Part 1 General

1.1 MINIMUM STANDARDS

.1 Execute work to meet or exceed:

.1 National Building Code 2005, including all amendments up to project date.
.2 National Fire Code 2005
.3 Occupational Health and Safety Act and Regulations for Construction Projects.
.4 Canadian Construction Safety Code (Latest Edition).
.5 Rules and regulations of authorities having jurisdiction.
.6 City of Winnipeg Standard Construction Specifications

1.2 OVERTIME

.1 Overtime costs shall be included in the Unit and Stipulated Prices provided in the form of Bid. No extra costs will be paid by the City for work which must be performed outside normal working hours.

1.3 EXAMINATION OF PLANS SPECIFICATIONS AND SITE OF WORK

.1 Contractor shall carefully examine and study all of the contract specifications and the site of the work in order to satisfy themselves by examination as to all conditions affecting the contract, the detailed requirements of the construction and extent of work involved.

.2 Contractor shall confirm overall dimensions and quantity of work and notify Contract Administrator of any discrepancies noted. No consideration shall be given for claims for extra compensations beyond that shown in the documents.

.3 No Bider may claim at any time after submission of a Bid that there was any misunderstanding of the terms and conditions of the contract relating to the site conditions.

1.4 FORM OF AGREEMENT

.1 The City of Winnipeg General Conditions for construction will be used for this project. The General Conditions attached thereto and the Supplementary General Conditions contained within the specification will govern the performance of this project.

.2 The Contractor must be familiar with this document.

1.5 TAXES

.1 Pay applicable Federal, Provincial and Municipal taxes.

1.6 FEES, PERMITS AND CERTIFICATES

.1 Provide authorities having jurisdiction with information requested.

.2 The contractor shall pay fees and obtain certificates and permits required.

.3 Furnish certificates and permits when requested.

1.7 WORKERS COMPENSATION BOARD OF MANITOBA (WCB)

.1 The contractor shall, at the time of entering into any contract with the City, at such intervals as required to demonstrate good standing, and at substantial performance, provide a Clearance Certificate from the WCB.

.2 The Bider whose Bid has been recommended to the City for acceptance shall submit this Clearance Certificate to the Contract Administrator in triplicate together with the agreement. One (1) copy of the Clearance Certificate shall be bound into each of the three (3) executed sets of the contract.

1.8 DOCUMENTS

.1 Keep one copy of contract documents on the site.

.2 Specifications shall govern over Drawings.

.3 Where details shown on the drawing or in the specification are not in accordance with manufacturer's requirement, Contractor to notify Contract Administrator immediately.

1.9 ADDITIONAL DRAWINGS

.1 Contract Administrator may furnish additional drawings to clarify work.

.2 Such documents become part of Contract Documents.

1.10 AS-BUILT DRAWINGS

.1 Obtain from Contract Administrator at commencement of work, two (2) sets of white prints of drawings for purpose of recording changes and deviations to work as-built.

.2 Maintain these prints and make available to trades so that all changes and deviations may be recorded promptly as they occur. Be responsible for ensuring that such record of all changes is up to date at all times. Upon completion of work, return these drawings complete and in good condition to Contract Administrator so that City will have record of exact location of all services and equipment.

1.11 SUPERVISION

.1 Ensure that any defects discovered are corrected before continuing work.

.2 Ensure site conditions are satisfactory for execution of work.

.3 Address to Contract Administrator all questions on work. Contract Administrator will transmit verbal instructions through contractor's superintendent.

.4 Co-ordinate all trades to provide a smooth, conflict free, flow of work.

.5 The Contractor shall have a competent person for emergency calls after construction hours and during weekends. It shall be the Contractor's responsibility to supply the City's

representative with the name and telephone number of the person to be contacted during these periods.

1.12 PLANT

.1 Supply all transportation, labour, materials, shoring, scaffolds, tools, cranes, derricks, plant and equipment to continuously carry out work, in an efficient manner.

1.13 CO-ORDINATION AND CO-OPERATION

.1 Site and building will be occupied and used during execution of work.

.2 Execute work with minimum disturbance to occupants, public and normal use of site and building.

.3 Maintain access and exits.

.4 Where security has been reduced by work of contract, provide temporary means to maintain security.

1.14 PROTECTION

.1 Refer to Section 01 56 00

1.15 USE OF SITE FACILITIES

.1 Refer to Section 01 11 40.

1.16 EXISTING SERVICES AND EQUIPMENT

.1 Prior to commencing repair work, the Contractor shall notify all public utilities and the City to locate telephone, gas, water, hydro cable and protective or alarm systems. All utilities and services shall be protected against damage or interruption. Notify City at least 48 hours in advanced of any necessary interruption. Any claims resulting from damage shall be the Contractor's responsibility.

.2 The Contractor shall maintain existing services in occupied areas unless alternative arrangements have been made with and approved by the City.

1.17 TEMPORARY FACILITIES AND SERVICES

.1 The Contractor shall provide and maintain temperature required to prevent frost damage to the work.

.2 The Contractor shall provide and maintain temporary facilities and services required to carry out the work.

.3 At the completion of the work, all temporary connections and equipment shall be removed and the services and finishes shall be made good by the Contractor to the satisfaction of the City.

1.18 SITE ACCESS

.1 The Contractor shall provide access to and about the site to ensure continuous and efficient delivery and movement of materials and equipment. Arrange routes so that they do not conflict with City's operations.

1.19 GARBAGE

.1 Refer to Section 01 74 21

1.20 INTERFEENCE

.1 Work requiring the shutdown of any of the City's existing services or equipment must not be done without prior written approval and according to the agreed construction schedule unless other arrangements are specifically arranged for through Contract Administrator.

1.21 CLEANING

.1 Refer to Section 01 74 12

1.22 SPECIAL REQUIRMENTS & LIMITATIONS

.1 Restrict all personnel employed in connection with the work to the vicinity of the work site.

.2 Prevent the unauthorized use of any and all facilities by such operatives or staff.

1.23 MATERIAL AND EQUIPMENT

.1 Use new products unless otherwise specified.

.2 Deliver and store material and equipment with manufacturer's labels and seals intact.

.3 When material or equipment is specified by standard or performance specifications, upon request of Contract Administrator, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

.4 The Contractor shall not use high velocity powder actuated fastening tools.

1.24 FIRE PREVENTION

.1 Refer to Section 01 35 30

1.25 CO-OPERATION

.1 The work shall be inspected and tested on behalf of the City by Concentric Associates International Incorporated (Concentric). Concentric must be kept informed at all time when work is being carried out

.2 A minimum 24 hours noticed shall be given prior to the required inspection unless agreed upon otherwise.

.3 Any work not accepted by the Contract Administrators shall be immediately corrected by the Contractor to the Contract Administrators satisfaction. Frequency of the tests will be determined by the Contract Administrator.

1.26 ADDITIONAL CONTRACT ADMINISTRATORS FEE

.1 When the Contract Administrator incurs additional cost directly as a result of the failure of the Contractor to perform the Contract in a reasonable manner and when initial tests and inspections reveal work not to the requirements of the contract documents, the Contractor shall pay for additional tests, inspections, and contract administration required by the Contract Administrator for the corrected work. The additional fees (including GST) shall be deducted from the Contractors progress payment claims. The Contractor will be made aware of the Contract Administrators additional fees in writing. The Contract Administrators invoice will be submitted with the Contractors progress billing. The City will pay the Contract Administrator the amount deducted from the Contractors progress billing.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION 01 10 05

Part 1 General

1.1 GENERAL CONDITIONS

.1 Sections of division 1 - general requirements, as applicable, shall form part of this summary and scope of work and of the contract.

.2 Each Contractor shall examine and become familiar with the work, specifications and drawings of all other Contractors which may affect the Work of the Contractor.

.3 This Summary and Scope of Work shall be read in conjunction with and form part of this Contract, and is intended to indicate the extent of the work and responsibilities to be undertaken by this Contractor.

1.2 WORK BY OTHERS

.1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Contract Administrator.

.2 Co-ordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Contract Administrator, in writing, any defects which may interfere with proper execution of work.

1.3 PROJECT SUMMARY

.1 The City of Winnipeg wishes to conduct the following work at the Millennium Library Parkade:

- .1 Localized top surface and through slab repairs on level P1.
- .2 Localized column and wall repairs on level P1 & P2.
- .3 Localized soffit repairs on egress ramps No. 3, 5 and 6.
- .4 Removal and replacement of the drive aisle traffic topping system on level P1.
- .5 Localized base coat repair and wear course upgrades in the parking stalls on level P1.
- .6 Removal and replacement of the P1 level drains as directed by Contract Administrator.
- .7 Removal and replacement of the P1 level drain piping as directed by Contract Administrator.
- .8 Rehabilitation of egress ramps No. 2, 3, 5 and 6.
- .9 Upgrades and repairs to the four (4) stairwells. This includes:
  - .1 The removal and replacement six (6) stair sections and handrails to match existing configuration as indicated on the drawings.
  - .2 Prepare, prime and painting exposed sections of handrails, stair pans and stringers.
  - .3 Conduct localized concrete repairs on landings as directed by Contract Administrator.

.10 Upgrade mechanical and electrical systems as indicated on the drawings. This includes:

.1 Replacing all pneumatic controls with digital controls

.2 Install fire detection sensors

.3 Hydronic boiler combustion air venting

.4 NOx detection system

.11 A cash allowance will be used to upgrade the following mechanical and electrical systems:

.1 Makeup air system burners (if required)

.2 Parkade Make-up Air Fan-Cleaning corrosion and coat.

.3 Parkade Exhaust Air Fan-Cleaning corrosion and coat.

.4 Fire hose cabinet openers

.5 Provide opening for Smith Street Snow Melt Boiler

.6 Install D.C. emergency lighting battery banks

.7 Upgrade emergency lighting as required

.8 Install additional exit signs

.9 Replace existing exit signs with LED type

.10 Install lamacoid identification on electrical equipment

.11 Install weather proof covers on receptacles

.12 Upgrade electrical connections on signage

.12 A cash allowance will be used to remove and replace the guards around ramps No. 3 and 6 as indicated on the drawings.

.13 Additional stipulated costs are requested for the following items:

.1 Remove and replace the P2 level concrete slab on grade and drainage system.

.2 Remove and replace the four (4) stairwells with cast on place concrete stairs and steel handrails.

1.4 WORK SEQUENCE

.1 Construct Work in stages to accommodate the City's continued use of premises during construction.

.2 Co-ordinate Progress Schedule and co-ordinate with the City’s occupied areas during construction.

.3 Construct Work in stages to provide for continuous public usage. Do not close off public usage of facilities until use of one stage of Work will provide alternate usage.

.4 Maintain fire access/control.

1.5 HOURS OF WORK

.1 The execution of work that generates excessive noise on levels P1 and P2 shall be restricted to between the hours of 9:00 p.m. and 5:00 a.m. Monday to Sunday and as directed by the City.

1.6 THE CITY OCCUPANCY

.1 The City will occupy premises during entire construction period for execution of normal operations.

.2 Co-operate with the City in scheduling operations to minimize conflict and to facilitate The City usage.

1.7 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows:

.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Reviewed Shop Drawings.
.5 List of Outstanding Shop Drawings.
.6 Change Orders.
.7 Other Modifications to Contract.
.8 Field Test Reports.
.9 Copy of Approved Work Schedule.
.10 Health and Safety Plan and Other Safety Related Documents.
.11 Other documents as specified.

1.8 PHASING REQUIRED

.1 The project is to commence two weeks up award of the project and substantial complete by November 30, 2013. The project will be completed in four phases indicated on the drawings. The following closure dates are to be incorporated into the construction schedule:

.1 Phase 1 will be completed between January 1, 2013 and March 31, 2013.
.2 During Phase 2 the Donald Street ramps (ramp 5 & 6) can only be closed between April 1, 2013 and June 30, 2013.
.3 During Phase 3 the Smith Street entrance ramp (ramp 2) can only be closed between July 1, 2013 and September 30, 2013. During phase 3, either ramps 1 or 4 must remain open to allow access and egress from P2 that is unless, the level P2 slab replacement proceeds.
.4 Level P2 slab replacement (including ramps 1 & 4) can only be closed between May 1, 2013 and August 31, 2013. If the work does not proceed, the work on ramps 1, 2, 3 and 4 are to be conducted in Phase 3 according to 1.2.2.3. If level P2 slab replacement is conducted, there is an opportunity to conduct work on ramps 1, 2, 3 and 4 when P2 work is being conducted between May 1 2013 and Aug 31 2013.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION 01 01 00

Part 1 General

1.1 USE OF SITE AND FACILITIES

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

.2 Maintain existing services to building and provide for personnel and vehicle access.

.3 Where security is reduced by work provide temporary means to maintain security.

.4 Contractor is to provide sanitary facilities for use by Contractor's personnel. Keep facilities clean.

.5 Closures: protect work temporarily until permanent enclosures are completed.

1.2 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to building operations, public and normal use of premises. Arrange with Contract Administrator to facilitate execution of work.

.2 Design, construct, and maintain temporary protection around areas of work within the existing structure.

1.3 EXISTING SERVICES

.1 Refer to Section 01 10 05.

1.4 SPECIAL REQUIREMENTS

.1 Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.2 Keep within limits of work and avenues of ingress and egress.

1.5 BUILDING SMOKING ENVIRONMENT

.1 Comply with the City’s smoking restrictions.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION 01 14 00

Part 1 General

1.1 REFERENCES

.1 The City of Winnipeg's General Conditions for Construction.

1.2 CASH ALLOWANCES

.1 Include in Contract Price specified cash allowances.

.2 Cash allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage, installation and other authorized expenses incurred in performing Work.

.3 Contract Price, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.

.4 Contract Price will be adjusted by written order to provide for excess or deficit to each cash allowance.

.5 Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for excess incurred and substantiated plus allowance for overhead and profit as set out in Contract Documents.

.6 Include progress payments on accounts of work authorized under cash allowances in Contract Administrator's monthly certificate for payment.

.7 Prepare schedule jointly with Contract Administrator and Contractor to show when items called for under cash allowances must be authorized by Contract Administrator for ordering purposes so that progress of Work will not be delayed.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

.1 Particular requirements for inspection and testing to be carried out by a testing laboratory approved by Contract Administrator are specified under various sections.

