



SUPPLEMENTAL SPECIFICATIONS

to the

1988 English Standard Specifications for Highways and
Bridges

and the

1995 Metric Standard Specifications for Highways and
Bridges

JULY 1, 2015

SECTION 901. (continued)

All forms shall be installed in accordance with approved fabrication and erection plans.

Form sheets shall not be permitted to rest directly on the top of the stringer or floor beam flanges. Sheets shall be securely fastened to form supports and shall have a minimum bearing length of 1 inch (25 mm) at each end. Form supports shall be placed in direct contact with the flange of stringer or floor beam. All attachments shall be made by permissible welds, bolts, or clips of other approved means. However, welding of form supports to flanges of steels not considered weldable and to portions of flange subject to tensile stresses shall not be permitted. Welding and welds shall be in accordance with the provisions of AWS D1.3 pertaining to fillet welds except that 1/8 inch (3 mm) fillet welds will be permitted.

Any permanently exposed form metal where the galvanized coating has been damaged shall be thoroughly cleaned and painted with galvanizing repair paint in accordance with Subsection 960.64 of the Standards. Minor heat discoloration in areas of welds need not be touched up.

The Contractor's method of construction should be carefully observed during all phases of the construction of the bridge deck slab. These phases include installation of the metal forms; location and fastening of the reinforcement; composition of concrete items; mixing procedures, concrete placement and vibration; and finishing of the bridge deck. Should the Engineer determine that the procedures used during the placement of the concrete warrant inspection of the underside of the deck, the Contractor shall remove at least one section of the forms at a location and time selected by the Engineer for each span in the contract at no additional cost to the project. This should be done as soon after placing the concrete as practicable in order to provide visual evidence that the concrete mix and the Contractor's procedures are obtaining the desired results. An additional section shall be removed at no additional cost to the project if the Engineer determines that there has been any change in the concrete mix or in the Contractor's procedures warranting additional inspection.

After the deck concrete has been in place for a minimum period of 2 days, the concrete shall be tested for soundness and bonding of the forms by sounding with a hammer as directed by the Engineer. If areas of doubtful soundness are disclosed by this procedure, the Contractor will be required to remove the forms from such areas for visual inspection after the pour has attained adequate strength. This removal of the permanent steel bridge deck forms shall be at no cost to the project. At locations where sections of the forms are removed, the Contractor will not be required to replace the forms, but the adjacent metal forms and supports shall be repaired to present a neat appearance and assure their satisfactory retention. As soon as the form is removed, the concrete surfaces will be examined for cavities, honeycombing and other defects. If irregularities do not justify rejection of the work, the concrete shall be repaired as the Engineer may direct and shall be given an Ordinary Surface Finish, in accordance with the contract specifications. If the concrete where the form is removed is unsatisfactory, additional forms, as necessary, shall be removed at no additional cost to the project to inspect and repair the slab, and the Contractor's methods of construction shall be modified as required to obtain satisfactory concrete in the slab. All unsatisfactory concrete shall be removed or repaired as directed by the Engineer.

The amount of sounding and form removal may be moderated, at the Engineer's discretion, after a substantial amount of slab has been constructed and inspected, if the Contractor's methods of construction and the results of the inspections as outlined above indicate that sound concrete is being obtained through the slabs.

The Contractor shall provide all facilities as are reasonably required for the safe and convenient conduct of the Engineer's inspection procedure.

901.62 Reinforcement.

The Contractor shall submit for approval detailed shop drawings and schedules of the reinforcing bars so that the reinforcement may be properly placed and its mass readily computed.

Coated bars shall be either epoxy coated or galvanized, as specified on the plans. Where coated bars are called for without distinction, they may be either epoxy coated bars or galvanized bars, however mixing epoxy coated and galvanized bars will not be permitted. Where coated bars are used in combination with uncoated bars in a reinforcing mat or cage and the coated bars will touch or be tied to uncoated bars with wire ties, only epoxy coated bars shall be used.

All support devices and ties for galvanized bars used in deck reinforcing shall be coated so that there is no electrical continuity either between reinforcing mats or between the reinforcing and the stay-in-place forms or steel beams.

All support devices and ties for epoxy coated bars used in deck reinforcing shall be either epoxy coated or coated with a plastic material compatible with the coating of the reinforcement.

All coated and un-coated reinforcing bars shall be stored above the surface of the ground on platforms, skids, or other supports and shall be protected from mechanical injury and surface deterioration caused by exposure to conditions producing rust. When placed in the work, reinforcing bars shall be free from dirt, loose rust or scale, mortar, paint, grease, oil, or other non-metallic coatings that reduce bond. Reinforcing bars shall be free from injurious defects such as cracks and laminations. Any injurious defects of the epoxy coating shall be repaired and allowed to cure completely prior to concrete placement.

