

ADDENDUM NO. 2
PROJECT MANUAL
CITY OF BRYAN
BRYAN, TEXAS
BRYAN–COULTER AIRFIELD APRON EXPANSION
TXDOT CSJ NO. 2617BRYAN

Bids will be received until August 25, 2026, at 11:00 A.M., local time.

This Addendum to the Bid Documents is issued to modify, explain, or correct the original Technical Specifications for Bryan-Coulter Airfield Apron Expansion (TxDOT CSJ No. 2617BRYAN) and is hereby made part of the Contract Documents. Acknowledgement of receipt of this addendum is required on the signature page of the Bid Form. Failure to acknowledge all addenda could render your Bid out of form and result in a non-responsive Bid.

A. BIDDING AND CONTRACTING REQUIREMENTS

1. TABLE OF CONTENTS

a. Page 1

ADD the following new section to the Table of Contents at the end of SPECIFICATIONS:

“Alternative Bid No. 1–Section 32 00 00 Construct, Maintain, and Remove Haul Route”

2. TXDOT BID FORM

REPLACE Bid Form pages 1 through 5 with the attached **Revised** Bid Form pages 1 through 5.

B. TXDOT SPECIFICATIONS

1. MODIFICATION TO ITEM 341–DENSE–GRADED HOT–MIX ASPHALT

REPLACE Modification to Item 341–Dense–Graded Hot–Mix Asphalt in its entirety with the attached revised Modification to Item 341–Dense–Graded Hot–Mix Asphalt.

2. ITEM 341–DENSE–GRADED HOT–MIX ASPHALT

REPLACE Item 341–Dense–Graded Hot–Mix Asphalt in its entirety with the attached revised Item 341–Dense–Graded Hot–Mix Asphalt.

C. SPECIFICATIONS

1. ALTERNATIVE BID NO. 1–SECTION 32 00 00–CONSTRUCT, MAINTAIN, AND REMOVE HAUL ROUTE

ADD the attached new Alternative Bid No. 1–Section 32 00 00–Construct, Maintain, and Remove Haul Route to the end of the Technical Specifications.

D. DRAWINGS

1. SHEET NO. 1–TITLE SHEET

REPLACE Sheet No. 1 with the attached revised Sheet No. 1.

2. SHEET NO. 2–GENERAL NOTES, SHEET INDEX, AND LEGEND

REPLACE Sheet No. 2 with the attached revised Sheet No. 2.

3. SHEET NO. 4–PROJECT QUANTITIES

REPLACE Sheet No. 4 with the attached revised Sheet No. 4.

4. SHEET NO. 8–PROJECT LAYOUT

REPLACE Sheet No. 8 with the attached revised Sheet No. 8.

5. SHEET NO. 9A–ALTERNATIVE BID NO. 1–CONSTRUCT, MAINTAIN, AND REMOVE HAUL ROUTE

ADD the attached Sheet No. 9A.

6. SHEET NO. 11–CSPP (RW OPEN)

REPLACE Sheet No. 11 with the attached revised Sheet No. 11.

7. SHEET NO. 12–CSPP (RW CLOSED)

REPLACE Sheet No. 12 with the attached revised Sheet No. 12.

8. SHEET NO. 15–STORMWATER POLLUTION PREVENTION PLAN

REPLACE Sheet No. 15 with the attached revised Sheet No. 15.

9. SHEET NO. 19–MARKING PLAN

REPLACE Sheet No. 19 with the attached revised Sheet No. 19.

10. SHEET NO. 25–MARKING DETAILS

REPLACE Sheet No. 25 with the attached revised Sheet No. 25.

**BIDDERS MUST ACKNOWLEDGE RECEIPT OF THIS ADDENDUM
IN THE SPACE PROVIDED IN THE BID FORM**

Dated at Brenham, Texas
August 6, 2026



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8/6/26 00:31:13:2

Modification to Item 341

Dense-Graded Hot-Mix Asphalt



For this project, Item 341, "Dense-Graded Hot-Mix Asphalt," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Section 341.2.1., "Aggregate." The paragraph is supplemented by the following:

"Reclaimed Asphalt Pavement (RAP) and Processed Asphalt Shingle Material (RAS) will not be allowed on the project."

Section 341.2.1.1., "Coarse Aggregate." The first sentence in the fourth paragraph is supplemented by the following:

"The surface coarse aggregate minimum SAC shall be B."

Section 341.2.4., "Asphalt Binder." The paragraph is voided and replaced by the following:

"Furnish PG 64-22 asphalt binder in accordance with Section 300.2.10, "Performance-Graded Binders." The JMF target asphalt content shall not be less than 5.3%."

Section 341.2.5., "Tack Coat." The first paragraph is voided and replaced by the following.

"Furnish CSS-1H, SS-1H, or a PG binder with a minimum high-temperature grade of PG 58 for tack coat binder in accordance with Item 300, "Asphalts, Oils, and Emulsions." Specialized tack coat materials listed on the Department's MPL are allowed or required when shown on the plans. Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use."

Section 341.2.7.1., "RAP." The section is voided in its entirety.

Section 341.2.7.2., "RAS." The section is voided in its entirety.

Section 341.4.1., "Certification." The paragraph is voided and replaced by the following.

Certification. Personnel certified by the Department-approved hot-mix asphalt certification program must conduct all mixture designs, sampling, and testing in accordance with Table 6. Supply the Engineer with a list of certified personnel and copies of their current certificates before beginning production and when personnel changes are made. Provide a mixture design developed and signed by a Level 2 certified specialist. Provide Level 1A certified specialists at the plant during production operations. Provide Level 1B certified specialists to conduct placement tests. Provide Level AGG101 certified specialists for aggregate testing.

Table 6, "Test Methods, Test Responsibility, and Minimum Certification Levels" is voided and replaced by the following.

Table 6
Test Methods, Test Responsibility, and Minimum Certification Levels

Test Description	Test Method	Contractor	Engineer	Level ¹
1. Aggregate and Recycled Material Testing				
Sampling	Tex-221-F	✓	✓	1A/AGG101
Dry sieve	Tex-200-F , Part I	✓	✓	1A/AGG101
Washed sieve	Tex-200-F , Part II	✓	✓	1A/AGG101
Deleterious material	Tex-217-F , Parts I & III	✓	✓	AGG101
Decantation	Tex-217-F , Part II	✓	✓	AGG101
Los Angeles abrasion	Tex-410-A		✓	TxDOT
Magnesium sulfate soundness	Tex-411-A		✓	TxDOT
Micro-Deval abrasion	Tex-461-A		✓	AGG101
Crushed face count	Tex-460-A	✓	✓	AGG101
Flat and elongated particles	Tex-280-F	✓	✓	AGG101
Linear shrinkage	Tex-107-E	✓	✓	AGG101
Sand equivalent	Tex-203-F	✓	✓	AGG101
Organic impurities	Tex-408-A	✓	✓	AGG101
2. Asphalt Binder & Tack Coat Sampling				
Asphalt binder sampling	Tex-500-C , Part II	✓	✓	1A/1B
Tack coat sampling	Tex-500-C , Part III	✓	✓	1A/1B
3. Mix Design & Verification				
Design and JMF changes	Tex-204-F	✓	✓	2
Mixing	Tex-205-F	✓	✓	2
Molding (TGC)	Tex-206-F	✓	✓	1A
Molding (SGC)	Tex-241-F	✓	✓	1A
Laboratory-molded density	Tex-207-F , Parts I & VI	✓	✓	1A
Rice gravity	Tex-227-F , Part II	✓	✓	1A
Ignition oven correction factors ²	Tex-236-F , Part II	✓	✓	2
Indirect tensile strength	Tex-226-F	✓	✓	1A
Hamburg Wheel test	Tex-242-F	✓	✓	1A
Boil test	Tex-530-C	✓	✓	1A
4. Production Testing				
Selecting production random numbers	Tex-225-F , Part I		✓	1A
Mixture sampling	Tex-222-F	✓	✓	1A/1B
Molding (TGC)	Tex-206-F	✓	✓	1A
Molding (SGC)	Tex-241-F	✓	✓	1A
Laboratory-molded density	Tex-207-F , Parts I & VI	✓	✓	1A
Rice gravity	Tex-227-F , Part II	✓	✓	1A
Gradation & asphalt binder content ²	Tex-236-F , Part I	✓	✓	1A
Control charts	Tex-233-F	✓	✓	1A
Moisture content	Tex-212-F , Part II	✓	✓	1A/AGG101
Hamburg Wheel test	Tex-242-F	✓	✓	1A
Micro-Deval abrasion	Tex-461-A		✓	AGG101
Boil test	Tex-530-C	✓	✓	1A
Abson recovery	Tex-211-F		✓	TxDOT
5. Placement Testing				
Selecting placement random numbers	Tex-225-F , Part II		✓	1B
In-place air voids	Tex-207-F , Parts I & VI	✓	✓	1A
In-place density (nuclear method)	Tex-207-F , Part III	✓		1B
Establish rolling pattern	Tex-207-F , Part IV	✓		1B
Control charts	Tex-233-F	✓	✓	1A
Ride quality measurement	Tex-1001-S	✓	✓	Note 3
Segregation (density profile)	Tex-207-F , Part V	✓	✓	1B
Longitudinal joint density	Tex-207-F , Part VII	✓	✓	1B
Thermal profile	Tex-244-F	✓	✓	1B

- Level 1A, 1B, AGG101, and 2 are certification levels provided by the Hot Mix Asphalt Center certification program.
- Refer to Section 341.4.9.2.3., "Production Testing," for exceptions to using an ignition oven.
- Profiler and operator are required to be certified at the Texas A&M Transportation Institute facility when Surface Test Type B is specified.

Section 341.4.5.2., Mixing and Discharge of Materials.” The first paragraph is voided and replaced by the following.

“Notify the Engineer of the target discharge temperature and produce the mixture within 25°F of the target. Monitor the temperature of the material in the truck before shipping to ensure that it does not exceed 350°F (or 275°F for WMA). The Department will not pay for or allow placement of any mixture produced above 350°F.”

This section is supplemented by the following:

“An automatic digital record printer is required at the plant. The batch weight ticket shall show the total weight of the batch and the weight of the asphalt. These tickets shall be given to the RPR at the end of each day’s production.”

Section 341.4.6., “Hauling Operations.” The paragraph is supplemented by the following:

“The Contractor shall assure the Engineer, in writing at the pre-paving conference, that adequate material will be available at the job site to ensure that starting and stopping of the paver is kept to an absolute minimum. Should the Engineer, in his opinion, determine this requirement is not being met, the Engineer may stop installation operations until satisfactory arrangements for delivery of sufficient material can be made.”

Section 341.4.7., “Placement Operations.” The fourth sentence of the second paragraph is voided and replaced by the following:

“Offset longitudinal joints of successive courses of hot mix by at least 12 inches.”

The third paragraph is supplemented by the following:

“Paved edges shall deviate by no more than 2 inches from a straight line along the edge. Straight edges may be produced by the Contractor using either a string set at the pavement edge, or by saw cutting the edge.

At crowns on rooftop hot mix sections and at valleys on inverted rooftop hot mix sections, break the lay-down machine screed so that the longitudinal pavement joint is at least 4 feet from the crown or valley, as applicable.

Bituminous Pavers shall be self-propelled, with an activated screed, which shall be heated as necessary, and shall be capable of spreading and finishing courses of bituminous plant mix material which will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface.

The Contractor will be required to use automatic grade controls on the paver on this project.

Bituminous material shall not be placed against previously completed material that has a temperature below 175°F. If necessary, longitudinal joints shall be preheated by using an infrared heater attached to the paver ahead of the screed a sufficient distance to allow for proper preheating. Transverse joints shall be preheated to a minimum of 250°F using a portable infrared heater. The temperature of the bituminous material being preheated shall not exceed 300°F.”

Section 341.4.7.2., “Tack Coat.” The paragraph is voided and replaced by the following.

- 4.7.2.1. Application. Clean the surface before placing the tack coat. The Engineer will set the rate between 0.04 and 0.10 gal. of residual asphalt per square yard of surface area. Apply a uniform tack coat at the specified rate unless otherwise directed. Apply the tack coat in a uniform manner to avoid streaks and other irregular patterns. Apply the tack coat to all surfaces the will come in contact with the subsequent HMA placement, unless otherwise directed. Allow adequate time for emulsion to break completely before placing any material. Prevent splattering of tack coat when placed adjacent to curb, gutter, and structures. Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use.
- 4.7.2.2. Sampling. The Engineer will obtain at least one sample of the tack coat binder per project in accordance with Tex-500-C, Part III, and test it to verify compliance with Item 300, “Asphalts, Oils, and Emulsions.” The Engineer will obtain the sample from the asphalt distributor immediately before use.

For emulsions, the Engineer may test as often as necessary to ensure the residual of the emulsion is greater than or equal to the specification requirement in Item 300, "Asphalts, Oils, and Emulsions."

Section 341.4.7.3.1.3., "Thermal Camera," is voided and replaced by the following.

Take immediate corrective action to eliminate recurring moderate thermal segregation when a hand-held thermal camera is used. Evaluate areas with moderate thermal segregation by performing density profiles in accordance with Section 341.4.9.3.3.2., "Segregation (Density Profile)." Provide the Engineer with the thermal profile of every subplot within one working day of the completion of each lot. Report the results of each thermal profile in accordance with Section 341.4.2., "Reporting and Responsibilities." When requested by the Engineer, provide the electronic files generated using the thermal camera. The Engineer will use a hand-held thermal camera to obtain a thermal profile at least once per project. No production or placement payment adjustments greater than 1.000 will be paid for any subplot that contains severe thermal segregation. Suspend operations and take immediate corrective action to eliminate severe thermal segregation unless otherwise directed. Resume operations when the Engineer determines that subsequent production will meet the requirements of this Section. Evaluate areas with severe thermal segregation by performing density profiles in accordance with Section 341.4.9.3.3.2. Remove and replace the material in any areas that have both severe thermal segregation and a failing result for Segregation (Density Profile) unless otherwise directed. The subplot in question may receive a production and placement payment adjustment greater than 1.000, if applicable, when the defective material is successfully removed and replaced.

Section 341.4.8., "Compaction." The second paragraph is supplemented by the following:

"All rollers shall be completely clean and free of soil, aggregate, asphalt, and all other materials which may damage or mar the hot mix in any way. Roller brushes, shoes, and water supply shall be in good condition and completely cover the roller from edge to edge."

The third paragraph is supplemented by the following:

"The Contractor shall be required to have a testing lab representative, with a field density measuring gauge, in the field during HMA operations to assist the Contractor in his setting of his rolling pattern and to provide field densities during HMA construction.

Immediately after coring of the surface course has been completed, the Contractor shall clean the coring water and residue from the asphalt to prevent staining of the surface."

The sixth paragraph is supplemented by the following:

"The Contractor shall provide a 12-foot straightedge for use by the RPR during the project."

Section 341.4.9.2.2.2., "Asphalt Binder Sampling," is voided and is not replaced.

Table 16, "Production and Placement Testing Frequency," is voided and replaced by the following.

Table 16
Production and Placement Testing Frequency

Description	Test Method	Minimum Contractor Testing Frequency	Minimum Engineer Testing Frequency
Individual % retained for #8 sieve and larger	Tex-200-F or Tex-236-F	1 per subplot	1 per 12 sublots ¹
Individual % retained for sieves smaller than #8 and larger than #200			
% passing the #200 sieve			
Laboratory-molded density	Tex-207-F	N/A	1 per subplot ¹
Laboratory-molded bulk specific gravity			
In-place air voids			
VMA	Tex-204-F		
Segregation (density profile) ²	Tex-207-F , Part V	1 per subplot	1 per project
Longitudinal joint density	Tex-207-F , Part VII		
Moisture content	Tex-212-F , Part II	When directed	
Theoretical maximum specific (Rice) gravity	Tex-227-F	N/A	1 per subplot ¹
Asphalt binder content	Tex-236-F	1 per subplot	1 per lot ¹
Hamburg Wheel test	Tex-242-F	N/A	1 per project
Recycled Asphalt Shingles (RAS) ³	Tex-217-F , Part III	N/A	
Thermal profile ²	Tex-244-F	1 per subplot	
Asphalt binder sampling and testing	Tex-500-C , Part II	1 per lot (sample only)	
Tack coat sampling and testing	Tex-500-C , Part III	N/A	
Boil test ⁴	Tex-530-C	1 per lot	

1. For production defined in Section 341.4.9.4., "Exempt Production," the Engineer will test one per day if 100 tons or more are produced. For Exempt Production, no testing is required when less than 100 tons are produced.
2. Not required when a thermal imaging system is used.
3. Testing performed by the Construction Division or designated laboratory.
4. The Engineer may reduce or waive the sampling and testing requirements based on a satisfactory test history.

Section 341.4.9.3.3.3., "Segregation (Density Profile)." The second paragraph is voided and replaced by the following.

Perform a minimum of one density profile per subplot. Perform additional density profiles when any of the following conditions occur, unless otherwise approved:

- the paver stops for more than 60 sec.;
- either the Contractor or the Engineer identifies areas with thermal segregation; or
- any visibly segregated areas exist.

Section 341.4.9.4., "Exempt Production." The second paragraph is voided and replaced by the following.

For exempt production, the Contractor is relieved of all production and placement sampling and testing requirements, except for coring, and the production and placement pay factors are 1.000. All other specification requirements apply, and the Engineer will perform acceptance tests for production and placement listed in Table 14 when 100 tons or more per day are produced.

Section 341.5., "Measurement," is voided and replaced by the following.

- 5.1 Dense Graded Hot-Mix Asphalt. Hot mix will be measured by the ton of composite hot-mix, which includes asphalt, aggregate, and additives. Measure the weight on scales in accordance with Item 520, "Weighing and Measuring Equipment."
- 5.2 Tack Coat. Tack coat will be measured at the applied temperature by strapping the tank before and after road application and determining the net volume in gallons from the calibrated distributor. The Engineer will witness all strapping operations for volume determination. All tack, including emulsions, will be measured by the gallon applied.

The Engineer may allow the use of a metering device to determine asphalt volume used and application rate if the device is accurate within 1.5% of the strapped volume.

Section 341.6., "Payment," the first paragraph is voided and replaced with the following.

The work performed and materials furnished in accordance with this Item and measured as provided under Section 341.5.1, "Measurement," will be paid for at the unit bid price for "Dense Graded Hot-Mix Asphalt" of the mixture type, SAC, and binder specified. These prices are full compensation for surface preparation, materials, placement, equipment, labor, tools, and incidentals.

Section 341.6., "Payment," is supplemented by the following.

The work performed and materials furnished in accordance with this Item and measured as provided under Section 341.5.2, "Measurement," will be paid for at the unit bid price for "Tack Coat" of the tack coat provided. These prices are full compensation for materials, placement, equipment, labor, tools, and incidentals.

Section 341.6.1.2., "Production Sublots Subject to Removal and Replacement." This section is voided and replaced by the following.

The bulk specific gravity of each core will be divided by the Engineer's average maximum theoretical specific gravity for that lot to determine the new payment adjustment factor of the subplot in question. If the new payment adjustment factor is 0.700 or greater, the new payment adjustment factor will apply to that subplot. If the new payment adjustment factor is less than 0.700, no payment will be made for the subplot. Remove and replace the failing subplot, or the Engineer may allow the subplot to be left in place without payment. The Engineer may also accept the subplot in accordance with Section 5.3.1., "Acceptance of Defective or Unauthorized Work." Replacement material meeting the requirements of this Item will be paid for in accordance with this Section.

Section 341.6.3., "Total Adjusted Pay (TAP) Calculation." The paragraph is supplemented by the following:

"No payment for Dense-Graded Hot-Mi Asphalt (HMA) shall be greater than 100 percent. However, payment in excess of 100 percent for any given accepted lots of HMA shall be used to offset payment for accepted lots of HMA that achieve a lot pay factor less than 100 percent. Tonnage amounts attributed to pavement mat thicknesses outside of the +/- 1/4-inches tolerance shall not be included in the TAP Calculation. The Design pavement mat thickness plus tolerance thickness will be included in the TAP Calculation."

Item 341

Dense-Graded Hot-Mix Asphalt



1. DESCRIPTION

Construct a hot-mix asphalt (HMA) pavement layer composed of a compacted, dense-graded mixture of aggregate, asphalt binder, and additives mixed hot in a mixing plant. Payment adjustments will apply to HMA placed under this Specification unless the HMA is deemed exempt in accordance with Section 341.4.9.4., "Exempt Production."

2. MATERIALS

Furnish uncontaminated materials of uniform quality that meet the requirements of the plans and specifications.

Notify the Engineer of all material sources and before changing any material source or formulation. The Engineer will verify that the specification requirements are met and document all material source changes when the Contractor makes a source or formulation change. The Engineer may sample and test project materials anytime during the project to verify specification compliance in accordance with Item 6, "Control of Materials."

2.1. Aggregate. Furnish aggregates from sources that conform to the requirements shown in Table 1 and this Section. Aggregate requirements in this Section, including those shown in Table 1, may be modified or eliminated when shown on the plans. Additional aggregate requirements may be specified when shown on the plans. Provide aggregate stockpiles that meet the definitions in this Section for coarse, intermediate, or fine aggregate. Aggregate from reclaimed asphalt pavement (RAP) is not required to meet Table 1 requirements unless otherwise shown on the plans. Supply aggregates that meet the definitions in [Tex-100-E](#) for crushed gravel or crushed stone. The Engineer will designate the plant or the quarry as the sampling location. Provide samples from materials produced for the project. The Engineer will establish the Surface Aggregate Classification (SAC) and perform Los Angeles abrasion, magnesium sulfate soundness, and Micro-Deval tests. Perform all other aggregate quality tests shown in Table 1. Document all test results in the mixture design report. The Engineer may perform tests on independent or split samples to verify Contractor test results. Stockpile aggregates for each source and type separately. Determine aggregate gradations for mixture design and production testing based on the washed sieve analysis in accordance with [Tex-200-F](#), Part II. Reclaimed Asphalt Pavement (RAP) and Processed Asphalt Shingle Material (RAS) will not be allowed on the project.

2.1.1. Coarse Aggregate. Coarse aggregate stockpiles must have no more than 20% material passing the No. 8 sieve. Aggregates from sources listed in the Department's *Bituminous Rated Source Quality Catalog* (BRSQC) are preapproved for use. Use only the rated values for HMA listed in the BRSQC. Rated values for surface treatment (ST) do not apply to coarse aggregate sources used in HMA. The surface coarse aggregate minimum SAC shall be B.

For sources not listed in the Department's BRSQC:

- build an individual stockpile for each material;
- request the Department test the stockpile for specification compliance;
- allow 30 calendar days for the Engineer to sample, test, and report results;
- use only when tested and approved; and
- once approved, do not add additional material to the stockpile unless otherwise allowed by the Engineer.

Provide coarse aggregate with at least the minimum SAC shown on the plans. SAC requirements apply only to aggregates used on the surface of travel lanes, unless otherwise shown on the plans. The SAC for sources in the Department's *Aggregate Quality Monitoring Program (AQMP)* ([Tex-499-A](#)) is listed in the BRSQC.

- 2.1.1.1. Blending Class A and Class B Aggregates. Class B aggregate meeting all other requirements shown in Table 1 may be blended with a Class A aggregate to meet requirements for Class A materials, unless otherwise shown on the plans. When blending Class A and Class B aggregates to meet a Class A requirement, ensure that at least 50% by weight, or volume if required, of the material retained on the No. 4 sieve comes from the Class A aggregate source, unless otherwise shown on the plans. Blend by volume if the bulk specific gravities of the Class A and Class B aggregates differ by more than 0.300. Coarse aggregate from RAP and recycled asphalt shingles (RAS) will be considered as Class B aggregate for blending purposes.

The Engineer may perform tests anytime during production, when the Contractor blends Class A and Class B aggregates to meet a Class A requirement. The Engineer will use the Department's mix design template, when electing to verify conformance, to calculate the percent of Class A aggregate retained on the No. 4 sieve by inputting the bin percentages shown from readouts in the control room at the time of production and stockpile gradations measured at the time of production. The Engineer may determine the gradations based on either washed or dry sieve analysis from samples obtained from individual aggregate cold feed bins or aggregate stockpiles. The Engineer may perform spot checks to verify the percent of Class A aggregate retained on the No. 4 sieve. The Engineer will use the gradations supplied by the Contractor in the mixture design report as an input for the template. A failing spot check will require confirmation with a stockpile gradation determined by the Engineer.

- 2.1.1.2. Micro-Deval Abrasion. The Engineer will perform at least one Micro-Deval abrasion test in accordance with [Tex-461-A](#) for each coarse aggregate source used in the mixture design that has a rated source soundness magnesium (RSSM) loss value greater than 15 as listed in the BRSQC. The Engineer will perform testing before the start of production and may perform additional testing anytime during production. The Engineer may obtain the coarse aggregate samples from each coarse aggregate source or may require the Contractor to obtain the samples. The Engineer may waive all Micro-Deval testing based on a satisfactory test history of the same aggregate source.

The Engineer will estimate the magnesium sulfate soundness loss for each coarse aggregate source, when tested, using the following formula:

$$Mg_{est.} = (RSSM)(MD_{act.}/RSMD)$$

where:

$Mg_{est.}$ = magnesium sulfate soundness loss

$RSSM$ = rated source soundness magnesium

$MD_{act.}$ = actual Micro-Deval percent loss

$RSMD$ = rated source Micro-Deval

When the estimated magnesium sulfate soundness loss is greater than the maximum magnesium sulfate soundness loss specified, the coarse aggregate source will not be allowed for use unless otherwise approved. The Engineer will consult the Materials and Tests Division, and additional testing may be required before granting approval.

- 2.1.2. Intermediate Aggregate. Aggregates not meeting the definition of coarse or fine aggregate will be defined as intermediate aggregate. Supply intermediate aggregates, when used, that are free of organic impurities. Supply intermediate aggregate from coarse aggregate sources, when used, that meet the requirements shown in Table 1, unless otherwise approved.