1.2 APPOINTMENT AND PAYMENT

.1 The Contract Administrator will appoint and pay for services of testing laboratory for the follow:

- .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
- .2 Inspection and testing performed exclusively for Contractor's convenience.
- .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
- .4 Mill tests and certificates of compliance.

.2 Where tests or inspections by designated testing laboratory reveal work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Contract Administrator to verify acceptability of corrected work.

1.3 CONTRACTOR'S RESPONSIBILITIES

.1 Provide labour, equipment and facilities to:

- .1 Provide access to Work for inspection and testing.
- .2 Facilitate inspections and tests.
- .3 Make good Work disturbed by inspection and test.
- .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

.2 Notify Contract Administrator sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Contract Administrator.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION 01 29 83

Part 1 General

1.1 DESCRIPTION

.1 This Section specifies requirements for a detailed Construction Progress Schedule.

1.2 REQUIREMENTS

.1 Prepare and submit a Construction Progress Schedule detailing Substantial Performance of the Work within the time period stated in the Bid Form.

.2 Construction Progress Schedule to include dates for:

- .1 Submission of Shop Drawings, material lists and samples.
- .2 Mobilization on-site.
- .3 Phase 1 duration.
- .4 Phase 2 duration.
- .5 Phase 3 duration.
- .6 Phase 4 duration.
- .7 Duration of Level P2 slab replacement.
- .8 Substantial Completion.

.3 Co-ordinate and schedule the work to accommodate any restrictions to construction activities necessitated by The City.

.4 Interim reviews of work progress based on work schedule will be conducted as decided by Contract Administrator and schedule updated by Contractor in conjunction with and to approval of Contract Administrator.

1.3 FORMAT

.1 The Contractor shall submit initial schedule within (7) seven days after award of Contract and re-submit updated schedule with each application for payment.

.2 Provide schedule in the form of a horizontal bar chart.

.3 Provide a separate bars for each trade or operation.

.4 Provide horizontal time scale identifying the first work day of each week.

.5 Include the dates for the commencement and completion of each major elements of construction.

.6 Updated schedule to show changes occurring since previous submission of schedule to include:

- .1 Activities modified since previous submission.
- .2 Revised projection of progress and completion.
- .3 Modifications due to change orders.
- .4 Other identifiable changes.

.5 Time will be the essence of the contract.

.7 The Contract Administrator and Contractor will meet to review the proposed Work Schedule and the Contractor will make necessary changes until a satisfactory schedule is arrived at. Deviation from the approved schedule must be approved by the Contract Administrator.

.8 The modified schedule, as approved in writing by the Contract Administrator required during the execution of the contract to reflect changes in the estimated quantity of work, shall form an integral part of the contract documents.

1.4 SUBMITALS

.1 Make submittals in accordance with Section 01 33 00-Submittals.

.2 Submit one opaque reproduction, plus two copies to be retained by the Contract Administrator.

.3 Contract Administrator will review schedule and return reviewed copy within five days after receipt.

Distribute copies of the revised schedule to:

.1 Job site office
.2 Subcontractors
.3 Other concerned parties
.4 The City
.5 Contract Administrator

.4 Instruct recipients to report to the Contractor within 10 days, any problems anticipated by the timetable shown in the schedule.

.5 Include costs for execution, preparation and reproduction of schedule submittals in bid documents.

1.5 QUALITY ASSURANCE

.1 Use experienced personnel, fully qualified in planning and scheduling to provide services from start of construction to Final Certificate, including Commissioning.

1.6 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.7 PROJECT MEETING

.1 Meet with Contract Administrator within 7 working days of Award of Contract date, to establish scope of Work and approach to project construction operations.

END OF SECTION 01 32 00

Part 1 General

1.1 DESCRIPTION

.1 This Section specifies the requirements for submittals of information by the Contractor for review by the Contract Administrator.

.2 Additional specific requirements for submittals may also be included in individual Sections of Divisions 1 through 32.

1.2 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 Make submittal submissions to Contract Administrator, with additional submissions to other parties involved with construction of the Project as directed by the Contract Administrator. Other parties may be one of the following, but shall not be restricted to, Contract Administrators, authorities, Contractors whose work must be coordinated with work related to submittals, or other organization as determined by the Contract Administrator.

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

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

.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 co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Review submittals prior to submission to the Contract Administrator. This review represents that necessary requirements have been determined and verified and that each submittal has been checked and coordinated with the requirements of the Work and the Contract Documents.

.7 Verify field measurements and affected adjacent Work are co-ordinated.

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

1.3 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Adjustments made on shop drawings by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.

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

.5 Accompany submissions with transmittal letter, in duplicate, containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.6 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Contractor
  - .2 Subcontractor.
  - .3 Supplier.
  - .4 Manufacturer.
  - .5 Other pertinent detail.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Wiring diagrams.

.9 Single line and schematic diagrams.

.10 Relationship to adjacent work.

.7 After Contract Administrator's review, distribute copies.

.8 Submit 3 prints and electronic copy (if available) of shop drawings for each requirement requested in specification Sections and as Contract Administrator may reasonably request.

.9 Submit 3 prints or electronic copy (if available) of 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.

.10 Submit 3 prints or electronic copy of test reports for requirements requested in specification Sections and as requested by Contract Administrator.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within 3 years of date of contract award for project and must conform to all current applicable code requirements.

.11 Submit 3 prints or electronic copy of 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.

.12 Submit 3 prints or electronic copy of manufacturer’s 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.

.13 Submit 3 prints or electronic copy of 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.

.14 Submit 3 prints or electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested Contract Administrator.

.15 Delete information not applicable to project.

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

.17 If upon review by Contract Administrator, no errors or omissions are discovered, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.18 Review of shop drawings prior to submission to the Contract Administrator. Review of shop drawings is for sole purpose of ascertaining conformance with general concept. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with the requirements of the work and the Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

.19 Resubmit immediately Drawings noted "see comments" if requested by the Contract Administrator, to ensure that corrections have been made.

.20 Drawings requiring resubmissions to be either corrected or resubmitted or to be superseded by other submitted Drawings.

.21 Do not make any changes to Shop Drawings after final review without written permission of the Contract Administrator.

.22 Where necessary and required, shop drawings be stamped and signed by a professional engineer licensed in the province of Manitoba.

1.4 SAMPLES

.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Contract Administrator.

.3 Notify Contract Administrator in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.4 Where colour, pattern or texture is criterion, submit full range of samples.

.5 Adjustments made on samples by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.

.6 Make changes in samples which Contract Administrator may require, consistent with Contract Documents.

.7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Clearance Certificate from the WCB. Submit transcription of insurance immediately after award of Contract.

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION 01 33 00

Part 1 General

1.1 SUMMARY

.1 This section specifies requirements for traffic control procedures required for this project.

1.2 PROTECTION OF PUBLIC TRAFFIC

.1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.

.2 When working on travelled way:

.1 Place equipment in position to present minimum of interference and hazard to traveling public.

.2 Keep equipment units as close together as working conditions permit and preferably on same side of traveled way.

1.3 INFORMATIONAL AND WARNING DEVICES

.1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting.

.2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as required.

.3 Meet with Contract Administrator prior to commencement of Work to prepare list of signs and other devices required for project.

.4 Continually maintain traffic control devices in use by:

.1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

.2 Removing or covering signs which do not apply to conditions existing from day to day.

1.4 OPERATIONAL REQUIRMENTS

.1 Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken and approved by Contract Administrator to protect and control public traffic, existing conditions for traffic to be restricted.

.2 Maintain existing conditions for traffic crossing right-of-way.

.3 Maintain existing conditions for traffic crossing right-of-way except when required for construction. With approval of Contract Administrator, existing conditions for cross traffic to be restricted.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION 01 35 14

Part 1 General

1.1 DESCRIPTION

.1 This Section specifies requirements for safety measures at the job site.

1.2 CONSTRUCTION SAFETY MESURES

.1 Observe and enforce construction safety measures required by National Building Code, The Workplace Safety and Health Act, and Regulations for Construction Projects, Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations – made under the Workplace Safety and Health Act, Workers' Compensation Board and municipal statutes, authorities, and Workplace Hazardous Materials Information System (WHIMIS).

.2 In the event of conflict between ay provisions of above authorities, the most stringent provisions will apply.

.3 Where applicable, the Contractor shall be designated the "Constructor", as defined by the Workers Compensation Board of Manitoba (WCB).

.4 Notify the Workplace Safety and Health Branch before commencing work on this project as required by the regulations.

.5 The Contractor shall follow the Workplace Safety and Health Branch requirements for avoiding Carbon Monoxide poisoning in enclosed ad semi enclosed worksites.

1.3 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of the Work required by insurance companies having jurisdiction and governing codes, regulations and by-laws and municipal fire prevention authorities.

.2 Act as fire warden. Maintain fire protection and enforce proper fire prevention practices.

1.4 OVERLOADING

.1 Ensure no party of work is subjected to a load which will endanger its safety or will cause permanent deformation. The load shall not exceed the 2.4 kPa design live load for all suspended slabs.

1.5 FALSEWORK

.1 If required, design and construct falsework in accordance with CSA S269.1.

1.6 SCAFFOLDING

.1 Design and construct scaffolding in accordance with CAN/CSA-S269.2.

1.7 MATERIALS ON SITE

.1 Comply with WHMIS requirements regarding all materials stored on site. Submit Material Safety Data Sheets to Contract Administrator prior to shipping materials.

.2 Contractor shall have a complete set of unexpired Material Safety Data Sheets (MSDSs) for all WHMIS controlled products on site. These MSDSs must be available on site for the Contractor's personnel.

.3 Label all containers of controlled products in accordance with WHMIS regulations.

.4 Where WHMIS controlled products are used, all of the Contractor's personnel are required to be trained in the safe use, handling, storage, and disposal of those products.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION 00 15 45

Part 1 General

1.1 REFERENCES

.1 Work shall conform to the requirements of the National Building Code and all amendments and all local, Municipal and Provincial building by-laws and ordinances.

1.2 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.3 HOARDING

.1 Erect temporary site enclosures using as indicated on the drawings.

.2 Provide lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.

.3 As directed, erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.

.4 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.4 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.

1.5 ACCESS TO SITE

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

1.6 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 public.

1.7 FIRE ROUTES

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

1.8 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.9 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

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

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Refer to section 01 74 21.

Part 2 Products

2.1 Not Used

.1 Not Used.

Part 3 Execution

3.1 Not Used

.1 Not Used.

END OF SECTION 01 56 00

Part 1 General

1.1 DUST TIGHT SCREENS

.1 Provide and maintain a temporary dust partition between the work area and the remainder of the building during the period of construction as required.

1.2 PROJECT CLEANLINESS

.1 Maintain the work in tidy condition, free from accumulation of waste products and debris.

.2 Remove waste material and debris from the site in timely matter.

1.3 FINAL CLEANING

.1 When the Work is Substantially Performed, remove surplus products, tools, construction, machinery and equipment not required for the performance of the remaining work.

.2 Remove waste products and debris other than that caused by the City or their employees, and leave the site clean and suitable for the use of the City and future renovation work.

.3 When the Work is Totally Performed, remove surplus products, tools, construction machinery and equipment. Remove waste products and debris other than that caused by the City.

.4 Remove waste materials from the site at regularly scheduled times. Do not burn waste materials on site.

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

.6 Leave the work broom clean before the inspection process commences.

.7 Remove dirt and other disfiguration from exterior surfaces.

.8 Sweep and wash clean paved areas.

.9 Wash windows and frames affected by the work.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION 00 17 12

1.5 Dust Tight Screens

.1 Provide and maintain a temporary dust partition between the work area and the remainder of the building during the period of construction as required.

Part 1 General

1.1 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 Protect, stockpile, store and catalogue salvaged items.

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

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

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

.7 Protect surface drainage, mechanical and electrical from damage and blockage.

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

.9 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.
- .3 Provide waybills for separated materials.

1.2 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste into waterways, storm, or sanitary sewers.

.3 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

1.3 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises.

1.4 SCHEDULING

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

Part 2 Products

2.1 **NOT USED**

.1 Not Used.

Part 3 Execution

3.1 **CLEANING**

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

.2 Clean-up work area as work progresses.

END OF SECTION 01 74 21

Part 1 General

1.1 MEASUREMENT PROCEDURES

.1 The contract is a stipulated sum for the work indicated in this section.

1.2 REFERENCES

.1 Standard Specifications (latest edition) except where modified by this section or the Contract Drawings, the specifications listed below shall govern:

.1 Canadian Environmental Assessment Act (CEAA), 1995.

.2 CSA Standard S350 Code Practice for Safety in Demolition of Structures

.3 CAN/CSA-S269.3 Access Scaffolding for Construction Purposes

1.3 PROTECTION

.1 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, trees, landscaping, adjacent grades. Provide bracing, shoring as required. Repair damage caused by demolition as directed by Contract Administrator.

.2 Support affected columns and adjacent floor structure and, if safety of structure being demolished or adjacent structures or services appears to be endangered, take preventative measures and then cease operations and notify Contract Administrator.

.3 Prevent debris from blocking surface drainage system, mechanical and electrical systems which must remain in operation.

.4 Do not dispose of waste or volatile materials such as: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout project.

.5 Do not pump water containing suspended materials into storm or sanitary sewers or onto adjacent properties.

.6 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities.

.7 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.

.8 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all affected levels.

1.4 **SUBMITTALS**

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

.2 Product Data: submit WHMIS MSDS - Material Safety Data Sheets if required.

.3 Shop drawings:

.1 Submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning, where required by authorities having jurisdiction.

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

.4 Hazardous Materials: provide description of Hazardous Materials and Notification of Filing with proper authorities prior to beginning of Work as required.

1.5 **REGULATORY REQUIREMENTS**

.1 Ensure work is performed in compliance with CEAA, and all applicable provincial regulations.

1.6 **DEFINITIONS**

.1 Demolition: rapid destruction of building following removal of hazardous materials.

.2 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.

1.7 **SCHEDULING**

.1 Ensure project time lines are met without compromising specified minimum rates of material diversion. Notify Contract Administrator in writing of delays.

Part 2 Products

2.1 **GENERAL**

.1 Equipment and heavy machinery to meet or exceed all applicable emission requirements.

.2 If fuel burning equipment is being used during demolition; the contractor shall follow the Workplace Safety and Health Branch recommended precautions for carbon monoxide poisoning in enclosed or semi enclosed areas.

