

Part 1 General

1.1 SCOPE OF WORK

- .1 The following specification is for work related to asphalt. Refer to Structural Drawings and Specification 03 30 00 for Granular Sub-Base for Concrete work.

1.2 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C117-[04] , Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C131-[06] , Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM C136-[06] , Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D422-[63(2007)] , Standard Test Method for Particle-Size Analysis of Soils.
 - .5 ASTM D698-[07e1] , Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).
 - .6 ASTM D1557-[09] , Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft³) (2,700kN-m/m³).
 - .7 ASTM D1883-[07e2] , Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
 - .8 ASTM D4318-[10] , Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-[88] , Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-[M88] , Sieves, Testing, Woven Wire, Metric.
- .3 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements .
- .2 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Granular sub-base material: in accordance with Section 31 05 16- Aggregate Materials and following requirements:

- .1 Crushed, pit run or screened stone, gravel or sand.
- .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117 . Sieve sizes to CAN/CGSB-8.2 .

.3 Table

Sieve Designation	% Passing			
100 mm	-	-	-	-
75 mm	100	100	100	-
50 mm	-	-	-	100
37.5 mm	-	-	-	-
25 mm	55-100	-	-	60-100
19 mm	-	-	-	-
12.5 mm	-	-	-	38-70
9.5 mm	-	-	-	-
4.75 mm	25-100	25-85	-	22-55
2.00 mm	15-80	-	-	13-42
0.425 mm	4-50	5-30	0-30	5-28
0.180 mm	-	-	-	-
0.075 mm	0-8	0-10	0-8	2-10

.4 Other properties as follows:

- .1 Liquid Limit: to ASTM D4318 , Maximum 25.
- .2 Plasticity Index: to ASTM D4318 , Maximum 6.
- .3 Los Angeles degradation: to ASTM C131 .
 - .1 Maximum loss by mass: 40 %.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for granular sub-base installation in accordance with manufacturer's written instructions.

- .1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .2 Proceed with installation only after unacceptable conditions have been remedied and after approval to proceed from Departmental Representative .

3.2 PLACING

- .1 Place granular sub-base after subgrade is inspected and approved by Departmental Representative .
- .2 Construct granular sub-base to depth and grade in areas indicated.

- .3 Ensure no frozen material is placed.
- .4 Place material only on clean unfrozen surface, free from snow or ice.
- .5 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
- .6 Place material to full width in uniform layers not exceeding 150 mm compacted thickness.
 - .1 Departmental Representative may authorize thicker lifts if specified compaction can be achieved.
- .7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .8 Remove and replace portion of layer in which material has become segregated during spreading.

3.3 COMPACTION

- .1 Refer to Structural Drawings for compaction under concrete slabs.
- .2 Compaction equipment to be capable of obtaining required material densities.
- .3 Compact to density of not less than 98 % maximum dry density in accordance with ASTM D698 .
- .4 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.
- .5 Apply water as necessary during compaction to obtain specified density.
- .6 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative .
- .7 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning .
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning .

3.5 SITE TOLERANCES

- .1 Finished sub-base surface to be within 10 mm of elevation as indicated but not uniformly high or low.

3.6 PROTECTION

- .1 Maintain finished sub-base in condition conforming to this section until succeeding base is constructed, or until granular sub-base is accepted by Departmental Representative.

END OF SECTION

Part 1 General

1.1 SCOPE OF WORK

- .1 The following specification is for work related to asphalt. Refer to Structural Drawings and Specification 03 30 00 for Aggregate Base Courses for Concrete work.

1.2 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C117-[04] , Standard Test Methods for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C131-[06] , Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .3 ASTM C136-[06] , Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .4 ASTM D698-[07e1] , Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).
 - .5 ASTM D1557-[09] , Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft³) (2,700kN-m/m³).
 - .6 ASTM D1883-[07e2] , Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
 - .7 ASTM D4318-[10] , Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-[88] , Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-[M88] , Sieves, Testing, Woven Wire, Metric.
- .3 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 31 05 16- Aggregate Material and 01 61 00- Common Product Requirements .
- .2 Storage and Handling Requirements:
 - .1 Stockpile minimum 50 % of total aggregate required prior to beginning operation.
 - .2 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .3 Replace defective or damaged materials with new.
 - .4 Store cement in weathertight bins or silos that provide protection from dampness and easy access for inspection and identification of each shipment.

