

EARTH WORK

1. GENERAL

1.1 Scope of Work

- .1 This section outlines the requirements for earthworks related to pavement and sidewalk construction. This includes excavation of organic and saturated materials, placement of suitable site and imported fill in pavement sub-grade and boulevard areas, backfilling of existing ditch areas within the limits of the construction area and excavation required for placement of base and sub-base materials for new pavement structures. Also included is the removal of existing land drainage pipe and culverts.

1.2 Measurement and Payment

- .1 Excavation of existing material from ditch or pavement areas will be measured and paid for in accordance with City of Winnipeg Standard Construction Specification CW 3170 for Excavation.
- .2 Sub-grade Compaction will be measured and paid for in accordance with City of Winnipeg Standard Construction Specification CW 3110.
- .3 Placement and compaction of fill material in general areas and ditches will be measured and paid for in accordance with City of Winnipeg Standard Construction Specification CW 3170 for Suitable Site Fill Material and Imported Fill Material.
- .4 Removal of existing culverts will be measured on a lineal metre basis and will be paid for at the Contract Unit Price per metre for "Removal of Culverts". The total length of pipe paid for will be the total number of lineal metres of pipe removed in accordance with this Specification as accepted and measured by the Contract Administrator.

2. PRODUCTS

2.1 Fill Material

- .1 Suitable Site Material to be as per City of Winnipeg Standard Construction Specification CW 3170.
- .2 Imported Fill Material to be as per City of Winnipeg Standard Construction Specification CW 3170.
- .3 Further to Specification CW 3170 all borrow material shall be obtained from a stockpile located just west of the existing Chemical Feed Facility. The Contractor shall utilize this stockpile as illustrated on Drawing CM-G001.
- .4 This stockpile will be measured at the beginning of construction as well as at the end of construction.
- .5 The unit price for Borrow Excavation will be inclusive of haul.

EARTH WORK

3. EXECUTION

3.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.

3.2 General and Ditch Excavation

- .1 Remove all standing water from existing ditch bottoms or general areas requiring excavation.
- .2 All vegetation and topsoil shall be removed from ditches or general areas. The sideslopes of existing ditches are to be cut to approximately 4H:1V or flatter to provide a transition zone between the in-situ and fill material.
- .3 Prior to placement of fill material the sub-grade shall be benched in order to key in the fill material to the *in-situ* material. The bench dimensions shall be as determined in the field by the Contract Administrator. Benching shall be considered incidental to excavation and no further payment shall be made.
- .4 The base of all areas to be filled shall be proof rolled in the presence of the Contract Administrator, prior to backfilling, to confirm that the sub-grade is undisturbed, competent, has been adequately cleaned of ponded water, disturbed, loosened, saturated, softened, organic and other deleterious material. Remedial work shall be carried out as directed by the Contract Administrator. Proof rolling shall be considered incidental to the placement of fill material in ditches and general fill areas and no additional payment shall be made.
- .5 Excavation for placement of pavement base materials, outside ditch areas, to be completed in accordance with City of Winnipeg Standard Construction Specification CW 3170.
- .6 Removal of the gravel within the contractor field office area, located between the east and middle bridge, shall be considered incidental to the excavation work associated with the excavation for new roadways or ditches and no further measurement or payment will be made. All gravel removed from this area shall be hauled and spread on the road leading to the Red River Floodway, which is located adjacent to the borrow area.

3.3 Placement of Fill Material

- .1 Fill material in sub-grade, boulevard and ditch areas shall be placed in 300 mm maximum depth loose lifts at or near to optimum water content and compacted to a minimum of 95% of its Standard Proctor density to the elevation of bottom of the sub-base material for pavement areas or topsoil for boulevard areas.
- .2 Suitable fill material is located just west of the site. This fill material shall be obtained starting from the west side and working in an easterly direction. After all material that is required has been removed, the area shall be trimmed and harrowed in preparation for seed application.

EARTH WORK

3.4 Sub-grade Compaction

- .1 The Contractor shall compact the sub-grade in areas of new pavement construction where excavation is required to place sub-base and base course material. Sub-grade Compaction will be completed in accordance with CW 3110.
- .2 Removal of Existing Culvert.
- .3 Remove existing culvert where indicated on the drawings.
- .4 Removal of the culvert, located at the northeast corner of the Site, shall be considered incidental to the excavation work associated with the excavation for new roadways or ditches and no further measurement or payment will be made.

END OF SECTION

LANDSCAPING STONE

1. GENERAL

1.1 Scope of Work

- .1 This Section outlines the requirements for the supply and installation of landscaping stone between the parking lot and the south side of the WTP Building (see Drawings).

1.2 Measurement and Payment

- .1 Landscaping stone will be measured and paid for on a lump sum basis. The price for "Landscaping Stone" will be payment in full for supplying and installing the fabric and stone in accordance with this Specification.

2. PRODUCTS

2.1 Manhole

- .1 Landscaping stone shall be riverrock that is clean and free from organic matter, in a mixture of sizes (diameters are nominal):
 - .1 50% - 100 mm diameter round stone
 - .2 35% - 150 mm diameter round stone
 - .3 15% - 200 mm diameter round stone
- .2 Landscape fabric shall be light, non-absorptive, non-woven material such as SuperPro20 or approved equal supply by Martek Corporation, intended for use as a weed barrier, allowing complete flow through of water.
- .3 Material samples shall be approved by the Contract Administrator prior to installation.

3. EXECUTION

3.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.
- .2 Prevent damage to buildings, landscaping, curbs, sidewalks, trees, fences, roads and adjacent property.

3.2 Installation of Landscaping Stone

- .1 Smooth out subgrade to extent practical for affected areas without existing geotextile or landscape fabric.

