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ADDENDUM NO. 2

Date:	**August 17, 2023**
Project Name:	**Runway 18L-36R Pavement Reconstruction**
Owner:	**Denton Enterprise Airport**
TxDOT CSJ No.:	**2318DENTN**
Garver Project No.	**23A11280**

This addendum shall be a part of the Plans, Contract Documents and Specifications to the same extent as though it were originally included therein, and it shall supersede anything contained in the Plans, Contract Documents, and Specifications with which it might conflict. This addendum, including all attachments, shall become part of the Contract and all provisions of the Contract shall apply thereto. The time provided for completion of the Contract has not been changed as noted in this addendum. Acknowledgement of receipt of this Addendum must be provided on TxDOT Bid Form page 7 included in the Contract Documents.

Revisions or additions made to the Contract Documents:

A. Specifications

1. Addition of "P-101 Preparation and Removal of Existing Pavements-MOD" in its entirety and replace with attached "P-101 Preparation and Removal of Existing Pavements-MOD" – Addendum No. 2.
2. Addition of "P-101 Preparation and Removal of Existing Pavements" in its entirety and replace with attached "P-101 Preparation and Removal of Existing Pavements" – Addendum No. 2.
3. Addition of "TX – 432 Riprap" – Addendum No.2.

B. Plans

1. Removal of the Moderate Crack Repair Detail in its entirety, Sheet "CP-005 PAVING DETAILS". No replacement, Item removed from bid form released in Addendum No.2.

Questions asked post Pre-Bid Meeting Include:

1. Do the base cans or junction cans which do not run parallel to the runway or taxiway still need a drain conduit running to the underdrain? Some junction/base cans are in the outfield and are a considerable distance from the underdrain. Please advise.
   - The plans indicate which cans are to be connected to the underdrain system. It does not appear that any of the base / junction cans in question will require any connection to underdrains. General Note number 4 on sheet EL-101: "Contractor shall connect light bases and junction structures to underdrain system where indicated by "T".

2. Can you give us some direction on what class unsuitable material we might encounter (4,000 CY)? The landfills could charge over $500 per load depending on the class.
   - Per the geotechnical report and record drawings, the unsuitable material encountered should not be considered a hazardous material to dispose of. The unsuitable material will likely be a

high PI fat clay, that could potentially be used as topsoil once dried. The contractor may dispose of the unsuitable material within designated stockpile locations identified on the southwest portion of the airfield. The contractor will be responsible for shaping and reestablishing vegetation of the stockpile once onsite disposal is complete. The contractor may also choose to dispose of material offsite, a disposal letter shall be provided to the engineer prior to hauling operations. The work associated with both disposal methods will be considered subsidiary to item P-155-4.2.

3. Referring to Sheet 60 dwg CP-003 Note 2; the Alternate select fill subgrade for Taxiway A7 is called for if the existing soils are not suitable for lime treatment. Where is this alternate select fill material and placement paid under? If it is intended for P152-4.3 Select fill, the please clarify is this item will need to consider a deduct for the lime qty as well?
   - Correct. If Item P-152-4.3 Select Fill (TXDOT 247) (12" Thickness) is warranted, there will be a deduct from the Lime and lime treated subgrade items to remove this square yardage.

4. Where is the over excavation for the existing materials paid under if it is not suitable for lime treatment? (Assuming 2,500 SY, approx. 850 CY)
   - As noted in section P-152-4.3, "Select Fill shall be paid per the square yard to the depth as indicated in the pay item and the plans. This item shall consist of the removal of existing material to the bottom of the specified section, the disposal of this additional materials, and the installation and compaction of select fill in accordance with these specifications." The over excavation mentioned shall be considered incidental to the P-152-4.3 select fill pay item.

5. Does the Bid item P152-4.2 Unsuitable excavation scope item (4,000 CY) include importing and placing suitable material to replace the unsuitable material that was hauled off ?
   - Correct, see section P-152.4.2.

6. Please provide the type and weight of the largest/heaviest aircraft at use in the airport. This info is needed for the manufacture of drainage structures.
   - The weight of the heaviest aircraft is 100,000 lbs.

7. Detail 4 on Sheet CC-202 shows 'Typical Riprap Installation Details'. Where does this apply? Please show where on the drawings the riprap is called out.
   - Riprap installation is called out on sheet CG-202 on the top left of the plan view.

8. At the Prebid you had mentioned that we need to submit a schedule with the bid at Bid time, can you confirm that it is required?
   - No schedule is required at Bid time, reference items listed below.
   - C-100-4 Project progress schedule: Critical QC activities must be shown on the project schedule as required by Section 80, paragraph 80-03, Execution and Progress.
   - 80-03 PROSECUTION AND PROGRESS: Unless otherwise specified, the Contractor shall submit his progress schedule for the Engineer's approval within 10 calendar or workdays after the effective date of the notice to proceed. The Contractor's progress schedule, when approved by the Engineer, may be used to establish major construction operations and to check on the progress of the work. The Contractor shall provide sufficient materials, equipment, and labor to guarantee the completion of the project in accordance with the plans and specifications within the time set forth in the bid. If the Contractor falls significantly behind the submitted schedule, the Contractor shall, upon the Engineer's request, submit a revised schedule for completion of the work within the contract time and modify his operations to provide such additional materials, equipment, and labor necessary to meet the revised

schedule. Should the prosecution of the work be discontinued for any reason, the Contractor shall notify the Engineer at least 48 hours in advance of resuming operations. The Contractor shall not commence any actual construction prior to the date on which the notice to proceed is issued by TxDOT.

- C-102-3.2 Schedule: Prior to the start of construction, the Contractor shall submit schedules in accordance with the approved Construction Safety and Phasing Plan (CSPP) and the plans for accomplishment of temporary and permanent erosion control work for clearing and grubbing; grading; construction; paving; and structures at watercourses. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the RPR.

9. Page 14, Bidder qualification section II: calls for submission of evidence of competency and financial responsibility. Can you confirm we will need to submit this even if we are prequalified with TXDOT?
   - Please refer to Page 14 Section I, Item C. "*such evidence of current TxDOT prequalification may be submitted as evidence of financial responsibility and competency in lieu of the above certified statements or reports. The bidders must acknowledge and sign the type of pre-qualification on the bid form."* Section I, Item C: If a Bidder is fully prequalified or prequalified under the bidder's questionnaire with the Texas Department of Transportation (TxDOT) and is on the TxDOT current "bidders list", such evidence of current TxDOT prequalification may be submitted as evidence of financial responsibility and competency in lieu of the above certified statements or reports. The bidders must acknowledge and sign the type of pre-qualification on the bid form. Bidders understand their limitations of prequalification both financially and for approved work experience related to airport development projects.