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

Part 3 Execution

3.1 PREPARATION

.1 Disconnect and re-route electrical lines affected by the demolition. Post warning signs on electrical lines and equipment, which must remain energized to serve other properties during period of demolition.

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

3.2 SAFETY CODE

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

3.3 REMOVAL OF HAZARDOUS WASTES

.1 Remove contaminated or dangerous materials defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

3.4 DEMOLITION

.1 Demolish parts of structure in accordance with approved schedule and construction phasing option.

.2 Stockpile materials as directed by Contract Administrator. Eliminate double handling where possible.

.3 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as work progresses.

.4 At end of each day's work, leave work in safe and stable condition.

.5 Removal from site:

.1 Remove stockpiled material as directed by Contract Administrator, when it interferes with operations of project construction. Supply separate, clearly marked disposal bins for categories of waste material.

.2 Remove stockpiles of like materials by an alternate disposal option once collection of materials is complete.

.3 Transport material designated for alternate disposal using approved haulers and receiving organizations in accordance with applicable regulations.

.4 Written authorization from Contract Administrator is required to deviate from haulers and receiving organizations.

.5 Ensure that these materials will not be disposed of in landfill or waste stream destined for landfill. Dispose of materials not designated for alternate disposal in accordance with applicable regulations.

.6 Remove and dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.

3.5 SALVAGE AND PROTECTION

.1 Salvage and protect items noted on drawings.

.2 Dismantle items containing materials for salvage and stockpile salvaged materials at locations as directed by Contract Administrator.

3.6 ARCHITECTURAL COATING REMOVAL

.1 Remove architectural coating on all exterior wall surfaces on ramp 2, 3, 5 and 6 and as indicated on the drawings.

.2 Remove coating using suitable means so as not damage existing concrete surfaces.

3.7 RESTORATION

.1 Restore areas and existing works outside areas of demolition to conditions that existed prior to beginning of Work and match condition of adjacent, undisturbed areas.

3.8 CLEANING

.1 Remove debris, trim surfaces and leave work site clean, upon completion of Work

.2 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

END OF SECTION 02 22 20

PART 1 General

1.1 REFERENCE STANDARDS

.1 Design, construction and removal of falsework and formwork to CSA A23.1-00, except as amended or extended herein, and to the requirements of The Occupational Health and Safety Act, 1990 and Ontario Regulation 213/91 and any amendments.

.2 Do falsework in accordance with CSA S269.1-1975 (R1998), except where specified otherwise.

.3 Do formwork in accordance with CAN/CSA-S269.3-M92 (R1998).

1.2 DEFINITION

.1 Architectural concrete: all formed surfaces exposed to view in the completed structure.

1.3 DESIGN REQUIREMENTS

.1 The contractor shall provide shoring to support all anticipated loads including, but not limited to, dead loads, construction live loads and lateral earthquake and wind loads.

.2 The shoring design shall take into account all unbalanced loads due to construction sequencing.

1.4 SHOP DRAWINGS

.1 Submit Shop Drawings in accordance with Section 01 30 00.

.2 The Shop Drawings shall include detail drawings and design calculations of falsework and formwork for columns, beams, slabs and concrete walls.

.3 The detail drawings and design calculations for falsework and formwork shall bear the signature and stamp of a Professional Engineer licensed in Ontario, and experienced in formwork design.

1.5 CERTIFICATION OF INSPECTION

.1 The Professional Engineer, whose signature and seal appear on the Construction Procedure Drawings, shall inspect the work, and certify in writing that the formwork and falsework are in accordance with calculations and Drawings reviewed by the Contract Administrator.

.2 Submit such certification to the Contract Administrator before placing concrete.

1.6 DELIVERY, STORAGE, AND PROTECTION

.1 Deliver, handle and store formwork materials and accessories to prevent weathering, warping or damage detrimental to the strength of the materials or to the surfaces to be formed.

.2 Ensure that formwork surfaces which will be in contact with concrete are not contaminated by foreign matter.

.3 Handle and erect the fabricated formwork to prevent damage.

PART 2 Products

2.1 MATERIALS

.1 General: materials shall conform to the requirements of CSA A23.1, except as amended or extended herein.

.2 Formwork lumber: plywood and wood formwork materials to CSA O121, CSA O86.1.

.3 Falsework materials: to CSA S269.1.

.4 Chamfers shall be formed by suitably shaped wood or premoulded elements secured in the forms.

.5 Form ties:

.1 Construct ties so that when end fasteners of ties are removed, no metal shall be within 50 mm of formed faces of concrete.

.2 Ties shall have a minimum working strength of 15 kN.

.6 Form release agent: chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing concrete from sticking to forms. Use "Crete-lease 727" manufactured by Cresset, "Sealtight Duogard Form Release Agent" manufactured by W. R. Meadows, or Contract Administrator-approved equal.

PART 3 Execution

3.1 PREPARATION

.1 Do not allow form release agent to come in contact with hardened concrete against which fresh concrete is to be placed, or where waterproofing, floor finishes, paint, etc., are applied directly to finished concrete surfaces. Remove with approved solvents any form coating which contacts reinforcing steel.

3.2 ERECTION

.1 Verify lines, levels and column centres before proceeding with formwork and ensure that dimensions agree with Drawings.

.2 Construct falsework in accordance with CSA S269.1.

.3 Construct forms to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA A23.1.

.4 Obtain Contract Administrator's permission before framing openings not indicated in concrete joists, beams or columns.

.5 Align form joints and make watertight. Keep form joints to minimum.

.6 Locate horizontal form joints for exposed columns 2400 mm above finished floor elevation.

.7 Use 20 mm chamfer strips on external corners of beams, joists and columns.

.8 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.9 Inspect and check the completed formwork and falsework to ensure that the work is in accordance with the shop drawings and design calculations, and that they are properly placed, rigid and secure, before placing concrete. The Engineer responsible for the design of formwork and falsework shall also inspection this work.

.10 Inspect forms immediately prior to placing concrete. Remove any loose metal ties, chairs, wood or other foreign material. Ensure that reinforcement, ties, inserts, anchors, etc., are clear of the forms.

.11 Clean formwork in accordance with CAN/CSA-S269.3.

.12 Removal of forms and falsework shall be based on the test results and condition of concrete. If, in the opinion of the Contract Administrator, removal of forms is likely to endanger whole or part of the structure, forms and falsework shall remain in place until stability is ensured, and as specified in Clause 1.7 of Section 03310. Leave formwork in place for following minimum periods of time after placing concrete:

.1 Fourteen days for beam soffits, slabs, decks and other structural members, unless replaced immediately with adequate shoring to standard specified for falsework to the satisfaction of the Contract Administrator

.13 Exercise care in removing forms for concrete so that edges, corners, etc. are not damaged.

.14 Re-use of falsework and formwork subject to requirements of CSA S269.1. Do not re-use formwork if there is any evidence of surface wear or defect which would impair concrete surface quality.

.15 Patch tie holes and defects with grout to match adjacent concrete in texture and colour, remove fins, thoroughly clean and coat forms, to approval of Contract Administrator, before reusing.

END OF SECTION 03 10 00

PART 1 General

1.1 REFERENCE STANDARDS

.1 Do reinforcing work in accordance with CSA A23.1, and welding of reinforcing with CSA W186, except where specified otherwise.

1.2 SOURCE QUALITY CONTROL

.1 Provide Contract Administrator with certified copy of Mill Test Report of reinforcing steel, showing physical and chemical analysis, minimum five weeks prior to commencing reinforcing work.

.2 Inform Contract Administrator of proposed source of material to be supplied.

1.3 SHOP DRAWINGS

.1 Submit Shop Drawings in accordance with Section 01 33 00.

.2 Shop Drawings shall include the following:

.1 Reinforcing placing Drawings to minimum scale of 1:100, showing size, location spacing and identification of all bars, and outline of all concrete surrounding steel, drawn to scale. Drawings shall show openings required for mechanical, electrical and other services, dimensioned and related to suitable grid line or elevation data.

.2 Bar lists showing all detailed dimensions, number of bars, size and location, prepared in accordance with recommendations of "Reinforcing Steel Manual of Standard Practice" by Reinforcing Steel Institute of Ontario.

.3 Shop drawings shall bear the signature and stamp of a professional engineer licensed in the province of Manitoba.

1.4 DELIVERY AND STORAGE

.1 Deliver, handle and store reinforcing accessories in accordance with CSA A23.1.

PART 2 Products

2.1 MATERIALS

.1 Reinforcing steel: new billet steel, grade 400 R or 400 W, deformed bars to CAN/CSA-G30.18.

.2 Where specified on drawings: Epoxy coated reinforcing steel shall be new billet steel, grade 400 R or 400 W, deformed bars to CAN/CSA-G30.18. Epoxy coating to ASTM A 775.

.3 Cold-drawn annealed steel wire ties: to CSA G30.3, minimum diameter 1.2 mm (18 ga).

.4 Chairs, bolsters, bar supports, spacers: to CSA A23.1. Chairs used to support bars in slabs shall be made from non-ferrous metal or other non-staining material.

.5 Mechanical splices: tapered threaded couplers, use "Lenton Rebar Splicing System" by Erico Products Inc., or Contract Administrator-approved equal.

.6 Plain round bars: to CSA G40.21.

2.2 FABRICATION

.1 Fabricate reinforcing in accordance with CSA A23.1, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Ontario.

.2 Provide lapped splice lengths as shown in the reinforcing lap length table on the shop drawings.

.3 Obtain Contract Administrator's approval for locations of reinforcement splices other than shown on placing drawings.

.4 Upon approval of Contract Administrator, weld reinforcement in accordance with CSA W186.

.5 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 INSPECTION AND TESTING

.1 Tests on reinforcing steel shall be by an independent inspection company.

.2 A series of specimens for each grade and size of reinforcing steel contained in any of 100 tonnes of steel shipped may be tested.

.3 A series of tests will include two bars for each test required of each size and grade of steel used. Reinforcing steel tests will be made in accordance with CAN/CSA-G30.18.

PART 3 Execution

3.1 FIELD BENDING

.1 Do not field bend reinforcement except where authorized by Contract Administrator.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars which develop cracks or splits.

3.2 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CSA A23.1.

.2 Tack-welding of crossing bars and welding of pipe supports to reinforcing bars will not be permitted, unless approved by the Contract Administrator.

.3 Concrete support blocks may be used to support bottom reinforcing steel in slabs and footings resting on working slabs or ground. Blocks shall be suitably tapered to ensure a permanent key with finished structure.

.4 Top steel in slab shall be supported on high chairs. Beam and slab steel in suspended concrete structures shall be supported and tied to chairs.

.5 Prior to placing concrete, notify the Contract Administrator for the purpose of reviewing reinforcing steel in place. In the case of a wall, notify the Contract Administrator prior to closing in wall forms.

3.3 FIELD TOUCH-UP

.1 Touch up damaged and cut ends of epoxy-coated reinforcing steel with compatible finish to provide continuous coating.

END OF SECTION 03 20 00

Part 1 General

1.1 MEASUREMENT PROCEDURES

.1 The contract is a stipulated sum for the work indicated in this section.

1.2 REFERENCES

.1 Except where modified by this section or the Contract Drawings, the standard specifications (latest edition) listed below shall govern:

.1 CAN3-A23.1 Concrete Materials and Methods of Construction

.2 CAN/CSA S413 Parking Structures

.3 CAN3-A266.4 Guidelines for Use of Admixtures in Concrete

.4 CAN/CSA-A23.5 Supplementary Cementing Materials

1.3 DESIGN REQUIREMENTS

.1 In accordance with CSA-A23.1/A23.2 and to the requirements in Part 2 - Products.

1.4 SUBMITTALS

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

.2 The mix design shall be submitted in accordance with the RMCAO and shall include a breakdown of the constituent components for each mix.

.3 Submit testing results and reports for review Contract Administrator and do not proceed without written approval when deviations from mix design or parameters are found.

.4 Concrete pours: submit accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in Part 3- Field Quality Control.

.5 Concrete hauling time: submit for review Contract Administrator deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.5 QUALITY ASSURANCE

.1 Submit to Contract Administrator, minimum 4 weeks prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

.1 When plant does not hold valid certification, provide test data and certification by qualified independent inspection and testing laboratory that materials used in concrete mixture will meet specified requirements.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Concrete hauling time: maximum allowable time for concrete to be delivered to site of Work and discharged not to exceed 120 minutes after batching.

.1 Modifications to maximum time limit must be agreed to Contract Administrator and concrete producer as described in CSA A23.1/A23.2.

.2 Deviations to be submitted for review by Contract Administrator.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

.3 Waste Management and Disposal:

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

Part 2 Products

2.1 CONCRETE

.1 Concrete for Level P2 Slab on Grade: to conform to CAN3-A23.1, exposure Class: C-4, unless modified herein. Use type 10 cement to give minimum compressive strength of 25 MPa in 28 days with 20mm nominal aggregate size and 5.5%+1.5% entrained air and 1 to 2 kg/m3 of polypropylene fiber.

.2 Concrete for Heated Ramp Topping: to CAN3-A23.1, exposure Class: C-1, unless modified herein. Use type 10 cement to give minimum compressive strength of 35 MPa in 28 days with 10mm nominal aggregate size, 7.5%+1.5% entrained air and 1 to 2 kg/m3 of polypropylene fiber.

.3 Unless otherwise specified: Concrete to conform to CAN3-A23.1, exposure Class: C-1, unless modified herein. Use type 10 cement to give minimum compressive strength of 35 MPa in 28 days with 20mm nominal aggregate size and 6.5%+1.5% entrained air.

2.2 ADMIXTURES

.1 Concrete admixtures shall be compatible with one another, and used in accordance with manufacturer's instructions, and CAN3-A266.4, "Guidelines for Use of Admixtures in Concrete".

2.3 ACCESSORIES

.1 Premoulded joint fillers:Bituminous impregnated fiber board: to ASTM D1751.

.2 Polyethylene film: 6 mil thickness to CAN/CGSB-51.34.

Part 3 Execution

3.1 PREPARATION

.1 Obtain Contract Administrator’s approval before placing concrete. Provide 24 hours notice prior to placing of concrete.

.2 Place concrete reinforcing in accordance with Section 03 20 00- Concrete Reinforcing and as directed by Contract Administrator.

.3 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Pumping of concrete is permitted only after approval of equipment and mix.

.5 Ensure reinforcement and inserts are not disturbed during concrete placement.

.6 Prior to placing of concrete obtain Contract Administrator's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.7 Protect previous Work from staining.

