## STRUCTURAL STEEL

All structural steel work shall conform to the recommendations and requirements contained in the "Manual of Steel Construction, Loac and Resistance Factor Design" (AISC Third Edition), and "Structural Welding Code - Steel" (AWS D1.1, latest edition). Steel fabricator shall be an AISC certified plant for complex steel structures or scheduled to be AISC certified within six months of being awarded the project. Non-certified fabricator shall provide documents indicating status of AISC certification to owner within five business days after bid. If fabricator is not certified at time of fabrication of steel for this project, it will be subject to rigorous additional special inspections not required for certified fabricators. The non-certified fabricator shall anticipate reimbursing the owner for the cost of these additional special inspections.

... All wide flange sections ("W Shapes"), fy = 50 ... Other rolled shapes, plates and bars unless ot .... Steel tubes. fy = 46 ksi.
... Steel pipe. fy = 35 ksi.
... All bolts for connecting structural members, unless otherwise noted.
... All anchor bolts, unless otherwise noted.
... Threaded rods, unless otherwise noted.
... fy = 105 ksi. High strength threaded rod whe

Note: A325 bolts shall be limited to 3/4" and 1" diameter (UON), with two bolts (minimum) at each "TC Bolts" (Tension Control). Holes for bolts shall be 1/16" larger than bolt diameter (UON).

No change in size or position of the structural elements shall be made without prior shall be hot-dip galv

Nonshrink grout shall be 5000 psi (min.) compressive strength

E7.

Temporary erection bracing shall be provided to hold structural steel securely in position. only after permanent members are in place and final connections are in place.

E6.

Ë

<u>E</u>9. Shop connections unless otherwise noted, shall be made by welding. Pretensioned and slip critical high strength Tension-Control" type bolts (Twist-off TC-Bolts or approved equal). Bolted connections shall be "slip critical" ty connections (where indicated), fully pretensioned "shear/bearing" type connections at bracing bays, and may be "

All shop and field welds shall be made by certified welders, and shall conform to the American Welding Soc edition. Carefully control welding technique to avoid distortion, including clamping prior to welding. iety Code, AWS DI.I, la

Electrodes for all field and shop welding shall conform to AWS E70-XX. Minimum weld size shall be 3/16" fillet (UON).

EIO.

E12. Ξ. All structural steel shall be shop primed except (a) structural steel to be fireproofed locations); and (b) top flanges of beams to which metal deck is welded shall not be proceedings. Field welding shall be inspected by qualified welding inspectors.

Connections shown on these drawings are generally schematic. They are intended to define the spatial relationship of the framed members and show a feasible method of making the connection. Where partial information is given on these drawings, it shall be the minimum requirement for the connection. Where bolts are shown but no number is given, the connection has not been completely detailed. Any connection that is not shown or is not completely detailed on the structural drawings shall be designed by a professional engineer registered in the State of Maine retained by the fabricator. Completely detailed means the following information is shown on the shop detail drawings:

All plate dimensions and grades.
All weld sizes, pitches, and returns.
All hole sizes and spacings.
Number and types of bolts.
Painting / Galvanizing requirements.

esign calculations for all beam connections (including beams within bracing bays and steel stairs) shall be submitted to the Structural rigineer for review and written approval prior to fabrication. Calculations shall be stamped by a structural engineer retained by the bricator and licensed in the state of Maine.

Substantial alterations of schematic connection details may impact architectural concept and shall not be made without prior written approval of the Structural Engineer.

COLD-FO

RMED METAL FRAMING

Ξ

Contractor shall submit erection drawings for exterior cold-formed framing based on architectural drawings, specifications, and these notes (uon). Submittal shall indicate all field connection details showing size / quantity of fasteners, size/gauge/location of clip angles, blocking, framing sizes/gages, tracks, and other pertinent information.

All stud walls connected to bottom flanges of beams shall have slip tracks at top which permit vertical beam deflection of span/240 at floor framing and span/180 at roof framing.

See framing plans for beam reactions.

Cuts, holes, coping, etc., required for work of other trades shall be shown on the shop drawings and made in the shop. of holes in structural steel members in the field will not be permitted, unless approved in writing by the Structural Engin ete) or below finish grade shall be

<u>m</u> &

EI 9.

E17.

EI 6.

EI 5.