10. There is a qualification acknowledgement check box on the bid form, does this satisfy the bidder qualification requirement as a whole or do will need to submit the additional financial documents as well? if so, do you have a form we can fill out /follow?
    - *The following steps are required if Full TxDOT Prequalification status is claimed.* It is helpful to include any documentation from TxDOT concerning Pre-Qualification status related to the Vendor Number the contractor plans to utilize.
    - Prequalified Bidder is on "current bidders list."
    - Full Prequalification box is checked.
    - Qualification Acknowledgement Signature is Executed.

11. Can you confirm the following documents will be submitted without any signatures or any other input for acknowledgement. (I know it's typical, but I wanted to confirm).
    - Please refer to the "Bid Package Responsiveness Checklist" on PDF Page 19 of the Bid Documents. The documents need to be printed and included in the Bid Package.
12. Can you confirm the following documents will be submitted without any signatures or any other input for acknowledgement. Page 28- Certificate regarding Disbarment, suspension, Ineligibility and voluntary suspension:
    - Documents shall be printed and included in the Bid Package
13. Can you confirm the following documents will be submitted without any signatures or any other input for acknowledgement. Page 28-Certificate regarding foreign trade restrictions:
    - Documents shall be printed and included in the Bid Package
14. Can you confirm the following documents will be submitted without any signatures or any other input for acknowledgement. Page 29- Buy America certification.

- No signature, documents need to be printed and included in the Bid Package: Nonconforming Items will need to be listed.

15. Can you confirm the following documents will be submitted without any signatures or any other input for acknowledgement. Page 31 – Certificate of non-segregated facility
    - No signature, document need to be to be printed, completed, and included in the Bid Package.

By: Mitchell McAnally

Mitchell McAnally, P.E.
Senior Project Manager

B. Attachments:

1. P-101 Preparation and Removal of Existing Pavements-MOD
2. P-101 Preparation and Removal of Existing Pavements
3. Tex-432 Riprap
4. CP-005 PAVING DETAILS

Item P-101 Preparation/Removal of Existing Pavements MODIFICATIONS

Item P-101 Preparation/Removal of Existing Pavements is hereby amended with respect to the paragraphs and sections sited below.

Add Section 101-1.2 as follows:

101-1.2 Limits of pavement removal and cold milling are estimated in the plans. Actual limits of these items shall be coordinated with the Engineer during construction.

REVISE SECTION 101-3.1 AS FOLLOWS:

101-3.1 Removal of existing pavement.

The Contractor's removal operation shall be controlled to not damage adjacent pavement structure, and base material, cables, utility ducts, pipelines, or drainage structures which are to remain under the pavement.

a. Concrete pavement removal. Full depth saw cuts shall be made perpendicular to the slab surface. The Contractor shall saw through the full depth of the slab including any dowels at the joint, removing the pavement and installing new dowels as shown on the plans and per the specifications. Where the perimeter of the removal limits is not located on the joint and there are no dowels present, the perimeter shall be saw cut the full depth of the pavement. The pavement inside the saw cut shall be removed by methods which will not cause distress in the pavement which is to remain in place. If the material is to be wasted on the airport site, it shall be reduced to a maximum size of 3-inches. Concrete slabs that are damaged by under breaking shall be repaired or removed and replaced as directed by the RPR.

The edge of existing concrete pavement against which new pavement abuts shall be protected from damage at all times. Spall and underbreak repair shall be in accordance with the plans. Any underlaying material that is to remain in place, shall be recompacted and/or replaced as shown on the plans. Adjacent areas damaged during repair shall be repaired or replaced at the Contractor's expense.

b. Asphalt pavement removal. Asphalt pavement to be removed shall be cut to the full depth, **including the base course as directed in the plans,** of the asphalt pavement around the perimeter of the area to be removed. If The material is to be wasted on the airport site it shall be broken to a maximum size of **2** inches.

c. Repair or removal of Base, Subbase, and/or Subgrade. All failed material including surface, base course, subbase course, and subgrade shall be removed and repaired as shown on the plans or as directed by the RPR. Materials and methods of construction shall comply with the applicable sections of these specifications. Any damage caused by Contractor's removal process shall be repaired at the Contractor's expense.

d. Disposal. All existing asphalt pavement removed shall be disposed of onsite as directed in the plans. All hauling will be considered a necessary and incidental part of the work. Costs associated with placement, grading, rolling, or compacting of the removed asphalt pavement shall be considered an incidental part of the work. Its costs shall be considered by the Contractor and included in the contract unit price for the pay items of work involved. No payment will be made separately or directly for hauling on any part of the work. Disposal of existing base material and subgrade shall be disposed of offsite.

Add paragraphs a, b, and c. to Section 101-3.2 as follows:

a. Soil Sterilants. Soil sterilants shall contain Bromacil or Prometone and shall be approved by the Engineer. Application rates shall be in accordance with the manufacturer's recommendations.

b. Crack Preparation. A high temperature compressed air lance shall be used at all times to blast out any vegetation, dirt, dampness and loose materials from the cracks. Existing crack sealant which is deteriorated shall be removed as directed by the Engineer or RPR. The high velocity hot air shall be not less than 2,000 °F in temperature. The air lance shall operate in a no flame ~~impingement condition and shall have a directional controlled velocity of 330 fps minimum and a~~ combustion temperature at ignition of no less than 2,000 °F. ~~After cleaning of crack, tack coat shall be applied prior to the application of emulsified asphalt and aggregate. Tack coat shall conform to Item P-603 of these specifications.~~

~~c. Filler Application. After cracks have been cleaned, received soil sterilant and tack coat, and have been approved by the Engineer, the cracks shall be filled with the emulsified asphalt and aggregate described within this specification. The mix shall be raked in the crack by hand in order to completely fill the entire crack. Once the crack is filled, excess asphalt mix shall be rounded up along the length of the crack, and pinched into the crack using a small asphalt roller. The application and compaction method shall be approved by the Engineer prior to beginning crack cleaning operations.~~

Revise paragraph 2, Section 101-3.3 as follows:

101-3.3 Removal of Foreign Substances/contaminates prior to overlay, seal-coat, or remarking. Removal of foreign substances/contaminates from existing pavement that will affect the bond of the new treatment shall consist of removal of rubber, fuel spills, oil, crack sealer, at least 90% of paint, and other foreign substances from the surface of the pavement. Areas that require removal are designated on the plans and as directed by the RPR in the field during construction.

