

**GENERAL NOTES:**

- The design is in accordance with the State Building Code of the Commonwealth of Massachusetts.
- The structural drawings shall be used in conjunction with the architectural, mechanical, electrical, plumbing, and landscape drawings and specifications.
- Details shown as typical are applicable to all similar conditions.
- All dimensions, elevations and conditions shall be verified in the field by the contractors and any discrepancies shall be brought to the attention of the Engineer for clarification before proceeding with the affected part of the work. For work attached to or within existing structures, the contractors shall determine all necessary dimensions, elevations and conditions required for the accurate fabrication and erection of the building components. The contractor shall verify all dimensions and conditions at the site and report any discrepancy to the engineer before ordering material and proceeding with the work. Dimensions and elevations noted in the contract documents as (+/-) and all field conditions shall be verified in the field (V.I.F.) by the contractors prior to the submission of shop drawings. Upon receipt of shop drawings, the engineer has the right to assume that all field dimensions, elevations and conditions have been verified by the contractors and that the shop drawings accurately reflect such verifications unless stated otherwise on the shop drawings.
- All blasting shall be completed prior to the placement of concrete.
- The contractor is entirely responsible for the stability of the structure during all phases of erection & construction. The contractor shall take special note that the horizontal stability of the building relies on the floor slabs and the roof deck diaphragm as well as by the bracing shown on the drawings. Temporary guys and bracings shall be provided as required in the AISC Specification considering this building as a non self-supporting frame.
- Where drawings and specifications show conflicting information, it shall be brought to the attention of the Engineer for clarification.
- General Contractor to Submit a Stamped Anchor Bolt Survey Plan of Anchor Bolt As-Builts.

**FOUNDATIONS:**

- Foundations shall bear on compacted granular fill or natural undisturbed soils having a minimum bearing capacity of 1.5 tons per square foot (as verified by the Geotechnical Engineer). Structural fill shall meet the requirements of the Geotechnical Report.
- All bottom of exterior foundations shall be a minimum of 4'-0" below finished grade, to provide adequate frost protection to footings.
- No foundations or slabs shall be placed in water or on frozen ground.
- The contractor should review the Geotechnical Report prepared by the Geotechnical Consultants. Any recommendations made by the Report shall become part of the job specifications.
- Basement level foundation walls are not designed to be free-standing. Do not place backfill without adequate bracing or until first floor framing is in place and has cured for seven days.
- Backfill on both sides of foundation and retaining walls at the same time, maintaining equal heights of backfill on each side, until final grade is reached on one side.
- If rock ledge is encountered during the excavation of the foundations, the ledge shall be overexcavated by a minimum of 12 inches. A 12 inch layer of compacted gravel shall be placed as a cushion between the ledge and the bottom of footing.

**STEEL JOISTS AND JOIST GIRDERS**

- All joists and joist girders to be manufactured by a certified Steel Joist Institute (SJI) member.
- Joist and Joist girders shall comply with SJI's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders" (hereafter, SJI's "Specifications") that are applicable to types of joists indicated.
- Prime joists with manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.
- Provide bridging anchors and number of rows of horizontal and/or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.
- Bridging shown on the drawings is schematically indicated. Detail and fabricate according to SJI's "Specifications." Furnish additional erection bridging if required for stability.
- Bridging shall not be used to support equipment, piping, conduit, ductwork, etc.
- Install and connect bridging concurrently with joist erection, before construction loads are applied.
- 1st joist space from horizontal bridging discontinuities shall be cross bridging. Cross bridging to align with top chord bridging.
- Joists and joist girders shall be designed for net uplift. (See Roof Uplift Key Plan)

