL ADMINISTRATION ACT (NUNAVUT)

4.1 The attention of the Contractor is drawn to the following statutory provision. It is a condition of this Contract that payment hereunder is subject to Section 46 of the *Financial Administration Act*, RSNWT (Nu) 1988, c F-4, as amended or re-enacted in successor legislation during the term of this Contract. Section 46 currently provides as follows:

"It is a condition of every contract made by or on behalf of the Government requiring an expenditure that an expenditure pursuant to the contract will be incurred only if there is a sufficient uncommitted balance in the appropriated item for the fiscal year in which the expenditure is required under the contract."

A5 JOINT AND SEVERAL LIABILITY

5.1 If the Contractor is comprised of more than one party, as in the case of a joint venture or a partnership, then all of the parties shall declare themselves to be bound jointly and severally with one another with respect to the fulfilment of all the terms and conditions of this Contract and hereby renounce their benefits of division and discussion and the obligations of such parties shall be joint and several, and each party shall execute this Contract.

A6 COUNTERPARTS

6.1 This Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original, but all of which shall constitute one and the same instrument. The parties agree that in accordance with the *Electronic Commerce Act*, SNu 2004, c7, signatures transmitted electronically, whether via facsimile or via email as attached files, shall be acceptable to bind the parties and shall not in any way affect the validity of this Contract.

SIGNED, SEALED AND DELIVERED in the presence of:

Contractor: Contractor's Full Legal Business Name and Address:

Seal

Facsimile No.

Contractor Authorized Signatory

Signature

Name Date

Title

Contractor Authorized Signatory

Signature

Name Date

Title

Owner: Owner's Full Legal Business Name and Address:

Department of Community & Government Services
P.O. Box 490
Rankin Inlet, NU X0C 0G0

Facsimile No.: (867) 645-8196

Owner Authorized Signatory

Signature

Name Date

Title

END OF ARTICLES OF AGREEMENT

TERMS OF PAYMENT

TP1 AMOUNT PAYABLE - GENERAL

1.1 Subject to any other provisions of the Contract, the Owner shall pay the Contractor, at the times and in the manner hereinafter set out, the amount by which the aggregate of the amounts described in TP2 exceed the aggregate of the amounts described in TP3 (the "**Aggregate Sum**").

1.2 The Contractor shall accept the Aggregate Sum as payment in full satisfaction for everything furnished and done by the Contractor in respect of the Work to which the payment relates.

TP2 AMOUNT PAYABLE TO THE CONTRACTOR

2.1 The amount payable to the Contractor is the aggregate of:

2.1.1 The amount referred to in the Articles of Agreement at A3.1;

2.1.2 The amounts, if any, that are payable to the Contractor pursuant to the General Conditions;

2.1.3 The amounts, if any, that are a bonus for Inuit labour achieved in accordance with the *Nunavummi Nangminiqaqtunik Ikajuuti* (the "**NNI Policy**") as described at GC50; and

2.1.4 The applicable Goods and Services Tax ("**GST**").

TP3 AMOUNT PAYABLE TO THE OWNER

3.1 The amount payable to the Owner is the aggregate of the amounts, if any, that the Contractor is liable to pay to the Owner pursuant to the Contract; including, without limitation, any penalties assessed for Inuit labour shortfalls in the Work, as described in the NNI Policy.

3.2 When making any payment to the Contractor in accordance with TP1, the failure of the Owner to deduct amounts owed under TP3.1 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.

TP4 TIME OF PAYMENT

4.1 The payment periods shall be every thirty (30) consecutive days or such other time interval as is agreed between the Contractor and the Owner (the "**Payment Period**").

4.2 The Contractor shall, on the expiration of a Payment Period, deliver to the Owner's Representative a written invoice for the portion of the Work that has been completed as of that date (the "**Invoice**"). The Contractor shall include with the Invoice the required associated backup documentation and a list of the materials that were delivered to the work site but not incorporated into the Work during that Payment Period. The Contractor's official Invoice shall include, as a minimum, the following information:

4.2.1 A full description of the Work completed, the Materials used, the contract number, the Contractor's GST registration number, and the dollar values as follows:

- Sub-total #1 (invoice amount without GST);
- Holdback amount;
- Sub-total #2 (which is Sub-total #1 less the Holdback amount); and
- Grand Total (which is Sub-total #2 plus GST)

4.3 The Owner's Representative, will, not later than ten (10) days after receipt of the Invoice:

4.3.1 Inspect or otherwise satisfy itself that the part of the Work and the Materials described in the invoice have been completed and provided in a satisfactory manner (an inspection may be carried out by either the Owner's Representative or its' consultant);

4.3.2 Coordinate with the Contractor to resolve any disagreements on the content and amount of the Invoice (obtaining a corrected invoice from the Contractor if changes are required);

4.3.3 Complete a request for contact payment ("**RCP**"), indicating on it the date that the Contractor's Invoice was approved;

4.3.4 Send to the Government of Nunavut, Community & Government Services ("**CGS**") finance section the original Invoice that has been agreed upon, along with the RCP signed by the Owner's Representative (and CGS Regional Project Manager or the Regional Director depending on the signing authority of these persons) and a copy of the *CGS Major Works Contract Payment Check List*, with the appropriate sections filled out; and

4.3.5 Send a copy of the agreed upon Invoice and the RCP to the Contractor.

4.4 Subject to TP1, the Owner will pay the Contractor in accordance with the amounts stipulated hereunder:

4.4.1 An amount that is equal to 90% of the value that is indicated in the Invoice, if a performance bond and a labour and material payment bond has been furnished by the Contractor in accordance with GC54; or

4.4.2 An amount that is equal to 90% of the value that is indicated in the Invoice if a security deposit has been furnished by the Contractor in accordance with GC54.

4.5 Payments to Nunavut businesses or Inuit firms, as defined by the NNI Policy, will become due and payable twenty (20) days after receipt of the Invoice, provided the Invoice is approved by the Owner's Representative as specified in TP4.3. Payments to other Contractors will become due and payable thirty (30) days after approval of the Invoice by the Owner's Representative as specified in TP4.3.

4.6 Subject to TP1, TP3 and TP4.3, the Owner will, within twenty (20) days for Nunavut businesses or Inuit firms and within thirty (30) days for other Contractors following the date of issue of a Certificate of Substantial Completion, pay the Contractor the amount referred to in TP1 less the following deductions:

4.6.1 The sum of all payments that were made pursuant to TP4.4;

4.6.2 An amount that is equal to the Owner's estimate of the cost of rectifying defects described in the Substantial Certificate of Completion; and

4.6.3 An amount that is equal to the Owner's Representative's estimate of the cost the Owner would incur to complete the outstanding Work described in the Substantial Certificate of Completion, other than the defects referred to in TP4.6.2.

4.7 It is a condition precedent to the Owner's payment obligation under TP4.6 that:

4.7.1 The Contractor has made and delivered to the Owner's Representative a statutory declaration described in TP4.10 in respect of the Substantial Certificate of Completion referred to in GC42.2, and

4.7.2 The Contractor has complied with the various requirements to provide Inuit, Nunavut and local employment and involvement reports as set out in this Contract.

4.8 Subject to TP1, TP3 and TP4.9, the Owner will, not later than twenty (20) days for Nunavut businesses or Inuit firms or thirty (30) days for other Contractors after the date of issue of a Certificate of Completion, pay the Contractor the amount referred to in TP1 less the following deductions:

4.8.1 The sum of all payments that were made pursuant to TP4.4, and;

4.8.2 The sum of all payments that were made pursuant to TP4.6.

4.9 It is a condition precedent to the Owner's payment obligation under TP4.8 that the Contractor has made and delivered, to the Owner's Representative, a statutory declaration as described in TP4.10 in respect of the Certificate of Completion referred to in GC42.1.

4.10 The statutory declaration referred to in TP4.7 and TP4.9 shall be in the form of the "Certificate of Completion Statutory Declaration", attached hereto.

TP5 PROGRESS REPORT AND PAYMENT NOT BINDING ON THE OWNER

5.1 Neither a RCP nor any payment made by the Owner, pursuant to these Terms of Payment shall be construed as an admission by the Owner that the Work, Materials, or any part thereof is complete, satisfactory or is in accordance with the Contract.

TP6 RIGHT OF SET-OFF

6.1 Without limiting any right of set-off or deduction given or implied by law or elsewhere in the Contract, the Owner may set-off any amount owed to the Owner by the Contractor under this Contract or any other current contract, against any amount payable to the Contractor under this Contract or any other current contract.

6.2 For the purposes of these Terms of Payment, "current contract", means a contract between the Owner and the Contractor where:

6.2.1 The Contractor has an undischarged obligation to perform or supply work, labour or material; or

6.2.2 The Owner has, since the date on which the Articles of Agreement were made, exercised any right to take work that is subject to the Contract out of the Contractor's hands.

TP7 PAYMENT IN EVENT OF TERMINATION

7.1 If the Contract is terminated pursuant to GC39, the Owner will pay the Contractor any amount that is lawfully due and payable to the Contractor as soon as is practicable under the circumstances.

Certificate of Completion

STATUTORY DECLARATION

THE MATTER OF the Contract bearing

#_____

BETWEEN:

The Government of Nunavut

-and-

_____

Insert full name of Contractor
(herein the "**Contractor**")

for

_____

_____

Briefly describe the work to be performed

dated the _____day of _____, 20____

and

IN THE MATTER OF the Certificate of Completion relating to Contract #_____:

I, _____ of _____

Full name of declarant Declarant's city of residence

DO SOLEMNLY DECLARE:

1. That I am_____

Declarant's position or title with the Contractor or that the declarant is the Contractor

And as such have a personal knowledge of the said Contract and of the facts and matters stated herein.

2. That all assessments and levies under the *Unemployment Insurance Benefit Entitlement Adjustments (Pension Payments) Act, SC 1987, c17, The Workers' Compensation Act, SNu 2007, c.15* or any other social or labour legislation in respect of the said Contract have been paid in full.

3. That all Subcontractors, labourers and suppliers of materials and equipment whatsoever who have entered into agreements to supply goods or services which have been incorporated into the construction of this project have been paid in full except for contractual holdbacks and the further amounts, if any, which are listed below and are being withheld from the Subcontractor(s) listed herein, due to legitimate disputes arising out of the performance, or lack of performance, of the work by the listed Subcontractor(s).

Amounts in Dispute

Subcontractor	Amount Being Withheld

And the following amounts, if any, which are being withheld pending payment to the Contractor by the Government of Nunavut.

Subcontractor	Amount Being Withheld

I make this SOLEMN DECLARATION conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the LAWS OF CANADA and NUNAVUT.

DECLARED before me in the City of _____this ____ day of _____, 20___

Signature of Declarant	Print name
Signature of person before whom declaration is made	Print name
Signature of a Notary Public, Commissioner, etc. and Notary seal	Print name

NOTES:

1. Where the Contractor is a corporation or a partnership, the Declarant's position in the corporation or partnership, and the corporation or partnership name should be clearly shown in #1.

2. Where the Contractor is an incorporated company, the declaration must be made by the President, Vice-President, Secretary Treasurer or a Director. If any other person makes the declaration, two copies of the by-law issued under the corporate seal, authorizing the individual to execute documents must be submitted with the first declaration of each contract.

3. Where the Contractor is an individual, that person must make the declaration. Where the Contractor is a partnership the declaration must be made by one of the partners.

4. If this declaration is not complete in every detail, it will be returned for completion and payment will be delayed.

5. The following sections of the *Criminal Code*, RSC 1985, c C-46 are hereby brought to the attention of the Declarant:

> Section 122: Everyone who, not being a witness in a judicial proceeding but being permitted, authorized or required by law to make a statement by affidavit, by solemn declaration or orally under oath, makes in such statement, before a person who is authorized by law to permit it to be made before him, an assertion with respect to a matter of fact, opinion, belief or knowledge, knowing that the assertion is false, is guilty of an offense and is liable to imprisonment for fourteen years.
>
> Section 122.1 (1): Everyone who, not being specially permitted, authorized or required by law to make a statement by affidavit, by solemn declaration or orally under oath, makes in such a statement, before a person who is authorized by law to permit it to be made before him, an assertion with respect to a matter of fact, opinion, belief or knowledge, knowing that the assertion is false, is guilty of an offense punishable on summary conviction.

Nunavut

Community & Government Services

Schedule of Local, Inuit and Nunavut Values
(As per General Condition 52.2)

Name of Contractor/SubContractor/Supplier:	Project Title:	Location:
Start Up Date:		

	April			May			June			July			August			September		
	Local	Inuit	Nunavut	Local	Inuit	Nunavut	Local	Inuit	Nunavut	Local	Inuit	Nunavut	Local	Inuit	Nunavut	Local	Inuit	Nunavut
Labour																		
Other																		
Total																		

	October			November			December			January			February			March		
	Local	Inuit	Nunavut	Local	Inuit	Nunavut	Local	Inuit	Nunavut	Local	Inuit	Nunavut	Local	Inuit	Nunavut	Local	Inuit	Nunavut
Labour																		
Other																		
Total																		

Construction Year _____ / _____

Totals	Local	Inuit	Nunavut
Labour			
Other			
Total			

Notes: This form will be given to the Contractor at the Pre-Construction meeting.

The Owner requires the anticipated total monthly value of all Local, Inuit and Nunavut labour and Other content to provide a benchmark for compliance. This information is to be submitted prior to release of the first payment. "Other" means Goods & Services excluding Labour.

The total of all monthly estimates should equal the total value shown on the submitted Appendix B-2 forms. Failure to meet Appendix B-2 Local, Inuit and Nunavut expenditures may result in penalties as stated in General Condition 55. Also refer to GC55 for allowable revisions to Inuit, Nunavut, Local and Other Content.

GENERAL CONDITIONS

TABLE OF CONTENTS

GENERAL CONDITIONS

GC1 INTERPRETATION

1.1 The following Definitions shall apply to all Contract Documents

1.1.1 "**Certificate of Completion**" means the certificate issued in accordance with GC42.1;

1.1.2 "**Certificate of Substantial Completion**" means the certificate issued in accordance with GC42.2;

1.1.3 "**Contract**" is the undertaking by the parties to this agreement to perform their respective duties, responsibilities and obligations as prescribed in the Contract Documents and represents the entire agreement between the parties;

1.1.4 "**Contract Documents**" means all of those documents listed in Appendix A of the Tender and Article A1.1 of the Articles of Agreement;

1.1.5 "**Contract Price**" is the amount stipulated in A3 of the Articles of the Agreement;

1.1.6 "**Contract Security**" means any security given by the Contractor to the Owner in accordance with the Contract;

1.1.7 "**Contractor**" is the person or entity identified as such in the Contract. The term Contractor may also include the Contractor's Representative;

1.1.8 "**Contractor's Representative**" means the Person designated at A1.3 of the Articles of Agreement;

1.1.9 "**Effective Date**" means the date specified in the Articles of Agreement;

1.1.10 "**Engineer**" means the person designated by the Owner as the Owner's Representative pursuant to the Articles of Agreement and includes his or her designate;

1.1.11 "**Material**" includes all commodities, articles and things required to be furnished by or for the Contractor under the Contract for incorporation into the work;

1.1.12 "**NNI Policy**" means *Nangminiqaqtunik Ikajuuti* which came into effect for the territory of Nunavut on April 1, 2000;

1.1.13 "**Owner**" means the Government of Nunavut;

1.1.14 "**Owner's Representative**" means the Person designated at A1.2 of the Articles of Agreement;

1.1.15 "**Person**" includes, unless the context otherwise requires, an individual, a partnership, sole proprietorship, firm, joint venture, consortium and a corporation;

1.1.16 "**Plant**" includes all animals, tools, implements, machinery, vehicles, buildings, structures, equipment and commodities, articles and things other than Material, that are necessary for the due performance of the Contract;

1.1.17 "**Project**" means the total undertaking contemplated by the Owner of which the Work may be the whole or a part;

1.1.18 "**Specifications**" are that portion of the Contract Document, wherever located and whenever issued, consisting of the written requirements and standards for products,

systems, workmanship, quality, and the services necessary for the performance of the Work;

1.1.19 "**Subcontractor**" means a person to whom the Contractor has, subject to GC4, subcontracted the whole or any part of the Work.

1.1.20 "**Substantial Completion**" as defined in the lien legislation applicable to the place of work. If such legislation is not in force, is not applicable or does not contain such definition, Substantial Completion shall have been reached when Work is ready for use or is being used for the purpose intended and is so certified by the Consultant pursuant to GC 42.2.

1.1.21 "**Substantial Performance**" as defined in the lien legislation applicable to the place of work. If such legislation is not in force, is not applicable or does not contain such definition, substantial performance shall have been reached when Work is ready for use or is being used for the purpose intended and is so certified by the Engineer;

1.1.22 "**Superintendent**" means the employee of the Contractor who is designated by the Contractor to act pursuant to GC17;

1.1.23 "**Tender**" means the Contractor's bid in response to the Owners request for tenders, wherein the Contractor offered its services to complete the Work; and

1.1.24 "**Work**" includes, 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.

1.2 The division into sections, the table of contents, and the headings in the Contract Documents, other than in the plans and Specifications, form no part of the Contract but are inserted for convenience of reference only.

1.3 In interpreting the Contract, in the event of discrepancies or conflicts between anything in the plans and Specifications and the General Conditions, the General Conditions govern.

1.4 In interpreting the plans and Specifications, in the event of discrepancies or conflicts between:

1.4.1 The plans and Specifications, the Specifications govern;

1.4.2 The various plans, the plans drawn with the largest scale govern, and

1.4.3 Figured dimensions and scaled dimensions, the figured dimensions govern.

1.5 Where reference is made to a part of the Contract by means of numbers preceded by letters, the reference shall be construed to be 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.

1.6 Any reference to a statutory provision shall include any subordinate legislation made and from time-to-time amended, extended or re-enacted.

1.7 This Contract shall be governed by and construed in accordance with the laws of Nunavut and the laws of Canada as applicable therein.

1.8 Unless otherwise indicated, all dollar amounts referred to in the Contract are in lawful money of Canada.

1.9 If any provision of this Contract is determined to be invalid or unenforceable in whole or in part, such invalidity or unenforceability shall attach only to such provision and everything else in this Contract shall continue in full force and effect. In the event any provision of this Contract, as amended from time to time, shall be deemed invalid or void, in whole or in part, by any court of competent jurisdiction, the remaining terms and provisions of this Contract shall remain in full force and effect.

1.10 Failure by either party to exercise any of its rights, powers or remedies hereunder or its delay to do so shall not constitute a waiver of those rights, powers or remedies. The single or partial exercise of a right, power or remedy shall not prevent its subsequent exercise or the exercise of any other right, power or remedy.

1.11 The Contractor shall comply, and shall require its Subcontractors to comply, with all applicable laws, orders, rules and regulations; and, without limiting the generality of the foregoing, the Contractor shall at its sole expense comply with all unemployment insurance, Worker's Safety and Compensation, income tax, payroll tax, Canada Pension Plan, Nunavut Safety Acts, Asbestos Safety Regulations, WSCC Asbestos Abatement Codes of Practice, WSCC Hazardous Assessment Codes of Practice, and occupational health and safety legislation/regulations applicable to Nunavut.

GC2 SUCCESSORS AND ASSIGNS

2.1 The Contract shall inure to the benefit of and be binding upon the parties hereto and their lawful heirs, executors, administrators, successors and assigns.

GC3 ASSIGNMENT OF CONTRACT

3.1 The Contract may not be assigned by the Contractor, either in whole or in part without the prior written consent of the Owner.

GC4 SUBCONTRACTING BY CONTRACTOR

4.1 Subject to this General Condition, the Contractor may subcontract any part of the Work so long as such subcontracting is consistent with the information provided on Appendix B-1 and B-2 of the Tender.

4.2 The Contractor shall notify the Engineer of its intention to subcontract.

4.3 A notification referred to in GC4.2 shall identify the part of the Work, and the Subcontractor with whom it is intended to subcontract. The Contractor shall invite Nunavut, Inuit and/or local companies to bid on subcontracts where the Contractor is not already using Nunavut, Inuit and/or local companies as subcontractors.

4.4 The Engineer may, within six (6) days of receipt of a notification referred to in GC4.2, object to the proposed subcontracting.

4.5 If the Engineer objects to a subcontracting pursuant to GC4.4, the Contractor shall not enter into the proposed subcontract.

4.6 The Contractor shall not, without the written consent of the Owner, change a Subcontractor who has been engaged by him in accordance with this Contract and the Tender. If any changes are made without the Engineer's consent, the Contract may be terminated at the sole option of the Owner.

4.7 Every subcontract entered into by the Contractor shall incorporate by reference all of the terms and conditions contained in the Contract Documents that are of general application.

4.8 In the event of subcontracting, despite the Engineer's consent being obtained, the Contractor shall not be relieved of any of its obligations under the Contract, nor shall the subcontracting impose any liability upon the Owner.

GC5 AMENDMENTS

5.1 No amendment or change in any of the provisions of the Contract shall have any force or effect unless it is reduced to writing and signed by the parties.

GC6 NO IMPLIED OBLIGATIONS

6.1 No implied terms or obligations of any kind by or on behalf of the Owner shall arise from anything in the Contract and the express covenants and agreements therein contained and made by the Owner are the only covenants and agreements upon which any rights against the Owner are to be founded.

6.2 The Contact supersedes all communications, negotiations and agreements, either written or oral, relating to the Work that was made prior to the date of the Contract.

GC7 TIME OF ESSENCE

7.1 Time is of the essence in this Contract.

GC8 INDEMNIFICATION BY CONTRACTOR

8.1 The Contractor shall indemnify and save the Owner harmless from and against all claims, demands, losses, damages, actions, suits or proceedings by whomever made, brought or prosecuted and in any manner based upon, arising out of, related to, occasioned by or attributable to the activities of the Contractor, his servants, agents, and Subcontractors in performing the Work including an infringement or an alleged infringement of patent of invention or any kind of intellectual property.

8.2 For the purposes of GC8.1, "activities" includes, but is not limited to, any act improperly carried out, any omission to carry out an act and any delay in carrying out an act.

GC9 NOTICES TO CONTRACTOR

9.1 Notices for the purposes of GC35, GC37 and GC38 shall be in writing and shall be given as follows:

9.1.1 By delivering the notice to the Contractor in person or, if the Contractor is a partnership, firm, joint venture consortium or corporation, to a senior administrative or executive officer thereof; or

9.1.2 By mailing the notice to the Contractor at his address as set out in the Articles of Agreement.

9.2 A notice referred to in GC9.1 shall be deemed to have been received by the Contractor:

9.2.1 On the day that it was delivered, if it was delivered pursuant to the requirements of GC9.1.1; or

9.2.2 On the earlier of either the day that it was received by the Contractor or the fifteenth day after it was mailed, if it was sent by mail pursuant to GC9.1.2,

9.3 Any notice, consent, order, direction, decision, or other communication, other than a notice referred to in GC9.1, that may be given to the Contractor pursuant to the Contract may be given in any manner, but if it is in writing it shall be deemed to have been received by the Contractor on:

9.3.1 The day that it was delivered to the Superintendent; or

9.3.2 The fifteenth (15^{th}) day after it was mailed to the Contractor at its address set out in the Articles of Agreement.

9.4 Where the postal service is disrupted by a strike, a notice, consent, order, direction, decision or other communication may be given to the Contractor by facsimile and shall be deemed to have been received by the Contractor twenty-four (24) hours after it was transmitted.

GC10 MATERIAL, PLANT AND REAL PROPERTY SUPPLIED BY THE OWNER

10.1 Subject to GC10.2, the Contractor is liable to the Owner for any loss or damage to Material, Plant or real property that is supplied or placed in the care, custody and control of the Contractor by the Owner for use in connection with the Contract, whether or not that loss or damage is attributable to causes beyond the Contractor's control.

10.2 The Contractor is not liable to the Owner for any loss or damage to Material, Plant or real property referred to in GC10.1, if the loss or damage results from and is directly attributable to reasonable wear and tear.

10.3 The Contractor shall not use any Material, Plant or real property referred to in GC10.1 except for the purpose of performing this Contract.

10.4 When the Contractor fails to make good any loss or damage for which he is liable under GC10.1 within a reasonable time after being required to so by the Engineer, the Engineer may cause the loss or damage to be made good at the Contractor's expense, and the Contractor shall thereupon be liable to the Owner for the cost thereof and shall, on demand, pay to the Owner an amount equal to that cost.

10.5 The Contractor shall keep such records of all Material, Plant and real property referred to in GC10.1 as the Engineer from time to time requires, and shall satisfy the Engineer, when requested, that such Material, Plant and real property are at the place and in the condition, which they ought to be.

GC11 MATERIAL, PLANT AND REAL PROPERTY BECOME THE PROPERTY OF THE OWNER

11.1 All Material and Plant and the interest of the Contractor in all real property, licenses, powers and privileges acquired, used or provided by him for the Contract shall, from the time of their acquisition, use or provision, be the property of the Owner for the purposes of the Work and shall continue to be the property of the Owner until:

11.1.1 In the case of Material, the Engineer indicates that he is satisfied that the Material will not be required for the Work; and

11.1.2 In the case of Plant, real property, licenses, powers and privileges, the Engineer indicates that he is satisfied that the interest vested in the Owner therein is no longer required for the purposes of the Work.

11.2 Without the written consent of the Engineer, Material or Plant that is the property of the Owner by virtue of GC11.1 shall not be taken away from the work site or used or disposed of except for the purposes of the Work.

11.3 The Owner is not liable for loss of or damage from any cause to the Material or Plant referred to in GC11.1. The Contractor is liable for such loss or damage, notwithstanding that the Material or Plant is the property of the Owner

GC12 MUNICIPAL PERMITS

12.1 The Contractor shall, within thirty (30) days after the Effective Date, tender to the municipal authority an amount equal to all fees and charges that would be lawfully payable to that municipal authority in respect of all building permits (the "**Building Permit Tender Amount**"), as if the Work were being performed for a person other than the Owner.

12.2 Within ten (10) days of tendering the Building Permit Tender Amount pursuant to GC12.1, the Contractor shall notify the Engineer of his action and of the amount tendered and whether or not the municipal authority has accepted that amount.

12.3 If the municipal authority does not accept the Building Permit Tender Amount, the Contractor shall pay the Building Permit Tender Amount to the Owner within six (6) days after the date stipulated in GC12.2.

12.4 For the purposes of GC12.1, to GC12.3, "municipal authority" means any authority that would have jurisdiction respecting permission to perform the Work if the owner were not the Owner.

GC13 PERFORMANCE OF WORK UNDER DIRECTION OF ENGINEER

13.1 The Contractor shall:

13.1.1 Permit the Engineer to have access to the Work and the work site at all times during the performance of the Contract;

13.1.2 Furnish the Engineer with such information respecting the performance of the Contract as he may require; and

13.1.3 Give the Engineer every possible assistance to enable the Engineer to carry out his duty to see that the Work is performed in accordance with the Contract, and to carry out any other duties and exercise any powers specially imposed or conferred on the Engineer under the Contract.

GC14 COOPERATION WITH OTHER CONTRACTORS

14.1 Where, in the opinion of the Engineer, it is necessary that other contractors or workers with or without Plant and Material, be sent onto the Work or its site, the Contractor shall, to the satisfaction of the Engineer, allow the other contractors or workers to access the site and the Contractor shall cooperate with them in the carrying out of their duties and obligations.

14.2 The Owner shall pay the Contractor the cost calculated in accordance with GC46 and GC47, for the extra labour, Plant and Material that was necessarily incurred by the other contractors or workers if:

14.2.1 The work of the other contractors or workers pursuant to GC14.1 could not have been reasonably foreseen or anticipated by the Contractor when submitting its Tender;

14.2.2 The Contractor incurs, in the opinion of the Engineer, extra expense in complying with GC14.1; and

14.2.3 The Contractor has given the Engineer written notice of his claim for the extra expense referred to in GC14.2.2 within ten (10) days of the date that the other contractors or workers were sent onto the Work or its site.

GC15 EXAMINATION OF WORK

15.1 If, at any time after the commencement of the Work but prior to the expiry of the warranty period, the Engineer has reason to believe that the Work or any part thereof has not been performed in accordance with the Contract, the Engineer may have that Work examined by an expert of his choice.

15.2 If, as a result of an examination of the Work referred to in GC15.1, it is established that the Work was not performed in accordance with the Contract, then, in addition to and without limiting or otherwise affecting any of the Owner's rights and remedies under the Contract either at law or in equity, the Contractor shall pay the Owner, on demand, all reasonable costs and expenses that were incurred by the Owner for the examination.

GC16 CLEARING OF SITE

16.1 The Contractor shall maintain the Work and its site in a tidy condition and free from the accumulation of waste material and debris, and in accordance with any directions of the Engineer.

16.2 Before the issue of a Certificate of Substantial Completion referred to in GC42.2, the Contractor shall remove all the Plant and Material not required for the performance of the remaining Work, and all waste material and other debris, and shall cause the Work and its site to be clean and suitable for occupancy or use by the Owner's servants, unless otherwise stipulated in the Contract. The Contractor shall, as directed by the Owner, take down all signs erected during construction.

16.3 Before the issue of a Certificate of Completion referred to in GC42.1, the Contractor shall remove from the Work and its site all surplus Plant and Material, and any waste material and other debris.

16.4 The Contractor's obligations described in GC16.1 to GC16.3 do not extend to waste material and other debris caused by the Owner's servants or contractors and other contractors or workers referred to in GC14.1.

GC17 CONTRACTOR'S SUPERINTENDENT

17.1 The Contractor shall, forthwith upon the award of the Contract, designate a Superintendent.

17.2 The Contractor shall forthwith notify the Engineer of the name, address and telephone number of a Superintendent designated pursuant to GC17.1.

17.3 A Superintendent designated pursuant to GC17.1 shall be in full charge of the Work site and the operations of the Contractor, his servants, agents, and Subcontractors in the performance of the Work and is authorized to accept any notice, consent, order, direction, decision or other communication on behalf of the Contractor that may be given to the Superintendent under the Contract.

17.4 The Contractor shall, until the Work has been completed, keep a competent Superintendent at the Work site at all times during working hours.

17.5 The Contractor shall, upon the request of the Engineer, remove any Superintendent who, in the opinion of the Engineer, is incompetent or has been conducting himself improperly and shall forthwith designate another Superintendent who is acceptable to the Engineer.

17.6 Subject to GC17.5, the Contractor shall not substitute a Superintendent without the written consent of the Engineer.

17.7 A breach by the Contractor of GC17.6 entitles the Engineer to refuse to issue any certificate referred to in GC42 until the Superintendent has returned to the Work site or another Superintendent who is acceptable to the Engineer has been substituted.

GC18 NATIONAL SECURITY

18.1 If the Owner is of the opinion that the Work is of a class or kind that involves the national security, he may order the Contractor to:

18.1.1 Provide the Owner with any information concerning Persons employed or to be employed by the Contractor for purposes of the Contract; and

18.1.2 Remove any Person from the Work and its site if, in the opinion of the Owner, that Person may be a risk to the national security.

18.2 The Contractor shall, in all contracts with Persons who are to be employed in the performance of the Contract, include provisions in said contracts to ensure that the Contractor performs any and all of the obligations that may be imposed upon him under GC17 to GC19.

18.3 The Contractor shall comply with an order of the Owner under GC18.1.

GC19 UNSUITABLE WORKERS

19.1 The Contractor shall, upon the request of the Engineer, remove any Person employed by him for purposes of the Contract who, in the opinion of the Engineer, is incompetent or has conducted himself improperly, and the Contractor shall not permit a Person who has been removed to return to the Work site.

GC20 INCREASED OR DECREASED COSTS

20.1 The Contract Price shall not be increased or decreased by reason of any increase or decrease in the cost of the Work that is caused by an increase or decrease in the cost of labour, Plant or Material or the wage rates set out in or prescribed pursuant to the labour conditions.

20.2 Notwithstanding GC20.1 and GC33, the Contract Price shall be adjusted in the manner provided in GC20.3, if any change in the cost of Materials is due to:

20.2.1 A change in the taxes imposed under the *Excise Act*, RSC 1985, c E-14, the *Excise Tax Act*, RSC 1985, c E-15, the *Old Age Security Act*, RSC 1985, c O-9, the *Customs Act*, RSC 1985, c1(2nd Supp) or the *Customs Tariff Act*; SC 1997, c36;

20.2.2 Occurs after the date of the submission by the Contractor of his Tender for the Contract; and

20.2.3 Affects the cost to the Contractor of Materials.

20.3 If a change referred to in GC20.2 occurs, the appropriate amount set out in the Articles of Agreement shall be increased or decreased by an amount equal to the amount that is established by an examination of the relevant records of the Contractor referred to in GC46 to be the increase or decrease in the cost incurred that is directly attributable to that change.

20.4 For the purpose of GC20.2, where a tax is changed after the date of submission of the Tender but public notice of the change has been given before that date of submission, the change shall be deemed to have occurred before the date of submission of the Tender.

GC21 PROTECTION OF WORK AND DOCUMENTS

21.1 The Contractor shall guard or otherwise protect the Work and its site, and protect the Contract, Specifications, plans, information, Material, Plant and real property, whether or not they are supplied by the Owner to the Contractor, against loss or damage from any cause, and he shall not use, issue, disclose or dispose of them without the written consent of the Owner, except as may be essential for the performance of the Work.

21.2 If any document or information given or disclosed to the Contractor is assigned a security rating by the Person who gave or disclosed it, the Contractor shall take all measures directed by the Engineer to be taken to ensure the maintenance of the degree of security that is ascribed to that rating.

21.3 The Contractor shall provide all facilities necessary for the purpose of maintaining security, and shall assist any Person authorized by the Owner to inspect or to take security measures in respect of the Work and its site.

21.4 The Engineer may direct the Contractor to do such things and to perform such additional Work, at no additional cost to the Owner, as the Engineer considers reasonable and necessary to ensure compliance with or to remedy a breach of GC21.1 to GC21.3.

GC22 PUBLIC CEREMONIES AND SIGNS

22.1 The Contractor shall not permit any public ceremony in connection with the Work without the prior consent of the Owner.

22.2 The Contractor shall not erect or permit the erection of any sign or advertising of the Work on its site without the prior written consent of the Engineer.

GC23 PRECAUTIONS AGAINST DAMAGE, INFRINGEMENT OF RIGHTS, FIRE AND OTHER HAZARDS

23.1 The Contractor shall, at his own expense, do whatever is necessary to ensure that:

23.1.1 No person, property, right, easement or privilege is injured, damaged or infringed by reason of the Contractor's activities in performing the Contract;

23.1.2 Pedestrian and other traffic on any public or private road or waterway is not unduly impeded, interrupted or endangered by the performance or existence of the Work or Plant;

23.1.3 Fire hazards in or about the Work or its site are eliminated and, subject to any direction that may be given by the Engineer, any fire is promptly extinguished;

23.1.4 The health and safety of all Persons employed in the performance of the Work is not endangered by the method or means of its performance;

23.1.5 Adequate medical services are available to all persons employed on the Work or its site at all times during the performance of the Work;

23.1.6 Adequate sanitation measures are taken in respect of the Work and its site; and

23.1.7 All stakes, buoys and marks placed on the Work or its site by or under the authority of the Engineer are protected and are not removed, defaced, altered or destroyed.

Without limiting any of the foregoing, the Contractor shall take all actions required or necessary to ensure compliance by all Persons employed in the performance of the Work or at the site of the Work, including the employees of the Contractor and Subcontractors and their employees, with the *Consolidation of Safety Act*, R.S.N.W.T. 1988, c.S-1 and any regulations thereunder.

23.2 The Engineer may direct the Contractor to do such things and to perform such additional Work as the Engineer considers reasonable and necessary to ensure compliance with or to remedy a breach of GC23.1.

23.3 The Contractor shall, at his own expense, comply with a direction of the Engineer made under GC23.2.

GC24 TOXIC AND HAZARDOUS SUBSTANCES

24.1 For the purposes of applicable legislation related to toxic and hazardous substances, the Owner shall be deemed to have control and management of the Work site with respect to existing conditions.

24.2 If the Contractor:

24.2.1 Encounters toxic or hazardous substances at the Work site, or

24.2.2 Has reasonable grounds, including disclosure by the Owner, to believe that toxic or hazardous substances are present at the Work site, which were not brought to the Work site by the Contractor or anyone for whom the Contractor is responsible

The Contractor shall:

24.2.3 Comply with all applicable safety and hazardous material legislation including but not limited to Nunavut Safety Acts, Asbestos Safety Regulations, WSCC Asbestos Abatement Codes of Practice, WSCC Hazardous Assessment Codes of Practice, and occupational health and safety legislation/regulations applicable to Nunavut;

24.2.4 Make all reports required by those legislations, regulations, rules and guidelines;

24.2.5 Take all reasonable steps, including stopping the Work, to ensure that no Person's exposure to any toxic or hazardous substances exceeds any applicable time weighted levels prescribed by applicable legislation at the Work site; and

24.2.6 Shall immediately report the circumstances to the Consultant and the Owner, in writing.

24.3 If the Owner and Contractor do not agree on the existence, significance of, or whether the toxic or hazardous substances were brought onto the Work site by the Contractor or anyone for whom the Contractor is responsible, the Owner shall retain and pay for an independent qualified expert to investigate and assess and recommend such matters (the "**Expert**"). The Expert's report shall be delivered to the Owner and the Contractor.

24.4 If the Owner and Contractor agree or if the Expert assess and recommends that the toxic or hazardous substances were not brought onto the Work site by the Contractor or anyone for whom the Contractor is responsible, the Owner shall, at the Owner's own expense, promptly:

24.4.1 Take all necessary steps, in accordance with applicable legislation in force at the Work site, to safely remove and dispose the toxic or hazardous substances;

24.4.2 Reimburse the Contractor for the costs of all steps taken pursuant to hiring the Expert; and

24.4.3 Extend the Contract time for such reasonable time as the Consultant may recommend in consultation with the Contractor and the Expert and reimburse the Contractor for reasonable costs incurred as a result of the delay.

24.5 If the Owner and Contractor agree or if the Expert assess and recommends that the toxic or hazardous substances were brought onto the Work site by the Contractor or anyone for whom the Contractor is responsible, the Contractor shall, at the Contractor's own expense, promptly:

24.5.1 Take all necessary steps, in accordance with applicable legislation in force at the Work site, to safely remove and dispose the toxic or hazardous substances;

24.5.2 Make good any damage to the Work, the Owner's property or property adjacent to the place of the Work;

24.5.3 Reimburse the Owner for reasonable costs incurred pursuant to hiring the Expert; and

24.5.4 Indemnify the Owner as required by GC 24.4.2.

24.6 If either party does not accept the Expert's findings, the disagreement shall be settled in accordance with GC62. If such disagreement is not resolved promptly, the parties shall act immediately in accordance with the Expert's determination and take the steps required in this GC24.4, it being understood that by so doing, neither party will jeopardize any claim that party may have to be reimbursed as provided herein.

GC25 INSURANCE

25.1 The Contractor shall, at his own expense, maintain insurance contracts in respect of the Work that are:

25.1.1 With insurance companies approved by the Owner. The insurance companies must comply with the *Insurance Act*, RSNWT (Nu) 1988, c I-4; and

25.1.2 In a form, of the nature, in the amounts, for the periods and containing the terms and conditions, if any, specified in GC55, GC56, GC57, GC58 and GC59.

GC26 INSURANCE PROCEEDS

26.1 If the Work or any part thereof is lost, damaged or destroyed and monies are paid to the Owner in respect of that loss, damage or destruction under an insurance contract maintained by the Contractor pursuant to GC25, the monies shall be held by the Owner for the purposes of the Contract.

26.2 The Owner may elect to retain the monies referred to in GC26.1 and in that event the monies belong to the Owner absolutely.

26.3 If an election is made pursuant to GC26.2, the Owner may cause an audit to be made of the accounts of the Contractor and of the Owner in respect of the part of the Work that was lost, damaged or destroyed for the purpose of establishing the difference, if any, between the aggregate of:

26.3.1 The amount of the loss or damage suffered or sustained by the Owner, including any costs incurred in respect of the clearing and cleaning of the Work and its site and any other amount that is payable by the Contractor to the Owner under the Contract, minus any monies retained pursuant to GC26.2; and

26.3.2 The amounts payable by the Owner to the Contractor pursuant to the Contract up to the date of the loss or damage.

26.4 The difference that is established pursuant to GC26.3 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.

26.5 When payment of a deficiency has been made pursuant to GC26.4, all rights and obligations of the Owner 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 GC26.3, be deemed to have been expended and discharged.

26.6 If an election is not made pursuant to GC26.2, the Contractor shall, subject to GC26.7, clear and clean the Work and its site and restore and replace the part of the Work that was lost, damaged or destroyed at his own expense as if that part of the Work had not yet been performed.

26.7 When the Contractor clears and cleans the work and its site and restores and replaces the Work referred to in GC26.6, the Owner shall pay him out of the monies referred to in GC26.1 so far as they will thereunto extend.

26.8 Subject to GC26.7, payment to the Owner pursuant to GC26.7 shall be made in accordance with the Contract but the amount of each payment shall be 100% of the amount claimed notwithstanding TP4.4.1 and TP4.4.2.

GC27 CONTRACT SECURITY

27.1 The Contractor shall obtain and deliver Contract Security to the Engineer in accordance with the provisions of GC53 and GC54.

27.2 If the whole or a part of the Contract Security referred to in GC27.1 is in the form of a security deposit, it shall be held and disposed of in accordance with GC41 and GC43.

27.3 If a part of the Contract Security referred to in GC27.1 is in the form of a labour and material payment bond, the Contractor shall post a copy of that bond on the work site.

GC28 CHANGES IN THE WORK

28.1 Subject to GC5, the Engineer may, at any time before he issues the Certificate of Completion:

28.1.1 Order work or Material in addition to that provided for in the plans and Specifications; and

28.1.2 Dispense with or change the dimensions, character, quantity, quality, description, location or position of the whole or any part of the Work or Material provided for in the plans and Specifications or in any order made pursuant to GC28.1.1, if that additional work or material dispensation, or change is, in his opinion, consistent with the general intent of the original Contract.

28.2 The Contractor shall perform the Work in accordance with such order, dispensations and changes that are made by the Engineer pursuant to GC28.1 from time to time, as if they had appeared in and been part of the original plans and Specifications.

28.3 The Engineer shall determine whether or not anything done or omitted by the Contractor pursuant to an order, dispensation or change referred to in GC28.1 increased or decreased the cost of the Work to the Contractor.

28.4 If the Engineer determines pursuant to GC28.3 that the cost of the Work to the Contractor has been increased, the Owner shall pay the Contractor the increased cost of the labour, Plant and Material that he necessarily incurred, calculated in accordance with GC46 and GC47.

28.5 If the Engineer determines pursuant to GC28.3 that the cost of the Work to the Contractor has been decreased, the Owner may reduce the amount payable to the Contractor under the Contract by an amount equal to the decrease in the cost of the labour, Plant and Material that was incurred calculated in accordance with GC46 and GC47.

28.6 An order, dispensation or change referred to in GC28.1 shall be in writing, signed by the Engineer and given to the Contractor in accordance with GC9.

GC29 INTERPRETATION OF CONTRACT BY ENGINEER

29.1 If, at any time before the Engineer has issued a Certificate of Completion referred to in GC42.1, 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:

29.1.1 The meaning of anything in the plans and Specifications;

29.1.2 The meaning to be given to the plans and Specifications in case of any error therein, omission therefrom, or obscurity or discrepancy in their wording or intention;

29.1.3 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;

29.1.4 Whether or not the labour, Plant or Material provided by the Contractor for performing the Work and carrying out the Contract are adequate to ensure that the Work will be performed in accordance with the Contract and that the Contract will be carried out in accordance with its terms;

29.1.5 What quantity of any kind of Work has been completed by the Contractor; or

29.1.6 The timing and scheduling of the various phases of the performance of the Work;

The question shall be decided by the Engineer whose decision shall be final and conclusive in respect of the Work.

29.2 The Contractor shall perform the Work in accordance with any decisions of the Engineer that are made under GC29.1 and in accordance with any consequential directions given by the Engineer.

GC30 WARRANTY AND RECTIFICATION OF DEFECTS IN WORK

30.1 Without restricting any warranty or guarantee implied or imposed by law or contained in the Contract Documents, the Contractor shall, at his own expense, rectify and make good any defect or fault that appears in the Work or comes to the attention of the Owner within twelve (12) months from the date of the Certificate of Substantial Completion referred to in GC42.2.

30.2 The Engineer may direct the Contractor to rectify and make good any defect or fault referred to in GC30.1 or covered by any other expressed or implied warranty or guarantee.

30.3 A direction referred to in GC30.2 shall be in writing, may include a stipulation in respect of the time within which a defect or fault is required to be rectified and made good by the Contractor, and shall be given to the Contractor in accordance with GC9.

30.4 The Contractor shall rectify and make good any defect or fault described in a direction given pursuant to GC30.2 within the time stipulated therein.

GC31 NON-COMPLIANCE BY CONTRACTOR

31.1 If the Contractor fails to comply with any decision or direction given by the Engineer pursuant to GC16, GC21, GC23, GC29 or GC30, the Engineer may employ such methods as he deems advisable to do that which the Contractor failed to do.

31.2 The Contractor shall, on demand, pay the Owner an amount that is equal to the aggregate of all costs, expenses and damage incurred or sustained by the Owner by reason of the Contractor's failure to comply with any decision or direction referred to in GC31.1, including the cost of any methods employed by the Engineer pursuant to GC31.1.

GC32 PROTESTING ENGINEER'S DECISIONS

32.1 The Contractor may, within ten (10) days after the communication to him of any decision or direction referred to in GC31.1, protest that decision or direction. After the ten (10) days has elapsed, the Contractor has no right of protest, unless by agreement of the Owner.

32.2 A protest referred to in GC32.1 shall be in writing, contain full reasons for the protest, be signed by the Contractor and be given to the Owner by delivery to the Engineer.

32.3 If the Contractor gives a protest pursuant to GC32.2, 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 lawful action he considers appropriate in the circumstances.

32.4 The giving of a protest by the Contractor pursuant to GC32.2 shall not relieve him from complying with the decision or direction that is the subject of the protest.

32.5 Subject to GC32.6, the Contractor shall take any action referred to in GC32.3 within three (3) months after the date that the Certificate of Completion is issued under GC42.1 and not afterwards.

32.6 The Contractor shall take any action referred to in GC32.3, resulting from a direction under GC31 within three (3) months after the expiry of a warranty or guarantee period and not afterwards.

32.7 Subject to GC32.8, if the Owner determines that the Contractor's protest is justified, the Owner 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.

32.8 Costs referred to in GC32.7 shall be calculated in accordance with GC46 and GC47.

GC33 CHANGES IN SOIL CONDITIONS AND NEGLECT OR DELAY BY THE OWNER

33.1 Subject to GC33.2 no payment, other than a payment that is expressly stipulated in the Contract, shall be made by the Owner to the Contractor for any extra expense or any loss or damage incurred or sustained by the Contractor.

33.2 If the Contractor incurs or sustains any extra expense or any loss or damage that is directly attributable to:

33.2.1 A substantial difference between the information relating to soil conditions at the Work site that is contained in the plans and Specifications or other documents supplied to the Contractor for his use in preparing his Tender, or a reasonable assumption of fact based thereon made by the Contractor, and the actual soil conditions encountered by the Contractor at the work site during the performance of the Contract; or

33.2.2 Any neglect or delay that occurs after the Effective Date on the part of the Owner in providing any information or in doing any act that the Contract either expressly requires the Owner to do or that would ordinarily be done by an owner in accordance with the usage of the trade.

The Contractor shall, within ten (10) days of the date that an event described in GC33.2.1 or GC33.2.2 occurred, give the Engineer written notice of the event and of his intention to claim for that extra expense or that loss or damage.

33.3 When the Contractor has given a notice referred to in GC33.2, he shall give the Engineer a written claim for extra expense or loss or damage within thirty (30) days of the date that the Certificate of Completion is issued and not afterwards.

33.4 A written claim referred to in GC33.3 shall contain a sufficient description of the facts and circumstances of the occurrence that is the subject of the claim to enable the Engineer to determine whether or not the claim is justified and the Contractor shall supply such further and other information for that purpose as the Engineer requires from time to time.

33.5 If the Engineer determines that a claim referred to in GC33.3 is justified, the Owner may make an extra payment to the Contractor in an amount that is calculated in accordance with GC46 and GC47.

33.6 If, in the opinion of the Engineer, an occurrence described in GC33.2 results in a saving of expenditure by the Contractor in performing the Contract, the Contract Price shall, subject to the GC33.7, be reduced by an amount that is equal to the saving.

33.7 The amount of the saving referred to GC33.6 shall be determined in accordance with GC46 and GC47.

33.8 If the Contractor fails to give a notice referred to in GC33.2 and a claim referred to in GC33.3 within the times stipulated, an extra payment will not be made to him in respect of the occurrence.

GC34 EXTENSION OF TIME

34.1 Subject to GC34.2, the Engineer may, on the application of the Contractor made before the day fixed by the Articles of Agreement for completion of the Work or before any other date previously fixed under this General Condition, extend the time for completion of the Work by fixing a new date, if in his opinion, causes beyond the control of the Contractor have delayed its completion.

34.2 An application referred to in GC34.1 shall be accompanied by the written consent of the bonding company whose bond forms part of the Contract Security.

GC35 ASSESSMENTS AND DAMAGES FOR LATE COMPLETION

35.1 For the purposes of this General Condition:

35.1.1 The Work shall be deemed to be completed on the date that the Substantial Certificate of Completion referred to in GC42.1 is issued; and

35.1.2 The phrase "period of delay" means the number of days commencing on the day fixed by the Articles of Agreement 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 GC34.1, and any other day on which, in the opinion of the Engineer, completion of the Work was delayed for reasons beyond the control of the Contractor.

35.2 If the Contractor does not complete the Work by the day fixed for its completion by the Articles of Agreement but completes it thereafter, the Contractor shall pay the Owner an amount equal to the aggregate of:

35.2.1 All salaries, wages, and travelling expenses incurred by the Owner in respect of Persons overseeing the performance of the Work during the period of delay;

35.2.2 The cost incurred by the Owner as a result of the inability to use the completed Work for the period of delay; and

35.2.3 All other expenses and damages incurred or sustained by the Owner during the period of delay as a result of the Work not being completed by the day fixed for its completion.

35.3 The Owner may waive its right to the whole or any part of the amount payable by the Contractor pursuant to GC35.2 if, in the opinion of the Owner, it is in the public interest to do so.

GC36 TAKING THE WORK OUT OF THE CONTRACTOR'S HANDS

36.1 The Owner may, at its sole discretion, take all or any part of the Work out of the Contractor's hands, and may employ such means as he sees fit to have the Work completed if the Contractor has:

36.1.1 Failed to, within six (6) days after receiving notice given by the Owner or the Engineer in accordance with GC9, remedied any delay in the commencement or any default in the diligent performance of the Work to the satisfaction of the Engineer;

36.1.2 Defaulted in the completion of any part of the Work within the time fixed for its completion by the Contract;

36.1.3 Become insolvent;

36.1.4 Committed an act of bankruptcy;

36.1.5 Advised that it will abandon or will not complete the Work, or has advised that it has abandoned the Work, or has abandoned the Work;

36.1.6 Made an assignment of the Contract without the consent required by GC3.1; or

36.1.7 Otherwise failed to observe or perform any of the provisions of the Contract.

36.2 If the whole or any part of the Work is taken out of the Contractor's hands pursuant to GC36.1:

36.2.1 The Contractor's right to any further payment that is due or accruing due under the Contract is, subject only to GC36.4, extinguished; and

36.2.2 The Contractor is liable to pay the Owner, upon demand, an amount that is equal to the amount of all loss and damage incurred or sustained by the Owner in respect of the Contractor's failure to complete the Work.