Part 2 Products

2.1 MATERIALS

- .1 Granular base: material in accordance with Section 31 05 16- Aggregate Materials and following requirements:
 - .1 Crushed stone or gravel.
 - .2 Gradations to be within limits specified when tested to ASTM C136 . Sieve sizes to CAN/CGSB-8.2 .
 - .1 Gradation Method #1 to:

Sieve Designation	% Passing		
	(1)	(2)	(3)
100 mm	-	-	-
75 mm	-	-	-
50 mm	100	-	-
37.5 mm	70-100	-	-
25 mm	-	100	-
19 mm	50-75	-	100
12.5 mm	-	65-100	70-100
9.5 mm	40-65	-	-
4.75 mm	30-50	35-60	40-70
2.00 mm	-	22-45	23-50
0.425 mm	10-30	10-25	7-25
0.180 mm	-	-	-
0.075 mm	3-8	3-8	3-8

- .2 Soaked CBR: to ASTM D1883 , minimum 100 , when compacted to 100% of ASTM D1557 .

Part 3 Execution

3.1 PLACEMENT AND INSTALLATION

- .1 Place granular base after sub-base surface is inspected and approved in writing by Departmental Representative.
- .2 Placing:
 - .1 Construct granular base to depth and grade in areas indicated.
 - .2 Ensure no frozen material is placed.
 - .3 Place material only on clean unfrozen surface, free from snow and ice.
 - .4 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
 - .5 Place material to full width in uniform layers not exceeding 150 mm compacted thickness.
 - .1 Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.

- .6 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .7 Remove and replace that portion of layer in which material becomes segregated during spreading.
- .3 Compaction Equipment:
 - .1 Ensure compaction equipment is capable of obtaining required material densities.
- .4 Compacting:
 - .1 Refer to Structural Drawings for compaction under concrete slabs.
 - .2 Compact to density not less than 100 % maximum dry density to ASTM D698.
 - .3 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
 - .4 Apply water as necessary during compacting to obtain specified density.
 - .5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved in writing by Departmental Representative.
 - .6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.2 SITE TOLERANCES

- .1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section[01 74 11- Cleaning .
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning .

3.4 PROTECTION

- .1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by Departmental Representative.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

1.2 REFERENCE STANDARDS

- .1 American Association of State Highway and Transportation Officials (AASHTO)
 - .1 AASHTO M320-[10] , Standard Specification for Performance Graded Asphalt Binder.
 - .2 AASHTO R29-[08] , Standard Specification for Grading or Verifying the Performance Graded of an Asphalt Binder.
 - .3 AASHTO T245-[97(2008)] , Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.
- .2 Asphalt Institute (AI)
 - .1 AI MS-2-[1994] , Mix Design Methods for Asphalt Concrete and Other Hot-Mixes.
- .3 ASTM International
 - .1 ASTM C88-[05] , Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
 - .2 ASTM D698-[12] , Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³(600 kN-m/m³)).
- .4 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section [01 33 00- Submittal Procedures] .
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt mixes and aggregate and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit viscosity-temperature chart for asphalt cement to be supplied showing either Saybolt Furol viscosity in seconds or Kinematic Viscosity in centistokes, temperature range 105 to 175 degrees C [4] weeks prior to beginning Work.
- .3 Samples:
 - .1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling 4 weeks prior to beginning Work.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and with manufacturer's written instructions .

- .2 Deliver and stockpile aggregates in accordance with Section 31 05 16- Aggregate Materials. Stockpile minimum 50 % of total amount of aggregate required before beginning asphalt mixing operation.
- .3 When necessary to blend aggregates from one or more sources to produce required gradation, do not blend in stockpiles.
- .4 Stockpile fine aggregate separately from coarse aggregate, although separate stockpiles for more than two mix components are permitted.
- .5 Provide approved storage, heating tanks and pumping facilities for asphalt cement.

