

This Manu-Spec® utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM), including *MasterFormat™*, *SectionFormat™* and *PageFormat™*. A Manu-Spec is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate product model numbers, styles and types are used in Specifier Notes and in the specification text Article titled "Acceptable Material." Metric conversion, where used, is soft metric conversion.

This Manu-Spec specifies galvanized steel rebar for concrete reinforcement.

03 21 00 REINFORCEMENT BARS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Galvanized deformed steel reinforcement bars and accessories.

Specifier Note: Revise the Paragraph below to suit the Project requirements. Add section numbers and titles as recommended by CSI MasterFormat and specifiers practice.

- B. Related Requirements:

Specifier Note: Include in this Paragraph only those sections and documents that directly affect the work of this section. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the Subparagraph below. Do not include Division 00 documents or Division 01 sections since it is assumed that all technical sections are related to all project Division 00 documents and Division 01 sections to some degree. Refer to other documents with caution since referencing them may cause them to be considered part of the Contract.

1. Section [03 21 13 - Galvanized Reinforcement Steel Bars]
2. Section [03 30 00 - Cast-in-Place Concrete].
3. Section [03 33 13 - Heavyweight Architectural Concrete].
4. Section [03 33 16 - Lightweight Architectural Concrete].
5. Section [03 41 16 - Precast Concrete Slabs].
6. Section [03 41 23 - Precast Concrete Stairs].
7. Section [03 45 13 - Faced Architectural Precast Concrete].
8. Section [_____].

1.2 REFERENCES

Specifier Note: Define terms that are unique to this Section and are not provided elsewhere in the contract documents. Include in this Article terms that are unique to the work result specified that may not be commonly known in the construction industry. Delete the following Paragraph if no Definitions are required.

- A. Definitions:
1. [_____].

Specifier Note: Paragraph below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain References Paragraph when specifying products and installation by an industry reference standard. List retained standard(s) referenced in this section alphabetically. Indicate issuing authority name, acronym, standard designation and

title. Establish policy for indicating edition date of standard referenced and update as applicable. Contract Conditions Section 01 42 00 - References may be used to establish the edition date of standards. This Paragraph does not require compliance with standard(s). It is a listing of all references used in this section. Only include here standards that are referenced in the body of the specification in PARTS 1, 2 and/or 3. Do not include references to building codes at any level.

B. Reference Standards:

1. American Association of State and Highway Transportation Officials (AASHTO).
 - a. AASHTO M111 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products (ASTM Designation: A 123/A 123M).
2. ASTM International (ASTM).
 - a. ASTM A90/A90M Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
 - b. ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - c. ASTM A153/A153M Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - d. ASTM A384 Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
 - e. ASTM A385 Practice for Providing High-Quality Zinc Coatings (Hot-Dip).
 - f. ASTM A615/A615M Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - g. ASTM A641/A641M Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - h. ASTM A706/A706M Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
 - i. ASTM A767/A767M Standard Specification for Zinc-coated (Galvanized) Steel Bars for Concrete Reinforcement
 - j. ASTM A780/A780M Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - k. ASTM A996/A996M Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
 - l. ASTM A1055/A1055M Standard Specification for Zinc and Epoxy Dual-Coated Steel Reinforcing Bars.
 - m. ASTM A1094/A1094M Standard Specification for Continuous Hot-Dip Galvanized Steel Bars for Concrete Reinforcement.
 - n. ASTM B6 Specification for Zinc.
 - o. ASTM B487 Test Method for Measurement of Metal and Oxide Coating Thickness by Microscopical Examination of Cross Section.
 - p. ASTM B852 Specification for Continuous Galvanizing Grade (CGG) Zinc Alloys for Hot-Dip Galvanizing of Sheet Steel
 - q. ASTM E376 Practice for Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Testing Methods.
3. American Welding Society (AWS).
 - a. AWS D1.4/D1.4M Structural Welding Code - Reinforced Steel.
4. Concrete Reinforcing Steel Institute (CRSI).
 - a. CRSI Manual of Standard Practice, 29th Edition
 - b. CRSI Placing Reinforcing Bars, 9th Edition.
5. US Green Building Council (USGBC).
 - a. LEED NC V4 LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations.