Test the stockpile if 10% or more of the stockpile is retained on the No. 4 sieve, and verify that it meets the requirements in Table 1 for crushed face count ([Tex-460-A](#)) and flat and elongated particles ([Tex-280-F](#)).

- 2.1.3. Fine Aggregate. Fine aggregates consist of manufactured sands, screenings, and field sands. Fine aggregate stockpiles must meet the fine aggregate properties in accordance with Table 1 and the gradation requirements in accordance with Table 2. Supply fine aggregates that are free of organic impurities. The Engineer may test the fine aggregate in accordance with [Tex-408-A](#) to verify the material is free of organic impurities. Unless otherwise shown on the plans, at most 10% of the total aggregate may be field sand or other uncrushed fine aggregate. Use fine aggregate, except field sand, from coarse aggregate sources that meet the requirements shown in Table 1, unless otherwise approved.

Test the stockpile if 10% or more of the stockpile is retained on the No. 4 sieve and verify that it meets the requirements in Table 1 for crushed face count ([Tex-460-A](#)) and flat and elongated particles ([Tex-280-F](#)).

Table 1
Aggregate Quality Requirements

Property	Test Method	Requirement
Coarse Aggregate		
SAC	Tex-499-A (AQMP)	As shown on the plans
Deleterious material, %, Max	Tex-217-F , Part I	1.5
Decantation, %, Max	Tex-217-F , Part II	1.5
Micro-Deval abrasion, %	Tex-461-A	Note ¹
Los Angeles abrasion, %, Max	Tex-410-A	40
Magnesium sulfate soundness, 5 cycles, %, Max	Tex-411-A	30
Crushed face count, ² %, Min	Tex-460-A , Part I	85
Flat and elongated particles @ 5:1, %, Max	Tex-280-F	10
Fine Aggregate		
Linear shrinkage, %, Max	Tex-107-E	3
Sand equivalent, %, Min	Tex-203-F	45 ³
Organic impurities	Tex-408-A	Note ⁴

1. Used to estimate the magnesium sulfate soundness loss in accordance with Section 341.2.1.1.2., "Micro-Deval Abrasion."
2. Only applies to crushed gravel.
3. The Department may perform [Tex-252-F](#) on fine aggregates not meeting this minimum requirement. Fine aggregates with a methylene blue value of 10.0 mg/g or less may be used.
4. Optional test.

Table 2
Gradation Requirements for Fine Aggregate

Sieve Size	% Passing by Wt. Or Volume
3/8"	100
#8	70–100
#200	0–30

- 2.2. Mineral Filler. Mineral filler consists of finely divided mineral matter such as agricultural lime, crusher fines, hydrated lime, or fly ash. Mineral filler is allowed unless otherwise shown on the plans. Use no more than 2% hydrated lime or fly ash, unless otherwise shown on the plans. Use no more than 1% hydrated lime if a substitute binder is used, unless otherwise shown on the plans or allowed. Test all mineral fillers except hydrated lime and fly ash in accordance with [Tex-107-E](#) to ensure specification compliance. The plans may require or disallow specific mineral fillers. Provide mineral filler, when used, that:
- is dry enough, free-flowing, and free of clumps and foreign matter as determined by the Engineer;
 - does not exceed 3% linear shrinkage when tested in accordance with [Tex-107-E](#); and
 - meets the gradation requirements shown in Table 3, unless otherwise shown on the plans.

Table 3
Gradation Requirements for Mineral Filler

Sieve Size	% Passing by Wt. or Volume
#8	100
#200	55–100

- 2.3. Baghouse Fines. Fines collected by the baghouse or other dust-collecting equipment may be reintroduced into the mixing drum.
- 2.4. Asphalt Binder. ~~Furnish the type and grade of performance-graded (PG) asphalt binder shown on the plans that meets the requirements of Item 300, "Asphalts, Oils, and Emulsions."~~ Furnish PG 64-22 asphalt binder in accordance with Section 300.2.10, "Performance-Graded Binders." The JMF target asphalt content shall not be less than 5.3%.
- 2.5. Tack Coat. ~~Furnish CSS-1H, SS-1H, EBL, or a PG binder with a minimum high-temperature grade of PG 58 for tack coat binder in accordance with Item 300. Specialized tack coat materials on the MPL for *Tracking Resistant Asphalt Interlayer* (TRAIL) will be allowed or required when shown on the plans. Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use, unless required in conformance with the manufacturer's recommendation for approved TRAIL products on the MPL.~~ Furnish CSS-1H, SS-1H, or a PG binder with a minimum high-temperature grade of PG 58 for tack coat binder in accordance with Item 300, "Asphalts, Oils, and Emulsions." Specialized tack coat materials listed on the Department's MPL are allowed or required when shown on the plans. Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use.
- 2.6. Additives. Use the type of additive specified when shown on the plans. Use the rate of additive specified in conformance with the manufacturer's recommendation. Additives that facilitate mixing and compaction or improve the quality of the mixture are allowed when approved. Provide the Engineer with documentation such as the bill of lading showing the quantity of additives used in the project unless otherwise directed.
- 2.6.1. Lime and Liquid Antistripping Agent. Lime or liquid antistripping agent is required when shown on the plans. When lime or a liquid antistripping agent is used, add in accordance with Item 301, "Asphalt Antistripping Agents." Do not add lime directly into the mixing drum of any plant where lime is removed through the exhaust stream unless the plant has a baghouse or dust collection system that reintroduces the lime into the drum.
- 2.6.2. Warm-Mix Asphalt (WMA). WMA is defined as HMA that is produced within a target temperature discharge range of 215°F and 275°F using approved WMA additives or processes from the MPL.
- WMA is allowed for use on all projects and is required when shown on the plans. When WMA is required, the maximum placement or target discharge temperature for WMA will be set at a value at or below 275°F.
- Department-approved WMA additives or processes may be used to facilitate mixing and compaction of HMA produced at target discharge temperatures above 275°F; however, such mixtures will not be defined as WMA.
- 2.6.3. Compaction Aid. Compaction aid is defined as a Department-approved chemical warm-mix additive, denoted as "chemical additive" on the MPL, that is used to facilitate mixing and compaction of HMA at a discharge temperature greater than 275°F.
- Compaction aid is allowed for use on all projects. Compaction aid is required when shown on the plans or as required in Section 341.4.7.1., "Weather Conditions."
- Warm-mix foaming processes, denoted as "foaming process" on the MPL, may be used to facilitate mixing and compaction of HMA at target discharge temperatures greater than 275°F; however, warm-mix foaming processes are not defined as a compaction aid.

- 2.7. Recycled Materials. Use of RAP and RAS is permitted unless otherwise shown on the plans. Use of RAS is restricted to only intermediate and base mixes unless otherwise shown on the plans. Do not exceed the maximum allowable percentages of RAP and RAS in accordance with Table 4. The allowable percentages in accordance with Table 4 may be decreased or increased when shown on the plans. Determine the asphalt binder content and gradation of the RAP and RAS stockpiles for mixture design purposes in accordance with [Tex-236-F](#), Part I. The Engineer may verify the asphalt binder content of the stockpiles anytime during production. Perform other tests on RAP and RAS when shown on the plans. Asphalt binder from RAP and RAS is designated as recycled asphalt binder. Calculate and ensure that the ratio of the recycled asphalt binder to total binder does not exceed the percentages in accordance with Table 5 during mixture design and HMA production when RAP or RAS is used. Use a separate cold feed bin for each stockpile of RAP and RAS during HMA production. Surface, intermediate, and base mixes referenced in Table 4 and Table 5 are defined as follows, unless otherwise shown on the plans.

- Surface. The final HMA lift placed at the top of the pavement structure.
- Intermediate. Mixtures placed below an HMA surface mix and less than or equal to 8.0 in. below the riding surface.
- Base. Mixtures placed greater than 8.0 in. below the riding surface. Unless otherwise shown on the plans, mixtures used for bond breaker are defined as base mixtures.

- 2.7.1. ~~RAP. RAP is salvaged, milled, pulverized, broken, or crushed asphalt pavement. Fractionated RAP is defined as a stockpile that contains RAP material with at least 95.0% passing the 1/2-in. sieve, before burning in the ignition oven, unless otherwise approved. The Engineer may allow the Contractor to use an alternate to the 1/2-in. screen to fractionate the RAP.~~

~~Use of Contractor-owned RAP, including HMA plant waste, is permitted unless otherwise shown on the plans. Department-owned RAP stockpiles are available for the Contractor's use when the stockpile locations are shown on the plans. If Department-owned RAP is available for the Contractor's use, the Contractor may use Contractor-owned fractionated RAP and replace it with an equal quantity of Department-owned RAP. Department-owned RAP generated by required work on the Contract is available for the Contractor's use when shown on the plans. Perform any necessary tests to ensure Contractor- or Department-owned RAP is appropriate for use. The Department will not perform any tests or assume any liability for the quality of the Department-owned RAP unless otherwise shown on the plans. The Contractor will retain ownership of RAP generated on the project when shown on the plans.~~

~~Do not use Department- or Contractor-owned RAP contaminated with dirt or other objectionable materials. Do not use Department- or Contractor-owned RAP if the decantation value exceeds 5% and the plasticity index is greater than 8. Test the stockpiled RAP for decantation in accordance with [Tex-406-A](#), Part I. Determine the plasticity index in accordance with [Tex-106-E](#) if the decantation value exceeds 5%. The decantation and plasticity index requirements do not apply to RAP samples with asphalt removed by extraction or ignition.~~

~~Do not intermingle Contractor-owned RAP stockpiles with Department-owned RAP stockpiles. Remove unused Contractor-owned RAP material from the project site upon completion of the project. Return unused Department-owned RAP to the designated stockpile location.~~

Table 4
Max Allowable Amounts of RAP¹

Max Allowable Fractionated RAP (%)		
Surface	Intermediate	Base
20.0	30.0	35.0

1. Must also meet the recycled binder to total binder ratio shown in Table 5.

- 2.7.2. ~~RAS. RAS is defined as processed asphalt shingle material from manufacturing of asphalt roofing shingles or from re-roofing residential structures. Post-manufactured RAS is processed manufacturer's shingle scrap~~

byproduct. Post-consumer RAS is processed shingle scrap removed from residential structures. Use of post-manufactured RAS or post-consumer RAS (tear-offs) is not permitted in surface mixtures unless otherwise shown on the plans. RAS may be used in intermediate and base mixtures unless otherwise shown on the plans. Up to 3% RAS may be used separately or as a replacement for fractionated RAP in accordance with Table 4 and Table 5. RAS may be used separately or in conjunction with RAP. Comply with all regulatory requirements stipulated for RAS by TCEQ.

Process the RAS by ambient grinding or granulating such that 100% of the particles pass the 3/8-in. sieve when tested in accordance with [Tex-200-F](#), Part I. Perform a sieve analysis on processed RAS material before extraction (or ignition) of the asphalt binder.

Add sand meeting the requirements of Table 1 and Table 2, or fine RAP, to RAS stockpiles if needed to keep the processed material workable. Any stockpile that contains RAS will be considered a RAS stockpile and be limited to no more than 3.0% of the HMA mixture in accordance with Table 4.

Certify compliance of the RAS with [DMS-11000](#), "Evaluating and Using Nonhazardous Recyclable Materials Guidelines." Treat RAS as an established nonhazardous recyclable material if it has not come into contact with any hazardous materials. Use RAS from shingle sources on the MPL. Remove all materials that are not part of the shingle, such as wood, paper, metal, plastic, and felt paper, before use. Determine the deleterious content of RAS material for mixture design purposes in accordance with [Tex-217-F](#), Part III. Do not use RAS if deleterious materials are more than 0.5% of the stockpiled RAS, unless otherwise approved. Submit a sample for approval before submitting the mixture design. The Department will perform the testing for deleterious material of RAS to determine specification compliance.

2.8.

Substitute Binders. No binder substitution will be allowed when shown on the plans. The Contractor may use a substitute PG binder shown in Table 5 instead of the PG binder originally specified, if using recycled materials, and if the substitute PG binder and mixture made with the substitute PG binder meet the following.

- The substitute binder meets the specification requirements for the substitute binder grade in accordance with Section 300.2.11., "Performance-Graded Binders."
- The mixture has less than 10.0 mm of rutting on the Hamburg wheel test ([Tex-242-F](#)) after the number of passes required for the originally specified binder. Use of substitute PG binders may be allowed only at the discretion of the Engineer if the Hamburg wheel test results are between 10.0 mm and 12.5 mm.

Table 5
Allowable PG Binders and Max Recycled Binder Ratios

Originally Specified PG Binder	Allowable Substitute PG Binder for Surface Mixes	Allowable Substitute PG Binder for Intermediate and Base Mixes	Maximum Ratio of Recycled Binder ¹ to Total Binder (%)		
			Surface	Intermediate	Base
76-22	70-22	70-22	15.0	25.0	30.0
70-22	Note ²	64-22	15.0	25.0	30.0
64-22	Note ²	Note ²	15.0	25.0	30.0
76-28	70-28	70-28	15.0	25.0	30.0
70-28	Note ²	64-28	15.0	25.0	30.0
64-28	Note ²	Note ²	15.0	25.0	30.0

1. Combined recycled binder from RAP and RAS. RAS is not permitted in surface mixtures unless otherwise shown on the plans.
2. No binder substitution is allowed.

3.

EQUIPMENT

Provide required or necessary equipment in accordance with Item 320, "Equipment for Asphalt Concrete Pavement."

4. CONSTRUCTION

Produce, haul, place, and compact the specified paving mixture. In addition to tests required in accordance with the Specification, the Contractor may perform other QC tests as necessary. Anytime during the project, the Engineer may perform production and placement tests as necessary in accordance with Item 5, "Control of the Work." Schedule and participate in a mandatory pre-paving meeting with the Engineer on or before the first day of paving unless otherwise shown on the plans.

- 4.1. **Certification.** Personnel certified by the Department-approved HMA certification program must conduct all mixture designs, sampling, and testing in accordance with Table 6. Supply the Engineer with a list of certified personnel and copies of their current certificates before beginning production and when personnel changes are made. Provide a mixture design developed and signed by a Level 2-certified specialist. Provide Level 1A-certified specialists at the plant during production operations. Provide Level 1B-certified specialists to conduct placement tests. Provide Level AGG101-certified specialists for aggregate testing. Certification. Personnel certified by the Department-approved hot-mix asphalt certification program must conduct all mixture designs, sampling, and testing in accordance with Table 6. Supply the Engineer with a list of certified personnel and copies of their current certificates before beginning production and when personnel changes are made. Provide a mixture design developed and signed by a Level 2 certified specialist. Provide Level 1A certified specialists at the plant during production operations. Provide Level 1B certified specialists to conduct placement tests. Provide Level AGG101 certified specialists for aggregate testing.

Table 6

Test Methods, Test Responsibility, and Min Certification Levels

Test Description	Test Method	Contractor	Engineer	Level ¹
Aggregate and Recycled Material Testing				
Sampling	Tex-221-F	✓	✓	1A/AGG101
Dry sieve	Tex-200-F, Part I	✓	✓	1A/AGG101
Washed sieve	Tex-200-F, Part II	✓	✓	1A/AGG101
Deleterious material	Tex-217-F, Part I and Part III	✓	✓	AGG101
Decantation	Tex-217-F, Part II	✓	✓	AGG101
Los Angeles abrasion	Tex-410-A	–	✓	Department
Magnesium sulfate soundness	Tex-411-A	–	✓	Department
Micro-Deval abrasion	Tex-461-A	–	✓	AGG101
Crushed face count	Tex-460-A	✓	✓	AGG101
Flat and elongated particles	Tex-280-F	✓	✓	AGG101
Linear shrinkage	Tex-107-E	✓	✓	AGG101
Sand equivalent	Tex-203-F	✓	✓	AGG101
Methylene blue test	Tex-252-F	–	✓	Department
Bulk specific gravity	Tex-201-F	✓	✓	AGG101
Organic impurities	Tex-408-A	✓	✓	AGG101
Asphalt Binder and Tack Coat Sampling				
Asphalt binder sampling	Tex-500-C, Part II	✓	✓	1A/1B
Tack coat sampling	Tex-500-C, Part III	✓	✓	1A/1B
Mix Design and Verification				
Design and job mix formula (JMF) changes	Tex-204-F	✓	✓	2
Mixing	Tex-205-F	✓	✓	2
Molding (Superpave gyratory compactor (SGC))	Tex-241-F	✓	✓	1A
Laboratory molded density	Tex-207-F, Part I and Part VI	✓	✓	1A
Rice gravity	Tex-227-F, Part II	✓	✓	1A
Ignition oven correction factors ²	Tex-236-F, Part II	✓	✓	1A
Indirect tensile strength	Tex-226-F	✓	✓	1A
Hamburg wheel test	Tex-242-F	✓	✓	1A
Witnessing mixing of correction factors	Tex-236-F, Part III	–	✓	Department

Test Description	Test Method	Contractor	Engineer	Level ¹
Boil test	Tex 530-C	✓	✓	1A
Production Testing				
Selecting production random numbers	Tex 225-F , Part I	–	✓	1A
Mixture sampling	Tex 222-F	✓	✓	1A/1B
Molding (SGC)	Tex 241-F	✓	✓	1A
Laboratory molded density	Tex 207-F , Part I and Part VI	✓	✓	1A
Rice gravity	Tex 227-F , Part II	✓	✓	1A
Gradation and asphalt binder content ²	Tex 236-F , Part I	✓	✓	1A
Control charts	Tex 233-F	✓	✓	1A
Moisture content	Tex 212-F , Part II	✓	✓	1A/AGG101
Hamburg wheel test	Tex 242-F	✓	✓	1A
Micro-Deval abrasion	Tex 461-A	–	✓	AGG101
Boil test	Tex 530-C	✓	✓	1A
Abson recovery	Tex 211-F	–	✓	Department
Placement Testing				
Selecting placement random numbers	Tex 225-F , Part II	–	✓	1B
Trimming roadway cores	Tex 251-F , Part I and Part II	✓	✓	1A/1B
In-place air voids	Tex 207-F , Part I and Part VI	✓	✓	1A
In-place density (nuclear method)	Tex 207-F , Part III	✓	–	1B
Establish rolling pattern	Tex 207-F , Part IV	✓	–	1B
Control charts	Tex 233-F	✓	✓	1A
Ride quality measurement	Tex 1001-S	✓	✓	Note ³
Segregation (density profile)	Tex 207-F , Part V	✓	✓	1B
Longitudinal joint density	Tex 207-F , Part VII	✓	✓	1B
Thermal profile	Tex 244-F	✓	–	1B
Shear bond strength test	Tex 249-F	–	✓	Department

1. Levels 1A, 1B, AGG101, and 2 are certification levels provided by the Hot Mix Asphalt Center certification program.

2. Refer to Section 341.4.9.2.3., "Production Testing," for exceptions to using an ignition oven.

3. Profiler and operator are required to be certified at the Texas A&M Transportation Institute facility when surface test Type B is specified.

Table 6
Test Methods, Test Responsibility, and Minimum Certification Levels

Test Description	Test Method	Contractor	Engineer	Level ¹
<i>1. Aggregate and Recycled Material Testing</i>				
Sampling	Tex-221-F	✓	✓	1A/AGG101
Dry sieve	Tex-200-F , Part I	✓	✓	1A/AGG101
Washed sieve	Tex-200-F , Part II	✓	✓	1A/AGG101
Deleterious material	Tex-217-F , Parts I & III	✓	✓	AGG101
Decantation	Tex-217-F , Part II	✓	✓	AGG101
Los Angeles abrasion	Tex-410-A		✓	TxDOT
Magnesium sulfate soundness	Tex-411-A		✓	TxDOT
Micro-Deval abrasion	Tex-461-A		✓	AGG101
Crushed face count	Tex-460-A	✓	✓	AGG101
Flat and elongated particles	Tex-280-F	✓	✓	AGG101
Linear shrinkage	Tex-107-E	✓	✓	AGG101
Sand equivalent	Tex-203-F	✓	✓	AGG101
Organic impurities	Tex-408-A	✓	✓	AGG101
<i>2. Asphalt Binder & Tack Coat Sampling</i>				
Asphalt binder sampling	Tex-500-C , Part II	✓	✓	1A/1B
Tack coat sampling	Tex-500-C , Part III	✓	✓	1A/1B
<i>3. Mix Design & Verification</i>				
Design and JMF changes	Tex-204-F	✓	✓	2
Mixing	Tex-205-F	✓	✓	2
Molding (TGC)	Tex-206-F	✓	✓	1A
Molding (SGC)	Tex-241-F	✓	✓	1A
Laboratory-molded density	Tex-207-F , Parts I & VI	✓	✓	1A
Rice gravity	Tex-227-F , Part II	✓	✓	1A
Ignition oven correction factors ²	Tex-236-F , Part II	✓	✓	2
Indirect tensile strength	Tex-226-F	✓	✓	1A
Hamburg Wheel test	Tex-242-F	✓	✓	1A
Boil test	Tex-530-C	✓	✓	1A
<i>4. Production Testing</i>				
Selecting production random numbers	Tex-225-F , Part I		✓	1A
Mixture sampling	Tex-222-F	✓	✓	1A/1B
Molding (TGC)	Tex-206-F	✓	✓	1A
Molding (SGC)	Tex-241-F	✓	✓	1A
Laboratory-molded density	Tex-207-F , Parts I & VI	✓	✓	1A
Rice gravity	Tex-227-F , Part II	✓	✓	1A
Gradation & asphalt binder content ²	Tex-236-F , Part I	✓	✓	1A
Control charts	Tex-233-F	✓	✓	1A
Moisture content	Tex-212-F , Part II	✓	✓	1A/AGG101
Hamburg Wheel test	Tex-242-F	✓	✓	1A
Micro-Deval abrasion	Tex-461-A		✓	AGG101
Boil test	Tex-530-C	✓	✓	1A
Abson recovery	Tex-211-F		✓	TxDOT
<i>5. Placement Testing</i>				
Selecting placement random numbers	Tex-225-F , Part II		✓	1B
In-place air voids	Tex-207-F , Parts I & VI	✓	✓	1A
In-place density (nuclear method)	Tex-207-F , Part III	✓		1B
Establish rolling pattern	Tex-207-F , Part IV	✓		1B
Control charts	Tex-233-F	✓	✓	1A
Ride quality measurement	Tex-1001-S	✓	✓	Note 3
Segregation (density profile)	Tex-207-F , Part V	✓	✓	1B
Longitudinal joint density	Tex-207-F , Part VII	✓	✓	1B
Thermal profile	Tex-244-F	✓	✓	1B

4. Level 1A, 1B, AGG101, and 2 are certification levels provided by the Hot Mix Asphalt Center certification program.

5. Refer to Section 341.4.9.2.3., "Production Testing," for exceptions to using an ignition oven.

6. Profiler and operator are required to be certified at the Texas A&M Transportation Institute facility when Surface Test Type B is specified.

- 4.2. Reporting and Responsibilities. Use Department-provided templates to record and calculate all test data, including mixture design, production and placement QC and QA, control charts, thermal profiles, segregation density profiles, and longitudinal joint density. Obtain the current version of the templates from the Department's website or from the Engineer. The Engineer and the Contractor will provide any available test results to the other party when requested. The maximum allowable time for the Contractor and Engineer to exchange test data is as shown in Table 7, unless otherwise approved. The Engineer and the Contractor will immediately report to the other party any test result that requires suspension of production or placement, or a payment adjustment less than 1.000, or that fails to meet the specification requirements. Record and electronically submit all test results and pertinent information on Department-provided templates.

Subsequent sublots placed after test results are available to the Contractor, which require suspension of operations, may be considered unauthorized work. Unauthorized work will be accepted or rejected at the discretion of the Engineer in accordance with Article 5.3., "Conformity with Plans, Specifications, and Special Provisions."

Table 7
Reporting Schedule

Reporting Schedule			
Description	Reported By	Reported To	To Be Reported Within
Production Quality Control			
Gradation ¹	Contractor	Engineer	1 working day of completion of the subplot
Asphalt binder content ¹			
Laboratory-molded density ²			
Moisture content ³			
Boil test ⁴			
Production Quality Assurance			
Gradation ³	Engineer	Contractor	1 working day of completion of the subplot
Asphalt binder content ³			
Laboratory-molded density ¹			
Hamburg wheel test ⁵			
Boil test ⁴			
Binder tests ⁵			

Description	Reported By	Reported To	To Be Reported Within
Placement Quality Control			
In-place air voids ²	Contractor	Engineer	1 working day of completion of the lot
Segregation ¹			
Longitudinal joint density ¹			
Thermal profile ¹			
Placement Quality Assurance			
In-place air voids ¹	Engineer	Contractor	1 working day after receiving the trimmed cores ⁶
Segregation ³			1 working day of completion of the lot
Longitudinal joint density ³			
Thermal profile ³			
Aging ratio ⁵			5 working days after receiving the cores
Shear bond strength test ⁵			
Payment adjustment summary	Engineer	Contractor	2 working days of performing all required tests and receiving Contractor test data

1. These tests are required on every subplot.
2. Optional test. When performed on split samples, report the results as soon as they become available.
3. To be performed at the frequency shown in Table 16 or as shown on the plans.
4. When shown on the plans.
5. To be reported as soon as the results become available.
6. Two days are allowed if cores cannot be dried to constant weight within 1 day.

The Engineer will use the Department-provided template to calculate all payment adjustment factors for the lot. Sublot samples may be discarded after the Engineer and Contractor sign off on the payment adjustment summary documentation for the lot.

Use the procedures described in [Tex-233-F](#) to plot the results of all QC and QA testing. Update the control charts as soon as test results for each subplot become available. Make the control charts readily accessible at the field laboratory. The Engineer may suspend production for failure to update control charts.

- 4.3. Quality Control Plan (QCP). Develop and follow the QCP in detail. Obtain approval for changes to the QCP made during the project. The Engineer may suspend operations if the Contractor fails to comply with the QCP.

