

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
Public Works and Government Services Canada
Telus Plaza North/Plaza Telus Nord
10025 Jasper Ave./10025 ave. Jaspe
5th floor/5e étage
Edmonton
Alberta
T5J 1S6
Bid Fax: (780) 497-3510

Revision to a Request for a Standing Offer

Révision à une demande d'offre à commandes

Regional Individual Standing Offer (RISO)

Offre à commandes individuelle régionale (OCIR)

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Offer remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'offre demeurent les mêmes.

Comments - Commentaires

THIS DOCUMENT CONTAINS A SECURITY
REQUIREMENT

Vendor/Firm Name and Address

**Raison sociale et adresse du
fournisseur/de l'entrepreneur**

Issuing Office - Bureau de distribution

Public Works and Government Services Canada
Telus Plaza North/Plaza Telus Nord
10025 Jasper Ave./10025 ave Jasper
5th floor/5e étage
Edmonton
Alberta
T5J 1S6

Title - Sujet Repair Underground Utilities	
Solicitation No. - N° de l'invitation W0134-12CYIZ/A	Date 2012-04-30
Client Reference No. - N° de référence du client DND	Amendment No. - N° modif. 001
File No. - N° de dossier PWU-1-34788 (308)	CCC No./N° CCC - FMS No./N° VME
GETS Reference No. - N° de référence de SEAG PW-\$PWU-308-9386	
Date of Original Request for Standing Offer Date de la demande de l'offre à commandes originale 2012-04-26	
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2012-05-18	
Address Enquiries to: - Adresser toutes questions à: Dong (RPC), Michael	Buyer Id - Id de l'acheteur pwu308
Telephone No. - N° de téléphone (780) 497-3874 ()	FAX No. - N° de FAX (780) 497-3510
Delivery Required - Livraison exigée	
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:	
Security - Sécurité This revision does not change the security requirements of the Offer. Cette révision ne change pas les besoins en matière de sécurité de la présente offre.	

Instructions: See Herein

Instructions: Voir aux présentes

Acknowledgement copy required	Yes - Oui	No - Non
Accusé de réception requis	<input type="checkbox"/>	<input type="checkbox"/>
The Offeror hereby acknowledges this revision to its Offer. Le proposant constate, par la présente, cette révision à son offre.		
Signature	Date	
Name and title of person authorized to sign on behalf of offeror. (type or print) Nom et titre de la personne autorisée à signer au nom du proposant. (taper ou écrire en caractères d'imprimerie)		
For the Minister - Pour le Ministre		

Solicitation No. - N° de l'invitation

W0134-12CXYZ/A

Client Ref. No. - N° de réf. du client

DND

Amd. No. - N° de la modif.

001

File No. - N° du dossier

PWU-1-34788

Buyer ID - Id de l'acheteur

pwu308

CCC No./N° CCC - FMS No/ N° VME

This revision is raised to attach the Annex "A" - Statement of Work document to the Request for a Standing Offer document.

All other terms and conditions remain the same.

**DEPARTMENT OF NATIONAL DEFENCE
4 WING - CFB COLD LAKE
WING CONSTRUCTION ENGINEERING**

**STANDING OFFER AGREEMENT (SOA)
FOR**

REPAIR OF UNDERGROUND UTILITIES-2012



**Job Number:
Date:
Design OPI:
Contract Engineer:**

**L-C252-9900/368
9 Jan 2012
Dwight Schock
Pierre Banville**

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LIST OF ANNEXES

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ANNEX A	4 Wing Ground Disturbance Notice
ANNEX B	Hot Work Permit
ANNEX C	4 Wing Confined space Entry Permit
ANNEX D	Prime Contractor Agreement
ANNEX E	4 Wing Road Closure Notice
ANNEX F	4 Wing Environmental Incident & Emergency Plan

LIST OF DRAWINGS

TITLE

DRAWING NB.

END

PART 1 - GENERAL

- 1.1 Description of Work .1 Work under this Contract comprises the labour, materials and equipment for excavating, repair and backfilling of underground water and sewer lines at 4 Wing Cold Lake, Cold Lake, AB.
- .2 Exact extent and location of work as per Engineer's instruction with each request for abatement services.
- 1.2 Security Authorization .1 This project will be issued with an SRCL.
- 1.3 Contract Administration .1 This contract will be administered in English.
- 1.4 Documents Required .1 Maintain at job site, one copy each of the following:
- .1 Contract drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed shop drawings.
 - .5 Change orders.
 - .6 Other modifications to Contract.
 - .7 Copy of approved work schedule.
 - .8 Manufacturers' installation and application instructions.
- 1.5 Work Schedule .1 Provide within 10 working days after Contract award, construction schedule showing anticipated progress stages and final completion of work within time period required by Contract documents.
- .2 Interim reviews of work progress based on work schedule will be conducted as deemed by DND Rep and schedule updated by Contractor in conjunction with and to approval of DND Rep.
-

1.6 Contractor's Use of Site

Exclusive and complete for execution of work except as follows:

.1 Movement around site shall be subject to restrictions imposed by Wing Commander and/or DND Rep.

.2 Do not unreasonably encumber site with materials or equipment.

.2 PLER/Jimmy Lake special precautions:

.1 Day to day restrictions enroute to Jimmy Lake site may occur from time to time while military live range missions are underway. These restrictions are usually of short duration in terms of hours however may result in a full day.

.2 No work will be permitted during the multi-nation Maple Flag exercises.

.3 Normal working hours are from 0730 to 1600 but are subject to change.

.4 Weekend work is permitted with special arrangements.

.5 Obtain permission from Wing Operation Range Control 48hrs before proceeding to site.

1.7 Property Damage

.1 Contractor is responsible to make good any damage to DND property resulting from his work conducted on site. Repairs shall be carried out at the contractors expense.

.2 The contractor shall immediately notify the DND Rep or Contracting Authority of any damage incident. Damage to any surface feature or underground utility are included in this definition such as gas lines, power lines, water lines, buildings, survey markers, etc.

.3 Any tree removed or damaged during the work must be replaced with a trees equalling the total diameter of trees removed. The replacement trees should be no less than half the calliper of the trees that are damaged/removed. CE Roads and Grounds (Loc 8432) should be contacted for a list of preferred species; each area will have specific requirements based on location, soils proximity to paved areas, moisture etc.

- 1.8 Codes and Standards .1 Perform work in accordance with the latest edition of National Building Code of Canada (NBC), and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- 1.9 Workmanship .1 Workmanship:
.1 Workmanship shall be executed by workers qualified in respective duties for which they are employed.
.2 Decisions as to quality or fitness of workmanship, in case of dispute, rest solely with DND Rep, whose decision is final.
- .2 Qualification:
.1 All work shall be carried out by qualified journeyman or apprentice in accordance with the conditions of the Alberta Provincial Act respecting manpower, vocational training and qualification.
.2 Apprenticed employees registered in the provincial apprenticeship program shall be permitted to work only under the direct supervision of a qualified journeyman.
- 1.10 Project Meetings .1 DND Rep will arrange project meetings, assume responsibility for setting times and recording and distributing minutes.
- 1.11 Project Layout .1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.
- .2 Provide devices as required to lay out and construct project.
- .3 Supply such devices as straight edges and templates required to facilitate DND Rep's inspection of work.
- .4 Supply stakes and other survey markers required for project layout.
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1.12 Location of
Equipment and
Fixtures

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform DND Rep of impending installations and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment as required by DND Rep.
- .5 Before the start of construction, the Contractor will be responsible to identify and preserve DND Survey Monuments.
- .6 If during construction, Contractor discovers a DND Survey Monument, (complete with marker post, 50 mm round pipe with 75 x 100 mm aluminium plate), do not disturb the area, carefully preserve survey monuments and inform DND Rep before proceeding.
- .7 Should a DND Survey Monument be disturbed during construction, the Contractor will be responsible to re-survey and replace if the Monument if necessary, by a certified land surveyor approved by DND Rep.

1.13 Cutting and
Patching

- .1 Execute cutting, including excavation, fitting and patching required to allow proper fitting of construction elements.
- .2 Where new elements connect with existing and where existing are altered, cut, patch and make good to match existing.
- .3 Obtain DND Rep's approval before cutting, boring or sleeving load-bearing members.
- .4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- .5 Fit construction elements to pipes, sleeves, ducts and conduits.

1.14 Existing
Services

- .1 It is the Contractor's ultimate responsibility to obtain a properly completed "4 Wing Ground Disturbance Form" (Annex A) to establish the location and extent of service lines in the area of work, before any clearing/digging is started.
- .2 Ten working days prior to the scheduled start date, the Contractor shall complete the "4 Wing Ground Disturbance Form".
- .3 The DND Rep will arrange for the form to be completed and signed by the authorized representative for:
 - .1 Electrical Distribution.
 - .2 POL Distribution.
 - .3 Sewer/Water/Drainage System.
 - .4 Heating Plant.
 - .5 Fire Department.
 - .6 UGSO (Unit General Safety Officer).
 - .7 W TIS
 - .8 Wing Operations.
 - .9 Commercial Utility Companies.
 - .10 Telus (Ticket Number)
 - .11 Alberta First Call
- .4 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to pedestrian and vehicular traffic.
- .5 Submit schedule to and obtain approval from DND Rep for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .6 Where unknown services are encountered, immediately advise DND Rep and confirm findings in writing.
- .7 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut-off points as directed by DND Rep.
- .8 Record locations of maintained, re-routed and abandoned service lines.

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- 1.15 Additional Drawings .1 DND Rep may furnish, if requested, additional copies of drawings and specifications.
- 1.16 Alterations, Additions or Repairs to Existing Building .1 Execute work with least possible interference or disturbance to occupants, public and normal use of premises. Arrange with DND Rep to facilitate execution of work.
- .2 Where security has been affected by work of Contract, provide temporary means to maintain security.
- .3 Where elevators or conveyors exist in building, only those assigned for Contractor's use may be used for moving men and material within building. Protect walls of passenger elevators to approval of DND Rep before use. Accept liability for damage, safety of equipment and overloading of existing equipment.
- .4 Provide temporary dust screens, barriers, and warning signs in locations where renovation and alteration work is adjacent to areas used by public or government staff.
- 1.17 Restoration of Disturbed Surfaces .1 The Contractor shall be responsible for the restoration of all disturbed areas including adjacent areas to excavations, disturbed grassed areas, hard surfaces and any other area damaged due to work carried out, as indicated and to the satisfaction of the DND Rep.
- 1.18 Building Smoking Environment .1 4 Wing Cold Lake has a smoking policy in effect. Contractor is to obtain a copy from DND Rep and adhere to it.
- 1.19 Asbestos Discovery .1 If, during execution of contract work, workers uncover or disturb suspected asbestos products that are not covered in the contract specifications, STOP work in that area and advise DND Rep.
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- 1.20 Security
- .1 Access
 - .1 Work carried out under the terms of this contract will be conducted within the General Restricted Area (GRA) where special and unique security regulations are enforced. Individuals without authorized passes in their possession will not be permitted to enter the GRA.
 - .2 Clearances
 - .1 Work clearance will be granted in two possible ways, please see clause 1.2 for authorization:
 - .1 Security Mitigation Measures
 - .2 Security Requirements Check List.
 - .3 Security Mitigation Measures
 - .1 In the case of Security Mitigation Measures, contractor will have access to the GRA only under full time escort.
 - .2 At no time shall the contractor's employees or sub-contractors be found within the GRA without an authorized pass and escort.
 - .3 Every effort will be made to provide escorts according to the provided construction schedule.
 - .4 The Contractor shall give minimum 48 hours notice (two working days) for the processing of the information and subsequent issue of the passes. The Contractor shall ensure that all employees are advised not to enter the GRA without prior authorization (GRA pass) and government issued photo identification.
 - .4 Security Requirements Check List
 - .1 All personnel employed by the Contractor and performing work within the GRA will be subject to a Reliability screening performed by Public Works and Government Services Canada Security Division. Prior to commencement of the Work, the Contractor and each of his personnel involved in the performance of the Contract must be security screened by the Canadian and International Industrial Security Division of the Department of Public Works and Government Services at the level of RELIABILITY STATUS.
 - .2 Information that the contractor must provide for this screening include: Date of Birth; Address; Country of Origin; Education/Professional qualifications; Employment history; and References/Personal character. The security Division will perform Criminal Record check and Credit check on each applicant. If significant adverse information
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1.20 Security
(Cont'd)

.4

(Cont'd)

.2 (Cont'd)

arises during the conduct of a security assessment, the individual will be notified, in person, and given an opportunity to explain the circumstances. If the Deputy Minister, PWGSC, after reviewing a security assessment, denies the granting of RELIABILITY STATUS, the individual(s) concerned shall be so notified in writing along with information relating to their right of appeal and subsequent admission to the GRA will be prohibited, pending the outcome of any appeal.

.3 The Contractor shall obtain GRA passes from the Wing Military Police Identification Section from information provided by the Contractor to the Contracting Authority or Contract Inspector. The Contractor shall give minimum 48 hours notice (two working days) for the processing of the information and subsequent issue of the passes. The Contractor shall ensure that all employees are advised not to enter the GRA without prior authorization (GRA pass) and government issued photo identification.

.4 The Contractor shall be responsible for his sub-contractors, ensuring all security related requirements are met.

.5 The Contractor shall provide a list of employees and sub-contractors, complete with telephone numbers, who may be contacted during non-working hours in the event of any emergency.

.6 The Contractor shall ensure that all passes issued to his designated employees and sub-contractors are returned for cancellation prior to issuance of the DND Rep's final certificate of completion.

.5

CLAWR (Cold Lake Air Weapons Range) Special conditions.

.1 The contractor shall provide DND a list of personnel who need access to the area to perform work under the terms of the contract.

.2 All personnel are required to attend a 1 hour "Range Safety Briefing" prior to conducting any work or accessing the PLER site.

