CONROE-NORTH HOUSTON REGIONAL AIRPORT(CXO)
TxDOT CSJ No. 2412CONRO

ADDENDUM NO. 1

October 22, 2025

TO ALL PROSPECTIVE BIDDERS:

All bidders shall acknowledge receipt of this and all other addenda on page 4 of 5 of the Bid Form. **Failure to acknowledge receipt of an addendum may be cause for rejection of the bid.** This addendum becomes a part of the contract documents. All provisions of the original plans, specifications, and contract documents shall remain in full force and effect, except as modified by this addendum.

A. You are hereby notified of the following amendments to the Bid Form for the subject project.

   a) **Revised term "Skidabrader" to "Shot Blasting" for bid item P-620-5.1.e. Revised P-620 spec numbers in descriptions.**

B. You are hereby notified of the following amendments to the Contract Documents/Specifications for the subject project.

   a) **Revised term "Skidabrader" to "Shot Blasting" for Table of Contents and P-620. Clarifications were made to the method of measurement and pay items for P-620.**

C. You are hereby notified of the following amendments to the Construction Plans for the subject project.

   a) **Revised term "Skidabrader" to "Shot Blasting" on sheets 0.1 and 0.2. Revised units to Square Yards. Revised P-620 spec numbers in the summary of quantities table.**

D. A copy of the pre-bid meeting minutes, and sign-in sheet are included with this addendum.

E. Additional Clarification and Questions:

   a) **See Questions and Answers included with pre-bid meeting minutes.**

ADDENDUM NO. 1 ISSUED BY:

H.W. Lochner, Inc.

Chris A. Whitfield, P.E.
Project Manager

TBPE Firm Registration No. 10488

CAW/sls
Enclosures
pc: 22494

Lochner

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CONROE-NORTH HOUSTON REGIONAL AIRPORT(CXO)

TxDOT CSJ No. 2412CONRO
Lochner Project No. 22494

PRE-BID MEETING MINUTES
Wednesday October 14, 2025; 11:00 a.m.

I. Sign In Sheet:

Name	Company	Email	Person	Virtual
Robert Johnson	TxDOT	robert.n.johnson@txdot.gov	✓	
Eli Lopez	TxDOT	eli.lopez@txdot.gov		✓
James Brown	Conroe-North Houston	james.brown@mctx.org	✓	
Stephen Schwieterman	Lochner	sschwieterman@hwlochner.com	✓	
Alexis Tomlinson	Lochner	atomlinson@hwlochner.com		✓
Paul Tollison	Conroe-North Houston	Paul.tollison@mctx.org	✓	
Mike Van Wormer	Hi-Lite	Mike.vanwormer@hi-lite.com	✓	
Josh Jones	Skidabrader	joshua.jones@skidabrader.com	✓	

Agenda:

II. Identify Key Personnel:

A. Robert Johnson, Project Manager, TxDOT

B. James Brown, Airport Manager, Conroe

C. Stephen Schwieterman, Project Manager, Lochner

III. Bidding Procedure:

A. Receipt and Opening of Bids:

1. Proposals will be received until **2:00 pm CST on Thursday, October 30, 2025**:

   Sealed bids for the construction of airport improvements at Statewide Airport Project India need to be addressed and delivered to Brandy Schwettmann, TxDOT Aviation Division, 6230 E. Stassney Lane, 2nd Floor, Austin, Texas 78744. The delivered package must be clearly marked as "Bid Proposal".

   Then publicly opened and read. Any bid received after closing time will be returned unopened.

2. Bidding documents may be examined at: TxDOT Aviation Division, 6230 E. Stassney Lane, Austin, TX 78704; or H.W. Lochner, 12750 Merit Drive, Suite 570, Dallas, Texas 75251

3. Envelopes containing bids must be sealed and addressed as shown in the Instructions To Bidders of the Contract Documents/Specifications.

4. See Notice to Bidders and Instructions to Bidders section in Contract Documents for bidding information.

B. Contract Provisions and Proposal Form:

1. Mandatory contract provisions are identified in General Provisions and Supplementary Provisions of the Contract Documents. **The DBE goal for this project is 0% and the bidders shall use the attached DBE participation plan and appropriate commitment agreement forms and submit those documents to TxDOT Aviation within 5 calendar days after the bid opening via email to AVRNFQ@txdot.gov.**

2. Proposers shall provide a statement of qualifications with their proposal of past similar work, a financial statement, and a statement of plant and equipment proposed for use on the project. In lieu of the financial statement, Contractors may provide evidence that they are pre-qualified with TXDOT for similar work and are on the current TXDOT bidders list.

3. The Contractor and his/her Subcontractors will be required to provide certificates of insurance for at least the minimum amounts specified in the Special Provisions.

4. Bidder shall reference the Aviation Division General Construction Contract Provisions.
http://txdot.gov/inside-txdot/division/aviation/general-provisions.html

5. The bidder shall submit the completed bid either on the form furnished by TxDOT or by submitting an electronically printed version. All blank spaces in the TxDOT bid form must be correctly filled in where indicated for each and every item for which quantity is given. The bidder shall state the price both in words and numerals for each pay item furnished in the bid.

6. A Bid Bond guarantee will be required with each bid as a certified check or a bid bond in the amount of two (2) percent of the total amount of the bid, made payable to the TxDOT Aviation.

