This specification outlines the requirements for the supply and installation of chain link security fence and gates.

PART 1 REFERENCES

This specification refers to the following standards, specifications, or publications:

ASTM International

A53/A53M	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
A90/A90M	Standard Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
A121	Standard Specification for Metallic-Coated Carbon Steel Barbed Wire
A123/A123M	Standard Specification for Zinc (Hot Dip Galvanized) coatings on Iron and Steel Products
A392	Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric
A653/A653-M	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

CSA Group

A23.1/A23.2	Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete
~~G164~~	~~Hot Dip Galvanizing of Irregularly Shaped Articles~~

Canadian General Standard Board (CGSB)

138.1	Fabric for Chain Link Fence
138.2	Steel Framework for Chain Link Fence
138.3	Installation of Chain Link Fence
138.4	Gates for Chain Link Fence
1.181	Ready-Mixed Organic Zinc-Rich Coating

PART 2 GENERAL

2.1 SUBMITTALS

.1 Submit in accordance with Section 01340 – Shop Drawings, Samples and Submissions.

.2 Product Data:

1. Submit manufacturer's instructions, printed product literature and data sheets for concrete mixes, fences, posts and gates and include product characteristics, performance criteria, physical size, finish and limitations.

2.2 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01600 – Material and Equipment.

.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.

PART 3 PRODUCTS

3.1 MATERIALS

.1 Concrete:

1. In accordance with ~~Section 03300~~ and CSA A23.1/A23.2.

~~2.~~.1 Concrete mix design to produce 30 MPa a minimum compressive strength at 28 calendar days containing 20 mm maximum size coarse aggregate with water/cement ratio and Air Category in accordance with CSA A23.1/A23.2, for Class "C2" exposure and 60 mm slump at time and point of deposit. Air entrainment in accordance with CSA A23.1/A23.2.

.2 Chain-link fence fabric in accordance with CAN/CGSB-138.1.

1. Type 1, Class A, medium style, grade as indicated in Contract Documents.

2. Height of wire: as indicated.
3. Steel wire fabric shall conform to the requirements of ASTM A392.
4. Typical widths are 1200 mm and 1800 mm. ~~The fabric shall be 1829 mm wide with~~
~~4.~~5. The mesh shall have a uniform 50 mm diamond pattern ~~chain link mesh~~ closed at one edge by knuckling and at the other edge by twisting to form a barb. The wire shall be 3.5 mm diameter.

.3 Posts, braces and rails: to CAN/CGSB-138.~~1~~2, continuous weld schedule 40 galvanized steel pipe. Dimensions as indicated.

~~.3~~1. All posts shall be fitted with waterproof caps so designed as to fit and fasten securely over the posts and carry the top rail.
2. Top rail: tubular or fabricated steel section continuously joined by means of sleeves or couplings throughout each stretch of fence extending between terminal posts.
3. Brace: tubular or fabricated steel section used for bracing terminal posts.

.4 Bottom tension wire: to CAN/CGSB-138.2, single strand, galvanized, steel wire, 5 mm diameter or as indicated.

.5 Tie wire fasteners: single strand, galvanized steel~~aluminum~~ wire conforming to requirements of fence fabric, 5 mm diameter.

.6 Tension bar: to ASTM A653, 5 x 20 mm minimum galvanized steel.

.7 Tension bar bands: 3 x 20 mm minimum galvanized steel or 5 x 20 mm minimum aluminum.

.8 Gates in accordance with CAN/CGSB-138.4. ~~Gates shall be in sizes defined as the distance between the inside faces of the gate posts.~~

.9 Gate frames in accordance with with ASTM A53/A53M, galvanized steel pipe, standard weight 42.~~9~~2 mm O.D. ~~1.pipe for outside frame, 31.8 mm O.D. pipe for interior bracing~~.

~~1.~~2. Fabricate gates as indicated with electrically welded joints, and hot-dip galvanized or painted with zinc pigmented paint after~~with~~ welding.
~~2.~~3. Fasten fence fabric to gate with twisted selvage at top.
~~3.~~4. Furnish gates with galvanized malleable iron hinges, latch and latch catch with provision for padlock that can be attached and operated form either side of installed gate.
~~4.~~5. Furnish double gates with chain hook to hold gates open and centre rest with drop bolt for closed position.

.10 Fittings and hardware: to CAN/CGSB-138.2,~~cast aluminum alloy,~~ galvanized steel ~~or malleable or ductile cast iron~~.

1. Tension bar bands: 3 x 20 mm minimum galvanized steel.
2. Post caps to provide waterproof fit, to fasten securely over posts and to carry rail.
3. Overhang tops to provide waterproof fit, to hold top rails and an outward projection to hold barbed wire overhang (when indicated on drawings).
4. Provide project with clips or recesses to hold 3 strands of barbed wire spaced 100 mm apart.
5. Projection of approximately 300 mm long to project from fence at 45 degrees above horizontal.