Submit a written QCP before the mandatory pre-paving meeting. Receive approval of the QCP before beginning production. Include the following items in the QCP.

- 4.3.1. Project Personnel. For project personnel, include:

- a list of individuals responsible for QC with authority to take corrective action,
- current contact information for each individual listed, and
- current copies of certification documents for individuals performing specified QC functions.

- 4.3.2. Material Delivery and Storage. For material delivery and storage, include:

- the sequence of material processing, delivery, and minimum quantities to assure continuous plant operations;
- aggregate stockpiling procedures to avoid contamination and segregation;
- frequency, type, and timing of aggregate stockpile testing to assure conformance with material requirements before mixture production; and
- procedure for monitoring the quality and variability of asphalt binder.

- 4.3.3. Production. For production, include:
- loader operation procedures to avoid contamination in cold bins;
 - procedures for calibrating and controlling cold feeds;
 - procedures to eliminate debris or oversized material;
 - procedures for adding and verifying rates of each applicable mixture component (e.g., aggregate, asphalt binder, RAP, RAS, lime, liquid antistrip, compaction aid, foaming process, and WMA);
 - procedures for reporting job control test results; and
 - procedures to avoid segregation and drain-down in the silo.
- 4.3.4. Loading and Transporting. For loading and transporting, include:
- type and application method for release agents, and
 - truck-loading procedures to avoid segregation.
- 4.3.5. Placement and Compaction. For placement and compaction, include:
- proposed agenda for mandatory pre-paving meeting, including date and location;
 - proposed paving plan (e.g., production rate, paving widths, joint offsets, and lift thicknesses);
 - type and application method for release agents in the paver and on rollers, shovels, lutes, and other utensils;
 - procedures for the transfer of mixture into the paver while avoiding physical and thermal segregation and preventing material spillage;
 - process to balance production, delivery, paving, and compaction to achieve continuous placement operations and good ride quality;
 - paver operations (e.g., speed, operation of wings, and height of mixture in auger chamber) to avoid physical and thermal segregation and other surface irregularities; and
 - procedures to construct quality longitudinal and transverse joints.
- 4.4. Mixture Design.
- 4.4.1. Design Requirements. Use the dense-graded design procedure provided in [Tex-204-F](#), unless otherwise shown on the plans. Design the mixture to meet the requirements shown in Tables 1, 2, 3, 4, 5, 8, 9, and 10.
- Design the mixture using an SGC, and 50 gyrations as the design number of gyrations (N_{design}). Use a target laboratory-molded density of 96.0% to design the mixture; however, adjustments can be made to the N_{design} value as shown in Table 9. The N_{design} level may be reduced to at least 35 gyrations at the Contractor's discretion.
- Use a Department-approved laboratory on the MPL to perform the Hamburg wheel test and provide results with the mixture design, or provide the laboratory mixture and request that the Department perform the Hamburg wheel test. Upon receiving the sample from the Contractor, the Engineer will be allowed 10 working days to provide the Contractor with Hamburg wheel test results on the laboratory mixture design.
- The Engineer will provide the mixture design when shown on the plans. The Contractor may submit a new mixture design anytime during the project. The Engineer will verify and approve all mixture designs (JMF1) before the Contractor can begin production.
- Provide the Engineer with a mixture design report using the Department-provided template. Include the following items in the report:
- the combined aggregate gradation, source, specific gravity, and percent of each material used;
 - the binder source and optimum design asphalt content;
 - asphalt binder content and aggregate gradation of RAP and RAS stockpiles;
 - the N_{design} level used on the SGC;

- results of all applicable tests;
- the mixing and molding temperatures;
- the signature of the Level 2 person or persons who performed the design;
- the date the mixture design was performed; and
- a unique identification number for the mixture design.

Table 8
Master Gradation Limits (% Passing by Wt. or Volume) and Void in Mineral
Aggregate (VMA) Requirements

Sieve Size	DG-B Fine Base	DG-C Coarse Surface	DG-D Fine Surface	DG-F Fine Mixture
2"	—	—	—	—
1-1/2"	100.0 ¹	—	—	—
1"	98.0–100.0	100.0 ¹	—	—
3/4"	84.0–98.0	95.0–100.0	100.0 ¹	—
1/2"	—	—	98.0–100.0	100.0 ¹
3/8"	60.0–80.0	70.0–85.0	85.0–100.0	98.0–100.0
#4	40.0–60.0	43.0–63.0	50.0–70.0	70.0–90.0
#8	29.0–43.0	32.0–44.0	35.0–46.0	38.0–48.0
#30	13.0–28.0	14.0–28.0	15.0–29.0	12.0–27.0
#50	6.0–20.0	7.0–21.0	7.0–20.0	6.0–19.0
#200	2.0–7.0	2.0–7.0	2.0–7.0	2.0–7.0
Design (VMA), % Min				
—	13.0	14.0	15.0	16.0
Production (Plant-Produced) (VMA), % Min				
—	12.5	13.5	14.5	15.5

1. Defined as Max sieve size. No tolerance allowed.

Table 9
Laboratory Mixture Design Properties

Mixture Property	Test Method	Requirement
Target laboratory-molded density, %	Tex-207-F	96.0
Design gyrations (N _{design})	Tex-241-F	50 ¹
Indirect tensile strength (dry), psi	Tex-226-F	85–200 ²
Boil test ³	Tex-530-C	—

1. Adjust within a range of 35–100 gyrations when shown on the plans, in accordance with the specification, or when mutually agreed between the Engineer and Contractor.
2. The Engineer may allow the indirect tensile test strength to exceed 200 psi if the corresponding Hamburg wheel rut depth is >2.5 mm and <12.5 mm.
3. When shown on the plans. Used to establish baseline for comparison to production results.

Table 10
Hamburg Wheel Test Requirements

High-Temperature Binder Grade	Test Method	Min # of Passes at 12.5-mm ¹ Rut Depth, Tested at 50°C
PG 64 or lower	Tex-242-F	10,000 ²
PG 70		15,000 ³
PG 76 or higher		20,000

1. The Hamburg wheel test will have a minimum rut depth of 2.5 mm.
2. May be decreased to at least 5,000 passes when shown on the plans.
3. May be decreased to at least 10,000 passes when shown on the plans.

4.4.2.

Job-Mix Formula Approval. The JMF is the combined aggregate gradation, N_{design} level, and target asphalt percentage used to establish target values for hot-mix production. JMF1 is the original laboratory mixture design used to produce the trial batch. When WMA is used, JMF1 may be designed and submitted to

the Engineer without including the WMA additive, foaming process, or compaction aid. When WMA or a compaction aid is used, document the additive or process used and recommended rate in the JMF1 submittal. The Engineer and the Contractor will verify JMF1 based on plant-produced mixture from the trial batch, unless otherwise approved. The Engineer may accept an existing mixture design previously used on a Department project and may waive the trial batch to verify JMF1. The Department may require the Contractor to reimburse the Department for verification tests if more than two trial batches per design are required.

4.4.2.1. Contractor's Responsibilities.

4.4.2.1.1. Providing Superpave Gyratory Compactor. Provide an SGC in accordance with Item 504, "Field Office and Laboratory," and make the SGC available to the Engineer for use in molding production samples.

4.4.2.1.2. Gyratory Compactor Correlation Factors. Use [Tex-206-F](#), Part II, to perform a gyratory compactor correlation when the Engineer uses a different SGC. Apply the correlation factor to all subsequent production test results.

4.4.2.1.3. Submitting JMF1. Furnish a mix design report (JMF1) with representative samples of all component materials and request approval to produce the trial batch. Provide approximately 25 lb. of the design mixture if opting to have the Department perform the Hamburg wheel test on the laboratory mixture, and request that the Department perform the test.

4.4.2.1.4. Supplying Aggregates. Provide approximately 40 lb. of each aggregate stockpile unless otherwise directed.

4.4.2.1.5. Supplying Asphalt. Provide at least 1 gal. of the asphalt material and enough quantities of any additives proposed for use.

4.4.2.1.6. Ignition Oven Correction Factors. Notify the Engineer before performing [Tex-236-F](#), Part II. Allow the Engineer to witness the mixing of ignition oven correction factor sample. Determine the aggregate and asphalt correction factors from the ignition oven in accordance with [Tex-236-F](#), Part II.

If the Engineer witnesses the mixing of the ignition oven correction factor samples, provide the Engineer with identically prepared samples of the mixtures before the trial batch production, including all additives (except water), and blank samples used to determine the correction factors for the ignition oven used for QA testing during production.

Correction factors established from a previously approved mixture design may be used for the current mixture design if the mixture design and ignition oven are the same as previously used, unless otherwise directed. Correction factors must be performed every 12 mo.

4.4.2.1.7. Boil Test. When shown on the plans, perform the test and retain the tested sample from [Tex-530-C](#) until completion of the project or as directed. Use this sample for comparison purposes during production.

4.4.2.1.8. Trial Batch Production. Provide a plant-produced trial batch upon receiving conditional approval of JMF1 and authorization to produce a trial batch. If applicable, include the WMA additive, foaming process, or compaction aid for verification testing of JMF1 and development of JMF2. Produce a trial batch mixture that meets the requirements shown in Tables 4, 5, and 11. The Engineer may accept test results from recent production of the same mixture instead of a new trial batch.

4.4.2.1.9. Trial Batch Production Equipment. Use only equipment and materials proposed for use on the project to produce the trial batch.

4.4.2.1.10. Trial Batch Quantity. Produce enough quantity of the trial batch to ensure that the mixture meets the specification requirements.

- 4.4.2.1.11. Number of Trial Batches. Produce trial batches as necessary to obtain a mixture that meets the specification requirements.
- 4.4.2.1.12. Trial Batch Sampling. Obtain a representative sample of the trial batch and split it into three equal portions in accordance with [Tex-222-F](#). Label these portions as “Contractor,” “Engineer,” and “Referee.” Deliver samples to the appropriate laboratory as directed.
- 4.4.2.1.13. Trial Batch Testing. Test the trial batch to ensure the mixture produced using the proposed JMF1 meets the mixture requirements shown in Table 11. Ensure the trial batch mixture is also in compliance with the Hamburg wheel requirement shown in Table 10. Use a Department-approved laboratory listed on the MPL to perform the Hamburg wheel test on the trial batch mixture, or request that the Department perform the Hamburg wheel test. Provide approximately 25 lb. of the trial batch mixture if opting to have the Department perform the Hamburg wheel test, and request that the Department perform the test. Upon receiving the sample from the Contractor, the Engineer will be allowed 10 working days to provide the Contractor with Hamburg wheel test results on the trial batch. Provide the Engineer with a copy of the trial batch test results.
- 4.4.2.1.14. Development of JMF2. After the Engineer grants full approval of JMF1, evaluate the trial batch test results, determine the optimum mixture proportions, and submit as JMF2. Adjust the asphalt binder content or gradation to achieve the specified target laboratory-molded density. The asphalt binder content established for JMF2 is not required to be within any tolerance of the optimum asphalt binder content established for JMF1; however, mixture produced using JMF2 must meet the VMA requirements for production shown in Table 8. If the optimum asphalt binder content for JMF2 is more than 0.5% lower than the optimum asphalt binder content for JMF1, the Engineer may perform or require the Contractor to perform [Tex-226-F](#) on Lot 1 production to confirm the indirect tensile strength does not exceed 200 psi. Verify that JMF2 meets the mixture requirements shown in Table 4 and Table 5.
- 4.4.2.1.15. Mixture Production. Use JMF2 to produce Lot 1 in accordance with Section 341.4.9.3.1.1., “Lot 1 Placement,” after receiving approval for JMF2 and a passing Hamburg wheel result on the trial batch from a laboratory listed on the MPL. Once JMF2 is approved, and without receiving the results from the Department’s Hamburg wheel test on the trial batch, the Contractor may proceed to Lot 1 production at their own risk.
- Notify the Engineer if electing to proceed without Hamburg wheel test results from the trial batch. Note that the Engineer may require up to the entire subplot of any mixture failing the Hamburg wheel test to be removed and replaced at the Contractor’s expense.
- 4.4.2.1.16. Development of JMF3. Evaluate the test results from Lot 1, determine the optimum mixture proportions, and submit as JMF3 for use in Lot 2.
- 4.4.2.1.17. JMF Adjustments. If JMF adjustments are necessary to achieve the specified requirements, make the adjustments before beginning a new lot. The adjusted JMF must:
- be provided to the Engineer in writing before the start of a new lot,
 - be numbered in sequence to the previous JMF,
 - meet the mixture requirements in accordance with Table 4 and Table 5,
 - meet the master gradation limits in accordance with Table 8, and
 - be within the operational tolerances of JMF2 in accordance with Table 11.
- 4.4.2.1.18. Requesting Referee Testing. Use referee testing, if needed, in accordance with Section 341.4.9.1., “Referee Testing,” to resolve testing differences with the Engineer.

Table 11
Operational Tolerances

Description	Test Method	Allowable Difference Between JMF2 and JMF1 Target ¹	Allowable Difference Between Current JMF and JMF2 ²	Allowable Difference Between Contractor and Engineer ³
Individual % retained on #8 sieve and larger	Tex-200-F or Tex-236-F	Must be Within Master Gradation Limits in Table 8	±5.04	±5.0
Individual % retained on sieves smaller than #8 and larger than #200			±3.04	±3.0
% passing the #200 sieve			±2.04	±1.6
Asphalt binder content, %	Tex-236-F	±0.5	±0.3	±0.3
Laboratory-molded density, %	Tex-207-F	±1.0	±1.0	±1.0
In-place air voids, %		–	–	±1.0
Laboratory-molded bulk specific gravity		–	–	±0.020
VMA, %, Min	Tex-204-F	Note ⁵	Note ⁵	–
Theoretical maximum specific (Rice) gravity	Tex-227-F	–	–	±0.020

1. JMF1 is the approved laboratory mixture design used for producing the trial batch. JMF2 is the approved mixture design developed from the trial batch used to produce Lot 1.
2. Current JMF is JMF3 or higher. JMF3 is the approved mixture design used to produce Lot 2.
3. Contractor may request referee testing when values exceed these tolerances.
4. When within these tolerances, mixture production gradations may fall outside the master gradation limits; however, the % passing the #200 will be considered out of tolerance when outside the master gradation limits.
5. Verify that Table 8 requirements are met for VMA.

4.4.2.2. Engineer's Responsibilities.

4.4.2.2.1. Superpave Gyratory Compactor. The Engineer will use a Department SGC, calibrated in accordance with [Tex-241-F](#), to mold samples for laboratory mixture design verification. For molding trial batch and production specimens, the Engineer will use the Contractor-provided SGC at the field laboratory or provide and use a Department SGC at an alternate location.

4.4.2.2.2. Conditional Approval of JMF1 and Authorizing Trial Batch. The Engineer will review and verify conformance with the following information within 2 working days of receipt:

- the Contractor's mix design report (JMF1);
- the Contractor-provided Hamburg wheel test results;
- all required materials including aggregates, asphalt, additives, and recycled materials; and
- the mixture specifications.

The Engineer will grant the Contractor conditional approval of JMF1 if the information provided on the paper copy of JMF1 indicates that the Contractor's mixture design meets the specifications. When the Contractor does not provide Hamburg wheel test results with laboratory mixture design, 10 working days are allowed for conditional approval of JMF1. The Engineer will base full approval of JMF1 on the test results on mixture from the trial batch.

Unless waived, the Engineer will determine the Micro-Deval abrasion loss in accordance with Section 341.2.1.1.2., "Micro-Deval Abrasion." If the Engineer's test results are pending after 2 working days, conditional approval of JMF1 will still be granted within 2 working days of receiving JMF1. When the Engineer's test results become available, they will be used for specification compliance.

The Contractor is authorized to produce a trial batch after the Engineer grants conditional approval of JMF1.

4.4.2.2.3. Hamburg Wheel Testing of JMF1. If the Contractor requests the option to have the Department perform the Hamburg wheel test on the laboratory mixture, the Engineer will mold samples in accordance with [Tex-242-F](#) to verify compliance with the Hamburg wheel test requirement shown in Table 10. Upon receiving the sample from the Contractor, the Engineer will be allowed 10 working days to provide the Contractor with Hamburg wheel test results on the laboratory mixture design.

- 4.4.2.2.4. Ignition Oven Correction Factors. The Engineer will determine ignition oven correction factors by one of the following options.
- Witness the mixing of ignition oven correction factor samples by the Contractor in accordance with [Tex-236-F](#), Part III. The Engineer will use the identically prepared samples provided by the Contractor to determine the aggregate and asphalt correction factors for the ignition oven in accordance with [Tex-236-F](#), Part II.
 - If the Engineer does not witness the mixing of ignition oven correction factor samples, the Engineer will prepare the samples to determine the aggregate and asphalt correction factors for the ignition oven in accordance with [Tex-236-F](#), Part II. Notify the Contractor before performing [Tex-236-F](#), Part II. Allow the Contractor to witness the Engineer performing [Tex-236-F](#), Part II.

Correction factors must be performed every 12 mo. to be used for QA testing during production.

- 4.4.2.2.5. Testing the Trial Batch. Within 1 full working day, the Engineer will sample and test the trial batch to ensure that the mixture meets the requirements shown in Table 11. If the Contractor requests the option to have the Department perform the Hamburg wheel test on the trial batch mixture, the Engineer will mold samples in accordance with [Tex-242-F](#) to verify compliance with the Hamburg wheel test requirement shown in Table 10.

The Engineer will have the option to perform the following tests on the trial batch.

- [Tex-226-F](#), to verify that the indirect tensile strength meets the requirement shown in Table 9.
- [Tex-530-C](#), to retain and use for comparison purposes during production.

- 4.4.2.2.6. Full Approval of JMF1. The Engineer will grant full approval of JMF1 and authorize the Contractor to proceed with developing JMF2 if the Engineer's results for the trial batch meet the requirements shown in Tables 8, 9, and 10. The Engineer will notify the Contractor that an additional trial batch is required if the trial batch does not meet these requirements.

- 4.4.2.2.7. Approval of JMF2. The Engineer will approve JMF2 within 1 working day if the mixture meets the requirements shown in Table 5 and Table 8. The asphalt binder content established for JMF2 is not required to be within any tolerance of the optimum asphalt binder content established for JMF1; however, mixture produced using JMF2 must meet the VMA requirements shown in Table 8. If the optimum asphalt binder content for JMF2 is more than 0.5% lower than the optimum asphalt binder content for JMF1, the Engineer may perform or require the Contractor to perform [Tex-226-F](#) on Lot 1 production to confirm the indirect tensile strength does not exceed 200 psi.

- 4.4.2.2.8. Approval of Lot 1 Production. The Engineer will authorize the Contractor to proceed with JMF2 for Lot 1 production after a passing Hamburg wheel test result on the trial batch is achieved from a laboratory listed on the MPL. The Contractor may proceed at their own risk with Lot 1 production without the results from the Hamburg wheel test on the trial batch.

If the Department-approved laboratory's sample from the trial batch fails the Hamburg wheel test, the Engineer will suspend production until further Hamburg wheel tests meet the specified values. The Engineer may require up to the entire subplot of any mixture failing the Hamburg wheel test be removed and replaced at the Contractor's expense.

- 4.4.2.2.9. Approval of JMF3 and Subsequent JMF Changes. JMF3 and subsequent JMF changes are approved if they meet the mixture requirements shown in Table 4 and Table 5, and the master gradation limits shown in Table 8, and they are within the operational tolerances of JMF2 shown in Table 11. The addition of a WMA additive to facilitate mixing or as a compaction aid does not require a new laboratory mixture design or trial batch. Current JMF changes that exceed the operational tolerances of JMF2 in accordance with Table 11 may require a new laboratory mixture design, trial batch, or both.

- 4.5. Production Operations. Perform a new trial batch when the plant or plant location is changed. All source changes for asphalt will require a passing Hamburg wheel test result from a laboratory listed on the MPL. The Contractor may proceed at their own risk with Lot 1 production without the results from the Hamburg wheel test on the trial batch. All aggregate source changes will require a new laboratory mixture design and trial batch. Take corrective action and receive approval to proceed after any production suspension for noncompliance with the specification. Submit a new mix design and perform a new trial batch when the asphalt binder content of:

- any RAP stockpile used in the mix is more than 0.5% higher than the value shown in the mixture design report, or
- RAS stockpile used in the mix is more than 2.0% higher than the value shown in the mixture design report.

- 4.5.1. Storage and Heating of Materials. Do not heat the asphalt binder above the temperatures specified in Item 300, or outside the manufacturer's recommended values. Provide the Engineer with daily records of asphalt binder and HMA discharge temperatures (in legible and discernible increments) in accordance with Item 320, unless otherwise directed. Do not store mixture for a period long enough to affect the quality of the mixture, nor in any case longer than 12 hr. unless otherwise approved.

- 4.5.2. Mixing and Discharge of Materials. ~~Notify the Engineer of the target discharge temperature and produce the mixture within 25°F of the target. Monitor the temperature of the material in the truck before shipping to ensure that it does not exceed the maximum production temperatures shown in Table 12. The Department will not pay for or allow placement of any mixture produced above the maximum production temperatures shown in Table 12.~~ Notify the Engineer of the target discharge temperature and produce the mixture within 25°F of the target. Monitor the temperature of the material in the truck before shipping to ensure that it does not exceed 350°F (or 275°F for WMA). The Department will not pay for or allow placement of any mixture produced above 350°F. An automatic digital record printer is required at the plant. The batch weight ticket shall show the total weight of the batch and the weight of the asphalt. These tickets shall be given to the RPR at the end of each day's production.

Table 12
Max Production Temperature

High-Temperature Binder Grade ¹	Max Production Temperature (°F)
PG 64	325 ²
PG 70	335 ²
PG 76	345 ²

1. The high-temperature binder grade refers to the high-temperature grade of the virgin asphalt binder used to produce the mixture.
2. The Max production temperature of WMA is 275°F.

Produce WMA within the target discharge temperature range of 215–275°F when WMA is required. Take corrective action anytime the discharge temperature of the WMA exceeds the target discharge range. The Engineer may suspend production operations if the Contractor's corrective action is not successful at controlling the production temperature within the target discharge range. Note that when WMA is produced, it may be necessary to adjust burners to ensure complete combustion such that no burner fuel residue remains in the mixture.

Control the mixing time and temperature so that substantially all moisture is removed from the mixture before discharging from the plant. Determine the moisture content, if requested, by oven-drying in accordance with [Tex-212-F](#), Part II, and verify that the mixture contains no more than 0.2% of moisture by weight. Obtain the sample immediately after discharging the mixture into the truck and perform the test promptly.

- 4.6. Hauling Operations. Clean all truck beds before use to ensure that mixture is not contaminated. Use a release agent listed on the MPL to coat the inside bed of the truck when necessary. Do not use diesel or any release agent not listed on the MPL. Use equipment for hauling as defined in Section 341.4.7.3.3., "Hauling Equipment." Use other hauling equipment only when allowed. The Contractor shall assure the Engineer, in writing at the pre-paving conference, that adequate material will be available at the job site to ensure that starting and stopping of the paver is kept to an absolute minimum. Should the Engineer, in his opinion, determine this requirement is not being met, the Engineer may stop installation operations until satisfactory arrangements for delivery of sufficient material can be made.
- 4.7. Placement Operations. Collect haul tickets from each load of mixture delivered to the project and provide the Department's copy to the Engineer approximately every hour, or as directed. Use a handheld thermal camera or infrared thermometer, when a thermal imaging system is not used, to measure and record the internal temperature of the mixture as discharged from the truck or material transfer device (MTD) before or as the mix enters the paver. Measure the mixture temperature at a minimum frequency of one per ten trucks, or as approved. Include an approximate station number or Global Positioning System coordinates of the location where the temperature was taken on each ticket. Ensure the mixture meets the temperature requirements shown in Table 12. Calculate the daily yield and cumulative yield for the specified lift and provide to the Engineer at the end of paving operations for each day unless otherwise directed. The Engineer may suspend production if the Contractor fails to produce and provide haul tickets and yield calculations by the end of paving operations for each day.

Prepare the surface by removing raised pavement markers and objectionable material such as moisture, dirt, sand, leaves, and other loose impediments from the surface before placing mixture. Remove vegetation from pavement edges. Place the mixture to meet the typical section requirements and produce a smooth, finished surface with a uniform appearance and texture. ~~Offset longitudinal joints of successive courses of hot mix by at least 6 in.~~ Offset longitudinal joints of successive courses of hot mix by at least 12 inches. Place mixture so that longitudinal joints on the surface course coincide within 6 in. of lane lines, are not placed in the wheel path, or will not be covered with pavement markings, or as directed. Ensure that all finished surfaces will drain properly. Place the mixture at the rate or thickness shown on the plans. The Engineer will use the guidelines shown in Table 13 to determine the compacted lift thickness of each layer when multiple lifts are required. The thickness determined is based on the rate of 110 lb. per square yard for each inch of pavement, unless otherwise shown on the plans.

Paved edges shall deviate by no more than 2 inches from a straight line along the edge. Straight edges may be produced by the Contractor using either a string set at the pavement edge, or by saw cutting the edge.

At crowns on rooftop hot mix sections and at valleys on inverted rooftop hot mix sections, break the lay-down machine screed so that the longitudinal pavement joint is at least 4 feet from the crown or valley, as applicable.

Bituminous Pavers shall be self-propelled, with an activated screed, which shall be heated as necessary, and shall be capable of spreading and finishing courses of bituminous plant mix material which will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface.

The Contractor will be required to use automatic grade controls on the paver on this project.

Bituminous material shall not be placed against previously completed material that has a temperature below 175°F. If necessary, longitudinal joints shall be preheated by using an infrared heater attached to the paver ahead of the screed a sufficient distance to allow for proper preheating. Transverse joints shall be preheated to a minimum of 250°F using a portable infrared heater. The temperature of the bituminous material being preheated shall not exceed 300°F.

