

SECTION 05 51 36- METAL WALKWAYS

PART 1- GENERAL

1.1 SUMMARY

A. SCOPE OF WORK

Provide all material, labor, equipment and services required by the project drawings and specifications for fabrication and installation of metal walkways such as catwalks, crossover platforms, landing platforms etc.

B. ADDITIONAL WORK INCLUDED IN THIS SECTION

1. Applicable field measurements, including but not limited to, verification of vertical distance between platforms or floors.
2. Other as required_____

C. WORK SPECIFICALLY EXCLUDED IN THIS SECTION

The following are not included in the contractor's work for this section unless noted otherwise:

- A. Temporary shoring or bracing of existing structures.
- B. Demolition and removal of existing work.
- C. Clean up of site prior to installation.
- D. Concrete supports or other concrete work
- E. Cutting; preparation of pockets; setting of plates, inserts, adapters, or other hardware or built in items.
- F. Placement of wire mesh and re-bar for concrete fill
- G. Temporary lights or electricity.
- H. Temporary safety rails needed on existing structures.
- I. Protection after erection.
- J. Wood trim or moldings, for treads or stringers.
- K. Rubber treads or carpets.
- L. Slip resistant concrete treatments.
- M. Field painting other than touch up of damaged surfaces.
- N. Final surface cleaning, passivation, or application of surface protectant after installation.
- O. Other_____

D. RELATED WORK SPECIFIED ELSEWHERE

(Includes but is not limited to:)

1. Conventional Metal Stairs in another Division 5 section
2. Metal Fabrications in another Division 5 section
3. Painting in Division 9
4. Alternating tread stairs used in conjunction with this section are addressed in section 05 51 33.23
5. Equipment access stairs used in conjunction with this section are addressed in section 05 51 00

(Note: Terminology used for "alternating tread stairs" varies among the codes or standards that address the component. This specification uses the term alternating tread stair. MasterFormat 2012 uses the term alternating tread ladder. The International Building Code (IBC) and NFPA-101 (Life Safety Code) use the term alternating tread device.)

1.2 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.3 REFERENCES

Aluminum Association

Aluminum standards and data

American Institute of Steel Construction (AISC)

Manual of Steel Construction
Code of Standard Practice

American Iron and Steel Institute

Type 304 Stainless Steel (UNS S30400)
Type 1010 Stainless Steel (UNS G10100)

American Society for Testing and Materials (ASTM)

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| A108 | Standard Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality |
| A123 | Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products. |
| A153 | Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware |
| A193 | Standard Specification for Alloy-Steel and Stainless Steel Bolting for High-Temperature or High Pressure Service and Other Special Purpose Applications |

- A240 Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
- A269 Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service
- A276 Standard Specification for Stainless Steel Bars and Shapes
- A307 Standard Specification for Carbon Steel Bolts, Studs and Threaded Rod 60,000 PSI Tensile Strength.
- A500 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- A513 Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
- A554 Standard Specification for Welded Stainless Steel Mechanical Tubing
- A563 Standard Specification for Carbon and Alloy Steel Nuts.
- A569 Standard Specification for Steel Sheet, Carbon and High Strength, Low Alloy, Hot-Rolled and Cold Rolled, General Requirements for.
- A780 Standard Practice for Repair of Damaged and Un-coated Areas of Hot-Dip Galvanized Coatings
- A786 Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates
- A1011 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability and Ultra High Strength
- F844 Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use

National Association of Architectural Metal Manufacturers (NAAMM)

NAAMM STANDARD AMP 510-92 Metal Stairs Manual 5th Edition

Society of Automotive Engineers

SAE J403 Chemical Compositions of SAE Carbon Steels

SAE J429 Mechanical and Material Requirements for Externally Threaded Fasteners

Society for Protective Coatings (SSPC)

SSPC-PC3	Power Tool Cleaning
SSPC Paint 20	Zinc Rich Coating
SSPC Paint 25	Zinc Oxide, Alkyd, Linseed Oil Primer for Use over Hand Cleaned Steel
SSPC-SP 2	Hand Tool Cleaning
SSPC-SP 3	Power Tool Cleaning
SSPC-SP 6	Commercial Blast Cleaning

All references are the latest edition unless noted otherwise.

1.4 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturer's written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for metal walkways, catwalks, crossovers, landings, etc. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- C. Coordinate locations of hanger rods, struts, column legs, etc. with other work so that they do not encroach on required stair width and are within the fire-resistance rated enclosure if applicable.