.8 Clean and remove stains prior to application for concrete finishes.

.9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.10 In locations where new concrete is dowelled to existing work, drill holes in existing concrete.

.1 Place steel dowels of deformed steel reinforcing bars and pack solidly with non shrink grout to anchor and hold dowels in positions as directed by Contract Administrator.

.11 Do not place load upon new concrete until authorized by Contract Administrator.

3.2 CONSTRUCTION

.1 Do cast-in-place concrete work in accordance with CSA-A23.1/A23.2.

.2 Sleeves and inserts:

.1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through joists, beams, column capitals or columns, except where indicated or approved by Contract Administrator.

.2 Where approved by Contract Administrator, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.

.3 Sleeves and openings greater than 100 x 100 mm not indicated, must be reviewed by Contract Administrator.

.4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Contract Administrator before placing of concrete.

.5 Check locations and sizes of sleeves and openings shown on drawings.

.6 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.

.3 Anchor bolts:

.1 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete.

.2 With approval of Contract Administrator grout anchor bolts in preformed holes or holes drilled after concrete has set, and as directed by Contract Administrator.

.3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.

.4 Set bolts and fill holes with shrinkage compensating grout epoxy grout.

.5 Locate anchor bolts used in connection with expansion shoes, rollers and rockers with due regard to ambient temperature at time of erection.

.4 Finishing and curing:

.1 Finish concrete in accordance with CSA-A23.1/A23.2 and as directed by Contract Administrator.

.2 Use procedures as reviewed by Contract Administrator or those noted in CSA-A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.

.3 Curing compounds are not permitted.

.4 Finish concrete floor to meet requirements of CSA-A23.1/A23.2.

.5 Provide finish as directed by Contract Administrator.

.6 Provide steel trowelled finish unless otherwise indicated.

.5 Toppings:

.1 Topping: as thick as indicated by Contract Administrator.

.2 In pouring base course, make allowance for topping thickness where indicated on drawings.

.3 Place topping in accordance with CSA-A23.1.

.4 Concrete topping for heated ramps shall receive a rough broom finish.

.6 Joint fillers:

.1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Contract Administrator.

.2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

.3 Locate and form isolation joints as indicated.

.4 Install joint filler.

.5 Use 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12 mm of finished slab surface unless indicated otherwise.

3.3 SURFACE TOLERANCE

.1 Concrete tolerance in accordance with CSA-A23.1/A23.2 straightedge method.

3.4 FIELD QUALITY CONTROL

.1 Inspection and testing of the concrete and concrete material will be carried out by a designated testing laboratory and in accordance with CAN/CSA A23.1 and as directed by the Contract Administrator.

.2 Number and frequency of cylinder tests taken shall be as follows: two 28-day and one 7-day test specimen taken for each 50 cubic metres of concrete, or fraction thereof, for each

class of concrete cast. Frequency of slump and air content tests shall be determined by the Contract Administrator.

.3 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Contract Administrator for review in accordance with CSA-A23.1/A23.2. Ensure testing laboratory is certified in accordance with CSA A283.

.4 Ensure test results are distributed for discussion at pre-pouring concrete meeting between Contract Administrator.

.5 Contractor will pay for costs of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.

.6 Non-Destructive Methods for Testing Concrete: in accordance with CSA-A23.1/A23.2.

.7 Inspection or testing by Contract Administrator will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

END OF SECTION 03 30 00

Part 1 General

1.1 CERTIFICATES

.1 Provide certification that plant, equipment and materials to be used in concrete comply with requirements of CAN 3-A23.1.

1.2 SUBMITTALS

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

.2 The mix design shall be submitted in accordance with the RMCAO and shall include a breakdown of the constituent components for each mix.

.3 Submit testing results and reports for review Contract Administrator and do not proceed without written approval when deviations from mix design or parameters are found.

.4 Concrete pours: submit accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.

.5 Concrete hauling time: submit for review Contract Administrator deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.3 REFERENCES

.1 Except where modified by this section or the Contract Drawings, the specifications (latest edition) listed below shall govern:

.1 CAN3-A23.1 Concrete Materials and Methods of Construction
.2 CAN/CSA S413 Parking Structures
.3 CAN3-A266.4 Guidelines for Use of Admixtures in Concrete
.4 CAN/CSA-A23.5 Supplementary Cementing Materials

1.4 CONDUIT

.1 Hidden conduit damaged during the execution of the work shall be repaired at the City's expense on a time and materials basis provided reasonable care is taken to avoid such damage. As part of avoiding any overt conduit damage, the affected areas of repair should be scanned in an efforts to locate hidden conduit.

.2 Where damage occurs to hidden conduit as a result of the contractor or his subcontractors failing to take reasonable care, the contractor shall be responsible for the cost of repair.

.3 Hidden conduit exposed during repairs which is severely corroded shall, when approved by the Contract Administrator, be replaced with surface mounted electrical conduit, made fully operational, at the City's expense, on a time and materials basis.

.4 Exposed electrical conduits damaged during the execution of the work shall be replaced with surface mounted electrical conduit, and made fully operational without charge to the

City. Surface mounted conduit shall be mechanically unfastened from the concrete surface to facilitate repairs. Conduit shall be fully protected during work and reinstated on completion.

1.5 MEASUREMENT FOR PAYMENT

.1 The repair areas shall be the projected surface area in square metres. The surface area dimensions shall be measured to the nearest 0.1 metre. Measurements shall be carried out by the Contract Administrator in the presence of the Contractor. Final measurements for payment of all concrete repairs to be carried out shall be measured and agreed upon by the Contract Administrator and the Contractors prior to removal.

1.6 SURFACE COATINGS

.1 After completion of concrete repairs, paint coatings on columns and walls shall be reinstated. New surface coatings shall be of colour and texture to blend into the existing building surface to highest degree possible.

.2 Contractor to include cost of surface coating reinstatement in unit prices for concrete repair work.

Part 2 Materials

2.1 CONCRETE

.1 Top surface repair concrete:

.1 Concrete to conform to CAN3-A23.1, exposure Class: C-1, unless modified herein. Use type 10 cement to give minimum compressive strength of 35 MPa in 28 days with 10mm nominal aggregate size, slump at point of discharge 80mm maximum, 7.5% $\pm$1.5% entrained air.

.2 Corrosion inhibiter shall be Catexol 1000 CI as manufactured by Axim Italcementi Group or approved equal in accordance with Section B6. The minimum dosage shall be 15 L/m^3 in accordance the manufactures instructions and recommendation of appendix C corrosion inhibitors–CAN/CSA S413.

.2 Through Slab Repair Concrete

.1 Concrete to conform to CAN3-A23.1, exposure Class: C-1, unless modified herein. Use type 10 cement to give minimum compressive strength of 35 MPa in 28 days with 20mm nominal aggregate size, slump at point of discharge 80mm maximum, 6.5% $\pm$1.5% entrained air.

.2 Corrosion inhibiter shall be Catexol 1000 CI as manufactured by Axim Italcementi Group or approved equal in accordance with Section B6. The minimum dosage shall be 15 L/m^3 in accordance the manufactures instructions and recommendation of appendix C corrosion inhibitors–CAN/CSA S413.

2.2 ADMIXTURES

.1 Concrete admixtures shall be compatible with one another, and used in accordance with manufacturer's instructions, and CAN3-A266.4, "Guidelines for Use of Admixtures in Concrete".

2.3 BONDING AGENTS

.1 Cement bonding slurry be made of a 1:1 ratio of Portland cement to fine aggregate by weight with sufficient water to form a cream like consistency.

.2 Non shrink grout bonding agent shall be Sika Top-Armatec 110 as manufactured by Sika Canada Inc. or approved equal in accordance with Section B6.

2.4 NON SHRINK-GROUT

.1 Sika 212 as manufactured by Sika Canada Inc.

.2 Approved equal in accordance with Section B6.

2.5 REINFORCING STEEL

.1 Refer to section 03 20 00.

Part 3 Execution

3.1 AREAS OF REPAIR

.1 Contractor will delineate and mark delaminated areas on the concrete surface using hammer sounding techniques and/or by chain dragging. Obtain Contract Administrator's approval before commencing concrete removal.

.2 As concrete removal progresses, extensions to the above marked areas may be necessary. Obtain Contract Administrator's approval of these additional areas before removal begins.

.3 Soffit delamination repairs will be broken through from above except where directed by Contract Administrator.

3.2 SHORING

.1 Design the shoring to safely support the loads it will be subjected to during construction. The shoring shall be designed by a Professional Contract Administrator registered in the Province of Manitoba and experienced in shoring design. shoring installation shall be reviewed by the Contract Administrators prior to commencement of any concrete removal.

.2 Shoring shall be installed in accordance with the reviewed shop drawings. Ensure that all installed shores are vertically plumb and snug at all times.

3.3 FORMWORK

.1 The Contractor shall construct all formwork including shoring and bracing to resist loads due to the weight of wet concrete, self-weight of forms and fluid pressure of concrete and to the requirements of CAN3-A23.1.

.2 Formwork shall be constructed with joints sufficiently tight to prevent leakage of grout or concrete. The edges of all plywood sheets shall be backed or supported to prevent separation or opening.

3.4 DELAMINATED CONCRETE REMOVAL

.1 No larger than 14kg class chipping hammers shall be used for removal of concrete cover to reinforcing steel. No larger than 7kg class chipping hammers shall be used for removal of concrete around and behind reinforcing steel.

.2 The concrete in the repair area shall be removed until sound concrete is reached or to a minimum depth of 25mm below the reinforcing steel. Concrete shall not be removed beyond this limit except where authorized by the Contract Administrators.

.3 Chipping shall extend along all reinforcing bars to the point where the exposed bars are free of heavy rust.

.4 Upon completion of initial chipping, the concrete surface immediately surrounding the repair area should be sounded for local delaminations. Chip additional delaminated areas as required.

.5 The perimeter of the patches shall be saw cut to a minimum of 13mm (1/2") deep to provide a vertical surface.

3.5 ABRASIVE BLAST CLEANING

.1 The reinforcement shall be sandblasted to SSPC-SP10 (near-white blast cleaning). The Contractor must ensure that adequate precautions are undertaken to protect the surrounding environment from damage resulting from blast cleaning operations.

3.6 CONCRETE PREPERATION

.1 The prepared concrete surface shall be thoroughly wetted down with potable water.

.2 The approved bonding agent shall be applied to the concrete surface prior to the placement of the repair mortar. The bonding agent shall be scrubbed into the surface, fully filling all voids and irregularities.

.3 Apply concrete mix when bonding agent is still wet. If bonding agent is allowed to dry, then an additional coat of bonding agent will be required. Pencil vibrators shall be used for consolidation.

3.7 PRESSURE GROUTING

.1 Apply grout in accordance with the manufacturers recommended.

.2 Mix and place bonding agent accordance with the manufacturers recommended.

.3 The non-shrink grout shall be mixed and placed in accordance with the manufacturer's recommendations.

3.8 FINISHING AND CURING

.1 Finish and cure concrete in accordance with CAN/CSA-A23.1. Repair surfaces shall be finished to the same level as the surrounding surfaces unless instructed otherwise.

3.9 FIELD QUALITY CONTROL

.1 Inspection and testing of the concrete and concrete material will be carried out by a designated testing laboratory and in accordance with CAN/CSA A23.1 and as directed by the Contract Administrator.

.2 Number and frequency of cylinder tests taken shall be as follows: two 28-day and one 7-day test specimen taken for each 50 cubic metres of concrete, or fraction thereof, for each class of concrete cast. Frequency of slump and air content tests shall be determined by the Contract Administrator.

.3 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Contract Administrator for review in accordance with CSA-A23.1/A23.2. Ensure testing laboratory is certified in accordance with CSA A283.

.4 Ensure test results are distributed for discussion at pre-pouring concrete meeting between Contract Administrator.

.5 Contractor will pay for costs of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.

.6 Non-Destructive Methods for Testing Concrete: in accordance with CSA-A23.1/A23.2.

.7 Inspection or testing by Contract Administrator will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

END OF SECTION 03 70 00

Part 1 General

1.1 REFERENCES

.1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.

.2 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.3 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.

.4 CAN/CSA-G164-M92 (R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.

.5 CSA W59-1989 (R2001), Welded Steel Construction (Metal Arc Welding/Imperial Version).

1.2 SYSTEM DESCRIPTION

.1 Design Requirements: National Building Code of Canada.

.2 Design metal stair, balustrade and landing construction and connections to NBC vertical and horizontal live load requirements.

.3 Detail and fabricate stairs to NAAMM Metal Stairs Manual.

1.3 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:

.1 For finishes, coatings, primers and paints.

.2 Shop Drawings

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

.2 Indicate construction details, sizes of steel sections and thickness of steel sheet.

.3 Submit shop drawing bearing stamp of a qualified professional engineer registered in the Province of Manitoba.

1.4 QUALITY ASSURANCE

.1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle 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.

Part 2 Products

2.1 MATERIALS

.1 Steel sections: to CAN/CSA-G40.20/G40.21 Grade 350 W.

.2 Steel plate: to CAN/CSA-G40.20/G40.21, Grade 300 W.

.3 Steel pipe: to ASTM A53/A53M, standard weight, schedule 40 seamless black.

.4 Steel tubing: to CAN/CSA-G40.20/G40.21, Grade 300 W, square, rectangular, round wall thickness, sizes and dimensions as indicated.

.5 Welding materials: to CSA W59.

.6 Bolts: to ASTM A307.

.7 High strength bolts: to ASTM A325M.

2.2 FABRICATION

.1 Fabricate to NAAMM, Metal Stair Manual.

.2 Weld connections where possible, otherwise bolt connections. Countersink exposed fastenings, cut off bolts flush with nuts. Make exposed connections of same material, colour and finish as base material on which they occur.

.3 Accurately form connections with exposed faces flush; mitres and joints tight. Make risers of equal height.

.4 Grind or file exposed welds and steel sections smooth.

.5 Shop fabricate stairs in sections as large and complete as practicable.

2.3 STEEL PAN STAIRS

.1 Fabricate stairs to match existing.

2.4 BAR BALUSTRADES

.1 Construct bar balustrades to match existing.

.2 Weld balustrades to stringers as indicated.

2.5 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating 600g/$m^2$to CAN/CSA-G164.

.2 Shop coat primer: to CAN/CGSB-1.40.