36.3 If the whole or any part of the Work that is taken out of the Contractor's hands pursuant to GC36.1 is completed by the Owner, the Engineer shall determine the amount, if any, of a holdback or a progress claim 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 Owner for any other loss or damage incurred or sustained by reason of the Contractor's default.

36.4 The Owner may pay the Contractor the amount determined not to be required pursuant to GC36.3.

GC37 EFFECT OF TAKING THE WORK OUT OF THE CONTRACTOR'S HANDS

37.1 The taking of the Work or any part thereof out of the Contractor's hands pursuant to GC36 does not operate so as to relieve or discharge the Contractor from any obligation under the Contract or imposed upon him by law, except the obligation to complete the performance of that part of the Work that was taken out of his hands.

37.2 If the Work or any part thereof is taken out of the Contractor's hands pursuant to GC36, all Plant and Material and the interest of the Contractor in all real property, licenses, powers and privileges

acquired, used or provided by the Contractor under the Contract shall continue to be the property of the Owner without compensation.

37.3 When the Engineer certifies that any Plant, Material, or any interest of the Contractor referred to in GC37.2 is no longer required for the purposes of the Work, or that it is not in the interests of the Owner to retain that Plant, Material, or interest, it shall revert to the Contractor.

GC38 SUSPENSION OF WORK

38.1 The Owner may, when in its opinion it is advisable to do so, require the Contractor to suspend performance of the Work either for a specified or an unspecified period by giving a notice of suspension to the Contractor in accordance with GC9.

38.2 When a notice referred to in GC38.1 is received by the Contractor in accordance with GC9, he shall immediately suspend all operations in respect of the Work except those that, in the opinion of the Engineer, are necessary for the care and preservation of the Work, Plant and Material.

38.3 The Contractor shall not, during a period of suspension, remove any part of the Work, Plant or Material from the work site without the consent of the Engineer.

38.4 If a period of suspension is thirty (30) days or less, the Contractor shall, upon the expiration of that period resume the performance of the Work. The Contractor is entitled to be paid by the Owner any extra accrued costs, calculated in accordance with GC46 and GC47, of any labour, Plant and Material necessarily incurred by him as a result of the suspension.

38.5 If, upon the expiration of a period of suspension of more than thirty (30) days, the Owner and the Contractor agree that the performance of the Work will be continued by the Contractor, the Contractor shall resume performance of the Work subject to any terms and conditions agreed upon by the Owner and the Contractor. The Contractor is entitled to be paid by the Owner any extra accrued costs, calculated in accordance with GC46 and GC47, of any labour, Plant and Material necessarily incurred by him as a result of the suspension.

38.6 If, upon the expiration of a period of suspension of more than thirty (30) days, the Owner and the Contractor do not agree that performance of the Work will be continued by the Contractor or upon the terms and conditions under which the Contractor will continue the Work, the notice of suspension shall be deemed to be a notice of termination pursuant to GC39.

GC39 TERMINATION OF CONTRACT

39.1 The Owner may terminate the Contract for convenience at any time by giving a notice of termination to the Contractor in accordance with GC9.

39.2 When a notice referred to in GC39.1 is received by the Contractor, he shall, subject to any conditions stipulated in the notice, forthwith cease all operations in performance of the Contract.

39.3 If the Contract is terminated pursuant to GC39.1, the Owner shall pay the Contractor, subject to GC39.4, an amount equal to the lesser of:

39.3.1 An amount, calculated in accordance with the Terms of Payment, that would have been payable to the Contractor had he completed the Work; and

39.3.2 An amount that is determined to be due to the Contractor pursuant to GC46,

39.3.3 Less the aggregate of all amounts that were paid to the Contractor by the Owner and all amounts that are due to the Owner from the Contractor pursuant to the Contract.

39.4 If the Owner and the Contractor are unable to agree about an amount referred to in GC39.3 that amount shall be determined by the method referred to in GC47.

GC40 CLAIMS AGAINST AND OBLIGATIONS OF THE CONTRACTOR OR SUBCONTRACTOR

40.1 The Owner may, in order to discharge lawful obligations of and satisfy lawful claims against the Contractor or a Subcontractor arising out of the performance of the Contract, pay any amount that is due and payable to the Contractor pursuant to the Contract directly to the obligees of and the claimants against the Contractor or Subcontractor.

40.2 A payment made pursuant to GC40.1, is to the extent of the payment, a discharge of the Owner's liability to the Contractor under the Contract and may be deducted from an amount payable to the Contractor under the Contract.

40.3 To the extent that the circumstances of the Work being performed for the Owner permit, the Contractor shall comply with all laws in force in Nunavut relating to payment periods, mandatory holdbacks, and creation and enforcement of mechanics' liens.

40.4 The Contractor shall discharge all his lawful obligations and shall satisfy all lawful claims against him arising out of the performance of the Work at least as often as the Contract requires the Owner to pay the Contractor.

40.5 The Contractor shall, whenever requested to do so by the Engineer, make a statutory declaration deposing to the existence and condition of any obligations and claims referred to in GC40.4.

40.6 GC40.1 shall only apply to claims and obligations that have been received by the Engineer in writing before payment to the Contractor pursuant to TP4.8 and within one hundred and twenty (120) days after a claimant:

40.6.1 Should have been paid in full under his contract with the Contractor or Subcontractor, where the claim is for money that was lawfully required to be held back from the claimant; or

41.6.2 Performed the last of the service, work or labour, or furnished the last of the Material pursuant to his contract with the Contractor or Subcontractor, where the claim is not for money referred to in GC40.6.1.

40.7 No interest will be paid to the Contractor on any monies withheld pursuant to GC40 due to a Contractor or Subcontractor's claim for non-payment.

GC41 SECURITY DEPOSIT - FORFEITURE OR RETURN

41.1 The Owner may convert the security deposit, if any, to its own use, if:

41.1.1 The Work is taken out of the Contractor's hands pursuant to GC36;

41.1.2 The Contract is terminated pursuant to GC39; or

41.1.3 The Contractor is in breach of or in default under the Contract.

41.2 If the Owner converts the security deposit pursuant to GC41.1, the amount realized shall be deemed to be an amount due from the Owner to the Contractor under the Contract.

41.3 Any balance of an amount referred to in GC41.2 that remains after payment of all losses, damage and claims of the Owner and others shall be paid by the Owner to the Contractor, if in the opinion of the Engineer, it is not required for the purposes of the Contract.

GC42 ENGINEER'S CERTIFICATES

42.1 On the date that, to the satisfaction of the Engineer, the Work has been completed and the Contractor has complied with the Contract and all orders and directions made pursuant thereto, the Engineer shall issue a Certificate of Completion to the Contractor.

42.2 If the Engineer is satisfied that the Work is sufficiently complete to be acceptable for use by the Owner, he may, at any time before he issues a Certificate of Completion, issue a Certificate of Substantial Completion to the Contractor.

42.3 A Certificate of Substantial Completion referred to in GC42.2 shall describe the parts of the Work not completed to the satisfaction of the Engineer and all things that must be done by the Contractor before a Certificate of Completion will be issued.

42.4 The Engineer may, in addition to the parts of the Work described in a Certificate of Substantial Completion, require the Contractor to rectify any other parts of the Work not completed to his satisfaction and to do any other things that are necessary for the completion of the Work.

GC43 RETURN OF SECURITY DEPOSIT

43.1 After a Certificate of Substantial Completion has been issued, the Owner shall, if the Contractor is not in breach of or in default under the Contract, return to the Contractor all or any part of the security deposit that, in the opinion of the Engineer, is not required for the purposes of the Contract.

43.2 After a Certificate of Completion has been issued, the Owner shall return to the Contractor the remainder of any security deposit, unless the Contract stipulates otherwise.

43.3 Interest shall not be paid on security deposits.

GC44 *INTENTIONALLY DELETED*

GC45 *INTENTIONALLY DELETED*

GC46 DETERMINATION OF COST - NEGOTIATION

46.1 The cost of the labour, Plant or Material for the purposes of the Contract shall be the amount agreed upon from time to time by the Contractor and the Engineer.

46.2 For the purpose of GC46.1, the Contractor, when requested by the Engineer, shall submit a detailed statement of the cost to him of the labour, Plant and Material referred to in GC46.1 to the Engineer.

GC47 DETERMINATION OF COST - FAILING NEGOTIATION

47.1 If the parties fail for any reason to achieve a determination of the cost of labour, Plant and Material, that cost shall be equal to the aggregate of:

47.1.1 All reasonable and proper amounts actually expended or legally payable by the Contractor in respect of the labour, Plant or Material that falls within one of the classes of expenditure described in GC47.2 that are directly attributable to the performance of the Contract, and

47.1.2 An allowance for profit and all other expenditures or costs, including overhead, general administration costs, financing and interest charges, and every other cost, charge and expense but not including those referred to in GC47.1.1 or of a class referred to in GC47.2, in an amount that is equal to:

(a) 10% of the sum of the expenses referred to in GC47.2.1;

(b) 20% of the sum of the expenses referred to in GC47.2.2 through GC47.2.8

47.2 For purposes of GC47.1.1 the classes of expenditure that may be taken into account in determining the cost of labour, Plant and Material are:

47.2.1 Payments to Subcontractors;

47.2.2 Wages, salaries and travelling expenses of employees of the Contractor while they are actually and properly engaged on the Work, other than wages, salaries, bonuses, living and travelling expenses of personnel of the Contractor generally employed at the head office or at a general office of the Contractor unless they are engaged at the Work site with the approval of the Engineer;

47.2.3 Assessments payable under any statutory authority relating to worker's compensation, unemployment insurance, pension plan or holidays with pay;

47.2.4 Rent that is paid for Plant or an allowance for depreciation of Plant owned by the Contractor that is necessary for and used in the performance of the Work, if that rent or allowance is reasonable and use of that Plant has been approved by the Engineer;

47.2.5 Payments for maintaining and operating Plant that is necessary for and used in the performance of the Work, and payments for effecting such repairs thereto as, in the opinion of the Engineer, 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;

47.2.6 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;

47.2.7 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

47.2.8 Any other payments made by the Contractor with the approval of the Engineer that are necessary for the performance of the Contract.

GC48 RECORDS TO BE KEPT BY CONTRACTOR

48.1 The Contractor shall:

48.1.1 Maintain full records of the expenditures of the Work together with all tender calls, quotations, contracts, correspondence, invoices, receipts and vouchers relating thereto; and

48.1.2 If relevant to a determination of cost under the Contract:

48.1.2.1 Make all records and Material referred to in GC48.1.1 available to audit and inspection by the Owner and the Comptroller General of the Government of the Nunavut or by Persons acting on behalf of either or both of them when requested;

48.1.2.2 Allow any of the Persons referred to in GC48.1.2 to make copies of and to take extracts from any of the records and Material referred to in GC48.1.1; and

48.1.2.3 Furnish any Person referred to in GC48.1.2 with information he may require from time to time in connection with such records and Material.

48.2 The records maintained by the Contractor pursuant to GC48.1.1 shall be kept intact by the Contractor until the expiration of two (2) years after the date that a Certificate of Completion was issued or until the expiration of such other period of time as the Owner may direct.

48.3 The Contractor shall cause all Subcontractors and all other Persons directly or indirectly having control of the Contractor to comply with GC48.1 and GC48.2 as if they were the Contractor.

GC49 LITIGATION

49.1 This Contract shall be deemed to have been made in Nunavut and shall be governed by the laws of Nunavut as far as applicable.

49.2 In the event of any legal action arising out of this Contract, the Contractor, if originating such action, may sue the Government of Nunavut in the name and style of "The Government of Nunavut" and the Government of Nunavut, if originating such action, may commence the action against the Contractor in his own behalf in the name and style of "The Government of Nunavut".

GC50 REQUIREMENTS FOR INUIT, LOCAL AND NUNAVUT CONTENT

50.1 The Contractor shall, in the performance of the Work, employ Inuit, Nunavut and local workers and use Inuit, Nunavut and local content to the greatest extent possible and at a minimum, no less than the amounts tendered by the Contractor in Appendix B-2 of the Tender. Workers shall meet all levels of proficiency, qualification and expertise as dictated by the authorities having jurisdiction and/or as defined in the Contract Documents.

50.2 The Contractor shall provide a schedule indicating the anticipated total monthly value of all Inuit, Nunavut and local content and labour to be expended in the execution of the Work. This

schedule shall provide the benchmark for ensuring compliance by the Contractor with the requirements for the use of Inuit, Local and Nunavut content during the Project.

50.3 For the Inuit labour bonus or penalty, as set out in the NNI Policy, the benchmark shall be the minimum prescribed level for Inuit labour identified on page 4 of Appendix J of the Tender.

GC51 MONITORING THE LEVEL OF INUIT, NUNAVUT AND LOCAL LABOUR

51.1 The Contractor is responsible to insure that every worker identified as Local or Nunavut meets the qualifying requirements of being ordinarily resident in Nunavut for the past twelve (12) months, and for local being a Nunavut resident ordinarily residing in the subject community for the past four (4) months. The Contractor may be required to provide proof of residency at any time throughout the Project.

51.2 Reasonable proof of Nunavut and local residency shall be any of the following:

51.2.1 The worker is listed on the Nunavut Tunggavik Inc. ("**NTI**") enrolment list and provides a physical address where he is residing; or

51.2.2 The worker has:

(a) Spent the last twelve (12) months ordinarily resident in Nunavut; and

(b) Has a valid Nunavut Health Care Card effective at least nine (9) months prior to start date of employment on the Project; and/or

(c) Has any other accepted proof of residency such as: a Nunavut General Hunting License, a Nunavut Driver's Licence, a lease or rental receipt, or a certified Schedule T222 Income Tax return from the previous year or proof that Income Tax was paid in the Nunavut during the previous tax year; and

(d) Provides a physical address where residing; or

51.2.3 The worker is included on a list of approved Local or Nunavut residents verified by the municipality of their residence.

51.3 The Contractor is responsible for ensuring that every worker identified as Inuit is on the NTI Inuit enrolment list, or would qualify to be on the list.

51.4 If requested by the Owner to do so, the Contractor shall obtain a signed consent form from a worker which verifies their residency and permits the Owner to obtain any and all information required to support the worker's claim of residency and/or Inuit status. A standard consent form is attached as page 4 of Appendix B of the Tender. A worker does not need to comply with the requirements of this clause 51.4 if the worker meets one of the requirements of GC51.2.

GC52 FAILURE TO COMPLY WITH PROPOSED INUIT, LOCAL AND NUNAVUT CONTENT

52.1 The parties to this Contract recognize the high cost of living in Nunavut, and the need to build the capacity of Inuit firms and labour in Nunavut, which is compensated for by the Owner

through the provision of bid adjustments for the use of Inuit, Nunavut and local labour and other Inuit, Nunavut and local content, and the provision of bonuses under the NNI Policy. It is a priority of the Owner to maximize the opportunities for Inuit, Nunavut and local workers and businesses to benefit from government contracts and the Owner may pay a premium in awarding its contracts to support this important objective.

52.2 It is a fundamental requirement of this Contract that the Contractor shall achieve, by the completion of the Contract, at least the amounts tendered on Appendix B-2 of the Tender, with the exception of decreasing the total amount of "other content" with corresponding equal or larger increases in the total amounts for local and non-local Inuit and Nunavut Content; specifically by:

52.2.1 Decreasing the total amount of "other payroll" and increasing the amount of Nunavut labour and the amount of local Nunavut labour, or the amount of Inuit labour and the amount of local Inuit labour; which the Contractor has identified in Appendix B-2 of the Tender; and

52.2.2 Decreasing the amount of "other content", excluding the amount of "other payroll" and increasing the amount of local Nunavut content (excluding local Nunavut labour) and the amount of Nunavut content (excluding Nunavut labour), or the amount of local Inuit content (excluding local Inuit labour) and the amount of Inuit content (excluding Inuit labour), which the Contractor has identified in Appendix B-2 of the Tender.

52.3 In the event that the amounts of Inuit, Nunavut and local expenditures actually achieved by the Contractor are less than the amounts identified in Appendix B-2, or as subsequently revised pursuant to clauses GC52.2 then the Owner may adopt one or more of the following remedies:

52.3.1 Withhold from any progress payment an amount equal to the difference between:

(a) The amounts identified in Appendix B-2 and the amount identified in the schedule of values referred to in GC50.2; or

(b) Any revised amounts pursuant to clause GC52.2 .1 and GC52.2.2 and the amount identified in the schedule of values referred to in GC50.2.

This amount may be released to the Contractor if at the date of a subsequent request the difference has been eliminated.

52.3.2 Deduct from any RCP or the request for substantial or final completion an amount equal to:

(a) 25% of the difference between the amounts identified in the schedule of values referred to in GC50.2 and the employment report and the amounts identified in Appendix B-2 of the Tender; and

(b) 25% of the difference between the amounts identified in clause GC52.2.1 and GC52.2.2 and the amount identified in Appendix B-2 or the schedule of values referred to in GC50.2 and the employment report.

52.3.3 Take the Contract out of the Contractor's hands, in accordance with GC36 and GC37; or

52.3.4 Any other remedy deemed reasonable by the Owner.

52.4 In the event that the amount of difference identified in GC52.2 is 15% or less of the amount proposed in Appendix B-2 of the Tender, the Owner, at its sole discretion, may waive the provisions of clause 52.3.

52.5 In the event that the minimum prescribed level of Inuit labour set out in Appendix J of the Tender is not met, then for future tenders where there are similar minimum prescribed levels for Inuit labour, the Contractor may be deemed "not responsible" as defined in the Government Contract Regulations.

GC53 OBLIGATION TO PROVIDE CONTRACT SECURITY

53.1 Where the Contract Price is:

53.1.1 Less than $250,000.00, the Engineer may require at the expense of the Owner the Contractor to provide Contract Security prescribed in GC54.

53.1.2 $250,000.00 or more, the Contractor shall, at his own expense, provide one or more of the forms of Contract Security prescribed in GC54.

53.2 If the Contractor is required to provide Contract Security pursuant to GC54, the security shall be delivered to the Engineer within fourteen (14) days after the date that the Contractor receives notice that his Tender or offer was accepted by the Owner.

GC54 PRESCRIPTION OF ACCEPTABLE CONTRACT SECURITY

54.1 If the Contractor is required to provide Contract Security pursuant to GC53, the Owner shall accept from the Contractor and the Contractor shall deliver one or more of the following forms of security:

54.1.1 A performance bond and a labour and material payment bond each in an amount that is equal to not less than fifty (50%) percent of the Contract Price;

54.1.2 A security deposit in an amount that is equal to 10% of the Contract Price; or

54.1.3 A form of security in an amount that is equal to 10% of the Contract Price from Nunavut Business Credit Corporation, subject to review and acceptance by the Owner, and any such security must at a minimum refer to the Project by name, contract number and the Contract Price.

54.2 A performance bond and a labour and material payment bond referred to in GC54.1.1 shall be in a form as approved by the Federal Treasury Board (Federal Contracts) and be issued by a bonding or surety company that is approved by the Owner.

54.3 A security deposit referred to in GC54.1.2, shall be in the form of:

54.3.1 "A letter of irrevocable guarantee" in the form authorized by the Contract authority payable to the Owner that is drawn on a bank to which the *Bank Act*, SC 1991, c 46 or *An Act Respecting Financial Services Cooperatives*, CQLR c C-67.3 applies; or

54.3.2 A certified cheque or bank draft from a bank acceptable to the Owner and made payable to the Owner.

54.4 The "letter(s) of irrevocable guarantee" referred to in GC54.3.1 shall be held uncashed until fourteen (14) days prior to their expiry date, unless the expiry date is extended for a further term, beyond the Contract completion date stated in the Articles of Agreement.

54.5 The certified cheque as referred to in GC54.3.2 shall be deposited by the Owner into the Owner's bank account.

GC55 COMPREHENSIVE GENERAL LIABILITY INSURANCE REQUIRMENTS

55.1 Comprehensive General Liability Insurance with limits of not less than five million dollars ($5,000,000.00) inclusive per occurrence for bodily injury, death, and damage to property including loss of use thereof. This insurance shall be maintained continuously from commencement of the Work until not less than twelve (12) months from the date of the Certification of Completion. The Owner is to be added as an insured under this policy. Such insurance shall include but is not limited to:

55.1.1 Premises, Property and Operations Liability;

55.1.2 Products and Completed Operations Liability;

55.1.3 Owners' and Contractors' Protective Liability;

55.1.4 Blanket Written Contractual Liability;

55.1.5 Non-Owned Automobile Liability;

55.1.6 Broad Form Property Damage Extension;

55.1.7 Use of explosives for blasting, shoring, excavating, underpinning, demolition, removal, pile driving and caisson work, work below ground surface, tunnelling and grading, as applicable;

55.1.8 Contingent Employer's Liability;

55.1.9 Person Injury Liability;

55.1.10 Employees as Additional Insureds;

55.1.11 Cross Liability With Respect To Additional Insureds;

55.1.12 Asbestos Abatement Liability, as applicable.

GC56 AUTOMOBILE LIABILITY INSURANCE AND AIRCRAFT AND WATER CRAFT LIABILITY REQUIREMENTS

56.1 Automobile liability insurance in respect of Contractor's owned and leased vehicles shall have limits of not less than two million dollars ($2,000,000.00) inclusive per occurrence for bodily injury, death, and damage to property, and when applicable:

56.1.1 S.E.F. No. 4a Explosives Endorsement;

56.1.2 S.E.F. No. 21b Blanket Fleet Endorsement.

56.2 Aircraft and watercraft liability insurance with respect to owned or non-owned aircraft and watercraft if used directly in or indirectly in the performance of the Work**,** including use of airport premises, with limits of not less than one million dollars ($1,000,000.00) inclusive per occurrence

for bodily injury, death and damage to property including loss of use thereof and limits of not less than one million dollars ($1,000,000.00) for aircraft passenger hazard. Such insurance shall be in a form acceptable to the Owner.

GC57 POLLUTION LIABILITY INSURANCE

57.1 The Contractor shall obtain and maintain at its own expense contractor's pollution liability insurance with limits of not less than ten million dollars ($10,000,000.00) per occurrence to cover claims that the Contractor may have to pay as a result of any claims caused by pollution (including for any clean-up costs). This policy must cover damages sustained by the Owner and any third parties. This policy must also cover claims arising out of the rendering, or failure to render, any professional services under this Contract (in relation with pollution claims).

57.2 This policy shall provide third party coverages for pollution damages caused by the Contractor performing insured services at a third-party site. The Owner is to be added as an additional insured without its ability to claim against the policy being affected.

GC58 PROPERTY INSURANCE (All "Risks" Course of Construction Insurance)

58.1 The Contractor shall obtain and pay for course of construction insurance for this Project as described in the following paragraphs:

58.1.1 All risks course of construction insurance on a very broad basis, to protect as insureds, all those who have direct participation in the construction of the Project, for claims which may arise as a result of loss or damage during course of construction;

58.1.2 Coverage for all risks of physical loss or damage or destruction while the Project is in course of construction, site preparation, reconstruction, repair, erection, fabrication, testing, and including all Materials, equipment machinery, structures, property, fitting, fixtures, betterment, and supplies of any nature whatsoever to enter into and form part of the finished Project while at the site of operations or elsewhere, all the property of the insureds or the property of others for which the insureds have assumed responsibility, or for whom the insured are required to carry insurance, including while on a river or lake crossing ferry in connection with land transportation, and including goods in transit to the site.

58.1.3 The term shall be from the earlier of the creation of any insurable interest (including but not limited to supply, storage or purchase of Material, supplies, Plant or equipment) or the commencement of work, to the date of the Certificate of Substantial Completion as certified by the Owner.

58.1.4 The limit of liability at the Project site is the estimated full completed value of the Project including, but not limited to, owner-supplied labour or Materials, reasonable profit, insurance costs, overhead, taxes, labour, administrative fees and all other expenses which are incurred as additional costs as a result of a partial or total loss.

58.1.5 The Contractor shall be responsible for a deductible to a maximum of fifty thousand dollars ($50,000.00).

GC59 GENERAL INSURANCE CONDITIONS

59.1 The amount of deductible on any insurance provided by Contractor shall be borne in its entirety by Contractor.

59.2 The Contractor waives all rights of recourse against the Owner for damages to Contractor's property or property of others for which Contractor is responsible and Contractor's insurers have no right of subrogation against the Owner.

59.3 All required insurance shall be endorsed to provide the Owner with thirty (30) days advance written notice of material change, cancellation or termination. Such notices shall be addressed to: the Owner (as noted on the Contractor's certificate of insurance), and sent in accordance with GC9.

59.4 Contractor shall provide, maintain and pay for any additional insurance which is required to be provided by the Contract Documents, or by law, or which he considers necessary to cover risks not otherwise covered by insurance specified in these conditions.

59.5 The Contractor shall complete the attached form Contractor's Certificate of Insurance, and shall within fourteen (14) days after the acceptance of the Tender deliver this completed certificate to the Owner. Substitute certificates will not be accepted; the Contractor must use this certificate.

GC60 ACCOMMODATION AND TRANSPORTATION

60.1 On contracts where a Commercial Room and Board Facility exists within the Community, the Contractor will be required to use a Commercial Room and Board Facility to house and feed all of its directly employed workers and workers employed by any Subcontractor or agent or any other business working on the Project. The Contractor, Subcontractors and agents shall not be required to use Commercial Room and Board Facilities for any workers who are local residents as defined in the NNI Policy, regardless of who they are employed by.

60.2 The following definitions shall apply to this section:

60.2.1 "Commercial Room and Board Facility" means a hotel or a bed and breakfast (tourist home) that holds a tourist establishment licence issued by the Owner under the *Travel and Tourism Act*, RSNWT (Nu) 1988, c T-7;

60.2.2 "Community" means the community in which the Project is located as defined in the Contract and includes the entire area within a twenty kilometre (20km) radius of the community.

60.3 The Commercial Room and Board Facility must meet the applicable requirements under the *Public Health Act*, RSNWT (Nu) 1988, c P-12, and regulations made thereunder, and the *Fire Prevention Act*, RSNWT (Nu) 1988, c F-6 and applicable regulations thereunder, and any other applicable Government of Nunavut or Federal legislation.

60.4 The Contractor may be permitted, in writing by the Owner, to house or feed employees in a camp or other alternative accommodation only if there are insufficient or inadequate Commercial Room and Board Facilities available in the subject Community, and the Contractor has provided documentation showing its unsuccessful attempts to house and feed workers due to unavailability of Commercial Room and Board Facilities in the Community (such as letters of regret or no

vacancy from all available local facilities), or if a facility fails to maintain the standards set out in 60.2 and 60.3 above.

60.5 The Contractor will comply with Appendix "H" of the *Instructions to Bidders*.

GC61 FORCE MAJEURE

61.1 Neither party shall be responsible for any delay or failure to perform its obligations under this Contract where such failure or delay is due to fire, flood, explosion, war, embargo, governmental action, terrorism, act of a public authority, act of God or any other cause beyond its control, except labour disruption, without additional notice.

61.2 The Consultant acknowledges that Nunavut frequently experiences severe weather, shortages in supplies and fuel, and interruptions of power service and communications that might constitute force majeur elsewhere, but shall not constitute a force majeur under this Contract. The Consultant will plan for those eventualities as much as possible.

61.3 In the event a force majeure event occurs which delays or threatens to delay performance of its obligations by a party, that party shall give prompt notice to the other party and shall take all reasonable steps to eliminate the cause or ameliorate the potential disruption and consequent losses.

61.4 Should the force majeure event last for longer than thirty (30) days, the Owner may terminate this Contract, in whole or in part, without further liability, expense or cost of any kind.

GC62 ALTERNATIVE DISPUTE RESOLUTION

62.1 The parties agree that, both during and after the performance of the terms of this Contract, each of them shall make bona fide efforts to resolve by good faith negotiations any dispute between them, which negotiations shall not terminate until the designate authorities of the Contractor and the Owner shall have considered the dispute. The parties shall, on a without prejudice basis, provide frank, candid and timely disclosure of all relevant facts, information and documents to facilitate such negotiation.

62.2 If the dispute is not resolved in the foregoing manner, then the dispute shall be finally settled by arbitration. This Contract specifically excludes the power of the Court to refuse to stay judicial proceedings. The arbitration shall take place in Iqaluit, Nunavut unless otherwise agreed.

62.3 Within twenty (20) days after the party requesting arbitration has given written notice of such request to the other party, the parties (acting reasonably) shall jointly appoint a single arbitrator. If the parties are unable to appoint a single arbitrator within the said twenty (20) day period, then the Contractor shall appoint one arbitrator and the Owner shall appoint one arbitrator, both such arbitrators to be appointed within ten (10) days after the end of the aforementioned twenty (20) day period, with a third arbitrator then being selected by those two arbitrators within five (5) days following their appointment. The third arbitrator shall alone conduct the arbitration. The arbitration will be final and binding and not subject to appeal and the procedures and substance of the arbitration will be governed by the *Arbitration Act*, RSNWT (Nu) 1988, c A-5.

62.4 Notwithstanding the foregoing, the Owner may at its sole option refer a particular dispute regarding confidential information, frustration or fundamental breach of the Contract to the Nunavut Court of Justice and not to arbitration.

GC63 SUPPLEMENTARY TERMS AND CONDITIONS

63.1 The Contractor and the Owner have mutually agreed upon the following supplemental terms, and nothing in the Tender will supersede the terms listed in this part:

END OF GENERAL CONDITIONS

SPECIFICATIONS

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SPECIFICATIONS

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LIST OF DRAWINGS

PART I - GENERAL

1.1 Location and Terrain

1. The Hamlet of Coral Harbour or Salliq, Nunavut is located on Southampton Island in the northern side of Hudson Bay. It is found at 64'08° N latitude and 83'09° W. In relation to other communities, Coral Harbour is 475 km northeast of Rankin Inlet.

2. Coral Harbour topography consists of sand to gravel landscape with low granite outcrops and inland lakes. Vegetation is typical arctic tundra and consists of mosses, lichens and grasses. The elevation at the Coral Harbour airstrip is approximately 64 meters above sea level.

1.2 Climate

1. July mean high and low temperatures are 13.9° C and 4.6° C.

2. January mean high and low temperatures are -25.8° C and -34.1° C.

3. Coral harbor receives a total of 28.5 cm of rainfall and 133.5 cm of snowfall per year.

1.3 Population

1. Population is approximately 769 people (2006).

2. Languages spoken: English and Inuktituk.

1.4 Services

1. Commercial accommodation services are available.

END OF SECTION 01001

PART 1 - GENERAL

1.1 Work Under this Contract

1. The Work under this contract consists of construction of the following:

   Petroleum Storage System Upgrades, Coral Harbour, Nunavut

   For the Government of the Nunavut, hereinafter called the Owner, including all equipment and appurtenances therein, as shown on the Contract Drawings and/or as specified herein, in accordance with the terms of this Contract.

1.2 Work Included

1. The Work, unless specifically stated otherwise, shall include the furnishing of all materials, products, labour and transportation necessary to complete the Work. The intent is that the Contractor provides a complete job.

2. The Work shall not be deemed complete until all components are placed in operation by the Contractor, and are operating to the satisfaction of the owner.

3. Any minor item of the Work not called for in the Specifications or shown on the Drawings, but is clearly required to meet the intent of the design and normally provided for the proper operation of such a facility, shall be provided as if specifically called for in the Contract Documents.

1.3 Documents Required

1. Maintain at the job site at least one copy of each of the following:

   1. Contract Drawings
   2. Specifications
   3. Two Sets of Record Drawings and Specifications
   4. Addenda
   5. Change Orders
   6. Reviewed Shop Drawings
   7. Modifications to the Contract
   8. Field Test Reports
   9. Construction Schedule
   10. Manufacturer's Installation and Application Instructions
   11. Occupational Health and Safety Regulations

1.4 Specifications

1. Sentence structure in parts of the Specifications is abbreviated, and phrases such as "shall be," and "the Contractor Shall" are deliberately omitted. Such sentences shall be read as though they are complete.

2. The use of the word "provide" means "supply and install"; or "supply labour and materials for the installation of". It does not mean supply only.

3. The word "concealed" in connection with piping, conduit, electrical work, controls and wherever used in other sections shall mean, "hidden from sight" as in ceiling spaces or furred out spaces.

4. The word "exposed" in connection with piping, conduit, electrical work, controls and whenever used in other sections shall mean "visible to persons within a building, in normal working areas.

1.5 Standards

1. Wherever Standards (i.e., CSA, ASTM and such) are referred to in these Contract Documents the current edition at the date of closing of tenders shall apply.

2. Where there is a clear conflict between the Standards and the Contract Documents, the Engineer shall, in the first instance, give an interpretation of the intent of the Contract.

3. Where there is an ambiguity between the Standards and any term of these Contract Documents, the Engineer shall, in the first instance, give an interpretation of the intent of the contract.

PART 2 - PARTICULAR SCOPE OF WORK

The Contractor shall note that the WORK, as described in the CONTRACT DOCUMENTS, is intended to be carried out over a single construction season.

1. The WORK is located in the Community of Coral Harbor at the main-site bulk petroleum storage facility - See Section 01001 for Community and Environmental Information.

2. Definitions:

    1. CONTRACTOR: the general contractor for the fuel storage facility as described in the GENERAL CONDITIONS of the contract.

    2. ENGINEER: the ENGINEER as described in the GENERAL CONDITIONS of the Contract. This position is normally filled by the GN Project Officer designated as in charge of this work.

    3. CONSULTANT: the design consultant for this work. As directed by the ENGINEER from time to time, correspondence, schedules, shop drawings, progress payments, etc., sent from the CONTRACTOR to the ENGINEER will normally be addressed to the CONSULTANT with a carbon copy to the ENGINEER. The CONSULTANT will provide recommendations to the ENGINEER as to the acceptability of the correspondence and, with the approval of the ENGINEER, inspect the work for the ENGINEER and provide comments upon the work. The CONSULTANT'S direction to the CONTRACTOR will be sent to the ENGINEER for approval and then forwarded to the CONTRACTOR (with a carbon copy to the ENGINEER). All instructions, change orders involving a change in the contract will be sent to the ENGINEER and issued directly by the ENGINEER to the CONTRACTOR.

4. RESIDENT ENGINEER: A representative of the CONSULTANT who may be on site periodically during construction. All correspondence will continue to be directed to the CONSULTANT and ENGINEER as directed above with carbon copies given to the RESIDENT ENGINEER. The RESIDENT ENGINEER will provide daily and weekly reports to the ENGINEER on both quantity and quality of the progress of construction.

5. OTHER CONTRACTORS: Another contractor whose work is outside the scope of this contract.

6. The WORK to be carried out includes but is not limited to:

    1. The WORK shall be located at the existing location of the Main Site Bulk Fuel Storage Facility. The approximate location of the facilities with respect to the community is shown on the DRAWINGS.

    2. The Contractor is advised that storage and dispensing capability shall be maintained throughout the period of construction. Interruptions shall be minimized and approved by the Engineer, when absolutely necessary, they shall be done in accordance with Section 01030, item 1.8.

    3. Mobilization to site of machinery and equipment necessary to perform the WORKS.

    4. Purchase and delivery to site of all materials and equipment for the project, as called for or inferred on the DRAWINGS and in the SPECIFICATIONS.

    5. Provision of the continued ability to dispense diesel fuel, Jet fuel and gasoline during the construction and winter laydown periods.

    <u>Main Site Bulk Fuel Storage Facility</u>

    1. Temporary relocation of fencing and rebuilding of existing and/or new access road over containment berm.

    2. Provision of temporary security fencing as required.

    3. Site preparation and placement of new support materials for modification of Tank No. 3.

    4. Empty all horizontal tanks containing Jet A-1 in to Tank No. 1.

    5. Empty, clean, gas-free, and prepare all horizontal tanks for temporary gasoline storage.

    6. Transfer all gasoline fuel from Tank No. 3 to horizontal tanks for the duration of the API 653 – repair work of Tank No. 3.

7. Empty, clean, maintain gas-free, and prepare existing Tank No. 3 for API 653 - repair work as per drawings.

8. Install shell jacking lugs, and temporary shell bracing to prevent out-of-round deformation.

9. Cut existing tank bottom and remove in sections.

10. Inspect existing tank foundation and remove unsuitable material.

11. Provide new material under tank, level and compact.

12. Raise, level, and compact the existing aggregate foundation and re-grade the area around the tank as indicated.

13. Install new tank bottom, nozzles, re-pads, and mainways.

14. Supply and install existing on-site fill diffuser pipe provided by GN.

15. Tie in marine cargo and marketing line to Tank No.3 as indicated on drawings. Provide piping modifications as indicated.

16. Upgrading of existing pipelines to suit tank re-allocations, general piping for new valves, fittings, supports and other equipment required to properly and safely operate this facility. All works shall be in accordance with applicable standards of this time period, most notably the Canadian Environmental protection Act (CEPA), the National Fire Code of Canada, API 650, API 653 and other associated standards.

17. Install new static electricity grounding.

18. Preform NDT and Hydrotest of tank 3 and piping.

19. Preparation and painting of Tank No. 3 and its piping and miscellaneous metal surfaces.

20. Following the API inspection of Tank No. 1 by other Contractor, Contractor must make appropriate piping configuration to ensure Tank No. 1 will be ready to receive gasoline during next fuel resupply and demobilize.

21. Transfer gasoline from horizontal tanks and Tank No. 1 to Tank No. 3 and commission gasoline system.

7. Clean and repurpose Tank No. 1 for Diesel fuel use following fuel transfer of gasoline to Tank No.3.

8. Strapping and calibration of all tanks subsequent to construction and inspections.

9. Repair containment berms as required.

10. Repair and/or replace existing fencing as required.

11. Start-up and Trial Operation shall be as described in Division 15 - Mechanical, of the SPECIFICATIONS.

12. All electrical circuits in panel boards, switches, starters, contactors, timers, etc. shall be properly identified and labeled with permanent and identifiable lamacoid labels.

13. The Contractor shall supply a list of all the unused materials to the Owner. The Owner has the first right to all materials, equipment, etc., not used.

14. Should the Contractor wish to change the scope of work outlined, they shall have to identify the proposed changes to the Engineer at the start of the project and prior to proceeding with work. Approval from the Engineer, in writing, is required prior to work commencing.

15. The Contractor shall, at the start of the project and prior to proceeding with any field work, arrange with the Engineer for the establishment of reference lines and a benchmark. Once the base lines and benchmark are set, it shall be the responsibility of the Contractor to protect and safeguard same throughout the construction period.

16. The Contractor shall include in his tender price the costs of transportation/shipping and handling of materials and all associated costs.

17. The Contractor shall take all necessary safety precautions while performing work so as not to create sparks or other dangerous situations which could cause an explosion.

18. Smoking or other "Hot Work" activity shall not be performed near designated storage facilities areas containing flammable products without appropriate approval and safety provisions.

19. The Contractor shall test the installations as described in Section 01410- Documentation, Testing and Acceptance Procedures.

20. The Contractor shall prepare and provide all the documentation and test information necessary to comply with Interim Inspection as outlined in Section 01410- Documentation, Testing and Acceptance Procedures.

21. The Contractor shall carry out any incidental works to make the facilities complete and to the satisfaction of the Engineer.

22. Carry out all clean-up and repair work necessary to existing roadways, ditches, etc. affected by new work and to the satisfaction of the Engineer.

Schedule

1. Scheduling of the WORK and adherence to the Schedule are of prime importance. The Contractor shall provide a schedule in accordance with Section 01310 Construction Schedules within fourteen (14) days of contract award.

2. It is the intent of these construction documents to allow the Contractor latitude in the scheduling and development of the logistics for accomplishing the final design. Toward that end, these documents provide milestones and deadlines for the overall project as well as performance specifications. The Contractor is obliged to meet the milestones, deadlines and performance specifications as detailed in this Section of specification documents. The Contractor will, in consultation with the Engineer, and subject to the approval of the Engineer, develop the specific methods for accomplishing the tasks outlined in these documents.

3. The Owner and Engineer must be notified of any changes to the scheduled tests as identified in Section 01 40 00 – Quality Control no fewer than 14 days before the scheduled date. The Consultant will notify the Contractor with written confirmation of travel plans, any schedule changes following this may result in the Contractor bearing all cost incurred by the Consultant due to the delay or schedule change, including but not limited to time on site, accommodations, and or travel costs.

4. The Contractor is fully responsible for providing an implementation schedule that is workable, and for following up and maintaining the currency of that schedule. The Contractor's chosen work schedule should be used to prepare the year-to-year work break down, in TENDER FORM C1. **All existing tankage and resupply piping shall be available for resupply for each construction year.** If Tank No. 3 cannot be ready the following fuel distribution must be followed:
    - Tank No. 9 to receive Jet A-1
    - Tank No. 2 to receive Diesel
    - Tank No. 1 to receive Gasoline

    In such event, the Contractor will be responsible for the repurposing Tank No. 1 to receive Gasoline.

5. Any sealift cargo delivery schedule included in these specifications or front-end contract are to be considered tentative. The Contractor is responsible to accommodate and keep track of any changes to the delivery schedule.

Contractor Responsibilities

1. Upon award of the Contract, the Contractor shall, within two weeks, submit to the Consultant and Engineer for approval shop drawings and technical literature for all materials and equipment pertaining to the WORKS. All O&M data and manufacturer's literature must be received by the Consultant before the first mobilization payment is authorized.

2. All Fuel that is left in the existing horizontal tanks will be transferred out by the Contractor to make room for the gasoline in Tank No. 3. Any waste oil or sludge left in any of the horizontal tanks will be disposed of in an approved manner by the Contractor. The Departmental Representative shall be on site to supervise the

transfer and disposal, as well-as record the volumes. The tank charts will be required prior to the transfer.

3. Earthworks and other work on the new facility will begin by the first week of June or as weather permits.

4. Sufficient lead time must be allowed so that all certification testing, tank strapping, etc. are completed in order for the tank to be commissioned and returned to service within the summer construction period.

5. All work of this Contract relative to tanks, piping, electrical and dispensing must be completed by October 1, 2015. The Contractor must ensure that all tanks are tested and cleaned and piped and ready to received product so as to not disrupt the delivery of fuel.

6. Safety and continuity of fuel delivery is paramount at all times.

Project Construction Sign

1. Erect and maintain a Construction sign, as supplied by the owner minimum 1200 x 2400 mm. The sign is to be located where directed by the Engineer.

2. The Contractor will be responsible for ensuring that the erected sign remains plumb, vertical and upright for the duration of the project.

3. Sign supports to be two 89 x 89 mm structural spruce, fir or cedar. Fasten sign to supports with stainless steel or hot dip galvanized screws.

4. Once the WORK is complete, carefully dismantle project sign and deliver to owner in Coral harbor.

PART 3 – FUEL MANAGMENT SEQUENCE OF EVENTS

Sequence of Event

The contractor is required to follow without deviation unless otherwise approved by the Owner in writing, the detailed sequence of events as listed below to ensure harmonious use of the facility and available tank storage spaces by the Contractor and other Contractor to complete their scope of work in its entirety.

1. Confirm fuel levels of Tank No.3 and all horizontal tanks upon arrival to site.

2. Inspect, empty Jet A-1 fuel into Tank No. 1 , and clean the number of horizontal tanks required to hold all gasoline contained in Tank No. 3.

3. Transfer all gasoline from Tank No. 3 to horizontal tanks.

4. Clean and gas-free Tank No. 3 prior to tank bottom replacement activities.

5. Transfer gasoline from all the horizontal tanks and Tank No. 1 to Tank No.3 after commissioning. Repurpose Tank No. 1 for future gasoline delivery.

6. Dispose of any sludge or waste oil material in the horizontal tanks in an approved manner.

7. Gas-free and clean all horizontal tanks.

8. Gas-free, clean Tank No. 1 and make ready for future diesel use.

PART 4 - PARTICULAR DESIGN DATA

The Contractor shall note that the following particular design data for the new tank and associated materials based on the *Design Rationale for Fuel Storage and Distribution Facilities* annexed by the Government of Nunavut, Petroleum Products Division.

1. Tank to be repaired to the latest API Standards, 650 and 653.

2. Bolt holes in shell nozzles shall straddle vertical centerline of tank.

3. Refer to specifications for painting requirements.

4. Tank Design Criteria:

    a. Design pressure: not to exceed 18 kpa

    b. Wind load: 190 km/hr

    c. Min. design metal temp: -46 ^{0} Celcius

    d. Max. operating temp: 37.7 ^{0} Celcius

    e. Product stored: Gasoline

END OF SECTION 01010

1. WORK SEQUENCE

.1 The Work shall be executed in a timely manner to ensure that construction is completed by the completion dates outlined in these documents. It is **critical** that planning, purchasing and preparation for delivery of all equipment and materials required for first year construction begin as soon as the contract is awarded. This includes preparation and arrangements for any air charters, if deemed necessary, to complete the Work on schedule.

.2 It is critical that the tank steel or other long delivery items (if required) be ordered immediately and prepared (including rolling and, if possible, sandblasting and priming of the exterior of the shell and roof plates) ready for shipment by vessel. Space for vessel transport usually needs to be booked well in advance with the designated resupply shipping company.

.3 The Contractor must coordinate activities with other Contractors to ensure the timely completion of the project.

.4 The Contractor shall confirm the dates and make all arrangements for shipping.

.5 Seasonal active layer and snow melt is usually sufficiently advanced by the end of May- early June, for earthwork to begin. Consequently, the Pre-Construction Meeting is generally scheduled for the first week in June, on site.

.6 **Compliance with NNI Policy must be followed.**

.7 The construction season is normally from the beginning of June to the end of October.

.8 **Note: All existing tankage and resupply piping shall be available for resupply, for each construction year.**

.9 Depending on the project scope, second year construction shall generally include *Substantial Completion of Construction*, ready for inspection at least two weeks before fuel resupply. Completion of deficiencies can be completed after the inspection provided all tankage and piping is available for fuel resupply.

.10 The Contractor shall consult with the Engineer on acceptable methods of carrying out the Work, the space available for storage of materials, erection of temporary facilities, location of granular borrow areas, and any other information pertinent to the Work. All costs associated with the forgoing shall be borne by the Contractor.

.11 The Contractor must ensure that gasoline dispensing capabilities to the community not be interrupted during regular dispensing hours.

.12 The Contractor's work must not impact the other Contractor's ability to complete their task by end of 2015 construction season. A description of the other Contractor's scope of work is as followed:

- API inspection of Tank No. 1
- API inspection of Tank No. 2
- Painting and commissioning of Tank No. 9

END OF SECTION 01014

1. THE CONSTRUCTION SITE

.1 The Owner will provide the lands upon which the Work is to be constructed.

2. CONTRACTOR'S USE OF THE SITE

.1 The Contractor will be required to share the site with another Contractor having a separate scope of work. The Contractor shall not encroach the other Contractor's working area with parked vehicles, equipment, tools, material, or any other obstructions without the consent of the other Contractor. Both parties involved will be required to take reasonable measures to allow each other proper conditions to complete the WORKS.

.2 The Contractor shall permit access to the Owner, the Engineer and other Contractors on the site for purposes of inspections, reviews, tests and carrying out work related to the Work.

.3 The Contractor shall have exclusive access to Tank No. 3, all the horizontal tanks, and their immediate surroundings.

.4 The Contractor shall provide access to the site for the local petroleum products operator for continued dispensing operations, resupply operations, product sampling, inspection, etc.

.5 The Contractor shall keep fuel dispensing systems operational throughout the duration of the Work, adhering to all safety requirements including maintaining secondary containment.

END OF SECTION 01015

1. SPECIAL PROJECT PROCEDURES

.1 The Owner reserves the right to let other contracts on the site of the Work related to the project and to do work with own forces on the project.

.2 The Owner shall coordinate the work and insurance coverage of other Contractors insofar as it affects the Work of this Contract.

.3 The Contractor shall coordinate work with that of other contractors and tie into works constructed by others as specified or shown in the contract documents.

.4 The Contractor shall report to the Engineer any apparent deficiencies in the work of other Contractors that would affect the Work of this contract as soon as they come to their attention, and shall confirm such a report in writing. Failure by the Contractor to so report shall invalidate any claims against the Owner by reason of deficiencies in the work of other Contractors, except as to those of which the Contractor could not reasonably be aware.

2. STORAGE FACILITIES AND USE OF PREMISES

.1 The Contractor may use such facilities and areas as the Owner may be willing and able to designate for the storage of material and product for the Work, without charge to the Contractor.

.2 Should the Contractor require additional facilities or areas, the Contractor shall make all the necessary arrangements with the Owners or occupants of such other facilities or areas and shall pay all rentals and all damages caused by such occupancy.

.3 The Contractor shall confine his apparatus, the storage of material and product and the operations of his workers to limits indicated by law, ordinances, permits or directions of the Engineer and the Community, and shall not unreasonably encumber the premises with his material, product or equipment.

.4 The Contractor shall enforce all regulations regarding signs, advertisements, fires, smoking and storage of flammable material or product.

.5 The Contractor shall not load or permit any part of the Work or of the Owner's structures to be loaded in any way that will endanger their safety.

3. USE OF COMPLETED PORTIONS OF THE WORK

.1 The Owner shall have the right to take possession of and use any completed or partially completed portions of the Work, notwithstanding that the time for completing the Work or such portions of the Work may not have expired. Taking possession of and use shall not be deemed acceptance of the Work.

.2 If such prior use increases the cost of the Work, the Contractor shall be entitled to such compensation as the Engineer in the first instance may determine.

4. DUMPING OF MATERIALS

.1 The Contractor shall make arrangements for the disposal of all waste material at the Community solid waste disposal facility.

.2 All waste oil form the horizontal tanks shall be shipped out of the community and disposed of in an approved manner.

5. TRAFFIC RESTRICTIONS

.1 The Contractor shall make every effort to keep disruptions to traffic flow to a minimum.

6. KNOWLEDGE OF THE SITE

.1 The Contractor shall make himself aware of the available methods of transportation for equipment and personnel to the site. Contractors are cautioned that transportation may only be by air or tug/barge service to some communities.

.2 Climatic data for design purposes is based on *The National Building Code Supplement No. 1,* "*Climatic Information for Building Design in Canada*", latest edition and consultation with the Department of Transport and also Environment Canada. The Contractor shall also refer to Section 01010, Part 2, regarding particular climatic design data.

.3 The Contractor shall have no claim on account of his failure to familiarize himself with site conditions prior to bidding on this contract. He is advised that local availability of construction equipment and labour is limited and other projects may require the equipment during the short construction season. Early arrangement should be made with the Community Office, Government Liaison Officer and/or local contractors for use of any equipment available.

.4 The Contractor is responsible for his own accommodation and services at the site as per the General Conditions of the Contract.

7. CONTINUITY OF PETROLEUM PRODUCTS DISPENSING

.1 The Contractor shall ensure that the fuel dispensing and metering facilities are fully operational throughout the project, during normal dispensing hours. Temporary shutdowns of the fuel dispensing system, during normal hours, of less than two (2) hours duration may be approved by the Engineer, in cooperation with the local PPD contract operator, for critical construction work.

