

Part 1 GENERAL**1.1 REFERENCE STANDARDS**

- .1 American Society for Testing and Materials International, (ASTM) :
 - .1 ASTM A 53/A 53M-18, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless;
 - .2 ASTM A 90/A 90M-13 (2018), Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings;
 - .3 ASTM A 121-13 (2017), Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire;
 - .4 ASTM A 653/A 653M-18, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Office des normes générales du Canada (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.
- .3 CSA Group (CSA)/CSA International :
 - .1 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .4 Department of Justice Canada (Jus) :
 - .1 Canadian Environmental Protection Act, 1999 (S.C. 1999, c. 33).
- .5 Health Canada - Workplace Hazardous Materials Information System (WHMIS) :
 - .1 Safety data sheets (SDSs).
- .6 The Master Painters Institute (MPI) - Architectural Painting Specification Manual – (2014) :
 - .1 MPI # 18, Organic Zinc Rich Primer.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings
 - .1 Convene pre-installation meeting 1 week prior to beginning work of this Section and on-site installation, with Contractor's Representative and Departmental Representative to :
 - .1 Verify project requirements;
 - .2 Review installation and substrate conditions;
 - .3 Co-ordination with other building subtrades;
 - .4 Review manufacturer's written installation instructions and warranty requirements.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - *Submittal Procedures*;
- .2 Contractor shall provide shop drawings of motorized barriers, manual barriers and crash bars that meet the design criteria described in sections 2.3, 2.4, 2.5 and 2.6 of this section. Shop drawings may differ from plans if they meet the design criteria and types of maneuvers presented in this section;
- .3 Shop Drawings for motorized barriers, manual barriers and crash bars :
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada;
 - .2 Shop drawings must indicate, for each type of barrier and for the crash bar, the layout of the hardware, the spaces and clearances required, as well as the details and characteristics of the electrical accessories, including voltage, power of the motors, auxiliary controls and wiring diagrams;
 - .3 Identify installation tolerances required, assembly conditions, routing of service lines, locations of operating components, controls and boxes.
- .4 Test reports: submit test reports certifying that products, materials and equipment comply with the physical characteristics and performance criteria.

1.4 CLOSEOUT SUBMITTALS

- .1 Operation and Maintenance Data: submit operation and maintenance data for motorized barriers and crash bars and their parts for incorporation into manual.

1.5 QUALITY ASSURANCE

- .1 Certifications: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 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 off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area;
 - .2 Store and protect barriers from nicks, scratches, and blemishes;
 - .3 Replace defective or damaged materials with new.

Part 2 PRODUCTS**2.1 MATERIALS**

- .1 Chain link fence fabric: according to CAN / CGSB-138.1 :
 - .1 Type 1, Class A, (zinc plated after weaving, hot dipped galvanized), minimal wire diameter: 4,8 mm;

