

1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 35 29 - Health, Safety and Emergency Response Procedures.
- .3 Section 03 30 00 - Cast-in-Place Concrete.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM A53/A53M-02, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A90/A90M-01, Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
 - .3 ASTM A121-99, Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
 - .4 A653/A653M-03, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .5 ASTM F1664-01, Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.
- .2 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.
- .3 Canadian Standards Association (CSA International).
- .4 The Master Painters Institute (MPI) - Architectural Painting Specification Manual - March 1998.

1.3 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings to indicate: size, connectors, wire fabric, hardware, details.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Collect and separate for disposal waste material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .3 Separate for reuse and place in designated containers steel waste in accordance with Waste Management Plan.
- .4 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Departmental Representative.
- .5 Divert unused concrete materials from landfill to local quarry.
- .6 Unused paint or coating material must be disposed of at official hazardous material collections site.
- .7 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .8 Fold up metal banding, flatten and place in designated area for recycling.

2 Products

2.1 MATERIALS

- .1 Concrete mixes and materials: in accordance with Section 03 30 00 - Cast-in-Place Concrete.
 - .1 Nominal coarse aggregate size: 20-25.
 - .2 Compressive strength: 32 MPa minimum at 28 days.
- .2 Concrete forms: Tubular fiber forms; diameters to suit concrete bases.
 - .1 Acceptable Material:
 - .1 Sonotube
- .3 Chain-link fence fabric: to CAN/CGSB-138.1.
 - .1 Type 1, Class A, medium style, Galvanized Steel.
 - .2 Height of fabric: as indicated.
 - .3 50 mm Diamond by 9 Gauge Wire.
 - .1 Not less than 366 g/m² average on a minimum of 2 specimens
 - .2 Cannot be less than 330 g/m² on any specimen.
 - .4 Posts, braces and rails: to CAN/CGSB-138.2, hot dipped galvanized, schedule 40 hot dipped galvanized steel pipe, scale free, medium style.
- .4 Top tension wire: to CAN/CGSB-138.2, single strand, galvanized steel wire.
- .5 Bottom tension wire: 6 gauge single strand, aluminum or galvanized steel wire conforming to requirements of fence fabric, 5mm diameter.
- .6 Tie wire fasteners: single strand, aluminum or galvanized steel wire conforming to requirements of fence fabric, 5mm diameter.
- .7 Tension bar: to ASTM A653/A653M, 5 x 20 mm minimum galvanized steel.
- .8 Tension bar bands: 3 x 20mm minimum galvanized steel or 5 x 20mm minimum aluminum.
- .9 Fittings and hardware: cast aluminum alloy or galvanized steel. Post caps provide waterproof fit, to fasten securely over posts and to carry top rail. Turnbuckles to be drop forged.
- .10 Gates: to CAN/CGSB-138.4.
- .11 Gate frames: to ASTM A53/A53M, galvanized steel pipe, standard weight 45 mm outside diameter pipe for outside frame, 35mm 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.
 - .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 Furnish single emergency gate with galvanized malleable iron hinges, automatic emergency release from inside, lockable from exterior side. provide all necessary supports for mounting.
 - .5 Padlocks supplied by Departmental Representative.
 - .6 Furnish double gates with chain hook to hold gates open and center rest with drop bolt for closed position.
- .12 Fittings and hardware: to CAN/CGSB-138.2, cast aluminum alloy.
 - .1 Tension bar bands: 3 x 20 mm minimum galvanized steel or 5 x 20 mm minimum aluminum.
 - .2 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.
 - .3 Overhang tops to provide waterproof fit, to hold top rails and an outward projection to hold barbed wire overhang.
 - .4 Provide projection 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.
- .6 Turnbuckles to be drop forged.
- .13 Organic zinc rich coating: to CAN/CGSB-1.181.
- .14 Grounding rod: 16 mm diameter copperwell rod, 3 m long.

2.2 FINISHES

- .1 Galvanizing:
 - .1 For chain link fabric: to CAN/CGSB-138.1 Grade 2, 488 g/m².
 - .2 For pipe: 550 g/m² minimum to ASTM A90.
 - .3 For barbed wire: to ASTM A121, Class 2.
 - .4 For other fittings: to CAN/CSA-G164.
- .2 Aluminum coating:
 - .1 For barbed wire: to ASTM A121, Class 2.
- .3 Vinyl coating: to ASTM F1664.
 - .1 0.045 mm dry film thickness minimum.

3 Execution

3.1 GRADING

- .1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.
 - .1 Provide clearance between bottom of fence and ground surface of 30mm to 50mm.

3.2 ERECTION OF FENCE

- .1 Erect fence along lines as indicated and to CAN/CGSB-138.3.
- .2 Excavate post holes as follows:
 - .1 Terminal/straining/end/corner/gate posts: 450mm diameter x 2000mm deep.
 - .2 Line Posts: 300mm diameter x 2000mm deep.
- .3 Excavate post holes to dimensions indicated.
- .4 Space line posts 3 m apart, measured parallel to ground surface.
- .5 Space straining posts at equal intervals not to exceed 150 m if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade, is greater than 150 m.
- .6 Install additional straining posts at sharp changes in grade and where directed by Departmental Representative.
- .7 Install corner post where change in alignment exceeds 10 degrees.
- .8 Install end posts at end of fence and at buildings.
- .9 Install gate posts on both sides of gate openings.
- .10 Place concrete in post holes or fiber forms as shown then embed posts into concrete to depths indicated.
 - .1 Extend concrete 50 mm above ground level and slope to drain away from posts.
 - .2 Brace to hold posts centered, in plumb position and true to alignment and elevation until concrete has set.
 - .3 Provide all protection during concrete placing and curing in hot and cold weather, and to CAN3-A23, Clause 21.
- .11 Do not install fence fabric until concrete has cured minimum of 5 days.
- .12 Install brace between end and gate posts and nearest line post, placed in center of panel and parallel to ground surface.
 - .1 Install braces on both sides of corner and straining posts in similar manner.
- .13 Install overhang tops and caps.

- .14 Install top rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.
- .15 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.
- .16 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.
 - .2 Twisted selvedge at top.
- .17 Secure fabric to top rails, line posts and bottom tension wire with tie wires at 450 mm intervals.
 - .1 Give tie wires minimum two twists.
- .18 Install barbed wire strands and clip securely to lugs of each projection.
- .19 Install grounding rods as indicated.

3.3 INSTALLATION OF GATES

- .1 Install gates in locations as indicated.
- .2 Level ground between gate posts and set gate bottom approximately 40 mm above ground surface.
- .3 Determine position of center gate rest for double gate.
 - .1 Cast gate rest in concrete as directed.
 - .2 Dome concrete above ground level to shed water.
- .4 Install gate stops.

3.4 TOUCH UP

- .1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of organic zinc-rich paint to damaged areas as indicated.
 - .1 Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.
 - .2 Clean and trim areas disturbed by operations. Dispose of surplus excavated material.

END OF SECTION