Part 2 Products

2.1 MATERIALS

- .1 Primer: Homogeneous medium curing liquid asphalt MC-30 or MC-250 as required.
- .2 Tack Coat: SS-1 to CCDG..
- .3 Asphalt Cement: CAN/CGSB-16.3.
- .4 Aggregate for Mix: 13 mm maximum size.
- .5 Fine Aggregate: Sand
- .6 Mineral Filler: Finely ground particles of limestone, hydrated lime, or other approved mineral dust, free of foreign matter.
- .7 Pit Run Gravel (Sub Base Course): 75mm maximum sized aggregate graded as outlined in Section 32 11 1.01
- .8 Crushed Gravel (Base course): 20 mm crushed gravel, graded as outlined in Section 32 11 23.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for asphalt paving in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 FOUNDATIONS

- .1 Foundations for roadways comprise:

- .1 150 mm compacted thickness of granular subbase. Sub-base material to meet the gradation limits as specified in 32 11 16.01 Granular Sub-base – for a material with 100% passing the 50mm sieve designation
- .2 100 mm compacted thickness of granular base . base material to meet the gradation limits and other requirements as specified in Section 32 11 23 – Aggregate Base Courses for a type 3 material
- .2 Construction of granular foundations: CCDG.
- .3 Compaction: compact each lift of granular material to 100 % maximum density to ASTM D698. Maximum lift thickness: 150 mm.

3.3 PAVEMENT THICKNESS

- .1 Heavy Duty Pavement:
 - .1 65 mm Asphalt type 2, per City of Saskatoon, IS-ME standards

3.4 PAVEMENT CONSTRUCTION

- .1 Application of prime coat: OPSS 302.
- .2 Construction of asphalt concrete: OPSS 310.
- .3 Surface preparation: CCDG.
- .4 Application of prime coat and tack coat : CCDG.
- .5 Construction of asphalt concrete: CCDG.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section [01 74 11- Cleaning] .
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section [01 74 11- Cleaning] .
- .3 Waste Management: separate waste materials for [recycling] [reuse] in accordance with Section [01 35 21- LEED Requirements] [01 74 19- Waste Management and Disposal] .
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM A53/A53M-10, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A90/A90M-09, Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
 - .3 ASTM A121-07, Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
 - .4 A653/A653M-10, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .5 ASTM C618-08a, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
 - .6 ASTM F1664-08, Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.
 - .7 ASTM A123/A123M-09, Standard Specification for Zinc (Hot Dip Galvanized) coatings on Iron and Steel Products.
- .2 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act (CEPA), latest edition, c. 33.
 - .2 Transportation of Dangerous Goods Act (TDGA), latest edition, c. 34.
- .3 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-138.1-96, Fabric for Chain Link Fence.
 - .2 CAN/CGSB-138.2-96, Steel Framework for Chain Link Fence.
 - .3 CAN/CGSB-138.3-96, Installation of Chain Link Fence.
 - .4 CAN/CGSB-138.4-96, Gates for Chain Link Fence.
 - .5 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
- .4 Canadian Standards Association (CSA International).
 - .1 CAN/CSA-A23.1/A23.2-00(latest edition), Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
 - .2 CAN/CSA-G164-M92(latest edition), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .5 Technical Criteria for Correctional Institutions (2015)

1.2 SUBMITTALS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Drawings to indicate all pertinent dimensions, connections, details, materials, finishes and all other information required to completely describe the chain link fence installation to this project.
- .3 Mock-up: Provide Mockup of a line post with tie wires.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations.
 - .2 Store and protect fence and gate materials from damage.
 - .3 Replace defective or damaged materials with new.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Separate for reuse and recycling and place in designated containers Steel, Metal and Plastic waste in accordance with Waste Management Plan.
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Departmental Representative.
- .7 Divert unused concrete materials from landfill to local facility as approved by Departmental Representative.
- .8 Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by Departmental Representative.
- .9 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in any other location where it will pose health or environmental hazard.
- .10 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 MATERIALS