.3 Contractor shall provide schedule minimum 14 days in advance of scheduled work on site. Any changes to this schedule shall be provided to the inspector at a minimum of 48 hours advance notice (two working days) for processing of information and subsequent clearances to PLER. The Contractor shall

1.20 Security .5
(Cont'd)

- (Cont'd)
.3 (Cont'd)
ensure that all employees are advised not to enter the PLER without prior authorization.
.4 Information that the contractor must provide for access: name of individual(s), dates and times for access, location of work, phone number, drivers licence.
.5 Work clearance will be granted by DND through Wing Operations Mr Dick Brakely @ local 7978.
.6 The Contractor shall be responsible for his sub-contractors, ensuring all security related requirements are met.
.7 Garbage or refuse shall be removed off the CLAWR.
.8 Feeding wildlife is prohibited.
.9 All meals must be prepared and consumed in a suitable enclosed space or building.
.10 Report to Range Safety Officer (RSO) as required by DND.
.11 The Contractor shall provide a list of employees and sub-contractors, complete with telephone numbers, who may be contacted during non-working hours in the event of any emergency.

PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

PART 1 - GENERAL

- 1.1 Section Includes .1 Shop drawings and product data.
.2 Samples.
- 1.2 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.3 Administrative .1 Submit to DND Rep submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
.2 Work affected by submittal shall not proceed until review is complete.
.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
.4 Where items or information is not produced in SI Metric units converted values are acceptable.
.5 Review submittals prior to submission to DND Rep. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.
.6 Notify DND Rep, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
.7 Verify field measurements and affected adjacent Work are coordinated.
-

1.3 Administrative
(Cont'd)

- .8 Contractor's responsibility for errors and omissions in submission is not relieved by DND Rep's Consultant's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by DND Rep Consultant review.
- .10 Keep one reviewed copy of each submission on site.

1.4 Shop Drawings

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .3 Allow 14 days for DND Rep's review of each submission.
- .4 Adjustments made on shop drawings by DND Rep are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to DND Rep prior to proceeding with Work.
- .5 Make changes in shop drawings as DND Rep may require, consistent with Contract Documents. When resubmitting, notify DND Rep in writing of any revisions other than those requested.
- .6 Accompany submissions with transmittal letter containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.

1.4 Shop Drawings
(Cont'd)

- .7 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .8 After DND Rep's review, distribute copies.
- .9 Submit prints, number as required by contractor plus two(2) copies to be retained by DND Rep, of shop drawings for each requirement requested in specification Sections and as consultant may reasonably request.
- .10 Submit prints, number as required by contractor plus two(2) copies to be retained by DND Rep, of product data sheets or brochures for requirements requested in specification Sections and as requested by DND Rep where shop drawings will not be prepared due to standardized manufacture of product.
- .11 Delete information not applicable to project.
- .12 Supplement standard information to provide details applicable to project.
- .13 If upon review by DND Rep, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same

1.4 Shop Drawings
(Cont'd)

- .13 (Cont'd)
procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .14 The review of shop drawings by Department of National Defence (DND) is for sole purpose of ascertaining conformance with general concept. This review shall not mean that DND approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

1.5 Product Data

- .1 Manufacturers' catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
- .2 Submit 2 copies of product data.
- .3 Sheet size: 215 x 280 mm.
- .4 Delete information not applicable to project.
- .5 Supplement standard information to provide details applicable to project.
- .6 Cross-reference product data information to applicable portions of Contract documents.

1.6 Samples

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
 - .2 Deliver samples prepaid to DND Rep.
 - .3 Notify DND Rep in writing, at time of submission of deviations in samples from requirements of SOA Documents.
-

- 1.6 Samples (Cont'd)
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
 - .5 Adjustments made on samples by DND Rep are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to DND Rep prior to proceeding with Work.
 - .6 Make changes in samples which DND Rep may require, consistent with Contract Documents.
 - .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

PART 2 - PRODUCTS

- 2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

- 3.1 Not Used .1 Not Used.

PART 1 - GENERAL

- 1.1 Section Includes .1 Informational and Warning Devices.
.2 Protection and Control of Public Traffic.
.3 Operational Requirements.
- 1.2 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.3 References .1 Uniform Traffic Control Devices for Canada, (UTCD) January 1976 (distributed by Transportation Association of Canada).
.2 Manual of Uniform Traffic Control Devices for Streets and Highways, US FHWA, Part IV, - 1988.
- 1.4 Protection of Public Traffic .1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.
.2 When working on travelled way:
.1 Place equipment in position to present minimum of interference and hazard to traveling public.
.2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
.3 Do not leave equipment on travelled way overnight.
.3 Do not close any lanes of road without approval of DND Rep . Before re-routing traffic erect suitable signs and devices in accordance with instructions contained in Part D of UTCD.
-

1.4 Protection of
Public Traffic
(Cont'd)

- .4 Keep travelled way graded, free of pot holes and of sufficient width for required number of lanes of traffic.
 - .1 Provide minimum 7 m wide temporary roadway for traffic in two-way sections through Work and on detours.
 - .2 Provide minimum 5 m wide temporary roadway for traffic in one-way sections through Work and on detours.
- .5 Provide and maintain road access and egress to property fronting along Work under Contract and in other areas as indicated, unless other means of road access exist that meet approval of DND Rep.

1.5 Informational
and Warning Devices

- .1 Provide and maintain signs, flashing warning lights and/or other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- .2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in Part D, Temporary Conditions Signs and Devices, of UTCD manual.
- .3 Place signs and other devices in locations recommended in UTCD manual.
- .4 Meet with DND Rep prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Dnd rep.
- .5 Continually maintain traffic control devices in use by:
 - .1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
 - .2 Removing or covering signs which do not apply to conditions existing from day to day.

1.6 Control of
Public Traffic

- .1 Provide competent flag persons, trained in accordance with, and properly equipped as specified in, UTCD manual in following situations:
-

1.6 Control of
Public Traffic
(Cont'd)

- .1 (Cont'd)
- .1 When public traffic is required to pass working vehicles or equipment which block all or part of travelled roadway.
 - .2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.
 - .3 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.
 - .4 Where temporary protection is required while other traffic control devices are being erected or taken down.
 - .5 For emergency protection when other traffic control devices are not readily available.
 - .6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
 - .7 At each end of restricted sections where pilot cars are required.
 - .8 Delays to public traffic due to contractor's operators: maximum 15min.
- .2 Where roadway, carrying two-way traffic, to be restricted to one lane, for 24 h each day, provide portable traffic signal system. Adjust, as necessary, and regularly maintain system during period of restriction. Signal system to meet requirements of Part IV of Manual of Uniform Traffic Control Devices to Street and Highways, US FHWA.

1.7 Operational
Requirements

- .1 Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified herein and approved by DND Rep to protect and control public traffic.
- .2 Maintain existing conditions for traffic crossing right-of-way.
-

PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

END

PART 1 - GENERAL

- 1.1 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.2 General Protection .1 Do not disrupt airport business except as permitted by DND Rep .
- .2 Provide temporary protection for safe handling of public, personnel, pedestrians and vehicular traffic:
- .3 Provide barricades and lights where directed.
- 1.3 Movement of Equipment and Personnel .1 In areas of airport not closed to aircraft traffic:
- .1 Obtain DND Rep's approval on scheduling of Work.
- .2 Control movements of equipment and personnel as directed by DND Rep .
- .3 Provide qualified field personnel at locations designated by DND Rep to relay signals from airport traffic control tower to equipment and personnel wishing to cross live traffic areas.
- .4 Obey signals from airport traffic control tower instantly.
- 1.4 Unserviceable Areas .1 Mark off areas made unserviceable for aircraft by Work of this Contract by providing plainly visible danger markings by day and red lights by night. Open flames and inflammable fuels are not permitted.
- .2 Park equipment not in use and stockpile materials so that stockpile tops are below 50 to 1 ratio from ends of useable landing strip and below 20 to 1 ratio from sides of aircraft traffic areas. Mark tops with red lights.
-

- 1.5 Trenching .1 Obtain DND Rep's written permission to undertake trenching on pavements open to aircraft traffic which cannot be completed, backfilled and sealed within one working day.
- 1.6 Airport Facilities .1 DND Rep will arrange for the location of underground facilities such as cables, pipes and ducts. Notify DND Rep of work areas sufficiently in advance of operations so that underground facilities can be located.
- 1.7 Paint Markings .1 Any paint applied to the aerodrome surface must be approved by DND Rep.
.2 All markings must be of non permanent type such as chalk or water soluble paint.
- 1.8 Radio Communications .1 Base authority will assign call signs.
.2 Do not use control tower frequencies for idle chatter.
- 1.9 Flight Safety .1 Prior to permitting personnel to cross active runways, taxiways, parking aprons or working within 60 m of active facility, establish radio contact with control tower and obtain specific clearances.
.2 Prior to starting work, obtain necessary closure of adjacent facilities.
.3 Maintain continuous radio watch. Obey all instructions promptly and explicitly.
.4 Radio:
.1 The Contractor's personnel and equipment authorized to enter the security area, will be given a DND two-way radio. If no radio are available, the Contractor shall be escorted to cross runways, taxiways or parking aprons.
.2 Any Contractor's employee found outside of the work site limit, will have his security pass revoked and will no longer be allowed inside the security area.
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- 1.10 Cleaning FOD .1 Where travel routes cross active runways,
taxiways or parking aprons, broom clean
immediately.
- .2 Where access routes cross active runways,
taxiways or parking aprons, keep crossings
free of mud and debris at all times.
- .3 See Section 01 74 11 - Cleaning for further
FOD info.

PART 2 - PRODUCTS

- 2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

END

PART 1 - GENERAL

- 1.1 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- .2 The contractor will be acting as the Prime Contractor for this contract and will certify this agreement in writing with the DND representative. Refer to Annex D for prime contractors's Agreement.
- 1.2 References .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Province of Alberta Occupational Health and Safety Act, R.S.A. 1980.
- 1.3 Submittals .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
- .1 Results of site specific safety hazard assessment.
- .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .3 Submit copies of Contractor's authorized representative's work site health and safety inspection reports to DND Rep weekly.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit Material Safety Data Sheets (MSDS) to DND Rep.
-

- 1.3 Submittals (Cont'd)
- .7 DND Rep will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 10 days after receipt of plan. Revise plan as appropriate and resubmit plan to DND Rep within 10 days after receipt of comments from DND Rep.
 - .8 DND Rep 's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
 - .9 Medical Surveillance: Where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to DND Rep.
 - .10 On-site Contingency and Emergency Response Plan: Address standard operating procedures to be implemented during emergency situations.
- 1.4 Filing of Notice
- .1 File Notice of Project with Provincial authorities prior to commencement of Work.
- 1.5 Safety Assessment
- .1 Perform site specific safety hazard assessment related to project.
- 1.6 Meetings
- .1 Schedule and administer Health and Safety meeting with DND Rep prior to commencement of Work.
- 1.7 Project/Site Conditions
- .1 Work at site may involve contact with:
 - .1 Asbestos.
 - .2 Lead Paint
- 1.8 General Requirements
- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to commencing any site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and
-

1.8 General
Requirements
(Cont'd)

- .1 (Cont'd)
Safety Plan must address project specifications.
- .2 DND Rep may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.9 Responsibility

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

1.10 Compliance
Requirements

- .1 Comply with Occupational Health and Safety Act, General Safety Regulation, Alberta. Reg. 1980. and 4 Wing Safety Measures listed below;
 - .2 Contractors and their personnel shall be familiar with this section and its requirements.
 - .3 Observe and enforce construction safety measures required by National Building Code 2005, Part 8; Provincial Government, Workmen's Compensation Board and municipal statutes and authorities.
 - .4 Hard hats and safety boots shall be worn at all times at construction site.
 - .5 Hard hats and safety boots shall be worn at all times while operating mobile equipment.
 - .6 Eye or face protection shall be worn when handling any material liable to injure or irritate the eyes or when engaging in any work producing hazard from flying objects or when operating power lawn equipment and tools.
 - .7 Hearing protection shall be worn when entering or working in a noise hazardous area. This is to include, but not limited, to the
-

1.10 Compliance
Requirements
(Cont'd)

- .7 (Cont'd)
flight line when aircraft are running, shop operations where sound levels exceed 85 decibels and operators of vehicles or equipment which produce excessive noise.
 - .8 Respirators shall be worn when a worker is or may be exposed to an oxygen deficient area or to harmful concentration of gas, vapours, smoke, fumes, mist or dust.
 - .9 All employees who handle or are exposed to hazardous materials as defined under the Hazardous Product Act (WHMIS Legislation) shall be WHMIS trained in accordance with the act.
 - .10 Material safety data sheets (MSDS) for all materials falling under the WHMIS program shall be supplied to the work site by the Contractor/Sub-contractor or user(s), and readily accessible to all on-site personnel.
 - .11 No employee shall enter or be permitted to enter a hazardous confined space unless such entry is made in compliance with Occupational Safety and Health and Labour Canada Standards.
 - .12 Confined spaces entry permit must be obtained from the Fire Department and completed prior to the entry into a confined space.
 - .13 Safety belts and lifelines shall be worn when working at heights greater than 3.26 metres above floor level where it is impractical to provide adequate work platforms or staging.
 - .14 All elevated work sites shall have the area underneath cordoned off to prevent injuries from falling debris.
 - .15 All construction sites which present a potential hazard to the public shall be properly cordoned off and signs prominently placed, warning of possible dangers.
 - .16 No burning, cutting, welding or use of any heat producing device is allowed without a hot work permit from the Fire Department (Annex B). A pre-work inspection and post-work inspection is mandatory.
 - .1 Fire Department phone number for Safety/Fire Inspector is:
 - .1 840-8000 ext 8198.
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1.10 Compliance
Requirements
(Cont'd)

- .17 All accidents are to be reported through the DND Rep immediately.
- .18 In addition to these 4 Wing Cold Lake's General Safety Contractor Regulations, all Alberta Occupational Health and Safety Regulations shall be adhered to at all times.
- .19 In event of conflict between any provisions of above authorities the most stringent provisions govern.
 - .1 The following are the known hazardous substances and/or hazardous conditions at the work site which will be considered as health or environmental hazards and shall be properly managed should they be encountered as part of the work.
 - .2 Specific hazards that may impact significantly on the contract or present significant risk:
 - a. Excavation
 - b. Hot work
 - c. Fall Hazards
 - d. Heavey Equipment
 - e. Overhead/underground Utilities
 - f. Traffic
 - .3 Contractors are required to be aware of the known hazardous substances and/or hazardous conditions and are to include in their tender price all work associated in working with, in and around the hazards.
 - .4 The above lists shall not be construed as being complete and inclusive of all safety and health hazards encountered as a result of the Contractor,s operations during the course of work. Include the above items into the hazard assessment program specified herein.