LANDSCAPING STONE

- .2 Place landscape fabric loosely (to allow for placement of cobble and rocks) over finished subgrade, after any debris is removed, to cover entire area as indicated, with 200 mm overlaps at sheet edges or onto existing fabric. Ensure settled fabric will extend to edges of area to receive stones, leaving a minimum of 200 mm beyond edges. Fold over and bury this 200 mm margin vertically in the soil at the edge. Ensure the subgrade below the stone will sheet drain out.
- .3 Cover fabric with stones, placing larger, rocks and cobbles first, then following with stones and finer material to ensure coverage of the fabric with at least 100 mm of stones, making sure that no fabric is visible.
- .4 The stone should be laid in layers min 200 mm deep so that there are no voids and to provide complete coverage (no dirt showing).
- .5 Following completion of installation, the Contractor shall remove all surplus material and leave adjacent areas clean and free of debris.

END OF SECTION

SUB-DRAINAGE

1. GENERAL

1.1 Scope of Work

- .1 This section outlines the requirements for the installation of sub-drain pipe at the perimeter of proposed roadways or in proposed parking areas.

1.2 Measurement and Payment

- .1 Installation of sub-drain pipe will be paid for in accordance with City of Winnipeg Standard Construction Specification CW 3120.

2. PRODUCTS

2.1 Sub-drain Fabric

- .1 Sub-drain Fabric to be as per City of Winnipeg Standard Construction Specification CW 3120.

2.2 Sub-drain Material

- .1 Sub-drain Material to be as per City of Winnipeg Standard Construction Specification CW 3120.

2.3 Sub-drain Pipe

- .1 Sub-drain Pipe to be as per City of Winnipeg Standard Construction Specification CW 3120.

3. EXECUTION

3.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.

3.2 Installation of Sub-drains

- .1 Complete installation of sub-drains in accordance with City of Winnipeg Standard Construction Specification CW 3120.

END OF SECTION

MANHOLES AND CATCHBASINS

1. GENERAL

1.1 Scope of Work

- .1 This Section outlines the requirements for the Supply and Installation of the containment manhole, located on the east side of the WTP.

1.2 Measurement and Payment

- .1 Supply and Installation of manholes will be measured and paid for in accordance with City of Winnipeg Standard Construction Specification CW 2130.
- .2 Supply and Installation of lifter rings will be paid for in accordance with City of Winnipeg Standard Construction Specification CW 3210. Payment item shall be Lifter Rings: ii.) 51 mm.
- .3 Safe Drain inserts will be measured and paid for on a unit basis. The price for "Safe Drain Inserts" will be payment in full for supplying and installing these units in accordance with this Specification.

2. PRODUCTS

2.1 Manhole

- .1 Manhole to be supplied as per City of Winnipeg Standard Construction Specification CW 2130.
- .2 The storm drain insert shall be a Safe Drain as manufactured by Safe Drain, Inc., custom constructed to closely fit the dimensions and shape of the manhole. The insert should be flanged on the top in order for the flange to rest upon the grate support ring. There shall be a butterfly type shut off valve mounted on a shallow flanged opening in the bottom of the insert. The butterfly valve shall be equipped with an offset wheel type actuator for ease of operation without removing the catch basin grate. Depth of the insert may not be less than 216 mm. Both valve and insert body shall be constructed of 12 or 14 gauge 304 stainless steel depending upon the size of the catch basin.
- .3 Two 51 mm lifter rings (City of Winnipeg Standard Drawing AP-007) should be set into each frame.
- .4 City of Winnipeg frame (Standard Drawing AP-004) and cover with City of Winnipeg cover (Standard Drawing AP-006) is to be utilized.

MANHOLES AND CATCHBASINS

3. EXECUTION

3.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.

3.2 Installation of Manhole

- .1 Complete placement of manhole in accordance with City of Winnipeg Standard Construction Specification CW 2130.
- .2 Set manhole 100 mm low in order to accommodate a 100 mm lifter ring. With the lifter ring installed, a standard City of Winnipeg cover can be utilized with the Safe Drain system.

END OF SECTION

ADJUSTMENT OF EXISTING MANHOLE / CATCHBASIN

1. GENERAL

1.1 Scope of Work

- .1 This Section outlines the requirements for the adjustment of existing manhole/catchbasin frames and valve boxes within the construction area.

1.2 Measurement and Payment

- .1 Adjustment of Manhole/Catchbasin Frames will be measured and paid for in accordance with City of Winnipeg Standard Construction Specification CW 3210. Payment items shall be Adjustment of Manhole/Catchbasin Frames, Cast-in-Place, and Precast.
- .2 Adjustment of Valve Boxes will be measured and paid for in accordance with City of Winnipeg Standard Construction Specification CW 3210. Payment items shall be Adjustment of Valve Boxes.

2. EXECUTION

2.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.

2.2 Adjustment of Existing Manhole/Catchbasin Frames

- .1 Existing catchbasins are set low to accommodate the two year construction staging. During year one of construction the Contractor shall grade and compact the base course material around each catchbasin so that each catchbasin functions properly. During year two of construction, prior to asphalt concrete application, the Contractor shall adjust the catchbasin by removing the frame and cover and flat top reducer. Then a precast concrete riser section shall be added. All work shall be in accordance with City of Winnipeg Standard Construction Specification CW 3210.
- .2 Existing manholes are set low to accommodate the two year construction staging. During year one of construction the Contractor shall grade and compact the base course material around each manhole so that the top of the frame does not project above the interim surface. During year two of construction, prior to asphalt concrete application, the Contractor shall adjust the catchbasin by removing the cover and adding a steel lifter ring. All work shall be in accordance with City of Winnipeg Standard Construction Specification CW 3210.

2.3 Adjustment of Existing Valve Boxes

- .1 Adjustment of existing valve boxes will be completed in accordance with City of Winnipeg Standard Construction Specification CW 3210.

END OF SECTION

PIPE CULVERTS

1. GENERAL

1.1 Scope of Work

- .1 This Section outlines the requirements for the Supply and Installation of culverts within the construction area.
- .2 This Section outlines the requirements for the abandonment of Culverts within the construction area.

