



SECTION 609

PAVED DRAINAGE

SECTION 609.10 CONCRETE CURB, GUTTER AND PAVED DITCH.

609.10.1 Description. This work shall consist of constructing curb, gutter or combination curb and gutter and paved ditches as shown on the plans or as directed by the engineer.

609.10.2 Material. Material, proportioning, air-entraining, mixing, slump and transporting of concrete shall be in accordance with [Sec 501](#). Concrete shall be either Class B or Pavement concrete. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

Item	Section
Reinforcing Steel for Concrete Structures	1036
Concrete Curing Material	1055.2
Material for Joints	1057

609.10.3 Construction Requirements.

609.10.3.1 These items shall be placed on a prepared subgrade of uniform density. Forms joined neatly and tightly, set accurately to alignment and grade and securely held in place by connections and bracing shall be used for this work. Forms for curved form lines shall be provided in a manner similar to that required for setting forms for concrete pavement in [Sec 502](#). Slip-form methods may be used for placement of concrete curb, concrete gutter, curb and gutter and paved ditch, provided proper lines, grades and typical sections are maintained.

609.10.3.2 Required reinforcement and tie bars shall be held in the specified position during the placing of concrete by bar chairs or other devices approved by the engineer. Joints shall be constructed at intervals and locations shown on the plans or as directed by the engineer.

609.10.3.3 Concrete shall be placed, finished and cured in accordance with [Sec 703](#).

609.10.3.4 Concrete shall be placed on the prepared and sprinkled subgrade, consolidated and struck off to the required thickness. Concrete shall be tamped or vibrated sufficiently to eliminate all voids and to bring mortar to the top, after which the surface shall be finished smooth and even. All edges shall be rounded with an edging tool having a 1/4-inch radius. Faces of curb shall be rounded at the top and bottom, by means of an approved tool, to the radius shown. After finishing, concrete shall be cured in the same manner as required for concrete pavement, except transparent membrane shall be used in lieu of pigmented membrane.

609.10.3.5 After the concrete has set sufficiently, the forms shall be removed, and where necessary, the contractor shall backfill adjacent to the concrete with suitable material, compacted and finished in a satisfactory manner.

609.10.3.6 During cold weather, the weather limitations and protection requirements of [Sec 502](#) will apply to this work.

609.10.4 Method of Measurement.

609.10.4.1 Curb, gutter and combination curb and gutter will be measured to the nearest linear foot. Measurement will be made along the curb face or along the flow line of gutters exclusive of paved approaches.

609.10.4.2 Paved ditches will be measured to the nearest 1/10 square yard.

609.10.5 Basis of Payment. The accepted quantities of curb, gutter, curb and gutter, and paved ditch, complete in place, will be paid for at the contract unit price for each of the pay items included in the contract. No direct payment will be made for the following:

- (a) Excavation below the upper surface of the concrete of these items.
- (b) Any work necessary for preparing the subgrade and backfilling the completed item.
- (c) Furnishing or installing reinforcement.

SECTION 609.20 INTEGRAL CURB.

609.20.1 Description. This work shall consist of curb constructed on the edge of concrete pavement as shown on the plans or as directed by the engineer.

609.20.2 Material. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

Item	Section
Concrete Curing Material	1055
Material for Joints	1057

609.20.2.1 Integral curb shall be constructed of concrete conforming to that required for concrete pavement, except coarse aggregate in accordance with the gradation requirements of [Sec 1005](#) may be used.

609.20.2.2 The quantity of coarse aggregate in the mix may be reduced to obtain better workability.

609.20.3 Construction Requirements.

609.20.3.1 The curb shall be an integral part of the supporting concrete pavement. The curb may be placed immediately after all pavement finishing operations have taken place and before the pavement has taken initial set, or tie bars may be set in the freshly finished pavement to serve ultimately as a tie between the pavement and the curb, which may be constructed later. Neither of these methods will be required for the distance needed for paving equipment to be backed up near a construction joint. The pavement surface within this relatively short distance shall be roughened throughout the area to be covered by the curb.

609.20.3.2 Forms joined neatly and tightly, set accurately to alignment and grade, and securely held in place by connections and bracing shall be used for this work. Forms for curved form lines shall be provided in a manner similar to that required for setting forms for concrete pavement in [Sec 502](#). Slip-form methods may be used for placement of integral curb provided all other requirements of [Sec 609.20](#) are met.

