CHAPTER VI
PAVEMENT STRUCTURE DESIGN

SECTION 6-05 3R/4R PROJECTS

6-05.1 GENERAL. Narrow, rough, or deteriorated pavements may be rehabilitated by widening and resurfacing with asphaltic concrete or other materials. Sections considered for this type of work on the interstate system are based on pavement conditions and are programmed based on recommendations, by log mile, from the Office of Transportation Management Systems. On all other systems, the district recommends sections to be programmed. Sections considered are based on pavement condition using information provided by the Office of Transportation Management Systems. Pavements programmed for resurfacing are processed in accordance with Section 2-01 as 3R projects (resurfacing, restoration and rehabilitation) or 4R projects (resurfacing, restoration, rehabilitation and reconstruction) and are submitted to the Design Division for processing. Short improvements resulting in small quantities are not usually considered for this type of improvement.

All projects on the interstate system and projects on the primary system classified as principal arterials in which the design does not meet the criteria for the functional classification and traffic involved, must be submitted for the FHWA approval. These projects are on the National Highway System (NHS). On all other systems the projects are processed by the Design Division using approved design criteria.

Cleaning out of existing channels and culverts is not provided for in contracts for resurfacing projects unless the resurfacing project involves more than incidental grading work.

6-05.2 PREPARATION OF OLD SURFACE. Previously resurfaced portland cement concrete pavements and asphaltic concrete pavements generally require only minimum surface preparation consisting primarily of patching badly broken areas. Concrete pavements which are to be resurfaced are prepared for this type of work by patching badly broken areas, cleaning joints, and removing old bituminous patches which are expected to cause difficulty when the hot asphaltic concrete is placed on the surface. Surface repair work in preparation for resurfacing is normally done by the Maintenance Division.

Undersealing is considered desirable for portland cement concrete pavements which are known to be pumping, or for pavements under which there are known to be cavities. The need for undersealing is determined by the district. If undersealing is considered desirable, this work may be done by either the Maintenance Division or by including it in the resurfacing contract. If undersealing is considered, caution should be exercised to determine if the proposed undersealing will damage any existing pavement drainage systems.

If the work of undersealing or pavement repair is to be done by maintenance forces, prior written approval of a "Construction by Maintenance" setup showing estimated cost of the work is secured from the Maintenance Division.

6-05.3 RETROFIT GEOCOMPOSITE PAVEMENT EDGE DRAINS. Recommendations for use of geocomposite pavement edge drains is made by the Design Division following the condition survey for 4R interstate projects and recommendations may be made by the district for other routes when 3R reports are submitted.

Condition surveys are performed by materials personnel wherein pavement cores are cut and removed, base samples are retrieved, and tube samples of the subgrade are recovered. Gradation tests are performed on the base. Moisture content, minus #200 [75 μm] sieve content, and both ASTM and AASHTO classifications are determined from the subgrade soil samples. The data is used to evaluate the relative permeability of the base and subgrade and the probable success of geocomposite pavement edge drains.

Criteria for geocomposite pavement edge drain use were developed based upon available literature and other states' experiences. The criteria includes the following:

- Fines (minus #200 [75 μm] sieve) content of the base is not in excess of 18 percent. (This indicates a base that is virtually impermeable. The literature indicates that geocomposite pavement edge drains will not only be ineffective but may do more harm than good at values in excess of 18 percent.)
- A subgrade must be more impermeable than the base. (This is indicated by comparing minus #200 [75 μm]

sieve contents and evaluating subgrade moisture content and soil classification data. Obviously, a free-draining subgrade would not require a supplemental drainage system.)

- Evidence of moisture-related damage from observations made during the condition survey. (These include pumping, D-cracking, etc.)
- Geocomposite pavement edge drains should not be used alone (i.e., without rehabilitation) except on pavements still in relatively good condition.
- Geocomposite pavement edge drains should be used with caution with rocky subgrades due to possible loss of edge support from ragged trench cuts.
- Recommended maximum drainage distance to outlet laterals or separation distance between laterals should be provided in the plans in accordance with Standard Plan 605.10. In addition, a drain outlet must be provided at a vertical sag. Obviously, none is needed at a vertical crest from which point the maximum drainage distance to an outlet is calculated. Laterals must also be provided where physical obstacles interrupt the continuity of the geocomposite pavement edge drain.
- Outlet gradients should be a minimum of 2 percent. Underdrain markers are specified to mark the outlet end of all pipe underdrains as shown on the standard plans unless a splash pad is provided.