- .1 Concrete mixes and materials: in accordance with CSA-A23.1.
 - .1 Refer to Section 03 30 00 and Structural Drawings.
- .2 Acute Exercise Yard Posts, weld plates and Roof Structure: Refer to structural drawings and Section 05 12 23 – Structural Steel for Buildings.
- .3 Acute Exercise Yard Roof Fabric: Welded wire mesh 51x51, mw25.8 x mw25.8. Refer to drawings for installation.
- .4 Chain-link fence fabric: to CAN/CGSB-138.1.
 - .1 Type 1, Galvanized, Class A, heavy style 50.8 mm diamond mesh, interwoven 4.8 mm (6 Gauge) wire diameter with twisted tight selvage at top and bottom.
 - .2 Height of fabric: as indicated on Drawings.
- .3 Barbed Tape Concertina (BTC): to CAN/CGSB-138.2, barbed type galvanized to CSC standards and the approval of the Departmental Representative. 20 x 0.5 mm clenched around a 2.5 mm diameter spring steel galvanized core wire to form a concertina coil with a nominal exterior coil diameter of 710 mm. The coil, when installed, shall have a minimum diameter of 635 mm. The barbed concertina shall have a 20 mm long blade type barbs measured from tip to tip of the blade, and barb clusters shall be spaced approximately 45 mm on centre. The concertina shall be formed by clipping adjacent loops of single helical coils together at a minimum of three (3) points on the circumference. Clips shall be galvanized. The resulting coil, when stretched, shall form a cylindrical pattern. The loop spacing shall not exceed 230 mm.
- .4 Barbed wire: for concertina coil support at fence top, two barbed wires stretched and fixed to post arms shall be provided. Barbed wire shall consist of two strands of 12 gauge wire with 4 point barbs at 130 mm spacings, all galvanized. To meet ASTM A121
- .5 Active Exercise Yard Posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe.
 - .1 Posts to be spaced a maximum of 2.5m apart.
 - .2 Line Posts: 73 mm O.D. standards continuous, weld schedule 40 pipe, galvanized, minimum 8.6 kg/m.
 - .3 Strain post minimum size shall be 114.3mm O.D., galvanized, minimum 15.93 kg/m.
 - .4 Terminal Posts: End, gate posts, corner and straining posts, 168.3 mm O.D. standard continuous weld schedule 40 pipe, galvanized, minimum 21.0 kg/m.
 - .5 Bottom and Top Rail: 42.2 mm O.D. galvanized pipe, plain ends random lengths, standard continuous weld schedule 40 pipe. Minimum 3.4 kg/m.
 - .6 Intermediate rails shall not be used.
- .6 Tie wire fasteners: Galvanized steel wire, single strand. Twist wire together in three complete rotations and cut ends off together with no protruding ends. Twists to be on non-patient side.
- .7 Tension bar: to ASTM A653/A653M, 5mm x 20 mm x full height of fence fabric. minimum

galvanized steel tie bands with 6 mm diameter zinc coated nuts and bolts with nuts welded to bolts or threads damaged after install to prevent removal of nuts. Touch up with galvanizing touch-up paint. TOBIE

- .8 Tie bands: 3mm x 20mm minimum to secure chain link fabric to bottom rail and top rail at 300 mm o/c.
- .9 Galvanized steel arms with integral post top combination shall be provided on all line post tops to hold dence top rails where concertina is to be installed as detailed and in accordance with CSC standards. Post top arms to provide waterproof fit. Secure post arm cap to top of post with 2 – 4.5mm dia. Stainless steel Torx with Pin Tec screws.
 - .1 Include custom galvanized steel arm with recesses to hold 2 strands of barbed wire configured s follows:
 - Location and spacing of recesses: as indicated
 - Length of galvanized steel arm: as indicated
 - Galvanized steel arm projection angle: as indicated
 - The end of each arm must be able to support a 113.4 kg (250 lb) load.
- .10 Gates: to CAN/CGSB-138.4.
 - .1 Active Exercise Yard: Refer to Drawings and Section 05 12 23 – Structural Steel for Buildings
- .11 Gate hinges to be self-closing.
- .12 Gate frames:
 - .1 Acute Exercise Yard: Refer to Drawings and Section 05 12 23 – Structural Steel for Buildings
 - .2 to ASTM A53/A53M, galvanized steel pipe, standard weight, 48 mm outside diameter pipe for outside frame, 43 mm outside diameter pipe for interior bracing.
 - .1 Fabricate gates as indicated with electrically welded joints, and hot-dip galvanized after welding.
 - .2 Fasten fence fabric to gate with twisted selvage at top and bottom.
 - .3 Furnish gates with galvanized malleable iron hinges, latch and latch catch with provision for padlock which can be attached and operated from either side of installed gate.
 - .4 Provide and install 3mm galvanized steel closure plates to all open pipe ends. Provide weeping hole in plates located at the bottom of pipes to allow moisture to escape. Weld in place. Make good all welds with galvanizing touch-up paint.
- .13 Fittings and hardware: to CAN/CGSB-138.2, galvanized steel, malleable cast iron or ductile cast iron. Turnbuckles, if used, to be welded secure.
- .14 All welded in place connections to be touched-up with galvanizing touch-up paint.
- .15 Grounding rod: 16 mm diameter copperwell rod, 3 m long, if required.
- .16 Galvanizing Touch-up Paint: Make good corrosive protection after welding where burnt by welding operations and where removed to facilitate welding operations, using:

