1.1 ACCESS AND EGRESS

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

1.2 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of adjacent premises. Make arrangements with Contract Administrator to facilitate work as stated.

.2 Closures: Protect work temporarily until permanent enclosures are completed.

.3 Facility access shall be provided 24 hours a day, seven days a week.

.4 Secure facilities at end of each workday.

1.3 SITE SMOKING ENVIRONMENT

.1 Comply with smoking restrictions.

END OF SECTION

1.1 RELATED REQUIREMENTS

.1 Section 01 29 10 - Measurement and Payment

.2 Section 02 50 00 - Site Remediation

.3 General Conditions for Construction C12.

1.2 GENERAL

.1 Submit complete and accurate prices for each Unit Price including overhead and profit, labour, materials, and equipment.

.2 Referenced specification Sections as identified, and Section 01 29 10 - Measurement and Payment and C12 stipulates pertinent requirements for products and methods to achieve the Work under each Unit Price.

1.3 UNIT PRICES

.1 Unit Price No. 1 - Soil Remediation

.2 Refer to Section 02 50 00 - Soil Remediation

.3 Unit Price shall be to excavate, load, haul and dispose of each cubic metre of impacted soil, based on the Contractor's Unit Price.

Measurement Unit	Removal Unit Price
cu m	$/cu m

END OF SECTION

1.1 RELATED REQUIREMENTS

.1 City of Winnipeg Request For Information (RFI) v1.0, as appended to this Section.

1.2 REQUESTS FOR INFORMATION

.1 General: Immediately upon discovery of the need for interpretation of the Contract Documents, prepare and submit a Request for Information (RFI) to the Contract Administrator in the form specified herein.

.1 Coordinate and submit RFIs in a prompt manner to avoid delays in the Work.

.2 Keep each RFI to one specific item only. Do not combine several items requiring interpretation into one RFI.

.3 For RFIs submitted by email include project name, RFI reference number and RFI subject in the email heading.

.2 Contract Administrator will only consider RFIs submitted by the Contractor. Contract Administrator will not accept, review, or reply to RFIs submitted by Subcontractors, Suppliers or other entities under Contract with the Contractor.

.3 Content of the RFI: Follow input requirements as illustrated the City's Request for Information (RFI) Submittal form.

.1 Attachments:

.1 Include detail drawings, sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to describe items requiring interpretation.

.2 Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached drawings and sketches.

1.3 RFI SUBMITTAL FORM

.1 Complete the City's Request for Information (RFI) Submittal form, which is appended to this Section.

.2 Submit RFI form and attachments as electronic files in Adobe Acrobat PDF format.

1.4 NUISANCE OR REDUNDANT RFI

.1 Contract Administrator will not respond to nor reply to the following Contractor-generated nuisance or redundant RFI's.

.1 Requests for approval of submittals.

.2 Requests for approval of substitutions.

.3 Requests for approval of Contractor's means and methods.

.4 Requests for approval of corrective actions for deficient Work.

.5 Requests for coordination information already indicated in the Contract Documents.

.6 Requests for adjustments in the Contract Time or the Contract Price.

.7 Requests for interpretation of Contract Administrator's response on submittals.

.8 Incomplete or inaccurately prepared RFIs.

.2 Do no list nuisance and redundant RFI's in the RFI log.

1.5 CONTRACT ADMINISTRATOR'S RESPONSE

.1 Contract Administrator will review each RFI, determine action (or no action) required, and submit his reply to the Contractor.

.2 Allow five working days for Contract Administrator's response time for each RFI. RFI's that are received by the Contract Administrator after [1:00 pm] on working days will be considered as have been received on the next working day.

.3 Contract Administrator's failure to reply to any RFI within the time period specified above or within a reasonable time period, as determine by the Contract Administrator, will not be considered a reason for a delay claim by the Contractor.

.4 The Contract Administrator may extend the response time for any RFI at his discretion. Reasons may include, but not necessarily be limited to, the following:

.1 Too many RFIs submitted on the same day or within a short time period.

.2 RFI's which require extensive review and research by the Contract Administrator, which may include requests for additional information from other sources, the timing of which the Contract Administrator has no control.

.3 RFIs which, in the Contract Administrator's opinion, will have no significant impact on the construction progress schedule and therefore may be deferred for a reasonable period of time.

.5 Contract Administrator's action may include a request for additional information, in which case Contract Administrator's response time will be re-adjusted to the date when the additional information is received by the Contract Administrator.

.6 If Contractor believes the Contract Administrator's RFI response warrants a change in the Contract Time or the Contract Price, notify the Contract Administrator in writing within [five] days of receipt of the Contract Administrator's RFI response.

1.6 CONTRACTOR'S RESPONSE

.1 On receipt of Contract Administrator's response to an RFI:
.1 Update RFI log as specified herein.
.2 Review response and, submit a reply to the Contract Administrator, within [five] working days of receipt of Contract Administrator response, stating whether the Contract Administrator's response is either acceptable or not acceptable.

.2 If Contract Administrator's response is acceptable:
.1 Distribute the response to affected parties and proceed accordingly.

.3 If Contract Administrator's response is considered not acceptable:
.1 Resubmit the RFI and include reason(s) for disagreement.
.2 Contract Administrator will review and submit a reply to the Contractor within 5 working days of receipt of resubmittal, notwithstanding the Contract Administrators extension of response time as specified herein.

END OF SECTION

Request for Information (RFI)

Date Submitted:	Click here to select a date.	**RFI No.:**	Enter RFI#
Project Name:	Click here to enter project name.	**Date Response Required by:**	Select date.

Submitted To:

Contract Administrator (CA):	Click here to enter name of Contact Administrator.
Department/Firm:	Click here to enter CA's Dept/Firm.

Consultant Ref. No.	Click here to enter Reference No.
Bid Opportunity No.	Click here to enter Bid Opp. No.

Requested By:

Name:	Click here to enter name.
Title:	Click here to enter Title.
Firm:	Click here to enter Firm name.
Email/Tel:	Click here to enter email/tel.

For City Office use		
	City File No.:	Click here to enter City File No.
	Project ID:	Click here to enter Project ID.
	Project Record Index No.:	Click here to enter PRI No.
	Purchase Order No.:	Click here to enter PO No.

For details and instructions on how to complete this document, click the [¶] icon under the Home tab to display the hidden text.

Request/Question: (to be completed by Contractor)

Click here to enter Question/Request.

Answer/Response: (to be completed by Contract Administrator)

Click here to enter Answer/Response.

Attachment(s): ☐

RFI Response Distribution: (to be completed by Contract Administrator)

- ☐ Contract Administrator
- ☐ Contractor
- ☐ City Project Manager
- ☐ Consultant
- ☐ Other: Click here to enter text.

1.1 RELATED REQUIREMENTS

.1 Section 01 22 00 Unit Prices

.2 Section 02 50 00 - Site Remediation

1.2 GENERAL

.1 The lump price offered for supply and installation shall include full compensation for supplying, hauling, installing, disposal, compaction, cleaning, testing, commissioning, and placing in service together with all other work subsidiary and incidental thereto for which separate payment is not provided elsewhere.

1.3 UNIT PRICE – ADMINISTRATION FOR MEASUREMENT AND PAYMENT

.1 For listing of Unit Prices refer to Section 01 22 00 - Unit Prices.

.2 Measurement for Soil Remediation Unit Prices :

.1 Following the determination of extent of impacted soils as indicated in Section 02 50 00, the site material will be measured on a volume basis. The volume to be paid for shall be the total number of cubic metres removed and number of cubic meters of imported fill material supplied, placed and compacted in place in accordance with this Specification acceptable to the Contract Administrator. No payment will be made for material placed outside of the limits of placement as directed by the Contract Administrator

END OF SECTION

1.1 RELATED DOCUMENTS

.1 Builders' Liens Act (Manitoba).

1.2 SCHEDULE OF VALUES

.2 Submit to Contract Administrator, Schedule of Values, at least 15 days prior to submitting first Application for Payment.

.3 Use Schedule of Values as basis for Contractor's Progress Claim.

.4 Form of Submittal:

.1 Submit typewritten Schedule of Values on letter size white paper.

.2 Use Table of Contents of this Tender as basis for format for listing costs of work for Sections under all Divisions.

.3 Identify each line item with number and title as listed in Table of Contents of this Tender.

.5 Itemize separate line item cost for work required by each Section of this Tender.

.6 After review by Contract Administrator, revise and resubmit Schedule as directed.

END OF SECTION

1.1 SECTION INCLUDES

.1 Photographic documentation of:

.1 Project site and surrounding properties to record existing conditions prior to start of Work.

.2 Project site during course of construction to record construction progress.

.3 Project site at final completion of the Work to record completed work.

.4 Other specific items as may be requested by Contract Administrator.

.2 Provide photographic documentation in accordance with procedures and submission requirements specified in this Section.

1.2 DEFINITIONS

.1 Within the content of this Section the term "photograph" shall mean "digital image".

.2 Digital image is a still picture taken with a digital camera which can be viewed on a computer with photo editing/viewing software.

1.3 DIGITAL IMAGES

.1 Use digital camera with capability of producing digital images at minimum 5.0 megapixels, uncompressed, saved in *.jpeg or *.tif format.

.2 Copy (burn) each set of images onto a flash drive.

.3 Identification: identify each disc with name and number of project, date of exposure, set number.

1.4 DISTRIBUTION

.1 Keep one set of photographs on site.

.2 Provide one set of photographs to Contract Administrator.

1.5 PRE-CONSTRUCTION PHOTOGRAPHS

.1 Provide photographs of existing site features, and adjacent buildings and surrounding properties to record existing conditions prior to start of construction work, to the satisfaction of the Contract Administrator.

.2 Allow for minimum 24 images for each set.

.3 Number of Sets Required: Three.

.4 Viewpoints: Exterior viewpoints including close ups of specific details in locations as determined by Contract Administrator.

1.6 CONSTRUCTION PROGRESS PHOTOGRAPHS

.1 Provide photographs of project site during progress of the Work to record construction progress.

.2 Provide photographs of remedial work for items of work identified by Contract Administrator as deficient, incomplete or otherwise non-conforming to contract documents.

.3 Allow for minimum 24 images for each set.

.4 Number of Sets Required: Three.

.5 Number of Viewpoints: Interior and exterior viewpoints including close ups of specific details, in locations determined by Contract Administrator.

.6 Frequency: Monthly with progress statement and as requested by Contract Administrator.

1.7 FINAL PHOTOGRAPHS

.1 Provide photographs of project site at final completion to record completed work.

.2 Number of Prints Required: Three.

.3 Allow for minimum 24 images for each set.

.4 Number of Viewpoints:

.1 Each adjacent building and surrounding property photographed as described in Article 1.5, and other exterior features.

.2 Close ups of specific details as determined by Contract Administrator.

.3 Locations of viewpoints as determined by Contract Administrator.

1.8 PHOTOGRAPH LABELING CONVENTION

.1 Provide progress digital images to the Contract Administrator monthly and at final completion of work.

.2 Label each photograph in accordance with the following naming convention example.

Project Descriptor		Element Descriptor (see Legend below)		Month		Year		Numerical Descriptor
psb-cp	_	a-ext	_	12	_	2019	_	00001
Public Safety Building-Car Park		Architectural - Exterior						(five digits)

.3 Legend

.1 Element Descriptor

Architectural - Exterior	a-ext
Architectural - Interior	a-int
Mechanical	m
Electrical	e

END OF SECTION

1.1 SECTION INCLUDES

.1 Shop drawings

.2 Product data, test reports, certificates.

.3 Manufacturer's instructions and field reports

.4 Samples

1.2 DEFINITIONS

.1 Action Submittals: Written and graphic information and physical samples that require Contract Administrator's responsive action. Unless specifically noted otherwise in individual section, the following are considered Action Submittals:

.1 Product Data

.2 Shop Drawings

.3 Reports

.4 Closeout Submittals

.2 Informational Submittals: Written and graphic information and physical samples that do not require Contract Administrator's responsive action. Submittals may be rejected for not complying with requirements. Unless specifically noted otherwise in individual section, the following are considered Informational Submittals:

.1 Certificates

.2 Maintenance Data

.3 Material Safety Data Sheets (MSDS)

.4 Inspection Reports

.5 Manufacturer's Instructions

1.3 ADMINISTRATIVE

.1 Submit to Contract Administrator submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Contract Administrator. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Contract Administrator, 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.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator ‘s review.

.10 Keep one reviewed copy of each submission on site.

.11 Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Contract Administrator's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

.1 Submittals that are received by the Contract Administrator after 1:00 pm on working days will be considered as have been received on the next working day.

.2 Initial Review: Allow five working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Contract Administrator will advise Contractor when a submittal being processed must be delayed for coordination.

.3 Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.

.4 Resubmittal Review: Allow five working days for review of each resubmittal.

1.4 SUBMITTAL SCHEDULE

.1 Submittal Schedule: Submit, as an Action Submittal, a list of submittals, arranged in chronological order by dates required by demolition schedule. Include time required for review when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Contract Administrator and additional time for handling and reviewing submittals required by those corrections.

.2 Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction progress schedule.

.1 Initial Submittal: Submit for review concurrently with the Construction Progress Schedule utilizing the Critical Path Method (CPM).

.1 Allow five working days for Consultant review of submittal schedule.

.2 Format: Arrange the following information in a tabular format:

.1 Scheduled date for first submittal.

.2 Specification Section number and title.

.3 Submittal Category: Action; Informational.

.4 Name of Subcontractor.

.5 Description of the Work covered.

.6 Scheduled date for Contract Administrator's final release or approval scheduled dates.

.2 Final (Revised) Submittal: Submit within 14 days of initial submittal.

.1 Submit revised submittal schedule to reflect Consultant review comments and changes in current status and timing for submittals.

.3 Progress Submittals: Submit updated Submittal Schedule at monthly intervals to coincide with project meetings.

1.5 SHOP DRAWINGS AND PRODUCT DATA

.1 Submit shop drawings for Contract Administrator's review.

.2 This review by the Contract Administrator is for the sole purpose of ascertaining conformance with the general concept of the scope of work. This review shall not mean that the Contract Administrator approves the content inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of their responsibilities for errors or omissions in the shop drawings or of their responsibility for meeting all requirements of the contract documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site,

for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all sub-trades.

.3 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.

.4 Shop drawings that do not include the stamp, date, and signature of the person responsible for reviewing the shop drawings before submittal to the Contract Administrator, will be rejected and returned without being examined.

.5 Submit shop drawings bearing stamp and signature of qualified professional engineer registered or registered in Province of Manitoba, Canada and who holds a “certificate of authorization” from the EGM, where specifically requested in the specifications. Shop drawings not bearing the required Engineer’s seal will be rejected and returned without being examined.

.6 Indicate materials, methods of construction and 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.

.7 Adjustments made on shop drawings by the Contract Administrator are not intended to change the Contract Price. If it is deemed that such adjustments affect the value of Work, state such in writing to the Contract Administrator prior to proceeding with fabrication or the Work.

.8 Make changes in shop drawings that the Contract Administrator may require, consistent with Contract Documents. When resubmitting, notify the Contract Administrator in writing of any revisions other than those requested.

.9 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 samples, and
- .5 other pertinent data.

.10 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and Address of:
  - .1 Subcontractor,
  - .2 Supplier, and
  - .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 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .2 Setting details
  - .3 Capacities

.4 Performance characteristics

.5 Standards

.6 Operating weight

.7 Relationship to adjacent work.

.8 Other

.12 Submit one digital file in Adobe PDF file format of the following submittals:

.1 Shop drawings for each requirement requested in specification sections and as the Contract Administrator may reasonably request.

.2 Product data sheets or brochures for requirements requested in specification Sections and as requested by Contract Administrator where shop drawings will not be prepared due to standardized manufacture of product.

.3 Test reports for requirements requested in specification Sections and as requested by Contract Administrator.

.1 Report signed by authorized official of testing laboratory

.2 Testing must have been within three years of date of contract award for project.

.4 Certificates for requirements requested in specification Sections and as requested by Contract Administrator.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract, complete with project name.

.5 Manufacturers' instructions for requirements requested in specification Sections and as requested by Contract Administrator.

.1 Pre-printed material describing installation of product, system or material, including special notices and material safety data sheets concerning impedances, hazards and safety precautions.

.6 Manufacturer's field reports for requirements requested in specification Sections and as requested by Contract Administrator.

.1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.11 Delete information not applicable to project.

.12 Supplement standard information to provide details applicable to project.

.13 If upon review by the Contract Administrator, no errors or omissions in compliance with the Contract Documents are discovered or if only minor corrections are made, copies will be returned, and Work may proceed. If, however, shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through the same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.14 No extension of Contract Time will be allowed for delays in the Work which may be caused for Contract Administrator 's rejection of shop drawings.

.15 Shop drawings, which contain deviations from the Contract Documents which are not presented to the Contract Administrator in writing will be rejected and returned without being examined.

1.6 TESTING

.1 Keep one set of photographs on site.

.2 Provide one set of photographs to Contract Administrator.

1.7 CERTIFICATES AND TRANSCRIPTS

.1 Prior to commencement of the Work, provide evidence of compliance with worker's compensation legislation at the place of the Work, including payments due thereunder.

.2 Submit transcription of insurance immediately after award of Contract.

END OF SECTION

1.1 DEFINITIONS

.1 Environmental Pollution and Damage: Presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: Prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2 SUBMITTALS

.1 Submittals: In accordance with Section 01 33 00 - Submittal Procedures.

.2 Two (2) weeks prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review by Contract Administrator. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.

.3 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.4 Environmental Protection Plan: Include:

.1 Name(s) of person(s) responsible for ensuring adherence to Environmental Protection Plan.

.2 Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from site.

.3 Name(s) and qualifications of person(s) responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.7 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.

.9 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.

.12 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.13 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

.14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

.15 Pesticide treatment plan: to be included and updated, as required.

1.3 FIRES

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

.2 Where fires or burning permitted, prevent staining or smoke damage to structures, materials, or vegetation that is to be preserved. Restore, clean and return to new condition stained or damaged work.

.3 Provide supervision, attendance and fire protection measures as directed.

1.4 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm, or sanitary sewers.

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 harmful substances in accordance with local authority requirements.

1.6 SITE CLEARING AND PLANT PROTECTION

.1 Any trees and plants that need to be protected should follow City's procedures.

.2 Restrict tree removal to areas indicated or designated by Contract Administrator. The Contractor shall take the following precautionary steps to avoid damage from his construction activities to existing boulevard trees within and adjacent to the limits of construction:

.1 The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards within 2 metres of any tree.

.2 Mature tree trunks shall be strapped with 25 x 150 x 2400 (1" x 6" x 8") wood planks. Smaller trees shall be similarly protected using appropriately sized wood planks.

.3 Excavations shall be carried out in such a manner so as to minimize damage to existing root systems. Roots over 50 mm in diameter that must be cut to facilitate

an excavation shall be neatly pruned with a saw prior to excavation and coated with an appropriate wound dressing to prevent infection.

.4 Operation of equipment within the dripline of trees shall be kept to the minimum required to perform the work. Equipment shall not be parked, repaired, refuelled; construction materials shall not be stored, and earth materials shall not be stockpiled within the driplines of trees. The dripline of a tree shall be considered to be the ground surface directly beneath the tips of its outermost branches. The Contractor shall ensure that the operations do not cause flooding or sediment deposition on areas where trees are located.

.5 Work on site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to tree branches does occur, the Contractor shall neatly prune the damaged branch.

.6 American elm trees are not to be pruned between April 1st and August 1st and Siberian elm trees between April 1st and July 1st of any year under provisions of The Dutch Elm Disease Act.

.3 All damages to existing trees caused by the Contractor's construction activities shall be repaired to the requirements and satisfaction of the City of Winnipeg, Parks and Open Space Division, Urban Forestry Branch.

.4 No separate measurement or payment will be made for protection of trees. It shall be considered incidental to the Contract Work.

1.7 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this contract.

.2 Control emissions from equipment and plant to local authority's 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.

1.8 NOTIFICATION

.1 Contract Administrator will notify Contractor in writing of observed non-compliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: After receipt of such notice, inform Contract Administrator of proposed corrective action and take such action for approval by Contract Administrator.

.3 Contract Administrator will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted, or equitable adjustments allowed to Contractor for such suspensions.

END OF SECTION

1.1 SECTION INCLUDES

.1 Inspection and testing, administrative, and enforcement requirements.

.2 Tests.

1.2 RELATED REQUIREMENTS

.1 Submission of tests to confirm product quality, Section 01 33 00 - Submittal Procedures.

.2 Material and workmanship quality, reference standards, Section 01 61 00 - Common Product Requirements.

1.3 REVIEW OF THE WORK

.1 Allow Contract Administrator access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Contract Administrator instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, surveys, inspections or approvals before such is made, uncover such Work, have tests, surveys or inspections satisfactorily completed and make good such Work.

.4 Contract Administrator will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, the City shall pay cost of examination and replacement.

1.4 ACCESS TO WORK

.1 Allow inspection/testing agencies access to the Work, offsite manufacturing, and fabrication plants.

.2 Cooperate to provide reasonable facilities for such access.

1.5 PROCEDURES

.1 Notify the appropriate agency and Contract Administrator in advance of the requirement for tests, in order that attendance arrangements can be made.

.2 Submit test reports requested in Specification sections or as may be requested by Contract Administrator. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide enough space to store and cure test samples.

1.6 DAMAGED OR DEFECTIVE WORK

.1 Promptly make good the City's property, adjacent buildings, or surrounding properties damaged by removals made under this Contract.

.2 If in opinion of Contract Administrator, it is not expedient to make good damage to property or buildings attributable to the course of the Work, the City will deduct from Contract price the difference in value between Work performed and that called for by repair or remediation to damaged buildings or property, amount of which will be determined by Contract Administrator.

1.7 REPORTS

.1 Submit four (4) copies of inspection and test reports promptly to the Contract Administrator.

.2 Provide copies to Subcontractor of work being inspected/tested and manufacturer/ fabricator of Material being inspected/tested.

1.8 TESTS

.1 Furnish test results as may be requested.

.2 The cost of tests and mix designs beyond those called for in the Drawings and Specifications or beyond those required by the Law of the Place of Work shall be appraised by the Contract Administrator.

END OF SECTION

1.1 INSTALLATION AND REMOVAL

.1 Provide temporary utilities in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.2 WATER SUPPLY

.1 A limited amount of water from the existing building supply will be made available for construction use.

.2 Provide, install and maintain temporary lines and connections at own expense.

.3 The City will pay utility charges.

1.3 TEMPORARY HEATING AND VENTILATION

.1 Maintain temperatures of minimum 10°C in areas in which construction is in progress.

1.4 TEMPORARY POWER AND LIGHT

.1 Provide and pay for temporary power required during construction for temporary lighting and the operating of power tools.

.2 Arrange for connection with Manitoba Hydro. Pay all costs for installation, maintenance and removal.

.3 Temporary power for electric cranes and other equipment requiring in excess of the supply required for temporary lighting and power tools is the responsibility of Contractor.

.4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

1.5 TEMPORARY COMMUNICATIONS FACILITIES

.1 Provide and pay for temporary telephone fax and internet hook up, lines and equipment necessary for own use and use of Contract Coordinator.

1.6 FIRE PROTECTION

.1 Provide and maintain adequate temporary fire protection equipment during performance of Work, as required by insurance companies having jurisdiction and governing Codes, regulations and By-Laws.

.2 Burning rubbish and construction waste materials is not permitted on site.

END OF SECTION

1.1 SECTION INCLUDES

.1 Construction aids.

.2 Office and sheds.

1.2 REFERENCE STANDARDS

.1 Canadian Standards Association (CSA)

.1 CAN/CSA-Z321, Signs and Symbols for the Occupational Environment.

.2 CAN/CSA-S269.2-16, Access Scaffolding for Construction Purposes.

1.3 INSTALLATION AND REMOVAL

.1 For review and approval of the Contract Administrator, prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.2 Indicate use of supplemental or other staging area.

.3 Provide construction facilities in order to execute work expeditiously.

.4 Remove from site all such work after use.

1.4 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2 and authority having jurisdiction approval.

.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms temporary stairs.

1.5 HOISTING

.1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.

.2 Hoists and cranes shall be operated by qualified operator.

1.6 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Drawings and Specifications. 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.

1.7 CONSTRUCTION PARKING

.1 Parking will be provided on Site subject to the approval of the Contract Administrator and provided it does not disrupt performance of Work. Parking the area is limited.

.2 Provide and maintain adequate access to project site.

1.8 CONSTRUCTOR'S SITE OFFICE

.1 Site office location subject to the approval of the Contract Administrator.

.2 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing lay-down table.

.3 Provide marked and fully stocked first-aid case in a readily available location.

.4 Subcontractors to provide their own offices as necessary, subject to the approval of the Contract Administrator. Direct location of these offices.

1.9 EQUIPMENT, TOOL AND MATERIAL 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.

1.10 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances. Location subject to approval of the Contract Administrator.

.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

.3 Existing facilities not to be used.

1.11 CONSTRUCTION SIGNAGE

.1 No signs or advertisements, other than warning signs, are permitted on site.

.2 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.

.3 Maintain approved signs and notices in good condition for duration of project and dispose of offsite on completion of project or earlier if directed by Contract Administrator.

1.12 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Contract Administrator.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

.4 Protect travelling public from damage to person and property.

.5 Contractor's traffic on roads selected for hauling material to and from Site to interfere as little as possible with public traffic.

.6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.7 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.8 Dust control: Adequate to ensure safe operation at all times.

END OF SECTION

1.1 SECTION INCLUDES

.1 Barriers.

.2 Environmental Controls.

.3 Traffic Controls.

.4 Fire Routes.

1.2 REFERENCE STANDARDS

.1 Canadian Standards Association (CSA)

.1 CSA-O121, Douglas Fir Plywood

.2 CAN/CSA O141 - Softwood Lumber

.3 CSA O151 - Canadian Softwood Plywood

1.3 INSTALLATION AND REMOVAL

.2 Provide temporary controls to execute Work expeditiously.

.3 Remove from site all such work after use and make good to adjacent surfaces and finishes.

1.4 HOARDING AND SITE FENCING

.1 Erect temporary site fence around property, construction laydown and trailer area to prohibit unauthorized access.

.2 Use minimum 2 100 mm high chain link or wire mesh fencing with posts at no more than 3 000 mm on centre. Provide lockable truck entrance gate(s) and equip gates with locks and keys.

.3 Dust mitigation or security measures on the fence may be required.

1.5 GUARD RAILS AND BARRICADES

.1 Provide as recommended by local governing authorities.

1.6 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.7 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

1.8 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.9 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect adjacent private and public property from damage during the performance of work.

.2 Be responsible for all damage incurred.

1.10 PROTECTION OF ADJACENT BUILDING FINISHES

.1 Provide protection for adjacent building finishes and equipment during the performance of work.

.2 Provide necessary screens, covers and hoardings.

.3 Confirm locations and installation with Contract Administrator at least five days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Product quality, availability, storage, handling, protection, and transportation.

.2 Manufacturer's instructions.

.3 Substitution procedures.

.4 Quality of Work, coordination and fastenings.

.5 Prevention of dust and mould contamination of products and materials during delivery, storage and handling.

1.2 REFERENCE STANDARDS

.1 Within text of each Specification section, reference may be made to reference standards.

.2 Conform to these reference standards, in whole or in part as specifically requested in Specifications.

.3 If there is question as to whether any product or system is in conformance with applicable standards, Contract Administrator reserves right to have such products or systems tested to prove or disprove conformance.

.4 Cost for such testing will be borne by the City in event of conformance with Drawings and Specifications or by Contractor in event of non-conformance.

.5 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.

1.3 QUALITY ASSURANCE

.1 Products, Materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Contract Administrator based upon requirements of Drawings and Specifications.

.4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout buildings.

.5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.4 AVAILABILITY

.1 Immediately upon receiving Letter of Intent, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of materials, equipment or articles are foreseeable, notify Contract Administrator within two days discovery of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In the event of failure to notify the Contract Administrator at commencement of Work, and should it subsequently appear that Work may be delayed for such reason, the Contract

Administrator reserves the right to substitute more readily available products of similar character, at no increase in Contract Price or contract time.

1.5 SUBSTITUTIONS

.1 The Work is based on the materials and methods specified in the Specifications.

.2 Substitutions are permitted during Bid period only, make application in accordance with B6 Substitutes.

