



Cherry Creek School District Technical Guidelines - 2020

DIVISION 05 - METALS

05 12 00 – STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

- A. Summary - Section includes:
 - 1. Load-bearing structural metal framing.

- B. Referenced Standards/Minimum Criteria:
 - 1. Design, Detailing, Fabrication, and Erection: AISC "Specification for Structural Steel Buildings" and "Load and Resistance Factor Design Specification for Structural Steel Buildings", latest editions.
 - 2. AISC "Specifications for Architecturally Exposed Structural Steel", latest edition.
 - 3. AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts", latest edition.
 - 4. AWS D1.1 "Structural Welding Code- Steel", latest edition.
 - 5. Steel Shapes, bars, and Plates: Conform to ASTM A992, ASTM A572, or A36.
 - 6. Standard Bolts and Nuts: Conform to ASTM A325.
 - 7. Slip-Critical High Strength Bolts and Nuts: Conform to ASTM A325.
 - 8. Anchor Bolts: Conform to ASTM A36.
 - 9. Steel Tubing: Steel tubing shall conform to ASTM A500.
 - 10. Steel Pipe: Conform to ASTM A501, or ASTM A53.

- C. Submittals Required:
 - 1. Shop drawings and calculations where required.
 - 2. Certificates:
 - a. Mill Test Reports: Furnish for all structural steel supplied if requested by Architect. Furnish all mill test reports and load test results of each lot of high strength bolts if required by Architect.
 - b. Welder Certificates: Furnish for all welding operations used for fabrication and erection.
 - 3. Product Data: Submit product data for load indicator bolts and slide bearing plates.
 - 4. Fabricator and Erector Qualifications: Submit prior to the submission of shop drawings.

- D. Restrictions/Critical Criteria:
 - 1. Welder Qualifications: Welding shall be done by AWS certified welding operators only.
 - 2. Testing Agency: If directed by the Architect, weld tests will be made by an approved laboratory selected and paid for by the School District. Testing agency must be experienced in X-ray or ultrasonic testing of weld joints.



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3. Fabricator and Erector Qualifications:
 - a. Structural steel fabricated and erected under this Section, and Metal Fabrications, Open Web Steel Joists, Steel Deck, and Metal Stairs furnished and installed under related Sections shall be furnished and installed under the single subcontract responsibility of an approved structural steel fabricator. If the structural fabricator subcontracts the erection, the erection subcontractor must also meet the minimum qualifications prior to bidding.
 - b. Fabricators and/or erectors for this project must demonstrate to the satisfaction of the School District the following qualifications in addition to any other requirements of the Project manual.
 - 1) Business longevity under current business name of five years or more immediately prior to bidding this project.
 - 2) Previous experience showing successfully completed projects of similar size and complexity as this project involving fabrication and erection of structural steel. Fabricators must show fabrication experience and erectors must show erection experience to be considered.
 - c. Any change of steel fabricator/erector required as a result of failure to meet the above requirements shall be made at no additional cost to the School District.
4. Allowable Tolerances: Erect individual pieces so deviation from plumb, level, and alignment shall not exceed 1 in 500.
5. Shop paint all steel shapes per AISC standards and SSPC technical criteria. For structural steel on the exterior of buildings, use primer compatible with final field paint (example, Tnemec) and install per SSPC, SP6 technical guidelines.

PART 2 - PRODUCTS

- A. Acceptable Manufacturers/Products:
 1. Materials are unrestricted provided they meet specification requirements.

05 20 00 – STEEL JOIST FRAMING

PART 1 - GENERAL

- A. Summary - Section includes:
 1. Open web steel joists.
 2. Bridging and accessories.
- B. References Standards/Minimum Criteria:
 1. Conform to latest edition of Standard Specifications of Steel Joist Institute (SJI) and AISC Specifications in materials, fabrication, design and erection.
 2. Welder Qualifications: Welding shall be done by AWS certified welding operators only.
 3. Manufacturer Qualifications: Joist manufacturer shall be a member of the Steel Joist Institute (SJI).



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- C. Submittals Required:
 - 1. Shop drawings.
 - 2. Design calculations for long-span joist field splices.

- D. Restrictions/Critical Criteria:
 - 1. All components, fasteners, and hardware by single manufacturer.
 - 2. Field modification of joists prohibited.
 - 3. Camber: Camber at mid-span of adjacent deep long-span joist shall not vary more than 1-inch at mid-span at time of erection.
 - 4. Shop painting criteria same as for structural steel.

PART 2 - PRODUCTS

- A. Acceptable Manufacturers/Products:
 - 1. Materials are unrestricted provided they meet specification requirements.

05 30 00 – STEEL DECKING

PART 1 - GENERAL

- A. Summary - Section includes:
 - 1. Galvanized and painted finish steel decking.
 - 2. Corrugated metal forming.
 - 3. Floor deck.
 - 4. Roof deck.
 - 5. Composite floor deck.
 - 6. Acoustical roof deck.
 - a. Include acoustical insulation to be provided by acoustical deck manufacturer and installed under applicable Division 07 – Roofing section.
 - 7. Filler plates, sump pans, and other accessories.