6-05.4 PAVEMENT REPAIR. Where repair work becomes too extensive to be handled by the district maintenance forces, such work may be included in the resurfacing contract. If such repair is to be done by contract, the district indicates on the plans the approximate locations and areas of pavement sections to be repaired in accordance with the requirements of the standard specifications. All pavement repairs 10 feet or greater in length may require additional tie bars along the longitudinal centerline joint or dowel baskets in accordance with Standard Plan 613.00. If ten (10) or more joints in a lane per mile of a project are proposed to be repaired or if the proposed pavement repair quantities in any lane exceeds two percent (2%) of the total lane area for that project, the district should request the Construction and Materials Division to review the project to verify that the proposed repair is warranted and to determine if there is a more economical alternative.

The standard specifications provide for the following types of pavement repair: Class A and Class B full depth, and Class A and Class B partial depth.

Full depth pavement repair consists of the removal of the existing variable thickness portland cement concrete and replacing with reinforced portland cement concrete. The quantities for subgrade compaction and aggregate for base should be estimated at 10% of the total area of pavement repair. It should be noted that all full depth pavement repairs must be doweled or tied into adjoining pavement to be eligible for federal funds.

Class A full depth pavement repairs are full depth with dowel bars. Class A full depth pavement repairs should be specified when the existing concrete pavement is in good structural condition, but there are localized structural failures at joints or cracks. Generally, Class A full depth pavement repairs should be specified on concrete pavements which are not to be overlayed immediately following the repair work.

Class A partial depth pavement repairs should be used on concrete pavement with shallow surface distresses at joints or cracks, or in spalled areas, on surfaces that have not been resurfaced and are either not to be resurfaced as part of the contract work or the resurfacing is less than 3 inches thick. The surface distresses should be less than half of the pavement thickness. The minimum dimension should be 16” x 16” [400 mm x 400 mm] as shown on Standard Plan 613.20. Smaller dimensions cause construction problems that increase repair costs. Coring may be required at these locations during the field check to determine if partial depth pavement repair is applicable. Class A partial depth pavement repair areas which will not be overlayed will use high strength concrete mixes as the patch material, and diamond grinding should be included in the contract to create a smooth ride at these locations. It is recommended that diamond grinding be conducted for the entire travel way width.

Class B full depth pavement repairs are full depth with #6 x 18" [#19 x 450 mm] deformed bars (tie bars) in lieu of dowel bars. Generally, Class B full depth pavement repairs should be specified on concrete pavements that are to be overlayed immediately following the repair work.

Class B partial depth pavement repair should be used on concrete pavements which have been overlayed or are to be overlayed immediately following the repair work. Class B partial pavement repairs should be used to address asphalt overlay distresses or distresses extending not more than one-half the underlying concrete pavement

thickness. For these repairs bituminous mixes will be used as the patching material.

The class of full or partial depth pavement repair to be specified for a project should be determined as part of the design field check of the project. The district may request assistance from the Construction and Materials Division in determining what type of pavement repairs should be considered for a project. On the plans, itemized proposal and any other listings/tabulations of the pavement repairs in the project proposal, the class of full or partial depth pavement repair should be indicated.

6-05.5 SPOT WEDGE AND LEVELING COURSE. If a small number and relatively small percentage of the surface area needs correction prior to placement of a continuous overlying course, spot wedging is provided. In cases where the existing pavement is in very poor condition such as deep ruts or warped section, a 1 in. [25 mm] minimum thickness leveling course may be required to improve the cross slope or riding qualities. A continuous leveling course may also be required to obtain desired superelevation on curves, and to provide crown correction for pavements being widened on one side. Pavements requiring a continuous leveling course will be considered to constitute a special case and the proposed typical section should be accompanied with a justified recommendation to the Design Division. Typical sections for resurfacing are shown on Forms D-70 and D-71.

Leveling course quantities may be determined by any of the following three methods:

- An estimate based on the general condition and roughness of the pavement to be resurfaced, correlated with similar previously constructed projects requiring a leveling course,
- An estimate based on computed leveling course quantities determined from representative sample portions of the project to be resurfaced. The length and number of sample portions selected for cross sectioning are left to the discretion of the district. The total length of the sample portions generally depends upon the time available for this work.
- A computed leveling course quantity based on complete cross sections of the entire project.