1.2 Measurement and Payment

- .1 Supply and Installation of Culverts will be measured and paid for in accordance with City of Winnipeg Standard Construction Specification CW 3610. Payment items shall be CSP Culverts i) Supply and ii) Install.
- .2 Abandonment of Culverts will be measured and paid for on a lump sum basis. The price for "Filling Existing Culverts" will be payment in full for supplying and placing cementitious fill and for all work necessary to fill the culvert in accordance with City of Winnipeg Standard Construction Specification CW 2160.

2. EXECUTION

2.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.

2.2 CMP Culvert Installation

- .1 CMP Culverts will be completed in accordance with City of Winnipeg Standard Construction Specification CW 3610.
- .2 All culverts shall be 2.0 mm gauge and 65 mm x 13 mm corrugation profile.

2.3 CMP Culvert Abandonment

- .1 Remove all water from culvert.
- .2 According to CW 2160 2.16 Table CW 2160.1 D) a flowable cement-stabilized fill shall be injected into the siphon, filling it to each end. Each end shall then be capped until the fill cures. The mixture should be capable of filling all voids in the culvert.

END OF SECTION

BASE MATERIAL

1. GENERAL

1.1 Scope of Work

- .1 This Section outlines the requirements for the placement and compaction of base course material for the construction of the new roadways and parking areas.

1.2 Measurement and Payment

- .1 Crushed Limestone Base Course Material will be measured on a weight basis and will be paid for at the Contract Unit Price per tonne for "Crushed Limestone Base Course Material". The total number of tonnes of Base Course Material paid for will be the total number of tonnes of Base Course Material supplied and placed in accordance with this specification as accepted and measured by the Contract Administrator.

2. PRODUCTS

2.1 Base Course Material

- .1 Base Course Material to be as per City of Winnipeg Standard Construction Specification CW 3110 for Crushed Limestone.

3. EXECUTION

3.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.

3.2 Placement and Compaction of Base Material

- .1 Complete placement and compaction of base material in accordance with City of Winnipeg Standard Construction Specification CW 3110.

END OF SECTION

SURFACE PREPARATION AND GRAVEL SURFACING

1. GENERAL

1.1 Scope of Work

.1 Water Treatment Plant Roads

- .1 The Contractor shall leave the base course material layer 25 mm below finished grade at the completion of Year 1 of the Contract. Before application of the asphalt concrete during Year 2 of the Contract, the Contractor shall remove deleterious material from the surface, scarify and re-compact to obtain 100% Standard Proctor Density before adding a uniform layer of base course material. To achieve a more uniform final layer of base course material, the Contractor shall move base course material from unsettled to settled areas (high to low areas).

.2 Main Access Road

- .1 The Contractor may be required to rehabilitate the Main Access Road, with limits from the end of the existing approach pavement at PR 207 to approximately 700 m west. If funding is available, one of the two options identified on Form B: Tender Prices will be implemented. If Option 1 is selected by the Contract Administrator, the roadway shall be rehabilitated by removing deleterious material, scarifying the existing granular surface, reshaping, and adding 150 mm of base course material. If Option 2 is selected by the Contract Administrator, the roadway shall be prepared for asphalt concrete by removing deleterious material, scarifying the existing granular surface, reshaping, and then compacting to 100% Standard Proctor Density. Finally, a 50 mm layer of base course material shall be spread, trimmed, and compacted to 100% Standard Proctor Density.

As the rehabilitation of the Main Access Road is dependent upon funding, the design has not yet been completed. The Main Access Road will be designed in the field and instructions issued to the Contractor at the time of construction.

1.2 Measurement and Payment

.1 Water Treatment Plant Roads

- .1 The work to remove deleterious materials, scarify the existing granular surface, move base from unsettled to settled areas, re-compacting to 100% Standard Proctor Density, and adding a final, uniform and compacted layer of base course material will be paid for in accordance with City of Winnipeg Standard Construction Specification CW 3110 for Crushed Limestone. All excavation, backfilling, and re-compacting roadway areas that have failed between Year 1 and Year 2 shall be considered incidental to the Work. All excavation, backfilling, and re-compacting roadway areas that have failed between Year 1 and Year 2 shall be considered incidental to the Work

.2 Main Access Road

- .1 The work to remove deleterious materials, scarify the existing granular surface, re-compacting to 100% Standard Proctor Density, and adding a final, uniform and compacted

SURFACE PREPARATION AND GRAVEL SURFACING

layer of base course material will be paid for in accordance with City of Winnipeg Standard Construction Specification CW 3150 for Crushed Limestone.. All areas of failure will be paid for in accordance with City of Winnipeg Standard Construction Specification CW 3110.

2. PRODUCTS

2.1 Base Course Material

- .1 Base Course Material to be as per City of Winnipeg Standard Construction Specification CW 3110 for Crushed Limestone.

3. EXECUTION

3.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.
- .2 All deleterious material shall be removed from the surface prior to surface scarification.
- .3 Any roadway failures shall be identified and fixed prior to surface preparation.

3.2 Scarification, Re-shaping, and Placement of Base Course Material

.1 General

- .1 Contrary to CW 3150 3.2.1 – Gravel Surfacing, the Contractor shall place and compact new surfacing material to a minimum of 100% Standard Proctor Density in accordance with Section 3.5 of CW 3110.

.2 Main Access Road Option 1: Gravel Rehabilitation

- .1 The entire roadway shall be scarified as specified in CW 3150.
- .2 Re-grade to proper grade and cross-sections shown on the Drawings or as directed by the Contract Administrator.
- .3 Place, Grade, and Compact 150 mm of new surfacing material to the finished elevations as specified by the Contract Administrator.

.3 Main Access Road Option 2: Placement of Asphalt Concrete

- .1 The entire roadway shall be scarified as specified in CW 3150.
- .2 Re-grade to proper grade and cross-sections shown on the Drawings or as directed by the Contract Administrator.