1.5 PERFORMANCE REQUIREMENTS:

- A. Design shall be performed by a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design stairs.
- B. Platform Surface: shall be capable of withstanding a single concentrated 1000 pound load without permanent deformation; or 100 pounds per square foot or 300 pounds on an area of 4 square inches without exceeding the allowable working stress of the material. The walkway, crossover or landing platform shall also be designed to withstand all required design loads (i.e. wind, snow, seismic, etc.) in accordance with the required project specifications and drawings.
- B. Platform Guard/Handrail: shall be capable of withstanding a single concentrated load of 200 pounds or a uniform load of 50 pounds per linear foot applied in any direction at any point on the rail without exceeding the allowable working stress of the material.
- C. Platform Structural Members: shall be capable of withstanding a single concentrated load of 1000 pounds at any point on the stair without permanent deformation; or a uniform live loading of 100 pounds per square foot applied in a downward direction to all tread surfaces or a 300 pound load on an area of 4 square inches without exceeding the allowable working stress of the material. Platform structural members shall also be

designed to withstand all required design loads (i.e. wind, snow, seismic, etc.) in accordance with the required project specifications and drawings.

1.6 FABRICATION REQUIREMENTS:

- A. Diamond Plate Platform Surface: shall be single part units cut, formed, and punched using plasma, bending, break and shearing equipment.
- B. Mounting Brackets and Toe-plates: shall be either formed or welded.
- C. Guards and Handrails: shall be bolted to platform per design drawings.

D. DIMENSIONS:

- 1. Platform: as specified in the drawings but in no case with a width less than the width of the connecting stair and with a length at least 30 inches in the direction of travel.
- 2. Guards: 42 inch nominal minimum vertical height from upper surface of top rail to top surface of metal walkway, crossover or landing platform.
- 3. Toe Plate: 4 inch nominal vertical height from its top edge to the top surface of the metal walkway, crossover or landing platform.

1.7 SUBMITTALS:

- A. Dimensional Prints: shall be submitted for approval prior to fabrication.
- B. Engineering calculations and drawings, both stamped by an engineer or architect licensed in the state of project implementation, upon request.

1.8 DELIVERY STORAGE AND HANDLING

Reference: AISC Code of Standard Practice, sections 6 & 7

- A. Deliver materials to the job-site in good condition and properly protected against damage to finished surfaces.
- B. Store material in a location and manner to avoid damage. Do not stack components. Lay out components on firm foundation material such that bending cannot occur.
- C. Store metal components in a clean dry location, away from uncured concrete, cement, or masonry products, acids, oxidizers, rain water, or any other chemical or substance that might damage the material or finish.
- D. Plan work and storage locations to keep on-site handling to a minimum.

- E. Exercise particular care to avoid damage to material finishes or unprotected surfaces when handling.

1.9 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Shall have produced stairs, platforms and railing systems for not less than 5 years or provide other acceptable evidence of being capable of acceptably manufacturing the project stairs railings and platform systems.
- B. Installer Qualifications: Shall have installed stairs, platforms and railing systems for not less than 5 years or provide other acceptable evidence of being capable of acceptably manufacture the project stairs railings and platform systems.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel" or AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel", as applicable.

PART 2- PRODUCTS

2.1 ACCEPTABLE MANUFACTURER:

LAPEYRE STAIR, INC.
5117 Toler St.
Harahan, LA. 70123
1-(800)-535-7631 or 1-(504)-733-6009
Fax 1-(504)-733-4393
LS.SALES@LAPEYRESTAIR.COM
WWW.LAPEYRESTAIR.COM

2.2 MATERIALS:

- A. Carbon Steel:
 - 1. Platform: AISI 1010/15 CS or ASTM A786, 3/16" diamond safety plate, 36 ksi Minimum yield stress.
 - 2. Handrails: 1-1/2" OD x 0.095"; Minimum 42 ksi yield stress. AISI 1010/15 CS per ASTM A1011 cold drawn, fully annealed tube per A500 Grade B or A513 grade 1008 or higher as-welded tubing.
 - 3. Guard posts: 1-1/2" OD x 0.095" or 1-1/4" Φ schedule 40; Minimum 42 ksi yield stress. AISI 1010/15 CS per ASTM A1011 cold drawn, fully annealed tube per A500 Grade B or A513 grade 1008 or higher as-welded tubing.