609.20.3.3 The finished curb shall be true to line, grade and cross section, with the top and face finished smooth. The top edges of the curb shall be rounded with approved edging tools. Curing shall be accomplished in the same manner as required for concrete pavement, except transparent membrane shall be used. Joints of preformed material shall be placed through the curb and into each underlying transverse pavement joint to the full depth of the joint in the pavement. The preformed material shall extend entirely through the curb to within 1/4 inch of the top and face of the curb.

609.20.3.4 Where tie bars are set in freshly finished pavement surface and membrane curing is used on the pavement, care shall be taken to avoid spraying the membrane on the protruding tie bars or the area on which the integral curb is to be placed. One of the other curing methods allowed in accordance with [Sec 502](#) shall be used for curing this area of the pavement.

609.20.3.5 Integral curb straightedged parallel to the centerline shall not show a variance greater than 1/4 inch from a 10-foot straightedge.

609.20.4 Method of Measurement. Final measurement of the completed integral curb will not be made except for authorized changes during construction or where appreciable errors are found in the contract quantity. Where required, integral curb will be measured to the nearest linear foot along the curb face, exclusive of paved approaches. The revision or correction will be computed and added to or deducted from the contract quantity.

609.20.5 Basis of Payment. The accepted quantity of integral curb, complete in place, will be paid for at the contract unit price for each of the pay items included in the contract. Payment for curb constructed on paved approaches will be included in the contract unit price for paved approaches.

SECTION 609.30 ASPHALT CURB.

609.30.1 Description. This work shall consist of constructing a curb of asphaltic concrete as shown on the plans or as directed by the engineer. All applicable provisions of [Sec 403](#) will apply to this construction.

609.30.2 Material. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

Item	Section
Coarse Aggregate	1002
Fine Aggregate	1002
Mineral Filler	1002
Asphalt Binder, Performance Graded (PG)	1015

609.30.3 Composition of Mixture. The asphaltic concrete mixture shall consist of aggregate, filler if needed, and asphalt binder combined in such proportions that the composition by weight of the finished mixture shall be within the limits specified for BP-1 or SP 125 mixture in accordance with [Sec 403](#). The contractor shall submit in writing to Construction and Materials for approval of the job mix formula the contractor proposes to use for asphalt curb. The BP-1 or SP-125 job mix formula approved for asphaltic concrete pavement shall not be used for asphalt curb.

609.30.4 Construction Requirements.

609.30.4.1 The curb shall be placed in position on a primed surface by means of an approved automatic curb machine that shapes and compacts the mixture to the specified cross section. The placement temperature of the mixture shall be approximately 260 F. All joints shall be carefully made in such a manner as to ensure a continuous bond between the old and new sections of the curb.

609.30.4.2 The newly laid curb shall be protected from traffic until the heat of the asphalt mixture has dissipated. Immediately after the asphalt curb has hardened, the curb shall be backfilled where required with suitable material.

609.30.4.3 If painting of the asphalt curb is specified in the contract, a primer coat of commercial grade asphalt base aluminum paint shall be applied first.

609.30.5 Method of Measurement. Asphalt curb will be measured to the nearest linear foot.

609.30.6 Basis of Payment. The accepted quantity of asphalt curb will be paid for at the contract unit price. No direct payment will be made for priming prior to placing the curb or for painting the completed curb.

SECTION 609.40 DRAIN BASIN ASPHALT CURB.

609.40.1 Description. This work shall consist of furnishing and constructing a drain basin as shown on the plans or as directed by the engineer.

609.40.2 Material. Drain basins shall consist of a drop inlet of the size and type shown on the plans, grates and bearing plates for drop inlet, Group C pipe in the size shown on plans and concrete slope protection at pipe outlet as shown on plans. These items shall be in accordance Division 1000, Material Details, and specifically as follows:

Item	Section
Rock Ditch Lining	609.60
Grates and Bearing Plates	614
Drop Inlet	1033

609.40.3 Construction Requirements. Excavation and backfilling shall be in accordance with Secs 604 and 725. The adjustment shall be made to the line and grade shown on the plans or as directed by the engineer. The concrete slope protection for the drain basin outlet shall be placed as shown on the plans or as directed by the engineer.

609.40.4 Basis of Payment. Payment for the accepted drain basin, complete in place, will be paid for at the contract unit price per each. Payment for the accepted quantities of Class 3 excavation required for installing the drop inlet for the drain basin will be paid for at the contract unit price.

SECTION 609.50 BLANK.

SECTION 609.60 ROCK DITCH LINER.

609.60.1 Description. This work shall consist of constructing rock ditch liners at locations shown on the plans or as directed by the engineer.

