

**SECTION 00758 - REINFORCED CONCRETE PAVEMENT REPAIR**

*(Follow all instructions and make all edits with "Track Changes" turned on. This Section is not published in the Oregon Standard. If there are no instructions [purple text] above a subsection, paragraph, sentence, or bullet, then include it in the Project, unless the item(s) that are included in the subsection, paragraph, sentence, or bullet are not required on the Project and then they should be deleted. In general do not re-number or re-letter subsections when item(s) are deleted. Delete all purple text before preparing the final document. All other modifications to this Section will require ODOT Technical Resource and State Specifications Engineer approval.)*

Section 00758 is not a Standard Specification and is included in this Project by Special Provision.

**Description**

**00758.00 Scope** - This Work consists of sawcutting and removing existing concrete Pavement and constructing new reinforced and continuously reinforced Portland cement concrete Pavement repairs as shown and specified.

**00758.01 Abbreviations:**

**HES** - High Early Strength

**00758.04 Pre-placement Conference** - Hold a pre-placement conference with all supervisory personnel who are to be involved in the concrete Pavement repair Work at a mutually agreed time. Ensure the Engineer, concrete Supplier and other Subcontractors are represented. Discuss methods of accomplishing all phases of the concrete Pavement repair Work.

**Materials**

**00758.10 Materials** - Furnish Materials meeting the following requirements:

Bonding Agents .....	02070
Concrete .....	02001
Curing Materials .....	02050
Grouts.....	02080
Hot Poured Joint Filler .....	02440.30
Portland Cement Concrete Repair Material .....	02015
Preformed Joint Fillers for Concrete.....	02440.10
Reinforcement .....	02510
Resin Bonded Anchor Systems.....	00535
Synthetic Macro Fiber Reinforcing .....	02045.20

#### **00758.11 Classes of Concrete -**

*(Use one of the following two options as instructed. Delete the option that does not apply.)*

*[ Option 1 - Use the following paragraph when HES concrete is NOT required. ]*

Furnish Class 4000 - 1 1/2 paving concrete.

*[ Option 2 - Use the following paragraph when the timeframe designated for opening traffic is less than 72 hours after concrete placement and HES concrete is required. ]*

Furnish Class HES4000 - 1 1/2 concrete designed to attain a minimum average compressive strength of 2,500 psi prior to allowing traffic on the concrete.

**00758.13 Concrete Mix Designs** - Prepare and submit either new mix designs or current mix designs for each class of concrete required according to Section 02001.

*(Use the following HES language when HES concrete is required under subsection .11.)*

*[ Begin HES language ]*

Provide HES mix designs that contain fiber reinforcement according to 02045.20. Introduce and mix the fibers in a way that will achieve uniform distribution.

Provide HES mix designs with a Strength-Maturity Relationship established per AASHTO T 276 and AASHTO T 325 during the mix design phase. Take a minimum of seven early age readings at 1, 2, 3, 4, 5, 6, and 24 hours. Each reading requires averaging the two maturity cylinders and breaking three compressive strength specimens. Submit the required concrete maturity data outlined in the "Reports" sections 11.1.1 through 11.1.10 of AASHTO T 276 and 11.1.1 through 11.1.5 of AASHTO T 325 for approval by the Engineer.

HES mix designs may use Type III Cement from the QPL or Cement that complies with the definition of hydraulic cement or blended hydraulic cement according to ASTM C219.

*[ End HES language ]*

**00758.15 Quality Control** - Provide quality control according to Section 00165, 00758.30, Section 02001, and the following:

##### **(a) Concrete Mixture -**

- Sample and test according to the MFTP.
- For all reinforced concrete Pavement repair, provide personnel according to 00758.30 to sample and test the mix for temperature, air content, slump, water-cementitious ratio, density and yield, from the first load of each placement,

whenever there is a visible change in the slump of the concrete, and when a set of cylinders is obtained.