1.11 Cell Phones

- .1 Use of cellular phones are prohibited within Refueling Compounds.
- .2 Cell phones shall not be operated within 15M of an aircraft.

1.12 Overloading

- .1 Ensure no part of work is subjected to loading that will endanger its safety or will cause permanent deformation.
-

- 1.13 Hazardous Material .1 All hazardous material must be identified and labelled in accordance with the Workplace Hazardous Material Information System (WHMIS) and copies of the Material Safety Data Sheet (MSDS) shall be supplied to both the Wing Fire Chief and DND Rep.
- 1.14 Unforeseen Hazards .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, and follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction. Advise DND Rep verbally and in writing.
- 1.15 Health and Safety Co-ordinator .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
- .1 Have minimum 2 years' site-related working experience specific to construction activities taking place.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .5 Be on site during execution of any hazardous Work and report directly to and be under direction of site supervisor.
- 1.16 Posting of Documents .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with DND Rep.
-

- 1.17 Correction of Non-Compliance .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by DND Rep.
- .2 Provide DND Rep with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 DND Rep may stop Work if non-compliance of health and safety regulations is not corrected.
- 1.18 Work Stoppage .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

PART 2 - PRODUCTS

- 2.1 Not Used .1 Not used.

PART 3 - EXECUTION

- 3.1 Not Used .1 Not used.

PART 1 - GENERAL

- 1.1 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.2 Fire Department Briefing .1 DND Rep will coordinate arrangements for contractor to be briefed on Fire Safety at their pre-work conference by Fire Chief before any work is commenced.
- 1.3 Reporting Fires .1 Know location of nearest fire alarm box and telephone, including emergency phone number.
- .2 Report immediately all fire incidents to the Fire Department as follows:
.1 Activate nearest fire alarm box, or
.2 Telephone 911 in case of EMERGENCY ONLY.
- .3 Person activating fire alarm box will remain at the front entrance to direct Fire Department to scene of fire.
- .4 When reporting fire by telephone, give location of fire, name or number of building and be prepared to verify the location.
- 1.4 Fire Safety Plan .1 Submit a fire safety plan for the construction site prior to commencement of construction work. The fire safety plan shall conform to the National Fire Code of Canada.
- .2 Post the fire safety plan at the entrance to the construction site or near the construction site's health and safety board.
- .3 The fire safety plan shall conform to the National Fire Code of Canada, and shall contain, at minimum:
.1 Emergency procedures to be used in case of fire, including
.1 Sounding the fire alarm;
.2 Notifying the fire department;
.3 Instructing occupants on procedures to be followed when the fire alarm sounds;
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- 1.4 Fire Safety Plan (Cont'd) .3 (Cont'd)
- .1 (Cont'd)
 - .4 Evacuating occupants, including special provisions for persons requiring assistance; and
 - .5 Confining, controlling and extinguishing fires.
 - .2 The appointment and organization of designated supervisory staff to carry out fire safety duties.
 - .3 The training of supervisory staff and other occupants in their responsibilities for fire safety.
 - .4 Documents including diagrams, showing the type, location and operation of building fire emergency systems.
 - .5 The holding of fire drills (where applicable).
 - .6 The control of fire hazards in the building.
 - .7 The inspection and maintenance of building facilities provided for the safety of occupants.
- 1.5 Interior and Exterior Fire Protection and Alarm Systems .1 Fire protection and alarm system will not be:
- .1 obstructed;
 - .2 shut-off; and
 - .3 left inactive at end of working day or shift without authorization from Fire Chief.
- .2 Fire hydrants, standpipes and hose systems will not be used for other than fire-fighting purposes unless authorized by Fire Chief.
- 1.6 Fire Protection System Impairment .1 Notify the DND Representative and Fire Chief 48 hours prior to shutting down any active fire protection system, including water supply, fire suppression, fire detection and life safety systems.
- .2 Implement all fire protection system impairments in accordance with the National Fire Code of Canada and departmental policy.
- 1.7 Fire Extinguishers .1 Supply fire extinguishers, as scaled by Fire Chief, necessary to protect work in progress and contractor's physical plant on site.
-

1.8 Blockage of Roadways

- .1 Advise Fire Chief of any work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by Fire Chief, erecting of barricades and digging of trenches.
- .2 Wing Transport shall be advised of any work that would impede "Emergency" vehicles located at:
 - .1 Building 4 - Fire Hall
 - .2 Building 5 - Wing Transport
 - .3 Building 785 - MP Station
 - .4 Building 75 - Ambulance location
- .3 Minimum horizontal clearance: clear width of not less than 5m.
- .4 Minimum vertical clearance: overhead height of not less than 6m.

1.9 Smoking Precautions

- .1 Smoking is prohibited in all DND buildings. Observe posted smoking restrictions near existing buildings.

1.10 Rubbish and Waste Materials

- .1 Rubbish and waste materials are to be kept to a minimum.
- .2 Burning of rubbish is prohibited.
- .3 Removal:
 - .1 Remove all rubbish from work site at end of work day or shift or as directed.
- .4 Storage:
 - .1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
 - .2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and removed as specified above.

1.11 Flammable and Combustible Liquids

- .1 Handling, storage and use of flammable and combustible liquids are to be governed by the current National Fire Code of Canada.
 - .2 Flammable and combustible liquids such as gasoline, kerosene and naphtha will be kept for ready use in quantities not exceeding 45 litres provided they are stored in approved
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1.11 Flammable and
Combustible Liquids
(Cont'd)

- .2 (Cont'd)
safety cans bearing Underwriters' Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires permission of Fire Chief.
- .3 Transfer of flammable and combustible liquids is prohibited within buildings or jetties.
- .4 Transfer of flammable and combustible liquids will not be carried out in vicinity of open flames or any type of heat-producing devices.
- .5 Flammable liquids having a flash point below 38° C such as naphtha or gasoline will not be used as solvents or cleaning agents.
- .6 Flammable and combustible waste liquids, for disposal, will be stored in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum and Fire Department is to be notified when disposal is required.

1.12 Hazardous
Substances

- .1 Work entailing use of toxic or hazardous materials, chemicals and/or explosives, or otherwise creating hazard to life, safety or health, will be in accordance with National Fire Code of Canada.
- .2 Obtain from Fire Chief a "Hot Work" permit(Annex B) for work involving welding, burning or use of blow torches and salamanders, in buildings or facilities.
- .3 When Work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with level of protection necessary for Fire Watch is at discretion of the Fire Chief. Contractors are responsible for providing fire watch service for work on a scale established and in conjunction with Fire Chief at pre-work conference.
- .4 Where flammable liquids, such as lacquers or urethanes are to be used, proper ventilation shall be provided and all sources of ignition are to be eliminated. Fire Chief is to be

- 1.12 Hazardous Substances (Cont'd) .4 (Cont'd) informed prior to and at cessation of such work.
- 1.13 Questions or Clarifications .1 Direct any questions or clarification on Fire Safety in addition to above requirements to the DND representative. DND is responsible to obtain clarifications from the Fire Chief.
- 1.14 Fire Inspection .1 Site inspections by Fire Chief will be coordinated through DND Rep.
- .2 Allow Fire Chief unrestricted access to work site.
- .3 Co-operate with Fire Chief during routine fire safety inspection of work site.
- .4 Immediately remedy all unsafe fire situations observed by Fire Chief.

PART 2 - PRODUCTS

- 2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

- 3.1 Not Used .1 Not Used.

PART 1 - GENERAL

- 1.1 General .1 Comply with all federal, provincial, and municipal regulatory requirements and guidelines for environmental protection and natural resource conservation
- 1.2 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.3 Fires .1 Fires and burning of rubbish on site not permitted.
- 1.4 Disposal of Wastes .1 Do not bury rubbish and waste materials on site unless approved by DND Rep.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .3 The contractor shall dispose of all rubbish and residue in accordance with existing provincial and/or municipal regulations and/or bylaws. A disposal manifest will be delivered to the Project Authority to ensure the waste has been accepted by a proper facility.
- .4 Costs associated with appropriate removal, transportation and disposal of ALL WASTE is the responsibility of the Contractor
- 1.5 Drainage .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .3 Control disposal or runoff of water containing suspended materials or other
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- 1.5 Drainage (Cont'd) .3 (Cont'd)
harmful substances in accordance with local authority requirements.
- 1.6 Site Clearing and Plant Protection .1 Protect trees and plants on site and adjacent properties where indicated.
- .2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.
- .5 Restrict tree removal to areas indicated or designated by DND Rep. See Section 01 00 01 1.6.3 for tree replacement requirements.
- 1.7 Work Adjacent to Waterways .1 Do not operate construction equipment in waterways.
- .2 Do not use waterway beds for borrow material.
- .3 Do not dump excavated fill, waste material or debris in waterways.
- .4 Design and construct temporary crossings to minimize erosion to waterways.
- .5 Do not skid logs or construction materials across waterways.
- .6 Avoid indicated spawning beds when constructing temporary crossings of waterways.
- .7 Do not blast under water or within 100 m of indicated spawning beds.
- 1.8 Pollution Control .1 Maintain temporary erosion and pollution control features installed under this contract.
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- 1.8 Pollution Control
(Cont'd)
- .2 Control emissions from equipment and plant to local authorities emission requirements.
 - .3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
 - .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- 1.9 Protection of Monitoring Wells
- .1 Protect any and all existing groundwater monitoring wells. Report any disturbances or damage to the Project Authority immediately. Wing Environment will need to be informed
- 1.10 Halocarbons
- .1 Refrigeration units will comply with the Federal Halocarbon Regulations (FHR), 2003.
 - .2 Halocarbon refrigerants shall be R410A or a suitable CFC free substitute. Non-halocarbon refrigerants are still acceptable.
 - .3 When the unit is installed, serviced, or decommissioned by a contractor, the Halocarbon Reporting Form must be completed and submitted to the Project Authority.
 - .4 Report all halocarbon releases to the Project Authority, Wing Fire Hall and Wing Environment.
- 1.11 Spill Response and Report
- .1 Spill kits will be on site where there is potential for spillage onto the ground.
 - .2 Personnel on site will be educated in the use of spill kits and spill response based on the equipment on site.
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- .3 Secondary containment will be provided for generators or other fuel-powered equipment. This equipment will not be located within 30m of a waterway.
- .4 Secondary containment for temporary fuel storage tanks, held on site by the contractor, will be implemented.
- .5 Any spill, regardless of size, will be reported immediately to the Project Authority following the Environmental Incident and Emergency Plan, so proper reporting procedures can be implemented.
- .6 An Environmental Incident Report will be completed and submitted to Wing Environment to report the spill within 24 hrs, follow-up may be required. Environmental Incident Report forms are available from W Env or Project Authority.
- .7 Should the spill exceed the capabilities of the spill kits and the personnel on site, the Fire Department shall be contacted.

PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

PART 1 - GENERAL

- 1.1 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.2 Associations .1 ANSI - American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, New York, U.S.A. 10036 URL <http://www.ansi.org>
- .2 ARI - Air Conditioning and Refrigeration Institute, 4100 N Fairfax Drive, Suite 200, Arlington, Virginia, U.S.A. 22203 URL <http://www.ari.org>
- .3 ASHRAE - American Society of Heating, Refrigeration and Air-Conditioning Engineers, 1791 Tullie Circle NE, Atlanta, Georgia, U.S.A. 30329 URL <http://www.ashrae.org>
- .4 ASTM - American Society for Testing and Materials, 100 Barr Harbor Drive West, Conshohocken, Pennsylvania 19428-2959 URL <http://www.astm.org>
- .5 AWPA - American Wire Producer's Association, 801 N Fairfax Street, Suite 211, Alexandria, VA U.S.A. 22314-1757 URL <http://www.awpa.org>
- .6 AWPA - American Wood Preservers' Association, P.O. Box 5690, Granbury Texas, U.S.A. 76049-0690 URL <http://www.awpa.com>
- .7 AWS - American Welding Society, 550 N.W. LeJeune Road, Miami, Florida U.S.A. 33126 URL <http://www.amweld.org>
- .8 CCA Canadian Construction Association, 75 Albert St., Suite 400 Ottawa, Ontario, K1P 5E7 URL <http://www.cca-acc.com>
- .9 CCDC Canadian Construction Documents Committee, Refer to ACEC, CCA, CSC or RAIC
- .10 CFFM - Canadian Forces Fire Marshal, 101 Colonel By Drive, 8NT MGen George R. Pearkes Bldg., Ottawa, Ontario K1A 0K2
- .11 CGSB - Canadian General Standards Board, Place du Portage, Phase III, 6B1, 11 Laurier
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1.2 Associations
(Cont'd)

- .11 (Cont'd)
Street, Hull, Quebec K1A 0S5 URL
<http://w3.pwgsc.gc.ca/cgsb>
- .12 CISC - Canadian Institute of Steel
Construction, 201 Consumers Road, Suite 300,
Willowdale, Ontario M2J 4G8 URL
<http://www.cisc-icca.ca>
- .13 CLA - Canadian Lumbermen's Association, 27
Goulburn Avenue, Ottawa, Ontario, K1N 8C7 URL
<http://www.cla-ca.ca>
- .14 CRCA - Canadian Roofing Contractors
Association, 155 Queen Street, Suite 1300,
Ottawa, Ontario K1P 6L1 URL
<http://www.roofingcanada.com>
- .15 CSA - Canadian Standards Association
International, 178 Rexdale Blvd., Toronto,
Ontario M9W 1R3 URL
<http://www.csa-international.org>
- .16 CSC - Construction Specifications Canada, 120
Carlton Street, Suite 312, Toronto, Ontario
M5A 4K2 URL <http://www.csc-dcc.ca>
- .17 CSDMA - Canadian Steel Door Manufacturers
Association, One Yonge Street, Suite 1801,
Toronto, Ontario M5E 1W7
- .18 CSSBI - Canadian Sheet Steel Building
Institute, 652 Bishop St. N., Unit 2A,
Cambridge, Ontario N3H 4V6 URL
<http://www.cssbi.ca>
- .19 CWC - Canadian Wood Council, 1400 Blair
Place, Suite 210, Ottawa, Ontario K1J 9B8 URL
<http://www.cwc.ca>
- .20 EC - Environment Canada, Conservation and
Protection, Inquiry Centre, 351 St. Joseph
Blvd, Hull, Québec KIA 0H3 URL
<http://www.ec.gc.ca>
- .21 MPI - The Master Painters Institute, 4090
Graveley Street, Burnaby, BC V5C 3T6 URL
<http://www.paintinfo.com>
- .22 NABA - National Air Barrier Association, PO
Box 2747, Winnipeg, Manitoba R3C 4E7 URL
<http://www.naba.ca>

