

211 Preparing the Foundation

211.1 Description

- (1) This section describes restoring, correcting, strengthening, or otherwise preparing the pavement foundation to a condition suitable for constructing and supporting a subbase, base, or surface course. Perform the work described in this section whether or not the contract contains the applicable Prepare Foundation bid items.
- (2) The department defines the pavement foundation as the finished earth subgrade, subbase, or base supporting subbase, base, or surface course.

211.2 (Vacant)

211.3 Construction

211.3.1 General

- (1) Prepare and construct the foundation to uniform density throughout. Construct the foundation to the required alignment and cross-section with equipment and methods adapted for the purpose. After shaping and compacting, provide a smooth foundation, at required density, and at the proper elevation and contour, to receive the next course.
- (2) If necessary to properly accomplish blading or to eliminate or prevent conditions of non-uniform stability or density, scarify the area forming the foundation to a uniform depth.
- (3) Unless specified otherwise, fill holes, ruts, and other depressions in the foundation with materials similar to those existing in the foundation. Excavate and remove high places to the required lines, grade, and section.
- (4) Do not place materials on frozen earth subgrades unless the engineer approves otherwise.
- (5) Excavate and backfill areas of yielding or unstable materials with the material the engineer directs.
- (6) The engineer may make minor adjustments in the plan finished grade line necessary to maintain the characteristics of a stabilized foundation by minimizing cutting into, or filling over the stabilized foundation, if these adjustments do not impair the riding qualities, drainage, or appearance of the finished pavement or cause a deviation from a grade established by a municipal ordinance.
- (7) Prepare the foundation to conform to the specifications for the specific subbase, base, or surface course constructed.

211.3.2 Earth Subgrade

- (1) If the foundation is an earth subgrade, constructed under this or a previous contract, prepare or restore the foundation by removing vegetation; excavating and removing materials above the required elevations; filling depressions below the required elevations; and smoothing, shaping, and compacting the subgrade to the required grade, section, and density.
- (2) Scarify the subgrade to a depth necessary for the type of material encountered. Shape and compact the subgrade to the required lines, grade, cross-section, and uniform density. Remove stones over 6 inches in greatest dimension encountered during the operations.
- (3) If the earth subgrade construction was substantially completed under a previous contract, do not presume that the previously completed work conforms to the requirements under this section.

211.3.3 Foundation for Non-Rigid Base

- (1) Prepare the foundation by scarifying, blading, leveling, and rolling as required to provide the required grade, cross-section, and density. Shape and compact for the full width of the roadbed for at least 1000 feet in advance of base laying operations. Unless specified otherwise, uniformly compact the foundation to not less than the density for standard compaction of the material in the foundation. Maintain the foundation ahead of the base laying operations in a smooth condition and at not less than specified density. Remove ruts or surface irregularities. Correct soft or yielding areas, holes, or other defects before placing the base. Remove snow or ice from the foundation before placing base.
- (2) Bring the foundation for open-graded base to the required grade and cross-section using a machine designed specifically for trimming foundations. The machine must utilize automatic sensors to trim to the required grade and cross-section. If trimmed material consists of crushed aggregate, salvage and use this material in the aggregate base for shoulder construction.

211.3.4 Foundation for Concrete Pavement and Concrete Base

211.3.4.1 General

- (1) Prepare the foundation for concrete pavement or concrete base by restoring, preparing, and conditioning unstabilized base courses. For areas of the foundation impracticable to prepare by machine methods, prepare these areas by hand methods satisfactory to the engineer.

- (2) Ensure that the base course is in a moist but not saturated condition during concrete placement. Water the base course, if required, not less than 6 hours before placing the concrete. If the base course subsequently dries, moisten it by sprinkling water just before placing the concrete. Sprinkle the water to avoid forming pools.
- (3) Trim and shape the base course for a concrete base or pavement for a width equal to the width of the intended base or pavement plus at least one foot on each side to approximately the required lines, grade, and cross-section; and then uniformly compact to the required density. Perform compaction with suitable rolling or other types of consolidating equipment. Unless specified otherwise, uniformly compact the foundation to not less than the density for standard compaction of earth subgrade, subbase, or base.
- (4) Complete preparing the base course for at least 300 feet in advance of depositing concrete, unless the engineer allows otherwise.
- (5) Trim and smooth ruts and irregularities in the base course surface caused by trucks or other equipment. Compact these ruts and irregularities ahead of concrete placing operations. Excavate, fill with suitable material, and compact soft and yielding spots.

211.3.4.2 Slip-Form Methods

- (1) If using slip-form methods, after satisfactorily compacting the base course, trim the area supporting the slip-form paver and where pavement will be placed to the required grade and cross-section using a machine equipped with automatic sensors and designed for trimming base course. If placing overlays on existing pavements, compact and bring shoulder areas supporting the slip-form paver to grade by similar means. Test these areas for compliance with the required grades and cross-section using engineer-approved methods.

211.3.4.3 Form Methods

- (1) After preparing the base course, set the forms and bring the base course to true section and elevation. Fill depressions and remove excess material. Dispose of excess material beyond the forms in a way that does not interfere with concrete placing and finishing operations. After trimming, compact loose areas and keep the base course smooth and at the specified density until concrete placement.
- (2) If the engineer allows hauling or other equipment on the prepared base course, repair the foundation, as necessary, by methods and equipment the engineer approves.