- If the results of any test are outside of the specification limits, stop the placement of the load. Correct the load or reject it and do not incorporate it into the work. Test subsequent loads before any further concrete placement. Correct the subsequent loads if any of the tests are still outside the specification limits. If the load cannot be corrected, reject it and do not incorporate it into the work. Testing of subsequent loads may return to the specified frequency when the test results from two consecutive loads are shown to meet the specification limits.

**(b) Records** - Deliver all batch tickets, water-cement ratio calculations, and all other records according to the MFTP.

#### **00758.16 Acceptance of Concrete:**

**(a) General** - Acceptance of concrete is based on the results of the Contractor's quality control testing according to Section 00165.

**(b) Aggregate** - Acceptance is based on the Contractor's quality control testing, if verified by the Agency according to Section 00165.

**(1) Aggregate Gradation** - A stockpile contains specification aggregate gradation when the quality level for each sieve size calculated according to 00165.40 is equal to or greater than the quality level in Table 00165-2 for a PF of 1.00. Each required sample represents a subplot. When the quality level in Table 00165-2 yields a PF of less than 1.00 for any constituent, the material is non-specification.

**(2) Non-specification Aggregate Gradation** - Stockpiled aggregates that contain non-specification aggregate gradation is rejected by the Engineer unless non-specification material is removed from the stockpile. Do not add additional Material to the stockpile until enough non-specification Material is removed so that the quality level for each constituent is equal to or greater than the quality level in Table 00165-2 for a 1.00 PF.

**(c) Plastic Concrete** - Acceptance of the plastic concrete is based on the tests performed by the Contractor's QCT, according to the tolerances and limits of Section 02001.

**(d) Hardened Concrete** - Cast and cure the test cylinders according to AASHTO R 100 in single use plastic molds and test at 28 Days according to AASHTO T 22.

**(1) General** - For all classes of concrete, acceptance of hardened concrete is based on an analysis of compressive strength tests of cylinders cast by the QCT. Test cylinders at an ODOT certified laboratory.

**(2) Actual Strength Test Value (ASTV)** - The ASTV at 28 Days is the average compressive strength of the three cylinders tested.

**(3) Sampling and Testing** - Sample and test according to Section 00165 and the MFTP.

**(4) Acceptance** - Furnish Material with an ASTV that meets or exceeds the  $f'_c$  (specified strength) for the mix design. If a set of cylinders has an ASTV less than  $f'_c$ , the Engineer will review the results to determine if the concrete represented by the cylinders requires removal. In any case, concrete that has an ASTV of less than 85 percent of the specified strength requires removal unless otherwise authorized, in writing, by the Engineer. The cost of removal, replacement, and all related Work is the Contractor's responsibility, subject, if the concrete is allowed to remain in place, to a price adjustment according to 00150.25.

If an ASTV falls below the  $f'_c$ , the Contractor may submit a written plan within 3 Days of the test for review by the Engineer. Provide a plan that outlines a proposed alternate method of evaluating compressive strength. Provide evidence that a reasonable  $f'_c$  (over design) was maintained and that there is credible evidence (besides low strength) that warrants consideration of this option. If the Engineer determines that the compressive strength test results are suspect from definable external factors, the Engineer may allow an alternate method of acceptance.

*(Use the following subsection .17 when spall repair is required.)*

**00758.17 Spall Repair Material** - For spall repair, furnish a PCC repair Material meeting the requirements of Section 02015 except do not use products that contain magnesium phosphate.

*(Use the following subsection .18 when bond breaker is required.)*

**00758.18 Bond Breaker** - Furnish a bond breaker complying with one of the following:

- Non-woven geotextile meeting the property requirements listed in Table 02320-4.
- Liquid curing compound evenly applied as a bond breaker in two applications, at a rate of 1 gallon per 130 to 165 square feet for each application, over the entire surface area.