1.2 Associations
(Cont'd)

- .23 NLGA - National Lumber Grades Authority, 406-First Capital Place, 960 Quayside Drive, New Westminster, B.C. V3M 6G2
- .24 NRC - National Research Council, Building M-58, 1200 Montreal Road, Ottawa, Ontario K1A 0R6 URL <http://www.nrc.gc.ca>
- .25 NSPE National Society of Professional Engineers, 1420 King Street, Alexandria, VA U.S.A. 22314-2794 URL <http://www.nspe.org>
- .26 QPL - Qualification Program List, c/o Canadian General Standards Board, Place du Portage, Phase III, 6Bl, 11 Laurier Street, Hull, Quebec K1A 1G6 URL <http://www.pwgsc.gc.ca/cgsb>
- .27 RAIC Royal Architectural Institute of Canada, 55 Murray Street, Suite 330, Ottawa, Ontario, K1N 5M3 URL <http://www.raic.org>
- .28 SCC - Standards Council of Canada, 270 Albert Street, Suite 2000, Ottawa, Ontario K1P 6N7 URL <http://www.scc.ca>
- .29 UL - Underwriters' Laboratories, 333 Pfingsten Road, Northbrook, Illinois, U.S.A. 60062-2096 URL <http://www.ul.com>
- .30 ULC - Underwriters' Laboratories of Canada, 7 Crouse Road, Toronto, Ontario M1R 3A9 URL <http://www.ulc.ca>

1.3 Reference
Standards

- .1 Within the text of the specifications, reference may be made to the following standards:
 - .1 AA - Aluminum Association
 - .2 ACI - American Concrete Institute
 - .3 ACEC - Association of Consulting Engineers of Canada
 - .4 AISC - American Institute of Steel Construction
 - .5 ANSI - American National Standards Institute
 - .6 API - American Petroleum Institute
 - .7 ASPT - Association for Asphalt Paving Technologists
 - .8 ASME - American Society of Mechanical Engineers
 - .9 ASTM - American Society for Testing and Materials

1.3 Reference Standards
(Cont'd)

- .1 (Cont'd)
- .10 AWMAC - Architectural Woodwork Manufacturers Association of Canada
- .11 AWPA - American Wire Producers Association
- .12 AWS - American Welding Society
- .13 CCA - Canadian Construction Association
- .14 CCDC - Canadian Construction Documents Committee
- .15 CCME - Canadian Council of Ministers of the Environment
- .16 CEC - Canadian Electrical Code (published by CSA)
- .17 CEMA - Canadian Electrical Manufacturer's Association
- .18 CEPA - Canadian Environmental Protection Act
- .19 CGSB - Canadian General Standards Board
- .20 CISC - Canadian Institute of Steel Construction
- .21 CLA - Canadian Lumberman's Association
- .22 CPCA - Canadian Painting Contractors' Association
- .23 CPI - Canadian Prestressed Concrete Institute
- .24 CPMA - Canadian Paint Manufacturers Association
- .25 CRCA - Canadian Roofing Contractors Association
- .26 CSA - Canadian Standards Association
- .27 CSC - Construction Specifications Canada
- .28 CSSBI - Canadian Sheet Steel Building Institute
- .29 ECP - Environmental Choice Program
- .30 EIMA - EIFS Industry Manufacturer's Association
- .31 EPA - Environmental Protection Agency
- .32 FGMA - Flat Glass Manufacturers Association
- .33 FM - Factory Mutual Engineering Corporation
- .34 GRI - Geosynthetic Research Institute
- .35 ICEA - Insulated Cable Engineers Association
- .36 IEEE - Institute of Electrical and Electronic Engineers
- .37 IPCEA - Insulated Power Cable Engineers Association
- .38 LSGA - Laminators Safety Glass Association
- .39 MSS Manufacturers Standardization Society of the Valve and Fittings Industry
- .40 NAAMM - National Association of Architectural Metal Manufacturers
- .41 NBC - National Building Code

<u>1.3 Reference Standards (Cont'd)</u>	.1	(Cont'd) .42 NEMA - National Electrical Manufacturers Association .43 NFPA - National Fire Protection Association .44 NHLA - National Hardwood Lumber Association .45 NLGA - National Lumber Grades Authority .46 NSPE - National Society of Professional Engineers .47 RAIC - Royal Archtectural Institute of Canada .48 SSPC - Steel Structures Painting Council .49 TTMAC - Terrazzo, Tile and Marble Association of Canada .50 ULC - Underwriters' Laboratories of Canada
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PART 2 - PRODUCTS

<u>2.1 Not Used</u>	.1	Not Used.
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PART 3 - EXECUTION

	.2	Not Used.
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PART 2 - PRODUCTS

<u>2.1 Not Used</u>	.1	Not Used.
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PART 3 - EXECUTION

<u>3.1 Not Used</u>	.1	Not Used.
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PART 1 - GENERAL

- 1.1 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.2 Installation and Removal .1 Provide temporary utilities controls in order to execute work expeditiously.
- .2 Remove from site all such work after use.
- .3 Remove temporary facilities from site when directed by Engineer.
- 1.3 Dewatering .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.
- 1.4 Water Supply .1 DND can provide, free of charge, temporary water for construction purposes.
- .2 Engineer will determine delivery points and quantitative limits. Engineer's written permission is required before any connection is made.
- .3 Provide, at no cost to DND, all equipment and temporary lines to bring these services to work area.
- .4 Supply of temporary services by DND is subject to DND requirements and may be discontinued by Engineer at any time without notice, without any acceptance of any liability for damage or delay caused by such withdrawal of temporary services.
- 1.5 Temporary Power and Light .1 DND can provide, free of charge, temporary electric power for construction purposes
- .2 Engineer will determine delivery points and quantitative limits. Engineer's written
-

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Temporary Utilities

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PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

END

PART 1 - GENERAL

- 1.1 Section Includes .1 Construction aids.
.2 Office and sheds.
.3 Parking.
.4 Project identification.
- 1.2 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.3 Related Sections .1 Section 01 51 00 - Temporary Utilities.
- 1.4 References .1 Canadian General Standards Board (CGSB)
.1 CGSB 1-GP-189M, Primer, Alkyd, Wood, Exterior.
.2 CAN/CGSB-1.59-97, Alkyd Exterior Gloss Enamel.
.2 Canadian Standards Association (CSA International)
.1 CAN/CSA-A23.1-00, Concrete Materials and Methods for Concrete Construction/Method of Test for Concrete.
.2 CSA O121-M1978 (R1998), Douglas Fir Plywood.
.3 CSA Z321-96, Signs and Symbols for the Occupational Environment.
- 1.5 Installation and Removal .1 Provide construction facilities in order to execute work expeditiously.
.2 Remove from site all such work after use.
.3 Remove temporary facilities from site when directed by DND Rep.
-

- 1.6 Scaffolding
- .1 Design and construct scaffolding in accordance with CAN/CSA-S269.2-M87 (R1998).
 - .2 Construct and maintain scaffolding in rigid, secure and safe manner.
 - .3 Erect scaffolding independent of walls. Remove promptly when no longer required.
 - .4 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms or temporary stairs.
- 1.7 Hoisting
- .1 Provide, operate and maintain hoists required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
 - .2 Hoists shall be operated by qualified operator.
- 1.8 Elevators
- .1 Designated existing and permanent elevators may be used by construction personnel and transporting of materials. Co-ordinate use with DND Rep .
 - .2 Provide protective coverings for finish surfaces of cars and entrances.
- 1.9 Site Storage/Loading
- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
 - .2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.
- 1.10 Construction Parking
- .1 Parking will be permitted on site provided it does not disrupt performance of Work.
 - .2 Provide and maintain adequate access to project site.
-

-
- 1.10 Construction Parking (Cont'd)
- .3 Build and maintain temporary roads where indicated and provide snow removal during period of Work.
 - .4 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.
 - .5 Clean runways and taxi areas where used by Contractor's equipment.
- 1.11 Security
- .1 Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m oc. Provide one lockable truck gate. Maintain fence in good repair.
 - .2 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays as directed by DND Rep.
- 1.12 Equipment, Tool and Materials Storage
- .1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
 - .2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.
- 1.13 Sanitary Facilities
- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
 - .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.
 - .3 Permanent facilities may be used on approval of DND Rep.
-

- 1.14 Construction Signage .1 Signs and notices for safety and instruction shall be in English or Graphic symbols and shall conform to Z321-96.
- .2 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by DND Rep.

PART 2 - PRODUCTS

- 2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

- 3.1 Not Used .1 Not Used.

END

PART 1 - GENERAL

- 1.1 Section Includes .1 Progressive cleaning.
.2 Final cleaning.
- 1.2 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.3 Related Section .1 Section 01 77 00 - Closeout Procedures.
- 1.4 Project Cleanliness .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by DND Rep. Do not burn waste materials on site.
.3 Clear snow and ice from access to building, bank/pile snow in designated areas only.
.4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
.5 Remove all waste materials and debris from site and dispose off DND property. Provide following information to DND Rep:
.1 Provide a Certificate of Disposal indicating the following:
.1 Date of disposition.
.2 Time of disposition.
.3 Location of disposition.
.4 Name of Vehicle operator.
.5 Vehicle License Number.
.6 Provide on-site containers for collection of waste materials and debris.
.7 Provide and use clearly marked separate bins for recycling.
-

1.4 Project
Cleanliness
(Cont'd)

- .8 Remove waste material and debris from site at end of each working day.
- .9 Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.
- .10 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .11 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .12 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .13 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
- .14 Foreign Object Damage control or FOD will be exercised on a continuous basis in vicinity of aircraft, runways or aprons. Control all blowing debris at all times. DND Rep will coordinate and approve Contractors plans to fulfill this requirement.

1.5 Final Cleaning

- .1 In preparation for acceptance of the project, on an interim or final certificate of completion, perform final cleaning.
- .2 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .3 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .4 Prior to final review, remove surplus products, tools, construction machinery and equipment.

1.5 Final Cleaning
(Cont'd)

- .5 Remove waste products and debris other than that caused by Owner or other Contractors.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.
- .9 Clean lighting reflectors, lenses, and other lighting surfaces.
- .10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .11 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
- .12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .14 Remove dirt and other disfiguration from exterior surfaces.
- .15 Clean and sweep roofs, gutters, areaways, and sunken wells.
- .16 Sweep and wash clean paved areas.
- .17 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.
- .18 Clean roofs, downspouts, and drainage systems.
- .19 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .20 Remove snow and ice from access to building.

.21 Leave entire work area neat and clean.

PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

————— END —————

PART 1 - GENERAL

- 1.1 Section Includes .1 Administrative procedures preceding preliminary and final inspections of Work.
- 1.2 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.3 Related Sections .1 Section 01 78 00- Closeout Submittals.
- 1.4 Inspection and Declaration .1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
.1 Notify DND Rep in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
.2 Request DND Rep's Inspection.
- .2 DND Rep's Inspection: DND Rep and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.
- .3 Completion: submit written certificate that following have been performed:
.1 Work has been completed and inspected for compliance with Contract Documents.
.2 Defects have been corrected and deficiencies have been completed.
.3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
.4 Operation of systems have been demonstrated to Owner's personnel.
.5 Work is complete and ready for Final Inspection.
- .4 Final Inspection: when items noted above are completed, request final inspection of Work by DND Rep , and Contractor . If Work is deemed
-

1.4 Inspection and Declaration (Cont'd) .4 Final Inspection:(Cont'd)
incomplete by DND Rep , complete outstanding
items and request reinspection.
PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

----- END -----

PART 1 - GENERAL

- 1.1 Section Includes
- .1 As-built, samples, and specifications.
 - .2 Equipment and systems.
 - .3 Product data, materials and finishes, and related information.
 - .4 Operation and maintenance data.
 - .5 Spare parts, special tools and maintenance materials.
 - .6 Warranties and bonds.
 - .7 Final site survey.
- 1.2 Precedence
- .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.3 Related Sections
- .1 Section 01 77 00 - Closeout Procedures.
- 1.4 Submission
- .1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
 - .2 Prior to Substantial Performance of the Work, submit to the DND Rep, three final copies of operating and maintenance manuals in English.
 - .3 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
 - .4 If requested, furnish evidence as to type, source and quality of products provided.
 - .5 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
 - .6 Pay costs of transportation.
-

1.5 Format

- .1 Assemble, coordinate, bind and index required data into Operation and Maintenance Manual. Organize data in the form of an instructional manual.
- .2 Organize data into same numerical order as contract specifications.
- .3 Provide O & M manual in PDF format on CD. Manual is to be FULLY INDEXED or BOOKMARKED.
- .4 Provide 1:1 scaled CAD files in dwg format on CD.
- .5 Only If requested by the DND Rep provide O % M Manuals in Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .6 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- .7 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
- .8 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .9 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .10 Text: Manufacturer's printed data, or typewritten data.

1.6 Contents - Each Volume

- .1 Cover sheet containing:
 - .1 Date submitted.
 - .2 Project title, location and project number.
 - .3 Names and addresses of Contractor, and all Sub-contractors.
- .2 Table of Contents.
- .3 Warranties, guarantees.
- .4 Copies of approvals, and certificates.