High-pressure water **or other method as approved by the engineer or RPR may be used for removal of foreign substances.** If chemicals are used, they shall comply with the state's environmental protection regulations. Removal methods used shall not cause major damage to the pavement, or to any structure or utility within or adjacent to the work area. Major damage is defined as changing the properties of the pavement, removal of asphalt causing the aggregate to ravel, or removing pavement over 1/8 inch deep. If it is deemed by the RPR that damage to the existing pavement is caused by operational error, such as permitting the application method to dwell in one location for too long, the Contractor shall repair the damaged area without compensation and as directed by the RPR.

Revise Section 101-3.5a as follows:

a. Patching. The milling machine shall be capable of cutting a vertical edge without chipping or spalling the edges of the remaining pavement and it shall have a positive method of controlling the depth of cut. The ~~RPR~~ **Contractor** shall layout the area to be milled with a straightedge in increments of 1-foot widths. **The Contractor's layout shall be approved by the RPR prior to beginning milling operations.** The area to be milled shall cover only the failed area. Any excessive area that is milled because the Contractor doesn't have the appropriate milling machine, or areas that are damaged because of his negligence, shall be repaired by the Contractor at the Contractor's Expense.

Revise Method of Measurement Section as follows:

METHOD OF MEASUREMENT

101-4.1 Pavement removal. The unit of measurement for pavement removal shall be the number of square yards removed by the Contractor. Any pavement removed outside the limits of removal because the

pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment. No direct measurement or payment shall be made for saw cutting. Saw cutting shall be incidental to pavement removal. Dowel bar removal shall be incidental to pavement removal.

101-4.2 Joint and crack repair. The unit of measurement for joint and crack repair shall be the linear foot of joint.

101-4.3 Removal of Foreign Substances/contaminates. The removal of Foreign Substances/contaminates shall not be measured separately but considered subsidiary to other items.

101-4.2 Variable Depth Cold milling. The unit of measure for cold milling shall be variable depth between 0”-4” inches of milling per square yard. The location of the cold milling shall be as shown on the plans.

101-4.3 Pavement Marking removal. The unit of pavement marking removal shall be per the square foot.

Revise Basis of Payment Section as follows:

BASIS OF PAYMENT

101-5.1 Payment. Payment shall be made at contract unit price for the unit of measurement as specified above. This price shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

Item P-101-5.1	**Asphalt Pavement Section Removal - per square yard**
Item P-101-5.2	**Asphalt over Concrete Removal (3”- 6”) - per square yard**
Item P-101-5.3	**Concrete Pavement Removal - per square yard**
Item P-101-5.4	**Cold Milling (2” Depth) – per square yard**
Item P-101-5.5	**Variable Depth Cold Milling (0”- 4” Depth) – per square yard**
Item P-101-5.6	**Pavement Marking Removal – per square foot**
Item P-101-5.7	**Minor Joint and Crack Repair (1/4” - ½”) - per linear foot**
~~**Item P-101-5.8**~~	~~**Moderate Joint and Crack Repair (Greater than 1/2”) - per linear foot**~~

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ITEM P-101 PREPARATION/REMOVAL OF EXISTING PAVEMENTS

DESCRIPTION

101-1.1 This item shall consist of preparation of existing pavement surfaces for overlay, surface treatments, removal of existing pavement, and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable plans.

101-1.2 Limits of pavement removal and cold milling are estimated in the plans. Actual limits of these items shall be coordinated with the Engineer during construction.

EQUIPMENT AND MATERIALS

101-2 All equipment and materials shall be as specified here and in the following paragraphs or approved by the Resident Project Representative (RPR). The equipment shall not cause damage to the pavement to remain in place.

CONSTRUCTION

101-3.1 Removal of existing pavement.

The Contractor's removal operation shall be controlled to not damage adjacent pavement structure, and base material, cables, utility ducts, pipelines, or drainage structures which are to remain under the pavement.

a. Concrete pavement removal. Full depth saw cuts shall be made perpendicular to the slab surface. The Contractor shall saw through the full depth of the slab including any dowels at the joint, removing the pavement and installing new dowels as shown on the plans and per the specifications. Where the perimeter of the removal limits is not located on the joint and there are no dowels present, the perimeter shall be saw cut the full depth of the pavement. The pavement inside the saw cut shall be removed by methods which will not cause distress in the pavement which is to remain in place. If the material is to be wasted on the airport site, it shall be reduced to a maximum size of 3-inches. Concrete slabs that are damaged by under breaking shall be repaired or removed and replaced as directed by the RPR.

The edge of existing concrete pavement against which new pavement abuts shall be protected from damage at all times. Spall and underbreak repair shall be in accordance with the plans. Any underlaying material that is to remain in place, shall be recompacted and/or replaced as shown on the plans. Adjacent areas damaged during repair shall be repaired or replaced at the Contractor's expense.

b. Asphalt pavement removal. Asphalt pavement to be removed shall be cut to the full depth, **including the base course as directed in the plans,** of the asphalt pavement around the perimeter of the area to be removed. If The material is to be wasted on the airport site it shall be broken to a maximum size of **2** inches.

c. Repair or removal of Base, Subbase, and/or Subgrade. All failed material including surface, base course, subbase course, and subgrade shall be removed and repaired as shown on the plans or as directed by the RPR. Materials and methods of construction shall comply with the applicable sections of these specifications. Any damage caused by Contractor's removal process shall be repaired at the Contractor's expense.

d. Disposal. All existing asphalt pavement removed shall be disposed of onsite as directed in the plans. All hauling will be considered a necessary and incidental part of the work. Costs associated with placement, grading, rolling, or compacting of the removed asphalt pavement shall be considered an incidental part of the work. Its costs shall be considered by the Contractor and included in the contract unit price for the pay items of work involved. No payment will be made separately or directly for hauling on any part of the work. Disposal of existing base material and subgrade shall be disposed of offsite.