### **Equipment**

**00758.20 Batch Plant** - Provide batch plants according to 02001.40.

**00758.21 Mixers** - Provide mixers according to 02001.40.

When Class HES concrete is required, mobile mixers may be used if the mixers conform to the following:

- The mixer is self-propelled and carries sufficient unmixed dry bulk cement, Sand, Coarse Aggregate, admixtures, and water to produce a minimum of 6 cubic yards of concrete on site.
- The mixer provides positive measurement of cement being introduced into the mix by meter or counter.
- The mixer provides positive control of the flow of water into the mixing chamber. Water flow is readily adjustable to provide for minor variations in aggregate moisture.
- Each mixer is calibrated to automatically proportion and blend all components according to the mix design on a continuous or intermittent basis as required by the placing operation.

Perform a calibration and yield test on each mixer prior to the first placement to accurately proportion the specified mix. Use a written calibration procedure from the mixer manufacturer, a procedure provided by the agency or other written procedure acceptable to the Agency. The calibration process may be witnessed by the Engineer. Provide the Engineer with information about the scheduled date, time and place for the calibration. Perform a new calibration when the source of Materials changes, when the mixer undergoes a major repair, or when requested by the Engineer.

**00758.22 Hauling Equipment** - Use truck mixers to transport concrete. Hauling equipment according to 02001.40.

**00758.23 Paving Equipment** - Provide paving Equipment according to the following:

- Able to vibrate, consolidate, and finish the slab to proper grade and Cross Section for the full width and depth of the concrete being placed.
- Capable of meeting the smoothness requirements.
- Approved by the Engineer.

**00758.24 Concrete Saws** - Provide power driven concrete saws for sawing joints, adequate in number of units and power to complete the sawing at the required rate. Also provide a standby saw on the Project Site. For sawing repair areas, provide specialized power driven concrete saws capable of sawing corners of the repair area through the bottom of the existing concrete Pavement section without cutting into adjacent concrete that is to remain in place. As an alternative to the specialized saw, provide a core drill for drilling corners of area to be removed.

**00758.25 Smoothness Testing Equipment** - Provide one 12-foot straightedge.

**00758.26 Concrete Drills** - Provide a drilling system consisting of drilling equipment and drilling supports that:

- Is capable of drilling holes of the required diameter and depth
- For dowels and tie bars, can produce holes parallel to the Pavement surface and parallel to the longitudinal joint within a tolerance of  $\pm 1/8$  inch
- For dowels and tie bars, can provide hole alignments at mid-depth of PCC Pavement

### **Labor**

**00758.30 Quality Control Personnel** - In addition to the certified technicians required in 02001.50, provide and designate an individual to be present at the placement site at all times during concrete placements and who is authorized and responsible for acceptance and rejection of Materials.

### **Construction**

**00758.40 Weather Limitations** - Coordinate all operations involved in repairing the Pavement so the Work will result in a finished Pavement according to the Specifications

regardless of the daily or seasonal variations in weather, temperature and humidity under when the Work is permitted to proceed.

Do not place PCC during periods of rain. Do not place PCC on frozen Bases. Stop placement when descending air temperature falls below 35 °F. Do not begin placement until the air temperature is 35 °F in the shade and rising and is forecast to remain above 35 °F.

Protect the Pavement from weather damage. Protect unhardened PCC from precipitation with protective material. When PCC is placed during cold weather and the air temperature is forecast to drop below 33 °F, prevent the concrete from freezing for a minimum of 7 Days after placement.

Remove and replace weather-damaged Pavement at no additional cost to the Agency.

*(Use the following subsections (a) through (f) as instructed. Use all subsections that do not have instructions. Do not change the alpha characters before the subsections.)*

#### **00758.41 Preparation:**

**(a) Removal of Existing Pavement** - Remove existing reinforced concrete Pavement full depth as shown or directed. Cut the reinforced concrete full depth with a concrete saw prior to removal. Remove concrete Pavement with Equipment approved by the Engineer in a manner that does not damage remaining Pavement and allows for specified connections. Saw corners of the repair area through the bottom of the existing concrete Pavement section without cutting into adjacent concrete that is to remain in place by using either a specialized saw or by coring only within the concrete to be removed. Rounded corners of the repair area due to the coring operation may remain in place. Repair damage to the existing Pavement due to the Contractor's operations, at no additional cost to the Agency, by extending the full depth repair to the satisfaction of the Engineer.

