

~~mined from the mix design weight of the aggregate multiplied by the number of batches produced minus any waste.~~

~~**560.06 BASIS OF PAYMENT.**~~

~~A. **Recycled Concrete Pavement.** The accepted quantities of Recycled Concrete Pavement will be paid according to Section 550.06 and the following:~~

Pay Item	Pay Unit
Nonreinforced Recycled Pavement	Square Yard
Prepare Stockpile Site	Lump Sum
Restore Stockpile Site	Lump Sum
Removal of Concrete Pavement	Square Yard
Coarse Aggregate, Size 4	Ton
Fine Aggregate	Ton

~~If the bid items "Fine Aggregate" and "Coarse Aggregate, Size 4" are not included as pay items in the Contract, payment for these items will be included in the price bid for "Nonreinforced Recycled Concrete Pavement."~~

~~B. **Miscellaneous Items.** When shown on the Plans, payment will be made at the Contract Unit Price for the following:~~

Pay Item	Pay Unit
Portland Cement, Type _____	Ton
Fly Ash	Ton
Steel Fabric, _____	Square Yard
Reinforcement Bars	Pound
Doweled Expansion Joint Assembly	Linear Foot
Doweled Contraction Joint Assembly	Linear Foot
Integral Curb	Linear Foot
Preformed Elastomeric Compression Joint Seal	Linear Foot
Longitudinal Shoulder Joint	Linear Foot

~~This payment will be full compensation for all labor, equipment, and materials necessary to complete the work.~~

**SECTION 570
PORTLAND CEMENT
CONCRETE PAVEMENT REPAIR**

570.01 DESCRIPTION.

This work consists of removing portions of existing Portland cement concrete pavements and adding new materials to produce a new Portland cement concrete pavement

repair. This work may also include dowel bar retro-fits and grinding to restore the ride to an existing Portland cement concrete pavement. Section 550 will be applied in conjunction with this section.

570.02 MATERIALS.

A. **General.** Materials shall meet the following:

Item	Section
Portland cement concrete	802
Grouts and mortar	806
Reinforcing steel	836
Dowel bars	836

B. **Portland Cement Concrete for Repairs.** Use a 6.5 bag mix of Type I cement with a maximum water content of 5.1 gal/bag of cement for full depth repairs. Use AASHTO M-85 high early cement for spall repairs. The concrete shall be air-entrained.

C. **Joint Materials.**

1. **Concrete Joint Sealer.** The joint sealer shall be as shown on the plans unless an alternate type is approved by the Engineer before use.
2. **Fillers and Sealant.** Materials shall meet the following:

Item	Section
Preformed expansion joint filler	826.02 C
Preformed expansion joint filler (Bituminous Type)	826.02 D
Preformed elastomeric compression joint seal	826.02 G
Hot-pour joint sealant	826.02
Silicone joint sealant	826.02 B
Backer rod	826.02 B.1

D. **Dowel Bar Retrofit.**

1. **Curing Compound.** The curing compound shall be a wax-based liquid membrane-forming compound that conforms to the requirements of AASHTO M 148 (ASTM C 309) Type 1-D or 2, Class A or B.
2. **Dowel Bars.** The dowel bars shall be plain, round bars fabricated from steel meeting AASHTO M 31, M 42, or M 53. Dowel bars shall be cut to the required length and cleaned to remove all cutting burrs, loose mill scale, rust, grease, and oil. The bars may be sheared providing the deformation of the bars from true round shape does not exceed 0.04 inch in diameter or thickness, and shall not extend more than 0.04 inch from the sheared end.

Dowel bars shall be epoxy-coated 100 percent on all surfaces. The epoxy coating shall be in accordance with AASHTO M 284. The dowel bars shall also be shop coated with a bond breaking release agent. The bond breaking release agent shall be a curing compound meeting the requirements specified above.

The dowel bars shall have tight fitting end caps made of nonmetallic materials that allow for 1/4 inch movement of the bar at each end. The Contractor shall submit sample end caps to the Engineer prior to use.