101-3.2 Preparation of joints and cracks prior to overlay/surface treatment. Remove all vegetation and debris from cracks to a minimum depth of 1 inch. If extensive vegetation exists, treat the specific area with a concentrated solution of a water-based herbicide approved by the RPR. Fill all cracks greater than 1/4 inch wide with a crack sealant per ASTM D6690. The crack sealant, preparation, and application shall be compatible with the surface treatment/overlay to be used. To minimize contamination of the asphalt with the crack sealant, underfill the crack sealant a minimum of 1/8 inch, not to exceed ¼ inch. Any excess joint or crack sealer shall be removed from the pavement surface.

~~Wider cracks (over 1-1/2 inch wide), along with soft or sunken spots, indicate that the pavement or the pavement base should be repaired or replaced as stated below.~~

~~Cracks and joints may be filled with a mixture of emulsified asphalt and aggregate. The aggregate shall consist of limestone, volcanic ash, sand, or other material that will cure to form a hard substance. The combined gradation shall be as shown in the following table.~~

~~Gradation~~

~~Sieve Size~~	~~Percent Passing~~
~~No. 4 (4.75 mm)~~	~~100~~
~~No. 8 (2.36 mm)~~	~~90-100~~
~~No. 16 (1.18 mm)~~	~~65-90~~
~~No. 30 (600 µm)~~	~~40-60~~
~~No. 50 (300 µm)~~	~~25-42~~
~~No. 100 (150 µm)~~	~~15-30~~
~~No. 200 (75 µm)~~	~~10-20~~

~~Up to 3% cement can be added to accelerate the set time. The mixture shall not contain more than 20% natural sand without approval in writing from the RPR.~~

~~The proportions of asphalt emulsion and aggregate shall be determined in the field and may be varied to facilitate construction requirements. Normally, these proportions will be approximately one part asphalt emulsion to five parts aggregate by volume. The material shall be poured or placed into the joints or cracks and compacted to form a voidless mass. The joint or crack shall be filled to within +0 to -1/8 inches of the surface. Any material spilled outside the width of the joint shall be removed from the pavement surface prior to constructing the overlay. Where concrete overlays are to be constructed, only the excess joint material on the pavement surface and vegetation in the joints need to be removed.~~

a. Soil Sterilants. Soil sterilants shall contain Bromacil or Prometone and shall be approved by the Engineer. Application rates shall be in accordance with the manufacturer's recommendations.

b. Crack Preparation. A high temperature compressed air lance shall be used at all times to blast out any vegetation, dirt, dampness and loose materials from the cracks. Existing crack sealant which is deteriorated shall be removed as directed by the Engineer or RPR. The high velocity hot air shall be not less than 2,000 °F in temperature. The air lance shall operate in a no flame impingement condition and shall have a directional controlled velocity of 330 fps minimum and a combustion temperature at ignition of no less than 2,000 °F. ~~After cleaning of crack, tack coat shall be applied prior to the application of emulsified asphalt and aggregate. Tack coat shall conform to Item P-603 of these specifications.~~

~~c. Filler Application. After cracks have been cleaned, received soil sterilant and tack coat, and have been approved by the RPR, the cracks shall be filled with the emulsified asphalt and aggregate described within this specification. The mix shall be raked in the crack by hand in order to completely fill the entire crack. Once the crack is filled, excess asphalt mix shall be rounded up along the length of the crack, and pinched into the crack using a small asphalt roller. The application and compaction method shall be approved by the Engineer prior to beginning crack cleaning operations.~~

101-3.3 Removal of Foreign Substances/contaminates prior to overlay, seal-coat, or remarking. Removal of foreign substances/contaminates from existing pavement that will affect the bond of the new treatment shall consist of removal of rubber, fuel spills, oil, crack sealer, at least 90% of paint, and other foreign substances from the surface of the pavement. Areas that require removal are designated on the plans and as directed by the RPR in the field during construction.

High-pressure water **or other method as approved by the engineer or RPR may be used for removal of foreign substances.** If chemicals are used, they shall comply with the state's environmental protection regulations. Removal methods used shall not cause major damage to the pavement, or to any structure or utility within or adjacent to the work area. Major damage is defined as changing the properties of the pavement, removal of asphalt causing the aggregate to ravel, or removing pavement over 1/8 inch deep. If it is deemed by the RPR that damage to the existing pavement is caused by operational error, such as permitting the application method to dwell in one location for too long, the Contractor shall repair the damaged area without compensation and as directed by the RPR.

Removal of foreign substances shall not proceed until approved by the RPR. Water used for high-pressure water equipment shall be provided by the Contractor at the Contractor's expense. No material shall be deposited on the pavement shoulders. All wastes shall be disposed of in areas indicated in this specification or shown on the plans.

101-3.4 Concrete spall or failed asphaltic concrete pavement repair.

a. Repair of concrete spalls in areas to be overlaid with asphalt. The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The perimeter of the repair shall be saw cut a minimum of 2 inches outside the affected area and 2 inches deep. The deteriorated material shall be removed to a depth where the existing material is firm or cannot be easily removed with a geologist pick. The removed area shall be filled with asphalt mixture with aggregate sized appropriately for the depth of the patch. The material shall be compacted with equipment approved by the RPR until the material is dense and no movement or marks are visible. The material shall not be placed in lifts over 4 inches in depth. This method of repair applies only to pavement to be overlaid.

b. Asphalt pavement repair. The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The failed areas shall be removed as specified in paragraph 101-3.1b. All failed material including surface, base course, subbase course, and subgrade shall be removed. Materials and methods of construction shall comply with the applicable sections of these specifications.

101-3.5 Cold milling. Milling shall be performed with a power-operated milling machine or grinder, capable of producing a uniform finished surface. The milling machine or grinder shall operate without tearing or gouging the underlaying surface. The milling machine or grinder shall be equipped with grade and slope controls, and a positive means of dust control. All millings shall be removed and disposed in areas designated on the plans. If the Contractor mills or grinds deeper or wider than the plans specify, the Contractor shall replace the material removed with new material at the Contractor's Expense.

a. Patching. The milling machine shall be capable of cutting a vertical edge without chipping or spalling the edges of the remaining pavement and it shall have a positive method of controlling the depth of cut. The ~~RPR~~ **Contractor** shall layout the area to be milled with a straightedge in increments of 1-foot widths. **The Contractor's layout shall be approved by the RPR prior to beginning milling operations.** The area to be milled shall cover only the failed area. Any excessive area that is milled because the Contractor doesn't have the appropriate milling machine, or areas that are damaged because of his negligence, shall be repaired by the Contractor at the Contractor's Expense.

b. Profiling, grade correction, or surface correction. The milling machine shall have a minimum width of 7 feet and it shall be equipped with electronic grade control devices that will cut the surface to the grade specified. The tolerances shall be maintained within +0 inch and -1/4 inch of the specified grade. The machine must cut vertical edges and have a positive method of dust control. The machine must have the ability to windrow the millings or cuttings or remove the millings or cuttings from the pavement and load them into a truck. All millings shall be removed and disposed of in areas designated on the plans.

c. Clean-up. The Contractor shall sweep the milled surface daily and immediately after the milling until all residual materials are removed from the pavement surface. Prior to paving, the Contractor shall wet down the milled pavement and thoroughly sweep and/or blow the surface to remove loose residual material. Waste materials shall be collected and removed from the pavement surface and adjacent areas by sweeping or vacuuming. Waste materials shall be removed and disposed off Airport property.