- .1 Primer Coat: Sprayon 500740 or approved equal
- .2 Finish Coat: Krylon Industrial Silver Zinc or approved equal

- .17 Top rails to be in lengths of 5500 mm, and shall be fitted with couplings or swaged for connecting the lengths into a continuous run. The couplings shall be not less than 152 mm long, with 2.0 mm minimum wall thickness, and shall allow for expansion and contraction of the rail.

- .18 Sleeves for horizontal rails shall allow for expansion and contraction. Sleeves to be 2.0 mm minimum wall thickness. Sleeves to be securely fastened to posts.

2.2 HARDWARE

- .1 For Active Exercise Yard, Gate G-3:
 - 1 Padlock Best Access Systems
#11B772 -LPS2127X2127

- .2 For Acute Exercise Yard, Gates G-1 & G-2:
 - 1 Folger Adams 800 series
 - .1 806ES Keyed Both Sides
 - .2 Paracentric key

2.3 FINISHES

- .1 Galvanizing:
 - .1 For chain link fabric: to CAN/CGSB-138.1 Grade 3 610 g/m² minimum.
 - .2 For pipe: 550 g/m² minimum to ASTM A90.
 - .3 For other fittings: to ASTM A123/A123M

Part 3 Execution

3.1 GRADING

- .1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.
 - .1 Acute Exercise Yard: Refer to drawings
 - .2 Active Exercise Yard: Provide clearance between bottom of fence and ground surface of 30 mm.

3.2 ERECTION OF FENCE

- .1 Acute Exercise Yard Fence: as per structural drawings and Section 05 12 23 – Structural Steel for Buildings.

- .2 Erect fence along lines as indicated and to CAN/CGSB-138.3.

- .3 Install line, staining and corner posts plumb. Set in concrete footings as indicated on drawings

- .4 Place concrete in post holes then embed posts into concrete to depths indicated. Brace to hold posts in plumb position and true to alignment and elevation until concrete has set. Ensure posts are centred in post holes.

- .5 Install fence fabric after concrete has cured, minimum of 5 days
- .6 Space line posts maximum 2.5 m apart, measured parallel to ground surface.
- .7 Install additional straining posts at sharp changes in grade and where directed by Departmental Representative.
- .8 Install corner post where change in alignment exceeds 10° and as indicated.
- .9 Install end posts at end of fence and at buildings. Install gate posts on both sides of gate openings.
- .10 Install galvanized steel arms with integral post top combination. Secure post arm cap to top of post with 2 – 4.5mm dia. Stainless steel Torx with Pin Tec screws
- .11 Install top and bottom rail between posts. Secure top rail to posts through post top holes and bottom rail to post sleeves. Ensure expansion and contraction is provided for top and bottom rails.
- .12 Lay out fence fabric to patient side of fence. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals. Ensure distance between tension bar and posts does not exceed 13 mm. Tight twisted selvedge at top and bottom as indicated previous in this section.
- .13 Secure fabric to top rails, line posts and bottom rails with tie wire at 300 o/c max. Twist wire together in three complete rotations and cut ends off together with no protruding ends. Twists to be on non-patient side.
- .14 Fence fabric shall be pulled taught before fixing in place. Secure fabric to top rails, line posts and bottom rails with tension bars and tension bar bands spaced at 300 mm intervals. Ensure distance between tension bar and posts does not exceed 13 mm. Taughtness of fabric to be measured by applying a 12 kg pull at the midpoint of the mesh panel (midpoint of posts/rails). Max. displacement to be 30mm max. from the fence at rest plane.
- .15 Install grounding rods as directed by the Departmental Representative.
- .16 Install barbed wire and concertina as indicated on the Drawings, reviewed shop drawings and as directed by the Departmental Representative in accordance with CSC standards.
- .17 Barbed wire tape concertina is to be supported and tied at 230mm spacing onto each strand of barbed wire.