.3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

2.6 SHOP PAINTING

.1 Clean surfaces in accordance with Steel Structures Painting Council Manual Volume 2.

.2 Apply one coat of shop primer except interior surfaces of pans.

.3 Apply two coats of primer of different colours to parts inaccessible after final assembly.

.4 Use primer as prepared by manufacturer without thinning or adding admixtures. Paint on dry surfaces, free from rust, scale, grease, do not paint when temperature is below 7 degrees C.

.5 Do not paint surfaces to be field welded.

Part 3 Execution

3.1 INSTALLATION OF STAIRS

.1 Install in accordance with NAAMM, Metal Stair Manual.

.2 Install plumb and true in exact locations, using welded connections wherever possible to provide rigid structure. Provide anchor bolts, bolts and plates for connecting stairs to structure.

.3 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

.4 Do welding work in accordance with CSA W59 unless specified otherwise.

.5 Touch up shop primer to bolts, welds, and burned or scratched surfaces at completion of erection.

3.2 CLEANING

.1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION 05 51 29

Part 1 General

1.1 REFERENCES

.1 CSA W59, Welded Steel Construction (Metal Arc Welding).

.2 SSPC Painting Manual Volume 2.

.3 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.

.4 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.5 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.

.6 CAN/CSA-G164-M92 (R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.

.7 CSA W59-1989 (R2001), Welded Steel Construction.

1.2 DESIGN REQUIREMENTS

.1 Design Requirements: National Building Code of Canada (NBC).

.2 Installed hand rail assembly and attachments to resist lateral force specified in clause 4.1.5.15 of the NBC.

1.3 SUBMITTALS

.1 Shop Drawings

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

.2 Indicate construction details, sizes of steel sections and thickness of steel sheet.

.3 Submit shop drawing bearing stamp of a qualified professional engineer registered in the Province of Manitoba.

.2 Submit Samples in accordance with Section 01 33 00-Submittal. Submit two 1000 mm long samples of handrail.

1.4 QUALITY ASSURANCE

.1 Perform welding to CSA W59.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21-Construction/Demolition Waste Management and Disposal, and with Waste Reduction Workplan.

Part 2 Products

2.1 STEEL RAILING

.1 Rails and Posts: as indicated on the approved shop drawings.

.2 Fittings: as indicated on the approved shop drawings.

.3 Exposed Fasteners: flush countersunk screws or bolts; consistent with design of railing.

.4 Splice Connectors: as indicated on the approved shop drawings.

.5 Galvanizing: to ASTM A123, provide minimum 380 g/sq m galvanized coating.

.1 Touch-Up Primer for Galvanized Surfaces: Refer to section 09 91 23.

.6 Shop Prefinishing: coating and colour as selected by the City.

2.2 FABRICATION

.1 Fit and shop assemble components in largest practical sizes for delivery to site.

.2 Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

.3 Provide anchors, plates required for connecting railings to structure.

.4 Exposed Mechanical Fastenings: flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

.1 Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

.2 Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.

.3 Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

.4 Accurately assemble components to each other and to building structure.

.5 Accommodate for expansion and contraction of members and building movement without damage to connections or members.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

.1 Supply items required to be cast into concrete with setting templates, to appropriate sections.

3.3 INSTALLATION

.1 Install handrails in accordance with the approved shop drawings.

.2 Install components plumb and level.

.3 Anchor railings to structure with anchors plates.

.4 Field weld anchors as indicated on shop drawings. Touch-up welds with primer. Grind welds smooth.

.5 Conceal bolts and screws whenever possible.

.6 Assemble with spigots and sleeves to accommodate tight joints and secure installation.

3.4 ERECTION TOLERANCES

.1 Maximum Variation from Plumb: 6 mm.

.2 Maximum Out-of-Position: 6mm.

END OF SECTION 05 52 16

Part 1 General

1.1 SCOPE OF WORK

.1 This section shall be responsible for all materials, labour, plant tools, and equipment necessary for the installation of a rubberized asphaltic membrane as specified and as shown on the drawings.

1.2 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's.

.3 Two copies of manufacturer's specifications for all products incorporated into the membrane system.

.4 A written acceptance from the membrane manufacturer stating that all the concrete and other surfaces with which the waterproofing membrane will come into contact with are fully adequate for the installation of the waterproofing system, prior to installing the primer.

.5 A set of written instructions for maintenance requirements.

.2 Design Requirements

.1 The membrane system both listed and those submitted for consideration as alternatives must have the capable of accommodating structural movements and deflection and cracks up to 1.5mm in width.

1.3 MATERIAL AND INSTALLATION REQUIREMENTS

.1 Adhesion of the waterproofing materials to the concrete substrate must be a minimum of 0.7 MPa.

.2 The concrete surface temperature and the ambient temperature shall be maintained at a minimum of 5°C 24 hours unless specifically permitted within manufacturer's recommended prior to placement and during placement.

.3 The moisture content of the concrete substrate shall be maintained within the waterproofing manufacturer's limits during the application of the waterproofing membrane.

.4 Installation procedures and details shall be completed in full accordance with manufacturer’s instructions.

.5 Where details shown on the drawings or in the specification are not in accordance with manufacturers requirements, notify Contract Administrator.

.6 Thickness of the membrane will be checked at random locations by a penetrating depth gauge or by cut tests. The bond between the membrane and the concrete substrate will be evaluated at random location.

1.4 QUALIFICATIONS

.1 The contractor performing the work under this section shall:

.1 Have a minimum of five (5) years proven satisfactory experience in the application of hot rubberized membrane systems.

.2 Have adequate equipment and skilled personnel to expediently complete this work.

.3 Approved systems must be capable of adequately performing on all the specified surfaces and shall be applied in strict accordance with the instructions provided by the manufacturer.

1.5 STANDARD SPECIFICATIONS

.1 Except where modified by this section or the contract drawings, the specifications listed below shall govern.

.1 CAN/CGSB 37-GP-9M Primer, Asphalt, Unfilled, for Asphalt Roofing, Damproofing and Waterproofing

.2 CAN/CGSB 37.50M Hot Applied, Rubberized Asphalt for Roofing and Waterproofing

.3 CAN/CGSB 37.51M Application for Hot Applied Rubberized Asphalt, for Roofing and Waterproofing

1.6 STORAGE

.1 Material shall be delivered and stored on site in their original containers or packages and clearly labelled as to manufacturer's name and quantity.

.2 Materials shall be kept dry and protected from damage, weather and deterioration at all times. Store materials in warm and dry areas.

1.7 WARRANTY

.1 The waterproofing system shall be guaranteed with a written warranty to be free of defects in workmanship and materials for a period of five (5) years from the date of completion of this contract as certified by the Contract Administrators.

.2 Any repair required under the warranty will be carried out in accordance with the recommendations of the Contract Administrators.

1.8 INSPECTION

.1 Installation of the hot rubberized membrane system will be inspected on behalf of City by Concentric.

.2 Thickness of the membrane will be checked at random locations by a penetrating depth gauge or by cut tests.

.3 Any work not accepted by the Contract Administrators shall be immediately corrected by the Contractor.

.4 Costs associated with the reinspection of deficient work will be paid by the Contractor.

1.9 MEASUREMENT FOR PAYMENT

.1 The contract is a stipulated sum for the installation of hot rubberized membrane and shall be full compensation for the work and materials supplied in this section, which includes preparation of base surfaces, treatment of cracks and surface voids, supply and installation of protection boards and for the supply and installation of the membrane system.

.2 Measurement of the membrane thickness to be measured to the nearest 1 millimeter.

Part 2 Materials

2.1 WATERPROOFING MEMBRANE

.1 The following have been approved for use on this project

.1 Hydrotech 6125 as manufactured by Hydrotech Membrane Corporation.

.2 790-11 as manufactured by Bakor.

.3 Approved equal in accordance with Section B6.

2.2 SURFACE CONDITIONER

.1 Surface conditioner shall be 56170, as supplied by Hydrotech Membrane Corporation or approved equal in accordance with Section B6 to CGSB 37-GP-9M.

2.3 MEMBRANE FABRIC REINFORCEMENT

.1 Membrane fabric reinforcement shall be polyester spunbonded fabric, supplied by Hydrotech Membrane Corporation or approved equal in accordance with Section B6.

2.4 STANDARD REINFORCING SHEET

.1 Membrane reinforcement shall be an elastosheet 300mm in width, Hydrotech 6147 elastosheet or approved equal in accordance with Section B6 to CGSB SP-64M.

2.5 HEAVY DUTY REINFORCING SHEET

.1 Membrane reinforcement shall be an elastosheet 300mm in width, Hydrotech 6146 elastosheet or approved equal in accordance with Section B6 to CGSB SP-64M.

2.6 CRACK SEALANT

.1 The crack sealant shall be Hi Spec 590-13 as manufactured by Bakor or approved equal in accordance with Section B6.

2.7 JOINT SEALANT

.1 Joint sealer shall be Hydrotech Sealz 6165 or approved equal in accordance with Section B6.

2.8 SECUREMENT BAR

.1 Continuous 3mm x 25mm x 3000mm aluminum, stainless or galvanized bar, pre-drilled for screws.

2.9 SEPRATION SHEET

.1 Polyethylene film: to CAN/CGSB-51.34, 0.15 mm thick containing minimum 50 % recycled content.

2.10 POLYSTYRENE INSULATION

.1 Extruded polystyrene (XPS) insulation to CAN/ULC-S701, Type 4, thickness 50 mm or as indicated on the drawings, shiplapped edges.

Part 3 Execution

3.1 SURFACE AND ENVIRONMENTAL CONDITIONS

.1 Concrete surfaces shall be clean and dry with a minimum wood float finish and uniform surface.

.2 Deteriorated, delaminated and scaled concrete must be repaired prior to membrane installation.

.3 Installation of the membrane shall not be undertaken during inclement weather or on frost or wet covered surfaces.

.4 The waterproofing contractor will be responsible for maintaining the level of cleanliness achieved during the interval between acceptance of the work and the actual application of the membrane.

3.2 NEW CONCRETE AREAS

.1 Installation of the waterproofing membrane on newly repaired concrete surfaces shall not be undertaken until a minimum cure time of 14 days is achieved or until the desired moisture content of the concrete or repair mortar, as recommended by the manufacturer, has been achieved and verified by testing.

3.3 PREPARATION OF SURFACES TO RECEIVE WATERPROOFING MEMBRANE

.1 Surfaces shall be clean and dry, free from surface water, ice, snow or frost, dust, dirt, grease, oil, soap, wax, paint, curing compound, laitance, and any other foreign materials before waterproofing operations commence.

.2 Areas where the surface is rough or where ridges exist must be prepared to provide the best possible surface for the waterproofing. All depressions and large voids in the concrete must be filled with an approved concrete mix on a fully prepared surface.

.3 Concrete surfaces to receive waterproofing shall be prepared by shotblasting in order to yield the best possible surface and in full accordance with manufacturer's instructions. Sandblasting and acid etching are not acceptable surface preparation methods. Areas not accessible to the shotblasting machine such as near column bases and vertical faces shall be sandblasted to remove loose bond inhibiting materials.

.4 Cracks and depressions shall be air blasted cleaned.

3.4 SURFACE CONDITIONER

.1 Apply surface conditioner uniformly over the entire area to receive waterproofing membrane within the time limit as specified by the manufacturer at rate of application and under conditions stated in manufacturer's recommendations.

.2 Allow ponding to dry before membrane application.

3.5 CRACKS AND CONSTRUCTION JOINTS

.1 Cracks, construction joints and perimeters of through slab repairs less than 1.5mm wide shall receive a double application of the membrane reinforced with a fully embedded mat of fabric reinforcement, 300mm wide and centered on the crack or joint. The second application must overlap the first by 75mm. This work shall be performed prior to application of membrane layers over full area.

.2 Construction joints, cracks and perimeters of through slab repairs greater than 1.5mm wide shall be routed to form a 10mm by 10mm joint. A bond breaker and joint sealer shall be installed as recommended by the manufacturer.

3.6 DECK TO VERTICAL JUNCTURES

.1 Vertical junctures to the deck shall receive a double application of the membrane reinforced with a fully embedded mat of standard reinforcing sheet. The reinforcing sheet shall extend 150mm on the horizontal surface and 150mm up the vertical surface. The second application must overlap the first by 75mm. Install continuous securement bars and fasten at 150mm o/c over second layer of membrane. This work shall be performed prior to application of membrane layers over full area.

.2 Lap height shall be uniform not ragged in appearance.

.3 Where indicated on drawings install metal flashing sheet fully embedded in the membrane. Mechanically attach the metal flashing using continuous fastening bars where vertical flashing height exceeds 300mm.

3.7 SURFACE CONDITIONER APPLICATION

.1 When surface conditioner is fully dry, apply membrane in strict accordance with manufacturer's recommendations with regard to rate of application, consistency, thickness, temperature, etc. Ensure full bond of membrane to substrate.

3.8 MEMBRANE APPLICATION

.1 Install two ply waterproofing membrane to achieve a continuous film a minimum thickness of 1.3 and a maximum of 2.0mm on the first ply and 1.3 and a maximum of 2.0mm on the second ply and as directed by the manufacturer.

.2 Install a protection board while the membrane is still warm and tacky.

.3 Membrane to be lapped up a minimum of 200mm at all vertical surfaces and as indicated on the drawings.

.4 Lay out work to keep all vehicular and pedestrian traffic across the membrane to the absolute minimum.

.5 Carefully mop membrane onto cleaned surfaces of floor drain seepage flanges. Do not block weep holes.

.6 Install separation sheet with minimum 150mm overlap at joints.

3.9 INSULATION INSTALLATION

.1 Place insulation, loose laid in parallel rows with ends staggered.

.2 Slightly bevel insulation to allow snug fit at cants or protrusions. Cut neatly around penetrations through roof.

.3 Place insulation boards to an irregular pattern to encourage close contact and fit.

3.10 MEMBRANE WEAR COURSE

.1 Install membrane covering as detailed in as indicated on the drawings.

3.11 SAFETY PRECAUTIONS

.1 Keep on hand, suitable safety equipment and first aid materials to provide against injury from the specific materials.

.2 Assure that all workers using the materials understand the safety precautions to be taken and abide by them.

3.12 CLEANING

.1 Employ manufacturer's recommended cleaning solvents to remove sealer inadvertently applied to surfaces other than floor slabs and uniform laps at vertical surfaces.

.2 Remove all unused materials and debris from the site on completion of the work.