1.6 STORAGE HANDLING AND PROTECTION

.3 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.4 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.5 Store products subject to damage from weather in weatherproof enclosures.

.6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Remove and replace damaged products at own expense and to satisfaction of Contract Administrator.

.8 Touch-up damaged factory finished surfaces to Contract Administrator's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.7 TRANSPORTATION

.1 Pay the costs of transportation of products required in the performance of Work.

.2 Transportation costs of products supplied by the City will be paid for by the City unless specified otherwise. Unload, handle and store such products, unless otherwise specified.

1.8 MANUFACTURERS' INSTRUCTIONS

.1 Unless otherwise indicated in the specifications, install or erect all products in accordance with manufacturer's recommendations. Do not rely on labels or enclosures that are provided with products. Obtain instructions directly from manufacturers.

.2 Notify Contract Administrator in writing of any conflicts between the Specifications and manufacturer's instructions so that the Contract Administrator may establish the course of action to follow.

.3 Improper installation or erection of products due to failure in complying with these requirements authorizes the Contract Administrator to require any removal and re-installation that may be considered necessary, at no increases in Contract price or Contract time.

1.9 QUALITY OF WORK

.1 Ensure quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Contract Administrator if required Work is such as to make it impractical to produce required results.

.2 Enforce discipline and good order among workers.

.3 Do not employ anyone unskilled in their required duties. Contract Administrator reserves right to require dismissal from site, workers deemed incompetent or careless.

.4 Decisions as to standard or fitness of quality of Work in cases of dispute rest solely with Contract Administrator, whose decision is final.

1.10 COORDINATION

.1 Ensure cooperation of workers during the Work. Maintain efficient and continuous supervision.

.2 Ensure Work of various Subcontractors does not conflict or create interference.

.3 Be responsible for the proper coordination and placement of openings, sleeves, and accessories.

.4 Supply all items required to be built in as and when required, together with templates, measurements and shop drawings.

.5 Ensure all workers examine the drawings and specifications covering the Work of others that may affect the performance of their own Work. Examine the Work of others and report to the Contract Administrator, in writing, any defects, or deficiencies that may affect the Work. In the absence of any report, the Contractor shall be held to have waived all claims for damage to or defects in such Work.

.6 Ensure that components openings that are required for the installation of Work is coordinated. Furnish the necessary information to the sections concerned in ample time to permit allowance for such items. Failure to comply with this requirement does not relieve the party at fault of the cost of cutting or drilling at a later date and subsequent patching.

1.11 CONCEALMENT

.1 In finished areas, conceal pipes, ducts, and wiring in floors, walls, and ceilings, except where indicated otherwise.

.2 Before installation, inform Contract Administrator if there is interference. Install as directed by Contract Administrator.

1.12 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.13 PROTECTION OF WORK IN PROGRESS

.1 Protect Work completed or in progress.

.2 Prevent overloading of any part of the building. Do not cut, drill, or otherwise sleeve any load bearing structural member unless specifically indicated on drawings or in Specifications without written approval of the Contract Administrator.

1.14 EXISTING UTILITIES

.1 When connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and building occupants and pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

END OF SECTION

1.1 MATERIALS

.1 Required for original installation.

.2 Change in materials or products not permitted unless previously approved by Contract Administrator during Bid period.

1.2 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which are to be exposed by uncovering work.

1.3 EXECUTION

.1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.

.2 Fit several parts together, to integrate with other Work.

.3 Uncover Work to install ill-timed Work.

.4 Remove and replace defective and non-conforming Work.

.5 Remove samples of installed Work for testing.

.6 Restore damaged work with new products in accordance with requirements of Drawings and Specifications.

.7 Refinish damaged surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse, recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

1.1 REFERENCE STANDARDS

.1 Canadian Standards Association:

.1 CAN/CSA-Z317.2, Special Requirements for Heating, Ventilation and Air Conditioning (HVAC) Systems in Health Care Facilities.

.2 CAN/CSA-Z317.10, Handling of Waste Materials in Health Care Facilities and Veterinary Health Care Facilities.

.3 CAN/CSA-Z317.13, Infection Control during Construction, Renovation, and Maintenance of Health Care Facilities.

1.2 GENERAL

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

.2 Store volatile waste in covered metal containers and remove from premises at end of each working day.

.3 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.4 Remove waste materials and debris from the site at regularly scheduled times or dispose of as otherwise directed by the Contract Administrator. Do not burn or bury waste materials or debris on site.

.5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

1.3 MATERIALS

.1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.4 CLEANING DURATION DEMOLITION

.1 Provide on-site containers for collection of waste materials, and debris.

.2 Dispose of waste materials and debris off site at regularly scheduled intervals.

.3 Maintain the Work in tidy condition, free from accumulation of waste products and debris.

.4 Clean interior areas prior to start of finish work; maintain areas free of dust and other contaminants during finishing operations.

.5 Clean all roads, walks and adjacent surfaces in accordance with direction of the Contract Administrator.

1.5 FINAL CLEANING

.1 Refer to General Conditions.

.2 When the Work is complete, remove surplus products, tools, construction machinery and equipment. Remove waste products and debris and leave the Work clean and suitable for occupancy by the City.

.3 Leave the work 'broom clean' before the inspection process commences.

.4 Remove debris and surplus materials from site.

.5 Broom clean and wash exterior walks, steps and platforms.

.6 Broom clean parking lots, pads and paving accessible to vehicle traffic.

.7 Remove dirt and other disfigurations from exterior surfaces.

.8 Sweep and wash clean paved areas. Rake clean other surfaces of grounds.

1.6 SNOW REMOVAL

.1 If required, provide snow removal at Substantial Performance of the Work.

.2 Clean snow from surfaces accessible to pedestrians and vehicles such as parking lots, pads and paving, sidewalks and pathways, steps, platforms and decks.

.3 Only temporary stockpiling of snow during removal process is permitted. Promptly remove stockpiled snow from site.

END OF SECTION

1.1 SECTION INCLUDES

.1 Requirements for waste management goals, waste management plan and waste management plan implementation.

1.2 RELATED REQUIREMENTS

.1 Section 02 82 00.01 - Asbestos Abatement Requirements Type 1 Work Procedures: For waste management and disposal for hazardous or designated materials.

.2 Section 02 82 00 .02 - Asbestos Abatement Requirements Type 2 Work Procedures: For waste management and disposal requirements for hazardous or designated materials.

.3 Section 02 82 00 .03 - Asbestos Abatement Requirements Type 3 Work Procedures: For waste management and disposal requirements for hazardous or designated materials.

1.3 DEFINITIONS

.1 Construction Waste: Solid wastes such as building materials, packaging and rubble resulting from construction, paving and infrastructure.

.2 Dangerous Goods: Product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.3 Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.

.4 Hazardous Material: Product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.5 Hazardous Waste: Hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.6 Recyclable Waste: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

.7 Recycling Facility: A business that specializes in collecting, handling, processing, distributing, or remanufacturing waste materials generated by new construction projects, into products or materials that can be used for this project or by others.

.8 Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

.9 Salvage and Reuse: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

1.4 SUSTAINABILTY OBJECTIVES

.1 The Contractor shall use all means available to divert the greatest extent practical and economically feasible, construction waste from landfills and incinerators. Develop and implement a demolition waste management plan, with waste management goals required for LEED Silver V4 certification.

.2 Establish waste diversion goals for the project by identifying at least five materials both structural and non-structural targeted for diversion.

.3 Provide the names of the recycling facilities where the material will be taken and how the recycling facility will process the material.

.4 Collect and record on-going waste diversion rates (landfill and recycled) weights to provide a final waste diversion report.

1.5 ACTION SUBMITTALS

.1 Submit draft waste management plan to the Contract Administrator prior to project start up meeting.

1.6 INFORMATIONAL SUBMITTALS

.1 Waste Reduction Progress Reports: Submit a monthly report to the Contract Coordinator and include the following information:

.1 Material category.

.2 Generation point of waste.

.3 Total quantity of waste in tons (tonnes)

.4 Quantity of waste salvaged, both estimated and actual in tons (tonnes).

.5 Quantity of waste recycled, both estimated and actual in tons (tonnes).

.6 Total quantity of waste recovered (salvaged plus recycled) in tons (tonnes).

.7 Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

.2 Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

.3 Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

.4 Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.7 WASTE MANAGEMENT PLAN

.1 General: Develop a waste management plan according to requirements in this Section and Sections 02 82 00.01, 02 82 00.02, and 02 82 00.03. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume but use same units of measure throughout waste management plan.

.2 Goals: Establish waste diversion goals for the project by identifying at least five materials targeted for diversion.

.3 Waste: Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work.

.4 Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

.1 Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.

.2 Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.

.3 Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

.5 Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1.8 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be reused, recycled and salvaged in locations as directed by Contract Administrator.

.2 Unless specified otherwise, materials for removal do not become Contractor's property.

.3 Use the following paragraph if material is to be turned over to Consultant.

.4 Protect, stockpile, store and catalogue salvaged items.

.5 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.6 Use the following paragraph for demolition projects.

.7 Protect structural components not removed for demolition from movement or damage.

.8 Use the following paragraph for demolition projects.

.9 Support affected structures. If safety of building is endangered, cease operations and immediately notify Contract Administrator.

.10 Protect surface drainage, storm sewers, sanitary sewers, and utility services from damage and blockage.

1.9 SCHEDULING

.1 Coordinate work with other activities at site to ensure timely and orderly progress of the work.

1.10 PREPARATION

.1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

1.11 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of adjacent property owners and public roadways.

.2 Maintain security measures established by the City.

.3 Provide temporary security measures as approved by Contract Administrator.

1.12 WASTE MANAGEMENT PLAN IMPLEMENTATION

.1 Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

.2 Minimize waste disposal to landfills, employ processes that ensure the generation of as little waste as possible, including the prevention of damage due to mishandling, improper storage, contamination, inadequate protection or other factors, as well as minimizing over packaging and poor quantity estimating.

.3 Of the inevitable waste that is generated, as many of the waste materials as economically feasible are to be salvaged for reuse and or recycled. However, the Contractor is to abide by any direction from Contract Authority regarding recyclable waste. Use of waste disposal in landfills or incinerators is to be minimized.

.4 Provide and pay for the proper disposal and salvage of construction materials and waste.

.5 Provide completely enclosed garbage containers.

.6 Use only brokerage, storage, transfer and disposal facilities licensed by authorities having jurisdiction for the recycling and disposal of waste material.

.7 Material Handling Procedures: Prevent contamination of material to be recycled and salvaged, and handle material consistent with requirements for acceptance by designated facilitates; where space permits, source separation is recommended; where material must be co-mingled, they must be taken to a processing facility for separation off site.

.8 Manager: Designate an on-site party responsible for instructing workers and overseeing and documenting results of the waste management plan for Project.

.9 Distribution: Distribute copies of the waste management plan to the Job Site Foreman, each Subcontractor, and the Contract Administrator.

.10 Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by parties at appropriate stages of Project.

.11 Separation Facilities: Lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, and return. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.

.12 Hazardous Wastes: Hazardous wastes shall be separated, stored, and disposed of according to local regulations.

.13 Application for Progress Payments: Submit with each Application for Progress Payment a Summary of Waste Generated by the Project:

.1 Failure to submit information shall render Application for Payment incomplete and delay Progress Payment.

.2 Submit summary on a form acceptable to City containing the following information:

.1 Amount in tonnes or cubic metres (tons or cubic yards) of material land filled from the Project.

.2 Identity of the landfill.

.3 Total disposal cost. Include manifests, weight tickets, receipt, and invoices.

.4 Each material recycled, reused, or salvaged from the Project.

.5 Amount tonnes or cubic metres (tons or cubic yards).

.6 Date removed from the job site, the receiving party, and the transportation cost.

.7 Amount of any money paid or received for the recycled or salvaged material.

.8 Net total cost or savings of salvage or recycling each material.

.3 Attach manifests, weight tickets, receipts, and invoices.

.4 The City will pay all tipping fees for non-recyclable material disposal at City owned landfill.

1.13 DISPOSAL OF WASTE

.1 Burying of rubbish and waste materials is prohibited unless approved by the Contract Authority.

.2 Disposal of waste volatile materials, mineral spirits, oil, paint thinner, into waterways, storm, or sanitary sewers is prohibited.

1.14 CLEANING

.1 Remove tools and waste materials on completion of work, leave work area in clean and orderly condition.

.2 Clean-up work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

1.15 SPECIAL PROGRAMS

.1 Be responsible for final implementation of programs involving tax credits or rebates or similar incentives related to recycling, if applicable to the Project.

.2 A current listing of recyclers specializing in specific categories of materials may be obtained from applicable government agencies. Most provinces have an Internet web site which offers information and suggested recycling sites.

.3 Obtain information packets relevant to all the above listed programs prior to starting work on the Project and confirm facility's ability to accept waste from Project.

.4 Document work methods, recycled materials, alternate disposal methods that qualify for tax credits, rebates, and other savings under programs listed by authority having jurisdiction.

END OF SECTION

1.1 SECTION INCLUDES

.1 As-built, samples, and specifications.

.2 Equipment and systems.

.3 Product data, materials, and related information.

.4 Operation and maintenance data.

.5 Warranties and bonds.

.6 Warranty Management Plan.

1.2 SUBMISSION

.1 Submittals: In accordance with Section 01 33 00 - Submittal Procedures.

1.3 FORMAT

.1 Three (3) hard copy (binders), one electronic format (PDF). Organize data in the form of an instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf, letter size format with spine and face pockets.

.3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.

.4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by systems, process flow, under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: Manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

1.4 CONTENTS – EACH VOLUME

.1 Table of Contents: provide title of project;

.1 Date of submission; names,

.2 Addresses and telephone numbers of Contract Administrator and Contractor with name of responsible parties;

.3 Schedule of products and systems indexed to content of volume.

.2 For each product or system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.5 AS-BUILTS AND SAMPLES

.1 Conform to D17 - As-Built Drawings and as follows.

.2 Maintain at the site for Contract Administrator one record copy of:

.1 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.

.3 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.4 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.5 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.6 Keep record documents and samples available for review by Contract Administrator.

1.6 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on three (3) sets of black line opaque drawings, and within copy of Specifications. Make arrangements of black line opaque copies.

.2 Annotate with coloured felt tip marking pens, maintaining separate colours for each major system, for recording changed information.

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and Shop Drawings: Legibly mark each item to record actual construction, including:

.1 Measured locations of utilities and appurtenances referenced to visible and accessible features of construction.

.2 Field changes of dimension and detail.

.3 Changes made by change orders.

.4 Details not on original Contract Drawings.

.5 References to related shop drawings and modifications.

.5 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.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.7 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 principals.

.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 the City’s permission, leave date of beginning of time of warranty until the Date of Total 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.

1.8 WARRANTY MANAGEMENT PLAN

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Contract Administrator for review.

.3 Warranty management plan to include required actions and documents to assure that the City receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Submit, warranty information made available during construction phase, to Contract Administrator for review prior to each monthly pay estimate.

.6 Assemble approved information in binder and submit upon acceptance of work.

.7 Except for items put into use with The City’s permission, leave date of beginning of time of warranty until Date of Total Performance is determined.

.8 Conduct joint four-month and nine-month warranty inspection, measured from time of acceptance, by Contract Administrator.

.9 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractor, Subcontractors, manufacturers or suppliers involved.

.2 Contractor's plans for attendance at four and nine-month post-construction warranty inspections.

.3 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

.10 Respond in a timely manner to oral or written notification of required construction warranty repair work.

.11 Written verification will follow oral instructions. Failure to respond will be cause for the Contract Administrator to proceed with action against Contractor.

1.9 PRE-WARRANTY CONFERENCE

.1 Meet with Contract Administrator, to develop understanding of requirements of this section. Schedule meeting prior to contract completion, and at time designated by Contract Administrator.

.2 Contract Administrator will establish communication procedures for:

.1 Notification of construction warranty defects.

.2 Determine priorities for type of defect.

.3 Determine reasonable time for response.

.3 Provide name, telephone number and address of licensed and bonded company that is authorized to initiate and pursue construction warranty work action.

.4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

END OF SECTION

1.1 SECTION INCLUDES

.1 Labour, equipment and services necessary for vibration monitoring during structure demolition, to the approval of the Contract Administrator.

1.2 RELATED REQUIREMENTS

.1 Section 02 23 23 - Vibration Instrumentation.

.2 Section 02 41 16 - Structure Demolition.

1.3 DEFINITIONS

.1 Accelerometer:

.1 Transducer whose electrical output responds directly to Acceleration.

.2 Due to the frequency range, Accelerometers are ideal for most types of rotating equipment, making them the most used transducer for vibration measurements.

.2 Acceleration:

.1 Rate of change of Velocity depicted as g's or in mm/s2.

.2 Acceleration is not constant but varies through vibration cycle, reaching maximum levels as Velocity reaches its minimum, typically when particular mass decelerated to a stop and about to begin accelerating again.

.3 Daytime: Hours between 7:00 am and 7:00 pm.

.4 Evening: Hours between 7:00 pm and 11:00 pm.

.5 Monitoring Period:

.1 Monitoring Period refers to period of time no greater than 20 minutes. A 24-hour day to be divided into 20-minute blocks, where data will be collected and reported.

.6 Night-time: Hours between 11:00 pm to 7:00 am.

.7 Peak Particle Velocity:

.1 Highest particle Velocity recorded during particular vibration event over 3 axes.

.2 Unit: Millimetres per second (mm/s).

.3 Symbol: PPV or Vpeak.

.8 Root Mean Square (RMS) Velocity:

.1 Square root of average of squared instantaneous vibration Velocity (V) over specified time interval or integration time (T) reported in millimetres per second (mm/s).

.2 For vibration monitoring, integration time (T) is one second.

.3 Unit: Millimetres per second (mm/s).

.4 Symbol: V_{RMS}.

.9 Utilities:

.1 Structures including, but not limited to natural gas mains, watermains, sewers Manitoba Hydro electrical cables, and Manitoba Hydro concrete conduit.

.10 Velocity:

.1 Rate of change in position, measured in distance per unit of time.

.2 When measuring vibration signals, Velocity represents the rate of change in displacement and expressed in inches (in) or millimetres (mm) per second.

.11 Vibration Alert Level:

.1 Value of instrumentation readings at which demolition operations cease, make Site and affected properties secure, and take necessary measures to mitigate vibration and assure safety of Work and public. Vibration Alert Level for each instrument represents maximum permissible vibration levels. For purpose of vibration monitoring and reporting alert levels are presented in the Table 1.03.11.1 below:

Table 1.03.11.1 Vibration Alert Level

Monitored activity	Alert Level
Vibration in buildings during: Daytime and Evening	PPV < 8 mm/sec for frequencies between 1 - 4 Hz. PPV < 15 mm/sec for frequencies between 4 - 10 Hz. PPV < 25 mm/sec for frequencies between > 10 Hz. For older or heritage buildings reduce limits above by 50%.
Vibration in buildings during: Night-time	PPV < 3 mm/sec for frequencies between 1 - 100 Hz.
Vibration in Utilities (as measured directly on the utility)	Modern structures: PPV < 25 mm/sec for frequencies between 1 - 100 Hz. Older structures: PPV < 10 mm/sec for frequencies between 1 - 100 Hz.

.2 Should limits in Table 1.03.11.1 be exceeded and Work stopped, Contractor responsible for costs associated with Work stoppage.

.12 Vibration Baseline Reading:

.1 Initial readings taken prior to demolition to provide baseline for reference to review and alert levels.

.13 Vibration Review Level:

.1 Assess the necessity of altering method, rate or sequence of demolition to reduce vibration levels for the value of instrumentation readings.

.2 Review levels presented in Table 1.03.13.1 below:

Table 1.03.13.1 Vibration Review Level	
Monitored activity	Review Level
Vibration in buildings during: Daytime and Evening	PPV < 5 mm/sec for frequencies between 1 - 4 Hz. PPV < 10 mm/sec for frequencies between 4 - 10 Hz. PPV < 20 mm/sec for frequencies between > 10 Hz. For older or heritage buildings reduce limits above by 50%.
Vibration in buildings during: Night-time	PPV < 1 mm/sec for frequencies between 1 - 100 Hz.
Vibration in Utilities (as measured directly on the utility)	Modern structures: PPV < 12 mm/sec for frequencies between 1 - 100 Hz. Older structures: PPV < 5 mm/sec for frequencies between 1 - 100 Hz.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Contractor to arrange for Vibration Monitoring in accordance with contract documents and to the approval of the Contract Administrator.

.2 Submit Vibration Reports in accordance with Section 01 33 00 Submittal Procedures.

.3 Documentation Package:

.1 Vibration Management Plan.

.2 Quality Management Plan:

.3 Calibration records and certificates.

.4 Monitoring Submittals Package:

.1 Baseline Vibration Report.

.2 Weekly Vibration Report.

.3 Records of complaints.

.5 Closeout Submittals Package:

.1 Submit Final Vibration Report including the following:

.1 Summary of vibration levels collected during monitoring program.

.2 Summary of exceedance.

.3 Summary of vibration complaints.

.4 Digital copy of complete dataset collected in Excel 2010 format.

1.5 QUALITY ASSURANCE

.1 Vibration Engineer Qualifications:

.1 Professional Engineer, licensed in Province of Manitoba, with minimum ten-year experience in construction vibration monitoring.

.2 Vibration Technician Qualifications:

.1 Minimum five-year monitoring experience with construction vibration monitoring.

.2 Vibration Engineers above may also conduct vibration monitoring.

.3 Vibration Management Plan:

.1 Submit within two weeks of Letter of Intent Vibration Management Plan including, but not limited to:

.1 Identify and map construction related vibration sources and associated controls.

.2 Identify potential sensitive receptors to vibration.

.3 Identify vibration criteria.

.4 Identify and map sensitive receptors for monitoring.

.5 Detailed vibration monitoring programs.

.6 Specify vibration controls.

.7 Qualifications of vibration engineer and vibration technician.

.8 Detailed plan of instrumentation types, numbers, locations, and layouts in conjunction with existing structures, subsurface utilities and private property. Include identification, elevation, station, offset, and coordinates for each instrumentation location.

.9 Methods statements for installing, monitoring, reporting, maintaining, and protecting instrumentation. Assure quality with following:

.1 Schedule for report submission.

.2 Roles and responsibilities.

.3 Complaints management procedure.

.4 Record keeping procedure.

.4 Quality Management Plan:

.1 Submit within two weeks of Letter of Intent Quality Management Plan including, but not limited to:

.1 Description of control measures to ensure calibration records of equipment (both annual calibration, and certification and Site calibration) are kept to date.

.2 Description of control measures to ensure proper maintenance of installed equipment in accordance with manufacturer's specifications.

.3 Description of control measures to reduce amount of data lost due to power failures.

.4 Description of control measures to reduce amount of data lost due to equipment failures, including mitigation actions in case of potential failures.

.5 Description of control measures in place for review and quality assurance of monthly reports sent to Contract Administrator.

.5 Calibration Records and Certificates:

.1 Submit calibration records and certificates 15 days before monitoring activities, for equipment used on site.

.2 Re-submit calibration certificates within seven days of issuance for equipment sent for calibration during duration of monitoring program.

.3 List of vibration monitoring equipment to be used, associated hardware (for example, pre-amplifiers, accelerometers, geo-phones, calibrators) include following:

.1 Manufacturer's name.

.2 Model.

.3 Serial numbers for components (for example, unit, pre-amplifiers, accelerometers).

.6 Baseline Vibration Report:

.1 Conduct baseline vibration monitoring minimum three weeks in advance of construction start.

.2 Conduct baseline vibration monitoring for minimum 24-hour period.

.3 Submit Baseline Vibration Report within seven days of baseline monitoring completion and prior to construction start.

.4 Include following information:

.1 Identify and map location of monitoring.

.2 Identify and map main sources of vibration.

.3 Identify baseline Monitoring Period, for each monitoring location, include following information in tabular form:

.1 Number of Monitoring Periods recorded (20-minute blocks).

.2 Number of Monitoring Periods not recorded due to regular maintenance and download operations.

.3 Number of Monitoring Periods not recorded due to equipment failure.

.4 Number of Monitoring Periods not recorded due to power failure.

.4 For each monitoring location, provide following information for each Monitoring Period in tabular form:

.1 Peak Particle Velocity, PPV.

.2 Frequency of recorded Peak Particle Velocity, PPV.

.3 Average hourly wind speed.

.4 Precipitation.

.5 Notes on data not reported within Monitoring Period, in following decreasing order of importance:

.1 Equipment failure.

.2 Power failure.

.7 Weekly Vibration Report:

.1 Submit within four business days after end of week, including the following information:

.1 Identify and map location of monitoring.

.2 Identify and map main sources of vibrations.

.3 For each monitoring location, provide the following information for each Monitoring Period in tabular form:

.1 Peak Particle Velocity, PPV.

.2 Frequency of the recorded Peak Particle Velocity, PPV.

.3 Precipitation.

.4 Notes on data not reported within the Monitoring Period, in the following decreasing order of importance:

.1 Equipment failure.

.2 Power failure.

.5 Identify vibration sources contributing to vibration levels during that Monitoring Period and reference to either on-site observations by monitoring technician or record of site activities by Contractor.

.4 Identify for the week, per monitoring location, and the following information in tabular form:

.1 Number of Monitoring Periods recorded (20-minute blocks).

.2 Number of Monitoring Periods not recorded due to regular maintenance and download operations.

.3 Number of Monitoring Periods not recorded due to equipment failure.

.4 Number of Monitoring Periods not recorded due to power failure.

.5 Number of Monitoring Periods exceeding the vibration review and alert levels.

.6 Number of Monitoring Periods vibration levels exceedance attributed to the site activities.

.5 Identify mitigation actions for equipment failure or power failures.

.6 Identify complaints registered during that week and disposition of complaints.

.7 Identify mitigation measures required addressing vibration level exceeded.

.8 Final Vibration Report:

.1 Submit within 30 Days of Work completion the following information:

.1 Identify and map location of monitoring locations.

.2 For each monitoring location provide following information for each Monitoring Period in tabular form:

.1 Peak Particle Velocity, PPV.

.2 Frequency of the recorded Peak Particle Velocity, PPV.

.3 Average hourly wind speed.

.4 Precipitation.

.5 Notes on data not reported within Monitoring Period, in following decreasing order of importance:

.1 Equipment failure.

.2 Power failure.

.3 Identify for each monitoring location, the following information in tabular form:

.1 Number of Monitoring Periods recorded (20-minute blocks).

.2 Number of Monitoring Periods not recorded due to regular maintenance and download operations.

.3 Number of Monitoring Periods not recorded due to equipment failure.

.4 Number of Monitoring Periods not recorded due to power failure.

.5 Number of Monitoring Periods vibration levels exceedance.

.6 Number of Monitoring Periods vibration levels exceedance attributed to site activities.

.7 Identify complaints registered and disposition of complaints.

.8 Supply tabular information in Excel 2010 digital format.

.9 Complaint Document Requirements:

.1 Implement, coordinate and maintain complaint system in place for entire duration of Work.

.2 Submit records of complaints received within one hour of reception.

.3 Prepare and submit to Contract Administrator assessment and disposition of complaint within 48 hours of reception of complaint.

.4 If compliant formalized to Contract Administrator, submit an assessment and disposition of the complaint within seven days of reception of complaint at no cost to the City.

.5 Assessment and disposition report to be filed by vibration engineer to include following minimum information:

.1 Records of complaint.

.2 List of site activities during period of complaint.

.3 Disposition of complaint including, but not limited to mitigation measures to be implemented.

1.6 SITE CONDITIONS

.1 Refer to Section 02 23 23 for specific guidance on installation of equipment.

.2 When installing vibration monitoring equipment on public property, obtain appropriate permits for installation on utilities and notify authorities having jurisdiction of monitoring installation.

.3 Install vibration monitors prior to start of Work.

.4 Contract Administrator reserves the right to request additional manufacturer documentation for vibration monitoring equipment used, with no extra costs to the City.

1.7 VIBRATION MONITORING EQUIPMENT

.1 Comply with Section 02 23 23 - Vibration Instrumentation.

1.8 PREPARATION

.1 Obtain written permission from building owners for instrumentation to be installed on their land or affixed to their buildings prior to installing instruments, and for access for purpose of monitoring.

.2 The monitoring program specified will not relieve the Contractor of its responsibility for undertaking whatever actions are required, including installation of additional instrumentation and monitoring, to ensure that Work proceeds in a safe and secure manner, and in conformance with requirements of Contract Documents.