3.3 INSTALLATION OF GATES & HARDWARE

- .1 Install gates in locations as indicated.
- .2 Level ground between gate posts and set gate bottom approximately 40 mm above ground surface.
- .3 Install gate stops where indicated
- .4

3.4 INSTALLATION OF FABRIC TO DETENTION EXTERIOR SWING GATES

- .1 Install chain link fabric to Detention Exterior Swing Gates, complete with tension bars to all sides of fabric in each opening and securely fastened to gate frame with tension bar bands spaced no more than 300 o/c.

3.5 TOUCH UP

- .1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

3.6 CLEANING

- .1 Clean and trim areas disturbed by operations. Dispose of surplus material as directed by Departmental Representative.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Not Used

1.2 REFERENCE STANDARDS

- .1 Agriculture and Agri-Food Canada
 - .1 The Canadian System of Soil Classification, Third Edition, 1998.
- .2 Canadian Council of Ministers of the Environment
 - .1 PN1340-[2005] , Guidelines for Compost Quality.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

1.4 QUALITY ASSURANCE

- .1 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Section 01 32 16.19- Construction Progress Schedules - Bar (GANTT) Chart .

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling, reuse in accordance with Section 01 74 19- Waste Management and Disposal .
- .2 Divert unused soil amendments from landfill to official hazardous material collections site approved by Departmental Representative.
- .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 Fertilizer:
 - .1 Fertility: major soil nutrients present in following amounts:
 - .2 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.
 - .3 Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil.
 - .4 Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil.
 - .5 Calcium, magnesium, sulphur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
 - .6 Ph value: 6.5 to 8.0 .
- .2 Peatmoss:
 - .1 Derived from partially decomposed species of Sphagnum Mosses.
 - .2 Elastic and homogeneous, brown in colour.
 - .3 Free of wood and deleterious material which could prohibit growth.
 - .4 Shredded particle minimum size: 5 mm.
- .3 Sand: washed coarse silica sand, medium to course textured.

2.3 SOURCE QUALITY CONTROL

- .1 Advise Departmental Representative 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.
- .4 Testing of topsoil will be carried out by testing laboratory designated by Departmental Representative.
 - .1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

Part 3 Execution

3.1 STRIPPING OF TOPSOIL

- .1 Begin topsoil stripping of areas as indicated after area has been cleared of brush, weeds and removed from site.
- .2 Strip topsoil to depths as indicated on drawings.
 - .1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.
- .3 Stockpile in locations as as directed by Departmental Representative
 - .1 Stockpile height not to exceed 2 m.
- .4 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill..

- .5 Protect stockpiles from contamination and compaction.

3.2 PREPARATION OF EXISTING GRADE

- .1 Verify that grades are correct.
 - .1 If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.
 - .1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
 - .2 Remove debris which protrudes more than 75 mm above surface.
 - .3 Dispose of removed material off site.
- .4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.
 - .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.3 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

- .1 Place topsoil after Departmental Representative has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm.
- .3 For sodded areas keep topsoil 15 mm below finished grade.
- .4 Spread topsoil as indicated to following minimum depths after settlement.
 - .1 150 mm for seeded areas.
 - .2 135 mm for sodded areas.
 - .3 300 mm for flower beds.
 - .4 500 mm for shrub beds.
- .5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.4 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 Departmental Representative.
 - .1 Leave surfaces smooth, uniform and firm against deep footprinting.