3.13 REPAIR OF DEFICIENCIES

.1 Any repair required under the warranty will be carried out in accordance with the recommendations of the Contract Administrators.

End of Section 07 10 00

Part 1 General

1.1 SCOPE OF WORK

.1 This section shall be responsible for all materials, labour, plant tools, and equipment necessary for traffic topping upgrades and repairs as specified and shown on the drawing.

1.2 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's.

.3 Two copies of manufacturer's specifications for all products incorporated into the membrane system.

.4 Written acceptance from the traffic topping manufacturer stating that all the concrete and other surfaces with which the traffic topping will come into contact with are fully adequate for the installation, prior to installing the primer and/or membrane.

.5 A set of written instructions for maintenance requirements.

1.3 MATERIAL AND INSTALLATION REQUIREMENTS

.1 Adhesion of the waterproofing materials to the concrete substrate must be a minimum of 0.7 MPa.

.2 The concrete surface temperature and the ambient temperature shall be maintained within manufacturer's recommendations prior to placement, during placement and after placement.

.3 The moisture content of the concrete substrate shall be maintained within the traffic topping manufacturer's limits during the application of the traffic topping.

.4 Thickness of the membrane will be checked at random locations by a wet film thickness gauge and/or by cut tests.

1.4 QUALIFICATIONS

.1 The contractor shall have a minimum of five (5) years proven satisfactory experience in the application of traffic topping system and have adequate equipment to expediently complete this work.

1.5 REFERENCES

.1 Except where modified by this section or the Contract Drawings, the specifications (latest edition) listed below shall govern:

.1 CAN/CGSB-37.58 Membranes, Elastomeric

.2 ASTM C957 Standard Specification for High Solids Contents, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface

.3 CAN/CSA S413 Parking Structures

1.6 WARRANTY

.1 The traffic topping system shall be guaranteed with a written warranty to be free of defects in workmanship and materials for a period of three (3) years from the date of completion of this contract as certified by the Contract Administrators. Any repair required under the warranty will be carried out in accordance with the recommendations of the Contract Administrators.

1.7 MEASUREMENT FOR PAYMENT

.1 Drive Aisle Traffic Topping

.1 Drive aisle traffic topping will not be measured but will be paid for as a fixed price item.

.2 The fixed price shall be full compensation for the removal of the existing drive aisle traffic topping, the preparation of base surfaces, treatment of cracks and surface voids and the supply and installation of the traffic topping system specified in clause 2.1.

.2 Parking Stall Traffic Topping

.1 The contract is a unit rate price (projected surface area in square metres) for the preparation of base surfaces, treatment of cracks and for the supply and installation of the primer and base coat.

.2 Parking Stall traffic topping wear course and painted pavement markings will not be measured but will be paid for as a fixed price item.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle 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.

Part 2 Materials

2.1 PARKING STALL TRAFFIC TOPPING SYSTEMS

.1 Vulkum 360 NF/950NF and/or 951NF as manufactured by Tremco.

.1 In accordance with manufacturers recommended thickness.

.2 Auto-Gard II as manufactured by Neogard.

.1 In accordance with manufacturers recommended thickness.

.3 Conipur II Deck Coating System as manufactured by BASF.

.1 In accordance with manufacturers recommended thickness.

.4 Approved equal in accordance with Section B6.

2.2 DRIVE ASILE TRAFFIC TOPPING SYSTEMS-POLYURETHANE WEAR COURSE

.1 Vulkum 360 NF/950NF as manufactured by Tremco.

.1 Base coat in accordance with manufacturers thickness.

.2 Wear course installed in a minimum of three applications to a total dry mil thickness of 40 mils (excluding aggregate).

.2 Auto-Gard II as manufactured by Neogard.

.1 Base coat in accordance with manufacturers thickness.

.2 Wear course installed in a minimum of three applications to a total dry mil thickness of 40 mils (excluding aggregate).

.3 Conipur E, as manufactured by BASF.

.1 Base coat in accordance with manufacturers thickness.

.2 Wear course installed in a minimum of three applications to a total dry mil thickness of 40 mils (excluding aggregate).

.4 Approved equal in accordance with Section B6.

2.3 DRIVE ASILE TRAFFIC TOPPING SYSTEMS-EPOXY WEAR COURSE

.1 Auto-Gard E- Heavy Duty System as manufactured by Neogard.

.1 In accordance with manufacturers recommended thickness.

.2 Conipur E- Heavy Duty System as manufactured by BASF.

.1 In accordance with manufacturers recommended thickness.

.3 Approved equal in accordance with Section B6.

2.4 COLOUR

.1 Colour: approved by the City from manufacturers standard colour range.

2.5 SEALANT

.1 Shall be compatible with the waterproofing system specified and approved for use by the Contract Administrator.

2.6 PAINT PAVEMENT MARKINGS

.1 To MPI -EXT 2.1B, Alkyd zone/traffic marking.

.2 Paints: in accordance with MPI recommendation for surface conditions.

.3 Paints: maximum VOC limit 100 g/L to SCAQMD Rule 1113.

.4 Colour: to MPI listed, yellow.

.5 Thinner: to MPI listed manufacturer.

2.7 PARKING STOPS

.1 Rubber Parking Stops as manufactured by Eco-Flex Recycled Rubber Solutions.

.2 Colour: black with yellow visible reflective tape.

Part 3 Execution

3.1 REMOVAL OF EXISTING TRAFFIC TOPPING

.1 Drive Aisles:

.1 Remove existing traffic topping to the extent indicated on the drawings.

.2 Remove in a manner so as not to damage the concrete surface below. Removal is to be performed until sound, bonded membrane is encountered. Prepare edges of existing traffic topping yield clean edge free from any debonded sections.

.2 Parking Stalls:

.1 The Contractor shall identify debonded areas of the existing traffic topping system. Agree on the areas with the Contract Administrator before proceeding with removal.

.2 Traffic topping system is to be removed 150mm around concrete repair areas. The cost for this work shall be included in the unit costs for either top surface and through slab repair and will not be measured.

.3 Remove in a manner so as not to damage the concrete surface below. Removal is to be performed until sound, bonded membrane is encountered. Prepare edges of existing traffic topping yield clean edge free from any debonded sections.

3.2 SURFACE CONDITIONS

.1 Concrete surfaces shall be clean and dry with a minimum wood float finish and uniform surface. Repair deteriorated, delaminated and scaled concrete prior to membrane installation.

.2 The waterproofing contractor will be responsible for maintaining the level of cleanliness achieved during the interval between acceptance of the work and the actual application of the traffic topping system.

3.3 SURFACE PREPARATION

.1 Surfaces shall be clean and dry, free from surface water, ice, snow or frost, dust, dirt, grease, oil, soap, wax, paint, curing compound, laitance, and any other foreign materials before waterproofing operations commence.

.2 Areas where the surface is rough or where ridges exist must be prepared to provide the best possible surface for the traffic topping. Depressions and large voids in the concrete must be filled with an approved concrete mix on a fully prepared surface.

.3 Concrete surfaces to receive waterproofing shall be prepared by shotblasting to yield the best possible surface and in full accordance with manufacturer's instructions. Sandblasting and acid etching are not acceptable surface preparation methods. Areas not

accessible to the shotblasting machine such as near column bases, and vertical faces shall be sandblasted to remove loose bond inhibiting materials.

3.4 SURFACE CONDITIONER

.1 Apply primer uniformly over the entire area to receive waterproofing membrane within the time limit as specified by the manufacturer at rate of application and under conditions stated in manufacturer's recommendations.

3.5 TREATMENT OF CRACKS

.1 Cracks, construction joints and perimeters of through slab patches less than 1.5mm shall receive an application of membrane 300mm wide over the centre of the crack.

.2 Cracks, construction joints and perimeters of through slab patches patches greater than 1.5mm shall be ground out to a minimum of 6mm wide by 13mm deep. Prime routed crack as required by manufacturer of sealant and install an approved bond breaker. Apply membrane as indicated 3.6.1.

3.6 APPLICATION

.1 Mix materials in full accordance with manufacturer's instructions.

.2 Apply base coat in accordance with manufacturer's written instructions. Pay particular attention to rate of application and thickness.

.3 Vertical junctures shall receive the first application. Install 100mm on the vertical and 50mm on the horizontal. Termination edges shall be uniform, not ragged in appearance.

.4 Drains shall receive the first application of base coat. Carry base coat on to seepage flanges and 150mm around perimeter. Do not block drainage opening. Allow base coat to cure prior to proceeding with second application.

.5 Install drive aisle base coat and lap 50mm onto the existing fully prepared parking stall traffic topping.

.6 Install localized areas of base coat in parking stall as directed by Contract Administrator. Lap 50mm onto the existing fully prepared parking stall traffic topping.

.7 Install polyurethane based wear course systems to thickness indicated in section 2.2.

.8 Install epoxy wear course to thickness recommended by manufacturer.

.9 If the thickness of the material is determined to be less than that specified, additional material shall be placed after the specified curing time has elapsed on the last application.

.10 Lap wear coarse 50mm past the based coat and onto the existing fully prepared existing wear course.

.11 Broadcast the aggregate to obtain the required slip resistant surface and in accordance with manufacturer’s recommendations.

3.7 PAINTED PAVEMENT MARKINGS

.1 Reinstate painted pavement markings to match original.

.2 Paint applicator: approved pressure with positive shut-off distributor capable of applying paint in single, double and dashed lines and capable of applying marking components uniformly, at rates specified, and to dimensions as indicated.

.3 Pavement markings: Lay out pavement markings.

.4 apply paint only when air temperature is above 10 degrees C

.5 Apply traffic paint evenly at rate of 3 m^2/L.

.6 Do not thin paint unless approved Contract Administrator.

.7 Symbols and letters to dimensions indicated.

.8 Paint lines: of uniform colour and density with sharp edges.

.9 Thoroughly clean distributor tank before refilling with paint of different colour.

.10 Paint markings: within plus or minus 12 mm of dimensions indicated.

3.8 PARKING STOPS

.1 Install rubber parking stops in accordance with drawings and manufactured instructions.

3.9 SAFETY PRECAUTIONS

.1 Keep on hand, suitable safety equipment and first aid materials to provide against injury from the specific materials. Assure that all workers using the materials understand the safety precautions to be taken and abide by them.

.2 Provide adequate measures including venting and plastic enclosures to ensure that no fumes enter the building.

3.10 CLEANING

.1 Employ manufacturer's recommended cleaning solvents to remove sealer inadvertently applied to surfaces other than floor slabs and uniform laps at vertical surfaces.

.2 Remove all unused materials and debris from the site on completion of the work.

3.11 REPAIR OF DEFICIENCIES

.1 Any repair required under the warranty will be carried out in accordance with the recommendations of the Contract Administrators.

END OF SECTION 07 10 70

Part 1 General

1.1 SCOPE OF WORK

.1 This section shall be responsible for all materials, labour, plant tools, and equipment necessary for the installation of joint sealant as specified and as shown on drawings.

1.2 REFERENCES

.1 Except where modified by this section or the Contract Drawings, the specifications (latest edition) listed below shall govern:

.1 CAN/CGSB-19.24 Multi-component, Chemical Curing Sealing Compound.

1.3 QUALIFICATIONS

.1 The contractor performing the work under this section shall:

.1 Have adequate equipment and skilled personnel to expediently complete this work.

.2 Approved systems must be capable of adequately performing on all the specified surfaces and shall be applied in strict accordance with the instructions provided by the manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

.2 Materials shall be kept dry and protected from damage, weather and deterioration at all times. Store materials in warm and dry areas.

1.5 WARRANTY

.1 The sealant shall be guaranteed with a written warranty to be free of defects in workmanship and materials for a period of two (2) years from the date of completion of this contract as certified by the Contract Administrators.

.2 Any repair required under the warranty will be carried out in accordance with the recommendations of the Contract Administrators.

Part 2 Materials

2.1 SEALANT

.1 Sealant shall be Dymeric 240 as manufactured by Tremco, or approved equal in accordance with Section B6.

.1 Colour to match existing.

2.2 BACK-UP MATERIALS

.1 Back-up materials shall be an extruded closed cell foam backer rod. Size shall be oversize by 30 to 50 %.

2.3 PRIMER

.1 Primer shall be as recommended by manufacturer.

.2 Joint cleaner shall be non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

Part 3 Execution

3.1 PREPARATION OF SURFACES

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.2 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.3 BACKUP MATERIAL

.1 Install joint filler to achieve correct joint depth and shape, with approximately 30 % compression.

3.4 APPLICATION

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

.2 Apply sealant in accordance with manufacturer's written instructions.

.3 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.4 Apply sealant in continuous beads.

.5 Apply sealant using gun with proper size nozzle.

.6 Use sufficient pressure to fill voids and joints solid.

.7 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.8 Tool exposed surfaces before skinning begins to give slightly concave shape.

.9 Remove excess compound promptly as work progresses and upon completion.

.10 Cure sealants in accordance with sealant manufacturer's instructions.

3.5 CLEANUP

.1 Clean adjacent surfaces immediately and leave work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

END OF SECTION 07 90 00

Part 1 General

1.1 Scope of Work

.1 This section shall be responsible for all materials, labour, plant tools, and equipment necessary for the interior painting as specified and as indicated on the drawing. This work is to include the following:

.1 Painting of exposed steel elements on four stairwells including the hand rails.

.2 Localized painting of soffit, column and wall repairs.

.3 Painting Make-up Air Fans and Exhaust Air Fans.

1.2 REFERENCES

.1 Maintenance Repainting Manual 2004, Master Painters Institute (MPI), including Identifiers, Evaluation, Systems, Preparation and Approved Product List.

.2 Material Safety Data Sheets (MSDS).

1.3 QUALITY ASSURANCE

.1 Qualifications:

.1 Contractor: to have a minimum of five years proven satisfactory experience. Provide a list of last three comparable jobs including, job name and location, specifying authority, and project manager.

.2 Qualified journeypersons as defined by local jurisdiction to be engaged in repainting work.

.3 Apprentices: may be employed provided they work under the direct supervision of qualified journeyperson in accordance with applicable trade regulations.

.2 Conform to latest MPI requirements for interior repainting work including cleaning, preparation and priming.

.3 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners and solvents) shall be in accordance with the latest edition of the MPI Approved Product List and shall be from a single manufacturer for each system used.

.4 Paint materials such as linseed oil, shellac, reducers and turpentine shall be the highest quality product of an approved manufacturer listed in MPI Maintenance Repainting Manual and shall be compatible with other coating materials as required.

