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| **Conformed Steel Framing** **General** **Related Sections** (List appropriate related sections here) **References** AISI/COS/NASPEC 2001 – Specification for the Design of Cold-Formed Steel Structural Members. AISI – Cold-Formed Steel Design Manual, 1996, with 1999 supplement. AISI/FOGS/2001 – Standard for Cold-Formed Steel Framing – General Provisions. AISI/COFS/2001 – Standard for Cold-Framed Steel Framing – Truss Design AISI/COFS/2001 – Standard for Cold-Framed Steel Framing – Prescriptive method for one and two story family dwelling. ASTM A 570-02e1 – Standard Test Methods and Definitions for Mechanical Testing of Steel Products ASTM C 645 – Standard Specification for Nonstructural Steel Framing Members. ASTM A 653/A 653M – Sheet Steel, Zinc-Coated (galvanized) or Zinc-Iron-Alloy-Coated (Galvanized) by the Hot-Dip Process. ASTM C-955 – Standard Specification for Load Bearing (Transverse and Axial) Steel Studs, Runner (Tracks), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases. ASTM A 1003/A1003M – Standard Specification for Sheet Steel, Carbon, Metallic and Non-Metallic Coated for Cold-Formed Framing Members. ASTM C-1007 – Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related accessories. AWS D1.1 – Structural Welding Code – Steel. AWS D1.3 – Structural Welding Code – Sheet Steel. SAE – J78, Steel Self-Drilling Tapping Screws, Latest Edition. SSPC Paint 20 – Zinc-Rich Primers (Type I and Type II – Organic). **Framing System:** Design, construct and install structural and non-structural cold formed framing in conformance with applicable building code and with AISA Standards for Cold-Formed Steel Framing including: General Provisions, Specifications for Design and Standards for Truss Design and Header Design. Design to provide for movement of components without damage, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges. Design system to accommodate construction tolerances, deflection of building structural members, and clearance of intended openings. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated in accordance with applicable building code. **SUBMITTALS** Submit under provisions of Section 01300. **Product Data:** Provide manufacturer’s standard catalog data for specific products demonstrating compliance with referenced standards. **Shop Drawings:** Show Layout, profiles, product components, anchorages, accessories, and finish colors. Indicated component details including, framed openings, bearing, anchorage, design loading, welds, type and location of fasteners, and accessories or items required of related Work. Indicate layout of all bearing members and supports including:  Studs Floor joists Ceiling joists Roof joists Floor trusses Roof trusses  Describe method for securing studs and other members to tracks and for boiled, welded and clipped framing connections. Submit calculations for loadings and stresses of all framing under Professional Engineer’s seal, who is experienced in design of this Work and licensed at the Project location. Include description of design criteria including.  Engineers analysis depicting member stresses and deflection Truss member sizes, gauges and connections at truss joints Truss support reactions Top Chord, bottom chord and web bracing requirements  Certificates: Product certificates signed by the manufacturer certifying material compliance with applicable codes, specified performance characteristics and criteria, and physical requirements. Installation Instructions: Manufacturer’s printed installation instructions. Submit special procedures, perimeter conditions requiring special attention. **DELIVERY, STORAGE, AND HANDLING** Storage and Protection Store materials is protected from exposure to harmful weather conditions.  **NON-LOAD-BEARING WALL FRAMING** **GENERAL** **RELATED SECTIONS** (List appropriate related sections here) **REFERENCES** AISI – NASPEC: 2004 North American Specification (NASPEC) for the Design of Cold-Formed Steel Structural Members. AISI/COS 2004 – Standard for Cold-Formed Steel Framing – Prescriptive Method for One and Two Story Family Dwelling. AISI – Standard for Cold-Formed Steel Framing General Provisions. ASTM A 653-08 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process. ASTM A 780 – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings ASTM A 1003-08 – Standard Specifications for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members. ASTM C 645-08 – Standard Specification for Nonstructural Steel Framing Members ASTM C 754-08 – Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products. ASTM C 955-08 – Standard Specification for Load Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases. ASTM C 1007-04 – Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories. ASTM C 1513 – Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials. ASTM E 119 – Standard Test Methods for Fire Tests of Building Construction and Materials. ASTM E 413 – Classification for Rating Sound Insulation. GA-600-06 – Gypsum Association Fire Resistance Design Manual IBC-2006 – International