101-3.6. Preparation of asphalt pavement surfaces prior to surface treatment. Existing asphalt pavements to be treated with a surface treatment shall be prepared as follows:

a. Patch asphalt pavement surfaces that have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt pavement similar to that of the existing pavement in accordance with paragraph 101-3.4b.

b. Repair joints and cracks in accordance with paragraph 101-3.2.

c. Remove oil or grease that has not penetrated the asphalt pavement by scrubbing with a detergent and washing thoroughly with clean water. After cleaning, treat these areas with an oil spot primer.

d. Clean pavement surface immediately prior to placing the surface treatment so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film.

101-3.7 Maintenance. The Contractor shall perform all maintenance work necessary to keep the pavement in a satisfactory condition until the full section is complete and accepted by the RPR. The surface shall be kept clean and free from foreign material. The pavement shall be properly drained at all times. If cleaning is necessary or if the pavement becomes disturbed, any work repairs necessary shall be performed at the Contractor's expense.

101-3.8 Preparation of Joints in Rigid Pavement prior to resealing. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the joint and does not damage the joint.

101-3.8.1 Removal of Existing Joint Sealant. All existing joint sealants will be removed by plowing or use of hand tools. Any remaining sealant and or debris will be removed by use of wire brushes or other tools as necessary. Resaw joints removing no more than 1/16 inch from each joint face. Immediately after sawing, flush out joint with water and other tools as necessary to completely remove the slurry.

101-3.8.2 Cleaning prior to sealing. Immediately before sealing, joints shall be cleaned by removing any remaining laitance and other foreign material. Allow sufficient time to dry out joints prior to sealing. Joint surfaces will be surface-dry prior to installation of sealant.

101-3.8.3 Joint sealant. Not Used.

101-3.9 Preparation of Cracks in Flexible Pavement prior to sealing. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, the method used cleans the cracks and does not damage the pavement.

101-3.9.1 Preparation of Crack. Widen crack with router by removing a minimum of 1/16 inch from each side of crack. Immediately before sealing, cracks will be blown out with a hot air lance combined with oil and water-free compressed air.

101-3.9.2 Removal of Existing Crack Sealant. Existing sealants will be removed by routing. Following routing any remaining debris will be removed by use of a hot lance combined with oil and water-free compressed air.

101-3.9.3 Crack Sealant. Not Used.

101-3.10 Removal of Pipe and other Buried Structures. Not used.

METHOD OF MEASUREMENT

101-4.1 Pavement removal. The unit of measurement for pavement removal shall be the number of square yards removed by the Contractor. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment. No direct measurement or payment shall be made for saw cutting. Saw cutting shall be incidental to pavement removal. Dowel bar removal shall be incidental to pavement removal.

101-4.2 Joint and crack repair. The unit of measurement for joint and crack repair shall be the linear foot of joint.

101-4.3 Removal of Foreign Substances/contaminates. The removal of Foreign Substances/contaminates shall not be measured separately but considered subsidiary to other items.

101-4.2 Variable Depth Cold milling. The unit of measure for cold milling shall be variable depth between 0”-4” inches of milling per square yard. The location of the cold milling shall be as shown on the plans.

101-4.3 Pavement Marking removal. The unit of pavement marking removal shall be per the square foot.

BASIS OF PAYMENT

101-5.1 Payment. Payment shall be made at contract unit price for the unit of measurement as specified above. This price shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

Item P-101-5.1	**Asphalt Pavement Section Removal - per square yard**
Item P-101-5.2	**Asphalt over Concrete Removal (3”- 6”) - per square yard**
Item P-101-5.3	**Concrete Pavement Removal - per square yard**
Item P-101-5.4	**Cold Milling (2” Depth) – per square yard**
Item P-101-5.5	**Variable Depth Cold Milling (0”- 2” Depth) – per square yard**
Item P-101-5.6	**Pavement Marking Removal – per square foot**
Item P-101-5.7	**Minor Joint and Crack Repair (1/4” - ½”) - per linear foot**
~~**Item P-101-5.8**~~	~~**Moderate Joint and Crack Repair (Greater than 1/2”) - per linear foot**~~

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

Advisory Circulars (AC)

AC 150/5380-6	Guidelines and Procedures for Maintenance of Airport Pavements.

ASTM International (ASTM)

ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

END OF ITEM P-101

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Item 432
Riprap

1. DESCRIPTION

Furnish and place concrete, stone, cement-stabilized, or special riprap.

2. MATERIALS

Furnish materials in accordance with the following Items.

- Item 420, "Concrete Substructures,"
- Item 421, "Hydraulic Cement Concrete,"
- Item 431, "Pneumatically Placed Concrete,"
- Item 440, "Reinforcement for Concrete," and
- DMS-6200, "Filter Fabric."

2.1. **Concrete Riprap**. Use Class B Concrete unless otherwise shown on the plans.

2.2. **Pneumatically Placed Concrete Riprap**. Use Class II concrete that meets Item 431, "Pneumatically Placed Concrete," unless otherwise shown on the plans.

2.3. **Stone Riprap**. Use durable natural stone with a bulk specific gravity of at least 2.50 as determined by Tex-403-A unless otherwise shown on the plans. Provide stone that, when tested in accordance with Tex-411-A, has weight loss of no more than 18% after 5 cycles of magnesium sulfate solution.

Perform a size verification test on the first 5,000 sq. yd. of finished riprap stone for all types of stone riprap at a location determined by the Engineer. Test the riprap stone in accordance with ASTM D5519. Additional tests may be required. Do not place additional riprap until the initial 5,000 sq. yd. of riprap has been approved.