.2 No dispensing facility is to be operated without the permanent or approved temporary metering equipment in service.

.3 All shutdowns must be coordinated with the local Petroleum Products contract operator. The operator and the Engineer must be advised at least 48 hours in advance of a proposed shutdown, with complete details of the nature of the shutdown, i.e., piping, equipment and metering devices affected, and the proposed timing and duration of the shutdown. The Contractor must receive the

approval of both the operator and the Engineer before proceeding with the shutdown. The Engineer has ultimate authority for approval of the shutdown and shall notify the Regional Petroleum Products Officer prior to any major disruption of product dispensing facilities. Longer shutdowns must be approved through the Regional Petroleum Products Officer.

.4 Prior to initiation of construction, the Engineer, in cooperation with the Regional Petroleum Products Officer, shall advise the local Petroleum contract operator of the contents of this Clause and shall provide him with the name and location of the Engineer. Approved temporary metering facilities shall be in operation until new facilities are accepted for permanent use. Temporary metering shall be to the approval of the Regional Petroleum Products Officer.

.5 Contractor to reconfigure piping layout to allow the horizontal tanks to supply the community dispensers following the gasoline transfer form Tank No. 3 to horizontal tanks.

8. COORDINATION WITH ANNUAL FUEL RESUPPLY OPERATION

.1 In accordance with the approved construction schedule, the Contractor shall ensure that all facilities including pipelines, shore connections, metering and tankage are complete, tested and approved for filling, when product is delivered to the site during each annual fuel resupply operation. All new and existing tankage must be completed for resupply as indicated in Section 01014. The Contractor must check the resupply dates for each year of the contract and coordinate all operations around the annual fuel resupply dates. The Contractor shall plan and allow for all tankage being full on completion of the resupply operation during each year of the contract.

.2 The Contractor shall be responsible for any delays in fuel delivery resulting from facilities not being available to receive product due to the Contractor’s operations and scheduling. The Contractor shall pay any and all charges resulting from such delays, including all extra barging and demurrage costs, alternate product storage costs and/or alternate product delivery costs.

.3 The Contractor shall contact the applicable carrier for scheduled shipping dates. The Owner will not accept any responsibility for any changes in the actual shipping dates.

END OF SECTION 01030

1. GENERAL

.1 Although the Specifications set forth the work of various trades under separate Divisions, it is not intended that the work of that trade is limited to, or includes all work set forth in that particular Division. The Contractor shall delegate the extent of the work to be done by the various trades and shall coordinate execution of the work by all trades.

.2 Although the Specifications are separated into titled Divisions, neither the Engineer nor the Owner will be an arbitrator to establish limits of any agreements between the Contractor and subcontractors.

.3 The Contractor is advised that no work shall be covered over until such is first approved by the Engineer. In general, work performed by one trade shall be inspected and accepted by the Engineer, before it is covered by the work of another trade, and the Contractor shall inform the Engineer accordingly.

2. COORDINATION

.1 The Contractor shall examine the Drawings before tendering and beginning the Work and report to the Engineer any discrepancies or interferences.

.2 Electrical and mechanical system layouts shown on the Drawings may be diagrammatic with locations of outlets, fittings and equipment approximate. Exact routing of conduits, wiring, pipes and tables shall be determined and coordinated by the Contractor to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Obtain the Engineer’s approval for locations of outlets, fittings and equipment.

3. CUTTING AND PATCHING

.1 The Contractor shall do all cutting, fitting, or patching of the Work that may be required to make its several parts come together properly and fit it to receive or be received by work of other contractors shown in, or reasonably implied by, the contract documents.

.2 Any cost caused by cutting and patching due to ill-timed work shall be borne by the Contractor.

.3 The Contractor shall not endanger any existing property or portion of the Work by cutting, digging or any other method, and shall be responsible for any damages caused by him.

.4 Where new work connects with existing work, and where existing work is altered, cut and patch as required.

.5 Coordinate the Work to minimize the amount of cutting and patching required.

.6 Do no cutting that may impair the strength of structures. Obtain the Engineer's approval before cutting, boring or sleeving load-bearing members.

.7 Make cuts clean and smooth and ensure patches equivalent to new work.

.8 Provide openings, holes and sleeves as required for, process mechanical, building mechanical, electrical and all other components of the Work. Provide openings in pre-cast work and cast-in-place work.

.9 Drill or field cut smaller openings or holes and cast openings larger than 100mm diameter.

END OF SECTION 01040

1. FIELD ENGINEERING

1.1 General

.1 The Engineer will provide a baseline, reference points and a benchmark.

.2 The Contractor shall be responsible for the correctness of the elevations and dimensions from the references as provided by the Engineer.

.3 The layout of the Work shall be in accordance with the work schedule, which is prepared by the Contractor, submitted to the Engineer for review and updated monthly.

.4 If the Contractor requests a change in layout procedure or sequence, he shall submit the request to the Engineer, giving a minimum of 48 hours notice of new or revised activities.

.5 The notice requesting a change shall be extended to 96 hours whenever a long weekend is involved.

1.2 Survey Assistance

.1 The Contractor shall supply acceptable survey assistants to the Engineer to assist in measuring, surveying, driving stakes and such other work as the Engineer requires to lay out the Work.

.2 For setting out line and stakes, two assistants shall be provided.

.3 For survey leveling and preparation of grade sheets, one assistant shall be provided.

.4 Survey assistants shall not be changed without the approval of the Engineer.

.5 If the Contractor fails to provide survey assistants that are acceptable to the Engineer, the Engineer will obtain assistants and deduct the cost and expenses thereof from the Progress Payment Certificates.

1.3 Construction Stakes

.1 Construction stakes including lathes and hubs shall be provided by the Contractor.

END OF SECTION 01050

1. GENERAL

.1 The laws and regulations of the Territory of Nunavut shall govern.

.2 The standards of the Work shall conform to or exceed the minimum standards of the Canadian General Standards Board, the Canadian Standards Association, the National Building Code of Canada, the National Fire Code of Canada, the Nunavut Public health Act, local municipal bylaws, the Canadian Standards Association (CSA) and Aboriginal Affairs and Northern Development Canada (AANDC).

.3 The Contractor shall ensure compliance on his part and on the part of all of his subcontractors, with the Workers' Compensation Ordinance and Regulations there under of the Government of the Nunavut.

.4 The attention of the Contractor is drawn to the requirements of the Nunavut Mechanics Lien Act and the requirements there under and the Contractor shall comply therewith.

.5 In carrying out the Work, the Contractor shall comply with all other acts and ordinances and regulations there under of the Government of the Nunavut as though they had been specifically named in this specification.

2. BURNING

.1 Restrictions of federal, territorial and municipal authorities shall be complied with, with permits to be obtained by the Contractor.

3. REGULATIONS, STANDARDS AND CODES

.1 Codes, standards and regulations are specified in other Sections of the Specifications and the Work, shall be done in accordance with those Codes, standards and regulations where applicable.

.2 The Contractor shall obtain and pay for all permits, inspections, etc. required by the authorities having jurisdiction, including local construction permits, quarry permits, water use permits, land use permits, etc.

.3 When all work has been completed, tested and placed in operation in accordance with the requirements of the Drawings and Specifications and all governing Codes and regulations, the Contractor shall request and obtain a Final Certificate of Approval, without reservations, from the inspection department(s) having jurisdiction, when applicable, and the certificate(s) shall be provided to the Engineer.

.4 The Contractor shall note that no allowance will be given for modification of the installation to meet requirements of governing Codes or regulations, unless such Codes or regulations were modified by legislation after the contract was awarded.

END OF SECTION 01060

1. ABBREVIATIONS - SPECIFICATIONS, METHODS, STANDARDS

.1 General

The following Codes and Standards govern specific portions of the Petroleum Products program and are referenced throughout this document. A comprehensive list of the applicable Codes and Standards, and their contact addresses, are provided in *Section 1.5 and 1.6 of the CCME, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Products.*

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
API	American Petroleum Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
CAN	National Standard of Canada
CCA	Canadian Construction Association
CEC	Canadian Electrical Code
CEMA	Canadian Electrical Manufacturers Association
CEPA	Canadian Environmental Protection Act
CGA	Canadian Gas Association
CGSB	Canadian General Standards Board
CISC	Canadian Institute of Steel Construction
CSA	Canadian Standards Association
CSPI	Corrugated Steel Pipe Institute
CUA	Canadian Underwriters Association
CWB	Canadian Welding Bureau
EEMAC	Electrical and Electronic Manufacturers Association of Canada
IAO	Insurance Advisory Organization
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IPCEA	Insulated Power Cable Engineers Association
ISO	International Organization for Standardization
LEMA	Lighting Equipment Manufacturers Association
NBC	National Building Code of Canada
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NFC	National Fire Code of Canada
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
SAE	Society of Automotive Engineers
SPC	The Society for Protective Coatings
SSPC	Steel Structures Painting Council (replaced by SPC)

ULC	Underwriters Laboratories of Canada
WCB	Worker's Compensation Board

Government Agencies and Abbreviations

INAC	Indian and Northern Affairs, Canada
GN	Community & Government Services (CGS) Government of Nunavut
MACA	Municipal and Community Affairs
NTPC	Nunavut Power Corporation
NWB	Nunavut Water Board
PPD	Petroleum Products Division
CGS	Community & Government Services
ENR	Environment and Natural Resources

.2 Use of Abbreviations

These abbreviations refer to specifications, methods and standards issued by the respective Associations, and the abbreviations are used in these Specifications.

Alphanumeric designations following the abbreviations denote the specification, method, or standard.

2. ABBREVIATIONS - METRIC

.1 General

These Specifications are in metric and metric usage is based upon SI units in accordance with *CSA Standard CAN/CSA-Z234.1-89 Canadian Metric Practice Guide*. In this Specification SI units are abbreviated in accordance with the Metric Units and Abbreviations below.

.2 Linear Measure

Meter	m
Millimeter	mm
Kilometer	km
Micrometer	µm

.3 Area

Square meter	m^2
Square millimeter	mm^2
Hectare	ha

.4 Volume

Cubic meter	m^3
Litre	L

.5 Mass and Density

Kilogram	kg
Gram	g
Tonne	t
Kilogram per meter	kg/m
Gram per meter	g/m

Kilogram per square meter	kg/m^2
Gram per square meter	g/m^2
Kilogram per cubic meter	kg/m^3

.6 Temperature

Degree Celsius	°C

.7 Force, Pressure, Stress

Newton	N
KiloNewton	kN
Pascal	Pa
KiloPascal	kPa
MegaPascal	MPa

.8 Velocity, Rate of Flow

Meter per second	m/s
Meter per hour	m/h
Kilometer per hour	km/h
Litre per second	L/s
Cubic meter per second	m^3/s

.9 Power, Energy, Heat, Work

Watt	W
Kilowatt	kW
Kilowatt hour	kWh
Joule	J

.10 Electricity

Ampere	A
Volt	V

END OF SECTION 01070

1. GENERAL

.1 All systems shall be installed and identified in accordance with recognized identification systems.

2. ELECTRICAL

.1 Electrical conductors shall be identified by colour code as specified in Section 16010 - General Electrical Provisions.

.2 Buried conduits shall be identified in accordance with local codes and as specified in Section 16010 - General Electrical Provisions.

.3 Nameplates shall be provided for electrical panels and equipment as specified in Section 16010 - General Electrical Provisions.

3. MECHANICAL

.1 Mechanical and process equipment shall be labeled in accordance with Sections 15010.

.2 Painting systems shall be labeled as specified in Section 09900.

4. PIPE ARROWS

.1 Arrows to indicate direction of flow shall be installed on the pipelines at the approximate locations indicated on the Drawings. Arrows shall be Brady #91-420, or approved equivalent, 50mm long x 40mm high, black on yellow background, single arrow, pointing in the direction of flow. Arrows shall be printed on Brady #B-946 or approved equivalent all weather film material with adhesive backing suitable to -46°C. Size of stickers to suit arrows. The above shall conform to ANSI A13.1, Colour Coding.

5. VALVE TAGS

.1 Valve tags shall be provided at valves as shown on the Drawings.

.2 Valve tags shall be fastened to valves with #16 brass jack chain and Brass ‘S’ hooks.

.3 Valve tags for each product shall be as indicated in the Standard Detail Drawing NT-P26 and as follows:

.1 The tags on the Low Sulphur Diesel Light (LSDL) fuel system shall be round, anodized aluminum, aluminum finish, Brady #49904 or approved equivalent, with product name and valve number stamped on each tag.

.2 The tags on the Gasoline fuel system shall be octagonal, anodized aluminum, red finish, Brady #49901 or approved equivalent, with product name and valve number stamped on each tag.

.3 The tags on the Jet A-1 aviation fuel system shall be round, anodized aluminum, yellow finish, Brady #49900 or approved equivalent, with product name and valve number stamped on each tag.

END OF SECTION 01080

1. ALTERNATIVE MATERIALS

.1 Although bidders are encouraged to submit alternatives whenever such will ensure a quality, performance and serviceability equal to, or greater than that inferred by the Drawings and Specifications. They should prepare their bid using the specified materials and procedures, submitting a separate proposal for any suggested alternative. This proposal shall show clearly the alternative details of materials and procedures. Any change in price shall be subject to the Engineer's approval, prior to acceptance.

.2 Where product or materials are specified by trade name or manufacturer's name, the arrangement of equipment shown on the Drawings is generally based on the equipment of the named manufacturer. Should the Contractor obtain authorization from the Engineer to supply product or materials of equivalent manufacture, he shall bear the costs of any modifications to the Drawings, equipment arrangements and ancillaries to suit said product.

END OF SECTION 01100

1. GENERAL

.1 Payments will be made on the basis of the lump sum prices bid and the unit prices bid in the tender, and in accordance with the general conditions.

.2 The prices bid for various items of work, unless specifically noted otherwise, shall include the supply of all labour, material, plant and equipment necessary to construct the Work in accordance with the Specifications.

.3 The prices bid for supply of materials and installation of materials shall be full compensation of supplying, hauling, installing, cleaning, testing, and placing in service, together with all other work subsidiary and incidental thereto for which separate payment is not provided elsewhere.

.4 The method of measurement of the quantities for payment and the basis for payment will be in accordance with the following items of this section. All measurement shall be done by the Engineer, using generally accepted field survey methods. Stationing interval for volume calculations shall not exceed ten (10) meters.

.5 Where the tender shows separate items for supply and installation, the unit prices or lump sum prices bid for supply shall include supplying, delivering, loading, unloading and all allowances for handling, storage, breakage and waste. Payment will be made only for materials actually installed.

.6 All materials on site, whether existing structures, vegetation, topsoil, gravel, sand or other excavated, or piled materials are the property of the Owner or the Owner of the land on which the Work is located. Only those materials specifically noted in the Specifications or on Drawings as belonging to the Contractor shall become the Contractor's property.

.7 Where there are excess excavated materials, unsuitable materials excavated or materials of any kind that are excavated but not used in the Work, such materials are not the property of the Contractor unless authorized in writing by the Engineer or specified to be disposed of by the Contractor.

.8 Where work is called for in these Specifications and is not specifically designated for payment under a pay item, the Contractor shall deem such work as incidental to the most closely associated pay items and make appropriate allowances in his bid price. The Contractor will not be allowed an additional amount for any items not included in the tender bid, but which are required to make the Work complete.

2. MEASUREMENT AND PAYMENT CLAUSES

2.1 Mobilization and Demobilization

.1 Mobilization and demobilization shall include the Contractor's costs of mobilization at the beginning of the project, and the costs of demobilization at the end of the project.

.2 Included in mobilization are such items as:

.1 bonding, insurance and permits;

.2 moving personnel, materials and equipment to the site, setting up temporary facilities and all preparation for performing the Work;

.3 inspection and acceptance by the Engineer of all materials and equipment received, including as necessary, the opening of crates and re-crating by the Contractor at his expense;

.4 the storing in an adequate and approved warehouse of those materials and equipment which will not be immediately used for construction;

.5 supply of literature and data for O&M manuals;

.6 return of Government property in compliance with the contract documents.

.3 Included in demobilization are removal of all personnel, materials and equipment, once work has been completed, tested and accepted by the Engineer, general cleanup of the site and the Work, supply drawings of record, and training.

.4 The lump sum price bid for this work shall be relative to the costs involved.

.5 Upon completion of mobilization as noted above, the Contractor shall be entitled to claim an amount not exceeding 70% of the lump sum amount stated under this item. Prior to billing for completion of mobilization, the Contractor will have complied with the conditions of *Section 01650, Clause 2.5*, in that all required operations and maintenance manual data and manufacturer's literature for material provided will have been provided to the Engineer. The remaining 30% shall be paid to the Contractor only after work for demobilization is completed to the satisfaction of the Engineer notwithstanding the holdback amount, in compliance with the Specifications, and the contract documents and the record drawings are turned over to the Engineer.

2.2 Lump Sum Contracts

.1 Payments will be made on the basis of the following:

.1 lump sum items in the schedule of breakdown prices in the tender;

.2 unit prices bid in the schedule of unit prices in the tender for provisional items;

.3 changes in the Work for items not covered by unit prices, in accordance with *Articles GC45 to GC49* of the contract.

.2 The Contractor must supply copies of invoices to substantiate claims if requested. Deletions will be proportioned on lump sum items or determined on the basis of unit prices.

.3 For each lump sum item in the schedule of breakdown prices, the Engineer will, in cooperation with the Contractor, estimate the percentage of the item completed at

the end of the payment period.

.4 Provisional work items to be paid by unit prices in the schedule of unit prices, the measurement and payment shall be as follows:

.1 Backfill

Backfill material shall include supply of approved borrow material where extra backfill is required. The unit price includes all royalties, borrow pit preparation, excavation, screening, loading, hauling, placing, compacting, trimming, and cleanup. Payment will be made only when extra material is ordered in writing by the Engineer.

Payment: Unit price per cubic meter placed and compacted.
Measurement: Survey cross sections before and after backfill.

.3 Labour Rates

Personnel rates include payroll cost of labour and all payroll burdens, room and board if applicable, and overhead and profit. Overhead includes the cost of superintendents, timekeepers and other administrative and supervisory personnel and their vehicles and other costs. The Contractor understands that the Owner may review these rates and require changes for good cause.

Payment: Unit price bid per hour.

.5 Equipment Rates

Equipment rates include operator, fuel, maintenance, overhead and profit. Overhead includes the cost of superintendents, timekeepers and other administrative and supervisory personnel and their vehicles and other costs. The Contractor understands that the Owner may review these rates and require changes for good cause.

Payment: Unit price bid per hour.

END OF SECTION 01150

1. PRECONSTRUCTION MEETING

.1 A preconstruction meeting will be arranged by the Engineer after the contract is awarded.

.2 The meeting will be held at the Engineer's office or at an alternate location at or near the site.

.3 The Contractor shall have in attendance the Superintendent, the Project Manager and representatives of the Subcontractors, if requested by the Engineer.

.4 The Engineer will have the consultant and/or the resident inspector in attendance, and any other personnel whom the Engineer feels may add to a successful meeting.

.5 The Owner may have a representative in attendance.

.6 Minutes will be taken by the Engineer and copies will be distributed to attendees.

.7 The preconstruction meeting agenda will include:

.1 Identification of key project personnel and lines of communication:

.1 Role of the Engineer, consultant and resident Inspector.

.2 Contract Authority.

.2 Schedule of Work:

.1 Contractor’s schedule and proposed work plan.

.2 Review Drawings and Specifications.

.3 Temporary facilities.

.4 Granular sources.

.5 Equipment.

.6 Resupply.

.7 Shutdowns.

.3 Schedule of values:

.1 Progress payments.

.2 Change orders.

.3 Project inspections.

.4 Measurement of unit costs.

.5 Claims/disputes.

.4 Site sign.

.5 Submissions:

.1 Worker's Compensation Board (WCB) certificates and Insurance certificates are required.

.2 Shop drawings.

.3 Mill test certificates.

.4 Weld manual.

.5 Welder's certificates.

.6 Authorities Having Jurisdiction:

.1 Government of Nunavut Fire Marshal.

.2 Environment and Natural Resources (ENR), Environmental Protection Services.

.3 Municipality.

.4 GN, CGS Electrical Safety Division.

.5 Weights and Measures Canada.

.7 GN Policy:

.1 Northern involvement.

.2 Local accommodation.

.3 Local labour.

.8 Application for fuel supply credit purchases.

.9 Record drawings.

.10 Maintenance manual information.

.11 Safety:

.1 Disposal of hazardous wastes.

.12 Painting:

.1 Painting inspection.

.2 Limitations on painting during unsuitable weather conditions.

.13 Identification of testing agencies:

.1 Tank inspections (API 653).

.2 Radiographic inspections.

.3 Strapping.

.4 Concrete testing agency.

.14 Determination of practical and reasonable time for retesting.

.15 Substantial completion inspection.

2. PROGRESS MEETINGS

.1 Progress meetings will be held on a regular monthly basis, or more frequently if requested by the Engineer.

.2 Accommodation for progress meetings shall be provided by the Contractor at or near the site.

.3 The Engineer will give to all parties advance notice of meeting dates, times and locations.

.4 The Contractor shall have in attendance the Superintendent, the Project Manager and representatives of the subcontractors, as requested by the Engineer.

.5 The Engineer will have the consultant and/or the resident inspector in attendance.

END OF SECTION 01200

1. GENERAL

.1 Submissions are required in accordance with the provisions of this section, to ensure that the specified materials and products are furnished and installed in accordance with the design intent as expressed in the contract documents.

.2 Individual submissions, as required, are in other Sections of the Specifications.

.3 Until submissions are reviewed, work involving relevant product or material may not proceed.

.4 Where the phrase "or approved equivalent alternative" occurs in the contract documents, do not assume that material, product or methods will be accepted as equal by the Engineer, unless the item has been specifically accepted for the Work in writing, by the Engineer, with approval by PPD.

2. IDENTIFICATION OF SUBMISSIONS

.1 Identify each submission and resubmission by showing at least the following information:

.1 Name, address and telephone number of the submitter, and a name of an individual for contact.

.2 Drawing number and specification number to which the submission applies.

.3 Whether it is an original submittal or resubmission.

.4 Confirmation of prior review by the Contractor.

.5 Date of submission or resubmission.

.6 Authorized signature of the Submitter.

3. COORDINATION OF SUBMISSIONS

.1 Prior to submission for the Engineer's review coordinate all material:

.1 Determine and verify field dimensions and conditions and conformance with the specifications, including material, catalogue numbers, type numbers and similar data.

.2 Coordinate requirements between trades.

.3 Coordinate with requirements under laws, regulations, etc.

.4 Secure required approvals of public agencies, inspection agencies and standards agencies and show proof of approvals acquisition.

.5 Indicate any deviations from the intent of design as expressed in the contract documents and request specific review of these deviations.

4. TIMING OF SUBMISSIONS

.1 Make submissions far enough in advance to allow adequate time for coordination, Engineer's review, revisions and resubmissions, and for supply and delivery in time

for the scheduled installation in the Work.

.2 Allow at least ten calendar days for the Engineer's review after receipt of submissions.

.3 Costs due to delays in submissions shall be borne solely by the Contractor.

END OF SECTION 01300

1. CONSTRUCTION SCHEDULE

.1 Within fourteen (14) days after awarding of the contract, the Contractor shall submit for approval to the Engineer, a construction schedule in the form of a Gantt bar chart showing all the principal phases of the Work. No Progress Payment Claim shall be certified until an acceptable construction schedule has been received by the Engineer.

.2 The construction schedule shall be updated monthly by the Contractor.

.3 If, in the opinion of the Engineer, any construction schedule is inadequate as a control tool, or if it does not show the Work being fully completed by the contract completion date, the Engineer may reject it and the Contractor shall provide a construction schedule that is acceptable to the Engineer.

.4 In scheduling the Work, the Contractor shall give due attention to the availability and delivery times for all materials and equipment and to the timing of available transportation facilities.

.5 The date of arrival of bulk petroleum products by barge, or other transportation means (i.e., the date at which tankage and fill piping are to be ready to receive product) is a critical date and shall be of prime consideration in the scheduling of the Work. If the Contractor should fall behind in his schedule due to his fault and is not ready when the barge arrives for resupply during each year of the contract, he shall bear all costs and consequences of the delay. A delayed schedule may result in having to deliver fuel by air cargo at the Contractor's expense until the facilities are complete, tested and accepted by the Engineer.

.5 It is emphasized that it is the sole responsibility of the Contractor to ascertain, from the approved carrier, the dates for delivery of cargo to the designated wharf, to arrange the details of shipping, to oversee the reception of materials at the site, and to carry out his work so as to meet the primary objective of the project - provision of facilities to receive shipments of bulk product in time for the yearly resupply. Rectification of any failure to meet this schedule, or any part of it, that may be imputed to the Contractor, shall be made at the Contractor's sole expense.

.6 The contractor must adhere to their submitted construction schedule. It is the Owner's intent to have the Engineer on site to witness the results of any quality control testing referenced in Section 01 40 00 – Quality Control. The Contractor is responsible to ensure that all required personnel and equipment is in place and ready for testing on the scheduled date, otherwise a minimum of 14 days' notice must be given to the Owner and Engineer with a proposed re-schedule date and reasons for re-scheduling. The Consultant will notify the Contractor with written confirmation of travel plans, any schedule changes following this may result in the Contractor bearing all cost incurred by the Consultant due to the delay or schedule change, including but not limited to time on site, accommodations, and or travel costs.

6. It is the Contractors responsibility to track and accommodate sealift cargo delivery schedules for supplying materials and equipment required to complete this project.

7. All work of this Contract relative to tanks, piping, electrical and dispensing must be completed by October 1, 2015. The Contractor must ensure that all tanks are

tested and cleaned and piped and ready to received product so as to not disrupt the delivery of fuel.

END OF SECTION 01310

PART 1 – GENERAL

1.1 Definitions

.1 Activity: An element of Work performed during course of project. An activity normally has an expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Actual Finish Date (AF): The point in time that Work actually ended on an activity.

.3 Actual Start Date (AS): The point in time that Work actually started on an activity.

.4 Bar Chart (Gantt Chart): A graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars.

.5 Baseline: Original approved plan (for Project, work package, or activity), plus or minus approved scope changes.

.6 Completion Milestones: They are firstly Substantial Completion and secondly Final Certificate.

.7 Constraint: Applicable restriction that will affect performance of Project. Any factor that affects when an activity can be scheduled.

.8 Control: Process of comparing actual performance with planned performance, analyzing variances, evaluating possible alternatives, and taking appropriate corrective action as needed.

.9 Critical Activity: Any activity on a critical path. Most commonly determined by using critical path method.

.10 Critical Path: Series of activities that determines the duration of a Project. In a deterministic model, critical path is usually defined as those activities with float less than or equal to a specified value, often zero. It is the longest path through Project.

.11 Critical Path Method (CPM): Network analysis technique used to predict Project duration by analyzing which sequence of activities (which path) has least amount of scheduling flexibility (least amount of float).

.12 Data Date (DD): Date at which, or up to which Project's reporting system has provided actual status and accomplishments.

.13 Duration (DU): Number of work periods (not including holidays or other non-working periods) required completing an activity or other Project element. Usually expressed as workdays or workweeks.

.14 Early Finish Date (EF): In critical path method, earliest possible point in time on which uncompleted portions of an activity (or Project) can finish, based on network logic and any schedule constraints. Early finish dates can change as Project progresses and changes are made to Project Plan.

.15 Early Start Date (ES): In critical path method, earliest possible point in time on which uncompleted portions of an activity (or Project) can start, based on network logic and any schedule constraints. Early start dates can change as Project progresses and changes are made to Project Plan.

.16 Finish Date: A point in time associated with an activities completion. Usually qualified by one of the following: actual, planned, estimated, scheduled, early, late, baseline, target, or current.

.17 Float: Amount of time that an activity may be delayed from its early start time without delaying Project finish time. Float is a mathematical calculation, and can change as Project progresses and changes are made to Project Plan. This resource is available to both PWS/PDD and Contractor.

.18 Lag: A modification of a logical relationship that directs a delay in successor task.

.19 Late Finish Date (LF): In critical path method, latest possible point in time that an activity may be completed without delaying a specified milestone (usually Project finish date).

.20 Late Start Date (LS): In critical path method, latest possible point in time that an activity may begin without delaying a specified milestone (usually Project finish date).

.21 Lead: A modification of a logical relationship that allows an acceleration of successor task.

.22 Logic Diagram: See Project network diagram.

.23 Master Plan: A summary-level schedule that identifies major activities and key milestones.

.24 Milestone: A significant event in Project, usually completion of a major deliverable.

.25 Monitoring: Capture, analysis, and reporting of Project performance, usually as compared to plan.

.26 Near-Critical Activity: An activity that has low total float.

.27 Non-Critical Activities: Activities which when delayed, do not affect specified Contract duration.

.28 Project Control System: Fully computerized system utilizing commercially available software packages.

.29 Project Network Diagram: Any schematic display of logical relationships of Project activities. Always drawn from left to right to reflect Project chronology.

.30 Project Plan: A formal approved document used to guide both Project execution and Project control. Primary uses of Project Plan are to document planning assumptions, and decisions to facilitate communication among stakeholders, and document approved scope, cost and schedule baselines. A Project Plan may be summary or detailed.

.31 Project Planning: Development and maintenance of Project Plan.

.32 Project Planning, Monitoring and Control System: Overall system operated by Contractor to enable monitoring of Project Work in relation to established milestones.

.33 Project Schedule: The planned dates for performing activities and the planned dates for meeting milestones. A dynamic, detailed record of tasks or activities that must be accomplished to satisfy project objectives. Monitoring and control process involves using project schedule in executing and controlling activities, and is used as a basis for decision making throughout project life cycle.

.34 Qualified Days Duration: Working days based on a 5-day week, discounting statutory holidays.

.35 Risk: An uncertain event or condition that, if it occurs, has a positive or negative effect on Project's objectives.

.36 Scheduled Finish Date (SF): Point in time that Work was scheduled to finish on an activity. Scheduled finish date is normally within a range of dates delimited by early start date and late start date.

.37 Scheduled Start Date (SS): Point in time that Work was scheduled to start on an activity. Scheduled start date is normally within range of dates delimited by early start date and late start date.

.38 Start Date: Point in time associated with an activity's start, usually qualified by one of the following: actual, planned, estimated, scheduled, early, late, target, baseline, or current.

.39 Work Breakdown Structure (WBS): A deliverable-oriented grouping of project elements that organizes and defines total Work scope of Project. Each descending level represents an increasingly detailed definition of Project Work.

1.2 System Description

.1 Project Time Management: Describes processes required to ensure timely completion of Project. These processes ensure that various elements of Project are properly coordinated. It consists of planning, time estimating, scheduling, progress monitoring and control.

.2 Planning: This is the most basic function of management, that of determining presentation of action and is essential.

1. It involves focusing on an objective consideration of future, and integrating forward thinking with analysis, therefore in planning, implicit assumptions are made about future so that action can be taken today.

2. Planning and scheduling facilitate accomplishment of objectives, and should be considered a continuous interactive process involving planning, review, scheduling, analysis, monitoring and reporting.

.3 Ensure that planning process is iterative and results in generally top-down processing with more detail being developed as planning progresses, and decisions concerning options and alternatives are made. This implies progressively more reliability of scheduling data. Detail Project schedule is used for analysis and progress monitoring.

.4 Ensure project schedule efficiencies through monitoring.

.1 When activities begin on time and are performed according to estimated durations without interruptions, original Critical Path will remain accurate. Changes and delays will however, create an essential need for continual monitoring of Project activities.

.2 Monitor progress of Project in detail to ensure integrity of Critical Path, by comparing actual completions of individual activities, with their scheduled completion and review process of activities, that have started but are not yet completed.

.3 Monitoring should be done sufficiently often so that causes of delays are immediately identified and removed if possible.

.5 Project Monitoring and Reporting: As Project progresses, keep team aware of changes to schedule and possible consequences. In addition to Bar Charts and CPM networks, use narrative reports to provide advice on seriousness of difficulties and measures to overcome them.

.1 Narrative reporting begins with statement on general status of Project followed by a summarization of delays, potential problems, corrective measures and Project status criticality.

1.3 CPM Requirements

.1 Ensure Master Plan and Detail Schedule are practical and remain within specified Contract duration.

.2 Master Plan and Detail Schedule deemed impractical by Engineer are to be revised and submitted for approval.

.3 Acceptance of Master Plan and Detail Schedule showing scheduled Contract duration shorter than specified Contract duration does not constitute change to Contract. Duration of Contract may only be changed through bilateral Agreement.

.4 Consider Master Plan and Detail Schedule deemed practical by Engineer, showing Work completed in less than specified Contract duration to have float.

.5 First Milestone on Master Plan and Detail Schedule will identify start Milestone with an “ES” constraint date equal to Award of Contract date.

.6 Calculate dates for completion milestones from Plan and Schedule using specified time periods for Contract.

.7 Substantial Completion with “LF” constraint to be equal to calculated date.

.8 Calculations on updates to be such that if early finish of Interim Certificate falls later than specified Contract duration, then float calculation to reflect negative float.

.9 Delays to non-critical activities, those with float may not be basis for time extension.

.10 Do not use float suppression techniques such as software constraints, preferential sequencing, extended activity times or imposed dates other than required by Contract.

.11 Allow and show Master Plan and Detail Schedule adverse weather conditions normally anticipated. Specified Contract duration has been predicated assuming normal amount of adverse weather conditions.

.12 Provide necessary crews and manpower to meet schedule requirements for performing Work within specified Contract duration. Simultaneous use of multiple crews on multiple fronts on multiple critical paths may be required.

.13 Arrange participation on and off site of Subcontractors and suppliers, as required by Engineer, for purpose of network planning, scheduling, updating and progress monitoring. Approvals by Engineer of original networks and revisions do not relieve Contractor from duties and responsibilities required by Contract.

.14 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this Contract.

1.4 Submissions

.1 Make submissions in accordance with Section 01300 – Submission Procedures.

.2 Submit to Consultant Project Control System for planning, scheduling, monitoring and reporting of project progress.

.3 Include costs for execution, preparation, and reproduction of schedule submissions in bid documents.

.4 Submit letter ensuring that schedule has been prepared in coordination with major Subcontractors.

.5 Refer to article “Progress Monitoring and Reporting” of this specification section for frequency of Project control system submissions.

.6 Submit Project planning, monitoring, and control system data as part of initial schedule submission and monthly status reporting in the following form:

.1 Diskette, CD or FTP site containing all schedule and cash flow information, clearly labeled with data date, specific update, and person responsible for update.

.2 Master Plan Bar Chart.

.3 Construction Detail schedule Bar Chart.

.4 Listing of project activities including milestones and logical connectors, networks (sub-networks) from Project start to end. Sort activities by activity identification number, and accompany with descriptions. List early and late start and finish dates together with durations, codes and float.

.5 Critically report listing activities and milestones with negative total float used as first sort for ready identification of critical paths through entire project. List early and late start and finish dates, together with durations, codes and float for critical activities.

.6 Progress report in early start sequence, listing for each trade, activities due to start, to be underway, or finished within two months from monthly update date. List activity identification number description, and duration. Provide columns for entry of actual start and finish dates, duration remaining and remarks concerning action required.

1.5 Quality Assurance

.1 Use experienced personnel, fully qualified in planning and scheduling to provide services from start of construction to Final Certificate, including Commissioning.

1.6 Project Milestones

.1 Recommended project milestones from targets for both Master Plan and Detail Schedule of the CPM construction network system are as outlined in Section 01014.

1.7 Master Plan

.1 Structure and base CPM construction networks system on WBS coding in order to ensure consistency throughout Project.

.2 Prepare comprehensive construction Master Plan (CPM logic diagram) and dependent Cash Flow Projection within ten (10) working days of finalizing Agreement to confirm validity or alternates of identified milestones.

.1 Master Plan will be used as a baseline.

.1 Revise baseline as conditions dictate and as required by Engineer.

.3 Reconcile revisions to Master Plan and Cash Flow Projections with previous baseline to provide continuous audit trial.

.4 Initial and subsequent Master Plans will include:

.1 CD containing schedule and cash flow information, clearly labeled with data date, specific update, and person responsible for update.
.2 Bar Chart identifying coding, activity durations, early\late and start\finish dates, total float, completion as percentile, current status and budget amounts.
.3 Network diagram showing coding, activity sequencing (logic), total float, early\late dates, current status and durations.
.4 Actual\Projected Monthly Cash Flow: Expressed annually and monthly, and shown in both graphical and numerical form.

1.8 Detail Schedule

.1 Provide detailed project schedule (CPM) logic diagram) within fourteen (14) working days of Award of Contract date showing activity sequencing, interdependencies, and duration estimates. Include listed activities as follows:

.1 Shop drawings.

.2 Samples.

.3 Approvals.

.4 Procurement.

.5 Construction.

.6 Installation.

.7 Site Works.

.8 Testing.

.9 Commissioning and acceptance.

.2 Detail CPM schedule to cover in detail minimum entire contract period beginning from Award of Contract date.

.1 Detail Activities completely and comprehensively throughout duration of

project.

.3 Relate Detail Schedule activities to basic activities and milestones developed and approved in Master Plan.

.4 Clearly show sequence and interdependence of construction activities and indicate:

.1 Start and completion of all items of Work, their major components, and interim milestone completion dates.

.2 Activities for procurement, delivery, installation and completion of each major piece of equipment, materials and other supplies, including:

.1 Time for submissions, re-submissions and review.

.2 Time for fabrication and delivery of manufactured products for Work.

.3 Interdependence of procurement and construction activities.

.3 Include sufficient detail to assure adequate planning and execution of Work. Activities should generally range in duration from three (3) to fifteen (15) works days each.

.5 Provide level of detail for project activities such that sequence and interdependency of Contact tasks are demonstrated, and allow coordination and control of project activities. Show continuous flow from left to right.

.6 Ensure that activities with no float are calculated and clearly indicated on logical CPM construction network system as being, whenever possible, continuous series of activities throughout the length of the project to form “Critical Path”. Increased numbers of critical activities are seen as an indication of increased risk.

.7 Insert Change Orders in appropriate and logical location of Detail Schedule. After analysis, clearly state and report to Engineer for review any effect created by insertion of new Change Order.

1.9 Review of the Construction Detail Schedule

.1 Allow five (5) work days for review by Engineer and Owner of proposed construction Detail Schedule.

.2 Upon receipt of reviewed Detail Schedule make necessary revisions and resubmit to Engineer for review within five (5) work days.

.3 Promptly provide additional information to validate practicability of Detail Schedule as required by Engineer.

.4 Submission of Detail Schedule indicates that it meets Contract requirements and will be executed generally in sequence.

1.10 Compliance with Detail Schedule

.1 Comply with reviewed Detail Schedule.

.2 Proceed with significant changes and deviations from scheduled sequence of activities which cause delay, only after written receipt of approval by Engineer.

.3 Identify activities that are behind schedule and causing delay. Provide measures to regain slippage.

.1 Corrective measures may include:

.1 An increase of personnel on site for effected activities or work package.

.2 An increase in materials and equipment.

.3 Overtime work and additional work shifts.

.4 Submit to Engineer, justification, project schedule data, and supporting evidence for approval of extension to Contract completion date or interim milestone date when required. Include as part of supporting evidence:

.1 Written submission of proof of delay based on revised activity logic, duration and costs, showing time impact analysis illustrating influence of each change or delay relative to approved contract schedule.

.2 Prepared schedule indicating how change will be incorporated into the overall logic diagram. Demonstrate perceived impact based on date of occurrence of change, and include status of construction at that time.

.3 Other supporting evidence requested by Engineer.

.4 Do not assume approval of Contract extension prior to receipt of written approval from Engineer.

.5 In event of Contract extension, clearly display in Detail Schedule that scheduled float time available for work involved has been used in full without jeopardizing earned float.

.1 Engineer will determine and advise Contractor number of allowable days for extension of Contract based on project schedule updates for period in question, and other factual information.

.2 Construction delays affecting project schedule will not constitute justification for extension of contract completion date.

.6 If delays are not advised to the Owner and Consultant at least 14 days prior to scheduled inspection work, the owner will have the right to claim fees associated with the delay.

1.11 Progress Monitoring and Reporting

.1 On an ongoing basis, Detail Schedule on job site must show "Progress to Date". Arrange participation on and off site of Subcontractors and suppliers, as and when necessary, for purpose of network planning, scheduling, updating and progress monitoring. Inspect Work with Engineer at least once monthly to establish progress on each current activity shown on applicable networks.

.2 Update and reissue project Work Breakdown Schedule and relevant coding structures as project develops and changes.

.3 Perform Detail Schedule update monthly with status dated (Data Date) on last working day of the month. Update to reflect activities completed to date, activities in progress, logic and duration changes.

.4 Do not automatically update actual start and finish dates by using default mechanisms found in project management software.

.5 Submit to Engineer one (1) copy of updated Detail Schedule.

.6 Requirements for monthly progress monitoring and reporting are basis for progress payment request.

.7 Submit monthly written report based on Detail Schedule, showing Work to date performed, comparing Work progress to planned, and presenting current forecasts. Report must summarize progress, defining problem areas and anticipated delays with respect to Work schedule, and critical paths. Explain alternatives for possible schedule recovery to mitigate any potential delay.

Include in report:

.1 Description of progress made.

.2 Pending Items and Status of: Permits, Shop drawings, Change orders, Possible time extensions.

.3 Status of Contract completion date and milestones.

.4 Current and anticipated problem areas, potential delays, and corrective measures.

.5 Review of progress and status of Critical Path activities.

END OF SECTION 01322

1. REQUIREMENTS FOR SHOP DRAWINGS AND PRODUCT DATA

.1 The Contractor shall arrange for the preparation of clearly identified shop drawings and submit shop drawings in the following form:

.1 One electronic pdf copy.

.2 The Contractor shall provide clearly identified product data and submit an electronic copy to be retained by the Engineer plus the number of copies required by the Contractor.

.3 Product data shall include, but not be limited to:

.1 product assembly drawings;
.2 materials list;
.3 principal dimensions;
.4 parts and components details;
.5 recommended spare parts list;
.6 letters of compliance with recognized standards where required;
.7 operation and maintenance data;
.8 operation curves;
.9 operation manuals where specified;
.10 product name and model number.

.4 Shop drawings shall be accurately drawn to a scale sufficiently large to show all pertinent features of the item, and its method of connection to the Work and shall have sufficient space for the Contractor's stamp and the Engineer's stamp.

.5 Shop drawings shall be in accordance with the International System of Units (S.I.) metric units.

.6 Prior to submission to the Engineer, the Contractor shall review all shop drawings. By this review, the Contractor represents that he has determined and verified all field measurements, field construction criteria, materials, catalogue numbers and similar data or will do so, and that he has checked and coordinated each shop drawing with the requirements of the Work and of the contract documents. The Contractor's review of each shop drawing shall be indicated by stamp, with the date and signature.

.7 The Contractor shall submit shop drawings to the Engineer for review, with reasonable promptness and in orderly sequence, so as to cause no delay in the Work or in the work of other Contractors. If either the Contractor or the Engineer so requests, they shall jointly prepare a schedule fixing the dates for submission and return of shop drawings. At the time of submission, the Contractor shall notify the Engineer in writing of any deviations in the shop drawings from the requirements of the contract documents.

.8 The Engineer will review and return shop drawings in accordance with a schedule agreed upon, or otherwise with reasonable promptness. The Engineer's review shall be for conformity to the design concept and for general arrangement only, 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 contract documents. A specific deviation on the shop drawings requested by the Contractor must be approved in writing by the Engineer.

.9 The Contractor shall make any changes in shop drawings which the Engineer may require, consistent with the contract documents, and resubmit unless otherwise directed by the Engineer. When resubmitting, the Contractor shall notify the Engineer in writing of any revisions made by the Contractor, other than those requested by the Engineer, in his previous review.

.10 Each reviewed shop drawing will be stamped by the Engineer with the following form of stamp:

REVIEWED	( )
REVIEWED AS MODIFIED	( )
REVISE AND RESUBMIT	( )
NOT REVIEWED	( )

This review by the Engineer is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that the Engineer approves the design of details inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents. 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 coordination of the Work of all subtrades.

By:

Date:

2. DESIGN BY THE CONTRACTOR

.1 When the Contractor is responsible for engineering design of portions of the Work, this shall be clearly and specifically indicated in the Drawings or in the Specifications of the Contract Documents.

.2 Where the Contractor is required, either by law or regulation, or by the Contract to provide engineering design, he shall use the services of a Professional Engineer registered in the Nunavut, and he shall submit shop drawings bearing the seal and signature of that registered Professional Engineer.

END OF SECTION 01340

1 GENERAL

.1 References

.1 Nunavut territory

.1 Safety Act, R.S.N.W.T. (latest edition)

.2 Canadian Council of Ministers of the Environment (CCME).

.1 CCME EPC LST PN 1326 – October 2003, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products.

.3 Canadian Federal Legislation (latest editions)

.1 Canadian Environmental Protection Act (CEPA)

.2 Canadian Environmental Assessment Act (CEAA)

.3 Transportation of Dangerous Goods Act (TDGA)

.4 Motor Vehicle Safety Act (MVSA)

.5 Storage Tank Systems for Petroleum

.4 Canadian Standards Association (CSA) (latest edition)

.1 CSA S350-M, Code of Practice for Safety in Demolition of Structures.

.5 Underwriters Laboratories of Canada (ULC) latest editions

.1 ULC ORD-C107.19, Secondary Containment of Underground Piping for Flammable and Combustible Liquids.

.2 ULC ORD-C58.15, Overfill Protection Devices for Underground Flammable Liquid Storage Tanks.

.3 ULC ORD-C58.I9, Spill Containment Devices for Underground Flammable Liquid Storage Tanks.

.4 CSA-S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structure.

.4 National Building Code of Canada 2010 Volume 2 part 8, Safety Measures at Construction and Demolition Sites.

2 SUBMISSIONS

.1 Contractor's site-specific Health and Safety Plan:

Within (14) fourteen days after date of the Notice to Proceed and prior to mobilization to site, submit a site-specific Health and Safety Plan. The Contractor's site-specific Health and Safety Plan must address items as follows:

.1 Safety and health risk or hazard analysis for each site task and operation found in the work plan.

.2 Personnel training requirements including as follows:

.1 Names of personnel and alternates responsible for site safety and health, hazards present on site and use of personal protective equipment.

.2 Work practices by which personnel can minimize risks from hazards, safe use of engineering controls and equipment on site, medical surveillance requirements, including recognition of symptoms and signs which might indicate overexposure to hazards, and elements of site-specific Health and Safety Plan.

.3 Personal protective equipment (PPE) program addressing:

.1 Donning and doffing procedures.

.2 PPE selection based upon site hazards.

.3 PPE use and limitations of equipment.

.4 Work mission duration, PPE maintenance and storage.

.5 PPE decontamination and disposal.

.6 PPE inspection procedures prior to, during, and after use.

.7 Evaluation of effectiveness of PPE program and limitations during temperature extremes, and other appropriate medical considerations.

.4 Medical surveillance requirements for personnel assigned to work at site:

.1 Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.

.2 Site control measures to be employed at site including site map, site work zones, use of 'buddy system', site communications including site security, alerting means for emergencies, standard

operating procedures, safe work practices and identification of nearest medical assistance.

.3 Decontamination procedures for both personnel and equipment.

.5 Emergency response requirements addressing:

.1 Pre-emergency planning, personnel roles, lines of authority and communication.

.2 Emergency recognition and prevention, safe distances and places of refuge, site security and control, evacuation routes and procedures.

.3 Decontamination procedures not covered under decontamination section.

.4 Emergency medical treatment and first aid.

.5 Emergency alerting and response procedures.

.6 Critique of response and follow-up, personal protective equipment (PPE) and emergency equipment selection and use.

.7 Site topography, layout, prevailing weather conditions, and;

.8 Procedures for reporting incidents to local, territorial, or federal agencies.

.6 Written respiratory protection plan for project activities.

.7 Procedures dealing with heat and/or cold stress.

The Engineer will review the Contractor's site-specific Health and Safety Plan and provide comments to the Contractor within (14) fourteen days after receipt of the plan. Revise plan as appropriate and resubmit the plan to the Engineer within (7) seven days after receipt of comments from Engineer.

.2 Respirator Fit Testing:

.1 Within (14) fourteen days after date of Notice to Proceed and prior to mobilization to site, submit proof of respirator fit testing for site personnel.

.3 On-site Contingency and Emergency Response Plan:

.1 Address standard operating procedures to be implemented during emergency situations.

.4 Off-site Contingency and Emergency Response Plan:

.1 Prior to commencing Work involving handling of hazardous materials, develop an off-site Contingency and Emergency Response Plan.

.2 The Plan must provide immediate response to serious site occurrence such as explosion, fire, or migration of significant quantities of toxic or hazardous material from site.

3 REGULATORY REQUIREMENTS

.1 Comply with specified standards and regulations to ensure safe operations at site containing hazardous or toxic materials.

4 SITE CONDITIONS

.1 Work at site will involve Works, as detailed in *Section 01011, Particular Scope of Work.*

5 GENERAL REQUIREMENTS

.1 Develop a written site-specific Health and Safety Plan prior to commencing any site work and continue to implement, maintain, and enforce plan until final demobilization from site. The Health and Safety Plan must address the Project Specifications.

.2 Ensure Health and Safety guidelines provide for safe and minimal risk working environment for site personnel and minimize impact of activities involving contact with any hazardous materials or hazardous wastes on the general public and the surrounding environment.

.3 Relief from, or substitution for, any portion or provision of the minimum Health and Safety guidelines, specified herein or related to the site- specific Health and Safety Plan, must be submitted to the Engineer in writing. The Engineer will respond in writing, either approving or requesting changes.

6 RESPONSIBILITY

.1 Be responsible for the safety of persons and property on site, and for the protection of persons off site and the environment to the extent that they may be affected by the conduct of the Work.

.2 Comply with and enforce compliance by employees with the safety requirements of the Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with the site-specific Health and Safety Plan.

7 HAZARD COMMUNICATION REQUIREMENTS

.1 Comply with Work Site Hazardous Materials Information Regulations, R.R.N.W.T.

.2 Provide the Engineer with Material Safety Data Sheets (MSDS) and documentation on any "hazardous" chemical that the Contractor or Contractor’s

Representatives plan to bring onto site.

8 WORK STOPPAGE

.1 Safety First policy; give precedence to safety and health of public and site personnel, and protection of the plant and environment, over cost and schedule considerations for the Work.

.2 Assign responsibility and obligation to the Health and Safety Officer where required, to stop or start Work when, at the Health and Safety Officer's discretion, it is necessary or advisable for reasons of health or safety. The Engineer may also stop Work for health or safety reasons.

9 UNFORESEEN HAZARDS

.1 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of Work, stop work and immediately advise the Engineer verbally and in writing.

10 PERSONAL HEALTH, SAFETY AND HYGIENE

.1 Training:

.1 Ensure personnel entering the jobsite are trained in accordance with specified personnel training requirements.

.2 Levels of Protection:

.1 Establish levels of protection for each Work area based on the planned activity and location of the activity, as per WCB regulations.

.3 Equipment Usage Procedures:

.1 Develop protective equipment usage procedures and ensure procedures are strictly followed by site personnel; include the following procedures as minimum:

.1 Ensure prescription eyeglasses worn are safety glass and do not permit contact lenses on site within work zones.

.2 Ensure footwear is steel-toed safety shoes or boots and is covered by rubber overshoes when entering or working in potentially contaminated work areas.