3. **Caulk.** The caulk for sealing the existing transverse joint crack at the bottom and sides of the slot shall be any commercial caulk designed as a concrete sealant that is compatible with the patch material being used.
 4. **Foam Core Board.** The foam core board shall be constructed of closed cell foam and be faced with poster board material or laminate on each side.
 5. **Patching Material.** "Concrete Patch Mix" shall be Five Star Highway Patch, Burke 928 Fast Patch, American Highway Technology's (AHT) dowel bar retrofit mortar or an approved equal. The concrete patch mix shall be mixed and placed according to the manufacturer's recommendations.
 6. **Chairs.** The chairs for supporting and holding the dowel bars in place shall be completely epoxy-coated according to Section 836.02 B, or made of nonmetallic material.
 7. **Concrete Mix Design.** The Contractor shall provide the Department with a concrete mix design for the patching material that meets a minimum compressive strength of 4,000 psi in six hours, prior to the beginning of work. this mix design shall include all additives and materials that will be used on the Project.
- E. **Joint Stitching.** This work consists of placing epoxy coated deformed bars into existing concrete pavement.
1. **Epoxy.** The epoxy resin shall be of the type intended for horizontal application and shall meet requirements of AASHTO M 235, Type 1, Grade 3. The Contractor shall mix epoxy resin as recommended by the manufacturer.
 2. **Tie Bars.** The tie bars shall be Grade 60 and epoxy-coated according to AASHTO M 284.

570.03 EQUIPMENT.

Equipment shall meet the following:

Item	Section
General	151.01
PCC equipment	153

570.04 CONSTRUCTION REQUIREMENTS.

- A. **General.** The notes in this section (570.04 A) apply to repairs made to non-reinforced jointed PCC pavements and to continuously reinforced PCC pavements.
1. **Restoring the Subgrade.** Concrete in full depth repair areas shall be removed by lifting with adequately sized equipment that will minimize disrup-

tion to the existing subgrade. Construction equipment will not be allowed in areas where the concrete has been removed. Voids deeper than one inch beneath the removed concrete shall be filled and compacted with granular fill as directed by the Engineer.

Any over-depth removal not authorized by the Engineer shall be replaced and compacted with Class 5 aggregate as approved by the Engineer. The cost for any unauthorized over-depth removal and Class 5 subsequently required shall be at the Contractor's expense.

2. **Forms for PCC Repairs.** The Contractor shall use forms on all exposed edges and steel forms for full-depth repairs longer than 15 feet longitudinally and continuous full-depth forms of steel or 2-inch thick lumber for repairs less than 15 feet longitudinally. All forms shall be placed according to Section 550.04 G.2.
3. **Damaged Areas.** Areas damaged during curing, spalling at full-depth repair edges when traffic is allowed on repair areas after sawcutting and before pavement removal shall be repaired at the Contractor's expense.
4. **Reinforcing Steel.** Include all costs for steel reinforcing, bar supports, and tie bars in the unit price bid for full-depth repairs.
5. **Spall Repair.** Outline the spall to be repaired using a minimum 3-inch depth sawcut. Keep sawcuts beyond the patch outline to a minimum and seal them with a non-shrinking mortar material. Remove loose or unsound concrete within the outlined area (2 feet × 2 feet minimum dimensions) down at least 3 inches to sound concrete using 15-pound chipping hammers (space or other wide flat bit) and hand tools. Cut off and remove reinforcing bars discovered during the removal process. Place a form to match the patch edge to the pavement edge where the patch extends to the pavement edge.

Sandblast the patch area. Remove all loose particles with air under pressure, directing the material away from traffic lanes. Paint the cleaned surface with an even coat of grout, placing the concrete before the grout whitens. Sandblast and regrout the patch area if any whitening occurs. Form a stiff slurry with equal parts by weight of Portland cement and fine aggregate mixed with water and apply with a stiff brush to the old concrete in a thin, even coating that does not run or puddle.

Change the repair to full-depth if in removing the existing pavement for spall repair the engineer determines the extent of damage requires a full-depth repair. Measure the final repair limits for full payment as full-depth repair, plus measure the original repair limits for one-half the bid price for spall repair.

Pour spall repairs when air temperatures are above 40°F.

6. **Repair Size and Longitudinal Joint Treatment.** Place no full-depth repairs less than six feet longitudinally. Place repairs less than full panel length, using a full-depth centerline bond breaker (such as a thickness of bituthene) and no centerline steel tie. Restore the longitudinal joint but not the tie bars between the mainline and a ramp or ramp taper when the repair falls in the area of a ramp.