An additional estimated quantity of up to 200 tons/mile [125 Mg/km] of leveling course material per 24 ft. [7.2 m] lane may be added to the computed theoretical amount to compensate for surface irregularities. Plant mix bituminous leveling course material meeting the requirements of Section 402 of the standard specifications are not used as a spot wedge or leveling course under high type pavement resurfacing. Normally, the bituminous mixture used as the surface bituminous mixture of the overlay should be used for the spot wedge or leveling course.

6-05.6 WIDENING AND RESURFACING. The type of bituminous mixture and asphalt binder to be used for widening and resurfacing should be in accordance with the criteria presented in Section 6-07 for new pavement structures. Refer to Subsection 6-03.4 for additional information. The thickness of the SP190 mixture to be placed is a minimum of 2 in. [50 mm]. The thickness of the SP250 mixture to be placed is a minimum of 3 in. [75 mm]. The thickness of the surface mixture to be placed is 1-$^3/_4$ in. [45 mm]. Proposed thicknesses, either individual or combined, other than stated above constitute a special case and the proposed typical section accompanied by justification and recommendations, should be submitted to the Design Division. Specify SP125, SP190, or SP250 mixtures for resurfacing all heavy and medium duty pavements and light duty pavements with ADT > 3500. Specify plant mix bituminous pavement mixtures for light duty pavements with 3500 ADT or less. Use of special mixes of asphaltic concrete will be considered as a special case and should be approved by the District Operations Engineer.

The width of the base widening shall be determined from Table 6-05.2. The additional 9 in. [225 mm] allows for up to 9 in. [225 mm] of resurfacing depth while maintaining an 11 ft. or 12 ft. [3.3 m or 3.6 m] traveled way width. The initial resurfacing should be specified to the outside edges of the widening. Any subsequent resurfacing lifts should be specified to the edges of the previous resurfacing limits.

TABLE 6-05.2
WIDTH OF BASE WIDENING

Existing Traveled Way Width	Widened Traveled Way Width	Width of Base Widening
10 ft. [3.0 m]	11 ft. [3.3 m]	1'-9" [525 mm]
11 ft. [3.3 m]	12 ft. [3.6 m]	1'-9" [525 mm]
10 ft. [3.0 m]	12 ft. [3.6 m]	2'-9" [825 mm]

Where widening is to be done and design year traffic volume is equal to or less than 3500 ADT, the depth of the widening should be 10 in. [250 mm] and be plant mix bituminous base material.

Where widening is to be done and design year traffic volume is more than 3500 ADT and bituminous shoulders are being provided in conjunction with the widening, Superpave mixtures should be specified. The thickness of the widening and the bituminous shoulders is determined using the design table shown in Figure 6-03.11. The 10-year projected traffic for the project is used for design of the pavement resurfacing structure and shoulder type. Other project concepts developed during preliminary design, such as pavement reconstruction, widening the travelway, adding lanes, or drainage improvements, use the 20 year design volume. The proposed resurfacing thickness of the existing pavement is included as part of the design thickness for the widening and shoulders. The widening and shoulder thickness should never exceed the total roadway pavement thickness. No Type 5 aggregate base material is provided beneath the widening and shoulders unless it will match the pavement and base configuration.

The depth of the widening is measured from the top of the existing pavement on tangents, and on the low side of superelevated curves. On the high side of superelevated curves the depth of the widening is measured from the top of the existing pavement on a vertical face at the edge of the existing pavement, and will be a minimum thickness as required above, with as much additional depth as necessary to extend to a minimum of 3 in. [75 mm] below the surface of the existing pavement or to a firm foundation. For estimating purposes the outside edge of the widening on the high side of superelevated curves has a vertical face equal to the depth of the trench, but in no case less than 3 in. [75 mm], as illustrated on Forms D-70 and D-71.

6-05.7 PORTLAND CEMENT CONCRETE PAVEMENTS. Diamond grinding should be considered for concrete pavements that are structurally adequate but a need to improve the ride or friction characteristics exist. In this case, there are few structure failures and only minor faulting at existing joints. Any faulting or pumping of fines means loss of pavement support in the faulted area or area of pumping. These conditions usually warrant undersealing of the pavement prior to grinding. Retrofitting edge drains should be considered if pumping of fines exists throughout the project limits and it is determined the base material is permeable enough to drain without clogging the edge drains, i.e., meeting the criteria presented in Subsection 6-05.3.