.3 Dispose of, or decontaminate personal protective equipment (PPE) worn on site at end of each workday, as required.

.4 Decontaminate reusable PPE before reissuing, as necessary.

.5 Ensure site personnel have passed respirator fit test prior to entering potentially contaminated work areas.

.6 Ensure facial hair does not interfere with proper respirator fit.

.4 Respiratory Protection

.1 Provide site personnel with sufficient training in usage and limitations of, and qualitative fit testing for, air purifying and supplied-air respirators in accordance with specified regulations.

.2 Develop, implement, and maintain respirator program.

.3 Monitor, evaluate and provide respiratory protection for site personnel.

.4 Ensure levels of protection, as listed, have been chosen to be consistent with site-specific potential airborne hazards associated with major contaminants identified on site.

.5 Immediately notify Engineer when level of respiratory protection required increases.

.6 Ensure appropriate respiratory protection during work activities.

.7 Assess ability for site personnel to wear respiratory protection.

.5 Heat Stress/Cold Stress

.1 Implement heat stress and/or cold stress monitoring program as applicable and include in site-specific the Health and Safety Plan.

.6 Personnel Hygiene and Personnel Decontamination Procedures

.1 Provide minimum as follows:

.1 Suitable containers for storage and disposal of used disposable Personal protective equipment (PPE).

.2 Potable water and suitable sanitation facility.

.7 Emergency Equipment and First-Aid Technician

.1 As a minimum, provide (1) one certified first-aid technician on site at all times when work activities are in progress. A copy of the first-aid technician's current certification shall be submitted to the Engineer.

.2 Locate and maintain emergency and first-aid equipment in appropriate location on site, including first-aid kit to accommodate number of site personnel; portable emergency eye wash and two 9 kg ABC type dry chemical fire extinguishers.

.8 Site Communications

.1 Post emergency numbers near site telephones.

.2 Ensure personnel use of “buddy” system and develop hand signal system appropriate for site activities.

.3 Provide an employee alarm system to notify personnel of site emergency situations or to stop Work activities if necessary.

.9 Safety Meetings:

.1 Schedule and administer a Health and Safety meeting with the Engineer prior to commencement of Work. A sign-up sheet of attendees shall be included in the minutes of the meeting.

.2 Conduct and record mandatory daily safety meetings for personnel, and additionally, as required by special or work-related conditions. A sign-up sheet of attendees shall be included in the minutes of the meetings:

.1 include refresher training for existing equipment and protocols,
.2 review ongoing safety issues and protocols and;
.3 examine new site conditions as encountered.

.3 Hold additional safety meetings on an as-needed basis.

.10 Bear Monitoring:

.1 the Contractor shall retain the services of a bear monitor if required under the local Hamlet policies .

11 AIR MONITORING

.1 Air Monitoring Program:

.1 Develop and implement an air monitoring program, as required, which meets WCB regulations.

.2 Air Monitoring Reporting:

.1 Report air monitoring results daily to Engineer as appropriate.

12 CONTINGENCY AND EMERGENCY RESPONSE

.1 Meet specified requirements.

.2 Arrange and attend coordination meeting to be held with appropriate authorities, including the Community, Fire, Nursing Station and Community Emergency Coordinator

.1 The meeting will identify off-site Emergency Response Coordinator through whom all information and coordination will occur in event of an incident.

13 SITE CONTROL

.1 Meet specified requirements.

.2 Prior to commencing work involving handling of drums and other containers, submit procedures for safe handling of drums and other containers.

.3 Implement and enforce drum handling program during activities involving drummed waste characterization including, but not limited to, handling, opening, sampling, staging, and consolidating.

.4 Confined Space Entry Program:

.1 Entry into a storage tank or any confined space shall be only made in strict accordance with the *American Petroleum Institute (API) Publication 2015, Cleaning Petroleum Storage Tanks, and RP 2016, Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks.*

.2 Confined space entry shall meet all the requirements of:

.1 *API Publication 2015, Cleaning Petroleum Storage Tanks.*

.2 *API Publication* RP2016, Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks.

.3 *Safety Act, General Safety Regulations, R.R.N.W.T.*

.4 *WCB Safety Regulations l/9 36 (1).*

END OF SECTION 01351

1. RECORDS DURING CONSTRUCTION

.1 The Contractor shall keep two (2) complete sets of all construction drawings on the site of the Work.

.2 One set of record drawings shall not be used other than to record changes due to field conditions and must be kept available for the Engineer to review at site at all times. These drawings shall be clearly marked up by the Contractor in **RED** to record all changes incorporated into the project during construction. The Drawings shall be clearly identified as **'record drawings'**. Failure to provide marked-up record drawings can result in hold back of monies under the *Section 01150 for Demobilization.*

.3 All final positions of tankage and pipe work shall be correctly plotted to scale and all revised dimensions noted. Neat, dimensioned sketches of all site coordinated systems and equipment, such as electrical layout, shall be prepared on separate sketches and appended to the record drawings.

.4 The Contractor shall keep these record drawings in good condition and not allow the use of this set for administration purposes by site personnel.

END OF SECTION 01390

1. GENERAL

.1 The Contractor is wholly responsible for the quality of materials and products, that are provided and for the Work.

.2 The Contractor is responsible for quality control and shall perform such inspections and tests as are necessary to ensure that the Work conforms to the requirements of the Contract Documents.

.3 During the progress of the Work, a sufficient number of tests shall be performed by the Contractor to determine that material, product and installation meet the specified requirements.

.4 Minimum requirements regarding quality control are specified in various sections of the Specifications, however, the Contractor shall perform as many inspections and tests as are necessary to ensure that the Work conforms to the requirements of the Contract Documents.

.5 Testing shall be in accordance with pertinent Codes and regulations, and with selected standards of the American Society for Testing Materials (ASTM) and Canadian Standards Association (CSA).

.6 Product testing, mill tests and laboratory reports to demonstrate that product and material supplied by the Contractor meet the requirements of the Specifications as are specified under various sections of the Contract Documents.

2. QUALITY CONTROL TESTING BY THE CONTRACTOR

.1 The Contractor shall retain the services of an independent testing agency under supervision of a registered Professional Engineer, and pay the cost of testing services for quality control including, but not limited to, the following:

.1 Sieve analysis of sands and aggregates to be supplied to the Work.

.2 Salinity of any soils imported to the site that may be in contact with any metal or concrete

.3 Standard Proctor Density curves for backfill materials.

.4 Standard Proctor Density curves for approved borrow materials.

.5 Compaction control tests for backfill and embankment material.

.6 Any product testing that is required and is specified under various sections of the Specifications.

.2 The Contractor shall promptly process and distribute all required copies of test reports, test information and related instructions to all of his subcontractors and suppliers, to ensure that all necessary retesting and replacement of construction can proceed without delay.

.3 The Contractor shall promptly provide the Engineer with originals plus copies of all test results.

3. QUALITY ASSURANCE TESTING BY THE OWNER

.1 The Owner may retain and pay for the services of an independent testing agency for testing for quality assurance, for the Owner's purposes.

.2 The Owner's testing agency and the Engineer may inspect and test materials, products and the Work for conformance with the requirements of the Contract Documents, however, they do not undertake to check the quality of the Work on behalf of the Contractor nor to provide quality control.

.3 Inspections and tests by the Owner's testing agency and by the Engineer do not relieve the Contractor of his responsibility to supply materials and products and perform the Work in accordance with the requirements of the Contract Documents.

.4 The Engineer, at their discretion, may order or perform any additional inspections and tests for purposes of his own, or for purposes of the Owner.

.5 The Contractor shall coordinate with the Engineer, the scheduling of testing and inspection by the Owner's testing agencies, or by the Engineer, to enable testing to be done as necessary, without delay, and the Contractor shall notify the Engineer sufficiently in advance of operations to allow for such inspection and tests by the Engineer's or the Owner's testing agency.

.6 Changes to scheduling of tests must not occur fewer than 14 days before the initial scheduled date and must be notified to the Owner and Consultant immediately. Changes to the schedule made after the Consultant's written confirmation of travel plans may result in the Contractor bearing all cost incurred by the Consultant due to the delay or schedule change, including but not limited to time on site, accommodations, and or travel costs.

4. CODE COMPLIANCE TESTING

.1 Inspections and tests required by Codes or ordinances, or by an Authority Having Jurisdiction (AHJ), shall be the responsibility of and shall be paid for by the Contractor.

5. RETESTING

.1 When tests on products, materials or completed work carried out by the Contractor or the Contractor's testing agency yield results not meeting the requirements of the Contract Documents, the Contractor, in addition to carrying out remedial work or replacement of the product or materials, shall provide for retesting of the remedied work and the replacement product and materials. Retesting shall be at the Contractor's expense.

.2 In every case where the Contractor has submitted test results which fail to meet the requirements of the Contract Documents, the Contractor shall submit within a

practical and reasonable time, as discussed in the preconstruction meeting, results of a retest showing that the results are in accordance with the requirements of the Contract Documents.

.3 Radiographic retesting of welds to be in accordance with *Section 15010*.

6. SHOP INSPECTION

.1 The Contractor shall notify the Engineer at least two weeks prior to commencement of fabrication of tankage and dispenser buildings in order that he may arrange for shop inspection of such if required.

.2 The Contractor shall provide access for the Engineer during all stages of fabrication.

.3 Mill test certificates shall be provided in duplicate (prior to shipping any material) for all steel to be used in fabrication. A copy of the welder's qualifications shall be provided to the Engineer prior to commencement of any welding. Qualified welding procedures shall also be provided.

.4 All tradesmen, welders, etc., who will be working on the site, shall be qualified and registered with the proper authorities of the Nunavut and certification shall be provided to the Engineer prior to commencing work.

7. INSPECTION AND TESTING

.1 As the Work progresses, the Contractor shall arrange to have same inspected, tested and accepted periodically by the Engineer in conformity with the Contract Documents. The Contractor shall advise the Engineer sufficiently in advance to allow him to get to the site and carry out these inspections.

.2 When the Work is completed and the Contractor has complied with the Contract and all orders and directions made pursuant thereto, he may request the issuance of a Substantial Completion Certificate or Final Certificate of Completion from the Engineer. All requests for the issuance of said certificates shall be made in writing to the Engineer at least fourteen (14) days prior to carrying out any tests that warrant the issuance of said certificates. The Contractor is advised that a maximum of one Substantial Completion and one Final Inspection will be allowed. If the Work is not satisfactorily completed, any additional Substantial Completion or Final Inspections shall be at the Contractor's expense, unless specifically requested by the Engineer.

.3 Cost of all testing, unless specified otherwise, shall be borne solely by the Contractor.

.4 All tests for materials and equipment described in these specifications, or elsewhere in the Contract Documents, shall be the Contractor's responsibility. For tests to be valid they shall be made and documented in the presence of the Engineer unless otherwise instructed.

.5 Testing performed by or on the behalf of the Government of the Nunavut shall in no way relieve the Contractor of his responsibility for ensuring that all

materials, equipment and workmanship meet the specified standards.

END OF SECTION 01400

1. TEMPORARY UTILITIES

1.1 References

.1 Canadian General Standards Boards (CGSB)

.2 Canadian Standards Association (CSA International)

.1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-0121-M1978(R2003), Douglas Fir Plywood.

.3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.

.4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.

1.1 Water

.1 Provide and pay all costs for all water required for the performance of the Work, in accordance with governing regulations and ordinances.

.2 Furnish and install all necessary temporary piping and upon completion of the Work remove all such temporary piping.

.3 Use of and disposal of water used for hydrotesting etc., is the responsibility of the Contractor.

.4 The Contractor is responsible for obtaining all required water use licenses from the Nunavut Water Board. Up to six months may be required to obtain a water license.

1.2 Electricity And Lighting

.1 Provide and pay all costs for electricity and artificial lighting required for the performance of the Work, in accordance with governing regulations and ordinances.

.2 Furnish and install all necessary temporary wiring, distribution boxes, panels, etc., and upon completion of the Work, remove all such temporary materials.

1.3 Telephone

.1 Provide, maintain and pay all costs for a telephone for the Contractor's use.

1.4 Heating And Ventilating

.1 Provide and pay all costs for heating and ventilating, coverings and enclosures as necessary to protect and perform the Work.

.2 Furnish and install all necessary temporary equipment, piping, wiring, ducting, and other materials to perform the Work and upon completion of the Work, remove all such temporary equipment.

.3 Temporary heating and ventilating shall be in accordance with all governing regulations and ordinances.

.4 Temporary heating and ventilating shall be provided to:

.1 facilitate progress of the Work;
.2 protect the Work and products against dampness and cold;
.3 prevent moisture condensation on surfaces;
.4 provide an atmosphere for curing materials, as required;
.5 provide adequate ventilation to meet safety regulations;
.6 prevent hazardous accumulation of dust, fumes, mists, vapours or gases in areas occupied during construction;
.7 ventilate storage spaces containing hazardous or volatile materials.

1.5 Sanitary Facilities

.1 Furnish and install all required temporary toilet buildings with sanitary toilets for use of all workmen; comply with all minimum requirements of the Department of Health and Social Services, or other public agency having jurisdiction; maintain in a sanitary condition at all times.

1.6 Fire Protection

.1 Provide and pay all costs for adequate fire protection of the Work and adjacent property.

.2 Furnish and install temporary fire extinguishers, hydrants and other equipment, and upon completion of the Work, remove all such temporary equipment.

1.7 Fuel Supply

.1 Applications must be made for credit purchases prior to mobilization. Failure to obtain credit will result in the Contractor having to pay cash for all fuel purchases in the community.

.2 The application shall be made to Petroleum Products Division, Public Works and Services, Rankin Inlet, Nunavut.

2. CONSTRUCTION AIDS

2.1 Temporary Plant

.1 Provide, arrange for, maintain and pay for all temporary items such as, but not limited to, stairs, ladders, scaffolding, ramps, transportation of labour and materials, runways, chutes, hoists, elevators, tools, templates, as required for the completion of the Work.

.2 The location of such items shall be such as to prevent interference with, marking of, or damage to any portion of the Work.

.3 All such items shall conform to all applicable National and local ordinances regulating safety, and to the *National Building Code of Canada (NBC)*.

2.2 Temporary Enclosures

.1 Furnish, install, and maintain for the duration of construction, all required scaffolds, tarpaulins, barricades, temporary dikes, fences, canopies, warning signs, steps, bridges, platforms, and other temporary construction necessary for proper completion of the work in compliance with all pertinent safety and other regulations.

2.3 Falsework And Temporary Construction Supports

.1 The Contractor shall be responsible for methods used for the falsework and temporary construction supports.

.2 Employ a qualified, Professional Engineer, registered in the Nunavut, for the design of temporary works, and design in accordance with *CSA S269.1, (Latest Edition) False work for Construction Purposes*.

.3 Record design calculations and drawings to show that temporary works are adequate. Provide design loads, material details and dimensions. Sign and seal design calculations and drawings, and revisions thereto.

.4 The Engineer's approval to proceed with falsework and temporary construction supports shall not relieve the Contractor of his responsibility.

2.4 Winter Construction

.1 Special construction methods required to perform the Work in severe weather shall be the responsibility of the Contractor.

.2 Where the Specifications call for Work to be performed within a given temperature range or above a minimum temperature, it shall be the Contractor's responsibility to provide all temporary enclosures and heat necessary to provide the conditions specified.

.3 Where compaction of backfill is specified, the Contractor shall perform the Work in a manner such that the specified compaction can be achieved.

.4 Where weather conditions are such that compaction of backfill consisting of excavated materials is not possible, the Contractor shall provide unfrozen granular material for backfill, at the Contractor's expense.

3. EXISTING UTILITIES AND STRUCTURES

.1 Existing utilities and structures include pipes, culverts, ditches or other items which are a part of an existing sewage, drainage or water system, or which are a part of an electrical, telephone, television, telecommunications or other utility system. Also

included are swales, poles, fences or any other structures encountered during construction.

.2 The Contractor shall be responsible for location, protection, removal or replacement of existing utilities and structures, or for repair of any damage which may occur during construction.

.3 Existing utilities and structures may be shown on the Drawings or described in the specifications. Such information is shown for design purposes and the existence, location and detail given is information that is obtained during the design period and is not necessarily complete, correct or current.

.4 The Contractor shall pay all costs and be responsible for establishing locations and state of use of all existing utilities that may affect the Work. The Contractor shall make satisfactory arrangements with the utility companies involved for the location, protection and inspection of existing utilities.

.5 Notice in writing shall be given by the Contractor to the utility companies 48 hours before work commences in the vicinity of existing utilities.

.6 The Contractor shall pay all the costs involved in protection of utilities, inspection of utilities, and all costs due to delays because of existing utilities and structures.

.7 The Contractor shall provide for the uninterrupted flow of all water courses, sewers and drains encountered during the Work.

.8 Access shall be maintained to all existing structures such as valves, hydrants, meter chambers and control structures at all times during construction.

.9 If interruption of service provided by an existing utility is necessary, a planned shutdown shall be approved by the owners of the utilities. Requests for a shutdown shall be made, by the Contractor, in writing, at least 48 hours in advance.

.10 The Contractor shall notify all customers, or make arrangements with the utility company to notify all customers, 24 hours in advance of a shutdown.

.11 Unless otherwise specified, the Contractor shall make arrangements for relocation of existing utilities that the Engineer requests to be relocated, and the actual relocation shall be constructed by the owner of the utility. The Contractor will be reimbursed the invoiced cost of the relocation. No extra payment is permitted for delays, or standby time.

.12 Contact the noted Owners of the utilities for further information:

Nunavut Power Corporation: QEC - 1 800 491 8127

Nunavut Utilities Ltd.: Hamlet Office - 1 867 925 8867

Nunavut Tel: Northwestel - 1 888 423 2333

4. TEMPORARY CONTROLS

4.1 Noise Controls

.1 Perform the Work in conformity with all municipal bylaws with respect to noise, hours of work, night work and holiday work. Night work or holiday work requires the written permission of the Engineer.

4.2 Dust Control

.1 Perform the Work in a manner that will not produce an objectionable amount of dust. Dust control measures shall be paid for by the Contractor.

4.3 Pollution Control

.1 Perform the Work in conformance with the applicable sections of the Territorial regulations with respect to air, ground and water pollution control requirements.

4.4 Disposal Of Waste

.1 Burying of rubbish and waste on site is not permitted.

.2 Disposal of waste or volatile materials into waterways, storm or sanitary sewers is not permitted.

.3 Pumping or draining water containing silt in suspension into waterways, sewers or drainage systems is prohibited.

.4 Disposal of all waste shall be as laid out in the GN guidelines.

5. TRAFFIC REGULATION

.1 The Contractor shall be responsible for the regulation of traffic during construction, and shall perform the Work in a manner that will cause the least disruption of traffic.

.2 The Contractor shall coordinate the Work with the Engineer, and the Owner to reduce traffic problems.

.3 The Contractor shall be responsible for providing traffic signs, and other traffic controls, as necessary.

.4 The Contractor shall supply all barriers, barricades, warning signs, detours, fences, and all other devices to protect the public. All applicable safety standards shall be followed.

.5 The Contractor shall obtain approval to block traffic temporarily, if it is necessary to do so, to perform the work. Obtain the written approval of applicable municipal departments and the Engineer. At least 48 hours prior to actually blocking traffic notify the following:

.1 Public Works departments (GN & Community)

.2 Utility companies

.3 Community fire department

.4 Police department (RCMP)

.6 Adequate construction parking, meeting local regulations, shall be provided by the Contractor.

.7 Haul routes shall be maintained by the Contractor. They shall be kept open to traffic and shall be clean at all times.

6. CONTRACTOR'S FIELD OFFICE

.1 Furnish and install a field office building adequate in size and accommodation for all Contractor's offices, Resident Engineer's office, and supply and tool room throughout the entire construction period.

.2 Field office to be located adjacent to the main work site.

.3 Field office is to be complete with telephone, fax machine and data line.

7. TEMPORARY USE OF OWNER'S FACILITIES AND THE WORK

.1 If the Owner permits the Contractor to make temporary use of the Owner's facilities, the Contractor shall use the facilities with care, providing all maintenance and repair, and shall leave the facilities in good working order when finished.

.2 Permanent systems shall not be used by the Contractor without the written permission of the Engineer.

.3 Permanent heating systems shall not be used for temporary heating without the written permission of the Engineer.

.4 If the Contractor obtains written permission to use existing heating systems or other systems temporarily, before completion, the Contractor shall change lubricants, filters and other accessory items completely before acceptance. Warranties shall be extended by the Contractor to ensure that the Owner receives the full warranty, as specified.

.5 Temporary or trial usage by the Owner of any mechanical machinery, apparatus, equipment or any other Work or materials supplied under the Contract, before final acceptance by the Engineer, is not to be construed as evidence of acceptance. The Owner shall have the privilege of such temporary and trial usage as soon as the Contractor shall claim that said work is completed.

END OF SECTION 01500

1. QUALITY

.1 Materials and products supplied and installed shall be new.

.2 Materials and products supplied shall conform to these specifications and to applicable standards.

.3 Workmanship shall be the best quality, executed by workmen experienced and skilled in their respective trades.

.4 Ensure full cooperation among all trades and coordination of the Work with continuous supervision.

.5 Use products for which replacement parts and service are readily available.

.6 Use products of one manufacturer for products of the same type or classification.

2. MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise specified, comply with the manufacturer's/supplier's instructions for material or product and installation methods.

.2 Notify the Engineer in writing of any conflict between these Specifications and the instructions of the manufacturer/supplier.

3. FASTENINGS

.1 Provide metal fastenings and accessories in the same texture, colour and finish as the base metal in which they occur. Prevent electrolytic action between dissimilar metals. Use non-corrosive fasteners, anchors and spacers for securing exterior work, or work that may be located in a corrosive atmosphere.

.2 Space anchors within limits of load bearing or shear capacity and ensure that they provide positive permanent anchorage.

.3 Space fastenings evenly and lay out neatly.

4. DELIVERY AND STORAGE

.1 The type, manufacturer, expiry date and storage instructions for paint to be used on the project are to be confirmed in writing and accepted by the Engineer, prior to shipping. All sand blasted and shop primed steel shall be subject to inspection prior to shipping.

.2 The Contractor shall provide adequate storage for all material and equipment delivered to site and shall be solely responsible for the safety and maintenance of such materials and equipment.

.3 All equipment, whether in transit, storage or after installation, shall be protected from weather, dust, corrosion, freezing, moisture, impact or malicious damage to the satisfaction of the Engineer and in accordance with the manufacturer’s instructions as applicable. Any material or equipment deteriorated or damaged due to inadequate protection shall be replaced at the Contractor’s expense.

.4 In general, mechanical and electrical equipment and machinery shall be stored in weatherproof buildings; special care shall be taken to protect electrical equipment and painting materials.

.5 The Contractor shall ensure that all dangerous substances such as paints, solvents, propane and petroleum fluids are stored in secure locked locations.

.6 All costs associated with transporting, storing and stockpiling material shall be borne by the Contractor.

5. HAZARDOUS MATERIALS AND MATERIAL SAFETY DATA SHEETS (MSDS)

.1 Controlled products, such as paints, thinners, solvents, fuels, etc., for incorporation into the Work shall be labeled in accordance with hazardous products legislation. Workplace Hazardous Material Information System (WHMIS) Material Safety Data Sheets (MSDS) shall be provided.

.2 Suppliers have the responsibility to ensure labels contain the information required by the legislation for the product. The Contractor shall ensure that the labels are protected and safeguarded in a manner satisfactory to the Engineer.

.3 The Contractor shall provide the Engineer with five (5) copies of Material Safety Data Sheets for all controlled products to be incorporated into the Work or required for operation. It shall be the Contractor's responsibility to provide this information.

.4 The MSDS shall be part of the operation and maintenance manual data to be provided to the Engineer and shall contain full details on the identification, safe handling and storage of controlled products and hazards associated with misuse.

.5 The Contractor shall instruct operators on the safe handling and hazards associated with the misuse of controlled products incorporated into the Work or required for operation as part of the commissioning process.

.6 The Contractor is advised that by legislation he is required to have the MSDS on the site during construction. The MSDS should be clearly outlined and available to all people working or visiting the site.

END OF SECTION 01600

1. GENERAL

.1 The Contractor shall follow the listed procedures for the documentation, testing and acceptance for the facility.

.2 The following procedures shall be carried out by the Contractor for testing and acceptance of the facility. At least fourteen (14) days written notice must be given to the Engineer and the Owner prior to conducting a Substantial Completion Inspection.

.3 All tests must be or have been witnessed by the Engineer or his representative and shall consist of, but not necessarily be limited to, items as further described.

2. DOCUMENTATION

.1 The Contractor shall submit proof of each welder's arc welding qualifications (a copy of a valid welding certificate) as issued by the Government of the Nunavut, in accordance with the *Boiler and Pressure Vessel Welding Regulations, API Std. 1104 and CSA Std. Z662*. Verify the validity of the certificates to the Work being performed. **It is mandatory that each welder working on tanks or pressure piping has a The Nunavut Class B Pressure Welding certification or equivalent red seal trade before starting work.**

.2 The Contractor shall submit weld inspection reports, radiographs and other weld test records, such as vacuum tests, to show Code compliance, as required by the applicable Codes and standards.

.3 The Contractor shall provide a witnessed certificate of each hydrostatic and other pressure testing carried out on the tanks, piping and special assemblies, such as the dispensing facilities. All piping pressure test certificates must be accompanied by a copy of the pressure and temperature recording charts, field data sheets and/or other documents to adequately support the success of the test as required by *Section 7.7 of CSA Standard, Z662 for Oil Transportation Systems*. All final tank hydrostatic tests must include details of the test together with elevation readings of the tank bases before, during and after the test, to verify the adequacy of the tank foundations.

.4 The Contractor shall submit a certificate of acceptance of the electrical installations as issued by the Electrical Inspector of the Government of the Nunavut (GN). The Contractor shall also include a record of the Megger test readings of the ground resistance pertaining to the grounding installations.

.5 The Contractor shall have submitted the original of finalized shop drawings, product and equipment data sheets, samples and five (5) copies of Operating & Maintenance Data and Spare Parts List to the Engineer, **prior to payment for mobilization as specified**, for each construction year**.**

.6 The Contractor shall submit marked-up copies of the Record Drawings to the Engineer, as specified.

.7 The Contractor shall submit to the Engineer a copy of test results for any other test which may have been requested during construction.

3. INSPECTION AND TESTING PROCEDURES

.1 **Tankage:** The following inspection shall have been completed, witnessed and documented. Each existing tank shall be drained, gas-freed, cleaned (including power brushing and vacuuming the tank floor plates ready for an API 653 repairs. All repairs shall be completed and tested in accordance with *API Standard 653, Tank Inspection, Repair, Alteration, and Reconstruction.*

The final hydrostatic test for any storage tank shall be made only when the tank has been completely built or modified and installed in its final position. Each tank must be completely isolated from any product piping by the installation of slip blinds, plugs and/or caps. Hydrostatic testing of the tanks shall be done as per *Section 15060 of these Specifications.*

After testing, thoroughly drain and flush the tanks with clean water. Clean and wipe dry the interior of each tank prior to final acceptance by the Engineer.

.2 **Pipelines and Piping in Tankage Area:** The following testing shall have been completed, witnessed and documented. Prior to testing, the piping is to be disconnected sufficiently to ensure that all construction debris and foreign material has been removed from the piping by flushing thoroughly with clean water. Install slip blinds at the tank, disconnect and plug or blind-off at the dispenser or at equipment (flexible connections, etc.) that may be damaged by the hydro test. No testing shall be made against block valves where leakage cannot be visually checked (use slip blinds). Install calibrated pressure and temperature recording equipment to monitor and document the success of the hydrostatic tests. If suitable monitoring equipment is not available, a calibrated pressure gauge can be used, provided suitable periodic pressure and temperature readings are taken throughout the test to adequately document the success of the test. The piping system under test must be totally isolated from the water supply during the test. All piping shall be hydrostatically tested as per *Specification, Section 15010*. All testing and flushing shall be performed in the presence of the Engineer.

The test records are to be signed by the Contractor and the Engineer or his representative after the test. After testing, the piping shall be flushed with clean water until no deposits are retained in the strainer baskets. After flushing, completely drain all water from the system. Reassemble the piping using new gaskets and new pipe thread compound.

4. SUBSTANTIAL COMPLETION INSPECTION

.1 The following inspection procedure shall be carried out by the Contractor in the presence of the Engineer and Consultant (and possibly a PPD representative) and shall consist of, but not necessarily be limited to:

.1 Carry out a visual inspection of the tankage areas and yard facilities as well as of the pipelines and sea hose connection point facilities. Particular attention should be directed to verifying the tightness of all joints and equipment connections.

.2 All valves shall be operated full cycle (open and close) and stem threads lubricated with low temperature lubricant as recommended by the valve manufacturer (repeat the operation as necessary and to the satisfaction of the Engineer).

.3 The Contractor shall provide a plug at the tank water draw-off valves (if not already installed). Fully open and close valves and ensure that the valves hold tight in the closed position.

.4 The gauge hatches shall be verified to hold tight.

.5 The pressure/vacuum vents shall be inspected; the inscription on the weights shall be noted for compliance with the pressure and vacuum settings called for on the drawings. Hoods shall be firmly installed. Serial numbers of the pressure/vacuum vents shall be recorded for each tank.

.6 The Contractor shall adjust level gauges and repeat test until accurate readings are obtained.

.7 All tank equipment shall be inspected and verified for proper operation.

.8 Confirm that the settings on all pressure relief valves have been verified and the relief directions have been confirmed.

.9 Check all electrical and static grounding conductors and connections. Perform a ground continuity and resistance test and provide a Certificate of Acceptance for the electrical installations from the *Electrical / Mechanical Safety Group of Public Works and Services.*

.10 Calibrate the operation of the automated tank gauging and overfill prevention system. Verify that the remote alarm signals, output relays and control valves are functioning as required.

.11 Check the fencing, the operation of all gates and the adequacy of the locking hardware.

.12 Ensure that all padlocking features exist at valves, gauge hatches, water draw-off valves. The Owner (PPD) will supply the locks, all keyed alike at no cost.

.13 Verify that tank gauging sign is installed on the railing beside each gauge hatch.

.2 At least fourteen (14) days written notice to the Engineer is required to coordinate the Substantial Completion Inspection. Phone verification shall also be undertaken by the Contractor to ensure that arrangements can be made to conduct the

inspection as requested.

END OF SECTION 01650

1. CLEANUP

.1 Maintain the working area in a clean and orderly manner as the Work progresses, and upon completion of construction, remove all waste materials, and all temporary facilities from the site.

.2 Haul surplus or salvage materials that are the property of the Owner to the Owner's storage site.

.3 Remove surplus or salvaged materials belonging to the Contractor from the site.

.4 Clean haul routes.

.5 Vacuum clean interior building areas when ready for painting, and continue vacuuming as needed.

.6 Remove grease, dust, dirt, stains, labels, fingerprints and other foreign materials from sight on exposed interior and exterior finished surfaces, including glass and other polished surfaces.

.7 Clean lighting reflectors, lenses and other lighting surfaces.

.8 Broom clean paved surfaces, rake clean other surfaces of ground.

.9 Remove debris and surplus materials from roof areas and accessible concealed spaces.

.10 Remove snow and ice from access to the buildings.

2. RECORD DOCUMENTS

.1 As specified in other Sections of the Specifications, the Contractor shall be required to prepare record drawings, to provide survey notes, to supply test results or other documents. Such information shall be turned over to the Engineer as soon as start-up is complete, and before the Final Certificate of Completion is issued.

.2 Record documents shall be neat, legible and accurate.

3. OPERATION AND MAINTENANCE MANUALS

.1 The original and five copies of the Operation and Maintenance (O&M) manuals for the Work will be produced, in part, by the Contractor, for completion by the Engineer (consultant). The Engineer will provide the binders.

.2 The Contractor's work includes: provision of the originals and five (5) copies of Manufacturer's and Supplier's information and warranties (prior to payment of the final 30% of the Mobilization Item (see *Section 01150, Measurement and Payment, Clause 2.1.5*) for each year of construction). The data is to be identified, separated into individual manual sets, organized into applicable categories of work, parallel to the Specifications Sections, and each Chapter.

.3 The Contractor shall deliver the final O&M Manual data, shop drawings, Manufacturers and Suppliers information, warranties, record drawings, and other materials to the Engineer at least fourteen (14) days before the Substantial Completion Inspection.

.4 The Contractor's O&M Manual submissions are to conform to the current edition of the "Specification for Operations and Maintenance Manuals" Department of Public Works & Services, Government of the Nunavut. Copy available from the Engineer, if necessary.

.5 All work described in this Section is the Contractor's work except where specifically indicated otherwise.

.6 The completed manual will contain ten chapters. The data is to be separated into individual manual sets, organized into applicable categories of work parallel to the Specifications Sections, and each chapter presented in order and identified. The responsibility for production of each chapter is indicated below:

Chapter 1	Introduction (Engineer/Consultant)
Chapter 2	Index (Engineer/Consultant)
Chapter 3	Background, Design Data (Engineer/Consultant)
Chapter 4	Schematic, Functional Data (Engineer/Consultant)
Chapter 5	Component Details (Engineer/Consultant)
Chapter 6	Operating Procedures (Engineer/Consultant)
Chapter 7	Maintenance Procedures (Engineer/Consultant/Contractor) (including lists of recommended spare parts by Contractor)
Chapter 8	Testing and Certification Documents (part by Contractor)
Chapter 9	Manufacturer Data, Shop Drawings and Service Information (Contractor)
Chapter 10	Appendices (Engineer/Consultant, unless directed otherwise in this Section)
	Gauging (Strapping) Charts (Contractor)

.7 The language of the manual will be English.

.8 Testing and certification documents for Chapter 8 shall be provided within one week of the Substantial Completion Inspection and shall include:

.1 Provide data sheets that provide actual operating conditions after the systems have been balanced or adjusted to design conditions. Data required includes final control settings, field check data on all motors, including R.P.M., voltage, phase and actual current under normal loads, alignment certificates from millwrights, electrical load balancing, etc.

.2 Include all data sheets recording compaction and/or concrete test results, data tests for leakage, drain operation, ground Megger tests, pump capacity tests, certification of meters, etc.

.3 List all items that require periodic inspection by independent inspectors. List the frequency of inspection, the inspection agency to contact, including addresses and current phone numbers.

.4 Include an original and five (5) photocopies of each certificate issued by the independent inspectors who make inspections pursuant to health, safety and other regulations of a similar nature. Indicate where the original of each such certificate is filed and where it is to remain displayed.

.5 Include originals of manufacturers' warranties in Copy 1 of the manual.

.6 Include clear, legible photocopies of manufacturers' warranties in Copies 2 through 6.

.7 Group warranties together to form a section in Chapter 8.

.9 Manufacturers' information data for Chapter 9 shall be provided at least fourteen (14) days prior to the Substantial Completion Inspection as follows:

.1 This chapter of the O&M Manual provides an original collection of all manufacturer's service manuals, parts lists, operating and maintenance instructions, performance curves and other applicable data that may be required in future years.

.2 Include information needed for operation, maintenance and repair of every component of the mechanical and electrical systems, and any other system requiring or likely to require operation or routine maintenance.

.3 Preface this Section with an index. List in order each item by the manufacturer's name and the pieces of equipment to which it refers. Include supplier's name, address and phone number.

.4 Include maintenance instructions for finished surfaces and materials and a copy of hardware and paint schedules.

.5 Include all original service manuals, data sheets and other manufacturer's information for each component.

.6 Manufacturer's information is to be an original and five (5) copies of the manual. Poor quality photocopies are **not** acceptable.

.7 On the first page of each inclusion, identify the piece of equipment to which it refers. Include nameplate information such as model, size, capacity, serial number, etc.

.8 Remove pages from manufacturer's information that are irrelevant to the equipment provided for this project.

.9 Where tables and curves are given for the full range of sizes, underline in **red** on all copies, the data that refers to the installed equipment. If more than one size or type in the same table was used, add the identification for each in the margin to assist in positive identification. Draw a thick black diagonal line across all data not applicable to equipment provided.

.10 If any warning instructions are included that, if ignored, could significantly

affect the equipment, mark these with red arrows in all copies, to draw the operator's attention.

.11 Service manuals must be the operating and maintenance type, which give parts lists, preferably including an exposed or sectioned drawing for guidance in assembling, installation details, lubrication and operations details. Sales types of brochures, which give only a very general description and few details, are **not** acceptable.

.12 Mount any items that are smaller than 216mm X 280mm on a full page for inclusion in the manual.

.13 Include all wiring diagrams complete with wire coding.

.10 Gauging Charts for each tank are to be included in the Appendix and are to be provided in draft form two weeks prior to the Substantial Completion Inspection. See *Section 15060*.

.11 Deliver any outstanding material prior to requesting Final Inspection, and payment of the final Mobilization amount.

END OF SECTION 01700

PART 1 – GENERAL

1.1 General Conditions

.1 The contractor shall read and be governed by the General Conditions, General Instructions, Instructions to Bidders, Addenda, Form of Tender and Agreement of the complete Specifications for this project.

.2 Complete work under this trade shall be governed by the dictates of good practice in all details of materials and methods even if not minutely specified. The work shall be properly coordinated with the requirements of other units of work specified in other sections.

1.2 Standards

.1 American Society for Testing and Materials: ASTM (where noted)

1.3 Site Conditions

.1 Visit the site and note all characteristics and irregularities affecting the work of this section.

.2 To proceed with the work will mean acceptance of the conditions and failure to comply with the above will in no sense form the basis for any claims.

1.4 Utility Lines

.1 Contact all required utility companies prior to commencing work and become informed of exact location of utilities. Protect utilities during construction and assume liability for damage to utilities.

1.5 Permits

.1 Obtain and pay for any permits required to complete the work.

1.6 Compaction Densities

.1 Compaction Densities are percentages of Standard Proctor maximum dry density at optimum moisture content obtainable from ASTM D698.

1.7 Inspection and Testing

.1 The Contractor will pay costs for inspection and testing as per Division 1, Section 01400.

.2 Sieve Analysis: The contractor will submit sieve test reports for the proposed fill materials before construction to determine suitability and conformance with the specifications. The Engineer may request additional tests as construction proceeds.

1.8 Protection

.1 Provide adequate protection around benchmarks, layout markers, survey markers and geodetic monuments.

.2 Provide protection to ensure no damage to existing facilities and equipment situated on site.

.3 Do not stockpile excavated material to interfere with site operations or drainage.

.4 Maintain adequate barriers and construction signs to prevent injury to the public.

PART 2 - PRODUCTS

2.1 Materials

.1 Refer to Section 02224 Site Works for materials specifications. All materials to be subject to Engineer's approval. Contractor will submit representative samples of proposed fill material for testing.

2.2 Stockpiling

.1 Stockpile fill materials in areas designated by Engineer. Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

PART 3 – EXCAVATION

3.1 Excavating

.1 Excavate to elevations and dimensions indicated for installation, construction and inspection of work specified.

.2 Excavate to well defined lines to minimize quantity of fill material required.

.3 Earth bottoms of excavations to be dry, undisturbed soil, level, free from loose or organic matter.

.4 Shoring is the responsibility of the Contractor. Excavation must not interfere with normal 45º splay of bearing from bottom of any footing.

.5 When complete, the Engineer shall inspect excavations to verify soil bearing capacity, depths and dimensions.

.6 Correct unauthorized excavation or over excavation at no extra cost as follows:

.1 General Use: Coarse Granular Fill compacted to 100% density per ASTM D698 - 07e1 Standard Test Methods for Laboratory Compaction

Characteristics of Soil Using Standard Effort (12 400 ft lbf/ft3 (600 kN m/m3))

3.2 Backfilling

.1 Do not commence backfilling until the Engineer has inspected areas of work to be backfilled.

.2 Areas to be backfilled shall be free from debris, snow, ice water or frozen ground. Backfill material shall not be frozen or contain ice, snow or debris.

.3 Place and compact fill materials in continuous horizontal layers not exceeding 200mm loose depth or 150mm compacted depth.

.4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures use extreme caution during backfill operations. Maximum unbalanced earth elevations against foundations to be 300mm unless noted otherwise. Shore as required. Shoring to be the responsibility of the Contractor.

3.3 Surplus Material

.1 Replace from the site and dispose of surplus or unsuitable material not required for backfill or grading.

3.4 Dewatering

.1 Keep excavations dry at all stages of construction.

.2 Control the grading adjacent to the excavation to prevent water running into excavated areas. If trenches are used, ensure that trench excavation does not interfere with or weaken footing bearing surfaces.

.3 Provide suitable equipment including pumps, piping, temporary drains, trenches and sumps to keep excavations free from water until concrete is placed, cured and structural adequacy is assured.

3.5 Permafrost Degradation

.1 Conduct any earthworks in a manner that does not unduly promote or cause short-term or long-term permafrost degradation.

END OF SECTION 02223

PART 1 – GENERAL

1.1 Related Work

.1	Summary of the Work	Section 01010
.2	Fencing, Signs and Markers	Section 02831
.3	General mechanical provisions	Section 15010
.4	Tankage	Section 15060

1.2 Reference Standards

.1 Specifications for aggregates and soils and the compaction of aggregates and soils refer to ASTM Sieve Analyses and ASTM Tests.

.2 Other materials are specified with reference to CGSB Standards, CSA Standards and ASTM Standards.

1.3 Submissions

.1 At least two (2) weeks before beginning work, the Contractor shall submit to the Engineer for review, a complete and detailed outline of the procedures and methods that he will employ for this section of the Work.

.2 The Contractor shall not begin work until the Engineer has reviewed the submission.

1.4 Product Delivery, Storage and Handling

.1 Deliver materials to the site and store in a manner such that granular materials are kept in separate piles and manufactured materials are stored according to the recommendations of the manufacturer.

.2 Sand and gravel material required shall be selected from available local sources within approximately 20 kilometer radius of the site. These sources shall be subject to the Engineer's approval, and Land Use Permits must be obtained by the Contractor for the use of these materials. The Contractor is responsible to obtain all necessary permits and be responsible to pay for all permits and Royalties.

.3 The Contractor is advised that crushing and/or screening and mixing of the material, especially for the fine gravel and sand, may be required to meet the specifications. The Contractor shall at no additional cost to the Owner screen and blend materials from one or more sources to achieve the gradations shown and to permit compaction to the required levels called for in this Section.

.4 The Owner reserves the right to have sampling of granular material and concrete, as well as compaction tests, carried out by an independent material testing firm to satisfy the specifications are met. Should results indicate that the specifications are not met, all costs related to the sampling, testing and correction of the problem will

be charged to the Contractor, unless the Contractor can produce proof of compliance.

.5 Frozen material and ice will not be accepted as backfill material.

NOTE: No earthwork construction shall be done when the surface of the ground is frozen. Compaction at freezing temperatures is not effective.

1.5 Job Conditions and Regulations

.1 Perform work in accordance with the Safety Act and General Safety Regulations of the Nunavut.

.2 Perform work in a manner that will cause the least disruption or danger to traffic and pedestrians.

.3 The Contractor is responsible for posting of warning and traffic signs, with supply and placing of barricades and protective hoarding.

1.6 Quality Assurance

.1 Refer to Section 01400 Quality Control.

.2 Submit to the Engineer, a list of sources of materials including sand, gravel and borrow materials.

.3 Provide samples, test results, sieve analyses and reports for preliminary approval of all materials.

1.7 Minimum Quality Control Test Frequencies

.1 The following frequencies of testing are the minimum required. The Contractor shall perform as many tests as are necessary to ensure that the Work conforms to the requirements of the contract regardless of the minimum number specified.

.2 Provide moisture/density curves for each type of material, from each source of material, to be compacted to a specified density.

.3 Field densities:

.1 Structures and Embankments (from excavated material) - one for each 400m^2 of each compacted layers.

.2 Subgrade Preparation - one field density for every 200m^2 of 150mm compacted layers.

1.8 Disposal

.1 All materials on site, whether stockpiled, stored or excavated, are the property of the Owner, and the Owner reserves the right to keep any part or all of the material.

.2 The Contractor shall dispose of debris, waste, unsuitable material, rock or excess

material in accordance with the Specifications.

.3 The Contractor is encouraged to reuse materials encountered on site to the extent they comply with the specifications in this Section.

.4 Disposal sites must be approved by the community and the Engineer.

.5 The Contractor shall dispose of all materials at sites, located by the Contractor, in cooperation with the community.

PART 2 – PRODUCTS

2.1 Granular Materials

.1 Fine Gravel shall comply with the following gradation. It shall be native, clean, well graded, organic free gravel. It is recommended that this material be taken from the Community Pit and should be crushed prior to placement.

Sieve Size	Percent Passing by Weight
25mm	100
20 mm	95 - 100
10mm	60 - 80
4.75 mm	40 - 60
2.36 mm	28 - 48
0.6 mm	13 - 29
0.3 mm	19 - 21
0.15 mm	6 - 15
0.075 mm	4 - 10

.2 Coarse Gravel shall comply with the following gradation, except that no more than 10% of the fill material shall pass through a No. 200 sieve. It shall be native, clean, well graded, organic free gravel.

Sieve Size	Percent Passing by Weight
75mm	100
40 mm	60 - 80
20mm	40 - 66
10 mm	25 - 54
4.75 mm	15 - 43
2.36 mm	10 - 35
0.6 mm	5 - 23
0.15 mm	3 - 12
0.075 mm	2 – 10

.3 Sand shall comply with the following gradation. It shall be native, clean, salt free, well graded, organic free, rounded or angular pieces containing no more than 4% particles passing a No. 200 sieve. It is recommended that this material be taken from the Community pit and screened prior to placement.

Sieve Size	Percent Passing by Weight
10mm	100
No. 4	80 - 100
No. 16	50 - 75
No. 50	15 - 30
No. 100	2 - 8

Sand shall be used as topping material for vertical tank bases, below and above membranes at dike walls, around underground piping and electrical conduits, and where called for elsewhere on the Drawings.

.4 Ring beam material (for tank foundation) shall comprise of well graded gravel with a maximum particle size of 25mm and less than 8% (by weight) finer than 0.08 mm.

2.2 Common Fill

.1 Shall be native material found on site or imported and free of stones larger than 100 mm in size, frozen matter, rubbish, and organics or vegetation (except natural vegetation over permafrost).

2.3 Rip Rap

.1 Use Class 1 Nominal Size 300mm hand placed rock rip rap.

.2 Rip Rap shall be:

- 100% smaller than 450mm or 136kg
- 20% larger than 350mm or 68kg
- 50% larger than 300mm or 36kg
- 80% larger than 200mm or 11kg

PART 3 – EXECUTION

3.1 Construction Methods - General

.1 The Contractor is advised that the Drawings and Specifications are not based on a legal survey plan of the existing facilities, or detailed survey information of existing site conditions.

.2 The location of property limits, fences and benchmarks are shown on the Plans. The Contractor is responsible to maintain and safeguard these throughout the construction period.

.3 Should a benchmark have to be relocated for the purpose of construction, it shall be relocated on a permanent structure and properly identified.

.4 The elevations and dimensions shown on the Project Drawings are for the purpose of construction, measurement and evaluating progress payments. The Contractor shall ensure that final elevations are adhered to.

.5 The Contractor is responsible for all construction surveys and documentation to verify quantities for payment.

.6 The Owner reserves the right to carry out independent testing of backfill materials and concrete as indicated in other Sections. This does not relieve the Contractor of his responsibility to provide his own testing to ensure proper installation of the materials.

3.2 Site Preparation

.1 At all developed areas, along pipelines and at spill basins.

.1 Prior to proceeding with any backfill operation, the Contractor shall prepare the sites as indicated below or as specifically directed by other parts of the Contract Documents.

.2 Remove all boulders resting on the ground in excess of 300mm in size. Buried boulders in excess of 300mm in size and so protruding from the grade that they interfere with new work, shall be removed and the hole left in the ground shall be backfilled immediately with fine gravel compacted to 95% standard proctor density (SPD). Extent of backfill shall exceed the hole by at least 1,000mm on all sides and extend a minimum of 450mm above adjacent ground elevations. Slope backfill sides at 2:1 maximum.

.3 Level off areas as required and prepare for backfilling operation as outlined below in order to reach the finish levels shown on the Drawings.

.4 Carry out an accurate survey to act as a reference for payment of material quantities.

.5 Proper precautions shall be taken during excavation so as not to expose unduly the permafrost surface. Prolonged exposure of the frozen soil may result in excessive thawing and water accumulation in the excavation. Backfill operation must follow soon after the excavation is undertaken. Limit and minimize the extent of clearing to allow backfill operation to follow soon after, so as to ensure that a 150mm minimum layer of backfill material is present at all times over excavated areas.

3.3 Placing and Compaction of Backfill Material

.1 Backfill material shall be in accordance with the Specifications outlined in *Clause 2.1*

.2 Throughout the developed areas, coarse gravel material shall be added, as required, in maximum 200mm lifts (150mm compacted thickness) to 350mm from

the finished grades shown on the Drawings, except at the base for vertical tanks where the coarse gravel shall terminate at a minimum of 600mm from tank base elevations, i.e., at perimeter of tanks. Each lift shall be compacted to 95% SPD.

.3 Granular base for vertical tanks:

.1 Shall be built to the details and thickness shown. Fine gravel material shall be placed in lifts no greater than 150mm and each lift shall be compacted to 95% SPD.

.2 The top surface of the granular base shall be constructed with a compacted fine gravel ringwall 600 mm wide and domed in the center with sand to a slope of 1:120, as recommended in *API 650, Appendix B, Recommendations for Design and Construction of Foundations for Aboveground Oil Storage Tanks; Figure B-2, Example of Foundation With Crushed Stone Ringwall and Clause B.4.3, Earth Foundations With a Crushed Stone and Gravel Ringwall.*

.3 Compaction equipment shall consist of a vibratory roller with an operating weight of not less than 1,000 kilograms, or other equipment of similar or better capacity, acceptable to the Engineer. Light hand-operated compactors, such as jumping jacks, and tracked equipment will not be considered adequate for compaction of tank foundations. The Contractor shall control the moisture level in the backfill material so as to achieve the required compaction levels.

.4 At areas under vertical tank bases:

.1 Cover material consisting of fine gravel shall be placed to within 50 mm of the final grade and compacted to 95% SPD. A fine gravel ringwall shall be constructed, as per Clause 3.3.3, with a 75mm minimum sand bed placed on the fine granular material, under the tank center (in a single lift), graded and compacted to 99% SPD. The top surface of the sand bed shall be domed to the center of the tank, at a slope of 1:120, as shown on the Drawings.

.5 The ground at the pipe supports:

.1 Grade the ground level to receive a fine gravel base pad for the pipe supports, i.e., boulders or rock outcrops shall be removed per Clause 3.2.2. The gravel base at the pipe supports shall be constructed to the thickness required by the field conditions, so as to insure a uniform slope for the piping (with no low areas that can trap water) and such that piping elevations, as shown on the Drawings, are maintained.

.2 Backfill with coarse gravel material placed and compacted to at least 90% SPD, in 200mm maximum (150mm compacted) lifts to an elevation 350mm below finished elevations. Fine gravel shall be placed on top of the coarse gravel in maximum 200mm lifts, to the elevations and details shown on the Drawings, and each lift shall be compacted to 90% SPD. The top surface of the fine gravel shall be uniform.

.6 Backfill under concrete slabs, sidewalks, pipe supports and anchoring blocks:

.1 Backfill with fine gravel, a minimum of 150mm thick, compacted to 95% SPD.