Table 13
Compacted Lift Thickness and Required Core Height

Mixture Type	Compacted Lift Thickness Guidelines		Min Untrimmed Core Height Eligible for Testing (in.)
	Min (in.)	Max (in.)	
DG-B	2.50	5.00	1.75
DG-C	2.00	4.00	1.50
DG-D	1.50	3.00	1.25
DG-F	1.25	2.50	1.25

4.7.1. Weather Conditions.

- 4.7.1.1. When Using a Thermal Imaging System. Place mixture when the roadway surface is dry and the roadway surface temperature is at or above the temperatures shown in Table 14A, unless otherwise approved or as shown on the plans. Place mixtures only when weather conditions and moisture conditions of the roadway surface are suitable as determined by the Engineer. Provide output data from the thermal imaging system to demonstrate to the Engineer that no recurring severe thermal segregation exists in accordance with Section 341.4.7.3.1.2., "Thermal Imaging System."

Table 14A
Min Pavement Surface Temperatures

High-Temperature Binder Grade ¹	Min Pavement Surface Temperatures (°F)	
	Subsurface Layers	Surface Layers
PG 64	35	40
PG 70	45 ²	50 ²
PG 76	45 ²	50 ²

1. The high-temperature binder grade refers to the high-temperature grade of the virgin asphalt binder used to produce the mixture.
2. The Contractor may pave at temperatures 10°F lower than these values when a chemical WMA additive is used as a compaction aid in the mixture or when using WMA.

- 4.7.1.2. When Not Using a Thermal Imaging System. When using a thermal camera instead of the thermal imaging system, place mixture when the roadway surface temperature is at or above the temperatures shown in Table 14B, unless otherwise approved or as shown on the plans. Measure the roadway surface temperature using a handheld thermal camera or infrared thermometer. The Engineer may allow mixture placement to begin before the roadway surface reaches the required temperature if conditions are such that the roadway surface will reach the required temperature within 2 hr. of beginning placement operations. Place mixtures only when weather conditions and moisture conditions of the roadway surface are suitable as determined by the Engineer.

Table 14B
Min Pavement Surface Temperatures

High-Temperature Binder Grade ¹	Min Pavement Surface Temperatures (°F)	
	Subsurface Layers	Surface Layers
PG 64	45	50
PG 70	55 ²	60 ²
PG 76	60 ²	60 ²

1. The high-temperature binder grade refers to the high-temperature grade of the virgin asphalt binder used to produce the mixture.
2. The Contractor may pave at temperatures 10°F lower than these values when a chemical WMA additive is used as a compaction aid in the mixture, when using WMA, or when using a paving process with equipment that eliminates thermal segregation. In such cases, for each sublot and in the presence of the Engineer, use a handheld thermal camera operated in accordance with [Tex-244-F](#) to demonstrate to the satisfaction of the Engineer that the uncompacted mat has no more than 10°F of thermal segregation.

4.7.2. Tack Coat.

~~4.7.2.1. Application. Clean the surface before placing the tack coat. The Engineer will set the rate between 0.04 and 0.10 gal. of residual asphalt per square yard of surface area. Apply a uniform tack coat at the specified rate unless otherwise directed. Apply the tack coat in a uniform manner to avoid streaks and other irregular patterns. Apply the tack coat to all surfaces that will come in contact with the subsequent HMA placement, unless otherwise directed. Apply adequate overlap of the tack coat in the longitudinal direction during placement of the mat to ensure bond of adjacent mats, unless otherwise directed. Allow adequate time for emulsion to break completely before placing any material. Prevent splattering of tack coat when placed adjacent to curb, gutter, and structures. Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use, unless required in conformance with the manufacturer's recommendation for approved TRAIL product use, or when shown on the plans.~~

4.7.2.1. Application. Clean the surface before placing the tack coat. The Engineer will set the rate between 0.04 and 0.10 gal. of residual asphalt per square yard of surface area. Apply a uniform tack coat at the specified rate unless otherwise directed. Apply the tack coat in a uniform manner to avoid streaks and other irregular patterns. Apply the tack coat to all surfaces the will come in contact with the subsequent HMA placement, unless otherwise directed. Allow adequate time for emulsion to break completely before placing any material. Prevent splattering of tack coat when placed adjacent to curb, gutter, and structures. Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use.

~~4.7.2.2. Sampling. The Engineer will obtain at least one sample of the tack coat binder per project per source in accordance with [Tex-500-C](#), Part III, and test it to verify compliance with Item 300. The Engineer will notify the Contractor when the sampling will occur and will witness the collection of the sample from the asphalt distributor immediately before use. Label the can with the corresponding lot and sublot numbers, producer, producer facility location, grade, district, date sampled, all applicable bills of lading (if available), and project information, including highway and control section job (CSJ) number. For emulsions, the Engineer may test as often as necessary to ensure the residual of the emulsion is greater than or equal to the specification requirement in Item 300.~~

4.7.2.2. Sampling. The Engineer will obtain at least one sample of the tack coat binder per project in accordance with [Tex-500-C](#), Part III, and test it to verify compliance with Item 300, "Asphalts, Oils, and Emulsions." The Engineer will obtain the sample from the asphalt distributor immediately before use. For emulsions, the Engineer may test as often as necessary to ensure the residual of the emulsion is greater than or equal to the specification requirement in Item 300, "Asphalts, Oils, and Emulsions."

- 4.7.3. Lay-Down Operations. Use the placement temperatures shown in Table 15 to establish the minimum placement temperature of the mixture delivered to the paving operation.

Table 15
Min Mixture Placement Temperature

High-Temperature Binder Grade ¹	Min Placement Temperature ^{2,3,4} (°F)
PG 64	260
PG 70	270
PG 76	280

1. The high-temperature binder grade refers to the high-temperature grade of the virgin asphalt binder used to produce the mixture.
2. The mixture temperature must be measured using a handheld thermal camera or infrared thermometer immediately before entering MTD or paver.
3. Min placement temperatures may be reduced 20°F if using a chemical WMA additive as a compaction aid, MTD with remixing capabilities, or paver hopper insert with remixing capabilities.
4. When using WMA, the minimum placement temperature is 215°F.

- 4.7.3.1. Thermal Profile. Use a handheld thermal camera or a thermal imaging system to obtain a continuous thermal profile in accordance with [Tex-244-F](#). Thermal profiles are not applicable in areas described in Section 341.4.9.3.1.4., "Miscellaneous Areas."

- 4.7.3.1.1. Thermal Segregation.

- 4.7.3.1.1.1. Moderate. Any areas that have a temperature differential greater than 25°F, but not exceeding 50°F.

- 4.7.3.1.1.2. Severe. Any areas that have a temperature differential greater than 50°F.

- 4.7.3.1.2. Thermal Imaging System. Review the output results when a thermal imaging system is used, and provide the automated report described in [Tex-244-F](#) to the Engineer daily, unless otherwise directed. Modify the paving process as necessary to eliminate any recurring (moderate or severe) thermal segregation identified by the thermal imaging system.

The Engineer may suspend paving operations if the Contractor cannot successfully modify the paving process to eliminate recurring severe thermal segregation. Density profiles are not required and not applicable when using a thermal imaging system.

Provide the Engineer with electronic copies of all daily data files that can be used with the thermal imaging system software to generate temperature profile plots daily or as requested.

- 4.7.3.1.3. Thermal Camera. ~~Provide the Engineer with the thermal profile of every subplot within 1 working day of the completion of each lot. When requested by the Engineer, provide the thermal images generated using the thermal camera. Report the results of each thermal profile in accordance with Section 341.4.2., "Reporting and Responsibilities." The Engineer will use a handheld thermal camera to obtain a thermal profile at least once per project.~~

~~Take immediate corrective action to eliminate recurring moderate thermal segregation when a handheld thermal camera is used.~~

~~Suspend operations and take immediate corrective action to eliminate severe thermal segregation unless otherwise directed. Resume operations when the Engineer determines that subsequent production will meet the requirements of this Section. No production or placement payment adjustments greater than 1,000 will be paid for any subplot that contains severe thermal segregation. Evaluate areas with severe thermal segregation by performing density profiles in accordance with Section 341.4.9.3.3.3., "Segregation (Density Profile)."~~

~~Remove and replace the material in any areas that have severe thermal segregation and a failing result for segregation (density profile), unless otherwise directed. The subplot in question may receive a production and placement payment adjustment greater than 1.000, if applicable, when the defective material is successfully removed and replaced.~~

Take immediate corrective action to eliminate recurring moderate thermal segregation when a hand-held thermal camera is used. Evaluate areas with moderate thermal segregation by performing density profiles in accordance with Section 341.4.9.3.3.2., "Segregation (Density Profile)." Provide the Engineer with the thermal profile of every subplot within one working day of the completion of each lot. Report the results of each thermal profile in accordance with Section 341.4.2., "Reporting and Responsibilities." When requested by the Engineer, provide the electronic files generated using the thermal camera. The Engineer will use a hand-held thermal camera to obtain a thermal profile at least once per project. No production or placement payment adjustments greater than 1.000 will be paid for any subplot that contains severe thermal segregation. Suspend operations and take immediate corrective action to eliminate severe thermal segregation unless otherwise directed. Resume operations when the Engineer determines that subsequent production will meet the requirements of this Section. Evaluate areas with severe thermal segregation by performing density profiles in accordance with Section 341.4.9.3.3.2. Remove and replace the material in any areas that have both severe thermal segregation and a failing result for Segregation (Density Profile) unless otherwise directed. The subplot in question may receive a production and placement payment adjustment greater than 1.000, if applicable, when the defective material is successfully removed and replaced.

- 4.7.3.2. Windrow Operations. Operate windrow pickup equipment so that when hot mix is placed in windrows, substantially all the mixture deposited on the roadbed is picked up and loaded into the paver.
- 4.7.3.3. Hauling Equipment. Use belly dump, live-bottom, or end dump trucks to haul and transfer mixture. Except for paving miscellaneous areas, end dump trucks are allowed only when used in conjunction with an MTD with remixing capability or when a thermal imaging system is used, unless otherwise approved.
- 4.7.3.4. Screed Heaters. Turn off screed heaters to prevent overheating of the mat if the paver stops for more than 5 min. The Engineer may evaluate the suspect area in accordance with Section 341.4.9.3.3.5., "Recovered Asphalt Dynamic Shear Rheometer (DSR)," if the screed heater remains on for more than 5 min. while the paver is stopped.
- 4.8. Compaction. Compact the pavement uniformly to contain between 3.8% and 8.5% in-place air voids. Take immediate corrective action to bring the operation within 3.8% and 8.5% when the in-place air voids exceed the range of these tolerances. The Engineer will allow paving to resume when the proposed corrective action is likely to yield between 3.8% and 8.5% in-place air voids.

Obtain cores in areas placed under exempt production, as directed, at locations determined by the Engineer. The Engineer may test these cores and suspend operations or require removal and replacement if the in-place air voids are less than 2.7% or more than 9.9%. Areas defined in Section 341.4.9.3.1.4., "Miscellaneous Areas," are not subject to in-place air void determination. All rollers shall be completely clean and free of soil, aggregate, asphalt, and all other materials which may damage or mar the hot mix in any way. Roller brushes, shoes, and water supply shall be in good condition and completely cover the roller from edge to edge.

Furnish the type, size, and number of rollers necessary to ensure desired compaction. Use additional rollers as required to remove any roller marks. Use only water or an approved release agent on rollers, tamps, and other compaction equipment unless otherwise directed. The Contractor shall be required to have a testing lab representative, with a field density measuring gauge, in the field during HMA operations to assist the Contractor in his setting of his rolling pattern and to provide field densities during HMA construction.

Immediately after coring of the surface course has been completed, the Contractor shall clean the coring water and residue from the asphalt to prevent staining of the surface.

Use the control strip method shown in [Tex-207-F](#), Part IV, on the first day of production to establish the rolling pattern that will produce the desired in-place air voids, unless otherwise directed.

Use tamps to thoroughly compact the edges of the pavement along curbs, headers, and similar structures and in locations that will not allow thorough compaction using rollers. The Engineer may require rolling using a trench roller on widened areas, in trenches, and in other limited areas.

Complete all compaction operations using breakdown rollers before the pavement temperature drops below 180°F, unless otherwise allowed. Compaction using a pneumatic or light finish roller operated in static mode is allowed for pavement temperatures above 160°F. The Contractor shall provide a 12-foot straightedge for use by the RPR during the project.

Allow the compacted pavement to cool to 160°F or lower before opening to traffic, unless otherwise directed. Sprinkle the finished mat with water or limewater, when directed, to expedite opening the roadway to traffic.

- 4.9. Acceptance Plan. Payment adjustments for the material will be in accordance with Article 341.6., "Payment."

Sample and test the hot mix on a lot and subplot basis. Suspend production if the production payment factor shown in Section 341.6.1., "Production Payment Adjustment Factors," or the placement payment factor shown in Section 341.6.2., "Placement Payment Adjustment Factors," for two consecutive lots is below 1.000. Resume production once test results or other information indicates to the satisfaction of the Engineer that the next material produced or placed will result in payment factors of at least 1.000.

- 4.9.1. Referee Testing. The Materials and Tests Division is the referee laboratory. The Contractor may request referee testing if a "remove and replace" condition is determined based on the Engineer's test results, or if the differences between Contractor and Engineer test results exceed the maximum allowable difference in accordance with Table 11 and the differences cannot be resolved. The Contractor may also request referee testing if the Engineer's test results require suspension of production and the Contractor's test results are within specification limits. Make the request within 5 working days after receiving test results and cores from the Engineer. Referee tests will be performed only on the subplot in question and only for the tests in question. Allow 10 working days from the time the referee laboratory receives the samples for test results to be reported. The Department may require the Contractor to reimburse the Department for referee tests if more than three referee tests per project are required and the Engineer's test results are closer to the referee test results than the Contractor's test results.

The Materials and Tests Division will determine the laboratory-molded density based on the molded specific gravity and the maximum theoretical specific gravity of the referee sample. The in-place air voids will be determined based on the bulk specific gravity of the cores, as determined by the referee laboratory, and the Engineer's average maximum theoretical specific gravity for the lot. Except for "remove and replace" conditions, referee test results are final and will establish payment adjustment factors for the subplot in question. The Contractor may decline referee testing and accept the Engineer's test results when the placement payment adjustment factor for any subplot results in a "remove and replace" condition. Placement sublots subject to be removed and replaced will be further evaluated in accordance with Section 341.6.2.2., "Placement Sublots Subject to Removal and Replacement."

- 4.9.2. Production Acceptance.

- 4.9.2.1. Production Lot. A production lot consists of four equal sublots. The default quantity for Lot 1 is 1,000 ton; however, when requested by the Contractor, the Engineer may increase the quantity for Lot 1 to no more than 4,000 ton. The Engineer will select subsequent lot sizes based on the anticipated daily production such

that approximately three–four sublots are produced each day. The lot size will be between 1,000 ton and 4,000 ton. The Engineer may change the lot size before the Contractor begins any lot.

If the optimum asphalt binder content for JMF2 is more than 0.5% lower than the optimum asphalt binder content for JMF1, the Engineer may perform or require the Contractor to perform [Tex-226-F](#) on Lot 1 to confirm the indirect tensile strength does not exceed 200 psi. Take corrective action to bring the mixture within specification compliance if the indirect tensile strength exceeds 200 psi, unless otherwise directed.

- 4.9.2.1.1. Incomplete Production Lots. If a lot is begun but cannot be completed, such as on the last day of production or in other circumstances deemed appropriate, the Engineer may close the lot. Adjust the payment for the incomplete lot in accordance with Section 341.6.1., "Production Payment Adjustment Factors." Close all lots within 5 working days unless otherwise allowed.
- 4.9.2.2. Production Sampling.
- 4.9.2.2.1. Mixture Sampling. The Engineer will perform or witness the sampling of production sublots from trucks at the plant in accordance with [Tex-222-F](#). The sampler will split each sample into three equal portions in accordance with [Tex-200-F](#) and label these portions as "Contractor," "Engineer," and "Referee." The Engineer will perform or witness the sample splitting and take immediate possession of the samples labeled "Engineer" and "Referee." The Engineer will maintain the custody of the samples labeled "Engineer" and "Referee" until the Department's testing is completed.
- 4.9.2.2.1.1. Random Sample. At the beginning of the project, the Engineer will select random numbers for all production sublots. Determine sample locations in accordance with [Tex-225-F](#). Take one sample for each subplot at the randomly selected location. The Engineer will perform or witness the sampling of production sublots.
- 4.9.2.2.1.2. Blind Sample. For one subplot per lot, the Engineer will sample, split, and test a "blind" production sample instead of the random sample collected by the Contractor. The location of the Engineer's "blind" sample will not be disclosed to the Contractor before sampling. The Engineer's "blind" sample may be randomly selected in accordance with [Tex-225-F](#) for any subplot or selected at the discretion of the Engineer. The Engineer may sample and test an additional blind sample when the random sampling process does not result in obtaining a sample.
- For one subplot per lot, the Contractor must obtain from the Engineer a "blind" production sample collected by the Engineer. If desired, the Contractor may witness the collection of blind samples. Test either the "blind" or the random sample; however, referee testing for the subplot (if applicable) will be based on a comparison of results from the "blind" sample.
- ~~4.9.2.2.2. Asphalt Binder Sampling. The Engineer will witness the Contractor obtain a 1-qt. sample of the asphalt binder for each lot of mixture produced. The Contractor will notify the Engineer when the sampling will occur. Obtain the sample at approximately the same time the mixture random sample is obtained. Sample from a port located immediately upstream from the mixing drum or pug mill and upstream from the introduction of any additives in accordance with [Tex-500-C](#), Part II. Label the can with the corresponding lot and subplot numbers, producer name, producer facility, grade, District, date sampled, all applicable bills of lading (if available), and project information, including highway and CSJ number. The Engineer will retain these samples for 1 yr. The Engineer may also obtain independent samples. If obtaining an independent asphalt binder sample and upon request of the Contractor, the Engineer will split a sample of the asphalt binder with the Contractor.~~

At least once per project, the Engineer will collect split samples of each binder grade and source used. The Engineer will submit one split sample to the Materials and Tests Division to verify compliance with Item 300, and will retain the other split sample for 1 yr.

- 4.9.2.3. Production Testing. The Contractor and Engineer must perform production tests shown in Table 16. The Contractor has the option to verify the Engineer's test results on split samples provided by the Engineer. Determine compliance with operational tolerances shown in Table 11 for all sublots.

Take immediate corrective action if the Engineer's laboratory-molded density on any sublot is less than 95.0% or greater than 97.0% to bring the mixture within these tolerances. The Engineer may suspend operations if the Contractor's corrective actions do not produce acceptable results. The Engineer will allow production to resume when the proposed corrective action is likely to yield acceptable results.

The Engineer may allow alternate methods for determining the asphalt binder content and aggregate gradation if the aggregate mineralogy is such that [Tex-236-F](#), Part I does not yield reliable results. Provide evidence that results from [Tex-236-F](#), Part I are not reliable before requesting permission to use an alternate method unless otherwise directed. Use the applicable test procedure as directed if an alternate test method is allowed.

Table 16
Production and Placement Testing Frequency

Description	Test Method	Min Contractor Testing Frequency	Min Engineer Testing Frequency
Individual % retained on #8 sieve and larger	Tex-200-F or Tex-236-F	1 per sublot	1 per 12 sublots ¹
Individual % retained on sieves smaller than #8 and larger than #200			
% passing #200 sieve			
Laboratory molded density	Tex-207-F	-	1 per sublot ¹
Laboratory molded bulk specific gravity			
In-place air voids			
VMA	Tex-204-F		
Segregation (density profile)	Tex-207-F , Part V	1 per sublot ²	1 per project
Longitudinal joint density	Tex-207-F , Part VII	1 per sublot ³	1 per project
Moisture content	Tex-212-F , Part II	When directed	1 per project
Theoretical maximum specific (Rice) gravity	Tex-227-F	-	1 per sublot ¹
Asphalt binder content	Tex-236-F	1 per sublot	1 per lot ¹
Thermal profile	Tex-244-F	1 per sublot ²	1 per project
Hamburg wheel test	Tex-242-F	-	
Deleterious in RAS ⁴	Tex-217-F , Part III	-	
Asphalt binder sampling and testing ^{4,5}	Tex-500-C , Part II	-	
Tack coat sampling and testing	Tex-500-C , Part III	-	
Boil test ⁶	Tex-530-C	1 per lot	
Shear bond strength test ⁷	Tex-249-F	-	

1. For production defined in Section 341.4.9.4., "Exempt Production," the Engineer will perform one test per day if 100 ton or more is produced. For exempt production, no testing is required when < 100 ton is produced.

2. To be performed in the presence of the Engineer when not using the thermal imaging system, unless otherwise approved.

3. To be performed in the presence of the Engineer.

4. Testing performed by the Materials and Tests Division or designated laboratory.

5. Sampling performed by the Contractor. The Engineer will witness sampling and retain the samples for 1 yr.

6. When shown on the plans.

7. Testing performed by the Materials and Tests Division or District for informational purposes on a sample obtained by the Contractor within the first four lots of the project.

Table 16
Production and Placement Testing Frequency

Description	Test Method	Minimum Contractor Testing Frequency	Minimum Engineer Testing Frequency
Individual % retained for #8 sieve and larger	Tex-200-F or Tex-236-F	1 per subplot	1 per 12 sublots ¹
Individual % retained for sieves smaller than #8 and larger than #200			
% passing the #200 sieve			
Laboratory-molded density	Tex-207-F	N/A	1 per subplot ¹
Laboratory-molded bulk specific gravity			
In-place air voids			
VMA	Tex-204-F		
Segregation (density profile) ²	Tex-207-F , Part V	1 per subplot	1 per project
Longitudinal joint density	Tex-207-F , Part VII		
Moisture content	Tex-212-F , Part II	When directed	
Theoretical maximum specific (Rice) gravity	Tex-227-F	N/A	1 per subplot ¹
Asphalt binder content	Tex-236-F	1 per subplot	1 per lot ¹
Hamburg Wheel test	Tex-242-F	N/A	1 per project
Recycled Asphalt Shingles (RAS) ³	Tex-217-F , Part III	N/A	
Thermal profile ²	Tex-244-F	1 per subplot	
Asphalt binder sampling and testing	Tex-500-C , Part II	1 per lot (sample only)	
Tack coat sampling and testing	Tex-500-C , Part III	N/A	
Boil test ⁴	Tex-530-C	1 per lot	

1. For production defined in Section 341.4.9.4., "Exempt Production," the Engineer will test one per day if 100 tons or more are produced. For Exempt Production, no testing is required when less than 100 tons are produced.
2. Not required when a thermal imaging system is used.
3. Testing performed by the Construction Division or designated laboratory.
4. The Engineer may reduce or waive the sampling and testing requirements based on a satisfactory test history.

- 4.9.2.4. Operational Tolerances. Control the production process within the operational tolerances shown in Table 11. When production is suspended, the Engineer will allow production to resume when test results or other information indicates the next mixture produced will be within the operational tolerances.
- 4.9.2.4.1. Gradation. Suspend operation and take corrective action if any aggregate is retained on the maximum sieve size shown in Table 8. A subplot is defined as out of tolerance if either the Engineer's or the Contractor's test results are out of operational tolerance. Suspend production when test results for gradation exceed the operational tolerances shown in Table 11 for three consecutive sublots on the same sieve or four consecutive sublots on any sieve, unless otherwise directed. The consecutive sublots may be from more than one lot.
- 4.9.2.4.2. Asphalt Binder Content. A subplot is defined as out of operational tolerance if either the Engineer's or the Contractor's test results exceed the values shown in Table 11. No production or placement payment adjustments greater than 1.000 will be paid for any subplot that is out of operational tolerance for asphalt binder content. Suspend production and shipment of the mixture if the Engineer's or the Contractor's asphalt binder content deviates from the current JMF by more than 0.5% for any subplot.

- 4.9.2.4.3. VMAs. The Engineer will determine the VMA for every subplot. For sublots when the Engineer does not determine asphalt binder content, the Engineer will use the asphalt binder content results from QC testing performed by the Contractor to determine VMA.
- Take immediate corrective action if the VMA value for any subplot is less than the minimum VMA requirement for production shown in Table 8. Suspend production and shipment of the mixture if the Engineer's VMA results on two consecutive sublots are below the minimum VMA requirement for production shown in Table 8. No production or placement payment adjustments greater than 1.000 will be paid for any subplot that does not meet the minimum VMA requirement for production shown in Table 8 based on the Engineer's VMA determination.
- Suspend production and shipment of the mixture if the Engineer's VMA result is more than 0.5% below the minimum VMA requirement for production shown in Table 8. In addition to suspending production, the Engineer may require removal and replacement or may allow the subplot to be left in place without payment.
- 4.9.2.4.4. Hamburg Wheel Test. The Engineer may perform a Hamburg wheel test on plant-produced mixture anytime during production. Suspend production until further Hamburg wheel tests meet the specified values when the production samples fail the Hamburg wheel test criteria shown in Table 10. The Engineer may require up to the entire subplot of any mixture failing the Hamburg wheel test to be removed and replaced at the Contractor's expense.
- If the Department-approved laboratory's Hamburg wheel test on plant-produced mixture results in a "remove and replace" condition, the Contractor may request that the Materials and Tests Division determine the final disposition of the material in question by re-testing the failing material.
- 4.9.2.5. Individual Loads of Hot Mix. The Engineer may reject individual truckloads of hot mix. When a load of hot mix is rejected for reasons other than temperature, contamination, or excessive uncoated particles, the Contractor may request that the rejected load be tested. Make this request within 4 hr. of rejection. The Engineer will sample and test the mixture. If test results are within the operational tolerances shown in Table 11, payment will be made for the load. If test results are not within operational tolerances, no payment will be made for the load.
- 4.9.3. Placement Acceptance.
- 4.9.3.1. Placement Lot. A placement lot consists of four placement sublots. A placement subplot consists of the area placed during a production subplot.
- 4.9.3.1.1. Lot 1 Placement. Placement payment adjustments greater than 1.000 for Lot 1 will be in accordance with Section 341.6.2., "Placement Payment Adjustment Factors"; however, no placement adjustment less than 1.000 will be assessed for any subplot placed in Lot 1 when the in-place air voids are greater than or equal to 2.7% and less than or equal to 9.9%. Remove and replace any subplot with in-place air voids less than 2.7% or greater than 9.9%.
- 4.9.3.1.2. Incomplete Placement Lots. An incomplete placement lot consists of the area placed as described in Section 341.4.9.2.1.1., "Incomplete Production Lots," excluding areas defined in Section 341.4.9.3.1.4., "Miscellaneous Areas." Placement sampling is required if the random sample plan for production resulted in a sample being obtained from an incomplete production subplot.
- 4.9.3.1.3. Shoulders, Ramps, Etc. Shoulders, ramps, intersections, acceleration lanes, deceleration lanes, and turn lanes are subject to in-place air void determination and payment adjustments unless shown on the plans as not eligible for in-place air void determination. Intersections may be considered miscellaneous areas when determined by the Engineer.
- 4.9.3.1.4. Miscellaneous Areas. Miscellaneous areas include areas that typically involve significant handwork or discontinuous paving operations, such as temporary detours, driveways, mailbox turnouts, crossovers,

gores, spot level-up areas, pavement repair sections less than 300 ft., and other similar areas. Temporary detours are subject to in-place air void determination when shown on the plans. Miscellaneous areas also include level-ups and thin overlays when the layer thickness shown on the plans is less than the minimum untrimmed core height eligible for testing in accordance with Table 13. The specified layer thickness is based on the rate of 110 lb. per square yard for each inch of pavement unless another rate is shown on the plans. When "Level Up" is listed as part of the bid item description, a payment adjustment factor of 1.000 will be assigned for all placement sublots as described in Article 341.6., "Payment." Miscellaneous areas are not eligible for random placement sampling locations. Compact miscellaneous areas in accordance with Section 341.4.8., "Compaction." Miscellaneous areas are not subject to in-place air void determination, thermal profiles testing, segregation (density profiles), or longitudinal joint density evaluations.