Provide grout or mortar in accordance with Item 421, "Hydraulic Cement Concrete," when specified. Provide grout with a consistency that will flow into and fill all voids.

Provide filter fabric in accordance with DMS-6200, "Filter Fabric." Provide Type 2 filter fabric for protection stone riprap unless otherwise shown on the plans. Provide Type 2 filter fabric for Type R, F, or Common stone riprap when shown on the plans.

2.3.1. **Type R**. Use stones between 50 and 250 lb. with at least 50% of the stones heavier than 100 lb.

2.3.2. **Type F**. Use stones between 50 and 250 lb. with at least 40% of the stones heavier than 100 lb. Use stones with at least 1 broad flat surface.

2.3.3. **Common**. Use stones between 50 and 250 lb. Use stones that are at least 3 in. in their least dimension. Use stones that are at least twice as wide as they are thick. When shown on the plans or approved, material may consist of broken concrete removed under the Contract or from other approved sources. Cut exposed reinforcement flush with all surfaces before placement of each piece of broken concrete.

2.3.4. **Protection**. Use boulders or quarried rock that meets the gradation requirements of Table 1. Both the width and the thickness of each piece of riprap must be at least 1/3 of the length. When shown on the plans or as approved, material may consist of broken concrete removed under the Contract or from other approved sources. Cut exposed reinforcement flush with all surfaces before placement of each piece of broken

concrete. Determine gradation of the finished, in-place, riprap stone under the direct supervision of the Engineer in accordance with ASTM D5519.

Table 1
In-Place Protection Riprap Gradation Requirements

Size	Maximum Size (lb.)	90% Size[1] (lb.)	50% Size[2] (lb.)	8% Size[3] Minimum (lb.)
12 in.	200	80–180	30–75	3
15 in.	320	170–300	60–165	20
18 in.	530	290–475	105–220	22
21 in.	800	460–720	175–300	25
24 in.	1,000	550–850	200–325	30
30 in.	2,600	1,150–2,250	400–900	40

1. Defined as that size such that 10% of the total riprap stone, by weight, is larger and 90% is smaller.
2. Defined as that size such that 50% of the total riprap stone, by weight, is larger and 50% is smaller.
3. Defined as that size such that 92% of the total riprap stone, by weight, is larger and 8% is smaller.

The Engineer may require in-place verification of the stone size. Determine the in-place size of the riprap stone by taking linear transects along the riprap and measuring the intermediate axis of the stone at select intervals. Place a tape measure along the riprap and determine the intermediate axis size of the stone at 2 ft. intervals. Measure a minimum of 100 stones, either in a single transect or in multiple transects, then follow ASTM D5519 Test Procedure Part B to determine the gradation. Table 2 is a guide for comparing the stone size in inches to the stone weight shown in Table 1.

Table 2
Protection Riprap Stone Size[1]

Size	Dmax (in.)	D90 (in.)	D50 (in.)	D8 (in.)
12 in.	13.76	10.14–13.29	7.31–9.92	3.39
15 in.	16.10	13.04–15.75	9.21–12.91	6.39
18 in.	19.04	15.58–18.36	11.10–14.21	6.59
21 in.	21.85	18.17–21.09	13.16–15.75	6.88
24 in.	23.53	19.28–22.29	13.76–16.18	7.31
30 in.	32.36	24.65–30.84	17.34–22.72	8.05

1. Based on a Specific Gravity of 2.5 and using the following equation for the intermediate axis diameter $D = \{(12*W)/(Gs*62.4*0.85)\}^{1/3}$

   where:
   D = intermediate axis diameter in in.;
   W = weight of stone in lbs.;
   Gs = Specific Gravity of stone.
   Note—If the Specific Gravity of the stone is different than 2.5, then the above equation can be used to determine the appropriate size using the actual Specific Gravity.

If required, provide bedding stone that, in-place, meets the gradation requirements shown in Table 3 or as otherwise shown on the plans. Determine the size distribution in Table 3 in accordance with ASTM D6913.

Table 3
Protection Riprap Bedding Material Gradation Requirements

Sieve Size (Sq. Mesh)	% by Weight Passing
3"	100
1-1/2"	50–80
3/4"	20–60
#4	0–15
#10	0–5

2.4. **Cement-Stabilized Riprap**. Provide aggregate that meets Item 247, “Flexible Base,” for the type and grade shown on the plans. Use cement-stabilized riprap with 7% hydraulic cement by dry weight of the aggregate.

2.5. **Special Riprap**. Furnish materials for special riprap according to the plans.

3. CONSTRUCTION

Dress slopes and protected areas to the line and grade shown on the plans before the placement of riprap. Place riprap and toe walls according to details and dimensions shown on the plans or as directed.

3.1. **Concrete Riprap**. Reinforce concrete riprap with 6 × 6 – W2.9 × W2.9 welded wire fabric or with No. 3 or No. 4 reinforcing bars spaced at a maximum of 18 in. in each direction unless otherwise shown. Alternative styles of welded wire fabric that provide at least 0.058 sq. in. of steel per foot in both directions may be used if approved. A combination of welded wire fabric and reinforcing bars may be provided when both are permitted. Provide a minimum 6-in. lap at all splices. Provide horizontal cover of at least 1 in. and no more than 3 in. at the edge of the riprap. Place the first parallel bar no more than 6 in. from the edge of concrete. Use approved supports to hold the reinforcement approximately equidistant from the top and bottom surface of the slab. Adjust reinforcement during concrete placement to maintain correct position.

Sprinkle or sprinkle and consolidate the subgrade before the concrete is placed as directed. All surfaces must be moist when concrete is placed.

Compact and shape the concrete once it has been placed to conform to the dimensions shown on the plans. Finish the surface with a wood float after it has set sufficiently to avoid slumping to secure a smooth surface or broom finish as approved.

Cure the riprap immediately after the finishing operation according to Item 420, “Concrete Substructures.”

3.2. **Stone Riprap**. Provide the following types of stone riprap when shown on the plans:

- **Dry Riprap**. Stone riprap with voids filled with only spalls or small stones.
- **Grouted Riprap**. Type R, F, or Common stone riprap with voids grouted after all the stones are in place.
- **Mortared Riprap**. Type F stone riprap laid and mortared as each stone is placed.