3.5 ACCEPTANCE

- .1 Departmental Representative will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.6 SURPLUS MATERIAL

- .1 Dispose of materials off site in accordance with Section 01 74 19 – Waste Management and Disposal..

3.7 CLEANING

- .1 Proceed in accordance with Section 01 74 11- Cleaning .
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .3 Separate waste materials for recycling, reuse in accordance with Section 01 74 19- Waste Management and Disposal

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Not Used

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Section 01 31 19- Project Meetings .
- .2 Scheduling:
 - .1 Schedule hydraulic seeding to coincide with preparation of soil surface.
 - .2 Schedule hydraulic seeding using grass mixtures and mixtures containing Trefoil or Crownvetch between dates recommended by Provincial Agricultural Department.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures .
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for seed, mulch, tackifier, fertilizer, liquid soil amendments and micronutrients.
- .3 Submit in writing to Departmental Representative seven (7) days prior to commencing work:
 - .1 Volume capacity of hydraulic seeder in litres.
 - .2 Amount of material to be used per tank based on volume.
 - .3 Number of tank loads required per hectare to apply specified slurry mixture per hectare.
- .4 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .5 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and with manufacturer's written instructions .
- .2 Delivery and Acceptance Requirements:
 - .1 Labelled bags of fertilizer identifying mass in kg, mix components and percentages, date of bagging, supplier's name and lot number.
 - .2 Inoculant containers to be tagged with expiry date.
- .3 Storage and Handling Requirements:

- .1 Store fertilizer off ground, indoors and in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Replace defective or damaged materials with new.

1.5 WARRANTY

- .1 For seeding, 12 months warranty period is extended to 1 full growing season.
- .2 End-of-warranty inspection will be conducted by Departmental Representative .

Part 2 Products

2.1 MATERIALS

- .1 Seed: "Canada pedigreed grade" in accordance with Government of Canada Seeds Act and Regulations.
 - .1 Grass mixture: "Certified", "Canada No. 1 Lawn Grass Mixture" in accordance with Government of Canada "Seeds Act" and "Seeds Regulations" and having a minimum germination of 75% and minimum purity of 97%.
 - .1 Mixture composition:
 - .1 15% Perennial ryegrass "Fiesta 3"
 - .2 30% Creeping Red Fescue "Aberdeen"
 - .3 15% Kentucky Blue "Quantum Leap"
 - .4 15% Kentucky Blue "Limousine"
 - .5 25% Kentucky Blue "BeDazzled"
 - .2 Mulch: specially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring , free of germination and growth inhibiting factors with following properties:
 - .1 Type I mulch:
 - .1 Made from wood cellulose fibre.
 - .2 Organic matter content: 95% plus or minus 0.5%.
 - .3 Value of pH: 6.0.
 - .4 Potential water absorption: 900%.
 - .3 Tackifier: water dilutable, liquid dispersion containing polyvinyl acetate terpolymer emulsion o colloidal polyacharide tackifier, adhering ti mulch during manufacturing, non toxic and without growth or germination inhibiting factors .
 - .4 Water: free of impurities that would inhibit germination and growth.
 - .5 Fertilizer:
 - .1 To Canada "Fertilizers Act" and Regulations.
 - .2 Complete synthetic, slow release with 35% of nitrogen content in water-insoluble form.
 - .6 Inoculants: inoculant containers to be tagged with expiry date.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for hydraulic seeding in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after approval to proceed from Departmental Representative.

3.2 PROTECTION OF EXISTING CONDITIONS

- .1 Protect structures, signs, guide rails, fences, plant material, utilities and other surfaces not intended for spray.
- .2 Immediately remove any material sprayed where not intended as directed by Departmental Representative .

3.3 PREPARATION OF SURFACES

- .1 Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.
- .2 Fine grade areas to be seeded free of humps and hollows.
 - .1 Ensure areas are free of deleterious and refuse materials.
- .3 Cultivated areas identified as requiring cultivation to depth of 25mm.
- .4 Ensure areas to be seeded are moist to depth of 150 mm before seeding.
- .5 Obtain Departmental Representative's approval of grade and topsoil depth before starting to seed.