- 4.9.3.2. Placement Sampling. The Engineer will select random numbers for all placement sublots at the beginning of the project. The Engineer will provide the Contractor with the placement random numbers only immediately after the subplot is completed. Mark the roadway location at the completion of each subplot and record the station number. Determine one random sample location for each placement subplot in accordance with [Tex-225-F](#). Adjust the random sample location by no more than necessary to achieve a 2-ft. clearance if the location is within 2 ft. of a joint or pavement edge.

Shoulders, ramps, intersections, acceleration lanes, deceleration lanes, and turn lanes are always eligible for selection as a random sample location; however, if a random sample location falls on one of these areas and the area is shown on the plans as not subject to in-place air void determination, cores will not be taken for the subplot and a 1.000 pay factor will be assigned to that subplot.

Provide the equipment and means to obtain and trim roadway cores onsite. Onsite is defined as in close proximity to where the cores are taken. Obtain the cores within 1 working day of the time the placement subplot is completed, unless otherwise approved. Obtain two 6-in. diameter cores side-by-side from within 1 ft. of the random location provided for the placement subplot. Mark the cores for identification, measure and record the untrimmed core height, and provide the information to the Engineer. The Engineer will witness the coring operation and measurement of the core thickness. Visually inspect each core and verify that the current paving layer is bonded to the underlying layer. Take corrective action if an adequate bond does not exist between the current and underlying layer to ensure that an adequate bond will be achieved during subsequent placement operations.

Trim the cores immediately after obtaining them from the roadway in accordance with [Tex-251-F](#) if the core heights meet the minimum untrimmed value in accordance with Table 13. Trim the cores onsite in the presence of the Engineer. Use a permanent marker or paint pen to record the lot and subplot numbers on each core, as well as the designation as Core A or Core B. The Engineer may require additional information to be marked on the core and may choose to sign or initial the core. The Engineer will take custody of the cores immediately after witnessing the trimming of the cores and will retain custody of the cores until the Department's testing is completed. Before turning the trimmed cores over to the Engineer, the Contractor may wrap the trimmed cores or secure them in a manner that will reduce the risk of possible damage occurring during transport by the Engineer. After testing, the Engineer will return the cores to the Contractor.

The Engineer may have the cores transported back to the Department's laboratory at the HMA plant via the Contractor's haul truck or other designated vehicle. In such cases where the cores will be out of the Engineer's possession during transport, the Engineer will use Department-provided security bags and the Protocol for Roadway Core Custody located on the Department's website to provide a secure means and process that protect the integrity of the cores during transport.

Decide whether to include the pair of cores in the air void determination for that subplot if the core height before trimming is less than the minimum untrimmed value shown in Table 13. Trim the cores in accordance with [Tex-251-F](#) before delivering to the Engineer if electing to have the cores included in the air void determination. If electing to not have the cores included in air void determination, inform the Engineer of the decision, and deliver untrimmed cores to the Engineer. The placement pay factor for the subplot will be 1.000 if cores will not be included in air void determination.

Instead of the Contractor trimming the cores onsite immediately after coring, the Engineer and the Contractor may mutually agree to have the trimming operations performed at an alternate location, such as a field laboratory or other similar location. In such cases, the Engineer will take possession of the cores immediately after they are obtained from the roadway and will retain custody of the cores until testing is completed. Either the Department or Contractor representative may perform trimming of the cores. The Engineer will witness all trimming operations in cases where the Contractor representative performs the trimming operation.

Dry the core holes and tack the sides and bottom immediately after obtaining the cores. Fill the hole with the same type of mixture and properly compact the mixture. Repair core holes using other methods when approved.

- 4.9.3.3. Placement Testing. Perform placement tests in accordance with Table 16. After the Engineer returns the cores, the Contractor may test the cores to verify the Engineer's test results for in-place air voids. The allowable differences between the Contractor's and Engineer's test results are shown in Table 11.

- 4.9.3.3.1. In-Place Air Voids. The Engineer will measure in-place air voids in accordance with [Tex-207-F](#) and [Tex-227-F](#). Before drying to a constant weight, cores may be pre-dried using a CoreDry or similar vacuum device to remove excess moisture. The Engineer will average the values obtained for all sublots in the production lot to determine the theoretical maximum specific gravity. The Engineer will use the average air void content for in-place air voids.

The Engineer will use the vacuum method to seal the core if required in accordance with [Tex-207-F](#). The Engineer will use the test results from the unsealed core to determine the placement payment adjustment factor if the sealed core yields a higher specific gravity than the unsealed core. After determining the in-place air void content, the Engineer will return the cores and provide test results to the Contractor.

- 4.9.3.3.2. Informational Shear Bond Strength Testing. The Engineer will select one random subplot within the first four lots of the project for shear bond strength testing. Obtain full-depth cores in accordance with [Tex-249-F](#) unless the HMA is being placed directly on concrete pavement. Label the cores with lot and subplot numbers and provide to the Engineer. Inspector must use pertinent Department form to document the CSJ number, producer of the tack coat, mix type, and shot rate. The Engineer will ship the cores to the Materials and Tests Division or District laboratory for shear bond strength testing. Results from these tests will not be used for specification compliance.

- 4.9.3.3.3. Segregation (Density Profile). Test for segregation using density profiles in accordance with [Tex-207-F](#), Part V. Density profiles are not required and are not applicable when using a thermal imaging system. Density profiles are not applicable in areas described in Section 341.4.9.3.1.4., "Miscellaneous Areas."

~~Perform at least one density profile per subplot. Perform additional density profiles when any of the following conditions occur, unless otherwise approved:~~

- ~~■ areas that are identified by either the Contractor or the Engineer with severe thermal segregation;~~
- ~~■ any visibly segregated areas that exist;~~
- ~~■ the paver stops due to lack of material being delivered to the paving operations and the temperature of the uncompacted mat before the initial breakdown rolling is less than the temperatures shown in Table 17.~~

Perform a minimum of one density profile per subplot. Perform additional density profiles when any of the following conditions occur, unless otherwise approved:

- the paver stops for more than 60 sec.;
- either the Contractor or the Engineer identifies areas with thermal segregation; or
- any visibly segregated areas exist.

Table 17
Min Uncompacted Mat Temperature Requiring Segregation Profile¹

High-Temperature Binder Grade ²	Min Temperature of Uncompacted Mat Allowed Before Initial Breakdown Rolling ^{3,4,5} (°F)
PG 64	<250
PG 70	<260
PG 76	<270

1. Applicable only to paver stops that occur due to lack of material being delivered to the paving operations and when not using a thermal imaging system.
2. The high-temperature binder grade refers to the high-temperature grade of the virgin asphalt binder used to produce the mixture.
3. The surface of the uncompacted mat must be measured using a handheld thermal camera or infrared thermometer.
4. Min uncompacted mat temperature requiring a segregation profile may be reduced 20°F if using a chemical WMA additive as a compaction aid, MTD with remixing capabilities, or paver hopper insert with remixing capabilities.
5. When using WMA, the Min uncompacted mat temperature requiring a segregation profile is 215°F.

Provide the Engineer with the density profile of every subplot in the lot within 1 working day of the completion of each lot. Report the results of each density profile in accordance with Section 341.4.2., "Reporting and Responsibilities."

The density profile is considered failing if it exceeds the tolerances shown in Table 18. When a thermal imaging system is not used, the Engineer will measure the density profile at least once per project. The Engineer's density profile results will be used when available. The Engineer may require the Contractor to remove and replace the area in question if the area fails the density profile and has surface irregularities as defined in Section 341.4.9.3.3.6., "Irregularities." The subplot in question may receive a production and placement payment adjustment greater than 1.000, if applicable, when the defective material is successfully removed and replaced.

Investigate density profile failures and take corrective actions during production and placement to eliminate the segregation. Suspend production if two consecutive density profiles fail unless otherwise approved. Resume production after the Engineer approves changes to production or placement methods.

Table 18
Segregation (Density Profile) Acceptance Criteria

Mixture Type	Max Allowable Density Range (highest to lowest, pcf)	Max Allowable Density Range (average to lowest, pcf)
DG-B	8.0	5.0
DG-C, DG-D, and DG-F	6.0	3.0

4.9.3.3.4. Longitudinal Joint Density.

4.9.3.3.4.1. Informational Tests. Perform joint density evaluations while establishing the rolling pattern and verify that the joint density is no more than 3.0 pcf below the density taken at or near the center of the mat. Adjust the rolling pattern, if needed, to achieve the desired joint density. Perform additional joint density evaluations, at least once per subplot, unless otherwise directed.

4.9.3.3.4.2. Record Tests. Perform a joint density evaluation for each subplot at each pavement edge that is or will become a longitudinal joint. Joint density evaluations are not applicable in areas described in Section 341.4.9.3.1.4., "Miscellaneous Areas." Determine the joint density in accordance with [Tex-207-F](#), Part VII. Record the joint density information and submit results on Department forms to the Engineer. The evaluation is considered failing if the joint density is more than 3.0 pcf below the density taken at the core

random sample location and the correlated joint density is less than 90.0%. The Engineer will make independent joint density verification at least once per project and may make independent joint density verifications at the random sample locations. The Engineer's joint density test results will be used when available.

Provide the Engineer with the joint density of every subplot in the lot within 1 working day of the completion of each lot. Report the results of each joint density in accordance with Section 341.4.2., "Reporting and Responsibilities."

Investigate joint density failures and take corrective actions during production and placement to improve the joint density. Suspend production if the evaluations on two consecutive sublots fail, unless otherwise approved. Resume production after the Engineer approves changes to production or placement methods.

- 4.9.3.3.5. Recovered Asphalt Dynamic Shear Rheometer (DSR). The Engineer may take production samples or cores from suspect areas of the project to determine recovered asphalt properties. Asphalt binders with an aging ratio greater than 3.5 do not meet the requirements for recovered asphalt properties and may be deemed defective when tested and evaluated by the Materials and Tests Division. The aging ratio is the DSR value of the extracted binder divided by the DSR value of the original unaged binder. Obtain DSR values in accordance with AASHTO T 315 at the specified high-temperature PG of the asphalt. The Engineer may require removal and replacement of the defective material at the Contractor's expense. The asphalt binder will be recovered for testing from production samples or cores in accordance with [Tex-211-F](#).

- 4.9.3.3.6. Irregularities. Identify and correct irregularities, including segregation, rutting, raveling, flushing, fat spots, mat slippage, irregular color, irregular texture, roller marks, tears, gouges, streaks, uncoated aggregate particles, or broken aggregate particles. The Engineer may also identify irregularities, and in such cases, the Engineer will promptly notify the Contractor. If the Engineer determines that the irregularity will adversely affect pavement performance, the Engineer may require the Contractor to remove and replace (at the Contractor's expense) areas of the pavement that contain irregularities. The Engineer may also require the Contractor to remove and replace (at the Contractor's expense) areas where the mixture does not bond to the existing pavement.

If irregularities are detected, the Engineer may require the Contractor to immediately suspend operations or may allow the Contractor to continue operations for no more than 1 day while the Contractor is taking appropriate corrective action.

- 4.9.4. Exempt Production. The mixture may be deemed as exempt production when mutually agreed upon between the Engineer and the Contractor, or when shown on the plans. Exempt production may be used for the following conditions.

- Anticipated daily production is less than 500 ton.
- Total production for the project is less than 5,000 ton.
- Pavement repair sections are equal to or greater than 300 ft. For pavement repair sections less than 300 ft., refer to Section 341.4.9.3.1.4., "Miscellaneous Areas."

~~Exempt production is not eligible for referee testing. For exempt production, the Contractor is relieved of all production and placement QC and QA sampling and testing requirements, except for coring operations when required by the Engineer. When mutually agreed upon between the Engineer and the Contractor, production sampling will be allowed at the point of delivery. When 100 ton or more per day is produced, the Engineer must perform acceptance tests for production and placement in accordance with Table 16. If the specification requirements listed below are met, the production and placement pay factors are 1.000: For exempt production, the Contractor is relieved of all production and placement sampling and testing requirements, except for coring, and the production and placement pay factors are 1.000. All other specification requirements apply, and the Engineer will perform acceptance tests for production and placement listed in Table 14 when 100 tons or more per day are produced.~~

- produce, haul, place, and compact the mixture in compliance with the specification and as directed;
- control mixture production to yield a laboratory-molded density that is within $\pm 1.0\%$ of the target laboratory-molded density as tested by the Engineer;
- compact the mixture in accordance with Section 341.4.8., "Compaction;"
- when a thermal imaging system is not used, the Engineer may perform segregation (density profiles) and thermal profiles in accordance with the specification; and
- all other specification requirements.

4.9.5. Ride Quality. Measure ride quality in accordance with Item 585, "Ride Quality for Pavement Surfaces," unless otherwise shown on the plans.

5. MEASUREMENT

~~5.1. Dense Graded HMA. Hot mix will be measured by the ton of composite hot mix, which includes asphalt, aggregate, and additives. Measure the weight on scales in accordance with Item 520, "Weighing and Measuring Equipment."~~

5.1. Dense Graded Hot-Mix Asphalt. Hot mix will be measured by the ton of composite hot-mix, which includes asphalt, aggregate, and additives. Measure the weight on scales in accordance with Item 520, "Weighing and Measuring Equipment."

~~5.2. Tack Coat. Tack coat will be measured at the applied temperature by strapping the tank before and after road application and determining the net volume in gallons from the calibrated distributor. The Engineer will witness all strapping operations for volume determination. All tack, including emulsions, will be measured by the gallon applied.~~

~~The Engineer may allow the use of a metering device to determine asphalt volume used and application rate if the device is accurate within 1.5% of the strapped volume.~~

5.2. Tack Coat. Tack coat will be measured at the applied temperature by strapping the tank before and after road application and determining the net volume in gallons from the calibrated distributor. The Engineer will witness all strapping operations for volume determination. All tack, including emulsions, will be measured by the gallon applied.

The Engineer may allow the use of a metering device to determine asphalt volume used and application rate if the device is accurate within 1.5% of the strapped volume.

6. PAYMENT

~~The work performed and materials furnished in accordance with this Item and measured as provided under Section 341.5.1., "Dense Graded HMA," will be paid for at the unit price bid for "Dense Graded Hot Mix Asphalt" of the mixture type, SAC, and binder specified. These prices are full compensation for surface preparation, materials, placement, equipment, labor, tools, and incidentals. The work performed and materials furnished in accordance with this Item and measured as provided under Section 341.5.1, "Measurement," will be paid for at the unit bid price for "Dense Graded Hot-Mix Asphalt" of the mixture type, SAC, and binder specified. These prices are full compensation for surface preparation, materials, placement, equipment, labor, tools, and incidentals.~~

The work performed and materials furnished in accordance with this Item and measured as provided under Section 341.5.2., "Tack Coat," will be paid for at the unit price bid for "Tack Coat" of the tack coat provided. These prices are full compensation for materials, placement, equipment, labor, tools, and incidentals. Payment adjustments will be applied as determined in accordance with this Item; however, a payment adjustment factor of 1.000 will be assigned for all placement sublots for level-ups only when "Level Up" is listed as part of the bid item description. A payment adjustment factor of 1.000 will be assigned to all production and placement sublots when "Exempt" is listed as part of the bid item description, and all testing requirements are met.

Payment for each subplot, including applicable payment adjustments greater than 1.000, will be paid only for sublots when the Contractor supplies the Engineer with the required documentation for production and placement QC and QA, thermal profiles, segregation density profiles, and longitudinal joint densities in accordance with Section 341.4.2., "Reporting and Responsibilities." When a thermal imaging system is used, documentation is not required for segregation density profiles on individual sublots; however, the thermal imaging system automated reports described in [Tex-244-F](#) are required.

Trial batches will not be paid for unless they are included in pavement work approved by the Department.

Payment adjustment for ride quality will be determined in accordance with Item 585.

The work performed and materials furnished in accordance with this Item and measured as provided under Section 341.5.2, "Measurement," will be paid for at the unit bid price for "Tack Coat" of the tack coat provided. These prices are full compensation for materials, placement, equipment, labor, tools, and incidentals.

6.1.

Production Payment Adjustment Factors. The production payment adjustment factor is based on the laboratory-molded density using the Engineer's test results. The bulk specific gravities of the samples from each subplot will be divided by the Engineer's maximum theoretical specific gravity for the subplot. The individual sample densities for the subplot will be averaged to determine the production payment adjustment factor in accordance with Table 19 for each subplot, using the deviation from the target laboratory-molded density in accordance with Table 9. The production payment adjustment factor for completed lots will be the average of the payment adjustment factors for the four sublots sampled within that lot.

Table 19
Production Payment Adjustment Factors for Laboratory-Molded Density¹

Absolute Deviation from Target Laboratory-Molded Density	Production Payment Adjustment Factor (Target Laboratory-Molded Density)
0.0	1.050
0.1	1.050
0.2	1.050
0.3	1.044
0.4	1.038
0.5	1.031
0.6	1.025
0.7	1.019
0.8	1.013
0.9	1.006
1.0	1.000
1.1	0.965
1.2	0.930
1.3	0.895
1.4	0.860
1.5	0.825
1.6	0.790
1.7	0.755
1.8	0.720

Absolute Deviation from Target Laboratory-Molded Density	Production Payment Adjustment Factor (Target Laboratory-Molded Density)
>1.8	Remove and replace

1. If the Engineer's laboratory-molded density on any subplot is <95.0% or >97.0%, take immediate corrective action to bring the mixture within these tolerances. The Engineer may suspend operations if the Contractor's corrective actions do not produce acceptable results. The Engineer will allow production to resume when the proposed corrective action is likely to yield acceptable results.

- 6.1.1. Payment for Incomplete Production Lots. Production payment adjustments for incomplete lots, described under Section 341.4.9.2.1.1., "Incomplete Production Lots," will be calculated using the average production payment factors from all sublots sampled.

A production payment factor of 1.000 will be assigned to any lot when the random sampling plan did not result in collection of any samples within the first subplot.

- 6.1.2. Production Sublots Subject to Removal and Replacement. ~~If after referee testing the laboratory-molded density for any subplot results in a "remove and replace" condition as shown in Table 19, the Engineer may require removal and replacement or may allow the subplot to be left in place without payment. The Engineer may also accept the subplot in accordance with Section 5.3.1., "Acceptance of Defective or Unauthorized Work." Replacement material meeting the requirements of this Item will be paid for in accordance with this Section.~~ The bulk specific gravity of each core will be divided by the Engineer's average maximum theoretical specific gravity for that lot to determine the new payment adjustment factor of the subplot in question. If the new payment adjustment factor is 0.700 or greater, the new payment adjustment factor will apply to that subplot. If the new payment adjustment factor is less than 0.700, no payment will be made for the subplot. Remove and replace the failing subplot, or the Engineer may allow the subplot to be left in place without payment. The Engineer may also accept the subplot in accordance with Section 5.3.1., "Acceptance of Defective or Unauthorized Work." Replacement material meeting the requirements of this Item will be paid for in accordance with this Section.

- 6.2. Placement Payment Adjustment Factors. The placement payment adjustment factor is based on in-place air voids using the Engineer's test results. The bulk specific gravities of the cores from each subplot will be divided by the Engineer's average maximum theoretical specific gravity for the lot. The individual core densities for the subplot will be averaged to determine the placement payment adjustment factor in accordance with Table 20 for each subplot that requires in-place air void measurement. A placement payment adjustment factor of 1.000 will be assigned to the entire subplot when the random sample location falls in an area shown on the plans as not subject to in-place air void determination. A placement payment adjustment factor of 1.000 will be assigned to quantities placed in areas described in Section 341.4.9.3.1.4., "Miscellaneous Areas." The placement payment adjustment factor for completed lots will be the average of the placement payment adjustment factors for up to four sublots within that lot.

Table 20
Placement Payment Adjustment Factors for In-Place Air Voids

In-Place Air Voids	Placement Pay Adjustment Factor	In-Place Air Voids	Placement Payment Adjustment Factor
<2.7	Remove and replace	6.4	1.042
2.7	0.710	6.5	1.040
2.8	0.740	6.6	1.038
2.9	0.770	6.7	1.036
3.0	0.800	6.8	1.034
3.1	0.830	6.9	1.032
3.2	0.860	7.0	1.030
3.3	0.890	7.1	1.028
3.4	0.920	7.2	1.026
3.5	0.950	7.3	1.024
3.6	0.980	7.4	1.022
3.7	0.998	7.5	1.020
3.8	1.002	7.6	1.018
3.9	1.006	7.7	1.016
4.0	1.010	7.8	1.014
4.1	1.014	7.9	1.012
4.2	1.018	8.0	1.010
4.3	1.022	8.1	1.008
4.4	1.026	8.2	1.006
4.5	1.030	8.3	1.004
4.6	1.034	8.4	1.002
4.7	1.038	8.5	1.000
4.8	1.042	8.6	0.998
4.9	1.046	8.7	0.996
5.0	1.050	8.8	0.994
5.1	1.050	8.9	0.992
5.2	1.050	9.0	0.990
5.3	1.050	9.1	0.960
5.4	1.050	9.2	0.930
5.5	1.050	9.3	0.900
5.6	1.050	9.4	0.870
5.7	1.050	9.5	0.840
5.8	1.050	9.6	0.810
5.9	1.050	9.7	0.780
6.0	1.050	9.8	0.750
6.1	1.048	9.9	0.720
6.2	1.046	>9.9	Remove and replace
6.3	1.044	—	—

6.2.1. Payment for Incomplete Placement Lots. Payment adjustments for incomplete placement lots described under Section 341.4.9.3.1.2., "Incomplete Placement Lots," will be calculated using the average of the placement payment factors from all sublots sampled and sublots where the random location falls in an area shown on the plans as not eligible for in-place air void determination.

If the random sampling plan results in production samples, but not in placement samples, the random core location and placement adjustment factor for the subplot will be determined by applying the placement random number to the length of the subplot placed.

If the random sampling plan results in placement samples, but not in production samples, no placement adjustment factor will apply for that subplot placed.

A placement payment adjustment factor of 1.000 will be assigned to any lot when the random sampling plan did not result in collection of any production samples.

- 6.2.2. Placement Sublots Subject to Removal and Replacement. If after referee testing the placement payment adjustment factor for any subplot results in a "remove and replace" condition as shown in Table 20, the Engineer will choose the location of two cores to be taken within 3 ft. of the original failing core location. The Contractor must obtain the cores in the presence of the Engineer. The Engineer will take immediate possession of the untrimmed cores and submit the untrimmed cores to the Materials and Tests Division, where they will be trimmed, if necessary, and tested for bulk specific gravity within 10 working days of receipt.

The bulk specific gravity of each core from each subplot will be divided by the Engineer's average maximum theoretical specific gravity for the lot. The individual core densities for the subplot will be averaged to determine the new payment adjustment factor of the subplot in question. If the new payment adjustment factor is 0.720 or greater, the new payment adjustment factor will apply to that subplot. If the new payment adjustment factor is less than 0.720, no payment will be made for the subplot. Remove and replace the failing subplot, or the Engineer may allow the subplot to be left in place without payment. The Engineer may also accept the subplot in accordance with Section 5.3.1., "Acceptance of Defective or Unauthorized Work." Replacement material meeting the requirements of this Item will be paid for in accordance with this Section.