The minimum bituminous overlay thickness over a bare concrete pavement, i.e., a concrete pavement to be overlaid for the first time or one in which an existing overlay is removed by coldmilling back down to the existing concrete pavement surface, should have a minimum thickness of 3-$^{3}/_{4}$ in. [95 mm]. An overlay thickness less than this constitutes a special case, and the proposed typical section should be accompanied with a justified recommendation to the Design Division. For heavy duty pavement rehabilitation projects, see Subsection 6-05.19.

6-05.8 ASPHALTIC CONCRETE PAVEMENTS. Previously resurfaced portland cement concrete pavements and existing asphaltic concrete pavements which are structurally adequate for the projected traffic, sometimes need resurfacing to correct minor rutting and surface cracking and to provide a new surface. This type of resurfacing generally requires a 1-$^{3}/_{4}$ in. [45 mm] thickness of SP125 asphaltic concrete. For light duty pavements with 3500 ADT or less, plant mix bituminous pavement mixtures are specified. Other proposed thicknesses constitute a special case and the proposed typical section should be accompanied with a justified recommendation to the Design Division. For heavy duty pavement rehabilitation projects, see Subsection 6-05.19.

6-05.9 BRIDGE REPAIR/REHABILITATION PROCEDURES. Bridge repair or rehabilitation should be coordinated with resurfacing projects when the bridge is on the same section of road or in the vicinity of the project. Prior to programming a section of road for resurfacing that includes a bridge or bridges, the district should consult with the

Bridge Division to determine the appropriate bridge repair/rehabilitation strategy.

On interstate routes it will be necessary to widen the bridge to standard width. If so, a bridge rehabilitation survey is prepared and submitted to the Bridge Division. Refer to Section 5-05 for survey data guidelines.

Once a project is on the approved right of way and construction program, the Bridge Division is responsible for coordinating the inspection, testing, and preparation of plans with other functional units and the district. After testing results and, if applicable, a bridge rehabilitation survey is submitted to the Bridge Division, a bridge memorandum or letter outlining recommended bridge work is sent to the district. The project manager should complete a checklist form indicating additional repair work necessary and return it to the Bridge Division. A form for this use can be found in the Bridge Forms category of the Design forms on the computer system. The project manager should consult with district Design, Construction and Maintenance when completing the checklist form.

6-05.10 TYPICAL SECTIONS. Projects without lip pavements, or pavements on which the lip is removed, require the use of Form D-71. Sketches should be 8-$^{1}/_{2}$"x 11" [216 mm x 279 mm] in size. Margins and space for title and project numbers are shown on Figure 6-05.1.

6-05.11 GUARDRAIL. Criteria for upgrading guardrail is given in Subsection 4-09.7(2).

6-05.12 THREE-STRAND GUARD CABLE. Criteria for the provision of three-strand guard cable is given in Subsection 4-04.5(2).

6-05.13 COLD MILLING. Cold milling on asphaltic concrete pavements may be considered on certain projects. Cold milling should be considered but not be limited to the following reasons:

- Remove ruts of $^{3}/_{8}$ in. [10 mm] or greater.
- Correct cross slope.
- Improve ride.
- Maintain or increase clearances under structures.
- Maintain gutter depth or curb height.
- Salvage quality aggregates for recycling purposes.
- Remove cracked surface course.
- Restore pavement texture.
- Avoid resurfacing of shoulders.
- Avoid adjustment of manholes or drop inlets.
- Improve asphalt lanes adjacent to PCC lanes.
- Permit uniform thickness and density of resurfacing materials.
- Eliminate need for leveling (wedge) course.
- Conserve mineral aggregates and asphalt plus reduce transportation of materials.
- Improve transitions at beginning and end of project and at bridges.

Recycling is preferred and should be considered for all milled material. Options include adding liquid asphalt and relaying on supplementary routes, shoulders and outer roadways. District operations and the core team should be contacted to determine if coldmillings should be contractor or commission retained.

If the district has a use for the material, the district should include in the proposal the special provision titled “Stockpiling Coldmilled materials (Commission Retained)”, DSP-93-37. In this special provision, the designer should list the location for stockpiling the milled material and the approximate round trip distance from the project to the stockpile location. If recycled material from the project will be used, the proposal should include the special provision titled “Reclaimed Bituminous Material,” MSP-94-01. Federal Interstate Maintenance funds may not be used to lay reclaimed material from the project on an interstate outer road or other route that is not part of the interstate system.

If it is determined that it is not economically feasible for the department to retain the milled material, the contractor is made responsible for the removal and proper disposal of the milled material according to the standard

specifications.