Replace full-depth repairs involving both lanes, using the following centerline treatments:

- a. Fill the centerline gap between the first pour and the existing concrete with cold bituminous material to prevent water infiltration. Remove this material before the second pour. Include all costs to provide, place, and remove this material in the price bid for the full-depth repair.
 - b. Treat centerline joint steel on repairs exceeding 15 feet in length as follows:
 - (1) Expose each half of existing bars independently and re-pour to leave the existing bar in its original location or,
 - (2) Install new #5 × 2 feet 6 inch tie bars in the joint before placing the second pour to establish the original tie bar pattern and steel cross-sectional area. Install tie bars by drilling and grouting with a high-viscosity epoxy, meeting the requirements of AASHTO M 235, Class 3. The price bid for full-depth repair shall include the costs for all material, equipment, and labor required to make the repairs, as specified above.
7. **Placing Portland Cement Concrete.** Full-depth repairs 100 feet and shorter in longitudinal dimension shall be placed the same day the concrete removal is initiated. Repairs longer than 100 feet shall be placed within 48 hours of the initiation of concrete removal.

Place, consolidate, finish, and cure the concrete according to Section 550 of the Specifications. Wet the faces of old concrete around the repair with water before placing the new concrete.

Finish full-depth repairs longer than 15 feet longitudinally with a mechanical screed capable of providing finish and ride requirements according to Section 550 with limited handwork. Finish concrete flush with adjacent pavement surface. Straight edge to ensure a smooth riding surface and texture longitudinally with a carpet-type artificial grass drag. Check with a 10-foot straightedge before the concrete has set and correct spots 1/8 inch high or low. Correct areas not meeting surface tolerance according to Section 550.04 P.1.

8. **Longitudinal Joint Sealing.**

The Contractor shall shape the longitudinal joint reservoir 1/4-inch wide by 3/4-inch deep in areas of full depth repairs. The joints shall be cleaned as directed by the Engineer. The sealant shall be a Type 2 Hot Applied Joint Sealant.

B. Non-Reinforced Jointed PCC Pavement Repairs.

1. **Existing Non-Reinforced, Jointed PCC Pavement Removal.** Saw the perimeter of the repair full depth with a diamond or carborundum blade. Make the final full-depth cut immediately after the partial-depth cuts when using more than one pass. Make transverse sawcuts parallel to existing transverse

joints when fixed joints are not used on the repair. Extend transverse sawcuts (only far enough into concrete to remain) to guarantee a full-depth cut of the repair area, and seal the cut with a non-shrinking mortar material. Remove concrete by the lift-out method within 48 hours of the transverse sawing. Prepare repair edges reasonably free of the frays or spalls. Make intermediate cuts with other types of saws without penetrating the subgrade to facilitate removal.

2. **Work Sequence.** Use the following work sequence after removing the existing PCC pavement:
 - a. Perform subgrade repair, full-depth concrete pavement repair, and partial-depth spall repair simultaneously.
 - b. Retrofit dowel bars, if called for on the Plans.
 - c. Perform stitching, if called for on the Plans.
 - d. Grind 12-foot driving lane, 3-foot transition in passing lane, and 3-foot transition in outside shoulder, if called for on the Plans. Grind transitions after the adjacent portion of the driving lane has been ground.
 - e. Clean and seal random cracks and transverse joints. Clean and seal longitudinal centerline and 10-foot shoulder joints.
3. **Bars for Transverse Joint at Full-Depth Repairs (Load Transfer).** Drill one 3/8-inch maximum diameter holes at mid-depth of slab spaced as shown using rigid frame-mounted drills for proper position and alignment. Brush holes with a stiff nylon brush and blow clean with compressed air to the back of the hole. Inject a high-viscosity epoxy (meeting AASHTO M 235 Class III) into the back of the hole with a pressurized caulking apparatus. Insert 1-1/4 inches × 18 inches smooth dowel or #9 × 18 inches deformed Grade 40 bars, as detailed, twisting 180 degrees to 360 degrees to allow air to escape and ensure completely filled holes with bars permanently fastened to the existing concrete. Apply small form to face of hole to keep epoxy from flowing out and remove it prior to placing concrete.

Align smooth dowel bars with the pavement direction and parallel to the plane of the surface. Lightly coat the end of each smooth dowel, extending into the patch with grease, according to Section 550.04 I.2.