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IV. Scope of Work:

A. The project consists of:

- ✈ **CONROE-NORTH HOUSTON REGIONAL AIRPORT (CXO)**
  - Airfield Marking Improvements
  - Remark Runway 14-32 and Runway 1-19

B. The construction time for this project is 40 calendar days.

- ✈ **PHASE 1A**
  - 7 Calendar Days
- ✈ **PHASE 1B**
  - 7 Calendar Days
- ✈ **PHASE 1C**
  - 7 Calendar Days
- ✈ **PHASE 2**
  - 5 Calendar Days
- ✈ **PHASE 3A**
  - 7 Calendar Days
- ✈ **PHASE 3B**
  - 7 Calendar Days

V. Site Access/Staging Area:

A. See CSPP sheets for contractor access and staging areas.

VI. Safety and Phasing Plan:

A. Contractor will be required to be in compliance with FAA Advisory Circular 150/5370-2G, Operational Safety on Airports during Construction (or latest edition).

B. TxDOT will provide Construction Observation throughout the project. The Contractor shall provide all testing as outlined in the Contract Documents / Specifications.

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Questions:

1. Will badging/flagging be required? Yes, the PM/Supervisor will go through training. A badge may be required for a security access point, but it will not be a SIDA badge.

2. If the contractor decides to bid on both schedules, which 2% bid bond should they reference? The contractor should use the highest value for their 2% bid bond.

3. Will there be additional staging areas? Yes, the airport has additional staging areas that may be used. An image of the additional areas will be attached below.

4. Does the airport have a spoils pile? Yes, the airport has a spoils pile. The additional staging area at the end of Runway 14 and the additional staging area at the end of Runway 19 both have spoils piles.

5. Does the airport have a designated place to drain "gray water"? The airport stated they can find a place on site to drain gray water.

6. When will construction start? Construction is anticipated to start March 2026.

7. Can you please clarify will grinding be allowed for marking removal in Schedule 1? Grinding for marking removal on concrete pavement will be allowed provided it doesn't damage the pavement. A test strip should be witnessed by RPR and airport personnel to make sure markings can be removed in this method without damage to the pavement.

8. There is a note on one of plan sheets stating that equipment over 12,500 lbs should not be used on airport pavement. However, most of our equipment will be over this amount for removal of marking, and re-marking. Does this weight limit apply to this project? This note was intended for smaller pavements. Conroe's runways are rated 75k pounds Dual Wheel on Runway 1-19 and 100k pounds on Runway 14-32. Contractor should make sure their equipment will not damage the pavement.

9. What equipment can be used for shot blasting for schedule 2? Equipment for shot blasting must be equipped to make a 72" minimum pass in width and be in compliance with specification TxDOT Special Specification 3016 Pavement Texturing attached in this addendum.

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Additional Items:

Additional photo to show the rubber build up on Runway 14.


Untitled Map
Legend
East Fork Crystal Creek
Staging Area
Staging area
Staging Area
Google Earth
Image © 2025 Airbus
3000 ft
N

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Date: October 14, 2025 | 11:00 AM – 12:00 PM

Location: Conroe-North Houston Regional Airport – Teams Virtual Option
10260 Carl Pickering Memorial Dr
Conroe, Texas 77303

Re: 2412CONRO Conroe-North Houston Regional Airport Project Pre-Bid Meeting
TxDOT CSJ No: 2412CONRO

Attendees:

Name	Company	Email	Person	Virtual
Robert Johnson	TxDOT	robert.n.johnson@txdot.gov	✓	
Eli Lopez	TxDOT	eli.lopez@txdot.gov		✓
James Brown	Conroe-North Houston	james.brown@mctx.org	✓	
Stephen Schwieterman	Lochner	sschwieterman@hwlochner.com	✓	
Alexis Tomlinson	Lochner	atomlinson@hwlochner.com		✓
Paul Tollison	Conroe-North Houston	Paul.tollison@mctx.org	✓	
Mike VanWormer	Hi-Lite	Mike.vanwormer@hi-lite.com	✓	
Josh Jones	Skidabrader	joshua.jones@skidabrader.com	✓	