SURFACE PREPARATION AND GRAVEL SURFACING

- .3 Place 50 mm of new surfacing material in preparation for the asphaltic concrete as specified by the Contract Administrator.
- .4 Water Treatment Plant Roads
 - .1 The entire roadway shall be scarified as specified in CW 3150.
 - .2 Move unsettled material to areas of settlement.
 - .3 Re-grade to proper grade and cross-section shown on the Drawings or as directed by the Contract Administrator.
 - .4 Contrary to CW 3150 3.1.4 the surface shall be re-compacted to a minimum of 100% Standard Proctor Density.
 - .5 Place new surfacing material as required in accordance to CW 3110 in preparation for the asphaltic concrete as specified by the Contract Administrator.

END OF SECTION

SUB-BASE MATERIAL

1. GENERAL

1.1 Scope of Work

- .1 This Section outlines the requirements for the placement and compaction of sub-base course material for the construction of the new roadways and parking areas.

1.2 Measurement and Payment

- .1 Placement and compaction of sub-base course material will be measured and paid for in accordance with City of Winnipeg Standard Construction Specification CW 3110 for Crushed Sub-Base Material, 50 mm Limestone.

2. PRODUCTS

2.1 Sub-Base Material

- .1 Sub-base Material to be as per City of Winnipeg Standard Construction Specification CW 3110 for Crushed Sub-base Material, 50 mm Limestone.

3. EXECUTION

3.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.
- .2 Placement and Compaction of Base Material
- .3 Complete placement and compaction of sub-base material in accordance with City of Winnipeg Standard Construction Specification CW 3110.

END OF SECTION

ASPHALTIC CONCRETE PAVING

1. GENERAL

1.1 Scope of Work

- .1 This Section outlines the requirements for the placement of the asphaltic concrete for pavements and overlays for the construction of new roadways and new parking areas.

1.2 Measurement and Payment

- .1 Construction of asphaltic concrete pavement and overlays will be paid for in accordance with City of Winnipeg Standard Construction Specification CW 3410.

2. PRODUCTS

2.1 Asphaltic Concrete Pavement

- .1 Asphaltic Concrete to be supplied as per City of Winnipeg Standard Construction Specification CW 3410, for Type 1A Asphalt.

3. EXECUTION

3.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.

3.2 Placement of Asphaltic Concrete Pavement

- .1 Complete placement of asphaltic concrete pavement and overlays in accordance with City of Winnipeg Standard Construction Specification CW 3410.
- .2 The Contractor will be required to place two lifts of 50 mm asphalt concrete on the Westerly Aqueduct Bridge, however only one final lift of 50 mm is required on the Middle and Easterly Aqueduct Bridges as indicated on the Drawings.
- .3 When paving over the Westerly Aqueduct Bridge the application of tack coat onto the protection board is required. The asphalt paving machine shall proceed in the same direction as the protection board. The Contractor shall saw-cut the asphalt, supply and place an approved joint sealant as shown on the Drawings.
- .4 The finished surface of each lift of bituminous pavement shall be smooth, free from segregation and roller marks, uniform and true to line and cross-section as shown on the Plans or as specified by the Contract Administrator.

ASPHALTIC CONCRETE PAVING

- .5 Finished top lift pavement, on which the surface is defective in texture, uniformity or riding quality, shall be corrected at the expense of the Contractor if so directed by the Contract Administrator. Correction shall be as outlined in Table 1 below.

Table 1: Bituminous Pavement

Defect Criteria	Rejection level	Type of Repair
Bituminous Mix Properties	Outside the following Ranges VMA 14 – 16% In place air voids 3.5 – 5%	Remove and replace
Segregation Minor to severe	As per definition >10% 100 m of one lane pavement	Remove and replace - Final lift only
Surface Defects		
	Areas containing excess or insufficient asphalt	Remove and replace
	Improper matching of longitudinal and transverse joints on final lift of asphalt concrete	Remove and replace joint
	Roller marks on final lift of asphalt concrete	Remove and replace
	Cracking or tearing	Remove and replace
	Contamination by diesel, hydraulic fluids, detergent or other harmful product	Remove and replace
	Foreign objects or materials that are detrimental to the asphalt concrete; and Clay balls or oversized materials	Remove and replace
Density	< 95% of Marshall density	Remove and replace

END OF SECTION

PORTLAND CEMENT CONCRETE PAVING

1. GENERAL

1.1 Scope of Work

- .1 This Section outlines the requirements for the construction of the new Portland cement concrete pavement for new roadways.

1.2 Measurement and Payment

- .1 Construction of Portland concrete pavement will be paid for in accordance with City of Winnipeg Standard Construction Specification CW 3310 for the applicable thickness and type of pavement constructed
- .2 Installation of drilled dowels and tie bars will be paid for in accordance with City of Winnipeg Standard Construction Specification CW 3230 for the applicable diameter and type of dowel or tie bar installed.

2. PRODUCTS

2.1 Portland Cement Concrete

- .1 Portland Cement Concrete to be as per City of Winnipeg Standard Construction Specification CW 3310.

2.2 Reinforcing Steel

- .1 Reinforcing steel to be as per City of Winnipeg Standard Construction Specification CW 3310.

2.3 Drilled Dowels and Tie Bars

- .1 Drilled Dowels and Tie Bars to be as per City of Winnipeg Standard Construction Specification CW 3230.

2.4 Dowell Assemblies

- .1 Dowell Assemblies to be as per City of Winnipeg Standard Construction Specification CW 3310.

3. EXECUTION

3.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.

PORTLAND CEMENT CONCRETE PAVING

3.2 Portland Cement Concrete Pavement

- .1 Complete placement of Portland cement concrete pavement in accordance with City of Winnipeg Standard Construction Specification CW 3310.

3.3 Joint Cleaning

- .1 Following the completion of step cutting and prior to sealing the vertical faces of all transverse expansion joints and longitudinal construction joints shall be thoroughly cleaned by sand blasting or by means of an abrasive rotary wheel or brush.

3.4 Joint Sealing

- .1 Complete sealing of all joints in Portland cement concrete pavement in accordance with City of Winnipeg Standard Construction Specification CW 3310.