3.4 Drainage of Excavations

.1 The Contractor shall take all the necessary measures to keep the excavations free of water at all times and to protect the excavations from damage that may be caused by rain, surface water run-off, ground thawing or otherwise. Create low points as required for pumping water out of the excavations or create temporary ditches to direct water away from the excavations.

.2 The Contractor shall, at his cost, be responsible for any additional excavation and backfill that may be required due to lack of proper drainage of the excavations, and which would have as an effect, the softening of the ground, and consequently, reduction in its load bearing capacity.

3.5 Removal of Contaminated Soil

.1 The Contractor shall contact the Engineer immediately should impacted soil or water be encountered during the work.

3.6 Cleanup

.1 The Contractor shall cleanup and dispose of all excess material, boulders and other debris as the Work progresses. All fuel contaminated soil shall be excavated and hauled to a remedial site, as directed by the Engineer, and replaced with clean compacted fill.

.2 Before the Work is considered complete, the Contractor shall remove all construction equipment, appliances, barricades, surplus materials, etc., and do such other work as may be necessary to leave the site or any other premises occupied by him in a neat, workmanlike condition, as required by the Engineer.

END OF SECTION 02224

PART 1 – GENERAL

1.1 Description

.1 This Section specifies requirements for chain link fencing, signs and markers.

1.2 Location

.1 As required to complete the work.

1.3 Quality Assurance

.1 Fence erection shall be carried out by experienced fence construction personnel.

.2 Supply materials to the latest edition of CAN/CGSB - 138.1 and CAN/CGSB-138.2.

1.4 Submissions

.1 Provide shop drawings prior to ordering materials.

.2 Shop drawings to indicate fence dimensions, assembly details, anchorage details and fence components.

PART 2 – PRODUCTS

2.1 Fabric

.1 Fabric shall be chain link, hot-dipped galvanized after weaving and having a nominal height of 1,830mm as called for on the Project Drawings.

.2 Chain link: 50mm x 50mm mesh with steel wire, gauge No. 9, galvanized with an average of 460g of zinc per m^2 of surface area.

.3 Top selvedge to have a twisted and barbed finish and bottom selvedge to have a knuckled finish. Top and bottom selvedge of gates only to be knuckled finish.

.4 Tensile strength of each individual picket to stand a tensile test of 550MPa.

2.2 Fabric Tie Wires

.1 Fabric to be secured to the posts at approximately 300mm intervals with No. 9 gauge galvanized steel tie wire.

.2 The fabric is to be fastened to the top rail, braces and tension wire with No. 9 gauge galvanized steel tie wire at approximately 450mm intervals.

.3 Tension wire is to be No. 6 gauge, single strand, 610g/m^2 electro-galvanized wire, stretched taut along the bottom of the fabric, and fastened to the fence fabric at 450mm intervals.

2.3 Posts and Rails

.1 Line posts shall be standard butt-weld Schedule 40 pipe, 60mm O.D. galvanized. Length to be 840mm longer than the height of fabric for concrete encased posts. Minimum weight of 5.4kg per meter. No tubing, conduit or open seam material shall be permitted.

.2 Terminal posts for ends, corners and straining posts shall be 89mm O.D., standard butt-weld Schedule 40 pipe, galvanized. Length of end, corner and straining posts to be 1,070mm longer than height of fabric. Minimum weight of 11.24kg per meter. No conduit or open seam material shall be permitted.

.3 Gate posts shall be standard butt-weld Schedule 40 pipe, see Table below for size, galvanized. Length shall be 1,070mm longer than height of fabric.

Frame O.D. (mm)	Gate Opening (mm)	Gate Post O.D. (mm)	Lineal (kg/m)
43	Single to 3,050 or Double to 6,100	89	11.24

.4 Top rail shall be 43mm O.D. galvanized pipe, plain ends, random lengths, standard butt-weld Schedule 40 pipe. No tubing, conduit or open seam material shall be permitted. Couplings shall be the outside sleeve type, at least 180mm in length for the top rail. The top rail is to pass through line post top and form a continuous brace for each stretch of fence. The top rail is to be secured to each terminal post with receptacle fittings. Couplings shall not be installed at more than 300mm from a post. If required to meet this condition, the top rail shall be cut to suit.

.5 Bracing shall be 43mm O.D. galvanized, same specifications as top rail. Horizontal brace, spaced midway between top rail and bottom of fence, shall be provided and shall extend from terminal post to first adjacent line post. End and gate posts are to have one brace. Corner and straining posts to have two braces.

.6 Fittings are to be hot-dipped galvanized, pressed steel, or aluminum moldings of sufficient strength to ensure the integrity of the fence.

2.4 Gates

.1 Gate frames shall be 43mm O.D., hot-dipped galvanized Schedule 40 steel pipe. Frames are to be electrically welded at all joints.

.2 Gate fabric shall be the same as fence fabric.

.3 Gate braces where required shall be 33mm O.D. galvanized steel pipe.

.4 Gate hardware to include galvanized, malleable iron hinges, pad-lockable hatch and latch catches properly aligned. All gates to be supplied with heavy duty chains and padlocks for locking. (Keyed alike padlocks will be provided by Petroleum Products Division).

.5 Main pedestrian gates, (Dutch style gates) 1,220mm wide, shall be made in two separate sections, as shown on Standard Detail Drawing, NT-S07.

.6 Hinges are to permit gate to swing back against fence 180 degrees.

2.5 Signs and Markers

.1 Safety signs at fences and gates shall be factory fabricated, weatherproof, 350mm X 350mm, fiberglass reinforced plastic, Brady #B-120 as available from Safety Supply Co., or approved equal, to be attached to the metal backing plate as per Standard Detail Drawing NT-S08, bearing the following:

PICTOGRAPHIC SYMBOL	LOCATION
07403 - No Admittance	One required for each gate, mounted on fence. Centerline at 1,500mm from grade and at 500mm from latch side of gate. Sign to be mounted on exterior of fence facing outward.
07404 - No Smoking	One required for each side of main facility or number shown on plot plan(s). Signs to be mounted on exterior of fence facing outward and centerline at 1,500mm above grade and located as per drawings.
Custom Made - CLOSE TANK VALVE AFTER USE	One required on the back of the main gate, facing in, centerline at 1,500mm above grade and located to read 'CLOSE TANK VALVE AFTER USE'. The sign shall be black indication on white background. See also, 2.5.5 below.

PART 3 – EXECUTION

3.1 Fencing

.1 Fence line posts shall be new and spaced a maximum of 2,000mm apart, as shown on the Project Drawings. Fence corner and gate posts shall also be new.

.2 Concrete footings for line, corner and gate posts and for gate center rests shall be rough cast in the ground and domed above the ground to shed water.

.3 Footings shall be no more than 150mm deeper than the end of the posts.

.4 Existing fence fabric may be used if found acceptable by the Engineer. New fence fabric shall be supplied to complete the Work. If there is a choice, the new fence fabric shall be placed along the front side.

.5 Fence fabric shall not be installed until footings have cured at least forty-eight (48) hours.

.6 Stretcher bars and bands shall be new, and fastened to fabric at 300mm intervals at corner and gate posts.

.7 Assembly of fencing components shall be with new metal fittings designed for the purpose, and in accordance with the manufacturer's instructions.

3.2 Signposting

.1 Pictographic signs for the fences shall have metallic backing plates as shown on the Standard Detail Drawing No. NT-S08, and the whole assembly shall be attached to the fence fabric using No. 9 galvanized steel wire ties.

.2 Pictographic signs for other areas shall be installed where shown on the Project Drawings and as per manufacturer's instructions.

3.3 Cleanup

.1 Touch up damaged galvanizing by cleaning with a wire brush and applying one (1) coat of polyvinyl butyral wash primer and touch up paint for galvanized metal. See Division 9, Section 09900, Painting.

.2 Clean up all concrete and other construction debris and earth removed from post holes, and re-grade the areas under and along the fence.

.3 Fill and compact earthworks under the fencing to a maximum of 150mm from the bottom of the fence fabric.

END OF SECTION 02831

PART 1 – GENERAL

1.1 Description

.1 This Section specifies requirements for concrete formwork, falsework and their accessories.

.2 The Work includes design, construction, erection and removal of concrete formwork, falsework and accessories.

1.2 Related Work

.1	Summary of the Work	Section 01010
.2	Site Work	Section 02224
.3	Concrete Reinforcement	Section 03200
.4	Cast-in-Place Concrete	Section 03300

1.3 Reference Standards (latest edition)

.1 Concrete Materials and Methods of Concrete Construction CAN/CSA-A23.1

.2 Methods of Test for Concrete CAN/CSA-A23.2

.3 ACI Detailing Manual ACI 315

.4 Reinforcing Steelwork Institute of Canada - Manual of Standard Practice (RSIC)

.5 Falsework for Construction Purposes CSA-S269.1

1.4 Design

.1 Design of concrete formwork and falsework are the responsibility of the Contractor.

1.5 Submissions

.1 Submissions shall be in accordance with Section 01300 – Submissions.

.2 Submit to the Engineer for review, shop drawings of proposed formwork and/or falsework.

.3 Show material sizes and grades, and spacing of members.

.4 Indicate rate and sequence of concrete placing used in design of formwork.

.5 Shop drawings shall bear the stamp of a qualified Professional Engineer registered in the Nunavut.

.6 Submit for review, shoring and re-shoring provisions, and removal schedules.

.7 Submit for review, proposed curing procedures.

.8 Submit for review, proposed hoarding and heating methods for cold weather concreting.

PART 2 – PRODUCTS

2.1 Forms

.1 Use material of suitable strength and quality to produce the specified surface finish.

.2 Use forms that are watertight, straight, flat, non-absorbent and non-staining.

2.2 Form Ties

.1 Use only ties with ends removable to a distance of not less than 38mm from the face of the finished concrete.

.2 Form ties with a removable cone cast in the concrete shall produce a cone hole not more than 25mm in diameter.

PART 3 – EXECUTION

3.1 Inspection

.1 Notify the Engineer to permit inspection of formwork at least 24 hours prior to placing of concrete.

3.2 Construction and Contraction Joint Layouts

.1 Construction and contraction joints shall be constructed where required as shown on the plans, as specified and/or according to CAN-A23.1. The Contractor shall prepare, and submit for approval, a location diagram and proposed details for all planned construction joints, and for layout of construction and contraction joints in slabs on grade, sidewalks, and other concrete paved areas.

.2 Construction joints shall be placed at a maximum spacing of 6 meters unless otherwise detailed or approved by the Engineer.

.3 Clean all construction joint surfaces that will be inaccessible after the erection of formwork.

3.3 Forms

.1 Assemble and erect in accordance with the formwork design.

.2 Allow for deflection of the formwork due to the weight of concrete.

.3 Make all form joints watertight.

.4 Make form surfaces smooth and flat.

.5 Clean forms properly before assembling in position, and as necessary, before concreting.

.6 Oil or coat forms before assembly in final position.

.7 Provide 20mm chamfer at all exposed exterior corners with interior angle of 120 degrees or less.

.8 Provide access for cleaning prior to concreting.

.9 Do not use temporary removable spacers or blocks to support reinforcement or other items, unless approved by the Engineer.

.10 Finished concrete exhibiting evidence of excessive form displacement, and/or excessive deflection, shall be cause for rejection of the Work and its removal and replacement at the Contractor's own expense.

.11 Obtain Engineer's approval before framing openings not indicated on the Drawings.

3.4 Tolerances

.1 Construct formwork to maintain the tolerances of concrete work in accordance with CAN-A23.1.

.2 Provide cambers to beam and slab forms as indicated on the Drawings, as directed, or in accordance with the following:

Beams - 5mm per 3,000mm of span
Slabs - 3mm per 1,000mm of span

3.5 Placing of Concrete

.1 Make a final inspection and ensure that forms are satisfactory and no deleterious materials are present inside the area to be concreted.

.2 Observe forms during concreting operations and correct any displacement of the form.

3.6 Form Removal

.1 Forms shall not be removed until removal operations cause no damage to concrete surfaces.

.2 Consider the location, character of the structure, weather and other conditions influencing the curing of concrete, in determining the time for removal of forms. Refer to CAN-A23.1.

.3 Leave shores in place until concrete has attained sufficient strength to adequately

support its own weight together with construction loads likely to be imposed. (See CAN-A23.1 for specific requirements.)
Vertical Surfaces - minimum 24 hrs provided curing is in accordance with the standards.
Other Surfaces - Until concrete has attained 2/3 of the specified 28 day strength, or with the Engineer's approval.

.4 Re-use of formwork and falsework subject to requirements of CAN-A23.1.

END OF SECTION 03100

PART 1 – GENERAL

1.1 Description

.1 This Section specifies requirements for the supply, fabrication and placing of reinforcing steel, including necessary supports, spacers, and related accessories.

1.2 Related Work

.1	Summary of Work	Section 01010
.2	Site Work	Section 02224
.3	Concrete Formwork	Section 03100
.4	Cast-in-Place Concrete	Section 03300

1.3 Reference Standards

.1 Concrete Materials and Methods of Concrete Construction CAN/CSA-A23.1

.2 Billet Steel bars for Concrete CSA-G30.12

.3 Welded Steel Wire Fabric for Concrete reinforcement CSA-G30.5

.4 ACI detailing Manual ACI-315

.5 Concrete Reinforcing Steel Institute (CRSI) Manual of Standard Practice

1.4 Submissions

.1 Submit shop drawings in accordance with Section 01300, at least 14 days before fabrication.

.2 Submit bending schedules and placing drawings.

.3 Show bar size, spacing, location and quantities to permit correct field placement without reference to structural drawings.

.4 Provide details to show placement of reinforcing where special conditions occur.

.5 Details shall be in accordance with ACI 315.

.6 Submit, as requested by the Engineer, certificates and mill tests for the material supplied.

1.5 Product Delivery, Storage and Handling

.1 Ship bar reinforcement in standard bundles easily identifiable and marked in accordance with the bar lists.

.2 Store reinforcement to prevent deterioration or contamination by dirt, detrimental rust, loose scale, paint, oil or other foreign substances that will destroy or reduce bond.

.3 Do not straighten or re-bend reinforcement in any manner.

.4 Do not use bars kinked or bent by improper handling or storage.

PART 2 – PRODUCTS

2.1 Reinforcing Steel

.1 Reinforcing steel to meet CSA-G30.12:

.1 10 M bars shall be 300 or 400MPa grade, minimum lap 450mm (unless noted otherwise).

.2 15 M bars and larger shall be 400MPa grade, minimum lap 650mm (unless noted otherwise).

.2 Welded steel wire fabric to CSA-G30.5, provide in flat sheets only. Minimum lap 150mm.

2.2 Chairs, Bolsters, Bar Supports, Spacers

.1 Provide adequate support of reinforcement according to CRSI Manual of Standard Practice.

.2 For exposed or architectural concrete surfaces, use accessories that are plastic coated, stainless steel or as indicated on the Drawings.

.3 Precast concrete block supports must be equal in strength and quality to the concrete in the structure.

.4 Chairs, bolster bar supports and spacers shall have sufficient strength to support the reinforcing under normal construction conditions. Bricks, rock or wood blocks shall not be used for bar supports.

2.3 Fabrication

.1 Fabricate reinforcing steel from bar sizes and grades indicated, within the following tolerances:

.1 Sheared length: plus or minus 25mm.

.2 Depth of truss bar: plus or minus 13mm.

.3 Stirrups, ties and spirals: plus or minus 13mm.

.4 Location of bends: plus or minus 25mm.

.2 Unless otherwise indicated, fabricate in accordance with CAN-A23.1.

PART 3 – EXECUTION

3.1 Inspection

.1 Notify Engineer to permit inspection after placement is completed. Reinforcing for all concrete pours shall be inspected after placing and prior to concreting.

.2 Provide adequate notice of scheduled pours to facilitate inspection of reinforcement, minimum of 24 hours.

3.2 Placing of Reinforcement

.1 Place reinforcement as shown on the reviewed shop drawings and in accordance with CAN-A23.1.

.2 Support reinforcement in position as follows:

.1 Beams, walls, and columns - laterally support reinforcement with supports in pairs on opposite faces.

.2 Do not use supports that will be forced into the supporting formwork or soil by the weight of the reinforcement or other construction loads.

.3 Separate layers of bars by purpose made spacers, cast mortar blocks, bars or equally suitable devices. Do not use pebbles, pieces of broken stone or brick, metal pipe or wooden blocks.

.4 Do **not** place bars on layers of fresh concrete as the Work progresses nor install bars during placing of concrete.

.3 Provide concrete cover as follows, unless detailed otherwise on the Drawings:

.1 Cast against and permanently exposed to earth: 75mm

.2 Exposed to earth, weather, or water:

No. 20 through No. 55 bars: 50mm
No. 15 bars, 16mm wire, and smaller: 40mm

.3 Not exposed to weather or not in contact with the ground:

.1 Slabs, walls and joists:

No. 45 and No. 55 bars: 40mm
No. 35 bars and smaller: 20mm

.2 Beams, girders, and columns:
Principal reinforcement, ties, stirrups and spirals 40mm

.3 Slabs on grade (top surface): 40mm

3.3 Welding of Reinforcement

.1 Welding of reinforcing bars is not permitted.

3.4 Splicing of Reinforcement

.1 Splice bars only as approved by the Engineer.

.2 Bar splices shall conform to CAN-A23.3, and as follows:
.1 10 M 450mm
.2 15 M 650mm
.3 20 M 750mm
.4 25 M 1,200mm

.3 Lap adjacent sheets of wire fabric to provide an overlap of at least one cross wire spacing plus 50mm, measured between outermost cross wires of each sheet. Only flat sheets are allowed, rolled wire fabric is not permitted.

3.5 Details

.1 Corner Bars: Install corners bars in walls and beams to match the larger size of normal reinforcement, unless otherwise noted on the Drawings.

.2 Openings in slabs or walls: Unless otherwise noted, install 2 additional 15 M bars on all sides of every opening, one near each concrete face, or the number of bars intercepted, divided equally between the two sides, whichever is greater. Bars to extend one lap length past each side of the opening.

END OF SECTION 03200

PART 1 – GENERAL

1.1 Description

.1 This Section specifies the requirements for design and preparation of the concrete mix, handling, placing, finishing and curing of cast-in-place concrete.

1.2 Related Work

.1	Summary of Work	Section 01010
.2	Site Work	Section 02224
.3	Concrete Formwork	Section 03100
.4	Concrete Reinforcement	Section 03200

1.3 Reference Standards

.1 Concrete Materials and Methods of Concrete Construction CAN/CSA - A23.1

.2 Methods of Test for Concrete CAN/CSA - A23.2

.3 Portland Cement CAN/CSA - A5

.4 Chemical Admixtures for Concrete CAN/CSA - A266.2

.5 Air-Entraining Admixtures for Concrete CAN/CSA - A266.1

.6 Have available on site one copy of CAN - A - 23.1 and CAN - A23.2. These CSA Standards shall form the basis for acceptable standards of concrete practice and methods.

1.4 Submissions

.1 Submit mix design and aggregate gradation curves for review at least 10 days in advance of concreting.

.2 Submit samples of aggregates, water and cement to be used, to an approved testing agency, if required by the Engineer.

.3 Submit schedule of proposed construction joints to the Engineer for review.

1.5 Quality Control Testing

.1 The Contractor will retain and pay for the services of an independent testing agency for testing as follows.

.2 Allow for casual labour and expenses in conjunction with testing.

.3 Concrete cylinder tests required for structural concrete:

.1 At least one set of 3 cylinders will be made for each type of concrete mix, for each day's concreting, or for each 40 cubic meters of concrete placed.

.2 Cylinders shall be taken at the point of deposit of the concrete.

.3 For each test slump, air content will be taken and 3 standard cylinders will be prepared and cured under laboratory conditions.

.4 One cylinder from each test will be broken at 7 days and the remaining cylinders broken at 28 days.

.5 When temperatures are below 5°C, additional field-cured cylinders will be prepared to verify that adequate strength is attained.

.4 Test results shall be distributed directly from the test laboratory to the Engineer and to the Contractor.

.5 Test reports shall include:

.1 Project name

.2 Date and time of sampling

.3 Supply method

.4 Specified strength and admixtures

.5 Cement type

.6 Exact location in structure

.7 Slump and air content

.8 Maximum aggregate size

.9 Test strength and age at time of test

.10 Date cylinder received by lab

.11 Testing technician identification

.12 Weather and temperature information

.6 If any tests reveal concrete not meeting specifications, the Engineer may enforce one or more remedial procedures such as:

.1 Change in mix design

.2 Change in concrete supplier

.3 Additional testing by coring or impact hammer

.4 Replacement of work

.5 Other procedures as necessary

.7 The costs of remedial work to bring concrete to meet specifications shall be borne by the Contractor.

.8 Refer to Section 01400 - Quality Control.

1.6 Quality Assurance Testing

.1 The Owner may retain and pay for the services of an independent testing agency for testing for quality assurance for the Owner's purposes.

.2 Site Mixed Concrete:

.1 Prior to pouring any site mixed concrete the Contractor will submit a mix design and conduct a trial concrete pour, using the proposed mix design and the proposed mixing methods. A set of three concrete test cylinders will becast and tested. Slump testing and air entrainment testing will also be employed.

.2 Measurements for mixing of concrete will be done by weighing of the components or by standard volume measurements approved by the Engineer. Measurement of volume by shovel is **not** permitted.

.3 If the concrete cylinders do not achieve the required strengths, the Contractor will modify the mix design and retest until a satisfactory mix is achieved. Cost for retesting will be borne by the Contractor.

.4 Once a procedure is approved, the mixing methods shall not vary.

.5 Allow at least one month for approval of the test results prior to a concrete pour.

1.7 Product Delivery, Storage and Handling

.1 Store all material in accordance with CAN - A23.1, Storage of Materials, except as otherwise noted.

.2 Store each shipment of cement separately to provide access to identification and inspection of each shipment.

.3 Clean stockpile areas of foreign materials.

.4 Do not use stockpiled material within 150mm of the ground surface if the stockpile is placed directly on the ground.

PART 2 – PRODUCTS

2.1 Cement

.1 Cement shall conform to CAN - A5 Portland Cement.

.2 Use Type 10 Normal Portland Cement unless specified otherwise.

2.2 Water

.1 Potable water, free of oily substances, alkaline or other organic matter shall be used. Seawater shall not be used.

2.3 Fine and Coarse Aggregates

.1 All aggregates shall conform to CAN - A23.1 and shall be saline free.

2.4 Air Entrainment Admixtures

.1 Air entrainment shall be to CAN - A266.1. SICA AEA air entrainment admixture, or equivalent, may be use with dosage to manufacturer's recommendations.

.2 No other air entrainment admixture shall be used, regardless of the type of cement selected, unless approved by the Engineer.

2.5 Chemical Admixtures

.1 Chemical admixtures shall conform to CAN - A266.2.

.2 Use chemical admixtures only as approved by the Engineer.

2.6 Vapour Barrier

.1 A 0.15mm (6mil) polyethylene vapour barrier, with 150mm laps, taped and sealed, shall be used, except where noted otherwise on the Drawings.

2.7 Concrete Curing Compound

.1 Chlorinated rubber type curing compound conforming to CAN - A23.1, Type 1, may be used with the approval of the Engineer.

2.8 Concrete Mix Requirements

.1 Unless indicated otherwise, the concrete mix design shall conform to the following:

Structural Component	Exposure Class	Aggregate Size mm	Minimum Concrete Strength MPa (28 days)	Slump mm	Cement Type	Percent Air Entrainment
Slab on Grade	C-1	20	35	75	10	5 – 8
Structural Slab, Wall, Columns and Beams	C-1	20	35	75	10	4 – 8
Sidewalks	C-2	20	35	25 - 75	10	5 – 8
Other	C-2	20	35	75	10	5 – 8

2.9 Mixing

.1 Ready-mixed concrete:

.1 Mix: premixed or Transit-mixed concrete according to CAN - A23.1 and to ASTM C94.

.2 Ensure that the concrete supplier has sufficient plant capacity and transporting apparatus to provide delivery so that the interval between successive loads does not exceed 15 minutes.

.2 Site-mixed concrete shall be in accordance with CAN - A23.1.

PART 3 – EXECUTION

3.1 Inspection

.1 The Engineer will inspect forms, foundations, reinforcing steel, construction joints, mixing, conveying and placing equipment before concreting.

3.2 Preparation

.1 Do not place concrete on soil that has been softened by mechanical disturbance or moisture.

.2 Re-tighten forms at construction joints.

.3 Roughen, thoroughly remove foreign matter and laitance, and saturate the hardened concrete at construction joints with water prior to concreting.

.4 Make suitable arrangements to protect fresh concrete from damage due to adverse weather conditions, such as rain, wind or extreme temperatures.

.5 **Concrete shall not be poured** against frozen ground, frozen concrete or into frosted formwork.

.6 Prepare all sleeves and ducts to be cast into concrete at the same time as the concrete formwork, to ensure that correct assembly and fit is obtained.

.7 Check mechanical drawings for sleeves, inserts, etc.

.8 Set sleeves, ties, anchor bolts, pipe hangers and other inserts and openings in concrete floors and walls as required.

3.3 Placing of Concrete

.1 Place concrete according to CAN - A23.1, and as specified herein.

.2 All formwork shall be cleaned of all debris, loose material, snow and ice immediately prior to pouring.

.3 Ensure proper placement and support of reinforcement and embedded material immediately ahead of a pour.

.4 Do not temporarily displace reinforcement for convenience in placing concrete.

.5 Do not use wood or other temporary spreaders or spacers.

.6 Do not insert reinforcement into fresh concrete.

.7 Confine concrete in a suitable vertical drop pipe to within 1,000mm or less of the concrete in place.

.8 Set screeds accurately for level surfaces or to maintain cambers as required.

.9 Ensure that concrete is adequately consolidated in the forms.

.10 Place concrete in such a manner that the concrete in the form is still plastic and can be integrated with fresh concrete.

.11 To prevent segregation, deposit concrete in horizontal layers 300mm to 450mm in thickness, as near as possible to its final position.

3.4 Cold Weather Placing

.1 When the air temperature is at or below 5°C, or when there is a possibility of it falling to that limit within 24 hours of placing, the requirements according to CAN -A23.1 shall be met.

.2 No calcium chloride shall to be used.

.3 Withdraw protection and heating gradually, so that air temperature around the concrete does not drop more than 15°C per day.

.4 Concrete shall be protected from alternate freezing and thawing for 14 days.

.5 Provide enclosures for heating such that air circulation is maintained.

.6 Frozen concrete will be rejected.

3.5 Hot Weather Placing

.1 Hot weather shall be considered to be an air temperature, in the shade, of 23° C or greater.

.2 Hot weather methods shall conform to CAN - A23.1.

.3 The concrete temperature at the time of placing in hot weather shall not exceed those specified in CAN - A23.1. In the event that this limit is exceeded, the concrete operations shall be suspended until the constituent materials of concrete are cooled.

.4 Retarding admixtures shall only be used, if approved by the Engineer, prior to use in the concrete.

.5 The use of ice may be required to lower the temperature of concrete for large pours.

3.6 Joints

.1 Construction, and/or control joints shall be provided where required, and as shown on the plans or according to CAN - A23.1. Control joints shall be spaced at maximum 6 meters, unless otherwise indicated.

.2 Carefully finish all face edges exposed to view true to line and elevation. Apply a neat cement paste or approved bonding agent to the hardened concrete immediately in advance of the fresh concrete.

.3 At watertight horizontal joints, apply the first layer of new concrete above the joint with an excess of mortar, obtained by omitting 20 to 50 percent of coarse aggregate from the normal mix.

.4 Make all construction or control joints in accordance with details shown on the Shop Drawings. The layout shall be submitted, by the Contractor, for approval by Engineer.

.5 Allow at least 2 hours after placing concrete in supporting columns or walls before placing beams, girders or slabs above.

.6 Place beams, girders, brackets, column capitals and haunches monolithically with the floor system, unless otherwise approved by the Engineer.

.7 See typical details for isolation joints at columns, and other locations.

.8 Construction joint layouts shown on the Drawings take precedence over the above requirements.

3.7 Vapour Barrier

.1 Install vapour barrier under concrete slabs-on-grade.

.2 Lap vapour barrier a minimum of 150mm at joints and seal with mastic cement.

.3 Seal punctures in vapour barrier before placing concrete. Use vapour barrier material at least 150mm larger than puncture and seal each patch with mastic cement.

3.8 Curing

.1 Curing shall be according to CAN - A23.1 and as specified herein.

.2 Prevent loss of moisture from concrete surfaces for at least 7 days after concreting.

.3 Protect unformed surfaces using the following methods, subject to approval by the Engineer.

.1 Curing compound

.2 Waterproof covering

.3 Sprinkling or ponding

.4 Damp sand, burlap or other suitable material

.4 Protect formed surfaces as follows, subject to approval by the Engineer.

.1 Leave forms in place and keep concrete wet by pouring water between concrete and forms.

.5 Maintain concrete temperatures as recommended according to CAN - A23.1.

3.9 Patching and Finishing of Hardened Concrete

.1 Patching, if required and if allowed, shall be done immediately after stripping.

.2 Methods of patching and repair shall be submitted to the Engineer and accepted before repair work is started.

.3 All form ties shall be cut back a minimum of 25mm and all tie holes shall be neatly patched and rubbed down.

3.10 Damp Proofing and Waterproofing

.1 Preparation of concrete surfaces for damp proofing and waterproofing shall conform to CAN - A23.1.

.2 Application of damp proofing and waterproofing shall conform to manufacturer's recommendations.

3.11 Concrete Specialties

.1 Provide and install all concrete specialties as shown on the Drawings, and/or as necessary to complete the concrete work.

.2 Included are fibreboard expansion joint covers, water stop and bond breakers.

END OF SECTION 03300

PART 1 – GENERAL

1.1 Description

.1 This Section specifies the requirements for supply, fabrication and installation of structural steel.

.2 The Work includes design, installation and removal of any bracing or other measures necessary to ensure stability of the steel framework during construction.

1.2 Related Work

.1	Summary of Work	Section 01010
.2	Site Work	Section 02224
.3	Miscellaneous Metal	Section 05500
.4	Painting	Section 09900

1.3 Reference Standards (latest edition)

.1	Steel Structures for Buildings	CAN/CSA 3-S16
.2	Welded Steel Construction (Metal Arc Welding)	CSA-W59
.3	Structural Quality Steels	CAN/CSA -G40.21

1.4 Design

.1 Design in accordance with standards in Clause 1.3 above.

.2 Design all the temporary systems to maintain stability of the Work at all phases of construction.

.3 Design of all members and connections not detailed on the Project Drawings shall be carried out and stamped by a Professional Engineer registered in the Nunavut.

1.5 Submissions

.1 Submit mill test certificates for the material supplied, as requested by the Engineer.

.2 Submit erection diagram and shop detail drawings for review by the Engineer ten (10) days in advance of fabrication.

.3 Complete shop fabrication and erection drawings shall be provided for all work and items.

.4 Provide separate layout plans and setting details for all bearing and attachment devices supplied under this Section.

.5 Shop drawings shall include details of all temporary bracing systems required for stability during construction, and shall show the extent of prior work that is required to be in place for the temporary bracing system.

.6 Bracing and stability systems, as shown on Project Drawings, are for stability of the completed structure and shall not be assumed as adequate for the various stages of construction.

.7 Before the placing of material orders, the Contractor shall submit for review by the Engineer, sketch drawings showing the general description of the proposed fabrication scheme. This shall include the general arrangement of plates or shapes, the location of all shop and field splices, and such other information as may be required by the Engineer to permit an assessment of the acceptability of the proposal.

.8 Shop drawings showing all details shall be prepared by the Contractor and submitted for review by the Engineer prior to fabrication.

.9 Fabrication executed before review of the shop drawings shall be at the Contractor's own risk.

.10 In addition to specific details, the shop drawings must include the following items:

.1 Drawings showing details of connections designed by the Contractor.

.2 All dimensions shall be correct at 20°C unless otherwise shown.

.3 Weld procedure identification shall be shown on the shop detail drawings.

.4 All material splice locations shall be shown on the Drawings.

.11 The Contractor shall submit copies of erection diagrams to the Engineer three weeks in advance of the scheduled start of erection. The proposal shall include all drawings and documents necessary to describe the following:

.1 Access to work.

.2 Sequence of Operation: Position of cranes, trucks with members and traffic accommodations.

.3 Position of Cranes: Particularly relative to substructure elements such as abutment backwalls, with details of load distribution of wheels and outriggers.

.4 Lifting Devices and Lifting Points: Devices shall grip girders near web/flange joints, not at outside edges of flange.

.12 All shop drawings, details, and erection drawings shall be signed and sealed by a Professional Engineer registered in the Nunavut. Drawings not sealed will be rejected unchecked.

1.6 Quality Control

.1 Refer to Section 01400, Quality Control.

.2 The Contractor shall perform as many tests as are necessary to ensure that the Work conforms to the requirements of the Contract.

.3 Inspections and tests shall include fabrication, welding and fastening.

PART 2 – PRODUCTS

(all standards shall be to the latest edition)

2.1 Structural Steel

.1 Unless noted otherwise, steel to conform to the following.

.2 Steel Sections and Plate: to CAN/CSA -G40.21-300WT.

.3 Hollow Structural Sections: to CAN/CSA -G40.21- 350WT Class C or H.

.4 Structural pipe: to ASTM A 53, Grade B or equivalent.

2.2 Bolts

.1 Bolts, nuts and washers: to ASTM A320 Grade L7 and ASTM A194 Grade 4.

.2 Anchor bolts, studs, nuts and washers: to ASTM A307.

2.3 Welding

.1 Welded steel construction (metal arc welding): to CSA-W59M.

.2 Certified electrodes and welding procedures: to CSA W48 series.

2.4 Primer

.1 Shop paint primer shall be applied as specified in Section 09900, Painting.

2.5 Hot Dip Galvanizing

.1 Hot Dip galvanizing shall be to CSA-G164-M.

PART 3 – EXECUTION

3.1 Inspection

.1 Notify the Engineer in advance as required to allow inspection of fabrication (including welding) and erection.

.2 Provide access to allow inspection of fit-up, welding, bolting and other aspects of the Work.

3.2 Surface Preparation, Priming and Painting

.1 Shop painting to be as specified in Section 09900, Painting.

.2 Blast cleaning: Unless otherwise noted, all steel components shall be blast cleaned after fabrication in accordance with the Society for Protective Coatings standard (SPC) No. SP10, Near-White Blast Cleaning. Essentially, this is a surface from which all oil, grease, dirt, rust, scale and foreign matter have been completely removed.

.3 Any damage on galvanized metal shall be given one coat of touch-up coating for galvanized metal with a prime coat of polyvinyl-butyral wash primer.

.4 Shop Primer: Unless otherwise noted, all steel surfaces shall receive one shop coat of inorganic zinc primer. Contact surfaces and areas in contact with concrete shall be blast cleaned, but not painted, and shall be kept free from over spray.

.5 Application Conditions: Application of primer or paint must be maintained at a temperature of not less than 5°C, for a period of not less than 12 hours, to dry the paint. During primer application and curing, all necessary means shall be taken to assure that the members are protected against the effects of weather. Primer shall not be applied over damp or frosted surfaces.

3.3 Fabrication

.1 Take field measurements as necessary to ensure that items fabricated in the shop will fit the structure.

.2 Reinforce hanger holes or openings for pipes or ducts with steel plates sized and welded in place to restore member to original design strength.

.3 Provide holes for attachment of other work only after obtaining Engineer's approval.

3.4 Welding

.1 Shop Qualifications: The Contractor shall be fully approved by the Canadian Welding Bureau (CWB) as per CSA-W47.1. Welding procedures shall be submitted for each type of weld used in the structure. The procedures shall bear the approval of the Canadian Welding Bureau and must also be approved by the Engineer prior to use on the structure.

.2 Welder Qualifications: Only welders, welding operators and tackers approved by the Canadian Welding Bureau, in the particular category, may be permitted to perform weldments. Their qualifications must be current and be available for examination by the Engineer.

.3 Welding Code: Except as otherwise noted on the Drawings, all welding, cutting and preparation shall be in accordance with the CSA-W59.

.4 Cleaning: All weld areas shall be clean and free of mill scale, dirt, grease, paint, etc., prior to welding.

.5 Preheat material and provide heated enclosures as required for all field welding or cutting to maintain the steel at temperatures above 10°C, unless qualified procedures are in place for welding at lower temperatures.

.6 Filler Metals: Low hydrogen electrodes, fluxes and low hydrogen welding practices are to be used throughout. The low hydrogen covering and flux shall be protected and stored in a warm dry container, as specified by CSA-W59.

.7 Automatic Welding Process: All flanges and web butt joints and all stiffener to web fillet welds shall be made by an approved semi or fully automatic submerged arc process. All webs to flange fillet welds shall be made by an approved fully automatic submerged process. These weld areas must be clean, free of mill scale, dirt, grease, etc., and be preheated as required, just prior to welding.

.8 Tack and Temporary Welds: Tack and temporary welds are not allowed, unless they are to be incorporated in the final weld.

.9 Methods of Weld Repair: Repair procedures for unsatisfactory welds must be submitted for approval by the Engineer prior to Work commencing.

.10 Arc Strikes: Arc strikes shall not be permitted. In the event of accidental arc strikes, the Contractor shall submit to the Engineer for approval his proposed repair procedure. The repair procedure shall include the complete grinding out of the crater produced by the arc strike. These areas shall be examined by the Engineer to ensure complete removal of the metal in the affected area.

.11 Grinding of Welds: Web members to chord members shall be ground flush in all locations exposed to view. All other welds ground to meet the requirements of CSA-W59-M.

3.5 Material Splices

.1 Additional splices, other than those shown on the detail drawings, will require approval of the Engineer. The Contractor shall bear the cost of inspection of these splices.

3.6 Handling and Storage

.1 All lifting and handling shall be done using devices that do not mark, damage, or distort the assemblies or members in any way. Girders shall be stored upright, supported on sufficient skids and safely shored to maintain the proper section without buckling, twisting, or any other damage or misalignment to the material.

3.7 Approval of Erection Scheme

.1 Before starting the Work of erection, the Contractor shall inform the Engineer fully in writing as to the method of erection he proposes to follow, and the amount and

character of equipment he proposes to use. This work plan shall be subject to the approval of the Engineer. The Engineer's approval shall not be considered to be relieving the Contractor of the responsibility for the safety of his methods or equipment, nor from carrying out the Work in full accordance with the Drawings and Specifications. No work shall be done until such written approval, by the Engineer, has been obtained.

.2 Erect in accordance with CAN/CSA -S16.1.

.3 Final touch up of the primer coating shall be carried out for complete coverage of the steelwork, including all field connections.

.4 Provide details of blocking for bearings, where necessary, to restrain movements due to horizontal forces and/or gravity effects.

.5 Provide details of grouting procedures, including design mix and aggregate gradation of grout, or specifications for other materials, proposed for setting anchor bolts and/or constructing grout pads. Non-metallic, non-shrink grout shall be used.

.6 Carry out field measurements of the constructed substructure.

.7 Bearing and Anchorage:

.1 Bearing plates shall not be placed upon bearing areas which are improperly finished, deformed, or irregular.

.2 Bearing plates shall be set level and in exact position.

.3 The Contractor shall accurately set anchor bolts, except where bolts are cast into concrete, which he shall coordinate in order to ensure their correct locations.

.4 When bearings are employed in conjunction with grout pockets in the substructure, bearings shall be set accurately on steel shims and grouted as detailed on the Drawings after erection has been completed.

END OF SECTION 05120

PART 1 – GENERAL

1.1 Description

.1 This Section specifies requirements for the supply, fabrication and installation of miscellaneous metals, including pipe supports.

1.2 Related Work

.1	Summary of Work	Section 01010
.2	Site Work	Section 02224
.3	Cast-in-Place Concrete	Section 03300
.4	Structural Steel	Section 05120
.5	Painting	Section 09900

1.3 Reference Standards

.1 Materials shall be in accordance with the latest edition of CSA, CGSB, ASTM and any other applicable Standards.

.2 Submit mill test certificates for the materials supplied, as requested by the Engineer.

1.4 Quality Assurance

.1 Employ tradesmen skilled in the trade and proficient in the use of the various materials specified.

.2 Perform Work in accordance with material manufacturers' instructions.

.3 Refer to Section 01400, Quality Control.

1.5 Submissions

.1 Submit detailed shop drawings for all miscellaneous metals, showing fabrication and erection details. Design of all connections to be carried out and sealed by a Professional Engineer registered in the Nunavut.

.2 Submit examples of aluminum or galvanized steel grating, handrails, and ladders for review and approval by the Engineer.

.3 Submit details and shop drawings for review and approval, by the Engineer, at least 10 days in advance of fabrication.

1.6 Product Delivery, Storage, Handling

.1 Deliver items on site in a safe manner.

.2 Deliver items in sufficient quantity to allow continuity of Work.

.3 Deliver products to the site in the largest practical sections. Tag and mark items for identification.

.4 Deliver items to be built in adjoining construction at proper time.

.5 Store items on site under cover in positions to ensure that no bending, warping or marring takes place.

.6 Prevent staining by concrete, mortar, plaster, oil, grease or other foreign substances.

.7 Do not paint or place crayon or other markings on exposed surfaces.

1.7 Job Conditions

.1 Give timely and accurate instructions to other trades for locations, levels, holes, and connections of anchors, sleeves and frames.

.2 Examine site conditions and take site measurements to ensure accurate and proper fitting, and clearance of obstructions.

PART 2 – PRODUCTS

2.1 Materials

.1 Steel: to conform to CSA-G40.21-M, Grade 300WT.

.2 Steel pipe: to conform to ASTM A333 Grade 6 or equal. Pipe wall thickness to suit the application and as indicated.

.3 Aluminum: to Alloy 6063-T6; 6351-T6 and 6061-T6 as specified herein.

.4 Galvanizing: to conform to CSA-G164-M.

.5 Stainless Steel: to ASTM A240, Type 316, as shown on the Drawings.

2.2 Fastenings and Anchor Bolts

.1 Nuts, bolts, washers, rivets and screws: to ASTM A320 Grade L7 and ASTM A194 Grade 4.

.2 Anchor bolts: to ASTM A307, unless specified otherwise.

.3 For fastenings in stainless steel and aluminum, use stainless steel ASTM A167, Type 316 ELC.

.4 All welding shall conform to CSA W47.1 and CSA W59. Use E70XX electrodes as per approved welding procedure.

.5 For anchors or fastening required to fix equipment after concrete has been poured, use anchorage in accordance with the equipment Manufacturer's recommendations.

.6 Provide angles, brackets, inserts, bolts, frames and all other items required to fasten metalwork to concrete, to metal framing or other parts of the structure, as shown on the Drawings.

2.3 Corrosion Protection

.1 Clean and paint all steel to conform to Section 09900, Painting.

.2 Use stainless steel where shown on Drawings.

.3 Hot dip galvanize all ferrous metal fixings and miscellaneous parts, including hangers, bolts, nuts and washers. Galvanize in accordance with CSA-G164M.

PART 3 – EXECUTION

3.1 Inspection

.1 Notify the Engineer to allow inspection of fit, welding, bolting and other items.

.2 Take field measurements as necessary to ensure proper fit of miscellaneous metal items into structures.

3.2 Fabrication

.1 Perform steel welding according to CSA W47.1 and W59 Specifications. All electrodes to be E70XX.

.2 Perform aluminum welding according to CSA S244.

.3 Trim and bevel ends and other items to enable satisfactory welding.

.4 Keep painting back from areas requiring welding after fabrication.

3.3 Finishing

.1 Apply touch up paint for galvanized metal after applying a coat of polyvinyl butyral wash primer.

.2 Clean and touch up shop primer after installation.

.3 Refer to Section 09900, Painting, for details of finishes.

3.4 Fastening, Anchoring

.1 Cast anchor bolts in concrete, as shown on the Drawings.

.2 Do not use self-drilling anchors or friction anchors where cast-in-place anchor bolts are specified.

3.5 Pipe Supports

.1 Pipe supports shall be provided at the facilities for pipelines and for piping where indicated on the Project Drawings.

.2 Where practical, all steel to be painted should be shop blasted and prime coated per Section 09900, Painting, with inorganic zinc primer, before shipping. Field painting of structures and miscellaneous steel shall be as specified in Section 09900, Painting.

.3 The maximum spacing of pipe supports inside and outside diked areas shall be as per the following (unless noted otherwise on the Project Drawings):

Pipe Size mm	Spacing of Supports mm
50	3 000
75	4 300
100	4 600
150	6 000

.4 Granular pads shall be provided under pipe supports, as per Section 02224, Site Work.

END OF SECTION 05500

PART 1 – GENERAL

1.1 Scope

.1 It is the intent of this Specification to provide for the complete painting of fuel storage facilities, phased in accordance with the equipment and material delivery schedules and weather conditions. Shop blasting and priming is encouraged wherever practical.

1.2 Reference Standards

.1 Society for Protective Coatings (SSPC)

SSPC Specification	Title
SP1	Solvent Cleaning
SP2	Hand Tool Cleaning
SP3	Power Tool Cleaning
SP5/NACE 1	White Metal Blast Cleaning
SP6/NACE 3	Commercial Blast Cleaning
SP7/NACE 4	Brush-off Blast Cleaning
SP10/NACE 2	Near White Metal Blast Cleaning
SPI2/NACE 5	High Pressure Water Jetting
SSPC VIS.1	Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning
SSPC VIS.2	Visual Standard No. 2, Standard Method of Evaluating Degree of Rusting on Painted Steel Surfaces
PA 1	Shop, Field and Maintenance Painting of Steel
PA 2	Measurement of Dry Paint Thickness with Magnetic Gauges
PA 8/NACE 11	Thin-Film Organic Linings Applied in New Carbon Steel Process Vessels

.2 American Society for Testing and Materials (ASTM)

ASTM Specification	Title
D1186	Measurement of Dry Film Thickness of Non-magnetic Organic Coatings Applied on a Magnetic Base
D2200	Pictorial Surface Preparation Standards for Painting Steel Surfaces

1.3 Submissions

.1 Submit full details of all products to be used for approval by the Engineer. List each product in relation to finish formula and include the following:

.1 Finish formula designation

.2 Product type and use

.3 Canadian Government Standards Board (CGSB) number

.4 Manufacturer's product number

.5 Colour number [numbers]

.6 Manufacturer's Material Safety Data Sheets (MSDS)

.7 Maximum VOC classification

.8 ECOLOGO certification

.2 Submit manufacturer's application instructions for each product specified for prior approval by the Engineer. Bind reviewed copy into operations and maintenance manuals.

.3 Submit full range of colour chips to be utilized on this Contract in accordance with Section 01340, Shop Drawings. Indicate location for each colour.

1.4 Quality Assurance

.1 Retain purchase orders, invoices and other documents to prove that all materials utilized in this contract meet the requirements of the Specifications. Produce documents when requested by the Engineer.

.2 The surface preparation methods as described by the Society for Protective Coatings (SSPC) are the minimum preparation specifications for each system. Proper surface preparation is essential.

.3 The materials approved in this Specification are designed for application by **professionally trained personnel**, using proper equipment under controlled conditions, and in accordance with SSPC, PA 1, Shop, Field and Maintenance Painting of Steel. Before using any of the products, the manufacturer's product data sheets, application procedures and safety precautions must be read and thoroughly understood.

.4 All work and materials applied under this Specification shall be subject to inspection by the Engineer, or his designated representative.

.5 The Contractor has full responsibility for the quality of the work, regardless of inspections carried out by the Engineer or his designated representative.

.6 The surface preparation, primer and finish coats for painting tankage, piping and steelwork, in the particular location for this Work (Coral Harbour) requires the preparation and application of one of the painting systems, as summarized in the following tables.

- **Table 2- Epoxy Coating System Summary**
- **Table 3- Moisture Cure Polyurethane Coating System Summary**

1.5 Delivery, Storage and Handling

.1 Prior to purchasing paint materials obtain written confirmation from the manufacturer, that the paint materials can be stored for a year without problems, and under what conditions. This requires that newly manufactured paint materials be supplied. Painting needs to be applied during the best weather, usually June, July and August, requiring that the paint materials be delivered on the sealift of the previous year, unless the materials are flown to site.

.2 Deliver and store materials in original containers, sealed, with labels intact.

.3 Indicate on containers or wrappings:

.1 Manufacturer's name and address

.2 Type of paint

.3 Compliance with applicable standard

.4 Colour number in accordance with established colour schedule

.5 Expiry date of coating materials

.4 Remove damaged, opened and rejected materials from site.

.5 Provide and maintain a dry, temperature controlled, weatherproof, secure storage.

.6 Observe manufacturer's recommendations for storage and handling.

.7 Store materials and supplies away from heat generating devices.

.8 Store materials and equipment in a well ventilated area with a temperature range of 7°C to 30°C. Extreme ambient temperature changes, +30°C to -46°C, are common in most regions and are detrimental to paint storage.

.9 Store temperature-sensitive products above minimum temperature, as recommended by the manufacturer.

.10 Keep areas used for storage, cleaning and preparation, clean and orderly to the approval of the Engineer. After completion of operations, return areas to clean condition to the approval of the Engineer.

.11 Provide a minimum of one 9kg, Type ABC, dry chemical, fire extinguisher adjacent to the storage area.

.12 Remove only in quantities required for same day use.

.13 Fire Safety Requirements:

.1 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC-approved, sealed containers and remove from site on a daily basis.

.2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada and the Canadian Environmental Protection Act.

1.6 Environmental Requirements

.1 Painting shall **not** be carried out:

.1 During a rain if the surface to be painted will be exposed to or is wetted by rain.

.2 When the temperature of the air, product and the steel surface to be painted is lower than 5°C, or when less than 3°C above the dew point, **unless approved, in writing, by the paint manufacturer.**

.3 When the relative humidity is greater than 85%, **unless approved, in writing, by the paint manufacturer.**

.4 If the atmospheric temperature is expected to drop below 0°C before the paint is dry, **unless otherwise recommended, in writing, by the paint manufacturer**.

.2 If agreed upon with the Engineer, and where it is practical to do so, painting may be carried out when the outside temperatures are below the minimum described above, provided that heated shelter conditions are employed in which the paint work is protected from rain, sleet, snow and the temperature of the air and steel substrate, and paint is maintained at not less than the minimum specified above. **Open flame heaters shall not be used because combustion moisture and oil fumes tend to condense on the colder steel resulting in loss of coating bond when the weather warms.**

.3 Adequate ventilation shall be supplied in sheltered and confined spaces, so that a buildup of toxic and/or flammable fumes does not occur which would present a fire, explosion or health hazard to the workers.

.4 Adequate ventilation shall be maintained during the painting, and for a sufficient length of time after the painting, such that the coatings will have dried or cured sufficiently, that recoating will not produce such deleterious effects as lifting, loss of adhesion, or loss of serviceability.

.5 Information should be obtained from the paint manufacturer concerning the period that his product shall be sheltered.

1.7 Safety Precautions

.1 Along with the safety procedures described below, the Contractor shall comply with the General Requirements of the Contract.

.2 Many of the paints and coatings listed in this Specification contain volatile and flammable solvents, oils and resins. Therefore, to ensure safety, the precautions identified by the paint manufacturer must be adhered to and all sources of ignition,

i.e., flames, sparks, pilot lights, etc., shall be eliminated from the work area.