N

350 0 350 700
Scale in Feet

LEGEND

REMARK AREA

1 Shot Blasting Limits Note:

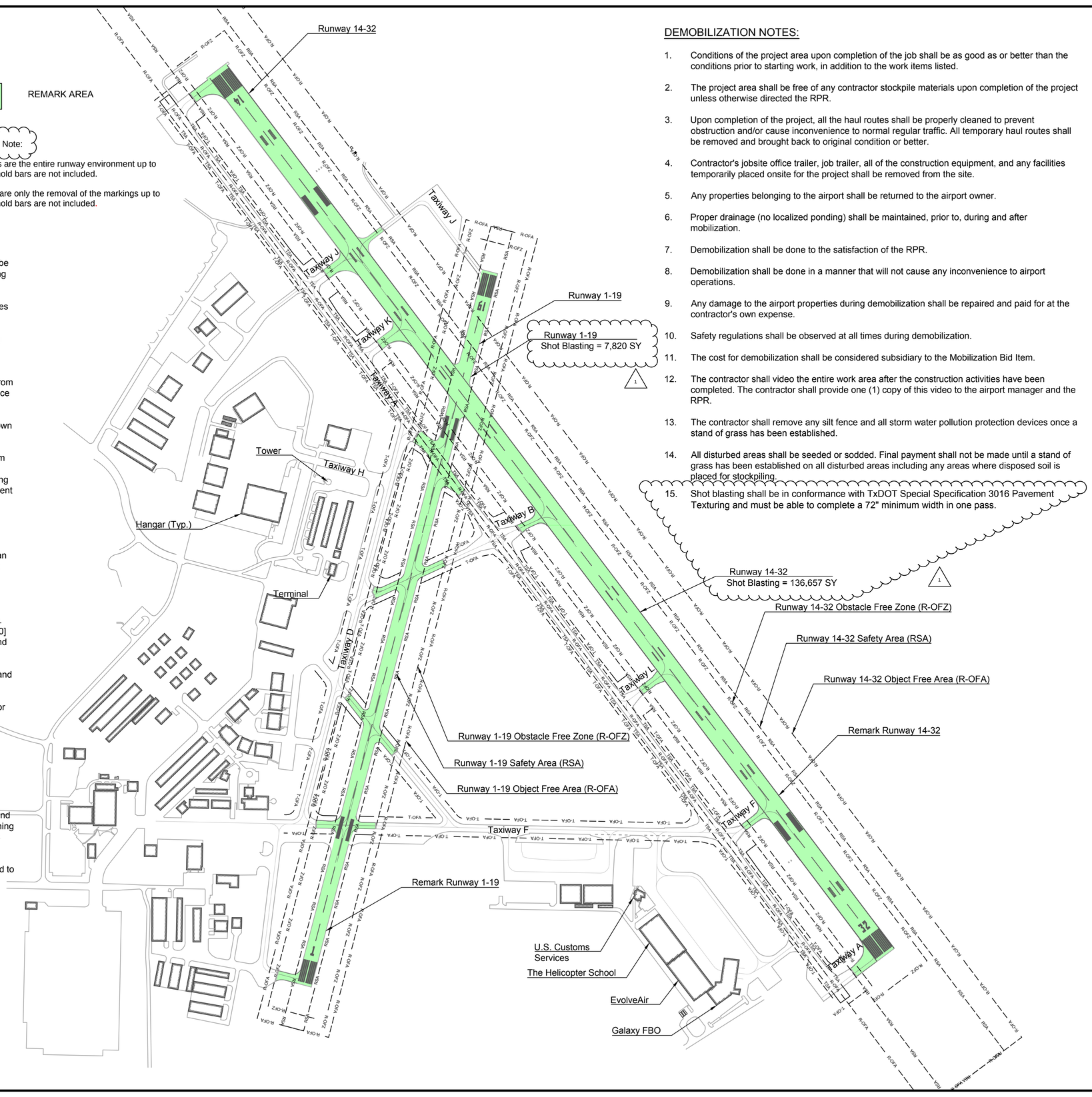
Runway 14-32 limits are the entire runway environment up to the hold bars. The hold bars are not included.

Runway 1-19 limits are only the removal of the markings up to the hold bars. The hold bars are not included.

GENERAL NOTES:

1. The existing features shown on these plans are those noted in the field and those taken from record drawings. This does not guarantee that all features are shown on the Plans. There will be no additional payment to the Contractor due to variations in size, quantity, or location of existing features.
2. Only rubber-tired vehicles under 12,000 lbs GVWR will be allowed on airport pavement surfaces without prior Engineer approval.
3. The Contractor shall be responsible for the restoration and seeding of the Contractor's staging area, access, and haul roads if damage has occurred due to construction activities. No direct payment will be made for these items. Seeding shall be done as required in accordance with Items T-901: Seeding and T-908: Mulching, of the FAA Specifications, returning the area to original or better condition. All of the Contractor's equipment and materials shall be removed from the Air Operations Area (AOA) prior to reopening the airfield pavement. The airport maintenance personnel shall be responsible for mowing the airfield.
4. Waste materials resulting from this Project shall be disposed of off Airport Property unless shown otherwise on these plans.
5. The Construction Safety and Phasing Plan (CSPP) drawings depict haul routes for access from surrounding public roadways and haul route through the airport perimeter fence. Contractor access and hauling operations are strictly limited to the haul routes shown. Any time an existing airfield pavement is traversed or crossed, the Contractor shall provide protection to the pavement edges. The Contractor is required to sweep and maintain the pavement as directed by the Resident Project Representative (RPR).
6. The Contractor will be required to repair any damage to public and airport roads and airfield pavements caused by the Contractor's trucks and equipment during the construction of the project. Repairs shall be adequate to return the pavements to a condition equal to or better than the condition prior to damage. All repair work shall be at the Contractor's expense. The airport entrance road and haul routes shall be videoed and photographed by the Contractor in the presence of the Engineer or the RPR prior to construction in order to document their existing condition.
7. The Contractor to work with ATCT to maintain the correct frequency during construction hours. The Contractor shall monitor Common Traffic Advisory Frequency (CTAF) 124.125 [0600-2100] and the Tower Frequency 120.45 [0600-2100] at all times during construction and shall respond to any instructions for Airport personnel and/or the RPR immediately. The Contractor shall provide their own radios capable of transmitting and receiving. The Contractor may utilize two-way construction radios on the project provided they do not interfere with existing Airport and FAA communication equipment and frequencies.
8. No changes to the approved Construction Safety and Phasing Plan will be allowed without prior approval and concurrence from the RPR, Airport, and FAA.
9. The Contractor shall provide the Airport with the contact information of the Supervisor on site.
10. The Contractor has the option of installing temporary drainage structures for construction of temporary access drives during construction. Once construction is complete, the drives and drainage structures shall be removed and the area restored to its original condition. This work shall be considered subsidiary to other bid items in the contract.
11. Contractor shall be responsible for obtaining water, as required for completion of the project, and shall coordinate with the local water provider for pricing, obtaining a water meter, and determining a location for water access. The cost of this work shall be considered subsidiary to other items bid.
12. Contractor shall provide sanitary portable toilet(s) for use on the jobsite, which shall be secured to prevent movement, for toilet quantity, see OSHA 1915.88(d)(2). Contractor shall coordinate maintenance of portable toilet(s) and shall escort the maintenance vehicles to the toilet(s) location(s).