3.4 FERTILIZING PROGRAM

- .1 Apply Fertilizer at a rate recommended by the manufacturer. Apply after fine grading and prior to compaction. Mix thoroughly into upper 50mm of topsoil.
- .2 Apply fertilizer at a time recommended by the manufacturer.

3.5 PREPARATION OF SLURRY

- .1 Measure quantities of materials by weight or weight-calibrated volume measurement satisfactory to Departmental Representative . Supply equipment required for this work.
- .2 Charge required water into seeder. Add material into hydraulic seeder under agitation. Pulverize mulch and charge slowly into seeder.
- .3 After materials are in seeder and well mixed, charge tackifier into seeder and mix thoroughly to complete slurry.

3.6 SLURRY APPLICATION

- .1 Hydraulic seeding equipment:
 - .1 Slurry tank.
 - .2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and/or mechanical agitation method.
 - .3 Capable of seeding by 50 m hand operated hoses and appropriate nozzles.
- .2 Slurry mixture applied per hectare.
 - .1 Seed: grass 300 kg
 - .2 Mulch: Type I 1400 to 2000 kg/Ha depending on slope and recommended by the supplier.
 - .3 Tackifier: apply at the rate of 50 to 100 kg/Ha depending on slope and recommended by the supplier.
 - .4 Water: Minimum 30,000 L. or quantity as required to form slurry in accordance to manufacturers recommendation.
 - .5 Fertilizer: apply at a rate as recommended by the supplier
- .3 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.
 - .1 Using correct nozzle for application.
 - .2 Using hoses for surfaces difficult to reach and to control application.
- .4 Blend application 500 mm into adjacent grass areas or sodded areas previous applications to form uniform surfaces.
- .5 Re-apply where application is not uniform.
- .6 Remove slurry from items and areas not designated to be sprayed.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning .
 - .1 Leave Work area clean at end of each day.
 - .2 Keep pavement and area adjacent to site clean and free from mud, dirt, and debris at all times.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning .
 - .1 Clean and reinstate areas affected by Work.
- .3 Waste Management: separate waste materials in accordance with Section 01 74 19- Waste Management and Disposal .
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
 - .2 Divert unused fertilizer from landfill to official hazardous material collections site approved by Departmental Representative.

3.8 PROTECTION

- .1 Protect seeded areas from trespass until plants are established.
- .2 Remove protection devices as directed by Departmental Representative.

3.9 MAINTENANCE DURING ESTABLISHMENT PERIOD

- .1 Perform following operations from time of seed application until acceptance by Departmental Representative.
- .2 Grass Mixture:
 - .1 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.
 - .2 Mow grass to 50 mm whenever it reaches height of 70 mm. Remove clippings which will smother grass as directed by Departmental Representative .
 - .3 Fertilize seeded areas after 10 weeks after germination provided plants have mature true leafsSpread half of required amount of fertilizer in one direction and remainder at right angles.
 - .4 Control weeds by mechanical or chemical means utilizing acceptable integrated pest management practices.
 - .5 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.
- .3 Legume Mixture:
 - .1 Repair minor dead and bare spots as determined by Departmental Representative to allow establishment of seed prior to acceptance.
 - .2 Repair major dead and bare spots as determined by Departmental Representativein accordance with site climatic averages and recommendations of local agricultural governmental representative.
 - .3 Remove clippings that will smother plants Departmental Representative.
 - .4 Water seeded areas to maintain optimum soil moisture level for germination and continued growth. Control watering to prevent washouts.

3.10 ACCEPTANCE

- .1 Seeded areas will be accepted by Departmental Representative provided that:
 - .1 Plants are uniformly established. Seeded areas are free of rutted, eroded, bare or dead spots.
 - .2 Areas have been mown at least twice .
 - .3 Areas have been fertilized.
- .2 Areas seeded in fall will achieve final acceptance in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

3.11 MAINTENANCE DURING WARRANTY PERIOD

- .1 Perform following operations from time of acceptance until end of warranty period:
 - .1 Repair and reseed dead or bare spots to satisfaction of Departmental Representative.

- .2 Mow areas seeded to 50 mm whenever it reaches height of 70 mm. Remove clippings that will smother grassed areas as directed by Departmental Representative.
- .3 Fertilize seeded 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 .

END OF SECTION