Building Code 2006 Edition. **DESIGN REQUIREMENTS** Design steel in accordance with American Iron and Steel Institute 2004′ Publication “Specification for the Design of Cold-Formed Steel Structural Members” (2004 AISI-NASPEC) except as otherwise shown or specified. Design steel in accordance with 2006 International Building Code (IBC 2006), except as otherwise shown. Design Loads: Non Load-Bearing Design Load As indicated on the Architectural Drawings or 5 PSF minimum design lateral load is required for interior walls by building code. Shaftwall Framing minimum design lateral load is typically 5-15 PSF. Design framing systems to withstand design loads without deflections greater than the following: Interior Non Load-Bearing Walls: Lateral deflection of L/120 Interior Non Load-Bearing Walls: Lateral deflection of L/180 Interior Non Load-Bearing Walls: Lateral deflection of L/240 Interior Non Load-Bearing Walls: Lateral deflection of L/360 Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change (range) of 67 degrees C (120 degrees F). Design framing system to accommodate deflection of primary building structure and construction tolerances. Design exterior non-load-bearing curtain wall framing to accommodate lateral deflection without regard to contribution of sheathing materials. Fire Response Characteristics for fire-resistance rated assemblies that incorporate non-load bearing steel framing: Provide materials and construction in accordance with the Gypsum Association Fire Resistance Design Manual GA-600-06 and/or the Gypsum Board manufacturer’s recommendations resulting from fire test ASTM E119. Sound Transmission Characteristics (STC): For Gypsum Assemblies that incorporate non load-bearing steel framing with STC rating requirements: Provide materials and construction in accordance with the Gypsum association Fire Resistance Design Manual GA-600-06 and/or the Gypsum Board Manufacturer’s recommendations resulting from sound tests performed in accordance to ASTM E 90 or ASTM E 336. | **PRODUCTS** **FRAMING MATERIALS** **General Requirements:** Load bearing (structural) cold-formed steel members shall be manufactured from structural quality steel having minimum yield strength of 33 ksi, having a minimum protective coating equal to G-60 galvanized finish, and conforming to one of the following standards: ASTM A653, ASTM A875, ASTM C955, or ASTM A1003. Non-load bearing (non-structural) cold-formed steel members shall have a minimum protective coating equal to G-40 galvanized finish and shall conform to ASTM C-645. Load bearing cold-formed steel member shall have engineering properties calculated in accordance with the AISI “Specification for the Design of Cold-Formed Steel Structural Members” and have minimum properties as published by NUCONSTELL. All structural framing accessories shall be formed from steel having minimum yield strength of 33 ksi with minimum protective coating equal to G-60 galvanized finish.  **EXECUTION** **EXAMINATION** Before beginning installation, verify that substrate conditions previously installed under other sections are acceptable for installation of metal framing in accordance with manufacturer’s installation instructions. Verify bearing elevations supporting members are correct before framing materials are installed. Select fasteners of adequate type, number, and quality to perform intended functions. Do not proceed with installation until unsatisfactory conditions have been corrected. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance. Verify that rough-in utilities and chases that will penetrate plane of trusses are in correct locations and do not interfere with truss, bracing, or bridging placement. **INSTALLATION** **General:** Prepare attachment surfaces so that they are plum, level, and in proper alignment for accepting cold-formed structural framing system. Set framing system plumb, square, aligned, without twist at correct elevation. Wall Framing: Install, bridge, and brace load-bearing (structural) walls in accordance with the approved shop drawings. Cold-formed structural framing may be shop or field fabricated into panelized wall assemblies, prior to erection, or stick built in the field. Provide temporary bracing to hold walls straight and plumb and in safe condition until permanent bracing has been installed. Stud size and spacing shall be in accordance with the approved shop drawings. Fasten wall framing members by screws, power actuated fasteners, welding, or a combination of methods in accordance with the approved shop drawings. Fabricate, handle and erect members and assemblies in a manner to prevent damage or distortion of the framing. Cut ends of framing members squarely by shearing or sawing. Install plumb, square, true to line and securely fastened. Construct corners using minimum three studs. Provide double stud wall openings at door jambs, and window jambs where indicated on shop drawings. Erect load bearing studs one piece full length. Splicing of studs or cutting of flange or lips is not permitted. Track shall have web contact with with a uniform and level bearing surface