1.9 INSTALLATION

.1 Comply with Section 02 23 23 - Vibration Instrumentation.

.2 Provide adequate number of vibration monitoring equipment for execution of Work. Minimum number of vibration monitoring equipment to cover the following buildings: As indicated in Appendix 1, Winnipeg City Hall, Cultural & Community Centre, Harmony Mansion, One88 Church Community, Red River College – The Roblin Centre, Red River College – Buhler Learning Commons, Winnipeg Police Credit Union Ltd., Heartland International English School, Miss Browns, European School of Esthetics, Paterson Global Foods Institute.

.3 Install vibration monitoring equipment for execution of this Section in accordance with requirements of Section 02 23 23 - Vibration Instrumentation.

.4 Vibration Engineer and Vibration Technician:

.1 Attend monitoring on a weekly basis for monitoring, relocation of equipment and review of site activities.

.2 Perform maintenance and changes in location of monitoring equipment as required, at no extra cost to the City.

.5 Install vibration monitoring equipment on site such that preference is given to foundation/basement floor at corner/wall closest to construction work front from buildings.

.6 Relocate vibration monitoring equipment to adequately monitor most affected building or structure.

1.10 MONITORING

.1 Supply equipment with remote data delivery capabilities.

.2 Immediately notify Contract Administrator in case an exceedance of the Vibration Alert Level is recorded.

.3 Define and implement at no cost to the City any mitigation measures required to comply with the Vibration Alert Levels defined in this Section.

.4 Assess any complaints (at the proposed locations or any other locations) arising from the construction activities at no cost to the City. Provide to Contract Administrator measurement results including an interpretation by the vibration engineer of the possible impacts such construction vibrations might have on the building or structure of the complaint.

1.11 FIELD QUALITY CONTROL

.1 Comply with Section 02 23 23 - Vibration Instrumentation.

1.12 CLEANING

.1 Clean-up and restore area upon completion of Work in accordance with Section 02 23 23 -Vibration Instrumentation and to the conditions prior to installation.

1.13 PROTECTION

.1 Refer to Section 02 23 23 - Vibration Instrumentation.

END OF SECTION

1.1 SECTION INCLUDES

.1 Instrumentation to used for vibration monitoring of the Work including calibration, installation, operation and maintenance of vibration instrumentation.

1.2 RELATED REQUIREMENTS

.1 Section 02 23 06 - Vibration Monitoring: For requirements to monitor vibration of the Work

.2 Section 02 41 16 - Structure Demolition.

1.3 DEFINITIONS

.1 Accelerometer:

.1 A transducer whose electrical output responds directly to acceleration. Accelerometers typically cover much wider frequency range, allowing them to pick up signals not present with other types of transducers. Due to frequency range, Accelerometers are ideal for most types of rotating equipment, making them the most used transducer for vibration measurements.

.2 Velocity:

.1 Rate of change in position, measured in distance per unit of time. When measuring vibration signals, Velocity also represents the rate of change in displacement and is expressed in inches (in) or millimetres (mm) per second.

.3 Acceleration:

.1 Rate of change of Velocity depicted as g's or in mm/s^2.

.2 Acceleration is not constant but will vary through the vibration cycle, reaching maximum levels as Velocity reaches its minimum. Typically, when a particular mass has decelerated to a stop and is about to begin accelerating again.

.4 Peak Particle Velocity:

.1 Highest particle Velocity which is recorded during a particular vibration event over the 3 axes.

.2 Unit: Millimetres per second (mm/s).

.3 Symbol: PPV.

.5 Root Mean Square (RMS) Velocity:

.1 Square root of the average of the squared instantaneous vibration Velocity (V) over a specified time interval or integration time (T) reported in millimetres per second (mm/s).

.2 For the purposes of vibration monitoring the integration time (T) is one second.

.3 Unit: Millimetres per second (mm/s).

.4 Symbol: v_{RMS}.

.6 Valid Monitoring Data:

.1 Monitoring data recorded and downloaded complying to the following conditions:

.2 60 minutes integration time of the recording.

.3 Data not fall within a period where Inclement Weather Conditions recorded.

.7 Inclement Weather Conditions:

.1 Hourly period atmospheric weather conditions on Site.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Within five days after Letter of Intent, submit cash flow forecast of approximate costs of the work compiled on a monthly basis over the term of the Contract.

.3 Calibration Records and Certificates for Vibration Monitoring Equipment:

.1 Submit calibration records and certificates, 15 days before monitoring activities, for the vibration monitoring equipment to be used.

.2 List of vibration monitoring equipment, associated hardware, software (for examples, unit, pre-amplifiers, accelerometers) and the following:

.1 Manufacturer’s name.

.2 Model.

.3 Serial numbers for all components.

.4 Keep a copy of the installed equipment calibration records and certificates on site for Contract Administrator review.

.5 Inform in advance if any planned changes to equipment due to regular maintenance operations.

.6 Inform Contract Administrator within 24 hours of any equipment failure, corrective actions taken, and loss of information.

1.5 QUALITY ASSURANCE

.1 Source Quality Control:

.1 Calibrate vibration monitoring instrument by manufacturer, or other authorized independent third-party calibration company, to appropriate standard as set out in the manufacturer documentation.

.2 Provide Laboratory Calibration Certificate issued in the past twelve months of calibration.

1.6 VIBRATION MONITORING EQUIPMENT

.1 Minimum Equipment Requirements:

.1 Capable of measuring tri-axial, in-ground, PPV in mm/s with a frequency range of 1 to 100 Hz.

.2 Direct sensor axis towards the source of vibration concern at each location.

.3 Monitors that building vibration and are located inside a building:

.1 Install at measure the foundation or basement floor at the corner or wall closest to the construction.

.2 Install at level to ensure accurate recording of vibration levels.

.4 Monitors that measure building vibration and are located outdoors:

.1 Install at ground level, or shallow-buried (150-300 mm deep) in the ground.

.2 Install at level to ensure accurate recording of vibration levels.

.5 Capable of remotely send information (as a minimum PPV and time of recording) pertaining to exceedance of the review level.

1.7 PREPARATION

.1 Minimum Equipment Requirements:

.1 Capable of measuring tri-axial, in-ground, PPV in mm/s with a frequency range of 1 to 100 Hz.

.2 Direct sensor axis towards the source of vibration concern at each location.

.3 Monitors that building vibration and are located inside a building:

.1 Install at measure the foundation or basement floor at the corner or wall closest to the construction.

.2 Install at level to ensure accurate recording of vibration levels.

.4 Monitors that measure building vibration and are located outdoors:

.1 Install at ground level, or shallow-buried (150-300 mm deep) in the ground.

.2 Install at level to ensure accurate recording of vibration levels.

.5 Capable of remotely send information (as a minimum PPV and time of recording) pertaining to exceedance of the review level.

1.8 INSTALLATION

.1 Vibration Monitoring Equipment:

.1 Field locate positions of instrumentation in accordance with Vibration Management Plan referenced in Section 02 23 06 - Vibration Monitoring.

.2 Inform Contract Administrator of planned changes in location prior to proceeding. Submit plan of changes for Contract Administrator review. Update Vibration Management Plan accordingly.

.3 Install access, such as temporary or mobile platforms for instrumentation installation and data collection on or in temporary Works.

.4 Provide and fabricate protection to installed vibration monitor.

.5 Install power supply for vibration monitors and for general area lighting as required by Contract Administrator during installation of instruments and for reading of instruments installed on or within temporary Work.

.6 Supply and operate vibration monitoring equipment to complete Work in accordance with Section 02 23 06 - Vibration Monitoring.

.7 Provide, monitor, and interpret data from additional instrumentation necessary to control its method of operation, ensure safety of personnel and ensure integrity of Work, at no extra cost to the City. Supply data from additional instrumentation in similar form in accordance with Section 02 23 06 -Vibration Monitoring.

.8 Calibrate, install, operate and maintain instruments in accordance with manufacturer's recommendation. Install within accuracy limits specified by manufacturer.

1.9 COMMISSIONING

.1 Operational Performance in General Conformance with Table 3.03.1:

Table 3.03.1 Instrumentation Operational Performance

Area	Service Definition	Minimum Service Level
System Availability	Monitoring system is considered to be available if the application is able to collect and store data and if such information can further be downloaded and presented to Contract Administrator upon request. Regular maintenance operations, such as calibration and data download are not considered outages as long as the duration of such operation can be completed, and the equipment be placed back into service within two hours of the start of the maintenance period.	90%
Planned Outage	Planned outage, agreed in writing with Contract Administrator and given seven days in advance and be less than four hours in duration.	100%
Fault Rectification	Faults with monitoring equipment, rectified within a target time of four business days from identification of the fault. Notify Contract Administrator within 48 hours of identification of fault.	90%

.2 Be responsible for maintaining the following functional performance related to vibration monitoring equipment:

.1 Inform Contract Administrator in writing, minimum seven days in advance, of planned changes in equipment due to regular maintenance or calibration required. Provide replacement unit at time of unit removal on Site at no extra cost to the City.

.2 Inform Contract Administrator in writing, within eight hours of occurrence, of damage sustained during performance of Work or un-planned maintenance of equipment that occurs. If outage is to last more than four hours, provide replacement unit within 48 hours at no extra cost to the City.

.3 If equipment failure, including power failure, results in non-compliance with Section 02 23 06 - Vibration Monitoring, assume responsibility for non-compliance.

1.10 PROTECTION

.1 Prevent traffic in proximity of monitoring equipment.

.2 Protect equipment from acts of vandalism or destruction.

.3 Protect from damage during demolition and maintain exposed instrumentation components. Repair or replace instruments damaged by performance of Work, to Contract Administrator's acceptance at no extra cost.

.4 Notify Contract Administrator of damage within eight hours of occurrence. Submit to Contract Administrator corrective action plan within 24 hours of occurrence.

END OF SECTION

1.1 SUMMARY

.1 Section Includes:

.1 Demolition and removal of buildings and site improvements.

.2 Partial removing below-grade construction.

.3 Disconnecting, capping or sealing, and abandoning in-place or removing site utilities.

.4 Salvaging items for reuse by the City.

.5 Post demolition subsurface site utility and foundation survey requirements.

.6 Pest and Rodent control.

1.2 RELATED REQUIREMENTS

.1 Section 02 81 01 - Hazardous Materials

.2 Section 02 82 00.01 - Asbestos Abatement Type 1 Precautions

.3 Section 02 82 00.02 - Asbestos Abatement Type 2 Precautions

.4 Section 02 82 00.03 - Asbestos Abatement Type 3 Precautions

.5 Section 31 23 33 - Excavating and Backfilling

1.3 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI)

.1 ANSI/ASSP A10.6-2006 (R2016), Safety and Health Program Requirements for Demolition Operations

.2 Canadian Environmental Assessment Agency (CEAA)

.3 Canadian Environmental Protection Act (CEPA)

.1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulation

.4 Canadian Standards Association (CSA International).

.1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures

.5 Environmental protection Agency (EPA)

.1 EPA CFR 86.098-10

.2 EPA CFR 86.098-11, Emission standards for 1998 and later model year diesel heavy-duty engines and vehicles.

.3 EPA CFR 86.098-23, Required data

.4 EPA 40 CFR 82 Subpart A - Protection of Stratospheric Ozone

.5 EPA 832/R-92-005, Storm Water Management for Construction Activities, Developing Pollution Prevention

.6 National Fire Protection Association (NFPA)

.1 NFPA 241 (2019), Standard for Safeguarding Construction, Alteration, and Demolition Operations

.7 Province of Manitoba

.1 The Dangerous Goods Handling and Transportation Act C.C.S.M c. D12 (DGHTA)

.2 CCME PN 1326, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products

.8 Underwriters Laboratories of Canada (ULC)

.1 ULC/ORD-C58.15, Overfill Protection Devices for Flammable Liquid Storage Tanks

.2 CAN/ULC-S660-08, Standard for Non-metallic Underground Piping for

.3 Flammable and Combustible Liquids.

1.4 DEFINITIONS

.1 Construction Waste: Solid wastes such as building materials, packaging and rubble resulting from construction, paving and infrastructure.

.2 Dangerous Goods: Product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.3 Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.

.4 Hazardous Material: Product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.5 Hazardous Waste: Hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.6 Recyclable Waste: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

.7 Recycling Facility: A business that specializes in collecting, handling, processing, distributing, or remanufacturing waste materials generated by new construction projects, into products or materials that can be used for this project or by others.

.8 Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.

.9 Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to the City ready to store. Include fasteners or brackets needed for reattachment elsewhere.

.10 Waste Audit (WA): Detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill.

.11 Waste Management Co-ordinator (WMC): Contractor representative responsible for supervising waste management activities as well as co-ordinating related, required submittal and reporting requirements.

.12 Waste Management Plan (WMP): A document which outlines the strategy for waste diversion from the beginning to the end of a construction or demolition project

.13 Waste Reduction Workplan (WRW): Written report which addresses opportunities for reduction, reuse, or recycling of materials. WRW is based on information acquired from WA.

1.5 MATERIAL OWNERSHIP

.1 Unless otherwise indicated, demolition waste becomes property of Contractor.

.2 Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to the City that may be uncovered during demolition remain the property of the City.

.1 Carefully salvage in a manner to prevent damage and promptly return to the City.

.3 The City shall forfeit ownership of any other salvageable materials that remain on the subject property at time of contract commencement. This includes, but is not limited to:

- Commercial Kitchen Equipment
- Diesel Generator
- Cooling Tower and Chiller – 350 tonne chiller about two years old (City retains refrigerant and control panel)
- Other Mechanical and HVAC equipment.

In doing so, it is the City's intent that the successful proponent will identify market opportunities and estimate values of said salvageable materials so as to reduce the overall value of the contract

1.6 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Construction Meeting: Convene pre-demolition meeting one week prior to beginning work of this Section, with Contract Administrator and the City to:

.1 Inspect and discuss condition of construction to be demolished.

.2 Review structural load limitations of existing structures.

.3 Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.

.4 Review and finalize protection requirements.

.5 Review procedures for noise control and dust control.

.6 Review procedures for protection of adjacent buildings.

.7 Review items to be salvaged and returned to the City.

.8 Establish lines of authority and lines of communication

.9 Identify start-up requirements, and

.10 Other items pertaining to the Contract

.2 Project Meetings: Conduct Job Progress Meetings in accordance with Section D23 - Job Meetings.

.3 Scheduling:

.1 Provide demolition schedule in accordance with Section D16 using Critical Path Method (CPM).

.2 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.

.1 In event of unforeseen delay notify Contract Administrator in writing.

1.7 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures and Section 01 74 21 - Construction/Demolition and Waste Management and Disposal.

.2 Prior to beginning of Work submit detailed Environmental Protection Plan in accordance with Section 01 35 43 - Environmental Procedures and waste management plans in accordance with Section 01 74 21 - Construction/Demolition and Waste Management and Disposal

.3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.

.1 Failure to submit could result in hold back of final payment.

.2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled, or landfilled.

.3 For each material reused, sold, or recycled from project, include quantities by number, type, and size of items and the destination.

.4 For each material landfilled or incinerated from project, include amount of material and identity landfill, incinerator, or transfer station.

.4 Shop Drawings:

.1 Submit for review and approval demolition drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning.

.2 Submit demolition drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.

.5 Qualification Data:

.1 For refrigerant recovery technician.

.2 For post demolition site utility and foundation survey, qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Contract Administrator.

.3 For professional engineer's experience with providing engineering survey of existing conditions of the kind indicated, including documentation that engineer is registered or licensed in Province of Manitoba, Canada.

.6 Engineering Survey: Submit engineering survey of condition of adjacent structures.

.7 Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

.1 Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain.

.8 Schedule of Building Demolition Activities:

.1 Comply with Section D16 using Critical Path Method (CPM), and as follows:

.1 Arrange demolition schedule so as not to interfere with the City's on-site operations or operations of adjacent occupied buildings, and public vehicular traffic as far as practical.

.9 Pre-Demolition Photographs or Video:

.1 Comply with Section 01 32 33 - Photographic Documentation, and as follows:

.1 Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by salvage and demolition operations.

.2 Submit before the Work begins.

1.8 CLOSEOUT SUBMITTALS

.1 Inventory: Submit a list of items that have been removed and salvaged.

1.9 QUALITY ASSURANCE

.1 Regulatory Requirements: Ensure Work is performed in compliance with CEAA, CEPA, applicable Provincial/Territorial and Municipal regulations, and DGHTA.

.2 Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

1.10 STORAGE, HANDLING AND PROTECTION

.1 Comply with Section 01 74 21 - Construction/Demolition and Waste Management Disposal, and as follows:

.1 Separate and store materials produced during dismantling of structures in designated areas.

.1 Provide waybills for separated materials

.2 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities:

.1 On-site source separation is recommended.

.2 Remove co-mingled materials to off-site processing facility for separation.

1.11 DISPOSAL OF WASTES

.1 Comply with Section 01 74 21 - Construction/Demolition and Waste Management and Disposal, Waste Management Plan.

1.12 ENVIRONMENTAL PROTECTION

.1 Comply with Section 01 35 43 - Environmental Procedures.

1.13 USE OF SITE AND FACILITIES

.1 Comply with Section D2 – Scope of Work and Section 01 14 00 - Work Restrictions.

1.14 SITE CONDITIONS

.1 Buildings to be demolished will be vacated and their use discontinued before start of the Work.

.2 Buildings across from demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.

.1 Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.

.2 Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.

.3 Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.

.3 Conditions existing at time of inspection for bidding purpose will be maintained by the City as far as practical.

.4 Hazardous Materials: Present in buildings and structures to be demolished. A report on the presence of hazardous materials is attached to this document as an Appendix. Examine report to become aware of locations where hazardous materials are present.

.1 Hazardous material remediation is specified elsewhere in the Contract Documents.

.2 Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

.5 On-site storage or sale of removed items or materials is not permitted.

1.15 EQUIPMENT

.1 Equipment and Heavy Machinery:

.1 On-Road Vehicles To: CEPA-SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations, and CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.

.2 Off-Road Vehicles To: EPA CFR 86.098-10, and EPA CFR 86.098-11.

.2 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

1.16 PERFORMANCE REQUIREMENTS

.1 Regulatory Requirements: Comply with governing notification regulations of authority having jurisdiction before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

.2 Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

.3 Do demolition work in accordance with CSA S350, Code of Practice for Safety in Demolition of Structures.

1.17 SOIL MATERIALS

.1 Satisfactory Soils: Comply with requirements in Section 31 23 33 - Excavating and Backfilling.

1.18 EXAMINATION

.1 Verify that utilities have been disconnected and capped before starting demolition operations.

.2 Review Project Record Documents of existing construction or other existing conditions and hazardous material information are attached to this project Manual as an Appendix. The City does not guarantee that existing conditions are same as those indicated in Project Record Documents.

.3 Engage a professional engineer to perform an engineering survey of condition of adjacent structures to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

.4 Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

.5 Verify that hazardous materials have been remediated before proceeding with building demolition operations.

.6 Inventory and record the condition of items to be removed and salvaged.

1.19 PREPARATION

.1 Prior to start of Work remove contaminated or hazardous materials listed as hazardous from site and dispose of at designated disposal facilities in safe manner and in accordance with DGHTA and other applicable requirements in Section 02 81 01 - Hazardous Materials. Refer also to Site Conditions in Part 1.

.2 Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

.3 Salvaged Items: Comply with the following:

.1 Clean salvaged items of dirt and demolition debris.

.2 Pack or crate items after cleaning. Identify contents of containers.

.3 Store items in a secure area until delivery to the City.

.4 Transport items to storage area designated by the City.

.5 Protect items from damage during transport and storage.

.4 Temporary Erosion and Sedimentation Control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.

.5 Protection of In-Place Conditions:

.1 Work in accordance with Section 01 35 43 - Environmental Procedures.

.2 Prevent movement, settlement or damage of adjacent services, walks, paving, properties, adjacent grades, and structures.

.1 Provide bracing, shoring and underpinning as required.

.2 Repair damage caused by demolition as directed by Contract Administrator.

.3 Support affected structures and, if safety of structure being demolished or adjacent structures or services appears to be endangered, take preventative measures, stop Work and immediately notify Contract Administrator.

.4 Prevent debris from blocking surface drainage system, elevators, mechanical and electrical systems which must remain in operation for demolition activities.

.6 Surface Preparation:

.1 Disconnect electrical and telephone service lines entering buildings to be demolished.

.1 Post warning signs on electrical lines and equipment which must remain energized to serve other properties during period of demolition.

.2 Disconnect and cap mechanical services.

.1 Natural gas supply lines: remove in accordance with gas company requirements.

.2 Sewer and Water Lines: Remove in accordance with authority having jurisdiction as directed by Contract Administrator.

.3 Other Underground Services: Remove and dispose of as directed by Contract Administrator.

.3 Underground storage tanks and piping: remove and dispose in accordance with CCME PN 1326.

.7 Pest Control

.1 Engage a pest control professional for removal of rodent and vermin.

1.20 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

.1 Existing Utilities to be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.

.1 Arrange to shut off utilities with utility companies.

.2 Do not disrupt active or energized utilities designated to remain undisturbed or traversing premises.

.3 If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.

.4 Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

.5 Repair all infrastructure that is damaged as a result of utility disconnection, to the standards identified in City of Winnipeg Standard Construction Specifications.

1.21 PROTECTION

.1 Existing Facilities: Protect adjacent facilities during demolition operations. Maintain exits from existing buildings.

.2 Prevent movement, settlement or damage of adjacent services, walks, paving, properties, adjacent grades structures.

.3 Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

.1 Strengthen or add new supports when required during progress of demolition.

.4 Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations.

.1 Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by the City and authorities having jurisdiction.

.2 Provide temporary services during interruptions to existing utilities, as acceptable to the City and authorities having jurisdiction.

.1 Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

.5 Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 01 56 00 - Temporary barriers and Enclosures.

.1 Protect adjacent buildings and facilities from damage due to demolition activities.

.2 Protect existing site improvements, appurtenances, and landscaping to remain.

.3 Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.

.4 Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

.5 Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.

.6 Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.

.7 Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.

.6 Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

1.22 DEMOLITION, GENERAL

.1 General: Demolish indicated buildings and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:

.1 Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.

.2 Maintain fire watch during and for at least 24 hours after flame-cutting operations.

.3 Maintain adequate ventilation when using cutting torches.

.4 Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

.2 Stockpiling:

.1 Label stockpiles, indicating material type and quantity.

.2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.

.3 Stockpile materials in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

.4 Stockpile materials in accordance with applicable fire and safety regulations.

.5 Supply separate, clearly marked disposal bins for categories of waste material.

.6 On-site sale of material is not permitted.

.3 Removal from Site:

.1 Remove stockpiled material as directed by Contract Administrator, when it interferes with operations of project construction.

.2 Remove stockpiles of like materials once collection of materials is complete.

.3 Transport material designated for disposal using approved licensed disposal facilities and in accordance with applicable regulations. Disposal facilities must be those approved of and listed in Environmental Protection Plan.

.4 Dispose of materials not designated for disposal in accordance with applicable regulations. Disposal facilities must be those approved of and listed in Environmental Protection Plan.

.4 Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

.1 Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from the City and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.

.2 Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

.5 Existing Mechanical Equipment:

.1 Ownership of the existing two-year-old, 350-ton mechanical chiller serving the Public Safety Building is granted to the Contractor.

.2 Existing equipment, mechanical or otherwise, not removed prior to issuance of tender, becomes the property of the Contractor.

1.23 DEMOLITION BY EXPLOSIVES

.1 Explosives: Use of explosives is not permitted, unless special permission is granted by the Contract Administrator.

1.24 DEMOLITION BY MECHANICAL MEANS

.1 Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.

.2 Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

.1 Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.

.3 Salvage: Items to be removed and salvaged are indicated below:

.1 Exterior limestone cladding, two palettes equal to 4 ft^3 each.

.4 Below-Grade Construction: Demolish foundation walls and other below-grade construction. Remove all pile caps to the top of the pile shaft.

.1 Remove below-grade construction, including basements, foundation walls, and footings, to at least 12 inches (300 mm) below lowest excavated grade.

.5 Existing Utilities: Abandon existing utilities and below-grade utility structures. Abandon utilities in accordance with City of Winnipeg standard construction specification and/or the methodology required by that Utility.

.6 Existing Utilities: Demolish existing utilities and below-grade utility structures that are within 5 feet (1.5 m) outside footprint indicated for new construction. Abandon utilities outside this area.

.1 Fill abandoned utility structures with materials in accordance with backfill requirements in Section 32 23 33 - Excavating and Backfilling or as indicated by the Contract Administrator.

.7 Existing Utilities: Demolish and remove existing utilities and below-grade utility structures.

.8 Hydraulic Elevator Systems: Demolish and remove elevator system, including cylinder, plunger, well assembly, steel well casing and liner, oil supply lines, and tanks.

1.25 POST DEMOLITION SUBSURFACE SITE UTILITY AND FOUNDATION SURVEY

.1 Upon demolition of existing foundations to extent indicated, engage registered land surveyor to record locations and elevations of remaining foundations and site utility services exposed and capped off during demolition.

1.26 SITE RESTORATION

.1 Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with materials in accordance with backfill requirements indicated in Section 31 23 33 - Excavating and Backfilling.

.2 Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

.1 Provide finished grade with minimum 1% slope from centre of property to edges of excavated areas.

1.27 REPAIRS

.1 Promptly repair damage to adjacent buildings caused by demolition operations.

1.28 DISPOSAL OF DEMOLISHED MATERIALS

.1 Remove demolition waste materials from Project site and dispose of them in an approved construction and demolition waste landfill acceptable to authorities having jurisdiction and recycle or dispose of them according to Section 01 74 21.

.2 Transport exterior limestone façade to crushing plant, provide evidence of final volume of crushed material to satisfaction of Contract Administrator. Final disposition of crushed limestone as directed by Contract Administrator.

.3 Do not allow demolished materials to accumulate on-site.

.4 Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

.5 Do not burn demolished materials.

1.29 CLEANING

.1 Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

.2 Clean roadways of debris caused by debris transport.

END OF SECTION

1.1 SECTION INCLUDES

.1 Removal and disposition of impacted soil present in the vicinity of the on-site underground storage tank.

1.2 RELATED REQUIREMENTS

.1 Section 02 65 00 –Storage Tank Removal

.2 Section 31 23 33 – Excavation, Trenching, and Backfilling

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Comply with all applicable legislation and by-laws, including, but not limited to:

.1 Treatment and Disposal of Petroleum Contaminated Soil, June 2016

.2 Contaminated Sites Remediation Act (CSRA), April 2014.

.2 Coordination:

.1 Coordinate with all regulatory agencies having authority and scheduling for delivery of materials to the Provincial approved treatment/disposal facility.

.2 The Contractor shall notify the Contract Administrator within two (2) hours upon discovery of any petroleum contaminated materials.

.3 The Contractor shall provide at least two (2) working days notice to the Contract Administrator prior to the removal of any contaminated soil.

1.4 MEASUREMENT AND PAYMENT PROCEDURES

.1 Costs associated with quantity adjustments of impacted soil to be administered as indicated in Section 01 29 10, based on the Unit Prices noted in Section 01 22 00.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit to Manitoba Sustainable Development and the Contract Administrator completed forms required for decommissioning fuel storage tanks.

1.6 GENERAL

.1 Excavation, transport and disposal at a Manitoba Sustainable Development approved facility of contaminated soil, debris, concrete, and stone, containing gasoline, fuel oil, and lube oil range hydrocarbons as confirmed by on-site inspection and testing.

.2 Set aside clean overburden material, if present, for potential re-use as backfill.

.3 Containment, transport and disposal by a licensed disposal contractor of any free phase petroleum product, as directed by the Contract Administrator.

.4 Containment, treatment and disposal of all groundwater in excavations, all run-off entering the excavations and wash water generated during the excavation of soils as agreed to by the Contract Administrator and regulatory authorities.

1.7 REMOVAL

.1 The Contract Administrator or his representative will oversee contaminated material removal activities and will make decisions as to the extent of contaminated material removed.

.2 The Contract Administrator will provide instructions as to the method and type of record keeping required for documenting quantities of contaminated soil for disposal.

.1 Make submittals of documents in accordance with Section 01 33 00 - Submittal Procedures.

.3 Locate and protect adjacent structures and foundations, trees, lawns, fencing, service poles, wires, utilities, paving, survey bench marks, monitor wells, and monuments not intended for removal which may be affected by the Work.