Use spalls and small stones lighter than 25 lb. to fill open joints and voids in stone riprap, and place to a tight fit.

Place mortar or grout only when the air temperature is above 35°F. Protect work from rapid drying for at least 3 days after placement.

Place filter fabric with the length running up and down the slope unless otherwise approved. Ensure fabric has a minimum overlap of 2 ft. Secure fabric with nails or pins. Use nails at least 2 in. long with washers or U-shaped pins with legs at least 9 in. long. Space nails or pins at a maximum of 10 ft. in each direction and 5 ft. along the seams. Alternative anchorage and spacing may be used when approved.

3.2.1. **Type R**. Construct riprap as shown in Figure 1 on the *Stone Riprap Standard* and as shown on the plans. Place stones in a single layer with close joints so most of their weight is carried by the earth and not the adjacent stones. Place the upright axis of the stones at an angle of approximately 90° to the embankment slope. Place each course from the bottom of the embankment upward with the larger stones in the lower courses.

Fill open joints between stones with spalls. Place stones to create a uniform finished top surface. Do not exceed a 6-in. variation between the tops of adjacent stones. Replace, embed deeper, or chip away stones that project more than the allowable amount above the finished surface.

Prevent earth, sand, or foreign material from filling the spaces between the stones when the plans require Type R stone riprap to be grouted. Wet the stones thoroughly after they are in place, fill the spaces between the stones with grout, and pack. Sweep the surface of the riprap with a stiff broom after grouting.

3.2.2. **Type F**.

3.2.2.1. **Dry Placement**. Construct riprap as shown in Figure 2 on the *Stone Riprap Standard*. Set the flat surface on a prepared horizontal earth bed, and overlap the underlying course to secure a lapped surface. Place the large stones first, roughly arranged in close contact. Fill the spaces between the large stones with suitably sized stones placed to leave the surface evenly stepped and conforming to the contour required. Place stone to drain water down the face of the slope.

3.2.2.2. **Grouting**. Construct riprap as shown in Figure 3 on the *Stone Riprap Standard*. Size, shape, and lay large flat-surfaced stones to produce an even surface with minimal voids. Place stones with the flat surface facing upward parallel to the slope. Place the largest stones near the base of the slope. Fill spaces between the larger stones with stones of suitable size, leaving the surface smooth, tight, and conforming to the contour required. Place the stones to create a plane surface with a variation no more than 6 in. in 10 ft. from true plane. Provide the same degree of accuracy for warped and curved surfaces. Prevent earth, sand, or foreign material from filling the spaces between the stones. Wet the stones thoroughly after they are in place, fill the spaces between them with grout, and pack. Sweep the surface with a stiff broom after grouting.

3.2.2.3. **Mortaring**. Construct riprap as shown in Figure 2 on the *Stone Riprap Standard*. Lap courses as described for dry placement. Wet the stones thoroughly before placing mortar. Bed the larger stones in fresh mortar as they are being place and shove adjacent stones into contact with one another. Spread excess mortar forced out during placement of the stones uniformly over them to fill all voids completely. Point up all joints roughly either with flush joints or shallow, smooth-raked joints as directed.

3.2.3. **Common**. Construct riprap as shown in Figure 4 on the *Stone Riprap Standard*. Place stones on a bed excavated for the base course. Bed the base course of stone well into the ground with the edges in contact. Bed and place each succeeding course in even contact with the preceding course. Use spalls and small stones to fill any open joints and voids in the riprap. Ensure the finished surface presents an even, tight surface, true to the line and grades of the typical sections.

Prevent earth, sand, or foreign material from filling the spaces between the stones when the plans require grouting common stone riprap. Wet the stones thoroughly after they are in place; fill the spaces between them with grout; and pack. Sweep the surface with a stiff broom after grouting.

3.2.4. **Protection**. Construct riprap as shown in Figure 5 on the *Stone Riprap Standard*. Place riprap stone on the slopes within the limits shown on the plans. Place stone for riprap on the filter fabric to produce a reasonably well-graded mass of riprap with the minimum practicable percentage of voids. Construct the riprap to the lines and grades shown on the plans or staked in the field. A tolerance of +6 in. and −0 in. from the slope line and grades shown on the plans is allowed in the finished surface of the riprap. Place riprap to its full thickness in a single operation. Avoid displacing the filter fabric. Ensure the entire mass of stones in their final position is free from objectionable pockets of small stones and clusters of larger stones. Do not place riprap in layers, and do not place it by dumping it into chutes, dumping it from the top of the slope, pushing it from the top of the slope, or any method likely to cause segregation of the various sizes. Obtain the desired distribution of the various sizes of stones throughout the mass by selective loading of material at the quarry or other source or by other methods of placement that will produce the specified results. Rearrange individual stones by mechanical equipment or by hand if necessary to obtain a reasonably well-graded distribution of stone sizes. Use the bedding thickness shown and place stone for riprap on the bedding material to produce a reasonably well-graded mass of riprap with the minimum practicable percentage of voids if required on the plans.

3.3. **Pneumatically Placed Concrete Riprap, Class II**. Meet Item 431, “Pneumatically Placed Concrete.” Provide reinforcement following the details on the plans and Item 440, “Reinforcement for Concrete.” Support reinforcement with approved supports throughout placement of concrete.

Give the surface a wood-float finish or a gun finish as directed. Cure the riprap with membrane-curing compound immediately after the finishing operation in accordance with Item 420, “Concrete Substructures.”

3.4. **Cement-Stabilized Riprap**. Follow the requirements of the plans and the provisions for concrete riprap except when reinforcement is not required. The Engineer will approve the design and mixing of the cement-stabilized riprap.

3.5. **Special Riprap**. Construct special riprap according to the plans.

4. MEASUREMENT

This Item will be measured by the cubic yard of material complete in place. Volume will be computed on the basis of the measured area in place and the thickness and toe wall width shown on the plans.

If required on the plans, the pay quantity of the bedding material for stone riprap for protection to be paid for will be measured by the cubic yard as computed from the measured area in place and the bedding thickness shown on the plans.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Riprap" of the type, thickness, and void-filling technique (Dry, Grout, Mortar) specified, as applicable. This price is full compensation for furnishing, hauling, and placing riprap and for filter fabric, expansion joint material, concrete and reinforcing steel, grout and mortar, scales, test weights, equipment, labor, tools, and incidentals.