.3 Breathing of sand blast dust, vapour, and/or spray mist shall be avoided. Coatings should be applied when ventilation is adequate. When available ventilation may not be adequate, workers shall wear appropriate respiratory protection.

.4 When mixing two component systems, special care should be taken to prevent the curing agent or mixed liquid from coming in contact with the skin or eyes. Also, always read the labels of both components, since the mixture may possess the hazards of both components.

.5 During the application of all coating material, all flames, welding and smoking must be prohibited from the area.

.6 Explosion proof equipment must be used when coating with certain of these materials in confined areas. Keep containers closed and away from heat, sparks and flame when not in use.

.7 **IMPORTANT!**

.1 When applying coatings by spray equipment observe all precautionary safety measures.

.2 Spray equipment must be handled with due care and in strict accordance with manufacturer's recommendations for personal safety, and to prevent a fire

.

.3 If precautions are not taken, spraying of any material can be hazardous, particularly when using high pressure airless equipment.

.4 High pressures may inject coating into the skin, causing serious injury requiring immediate hospital treatment.

.5 When using or handling spray equipment, hoses and the like, observe all safety practices. In addition, when spraying paint or coatings, wear respirator recommended for the product being handled.

.6 In all cases wear the proper type of protective eye equipment.

.8 Smoking shall not be permitted within the work area or the limits prescribed by local fire regulations. All matches, lighters and smoking materials shall be left outside these areas.

.9 On existing tanks, care must be exercised in the use of power wire brushing. Power wire brushes should be air driven, or if electric motors are used, they must be rated for Class 1, Group IIA Hazardous Location Use. Operators must **REMEMBER THIS IS A HAZARDOUS AREA**, and use only non-sparking metal brushes, scrapers, etc.

.10 Every precaution shall be exercised to prevent contamination of the tanks or their contents. **To prevent entry of contaminants into the tanks during cleaning operations, all inspection ports, breathers or other openings in the tanks shall**

be sealed with heavy duty polyethylene hoods securely taped into position. Cleaning and rust removal from these areas shall be carried out by hand-cleaning methods under direct supervision.

PART 2 – MATERIALS

2.1 Qualified Products

.1 Paint materials for each coating formula to be the products of a single manufacturer.

.2 Materials shall be new, first line brands of recent blend, delivered to site in original containers with seals intact.

.3 In selecting the coating system to be used over old paintwork, compatibility of coating systems must be considered.

.4 In maintenance painting, it is generally desirable to use the same generic type of paint as was used in the original painting, however, newer surface-compatible coatings require only that the compatibility be carefully checked.

2.2 Colours

.1 All colours to be prepared by factory tinting.

.2 For finish colours refer to Table 1 - Finish Colour Schedule, as follows:

TABLE 1 **–** FINISH COLOUR SCHEDULE

STRUCTURE	PRODUCT OR PART	FINISH COLOUR
STORAGE TANKS	Jet A-1 aviation fuel	Panorama Tank White with **black,** identification at inlet/outlet nozzles, loading valves, joint valves, fittings and also on diametrically opposite sides.
	Low Sulphur Diesel Light fuel (LSDL)	Panorama Tank White with Galway Green, identification at inlet/outlet nozzles and also on diametrically opposite sides
	Gasoline	Panorama Tank White with Orange, identification at inlet/outlet nozzles and also on diametrically opposite sides
	Any piping up the side of the tank: manways and nozzles, gauge hatch, brackets for piping, electrical conduits and light fixture supports, stairway handrails	Colour of tank
	Structural members, stairs and platforms	Colour of tank
	Tank skids	Colour of tank

STRUCTURE	PRODUCT OR PART	FINISH COLOUR
PIPING, FLANGES and FITTINGS (Tankage Areas and Pipelines) (new and existing)	Vents or gauges that are white metal or aluminum	Not painted
	Touch-ups at spot welds on galvanized metal	Zinc base
	Buried pipes with protective wrapping or Yellow Jacket	Not painted
	Above ground pipe and fittings	Light Gray product with colour ID. For Jet A-1 the colour coding is 2 black bands 100 mm wide and not more than 6 m apart.
ALL VALVES and CHECK VALVES and 1.0m of PIPING	On LSDL fuel	Galway Green
	On Gasoline	Orange
	On Jet A-1 aviation fuel	Black
	Brass caps, valve stems, brass tags and nameplates	**Not painted (Paint will have to be removed if inadvertently applied)** **(Do Not Sand Blast)**
FLEXIBLE CONNECTORS	Flanges	Light Gray
	Braided portions	Not painted
PIPE SUPPORTS, ANCHORS, GUIDES, ISLAND COVER PLATES and FASCIA	Metal	Light Gray
STILES, CATWALKS and STAIRWAYS (not on tanks)	Concrete	Not painted
	Stringers and Handrails	Light Gray with Black trim
	Galvanized grating and treads	Not painted or colour of railings
	Touch-ups at spot welds on galvanized metal	Zinc base
LIGHT FIXTURES, POSTS and BRACKETS (not on tanks)	Electrical conduits up stairways and along catwalks, boxes, and light fixture supports	Light Gray
DIKE DRAIN, SUMP PUMP, PIPING and SUPPORTS	Metal piping and supports and interior of sump surface	Light Gray
	Hoses and pump body	Not painted
FLOODLIGHTING	Metal poles and cross arms	Light Gray
POLES and POWER ENTRANCE POLE	Wood pole and lighting fixtures	Not painted
YARD ELECTRICAL CONDUIT and BOXES	All galvanized conduit and boxes	Colour of adjacent piping or tank
	Conduits supports and clamps	Light Gray
	Conduits, boxes and supports	Same colour as tank

STRUCTURE	PRODUCT OR PART	FINISH COLOUR
FENCE and GATES	New galvanized metal fence and gate	Not painted
	Back-up metal plates for signs	Light Gray or galvanize
BOLLARDS & SEA HOSE ANCHORS	Pipe	Yellow with silver reflective tape 75mm wide, Safety Supply Catalogue #517A064
	Concrete Cap	Yellow
EMERGENCY LADDER RUNGS ON GATES	Horizontal pipes	Red
NAMEPLATES, TAGS and GLASS SURFACES	These surfaces shall be protected during painting operation with masking tape (to be removed on completion)	Not painted **(paint will have to be removed)** **(Do Not Sand Blast)**

2.3 Coating Systems

.1 For tank, piping and other structural painting, coating system alternatives are offered between an epoxy coating system and a moisture-cured polyurethane coating system, depending on site location. For approved coating systems, refer to *Table 2 - Epoxy Coating System Summary and Table 3 - Moisture Cure Polyurethane Coating System Summary.* Also refer to the Material Safety Data Sheets (MSDS).

.2 The following initial surface conditions, as described in the Steel Structure Painting Council (SSPC) Handbook shall be referred to when preparing surfaces for painting:

.1 New Construction (unpainted steel):

Condition A - Steel surface covered with adherent mill scale with little if any rust.

Condition B - Steel surface which has begun to rust and from which mill scale has begun to flake.

Condition C - Steel surface from which most of the mill scale has rusted away or from which it can be scraped, but with little pitting visible.

Condition D - Steel surface where the mill scale has rusted away and pitting is visible.

.2 Previously Painted Steel:

Condition E - Paint almost intact, some primer may show, rust covers less than 0.10% of the surface, also new shop blasted and primed surfaces are included

Condition F - Finish coat somewhat weathered, primer may show, slight staining or blistering, after stains are wiped off less than 1% of area shows rust, blistering, loose mill scale or loose paint film

Condition G - Paint thoroughly weathered, blistered or stained, up to 10% of surface is covered with rust blisters, hard scale or loose paint film, very little pitting visible

Condition H - Large portions of surface are covered with rust, pits, rust nodules and non-adherent paint, pitting is visible.

.3 Epoxy Painting System

The following Epoxy Painting System, listed below in *Table 2, Epoxy Coating System,* describes the tank steel, structural steel, appurtenance and piping painting using an epoxy system. The epoxy systems are recommended for severe corrosion conditions and have been proven in the north. However, there can be difficulty in applying the product properly in coastal regions of the Arctic, due to poor environmental conditions. The manufacturer shall be consulted for any particular application requirements recommended for the site location.

TABLE 2 – EPOXY COATING SYSTEM SUMMARY

SURFACE	CONDITION	SSPC PREP SPEC.	PRIMER	FINISH COATS
NEW or EXISTING TANK (EXTERIOR) Tanks & railings, platforms, piping and other associated steel works ***(6 to 9mils total)***	A, B, C, D	SP10, Near White Metal Blast Cleaning	**Reinforced Inorganic Zinc Primer** Shop/Field Primed with **1 coat (**25-75µm)(1–3mils) Devoe Catha-Coat 302H, or approved equal.	**Low Temp. Cure Hi-Build Epoxy** **2 coats**, **(**100-150µm)(4-6mils) total Low Temp. Cure Hi-Build Epoxy Devoe Bar-Rust 236, or approved equal.
	H	SP12/NACE 5 High Pressure Water Jet Cleaning, see Table 3, **for lead based paint removal**		
NEW or EXISTING TANK (INTERIOR) Tank bottom and shell including columns and other wetted surfaces ***(10 mils total dft)***	A, B, C, D	SP10, Near White Metal Blast Cleaning	Interline 850 Phenolic Epoxy at 5 mils DFT	Interline 850 Phenolic Epoxy at 5 mils DFT

SURFACE	CONDITION	SSPC PREP SPEC.	PRIMER	FINISH COATS
EXISTING TANKS (Encapsulation of Lead Based Paint) (EXTERIOR) **Tanks** & railings, platforms, piping and other steel works ***(6 to 10mils total)***	E, F or G	SP6 Commercial Blast Cleaning, with vacuum pickup or SP7 Brush-off Blast Cleaning	**Reinforced Inorganic Zinc Primer** Spot Prime with **1 coat** (25-75µm)(1-3mils) Devoe Catha-Coat 302H, or approved equal.	**Low Temp. Cure Hi-Build Epoxy** **2 coats**, **(**100-150µm)(4-6mils) total Devoe Bar-Rust 236, or approved equal.
	H	SP12/NACE No. 5 High Pressure Water Jet Cleaning, see Tables 6 & 7, for lead based paint removal		
MAINTENANCE **Previously coated with epoxy** Existing tanks, railings, platforms, piping and other steel works. ***(5 - 8mils total)***	E, F or G	SP2 or SP3 Hand/Power Tool Cleaning Rusted Areas and SP1 Solvent Cleaning, see Tables 6 & 7, for epoxy coating maintenance	**Reinforced Inorganic Zinc Primer** Feather and Spot Prime Rusted Areas with **1 coat** (25-75µm)(1-3mils) Devoe Catha-Coat 302H, or approved equal.	**Low Temp. Cure, Hi-Build Epoxy** **1 coat** **(**75-100µm)(3-4mils) Devoe Bar-Rust 236, or approved equal.
SURFACE Stairs, railings and platforms, gratings, conduit and appurtenances ***(5-8mils total)***	Alum/galv	SP1 Solvent Cleaning	**Ethyl Silicate Inorganic Zinc Coating** Leave unpainted or **1 coat** **(**50-100µm)(2-4mils) Devoe Catha-Coat 304V, or approved equal	**Low Temp. Cure, Hi-Build Epoxy** Optional for Colour: **1 coat** (75-100µm)(3-4mils) Devoe Bar-Rust 236, or approved equal.
FENCING Touch-up	Alum/galv	SP1 Solvent Cleaning	**Ethyl Silicate Inorganic Zinc Coating** Clean and Spot Prime Rusted Areas with **1 coat** (25-75µm)(1-3mils) Devoe Catha-Coat 304V, or approved equal.	
DISPENSER and SHELTER BUILDINGS Skids, piping and equipment ***(4 - 5mils total)***	A, B, C or D	SP2 or SP3 Hand/Power Cleaning	**1 coat** **(**38 µm)(1.5mils) **Alkyd Machinery Enamel System Aluminum Primer** see *Division 13 and Particular Specification Section.*	**2 coats** **(**75-100µm)(3-4mils) total) **Alkyd Machinery Enamel System** see *Division 13 and Particular Specification Section*.

SURFACE	CONDITION	SSPC PREP SPEC.	PRIMER	FINISH COATS
DISPENSER and SHELTER BUILDINGS Exterior ***(4 - 5 mils total)***	A, B, C or D	SP7 Brush-off Blast Cleaning	**1 coat** **(**38µm)(1.5mils) **Alkyd Machinery Enamel System Aluminum Primer** see *Division 13 and Particular Specification Section.*	**2 coats** **(**75-100µm)(3-4mils) total) **Alkyd Machinery Enamel System** see *Division 13 and Particular Specification Section*.

Note: *1.* ***A pre-wash treatment using a chloride removal agent, such as Devprep 88 or Chlor*Rid,*** *with a hot water medium pressure Hydro Blaster (3 500 to 5 000 psi) shall be done on all tanks exposed to a marine environment.*

2. ***Care must be taken with use of low temperature cure accelerators;*** *total loss of adhesion may result. Consult with paint manufacturer for direction.*

.3 Moisture Cure Polyurethane Painting System

The following Moisture Cure Polyurethane Painting System, listed below in *Table 3, Moisture Cure Polyurethane Coating System Summary,* describes the tank steel, structural steel, appurtenance and piping painting system using a moisture cure polyurethane system. The moisture cure polyurethane coating system is a new generation coating system which has also been proven to be quite user friendly in the north, particularly in the Arctic Coastal Regions, where high humidity and lower cure temperatures are encountered.

TABLE 3 – MOISTURE CURE POLYURETHANE COATING SYSTEM SUMMARY

SURFACE	CONDITION	SSPC PREP SPEC.	PRIMER	FINISH COATS
NEW or EXISTING TANK (EXTERIOR) **Tanks** & railings, platforms, piping and other associated steel works, **Piping** and **Pipelines** (7-9 mils Total)	A, B, C, D	***SP10 Near White Blast Cleaning***	**Moisture Cure, Polyurethane Zinc Primer** Shop or field prime with **1 coat** **(**50-75µm)(2-3mils) Xymax MonoZinc ME III or Wasser MC-Zinc; or approved equal **and Moisture Cure, Polyurethane** **Intermediate Coat 1 coat,** **(5**0-75µm)(2-3mils) Xymax MonoFerro, or Wasser MC-CR; or approved equal	**Moisture Cure, Aliphatic Polyurethane** **1 coat,** (50-75µm)(2-3mils) Xymax MaxCoat A, or Wasser MC-Luster, or approved equal (may be applied by roller or brush)

SURFACE	CONDITION	SSPC PREP SPEC.	PRIMER	FINISH COATS
EXISTING TANKS (Encapsulation of Lead Based Paint) (EXTERIOR) **Tanks** & railings, platforms, piping and other associated steel works, **Pipelines** and **Piping** ***(7 - 9 mils total)***	E, F, G	SP6 Commercial Blast Cleaning, with vacuum pickup or SP7 Brush-off Blast Cleaning	**Moisture Cure, Polyurethane Zinc Primer** (Spot Prime) **1 coat** (50-75µm)(2-3mils) Xymax MonoZinc ME III or Wasser MC-Zinc; or approved equal **and Moisture Cure, Polyurethane** **Intermediate Coat 1 coat** (50-75µm)(2-3mils) Xymax MonoFerro, Or Wasser MC-CR; or approved equal	**Moisture Cure, Aliphatic Polyurethane** **1 coat** (50-75µm)(2-3mils) Xymax MaxCoat A, or Wasser MC-Luster, or approved equal (may be applied by roller or brush)
	H	SP12/NACE 5 High Pressure Water Jet Cleaning, see Tables 6 & 7, for lead based paint removal		
SURFACE Stairs and platforms, gratings, conduit, appurtenances and fence touch-up ***(4- 6 mils total)***	Alum/galv	SP1 Solvent Cleaning	**Moisture-cured, Polyurethane Zinc Primer. 1 coat** (50-75µm)(2-3mils) Xymax Monozinc 390, Wasser MC-Miozinc, or approved equal	**Moisture Cure, Aliphatic Polyurethane** (optional for colour) **1 coat** (50-75µm)(2-3mils) Xymax MaxCoat A, or Wasser MC-Luster, or approved equal
STRUCTURAL STEEL Stiles and railings, floodlight poles and cross arms (if not shop primed), island spiffy fascia and cover plates. ***(7 - 9 mils total)***	All	***SP6 Commercial Blast Cleaning***	**Moisture Cure, Polyurethane Zinc Primer 1 coat** (50-75µm)(2-3mils) Xymax MonoZinc ME III or Wasser MC-Zinc; or approved equal **And Moisture Cure, Polyurethane** **Intermediate Coat 1 coat** (50-75µm)(2-3mils) Xymax MonoFerro, or Wasser MC-CR; or approved	**Moisture Cure, Aliphatic Polyurethane** **1 coat** (50-75µm)(2-3mils) Xymax MaxCoat A, or Wasser MC-Luster, or approved equal (may be applied by roller or brush)

DISPENSER and SHELTER BUILDINGS Exterior ***(3 - 4 mils total)***	A, B, C or D	SP7 Brush-off Blast Cleaning	**Moisture-cured, Polyurethane Zinc Primer.** **1 coat** (50µm)(2mils) Xymax Monozinc 390, Wasser MC-Miozinc, or approved equal.	**Moisture Cure, Aliphatic Polyurethane** **I coat** **(**50µm)(2mils) Xymax MaxCoat A, or Wasser MC-Luster, or approved equal

*Note: 1. A **pre-wash treatment using a chloride removal agent, such as Devprep 88 or Chlor*Rid**, with a hot water medium pressure Hydro Blaster (3 500 to 5 000 psi) shall be done on all tanks exposed to a marine environment.*

2. ***Care must be taken with use of low temperature cure accelerators**; total loss of adhesion may result. Consult with paint manufacturer for direction.*
3. *The above coating systems (Table 2 and Table 3) can also be applied in the Mackenzie Valley interior regions.*

.4 Encapsulation of Lead Based Paint (Severe Coastal Environment)

For severe coastal regions, where existing tank, piping and other structural painting systems contain lead based paint, alternatives are offered between an epoxy coating system and a moisture cure polyurethane coating system, depending on site location. Coating systems provided in *Table 2 - Epoxy Coating System Summary and Table 3 - Moisture Cure Polyurethane Coating System Summary, can be used with the appropriate cleaning method.*

.1 For existing paint conditions E, F and G, the rust blisters and failed coating areas can be removed by *SP6 Commercial Blast Cleaning or SP7 Brush-off Blast Cleaning*, provided the paint and sand removed is contained and disposed of in an environmentally friendly manner.

.2 For existing paint condition H, the remaining coating shall be removed, by either *SP6 Commercial Blast Cleaning or SP12/NACE 5 High Pressure Water Jet Cleaning*, provided the lead contaminated paint removed is contained and disposed of in an environmentally friendly manner.

2.4 Thinners

.1 Whenever required, thinners shall be used only in accordance with paint manufacturer's written recommendations.

2.5 Trim and Product Identification

.1 All paint used for trim and product identification shall be a high gloss alkyd enamel, 2 mils minimum dry film thickness, applied over a coating system specified above.

PART 3 – EXECUTION

3.1 Surface Cleaning and Preparation

.1 General:

.1 Typical contaminants that shall be removed during surface preparation are moisture, oil, grease, **chloride salts**, loose paint, rust, loose mill scale, corrosion products and dirt. Tightly adhered or intact mill scale does not

have to be removed unless SP6 blast cleaning is specified.

.2 The surfaces before sandblasting or other cleaning method (particularly in Arctic Coastal Regions) shall be tested for chloride residual salts and if detected shall be removed. Medium pressure 24 150 to 31 000kPa (3,500 to 4,500 psi) Hydro Blast water washing with a surface passivator chemical additive, such as Devprep 88, CHLOR*RID and/or HOLD*BLAST, shall be used to remove traces of residual salts from the surfaces to be cleaned. The Hydro Blast wash is done before sandblasting so that the blasting doesn't drive the salt residue into the cleaned steel surfaces.

.3 Paint manufacturer shall provide minimal allowable remaining surface salt concentrations and make recommendations for methods of verification or testing for salt levels.

.4 After cleaning, the steel surfaces shall be primed as soon as possible. If the cleaned steel surfaces become contaminated by flash rust, dirt, grease or oil after the initial cleaning but before the priming paint can be applied, the surfaces shall be re-cleaned to meet the requirements specified for the initial cleaning of the steel. Some light flash rusting is acceptable if cleaning is by water blasting.

.5 Particular attention shall be given to edges, crevices, nuts, bolts, rivets and weld seams. Sharp edges, weld spatter, etc., shall be ground smooth before cleaning.

.6 Tight, inaccessible metal to metal plates, etc., shall be sealed with a compatible joint sealing compound, as approved by the manufacturer.

.7 All dirt, stones and other debris must be cleaned out of the skid beams of the buildings, from the bases of the horizontal and vertical tanks and from the steel bases of the pipe supports.

.8 Any existing paint film shall be sound and firmly bonded to the substrate and prepared in accordance with this Section.

.9 Prior to painting, all metal surfaces shall be blown down and free of all surface dust.

.10 Clean no more surface than can be dried and primed the same day.

.11 Cleaning shall be approved by the Engineer prior to painting.

3.2 Tank and Steel Surface Preparation Systems

.1 General:

As a general rule, the *SSPC Surface Preparation* Specifications, shown in Table 6, shall be applied to surfaces being prepared for painting:

TABLE 6 – SURFACE PREPARATIONS PRIOR TO PAINTING

SSPC SPECIFICATION	DESCRIPTION
SP1 - Solvent Cleaning	Removal of oil, grease, dirt, soil, salts and contaminants by cleaning with solvent, vapour, alkali, emulsion or steam.
SP2 - Hand Tool Cleaning	Removal of loose rust, loose mill scale and loose paint to the degree specified, by hand chipping, scraping and wire brushing.
SP3 - Power Tool Cleaning	Removal of loose rust, loose mill scale and loose paint to the degree specified, by power tool chipping, descaling, sanding, wire brushing and grinding.
SP5 - White Metal Blast Cleaning	Blast clean until 100% of the surface is a gray-white, uniform metallic color, slightly roughened to form a suitable anchor pattern for coatings. The surface shall be free of all oil, grease, dirt, visible mill scale, rust, corrosion products, oxides, paint or any other foreign matter.

SSPC SPECIFICATION	DESCRIPTION
SP6 - Commercial Blast Cleaning	Blast clean until at least two-thirds of the surface area is free of all visible residues.
SP7 - Brush-Off Blast Cleaning	Blast clean to remove loose rust, loose mill scale and loose paint to the degree specified, by power tool chipping, descaling, sanding, wire brushing and grinding.
SP10 - Near White Metal Blast Cleaning	Blast clean until 95% of the surface is a gray-white, uniform metallic color, slightly roughened to form a suitable anchor pattern for coatings. The surface, when viewed without magnification, shall be free of all oil, grease, dirt, visible mill scale, rust, corrosion products, oxides, paint or any other foreign matter.
SP12/NACE 5 - High Pressure Water Jet Cleaning	Water blast clean to remove all salt, oil, grease, dirt, soil, loose paint scale etc. Water pressure in excess of 34 475kPa (5 000 psi) up to 137 900kPa (20 000 psi) is required.

.2 Surface Preparation Specifications:

.1 The following Steel Surface Preparation Specifications, listed below in *Table 7, Tank Surface Preparation Specifications,* describes the tank steel condition and the SPC/SSPC Surface Preparation Specifications, with a brief description of the process, that shall be used to prepare the steel surfaces for painting, as specified in the Contract documents:

TABLE 7 – TANK SURFACE PREPARATION SPECIFICATIONS

PAINT CONDITION	SURFACE PREPARATION
Conditions A, B, C and D (Unpainted Steel)	**SPC/SSPC Surface Preparation Specification SP6 - Commercial Blast Cleaning or SP10 – Near White Metal Blast Cleaning**. The surfaces after sandblasting shall be free from detrimental foreign matter such as oil, grease, smoke film, dirt, mill scale or rust, and shall have a suitable anchor pattern for the prime coat.
Condition E (Sound Epoxy Paint System or Sandblasted and Shop Primed Systems) where the existing paint system is known to be compatible with the paint system to be applied and less than 0.1% of the area, as evaluated in accordance with SPC/SSPC Visual Standard No. 2, is covered by rust	**SPC/SSPC Surface Preparation Specification SP1 - Solvent Cleaning.** The surfaces after cleaning shall be free from detrimental foreign matter such as oil, grease, soil, cutting and drawing compounds and other contaminants. All blisters and defects shall be removed by sanding and feathering.

PAINT CONDITION	SURFACE PREPARATION
Conditions F and G (Slightly Deteriorated Paint Systems) Where the existing paint system is mainly intact but shows a slight film degradation, including any or all of the following defects: • slight blistering, flaking or peeling of the paint; • light rust staining but no pitting of the steel substrate; • where 0.1% to 10% of the area, as evaluated in accordance with SPC/SSPC Visual Standard No. 2, is covered by rust or rust blisters (exclusive of rust stains).	**SPC/SSPC Surface Preparation Specification SP2 - Hand Tool Cleaning or SP3 - Power Tool Cleaning or SP12 – Hydro Blasting or Brush-Off Blast Cleaning.** When cleaned, the surface shall be free from loose rust, loose, cracked and blistered paint, chalk accumulation, oil, grease, smoke film, dirt, dust and any other detrimental foreign matter. Thick edges of the remaining old paint shall be feathered. All remaining old paint shall have sufficient adhesion that it cannot be lifted by inserting the blade of a putty knife under it.
Condition H (Severely Deteriorated Paint Systems) Where the existing paint system shows severe degradation, including any or all of the following defects: • considerable peeling of the paint film; • considerable blistering, cracking, flaking or loose chalking; • considerable rust staining with severe pitting of the steel substrate; • where greater than 10% of the area as evaluated in accordance with SPC/SSPC Visual Standard No. 2, is covered by rust or rust blisters, exclusive of rust stains.	**SPC/SSPC Surface Preparation Specification SP6 - Commercial Blast Cleaning or SP10 – Near White Metal Blast Cleaning.** **For lead based paint system removal, SP12/NACE 5 - High Pressure Water Jet Cleaning may be used.** All rust deposits shall be chipped off and the area sufficiently abraded to provide a good anchor pattern for paint. All accessible weld flux and spatter shall be removed. The prime coat shall be applied as soon as possible after cleaning, before deterioration of the cleaned surface occurs.

.2 Condition E, F and G (Lead Free Paint Systems):

.1 When cleaned, the surface shall be free from loose rust, salt residues, loose cracked or blistered paint, chalk accumulation, oil, grease, smoke film, dirt, dust and any other detrimental foreign matter. Thick edges of the remaining paint shall have sufficient adhesion that it cannot be lifted by inserting the blade of a putty knife under it.

.2 Thick edges of remaining paint shall be sanded and feathered.

.3 Conditions F, G and H (Deteriorated Lead-Based Paint Systems):

.1 Where the existing paint system contains hazardous levels of lead, it shall be cleaned in accordance with *SSPC-SP SP6 - Commercial Blast Cleaning or SP7 - Brush-Off Blast Cleaning, or* it may be cleaned in accordance with *SSPC-SP 12/NACE 5 STANDARDS to WJ-2/SC-2* cleanliness - *High Pressure Jet Washing*.

.2 An alkaline cleaning agent such as Devoe Devprep 88 or CHLOR*RID and/or HOLD*BLAST shall be applied to the tank before cleaning.

.3 Where high pressure water jetting **(Hydro Blast Cleaning)** is specified, all surfaces to be re-coated shall be cleaned in accordance with *SSPC-SP 12/NACE 5 STANDARDS to WJ-2/SC-2* cleanliness. The method of high-pressure (HP) water jetting (WJ) ultimately selected by the Contractor will be based on the Contractor's confidence in the capabilities of the equipment and its components. A minimum of 34,475kPa (5,000psi) to 137,900kPa (20,000psi) shall be used, unless otherwise authorized in writing. The WJ-2 surface shall be cleaned to a matte finish with all loose paint and rust blisters removed. The nozzle may include a rotating head and must be held a minimum of 50mm to a maximum of 250mm from the surface being cleaned.

NOTE: Hydro Blast Cleaning shall only be used if the surface had been initially sandblasted and has an adequate anchor pattern (50µm [2mils] minimum) for the primer.

.4 All rust and loose paint shall be collected on a geotextile filter fabric mat secured around the tank base during cleaning. Proper disposal of the contaminated material will be required.

.4 Unpainted surfaces:

.1 Brass and bronze surfaces shall be cleaned but not painted.

.2 All working parts of valves, pumps, meters and all name plates shall be cleaned but not painted.

.3 Pumps, meters and unpainted aluminum tank fittings shall be cleaned but not painted.

.4 Any paint accidentally applied to such areas shall be removed immediately, and all masking tape shall be removed after painting. **Sand blasting shall not be permitted to remove the paint from these surfaces (only solvent cleaning and scraping).**

.5 Piping surfaces:

.1 All piping, valves and fittings shall be cleaned and prepared for painting in accordance with *SSPC Surface Preparation Specification SP SP6 – Commercial Blast Cleaning, SP7 - Brush-Off Blast Cleaning, SP2 - Hand Tool Cleaning or SP3 - Power Tool Cleaning*, depending on the painting system specified.

.2 Where severely pitted piping is encountered, the Contractor shall advise the Engineer of the condition of the piping and await further instructions before proceeding with the surface preparation.

.6 Structural and other steel surfaces:

.1 All structural and other steel surfaces shall be cleaned and prepared for painting in accordance with *SSPC Surface Preparation Specification SP SP6 - Commercial Blast Cleaning, SP7 - Brush-Off Blast Cleaning, SP2 - Hand Tool Cleaning or SP3 - Power Tool Cleaning*, depending on the painting system specified.

.2 Galvanized or aluminum surfaces (conduit, stair treads, catwalks, etc.) shall be cleaned as above, except for new surfaces, which shall be cleaned in accordance with *SSPC Surface Preparation Specification SP1 - Solvent Cleaning.* The cleaned surface shall be immediately coated with a polyvinyl-butyral wash primer or other primer recommended by the manufacturer.

.3 Lead Paint Removal and Disposal:

.1 Lead and Silica Dust Hazards:

.1 Metallic lead is not water soluble between pH ranges of 5 to 12, and, if prevented from contacting water or water vapour, it will not leach into the environment. Lead particulate matter however, which is 10 microns in size or smaller, generated by sandblasting is available for immediate absorption into the human blood stream. Metallic lead can enter the body by inhalation of fumes or breathing lead dust particles.

.2 Free silica dust has been classified as a carcinogenic to humans when inhaled in the form of quartz or cristobalite from occupational sources.

.3 Sandblasting of leaded paint creates particulates of all sizes that

become airborne and disperse into the environment. Prevention of silica and lead dispersion into the environment, worker protection and safe disposal constitute responsible management of silica and lead-containing products.

.4 Hydro Blasting to remove loose paint from the tanks and collecting it on a geotextile filter mat will contain any lead hazard and thus allow for proper disposal.

.2 Painted Steel Structure Evaluation:

.1 Sampling of tank paint or paint on other structures for confirmation of lead and the lead concentration is recommended prior to removal or encapsulation of the paint. A paint sample should be collected from a 25mm square of tightly adhered paint, comprised of all layers of the paint. Make sure to scrape down to the substrate, being careful not to include the substrate in the sample. Analysis of the paint should be done by an accredited laboratory.

.2 Sandblasting, because of the potential health and environmental hazards, should only be considered after a thorough evaluation of the tank and other paint removal options. Options other than complete paint removal and repainting include:

- power tool removal with vacuum pick-up;
- power tool rotary cleaning;
- needle guns with vacuum pick-up;
- ultra-high pressure water jetting;
- chemical strippers.

.3 Containment of Paint and Abrasive Debris:

.1 A containment system includes the cover panels, screens, scaffolds, supports and shrouds used to enclose an entire work area or a vacuum paint removal tool. The purpose is to minimize and prevent debris generated during surface preparation from entering into the environment, and to facilitate the controlled collection of the debris for disposal. Containment systems may also employ the use of ground covers or water booms.

.2 Lead paint debris is a contaminant as defined under the Environmental Protection Act, and is also a public health hazard and must be contained on site. The debris must be collected and packaged into drums or other secure containers, pending approved disposal.

.3 Containment devices include drop sheets or tarps, shrouding or free-hanging enclosures, total structure enclosures and negative pressure containment and filter fabric collection.

.4 Recovery of Abrasive and Paint Debris:

.1 Collection of paint residues must be undertaken frequently to prevent dispersal by wind or sandblasting operations. A vacuum is recommended as a rapid on-site collection method. Sweeping and shoveling are also used for cleaning abrasives from ground covers. Collection of water blast debris can be collected in a geotextile filter fabric mat.

.2 Collection containers, which are used for waste collection and storage pending disposal, must not allow sandblasting wastes to spill or leak materials into the environment.

.3 Debris removal techniques include:

.1 capture from surface at point of cleaning;

.2 capture from containment enclosures;

.3 capture from the ground or water channeling debris to specified collection points;

.4 capturing paint and debris from high pressure water cleaning in a geotextile filter fabric mat.

.5 Disposal:

.1 Contaminant generator registration is required by the Department of Resources, Wildlife and Economic Development (RWED) Environmental Protection Division of the Government of the Nunavut.

.2 Lead waste must be transported to disposal facilities in compliance with Transportation of Dangerous Goods Regulations.

.3 Waste disposal and/or transportation manifests are to be obtained from the Department of Resources, Wildlife and Economic Development (RWED) Environmental Protection Division of the Government of the Nunavut.

.4 Disposal approvals for lead-containing material is based on a case-by-case basis as determined by lead concentration, volumes and location.

3.3 Coating Application

.1 General:

.1 All painting to be performed under this contract shall be performed in conformance with the best practices of the trade, in conformance with the recommendations of the coating manufacturer, and in conformance with applicable portions of the Steel Painting Council Specification SSPC-PA1,

when those specifications are not in conflict with these standard specifications.

.2 All surfaces cleaned to bare metal shall be coated with the specified prime coat the same working day. Any cleaned surface which rusts before the application of the prime coat shall be re-cleaned.

.3 The methods of application, thinning instructions, drying interval and film thickness requirements for each of the coating systems as described hereunder shall be in accordance with the reviewed manufacturer's Product Data Sheets and recommended application procedures.

.4 All the protective coatings in this specification will require certification from the manufacturer as to what maximum relative humidity and minimum temperature restrictions apply. The surface shall be visibly dry and free from condensate at the time of application. The surface must be verified to be free of any frozen water products by an approved third party inspector when application is below Zero (0^{o}C), the use of 20X power magnifier is recommended.

.5 All paint shall be prepared at the factory ready for application. The addition of thinner or other material to the paint after the paint has been shipped shall not be permitted, except as recommended by the manufacturer and by permission of the Engineer. The Contractor shall furnish the paint manufacturer's certification that the paint complies with the paint system requirements specified.

.6 Tinting: All tinting materials required shall be added to the paint at the time of the paint's manufacture. Field tinting will not be allowed.

.7 All containers shall be labeled showing the exact title of the paint, the manufacturer's name, date of manufacture, the manufacturer's batch number, and the specification number as well as the lot number, if appropriate. Containers shall be packaged in new approved cans.

.8 Precautions concerning the handling and application of paint shall be shown on the labels on paint and solvent containers.

.9 Proprietary coatings shall be applied equivalent in all respects and at the same film thickness as the specified coating.

.10 If, when measured by SSPC PA-2 or ASTM D1186, it is evident that the specified minimum dry film thickness has not been attained, additional coating shall be applied until the specified thickness is obtained. For coating systems whose total thickness does not meet the minimum specified, additional primer or intermediate coats shall be applied until the specified thickness of the system is obtained.

.11 Sufficient time shall elapse between successive coats to permit them to dry properly for recoating. Consult specific product data sheets, and/or paint manufacturer, for proper cure times.

.12 The dry film thickness measurements shall be made in accordance with SSPC PA-2, Measurement of Dry Paint Thickness with Magnetic Gauge, or ASTM D1186. The minimum dry film thickness shall be 200µm (8mils), or as specified in the applicable Coating System Summary table, as per 3.2.3.10.

.13 The tolerances, unless otherwise specified, shall be in accordance with SSPC PA-2.

.14 **Caution: The use of a low temperature cure accelerator may reduce the surface compatibility qualities. Check all details with the paint manufacturer before using.**

.2 Primer:

.1 Spot Priming:

.1 Priming paint shall be uniformly applied by a brush after all sharp edges, weld spatter, etc. has been ground smooth.

.2 A primer stripe coat shall be applied to all surfaces where there are edges or corners (all bolts shall be brush stripe coated), with additional brush applications of a penetrating nature into tight metal-to-metal areas prior to application of an approved joint sealer compound as prescribed in 3.1.1.10.

.3 When runs or sags occur in the applied primer, to be brushed out.

.4 The applied primer shall be free from pin holes, coarse particles and dirt.

.5 All welds and crevice areas shall be spot primed prior to application of the full primer coat.

.2 Complete Primer:

.1 Priming paint may be applied by brush or spray; <u>rollers will not</u> be allowed, unless it can be shown that the total dry film thickness and good coverage can be attained.

.2 The primer shall be applied uniformly over the entire surface to be protected.

.3 Unless specified, the first coat of a multi-topcoat system shall be tinted sufficiently and as recommended by the manufacturer to differentiate it from the second coat, i.e. gray coats and white coats can be alternated.

.4 Each successive top coat shall be applied only after the previous coat has been cured in accordance with the requirements of the paint manufacturer

.5 Where runs or sags occur, they shall be brushed out.

.6 The primer shall be carefully applied by brush around rivets, bolt heads, plates, crevices, welds, corners, edges and other areas from which all of the rust could not be removed, to ensure complete wetting of these areas.

.7 **The applied primer shall be free from pin holes, coarse particles and dirt.**

.8 Care shall be exercised in the application in the lap-in area to allow sufficient time for curing of the first application.

.3 Thinning:

.1 When thinning is required, only thinners recommended by the paint manufacturer shall be used, and shall be used as recommended by the manufacturer.

.4 Drying Time:

.1 Before applying additional primer or coating topcoats, the minimum drying interval required under particular temperature conditions shall be as recommended by the paint manufacturer.

.2 Where conditions are near the lower limit of temperature or the upper limit of relative humidity, or both (i.e., not 'good' conditions), and they appear detrimental to the curing of the applied coating, a longer drying interval will be required. Therefore, before applying additional coats, the painter shall assure himself that the applied coating is sufficiently dry or cured, as applicable.

.3 Low temperature cure accelerators are available for some coating materials. Before using low temperature cure accelerators, confirm with the paint manufacturer that loss of adhesion will not result. Reduced cure time does reduce the bonding strength for some coatings.

.4 Films shall be considered dry for re-coating or top coating when the succeeding coating can be applied without the development of any detrimental failure of either the undercoat, topcoat or failure of the system to reach complete cure, under the application temperatures.

.5 Film Thickness:

.1 Each coat of primer shall have a dry film thickness as specified in the applicable Coating System Summary table, and shall be within the minimum average thickness tolerances specified.

.2 The film thickness of approved equal proprietary primers shall be the

same as the film thickness of the related primer specified.

.3 In the event the required thickness is not attained, additional primer shall be applied until the thickness is obtained.

.3 Topcoat:

.1 The topcoat described in the applicable Coating System Summary table, shall be applied by brush or, when thinned in accordance with the manufacturer's recommendations, by spraying. Airless spray is the preferred method of application.

.2 The finish, when applied by any of these methods, shall be smooth and uniform in appearance, colour, sheen and texture.

.3 There shall be no ridges or sagging. **The finish shall be free from pin holes, coarse particles and dirt.**

.4 The lap-in area shall exhibit uniformity with the rest of the area being painted.

.5 Each successive intermediate or top coat shall be applied only after the previous coat has been cured in accordance with the requirements of the paint manufacturer.

NOTE: Some coating systems have a maximum cure time when further coating applications require additional special preparation.

.6 Film Thickness

.1 Sufficient primer or intermediate coating shall be applied to achieve the minimum dry film thickness of each coat as specified in the applicable Coating System Summary table (above) and as per Item 3.2.3.10 (below).

.2 These minimum film thicknesses should be maintained, whether the painting is over unpainted surfaces or over previously painted surfaces.

.3 The film thickness of approved equal proprietary topcoats shall be the same as film thickness of the related system as specified in the applicable Coating System Summary table.

.7 The topcoat shall be suitable for application over the primer and shall not cause wrinkling, lifting, loss of adhesion or other defects.

.8 Unless specified, the first coat of a multi-topcoat system shall be tinted sufficiently and as recommended by the manufacturer to differentiate it from the second coat, i.e. white and gray coats can be alternated.

.9 In all cases, the paint manufacturer's application instructions,

recommendations and specifications shall be followed, in preference to this specification, with the written approval of the Engineer.

.10 The total dry film thickness, including primer and intermediate coats, shall be within the tolerances specified in the applicable *Coating System Summary Table* selected.

3.4 Identification

.1 Tank numbers and product:

.1 The number and product name of each tank is to be painted in black on each tank, using letters 150mm high by 25mm stroke.

.2 The tank number is to be centered in a colour coded identification box (75mm wide border) to the dimensions suitable for the wording, i.e., leave a 150mm minimum spacing between words and the border, and located 1,500mm above the base of each tank.

.3 The location of the identification box is to be centered over the inlet and outlet nozzles of the tank, and/or diametrically opposing sides, or each end of horizontal tanks, or as otherwise directed by the Engineer.

.2 Piping product:

.1 All piping in the tank area shall be painted light gray.

.2 All valves and a one meter (1,000mm) portion of piping on both sides of the valve or fitting shall be colour coded to indicate the product. Also, a one meter (1,000mm) section of piping at the tanks and buildings shall be colour coded.

.3 All resupply pipeline valves, and a portion of piping one meter (1,000mm) long on each side of the valves, shall be colour coded to identify the product at each of the following locations:

.1 at the sea hose or truck unloading point and at loading points;

.2 at buildings;

.3 on each side of every valve.

.3 Painting information:

.1 The date of painting, together with the name of the paint manufacturer and paint system are to be shown in 32mm high black letters below the tank number and product identification box.

.2 This information is to be placed on all tanks 100mm below the tank number and product identification box above the inlet/outlet valve.

3.5 Patch Test for Compatibility

.1 Conduct a patch test on a 600mm by 600mm square test panel or equivalent area.

.2 Select an area where the existing paint system is sound or, if no completely sound area is available, the best area this is available.

.3 Remove all dirt, dust and grease by wiping with a clean cloth wetted with mineral spirits.

.4 Remove any loose paint or loose rust by scraping and feathering any rough edges with fine sandpaper.

.5 Apply the coating material being proposed for the job, to the patch area by brush. The environmental conditions described above shall prevail at the time of painting.

.6 Examine the patch area during, immediately after and 24 hours after the painting for softening, lifting, blistering, bleeding, alligatoring or streaking discoloration. Any of these defects are indicative of incompatibility.

END OF SECTION 09900

PART 1 – GENERAL

1.1 Related Work

.1	Substantial Completion Inspection Requirements	Section 01650
.2	Painting	Section 09900
.3	Tankage	Section 15060

PART 2 – PRODUCTS

2.1 General

.1 The materials supplied under this Section shall be new, except as otherwise specified, of uniform pattern and quality throughout the work, suitable for use with petroleum products, and acceptable to the Mechanical/Electrical Safety and Asset Management Divisions of the Department of Public Works and Services (PW&S) of the Government of the Nunavut (GN) with respect to their use.

.2 The Contractor is responsible to inspect any materials provided by the Owner for incorporation into his work. The Contractor shall, within seven (7) days of their arrival on site, bring to the Engineer's attention, any item that he considers to be unsatisfactory. Use of Owner supplied material in no way relieves the Contractor of his responsibilities under this contract.

2.2 Pipe and Fittings

.1 Pipe and pipe nipples, unless otherwise specified, shall be carbon steel pipe, black, to ASTM A333, Grade 6 specifications conforming to the following:

.1 Pipe 100mm dia. and larger to be Electric Resistance Welded (ERW).

.2 Pipe 75mm dia. and smaller to be seamless.

.3 Pipe 50mm dia. and larger to be Schedule 40.

.4 Pipe 38mm dia. and smaller to be Schedule 80.

.2 Galvanized pipe and pipe nipples shall conform to the specifications for black carbon steel pipe above, with the addition of galvanizing to conform to *ASTM A-153* specification.

.3 Fittings shall be carbon steel, butt weld type, seamless, black, conforming to *ASTM A234 Grade B,* unless otherwise specified. Fittings 50mm and larger shall be Schedule 40 and butt weld fittings 38mm and smaller, shall be Schedule 80.

.4 Socket weld and threaded type fittings shall be forged steel, black, conforming to *ASTM A-350, Grade LF2, 20 680kPa (Class 3,000),* unless otherwise specified, with dimensions to *ANSI B16.11* and threads to *ANSI B1.20.1*.

.5 Malleable iron fittings, where called for, shall be black, 1,034kPa (Class 150), conforming to *ASTM A-197*, unless otherwise specified, and dimensions to *ANSI B16.3* and threading to *ANSI B1.20.1*.

.6 Galvanized malleable iron fittings, where called for, shall be same as for malleable iron fittings above with the addition of galvanizing conforming to ASTM A-153 specification.

2.3 Flanges, Gaskets, Nuts and Bolts

.1 Flanges shall be 1 034kPa (Class 150), *ANSI B16.5*, raised face, *ASTM A-350, Grade LF2,* faced and drilled, forged steel, welding neck, slip-on or threaded as called for, unless otherwise specified. **Flat faced flanges shall only be used to mate with equipment with flat faced flanges, and shall be Class 150 flanges with the raised face machined flat. Cast or malleable iron flanges shall not be used on fuel piping systems.**

.2 Gaskets shall be sprial wound type for raised face flanges , and for flat-faced flanges. Gaskets shall have 316 ss outer ring with flexible graphite filler, Flexitallic style CG or approved equal, Do not apply a surface treatment of any kind to the gasket. **Gaskets used on fuel systems shall be fire safe, not a synthetic elastomer material.**

.3 Flange bolting shall be alloy steel stud bolts, threaded full length, to *ASTM Spec. A-320, Grade L7*, sizes and lengths to suit. Nuts for stud bolts shall be alloy steel, semi-finished, hexagonal head nuts of standard heavy-duty series per *ASTM Spec. A-194, Grade 4* Stud Bolts, threaded in accordance with *ANSI B1.1*, coarse thread series, *Class 2A* fit. Nuts tapped in accordance with *ANSI B1.1*, coarse thread series, *and Class 2B* fit.

2.4 Flexible Connectors

.1 Flexible connectors 50mm diameter and larger, shall be annular stainless steel, corrugated flexible metal hose, single braided, with 1,034kPa (Class 150), *ANSI B16.5* raised face, forged steel flange ends, Flextech Industries Ltd. # FT 351 or U.S. Hose Corporation (Senior Flexonics Inc.) Flexon A-6, 316L stainless steel, or approved equivalent. Flexible connector lengths shall be as follows:

Pipe Size (mm)	Minimum Length of Flexible Connector (mm)
50	305
75	450
100	610
150	610

.2 Flexible connectors 38 and smaller shall be as indicated on the project drawings.

2.5 Valves

.1 Cast steel flanged gate valves shall be full bore, low temperature cast carbon steel, flexible gate, O.S.&Y, flanges ANSI 1 034kPa (Class 150), raised face, face to face

dimensions to *ANSI B16.10*, flanges to *ANSI B16.5*, and as follows:

.1	Body material:	Low temperature carbon steel to *ASTM A352, Grade LCB or LCC.*
.2	Trim material:	Wedge - Type 316 SS Seat - Stellite Stem - Type 316 SS
.3	Standard of Acceptance:	- Crane No. 47 LU-F, A-352, Grade LCB or LCC. - Velan A-352, Grade LCB or LCC with equivalent trim. - Kitz A-352, Grade LCB or LCC with equivalent trim. - Newman-Hattersly A-352, Grade LCB or LCC with equivalent trim - Bonney Forge A-352, Grade LCB or LCC with equivalent trim. - or equal.

.2 Forged Steel flanged gate valves shall be conventional port opening, bolted bonnet, O.S.&Y., ANSI 1,034kPa (Class 150), raised face, face to face dimensions to *ANSI B16.10*, flanges to *ANSI B16.5*, and as follows:

.1	Body material:	Carbon steel to *ASTM A105N*.
.2	Trim material:	Wedge - stainless steel 316 stellited. Seat - stainless steel 316 stellited. Stem - stainless steel 316B.
.3	Standard of Acceptance:	Crane #B-3510 XU-F or equivalent, Velan, Kitz, Newman-Hattersly or Bonney Forge.

.3 Cast steel flanged ball valves shall be 1,034kPa (Class 150), full bore, low temperature cast carbon steel, raised face, face to face dimensions to *ANSI B16.10*, flanges to *ANSI B16.5*, and as follows:

.1	Body material:	Low temperature carbon steel to *ASTM A-352, Grade LCB or LCC.*
.2	Standard of Acceptance:	Crane Tork Seal Ball Valve or equivalent, Velan, Kitz, Newman-Hattersly or Bonney Forge.

.4 Water drain valves at both vertical ltanks and norizontal tanks shall be Shand & Jurs Model 96181, 50 mm diameter, threaded mounting connection, complete with internal syphon extension and padlocking feature.

.10 For other valves the Contractor shall refer to the project drawings.

2.6 Thermal Pressure Relief Valves

.1 Thermal pressure relief by-pass valves shall be Crosby series 800, or approved equal, 150# flanged ends with 316 stainless steel body, spring, and trim. O-ring to be low temperature Buna-N rated for -40C service.

.2 Pressure settings at pressure relief valves shall be as follows:

.1 At tank valve by-pass lines the pressure setting shall be 525kPa (75psi).

.2 At other valve bypasses in the piping, where indicated on the project drawings, the pressure relief valves shall be set at 172kPa (25psi).

PART 3 – EXECUTION

3.1 Welding

.1 Welding of steel pipes shall conform to *API Standard 1104 - Standard for Welding Pipelines and Related Facilities* or *CSA-Z662, Oil and Gas Pipeline Systems*.

.2 The welding work shall be carried out by fully qualified tradesmen, in accordance with appropriate CSA and API Standards, using good trade practices.

.3 Welder qualification for work on pressure piping and fuel tanks shall be as per *Section XI of the ASME Code - Boiler and Pressure Vessel Code: Welding Qualifications*. All welders, to be accepted, must be registered in the Nunavut prior to starting work and possess a valid 'B' Pressure Welding certification.

.4 Welding electrodes and their exposure and utilization shall be as specified in Clause 3.1.8 of Section 15060.

.5 Prior to commencing work, qualified welding procedures shall be submitted to the Engineer in accordance with Section 01400. Welders shall be qualified to the procedures in accordance with the latest *CSA-Z662 - Oil and Gas Pipeline Systems, ASME Code Section IX* and /or *CSA W47.1 or W55.2 Specifications*.

.6 Each welder shall be registered and qualified to work in the Nunavut as certified by the Electrical/Mechanical Safety Division of the Department of Public Works and Services, Government of the Nunavut, phone (867) 920-8801. A copy of each welder's qualifications shall be provided to the Engineer before the welder starts work.

3.2 Layout and Installation

.1 All pipe, fittings, appurtenances and equipment, shall be laid out and installed in accordance with the lines, elevations, and grades indicated on the Drawings.