.4 Notify all regulatory agencies having authority, as required.

.5 All excavations are to remain within the established site property boundaries.

.6 The vertical and horizontal limits of excavation are unknown and will be determined by the Contract Administrator or his representative during the commencement of the work based on field testing of petroleum hydrocarbon concentration, combined with collection of confirmatory soil samples for laboratory analysis. The laboratory results should be available within five days of sampling.

.7 The lateral limits of all excavations will be based on post-excavation testing results.

1.8 CONTAINMENT OF MATERIAL ON SITE

.1 All groundwater in excavations, all run-off entering the excavations of impacted soil and wash water generated during the excavation of impacted soils, will be temporarily stored on-site in spill-proof and leak-proof containers, as approved by the Contract Administrator, prior to their disposal. All waters will be disposed based upon the Contractor's method, as approved by the Contract Administrator, following receipt of analytical results. The Contractor shall be prepared to demonstrate that the treatment method is the most cost efficient. In addition, the Contract Administrator shall demonstrate that the methodology chosen has minimized the amount of impacted materials on the site.

.2 Contractor to cover contaminated soil stockpiles on the site at all times with PVC plastic or equivalent to prevent loss or erosion.

.3 All petroleum free phase products will be contained in spill and leak proof containers, as approved by the Contract Administrator, prior to their removal off-site for disposal.

.4 All storage vessels for soils, product or groundwater must be readily accessible for sampling by the Contract Administrator. These vessels must have a means of securing access to prevent unauthorized and/ or accidental entry into the vessels by trespassers.

.5 All storage vessels for soils, product and groundwater must be readily accessible for clean-out prior to their removal from the site.

1.9 TESTING

.1 All contaminant sampling and testing of soils and water will be carried out by the Contract Administrator. All other sampling and testing will be conducted by the Contractor at his expense.

.2 When the final soil testing confirms contaminant, levels are at or below the established remediation objective, documentation shall be prepared by the Contract Administrator including reference to confirmatory results. Samples may require up to five working days to receive analytical results; Contractor to schedule work to conform to this timing.

.3 The Contract Administrator will contact Regulatory Agency for agreement that contamination has been cleaned up.

1.10 PROTECTION

.1 Prevent debris from blocking roads, ditches, and drains.

.2 Ensure safe passage of persons around the excavation area.

.3 Suppress dust and odours during excavation activities.

END OF SECTION

1.1 RELATED REQUIREMENTS

.1 Section 02 50 00 – Site Remediation.

.2 Section 31 23 33 – Excavation, Trenching, and Backfilling

1.2 SECTION INCLUDES

.1 Materials and procedures for removal of underground storage tanks and aboveground storage tanks.

1.3 REFERENCE STANDARDS

.1 Canadian Environmental Protection Act (CEPA), 1999

.1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.

.2 Canadian Council of Ministers of the Environment (CCME)

.1 CCME PN 1326-2003, Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products.

.2 CCME PN 1299-2006, Canadian Environmental Quality Guidelines.

.1 Chapter 7-2006, Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health.

.3 National Research Council of Canada Canadian Commission of Building and Fire Codes

.1 National Fire Code of Canada (2015).

.4 Canadian Federal Legislation

.1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.2 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.

.3 Canada Labour Code (R.S. 1985, c. L-2).

.1 Part II (September 2000) - Occupational Health and Safety.

.4 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

.5 Underwriters' Laboratories of Canada (ULC)

.6 Manitoba Regulation (MR)

.1 Storage and Handling of Petroleum Products and Allied Products, MR 188/2001.

.2 Dismantling and Removal of Petroleum Product and Allied Product Storage Tank Systems, October 3, 2014.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Quality Control: in accordance with Section 01 45 00 - Quality Control:

.3 Provide written storage tank description in accordance with Section 01 33 00 - Submittal Procedures.

.4 Forward affidavit of destruction of the underground storage tank and removal and destruction, or reuse, of the aboveground storage tanks to the authority having jurisdiction and Contract Administrator.

1.5 QUALITY ASSURANCE

.1 Contractor must be/retain licensed/certified by Provincial authorities having jurisdiction for removal of underground and aboveground storage tanks.

.1 License/certificate, title and number must accompany tender document.

.2 Regulatory Requirements: ensure underground storage tank and aboveground storage tank removal is performed in compliance with applicable Provincial Regulations.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Segregate and deliver non-salvageable or non-recyclable materials, including waste liquids and sludges and impacted soil to Provincially licensed waste facility.

1.7 PREPARATION SAFETY AND SECURITY

.1 Conform to or exceed Federal and Provincial codes, local municipal by-laws, by-laws, and codes and regulations of utility authorities having jurisdiction.

.2 Protection:

.1 Meet safety requirements of Occupational Safety and Health, Canada Labour Code Part II and Regulations for Construction Projects.

.2 Provide temporary protection for safe movement of personnel and vehicle traffic.

.3 Disconnect or remove source of ignition from vicinity of underground storage tank and aboveground storage tanks.

.4 Cut, braze, or weld metal only in monitored areas established to be free of ignitable vapour concentrations.

.5 Ground and bond metal equipment, including tanks and transfer pipes, before operating equipment or transferring flammable materials.

.6 Use non-sparking tools and intrinsically safe electrical equipment.

.7 Smoking is not permitted.

.3 Liquid petroleum product and sludge are regulated hazardous wastes and must be handled in accordance with The Dangerous Goods Handling and Transportation Act.

1.8 EXCAVATION TRENCHING AND BACKFILL

.1 Do work in accordance with Section 31 23 33 – Excavating, Trenching, and Backfilling.

.2 Provide protective material around excavation.

.3 Provide constant supervision during excavation and backfilling.

.4 Excavation

.1 Excavate until top of underground storage tank and connection and openings exposed.

.2 Disconnect piping.

.1 Remove fill tube.

.2 Disconnect fill gauge, product, and vent lines.

.3 Cap or plug open ends of lines that are not to be used further.

.4 Remove piping from ground.

.3 Temporarily plug tank openings.

.4 Continue excavation until tank completely exposed.

.5 Temporarily stockpile on-site soil in vicinity of tank, until waste classification can be established prior to final disposal.

.5 Prevent movement, settlement, or damage of adjacent services, walks, paving, and adjacent grades. Provide bracing and shoring as required.

.6 Decommission groundwater monitoring well in vicinity of underground storage tank, in accordance with standard industry practices, applicable regulations, and as directed by Contract Administrator.

1.9 TANK REMOVAL

.1 Remove tank in accordance with CCME Code of Practice PN 1326, the National Fire Code of Canada and applicable provincial regulations and standards, and place in a secure location.

.2 Block tank to prevent movement.

.3 Contact Contract Administrator immediately if there is evidence of contamination in underground storage tank excavation, stop Work until further notice.

.1 Upon informing and obtaining approval by the Contract Administrator, the Contractor maybe instructed to stockpile contaminated soil in separate pile on-site from clean excavated material.

.4 Remove and replace contaminated soil and accumulated flammable or combustible liquid with clean fill common to local area in accordance with Section 31 23 33 - Excavating, Trenching and Backfilling.

1.10 PIPING REMOVAL

.1 Remove piping in accordance with CCME Code of Practice PN 1326, the National Fire Code of Canada and applicable provincial regulations and standards.

.2 Remove all existing underground piping associated with the underground system up to the face of the exterior foundation wall of the building. Patch the fill pipe stubs remaining in the building foundation wall with non-shrink grout. There is no requirement for any pipe removal work inside the building.

.3 Remove all existing piping associated with the aboveground storage tank systems (2), where appropriate.

1.11 VAPOUR REMOVAL

.1 Purging:

.1 Purge vapours to less than 10% of lower explosive limit (LEL).

.2 Verify with combustible gas metre and provide proof (photographic or written statement on Contractor letterhead).

.2 Inerting:

.1 Displace oxygen to levels below necessary to sustain combustion.

.2 Verify with combustible gas metre.

.3 Water Method:

.1 Fill tank with water to expel vapours.

.2 Remove and dispose of contaminated water in accordance with regulations after tank is removed from site.

.3 Verify with combustible gas metre.

.4 Dry Ice Method:

.1 Add 1.85 gm of solid carbon dioxide (dry ice) for each 100-litre capacity.

.2 Crush and distribute ice evenly over greatest area to secure rapid evaporation. Avoid skin contact.

.3 Verify dry ice has vapourized.

.5 Air Method:

.1 Ventilate tank with air using small gas exhauster operated with compressed air or other suitable means.

.2 Air to enter opening at one end and to exit opening at other end to quickly remove vapour.

.3 Test interior of tank to determine when tank is free of vapour.

1.12 CAPPING

.1 Cap holes before tank is removed from site.

.1 Leave vents open.

.2 Plug corrosion leak holes using screwed (boiler) plugs.

.3 Leave 3 mm vent hole in one plug to prevent tank from being subjected to excessive pressure differential caused by extreme temperature change.

1.13 SECURING AND REMOVAL FROM SITE

.1 Check vapour levels prior to transport.

.1 Remove vapour if required.

.2 Dispose of tank in accordance with local, Provincial and Federal regulations

.3 Truck removal:

.1 Secure tank on truck for transport to disposal site.

.2 Cut suitable openings in tank sides to render tank unusable.

.3 Ensure 3 mm vent hole located at upper most point on tank.

1.14 SITE REMEDIATION

.1 To CCME PN 1299.

.2 Repair/replace finish grade to match surrounding area, as specified in Section 31 23 33 – Excavating, Trenching, and Backfilling.

.3 In event of required site remediation, consult with the Contract Administrator.

1.15 WORKMANSHIP AND DISPOSAL

.1 Tanks destined for disposal:

.1 Dismantle, cut sufficient openings or otherwise render the underground storage tank unusable.

.2 Identify destination of aboveground storage tanks if to be taken for re-use.

END OF SECTION

1.1 REFERENCES

.1 Refer to the following information (further referred to herein as the "Assessment Reports"), attached in the Appendix, for information pertaining to hazardous building materials that have been identified and may require disturbance during the Work:

.1 City of Winnipeg "Asbestos Inventory Control" for the Public Safety Building and the Civic Centre Car Park (inspection date April 9, 2018, and associated drawings).

.1 Note that information for the Civic Parkade is included here for reference only, since the asbestos abatement and hazardous material remediation of the Civic Parkade is not part of the current scope of work.

.2 Stantec Consulting Ltd. Hazardous Building Materials Review and Assessment.

1.2 DEFINITIONS

.1 Dangerous Goods: product, substance, or organism that is specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 Hazardous Building Material: component of a building or structure that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when altered, disturbed or removed during maintenance, renovation or demolition.

.3 Hazardous Material: product, substance, or organism that is used for its original purpose; and that is either Dangerous Goods or a material that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.4 Hazardous Waste: any Hazardous Material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.5 Workplace Hazardous Materials Information System (WHMIS): Canada-wide system designed to give employers and workers information about Hazardous Materials used in workplace. Under WHMIS, information on Hazardous Materials is provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by combination of federal and provincial laws.

1.3 REFERENCE STANDARDS

.1 Canadian Environmental Protection Act, 1999 (CEPA 1999).

.1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 National Research Council Canada Institute for Research in Construction (NRC-IRC)

.1 National Fire Code of Canada 2015.

.4 Department of Justice Canada

.1 Transportation of Dangerous Goods Act (TDG Act) 1999, (c. 34).

.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2003-400).

.5 Government of Manitoba

.1 Manitoba Workplace Safety and Health Act and Regulation, including amendments to date of work (MB Reg. 217/2006).

.2 Manitoba Hazardous Waste Regulation MR 55/2003.

.3 Manitoba's The Dangerous Goods Handling and Transportation Act 195/2015.

.6 SAFE Work Manitoba

.1 Guide for Asbestos Management, 2017.

.7 City of Winnipeg Requirements.

.8 Government of Canada

.1 The Federal Transportation of Dangerous Goods Regulation (SOR/2001-286).

.2 The Federal PCB Regulations (SOR/2008-273).

.3 The Federal Halocarbons Regulation (July 2003).

.9 Canadian Construction Association

.1 Standard Construction Document CCA 82 "Mould Guidelines for the Canadian Construction Industry" (2004 – further referred to herein as "CCA 82").

1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.1 Submit to Contract Administrator current Material Safety Data Sheet (MSDS) for each Hazardous Material required prior to bringing Hazardous Material on site.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Co-ordinate storage of Hazardous Materials with Contract Administrator and abide by internal requirements for labelling and storage of materials and wastes.

.2 Store and handle Hazardous Materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

.3 Store and handle flammable and combustible materials in accordance with current National Fire Code of Canada 2015 requirements.

.4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.

.1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.

.2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Contract Administrator.

.5 Transfer of flammable and combustible liquids is prohibited within buildings.

.6 Do not transfer of flammable and combustible liquids in vicinity of open flames or heat-producing devices.

.7 Do not use flammable liquids having flash point below 38 degrees C, such as naphtha or gasoline as solvents or cleaning agents.

.8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.

.9 Observe smoking regulations, smoking is prohibited in areas where Hazardous Materials are stored, used, or handled.

.10 Storage requirements for quantities of Hazardous Materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:

.1 Store Hazardous Materials and wastes in closed and sealed containers.

.2 Label containers of Hazardous Materials and wastes in accordance with WHMIS.

.3 Store Hazardous Materials and wastes in containers compatible with that material or waste.

.4 Segregate incompatible materials and wastes.

.5 Ensure that different Hazardous Materials or Hazardous Wastes are not mixed.

.6 Store Hazardous Materials and wastes in secure storage area with controlled access.

.7 Maintain clear egress from storage area.

.8 Store Hazardous Materials and wastes in location that will prevent them from spilling into environment.

.9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.

.10 Maintain inventory of Hazardous Materials and wastes, including product name, quantity, and date when storage began.

.11 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.12 Report spills or accidents immediately to Contract Administrator. Submit a written spill report to Contract Administrator within 24 hours of incident.

1.6 TRANSPORTATION

.1 Transport Hazardous Materials and wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.2 If Hazardous Waste is generated on site:

.1 Co-ordinate transportation and disposal with Contract Administrator.

.2 Ensure compliance with applicable federal, provincial and municipal laws and regulations for generators of Hazardous Waste.

.3 Use licensed carrier authorized by provincial authorities to accept subject material.

.4 Prior to shipping material obtain written notice from intended Hazardous Waste treatment or disposal facility that it will accept material and that it is licensed to accept this material.

.5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.

.6 Ensure that trained personnel handle, offer for transport, or transport Dangerous Goods.

.7 Provide photocopy of shipping documents and waste manifests to Contract Administrator.

.8 Track receipt of completed manifest from consignee after shipping Dangerous Goods. Provide a photocopy of completed manifest to Contract Administrator.

.9 Report discharge, emission, or escape of Hazardous Materials immediately to Contract Administrator and appropriate provincial authority. Take reasonable measures to control release.

1.7 EXISTING CONDITIONS

.1 Reports and information pertaining to Hazardous Building Materials present within the building that may be handled, removed, or otherwise disturbed and disposed of during the Work are included in Appendix 2.

.2 Notify Contract Administrator of suspected Hazardous Building Material discovered during Work and not apparent from drawings, specifications, or reports pertaining to the Work. Do not disturb such material pending instructions from Contract Administrator.

1.8 MATERIALS

.1 Only bring on site quantity of Hazardous Materials required to perform work.

.2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with Hazardous Materials.

1.9 HAZARDOUS MATERIALS ABATEMENT

.1 Scope of abatement activities for Hazardous Building Materials (other than asbestos, and lead, which are specified elsewhere in the tender documents), is summarized below, in general form.

.1 Abatement shall be conducted to handle, alter, remove and/or dispose of Hazardous Building Materials as identified in the Assessment Reports and summarized below in accordance with applicable regulations, guidelines, standards and/or best practices for such work.

.2 Contractor is responsible for reviewing plans, specifications and reports such that they understand the locations and amounts of Hazardous Building Materials that require removal and disposal.

.1 Work of this project will involve removal of all Hazardous Building Materials as summarized herein.

.3 The listing below is a summary of the Hazardous Building Material categories that have been presumed as present (other than asbestos and lead, which are specified elsewhere in the tender documents), along with the associated removal and disposal regulations, guidelines and/or standards.

.1 Polychlorinated Biphenyls (PCBs)

.1 Should a material suspected to contain PCBs become uncovered during Work activities (i.e., dielectric fluids, hydraulic fluids), all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if PCBs are present.

.2 PCB-containing items identified for removal and disposal should be handled, transported, stored and disposed of in accordance with the following:

.1 The transportation and disposal requirements of MB Reg. 195/2015.

.2 The transportation requirements of the Federal Transportation of Dangerous Goods Regulation.

.3 The Federal PCB Regulations (SOR/2008-273).

.3 Although PCBs may also be present in other items in limited amounts as indicated in the Assessment Reports (e.g., plastics, molded rubber parts, applied dried paints, coatings or sealants, caulking, adhesives, paper, sound-deadening materials, insulation, or felt and fabric products such as gaskets), PCBs are not expected to be present in those materials in concentrations that would necessitate the requirement for PCB-specific handling procedures, separate removal and/or disposal considerations for renovation or demolition.

.2 Mould

.1 Mould and/or moisture-impacted building materials have not been identified, however, may potentially be encountered during work of the Project. If the potential presence of mould (expected to be small amounts) on building materials is identified, workers conducting removal of those materials should be notified of the potential presence of mould and should be provided with respiratory protection and/or other personal protective equipment as deemed necessary for the work that they will be conducting. Refer to CCA 82 for applicable PPE and procedures.

.1 If the moisture-impacted building materials are asbestos-containing materials or are coated with lead-containing paint, the provisions of the appropriate section for asbestos abatement or lead abatement will prevail and will be sufficient to protect workers and adjacent spaces from exposure to mould.

.2 If significant mould contamination is identified in concealed locations, an experienced mould abatement contractor may be required to assist with removal in accordance with applicable guidelines and standards for such work (e.g., CCA 82).

.3 Rodent or avian waste

.1 In the event that rodent or avian waste is encountered, clean-up should be conducted following standard procedures for protection against microbial contamination, including but not limited to the following:

.1 Wear rubber, latex, or vinyl gloves and an N95 disposable respirator (at a minimum).

.1 Note that if waste is in an area where asbestos abatement is being undertaken, respiratory protection and protective coveralls already employed will be sufficient.

.2 Spray the urine and droppings with a disinfectant or a mixture of bleach and water and let soak 5 minutes. The recommended concentration of bleach solution is 1-part bleach to 10 parts water. When using a commercial disinfectant, following the manufacturer's instructions on the label for dilution and disinfection time.

.3 Use disposable rags/cloths or paper towel to pick up the urine and droppings.

.4 Place the waste in a plastic bag and seal tightly. Place the full bag in a second plastic bag and seal.

.5 After the rodent droppings and urine have been removed, disinfect items that might have been contaminated by rodents or their urine and droppings.

.6 Remove gloves for disposal with other contaminated waste, and thoroughly wash hands with soap and water (or use a waterless alcohol-based hand rub when soap is not available, and hands are not visibly soiled).

.4 Mercury

.1 Removal of light fixtures is not required as part of this Contract.

.2 If removal of various light fixtures is necessary to facilitate other work, then:

.1 When mercury-containing items are removed (fluorescent light tubes), ensure all mercury waste

is handled, stored and disposed of in accordance with the requirements the following:

.1 Transportation and disposal requirements of MB Reg. 195/2015.

.2 Transportation requirements of the Federal Transportation of Dangerous Goods Regulation.

.2 Precautions should be taken if workers may potentially be exposed to mercury or mercury vapours to ensure that worker exposure levels do not exceed the occupational exposure limit of applicable regulations This can be achieved by providing respiratory and skin protection applicable to the hazard and task to be completed.

.5 Ozone-Depleting Substances (ODSs)

.1 Building related cooling and refrigeration equipment suspected to be ODS-containing was not identified per the Assessment Reports.

.6 Silica

.1 When silica-containing materials are to be disturbed and/or removed (e.g., demolition of concrete slabs, masonry or concrete units, ceramic tiles, terrazzo flooring, acoustic ceiling tiles, etc.), ensure dust control measures are employed such that airborne silica dust concentrations do not exceed the exposure limit as stipulated by the COHSR and MB Reg. 217/2006 (Cristobalite and Quartz – each 0.025 mg/m^3). This would include, but not be limited to, the following:

.1 Providing workers with respiratory protection.

.2 Wetting the surface of the materials, use of water or dust suppressing agents to prevent dust emissions.

.3 Providing workers with facilities to properly wash prior to exiting the work area.

1.10 DISPOSAL

.1 Dispose of Hazardous Waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Recycle Hazardous Wastes for which there are approved, cost effective recycling process available.

.3 Send Hazardous Wastes to authorized Hazardous Waste disposal or treatment facilities.

.4 Burning, diluting, or mixing Hazardous Wastes for purpose of disposal is prohibited.

.5 Disposal of Hazardous Materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

.6 Dispose of Hazardous Wastes in timely fashion in accordance with applicable provincial regulations.

.7 Minimize generation of Hazardous Waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

.8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:

.1 Hazardous Wastes recycled in manner constituting disposal.

.2 Hazardous Waste burned for energy recovery.

.3 Lead-acid battery recycling.

.4 Hazardous Wastes with economically recoverable precious metals.

1.11 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning. Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – Cleaning.

END OF SECTION

1.1 SUMMARY

.1 Refer to the following information (further referred to herein as the "Assessment Reports"), attached in the Appendix of the Specifications, for information pertaining to asbestos-containing materials (ACMs) that have been identified and may require disturbance during the Work:

.1 City of Winnipeg "Asbestos Inventory Control" for the Public Safety Building and the Civic Centre Car Park (inspection date April 9, 2018, and associated drawings).

.1 Note that information for the Civic Parkade is included here for reference only, since the asbestos abatement and hazardous material remediation of the Civic Parkade is not part of the current scope of work.

.2 Stantec Consulting Ltd. Hazardous Building Materials Review and Assessment.

.2 The Assessment Reports indicate that ACMs including, but not limited to, the following are present, all of which are to be removed for appropriate disposal as part of the Work.

.1 Brown mastic on metal duct work throughout.
.2 Black mastic on fibreglass pipe insulation throughout.
.3 Gold mastic in electrical room.
.4 Plaster applied to walls and ceilings throughout.
.5 Texture coat applied to walls and ceilings throughout.
.6 Insulation on mechanical pipes (straights and fittings) throughout.
.7 Insulation on ducts throughout.
.8 Cement pipe associated with rainwater drainage system.
.9 Gaskets in flanges of mechanical pipes and systems throughout.
.10 Vinyl floor tiles and associated mastics in multiple locations.
.11 Tank insulation in the mechanical and boiler rooms.
.12 Drains and sealants associated with the roof.
.13 Roofing material (asphalt; mastics) associated with the roof.
.14 Insulation in fire-rated doors throughout.

.3 Abatement shall be conducted to handle, alter, remove and/or dispose of all ACMs as identified in the Assessment Reports in accordance with applicable regulations, guidelines, standards and/or best practices for such work, including, but not limited to, the following:

.1 Government of Manitoba

.1 Manitoba Workplace Safety and Health Act and Regulation, including amendments to date of work.

.2 Manitoba Hazardous Waste Regulation MR 55/2003.

.2 SAFE Work Manitoba

.1 Guide for Asbestos Management, 2017.

.3 City of Winnipeg Requirements.

.4 Contractor is responsible for reviewing plans, specifications and reports such that they understand the locations and amounts of ACMs that are to be removed.

.5 Contractor is responsible to remove and dispose of sufficient wall, celling and/or other materials (where present and necessary) – whether or not they are asbestos-containing – to expose and remove/dispose of concealed ACMs (e.g., mechanical insulation in wall or ceiling cavities).

.6 Contractor is responsible to uncouple, detach or otherwise disconnect applicable joints in mechanical pipes and systems throughout to allow for removal of asbestos-containing gaskets.

.7 Unless otherwise determined through risk assessment conducted by the Contractor's competent person, comply with requirements of this section when performing Work that would be considered "Type 1" asbestos abatement work as defined in the SAFE Work Manitoba 2017 "Guide for Asbestos Management" for tasks involving Non-Friable ACMs handled in conjunction with recognized control measures, including, but not limited to:

.1 Installing or removing Non-Friable products (that are in good condition) manufactured with ACMs without cutting, breaking, sanding or vibrating the materials including but not limited to materials such as gaskets, construction mastics, manufactured cement products, vinyl floor tiles, provided such materials are in a Non-Friable condition and are not rendered Friable by such work.

.2 Using non-powered hand tools designed to cut, drill or abrade a Non-Friable manufactured product containing asbestos, as long as water is used to control fibre release and waste products disposed of as an ACM.

.3 Cutting, grinding, drilling or sanding ACMs mentioned above with a power tool as long as the power tool is equipped with a HEPA filter. Water is used to control fibre release for the packaging of waste ACMs.

.4 The transportation or handling of ACM in asbestos waste containers.

.5 Working with Non-Friable flooring and cementitious ACMs; removing asbestos-containing flooring (for example vinyl asbestos floor tile), asbestos cement products, shingles and wallboard, asbestos-containing cementitious siding (millboard, wallboard or Transite) and asbestos cement piping.

.6 Deviation from the procedures outlined in this specification must be approved by the Contract Administrator prior to implementation.

.1 The Contractor may choose to combine tasks outlined in this specification section with other tasks being completed under more stringent procedures (e.g., Section 02 82 00.02 or Section 02 82 00.03 – Asbestos Abatement Requirements Type 2 and Type 3 Procedures), provided that the procedures of the more stringent section will prevail for all "combined" work.

1.2 SECTION INCLUDES

.1 Requirements, applicable procedures and personal protective equipment to be utilized during abatement of ACMs of the types described herein.

1.3 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal

.3 Section 02 82 00.02 - Asbestos Abatement Type 2 Precautions

.4 Section 02 82 00.03 - Asbestos Abatement Type 3 Precautions

1.4 REFERENCE STANDARDS

.1 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.2 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1992, (c. 34).

.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).

.3 Government of Manitoba

.1 Manitoba Workplace Safety and Health Act and Regulation, including amendments to date of work (MB 217/2006).

.2 Manitoba Hazardous Waste Regulation MR 55/2003.

.4 SAFE Work Manitoba

.1 Guide for Asbestos Management, 2017.

1.5 DEFINITIONS

.1 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.

.2 Asbestos-Containing Materials (ACMs): materials that contain asbestos in amounts as listed below, and are identified under Existing Conditions including fallen materials and settled dust:

.1 A friable material containing 0.1% or greater asbestos;

.2 A non-friable material containing 1.0% or greater asbestos; and

.3 All vermiculite insulation must be treated as an ACM.

.3 Asbestos Work Area: area where work takes place which will, or may, disturb ACMs.

.4 Competent Worker: in relation to specific work, means a worker who:

.1 Is qualified because of knowledge, training and experience to perform the work.

.2 Is familiar with the provincial and federal laws and with the provisions of the regulations that apply to the work.

.3 Has knowledge of all potential or actual danger to health or safety in the work.

.5 Friable Material: means material that:

.1 When dry, can be crumbled, pulverized or powdered by hand pressure, or crumbled, pulverized or powdered.

.6 HEPA Vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

.1 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.2 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

.3 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for work.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit Provincial and/or local requirements for Notice of Project Form.

.3 Submit proof of Contractor's Asbestos Liability Insurance in accordance with D10.

.4 Submit proof satisfactory to Contract Administrator that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.

.5 Submit to Contract Administrator necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.

.6 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a Competent Worker in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.

.7 Submit proof satisfactory to Contract Administrator that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

1.7 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.

.2 Health and Safety:

.1 Perform construction occupational health and safety in accordance with applicable provincial occupational health and safety regulations.

.2 Safety Requirements: worker protection.

.1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:

.1 Air purifying half-mask respirator with P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator is to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

.2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the Contractor and worn by every worker who enters the work area, and the protective clothing shall consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing to include suitable footwear, and to be repaired or replaced if torn.

.2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.

.4 Facilities for washing hands and face shall be provided within or close to the Asbestos Work Area.

.5 Ensure workers wash hands and face when leaving Asbestos Work Area. Facilities for washing are to be supplied by the Contractor.

.6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal packaging material in appropriate on-site bins for recycling.

.4 Separate and place in designated containers recyclable metal and plastic waste.

.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 Fold up metal banding, flatten and place in designated area for metal recycling.