Payment for excavation of toe wall trenches, for all necessary excavation below natural ground or bottom of excavated channel, and for shaping of slopes for riprap will be included in the unit price bid per ~~cubic~~ **square** yard of riprap.

When bedding is required for protection stone riprap, payment will be made at the unit price for "Bedding Material" of the thickness specified. This price is full compensation for furnishing, hauling, placing, and maintaining the bedding material until placement of the riprap cover is completed and accepted; excavation required for placement of bedding material; and equipment, scales, test weights, labor, tools, and incidentals. No payment will be made for excess thickness of bedding nor for material required to replace embankment material lost by rain wash, wind erosion, or otherwise.

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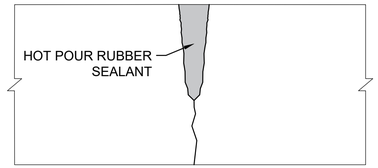
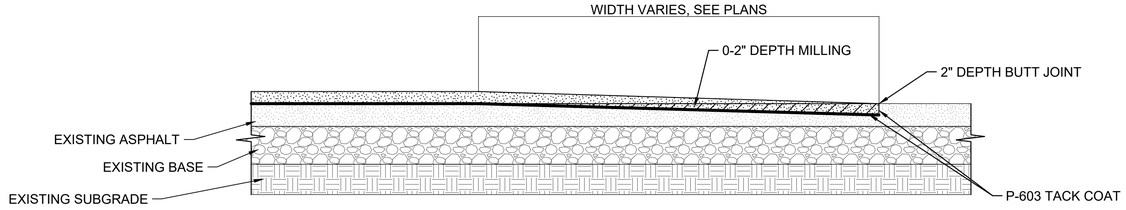


LOW SEVERITY CRACK REPAIR DETAIL (1/4" TO 1/2")

1 / CP-005 — SCALE: NONE

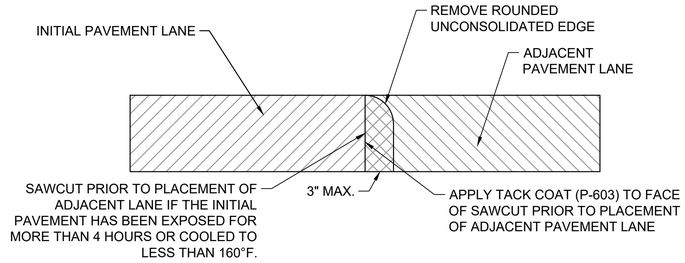
NOTES:

1. THOROUGHLY CLEAN AND BLOW OUT CRACK TO SOUND MATERIAL.
2. HOT LANCE CRACK.
3. FILL WITH HOT POUR RUBBER SEALANT.
5. OVERBAND IS NOT ALLOWED.
6. SPILLAGE OR OVER FILLING CRACKS AND JOINTS SHALL BE IMMEDIATELY CLEANED/REMOVED TO THE SATISFACTION OF THE ENGINEER OR THE CRACK OR JOINT SEAL SHALL BE REMOVED AND REDONE.



TRANSITION TO EXISTING PAVEMENT (BUTT JOINT) DETAIL

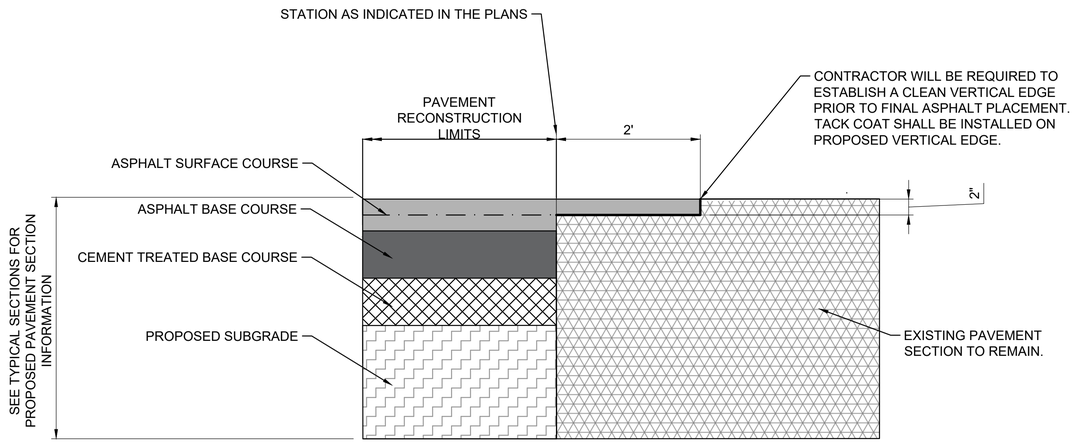
3 / CP-005 — SCALE: NONE



ASPHALT LONGITUDINAL CONSTRUCTION JOINT DETAIL

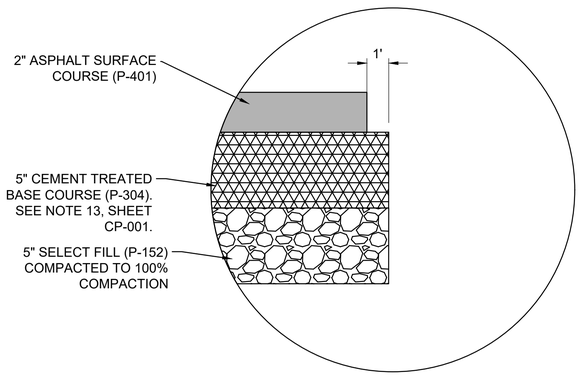
4 / CP-005 — SCALE: NONE

2



PAVEMENT SECTION TRANSITION DETAIL

5 / CP-005 — SCALE: NONE



ACCESS ROAD TYPICAL SECTION DETAIL

6 / CP-005 — SCALE: NONE

REGISTRATION NO. F-5713

STATE OF TEXAS
MITCHELL R. McANALLY
114422
PROFESSIONAL ENGINEER

Digitally Signed 08/11/2023

REV.	DATE	DESCRIPTION	BY
2	08/17/23	ADDENDUM NO. 02	MRM

DENTON ENTERPRISE AIRPORT
DENTON, TX

RUNWAY 18L-36R PAVEMENT RECONSTRUCTION

PAVING DETAILS

JOB NO.: 23A11280
DATE: JULY 2023
DESIGNED BY: GJT
DRAWN BY: DJD

BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRAWING NUMBER
CP-005

SHEET NUMBER **62**