- .2 Mesh size: 50,8 mm;
- .3 Height of the fence: Variable, see on construction plans;
- .4 The average zinc coating weight shall not be less than 610 g / m² of uncoated wire;
- .5 Minimum tensile strength: 10 000 N.
- .2 Barrier frame and bracing: in accordance with ASTM A 53 / A 53M, standard galvanized steel pipe with an outside diameter of 73 mm or of 42.2 mm for the peripheral frame, as shown on plans;
- .3 Posts: galvanized steel pipes, according to CAN / CGSB-138.2, with a maximum elastic limit of 344 MPa, dimensions shown on plans :
 - .1 Corner post: outside diameter of 168,3 mm, linear density 28,2 kg/m;
 - .2 Straining post: outside diameter of 114,3 mm, linear density 15,9 kg/m.
- .4 Tie wires: 3,7 mm (9 gauge) galvanized steel;
- .5 Tension bars: Galvanized steel, according to ASTM A 653 / A 653M, at least 5 mm x 20 mm;
- .6 Assembly and hardware parts in accordance with CAN / CGSB-138.2, galvanized steel :
 - .1 Galvanized steel tension bar band, minimum 3 mm x 20 mm;
 - .2 Galvanized steel post caps for water tightness, securely fastened to posts and carrying the top rail;
 - .3 Watertight overhead connections to secure top rails and post arms to support barbed wire;
 - .4 Post arms measuring 625 mm in length at a 45-degree angle from the horizontal, with fasteners or niches 450 mm apart to maintain 2 rows of barbed wire;
 - .5 Turnbuckles to be drop forged.
- .7 Zinc Rich Organic Coating: to CAN / CGSB-1.181;
- .8 2,5 mm diameter barbed wire made of galvanized zinc-coated steel in accordance to CAN / CGSB-138.2, with 4 tips every 150 mm;
- .9 Barbed tape consisting of 20 mm x 0.5 mm galvanized steel tape clenched around a galvanized spring steel core wire 2.5 mm in diameter to form a 710 mm nominal diameter concertina coil. When installed, the diameter of the coil stretched should be 630 mm and the space between the loops should not exceed 230 mm. Blades should be 20 mm from one end to the other and the barbed wire should be spaced approximately 45 mm from center to center;
- .10 Grounding Pins: in accordance with Section 26 05 28 – *Grounding secondary*.

2.2 FINISHES

- .1 Galvanizing :
 - .1 For chain link fabric: to CAN/CGSB-138.1;
 - .2 For pipe: 610 g/m² minimum to ASTM A 90;
 - .3 For barbed wire: to CAN/CGSB-138.2;
 - .4 For other fittings: to CAN/CSA-G164.

2.3 MOTORIZED SLIDING BARRIERS



.1 Design criteria :

- .1 The motorized sliding barriers must provide a free clearance of **7,3 m** or 4,5 m wide as shown on plans and a free height of 4,5 m;
- .2 The motorized sliding barrier must have a three points locking device (bottom, middle and top) or a rack and pinion locking mechanism and a locking column to hang the barrier;
- .3 The locking column shall be provided with an easily accessible manual override mechanism;
- .4 The actuating mechanism and rail must be protected from the weather and heated to operate in all conditions. The teeth of the rack, if any, may not be protected, but they must be oriented downwards and visible to the operator of the mechanism;
- .5 External perimeter motorized sliding barrier and associated crash bars must be designed to support additional weight;
- .6 A guide rail must be installed under the barrier;
- .7 Motors must be installed near the ground to ensure easy access for maintenance;
- .8 All barrier components must be galvanized.

.2 Types of maneuver

- .1 Depending on the type of operation, the motorized sliding barriers must be equipped with the following equipment :
 - .1 Electric operation, using an electric door opener.
- .2 The movement of the door from a closed position must only be possible electrically or mechanically;
- .3 Sliding doors must be equipped with a system limiting the closed and open position of the door;
- .4 Sliding doors must not be able to be opened simultaneously;
- .5 Sliding doors must be interlocked to prevent them from being unlocked simultaneously;
- .6 External and internal perimeter sliding doors must be manually lockable.

.3 Electric door openers

- .1 Electric motors, control devices, pushbutton remote controls, relays and other electrical equipment: CSA and ULC approved;
- .2 Motor capable of operating a sliding barrier at a speed of up to 500 mm per second. The speed must be adjustable and can be chosen by the operator on site;
- .3 The motor must be protected against overloads;
- .4 Operating devices :
 - .1 Push button remote control stations.
- .5 Brake designed to stop and hold the door in any position;

- .6 Auxiliary maneuver: hand-cranked, at ground level, to disengage the engine and maneuver the doors manually;
- .7 Safety contacts: electromechanical or electropneumatic devices placed in the bottom rail of the doors and over the entire length of the latter, intended to cause the stop and the immediate reassembly of the door on detection of an obstacle.