Depth of milling should be determined by:

- Average and maximum rut depths.
- Current surface course thickness, obtained through core drilling or data from district or the Construction and Materials Division. The entire surface course should be removed to avoid leaving thin layers of surface course material, which may delaminate or unravel off of the underlying course.
- Required structure clearances.

When snowplowable raised pavement markers (SRPM) are present, they should be noted on the plans for removal by the contractor. See Subsection 8-05.2(6) for more information regarding SRPM removal and replacement.

6-05.14 SCRUB SEAL TREATMENT. The scrub seal is a process by which an anionic charged polymer modified asphalt agent is applied to an asphalt pavement surface and scrubbed into the cracks and voids with a broom. A small layer of aggregate is then applied over the asphalt and then broomed once again, forcing the mix into the cracks and voids to form a seal. The seal is then rolled with a pneumatic tire roller. Since scrub seal is meant to be used as a preventive maintenance measure, its primary purpose is to fill cracks and seal an asphalt pavement.

Scrub sealing is less expensive per mile [km] than a 1 in. [25 mm] hot mix overlay, chip seal, and microsurfacing. This process helps to prevent light deterioration, retard progressive failures, and reduce routine maintenance service activities. The traveled way can be opened to traffic about two (2) hours after application.

Scrub sealing should be used only on pavements with ADT less than 7500 and of sound condition. This process should be used only on stable pavements that are dry, oxidized, and cracked, since it is not intended to improve the structural condition of the pavement.

6-05.15 VERTICAL CLEARANCES. The minimum vertical clearances used in the design of grade separation structures, as set out in Section 5-04, include an allowance of 6 in. [150 mm] for future resurfacing of the facility under the structure. The preparation of plans for resurfacing projects includes the checking of the vertical clearance at grade separation structures. Reduction of vertical clearance to less than the required minimum for 3R and 4R projects should be included in the design exception information form (Subsection 2-01.8), showing the existing vertical clearance and the thickness of the proposed resurfacing, and submitted to the Design Division for approval. Upon approval of any design exceptions to minimum vertical clearances, the project manager should notify the District Operations Engineer so measurement and posting of final vertical clearance is coordinated.

District personnel shall erect signs on bridges when the actual minimum vertical clearance is 15'-2" [4.6 m] or less outside designated commercial zone areas or when the minimum vertical clearance is 16'-2" [4.9 m] or less in designated commercial zones. All signs shall indicate a vertical clearance 2 in. [50 mm] less than the actual clearance.

6-05.16 MICRO-SURFACING. Micro-surfacing is defined as a properly proportioned mixture of hard, angular aggregate, mineral filler, emulsified asphalt and water, mixed and spread as surface treatment. The filler can be Portland cement, hydrated lime or other approved materials.

Micro-surfacing is designed for correcting minor surface irregularities, such as alligator cracks, or filling ruts. After placement, the water “breaks” and evaporates, leaving a hard asphalt/cement/aggregate mixture that is resistant to further compaction or movement. Because the aggregates required to make such a mixture are hard and angular, the mixture has good friction properties, and can also be used to improve surface friction conditions. It should not be used primarily for sealing surfaces, due to the rigidity of the mixture.

Micro-surfacing is not a structural layer and will not bridge any distress. It only fills depressions and will not stop further rutting. It does not contain rejuvenators, but hard asphalt, which will not rejuvenate an oxidized surface. It does not fill or seal cracks. Existing cracks will reflect through the micro-surfacing within a few months.

Micro-surfacing is applied using a slurry/screed operation. It may be used to fill ruts, one at a time, or, for shallower

rutting, it may be used with a "scratch" coat, just filling the low or shallow points to restore the cross slope. There is some consolidation as the water leaves, thus deeper applications should be done in multiple layers with a time interval in between applications. The current specification includes three versions of micro-surfacing. Designer should specify Type IIIR for filling deeper ruts (>1/2") or for raising shoulders. Type IIIR is applied with a narrow screed box, with no limit on the quantity used per square yard. Type II is a light, one-pass application and should be used to correct minor surface irregularities. For this application, it is only recommended for light traffic (<3500 ADT) routes with no rutting. Type III is a thicker application and should be specified for heavier traffic routes. Two passes are required to place Type III. The first pass is used to fill shallower ruts (<1/2"), and the final pass completes the coverage. Type II or III might be used in conjunction with Type IIIR applications.