609.60.2 Material. The material for rock ditch liner shall consist of a predominantly one-sized, durable stone, shot rock or broken concrete. Acceptance by the engineer may be made

by visual inspection. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

Item	Section
Geotextile Fabric	1011

609.60.2.1 Type 1 Rock Ditch Liner shall consist of material with a predominant rock size of 3 inches, a maximum rock size of 6 inches and a gradation such that no more than 15 percent will be less than one inch.

609.60.2.2 Type 2 Rock Ditch Liner shall consist of material with a predominant rock size of 6 inches, a maximum rock size of 10 inches and a gradation such that no more than 15 percent will be less than 3 inches.

609.60.2.3 Type 3 Rock Ditch Liner shall consist of material with a predominant rock size of 12 inches, a maximum rock size of 20 inches and a gradation such that no more than 15 percent will be less than 4 inches.

609.60.2.4 Type 4 Rock Ditch Liner shall consist of material with a predominant rock size of 19 inches, a maximum rock size of 28 inches and a gradation such that no more than 15 percent will be less than 6 inches.

609.60.2.5 Bedding material shall be used under Type 3 and Type 4 Rock Ditch Liner. Bedding material shall consist of crushed stone or gravel with a gradation consisting of 100 percent passing the 3-inch sieve, 30 to 70 percent passing the 1 1/2-inch sieve and 0 to 15 percent passing the No. 4 sieve.

609.60.3 Construction Requirements. Rock ditch liner shall be placed to the approximate shape and thickness shown on the plans for the specified ditch or as directed by the engineer. The rock shall be dumped on a subgrade of reasonably uniform density and left in a rough condition meeting the approval from the engineer.

609.60.4 Method of Measurement. Rock ditch liner and bedding material will each be measured to the nearest cubic yard of material.

609.60.5 Basis of Payment.

609.60.5.1 If shown on the plans that the material for rock ditch liner is to be obtained from the right of way or other sources furnished by the Commission, the excavating, including all breaking, loading, and hauling, regardless of distance, to the site of the rock ditch liner will be paid for and considered completely covered under such contract items as Class A Excavation, Class C Excavation, Unclassified Excavation, Excavation for Structures or other applicable items. If payment is made under these conditions, separate payment for furnishing rock ditch liner will not be made.

609.60.5.2 If the plans show material for rock ditch liner to be secured from sources cited in [Sec 609.60.5.1](#) and this material is made unsuitable or unattainable by the contractor's operations, the contractor shall provide suitable material and dispose of any surplus material at the contractor's expense.

609.60.5.3 If the contract documents provide for obtaining material from the right of way or other source furnished by the Commission, but all or part of the required quantity of acceptable material is not available, unless the shortage is due to the contractor's operations, payment for such additional rock base material that the contractor will be required to furnish

and haul will be made per square yard at the fixed contract unit price in [Sec 109](#), and will be measured in accordance with [Sec 109.1](#).

609.60.5.4 If the plans do not provide for a source of material, the contractor shall provide the material. All costs for securing the source, quarrying, excavating, breaking and hauling the material to the site will be paid for at the contract unit price for Furnishing Rock Ditch Liner.

609.60.5.5 Placing Rock Ditch Liner will be paid for at the contract unit price per cubic yard.

609.60.5.6 The accepted quantity of bedding material, complete in place, will be paid for at the contract unit price. No direct payment will be made for excavation or for any work necessary to prepare the subgrade for the bedding material.

609.60.5.7 No direct payment will be made for excavation below the upper surface of the rock ditch liner, or for any work necessary for preparing the subgrade and backfilling the completed item.

SECTION 609.70 ROCK LINING.

609.70.1 Description. This work shall consist of constructing rock lining at the locations shown on the plans or as directed by the engineer.

609.70.2 Material. The material for rock lining shall be in accordance with [Sec 611.30](#) for Type 2 Rock Blanket.

609.70.3 Construction Requirements. The rock lining material shall be placed by dumping and left in a rough condition to the approximate shape of the channel bottom.

609.70.4 Method of Measurement. Final measurement of the completed rock lining will not be made except for authorized changes during construction, or where appreciable errors are found in the contract quantity. Where required, measurement will be made to the nearest cubic yard of material in place in the completed rock lining. The revision or correction will be computed and added to or deducted from the contract quantity.

609.70.5 Basis of Payment. The accepted quantity of rock lining, complete in place, will be paid for at the contract unit price. No direct payment will be made for any excavation required to place the rock lining.