SECTION 901. (continued)

Epoxy coated reinforcing bars shall be coated in a certified epoxy coating applicator plant in accordance with the Concrete Reinforcing Steel Institute's Voluntary Certification Program for Fusion-Bonded Epoxy Coated Applicator Plants. Epoxy coated reinforcing steel shall be handled and stored by methods that will not damage the epoxy coating. All systems for handling epoxy coated reinforcing bars shall have adequately padded contact areas. All bundling bands shall be padded and all bundles shall be lifted with a strong back, multiple supports, or platform bridge so as to prevent bar to bar abrasion from sags in the bundle. Bars or bundles shall not be dropped or dragged. Epoxy coated reinforcing bars shall be stored on wooden or padded supports.

Epoxy coated reinforcing steel shall be protected from sunlight, salt spray, and exposure to the weather. Provisions shall be made for continuous air circulation around the coated reinforcing to minimize condensation under the protective covering.

If it is impractical to obtain or use bars of the full length required, the bars shall be lapped for the length shown on the plans or joined with mechanical splicers. If no lap length is provided, the lap length shall be calculated for the type of bar used according to the latest AASHTO Standard Specifications for Highway Bridges for a Class C tension lap splice.

If mechanical splicers are used proper consideration shall be given to the installation sequence and shall be so noted on the reinforcing steel shop drawings. The mechanical splicing system shall be assembled in accordance with the manufacturer's recommendations.

Reinforcement bars to be spliced mechanically shall be marked using indelible ink prior to splice attachment to ensure sufficient embedment in the splicing device. Assembly features shall provide for reasonably error free work under construction conditions. Mechanical reinforcing bar splicers shall be staggered in accordance with the Plans.

The entire splice area of epoxy coated mechanical splicing systems shall be painted with a compatible approved epoxy repair coating after the system is assembled. The entire splice area of galvanized splicing systems shall be painted with a compatible approved galvanizing repair coating after the system is assembled. For mechanical splicer systems that cannot be effectively sealed with an epoxy or galvanizing repair coating, an approved heat shrink tube/sleeving shall be required after installation to seal the system. The mechanical splicer shall not be encased in concrete until the visual inspection and the required testing have been completed and approved by the Engineer.

The steel shall be bent in the shop true to templates and shall be placed accurately as shown on the plans with the following tolerance:

1. Cover (clearance from face of concrete to face of bar) $\pm \frac{1}{4}$ inch (5 mm).
2. Horizontal spacing of bars ± 2 inches (50 mm) (however the required number of bars must be placed). The minimum spacing cannot be decreased. The reinforcement shall be placed so as to ensure it remains in the correct position during the placing and hardening of the concrete. The clear distance between spliced bars and/or splicing devices shall not be less than 1-1/2 times the nominal diameter of the bars, 1-1/2 times the maximum size of the coarse aggregate, nor less than 1½ inches (40 mm).

The required distance between reinforcing steel and the forms shall be maintained by means of stays, blocks, ties, hangers or other approved supports. The spacing of reinforcing supports shall not exceed 4 feet (1.2 m).

Steel reinforcing mats shall be firmly secured against displacement by tying every other intersection point with a maximum of 12 inches (300 mm) between tied joints. In addition, steel reinforcing mats (top and bottom) shall be securely connected together so that uniform vertical spacing can be maintained throughout. This connection may be accomplished by tying with coated tie wires or other means as approved by the Engineer. Connections between the top and bottom mats of reinforcement shall be placed no farther apart than 4 feet (1.2 m). on center. Support devices may be utilized for this purpose. Connection devices shall neither deflect the steel reinforcing nor interfere with the smooth flow of concrete.

Blocks for holding reinforcement from contact with the forms shall be precast mortar blocks of approved shape and dimensions. Blocks for spacing reinforcing bars shall also be precast mortar blocks of approved designs and short enough to permit their ends to be adequately covered with concrete. The precast mortar blocks shall be made from the same materials and of the same proportions of sand and cement as that of the concrete in which they are to be used. They shall be cast and properly cured before use and shall have a wire of copper or other non-rusting metal or other approved device cast into each block suitably placed so that the block can be securely fastened to the reinforcement. Layers of bars, except for those placed in bridge decks, shall be separated by such blocks, which may be reinforced, and which shall have slots to receive the bars and hold them in place, or by other approved means. Any parts of metal supports that are left in place within 3 inches (75 mm) of an exposed surface of the concrete shall be made of either non-rusting metal, or shall be epoxy coated or galvanized to match the reinforcement. Galvanizing of such parts shall be in accordance with Subsection 960.64. The use of pebbles, pieces of broken stone, metal pipe or wooden blocks will not be permitted.

Reinforcement in any member or section shall be in place and approved by the Engineer before the placing of concrete begins. In no case shall reinforcing steel be driven or forced into the concrete and any reinforced concrete placed in violation of this provision will be rejected by the Engineer, and then shall be removed and replaced by the Contractor entirely at his/her own expense.