4. **Transverse Joint Sealing at Full-Depth Repairs.** Seal smooth doweled transverse joints at full-depth repairs according to Section 550.04 M, allowing traffic on the new pavement from the end of the curing period to the beginning of the joint sealing.

Seal fixed transverse joints at full-depth repairs with Type I hot poured elastic-type joint sealant, according to Section 550.04 M. Shape the reservoir to 1/4 to 3/8-inch wide by 1 inch deep, clean as directed by the Engineer, and seal.

- C. **Dowel Bar Retrofit.** This work consists of retrofitting epoxy-coated bars into existing concrete pavement.

Prior to construction, the Contractor shall provide the Engineer with the manufacturer's product literature for usage of the patch mix.

The Contractor shall install the dowel bars in the existing concrete pavement as shown in the plans and according to the following specifications:

1. **Sawing.** Slots shall be cut in the pavement with a gang saw capable of cutting a minimum of three slots in the wheel path, at a time. The slots shall be cut to the depth required to place the center of the dowel at mid-depth in the concrete slab. Multiple saw cuts parallel to the centerline may be required to properly remove material from the slot.
2. **Jack Hammers.** Jack hammers used to remove the concrete shall not be larger than the 30-pound class.
3. **Cleaning.** All exposed surfaces and cracks in the slot shall be sandblasted and cleaned of saw slurry and loose material before installing the dowel. All loose material will be disposed of by the Contractor off of the highway Right of Way.
4. **Dowel Bar Chair Placement.** Dowel bars shall be placed in a chair that will provide a minimum of 1/4-inch clearance between the bottom of the dowel and the bottom of the slot. The dowel bar shall be placed to the depth shown in the plans, parallel to the centerline, and parallel to pavement surface of the lower panel at the transverse joint, all to a tolerance of 1/4 inch. The chair design shall hold the dowel bar securely in place during the placement of the patch mix.
5. **Joint Caulking.** Caulk the existing transverse joint crack at the bottom and sides of the slot as shown in the Plans. The transverse joint crack shall be caulked to provide a tight fit for the foam core board at the transverse joint and to prevent any of the patch mix from entering the crack at the bottom or the sides of the slot. The sealant shall not extend beyond 3/8 inch of each side of the existing transverse joint crack.
6. **Dowel Bar Placement.** The dowel bar shall be placed through the foam core board at the specified location. The dowel bar shall be placed so a minimum of 7 inches is placed on either side of the transverse joint. The foam core board shall be capable of remaining in a vertical position and tight to all edges during the placement of the patch mix. If for any reason the foam core board shifts during the placement of the patch mix, the work shall be rejected and replaced at the Contractor's expense.
7. **Mixing Patch Material.** The patch material shall be mixed with a hand mixer. A metering or measuring device for the water is required. The Contractor shall assure that a consistent batch of patch mix is being produced. A mobile mixer is not acceptable.

The patching material will be tested by the Engineer at a rate of one test for each four hours of production. A minimum compressive strength of 4,000 psi in 6 hours is required. If compressive strengths are not being met, production shall cease and the Contractor shall resubmit a mix design correcting the strength problems.

8. **Existing Concrete Surface Preparation.** The existing concrete surfaces inside the slotted area shall be moistened with water, using a hand sprayer immediately prior to placing the patch mix.
 9. **Placing Patch Mix.** The patch mix shall be placed into the slot and vibrated with a small hand-held vibrator to ensure that the patch mix completely surrounds the dowel bar.
 10. **Curing.** The surface of the patched area shall be flushed with a curing compound that meets the requirements of AASHTO M 148 (ASTM C 309) Type 1-D or 2, Class A or B. The curing compound shall be applied within 30 seconds after a set of three dowel bar patches have been finished.
 11. **Spall Repairs.** Any spalling that occurs to the transverse joints shall be repaired at the Contractor's expense. The joint shall be sawed and sealed as shown in the plans.
 12. **Opening to Traffic.** The dowel bar retrofit portion of the project will not be opened to traffic until the surface has been ground.
 13. **Grinding.** Grinding of pavements and dowel bar retrofit slots shall wait a period of 24 hours or until the next working day.
- D. **Joint Stitching.** The Contractor shall install the tie bars in the existing pavement alternately from opposite sides of the joint or crack to produce a cross-stitching pattern.