*(Use the following subsection (b) when removal of terminal expansion joint steel w-beam flange and web is required.)*

**(b) Removal of Terminal Expansion Joint Steel W-Beam Flange and Web** - Remove the existing terminal expansion joint steel W-beam top flange and web as shown or as directed. Cut the steel web to facilitate removal. Cut the steel web so that no more than 1/4 inch remains above the existing sleeper slab. Perform the removal in a manner that does not damage remaining Pavement and sleeper slab. Repair any damage to the existing Pavement or sleeper slab due to the Contractor's operations, at no additional cost to the Agency, to the satisfaction of the Engineer.

**(c) Preparation of Base** - Remove loose or damaged base material completely, leaving no loose base material. Compact and level base material to the satisfaction of the Engineer.

**(d) Reinforced Bar Lap Area** - After the existing Pavement is removed, install resin bonded anchors according to Section 00535 and as shown.

*(Use the following subsection (e) when spall repair is required.)*

**(e) Spall Repair Areas** - Sawcut the existing concrete Pavement to a nominal depth of 2 inches. Remove existing concrete within the perimeter of the sawcut to a depth of 2 inches or to sound concrete as determined by the Engineer. If jack hammers are used for removing Pavement, provide jackhammers that do not weigh more than 30 pounds, and if chipping hammers are used for removing Pavement, provide chipping hammers that do not weigh more than 15 pounds. Do not operate hammers at an angle greater than 45 degrees measured from the surface of the Pavement. Repair damage to the existing Pavement due to the Contractor's operations, at no additional cost to the Agency by extending the repair to the satisfaction of the Engineer.

**(f) Preparation of Existing Concrete** - After Pavement in repair areas is removed, sandblast all vertical surfaces of adjoining concrete. Before placement of concrete, blow clean the area with compressed air, dampen the area to be paved with a light application of water, and apply a coat of epoxy grout or bonding agent to all vertical surfaces. If grouted surfaces become dry before new concrete is placed, prepare the existing concrete again as specified.

#### **00758.43 Placing Reinforcement:**

**(a) General** - Place reinforcement as shown and specified. Lap splices according to Section 00530. The Contractor's Equipment hauling reinforcement to the site will not be permitted on the Subgrade or the Base Material.

Use reinforcement that is straight, clean, and free of scale or other matter that would interfere with its bonding to the concrete.

Place the reinforcement on support devices that maintain it in specified position during concrete placement.

**(b) Deformed Bar Reinforcement** - Tie or clip at every other transverse bar intersection, as a minimum, in a manner that does not allow for displacement. Tie or clip every lap splice as shown.

**(c) Support Devices** - Furnish support devices used to hold reinforcement in proper position in the concrete that:

- Hold the reinforcement within 1/2 inch of the vertical position shown.
- Not displace more than 3 cubic inches of concrete when embedded in the slab.

Obtain approval of the proposed support devices before use. If concrete placement operations displace the reinforcement, stop production and place additional support devices.

**(d) Tie Bars** - Place tie bars required for joint contact at existing concrete Pavement by one of the following methods:

- (1)** Drill the hardened concrete section and then insert the tie bars as resin-bonded anchors according to Section 00535.

(2) Insert the tie bars into the plastic concrete before vibrating and finishing the concrete. The tie bars may be bent before insertion. Replace any loose tie bars according to 00758.43(d)(1) at no additional cost to the Agency.

(3) Use threaded mechanical splice couplers from the QPL, or approved equal. Submit splices for approval before using. Furnish rebar splices that are:

- Accompanied by manufacturer's quality compliance certificate according to 00165.35.
- Installed according to manufacturer's recommendations.