Runway 14-32 Safety Dimensions	
Runway ARC:	D-II
Runway Length & Width:	7,501' x 150'
Runway Safety Area (RSA):	9,501' x 500'
Runway Object Free Area (R-OFA):	9,501' x 800'
Runway Obstacle Free Zone (R-OFZ):	7,901' x 400'
Runway 1-19 Safety Dimensions	
Runway ARC:	B-II
Runway Length & Width:	5,000' x 100'
Runway Safety Area (RSA):	5,600' x 150'
Runway Object Free Area (R-OFA):	5,600' x 500'
Runway Obstacle Free Zone (R-OFZ):	5,400' x 400'



DEMOBILIZATION NOTES:

1. Conditions of the project area upon completion of the job shall be as good as or better than the conditions prior to starting work, in addition to the work items listed.
2. The project area shall be free of any contractor stockpile materials upon completion of the project unless otherwise directed the RPR.
3. Upon completion of the project, all the haul routes shall be properly cleaned to prevent obstruction and/or cause inconvenience to normal regular traffic. All temporary haul routes shall be removed and brought back to original condition or better.
4. Contractor's jobsite office trailer, job trailer, all of the construction equipment, and any facilities temporarily placed onsite for the project shall be removed from the site.
5. Any properties belonging to the airport shall be returned to the airport owner.
6. Proper drainage (no localized ponding) shall be maintained, prior to, during and after mobilization.
7. Demobilization shall be done to the satisfaction of the RPR.
8. Demobilization shall be done in a manner that will not cause any inconvenience to airport operations.
9. Any damage to the airport properties during demobilization shall be repaired and paid for at the contractor's own expense.
10. Safety regulations shall be observed at all times during demobilization.
11. The cost for demobilization shall be considered subsidiary to the Mobilization Bid Item.
12. The contractor shall video the entire work area after the construction activities have been completed. The contractor shall provide one (1) copy of this video to the airport manager and the RPR.
13. The contractor shall remove any silt fence and all storm water pollution protection devices once a stand of grass has been established.
14. All disturbed areas shall be seeded or sodded. Final payment shall not be made until a stand of grass has been established on all disturbed areas including any areas where disposed soil is placed for stockpiling.
15. Shot blasting shall be in conformance with TxDOT Special Specification 3016 Pavement Texturing and must be able to complete a 72" minimum width in one pass.

10/22/2025
STATE OF TEXAS
CHRIS A. WHITFIELD
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CONROE-NORTH HOUSTON REGIONAL AIRPORT
CONROE, TEXAS
TXDOT CSJ NO. 2412CONRO

PROJECT NO.	22494
DRAWN BY	SED
DATE	03-13-25
CHECKED BY	KWR
DATE	04-18-25
DESIGNED BY	APT
DATE	03-13-25
REVISIONS	ADDENDUM 1
DATE	10-22-2025

GENERAL LAYOUT

0.1

1

TXDOT AVIATION
CONROE-NORTH HOUSTON REGIONAL AIRPORT
SUMMARY OF QUANTITIES

ITEM NO.	SPEC	ITEM DESCRIPTION	UNIT	QUANTITY	
				ESTIMATED	AS-CONST.
BID SCHEDULE 1					
Mark Runways 14-32 and 1-19					
1.01	C-105-6.1	Mobilization	L.S.	1	
1.02	S-1-2.1	Temporary Marking, Lighting and Barricades	L.S.	1	
1.03	P-620-5.1.a.1	Removal of Existing Runway Markings	S.F.	243,050	
1.04	P-620-5.1.a.2	Removal of Existing Taxiway Markings	S.F.	34,860	
1.05	P-620-5.1.b.1	Reflectorized Pavement Marking (White)	S.F.	156,670	
1.06	P-620-5.1.b.2	Reflectorized Pavement Marking (Yellow)	S.F.	13,030	
1.07	P-620-5.1.b.3	Non-Reflectorized Pavement Marking (Black)	S.F.	111,650	
BID SCHEDULE 2					
Mark Runways 14-32 and 1-19					
2.01	C-105-6.1	Mobilization	L.S.	1	
2.02	S-1-2.1	Temporary Marking, Lighting and Barricades	L.S.	1	
2.03	P-620-5.1.e	Shot Blasting	S.Y.	144,500	
2.04	P-620-5.1.b.1	Reflectorized Pavement Marking (White)	S.F.	156,670	
2.05	P-620-5.1.b.2	Reflectorized Pavement Marking (Yellow)	S.F.	13,030	
2.06	P-620-5.1.b.3	Non-Reflectorized Pavement Marking (Black)	S.F.	111,650	