END OF SECTION

PAINTED TRAFFIC LINES AND MARKINGS

1. GENERAL

1.1 Scope of Work

- .1 This Section outlines the requirements for the painting of permanent and temporary traffic lines and markings on roadways and in parking lots.

1.2 Measurement and Payment

- .1 Painted Traffic and Parking Lines will be measured on a linear measure basis and will be paid for at the Contract Unit Price per metre for "Painted Traffic and Parking Lines". The total length of line painting paid for will be the total number of metres of line painted in accordance with this Specification as accepted and measured by the Contract Administrator.
- .2 Painted Handicap Parking Stall Markings will be measured on a unit basis and will be paid for at the Contract Unit Price for "Painted Handicap Parking Stall Markings". The total number of parking stall markings paid for will be the total number of parking stall markings painted in accordance with this specification as accepted and measured by the Contract Administrator.

2. PRODUCTS

2.1 Paint

- .1 All materials supplied under this Specification shall be of a type approved by the Contract Administrator, and shall be subject to inspection and testing by the Contract Administrator.
- .2 The paint supplied for parking stall lines and markings shall be in accordance with CAN/CGSB-1.220-2001. The paint colour shall be an approximate match to the following U.S. federal Standard 595B colours when tested in accordance with CGSB standard 1-GP-71:
 - .1 White – 37925
 - .2 Yellow – 33538
 - .3 Blue – 35250

2.2 Glass Beads

- .1 All materials supplied under this Specification shall be of a type approved by the Contract Administrator, and shall be subject to inspection and testing by the Contract Administrator.
- .2 Reflectorizing Glass Beads shall be supplied in accordance with OPSS 1750 Material Specification for Traffic Paint Reflectorizing Glass Beads.

PAINTED TRAFFIC LINES AND MARKINGS

3. EXECUTION

3.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.

3.2 Application

- .1 Paint and glass beads shall be applied in accordance with CAN/CGSB-1.220-2001.
- .2 All paint markings shall be painted within plus or minus 10 mm.
- .3 The colour of the applicable paint marking shall be as indicated on the drawings.
- .4 Handicap parking stall background marking shall be coloured blue. The contrasting interior handicap symbol shall be coloured yellow.

END OF SECTION

CONCRETE WALKS, CURBS, AND GUTTERS

1. GENERAL

1.1 Scope of Work

- .1 This Section outlines the requirements for the construction of the new Portland cement concrete sidewalks, curb and gutter for the new roadway and parking areas.

1.2 Measurement and Payment

- .1 Construction of concrete curb, curb and gutter and gutter will be paid for in accordance with City of Winnipeg Standard Construction Specification CW 3310.
- .2 Construction of concrete sidewalk will be measured on an area basis and will be paid for in accordance with City of Winnipeg Standard Construction Specification CW 3310. The total area of concrete sidewalk paid for will be the total number of square metres of sidewalk constructed in accordance with this specification as accepted and measured by the Contract Administrator.

2. PRODUCTS

2.1 Portland Cement Concrete

- .1 Portland Cement Concrete to be as per City of Winnipeg Standard Construction Specification CW 3310.

2.2 Reinforcing Steel

- .1 Reinforcing steel to be as per City of Winnipeg Standard Construction Specification CW 3310.

2.3 Drilled Tie Bars

- .1 Drilled Tie Bars to be as per City of Winnipeg Standard Construction Specification CW 3230.

3. EXECUTION

3.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.

CONCRETE WALKS, CURBS, AND GUTTERS

3.2 Construction of Concrete Sidewalk, Curb and Curb and Gutter

- .1 Complete construction of concrete curb and curb and gutter in accordance with City of Winnipeg Standard Construction Specification CW 3310.
- .2 Where full width concrete sidewalk is to be constructed up to the back of curb the Contractor shall install 200 mm long 10M deformed bars into the back of curb at 600 mm on centre. The Contractor shall ensure that adequate cover is maintained between the end of the bars and the face of curb to prevent spalling of the curb face at the bars. Installation of the 10 M deformed bars shall be considered incidental to the installation of the curb and no further measurement or payment shall be made.
- .3 Complete construction of concrete sidewalk in accordance with City of Winnipeg Standard Construction Specification CW 3325
- .4 At the locations indicated on the Drawings the Contractor shall construct the gutter portion only of proposed curb and gutter. This shall be accomplished by either producing a mould which meets the standard details for concrete curb and gutter, minus the curb section, or by constructing curb and gutter and striking off the curb section

END OF SECTION

CHAIN LINK FENCES AND GATES

1. GENERAL

1.1 Scope of Work

- .1 The following Specification shall be used in the removal of any fence at the Winnipeg WTP.
- .2 Removal of existing chain link fence generally pertains to that fencing erected for construction purposed to protect the GWWD Aqueduct and DBPS compound.

1.2 Measurement and Payment

- .1 Removal of Chain Link Fence (including gates) will be measured on a linear measure basis and will be paid for at the Contract Unit Price per metre for "Removal of Chain Link Fence". The total length of chain link fence removal paid for will be the total number of metres of fence removed in accordance with this specification as accepted and measured by the Contract Administrator.

2. PRODUCTS

2.1 Materials

- .1 No products

3. EXECUTION

3.1 Removal of Fence

- .1 Removal of existing fence shall not occur until construction of the roadways and parking lot is complete as the DBPS and GWWD Aqueduct must be protected until this time.
- .2 Carefully remove and salvage all above grade fencing components and return to the City of Winnipeg. Any components damaged by the Contractor shall be replaced at his expense.
- .3 Remove and dispose of all fence posts, as directed by the Contract Administrator and backfill all remaining holes with compacted base course material to existing grade. Backfilling and compaction of backfill in post holes shall be considered incidental to the removal of the fence.

END OF SECTION

SUPPLY AND INSTALLATION OF STEEL BOLLARDS

1. GENERAL

1.1 Scope of Work

- .1 This Specification shall cover the supply and installation of steel bollards as indicated on the Drawings.