-
- 1.6 Contents - Each .5 Provide data as specified in individual
Volume sections of this specification with schedule
(Cont'd) of products and systems, indexed to content of
volume.
- .6 For each product or system: list names,
addresses and telephone numbers of
subcontractors and suppliers, including local
source of supplies and replacement parts.
 - .7 Nameplate information including equipment
number, make, size, capacity, model number and
serial number.
 - .8 Parts list.
 - .9 Installation details.
 - .10 Operating instructions.
 - .11 Maintenance instructions for equipment.
 - .12 Maintenance instructions for finishes.
 - .13 One complete set of reviewed final shop
drawings and product data.
 - .14 Drawings: supplement product data to
illustrate relations of component parts of
equipment and systems, to show control and
flow diagrams.
 - .15 Typewritten Text: as required to supplement
product data. Provide logical sequence of
instructions for each procedure, incorporating
manufacturer's instructions.
- 1.7 As-builts and .1 In addition to requirements in General
Samples Conditions, maintain one record copy of:
- .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to
the Contract.
 - .5 Reviewed shop drawings, product data,
and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field
office apart from documents used for
-

1.8 Recording
Actual Site
Conditions
(Cont'd)

- .5 Contract Drawings and shop drawings: (Cont'd)
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
- .6 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .7 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.9 As Built
Drawings

- .1 At completion of project and prior to final inspection, transfer as-built notations to second paper drawing set and submit to DND Rep for review.
 - .1 Prepare as-built drawings in AutoCAD format following same conventions used for original design drawings or use DND CAD Standards ie: levels, colors, weights, etc.
 - .2 In addition to as-built printed set, drawings shall be submitted in electronic file format (both AutoCAD and PDF) on CD or DVD media.

1.10 As Built
Survey Drawings

- .1 Provide "As-Built Survey" with project deviations relative to DND survey monuments and obtain an accurate record of all manhole locations, catch basins, storm outfalls, sewer alignment, utilities (ie: elec, gas, telecom, etc), paint lines, roads, sidewalks, etc. pertinent to the project.
- .2 Submit survey with final record drawing submission.
- .3 Use GPS and Total station to survey new installations and surface features, including underground utility lines.
- .4 All surveys to be performed by a Registered Alberta Land Surveyor.

1.10 As Built
Survey Drawings
(Cont'd)

- .5 Horizontal and vertical accuracy shall be minimum Third Order. Vertical and horizontal control in the vicinity of survey shall be used.
- .6 All control point information and coordinate system (NAD 83-UTM) used must be obtained at 4 Wing WCE GIS cell prior to starting the survey.
- .7 Accuracy: Horizontal - third order (Northing & Easting coordinates); Vertical (control points, Building floor elevation, Manhole & catchbasin only), - third order. Vertical (all other features), total station elevations.
- .8 Control points and temporary iron bars used, along with their coordinates and elevations must be indicated on each survey drawing.
- .9 An electronic drawing copy of existing site will be provided by WCE GIS.
- .10 Provide one as-built hard copy drawing set. Submit final drawing set on full size media using DND CAD Standard Drawing Sheet.
- .11 In addition to as-built printed set, drawings shall be submitted in electronic file format (both AutoCAD and PDF) on CD/DVD.
- .12 Provide as-built electronic copy in AutoCAD 3D file format. Ensure all features are drawn in 3D (x y z).
- .13 Follow DND CAD and GIS Standards for easy incorporation of data into existing GIS spatial database.
- .14 Provide comma delimited ASCII text file for each survey point: Point Number, Easting, Northing, Elevation, Feature Class Name/Layer Name/Survey Code and optional description.
- .15 For information regarding WCE GIS system contact: 4WCE GIS Co-ordinator at (780)840-8000 ext 8251.

1.11 Water Valve
Markers

- .1 Install DND supplied blue marker stake at each water valve location. Markers are provided by DND WCE Plumbing Shop @ loc 8427.

1.12 Equipment and
Systems

- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
 - .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
 - .3 Include installed colour coded wiring diagrams.
 - .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
 - .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
 - .6 Provide servicing and lubrication schedule, and list of lubricants required.
 - .7 Include manufacturer's printed operation and maintenance instructions.
 - .8 Include sequence of operation by controls manufacturer.
 - .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
 - .10 Provide installed control diagrams by controls manufacturer.
 - .11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
 - .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
-

1.12 Equipment and
Systems
(Cont'd)

- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test and balancing reports.
- .15 Additional requirements: As specified in individual specification sections.

1.13 Materials and
Finishes

- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional Requirements: as specified in individual specifications sections.

1.14 Spare Parts

- .1 Provide spare parts, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to location as directed; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to DND Rep. Include approved listings in Maintenance Manual. Include the following:
 - .1 Part number.
 - .2 Identification of equipment or system for which parts are applicable.
 - .3 Installation instructions as applicable.
 - .4 Name and address of nearest supplier.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.15 Maintenance
Materials

- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to location as directed; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to DND Rep. Include approved listings in Maintenance Manual.
- .5 Identify, on carton or package, colour, room No., system or area as applicable where item is used
- .6 Obtain receipt for delivered products and submit prior to final payment.

1.16 Special Tools

- .1 Provide special tools, in quantities specified in individual specification section.
- .2 Provide items with tags identifying their associated function and equipment.
- .3 Deliver to location as directed; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to DND Rep. Include approved listings in Maintenance Manual and Include the following:
 - .1 Identification tag reference.
 - .2 Identification of equipment or system for which tools are applicable.
 - .3 Instruction on intended use of tool.

1.17 Storage,
Handling and
Protection

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.

1.17 Storage,
Handling and
Protection
(Cont'd)

.5 Remove and replace damaged products at own
expense and to satisfaction of DND Rep.

1.18 Warranties and
Bonds

.1 Separate each warranty or bond with index tab
sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and
manufacturer, with name, address, and
telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in
duplicate by subcontractors, suppliers, and
manufacturers, within ten days after
completion of the applicable item of work.

.4 Except for items put into use with Owner's
permission, leave date of beginning of time of
warranty until the Date of Substantial
Performance is determined.

.5 Verify that documents are in proper form,
contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and bonds until time
specified for submittal.

PART 2 - PRODUCTS

2.1 Not Used

.1 Not Used.

PART 3 - EXECUTION

3.1 Not Used

.1 Not Used.

PART 1 - GENERAL

- 1.1 Standard .1 Concrete materials and methods of construction: to CAN/CSA-A23.1-M90 unless otherwise specified.
- .2 CAN/CSA-A23.1-M90, Concrete Materials and Methods of Concrete Construction.
- .3 CAN/CSA-O86.1-M89, Engineering Design in Wood (Limit States Design).
- .4 CAN3-O86S1/O86.1S1-87, Supplement No. 1-1987, to CAN3-O86-M84, Engineering Design in Wood (Working Stress Design) and CAN3-O86.1-M84 Engineering Design in Wood (Limit States Design).
- .5 CSA O121-M1978, Douglas Fir Plywood.
- 1.2 Inspection .1 Give Engineer minimum 24 h notice before each concrete pour.

PART 2 - PRODUCTS

- 2.1 Materials .1 Portland cement: to CAN/CSA-A5-93, Type 50.
- .2 Formwork materials:
.1 For concrete without special architectural features, use plywood and wood formwork materials to CSA-O121 or CAN3-O86S1/O86.1S1 .
- .3 Shrinkage compensating grout: pre-mixed, non-metallic aggregate, 50 MPa compressive strength at 28 days.
- .4 All other concrete materials: to CAN/CSA-A23.1-M90.
- 2.2 Mix Proportions .1 Method: Alternative (1) of CAN/CSA-A23.1-M90.
- .2 Cement type: as specified under 2.1.
-

2.2 Mix Proportions (Cont'd)

- .3 Minimum 28 day compressive strength and exposure classification:
 - .1 32 MPa; C-2.
- .4 Nominal size of coarse aggregate: Clause 14 of CAN/CSA-A23.1-M90.
- .5 Slump: to Table 6 of CAN/CSA-A23.1-M90.
- .6 Air content: all concrete to contain purposely entrained air in accordance with Table 10 of CAN/CSA-A23.1-M90.
- .7 Admixtures: to Clause 6 of CAN/CSA-A23.1-M90.

2.3 Unshrinkable Fill

- .1 Portland cement: to CAN/CSA-A5-93, Type 10 for winter construction. Type 30 may be used upon Engineer's approval.
- .2 Slump: 150 mm to 200 mm.
- .3 Nominal size of coarse aggregate: Clause 14 of CAN/CSA-A23.1-M90.
- .4 Air content: 4 to 6 %.
- .5 Admixtures: to Clause 6 of CAN/CSA-A23.1-M90.
- .6 Minimum 28 day compressive strength:
 - .1 0.40 MPa.

PART 3 - EXECUTION

3.1 Finishes

- .1 Concrete to be finished as indicated by Engineer.

3.2 Defective Work

- .1 Concrete will be considered defective if it does not meet all requirements specified or contains excessive honeycombing or embedded debris.
- .2 Concrete will be rejected if it does not meet the specified strength.

3.3 Repair Work

- .1 Repair defective areas indicated by Engineer while concrete is still plastic to the satisfaction of Engineer.
- .2 Where directed, remove defective work and replace with new concrete.
- .3 Where directed grind off high surface irregularities.

3.4 Unshrinkable Fill

- .1 Unshrinkable fill shall be used under existing pavement or concrete where the material has caved in.
- .2 The limit of excavation shall be established and the pavement saw cut in straight lines. Minimize under mining of adjacent pavement. Conduct trenching following appropriate safety measures.
- .3 When the storm sewer has been repaired or installed, bedded and protected with sand as required, the trench shall be filled with the flowable, unshrinkable fill, up to the underside of the pavement materials. Consolidate to ensure that any undercut areas of pavement are fully supported.

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Section 01 33 00 - Submittal Procedures.
 - .2 Section 01 35 43 - Environmental Procedures.
- 1.2 Measurement Procedures
- .1 Work performed under this Section will be of prime contract.
 - .2 Excavated materials will be measured in cubic metres in their original location.
 - .1 Common excavation quantities measured will be actual volume removed within following limits:
 - .1 Width for trench excavation as indicated.
 - .2 Width for excavation for structures as indicated.
 - .3 Depth from ground elevation and surface of pavement or surface of sidewalk immediately prior to excavation, to elevation as indicated or as directed by Engineer.
 - .2 Rock quantities measured will be actual volume removed within following limits:
 - .1 Width for trench excavation as indicated.
 - .2 Width for excavation for structures to be bounded by vertical planes up to 500 mm outside of and parallel to neat lines of footings as indicated.
 - .3 Depth from rock surface elevations immediately prior to excavation, to elevation as indicated.
 - .4 Where design elevation is less than 300 mm below original rock surface, depth will be considered to be 300 mm below original rock surface.
 - .5 Volume of individual boulders and rock fragments will be determined by measuring three maximum mutually perpendicular dimensions.
 - .3 Sheeting and bracing left in place on direction of Engineer will be measured in square metres of surface area of plane surface of sheeting.
 - .4 Shoring, bracing, cofferdams, underpinning and de-watering of excavation will not be measured separately for payment.
-

1.2 Measurement
Procedures
(Cont'd)

- .5 Backfilling to authorized excavation limits will be measured in cubic metres compacted in place for each type of material specified.
- .6 Placing and spreading of topsoil will be measured for payment in cubic metres calculated from cross sections taken in area of excavation from original location. If double handling of topsoil is directed by Engineer (stockpiling and later placing), then quantities will be measured twice; on excavation from original location and on excavation from stockpile.

1.3 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C 117-95, Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C 136-96a, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D 422-98, Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D 698-00a, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
 - .5 ASTM D 1557-00, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³).
 - .6 ASTM D 4318-00, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A3000-98-A5-98, Portland Cement.
 - .2 CAN/CSA-A23.1-00, Concrete Materials and Methods of Concrete Construction.

1.4 Definitions

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
 - .1 Rock : any solid material in excess of 0.25 m³ and which cannot be removed by means

1.4 Definitions
(Cont'd)

- .1 (Cont'd)
 - .1 Rock : (Cont'd)
of heavy duty mechanical excavating equipment with 0.95 to 1.15 m³ bucket. Frozen material not classified as rock.
 - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
- .3 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .4 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .5 Unsuitable materials:
 - .1 Weak and compressible materials under excavated areas.
 - .2 Frost susceptible materials under excavated areas.
 - .3 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D 4318, and gradation within limits specified when tested to ASTM D 422 and ASTM C 136: Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.
 - .2 Table

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 - 45
 - .3 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.
- .6 Unshrinkable fill: very weak mixture of Portland cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.5 Submittals

- .1 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Inform Engineer at least 4 weeks prior to commencing Work, of proposed source of fill unshrinkable fill materials and provide access for sampling.
 - .3 Submit 70 kg samples of type of fill unshrinkable fill specified including representative samples of excavated material.
 - .4 Ship samples prepaid to Engineer , in tightly closed containers to prevent contamination.

1.6 Quality Assurance

- .1 Where Consultant/Engineer is employee of Contractor, submit proof that Work by Consultant/Engineer is included in Contractor's insurance coverage.
- .2 Submit design and supporting data at least 2 weeks prior to commencing Work.
- .3 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Alberta, Canada.
- .4 Keep design and supporting data on site.
- .5 Engage services of qualified professional Engineer who is registered or licensed in Province of Alberta, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.

1.7 Waste Management and Disposal

- .1 Separate and recycle waste materials in accordance with Section 01 35 43 - Environmental Procedures.
 - .2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.
 - .3 Place materials defined as hazardous or toxic in designated containers.
 - .4 Ensure emptied containers are sealed and stored safely.
-

1.8 Protection of Existing Features

- .1 Protect existing features in accordance with Section 01 35 14 - Special Procedures for Traffic Control and applicable local regulations.

 - .2 Existing buried utilities and structures:
 - .1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .2 Prior to commencing excavation Work, notify applicable Owner or authorities having jurisdiction, establish location and state of use of buried utilities and structures. Owners or authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.
 - .3 Confirm locations of buried utilities by careful test excavations.
 - .4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.
 - .5 Where utility lines or structures exist in area of excavation, obtain direction of Engineer before removing or re-routing. Costs for such Work to be paid by Engineer.
 - .6 Record location of maintained, re-routed and abandoned underground lines.
 - .7 Confirm locations of recent excavations adjacent to area of excavation.