**REINFORCED CONCRETE:**

- All structural concrete shall be normal weight, stone aggregate concrete, and shall be proportioned, mixed and placed under the supervision of a control engineer in accordance with ACI 318, 318 and 301 standards, latest editions. Concrete shall develop the following 28 day strengths:
  - Concrete Flatwork exposed to weather: 4500 psi (6% air entrained)
  - Exterior: walls, footings, piers and slabs: 3000 psi (6% air entrained)
  - Interior Slabs on Grade: 3000 psi (2% air entrained)
  - Slab on Deck: 3500 psi
  - All other concrete: 3000 psi
- Reinforcing bars including stirrups shall conform to ASTM A615 with 60,000 psi yield strength with minimum anchorage and splice requirements for reinforcing in accordance with ACI 318, latest edition. Welded wire fabric shall conform to ASTM A105.
- Concrete walls shall be cast in alternate panels not exceeding 90 ft. in length. The use of pour strips at splices in horizontal reinforcing may be used to extend the length of pours.
- Slabs on grade shall be placed in accordance with the latest ACI recommendations.
- Slabs on grade shall be placed on a layer of well graded granular material compacted to 95% of maximum dry density.
- Provide concrete pads for mechanical equipment according to the requirements of the manufacturer and in accordance with the typical details, and mechanical drawings.
- Detailing of reinforcement shall be according to the latest edition of ACI 318 "Details and Detailing of Concrete Structures".
- Not all openings through concrete slabs and walls are shown on structural drawings. Openings indicated on the drawings or any additional openings or inserts required must be verified with respective trades before placement of concrete.
- See architectural drawings for finishes, depressions, reglets, notches, and other architectural features.
- Concrete exposed to the exterior shall be air entrained.
- Unless noted otherwise, provide the following clear cover for reinforcing steel:
  - Footings: 3"
  - Foundation Walls: 2"
  - Interior Slabs: 1"
  - Exterior Slabs: 2"
  - Columns, Piers or Pilasters: 1 1/2" to ties.
- All exposed concrete to be rubbed to a smooth finish.
- All Anchor Bolts shall be dryset (Set prior to placement) (wet setting is unacceptable).

**STRUCTURAL STEEL & METAL DECK:**

- All structural steel work shall conform to the "Specifications for Design, Fabrication and Erection of Structural Steel for Buildings" of the American Institute of Steel Construction. All joists and joist girders shall conform to the latest Steel Joist Institute Standard Specifications.
- The structural steel shall conform to the following:
  - Structural W shapes: ASTM A572 (Grade 50) or A992
  - Plates, channels and angles: ASTM A36.
  - Structural tubing HSS: ASTM A500 Grade B or C.
  - Structural pipe: ASTM A53 Grade B.
- All floor deck to be composite floor deck (unless noted otherwise), of the size, type and finish indicated on the plans.
- All deck to be placed continuously over two or more spans except in areas where there is only one span.
- Provide 16 gage (minimum thickness) metal closures (pour stops) all around periphery and edges of openings
- All column ends shall be sawed or milled.
- The contractor shall supply all plates, clips, seat angles, connections, etc. as required for completion of the structure, even if such items are not explicitly called for on the architectural or structural drawings.
- All connections of non-composite beams where reactions are not given on the plans shall be designed for the Allowable Uniform Loads on Beams divided by two.
- Provide temporary shoring for metal deck or concrete slabs as required for those areas where they cannot support the weight of wet concrete and construction loads. Shoring shall be kept in place until concrete attains full strength.
- Design and detail all connections according to the AISC specifications.
- Design all brace connections to develop the full capacity of the member unless otherwise noted.
- All connections shall be bolted with ASTM A325 or A490 high-strength bolts or welded in accordance with AWS and AISC requirements.
- Unless otherwise noted All composite beams connections shall be designed for 2.0 times the reaction from the Allowable Uniform Loads on Beams tables. Unless noted otherwise all girders shall be designed for 1.5 times the reaction from the Allowable Uniform Loads on Beam tables. Girders are defined as horizontal framing members that support other horizontal framing members. Beams are defined as horizontal framing members which do not support other members.
- The fabricator shall submit job standards for each type of connection to be used on the project. If shop dwgs. are submitted without prior submittal of job standards the shop drawings will be returned without review.

**INTENT OF THE STRUCTURAL DRAWINGS:**

- The intent of the structural drawings is to show the main structural features and structural design for the project. Architectural details are shown incidentally only and not completely. Therefore, architectural drawings must be used in conjunction with the structural drawings.

**SHOP DRAWINGS:**

- All shop drawings submitted to the Engineer should indicate the date, revision number and issue description of the reference drawings (the structural contract drawings used to prepare the shop drawings). If shop drawings are not prepared according to the latest structural drawings, or if shop drawings are submitted without indicating reference drawings, the shop drawings will be returned without review.
- All shop drawings shall be checked by the Subcontractor and reviewed by the General Contractor prior to submission. Shop drawings which have not been checked by the Subcontractor or reviewed by the General Contractor will be returned without review.
- Review of shop drawings by the Engineer does not relieve the Contractor from full conformance to the contract documents.