2.4 CRASH BARS

- .1 Crash bars are attached to the sliding gates or rack rail and must be remotely controlled at the same time as the sliding gates;
- .2 Crash bars must be made of an I-steel beam or rectangular bars placed on heavy-duty anti-friction rollers. A 6804-kg vehicle traveling at 48,3 km/h must be rendered unusable after hitting the bar in a test equivalent to obtaining US Department of State (K4) certification.;
- .3 The crash bar must be supported by a minimum of three (3) heavy supports that also serve as protection for the external perimeter fence. The safety bar must always rest on two (2) heavy supports, in open or closed position.

2.5 MANUAL SLIDING BARRIER

- .1 Design criteria :
 - .1 The manual sliding barrier must provide a clearance of 4.9 m wide by 4.5 m high;
 - .2 The manual sliding barrier must have a closing device in three points (bottom, middle and top);
 - .3 The rail must be able to support the weight of the barrier and all accessories;
 - .4 All barrier components must be galvanized.
- .2 Types of maneuver :
 - .1 Sliding doors must be equipped with a system limiting the closed and open position of the door;
 - .2 External and internal perimeter sliding doors must be manually lockable.

2.6 MANUAL 2 DOOR SWING GATES

- .1 Design criteria :
 - .1 Swing gates must provide a clearance of 4 m wide;
 - .2 The swing gate for vehicles must have a closing device in three points (bottom, middle and top);
 - .3 All barrier components must be galvanized.



2.7 LOCK AND KEY PATH FOR BARRIERS

- .1 The lock types and key path information are shown in the table below. For security reasons, the key path numbers will be provided by SCC during the Works.

Location	Barrier names	Types of barriers	Type of lock / padlock	Other information
Main entrance (west side)	BM 1-1; BM 1-2	Motorized sliding barrier	Folger Adam electro-mechanical or approved equivalent	Same key path for 2 motorized barriers
	BP 1-2 BP 1-2 BP 1-3	Pedestrian gate	BEST security padlock or approved equivalent	
Barrier 20 (North side)	BM 2-1 BM 2-2 BM 2-3	Motorized sliding barrier	Folger Adam electro-mechanical or approved equivalent	Same key path for 3 motorized barriers
	BM 2-4 BM 2-5	Motorized sliding barrier	Folger Adam electro-mechanical or approved equivalent	Same key path for 2 motorized barriers
	BP 2-1 BP 2-2 BP 2-3	Pedestrian gate	Folger Adam electro-mechanical or approved equivalent	Same key path for 3 gates
East Entrance	BV 3-1 BV 3-2 BV 3-3	Barrier for vehicles	BEST security padlock or approved equivalent	

- .2 Three (3) spare lock cases must be provided.
- .3 Three (3) spare mechanisms for opening pedestrian gates must be provided

Part 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for automatic entrances installation 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 INSTALLATION

- .1 Install motorized sliding barriers in accordance with manufacturer's instructions;
- .2 Install electric motors, control devices, push-button control stations, relays and all other electrical equipment required to operate motorized sliding barriers;
- .3 Also install all necessary power wiring from the connection point near each barrier;
- .4 Adjust moving parts so that sliding barriers operate smoothly.

3.3 FIELD QUALITY CONTROL

- .1 Have manufacturer of products supplied under this Section review Work involved in handling, installation/application, protection and cleaning of its products, and submit written reports in acceptable format to verify compliance of Work with Contract;
- .2 Schedule site visits to review Work at stages listed :
 - .1 After delivery and storage of products, and when preparatory Work on which Work of this Section depends is complete, but before installation begins;
 - .2 Twice during progress of Work at 25% and 60% complete.
 - .3 Upon completion of Work, after cleaning is carried out.

3.4 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* :
 - .1 Clean galvanized steel surfaces according to the manufacturer's instructions.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - *Construction/Demolition Waste Management and Disposal*.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction;
- .2 Repair damage to adjacent materials caused by aluminum door and frame installation.

END OF SECTION