211.3.5 Foundation for Asphaltic Surfacing

211.3.5.1 General

- (1) Prepare aggregate base, existing asphaltic pavement or surfacing, or concrete base and pavement foundations for asphaltic surfacing sufficiently ahead of prime-coating or surfacing to allow uninterrupted placement. Remove material that may adversely affect bond before surfacing.
- (2) Prepare the foundation for asphaltic shoulders by excavating and shaping existing aggregate shoulders. Use excavated material to shape remaining aggregate shoulders or to widen the roadbed.

211.3.5.2 Aggregate Base

- (1) Scarify, shape, trim, and compact, where and as necessary, the surface of the aggregate base to produce the required cross-sectional contour; a profile free from abrupt changes in elevation; and a surface without pits, hollows, depressions, or projections.
- (2) Perform shaping and trimming with long-wheel-base motor graders or subgrade finishers designed for the purpose.

211.3.5.3 Asphaltic Treated Surfaces and Pavements

- (1) Remove areas that will cause raveling, shoving, or bleeding of overlying pavement. If the engineer directs, remove other areas the engineer deems unsuitable. Remove protruding joint filler from cracks to at least the surface of the old pavement and remove excess fillers and sealants from the surface.
- (2) Clean loose material from holes in the existing asphaltic pavement or surfacing. Fill the holes with asphaltic surface mixture and consolidate the mixture over its full depth.

211.3.5.4 Concrete Pavements and Bases

- (1) Remove surplus crack and joint sealants from the pavement surface. Remove protruding joint materials, fillers, and sealer, from joints and cracks to at least the surface of the old concrete.
- (2) Completely remove unstable patches of asphaltic surface used to fill localized pits, depressions, or badly spalled, or disintegrated areas of the old pavement to the underlying concrete. Remove loose concrete or concrete with developing spalling within or adjacent to these areas.

211.3.6 Incorporating or Disposing of Surplus or Unsuitable Material

- (1) Dispose of surplus or unsuitable material as specified in [205.3.12](#). The contractor may use aggregates with suitable engineering properties for building shoulders. The contractor may process and incorporate material resulting from removing old asphaltic pavement or surfacing in aggregate base or shoulders as allowed under [305](#).

211.3.7 Other Work

- (1) Perform preparatory work the plans show, contract requires, or as the engineer directs. This work may consist of removing and replacing base or subbase material; correcting the subgrade; removing existing asphaltic surface courses, curbs, gutters, or lip curbs; widening or patching base or existing pavement; furnishing and placing additional base; and similar work or operations.
- (2) If the engineer revises the profile grade, beyond minor adjustments designated in [211.3.1](#), when preparing the foundation for the construction of a base or surface course, perform the work as revised.

211.4 Measurement

- (1) The department will only measure work under the Prepare Foundation bid items within the limits the plan designates. Work outside the limits the plan designates is incidental to the contract.
- (2) The department will measure the EACH Prepare Foundation bid items under this section as each individual project acceptably completed.
- (3) The department will measure Prepare Foundation for Asphaltic Shoulders by the station, measured along each side of the traveled way.
- (4) The department will measure Prepare Foundation for Base Aggregate by the station, measured along the centerline or reference line of each roadway.

211.5 Payment

211.5.1 General

- (1) The department will pay for measured quantities at the contract unit price under the following bid items:

<u>ITEM NUMBER</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
211.0101	Prepare Foundation for Asphaltic Paving (project)	EACH
211.0201	Prepare Foundation for Concrete Pavement (project)	EACH
211.0301	Prepare Foundation for Concrete Base (project)	EACH
211.0400	Prepare Foundation for Asphaltic Shoulders	STA
211.0500	Prepare Foundation for Base Aggregate	STA

- (2) Payment is full compensation for the work required under this section, within the limits the plan designates for the Prepare Foundation bid items, except as specified otherwise here in 211.5. Required work performed outside the limits the plan designates is incidental. If the contract does not contain a specific Prepare Foundation bid item, work required under this section is incidental.
- (3) Payment also includes water for compaction and dust control except, if the contract contains the Water bid item, the department will pay separately for compaction and dust control water under [624.5](#).
- (4) The department will pay separately for the following work under the pertinent contract bid items, or absent the pertinent items, as extra work:
 - Excavating and backfilling areas of yielding or unstable materials.
 - Performing engineer-ordered alterations of work previously completed.
 - Patching base or furnishing asphaltic surface mixtures for repair of asphaltic treated foundations.
 - Furnishing and placing required filling from beyond the roadbed limits to restore or adjust to required elevation a foundation constructed under a previous contract.

211.5.2 Other Work

- (1) The department will pay separately for the preparatory work required in [211.3.7\(1\)](#) under the pertinent contract bid items, or absent the pertinent items, as extra work.
- (2) The department will pay for the additional work required in [211.3.7\(2\)](#) at the contract unit prices, subject to provisions for increased or decreased quantities under [104.2.2.4](#), for the pertinent bid items, or absent the pertinent items, as extra work.