

The Executed Agreement including General Conditions and Supplementary Conditions, Division 01, applicable drawings and amendments are part of and are to be read in conjunction with this Section

## PART 1 - GENERAL

### 1.1 SUMMARY OF THIS SECTION

- .1 As summarized and described herein, but not restricted to the following:
  - .1 Providing exterior laterally load designed bearing stud walls, as noted on the documents.

### 1.2 REFERENCES

- .1 ASTM A307-14, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength
- .2 ASTM A653/A653M-13, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- .3 ASTM A780/A780M-09, "Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings".
- .4 CAN/CGSB-7.1-98, "Lightweight Steel Framing Components".
- .5 CSA W47.1-09 (R2014), "Certification of Companies for Fusion Welding of Steel Structures".
- .6 CSA W59-13, "Welded Steel Construction (Metal Arc Welding)"
- .7 CSA S136-12 Package, "Cold Formed Steel Structural Members".

### 1.3 QUALITY ASSURANCE

- .1 Do welding in accordance with CSA S136 and CSA W59.
- .2 Companies engaged in welding: certified by the Canadian Welding Bureau to CSA W47.1, with welding procedures approved and welders qualified for the base material types and thicknesses that are to be welded.

### 1.4 DESIGN CRITERIA

- .1 Structural properties in accordance with CSA S136, limit states design principles using factored loads and resistances.
  - .2 Loads and load factors in accordance with the National Building Code.
  - .3 Resistances and resistance factors in accordance with the National Building Code.
-

- .4 Select studs which will deflect under specified lateral loads not more than for wall studs supporting masonry veneer cladding. Limit free play and movement in connections perpendicular to the plane of the framing to 1/16" relative to the building structure.
- .5 Space wall studs at 16" maximum intervals.
- .6 Stud depth is shown on the drawings. Adjust stud material thickness, stud spacing, or both as required by design criteria.
- .7 Design metal stud systems and attachments to accommodate the full range of tolerances permitted in adjoining materials.
- .8 Take into account local loadings due to anchorage of cladding and interior wall mounted fixtures where shown.
- .9 Design bridging to prevent member rotation and member translation perpendicular to the minor axis for lateral load bearing studs. Provide for secondary stress effects due to torsion between lines of bridging. Sheathing may be used to help restrain member rotation and translation perpendicular to the minor axis for wind bearing studs. Do not rely on cladding, sheathing, or insulation for lateral bracing. Provide metal bridging at 5'-0" o.c. maximum. Use closer spacing if required by structural design.

#### 1.5 SUBMITTALS

- .1 Submit shop drawings indicating design loads, member sizes and spacings, materials, thicknesses exclusive of coatings, section properties, coating specifications, connection and bridging details, types, sizes, and spacing of fasteners or welds, and tolerances. Indicate locations, dimensions, openings, tolerances, and requirements for coordination of adjoining Work.
  - .2 Show nominal weld leg sizes for materials less than 1/8" thick. For such welds the throats shall not be less than the thickness of the thinnest connected part.
  - .3 Show coordination with masonry connectors for exterior cladding.
  - .4 Submit two (2) certified copies of mill reports covering chemical and mechanical properties, and coating designation of steel used in the Work.
  - .5 Submit product data for mechanical fasteners, indicating sizes, load capacities, and type of corrosion protection.
  - .6 Submit samples of all framing components and fasteners if requested.
  - .7 Do not construct Work until review of submittals other than field review reports is completed.
  - .8 Submit two (2) copies of field review reports.
-

## 1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.
- .2 Trade Contractor to ensure that all packaging, recycling material is to be placed in appropriate labelled containers.
- .3 The majority of components specified for this section shop fabricated contractor to ensure that all loose end components remaining after installation are taken back to shop for possible re-use.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Steel sheet: to CSA S136, with hot-dip Zinc galvanized metallic coating.
- .2 Hot-dip Zinc galvanized coating: to ASTM A653/A653M.
- .3 Welding materials: to CSA W59.
- .4 Welding electrodes: 480 MPa minimum tensile strength series (e.g. E480XX, E480S-X).
- .5 Primer: zinc-rich organic, to SSPC-10.

### 2.2 FRAMING

- .1 Member configurations and cutouts: to CAN/CGSB-7.1.
- .2 Steel studs: roll-formed of electrolytic Zinc coated galvanized Aluminum-Zinc coated steel sheet of thickness, material, and profile dictated by design, identified as to thickness by indelible markings or colour coded by thickness as follows:

Colour	Nominal Base Metal
<u>Code</u>	<u>Thickness</u>
Green	.06"
- .3 Tracks: cold-formed of same kind of steel sheet as studs, of same or greater thickness, identified or colour coded in the same manner.
- .4 Bridging channels: 1 1/2" x 1/2" x 1/16" min. cold-formed of galvanized steel sheet.
- .5 Bridging clips: angles of 1/16" min. galvanized steel sheet, with 1 1/2" legs and length less than stud depth by up to 1/2", prepunched for screw attachment to studs and bridging.
- .6 Cutouts: provide cutouts to fit bridging at intervals of 4'-0" o.c.; centre cutouts on web of studs; limit unreinforced cutouts to the following dimensions:

Member <u>Depth</u>	Max. Across Member <u>Depth</u>	Max. Along Member <u>Length</u>	Min. Centre To Centre <u>Spacing</u>	Min. from <u>End*</u>
3 5/8"	1 1/2"	4 1/2"	2'-0"	1'-0"
4"	1 1/2"	4 1/2"	2'-0"	1'-0"
6"	2 1/2"	4 1/2"	2'-0"	1'-0"
8"	2 1/2"	4 1/2"	2'-0"	1'-4"

\*to cutout centerline

### 2.3 FASTENERS

- .1 Concrete anchors: threaded fasteners designed to screw into in pre-drilled holes in concrete, expansion anchors, or drilled adhesive-set stud anchors; with minimum shank diameter of 1/4" 400 Series stainless steel coated with zinc and dichromate conversion
- .2 Bolts and nuts: to ASTM A307, with large flat washers, hot dip galvanized steel.
- .3 Screws: hex, pan, or wafer head, self-drilling, self-tapping sheet metal screws, zinc or cadmium plated with 0.008 mm minimum coating. Select fasteners known not to strip with the combination of material thicknesses being fastened and tools to be used.

## PART 3 - EXECUTION

### 3.1 WORKMANSHIP

- .1 Cut members using saw or shears.

### 3.2 ERECTION

- .1 Construct framing piece by piece.
- .2 Erect framing true and plumb within specified tolerances. Take actual built dimensions of previously constructed work into account and accommodate them by adjusting position of framing. Make all field measurements necessary to ensure fit of all members.
- .3 Provide temporary bracing, if required for framing to sustain loads applied during erection and subsequent construction.
- .4 Anchor tracks securely to structure at 24" o.c. maximum. Place one additional anchor within 4" of each end of each piece of track, and additionally as required by structural design.
- .5 Erect studs plumb and in alignment, and attach both flanges to legs of top and bottom tracks with one screw, No. 8 minimum diameter, at each connection (4 per stud). Do not splice studs.
- .6 Reinforce cutouts which occur within 1/2" of the end of a stud. Align stud cutouts horizontally. Do not allow additional cutouts to be made in the field, except as approved by the Engineer responsible for preparation of shop drawings.

- .7 Use flexible stud clips to attach studs to overhead structures. Use sliding stud clips to attach studs to overhead structures. Leave a minimum gap of 1/2" to accommodate structural movement. Design end connections for maximum take-up of play plus lateral deflection under full design load.
- .8 Install additional studs at not more than 2" from abutting walls, openings, terminations against other materials, and on each side at corners.
- .9 Frame all openings in stud walls, except openings less than 4" in any dimension, and provide framing at points of attachment of wall mounted fixtures to adequately carry loads by using additional framing members and bracing as required structurally.
- .10 Brace steel studs with horizontal bridging channels through stud cutouts, flat strap bridging at maximum vertical centres of 4'-0" for brick veneer. Fasten horizontal bridging channels to each stud with bridging clips using four (4) No. 8 min. diameter screws or by welding.
- .11 Install bridging in longest practical lengths. Where splices are required, make them more than one stud space long, with each end fastened at a stud, or reinforce splices with inverted channel bridging pieces 12" long, centred on the joint, and fastened at ends (4 screws or welds, 1 at each end of reinforcement, 1 at end of each spliced piece).
- .12 Co-ordinate erection of studs with installation of service lines.
- .13 Use screws long enough to penetrate beyond joined materials by more than three (3) exposed threads. Use wafer-head fasteners or welds where panel products will be installed against the attachment.
- .14 Use screws with drilling and holding capabilities recommended by the manufacturer for the materials being fastened. Select different screws if initial selection fails to drill effectively, or tends to strip out.
- .15 Repair damaged zinc coating and all welds using zinc-rich primer in accordance with ASTM A780.
- .16 Provide track head and shoe at all structural cross-bracing intersections, refer to structural detail.

### 3.3 ERECTION TOLERANCES

- .1 Plumb: 1/500 of member length maximum.
- .2 Straightness (camber and sweep): 1/1000 of member length, maximum. Replace members with local buckling or bends.
- .3 Spacing: not more than 1/8" from design spacing, non-cumulative.
- .4 Location: within 3/8" of indicated alignment, and within 5 mm where alignment of structure permits.

- .5 Gap between end of stud and web of track (when connected): 0.16" maximum.
- .6 Alignment of adjoining or abutting members in the same plane, where supporting continuous cladding or sheathing: 0.04" maximum.

#### 3.4 FIELD QUALITY CONTROL

- .1 The Engineer responsible for design of the metal stud system shall review the work in progress at the site prior to covering of the work.
- .2 These field reviews shall include review of mill test reports, welded connections, member sizes and material thickness, coating thickness, screwed connections, erection tolerances, and all field cutting, including cutting and patching for other trades.

END OF SECTION