Tie bars are not required along the longitudinal joint for repairs less than 15 feet in length.

**(e) Dowel Bars** - Furnish smooth, round, epoxy coated dowel bars. Lubricate dowel bars with bond-breaking compound approved by the Engineer. Place dowels in supporting framework or support devices that hold dowels parallel with each other, parallel with the surface of the Pavement, and parallel with the centerline of the Roadway. Obtain approval of the proposed method of support prior to use. Place dowels with a maximum alignment tolerance of 5 degrees or 3/16 inch in the length of the dowel and within 3/8 inch of the center of the slab vertically.

Furnish dowel bar caps on the lubricated end of each dowel bar used in an expansion joint. Furnish dowel caps filled with a soft compressible Material with enough range of movement to allow complete closure of the expansion joint.

At existing concrete Pavement surfaces drill the existing concrete, insert and grout the dowel bars in place. Drill the holes large and deep enough to insert the dowel bars with adequate grout. Adjust hole locations to avoid damaging any existing reinforcement when drilling the holes. Blow the holes clean with compressed air before grouting. Center the bar in the hole for the full length of embedment before grouting. Pump the grout into the hole around the bar so the back of the hole is filled first. Do not allow blocking or shimming to impede the flow of the grout into the hole. If dams are needed, place them at the front of the holes to confine the grout. Place the dams to permit the escape of air without leaking grout. Do not remove dams until grout has cured in the hole.

**00758.44 Handling, Measuring, and Batching Materials** - Provide the plant site, layout, Equipment and provisions for transporting Material that is adequate to assure a continuous supply of Material to the Project Site.

**(a) Aggregates** - Stockpile and remove the Aggregate from stockpiles in a manner that holds segregation to a minimum.

Do not use Aggregates that become segregated, mixed with earth or foreign material, or contain lumps of hardened Material. Thaw frozen Aggregates or Aggregates containing frozen lumps before use.

**(b) Batching** - Batch Materials according to 02001.40.



**00758.45 Mixing Concrete** - Mix Materials according to 02001.40. For Projects requiring HES concrete, mobile mixers may be used.

**00758.46 Placing Concrete:**

**(a) General** - Perform the strike-off, consolidation, final floating and surface finishing according to the following:

- Vibrate throughout the concrete until it is uniformly consolidated. Do not segregate.
- Strike off the concrete with templates or screeds designed and manipulated to shape the concrete to the specified Cross Section between the forms, carrying a slight excess of concrete in front of the leading edge of templates or screeds at all times.
- Following the vibrating and strike-off operations, float the concrete. Include transverse floating or other smoothing and finishing actions as necessary. Check and correct the surface according to 00758.49. Keep the surface free from laitance, soupy mortar, marks or irregularities.
- Finish the surface according to 00758.49.

Correct all damage to the Subgrade or Base due to the Contractor's operations, at no additional cost to the Agency, to the satisfaction of the Engineer.

**(b) One Lift** - Place the concrete in final position in one lift so a minimum of finishing is necessary to provide a dense, homogenous Pavement conforming to true grades and Cross Sections.

**(c) Provision for Joints and Other Devices** - While placing concrete, make provision for constructing joints, placing dowels, tie bars, and other devices, as shown and directed, and according to 00758.43 and 00758.48.

**(d) Reject Concrete Material** - Reject concrete if it:

- Is not in place within 90 minutes after being mixed.
- Has begun to take an initial set before placement.

**(e) Hand Operated Equipment** - Use shovels to hand spread and distribute the concrete. Do not use rakes. Do not foul the concrete with foreign matter, or disturb joint devices during such operations. Provide hand operated mechanical vibrators satisfactory to the Engineer. Use the vibrators to consolidate the concrete Pavement at least 6 feet each side of construction and expansion joints and all other areas as directed.

**(f) Illumination** - During hours of darkness, adequately illuminate Work areas at no additional cost to the Agency.

**00758.48 Joints:**

**(a) General** - Furnish and construct contraction, expansion, or construction joints transverse or longitudinal as shown or directed. Extend all joints and joint filler to Pavement edges or to each other as applicable.