**DESIGN LOADS**

The building has been designed to conform to the 2009 IBC with local amendments and to resist the following loads:

**FLOOR:**

Live Load = 40 psf  
Partition Load = 15 psf

**ROOF:**

Live Load = 20 psf

**WIND:**

- Wind Speed (3 Second Gust) V=99 MPH
- Wind Importance Factor: iw = 1.00
- Building Category II
- Wind Exposure "C"
- Internal Pressure Coefficient = ± 0.18
- Components and Cladding  
Wind Pressure See Figure 6-3 of ASCE7-05

**SNOW LOADS**

Ground Snow Pg = 50 psf  
Flat Roof SnowPf = 35 psf (IBC)  
Snow Exposure Factor Ce = 1.00  
Snow Load Importance Factor I = 1.00  
Thermal Factor Ct = 1.00

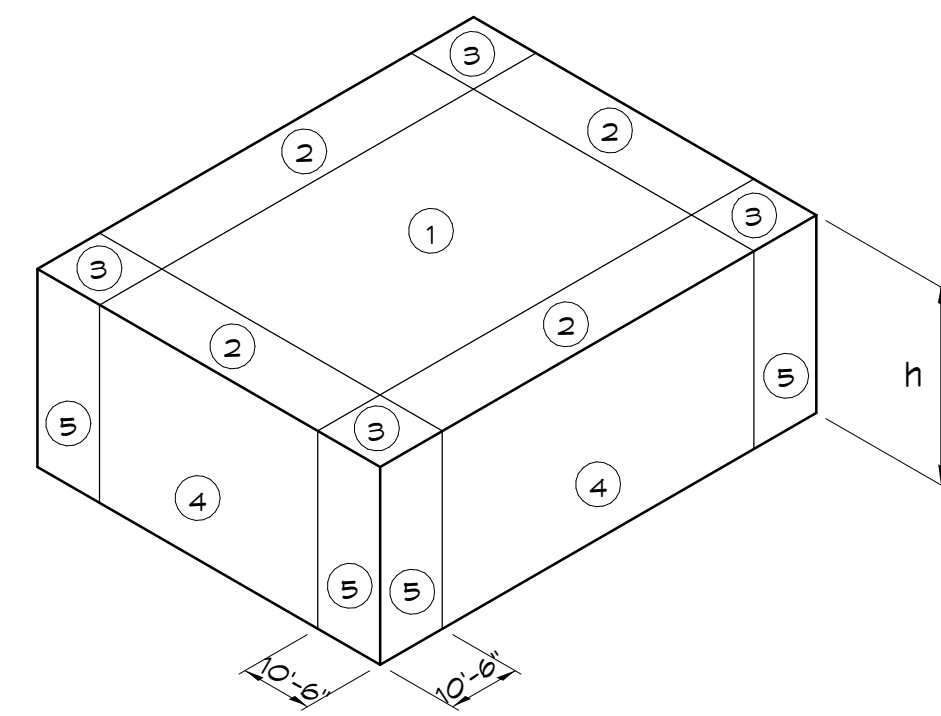
**SEISMIC LOADS**

- Seismic Importance Factor I=1.0
- Seismic Use Group(Occupancy Category): "II"
- Mapped Spectral Response Accelerations:  
Ss=0.313  
Si=0.077
- Site Class C
- Spectral Response Coefficients:  
SDS = 0.250  
SD1 = 0.087
- Seismic Design Category B
- Basic Seismic Force Resisting System:  
Steel System Not Specifically Detailed For Seismic Resistance.
- Seismic Response Coefficient(s) Cs= 0.033
- Response Modification Factor(s) R= 3.0
- Design Base Shear:  
V = 128k
- Analysis Procedure: Equivalent Lateral Force

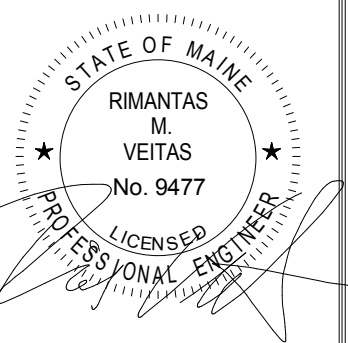
**ABBREVIATIONS OF STRUCTURAL DRAWINGS:**