 - .3 Existing buildings and surface features:
 - .1 Conduct, with Engineer, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
 - .2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair to approval of Engineer.
 - .3 Where required for excavation, cut roots or branches as approved by Engineer
-

PART 2 - PRODUCTS

2.1 Materials

- .1 Type 1 and Type 2 fill: properties the following requirements:
 - .1 Crushed, pit run or screened stone, gravel or sand.
 - .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1.

Sieve Designation	% Passing -	
-	Type 1	Type 2
75mm	-	100
50mm	-	-
37.5mm	-	-
25mm	100	-
19mm	75-100	-
12.5mm	-	-
9.5mm	50-100	-
4.75mm	30-70	22-85
2.0mm	20-45	-
0.425mm	10-25	5-30
0.180mm	-	-
0.075mm	3-8	0-10

- .2 Type 3 fill: selected material from excavation or other sources, approved by Engineer for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.
- .3 Unshrinkable fill: proportioned and mixed to provide:
 - .1 Maximum compressive strength of 0.4 MPa at 28 days.
 - .2 Maximum Portland cement content of 25 kg/m³.
 - .3 Minimum strength of 0.07 MPa at 24 h.
 - .4 Concrete aggregates: to CAN/CSA-A23.1.
 - .5 Portland cement: Type 10.
 - .6 Slump: 160 to 200 mm.
- .4 Shearmat: honeycomb type bio-degradable cardboard 100 mm thick, treated to provide sufficient structural support for poured concrete until concrete cured.
- .5 Geotextiles: Type and kind as designated by Engineer

PART 3 - EXECUTION

- 3.1 Site Preparation
- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
 - .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly
- 3.2 Stripping of Topsoil
- .1 Commence topsoil stripping of areas as indicated after area has been cleared of brush weeds and grasses and removed from site.
 - .2 Strip topsoil to depths as directed by Engineer. Do not mix topsoil with subsoil.
 - .3 Stockpile in locations as indicated. Stockpile height not to exceed 2 m.
 - .4 Dispose of unused topsoil as directed by Engineer or off site.
- 3.3 Stockpiling
- .1 Stockpile fill materials in areas designated by Engineer . Stockpile granular materials in manner to prevent segregation.
 - .2 Protect fill materials from contamination.
- 3.4 Cofferdams, Shoring, Bracing and Underpinning
- .1 Obtain permit from authority having jurisdiction for diversion of water course.
 - .2 Construct temporary Works to depths, heights and locations as indicated or approved by Engineer.
 - .3 During backfill operation:
 - .1 Unless otherwise as indicated or as directed by Engineer , remove sheeting and shoring from excavations.
 - .2 Do not remove bracing until backfilling has reached respective levels of such bracing.
 - .3 Pull sheeting in increments that will ensure compacted backfill is maintained at an elevation at least 500 mm above toe of sheeting.
-

3.4 Cofferdams,
Shoring, Bracing
and Underpinning
(Cont'd)

- .4 When sheeting is required to remain in place, cut off tops at elevations as indicated.
- .5 Upon completion of substructure construction:
 - .1 Remove cofferdams, shoring and bracing.
 - .2 Remove excess materials from site and restore water courses as indicated and as directed by Engineer.

3.5 Dewatering and
Heave Prevention

- .1 Keep excavations free of water while Work is in progress.
- .2 Submit for Engineer's review details of proposed dewatering or heave prevention methods, such as dikes, well points, and sheet pile cut-offs.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
- .4 Protect open excavations against flooding and damage due to surface run-off.
- .5 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures and in a manner not detrimental to public and private property, or any portion of Work completed or under construction.
- .6 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, water courses or drainage areas.

3.6 Excavation

- .1 Excavate to lines, grades, elevations and dimensions as indicated.
 - .2 Remove concrete masonry paving walks demolished foundations and rubble and other obstructions encountered during excavation.
 - .3 Excavation must not interfere with bearing capacity of adjacent foundations.
 - .4 Do not disturb soil within branch spread of trees or shrubs that are to remain. If
-

3.6 Excavation
(Cont'd)

- .4 (Cont'd)
excavating through roots, excavate by hand and cut roots with sharp axe or saw.
 - .5 For trench excavation, unless otherwise authorized by Engineer in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.
 - .6 Keep excavated and stockpiled materials a safe distance away from edge of trench as directed by Engineer .
 - .7 Restrict vehicle operations directly adjacent to open trenches.
 - .8 Dispose of surplus and unsuitable excavated material off site.
 - .9 Do not obstruct flow of surface drainage or natural watercourses.
 - .10 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
 - .11 Notify Engineer when bottom of excavation is reached.
 - .12 Obtain Engineer approval of completed excavation.
 - .13 Remove unsuitable material from trench bottom to extent and depth as directed by Engineer.
 - .14 Correct unauthorized over-excavation as follows:
 - .1 Fill under bearing surfaces and footings with concrete specified for footings.
 - .2 Fill under other areas with Type 2 fill compacted to not less than 97 % of corrected maximum dry density.
 - .15 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil. Clean out rock seams and fill with concrete mortar or grout to approval of Engineer .
 - .16 Install geotextiles in as directed by Engineer.
-

3.7 Fill Types and
Compaction

- .1 Use fill of types as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D 698 and ASTM D 1557.
- .1 Exterior side of perimeter walls: use Type 3 fill to subgrade level. Compact to 95 %.
- .2 Within building area: use Type 2 to underside of base course for floor slabs. Compact to 98 %.
- .3 Under concrete slabs: provide 150 mm compacted thickness base course of Type 1 fill topped with shearmat filler as indicated to underside of slab. Compact base course to 100%
- .4 Retaining walls: use Type 2 fill to subgrade level on high side for minimum 500 mm from wall and compact to 95 %. For remaining portion, use Type 3 fill compacted to 95 %.
- .5 Place unshrinkable fill in areas as indicated.

3.8 Bedding and
Surround of
Underground
Services

- .1 Place and compact granular material for bedding and surround of underground services as indicated.
- .2 Place bedding and surround material in unfrozen condition.

3.9 Backfilling

- .1 Vibratory compaction equipment: .
- .2 Do not proceed with backfilling operations until Engineer has inspected and approved installations.
- .3 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .4 Do not use backfill material which is frozen or contains ice, snow or debris.
- .5 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .6 Backfilling around installations.
- .1 Place bedding and surround material as specified elsewhere.
- .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
-

3.9 Backfilling .6
(Cont'd)

- (Cont'd)
- .3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 1.0 m.
 - .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
 - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Engineer or:
 - .2 If approved by Engineer , erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Engineer .
 - .7 Place unshrinkable fill in areas as indicated.
 - .8 Consolidate and level unshrinkable fill with internal vibrators.
 - .9 Install drainage filter system in backfill as indicated.

3.10 Restoration .1

- .1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Engineer .
- .2 Replace topsoil as indicated.
- .3 Reinstate lawns to elevation which existed before excavation.
- .4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstate areas affected by Work as directed by Engineer .
- .6 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.

PART 1 - GENERAL

- 1.1 References .1 ASTM A48-83(1990), Specification for Gray Iron Castings.
- .2 ASTM C478M-90, Specification for Precast Reinforced Concrete Manhole Sections.
- .3 CAN/CSA A8-M88, Masonry Cement.
- .4 CSA A82.56-M1976, Aggregate for Masonry Mortar.
- .5 CAN/CSA-G30.18-M92, Billet Steel Bars for Concrete Reinforcement.
- .6 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
- 1.2 Material Certification .1 Submit manufacturer's test data and certification at least 4 weeks prior to commencing work. Include manufacturer's drawings, information and shop drawings where pertinent.
- 1.3 Scheduling of Work .1 Schedule work to minimize interruptions to existing services and to maintain existing flow during construction.
- .2 Submit schedule of expected interruptions for approval and adhere to approved schedule.

PART 2 - PRODUCTS

- 2.1 Materials .1 Cast-in-place concrete: to Section 03 30 05.
- .2 Precast manhole units: to ASTM C478M, circular or oval. Top sections eccentric cone or flat slab top type with opening offset for vertical ladder installation. Monolithic bases to be approved by Engineer and set on concrete slabs cast in place.
- .3 Precast catch basin sections: to ASTM C478M.
-

2.1 Materials
(Cont'd)

- .4 Joints: to be made watertight using rubber rings, bituminous compound, epoxy resin cement or cement mortar.
- .5 Mortar:
 - .1 Aggregate: to CSA A82.56.
 - .2 Cement: to CAN/CSA-A8.
- .6 Ladder rungs: to CAN/CSA-G30.18, No. 25M billet steel deformed bars, hot dipped galvanized to CAN/CSA G164. Rungs to be safety pattern (drop step type).
- .7 Adjusting rings: to ASTM C478M.
- .8 Drop manhole pipe: to be same as sewer pipe.
- .9 Galvanized iron sheet: to be approximately 2 mm thick.
- .10 Steel gratings, I-beams and fasteners: as indicated.
- .11 Frames, gratings, covers to dimensions as indicated and following requirements:
 - .1 Metal gratings and covers to bear evenly on frames. A frame with grating or cover to constitute one unit. Assemble and mark unit components before shipment.
 - .2 Gray iron castings: to ASTM A48, strength class 30B.
 - .3 Castings: coated with two applications of asphalt varnish.
 - .4 Manhole frames and covers:; heavy duty municipal type for road service; light duty for landscape service. Cover cast without perforations and complete with two 25 mm square lifting holes.
- .12 Granular bedding and backfill: with following requirements:
 - .1 Crushed or screed stone, gravel or sand.
 - .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1.

Sieve Designation	% Passing	
	Stone/Gravel	Gravel/Sand
200 mm	-	-
75 mm	-	-
50 mm	-	-
38.1 mm	-	-
25 mm	100	-
19 mm	-	-

2.1 Materials
(Cont'd)

- .12 Granular bedding and backfill: (Cont'd)
.2 (Cont'd)

Sieve Designation	% Passing	
	Stone/Gravel	Gravel/Sand
12.5 mm	65-90	100
9.5 mm	-	-
4.75 mm	35-55	50-100
2.00 mm	-	30-90
0.425 mm	10-25	10-50
0.180 mm	-	-
0.075 mm	0-8	0-10

- .13 Unshrinkable fill: to Section 31 23 10.

PART 3 - EXECUTION

3.1 Excavation and Backfill

- .1 Excavate and backfill in accordance with Section 31 23 10.
.2 Obtain approval of Engineer before installing manholes or catch basins.

3.2 Concrete Work

- .1 Do concrete work in accordance with Section 03 30 05.
.2 Position metal inserts in accordance with dimensions and details as indicated.

3.3 Installation

- .1 Construct units in accordance plumb and true to alignment and grade.
.2 Complete units as pipe laying progresses. Maximum of three units behind point of pipe laying will be allowed.
.3 Dewater excavation to approval of Engineer and remove soft and foreign material before placing concrete base.
.4 Cast bottom slabs directly on undisturbed ground.
.5 Set precast concrete base on 150 mm minimum of granular bedding compacted to 100% corrected maximum dry density.

3.3 Installation .6
(Cont'd)

- Precast units:
- .1 Set bottom section of precast unit in bed of cement mortar and bond to concrete slab or base. Make each successive joint watertight with Engineer approved rubber ring gaskets, bituminous compound, cement mortar, epoxy resin cement, or combination thereof.
 - .2 Clean surplus mortar and joint compounds from interior surface of unit as work progresses.
 - .3 Plug lifting holes with precast concrete plugs set in cement mortar or mastic compound.
- .7 For sewers:
- .1 Place stub outlets and bulkheads at elevations and in positions indicated.
 - .2 Bench to provide a smooth U-shaped channel. Side height of channel to be 0.75 times full diameter of sewer. Slope adjacent floor at 1 in 20. Curve channels smoothly. Slope invert to establish sewer grade..
- .8 Compact granular backfill to 95% corrected maximum dry density.
- .9 Place unshrinkable backfill in accordance with Section 31 23 10.
- .10 Installing units in existing systems:
- .1 Where new unit is to be installed in existing run of pipe, ensure full support of existing pipe during installation, and install new unit as specified.
 - .2 Make joints watertight between new unit and existing pipe.
 - .3 Where deemed expedient to maintain service around existing pipes and when systems constructed under this project are ready to be put in operation, complete installation with appropriate break-outs, removals, redirection of flows, blocking unused pipes or other necessary work.
- .11 Place frame and cover on top section to elevation as indicated. If adjustment required use concrete ring.
- .12 Clean units of debris and foreign materials. Remove fins and sharp projections. Prevent debris from entering system.
- .13 Install safety platforms in manholes having depth of 5 m or greater.

3.4 Adjusting Tops of Existing Units

- .1 Remove existing gratings, frames and I beams and store for re-use at locations designated by Engineer.
- .2 Sectional units:
 - .1 Raise or lower straight walled sectional units by adding or removing precast sections as required.
 - .2 Raise or lower tapered units by removing cone section, adding, removing, or substituting riser sections to obtain required elevation, then replace cone section. When amount of raise is less than 600 mm use standard manhole brick, modular or grade rings.
- .3 Monolithic units:
 - .1 Raise monolithic units by roughening existing top to ensure proper bond and extend to required elevation with cast-in-place concrete.
 - .2 Lower monolithic units with straight wall by removing concrete to elevation indicated for rebuilding.
 - .3 When monolithic units with tapered upper section are to be lowered more than 150 mm, remove concrete for entire depth of taper plus as much straight wall as necessary, then rebuild upper section to required elevation with cast-in-place concrete.
 - .4 Install additional manhole ladder rungs in adjusted portion of units as required.
 - .5 Re-use existing gratings, frames and I beams.
 - .6 Re-set gratings and frames to required elevation on full bed of cement mortar, parge and trowel smooth.

3.5 Sealing over Existing Units

- .1 Cut galvanized iron sheet to extend 50 mm beyond opening of existing manhole or catch basin grating. Center iron sheet over existing grating and spot or stitchweld to grating.