4. Bolts: Hex Head SAE J429 Grade 5, ½" Φ x 13 TPI or Carriage Head A307 as shown on project drawings; dimensions per ANSI/ASME B18.2.1.
5. Nuts: ASTM A563 Grade A, B, C, D or O; dimensions per ANSI/ASME B18.2.2.
6. Washers: ASTM F844 or F436; dimensions per ANSI/ASME B18.22.1

B. Stainless Steel:

1. Platform: AISI 304 SS, 3/16" diamond safety plate
2. Handrails: 1.5" OD x 0.065" AISI 304 SS cold drawn, fully annealed tube, ASTM A554.
3. Bolts, Nuts & Washers: AISI 304 SS ½" Φ

C. Aluminum:

1. Platform: Aluminum alloy 5052 H32 or H34, 1/4" diamond safety plate
2. Handrails: 1-1/2" x 1/8" tube aluminum alloy 6063-T4

D. Miscellaneous Material:

1. Handrail clamps: Cast aluminum
2. Post Installed Anchors: Torque controlled expansion anchors or chemical anchors capable of withstanding without failure a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete as determined by testing according to ASTM E488, conducted by a qualified independent testing agency. Carbon steel anchor components are to be zinc plated per ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated. Stainless Steel anchor components are to be Alloy Group 1 or Group 2, per ASTM F593/A594, unless otherwise indicated.
3. Shop Primers shall comply with Section 099113 "Exterior Painting" and Section 099123 "Interior Painting".
4. Universal Shop Primer shall be fast-curing, lead and chromate free, universal modified alkyd primer complying with MPI #79 and compatible with topcoat. (Use primer containing pigments that make it easily distinguishable from zinc-rich primer).
5. Shop primer for Galvanized Steel shall be formulated for exterior use over zinc-coated metal and compatible with finished paint systems indicated.

2.3 FABRICATION:

A. General:

Fabricate metal walkways, crossover or landing platforms to conform with other applicable sections of this specification, and in accordance with approved shop drawings or dimensional prints.

B. Cut, drill and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Clearly mark units for reassembly and coordinated installation. Cut, form, and punch crossover and/or landing platforms with mounting brackets and toe-plates as appropriate.

1. Carbon Steel: Gas metal arc welding may be used.

2. Stainless Steel: Gas tungsten arc welding and/or gas metal arc welding may be used.

3. Aluminum: Gas tungsten arc welding and/or gas metal arc welding may be used.

C. Form bent metal corners to smallest radius possible without causing grain separation or otherwise impairing work. Form exposed work with accurate angles, surfaces and straight edges.

D. Welded connections are to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap
3. Remove weld flux immediately
4. Weld exposed corners and seams continuously unless otherwise indicated
5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 3 welds: partially dressed weld with spatter removed.

E. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use carriage bolts unless otherwise indicated. Locate joints where least conspicuous.

F. Fabricate joints that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

2.4 FINISHES:

- A. Finish metal walkways after assembly. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Galvanizing: Hot dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron properties. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion. Fill vent and drain holes that are exposed in the Finished Work (unless indicated to remain as weep holes) by plugging with zinc solder and filing off smooth.
- C. Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with SSPC SP 3 "Power Tool Cleaning".
- D. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC PA 1 "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
- E. Finishes shall be as follows:
 - 1. Carbon Steel may be any of the following finishes:
 - a. Gray Primer: Epoxy Powder Coat or
 - b. Safety Yellow Paint: Polyester TGIC* Powder Coat or
 - c. Iron Gray: TGIC*
 - d. Typical RAL selections: Polyester Powder Coat
 - e. Hot-Dip Galvanized: per ASTM A123
(*Triglycidyl Isocyanurate)
 - 2. Stainless Steel shall be a natural finish.
 - 3. Aluminum shall be a natural finish:

PART 3- EXECUTION:

3.1 PREPARATIONS:

- A. Coordination: Coordinate start and installation of metal walkway, crossovers, or landing platforms with all other related and adjacent work. Installation shall not start until the construction has progressed to the point that weather conditions and remaining construction operations will not damage platform installation.
- B. Verification: Verify that dimensions are correct and that substrate is in proper condition for platform installation. Do not proceed to install until all necessary corrections have been made.

3.2 INSTALLATION:

- A. Install metal walkways, crossovers or landing platforms (with equipment access stair or alternating tread stair if applicable) in accordance with project design drawings and specifications, securing with 2 bolts and handrail clamps as applicable.
- B. Fastening to in-place Construction: Provide anchorage devices and fasteners where necessary for securing metal walkways, crossovers or landing platforms to in-place construction. Where applicable, include threaded fasteners for concrete and masonry inserts, through bolts, lag bolts, and other connections.
- C. Immediately after erection clean field welds, bolted connections and abraded areas of shop paint. Touch up with matching paint any chipped or abrasion damage to factory finish; or touch up any damage to galvanized surfaces using galvanized repair paint in accordance with ASTM A780.
- D. Visually inspect completed work to verify acceptable installation.

3.3 CLEAN-UP

Leave work area clean and free of debris.