The type, size, and length of the tie bars shall be shown in the Plans. The location, angle size, and depth of the holes shall be as shown in the Plans. The minimum depth of cover from the pavement surface to the tie bar shall be as shown in the Plans. No bars shall be installed within 9 inches of an existing transverse contraction joint. Tie bars shall be installed the same day the holes are drilled.

1. **Drilling.** The drills used for making the holes shall be hydraulic percussive type and shall be mounted on a ridged frame to provide proper position and alignment. The Contractor shall exercise care in drilling holes for the placement of the tie bars. Damage to any pavement shall be repaired to the satisfaction of the Engineer at the Contractor's expense.
2. **Cleaning.** Prior to injecting epoxy resin, the drilled holes shall be blown clean with compressed air using a device that will reach the bottom of the hole to ensure that all debris or loose material has been removed.
3. **Epoxy.** The epoxy shall be injected in the bottom of the hole with a pressurized caulking apparatus which allows air to escape and the epoxy to flow up toward the pavement surface as the tie bar is inserted. The holes shall be filled with epoxy prior to insertion of the tie bar so that the epoxy will be level with the top of the pavement after bar insertion.
4. **Tie Bars.** the tie bars shall be placed so that there is an equal length of bar embedded in the adjacent sides of the joint or crack without protruding through the bottom of the slab. The tie bars shall be rotated 180 degrees to 360 degrees during the insertion to eliminate voids and to ensure complete

bonding of the bar. The top shall be filled or cut to level the epoxy with the existing pavement.

- E. **Grinding.** This work consists of grinding existing PCC pavement to provide a skid resistant surface to meet smoothness requirements.
1. **Equipment.** Grinding equipment shall conform to Section 153.15.
 2. **Construction Requirements.** The entire pavement surface area specified shall be ground and textured until the surface of both sides of the transverse joints and cracks are in the same plane and meet the smoothness required. Misalignment of the planes of the surfaces on the adjacent sides of the joint or crack, which are in excess of 1/16 inch, shall be ground until the surfaces are flush. The finished texture shall be uniform.
 - a. **Grinding Depth.** Extra depth grinding to eliminate minor depressions in order to provide texturing of all pavement surface is not required. A minimum removal of 1/16 of an inch is required at all locations except at culverts, dips, or similar conditions. Exceptions shall be made by the Engineer in the field. However, it is the intent of this specification that nearly 100 percent of the area specified is to be textured.
 - b. **Grinding Direction.** Grinding shall be performed in a longitudinal direction. Grinding shall begin and end at lines normal to the pavement centerline within any one ground area. The area ground shall not be left smooth or polished.
 - c. **Texture.** Grinding shall result in a parallel corduroy-type texture consisting of grooves between 0.090 and 0.130 inches wide. The distance between grooves shall be between 0.060 and 0.125 inches. The peaks of the ridges shall be approximately 1/16 of an inch higher than the bottom of the grooves. Adequate cross slope drainage shall be maintained.
 - d. **Transitions.** Auxiliary or ramp lane grinding shall transition as required from the mainline edge to provide positive drainage and an acceptable riding surface.
 - e. **Slope.** The transverse slope of the pavement shall be uniform to the degree that no depressions or misalignment of slope greater than 1/4 inch in 10 feet exists when tested with a 10-foot straightedge. Straightedge requirements do not apply across longitudinal joints or outside ground areas.
 - f. **Clean-Up.** The pavement shall be left in a clean condition. The removal of all slurry or residue resulting from the grinding operation shall be continuous. The Contractor shall control the grinding operation so the residue from the operation does not flow across lanes used by traffic.
 3. **Ride Quality.**
 - a. **Equipment.** The Contractor shall furnish and operate an approved 25-foot, California-style profilograph. The profilograph shall consist of a 25-foot frame, supported upon a multiple system of wheels at both

ends. The profile shall be recorded from the vertical movement of a wheel, attached to the frame at midpoint in reference to the mean elevation of the points of contact established by the support wheels. The profilogram shall be recorded on a scale of one inch equal to 25 feet longitudinally and 1 inch vertically.