PAY ITEM NOTES:

1. General
   a. The Contractor shall provide copies of all subcontracts to the RPR 14 days prior to the pre-construction conference. At a minimum, the information shall include the following:
      - Subcontractor's legal company name.
      - Subcontractor's legal company address, including County name.
      - Principal contact person's name, telephone and fax number.
      - Complete narrative description, and dollar value of the work to be performed by the subcontractor.
      - Copies of required insurance certificates in accordance with the specifications.
      - Minority/ non-minority status.
   b. See Section 80-01 of the General Provisions of the Specifications.

2. Phasing
   a. Liquidated damages shall be assessed for phase 2 for nighttime work individually and for the project as a whole.
   b. Contractor shall be required to schedule the closure for each Runway with the Airport and the RPR a minimum of 72 hours in advance.

3. Permitting
   a. Contractor shall be responsible for applying for all applicable permits through the City and pay any required permitting fees.

4. Water
   a. Contractor shall be responsible for obtaining water for the project and shall coordinate with the City of Conroe to determine acceptable locations for water access near the jobsite.
   b. Contractor shall coordinate with the City of Conroe to obtain a meter for water access and for determination of the pricing for water. Cost of water shall be incidental to other items bid.
   c. Contractor shall install an overhead standpipe at the water access location to enable filling of equipment without a direct connection to the hydrant.
   d. Contractor shall be responsible for any damage incurred to existing water source(s) due to improper use and/or protection, and the Contractor shall immediately make any repairs necessary if damage is incurred.

5. Mobilization
   a. Prior to beginning any work, the Contractor shall complete a Safety Plan Compliance Document, it shall be approved by the Airport Manager and the Engineer, and the Contractor shall complete closures and place low profile barricades as required in the Construction Safety and Phasing Plan.
   b. Contractor is required to document the condition of the haul route and public and airport pavements in the vicinity of the construction limits prior to mobilizing to the jobsite. Video and photo documentation shall be provided to the Engineer and Airport prior to beginning work.
   c. Any damage incurred to pavements due to the Contractor's equipment or operations shall be repaired to a condition equal to or better than the condition prior to the beginning of work. All repairs shall be completed to the satisfaction of the Engineer at the Contractor's expense.

6. Temporary Marking, Lighting, and Barricades
   a. Contractor shall sufficiently weight barricades and closure markings to prevent movement. Contractor shall adjust and provide additional support for these items to prevent movement as required and as directed by the Airport, Engineer, or Engineer's representative.
   b. This item shall include providing temporary power service as required to maintain lighted edge lights and signs for pavements that are scheduled to remain open and cover or disable lights and signs for closed pavements in each respective phase.
   c. This item shall include covering or otherwise disabling lights,signs, markings directing aircraft to closed pavements.
   d. Work required for the construction and deconstruction of temporary access roads for haul of materials shall be covered under pay item, "Temporary Marking, Lighting and Barricades".
   e. Any damage incurred to pavements due to the Contractor's equipment or operations shall be repaired to a condition equal to or better than the condition prior to the beginning of work. All repairs shall be completed to the satisfaction of the Engineer and be subsidiary to Temporary Marking, Lighting and Barricades pay item.

7. Pavement Marking Removal
   i. Pavement Marking removal shall be paid for only for markings removed from pavement that is scheduled to remain in place. The quantity for this item includes the markings scheduled for removal and their respective black outlines as shown on the Demolition Plans.
   j. Shot blast is not allowed and all waste from paint removal shall be removed and disposed off airport property per federal, state, and local regulations.

8. Pavement Markings
   a. Surface Preparation, Pavement Marking Removal shall be paid for only for markings removed from pavement that is scheduled to remain in place. The quantity for this item includes the "blacked out" markings scheduled for removal and their respective black outlines as shown on the Demolition Plans.
   b. No pavement markings shall be allowed to be placed until the pavement receiving paint is cleaned of cure compound, cleaned, and approved by the RPR for receiving paint.
   c. Any damage to new or existing paint shall be re-painted to the satisfaction of the RPR. This shall be considered subsidiary to other pay items.

10/22/2025
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PROJECT NO.	22494
DRAWN BY	SED
DATE	03-13-25
CHECKED BY	KWR
DATE	04-18-25
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REVISIONS	ADDENDUM 1
DATE	10-22-2025

SUMMARY OF QUANITIES AND PAY ITEM NOTES

0.2

ITEM P-620
RUNWAY AND TAXIWAY MARKING

DESCRIPTION

620-1.1 This item shall consist of the preparation and painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Resident Project Representative (RPR). The terms "paint" and "marking material" as well as "painting" and "application of markings" are interchangeable throughout this specification.

