

# Appendix D – Fence Layout and Specification



**MMCD Section 32 31 13S Chain Link Fences and Gates**

**1.0 GENERAL**

**1.2 References**

- Add 1.2.2 CAN/CGSB-138.1-M80, Fence, Chain Link Fabric
- Add 1.2.3 CAN/CGSB-138.2-M80, Fence, Chain Link, Framework, Zinc-Coated, Steel.
- Add 1.2.4 CAN/CGSB-138.3-M80, Fence, Chain Link Installation.
- Add 1.2.5 CAN/CGSB-138.4-M82, Fence, Chain Link, Gates.
- Add 1.2.6 CSA G164-M1981, Hot Dip Galvanizing of Irregularly Shaped Articles.
- Add 1.2.7 ASTM A90-81, Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.
- Add 1.2.8 ASTM A53-88a, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
- Add 1.2.9 CGSB 1-GP-181M-77, Coating, Zinc-Rich, Organic, Ready Mixed.

**1.4 Samples**

- Delete 1.4.1 and replace with the following  
 Prior to the start of the work, submit a 300 mm long powder-coated pipe sample that will be representative of the quality of the powder-coating for all powder-coated fencing materials installed as part of the *Work*.

**1.6 Inspection and Testing**

- Add 1.6.2 The surface of the posts and rails will be scratch tested to ensure the finish does not flake. Finishes that flake when scratched will be rejected.

**1.7 Qualifications**

- Add 1.7.1 Execute work in this Section only by a *Contractor* who has adequate equipment, skilled tradesmen, and materials to perform the work expeditiously and to the contract specifications.

**2.0 PRODUCTS**

**2.1 Materials**

- Delete 2.1.1 and replace with the following
- Delete 2.1.3 and replace with the following
  - Chain-link fence fabric: to CAN/CGSB-138.1.
  - 1. All chain link fabric shall be galvanized, vinyl coated, black, commercial and heavy grade with 50 mm openings. The widest rolls of fabric shall be employed in the construction of the appropriate fence type (i.e. 1200 mm wide rolls for 1200 mm high fencing and 2400 mm wide rolls for 2400 mm high fencing, etc.).
  - 2. Fabric gauges, fabric opening sizes, fence heights, and post spacing shall be as follows:
    - .1 For passive and low activity City and Park areas the chain link fence shall be:
      - .1 1200 mm high with the post spacing 3000 mm o.c. and,

- .2 Chain link fabric shall be 9 gauge (3.55 mm diameter) galvanized, vinyl coated, black, commercial grade with 50 mm openings.
- .2 For high activity City and Park areas the chain link fence shall be:
  - .1 1200 mm high with the post spacing 2400 mm o.c. and,
  - .2 Chain link fabric shall be 6 gauge (4.50 mm) galvanized, vinyl coated, black, commercial and heavy grade with 50 mm openings
- .3 For the baseball diamond backstop the chain link fence shall be:
  - .1 4600 mm and higher with the post spacing 2400 mm o.c and,
  - .2 Chain link fabric shall be 6 gauge (4.50 mm) galvanized, vinyl coated, black, commercial and heavy grade with 38mm openings.
- .4 For the soccer playing field backstop fences the chain link fence shall be:
  - .1 6000 mm and higher with the post spacing 2400 mm o.c and,
  - .2 Chain link fabric shall be 6 gauge (4.50 mm) 6 gauge galvanized, vinyl coated, black, commercial and heavy grade with 38 mm openings.

Delete 2.1.4 and replace with the following

Posts and rails for all fencing locations are to CAN/CGSB-138.2, schedule 40 galvanized steel pipe and shall be powder-coated black steel pipe. No short lengths, tubing, conduit or open seam material will be permitted.

- .1 Post and rail sizes shall be as follows:
  - .1 For passive/active public/non-public areas which are 1200 mm or 2400 mm and higher:
    - .1 Corner and gate posts shall be 75 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.
    - .2 Line posts shall be 60 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.
    - .3 Top and bottom rails and horizontal braces shall be 48 mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.
  - .2 Baseball diamond backstop which are 4600 mm and higher:

- .1 Corner and line posts shall be 114 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.
  - .2 Top, bottom, and horizontal bracing rails shall be 48 mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.
  - .3 Post extensions for the overhang shall be 75 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe. At connection install welded 13 mm plate steel gussets as per the drawings herein. Overhang horizontal rails and bracing shall be 48 mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.
- .3 Soccer playing field backstop which are 6000 mm and higher:
- .1 Corner and line posts shall be 89 mm nominal outside diameter, standard continuous weld Schedule 40 powder-coated black steel pipe.
  - .2 Top, bottom, and horizontal bracing rails shall be 48 mm nominal outside diameter, plain ends, continuous lengths, standard continuous weld Schedule 40 powder-coated black steel pipe.