Construct all joints at right angles to the surface of the Pavement. Provide joints that do not vary from the specified or indicated line by more than 1/4 inch. Provide the tops of joint filler, when required, slightly, but not more than 1/8 inch, below and paralleling finished Pavement grade and Cross Section. Protect top edges of filler from damage by paving operations.

Construct all joints that contain preformed filler before the final floating and surface finishing of the concrete, unless otherwise directed.

**(b) Longitudinal Joints** - Construct contact type or weakened plane type longitudinal joints as shown.

**(1) Longitudinal Contact Joints** - Construct longitudinal contact joints when concrete is placed against hardened concrete, between strips of Pavement, or between a strip of Pavement and a concrete gutter.

**(2) Longitudinal Weakened Plane Joints** - Construct weakened plane joints by sawing to the depths and maximum width shown. To prevent uncontrolled cracking, saw longitudinal weakened plane joints at the earliest possible time following placement of the concrete without damaging the Pavement or joint. Saws may be single or tandem, as the Contractor elects, and be controlled by guides to true line. Restore curing agents broken or damaged by the sawing operations.

**(c) Construction Joints** - Construct construction joints when there is an interruption of 45 minutes in the concrete placing operations, or 10 minutes for Class HES concrete. Place construction joints no closer than 10 feet from the end of a repair or from an adjacent construction joint.

Furnish new concrete placed against construction joints that conform to the proportions and consistency of the previously placed concrete.

**(1) Continuously Reinforced Concrete Pavement** - Provide a self-supported working platform at each construction joint that is at least 4 feet wide and long enough to span the entire width of the Pavement Panel being constructed. Construct and support the platform so it does not rest upon or touch the reinforcing steel. Have the workers use this platform when working in the area around the construction joints. Do not walk on the reinforcing steel. Remove all debris and spilled concrete at and beyond the joint. Support the reinforcement as shown.

**(2) Other Pavements** - Unless otherwise shown, do not construct construction joints within 10 feet of a transverse joint. If sufficient concrete has not been mixed at the time of interruption to form a slab at least 10 feet long, remove the concrete back to the last joint and dispose of as directed.

**00758.49 Surface Finishing** - After the concrete has been given a preliminary finish, check the surface of the fresh concrete in the longitudinal and transverse direction with a 12-foot straightedge. Correct surface deviations more than allowed by 00758.56(a). Lap each successive check with the previous check path by at least half the length of the straightedge.

**(a) Textured Finish** - Upon completion of the machine floating, straightedge testing, edge tooling and, if necessary, hand floating, and before initial set of the surface concrete, give the surface of the concrete a textured finish.

Accomplish the textured finish with a steel-tine tool with 1/8-inch tines that will mark the finished concrete to a depth of 1/8 inch to 3/16 inch. Randomly space the markings from 1/2 inch to 1 1/4 inches as approved. Avoid overlaps of the texturing. Construct markings either perpendicular or parallel to the Roadway centerline to match the adjacent concrete Pavement textured finish.

With approval of the Engineer, an artificial turf or broom finish may be on roads to receive an overlay.

**(b) Transverse Profile** - Match the surface of the fresh concrete in the transverse direction to the surface of the existing concrete at the ends of the patch. Taper into existing Pavement ruts in the first and last 10 to 20 feet to provide a transverse surface finish for the remainder of the patch meeting the requirements of this section.

**00758.52 Edge Tooling and Filling** - Tool edges at transverse joints and longitudinal joints of new Pavement and clean joints of previously placed concrete to remove laitance and mortar resulting from finishing operations, and to provide clean rounded edges without ridges on the surface. Perform tooling of edges at construction joints to produce an edge radius that is less than or equal to 1/8 inch.