MATERIALS

620-2.1 MATERIALS ACCEPTANCE. The Contractor shall furnish manufacturer's certified test reports, for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. This certification along with a copy of the paint manufacturer's surface preparation; marking materials, including adhesion, flow promoting and/or floatation additive; and application requirements must be submitted and approved by the Resident Project Representative (RPR) prior to the initial application of markings. The reports can be used for material acceptance or the RPR may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the RPR upon arrival of a shipment of materials to the site. All material shall arrive in sealed containers that are easily quantifiable for inspection by the RPR.

620-2.2 MARKING MATERIALS.

TABLE 1
MARKING MATERIALS

Paint[1]				Glass Beads[2]	
Type	Color	Fed Std. 595 Number	Application Rate Maximum	Type	Application Rate Minimum
Waterborne Type 1	White	37925	115 ft^2/gal	Type 1 Gradation A	7 lb/gal
Waterborne Type 1	Yellow	33583 or 33655	115 ft^2/gal	Type 1 Gradation A	7 lb/gal I
Non-Reflective Pavement Marking Type 1	Black	37038	115 ft^2/gal	Type 1 Gradation A	None

[1] See paragraph 620-2.2a
[2] See paragraph 620-2.2b

a. Paint. Paint shall be waterborne in accordance with the requirements of this paragraph. Paint colors shall comply with Federal Standard No. 595.

Paint Color	Fed Std. No 595 Color Number
White	37925
Yellow	33538 or 33655
Black	37038

APPLICATION RATES FOR PAINT AND GLASS BEADS FOR TABLE 1

Paint		Glass Beads		
Type	**Application Rate Maximum**	**Type I, Gradation A[1] Minimum**	**Type III Minimum**	**Type IV[1] Minimum**
Waterborne Type I	115 ft^2/gal.	7 lb/gal.	10 lb/gal.	--
Temporary Marking Waterborne Type I or II	230 ft^2/gal.	No beads	No beads	No beads

[1]Glass bead application rate for Red and Pink paint shall be reduced by 2 lb/gal for Type I and Type IV beads.

Waterborne. Paint shall meet the requirements of Federal Specification TT-P-1952F, Type I**.** The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis.

Reflective media. Glass beads for white and yellow paint shall meet the requirements for Federal Specification TT-B-1325D Type I, Gradation A.

Glass beads for red and pink paint shall meet the requirements for Type I, Gradation A.

Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment.

Glass beads shall not be used in black and green paint.

Type III glass beads shall not be used in red and pink paint.

CONSTRUCTION METHODS

620-3.1 WEATHER LIMITATIONS. Painting shall only be performed when the surface is dry, and the ambient temperature and the pavement surface temperature meet the manufacturer's recommendations in accordance with paragraph 620-2.1. Painting operations shall be discontinued when the ambient or surface temperatures do not meet the manufacturer's recommendations. Markings shall not be applied when the wind speed exceeds 10 mph unless windscreens are used to shroud the material guns. Markings shall not be applied when weather conditions are forecasts to not be within the manufacturers' recommendations for application and dry time.

620-3.2 EQUIPMENT. Equipment shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an atomizing spray-type or airless type marking machine with automatic glass bead dispensers suitable for application of traffic paint. It shall produce an even and uniform film thickness and appearance of both paint and glass beads at the required coverage and shall apply markings of uniform cross-sections and clear-cut edges without running or spattering and without over spray. The marking equipment for both paint and beads shall be calibrated daily.

620-3.3 PREPARATION OF SURFACES. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other contaminates that would reduce the bond between the

paint and the pavement. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the RPR. After the cleaning operations, sweeping, blowing, or rinsing with pressurized water shall be performed to ensure the surface is clean and free of grit or other debris left from the cleaning process.

a. Preparation of new pavement surfaces. The area to be painted shall be cleaned by broom, blower, water blasting, or by other methods approved by the RPR to remove all contaminants, including PCC curing compounds, minimizing damage to the pavement surface.

b. Preparation of pavement to remove existing markings. Existing pavement markings shall be removed by ~~rotary grinding,~~ water blasting, **Shot Blasting** or by other methods approved by the ~~RP~~R **engineer** minimizing damage to the pavement surface. The removal area may need to be larger than the area of the markings to eliminate ghost markings. After removal of markings on asphalt pavements, apply a fog seal or seal coat to 'block out' the removal area to eliminate 'ghost' markings. See P-620-3.10 Removals of Markings for construction method of marking removals. Method of Measurement for marking removals and Basis of Payment for marking removals are addressed under P-620-3.10.

c. Preparation of pavement markings prior to remarking. Prior to remarking existing markings, loose existing markings must be removed minimizing damage to the pavement surface, with a method approved by the RPR. After removal, the surface shall be cleaned of all residue or debris.

Prior to the application of markings, the Contractor shall certify in writing that the surface is dry and free from dirt, grease, oil, laitance, or other foreign material that would prevent the bond of the paint to the pavement or existing markings. This certification along with a copy of the paint manufactures application and surface preparation requirements must be submitted to the RPR prior to the initial application of markings.

620-3.4 LAYOUT OF MARKINGS. The proposed markings shall be laid out in advance of the paint application. The locations of markings to receive glass beads shall be shown on the plans.

620-3.5 APPLICATION. A period of days shall elapse between placement of surface course or seal coat and application of the final permanent paint markings. ~~Paint shall be applied at the locations and to the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface has been approved by the RPR~~.