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with [Architect] [Engineer]'s and Contractor's duties and responsibilities in Contract Conditions and Section 01 33 00 - Submittal Procedures.

1.3 ADMINISTRATIVE REQUIREMENTS

Specifier Note: Retain and edit the following Paragraph to suit Project requirements.

- A. Coordination: Coordinate work of this Section with Section [03 30 00 - Cast-in-Place Concrete] [03 33 13 - Heavyweight Architectural Concrete] [03 33 16 - Lightweight Architectural Concrete] [03 41 16 - Precast Concrete Slabs] [03 41 23 - Precast Concrete Stairs].
- B. Pre-installation Meeting: Convene pre-installation meeting after Award of Contract and one week prior to commencing work of this Section to verify Project requirements, substrate conditions and coordination with other building subtrades, and to review manufacturer's written recommendations.
 1. Comply with Section 01 31 19 Project Meetings and coordinate with other similar pre-installation meetings.
 2. Notify attendees 2 weeks prior to meeting and ensure meeting attendees include as minimum:
 - a. Owner.

Specifier Note: Retain and edit the following Paragraph to suit Contract Conditions.

- b. [Architect] [Engineer].
- c. Reinforcement bar manufacturer's technical representative.
3. Ensure meeting agenda includes review of methods and procedures related to reinforcement bar placement including coordination with related work.
4. Record meeting proceedings including corrective measures and other actions required to ensure successful completion of work and distribute to each attendee within 1 week of meeting.

1.4 SUBMITTALS

- A. Product Data: Manufacturer's standard specifications and descriptive literature, including:
 1. Physical characteristics.
 2. Performance criteria.
 3. Safety Data Sheets (SDS).
 4. Environmental Product Declaration (EPD).
- B. Samples: Submit 6 inches minimum long sample of each size of reinforcement bar specified.

Specifier Note: Specify submittals intended to document manufacturer storage, installation and other instructions.

- C. Manufacturer's written instructions, including:
 1. Delivery, storage and handling recommendations.
 2. Preparation and application recommendations.
- D. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
- E. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria, and physical requirements.
- F. Manufacturer's Field Reports: Submit manufacturer's field reports within 3 days of each manufacturer representative's site visit and inspection.

Specifier Note. Coordinate the following Paragraph with Article 3.1 of this Section and edit the option for number of years experience where necessary.

- G. Installer's Qualifications: Submit verification outlining [two] years minimum experience of work similar to work of this Section.

Specifier Note: Delete the following Paragraph if welding of reinforcement bars is not permitted.

- H. Welder's Certification: Submit verification of welder's certification from AWS.

Specifier Note: Coordinate Article below with Contract Conditions and with Section 01 78 36 - Warranties

- I. Warranty: Fully executed, issued in [Owner's] name, and registered with manufacturer.
 1. Manufacturer's [1-year] warranty, from date of substantial completion, covering defects in materials.

Specifier Note: Retain the following only if specifying for a LEED project. Specify only the technical submittal requirements necessary to achieve the credits desired for this Project.

- J. Sustainable Design (LEED) Submittals:
 1. LEED Submittals: In accordance with Section [01 35 21 – LEED Requirements].
 2. Submit verification for items when appropriate as follows:
 - a. MR 5 - Regional Materials.
 - b. [].

1.5 CLOSEOUT SUBMITTALS

Specifier Note: Retain and edit the following Paragraph to meet project requirements. Verify section number and title of Division 01 section which deals with Closeout Submittals on Project before editing the Paragraph.

- A. Make submittals in accordance with Section [01 77 00 - Closeout Procedures] [01 78 00 - Closeout Submittals].
- B. Operation and Maintenance Data: Supply maintenance data for galvanized reinforcement bars for incorporation into manual specified in Section [01 77 00 - Closeout Procedures] [01 78 00 - Closeout Submittals] [01 78 23 - Operation and Maintenance Manuals].

1.6 QUALITY ASSURANCE

Specifier Note: Retain and edit the following Paragraph to suit Project requirements. Coordinate this Paragraph with Article 3.1 - Installer's Qualifications.