Delete 2.1.5 and replace with the following

Bottom tension wire: single strand, black vinyl gated galvanized steel wire, 6 gauge (4.5mm Diameter).

Delete 2.1.6 and replace with the following

Tie wire fasteners shall be single strand, black vinyl coated galvanized aluminium or steel wire conforming to requirements of fence fabric.

Delete 2.1.7 and replace with the following

Tension bars: 4.76 x 19 mm minimum galvanized black power coated steel.

Delete 2.1.8 and replace with the following

Tension bar bands: 3 x 20 mm galvanized black powder coated steel or 5x20 mm minimum black powder coated aluminium.

Delete 2.1.9 and replace with the following

Install the chain link fence person gates and vehicle gates as shown on the *Contract Drawing*.

- .1 Chain Link Vehicle Gates.



- .1 The vehicle gates shall not be used as a centre post. The closure device shall be operated by securing the gates together when in the closed position. The closure device shall be operated independent of the locking pins. Closure device must accept a standard padlock.
  - .2 The vehicle gate is to have locking pins with locking pin aluminum sleeves recessed 25 mm into the concrete walkway to secure the gates in the open and closed positions. The top of the sleeve shall be flused with the surrounding concrete surface. The locking pin rod shall be spring-loaded so that the pin is always in the raised position unless pushed and turn locked into place, as per the drawings herein.
  - .3 The vehicle gate shall be to the full height of the fence and shall not be bridged with a top rail over it as to eliminate any restrictions on the height of objects passing through the gate.
  - .4 The vehicle gate is to operate on wheels which fully support the weight of the gate. The wheels must be suitable for use on concrete surfaces and must not mark the concrete surface.
  - .5 Vehicle gates shall not have signage inserts.
  - .6 All hinges shall be welded into place.
- .2 Chain Link Person Gates.
- .1 The person gates are to have clear openings of 1219 mm.
  - .2 The person gates shall be used as a closure device to operate by securing the gate to the gate post when in the closed position. The closure devices shall be operated independent of the locking pins. Closure device must accept a standard padlock.
  - .3 The person gates shall have locking pins with locking pin aluminum sleeves recessed 25 mm into the concrete walkway to secure the gates in the open and closed positions. The top of the sleeve shall be flushed with the surrounding concrete surface. The locking pin rod shall be spring-loaded so that the pin is always in the raised position unless pushed and turn locked into place, as per the drawings herein.
  - .4 For soccer playing field entry gates, the gates shall not have locking pins for the open positions. Field entry gates shall be able to swing 180 degrees wide and lock open by attaching to main fence line.

			<p>.5 The person gates shall be to the full height of the fence and shall not be bridged with a top rail over them as to eliminate any restrictions on the height of objects passing through the gate.</p> <p>.6 All hinges shall be welded into place.</p>
		Delete 2.1.10 and replace with the following	All fastenings and fittings shall be hot dip galvanized. All caps shall be powder coated black and welded in place.
<b>2.2</b>	<b>Finishes</b>	Add 2.2.4	<p>Powdercoating:</p> <p>.1 Powdercoat all exposed surfaces. Powder coating to use powdercoat paint on acid washed surfaces. Wash and coating shall be completed on a conveyor system. Dipping is not acceptable. Finish must be baked dry. Colour shall be black except for backstop signage and signage inserts which are to have <i>Owner</i> selected custom colours.</p> <p>.2 The powder-coat finish must not crack or chip when scratched tested.</p>
		Add 2.2.5	Organic zinc rich Galvicon paint coating: to CGSB 1_GP-181M shall be applied to all joints, welds and damaged areas. Two coats are required. Paint to have a high gloss finish. Use black or a custom colour as necessary to match the surrounding powder-coating.
<b>3.0</b>	<b>EXECUTION</b>		
<b>3.1</b>	<b>Grading</b>	Delete 3.1 and replace with the following	<p>.1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.</p> <p>.2 Accurately survey and layout the specified work as shown on the <i>Contract Drawing</i>.</p> <p>.3 The installation procedures for all materials must be in strict accordance with the manufacturer's specifications and provide for a long-term successful installation of all materials.</p>
<b>3.2</b>	<b>Installation of Fence</b>	Delete 3.2 and replace with the following	<p>.1 Erect fences along lines as shown on the <i>Contract Drawing</i> and in accordance with CAN/CGSB-138.3.</p> <p>.2 Space straining posts at equal intervals not exceeding 150 metres if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade is greater than 150 metres.</p> <p>.3 Install end posts at end of fence and at changes in fence alignment. Install gate posts on both sides of gate openings.</p> <p>.4 Embed posts into concrete to depths indicated. Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.</p>