The edges of the markings shall not vary from a straight line more than 1/2 inch in 50 feet, and marking dimensions and spacing shall be within the following tolerances:

MARKING DIMENSIONS AND SPACING TOLERANCE

Dimension and Spacing	Tolerance
36 inch or less	±1/2 inch
greater than 36 inch to 6 feet	±1 inch
greater than 6 feet to 60 feet	±2 inch
greater than 60 feet	±3 inch

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate shown in Table 1. The addition of thinner will not be permitted.

Glass beads shall be distributed upon the marked areas at the locations shown on the plans to receive glass beads immediately after application of the paint. A dispenser shall be furnished that is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate shown in Table 1. Glass beads shall not be applied to black paint or green paint. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made. Different bead types shall not be mixed. Regular monitoring of glass bead embedment and distribution should be performed.

~~**620-3.6 APPLICATION--PREFORMED THERMOPLASTIC AIRPORT PAVEMENT MARKINGS.**~~

620-3.7 CONTROL STRIP. Prior to the full application of airfield markings, the Contractor shall prepare a control strip in the presence of the RPR. The Contractor shall demonstrate the surface preparation method and all striping equipment to be used on the project. The marking equipment must achieve the prescribed application rate of paint and population of glass beads (per Table 1) that are properly embedded and evenly distributed across the full width of the marking. Prior to acceptance of the control strip, markings must be evaluated during darkness to ensure a uniform appearance.

620-3.8 RETRO-REFLECTANCE. [Reflectance shall be measured with a portable retro-reflectometer meeting ASTM E1710 (or equivalent). A total of 6 reading shall be taken over a 6 square foot area with three (3) readings taken from each direction. The average shall be equal to or above the minimum levels of all readings which are within 30% of each other.

MINIMUM RETRO-REFLECTANCE VALUES

Material	Retro-reflectance mcd/m²/lux		
	White	Yellow	Red
Initial Type I	300	175	35
Initial Type III	600	300	35
Initial Thermoplastic	225	100	35
All materials, remark when less than[1]	100	75	10

[1] 'Prior to remarking determine if removal of contaminants on markings will restore retro-reflectance.

620-3.9 PROTECTION AND CLEANUP. After application of the markings, all markings shall be protected from damage until dry. All surfaces shall be protected from excess moisture and/or rain and from disfiguration by spatter, splashes, spillage, or drippings. The Contractor shall remove from the work area all debris, waste, loose reflective media, and by-products generated by the surface preparation and application operations to the satisfaction of the RPR. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations.

620-3.10 REMOVAL OF MARKINGS. Designated existing pavement markings shall be physically removed by ~~sandblasting, chemical removal~~ **waterblasting, and shot blasting** or other means approved by the Engineer. Removal by painting over existing markings will not be allowed. Any methods used shall not cause major damage to the pavement. Major damage is defined as changing the properties of the pavement or removing pavement over 1/8 inch deep. If chemicals are used, they shall comply with the state's environmental protection regulations. No material shall be deposited on the runway shoulders. All wastes shall be disposed of as indicated by the Engineer.

METHOD OF MEASUREMENT

620-4.1a The quantity of surface preparation **and removal** shall be measured by the number of square feet for each type of surface preparation specified in paragraph 620-3.3.

620-4.1b The quantity of markings **including reflective media** to be paid for shall be measured by the number of square feet of painting.

~~**620-4.1c The quantity of reflective media shall be paid for by [the number of pounds] [lump sum] of reflective media.**~~

620-4.1d The quantity of temporary markings shall not be paid for separately and shall be subsidiary to the item **it is** contained to in accordance with the specifications and accepted by the Engineer.

620-4.1e The quantity of pavement marking removals for **shot blasting** is to be paid for shall be the number of square ~~feet~~ **yards** of marking removals**.**

BASIS OF PAYMENT

620-5.1 This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item complete in place and accepted by the RPR in accordance with these specifications.

620-5.1a Payment for surface preparation **and removal** shall be made at the contract price for the number of square feet for each type of surface preparation specified in paragraph 620-3.3.

620-5.1b Payment for markings **including reflective media** shall be made at the contract price for by the number of square feet of painting.

~~**620-5.1c** Payment for reflective media shall be~~ **subsidiary to the final markings** ~~made at the contract unit price for [the number of pounds of reflective media] [lump sum].~~

620-5.1d Payment for temporary markings shall not be paid for **separately and shall be subsidiary to the item it is contained.** ~~be made at the contract price for the number of square feet of painting. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.~~

620-5.1e Payment for marking removals **for shot blasting** shall be made at the contract price for the number of square ~~feet~~ **yards** of marking removals.