.8 Disposal of asbestos waste generated by Work activities must comply with Federal, Provincial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 mil bags or leak proof drums. Label containers with appropriate warning labels.

.9 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.9 EXISTING CONDITIONS

.1 Reports and information pertaining to ACMs to be handled, removed, or otherwise disturbed and disposed of during this project are bound into this specification in Appendix 2.

.2 Notify Contract Administrator of suspected ACM discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Contract Administrator.

1.10 SCHEDULING

.1 Hours of Work: perform work during normal working hours as indicated in Contract Documents.

1.11 MATERIALS

.1 Drop Sheets:

.1 Polyethylene: 0.15 mm thick.

.2 FR Polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with Polyethylene.

.2 Waste Containers: contain waste in two separate containers.

.1 Inner container: 0.15 mm thick sealable Polyethylene waste bag.

.2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable Polyethylene bag.

.3 Labelling requirements: affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site. Label containers in accordance with Asbestos Regulations 29 CFR 1910.1001. Label in both official languages.

.3 Tape: fibreglass-reinforced duct tape suitable for sealing Polyethylene under both dry conditions and wet conditions using Amended Water.

.4 Slow-drying sealer: non-staining, clear, water-dispersible type that remains tacky on surface for at least eight hours and designed for purpose of trapping residual asbestos fibres.

1.12 PROCEDURES

.1 Asbestos abatement work is to be completed in general accordance with the requirements of the SAFE Work Manitoba 2017 “Guide for Asbestos Management”. Where discrepancies exist between that document and these specifications, the more stringent will apply.

.2 Perform construction in accordance with the provisions of the applicable provincial occupational health and safety regulations.

.3 Notification to the City of Winnipeg and Manitoba Workplace Safety and Health to be completed prior to work resulting in the potential release of ACMs.

.4 If electrical isolations are conducted or become required during the work, then Lock Out Tag Out will be conducted in accordance with applicable regulations and The City’s protocols. All affected persons will be notified, including The City’s central control, as well as any facility staff, users or contractors present.

.5 Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area.

.1 Remove visible dust from surfaces in the work area where dust is likely to be disturbed during course of work.

.2 Use HEPA Vacuum or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate.

.3 Do not use compressed air to clean up or remove dust from any surface.

.6 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.

.1 Use FR Polyethylene drop sheets over flooring such as carpeting that absorbs dust (or attic insulation if work is within ceiling spaces) and over flooring/surfaces in Asbestos Work Area where dust and contamination cannot otherwise be safely contained. Drop sheets are not to be reused.

.7 Wet materials containing asbestos to be abraded, cut, drilled in localized areas, scraped or otherwise disturbed unless wetting creates hazard or causes damage.

.1 Use garden reservoir type low-velocity fine-mist Sprayer.

.2 Perform Work to reduce dust creation to lowest levels practicable.

.3 Contamination of surrounding areas indicated by visual inspection by the Contract Administrator will require complete enclosure and clean-up of affected areas.

.8 Remove ACM ceiling tiles in-tact from support tracking (T-bar grid), where possible. Place into appropriate waste bag.

.9 Frequently and at regular intervals during Work and immediately on completion of work:

.1 Dust and waste to be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping (including T-bar grid from which ACM ceiling tiles are removed), and placed in a waste container; and

.2 Drop sheets to be wetted and placed in a waste container as soon as practicable.

.10 Cleanup:

.1 Place dust and asbestos-containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste; wet and fold these items to contain dust, and then place in plastic bags.

.2 Clean exterior of each waste-filled bag using damp cloths or HEPA Vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.

.3 Seal waste bags and remove from site. Dispose of in accordance with requirements of Provincial and Federal Authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that the appropriate guidelines and regulations for asbestos disposal are followed.

.4 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA Vacuum.

1.13 AIR MONITORING

.1 From beginning of Work until completion of cleaning operations, if required, the City shall retain an independent, competent (as described in the SAFE Work Manitoba 2017 “Guide for Asbestos Management”) third party to take air samples inside and outside of Asbestos Work Area in accordance with the recommendations set forth in the SAFE Work Manitoba 2017 “Guide for Asbestos Management”.

.1 Air sample analysis will be conducted by Phase Contrast Microscopy (PCM) using the NIOSH 7400 method: Asbestos and Other Fibers by PCM for airborne asbestos exposure analysis as per regulatory guidelines.

.2 For area samples, the City requires a minimum of 1,283 litres of air to be collected, with detection limits of less than 0.03 fibres per cubic centimetre.

.3 Air sample results will be provided to the City, the Contractor and the Contract Administrator within 2-hours of sample collection.

.4 Analysis will be conducted by qualified persons or laboratories that take part in a documented QA/QC program for such analysis.

.2 Contractor will be notified to Stop Work when airborne fibre measurements exceed 0.05 fibres/cubic centimetre, when PPE and protection factors are considered, and to correct procedures.

.1 Additional monitoring will be conducted, where possible, to verify procedural corrections were effective.

.3 If air monitoring shows that areas outside Asbestos Work Area are contaminated as determined by the Contract Administrator, Contractor will be notified to maintain and clean these areas in same manner as that applicable to Asbestos Work Area, at no additional cost to the Contract.

.4 When asbestos leakage from Asbestos Work Area has occurred, or is likely to occur, Contract Administrator may order Work shutdown and correction of deficiencies.

.5 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

.6 Contractor will be provided with authorization to remove enclosure structures upon receipt of acceptable air sample results.

.1 The City's air monitoring consultant will be responsible for contacting the appropriate building maintenance staff to turn the air back on once the monitoring has passed.

1.14 INSPECTION

.1 Perform random inspection of Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviation[s] from these requirements that have not been approved in writing by Contract Administrator may result in Work stoppage, at no cost to the City.

.2 Contract Administrator may inspect Work for:

.1 Daily adherence to specific procedures and materials.

.2 Final cleanliness and completion.

.3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

.3 When asbestos leakage from Asbestos Work Area has occurred, or is likely to occur, Contract Administrator may order Work shutdown.

.1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

END OF SECTION

1.1 SUMMARY

.1 Refer to the following information (further referred to herein as the "Assessment Reports"), attached in Appendix of the Specifications, for information pertaining to asbestos-containing materials (ACMs) that have been identified and may require disturbance during the Work:

.1 City of Winnipeg "Asbestos Inventory Control" for the Public Safety Building and the Civic Centre Car Park (inspection date April 9, 2018, and associated drawings).

.1 Note that information for the Civic Parkade is included here for reference only, since the asbestos abatement and hazardous material remediation of the Civic Parkade is not part of the current scope of work.

.2 Stantec Consulting Ltd. Hazardous Building Materials Review and Assessment.

.2 The Assessment Reports indicate that ACMs including, but not limited to, the following are present, all of which are to be removed for appropriate disposal as part of the Work.

.1 Brown mastic on metal duct work
.2 Black mastic on fibreglass pipe insulation throughout.
.3 Gold mastic in electrical room.
.4 Plaster applied to walls and ceilings throughout.
.5 Texture coat applied to walls and ceilings throughout.
.6 Insulation on mechanical pipes (straights and fittings) throughout.
.7 Insulation on ducts throughout.
.8 Cement pipe associated with rainwater drainage system.
.9 Gaskets in flanges of mechanical pipes and systems throughout.
.10 Vinyl floor tiles and associated mastics in multiple locations.
.11 Tank insulation in the mechanical and boiler rooms.
.12 Drains and sealants associated with the roof.
.13 Roofing material (asphalt; mastics) associated with the roof.
.14 Insulation in fire-rated doors throughout.

.3 Abatement shall be conducted to handle, alter, remove and/or dispose of all ACMs as identified in the Assessment Reports in accordance with applicable regulations, guidelines, standards and/or best practices for such work, including, but not limited to, the following:

.1 Government of Manitoba

.1 Manitoba Workplace Safety and Health Act and Regulation, including amendments to date of work.

.2 Manitoba Hazardous Waste Regulation MR 55/2003.

.2 SAFE Work Manitoba

.1 Guide for Asbestos Management, 2017.

.3 City of Winnipeg Requirements.

.4 Contractor is responsible for reviewing plans, specifications and reports such that they understand the locations and amounts of ACMs that are to be removed.

.5 Contractor is responsible to remove and dispose of sufficient wall, celling and/or other materials (where present and necessary) – whether or not they are asbestos-containing – to expose and remove/dispose of concealed ACMs (e.g., mechanical insulation in wall or ceiling cavities).

.6 Contractor is responsible to uncouple, detach or otherwise disconnect applicable joints in mechanical pipes and systems throughout to allow for removal of asbestos-containing gaskets.

.7 Unless otherwise determined through risk assessment conducted by the Contractor's Competent Worker, comply with requirements of this section when performing Work that would be considered "Type 2" asbestos abatement work as defined in the SAFE Work Manitoba 2017 "Guide for Asbestos Management" for tasks where it is expected that asbestos fibres may be released as a result of the work activity and work can be carried out in less than 3 hours, including, but not limited to:

.1 Using non-powered hand tools to cut, shape, drill or remove a Non-Friable manufactured ACM if water is not used to control fibre release.

.2 Removing part of a false-ceiling to gain access to a work area and where Friable ACM is, or is likely to be, lying on the surface of the false ceiling.

.3 Removal, encapsulating, enclosing or disturbance of a minor amount (less than 1 m^2) of Friable ACM during the repair, alteration, maintenance, demolition or dismantling of a building, structure, machine, tool or equipment if the work is carried out in less than 3 hours.

.4 Removal of Non-Friable asbestos material (e.g., stucco finish) where the material must be cut, broken, or otherwise damaged and become Friable as a result of the removal process.

.5 Performing glove bag operations.

.6 Any other asbestos abatement works not mentioned in Type 1 or Type 3 that may result in the release of asbestos fibre as a result of the work activity, and that may cause a worker exposure in excess of the occupational exposure limit.

.8 Deviation from the procedures outlined in this specification must be approved by the Contract Administrator prior to implementation.

.1 The Contractor may choose to combine tasks outlined in this specification section with other tasks being completed under more stringent procedures (e.g. Section 02 82 00.03 – Asbestos Abatement Requirements Type 3 Procedures), provided that the procedures of the more stringent section will prevail for all "combined" work.

1.2 SECTION INCLUDES

.1 Requirements, applicable procedures and personal protective equipment to be utilized during abatement of ACMs as outlined herein.

1.3 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 74 21 – Construction/Demolition Waste Management and Disposal

.3 Section 02 82 00.01 - Asbestos Abatement Type 1 Precautions

.4 Section 02 82 00.03 - Asbestos Abatement Type 3 Precautions

1.4 REFERENCE STANDARDS

.1 Department of Justice Canada (Jus)
- .1 Canadian Environmental Protection Act, 1999 (CEPA).

.2 Transport Canada (TC)
- .1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1992, (c. 34).
- .2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).

.3 Government of Manitoba
- .1 Manitoba Workplace Safety and Health Act and Regulation, including amendments to date of work (MB 217/2006).
- .2 Manitoba Hazardous Waste Regulation MR 55/2003.

.4 SAFE Work Manitoba
- .1 Guide for Asbestos Management, 2017.

1.5 DEFINITIONS

.1 Airlock: system for permitting ingress or egress without permitting air movement between contaminated area and uncontaminated area, typically consisting of two curtained doorways at least 2 m apart.

.2 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.

.3 Asbestos-Containing Materials (ACMs): materials that contain asbestos in amounts as listed below, and are identified under Existing Conditions including fallen materials and settled dust:

- .1 A friable material containing 0.1% or greater asbestos;
- .2 A non-friable material containing 1.0% or greater asbestos; and
- .3 All vermiculite insulation must be treated as an ACM.

.4 Asbestos Work Area: area where work takes place which will or may disturb ACMs.

.5 Authorized Visitors: Contract Administrator, and representatives of regulatory agencies.

.6 Competent Worker: in relation to specific work, means a worker who:

- .1 Is qualified because of knowledge, training and experience to perform the work.
- .2 Is familiar with the provincial and federal laws and with the provisions of the regulations that apply to the work.

.3 Has knowledge of all potential or actual danger to health or safety in the work.

.7 Curtained Doorway: arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:

.1 Place two overlapping sheets of Polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.

.2 Reinforce free edges of Polyethylene with duct tape and weight bottom edge to ensure proper closing.

.3 Overlap each Polyethylene sheet at openings not less than 1.5 m on each side.

.8 DOP Test: testing method used to determine integrity of negative pressure unit using dioctyl phthalate (DOP) HEPA-filter leak test.

.9 Friable Material: means material that:

.1 When dry, can be crumbled, pulverized or powdered by hand pressure, or

.2 Is crumbled, pulverized or powdered.

.10 HEPA Vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

.11 Negative Pressure: system that extracts air directly from work area, filters such extracted air through High Efficiency Particulate Air filtering system, and discharges this air directly outside work area to exterior of building.

.1 System to maintain minimum pressure differential of 5 Pa relative to adjacent areas outside of work areas, be equipped with alarm to warn of system breakdown, and be equipped with instrument to continuously monitor and automatically record pressure differences.

.12 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.13 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

1.6 ACTION AND INFORMATIONALSUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit proof satisfactory to Contract Administrator that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.

.3 Submit Provincial and/or local requirements for Notice of Project Form.

.4 Submit proof of Contractor's Asbestos Liability Insurance.

.5 Submit to Contract Administrator necessary permits for transportation and disposal of asbestos containing waste and proof that asbestos-containing waste has been received and properly disposed.

.6 Submit proof that all asbestos workers and/or supervisor have received appropriate training from a Competent Worker in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing. Instruction and training related to respirators includes, at minimum:

.1 Fitting of equipment.

.2 Inspection and maintenance of equipment.

.3 Disinfecting of equipment.

.4 Limitations of equipment.

.7 Submit proof that supervisory personnel have attended asbestos abatement course, of not less than two days duration.

.8 Submit Worker's Compensation Board status and transcription of insurance.

.9 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:

.1 Encapsulants.

.2 Amended Water.

.3 Slow drying sealer.

.10 Submit proof satisfactory to Contract Administrator that employees have respirator fitting and testing. Workers must be fit tested with respirator that is personally issued.

1.7 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at the time work is performed.

.2 Health and Safety:

.1 Perform construction occupational health and safety in accordance with applicable provincial occupational health and safety regulations.

.2 Safety Requirements: worker and visitor protection.

.1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:

.1 Full-facepiece powered, air purifying respirator with P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or

after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

.2 Disposable type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the Contractor and worn by every worker who enters the work area, and the protective clothing to consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing. It includes suitable footwear, and it to be repaired or replaced if torn.

.3 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.4 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.

.5 Ensure workers wash hands and face when leaving Asbestos Work Area.

.6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

.7 Visitor Protection:

.1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.

.2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.

.3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal packaging material in appropriate on-site bins for recycling.

.4 Separate for reuse and recycling and place in designated containers steel, metal, and/or plastic waste.

.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 Fold up metal banding, flatten and place in designated area for recycling.

.8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 mil bags or leak proof drums. Label containers with appropriate warning labels.

.9 Provide manifests describing and listing waste created. Transport containers by approved means to licenced landfill for burial.

1.9 EXISTING CONDITIONS

.1 Reports and information pertaining to ACMS to be handled, removed, or otherwise disturbed and disposed of during this Project are bound into this specification in Appendix 2, and/or are available from the Contract Administrator.

.2 Notify Contract Administrator of suspected ACM discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Contract Administrator.

1.10 SCHEDULING

.1 Hours of Work: perform work during normal working hours as indicated in Contract Documents.

1.11 MATERIALS

.1 Drop and Enclosure Sheets:

.1 Polyethylene: 0.15 mm thick.

.2 FR Polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with Polyethylene.

.2 Waste Containers: contain waste in two separate containers.

.1 Inner container: 0.15 mm thick sealable Polyethylene bag.

.2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable Polyethylene bag.

.3 Labelling requirements: affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site. Label containers in accordance with Asbestos Regulations 29 CFR 1910.1001. Label in both official languages.

.3 Tape: tape suitable for sealing Polyethylene to surfaces under both dry and wet conditions using Amended Water.

.4 Slow-drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.

.1 Sealer: flame spread, and smoke developed rating less than 50.

.5 Encapsulant: penetrating type conforming to CAN/CGSB-1.205.

1.12 PREPARATION

.1 Asbestos abatement work is to be completed in general accordance with the requirements of the SAFE Work Manitoba 2017 “Guide for Asbestos Management”. Where discrepancies exist between that document and these specifications, the more stringent will apply.

.2 Perform construction occupational health and safety in accordance with applicable provincial occupational health and safety regulations.

.3 Notification to Manitoba Workplace Safety and Health to be completed prior to work resulting in the potential release of ACMs.

.4 Work Areas:

.1 Shut off and isolate air handling and ventilation systems to prevent fibre dispersal to other building areas during work phase. Conduct smoke tests to ensure that duct work is airtight. Seal and caulk joints and seams of active return air ducts within Asbestos Work Area.

.1 Lock Out Tag Out will be conducted in accordance with applicable regulations and The City’s protocols. All affected persons will be notified, including The City’s central control, as well as any facility staff, users or contractors present.

.2 Clean proposed work areas using, where practicable, HEPA Vacuum cleaning equipment. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA Vacuum equipment.

.3 The spread of dust from the work area to be prevented by:

.1 Using enclosures of Polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure material is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls.

.2 Using curtains of Polyethylene sheeting or other suitable material that is impervious to asbestos, fitted on each side of each entrance or exit from the work area.

.4 Put Negative Pressure system in operation and operate continuously from time first Polyethylene is installed to seal openings until final completion of work including final cleanup. The system to maintain a negative air pressure, relative to the area outside the enclosed area. Air is to be exhausted directly outdoors. The system to be inspected and maintained by a Competent Worker prior each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it to be replaced before the ventilation system is used.

.1 Negative air units are to be dioctyl phthalate (DOP) tested on-site, prior to installation/use, with test results provided to Contract Administrator for review.

.5 Seal off openings such as corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with Polyethylene sheeting sealed with tape.

.6 Cover floor and wall surfaces with Polyethylene sheeting sealed with tape. Cover floors first so that Polyethylene extends at least 300 mm up walls then cover walls to overlap floor sheeting.

.7 Build Airlocks at entrances to and exits from work areas so that work areas are always closed off by one Curtained Doorway when workers enter or exit.

.8 At each access to work areas install warning signs in both official languages in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used: "CAUTION ASBESTOS HAZARD AREA (25 mm) NO UNAUTHORIZED ENTRY (19 mm) WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)".

.9 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Fire Commissioner of Canada and Provincial Fire Marshall Authority having jurisdiction.

.10 Where application of water is required for wetting asbestos containing materials, shut off electrical power, provide 24-volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.

.11 After preparation of work areas and Decontamination Enclosure Systems, for the removal of all other ACMs, remove within work area and dispose of as contaminated waste in specified containers. Spray asbestos debris and immediate work area with Amended Water to reduce dust, as work progresses.

.5 Worker Decontamination Enclosure System:

.1 Worker Decontamination Enclosure System includes Equipment and Access Room, Shower Room, and Clean Room, as follows:

.1 Equipment and Access Room: build Equipment and Access Room between Shower Room and work area[s], with two Curtained Doorways, one to Shower Room and one to work area[s]. Install waste receptor, and storage facilities for workers' shoes and protective clothing to be worn in work area[s]. Build Equipment and Access Room large enough to accommodate specified facilities, other equipment needed, and at least one worker allowing him /her sufficient space to undress comfortably.

.2 Shower Room: build Shower Room between Clean Room and Equipment and Access Room, with two Curtained Doorways, one to Clean Room and one to Equipment and Access Room. Provide one shower for every five workers. Provide constant supply of hot and cold or warm water. Provide piping and connect to water sources and drains. Pump waste water through 5 micrometre filter

system before directing into drains. Provide soap, clean towels, and appropriate containers for disposal of used respirator filters.

.3 Clean Room: build Clean Room between Shower Room and clean areas outside of enclosures, with two Curtained Doorways, one to outside of enclosures and one to Shower Room. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.

.6 Container and Equipment Decontamination Enclosure System:

.1 Container and Equipment Decontamination Enclosure System consists of Staging Area within work area, Washroom, Holding Room, and Unloading Room. Purpose of system is to provide means to decontaminate waste containers, scaffolding, waste and material containers, vacuum and spray equipment, and other tools and equipment for which Worker Decontamination Enclosure System is not suitable.

.1 Staging Area: designate Staging Area in work area for gross removal of dust and debris from waste containers and equipment, labelling and sealing of waste containers, and temporary storage pending removal to Washroom. Equip Staging Area with Curtained Doorway to Washroom.

.2 Washroom: build Washroom between Staging Area and Holding Room with two Curtained Doorways, one to Staging Area and one to Holding Room. Provide high-pressure low-volume sprays for washing of waste containers and equipment. Pump waste water through 5 micrometre filter system before directing into drains. Provide piping and connect to water sources and drains.

.3 Holding Room: build Holding Room between Washroom and Unloading Room, with two Curtained Doorways, one to Washroom and one to Unloading Room. Build Holding Room sized to accommodate at least two waste containers and largest item of equipment used.

.4 Unloading Room: build Unloading Room between Holding Room and outside, with two Curtained Doorways, one to Holding Room and one to outside.

.7 Construction of Decontamination Enclosures:

.1 Build suitable framing for enclosures or use existing rooms where convenient, and line with Polyethylene sheeting sealed with tape.

.2 Build Curtained Doorways between enclosures so that when people move through or when waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.

.8 Maintenance of Enclosures:

.1 Maintain enclosures in tidy condition.

.2 Ensure that barriers and Polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.

.3 Visually inspect enclosures at beginning of each working period.

.4 Use smoke methods to test effectiveness of barriers when directed by Contract Administrator.

.9 Do not begin Asbestos Abatement work until:

.1 Arrangements have been made for disposal of waste.

.2 For wet stripping techniques, arrangements have been made for containing, filtering, and disposal of waste water.

.3 Work area[s] and decontamination enclosures are effectively segregated.

.4 Tools, equipment, and materials waste containers are on hand.

.5 Arrangements have been made for building security.

.6 Warning signs are displayed where access to contaminated areas is possible.

.7 Notifications have been completed and other preparatory steps have been taken.

1.13 SUPERVISION

.1 Minimum of one Supervisor for every ten workers is required.

.2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of ACMs.

1.14 PROCEDURES

.1 Before removing asbestos:

.1 Prepare site.

.2 Spray asbestos material with water containing specified wetting agent, using airless spray equipment capable of providing "mist" application to prevent release of fibres. Saturate asbestos material sufficiently to wet it to substrate without causing excess dripping. Spray asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion.

.2 Remove saturated asbestos material in small amounts. Do not allow saturated asbestos to dry out. As it is being removed pack material in sealable plastic bags 0.15 mm minimum thick and place in labelled containers for transport.

.3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination area, and store in a holding area pending removal to Unloading Room and outside. Ensure that containers are removed from holding area by workers who have entered from uncontaminated areas dressed in clean coveralls.

.4 After completion of removal work, wire brush, HEPA Vacuum and/or wet-sponge surfaces from which asbestos has been removed to remove visible material.

.5 Where Contract Administrator decides complete removal of ACM is impossible due to obstructions such as structural members or major service elements, and provides written direction, encapsulate material as follows:

.1 Apply penetrating type sealer to penetrate existing sprayed asbestos surfaces uniformly to substrate.

.6 After removal of visible asbestos, and after encapsulating ACM impossible to remove, wet clean entire work area including Equipment and Access Room, and equipment used in process. After 24-hour period to allow for dust settling, wet clean these areas and objects again. During this settling period no entry, activity, or ventilation will be permitted. After second 24-hour period under same conditions, clean these areas and objects again using HEPA Vacuum followed by wet cleaning. After inspection by Contract Administrator apply continuous coat of slow drying sealer to surfaces of work area. Allow at least 16 hours with no entry, activity, ventilation, or disturbance other than operation of Negative Pressure units during this period.

.7 Work is subject to visual inspection and air monitoring. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.

.8 Cleanup:

.1 Frequently during Work and immediately after completion of work, clean up dust and asbestos-containing waste using HEPA Vacuum or by damp mopping.

.2 Place dust and asbestos-containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.

.3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA Vacuum and place in second clean waste bag.

.4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.

.5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA Vacuum.

1.15 FINAL CLEANUP

.1 Remove Polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible asbestos-containing particles observed during cleanup, immediately, using HEPA Vacuum equipment.

.2 Place Polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.

.3 Include in clean-up Work areas, Equipment and Access Room, Washroom, Shower Room, and other contaminated enclosures.

.4 Include in clean-up sealed waste containers and equipment used in Work and remove from work areas, via Container and Equipment Decontamination Enclosure System, at appropriate time in cleaning sequence.

.5 As work progresses, and to prevent exceeding available storage capacity on site, remove sealed and labelled containers containing asbestos waste and dispose of to authorized disposal area in accordance with requirements of disposal authority. Ensure that each shipment of containers transported to dump is accompanied by Contractor's representative to ensure that dumping is done in accordance with governing regulations.

1.16 AIR MONITORING

.1 From beginning of Work until completion of cleaning operations, The City shall retain an independent, competent (as described in the SAFE Work Manitoba 2017 “Guide for Asbestos Management”) third party (further referred to herein as the “Hazmat Consultant”) to take air samples inside and outside of Asbestos Work Area in accordance with the recommendations set forth in the SAFE Work Manitoba 2017 “Guide for Asbestos Management”.

.1 Air sample analysis will be conducted by Phase Contrast Microscopy (PCM) using the NIOSH 7400 method: Asbestos and Other Fibers by PCM for airborne asbestos exposure analysis as per regulatory guidelines.

.1 For Type 2 work, and for post-abatement samples, The City requires a minimum of 3,850 litres of air to be collected, with detection limits of less than 0.01 fibres per cubic centimetre.

.2 For perimeter surveillance (area samples) outside a Type 2 enclosure or associated with glove bag asbestos removal, The City requires a minimum of 1,283 litres of air to be collected, with detection limits of less than 0.03 fibres per cubic centimetre

.3 When monitoring inside a Type 2 enclosure (occupational samples), to evaluate or demonstrate the efficacy of various control measures (wetting, respirators, air exchange, etc.) where the anticipated fibre concentration is at or slightly above 0.1 fibres per cubic centimetre, a minimum sample size of 400 litres of air will be collected.

.2 Air sample results will be provided to The City, the Contractor and the Contract Administrator within 2-hours of sample collection.

.3 Analysis will be conducted by qualified persons or laboratories that take part in a documented QA/QC program for such analysis.

.2 Contractor will be notified to Stop Work when airborne fibre measurements exceed 0.05 fibres per cubic centimetre, when PPE and protection factors are considered, and to correct procedures.

.1 Additional monitoring will be conducted, where possible, to verify procedural corrections were effective.

.3 If air monitoring shows that areas outside Asbestos Work Area are contaminated as determined by the Contract Administrator, Contractor will be notified to maintain and clean these areas in same manner as that applicable to Asbestos Work Area, at no additional cost to the Contract.

.4 When asbestos leakage from Asbestos Work Area has occurred, or is likely to occur, Contract Administrator may order Work shutdown and correction of deficiencies.

.5 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

.6 Post-abatement testing must be completed.

.1 After Asbestos Work Area has passed visual inspection by Contractor and/or Contract Administrator and acceptable coat of lock-down agent has been applied to surfaces within enclosure by the Contractor, and appropriate setting period has passed, post-abatement air monitoring within Asbestos Work Area must be conducted.

.1 Final air monitoring results must show fibre levels of less than 0.01 fibres per cubic centimetre.

.2 If air monitoring results show fibre levels in excess of 0.01 fibres per cubic centimetre, Contractor will re-clean work area and apply another acceptable coat of lock-down agent to surfaces, at no additional cost to Contract.

.3 Repeat as necessary until fibre levels are less than 0.01 fibres per cubic centimetre, at no additional cost to Contract.

.7 Photos, along with a description of the work are to be included in the Prep Inspection, Daily Interim, and Final Clearance Site Inspection Reports to be prepared by The City's air monitoring consultant.

.8 Contractor will be provided with authorization to remove enclosure structures upon receipt of acceptable air sample results.

.1 The City's air monitoring consultant will be responsible for contacting the appropriate building maintenance staff to turn the air back on once the monitoring has passed.