- B. Referenced Standards/Minimum Criteria:
 - 1. Conform to AISI Specifications for the Design of Cold-Formed Steel Structural Members, latest edition.
 - 2. Welder Qualifications: Welding shall be done by AWS certified welding operators only.
 - 3. Approvals: Manufacturer's product must have I.C.B.O. approval.
 - 4. Galvanized Decking: Form decking with galvanized finish from steel sheets conforming to ASTM A611, Grades C or D; or conforming to ASTM A446, Grade A, C, or E. Galvanized finish shall conform to ASTM A525, G 60 light commercial coating.
 - 5. Painted Finish Decking: Form decking with painted finish from steel sheet conforming to ASTM A611, Grades C, D, or E; or conforming to ASTM A446, Grades A, B, C, D, E, or F.

- C. Submittals Required:
 - 1. Shop drawings.



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- D. Restrictions/Critical Criteria:
1. Welding: By shielded arc process. Conform to American Welding Society Standards. Employ only skilled welding operators capable of meeting the qualifications of AWS Code and who have been certified by an approved testing laboratory.
 2. Deck units shall span over three (3) or more spans wherever possible.
 3. If Acoustical deck by EPIC Metals is used, specify whether it is factory or field painted.

PART 2 - PRODUCTS

- A. Acceptable Manufacturers:
1. Vulcraft Sales Corp. www.vulcraft.com.
 2. Verco Manufacturing, Inc. www.vercodeck.com.
 3. EPIC Metals Corp. www.epicmetals.com (for specialized acoustical roof deck).
 4. Approved Substitute.

05 40 00 – COLD-FORMED METAL FRAMING

PART 1 - GENERAL

- A. Summary - Section includes:
1. Cold formed load-bearing metal studs and joists.
- B. References Standards/Minimum Criteria:
1. Conform to AISI Specification for the design of Cold-Formed Steel Structural Members, latest edition.
 2. Install framing in accordance with ASTM C1007.
 3. Welders shall be qualified in accordance with AWS D1.1 and AWD 1.3.
 4. Steel: Form from steel conforming to ASTM A570, Grade D, except that the minimum yield point shall be 50 ksi for 16 gauge and heavier.
 5. Bridging: Bridging may be either 18 gauge or heavier channel studs of the same nominal width as the studs, staggered not more than 16-inches; or continuous minimum 1-1/2-inch cold-rolled channels positioned through stud punch-outs. The ratio of unbraced length to least radius of gyration (l/r) of the bridging members shall not exceed 300. Channel stud bridging shall be formed from steel conforming to ASTM A611, Grade C. Continuous channels used for bridging shall conform to ASTM A645.
 6. Allowable tolerance: Maximum variation 1/8" in 10'-0".
 7. Provide deep leg top track and/or slip joint at top to allow for load deflection and/or slab movement.
- C. Submittals Required:
1. Shop drawings.
 2. Product Data.



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- D. Referenced Standards/Critical Criteria:
1. All erection of framing to comply with manufacturer's approved methods. Framing may be prefabricated into panels at the Contractor's option. Space studs not more than 16-inches on center. Weld joints; screwed connections will not be allowed. Welding shall be done with AWS A5.1 or A5.5 E60XX electrodes.
 2. Splices in studs or joists are not permitted. Seat studs squarely in the track with the stud web and flanges abutting the track web, plumbed or aligned, and securely attach to flanges or web of upper and lower tracks by welding.

PART 2 - PRODUCTS

- A. Acceptable Manufacturers - Structural Studs and Joists:
1. Clark-Western Metal Lath Company: www.westsidebmc.com.
 2. Unimast, Inc. www.clarkdietrich.com.
 3. SCAFCO Steel Stud Company: www.scafco.com.
 4. ClarkDietrich Building Systems: www.clarkdietrich.com.
 5. MarinoWare: www.marinoware.com.
 6. Studco US: www.studcosystems.com.
 7. Approved substitute

05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

- A. Summary - Section includes but is not limited to:
1. Anchor bolts and weld plates for anchoring metal fabrications.
 2. Steel handrail brackets and handrails.
 3. Railing sleeves.
 4. Steel ladders.
 5. Steel railings and guardrails.
 6. Areaway gratings.
 7. Overhead rolling door supports.
 8. Foot scrapers.
 9. Folding panel partition supports.
 10. Exterior door stop supports.
 11. Exterior abrasive stair nosings.
 12. Unistrut grid and support system.
 13. Steel column covers.
 14. Auditorium stage ceiling grid and supports.
 15. Bollard posts.
 16. Auditorium catwalk caged wall ladder.
 17. Expansion joint supports.
 18. Frames around roof and floor openings.
 19. Steel angles, lintels, and columns at window and door openings.