|        |                         |        |                          |
|--------|-------------------------|--------|--------------------------|
| A.B.   | Anchor Bolt             | L.P.   | Low Point                |
| A.R.   | Anchor Rod              | LVL    | Laminated Veneer Lumber  |
| ARCH.  | Architectural/Architect | MC     | Moment Connection        |
| BOF    | Bottom of Footing       | MIN.   | Minimum                  |
| CJ     | Control Joint           | N.S.   | Near Side                |
| CL     | Center line             | O.C.   | On Center                |
| CONC.  | Concrete                | FL     | Plate                    |
| CMU    | Concrete Masonry Unit   | P.T.   | Pressure Treated         |
| DIA.   | Diameter                | RD     | Roof Drain               |
| DWGS.  | Drawings                | REINF. | Reinforced / Reinforcing |
| EF     | Each Face               | REQD.  | Required                 |
| EL.    | Elevation               | RTU    | Roof Top Unit            |
| EOD    | Edge of Deck            | T&B    | Top & Bottom             |
| EW B.  | Each Way Bottom         | TOC    | Top of Concrete          |
| EXIST. | Existing                | TOS    | Top of Steel             |
| FDN.   | Foundation              | TOW    | Top of Wall              |
| F.S.   | Far Side                | TYF.   | Typical                  |
| FTG.   | Footing                 | UNO.   | Unless Noted Otherwise   |
| H.P.   | High Point              | VERT.  | Vertical                 |
| HSS    | Hollow Structural Steel | V.I.F. | Verify in Field          |
| HORZ.  | Horizontal              | W      | With                     |
| LAM    | Parallam                |        |                          |
| LLH    | Long Leg Horizontal     |        |                          |
| LLV    | Long Leg Vertical       |        |                          |

Refer to project specifications for additional requirements.



| COMPONENT & CLADDING WIND PRESSURES                              |                           |                |      |
|--|---------------------------|----------------|------|
| WIND SPEED, V=99 MPH<br>MEAN ROOF HEIGHT, h=15 Ft.<br>EXPOSURE C |                           |                |      |
| ZONE   | EFFECTIVE WIND AREA (FT.) | PRESSURE (PSF) |      |
| 1  | 10                        | -40.1          | 10.0 |
|  | 20                        | -37.9          | 10.0 |
|  | 50                        | -34.9          | 10.0 |
| 2  | 100                       | -32.7          | 10.0 |
|  | 10                        | -63.0          | 10.0 |
|  | 20                        | -59.9          | 10.0 |
| 3  | 50                        | -58.7          | 10.0 |
|  | 100                       | -52.5          | 10.0 |
|  | 10                        | -85.9          | 10.0 |
| 4  | 20                        | -81.8          | 10.0 |
|  | 50                        | -76.5          | 10.0 |
|  | 100                       | -72.4          | 10.0 |
| 5  | 10                        | -27.4          | 27.4 |
|  | 20                        | -27.4          | 27.4 |
|  | 50                        | -26.0          | 25.3 |
| 5  | 100                       | -24.9          | 23.6 |
|  | 10                        | -50.3          | 27.4 |
|  | 20                        | -50.3          | 27.4 |
| 5  | 50                        | -44.5          | 25.3 |
|  | 100                       | -40.1          | 23.6 |



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Revisions:  
1 06/30/17 Steel Bid - Addendum #1  
4 08/15/17 Addendum #2

Date: JULY 2017  
Scale: 1/8" = 1'-0"  
**GENERAL NOTES**

**S2.01**

| BAR SIZE | "LAP SPLICES" | "TENSION LAP SPLICES" |          |            |          | "COMPRESSION" "LAP SPLICES" |
|----------|---------------|-----------------------|----------|------------|----------|-----------------------------|
|          |               | Fc=3000               |          | Fc=4000    |          |                             |
|          |               | ALL CONCRETE          | TOP BARS | OTHER BARS | TOP BARS |                             |
| 3        | 14"           | 28"                   | 21"      | 24"        | 19"      | 12"                         |
| 4        | 18"           | 37"                   | 29"      | 32"        | 25"      | 15"                         |
| 5        | 23"           | 46"                   | 36"      | 40"        | 31"      | 19"                         |
| 6        | 27"           | 56"                   | 43"      | 48"        | 37"      | 23"                         |
| 7        | 32"           | 61"                   | 63"      | 70"        | 53"      | 27"                         |
| 8        | 36"           | 63"                   | 72"      | 79"        | 61"      | 30"                         |
| 9        | 41"           | 105"                  | 81"      | 90"        | 69"      | 34"                         |
| 10       | 46"           | 118"                  | 91"      | 101"       | 78"      | 39"                         |
| 11       | 50"           | 131"                  | 101"     | 112"       | 86"      | 43"                         |

- NOTES:**
- ALL SPLICES TO BE "LAP SPLICES" UNLESS NOTED OTHERWISE IN SECTIONS.
  - TENSION AND COMPRESSION LAP SPLICE WILL BE INDICATED ON PLANS AND SECTIONS.
  - A TOP BAR IS A HORIZONTAL WITH AT LEAST 12" OF FRESH CONCRETE BELOW.