1.17 INSPECTION

.1 Perform random inspection of Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviation[s] from these requirements that have not been approved in writing by Contract Administrator may result in Work stoppage, at no cost to the City.

.2 Contract Administrator may inspect Work for:

.1 Daily adherence to specific procedures and materials.

.2 Final cleanliness and completion.

.3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

.3 When asbestos leakage from Asbestos Work Area has occurred, or is likely to occur, Contract Administrator may order Work shutdown.

.1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

END OF SECTION

1.1 SUMMARY

.1 Refer to the following information (further referred to herein as the "Assessment Reports"), attached in the Appendix of the Specifications, for information pertaining to asbestos-containing materials (ACMs) that have been identified and may require disturbance during the Work:

.1 City of Winnipeg "Asbestos Inventory Control" for the Public Safety Building and the Civic Centre Car Park (inspection date April 9, 2018, and associated drawings).

.1 Note that information for the Civic Parkade is included here for reference only, since the asbestos abatement and hazardous material remediation of the Civic Parkade is not part of the current scope of work.

.2 Stantec Consulting Ltd. Hazardous Building Materials Review and Assessment.

.2 The Assessment Reports indicate that ACMs including, but not limited to, the following are present, all of which are to be removed for appropriate disposal as part of the Work.

.1 Brown mastic on metal duct work

.2 Black mastic on fibreglass pipe insulation throughout.

.3 Gold mastic in electrical room.

.4 Plaster applied to walls and ceilings throughout.

.5 Texture coat applied to walls and ceilings throughout.

.6 Insulation on mechanical pipes (straights and fittings) throughout.

.7 Insulation on ducts throughout.

.8 Cement pipe associated with rainwater drainage system.

.9 Gaskets in flanges of mechanical pipes and systems throughout.

.10 Vinyl floor tiles and associated mastics in multiple locations.

.11 Tank insulation in the mechanical and boiler rooms.

.12 Drains and sealants associated with the roof.

.13 Roofing material (asphalt; mastics) associated with the roof.

.14 Insulation in fire-rated doors throughout.

.3 Abatement shall be conducted to handle, alter, remove and/or dispose of all ACMs as identified in the Assessment Reports in accordance with applicable regulations, guidelines, standards and/or best practices for such work, including, but not limited to, the following:

.1 Government of Manitoba

.1 Manitoba Workplace Safety and Health Act and Regulation, including amendments to date of work.

.2 Manitoba Hazardous Waste Regulation MR 55/2003.

.2 SAFE Work Manitoba

.1 Guide for Asbestos Management, 2017.

.3 City of Winnipeg Requirements.

.4 Contractor is responsible for reviewing plans, specifications and reports such that they understand the locations and amounts of ACMs that are to be removed.

.5 Contractor is responsible to remove and dispose of sufficient wall, celling and/or other materials (where present and necessary) – whether or not they are asbestos-containing – to expose and remove/dispose of concealed ACMs (e.g., mechanical insulation in wall or ceiling cavities).

.6 Contractor is responsible to uncouple, detach or otherwise disconnect applicable joints in mechanical pipes and systems throughout to allow for removal of asbestos-containing gaskets.

.7 Unless otherwise determined through risk assessment conducted by the Contractor's Competent Worker, comply with requirements of this section when performing Work that would be considered "Type 3" asbestos abatement work as defined in the SAFE Work Manitoba 2017 "Guide for Asbestos Management" for tasks where asbestos fibre is expected to be released because of the work activity, including, but not limited to:

.1 Removing, encapsulating, enclosing or disturbing friable ACM during the repair, alteration, maintenance, demolition, or dismantling of a building, structure, machine, tool or equipment, or part of it and where the job takes longer than 3 hours to complete. Work done in less than 3 hours can be conducted in accordance with Type 2 asbestos practice.

.2 Spray application of a sealant or encapsulant onto a friable ACM that is greater than one square metre (1 m^2).

.3 Cleaning or removal of air-handling equipment, including rigid ducting, in a building that has, or previously had, sprayed-on asbestos fireproofing, thermal or acoustic insulation in the building, unless it can be shown that the air handling equipment has been effectively cleaned and cleared of the presence of asbestos.

.4 Repairing, altering or dismantling a boiler, furnace, kiln or similar device, or part thereof, where ACM has been used or applied.

.5 Repair, alteration or demolition of equipment made in part of refractory ACM.

.6 Grinding, cutting, drilling, sanding or scraping any ACMs involved in Type 1 work with a power tool not equipped with a HEPA filter.

.7 Demolishing, dismantling, altering or repairing any building or structure, or part of it, in which insulating ACM was used or in which asbestos products were manufactured.

.8 Dry removal of friable ACM when wet removal is not feasible as determined by a risk assessment and to be indicated on the notification to the director of Workplace Safety and Health.

.8 Deviation from the procedures outlined in this specification must be approved by the Contract Administrator prior to implementation.

1.2 SECTION INCLUDES

.1 Requirements for procedures and personal protective equipment to be utilized during abatement of ACMs as outlined herein.

1.3 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 74 21 – Construction/Demolition Waste Management and Disposal

.3 Section 02 82 00.01 - Asbestos Abatement Type 1 Precautions

.4 Section 02 82 00.02 - Asbestos Abatement Type 2 Precautions

1.4 REFERENCE STANDARDS

.1 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).

.2 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1992, (c. 34).

.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).

.3 Government of Manitoba

.1 Manitoba Workplace Safety and Health Act and Regulation, including amendments to date of work (MB 217/2006).

.2 Manitoba Hazardous Waste Regulation MR 55/2003.

.4 SAFE Work Manitoba

.1 Guide for Asbestos Management, 2017.

1.5 DEFINITIONS

.1 Airlock: System for permitting ingress or egress without permitting air movement between contaminated area and uncontaminated area, typically consisting of two Curtained Doorways at least 2 m apart.

.2 Amended Water: Water with a non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.

.3 Asbestos-Containing Materials (ACMs): Materials that contain asbestos in amounts as listed below, and are identified under Existing Conditions including fallen materials and settled dust:

.1 A friable material containing 0.1% or greater asbestos;

.2 A non-friable material containing 1.0% or greater asbestos; and

.3 All vermiculite insulation must be treated as an ACM.

.4 Asbestos Work Areas: Area where work takes place which will or may disturb ACMs.

.5 Authorized Visitors: Contract Administrator, Contract Administrator, and representatives of regulatory agencies.

.6 Competent Worker: In relation to specific work, means a worker who:

.1 Is qualified because of knowledge, training and experience to perform the work.

.2 Is familiar with the provincial and federal laws and with the provisions of the regulations that apply to the work.

.3 Has knowledge of all potential or actual danger to health or safety in the work.

.7 Curtained Doorway: Arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:

.1 Place two overlapping sheets of Polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.

.2 Reinforce free edges of Polyethylene with duct tape and weight bottom edge to ensure proper closing.

.3 Overlap each Polyethylene sheet at openings not less than 1.5 m on each side.

.8 DOP Test: Testing method used to determine integrity of Negative Pressure unit using dioctyl phthalate (DOP) HEPA-filter leak test.

.9 Friable Material: Means material that:

.1 When dry, can be crumbled, pulverized or powdered by hand pressure, or

.2 is crumbled, pulverized or powdered.

.10 HEPA Vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

.11 Negative Pressure: System that extracts air directly from work area, filters such extracted air through High Efficiency Particulate Air filtering system, and discharges this air directly outside work area to exterior of building.

.1 System to maintain minimum pressure differential of 5 Pa relative to adjacent areas outside of work areas, be equipped with alarm to warn of system breakdown, and be equipped with instrument to continuously monitor and automatically record pressure differences.

.12 Non-Friable Materials: Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.13 Polyethylene Sheeting Sealed with tape: Polyethylene sheeting of type and thickness specified sealed with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide continuous polyethylene membrane to protect underlying surfaces from water damage or damage by sealants, and to prevent escape of asbestos fibres through sheeting into clean area.

.14 Sprayer: Garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit proof satisfactory to Contract Administrator that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.

.3 Submit Provincial and/or local requirements for Notice of Project Form.

.4 Submit proof of Contractor's Asbestos Liability Insurance.

.5 Submit to Contract Administrator necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.

.6 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a Competent Worker in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing. Instruction and training related to respirators is to include, at a minimum:

.1 Fitting of equipment.

.2 Inspection and maintenance of equipment.

.3 Disinfecting of equipment.

.4 Limitations of equipment.

.7 Submit proof that supervisory personnel have attended asbestos abatement course, of not less than two days duration.

.8 Submit Worker's Compensation Board status and transcription of insurance.

.9 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:

.1 Encapsulants,

.2 Amended Water, and

.3 Slow drying sealer.

.10 Submit proof satisfactory to Contract Administrator that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

1.7 QUALITY ASSURANCE

.1 Regulatory Requirements: Comply with Federal, Provincial and local requirements pertaining to asbestos, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.

.2 Health and Safety:

.1 Perform construction occupational health and safety in accordance with applicable provincial occupational health and safety regulations.

.2 Safety Requirements: Worker and visitor protection.

.1 Protective Equipment and Clothing to be Worn by Workers While in Asbestos Work Area Includes, at a Minimum:

.1 Full-facepiece powered air purifying respirator (PAPR) with P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

.2 Disposable type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the Contractor and worn by every worker who enters the work area, and the protective clothing to consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing. It includes suitable footwear, and it to be repaired or replaced if torn. Requirements for each worker:

.1 Remove street clothes in clean change room and put on respirator with new filters or reusable filters that have been tested as satisfactory, clean coveralls and head covers before entering Equipment and Access Rooms or Asbestos Work Area. Store street clothes, uncontaminated

footwear, towels, and similar uncontaminated articles in clean change room.

.2 Remove gross contamination from clothing before leaving work area then proceed to Equipment and Access Room and remove clothing except respirators. Place contaminated work suits in receptacles for disposal with other asbestos-contaminated materials. Leave reusable items except respirator in Equipment and Access Room. Still wearing the respirator proceed naked to showers. Using soap and water wash body and hair thoroughly. Clean outside of respirator with soap and water while showering; remove respirator; remove filters and wet them and dispose of filters in container provided for purpose; and wash and rinse inside of respirator. When not in use in work area, store work footwear in Equipment and Access Room. Upon completion of asbestos abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from Equipment and Access Room.

.3 After showering and drying off, proceed to clean change room and dress in street clothes at end of each day's work, or in clean coveralls before eating, smoking, or drinking. If re-entering work area, follow procedures outlined in paragraphs above.

.4 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers must not use this system as means to leave or enter work area.

.2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.3 Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual asbestos abatement.

.4 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in both official languages.

.5 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

.6 Visitor Protection:

.1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.

.2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.

.3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal packaging material in appropriate on-site bins for recycling.

.4 Separate for reuse and recycling and place in designated containers steel, metal, and plastic waste.

.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 Fold up metal banding, flatten and place in designated area for recycling.

.8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 mil bags or leak proof drums. Label containers with appropriate warning labels.

.9 Provide manifests describing and listing waste created. Transport containers by approved means to licenced landfill for burial.

1.9 EXISTING CONDITIONS

.1 Reports and information pertaining to ACMS to be handled, removed, or otherwise disturbed and disposed of during the Work are attached in Appendix 2.

.2 Notify Contract Administrator of suspected ACM discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Contract Administrator.

1.10 SCHEDULING

.1 Hours of Work: perform work during normal working hours as indicated in Contract Documents.

1.11 MATERIALS

.1 Drop and Enclosure Sheets:

.1 Polyethylene: 0.15 mm thick.

.2 FR Polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with Polyethylene.

.2 Waste Containers: Contain waste in two separate containers.

.1 Inner Container: 0.15 mm thick sealable Polyethylene bag.

.2 Outer Container: Sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable Polyethylene bag.

.3 Labelling Requirements: Affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site. Label containers in accordance with Asbestos Regulations 29 CFR 1910.1001. Label in both official languages.

.3 Tape: Tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended Water.

.4 Slow-Drying Sealer: Non-staining, clear, water - dispersible type that remains tacky on surface for at least eight hours and designed for purpose of trapping residual asbestos fibres.

.1 Sealer: Flame spread, and smoke developed rating less than 50.

.5 Encapsulant: Penetrating type conforming to CAN/CGSB-1.205.

1.12 PREPARATION

.1 Asbestos abatement work is to be completed in general accordance with the requirements of the SAFE Work Manitoba 2017 “Guide for Asbestos Management”. Where discrepancies exist between that document and these specifications, the more stringent will apply.

.2 Perform construction occupational health and safety in accordance with applicable provincial occupational health and safety regulations.

.3 Notification to Manitoba Workplace Safety and Health to be completed prior to work resulting in the potential release of ACMs.

.4 Work Areas:

.1 Shut off and isolate air handling and ventilation systems to prevent fibre dispersal to other building areas during work phase. Conduct smoke tests to ensure that duct work is airtight. Seal and caulk joints and seams of active return air ducts within Asbestos Work Area.

.1 Lock Out Tag Out will be conducted in accordance with applicable regulations and The City’s protocols. All affected persons will be notified, including The City’s central control, as well as any facility staff, users or contractors present.

.2 Clean proposed work areas using, where practicable, HEPA Vacuum cleaning equipment. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA Vacuum equipment.

.3 The Spread of Dust from the Work Area to be Prevented by:

.1 Using enclosures of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure material is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls.

.2 Using curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted on each side of each entrance or exit from the work area.

.4 Put negative pressure system in operation and operate continuously from time first Polyethylene is installed to seal openings until final completion of work including final cleanup. The system to maintain a negative air pressure, relative to the area outside the enclosed area. The system to be inspected and maintained by a competent worker prior each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it to be replaced before the ventilation system is used.

.1 Negative air units are to be dioctyl phthalate (DOP) tested on-site, prior to installation/use, with test results provided to Contract Administrator for review.

.5 Seal off openings such as corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with Polyethylene sheeting sealed with tape.

.6 Cover floor and wall surfaces with Polyethylene sheeting sealed with tape. Cover floors first so that polyethylene extends at least 300 mm up walls then cover walls to overlap floor sheeting.

.7 Build airlocks at entrances to and exits from work areas so that work areas are always closed off by one curtained doorway when workers enter or exit.

.8 At each access to work areas install warning signs in both official languages in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used: "CAUTION ASBESTOS HAZARD AREA (25 mm) NO UNAUTHORIZED ENTRY (19 mm) WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)".

.9 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Fire Commissioner of Canada and Provincial Fire Marshall Authority having jurisdiction.

.10 Where application of water is required for wetting ACMs, shut off electrical power, provide 24-volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.

.11 After preparation of work areas and decontamination enclosure systems, for the removal of all other ACMs, remove within work area and dispose of as contaminated waste in specified containers. Spray asbestos debris

and immediate work area with Amended Water to reduce dust, as work progresses.

.5 Worker Decontamination Enclosure System:

.1 Worker decontamination enclosure system includes equipment and access room, shower room, and clean room, as follows:

.1 Equipment and Access Room: Build equipment and access room between shower room and work area[s], with two curtained doorways, one to shower room and one to work area[s]. Install waste receptor, and storage facilities for workers' shoes and protective clothing to be worn in work area[s]. Build equipment and access room large enough to accommodate specified facilities, other equipment needed, and at least one worker allowing him /her sufficient space to undress comfortably.

.2 Shower Room: Build shower room between clean room and equipment and access room, with two curtained doorways, one to clean room and one to equipment and access room. Provide one shower for every five workers. Provide constant supply of hot and cold or warm water. Provide piping and connect to water sources and drains. Pump waste water through 5 micrometre filter system before directing into drains. Provide soap, clean towels, and appropriate containers for disposal of used respirator filters.

.3 Clean Room: Build clean room between shower room and clean areas outside of enclosures, with two curtained doorways, one to outside of enclosures and one to shower room. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.

.6 Container and Equipment Decontamination Enclosure System:

.1 Container and equipment decontamination enclosure system consists of staging area within work area, washroom, holding room, and unloading room. purpose of system is to provide means to decontaminate waste containers, scaffolding, waste and material containers, vacuum and spray equipment, and other tools and equipment for which worker decontamination enclosure system is not suitable.

.1 Staging Area: Designate staging area in work area for gross removal of dust and debris from waste containers and equipment, labelling and sealing of waste containers, and temporary storage pending removal to washroom. equip staging area with curtained doorway to washroom.

.2 Washroom: Build washroom between staging area and holding room with two curtained doorways, one to staging area and one to holding room. provide high-pressure low-volume sprays for washing of waste containers and equipment. pump waste water

through 5 micrometre filter system before directing into drains. Provide piping and connect to water sources and drains.

.3 Holding Room: Build holding room between washroom and unloading room, with two curtained doorways, one to washroom and one to unloading room. Build holding room sized to accommodate at least two waste containers and largest item of equipment used.

.4 Unloading Room: Build unloading room between holding room and outside, with two curtained doorways, one to holding room and one to outside.

.7 Construction of Decontamination Enclosures:

.1 Build suitable framing for enclosures or use existing rooms where convenient, and line with polyethylene sheeting sealed with tape.

.2 Build curtained doorways between enclosures so that when people move through or when waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.

.8 Maintenance of Enclosures:

.1 Maintain enclosures in tidy condition.

.2 Ensure that barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.

.3 Visually inspect enclosures at beginning of each working period.

.4 Use smoke methods to test effectiveness of barriers when directed by Contract Administrator.

.9 Do not begin Asbestos Abatement work until:

.1 Arrangements have been made for disposal of waste.

.2 For wet stripping techniques, arrangements have been made for containing, filtering, and disposal of waste water.

.3 Work area[s] and decontamination enclosures are effectively segregated.

.4 Tools, equipment, and materials waste containers are on hand.

.5 Arrangements have been made for building security.

.6 Warning signs are displayed where access to contaminated areas is possible.

.7 Notifications have been completed and other preparatory steps have been taken.

1.13 SUPERVISION

.1 Minimum of one Supervisor for every ten workers is required.

.2 Approved supervisor must remain within asbestos work area during disturbance, removal, or other handling of ACMs.

1.14 PROCEDURES

.1 Before Removing Asbestos:

.1 Prepare site.

.2 Spray asbestos material with water containing specified wetting agent, using airless spray equipment capable of providing "mist" application to prevent release of fibres. Saturate asbestos material sufficiently to wet it to substrate without causing excess dripping. Spray asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion.

.2 Remove saturated asbestos material in small sections. Do not allow saturated asbestos to dry out. As it is being removed pack material in sealable plastic bags 0.15 mm minimum thick and place in labelled containers for transport.

.3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to staging area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination washroom. Wash containers thoroughly in decontamination washroom, and store in holding room pending removal to unloading room and outside. Ensure that containers are removed from holding room by workers who have entered from uncontaminated areas dressed in clean coveralls.

.4 After completion of removal work, wire brush, HEPA vacuum and/or wet-sponge surfaces from which asbestos has been removed to remove visible material.

.5 Where Contract Administrator decides complete removal of ACM is impossible due to obstructions such as structural members or major service elements, and provides written direction, encapsulate material as follows:

.1 Apply penetrating type sealer to penetrate existing sprayed asbestos surfaces uniformly to substrate.

.6 After removal of visible asbestos, and after encapsulating ACM impossible to remove, wet clean entire work area including Equipment and Access Room, and equipment used in process. After 24-hour period to allow for dust settling, wet clean these areas and objects again. During this settling period no entry, activity, or ventilation will be permitted. After second 24-hour period under same conditions, clean these areas and objects again using HEPA vacuum followed by wet cleaning. After inspection by Contract Administrator apply continuous coat of slow drying sealer to surfaces of work area. Allow at least 16 hours with no entry, activity, ventilation, or disturbance other than operation of negative pressure units during this period.

.7 Work is subject to visual inspection and air monitoring. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.

.8 Cleanup:

.1 Frequently during Work and immediately after completion of work, clean up dust and asbestos-containing waste using HEPA Vacuum or by damp mopping.

.2 Place dust and asbestos-containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.

.3 Immediately before their removal from asbestos work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.

.4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.

.5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

1.15 FINAL CLEANUP

.1 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible asbestos-containing particles observed during cleanup, immediately, using HEPA vacuum equipment.

.2 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.

.3 Include in clean-up work areas, equipment and access room, washroom, shower room, and other contaminated enclosures.

.4 Include in clean-up sealed waste containers and equipment used in Work and remove from work areas, via container and equipment decontamination enclosure system, at appropriate time in cleaning sequence.

.5 As work progresses, and to prevent exceeding available storage capacity on site, remove sealed and labelled containers containing asbestos waste and dispose of to authorized disposal area in accordance with requirements of disposal authority. Ensure that each shipment of containers transported to dump is accompanied by Contractor's representative to ensure that dumping is done in accordance with governing regulations.

1.16 AIR MONITORING

.1 From beginning of Work until completion of cleaning operations, The City shall retain an independent, competent (as described in the SAFE Work Manitoba 2017 “Guide for Asbestos Management”) third party (further referred to herein as the “Hazmat Contract Administrator”) to take air samples inside and outside of asbestos work area in accordance with the recommendations set forth in the SAFE Work Manitoba 2017 “Guide for Asbestos Management”.

.1 Air sample analysis will be conducted by Phase Contrast Microscopy (PCM) using the NIOSH 7400 method: Asbestos and Other Fibers by PCM for airborne asbestos exposure analysis as per regulatory guidelines.

.2 For Type 3 work, and for post-abatement samples, The City requires a minimum of 3,850 litres of air to be collected, with detection limits of less than 0.01 fibres per cubic centimetre.

.3 For perimeter surveillance (area samples) outside a Type 3 enclosure the City requires a minimum of 1,283 litres of air to be collected, with detection limits of less than 0.03 fibres per cubic centimetre.

.4 When monitoring inside a Type 3 enclosure (occupational samples), to evaluate or demonstrate the efficacy of various control measures (wetting, respirators, air exchange, etc.) where the anticipated fibre concentration is at or slightly above 0.1 fibres per cubic centimetre, a minimum sample size of 400 litres of air will be collected.

.5 Random monitoring inside the hoarding is to be expected for all Type 3 work, to ensure dust levels are controlled.

.6 Air sample results will be provided to the City, the Contractor and the Contract Administrator within two-hours of sample collection.

.7 Analysis will be conducted by qualified persons or laboratories that take part in a documented QA/QC program for such analysis.

.2 Contractor will be notified to stop work when airborne fibre measurements exceed 0.05 fibres/cubic centimetre, when PPE and protection factors are considered, and to correct procedures.

.1 Additional monitoring will be conducted, where possible, to verify procedural corrections were effective.

.3 If air monitoring shows that areas outside asbestos work area are contaminated as determined by the Contract Administrator, Contractor will be notified to maintain and clean these areas in same manner as that applicable to asbestos work area, at no additional cost to the Contract.

.4 When asbestos leakage from asbestos work area has occurred, or is likely to occur, Contract Administrator may order Work shutdown and correction of deficiencies.

.5 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

.6 Post-abatement testing must be completed.

.1 After asbestos work area has passed visual inspection by Contractor and Contract Administrator and acceptable coat of lock-down agent has been applied to surfaces within enclosure by the Contractor, and appropriate setting period has passed, post-abatement air monitoring within asbestos work area must be conducted.

.1 Final air monitoring results must show fibre levels of less than 0.01 fibres per cubic centimetre.

.2 If air monitoring results show fibre levels in excess of 0.01 fibres per cubic centimetre, Contractor will re-clean work area and apply another acceptable coat of lock-down agent to surfaces, at no additional cost to Contract.

.3 Repeat as necessary until fibre levels are less than 0.01 fibres per cubic centimetre, at no additional cost to Contract.

.7 Photos, along with a description of the work are to be included in the prep inspection, daily interim, and final clearance site inspection reports to be prepared by the City's air monitoring Contract Administrator.

.8 Contractor will be provided with authorization to remove enclosure structures upon receipt of acceptable air sample results.

.1 The City's air monitoring Contract Administrator will be responsible for contacting the appropriate building maintenance staff to turn the air back on once the monitoring has passed.

1.17 INSPECTION

.1 Perform random inspection of asbestos work area to confirm compliance with specification and governing authority requirements. Deviation[s] from these requirements that have not been approved in writing by Contract Administrator may result in Work stoppage, at no cost to the City.

.2 Preliminary inspection of Type 3 containment is required by the City's air monitoring Contract Administrator prior to any contaminated work.

.3 Contract Administrator may Inspect Work for:

.1 Daily adherence to specific procedures and materials.

.2 Final cleanliness and completion.

.3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

.4 When asbestos leakage from asbestos work area has occurred, or is likely to occur, Contract Administrator may order Work shutdown.

.1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

END OF SECTION

1.1 RELATED WORK

.1 Concrete reinforcement: Section 03 20 00.

.2 Cast-in-place concrete: Section 03 30 00.

1.2 REFERENCES

.1 Current editions of reference standards shall be applicable.

.2 Canadian Standards Association (CSA)

.1 CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.

.2 CAN/CSA-O86.1, Engineering Design in Wood (Limit States Design).

.3 CAN3-O86S1/O86.1S1, Supplement No. 1 and CAN/CSA-O86.1 Engineering Design in Wood (Limit States Design).

.4 CSA O121, Douglas Fir Plywood.

.5 CSA O151, Canadian Softwood Plywood.

.6 CSA O153, Poplar Plywood.

.7 CAN3-O188.0, Standard Test Methods for Mat-Formed Wood Particleboards and Waferboard.

.8 CSA S269.1, Falsework for Construction Purposes.

.9 CSA S269.3, Concrete Formwork.

.3 Underwriters Laboratory Canada (ULC)

.1 CAN/ULC-S701 - Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.3 SHOP DRAWINGS

.1 Submit shop drawings for formwork and falsework in accordance with Section 01 33 00 - Submittals.

.2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts.

.3 Comply with CAN/CSA-S269.3 for formwork drawings and CSA S269.1 for falsework drawings.

.4 Indicate formwork design data, such as permissible rate of concrete placement, and temperature of concrete, in forms.

.5 Indicate sequence of erection and removal of formwork/falsework to Contract Administrator.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Comply with Section 01 74 21 - Construction Waste Management and Disposal.

1.5 FORMWORK MATERIALS

.1 Formwork materials:

.1 For concrete without special architectural features: plywood and wood formwork materials to CSA-0121, CAN3-O86S1/O86.1S1, and CSA-O153.

.2 For concrete with special architectural features: formwork materials to CAN/CSA-A23.1.

.2 Form liner:

.1 Plywood: high density overlay, Douglas Fir to CSA O121, T & G edge, 16mm thick. Sound, undamaged sheets with clean, smooth, true edges.

.3 Steel forms: tight fitting and adequately stiffened to support weight of concrete without deflection detrimental to structural tolerances and appearance of finished concrete surfaces.

.4 Form Ties:

.1 For concrete not designated 'Architectural' use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.

.2 All form tie holes to be patched.

.5 Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sizes as required, of sufficient strength and character to maintain formwork in place while pouring concrete.

.6 Falsework Materials: To CSA S269.1.

1.6 ACCESSORIES

.1 Form Release Agent: Chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps.

.2 Form Stripping Agent: Colourless mineral oil, free of kerosene, with viscosity between 70 and 110 s Saybolt Universal, at 40°C, flashpoint minimum 150°C, open cup.

.3 Fillets for Chamfered Corners: Unless otherwise indicated 25 x 25 mm. Special sizes, shapes and profiles as indicated on drawings.

.4 Void Forms:

.1 Paper Forms: Corrugated paper forms with cellular core, 150 mm thickness, minimum compressive strength 69 kPa. Protected all four sides by wax coated moisture protection. Shearmat or VF VoidForm or equal.

.1 Location: structural slabs, beams, walls, and elsewhere indicated.

.2 Expanded polystyrene forms: expanded polystyrene board insulation to CAN/ULC-S701, Type 1, compressive strength 55 kPa, thickness indicated.

.5 Board Insulation: Extruded polystyrene to CAN/ULC-S701 minimum compressive strength 690 kPa, 100 psi, thickness indicated.

.6 Flexible Rubber Waterstops: Basis of design products are Sikaswell S-2 and Sika hydrotite CJ-0725-3K. Alternative manufacture subject to equivalent performance of basis of design: Williams Products Inc., Greenstreak

1.7 FABRICATION AND ERECTION

.1 Verify lines, levels, and centres before proceeding with formwork and falsework. Ensure dimensions agree with drawings.