When micro-surfacing is applied over any type of existing striping, the material can release from the old pavement marking in a few months. This can cause confusion as well as make for an unsightly appearance. Contracts for micro-surfacing should include removal of the existing striping before micro-surfacing.

6-05.17 RETROFIT DOWEL BARS. Dowel bars should be retrofitted only to correct working cracks. Load transfer restoration (LTR), also called retrofitted load transfer, refers to the placement of load transfer devices across cracks in an existing jointed PCC pavement. Load transfer restoration should be used at transverse cracks that have developed in an existing jointed PCC pavement so that load transfer can be maintained across the crack, thereby preventing the crack from deteriorating.

The optimum time to apply this technique is when the pavement is just beginning to show signs of distress, such as pumping and the onset of faulting. Pavements with little remaining structural life (as evidenced by a substantial amount of slab cracking) and pavements with durability distresses (such as D-cracking or reactive aggregate) are not good candidates for LTR.

Unless significant faulting has not yet developed on the project, diamond grinding is almost always performed after the placement of the retrofitted dowel bars. Diamond grinding removes the existing faulting and restores a smooth riding surface.

6-05.18 UNBONDED CONCRETE OVERLAYS. In specifications for unbonded concrete overlays, there are provisions that require the contractor to establish the existing roadway profile and set the final overlay profile. For this reason the bid item for contractor staking should be included in the contract. For alternate bid projects, this pay item should be included in Section 1 to apply to both the asphalt and concrete overlay alternates.

During construction, the contractor establishes the existing roadway profile and sets the final overlay profile. The resident engineer may adjust the final profile as needed. The profiles are determined in order to account for existing undulations in the pavement and to re-establish a smooth profile, not to re-establish the vertical alignment grade control points. The cubic yards of concrete required will be determined by the resident engineer from the set or adjusted profile. This quantity will be the field established plan quantity and will be paid for at the contract unit price for unbonded concrete overlay. The plan quantity included in the contract should account for the additional concrete material in excess of the specified overlay thickness. This will require the designer to estimate what these quantities are during the field check, to avoid an overrun in project cost. It is recommended the field check include establishment of a profile line for estimation of concrete material quantity needed. The designer may want to review records of past projects to determine typical quantities greater than the overlay thickness.

If existing asphalt overlays are being removed, a pay item should be included for a Section 401 bituminous interlayer 1" thick. If existing asphalt is partially removed and at least 2" of existing asphalt remains over the existing concrete, the pay item for surface preparation should be included and no bituminous interlayer is necessary.

6-05.19 HEAVY DUTY PAVEMENT REHABILITATION PROJECTS. All heavy duty pavement projects, with the exception of 4R projects on Route I-70 or 4R projects involving short-term rehabilitation strategies, will normally involve alternate bids on pavements. The rehabilitation strategy for heavy duty routes should be alternate bids on pavements with the alternates being an 8" concrete unbonded overlay over a 1" AC bond breaker or 1 3/4" SP125BSM over 3" SP250B over 7 1/4" SP250C over rubblized concrete pavement. At a minimum, the top 4 3/4" of the HMA overlay need to use polymer modified asphalt in accordance with Section 6-07 and the remaining lifts PG 64-22 asphalt binder. Justification must be given and approval received from the Central Office to use anything

less than these two alternates, such as a 7 3/4" AC overlay. Route I-70 has been exempted from alternate bids at this time because long-term rehabilitation strategies are not under consideration until it has been established what existing lanes will be used in the future capacity expansion of the facility.

6-05.20 ASPHALT OVER RUBBILIZED PAVEMENT. Rubblization is the in-place breaking of an existing PCC pavement into an aggregate base for new hot mix asphalt. When major asphalt rehabilitation over existing concrete pavement is considered the existing pavement is rubblized prior to the asphalt overlay. If the existing pavement consists of asphalt over concrete the existing asphalt should be removed prior to rubblization.

When rubblization is used, the asphalt is paid for by the ton of mix necessary to obtain the thickness indicated by Construction and Materials. The plan quantity should be established with consideration for thickness in excess of that specified to account for irregularities in the existing pavement. Similar to unbonded overlay the contractor is required to establish the existing roadway profile and set the final overlay profile. For this reason the bid item for contractor staking should be included in the contract.

There must be adequate subgrade support under old rigid pavements. Dynamic cone penetrometer (DCP) testing of the unbound layers under the PCC pavement, performed during the condition surveys, must indicate that adequate support exists for rubblization to occur.