1.2 Measurement and Payment

- .1 The supply and installation of steel bollards will be measured on a unit basis. The number to be paid for shall be the total number of steel bollards supplied and installed in accordance with this Specification and accepted by the Contract Administrator. The supply and installation of steel bollards will be paid for at the Contract Unit Price for "Supply and Installation of Steel Bollards". The bid items will be a) Type 1: 400 mm and b) Type 2: 150 mm.

2. PRODUCTS

2.1 Steel Bollards

- .1 The Contractor shall be responsible for the supply, safe storage, and handling of all materials set forth in this Specification. All materials supplied under this Specification shall be subject to inspection and testing by the Contract Administrator.
- .2 The steel bollards shall be supplied in accordance with ASTM A53, DN 150 or DN 400 mm O.D. nominal (Weight Class XS, 10.97 mm wall thickness) galvanized pipe.
- .3 Concrete for filling the steel bollards shall be 30 MPa Normal Portland Type 10 supplied in accordance with CW 3310.

3. EXECUTION

3.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.

3.2 Installation of Bollards

- .1 The steel bollards shall be installed in accordance with the steel bollard detail as shown on Drawings.

END OF SECTION

TOPSOIL AND FINISH GRADING

1. GENERAL

1.1 Scope of Work

- .1 The Work of this Section outlines the requirements for topsoil placement and finish grading for the purposes of grass growth only. Schedule placing of topsoil and finish grading to undertake seeding operation under optimum soil moisture conditions and weather conditions.

1.2 Measurement and Payment

- .1 Topsoil and finish grading shall be incidental to works performed in Section 02922 – Seeding.

2. PRODUCTS

2.1 Topsoil

- .1 Topsoil to be as per City of Winnipeg Standard Construction Specification CW 3540.

2.2 Fertilizer

- .1 Fertilizer to be as per City of Winnipeg Standard Construction Specification CW 3540.

3. EXECUTION

3.1 Preparation of Sub-grade

- .1 Verify the sub-grade elevations are within approved tolerances. Do not commence placement of topsoil until sub-grade elevations have been reviewed and approved by the Contract Administrator.
- .2 Grade area only when soil is dry to lessen soil compaction. Cultivate entire area to a depth of 100 mm. Cross cultivate area where equipment has compacted soil.
- .3 Grade soil establishing natural contours and eliminating uneven areas and low spots, ensuring positive drainage. Ensure soil utilized for topsoil is free of all debris and deleterious material in excess of 25 mm diameter.

3.2 Placing of Topsoil

- .1 Place topsoil only after Contract Administrator has accepted sub-grade.
- .2 During dry conditions, spread topsoil in uniform layers to a minimum depth of 100 mm, over unfrozen sub-grade free of standing water.

TOPSOIL AND FINISH GRADING

- .3 Establish traffic patterns for equipment that will prevent driving on topsoil after it has been spread to avoid compaction.
- .4 Fine grade entire topsoiled area to eliminate rough spots and low areas ensuring positive drainage. Grade ditches to depth required for maximum run-off.

3.3 Finish Grading

- .1 Fine grade entire topsoiled area to contours and elevations as requested by Contract Administrator. Eliminate rough spots and low areas to ensure positive drainage.
- .2 Fine grade and loosen topsoil bed by means of cultivation and subsequent raking.
- .3 Feather topsoil as required around the perimeter of the Site into existing areas that require regrowth of vegetation.
- .4 Maintain placed topsoil as specified until seeding is completed.

3.4 Clean-up

- .1 Clean-up immediately any soil or debris spilled onto gravel, pavement, or concrete. Do not damage surfaces.
- .2 Remove and dispose of all screenings, stones, debris, roots, etc.

END OF SECTION

SEEDING

1. GENERAL

1.1 Scope of Work

- .1 Further to CW 3520 and CW3540, this specification covers supply and placement of topsoil and seed.
- .2 Topsoil selection and placement shall conform to the standards outlined in section 02911

1.2 Measurement and Payment

- .1 Seeding will be measured and paid for in accordance with City of Winnipeg Standard Construction Specification CW 3520 for Seeding.

2. PRODUCTS

2.1 Fertilizer

- .1 A complete synthetic starter fertilizer with an N-P-K analysis of 8-32-16 shall be placed.

2.2 Grass Seed

- .1 The mix shall be 40% Fults Alkaligrass, 30% Walsh Western Wheatgrass, 20% Aberdeen Creeping Red Fescue, 10% Perennial Rye.

2.3 Hydro Mulch

- .1 Hydro mulch shall be a cellulose fibre product.

3. EXECUTION

3.1 General

- .1 Do not perform work during inclement weather conditions or under adverse field conditions such as frozen ground or ground covered with snow, ice, or standing water.
- .2 The synthetic starter fertilize shall be placed via a drop spreader on the areas at a rate defined by the manufacturer and incorporated into the upper 50 mm of the topsoil.
- .3 Water all areas prior to the application of the hydro mulch. Seed bed should be moist to maintain seed germination and grass growth.
- .4 Further to CW 3520, the established turf area shall be mowed at regular intervals to a height of 50-60 mm. To ensure seedling vigour, and limit damage to the leaf tissue, only sharp mower blades shall be used.

END OF SECTION

SPECIALTY COATINGS FOR CONCRETE

1. GENERAL

1.1 Work Included

- .1 Supply and Installation of specialty coatings for the concrete pavement areas adjacent to the south side of the Bulk Chemical Building and Sodium Hypochlorite Building, and East Side of the WTP Building. Exact areas will be designated by the Contract Administrator.

1.2 Measurement and Payment

- .1 Coatings for Concrete will be measured for payment by an area based on the number of square metres used to coat the concrete pavement surfaces. The price per square metre for "Concrete Coatings" will be payment in full for supplying and installing all concrete pavement coatings in accordance with this Specification.