Payment will be made under:

P-620-5.1.a.1	Removal of Existing Runway Markings	Per Square Foot
P-620-5.1.a.2	Removal of Existing Taxiway Markings	Per Square Foot
P-620-5.1.b.1	Reflectorized Pavement Marking (White)	Per Square Foot
P-620-5.1.b.2	Reflectorized Pavement Marking (Yellow)	Per Square Foot
P-620-5.1.b.3	Non-Reflectorized Pavement Marking (Black)	Per Square Foot
P-620-5.1.e	Shot Blasting	Per Square Yard

REFERENCES

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

ASTM International (ASTM)

ASTM D476 Standard Classification for Dry Pigmentary Titanium Dioxide Products

ASTM D968 Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive

ASTM D1652 Standard Test Method for Epoxy Content of Epoxy Resins

ASTM D2074 Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method

ASTM D2240 Standard Test Method for Rubber Property - Durometer Hardness

ASTM D7585 Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments

ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester

ASTM E1710 Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer

ASTM E2302 Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer

ASTM G154 Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

Code of Federal Regulations (CFR)

40 CFR Part 60, Appendix A-7, Method 24
Determination of volatile matter content, water content, density, volume solids, and weight solids of surface coatings

29 CFR Part 1910.1200 Hazard Communication

Federal Specifications (FED SPEC)

FED SPEC TT-B-1325D Beads (Glass Spheres) Retro-Reflective

FED SPEC TT-P-1952F Paint, Traffic and Airfield Marking, Waterborne

FED STD 595 Colors used in Government Procurement

Commercial Item Description

A-A-2886B Paint, Traffic, Solvent Based

Advisory Circulars (AC)

AC 150/5340-1	Standards for Airport Markings
AC 150/5320-12	Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces

END OF ITEM P-620

Special Specification 3016
Pavement Texturing

1. DESCRIPTION

This Item governs for the texturing of existing asphaltic concrete pavement and hydraulic cement concrete pavement and the texturing of bridge deck surfaces at the locations shown on the plans or as directed and in accordance with this Item.

2. EQUIPMENT

The texturing must be done by a machine designed and built for high production pavement texturing. Each machine must have a minimum average production rate of 1,200 sq. yd. per hour for concrete surfaces and 1,800 sq. yd. per hour. for asphalt surfaces. The machine must employ the High Velocity Impact Method (HVIM) by hurling steel abrasive media at high velocity to abrade and texture the surface. The machine must be capable of varying the velocity of the steel abrasive as well as the speed of the machine to produce the desired surface texture. No objectionable dust must be emitted during the work. The machinery must direct the velocity of abrasion in a bi-directional fashion, giving uniform abrasion to the surface. When transverse or longitudinal grooves are present, the abrasion will be at an angle transverse to the grooves to give equal texture to the groove edges.

On-board controls capable of providing and monitoring uniform velocity and direction will be required. Self-contained lighting for night operations will be required.

A generator-driven electromagnet equal in width and production to the texturing machine will be available on the project. It will be used to pick up any steel abrasive left behind the machine if deemed necessary by the Engineer.

Verifiable proof of prior major pavement texturing, in accordance with this Specification, or satisfactory test sections performed at the Contractor's expense will be necessary before the equipment will be approved.

3. CONSTRUCTION

Texturing must be done on the areas indicated on the plans. Texturing must be performed in a continuous operation of consecutive passes up to 6 ft. in width (if necessary), parallel to the centerline, so that 1-12 ft. lane can be completed in a maximum of two passes. The textured surface must have a uniform surface appearance and be devoid of machine produced streaks, ruts, or over-lap grooves which will inhibit the free flow of water. It must have a non-directional texture. Following the texturing operation, the electromagnet must pass over the entire surface if deemed necessary by the Engineer.

The texturing must not encroach on the existing centerline stripes, lane stripes, traffic arrows, cross bar stripes, traffic buttons, or other traffic markings unless approved. The distance from the edge of traffic markings to the texture must be a maximum of 3 in. The longitudinal area between dashed lane markings need not be textured.

All surface materials removed during the texturing process must be collected and stored in the vacuum unit until it can be removed from the project and disposed of by the Contractor. No onsite transfer or storage of the materials will be permitted. No loose material will be left on the roadway or swept off to the side of the roadway. Haul and dispose removed material in conformance with applicable federal, state, and local regulations. Obtain approval for the sequence of work and the estimated daily production.

4. TESTING

One of the following two testing procedures will be required.

4.1. **Test Method Tex 436-A**. When texturing first starts, the Engineer will test a minimum of four randomly selected wheelpath locations per lane mile in accordance with Tex-436-A. After the first lane mile, the Engineer will determine which subsequent lane miles will be tested. The minimum average texture depth must be shown on the plans. Surfaces not meeting this texture depth will be retextured at the Contractor's expense.

4.2. **ASTM E2380**. When texturing first starts, the Contractor will test a minimum of four randomly selected wheelpath locations approved per lane mile in accordance with ASTM E2380. After the first lane mile, the Engineer will determine which subsequent lane miles will be tested. Testing must be performed by the Contractor's technician under the supervision of the Engineer. The average of all tests over each lane mile must be 10 sec. or less. Sections not meeting this criterion will be retextured at the Contractor's expense.

5. MEASUREMENT

Texturing will be measured by the square yard of surface area for each pavement type. Pavement types are asphaltic concrete pavement, hydraulic cement concrete pavement, and bridge decks. Square yard calculations will be based on the dimensions shown on the plans or as adjusted by the Engineer.

6. PAYMENT

The work performed in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Texturing Asphaltic Concrete Pavement," "Texturing Hydraulic Cement Concrete Pavement," or "Texturing Bridge Decks." This price will be full compensation for texturing the pavement surface as well as vacuuming, hauling, unloading, and disposing of the material, for all labor, equipment, supplies, and incidentals.