- A. Installer's Qualifications: Trained installers with [two] years minimum verifiable experience of work similar to work of this Section.

Specifier Note: Retain and edit the following Paragraph to suit the Project requirements and Contract Conditions. Edit the location for the Place of the Work.

- B. Reinforcement Design: Design reinforcement under direct supervision of Professional Engineer experienced in design of this work and licensed in [State of _____] [District of Columbia].

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in accordance with manufacturer's written instructions and to ASTM A1094/A1094M.
1. Deliver materials in with identification labels intact and product name and manufacturer clearly visible, and in lengths and sizes to suit Project.
- B. Store materials protected from exposure to harmful environmental conditions, clean and dry.

1.8 WARRANTY

- A. Project Warranty: Refer to Contract Conditions for Project warranty provisions.

Specifier Note: Retain and edit the following Paragraph to suit project requirements.

- B. Manufacturer's warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official.
1. Manufacturer's warranty is in addition to and not intended to limit other rights Owner may have under Contract Conditions.

PART 2 PRODUCTS

Specifier Note: Retain Article below for proprietary method specification. Add product attributes performance characteristics, material standards and descriptions in other Articles as applicable. Use of such phrases as or equal, approved equal or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining or equal products.

2.1 MANUFACTURER

- A. AZZ GalvaBar.
- B. Contact Information: 5101 Bird Creek Avenue, Catoosa, OK 47015; Phone: (918) 379-0090; Email: galvabar@azz.com; Website: www.azz.com/galvabar.

2.2 PERFORMANCE

- A. Comply with AASHTO M111.
- B. Comply with CSRI Manual of Standard Practice.
- C. Steel bars: To [ASTM A1094/ A1094M].

2.3 DESCRIPTION

- A. Deformed galvanized steel reinforcing bars: To [ASTM A1094/ A1094M].

Specifier Note: Retain and edit the following Paragraph to suit Project requirements. If multiple sizes of reinforcing bars are required specify them in the following Paragraph or indicate the sizes on the drawings.

1. Bar designation size: [3] [4] [5] [6] [7] [8] [9] [10] [11] [As indicated].
2. Metalurgically bond 50 micron (2 mil) minimum zinc alloy to steel reinforcement bars: To [ASTM A1094/A1094M].

Specifier Note: Retain and edit the following Paragraph to suit Project requirements. AZZ GalvaBar offers an optional passivation-quench treatment on its galvanized reinforcement bars where required. Contact AZZ GalvaBar for further details before specifying.

3. Finish: [Standard] [Passivation-quench treatment].
- B. Acceptable Materials: AZZ GalvaBar, AZZ GalvaBar.

2.4 ACCESSORIES

- A. Reinforcement Ties: Galvanized steel wire to ASTM A641/A641M.

PART 3 EXECUTION

3.1 INSTALLER QUALIFICATIONS

Specifier Note: In the following Paragraph edit the option for number of years experience to suit Project requirements.

- A. Use only trained installers with [two] years minimum experience of work similar to work of this Project.

Specifier Note: Retain the following Paragraph only when welding of reinforcement bars is permitted.

- B. Use only welders certified by AWS.

3.2 EXAMINATION

- A. Verification of Conditions: Verify that existing conditions or conditions previously installed under other Sections or Contracts are acceptable for Work of this Section.

Specifier Note: Retain and edit the following Paragraph to suit Contract Conditions.

1. Inform [Architect] [Engineer] of unacceptable conditions immediately upon discovery.

Specifier Note: Retain and edit the following Paragraph to suit Contract Conditions.

2. Proceed with application only after unacceptable conditions have been remedied and after receipt of written approval to proceed from [Architect] [Engineer].
3. Starting installation of concrete reinforcing bars implies conditions are acceptable for Work of this Section.

3.3 PREPARATION

- A. Ensure concrete forms are in place for work to be done in accordance with Section [03 30 00 - Cast-in-Place Concrete] [03 33 13 - Heavyweight Architectural Concrete] [03 33 16 - Lightweight Architectural Concrete] [03 41 16 - Precast Concrete Slabs] [03 41 23 - Precast Concrete Stairs] Section [03 45 13 - Faced Architectural Precast Concrete].