Fill all areas of minor honeycomb or other minor defect in composition of the concrete along the exposed sides of concrete with a stiff mortar of cement and Fine Aggregate, and apply to the moistened concrete to the satisfaction of the Engineer. Remove and replace areas showing serious defects in composition of the concrete with specified quality concrete for full panel width between longitudinal joints or edges, and for a length not less than 10 feet. Low spots exceeding 1/4 inch in depth, if in hardened concrete, may be filled with an epoxy grout, provided the filling is neat and blends inconspicuously with adjoining concrete. Prepare the area according to the grout manufacturer's recommendations.

**00758.53 Curing Concrete** - Immediately after the final floating, surface finishing and edging have been completed, and while the concrete surface is still moist, cover and cure the entire exposed surface of the newly placed concrete for at least 72 hours. If the Specifications require opening the lanes to traffic in less than 72 hours, remove curing covers just prior to opening to traffic. Use one of the following provisions:

**(a) Liquid Membrane-Forming Compounds** - Apply liquid membrane-forming compound uniformly to the concrete by pressure-spray methods at a rate of at least 1 gallon per 150 square feet. Mix the liquid membrane-forming compound thoroughly before and during use.

Liquid membrane-forming compounds are not allowed when asphalt concrete Pavement is to be placed on the new concrete.

**(b) Other Coverings** - Apply clear or white polyethylene film or insulated curing blankets as a waterproof and moisture-proof covering. Place the film or blankets beyond the edge of the repaired areas and weight to hold in position. Do not mar the concrete with the covering.

*(Use the following paragraph when HES concrete is required under subsection .11.)*

For class HES concrete using a cement other than portland cement, cure the concrete as recommended by the cement manufacturer. Obtain authorization for the method of curing before starting construction.

**00758.54 Longitudinal Pavement Cracks** - Remove and replace all patches that show longitudinal cracking or do not bond at no additional cost to the Agency.

*(Use the following subsection .55 when spall repair is required.)*

**00758.55 Spall Repair** - In spalled areas, remove the existing Pavement according to 00758.41(e). Prepare the repair area according to 00758.41(f) and the PCC repair Material manufacturer's recommendations. Mix and place PCC patching Material according to the manufacturer's recommendation. Use shovels to hand spread and distribute the concrete. Do not use rakes. Do not contaminate the concrete with foreign matter.

**00758.56 Surface Tolerance, Testing, and Correction** - Provide the surface of finished Pavement that does not deviate from longitudinal and transverse smoothness more than the limits identified below. Perform straightedge testing under the supervision of the Engineer as soon as the hardness of the concrete permits.

**(a) Straightedge Testing and Tolerance** - Test Pavement surface longitudinal and transverse smoothness with a 12-foot straightedge. The extent of the testing is determined by the Engineer. Provide a Pavement surface that does not deviate from the straightedge at any point by more than 1/8 inch, except the transverse surface at the patch ends may vary as required in 00758.49(b).

**(b) Correcting Deficiencies** - Correct all segments that exceed the requirements of 00758.56(a) by one of the following methods:

**(1)** Remove the non-specification concrete Pavement as determined by the Engineer and replace with Specification concrete Pavement.

**(2)** Profile with an abrasive grinder equipped with a cutting head comprised of multiple diamond blades. Take care not to unnecessarily sacrifice concrete cover over the reinforcing steel.

Retest according to 00758.56(a). Perform all corrective Work at no additional cost to the Agency, including traffic control.

## **Maintenance**

**00758.60 Protection of Concrete** - Repair or replace any part of the Pavement damaged by traffic or damaged from any other causes before its official acceptance, according to 00170.80. Do not operate construction Equipment or allow Public Traffic on newly placed concrete until all of the following requirements are met:

**(a)** The Contractor complies with 00150.60.

(b) The concrete attains a compressive strength of at least 2,500 psi as determined by testing at least two cylinders cured according to AASHTO R 100 (field cure) and tested according to AASHTO T 22.