.2 Equipment shall be set in place and final alignments completed before connections are made. Flexible connectors shall be installed straight, in a relaxed condition, as their inclusion into systems is intended to offset minor future misalignments that may occur due to natural conditions.

.3 Pipes shall be joined and supported so that no undue stress or strain is created in the lines or in connected equipment. Supports for piping shall be spaced as indicated in Section 05500. Flanges shall be installed with holes straddled about the vertical axis and tightened evenly in balanced fashion. Flanges shall not be used to force parts into position.

.4 The Contractor shall install pipelines with gradual uniform slopes as specified on the Drawings, with no low areas that will trap water.

.5 The direction of welding for steel pipe shall be the Uphill Method in all cases.

3.3 Pipelines and Piping

.1 Piping shall be installed above ground, unless otherwise specified.

.2 All piping shall be installed with uniform slopes to permit drainage of lines.

3.4 Pressure Relief Bypasses

.1 Thermal pressure relief by-pass lines shall be installed at valves on the piping systems where and as indicated on the Drawings.

.2 Pressure relief valves in pressure relief bypasses shall be installed so that thermal pressure build-up in the piping system is relieved in the direction of the tanks.. The accumulated pressure build-up, in a series of pressure relief bypasses, shall be checked to ensure that the pressure does not exceed the design pressure of the piping system.

.3 External pressure relief valves shall be engraved or impression stamped to permanently indicate relief direction and pressure setting.

3.5 Inspection, Testing and Pigging of Pipelines and Product Piping

.1 Welding of joints on pipelines shall be complete fusion and complete penetration. Fifteen percent (15%) of all welded joints shall be radiographically inspected for 100% of their circumferences. Welds with defects shall be repaired and inspected by the same means previously used.

.2 Welding, repairs and radiographic inspections shall be in accordance with *CSA-Z662, Oil Pipeline Systems*, and latest publication.

.3 The Owner reserves the right to engage, at his expense, the services of an independent firm to carry out radiographic inspections of any or all welded joints. Any faulty joints shall be repaired at the Contractor’s expense and retested radiographically, at the Contractor’s expense, until such are found satisfactory. In

addition, two additional joints shall be radiographed for each failed joint.

.4 Sections of the pipelines shall be tested hydrostatically at 1,380kPa (200psi) at the lowest point. The piping shall be isolated from the tanks, dispensers, valves, flexible connectors and other equipment that may leak or be damaged during the test. The pressure shall be maintained for 24 hours minimum and all joints shall be inspected. The pressure and temperature shall be recorded every hour during the test. Any leak shall be repaired immediately and testing redone.

NOTE: Any meters in the system shall be bypassed and isolated during testing and flushing.

.5 Once the testing of the pipelines is completed, the pipelines shall be drained and pigged with a T.D. Williamson Inc. FJR Pig, or equivalent, to remove debris and all water from the lines.

.6 The pig shall be moved with air pressure not exceeding 1,034kPa. A minimum of three passes of the pig in each line shall be made to assure cleanliness and that the pipelines are free of water.

.7 Testing of the piping, other than to the island dispensers, shall be tested hydrostatically at 1,380kPa (200psi) at the lowest point. The pressure shall be maintained for 24 hours minimum and all joints shall be inspected. The pressure and temperature shall be recorded every hour during the test. Any leak shall be repaired immediately and testing redone.

NOTE: The piping shall be isolated from the tanks, dispensers, valves, flexible connectors and other equipment that may leak or be damaged during the test. Any meters in the system shall be bypassed and isolated during testing and flushing.

.9 Testing of the piping in the dispenser buildings and from the dispenser buildings to the island dispensers may be air (soap bubble) tested at 415kPa (60psi). The pressure shall be maintained for two (2) hours, while each joint is tested with a soapy solution. Any leak shall be repaired immediately.

.10 Once the hydrostatic and/or air testing are completed and accepted, by the Engineer, the Contractor shall proceed to the start-up and trial operation.

3.6 Dismantling of Existing Piping and Other Structures and Equipment

.1 To ‘dismantle’ shall mean to cut and/or to take apart and lay flat any welded, bolted or riveted tanks, pipes or other structure or surplus pipe etc., that is present on site, which will not be reused and is to be discarded.

.2 Before dismantling work begins on any tank, the Contractor shall empty, clean and gas free such as per Section 15060.

.3 When called for by the Works, the dismantling of tanks that have been used to store leaded gasoline, and the disposal of steel or other material removed from those tanks, shall be done in accordance with *API Publication 2202 - Guidelines for Protecting against Lead Hazard when Dismantling and Disposing of Steel from*

Tanks that have contained Leaded Gasoline.

.4 Hot work shall be done on a tank only after the tank has been gas freed and tested for hydrocarbon vapours immediately prior to undertaking the work. Confined Space procedures are in effect when working inside a fuel storage tank. Continuous monitoring of the tank atmosphere, in the tank, shall be required while workers are working inside a tank.

.5 The dismantled pieces of tank steel plates shall not be larger than three meters square. The disassembled pieces of structural shapes shall be cut to maximum lengths of six meters or as specified by the Engineer.

.6 All valves, flexible connectors and usable equipment shall be removed from the piping and turned over to the Regional Petroleum Products Officer for future use or disposal. The disassembled piping shall be cut to maximum lengths of six meters or as directed by the Engineer.

.7 All dismantled material and equipment shall remain the property of the Government of the Nunavut. It shall be removed from site and transported by the Contractor to the disposal site or elsewhere as directed by the Engineer.

END OF SECTION 15010

PART 1 – GENERAL

1.1 References

.1 ANSI/ASME B31.1-1989, Power Piping.

.2 ANSI/ASME Boiler and Pressure Vessel Code-1992:

.1 Section 1: Power Boilers.

.2 Section V: Nondestructive Examination.

.3 Section IX: Welding and Brazing Qualifications.

.3 CSA W48 series-M1980, Electrodes.

.4 CSA B51-M1991, Boiler, Pressure Vessel and Pressure Piping Code.

.5 CAN/CSA-W117.2-M87, Safety in Welding, Cutting and Allied Processes.

.6 CSA W178.1-1990, Certification of Welding Inspection Organizations.

.7 CSA W178.2-1990, Certification of Welding Inspectors.

.8 CAN/CGSB-48.2-92, Spot Radiography of Welded Butt Joints in Ferrous Materials.

.9 AWS B3.0-1980, Welding Procedures and Performance Qualifications.

.10 AWS C1.1-66, Recommended Practices for Resistance Welding.

.11 AWS W1-1980, Welding Inspection.

1.2 Welders Qualifications

.1 Welding qualifications to be in accordance with CSA B51. All welders to be registered in the Nunavut.

.2 Use qualified and licensed welders possessing certificate for each procedure to be performed from authority having jurisdiction.

.3 Furnish welder's qualifications to Engineer prior to work commencing on project.

.4 Each welder to possess identification stamp issued by authority having jurisdiction.

1.3 Inspectors Qualifications

.1 Inspectors to be qualified to CSA W178.2.

1.4 Welding Procedures

.1 Registration of welding procedures in accordance with CSA B51.

.2 Copy of welding procedures to be available for inspection at all times.

.3 Safety in welding, cutting and allied processes to be in accordance with CAN/CSA-W117.2.

PART 2 – PRODUCTS

2.1 Electrodes

.1 Electrodes: in accordance with CSA W48 Series.

PART 3 – EXECTUTION

3.1 Workmanship

.1 Welding to be in accordance with ANSI/ASME B31.1/3/4, ANSI/ASME Boiler and Pressure Vessel Code, Sections I and IX and ANSI/AWWA C206, using procedures conforming to AWS B3.0, AWS C1.1, API 1104 and all applicable requirements of Authority having jurisdiction.

3.2 Installation Requirements

.1 Identify each weld with welder's identification stamp.

.2 Backing rings:

.1 Where used, fit to minimize gaps between ring and pipe bore.

.3 Prior to commencing any welding work provide in written form the following for review by the Engineer:

.1 All welder qualifications.

.2 Description of welding procedures including the diameter, thickness and grades of all piping and fittings used in the work.

.4 Pipe may not be moved while the welds are incomplete.

.5 Steel die stencils shall not be used at the welders work.

.6 Pipe shall not be welded to structural steel.

.7 Welding shall not be permitted when in the Engineer’s opinion weather is not suitable.

.8 Provide for preheating where required by applicable codes. Prior to commencing

work provide written description of preheating methods for review by Engineer.

.9 Striking of arc except at welding groove is not acceptable.

.10 All welds to be completed on the same working day the weld is commenced.

3.3 Inspection and Tests – General Requirements

.1 Review all weld quality requirements and defect limits of applicable codes and standards with Engineer before any work is started.

.2 Formulate "Inspection and Test Plan" in co-operation with Engineer.

.3 Do not conceal welds until they have been inspected, tested and approved by Engineer.

.4 Provide for inspector to visually inspect all welds during early stages of welding procedures in accordance with AWS W1. Repair or replace all defects as required by codes and as specified herein.

3.4 Specialist Examinations and Tests

.1 General:

.1 Perform examinations and tests by specialist qualified in accordance with CSA W178.1 and CSA W178.2 and approved by Engineer.

.2 To ANSI/ASME Boiler and Pressure Vessels Code, Section V, CSA B51 and requirements of authority having jurisdiction.

.3 Inspect and test 15% of all welds in by non-destructive visual examination and full gamma ray radiographic (hereinafter referred to as "radiography") tests.

.2 Hydrostatically test all welds to requirements of ANSI/ASME B31.1.

.3 Visual examinations: include entire circumference of weld externally and wherever possible internally.

.4 Failure of visual examinations:

.1 Upon failure of any weld by visual examination perform additional testing as directed by Engineer of a total of up to 10% of all welds, selected at random by Engineer by radiographic tests.

.5 Radiographic tests as follows:

.1 Full radiography to CAN/CGSB-48.2:

.1 Conduct radiographic tests on 15% of all welds, selected at random by Engineer from all welds.

.2 Radiographic film:

.1 Identify each radiographic film with date, location, name of welder, and submit to Engineer. Replace film if rejected because of poor quality.

.3 Interpretation of radiographic films:

.1 To be by qualified radiographer.

.4 Failure of radiographic tests:

.1 If any weld test fails, tests will be extended to all welds made by welder responsible.

3.5 Defects Causing Rejection

.1 As described in ANSI/ASME B31.1 and ANSI/ASME Boiler and Pressure Vessels Code.

3.6 Repairs of Welds Which Failed Tests

.1 Re-inspect and re-test repaired or re-worked welds at no additional cost to the project.

.2 Repairs will not be permitted if the defect is a crack or the defective segment has been previously repaired.

.3 All repairs and defect removal shall be in accordance with the provisions of ASME Section IX or API 1104.

END OF SECTION 15051

PART 1 – GENERAL

1.1 Description

.1 This Section specifies requirements for the modification and repair of existing Tank No. 3, including appurtenances, testing, calibration and inspection. It also includes the procedures for product transfer and the procedures for emptying, cleaning and gas freeing of tanks.

1.2 Related Work

.1	Summary of the Work	Section 01010
.2	Shop Drawings	Section 01340
.3	Substantial Completion Inspection Requirements	Section 01650
.4	Site Work	Section 02224
.5	Structural Steel	Section 05120
.6	Painting	Section 09900
.7	General Mechanical Provisions	Section 15010

1.3 Specifications and Codes

.1 Design and field erected vertical fuel storage tanks shall conform to the latest edition of *API Std. 650 - Welded Steel Tanks for Oil Storage* and applicable Appendices, and in accordance with the details in the Drawings and the particulars of this Section.

PART 2 – PRODUCTS

2.1 General

.1 The following requirements shall be taken into account in the modification and repair of tankage:

.1 Maximum specific gravity of stored liquid is to be 0.85.

.2 Design temperature range, wind, and snow loads, shall be in accordance with the *National Building Code (NBC) and Supplement No. 1*. The Contractor shall also communicate with the Department of Transport and Environment Canada and refer to Section 01010 for particular data on the locality where the Work is to be carried out.

2.2 Vertical Tanks (Field Erected)

.1 Plates for vertical tanks, i.e., floor, roof, and shell, shall conform to steels listed in API Std. 650 for Group IIIA materials, i.e., for design metal temperature below minus 40°C, and as per the following:

ASTM	CSA	National Standard
A131M Gr. CS A573M Gr. 400 A516M Gr. 380 A516M Gr. 415 A516 Gr. 55	G 40.21M - 260 WT	Grade 41

.2 All plates shall be normalized, killed, and made to fine grain practice.

.3 Each plate, as rolled, shall be impact tested in accordance with API Std. 650 at a metal temperature of minus 40°C, or lower, to show a minimum Charpy V-Notch longitudinal impact strength of 20 J (15ft-lbf) on the full size specimen.

.4 The Contractor shall provide the Engineer with copies of mill certificates and obtain approval of such prior to shipping of steel plates.

.5 All structural shapes used in the modification and repair of tankage shall conform to CSA G40.21-300WT.

.6 The material for all connections and nozzles, 100mm Ø and smaller, provided for each opening called for on the Drawings shall conform to the latest edition *API Standard 650*, or to *CSA Z145.12, NP20 (ANSI Class 150)* steel weld neck flanges welded to lengths of Schedule 80 *ASTM A-333 Standard for Seamless and Welded Steel Pipe for Low Temperature Services, Grades 1 and 6*. Forgings shall conform to *ASTM A-350, Grade LF2 Standard.*

.7 The material for nozzles and manhole necks, over 100 mm Ø, provided for each opening called for on the Drawings, shall be fabricated from similar plate material as used for the tank shell, conforming to the requirements of *API Std. 650*.

.8 The flanges shall conform to *ASTM A-350, Grade LF2* forged carbon and low-alloy steel forgings and to *ANSI B16.5 Specifications*.

.9 Bolting shall be with alloy steel heavy hexagonal head bolts conforming to *ASTM A-320, Grade L7*, sizes and lengths to suit. Nuts shall be alloy steel, semi-finished, hexagonal, standard heavy series conforming to *ASTM A-194, Grade 4 Specifications*. Bolts to be threaded in accordance with *ANSI B1.1, coarse thread series, Class 2A fit*. Nuts to be tapped in accordance with *ANSI B1.1, coarse thread series, Class 2B fit.*

.10 The welding electrodes shall be low hydrogen series E70XX classification conforming to the latest edition of *AWS A5.1* and suitable for the current characteristics, the position of welding and other conditions of intended use.

Selected electrodes shall be designated on shop and erection drawings and in qualified welding procedures.

.11 The connections shall conform to *API Std. 650*, except as amended or extended by the Drawings or this section. Gaskets shall be sprial wound type for raised face flanges , and for flat-faced flanges. Gaskets shall have 316 ss outer ring with flexible graphite filler, Flexitallic style CG or approved equal.

.12 Appurtenances shall conform to *API Std. 650*, except as amended or extended by the Drawings or this section. Appurtenances to be included are as shown on the Drawings.

.13 All manholes and manhole covers shall be shop fabricated to *API Std. 650* and as per the Drawings.

PART 3 – EXECUTION

3.1 General

.1 Modification, repair, inspection, welding and labeling of vertical tanks shall be to the latest edition of *API Standard 650, 653, and CAN4/ULC-S601 Standard* respectively, except as amended or extended by the Drawings or by this section.

.2 No welding shall be permitted during fuel resupply.

.3 Shell plates and re-pads shall be shaped to suit the curvature of the tanks.

.4 Prior to commencing work, qualified welding procedures shall be submitted to the Engineer in accordance with these specifications. Welders shall be qualified to the procedures in accordance with the latest *API Standard 650, API Standard 1104, ASME Code Section IX* and/or appropriate *CSA W47.1 or W55.2 Specifications* as applicable.

.5 Each welder working on pressure piping and tank erection shall be registered and qualified to work in the Nunavut, and possess a valid GN A or B Pressure Ticket, as certified by the *Chief Boiler Inspector, Electrical/Mechanical Section, Asset Management Division of the Department of Public Works and Services of the Government of the Nunavut, phone (867) 920-3257.*

.6 Appropriate standard API or ULC Monogrammed nameplates shall be affixed to tankage. The Contractor shall fill out completely all information required on the standard name plates, i.e. nominal diameter, height, capacity, etc. and all information shall be stated in metric units.

.7 Welding electrodes are affected by humidity and therefore, to retain their quality, special precautions must be followed when same are not maintained in dry environments or when containers are opened. Prior to utilization, electrodes in open containers shall be maintained heated in proper sized ovens as per manufacturer's recommendations at all times.

3.2 Welding, Testing and Inspection of Vertical Tanks (Field Erected)

.1 Welding shall be performed as per *API Std. 650, Sections 5.2 and 7.0*.

.2 Radiographic inspections shall be carried out on 100% of butt weld shell joints of vertical tanks in accordance with *API Std. 650*. The shell to bottom weld shall be 100% inspected by Magnetic Particle or Dye Penetrant inspection. A qualified independent inspection firm shall be provided by the Contractor for this work. The selection of the firm will be subject to approval by the Engineer.

.3 Radiographic and other inspection reports, certifying the welding, shall be submitted to the Engineer along with a drawing of the developed shell lengths clearly showing the location where the radiographs were taken.

.4 Inspection and testing of new tank bottom welds shall cover 100% of the tank bottom and be by vacuum test method in accordance with *API Std. 650,* using soap suds, linseed oil or other non-toxic product and shall be performed by a qualified independent inspection firm as mentioned above.

.5 All NDT testing shall be completed and certified by qualified personnel from an independent inspection firm and electronic copies of the inspection reports shall be supplied to the owner.

.6 Upon completion of the tank repair and confirmation by the Engineer tank is acceptable; the tank shall be hydrostatically tested as per this section.

3.3 Emptying, Cleaning and Gas Freeing Tanks

.1 When tanks are to be emptied, the Contractor shall give due notice to the Engineer the product transfer, as per Product Transfer Procedures outlined in this section.

.2 The Contractor shall observe all safety precautions and confined space entry procedures at all times as required by the *Prevention Services Department of the Workers' Compensation Board (867) 669-4407* and the *Chief Safety Officer at (867) 669-4403.*

.3 When emptying, cleaning or gas freeing a tank, the Contractor shall follow the procedures and precautions necessary for the safety and health of personnel, as described in *API Publication 2015 entitled "Cleaning Petroleum Storage Tanks,"* as well as *API Publication 2015A* entitled *"Guide for Controlling Lead Hazard Associated with Tank Entry and Cleaning"* whenever a tank is known to have contained leaded gasoline.

.4 Any contaminated product and/or sludge removed from a tank shall be placed in metal containers and disposed of as directed by the Engineer.

.5 After a tank has been emptied of all product and sludge, it shall be dried and

ventilated or steamed until the tank is free of hydrocarbon vapours. The tank shall be tested with a gas/oxygen meter to ascertain that it is gas free and safe to enter.

.6 In all cases where existing tanks are emptied and gas freed, the tank shall be inspected by an API 653 Tank Inspector. The Contractor and the Engineer shall also make a visual inspection of the interior of the tanks to determine if any defects, metal pitting, rust or corrosion are present other than previously reported. All repairs shall be made in accordance with API Standard 653 and shall be tested and inspected to the satisfaction of the API Inspector. Contractor shall retain a certified API inspector as part of this contract. Tank No.1 API inspection falls under the scope of work for the other Contractor.

.6 After all tank repairs, modifications, installation of equipment and tank cleaning are completed, the Contractor shall advise the Engineer to that effect and obtain his authorization before closing the tank.

3.4 Hydrostatic Testing and Repairs

.1 After completion, the shell of new, relocated or extended tankage, shall be tested hydrostatically with water for a minimum of 24 hours. Seawater may be used, provided that it is discharged by pipe or hose to the sea after use, and that the tanks are thoroughly drained and high pressure washed with fresh water immediately after test completion.

.2 Any dirt or excessive rust accumulation on the interior surface of the tanks shall be wire brushed and cleaned to the satisfaction of the Engineer. The Contractor shall provide adequate temporary lighting inside the tank during inspection of tanks by the Engineer.

.3 During the filling operation, the tanks and granular bases shall be inspected frequently for leaks or excessive settlement. coordinate readings shall be taken by a qualified surveyor at a minimum of eight (8) locations (or no more than 10 m apart, whichever is the lesser), starting at the inlet nozzle of the tank, on the bottom flange along the perimeter of the tank. A set of readings shall be taken before, during, and after testing and shall be submitted to the Engineer as part of the tank testing record.

.4 For vertical tanks with tight roof, **the filling height shall not be above the safe fill height** to prove the structural integrity of the tank**.**

.5 All defects found in welds, or leaks discovered, shall be repaired immediately by the Contractor at no extra cost. Any excessive settlement of the tank during the filling operation shall be reported immediately to the Engineer for instructions, and the filling operation halted until corrective action, as specified by the Engineer, has been taken.

.6 All above mentioned tests shall be made in the presence of the Engineer to be officially recognized. The Contractor shall first satisfy himself that facilities are ready for testing, and then give the Engineer sufficient advance notice of his intent to carry out the test, so that the Engineer may arrange to witness the test.

3.5 Product Transfer

.1 All methods and procedures to be used by the Contractor for effecting product transfer shall be previously approved by the Engineer and the Regional Petroleum Products Officer.

.2 The Engineer shall be notified in writing by the Contractor, a minimum of five (5) working days in advance of any proposed transfer of product, so that the Government of the Nunavut Regional Petroleum Products Officer and the Engineer can be on-site during the transfer operation.

.3 All details of the proposed product transfer shall be provided by the Contractor to the Engineer.

.4 The Engineer's representative at site shall be responsible for notifying the Regional Petroleum Products Officer and the Engineer of the proposed product transfer.

.5 The product transfer shall only proceed while the Regional Petroleum Products Officer or his authorized representative is on site. The Contractor shall be held responsible and pay for any variance in product quantities for failing to ensure that the Regional Petroleum Products Officer, or his representative, is on-site during the product transfer.

.6 During transfer of product the Contractor shall adhere to the following procedures:

.1 Accurate certified strapping charts must be available on-site prior to the product transfer.

.2 The Contractor shall supply portable explosion-proof pumping equipment, with sufficient capacity, and all necessary hoses and adaptors to transfer the product.

.3 The Petroleum Products Officer and the Contractor shall establish the quantity of product to be transferred and arrange for an accounting of the product quantities before and after the transfer operation.

.4 During the transfer operation, all piping, fittings, valves and equipment shall be thoroughly checked for leaks and deficiencies.

.5 Tank dips shall be taken and recorded before and after the product transfer, (including the product temperature, level of any water in the bottom of the tanks) and recorded in the Engineer's daily logbook with copies to the Regional Petroleum Products Officer.

.6 For each transfer of product, for meter proving or other reasons, meter readings shall be taken and recorded before and after the product transfer and recorded in the Engineer's logbook with copies to the Regional Petroleum Products Officer.

.7 Once the fuel transfer is complete, the amount of sludge and/or contaminated

product remaining in the tank shall be confirmed by the Petroleum Products Officer, shall be recorded by the Contractor, and this quantity shall be verified by the Engineer. Disposal of any contaminated product and disposal of any empty drums shall be made at an approved facility and a waste manifest shall be provided to the Engineer.

.8 The Contractor shall be responsible for any fuel spills resulting from his fuel transfer operations. The Contractor shall pay for all clean-up costs and for any fuel spilled.

3.6 Protective Coating

.1 The exterior surface of the bottom, shell, and roof plates for new vertical steel tanks shall be shop blasted and primed with inorganic zinc primer prior to shipping, as per Section 09900.

.2 Where practical, the exterior of all horizontal tanks shall be grit blasted, shop primed with inorganic zinc primer and finish coated prior to shipping, as per Section 09900.

3.7 Strapping and Calibration of Tanks

.1 Modified tanks shall be calibrated as part of the Contract. The Contractor shall engage the services of an independent firm, approved by the Engineer, who is experienced in tank strapping and calibration to carry out the fieldwork and the preparation of the tank charts.

.2 The Contractor shall confirm with the Engineer that the strapping firm is acceptable to the Government of the Nunavut (GN).

.3 The strapping and calibration shall be carried out in accordance with *API Std. 2550, latest edition, and MPMS Chapter 2, Section 2A*, for vertical tanks, and *API Std. 2551,* latest edition, for horizontal tanks.

.4 Strapping and calibration of tanks shall be done after the tanks have been hydrostatically tested. Strapping and Calibration can be done at any fill condition, but preferably at the time of emptying, when the tank is two-thirds full of water.

.5 Tank charts shall be produced to indicate volumes in litres at each 10mm interval, with a key scale to show calculation volumes for 1mm intervals.

.6 Five (5) copies of the charts and field data shall be provided to the Engineer. Two (2) copies of the charts and field data shall be made available to the Engineer two (2) weeks prior to the Substantial Completion Inspection and also prior to any fuel transfers taking place.

.7 Rough field data shall be provided to the Engineer within five (5) days of completion of strapping in the field. Data to be faxed to the Regional Petroleum Products Officer within 24 hours of completion of strapping.

END OF SECTION 15060

PART 1 – GENERAL

1.1 Related Work

.1 Substantial Completion Inspection Requirements Section 01650

1.2 General

.1 These specifications shall be read together with the Drawings and all other sections of the contract documents.

.2 The complete Work under this trade shall be governed by the dictates of good practice in all details of materials and methods even if not minutely specified. The Work shall be properly co-ordinated with the requirements of other units of work specified in other sections.

.3 The Contractor shall, upon being awarded a contract, submit five (5) complete sets of electrical drawings to the *Electrical/Mechanical Safety Section {Phone: (867) 975-5419}, Department of Community & Government Services of the Government of the Nunavut* for approval. When the Drawings are approved, submit one copy of approved drawings both to the Engineer and to the Owner for their records.

.4 The Contractor shall obtain all necessary electrical permits from the local authorities having jurisdiction before the start of the project and the costs of these permits shall be borne by the Contractor. The Contractor shall obtain and pay for all other permits, inspections, etc., required by the Department of Community & Government Services of the Government of the Nunavut.

.5 The Contractor shall co-ordinate Work with the Nunavut Power Corporation (NTPC) for connection of electrical services, if required.

.6 The Contractor shall submit shop drawings, product data, and samples in accordance with *Section 01340*. Indicate details of construction, dimensions, capacities, weights and electrical performance characteristics of equipment or material. Where applicable, include wiring, single line, and schematic diagrams.

.7 The Contractor shall provide Operation and Maintenance data for incorporation into the Operation and Maintenance Manual, as specified in *Section 01340*.

.8 When all work has been completed, the Contractor shall obtain a Final Certificate of Approval (without reservations) from the Electrical Inspector having jurisdiction certifying that the installation is in accordance with the requirements of the contract drawings, specifications and all governing codes and regulations.

.9 Upon completion of the project, the Contractor shall provide the Owner with a complete set of record drawings, with changes indicated in red.

1.3 Specifications and Codes

.1 All work shall be in compliance with the *Canadian Electrical Code (CEC) Part 1, C22.1*, latest edition, with particular reference to Sections 10, 18 and 20.

.2 The Contractor is advised to verify with the *Electrical/Mechanical Safety Section [Phone: (867) 975-5419],* Department of Community & Government Services of the Government of the Nunavut, for local applicable bylaws and for any particular special requirements that might be applicable to the installation.

.3 For additions, modifications, renovations to existing facilities use of the Division System of Classification should be broken into Division 1 and Division 2 in accordance with CEC-18-000(3).

PART 2 – PRODUCTS

2.1 General

.1 All materials and equipment shall be new and of a uniform pattern throughout the Work. All electrical components shall be CSA approved and comply with the requirements of the *Electrical/Mechanical Safety Section [Phone: (867) 975-5419],* Department of Community & Government Services of the Government of the Nunavut with respect to their application.

.2 Any item or equipment described or identified for use by manufacturer's type, model or catalogue number shall be provided with additional features or modifications as specified herein or as shown on the Drawings or required for the installation.

2.8 Grounding Wire and Connectors

.1 Materials for grounding systems shall be in accordance with *Section 10 of the Canadian Electrical Code*, except that the ground wire sizes shall be no less than the sizes indicated on the Drawings and shall be copper stranded copper.

.2 The ground wire for anti-static grounding shall be minimum No. 4 AWG stranded copper c/w tin plated lug connections.

PART 3 – EXECUTION

3.1 General

.1 Electrical layout shall be in accordance with the intent expressed by the Drawings and Specifications and/or as required by site conditions.

3.2 Conduits

.1 All conduits shall enter properly and be secured to all fittings, outlet boxes, panel tubs, etc. by means of locknuts and bushings. All unused openings shall be sealed

with a threaded plug. Running threads shall **not** be used.

.2 Install conduits and fittings neatly and square to building and tank structure lines.

3.3 Electrical Grounding

.1 Grounding of electrical service entrance equipment and other equipment shall comply with *Section 10 of the Canadian Electrical Code.*

.2 All grounding connections and methods shall be approved for the purpose and in compliance with NFPA 77 Recommended practices on Static Electricity 2000 edition.

.3 Exposed non-current-carrying metal parts of electrical equipment, including the frames or metal exteriors of motors, fixed or portable lamps or other utilization equipment, lighting fixtures, cabinets, cases, and conduit shall be bonded to ground in accordance with Rule-18-074 (Hazardous Locations) or bonding conductors sized in accordance with Rule 10-814

3.4 Static Electricity Grounding

.1 Pipelines, piping, tanks, Operators Shelter Building, Garages, dispenser buildings, fences and gates shall be bonded and grounded, as shown on the Project Drawings.

.2 Bonding jumpers shall be installed across valves, expansion joints and flanged joints to ensure continuity. Maintain the continuity of the grounding systems throughout the installation by ensuring proper ground wire connections and joins at all terminations.

.3 Ground tests shall be conducted by the Contractor for each pipeline.

.4 Grounding devices must not be allowed to penetrate the liner membrane. If any damage to the liner membrane occurs, it shall be repaired by the Contractor to the Engineer's satisfaction at no extra cost to the Owner, and as per Section 02592.

.5 A ground cable complete with sturdy clamp for grounding of tank trucks shall be provided at all truck loading or unloading points and as shown on the Project Drawings and as shown on Standard Detail Drawings NT-E25 or NT-E26 Revised Edition of 2009.

3.5 Testing

.1 Test all tank gauging and overfill prevention systems.

.2 Anti-static ground continuity tests shall be conducted for each tank by the Contractor.

.3 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project. Pay all costs for testing as required.

.4 Submit test results to Engineer for review.

END OF SECTION 16010

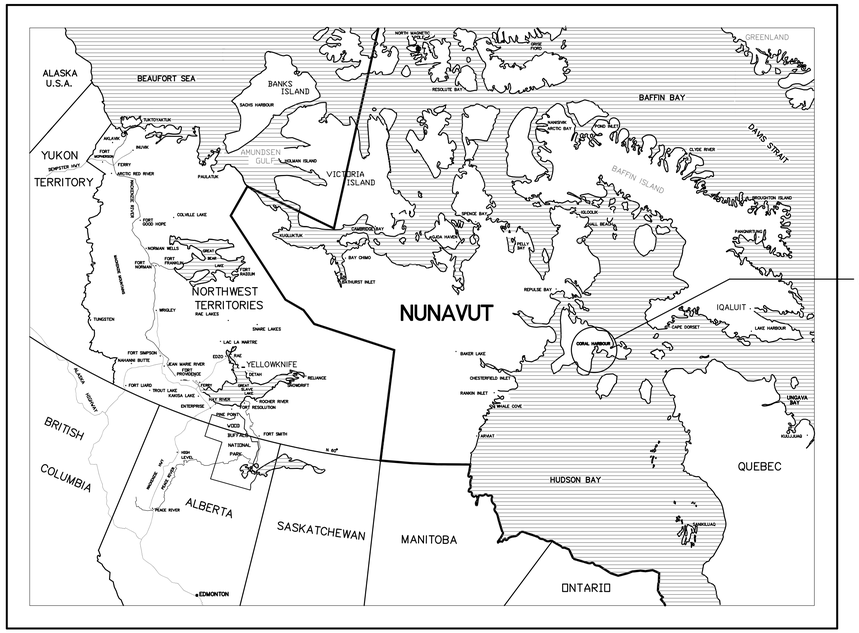
APPENDIX A
DRAWINGS

CORAL HARBOUR FUEL STORAGE TANK 3 BOTTOM REPLACEMENT

FOR TENDER

FEBRUARY 2015

NUNAMI
STANTEC LIMITED
1331 CLYDE AVENUE,SUITE 400,
OTTAWA, ON
K2C 3G4, Canada
PHONE: (613) 738-6092
FAX: (613) 722-2799
WWW.STANTEC.COM



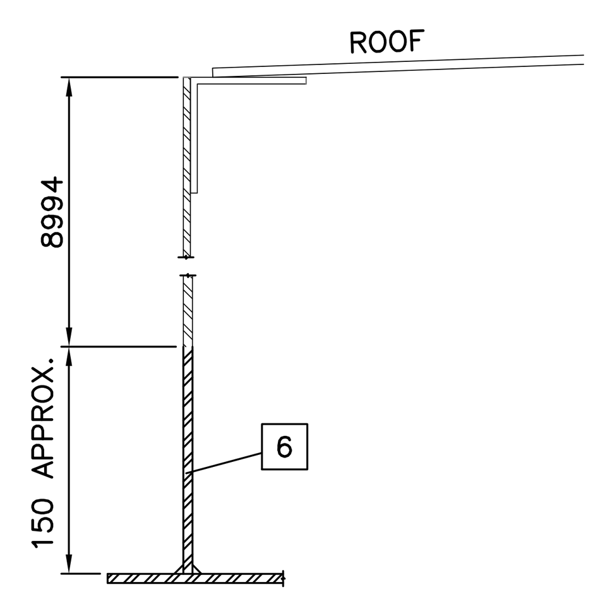
LIST OF DRAWINGS

MECHANICAL

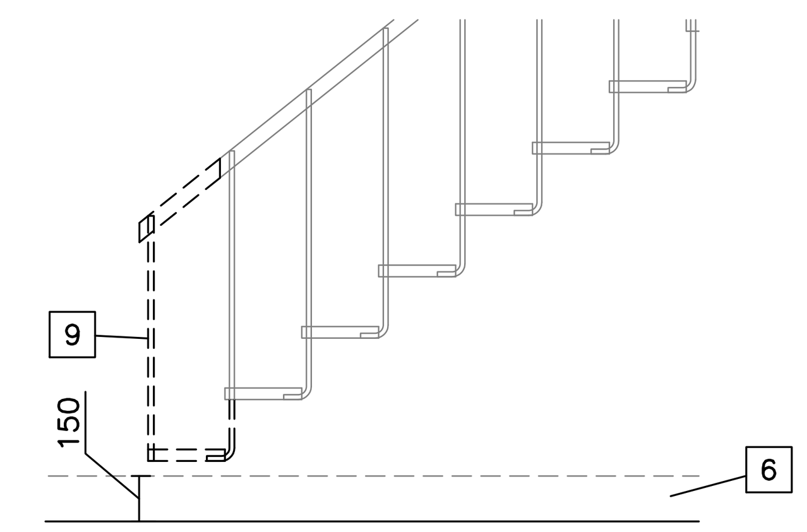
M100 - LOCATION AND DEMOLITION PLANS
M101 - FLOOR LAYOUT AND PLATE DETAILS
M102 - RAFTER LAYOUT AND PIPING DETAILS
M501 - NOZZLE DETAILS
M502 - TANK DETAILS
M503 - ELECTRICAL DETAILS

STANTEC PROJECT No:
122510497

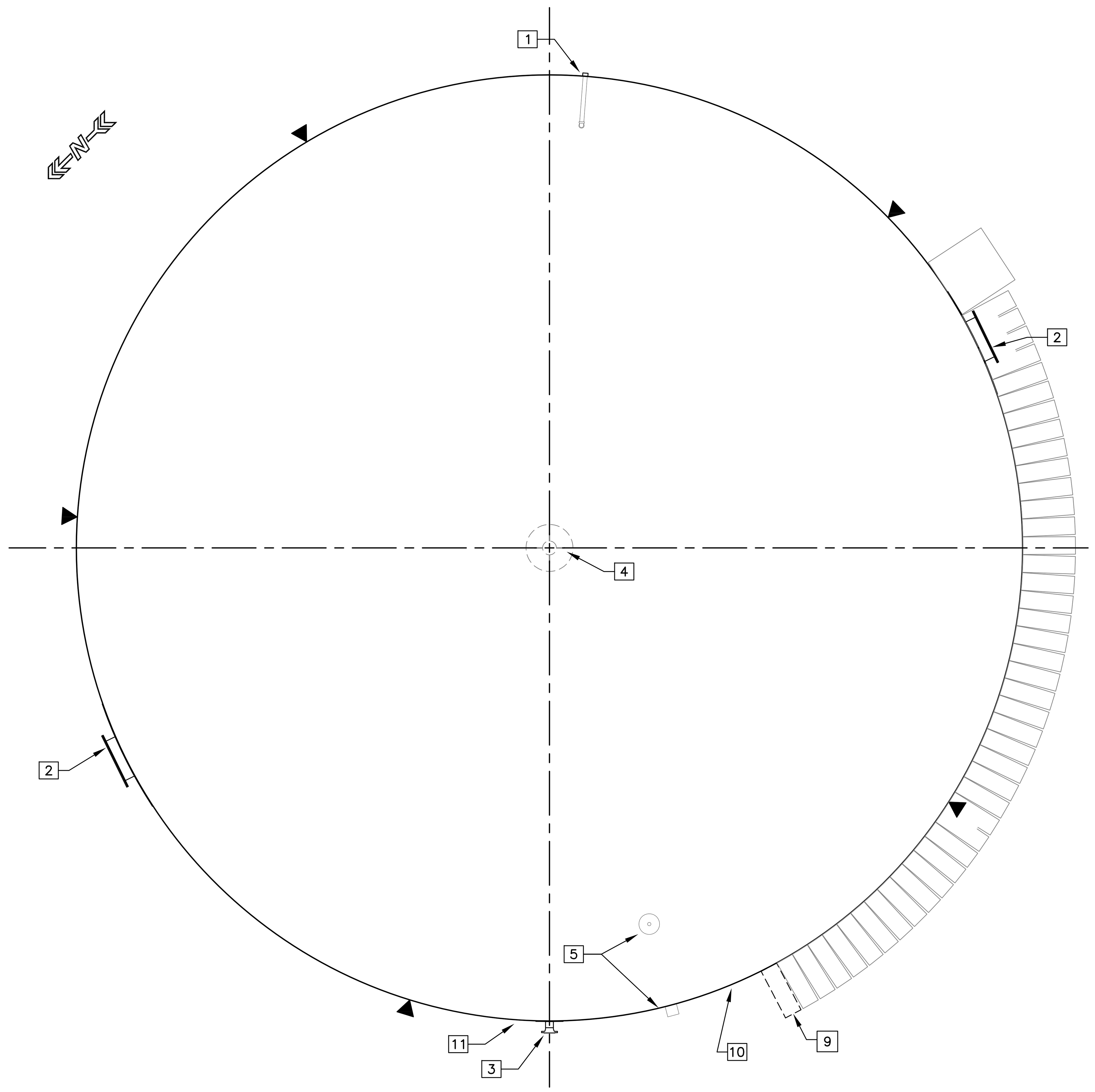
NOTES:
1. REMOVE EXISTING Dn50 WATER DRAW-OFF AND REPLACE NOZZLE WITH NEW AS PER DETAIL 3, M501.
2. REMOVE EXISTING Dn600 MANWAY AND REPLACE WITH NEW AS PER DETAIL 4, M501.
3. REMOVE EXISTING Dn100 NOZZLE AND REPLACE WITH NEW AS PER DETAIL 2, M501.
4. JACK, LEVEL, PLUMB, AND MODIFY EXISTING CENTER COLUMN AS PER DETAIL 5, M502. PROVIDE STRIKER PLATE AND ADJUST HEIGHT AS INDICATED.
5. EXISTING LEVEL GAUGE TO REMAIN. ASSOCIATED FLOAT GUIDE WIRE ATTACHMENTS ON EXISTING BOTTOM PLATES TO BE REMOVED AND REPLACED AFTER COMPLETION OF NEW BOTTOM PLATE.
6. ENTIRE TANK IS TO BE ELEVATED TO ENSURE NOZZLES MAINTAIN THE SAME ELEVATION. FILL, LEVEL, AND COMPACT FOUNDATION MATERIAL. SEE DETAIL 4, M502.
7. CUT 150mm FROM THE BOTTOM OF THE EXISTING SHELL, ALL AROUND TANK, BEFORE INSTALLING NEW BOTTOM PLATES AND APPURTANCES.
8. REMOVE EXISTING GROUNDING SYSTEM. REPLACE WITH 3 NEW GROUNDING LUGS, EVENLY SPACED AROUND TANK, AS PER DETAIL 6, M501. PROVIDE AND INSTALL A 3.05m GROUND ROD AND #4 BARE COPPER WIRE FOR EACH LUG.
9. REMOVE LOWEST TREAD AND HANDRAIL FROM STAIRWAY AS INDICATED.
10. REMOVE EXISTING Dn25 NOZZLE AND REPLACE WITH NEW INSERTION PLATE AS PER DETAIL 1, M501.
11. REMOVE EXISTING JUNCTION BOX ON THE TANK, FLEX CONNECTION, AND UNDERGROUND WIRING BACK TO JUNCTION BOX ON PIPE RACK. RELOCATE CONDUIT BRACKETS ON TANK AND PIPE AS REQUIRED TO SUIT TANK AND PIPING MODIFICATIONS.



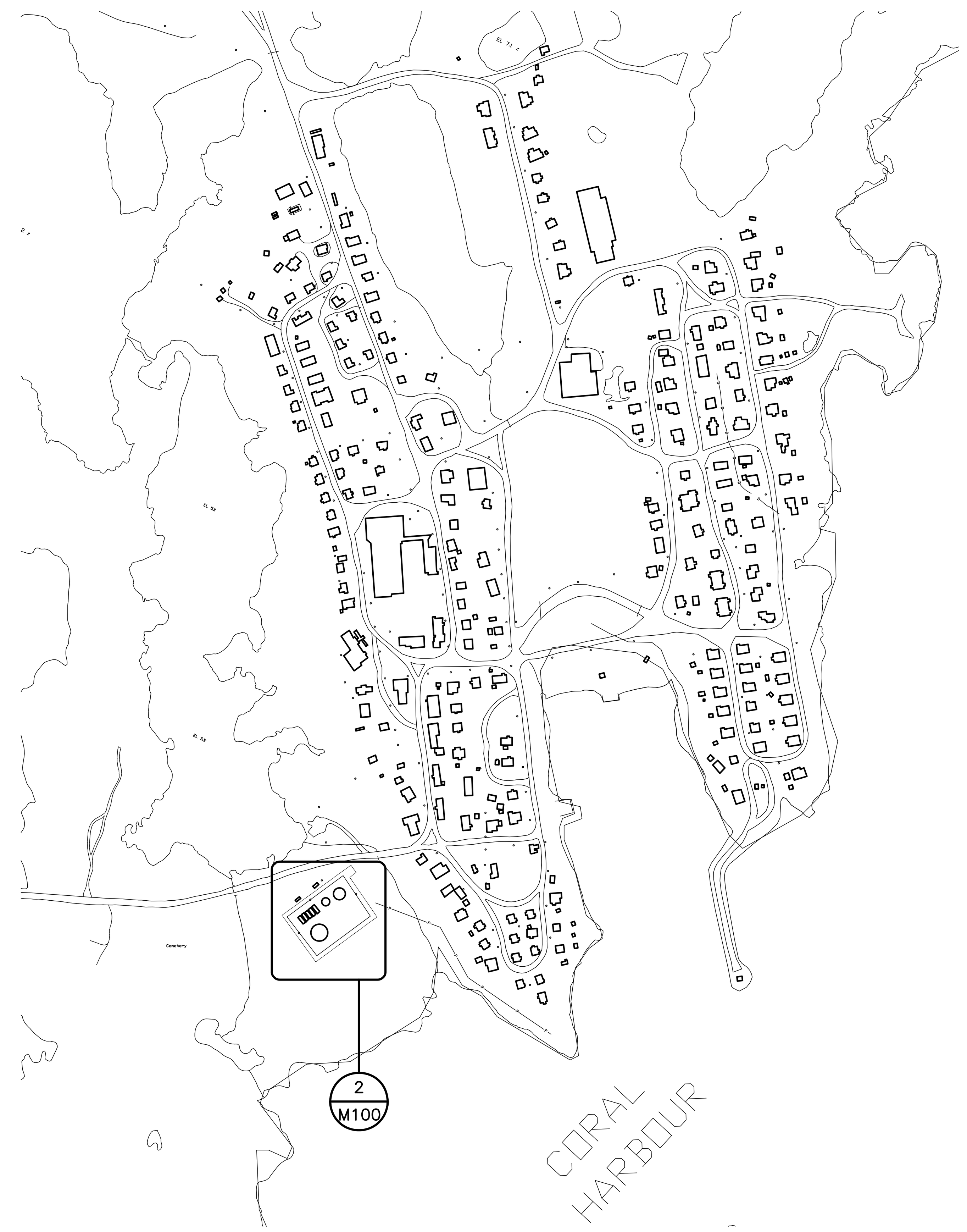
SHELL CUT DETAIL
SCALE NTS



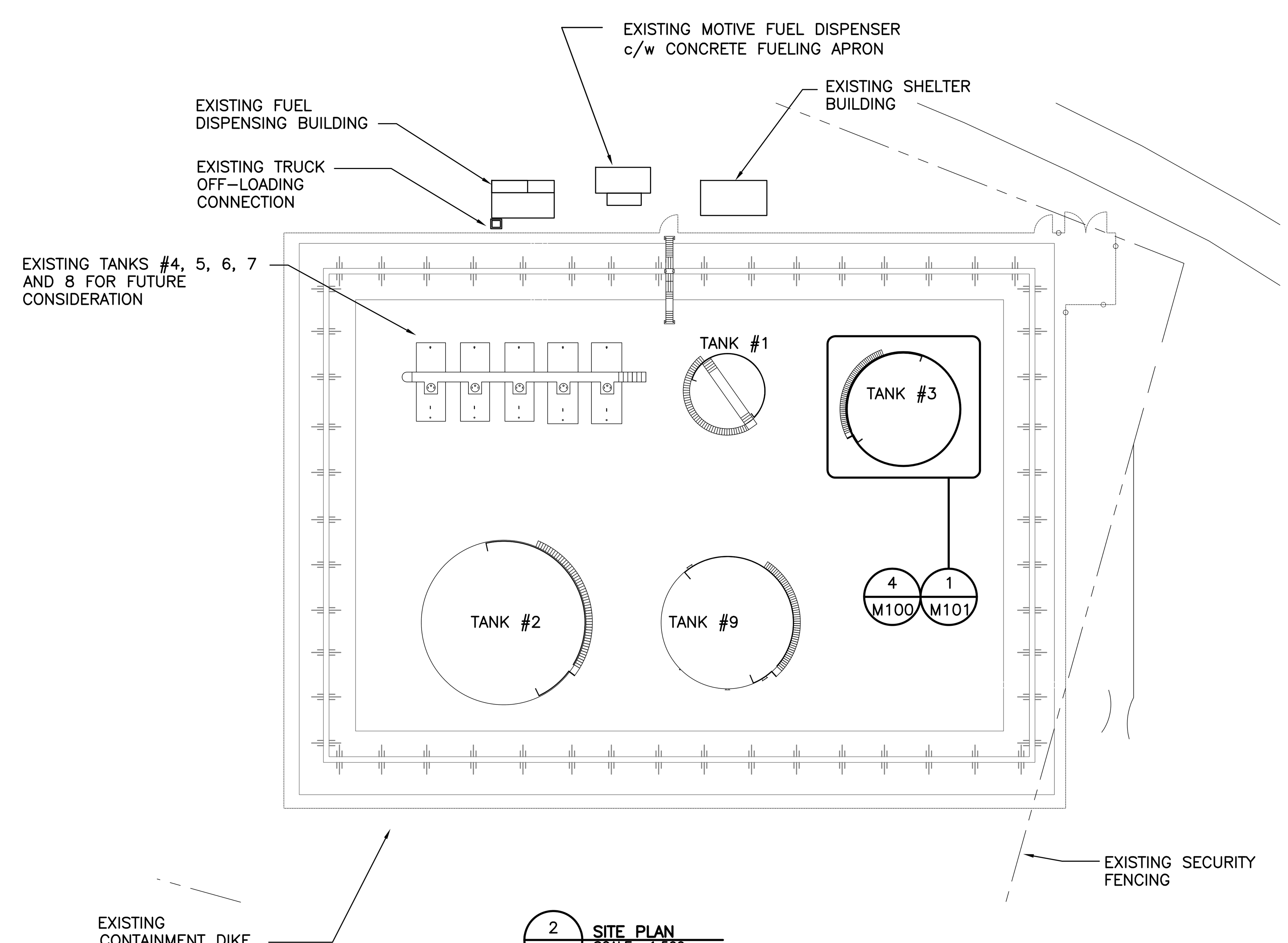
STAIR MODIFICATION
SCALE NTS



4 M100 DEMOLITION PLAN
SCALE 1:50



1 M100 COMMUNITY PLAN
SCALE 1:5000



2 M100 SITE PLAN
SCALE 1:500

NOTES:
1. CONFIRM DIMENSIONS PRIOR TO FABRICATION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
2. PROVIDE NEW CERTIFIED STRAPPING CHARTS TO OWNER AFTER SUCCESSFUL COMPLETION OF HYDROTEST.

LEGEND
(1) NOTE REFERENCE
(Y) TANK APPURTENANCE
DETAIL REFERENCE

STAMP | STAMP

REGISTERED PROFESSIONAL ENGINEER — J.M. FARAGALLI — LICENSEE L2624 — NWT/NU

NOTE: THIS DRAWING ILLUSTRATES INFORMATION SPECIFIC TO A STANTEC CONSULTING LIMITED PROJECT AND MUST NOT BE USED FOR OTHER PURPOSES.