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20. Exterior and interior bench supports.
 21. Steel base and threshold plates at Gymnasium.
 22. Mechanical screen walls on roof.
 23. Trench drain system.
 24. Checkered plate.
 25. Roof ladders.
 26. Elevator pit ladder.
 27. Perforated sheet metal.
 28. All other miscellaneous angles, channels, tubes, and plates as indicated.
- B. Referenced Standards/Minimum Criteria:
1. Steel: Conform to AISC "Specifications for Architecturally Exposed Structural Steel", latest edition.
 2. Welding: Conform to "AWS Structural Welding Code".
 3. Steel, Shapes, Bars, and Plates: Conform to ASTM A36.
 4. Steel Pipe and Tubing: Conform to ASTM A53, A501, or A500.
 5. Headed Anchor Studs: Conform to ASTM A108.
 6. Reinforcing Steel Grade 60 Weldable: Conform to ASTM A706.
 7. Shop Paint: Steel Structure Painting Council Specification. SSPC - Paint - 25 or Tnemec Series 10-99 Primer. See shop painting for structural steel for compatibility requirements.
- C. Submittals Required:
1. Shop drawings.
 2. Product data (stair nosings and trench drain system) as required.
- D. Restrictions/Critical Criteria:
1. All cuts shall be clean and sharp with edges ground smooth. On completion, the work shall be straight, rigid and tight, and free from defects.
 2. Close exposed ends of steel pipe, channel, or tubing with welded steel plate caps.
 3. Comply with latest American Welding Society Standards. Miter and cope intersections and weld all around. Remove splatter and grind exposed welds to blend and contour surfaces to match those adjacent.
 4. Provide OSHA compliant fixed steps or ladders at:
 - a. Roof access hatches.
 - b. Vertical offsets between roof levels that exceed 36-inches.
 - c. Under crawl space access hatches.
 - d. Auditorium catwalk access points. Provide ladder guards.
 5. Auditorium catwalk wall ladders shall have removable access panel at bottom of cage.
 6. Minimum tread dimension for steel ladders to be 2-1/2-inches x 3/8-inch. Treads shall be spaced no more than 12-inches on center.
 7. "Ships Ladders" are not recommended.



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PART 2 - PRODUCTS

- A. Acceptable Manufacturers/Products:
 - 1. Materials are unrestricted for steel shapes provided they meet specification requirements.
 - 2. Abrasive Stair Nosings: "Super-Grit Aluminum" by Wooster Products: www.woosterproducts.com, or similar "Special Purpose Treads, Type 138". Provide concealed fasteners.
 - 3. Areaway Gratings:
 - a. Bearing bar and cross bar size and spacing shall be as required for span and size of opening. Grating shall be able to support uniform liveload of 120 psf. Provide 24-inch x 24-inch hinged access hatch with angle frame, grating cover, and padlock hasp. Secure grating to frame with saddle clips and self-drilling vandal proof fasteners.
 - b. Provide manufactured galvanized steel bar gratings as manufactured/ supplied by
 - 1) Ohio Gratings, Inc. www.ohiogratings.com.
 - 2) Ametco Mfg. www.ametco.com.
 - 3) McNichols Company: www.mcnichols.com.
 - 4) Peterson Company: www.peterson-co.com.
 - 5) Approved substitute.

05 51 00 – METAL STAIRS

PART 1 - GENERAL

- A. Summary - Section includes:
 - 1. Pan tread, channel stringer stairs.
 - 2. Stringer and wall-mounted handrails.
- B. Referenced Standards/Minimum Criteria:
 - 1. Steel: AISC Code of Standard Practice for Steel Buildings and Bridges, Architecturally Exposed Structural Steel.
 - 2. Welding: AWS D1.1 and D1.3 Structural Welding Code - Steel.
 - 3. Stairways: Standard construction details of "Metal Stairs Manual" of the National Association of Architectural Metal manufacturers, latest edition.
- C. Submittals Required:
 - 1. Shop drawings.
 - 2. Color options for abrasive stair nosings.
- D. Restrictions/Critical Criteria:
 - 1. Welder Qualifications: Welding shall be done by operators currently qualified according to AWS D1.1 and D1.3.



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2. Shop Painting: Spray apply to uniform dry film thickness of 2.0-3.0 mils, free of runs, sags or other defects. Omit shop primer within 2-inches of field welded connections, compression joints surfaces, and steel embedded in concrete. Specify primer compatible with final field paint (example, Tnemec).
3. Pan Tread Channel Stringer Stairs:
 - a. Design Criteria: Engineered by the fabricator to carry 100 psf uniform load.
 - b. Stair Components: Stair runs and platform minimum dimensions per local code.
 - c. Tread and Platform Pans: 10 gauge steel. 2.5 lb. minimum self-furring lath tack welded to pans immediately before concrete fill is placed.
 - d. Risers: Closed type.
 - e. Concrete Fill: Per Division 03 Section "Cast-in-place Concrete".
 - f. Abrasive Stair Nosings: "Spectra Safety Tread", Type WP3JT by Wooster Products: www.woosterproducts.com, or similar substitute with blanked out sure hold anchor.
 - g. Handrails: In compliance with local codes for structural performance and dimensions.

PART 2 - PRODUCTS

- A. Acceptable Products/Materials:
 1. Materials are generally unrestricted provided they meet specification requirements.

END OF SECTION