- 6.3. Total Adjusted Pay (TAP) Calculation. TAP will be based on the applicable payment adjustment factors for production and placement for each lot. No payment for Dense-Graded Hot-Mi Asphalt (HMA) shall be greater than 100 percent. However, payment in excess of 100 percent for any given accepted lots of HMA shall be used to offset payment for accepted lots of HMA that achieve a lot pay factor less than 100 percent. Tonnage amounts attributed to pavement mat thicknesses outside of the +/- 1/4-inches tolerance shall not be included in the TAP Calculation. The Design pavement mat thickness plus tolerance thickness will be included in the TAP Calculation.

$$TAP = (A+B)/2$$

where:

A = Bid price × production lot quantity × average payment adjustment factor for the production lot

B = Bid price × placement lot quantity × average payment adjustment factor for the placement lot + (bid price × quantity placed in miscellaneous areas × 1.000)

Production lot quantity = Quantity actually placed - quantity left in place without payment

Placement lot quantity = Quantity actually placed - quantity left in place without payment - quantity placed in miscellaneous areas

ALTERNATIVE BID NO. 1–SECTION 32 00 00
CONSTRUCT, MAINTAIN, AND REMOVE HAUL ROUTE

PART 1-GENERAL

1.01 SUMMARY

- A. Work Included: The work under this section includes all items related to construction of a haul route as shown on the Drawings including clearing and grubbing, excavation, site grading and draining, dewatering, aggregate, water for dust control, steel plates, flaggers, removal of temporary items upon completion, restoration, and other incidentals.
- B. Related Sections and Divisions: Applicable provisions of Division 01 shall govern work in this section.

1.02 MEASUREMENT AND PAYMENT

- A. Measurement and Payment: Payment for construct, maintain, and remove haul route shall be measured and paid for in accordance with the Bid Proposal. The unit price will be complete compensation for all equipment, materials, labor, and supervision required.

1.03 REFERENCES

- A. The applicable provisions of the following standards shall apply as if written here in their entirety:
 - 1. TxDOT Texas Department of Transportation Construction Bulletin No. 14.
 - 2. TxDOT Texas Department of Transportation–Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (Standard Specifications).

1.04 RELATED SECTIONS

- A. Item 110–Excavation.
- B. Item 132–Embankment.
- C. Item 164–Seeding for Erosion Control.
- D. Item 247–Flexible Base.

PART 2-PRODUCTS

2.01 MANUFACTURERS

- A. The materials must be approved by ENGINEER prior to delivery of any materials.

2.02 MATERIALS AND/OR EQUIPMENT

- A. Materials necessary for the proper construction of the work shall be provided in accordance with the above related sections.
- B. 3/4-inch steel plate shall be provided and placed in accordance with the Drawings. Steel plate shall meet or exceed ASTM A36.
- C. Culvert pipe shall be provided and placed in accordance with the Drawing.
- D. Equipment necessary for the proper construction of the work shall be on the project prior to the start of construction operations. All equipment shall be maintained in a satisfactory working condition.

PART 3-EXECUTION

3.01 CONSTRUCTION

- A. Provide and place water for dust control as directed by ENGINEER.
- B. Furnish and place flexible base at a minimum depth of 8-inches and in accordance with TxDOT Item 247–Flexible Base. Maintain the aggregate surface for the duration of the haul route.
- C. Remove all items associated with the haul route, replace sections of fence removed for the haul route, and restore the area used as a temporary road.
- D. Restore the site in accordance with TxDOT Item 160–Topsoil, and Item 164–Seeding for Erosion Control.
- E. CONTRACTOR is responsible to maintain drainage in the area of the haul route.

END OF SECTION

CONSTRUCTION PLANS FOR BRYAN - COULTER AIRFIELD

APRON EXPANSION

JULY 2026

TxDOT CSJ. NO. 2617BRYAN
STRAND PROJECT NO. 4401.006



LOCATION MAP

GENERAL DESCRIPTION OF PROJECT

BASE BID:
CONSTRUCT APRON EXPANSION, DETENTION BASIN, AND OUTFALL
STRUCTURE

ALTERNATIVE BID NO. 1:
CONSTRUCT, MAINTAIN, AND REMOVE HAUL ROUTE

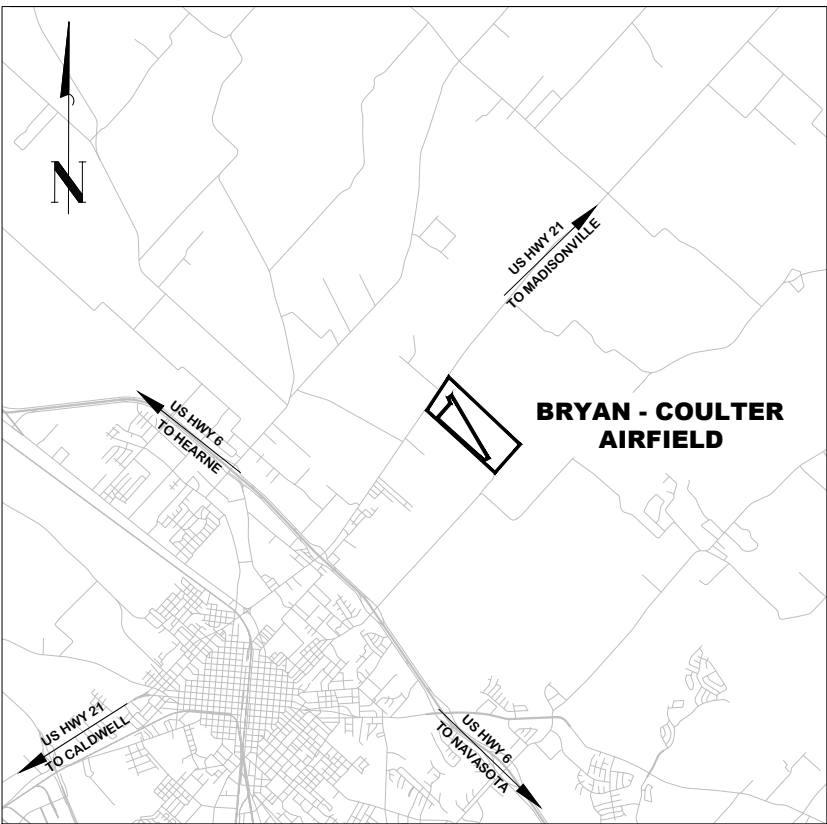
1

MAYOR:
BOBBY GUTIERREZ

CITY COUNCIL MEMBERS:
JAMES EDGE, MAYOR PRO-TEM
PAUL TORRES
RAY ARRINGTON
JARED SALVATO
MARCA EWERS-SHURTLEFF
KEVIN BORISKIE

AIRFIELD PAVEMENT RATING:
12,500 SINGLE WHEEL

AIRPORT MANAGER:
BRANDON REID



VICINITY MAP



STRAND ASSOCIATES, INC.
BRENHAM, TEXAS



DATE	8/4/2026
REVISIONS	
ADDENDUM NO. 2	
NO.	1

TITLE SHEET
CITY OF BRYAN, TEXAS
BRYAN - COULTER AIRFIELD
APRON EXPANSION

JOB NO.
4401.006

PROJECT MGR.
MKG



SHEET
1

PROJECT GENERAL NOTES:

1. AIRPORT INFORMATION:

A. AIRPORT NAME:

BRYAN — COULTER AIRFIELD

B. FAA IDENTIFIER:

CFD

C. AIRPORT CTAF/UNICOM:

123.00

D. AIRPORT OWNER:

CITY OF BRYAN

E. AIRPORT OPERATOR NAME:

BRANDON REID

PHONE NUMBER:

979—209—5233

F. RPR NAME:

TBD

PHONE NUMBER:

TBD
2. DEFINITIONS:

A. NOTICE TO ARMEN (NOTAM):

DEFINED AS A NOTICE CONTAINING INFORMATION (NOT KNOWN SUFFICIENTLY IN ADVANCE TO PUBLICIZE BY OTHER MEANS) CONCERNING THE ESTABLISHMENT, CONDITION, OR CHANGE IN ANY COMPONENT (FACILITY, SERVICE, OR PROCEDURE OF, OR HAZARD IN THE NATIONAL AIRSPACE SYSTEM) THE TIMELY KNOWLEDGE OF WHICH IS ESSENTIAL TO PERSONNEL CONCERNED WITH FLIGHT OPERATIONS. NOTAMS CAN BE VIEWED AT NOTAMS.AIM.FAA.GOV/NOTAMSEARCH

B. OBJECT FREE AREA (OFA):

AN AREA ON THE GROUND CENTERED ON THE RUNWAY, TAXIWAY, OR TAXILANE CENTERLINE PROVIDED TO ENHANCE SAFETY OF AIRCRAFT OPERATIONS BY HAVING THE AREA FREE OF OBJECTS EXCEPT FOR THOSE OBJECTS THAT NEED TO BE LOCATED IN THE OFA FOR AIR NAVIGATION OR AIRCRAFT GROUND MANEUVERING PURPOSES.

C. OBSTACLE FREE ZONE (OFZ):

THE AIRSPACE BELOW 150 FT ABOVE THE ESTABLISHED AIRPORT ELEVATION AND ALONG THE RUNWAY AND EXTENDED RUNWAY CENTERLINE THAT IS REQUIRED TO BE CLEAR OF ALL OBJECTS, EXCEPT FOR FRANGIBLE VISUAL NAVAIDS THAT NEED TO BE LOCATED IN THE OFZ BECAUSE OF THEIR FUNCTION, IN ORDER TO PROVIDE CLEARANCE PROTECTION FOR AIRCRAFT LANDING OR TAKING OFF FROM THE RUNWAY AND FOR MISSED APPROACHES. THE OFZ IS SUBDIVIDED AS FOLLOWS: RUNWAY OFZ (ROFZ), INNER APPROACH OFZ, INNER TRANSITIONAL OFZ, AND PRECISION OFZ (POFZ). REFER TO CURRENT EDITION OF FAA AC NO. 150/5300—13 FOR GUIDANCE ON OFZ.

D. RUNWAY SAFETY AREA (RSA):

A DEFINED SURFACE SURROUNDING THE RUNWAY PREPARED OR SUITABLE FOR REDUCING THE RISK OF DAMAGE TO AIRPLANES IN THE EVENT OF AN UNDERSHOOT, OVERSHOOT, OR EXCURSION FROM THE RUNWAY, IN ACCORDANCE WITH AC 150/5300—13.

E. TAXIWAY SAFETY AREA (TSA):

A DEFINED SURFACE ALONGSIDE THE TAXIWAY PREPARED OR SUITABLE FOR REDUCING THE RISK OF DAMAGE TO AN AIRPLANE UNINTENTIONALLY DEPARTING THE TAXIWAY, IN ACCORDANCE WITH AC 150/5300—13.

3. COMMONLY USED TERMS:

A. AC

— ADVISORY CIRCULAR

B. CFR

— CODE OF FEDERAL REGULATIONS

C. CSPP

— CONSTRUCTION SAFETY AND PHASING PLAN

D. CTAF

— COMMON TRAFFIC ADVISORY FREQUENCY

E. FAA

— FEDERAL AVIATION ADMINISTRATION

F. FOD

— FOREIGN OBJECT DEBRIS

G. RPR

— RESIDENT PROJECT REPRESENTATIVE

H. ROFA

— RUNWAY OBJECT FREE AREA

I. ROFZ

— RUNWAY OBSTACLE FREE ZONE

J. RSA

— RUNWAY SAFETY AREA

K. TOFA

— TAXIWAY/TAXILANE OBJECT FREE AREA

L. TSA

— TAXIWAY/TAXILANE SAFETY AREA

M. TxDOT

— TEXAS DEPARTMENT OF TRANSPORTATION AVIATION DIVISION

4. ALL CONSTRUCTION SHALL COMPLY WITH CURRENT EDITION OF FAA AC NO. 150/5370—2, "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".

5. SEE THE CONTRACT DOCUMENTS AND SPECIFICATION BOOK FOR ADDITIONAL SAFETY REQUIREMENTS.

6. CONTRACTOR SHALL PROVIDE THE ENGINEER A PRELIMINARY PROJECT CONSTRUCTION SCHEDULE BY PHASE AT LEAST 4 DAYS PRIOR TO THE PRE—CONSTRUCTION CONFERENCE. THIS SCHEDULE WILL BE REVIEWED BY TxDOT, AIRPORT OPERATOR, AND ENGINEER, THEN DISCUSSED AT THE PRE—CONSTRUCTION CONFERENCE. A FINAL DETAILED PROJECT SCHEDULE, BROKEN DOWN BY PHASE, IS REQUIRED TO BE SENT TO THE ENGINEER NO LATER THAN 10 CALENDAR DAYS AFTER THE NOTICE TO PROCEED DATE.

7. CONTRACTOR'S PROJECT SCHEDULE SHOULD BE COMPLETED IN MICROSOFT PROJECT OR SIMILAR SCHEDULING SOFTWARE. CONTRACTOR SHALL UPDATE THIS PROJECT SCHEDULE EVERY MONTH AND SUBMIT WITH EACH PAY REQUEST SUBMITTAL. PAY REQUEST WILL NOT BE APPROVED UNTIL AN UPDATED SCHEDULE IS SUBMITTED. THIS IS DONE TO KEEP ALL PARTIES AWARE OF MONTH TO MONTH CONSTRUCTION PROGRESS.
8. CONTRACTOR SHALL NOT USE THE TERMINAL BUILDING NOR ITS RELATED FACILITIES. CONTRACTOR IS RESPONSIBLE FOR PROVIDING HIS OWN TOILET FACILITY.

9. CONTRACTOR IS RESPONSIBLE FOR OBTAINING SUFFICIENT WATER FOR CONSTRUCTION OF PROJECT IMPROVEMENTS.

10. ALL MONUMENTS FOR THIS PROJECT'S HORIZONTAL AND VERTICAL CONTROL ARE SHOWN ON THE "PROJECT LAYOUT" SHEET. CONTRACTOR SHALL VERIFY CONDITION OF ALL MONUMENTS BEFORE CONSTRUCTION BEGINS. CONTRACTOR SHALL PERFORM LEVEL LOOP OF ALL MONUMENTS USED AND PROVIDE RESULTS TO THE ENGINEER BEFORE CONSTRUCTION COMMENCES (NO SEPARATE PAY). ANY MONUMENTS DISTURBED SHALL BE REPLACED TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.

11. UTILITY LINES SHOWN ON THE PLANS ARE SHOWN FOR THE PURPOSE OF MAKING THE CONTRACTOR AWARE THAT THEY EXIST. NEITHER THE RESPECTIVE UTILITY PROVIDERS NOR THE ENGINEER GUARANTEES THE ACCURACY THEREOF.

12. ANY AND ALL EXISTING UTILITY LINES, PAVEMENT, LIGHTING FIXTURES, HANGARS, FENCES, ETC., INTENDED TO REMAIN, WHICH ARE DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AT THE CONTRACTOR'S EXPENSE.

13. ALL CONTRACTOR OPERATIONS WITHIN THE AIRPORT PROPERTY SHALL BE SCHEDULED AND COORDINATED THROUGH THE RPR AND AIRPORT OPERATOR A MINIMUM OF 48 HOURS PRIOR TO COMMENCING OPERATIONS.

14. NOTAM'S WILL BE ISSUED BY THE AIRPORT OPERATOR AS NECESSARY. ONLY THE AIRPORT OPERATOR MAY INITIATE OR CANCEL NOTAMS ON AIRPORT CONDITIONS AND IS THE ONLY ENTITY THAT CAN CLOSE OR OPEN A RUNWAY. THE AIRPORT OPERATOR MUST COORDINATE THE ISSUANCE, MAINTENANCE, AND CANCELLATION OF NOTAMS ABOUT AIRPORT CONDITIONS RESULTING FROM CONSTRUCTION ACTIVITIES WITH TENANTS AND THE LOCAL AIR TRAFFIC FACILITY (CONTROL TOWER, APPROACH CONTROL, OR AIR TRAFFIC CONTROL CENTER), AND MUST EITHER ENTER THE NOTAM INTO NOTAM MANAGER, OR PROVIDE INFORMATION ON CLOSED OR HAZARDOUS CONDITIONS ON AIRPORT MOVEMENT AREAS TO THE FAA FLIGHT SERVICE STATION (FSS) SO IT CAN ISSUE A NOTAM.

15. CONTRACTOR SHALL NOTIFY THE RPR OF AIRPORT/RUNWAY CLOSURES A MINIMUM OF TWO WEEKS IN ADVANCE OF THE CLOSURE.

16. CONTRACTOR SHALL INSTALL CLOSED RUNWAY MARKERS AT EACH RUNWAY END PRIOR TO STARTUP OF ANY WORK LOCATED WITHIN THE ROFZ. CLOSED RUNWAY MARKERS SHALL NOT BE INSTALLED UNTIL THE APPROPRIATE NOTAM CLOSING THE RUNWAY HAS BEEN ISSUED BY THE AIRPORT OPERATOR.

17. ALL AIRFIELD LIGHTING ASSOCIATED WITH A CLOSED RUNWAY SHALL BE TURNED OFF PRIOR STARTUP OF ANY WORK WITHIN THE ROFZ.

18. THE ROFZ IS SHOWN ON THE SHEETS TITLED "PROJECT LAYOUT" AND "CSPP". CONTRACTOR SHALL REFRAIN FROM OPERATING EQUIPMENT AND VEHICLES WITHIN THE LIMITS OF THE ROFZ WHILE RUNWAY IS ACTIVE.

19. IN ACCORDANCE WITH AC 150/5370—2, STOCKPILED MATERIALS AND EQUIPMENT STORAGE ARE NOT PERMITTED WITHIN THE RSA AND ROFZ, AND IF POSSIBLE SHOULD NOT BE PERMITTED WITHIN THE ROFA OF AN OPERATIONAL RUNWAY. THE CONTRACTOR MUST ENSURE THAT STOCKPILED MATERIALS AND EQUIPMENT ADJACENT TO THESE AREAS ARE PROMINENTLY MARKED AND LIGHTED DURING HOURS OF RESTRICTED VISIBILITY OR DARKNESS. THIS INCLUDES DETERMINING AND VERIFYING THAT MATERIALS ARE STABILIZED AND STORED AT AN APPROVED LOCATION SO AS NOT TO BE A HAZARD TO AIRCRAFT OPERATIONS AND TO PREVENT ATTRACTION OF WILDLIFE AND DEVELOPMENT OF FOD.

20. STOCKPILED MATERIAL SHALL BE CONSTRAINED IN A MANNER TO PREVENT MOVEMENT AS A RESULT OF AIRCRAFT BLAST OR WIND. MATERIAL SHALL NOT BE STORED NEAR AIRCRAFT TURNING AREAS OR MOVEMENT AREAS.

21. STOCKPILES SHALL NOT BE PLACED WITHIN ANY WATER OF THE UNITED STATES, INCLUDING WETLANDS.

22. CONTRACTOR SHALL REFRAIN FROM OPERATING EQUIPMENT ON AIRFIELD PAVEMENT (I.E. RUNWAYS, TAXIWAYS, APRON, ETC.) EXCEPT AS ABSOLUTELY NECESSARY TO CONSTRUCT PROJECT IMPROVEMENTS. ANY AREAS DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AT THE CONTRACTOR'S EXPENSE.

23. REMOVED MATERIALS, UNLESS NOTED FOR SALVAGE, SHALL BECOME THE CONTRACTOR'S PROPERTY AND SHALL BE DISPOSED OF OFF—SITE IN ACCORDANCE WITH APPLICABLE LAWS. MATERIALS DESIGNATED FOR SALVAGE SHALL REMAIN THE PROPERTY OF THE AIRPORT OWNER AND SHALL BE DELIVERED, IN GOOD CONDITION, TO A LOCATION ON THE AIRPORT AS DESIGNATED BY THE AIRPORT OPERATOR.

24. WASTE SHALL BE DISPOSED IN A LICENSED LANDFILL. SPOIL SHALL BE PLACED IN UPLANDS FREE OF THREATENED AND ENDANGERED SPECIES.
25. WASTE AND LOOSE MATERIALS, COMMONLY REFERRED TO AS FOD, ARE CAPABLE OF CAUSING DAMAGE TO AIRCRAFT LANDING GEARS, PROPELLERS, AND JET ENGINES. THE CONTRACTOR SHALL NOT LEAVE OR PLACE FOD ON OR NEAR ACTIVE AIRCRAFT MOVEMENT AREAS. FOD TRACKED ONTO THESE AREAS MUST BE CONTINUOUSLY REMOVED BY THE CONTRACTOR DURING CONSTRUCTION.

26. CONTRACTOR SHALL CAREFULLY CONTROL AND CONTINUOUSLY REMOVE FOD THAT MIGHT ATTRACT WILDLIFE.

27. OPEN—FLAME WELDING OR TORCH—CUTTING OPERATIONS SHALL BE PROHIBITED UNLESS ADEQUATE FIRE AND SAFETY PRECAUTIONS ARE PROVIDED AND HAVE BEEN APPROVED BY THE ENGINEER.

28. CONSTRUCTION VEHICLES, CONSTRUCTION EQUIPMENT, OPEN TRENCHES, EXCAVATIONS AND STOCKPILED MATERIAL AT THE CONSTRUCTION SITE SHALL BE PROMINENTLY MARKED WITH 3'X3' ORANGE AND WHITE CHECKERED FLAGS AND FLASHING YELLOW LIGHTS (ACCEPTABLE TO THE AIRPORT OPERATOR AND THE ENGINEER).

29. CONTRACTOR SHALL HAVE A PERSON ON CALL 24 HOURS A DAY FOR EMERGENCY MAINTENANCE OF AIRPORT HAZARDOUS LIGHTING AND BARRICADES. THE CONTRACTOR SHALL SUBMIT A LIST OF EMERGENCY CONTACTS TO THE ENGINEER (IN THE ORDER IN WHICH THEY SHOULD BE CALLED) PRIOR TO THE PRE—CONSTRUCTION CONFERENCE.

30. NO CONSTRUCTION MAY OCCUR WITHIN THE ROFA/TOFA WHILE THE RUNWAY/TAXIWAY IS OPEN FOR AIRCRAFT OPERATIONS.

31. CONTRACTOR MUST PROMINENTLY MARK OPEN TRENCHES AND EXCAVATIONS AT THE CONSTRUCTION SITE WITH RED OR ORANGE FLAGS, AS APPROVED BY THE ENGINEER, AND LIGHT THEM WITH RED LIGHTS DURING HOURS OF RESTRICTED VISIBILITY OR DARKNESS.

32. OPEN TRENCHES OR EXCAVATIONS ARE NOT PERMITTED WITHIN THE RSA/TSA WHILE THE RUNWAY/TAXIWAY IS OPEN. IF THE RUNWAY/TAXIWAY IS OPENED BEFORE EXCAVATIONS ARE BACKFILLED, THE CONTRACTOR SHALL COVER THE EXCAVATIONS APPROPRIATELY. COVERINGS FOR OPEN TRENCHES OR EXCAVATIONS SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT THE WEIGHT OF THE HEAVIEST AIRCRAFT OPERATING ON THE RUNWAY.

33. CONSTRUCTION, INCLUDING EXCAVATIONS, MAY BE PERMITTED IN THE ROFA OF AN OPEN RUNWAY, HOWEVER, EQUIPMENT MUST BE REMOVED FROM THE ROFA WHEN NOT IN USE, AND MATERIAL SHOULD NOT BE STOCKPILED IN THE ROFA.

34. CONTRACTOR SHALL USE HIGHLY REFLECTIVE LOW—PROFILE BARRICADES TO BARRICADE TAXIWAYS LEADING TO CLOSED RUNWAYS, TAXIWAYS, AND/OR APRONS. THE CONTRACTOR SHALL MARK ALL BARRICADES WITH RED LIGHTS, EITHER STEADY BURNING OR FLASHING, AND MUST MEET THE LUMINANCE REQUIREMENTS OF THE TXDOT HIGHWAY DEPARTMENT. BATTERIES POWERING LIGHTS WILL LAST LONGER IF LIGHTS FLASH. LIGHTS MUST BE MOUNTED ON BARRICADES AND SPACED AT NO MORE THAN 10 FEET. LIGHTS MUST BE OPERATED BETWEEN SUNSET AND SUNRISE AND DURING PERIODS OF LOW VISIBILITY WHENEVER THE AIRPORT IS OPEN FOR OPERATIONS. THEY MAY BE OPERATED BY PHOTOCELL, BUT THIS MAY REQUIRE THAT THE CONTRACTOR TURN THEM ON MANUALLY DURING PERIODS OF LOW VISIBILITY DURING DAYTIME HOURS.

35. IN THE EVENT THAT UNANTICIPATED ARCHEOLOGICAL DEPOSITS ARE ENCOUNTERED DURING CONSTRUCTION, WORK IN THE IMMEDIATE AREA WILL CEASE. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER AND TXDOT PROJECT MANAGER, AND THE TXDOT PROJECT MANAGER WILL CONTACT PROFESSIONAL ARCHEOLOGISTS TO INITIATE POST—REVIEW DISCOVERY PROCEDURES UNDER PROVISIONS OF 36 CRF 800.13.

36. IN THE EVENT THAT UNANTICIPATED HAZARDOUS MATERIALS ARE ENCOUNTERED DURING CONSTRUCTION, WORK IN THE IMMEDIATE AREA WILL CEASE AND THE CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER AND TXDOT PROJECT MANAGER.

37. ALL STAGING EQUIPMENT, STOCKPILES, ETC. WILL BE SITED SO THAT NO FAA PART 77 SURFACES OR RUNWAY/TAXIWAY OBJECT FREE AREAS ARE OBSTRUCTED. THE ENGINEER OR AIRPORT MANAGER SHALL BE CONTACTED FOR VERIFICATION.