3.4 INSTALLATION

Specifier Note: Complete manufacturer installations available here: <http://www2.azz.com/galvabar-guidelines>

- A. Place concrete reinforcing bars within concrete forms in accordance with manufacturer's written recommendations, and to CSRI Placing Reinforcement Bars recommendations.

Specifier Note: Retain and edit the Following Paragraph to suit Contract Conditions.

- B. Splicing Reinforcement Bars: Splice reinforcement bar lengths only after receipt of authorization from [Architect] [Engineer].
 1. Stagger splices.
 2. Ensure that distance between staggered splices is length required for lapped splice minimum.
 3. Ensure reinforcing bar splices are full contact splices.
 4. Splices are permitted only where distance between splice and adjacent bar or surface of concrete is two inches or greater.

Specifier Note: Retain and edit the following Paragraph only when welding of reinforcement bars is permitted.

- C. Welding Reinforcement Bars: Weld reinforcement bar lengths only [after receipt of authorization from [Architect] [Engineer]] [where indicated].
 1. Welding according to AWS D1.4.
- D. Repair damaged or uncoated areas of concrete reinforcing bars to ASTM A780/A780M.
- E. Secure reinforcing bars in place using galvanized steel wire ties in patterns and positions indicated.
- F. Ensure reinforcing bars are held in patterns and positions indicated and are ready to receive concrete in accordance with Section [03 30 00 - Cast-in-Place Concrete] [03 33 13 - Heavyweight Architectural Concrete] [03 33 16 - Lightweight Architectural Concrete] [03 41 16 - Precast Concrete Slabs] [03 41 23 - Precast Concrete Stairs].

3.5 FIELD QUALITY CONTROL

Specifier Note: Specify requirements if manufacturers are to provide field quality control with onsite personnel for instruction or supervision of product application. Manufacturer field reports are included under PART 1, Submittals.

A. Manufacturer's Services:

Specifier Note: Use the following Paragraphs only when manufacturer's field services are provided and are required to verify the quality of the application. Establish the number and duration of periodic site visits required by manufacturer and specify below. Contact AZZ GalvaBar to determine any costs associated with Technical Representatives providing manufacturer's field services. Delete the following Paragraph if field services are not required.

1. Coordinate manufacturer's services with Section [01 45 00 - Quality Control].

Specifier Note: Delete the following paragraph if no costs are associated with manufacturer's services.

2. Arrange for payment for manufacturer's services.
3. Have manufacturer review work involved in handling, placement, protection, touch-up and cleaning of galvanized reinforcement bars and submit written reports in acceptable format to verify compliance of Work with Contract Conditions.
4. Manufacturer's Field Services: Provide manufacturer's field services consisting of product use recommendations and periodic site visits for product installation review in accordance with manufacturer's instructions.

Specifier Note: Retain and edit the following Paragraph to suit Contract Conditions.

- a. Report any inconsistencies from manufacturer's recommendations immediately to [Architect] [Engineer].

Specifier Note: Edit the following Paragraph to meet Project requirements. Coordinate site visits with manufacturer or delete the Paragraph and all of its subparagraphs if site visits are not required.

5. Schedule site visits to review work at stages listed:
 - a. After delivery and storage of reinforcement bars, and when preparatory work on which Work of this Section depends is complete, but before application begins.
 - b. During progress of work.
 - c. Upon completion of work.

Specifier Note: Retain and edit the following Paragraph to suit Contract Conditions.

- d. Obtain reports within three days of review and submit immediately to [Architect] [Engineer].

3.6 CLEANING

- A. Perform daily progress cleaning.
 1. Leave work area clean at end of each day.
- B. Upon completion, remove surplus materials, rubbish, tools and equipment.
- C. Collect recyclable waste and dispose of in accordance with manufacturer's written recommendations and at appropriate recycling facilities.

Specifier Note: Specify protection methods completed after installation, but prior to acceptance by the owner. Include only statements unique to this Section. Coordinate the following Article with Section 01 76 00 - Protecting Installed Construction.

3.7 PROTECTION

- A. Protect installed reinforcement bars from damage during construction.
- B. Repair or replace adjacent materials damaged by installation of reinforcement bars.

END OF SECTION