1.3 Qualification

- .1 Installation is to be done by an established firm having at least ten (10) years of proven, satisfactory experience in this trade and employing skilled personnel. The firm is to be authorized by the coating manufacturer to install the specified product and product line.
- .2 The coating manufacturer is to have a minimum of ten (10) years proven, satisfactory experience in the manufacturing of chemical containment coating systems that are recommended by the Manufacturer.
- .3 Each coating system is to have a proven minimum one (1) full year containment with exposure to the chemical in which it is intended to contain, with no detrimental effects and staining on the coating system after spills of 72 hour duration.
- .4 Submit proof of qualifications and authorization in writing to the Contract Administrator, four (4) weeks prior to commencement of Work.

1.4 Design Standards, Code Requirements

- .1 Conform to requirements of SSPC Publications and visual standards, explanatory notes, comments and appendices:
 - .1 SSPC-PA-1 Shop, field and maintenance painting
 - .2 SSPC-SP-1 Solvent cleaning
 - .3 SSPC-SP-2 Hand cleaning
 - .4 SSPC-SP-3 Power tool cleaning
 - .5 SSPC-SP-5 White Metal Blast Cleaning
 - .6 SSPC-SP-6 Commercial blast cleaning

SPECIALTY COATINGS FOR CONCRETE

- .7 SSPC-SP-7 Brush off blast cleaning
- .8 SSPC-SP-10 Near white metal blast cleaning
- .9 SSPC-SP-13 Surface Preparation of Concrete

1.5 Submittals

- .1 Submit in accordance with Section 01300 - Submittals.
- .2 The coatings manufacturer shall certify in writing that the recommended system for containment coating has been used for ten (10) years in such containment, and that the Manufacturer's warranty includes intended chemical service and crack-bridging.
- .3 Submit colour samples of coating, minimum colour sample size 50 mm x 100 mm with finish indicated.
- .4 Indicate location of where the specific coating is to be applied.
- .5 Indicate specific coating sequence for each coating system and substrate.
- .6 Indicate dry film thickness requirements for each coating layer within the coating system.
- .7 Submit manufacturer's product data sheets and installation guides. A minimum of one (1) copy of the reviewed product data sheets and installation guides shall remain on Site at all times for all to view.
- .8 Prepare 300 mm x 200 mm samples of each coating type to Contract Administrator. Apply finishes on identical type materials to which they will be applied.
- .9 Submit manufacturer's preferred keyed-in coating termination detail for review by the Contract Administrator. Modify the termination detail as requested by the Contract Administrator at no additional cost.

1.6 Inspection and Testing

- .1 Allow ample time for notification, review, and corrective Work, if required, before scheduling coating installation.
- .2 Inspection, and testing is to be performed by a third party CSA and SSPC certified inspection and testing firm. Testing of substrate required to be performed prior to the application of the coating and while the coating is being applied and curing is to be paid for by the Contractor. Testing of coating once the coating is cured, will be paid for by the City. Provide unencumbered access to all portions of Work and cooperate with appointed firm.
- .3 Notify the Contract Administrator at least 48 hours in advance of any coating installation or final substrate preparation.
- .4 Repair all areas where the substrate surfaces and coatings were tested.

SPECIALTY COATINGS FOR CONCRETE

- .5 Testing of concrete will be performed in accordance with the indicated SSPC design standards. Test results are to be issued to the Contractor, the Contract Administrator, and the City.
- .6 The Contractor is to pay costs for required retesting due to defective materials or workmanship.
- .7 A minimum of one (1) complete SSPC test is to be performed on each concrete surface designated for coating.

1.7 Maintenance Data

- .1 Provide maintenance data for coatings complete with pertinent details, data sheets, and warnings against harmful maintenance materials and practices for incorporation into maintenance manual.

2. PRODUCTS

- .1 Quality: Manufacturer's highest quality products suitable and guaranteed for intended use.
- .2 The same Manufacturer is to be used for the Work.
- .3 Coating systems to be monolithic and pinhole free.
- .4 Coating system used for different substrates within the same containment area are to be compatible to allow for full encapsulation of embedded items.
- .5 Coating system to fully encapsulate column base plates and anchor bolts within the containment areas. Grouts and injection gel epoxy used for anchor bolt anchorage or support are not intended to provide secondary containment. Coating system is to be compatible grouts and injection gel epoxy.
- .6 Coating system used on the housekeeping pads or concrete surfaces of containment areas are to be slip resistant. Do not use sand or other abrasive minerals as a broadcasting girt to obtain slip resistance.
- .7 Coating systems must be capable of bridging a 300 μ moving cracks, such as shrinkage cracks, in the concrete substrate, with no breach or damage of any kind to the coating system. Coating must have memory and open or close with moving cracks without developing cracks or wrinkles. Manufacturer must show such crack-bridging of 300 μ in a mechanical demonstration unit as a submittal prior to an award.
- .8 Coating systems at full extension of crack-bridging shall not be damaged and must be certified to withstand the chemicals listed at full extension of crack-bridging with no adverse effects of any kind.
- .9 Coating Manufacturer shall certify and guarantee that the coating systems recommended shall be totally unaffected by UV light exposure on a 24 hour per day basis.

SPECIALTY COATINGS FOR CONCRETE

- .10 Coatings shall be applied in containment areas to all concrete surfaces except FRP and galvanized grating surfaces.
- .11 Acceptable coating manufacturer's are:
 - .1 Carboline Coatings Company, St. Louis, MO
 - .2 KCC Corrosion Control Co. Ltd., Houston TX
- .12 Colours to be selected by the City from submitted samples.
- .13 Vicinity of Chemical Storage Building, design requirements:
 - .1 Chemical: 39% Ferric Chloride
 - .2 Containment period: 72 hours
 - .3 Temperature: -40°C to +40°C
 - .4 Exposed to UV light
 - .5 Neutralization chemical for spills: Sodium Hydroxide
 - .6 Minimum crack bridging capability: 300 µ
- .14 Vicinity of Chemical Storage Building, design requirements:
 - .1 Chemical: 93% Sulphuric Acid
 - .2 Containment period: 72 hours
 - .3 Temperature: -40°C to +40°C
 - .4 Exposed to UV light
 - .5 Neutralization chemical for spills: Water and Caustic Soda, Lime, or Soda Ash.
 - .6 Minimum crack bridging capability: 300 µ
- .15 Vicinity of Chemical Storage Building, design requirements:
 - .1 Chemical: 50% Sodium Hydroxide
 - .2 Containment period: 72 hours
 - .3 Temperature: -40°C to +40°C
 - .4 Exposed to UV light
 - .5 Neutralization chemical for spills: Water and Sulphuric Acid