38. CONTRACTOR IS REQUIRED TO PARTICIPATE IN A PRE—PAVE MEETING INCLUDING AIRPORT, TXDOT, ENGINEER, QA LAB, AND CONTRACTOR'S QC LAB.
- | SHEET INDEX | |
|--------------|--|
| Sheet Number | Sheet Title |
| 1 | TITLE SHEET |
| 2 | GENERAL NOTES, SHEET INDEX, AND LEGEND |
| 3 | TXDOT AIRPORT LAYOUT DRAWING |
| 4 | PROJECT QUANTITIES |
| 5 | BORE LOCATION MAP |
| 6 | BORE LOG DATA - I |
| 7 | BORE LOG DATA - II |
| 8 | PROJECT LAYOUT |
| 9 | HAUL ROUTE |
| 9A | ALTERNATIVE BID NO. 1 - CONSTRUCT, MAINTAIN, AND REMOVE HAUL ROUTE |
| 10 | CSPP NOTES |
| 11 | CSPP (RW OPEN) |
| 12 | CSPP (RW CLOSED) |
| 13 | EROSION CONTROL PLAN |
| 14 | EROSION CONTROL DETAILS |
| 15 | STORMWATER POLLUTION PREVENTION PLAN |
| 16 | PAVEMENT SECTION |
| 17 | PAVEMENT DETAILS |
| 18 | GRADING PLAN - APRON |
| 19 | MARKING PLAN |
| 20 | DETENTION BASIN GRADING |
| 21 | MAIN CHANNEL FL - I |
| 22 | MAIN CHANNEL FL - II |
| 23 | DETENTION BASIN FL - I |
| 24 | DETENTION BASIN FL - II |
| 25 | MARKING DETAILS |
| 26 | GENERAL AND STRUCTURAL DETAILS |
| 27 | SET P-PD-A(I) |
| 28 | SET P-PD-A(II) |
| 29 | ELECTRICAL LAYOUT |
-
- | DATE: | 8/4/2026 | | | | | | | | |
|----------------|----------|--|--|--|--|--|--|--|--|
| REVISIONS | | | | | | | | | |
| ADDENDUM NO. 2 | | | | | | | | | |
| NO. | 1 | | | | | | | | |
- GENERAL NOTES, SHEET INDEX, AND LEGEND
- CITY OF BRYAN, TEXAS
BRYAN - COULTER AIRFIELD
APRON EXPANSION
- JOB NO.

4401.006

PROJECT MGR.

MKG

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SHEET

2
- EXISTING FEATURES LEGEND
- | SYMBOLS: | DESCRIPTION: | SYMBOLS: | DESCRIPTION: | SYMBOLS: | DESCRIPTION: | SYMBOLS: | DESCRIPTION: | SYMBOLS: | DESCRIPTION: |
|----------|--------------------------|----------|-----------------------------|----------|-------------------|----------|---|----------|-------------------|
| | BARBED WIRE FENCE | | UNDERGROUND ELECTRICAL LINE | | CONCRETE MONUMENT | | METER POLE OR LIGHT | | WATER METER |
| | BOARD FENCE | | GAS LINE | | FIRE HYDRANT | | UTILITY POLE | | WATER VALVE |
| | CHAIN LINK FENCE | | SEWER LINE | | GAS METER | | GUY WIRE | | SPRINKLER HEAD |
| | DITCH | | WATER LINE | | GAS RISER | | SHRUB/BUSH/HEDGES | | IRRIGATION VALVE |
| | RAILROAD CROSSING | | TOP/TOE OF SLOPE | | GAS VALVE | | TREE (CANOPY NOT MEASURED UNLESS SHOWN OTHERWISE) | | SURVEY CONTROL |
| | TELEPHONE LINE | | FIBER OPTIC LINE | | MAILBOX | | STORM SEWER MANHOLE | | TBM BENCHMARK |
| | OVERHEAD ELECTRICAL LINE | | BRUSH | | STREET SIGN | | TELEPHONE PEDESTAL | | ASPHALT PAVEMENT |
| | | | IRON PIPE OR ROD | | CLEANOUT | | TELEPHONE RISER | | CONCRETE PAVEMENT |
| | | | | | SEWER MANHOLE | | TELEPHONE MANHOLE | | GRAVEL PAVEMENT |
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STATE OF TEXAS MOLLY KATE GOFF 152281 LICENSED PROFESSIONAL ENGINEER 8/4/26					
DATE: 8/4/2026					
REVISIONS					
ADDENDUM NO. 2					
NO. 1					
PROJECT QUANTITIES					
CITY OF BRYAN, TEXAS					
BRYAN - COULTER AIRFIELD					
APRON EXPANSION					
JOB NO. 4401.006					
PROJECT MGR. MKG					
SA STRAND ASSOCIATES®					
SHEET 4					

ITEM NO.	FAA or TxDOT ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY	FINAL QUANTITY
BASE BID –APRON EXPANSION, DETENTION BASIN, AND OUTFALL STRUCTURE					
1.	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	LS	1	
2.	C-105	Mobilization	LS	1	
3.	L-108	No. 6 AWG, Solid, Bare Counterpoise Wire, Installed in a Trench, Above the Conduit, Including Ground Rods and Connectors	LF	1700	
4.	L-108	AWOS Cabling (16~Conductor Underground-Rated-Gel-Filled, Shielded Multiconductor Signal Cable.)	LF	1000	
5.	L-108	AWOS Cabling (4~Conductor Underground-Rated-Gel-Filled, Shielded Multiconductor Signal Cable.)	LF	1000	
6.	L-108	AWOS Cabling (3~#12 THWN-2 Conductors for 120 Volt Power)	LF	500	
7.	L-108	Windcone Cabling (1~#6 THWN-2)	LF	3600	
8.	L-110	Non-Encased, Electrical PVC Conduit (Type I), 2-Inch in a Single Trench	LF	850	
9.	L-110	Concrete-Encased, Electrical PVC Conduit (Type I), 2-Inch in a Single Trench	LF	350	
10.	L-110	Non-Encased, Electrical PVC Conduit (Type I), 1-Inch in a Single Trench	LF	950	
11.	L-110	Concrete-Encased, Electrical PVC Conduit (Type I), 1-Inch in a Single Trench	LF	1,550	
12.	L-115	L-867 Can (Size B) (In Concrete) for Junction Box	EA	3	
13.	P-620	Reflectorized Pavement Marking	SF	2,135	
14.	P-620	Retroreflective Markers (L-853)(Type I)(Style II)	EA	40	
15.	P-620	Tie Down Label Markings	EA	28	
16.	Special	Tie Down Anchor	EA	18	
17.	Section 32 00 00	Maintain and Rehabilitate Haul Route	LS	1	
18.	Special	Outfall Structure (Class C Concrete)(Grade 60 Reinforcement Steel)	LS	1	
19.	Special	Detention Basin Pilot Channel (Class A Concrete)	SY	575	
20.	Special	Install Runway Closure Markers	LS	1	
21.	Special	Permeant Turf Reinforcement Mat	SY	460	
22.	TxDOT 110	Excavation (Special)	CY	19,000	
23.	TxDOT 132	Embankment (FNL)(DC)(TY D)	CY	18,200	
24.	TxDOT 160	Furnishing and Placing Topsoil	SY	24,000	
25.	TxDOT 164	Broadcast Seeding (Perm)(Rural)	SY	24,000	
26.	TxDOT 169	Soil Retention Blanket (Mod)(Clay)(Long)	SY	10,250	
27.	TxDOT 247	Flexible Base (Complete in Place)(15 Inches)(Type A, Grade 1-2)	SY	12,800	
28.	TxDOT 260	Lime Treatment (Subgrade)(10 Inches)	SY	13,600	
29.	TxDOT 260	Commercial or Quicklime (Slurry)(6 Percent)(Based on Dry Weight)	TON	335	
30.	TxDOT 310	Prime Coat (MC-30 at 0.15 GAL/SY)	GAL	1,890	
31.	TxDOT 341	Tack Coat (at 0.10 GAL/SY)	GAL	1,260	
32.	TxDOT 341	Dense-Graded Hot Mix Asphalt (PG 64-22)(Type D)(1.5 Inches)	TON	1,040	
33.	TxDOT 341	Dense-Graded Hot Mix Asphalt (PG 64-22)(Type C)(2.5 Inches)	TON	1,730	
34.	TxDOT 432	Riprap (Stone TYP R)(Dry)(12 Inches)	CY	15	
35.	TxDOT 464	Reinforced Concrete Pipe (ARCH)(CL III)(DES 7)	LF	35	
36.	TxDOT 465	3-Foot-8-Inch by 7-Foot-4-Inch Junction Box, With 4-Foot by 7-Foot-6-Inch High Capacity Inlet Frame	EA	1	
37.	TxDOT 467	Safety End Treatment (TY II)(DES 7)(RCP)(4:1)(C)	EA	1	
ALTERNATIVE BID NO. 1–CONSTRUCT, MAINTAIN, AND REMOVE HAUL ROUTE					
A1.1	Section 32 00 00	Maintain and Rehabilitate Haul Route	LS	-1	
A1.2	Section 32 00 00	Construct, Maintain, and Remove Haul Route	LS	1	

1

PAY ITEM NOTES:

1.

FAA/TxDOT ITEMS DENOTED AS "SPECIAL" REFERENCE PLAN SHEET DETAILS AND/OR NOTES ONLY, AND DO NOT REFERENCE ANY SPECIFICATION INCLUDED IN THE CONTRACT DOCUMENTS.

2.

ITEMS NOT SPECIFICALLY LISTED ON THE BID FORM ARE CONSIDERED SUBSIDIARY TO RELATED ITEMS OF WORK.

MAJOR WORK ITEM DESCRIPTIONS	
1 LIMITS OF APRON PAVEMENT.	
2 LIMITS OF SEEDING.	
3 DITCH IMPROVEMENTS.	

PRIMARY AIRPORT
CONTROL STATION (PAC)
PID=AB2832 PAC

ELEV.=352.8

LOCATION: STEEL ROD IN SLEEVE
ON TOP OF A CUT, 685.0 FT
SOUTHWEST OF THE CENTER OF
THE RUNWAY, 111.9 FT NORTHEAST
OF THE TAXI CENTERLINE
(CONTRACTOR SHALL VERIFY).

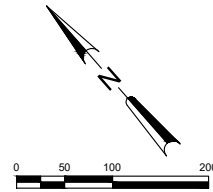
SECONDARY AIRPORT
CONTROL STATION (SAC)
PID=BM1085 SAC

ELEV.=359.31

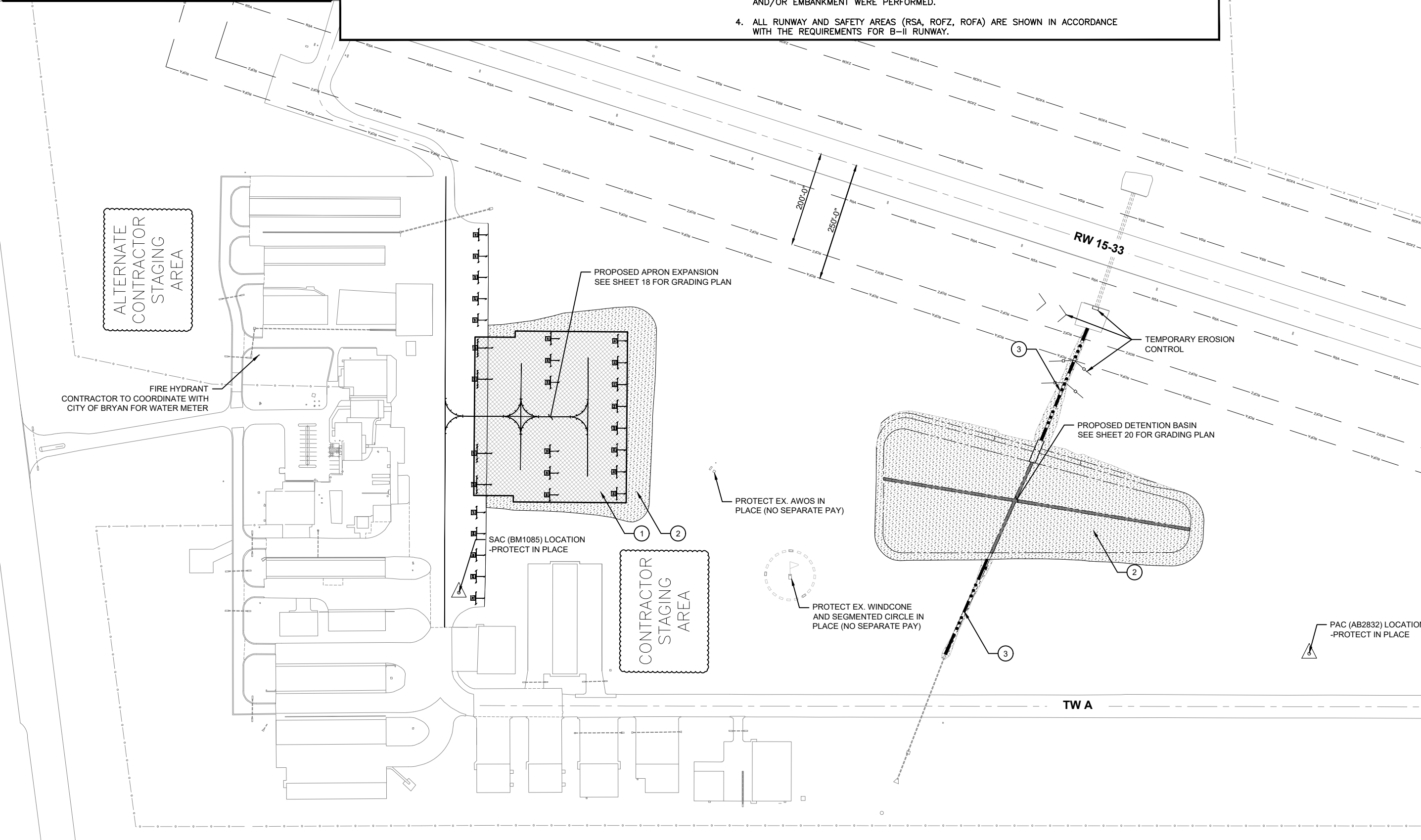
LOCATION: STEEL NAIL IN
SOUTHWEST CORNER OF APRON
PAVEMENT, 28.2 FT SOUTHEAST
FROM TAXIWAY CENTERLINE
(CONTRACTOR SHALL VERIFY).

NOTE:

- CONTRACTOR SHALL PERFORM LEVEL LOOP OF ALL BENCHMARKS AND PROVIDE RESULTS TO ENGINEER BEFORE BEGINNING CONSTRUCTION (NO SEPARATE PAY).
- CONTRACTOR SHALL PROTECT IN PLACE PAC AND SAC THROUGHOUT THE DURATION OF CONSTRUCTION. IF IT APPEARS CONSTRUCTION ACTIVITIES WILL REQUIRE DISTURBING THE PAC OR SAC, COORDINATE WITH THE ENGINEER PRIOR TO ANY OF THESE ACTIVITIES.
- IN THE EVENT THE CONTRACTOR WOULD LIKE TO PROTEST EXCAVATION OR EMBANKMENT QUANTITIES, CONTRACTOR SHALL PERFORM SURVEY, STAMPED BY AN RPLS, OF THE PRE-CONSTRUCTION SITE CONDITIONS WHERE EXCAVATION AND/OR EMBANKMENT WILL BE PERFORMED, AS WELL AS PERFORM SURVEY, STAMPED BY AN RPLS, OF THE POST-CONSTRUCTION SITE CONDITIONS WHERE EXCAVATION AND/OR EMBANKMENT WERE PERFORMED.
- ALL RUNWAY AND SAFETY AREAS (RSA, ROFZ, ROFA) ARE SHOWN IN ACCORDANCE WITH THE REQUIREMENTS FOR B-II RUNWAY.



DATE:	8/4/2026
REVISIONS	
ADDENDUM NO. 2	
NO.	1



PROJECT LAYOUT
CITY OF BRYAN, TEXAS
BRYAN - COULTER AIRFIELD
APRON EXPANSION

JOB NO.
4401.006

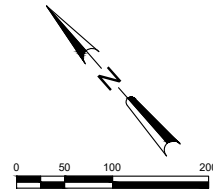
PROJECT MGR.
MKG


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HAUL ROUTE NOTES:

- ALL MATERIALS AND LABOR FOR THE HAUL ROUTE SHALL BE PAID FOR UNDER BID ITEM "CONSTRUCT, MAINTAIN, AND REMOVE HAUL ROUTE."
- CONTRACTOR SHALL HAVE FLAGGING PERSONNEL, WITH RADIOS, AT ALL TIMES WHILE HAULING OPERATIONS ARE BEING CONDUCTED (NO SEPARATE PAY).
- CONTRACTOR SHALL PROVIDE 3/4" STEEL PLATE TO PROTECT TAXIWAY ASPHALT SURFACE. (NO SEPARATE PAY)
- CONTRACTOR SHALL COORDINATE WITH ENGINEER AND OWNER IF HAUL ROUTE VARIES FROM WHAT IS SHOWN.
- CONTRACTOR SHALL PROTECT PAVEMENT, HANGARS, FENCE, AIRPORT STRUCTURES, AND ELECTRICAL ITEMS IN PLACE. (NO SEPARATE PAY)
- CONTRACTOR TO RESTORE AIRPORT FENCE AND WALLIS ROAD DITCH. (NO SEPARATE PAY)



DATE:	8/4/2026
REVISIONS	
ADDENDUM NO. 2	
NO.	1

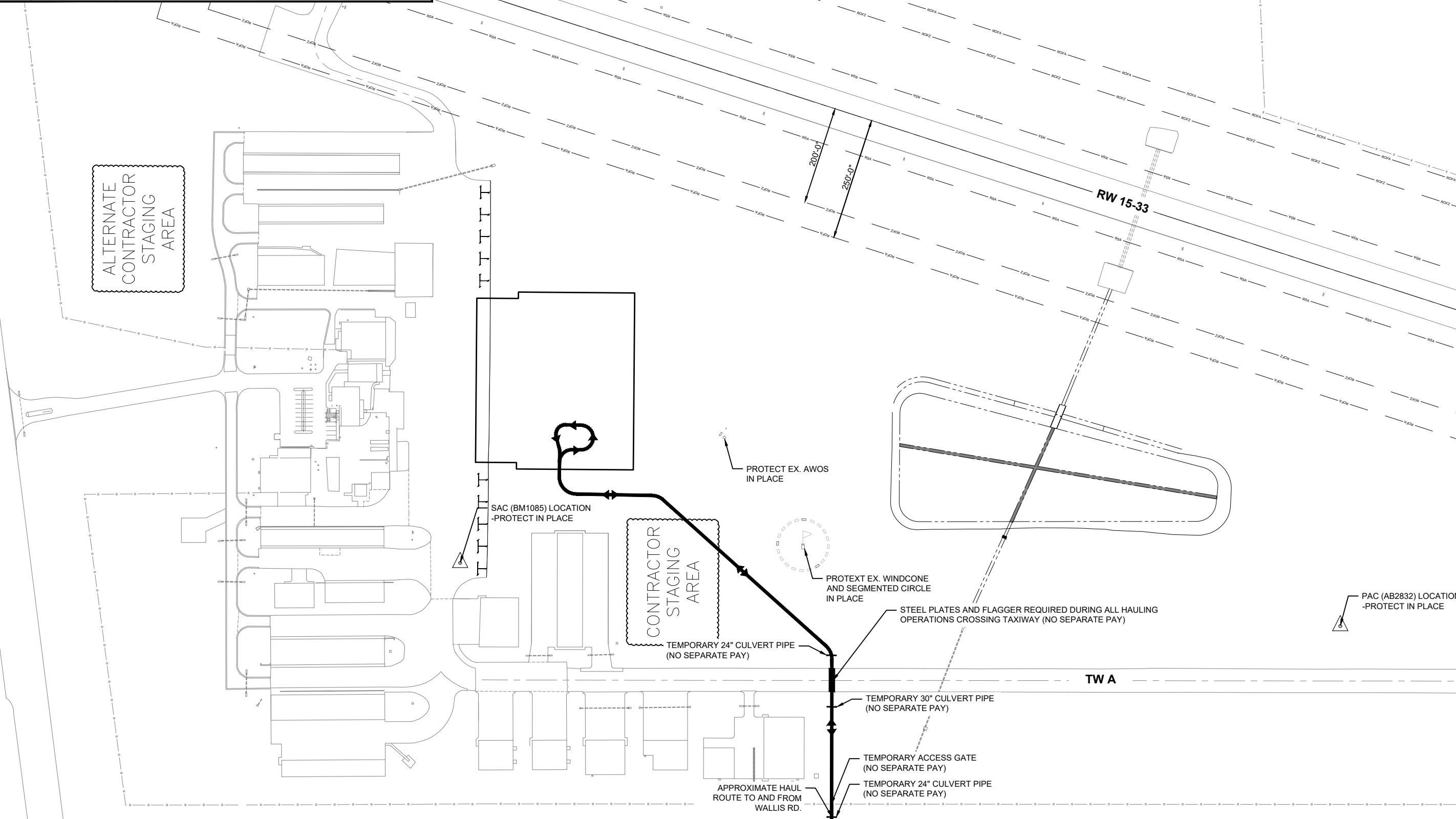
ALTERNATIVE BID NO. 1
CONSTRUCT, MAINTAIN, AND REMOVE HAUL ROUTE

CITY OF BRYAN, TEXAS
BRYAN - COULTER AIRFIELD
APRON EXPANSION

JOB NO.
4401.006
PROJECT MGR.
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GENERAL PHASING NOTES:

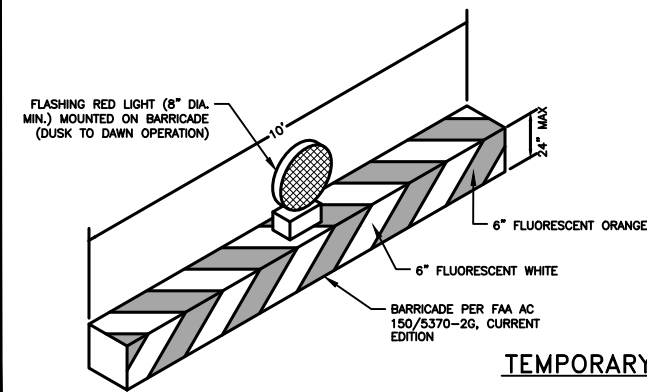
1. TEMPORARY LOW-PROFILE BARRICADES SHALL BE USED AS NECESSARY DURING CONSTRUCTION TO SAFELY DIRECT PILOTS TO AND FROM THE RUNWAY AND ON THE APRON. SEE "PROJECT GENERAL NOTES" FOR MORE INFORMATION ON AIRPORT CONSTRUCTION SAFETY.
2. THESE CONSTRUCTION PHASES ARE PRELIMINARY. CONTRACTOR SHALL PROVIDE THE ENGINEER A PRELIMINARY PROJECT CONSTRUCTION SCHEDULE, BY PHASE, AT LEAST 4 DAYS PRIOR TO THE PRE-CONSTRUCTION CONFERENCE. THIS SCHEDULE WILL BE REVIEWED BY TXDOT, AIRPORT OPERATOR, AND ENGINEER, THEN DISCUSSED AT THE PRE-CONSTRUCTION CONFERENCE. A FINAL DETAILED PROJECT SCHEDULE, BROKEN DOWN BY PHASE, IS REQUIRED TO BE SENT TO THE ENGINEER NO LATER THAN 10 CALENDAR DAYS AFTER THE NOTICE TO PROCEED DATE.
3. WHEN THE RUNWAY IS ACTIVE, CONTRACTOR SHALL ENSURE ALL CONSTRUCTION TRAFFIC OPERATORS VERIFY THE PRESENCE OF AN AIRCRAFT ON APPROACH TO OR DEPARTURE FROM A RUNWAY PRIOR TO DRIVING AROUND THE RUNWAY END. IF AN AIRCRAFT IS PRESENT, CONSTRUCTION TRAFFIC SHALL HOLD AT A POINT PERPENDICULAR TO THE RUNWAY END, OUTSIDE THE ROFZ, UNTIL THE AIRCRAFT HAS COMPLETED ITS MOVEMENT.
4. ALL HANGAR OWNERS/TENANTS SHALL BE NOTIFIED BY THE AIRPORT OPERATOR A MINIMUM OF 2 WEEKS PRIOR TO START OF CONSTRUCTION TO ALLOW RELOCATION OF AIRCRAFT. CONTRACTOR SHALL GIVE THE AIRPORT OPERATOR SUFFICIENT NOTICE TO BEGIN CONTACTING HANGAR OWNERS/TENANTS.
5. RUNWAY CLOSURE MARKERS SHALL BE INSTALLED/REMOVED AS NEEDED BASED ON WORK BEING PERFORMED WITHIN THE ROFZ. SEE "PROJECT GENERAL NOTES" FOR MORE INFORMATION ON AIRPORT CONSTRUCTION SAFETY.
6. PHASING SHOWN DOES NOT REFLECT CURE PERIODS THAT MAY BE NECESSARY BETWEEN OR DURING PHASES.
7. ALL WORK WITHIN THE ROFA SHALL STAY UNDER 15 FEET VERTICALLY, FROM EXISTING GROUND.
8. RW CLOSURE SHALL BE LIMITED TO MONDAY THROUGH THURSDAY. RW SHALL REMAIN OPEN ON FRIDAYS THROUGH SUNDAYS.

PHASE I CONSTRUCTION ACTIVITIES (RW 15-33 OPEN)

1. HOLD PRE-CONSTRUCTION CONFERENCE AND RECEIVE NOTICE TO PROCEED FROM TXDOT.
2. INSTALL CONTRACTOR STAGING AREA, CONSTRUCTION EXIT, AND TEMPORARY SEDIMENT CONTROL DEVICES.
3. PERFORM GRADING ACTIVITIES OUTSIDE THE ROFA AND INSTALL ADDITIONAL TEMPORARY EROSION CONTROL DEVICES AS GRADING WORK PROGRESSES.
4. PRIOR TO ANY PAVING ACTIVITIES, CONTRACTOR SHALL POTHOLE EXISTING AWOS UTILITIES TO DETERMINE IF THE CABLES ARE DIRECT BURIED OR INSTALLED IN CONDUIT. CONTRACTOR SHALL INSTALL NEW CABLES IF NEEDED IN ACCORDANCE WITH SHEET 29.
5. CONSTRUCT APRON EXPANSION. MATERIAL FROM THE PROPOSED DETENTION POND SHALL BE USED TO CONSTRUCT APRON EXPANSION.
6. HOLD PRE-PAVE MEETING AT AIRPORT PRIOR TO PLACING PAVEMENT.