.5 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Contract Administrator.

.6 Standard of Acceptance: when viewed using final lighting source surfaces shall indicate the following:

.1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.

.2 Final coat to exhibit uniformity of colour and sheen across full surface area.

1.4 PERFORMANCE REQUIREMENTS

.1 Environmental Performance Requirements:

.1 Provide paint products meeting MPI "Environmentally Friendly" E1 ratings based on VOC (EPA Method 24) content levels.

.2 Where indoor air quality (odour) is a problem, use only MPI listed materials having a minimum E2 rating.

1.5 SCHEDULING

.1 Submit work schedule for various stages of painting to Contract Administrator for review.

.2 Paint occupied facilities in accordance with approved schedule.

.3 Obtain written authorization from Contract Administrator for changes in work schedule.

.4 Schedule repainting operations to prevent disruption by other trades if applicable and by occupants in and about building.

1.6 SUBMITTALS

.1 Provide product data and manufacturer's installation/application instructions for each paint and coating product to be used in accordance with the requirements of Section 01 33 00 - Submittal Procedures.

.2 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.

.1 Submit full range colour sample chips for review and selection. Indicate where colour availability is restricted.

1.7 DELIVERY, HANDLING AND STORAGE

.1 Deliver, store and handle materials in accordance with as follows:

.1 Deliver and store materials in original containers, sealed, with labels intact.

.2 Labels to indicate:

.1 Manufacturer's name and address.

.2 Type of paint or coating.

.3 Compliance with applicable standard.

.4 Colour number in accordance with established colour schedule.

.3 Remove damaged, opened and rejected materials from site.

.4 Store and handle in accordance with manufacturer's recommendations.

.5 Store materials and equipment in secure, dry, well-ventilated area with temperature range between 7 degrees C to 30 degrees C. Store materials and supplies away from heat generating devices and sensitive products above minimum temperature as recommended by manufacturer.

1.8 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:

.1 Do not perform repainting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application and until paint has cured sufficiently.

.2 Co-ordinate use of existing ventilation system with City and ensure its operation during and after application of paint as required.

.3 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements. Use of gas-fired appliances is not permitted.

.2 Surface and Environmental Conditions:

.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when ventilation conditions are such that airborne particles will not affect quality of finished surface.

.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.

.3 Apply paint when previous coat of paint is dry or adequately cured, unless otherwise pre-approved by specific coating manufacturer.

.4 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of the Contract Administrator such that painted surfaces will have dried and cured sufficiently before occupants are affected.

1.9 MAINTENANCE

.1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Submit one litre can of each type and colour of finish coating. Identify type and colour in relation to established colour schedule and finish system.

Part 2 Products

2.1 MATERIALS

.1 Paint materials listed in latest edition of MPI Approved Product List (APL) are acceptable for use on this project.

.2 Paint materials for repaint systems to be products of single manufacturer.

.3 Interior surfaces:

.1 100% Acrylic latex-semi gloss.

.2 Primer as recommended by paint manufacturer.

.4 Steel Stairs, Handrails and Miscellaneous Metals:

.1 Primer shall be M06 Alkyd Metal Primer as manufactured by Benjamin Moores & Co Limited.

.2 Paint shall be two coats M22 Urethane Alkyd Gloss Enamel as manufactured by Benjamin Moores & Co Limited.

.3 Equal approved in accordance with Section B6.

.4 Supply four one litre cans of finished paint for railings.

.5 Zinc Rich Coating: to CGSB 1-GP-181:

.1 Organic zinc rich primer for galvanized fabrications where torch up is to remain unpainted in finish work shall be Galvafroid by W. R. Meadows of Canada Ltd.

.2 Equal approved in accordance with Section B6.

.6 Paints, coatings, thinners, solvents, cleaners and other fluids used in repainting, as per manufacturer's instructions.

2.2 COLOURS

.1 Selection of colours will be from manufacturer's full range of colours. Colour selection and approved by the City.

.2 Where specific products are available in restricted range of colours, selection will be based on limited range.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 PREPARATION

.1 Perform preparation and operations for interior painting in accordance with MPI Maintenance Repainting Manual requirements except where otherwise specified.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

.3 Clean and prepare interior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:

.1 Remove dust, dirt, and surface debris by vacuuming wiping with dry, clean cloths or compressed air.

.2 Wash surfaces with a biodegradable detergent and clean warm water using stiff bristle brush to remove dirt, oil and surface contaminants.

.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

.4 Allow surfaces to drain completely and to dry thoroughly. Allow sufficient drying time and test surfaces using an electronic moisture meter before commencing work.

.5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.

.6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.

.4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminates from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.

.5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.

.6 Do not apply paint until prepared surfaces have been accepted by Contract Administrator.

.7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from distance up to 1000 mm.

3.3 EXISTING CONDITIONS

.1 Prior to commencing work, examine site conditions and existing interior substrates to be repainted. Report in writing to Contract Administrator regarding damages, defects, or unsatisfactory or unfavourable conditions or surfaces that will adversely affect this work.

.2 Do not commence until such adverse conditions and defects have been corrected and surfaces and conditions are acceptable to Painting Subcontractor and Inspection Agency.

3.4 PROTECTION

.1 Protect existing surfaces and adjacent fixtures and furnishings from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Contract Administrator.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Protect factory finished products and equipment.

.4 Protect general public and building occupants in and about building.

.5 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and surface mounted equipment, fittings and fastenings prior to undertaking re-painting operations. Store items and re-install after painting is completed.

.6 Move and cover furniture and portable equipment as necessary to carry out repainting operations. Replace as painting operations progress.

.7 As repainting operations progress, place "WET PAINT" signs in occupied areas to approval of Contract Administrator.

3.5 APPLICATION

.1 Apply paint by method that is best suited for substrate being repainted using brush, roller, air sprayer and/or airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:

.1 Apply paint in uniform layer using brush and/or roller of types suitable for application.

.2 Work paint into cracks, crevices and corners.

.3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.

.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple unless approved by Contract Administrator.

.5 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray Application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Keep paint ingredients properly mixed in containers during paint application by continuous mechanical agitation frequently as necessary.

.3 Apply paint in uniform layer, with overlapping at edges of spray pattern.

.4 Back roll spray applications and brush out runs and sags immediately.

.5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Contract Administrator.

.5 Apply paint coats in continuous manner and allow surfaces to dry and properly cure between coats for minimum time period as recommended by manufacturer. Minimum dry film thickness of coats not less than that recommended by manufacturer. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Sand and dust between coats to remove visible defects.

.7 Repaint surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.

.8 Repaint top, bottom, and vertical edges of doors to be repainted.

.9 Repaint inside of cupboards and cabinets as specified for outside surfaces.

.10 Repaint closets and alcoves to match existing, unless otherwise scheduled or noted.

3.6 FIELD QUALITY CONTROL

.1 Advise Contract Administrator and Paint Inspection Agency when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.

3.7 CLEANING

.1 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

.2 Keep work area free from unnecessary accumulation of tools, equipment, surplus materials and debris.

.3 Remove combustible rubbish materials and empty paint cans each day and safely dispose of same in accordance with requirements of authorities having jurisdiction.

.4 Clean equipment and dispose of wash water used for water borne materials, solvents used for oil based materials as well as other cleaning and protective materials (e.g. rags, drop cloths, and masking papers), paints, thinners, paint removers/strippers in accordance with safety requirements of authorities having jurisdiction and as noted herein.

.5 Clean painting equipment in leak-proof containers that will permit particulate matter to settle out and be collected. Sediment remaining from cleaning operations to be recycled or disposed of in manner acceptable to authorities having jurisdiction.

.6 Recycle paint and coatings in excess of repainting requirements as specified.

3.8 RESTORATION

.1 Clean and re-install hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on affected exposed surfaces. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Contract Administrator. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Contract Administrator.

END OF SECTION 09 91 23

Part 1 General

1.1 SUBMITTALS

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00.

1.2 BYLAWS AND SPECIFICATIONS

.1 Bylaws shall conform to the requirements of the National Building Code (latest edition) and all amendments and all local Municipal and Provincial building by-laws, authorizations having jurisdiction and ordinances.

.2 Standard specifications except where modified by this section or the contract drawings, the specifications (latest edition) listed below shall govern.

.1 National Building Code of Canada.

.2 National Research Canadian Plumbing Code.

1.3 MEASUREMENT OF PAYMENT

.1 The contract is a unit rate for the supply and installation of each drain replaced on Level P1.

.2 The contract is a unit rate for the removal of the existing and the supply and installation of new drain piping on Level P1.

.3 The contract is a stipulated sum for the supply and installation of drains and drain piping and will not be measured for payment for the Level P2 slab on grade replacement.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

.2 Materials shall be kept dry and protected from damage, weather and deterioration at all times. Store materials in warm and dry areas.

Part 2 Products

2.1 MATERIALS

.1 P1 Level Drains: ZAL-625-HY as manufactured by Zurn with removable sediment bucket or equal approved in accordance with Section B6.

.2 Slab on Grade Drains: ZX-211Y as manufactured by Zurn with removable sediment bucket or equal approved in accordance with Section B6.

.3 Landscape Drains: FD-870-TG as manufactured by Watt Drainage or equal approved in accordance with Section B6.

.1 Provide perforated standpipe and ballast guard riser sections to accommodate top of finish grade.

.4 Plumbing Fittings shall be cast iron that meets CAN3-B125-M85.

.5 Drain pipe shall be cast iron pipe 100mm in diameter. Pipe shall have CSA mark of approval.

.6 Pipe Hangers shall be Fabricate hangers and supports in accordance with ANSI B31.1 and MSS-SP58.

.7 Anchors for cast-in-place concrete shall be galvanized steel wedge to MSS-SP58, Type 18. ULC listed for pipe NPS 3/4 through NPS 8.

.8 Middle attachments shall be carbon steel threaded rod electro-galvanized for mechanical room finish.

.9 Riser clamps shall be steel or cast iron pipe to MSS-SP58, Type 42. ULC listed.

.10 P2 Level Storm Sewer Piping: Refer to section 33 41 00.

Part 3 Execution

3.1 INSTALLATION

.1 Ensure condition of concrete surrounding the drains is sound prior to installing drains. Perform concrete repairs in accordance with Section 03700 as directed by the Contract Administrator.

.2 The drain body must be installed such that the top flanges are flush with the top surface of the concrete deck.

.3 Do not cut or damage any reinforcement to accommodate new drain installation unless authorized by the Contract Administrator.

.4 Drain shall be connection to the existing drainage system in accordance with the latest edition of the local plumbing code.

.5 Contractor to ensure that all debris is removed from the drains and that weep holes are clear.

3.2 PIPE INSTALLATION

.1 Install straight parallel and close to walls and ceilings with uniform slope of 1:50. Use standard fittings for direction change.

.2 Run pipes to closest drain riser.

.3 Plug or cap pipe and fittings to keep debris out during construction.

.4 Contractor to ensure that all debris is removed from the pipes.

3.3 HANGER INSTALLATION

.1 Use approved pipe hangers and vertical clamps.

.2 Offset hanger so that rod is vertical in operating position.

.3 Adjust hangers to equalize load.

3.4 LEVEL P2 STORM SEWER PIPING

.1 Refer to section 33 41 00 storm utility drainage piping.

.2 Drain shall be connection to the existing drainage system in accordance with the latest edition of the local plumbing code and authorities having jurisdiction.

.3 Place concrete around drain as per Section 03 30 00 finish to match the existing slab.

END OF SECTION 15 20 00

Part 1 General

1.1 MEASUREMENT PROCEDURES

.1 The contract is a stipulated sum for the trench excavation as indicated and will not be measured for payment.

.2 The contract is a stipulated sum for the supply, installation and compaction of granular fill as specified and will not be measured for payment.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D422-63 2002, Standard Test Method for Particle-Size Analysis of Soils.

.4 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ;) (600 kN-m/m ;).

.5 ASTM D1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ;) (2,700 kN-m/m.

.6 City of Winnipeg Standard Specifications

1.3 DEFINITIONS

.1 Excavation class: common excavation.

.1 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.2 Topsoil:

.1 Refer to section 32 91 19.

.3 Waste material: excavated material unsuitable for use and remove from site.

.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 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

.6 Unsuitable materials:

.1 Weak, chemically unstable, and compressible materials.

.2 Frost susceptible materials:

.1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422.

.7 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.4 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00.

.2 Samples:

.1 Submit samples in accordance with Section 01 33 00.

1.5 QUALITY ASSURANCE

.1 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Manitoba.

.2 Keep design and supporting data on site.

.3 Engage services of qualified professional Engineer who is registered or licensed in Province of Manitoba, Canada in which Work is to be carried out to design shoring, bracing and underpinning if required.

.4 Do not use soil material until written report of soil test results are approved by Contract Administrator.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and CW 1130.

1.7 EXISTING CONDITIONS

.1 Buried services:

.1 Before commencing work verify and establish location of buried services on and adjacent to site.

.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.

.3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.

.4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.5 Prior to beginning excavation Work, notify applicable Contract Administrator or authorities having jurisdiction establish location and state of use of buried utilities and structures. Contract Administrator or authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.6 Confirm locations of buried utilities by careful test excavations.

.7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.

.8 Where utility lines or structures exist in area of excavation, obtain direction of Contract Administrator before re-routing. Costs for such Work are to be paid by The City.

.9 Record location of maintained, re-routed and abandoned underground lines.

.10 Confirm locations of recent excavations adjacent to area of excavation.

.2 Existing buildings and surface features:

.1 Conduct, with Contract Administrator, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.

.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Contract Administrator.

Part 2 Products

2.1 BASE COURSE MATERIALS

.1 Base course material will be approved by the Contract Administrator.

.2 Base course material will consist of sound, hard, crushed rock, crushed gravel, or crushed concrete.

.3 Crushed rock and crushed gravel will be free from organic or soft material that would disintegrate through decay or weathering.

.4 Base course material will consist of sound durable particles produced by crushing, screening and grading of recovered materials, free from soft material that would decay or disintegrate from weathering.

.5 Crushed concrete base course material is limited to a maximum of two percent of the total dry weight of deleterious material. Deleterious material includes porcelain, vegetation, organic material, wood, glass, plastic, metal, reinforcing steel, building rubber, brick, salvaged asphalt materials, clay, shale, and friable particles.