3.6 Leakage Test

- .1 Install watertight plugs or seals on inlets and outlets of each new sanitary sewer manhole and fill manhole with water. Leakage not to exceed 0.3% per hour of volume of manhole.
 - .2 If permissible leakage is exceeded, correct defects. Repeat until acceptable to Engineer.
-

3.6 Leakage Test .3 Engineer will issue Test Certificate for each
(Cont'd) manhole passing test.

END

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
- .1 Materials and installation for water mains, hydrants, valves, valve boxes, and valve chambers, including service connections.
- 1.2 RELATED SECTIONS
- .1 Section 01 33 00 - Submittal Procedures.
 - .2 Section 01 78 00 - Closeout Submittals.
 - .3 Section 31 23 10 - Excavating, Trenching and Backfilling.
- 1.3 MEASUREMENT PROCEDURES
- .1 Measure trenching and backfilling, other than granular bedding and surround in accordance with Section 31 23 10 - Excavating Trenching and Backfilling.
 - .2 Measure water main including trenching and backfilling, in metres of each size of pipe installed.
 - .1 Horizontal measurement will be made over surface, through valves and fittings, after work has been completed.
 - .2 Measure lateral connections from water main to hydrants as water main and include curb valve and adjustable valve box.
 - .3 Measure tunnelling, boring or jacking for under crossings, including encasing pipes and grouting, in metres, as indicated.
 - .4 Measure hydrants including excavation and backfilling, in units installed.
 - .5 Measure service connections including trenching and backfilling, in metres of each size of pipe installed.
 - .6 Measure valves in units installed including excavation and backfilling, valves and valve boxes and thrust blocks.
 - .7 Measure valve chambers including excavation and backfilling, in units installed.
 - .8 Measure granular bedding and surround material in cubic metres tonnes.
-

1.3 MEASUREMENT
PROCEDURES
(Cont'd)

.9 Measure concrete for bedding, encasement of pipes, supports and thrust blocks in cubic metres.

1.4 SUBMITTALS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit complete shop drawings and construction schedule for water mains 600 mm diameter and larger. Include method for installation of water main.
- .3 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .4 Inform Engineer of proposed source of bedding materials and provide access for sampling.
- .5 Submit manufacturer's test data and certification that pipe materials meet requirements of this section. Include manufacturer's drawings, information and shop drawings where pertinent.
- .6 Pipe certification to be on pipe.

1.5 CLOSEOUT
SUBMITTALS

- .1 Provide data to produce record drawings, including directions for operating valves, list of equipment required to operate valves, details of pipe material, location of air and vacuum release valves, hydrant details, maintenance and operating instructions in accordance with Section 01 78 00 - Closeout Submittals.
 - .1 Include top of pipe, horizontal location of fittings and type, valves, valve boxes, valve chambers and hydrants.

1.6 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate waste materials for reuse and recycling.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

1.6 WASTE
MANAGEMENT AND
DISPOSAL
(Cont'd)

- .4 Separate for reuse and recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste Management Plan.
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .7 Ensure emptied containers are sealed and stored safely.
- .8 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Engineer .
- .9 Divert unused concrete materials from landfill to local quarry facility as approved by Engineer .
- .10 Dispose of unused asbestos cement pipe in accordance with regulations governing disposal of hazardous materials.
- .11 Divert unused aggregate materials from landfill to quarry facility for reuse as approved by Engineer .
- .12 Dispose of unused disinfection material at official hazardous material collections site approved by Engineer .
- .13 Do not dispose of unused disinfection material into sewer system, into streams, lakes, onto ground or in other location where they will pose health or environmental hazard.
- .14 Fold up metal banding, flatten and place in designated area for recycling.

1.7 SCHEDULING OF
WORK

- .1 Schedule Work to minimize interruptions to existing services.
- .2 Submit schedule of expected interruptions to Engineer for approval and adhere to interruption schedule as approved by Engineer
- .3 Notify Engineer minimum of 24 h in advance of interruption in service.

2.1 PIPE, JOINTS
AND FITTINGS
(Cont'd)

- .3 Polyvinyl chloride pressure pipe: to ANSI/AWWA C900, pressure class 150, DR 18, 1 MPa gasket bell end.
 - .1 CSA-B137.3, PVC series 160, 1.1 MPa elastomeric gasket coupling.
 - .2 Composite epoxy impregnated fibreglass PVC pipe to ASTM D 2996, class H. Unplasticized PVC core over wrapped with bonded fibreglass reinforced epoxy resin. Pressure class 300, 2.4 MPa with cast iron outside diameter and integral bell gasketed joints to ANSI/ASTM D2992. Material to ASTM D 2310, classification RTRP-11HZ-5001-PVC-13223.
 - .3 Cast iron fittings: to ANSI/AWWA C110/A21.10, and for pipe diameters larger than NPS4 cement mortar lined to ANSI/AWWA C104/A21.4.
- .4 Polyethylene pressure pipe:
 - .1 NPS 1/2 to NPS 6: to CSA B137.1 type PE 3406, series 160 ASTM F 714, type PE 3408, series DR 11.
 - .2 90 mm to 1600 mm: to CGSB 41-GP-25M, type PE 1404, series 250.
 - .3 Polyethylene to polyethylene joints: to be thermal butt fusion joined, to ASTM D 2657.

2.2 VALVES AND
VALVE BOXES

- .1 Valves to open counter clockwise.
- .2 Gate valves: to ANSI/AWWA C500, standard iron body, brass mounted double disc valves with non-rising stems, suitable for 1 Pa with flanged or grooved type coupling joints.
- .3 Underground type indicator valve where indicated. Indicator post to accurately indicate valve open or closed. Valve to be electrically supervised.
- .4 Air and vacuum release valves: heavy duty combination air release valves employing direct acting kinetic principle.
 - .1 Fabricate valves of cast iron body and cover, with bronze trim, stainless steel floats with shock-proof synthetic seat suitable for 2 MPa working pressure.
 - .2 Valves to expel air at high rate during filling, at low rate during operation, and to admit air while line is being drained.
 - .3 Valve complete with surge check unit.
 - .4 Ends to be flanged to ANSI/AWWA C110/A21.10.

2.2 VALVES AND
VALVE BOXES
(Cont'd)

- .5 Cast iron valve boxes: three piece sliding type adjustable over minimum of 450 mm complete with valve operating extension rod, 30 mm minimum diameter, of such length that when set on valve operating nut top of rod will not be more than 150 mm below cover.
 - .1 Base to be large round type with minimum diameter of 300 mm.
 - .2 Top of box to be marked "WATER".

2.3 VALVE CHAMBERS

- .1 Precast concrete sections to ASTM C 478M. Cast ladder rungs integral with unit; field installation not permitted.
- .2 Valve chamber frames and covers: gray iron castings, minimum tensile strength 200 MPa, with two coats, shop applied, approved asphalt coating with a mass of approximately 215 kg per set.
 - .1 Design and dimensions as indicated.
 - .2 Cover to be marked "WATER"/"EAU" .
- .3 Jointing materials:
 - .1 Manufacturer's rubber ring gaskets.
 - .2 Mastic joint filler.
 - .3 Combination of above types.
- .4 Ladder rungs for valve chambers: 20 mm diameter deformed rail steel bars to CAN/CSA-G30.18, hot-dipped galvanized after fabrication to CAN/CSA-G164. Rungs to be safety pattern.

2.4 HYDRANTS

- .1 Post type hydrants: compression type hydrant, to CAN/ULC-S520, designed for working pressure of 12 psi with two 65 mm threaded hose outlets, one 100 mm threaded pumper connection, 150 mm riser barrel, 125 mm bottom valve and 150 mm connection for main.
 - .1 Hydrants to open counter clockwise, threads to local standard, fittings to be internal lug quick-connect to CAN4-S543. Provide metal caps and chains.
 - .2 Provide key operated gate valve located 1 m from hydrant.
- .2 Hydrant paint: exterior enamel to CAN/CGSB-1.88.

2.5 PIPE BEDDING
AND SURROUND
MATERIAL

.1 Granular material to: following requirements:

- .1 Crushed or screened stone, gravel or sand.
- .2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.
- .3 Table

Sieve Designation	% Passing	
	Stone/Gravel	Gravel/Sand
200 mm	-	-
75 mm	-	-
50 mm	-	-
38.1 mm	-	-
25 mm	100	-
19 mm	-	-
12.5 mm	65-90	100
9.5 mm	-	-
4.75 mm	35-55	80-100
2.00 mm	-	50- 90
0.425 mm	10-25	10- 50
0.180 mm	-	-
0.075 mm	0- 8	0- 10

.2 Concrete mixes and materials required for bedding cradles, encasement, supports, thrust blocks: to Section 03 30 05 - Cast-in-Place Concrete.

2.6 BACKFILL
MATERIAL

.1 As indicated. Type 3, in accordance with Section 31 23 10 - Excavating, Trenching and Backfilling.

2.7 PIPE
DISINFECTION

- .1 At repair locations add Liquid chlorine to ANSI/AWWA B301 to disinfect water mains.
- .2 Undertake disinfection of water mains in accordance with ANSI/AWWA C651.
- .3 Provide min 4L to disinfect outer casing and min 4 L inside before closing line.

PART 3 - EXECUTION

- 3.1 PREPARATION .1 Clean pipes, fittings, valves, hydrants, and appurtenances of accumulated debris and water before installation.
.1 Inspect materials for defects to approval of Engineer .
.2 Remove defective materials from site as directed by Engineer .
- 3.2 TRENCHING .1 Do trenching work in accordance with Section 31 23 10 - Excavating Trenching and Backfilling.
- 3.3 CONCRETE BEDDING AND ENCASEMENT .1 Do concrete work in accordance with Section 03 30 05 - Cast-in-Place Concrete.
.1 Place concrete to details as indicated.
.2 Pipe may be positioned on concrete blocks to facilitate placing of concrete. When necessary, rigidly anchor or weight pipe to prevent flotation when concrete is placed.
.3 Do not backfill over concrete within 24 hours after placing.
- 3.4 GRANULAR BEDDING .1 Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness to min depth of 150 mm below bottom of pipe.
.2 Do not place material in frozen condition.
.3 Shape bed true to grade to provide continuous uniform bearing surface for pipe.
.4 Shape transverse depressions in bedding as required to suit joints.
.5 Compact each layer full width of bed to at least 95% maximum density to ASTM D 698.
.6 Fill authorized or unauthorized excavation below design elevation of bottom of specified bedding in accordance with Section 31 23 10 -
-

3.4 GRANULAR
BEDDING
(Cont'd)

- .6 (Cont'd)
Excavating Trenching and Backfilling with compacted bedding material.

3.5 PIPE
INSTALLATION

- .1 Lay pipes to ANSI/AWWA Manual code of Practice and manufacturer's standard instructions and specifications. Do not use blocks except as specified.
- .2 Join pipes in accordance with manufacturer's recommendations.
- .3 Before breaking into existing pipe to facilitate repairs, notify engineer and ensure that no contamination enters open line.
- .4 Disinfect lines as per section 2.7.
- .5 Bevel or taper ends of PVC pipe to match fittings.
- .6 Handle pipe by methods recommended by pipe manufacturer. Do not use chains or cables passed through pipe bore so that weight of pipe bears on pipe ends.
- .7 Lay pipes on prepared bed, true to line and grade.
 - .1 Ensure barrel of each pipe is in contact with shaped bed throughout its full length.
 - .2 Take up and replace defective pipe.
 - .3 Correct pipe which is not in true alignment or grade or pipe which shows differential settlement after installation greater than 10 mm in 3m.
- .8 Face socket ends of pipe in direction of laying. For mains on grade of 2% or greater, face socket ends up-grade.
- .9 Do not exceed permissible deflection at joints as recommended by pipe manufacturer.
- .10 Keep jointing materials and installed pipe free of dirt and water and other foreign materials.
 - .1 Whenever work is stopped, install a removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
- .11 Position and join pipes with equipment and methods approved by Engineer .

3.5 PIPE
INSTALLATION
(Cont'd)

- .12 Cut pipes in approved manner as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
 - .13 Align pipes before jointing.
 - .14 Install gaskets to manufacturer's recommendations. Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.
 - .15 Avoid displacing gasket or contaminating with dirt or other foreign material.
 - .1 Remove disturbed or contaminated gaskets.
 - .2 Clean, lubricate and replace before jointing is attempted again.
 - .16 Complete each joint before laying next length of pipe.
 - .17 Minimize deflection after joint has been made.
 - .18 Apply sufficient pressure in making joints to ensure that joint is completed to manufacturer's recommendations.
 - .19 Ensure completed joints are restrained by compacting bedding material alongside and over installed pipes or as otherwise approved by Engineer .
 - .20 When stoppage of work occurs, block pipes in an approved manner to prevent creep during down time.
 - .21 Recheck plastic pipe joints assembled above ground after placing in trench to ensure that no movement of joint has taken place.
 - .22 Do not lay pipe on frozen bedding.
 - .23 Do hydrostatic and leakage test and have results approved by Engineer before surrounding and covering joints and fittings with granular material.
 - .24 Backfill remainder of trench.
-

3.6 VALVE
INSTALLATION

- .1 Install valves to manufacturer's recommendations at locations as indicated.
- .2 Support valves located in valve boxes or valve chambers by means of Bedding same as adjacent pipe. Maximum length of pipe on each end of valve shall be 1 m. Valves not to be supported by pipe.
- .3 Install underground post-type indicator valves as indicated.

3.7 VALVE CHAMBERS

- .1 Use precast units as approved by Engineer
- .2 Construct units as indicated, plumb and centred over valve nut, true to alignment and grade, and not resting on pipe.
- .3 Place reinforcing steel and miscellaneous metals required to be embedded in concrete to details indicated and in accordance with Section 03 30 05 - Cast-in-Place Concrete.
- .4 Set precast concrete slab on 150 mm minimum of compacted granular bedding.
- .5 Set bottom section of precast unit in bed of cement mortar and bond to bottom slab.
 - .1 Make each successive joint watertight with approved rubber ring gaskets, mastic joint filler, cement mortar, or combination thereof.
- .6 Clean surplus mortar and joint compounds from interior surface of valve chamber as work progresses.
- .7 Plug lifting holes with mastic compound mortar.
- .8 Place frame and cover on top section to elevation indicated. If adjustment is required use concrete ring.
- .9 Clean valve chambers of debris and foreign materials; remove fins and sharp projections.