.2 Obtain Contract Administrator's permission for use of earth forms. Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.3 Construct falsework in accordance with CSA S269.1.

.4 Form release agent: apply on formwork in accordance with manufacturer's specifications. Apply prior to placing reinforcing steel, anchoring devices and embedded parts. Do not apply form release agent where concrete surfaces are to receive special finishes or applied coverings, which are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces wet prior to placing concrete. Take precautions to keep form release agent from contacting reinforcing steel.

.5 Do not place shores and mud sills on frozen ground.

.6 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.7 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1.

.8 Arrange and assemble formwork to permit easy dismantling and stripping, so that concrete is not damaged during its removal.

.9 Arrange forms to allow stripping without removal of principle shores, where these are required to remain in place.

.10 Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain. Close temporary ports or openings with tight-fitting panels, flush with inside face to forms, neatly fitted so those joints will not be apparent in exposed concrete surfaces.

.11 Form weep holes and drainage holes in formwork as indicated. If wood forms are used, remove after concrete has set.

.12 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated. Obtain Contract Administrator's permission before framing openings not indicated on Structural Drawings.

.13 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.14 Use chamfer strips on external corners of columns, beams, slabs where exposed in final assembly, and elsewhere indicated. Use chamfer strips at interior corners of concrete members, joints, and elsewhere indicated. Form special chamfer or bullnose corners to details indicated on drawings.

.15 Align form joints and make watertight. Keep form joints to minimum.

.16 Construct forms for architectural concrete, and place ties as indicated and/or as directed. Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.

.17 Clean formwork in accordance with CAN/CSA-A23.1 before placing concrete.

.18 Slip forming and flying forms may be acceptable, subject to submittal of details of equipment and procedures for Contract Administrator's review and acceptance.

.19 Inspect completed formwork, falsework, shoring and bracing to ensure that work is in accordance with formwork and falsework design and that supports, wedges, fastenings, ties and embedded parts are secure.

.20 Inform Contract Administrator when formwork is complete and has been cleaned to allow for inspection. Obtain approval prior to placing concrete.

1.8 VOID FORM INSTALLATION

.1 Install void forms where indicated, level, and to proper elevation.

.2 Use paper type void forms under beams, slabs, areaway walls.

.3 Use expanded polystyrene insulation void forms under walls.

.4 Where void form is to be placed in areas that will be above existing grade elevations the placement, leveling and compaction of backfill materials to be completed before void form is placed.

.5 Wrap paper type forms with polyethylene film to protect from moisture. Cover paper type void form with 6 mm thick hardboard.

.6 Provide minimum 300 x 300 mm sections of hardboard at bolster and chair locations.

.7 Protect from damage until concrete placement. Replace crushed, damaged, or wet void form before placing concrete.

1.9 REMOVAL AND RESHORING

.1 Notify Contract Administrator 48 hours in advance prior to removing formwork.

.2 Do not remove forms and bracing until concrete has gained sufficient strength to carry its own weight, construction loads, design loads that are liable to be imposed upon it. Verify strength of concrete by compressive test results.

.3 Leave formwork in place for following minimum periods of time after placing concrete:

LOCATION	TEMPERATURE IN °C		
	21-35	15-21	10-15
Wall Side Forms	7 days	7 days	7 days

.4 Re-shore structural members where required due to design requirements or construction conditions and as required to permit progressive construction. Remove forms supporting loads only when concrete has attained 75% of required 28-day compressive strength.

.5 Remove formwork progressively and in accordance with Building and Safety Code requirements and so that no shock loads or unbalanced loads are imposed on structure.

.6 Loosen forms carefully. Do not wedge pry bars, hammers, or tools against concrete surfaces.

.7 Store removed forms, for exposed concrete, so surfaces in contact with fresh concrete will not be damaged. Marked or scored forms will be rejected.

.8 Re-use formwork and falsework subject to requirements of CAN/CSA-A23.1.

END OF SECTION

1.1 RELATED WORK

.1 Section 03 10 00 - Concrete Formwork

.2 Section 03 30 00.- Cast-In-Place Concrete

1.2 REFERENCE STANDARDS

.1 Current editions of reference standards shall be applicable.

.2 American Concrete Institute (ACI)

.1 ACI 315R - Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.

.3 American National Standards Institute/American Concrete Institute (ANSI/ACI)

.1 ANSI/ACI 315 - Details and Detailing of Concrete Reinforcement.

.4 ASTM

.1 ASTM A 775/A 775M - Specification for Epoxy-Coated Reinforcing Steel Bars.

.5 Canadian Standards Association (CSA)

.1 CAN/CSA-A23.1 - Concrete Materials and Methods of Concrete Construction.

.2 CAN3-A23.3 - Design of Concrete Structures for Buildings.

.3 CSA G30.3 - Cold Drawn Steel Wire for Concrete Reinforcement.

.4 CSA ASTM A185/A185M - Welded Steel Wire Fabric for Concrete Reinforcement.

.5 CAN/CSA-G30.18 - Billet-Steel Bars for Concrete Reinforcement.

.6 CAN/CSA-G40.21 - Structural Quality Steels.

.7 CSA G164 - Hot Dip Galvanizing of Irregularly Shaped Articles.

.8 CSA W186 - Welding of Reinforcing Bars in Reinforced Concrete Construction.

1.3 SOURCE QUALITY CONTROL

.1 Upon request provide Contract Administrator with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum four weeks prior to commencing reinforcing work.

.2 Upon request inform Contract Administrator of proposed source of material to be supplied.

1.4 SHOP DRAWINGS

.1 Submit shop drawings consisting of bar bending details, lists, and placing of reinforcement in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate bar bending details, lists, quantities of reinforcement, sizes, spacing, locations of reinforcement and mechanical splices if approved by Contract Administrator, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacing and location of chairs, spacers and hangers.

.3 Prepare reinforcement drawings in accordance with Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Canada, ANSI/ACI 315, ACI 315R, Manual Engineering and Placing Drawings for Reinforced Concrete Structures.

.4 Design and detail lap lengths and bar development lengths to CAN3-A23.3, unless otherwise indicated. Provide type B tension lap splices where indicated unless otherwise indicated.

1.5 SUBSTITUTES

.1 Substitute different size bars only if permitted in writing by Contract Administrator.

1.6 DELIVERY, STORAGE, HANDLING

.1 Store materials carefully, clear from ground and protect from rust, soiling, distortion and other damage.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Comply with Section 01 74 21 - Construction Waste Management and Disposal.

1.8 MATERIALS

.1 Reinforcing Steel: Billet steel, grade 400, deformed bars to CAN/CSA-G30.18, unless indicated otherwise.

.2 Reinforcing Steel: Weldable low alloy steel deformed bars to CAN/CSA-G30.18.

.3 Cold-Drawn Annealed Steel Wire Ties: To CSA G30.3.

.4 Welded Steel Wire Fabric: To ASTM A185/A185M. Provide in flat sheets only.

.5 Epoxy Coating of Non-Prestressed Reinforcement: To ASTM A 775/A 775M.

.6 Galvanizing of Non-Prestressed Reinforcement: To CSA G164, minimum zinc coating 600 g/m².

.7 Chairs, Bolsters, Bar Supports, Spacers: To CAN/CSA-A23.1. Use corrosion resistant at architectural concrete locations.

.8 Mechanical Splices: Subject to approval of Contract Administrator.

.9 Plain Round Bars: To CAN/CSA-G40.21.

1.9 FABRICATION

.1 Fabricate reinforcing in accordance with CAN/CSA-A23.1, ANSI/ACI 315 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute

of Canada, ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures unless indicated otherwise.

.2 Obtain Contract Administrator's approval for locations of reinforcement splices other than shown on placing drawings.

.3 Upon approval of Contract Administrator, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement clearly identified in accordance with bar bending details and lists.

1.10 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Contract Administrator.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars that develop cracks or splits.

1.11 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CAN/CSA-A23.1.

.2 Use plain round bars as slip dowels in concrete. Paint portion of dowel intended to move within hardened concrete with one coat of lead or asphalt paint. When paint is dry, apply a thick even film of mineral lubricating grease.

.3 Keep reinforcing steel 65 mm back from construction joints and non-doweled joints.

.4 Use chairs, bolsters, bar supports, spacers acceptable to Contract Administrator.

.5 Use corrosion resistant chairs, bolsters, bar support, spacers, in areas where concrete is to be left exposed and where directed by Contract Administrator.

.6 Protect epoxy and paint coated portions of bars with covering during transportation and handling.

.7 Securely tie reinforcing in place with No.16-gauge wire.

.8 Do not use reinforcement having kinks or bends not indicated or detailed on drawings.

.9 Obtain Contract Administrator's approval before welding or cutting reinforcing bars.

.10 Splice reinforcement where indicated on drawings.

.11 Prior to placing concrete, obtain Contract Administrator's acceptance of reinforcing steel and position.

.12 Ensure cover to reinforcement is maintained during concrete pour.

1.12 FIELD TOUCH-UP

.1 Touch up damaged and cut ends of epoxy coated and galvanized reinforcing steel with compatible finish to provide continuous coating.

END OF SECTION

1.1 RELATED WORK

.1 Section 03 10 00 - Concrete Forms and Accessories

.2 Section 03 20 00 - Concrete Reinforcement

.3 Work specified in respective trade sections requiring inserts and openings in concrete.

1.2 REFERENCES

.1 Current editions of reference standards shall be applicable.

.2 American Society for Testing and Materials (ASTM)

.1 ASTM C109, Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inch or 50 mm Cube Specimens).

.2 ASTM C260, Specification for Air-Entrained Admixtures for Concrete.

.3 ASTM C309, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.4 ASTM C494, Specification for Chemical Admixtures for Concrete.

.5 ASTM C939, Test Method for Flow of Grout for Preplaced-Aggregate Concrete.

.6 ASTM C1017, Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

.7 ASTM D1751, Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.8 ASTM D1752, Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

.9 ASTM E1155, Test Method for Determining Floor Flatness and Levelness Using the F-Number System.

.3 Canadian Standards Association (CSA)

.1 CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.

.2 CAN/CSA-A23.2, Methods of Test for Concrete.

.3 CAN/CSA-A3000, Cementitious Materials Compendium.

.4 Canadian Government Standards Association (CSA)

.1 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction, Section 031516.

.5 American National Standards Board (CGSB)

.1 ANSI/ACI 117, Tolerances for Concrete Construction and Materials.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 At least four weeks prior to commencing work inform Contract Administrator of proposed source of aggregates and provide access for sampling.

.3 At least four weeks prior to commencing work, upon request, submit to Contract Administrator samples of following materials proposed for use:

- .1 One kg of each type of Portland Cement.
- .2 One kg of each type of Supplementary Cementing Material.
- .3 One kg of each type of Blended Hydraulic Cement.
- .4 One L of each admixture.
- .5 One L of curing compound.
- .6 One metre length of joint filler.
- .7 Waterstops.

1.4 CERTIFICATES

.1 Minimum four weeks prior to starting concrete work submit to Contract Administrator manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:

- .1 Portland cement.
- .2 Blended hydraulic cement.
- .3 Supplementary cementing materials.
- .4 Grout.
- .5 Admixtures.
- .6 Aggregates.
- .7 Water.
- .8 Joint filler.

.2 Provide certification that mix proportions selected will produce concrete of specified quality and yield and that strength will comply with CAN/CSA-A23.1, and that mix design is adjusted to prevent alkali aggregate reactivity problems. Provide test reports on the Alkali-Silica reactivity test.

.3 Provide certification that plant, equipment, and all materials to be used in concrete to comply with CAN/CSA-A23.1/A23.2.

1.5 QUALITY ASSURANCE

.1 Minimum four weeks prior to starting concrete work, submit proposed quality control procedures for Contract Administrator's review for following items:

- .1 Falsework erection.
- .2 Hot weather concrete.
- .3 Cold weather concrete.

.4 Curing.

.5 Finishes.

.6 Formwork removal.

.7 Joints.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Comply with Section 01 74 21 - Construction Waste Management and Disposal.

1.7 MATERIALS

.1 Portland Cement: To CAN/CSA-A3000, normal Type GU or sulfate resistant Type HS where indicated on drawings or in mix design.

.2 Blended Hydraulic Cement: To CAN3-A3000.

.3 Supplementary Cementing Materials: To CAN/CSA-A3000.

.4 Water: To CAN/CSA-A23.1.

.5 Aggregates: To CAN/CSA-A23.1. Coarse aggregates to be normal density.

.6 Air Entraining Admixture: To ASTM C 260.

.7 Chemical admixtures: to ASTM C 494. Contract Administrator to approve accelerating or set retarding admixtures during cold and hot weather placing of concrete.

.8 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents. Of pouring consistency, capable of developing compressive strength of 50 MPa after 28-day cure.

.9 Non-premixed dry pack grout: composition of non-metallic aggregate Portland cement with sufficient water for the mixture to retain its shape when made into a ball by hand and capable of developing compressive strength of 50 MPa at 28 days.

.10 Curing Compound: To CAN/CSA-A23.1 white and to ASTM C 309.

.11 Cushion Pads: Tough, resilient, weather, moisture, and oil resistant material that will not corrode or cause corrosion, consisting of either layers of approved cotton duck saturated and bound together by approved rubber or synthetic compounds, or made from specially compounded synthetic materials.

.12 Pre-moulded joint fillers:

.1 Bituminous impregnated fiber board to ASTM D1751, thickness indicated.

.13 Dovetail anchor slots: minimum 0.6 mm thick (24 gauge) galvanized steel with insulation filled slots.

.14 Dampproof membrane:

.1 As per section 07 14 13.

1.8 CONCRETE MIXES

.1 All concrete work shall be in accordance with CAN/CSA-A23.1-14.

.2 Contractor to provide proprietary mix design performance record as required by the Manitoba Redi-Mix Association.

.3 Refer to structural drawing S6, Table C.1 for Concrete mixes information.

1.9 PREPARATION

.1 Obtain Contract Administrator's approval before placing concrete. Provide Contract Administrator 48 hours of notice prior to concrete placing.

.2 Pumping of concrete is permitted only after review of equipment and mix by Contract Administrator.

.3 Ensure reinforcement and inserts are not disturbed during concrete placement.

.4 Prior to placing of concrete, obtain Contract Administrator's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.5 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.6 In locations where new concrete is doweled to existing work, drill holes in existing concrete. Place steel dowels of deformed steel reinforcing bars and pack solidly with epoxy grout to anchor and hold dowels in position.

.7 Do not place load upon new concrete until authorized by Contract Administrator.

1.10 CONSTRUCTION

.1 Do cast-in-place concrete works in accordance with CAN/CSA-A23.1.

.2 Maintain concrete cover around reinforcing as indicated.

.3 Place concrete in its final position as soon as possible after mixing and must be placed within 1.5 hours after the water has been added to the dry materials. Do not use any concrete more than 1.5 hours since mixing cement and water or having a partial set before placing.

.4 Pour concrete continuously between predetermined construction and control joints. Do not "break" or interrupt successive pours such that "cold" joints occur.

.5 Joint Fillers:

.1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Contract Administrator. When more than one piece is required for a joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

1.11 COLD WEATHER CONCRETE PLACING

.1 Maintain following minimum requirements for protecting concrete during and after placement in freezing weather. Except as noted below, concrete curing and protection to be in accordance with CAN/CSA-A23.1/A23.2.

.2 Before any concrete is placed, remove ice, snow, and frost completely from all formwork, reinforcing and other surfaces. Raise temperature of formwork, reinforcing, and other surfaces above 10°C for 24 hours minimum prior to concrete placing. Where concrete work is to come in contact with the earth, the surfaces of the earth shall be completely free of frost when the concrete is placed thereon.

.3 Heat concrete aggregates and water to a temperature not over 80°C. Concrete shall not be less than 10°C nor more than 30°C in temperature when deposited. Concrete when placed during freezing weather (or if freezing is anticipated during curing period) shall be fully enclosed and the temperature of the concrete maintained at not less than 20°C for 5 days and not less than 5°C for an additional 5 days. Provide adequate heating to attain the specified concrete strengths required prior to stripping or provide a concrete mix that will meet the specified stripping strengths under reduced curing temperatures.

.4 Keep protecting covering clear of concrete and form surfaces to permit full circulation of air. Maintain intact for at least 24 hours after the artificial heat is discontinued.

.5 Construct heating enclosures/hoarding to be strong and windproof, well ventilated. Locate heating units to prevent local damage to concrete due to local overheating, over drying, or combustion gases.

.6 Use only heat exchange fuel oil type heaters for slabs and flat areas. Vent units to outside the building/hoarding. Direct-fired units are not acceptable.

1.12 FINISHING

.1 Finish concrete in accordance with CAN/CSA-A23.1/A23.2.

.2 Use procedures acceptable to Contract Administrator and as noted in CAN/CSA-A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.

.3 Do not sprinkle dry cement or dry cement and sand mixture over concrete surfaces.

.4 Saw cut crack-control joints to CAN/CSA-A23.1/A23.2.

.5 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radius edges unless otherwise indicated.

.6 Fill and patch honeycomb areas, rub form joint lines from all exposed concrete.

.7 Fill and patch form tie holes on exposed concrete.

.8 Where floor drains occur, finish floor slabs level around walls and pitched to drains minimum 6 mm in 3 metres unless indicated otherwise.

.9 Provide steel trowelled, smooth, burnished finish where slabs to be left exposed or to receive carpeting, resilient flooring, floor paint or other applied floor finishes. Burnish to smooth, even finish without ridges, trowel marks, voids, or other imperfections that may transmit through flooring material.

.10 Provide screed, swirl-trowelled, or scratch finish where bonded topping, terrazzo, ceramic floor tile or other hard surface or bonded topping is to be applied. Provide depressions to accommodate bonded topping, terrazzo, etc.

.11 Provide broomed non-slip surface to exterior concrete paving, sidewalks, curbs, ramps, and stairs.

1.13 CURING AND SEALING

.1 Cure concrete in accordance with CAN3-A23.1/A23.2.

.2 Use curing compounds compatible with applied finish on concrete surfaces. Provide written declaration that compounds used are compatible.

.3 Do not use curing and sealing compounds on surfaces where bond is required for additional concrete, floor finishes or other surface coatings.

1.14 SIDEWALKS, CURBS AND PAVING

.1 Refer to City of Winnipeg standard construction specification.

1.15 DEFECTIVE CONCRETE

.1 Modify or replace concrete not conforming to lines, detail and elevations indicated on drawings.

.2 Repair or replace concrete not properly placed, resulting in excessive honeycombing and other defects in critical areas of stress.

.3 Do not patch, fill, touch-up, repair or replace exposed architectural concrete except upon expressed direction of the Contract Administrator for each individual area.

.4 Notify Contract Administrator of proposed methods of repairing or replacing defective concrete. Methods of repairing or replacing defective concrete shall be acceptable to the Contract Administrator.

1.16 FIELD QUALITY CONTROL

.1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory appointed by the Contract Administrator.

.2 Costs for inspection agency will be paid by Contractor.

.3 Inspection and testing of concrete and concrete materials shall be done in accordance with CAN/CSA-A23.1/A23.2, and as specified below.

.4 Take three test cylinders from each 75 cubic metres of each class of concrete placed or for each day of concrete placement if the latter is less than 75 cubic metres. Testing shall be as follows:

.1 One seven-day laboratory cured test.

.2 Two 28-day laboratory cured tests.

.5 Take one additional test cylinder during cold weather concreting. Cure cylinder on job site under same conditions as concrete that it represents.

.6 Make at least one slump test for each set of test cylinders taken.

.7 Cure concrete test cylinders in location designated by testing agency for a minimum of 48 hours prior to transporting to laboratory.

.8 Additional testing required due to low, inaccurate or otherwise questionable results shall be paid by the Contractor.

.9 Non-destructive Methods for Testing Concrete shall be in accordance with CAN/CSA-A23.2.

.10 Inspection or testing by the City will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

END OF SECTION

1.1 SUMMARY

.1 Section Includes:

.1 Rubberized-asphalt waterproofing membrane, reinforced.

.2 Insulation.

1.2 PREINSTALLATION MEETINGS

.1 Preinstallation Conference: Conduct conference at Project site.

.1 Review waterproofing requirements, including surface preparation, substrate condition and pre-treatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.3 ACTION SUBMITTALS

.1 Product Data: For each type of product. Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.

.2 Shop Drawings: Show locations and extent of waterproofing. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins to adjoining waterproofing, and other termination conditions.

1.4 INFORMATIONAL SUBMITTALS

.1 Qualification Data: For Installer and testing agency.

.2 Field quality-control reports.

.3 Sample Warranties: For special warranties.

1.5 QUALITY ASSURANCE

.1 Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

.2 Mock-Ups: Install waterproofing to 100 sq. ft. (9.3 sq. m) of deck to demonstrate surface preparation, crack and joint treatment, corner treatment, thickness, texture, and execution quality. Install pavers and paver supports to demonstrate aesthetic effects and set quality standards for materials and execution.

.1 Approval of mock-ups does not constitute approval of deviations from the Contract Documents contained in mock-ups unless Contract Administrator specifically approves such deviations in writing.

.2 Subject to compliance with requirements, approved mock-ups may become part of the completed Work if undisturbed at time of Substantial Completion.

.3 Source Limitations: Obtain waterproofing materials sheet flashings protection course from single source from single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by waterproofing manufacturer.

.2 Remove and replace liquid materials that cannot be applied within their stated shelf life.

.3 Protect stored materials from direct sunlight.

1.7 FIELD CONDITIONS

.1 Weather Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate, or when temperature is below zero deg F (minus 18 deg C).

.1 Do not apply waterproofing in snow, rain, fog, or mist.

.2 Maintain adequate ventilation during application and curing of waterproofing materials.

1.8 WARRANTY

.1 Special Warranty: Manufacturer agrees to repair or replace waterproofing and sheet flashings that do not comply with requirements or that fail to remain watertight within specified warranty period.

.1 Warranty includes removing and reinstalling protection board, drainage panels, insulation, pedestals, and pedestal-mounted pavers on plaza decks.

.2 Warranty insulation retains 80 percent of original published thermal value.

.3 Warranty pavers do not dish or warp and do not crack, split, or disintegrate in freeze-thaw conditions.

.4 Warranty Period: Ten years from date of Substantial Completion.

.2 Special Installer's Warranty: Specified form signed by Installer, covering Work of this Section, for warranty period of two years.

.1 Warranty includes removing and reinstalling protection board, drainage panels, and insulation.

1.9 MANUFACTURERS

.1 Acceptable Manufacturers:

.1 Soprema, 310 Quadral Drive, Wadsworth OH 44281, (800) 356-3521, (330) 334-0066

.2 Carlisle Coatings & Waterproofing Inc, 900 Hensley Lane, Wylie TX 75098, (800) 527-7092, (972) 442-0076.

1.10 WATERPROOFING MEMBRANE

.1 Hot Fluid-Applied, Rubberized-Asphalt Waterproofing Membrane: Single component; 100 percent solids; hot fluid-applied, rubberized asphalt.

.2 Acceptable Products:

.1 Colphene H, by Soprema.

.2 CCW 500 by Carlisle.

1.11 AUXILIARY MATERIALS

.1 General: Auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with waterproofing.

.2 Primer: ASTM D41/D41M, asphaltic primer.

.3 Elastomeric Sheet: 50-mil- (1.3-mm) minimum, uncured sheet neoprene with manufacturer's recommended contact adhesives as follows:

.1 Tensile Strength: 1400 psi (9.6 MPa) minimum; ASTM D412, Die C.

.2 Elongation: 300 percent minimum; ASTM D412.

.3 Tear Resistance: 125 psi (860 kPa) minimum; ASTM D624, Die C.

.4 Brittleness: Does not break at minus 30 deg F (34 deg C); ASTM D2137.

.4 Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum termination bars; approximately 1 by 1/8 inch (25 by 3 mm) thick; with stainless-steel anchors.

.5 Sealants and Accessories: Manufacturer's recommended sealants and accessories.

.6 Reinforcing Fabric: Manufacturer's recommended, spun-bonded polyester fabric.

.7 Protection Course: ASTM D6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:

.1 Thickness: 1/8 inch (3 mm), nominal, for vertical applications; 1/4 inch (6 mm), nominal, elsewhere.

.8 Protection Course: Manufacturer's standard, 80- to 90-mil- (2.0- to 2.3-mm-) thick, fiberglass-reinforced rubberized asphalt or modified bituminous sheet.

1.12 MOLDED-SHEET DRAINAGE PANELS

.1 Woven-Geotextile-Faced, Molded-Sheet Drainage Panel: Manufactured composite subsurface drainage panels consisting of a woven-geotextile facing with an apparent opening size not exceeding No. 40 (0.43-mm) sieve, laminated to one side with or without a polymeric film bonded to the other side of a studded, nonbiodegradable, molded-plastic-sheet drainage core, with a horizontal flow rate not less than 2.8 gpm/ft. (35 L/min. per m).

1.13 INSULATION

.1 Extruded-polystyrene board insulation complying with ASTM C578, Type VII, 60-psi (414-kPa) minimum compressive resistance; unfaced; fabricated with ship lapped or channel edges and with one side having ribbed drainage channels.

1.14 EXAMINATION

.1 Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

.1 Verify that concrete has cured and aged for minimum time period recommended by waterproofing manufacturer.

.2 Verify that substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D4263.

.2 Proceed with installation only after unsatisfactory conditions have been corrected.

1.15 PREPARATION

.1 Clean and prepare substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for waterproofing application.

.2 Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.

.3 Close off deck drains and other deck penetrations to prevent spillage and migration of waterproofing fluids.

.4 Remove grease, oil, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

.1 Abrasive blast clean concrete surfaces uniformly to expose top surface of fine aggregate according to ASTM D4259 with a self-contained, recirculating, blast-cleaning apparatus. Remove material to provide a sound surface free of laitance, glaze, efflorescence, curing compounds, concrete hardeners, or form-release agents. Remove remaining loose material and clean surfaces according to ASTM D4258.

.5 Remove fins, ridges, and other projections, and fill honeycomb, aggregate pockets, and other voids.

1.16 JOINTS, CRACKS, AND TERMINATIONS

.1 Prepare and treat substrates to receive waterproofing membrane, including joints and cracks, deck drains, corners, and penetrations according to manufacturer's written instructions.

.1 Rout and fill joints and cracks in substrate. Before filling, remove dust and dirt according to ASTM D4258.

.2 Adhere strip of elastomeric sheet to substrate in a layer of hot rubberized asphalt. Extend elastomeric sheet a minimum of 6 inches (150 mm) on each side of moving joints and cracks or joints and cracks exceeding 1/8

inch (3 mm) thick, and beyond deck drains and penetrations. Apply second layer of hot fluid-applied, rubberized asphalt over elastomeric sheet.

.3 Embed strip of reinforcing fabric into a layer of hot rubberized asphalt. Extend reinforcing fabric a minimum of 6 inches (150 mm) on each side of non-moving joints and cracks not exceeding 1/8 inch (3 mm) thick, and beyond roof drains and penetrations.

.1 Apply second layer of hot fluid-applied, rubberized asphalt over reinforcing fabric.

1.17 FLASHING INSTALLATION

.1 Install elastomeric sheets at terminations of waterproofing membrane according to manufacturer's written instructions.

.2 Prime substrate with asphalt primer.

.3 Install elastomeric sheet and adhere to deck and wall substrates in a layer of hot rubberized asphalt.

.4 Extend elastomeric sheet up walls or parapets a minimum of 8 inches (200 mm) above plaza-deck pavers and 6 inches (150 mm) onto deck to be waterproofed.

.5 Install termination bars and mechanically fasten to top of elastomeric flashing sheet at terminations and perimeter of waterproofing.

1.18 MEMBRANE APPLICATION

.1 Apply primer, at manufacturer's recommended rate, over prepared substrate and allow it to dry.

.2 Heat and apply rubberized asphalt according to manufacturer's written instructions.

.1 Heat rubberized asphalt in an oil- or air-jacketed melter with mechanical agitator specifically designed for heating rubberized asphalt.

.3 Start application with manufacturer's authorized representative present.

.4 Unreinforced Membrane: Apply hot rubberized asphalt to substrates and adjoining surfaces indicated. Spread to form a uniform, unreinforced, seamless membrane, 180-mil (4.5-mm) average thickness, but not less than 125 mils (3.2 mm) thick.