PHASE III CONSTRUCTION ACTIVITIES (RW 15-33 OPEN)

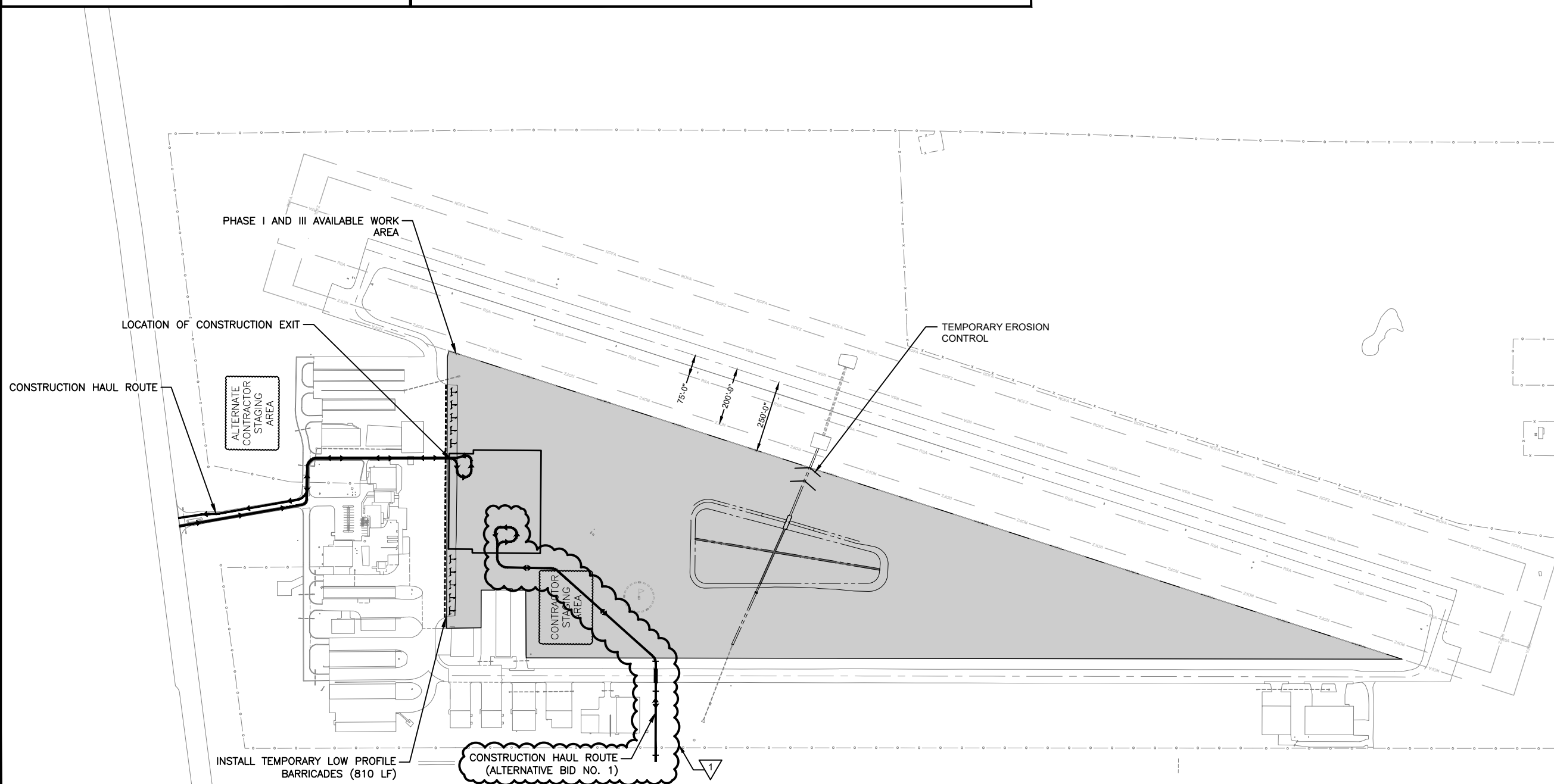
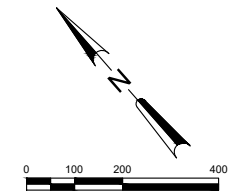
1. COMPLETE GRADING AND SEEDING.
2. COMPLETE STRIPING AND RETROREFLECTORS.
3. REGRADE CONTRACTOR STAGING AREA, COMPLETE SEEDING OPERATIONS TO REESTABLISH VEGETATIVE GROWTH IN THE STAGING AREA (NO SEPARATE PAY), AND REPAIR HAUL ROUTE PAVEMENT (SUBSIDIARY TO OTHER ITEMS OF WORK).
4. HOLD FINAL INSPECTION MEETING AND COMPLETE PUNCH LIST ITEMS.



NOTES:

1. BARRICADES SHALL BE SPACED WITH LIGHTING NOT EXCEEDING 20' ON CENTER, AND SPACING BETWEEN BARRICADES NOT EXCEEDING 10'.
2. FLUORESCENT ORANGE AND WHITE STRIPES SHALL BE ON THREE SIDES OF BARRICADE.
3. LOCATIONS FOR TEMPORARY BARRICADES ARE SHOWN ON THIS SHEET. LOCATIONS FOR BARRICADES SHOWN ARE A MINIMUM. CONTRACTOR SHOULD MAKE HIS OWN DETERMINATION AS TO LOCATION OF ADDITIONAL BARRICADES TO PROTECT WORK AND TO CONTROL THE FLOW OF AIRPLANE TRAFFIC.
4. USE OF RAILROAD TIES ARE NOT ALLOWED FOR TEMPORARY BARRICADES.

TEMPORARY LOW-PROFILE BARRICADE DETAIL



DATE:	8/4/2026
REVISIONS	ADDENDUM NO. 2
NO.	1

CSPP (RW OPEN)

CITY OF BRYAN, TEXAS
BRYAN - COULTER AIRFIELD
APRON EXPANSION

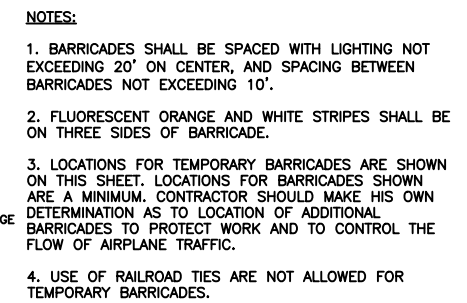
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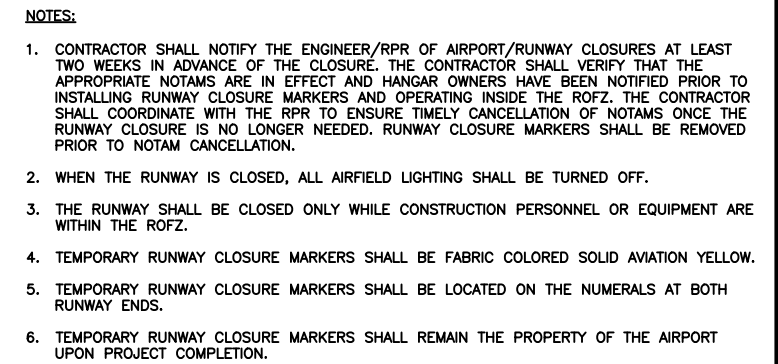
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1. TEMPORARY LOW-PROFILE BARRIERS SHALL BE USED AS NECESSARY, DURING CONSTRUCTION TO SAFELY DIRECT PILOTS TO AND FROM THE RUNWAY AND ON THE APRON. SEE "PROJECT GENERAL NOTES" FOR MORE INFORMATION ON AIRPORT CONSTRUCTION SAFETY.
2. THESE CONSTRUCTION PHASES ARE PRELIMINARY. CONTRACTOR SHALL PROVIDE THE ENGINEER A PRELIMINARY PROJECT CONSTRUCTION SCHEDULE, BY PHASE, AT LEAST 4 DAYS PRIOR TO THE PRE-CONSTRUCTION CONFERENCE. THIS SCHEDULE WILL BE REVIEWED BY TxDOT, AIRPORT OPERATOR, AND ENGINEER, THEN DISCUSSED AT THE PRE-CONSTRUCTION CONFERENCE. A FINAL DETAILED PROJECT SCHEDULE, BROKEN DOWN BY PHASE, IS REQUIRED TO BE SENT TO THE ENGINEER NO LATER THAN 10 CALENDAR DAYS AFTER THE NOTICE TO PROCEED DATE.
3. WHEN THE RUNWAY IS ACTIVE, CONTRACTOR SHALL ENSURE ALL CONSTRUCTION TRAFFIC OPERATORS VERIFY THE PRESENCE OF AN AIRCRAFT ON APPROACH TO OR DEPARTURE FROM A RUNWAY PRIOR TO DRIVING AROUND THE RUNWAY END. IF AN AIRCRAFT IS PRESENT, CONSTRUCTION TRAFFIC SHALL HOLD AT A POINT PERPENDICULAR TO THE RUNWAY END, OUTSIDE THE ROFZ, UNTIL THE AIRCRAFT HAS COMPLETED ITS MOVEMENT.
4. ALL HANGAR OWNERS/TENANTS SHALL BE NOTIFIED BY THE AIRPORT OPERATOR A MINIMUM OF 2 WEEKS PRIOR TO START OF CONSTRUCTION TO ALLOW RELOCATION OF AIRCRAFT. CONTRACTOR SHALL GIVE THE AIRPORT OPERATOR SUFFICIENT NOTICE TO BEGIN CONTACTING HANGAR OWNERS/TENANTS.
5. RUNWAY CLOSURE MARKERS SHALL BE INSTALLED/REMOVED AS NEEDED BASED ON WORK BEING PERFORMED WITHIN THE ROFZ. SEE "PROJECT GENERAL NOTES" FOR MORE INFORMATION ON AIRPORT CONSTRUCTION SAFETY.
6. PHASING SHOWN DOES NOT REFLECT CURE PERIODS THAT MAY BE NECESSARY BETWEEN OR DURING PHASES.
7. ALL WORK WITHIN THE ROFA SHALL STAY UNDER 15 FEET VERTICALLY, FROM EXISTING GROUND.
8. RW CLOSURE SHALL BE LIMITED TO MONDAY THROUGH THURSDAY. RW SHALL REMAIN OPEN ON FRIDAYS THROUGH SUNDAYS.

1. A NOTAM MUST BE FILED PRIOR TO CLOSING RW 15-33.
2. CLOSE RW 15-33.
3. DE-ENERGIZE RW MIRLs AND PAPIs.
4. INSTALL TEMPORARY SEDIMENT CONTROL DEVICES WITHIN THE ROFA.
5. PERFORM GRADING ACTIVITIES INSIDE THE ROFA.
6. PERFORM SEEDING AND/OR SODDING INSIDE THE ROFA AND CONTINUE WATERING THESE AREAS TO ESTABLISH VEGETATIVE GROWTH AS NEEDED DURING CLOSURE.
7. REOPEN RW AND RE-ENERGIZE MIRLs AND PAPIs



TEMPORARY LOW-PROFILE BARRICADE DETAIL



TEMPORARY RUNWAY
CLOSURE MARKER



DATE:	8/4/2026	
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ADDENDUM NO. 2

NO.	1
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CSPP (RW CLOSED)

**BRYAN - COULTER AIRFIELD
APRON EXPANSION**

JOB NO.
4401.006

SUBJECT MGR.
MKG



SHEET
12

SITE DESCRIPTION

PROJECT LIMITS: THE PROJECT WILL BE CONFINED TO THE BRYAN - COULTER AIRFIELD PROPERTY.
LATITUDE: N 30° 42' 56.50" LONGITUDE: W 96° 19' 52.90"

PROJECT DESCRIPTION:

BASE BID:
CONSTRUCT APRON EXPANSION, DETENTION BASIN, AND OUTLET STRUCTURE.

ALTERNATIVE BID NO. 1:
CONSTRUCT, MAINTAIN, AND REMOVE HAUL ROUTE

SOIL STABILIZATION PRACTICES:

- TEMPORARY SEEDING
- PERMANENT PLANTING, SODDING, OR SEEDING
- MULCHING
- SOIL RETENTION BLANKET
- BUFFER ZONES
- PRESERVATION OF NATURAL RESOURCES

OTHER:
DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME AND BE COMPLETED WITHIN 21 DAYS.

STRUCTURAL PRACTICES:

- SILT FENCES
- HAY BALES
- ROCK BERMS
- DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- DIVERSION DIKE AND SWALE COMBINATIONS
- PIPE SLOPE DRAINS
- PAVED FLUMES
- ROCK BEDDING AT CONSTRUCTION EXIT
- TIMBER MATTING AT CONSTRUCTION EXIT
- CHANNEL LINERS
- SEDIMENT TRAPS
- SEDIMENT BASINS
- STORM INLET SEDIMENT TRAP
- STONE OUTLET STRUCTURES
- CURBS AND GUTTERS
- STORM SEWERS
- VELOCITY CONTROL DEVICES

OTHER:

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:
ALL WORK TO BE PERFORMED BY THE CONTRACTOR(S)
REFER TO THE SHEETS TITLED "PROJECT LAYOUT", AND "EROSION CONTROL PLAN".

STORM WATER MANAGEMENT:
STORMWATER DRAINAGE WILL BE PROVIDED BY OVERLAND SHEET FLOW, DITCHES, CULVERTS, AND/OR OTHER EXISTING DRAINAGE STRUCTURES.

EROSION AND SEDIMENT CONTROLS

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE:
ALL EROSION AND SEDIMENT CONTROLS WILL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT WILL BE DONE AT THE EARLIEST DATE POSSIBLE, BUT NO LATER THAN 7 CALENDAR DAYS AFTER THE SURROUNDING EXPOSED GROUND HAS DRIED SUFFICIENTLY TO PREVENT DAMAGE FROM HEAVY EQUIPMENT. THE AREAS ADJACENT TO CREEKS AND DRAINAGE WAYS SHALL HAVE PRIORITY FOLLOWED BY DEVICES USED FOR SILT REDUCTION IN THE DISTURBED AREAS.

INSPECTION:
AN INSPECTION WILL BE PERFORMED BY A RESIDENT PROJECT REPRESENTATIVE EVERY 7 DAYS AND AFTER MORE THAN 1/2-INCH RAINFALL EVENT. AN INSPECTION REPORT WILL BE MADE PER EACH INSPECTION. BASED ON THE INSPECTION RESULTS, THE CONTROLS SHALL BE REVISED PER THE INSPECTION REPORT.

WASTE MATERIALS:
ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER. THE DUMPSTER WILL MEET ALL STATE AND LOCAL SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER WILL BE EMPTIED AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION AT AN APPROVED LANDFILL. NO CONSTRUCTION WASTE MATERIAL WILL BE BURIED ON SITE.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING):
AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, AND CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS, THE SPILL COORDINATOR AND TxDOT PROJECT MANAGER SHALL BE CONTACTED IMMEDIATELY.

SANITARY WASTE:
ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION.

OFFSITE VEHICLE TRACKING:
HAUL ROADS DAMPENED FOR DUST CONTROL
LOADED HAUL TRUCKS TO BE COVERED WITH TARPULIN
EXCESS DIRT ON ROAD REMOVED DAILY
STABILIZED CONSTRUCTION ENTRANCE

OTHER:
REMARKS:
DISPOSAL AREAS, STOCKPILES, AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT MAY ENTER RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLANDS, WATERBODY OR STREAMBED. CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS. ALL WATERWAYS SHALL BE CLEARED AS SOON AS PRACTICAL OF TEMPORARY EMBANKMENT, TEMPORARY BRIDGES, MATTING, FALSEWORK, PILING, DEBRIS OR OTHER OBSTRUCTIONS PLACED DURING CONSTRUCTION OPERATION THAT ARE NOT A PART OF THE FINISHED WORK.

PROJECTS WITH 5 ACRES OR MORE OF SOIL DISTURBANCE INCLUDING REQUIRED ASSOCIATED PSL's PER TPDES GP TXR 150000:
THE ENGINEER WILL FILE A NOTICE OF INTENT (NOI) AND A NOTICE OF TERMINATION (NOT) ALONG WITH OTHER REQUIREMENTS PER TPDES GP TXR 150000 AS THE ENTITY HAVING OPERATIONAL CONTROL OVER CONSTRUCTION PLANS AND SPECIFICATIONS FOR WORK SHOWN ON THE SWP3, AS PROVIDED IN THE PLANS AND SPECIFICATIONS, IN THE AIRPORT. THE DEPARTMENT WILL BE CONSIDERED AN OPERATOR UNDER THE TPDES GP TXR 150000 AND RESPONSIBLE FOR PART III, SECTION B.1. OPERATORS WITH CONTROL OVER PLANS AND SPECIFICATIONS OF THE TDPES GP TXR 150000.

THE CONTRACTOR WILL BE CONSIDERED AN OPERATOR UNDER THE TPDES GP TXR 150000 AND RESPONSIBLE FOR PART III, SECTION B.2. OPERATORS WITH DAY-TO-DAY OPERATIONAL CONTROL, OF THE TPDES GP TXR 150000 FOR CONSTRUCTION IN THE RIGHT OF WAY. IN ADDITION TO THE DEPARTMENTS'S FILING, THE CONTRACTOR SHALL FILE A NOTICE OF INTENT (NOI) AND NOTICE OF TERMINATION (NOT) ALONG WITH OTHER REQUIREMENTS AS THE ENTITY OF HAVING DAY-TODAY OPERATIONAL CONTROL OF THE CONSTRUCTION ACTIVITIES IN THE AIRPORT. THIS IS IN ADDITION TO THE CONTRACTOR BEING RESPONSIBLE FOR THE TPDES GP TXR 15000 AND PART III, SECTION B.1. AND B.2. REQUIREMENTS FOR ON- RIGHT OF WAY AND OFF- RIGHT OF WAY PROJECT SPECIFIC LOCATIONS. ADHERE TO ALL REQUIREMENTS OF THE SW3P AS PROVIDED IN THE PLANS AND SPECIFICATIONS.



DATE:	8/4/2026								
REVISIONS									
ADDENDUM NO. 2									
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STORMWATER POLLUTION PREVENTION PLAN

CITY OF BRYAN, TEXAS
BRYAN - COULTER AIRFIELD
APRON EXPANSION

JOB NO.

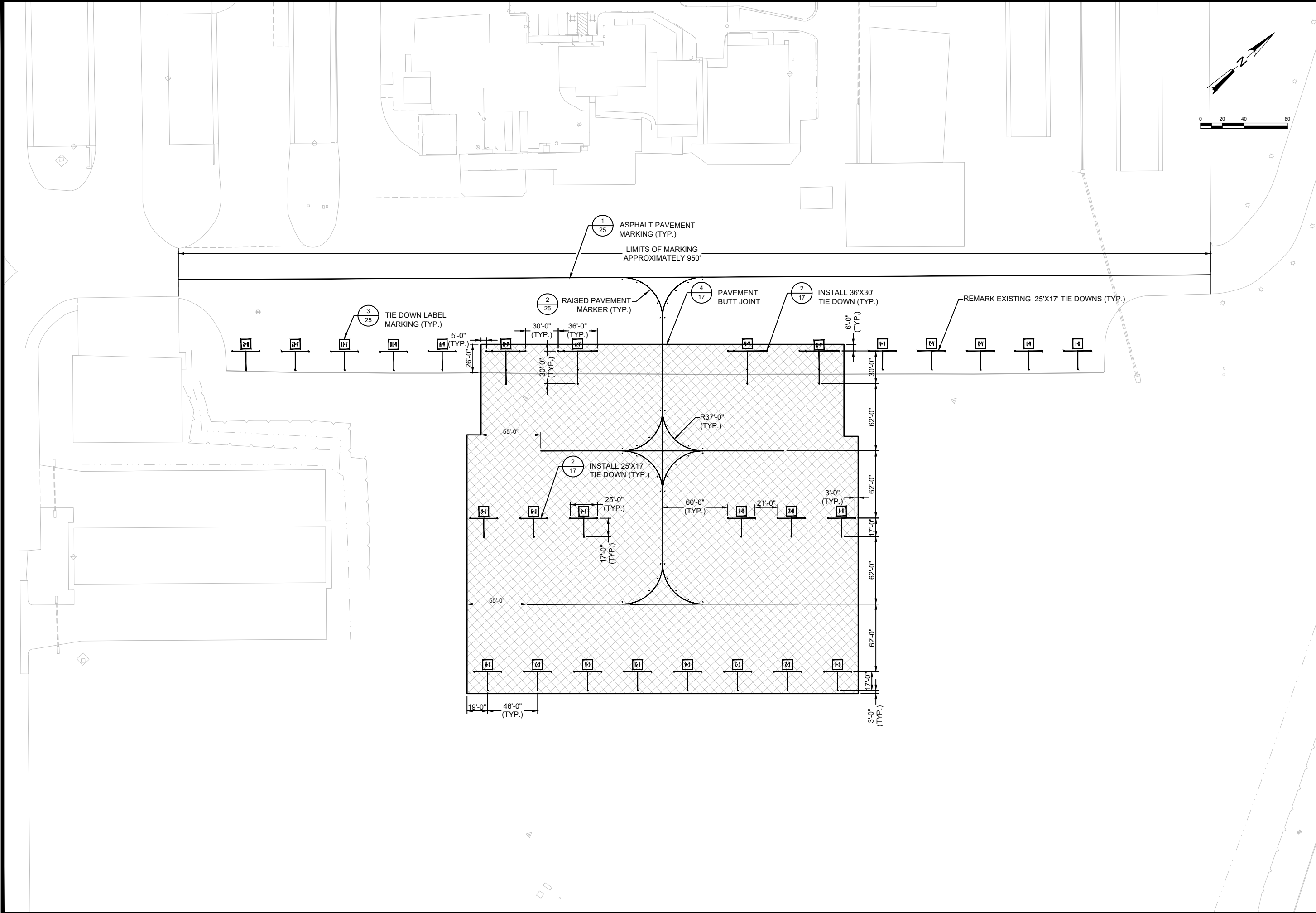
4401.006

PROJECT MGR.

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STATE OF TEXAS
MOLLY KATE GOFF
152281
LICENSED
PROFESSIONAL ENGINEER
Molly Kate Goff
8/4/26

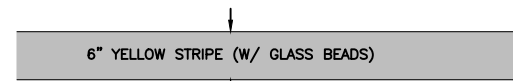
DATE:	8/4/2026
REVISIONS	
ADDENDUM NO. 2	
NO.	1

MARKING PLAN
CITY OF BRYAN, TEXAS
BRYAN - COULTER AIRFIELD
APRON EXPANSION

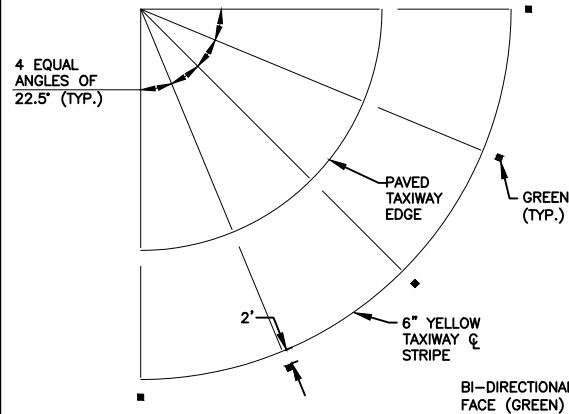
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19

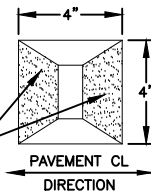


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NTS TAXIWAY CENTERLINE MARKING



RETROREFLECTOR
PLACEMENT ON CURVES
NTS

- NOTES:
1. ON TAXIWAYS ORIENTED PARALLEL TO THE RUNWAY AND ON TAXIWAY CURVES, GREEN CENTERLINE MARKERS SHALL BE PLACED 2' FROM THE CENTERLINE TOWARDS THE RUNWAY SIDE. ON TAXIWAYS ORIENTED PERPENDICULAR TO THE RUNWAY, GREEN CENTERLINE MARKERS SHALL BE PLACED 2' FROM THE CENTERLINE ON THE SIDE SHOWN ON THE MARKING PLAN SHEETS.
 2. REFLECTORS SHALL BE GREEN AND CONFORM TO (L-853), TYPE 1, STYLE II.

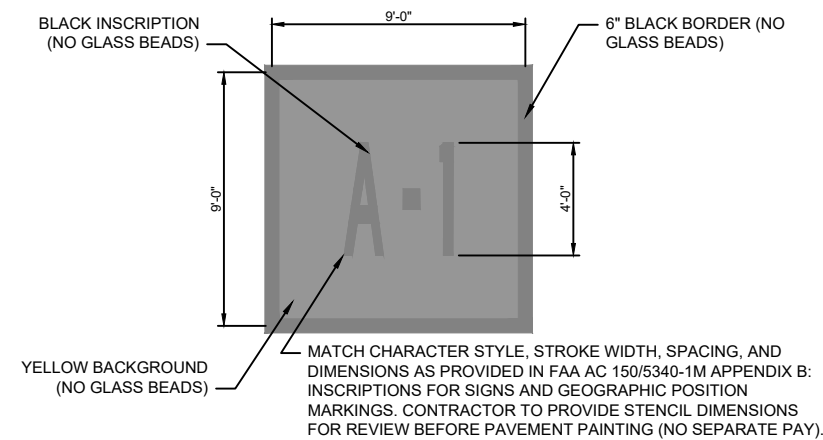


TAXIWAY REFLECTORS - (P-620)
NTS

2
25
NTS RETROREFLECTIVE PAVEMENT MARKING DETAIL

NOTE:

TIE DOWN LABEL
MARKINGS SHALL BE
PAID FOR BY EACH.



3
25
NTS TIE DOWN LABEL MARKING DETAIL



NO.	DATE:		REVISIONS	
	DATE	BY	DESCRIPTION	ADDENDUM NO.
1	8/4/2026			2

MARKING DETAILS

CITY OF BRYAN, TEXAS
BRYAN - COULTER AIRFIELD
APRON EXPANSION

JOB NO.
4401.006

PROJECT MGR.
MKG



SHEET
25