

711.00 Barrier Rails

711.01 Description

A. Fixed Form Jersey & Retrofit Rail

1. Before cast-in-place barrier rail is constructed on the existing bridge curb section, *SSHC Subsection 704.03*. requires that old concrete which is to be in contact with the new concrete be cleaned of all laitance (loose particles of concrete, dirt, or other foreign materials).
2. Structurally, the existing curb surface need not be roughened, but must be clean. To assure a clean surface and to obtain maximum bond at the interface, sandblasting the old curb surface shall be required. Other methods of cleaning may be approved by the Project Manager.
3. Surface preparation, such as sandblasting, should be completed prior to setting the epoxy coated dowels.
4. When retrofit is part of a deck overlay, the contractor may request permission to place the finish machine on the retrofit rail. Construction's policy will be:
 - (a) A minimum cure time of at least 48 hours prior to placing the mass of a finish machine on the rail, AND
 - (b) Finish machine rail support feet must be spaced less than 1'-9" (550 mm) apart.
 - (1) If these conditions are unacceptable to the contractor, a minimum cure time of 72 hours will be required. After 72 hours there are no special conditions for placing a finishing machine on the barrier rail.

B. Cast-In-Place (Retrofit) Barrier Rail

1. This work is routinely combined with a deck repair project and includes an overlay. Often contractors will place the new rail prior to placing overlay. In these situations, the contractor intends to place the finish machine's rail on top of the new barrier rail. Question: How long must the new rail cure before allowing the deck finishing machine to be placed on it?
 - a. 48 hours must expire prior to placing the weight of a finishing machine on the rail.
 - b. Rail supports (legs) must be placed at a spacing of no greater than 18 inches (500 mm).
 - c. Rail supports and rail cannot be placed until the surface has sufficiently cured to prevent scuffing and/or marring.
 - d. Care must be taken to prevent damage to the face or back of the barrier rail.

C. Slip Form Barrier Rail

1. Slip form rails have at times displayed transverse cracks, longitudinal cracks, reinforcing steel shadows, and nonuniformity of top elevations. Consideration of the following construction problems and solutions will help to eliminate problems:
2. Longitudinal Cracks
 - (a) Longitudinal cracks and vertical cracks near posts can be prevented with proper construction techniques. (Consolidate uniformly, obtain proper rebar clearance and wet cure.)

711.02 Material Requirements (See Section 706)

711.03 Construction Methods

A. Concrete Surface Finish (Rail and Beams)

1. Ordinary surface finish is required for rails. Beams need only have "popcorns" filed.

B. Surface Finish

1. The type of surface finish required for concrete structures is governed by the special provisions, the plans and *SSHC Subsection 704.03*. A pre-construction study of these sources will bring to light any possible differences of opinion concerning requirements and allow time for their solution.
2. For either ordinary surface finish, rubbed finish, grout cleaned finish, or floated surface finishes, the contractor should be required to perform the work as promptly as practical after the removal of the forms. If this work is started promptly, and the surface finishing work performed before the concrete becomes excessively hardened, a much better surface finish will be obtained. Also, this better finish will be obtained with less work and consequently at lower cost.
3. If the required finish is a rubbed finish, then *SSHC Subsection 704.03* does not authorize plastering an excess of mortar on the surface of the concrete. The mortar is to be applied, as stated in the Specifications.
4. Note that proper rubbing is a sequence of three steps:
 - a. The surface is thoroughly saturated and then rubbed with the medium coarse stone faced with mortar. The paste (rubbed up from the surface of the concrete, and not applied as a plaster) is left on.
 - b. The surface is wetted and rubbed with a fine carborundum stone. The paste is left to dry on the surface.

- c. The dried paste is rubbed off completely with burlap. Some laborers will not distinguish between coarse and fine stones, or the contractor may originally furnish only one grade. Check with the Project Manager as to the proper degree of fineness of the stones being used, on the basis of the finished results. Request the Project Manager's inspection of the first finishing work done in order that he/she can set standards for methods and results in subsequent work. Ordinary surface finish, rubbed finish, grout cleaned finish, and floated surface finishes include leaving all chamfer lines and all plane surfaces intersection lines cut clean and straight.
- 5. Special provisions currently allow the use of a special surface coating as an alternate to a rubbed surface finish.
- 6. Special attention and inspection should be given to the close tolerance required in finishing of the concrete at the bearing plate areas on abutment and pier caps. Promptly after the concrete has hardened sufficiently, remove the anchor-bolt templates and finish the bearing area to a true surface. A small carpenter's level is very helpful to level the area. Prompt and efficient performance of this work will save much grinding of the hardened concrete at the time the bearing plates are set, and will yield better, more uniform bearing areas.

NOTE: To enhance the ability to hand finish slipped rail, CONFILM is recommended. CONFILM is a Master Builders product and should be used per manufacturer's recommendations.