.6 The base course material will be well graded and conform to the grading requirements of TABLE CW 3110.2 – Base Course Material Grading Requirements.

.7 Base course material when subjected to the abrasion test will have a loss of not more than 35% when tested in accordance with grading B of ASTM C131, Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angelas Machine.

.8 Crushed rock or gravel material passing the 315 sieve will have a liquid limit not greater than 25 and a plasticity index not greater than 6.

Part 3 Execution

3.1 SITE PREPARATION

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

.2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly as indicated on drawings.

3.2 PREPARATION/PROTECTION

.1 Protect existing features in accordance with Section 01 56 00-Temporary Barriers and Enclosures and applicable local regulations.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Contract Administrator approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

3.3 STOCKPILING

.1 Stockpile fill materials in areas designated by Contract Administrator.

.1 Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

.3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.4 EXCAVATION

.1 Advise Contract Administrator at least 7 days in advance of excavation operations for initial cross sections to be taken.

.2 Excavate to lines, grades, elevations and dimensions as directed by Contract Administrator.

.3 Remove concrete, demolished foundations and rubble and other obstructions encountered during excavation in accordance with Section 02 22 20-Demolition of Stuctures

.4 Excavation must not interfere with bearing capacity of adjacent foundations.

.5 Do not disturb soil within branch spread of trees or shrubs that are to remain.

.1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

.6 For trench excavation, unless otherwise authorized by Contract Administrator in writing, do not excavate more than 10 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.

.7 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Contract Administrator.

.8 Restrict vehicle operations directly adjacent to open trenches.

.9 Dispose of surplus and unsuitable excavated material off site.

.10 Do not obstruct flow of surface drainage or natural watercourses.

.11 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.12 Notify Contract Administrator when bottom of excavation is reached.

.13 Obtain Contract Administrator approval of completed excavation.

.14 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Contract Administrator.

.15 Correct unauthorized over-excavation as follows:

.1 Fill under bearing surfaces and footings with fill concrete as directed by Contract Administrator.

.16 Hand trim, make firm and remove loose material and debris from excavations.

.1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

.2 Clean out rock seams and fill with concrete mortar or grout to approval of Contract Administrator.

3.5 BACKFILLING

.1 Do not proceed with backfilling operations until completion of following:

.1 Contract Administrator has inspected and approved installations.

.2 Contract Administrator has inspected and approved of construction below finish grade.

.3 Inspection, testing, approval, and recording location of underground utilities.

.4 Removal of concrete formwork.

.5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.

.2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers not exceeding 75 mm compacted thickness up to grades indicated. Compact each layer to 98% standard Proctor dry density before placing succeeding layer.

.5 Backfilling around installations:

.1 Place bedding and surround material as specified elsewhere.

.2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.

.3 Place layers simultaneously on both sides of installed Work to equalize loading.

.4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:

.1 If approved by Contract Administrator, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Contract Administrator.

3.6 RESTORATION

.1 Upon completion of Work, remove waste materials and debris from site.

.2 Reinstate lawns to elevation which existed before excavation.

.3 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.

.4 Clean and reinstate areas affected by Work as directed by Contract Administrator.

.5 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.

.6 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION 31 23 33

Part 1 General

1.1 MEASUREMENT PROCEDURES

.1 The contract is a stipulated sum for the supply, installation and placement of topsoil as specified and will not be measured for payment.

1.2 REFERENCES

.1 Agriculture and Agri-Food Canada

.1 The Canadian System of Soil Classification, Third Edition, 1998.

1.3 DEFINITIONS

.1 Compost:

.1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.

1.4 SUBMITTALS

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

1.5 WASTE MANAGEMENT AND DISPOSAL

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

.2 Divert unused soil amendments from landfill to official hazardous material collections site approved by Contract Administrator.

.3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

Part 2 Products

2.1 TOPSOIL

.1 Topsoil for seeded areas: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.

.1 Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70% sand, minimum 7% clay, and contain 2 to 10% organic matter by weight.

.2 Contain no toxic elements or growth inhibiting materials.

.3 Finished surface free from:

.1 Debris and stones over 50 mm diameter.

.2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

.4 Consistence: friable when moist.

2.2 SOIL AMENDMENTS

.1 Sand: washed coarse silica sand, medium to course textured.

.2 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.3 SOURCE QUALITY CONTROL

.1 Advise Contract Administrator of sources of topsoil to be utilized with sufficient lead time for testing.

.2 Contractor is responsible for amendments to supply topsoil as specified.

.3 Soil testing by recognized testing facility for PH, P and K, and organic matter.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 PREPARATION OF EXISTING GRADE

.1 Verify that grades are correct.

- .1 If discrepancies occur, notify Contract Administrator and do not commence work until instructed Contract Administrator.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.2 Remove debris, roots, branches, stones in excess of 50mm diameter and other deleterious materials.

- .1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
- .2 Remove debris which protrudes more than 75mm above surface.
- .3 Dispose of removed material off site.

.3 Cultivate entire area which is to receive topsoil to minimum depth of 100mm.

- .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.3 PLACING AND SPREADING OF TOPSOIL

.1 Place topsoil after Contract Administrator has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 150 mm.

.3 For sodded areas keep topsoil 15mm below finished grade.

.4 Spread topsoil as indicated.

.5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.4 SOIL AMENDMENTS

.1 For turf : apply and thoroughly mix soil amendments into top 50mm of existing soil as recommended by fertilizer manufacturer.

3.5 FINISH GRADING

.1 Grade to eliminate rough spots and low areas and ensure positive drainage.

.1 Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Consolidate topsoil to required bulk density using equipment approved by Contract Administrator.

.1 Leave surfaces smooth, uniform and firm against deep footprinting.

3.6 ACCEPTANCE

.1 Contract Administrator will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

.2 If requested testing of topsoil as specified in Section 01 29 83-Payment Procedures for Testing Laboratory Services.

3.7 SURPLUS MATERIAL

.1 Dispose of materials except topsoil not required where directed by Contract Administrator off site.

3.8 CLEANING

.1 Proceed in accordance with Section 01 74 12-Cleaning, Protection, Demolition.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION 32 91 19

Part 1 General

1.1 MEASUREMENT PROCEDURES

.1 The contract is a stipulated sum for the supply, installation and acceptance as indicated and will not be measured for payment.

1.2 SUBMITTALS

.1 Samples.

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

.2 Submit:

.1 Sod for each type specified.

.1 Install approved samples in one square metre mock-ups and maintain in accordance with maintenance requirements during establishment period.

.2 Bio-degradable geotextile fabric.

.3 Obtain approval of samples by Contract Administrator.

1.3 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

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

1.4 SCHEDULING

.1 Schedule sod laying to coincide with preparation of soil surface.

.2 Schedule sod installation when frost is not present in ground.

1.5 WASTE MANAGEMENT AND DISPOSAL

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

.2 Divert unused fertilizer from landfill to official hazardous material collections site.

.3 Do not dispose of unused fertilizer into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

.1 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop.

.1 Turf Grass Nursery Sod types:

.1 Number One Kentucky Bluegrass Sod: Nursery Sod grown solely from seed of cultivars of Kentucky Bluegrass, containing not less than 50% Kentucky Bluegrass cultivars.

.2 Number One Kentucky Bluegrass Sod - Fescue Sod: Nursery Sod grown solely from seed mixture of cultivars of Kentucky Bluegrass and Chewing Fescue or Creeping Red Fescue, containing not less than 40% Kentucky Bluegrass cultivars and 30% Chewing Fescue or Creeping Red Fescue cultivar[s].

.3 Number One Named Cultivars: Nursery Sod grown from certified seed.

.2 Turf Grass Nursery Sod quality:

.1 Not more than 2 broadleaf weeds or 10 other weeds per 40 square metres.

.2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.

.3 Mowing height limit: 35 to 65 mm.

.4 Soil portion of sod: 6 to 15 mm in thickness.

.2 Water:

.1 Supplied by Contractor.

.3 Fertilizer:

.1 To Canada "Fertilizers Act" and "Fertilizers Regulations".

.2 Complete, synthetic, slow release with 65% of nitrogen content in water-insoluble form.

2.2 SOURCE QUALITY CONTROL

.1 Obtain approval from Contract Administrator of sod at source.

.2 When proposed source of sod is approved, use no other source without written authorization from Contract Administrator.

Part 3 Execution

3.1 PREPARATION

.1 Verify that grades are correct and prepared in accordance with Section 32 919-Topsoil Placement and Grading. If discrepancies occur, notify Contract Administrator and do not commence work until instructed by Contract Administrator.

.2 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.

.3 Fine grade surface free of humps and hollows to smooth, even grade, as indicated on drawings to tolerance of plus or minus 8mm, for Turf Grass Nursery Sod surface to drain naturally.

.4 Remove and dispose of weeds; debris; stones 50mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site.

3.2 SOD PLACEMENT

.1 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.

.2 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.

.3 Roll sod as directed by Contract Administrator. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

3.3 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following operations from time of installation until acceptance.

.2 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100mm.

.3 Cut grass to 50mm when or prior to it reaching height of 75mm. Remove clippings which will smother grassed areas.

.4 Maintain sodded areas weed free.

.5 Fertilize areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

3.4 ACCEPTANCE

.1 Turf Grass Nursery Sod areas will be accepted by Contract Administrator provided that:

- .1 Sodded areas are properly established.
- .2 Sod is free of bare and dead spots.
- .3 No surface soil is visible from height of 1500 mm when grass has been cut to height of 50mm.
- .4 Sodded areas have been cut minimum 2 times prior to acceptance.

.2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

3.5 MAINTENANCE DURING WARRANTY PERIOD

.1 Perform following operations from time of acceptance until end of warranty period:

- .1 Water sodded Turf Grass Nursery Sod areas at weekly intervals to obtain optimum soil moisture conditions to depth of 100mm.

.2 Repair and resod dead or bare spots to satisfaction of Contract Administrator.

.3 Cut grass and remove clippings to height as follows:

- .1 Turf Grass Nursery Sod:
  - .1 50mm during normal growing conditions.
- .2 Cut grass at 2 week intervals, but at intervals so that approximately one third of growth is removed in single cut.

.3 Eliminate weeds by mechanical means to extent acceptable to Contract Administrator.

3.6 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION 32 92 23

Part 1 General

1.1 MEASUREMENT PROCEDURES

.1 Supply and installation of the Level P2 Storm Drainage Piping will not be measured but will be paid for as a fixed price item.

1.2 REFERENCES

.1 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3(600 kN-m/m^3)).

.2 ASTM D2680-01, Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping.

.3 ASTM D3034-00, Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

.4 CAN/CSA-B181.2, PVC Drain, Waste, and Vent Pipe and Pipe Fittings

.5 CAN/CSA-B182.1, PVC Sewer Pipe and Fittings

1.3 SUBMITTALS

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

.2 Shop drawings to indicate proposed method for installing carrier pipe for undercrossings.

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

.4 Certification to be marked on pipe.

.5 Submit to Contract Administrator 1 copy of manufacturer's installation instructions.

1.4 WASTE MANAGEMENT AND DISPOSAL

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

1.5 SCHEDULING

.1 Schedule Work to minimize interruptions to existing services and to maintain existing flow during construction.

.2 Submit schedule of expected interruptions for approval and adhere to approved schedule.

Part 2 Products

2.1 PLASTIC PIPE

.1 Type PSM Poly Vinyl Chloride (PVC): to CSA-B182.2.

.1 Standard Dimensional Ratio (SDR): 28.

.2 Locked-in gasket and integral bell system.

.3 Nominal lengths: 6 m.

2.2 BACKFILL MATERIAL

.1 Refer to Section 31 23 33- Excavating, Trenching and Backfilling

Part 3 Execution

3.1 PREPARATION

.1 Clean pipes and fittings of debris and water before installation, and remove defective materials from site to approval of Contract Administrator.

3.2 TRENCHING

.1 Do trenching Work in accordance with Section 31 23 33 - Excavating, Trenching and Backfilling.

.2 Do not allow contents of sewer or sewer connection to flow into trench.

.3 Trench alignment and depth to approval of Contract Administrator prior to placing bedding material and pipe.

3.3 GRANULAR BEDDING

.1 Refer to Section 31 23 33- Excavating, Trenching and Backfilling

3.4 INSTALLATION

.1 Lay and join pipes to: ASTM C12.

.2 Lay and join pipe in accordance with manufacturer's recommendations and to approval of Contract Administrator.

.3 Handle pipe using methods approved by Contract Administrator.

.1 Do not use chains or cables passed through rigid pipe bore so that weight of pipe bears upon pipe ends.

.4 Lay pipes on prepared bed, true to line and grade with pipe inverts smooth and free of sags or high points.

.1 Ensure barrel of each pipe is in contact with shaped bed throughout its full length.

.5 Begin laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.

.6 Do not exceed maximum joint deflection recommended by pipe manufacturer.

.7 Do not allow water to flow through pipes during construction except as may be permitted by Contract Administrator.

.8 Whenever Work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.

.9 Install plastic pipe and fittings in accordance with CSA B182.11.

.10 When any stoppage of Work occurs, restrain pipes as directed by Contract Administrator, to prevent "creep" during down time.

.11 Plug lifting holes with Contract Administrator approved prefabricated plugs, set in shrinkage compensating grout.

.12 Cut pipes as required for special inserts, fittings or closure pieces, as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.

.13 Make watertight connections to manholes and catch basins.

.1 Use shrinkage compensating grout when suitable gaskets are not available.

.14 Use prefabricated saddles or approved field connections for connecting pipes to existing sewer pipes.

.1 Joint to be structurally sound and watertight.

.15 Temporarily plug open upstream ends of pipes with removable watertight concrete, steel or plastic bulkheads.

3.5 PIPE SURROUND

.1 Refer to Section 31 23 3333 - Excavating, Trenching and Backfilling

3.6 BACKFILL

.1 Refer to Section 31 23 3333 - Excavating, Trenching and Backfilling

3.7 FIELD TESTING

.1 Repair or replace pipe, pipe joint or bedding found defective.

.2 When directed by Contract Administrator, draw tapered wooden plug with diameter of 50 mm less than nominal pipe diameter through sewer to ensure that pipe is free of obstruction.

.3 Remove foreign material from sewers and related appurtenances by flushing with water.

.4 Television and photographic inspections:

.1 Carry out inspection of installed sewers by television camera, photographic camera or by other related means.

.2 Provide means of access to permit Contract Administrator to do inspections.

END OF SECTION 03 30 00