and securely anchored with fasteners, sized and spaced in accordance with the approved connection details. Erect load bearing studs, brace, and reinforce to develop full strength, to achieve design requirements. Fully seat axial loaded studs in receiving tracks (maximum 1/8 inch (3.2 mm) gap between stud and track web is acceptable). Align load bearing studs with joists or trusses or use a load distribution member to transfer loads to other structural components or foundations. Provide slip connections where required allowing for vertical movements of the structure without imposing vertical loads on the wall framing. Coordinate placement of insulation in multiple stud spaces after erection. Provide suitable insulation where wall framing assemblies will form voids, that will not be accessible after completion of framing. Install intermediate studs above and below openings to align with wall stud spacing. Provide structural framing shear walls where indicated or required in accordance with the shop drawings. Attach strapping or blocking to studs for attachment of fixtures anchored to walls. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.  **SUBMITTALS** Submit under provisions of Section 01300 **Product Data:** Submit Manufacturer’s literature, data sheets on each product to be used, including:  Manufacturer to provide independent third party certification documentation, demonstrating product compliance with current building codes and standards  Example: ICC Evaluation Service Report. Preparation instructions and recommendations. Storage and handling requirements and recommendations. Installation Methods.  **Shop Drawings:** Provide plan, section, elevation, and perspective drawings as required to note the following:  Size, spacing and location of framing members, wall framing sections and opening elevations. Framing member fastening requirements: Show connection details with screw types and locations, weld lengths and locations and other fastener requirements. Details of vertical deflection connections to structures. Structural bracing location and spacing. Verification Samples: For each finish product specified, two samples representing each product specified.  **QUALITY ASSURANCE** (List provisions here) **MATERIALS – STEEL** **Coatings:** Galvanized Steel Meeting or Exceeding the Requirements of ASTM A 1003-08.  Non Load-Bearing Steel Coating: Galvanized G40 minimum coating; complying with ASTM C 645-08 minimums. Non Load-Bearing Steel Coating: Galvanized G-60 minimum coating. Non Load-Bearing Steel Coating: Galvanized G-90 minimum coating.  **Yield Strength:**  Framing elements manufactured from galvanized steel ranging from 18-43 mills (25Ga-18Ga) thickness must be manufactured from 33ksi minimum steel. Framing elements manufactured from galvanized steel ranging from 54-97 mills (16Ga-12Ga) thickness must be manufactured from 50ksi minimum steel.  **EXECUTION** **FABRICATION** Prior to fabrication of framing, submit shop drawings to the architect or engineer to obtain approval. Framing components may be preassembled into panels prior to erecting. Prefabricate panels so they are square, with components attached in a manner which prevents racking and minimizes distortion during lifting and transport. **Fabrication Instructions:** Cut all framing components square fro attachment to perpendicular members or as required for an angular fit against abutting members. Plumb, align and securely attach studs to flanges of both upper and lower runners, except that in the case of interior, non-load bearing walls where studs need to be attached to upper and lower runners. In all doubled jamb studs and doubled headers not accessible to insulation contractors, provide insulation equal to that specified elsewhere. Splices in members other than top and bottom runner track are not permitted. Provide temporary bracing where required, until erection is complete. Handling and lifting of pre-fabricated panels shall be done in a manner so as not to cause distortion in any manner.  **ERECTION – NON-LOAD-BEARING WALL APPLICATIONS** Install cold-formed framing in accordance with ASTM C 754 Install in accordance with manufacturer’s instructions. **Framing Installation:** Install framing components plumb, level and square, in strict accordance with approved drawings. Align floor and ceiling trakcs; locate to layout and securely anchor to the supporting structure. Align and plumb studs, and securely attach both upper and lower track legs to the flanges of the stud with approved fastener. Install jack studs or cripples below window sills, above door and window headers and elsewhere as required to provide lateral support. Provide lateral bracing by use of wall sheathing and/or cold rolled channel or horizontal strapping. Bracing shall conform to Section D3 of AISI-NASPEC. Provisions for vertical movement of supporting structure must be made at all locations noted on the Contract Documents and/or where indicated in the engineered drawings. Handling and lifting of pre-fabricated panels shall be done in a manner so as not to cause distortion in any manner. |