.5 Reinforced Membrane: Apply hot rubberized asphalt to substrates and adjoining surfaces indicated. Spread to a thickness of 90 mils (2.3 mm); embed reinforcing fabric, overlapping sheets 2 inches (50 mm); spread another 125-mil- (3.2-mm-) thick layer to provide a uniform, reinforced, seamless membrane 215 mils (5.5 mm) thick.

.6 Apply waterproofing over prepared joints and up wall terminations and vertical surfaces to heights indicated or required by manufacturer.

.7 Cover waterproofing with protection course with overlapped joints before membrane is subject to construction or vehicular traffic.

1.19 MOLDED-SHEET DRAINAGE PANEL INSTALLATION

.1 Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate according to manufacturer's written instructions. Use methods that do not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.

.1 For vertical applications, install board insulation and protection course before installing drainage panels.

1.20 INSULATION INSTALLATION

.1 Install one or more layers of board insulation to achieve required thickness and insulation drainage panels over waterproofed surfaces. Cut and fit to within 3/4 inch (19 mm) of projections and penetrations.

.2 On vertical surfaces, set insulation units into rubberized asphalt according to manufacturer's written instructions.

.3 On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

.4 Limit variation in paving installation to within 1/4 inch in 10 feet (6 mm in 3 m) of surface plane in any direction; noncumulative.

1.21 FIELD QUALITY CONTROL

.1 Engage a full-time site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions; surface preparation; and application of membrane, flashings, protection, and drainage components; furnish daily reports to Contract Administrator.

.1 Site representative shall measure membrane thickness with pin tester or other suitable device at least once for every 100 sq. ft. (10 sq. m) and include measurements in reports.

1.22 CLEANING AND PROTECTION

.1 Protect waterproofing from damage and wear during remainder of construction period.

.2 Protect installed board insulation from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

.3 Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

1.1 SUMMARY

.1 Section Includes:

.1 Removal of topsoil and subsoil.

.2 Cutting, grading, filling, and rough contouring

1.2 RELATED SECTIONS

.1 Section 02 41 16 - Structure Demolition

.2 Section 31 22 19 - Finish Grading:

.3 Section 31 23 33 – Excavating and Backfilling.

1.3 MEASUREMENT AND PAYMENT

.1 There are no measurement and payment items in this Section.

1.4 REFERENCES

.1 American association of State Highway and Transportation officials (AASHTO)

.1 AASHTO T 180-15 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 inch) Drop.

.2 ASTM

.1 ASTM C136/A136M-14 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 ASTM D698-12e2 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3 (600 kN-m/m^3)).

.3 ASTM D1556/D1556M-15 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

.4 ASTM D1557-12e1 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

.5 ASTM D2167-15 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

.6 ASTM D2419-09 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

.7 ASTM D2434-68(2006) - Standard Test Method for Permeability of Granular Soils (Constant Head).

.3 The City of Winnipeg

.1 Specification CW 3170, Earth Work and Grading

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.6 CLOSEOUT SUBMITTALS

.1 Provide closeout submittals in accordance with Section 01 78 00 - Closeout Submittals.

.2 Record Documentation: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.7 QUALITY ASSURANCE

.1 Perform Work to City of Winnipeg standards. Maintain one copy of document on site.

1.8 MATERIALS

.1 Subsoil Fill: Type as specified in Section 31 23 33.

1.9 GENERAL

.1 Construction Methods: To CW 3170 as follows:

.1 Where discrepancies occur between CW 3170 and the following, the most stringent requirement to apply.

1.10 EXAMINATION

.1 Verify that survey bench mark and intended elevations for the Work are as indicated.

1.11 PREPARATION

.1 Identify required lines, levels, contours, and datum.

.2 Stake and flag locations of known utilities.

.3 Locate, identify and protect utilities that remain, from damage.

.4 Notify utility company to remove and relocate utilities.

.5 Protect above and below grade utilities that remain.

.6 Protect plant life, lawns, and other features remaining as a portion of final landscaping.

.7 Protect bench marks, survey control point, fences, sidewalks, paving, curbs from excavating equipment and vehicular traffic.

1.12 SUBSOIL EXCAVATION

.1 Excavate subsoil from areas to be further excavated, re-landscaped, or re-graded from entire site.

.2 Do not excavate wet subsoil or excavate and process wet material to obtain optimum moisture content.

.3 When excavating through roots, perform work by hand and cut roots with sharp axe.

.4 Remove subsoil from site.

.5 Stockpile in area designated on site to depth not exceeding 2.5 m and protect from erosion. Remove from site, subsoil not being reused.

.6 Benching Slopes: Horizontally bench existing slopes greater than 1:4 to key placed fill material to slope to provide firm bearing.

.7 Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

1.13 FILLING

.1 Install Work in accordance with City of Winnipeg standards.

.2 Fill areas to contours and elevations with unfrozen materials.

.3 Place fill material on continuous layers and compact in accordance with the schedule at end of this section.

.4 Maintain optimum moisture content of fill materials to attain required compaction density.

.5 Slope grade minimum 1.5:100, unless noted otherwise.

.6 Make grade changes gradual. Blend slope into level areas.

.7 Remove surplus fill materials from site.

1.14 TOLERANCES

.1 Top Surface of Subgrade: Plus, or minus 30 mm from required elevation.

1.15 FIELD QUALITY CONTROL

.1 Section 01 45 00 – Quality Control.

.2 Testing: To ASTM D1556/D1556M, ASTM D1557, ASTM D698, AASHTO T 180, ASTM D2167.

.3 If tests indicate Work does not meet specified requirements, remove Work, replace and retest.

1.16 SCHEDULES

.1 Subsoil Fill:

.1 Fill Materials: In accordance with Section 31 23 33.

END OF SECTION

1.1 SUMMARY

.1 Section Includes

.1 Final grade topsoil for finish landscaping.

1.2 RELATED SECTIONS

.1 Section 31 05 13 - Soil Materials.

.2 Section 31 23 33 – Excavating, Trenching and Backfilling.

.3 Section 32 92 23 - Sodding: Finish ground cover.

1.3 MEASUREMENT AND PAYMENT

.1 There are no measurement and payment items in this Section.

1.4 REFERENCES

.1 The City of Winnipeg

.1 Specification CW 3170, Earth Work and Grading

1.5 MATERIAL

.1 Granular: Type as specified in Section 31 23 33.

1.6 EXECUTION

.1 Construction Methods: To CW 3170 as follows:

.1 Where discrepancies occur between CW 3170 and the following, the most stringent requirement to apply.

1.7 EXAMINATION

.1 Verify substrate base has been contoured and compacted.

1.8 SUBSTRATE PREPARATION

.1 Eliminate uneven areas and low spots.

.2 Remove debris, roots, branches, stones, in excess of 13 mm in size. Remove subsoil contaminated with petroleum products.

1.9 PLACING GANULAR

.1 Place material to eliminate rough or low areas. Maintain profiles and contour of subgrade.

.2 Remove roots, weeds, rocks, and foreign material while spreading.

.3 Compact to 95% of Standard Proctor Density.

.4 Remove surplus subsoil and topsoil from site.

1.10 TOLERANCES

.1 Top of Granular: Plus, or minus 13 mm.

1.11 PROTECTION OF FINISHED WORK

.1 Protect landscaping and other features remaining as final work.

.2 Protect existing structures, fences, sidewalks, utilities, paving and curbs.

1.12 SCHEDULES

.1 Granular: 100 mm thickness.

END OF SECTION

1.1 SUMMARY

.1 Control of groundwater, site drainage, and storm flows during demolition. Contractor is cautioned that the work involves construction and demolition in and around areas of local drainage. These areas may be subject to frequent periodic inundation.

1.2 RELATED REQUIREMENTS

.1 Section 02 41 16 - Structure Demolition

1.3 REFERENCE STANDARDS

.1 ASTM:

.1 D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³))

.2 The City of Winnipeg

.1 CW 1110 – General Instructions

.2 CW 1130 – Site Requirements

.3 CW 2030 – Excavation Bedding and Backfill

1.4 ACTIONS AND INFORMATIONAL SUBMITTALS

.1 Contractor to get approval from the City of Winnipeg Water and Waste Department for their Dewatering and Drainage Plan.

1.5 MATERIALS

.1 Onsite materials may be used within the limits of construction to construct temporary dams and berms. Materials such as plastic sheeting, sand bags, and storm sewer pipe may also be used if desired by Contractor.

1.6 GENERAL

.1 For all excavation, Contractor shall provide suitable equipment and labor to remove water, and keep the excavation dewatered so that construction or demolition can be carried on under dewatered conditions.

.1 Water control shall be accomplished such that no damage is done to adjacent channel banks or structures.

.2 Continuously control water during course of construction or demolition, including weekends and holidays and during periods of Work stoppages, and provide adequate backup systems to maintain control of water.

.2 Contractor is responsible for investigating and becoming familiar with all site conditions that may affect the Work including surface water, potential flooding conditions, level of groundwater and the time of year the Work is to be done.

.3 Contractor shall conduct operations in such a manner that storm, or other waters may proceed uninterrupted along their existing drainage courses.

.1 By submitting a bid, Contractor acknowledges that Contractor has investigated the risk arising from such waters and has prepared bid accordingly and assumes all of said risk.

.4 At no time during construction shall Contractor affect existing surface or subsurface drainage patterns of adjacent property.

.1 Any damage to adjacent property resulting from Contractor's alteration of surface or subsurface drainage patterns shall be repaired by Contractor at no additional cost to the City.

.5 Pumps and generators used for dewatering and water control shall be quiet equipment enclosed in sound deadening devices.

.6 Contractor shall remove all temporary water control facilities when they are no longer needed or at the completion of the Project.

.7 All excavations made as part of dewatering operations shall be backfilled with the appropriate material and compacted to ninety-five percent (95%) of Maximum Standard Proctor Density (ASTM D698) except where replacement by other materials and/or methods are required.

1.7 CONSTRUCTION

.1 Surface Water Control:

.1 Contractor shall coordinate, evaluate, design, construct, and maintain temporary water conveyance systems.

.1 These systems shall not worsen flooding, alter major flow paths, or worsen flow characteristics during construction. Contractor is responsible to ensure that any such worsening of flooding does not occur.

.2 Contractor is solely responsible for determining the methods and adequacy of water control measures.

.2 At a minimum, Contractor shall be responsible for diverting the quantity of surface flow around the construction or demolition area so that the excavations will remain free of surface water for the time it takes to complete all the work. Contractor is cautioned that the minimum quantity of water to be diverted is for erosion control and construction purposes and not for general protection of the site.

.1 It shall be Contractor's responsibility to determine the quantity of water which shall be diverted to protect the work from damage caused by stormwater.

.3 Contractor shall, at all times, maintain drainage.

.1 Temporary structures such as berms, sandbags, pipeline diversions, etc., may be permitted for the control of channel flow, as long as such measures are not a major obstruction to drainage, do not worsen flooding, or alter historic flow routes.

.2 Groundwater Control:

.1 Contractor shall install adequate measures to maintain the level of groundwater below the foundation subgrade elevation and maintain sufficient bearing capacity for all structures, pipelines, earthwork, and rockwork.

.1 Such measures may include, but are not limited to, installation of perimeter subdrains, pumping from drilled holes or by pumping from sumps excavated below the subgrade elevation.

.2 Dewatering from within the foundation excavations shall not be allowed.

.2 The foundation bearing surfaces are to be kept dewatered and stable until the structures or other types of Work are complete and backfilled.

.1 Disturbance of foundation subgrade by Contractor operations shall not be considered as originally unsuitable foundation subgrade and shall be repaired at Contractor's expense.

.3 Contractor shall dispose of groundwater as follows:

.1 Obtain discharge permit for water disposal from authorities having jurisdiction and in compliance with all local, Municipal, Provincial and Federal environmental regulations, ordinances, bylaws, etc.

.2 Treat water collected by dewatering operations, as required by regulatory agencies, prior to discharge.

.3 Discharge water as required by discharge permit and in manner that will not cause erosion or flooding, or otherwise damage existing facilities, completed work, or adjacent property.

.4 Remove solids from treatment facilities and perform other maintenance of treatment facilities as necessary to maintain their efficiency.

.4 Any temporary dewatering trenches or well points shall be restored following dewatering operations to reduce permeability in those areas as reviewed by the Contract Administrator.

END OF SECTION

1.1 RELATED REQUIREMENTS

.1 Section 02 41 16 – Structure Demolition

.2 Section 31 22 19 - Finish Grading

.3 Section 31 22 13 - Rough Grading

.4 Section 31 23 19 - Dewatering

1.2 MEASUREMENT AND PAYMENT

.1 There are no measurement and payment items in this Section.

1.3 REFERENCE STANDARDS

.1 ASTM

.1 ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))

ASTM D 1556, Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

.2 ASTM D 2167, Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

.2 The City of Winnipeg

.1 Specification CW 2030-R7, Excavating Bedding and Backfill

1.4 DEFINITIONS

.1 Unclassified Excavation: Excavation of deposits of whatever character encountered in Work.

.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.

.1 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 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 At least four weeks prior to commencing work inform Contract Administrator of proposed source of fill materials.

.3 Submit 20 kg samples of granular fill materials specified including representative samples of excavated material. In case of coarse gravelly soil or coarse crushed stone submit 70 kg samples.

.4 Ship samples prepaid to testing agency clearly marked in tightly closed containers to prevent contamination.

.5 Submit samples of each type of granular fill material or as requested by the Contract Administrator to a recognized testing agency to ensure materials conform to specified requirements. Submit samples at least four weeks prior to use of the material.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Comply with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Waste Management Plan.

1.7 QUALITY ASSURANCE

.1 Submit design and supporting data at least two weeks prior to commencing Work.

.2 Design and supporting data submitted to bear stamp and signature of qualified Professional Engineer registered or licensed in the Province of Manitoba.

.3 Keep design and supporting data on site.

.4 Engage services of qualified Professional Engineer who is registered in the province of Manitoba in which Work is to be carried out to design and inspect shoring, bracing and underpinning required for Work.

.5 Contract Administrator retains sole authority to accept or reject nonconforming materials.

1.8 PROTECTION OF EXISTING FEATURES

.1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.

.2 Existing 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 any excavation work, notify applicable owner or authorities and establish the location and state of use of buried utilities. Owners or authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.3 Re-rout, move, cap, or otherwise disturb utilities and structures as indicated on the Drawings.

.4 If any utility or structure not indicated on the Drawings is encountered, notify Contract Administrator immediately and address the obstacle as directed by Contract Administrator.

.5 Confirm locations of buried utilities by careful test excavations.

.6 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities encountered.

.7 Where utility lines or structures exist in area of excavation, obtain direction of Contract Administrator before moving, re-routing or otherwise disturbing utilities or structures. Include costs in Contract Price, which shall include costs for patching and making good damaged utilities or structures or any liens incurred resulting from Work. Costs for such work are incidental to the Contract.

.8 Record locations of maintained, re-routed, abandoned underground utility lines.

.3 Existing Buildings and Surface Features:

.1 Conduct condition survey of existing buildings, trees, and other plants, lawns, fencing, service poles, wires, paving, survey bench marks, and monuments which may be affected by work. Condition to be documented as described in 01 32 33.

.2 Protect existing buildings and surface features from damage while work is in progress. In event of damage, immediately make repair to approval of Contract Administrator.

.3 Provide adequate protection around bench markers, layout markers, survey markers, and geodesic monuments.

.4 Where excavation necessitates root or branch cutting, do so only as instructed by Contract Administrator.

.5 All shoring and protection of surface features should be designed by a structural engineer registered in the Province of Manitoba. Design is to be submitted to the Contract Administrator for review and approval.

.4 Protect bottoms of excavations from softening. Should softening occur, remove softened soil and replace with appropriate fill to satisfaction of Contract Administrator.

.5 Protect bottoms of excavations from freezing.

.6 Effect approved methods to minimize dust as a result of this work.

1.9 EXISTING CONDITIONS

.1 Contractor to undertake additional geotechnical investigation work required to design shoring or any other temporary support structure to complete the Work. Cost of additional geotechnical investigation is incidental to the Contract.

.2 The Contractor and Subcontractors are responsible for assuring themselves of the actual site and sub-surface soil conditions.

1.10 FILL MATERIALS

.1 Fill material for excavations are to be imported clay as defined in CW 2030, Clause 2.1, Sentence 6.

.2 Top 100 mm surface to consist of Type 2 Material to the gradation indicated in Table CW 2030.1.

1.11 GENERAL

.1 Construction Methods: All fill materials to be placed in 200 mm lifts and compacted to 95% of Standard Proctor Density. To CW 2030 and as follows.

.1 Where discrepancies occur between CW 2030 and the following, the most stringent requirement to apply.

1.12 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

1.13 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.

1.14 PREPARATION/PROTECTION

.1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

1.15 STRIPPING OF TOPSOIL

.1 Do not use topsoil stripped from site for finish grading or landscaping work. Remove from site.

.2 Topsoil stripped from site may be used for finish grading and landscaping.

.3 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.

.4 Commence topsoil stripping of areas as indicated after area has been cleared of brush, weeds, and grasses and removed from site.

.5 Strip topsoil to depths as indicated. Avoid mixing topsoil with subsoil.

.6 Stockpile in locations as directed by Contract Administrator. Stockpile height not to exceed 2 m

.7 Dispose of unused topsoil off site.

1.16 STOCKPILING

.1 Stockpile fill materials in areas designated by Contract Administrator. Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

.3 Do not stockpile material on completed pavement where damage to pavement may occur.

1.17 SHORING, BRACING AND UNDERPINNING

.1 Shoring: To CW 2030, Clause 3.5., and as follows.

.1 Where discrepancies occur between CW 2030 and the following, the most stringent requirement to apply.

.2 Construct temporary works to depths, heights and locations as required to facilitate demolition of the Works.

.3 During Backfill Operation:

.1 Unless otherwise as indicated or as directed by Contract Administrator, remove sheeting and shoring from excavations.

.2 Do not remove bracing until backfilling has reached respective levels of such bracing.

.4 Pull sheeting in increments that will ensure compacted backfill is maintained at an elevation at least 500 mm above toe of sheeting.

.5 When sheeting is required to remain in place, cut off tops at elevations as indicated or as directed by Contract Administrator.

1.18 DEWATERING AND HEAVE PREVENTION

.1 Dewatering and Heave Protection: To Section 31 23 19.

.2 Keep excavations free of water while work is in progress.

.3 Submit for Contract Administrator review details of proposed dewatering methods, such as dikes or well points, and sheet pile cut-offs.

.4 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.

.5 Protect open excavations against flooding and damage due to surface run-off.

.6 Dispose of water in accordance with Section 01 35 43 - Environmental Procedure and in manner not detrimental to public and private property, or any portion of Work completed or under construction.

1.19 EXCAVATION

.1 Excavate as required to remove building foundations and footings and to cut off and remove concrete piles/pile caps as specified elevations on the drawings.

.2 Remove demolished concrete footings, foundations, slab, curbs and rubble and other obstructions encountered in accordance with Section 01 74 21 – Demolition Requirements.

.3 Keep excavated and stockpiled materials a safe distance away from edge of excavation.

.4 Restrict vehicle operations directly adjacent to open excavations unless an engineered shoring system has been constructed capable of supporting adjacent vehicular loads.

.5 Dispose of surplus and unsuitable excavated material in accordance with Section 02 41 16 – Structure Demolition.

.6 Do not obstruct flow of surface drainage or natural watercourses.

.7 Correct unauthorized excavation at no extra cost as follows:

.1 Fill with Class A Limestone granular fill compacted to 95% density or material approved by the Contract Administrator.

.8 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.

.9 Ensure grading is such that a minimum depth 125 mm of granular fill is accommodated over the entire area with the edges of the fill area matching the elevation with the existing ground all around and with maximum grades of 1:12. Scrape subgrades as required. Remove or compact to 95% density any loose materials.

.10 Upon completion of excavation notify Contract Administrator for review.

1.20 FILL MATERIAL AND COMPACTION

.1 Compaction densities are percentages of maximum densities obtained from ASTM D698 Standard Proctor Dry Density.

.2 Dimensions specified herein are minimum dimensions after compaction.

.3 Use fill materials indicated.

1.21 BACKFILLING

.1 Do not proceed with backfilling operations until Contract Administrator has reviewed the site.

.2 Areas to be backfilled to be free from debris, snow, ice, water or frozen ground.

.3 Do not use backfill material that is frozen or contains ice, snow or debris.

.4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:

.1 Permit concrete to cure until it has sufficient strength to withstand earth and compaction pressure; or

.2 If acceptable to Contract Administrator, erect bracing or shoring to counteract unbalance, and leave in place until removal is authorized by Contract Administrator.

.5 Place unshrinkable fill in areas indicated.

.6 Consolidate and level unshrinkable fill with internal vibrators.

.7 Place backfill material in uniform layers not exceeding 200 mm loose thickness. Compact each layer before placing succeeding layer.

.8 Use methods to prevent disturbing or damage to buildings, trees, buried services, drainage system, or other installations. Notify Contract Administrator of any damage and make good at no additional cost to Contract.

1.22 SITE GRADING

.1 Rough Grading: To Section 31 22 13, and as follows.

.1 Rough grade site to levels matching adjacent ground levels to the satisfaction of Contract Administrator. Crown to be at middle of property to low points at perimeter of work area. Refer to drawings for crown of soil and direction of ground slope. Water to be prevented from ponding beside existing building and site graded to pavement for drainage. Contractor and field engineer to adjust as required to prevent ponding at no additional cost to contract.

.2 Compact filled and disturbed areas to 95 % proctor density.

.3 Grading to be mounded over top any remains of piles and the mound shall be graded at a 1:12 slope away from the pile. Contractor to have a minimum of 100 mm of soil above top of pile.

1.23 RESTORATION

.1 Upon completion of work, remove surplus materials and debris in accordance with Section 02 41 16 – Structure Demolition and correct defects noted by Contract Administrator.

.2 Clean and reinstate pavements and sidewalks disturbed by excavation to the equivalent thickness, structural integrity and elevation which existed before excavation.

.3 Clean and reinstate areas affected by Work as directed by Contract Administrator.

.4 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.

.5 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

.6 Refer to Section 03 30 00 for restoration of sidewalks, curbs and paving.

1.24 INSPECTION AND TESTING

.1 Testing of fill materials and compaction will be carried out by a certified testing agency arranged and payed for by the Contractor and approved by the Contract Administrator.

.2 Costs of inspection and testing will be payed by the Contractor.

.3 Sieve Analysis: If requested by the Contract Administrator, proposed fill materials will be tested to confirm suitability for intended use and conformity with specifications.

.4 Density Test: Test to be conducted on compacted fill to ASTM D 698. In-place tests to ASTM D 1556 and ASTM D 2167. Frequency of tests to be minimum one test per lift and every 500m^2 of backfill placed.

.5 If, during progress of work, tests indicate fills and compaction do not meet specified requirements, remove defective fills, replace, compact and retest at no extra cost to the Contract.

1.25 CLEANING

.1 Clean site in accordance with Section 01 74 11 - Cleaning.

.2 On completion of back filling remove surplus materials, tools, and equipment.

END OF SECTION

1.1 SECTION INCLUDES

.1 This section refers to the requirements for the Supply and Installation of Permanent Chain Link Fence, Vehicle Access Gates, Walk Gates and associated works. It includes all permits and locates required to supply of material, loading, hauling, installation, electrical, mechanical, disposal of excess material, and associated works.

1.2 REFERENCES

.1 Specification CW 3550, 5.2 Chain Link Fence.

1.3 SUBMITTALS

.1 Submit in accordance the following:

.1 Contractor shall submit Shop Drawings indicating materials, core thickness, and finishes.

.2 Contractor shall submit a complete design package including drawings, details, and data sheets for all fencing materials and components to be used for the Work.

.3 Contractor shall submit the complete design package to the Purchaser for approval, prior to commencement of the Work.

1.4 QUALITY ASSURANCE

.1 Contractor to abide by the bylaws and regulations of the Province, and/or Municipality in which the Work is located and abide by the laws and regulations public safety.

.2 Contractor to abide by the regulations of the Manitoba Workplace Health and Safety apply to the work of this section.

1.5 EXISTING CONDITIONS

.1 The Contractor shall ensure that the proposed location of the posts is not in conflict with the location of any electrical wire, ground cable, conduit, or other existing facilities or equipment.

.2 If a proposed post location conflicts with any existing electrical wire, ground cable, conduit, or other existing facilities or equipment, the Purchaser's representative must be notified immediately and before any work commences.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Not used.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Disposal of all excess, waste and recycling materials as directed by the Contract Administrator.

.2 All materials on Site and Other Work Areas whether stockpiled, stored, or excavated are the property of the Purchaser, and the Purchaser reserves the right to keep any part or all of the material.

.3 Separate waste materials for reuse and recycling.

.4 Divert excess materials from landfill to local quarry or recycling facility for reuse as directed by Contract Administrator.

1.8 CLEANING

.1 The Contractor shall perform cleaning as required immediately after installation.

.2 The Contractor shall prepare and touch up any damaged galvanized surfaces with a wire brush removing loose and cracked coatings and apply two coats of organic zinc-rich coating.

.3 The Contractor shall clean, trim and re-grade any ground disturbed by the Contractor during the performance of the Work.

.4 The Contractor shall remove all surplus materials, rubbish, tools and equipment barriers upon completion of the Work.

1.9 GENERAL

.1 During the construction the contractor is expected to provide temporary construction fencing as specified in section 01 56 00. Once the site has been graded a Permanent Fence is to be installed around the perimeter of the construction property as located on the drawings.

.2 The Contractor shall be responsible for the supply, safe storage and handling of all materials.

.3 The Contractor shall design and supply all materials for the Work including but not limited to fencing, gates, and all associated components and consumables.

.4 The Contractor shall immediately notify the Contract Administrator of any materials damage, and make all necessary repairs or replacements, at its own expense, to the satisfaction of the Purchaser's representative.

.5 All materials supplied for the Work shall be subject to inspection and testing at any time during the Work.

.6 The Contractor shall be in compliance with manufacturer written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.7 The Contractor shall level the ground along fence line in order that bottom wire of fence between posts can be maintained at not more than 50mm above ground except at grade breaks. Once a survey inspection of proposed fence line ground is completed and deemed satisfactory, then construction may proceed.

1.10 CHAIN LINK FENCE AND GATES

.1 Contractor shall supply Chain Link Fence and Gates as specified in City of Winnipeg Standard Construction Specification CW 3550.

.2 The fence shall consist of:

.1 A height of 2440mm. With dimensions as shown in Table CW 3550-R2.1.

.2 Fence to include a top rail and bottom tension with tensile strength of at least 500 Mpa and 1400 Kg break strength.

.3 All fittings, accessories, and posts as specified in CW 3550.

1.11 GATES

.1 Site to have 2 double swing 9 metre opening Vehicle Gates and 2 double swing 1.2 metre (minimum) opening Walk Gates.

.2 All gates shall have top and bottom rails.

.3 Location of the gates to determined by the Contract Administrator.

.4 Hinge: Shall be structurally designed to support all gates without deformation during opening and closing and capable of swinging 110º in or out.

.5 Latch: Shall be clamp-on gravity system that is self latching.

.6 Gate posts: Shall be 114mm outside diameter posts with a length of 5500mm and a thickness of 8mm.

1.12 PADLOCKS

.1 Each gate shall be provided with a padlock (long shank type).

.2 Remove and grind smooth burrs, filings, sharp protrusions, and other projections from metal fabrications to prevent possible injury. Correct dangerous or potentially harmful installations.

1.13 SITE INSPECTION

.1 The Contractor shall verify that the fence can be installed in accordance with the Drawings prior to commencing the Work. Contractor to coordinate with utility locates.

1.14 FENCE/FENCE POSTS

.1 The fence posts shall be installed based on the contractor’s approved design. The fence posts shall be designed to support fencing and withstand incremental weather.

.2 The top elevation of the posts shall be averaged over irregularities in the grade at the Site in order to ensure a smooth and uniform transition of the top fence post.

.3 Line posts shall be installed by driven methods. Gate posts and corner posts shall be installed with footings if required.

.4 The Contractor shall install additional posts and field cut panels as required where grade separation occurs to close gaps to a maximum of 620 sq. cm.

.5 The Contractor shall install additional hardware as required.

.6 The Contractor shall use step fence panel sections at steep slopes where required and use longer poles (field cut) as required to install panels.

.7 The Contractor shall install posts true to line and plumb.

1.15 ERECTION

.1 Set posts level and plumb.

.2 Install gate arms in locations provided by the Contract Administrator.

END OF SECTION