3.8 HYDRANTS

- .1 Install hydrants at locations as indicated.
 - .2 Install hydrants in accordance with AWWA M17.
-

3.8 HYDRANTS
(Cont'd)

- .3 Install gate valve and cast iron valve box on hydrant service leads as indicated.
- .4 Set hydrants plumb, with hose outlets parallel with edge of pavement or curb line, with pumper connection facing roadway and with body flange set at elevation of 50 mm above final grade.
- .5 Place concrete thrust blocks as indicated and specified ensuring that drain holes are unobstructed.
- .6 To provide proper draining for each hydrant, excavate pit measuring not less than 1 x 1 x 0.5 m deep and backfill with coarse gravel or crushed stone to level 150mm above drain holes.
- .7 Place appropriate sign on installed hydrants indicating whether or not they are in service during construction.

3.9 THRUST BLOCKS
AND RESTRAINED
JOINTS

- .1 For thrust blocks: do concrete Work in accordance with Section 03 30 05 - Cast-in-Place Concrete.
- .2 Place concrete thrust blocks between valves, tees, plugs, caps, bends, changes in pipe diameter, reducers, hydrants and fittings and undisturbed ground as indicated.
- .3 Keep joints and couplings free of concrete.
- .4 Do not backfill over concrete within 24 hours after placing.
- .5 For restrained joints: only use restrained joints approved by Engineer .

3.10 HYDROSTATIC
AND LEAKAGE TESTING

- .1 Do tests in accordance with ANSI/AWWA C600 C603.
- .2 Provide labour, equipment and materials required to perform hydrostatic and leakage tests hereinafter described.
- .3 Notify Engineer at least 24 hours in advance of proposed tests.
 - .1 Perform tests in presence of Engineer .

3.10 HYDROSTATIC
AND LEAKAGE TESTING
(Cont'd)

- .4 Where section of system is provided with concrete thrust blocks, conduct tests at least 5 days after placing concrete or 2 days if high early strength concrete is used.
 - .5 Test pipeline in sections not exceeding 365 m in length, unless otherwise authorized by Engineer .
 - .6 Upon completion of pipe laying and after Engineer has inspected Work in place, surround and cover pipes between joints with approved granular material placed to dimensions indicated.
 - .7 Leave hydrants, valves, joints and fittings exposed.
 - .8 When testing is done during freezing weather, protect hydrants, valves, joints and fittings from freezing.
 - .9 Strut and brace caps, bends, tees, and valves, to prevent movement when test pressure is applied.
 - .10 Open valves.
 - .11 Expel air from main by slowly filling main with potable water..
 - .12 Thoroughly examine exposed parts and correct for leakage as necessary.
 - .13 Remove joints, fittings and appurtenances found defective and replace with new sound material and make watertight.
 - .14 Repeat hydrostatic test until defects have been corrected.
 - .15 Do not exceed allowable leakage of .03 L/mm diameter per 300M of pipe, including lateral connections per hour.
 - .16 Locate and repair defects if leakage is greater than amount specified.
 - .17 Repeat test until leakage is within specified allowance for full length of water main.
-

3.11 HYDRANT FLOW TESTS

- .1 Conduct flow tests on every hydrant to determine fire flows prior to painting hydrant caps and ports.

3.12 PAINTING OF HYDRANTS

- .1 After installation, paint hydrants red yellow.
- .2 After hydrant flow tests, paint caps and ports to meet colour selections approved by authority having jurisdiction.

3.13 FLUSHING AND DISINFECTING

- .1 Flushing and disinfecting operations:
witnessed by Engineer.
 - .1 Notify Engineer at least 4 days in advance of proposed date when disinfecting operations will begin.
- .2 Flush water mains through available outlets with a sufficient flow of potable water to produce velocity of 1.5 m/s, within pipe for minimum 10 minutes, or until foreign materials have been removed and flushed water is clear.
- .3 Flushing flows as follows:

Pipe Size NPS	Flow (L/s) Minimum
6 and below	38
8	75
10	115
12	150
- .4 Provide connections and pumps for flushing as required.
- .5 Open and close valves, hydrants and service connections to ensure thorough flushing.
- .6 When flushing has been completed to Engineer approval, introduce strong solution of chlorine as approved by Engineer into water main and ensure that it is distributed throughout entire system.
- .7 Disinfect water mains.
- .8 Take water samples at hydrants and service connections, in suitable sequence, to test for chlorine residual.

National Defence
4 Wing Cold Lake
Job# L-C252-9900/347

Site Water Utility
Distribution Piping

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3.14 SURFACE
RESTORATION

.1 After installing and backfilling over water
mains, restore surface to original condition.

END

ANNEX A

4 Wing Ground Disturbance & Clearance Notice

R-2010-08-010

Project Name: _____	Project File No.: _____
Contact Name: _____	Telephone #: _____
Organization: _____	Work Start Date: _____
Work Location (incl. Base address and Legal with diagram/sketch attached) _____	Disturbance Depth: _____
Description of Work: _____	Site pre-marked: _____

Utility / Contact Information	Remarks & Date	Name and sign-off
Wing Operations Loc 8006/Fax 780-840-7341		
4 Wing Fire Dept Loc 8401/Fax 780-840-7317		
PMO - GIS Records Loc 8251/Fax 780-840-7316		
Wing Environment Loc 8430/ Fax 780-840-7305		
TIS Line/Help Desk Loc 7053 /Fax 780-840-7349	Remedy Ticket #	
Electrical- CE Electrical Loc 8429/ Fax 780-840-4029		
Water/Sewer/Steam/Gas -CE Plumbing Loc 8427/ Fax 780-840-4000		
WFE Loc 8960/8411/ Fax 780-840-7314		
Alberta 1-Call Phone: 1-800-242-3447	Ticket #	<i>No response required</i>
Eastlink Fax 780-826-7028		
Canada Locators Fax 1-780-636-3575	(Telus)	
Alberta Supernet Fax 1-780-488-9875		
ATCO Electric Fax 780-594-3090		
ATCO Gas Fax 780-594-3090		
ATCO PIPELINES 1-780-808-0777		
ALTA GAS Fax 780-826-4712		
DCC Loc 7058 Fax: 780-594-6161	<i>Information only</i>	<i>No response required</i>

INSTRUCTIONS:

- * ALLOW MINIMUM 5 WORKING DAYS NOTICE FOR COMPLETION OF NOTICE LOCATES.
- In case of any delay beyond 14 days or conditions at job site change the entire ground disturbance permit process must be completed again.
- A person does not commit an offence under the act if he can demonstrate that he made all reasonable efforts to procure inspection and supervision required for the undertaking.
- The contractor shall confirm to their satisfaction that the work area is clearly staked/ marked and correctly color coded to Standards. Contractor shall not proceed with any ground disturbance if work area is not properly identified or if doubts to actual location of marked utilities.
- ALL ground disturbances within 1 meter of marked/flagged electrical/communications and within 5 meters of gas lines must be hand exposed by hand digging (or hydrovac) prior to use of mechanical equipment.

Annex B

4 WING COLD LAKE HOT WORK AUTHORIZATION PERMIT # _____

Date : _____ Start Time : _____ Expiry Time : _____ Date : _____

INSPECTOR : Rank _____ Name _____ LOCATION : _____

Type of work : Welding/Cutting Soldering Hot Roofing Other _____

CONFINED SPACE : Yes No
 Confined Space Entry Permit on site Yes No

- Note : If a confined space entry permit is required and not on site, then a hot work authorization chit may not be issued.
- Before approving any hot work, the Fire Inspector shall inspect the work site and surrounding area to confirm that all precautions have been taken to prevent fire IAW NFPA 51B.
- If hot work is to be done in a Hangar, all Aircraft SHALL be removed.

<p><u>GENERAL PRECAUTIONS</u></p> <p>() Sprinkler/alarms in service. (if applicable)</p> <p>() Welding Equipment in good repair.</p>	<p><u>FIRE WATCH</u></p> <p>() To be provided during and 30 min after operation.</p> <p>() Serviceable Fire Extinguisher.</p> <p>() Trained in Action in event of a Fire.</p>
<p><u>WITHIN 11M OF WORK AREA</u></p> <p>() Combustible Products removed from area.</p> <p>() Combustible floors wet down or covered with non combustible material.</p> <p>() Flammable and Combustible liquids removed or safely stored.</p> <p>() Wall and floor openings covered.</p> <p>() If practicle, covers suspended beneath work to collect sparks.</p>	<p><u>WORK WITHIN WALLS OR CEILINGS</u></p> <p>() Non combustible construction and without combustible coverings.</p> <p>() Combustibles removed from other side of partition.</p> <p><u>HERMAN NELSON HEATERS</u></p> <p>() Personnel trained in proper start-up, shut down and re-fueling procedures prior to use.</p> <p>() Fire extinguisher available.</p>
<p><u>HOT ROOFING OPERATIONS</u></p> <p>() Tar kettle located in a safe location at least 5 meters from an exit or combustible materials, including walls, or on a non-combustible roof (unless approved by WFC).</p> <p>() Thermostate on the kettle is operational and kettle is constantly supervised.</p> <p>() Servicable Dry Chemical or CO2 fire extinguisher available.</p> <p>() A metal lid that can be closed in case of a fire.</p> <p>() Inform the contractor that : used mops and rags shall be cleaned and stored away from the building and other combustible materials at the end of each work day or disposed separate from other waste.</p> <p style="text-align: center;">NOT LEFT ON THE ROOF.</p>	

CONTRACTOR : Name : _____ COMPANY _____
 Address : _____
 Phone Number : _____ Cell Phone : _____

I have received the Fire Department briefing and agree to comply with all regulations. The Fire Department shall be notified of any changes affecting the operations authorized by this permit. Failure to comply with these safety precautions may result in you or your company being held responsible for any damages incurred. The Fire Department is to be notified at 840-8000 Loc 8401 when the inspection 30 minutes after the completion of any hot work for that day has been completed.

Signature of on site Supervisor _____

Approved by _____ Wing Fire Department.

Fire Department Emergency Number 840-8333 OR Loc. 8333

ANNEX C
4 Wing Confined Space Entry Permit

NOTE: This permit is valid only for the work and time described!
Fire Hall must be notified prior to entry Ph 840-8000 Ext 8401 EMERGENCY RESCUE PHONE EXT 911

Permit # _____ Date: ____/____/____ Time of Entry: _____ Hrs Expiration: _____ Hrs
Type/Class of Space: _____ Location: _____
Unit/Section: _____ Supervisor: _____

Description of Work: _____

ATMOSPHERIC TESTER Make: _____ Model: _____ Ser#: _____
Date of Last Calibration: ____/____/____ Calibrator: _____

Pre Entry Test Results						
TEST	ACCEPTABLE LEVEL		AMOUNT TESTED	SIGNATURE		
Oxygen	Min 19.5%	Max 23%				
Explosive Gases	5% LEL					
Carbon Monoxide (CO)	10 ppm (max)					
Hydrogen Sulfide (H ₂ S)	5 ppm (max)					
Toxic Gases	50% of TLV (max)					
EQUIPMENT REQ'D	Y	N	TYPE USED	PRE ENTRY REQUIREMENTS	Y	N
Respirators				Hazard Assessment Report Reviewed		
Air Line Respirators				Bleed Pressure		
SCBA Equip				Drain		
Ventilation Equip				Purge		
Communications				Ventilation		
Fall Arrest Equip				Electrical Lockout/Tagout		
Mechanical Lifting Device				Blinding/Blanking		
Personal Alarms				Hot Work Permit (Fire Hall)		
Fire Extinguishers				All Safety Equip on Site		
Life Jackets				Barricades/Signs Erected		
Barricades				Fire Hall Notified		
Non Sparking Tools				Others (Specify)		

Special Instructions _____

I certify that I have performed all required tests and preventive measures (IAW the Hazard Assessment Report) for the safe entry into this confined space.

Qualified Person (Print) _____ Signature
I certify that I have reviewed the Hazard Assessment Report and have been briefed on all tests and preventive measures required for safe entry into this confined space.

First Name (print) Last Name (print) _____ Signature
I certify that all personnel have exited this confined space and the Fire Hall has been notified.

Name (print) _____ Signature

NOTE: This report is to be retained by the supervisor for a minimum of two years

ANNEX D

Date:

Subject: Prime Contractor Agreement

Contract Description:

Project No.:

Contract No.:

Award Date:

Completion Date:

DCC Site Office:

Site Office Address:

Contractors Name:

Contractors Address:

Provincial / Territory
Reference:

(Alberta Occupational Health & Safety Act, Section 3)

The "Contractor" is required to fully comply with all Provincial / Territory Safety Acts, Codes and Regulations. For this reason, this letter is to certify that the "Contractor" referenced above will be acting as the "Prime (Principal) Contractor" for this contract.

(Contractors Representative: Print Name and Title)

(Signature)

(Date)

ANNEX E

4 Wing Road Closure Notice

R-2010-08-10

Project Name: _____	Project File No.: _____
Contact Name: _____	Telephone #: _____
Organization: _____	RETURN FAX #: _____
	Road Closure Start Date: _____
	Road Closure Start Time: _____
	Road Closure End Date: _____
	Road Closure End Time: _____

Work Location (incl. Base address and Legal with diagram/sketch attached) _____

Description of Work: _____

Contact Information	Remarks & Date	Name and sign-off
4 Wing Fire Dept Loc 8401/Fax 780-840-7317		
Wing Ops O Fax 780-840-7341 (If within GRA)		
Wing Logistics Fax 780-840-7366		<i>John White</i>
NCO I/C GPV Fax 780-840-4028		
Wing Secur O Fax 780-840-7339		
DCC Loc 7058 Fax: 780-594-6161	<i>Information only</i>	<i>No response required</i>

INSTRUCTIONS:

- * ALLOW MINIMUM 7 WORKING DAYS NOTICE FOR COMPLETION OF NOTICE.
- In case of any delay during an active closure past the stated "work end date" the entire road closure permit process must be completed again a minimum of 48 hours in advance.
- A person does not commit an offence under the act if he can demonstrate that he made all reasonable efforts to procure inspection and supervision required for the undertaking.
- The contractor shall provide traffic accommodation to the satisfaction of the designated 4 Wing Representative.
- The contractor shall provide road closure notice to effected businesses and or residents a minimum of 48 hours in advance of scheduled closure as required by 4 Wing Representative.
- Contractor shall not proceed with any closure of work area prior to sign off from above 4 Wing representative sections listed above.
- The following closure(s) will apply to all except authorized and emergency vehicles.