*(Use the following paragraph when HES concrete is required under subsection .11.)*

For HES concrete, the concrete attains a compressive strength of at least 2,500 psi according to the Strength-Maturity Relationship established during the mix design. Place a minimum of two probes in the last portion of each repair section according to section 10 of AASHTO T 325.

(c) Approval is given by the Engineer before opening to traffic.

(d) The surface of the concrete is protected from scarring or abrasion and kept free of stones, loose mortar and other matter apt to be deleterious to the concrete in the paths of Equipment.

If a repair at a single location cannot be completed in one shift, the unfinished Work may be temporarily backfilled with rapid setting Controlled Low Strength Materials (CLSM). Limit the length of the temporary backfill to 10 feet and construct the backfill to prevent the corners from breaking under traffic. Do not open to traffic until the compressive strength of the CLSM is 100 psi, and do not allow traffic on temporarily backfilled Material for a total duration of more than 16 hours. Monitor the location while open to traffic and immediately backfill any potholes with cold patch.

**00758.61 Protection of Shoulders** - A portion of the Shoulder adjacent to the proposed patch may be removed as necessary to ensure proper forming at the edge or the patch. Prior to opening to traffic, replace the disturbed Shoulder area with Material types and thickness similar to the existing Shoulder. Compact and restore Shoulders to match the existing line and grade.

#### **Measurement**

**00758.80 Measurement** - The quantities of Work performed under this Section will be measured according to the following:

(a) **Pavement Repair** - Reinforced concrete and continuously reinforced concrete Pavement repair will be measured on the area basis and is determined by measuring the width and length of each separate repair. The width is the measured edge-to-edge width of the repair on the surface of the Pavement perpendicular to the centerline of the Roadway. The length is the measured length from end-to-end of the repair parallel to the centerline of the Roadway, including the length of the bar lap splices.

The measurement of extra thickness of Pavement, as shown or as ordered, is determined by conversion on a proportionate volume basis to an equivalent number of square yards of specified thickness Pavement.

*(Use the following subsection (b) when spall repair is required.)*

(b) **Spall Repair** - Spall repair will be measured on the area basis and is determined by measuring the width and length of each separate repair. The width is the measured

edge-to-edge width of the repair on the surface of the Pavement perpendicular to the centerline of the Roadway. The length is the measured length from end-to-end of the repair parallel to the centerline of the Roadway.

The measurement of extra thickness of Pavement, as shown or as ordered, is determined by conversion on a proportionate volume basis to an equivalent number of square yards of specified thickness Pavement.

**(c) Pavement Repair at Joints** - Pavement repairs at joints will be measured on the length basis.

### Payment

**00758.90 Payment** - The accepted quantities of Work performed under this Section will be paid for at the Contract unit price, per unit of measurement, for the following items:

*(Delete Pay Item(s) from the list that are not included in the Schedule of Items, but do not change the alpha characters next to the Pay Items.)*

Pay Item	Unit of Measurement
(a) Continuously Reinforced Concrete Pavement Repair.....	Square Yard
(b) Reinforced Concrete Pavement Repair .....	Square Yard
(c) Spall Repair.....	Square Yard
(d) Extra for Expansion Joint Repair.....	Foot
(e) Extra for Terminal Expansion Joint Repair.....	Foot
(f) Extra for Terminal Expansion Joint Repair (Steel Beam).....	Foot

Items (a) and (b) include:

- Removing concrete Pavement;
- Preparing the cut edges;
- Resin bonded anchors; and
- Replacement of disturbed Shoulder according to 00758.61.

Item (c) includes removing concrete.

Items (d), (e), and (f) include all additional costs for removing existing joints, removing all or portions of existing steel beams, and placing dowel bars and associated expansion joint Material.

Sawcutting will be paid for according to Section 00310.

Payment will be payment in full for furnishing and placing all Materials, and for providing all Equipment, labor, and Incidentals necessary to complete the Work as specified.

No separate or additional payment will be made for intermediate bar lap splices or CLSM necessary to accommodate staging or to reopen the Roadway to traffic.