APP'D	NO.	DETAILS	DATE
JPD	B	ISSUED FOR TENDER	02.24.2015
JPD	A	ISSUED FOR REVIEW	01.29.2015

REVISIONS

DWG. NO.	DESCRIPTION	DATE

REFERENCES

PROJECT: CORAL HARBOUR FUEL STORAGE TANK 3 BOTTOM REPLACEMENT

SITE ADDRESS: CORAL HARBOUR, NUNAVUT

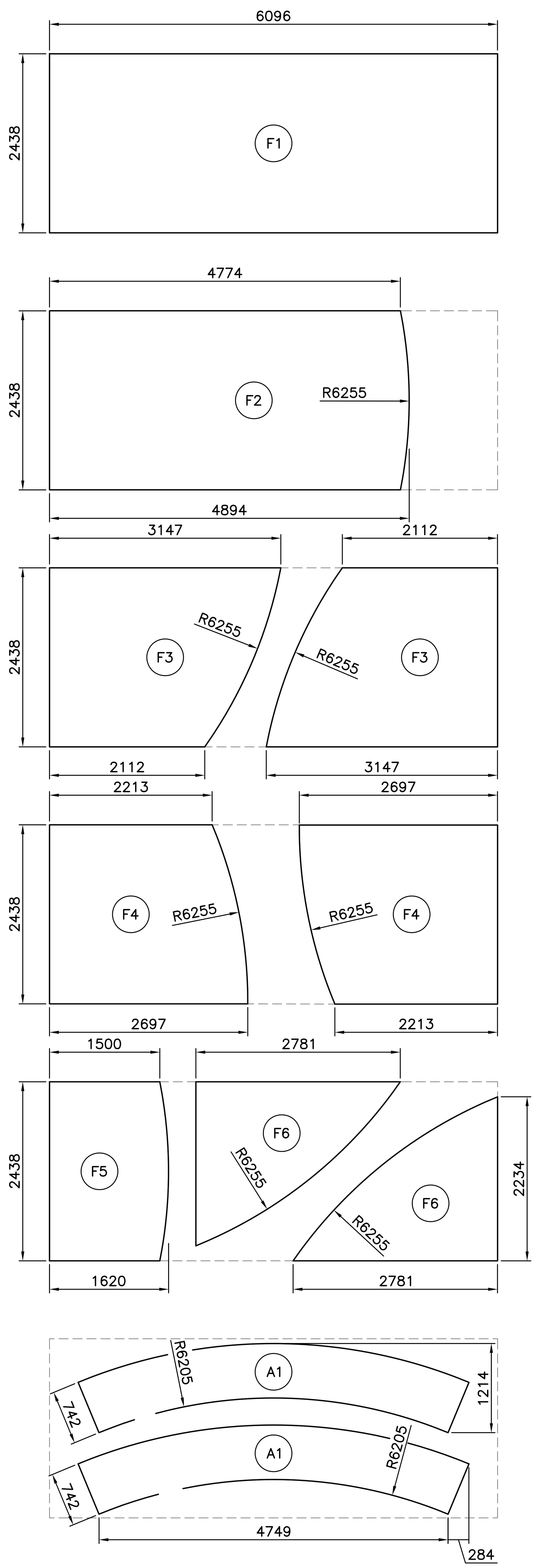
CLIENT: DEPARTMENT OF COMMUNITY GOVERNMENT SERVICES, GOVERNMENT OF NUNAVUT

JOB No.:	SCALE:	DATE:
122510497	AS NOTED	01/20/2015
DRAWN BY	DESIGNED BY:	APPROVED BY
BJL	JPD	IF

DRAWING TITLE:
LOCATION AND DEMOLITION PLANS

DRAWING No.:	REVISION No.
M100	B

NUNAMI STANTEC LIMITED



(2) M101 FLOOR PLATE DETAILS
SCALE 1:50

0 0.5m 1m 1.5m 2m 2.5m
1:50

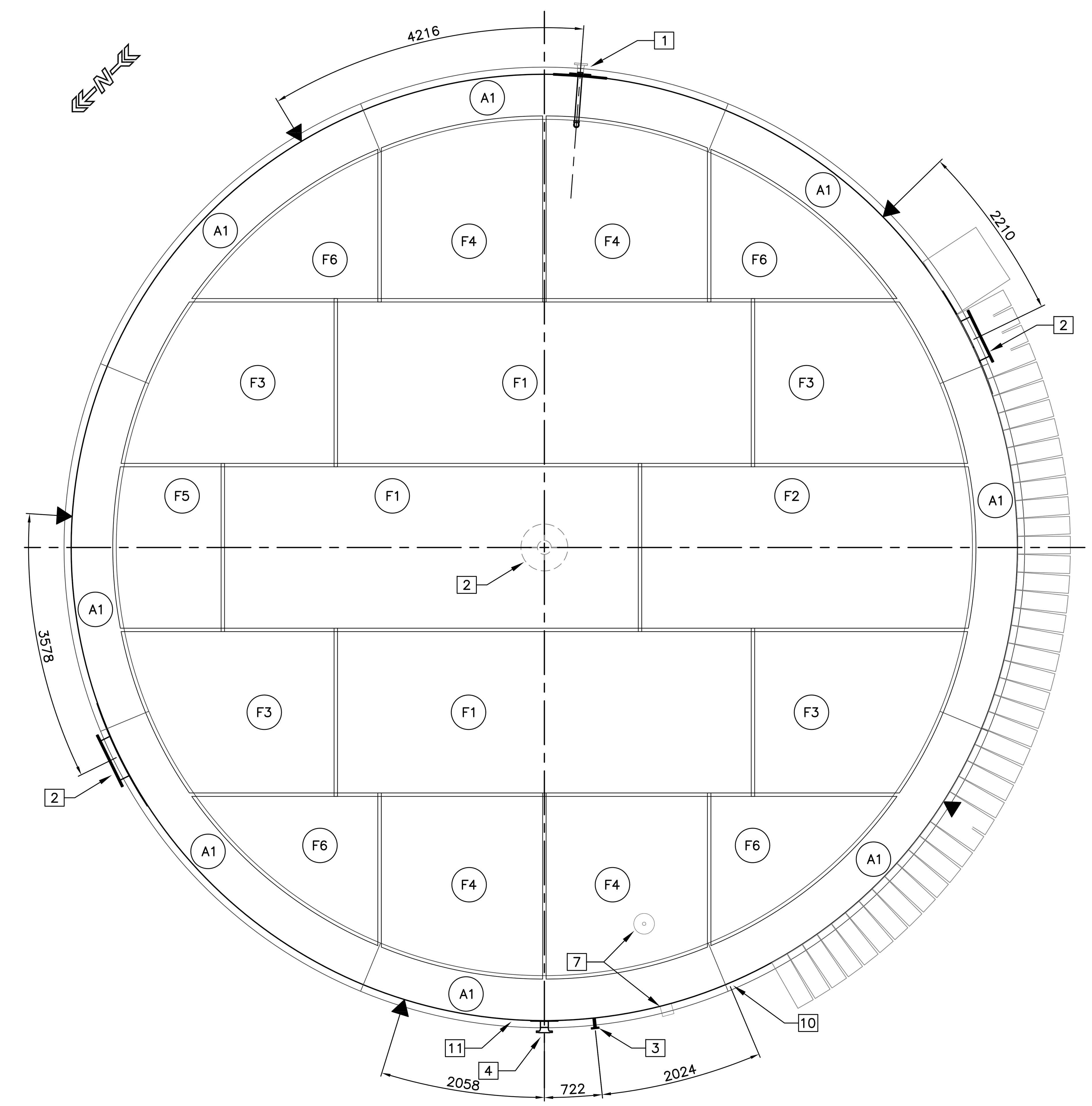
NOTES:
1. NEW Dn50 WATER DRAW-OFF NOZZLE AS PER DETAIL 3, M501.
2. NEW Dn600 MANWAY AS PER DETAIL 4, M501.
3. NEW Dn25 FLANGED NOZZLE AS PER DETAIL 5, M501.
4. NEW Dn100 NOZZLE AS PER DETAIL 2, M501. REFER TO DETAIL 2, M102 FOR DETAILS OF NEW PIPING.
5. JACK, LEVEL, PLUMB, AND MODIFY EXISTING CENTER COLUMN AS PER DETAIL 5, M502. PROVIDE STRIKER PLATE AND ADJUST HEIGHT AS INDICATED.
6. EXISTING LEVEL GAUGE TO REMAIN. ASSOCIATED FLOAT GUIDE WIRE ATTACHMENTS ON EXISTING BOTTOM PLATES TO BE REMOVED AND REPLACED AFTER COMPLETION OF NEW BOTTOM PLATE.
7. CUT 150mm FROM THE BOTTOM OF THE EXISTING SHELL, ALL AROUND TANK, BEFORE INSTALLING NEW BOTTOM PLATES AND APPURTANCES.
8. ENTIRE TANK IS TO BE ELEVATED TO ENSURE NOZZLES MAINTAIN THE SAME ELEVATION. FILL, LEVEL, AND COMPACT FOUNDATION MATERIAL. SEE DETAIL 4, M502. CUT HEIGHT TO BE MEASURED FROM THE TOP OF TANK TO ENSURE TANK HEIGHT IS EVEN.
9. INSTALL 3 NEW GROUNDING LUGS, EVENLY SPACED AROUND TANK, AS PER DETAIL 6, M501. PROVIDE AND INSTALL A 3.05m GROUND ROD AND #4 BARE COPPER WIRE FOR EACH LUG.
10. NEW INSERTION PLATE AS PER DETAIL 1, M501.
11. INSTALL NEW ELECTRICAL COMPONENTS AS INDICATED ON DETAIL 3, M503 AND AS REQUIRED TO COMPLETE MODIFICATION OF THE LIGHTING SYSTEM.

TANK INFO

NUMBER	3
PRODUCT	GASOLINE
AGE	34 yrs
DIAMETER	13.72m
HEIGHT	9.15m
SAFE FILL HEIGHT	9.15m
CAPACITY	1340m3
1ST COURSE SHELL THK.	5mm

BILL OF MATERIALS

TAG	QTY.	SIZE	DESCRIPTION	MATERIAL SPEC
F1	3	6096x2438x6	STEEL PLATE, FULL SHEET	G40.21, Gr. 260WT
F2	1	4894x2438x6	STEEL PLATE, CUT 1 FROM FULL SHEET	G40.21, Gr. 260WT
F3	4	3147x2438x6	STEEL PLATE, CUT 2 FROM FULL SHEET	G40.21, Gr. 260WT
F4	4	2697x2438x6	STEEL PLATE, CUT 2 FROM FULL SHEET	G40.21, Gr. 260WT
F5	1	2438x1620x6	STEEL PLATE, CUT 1 FROM REMAINDER OF F6	G40.21, Gr. 260WT
F6	4	2781x2234x6	STEEL PLATE, CUT 2 FROM FULL SHEET	G40.21, Gr. 260WT
A1	8	5328x1228x8	STEEL PLATE, CUT 2 FROM FULL SHEET	G40.21, Gr. 260WT



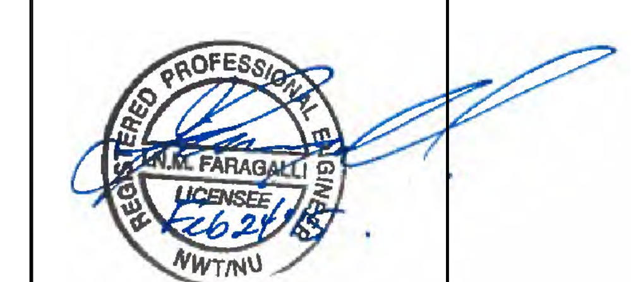
(1) M101 FLOOR PLATE LAYOUT
SCALE 1:50

0 0.5m 1m 1.5m 2m 2.5m
1:50

NOTES:
1. CONFIRM DIMENSIONS PRIOR TO FABRICATION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
2. PROVIDE NEW CERTIFIED STRAPPING CHARTS TO OWNER AFTER SUCCESSFUL COMPLETION OF HYDROTEST.

LEGEND
(1) NOTE REFERENCE
(Y) TANK APPURTENANCE
DETAIL REFERENCE

STAMP | STAMP



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JPD	A	ISSUED FOR REVIEW	01.29.2015

REVISIONS

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SITE ADDRESS: CORAL HARBOUR, NUNAVUT

CLIENT: DEPARTMENT OF COMMUNITY GOVERNMENT SERVICES, GOVERNMENT OF NUNAVUT

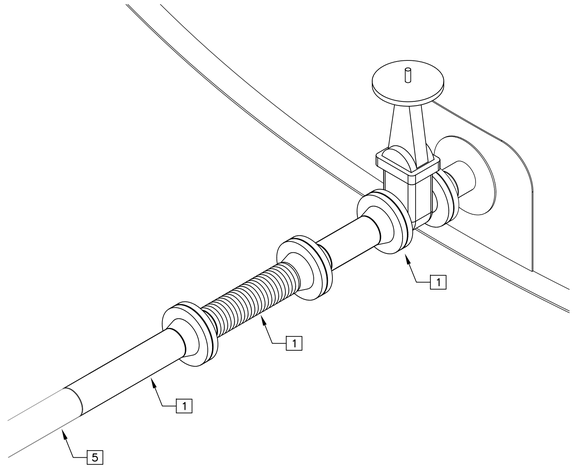
JOB No.:	SCALE:	DATE:
122510497	AS NOTED	01/20/2015
DRAWN BY	DESIGNED BY:	APPROVED BY
BJL	JPD	IF

DRAWING TITLE:
FLOOR LAYOUT AND PLATE DETAILS

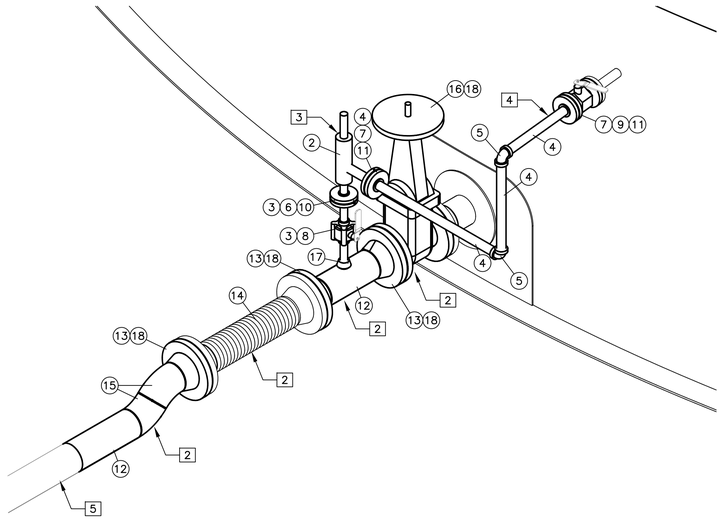
DRAWING No.: **M101**
REVISION No. **B**

NUNAMI STANTEC LIMITED

NOTES:
1. REMOVE EXISTING Dn100 NOZZLE, VALVE, FLEXIBLE CONNECTION, AND SECTIONS OF SUPPLY PIPING AS INDICATED. EXACT DIMENSION TO SUIT NEW FIT-UP DIMENSIONS.
2. INSTALL NEW Dn100 GATE VALVE, FLEXIBLE CONNECTION, AND OFFSET PIPING TO CONNECT TO NEW Dn100 TANK NOZZLE. MODIFY EXISTING PIPE SUPPORT AS REQUIRED TO SUPPORT PIPING AT NEW ELEVATION.
3. INSTALL PRESSURE RELIEF VALVE.
4. CONNECT DN25 RELIEF PIPING TO NEW TANK NOZZLE.
5. RELOCATE CONDUIT BRACKET ON PIPING IN THIS APPROXIMATE LOCATION AS REQUIRED TO SUIT NEW ELECTRICAL COMPONENTS AND PIPE OFFSET.
6. BOND FLEXIBLE CONNECTOR AS PER DETAIL 1, M503.

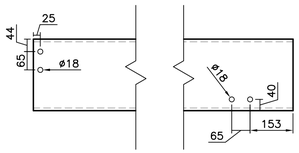


DEMOLITION



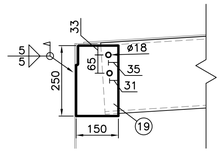
NEW WORK

2 / M102 PIPING MODIFICATIONS
SCALE NTS

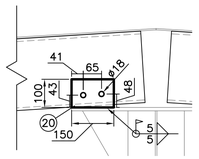


RAFTER – SHELL END

RAFTER – COLUMN END



RAFTER CLIP – SHELL



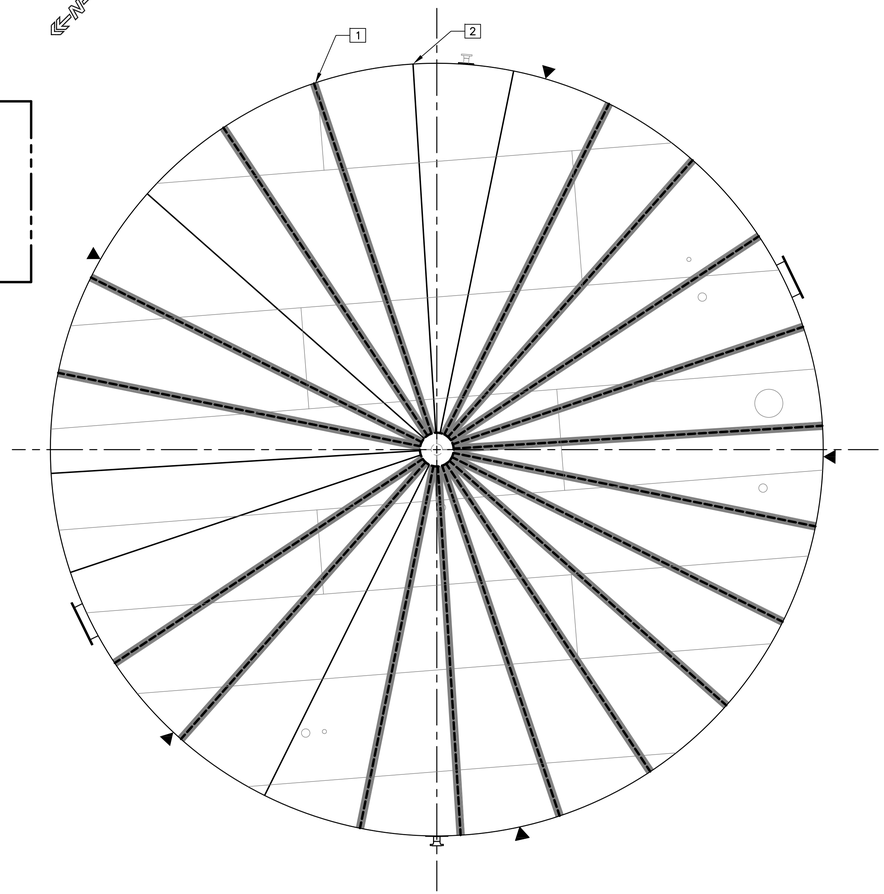
RAFTER CLIP – COLUMN

NOTES:
1. REPLACE EXISTING RAFTER WITH NEW. PROVIDE NEW CLIPS AND BOLTING MATERIAL AS PER DETAILS THIS SHEET. 18 TOTAL TO BE REPLACED.
2. EXISTING RAFTER TO REMAIN, 6 TOTAL.

CAUTION:
1. NEW RAFTER SIZE IS BASED UPON API CODE REQUIREMENTS AND ESTIMATION FROM API INSPECTION PHOTOS. CONFIRM EXACT SIZES ON SITE AND NOTIFY ENGINEER OF DISCREPANCY PRIOR TO START OF WORK.
2. IF RAFTER SIZE DIFFERS FROM SPECIFIED MATERIAL, NOTIFY ENGINEER FOR REQUIRED FIELD MODIFICATIONS TO COLUMN RAFTER CLIP DETAIL.
3. CONFIRM EXACT NUMBER AND LOCATION OF RAFTERS TO BE REPLACED WITH ENGINEER PRIOR TO START OF WORK.

BILL OF MATERIALS

TAG	QTY.	SIZE	DESCRIPTION	MATERIAL SPEC
1	130m	C250x30	STEEL CHANNEL	G40.21, Gr. 260WT
2	1	20x25	PRESSURE SAFETY VALVE	SEE SPEC
3	1m	20	PIPE, PE, SCH 80	A333, Gr. 6
4	3m	25	PIPE, PE, SCH 80	A333, Gr. 6
5	2	25	90 ELBOW, SW, 3000LB	A105N
6	2	20	FLG, RF, SW, 150 LB	A350, LF2
7	3	25	FLG, RF, SW, 150 LB	A350, LF2
8	1	20	BALL VALVE, SW, RB FLOATING	SEE SPEC
9	1	25	BALL VALVE, FLG, RF, RB FLOATING	SEE SPEC
10	1	20	GASKET & STUD BOLT SET, 4 – 13mm x 64mm	A320 L7/A194 Gr.4 316 S.S. c/w FLEX. GRAPHITE
11	3	25	GASKET & STUD BOLT SET, 4 – 13mm x 70mm	A320 L7/A194 Gr.4 316 S.S. c/w FLEX. GRAPHITE
12	2m	100	PIPE, PE, SCH 40	A333, Gr. 6
13	3	100	FLG, RF, WN, 150 LB	A350, LF2
14	1	100	S.S. FLEX CONNECTOR, FLG, 150 LB, 500 LG	316 S.S. BRAIDED
15	2	100	45 ELBOW, BE, SCH 40	A105N
16	1	100	GATE VALVE, FLG, 150 LB	SEE SPEC
17	1	150x20	SOCK-O-LET, 3000 LB	A105N
18	4	100	GASKET & STUD BOLT SET, 8 – 16mm x 95mm	A320 L7/A194 Gr.4 316 S.S. c/w FLEX. GRAPHITE
19	18	250x150x10	STEEL PLATE, COPED FOR ROOF RING	G40.21, Gr. 260WT
20	18	150x100x10	STEEL PLATE	G40.21, Gr. 260WT
21	72	16ø x 40	HEAVY DUTY BOLTS	A320 L7/A194 Gr.4



1 / M102 ROOF RAFTER AND PLATE LAYOUT
SCALE 1:50

0 0.5m 1m 1.5m 2m 2.5m
1:50

NOTES:
1. CONFIRM DIMENSIONS PRIOR TO FABRICATION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
2. PROVIDE NEW CERTIFIED STRAPPING CHARTS TO OWNER AFTER SUCCESSFUL COMPLETION OF HYDROTEST.

LEGEND
(1) NOTE REFERENCE
(Y) TANK APPURTENANCE
DETAIL REFERENCE

STAMP

STAMP

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APP'D	NO.	DETAILS	DATE
JPD	B	ISSUED FOR TENDER	02.24.2015
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REVISIONS

DWG. NO.	DESCRIPTION	DATE

REFERENCES

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SITE ADDRESS: CORAL HARBOUR, NUNAVUT

CLIENT: DEPARTMENT OF COMMUNITY GOVERNMENT SERVICES, GOVERNMENT OF NUNAVUT

JOB No.:	SCALE:	DATE:
122510497	AS NOTED	01/20/2015

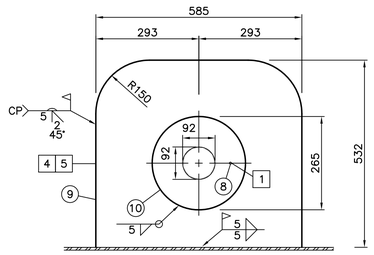
DRAWN BY	DESIGNED BY:	APPROVED BY
BJL	JPD	IF

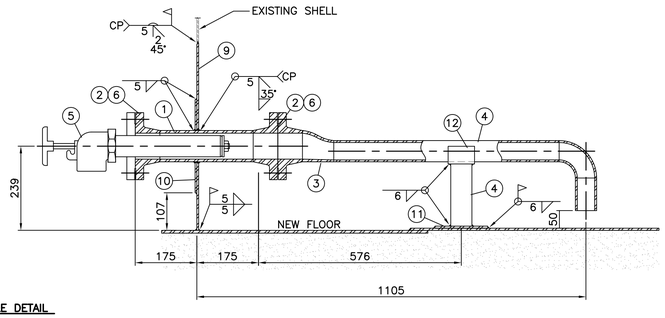
DRAWING TITLE:
RAFTER LAYOUT AND PIPING DETAILS

DRAWING No.:	REVISION No.	
M102	**B**	NUNAMI STANTEC LIMITED

L:\TANK 3 - Bottom Design\drawings\122497_mech.dwg PRINTED: Feb 24, 2015

NOTES:
1. DRILL AND TAP A 6mm TELLTALE HOLE IN NEW REPAD AND INSTALL A 6mm PLUG.
2. WHEN WELDING FLOOR PLATES TO SHELL, LEAVE A MINIMUM OF 300mm UN-WELDED ON BOTH SIDES OF THE VERTICAL JOIN OF THE NEW INSERT PLATE. ONCE INSERT PLATE IS INSTALLED, PROCEED WITH WELDING AS PER NOTE 3 BELOW.
3. WELDIN SEQUENCE OF INSERT PLATE INTO SHELL SHOULD BE AS FOLLOWS:
   - VERTICAL JOINTS
   - HORIZONTAL JOINTS
   - SHELL TO FLOOR JOINTS
4. MAINTAIN A MINIMUM OF 175mm BETWEEN INSERT PLATE WELDS AND VERTICAL AND HORIZONTAL SHELL JOINTS.
5. ROLL INSERT PLATE TO TANK RADIUS.



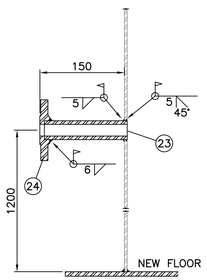


3 / M501 WATER DRAW-OFF NOZZLE DETAIL
SCALE 1:8

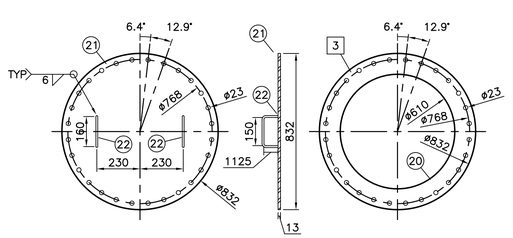
TAG	QTY.	SIZE	BILL OF MATERIALS DESCRIPTION	MATERIAL SPEC
1	0.5m	80	PIPE, SMLS, PE, SCH 80	A333, Gr. 6
2	1	80	FLANGE, RF, WN, 150LB	A350, LF2
3	1	80x50	REDUCER, ECC, SMLS, SCH 80	A234, Gr. B
4	2m	50	PIPE, SMLS, PE, SCH 80	A333, Gr. 6
5	1	50	WATER DRAW-OFF VALVE	SHAND & JURS 96181-02-01
6	2	80	GASKET AND STUD BOLT SET, 4 - 16mm x 95mm	A320 L7/A194 Gr.4 316 S.S. c/w FLEX. GRAPHITE
7			NOT USED	
8	4	6	THREADED PLUG	A105N
9	1	585x532x5	STEEL PLATE, CUT PER DETAIL 3	G40.21, Gr. 260WT
10	1	265øx5	STEEL PLATE, CUT PER DETAIL 3	G40.21, Gr. 260WT
11	1	150x150x6	STEEL PLATE, CUT PER DETAIL 3	G40.21, Gr. 260WT
12	1	C100x8	STEEL CHANNEL, 100mm LONG	G40.21, Gr. 260WT
13	1	305øx5	STEEL PLATE, CUT PER DETAIL 2	G40.21, Gr. 260WT
14	1	655x502x5	STEEL INSERT PLATE, CUT PER DETAIL 2	G40.21, Gr. 260WT
15	0.5m	100	PIPE, SMLS, PE, SCH 80	A333, Gr. 6
16	1	100	FLANGE, RF, WN, 150LB	A350, LF2
17	1	300x300x5	STEEL PLATE, CUT PER DETAIL 1	G40.21, Gr. 260WT
18	2	1258x1255x5	STEEL PLATE, CUT AS PER DETAIL 4	G40.21, Gr. 260WT
19	2	1605x1358x5	STEEL INSERT PLATE, CUT PER DETAIL 4	G40.21, Gr. 260WT
20	2	ø832x10	STEEL PLATE, MANWAY FLANGE	G40.21, Gr. 260WT
21	2	ø832x13	STEEL PLATE, MANWAY COVER	G40.21, Gr. 260WT
22	4	ø10x320LG.	STEEL BAR	G40.21, Gr. 260WT
23	0.5m	25	PIPE, SMLS, PE, SCH 160	A333, Gr. 6
24	1	25	FLG, RF, SW, CL150	A350, LF2
25	5	75x65x6	STAINLESS STEEL PLATE, CUT PER DETAIL 6	316 S.S.
26				
27				
28				

NOTES:
1. CONFIRM DIMENSIONS PRIOR TO FABRICATION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
2. PROVIDE NEW CERTIFIED STRAPPING CHARTS TO OWNER AFTER SUCCESSFUL COMPLETION OF HYDROTEST.
3. BOLTING FLANGE SHALL HAVE A MACHINED FACE WITH SURFACE PROFILE TO API STANDARD WITH MINIMUM FINISHED THICKNESS OF 10mm.

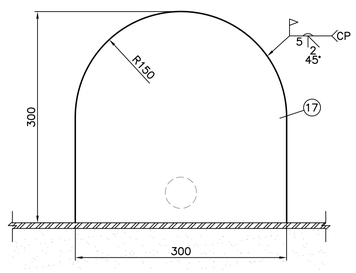
LEGEND
(1) NOTE REFERENCE
(Y) TANK APPURTENANCE
3/M501 DETAIL REFERENCE



5 / M501 DN25 NOZZLE DETAIL
SCALE NTS

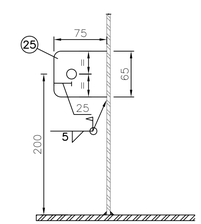


4 / M501 DN600 MANWAY DETAIL
SCALE NTS

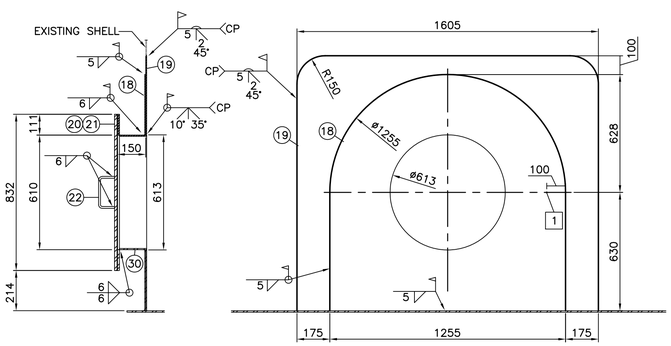


1 / M501 INSERT PLATE DETAIL
SCALE 1:4

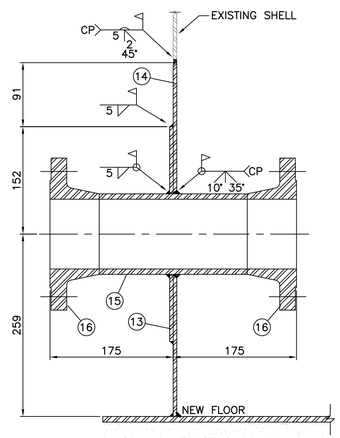
NOTES:
1. DRILL AND TAP A 6mm TELLTALE HOLE IN NEW REPAD AND INSTALL A 6mm PLUG.
2. MAINTAIN A MINIMUM OF 175mm BETWEEN REPAD WELDS AND VERTICAL AND HORIZONTAL SHELL JOINTS.

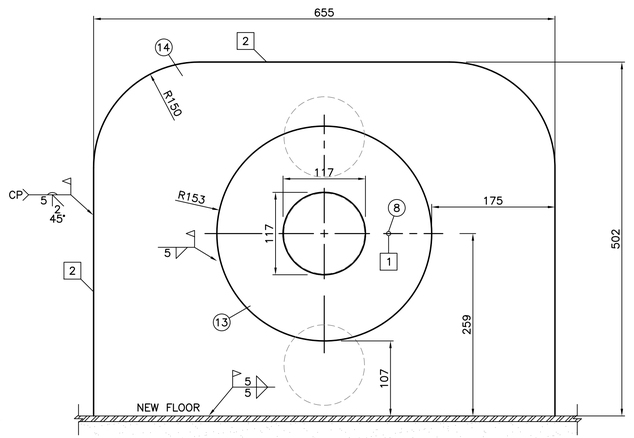


6 / M501 GROUND LUG DETAIL
SCALE NTS



4 / M501 DN600 MANWAY DETAIL
SCALE NTS





2 / M501 DN100 NOZZLE DETAIL
SCALE 1:4

STAMP

STAMP

APP'D	NO.	DETAILS	DATE
JPD	B	ISSUED FOR TENDER	02.24.2015
JPD	A	ISSUED FOR REVIEW	01.29.2015

REVISIONS

DWG. NO.	DESCRIPTION	DATE

REFERENCES

PROJECT: CORAL HARBOUR FUEL STORAGE TANK 3 BOTTOM REPLACEMENT

SITE ADDRESS: CORAL HARBOUR, NUNAVUT

CLIENT: DEPARTMENT OF COMMUNITY GOVERNMENT SERVICES, GOVERNMENT OF NUNAVUT

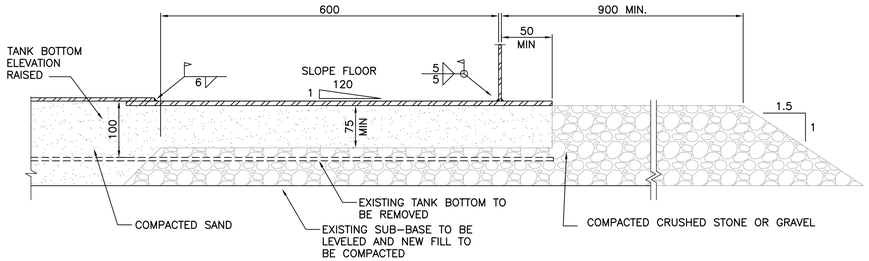
JOB No.:	SCALE:	DATE:
122510497	AS NOTED	01/20/2015
DRAWN BY: BJL	DESIGNED BY: JPD	APPROVED BY: IF

DRAWING TITLE:
NOZZLE DETAILS

DRAWING No.:	REVISION No.
M501	B

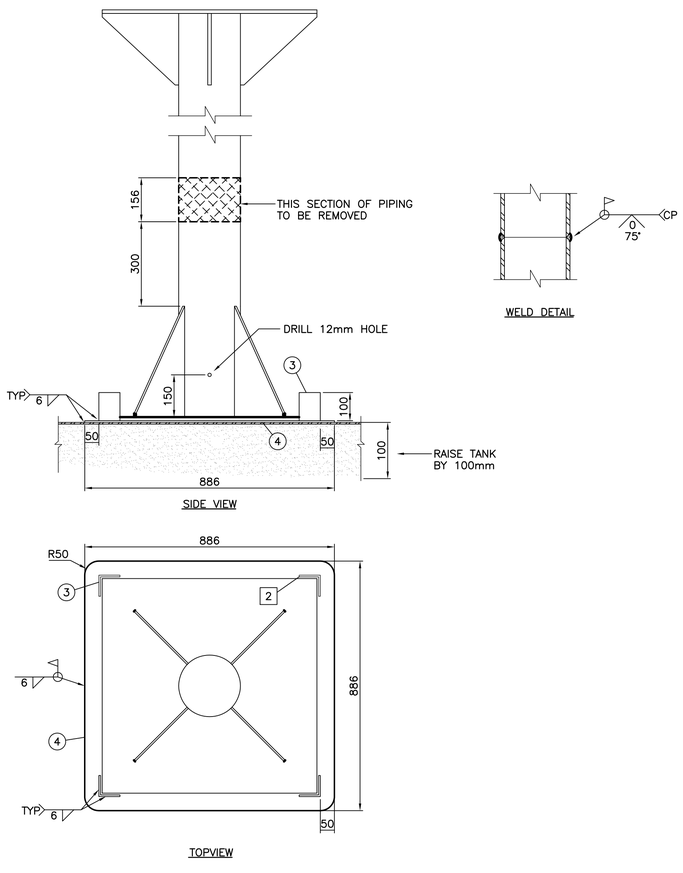
NUNAMI STANTEC LIMITED

NOTES:
1. REMOVE UNSUITABLE FILL MATERIAL AND REPLACE WITH NEW THOROUGHLY COMPACTED FILL MATERIAL AS PER API 650 REQUIREMENTS.



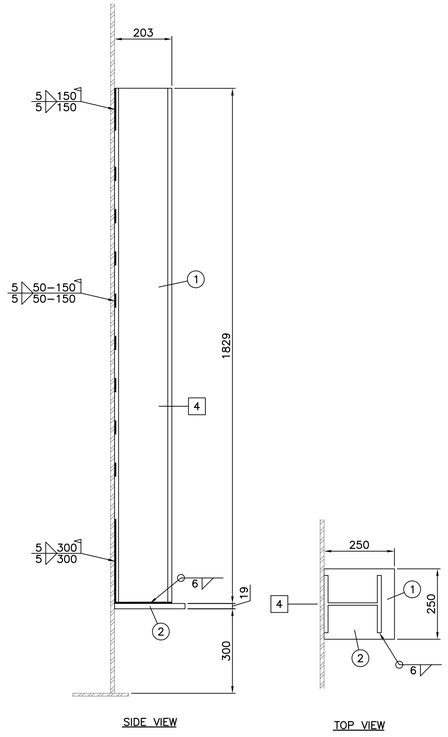
4 / M502 RAISED TANK FOUNDATION DETAIL
SCALE NTS

NOTES:
1. TEMPORARILY SUPPORT UPPER PORTION OF COLUMN DURING MODIFICATIONS TO LOWER PORTION.
2. PROVIDE A MIN OF 2mm CLEARANCE BETWEEN BASEPLATE AND GUIDES.

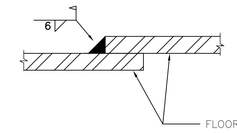


WELD DETAIL

5 / M502 TANK COLUMN MODIFICATIONS
SCALE NTS



3 / M502 JACKING LUG DETAIL
SCALE NTS

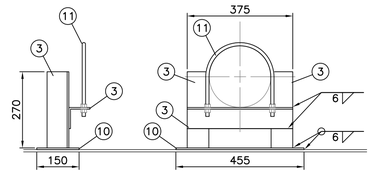


1 / M502 LAP WELD DETAIL
SCALE NTS

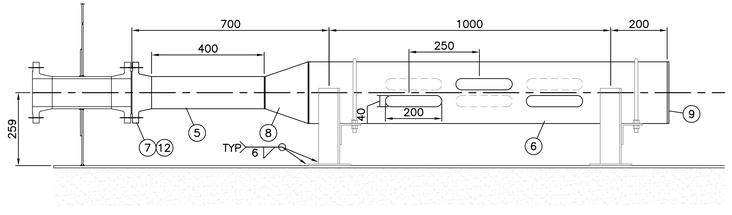
BILL OF MATERIALS

TAG	QTY.	SIZE	DESCRIPTION	MATERIAL SPEC
1	16m	W200x52	STEEL BEAM, JACKING LUG COLUMN	G40.21, Gr. 260WT
2	8	250x250x19	STEEL PLATE, JACKING LUG BASE	G40.21, Gr. 260WT
3	3m	75x75x6mm	STEEL ANGLE	G40.21, Gr. 260WT
4	1	886x886x6	STEEL PLATE, AS PER DETAIL 5	G40.21, Gr. 260WT
5	1m	100	PIPE, PE, SCH 40	A333, Gr. 6
6	2.5m	200	PIPE, PE, SCH 40	A333, Gr. 6
7	1	100	FLG, RF, WN, 150 LB	A350, LF2
8	1	200x100	REDUCER, BE, SCH 40	A105N
9	1	219ø x 6	STEEL PLATE, END CAP	G40.21, Gr. 260WT
10	2	455x150x6	STEEL PLATE, AS PER DETAIL 2	G40.21, Gr. 260WT
11	2	200	U-BOLT C/W 4 HD HEX NUTS	A325
12	4	100	GASKET & STUD BOLT SET, 8 – 16mm x 95mm	A320 L7/A194 Gr.4 316 S.S. c/w FLEX. GRAPHITE
13				
14				
15				
16				
17				
18				
19				
20				

NOTES:
1. CUT 6 200x40 HOLES, 3 PER SIDE AND OFFSET AS INDICATED.



SUPPORT DETAILS



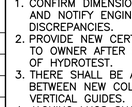
SIDE VIEW

2 / M502 DN100 INLET DIFFUSER
SCALE 1:4

NOTES:
1. CONFIRM DIMENSIONS PRIOR TO FABRICATION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
2. PROVIDE NEW CERTIFIED STRAPPING CHARTS TO OWNER AFTER SUCCESSFUL COMPLETION OF HYDROTEST.
3. THERE SHALL BE A 3mm MINIMUM GAP BETWEEN NEW COLUMN BASE PLATE AND VERTICAL GUIDES.
4. JACKING LUGS SHALL NOT BE SPACED MORE THAN 6m APART FROM EACH OTHER.
5. ALL WORK TO BE DONE AS PER API 650/653 TANK CODES.

LEGEND
(1) NOTE REFERENCE
(Y) TANK APPURTENANCE
(4/M502) DETAIL REFERENCE

STAMP



STAMP

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APP'D	NO.	DETAILS	DATE
JPD	B	ISSUED FOR TENDER	02.24.2015
JPD	A	ISSUED FOR REVIEW	01.29.2015

REVISIONS

DWG. NO.	DESCRIPTION	DATE

REFERENCES

PROJECT: CORAL HARBOUR FUEL STORAGE TANK 3 BOTTOM REPLACEMENT

SITE ADDRESS: CORAL HARBOUR, NUNAVUT

CLIENT: DEPARTMENT OF COMMUNITY GOVERNMENT SERVICES, GOVERNMENT OF NUNAVUT

JOB No.:	SCALE:	DATE:
122510497	AS NOTED	01/20/2015
DRAWN BY: BJL	DESIGNED BY: JPD	APPROVED BY: IF

DRAWING TITLE:
TANK DETAILS

DRAWING No.:	REVISION No.
M502	B

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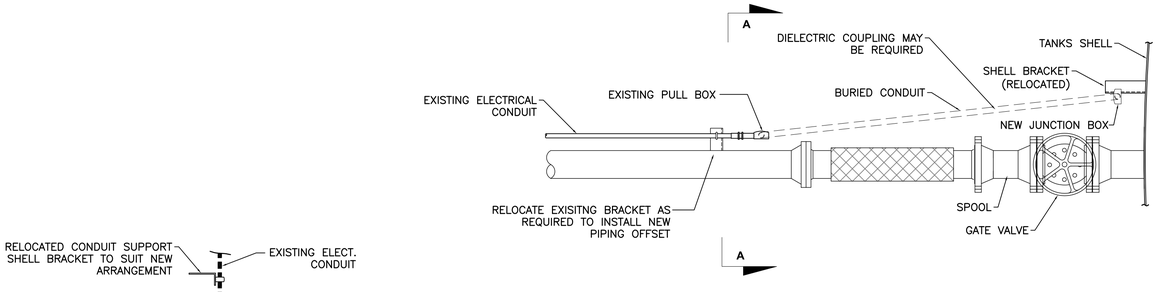
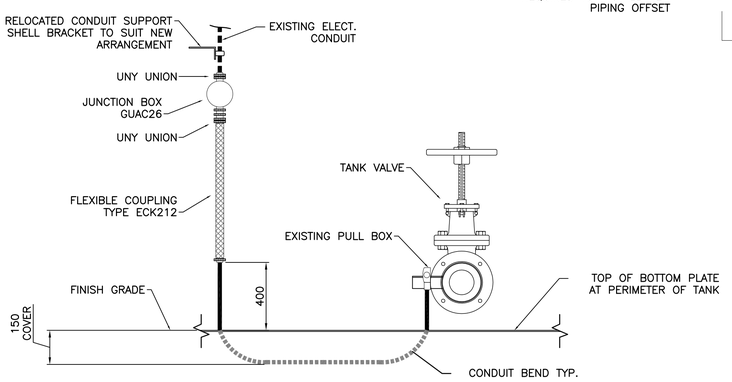
L:\TANK 3 - Bottom Design\drawings\122497_mech.dwg PRINTED: Feb 24, 2015



PLAN VIEW

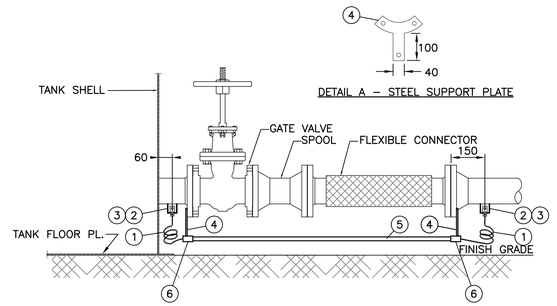


SECTION A–A

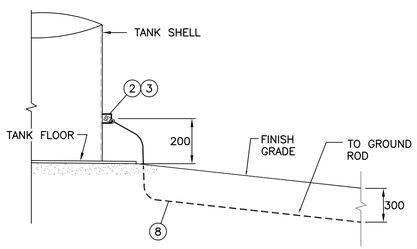
3 / M503 LIGHTING POWER MODIFICATIONS
SCALE NTS

BILL OF MATERIALS

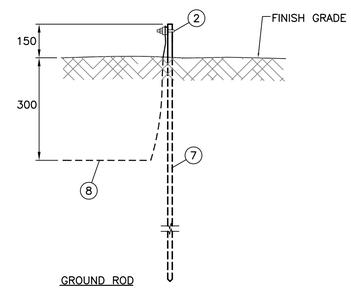
TAG	QTY.	DESCRIPTION
1	3m	#4 STRANDED INSULATED COPPER GROUND WIRE
2	6	BURNDY CONNECTOR SCRULUGS TYPE KPA c/w BRASS BOLT & NUTS
3	5	BONDING LUG PLATE, SEE DETAIL 6 ON M501
4	2	STEEL SUPPORT PLATE FOR BOND CABLE
5	3m	25ø CONDUIT
6	5	CONDUIT CONNECTOR
7	3	GROUND ROD 19ø x 3,050 LONG BLACKBURN #7510 COPPER–STEEL
8	30m	#4 STRANDED BARE COPPER GROUND WIRE
9		
10		
11		



1 / M503 GROUNDING VALVES SPOOL PIECES & FLEXIBLE CONNECTORS
SCALE NTS



TANK CONNECTION



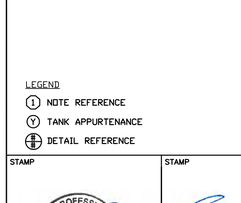
GROUND ROD

2 / M503 TANK GROUNDING DETAIL
SCALE NTS

NOTES:
1. CONFIRM DIMENSIONS PRIOR TO FABRICATION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
2. ALL WORK TO BE DONE AS PER API 650/653 TANK CODES.

LEGEND
(1) NOTE REFERENCE
(Y) TANK APPURTENANCE
(M503) DETAIL REFERENCE

STAMP



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JPD	A	ISSUED FOR TENDER	02.24.2015
APP'D	NO.	DETAILS	DATE

REVISIONS

DWG. NO.	DESCRIPTION	DATE

REFERENCES

PROJECT: CORAL HARBOUR FUEL STORAGE TANK 3 BOTTOM REPLACEMENT

SITE ADDRESS: CORAL HARBOUR, NUNAVUT

CLIENT: DEPARTMENT OF COMMUNITY GOVERNMENT SERVICES, GOVERNMENT OF NUNAVUT

JOB No.:	SCALE:	DATE:
122510497	AS NOTED	01/20/2015
DRAWN BY: BJL	DESIGNED BY: JPD	APPROVED BY: IF

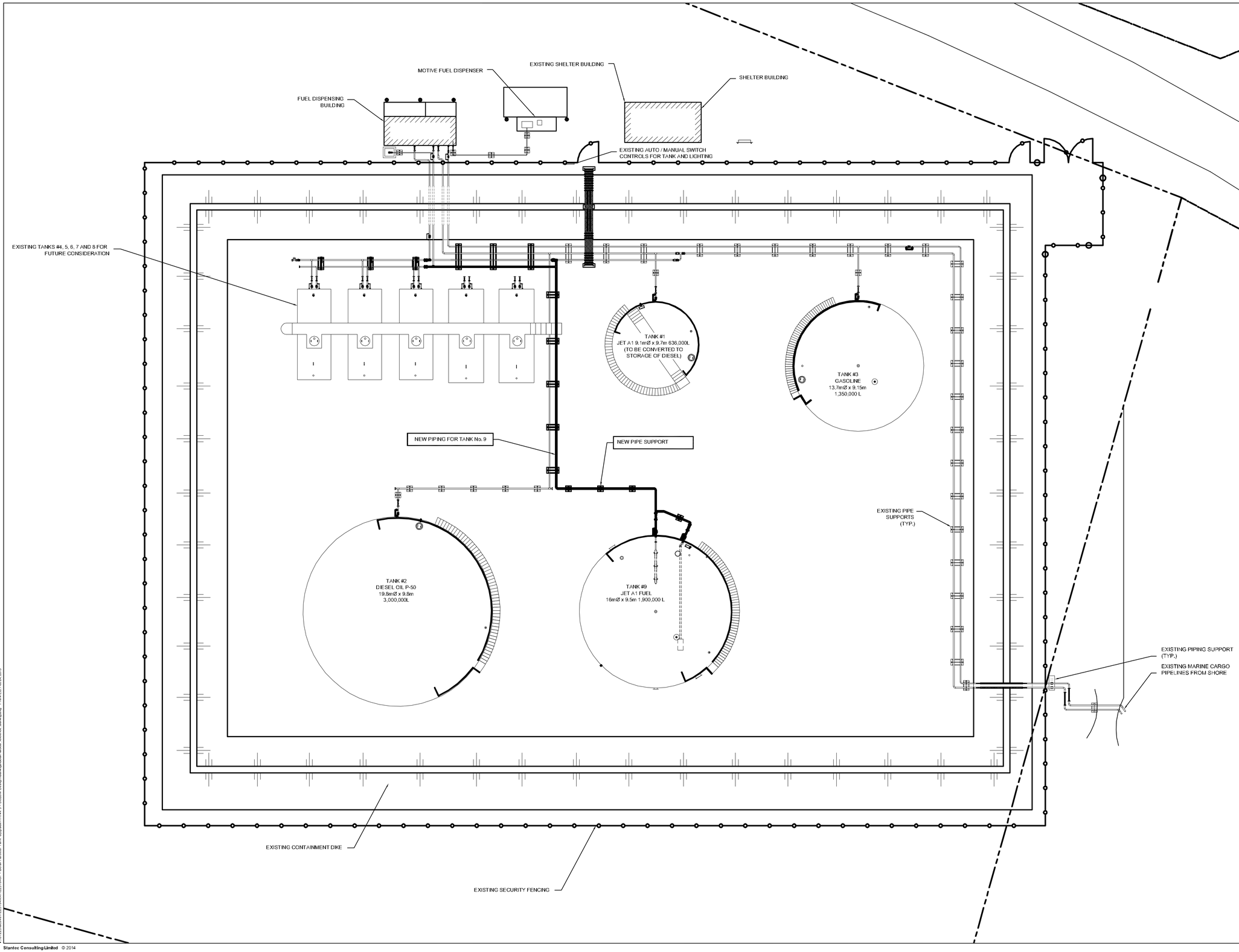
DRAWING TITLE:
ELECTRICAL DETAILS

DRAWING No.:	REVISION No.	
M503	**A**	NUNAMI STANTEC LIMITED

NUNAMI STANTEC

APPENDIX B

REFERENCE DRAWING – SITE PIPING



NOTES:

STAMP	STAMP

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APP'D	NO.	DETAILS	DATE

REVISIONS

DWG. NO.	DESCRIPTION	DATE

REFERENCES

PROJECT: CORAL HARBOUR FUEL STORAGE TANK 3 BOTTOM REPLACEMENT

SITE ADDRESS: CORAL HARBOUR, NUNAVUT

CLIENT: DEPARTMENT OF COMMUNITY GOVERNMENT SERVICES, GOVERNMENT OF NUNAVUT

JOB No.:	SCALE:	DATE:
122510497	NTS	02/24/2015
DRAWN BY: WJD	DESIGNED BY: DB	APPROVED BY: IF

DRAWING TITLE:

MAIN SITE STORAGE FACILITY
SITE PIPING REFERENCE

DRAWING No.:	REVISION No.
	A

NUNAMI STANTEC LIMITED

V:\0122\active\122510497_Coral Harbour Tank Upgrade\TANK 3 - Bottom Deck\drawings\Coral Harbour reference drawing.dwg PRINTED: Feb 24, 2015