.106. Turnbuckles to be drop forged.

.11 Organic zinc rich coating: to CAN/CGSB-1.181.

.12 Barbed wire: 2 mm diameter galvanized steel wire in accordance with ASTM A121, 4 point barbs 125 mm spacing.

.13 Grounding rod: 16 mm diameter copperweld rod, 3 m long, if indicated.

.12.14 The fabric and other components used on gates shall match those of the fence and shall be subject to the same quality requirements.

3.2 FINISHES

.1 Galvanizing:

1. For chain link fabric: 490 g/m^2 minimum in accordance with CAN/CGSB-138.1.
2. For pipe: 550 g/m^2 minimum in accordance with ASTM A90/A90M.
3. For barbed wire in accordance with CAN/CGSB-138.2ASTM A121, Class 2.
4. For other fittings: in accordance with ASTM A123/A123MCAN/CSA G164-M92.

.2 Aluminum coating:

1. For barbed wire in accordance with ASTM A121, Class 2.

.3 Vinyl coating:

1. 1.8 mil dry film thickness minimum.

PART 4 EXECUTION

4.1 EXAMINATION

.1 Verification of Conditions: Verify conditions of substrate previously installed under other Sections or Contracts are acceptable for fence and gate installation in accordance with manufacturer's written instructions.

1. Inform the Owner of unacceptable conditions immediately upon discovery.
2. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from the Owner.

4.14.2 GRADING

.1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.

.11. Provide clearance between bottom of fence and ground surface of neither less than 30 mm tonor more than 50 mm.

4.24.3 ERECTION OF FENCE

.1 Erect fence along lines indicated or as directed, and in accordance with CAN/CGSB-138.3.

.2 Excavate post holes to dimensions indicated on contract drawings. Bulb bottom of holes for corner, end and gate posts and for intermediate posts at every 60 m along fence line.

.3 Space line posts 3 m apart, measured parallel to ground surface.

.4 Space straining posts at equal intervals not exceeding 150 m if distance is greater than 150 m between end or corner posts on straight continuous lengths of fence over reasonably smooth grade.

.5 Install additional straining posts at sharp changes in grade and where directed by the Owner.

.6 Install corner post where change in alignment exceeds 10 degrees.

.7 Install end posts at end of fence and at buildings.

.71. Install gate posts on both sides of gate openings.

.8 Place concrete in post holes then embed posts into concrete to depths indicated.

1. Extend concrete 50 mm above ground level and slope to drain away from posts.

.82. Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.

.9 Do not install fence fabric until concrete has cured a minimum of 5 calendar days.

.10 Install brace between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface.

.101. Install braces on both sides of corner and straining posts in similar manner.

.11 Install overhang tops and caps.

.12 Install top rail between posts and fasten securely to ~~terminal~~ posts and secure waterproof caps and overhang tops.

.13 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.

.14 Lay out fence fabric. 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.

1. Knuckled selvedge at bottom.
.142. Twisted selvedge at top.

.15 Secure fabric to top rails, line posts and bottom tension wire with tie wires at 450 mm intervals. Give tie wires minimum two twists.

.16 Install barbed wire strands and clip securely to lugs of each bracket.

.16.17 Install grounding rods as indicated.

4.34.4 INSTALLATION OF GATES

.1 Install gates in locations indicated or where directed.

.2 Level ground between gate posts and Sset gate bottom approximately 40 mm above ground surface.

.3 Determine position of centre gate rest for double gate. Cast gate rest in concrete. Dome concrete above ground level to shed water.

.4 Install gate stops where indicated.

4.44.5 TOUCH UP

.1 Repair damaged galvanized surfaces.

.11. Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of organic zinc-rich paint to damaged areas.
.22. Pre-treat damaged surfaces according to manufactures' instructions for zinc-rich paint.

~~4.5~~4.6 CLEANING

.1 Clean and trim areas disturbed by operations. Dispose of surplus excavated material and replace damaged sod as directed.

PART 5 PAYMENT

5.1 MEASUREMENT FOR PAYMENT

.1 Supply and install of chain link fence will be measured in metres installed and shall include the length of brace panels. Gate openings shall not be measured.

.2 Supply and install of barb wire and brackets will be measured in metres.

.3 Supply and install of chain link fence gates will be measured as units, regardless of the size and type of gate erected. Gates shall be in sizes defined as the distance between the inside faces of the gate posts.

.4 Posts will not be measured but considered incidental to the work.

.5 The cost to repair any damage to the zinc coating shall be deemed to be included in the contract price of the appropriate tender item listed above.

5.2 BASIS OF PAYMENT

.1 All costs associated with the work outlined in this specification shall be deemed to be included in the appropriate unit and lump sum prices quoted as outlined in the Measurement for Payment subsection of this section and as included in the MERX Schedule of Quantities and Prices.

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