All beams and columns encased in masonry (or corthick, or shall be galvanized. ovide galvanized steel angle lintels over all openings in the sof wall thickness. Lintels shall have a minimum of

L4  $\times$  3 I/2  $\times$  5/16 for clear spans less than 4'-0" L5  $\times$  3 I/2  $\times$  5/16 for clear spans 4'-0" to less than 6'-0" L6  $\times$  3 I/2  $\times$  3/8 for clear spans 6'-0" to less than 8'-6" L6  $\times$  4  $\times$  7/16 for clear spans 8'-6" to less than 10'-0" L7  $\times$  4  $\times$  7/16 for clear spans 10'-0" to less than 11'-6".

5

The structural engineer retained by the cold form contractor shall perform at least one site visit to observe installation of engineered cold form framing. The cold form engineer shall document the site visit by sending a brief letter to the architect stating that the installe cold-form framing appears to be in general conformance with the approved cold form submittal and that observed items needing correction have been corrected.

Contractor shall submit stamped calculations for cold-formed framing at exterior walls and for cold form trusses. Structural engineer shall be currently registered in Maine. Maximum horizontal deflection of wall studs shall not exceed 1/360 of wall height at EIFS (or metal) wall panels or 1/600 of wall height at walls with masonry veneer.

<del>7</del>.

£3.

ially loaded studs shall not be permitted. Exterior

F2.

el members shown on plans but not identified as to size, section or material grade shall be included in the bid price for the ming sizes, sections or material grades shown for similarly loaded members having approximately the same overall length. bers and their associated costs shall be identified in the bid for the work.

E2 I.

Channel stringers for stairs shall be C12x20.7, typical.

Stairs shall be designed for dead load plus the worst case of 100 psf uniform centrated live load at any location. Provide additional support members not sitional cost to the owner. n live load, 100 psf nor shown on design docu б

F9.

All work shall meet the requi

All galv Grade shall be

vanized studs 12, 14, and 16 gage shall be formed from steel that corresponds to the minimum requirements of ASTM A-446, D with a minimum yield of 50,000 psi. All galvanized 18 gage studs, all galvanized track bridging end closures, and accessories e formed from steel that corresponds to the requirements of ASTM A-446, Grade A with a minimum of 33,000 psi.

F7.

All studs shall be forn

steel having a minimum G-60 galvar

zed coating, in co

of ASTM A-525.

All ext contrac quality

erior wall studs shall be marked with the manufacturer's name and gage size of material, and it shall be incumbent upon this ctor to notify the manufacturer, in writing, of this requirement. In lieu of this requirement, the contractor may submit a written control statement for review and approval describing how framing of different gauges is distinguished.

Hangers for stair landings shall be HSS 3x3x1/4 (minimum).

ng with the AISC

o bear" at locations von drawings.

Ends of columns at bearing conn Holes for utilities in structural steel shall not exceed 2" diameter in approval from the structural engineer. Penetrations shall be drilled. at column splices shall be "finished to bear" to ensure unifrom and shall not exceed 13/16" diameter

E26.

E25.

E24.

E23.

F15.

ers shall be .145" dia

ctural steel and .177"

See Detail E8 / S5.2 for additional requirements pertaining to cold form trusses

Ancho engine

orage of cold-formed metal framing to adjacent structural components, including four ering calculations and clearly detailed on cold-formed metal framing shop drawings.

wall studs shall not be installed until concrete slabs have been placed.

Minimum 10" unpunched steel is required at both ends of joists and studs. When field cutting redusteel, web stiffener shall be installed.

n 10" unpu

All studs shall be seated squarely in tracks and have full bearing against inside track web (top and bottom) prior to stud and track attachment. Tracks shall be attached to a common structural element.

All fasteners connecting light gage members and accessories shall be a minimum of No. 12 size on center. Number of fasteners shall be as shown on details. All fasteners shall be galvanized.

erican Society for Testing and Materials (ASTM).

ican Welding Society (AWS) D1.3 Structural Welding Code - Sheet Steel.

can Iron and Steel Institute (AISI) Specification for the Design of Cold-Formed Steel Structural Mer

nents of the latest edition of the following standards:

### STRUCTU RAL STEEL (CONTINUED)

Metal

Metal roof deck shall be galvar work and materials pertaining to metal deck shall conform to Steel Deck Institute codes, specifications,

Metal roof deck shall be 1 1/2" thick, wide rib (Type B), Fy = 33 ksi (min.), 20 gage, 3 span minimun

At all end supports, intermediate supports, and sides of deck adjacent to walls:

At sidelaps: (3) #10 tek screw sidelap fasteners per span deck shall be 2-inch, 20 gage, three span minimum, Fy=40~ksi

mposite floor deck shall be fastened unless noted otherwise:

At all end and intermediate supports: 5/8" diameter puddle welds at 11" o.c. (33/4 pattern)

At sidelaps: #10 tek screws at equal spaces between supports at 24" o.c.

steel bar joists shall conform to the following (UON):

Oper

Il work and materials pertaining to open web steel joists shall conform to Steel Joist Institute "Standard Specifications for Open Steel Joists" and "Recommended Code of Standard Practice for Steel Joists and Joist Girders." oms attached to steel joists shall be attached to panel points of joists only, or an additional diagonal joist from the location of the concentrated load to a panel point (see typical details).

c. Provide bridging at the first panel point of roof joists to accommodate wind uplift loads. Provide additional bridging in accordance with SJI requirements for steel bar joists. Joist manufacturer shall verify all bridging sizes, types, and locations for gravity and uplift loads All required joist bridging shall be specified and provided by the joist fabricator.

d. All bridging and bridging anchors shall be completely installed before construction loads are placed on the joists. Bridging shall support the top chord against lateral movement during the construction period and shall hold the joist in approximate location as shown on the plans.

e. Steel joists shall be shop primed per specifications.

f. Bottom chords of all joists shall be designed to support a service load of 10 psf or an equolocated at any point along bottom chord panels.

Concrete slabs shall encase all columns on all sides except at designated stair, elevator, or mechanical chase openings, support angles or brackets where necessary to accommodate this requirement.

ion control bolt assemblies shall conform to ASTM F1852. All bolts shall be lubric

Twist-

The fal 1705.3. ator and erector of the structural steel frame shall submit a "Statement of Responsibility" in accordance with IBC section

E33. aral Steel Erector shall notify the owner's special inspector in a timely manner so that scheduling of independent continuous tion can be performed during the placement of slip-critical bolts, field fillet welds larger than 5/16 inch, and multi-pass field we type (per IBC table 1704.3).

Structural steel shop drawings shall be submitted in at most two phases for the entire project. Each phase shall be a complete "stand alone" package containing all stamped calculations, erection drawings, piece drawings, and other specified items. Specific questions pertaining to the shop drawings, design criteria, or other items shall be submitted to the architect in writing for review and comment.

E34.

ving (UON):

Wind Load

# **DESIGN LOADS**

Typical Floor = 100 psf.
Typical Floor Corridor = 100 psf.
Stairs = 100 psf.
Mechanical Equipment Room = 125 psf or equipment weight.

a. Pf = 51 psf (plus drift loads).
b. Ce = 1.0.
c. Is = 1.2.
d. Ct = 1.0.

a. IE = 1.5. b. Spectral Respo Ss = .376. S1 = .100.

Bearing Capacity = 8000 psf at spread footings.
Bearing Capacity = 5000 psf at strip footings.
Frost Depth = 4'-0".
Retaining Wall Parameters
\* "Active:" Ka = 0.33.
\* "At-Rest:" Ko = 0.45.
\* "Passive:" Kp = 3.0.
\* Soil Unit Weight = 125 pcf.
\* Sliding Coefficient = 0.40.
IBC Seismic Soil Site Class: "B."

ABBRE

SI = .100.

c. Spectral Response Coefficients:
 SDS = .251.
 SDI = .067.

d. Seismic Design Category = "C."
e. Seismic Force Resisting Systems:
 Structural Steel System Not Speci
 Detailed for Seismic Resistance
 Detailed for Seismic Resistance
 Design Base Shear:
 E (N/S) = 328k.
 E (E/W) = 328k.
 Cs (N/S) = .071.
 Cs (E/W) = .071.
 Qs (E/W) = .071.
 Qs (E/W) = 3.0.
 R (N/S) = 3.0.
 R (E/W) = 3.0.
 R (E/W) = 3.0.
 R (Seismic Use Group = III.

Price Ctructural Fingineers, Inc.





7-9-07

ISSUED FOR BIDDING / CONSTRUCTION

7-9-07 DATE

ADMINISTRATION BUILDING

PORTLAND, MAINE

PROJECT TITLE: MAINE TURNPIKE AUTHORITY

BIDDING/CONSTRUCTION **DESCRIPTION** 

GENERAL STRUCTURAL NOTES