- b. **Calibration.** Prior to pavement grinding on the project and periodically thereafter, the calibration of the profilograph shall be checked by the Contractor in the presence of the Engineer. The horizontal scale can be checked by running the profilograph over a known distance and scaling the results on the profilogram. The cause of incorrect scales shall be determined and corrected prior to using the profilograph.
- c. **Operation.** The profilograph shall be operated at a speed no greater than a normal walk. Two passes shall be made in the ground lane, one in each approximate wheel path. The test wheel shall be lifted and the profilogram clearly labeled to mark the beginning and end of each trace, equations, and 500-foot markers. Each trace shall be completely labeled to show the project, stationing, lane, wheel path, date ground, date tested, and operator's name. Each tracing shall be furnished to the agency personnel prior to moving on to the next phase of work in the test area. All area(s) that need to be reground will be retested and have the retest results fastened to the original tracing.
- d. **Evaluation.** After completion of grinding and texturing, the pavement surface shall have an average profile index of 0.3 inches or less in each 0.1 mile section. Individual bumps in excess of 0.3 inches in 25 feet, as measured by the profilograph, will be ground as directed by the Engineer. Evaluation consists of determining the profile index to the nearest 0.5 inches/mile by measuring and summing scallops that appear above and below a 0.2-inch blanking band. The average profile index will be determined from the two wheel paths in the ground lane.

The following areas of pavement will be exempt from the 0.3 inches in each 0.1 mile segment. 1) Pavement on horizontal curves having a centerline radius of curve less than 1,000 feet and pavement within the super elevation transition of such curves. 2) Pavement within 50 feet of the end of the project. 3) Pavement for ramps, acceleration and deceleration lanes, approaches, structure decks, city streets or county roads. 4) Pavement within 50 feet of a transverse joint that separates the pavement from a structure deck or an approach slab.

The Department will spot check or retest areas it desires, with their own profilograph. If a discrepancy between the profilograms exist, the cause of the discrepancy shall be determined and the area re-run if necessary, as determined by the Engineer.

Pay Item	Pay Unit
PCC Pavement Grinding	Square Yard

4. **Joints.**

- a. **One-Half Inch Transverse PCC Joint Cleaning and Sealing.** Joints to be cleaned and resealed shall be done so in accordance with Section

550.04 M. Clean and reseal the portion of the transverse joint ground. Remove existing sealant without damaging that to remain.

- b. **Longitudinal PCC Joint Cleaning and Sealing.** Remove existing hot pour, sandblast, and blow the joint clean, and fill with Type I hot pour.

F. Continuously Reinforced PCC Pavement Repairs.

1. **Existing Concrete Removal.** Saw the repair area edges with a diamond or carborundum blade as shown in the plans, leaving the edges reasonably free of frays or spalls at the pavement surface.

Use 35-pound or smaller air hammers to avoid damage to reinforcing steel within the 18-inch lap areas and to avoid spalling at the bottom of the joint (beneath the partial-depth sawcut). Do not bend reinforcing steel which is to remain in place. Use a concrete cutter 24 inches from the partial-depth sawcut to facilitate removal. Break large areas, using a heavy ball, drop hammer, hydro-hammer, or other heavy equipment. First break a full-depth, two-foot strip along the sawcut or sawcut line with a concrete cutter, hand tools, or equipment no larger than a 35-pound air hammer. Use no heavy equipment adjacent to concrete in place less than 48 hours. Remove from the roadway and dispose of all the material off the Right of Way at the end of each day.

2. **Full-Width, Full-Depth Repairs.** Place the first lane at locations where both lanes are to be repaired in the following manner:
 - a. Connect longitudinal rebars with mechanical splices, meeting the American Concrete Institute (ACI) Building Code for Reinforced Concrete (Chapter 12.14.3.4).
 - b. Use Class AE high-early concrete with a Type A additive designed to attain 3,000 psi compressive strength within 24 hours.
 - c. Place Portland cement concrete between 4 p.m. and 8 p.m. with rebar connections not fully tied until within 20 minutes prior to the pour.

570.05 METHOD OF MEASUREMENT.

- A. **Spall Repair.** Measure and pay for spall repair by the square foot of repair area specified and accepted by the Engineer. Include all costs for work performed, labor, and materials.
- B. **Longitudinal PCC Joint Cleaning and Sealing.** Include all costs for material and labor for forming or sawing, cleaning, and sealing longitudinal joints in the unit price bid for "Longitudinal PCC Joint Cleaning and Sealing."
- C. **Full-Depth Repair Items.** Include all costs for removing, hauling, and disposing of concrete and any material sticking to the removed concrete in the unit price bid for "Full-Depth Repair Items."
- D. **Dowel Bars.** Include all costs for work, labor, and materials to install the smooth or deformed bars, as described above, in the unit price bid for "Dowel Bars."
- E. **1/2-Inch Transverse PCC Joint Clean and Sealing.** Include all costs to form, clean, and seal smooth doweled joints in the unit price bid for "1/2-Inch Transverse PCC Joint Clean and Sealing."