- .5 Do not install fence fabric or pickets until concrete has cured a minimum of 5 days.
  - .6 Install intermediate rail between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface. Install intermediate rails on both sides of corner and straining posts in similar manner.
  - .7 Install and weld overhang tops and caps.
  - .8 Install rails between posts and weld securely to terminal posts and secure waterproof caps and overhang tops.
  - .9 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. Knuckled selvedge at bottom. Twisted selvedge at top.
  - .10 For sport activity fencing provide clearance between bottom of fence and concrete curb neither less than 15 mm nor more than 40mm. In other areas provide 50 to 75 mm clearance between the bottom of the fence and the ground. The clearance under all rails shall be consistent.
  - .11 Secure fabric to rails and posts with tie wires as follows. Give tie wires a minimum of two twists.
    - .1 At every knuckle for 50 mm opening mesh.
    - .2 At every second knuckle for 38 mm opening mesh.
    - .3 At every fourth knuckle for 25 mm opening mesh.
- 3.3 Removal and Re-use of Usable Existing Chainlink Fabric** Add 3.3
- .1 Cut tie wires and remove existing fabric. Take care not to stretch or otherwise damage the fabric. Do not re-use damage portions of existing fabric.
  - .2 Cut fabric to length and height as required. Ensure cut edges are properly and securely tied. Attach fabric as per the specifications herein.
  - .3 All surplus fabric shall be rolled up into roll sizes that are manageable by one person and handed over to the City if, requested to do so. Damaged fabric shall be disposed of off-site.
- 3.4 Removal and Re-use of Usable Existing Chainlink Posts and Rails** Add 3.4
- .1 Cut existing posts and rails taking care to maximize the usable length of the existing post or rail. Do not re-use damage posts or rails.
  - .2 Cut posts and rails as required. Prepare surfaces and powder-coat as per the specifications herein. Install posts and rails as per the specifications

			herein. 2400 mm post spacing can be adjusted to accommodate re-used rails. Ensure that where spacing is adjusted it is consistent and in one section of fence.
			.3 Dispose of damaged or surplus posts, rails, and mesh off-site.
3.5	<b>Touch Ups</b>	Add 3.5	.1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of black high gloss organic zinc-rich Galvicon paint to damaged areas, allowing the manufacturer's recommended drying time between coats. Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint. .2 Wire brush, clean, and paint all welds with two coats of high gloss zinc rich Galvicon paint, allowing the manufacturer's recommended drying time between coats. Use paint colour that matches surrounding powder-coated surfaces.
3.6	<b>Site clean-Up</b>	Add 3.6	Upon completion of the work remove all containers, surplus materials, and installation debris, etc. Project area must be left in a clean and orderly condition.
3.7	<b>Maintenance Supplies</b>	Add 3.7	Upon completion of the work, the <i>Contractor</i> shall provide the <i>City</i> with maintenance materials consisting of the following. .1 Two (2) 500 ml cans of black high gloss organic zinc-rich paint. .2 One (1) 500 ml can of high gloss organic zinc-rich paint of each custom colour. .3 Four (4) packages of 50 tie wires.
3.8	<b>Protection</b>	Add 3.8	.1 The <i>Contractor</i> is responsible for the protection of all new and existing facilities from damage and/or disfiguration from the processes of the Work and from vandalism. Any damage or disfiguration must be repaired promptly and to the original condition of the facility prior to the damage. .2 Acceptance of the repair work is at the sole discretion of the <i>Contract Administrator</i> and the <i>City</i> . All repairs must be completed and accepted prior to <i>Total Performance</i> of the Work being granted.