SPECIALTY COATINGS FOR CONCRETE

- .6 Minimum crack bridging capability: 300 μ
- .16 Vicinity of Chemical Storage Building, design requirements:
 - .1 Chemical: 19% Aqua Ammonia
 - .2 Containment period: 72 hours
 - .3 Temperature: -40°C to +40°C
 - .4 Exposed to ultraviolet light
 - .5 Neutralization chemical for spills: Dilute Sulphuric Acid
 - .6 Minimum crack bridging capability: 300 μ
- .17 Vicinity of Sodium Hypochlorite Building, design requirements:
 - .1 Chemical: 0.8% Sodium Hypochlorite
 - .2 Containment period: 72 hours
 - .3 Temperature: -40°C to +40°C
 - .4 Exposed to UV light
 - .5 Neutralization chemical for spills: Sodium Bisulphite
 - .6 Minimum crack bridging capability: 300 μ
- .18 Vicinity of East Side Water Treatment Plant, design requirements:
 - .1 Chemical: 35% Hydrogen Peroxide
 - .2 Containment period: 72 hours.
 - .3 Temperature: -40°C to +40°C
 - .4 Exposed to UV light
 - .5 Neutralization chemical for spills
 - .6 Minimum crack bridging capability: 300 μ

SPECIALTY COATINGS FOR CONCRETE

3. EXECUTION

3.1 Pre-Installation Conference

- .1 Pre-installation conference for specialty coating products: prior to installation of specialty coating products, conduct a meeting with applicator, installers of Work adjacent to or that penetrates the specialty coating products, the Contract Administrator and Manufacturer's technical representative to review the following:
 - .1 General project requirements.
 - .2 Manufacturer's product data sheets and installation guides.
 - .3 Substrate conditions, moisture content, procedures for substrate preparation, and product installations.
 - .4 The Manufacturer's technical representative is to issue reports to the Contract Administrator confirming that the substrate conditions and installation procedures are being followed for each area where the specific product is being utilized.
 - .5 Responsibility and costs associated with verification and correlation of field dimensions, fabrication processes, techniques of construction, installation, and coordination of Work and Manufacturer's technical representative for all parts of the Work rests with the Contractor.

3.2 General

- .1 Notify the Contract Administrator of any conditions which would prejudice proper installation of this Work.
- .2 Commencement of this Work implies acceptance of existing conditions.
- .3 Steel substrates to be prepared to a SSPC-SP 5, White Metal Blast Cleaning.
- .4 Concrete substrates to be prepared to SSPC-SP 13, Table 1, Severe Service.
- .5 Apply each coat as a continuous film of uniform thickness. Recoat thin spots or bare areas before next coat of the coating is applied.
- .6 Remove weld spatter, weld slag and flux from metal before coating.
- .7 Remove concrete spatter and droppings before coating is applied.
- .8 Remove defective or damaged coatings as required by the Contract Administrator. Cost for defective or damaged coating removal and replacement will be at the Contractor's expense.
- .9 Relative humidity of the concrete surface for concrete substrates is to conform to SSPC-SP13 Table 1 Severe Service, using the ASTM F 2170 test method except that the relative humidity is to be less than 50 percent after surface preparation.

SPECIALTY COATINGS FOR CONCRETE

- .10 Concrete surface tensile strength shall be 2.1 MPa minimum. Remediation of the concrete for values lower than 2.1 MPa will be at the Contractor's expense.
- .11 Termination of coatings to be keyed into the concrete substrate.

3.3 Protection

- .1 Protect other surfaces from substrate preparation, coatings and damage. Repair damage.
- .2 Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- .3 Collect waste, cloths and material which may constitute a fire hazard, place in closed metal containers and remove daily from Site.

3.4 Brush Application

- .1 Where spray applications is not practical, work paint into cracks, crevices and corners and paint surfaces by brush.
- .2 Brush out runs and sags.
- .3 Remove runs, sags and brush marks from finished Work and repaint.

3.5 Spray Application

- .1 Provide and maintain specialized equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
- .2 Provide traps or separators to remove oil and water from compressed air and drain periodically during operations.
- .3 Test equipment for proper mixing proportion prior to application of coating following Manufacturer's written instructions.
- .4 Apply paint in uniform layer, with overlapping at edges of spray pattern.
- .5 Brush out immediately runs and sags.
- .6 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray. In areas not accessible to spray gun, use brushes, daubers or sheepskins.
- .7 Remove runs, sags and brush marks from finished Work and repaint.

3.6 Shop Painting

- .1 Do shop painting after fabrication and before damage to surface occurs from weather or other exposure.

SPECIALTY COATINGS FOR CONCRETE

- .2 Do not shop paint metal surfaces which are to be embedded in concrete.
- .3 Copy previous erection marks and weight marks on areas that have been shop painted as required.

3.7 Field Painting

- .1 Touch-up metal which has been shop coated with same type of paint and to same thickness as shop coat. This touch-up to include cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas.
- .2 Field paint surfaces which are accessible before erection but which are not to be accessible after erection.
- .3 Do not apply specialty coatings until concrete Work is completed and cured as required by the coating manufacturer, except as directed by Contract Administrator. If concreting or other operations damage paint, clean and repaint damaged area.

3.8 Extended Warranty

- .1 Provide a five (5) year warranty against delamination of the coating and coating system, delamination of the coating and coating system from the substrate, defective coating and coating system application, and defects in the coating and coating system. Defects in the coating system will also include staining of the coating or coating system from the specified chemicals and neutralization chemicals.

END OF SECTION