- F. **__Inch Concrete Pavement Repair (Full-Depth - Doweled).** Include all costs to form, clean, and seal fixed joints in the unit priced bid for “__Inch Concrete Pavement Repair (Full-Depth - Doweled).”
- G. **Sawcuts.** Sawcuts will be measured by the linear foot. Measure sawcuts around the perimeter of full-depth jointed pavement repairs for payment. Include the costs for all other sawcuts in the bid item for the work being performed.
- H. **Full-Depth Repairs.** Measure full-depth concrete pavement repairs by the square yard of the area specified and accepted by the Engineer. Pay for the full-depth repair quantity at the contract unit price bid.
- I. **Dowel Bar Retrofit.** Installation of the dowel bars will be measured and paid for as “Dowel Bar Retrofit Type B” for each dowel bar installed and accepted by the Engineer. Payment shall be full compensation for all labor, equipment, and material necessary to complete the work, as specified.
- J. **Joint Stitching.** Installation of tie bars will be measured and paid for as “Epoxy-Coated Deformed Bars” for each tie bar installed and accepted by the Engineer. Any bars that are damaged or not functioning shall be replaced at the expense of the Contractor. Payment shall be full compensation for all labor, equipment, and materials necessary to complete the work, as specified.
- K. **Grinding.** Grinding will be measured per square yard of pavement ground and accepted by the Engineer. Payment for grinding shall be full compensation for all labor and equipment necessary to complete the work.
- L. **One-Half Inch Transverse PCC Joint Cleaning and Sealing.** Measure the joints cleaned and sealed by the linear foot. Regardless of joint width, include all costs for work, including sawing and backer rod when required, in the unit price bid for “1/2-Inch Transverse PCC Joint Cleaning and Sealing,” “Longitudinal PCC Joint Cleaning and Sealing,” and “Random PCC Crack Cleaning and Sealing.”
- M. **Longitudinal PCC Joint Cleaning and Sealing.** Include all costs for extra work and materials to fill varying joint widths and depths in the unit price bid for “Longitudinal PCC Joint Cleaning and Sealing.”
- N. **Full-Depth Repair - End Preparation.** Include all costs for sawing, concrete removal, and preparation of reinforcing steel within each 2-foot end of the full lane width, full-depth repair in the unit price bid price for “Full-Depth Repair - End Preparation.” Include all costs of removing, hauling, and disposing of the rest of the removed concrete in the unit price bid for full-depth repair items.
- O. **Full-Depth Repair - End Prep-Mech Splice.** Include all costs for sawing, concrete removal, reinforcing steel preparation, and mechanical splice rebar connections within each 2-foot end of the full-depth repair (full lane width) in the unit price bid for “Full-Depth Repair - End Prep-Mech Splice.”
- P. **Full-Depth Continuous Concrete Repair.** Full-Depth continuous reinforced concrete repair shall be measured and paid for by the square yard of area specified and accepted by the Engineer at the contract unit price bid. Additional repair area

and additional end preparation for Engineer-approved extension of full-depth repairs will be measured and paid for.

570.06 BASIS OF PAYMENT SUMMARY.

Pay Item	Pay Unit
PCC Pavement Grinding	SY
Doweled Contraction Joint Assembly	LF
Dowel Bars	EA
Dowel Bar Retrofit - Type BEA	
Full-Depth Repair - End Prep - Mech Spine	EA
Full-Depth Repair - End Preparation	EA
___-Inch Concrete Pavement Repair - Full-Depth Doweled	SY
___-Inch Concrete Pavement Repair - Full-Depth Continuous	SY
1/2-Inch Transverse PCC Joint Cleaning & Sealing	LF
Contraction Joint Silicone Seal	LF
Longitudinal PCC Joint Cleaning & Sealing	LF
Random PCC Crack Cleaning & Sealing	LF
Spall Repair - Partial-Depth	SF
___-Inch Full-Depth Sawcuts	LF
Epoxy-Coated Deformed Bars	EA